

MODEL 3000 PULL TYPE PLANTER (EdgeVac® Seed Metering) OPERATOR & PARTS MANUAL

M0208

Rev. 9/07

This manual is applicable to: Model: 3000 Pull Type Planters
 Serial Number: 643873 And On

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

Model Number 3000 _____

Serial Number _____

Date Purchased _____

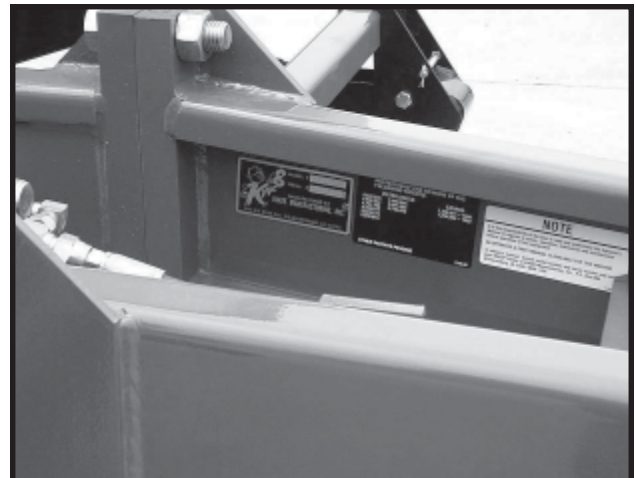
Monitor Serial Number _____
Measured Pulses Per Mile/Km (Radar Distance Sensor) _____
Measured Pulses Per Mile/Km (Magnetic Distance Sensor) _____

SERIAL NUMBER

The serial number plate is located on the planter hitch 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.

D061199219



KINZE®, the KINZE® logo, Double Frame®, Interplant® and EdgeVac® are registered trademarks of KINZE Manufacturing, Inc.

Rev. 9/07

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 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.
- Inflate tires to specified PSI air pressure. Tighten wheel lug bolts to specified torques.
- Check to be sure all safety decals are correctly located and legible. Replace if damaged.
- Check to be sure the 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.
- 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. 3000 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.

- Check for proper operation of vacuum fan with tractor to be used with planter.
- 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.
- Check with the customer as to the performance of the EdgeVac® Seed Metering System.
- 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

TABLE OF CONTENTS

TO THE OWNER	1-1
WARRANTY	1-2
INTRODUCTION	2-1
SPECIFICATIONS	3-1
SAFETY PRECAUTIONS	4-1
SAFETY WARNING SIGNS	5-1
MACHINE OPERATION	
Analog Vacuum Gauge	6-8
Checking Granular Chemical Application Rate	6-88
Checking Seed Population	6-87
Contact Wheel Spring Adjustment	6-3
Contact Wheel Drive Sprockets	6-4
Digital Vacuum Gauge Operation	6-8
Dry Fertilizer Attachment	6-79
Dry Fertilizer Rate Charts	6-81
Electronic Seed Monitor System	
KPM I	6-10
KPM II Stack-Mode	6-16
KPM III	6-44
Fertilizer Openers And Attachments	6-74
Field Adjustments	
Seed Rate Transmission Adjustment	6-4
Field Test	6-87
Hydraulic Planter Lift Operation	6-7
Hydraulic Row Marker Operation	6-7
Initial Preparation Of The Planter	6-1
Interplant® Self-Leveling Hitch Extension	6-86
Leveling The Planter	6-3
Liquid Fertilizer Attachment	6-82
Liquid Fertilizer Rate Charts	6-84
Metric Conversion Table	6-86
Planting Speed	6-86
Ridge Planting	6-5
Row Marker Length Adjustment	6-9
Row Marker Speed Adjustment	6-9
Shear Protection	6-6
Tire Pressure	6-3
Tire Scraper	6-5
Tractor Preparation And Hookup	6-1
Tractor Requirements	6-1
Transporting The Planter	6-86
Vacuum Fan Motor Valve Block Assembly	6-8
Wrap Spring Wrench Operation	6-5

TABLE OF CONTENTS

SEED METER OPERATION/MAINTENANCE

Field Adjustments

General Planting Rate Information	7-1
Planting And Application Rate Charts	7-5
Seed Meter Singulator Brush And Vacuum Level Adjustment	7-23
Seed Meter	7-2
Seed Meter Cleanout	7-4
Seed Meter Drive Release	7-25
Seed Meter Maintenance	7-26
Seed Metering System Troubleshooting	7-27
Vacuum Manifold Maintenance	7-26

ROW UNIT OPERATION

Closing Wheel Shield	8-2
Coulter Mounted Residue Wheels	8-13
Covering Discs/Single Press Wheel Adjustment	8-2
Drag Closing Attachment	8-3
Frame Mounted Coulter	8-8
Granular Chemical Bander Shield	8-15
Granular Chemical Banding Options	8-14
Granular Chemical Hopper And Drive	8-14
Interplant® Push Row Unit Clutch Sprockets	8-17
Interplant® Push Row Unit Lockups	8-16
Interplant® Push Row Unit Vacuum Hose Shutoff	8-17
Planting Depth	8-1
Quick Adjustable Down Force Springs	8-6
Residue Wheels (For Use With Frame Mounted Coulter)	8-9
Row Unit Chain Routing	8-5
Row Unit Extension Brackets	8-4
Row Unit Mounted Bed Leveler	8-10
Row Unit Mounted Disc Furrower	8-9
Row Unit Mounted No Till Coulter	8-12
Row Unit Mounted Residue Wheel	8-10
Seed Hopper	8-4
Spring Tooth Incorporator	8-15
“V” Closing Wheel Adjustment (Rubber And Cast Iron)	8-1

LUBRICATION

Bushings	9-3
Drive Chains	9-1
Grease Fittings	9-5
Interplant® Push Row Unit Lockups	9-4
Liquid Fertilizer Piston Pump Crankcase Oil Level	9-5
Lubrication Symbols	9-1
Sealed Bearings	9-1
Wheel Bearings	9-5
Wrap Spring Wrench Assembly	9-4

TABLE OF CONTENTS

MAINTENANCE

15" Seed Opener Disc Blade/Bearing Assembly	10-5
Chain Tension Adjustment	10-2
Check Valve Inspection (Located In Valve Block Below Vacuum Fan Motor Assembly)	10-14
Coulter Mounted Residue Wheels	10-9
Drag Closing Attachment	10-3
Electrical Wiring Diagram For Light Package	10-18
Frame Mounted Coulter And Attachment	10-6
Gauge Wheel Adjustment	10-3
Gauge Wheel Arm Bushing And/Or Seal Replacement	10-4
Gauge Wheel Arm Pivot Spindle Replacement	10-4
Granular Chemical Attachment	10-10
Hydraulic System Schematics	10-19
Hydraulic Diagram - Vacuum Fan Motor System	10-21
Mounting Bolts And Hardware	10-1
Piston Pump Storage	10-17
Preparation For Storage	10-18
Relief Valve Inspection (Located In Valve Block Below Vacuum Fan Motor Assembly)	10-14
Row Marker Bearing Lubrication Or Replacement	10-16
Row Marker Sequencing/Flow Control Valve Inspection	10-14
Row Unit Mounted Bed Leveler	10-8
Row Unit Mounted Disc Furrower	10-7
Row Unit Mounted No Till Coulter	10-9
Row Unit Mounted Residue Wheel	10-8
Seed Meter Maintenance	<i>See "Seed Meter Operation/Maintenance" Section</i>
Seed Tube Guard/Inner Scraper	10-6
Spring Tooth Incorporator	10-10
Tire Pressure	10-1
Torque Values Chart	10-1
Troubleshooting	
Closing Wheel Troubleshooting	10-3
KPM I/KPM II Stack-Mode Electronic Seed Monitor Troubleshooting	10-11
KPM III Electronic Seed Monitor Troubleshooting	10-12
Lift Circuit Troubleshooting	10-13
Piston Pump Troubleshooting	10-17
Row Marker Operation Troubleshooting	10-15
Seed Metering System Troubleshooting	<i>See "Seed Meter Operation/ Maintenance" Section</i>
Wheel Bearing Lubrication Or Replacement	10-16
PARTS LIST INDEX	P1
PARTS SECTION NUMERICAL INDEX	P121


TABLE OF CONTENTS

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 information which, if not heeded, could result in damage to the machine.



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 3000 Pull Type planter is available in various configurations and row spacings. Double Frame[®] Conversion Packages, Liquid Fertilizer Packages, Dry Fertilizer Packages and Interplant[®] Packages are also available.

GENERAL INFORMATION

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

Right hand (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.

D06260650



Model 3000 EdgeVac[®] 6 Row 30" Pull Type Planter Shown With Liquid Fertilizer, Squeeze Pump And Notched Single Disc Opener Packages Installed

INTRODUCTION

SPECIFICATIONS

BASE MACHINE TYPE - Pull Type (Rigid Frame)

SEED METER TYPE - EdgeVac® Seed Metering System

EDGEVAC® SEED METERING SYSTEM INCLUDES -

EdgeVac® Seed Meters (Less Seed Discs), Meter Drive Clutches, No. 41 Chains, 1.75 Bu. Seed Hoppers With Lids, 20" Diameter Vacuum Fan With Mounting Components, Hydraulic Motor, Hoses And Fittings, 4" Diameter Vacuum Feed Hoses, Distribution Manifolds And 2" Vacuum Distribution Hoses

PLANTING UNIT TYPES - Push And Pull Row Units

ROW SPACING	<u>Standard</u>	<u>Interplant® Package</u>
	4 Row Narrow - 30" Rows	7 - 15" Rows
	4 Row Wide - 36" Or 38" Rows	7 - 18" Or 19" Rows
	6 Row Narrow - 30" Rows	11 - 15" Rows
	6 Row Wide - 36" Or 38" Rows	11 - 18" Or 19" Rows
	8 Row Narrow - 30" Rows	15 - 15" Rows

DRIVE SYSTEM - 4.10" x 6" Spring-Loaded Contact Drive Tire(s) With No. 40 Chain(s)
(One Drive Tire On 4 Row Planters And Two On 6 And 8 Row Planters)
- Quick-Adjust End Mounted Seed Transmission With Machined Sprockets
- 7/8" Hex Drive And Drill Shafts

TRANSPORT TIRES - 7.50" x 20" Transport Tires: Two Tires On 4 Row Sizes And Four Tires On 6 And 8 Row Sizes
- Adjustable Height Wheels Allow For Ridge Planting

LIFT - Master/Slave Hydraulics
- 2 Master/Slave Rephasing Cylinders On 4 Row Planters
- 2 Master/Slave Rephasing Cylinders And 2 Assist Cylinders On 6 And 8 Row Planters

SEED METER/VACUUM SYSTEM HYDRAULIC REQUIREMENTS -

- 13 GPM @ 2000 PSI
- Zero PSI Case Drain Plus One Remote Outlet (Pressure And Return) For Vacuum Fan Hydraulic Motor

ROW MARKERS - Heavy Duty Conventional Markers On 4 Row Narrow/Wide And 6 Row Narrow Planters
- Two-Fold Low Profile Markers On 6 Row Wide And 8 Row Narrow Planters

HYDRAULICS - Standard Single SCV For Operation Of Lift And Markers
- Optional Dual SCV For Independent Operation Of Lift And Markers
- Hydraulic Sequence Valve With Flow Controls Allows Alternating Marker Operation And Marker Speed Adjustment

SPECIFICATIONS

DIMENSIONS/WEIGHTS - OPERATING

PLANTER SIZE	4 Row 30"	4 Row 36"/38"	6 Row 30"	6 Row 36"/38"	8 Row 30"
Width	12' 8"	14' 8"	17' 8"	20' 2"	21' 10"
Single Frame Length	11' 4"	11' 4"	11' 4"	11' 4"	11' 4"
Double Frame® Length	13' 10"	13' 10"	13' 10"	13' 10"	13' 10"
*Single Frame Weight	2480 lbs.	2570 lbs.	3786 lbs.	4070 lbs.	5238 lbs.
*Double Frame® Weight	2890 lbs.	3018 lbs.	4368 lbs.	4720 lbs.	5972 lbs.

* Base machine weights include planter frame including row markers, hydraulic cylinders, hoses, fittings, tires, wheels, drive and drill shafts, sprockets, chains and required drive components, parking jack, safety/warning lights, SMV sign, transport safety chain, KINZE® pull row units (closing wheel arms less closing wheels) with seed hoppers and lids, quick adjustable dual down force springs, EdgeVac® meters (less seed discs) and vacuum seed metering system fan, manifolds and hoses.

MACHINE OPTIONS

- Double Frame® Conversion Package
- 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
- Flow Control Needle Valve Kit
- Dual Valve Conversion Package
- Interplant® Package
- Liquid Fertilizer With Fertilizer Opener, Pump And Low Rate Check Valve Options
- Dry Fertilizer With Fertilizer Opener Options









ROW UNIT OPTIONS/ATTACHMENTS


- Seed Meter Discs
- 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 Extension Bracket
- Row Unit Mounted No Till Coulter
- Row Unit Mounted Disc Furrowers
- Row Unit Mounted Bed Leveler
- Row Unit Mounted Residue Wheel
- Coulter Mounted Residue Wheels
- Frame Mounted Coulter
- Residue Wheel Attachment For Frame Mounted Coulter

SAFETY PRECAUTIONS

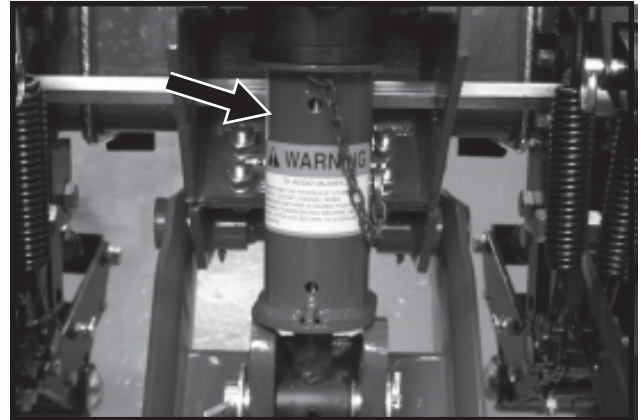
Safe and careful operation of the tractor and planter at all times will contribute significantly to the prevention of accidents.

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.**
-  **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.**
-  **Never permit any persons other than the operator to ride on the tractor.**
-  **Never ride on the planter or allow others to do so.**
-  **Do not allow anyone to stand between the tongue or hitch and the towing vehicle when backing up to the planter.**
-  **Always make sure there are no persons near the planter when row marker assemblies are in operation.**

-  **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.**

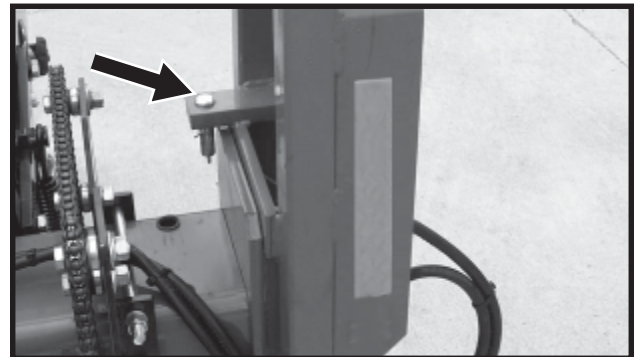
D05170003a






Lift Cylinder Safety Lockup

-  **Always install all cylinder safety lockup devices before transporting the planter.**
-  **Never work under the planter while in raised position without installing cylinder safety lockup devices.**

D061199108a




Conventional Row Marker Lockup


-  **Install safety lockup devices on row markers prior to transporting the planter or working around the unit. (If Applicable)**
-  **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.**

SAFETY PRECAUTIONS

 Limit towing speed to 15 MPH. Tow only with farm tractor of minimum 50 HP.

 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.

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


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

 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 the 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.

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


 Store the 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.

 The seed and fertilizer metering systems on this planter are 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.

 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.

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

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

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

 Never operate vacuum fan with cover removed.

 Always wear ear protection when working around operating vacuum fan.

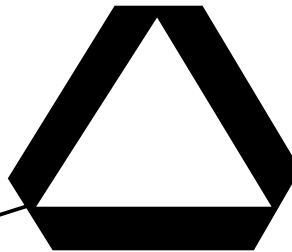
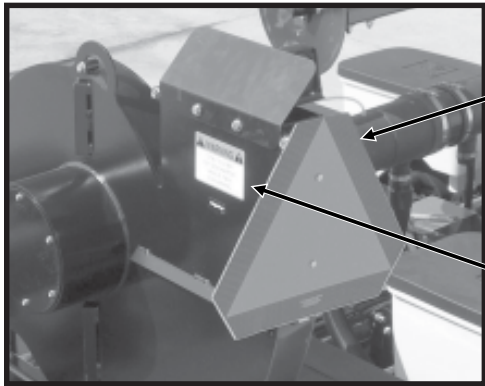
SAFETY WARNING SIGNS

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.

D08220667



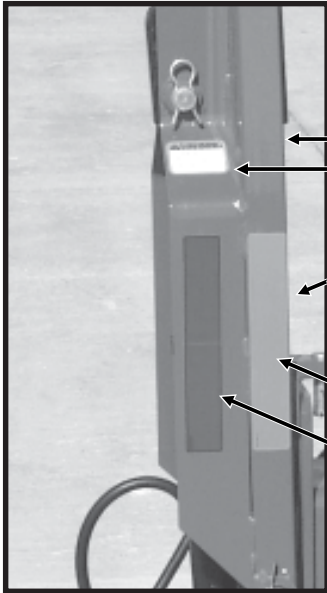
Part No. GD2199 SMV Sign (Qty. 1)



Part No. G7100-301 (Qty. 2 - One On Each Side Of Vacuum Fan)

SAFETY WARNING SIGNS

D101900103



Conventional Row Marker



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

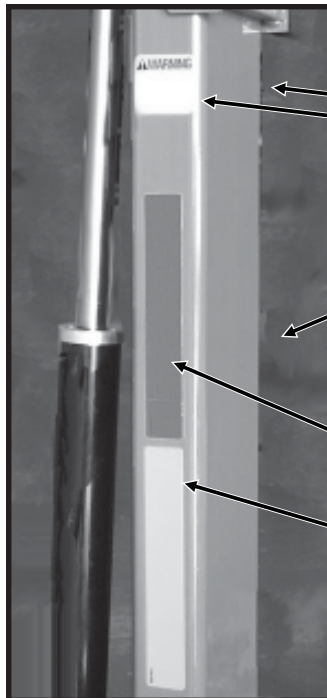


Part No. G7100-259 Amber Reflective Decal Front (Qty. 2 - One Per Row Marker)

Part No. G7100-260 Orange Reflective Decal Inside Rear (Qty. 2 - One Per Row Marker)

Part No. G7100-258 Red Reflective Decal Outside Rear (Qty. 2 - One Per Row Marker) (If Applicable)

D102400118a



Low Profile Row Marker



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



Part No. G7100-259 Amber Reflective Decal Front (Qty. 2 - One Per Row Marker)

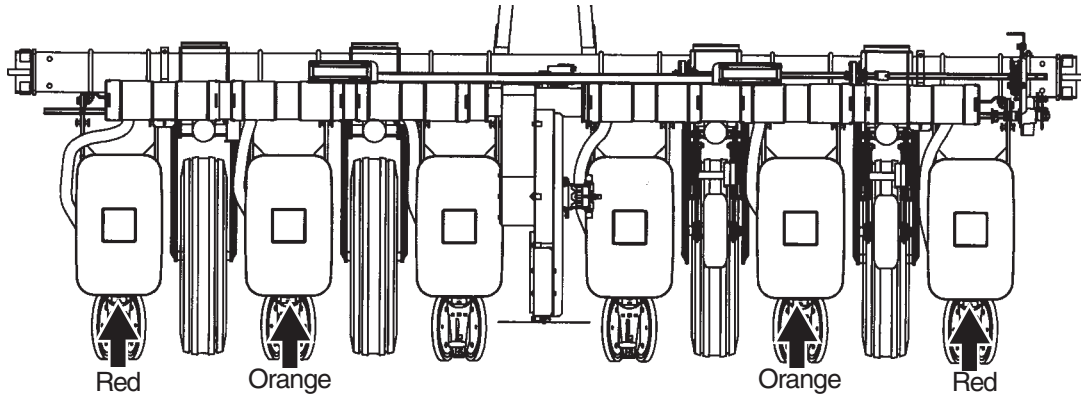
Part No. G7100-258 Red Reflective Decal Top Rear (Qty. 2 - One Per Row Marker)

Part No. G7100-260 Orange Reflective Decal Bottom Rear (Qty. 2 - One Per Row Marker) (If Applicable)

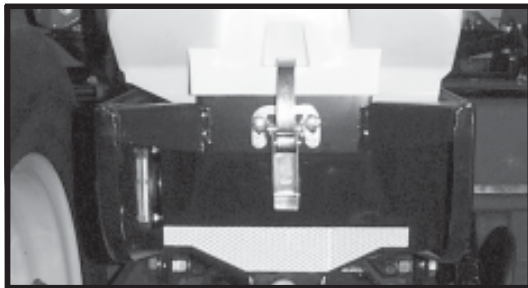
SAFETY WARNING SIGNS

(PLTR181)

4/6 Row

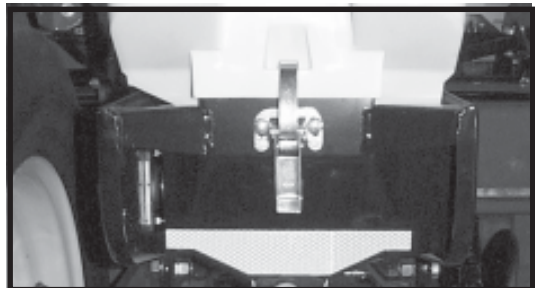


D060800114



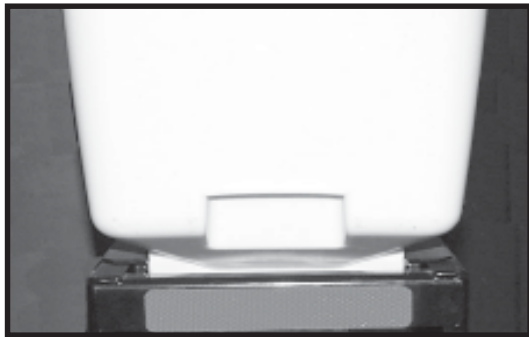
Part No. G7100-261 Red Reflective Decal
(Qty. 2 - One Per Row Unit Located On The Hopper Support On The Outside Row Unit On Both Ends Of The Planter)

D060800114



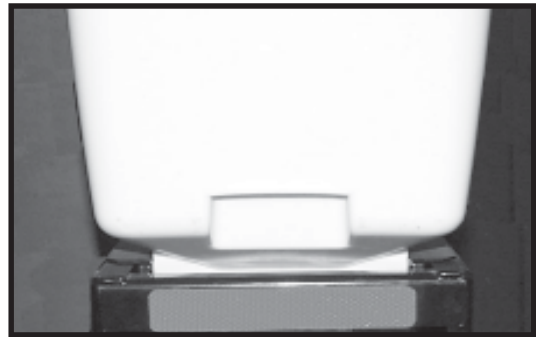
Part No. G7100-263 Orange Reflective Decal
(Qty. 2 - One Per Row Unit Located On The Hopper Support On The Second Row Unit In On Both Ends Of The Planter)

D062300102



Part No. G7100-258 Red Reflective Decal
(Qty. 2 - One Per Row Unit Located On The Granular Chemical Hopper Panel Extension On The Outside Row Unit On Each End Of The Planter) (If Applicable)

D062300102

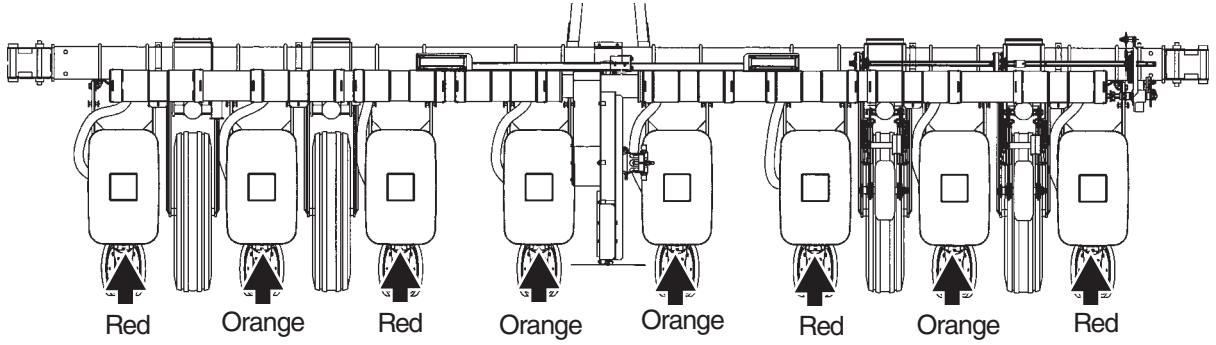


Part No. G7100-260 Orange Reflective Decal
(Qty. 2 - One Per Row Unit Located On The Granular Chemical Hopper Panel Extension On The Second Row Unit In On Each End Of The Planter) (If Applicable)

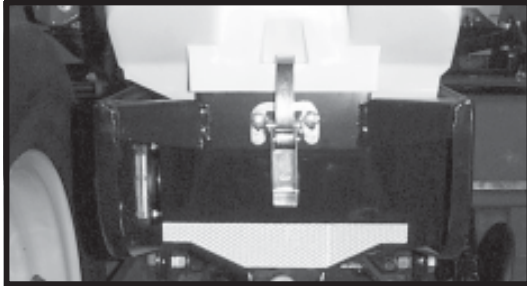
SAFETY WARNING SIGNS

(PLTR182)

8 Row

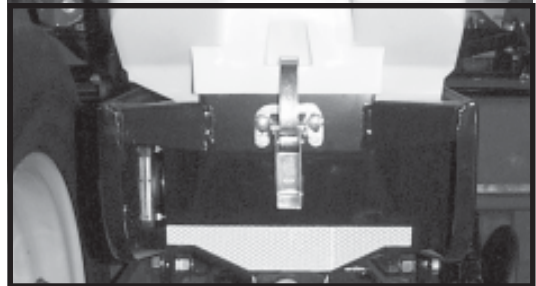


D060800114



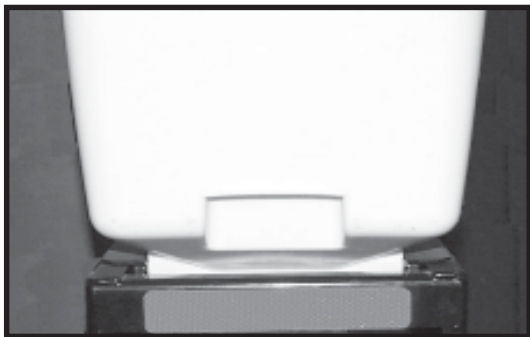
Part No. G7100-261 Red Reflective Decal (Qty. 4 - One Per Row Unit Located On The Hopper Support On The First, Third, Sixth And Eighth Row Units)

D060800114



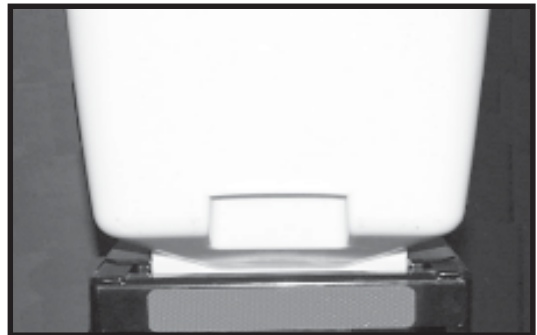
Part No. G7100-263 Orange Reflective Decal (Qty. 4 - One Per Row Unit Located On The Hopper Support On The Second, Fourth, Fifth And Seventh Row Units)

D062300102



Part No. G7100-258 Red Reflective Decal (Qty. 2 - One Per Row Unit Located On The Granular Chemical Hopper Panel Extension On The First, Third, Sixth And Eighth Row Units) (If Applicable)

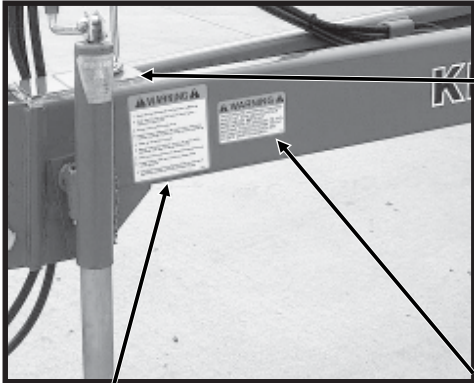
D062300102



Part No. G7100-260 Orange Reflective Decal (Qty. 2 - One Per Row Unit Located On The Granular Chemical Hopper Panel Extension On The Second, Fourth, Fifth And Seventh Row Units) (If Applicable)

SAFETY WARNING SIGNS

D061199109



Part No. G7100-302 (Qty. 1)

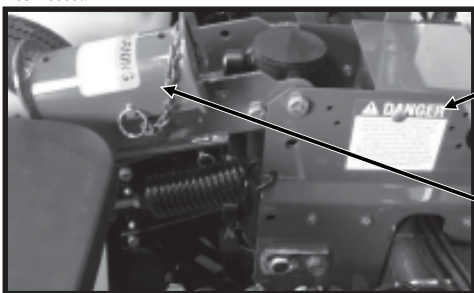


Part No. G7100-46 (Qty. 1)

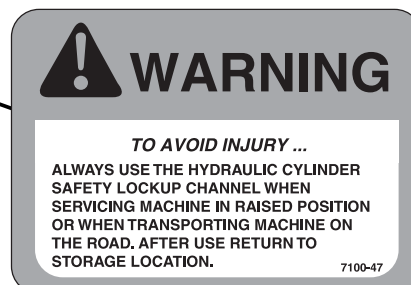


Part No. G7100-90 (Qty. 1)

D05170009a



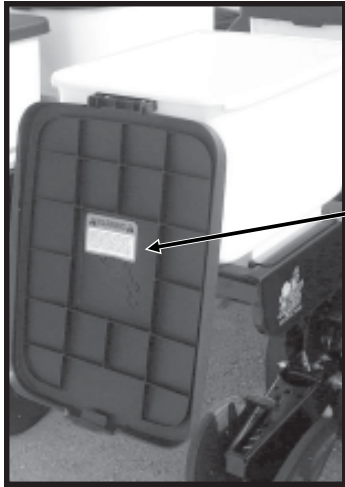
Part No. G7100-89 (Qty. 1
Per Contact Wheel Assembly)



Part No. G7100-47 (Qty. 1
Per Contact Wheel Assembly)

SAFETY WARNING SIGNS

D06039901



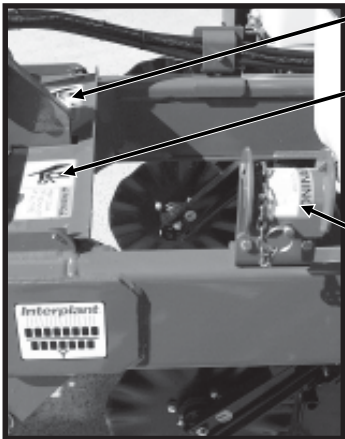
! WARNING !

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

Part No. G7100-115 (1 Per Row Unit - Located On Underside Of Granular Chemical Hopper Lid)

D06079913



! WARNING !

KEEP CLEAR OF MECHANISM AT ALL TIMES.

7100-253

Part No. G7100-253 (Qty. 2 - Located On Interplant® Self-Leveling Hitch Extension)

! WARNING !

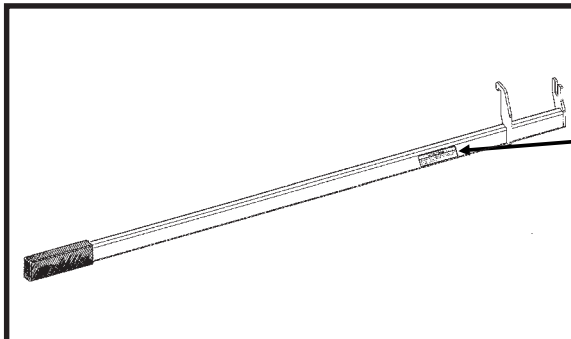
TO AVOID INJURY...

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

7100-255

Part No. G7100-255 (Qty. 1 - Located On Interplant® Lift Cylinder Lockup)

A12177b



! CAUTION !

SET DOWN PRESSURE SPRINGS TO MINIMUM. LOWER PLANTER TO GROUND AND EMPTY SEED HOPPERS. REQUIRES 90 LB MIN TO LIFT .

7100-249

Part No. G7100-249 (Qty. 1 - Located On Interplant® Push Row Unit Lift Lever)

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.

The KINZE EdgeVac® Seed Metering System include seed meters, seed discs and an air system consisting of a hydraulic driven vacuum fan which draws air through the manifolds and hoses and the seed meters on each row unit.

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.

A 12 volt DC electrical system is required on all 3000 series planters.

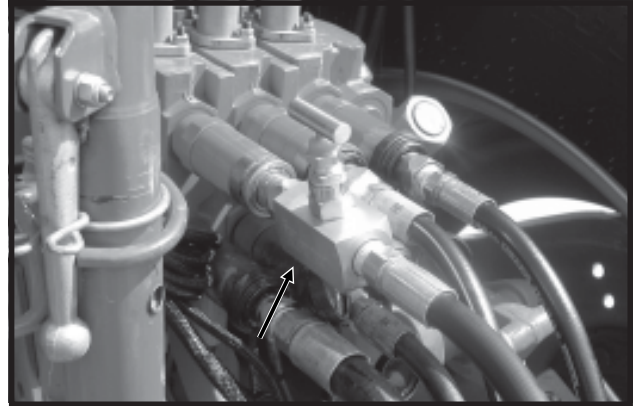
Two dual remote hydraulic outlets (SCV) are required. One outlet operates the lift/markers and one along with a zero pressure case drain operates the vacuum fan motor. Three dual remote hydraulic outlets (SCV) are required on machines equipped with the optional dual valve hydraulic system.

Maximum hydraulic flow rate of 13 GPM @ 2000 PSI is required (in addition to planter lift/marker hydraulic requirements) to operate the seed metering system vacuum fan motor.

IMPORTANT: Connect hydraulic motor case drain to a case drain return line with zero PSI on the tractor. Failure to connect to a return with zero PSI will cause damage to the hydraulic motor shaft seal. Warranty will not apply on damaged motors resulting from improper hydraulic line connection. DO NOT connect hydraulic motor case drain to a SCV outlet or motor return circuit connection. Contact tractor manufacturer for specific details on "zero pressure return".

NOTE: A Flow Control Needle Valve Kit, to provide a flow control option for tractors that are not equipped with a good method for finite adjustment of hydraulic flow is available from KINZE® Repair Parts through your KINZE® Dealer.

D04050604



G1K426 Needle Valve Kit

TRACTOR PREPARATION AND HOOKUP

D100202108



1. Adjust tractor drawbar so it is 13 to 17 inches above the ground. Adjust the drawbar so the hitch pin hole is directly below the center line of the PTO shaft. Make sure the drawbar is in a stationary position.
2. Back tractor to planter and connect with a minimum $\frac{3}{4}$ " diameter hitch pin. Make sure hitch pin is secured with locking pin or cotter pin.

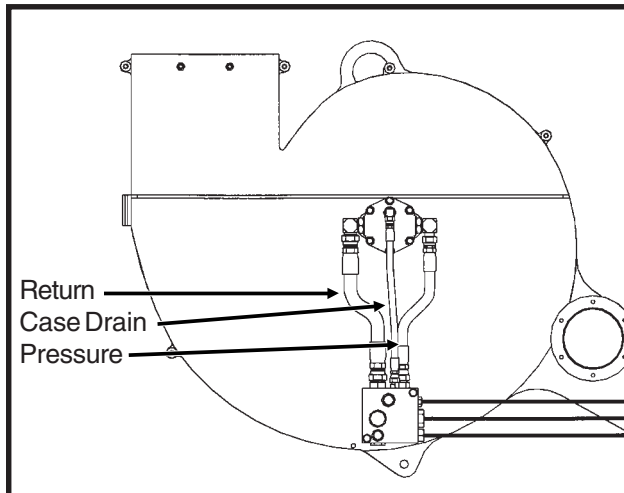
MACHINE OPERATION

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 using an unused clevis mounting hole on the planter hitch. The attaching hardware should be torqued to 840 ft. lbs.
4. Connect hydraulic hoses to tractor ports in a sequence which is both familiar and comfortable to the operator.

The vacuum fan motor hydraulic hoses are as follows:

- $\frac{3}{8}$ " Hose From Motor - Case Drain
- $\frac{3}{4}$ " Hose From Motor - Return
- $\frac{1}{2}$ " Hose To Motor - Pressure

PT79a



NOTE: If tractor is equipped with an adjustable flow outlet (SCV), adjust to full flow position.



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

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

5. Connect ASAE Standards 7 terminal connector for safety/warning lights on planter to ASAE Standards receptacle on tractor. If your tractor is not equipped with an ASAE Standards receptacle, check with your tractor manufacturer for availability. Check to be sure warning lights on planter are working in conjunction with warning lights on tractor.

Connect harness on planter to digital vacuum gauge console on tractor. Connect power lead to power source. A power lead adapter may be required.

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

01239805b



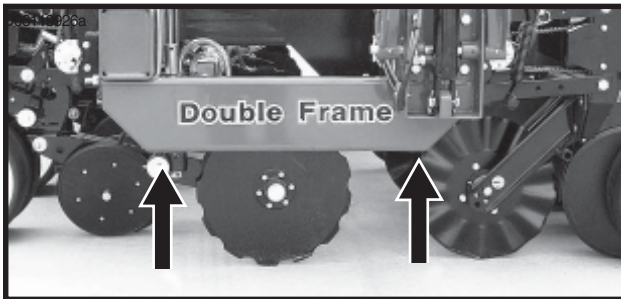
7. Lower planter to the planting position and check to be sure planter is level fore and aft. If hitch height is too high or low, disconnect planter and adjust hitch clevis up or down as necessary.

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 bracket allow the clevis to be raised or lowered. In addition, the clevis may be turned over for a finer adjustment between mounting holes. When installing the clevis mounting bolt, tighten hex nut to proper torque setting.



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.

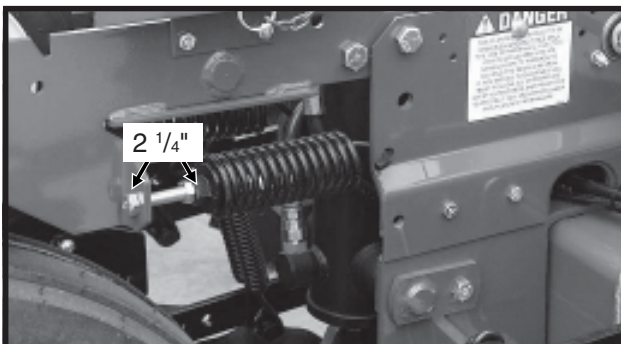
It is important for the planter to operate level laterally. Tire pressure must be maintained at pressures specified. See "Tire Pressure".

CONTACT WHEEL SPRING ADJUSTMENT

There are two dospring tension is factory preset and should require no further adjustment.

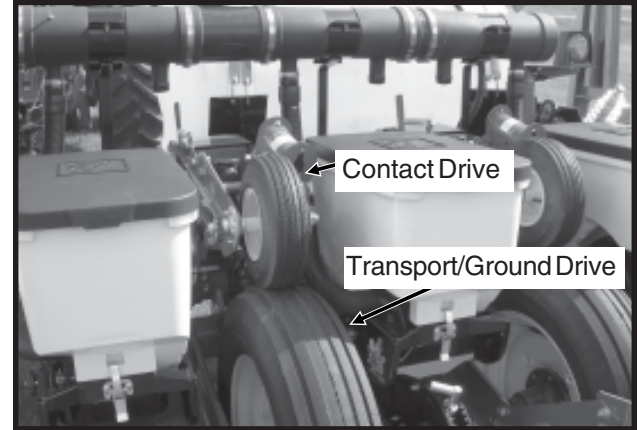
The tension is set leaving 2 1/4" between the spring plug and the bolt head.

D061199222



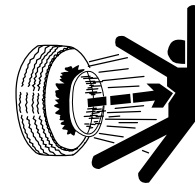
TIRE PRESSURE

D06260656



Tire pressure should be checked regularly and maintained as follows:

- 7.50" x 20" Transport/Ground Drive 40 PSI
- 4.10" x 6" Contact Drive 50 PSI



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

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

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

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

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

MACHINE OPERATION

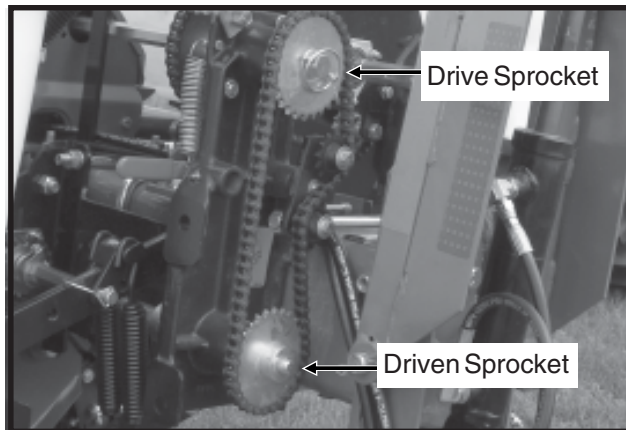
SEED RATE TRANSMISSION ADJUSTMENT

Planting population rate changes are made at the end mounted transmission. The seed rate transmission is 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.

Chain tension is controlled by a spring-loaded dual-sprocket idler. The idler assembly is adjusted with a 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. See "Wrap Spring Wrench Operation."

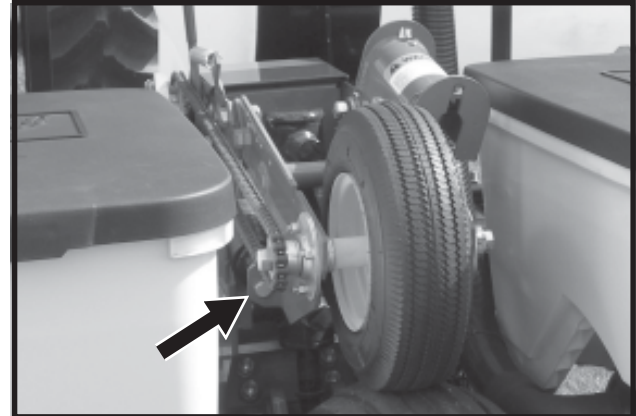
The planting rate charts found in the Seed Meter Operation/Maintenance section will aid you in selecting the correct sprocket combinations.

D06260624



CONTACT WHEEL DRIVE SPROCKETS

D06260656



NOTE: The 15 tooth sprocket at each contact drive wheel can be interchanged with the 19 tooth or 30 tooth sprockets from the sprocket storage rod bolted to the reverser plate at the transmission assembly. The 15 tooth sprocket requires use of 132 pitch No. 40 chain; the 19 tooth sprocket requires use of 134 pitch No. 40 chain; and the 30 tooth sprocket requires use of 140 pitch No. 40 chain.

Chain tension is controlled by a spring-loaded sprocket idler. The amount of spring tension on the chain is controlled by the idler arm.

The planting rate charts found in the Seed Meter Operation/Maintenance section will aid you in selecting the correct sprocket.

NOTE: 15, 19 and 30 tooth drive sprockets are NOT applicable to all rate charts. Check chart titles to ensure the proper rate chart is selected.

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

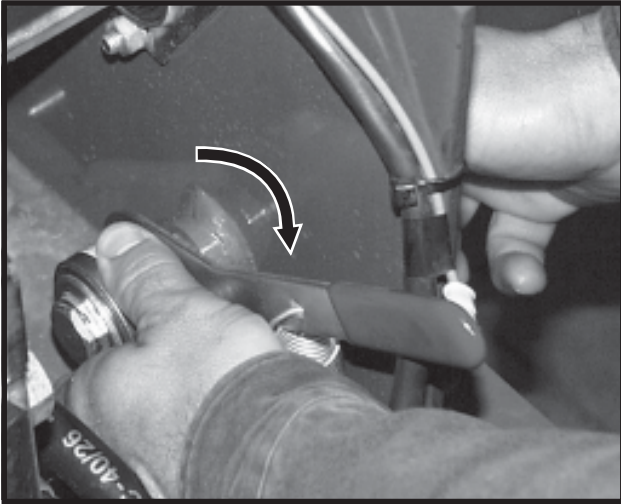
MACHINE OPERATION

WRAP SPRING WRENCH OPERATION

The chain idler is equipped with a wrap spring wrench. Chain tension is released and/or added as shown below.

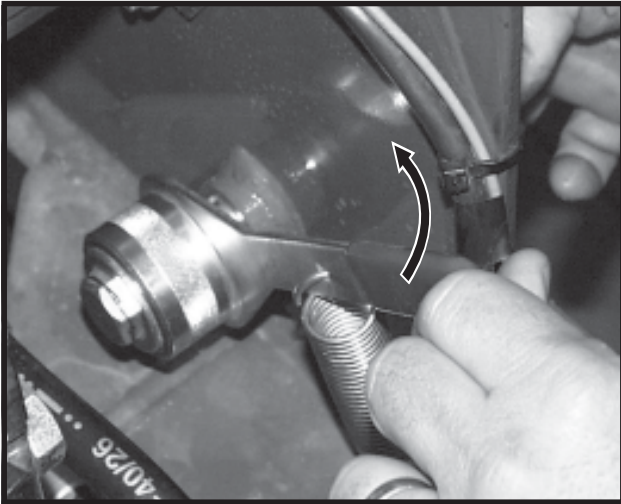
To release chain tension, rotate the knurled collar on the wrap spring wrench while rotating the chain idler away from the chain.

D10290305



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

D10290304

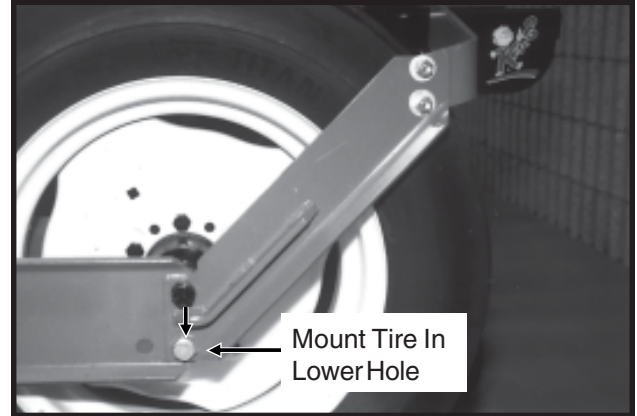


The wrap spring wrenches are made in L.H. and R.H. configurations, which can be identified by the silver or gold release collar, respectively.

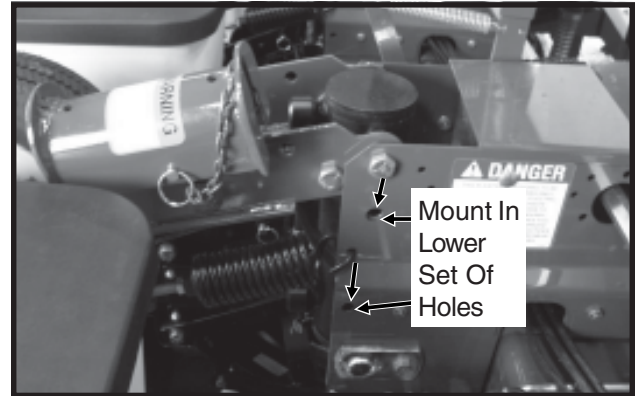
RIDGE PLANTING

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

83154-1



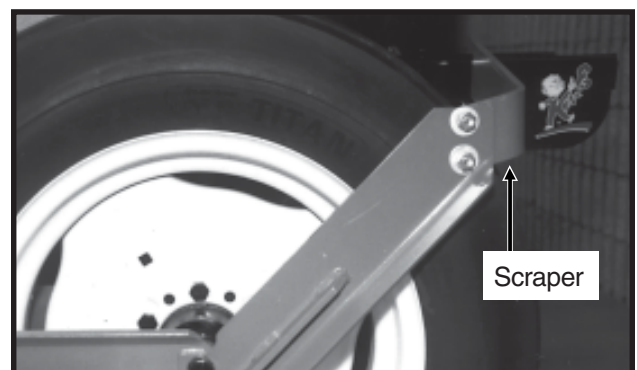
D05170009a



TIRE SCRAPER

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

83154-1

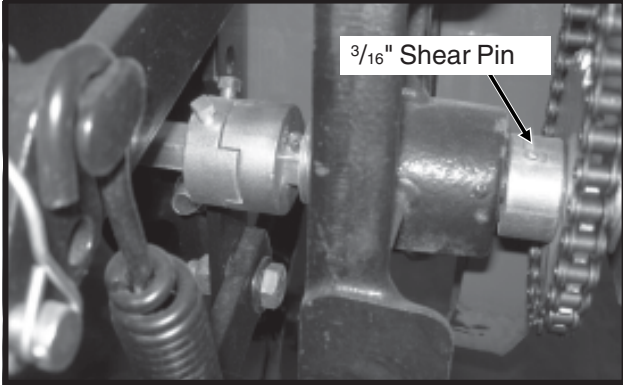


MACHINE OPERATION

SHEAR PROTECTION

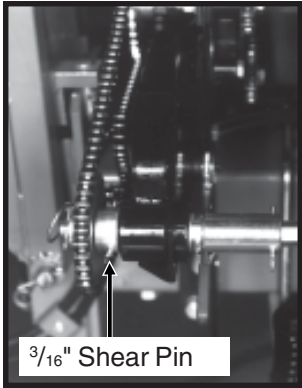
The planter driveline and row unit components are protected from damage by shear pins.

D09280654



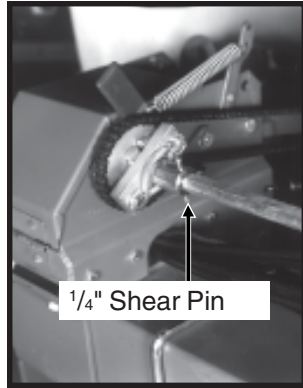
Transmission Shaft

61111-5



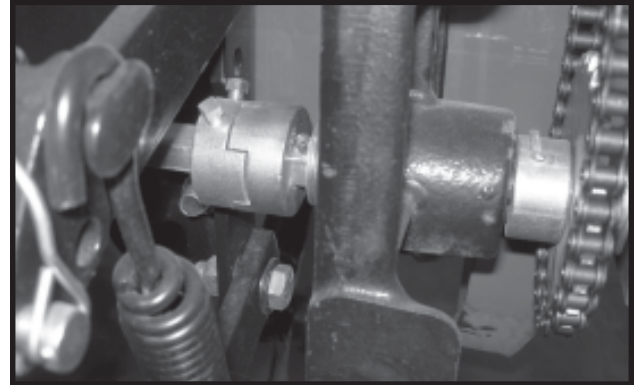
Dry Fertilizer Driveline

61111-33



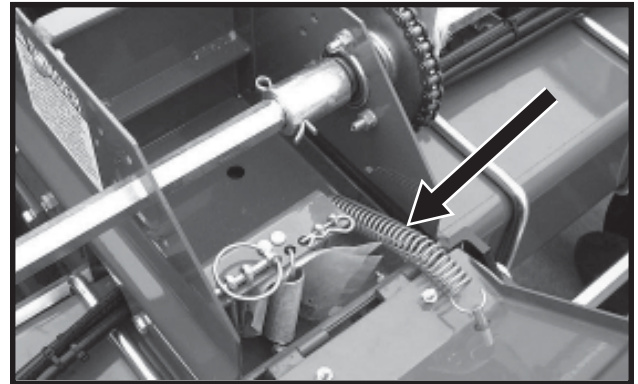
Liquid Fertilizer Driveline

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.

D061199204



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

MACHINE OPERATION

HYDRAULIC PLANTER LIFT OPERATION

The planter lift system consists of a master cylinder on one side of the planter (R.H. outer) and a slave cylinder on the other side of the planter (L.H. outer). On 6 row and 8 row sizes, lift assist cylinders are used on the inner wheel modules.

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

The assist cylinders are plumbed in parallel in the lift circuit with the master/slave cylinders and provide additional lift capacity. (If applicable)

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



WARNING: Always position lockup devices in “safety” position when transporting or storing planter. See “Safety Precautions”.

HYDRAULIC ROW MARKER OPERATION

Model 3000 planters are equipped with a single valve hydraulic system or an optional dual valve hydraulic system. The single valve system requires the planter to be raised in order to lift the row markers. Each time the planter is lowered, the row markers will alternately be lowered. If the planter is raised to cross a waterway, the opposite row marker will be lowered when the planter is lowered back to the ground. Therefore, it will be necessary to stop and again raise and lower the planter to restore correct row marker operation.

If planting in this type of situation, dual valve hydraulics are highly recommended. The optional dual valve hydraulic system allows the planter to be raised and lowered independent of the row markers. When raising the planter for a waterway the row marker that is down will clear the ground and not disturb the waterway. When the planter is again lowered the same row marker will continue to mark the path for the return pass. Each time a row marker is raised, the sequencing valve will direct flow to lower the opposite row marker.

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



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



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

MACHINE OPERATION

DIGITAL VACUUM GAUGE OPERATION

The digital vacuum gauge console is equipped with an ON-OFF-ON type selector switch. The “FAN 1” setting should be used when the planter is equipped with one vacuum fan.

NOTE: The toggle switch should be left in OFF position when the planter is not in use. If left in either fan position, the tractor battery will be drained.

D10240583



The digital vacuum gauge is calibrated at the factory, however, vacuum variation throughout the manifold system may occur. It may be necessary to adjust the digital readout so it agrees with the actual vacuum at the meter. With the seed discs loaded with seed, compare the digital vacuum gauge readout to the reading taken from the analog gauge or a hand held gauge at several meters along the length of the planter. The elbow located on the covers of the seed meters allow testing of meter vacuum pressure without removing the vacuum hoses. If there is more difference than 1" or 2" (H₂O), the digital gauge can be adjusted by inserting a small flat blade screwdriver into the opening on the back of the digital gauge housing and turning the potentiometer until the digital gauge displays the vacuum that is present at the meter. Compare readings at 10" and 20" of vacuum.

ANALOG VACUUM GAUGE

The analog vacuum gauge connects directly to the manifold. The digital vacuum gauge should then be calibrated to match that reading. See “Digital Vacuum Gauge Operation”.

D06260653



The only adjustment to the gauge is to “zero” the needle with no vacuum present. If there is a significant difference between this gauge and a reading taken at the meters, a different manifold location should be found to connect the gauge hose.

VACUUM FAN MOTOR VALVE BLOCK ASSEMBLY

A pressure relief valve in the hydraulic circuit prevents build up of oil pressure over 35 PSI in the case drain line when the vacuum fan motor is in operation. This valve will vent oil to the outside of the valve block through a drain hole in the aluminum valve block, whenever the case drain is connected improperly or pressure builds.

See “Hydraulic Diagram - Vacuum Fan Motor System” in Maintenance section.

The valve block also contains a check valve that serves two purposes. This valve (a) prevents the vacuum fan from operating in the wrong direction if pressure is applied to the return side of the motor and (b) allows the fan to coast to a stop when the tractor hydraulic control is returned to the neutral position.

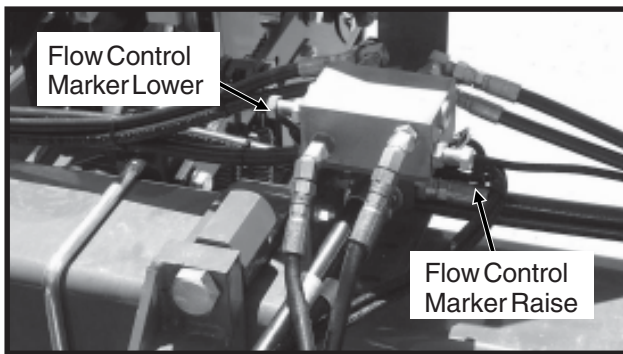
NOTE: If reverse pressure is applied the fan will turn at a reduced speed.

MACHINE OPERATION

ROW MARKER SPEED ADJUSTMENT

The row marker hydraulic system includes two flow control valves. One flow control valve sets the lowering speed of both row markers and one sets the raising speed of both markers. To adjust row 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 row markers. Tighten jam nut after adjustments are made.

D05259913



IMPORTANT: The flow controls should be properly adjusted before the row marker assemblies are first put into use. Excessive row marker travel speed can damage the row marker assembly.

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

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

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



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

ROW MARKER LENGTH ADJUSTMENT

To determine the correct length at which to set the row marker assemblies, multiply the number of rows by the average row spacing in inches. This provides the total planting width. Adjust the row marker extension so the distance from the marker disc blade to the center line of the planter is equal to the total planting width previously obtained. Both the 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 the 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
--

72359-61



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

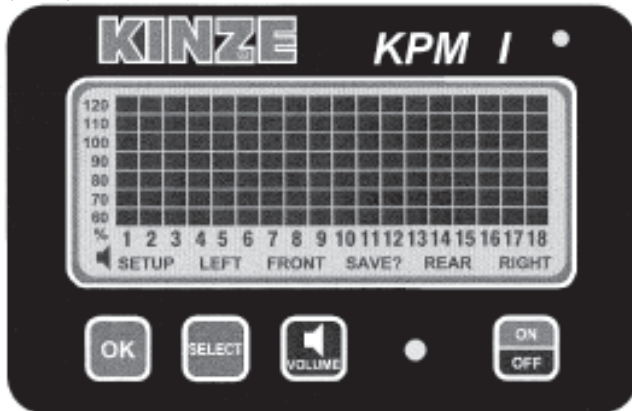
IMPORTANT: A marker disc blade assembly that is set at a sharper angle than necessary will add unnecessary stress to the complete row marker assembly and shorten the life of bearings and blades. Set the blade angle only as needed to leave a clear mark.

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

Notched marker blades, 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.

Monitor Key Functions	6-10
LCD Functions	6-10
Changing The Audible Alarm Volume	6-11
Warnings And Alarms	6-11
Replacing A Faulty Sensor	6-12
Field Operation	6-13
Programming/Connecting Seed Tubes	6-13

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”.



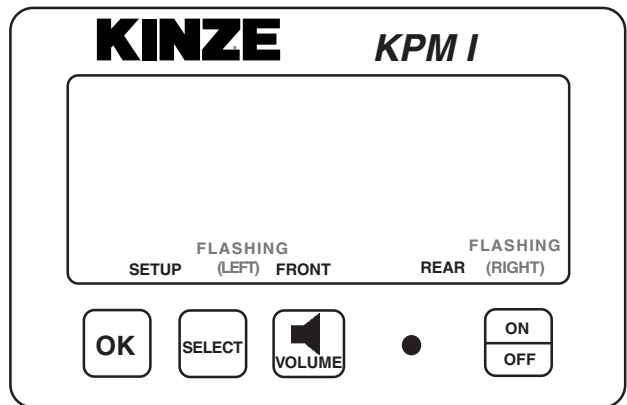
PROGRAMMING/CONNECTING SEED TUBES

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

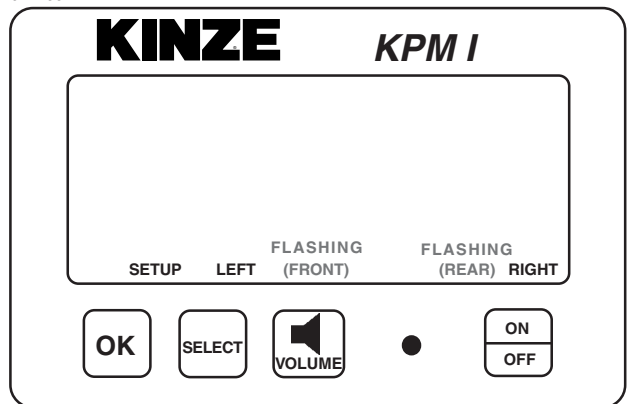
STEP 2 Press the ON key. The monitor automatically enters the setup procedure. If the monitor was accidentally powered on with no sensors attached, the user can turn the monitor off at this point and the previous configuration is not lost.

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.

01229910



01229911

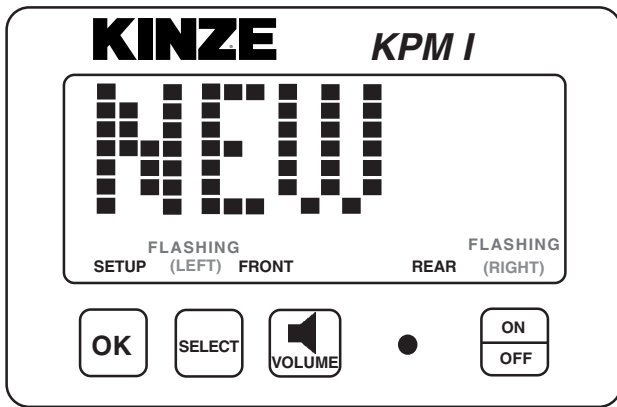


NOTE: Model 3000 planters will use the rear configuration only. When Interplant® Package rows are in use, select the rear/front configurations. When all rows can be viewed on a single display (rear), pressing the select key has no function.

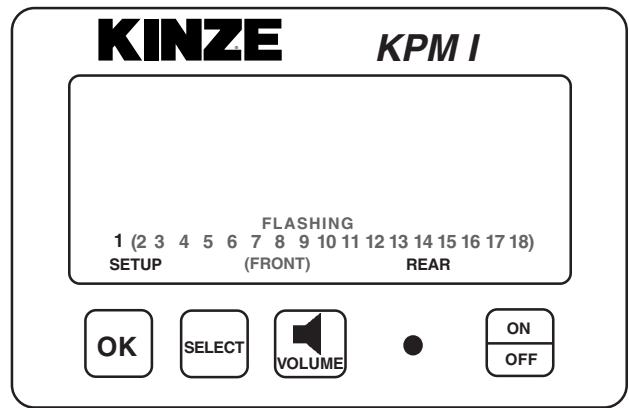
STEP 4 Press and hold the OK key to confirm the selection and continue holding until the row numbers appear on the display. During confirmation, the display will alternate between “NEW” and “SYS” to alert the user that the previous configuration will be lost. With the rear/front mode selected, the monitor 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.

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.

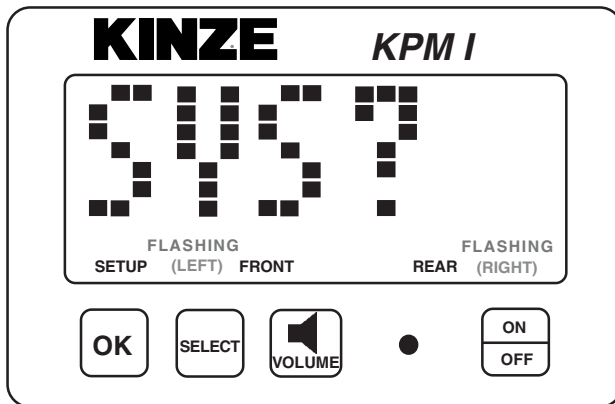
01229912



01229915

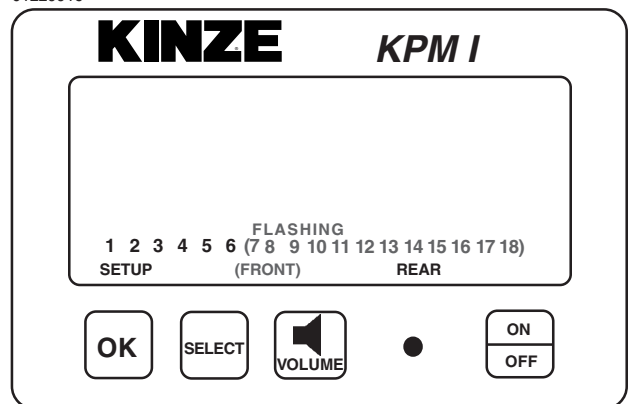


01229912a



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.

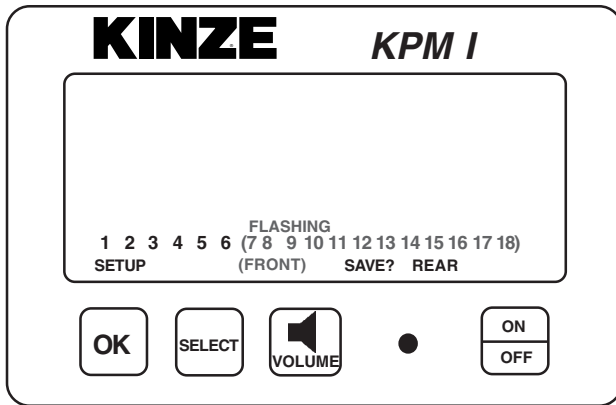
01229916



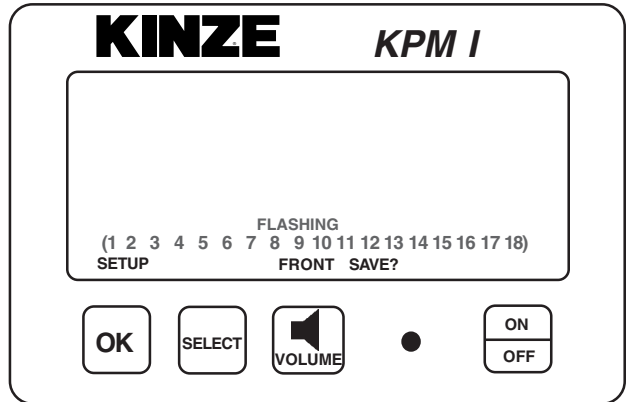
STEP 7 If this condition is satisfied, press and hold the OK key to save the setup for the current section. The SAVE? icon will show followed by continuous short beeps indicating the monitor is preparing to save. The installer has 5 seconds to decide if he wants to save the current configuration. During 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.

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.

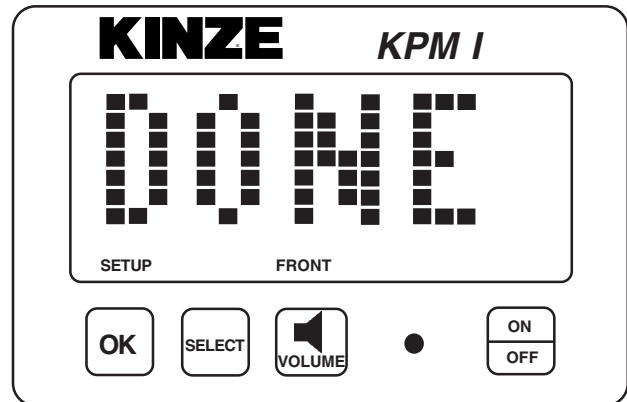
01229917



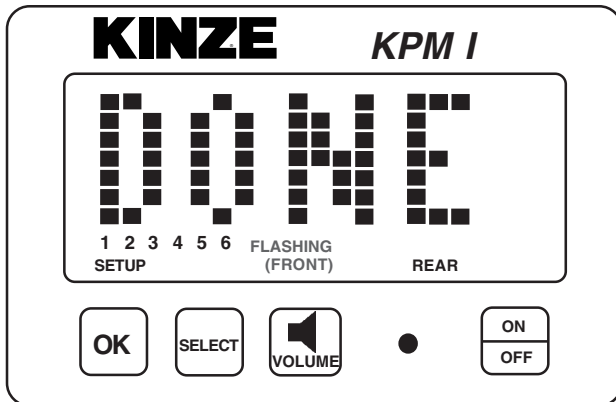
01229919



01229920



01229918

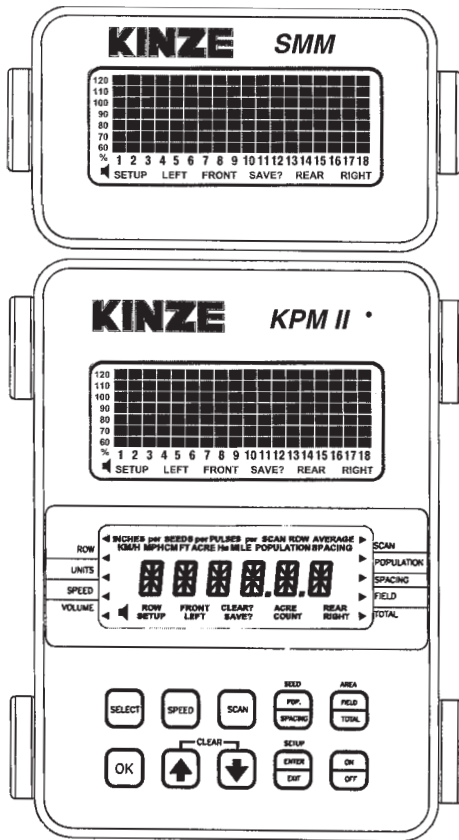


NOTE: Individual seed tubes may be unplugged for special situations. An alarm will sound which can be silenced by touching the OK key. The monitor will recognize each seed tube when reconnected.

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.

Monitor Key Functions	6-17
Upper LCD Functions	6-18
Lower LCD Functions	6-19
Programming	
Changing The Audible Alarm Volume	6-21
Units (Metric Or English)	6-22
Row Spacing	6-22
Speed	6-24
Clearing Total Area	6-25
Area Counter/Speedometer Mode	6-26
Warnings And Alarms	6-26
Replacing A Faulty Sensor	6-27
Field Operation	6-28
Clearing Field Area	6-29
Programming/Connecting SMM Console, Shaft Rotation Sensors, Seed Tubes And/Or Radar/Magnetic Distance Sensors	6-30
Row-By-Row Alarm Level Setting	6-42

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

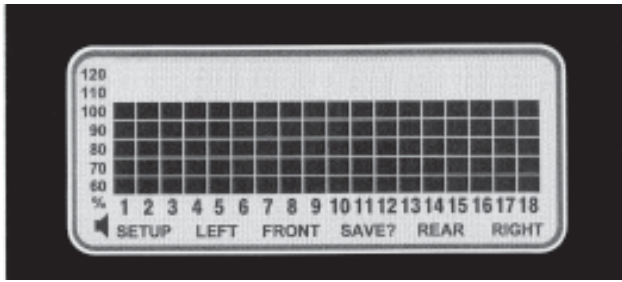
- Enters and exits the programming mode.

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.

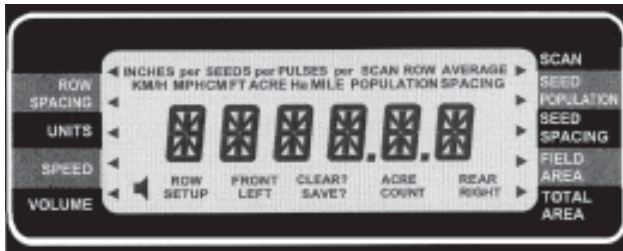
STEP 2 Press SELECT key again to activate both sections.

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.

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.

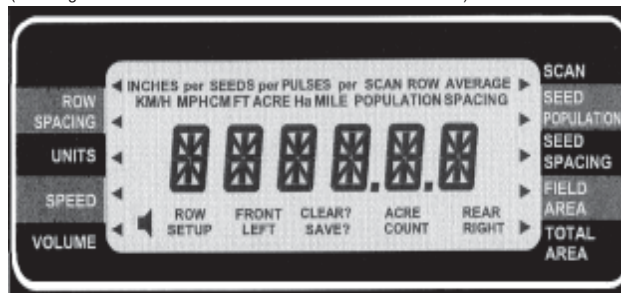


(MTR28c)

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

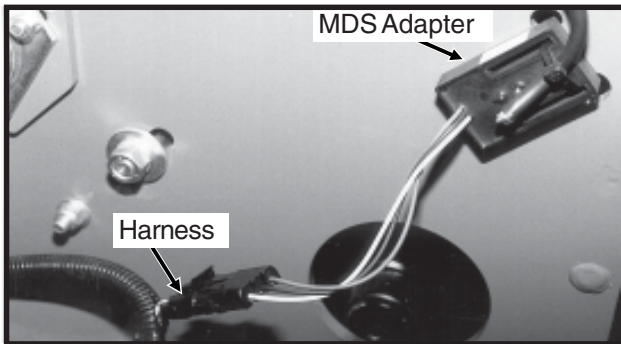
PROGRAMMING/CONNECTING SMM CONSOLE, SHAFT ROTATION SENSORS, SEED TUBES AND/OR RADAR/MAGNETIC DISTANCE SENSORS

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



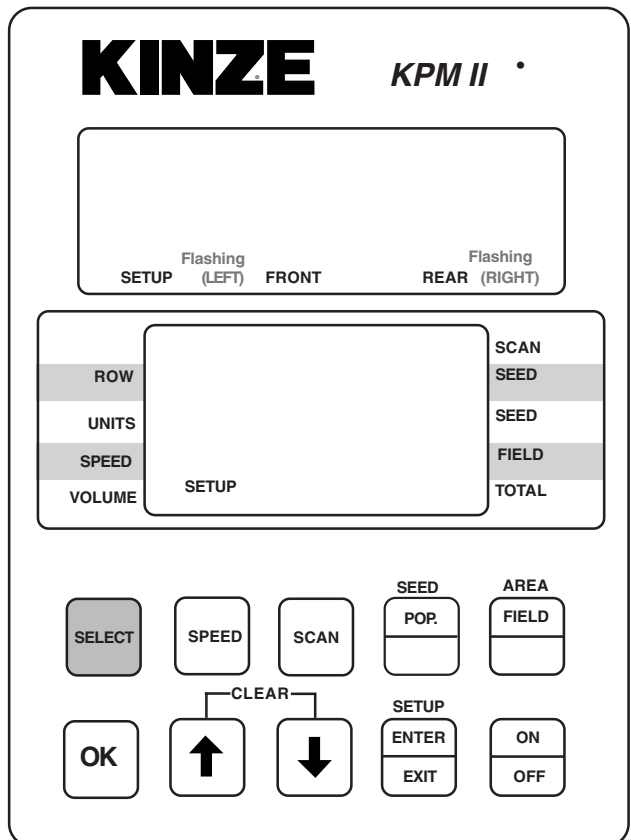
01189910



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

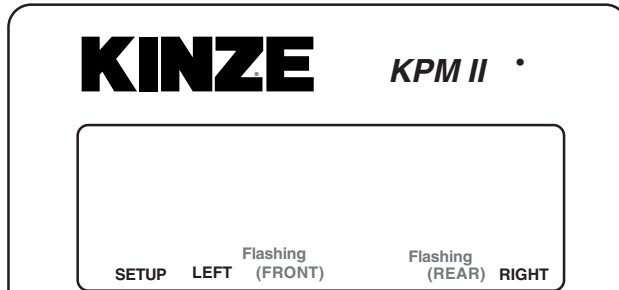


NOTE: SMM console may not be applicable to all models.

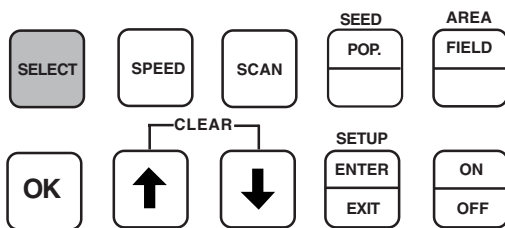
MACHINE OPERATION

KPM II STACK-MODE

12060211



ROW	SETUP	SCAN
UNITS		SEED
SPEED		FIELD
VOLUME		TOTAL



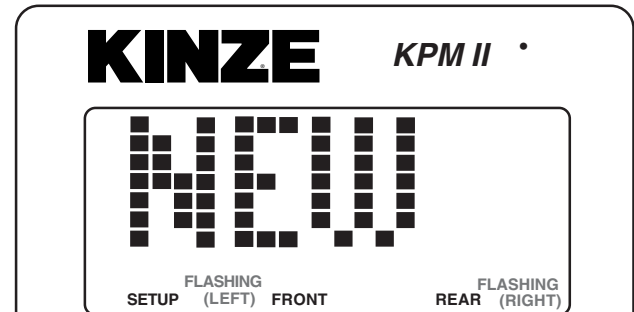
NOTE: SMM console may not be applicable to all models.

NOTE: Model 3000 planters select the rear configuration only.

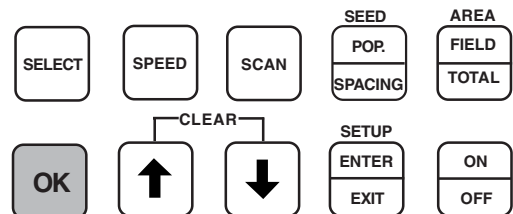
STEP 4 Press and hold the OK key to confirm selection. The upper display will alternate between “NEW” and “SYS?”.

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



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

MACHINE OPERATION

KPM II STACK-MODE

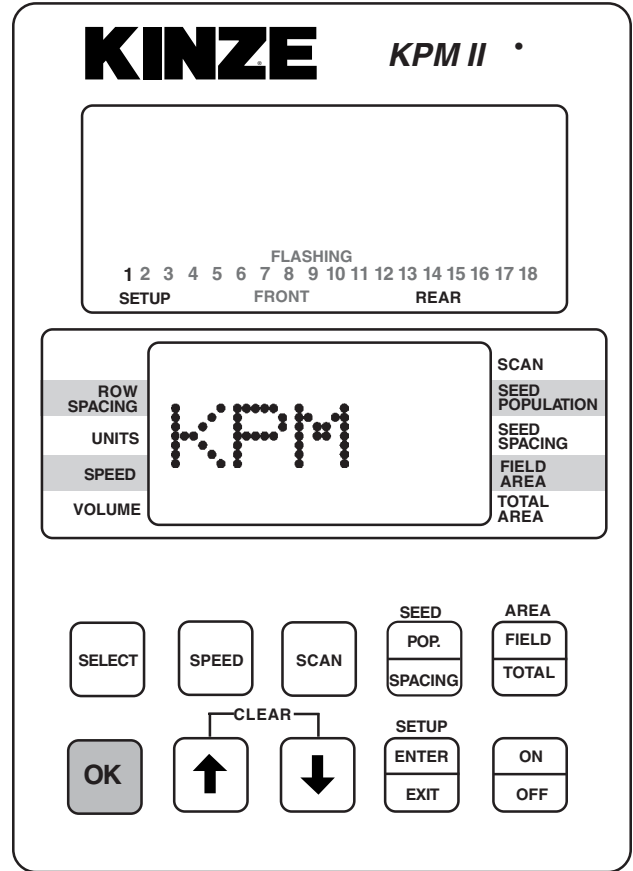
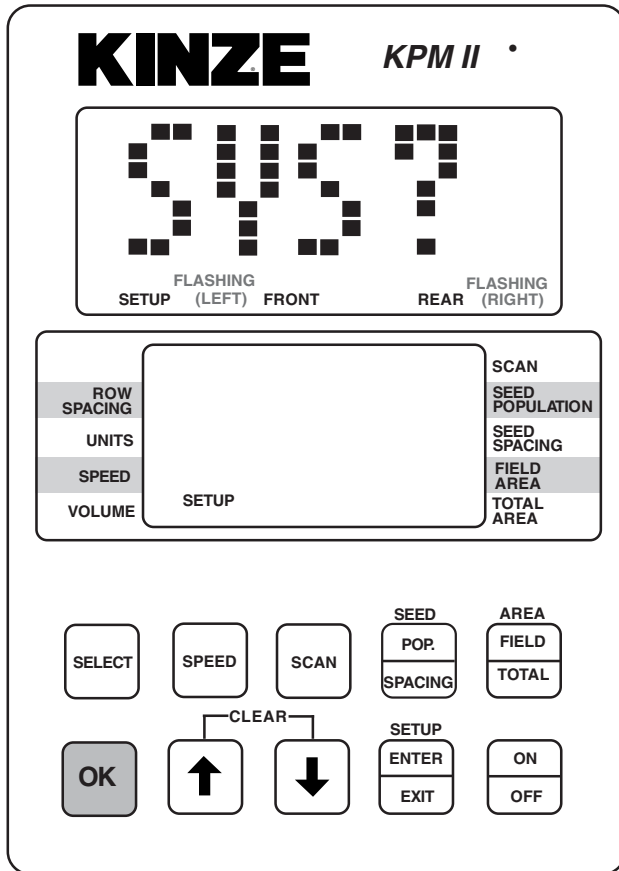
NOTE: Illustrated using rear/front configuration. The KPM II Stack-Mode console shows LEFT in the left/right configuration, REAR in the rear/front configuration and FRONT LEFT/REAR LEFT in the four sections configuration.

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.

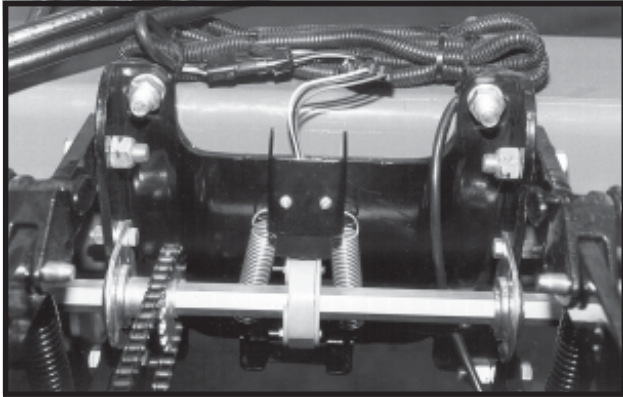
NOTE: SMM console may not be applicable to all models.

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.

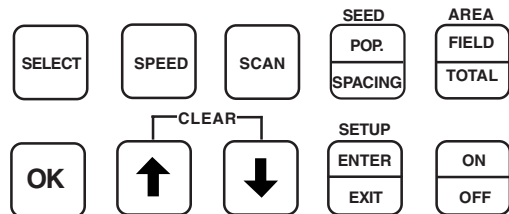
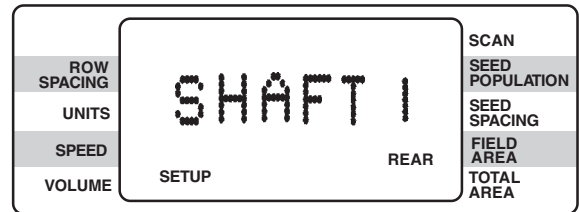
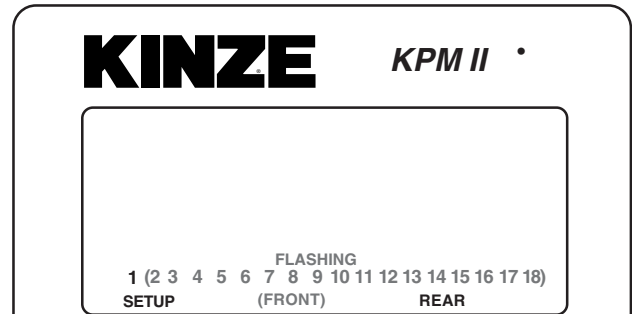
01189906



“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



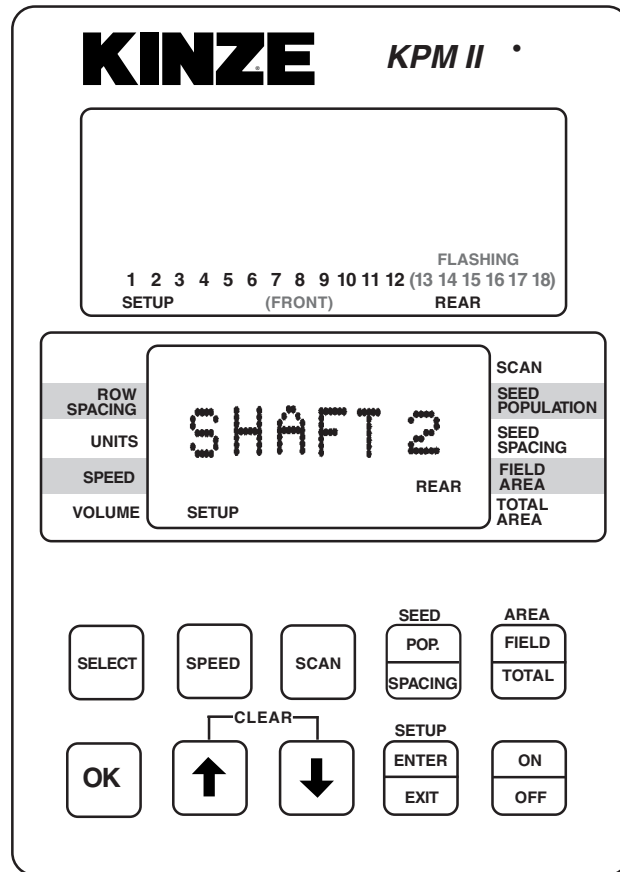
NOTE: SMM console may not be applicable to all models.

MACHINE OPERATION

KPM II STACK-MODE

STEP 6 (Continued)

12060211

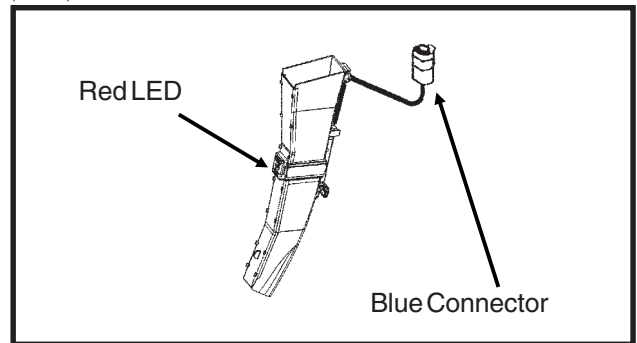


NOTE: SMM console may not be applicable to all models.

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.

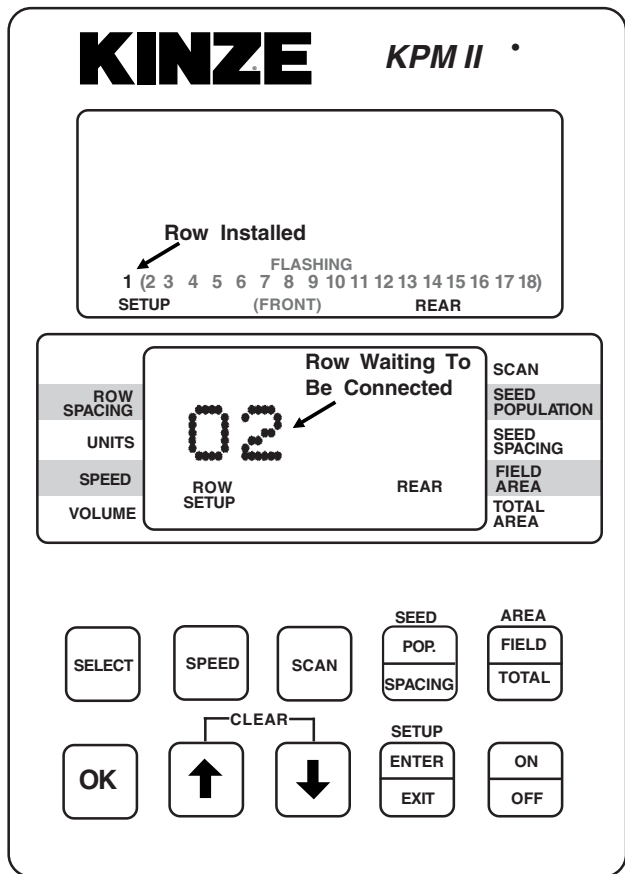
(A11948)



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.

STEP 7 (Continued)

12060211



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

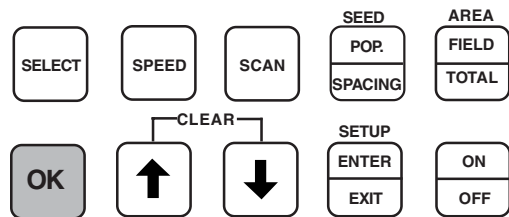
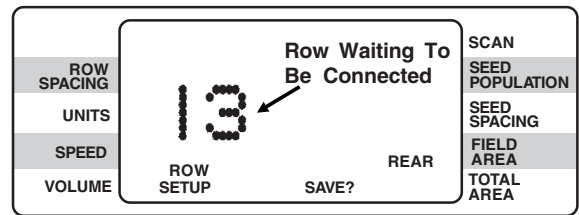
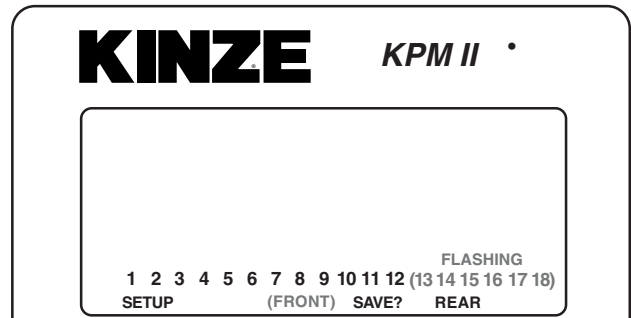
MACHINE OPERATION

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.

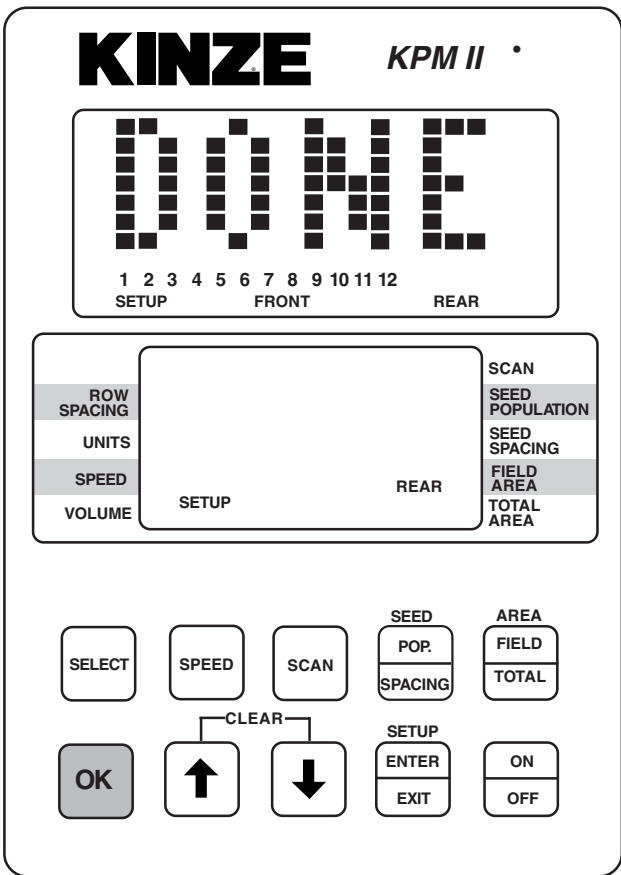
12060211



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

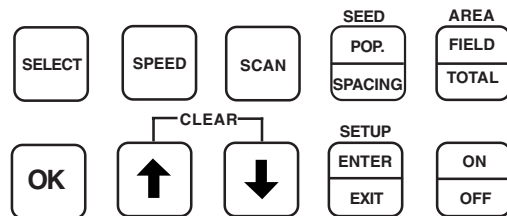
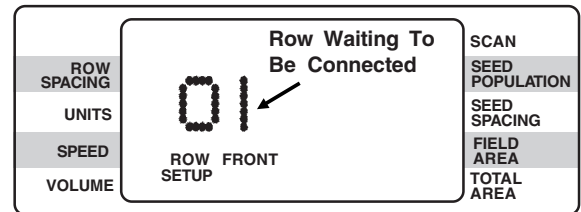
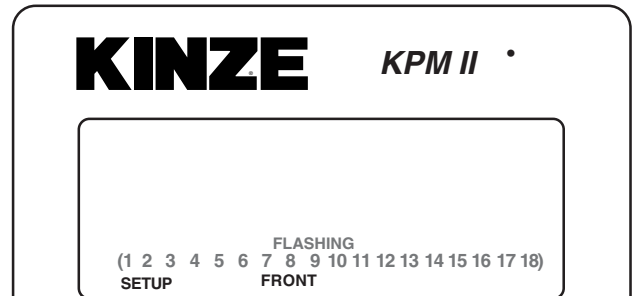
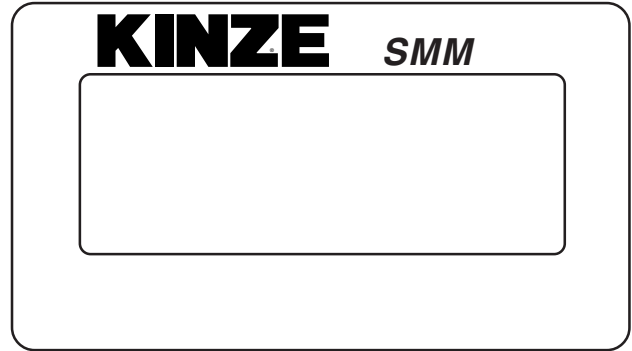
KPM II STACK-MODE

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



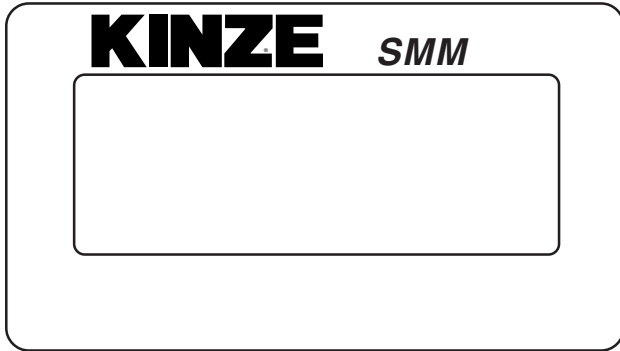
NOTE: SMM console may not be applicable to all models.

MACHINE OPERATION

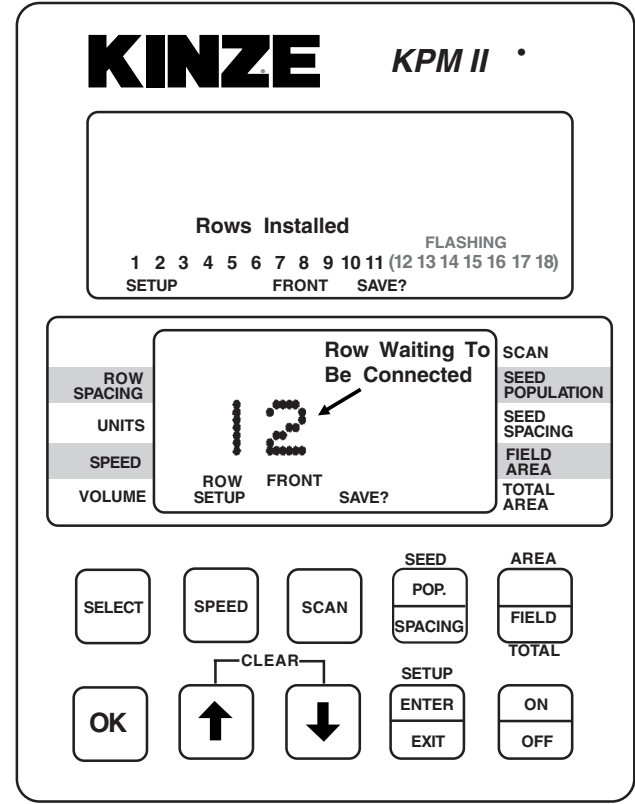
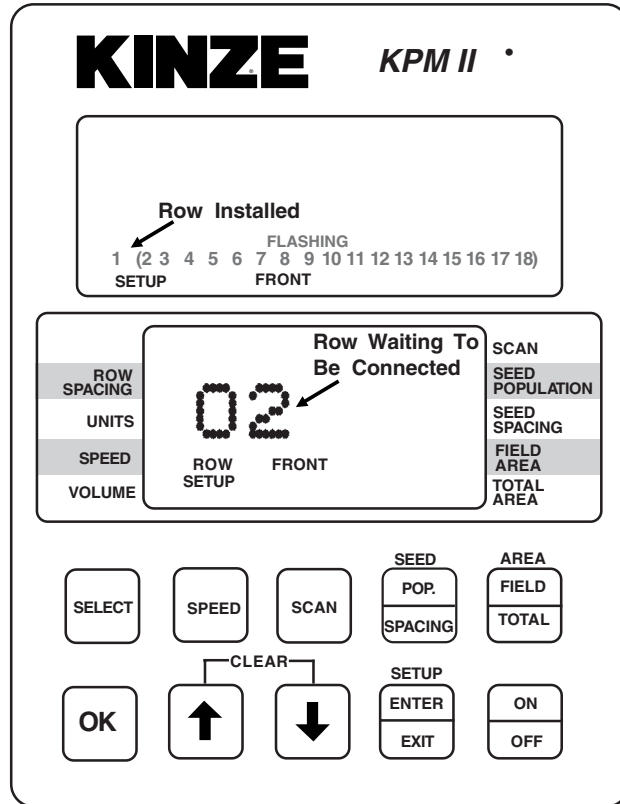
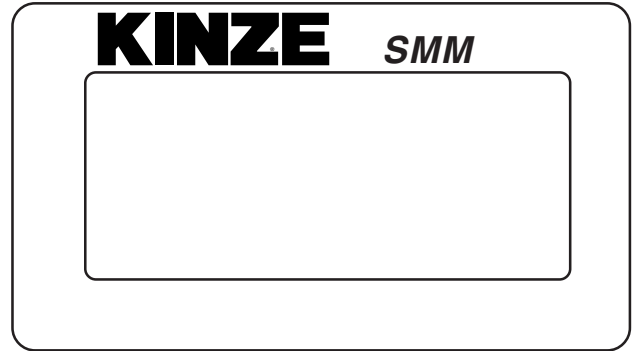
KPM II STACK-MODE

STEP 9 (Continued)

12060213



12060214



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

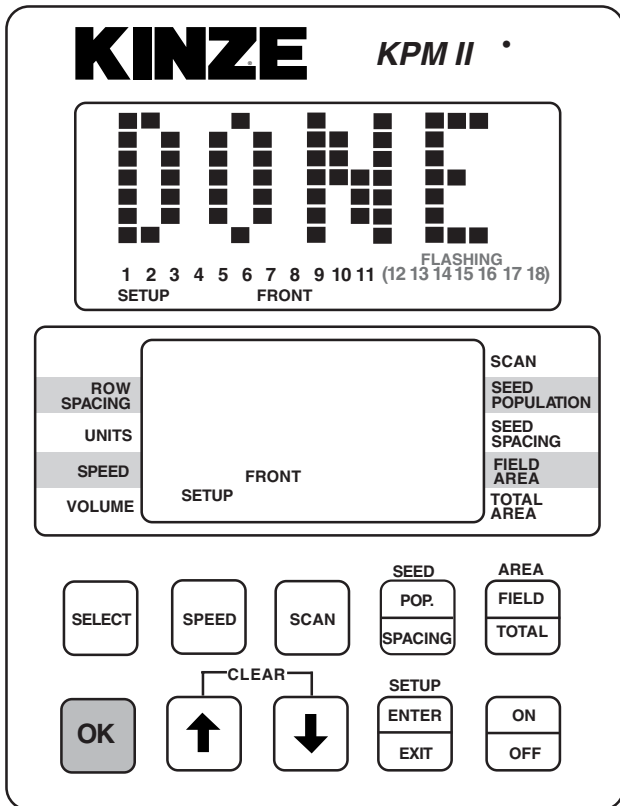
NOTE: SMM console may not be applicable to all models.

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: 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.

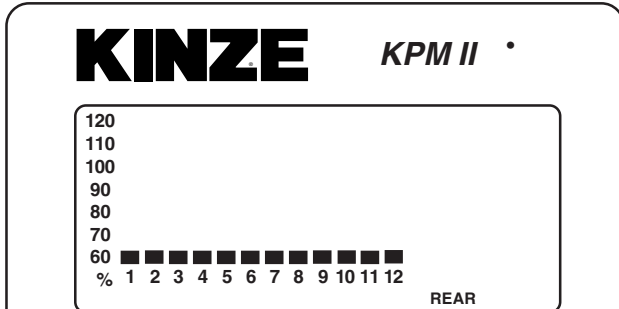
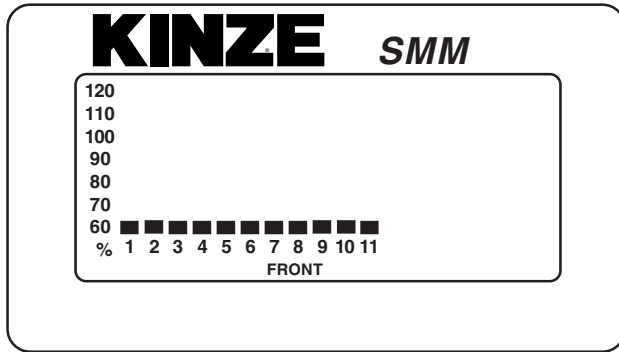
NOTE: To connect the radar distance sensor, install the 10" monitor/radar adapter between the console and radar distance sensor to adapt the monitor system to various tractor radar systems. **DO NOT CONNECT 10" MONITOR/RADAR ADAPTER PRIOR TO THIS STEP.**

MACHINE OPERATION

KPM II STACK-MODE

STEP 10 (Continued)

12060216



ROW SPACING	GNDSPD	SCAN
UNITS		SEED POPULATION
SPEED		SEED SPACING
VOLUME		FIELD AREA
	REAR	TOTAL AREA

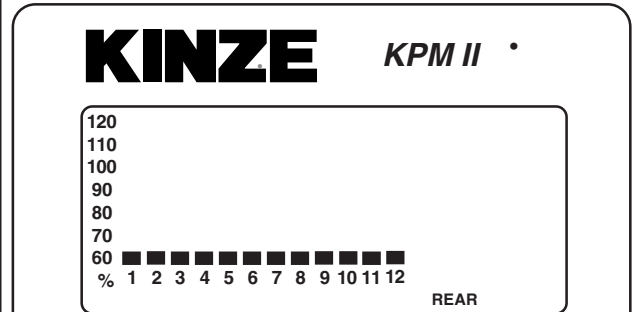
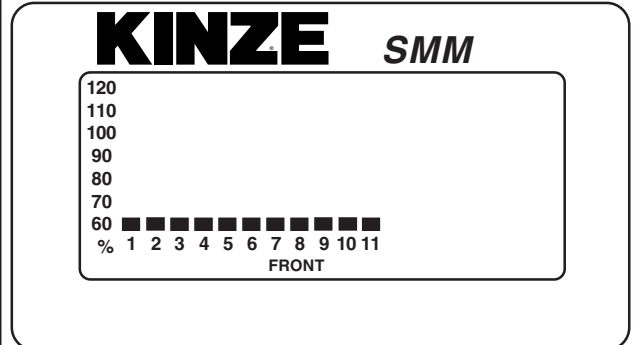
SELECT	SPEED	SCAN	SEED POP. SPACING	AREA FIELD TOTAL
OK	CLEAR		SETUP ENTER EXIT	ON OFF
	↑	↓		

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



ROW SPACING	MPH	SCAN
UNITS		SEED POPULATION
SPEED		SEED SPACING
VOLUME		FIELD AREA
	0.0	TOTAL AREA

SELECT	SPEED	SCAN	SEED POP. SPACING	AREA FIELD TOTAL
OK	CLEAR		SETUP ENTER EXIT	ON OFF
	↑	↓		

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

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.

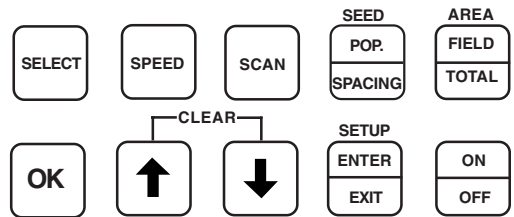
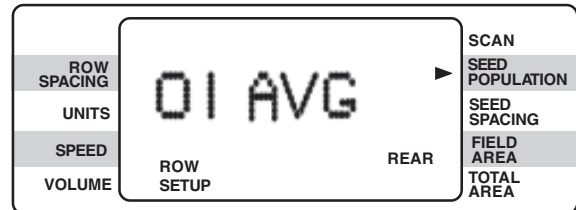
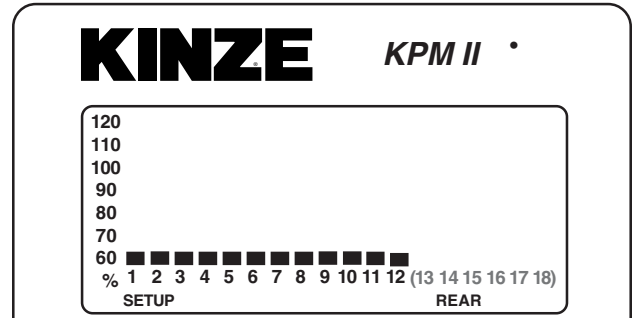
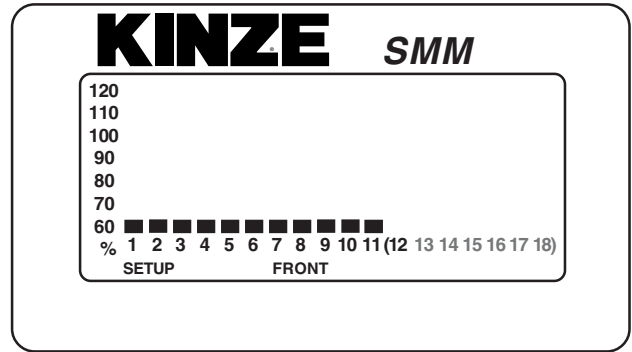
NOTE: Illustrated using rear/front configuration. The KPM II Stack-Mode console shows LEFT in the left/right configuration, REAR in the rear/front configuration and FRONT LEFT/REAR LEFT in the four sections configuration. The SMM console shows RIGHT in the left/right configuration, FRONT in the rear/front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

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.

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.

KPM III ELECTRONIC SEED MONITOR

D10190501



The KPM III electronic seed monitor system consists of (a) a KPM III 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 (if applicable), which are installed on the planter drill shafts; and (e) 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 (requires 12 volts DC). The console receives information from each of the sensors and translates 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.

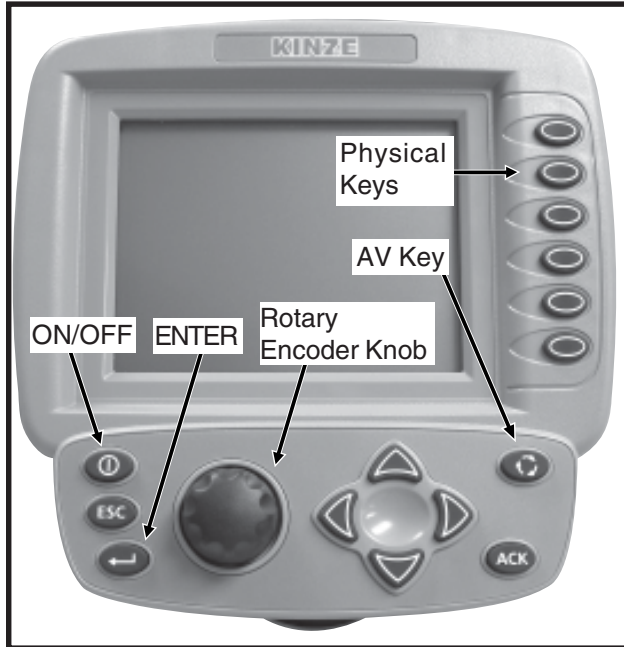
The monitor system will power down if no activity is detected within one hour. No activity means there has been no new seed flow and no operator push key input.

Monitor Key Functions	6-45
Configuring Planter Monitor	6-46
Programming/Connecting Seed Tubes, Shaft Rotation Sensors And/Or Radar/Magnetic Distance Sensors	6-48
Changing Volume, Contrast And Backlighting	6-50
Programming Interplant® Condition, Row Spacing And Units (Metric Or English)	6-51
Programming Row Unit Alarms Levels	6-52
Speed Sensor Calibration/Programming	6-53
Reprogramming Speed Sensor	6-54
Adding Interplant® Rows (If Rear Rows Have Previously Been Programmed)	6-58
Adding Even-Row Package (If Front Rows Have Previously Been Programmed)	6-60
Enabling/Disabling Interplant® Rows	6-62
Warnings And Alarms	6-65
Field Operation	6-67
Area Management	6-68
Area Counters	6-70
Clearing Field Area	6-71
Acre Count Mode	6-71
Replacing Faulty Sensor(s)	6-73

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.

D10190501



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.



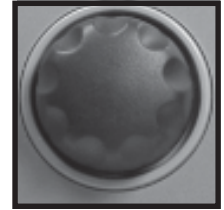
ENTER KEY

- 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.



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.



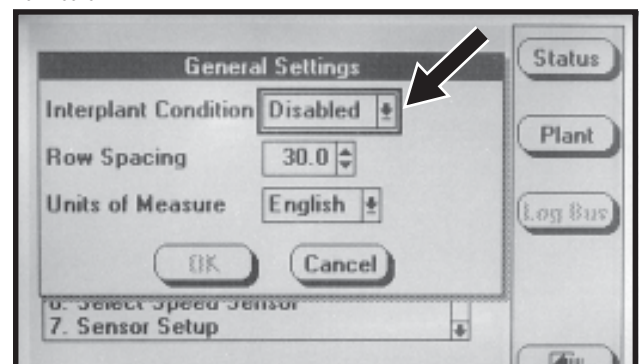
ARROW KEYS

- UP arrow key is used to increase the value of an item by one or to scroll up.
- DOWN arrow key is used to decrease the value of an item by one or to scroll down.
- LEFT arrow key multiplies the numeric value of the item by 10.
- RIGHT arrow key divides the numeric value of the item by 10.



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.

D02140616

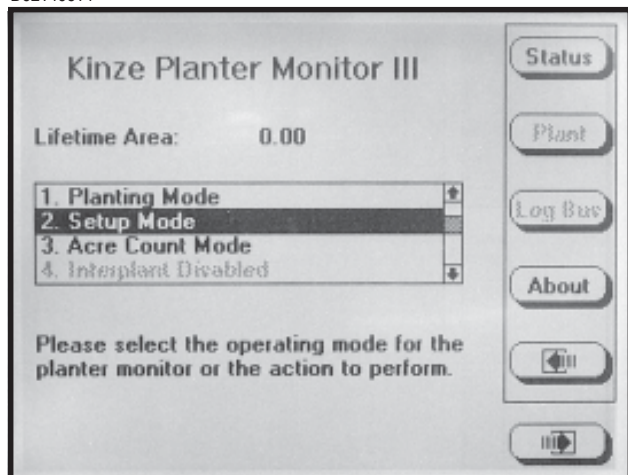


CONFIGURING PLANTER MONITOR

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

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

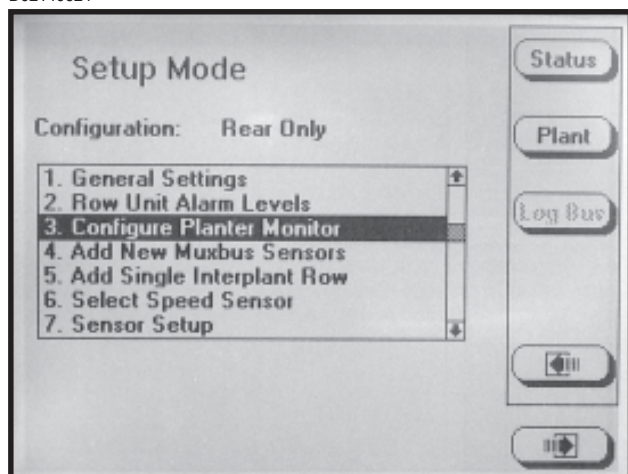
D02140614



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

STEP 3 Select “Configure Planter Monitor” by turning the knob or using the UP and DOWN arrow keys. Press the knob or the ENTER key to display the highlighted item.

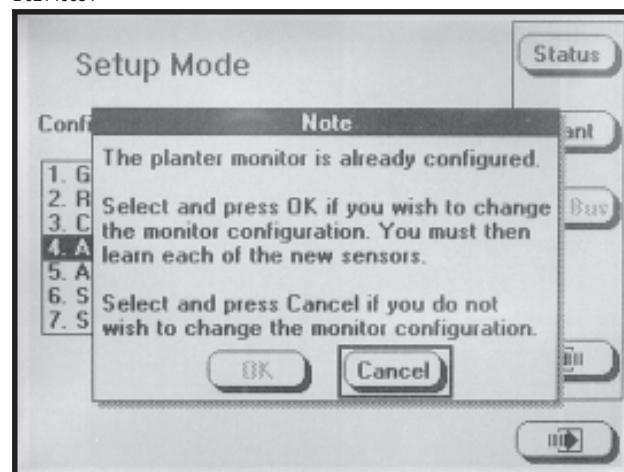
D02140624



NOTE: The planter monitor cannot be reconfigured while planting.

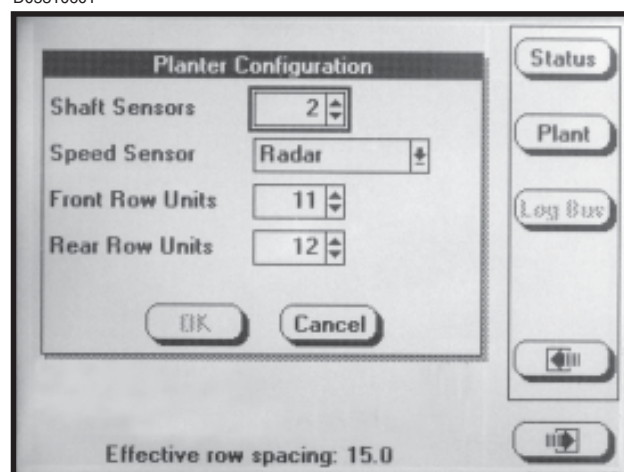
NOTE: If the monitor has already been configured the message shown below will appear.

D02140634



STEP 4 Press the knob or ENTER key, to highlight the “Shaft Sensors” field. Enter the number of “Shaft Sensors” by turning the knob or using the UP or DOWN arrow keys. When the correct value is displayed press the knob or ENTER key. The black box will advance to “Speed Sensor” field.

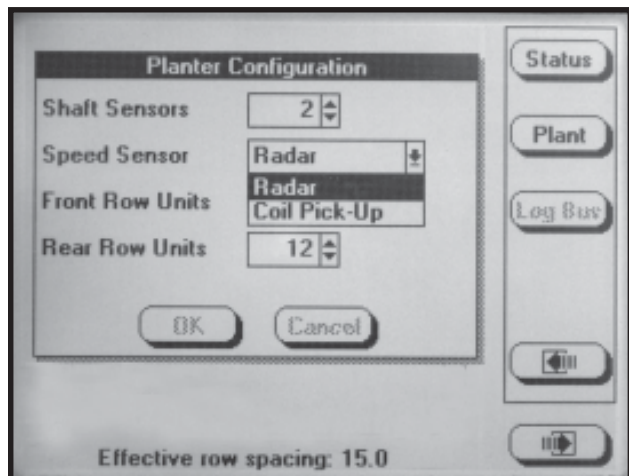
D05310601



NOTE: The numeric value may be changed only if the item is highlighted. Turning the rotary encoder knob increases or decreases the value of the item. The UP arrow key may be used to increase the value of the item by one and the DOWN arrow key may be used to decrease the value of the field by one.

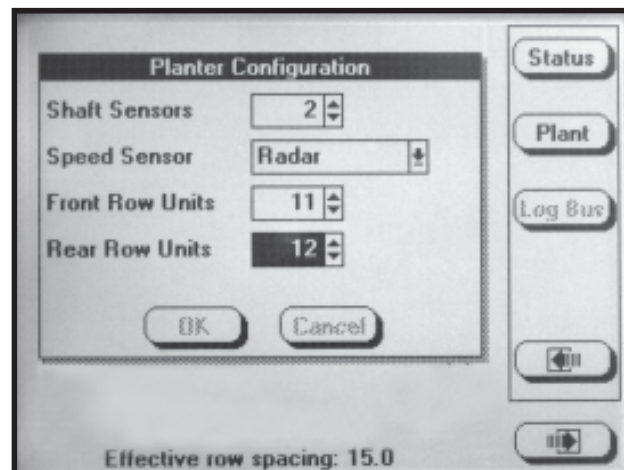
STEP 5 Press the knob or ENTER key and a drop down menu will appear; select either “Radar” or “Coil Pick-Up” (MDS) by turning the knob or using the UP or DOWN arrow keys. When the desired selection is highlighted press the knob or ENTER key. The black box will advance to “Front Row Units” field.

D05310604



STEP 7 Press the knob or ENTER key to highlight the “Rear Row Units” field. Turn the knob or use the UP or DOWN arrow keys to obtain correct number of pull row units. Press the knob or ENTER key when desired quantity is displayed. The black box will advance to the OK key.

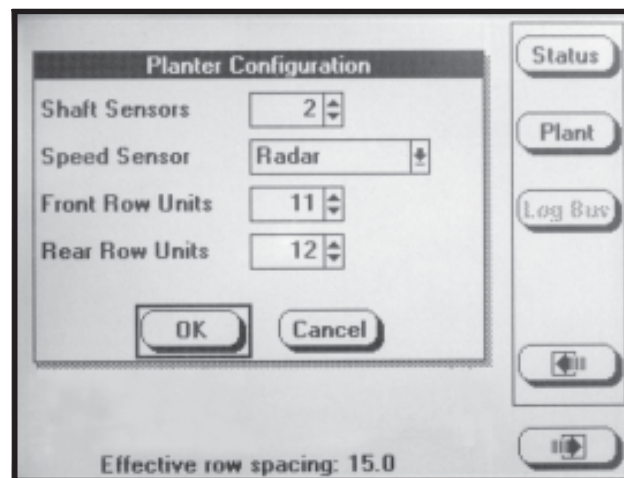
D05310606



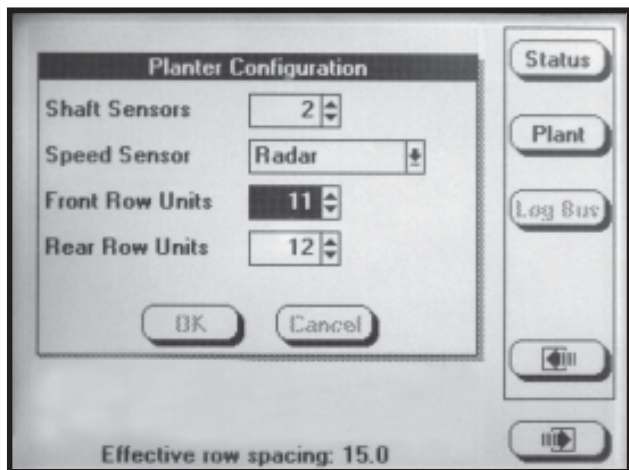
STEP 6 If there are front rows on the planter, press the knob or ENTER key to highlight the “Front Row Units” field. Turn the knob or use the UP or DOWN arrow keys to obtain correct number of push row units. Press the knob or ENTER key when desired quantity is displayed. The black box will advance to “Rear Row Units” field. If no front rows need to be entered simply turn the knob or press the DOWN arrow key to advance to “Rear Row Units”.

STEP 8 Press the knob or the ENTER key to save the information.

D05310607



D05310605



NOTE: To prevent the configuration from being saved press ESC or select the CANCEL button, then press the rotary encoder knob or ENTER key.

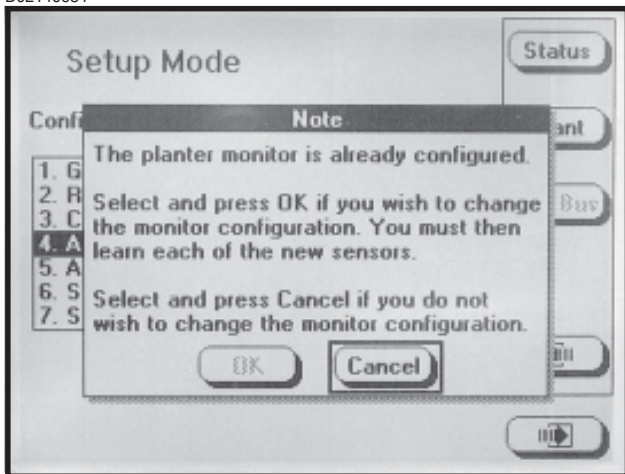
STEP 9 The monitor screen shown below will appear.

If the new planter configuration is to be saved turn the knob or press the UP or DOWN arrow keys to select the OK button then press the knob or ENTER key to save the planter configuration into the KPM III. If the monitor configuration is not to be changed select the CANCEL key, press the knob or ENTER key to CANCEL or press the ESC key.

If OK is selected the monitor will advance to "Sensor Setup" (STEP 4 in PROGRAMMING/CONNECTING SEED TUBES, SHAFT ROTATION SENSORS AND/OR RADAR/MAGNETIC DISTANCE SENSORS section).

NOTE: STEP 9 does not apply if configuring the monitor for the first time.

D02140634



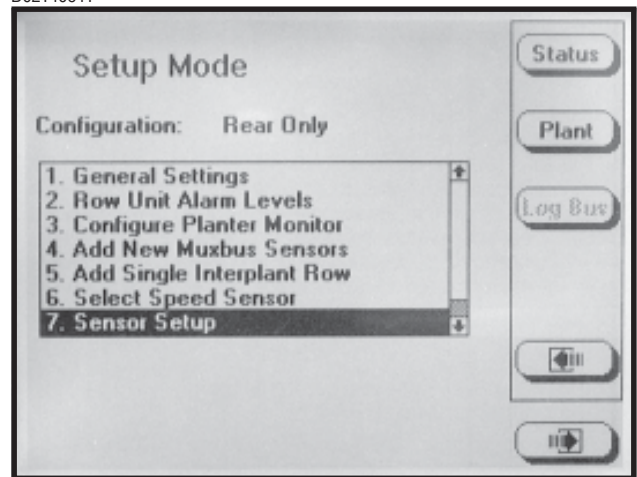
PROGRAMMING/CONNECTING SEED TUBES, SHAFT ROTATION SENSORS AND/OR RADAR/MAGNETIC DISTANCE SENSORS

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

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

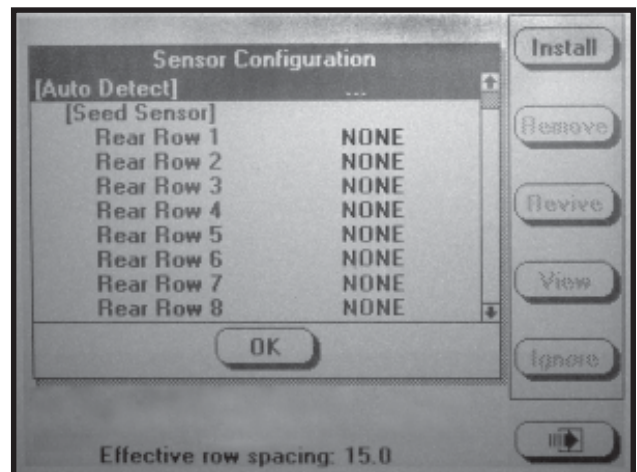
STEP 3 Select "Sensor Setup" by turning the knob or using the UP or DOWN arrow keys. Press the knob or ENTER key to display the highlighted item.

D02140641



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 INSTALL key.

D02210601a

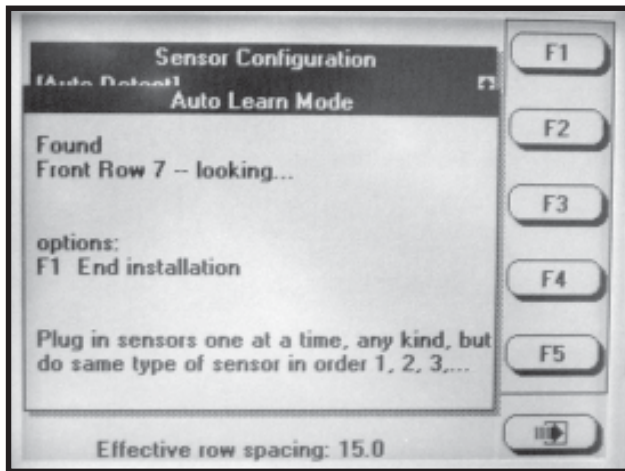


STEP 5 Plug in the first seed sensor (row 1), working from left to right (rear row units and front next if applicable). When a sensor is connected to the planter harness wait for the monitor to acknowledge with two beeps.

Continue connecting seed sensors along with shaft rotation sensors or speed sensors. Progress will reflect on the LCD screen. The example below indicates that the last seed sensor found was Front Row 7 and the monitor is looking for the next sensor.

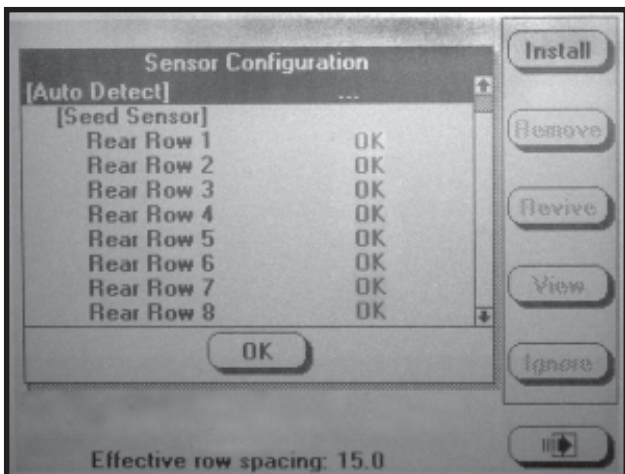
When all sensors are installed press the F1 key to end the installation.

D02170617



NOTE: After each sensor has been installed “OK” will appear after the sensor name.

D02210601b

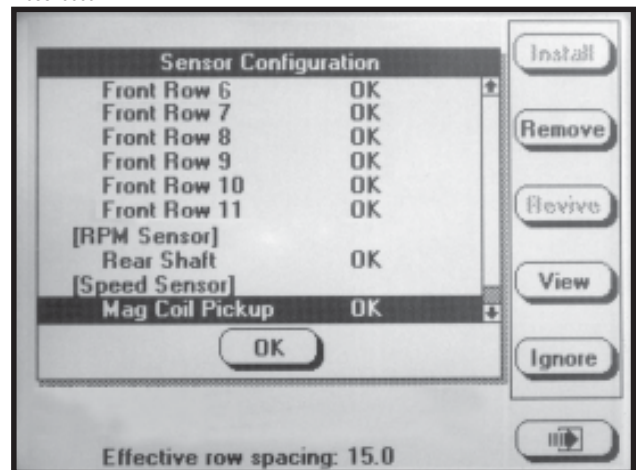


STEP 6 If “OK” appears behind ALL sensors, press the knob or the ENTER key to save the configuration. The “Setup Mode” menu will then appear.

NOTE: If “NONE” appears after a sensor, the sensor was not recognized. All sensors must be disconnected from the planter harness and reconnected as described in STEP 5.

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.

D05310609



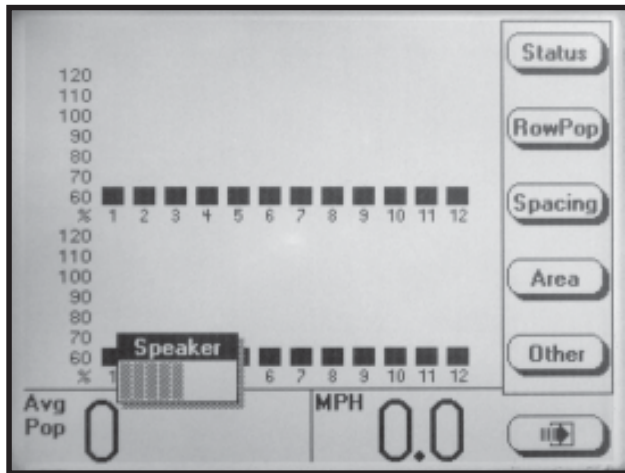
STEP 7 To return to “Planting Mode” select the PLANT key or press the F6 key until “Planting Mode” screen appears.

CHANGING VOLUME, CONTRAST AND BACKLIGHTING

The alarm volume and 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 speaker adjustment dialog box will appear in the lower L.H. corner of the display.

D05310610

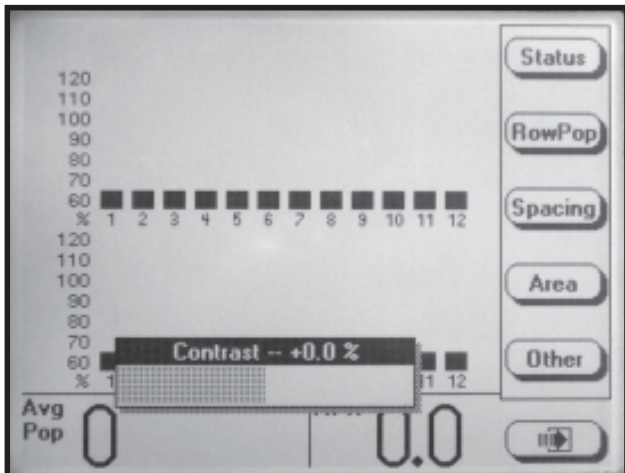


STEP 2 Use the LEFT and RIGHT arrows or turn the rotary encoder knob to adjust the volume. The volume of the sound emitted from the speaker changes as the adjustment is being made.

STEP 3 To adjust contrast or backlight, go to STEP 4. If finished press ENTER to save and exit.

STEP 4 Press the AV button a second time. The contrast adjustment dialog box will appear in the lower portion of the display.

D05310611

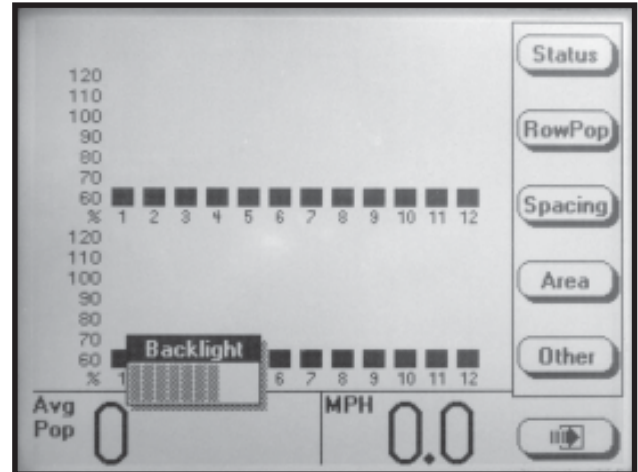


STEP 5 Use the LEFT and RIGHT arrows or turn the knob to adjust contrast. The effect of the adjustment will be visible on the display.

STEP 6 To adjust backlighting go to STEP 7. If finished press ENTER to save and exit.

STEP 7 Press the AV button a third time. The backlight adjustment dialog box will appear in the lower L.H. corner of the display.

D05310612



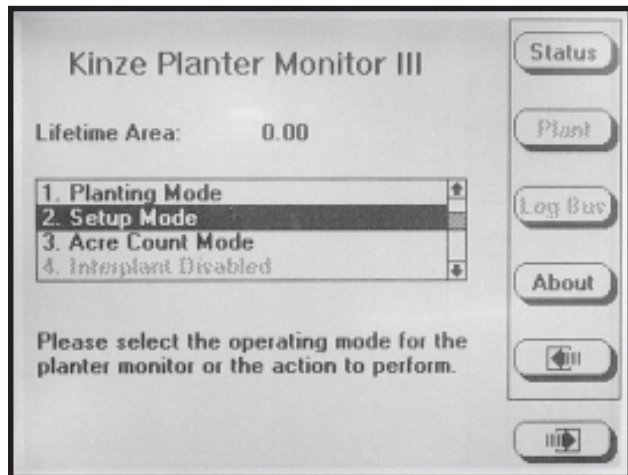
STEP 8 Use the LEFT and RIGHT arrows or turn the knob to adjust backlighting. The effect of the adjustment will be visible on the display.

STEP 9 Press the knob, ENTER or press the AV button a fourth time to save the volume, contrast and backlight settings. The backlight adjustment dialog box will disappear.

**PROGRAMMING INTERPLANT® CONDITION,
ROW SPACING AND UNITS (Metric Or English)**

STEP 1 To enter “Mode Selection” screen press the F6 key until “Mode Selection” screen appears.

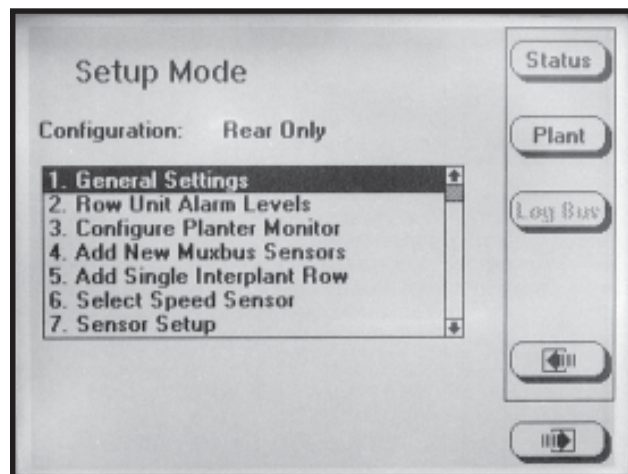
D02140614



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

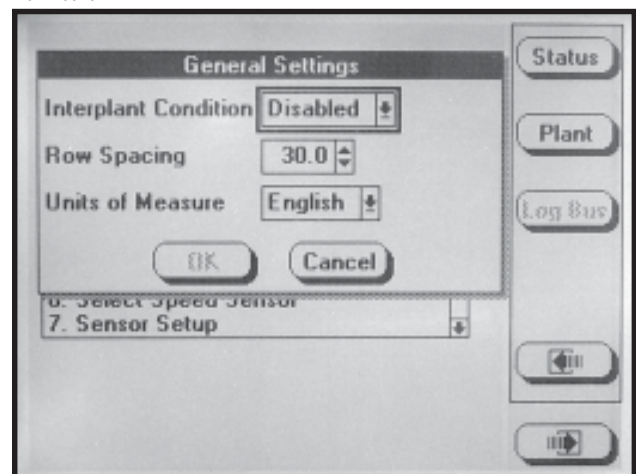
STEP 3 Select “General Settings” by turning the knob or using the UP or DOWN arrow keys. Press the knob or the ENTER key to display the highlighted item.

D02140615



STEP 4 Press the knob or ENTER key and a drop down menu will appear. Select either “Enabled” (push row units are being used for planting) or “Disabled” (push row units are not being used for planting and no seed rate alarms will be generated for the front rows; no bargraphs are to be displayed for the front rows and the front rows do not contribute to the average population and spacing or acre counts). Use the knob or UP or DOWN arrow keys to make selection. Press the knob or ENTER key to select highlighted item. The black box will advance to “Row Spacing” field.

D02140616



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

STEP 5 Press the knob or ENTER key to enter the correct value for “Row Spacing”. Turn the knob to increase or decrease the number. The UP arrow key is used to increase the value of the item by one and the DOWN arrow key is used to decrease the value of the field by one. The LEFT arrow key multiplies the value of the item by 10 and the RIGHT arrow key divides the value of the item by 10. When the correct number has been entered press the knob or ENTER key. The black box will advance to “Units of Measure” field.

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 6 Select “Units Of Measure” field by pressing the knob or ENTER key and a drop down menu will appear. Select either “English” or “Metric” by turning the knob or using the UP or DOWN arrow keys. Press the knob or the ENTER key. The black box will advance to OK.

STEP 7 Press the knob or ENTER key, when correct values are entered.

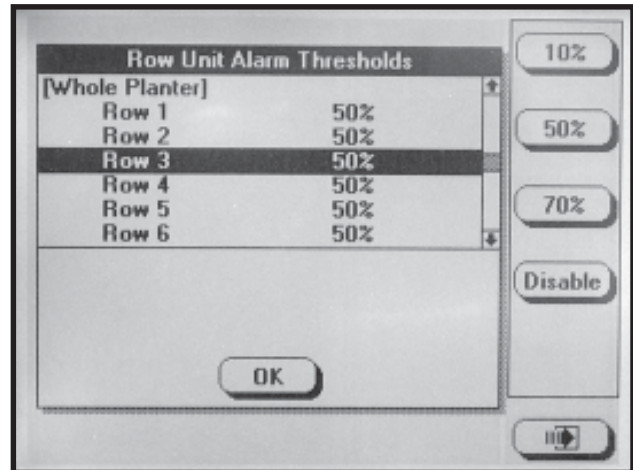
STEP 8 To return to “Planting Mode” press the PLANT key.

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%, 10% or disabled for any row.

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

D02140623



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 To enter “Mode Selection”, press F6 key until the “Mode Selection” screen appears.

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

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

STEP 4 To set alarm thresholds for whole planter, select “Whole Planter”. Press the key next to the desired threshold. When the desired threshold has been specified for all row units, press the knob or ENTER key.

To set alarm thresholds for all the rows in one section, select rear section or front section. Press the key next to the desired threshold. When the desired threshold has been specified for all row units, press the knob or ENTER key.

To set alarm thresholds for individual rows, select the desired row. Press the key next to the desired threshold. When the desired threshold has been specified for all row units, press the knob or ENTER key.

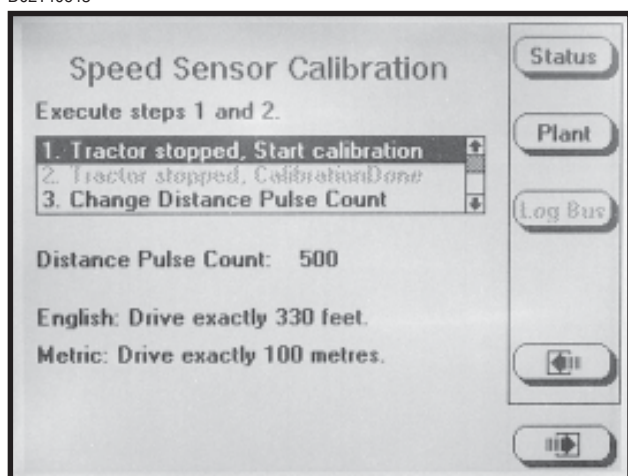
STEP 5 To return to “Planting Mode” press the PLANT key.

SPEED SENSOR CALIBRATION/PROGRAMMING

STEP 1 To enter the “Speed Sensor Calibration” mode, press F6 until the “Mode Selection” screen appears. (If Applicable) Select “Setup Mode” and press the rotary encoder knob or ENTER key. Press F6 to advance to the “Speed Sensor Calibration” screen.

The Distance Pulse Count is used to record how many pulses are generated per mile/kilometer from the ground speed sensor. The monitor will display the current pulses per mile/kilometer using a 6 digit, no decimal place format.

D02140643



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 monitor 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.**

- 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.
- Select “Tractor stopped. Start calibration”.
- Press the rotary encoder knob or ENTER key to change the Distance Pulse Count on the display to 0.

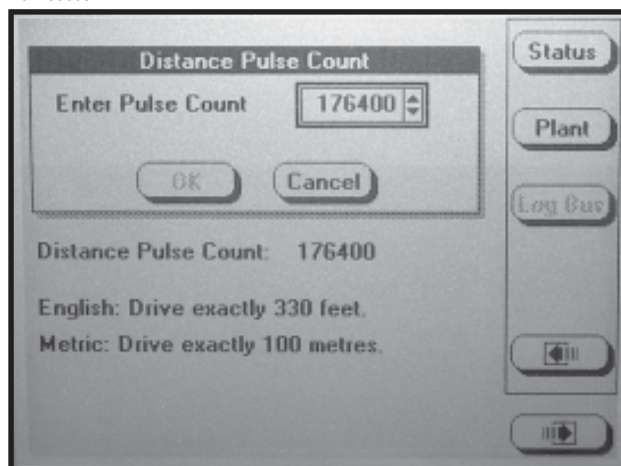
NOTE: If the Distance Pulse Count number starts to count pulses with the tractor not moving, check radar distance sensor for vibration or other interference.

- 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.
- Select “Tractor stopped. Calibration Done”.
- Press the knob or ENTER key.

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

STEP 2 Select “Change Distance Pulse Count” by turning the knob or using the DOWN arrow key. Press the knob or ENTER key.

D02200605



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

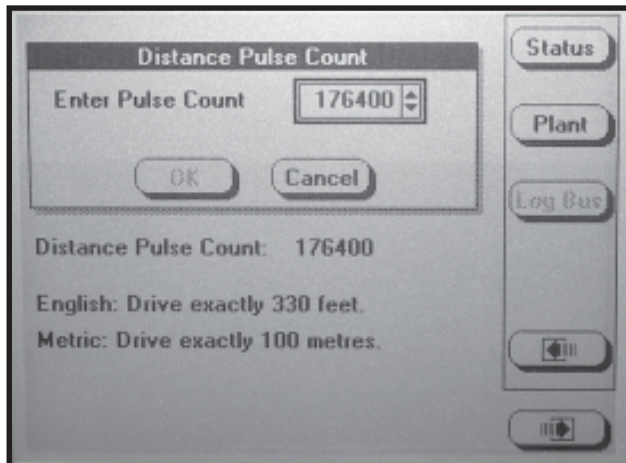
STEP 3 To return to “Planting Mode” press the PLANT key.

WHEN THE CORRECT DISTANCE PULSE COUNT IS KNOWN, CALIBRATION IS NOT NEEDED AND THE FOLLOWING STEPS MAY BE USED.

STEP 1 To enter the “Speed Sensor Calibration” screen, press F6 key until the “Mode Selection” screen appears. (If Applicable) Select “Setup Mode” and press the rotary encoder knob or ENTER key. Press F6 key to advance to the “Speed Sensor Calibration” screen.

STEP 2 Select “Change Distance Pulse” field by turning the knob or using the UP or DOWN arrow keys. Press the knob or ENTER key.

D02200605



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

STEP 3 With the “Enter Pulse Count” field selected press the knob or ENTER key.

STEP 4 Change the Pulse Count to the desired value using the UP or DOWN arrow keys or turn the knob until the desired value is obtained. Press the knob or ENTER key.

NOTE: The LEFT arrow key multiplies the value of the item by 10 and the RIGHT arrow key divides the value of the item by 10.

STEP 5 Select OK by pressing the knob or ENTER key to save the new count. Select CANCEL to retain the old value of the Distance Pulse Count.

STEP 6 Press PLANT key to return to main planting screen.

REPROGRAMMING SPEED SENSOR

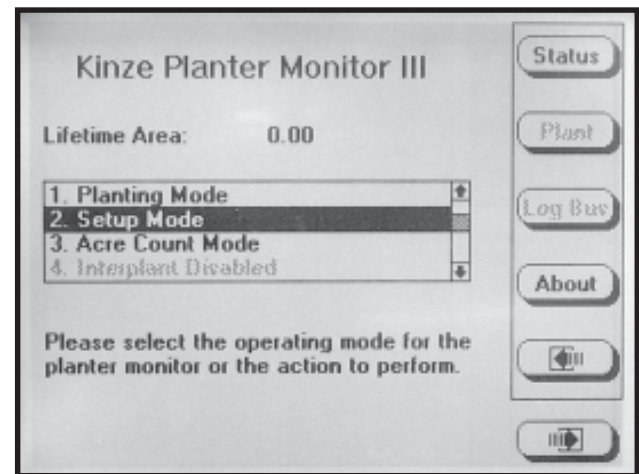
This setting must be specified when the monitor is first configured. It will be necessary to reprogram to use an alternate speed sensor.

NOTE: Speed sensors may not be changed while planting.

RADAR TO MAGNETIC DISTANCE SENSOR

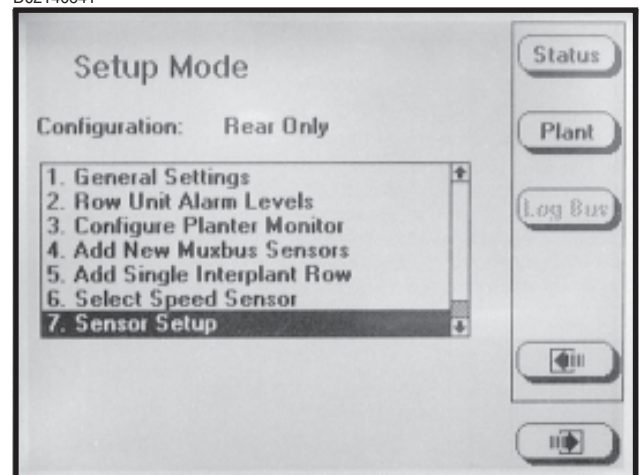
STEP 1 Press the F6 key until the “Mode Selection” screen appears. Select “Setup Mode” by turning the rotary encoder knob or using the UP or DOWN arrow keys. Press the knob or ENTER key to display the highlighted item.

D02140614



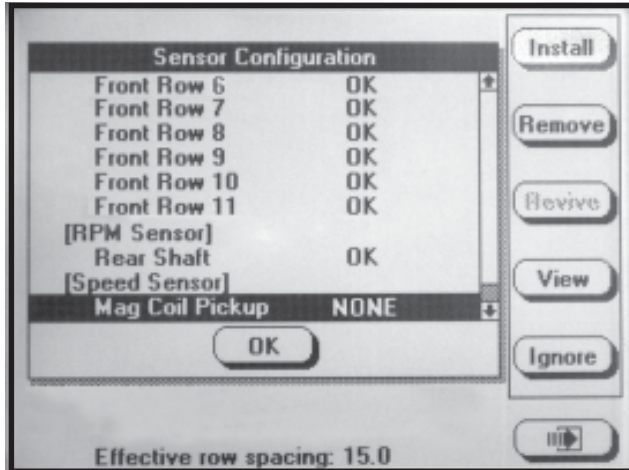
STEP 2 Turn the knob or use the UP or DOWN arrow keys to choose “Sensor Setup”. Press the knob or ENTER key to display the highlighted item.

D02140641



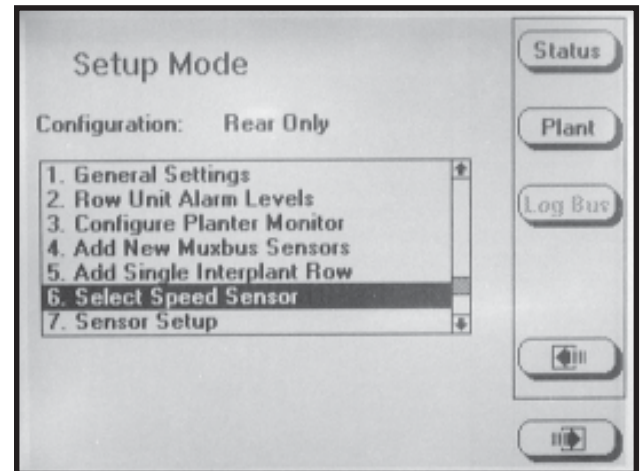
STEP 3 Turn the knob or use the UP or DOWN arrow keys to highlight “Mag Coil Pickup”. Plug in Magnetic Distance Sensor and press the INSTALL key. Press the knob or ENTER key to save information.

D05310609a

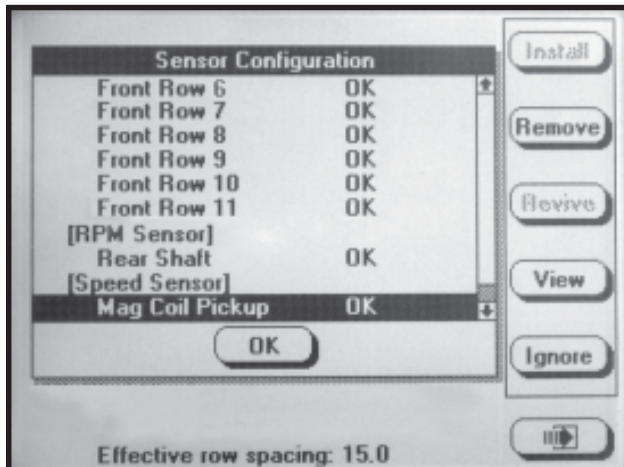


STEP 4 Turn the knob or use the UP or DOWN arrow keys to select “Select Speed Sensor” and press the knob or ENTER key. Press the knob or ENTER key to select the “Speed Sensor” field and a drop down menu will appear. Turn the knob or use the UP or DOWN arrow keys to select “Coil Pick-Up” and press the knob or ENTER key to make selection. The black box will advance to OK press the knob or ENTER key to save the information.

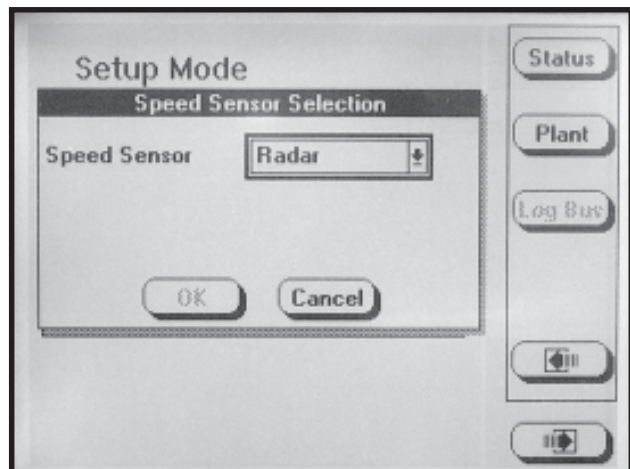
D02140639



D05310609

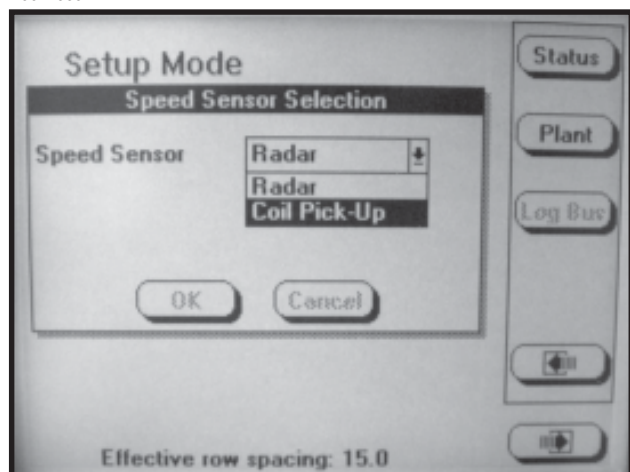


D02140639



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

D06210601



STEP 5 Unplug the radar from the tractor.

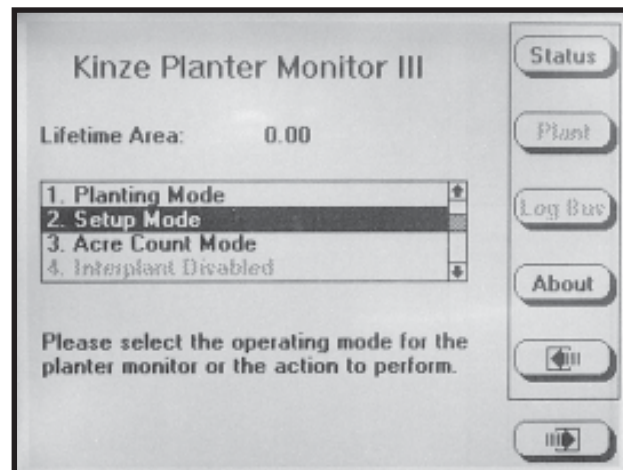
STEP 6 Press the PLANT key to return to main planting screen.

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 TO RADAR

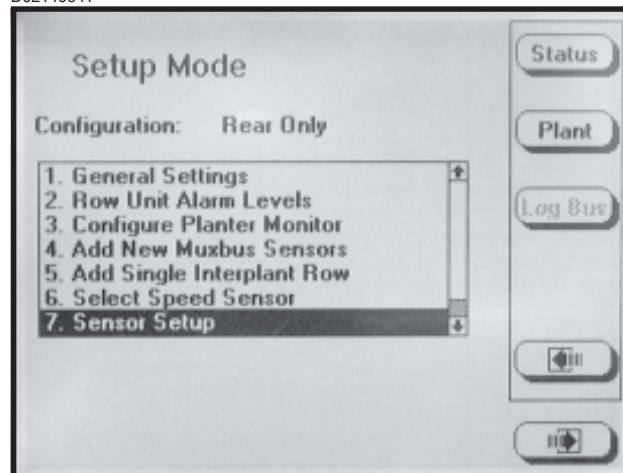
STEP 1 Press the F6 key until the “Mode Selection” screen appears. Select “Setup Mode” by turning the rotary encoder knob or using the UP or DOWN arrow keys. Press the knob or ENTER key to display the highlighted item.

D02140614

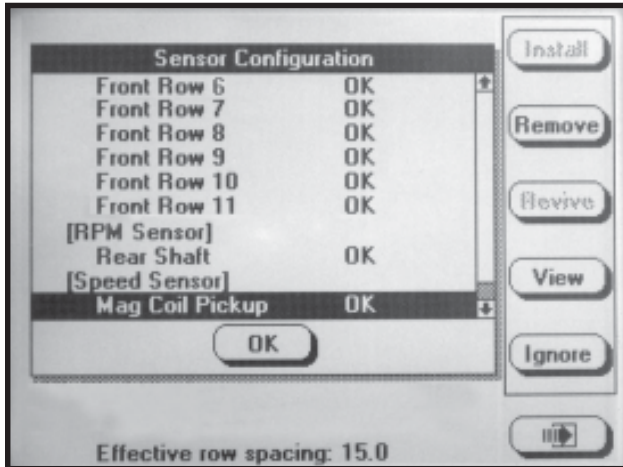


STEP 2 Turn the knob or use the UP or DOWN arrow keys to choose “Sensor Setup”. Turn the knob or use the UP or DOWN arrow keys to highlight “Mag Coil Pickup”. Press the REMOVE key, a note will appear for confirmation select as appropriate. Unplug Magnetic Distance Sensor and press the knob or ENTER key to save the information.

D02140641

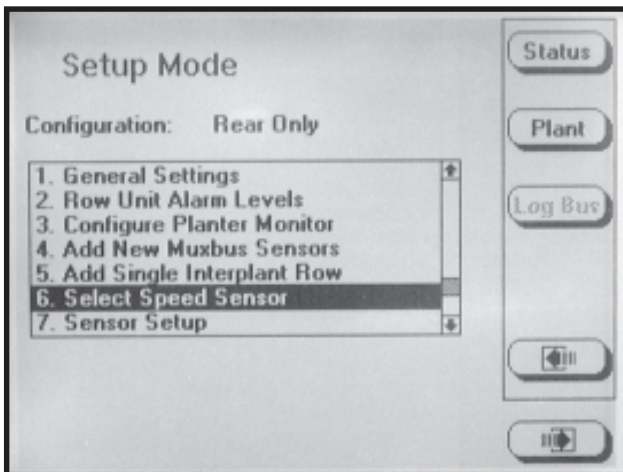


D05310609

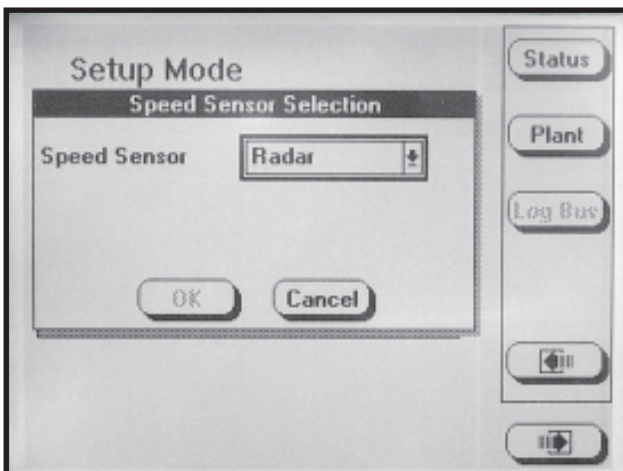


STEP 3 Turn the knob or use the UP or DOWN arrow keys to select “Select Speed Sensor” and press the knob or ENTER key. Press the knob or ENTER key to select the “Speed Sensor” field and a drop down menu will appear. Turn the knob or use the UP or DOWN arrow keys to select “Radar” and press the knob or ENTER key to make selection.

D02140639

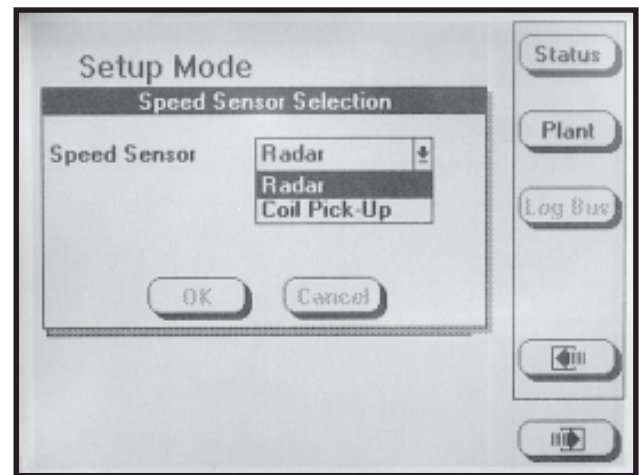


D02140639



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

D02140640



STEP 4 Plug in the Radar and the black box will advance to OK. Press the knob or ENTER key to save the information.

STEP 5 Press the PLANT key to return to main planting screen.

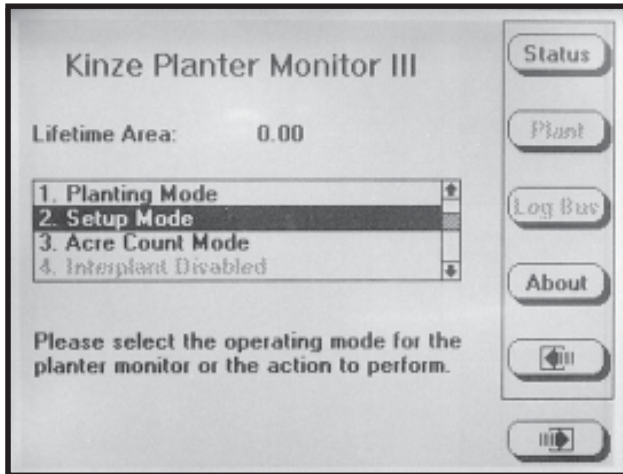
NOTE: When switching between speed sensors, verify the distance pulse count is correct for the chosen sensor. There will be significant distance pulse count variation between radar and magnetic distance sensors.

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

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

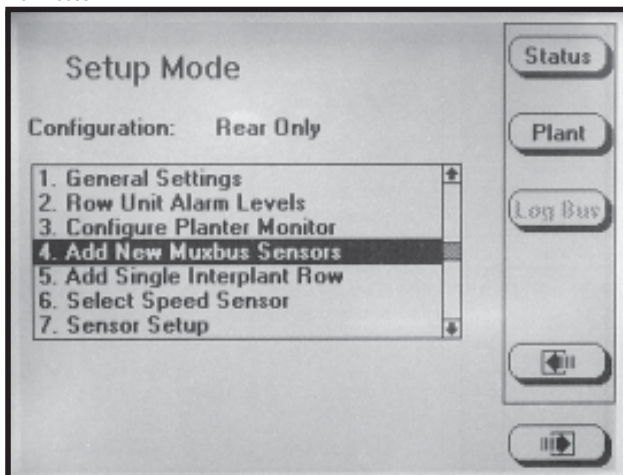
STEP 2 Select “Setup Mode” by turning the rotary encoder knob or using the UP or DOWN arrow keys. Press the knob or ENTER key to display the highlighted item.

D02140614



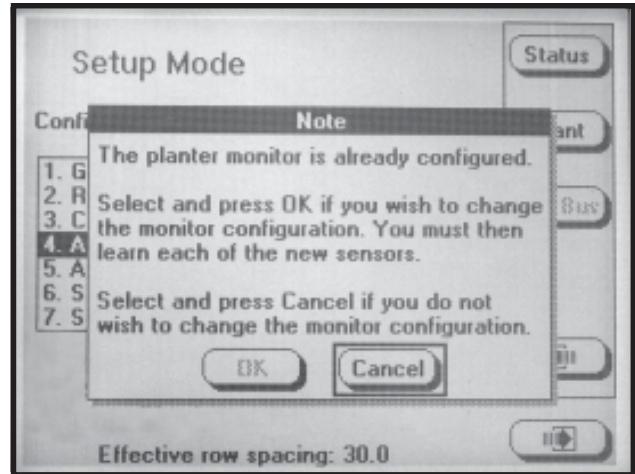
STEP 3 Select “Add New Muxbus Sensors” by turning the knob or using the UP and DOWN arrow keys. Press the knob or ENTER key to display the highlighted item.

D02140633



STEP 4 The note shown below will appear. Select OK by turning the knob or using the UP or DOWN arrow keys. Press the knob or ENTER key to make the selection.

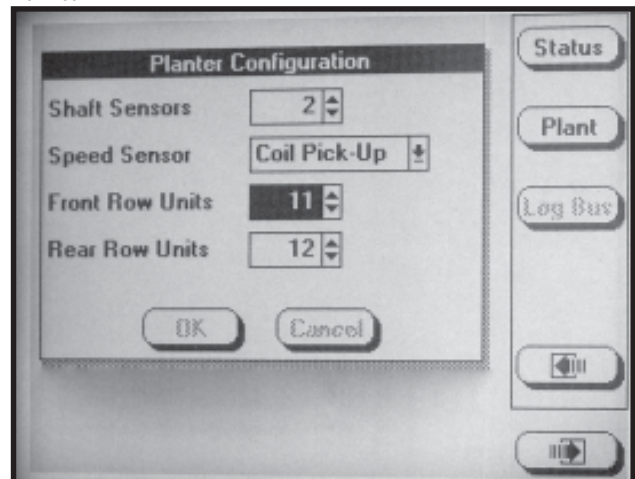
D03010601



STEP 5 Turn the knob or use the UP or DOWN arrow keys to select the “Front Row Units” field and press the knob or ENTER key to highlight the field. Turn the knob or use the UP or DOWN arrow keys to obtain the desired number of rows. When the correct value has been entered press the knob or ENTER key. The black box will advance to the OK key. Press the knob or ENTER key to save the information.

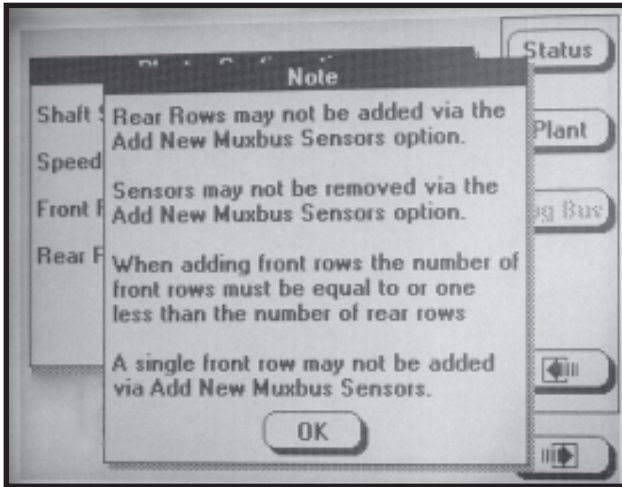
NOTE: To prevent the configuration from being changed select CANCEL, then press the knob, ENTER key or ESC key.

D02220674



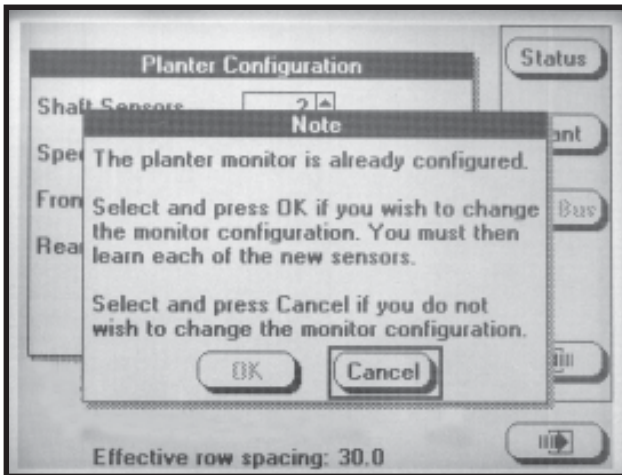
NOTE: Attempting to add rear rows while adding new muxbus sensors will cause the following note to appear.

D02220675



STEP 6 The note shown below will appear. Select OK by turning the knob or using the UP or DOWN arrow keys. Press the knob or ENTER key to make the selection.

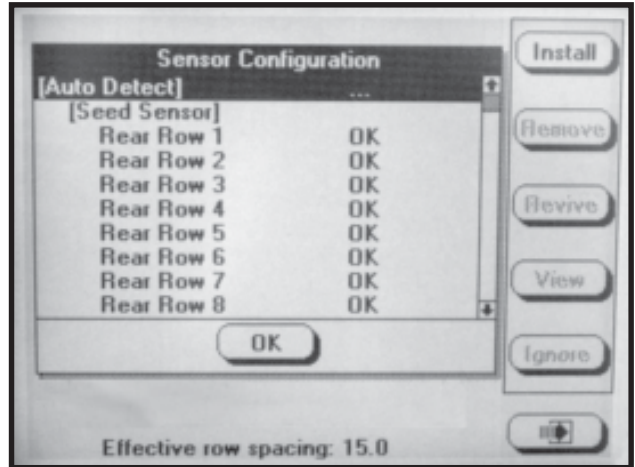
D03010603



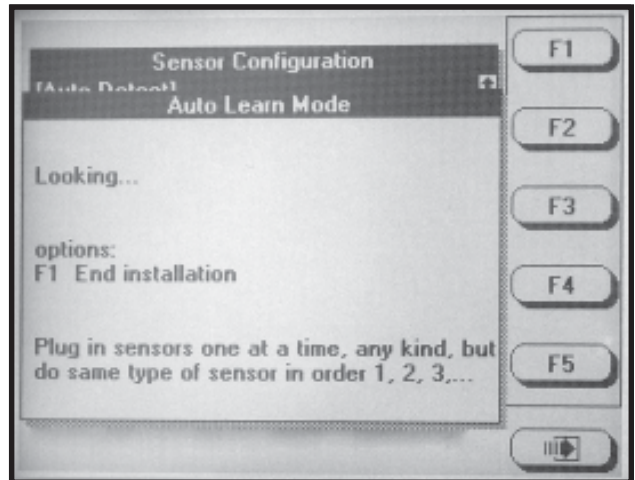
NOTE: To prevent the configuration from being changed select CANCEL, then press the knob, ENTER key or ESC key.

STEP 7 The sensor configuration screen will appear. With [Auto Detect] highlighted select INSTALL. Begin to install sensors from left to right.

D02230604a



D02220672

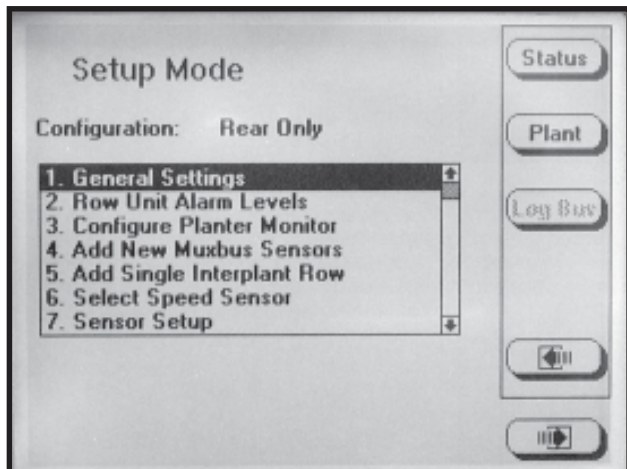


STEP 8 When all sensors are learned select F1 to end installation. Scroll down to verify the front rows are learned. Select OK by pressing the knob or ENTER key.

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

STEP 9 Select “General Settings”, by turning the knob or using the UP or DOWN arrow keys. Press the knob or ENTER key to make the selection.

D02140615



STEP 10 Select the “Row Spacing” field by turning the knob or using the UP or DOWN arrow keys. Press the knob or ENTER key to highlight field. Adjust the row spacing to Interplant spacing by turning the knob or using the UP or DOWN arrow keys. Press the knob or ENTER key to enter the value. Then turn the knob or use the UP or DOWN arrow keys to advance to OK. Press the knob or enter key to save row spacing.

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

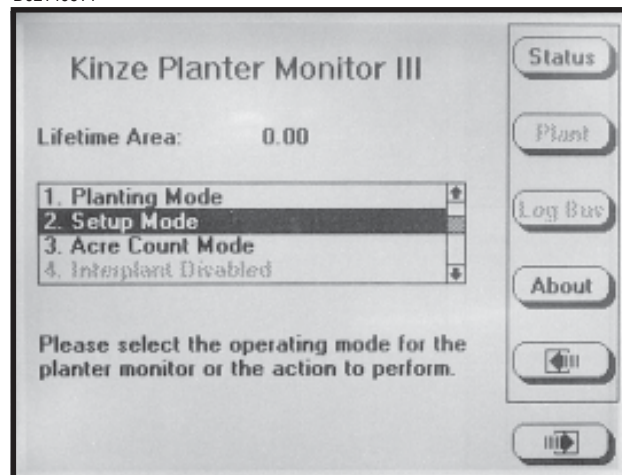
STEP 11 To return to “Planting Mode” press the PLANT key.

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

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

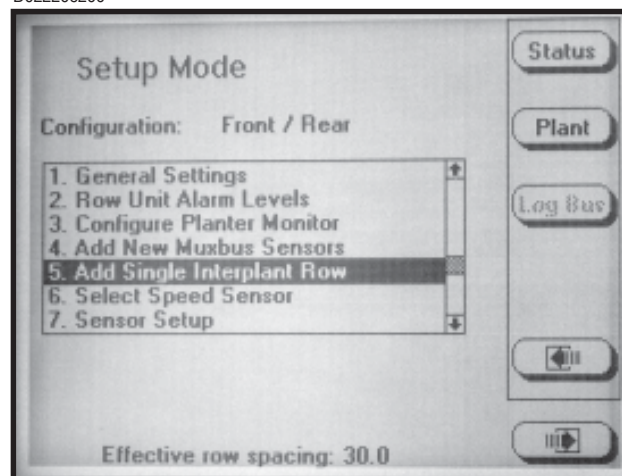
STEP 2 Select “Setup Mode” by turning the rotary encoder knob or using the UP or DOWN arrow keys. Press the knob or ENTER key to display the highlighted item.

D02140614



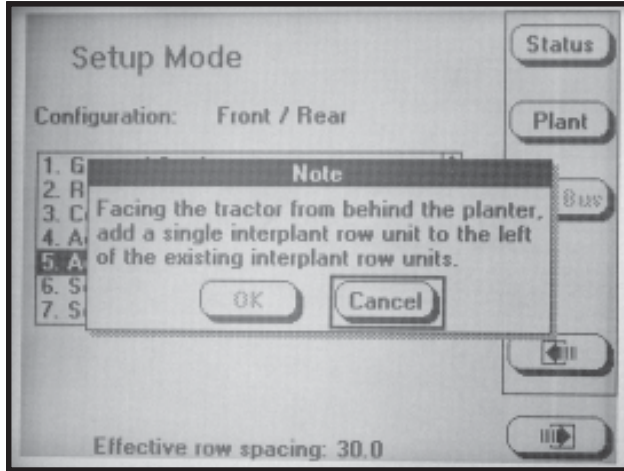
STEP 3 Select “Add Single Interplant Row” by turning the knob or using the UP and DOWN arrow keys. Press the knob or the ENTER key to display the highlighted item.

D022206200



STEP 4 To confirm the following note turn the knob or use the UP or DOWN arrow keys to select OK and 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.

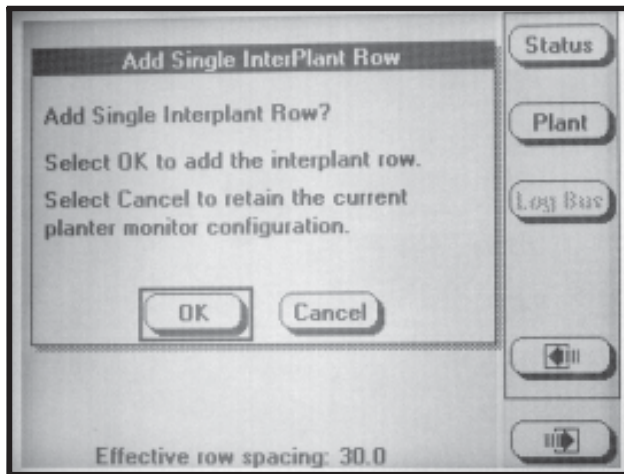
D022206201



STEP 5 To “Add Single Interplant Row” the following screen will appear.

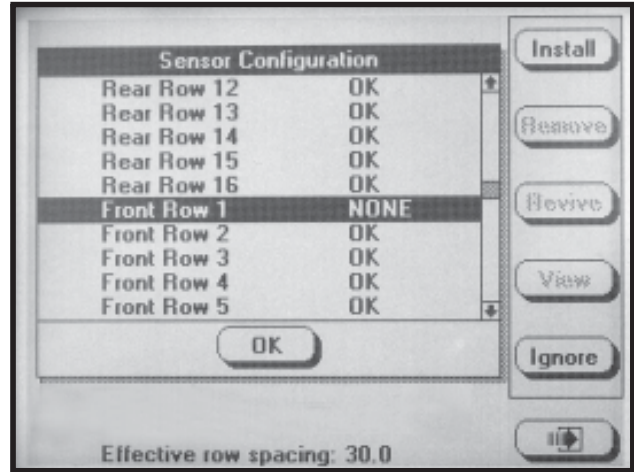
If the single Interplant row is to be added turn the knob or use the UP or DOWN arrow keys to select OK and then press the knob or ENTER key to add the Interplant row. If the single Interplant row is not to be added select the CANCEL key and press the knob or ENTER key to cancel or press the ESC key.

D022206202



STEP 6 The “Sensor Configuration” screen will appear. Plug in the new sensor then scroll down to highlight “Front Row 1” by turning the knob or using the UP or DOWN arrow keys. Select INSTALL to learn the new sensor. Press the knob or ENTER key to return to setup mode.

D02220670

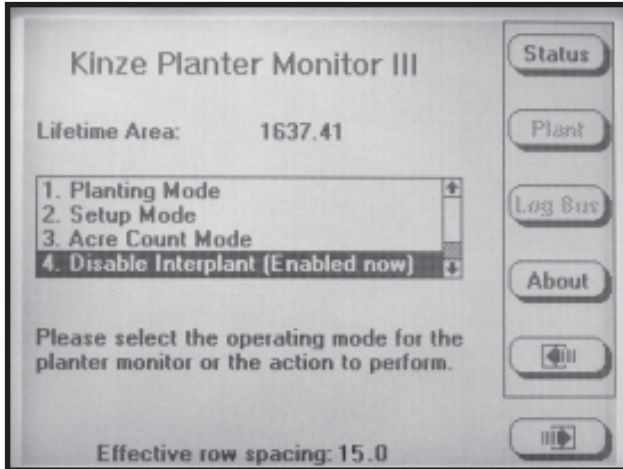


STEP 7 To return to “Planting Mode” press the PLANT key.

ENABLING/DISABLING INTERPLANT® ROWS

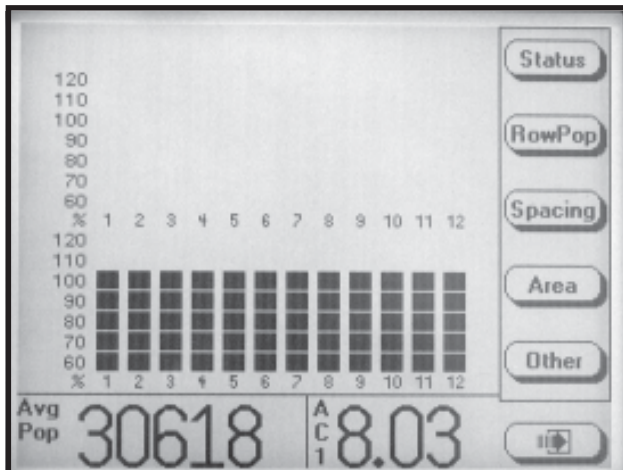
To Enable or Disable Interplant (a) press the F6 key until the “Mode Selection” screen appears, (b) turn the rotary encoder knob or use the UP or DOWN arrow keys to highlight “Disable/Enable Interplant”, (c) press the knob or ENTER key to “Disable” or “Enable” Interplant. To verify selection, the row spacing is displayed on the bottom of the screen.

D03010605a



Either select the “Planting Mode” by turning the knob or using the UP arrow key and press the knob or ENTER key or press F6 to return to the “Planting Mode”.

D02240602



ROW POPULATION

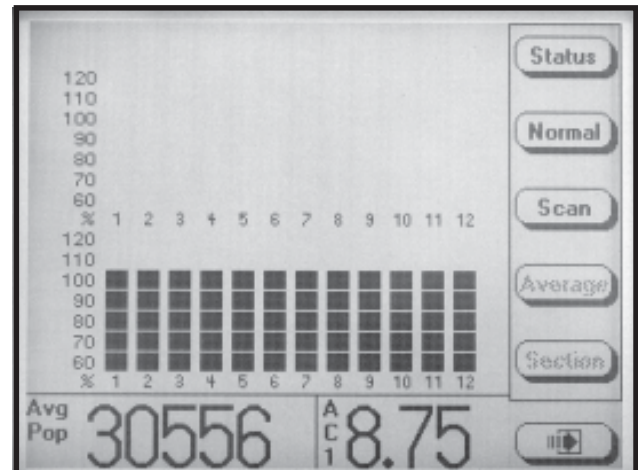
- Press the ROW POP key to display row population. Average planter population will be shown in the lower L.H. corner of the display.

D05310614



- Press the SCAN key 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.

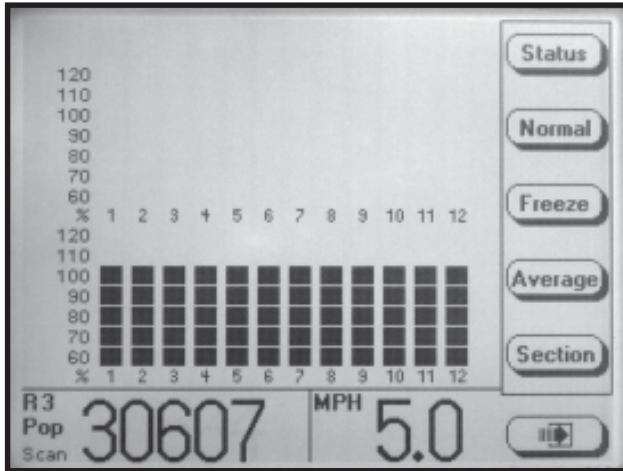
D02240604



- Press the FREEZE key 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 SCAN key.

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

D05310615



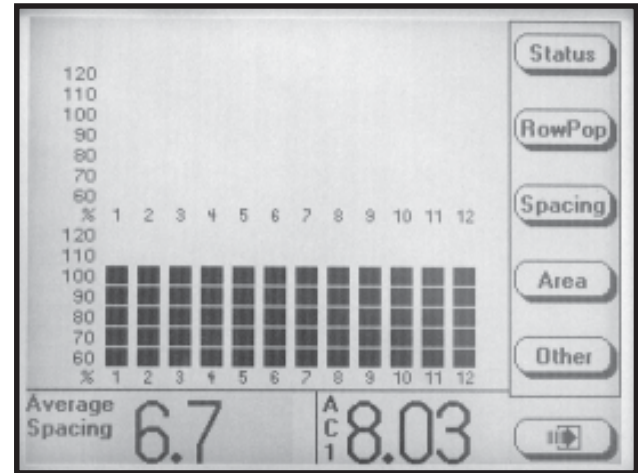
- When either Scan or Frzn is displayed in the L.H. corner the SECTION and arrow keys function as follows: (a) SECTION or RIGHT arrow key advances to the first row of the next section; (b) SECTION or LEFT arrow key selects the first row of the previous section, wrapping around to the first row of the last section when moving past the first section; (c) UP arrow key moves forward to the next row of the planter, wrapping around to the first row when moving past the last row; (d) 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 AVERAGE key to display the average population in the bottom L.H. corner.
- Press the NORMAL key to display the normal screen for planting mode.

NOTE: If the rows are being scanned and the AVERAGE key is selected the scan function will stop.

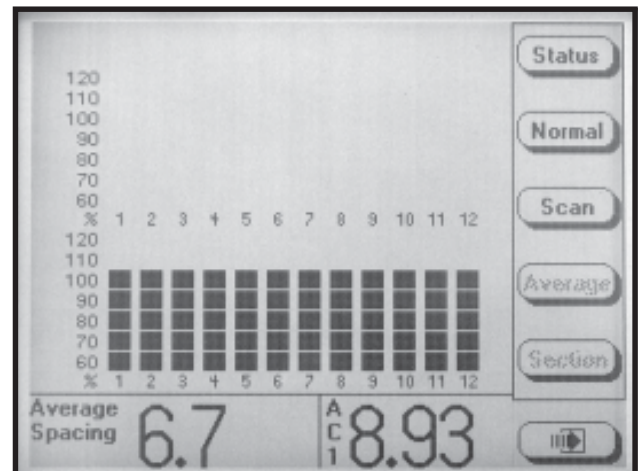
ROW SPACING

- Press the SPACING key to display seed spacing keys. Seed spacing will appear in the bottom L.H. corner of the display.

D02240602



D02240605



- Press the SCAN key 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 FREEZE key to stop scanning and the left display item will be frozen on a particular row. “Frzn” appears to indicate the display is frozen. To resume scan press the SCAN key.

- When either "Scan" or "Frzn" is displayed in the left display item the SECTION and arrow keys function as follows: (a) SECTION and RIGHT arrow key advances to the first row of the next section; (b) LEFT arrow key selects the first row of the previous section, wrapping around to the first row of the last section when moving past the first section; (c) UP arrow key moves forward to the next row of the planter, wrapping around to the first row when moving past the last row; (d) 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 AVERAGE key to display the average seed spacing in the bottom L.H. corner.
- Press the NORMAL key to display the main planting mode.

NOTE: If the rows are being scanned and the AVERAGE key is selected the scan function will stop.

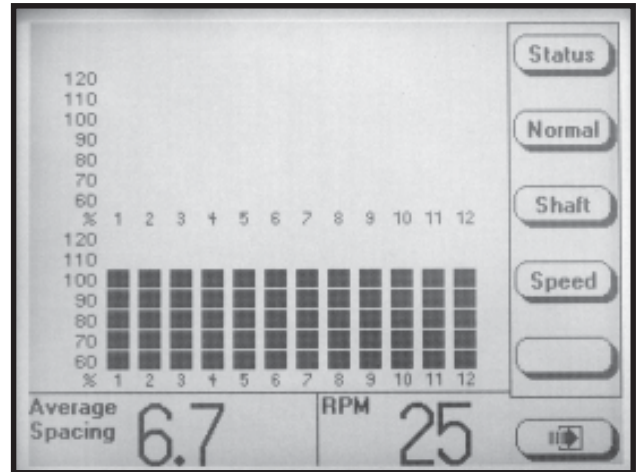
SPEED/SHAFT ROTATION

- Press the OTHER key to display items available to display in the bottom R.H. corner.

- Press the SHAFT key to view the average meter shaft RPM. The value will appear in the bottom R.H. corner of the display.

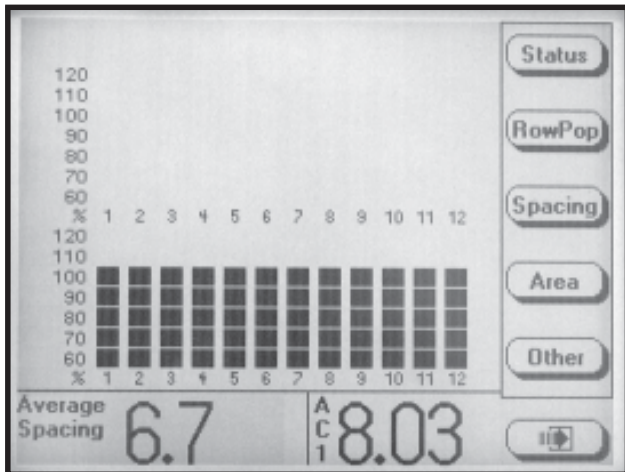
NOTE: Applicable to planters with shaft rotation sensors installed.

D02240607

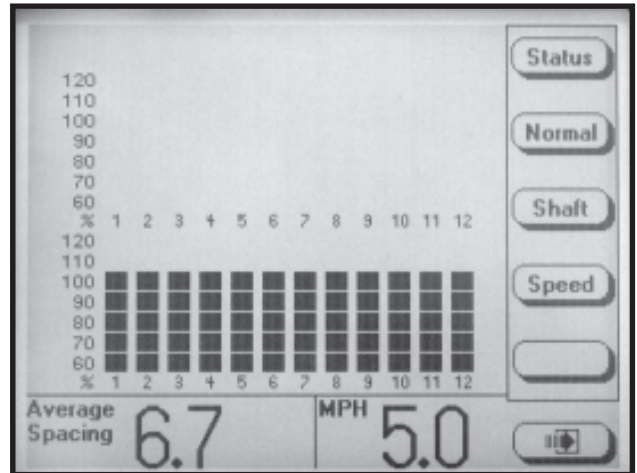


- Press the SPEED key to view the ground speed. The value will appear in the bottom R.H. corner of the display.

D02240602



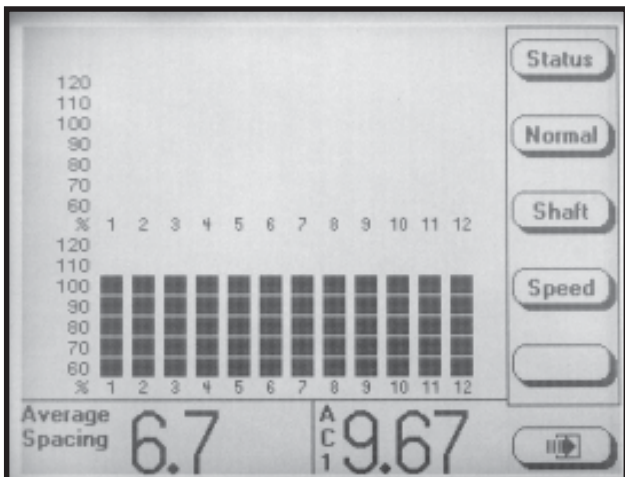
D02240608



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

- Press NORMAL to bring back the standard key labels.

D02240606



WARNINGS AND ALARMS

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 clear 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 STATUS key.

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

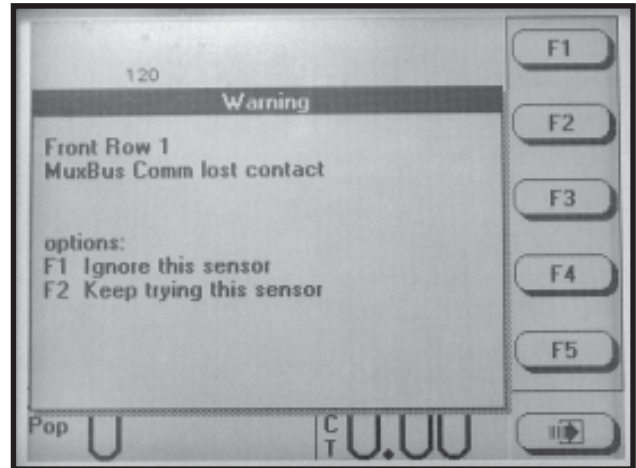
NOTE: The only way to remove an alarm is to find and correct the problem. Alarms are not reported for rows that seed rate alarm thresholds have been disabled.

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

2. **Section Not Planting** - When the monitor detects an entire section not planting, the monitor will emit three beeps 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 STATUS key to view the alarm message.

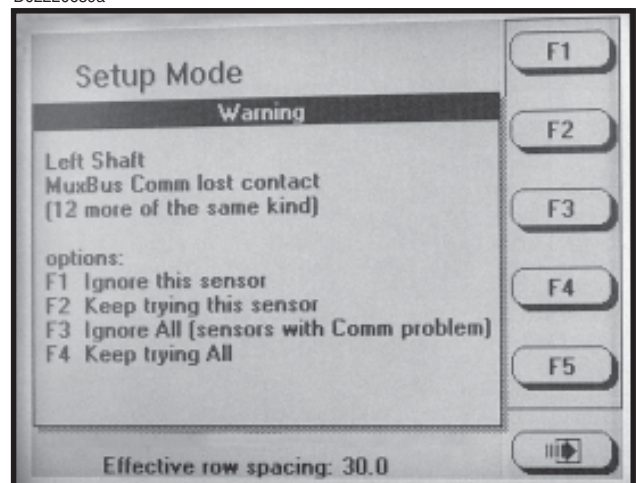
3. **Seed Counting Sensors Not Communicating With Monitor** - When the monitor detects a communication error between the sensor and the monitor, the monitor will emit two beeps to alert the user. Try to reestablish communication with sensor(s) by pressing F2. If the monitor is unable to establish communication there may be (a) a faulty sensor, (b) a poor electrical connection or (c) a cut or pinched wire harness.

D02220687



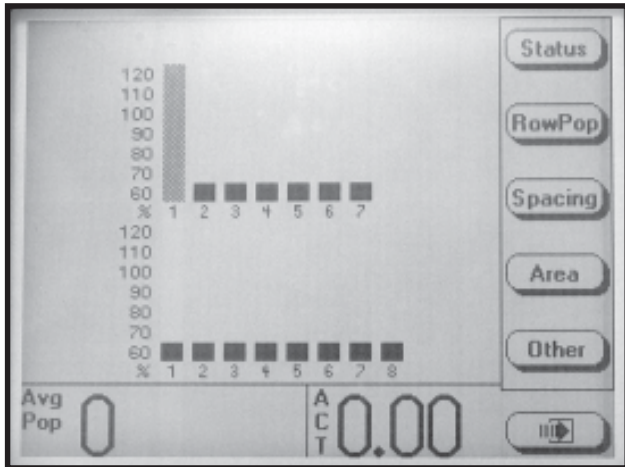
If multiple sensors have lost contact, the message will indicate which sensors have lost contact.

D02220659a



NOTE: When it is known that a sensor or a group of sensors are faulty, F1 or F3 should be pressed. The monitor will no longer try to communicate with the sensor(s). In the planting mode the corresponding bargraphs will be grayed out in the main screen.

D02220691



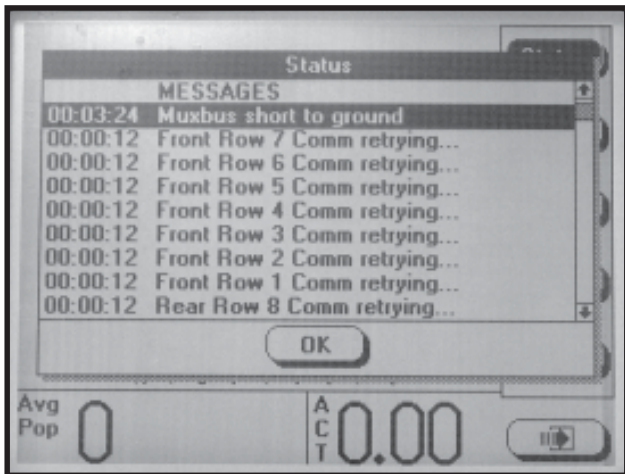
NOTE: If the sensors are not faulty, F2 or F4 should be pressed and the message shown below will appear when the STATUS key is pressed.

- 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 LED on the seed tube sensor will not flash. The sensor will not function until the problem is corrected.

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

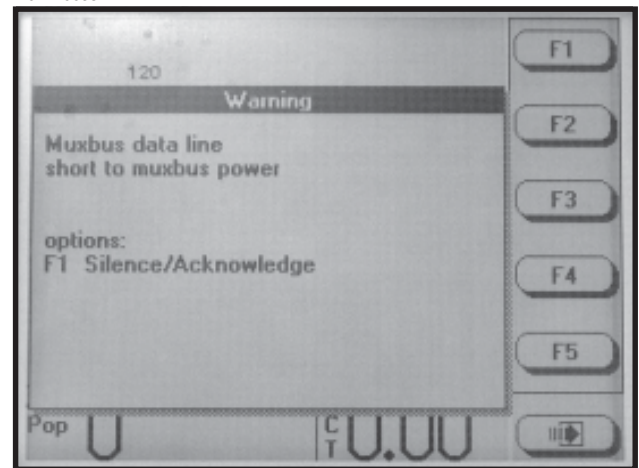
- 5. Wire Shorts -** When a wire is shorted any one of the messages shown below will appear, stating which wires are shorted. The short must be located and fixed to continue planting. Cycle the power on the monitor to clear the alarm.

D02220685

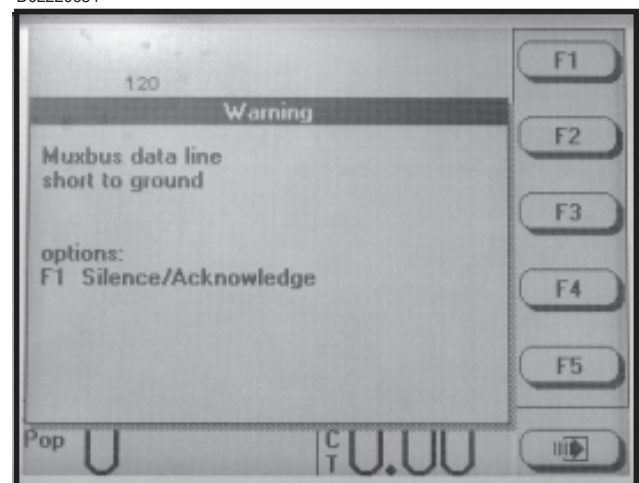


NOTE: If a sensor has been ignored, the sensor configuration screen will display as shown below.

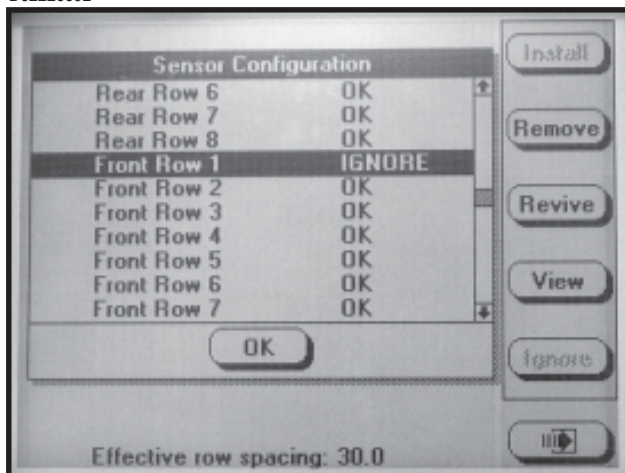
D02220683



D02220684



D02220692

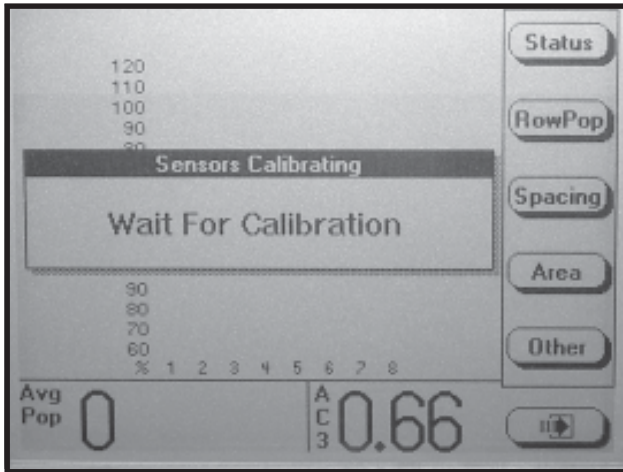


FIELD OPERATION

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

If the monitor has been configured, it will enter the normal planting mode and attempt to communicate with the seed sensors.

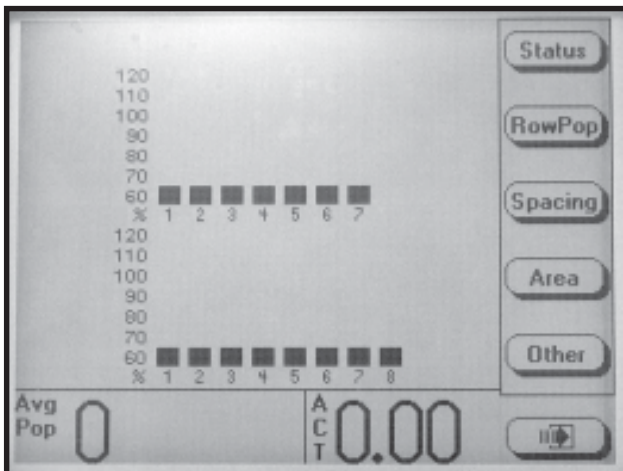
D02200606



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

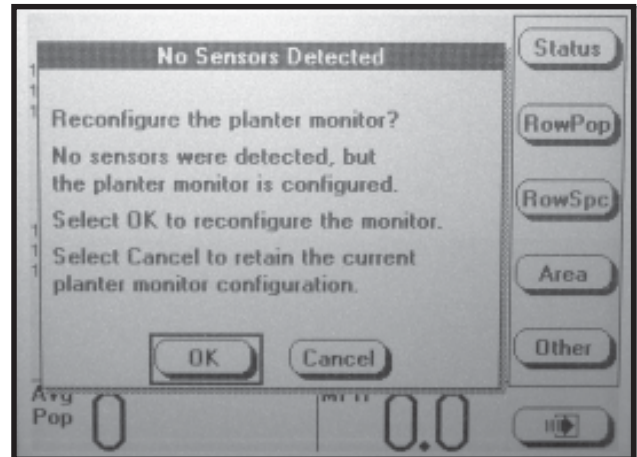
NOTE: If the monitor can communicate with the sensors the normal planting mode screen will be displayed.

D0220689a



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

D02200627



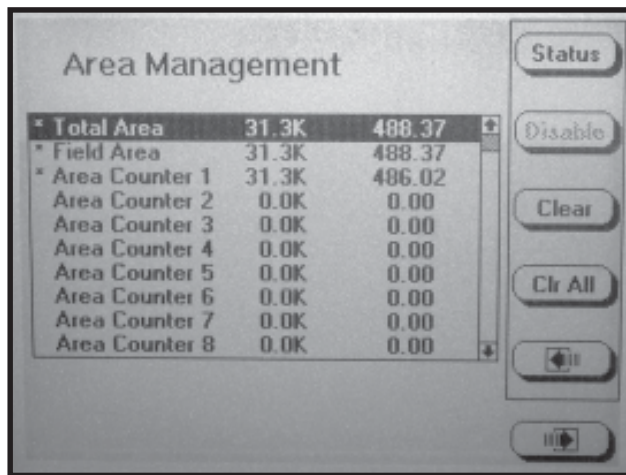
NOTE: Selecting OK will reconfigure the monitor requiring all sensors to be re-learned. Selecting CANCEL will maintain the current configuration and the monitor will continue trying to communicate with the sensors.

AREA MANAGEMENT

There are 10 area counters: Total Area, Field Area and area counters 1 through 8. 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 8 may be cleared independent of each other. They may also be started or stopped at anytime. 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 enter the "Area Management" screen, press the F6 key until the "Area Management" screen appears.

D02210626a



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

- The asterisk next to the name of the area counter indicates the area counter is enabled and accumulating area.

EXAMPLE: In the photo shown above, 31.3K indicates the average seed population for the accumulated area is 31,300 seeds per unit area (acre/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/hectare).

- Turn the knob or use the UP or DOWN arrow keys to highlight the desired "Area Counter".
- Press the ENABLE or DISABLE key.

NOTE: Up to four area counters can be enabled at one time (two area counters in addition to Total Area and Field Area). If four area counters are already enabled, disable one active area counter in order to enable a new area counter. To disable or enable area counters see next column.

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

ENABLE AREA COUNTER

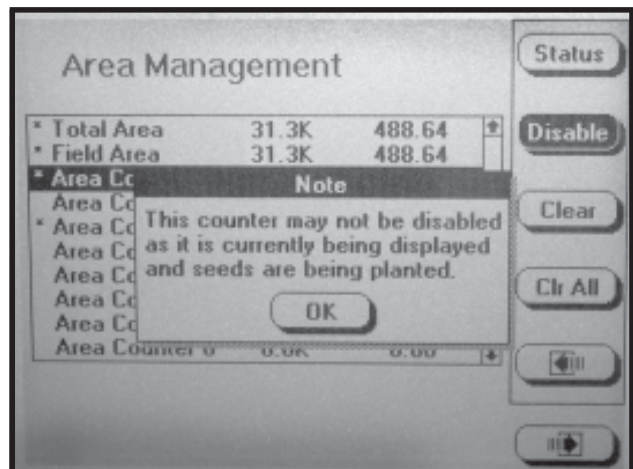
Each of the "Disabled Area Counters" may be enabled up to a total of four "Area Counters". To Enable a Disabled "Area Counter": (a) highlight the desired "Area Counter" by turning the rotary encoder knob or using the UP or DOWN arrow keys; (b) press the ENABLE key or press the knob or ENTER key and an asterisk will appear next to the "Area Counter". The Enabled "Area Counter" starts accumulating area.

DISABLE AREA COUNTER

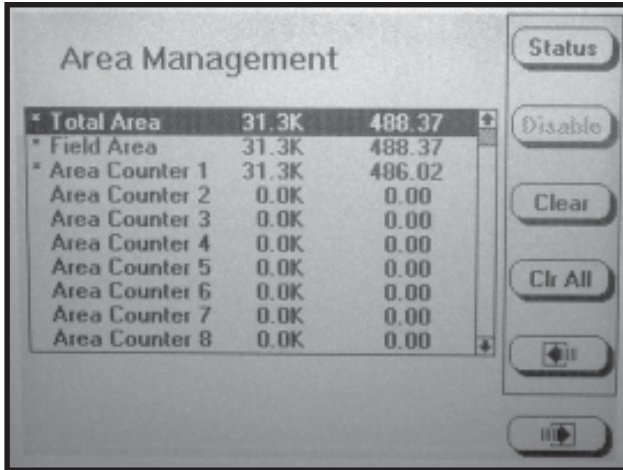
Each of the Enabled Area Counters may be disabled, with the exception of the Total Area Counter. To disable an enabled area counter: (a) highlight that "Area Counter"; (b) press the DISABLE key or press the rotary encoder knob or ENTER key and the asterisk next to the "Area Counter" will disappear. The "Disabled Area Counter" will no longer accumulate area.

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

D02210627a

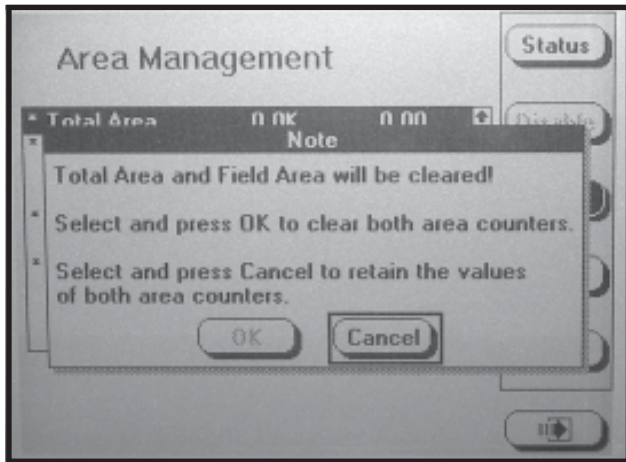


D02210626a



NOTE: If the total area is highlighted and the CLEAR key is pressed the following request for confirmation will appear.

D02200612



CLEAR AREA COUNTER

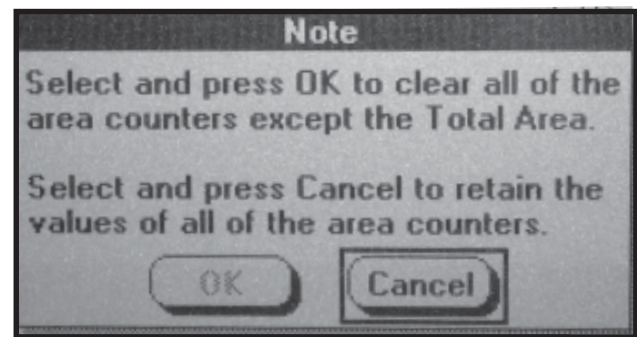
Total Area, Field Area and Area Counters 1 through 8 can be cleared, whether they are Enabled or Disabled. Clearing the “Total Area” counter forces the “Field Area” counter to also be cleared. Clearing any other “Area Counter” including the “Field Area” counter clears only that counter.

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

To clear an Area Counter: (a) highlight the desired area counter, by turning the rotary encoder knob or using the UP or DOWN arrow keys, (b) press the CLEAR key, (c) the request for confirmation shown below will appear, (d) turn the knob or use the UP or DOWN arrow keys to select OK or CANCEL, (e) press the knob or ENTER key to make selection.

To Clear All Area Counters except the “Total Area Counter”: (a) select the CLR ALL key; (b) a request for confirmation will appear; (c) turn the knob or use the UP or DOWN arrow keys to select either OK or CANCEL; (d) press the knob or ENTER key to confirm selection.

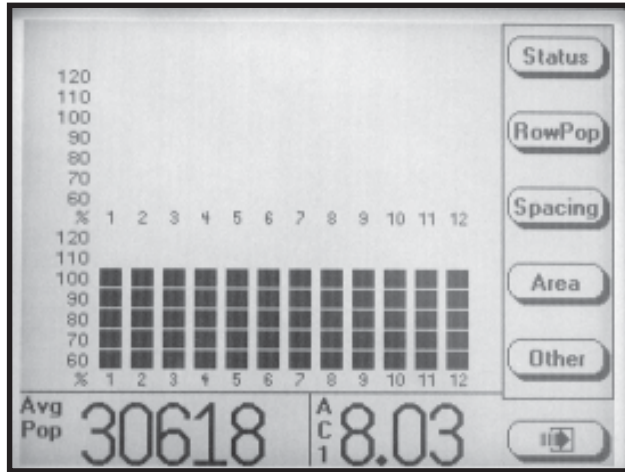
D02210628



AREA COUNTERS

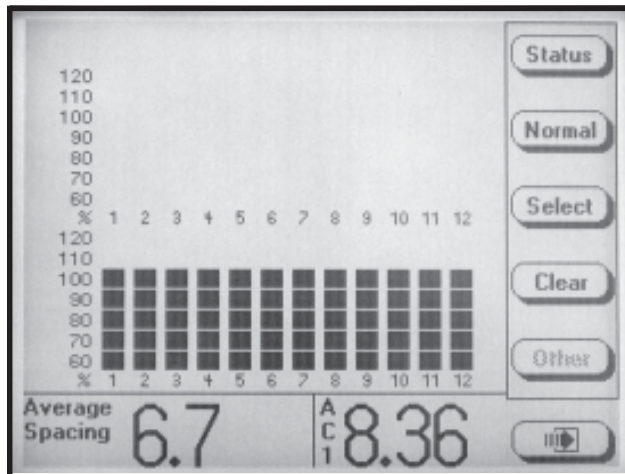
STEP 1 On the main planting screen press the AREA key.

D02240602



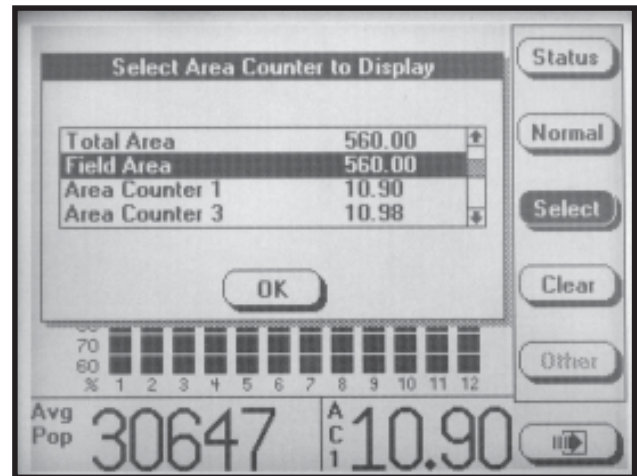
STEP 2 Press the SELECT key to display the list of the Enabled Area Counters.

D02240603



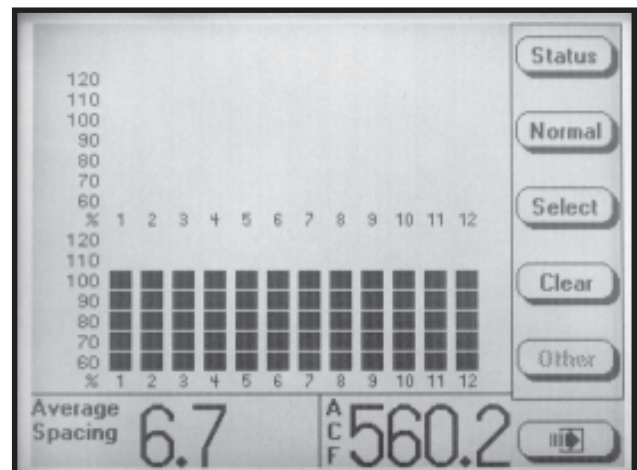
STEP 3 To select the desired active "Area Counter" turn the knob or use the UP or DOWN arrows to highlight the desired "Area Counter".

D02240609



STEP 4 Press the knob or ENTER key to select OK. The planting screen will then be displayed. Press NORMAL to display main planting screen.

D02240610

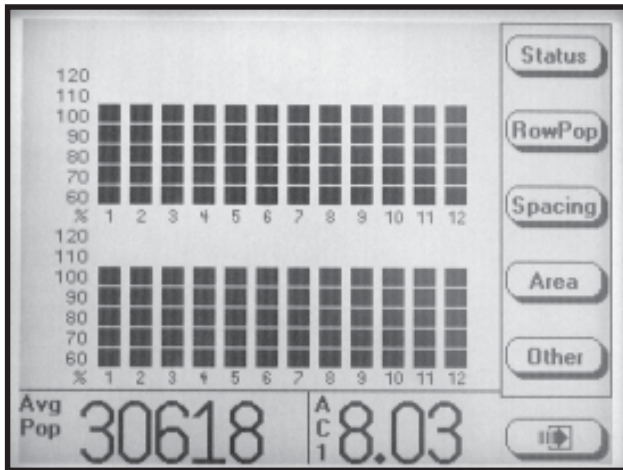


NOTE: The abbreviation for the selected area counter numerical value will appear in the bottom R.H. corner of the screen. In the above photo "ACF" represents "Area Counter Field".

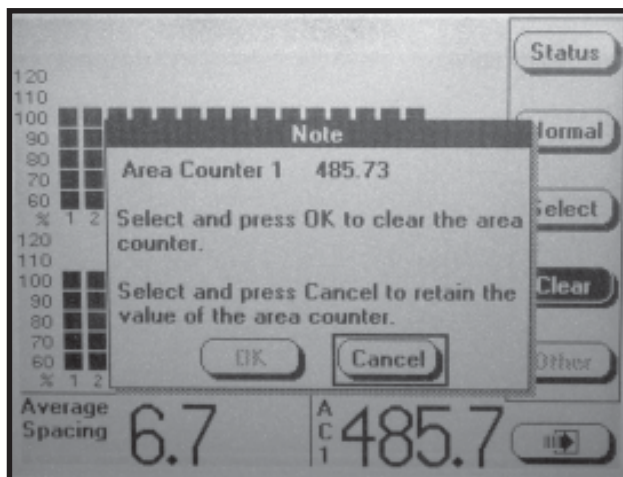
CLEARING FIELD AREA

To reset the counter, display the main planting screen by pressing the F6 key until it appears. Press the AREA key then select the CLEAR key, a dialog box will appear requesting confirmation to clear. Select OK or CANCEL key by turning the rotary encoder knob or using the UP or DOWN arrow keys. Press the knob or ENTER key to verify the selection.

D02210625



D02210625



NOTE: Only the displayed Area Counter can be disabled.

ACRE COUNT MODE

When a tractor is equipped with a radar distance sensor, accumulating area without a planter attached is possible. Two routes are provided to enter acre count mode: (a) Installation of an Acre Count Switch Kit or (b) entry into Acre Count Mode.

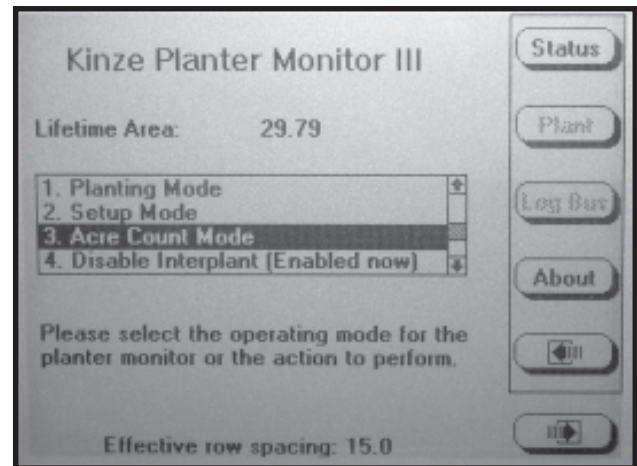
Acre Count Switch Kit

STEP 1 With the monitor OFF, attach an Acre Count Switch Kit to the Muxbus connector and then turn monitor ON and advance to STEP 2.

Acre Count Mode

STEP 1 Press the F6 key until the “Mode Selection” screen appears. Turn the rotary encoder knob or use the UP or DOWN arrow keys to select “Acre Count Mode”. Press the knob or ENTER key.

D02200618



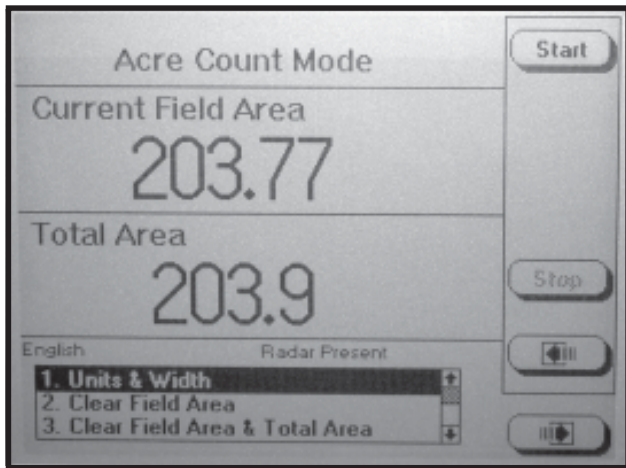
NOTE: If no radar unit is detected a warning will appear.

NOTE: If using acre count mode, acre (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.

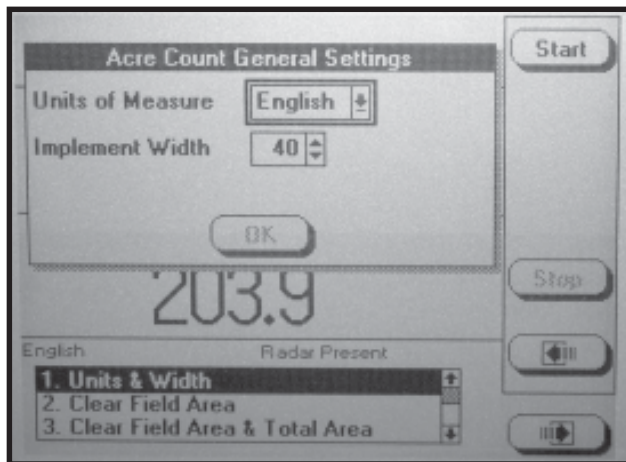
STEP 2 In the menu, “Units & Width” will be highlighted. Press the knob or ENTER key.

D02200619



STEP 3 A drop down menu will appear. Select the correct units of measure “English” or “Metric” by turning the knob or using the UP or DOWN arrow keys. Press the knob or ENTER key to make the selection. The black box will advance to “Implement Width” field showing implement width in feet.

D02200621



STEP 4 Press the knob or ENTER key to highlight the field. Turn the knob or use the UP or DOWN arrow keys to select desired number in feet. When desired number is obtained press the knob or ENTER key. The black box will advance to OK key.

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

STEP 5 Press the knob or ENTER key when done.

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

STEP 6 To begin accumulating area press the START key.

STEP 7 To stop accumulating area or to move to a different location, press the STOP key.

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. Clearing the “Total Area” counter causes the “Field Area” counter to also be cleared.

- **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. Select OK and press the knob or ENTER key to clear the field to zero. Select Cancel and press the knob or the ENTER key to retain the current field value.

- **To Clear Both Field Area And Total Area.** Highlight the “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. Select OK and press the knob or ENTER key to clear the field to zero. Select CANCEL and press the knob or ENTER key to retain the current field value.

With planter reconnected to monitor return to normal plant screen by pressing the F6 key until the “Mode Selection” screen appears. Select “Planting Mode” by turning the knob or using the UP or DOWN arrow keys, press the knob or ENTER key.

REPLACING FAULTY SENSOR(S)

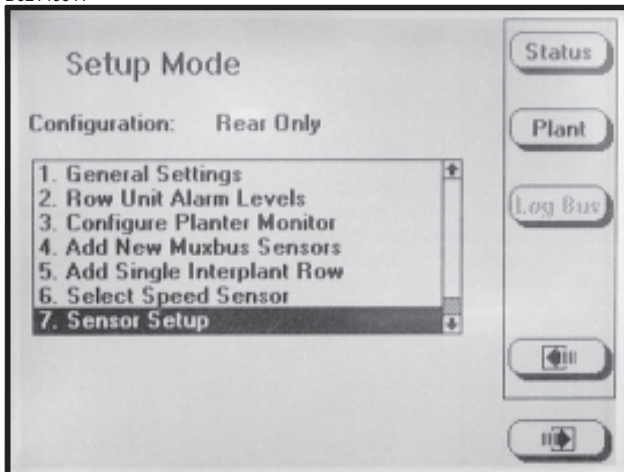
To replace a single faulty sensor: (a) turn OFF the monitor, (b) replace the sensor, (c) turn monitor ON. It will then recognize that a single sensor has been replaced.

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

To replace more than one faulty sensor:

- STEP 1** Press F6 key until the “Mode Selection” screen appears.
- STEP 2** Select “Setup Mode” by turning the knob or press the UP or DOWN arrow keys. Press the knob or ENTER key to display the highlighted item.
- STEP 3** Select “Sensor Setup” by turning the knob or using the UP or DOWN arrow keys. Press the knob or ENTER key to display the highlighted item.

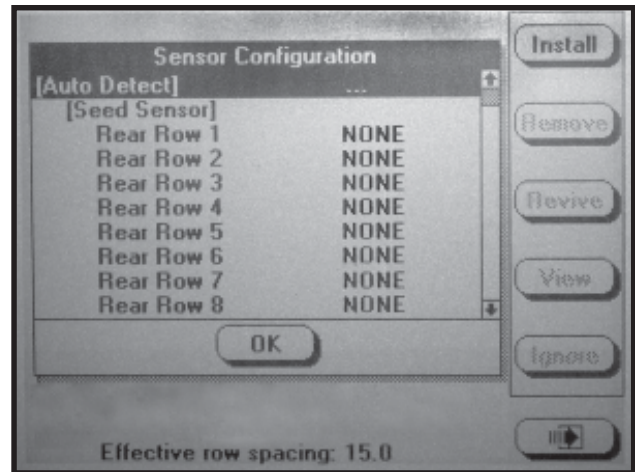
D02140641



- STEP 4** Highlight faulty sensor. Press REMOVE key and unplug sensor. Plug in new sensor and press INSTALL key.

Repeat above procedure for each faulty sensor being replaced.

D02210601a



NOTE: Highlighting a sensor and pressing VIEW gives additional information when troubleshooting a problem. If a faulty sensor has been ignored it may be highlighted in the list of sensors, press REVIVE. The monitor will try to communicate with the sensor. If successful, “OK” will appear next to the sensor.

- STEP 5** Press the knob or ENTER key to return to “Setup Mode” screen.
- STEP 6** To return to “Planting Mode” press the PLANT key.

See “KPM III Electronic Seed Monitor Troubleshooting” in the Maintenance Section.

MACHINE OPERATION

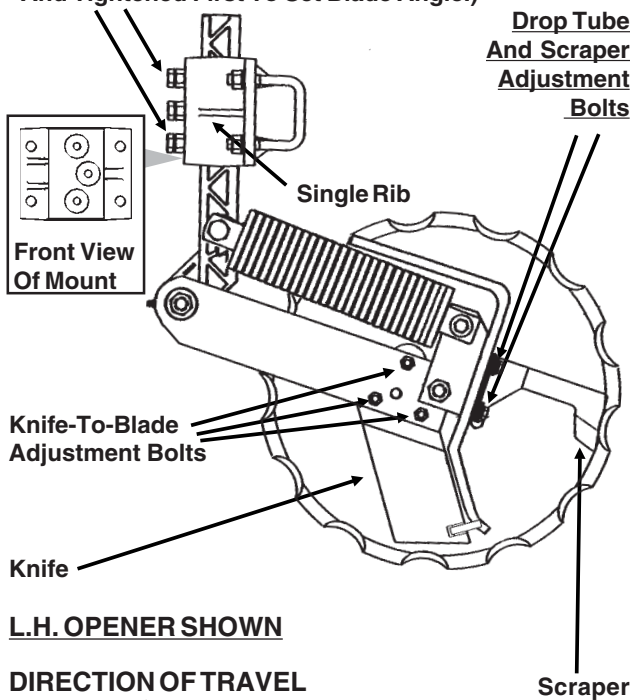
NOTCHED SINGLE DISC FERTILIZER OPENER (Style A)

The notched single disc fertilizer opener is designed for use in minimum and no till planting conditions. Placement of fertilizer with the 16³/₄" 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.)



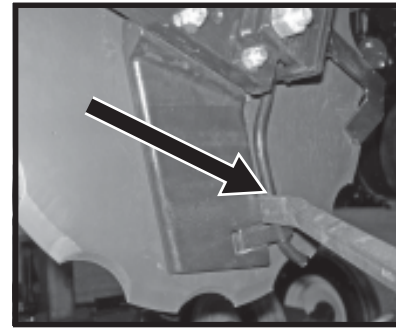
L.H. OPENER SHOWN

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.

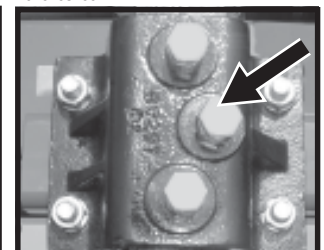
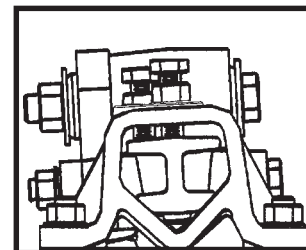
Adjust scraper to just touch the opener blade. As the mounting hardware is tightened, the scraper is drawn tighter to the blade. After adjustment, rotate opener blade to be sure blade will turn by hand with slight resistance, but will not coast or freewheel.

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)

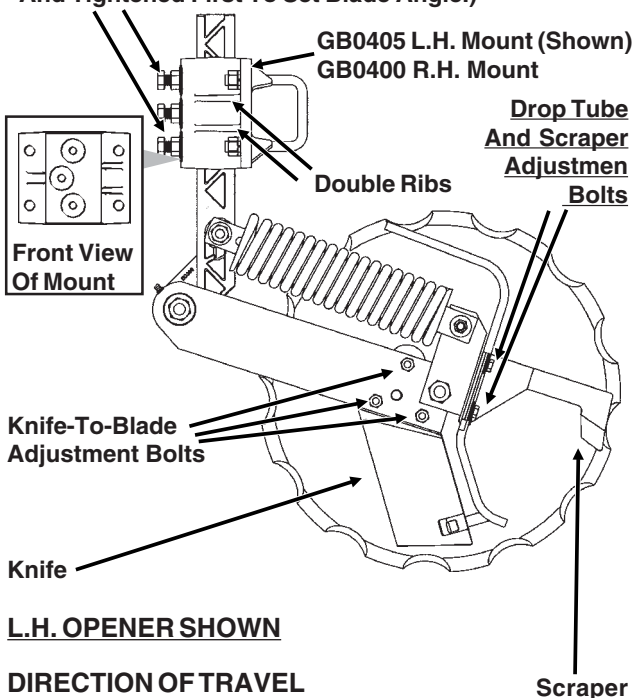
The notched single disc fertilizer opener is designed for use in minimum and no till planting conditions. Placement of fertilizer with the 16³/₄" diameter notched single disc fertilizer opener is recommended at 2 1/2" - 3" from the row. The opener is designed to hold the blade at a set-angle so the knife 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.

(A12429/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.)



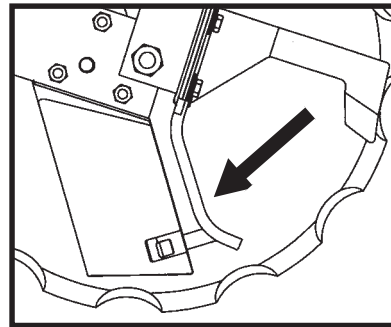
L.H. OPENER SHOWN

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.

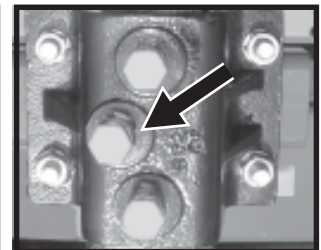
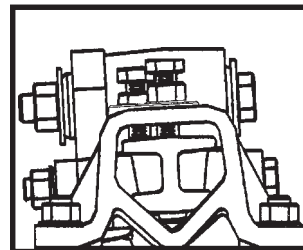
Adjust scraper to just touch the opener blade. As the mounting hardware is tightened, the scraper is drawn tighter to the blade. After adjustment, rotate opener blade to be sure blade will turn by hand with slight resistance, but will not coast or freewheel.

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 double ribs are on the same side of the blade as the drop tube.

FRTZ296

D070103100

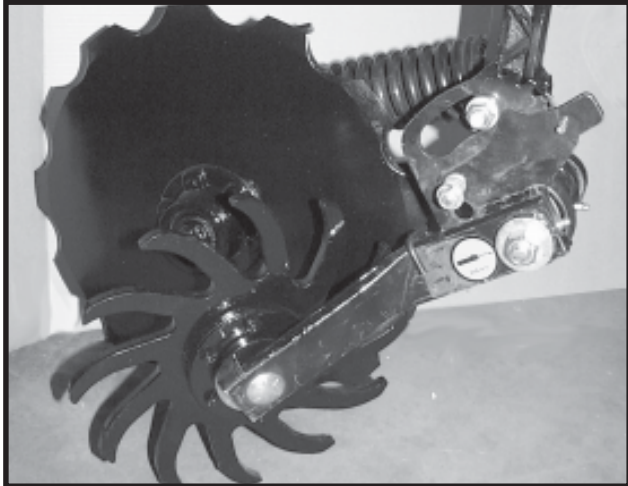


NOTE: Recommended maximum operating depth is 4". To adjust depth: (a) Loosen depth adjustment cap screws. (b) Adjust depth to desired setting. (c) Tighten upper and lower cap screws slightly to hold opener arm in place. (d) Tighten middle cap screw to set the opener arm angle. (e) Tighten upper and lower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

MACHINE OPERATION

RESIDUE WHEEL ATTACHMENT FOR NOTCHED SINGLE DISC FERTILIZER OPENER

D052201104

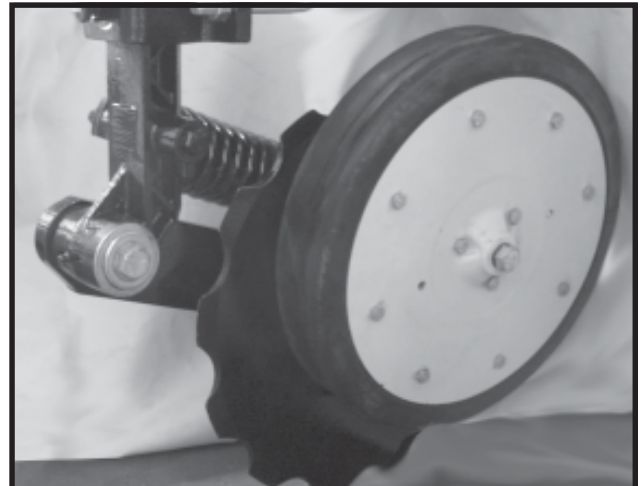


The residue wheel attachment for the notched single disc fertilizer opener is designed for applications where row unit mounted residue wheel attachments cannot be installed. The residue wheel is attached to the notched single disc fertilizer opener using $\frac{5}{8}$ " x 7 $\frac{1}{2}$ " and $\frac{1}{2}$ " x 6 $\frac{1}{2}$ " hardware.

Maximum depth is set by lifting the residue wheel and moving the adjustment lever down to increase depth or up to decrease depth in 1" increments (in relation to blade depth setting). Adjust all rows the same. Down force on the residue wheel is maintained by a torsion spring and is not adjustable.

DEPTH/GAUGE WHEEL ATTACHMENT FOR NOTCHED SINGLE DISC FERTILIZER OPENER

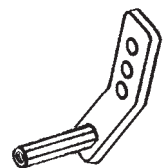
D061101202a



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.

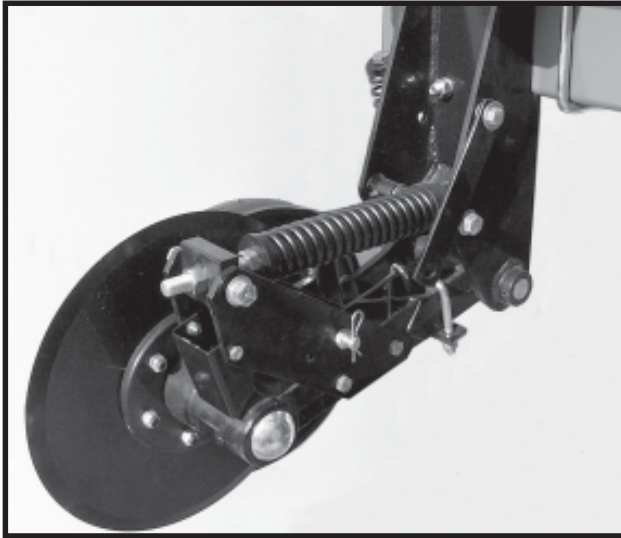
(FRTZ256a)



MACHINE OPERATION

HD SINGLE DISC FERTILIZER OPENER

D062601103



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

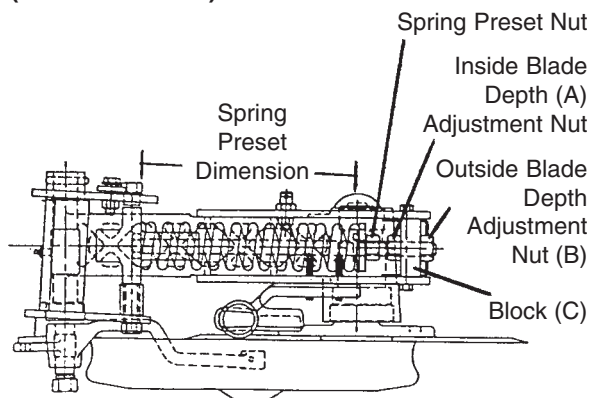
If planter frame is level and at 20" operating height, maximum blade depth for placement of fertilizer is approximately 5". Soil conditions can affect depth slightly.

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

L0114(PLTR3)

DIRECTION OF TRAVEL →

(Overhead View)



R.H. Configuration Shown

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

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

* Suggested initial setting.

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

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

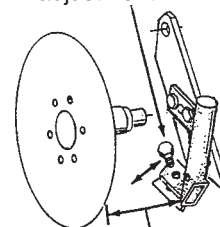
WARNING: Always install all safety lockup devices before working under the machine.

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

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

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

FOC016(PLTR4)

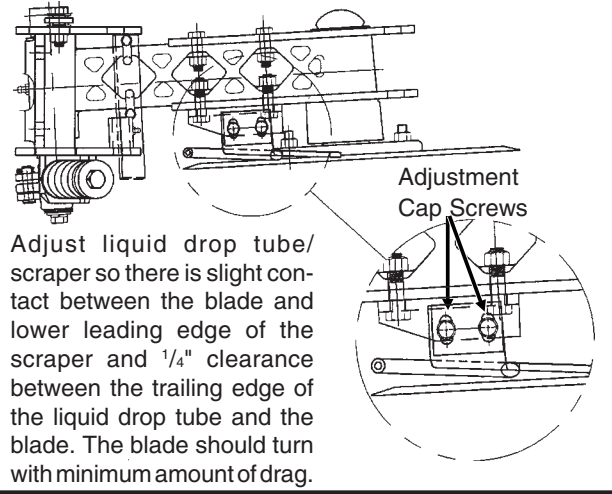


Adjust scrapper to maintain 1/8" gap between drop tube and opener blade. Distance is exaggerated in above illustration.

MACHINE OPERATION

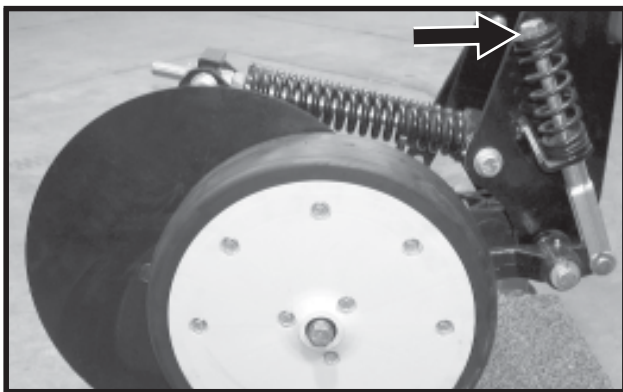
Maintain liquid fertilizer drop tube/scraper adjustment as shown below.

(INS16a)



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

D121202101



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

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

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

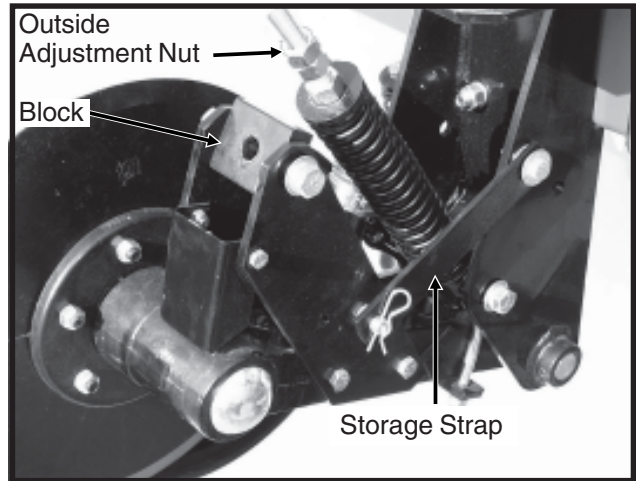
STEP 1 With the planter in the planting position, remove outside blade depth adjustment nut. ("B" in illustration on previous page.)

STEP 2 Raise planter until adjustment bolt clears adjustment block.

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

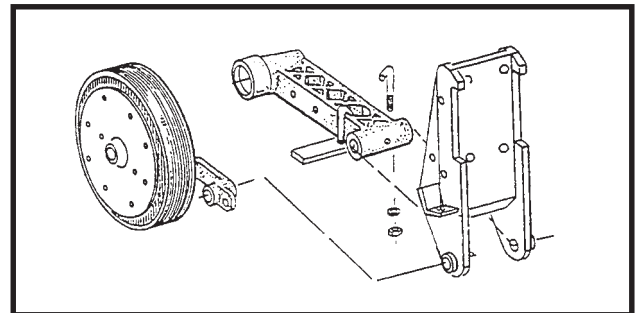
STEP 4 Reinstall depth adjustment nut and tighten.

D062601102



NOTE: The HD single disc fertilizer opener is equipped with a lockup bar that automatically raises and locks the soil press wheel when the blade assembly is raised.

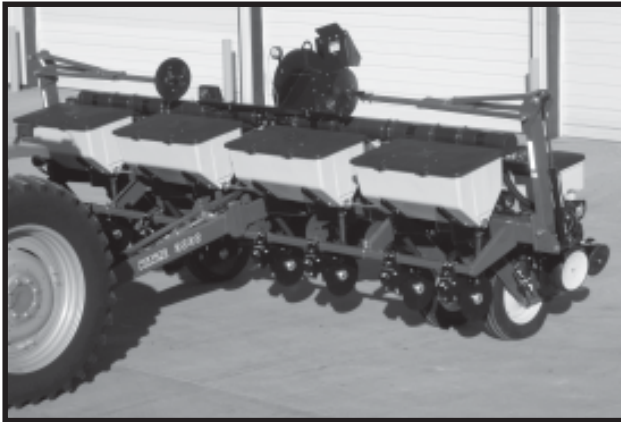
FOC016(PLTR5b)



MACHINE OPERATION

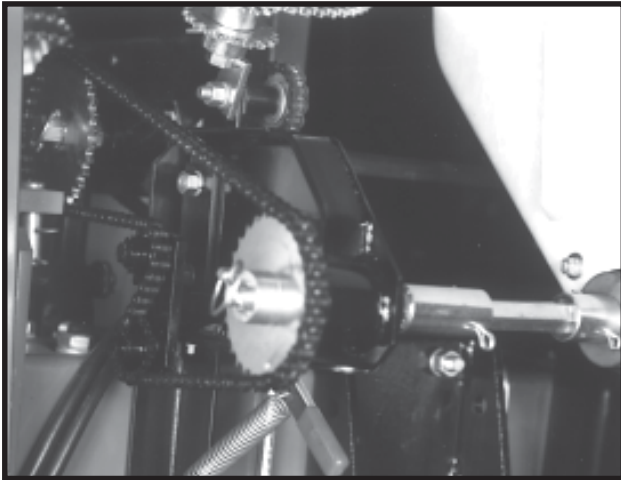
DRY FERTILIZER ATTACHMENT

D11090616



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

61111-7



(PLTR7)



Shown With Augers Positioned For Low Rate Delivery

(PLTR6)



Shown With Augers Positioned For High Rate Delivery

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

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

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

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

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

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

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



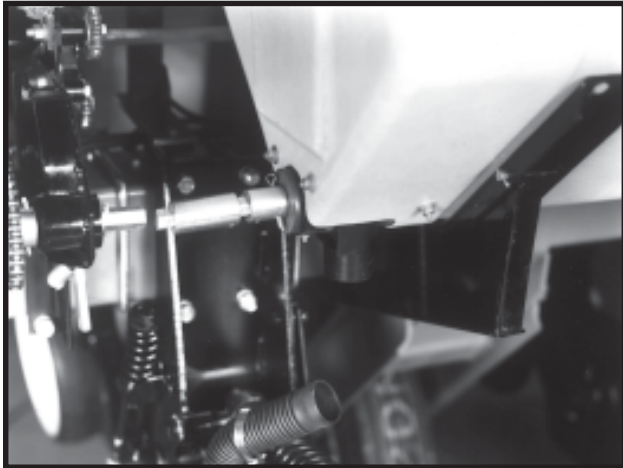
WARNING: Agricultural chemicals can be dangerous if not selected and handled with care. Always read and follow directions supplied by the chemical manufacturer.

MACHINE OPERATION

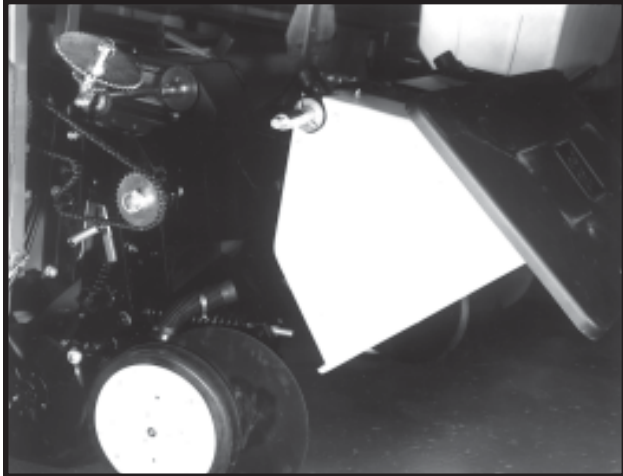
CLEANING

The dry fertilizer hoppers are designed to tip forward for dumping and ease of cleaning. To dump hoppers, first disconnect the drive shaft from the transmission and/or adjacent hopper. **LOOSEN HOSE CLAMPS AND REMOVE HOSES FROM EACH HOPPER.** Remove the rear $\frac{1}{2}$ " x $1\frac{1}{4}$ " cap screw from between each hopper saddle and hopper mount. Rotate each hopper lid to the back side of the hopper and carefully tip the hopper forward. After dumping contents, flush all loose fertilizer from the hoppers and hoses.

61111-45



61111-14



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

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

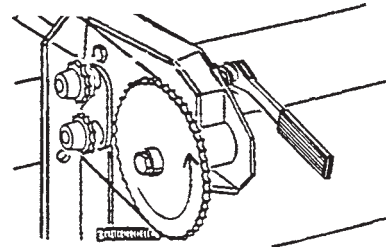
To reassemble, slide auger assembly through the outlet housing back into the hopper. Secure in place by reinstalling the bearing and cotter pin.

59542-38



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

(PLTR8a)



DIRECTION OF ROTATION

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

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

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

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

MACHINE OPERATION

DRY FERTILIZER APPLICATION RATES

APPROXIMATE RATE IN POUNDS PER ACRE

Drive Sprocket	Driven Sprocket	Low Rate Position			High Rate Position		
		30" Rows	36" Rows	38" Rows	30" Rows	36" Rows	38" Rows
15	35	32	26	25	94	78	74
15	33	36	30	28	109	91	86
15	30	39	33	31	120	100	95
19	33	45	37	36	135	114	107
19	30	50	42	39	153	126	120
15	19	58	48	46	174	144	136
30	35	61	51	48	188	156	148
30	33	67	55	52	200	166	157
33	35	69	58	55	206	172	163
35	33	76	63	61	214	193	183
33	30	81	67	64	241	200	190
19	15	93	77	73	278	230	219
30	19	116	96	91	347	288	274
33	19	127	105	100	382	317	301
35	19	133	111	106	402	335	318
30	15	146	121	115	440	365	347
33	15	161	134	127	482	400	380
35	15	168	141	133	510	424	403

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

Direction Of Rotation



High Rate Position



Low Rate Position

(PLTR6/PLTR7)

The above chart is for planters equipped with contact drive. See "Tire Pressure" for recommended tire pressures.

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

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

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

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

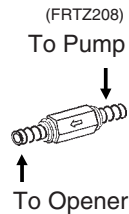
36" multiply by 0.83

38" multiply by 0.79

MACHINE OPERATION

LIQUID FERTILIZER ATTACHMENT

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



OPTIONAL SQUEEZE PUMP

D06260650



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

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

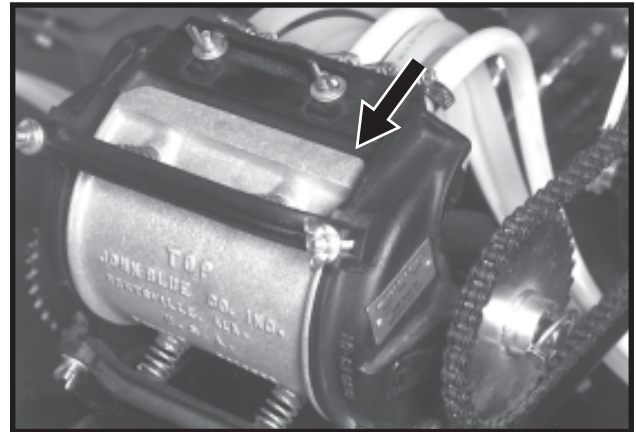
IMPORTANT: Certain analysis of fertilizer if placed too close to the seed may cause germination or seedling damage especially if used in amounts in excess of fertilizer manufacturer's recommendations. Check with your fertilizer dealer or manufacturer for the correct amount and placement.



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

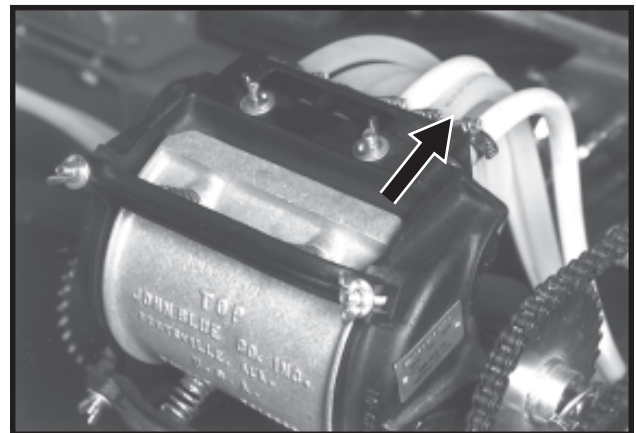
Shut-off valves provided at various locations should be closed to shut off flow when the planter sits overnight or for extended periods of time. It is also important to close the tank valves whenever service on the pump or hoses is being performed. To prolong the life of the hoses in the squeeze pump,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

81689-16



Discharge Manifold Rearward

81689-19



Discharge Manifold Forward

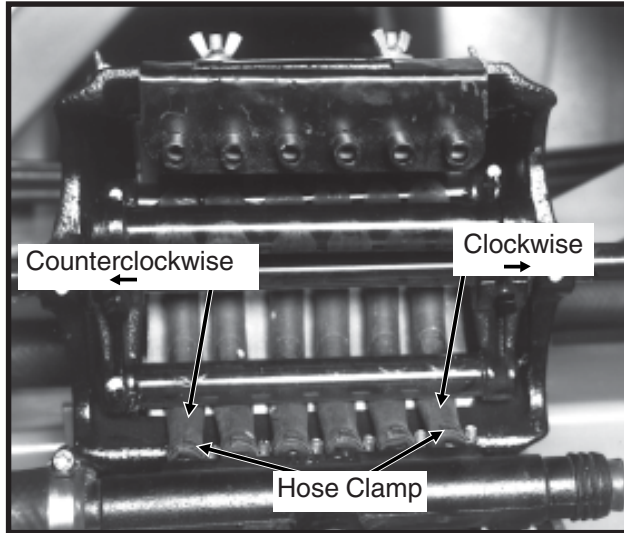
The discharge manifold must be in the forward position when the pump is in operation. To reposition the manifold, loosen the wing nuts and slide the manifold forward and sideways or rearward as required and retighten nuts.

MACHINE OPERATION

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

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

61010-5



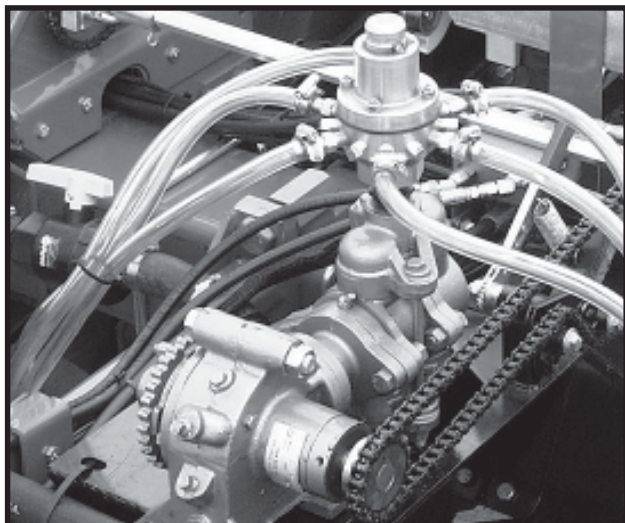
For the right hand hose (facing the pump from front of planter as shown above) twist the hose 1/4 turn in the clockwise direction.

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

Retighten hose clamps.

OPTIONAL PISTON PUMP

D06299905

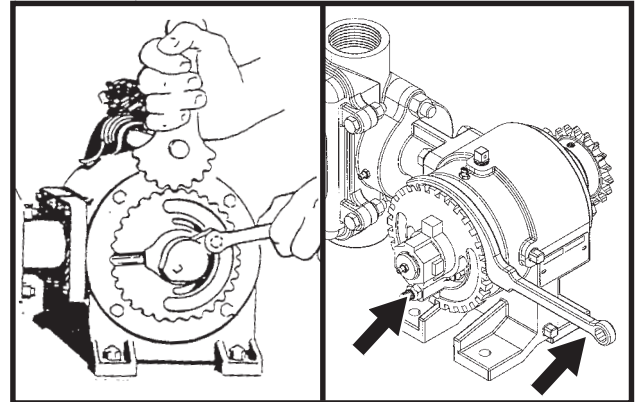


If the machine is equipped with the piston pump option, the rate of liquid fertilizer application is determined by the piston pump settings.

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

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

(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.

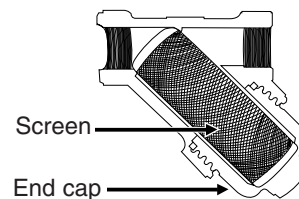
NOTE: Periodically check flow to all rows. If one or more lines are plugged, set rate will be delivered to remaining rows.

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

LIQUID FERTILIZER SQUEEZE PUMP APPLICATION RATES

GALLONS PER ACRE

Drive	Driven	30" Rows	36" Rows	38" Rows	Drive	Driven	30" Rows	36" Rows	32" Rows
15	*62	6.9	5.8	5.5	46	*62	21.2	17.7	16.7
19	*62	8.8	7.3	6.9	15	19	22.5	18.8	17.8
15	46	9.3	7.8	7.4	32	34	26.9	22.4	21.2
19	46	11.8	9.8	9.3	34	32	30.3	25.3	24.0
15	34	12.6	10.5	9.9	19	15	36.2	30.1	28.6
15	32	13.4	11.2	10.6	46	34	38.6	32.2	30.5
32	*62	14.7	12.3	11.6	46	32	41.0	34.2	32.4
19	34	16.0	13.3	12.6	32	19	48.1	40.1	38.0
19	32	17.0	14.1	13.4	34	19	51.1	42.6	40.3
32	46	19.9	16.6	15.7	*62	34	52.1	43.4	41.1
34	46	21.1	17.6	16.7					

*Optional sprocket.

The above chart is for planters equipped with contact drive. See "Tire Pressure" for recommended tire pressures.

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

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

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

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

LIQUID FERTILIZER PISTON PUMP APPLICATION RATES GALLONS PER ACRE

Applies to Model LM-2455-R And NGP-6055 Pumps With 18 Tooth Sprocket

Pump Setting	1	2	3	4	5	6	7	8	9	10
4 Row 30"	8.3	16.5	24.8	32.6	41.3	49.5	57.8	66.0	74.3	83.5
4 Row 36"	6.9	13.7	20.6	27.5	34.4	41.3	48.2	55.0	61.9	68.8
4 Row 38"	6.5	13.0	19.5	26.0	32.6	39.1	45.6	52.1	58.7	65.2
6 Row 30"	5.5	11.0	16.5	22.0	27.5	33.0	38.5	44.0	49.5	55.0
6 Row 36"	4.6	9.2	13.7	18.3	22.9	27.5	32.1	36.7	41.3	45.9
6 Row 38"	4.4	8.7	13.0	17.4	21.7	26.0	30.4	34.8	39.1	43.4
8 Row 30"	4.1	8.3	12.4	16.5	20.6	24.8	28.9	33.0	37.1	41.3

The above chart 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:

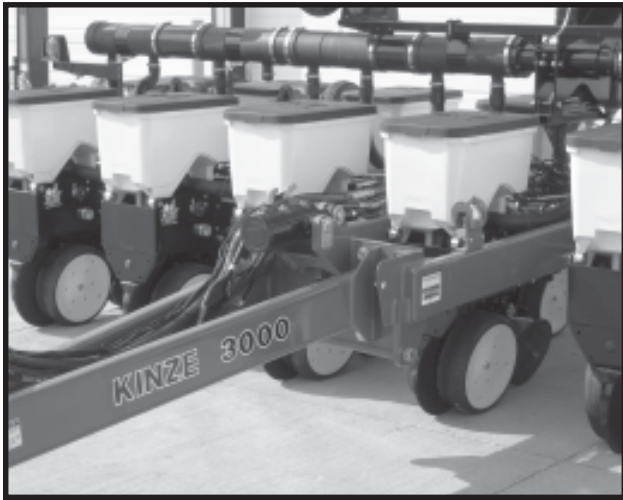
36" multiply by 0.83

38" multiply by 0.79

MACHINE OPERATION

INTERPLANT® SELF-LEVELING HITCH EXTENSION

D08220607



The Interplant® Self-Leveling Hitch Extension is designed to allow the planter to raise level, front to rear, when Interplant® push row units are installed, and to provide increased transport ground clearance under push row units.

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 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. Generally, higher ground speeds will cause more variation in seed spacing. Speeds above 5.5 MPH are typically not recommended. See “Planting And Application Rate Charts” in Seed Meter Operation/ Maintenance section for specific recommendations.

MACHINE OPERATION

FIELD TEST

With any change of field and/or planting conditions, seed size or planter adjustment, we recommend a field test be made to ensure proper seed placement and operation of row units. See “Planting And Application Rate Charts” in the Seed Meter Operation/Maintenance section and “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” and “Row Marker Speed Adjustment”.
- Check for proper application rates and placement of granular chemicals on **all** rows. See “Checking Granular Chemical Application Rate”.
- Check for desired depth placement and seed population on **all** rows. See “Checking Seed Population”.
- Check for proper application rates of fertilizer on **all** rows. See proper “Fertilizer Application Rate Chart”.

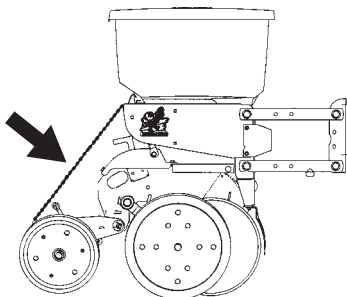
After the planter has been field tested, reinspect the machine.

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

CHECKING SEED POPULATION

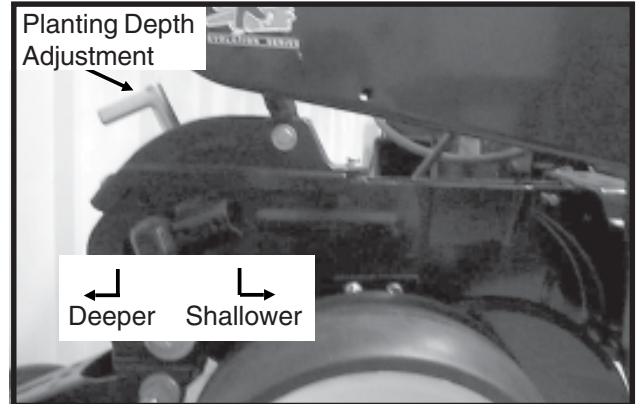
1. Tie up one or more sets of closing wheels by running a chain or rubber tarp strap between the hopper support panel and closing wheels. It may be necessary to decrease closing wheel arm spring tension.

(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					
	15"	18"	19"	30"	36"	38"
$\frac{1}{1000}$	34' 10"	29' 0"	27' 8"	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 performance. For example, if spacing between kernels of corn at the transmission setting being used is 8" and a gap of 16" is observed, a seed cell has lost its seed. If two seeds are found within a short distance of each other, the seed cell has metered two seeds instead of one.

See “Seed Metering System Troubleshooting” in the Seed Meter Operation/Maintenance section of this manual.

MACHINE OPERATION

Determining Pounds Per Acre

To determine pounds per acre:

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

To determine bushels per acre:

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

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 “Seed Metering System Troubleshooting” in the Seed Meter Operation/Maintenance section of this manual.

CHECKING GRANULAR CHEMICAL APPLICATION RATE

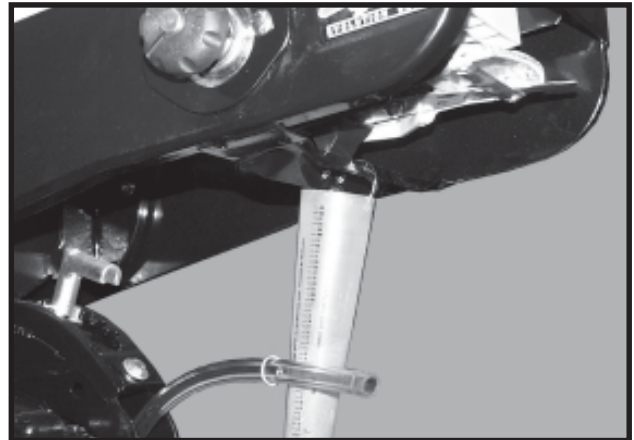
Many things can affect the rate of delivery of granular chemicals such as temperature, humidity, speed, ground conditions, flowability of different material or any obstruction in the meter.



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.

SEED METER OPERATION/MAINTENANCE

GENERAL PLANTING RATE INFORMATION

These planting rate charts are applicable to KINZE® Model 3000 EdgeVac® Pull Type Planters. See “Tire Pressure” for recommended tire pressures.

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

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

The following seed discs are available for use with the KINZE® EdgeVac® Seed Metering System:

Corn/Popcorn: 39 cell. Light blue color-coded. For all seed corn grades from 35 to 70 pounds per 80,000 kernel count unit or popcorn seed size range from 2210 to 4200 seeds per pound. *When planting popcorn this seed disc requires use of seed baffle. See “Seed Meter” on pages 7-2 and 7-3 for additional information.*

Low-Rate Corn/Popcorn: 24 cell. Light green color-coded. For all seed corn grades from 35 to 70 pounds per 80,000 kernel count unit or popcorn seed size range from 2210 to 4200 seeds per pound. *When planting popcorn this seed disc requires use of seed baffle. See “Seed Meter” on pages 7-2 and 7-3 for additional information.*

Soybean: 60 cell. Black color-coded. Seed size range from 2200 to 4000 seeds per pound. *This seed disc requires use of seed baffle. See “Seed Meter” on pages 7-2 and 7-3 for additional information.*

Soybean, High-Rate: 120 cell. Dark blue color-coded. Seed size range from 2200 to 4000 seeds per pound. *This seed disc requires use of seed baffle. See “Seed Meter” on pages 7-2 and 7-3 for additional information.*

Milo/Grain Sorghum: 60 cell. Yellow color-coded. Seed size range from 10,000 to 20,000 seeds per pound. *This seed disc requires use of seed baffle and cleanout brush. See “Seed Meter” on pages 7-2 and 7-3 for additional information.*

Hill-Drop Cotton, Acid-Delinted (3 Seeds Per Cell): 20 cell. Brown color-coded. Cotton seed size range from 3800 to 5200 seeds per pound. *This seed disc requires use of cleanout brush w/ball-type ejector. See “Seed Meter” on pages 7-2 and 7-3 for additional information.*

Cotton, Acid-Delinted/Small Dry Edible Bean: 54 cell. Dark green color-coded. Cotton seed size range from 3800 to 5200 seeds per pound or dry edible bean seed size range from 1200 to 2500 seeds per pound. *This seed disc requires use of cleanout brush w/ball-type ejector. See “Seed Meter” on pages 7-2 and 7-3 for additional information.*

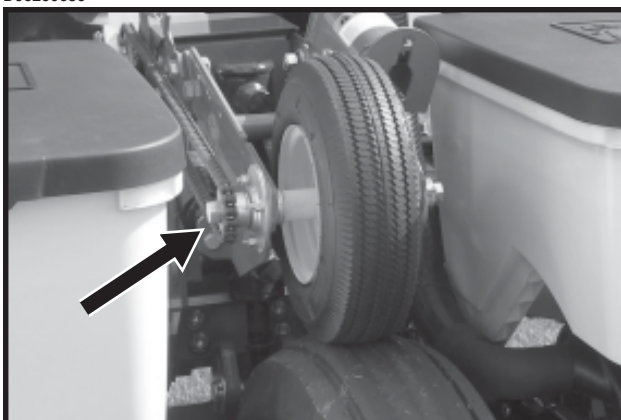
Large Dry Edible Bean: 54 cell. Tan color-coded. Seed size range from 800 to 1200 seeds per pound.

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

NOTE: See “Seed Meter Singulator Brush And Vacuum Level Adjustments” on page 7-23.

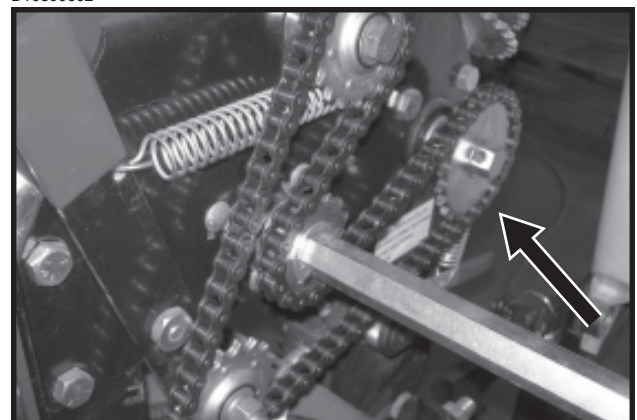
NOTE: 15, 19 and 30 tooth drive sprockets are NOT applicable to all rate charts. Check chart titles to ensure the proper rate chart is selected. 15 tooth sprocket(s) require use of 132 pitch No. 40 chain(s); 19 tooth sprocket(s) require use of 134 pitch chain(s); and 30 tooth sprocket(s) require use of 140 pitch chain(s).

D06260656



NOTE: Contact wheel drive sprocket referenced in each rate chart title.

D10300602

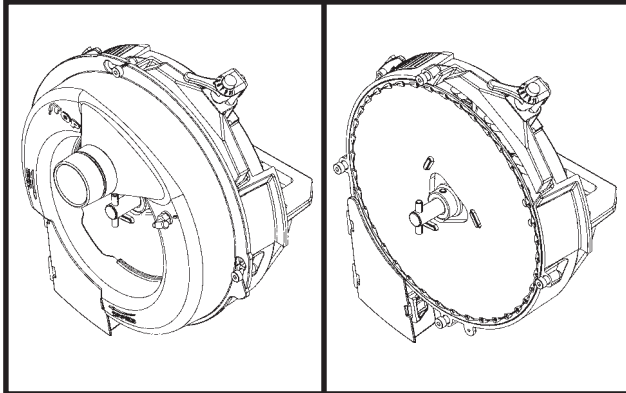


NOTE: Reverser driven sprocket referenced in each rate chart title.

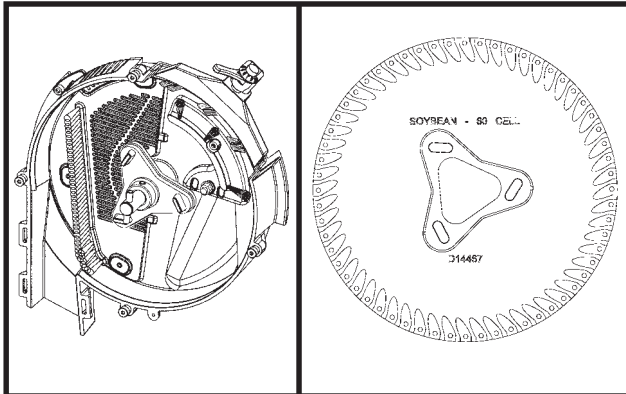
SEED METER OPERATION/MAINTENANCE

SEED METER

(METR71/METR71a)

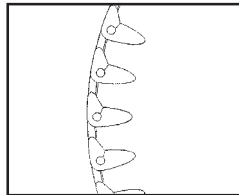


(METR70/D14467a)

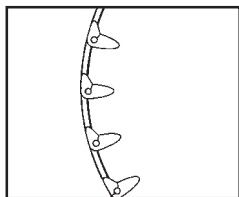


The seed discs below and at right are available for use with the KINZE® EdgeVac® Seed Metering System:

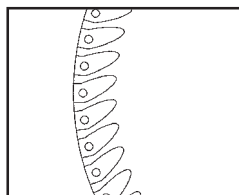
Corn/Popcorn: 39 cell. For all seed corn grades from 35 to 70 pounds per 80,000 kernel count unit. Popcorn seed size range from 2210 to 4200 seeds per pound (*Light blue color-coded.*)
(D14465)



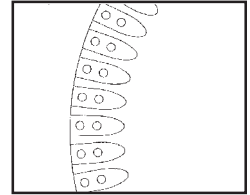
Low-Rate Corn/Popcorn: 24 cell. For all seed corn grades from 35 to 70 pounds per 80,000 kernel count unit. Popcorn seed size range from 2210 to 4200 seeds per pound. (*Light green color-coded.*)
(D16734a)



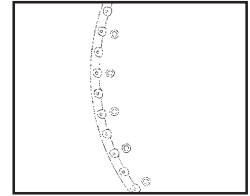
Soybean: 60 cell. Seed size range from 2200 to 4000 seeds per pound. (*Black color-coded.*)
(D14467a)



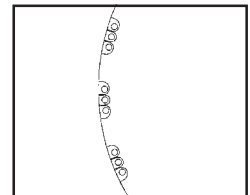
Soybean, High-Rate: 120 cell. Seed size range from 2200 to 4000 seeds per pound. (*Dark blue color-coded.*)
(D14468a)



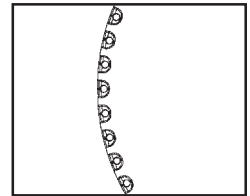
Milo/Grain Sorghum: 60 cell. Seed size range from 10,000 to 20,000 seeds per pound. (*Yellow color-coded.*)
(D17050)



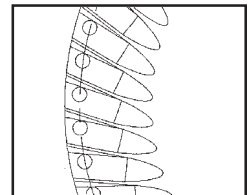
Hill-Drop Cotton, Acid-Delinted (3 Seeds Per Cell): 20 cell. Cotton seed size range from 3800 to 5200 seeds per pound. (*Brown color-coded.*)
(D17187)



Cotton, Acid-Delinted/Small Dry Edible Bean: 54 cell. Cotton seed size range from 3800 to 5200 seeds per pound. Dry edible bean seed size range from 1200 to 2500 seeds per pound. (*Dark green color-coded.*)
(D17186)



Large Dry Edible Bean: 54 cell. Seed size range from 800 to 1200 seeds per pound. (*Tan color-coded.*)
(D14477)



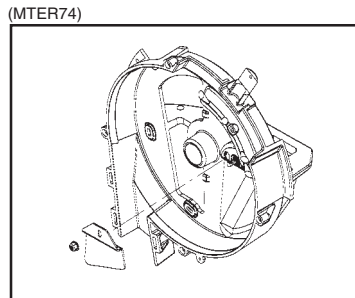
Install the selected seed disc. Position the vacuum cover on the meter by aligning the keyhole slots over the bolt heads. Push the cover on the meter and turn counter clockwise to lock in place. **See following page for additional components required with specific seed discs.**

NOTE: Use of damaged seed or seed containing foreign material will cause plugging of seed disc orifices and require more frequent seed meter cleanout to prevent underplanting.

SEED METER OPERATION/MAINTENANCE

SEED BAFFLE

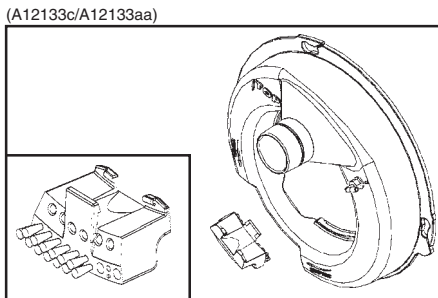
- Milo/Grain Sorghum
- Soybeans
- Popcorn



The **seed baffle** is designed to prevent excessive seed in the meter from restricting air flow through the seed. **Used with 60 Cell Milo/Grain Sorghum Disc, 60 Cell Soybean Disc, 120 Cell High-Rate Soybean Disc and 39 Cell and 24 Cell Popcorn Discs.**

CLEANOUT BRUSH

- Milo/Grain Sorghum

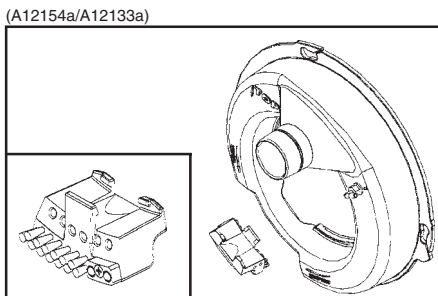


The **cleanout brush** is designed to remove foreign material and seed remnants to help prevent plugging of seed disc orifices.

Used with 60 Cell Milo/Grain Sorghum Disc.

CLEANOUT BRUSH W/BALL-TYPE EJECTOR

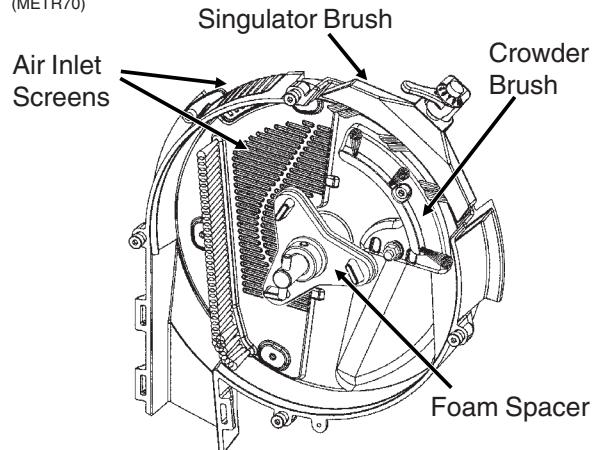
- Cotton
- Small Edible Beans



The **cleanout brush w/ball-type ejector** is designed to eject seed remnants from the seed disc orifices. **Used with 20 Cell Hill-Drop Cotton, Acid-Delinted (3 Seeds Per Cell) Disc and 54 Cell Acid-Delinted Cotton/Small Dry Edible Bean Disc.**

NOTE: Foreign material in seed disc orifices, such as seed chips, hulls, stems, etc., may affect seed delivery. Clean seed is required to ensure accurate seed metering from the vacuum seed meter. Seed discs should be removed daily to check for buildup of foreign material in the seed disc orifices.

(MTER70)

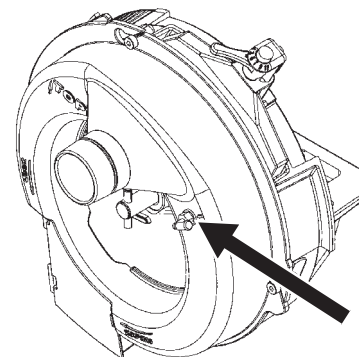


The crowder brush aids in the singulation of small flat seeds by (a) crowding seeds to the outer perimeter of the seed disc and (b) orienting seeds to allow the singulator brush to be more effective.

The air inlet screens allow air to enter the system and aids in keeping field residue or other foreign material out of the meter.

The foam spacer gently preloads the seed disc against the vacuum cover when no vacuum is present.

(MTER71)



The $\frac{3}{16}$ " hose barb elbow on the seed meter vacuum cover allows measurement of vacuum level at each meter. A customer-supplied vacuum gauge is required.

See "Seed Meter Singulator Brush And Vacuum Level Adjustments", "Seed Meter Maintenance" and "Preparation For Storage" for additional EdgeVac® Seed Metering System information.

SEED METER OPERATION/MAINTENANCE

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 vacuum 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. More frequent cleaning of monitor seed tubes may be necessary due to use of additional graphite or talc.

Talc seed lubricant may be used in lieu of or in addition to graphite to improve seed release from the 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 maintain meter performance.

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.

SEED METER 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. Lay the hopper on its right side.

Disassemble seed meter by rotating vacuum cover clockwise to align keyhole slots with bolt heads. Lift off cover. Remove seed disc. Empty the meter and hopper by allowing the seed to run out of the meter. Inspect brushes in meter to ensure all seed is removed. Replace seed disc and install vacuum cover.

NOTE: Use of damaged seed or seed containing foreign material will cause plugging of seed cell orifices and require more frequent seed meter cleanout to prevent underplanting.

SEED METER OPERATION/MAINTENANCE

PLANTING RATES FOR CORN/POPCORN 39 CELL DISC

15 TOOTH CONTACT WHEEL DRIVE /23 TOOTH REVERSER DRIVEN SPROCKETS (See Page 7-1)

APPROXIMATE SEEDS/ACRE FOR VARIOUS ROW WIDTHS

15" Rows	18" Rows	19" Rows	30" Rows	36" Rows	38" Rows	Transmission Sprockets		Recomm. Speed Range (MPH)	Average Seed Spacing In Inches
						Drive	Driven		
46,414	38,678	36,642	23,207	19,339	18,321	15	28	4 to 6	9.0
48,133	40,111	37,999	24,066	20,055	19,000	15	27	4 to 6	8.7
49,984	41,653	39,461	24,992	20,827	19,730	15	26	4 to 6	8.4
51,983	43,319	41,039	25,992	21,660	20,520	15	25	4 to 6	8.0
52,602	43,835	41,528	26,301	21,918	20,764	17	28	4 to 6	7.9
54,149	45,124	42,749	27,075	22,562	21,375	15	24	4 to 6	7.7
54,550	45,459	43,066	27,275	22,729	21,533	17	27	4 to 6	7.7
56,503	47,086	44,608	28,252	23,543	22,304	15	23	4 to 6	7.4
56,648	47,207	44,722	28,324	23,603	22,361	17	26	4 to 6	7.4
58,791	48,992	46,414	29,395	24,496	23,207	19	28	4 to 6	7.1
58,914	49,095	46,511	29,457	24,548	23,256	17	25	4 to 6	7.1
60,968	50,807	48,133	30,484	25,403	24,066	19	27	4 to 6	6.9
61,369	51,141	48,449	30,685	25,570	24,225	17	24	4 to 6	6.8
63,313	52,761	49,984	31,656	26,380	24,992	19	26	4 to 6	6.6
64,037	53,364	50,556	32,019	26,682	25,278	17	23	4 to 6	6.5
65,845	54,871	51,983	32,923	27,436	25,992	19	25	4 to 6	6.4
68,399	56,999	53,999	34,199	28,500	27,000	15	19	4 to 6	6.1
68,589	57,157	54,149	34,294	28,579	27,075	19	24	4 to 6	6.1
71,167	59,306	56,185	35,584	29,653	28,092	23	28	4 to 6	5.9
71,571	59,643	56,503	35,786	29,821	28,252	19	23	4 to 6	5.8
73,803	61,503	58,266	36,902	30,751	29,133	23	27	4 to 6	5.7
74,262	61,885	58,628	37,131	30,942	29,314	24	28	4 to 6	5.6
76,446	63,705	60,352	38,223	31,852	30,176	15	17	4 to 6	5.5
77,012	64,177	60,799	38,506	32,088	30,400	24	27	4 to 6	5.4
77,519	64,599	61,199	38,759	32,300	30,600	17	19	4 to 6	5.4
79,708	66,423	62,927	39,854	33,211	31,464	23	25	4 to 6	5.2
80,450	67,042	63,513	40,225	33,521	31,757	26	28	4 to 6	5.2
83,029	69,191	65,549	41,514	34,595	32,775	23	24	4 to 6	5.0
83,173	69,311	65,663	41,587	34,655	32,832	24	25	4 to 6	5.0
83,544	69,620	65,956	41,772	34,810	32,978	27	28	4 to 6	5.0
86,639	72,199	68,399	43,319	36,099	34,199	23	23	4 to 6	4.8
89,848	74,873	70,932	44,924	37,436	35,466	28	27	4 to 6	4.7
89,971	74,976	71,030	44,985	37,488	35,515	27	26	4 to 6	4.6
90,406	75,338	71,373	45,203	37,669	35,686	24	23	4 to 6	4.6
93,303	77,753	73,660	46,652	38,876	36,830	28	26	4 to 6	4.5
93,570	77,975	73,871	46,785	38,987	36,935	27	25	4 to 6	4.5
94,172	78,477	74,347	47,086	39,239	37,173	25	23	4 to 6	4.4
96,831	80,693	76,446	48,416	40,346	38,223	19	17	4 to 6	4.3
97,469	81,224	76,949	48,734	40,612	38,474	27	24	4 to 6	4.3
97,939	81,616	77,321	48,970	40,808	38,660	26	23	4 to 6	4.3
101,078	84,232	79,799	50,539	42,116	39,899	28	24	4 to 6	4.1
101,706	84,755	80,294	50,853	42,378	40,147	27	23	4 to 6	4.1
104,878	87,399	82,799	52,439	43,699	41,399	23	19	4 to 6	4.0
105,473	87,894	83,268	52,737	43,947	41,634	28	23	4 to 6	4.0
109,438	91,199	86,399	54,719	45,599	43,199	24	19	4 to 6	3.8
113,998	94,999	89,999	56,999	47,499	44,999	25	19	4 to 6	3.7
117,217	97,681	92,540	58,609	48,840	46,270	23	17	4 to 6	3.6
118,558	98,798	93,599	59,279	49,399	46,799	26	19	4 to 6	3.5
122,313	101,928	96,563	61,157	50,964	48,282	24	17	4 to 6	3.4
123,118	102,598	97,199	61,559	51,299	48,599	27	19	4 to 6	3.4
127,410	106,175	100,587	63,705	53,087	50,293	25	17	4 to 6	3.3
127,678	106,398	100,798	63,839	53,199	50,399	28	19	4 to 6	3.3
132,506	110,422	104,610	66,253	55,211	52,305	26	17	4 to 6	3.2
132,846	110,705	104,878	66,423	55,352	52,439	23	15	4 to 6	3.1
137,603	114,669	108,634	68,801	57,334	54,317	27	17	4 to 6	3.0

IMPORTANT: See "General Planting Rate Information" and "Checking Seed Population" pages for additional information. Always check seed population in the field to ensure planting rates are correct.

SEED METER OPERATION/MAINTENANCE

PLANTING RATES FOR CORN/POPCORN 39 CELL DISC

19 TOOTH CONTACT WHEEL DRIVE /23 TOOTH REVERSER DRIVEN SPROCKETS (See Page 7-1)

APPROXIMATE SEEDS/ACRE FOR VARIOUS ROW WIDTHS

15" Rows	18" Rows	19" Rows	30" Rows	36" Rows	38" Rows	Transmission Sprockets		Recomm. Speed Range (MPH)	Average Seed Spacing In Inches
						Drive	Driven		
58,791	48,992	46,414	29,395	24,496	23,207	15	28	4 to 6	7.1
60,968	50,807	48,133	30,484	25,403	24,066	15	27	4 to 6	6.9
63,313	52,761	49,984	31,656	26,380	24,992	15	26	4 to 6	6.6
65,845	54,871	51,983	32,923	27,436	25,992	15	25	4 to 6	6.4
66,629	55,524	52,602	33,315	27,762	26,301	17	28	4 to 6	6.3
68,589	57,157	54,149	34,294	28,579	27,075	15	24	4 to 6	6.1
69,097	57,581	54,550	34,549	28,790	27,275	17	27	4 to 6	6.1
71,571	59,643	56,503	35,786	29,821	28,252	15	23	4 to 6	5.8
71,755	59,796	56,648	35,877	29,898	28,324	17	26	4 to 6	5.8
74,468	62,057	58,791	37,234	31,028	29,395	19	28	4 to 6	5.6
74,625	62,187	58,914	37,312	31,094	29,457	17	25	4 to 6	5.6
77,226	64,355	60,968	38,613	32,178	30,484	19	27	4 to 6	5.4
77,734	64,778	61,369	38,867	32,389	30,685	17	24	4 to 6	5.4
80,196	66,830	63,313	40,098	33,415	31,656	19	26	4 to 6	5.2
81,114	67,595	64,037	40,557	33,797	32,019	17	23	4 to 6	5.2
83,404	69,503	65,845	41,702	34,752	32,923	19	25	4 to 6	5.0
86,639	72,199	68,399	43,319	36,099	34,199	15	19	4 to 6	4.8
86,879	72,399	68,589	43,440	36,200	34,294	19	24	4 to 6	4.8
90,145	75,121	71,167	45,073	37,561	35,584	23	28	4 to 6	4.6
90,657	75,547	71,571	45,328	37,774	35,786	19	23	4 to 6	4.6
93,484	77,904	73,803	46,742	38,952	36,902	23	27	4 to 6	4.5
94,065	78,387	74,262	47,032	39,194	37,131	24	28	4 to 6	4.4
96,831	80,693	76,446	48,416	40,346	38,223	15	17	4 to 6	4.3
97,549	81,291	77,012	48,774	40,645	38,506	24	27	4 to 6	4.3
98,191	81,825	77,519	49,095	40,913	38,759	17	19	4 to 6	4.3
100,963	84,136	79,708	50,481	42,068	39,854	23	25	4 to 6	4.1
101,904	84,920	80,450	50,952	42,460	40,225	26	28	4 to 6	4.1
105,170	87,641	83,029	52,585	43,821	41,514	23	24	4 to 6	4.0
105,353	87,794	83,173	52,676	43,897	41,587	24	25	4 to 6	4.0
105,823	88,186	83,544	52,911	44,093	41,772	27	28	4 to 6	4.0
109,742	91,452	86,639	54,871	45,726	43,319	23	23	4 to 6	3.8
113,807	94,839	89,848	56,903	47,420	44,924	28	27	4 to 6	3.7
113,963	94,969	89,971	56,982	47,485	44,985	27	26	4 to 6	3.7
114,514	95,428	90,406	57,257	47,714	45,203	24	23	4 to 6	3.7
118,184	98,487	93,303	59,092	49,243	46,652	28	26	4 to 6	3.5
118,522	98,768	93,570	59,261	49,384	46,785	27	25	4 to 6	3.5
119,285	99,404	94,172	59,643	49,702	47,086	25	23	4 to 6	3.5
122,653	102,211	96,831	61,327	51,105	48,416	19	17	4 to 6	3.4
123,460	102,883	97,469	61,730	51,442	48,734	27	24	4 to 6	3.4
124,057	103,380	97,939	62,028	51,690	48,970	26	23	4 to 6	3.4
128,033	106,694	101,078	64,016	53,347	50,539	28	24	4 to 6	3.3
128,828	107,357	101,706	64,414	53,678	50,853	27	23	4 to 6	3.2
132,846	110,705	104,878	66,423	55,352	52,439	23	19	4 to 6	3.1
133,599	111,333	105,473	66,800	55,666	52,737	28	23	4 to 6	3.1
138,622	115,518	109,438	69,311	57,759	54,719	24	19	4 to 6	3.0
144,398	120,332	113,998	72,199	60,166	56,999	25	19	4 to 6	2.9
148,475	123,729	117,217	74,237	61,865	58,609	23	17	4 to 6	2.8
150,174	125,145	118,558	75,087	62,572	59,279	26	19	4 to 6	2.8
154,930	129,109	122,313	77,465	64,554	61,157	24	17	4 to 6	2.7
155,950	129,958	123,118	77,975	64,979	61,559	27	19	4 to 6	2.7
161,386	134,488	127,410	80,693	67,244	63,705	25	17	4 to 6	2.6
161,726	134,771	127,678	80,863	67,386	63,839	28	19	4 to 6	2.6
167,841	139,868	132,506	83,921	69,934	66,253	26	17	4 to 6	2.5
168,272	140,226	132,846	84,136	70,113	66,423	23	15	4 to 6	2.5
174,297	145,247	137,603	87,148	72,624	68,801	27	17	4 to 6	2.4

IMPORTANT: See "General Planting Rate Information" and "Checking Seed Population" pages for additional information. Always check seed population in the field to ensure planting rates are correct.

SEED METER OPERATION/MAINTENANCE

PLANTING RATES FOR LOW-RATE CORN/POPCORN 24 CELL DISC

15 TOOTH CONTACT WHEEL DRIVE /23 TOOTH REVERSER DRIVEN SPROCKETS (See Page 7-1)

APPROXIMATE SEEDS/ACRE FOR VARIOUS ROW WIDTHS

15" Rows	18" Rows	19" Rows	30" Rows	36" Rows	38" Rows	Transmission Sprockets		Recomm. Speed Range (MPH)	Average Seed Spacing In Inches
						Drive	Driven		
28,562	23,802	22,549	14,281	11,901	11,275	15	28	4 to 6	14.6
29,620	24,683	23,384	14,810	12,342	11,692	15	27	4 to 6	14.1
30,759	25,633	24,284	15,380	12,816	12,142	15	26	4 to 6	13.6
31,990	26,658	25,255	15,995	13,329	12,628	15	25	4 to 6	13.1
32,370	26,975	25,556	16,185	13,488	12,778	17	28	4 to 6	12.9
33,323	27,769	26,307	16,661	13,884	13,154	15	24	4 to 6	12.5
33,569	27,975	26,502	16,785	13,987	13,251	17	27	4 to 6	12.5
34,771	28,976	27,451	17,386	14,488	13,726	15	23	4 to 6	12.0
34,861	29,050	27,521	17,430	14,525	13,761	17	26	4 to 6	12.0
36,179	30,149	28,562	18,089	15,074	14,281	19	28	4 to 6	11.6
36,255	30,212	28,622	18,127	15,106	14,311	17	25	4 to 6	11.5
37,519	31,266	29,620	18,759	15,633	14,810	19	27	4 to 6	11.1
37,766	31,471	29,815	18,883	15,736	14,907	17	24	4 to 6	11.1
38,962	32,468	30,759	19,481	16,234	15,380	19	26	4 to 6	10.7
39,408	32,840	31,111	19,704	16,420	15,556	17	23	4 to 6	10.6
40,520	33,767	31,990	20,260	16,883	15,995	19	25	4 to 6	10.3
42,092	35,076	33,230	21,046	17,538	16,615	15	19	4 to 6	9.9
42,209	35,174	33,323	21,104	17,587	16,661	19	24	4 to 6	9.9
43,795	36,496	34,575	21,898	18,248	17,288	23	28	4 to 6	9.5
44,044	36,703	34,771	22,022	18,352	17,386	19	23	4 to 6	9.5
45,417	37,848	35,856	22,709	18,924	17,928	23	27	4 to 6	9.2
45,700	38,083	36,079	22,850	19,041	18,039	24	28	4 to 6	9.2
47,044	39,203	37,140	23,522	19,602	18,570	15	17	4 to 6	8.9
47,392	39,493	37,415	23,696	19,747	18,707	24	27	4 to 6	8.8
47,704	39,753	37,661	23,852	19,877	18,830	17	19	4 to 6	8.8
49,051	40,876	38,724	24,525	20,438	19,362	23	25	4 to 6	8.5
49,508	41,257	39,085	24,754	20,628	19,543	26	28	4 to 6	8.4
51,095	42,579	40,338	25,547	21,289	20,169	23	24	4 to 6	8.2
51,183	42,653	40,408	25,592	21,326	20,204	24	25	4 to 6	8.2
51,412	42,843	40,588	25,706	21,422	20,294	27	28	4 to 6	8.1
53,316	44,430	42,092	26,658	22,215	21,046	23	23	4 to 6	7.8
55,291	46,076	43,651	27,645	23,038	21,825	28	27	4 to 6	7.6
55,367	46,139	43,711	27,683	23,069	21,855	27	26	4 to 6	7.6
55,634	46,362	43,922	27,817	23,181	21,961	24	23	4 to 6	7.5
57,417	47,848	45,329	28,709	23,924	22,665	28	26	4 to 6	7.3
57,581	47,985	45,459	28,791	23,992	22,730	27	25	4 to 6	7.3
57,952	48,294	45,752	28,976	24,147	22,876	25	23	4 to 6	7.2
59,589	49,657	47,044	29,794	24,829	23,522	19	17	4 to 6	7.0
59,981	49,984	47,353	29,990	24,992	23,677	27	24	4 to 6	7.0
60,270	50,225	47,582	30,135	25,113	23,791	26	23	4 to 6	6.9
62,202	51,835	49,107	31,101	25,918	24,553	28	24	4 to 6	6.7
62,588	52,157	49,412	31,294	26,079	24,706	27	23	4 to 6	6.7
64,541	53,784	50,953	32,270	26,892	25,477	23	19	4 to 6	6.5
64,907	54,089	51,242	32,453	27,044	25,621	28	23	4 to 6	6.4
67,347	56,122	53,168	33,673	28,061	26,584	24	19	4 to 6	6.2
70,153	58,461	55,384	35,076	29,230	27,692	25	19	4 to 6	6.0
72,134	60,111	56,948	36,067	30,056	28,474	23	17	4 to 6	5.8
72,959	60,799	57,599	36,479	30,400	28,800	26	19	4 to 6	5.7
75,270	62,725	59,424	37,635	31,362	29,712	24	17	4 to 6	5.6
75,765	63,138	59,814	37,883	31,569	29,907	27	19	4 to 6	5.5
78,406	65,338	61,900	39,203	32,669	30,950	25	17	4 to 6	5.3
78,571	65,476	62,030	39,286	32,738	31,015	28	19	4 to 6	5.3
81,542	67,952	64,375	40,771	33,976	32,188	26	17	4 to 6	5.1
81,751	68,126	64,541	40,876	34,063	32,270	23	15	4 to 6	5.1
84,679	70,565	66,851	42,339	35,283	33,426	27	17	4 to 6	4.9

IMPORTANT: See "General Planting Rate Information" and "Checking Seed Population" pages for additional information. Always check seed population in the field to ensure planting rates are correct.

SEED METER OPERATION/MAINTENANCE

PLANTING RATES FOR LOW-RATE CORN/POPCORN 24 CELL DISC

19 TOOTH CONTACT WHEEL DRIVE /23 TOOTH REVERSER DRIVEN SPROCKETS (See Page 7-1)

APPROXIMATE HILLS/ACRE FOR VARIOUS ROW WIDTHS

15" Rows	18" Rows	19" Rows	30" Rows	36" Rows	38" Rows	Transmission Sprockets		Recomm. Speed Range (MPH)	Average Seed Spacing In Inches
						Drive	Driven		
36,179	30,149	28,562	18,089	15,074	14,281	15	28	4 to 6	11.6
37,519	31,266	29,620	18,759	15,633	14,810	15	27	4 to 6	11.1
38,962	32,468	30,759	19,481	16,234	15,380	15	26	4 to 6	10.7
40,520	33,767	31,990	20,260	16,883	15,995	15	25	4 to 6	10.3
41,003	34,169	32,370	20,501	17,084	16,185	17	28	4 to 6	10.2
42,209	35,174	33,323	21,104	17,587	16,661	15	24	4 to 6	9.9
42,521	35,434	33,569	21,261	17,717	16,785	17	27	4 to 6	9.8
44,044	36,703	34,771	22,022	18,352	17,386	15	23	4 to 6	9.5
44,157	36,797	34,861	22,078	18,399	17,430	17	26	4 to 6	9.5
45,826	38,189	36,179	22,913	19,094	18,089	19	28	4 to 6	9.1
45,923	38,269	36,255	22,961	19,135	18,127	17	25	4 to 6	9.1
47,524	39,603	37,519	23,762	19,802	18,759	19	27	4 to 6	8.8
47,836	39,864	37,766	23,918	19,932	18,883	17	24	4 to 6	8.7
49,352	41,126	38,962	24,676	20,563	19,481	19	26	4 to 6	8.5
49,916	41,597	39,408	24,958	20,798	19,704	17	23	4 to 6	8.4
51,326	42,771	40,520	25,663	21,386	20,260	19	25	4 to 6	8.1
53,316	44,430	42,092	26,658	22,215	21,046	15	19	4 to 6	7.8
53,464	44,554	42,209	26,732	22,277	21,104	19	24	4 to 6	7.8
55,474	46,228	43,795	27,737	23,114	21,898	23	28	4 to 6	7.5
55,789	46,491	44,044	27,894	23,245	22,022	19	23	4 to 6	7.5
57,529	47,941	45,417	28,764	23,970	22,709	23	27	4 to 6	7.3
57,886	48,238	45,700	28,943	24,119	22,850	24	28	4 to 6	7.2
59,589	49,657	47,044	29,794	24,829	23,522	15	17	4 to 6	7.0
60,030	50,025	47,392	30,015	25,012	23,696	24	27	4 to 6	7.0
60,425	50,354	47,704	30,212	25,177	23,852	17	19	4 to 6	6.9
62,131	51,776	49,051	31,066	25,888	24,525	23	25	4 to 6	6.7
62,710	52,258	49,508	31,355	26,129	24,754	26	28	4 to 6	6.7
64,720	53,933	51,095	32,360	26,967	25,547	23	24	4 to 6	6.5
64,832	54,027	51,183	32,416	27,013	25,592	24	25	4 to 6	6.5
65,122	54,268	51,412	32,561	27,134	25,706	27	28	4 to 6	6.4
67,534	56,278	53,316	33,767	28,139	26,658	23	23	4 to 6	6.2
70,035	58,362	55,291	35,017	29,181	27,645	28	27	4 to 6	6.0
70,131	58,443	55,367	35,066	29,221	27,683	27	26	4 to 6	6.0
70,470	58,725	55,634	35,235	29,362	27,817	24	23	4 to 6	5.9
72,729	60,607	57,417	36,364	30,304	28,709	28	26	4 to 6	5.7
72,936	60,780	57,581	36,468	30,390	28,791	27	25	4 to 6	5.7
73,406	61,172	57,952	36,703	30,586	28,976	25	23	4 to 6	5.7
75,479	62,899	59,589	37,739	31,450	29,794	19	17	4 to 6	5.5
75,975	63,313	59,981	37,988	31,656	29,990	27	24	4 to 6	5.5
76,342	63,619	60,270	38,171	31,809	30,135	26	23	4 to 6	5.5
78,789	65,658	62,202	39,395	32,829	31,101	28	24	4 to 6	5.3
79,279	66,066	62,588	39,639	33,033	31,294	27	23	4 to 6	5.3
81,751	68,126	64,541	40,876	34,063	32,270	23	19	4 to 6	5.1
82,215	68,512	64,907	41,107	34,256	32,453	28	23	4 to 6	5.1
85,306	71,088	67,347	42,653	35,544	33,673	24	19	4 to 6	4.9
88,860	74,050	70,153	44,430	37,025	35,076	25	19	4 to 6	4.7
91,369	76,141	72,134	45,685	38,070	36,067	23	17	4 to 6	4.6
92,415	77,012	72,959	46,207	38,506	36,479	26	19	4 to 6	4.5
95,342	79,451	75,270	47,671	39,726	37,635	24	17	4 to 6	4.4
95,969	79,974	75,765	47,985	39,987	37,883	27	19	4 to 6	4.4
99,314	82,762	78,406	49,657	41,381	39,203	25	17	4 to 6	4.2
99,523	82,936	78,571	49,762	41,468	39,286	28	19	4 to 6	4.2
103,287	86,072	81,542	51,643	43,036	40,771	26	17	4 to 6	4.0
103,552	86,293	81,751	51,776	43,147	40,876	23	15	4 to 6	4.0
107,259	89,383	84,679	53,630	44,691	42,339	27	17	4 to 6	3.9

IMPORTANT: See "General Planting Rate Information" and "Checking Seed Population" pages for additional information. Always check seed population in the field to ensure planting rates are correct.

SEED METER OPERATION/MAINTENANCE

**PLANTING RATES FOR SOYBEAN AND MILO/GRAIN SORGHUM 60 CELL DISCS
15 TOOTH CONTACT WHEEL DRIVE /23 TOOTH REVERSER DRIVEN SPROCKETS (See Page 7-1)
APPROXIMATE SEEDS/ACRE FOR VARIOUS ROW WIDTHS**

15" Rows	18" Rows	19" Rows	30" Rows	36" Rows	38" Rows	Transmission Sprockets		Recomm. Speed Range (MPH)	Average Seed Spacing In Inches
						Drive	Driven		
71,406	59,505	56,373	35,703	29,752	28,186	15	28	4 to 6	5.9
74,050	61,708	58,461	37,025	30,854	29,230	15	27	4 to 6	5.6
76,898	64,082	60,709	38,449	32,041	30,355	15	26	4 to 6	5.4
79,974	66,645	63,138	39,987	33,323	31,569	15	25	4 to 6	5.2
80,926	67,439	63,889	40,463	33,719	31,945	17	28	4 to 6	5.2
83,306	69,422	65,768	41,653	34,711	32,884	15	24	4 to 6	5.0
83,924	69,936	66,255	41,962	34,968	33,128	17	27	4 to 6	5.0
86,928	72,440	68,628	43,464	36,220	34,314	15	23	4 to 6	4.8
87,151	72,626	68,804	43,576	36,313	34,402	17	26	4 to 6	4.8
90,447	75,372	71,406	45,223	37,686	35,703	19	28	4 to 6	4.6
90,637	75,531	71,556	45,319	37,766	35,778	17	25	4 to 6	4.6
93,797	78,164	74,050	46,898	39,082	37,025	19	27	4 to 6	4.5
94,414	78,678	74,537	47,207	39,339	37,269	17	24	4 to 6	4.4
97,404	81,170	76,898	48,702	40,585	38,449	19	26	4 to 6	4.3
98,519	82,099	77,778	49,259	41,050	38,889	17	23	4 to 6	4.2
101,301	84,417	79,974	50,650	42,209	39,987	19	25	4 to 6	4.1
105,229	87,691	83,076	52,615	43,845	41,538	15	19	4 to 6	4.0
105,521	87,935	83,306	52,761	43,967	41,653	19	24	4 to 6	4.0
109,488	91,240	86,438	54,744	45,620	43,219	23	28	4 to 6	3.8
110,109	91,758	86,928	55,055	45,879	43,464	19	23	4 to 6	3.8
113,544	94,620	89,640	56,772	47,310	44,820	23	27	4 to 6	3.7
114,249	95,207	90,196	57,124	47,604	45,098	24	28	4 to 6	3.7
117,609	98,008	92,849	58,805	49,004	46,425	15	17	4 to 6	3.6
118,480	98,734	93,537	59,240	49,367	46,769	24	27	4 to 6	3.5
119,260	99,383	94,152	59,630	49,692	47,076	17	19	4 to 6	3.5
122,627	102,189	96,811	61,314	51,095	48,405	23	25	4 to 6	3.4
123,770	103,141	97,713	61,885	51,571	48,856	26	28	4 to 6	3.4
127,737	106,447	100,845	63,868	53,224	50,422	23	24	4 to 6	3.3
127,959	106,632	101,020	63,979	53,316	50,510	24	25	4 to 6	3.3
128,530	107,108	101,471	64,265	53,554	50,735	27	28	4 to 6	3.3
133,290	111,075	105,229	66,645	55,538	52,615	23	23	4 to 6	3.1
138,227	115,189	109,127	69,113	57,595	54,563	28	27	4 to 6	3.0
138,417	115,347	109,276	69,208	57,674	54,638	27	26	4 to 6	3.0
139,086	115,905	109,804	69,543	57,952	54,902	24	23	4 to 6	3.0
143,543	119,619	113,324	71,772	59,810	56,662	28	26	4 to 6	2.9
143,954	119,961	113,648	71,977	59,981	56,824	27	25	4 to 6	2.9
144,881	120,734	114,380	72,440	60,367	57,190	25	23	4 to 6	2.9
148,971	124,143	117,609	74,486	62,071	58,805	19	17	4 to 6	2.8
149,952	124,960	118,383	74,976	62,480	59,191	27	24	4 to 6	2.8
150,676	125,563	118,955	75,338	62,782	59,477	26	23	4 to 6	2.8
155,505	129,588	122,767	77,753	64,794	61,384	28	24	4 to 6	2.7
156,471	130,393	123,530	78,236	65,196	61,765	27	23	4 to 6	2.7
161,351	134,459	127,383	80,676	67,230	63,691	23	19	4 to 6	2.6
162,266	135,222	128,105	81,133	67,611	64,053	28	23	4 to 6	2.6
168,367	140,306	132,921	84,183	70,153	66,461	24	19	4 to 6	2.5
175,382	146,152	138,459	87,691	73,076	69,230	25	19	4 to 6	2.4
180,334	150,278	142,369	90,167	75,139	71,184	23	17	4 to 6	2.3
182,397	151,998	143,998	91,199	75,999	71,999	26	19	4 to 6	2.3
188,175	156,812	148,559	94,087	78,406	74,279	24	17	4 to 6	2.2
189,413	157,844	149,536	94,706	78,922	74,768	27	19	4 to 6	2.2
196,015	163,346	154,749	98,008	81,673	77,374	25	17	4 to 6	2.1
196,428	163,690	155,075	98,214	81,845	77,537	28	19	4 to 6	2.1
203,856	169,880	160,939	101,928	84,940	80,469	26	17	4 to 6	2.1
204,378	170,315	161,351	102,189	85,158	80,676	23	15	4 to 6	2.0
211,696	176,414	167,129	105,848	88,207	83,564	27	17	4 to 6	2.0

IMPORTANT: See "General Planting Rate Information" and "Checking Seed Population" pages for additional information. Always check seed population in the field to ensure planting rates are correct.

SEED METER OPERATION/MAINTENANCE

**PLANTING RATES FOR SOYBEAN AND MILO/GRAIN SORGHUM 60 CELL DISCS
19 TOOTH CONTACT WHEEL DRIVE /23 TOOTH REVERSER DRIVEN SPROCKETS (See Page 7-1)
APPROXIMATE SEEDS/ACRE FOR VARIOUS ROW WIDTHS**

15" Rows	18" Rows	19" Rows	30" Rows	36" Rows	38" Rows	Transmission Sprockets		Recomm. Speed Range (MPH)	Average Seed Spacing In Inches
						Drive	Driven		
90,447	75,372	71,406	45,223	37,686	35,703	15	28	4 to 6	4.6
93,797	78,164	74,050	46,898	39,082	37,025	15	27	4 to 6	4.5
97,404	81,170	76,898	48,702	40,585	38,449	15	26	4 to 6	4.3
101,301	84,417	79,974	50,650	42,209	39,987	15	25	4 to 6	4.1
102,507	85,422	80,926	51,253	42,711	40,463	17	28	4 to 6	4.1
105,521	87,935	83,306	52,761	43,967	41,653	15	24	4 to 6	4.0
106,303	88,586	83,924	53,152	44,293	41,962	17	27	4 to 6	3.9
110,109	91,758	86,928	55,055	45,879	43,464	15	23	4 to 6	3.8
110,392	91,993	87,151	55,196	45,997	43,576	17	26	4 to 6	3.8
114,566	95,472	90,447	57,283	47,736	45,223	19	28	4 to 6	3.7
114,807	95,673	90,637	57,404	47,836	45,319	17	25	4 to 6	3.6
118,809	99,008	93,797	59,405	49,504	46,898	19	27	4 to 6	3.5
119,591	99,659	94,414	59,796	49,830	47,207	17	24	4 to 6	3.5
123,379	102,816	97,404	61,689	51,408	48,702	19	26	4 to 6	3.4
124,791	103,992	98,519	62,395	51,996	49,259	17	23	4 to 6	3.4
128,314	106,928	101,301	64,157	53,464	50,650	19	25	4 to 6	3.3
133,290	111,075	105,229	66,645	55,538	52,615	15	19	4 to 6	3.1
133,661	111,384	105,521	66,830	55,692	52,761	19	24	4 to 6	3.1
138,685	115,571	109,488	69,343	57,786	54,744	23	28	4 to 6	3.0
139,472	116,227	110,109	69,736	58,113	55,055	19	23	4 to 6	3.0
143,822	119,852	113,544	71,911	59,926	56,772	23	27	4 to 6	2.9
144,715	120,596	114,249	72,358	60,298	57,124	24	28	4 to 6	2.9
148,971	124,143	117,609	74,486	62,071	58,805	15	17	4 to 6	2.8
150,075	125,062	118,480	75,037	62,531	59,240	24	27	4 to 6	2.8
151,062	125,885	119,260	75,531	62,943	59,630	17	19	4 to 6	2.8
155,328	129,440	122,627	77,664	64,720	61,314	23	25	4 to 6	2.7
156,775	130,646	123,770	78,387	65,323	61,885	26	28	4 to 6	2.7
161,800	134,833	127,737	80,900	67,416	63,868	23	24	4 to 6	2.6
162,081	135,067	127,959	81,040	67,534	63,979	24	25	4 to 6	2.6
162,805	135,670	128,530	81,402	67,835	64,265	27	28	4 to 6	2.6
168,834	140,695	133,290	84,417	70,348	66,645	23	23	4 to 6	2.5
175,087	145,906	138,227	87,544	72,953	69,113	28	27	4 to 6	2.4
175,328	146,107	138,417	87,664	73,053	69,208	27	26	4 to 6	2.4
176,175	146,812	139,086	88,087	73,406	69,543	24	23	4 to 6	2.4
181,822	151,518	143,543	90,911	75,759	71,772	28	26	4 to 6	2.3
182,341	151,951	143,954	91,171	75,975	71,977	27	25	4 to 6	2.3
183,516	152,930	144,881	91,758	76,465	72,440	25	23	4 to 6	2.3
188,697	157,248	148,971	94,349	78,624	74,486	19	17	4 to 6	2.2
189,939	158,282	149,952	94,969	79,141	74,976	27	24	4 to 6	2.2
190,856	159,047	150,676	95,428	79,523	75,338	26	23	4 to 6	2.2
196,973	164,145	155,505	98,487	82,072	77,753	28	24	4 to 6	2.1
198,197	165,164	156,471	99,098	82,582	78,236	27	23	4 to 6	2.1
204,378	170,315	161,351	102,189	85,158	80,676	23	19	4 to 6	2.0
205,537	171,281	162,266	102,769	85,641	81,133	28	23	4 to 6	2.0
213,264	177,720	168,367	106,632	88,860	84,183	24	19	4 to 6	2.0
222,150	185,125	175,382	111,075	92,563	87,691	25	19	4 to 6	1.9
228,423	190,352	180,334	114,211	95,176	90,167	23	17	4 to 6	1.8
231,036	192,530	182,397	115,518	96,265	91,199	26	19	4 to 6	1.8
238,354	198,629	188,175	119,177	99,314	94,087	24	17	4 to 6	1.8
239,923	199,935	189,413	119,961	99,968	94,706	27	19	4 to 6	1.7
248,286	206,905	196,015	124,143	103,452	98,008	25	17	4 to 6	1.7
248,809	207,340	196,428	124,404	103,670	98,214	28	19	4 to 6	1.7
	215,181	203,856	129,109	107,591	101,928	26	17	4 to 6	1.6
	215,733	204,378	129,440	107,866	102,189	23	15	4 to 6	1.6
	223,457	211,696	134,074	111,729	105,848	27	17	4 to 6	1.6

IMPORTANT: See "General Planting Rate Information" and "Checking Seed Population" pages for additional information. Always check seed population in the field to ensure planting rates are correct.

SEED METER OPERATION/MAINTENANCE

**PLANTING RATES FOR SOYBEAN 60 CELL DISC -
30 TOOTH CONTACT WHEEL DRIVE/17 TOOTH REVERSER DRIVEN SPROCKETS (See Page 7-1)
APPROXIMATE SEEDS/ACRE FOR VARIOUS ROW WIDTHS**

15" Rows	18" Rows	19" Rows	30" Rows	36" Rows	38" Rows	Transmission Sprockets		Recomm. Speed Range (MPH)	Average Seed Spacing In Inches
						Drive	Driven		
193,217	161,014	152,539	96,608	80,507	76,270	15	28	4 to 6	2.2
200,373	166,977	158,189	100,186	83,489	79,095	15	27	4 to 6	2.1
208,079	173,400	164,273	104,040	86,700	82,137	15	26	4 to 6	2.0
216,403	180,336	170,844	108,201	90,168	85,422	15	25	4 to 6	1.9
218,979	182,482	172,878	109,489	91,241	86,439	17	28	4 to 6	1.9
225,419	187,850	177,963	112,710	93,925	88,981	15	24	4 to 6	1.9
227,089	189,241	179,281	113,545	94,620	89,640	17	27	4 to 6	1.8
235,220	196,017	185,700	117,610	98,008	92,850	15	23	4 to 6	1.8
235,823	196,519	186,176	117,912	98,260	93,088	17	26	4 to 6	1.8
244,741	203,951	193,217	122,371	101,975	96,608	19	28	4 to 6	1.7
245,256	204,380	193,623	122,628	102,190	96,812	17	25	4 to 6	1.7
	211,505	200,373	126,903	105,752	100,186	19	27	4 to 6	1.6
	212,896	201,691	127,738	106,448	100,846	17	24	4 to 6	1.6
	219,639	208,079	131,784	109,820	104,040	19	26	4 to 6	1.6
	222,152	210,460	133,291	111,076	105,230	17	23	4 to 6	1.6
	228,425	216,403	137,055	114,213	108,201	19	25	4 to 6	1.5
	237,284	224,795	142,370	118,642	112,397	15	19	4 to 6	1.5
	237,943	225,419	142,766	118,971	112,710	19	24	4 to 6	1.5
	246,888	233,894	148,133	123,444	116,947	23	28	4 to 6	1.4
	248,288	235,220	148,973	124,144	117,610	19	23	4 to 6	1.4
		242,557	153,619	128,016	121,278	23	27	4 to 6	1.4
		244,063	154,573	128,811	122,032	24	28	4 to 6	1.4
			159,120	132,600	125,621	15	17	4 to 6	1.3
			160,298	133,582	126,551	24	27	4 to 6	1.3
			161,353	134,461	127,384	17	19	4 to 6	1.3
			165,909	138,257	130,981	23	25	4 to 6	1.3
			167,454	139,545	132,201	26	28	4 to 6	1.2
			172,822	144,018	136,438	23	24	4 to 6	1.2
			173,122	144,268	136,675	24	25	4 to 6	1.2
			173,895	144,912	137,286	27	28	4 to 6	1.2
			180,336	150,280	142,370	23	23	4 to 6	1.2
			187,015	155,846	147,643	28	27	4 to 6	1.1
			187,272	156,060	147,846	27	26	4 to 6	1.1
			188,176	156,814	148,560	24	23	4 to 6	1.1
			194,207	161,840	153,322	28	26	4 to 6	1.1
			194,762	162,302	153,760	27	25	4 to 6	1.1
			196,017	163,347	154,750	25	23	4 to 6	1.1
			201,551	167,960	159,120	19	17	4 to 6	1.0
			202,877	169,065	160,166	27	24	4 to 6	1.0
			203,858	169,881	160,940	26	23	4 to 6	1.0
			210,391	175,326	166,099	28	24	4 to 6	1.0
			211,698	176,415	167,130	27	23	4 to 6	1.0
			218,301	181,917	172,343	23	19	4 to 6	1.0
			219,539	182,949	173,320	28	23	4 to 6	1.0
			227,792	189,827	179,836	24	19	4 to 6	0.9
			237,284	197,736	187,329	25	19	4 to 6	0.9
			243,983	203,319	192,618	23	17	4 to 6	0.9
			246,775	205,646	194,822	26	19	4 to 6	0.8
				212,159	200,993	24	17	4 to 6	0.8
				213,555	202,315	27	19	4 to 6	0.8
				220,999	209,368	25	17	4 to 6	0.8
				221,465	209,809	28	19	4 to 6	0.8
				229,839	217,743	26	17	4 to 6	0.8
				230,429	218,301	23	15	4 to 6	0.8
				238,679	226,117	27	17	4 to 6	0.7

NOTE: Planting rates over 250,000 seeds/acre are not recommended with subject seed disc and/or drive ratio.

IMPORTANT: See "General Planting Rate Information" and "Checking Seed Population" pages for additional information. Always check seed population in the field to ensure planting rates are correct.

SEED METER OPERATION/MAINTENANCE

PLANTING RATES FOR HIGH-RATE SOYBEAN 120 CELL DISC

15 TOOTH CONTACT WHEEL DRIVE /23 TOOTH REVERSER DRIVEN SPROCKETS (See Page 7-1)

APPROXIMATE SEEDS/ACRE FOR VARIOUS ROW WIDTHS

15" Rows	18" Rows	19" Rows	30" Rows	36" Rows	38" Rows	Transmission Sprockets		Recomm. Speed Range (MPH)	Average Seed Spacing In Inches
						Drive	Driven		
142,811	119,009	112,746	71,406	59,505	56,373	15	28	4 to 6	2.9
148,100	123,417	116,921	74,050	61,708	58,461	15	27	4 to 6	2.8
153,796	128,164	121,418	76,898	64,082	60,709	15	26	4 to 6	2.7
159,948	133,290	126,275	79,974	66,645	63,138	15	25	4 to 6	2.6
161,852	134,877	127,778	80,926	67,439	63,889	17	28	4 to 6	2.6
166,613	138,844	131,536	83,306	69,422	65,768	15	24	4 to 6	2.5
167,847	139,873	132,511	83,924	69,936	66,255	17	27	4 to 6	2.5
173,857	144,881	137,255	86,928	72,440	68,628	15	23	4 to 6	2.4
174,303	145,252	137,607	87,151	72,626	68,804	17	26	4 to 6	2.4
180,894	150,745	142,811	90,447	75,372	71,406	19	28	4 to 6	2.3
181,275	151,062	143,112	90,637	75,531	71,556	17	25	4 to 6	2.3
187,594	156,328	148,100	93,797	78,164	74,050	19	27	4 to 6	2.2
188,828	157,357	149,075	94,414	78,678	74,537	17	24	4 to 6	2.2
194,809	162,341	153,796	97,404	81,170	76,898	19	26	4 to 6	2.1
197,038	164,198	155,556	98,519	82,099	77,778	17	23	4 to 6	2.1
202,601	168,834	159,948	101,301	84,417	79,974	19	25	4 to 6	2.1
210,458	175,382	166,151	105,229	87,691	83,076	15	19	4 to 6	2.0
211,043	175,869	166,613	105,521	87,935	83,306	19	24	4 to 6	2.0
218,977	182,481	172,876	109,488	91,240	86,438	23	28	4 to 6	1.9
220,219	183,516	173,857	110,109	91,758	86,928	19	23	4 to 6	1.9
227,087	189,239	179,279	113,544	94,620	89,640	23	27	4 to 6	1.8
228,498	190,415	180,393	114,249	95,207	90,196	24	28	4 to 6	1.8
235,218	196,015	185,699	117,609	98,008	92,849	15	17	4 to 6	1.8
236,961	197,467	187,074	118,480	98,734	93,537	24	27	4 to 6	1.8
238,519	198,766	188,305	119,260	99,383	94,152	17	19	4 to 6	1.8
245,254	204,378	193,622	122,627	102,189	96,811	23	25	4 to 6	1.7
247,539	206,283	195,426	123,770	103,141	97,713	26	28	4 to 6	1.7
	212,894	201,689	127,737	106,447	100,845	23	24	4 to 6	1.6
	213,264	202,040	127,959	106,632	101,020	24	25	4 to 6	1.6
	214,217	202,942	128,530	107,108	101,471	27	28	4 to 6	1.6
	222,150	210,458	133,290	111,075	105,229	23	23	4 to 6	1.6
	230,378	218,253	138,227	115,189	109,127	28	27	4 to 6	1.5
	230,695	218,553	138,417	115,347	109,276	27	26	4 to 6	1.5
	231,809	219,609	139,086	115,905	109,804	24	23	4 to 6	1.5
	239,239	226,647	143,543	119,619	113,324	28	26	4 to 6	1.5
	239,923	227,295	143,954	119,961	113,648	27	25	4 to 6	1.5
	241,468	228,759	144,881	120,734	114,380	25	23	4 to 6	1.4
	248,286	235,218	148,971	124,143	117,609	19	17	4 to 6	1.4
	249,919	236,766	149,952	124,960	118,383	27	24	4 to 6	1.4
		237,909	150,676	125,563	118,955	26	23	4 to 6	1.4
		245,535	155,505	129,588	122,767	28	24	4 to 6	1.3
		247,060	156,471	130,393	123,530	27	23	4 to 6	1.3
			161,351	134,459	127,383	23	19	4 to 6	1.3
			162,266	135,222	128,105	28	23	4 to 6	1.3
			168,367	140,306	132,921	24	19	4 to 6	1.2
			175,382	146,152	138,459	25	19	4 to 6	1.2
			180,334	150,278	142,369	23	17	4 to 6	1.2
			182,397	151,998	143,998	26	19	4 to 6	1.1
			188,175	156,812	148,559	24	17	4 to 6	1.1
			189,413	157,844	149,536	27	19	4 to 6	1.1
			196,015	163,346	154,749	25	17	4 to 6	1.1
			196,428	163,690	155,075	28	19	4 to 6	1.1
			203,856	169,880	160,939	26	17	4 to 6	1.0
			204,378	170,315	161,351	23	15	4 to 6	1.0
			211,696	176,414	167,129	27	17	4 to 6	1.0

NOTE: Planting rates over 250,000 seeds/acre are not recommended with subject seed disc and/or drive ratio.

IMPORTANT: See "General Planting Rate Information" and "Checking Seed Population" pages for additional information. Always check seed population in the field to ensure planting rates are correct.

SEED METER OPERATION/MAINTENANCE

PLANTING RATES FOR HIGH-RATE SOYBEAN 120 CELL DISC

19 TOOTH CONTACT WHEEL DRIVE /23 TOOTH REVERSER DRIVEN SPROCKETS (See Page 7-1)

APPROXIMATE SEEDS/ACRE FOR VARIOUS ROW WIDTHS

15" Rows	18" Rows	19" Rows	30" Rows	36" Rows	38" Rows	Transmission Sprockets		Recomm. Speed Range (MPH)	Average Seed Spacing In Inches
						Drive	Driven		
180,894	150,745	142,811	90,447	75,372	71,406	15	28	4 to 6	2.3
187,594	156,328	148,100	93,797	78,164	74,050	15	27	4 to 6	2.2
194,809	162,341	153,796	97,404	81,170	76,898	15	26	4 to 6	2.1
202,601	168,834	159,948	101,301	84,417	79,974	15	25	4 to 6	2.1
205,013	170,844	161,852	102,507	85,422	80,926	17	28	4 to 6	2.0
211,043	175,869	166,613	105,521	87,935	83,306	15	24	4 to 6	2.0
212,606	177,172	167,847	106,303	88,586	83,924	17	27	4 to 6	2.0
220,219	183,516	173,857	110,109	91,758	86,928	15	23	4 to 6	1.9
220,783	183,986	174,303	110,392	91,993	87,151	17	26	4 to 6	1.9
229,132	190,944	180,894	114,566	95,472	90,447	19	28	4 to 6	1.8
229,615	191,346	181,275	114,807	95,673	90,637	17	25	4 to 6	1.8
237,619	198,016	187,594	118,809	99,008	93,797	19	27	4 to 6	1.8
239,182	199,318	188,828	119,591	99,659	94,414	17	24	4 to 6	1.7
246,758	205,632	194,809	123,379	102,816	97,404	19	26	4 to 6	1.7
249,581	207,984	197,038	124,791	103,992	98,519	17	23	4 to 6	1.7
	213,857	202,601	128,314	106,928	101,301	19	25	4 to 6	1.6
	222,150	210,458	133,290	111,075	105,229	15	19	4 to 6	1.6
	222,768	211,043	133,661	111,384	105,521	19	24	4 to 6	1.6
	231,142	218,977	138,685	115,571	109,488	23	28	4 to 6	1.5
	232,453	220,219	139,472	116,227	110,109	19	23	4 to 6	1.5
	239,703	227,087	143,822	119,852	113,544	23	27	4 to 6	1.5
	241,192	228,498	144,715	120,596	114,249	24	28	4 to 6	1.4
	248,286	235,218	148,971	124,143	117,609	15	17	4 to 6	1.4
		236,961	150,075	125,062	118,480	24	27	4 to 6	1.4
		238,519	151,062	125,885	119,260	17	19	4 to 6	1.4
		245,254	155,328	129,440	122,627	23	25	4 to 6	1.3
		247,539	156,775	130,646	123,770	26	28	4 to 6	1.3
			161,800	134,833	127,737	23	24	4 to 6	1.3
			162,081	135,067	127,959	24	25	4 to 6	1.3
			162,805	135,670	128,530	27	28	4 to 6	1.3
			168,834	140,695	133,290	23	23	4 to 6	1.2
			175,087	145,906	138,227	28	27	4 to 6	1.2
			175,328	146,107	138,417	27	26	4 to 6	1.2
			176,175	146,812	139,086	24	23	4 to 6	1.2
			181,822	151,518	143,543	28	26	4 to 6	1.1
			182,341	151,951	143,954	27	25	4 to 6	1.1
			183,516	152,930	144,881	25	23	4 to 6	1.1
			188,697	157,248	148,971	19	17	4 to 6	1.1
			189,939	158,282	149,952	27	24	4 to 6	1.1
			190,856	159,047	150,676	26	23	4 to 6	1.1
			196,973	164,145	155,505	28	24	4 to 6	1.1
			198,197	165,164	156,471	27	23	4 to 6	1.1
			204,378	170,315	161,351	23	19	4 to 6	1.0
			205,537	171,281	162,266	28	23	4 to 6	1.0
			213,264	177,720	168,367	24	19	4 to 6	1.0
			222,150	185,125	175,382	25	19	4 to 6	0.9
			228,423	190,352	180,334	23	17	4 to 6	0.9
			231,036	192,530	182,397	26	19	4 to 6	0.9
			238,354	198,629	188,175	24	17	4 to 6	0.9
			239,923	199,935	189,413	27	19	4 to 6	0.9
			248,286	206,905	196,015	25	17	4 to 6	0.8
			248,809	207,340	196,428	28	19	4 to 6	0.8
				215,181	203,856	26	17	4 to 6	0.8
				215,733	204,378	23	15	4 to 6	0.8
				223,457	211,696	27	17	4 to 6	0.8

NOTE: Planting rates over 250,000 seeds/acre are not recommended with subject seed disc and/or drive ratio.

IMPORTANT: See "General Planting Rate Information" and "Checking Seed Population" pages for additional information. Always check seed population in the field to ensure planting rates are correct.

SEED METER OPERATION/MAINTENANCE

PLANTING RATES FOR ACID-DELINTED HILL-DROP COTTON, 3 SEEDS PER CELL, 20 CELL DISC
15 TOOTH CONTACT WHEEL DRIVE /23 TOOTH REVERSER DRIVEN SPROCKETS (See Page 7-1)

APPROXIMATE HILLS/ACRE FOR VARIOUS ROW WIDTHS

15" Rows	18" Rows	19" Rows	30" Rows	36" Rows	38" Rows	Transmission Sprockets		Recomm. Speed Range (MPH)	Average Hill Spacing In Inches
						Drive	Driven		
23,802	19,835	18,791	11,901	9,917	9,395	15	28	4 to 6	17.6
24,683	20,569	19,487	12,342	10,285	9,743	15	27	4 to 6	16.9
25,633	21,361	20,236	12,816	10,680	10,118	15	26	4 to 6	16.3
26,658	22,215	21,046	13,329	11,108	10,523	15	25	4 to 6	15.7
26,975	22,480	21,296	13,488	11,240	10,648	17	28	4 to 6	15.5
27,769	23,141	21,923	13,884	11,570	10,961	15	24	4 to 6	15.1
27,975	23,312	22,085	13,987	11,656	11,043	17	27	4 to 6	14.9
28,976	24,147	22,876	14,488	12,073	11,438	15	23	4 to 6	14.4
29,050	24,209	22,935	14,525	12,104	11,467	17	26	4 to 6	14.4
30,149	25,124	23,802	15,074	12,562	11,901	19	28	4 to 6	13.9
30,212	25,177	23,852	15,106	12,589	11,926	17	25	4 to 6	13.8
31,266	26,055	24,683	15,633	13,027	12,342	19	27	4 to 6	13.4
31,471	26,226	24,846	15,736	13,113	12,423	17	24	4 to 6	13.3
32,468	27,057	25,633	16,234	13,528	12,816	19	26	4 to 6	12.9
32,840	27,366	25,926	16,420	13,683	12,963	17	23	4 to 6	12.7
33,767	28,139	26,658	16,883	14,070	13,329	19	25	4 to 6	12.4
35,076	29,230	27,692	17,538	14,615	13,846	15	19	4 to 6	11.9
35,174	29,312	27,769	17,587	14,656	13,884	19	24	4 to 6	11.9
36,496	30,413	28,813	18,248	15,207	14,406	23	28	4 to 6	11.5
36,703	30,586	28,976	18,352	15,293	14,488	19	23	4 to 6	11.4
37,848	31,540	29,880	18,924	15,770	14,940	23	27	4 to 6	11.0
38,083	31,736	30,065	19,041	15,868	15,033	24	28	4 to 6	11.0
39,203	32,669	30,950	19,602	16,335	15,475	15	17	4 to 6	10.7
39,304	32,753	31,029	19,652	16,376	15,515	23	26	4 to 6	10.6
39,493	32,911	31,179	19,747	16,456	15,590	24	27	4 to 6	10.6
39,670	33,058	31,318	19,835	16,529	15,659	25	28	4 to 6	10.5
39,753	33,128	31,384	19,877	16,564	15,692	17	19	4 to 6	10.5
40,876	34,063	32,270	20,438	17,032	16,135	23	25	4 to 6	10.2
41,012	34,177	32,378	20,506	17,088	16,189	24	26	4 to 6	10.2
41,139	34,282	32,478	20,569	17,141	16,239	25	27	4 to 6	10.2
41,257	34,380	32,571	20,628	17,190	16,285	26	28	4 to 6	10.1
42,579	35,482	33,615	21,289	17,741	16,807	23	24	4 to 6	9.8
42,653	35,544	33,673	21,326	17,772	16,837	24	25	4 to 6	9.8
42,721	35,601	33,727	21,361	17,801	16,864	25	26	4 to 6	9.8
42,785	35,654	33,777	21,392	17,827	16,889	26	27	4 to 6	9.8
42,843	35,703	33,824	21,422	17,851	16,912	27	28	4 to 6	9.8
44,430	37,025	35,076	22,215	18,513	17,538	23	23	4 to 6	9.4
46,076	38,396	36,376	23,038	19,198	18,188	28	27	4 to 6	9.1
46,139	38,449	36,425	23,069	19,225	18,213	27	26	4 to 6	9.1
46,281	38,568	36,538	23,141	19,284	18,269	25	24	4 to 6	9.0
46,362	38,635	36,601	23,181	19,317	18,301	24	23	4 to 6	9.0
47,848	39,873	37,775	23,924	19,937	18,887	28	26	4 to 6	8.7
47,985	39,987	37,883	23,992	19,994	18,941	27	25	4 to 6	8.7
48,294	40,245	38,127	24,147	20,122	19,063	25	23	4 to 6	8.7
49,657	41,381	39,203	24,829	20,690	19,602	19	17	4 to 6	8.4
49,762	41,468	39,286	24,881	20,734	19,643	28	25	4 to 6	8.4
49,984	41,653	39,461	24,992	20,827	19,730	27	24	4 to 6	8.4
50,225	41,854	39,652	25,113	20,927	19,826	26	23	4 to 6	8.3
51,835	43,196	40,922	25,918	21,598	20,461	28	24	4 to 6	8.1
52,157	43,464	41,177	26,079	21,732	20,588	27	23	4 to 6	8.0
53,784	44,820	42,461	26,892	22,410	21,230	23	19	4 to 6	7.8
54,089	45,074	42,702	27,044	22,537	21,351	28	23	4 to 6	7.7
56,122	46,769	44,307	28,061	23,384	22,154	24	19	4 to 6	7.5
58,461	48,717	46,153	29,230	24,359	23,077	25	19	4 to 6	7.2
60,111	50,093	47,456	30,056	25,046	23,728	23	17	4 to 6	7.0

IMPORTANT: See "General Planting Rate Information" and "Checking Seed Population" pages for additional information. Always check seed population in the field to ensure planting rates are correct.

SEED METER OPERATION/MAINTENANCE

PLANTING RATES FOR ACID-DELINTED HILL-DROP COTTON, 3 SEEDS PER CELL, 20 CELL DISC
 19 TOOTH CONTACT WHEEL DRIVE /23 TOOTH REVERSER DRIVEN SPROCKETS (See Page 7-1)
 APPROXIMATE HILLS/ACRE FOR VARIOUS ROW WIDTHS

15" Rows	18" Rows	19" Rows	30" Rows	36" Rows	38" Rows	Transmission Sprockets		Recomm. Speed Range (MPH)	Average Hill Spacing In Inches
						Drive	Driven		
30,149	25,124	23,802	15,074	12,562	11,901	15	28	4 to 6	13.9
31,266	26,055	24,683	15,633	13,027	12,342	15	27	4 to 6	13.4
32,468	27,057	25,633	16,234	13,528	12,816	15	26	4 to 6	12.9
33,767	28,139	26,658	16,883	14,070	13,329	15	25	4 to 6	12.4
34,169	28,474	26,975	17,084	14,237	13,488	17	28	4 to 6	12.2
35,174	29,312	27,769	17,587	14,656	13,884	15	24	4 to 6	11.9
35,434	29,529	27,975	17,717	14,764	13,987	17	27	4 to 6	11.8
36,703	30,586	28,976	18,352	15,293	14,488	15	23	4 to 6	11.4
36,797	30,664	29,050	18,399	15,332	14,525	17	26	4 to 6	11.4
38,189	31,824	30,149	19,094	15,912	15,074	19	28	4 to 6	11.0
38,269	31,891	30,212	19,135	15,945	15,106	17	25	4 to 6	10.9
39,603	33,003	31,266	19,802	16,501	15,633	19	27	4 to 6	10.6
39,864	33,220	31,471	19,932	16,610	15,736	17	24	4 to 6	10.5
41,126	34,272	32,468	20,563	17,136	16,234	19	26	4 to 6	10.2
41,597	34,664	32,840	20,798	17,332	16,420	17	23	4 to 6	10.1
42,771	35,643	33,767	21,386	17,821	16,883	19	25	4 to 6	9.8
44,430	37,025	35,076	22,215	18,513	17,538	15	19	4 to 6	9.4
44,554	37,128	35,174	22,277	18,564	17,587	19	24	4 to 6	9.4
46,228	38,524	36,496	23,114	19,262	18,248	23	28	4 to 6	9.0
46,491	38,742	36,703	23,245	19,371	18,352	19	23	4 to 6	9.0
47,941	39,951	37,848	23,970	19,975	18,924	23	27	4 to 6	8.7
48,238	40,199	38,083	24,119	20,099	19,041	24	28	4 to 6	8.7
49,657	41,381	39,203	24,829	20,690	19,602	15	17	4 to 6	8.4
49,784	41,487	39,304	24,892	20,744	19,652	23	26	4 to 6	8.4
50,025	41,687	39,493	25,012	20,844	19,747	24	27	4 to 6	8.4
50,248	41,874	39,670	25,124	20,937	19,835	25	28	4 to 6	8.3
50,354	41,962	39,753	25,177	20,981	19,877	17	19	4 to 6	8.3
51,776	43,147	40,876	25,888	21,573	20,438	23	25	4 to 6	8.1
51,949	43,291	41,012	25,975	21,645	20,506	24	26	4 to 6	8.0
52,109	43,424	41,139	26,055	21,712	20,569	25	27	4 to 6	8.0
52,258	43,549	41,257	26,129	21,774	20,628	26	28	4 to 6	8.0
53,933	44,944	42,579	26,967	22,472	21,289	23	24	4 to 6	7.8
54,027	45,022	42,653	27,013	22,511	21,326	24	25	4 to 6	7.7
54,114	45,095	42,721	27,057	22,547	21,361	25	26	4 to 6	7.7
54,194	45,161	42,785	27,097	22,581	21,392	26	27	4 to 6	7.7
54,268	45,223	42,843	27,134	22,612	21,422	27	28	4 to 6	7.7
56,278	46,898	44,430	28,139	23,449	22,215	23	23	4 to 6	7.4
58,362	48,635	46,076	29,181	24,318	23,038	28	27	4 to 6	7.2
58,443	48,702	46,139	29,221	24,351	23,069	27	26	4 to 6	7.2
58,623	48,853	46,281	29,312	24,426	23,141	25	24	4 to 6	7.1
58,725	48,937	46,362	29,362	24,469	23,181	24	23	4 to 6	7.1
60,607	50,506	47,848	30,304	25,253	23,924	28	26	4 to 6	6.9
60,780	50,650	47,985	30,390	25,325	23,992	27	25	4 to 6	6.9
61,172	50,977	48,294	30,586	25,488	24,147	25	23	4 to 6	6.8
62,899	52,416	49,657	31,450	26,208	24,829	19	17	4 to 6	6.6
63,031	52,526	49,762	31,516	26,263	24,881	28	25	4 to 6	6.6
63,313	52,761	49,984	31,656	26,380	24,992	27	24	4 to 6	6.6
63,619	53,016	50,225	31,809	26,508	25,113	26	23	4 to 6	6.6
65,658	54,715	51,835	32,829	27,357	25,918	28	24	4 to 6	6.4
66,066	55,055	52,157	33,033	27,527	26,079	27	23	4 to 6	6.3
68,126	56,772	53,784	34,063	28,386	26,892	23	19	4 to 6	6.1
68,512	57,094	54,089	34,256	28,547	27,044	28	23	4 to 6	6.1
71,088	59,240	56,122	35,544	29,620	28,061	24	19	4 to 6	5.9
74,050	61,708	58,461	37,025	30,854	29,230	25	19	4 to 6	5.6
76,141	63,451	60,111	38,070	31,725	30,056	23	17	4 to 6	5.5

IMPORTANT: See "General Planting Rate Information" and "Checking Seed Population" pages for additional information. Always check seed population in the field to ensure planting rates are correct.

SEED METER OPERATION/MAINTENANCE

PLANTING RATES FOR ACID-DELINTED COTTON/SMALL DRY EDIBLE BEAN 54 CELL DISC
 15 TOOTH CONTACT WHEEL DRIVE /23 TOOTH REVERSER DRIVEN SPROCKETS (See Page 7-1)

APPROXIMATE SEEDS/ACRE FOR VARIOUS ROW WIDTHS

15" Rows	18" Rows	19" Rows	30" Rows	36" Rows	38" Rows	Transmission Sprockets		Recomm. Speed Range (MPH)	Average Seed Spacing In Inches
						Drive	Driven		
64,265	53,554	50,735	32,132	26,777	25,368	15	28	4 to 6	6.5
66,645	55,538	52,615	33,323	27,769	26,307	15	27	4 to 6	6.3
69,208	57,674	54,638	34,604	28,837	27,319	15	26	4 to 6	6.0
71,977	59,981	56,824	35,988	29,990	28,412	15	25	4 to 6	5.8
72,834	60,695	57,500	36,417	30,347	28,750	17	28	4 to 6	5.7
74,976	62,480	59,191	37,488	31,240	29,596	15	24	4 to 6	5.6
75,531	62,943	59,630	37,766	31,471	29,815	17	27	4 to 6	5.5
78,236	65,196	61,765	39,118	32,598	30,882	15	23	4 to 6	5.3
78,436	65,364	61,923	39,218	32,682	30,962	17	26	4 to 6	5.3
81,402	67,835	64,265	40,701	33,918	32,132	19	28	4 to 6	5.1
81,574	67,978	64,400	40,787	33,989	32,200	17	25	4 to 6	5.1
84,417	70,348	66,645	42,209	35,174	33,323	19	27	4 to 6	5.0
84,973	70,810	67,084	42,486	35,405	33,542	17	24	4 to 6	4.9
87,664	73,053	69,208	43,832	36,527	34,604	19	26	4 to 6	4.8
88,667	73,889	70,000	44,334	36,945	35,000	17	23	4 to 6	4.7
91,171	75,975	71,977	45,585	37,988	35,988	19	25	4 to 6	4.6
94,706	78,922	74,768	47,353	39,461	37,384	15	19	4 to 6	4.4
94,969	79,141	74,976	47,485	39,571	37,488	19	24	4 to 6	4.4
98,540	82,116	77,794	49,270	41,058	38,897	23	28	4 to 6	4.2
99,098	82,582	78,236	49,549	41,291	39,118	19	23	4 to 6	4.2
102,189	85,158	80,676	51,095	42,579	40,338	23	27	4 to 6	4.1
102,824	85,687	81,177	51,412	42,843	40,588	24	28	4 to 6	4.1
105,848	88,207	83,564	52,924	44,103	41,782	15	17	4 to 6	4.0
106,632	88,860	84,183	53,316	44,430	42,092	24	27	4 to 6	3.9
107,334	89,445	84,737	53,667	44,722	42,369	17	19	4 to 6	3.9
110,364	91,970	87,130	55,182	45,985	43,565	23	25	4 to 6	3.8
111,393	92,827	87,942	55,696	46,414	43,971	26	28	4 to 6	3.8
114,963	95,802	90,760	57,481	47,901	45,380	23	24	4 to 6	3.6
115,163	95,969	90,918	57,581	47,985	45,459	24	25	4 to 6	3.6
115,677	96,397	91,324	57,838	48,199	45,662	27	28	4 to 6	3.6
119,961	99,968	94,706	59,981	49,984	47,353	23	23	4 to 6	3.5
124,404	103,670	98,214	62,202	51,835	49,107	28	27	4 to 6	3.4
124,575	103,813	98,349	62,288	51,906	49,174	27	26	4 to 6	3.4
125,177	104,314	98,824	62,588	52,157	49,412	24	23	4 to 6	3.3
129,189	107,658	101,991	64,595	53,829	50,996	28	26	4 to 6	3.2
129,558	107,965	102,283	64,779	53,983	51,141	27	25	4 to 6	3.2
130,393	108,661	102,942	65,196	54,330	51,471	25	23	4 to 6	3.2
134,074	111,729	105,848	67,037	55,864	52,924	19	17	4 to 6	3.1
134,956	112,464	106,545	67,478	56,232	53,272	27	24	4 to 6	3.1
135,608	113,007	107,059	67,804	56,503	53,530	26	23	4 to 6	3.1
139,955	116,629	110,491	69,977	58,314	55,245	28	24	4 to 6	3.0
140,824	117,353	111,177	70,412	58,677	55,588	27	23	4 to 6	3.0
145,216	121,014	114,644	72,608	60,507	57,322	23	19	4 to 6	2.9
146,040	121,700	115,295	73,020	60,850	57,647	28	23	4 to 6	2.9
151,530	126,275	119,629	75,765	63,138	59,814	24	19	4 to 6	2.8
157,844	131,536	124,613	78,922	65,768	62,307	25	19	4 to 6	2.6
162,301	135,250	128,132	81,150	67,625	64,066	23	17	4 to 6	2.6
164,158	136,798	129,598	82,079	68,399	64,799	26	19	4 to 6	2.5
169,357	141,131	133,703	84,679	70,565	66,851	24	17	4 to 6	2.5
170,471	142,059	134,583	85,236	71,030	67,291	27	19	4 to 6	2.5
176,414	147,011	139,274	88,207	73,506	69,637	25	17	4 to 6	2.4
176,785	147,321	139,567	88,393	73,660	69,784	28	19	4 to 6	2.4
183,470	152,892	144,845	91,735	76,446	72,422	26	17	4 to 6	2.3
183,941	153,284	145,216	91,970	76,642	72,608	23	15	4 to 6	2.3
190,527	158,772	150,416	95,263	79,386	75,208	27	17	4 to 6	2.2

IMPORTANT: See "General Planting Rate Information" and "Checking Seed Population" pages for additional information. Always check seed population in the field to ensure planting rates are correct.

SEED METER OPERATION/MAINTENANCE

**PLANTING RATES FOR ACID-DELINTED COTTON/SMALL DRY EDIBLE BEAN 54 CELL DISC
19 TOOTH CONTACT WHEEL DRIVE /23 TOOTH REVERSER DRIVEN SPROCKETS (See Page 7-1)
APPROXIMATE SEEDS/ACRE FOR VARIOUS ROW WIDTHS**

15" Rows	18" Rows	19" Rows	30" Rows	36" Rows	38" Rows	Transmission Sprockets		Recomm. Speed Range (MPH)	Average Seed Spacing In Inches
						Drive	Driven		
81,402	67,835	64,265	40,701	33,918	32,132	15	28	4 to 6	5.1
84,417	70,348	66,645	42,209	35,174	33,323	15	27	4 to 6	5.0
87,664	73,053	69,208	43,832	36,527	34,604	15	26	4 to 6	4.8
91,171	75,975	71,977	45,585	37,988	35,988	15	25	4 to 6	4.6
92,256	76,880	72,834	46,128	38,440	36,417	17	28	4 to 6	4.5
94,969	79,141	74,976	47,485	39,571	37,488	15	24	4 to 6	4.4
95,673	79,727	75,531	47,836	39,864	37,766	17	27	4 to 6	4.4
99,098	82,582	78,236	49,549	41,291	39,118	15	23	4 to 6	4.2
99,353	82,794	78,436	49,676	41,397	39,218	17	26	4 to 6	4.2
103,110	85,925	81,402	51,555	42,962	40,701	19	28	4 to 6	4.1
103,327	86,106	81,574	51,663	43,053	40,787	17	25	4 to 6	4.0
106,928	89,107	84,417	53,464	44,554	42,209	19	27	4 to 6	3.9
107,632	89,693	84,973	53,816	44,847	42,486	17	24	4 to 6	3.9
111,041	92,534	87,664	55,521	46,267	43,832	19	26	4 to 6	3.8
112,312	93,593	88,667	56,156	46,796	44,334	17	23	4 to 6	3.7
115,483	96,236	91,171	57,741	48,118	45,585	19	25	4 to 6	3.6
119,961	99,968	94,706	59,981	49,984	47,353	15	19	4 to 6	3.5
120,294	100,245	94,969	60,147	50,123	47,485	19	24	4 to 6	3.5
124,817	104,014	98,540	62,408	52,007	49,270	23	28	4 to 6	3.4
125,525	104,604	99,098	62,762	52,302	49,549	19	23	4 to 6	3.3
129,440	107,866	102,189	64,720	53,933	51,095	23	27	4 to 6	3.2
130,244	108,536	102,824	65,122	54,268	51,412	24	28	4 to 6	3.2
134,074	111,729	105,848	67,037	55,864	52,924	15	17	4 to 6	3.1
135,067	112,556	106,632	67,534	56,278	53,316	24	27	4 to 6	3.1
135,956	113,297	107,334	67,978	56,648	53,667	17	19	4 to 6	3.1
139,795	116,496	110,364	69,897	58,248	55,182	23	25	4 to 6	3.0
141,097	117,581	111,393	70,549	58,791	55,696	26	28	4 to 6	3.0
145,620	121,350	114,963	72,810	60,675	57,481	23	24	4 to 6	2.9
145,873	121,561	115,163	72,936	60,780	57,581	24	25	4 to 6	2.9
146,524	122,103	115,677	73,262	61,052	57,838	27	28	4 to 6	2.9
151,951	126,626	119,961	75,975	63,313	59,981	23	23	4 to 6	2.8
157,579	131,316	124,404	78,789	65,658	62,202	28	27	4 to 6	2.7
157,795	131,496	124,575	78,898	65,748	62,288	27	26	4 to 6	2.7
158,557	132,131	125,177	79,279	66,066	62,588	24	23	4 to 6	2.6
163,639	136,366	129,189	81,820	68,183	64,595	28	26	4 to 6	2.6
164,107	136,756	129,558	82,053	68,378	64,779	27	25	4 to 6	2.5
165,164	137,637	130,393	82,582	68,818	65,196	25	23	4 to 6	2.5
169,828	141,523	134,074	84,914	70,761	67,037	19	17	4 to 6	2.5
170,945	142,454	134,956	85,472	71,227	67,478	27	24	4 to 6	2.4
171,771	143,142	135,608	85,885	71,571	67,804	26	23	4 to 6	2.4
177,276	147,730	139,955	88,638	73,865	69,977	28	24	4 to 6	2.4
178,377	148,648	140,824	89,189	74,324	70,412	27	23	4 to 6	2.3
183,941	153,284	145,216	91,970	76,642	72,608	23	19	4 to 6	2.3
184,984	154,153	146,040	92,492	77,077	73,020	28	23	4 to 6	2.3
191,938	159,948	151,530	95,969	79,974	75,765	24	19	4 to 6	2.2
199,935	166,613	157,844	99,968	83,306	78,922	25	19	4 to 6	2.1
205,581	171,317	162,301	102,790	85,659	81,150	23	17	4 to 6	2.0
207,933	173,277	164,158	103,966	86,639	82,079	26	19	4 to 6	2.0
214,519	178,766	169,357	107,259	89,383	84,679	24	17	4 to 6	1.9
215,930	179,942	170,471	107,965	89,971	85,236	27	19	4 to 6	1.9
223,457	186,214	176,414	111,729	93,107	88,207	25	17	4 to 6	1.9
223,928	186,606	176,785	111,964	93,303	88,393	28	19	4 to 6	1.9
232,396	193,663	183,470	116,198	96,831	91,735	26	17	4 to 6	1.8
232,991	194,160	183,941	116,496	97,080	91,970	23	15	4 to 6	1.8
241,334	201,112	190,527	120,667	100,556	95,263	27	17	4 to 6	1.7

IMPORTANT: See "General Planting Rate Information" and "Checking Seed Population" pages for additional information. Always check seed population in the field to ensure planting rates are correct.

SEED METER OPERATION/MAINTENANCE

**PLANTING RATES FOR LARGE DRY EDIBLE BEAN 54 CELL DISC
15 TOOTH CONTACT WHEEL DRIVE /23 TOOTH REVERSER DRIVEN SPROCKETS (See Page 7-1)
APPROXIMATE SEEDS/ACRE FOR VARIOUS ROW WIDTHS**

15" Rows	18" Rows	19" Rows	30" Rows	36" Rows	38" Rows	Transmission Sprockets		Recomm. Speed Range (MPH)	Average Seed Spacing In Inches
						Drive	Driven		
64,265	53,554	50,735	32,132	26,777	25,368	15	28	4 to 6	6.5
66,645	55,538	52,615	33,323	27,769	26,307	15	27	4 to 6	6.3
69,208	57,674	54,638	34,604	28,837	27,319	15	26	4 to 6	6.0
71,977	59,981	56,824	35,988	29,990	28,412	15	25	4 to 6	5.8
72,834	60,695	57,500	36,417	30,347	28,750	17	28	4 to 6	5.7
74,976	62,480	59,191	37,488	31,240	29,596	15	24	4 to 6	5.6
75,531	62,943	59,630	37,766	31,471	29,815	17	27	4 to 6	5.5
78,236	65,196	61,765	39,118	32,598	30,882	15	23	4 to 6	5.3
78,436	65,364	61,923	39,218	32,682	30,962	17	26	4 to 6	5.3
81,402	67,835	64,265	40,701	33,918	32,132	19	28	4 to 6	5.1
81,574	67,978	64,400	40,787	33,989	32,200	17	25	4 to 6	5.1
84,417	70,348	66,645	42,209	35,174	33,323	19	27	4 to 6	5.0
84,973	70,810	67,084	42,486	35,405	33,542	17	24	4 to 6	4.9
87,664	73,053	69,208	43,832	36,527	34,604	19	26	4 to 6	4.8
88,667	73,889	70,000	44,334	36,945	35,000	17	23	4 to 6	4.7
91,171	75,975	71,977	45,585	37,988	35,988	19	25	4 to 6	4.6
94,706	78,922	74,768	47,353	39,461	37,384	15	19	4 to 6	4.4
94,969	79,141	74,976	47,485	39,571	37,488	19	24	4 to 6	4.4
98,540	82,116	77,794	49,270	41,058	38,897	23	28	4 to 6	4.2
99,098	82,582	78,236	49,549	41,291	39,118	19	23	4 to 6	4.2
102,189	85,158	80,676	51,095	42,579	40,338	23	27	4 to 6	4.1
102,824	85,687	81,177	51,412	42,843	40,588	24	28	4 to 6	4.1
105,848	88,207	83,564	52,924	44,103	41,782	15	17	4 to 6	4.0
106,632	88,860	84,183	53,316	44,430	42,092	24	27	4 to 6	3.9
107,334	89,445	84,737	53,667	44,722	42,369	17	19	4 to 6	3.9
110,364	91,970	87,130	55,182	45,985	43,565	23	25	4 to 6	3.8
111,393	92,827	87,942	55,696	46,414	43,971	26	28	4 to 6	3.8
114,963	95,802	90,760	57,481	47,901	45,380	23	24	4 to 6	3.6
115,163	95,969	90,918	57,581	47,985	45,459	24	25	4 to 6	3.6
115,677	96,397	91,324	57,838	48,199	45,662	27	28	4 to 6	3.6
119,961	99,968	94,706	59,981	49,984	47,353	23	23	4 to 6	3.5
124,404	103,670	98,214	62,202	51,835	49,107	28	27	4 to 6	3.4
124,575	103,813	98,349	62,288	51,906	49,174	27	26	4 to 6	3.4
125,177	104,314	98,824	62,588	52,157	49,412	24	23	4 to 6	3.3
129,189	107,658	101,991	64,595	53,829	50,996	28	26	4 to 6	3.2
129,558	107,965	102,283	64,779	53,983	51,141	27	25	4 to 6	3.2
130,393	108,661	102,942	65,196	54,330	51,471	25	23	4 to 6	3.2
134,074	111,729	105,848	67,037	55,864	52,924	19	17	4 to 6	3.1
134,956	112,464	106,545	67,478	56,232	53,272	27	24	4 to 6	3.1
135,608	113,007	107,059	67,804	56,503	53,530	26	23	4 to 6	3.1
139,955	116,629	110,491	69,977	58,314	55,245	28	24	4 to 6	3.0
140,824	117,353	111,177	70,412	58,677	55,588	27	23	4 to 6	3.0
145,216	121,014	114,644	72,608	60,507	57,322	23	19	4 to 6	2.9
146,040	121,700	115,295	73,020	60,850	57,647	28	23	4 to 6	2.9
151,530	126,275	119,629	75,765	63,138	59,814	24	19	4 to 6	2.8
157,844	131,536	124,613	78,922	65,768	62,307	25	19	4 to 6	2.6
162,301	135,250	128,132	81,150	67,625	64,066	23	17	4 to 6	2.6
164,158	136,798	129,598	82,079	68,399	64,799	26	19	4 to 6	2.5
169,357	141,131	133,703	84,679	70,565	66,851	24	17	4 to 6	2.5
170,471	142,059	134,583	85,236	71,030	67,291	27	19	4 to 6	2.5
176,414	147,011	139,274	88,207	73,506	69,637	25	17	4 to 6	2.4
176,785	147,321	139,567	88,393	73,660	69,784	28	19	4 to 6	2.4
183,470	152,892	144,845	91,735	76,446	72,422	26	17	4 to 6	2.3
183,941	153,284	145,216	91,970	76,642	72,608	23	15	4 to 6	2.3
190,527	158,772	150,416	95,263	79,386	75,208	27	17	4 to 6	2.2

IMPORTANT: See "General Planting Rate Information" and "Checking Seed Population" pages for additional information. Always check seed population in the field to ensure planting rates are correct.

SEED METER OPERATION/MAINTENANCE

**PLANTING RATES FOR LARGE DRY EDIBLE BEAN 54 CELL DISC
19 TOOTH CONTACT WHEEL DRIVE /23 TOOTH REVERSER DRIVEN SPROCKETS (See Page 7-1)
APPROXIMATE SEEDS/ACRE FOR VARIOUS ROW WIDTHS**

15" Rows	18" Rows	19" Rows	30" Rows	36" Rows	38" Rows	Transmission Sprockets		Recomm. Speed Range (MPH)	Average Seed Spacing In Inches
						Drive	Driven		
81,402	67,835	64,265	40,701	33,918	32,132	15	28	4 to 6	5.1
84,417	70,348	66,645	42,209	35,174	33,323	15	27	4 to 6	5.0
87,664	73,053	69,208	43,832	36,527	34,604	15	26	4 to 6	4.8
91,171	75,975	71,977	45,585	37,988	35,988	15	25	4 to 6	4.6
92,256	76,880	72,834	46,128	38,440	36,417	17	28	4 to 6	4.5
94,969	79,141	74,976	47,485	39,571	37,488	15	24	4 to 6	4.4
95,673	79,727	75,531	47,836	39,864	37,766	17	27	4 to 6	4.4
99,098	82,582	78,236	49,549	41,291	39,118	15	23	4 to 6	4.2
99,353	82,794	78,436	49,676	41,397	39,218	17	26	4 to 6	4.2
103,110	85,925	81,402	51,555	42,962	40,701	19	28	4 to 6	4.1
103,327	86,106	81,574	51,663	43,053	40,787	17	25	4 to 6	4.0
106,928	89,107	84,417	53,464	44,554	42,209	19	27	4 to 6	3.9
107,632	89,693	84,973	53,816	44,847	42,486	17	24	4 to 6	3.9
111,041	92,534	87,664	55,521	46,267	43,832	19	26	4 to 6	3.8
112,312	93,593	88,667	56,156	46,796	44,334	17	23	4 to 6	3.7
115,483	96,236	91,171	57,741	48,118	45,585	19	25	4 to 6	3.6
119,961	99,968	94,706	59,981	49,984	47,353	15	19	4 to 6	3.5
120,294	100,245	94,969	60,147	50,123	47,485	19	24	4 to 6	3.5
124,817	104,014	98,540	62,408	52,007	49,270	23	28	4 to 6	3.4
125,525	104,604	99,098	62,762	52,302	49,549	19	23	4 to 6	3.3
129,440	107,866	102,189	64,720	53,933	51,095	23	27	4 to 6	3.2
130,244	108,536	102,824	65,122	54,268	51,412	24	28	4 to 6	3.2
134,074	111,729	105,848	67,037	55,864	52,924	15	17	4 to 6	3.1
135,067	112,556	106,632	67,534	56,278	53,316	24	27	4 to 6	3.1
135,956	113,297	107,334	67,978	56,648	53,667	17	19	4 to 6	3.1
139,795	116,496	110,364	69,897	58,248	55,182	23	25	4 to 6	3.0
141,097	117,581	111,393	70,549	58,791	55,696	26	28	4 to 6	3.0
145,620	121,350	114,963	72,810	60,675	57,481	23	24	4 to 6	2.9
145,873	121,561	115,163	72,936	60,780	57,581	24	25	4 to 6	2.9
146,524	122,103	115,677	73,262	61,052	57,838	27	28	4 to 6	2.9
151,951	126,626	119,961	75,975	63,313	59,981	23	23	4 to 6	2.8
157,579	131,316	124,404	78,789	65,658	62,202	28	27	4 to 6	2.7
157,795	131,496	124,575	78,898	65,748	62,288	27	26	4 to 6	2.7
158,557	132,131	125,177	79,279	66,066	62,588	24	23	4 to 6	2.6
163,639	136,366	129,189	81,820	68,183	64,595	28	26	4 to 6	2.6
164,107	136,756	129,558	82,053	68,378	64,779	27	25	4 to 6	2.5
165,164	137,637	130,393	82,582	68,818	65,196	25	23	4 to 6	2.5
169,828	141,523	134,074	84,914	70,761	67,037	19	17	4 to 6	2.5
170,945	142,454	134,956	85,472	71,227	67,478	27	24	4 to 6	2.4
171,771	143,142	135,608	85,885	71,571	67,804	26	23	4 to 6	2.4
177,276	147,730	139,955	88,638	73,865	69,977	28	24	4 to 6	2.4
178,377	148,648	140,824	89,189	74,324	70,412	27	23	4 to 6	2.3
183,941	153,284	145,216	91,970	76,642	72,608	23	19	4 to 6	2.3
184,984	154,153	146,040	92,492	77,077	73,020	28	23	4 to 6	2.3
191,938	159,948	151,530	95,969	79,974	75,765	24	19	4 to 6	2.2
199,935	166,613	157,844	99,968	83,306	78,922	25	19	4 to 6	2.1
205,581	171,317	162,301	102,790	85,659	81,150	23	17	4 to 6	2.0
207,933	173,277	164,158	103,966	86,639	82,079	26	19	4 to 6	2.0
214,519	178,766	169,357	107,259	89,383	84,679	24	17	4 to 6	1.9
215,930	179,942	170,471	107,965	89,971	85,236	27	19	4 to 6	1.9
223,457	186,214	176,414	111,729	93,107	88,207	25	17	4 to 6	1.9
223,928	186,606	176,785	111,964	93,303	88,393	28	19	4 to 6	1.9
232,396	193,663	183,470	116,198	96,831	91,735	26	17	4 to 6	1.8
232,991	194,160	183,941	116,496	97,080	91,970	23	15	4 to 6	1.8
241,334	201,112	190,527	120,667	100,556	95,263	27	17	4 to 6	1.7

IMPORTANT: See "General Planting Rate Information" and "Checking Seed Population" pages for additional information. Always check seed population in the field to ensure planting rates are correct.

SEED METER OPERATION/MAINTENANCE

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

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

SEED METER OPERATION/MAINTENANCE

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.

SEED METER OPERATION/MAINTENANCE

**See “Liquid or Dry Fertilizer Rate Charts”
in Machine Operation section.**

SEED METER OPERATION/MAINTENANCE

SEED METER SINGULATOR BRUSH AND VACUUM LEVEL ADJUSTMENTS

SEED DISC SELECTION

CROP	CELLS	SEED SIZE RANGE	COLOR-CODE
Corn	39	35 To 70 Lbs./80,000 Kernel Count Unit	Light Blue
Low-Rate Corn	24	35 To 70 Lbs./80,000 Kernel Count Unit	Light Green
Popcorn	39	2210 To 4200 Seeds/Lb.	Light Blue
Low-Rate Popcorn	24	2210 To 4200 Seeds/Lb.	Light Green
Soybean	60	2200 To 4000 Seeds/Lb.	Black
High-Rate Soybean	120	2200 To 4000 Seeds/Lb.	Dark Blue
Milo/Grain Sorghum	60	10,000 To 20,000 Seeds/Lb.	Yellow
Hill-Drop Cotton, Acid-Delinted (3 Seeds Per Cell)	20	3800 To 5200 Seeds/Lb.	Brown
Cotton, Acid-Delinted	54	3800 To 5200 Seeds/Lb.	Dark Green
Dry Edible Bean (Small)	54	1200 To 2500 Seeds/Lb.	Dark Green
Dry Edible Bean (Large)	54	800 To 1200 Seeds/Lb.	Tan

EDGEVAC® INITIAL SETTINGS

CROP	SIZE	SEED DISC	SINGULATOR BRUSH SETTING	VACUUM SETTING (H ₂ O)	SEE NOTES
Corn	35-45 Lbs./80K	Corn/Popcorn	7	20	4, 5
	45-60 Lbs./80K	Corn/Popcorn	6	20	4, 5
	60-70 Lbs./80K	Corn/Popcorn	5	20	4, 5
Popcorn	2210-4200 Seeds/Lb.	Corn/Popcorn	9	18	1, 4, 5
Soybeans	2200-4000 Seeds/Lb.	Soybean	5	10	1
Milo/Grain Sorghum	10,000-20,000 Seeds/Lb.	Milo/Grain Sorghum	7	18	1, 2
Hill-Drop Cotton	3800-5200 Seeds/Lb.	Hill-Drop Cotton	8	23	3
Cotton	3800-5200 Seeds/Lb.	Cotton	8	20	3
Edible Beans	800-1200 Seeds/Lb.	Large Edible Bean	5	18	5
	1200-2500 Seeds/Lb.	Small Edible Bean	6	18	3, 5

NOTES:

- Requires use of seed meter baffle. Refer to page 7-3 for additional information.
- Requires use of cleanout brush. Refer to page 7-3 for additional information.
- Requires use of cleanout brush w/ball-type ejector. Refer to page 7-3 for additional information.
- For flat seeds, higher vacuum level may be required.
- Larger seeds may require a lower numbered singulator brush setting from the initial setting. Smaller seeds may require a higher numbered setting.

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

IMPORTANT: See “General Planting Rate Information” and “Checking Seed Population” pages for additional information. Always check seed population in the field to ensure planting rates are correct.

NOTE: Singulator brush settings are marked from 1 thru 11. The lower the singulator brush setting, the less aggressive. The higher singulator brush settings are the most aggressive. Refer to illustrations on page 7-24.

NOTE: Optimum meter performance will be attained with consistent seed size and shape. A mixture of seed sizes and shapes will affect meter performance.

NOTE: 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 disc fill (population). See “Seed Meter”.

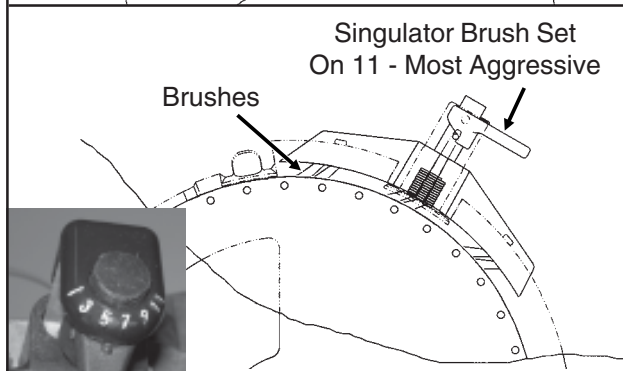
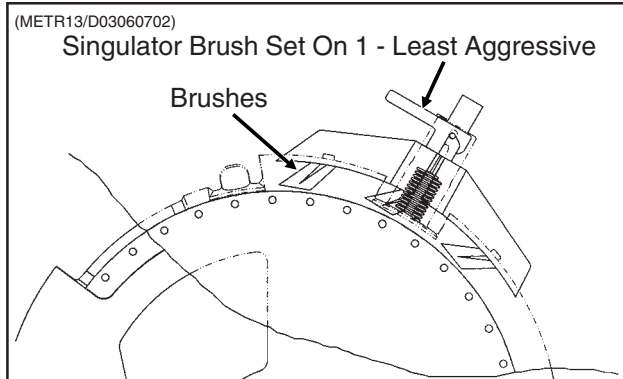
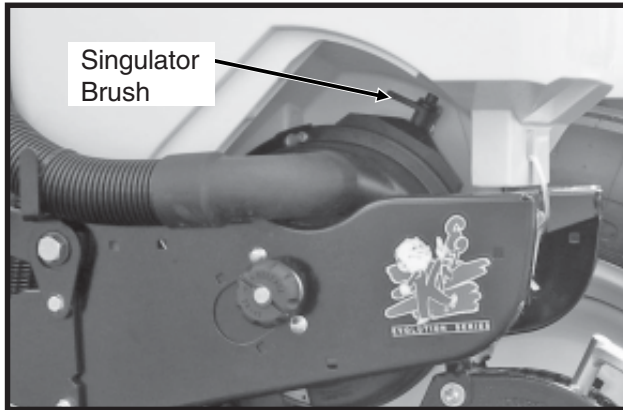
NOTE: Excessive seed treatment, humidity and light-weight seed can affect meter performance. Use 1/2 cup of talc with each hopper fill of seed and mix thoroughly so that all seeds are coated, adjust rates as needed. Use of talc will aid the seed flow into the meter, singulation and seed drop from the disc.

SEED METER OPERATION/MAINTENANCE

STEP 1 Select seed disc (and seed meter baffle, cleanout brush and/or cleanout brush w/ball-type ejector if applicable) to match crop and population.

STEP 2 Adjust the singulator brush to initial setting. Note that seed size, seed shape, seed treatments, travel speed and planting rate will all affect meter performance.

D06260660



STEP 3 With vacuum fan running, lower planter to planting position and drive forward a short distance to load seed into the seed disc cells.

Adjust vacuum level to the initial setting according to the tables on preceding page. Note that seed size, seed shape, seed treatments, travel speed and planting rate will all affect meter performance.

NOTE: Vacuum reading will be much lower when seed disc cells are empty. Prior to setting vacuum level, load all seed cells.

D10240583



See “Digital Vacuum Gauge Operation” in Machine Operation section

NOTE: Operate vacuum fan 3-5 minutes to bring oil up to normal operating temperature prior to making the final vacuum level adjustment.

STEP 4 Perform optional seed disc fill check.

D101906132



D101906130



With vacuum hose connected and vacuum fan operating, remove vacuum cover and seed disc as an assembly. Inspect seed discs for proper seed fill.

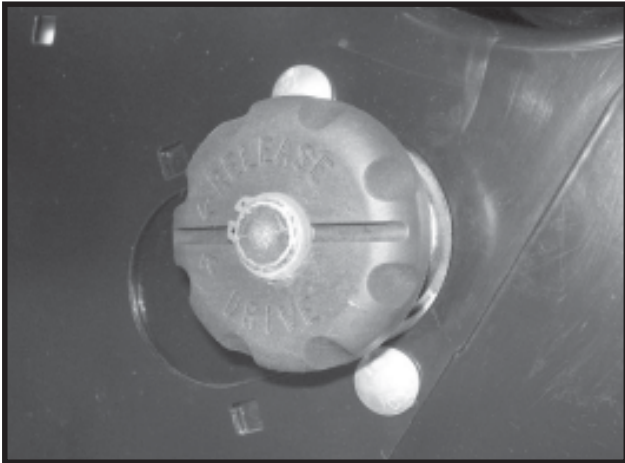
See “Seed Metering System Troubleshooting” at the end of this section.

SEED METER OPERATION/MAINTENANCE

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 meter and mount or hopper. Disconnecting the drive allows the operator to check granular chemical application rates without dropping seed. It also allows the drive to one or more of the rows to be disconnected when finishing fields.

D011006101

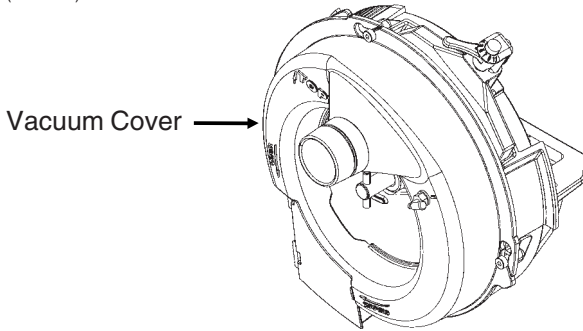


To disengage the drive, turn the knob $\frac{1}{4}$ turn counter-clockwise. To engage the drive, turn the knob $\frac{1}{4}$ turn clockwise.

SEED METER OPERATION/MAINTENANCE

SEED METER MAINTENANCE

(METR71)



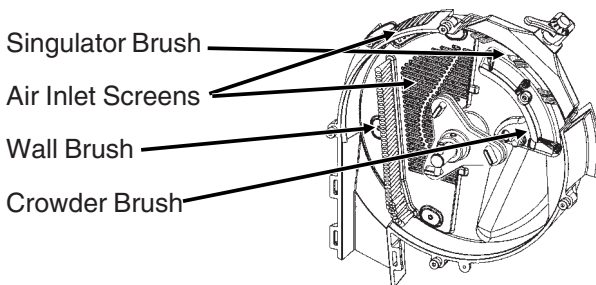
Clean, high quality seed should be used for maximum meter accuracy. Damaged or cracked seed, hulls or foreign material may become lodged in the seed disc orifices and greatly reduce meter accuracy.

It is suggested that the seed disc be inspected and cleaned daily, checking for any buildup of foreign material or any blocked orifices. Clean the seed disc by washing it with soap and water as needed. Dry thoroughly.

Inspect singulator brush for wear and replace if necessary following every 200 acres per row of operation.

The seed disc and/or vacuum cover should be replaced if abnormally high vacuum is required for consistent operation or if consistent operation can not be achieved. If adjustment of the singulator brush does not affect performance of the meter or if the brushes appear frayed, the singulator brush may need to be replaced. If the seed disc orifices are plugged frequently with seed remnants, the cleanout brush or cleanout brush with ball-type ejector (if applicable) may need to be replaced. High quality seed should be used to attain best performance.

(METR70)



Prior to each planting season, inspect seed discs, singulator brush, crowder brush, wall brush and air inlet screens and clean or replace as needed.

See "Preparation For Storage" for additional EdgeVac® Seed Metering System maintenance.

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

NOTE: Remove seed discs from meters for annual storage and store the seed discs vertically on a dowel or pipe.

VACUUM MANIFOLD MAINTENANCE

In the course of normal operation, dust will accumulate in manifolds and hoses. Manifolds should be cleaned annually. More frequent cleaning may be necessitated by abnormally dusty planting conditions.

Remove vacuum hose from each seed meter. Operate the vacuum fan at full hydraulic flow from the tractor for two minutes to clear manifolds, hoses and fittings of dust and debris.

SEED METER OPERATION/MAINTENANCE

SEED METERING SYSTEM TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Low seed count.	Meter RPM too high.	Reduce planting rate or planting speed.
	Singulator brush setting too aggressive.	Adjust singulator brush.
	Vacuum level too low.	Increase fan speed.
	Seed sensor not picking up all seeds dropped.	Clean seed tube. Move meter to different row.
	Seeds sticking to seed disc.	Use graphite or talc to aid release.
	Seed treatment buildup in seed disc recesses.	Reduce amount of treatment used and or mix thoroughly. Add talc.
	Seed size too large for disc used.	Use appropriate disc for seed size.
	Wrong transmission setting.	Change transmission to desired rate.
	Wrong seed disc.	Use appropriate disc for seed type and size.
	Drive wheel slippage.	Compensate by adjusting transmission sprockets.
	Low tire pressure.	Adjust tire pressure to correct level.
	Failed/worn drive components.	Inspect and replace parts as required.
	Plugged orifices in seed disc.	Inspect and clean disc. Check cleanout brush. (If Applicable)
	Loss of vacuum at meter.	Check for foreign material between vacuum cover and disc. Inspect parts for wear/damage. Clean or replace as required.
	Seed bridging in hopper.	Add graphite to improve seed flow.
	Faulty vacuum gauge reading.	Repair/replace gauge.
	Dirt in vacuum manifold.	Check vacuum manifold for dirt and clean.
	Seed baffle (If Applicable) not allowing seed flow due to bridging of seed.	Thoroughly mix talc to coat all seeds. Remove seed baffle. See "Seed Meter" in Seed Meter Operation/Maintenance section.
	60 cell soybean disc not filling properly due to excessive RPM.	Replace with 120 cell soybean disc.
	Seed disc worn.	Replace.
Vacuum cover worn.	Replace.	
Not planting seed.	Seed hoppers empty.	Fill seed hopper.
	Seed tube plugged/damaged.	Clean or replace tube.
	Meter drive damaged.	Repair/replace drive components.
	Low/no vacuum.	Inspect vacuum system and repair as necessary.
	Singulator brush setting too aggressive.	Adjust singulator brush.
	Faulty vacuum gauge.	Repair/replace vacuum gauge.
	Seed bridging in hopper.	Add graphite to improve seed flow.
	Loss of vacuum at meter.	Check for foreign material between vacuum cover and disc. Inspect parts for wear/damage. Clean and/or replace as required.
	Wrong seed disc.	Use appropriate disc for seed type and size.
	Meter drive clutch not engaged.	Engage drive clutch.
	Fan not running.	Start fan.
	Dirt in vacuum manifold.	Check vacuum manifold for dirt and clean.

(Continued On Following Page)

SEED METER OPERATION/MAINTENANCE

SEED METERING SYSTEM TROUBLESHOOTING (Continued)

PROBLEM	POSSIBLE CAUSE	SOLUTION
Not planting seed. (Continued)	Seed baffle (If Applicable) not allowing seed flow due to bridging of seed.	Thoroughly mix talc to coat all seeds. Remove seed baffle. See "Seed Meter" in Seed Meter Operation/Maintenance section.
	60 cell soybean disc not filling properly due to excessive RPM.	Replace with 120 cell soybean disc.
High seed count.	Wrong transmission setting.	Change transmission to desired rate.
	High vacuum.	Adjust vacuum level to appropriate level.
	Wrong seed disc.	Replace seed disc.
	Singulator brush setting not aggressive enough.	Adjust singulator brush.
	Worn singulator brush.	Inspect brush and replace as required.
	Seed leaking past wall brush.	Inspect wall brush condition and installation. Replace as necessary.
	Faulty vacuum gauge.	Check gauge line for dirt/obstruction. Repair/replace vacuum gauge.
Poor seed spacing.	Obstruction in seed tube.	Clean seed tube.
	Dirty/damaged seed disc.	Inspect seed disc for damage, foreign material in orifices or seed treatment buildup in recesses. Clean or replace as required.
	Wrong vacuum setting.	Adjust vacuum to appropriate level.
	Excess foreign material in seed.	Inspect and clean meter and seed discs. Use clean, undamaged seed.
	Incorrect singulator brush setting.	Adjust singulator brush to appropriate setting.
	Inconsistent driveline.	Inspect drive components for rust, misalignment, worn or damaged parts. Replace/repair as required.
	Toolbar not level or wrong height.	Adjust hitch to level toolbar and row units.
	Planting too fast for conditions.	Reduce speed.
	Rough field conditions.	Reduce speed.
Irregular seed population.	Driving too fast.	Reduce speed.
	Drive wheels slipping.	Reduce speed. Decrease row unit down pressure spring settings.
Unable to achieve desired vacuum level.	Tractor hydraulic flow set too low.	Increase flow to fan motor.
	Incorrect hydraulic connections.	Check all hydraulic connections and hose routings.
	Damaged fan components.	Inspect motor and impeller for wear/damage and repair/replace as necessary.
	Vacuum hose pinched/kinked/ blocked.	Inspect air lines for any damage or obstruction. Clean air lines and manifold by removing end cap from manifold and running fan at high speed.
	Vacuum hose loose/disconnected.	Inspect and reattach all air hoses.
	Tractor not producing required hydraulic flow/pressure.	Have tractor serviced by qualified technician.
	Dirt in vacuum gauge line.	Check gauge line for dirt/obstruction and clean.

ROW UNIT OPERATION

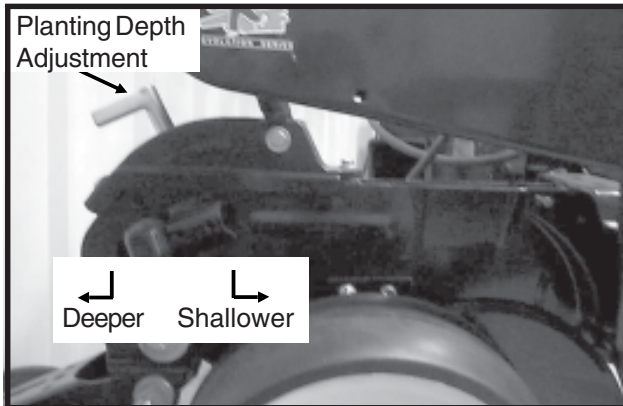
PLANTING DEPTH

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)

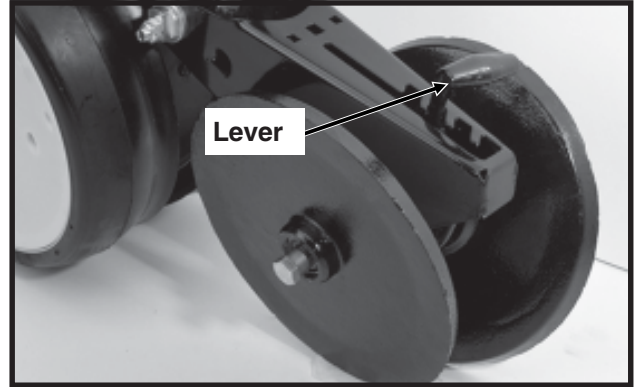


WARNING: Raise planter and install safety lockup devices before making closing wheel adjustments.

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.

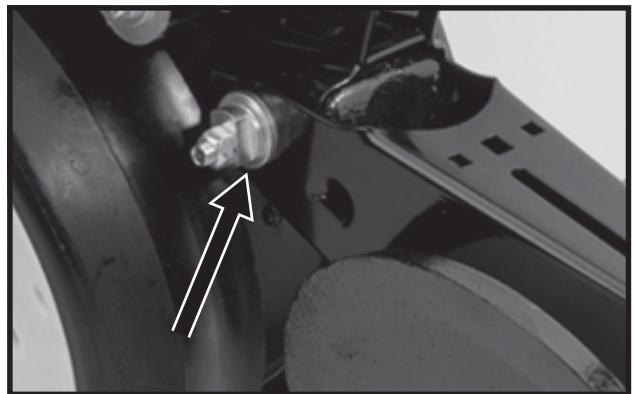
LF212299-15



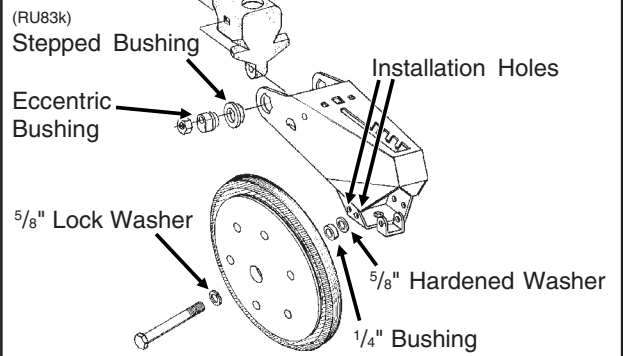
Light soil usually requires less down force at average depth (approximately 2") while heavy soil requires increased down force.

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.

LF2122299-15



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.

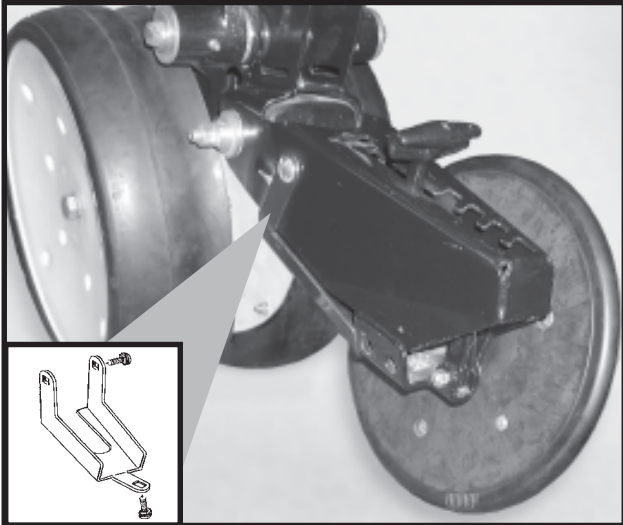


ROW UNIT OPERATION

CLOSING WHEEL SHIELD

(Rubber And Cast Iron “V” Closing Wheels)

D11090208a



Shown With Closing Wheel Removed For Visual Clarity

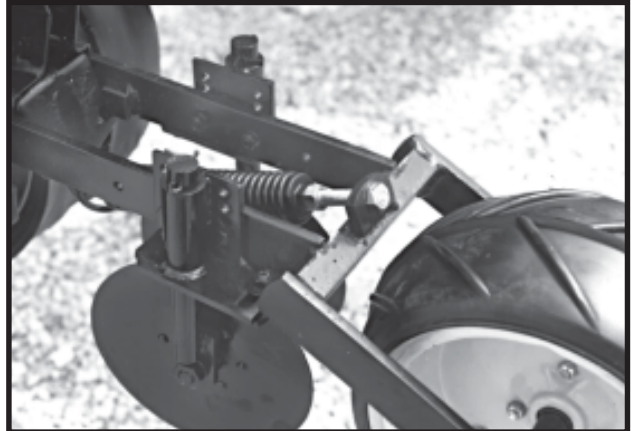
The optional closing wheel shield is designed to be installed onto the underside of the closing wheel arm to help prevent root balls and stalks from plugging the closing wheels.

COVERING DISCS/SINGLE PRESS WHEEL ADJUSTMENT



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

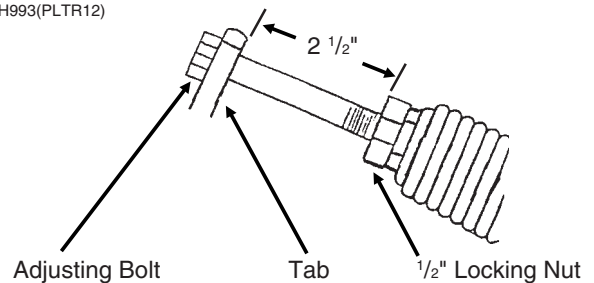
72359-31



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

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

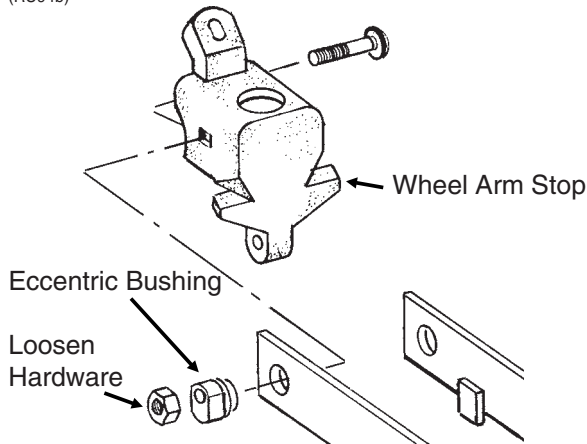
RH993(PLTR12)



ROW UNIT OPERATION

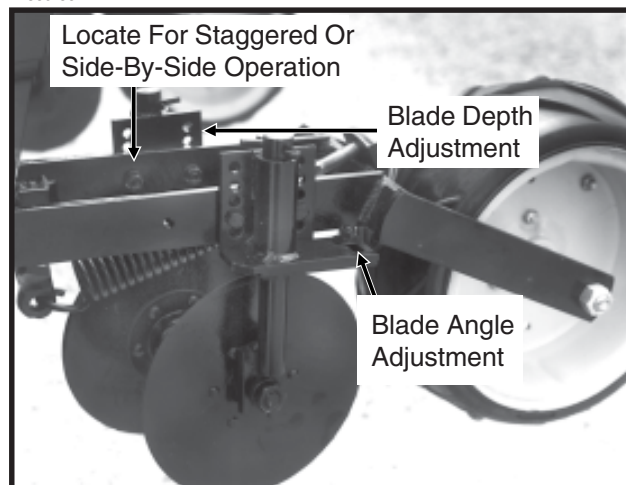
Eccentric bushings in the wheel arm stop allow for lateral adjustment of the covering discs/single press wheel assembly. Using a $\frac{3}{4}$ " wrench, loosen the hardware which attaches the assembly to the wheel arm stop. Using another $\frac{3}{4}$ " wrench, turn the eccentric bushings until the press 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



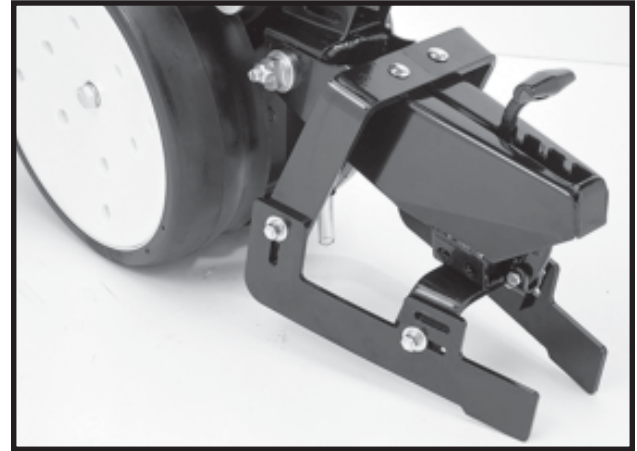
Five sets of holes in each disc bracket allow for $\frac{1}{2}$ " incremental blade depth adjustment.

Slotted holes in the disc mount and bracket allow for $0^\circ - 15^\circ$ blade angle adjustment.

Adjust covering discs on all row units to similar settings.

DRAG CLOSING ATTACHMENT

LF212299-18



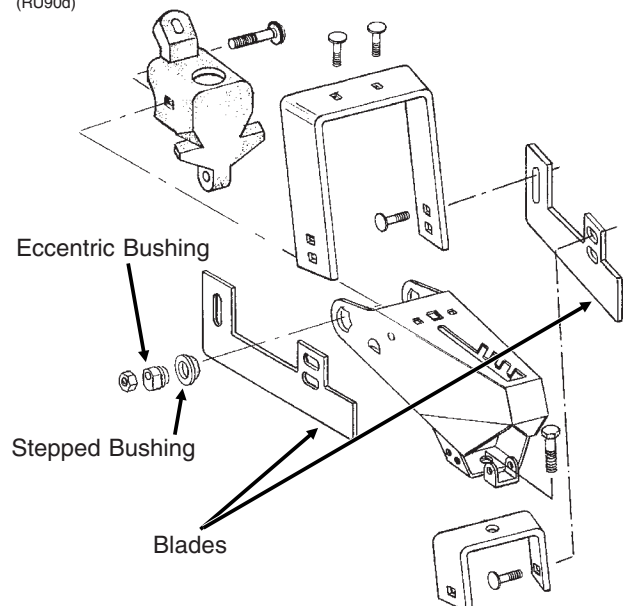
The drag closing attachment is designed to pull loose soil over the seed trench.

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.

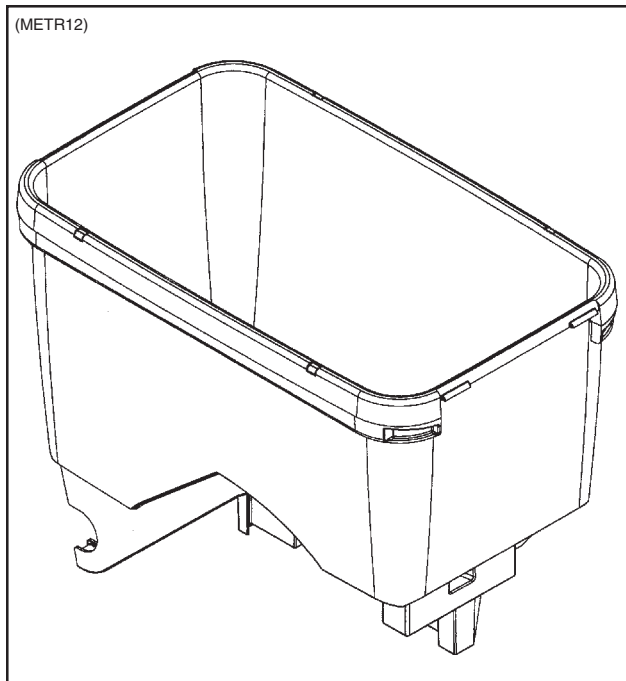
(RU90d)



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

ROW UNIT OPERATION

SEED HOPPER

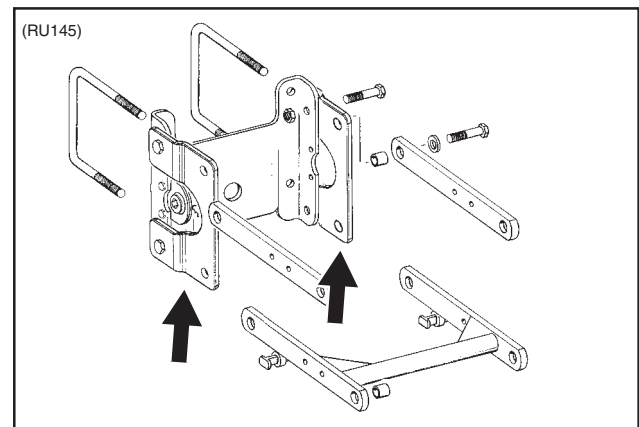


The seed hopper has a capacity of 1.75 bushels.

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 "Seed Meter" in Seed Meter Operation/Maintenance section.

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" in Seed Meter Operation/Maintenance section.

ROW UNIT EXTENSION BRACKETS



Row unit extension brackets are required on all rear row units if the Model 3000 planter is equipped with coulter mounted residue wheels and HD single disc fertilizer openers. The brackets extend the row units rearward 4" to provide required clearance.

ROW UNIT OPERATION

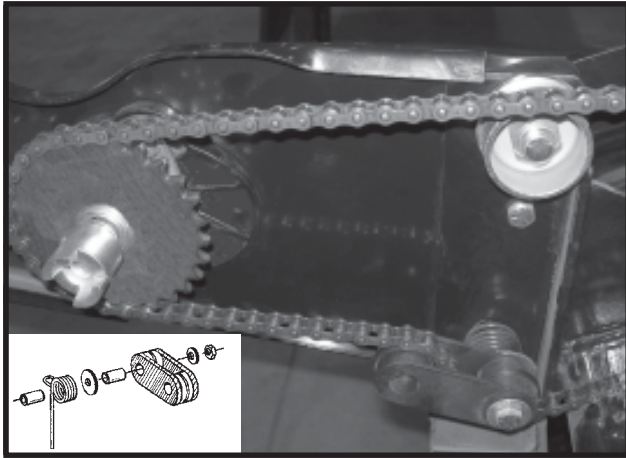
ROW UNIT CHAIN ROUTING

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.

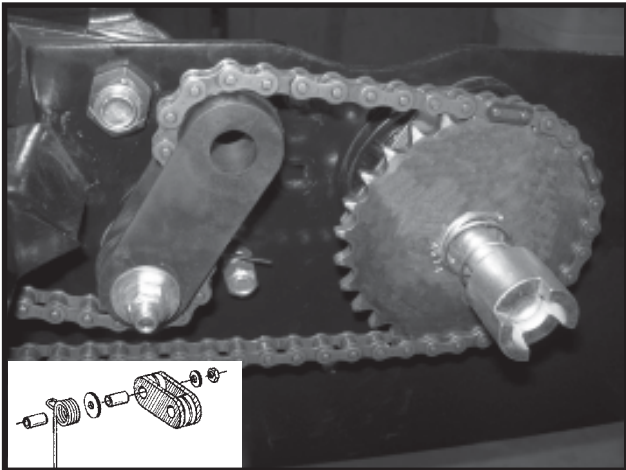
NOTE: When idler shows signs of wear, it can be reversed for prolonged use.

D09280611a(RU80g)



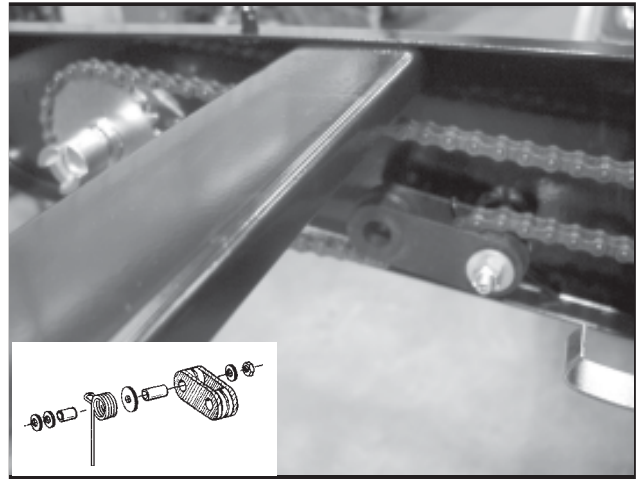
Pull Row Unit Meter Drive

D09280603a(RU80g)



Push Row Unit Meter Drive

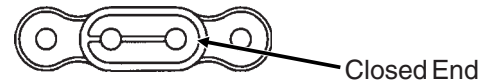
D051705102



Row Unit Granular Chemical Drive

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

(PLTR24)



Direction Of Chain Travel →

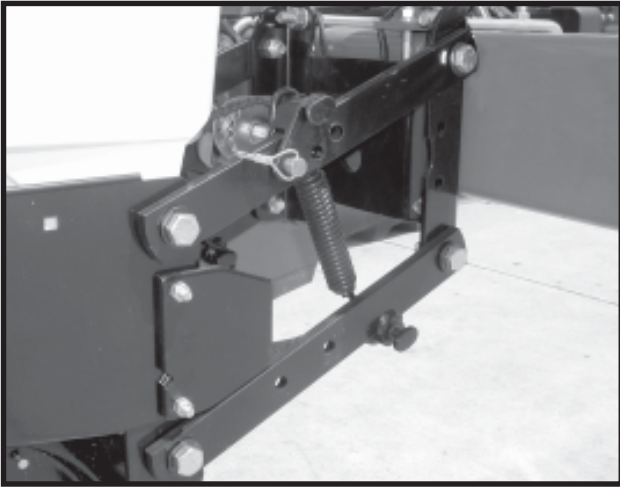
ROW UNIT OPERATION

QUICK ADJUSTABLE DOWN FORCE SPRINGS

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

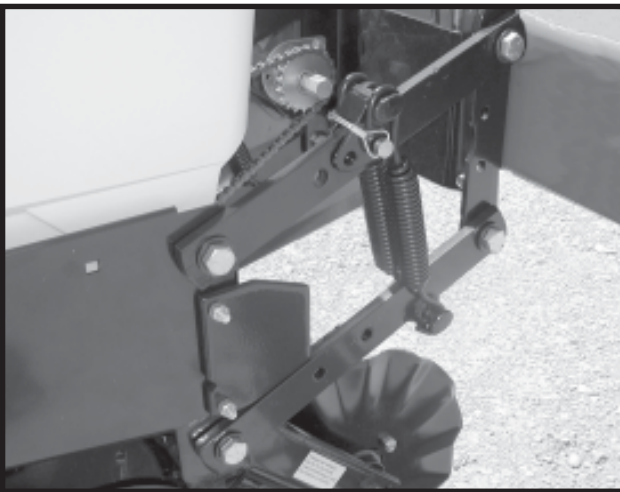
Two springs per row, one on the L.H. parallel arms and one on the R.H. parallel arms, are used unless equipped with row unit mounted no till coulters. Four springs per row are used with row unit mounted no till coulters.

D06300305



Two Springs Per Row (Dual)

D07010301

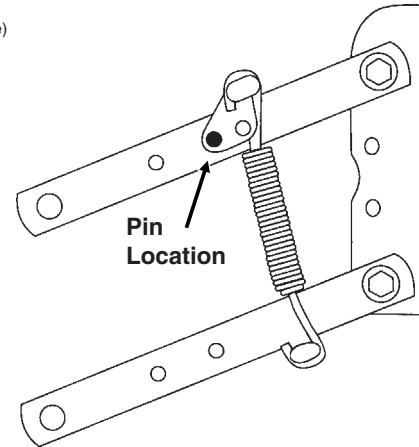


**Four Springs Per Row (Quad)
(Used Only In Conjunction With Row Unit
Mounted No Till Coulters)**

NOTE: Four springs per row are to be used with row unit mounted no till coulters only.

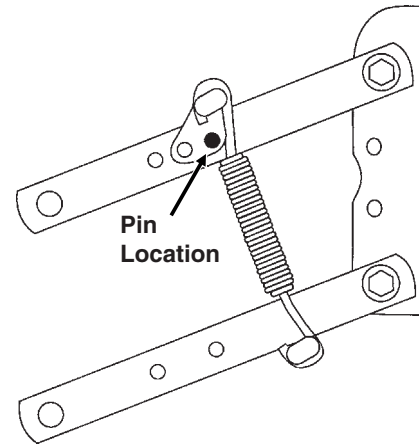
There are four positions for spring tension adjustment. Position 1 allows for minimum down pressure and position 4 for maximum down pressure.

L0096(PLTR27e)



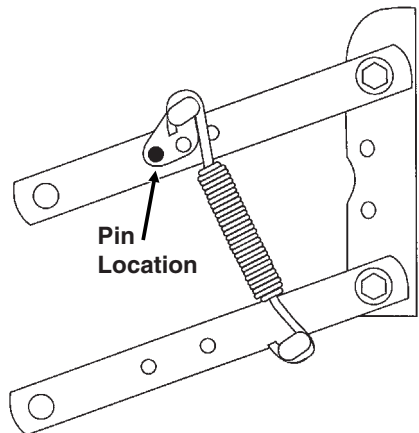
Position 1 (Minimum)

(PLTR28e)



Position 2

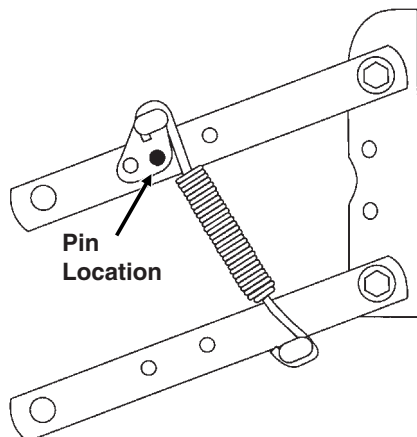
(PLTR29e)



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.



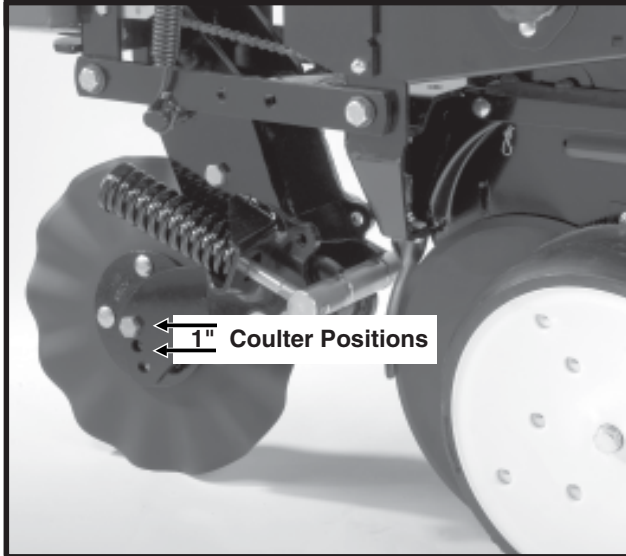
WARNING: Always install safety lockup devices or lower machine to the ground before working under or around the machine.

IMPORTANT: Springs must always be installed with open side of spring hooks toward the seed hoppers to prevent binding on spring mount adjustment pins.

ROW UNIT OPERATION

FRAME MOUNTED COULTER

LF083002101

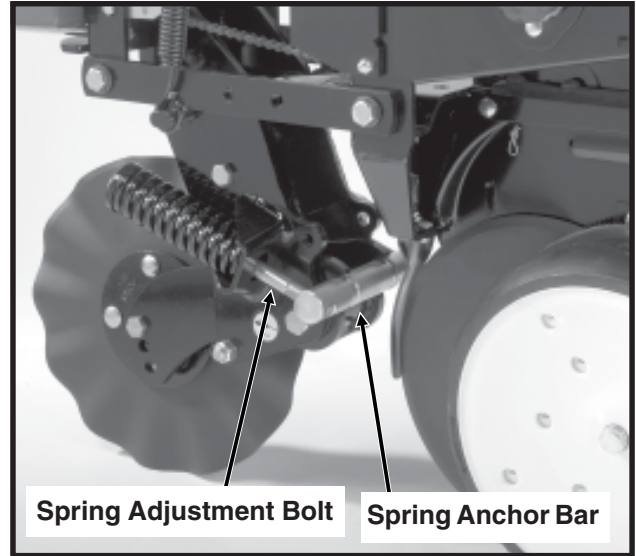


Frame mounted coulters with 1" bubbled, 1" fluted (8 flutes) or 3/4" fluted (13 flutes) blades may be used on pull row units only. (Not compatible with push row units.)

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.

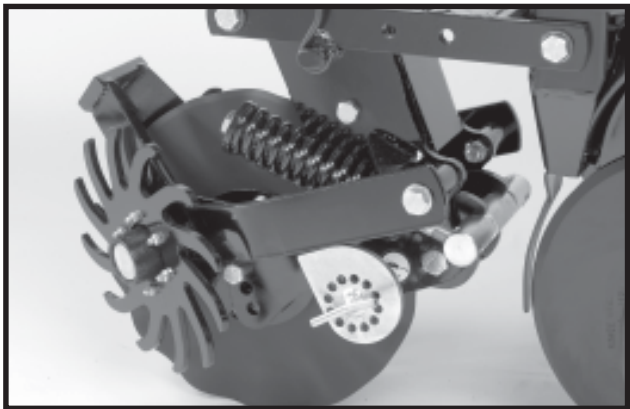
ROW UNIT OPERATION

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.

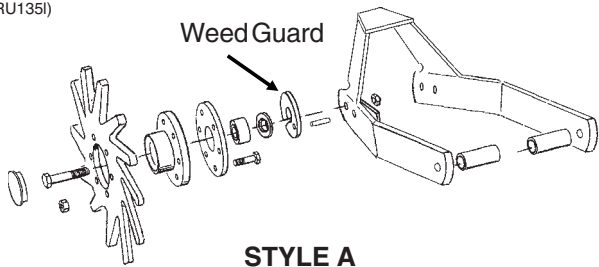
LF083002102



STYLE A Shown

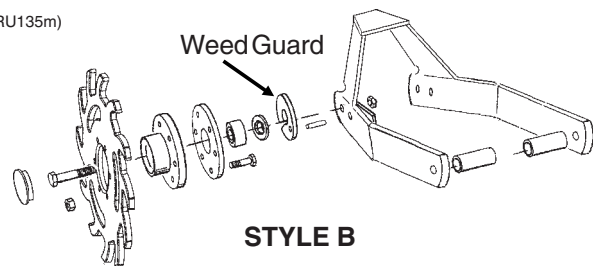
The residue wheels are attached to the frame mounted coulter with two cap screws and sleeves allowing the unit to free-float. A 2-position spindle bolt mounting allows the tined wheels to be mounted interlocked or staggered. Depth adjustment is made using a spring-loaded cam and pin with 11 positions 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

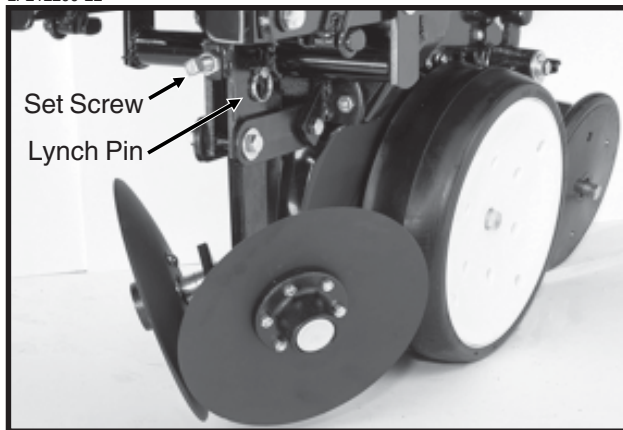
NOTE: Opening in weed guard must point down.

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.

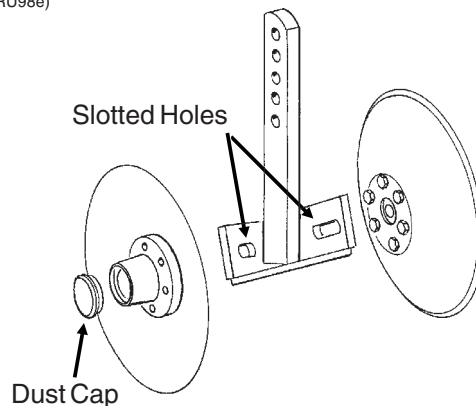
Disc furrowers are used to clear crop residue, dirt clods and dry soil from in front of the row units for a clean and smooth seed bed. Notched blades are used for heavier residue conditions. The notched blades cut crop residue and move it aside to prevent plugging or pushing.

LF212299-22



Vertical adjustment in 1/3" increments is possible by removing the lynch pin which secures the vertical support arm and moving the support arm up or down as required. 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)

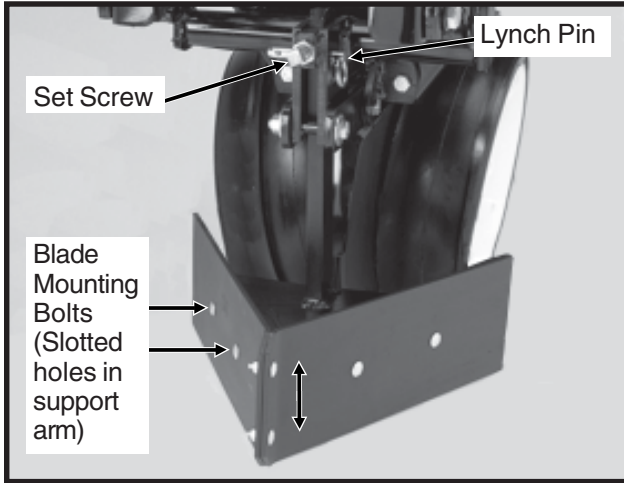


Slotted holes in the support arm where the blades are mounted allow fore and aft adjustment of the disc blades. Blades can be adjusted so the front edges meet or one blade can be moved to the rear and the other to the front of the slot so the cutting edge of one blade overlaps the edge of the other blade.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

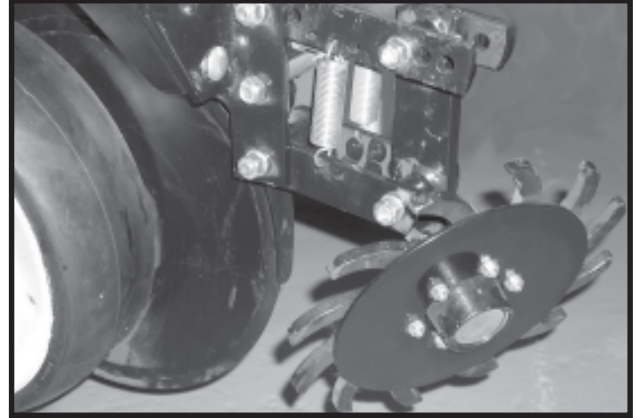
Slotted holes in the support arm where the blades are mounted allow tilting of the blades. The blades can be tilted up or down at the front for desired adjustment.

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

ROW UNIT MOUNTED RESIDUE WHEEL

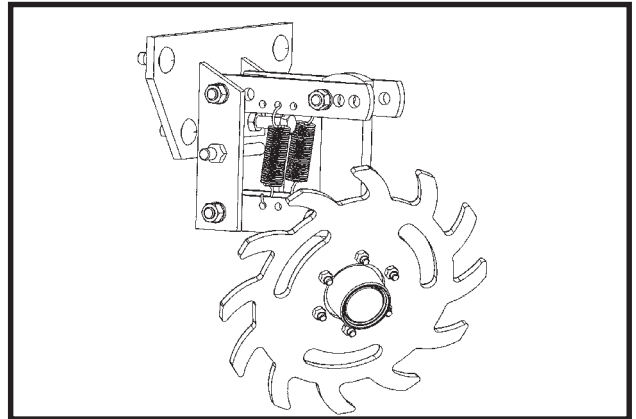
The row unit mounted residue wheel may be used on pull row units and push row units.

D101701113



STYLE A

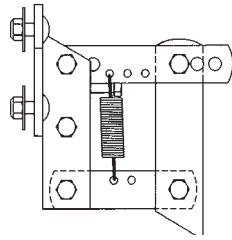
(A12685)



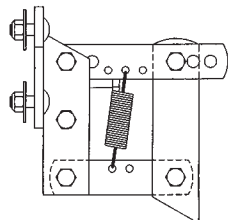
STYLE B

ROW UNIT OPERATION

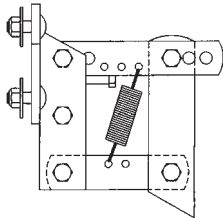
Two adjustable springs on the parallel links on each residue wheel allow for down force adjustment. Position 1 as shown below provides minimum down pressure and position 3 maximum down pressure.



Position 1 (Minimum) (PLTR31a)



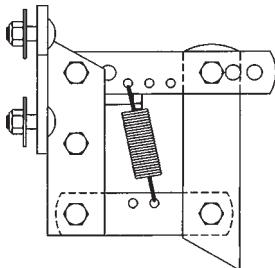
Position 2 (PLTR32a)



Position 3 (Maximum) (PLTR33a)

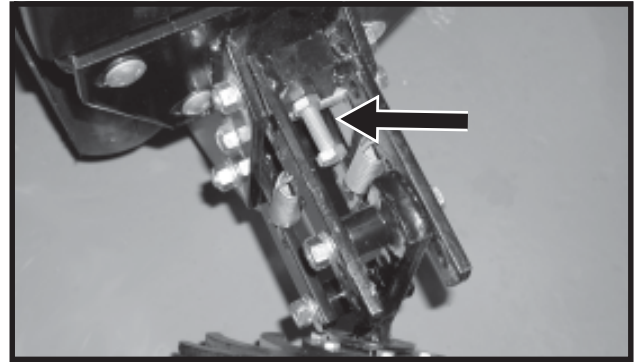
For additional uplift or float, position springs as shown below.

(PLTR34a)



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

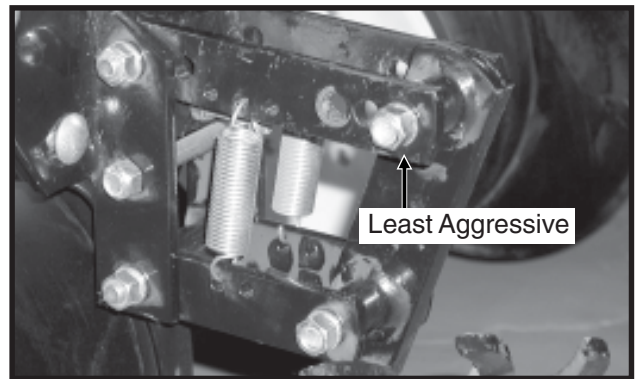
D101701112



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.

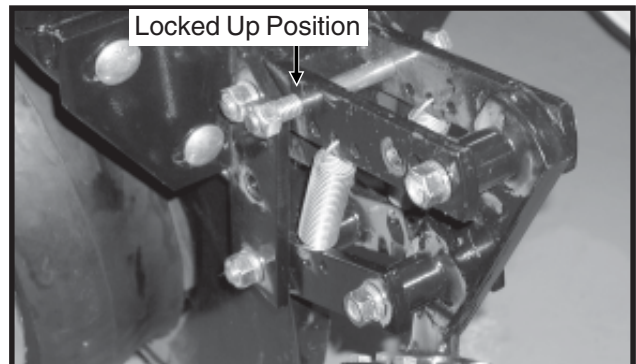
Three holes in the upper link allow for wheel angle adjustment. With the wheel mount in the most vertical position, using the rear hole in the upper link, the residue wheel is most aggressive. Moving the wheel mount to one of the forward holes reduces the aggressiveness of the wheel for use in mulch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

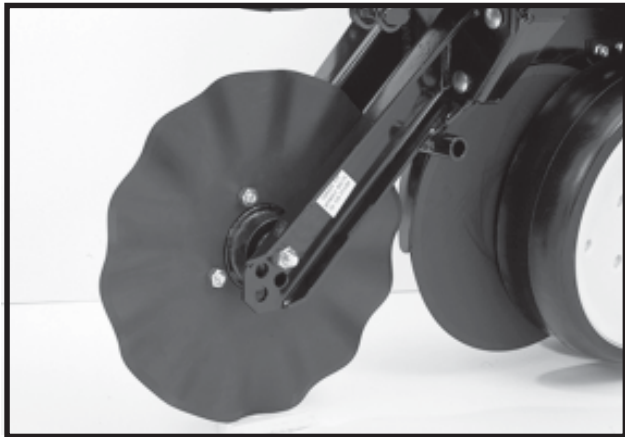
D011701203



ROW UNIT OPERATION

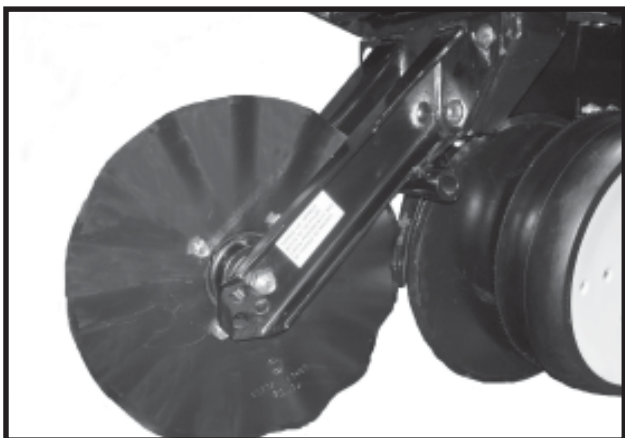
ROW UNIT MOUNTED NO TILL COULTER

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 $\frac{3}{4}$ " fluted (13 flutes) blades may be used on pull row units and push row units. ($\frac{3}{4}$ " fluted shown)

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

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

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

NOTE: Torque $\frac{5}{8}$ " spindle 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 Coultter

D05170708a

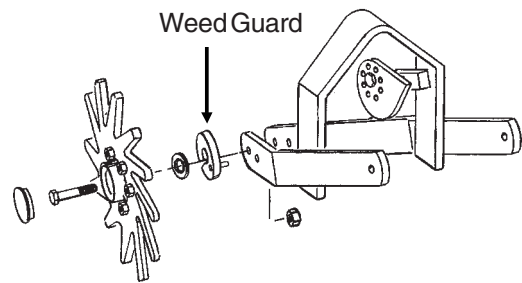


STYLE B - Used With Style B Row Unit Mounted No Till Coultter

Coultter 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 coultter mounted residue wheels.

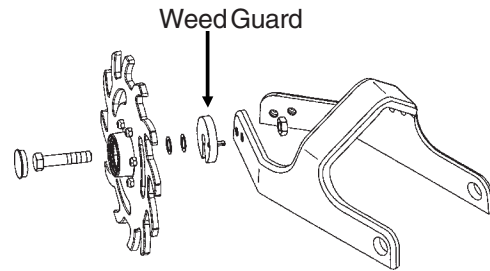
The coultter mounted residue wheels are attached to the row unit mounted no till coultter with one cap screw and sleeve allowing the unit to free-float. A 2-position spindle bolt mounting allows the tined wheels to be mounted interlocked or staggered. A lock nut on the inside of the mount locks the spindle 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.

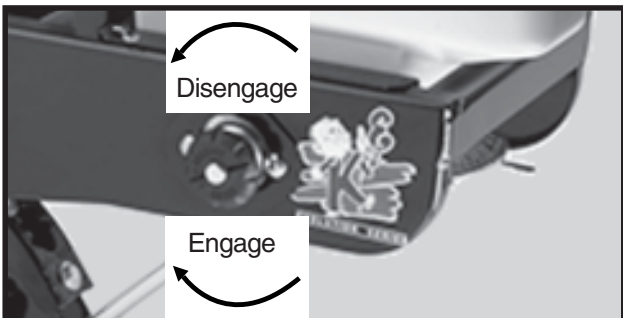
The metering gate located on the bottom of the hopper regulates the application rate. See "Dry Insecticide And Dry Herbicide Application Rate Charts" in this manual. Calibrate using the chemical manufacturers' instructions.



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 1/4 turn clockwise. To disengage the drive, turn the knob 1/4 turn counterclockwise. Slotted holes in the hopper support panel and clutch housing allow for alignment adjustment between the clutch drive coupler and meter shaft.

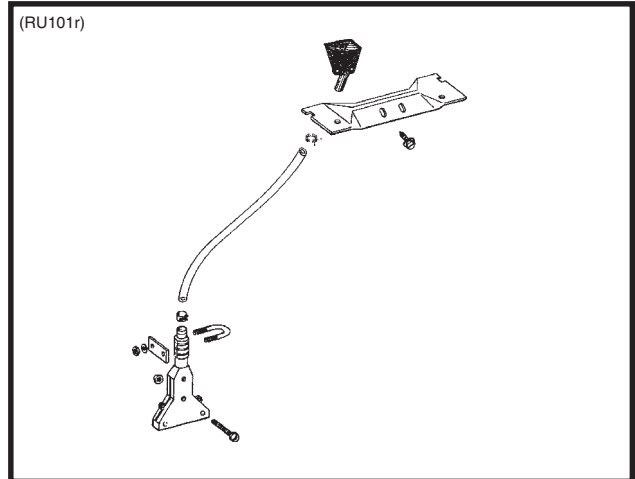
LF212299-4



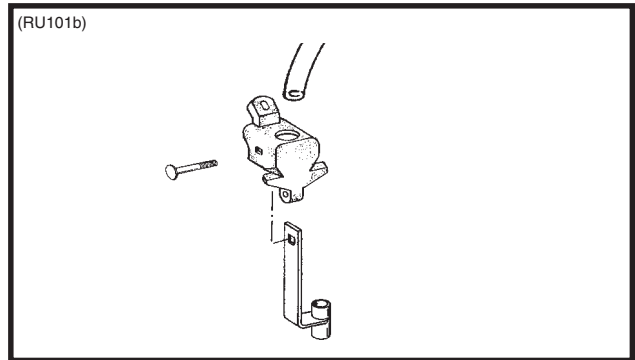
GRANULAR CHEMICAL BANDING OPTIONS

Granular chemical banding options allow 4 1/2" slope-compensating banding, straight drop in-furrow placement or 14" rear banding.

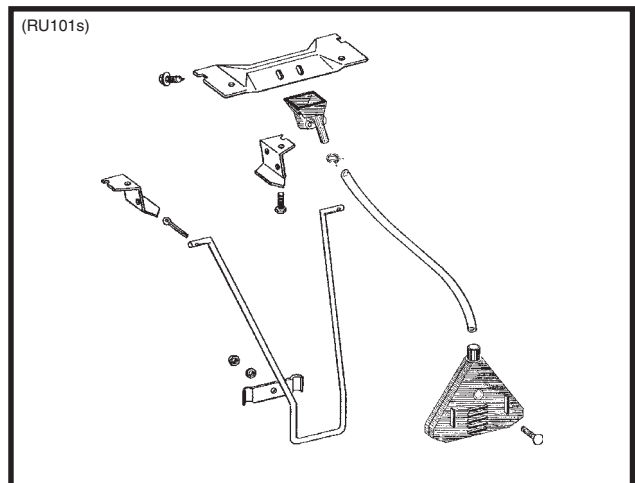
NOTE: The granular chemical rear bander is not compatible with the covering discs/single press wheel option.



4 1/2" Slope-Compensating Bander



Straight Drop In-Furrow Placement

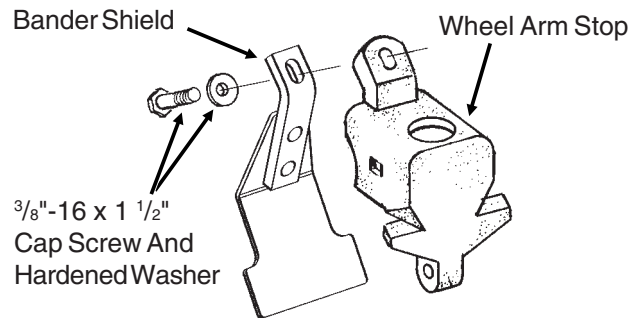


ROW UNIT OPERATION

GRANULAR CHEMICAL BANDER SHIELD

The optional granular chemical bander 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)

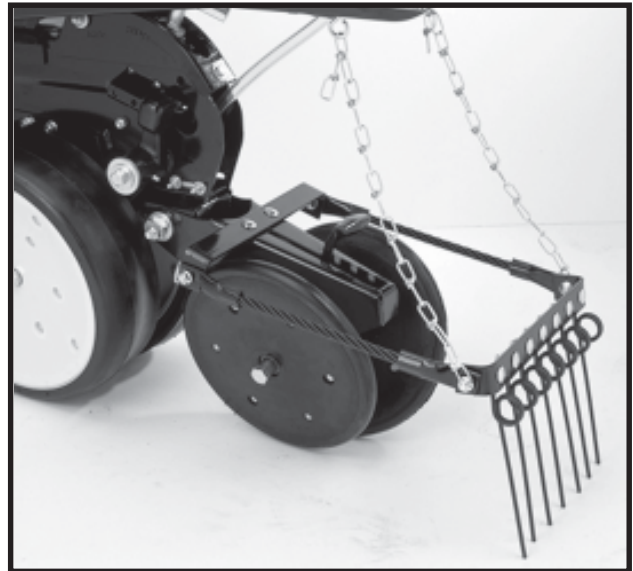


SPRING TOOTH INCORPORATOR

The spring tooth incorporator smoothes 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 $\frac{1}{8}$ " 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



ROW UNIT OPERATION

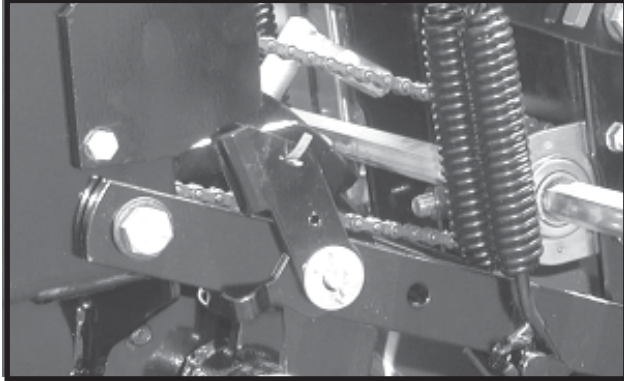
INTERPLANT® PUSH ROW UNIT LOCK-UPS

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



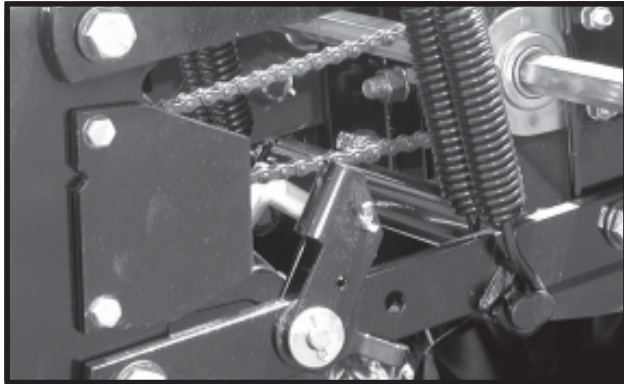
WARNING: Always install all safety lockup devices or lower planter to the ground before working under or around the machine.

D062603106



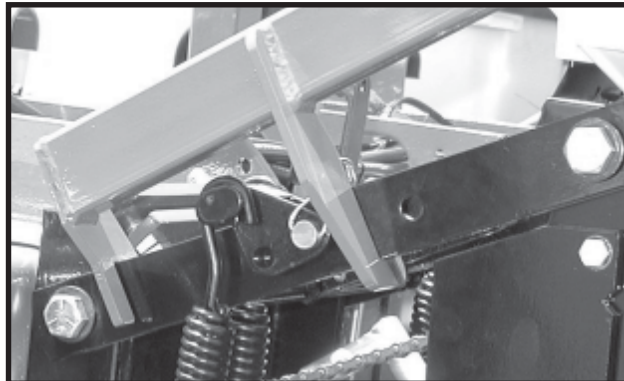
Push Row Unit Locked In Raised Position

D062603103



Lockup Released For Field Operation

D062603106a

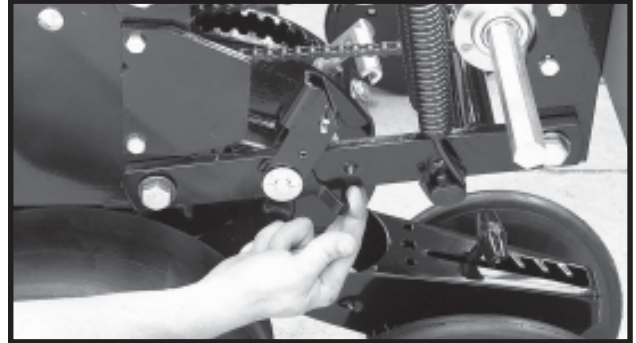


Lift Lever Positioned To Lift Push Row Unit

To lock in raised position:

1. Set row unit down pressure springs to minimum setting.
2. Lower the planter to the planting position.
3. Empty seed hoppers.
4. On each push row unit lockup, flip the spring tab forward.

D060499108

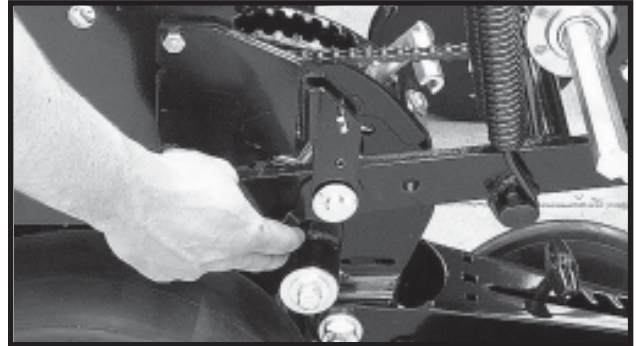


5. Using the lift lever, raise the push row unit to allow the spring loaded lockups to snap into locked position under the row unit stops.
6. Repeat Steps 4 and 5 on remaining push row units.

To release lockups:

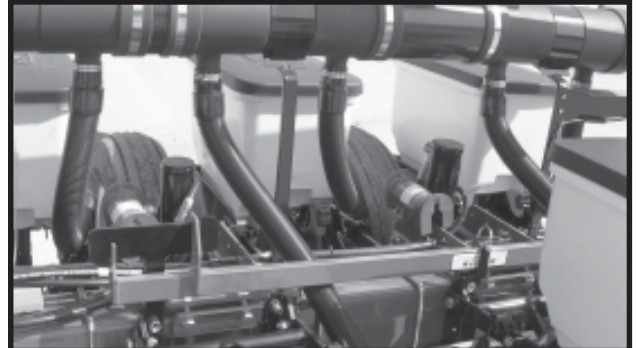
1. Lower the planter to the planting position.
2. On each push row unit lockup, flip the spring tab rearward.

D060499107



3. Using the lift lever, raise the push row unit to allow the spring loaded lockups to snap out of locked position. Lower row unit to the ground.
4. Repeat Step 3 on remaining push row units.

D08220663

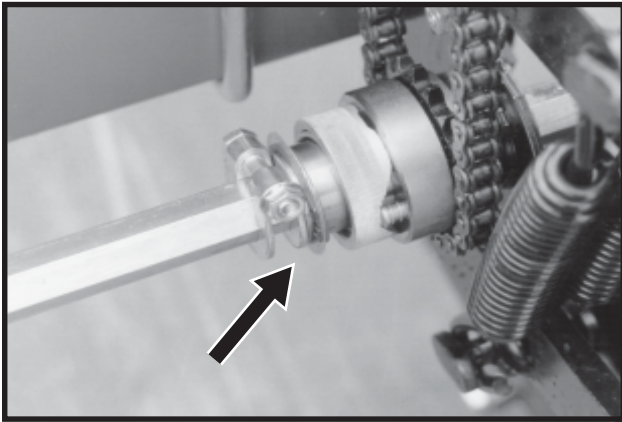


Lift Lever In Storage Location

ROW UNIT OPERATION

INTERPLANT® PUSH ROW UNIT CLUTCH SPROCKET

06309716



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

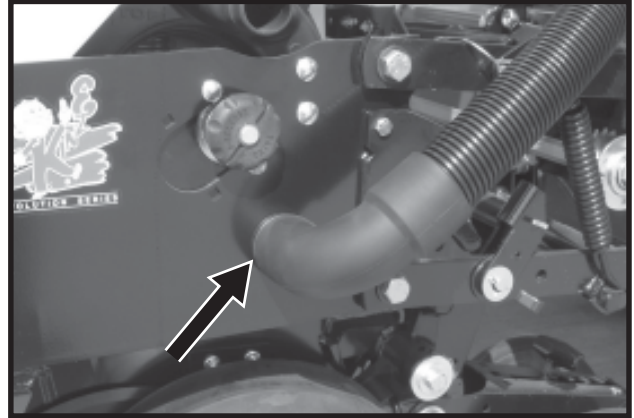
To disengage the push row unit drill shaft using the clutch sprocket, rotate the knurled collar on the clutch sprocket $\frac{1}{4}$ turn. Then using a $\frac{7}{8}$ " wrench on the drill shaft, rock the drill shaft slightly to take pressure off of the spring loaded pins in the clutch to allow the pins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



WARNING: Always install all safety lockup devices or lower planter to the ground before working under or around the machine.

INTERPLANT® PUSH ROW UNIT VACUUM HOSE SHUTOFF

D08220662



When the push row units are not being used, move the row unit end of the 2" vacuum hose on each push row unit to the storage mount located on the side of the shank as shown.



WARNING: Always install all safety lockup devices or lower machine to the ground before working under or around the machine.

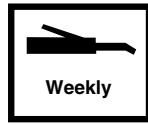
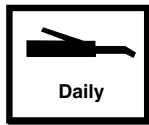
ROW UNIT OPERATION

LUBRICATION

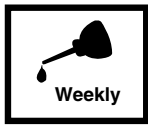
The following pages show the locations of all lubrication points. Proper lubrication of all moving parts will help ensure efficient operation of your KINZE® planter and prolong the life of friction producing parts.

⚠ WARNING: Always install safety lockup devices or lower the planter to the ground before working under or around the machine.

LUBRICATION SYMBOLS



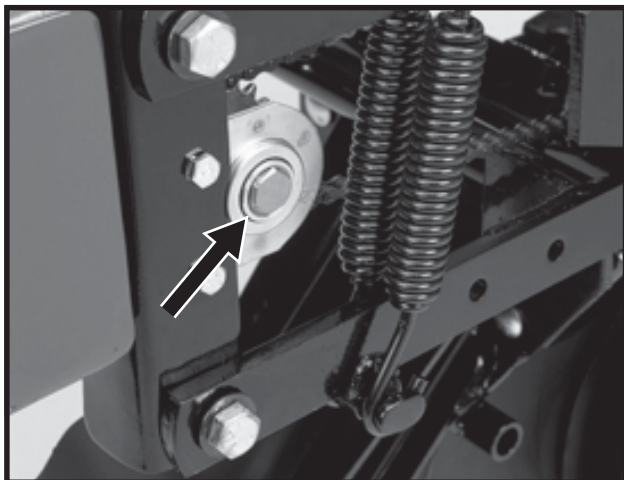
Lubricate at frequency indicated with an SAE multipurpose grease.



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

SEALED BEARINGS

LF212199-3

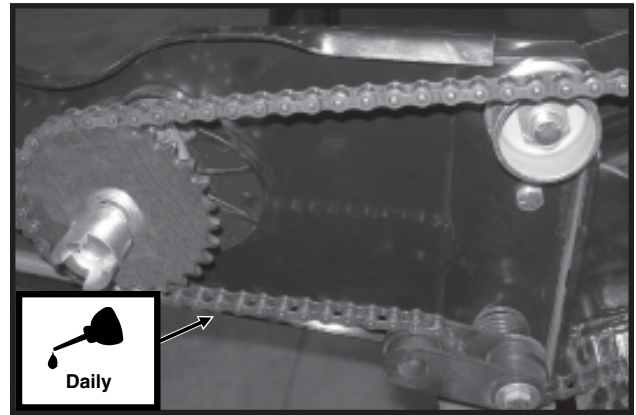


A number of sealed bearings are used on your KINZE® planter to provide trouble free operation. These are located in such areas as the drive shaft, row units and transmission bearings. Sealed bearings are lubricated for life. Due to the seals, relubrication is not practical.

DRIVE CHAINS

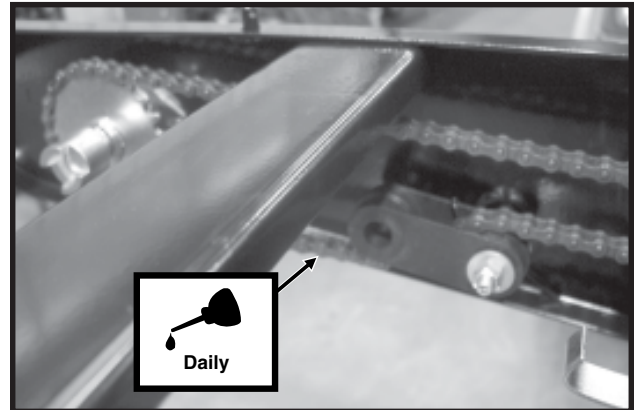
All transmission and drive chains should be lubricated daily with a high quality chain lubricant. Extreme operating conditions such as dirt, temperature or speed may require more frequent lubrication. If a chain becomes stiff, it should be removed, soaked and washed in solvent to loosen and remove dirt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

D09280611a



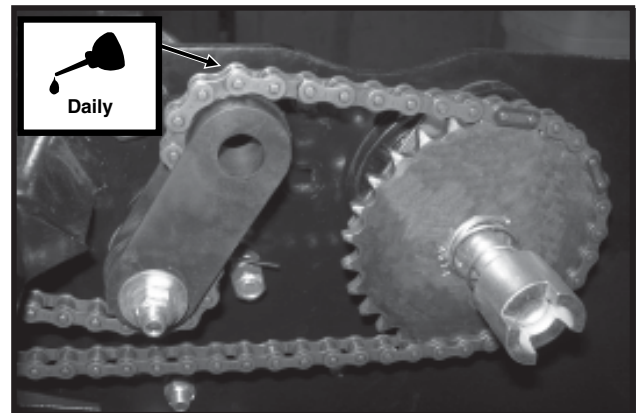
Pull Row Unit Drive Chains

D051705102



Row Unit Granular Chemical Drive Chains

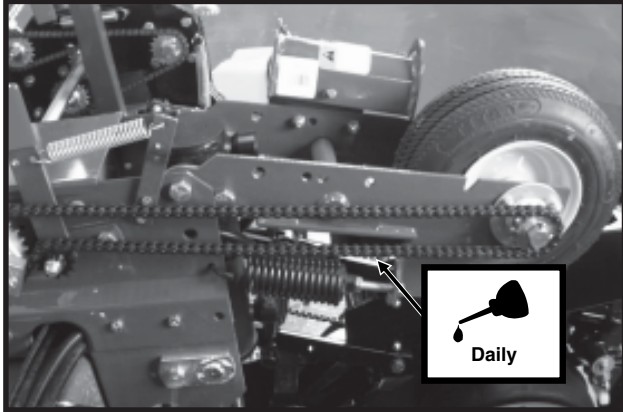
D09280603a



Push Row Unit Drive Chains

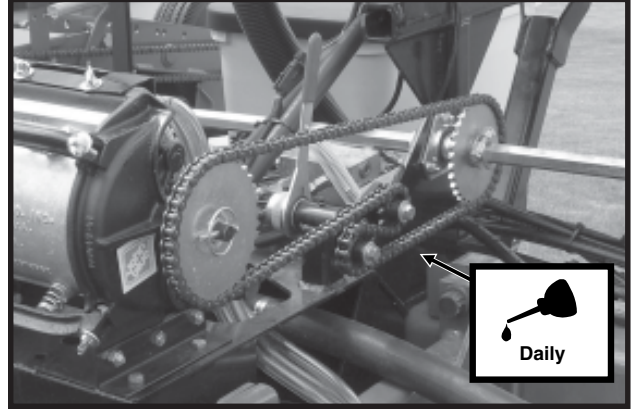
LUBRICATION

D05170013a



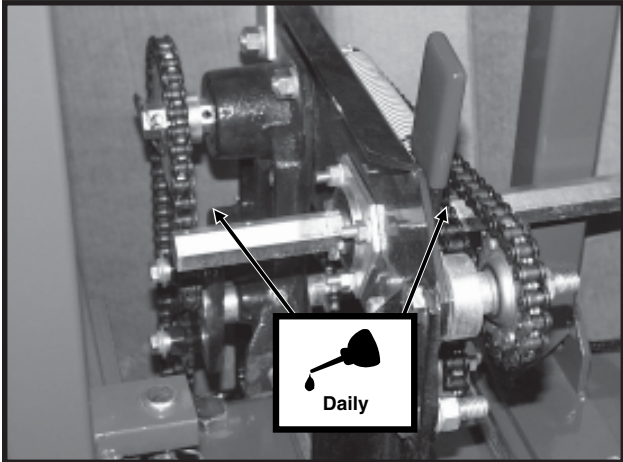
Contact Wheel Drive Chains

D06260626



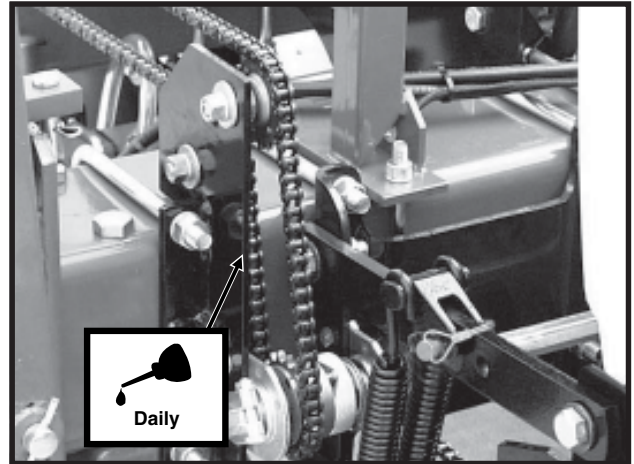
Liquid Fertilizer Drive Chain
(Squeeze Pump Shown)

D06259920



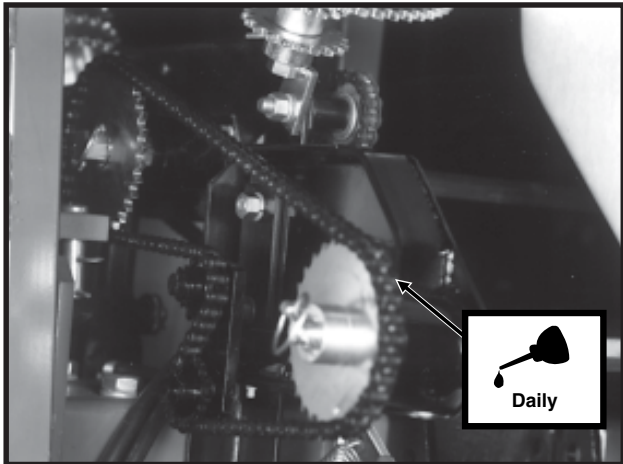
Seed Rate Transmission Assembly And Reverser
Plate Chains

D06119927b



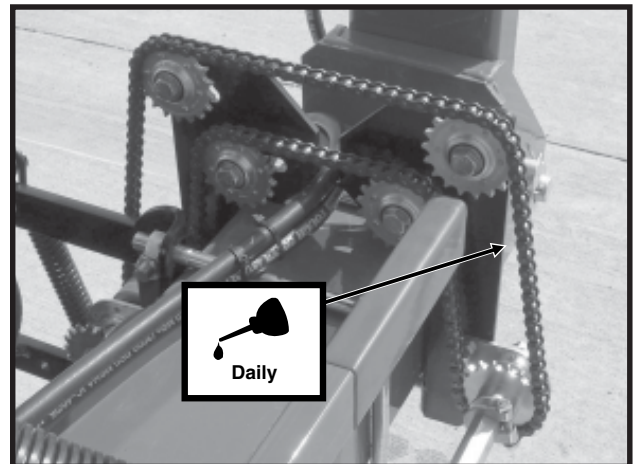
Interplant® Drive Chain (Double Frame®)

61111-7



Dry Fertilizer Drive Chain

D08220665



Interplant® Drive Chain (Single Frame)

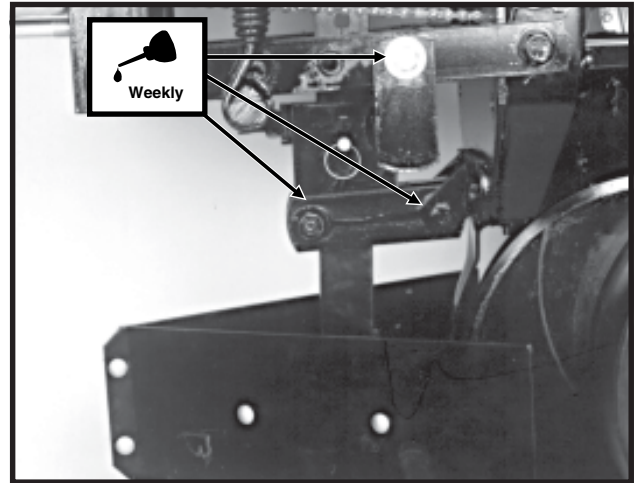
LUBRICATION

BUSHINGS

Lubricate bushings at the frequency indicated.

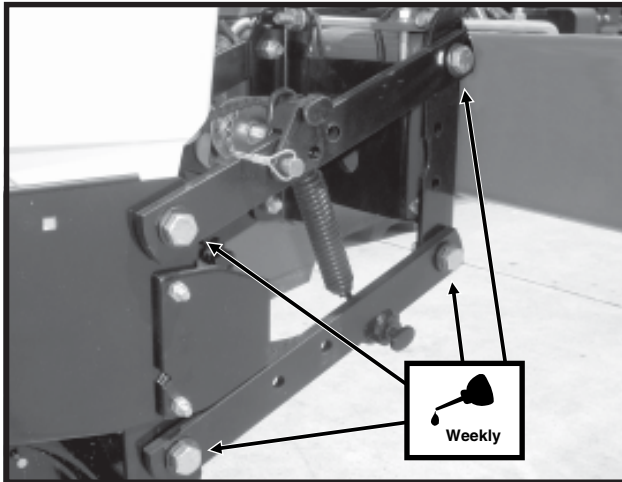
Using a torque wrench, check each bolt for proper torque. If bolt is loose, it should be removed and the bushing inspected for cracks and wear. Replace bushing if necessary. **Only hardened flat washers should be used. Replace damaged flat washers with proper part. Torque hardware to 130 ft. lbs.**

59386-26



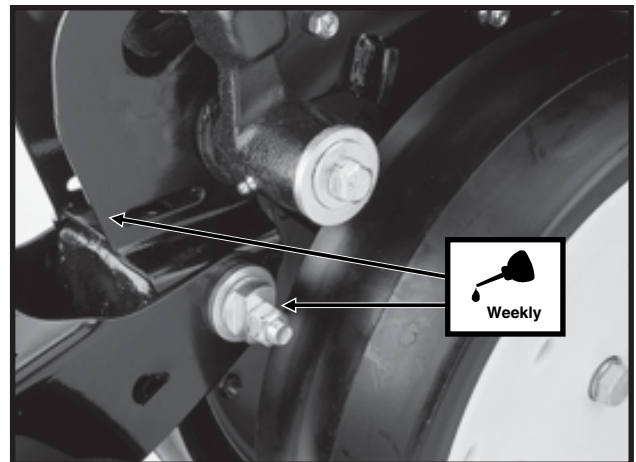
Row Unit Mounted Bed Leveler Parallel Linkages (6 Per Row)

D06300305



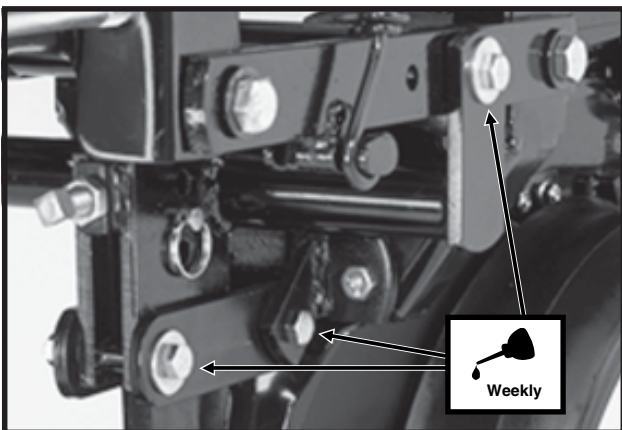
Pull Row Unit And/Or Push Row Unit Parallel Linkages (8 Per Row)

LF212199-2



Row Unit "V" Closing Wheel, Covering Discs/ Single Press Wheel And/Or Drag Closing Wheel Eccentric Bushings (2 Per Row)

LF212299-22



Row Unit Mounted Disc Furrower Parallel Linkages (6 Per Row)

LUBRICATION

WRAP SPRING WRENCH ASSEMBLY

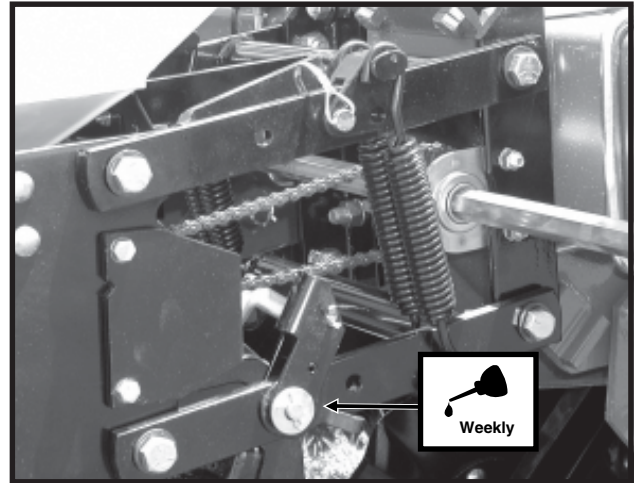
The chain idler is equipped with a wrap spring wrench. The wrench components may require occasional lubrication to operate correctly. Disassembly is required to lubricate. (a) Remove the 1/4"-20 x 1/2" cap screw that secures the idler with sprockets to the wrench tightener shaft. (b) Remove the wrap 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



INTERPLANT® PUSH ROW UNIT LOCKUPS

D062603103



2 Per Row

LUBRICATION

WHEEL BEARINGS

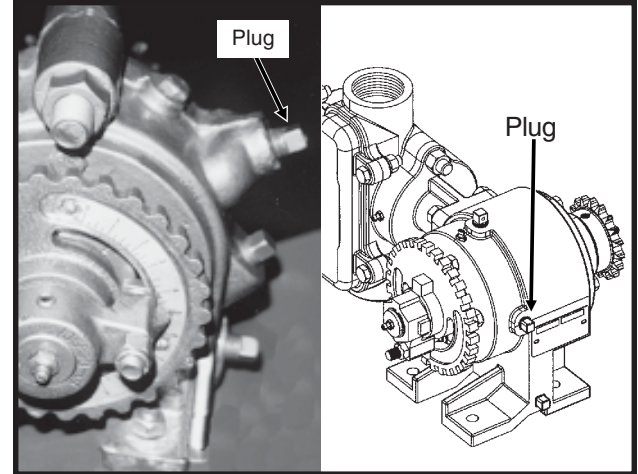
All wheel bearings should be repacked annually and checked for wear. This applies to all drive wheels, transport wheels and marker hubs.

To check for wear, raise 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 "Wheel Bearing Lubrication Or Replacement" in 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

12229799//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.

GREASE FITTINGS

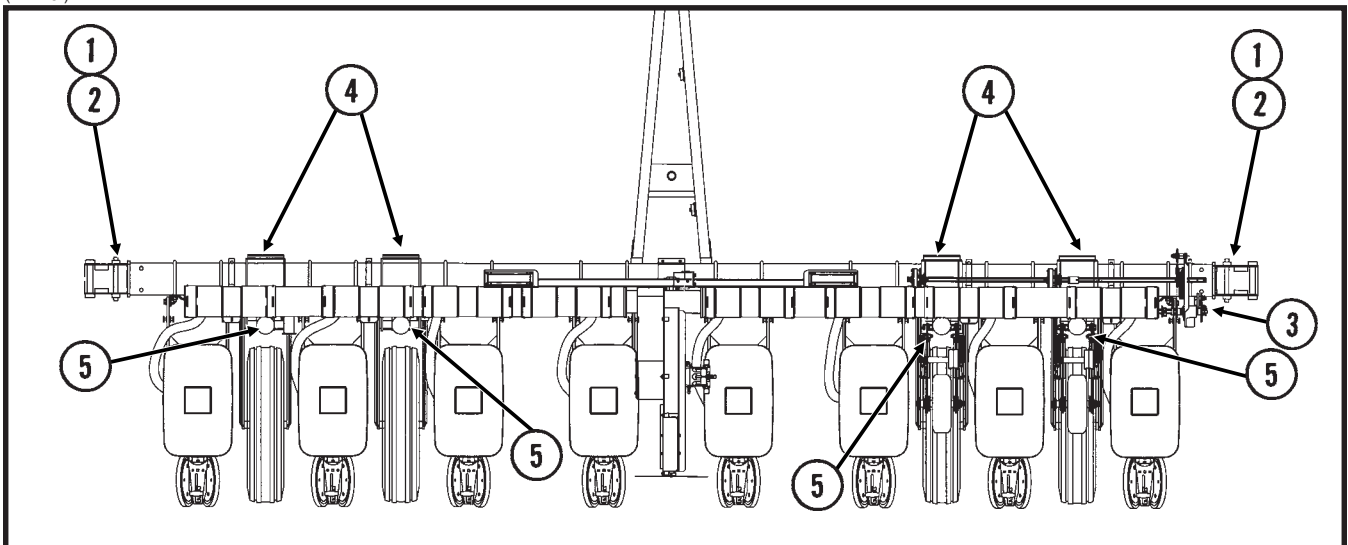
Those parts equipped with grease fittings should be lubricated at the frequency indicated with an SAE multipurpose grease. Be sure to clean the fitting thoroughly before using grease gun. The frequency of lubrication recommended is based on normal operating conditions. Severe or unusual conditions may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

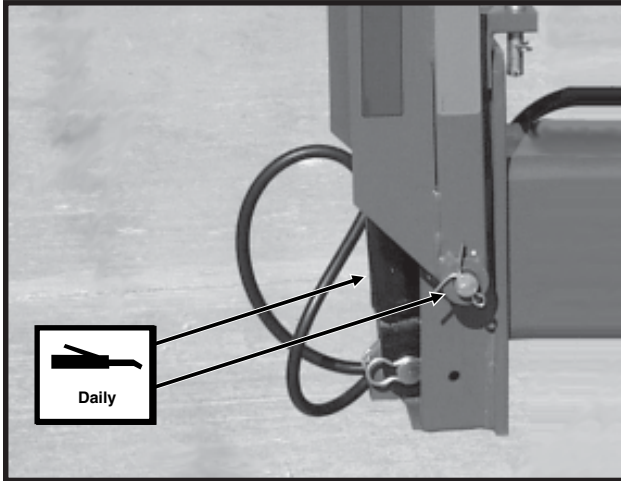
(PLTR182)



Model 3000 8 Row 30" Planter Shown

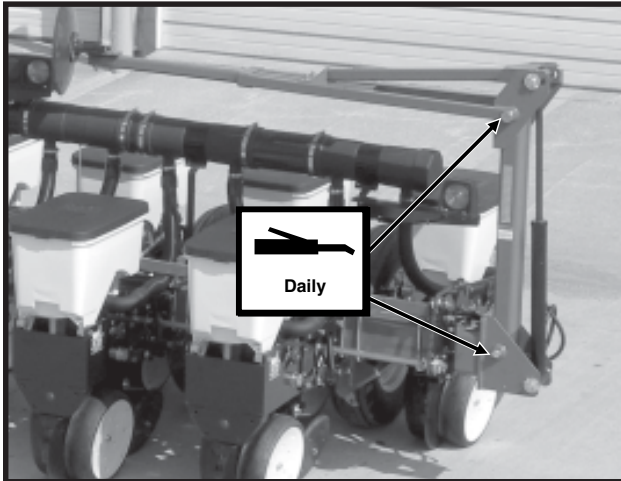
LUBRICATION

D101900103a



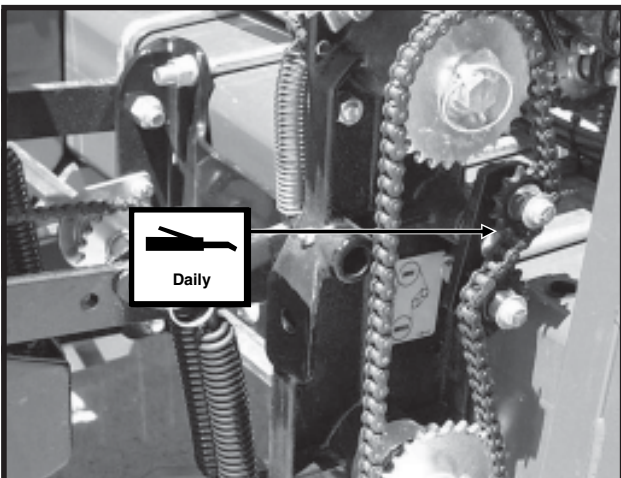
1. Conventional Row Marker Assembly - 4 Zerks Per Assembly

D08220659



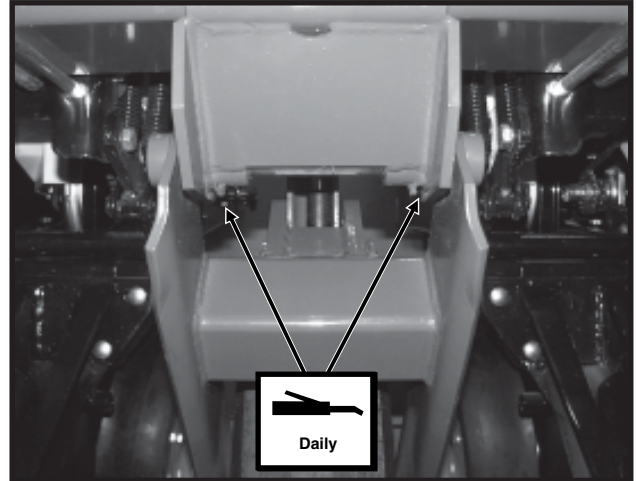
2. Low Profile Row Marker Assembly - 2 Zerks Per Assembly

D05259914



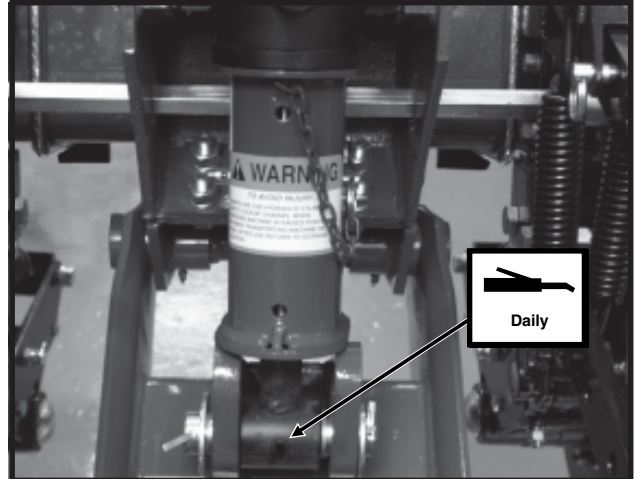
3. Seed Rate Transmission Assembly - 1 Zerk (Idler)

D06289928



4. Wheel Module Assembly - 2 Zerks Per Module

D05170003a

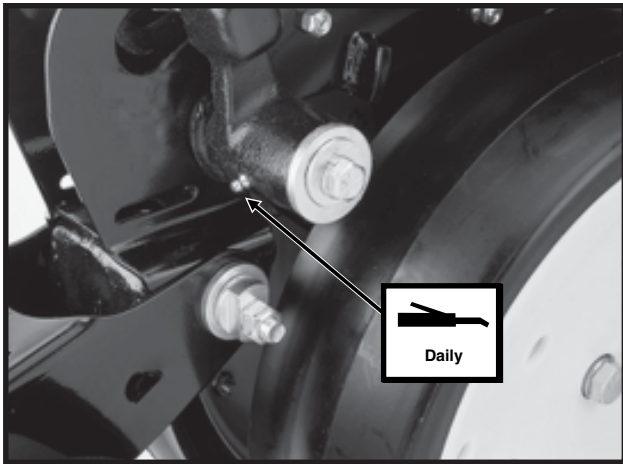


5. Lift Cylinders (Master, Slave And Assist) - 1 Zerk Per Cylinder.

LUBRICATION

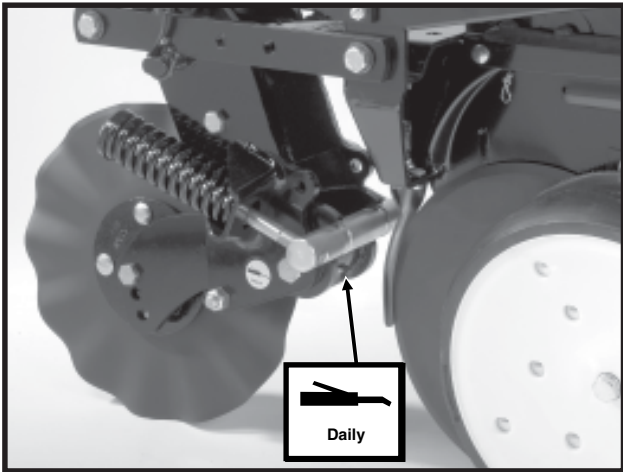
Row Unit

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.)

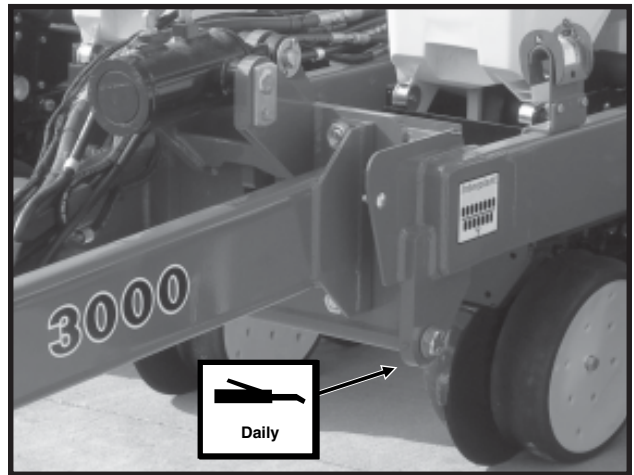
LF083002101



Frame Mounted Coupler - 1 Zerk Per Arm

Interplant® Attachment

D08220607

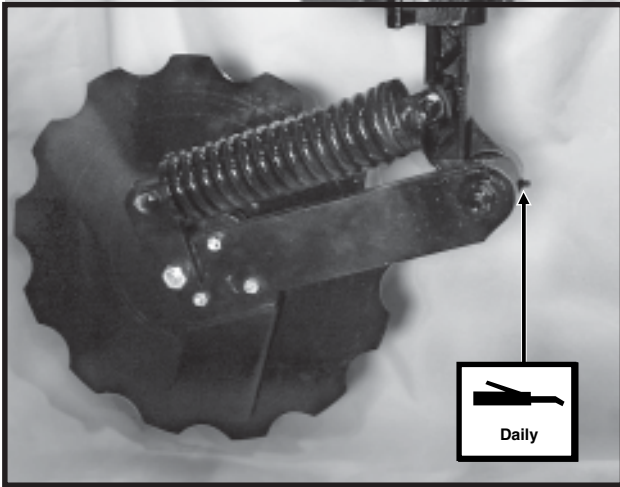


Interplant® Self-Leveling Hitch Extension - 2 Zerks

LUBRICATION

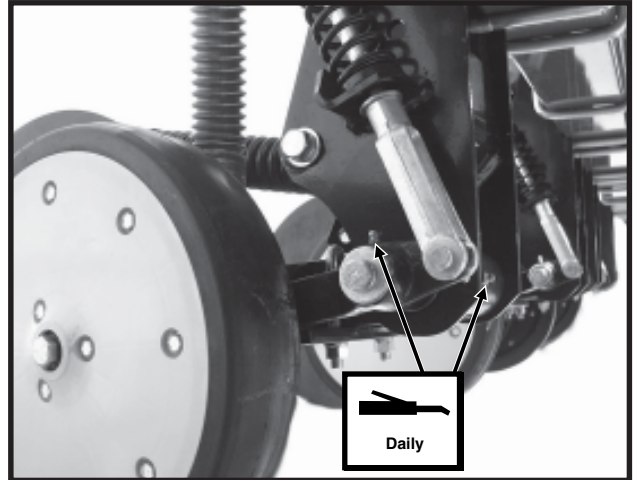
Fertilizer Openers

D060801304



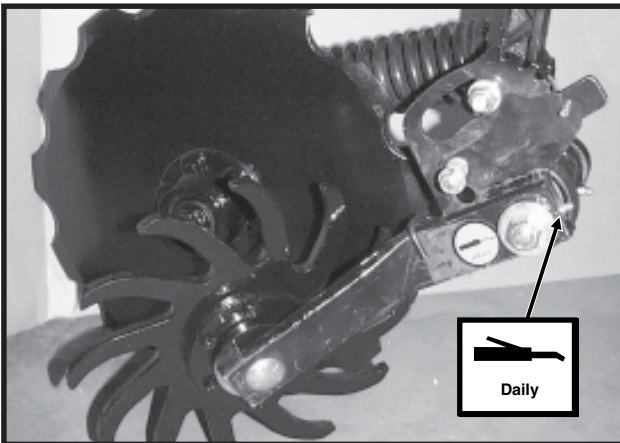
Notched Single Disc Fertilizer Opener - 1 Zerk

D060801304



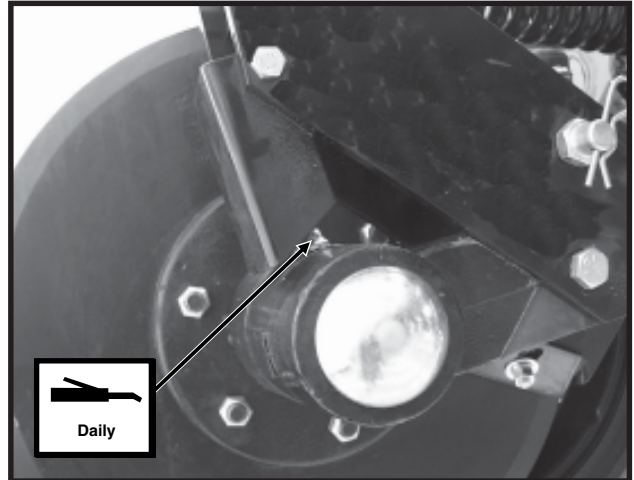
HD Single Disc Fertilizer Opener - 2 Zerks
(Located On Wheel Arm And Opener Mount)

D052201104



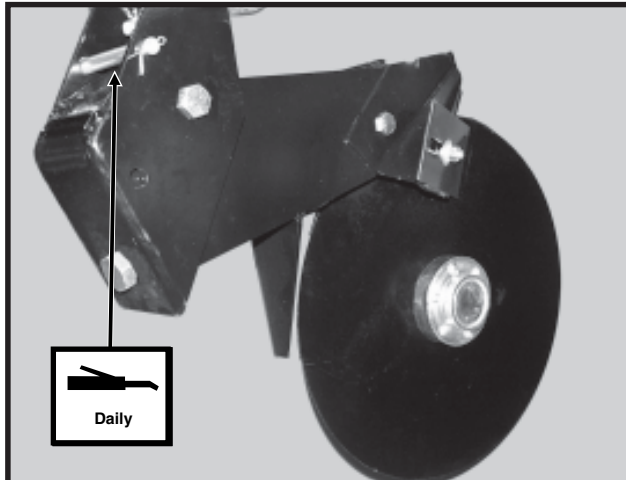
Residue Wheel Attachment For Use With Notched Single Disc Fertilizer Opener - 1 Zerk

D060801303



HD Single Disc Fertilizer Opener - 1 Zerk
(Located On Disc Opener Spindle Hub)

D06259919

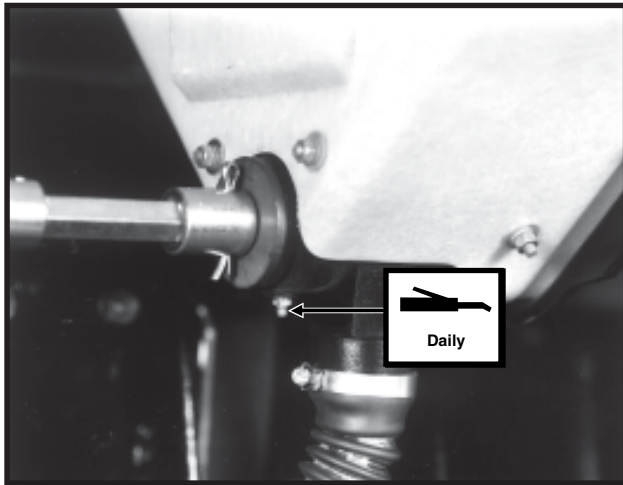


Double Disc Fertilizer Opener - 1 Zerk

LUBRICATION

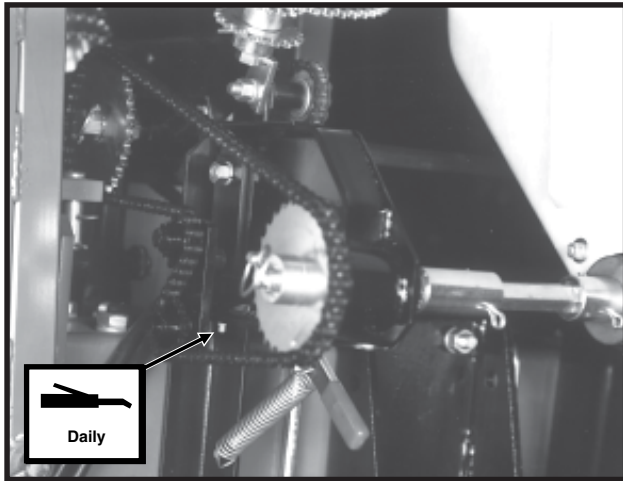
Dry Fertilizer Attachment

61111-28



Fertilizer Hopper - 2 Zerks Per Hopper

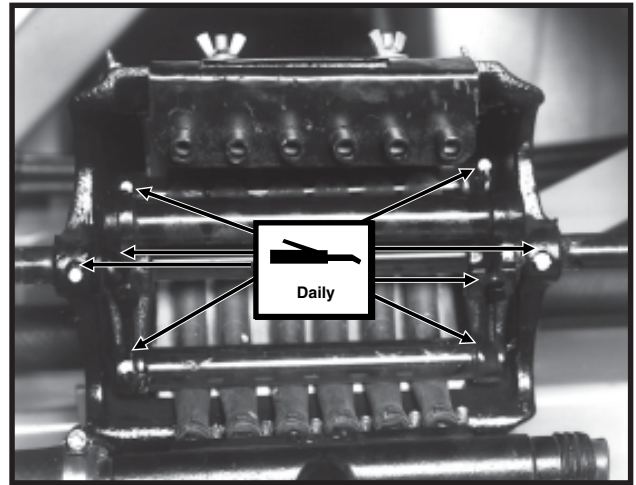
61111-7



Fertilizer Transmission - 1 Zerk Per Transmission

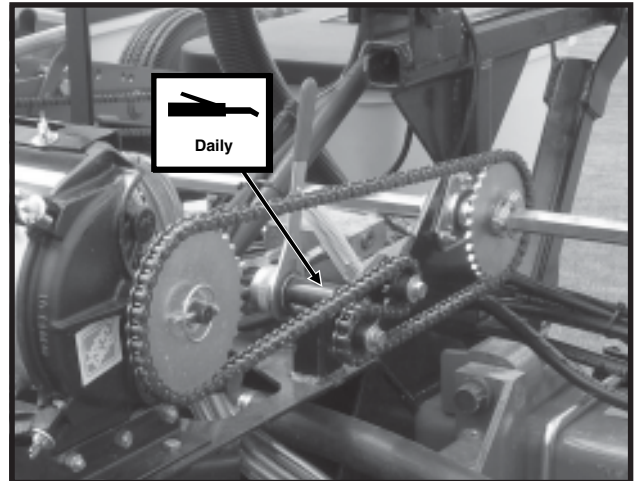
Liquid Fertilizer Attachment

61010-6



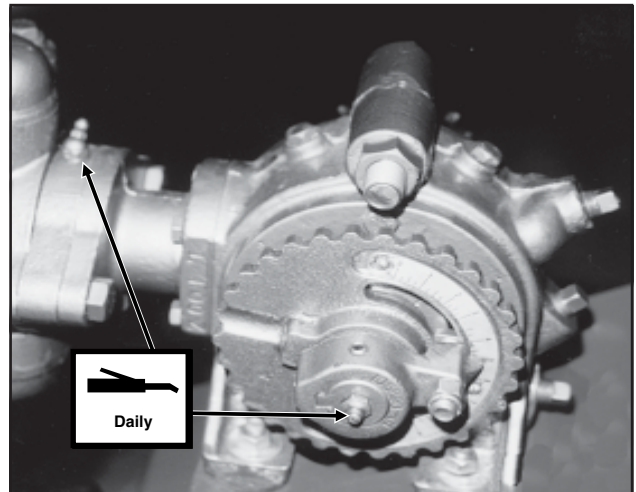
Squeeze Pump - 8 Zerks Per Pump

D06260626



Squeeze Pump/Piston Pump Drive Chain Idler - 1 Zerk Per Idler (Squeeze Pump Shown)

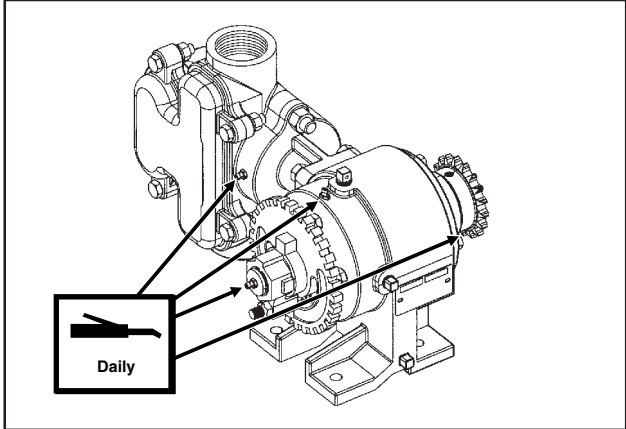
12229799



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

LUBRICATION

(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.

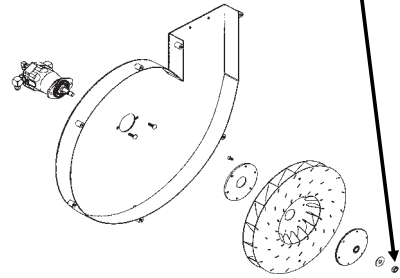
Row Unit Parallel Linkage Bushing Hardware - 130 Ft. Lbs.
(See “Bushings” in the Lubrication section of this manual.)

5/8" No Till Coulter Spindle Hardware - 120 Ft. Lbs.

Ground Drive Tire Lug Bolts - 90 Ft. Lbs.

IMPORTANT: Over tightening hardware can cause as much damage as under tightening. Tightening hardware beyond the recommended range can reduce its shock load capacity.

IMPORTANT: Torque setting for 5/8"-18 hex jam nut that secures fan impellor assembly to motor shaft is 50 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

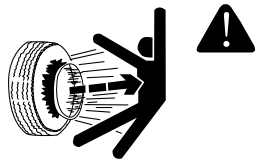
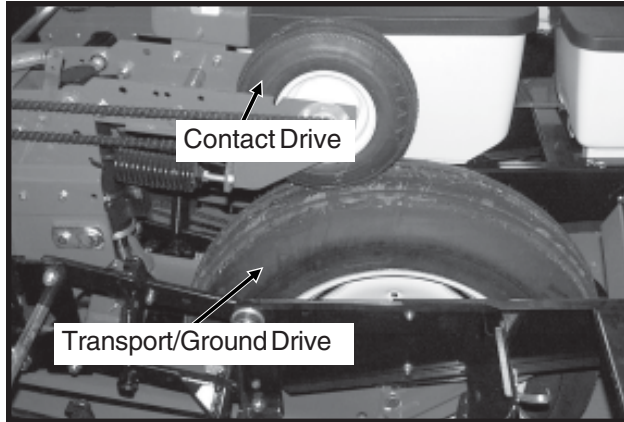
MAINTENANCE

TIRE PRESSURE

Tire pressure should be checked regularly and maintained as follows:

- 7.50" x 20" Transport/Ground Drive 40 PSI
- 4.10" x 6" Contact Drive 50 PSI

D05220002a



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

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

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

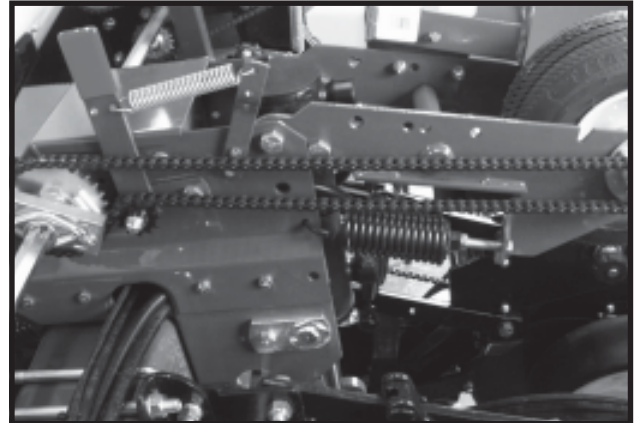
When inflating tires, use a clip-on air chuck and extension hose long enough to allow you to stand to one side and NOT in front of or over the tire assembly. Use a safety cage to enclose the tire and rim assembly when inflating.

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

CHAIN TENSION ADJUSTMENT

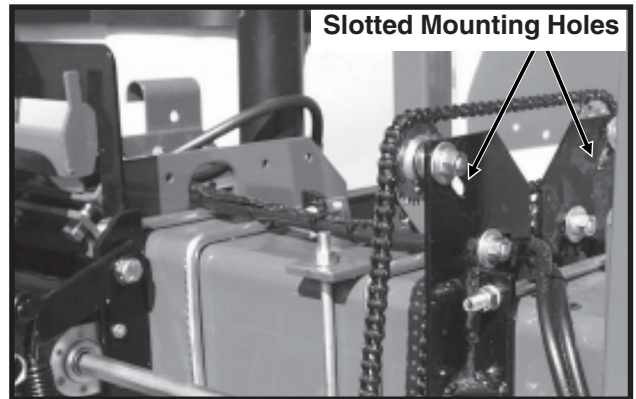
Drive chains are equipped with spring loaded idlers and are self-adjusting. The only adjustment needed is to shorten the chains if wear stretches a chain and reduces spring tension. The pivot point of these idlers should be checked periodically to ensure they rotate freely.

D060799115



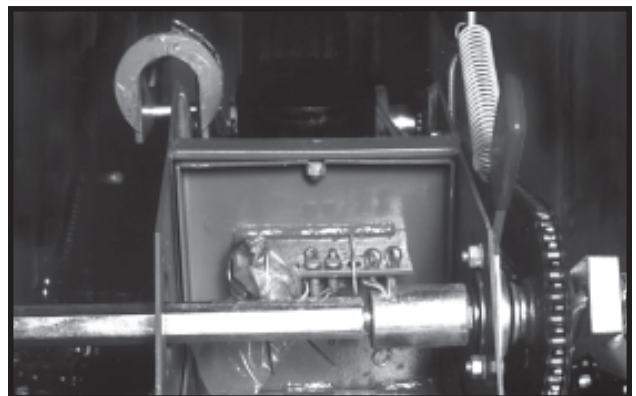
Interplant® push row unit drive chain adjustment is made by loosening the idler sprocket mounting hardware and sliding the sprockets in the slotted mounting holes.

D06079909



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

61010-1a



See "Wrap Spring Wrench Assembly" in Lubrication Section for additional information.

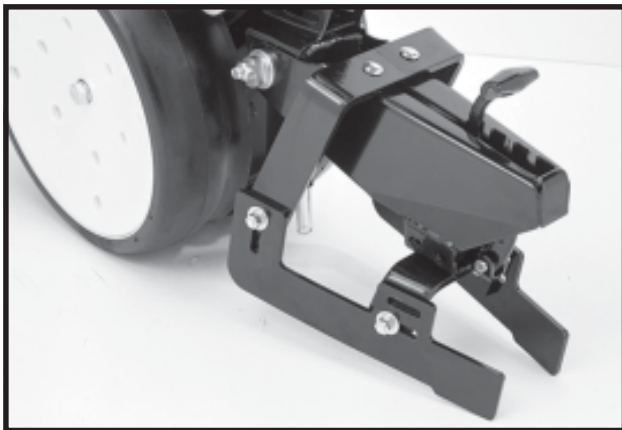
MAINTENANCE

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”.

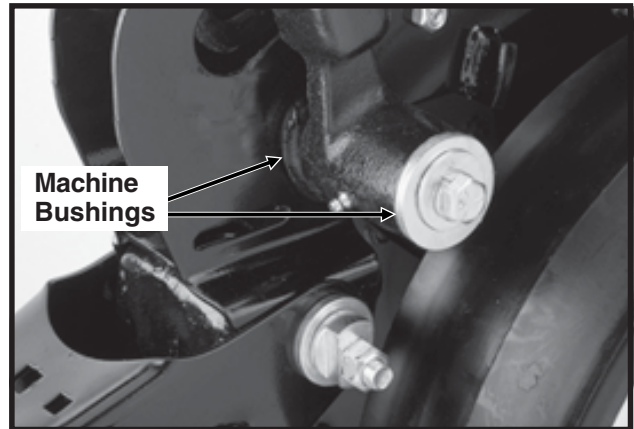
DRAG CLOSING ATTACHMENT

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



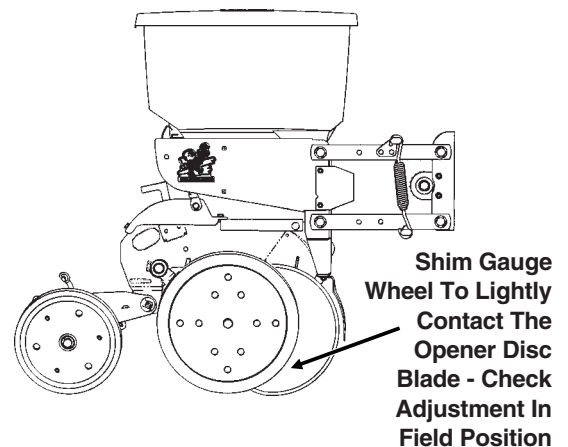
(RU113g)

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.

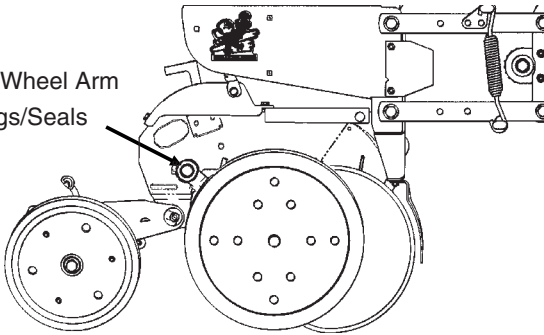


MAINTENANCE

GAUGE WHEEL ARM BUSHING AND/OR SEAL REPLACEMENT

(RU113g)

Gauge Wheel Arm Bushings/Seals

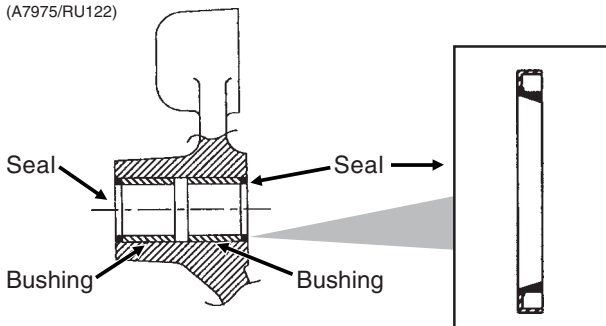


NOTE: A Gauge Wheel Arm Bushing And Seal Driver Kit (G1K296), for use in bushing and seal replacement, is available through your KINZE® Dealer.

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.

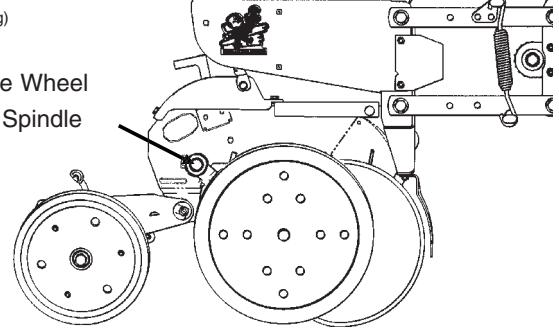
NOTE: Special machine bushing between gauge wheel arm and gauge wheel.

9. Shim for proper gauge wheel tire/disc blade clearance.
10. Lubricate with an SAE multipurpose grease.

GAUGE WHEEL ARM PIVOT SPINDLE REPLACEMENT

(RU113g)

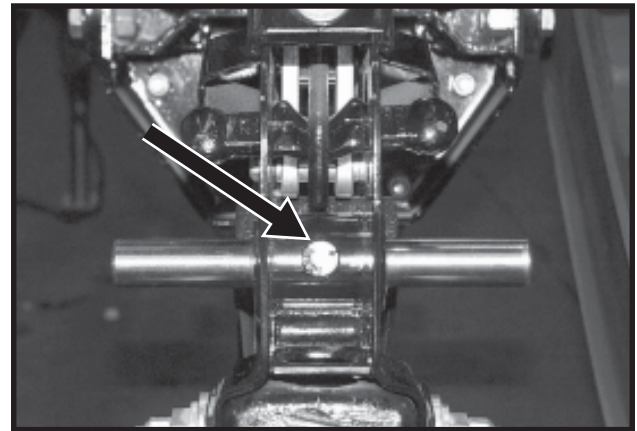
Gauge Wheel Pivot Spindle



To replace gauge wheel pivot spindle:

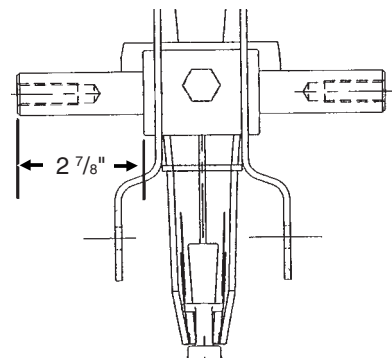
1. Remove the gauge wheel and arm assemblies from the shank assembly.
2. Remove 1/2" x 3/4" cap screw that locks the pivot spindle in place and remove the spindle.

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

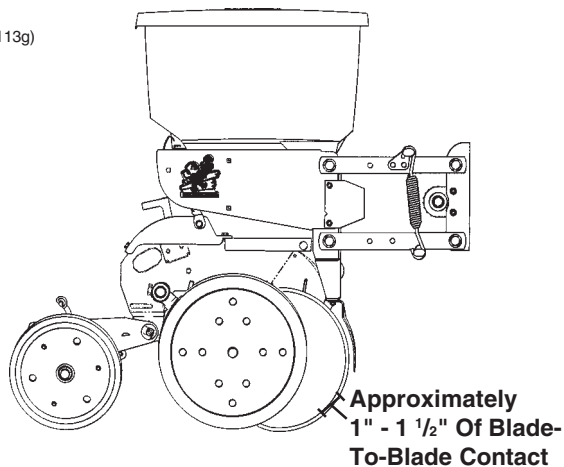
15" SEED OPENER DISC BLADE/ BEARING ASSEMBLY

Approximately 1" - 1 1/2" of blade-to-blade contact should be maintained to properly open and form the seed trench. As the blade diameter decreases, due to wear, it will be necessary to relocate machine bushings from inside to outside to maintain approximately 1" - 1 1/2" of contact.

NOTE: If proper blade-to-blade contact cannot be maintained after relocating machine bushings or if blade diameter wears below 14 1/2", the blade 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 1/2" of blade-to-blade contact.

IMPORTANT: Left hand side of opener uses a left hand threaded cap screw. DO NOT OVER TIGHTEN. 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 5/8"-11 Grade 5 cap screw to value shown in "Torque Values Chart".

NOTE: Replace disc blade only with disc blade 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 1/4" rivets from bearing housing to expose bearing.
3. After installing new bearing, install three evenly spaced 1/4" 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 1/4" cap screws and install rivets in those three holes.
4. Reinstall disc blade/bearing assembly, washer and cap screw. Torque 5/8"-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.

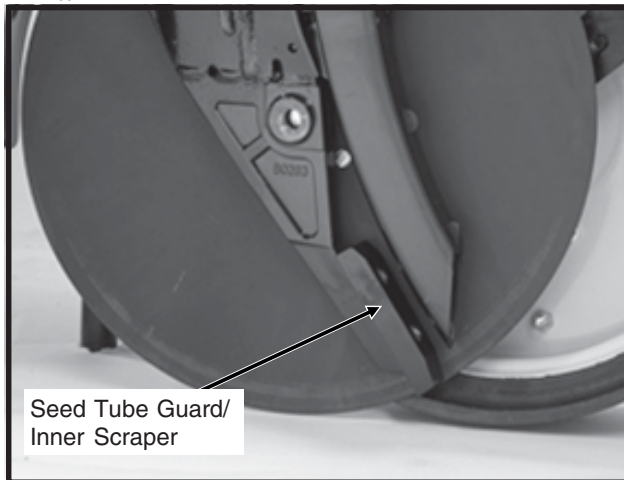
MAINTENANCE

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

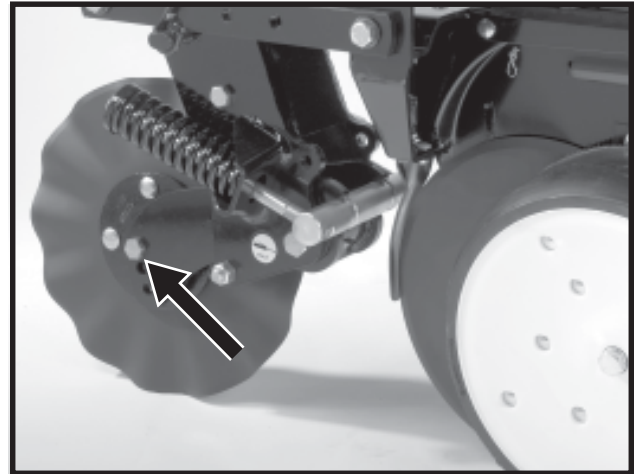
IMPORTANT: No till planting or planting in hard ground conditions, especially when the planter is not equipped with no till coulters, and/or excessive blade-to-blade contact will increase seed tube guard wear and necessitate more frequent inspection and/or replacement.

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.

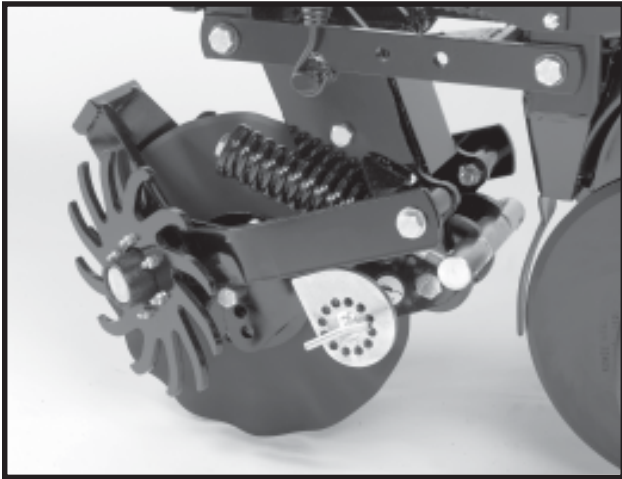
See "Frame Mounted Coulters" in Row Unit Operation section of this manual for depth and spring adjustment.

When the 16" diameter coulters 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

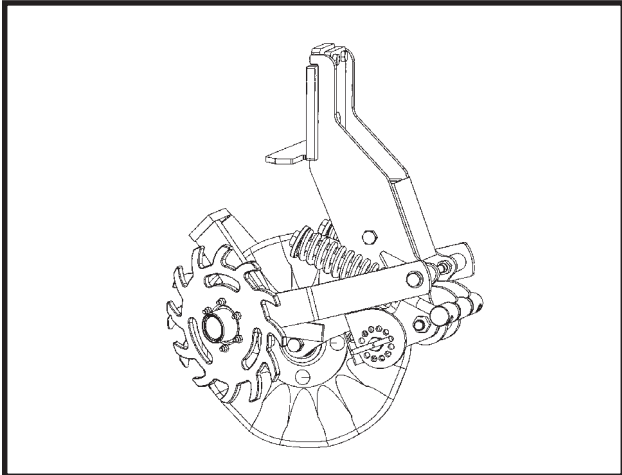
RESIDUE WHEELS (For Use With Frame Mounted Coulter)

LF083002102



STYLE A

(RU154)

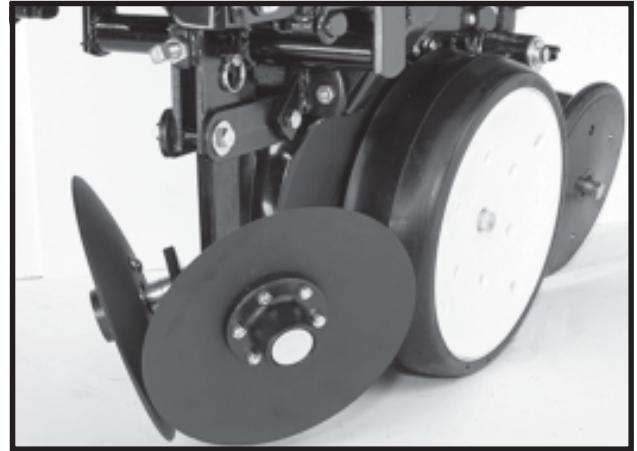


STYLE B

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.**

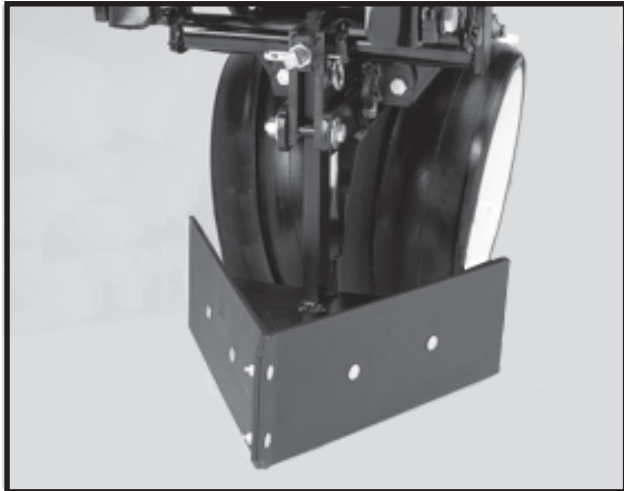
The blade hubs are equipped with sealed bearings. If bearings sound or feel rough when the blade is rotated, replace the bearings.

When the 12" diameter blades (solid or notched) are worn to 11", they should be replaced.

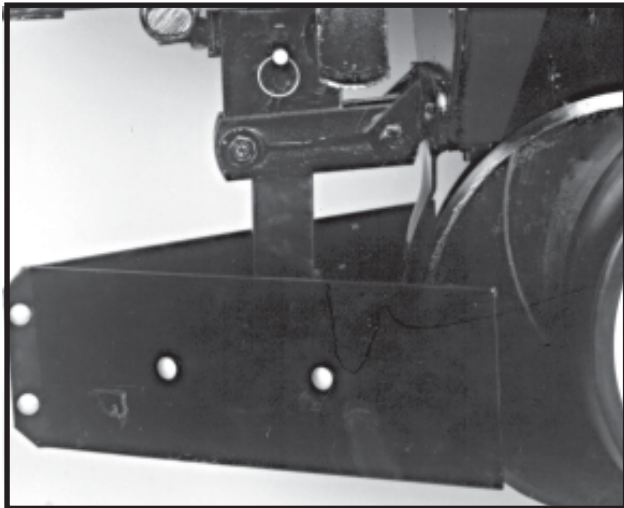
MAINTENANCE

ROW UNIT MOUNTED BED LEVELER

LF212299-25a



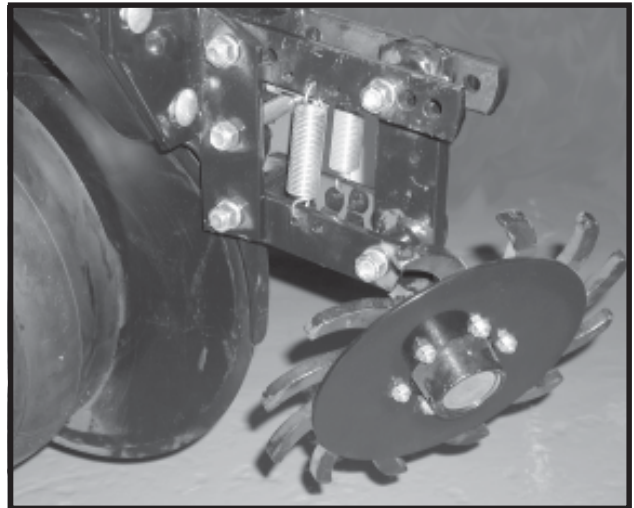
59386-26



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 cap screws to 57 ft. lbs.**

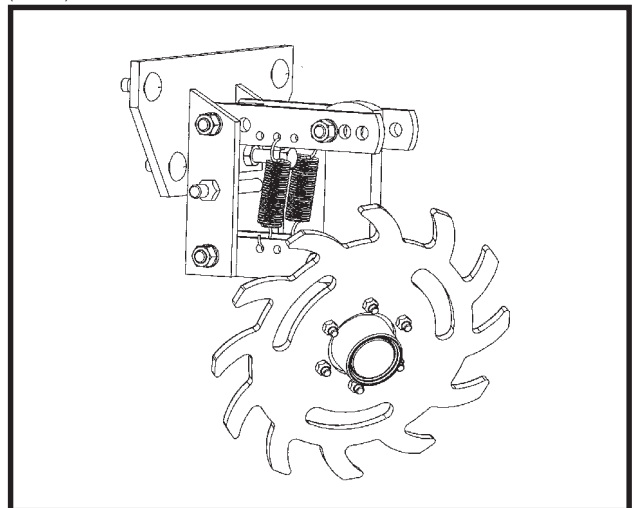
ROW UNIT MOUNTED RESIDUE WHEEL

D101701113



STYLE A

(A12685)



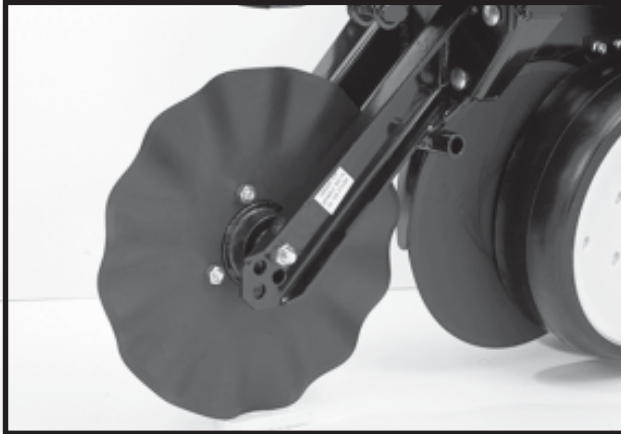
STYLE B

The wheel hub is equipped with sealed bearings. If a bearing sounds or feels rough when the wheel is rotated, replace the bearings.

MAINTENANCE

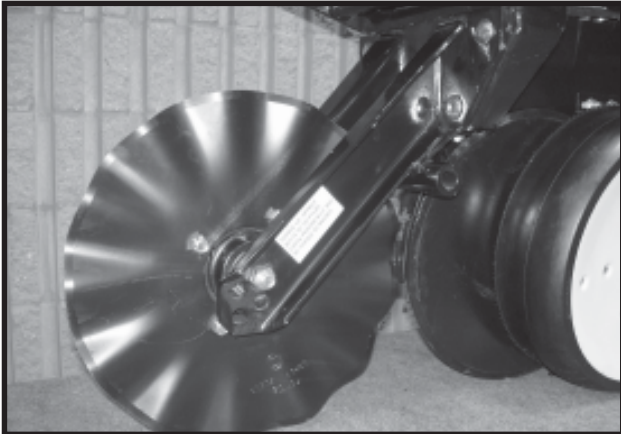
ROW UNIT MOUNTED NO TILL COULTER

LF212299-19a



STYLE A (Two Sleeves For Installing Coupler Mounted Residue Wheels)

D0517076



STYLE B (One Sleeve For Installing Coupler 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 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 are worn to 14 $\frac{1}{2}$ " (maximum allowable wear), they should be replaced.

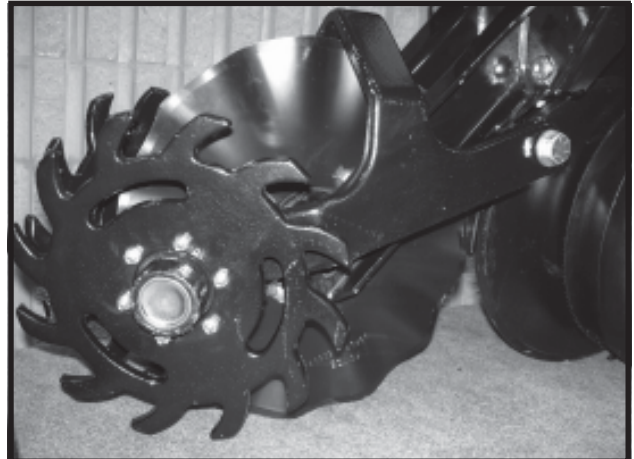
COULTER MOUNTED RESIDUE WHEELS

LF212299-23



STYLE A - Used With Style A Row Unit Mounted No Till Coulters

D0517078



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.

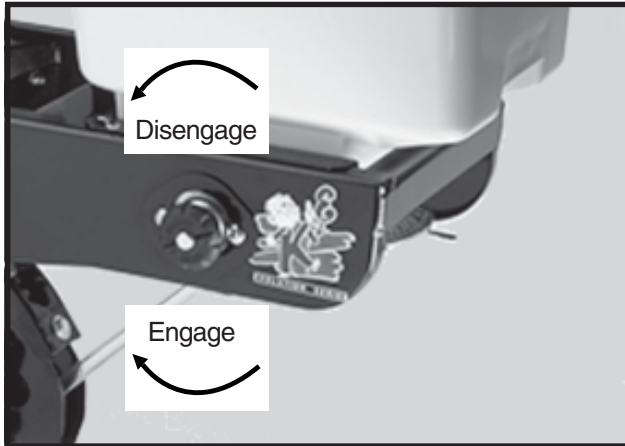
MAINTENANCE

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.

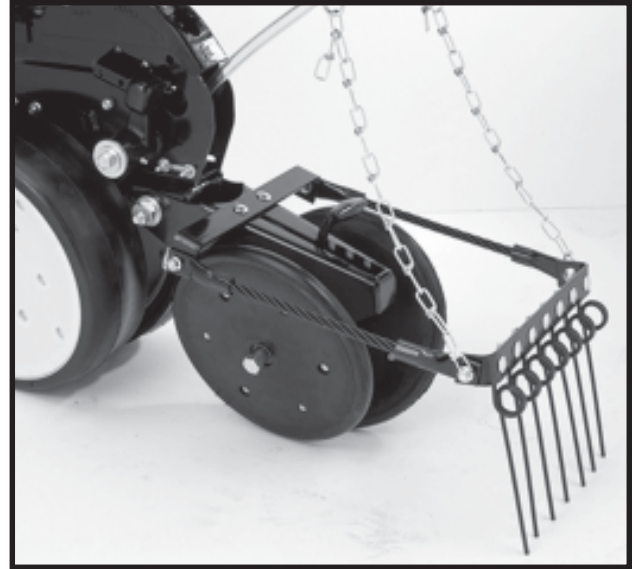
LF212299-4



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 Stack-Mode 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

LIFT CIRCUIT OPERATION TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	TROUBLESHOOTING*	SOLUTION
Planter raising uneven.	Master cylinder is leaking.	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.	Raise and lower planter. As planter lowers, the side with leaking slave cylinder will drop rapidly. 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.	Install lockups on the master cylinder. Retract assist cylinders 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 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.

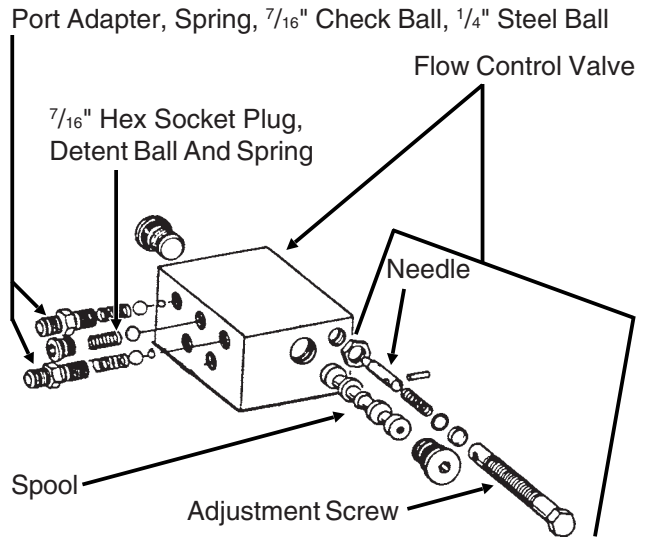
3. Remove plug from both sides of valve block and remove spool.
4. Inspect all parts for pitting, contamination or foreign material. Also check seating surfaces inside the valve. Replace any parts found to be defective.
5. Lubricate spool with a light oil and reinstall. Check to be sure spool moves freely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

IMPORTANT: Make sure correct check ball(s) and spring(s) 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.

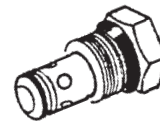
NOTE: When oil is cold, hydraulics operate slowly. Make sure all adjustments are made with warm oil.

(PLTR43)



CHECK VALVE INSPECTION (Located In Valve Block Below Vacuum Fan Motor Assembly)

(TWL24b)



The check valve operates as a check in the return line to prevent reverse operation of the vacuum fan motor. If the valve fails to function properly, it should be removed for inspection. Check for foreign material or check to see if the o-ring is leaking internally. Replace if found to be defective.

RELIEF VALVE CARTRIDGE INSPECTION (Located In Valve Block Below Vacuum Fan Motor Assembly)

(A11340)

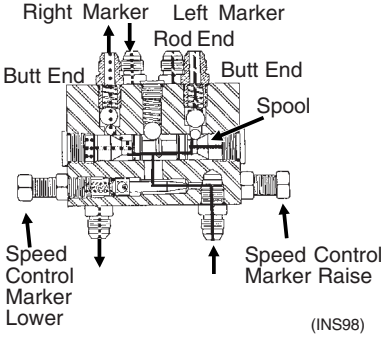


The pressure relief valve helps prevent damage to the vacuum fan motor by limiting pressure in the motor case drain line. It is set to open at 35 PSI. If the valve fails to function properly, it should be removed for inspection. Check for foreign material and contamination on both the valve and the seating area of the valve body. Replace if found to be defective.

NOTE: Case drain pressure will build if the case drain hose to the tractor is connected where pressure is present.

MAINTENANCE

ROW MARKER OPERATION TROUBLESHOOTING

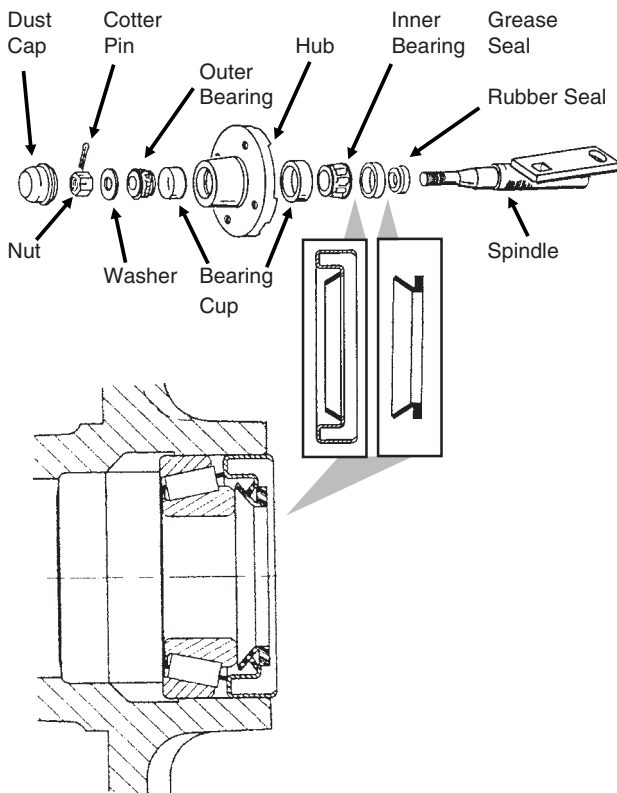
PROBLEM	POSSIBLE CAUSE	SOLUTION
<p>Same marker always operating.</p>  <p>(INS98)</p>	<p>Inadequate oil flow to sequencing valve. Most commonly associated with single valve system (lift and markers on same remote).</p>	<p>TEST: Raise planter and install transport lockups. Attempt to raise and lower planter. All hydraulic oil will be directed to markers. If markers function properly, the sequence valve is OK. Slow raising of marker arm so the planter is up before the marker arm is completely up.</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

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.

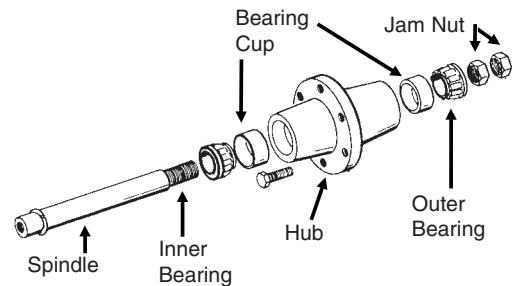
(PLTR45/PLTR99/PLTR98/PLTR102)



WHEEL BEARING LUBRICATION OR REPLACEMENT

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

PTD057(EF35e)



MAINTENANCE

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.

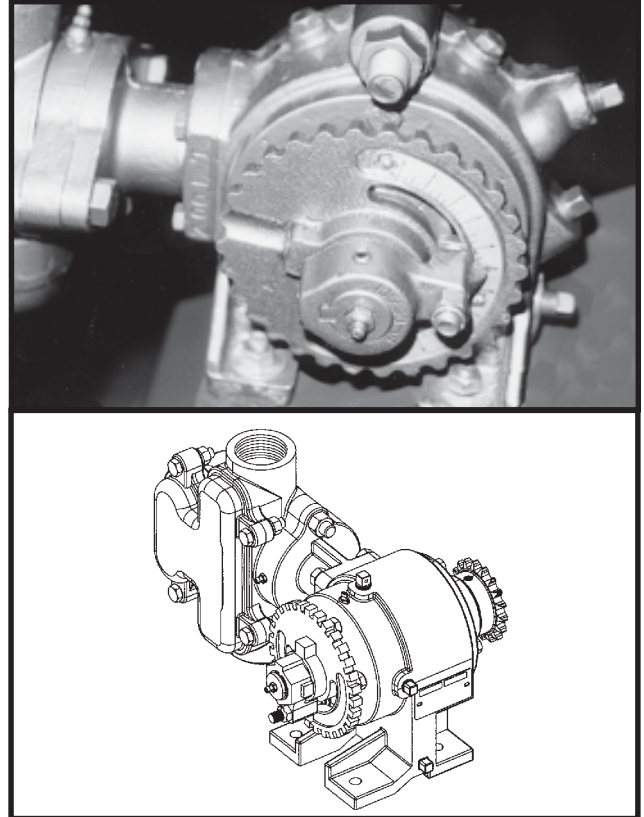
Overnight Storage

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.

12229799/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.

Remove seed discs from seed meters, clean and store meters in a rodent-free, dry area with discs removed. Store seed discs vertically on a dowel or pipe.

Remove vacuum hose from each seed meter. Operate the vacuum fan at full hydraulic flow from the tractor for two minutes to clear manifolds, hoses and fittings of dust and debris.

Clean breather on analog vacuum gauge.

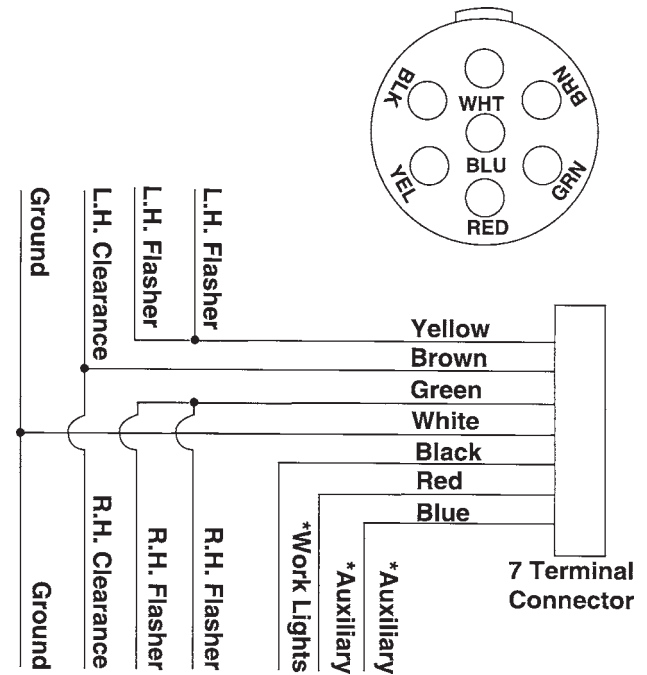
Grease or paint disc openers/blades and row marker disc blades to prevent rust.

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.

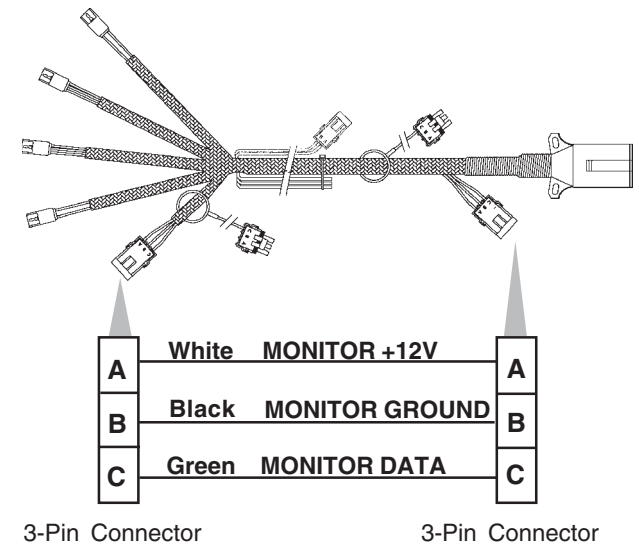
ELECTRICAL WIRING DIAGRAM FOR LIGHT PACKAGE

(WGN66b)



* Optional customer-supplied auxiliary lights and wires may be wired into existing plug terminals.

(A9206a)

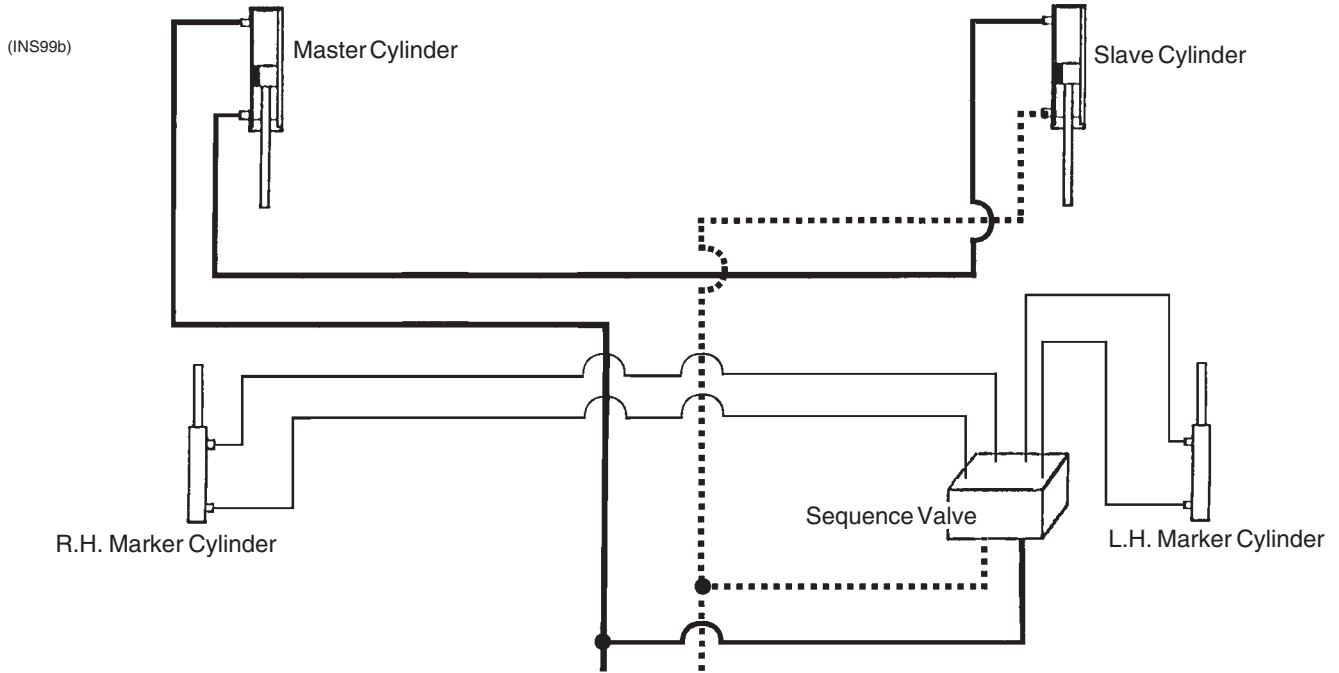


The light package supplied on the Model 3000 planter meets ASAE Standards. For the correct wiring harness to be wired into the lights on your tractor, check with the tractor manufacturer.

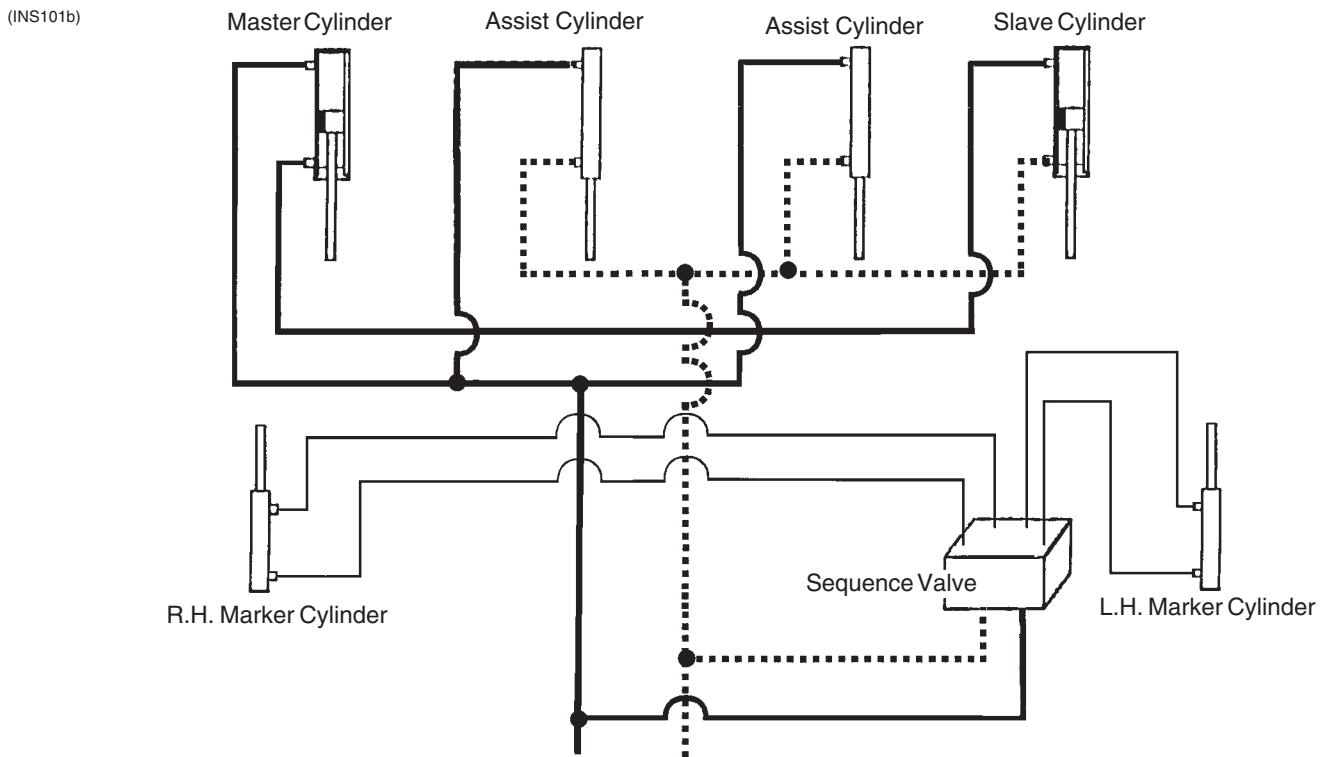
MAINTENANCE

HYDRAULIC SYSTEM SCHEMATIC

4 Row - Planter Raising



6/8 Row - Planter Raising



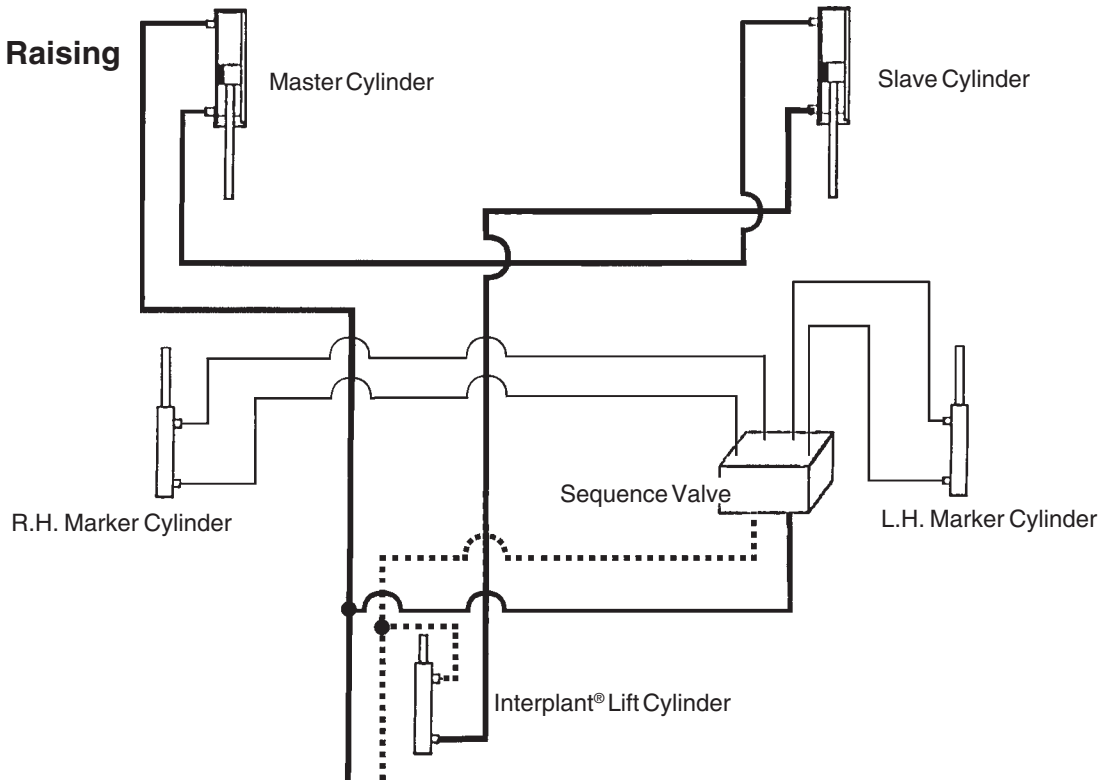
Return Oil
Pressure Oil ———

MAINTENANCE

HYDRAULIC SYSTEM SCHEMATIC (Equipped With Interplant® Self-Leveling Hitch Extension)

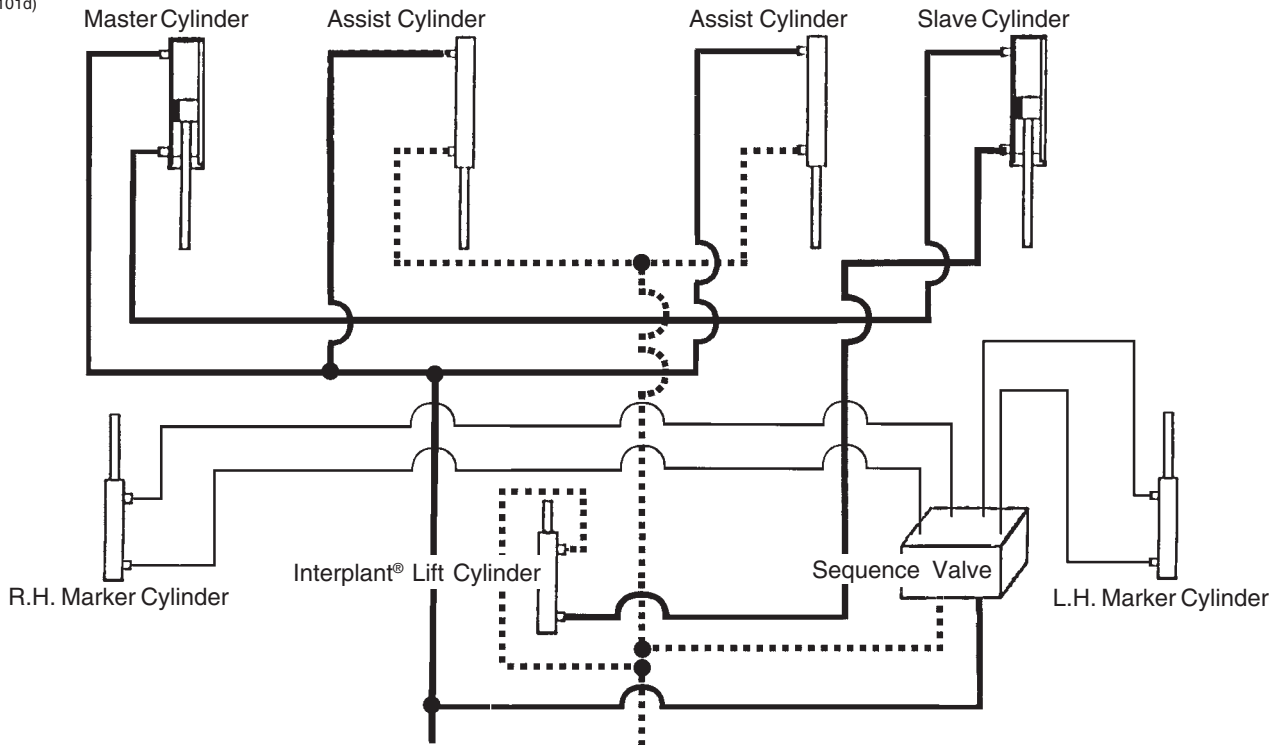
4 Row - Planter Raising

(INS99d)



6/8 Row - Planter Raising

(INS101d)

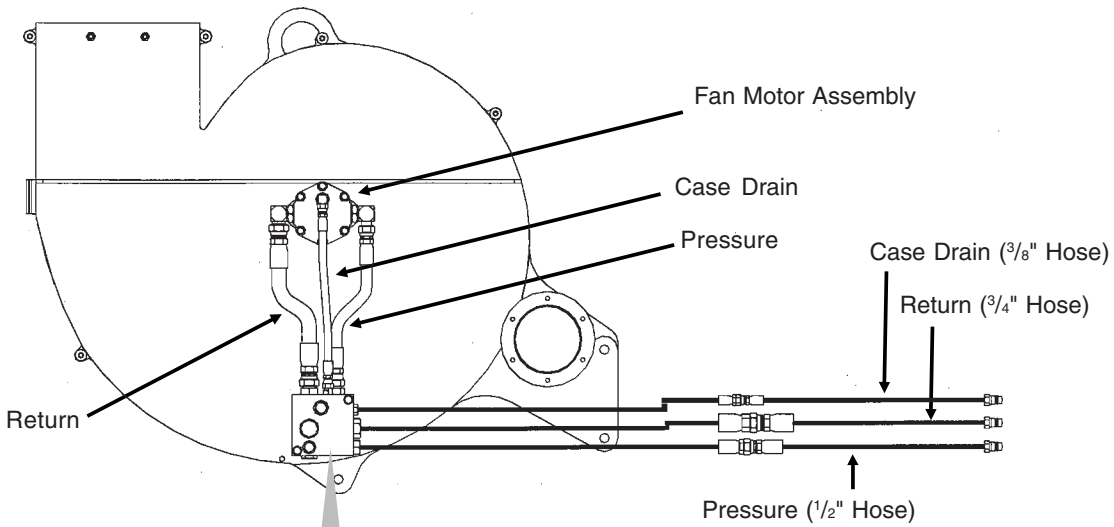


Return Oil
Pressure Oil ———

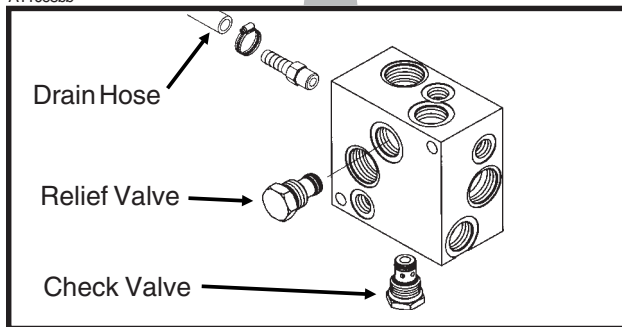
MAINTENANCE

HYDRAULIC DIAGRAM - VACUUM FAN MOTOR SYSTEM

(PT79)



A11068bb



Vacuum Fan Motor
Valve Block Assembly
(See Machine Operation
Section)

IMPORTANT: Connect hydraulic motor case drain to a case drain return line with zero pressure on the tractor. Failure to connect to a return with zero pressure will cause damage to the hydraulic motor. DO NOT connect hydraulic motor case drain to SCV outlet. Contact tractor manufacturer for specific details on “zero pressure return”.

MAINTENANCE

PARTS LIST INDEX

ROW UNIT

15" Seed Opener Disc Blade/Bearing Assembly And Scrapers	P5
Coulter Mounted Residue Wheels	P28
Covering Discs/Single Press Wheel	P8
Drag Closing Attachment	P11
Frame Mounted Coulter W/Residue Wheels	P30
Gauge Wheels	P6
Granular Chemical Banding Options	P19
Granular Chemical Hopper And Hopper Panel Extension	P16
Granular Chemical Meter And Meter Drive	P18
Hopper Support And Meter Drive	P12
Parallel Arms, Mounting Support Plate And Quick Adjustable Down Force Springs	P4
Row Unit Mounted Bed Leveler	P22
Row Unit Mounted Disc Furrower	P24
Row Unit Mounted No Till Coulter	P21
Row Unit Mounted Residue Wheel	P26
Seed Hopper And Lid	P13
Seed Meter	P14
Shank Assembly, Seed Tube And Depth Adjustment	P2
Spring Tooth Incorporator	P20
"V" Closing Wheels	P10

EDGEVAC® SYSTEM

Digital Vacuum Gauge, Analog Vacuum Gauge And Vacuum Fan Assembly	P34
Manifolds And Distribution Hoses	P40
Optional Flow Control Needle Valve Components	P38
Vacuum Fan Hydraulic Components	P36
Vacuum Fan Hydraulic Motor Assembly	P38
Vacuum Fan Motor Valve Block Assembly (Located Below Vacuum Fan Assembly)	P39

BASE MACHINE

Contact Wheel And Arm Assembly	P46
Cylinders	P58
Driveline	P48
Electrical Components And SMV Sign	P70
Hitch And Frame Assembly	P42
Hydraulic System	P64
Row Marker Assemblies	P52
Row Marker Sequencing/Flow Control Valve	P62
Row Marker Spindle/Hub/Blade	P56
Safety Chain	P42
Seed Rate Transmission Assembly	P50
Transport And Ground Drive Wheel Assembly	P44

ELECTRONIC SEED MONITOR

KPM I Electronic Seed Monitor	P72
KPM II Stack-Mode Electronic Seed Monitor	P74
KPM III Electronic Seed Monitor	P76

INTERPLANT® SYSTEM

Interplant® Push Row Unit	P32
Interplant® Push Row Unit Drive	P78
Interplant® Self-Leveling Hitch Extension	P80

FERTILIZER

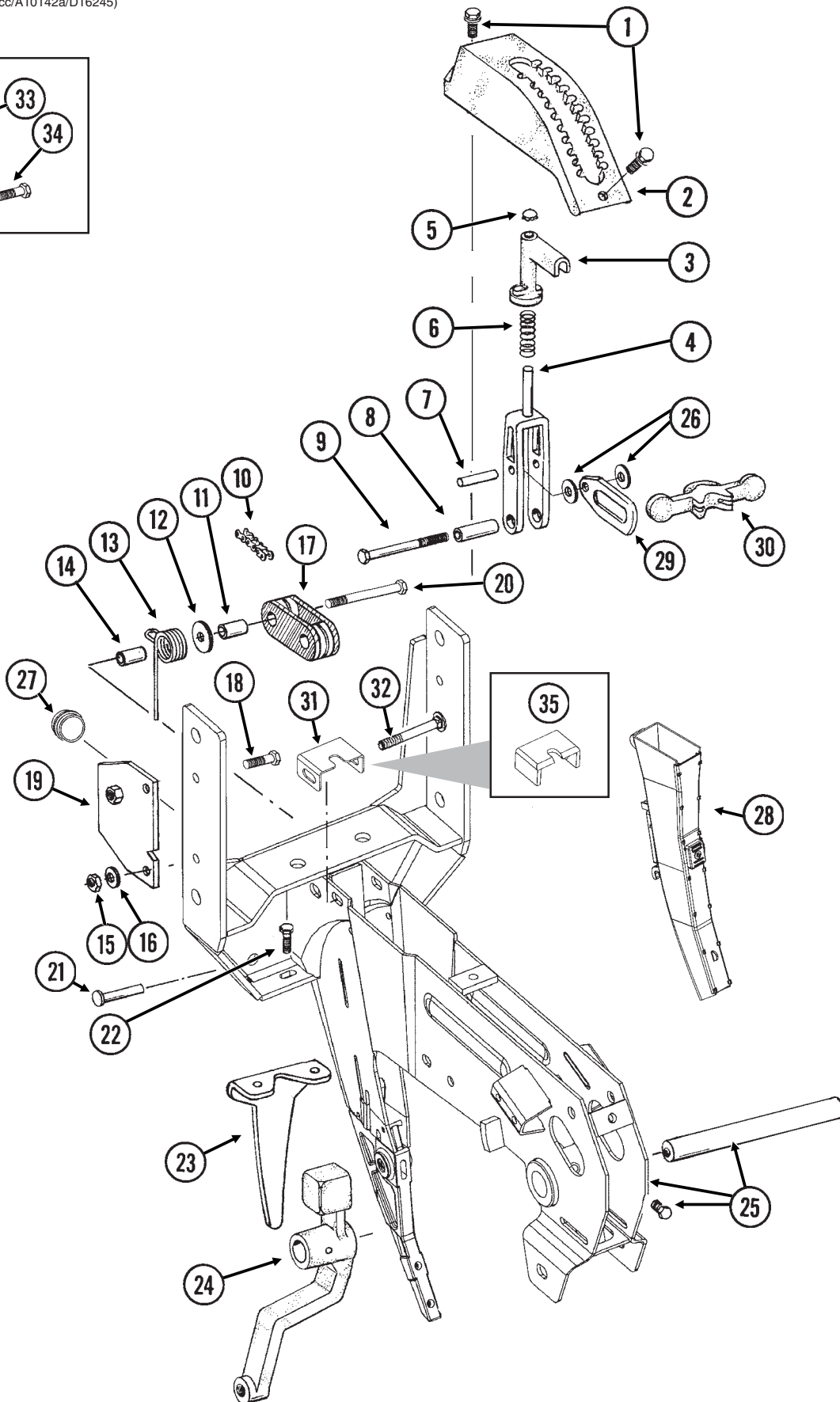
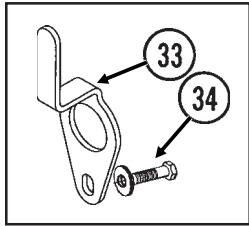
Dry Fertilizer	P94
Fertilizer Openers, Mounts And Attachments	P82
Liquid Fertilizer	P100

Decals, Paint And Miscellaneous	P117
---------------------------------------	------

Numerical Index	P121
-----------------------	------

SHANK ASSEMBLY, SEED TUBE AND DEPTH ADJUSTMENT

(D17014/METR29cc/A10142a/D16245)

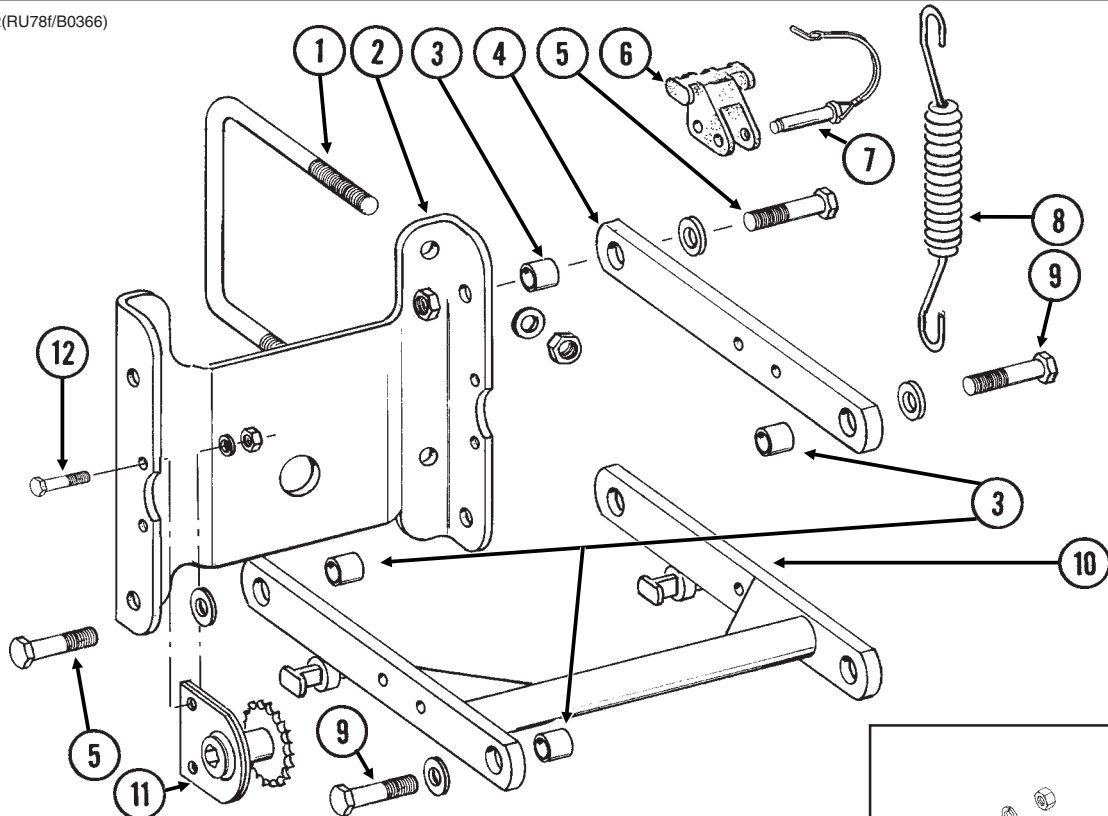


SHANK ASSEMBLY, SEED TUBE AND DEPTH ADJUSTMENT

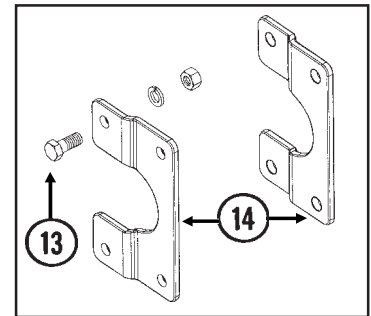
ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
1.	G11015	2	Hex Washer Head Cap Screw, 3/8"-16 x 1 1/4"
2.	GB0274	1	Cover, Depth Adjustment
3.	GB0266	1	Handle, Depth Adjustment
4.	GB0267	1	Lever, Depth Adjustment
5.	GD3612	1	Cap Plug
6.	GD10993	1	Spring
7.	GD13361	1	Pin, 3/8" x 1 2/3"
8.	GD11259	1	Sleeve, 3/8" 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.	G3303-108	1	Chain, No. 41, 108 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.	G10210	1	Washer, 3/8" USS
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.		-	Wheel Arm, 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 13/32" 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 P72-P77
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.	GD17014	1	Hose Protector
34.	G10047	1	Hex Head Cap Screw, 3/8"-16 x 1 3/4"
	G10203	2-3	Washer, 3/8" SAE
	G10108	1	Lock Nut, 3/8"-16
35.	GD16245	-	Sun Shade (Rubber)

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

RUB021/RUB022(RU78/B0366)

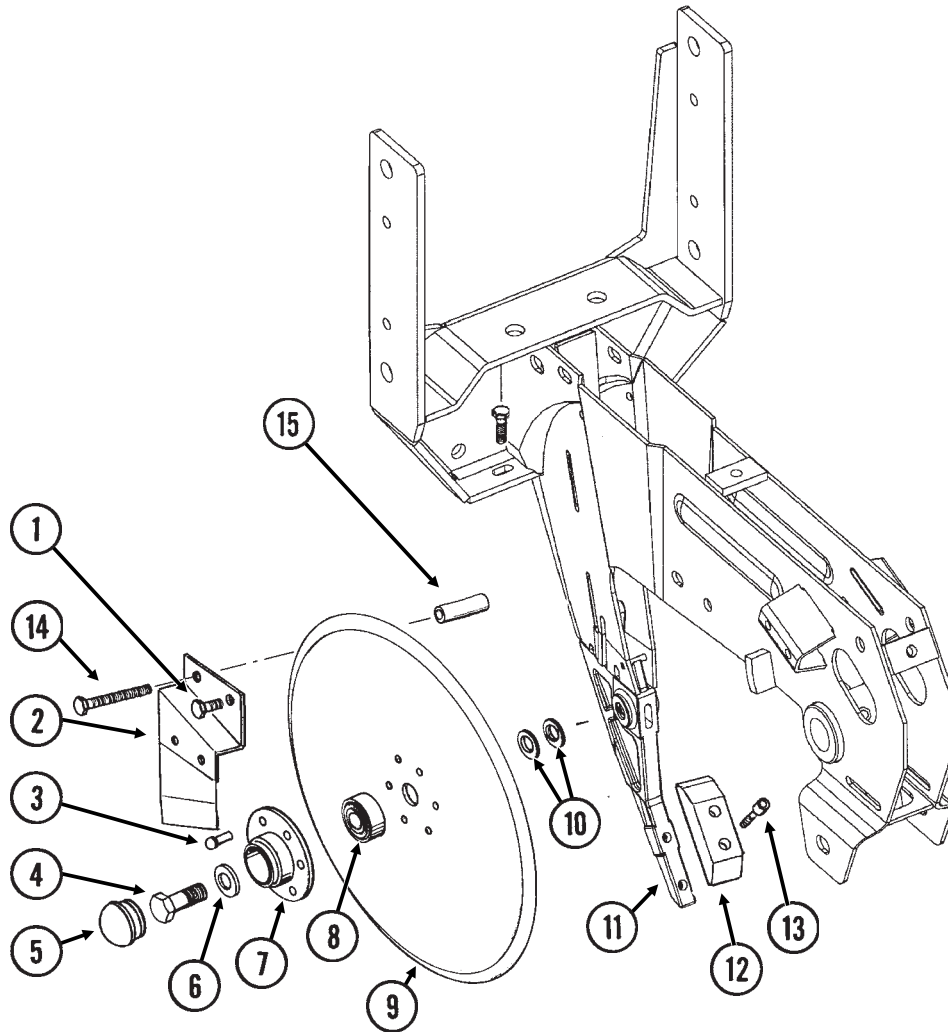


ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
1.	GD1114	2	U-Bolt, 7" x 7" x 5/8"-11
	G10230	4	Lock Washer, 5/8"
	G10104	4	Hex Nut, 5/8"-11
2.	GD10036	1	Mounting Support Plate
3.	GB0218	4	Bushing, 21/32" I.D. x 7/8" O.D. x 19/32" Long
4.	GD11422	2	Upper Parallel Arm
5.	G10732	4	Hex Head Cap Screw, 5/8"-18 x 2"
	GD7805	4	Special Washer, 5/8", Hardened
	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.	G10007	4	Hex Head Cap Screw, 5/8"-11 x 1 1/2"
	G10230	4	Lock Washer, 5/8"
	G10104	4	Hex Nut, 5/8"-11
14.	GB0366	2	Extension Bracket
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

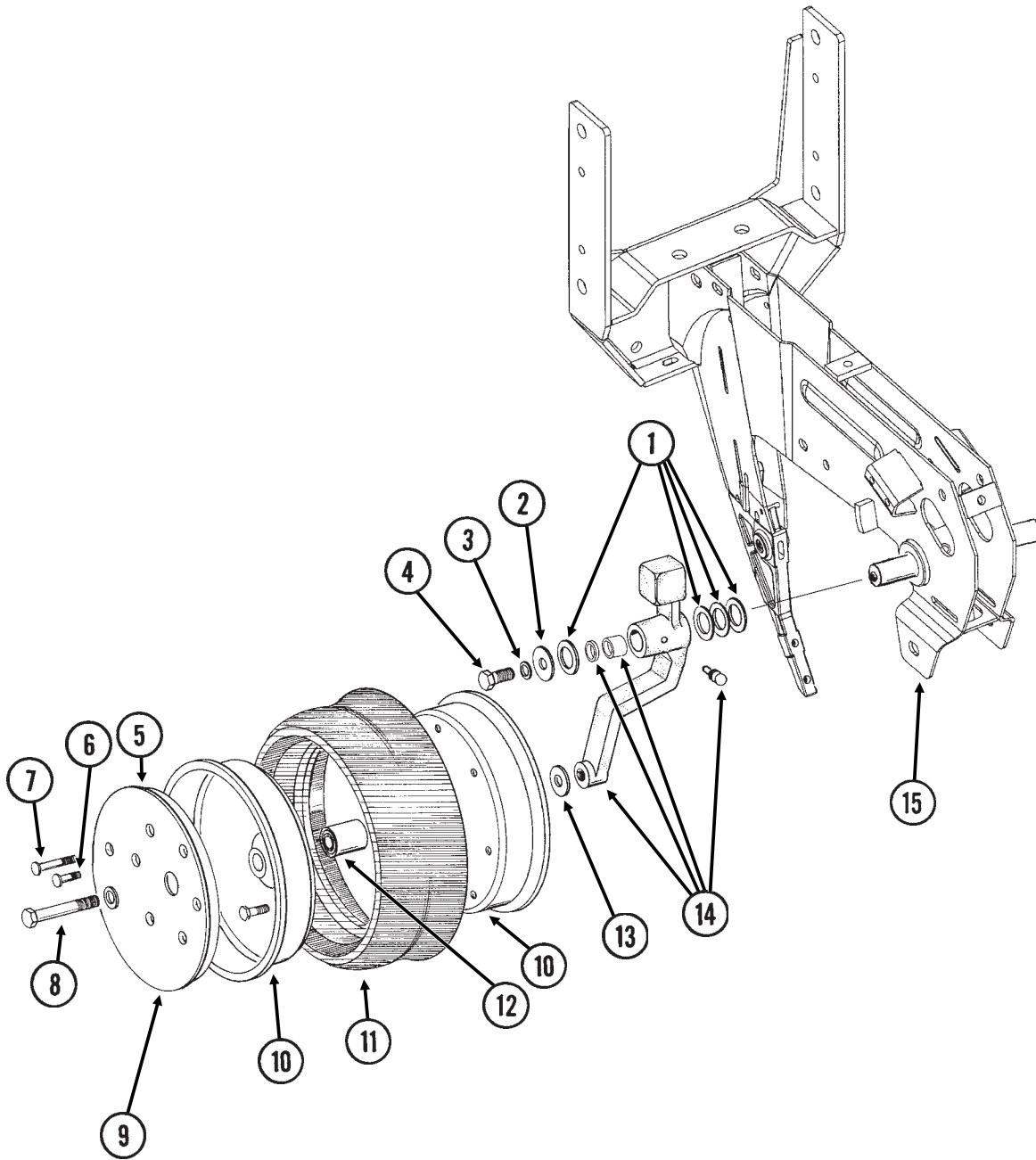
(RU139)



ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
1.	G10328	2	Hex Head Cap Screw, $\frac{3}{8}$ "-16 x $\frac{5}{8}$ "
	G10622	2	Serrated Flange Nut, $\frac{3}{8}$ "-16
2.	GA2012R	1	Disc Scraper, R.H.
	GA2012L	-	Disc Scraper, L.H. (Shown)
3.	G10427	12	Rivet, $\frac{1}{4}$ " x $\frac{1}{2}$ "
4.	GD11017	1	Special Hex Head Cap Screw, $\frac{5}{8}$ "-11 x 1 $\frac{1}{2}$ ", L.H. Threads
	G10007	1	Hex Head Cap Screw, $\frac{5}{8}$ "-11 x 1 $\frac{1}{2}$ "
5.	GD11845	2	Dust Cap
6.	G10204	2	Special Machine Bushing, $\frac{5}{8}$ " 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, $\frac{5}{8}$ " (.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, $\frac{5}{16}$ "-18 x 1", Grade 8
14.	G10325	1	Hex Head Cap Screw, $\frac{3}{8}$ "-16 x 2 $\frac{3}{4}$ "
	G10622	1	Serrated Flange Nut, $\frac{3}{8}$ "-16
15.	GD11259	1	Sleeve, $\frac{3}{8}$ " I.D. x $\frac{5}{8}$ " O.D. x 1 $\frac{25}{32}$ " Long
A.	GA8324	-	Disc Blade/Bearing Assembly, Less Dust Cap (Items 3 And 7-9)

GAUGE WHEELS

(RU140)

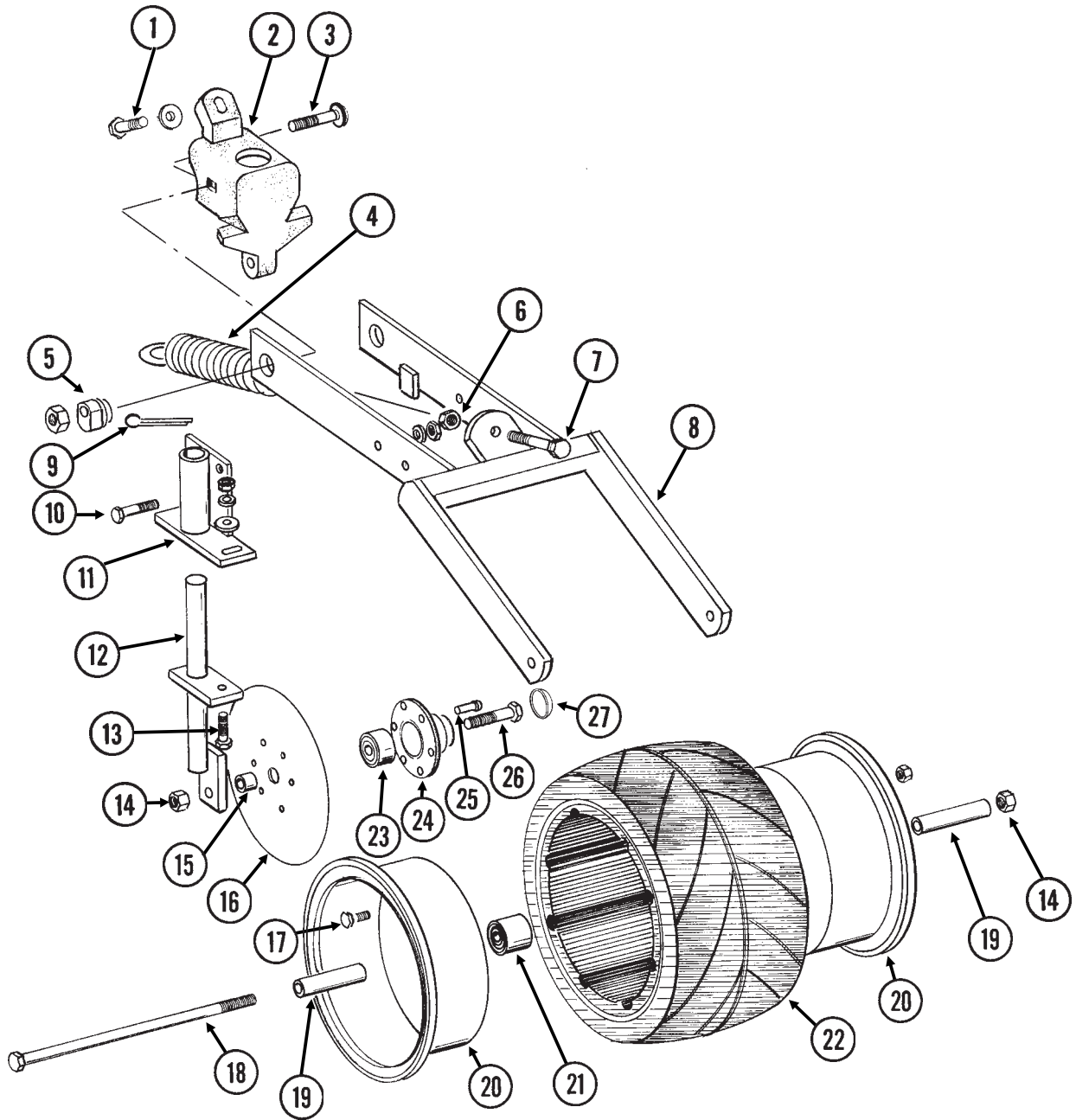


GAUGE WHEELS

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)

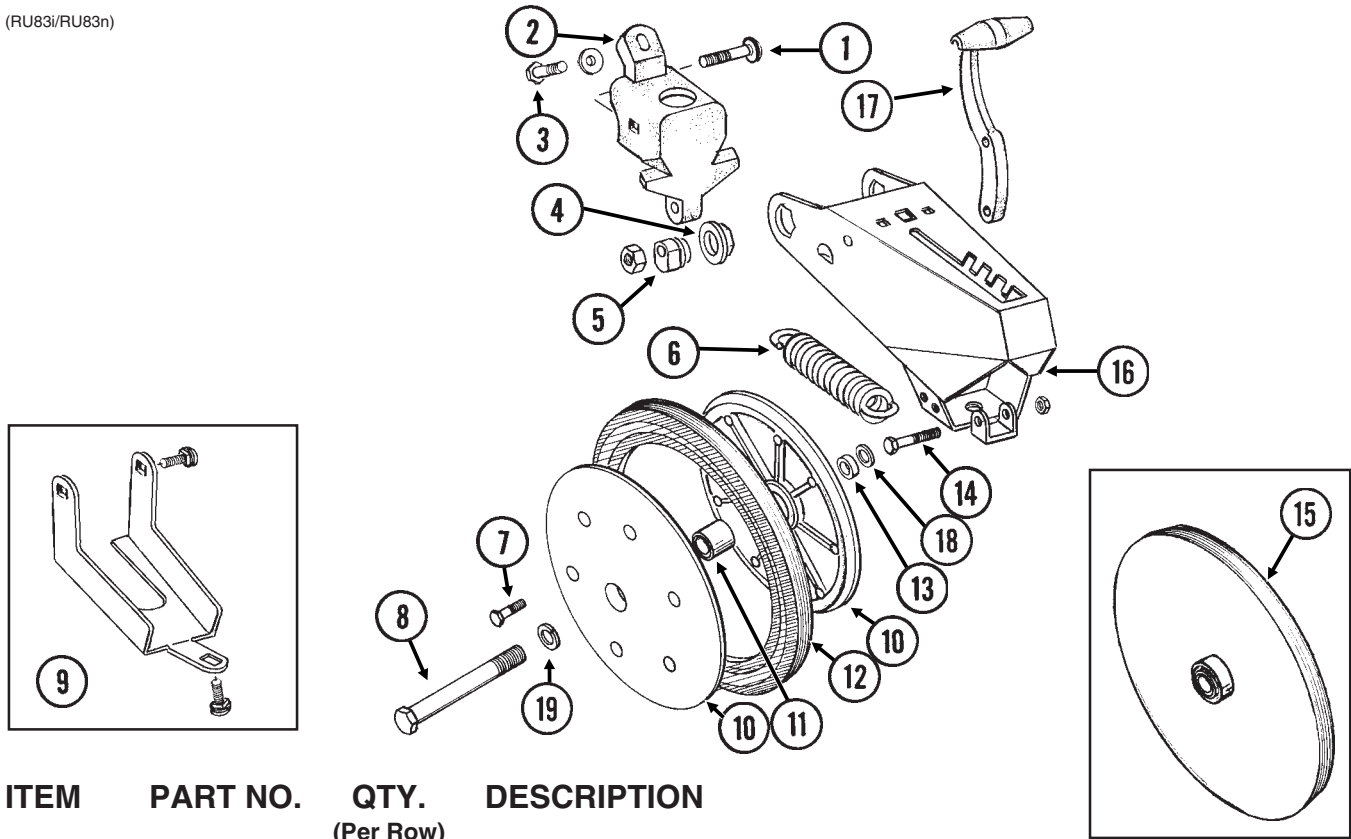


COVERING DISCS/SINGLE PRESS WHEEL

ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
1.	G10001	1	Hex Head Cap Screw, $\frac{3}{8}$ "-16 x 1"
	G10210	1	Washer, $\frac{3}{8}$ " USS
2.	GB0268	1	Wheel Arm Stop
3.	G10801	2	Carriage Bolt, $\frac{1}{2}$ "-13 x 2 $\frac{1}{4}$ "
	G10315	-	Carriage Bolt, $\frac{1}{2}$ "-13 x 2 $\frac{1}{2}$ " (Used W/Straight Drop In-Furrow Granular Chemical Bracket)
	G10102	2	Hex Nut, $\frac{1}{2}$ "-13
4.	GA2054	1	Spring
5.	GB0239	2	Eccentric Bushing
6.	G10102	1	Hex Nut, $\frac{1}{2}$ "-13
7.	G10015	1	Adjusting Bolt, $\frac{1}{2}$ "-13 x 5"
8.	GA6619	1	Mounting Arm
9.	G10463	2	Cotter Pin, $\frac{1}{4}$ " x 1 $\frac{1}{2}$ "
10.	G10171	4	Hex Head Cap Screw, $\frac{5}{16}$ "-18 x 1 $\frac{1}{4}$ "
	G10232	4	Lock Washer, $\frac{5}{16}$ "
	G10106	4	Hex Nut, $\frac{5}{16}$ "-18
11.	GA6620	2	Bracket
12.	GA6618	2	Mount
13.	G10303	2	Carriage Bolt, $\frac{5}{16}$ "-18 x 1"
	G10219	2	Washer, $\frac{5}{16}$ " USS
	G10232	2	Lock Washer, $\frac{5}{16}$ "
	G10106	2	Hex Nut, $\frac{5}{16}$ "-18
14.	G10107	3	Lock Nut, $\frac{5}{8}$ "-11
15.	GD1109	2	Bushing, $\frac{41}{64}$ " I.D. x $\frac{7}{8}$ " O.D. x $\frac{1}{4}$ " Long
16.	GD9290	2	Disc Blade, 8"
17.	G10018	7	Hex Head Cap Screw, $\frac{5}{16}$ "-18 x $\frac{5}{8}$ "
	G10109	7	Lock Nut, $\frac{5}{16}$ "-18, Grade 8
18.	G10152	1	Hex Head Cap Screw, $\frac{5}{8}$ "-11 x 9"
19.	GD3180-12	2	Sleeve, $\frac{5}{8}$ " I.D. x $\frac{7}{8}$ " O.D. x 2 $\frac{7}{8}$ " 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, $\frac{1}{4}$ " x $\frac{1}{2}$ "
26.	G10006	2	Hex Head Cap Screw, $\frac{5}{8}$ "-11 x 2 $\frac{1}{4}$ "
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

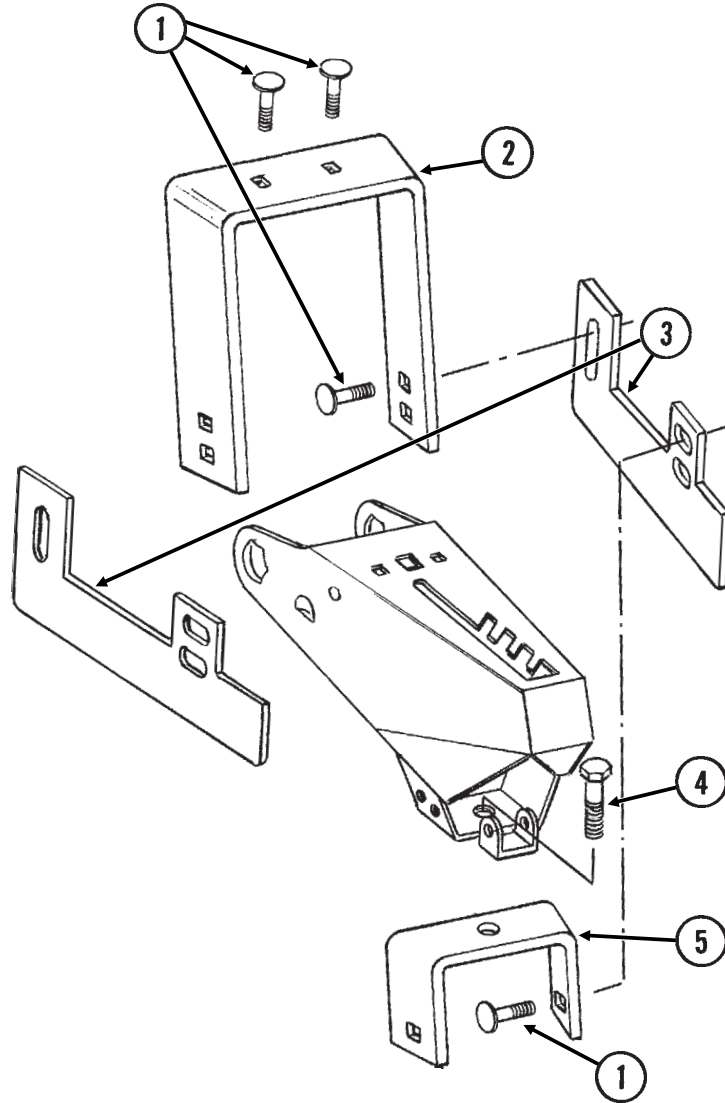
(RU83i/RU83n)



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"
	G10210	1	Washer, 3/8" USS
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"
	G10210	1	Washer, 3/8" USS
	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, 41/64" 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.	GD7805	2	Special Washer, 5/8", Hardened
19.	G10230	2	Lock Washer, 5/8"
A.	GA6434	-	Rubber Closing Wheel Complete W/Bearing (Items 7 And 10-12)

DRAG CLOSING ATTACHMENT

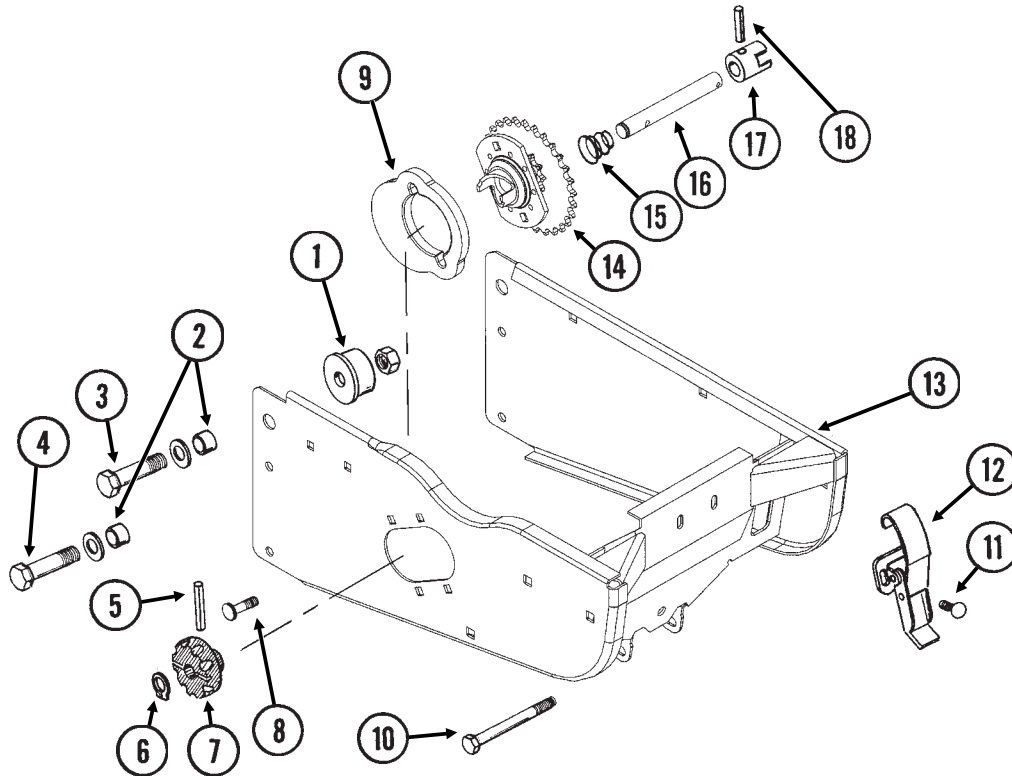
RUB050(RU90c)



ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Row)	
1.	G10599	6	Carriage Bolt, 3/8"-16 x 1 1/4"
	G10210	6	Washer, 3/8" USS
	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

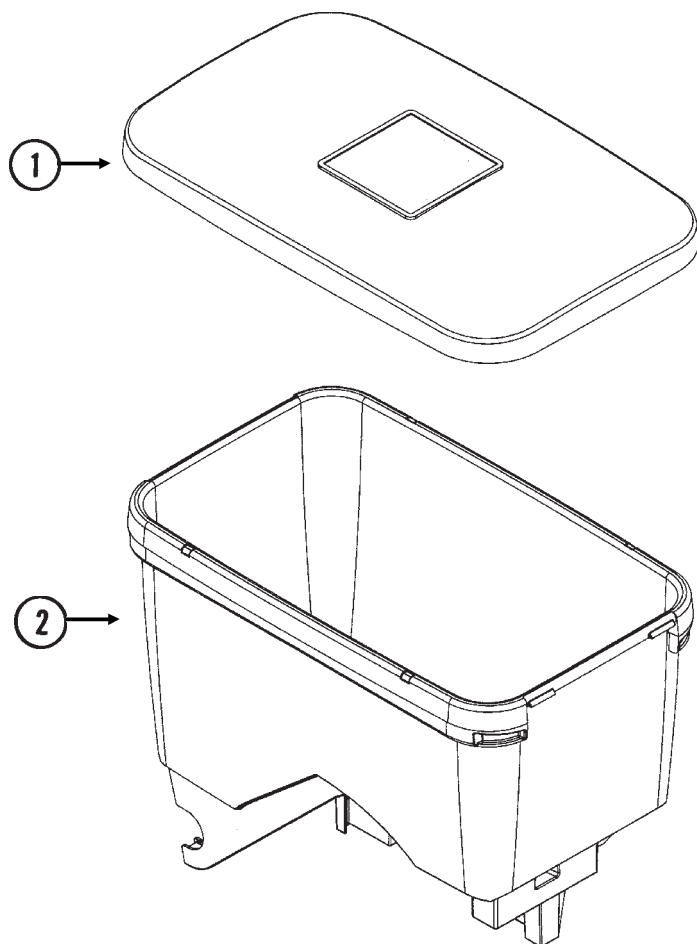
(METR72)



ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
1.	GB0314	2	Hopper Mount
2.	GB0218	4	Bushing, $\frac{21}{32}$ " I.D. x $\frac{7}{8}$ " O.D. x $\frac{19}{32}$ " Long
3.	G10752	2	Hex Head Cap Screw, $\frac{5}{8}$ "-18 x 2 $\frac{1}{4}$ "
	GD7805	2	Special Washer, $\frac{5}{8}$ ", Hardened
	G10412	2	Lock Nut, $\frac{5}{8}$ "-18
4.	G10751	2	Hex Head Cap Screw, $\frac{5}{8}$ "-18 x 1 $\frac{3}{4}$ "
	GD7805	2	Special Washer, $\frac{5}{8}$ ", Hardened
	G10412	2	Lock Nut, $\frac{5}{8}$ "-18
5.	G10602	1	Spring Pin, $\frac{1}{4}$ " x 1 $\frac{1}{2}$ "
6.	G10567	1	External Retaining Ring, $\frac{5}{8}$ "
7.	GD11239	1	Knob
8.	G10338	2	Carriage Bolt, $\frac{5}{16}$ "-18 x 1 $\frac{1}{4}$ "
	G10620	2	Serrated Flange Nut, $\frac{5}{16}$ "-18
9.	GB0331	1	Clutch Adapter Plate
10.	G10061	1	Hex Head Cap Screw, $\frac{3}{8}$ "-16 x 3 $\frac{1}{2}$ "
	G10210	2	Washer, $\frac{3}{8}$ " USS
	G10108	1	Lock Nut, $\frac{3}{8}$ "-16
11.	G10309	2	Carriage Bolt, $\frac{1}{4}$ "-20 x $\frac{5}{8}$ ", Grade 2
	G10621	2	Serrated Flange Nut, $\frac{1}{4}$ "-20
12.	GA2007	1	Hopper Hold Down Latch
13.	GA10155	1	Hopper Support
14.	GA12143	1	Double Sprocket And Bearing, Drive Clutch, 11/28 Tooth
15.	GD11413	1	Spring
16.	GD15747	1	Shaft
17.	GB0278	1	Coupler
18.	G10546	1	Spring Pin, $\frac{3}{16}$ " x 1 $\frac{1}{4}$ "
A.	GA12144	-	Meter Drive Assembly, 11/28 Tooth (Items 5-7 And 14-18)

SEED HOPPER AND LID

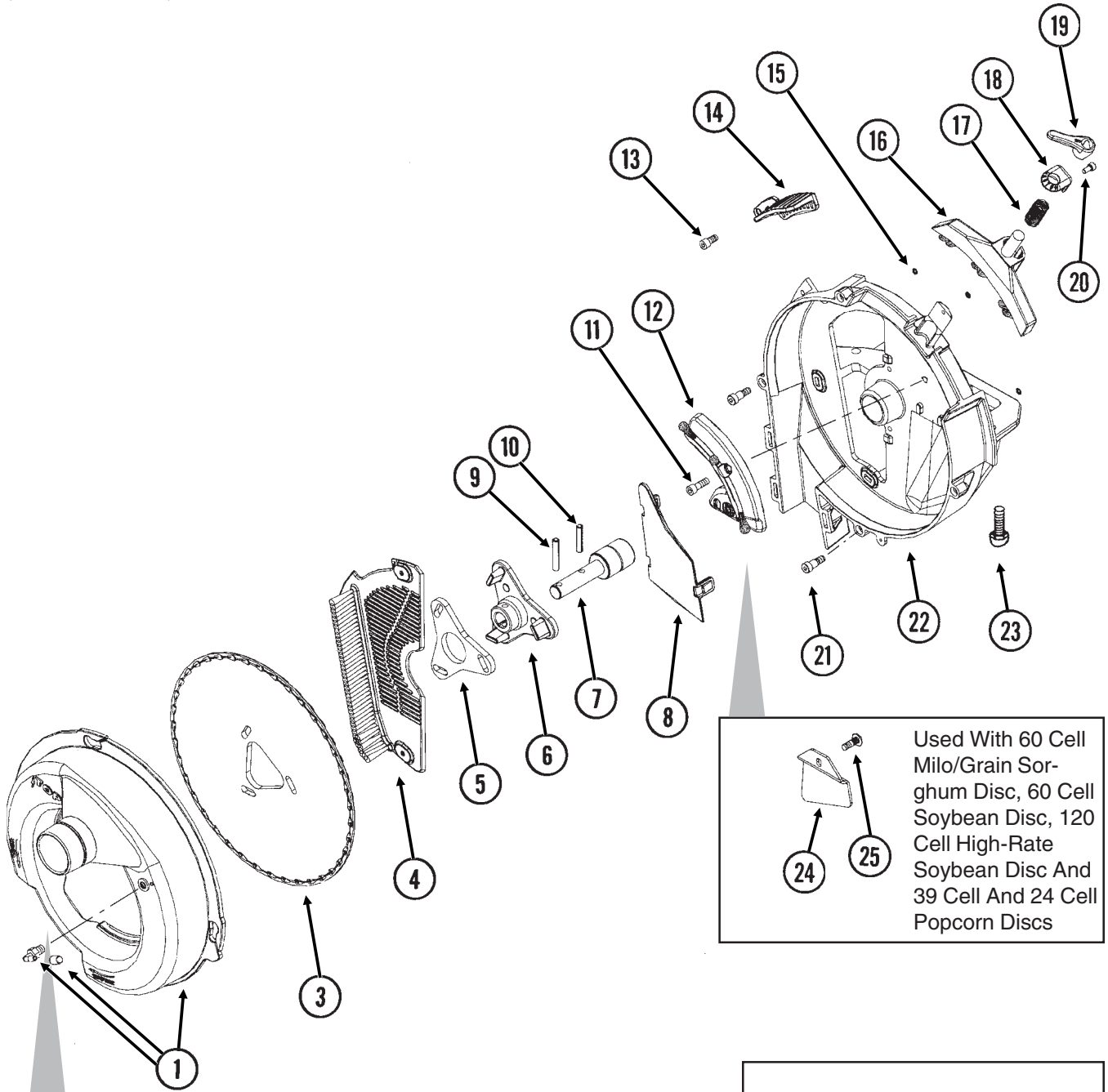
(METR12)



ITEM	PART NO.	QTY.	DESCRIPTION
1.	GD11279	1	Lid
2.	GA10634	1	Seed Hopper

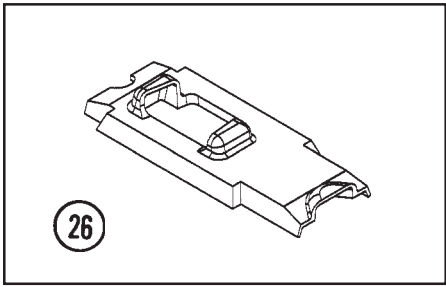
SEED METER

(METR69/METR65/A12133)



Used With 60 Cell Milo/Grain Sorghum Disc, 60 Cell Soybean Disc, 120 Cell High-Rate Soybean Disc And 39 Cell And 24 Cell Popcorn Discs

<p>2</p>	<p>Used With 60 Cell Milo/Grain Sorghum Disc</p>
<p>27</p>	<p>Used With 20 Cell Hill-Drop Acid-Delinted Cotton Disc And 54 Cell Acid-Delinted Cotton/ Small Dry Edible Bean Disc</p>

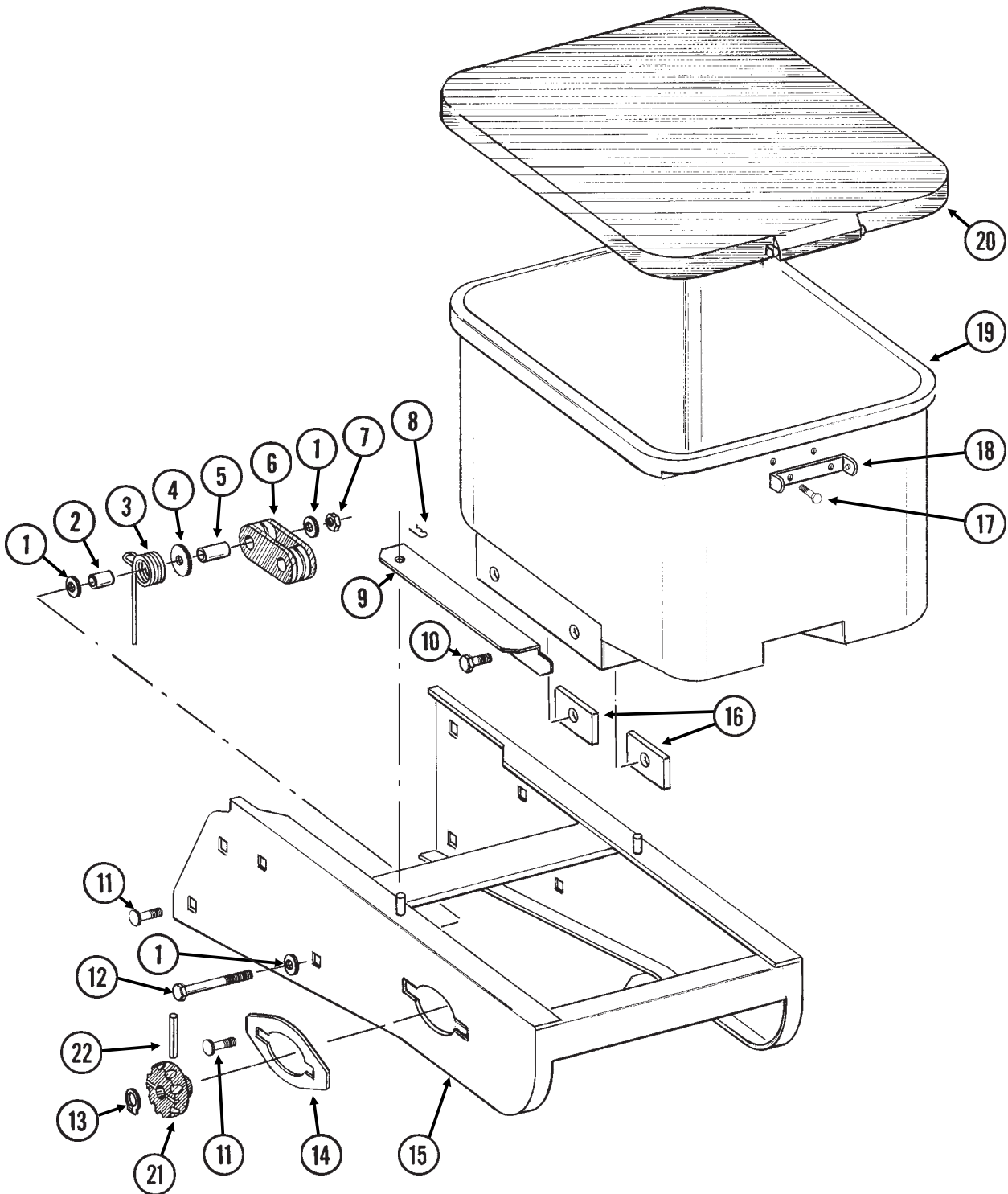


SEED METER

ITEM	PART NO.	QTY.	DESCRIPTION
1.	GA11911	1	Vacuum Cover W/Elbow And Cap
	GD17099	-	³ / ₁₆ " Hose Barb Elbow
	GD17152	-	Cap
2.	GA12133	1	Cleanout Brush (Used With 60 Cell Milo/Grain Sorghum Disc)
3.	GD17049	-	Seed Disc, Corn/Popcorn, 39 Cell, Light Blue Color-Coded
	GD17048	-	Seed Disc, Low-Rate Corn/Popcorn, 24 Cell, Light Green Color-Coded
	GD14467	-	Seed Disc, Soybean, 60 Cell, Black Color-Coded
	GD14468	-	Seed Disc, High-Rate Soybean, 120 Cell, Dark Blue Color-Coded
	GD17050	-	Seed Disc, Milo/Grain Sorghum, 60 Cell, Yellow Color-Coded
	GD17187	-	Seed Disc, Hill-Drop Cotton, Acid-Delinted, 20 Cell (3 Seeds Per Cell), Brown Color-Coded
	GD17186	-	Seed Disc, Cotton, Acid-Delinted/Small Dry Edible Bean, 54 Cell, Dark Green Color-Coded
	GD14477	-	Seed Disc, Large Dry Edible Bean, 54 Cell, Tan Color-Coded
4.	GD17028	1	Wall Brush/Vent
5.	GD17021	1	Foam Spacer
6.	GB0328	1	Mount
7.	GA5698	1	Bearing
8.	GD14541	1	Discharge Cover
9.	G10602	1	Spring Pin, ¹ / ₄ " x 1 ¹ / ₂ "
10.	G10603	1	Spring Pin, ¹ / ₄ " x 1 ¹ / ₄ "
11.	G11213	1	Hex Socket Head Cap Screw, ¹ / ₄ "-20 x ³ / ₄ "
12.	GA11935	1	Crowder Brush
13.	G10260	1	Hex Socket Head Cap Screw, ¹ / ₄ "-20 x ¹ / ₂ "
14.	GD17047	1	Air Inlet Screen
15.	GD17162	3	Push Nut, ¹ / ₈ " I.D.
16.	GA10755	1	Singulator Brush
17.	GD14592	1	Spring
18.	GB0358	1	Cap
19.	GD15663	1	Brush Adjustment Lever
20.	G11173	1	Hex Socket Head Cap Screw, No. 10-24 x ³ / ₈ ", Stainless Steel
21.	G11172	4	Hex Socket Head Shoulder Screw, ¹ / ₄ "-20 x ³ / ₈ ", Stainless Steel
22.	GB0319	1	Housing
23.	G11009	2	Locking Thumbscrew, ⁵ / ₁₆ "-18 x ³ / ₄ "
	G10232	2	Lock Washer, ⁵ / ₁₆ " (SDS Planters)
24.	GD17104	1	Seed Baffle (Used With 60 Cell Milo/Grain Sorghum Disc, 60 Cell Soybean Disc, 120 Cell High-Rate Soybean Disc And 39 Cell And 24 Cell Popcorn Discs)
25.	G11210	1	Rib Neck Bolt, ¹ / ₄ "-20 x ³ / ₄ "
	G10323	1	Hex Flange Nut, ¹ / ₄ "-20, No Serration
26.	GD15700	1	Shank Cover, EdgeVac [®] Meter
27.	GA12154	-	Cleanout Brush W/Ball-Type Ejector (Used With 20 Cell Hill-Drop Acid-Delinted Cotton Disc And 54 Cell Acid-Delinted Cotton/Small Dry Edible Bean Disc)

GRANULAR CHEMICAL HOPPER AND HOPPER PANEL EXTENSION

(METR14d)

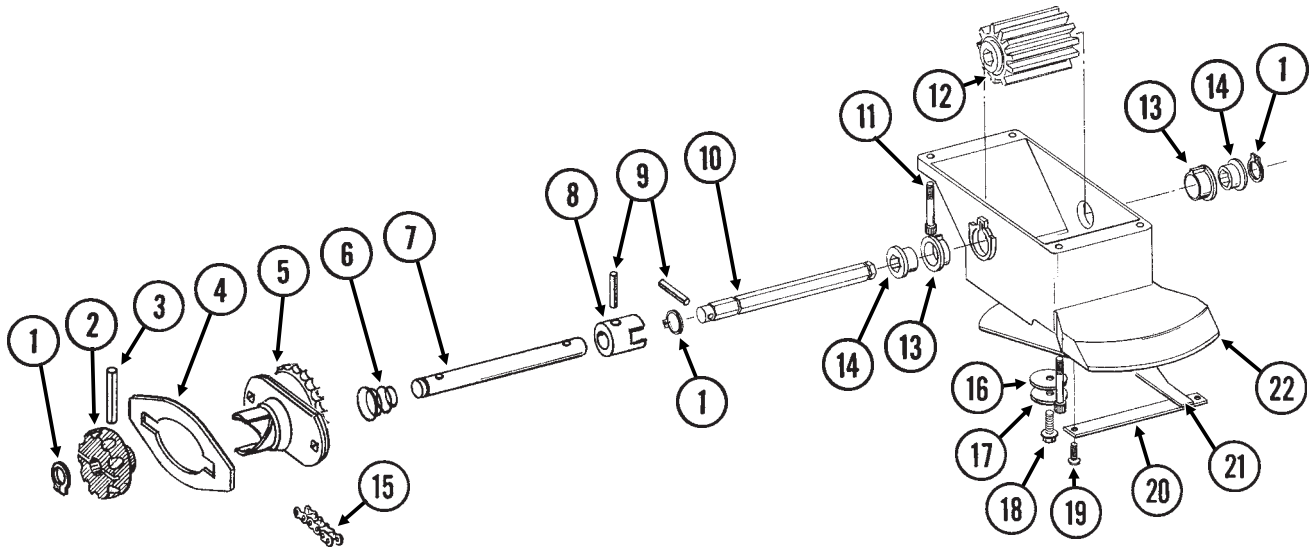


GRANULAR CHEMICAL HOPPER AND HOPPER PANEL EXTENSION

ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
1.	G10210	3	Washer, $\frac{3}{8}$ " USS
2.	GD2971-10	1	Sleeve, $\frac{9}{16}$ " Long
3.	GD11219	1	Spring
4.	G10201	1	Special Washer, $\frac{3}{8}$ " x 1 $\frac{1}{2}$ " O.D.
5.	GD1026	1	Sleeve, 1 $\frac{3}{16}$ " Long
6.	GD11962	1	Idler
7.	G10108	1	Lock Nut, $\frac{3}{8}$ "-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, $\frac{3}{8}$ "-16 x $\frac{3}{4}$ "
	G10229	4	Lock Washer, $\frac{3}{8}$ "
11.	G10312	8	Carriage Bolt, $\frac{5}{16}$ "-18 x $\frac{3}{4}$ "
	G10620	8	Serrated Flange Nut, $\frac{5}{16}$ "-18
12.	G10325	1	Hex Head Cap Screw, $\frac{3}{8}$ "-16 x 2 $\frac{3}{4}$ "
13.	G10567	3	External Retaining Ring, $\frac{5}{8}$ "
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, $\frac{1}{4}$ "-20 x $\frac{3}{4}$ "
	G10621	2	Serrated Flange Nut, $\frac{1}{4}$ "-20
18.	GD1060	1	Hinge
19.	GA8371	1	Hopper
20.	GA4444	1	Lid
21.	GD11239	1	Knob
22.	G10602	1	Spring Pin, $\frac{1}{4}$ " x 1 $\frac{1}{2}$ "

GRANULAR CHEMICAL METER AND METER DRIVE

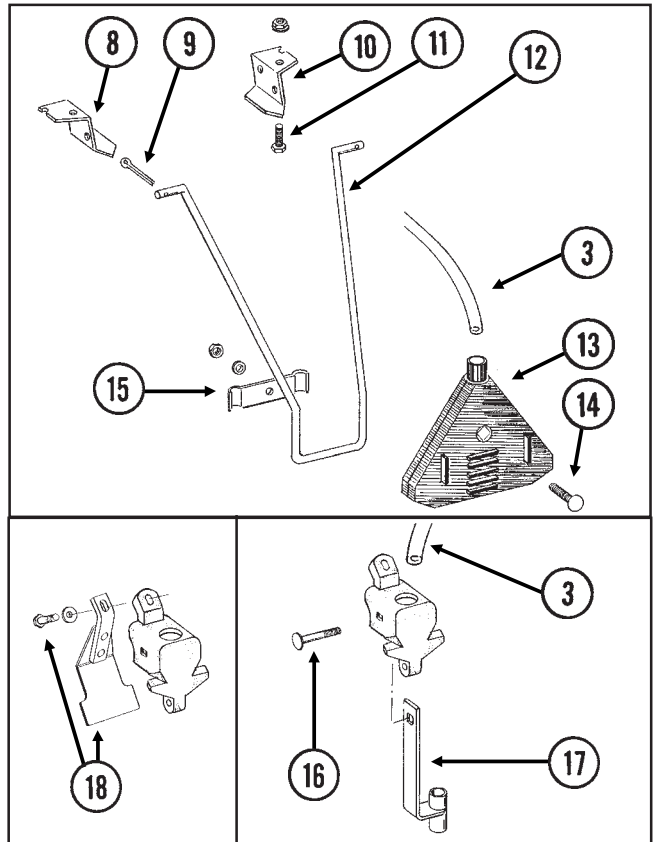
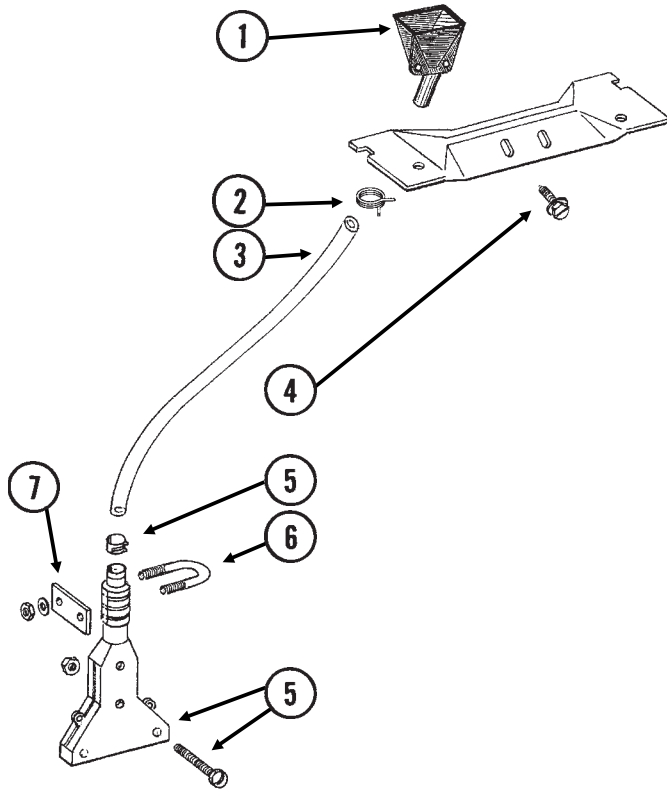
RUA051/RUB028(RU91a)



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.	G3303-108	1	Chain, No. 41, 108 Pitch Including Connector Link
	GR0196	1	Connector Link, No. 41
16.	G10660	1	Wave Washer, 1/2"
17.	G10209	1	Washer, 1/4" USS
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

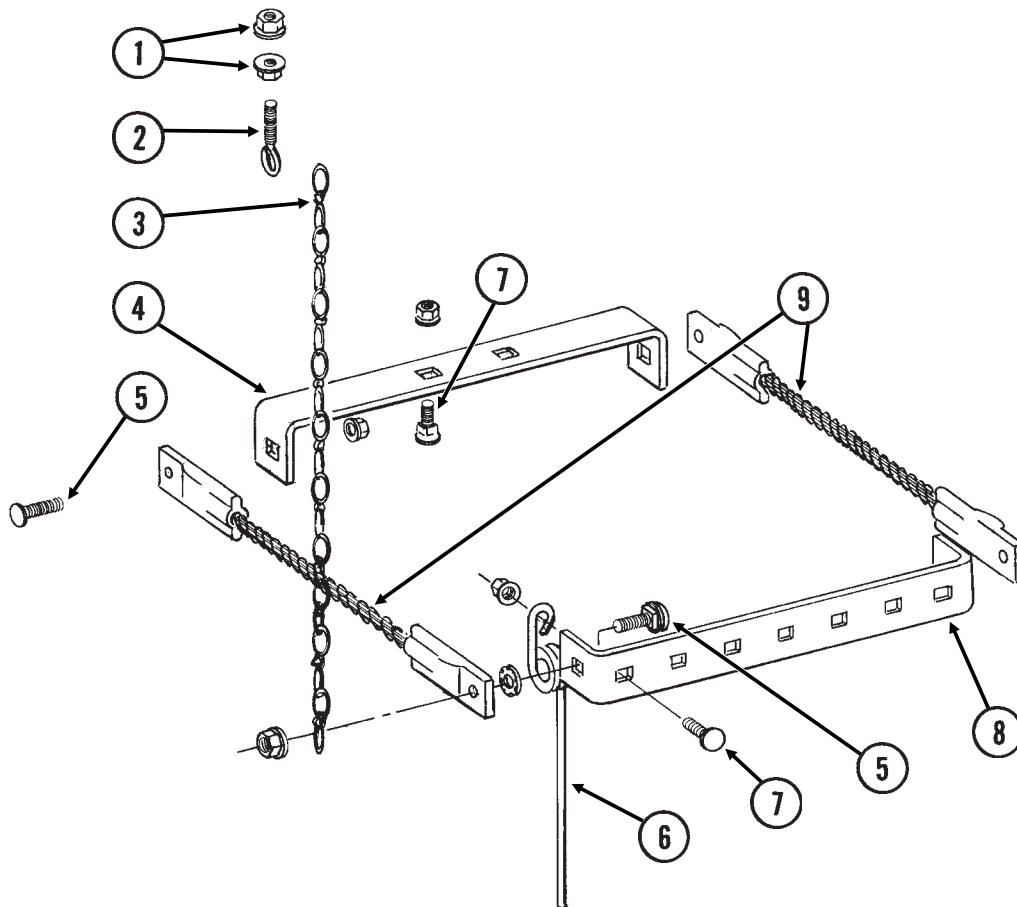
RUA061/RUA073(RU101mm/RU83m)



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
	G10209	2	Washer, 1/4" USS
	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"
	GD14659	1	Special Washer, 3/8", Hardened

SPRING TOOTH INCORPORATOR

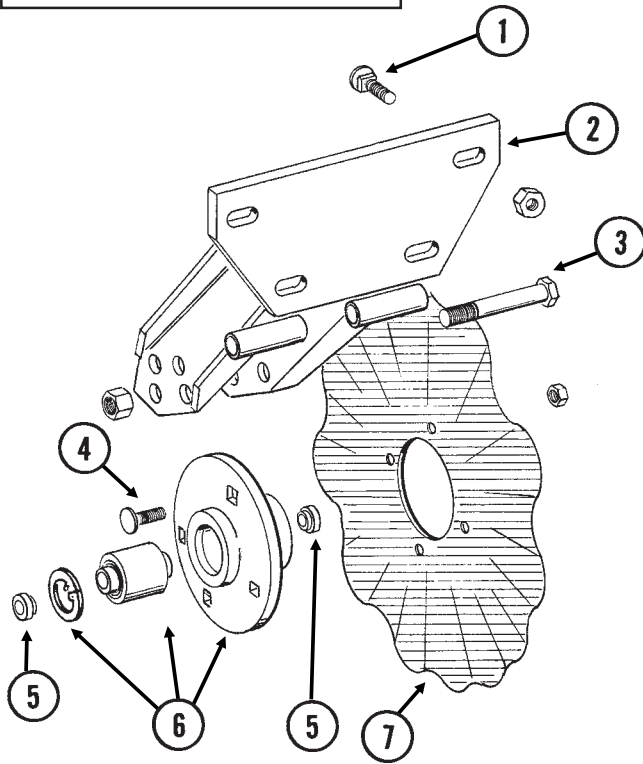
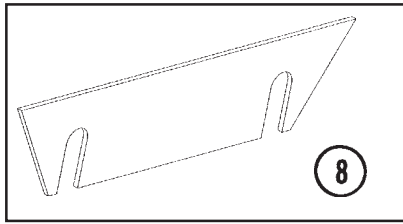
RUA055(RU95)



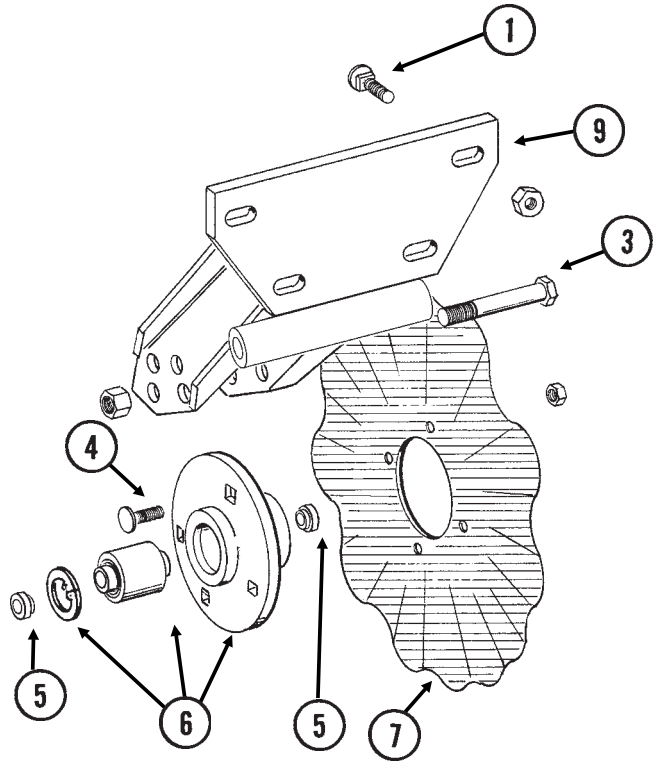
ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
1.	G10621	4	Serrated Flange Nut, 1/4"-20
2.	GD2460	2	Eyebolt, 1/4"-20
3.	G3305-01	4	Twin Loop Chain, 9 Links
4.	GD1143	1	Front Bracket
5.	G10305	4	Carriage Bolt, 3/8"-16 x 1"
	G10529	4	External Tooth Lock Washer, 3/8"
	G10622	4	Serrated Flange Nut, 3/8"-16
6.	GD1145	7	Spring Tooth
7.	G10308	9	Carriage Bolt, 3/8"-16 x 3/4"
	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

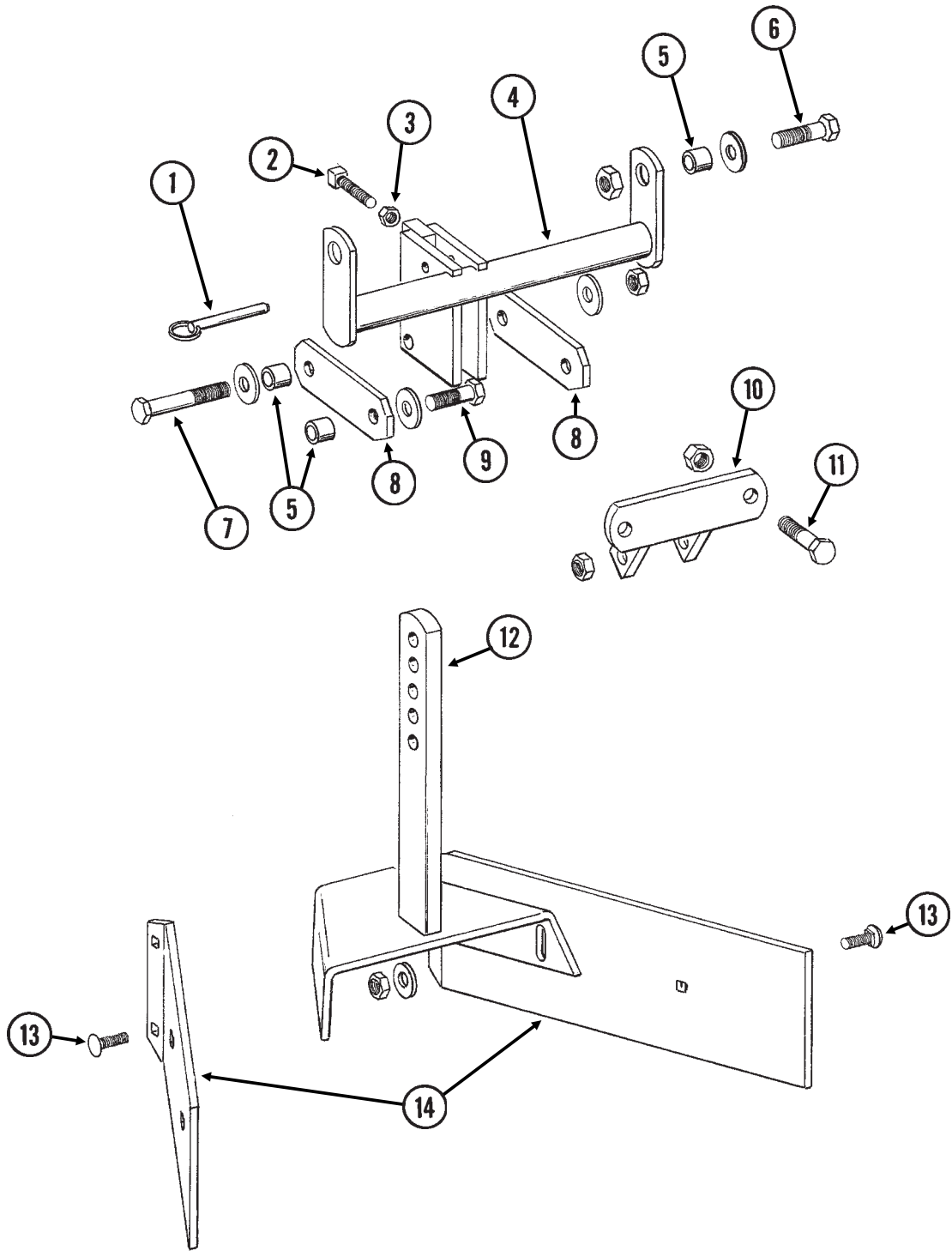


STYLE B

ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
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	-
9.	GA11520	1	Arm (Style B)

ROW UNIT MOUNTED BED LEVELER

RUA059/RUA060(RU99/RU100)

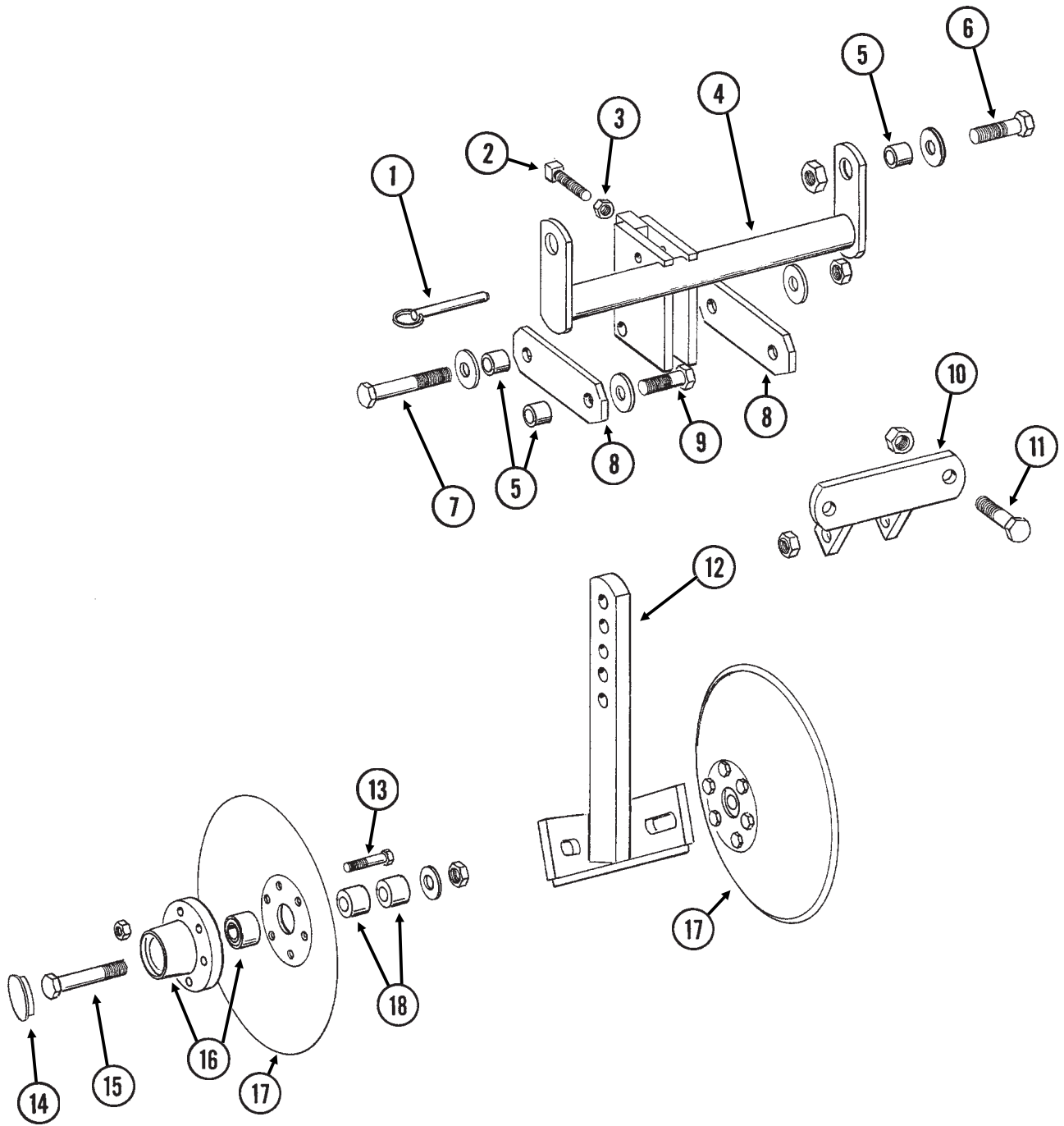


ROW UNIT MOUNTED BED LEVELER

ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
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"
	GD14674	2	Special Washer, 1/2", Hardened
	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"
	G10219	4	Washer, 5/16" USS
	G10109	6	Lock Nut, 5/16"-18, Grade 8
14.	GD8266	2	Blade

ROW UNIT MOUNTED DISC FURROWER

RUA059/RUA058(RU99/RU98g)

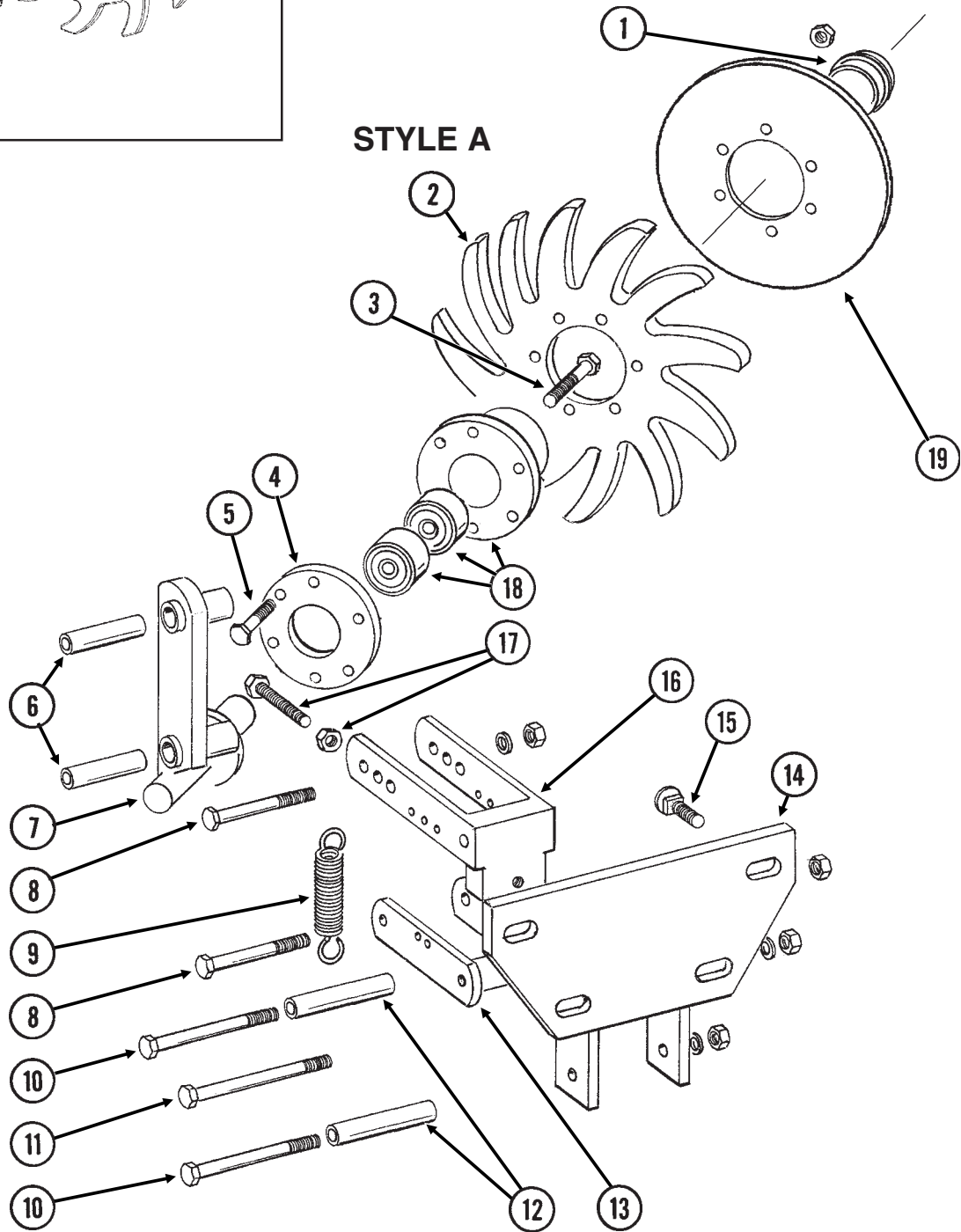
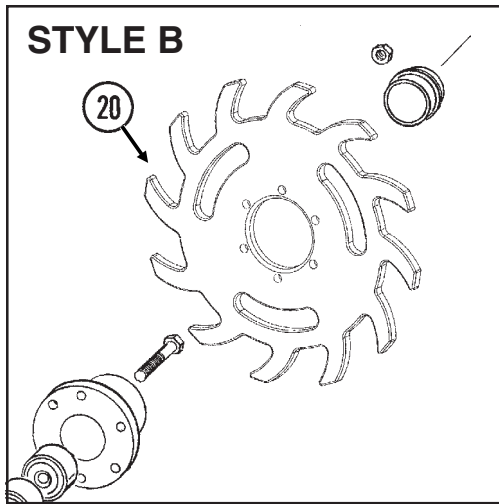


ROW UNIT MOUNTED DISC FURROWER

ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
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"
	GD14674	2	Special Washer, 1/2", Hardened
	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"
	GD7805	2	Special Washer, 5/8", Hardened
	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

(RU103dd/RU103d)



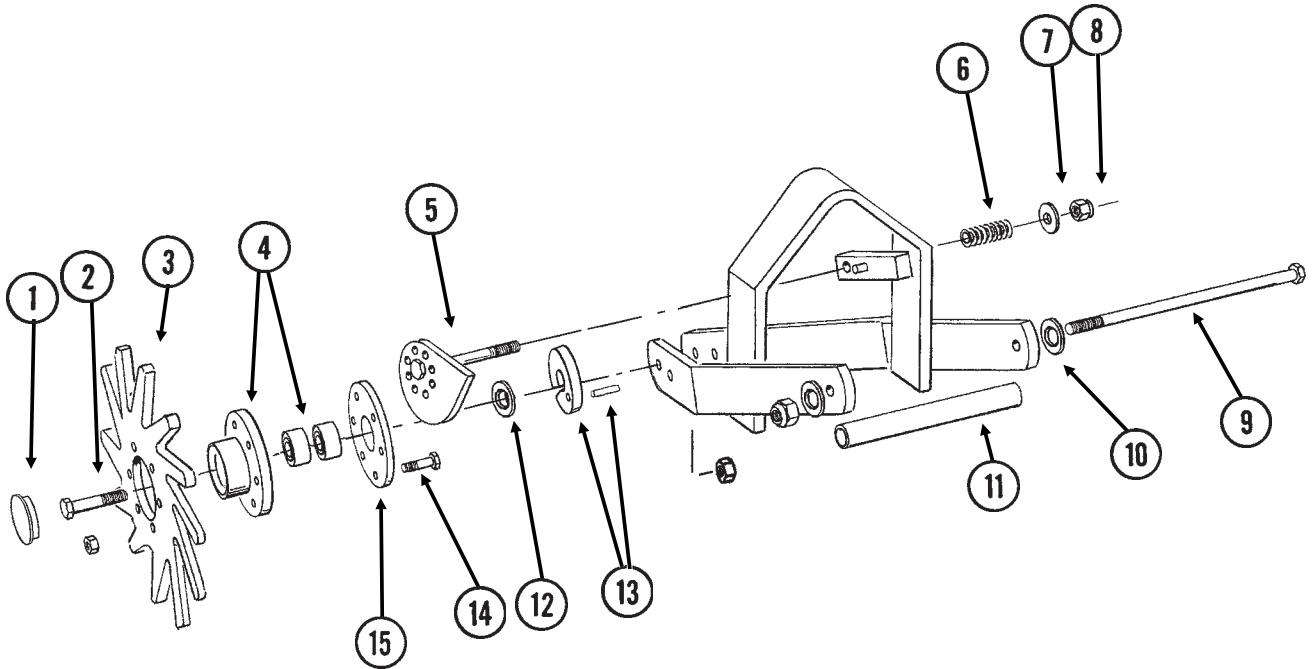
ROW UNIT MOUNTED RESIDUE WHEEL

ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Row)	
1.	GD1132	1	Dust Cap
2.	GD10552	1	Wheel, 12 Tine, $\frac{3}{8}$ " x 12"
3.	G10006	1	Hex Head Cap Screw, $\frac{5}{8}$ "-11 x 2 $\frac{1}{4}$ "
4.	GD9724	1	Backing Plate
5.	G10133	6	Hex Head Cap Screw, $\frac{5}{16}$ "-18 x 1 $\frac{1}{2}$ "
	G10109	6	Lock Nut, $\frac{5}{16}$ "-18, Grade 8
6.	GD9720	2	Spacer, $\frac{1}{2}$ " x 2 $\frac{3}{16}$ " Long
7.	GA6838	1	Wheel Mount
8.	G10033	2	Hex Head Cap Screw, $\frac{1}{2}$ "-13 x 3 $\frac{1}{2}$ "
	G10228	2	Lock Washer, $\frac{1}{2}$ "
	G10102	2	Hex Nut, $\frac{1}{2}$ "-13
9.	GD5857	2	Spring
10.	G10045	2	Hex Head Cap Screw, $\frac{1}{2}$ "-13 x 4 $\frac{1}{2}$ "
	G10228	2	Lock Washer, $\frac{1}{2}$ "
	G10102	2	Hex Nut, $\frac{1}{2}$ "-13
11.	G10348	1	Hex Head Cap Screw, $\frac{1}{2}$ "-13 x 5" (Lockup Bolt)
	G10111	1	Lock Nut, $\frac{1}{2}$ "-13
12.	GD9715	2	Spacer, $\frac{1}{2}$ " x 3" Long
13.	GA6834	1	Lower Link
14.	GA6832	1	Mount
15.	G10574	4	Carriage Bolt, $\frac{1}{2}$ "-13 x 1 $\frac{1}{4}$ "
	G10111	4	Lock Nut, $\frac{1}{2}$ "-13
16.	GA6833	1	Upper Link
17.	G10371	1	Hex Head Cap Screw, $\frac{1}{2}$ "-13 x 3", Full Thread
	G10501	1	Hex Jam Nut, $\frac{1}{2}$ "-13, Grade 2
18.	GA5654	1	Hub W/Bearings
	GA2014	-	Bearing
19.	GD12534	-	Cover
20.	GB0387	1	Wheel, 12 Tine, $\frac{3}{8}$ " 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)

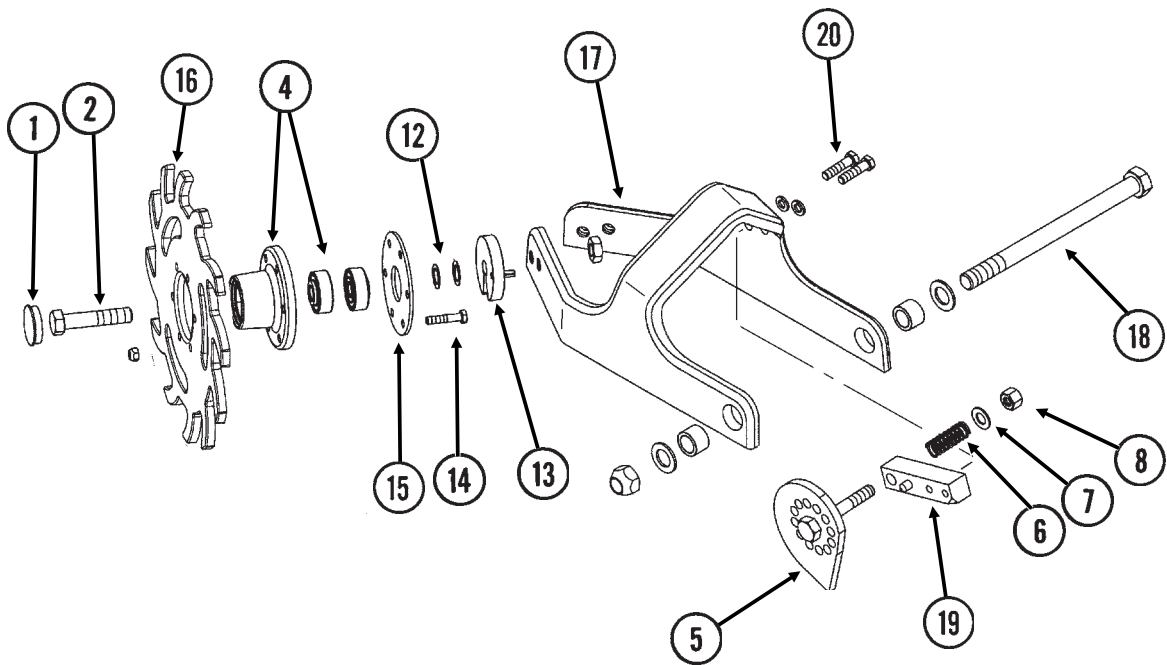
COULTER MOUNTED RESIDUE WHEELS

(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

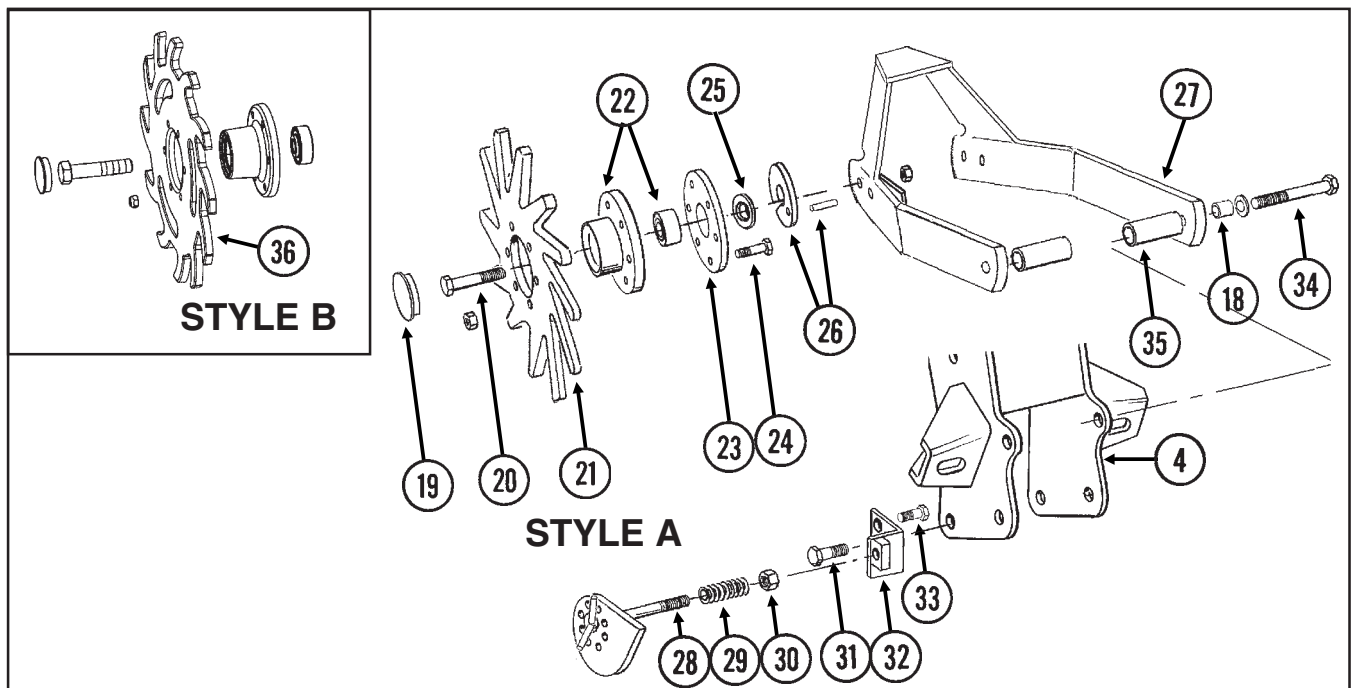
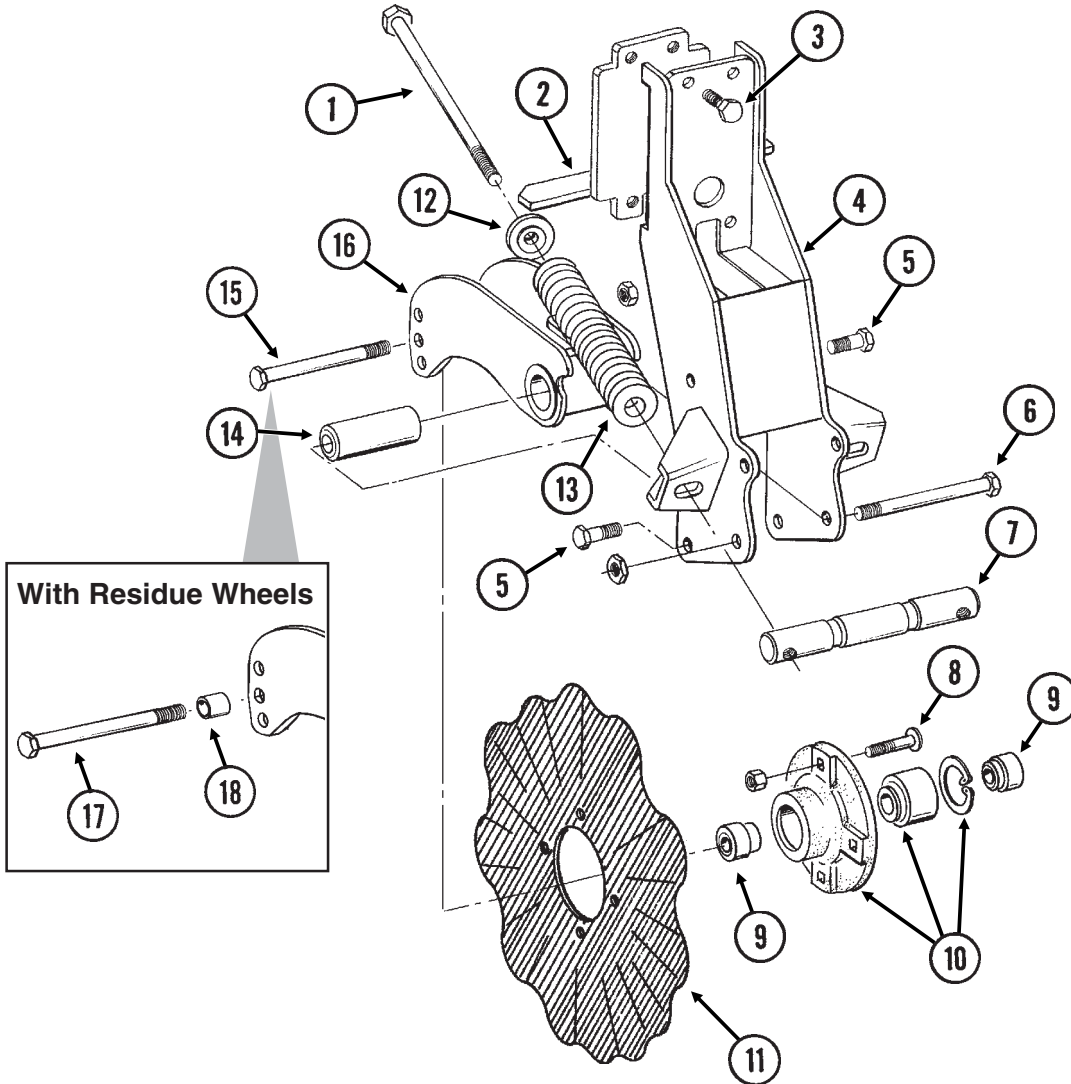


COULTER MOUNTED RESIDUE WHEELS

ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
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.	GA7412	1	Cam
6.	GD10519	1	Spring
7.	G10206	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
	GD14674	2	Special Washer, 1/2", Hardened
	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
	G10194	2	Washer, 3/4" SAE
	G11228	1	Lock Nut, 3/4"-10
19.	GA12256	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)

FRAME MOUNTED COULTER W/RESIDUE WHEELS

(RU135c/RU135g/RU153b/RU135hh)



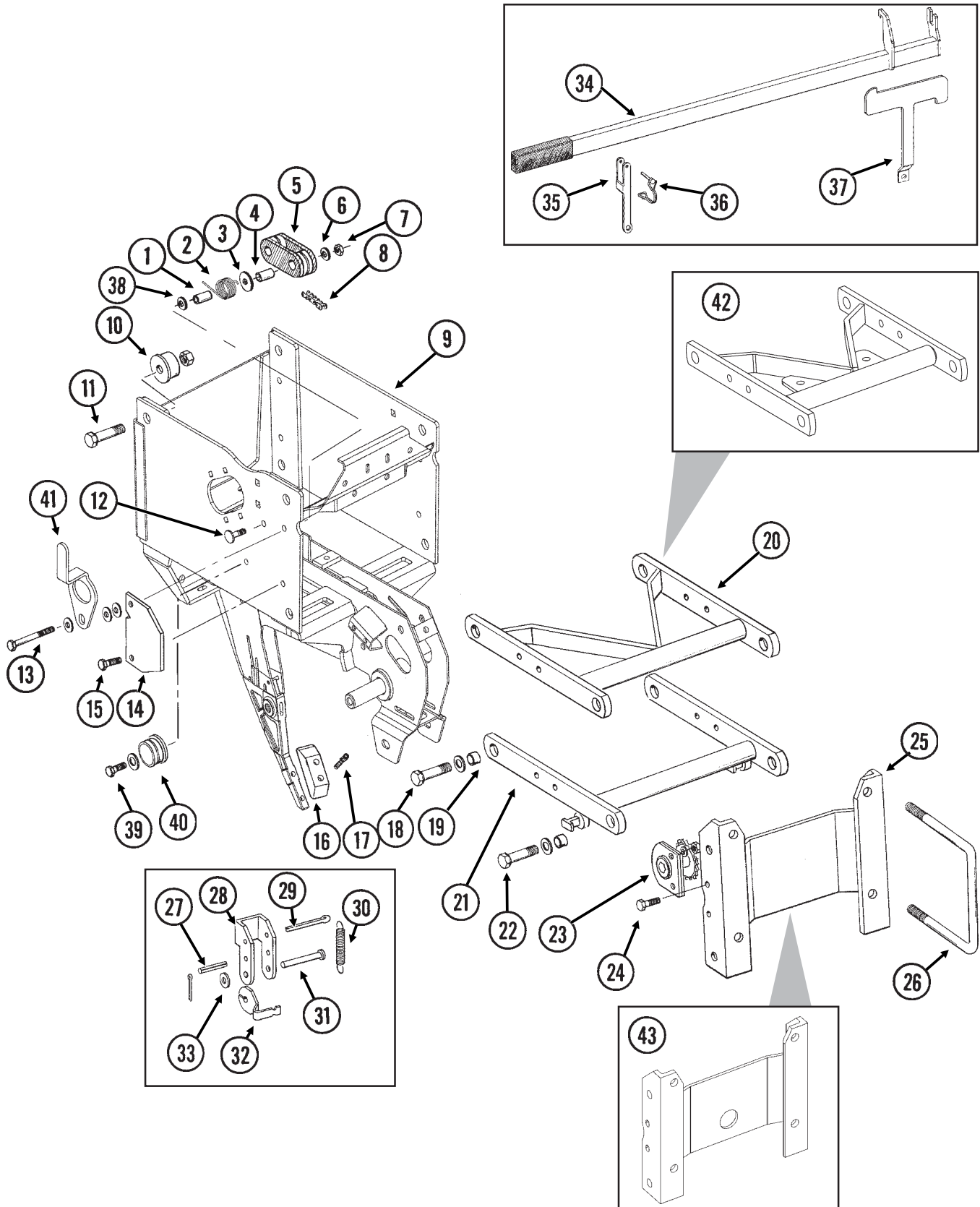
FRAME MOUNTED COULTER W/RESIDUE WHEELS

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, 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, 21/32" I.D. x 7/8" O.D. x 19/32" 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.	GB0386	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)

INTERPLANT® PUSH ROW UNIT

(RU156b/RU150a/A11969/A11971)

NOTE: Push row units use the same seed tube, row unit depth adjustment components, quick adjustable down force springs, 15" opener disc blades, gauge wheels, closing wheels, meter drive and seed hopper as the pull row unit. See those pages for common parts.

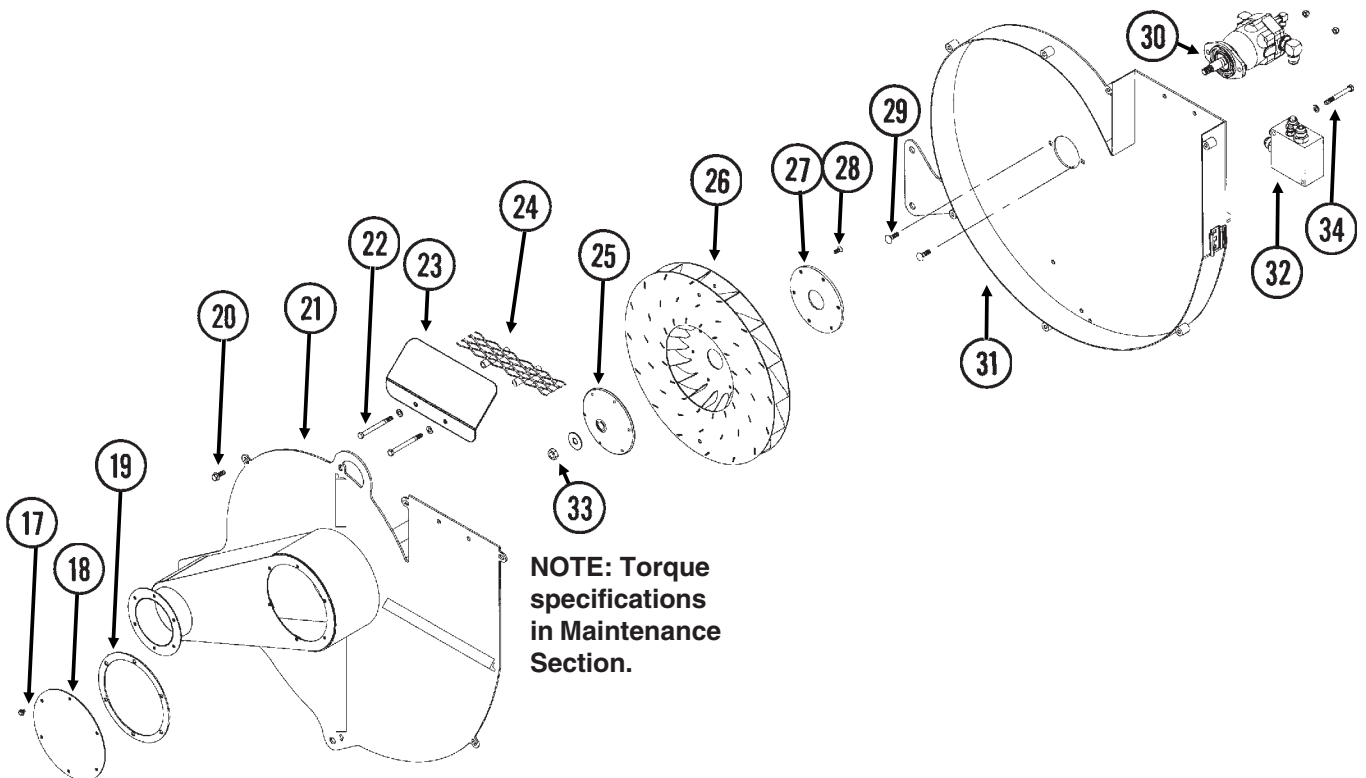
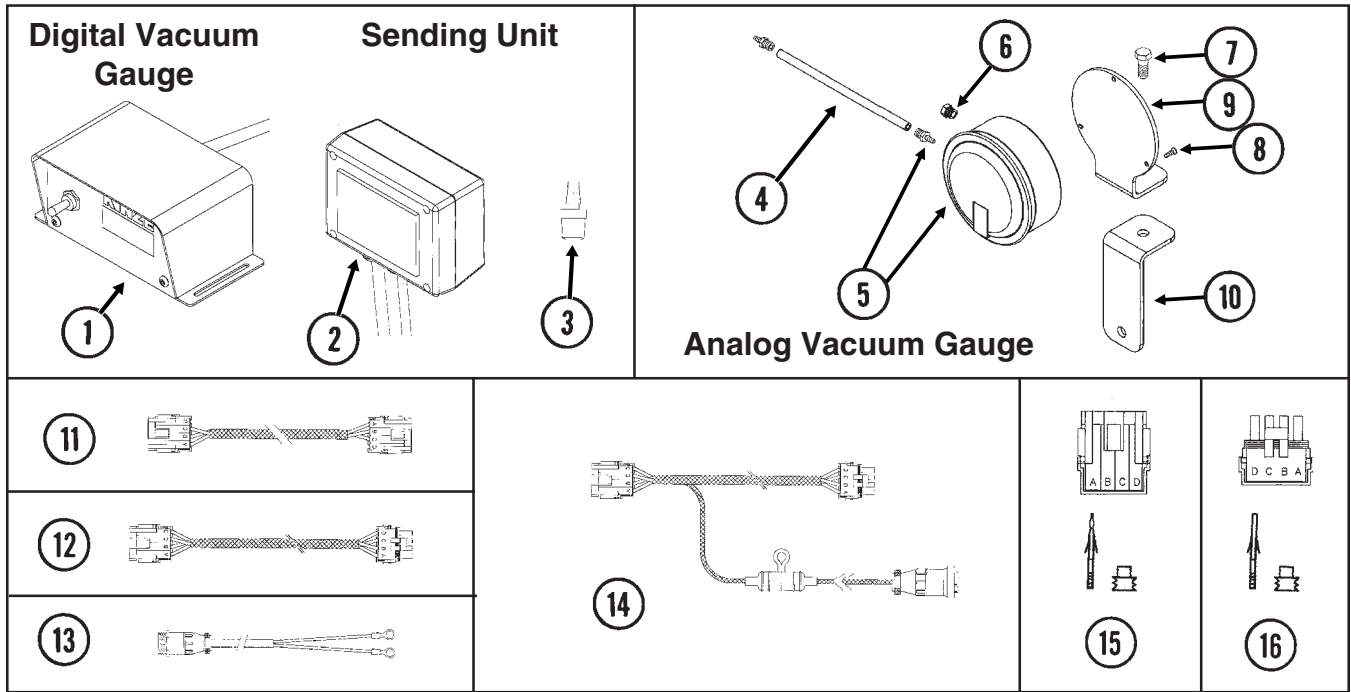


INTERPLANT® PUSH ROW UNIT

ITEM	PART NO.	QTY. (Per Row)	DESCRIPTION
1.	GD1026	1	Sleeve, 1 3/16" Long
2.	GD11218	1	Spring
3.	G10201	1	Special Washer, 3/8" x 1 1/2" O.D.
4.	GD8893-01	1	Sleeve, 1 3/8" Long
5.	GD11962	1	Idler
6.	G10210	1	Washer, 3/8" USS
7.	G10108	1	Lock Nut, 3/8"-16
8.	G3303-100	1	Chain, No. 41, 100 Pitch Including Connector Link and Offset Link
	GR0196	1	Connector Link, No. 41
	GR0202	-	Offset Link, No. 41
9.	GA10161	-	Push Row Unit Shank
10.	GB0314	2	Hopper Mount
11.	G10751	2	Hex Head Cap Screw, 5/8"-18 x 1 3/4"
	G10412	2	Lock Nut, 5/8"-18
12.	G10599	1	Carriage Bolt, 3/8"-16 x 1 1/4"
	G10101	1	Hex Nut, 3/8"-16
	G10108	1	Lock Nut, 3/8"-16
13.	G10753	1	Hex Head Cap Screw, 3/8"-16 x 4 1/2"
	G10203	3	Washer, 3/8" SAE
14.	GD10867	2	Stop
15.	G10004	3	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	G10108	3	Lock Nut, 3/8"-16
16.	GB0301	1	Seed Tube Guard/Inner Scraper
17.	G10912	2	Hex Socket Head Cap Screw, 5/16"-18 x 1", Grade 8
18.	G10751	4	Hex Head Cap Screw, 5/8"-18 x 1 3/4"
	GD7805	4	Special Washer, 5/8", Hardened
	G10412	4	Lock Nut, 5/8"-18
19.	GB0218	8	Bushing, 21/32" I.D. x 7/8" O.D. x 19/32" Long
20.	GA8930	-	Upper Arm
21.	GA5787	1	Lower Arm
22.	G10732	4	Hex Head Cap Screw, 5/8"-18 x 2"
	GD7805	4	Special Washer, 5/8", Hardened
	G10412	4	Lock Nut, 5/8"-18
23.	GA1720	1	Bearing/Sprocket, 7/8" Hex Bore
24.	G10004	2	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	G10229	2	Lock Washer, 3/8"
	G10101	2	Hex Nut, 3/8"-16
25.	GA5786	1	Mounting Plate
26.	GD1114	2	U-Bolt, 7" x 7" x 5/8"-11
	GD1113	-	U-Bolt, 5" x 7" x 5/8"-11
	G10230	4	Lock Washer, 5/8"
	G10104	4	Hex Nut, 5/8"-11
27.	G10718	2	Spring Pin, 5/16" x 1 1/8"
28.	GD11264	2	Lockup
29.	G10463	2	Cotter Pin, 1/4" x 1 1/2"
30.	GD11447	2	Spring
31.	G10284	2	Clevis Pin, 1/2" x 1 1/2"
	G10456	2	Cotter Pin, 1/8" x 3/4"
32.	GD11263	2	Spring Tab
33.	G10216	2	Washer, 1/2" USS
34.	GA12117	1	Lift Lever W/Boot
	GD11649	-	Boot
35.	GD18073	1	Bracket
36.	GD9695	1	Wire Lock Pin, 1/4" x 1 3/4"
37.	GD18075	1	Mount
38.	G10203	1	Washer, 3/8" SAE
39.	G10001	1	Hex Head Cap Screw, 3/8"-16 x 1"
	G10210	-	Washer, 3/8" USS
	G10108	1	Lock Nut, 3/8"-16
40.	GD17052	1	Vacuum Plug
41.	GD17014	1	Hose Protector
42.	GA11969	-	Upper Arm
43.	GA11971	-	Mounting Plate

DIGITAL VACUUM GAUGE, ANALOG VACUUM GAUGE AND VACUUM FAN ASSEMBLY

(A11154/A11156/GR1736/A10765/A11158/A11699/A7856/A11155/A8329/METR68)

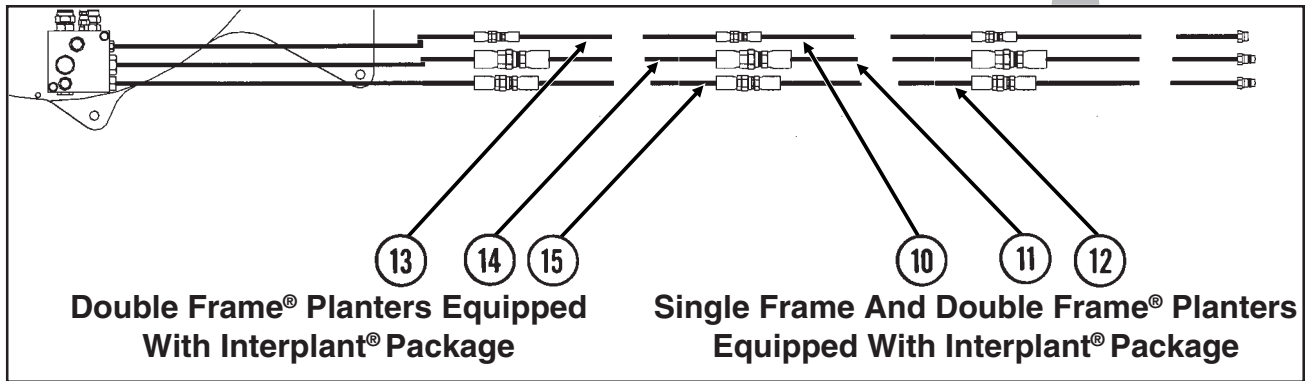
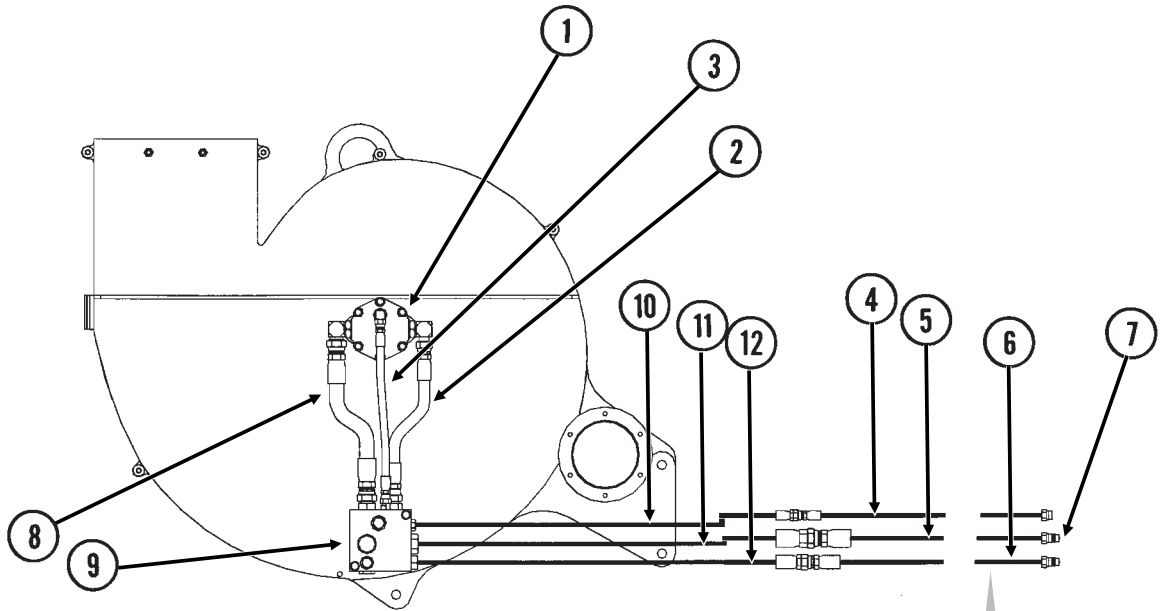


DIGITAL VACUUM GAUGE, ANALOG VACUUM GAUGE AND VACUUM FAN ASSEMBLY

ITEM	PART NO.	QTY.	DESCRIPTION
1.	GA11154	1	Digital Vacuum Gauge W/4-Pin Connector
2.	GA11156	1	Sending Unit W/1/4" Tubing And Harness W/4-Pin Male Connector
	GD16324-01	-	Tubing, 1/4" x 45"
	GA9964	-	Strain Relief
3.	GR1736	1	Hose Barb, 1/8" NPT To 1/8" Barb
4.	GD15849-02	1	Clear Plastic Tubing, 5/16" O.D. x 120"
5.	GA10765	1	Analog Vacuum Gauge W/Hose Barb
	GR1777	-	Hose Barb, 1/8" Male NPT To 3/16" Barb
6.	GA10799	1	Breather, 1/8" Male NPT
7.	G10001	1	Hex Head Cap Screw, 3/8"-16 x 1"
	G10108	1	Lock Nut, 3/8"-16
8.	G11215	3	Hex Socket Head Cap Screw, No. 6-32 x 3/8", Grade 8
9.	GD15804	1	Mount
10.	GD15803	1	Support
11.	GA11917	1	Harness, 240"
12.	GA11699	-	Extension Harness, 180"
13.	GA7856	-	Power Lead Adapter
14.	GA11155	1	Harness W/Fuse Holder And Fuse, 132"
	GD14258	-	Fuse Holder
	GD14660	-	Fuse, 2 Amp Delay Action
	G1K268	-	Console Cable Connector Kit, Includes: (1) 3-Pin Connector, (1) Cable Clamp, (1) Lock Ring, (3) Female Terminal Pins
15.	GA8328	-	4-Pin Connector W/Female Housing, 4 Seals And 4 Pin Contacts
16.	GA8329	-	4-Pin Connector W/Male Housing, 4 Seals And 4 Socket Contacts
17.	G11166	6	Whiz Lock Bolt, 1/4"-20 x 3/4"
18.	GD16233	1	Manifold
19.	GD16241	1	Gasket
20.	G11124	7	Whiz Lock Bolt, 3/8"-18 x 1"
21.	GA11086	1	Cover
22.	G10063	2	Hex Head Cap Screw, 3/8"-16 x 4"
	G10203	2	Washer, 3/8" SAE
	G10108	2	Lock Nut, 3/8"-16
23.	GD15863	1	Discharge Deflector
24.	GA11987	1	Screen
25.	GD15790	1	Hub
26.	GA10635	1	Impeller
27.	GD15789	1	Backing Plate
28.	G11133	6	Hex Socket Head Cap Screw, 5/16"-18 x 3/4", Grade 8
29.	G10599	2	Carriage Bolt, 3/8"-16 x 1 1/4"
	G10229	2	Lock Washer, 3/8"
	G10101	2	Hex Nut, 3/8"-16
30.		-	See "Vacuum Fan Hydraulic Motor Assembly", Page P38
31.	GA11085	1	Shroud
32.		-	See "Vacuum Fan Motor Valve Block Assembly (Located Below Vacuum Fan Assembly)", Page P39
33.	G10205	1	Washer, 5/8" SAE
	G10499	1	Hex Jam Nut, 5/8"-18, Grade 2
34.	G10809	2	Hex Head Cap Screw, 3/8"-16 x 3 1/4"
	G10229	2	Lock Washer, 3/8"
A.	GA11087	-	Vacuum Fan Assembly (Items 17-34 On This Page And Items 1-3, 8 And 9 On Pages P36 And P37)

VACUUM FAN HYDRAULIC COMPONENTS

(PT79a)



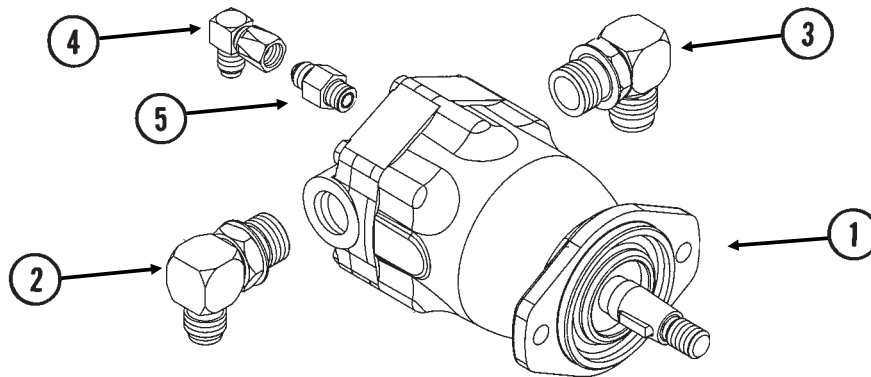
VACUUM FAN HYDRAULIC COMPONENTS

ITEM	PART NO.	QTY.	DESCRIPTION
1.		-	See "Vacuum Fan Hydraulic Motor Assembly", Page P38
2.	*A8261	1	Hose Assembly, 1/2" x 13 1/2"
3.	*A12015	1	Hose Assembly, 3/8" x 17"
4.	*A12006	1	Hose Assembly, 3/8" x 100"
5.	*A3394	1	Hose Assembly, 3/4" x 100"
6.	*A8293	1	Hose Assembly, 1/2" x 100"
7.	GD4086	-	ISO Coupler
8.	*A3352	1	Hose Assembly, 3/4" x 13 1/2"
9.		-	See "Vacuum Fan Motor Valve Block Assembly (Located Below Vacuum Fan Assembly)", Page P39
10.	*A12004	1-2	Hose Assembly, 3/8" x 56"
11.	*A3364	1-2	Hose Assembly, 3/4" x 56"
12.	*A8271	1-2	Hose Assembly, 1/2" x 56"
13.	*A12005	1	Hose Assembly, 3/8" x 30"
14.	*A3393	1	Hose Assembly, 3/4" x 30"
15.	*A8292	1	Hose Assembly, 1/2" x 30"

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

VACUUM FAN HYDRAULIC MOTOR ASSEMBLY

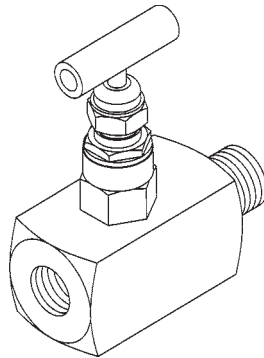
(METR21a)



ITEM	PART NO.	QTY.	DESCRIPTION
1.	GA10149 GR1734	1 -	Hydraulic Motor Seal Kit
2.	G6801-10-12 GR1467	1 -	Elbow W/O-Ring, 90°, 7/8"-14 Male JIC To 1 1/16"-12 O-Ring
3.	G6801-12 GR1467	1 -	Elbow W/O-Ring, 90°, 1 1/16"-12 Male JIC To O-Ring
4.	G6500-06	1	Swivel Elbow, 90°, 9/16"-18 Male JIC To Female
5.	G6400-06 GR1045	1 -	Connector W/O-Ring, 9/16"-18 Male JIC To O-Ring O-Ring

OPTIONAL FLOW CONTROL NEEDLE VALVE KIT

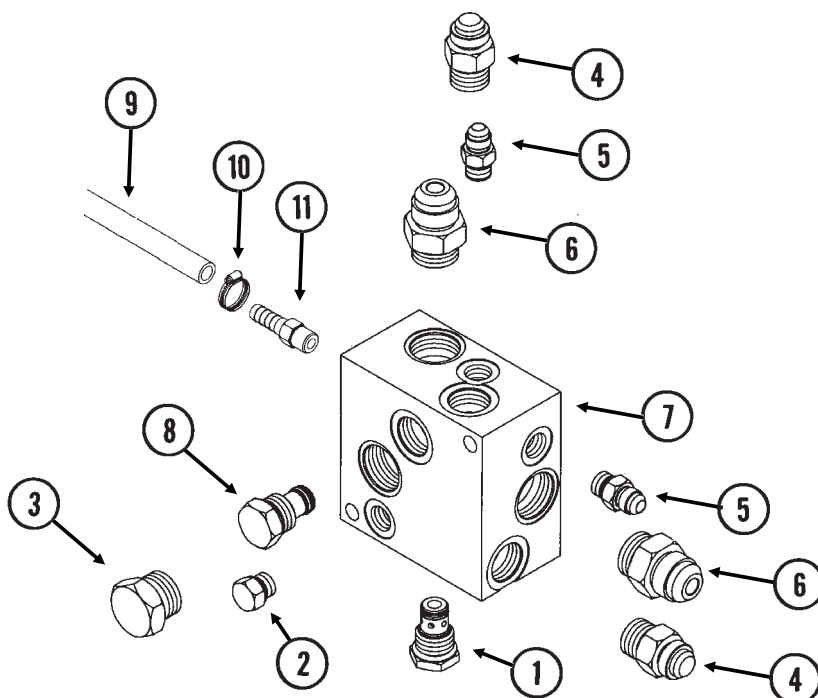
(A11650)



ITEM	PART NO.	QTY.	DESCRIPTION
1.	G1K426	-	Needle Valve Kit W/Instructions

VACUUM FAN MOTOR VALVE BLOCK ASSEMBLY (Located Below Vacuum Fan Motor Assembly)

(A11068c)

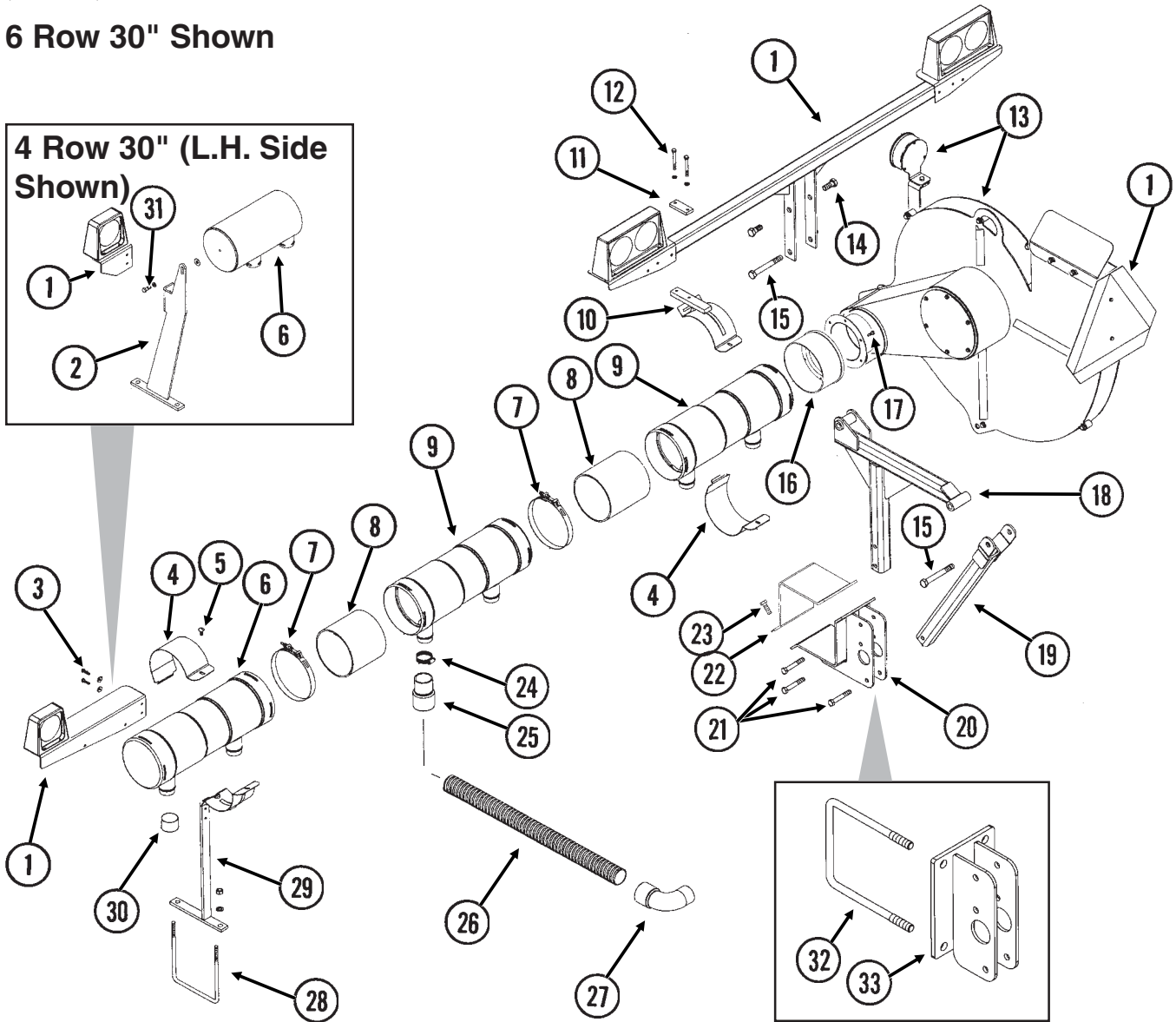
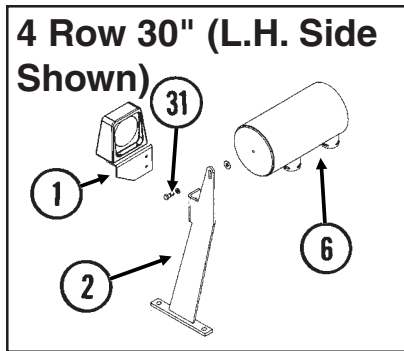


ITEM	PART NO.	QTY.	DESCRIPTION
1.	GA4293	1	Check Valve
	GR0764	-	Seal Kit, Includes: (2) O-Rings, (1) BU Ring
2.	G6408-06	1	Plug W/O-Ring, $\frac{9}{16}$ "-18 O-Ring
	GR1045	-	O-Ring
3.	G6408-12	1	Plug W/O-Ring, 1 $\frac{1}{16}$ "-12 O-Ring
	GR1467	-	O-Ring
4.	G6400-10	2	Connector W/O-Ring, $\frac{7}{8}$ "-14 Male JIC To O-Ring
	GR1466	-	O-Ring
5.	G6400-06	2	Connector W/O-Ring, $\frac{9}{16}$ "-18 Male JIC To O-Ring
	GR1045	-	O-Ring
6.	G6400-12	2	Connector W/O-Ring, 1 $\frac{1}{16}$ "-12 Male JIC To O-Ring
	GR1467	-	O-Ring
7.	GD16188	1	Valve Block
8.	GA11934	1	Relief Valve Cartridge
9.	GD6279-05	1	Clear Plastic Tubing, $\frac{9}{16}$ " O.D. x 60"
10.	G10681	1	Hose Clamp, No. 6
11.	GD11700	1	Adapter, $\frac{1}{4}$ " NPT To $\frac{3}{8}$ " Barb

MANIFOLDS AND DISTRIBUTION HOSES

(PT85/A11981)

6 Row 30" Shown



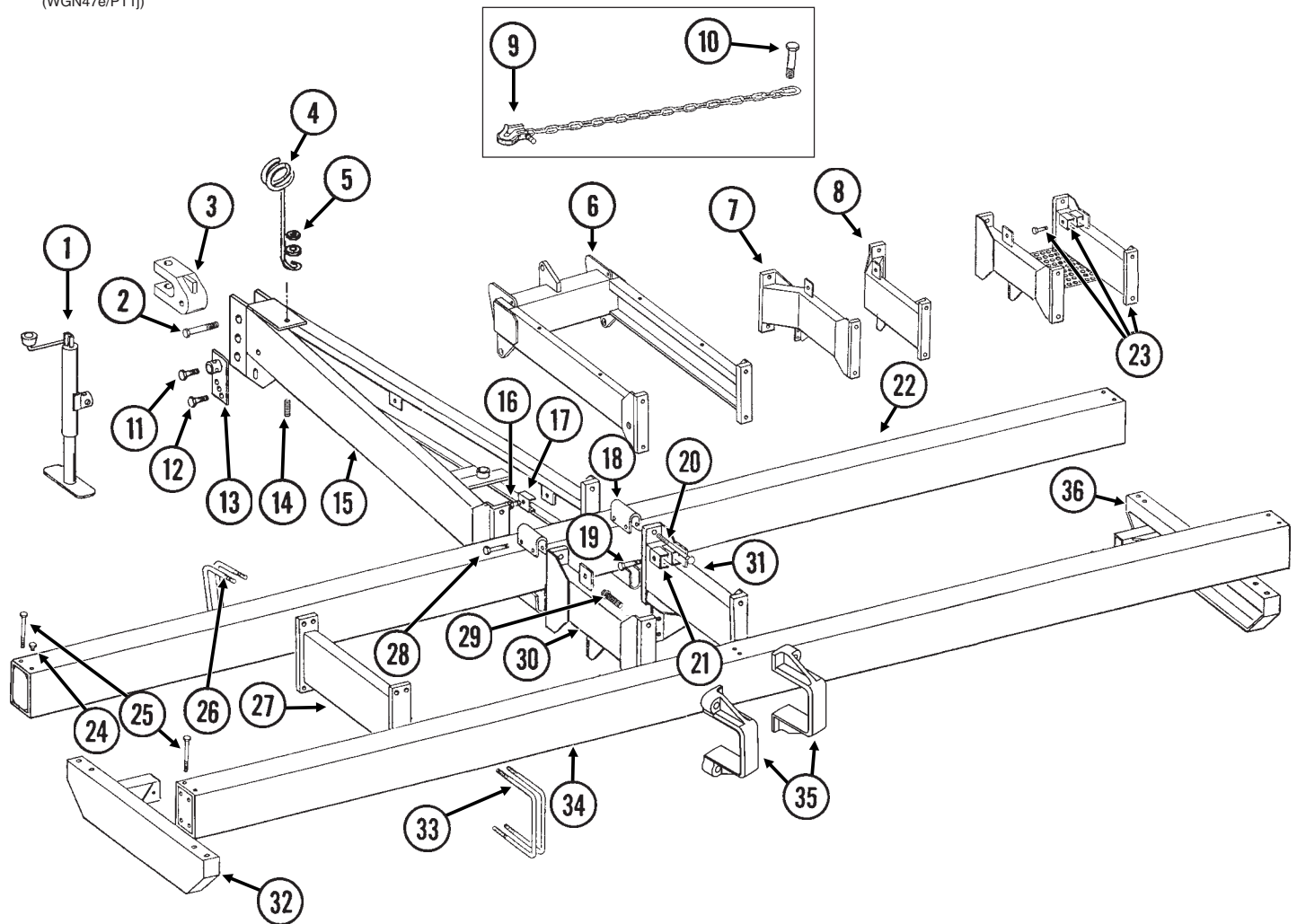
ITEM	PART NO.	QTY.	DESCRIPTION
1.		-	See "Electrical Components And SMV Sign", Pages P70 And P71
2.	GA11983	1	Support, L.H., 4 Row 30" Only (Shown)
	GA12194	-	Support, R.H., 4 Row 30" Only
3.	G10064	4	Hex Head Cap Screw, 1/4"-20 x 1"
	G10209	4	Washer, 1/4" USS
	G10110	4	Lock Nut, 1/4"-20, Grade B
4.	GD15854	-	Clamp
5.	G10312	-	Carriage Bolt, 5/16"-18 x 3/4"
	G10620	-	Serrated Flange Nut, 5/16"-18
6.	GD15850	-	Manifold, 21" (Open One End/Two Drops), 4 Row 36"/38", 6 Row 30"/36"/38" And 8 Row 30" (Shown)
	GA11984	-	Manifold, 22" (Open One End/Two Drops), 4 Row 30" (Shown)
	GA11985	-	Manifold, 12 1/4" (Open One End/One Drop), 4 Row 30"
7.	G11145	-	T-Bolt Clamp, 7"

MANIFOLDS AND DISTRIBUTION HOSES

ITEM	PART NO.	QTY.	DESCRIPTION
8.	GD15856-01	-	Pipe, 6" x 14", 8 Row 30"
	GD15856-03	-	Pipe, 6" x 11", 6 Row 30" And 8 Row 30"
	GD15856-04	-	Pipe, 6" x 6", 6 Row 30" And 8 Row 30"
	GD15856-05	-	Pipe, 6" x 17 1/2", 6 Row 36"/38"
	GD15856-14	-	Pipe, 6" x 6", 4 Row 36"/38" And 6 Row 36"/38"
	GD15856-19	-	Pipe, 6" x 7", 4 Row 36"/38", 6 Row 30" And 8 Row 30"
9.	GD15799	-	Manifold, 21" (Open Both Ends/Two Drops)
10.	GA11963	-	Mount
11.	GD17090	-	Clamp
12.	G10583	-	Hex Head Cap Screw, 5/16"-18 x 2 3/4"
	G10232	-	Lock Washer, 5/16"
13.		-	See "Digital Vacuum Gauge, Analog Vacuum Gauge And Vacuum Fan Assembly", Pages P34 And P35
14.	G10007	2	Hex Head Cap Screw, 5/8"-11 x 1 1/2"
	G10230	2	Lock Washer, 5/8"
	G10104	2	Hex Nut, 5/8"-11
15.	G10046	2	Hex Head Cap Screw, 5/8"-11 x 5"
	G10230	2	Lock Washer, 5/8"
	G10104	2	Hex Nut, 5/8"-11
16.	GA11933	2	Manifold Flange
17.	G10023	12	Hex Head Cap Screw, 1/4"-20 x 3/4"
	G10227	12	Lock Washer, 1/4"
18.	GA11929	1	Support
19.	GA11931	1	Fan Stabilizer
20.	GA11928	1	Clamp
21.	G10585	3	Hex Head Cap Screw, 1/2"-13 x 3 1/4"
	G10228	3	Lock Washer, 1/2"
	G10102	3	Hex Nut, 1/2"-13
22.	GD6182	1	Clamp
23.	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
24.	G10676	-	Hose Clamp, No. 36, Stainless Steel
25.	GD14627	-	Coupler
26.	GD15792-23	-	Hose, 2" x 34" (Pull Row Unit)
	GD15792-04	-	Hose, 2" x 36" (Single Frame Push Row Unit)
	GD15792-25	-	Hose, 2" x 63" (Double Frame® Push Row Unit)
27.	GD14626	-	Elbow, 90°, 2"
28.	GD7145	-	U-Bolt, 7" x 7" x 1/2"-13
	G10228	-	Lock Washer, 1/2"
	G10102	-	Hex Nut, 1/2"-13
29.	GA11932	-	Support
30.	G11147	-	Cap, 2"
31.	G10001	2	Hex Head Cap Screw, 3/8"-16 x 1"
	G10229	2	Lock Washer, 3/8"
	G10210	2	Washer, 3/8" USS
32.	GD1114	-	U-Bolt, 7" x 7" x 5/8"-11
	G10230	-	Lock Washer, 5/8"
	G10104	-	Hex Nut, 5/8"-11
33.	GA11981	1	Mount (Single Frame With Push Row Units)

HITCH AND FRAME ASSEMBLY/SAFETY CHAIN

(WGN47e/PT1)



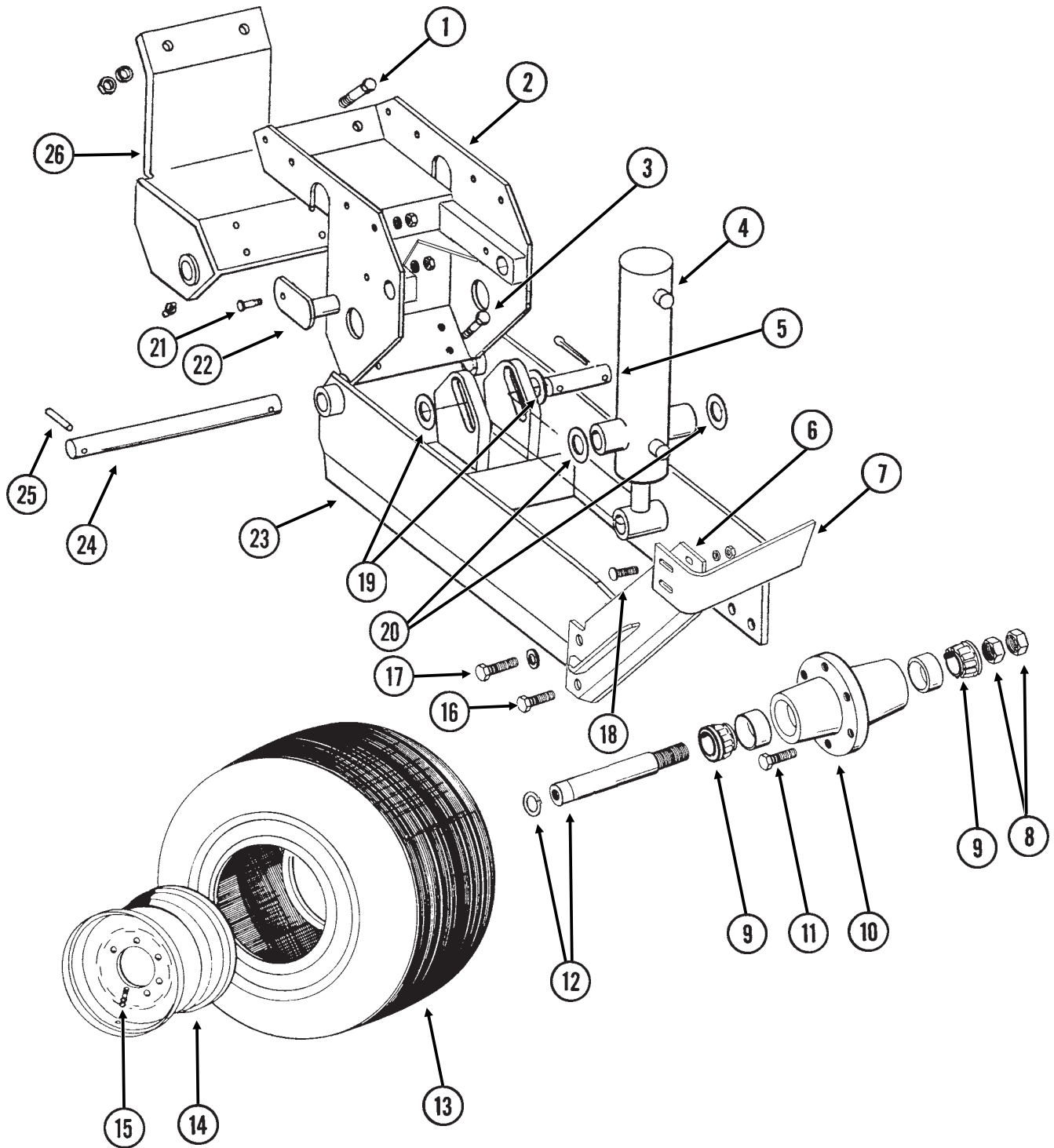
ITEM	PART NO.	QTY.	DESCRIPTION
1.	G4100-02	1	Jack Assembly
	GR0255	-	Repair Kit (Chain And Pin)
2.	G10169	1	Hex Head Cap Screw, 1 1/4"-7 x 6"
	G10157	1	Lock Nut, 1 1/4"-7
3.	GB0156	1	Clevis
4.	GD16328	1	Hose Holder
5.	G10348	1	Hex Head Cap Screw, 1/2"-13 x 5"
	G10216	1	Washer, 1/2" USS
	G10228	1	Lock Washer, 1/2"
	G10102	1	Hex Nut, 1/2"-13
6.		-	See "Interplant® Self-Leveling Hitch Extension", Pages P80 And P81
7.	GA9428	-	Center Extension, L.H., Offset, 24"
8.	GA9429	-	Center Extension, R.H., Offset, 24"
9.	GA4774	1	Safety Chain, 3/8"
	G1K411	-	Safety Chain Repair Kit, Includes: (1) Hook, (1) Flat Washer, (1) Latch Pin, (1) Safety Latch, (1) Spring, (1) Retaining Ring

HITCH AND FRAME ASSEMBLY/SAFETY CHAIN

ITEM	PART NO.	QTY.	DESCRIPTION
10.	G11058	1	Hex Head Cap Screw, 1 1/4"-7 x 3"
	G10206	1	Washer, 1 1/2" SAE
	GD10646	1	Special Washer
	G10157	1	Lock Nut, 1 1/4"-7
11.	G10007	1	Hex Head Cap Screw, 5/8"-11 x 1 1/2"
	G10107	1	Lock Nut, 5/8"-11
12.	G10017	1	Hex Head Cap Screw, 1/2"-13 x 1 1/2"
	G10216	1	Washer, 1/2" USS
	G10111	1	Lock Nut, 1/2"-13
13.	GA7909	1	Jack Adjustment Bracket
14.	GD5888	1	Spring
15.	GA8670	1	Hitch
16.	G10047	2	Hex Head Cap Screw, 3/8"-16 x 1 3/4"
	G10108	2	Lock Nut, 3/8"-16
17.	GD5875	2	Hose Clamp, 9/16" x 2 1/2" x 2"
18.	GA5197	-	Spacer
19.	G10048	-	Hex Head Cap Screw, 3/8"-16 x 2"
	G10108	-	Lock Nut, 3/8"-16
20.	G10993	4	Hex Head Cap Screw, 1"-8 x 8 1/2", Grade 8
	G10647	4	Hex Nut, 1"-8, Grade 8
21.	GD6027	-	Hose Clamp, 3/4" x 2 1/2" x 2 1/2"
22.	A8011	1	Double Frame® Toolbar, 7" x 5" x 120", 4 Row 30" (Non-Stock Item)
	A8012	-	Double Frame® Toolbar, 7" x 5" x 144", 4 Row 36"/38" (Non-Stock Item)
	A8013	-	Double Frame® Toolbar, 7" x 5" x 180", 6 Row 30" (Non-Stock Item)
	A8014	-	Double Frame® Toolbar, 7" x 5" x 220", 6 Row 36"/38" (Non-Stock Item)
	A8015	-	Double Frame® Toolbar, 7" x 5" x 240", 8 Row 30" (Non-Stock Item)
23.	GA9007	-	Hitch Extension W/Hose Clamps And Hardware
	GD6027	-	Hose Clamp, 3/4" x 2 1/2" x 2 1/2"
	G10048	-	Hex Head Cap Screw, 3/8"-16 x 2"
	G10108	-	Lock Nut, 3/8"-16
24.	G10903	-	Cap Plug
25.	G10895	8	Hex Head Cap Screw, 3/4"-10 x 8 1/2"
	G10112	8	Lock Nut, 3/4"-10
26.	GD1113	-	U-Bolt, 5" x 7" x 5/8"-11
	G10230	-	Lock Washer, 5/8"
	G10104	-	Hex Nut, 5/8"-11
27.	GA4265	-	Straight Extension
28.	G10061	4	Hex Head Cap Screw, 3/8"-16 x 3 1/2"
	G10210	4	Washer, 3/8" USS
	G10108	4	Lock Nut, 3/8"-16
29.	G11085	4	Flanged Cap Screw, 12 Point, 1"-14 x 3"
30.	GA9427	-	Hitch/Center Extension, L.H., Straight, 24"
31.	GA9426	-	Hitch/Center Extension, R.H., Straight, 24"
32.	GA9439	-	End Extension, L.H.
33.	GD1114	-	U-Bolt, 7" x 7" x 5/8"-11
	G10230	-	Lock Washer, 5/8"
	G10104	-	Hex Nut, 5/8"-11
34.	A8016	1	Toolbar, 7" x 7" x 120", 4 Row 30" (Non-Stock Item)
	A8017	-	Toolbar, 7" x 7" x 144", 4 Row 36"/38" (Non-Stock Item)
	A8018	-	Toolbar, 7" x 7" x 180", 6 Row 30" (Non-Stock Item)
	A8019	-	Toolbar, 7" x 7" x 220", 6 Row 36"/38" (Non-Stock Item)
	A8020	-	Toolbar, 7" x 7" x 240", 8 Row 30" (Non-Stock Item)
35.	GB0329	2	Hitch Clamp
36.	GA9438	-	End Extension, R.H.

TRANSPORT AND GROUND DRIVE WHEEL ASSEMBLY

(PT2))



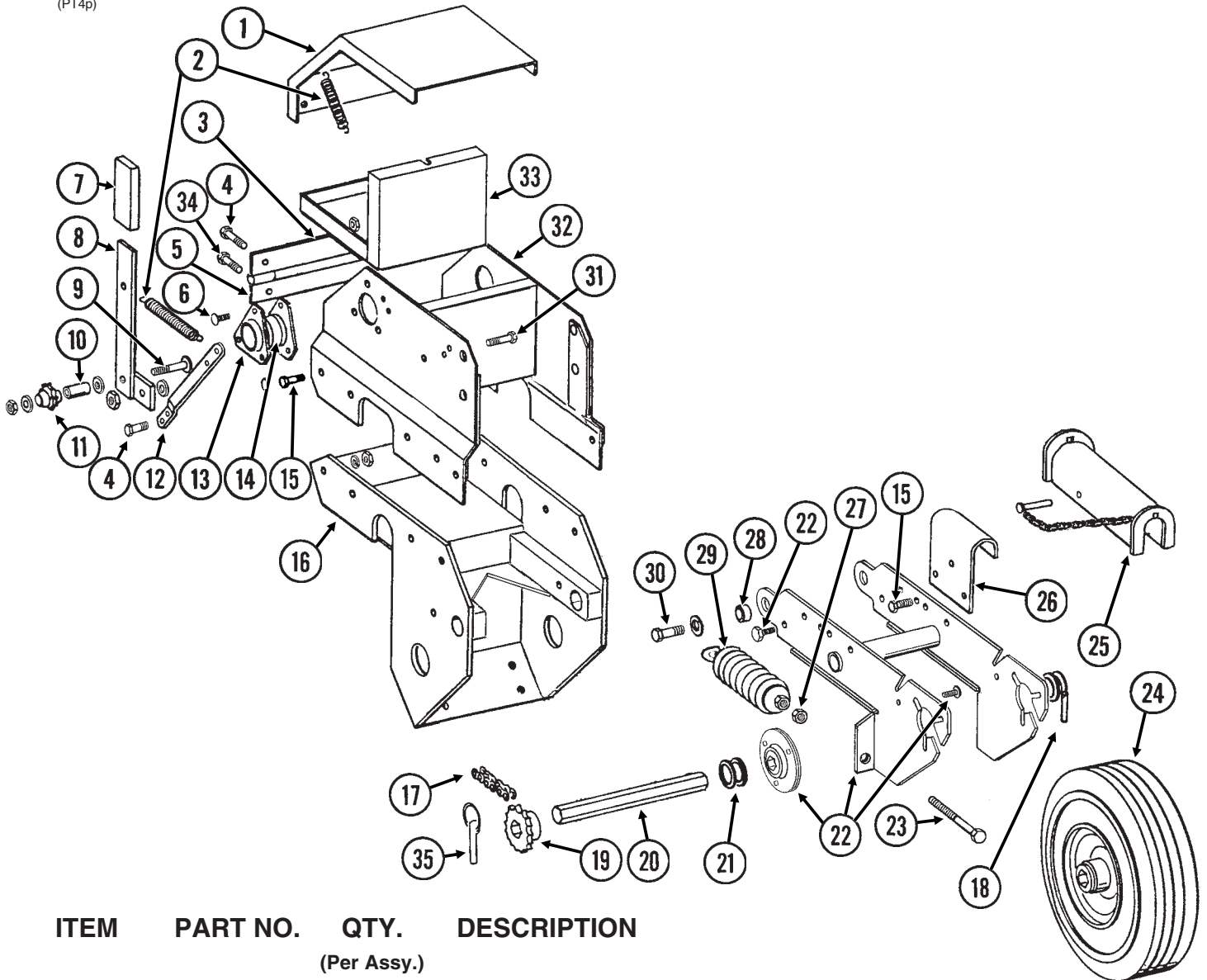
TRANSPORT AND GROUND DRIVE WHEEL ASSEMBLY

ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Assy.)	
1.	G10009	2	Hex Head Cap Screw, 5/8"-11 x 2 1/2"
	G10230	2	Lock Washer, 5/8"
	G10104	2	Hex Nut, 5/8"-11
2.	GA5122	1	Wheel Tower Clamp
3.	G10008	4	Hex Head Cap Screw, 5/8"-11 x 2"
	GD7805	4	Special Washer, 5/8", Hardened
	G10230	4	Lock Washer, 5/8"
	G10104	4	Hex Nut, 5/8"-11
4.		-	See "Master/Slave/Lift Assist Cylinders", Pages P58 And P59
5.	GD5841	1	Pin, 1 1/4" x 5 5/8"
	G10460	2	Cotter Pin, 1/4" x 2"
6.	GA7376	1	Scraper Mount
7.	GD10010	1	Scraper
8.	G11081	2	Hex Jam Nut, 1 1/2"-12, Grade 2
9.	GA0895	2	Bearing
10.	GA2148	1	Hub W/Cups, 6 Bolt
	GR0434	-	Cup
11.	GR0270	6	Lug Bolt, 9/16"-18
12.	GA2558	1	Spindle W/Round External Retaining Ring, 9 1/2"
	GD11490	-	Round External Retaining Ring
13.	GD13401	-	Tire, 7.50" x 20", 8 Ply, Tubeless W/O Center Rib (Specify Brand*)
14.	GA2142	1	Rim, 5.50" x 20"
15.	GA7434	1	Valve Stem
16.	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
17.	G10026	2	Hex Head Cap Screw, 3/4"-10 x 2"
	G10231	2	Lock Washer, 3/4"
18.	G10636	4	Carriage Bolt, 1/2"-13 x 1 1/2"
	G10228	4	Lock Washer, 1/2"
	G10216	4	Washer, 1/2" USS
	G10102	4	Hex Nut, 1/2"-13
19.	G10139	2	Washer, 1 1/4" USS
20.	G10159	-	Machine Bushing, 1 1/4", 10 Gauge (As Required)
21.	G10581	2	Hex Head Cap Screw, 1/2"-13 x 2 1/4"
	G10111	2	Lock Nut, 1/2"-13
22.	GA5121	2	Pin, 2 1/8"
23.	GA8839	1	Arm
24.	GD11695	1	Pin, 1 1/4" x 13 1/4"
25.	G10610	2	Spring Pin, 3/8" x 2"
26.	GA9877	1	Clamp W/Grease Fittings
	G10640	2	Grease Fitting, 1/4"-28
A.	GA2147	-	Hub And Spindle Assembly (Items 8-10 And 12)
B.	GA7409	-	Scraper Assembly (Items 6, 7, 16 And 18)

* 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

(PT4p)



ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Assy.)	
1.	GA5182	1	Cover
2.	GD5857	2	Spring
3.	GD5790	1	Hinge W/Pins, Male
4.	G10023	4	Hex Head Cap Screw, 1/4"-20 x 3/4"
	G10227	4	Lock Washer, 1/4"
	G10103	4	Hex Nut, 1/4"-20
5.	GD5789	1	Hinge, Female
6.	G10303	-	Carriage Bolt, 5/16"-18 x 1"
	G10232	-	Lock Washer, 5/16"
	G10219	-	Washer, 5/16" USS (As Required)
	G10106	-	Hex Nut, 5/16"-18
7.	GD5827	1	Cover
8.	GA5157	1	Idler Arm, L.H.
	GA5158	-	Idler Arm, R.H.
9.	G10306	1	Carriage Bolt, 3/8"-16 x 2"
	G10203	-	Washer, 3/8" SAE (As Required)
	G10210	-	Washer, 3/8" USS (As Required)
	G10108	1	Lock Nut, 3/8"-16
10.	GD1026	1	Sleeve, 1 3/16" Long
11.	GD7426	1	Sprocket, 12 Tooth

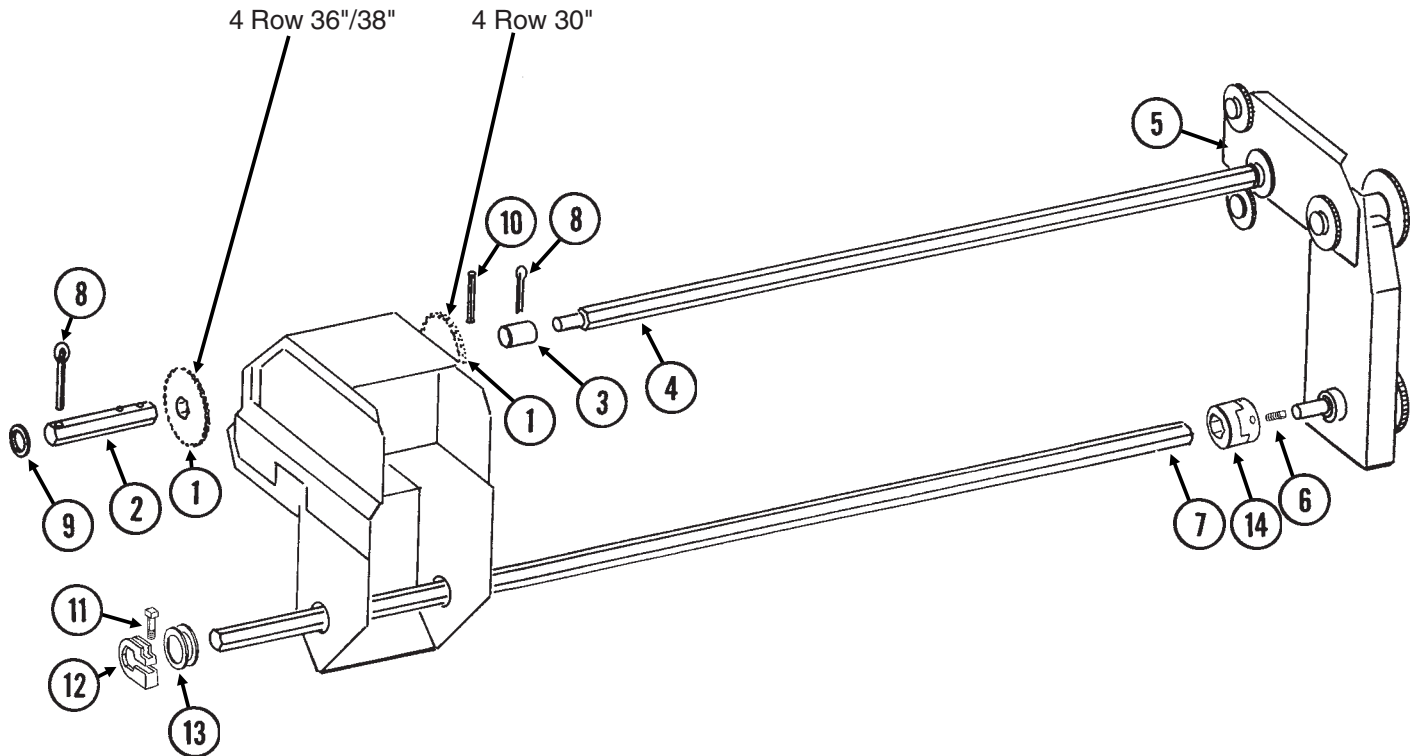
CONTACT WHEEL AND ARM ASSEMBLY

ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Assy.)	
12.	GD5860	1	Bar
13.	G3400-01	-	Flangette
14.	G2100-03	-	Bearing, 7/8" Hex Bore, Spherical
15.	G10001	6	Hex Head Cap Screw, 3/8"-16 x 1"
	G10229	6	Lock Washer, 3/8"
	G10101	6	Hex Nut, 3/8"-16
16.		-	See "Transport And Ground Drive Wheel Assembly", Pages P44 And P45
17.	G3310-132	1	Chain, No. 40, 132 Pitch Including Connector Link (Used With 15 Tooth Sprocket)
	G3310-134	1	Chain, No. 40, 134 Pitch Including Connector Link (Used With 19 Tooth Sprocket)
	G3310-140	1	Chain, No. 40, 140 Pitch Including Connector Link (Used With 30 Tooth Sprocket)
	GR0912	-	Connector Link, No. 40
18.	G10602	1	Spring Pin, 1/4" x 1 1/2"
19.	GA5105	1	Sprocket, 15 Tooth
	GA5107	-	Sprocket, 19 Tooth
	GA5114	-	Sprocket, 30 Tooth
20.	GD6825-10.375	1	Hex Shaft, 7/8" x 10 3/8" (2 Holes)
21.	G10233	6	Machine Bushing, 1", 10 Gauge
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	2	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.	G10890	2	Hex Head Adjusting Bolt, 1/2"-13 x 4", Grade 2
24.	GA5090	1	Tire And Rim Assembly (Specify Brand*)
	GD5753	-	Tire, 4.10" x 6" (Specify Brand*)
	GD5752	-	Inner Tube
25.	GA9870	-	Lockup W/Pin (Used W/Item 23, Pages P38 And P39)
26.	GD7944	1	Mount
27.	G10501	2	Hex Jam Nut, 1/2"-13, Grade 2
28.	GB0218	2	Bushing, 21/32" I.D. x 7/8" O.D. x 19/32" Long
29.	GA2068	2	Spring W/Plug
30.	G10751	2	Hex Head Cap Screw, 5/8"-18 x 1 3/4"
	G10235	6	Machine Bushing, 7/8", 14 Gauge
	GD7805	2	Special Washer, 5/8", Hardened
	G10412	2	Lock Nut, 5/8"-18
31.	G10001	1	Hex Head Cap Screw, 3/8"-16 x 1"
	G10229	1	Lock Washer, 3/8"
	G10370	1-2	Machine Bushing, 3/8", 22 Gauge
	GD5756	1	Special Nut, 3/8"-16
32.	GA5118	1	Mount
33.	GA7235	1	Tool Box Insert
34.	G10064	2	Hex Head Cap Screw, 1/4"-20 x 1"
	G10209	2	Washer, 1/4" USS
	G10227	2	Lock Washer, 1/4"
	G10103	2	Hex Nut, 1/4"-20
35.	GD2558	1	Lynch Pin, 1/4"
A.	G1K253	-	Contact Wheel Arm Replacement Kit, (Items 18, 20, 22, 23 And 27)

* 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 brand may affect rates. Field checks are recommended after any change in contact tires.

DRIVELINE, 4 ROW 30"/36"/38"

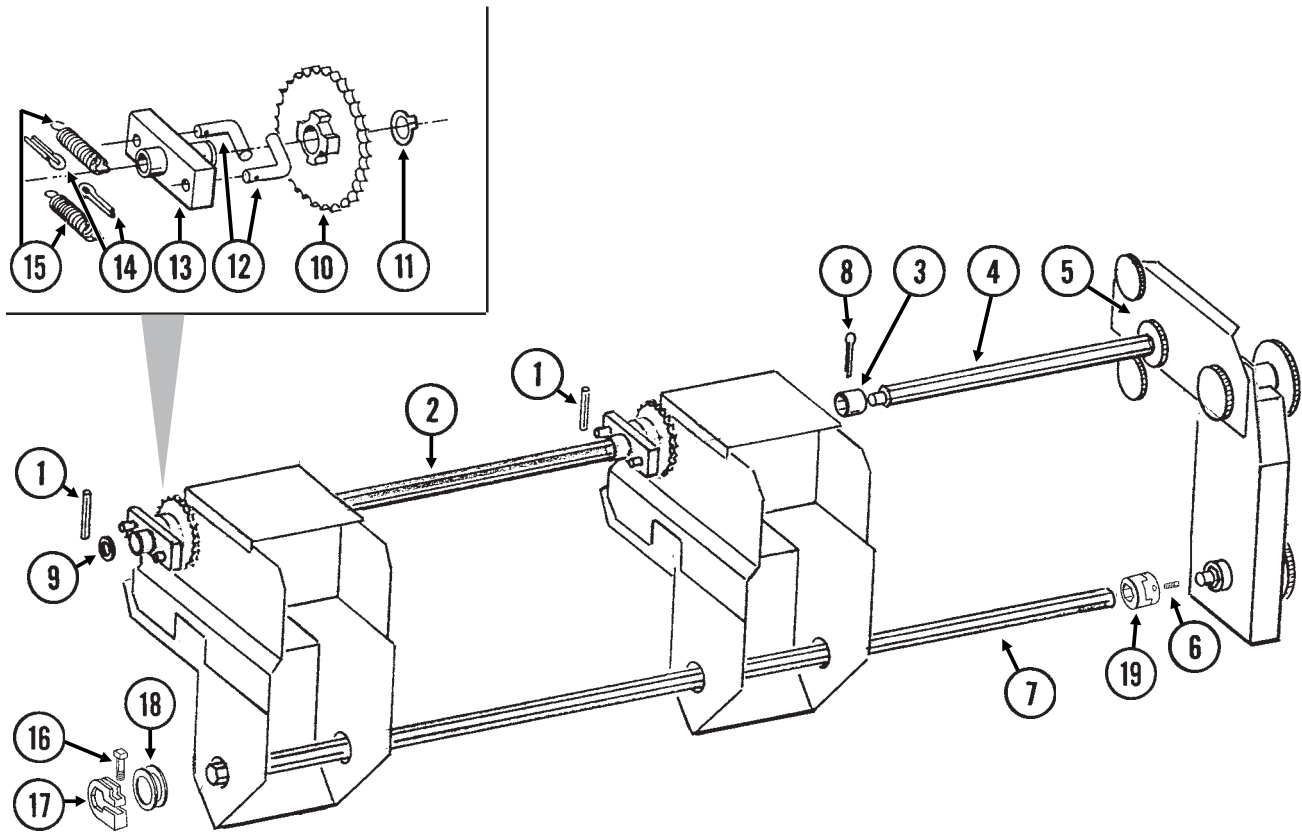
PTD033(PT5b)



ITEM	PART NO.	QTY.	DESCRIPTION
1.	GA5114	1	Sprocket, 30 Tooth
2.	GD7819	1	Hex Shaft, $\frac{7}{8}$ " x 15 $\frac{1}{4}$ " (3 Holes), 4 Row 30"
	GD5958	-	Hex Shaft, $\frac{7}{8}$ " x 16" (4 Holes), 4 Row 36"/38"
3.	GD5961	1	Coupler, 2 $\frac{1}{4}$ "
4.	GD5885-02	1	Hex Shaft, $\frac{7}{8}$ " x 19" (6 Holes), 4 Row 30"
	GD5885-03	-	Hex Shaft, $\frac{7}{8}$ " x 24" (6 Holes), 4 Row 36"/38"
5.		-	See "Seed Rate Transmission Assembly", Pages P50 And P51
6.	G10131	4	Square Head Set Screw, $\frac{5}{16}$ "-18 x $\frac{3}{4}$ "
7.	GD0914-109	1	Hex Shaft, $\frac{7}{8}$ " x 109" (No Holes), 4 Row 30"
	GD0914-134	-	Hex Shaft, $\frac{7}{8}$ " x 134" (No Holes), 4 Row 36"/38"
8.	G10460	2	Cotter Pin, $\frac{1}{4}$ " x 2"
9.	G10233	-	Machine Bushing, 1", 10 Gauge (As Required)
10.	G10602	1	Spring Pin, $\frac{1}{4}$ " x 1 $\frac{1}{2}$ "
11.	G10130	1	Square Head Machine Bolt, $\frac{5}{16}$ "-18 x 1 $\frac{3}{4}$ "
	G10923	1	Flange Nut, $\frac{5}{16}$ "-18, No Serration
12.	GD11045	1	Lock Clamp
13.	G10233	2	Machine Bushing, 1", 10 Gauge
14.	GB0287	2	Coupler
A.	G1K269	-	Lock Clamp Kit (Items 11 And 12)

DRIVELINE, 6 ROW 30"/36"/38" AND 8 ROW 30"

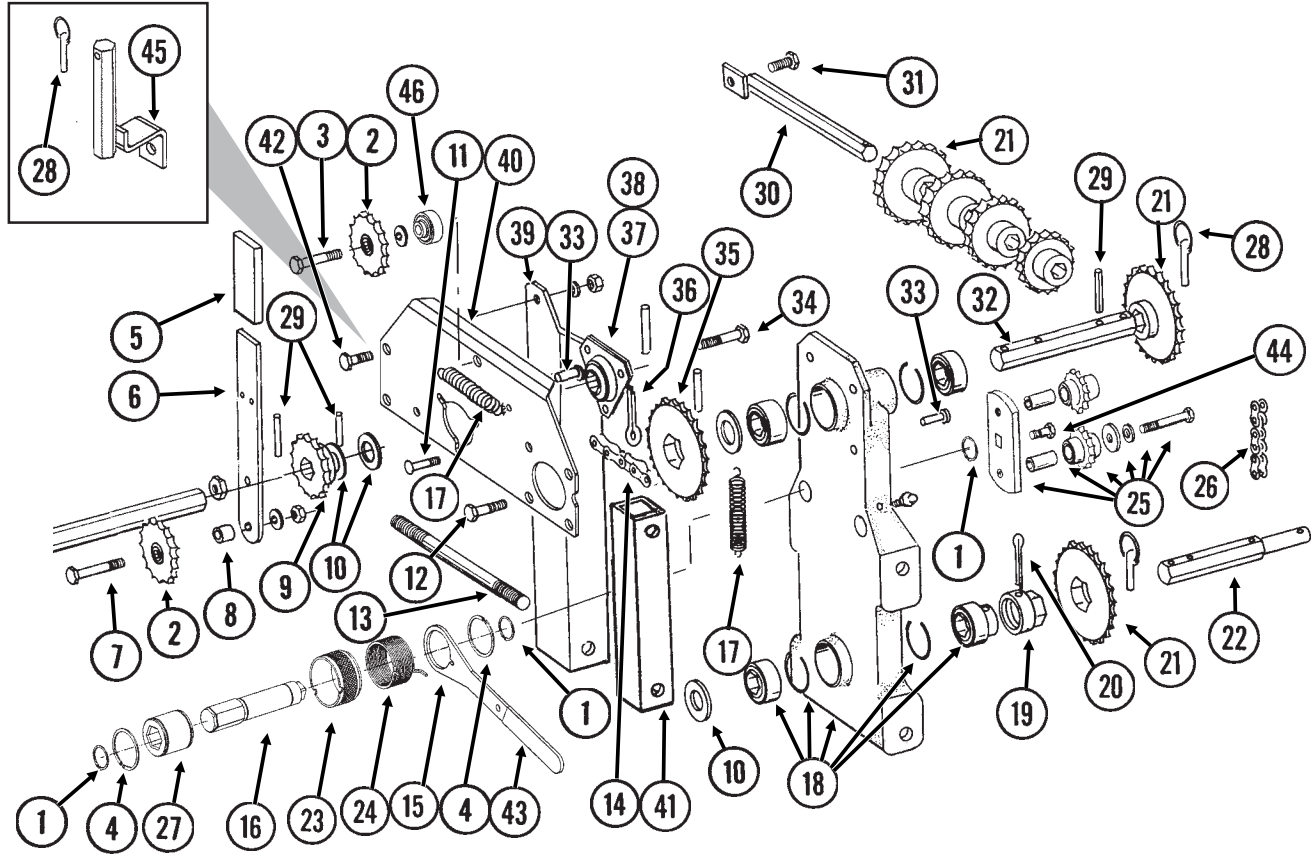
PTD016/PTD034(PT6/PT7c)



ITEM	PART NO.	QTY.	DESCRIPTION
1.	G10602	2	Spring Pin, 1/4" x 1 1/2"
2.	GD5884-01	1	Hex Shaft, 7/8" x 36" (3 Holes), 6 Row 30" And 8 Row 30"
	GD5960	-	Hex Shaft, 7/8" x 50" (6 Holes), 6 Row 36"/38"
3.	GD5961	1	Coupler, 2 1/4"
4.	GD5885-01	1	Hex Shaft, 7/8" x 30" (6 Holes), 6 Row 30"/36"/38" And 8 Row 30"
5.		-	See "Seed Rate Transmission Assembly", Pages P50 And P51
6.	G10131	4	Square Head Set Screw, 5/16"-18 x 3/4"
7.	GD0914-170	1	Hex Shaft, 7/8" x 170" (No Holes), 6 Row 30"
	GD0914-210	-	Hex Shaft, 7/8" x 210" (No Holes), 6 Row 36"/38"
	GD0914-230	-	Hex Shaft, 7/8" x 230" (No Holes), 8 Row 30"
8.	G10460	2	Cotter Pin, 1/4" x 2"
9.	G10233	-	Machine Bushing, 1", 10 Gauge (As Required)
10.	GA5165	1	Sprocket, 30 Tooth
11.	G10430	1	External Retaining Ring, 1 1/4"
12.	GD1255	2	L-Pin
13.	GA0378	1	Block And Hub Assembly
14.	G10453	2	Cotter Pin, 3/16" x 1"
15.	GD1256	2	Spring
16.	G10130	1	Square Head Machine Bolt, 5/16"-18 x 1 3/4"
	G10923	1	Flange Nut, 5/16"-18, No Serration
17.	GD11045	1	Lock Clamp
18.	G10233	2	Machine Bushing, 1", 10 Gauge
19.	GB0287	2	Coupler
A.	GA5164	-	Ratchet/Sprocket Assembly, Includes: (2) GD1256, (2) G10464, (1) GA0378, (2) GD1255, (1) GA5165, (1) G10430
B.	G1K269	-	Lock Clamp Kit (Items 16 And 17)

SEED RATE TRANSMISSION ASSEMBLY

PTD040/PTD066/PTD041(METR34aa/PT8m)



ITEM	PART NO.	QTY.	DESCRIPTION
1.	G11075	3	External Inverted Snap Ring, 7/8"
2.	GA7154	2	Sprocket W/Bearing, 18 Tooth
3.	G10038	1	Hex Head Cap Screw, 1/2"-13 x 3"
	G10128	-	Machine Bushing, 1/2", 14 Gauge (As Required)
	G10228	1	Lock Washer, 1/2"
	G10102	1	Hex Nut, 1/2"-13
4.	G10496	2	External Inverted Snap Ring, 1 1/2"
5.	GD5827	1	Cover
6.	GD5829	1	Arm
7.	G10053	1	Hex Head Cap Screw, 1/2"-13 x 2 1/2"
	G10128	-	Machine Bushing, 1/2", 14 Gauge (As Required)
	G10228	1	Lock Washer, 1/2"
	G10102	1	Hex Nut, 1/2"-13
8.	GD4887-01	1	Sleeve, 1/2" I.D. x 5/8" Long
9.	GA5105	1	Sprocket, 15 Tooth
10.	G10233	-	Machine Bushing, 1", 10 Gauge
11.	G10303	3	Carriage Bolt, 5/16"-18 x 1"
	G10232	3	Lock Washer, 5/16"
	G10106	3	Hex Nut, 5/16"-18
12.	G10037	3	Hex Head Cap Screw, 1/2"-13 x 1 1/4"
	G10228	3	Lock Washer, 1/2"
	G10102	3	Hex Nut, 1/2"-13
13.	GD6793	2	Stud, 5/8"-11 x 9 1/2" (Threaded Both Ends)
	G10230	4	Lock Washer, 5/8"
	G10104	4	Hex Nut, 5/8"-11
14.	G3310-92	1	Chain, No. 40, 92 Pitch Including Connector Link
	GR0912	-	Connector Link, No. 40
15.	GD14431	1	Handle

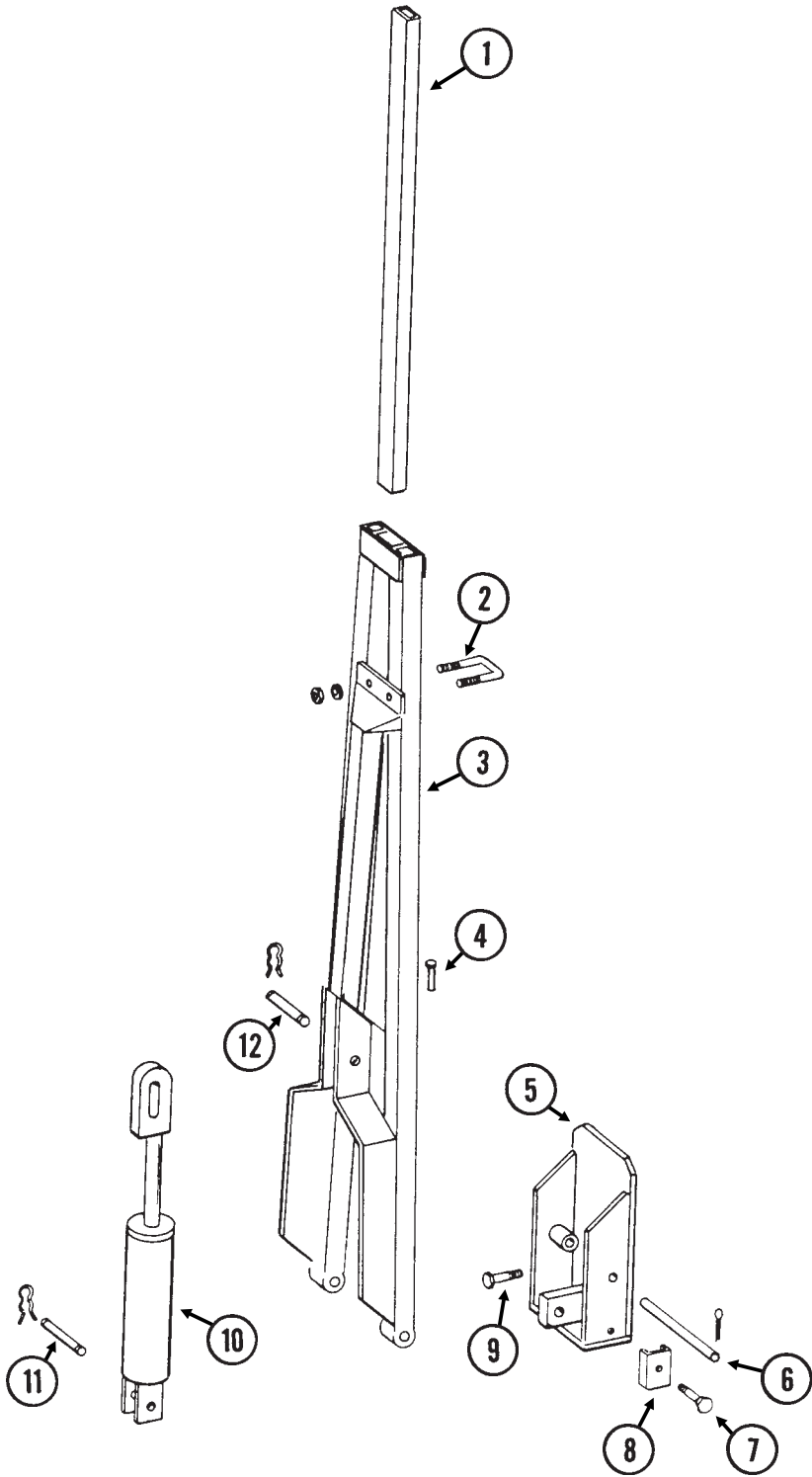
SEED RATE TRANSMISSION ASSEMBLY

ITEM	PART NO.	QTY.	DESCRIPTION
16.	GD14427	1	Tightener Shaft, 4 7/8"
17.	GD5857	2	Spring
18.	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
	G10641	-	Grease Fitting, 1/8" NPT
19.	GD7127	1	Shear Coupler
20.	G10462	1	Cotter Pin, 3/16" x 2"
	G10641	-	Grease Fitting, 1/8" NPT
21.	GA5105	1	Sprocket, 15 Tooth
	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
22.	GD7822	1	Shaft, 7/8" x 7"
23.	GD14430	1	Release Collar, Gold, R.H.
24.	GD14413	1	Torsion Spring, L.H. (Used On R.H. Wrap Spring Wrench)
25.	GA7336	1	Idler W/Bolt-On Sprockets
	GD7426	-	Sprocket, 12 Tooth
	GD1026	-	Sleeve, 1 3/16" Long
	G10210	-	Washer, 3/8" USS
	G10229	-	Lock Washer, 3/8"
	G10047	-	Hex Head Cap Screw, 3/8"-16 x 1 3/4"
26.	G3310-80	1	Chain, No. 40, 80 Pitch Including Connector Link
	GR0912	-	Connector Link, No. 40
27.	GD14432	1	Sleeve, 1 1/4"
28.	GD2558	4	Lynch Pin, 1/4"
29.	G10602	5	Spring Pin, 1/4" x 1 1/2"
30.	GA5146	1	Sprocket Storage Rod
31.	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
32.	GD5835	1	Shaft, 7/8" x 7"
33.	G10408	1	Clevis Pin, 5/16" x 3/4"
	G10409	1	Retaining Ring, 5/16"
34.	G10004	1	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	G10229	1	Lock Washer, 3/8"
	G10203	-	Washer, 3/8" SAE (As Required)
	GD15538	2	Spacer, 3/8" I.D. x 7/8" O.D., 7 Gauge
	GD5756	1	Special Nut, 3/8"-16
35.	GA5108	-	Sprocket, 23 Tooth
	GA5106	1	Sprocket, 17 Tooth
36.	G10460	1	Cotter Pin, 1/4" x 2"
37.	GA7841	1	Bearing, 7/8" Hex Bore
38.	G3400-01	2	Flangette
39.	GD5830	1	Angle Support, R.H.
40.	GD16302	1	Reverser Plate
41.	GD9047	1	Spacer
42.	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
43.	G11078	1	Vinyl Cap
44.	G11100	1	Hex Socket Button Head Cap Screw, 1/4"-20 x 1/2", Grade 8
	G10227	1	Lock Washer, 1/4"
	G10209	1	Washer, 1/4" USS
45.	GA12178	1	Sprocket Storage Rod
46.	GB0259	1	Spacer, 1"
A.	G1K378	1	Wrap Spring Wrench Replacement Kit, Gold Collar, R.H. (Items 1, 4, 15, 16, 23, 24, 27, 43 And 44)

ROW MARKER ASSEMBLY, CONVENTIONAL

4 ROW 30"/36"/38" AND 6 ROW 30"

MKR010(MKR1a)



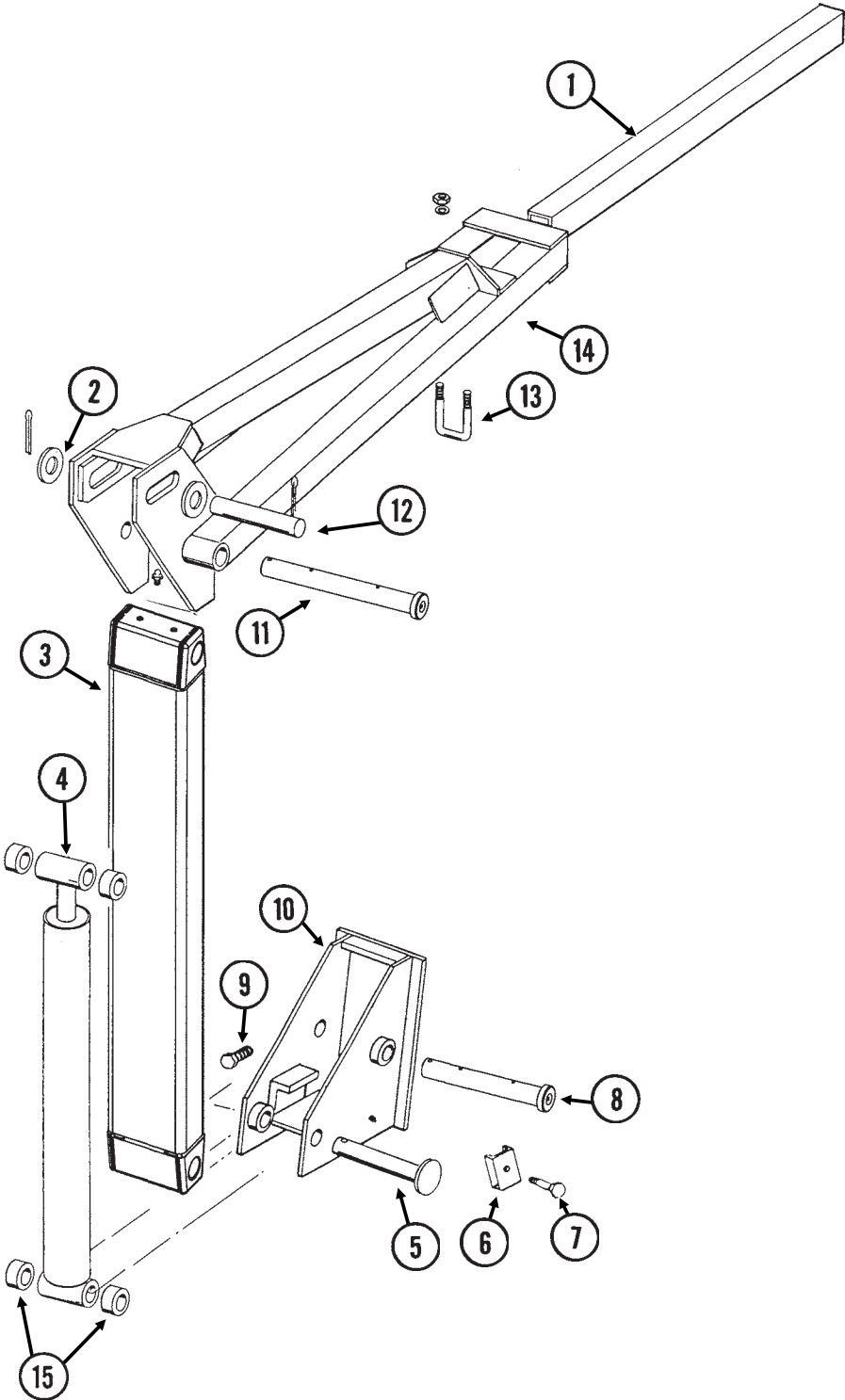
ROW MARKER ASSEMBLY, CONVENTIONAL

4 ROW 30"/36"/38" AND 6 ROW 30"

ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Assy.)	
1.	GD0453-02	1	Extension Tube, 40", 4 Row 30"
	GD0453-06	-	Extension Tube, 30", 4 Row 30" W/Optional Interplant® Package
	GD0453-07	-	Extension Tube, 45", 4 Row 36"/38" And 6 Row 30"
2.	GD2721	1	U-Bolt, 2" x 2" x 1/2"-13
	G10228	2	Lock Washer, 1/2"
	G10102	2	Hex Nut, 1/2"-13
3.	GA5175	1	Arm W/Grease Fittings, 31 1/2", 4 Row 30"
	GA5184	-	Arm W/Grease Fittings, 44 1/2", 4 Row 36"/38"
	GA5183	-	Arm W/Grease Fittings, 58 1/2", 6 Row 30"
	G10640	-	Grease Fitting, 1/4"-28
4.	GD0462	1	Safety Lockup Pin
	G10670	1	Hair Pin Clip, No. 3
	G10187	1	Spring Pin, 5/32" x 2"
5.	GA5177	1	Mount W/Grease Fittings, 4 Row 30"
	GA5178	-	Mount W/Grease Fittings, 4 Row 36"/38" And 6 Row 30"
	G10640	-	Grease Fitting, 1/4"-28
6.	GD0438	1	Pin, 13 1/2"
	G10460	2	Cotter Pin, 1/4" x 2"
7.	G10133	1	Hex Head Cap Screw, 5/16"-18 x 1 1/2"
	G10109	1	Lock Nut, 5/16"-18
8.	GD5892	1	Hose Clamp, 5/8" x 1 1/2" x 1 1/2"
9.	G10008	4	Hex Head Cap Screw, 5/8"-11 x 2"
	G10230	4	Lock Washer, 5/8"
10.		-	See "Row Marker Cylinder", Page P60
11.	GR0367	1	Pin, 1" x 2 7/8"
	GR0193	2	Hair Pin Clip
12.	GR0375	1	Pin, 1" x 3 1/2"
	GR0193	2	Hair Pin Clip

ROW MARKER ASSEMBLY, TWO-FOLD LOW PROFILE 6 ROW 36"/38" AND 8 ROW 30"

(MKR2f)



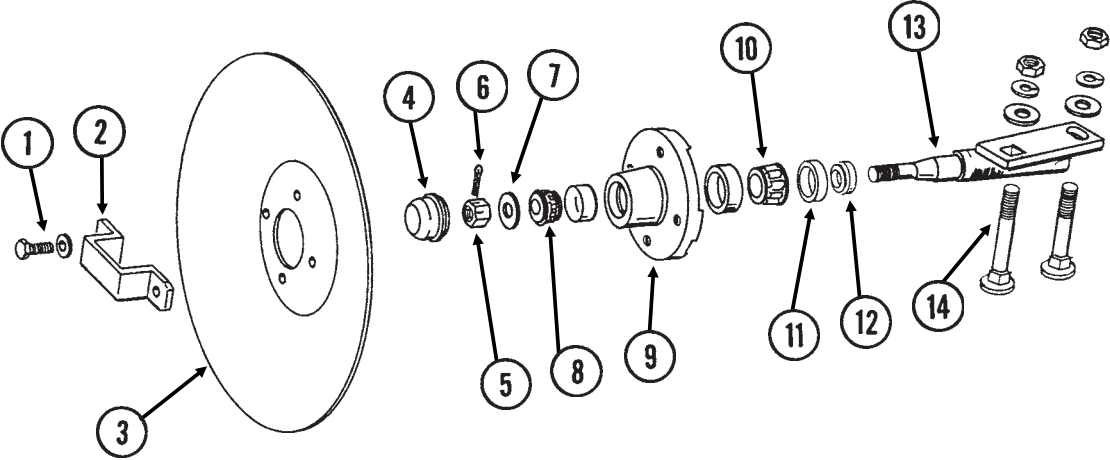
ROW MARKER ASSEMBLY, TWO-FOLD LOW PROFILE

6 ROW 36"/38" AND 8 ROW 30"

ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Assy.)	
1.	GD0453-03	1	Extension Tube, 50", 6 Row 36"/38" And 8 Row 30"
2.	G10226	2	Washer, 1 1/4" SAE
3.	GA11591	-	Arm, First Stage
4.		-	See "Row Marker Cylinder", Page P60
5.	GD15386	1	Pin, 1 1/4" x 7 5/8"
	G10460	1	Cotter Pin, 1/4" x 2"
6.	GD5875	1	Hose Clamp, 9/16" x 2 1/2" x 2"
7.	G10133	1	Hex Head Cap Screw, 5/16"-18 x 1 1/2"
	G10109	1	Lock Nut, 5/16"-18
8.	GA11767	-	Pin W/Grease Fitting, 1 1/4" x 9 1/2"
	G10640	-	Grease Fitting, 1/4"-28
	G10460	-	Cotter Pin, 1/4" x 2"
9.	G10879	4	Flanged 12 Point Bolt, 5/8"-11 x 2", Special Hardened
10.	GA5130	1	Mount
11.	GA11766	-	Pin W/Grease Fitting, 1 1/4" x 11 13/16"
	G10640	-	Grease Fitting, 1/4"-28
	G10460	-	Cotter Pin, 1/4" x 2"
12.	GD2161	1	Pin, 1 1/4" x 8 1/4"
	G10460	2	Cotter Pin, 1/4" x 2"
13.	GD2721	1	U-Bolt, 2" x 2" x 1/2"-13
	G10228	2	Lock Washer, 1/2"
	G10102	2	Hex Nut, 1/2"-13
14.	GA5190	1	Arm, Second Stage, 35", 6 Row 36"/38"
	GA5188	-	Arm, Second Stage, 46", 8 Row 30"
15.	GD0752-41	-	Sleeve, 1" (If Applicable)

ROW MARKER SPINDLE/HUB/BLADE

MKR020(MKR3a)

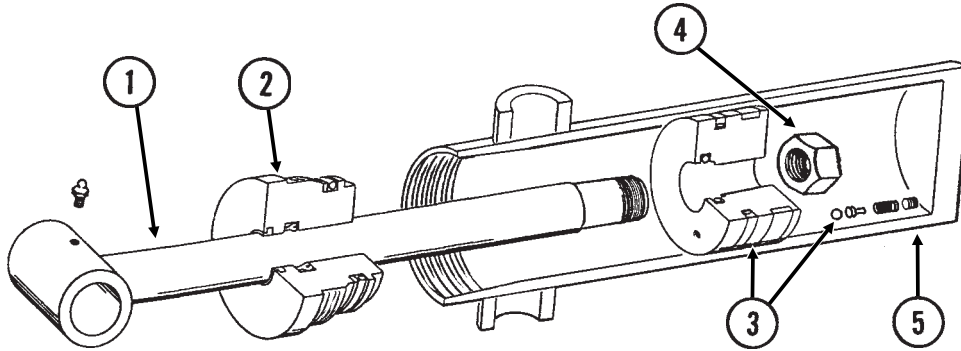


ROW MARKER SPINDLE/HUB/BLADE

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

MASTER LIFT CYLINDER

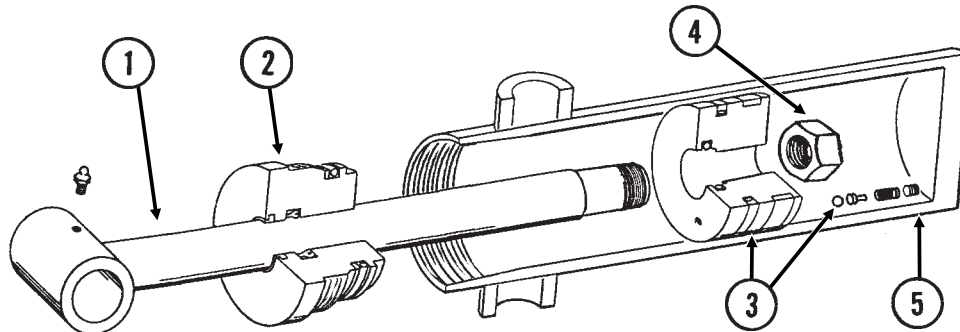
CYL038(CYL1a)



ITEM	PART NO.	QTY.	DESCRIPTION
1.	GA8912 G10449	1 -	Rod Assembly W/Grease Fitting Grease Fitting, $\frac{3}{16}$ ", Drive-In
2.	GD12507	1	Gland
3.	GA8916 GR1169	1 1	Piston W/Rephasing Valve Rephasing Valve Replacement Kit (Set Screw, Guide, 2 Springs And Ball)
4.	G10958	1	Lock Nut, 1"-14
5.	A4295	1	Barrel (Non-Stock Item)
A.	GA8917	-	Cylinder Complete, 3 $\frac{1}{2}$ " x 8" (<i>Part Number Stamped On Barrel</i>)
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)

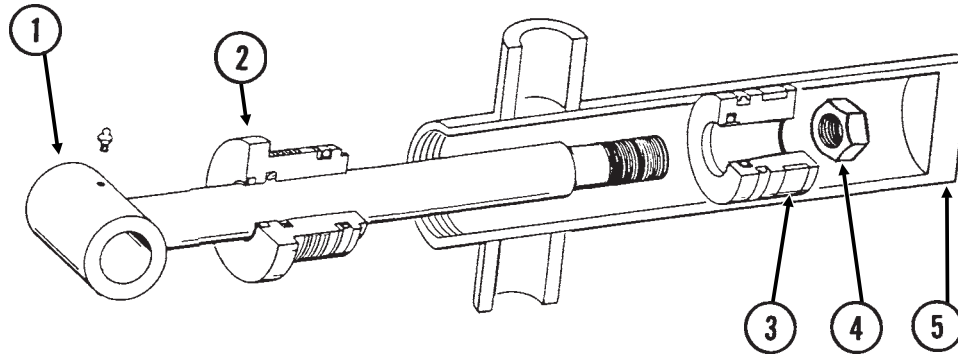


ITEM	PART NO.	QTY.	DESCRIPTION
1.	GA8912 G10449	1 -	Rod Assembly W/Grease Fitting Grease Fitting, $\frac{3}{16}$ ", Drive-In
2.	GD12505	1	Gland
3.	GA8914 GR1169	1 1	Piston W/Rephasing Valve Rephasing Valve Replacement Kit (Set Screw, Guide, 2 Springs And Ball)
4.	G10958	1	Lock Nut, 1"-14
5.	A7538	1	Barrel (Non-Stock Item)
A.	GA8915	-	Cylinder Complete, 3 $\frac{1}{4}$ " x 8" (<i>Part Number Stamped On Barrel</i>)
B.	GR1527	-	Seal Kit, Includes: (1) Wear Ring, (1) T-Seal, (2) O-Rings, (1) BU Ring, (1) U-Cup, (1) Wiper

LIFT ASSIST CYLINDER

6 ROW 30"/36"/38" AND 8 ROW 30"

CYL026(CYL4d)

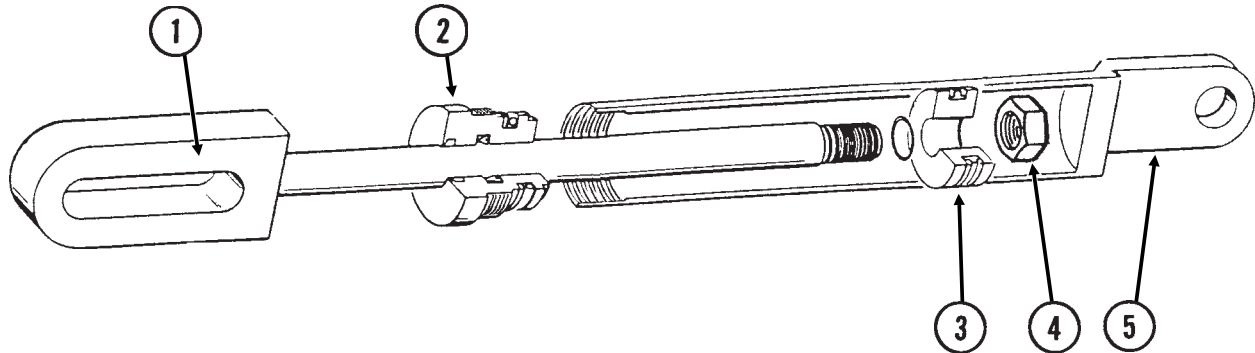


ITEM	PART NO.	QTY.	DESCRIPTION
1.	GA8831	1	Rod Assembly W/Grease Fitting
	G10640	-	Grease Fitting, 1/4"-28
2.	GD11926	1	Gland
3.	GD5956	1	Piston
4.	G10958	1	Lock Nut, 1"-14
5.	A8827	1	Barrel (Non-Stock Item)
A.	GA8828	-	Cylinder Complete, 2 1/2" x 8" (<i>Part Number Stamped On Barrel</i>)
B.	GR1522	-	Seal Kit, Includes: (1) T-Seal, (2) O-Rings, (1) BU Ring, (1) U-Cup, (1) Wiper

ROW MARKER CYLINDER

4 ROW 30"/36"/38" AND 6 ROW 30"

CYL030(CYL2c)



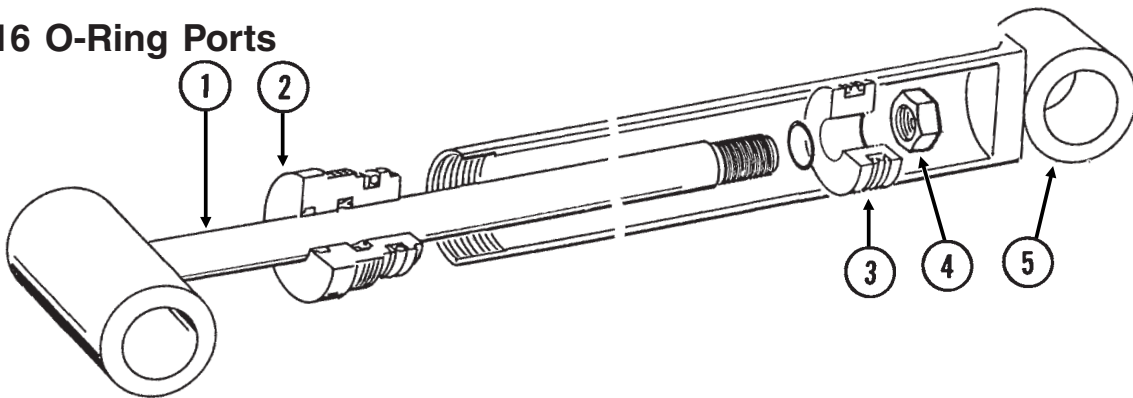
ITEM	PART NO.	QTY.	DESCRIPTION
1.	GA8918	1	Rod Assembly
2.	GD12510	1	Gland
3.	GD12511	1	Piston
4.	G10967	1	Lock Nut, 3/4"-16
5.	A8775	1	Barrel (Non-Stock Item)
A.	GA8919	-	Cylinder Complete, 2" x 8" (<i>Part Number Stamped On Barrel</i>)
B.	GR1529	-	Seal Kit, Includes: (1) T-Seal, (2) O-Rings, (1) BU Ring, (2) U-Cups, (1) Wiper, (1) IS511 Instruction

ROW MARKER CYLINDER

6 ROW 36"/38" AND 8 ROW 30"

CYL039(CYL3e)

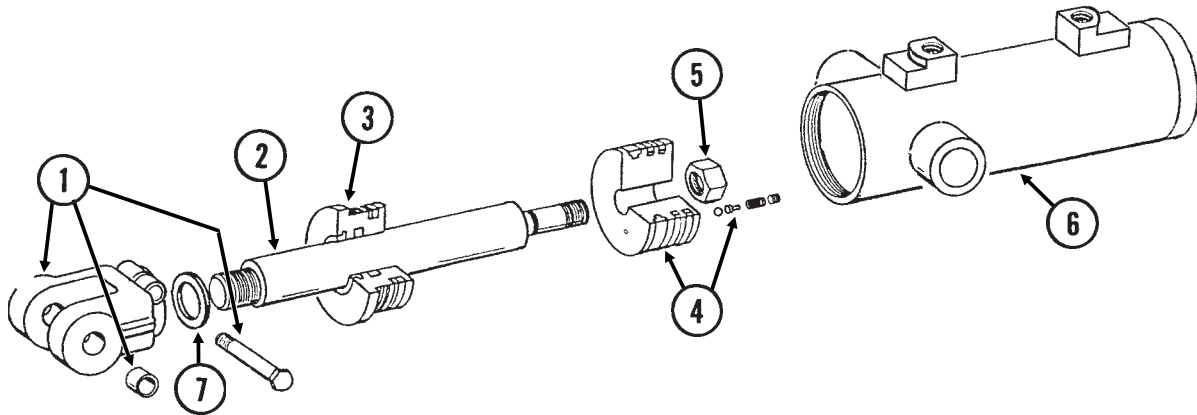
3/4"-16 O-Ring Ports



ITEM	PART NO.	QTY.	DESCRIPTION
1.	GA9440	1	Rod Assembly
2.	GD12510	1	Gland
3.	GD12511	1	Piston
4.	G10967	1	Lock Nut, 3/4"-16
5.	A9442	1	Barrel (Non-Stock Item)
A.	GA9443	-	Cylinder Complete, 2" x 20 1/16" (<i>Part Number Stamped On Barrel</i>)
B.	GR1529	-	Seal Kit, Includes: (1) T-Seal, (2) O-Rings, (1) BU Ring, (2) U-Cups, (1) Wiper, (1) IS511 Instruction

INTERPLANT® LIFT CYLINDER

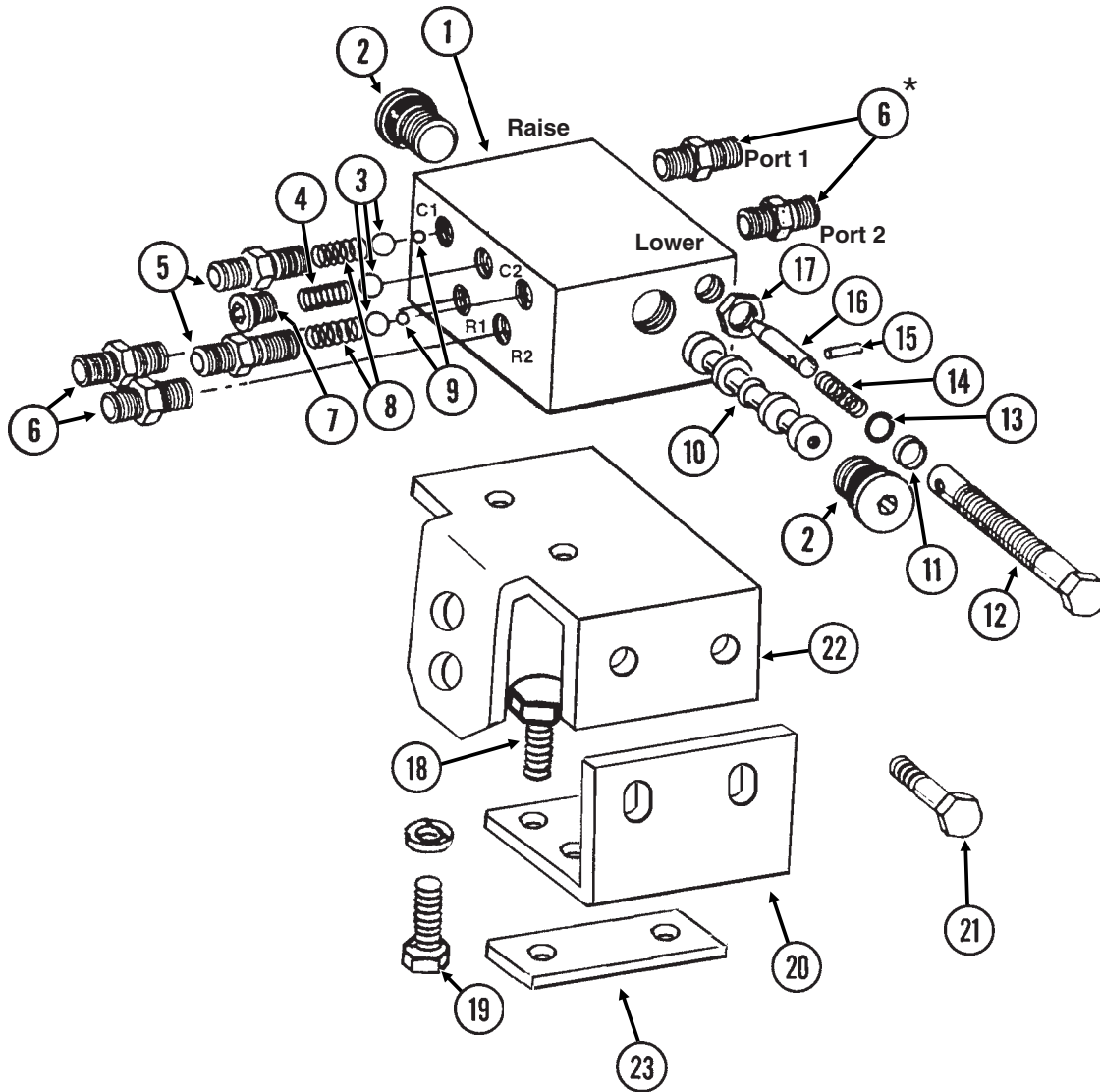
(CYL33c)



ITEM	PART NO.	QTY.	DESCRIPTION
1.	GA8130	1	Clevis W/Bushings, Hex Head Cap Screw And Hex Nut
	GR1401	2	Bushing
	G10939	1	Hex Head Cap Screw, 3/8"-16 x 2 1/4"
	G10101	1	Hex Nut, 3/8"-16
2.	GD12513	1	Rod
3.	GD11995	1	Gland
4.	GA8924	1	Piston W/Rephasing Valve
	GR1169	-	Rephasing Valve Replacement Kit (Set Screw, Guide, 2 Springs And Ball)
5.	G10958	1	Lock Nut, 1"-14
6.	A8923	1	Barrel (Non-Stock Item)
7.	G10957	4	Steel Shim
A.	GA8897	-	Cylinder Complete, 4 1/4" x 4" (<i>Part Number Stamped On Barrel</i>)
B.	GR1523	-	Seal Kit, Includes: (1) Wiper, (2) O-Rings, (1) BU Ring, (1) U-Cup, (1) Seal, (1) Expander, (2) Cast Iron Ring

ROW MARKER SEQUENCING/FLOW CONTROL VALVE

VVB025/PHS035(PT11b)



ROW MARKER SEQUENCING/FLOW CONTROL VALVE

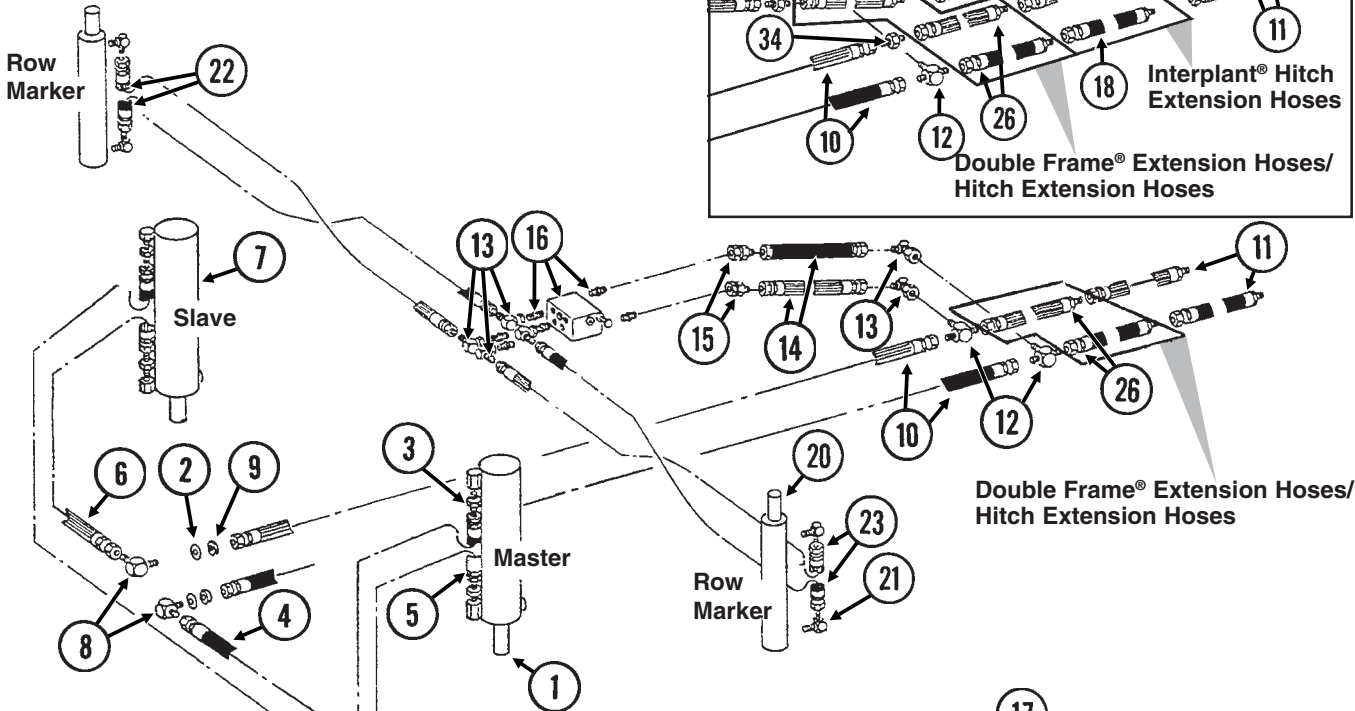
ITEM	PART NO.	QTY.	DESCRIPTION
1.		-	Valve Body (Non-Stock Item)
2.	GR1047	2	Hex Socket Plug W/O-Ring
	GR1037	-	O-Ring
3.	GR1044	3	7/16" Check Ball
4.	GR1033	1	Detent Spring
5.	GR1032	2	Port Adapter W/O-Ring
	GR1045	-	O-Ring
6.	*G6400-06	4	Connector W/O-Ring, 9/16" Male JIC To O-Ring
	GR1045	-	O-Ring
7.	GR1034	1	Hex Socket Plug W/O-Ring
	GR1035	-	O-Ring
8.	GR1036	2	Spring
9.	GR1043	2	1/4" Steel Ball
10.		-	Spool (Non-Stock Item)
11.	GR1041	2	Teflon BU Ring
12.	GR1042	2	Adjustment Screw
13.	GR1040	2	O-Ring
14.	GR1046	2	Compression Spring
15.	GR1039	2	Spring Pin
16.	GR1038	2	Needle
17.	GR1048	2	Hex Jam Nut, 1/2"-20
18.	G10001	2	Hex Head Cap Screw, 3/8"-16 x 1"
	G10203	2	Washer, 3/8" SAE
	G10229	2	Lock Washer, 3/8"
19.	G10001		Hex Head Cap Screw, 3/8"-16 x 1"
	G10229	2	Lock Washer, 3/8"
20.	GD10223	1	Mounting Angle
21.	G10001	2	Hex Head Cap Screw, 3/8"-16 x 1"
	G10203	2	Washer, 3/8" SAE
	G10229	2	Lock Washer, 3/8"
	G10101	2	Hex Nut, 3/8"-16
22.	GD10224	1	Valve Mounting Angle
23.	GD17282	1	Shim, 1" x 3 1/2"
A.	GA5552	-	Valve Assembly Complete (Items 1-17)
B.	GA5572	-	Flow Control Portion Only (Items 11-17)

*Not used on sizes with 3/8" hoses.

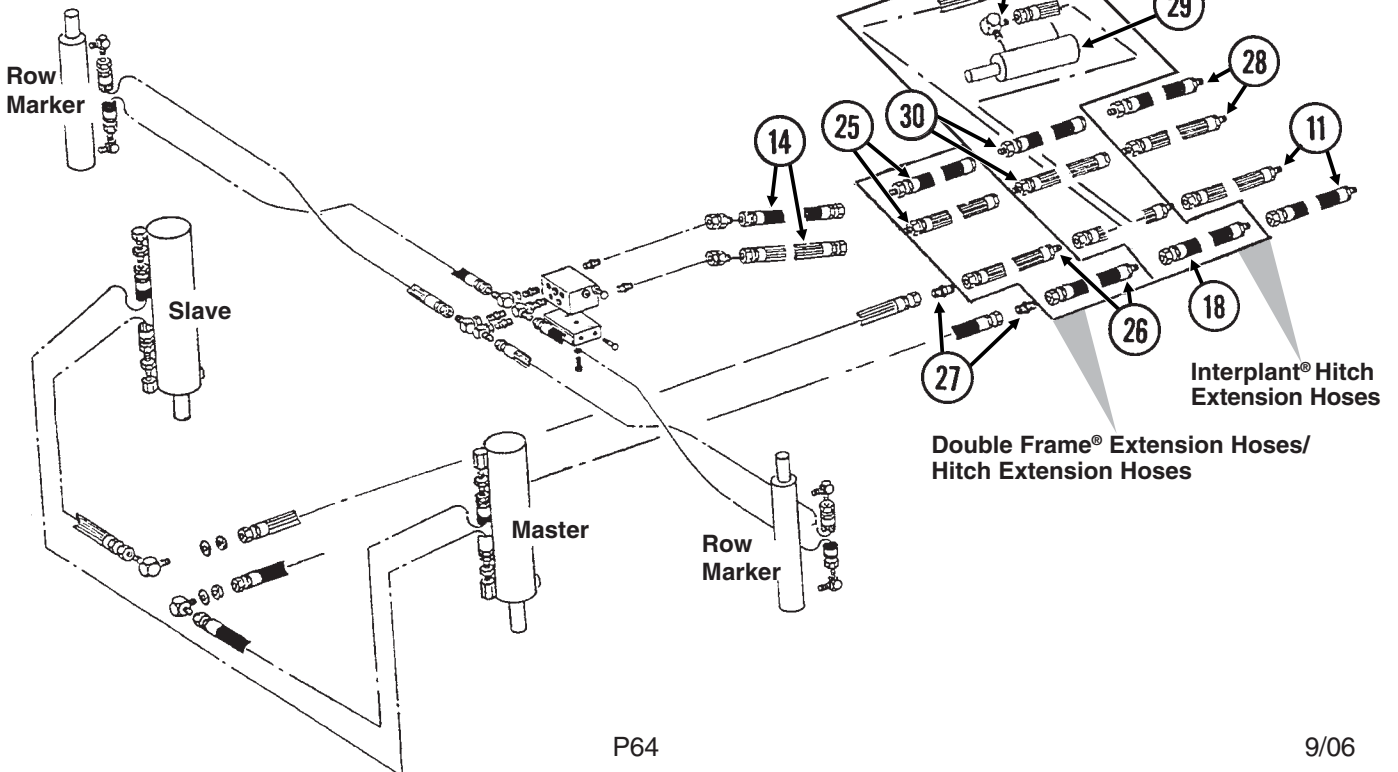
HYDRAULIC SYSTEM, 4 ROW 30"/36"/38" CONVENTIONAL ROW MARKER

PHS001/PHS002/PHS003(PT12d/PT12e/PT13d)

Single Valve



Dual Valve



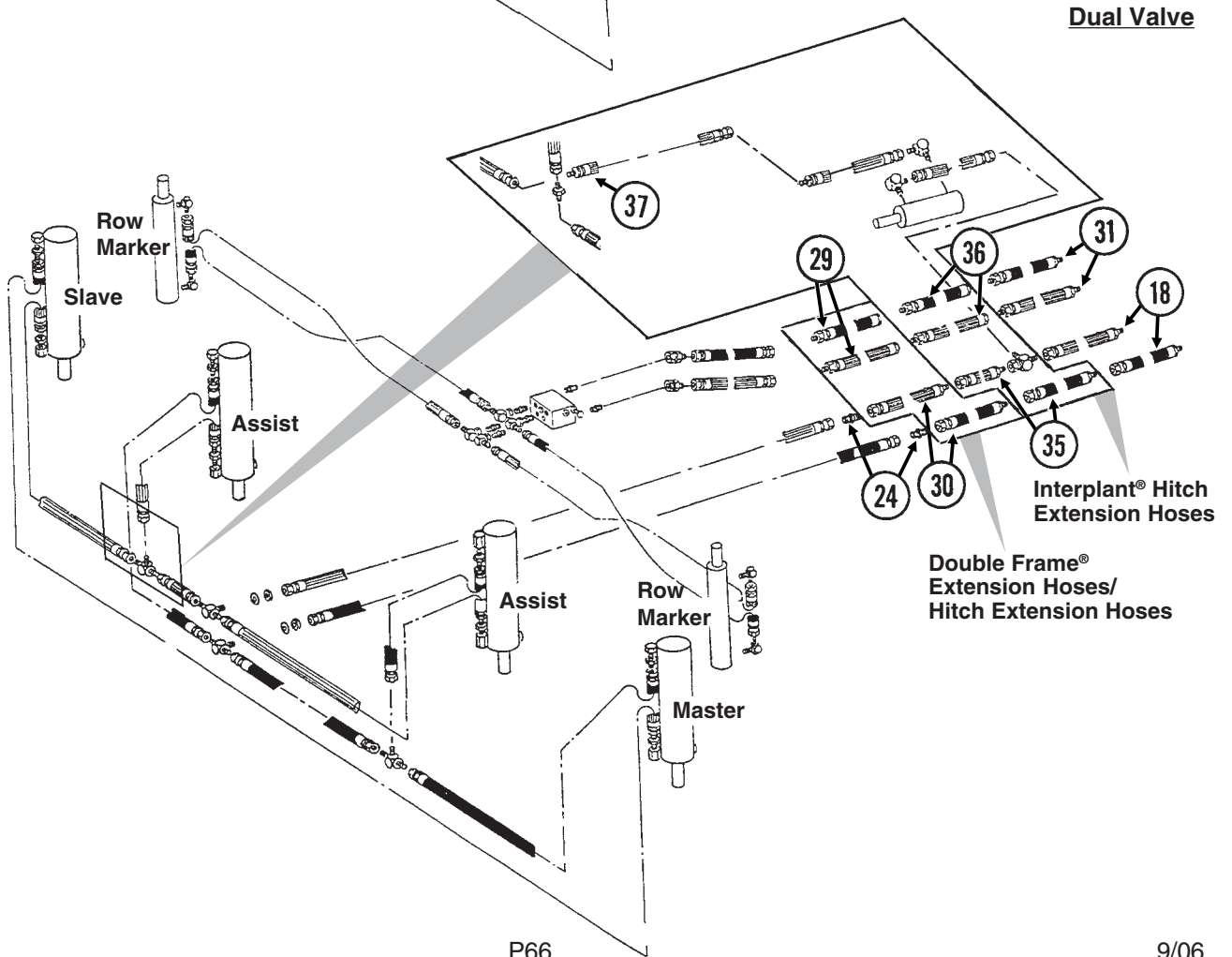
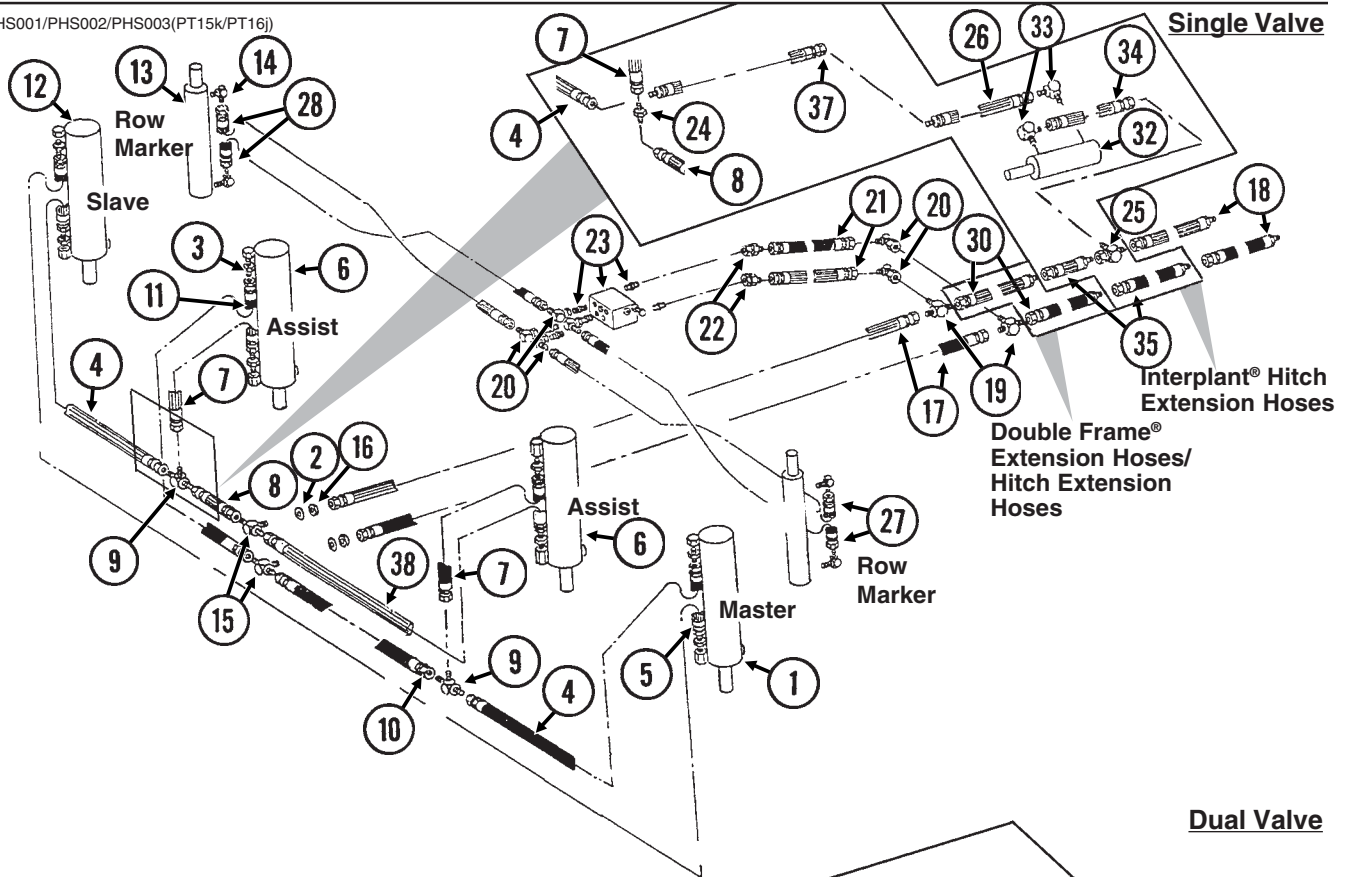
HYDRAULIC SYSTEM, 4 ROW 30"/36"/38" CONVENTIONAL ROW MARKER

ITEM	PART NO.	QTY.	DESCRIPTION
1.		-	See "Master Lift Cylinder", Page P58
2.	G10215	2	Machine Bushing, 3/4", 14 Gauge
3.	G6400-08	4	Connector W/O-Ring, 3/4"-16 Male JIC To O-Ring
	GR1037	-	O-Ring
4.	*A1018	1	Hose Assembly, 3/8" x 40", 4 Row 30"
	*A1020	-	Hose Assembly, 3/8" x 48", 4 Row 36"/38"
5.	*A3113	1	Hose Assembly, 3/8" x 84", 4 Row 30"
	*A3136	-	Hose Assembly, 3/8" x 100", 4 Row 36"/38"
6.	*A1020	1	Hose Assembly, 3/8" x 48", 4 Row 30"
	*A1021	-	Hose Assembly, 3/8" x 56", 4 Row 36"/38"
7.		-	See "Slave Lift Cylinder", Page P58
8.	G2701-08	2	Bulkhead Elbow, 90°, 3/4"-16 Male JIC
9.	G306-08	2	Lock Nut, 3/4"-16
10.	*A1076	2	Hose Assembly, 3/8" x 30"
11.	*A3135	2	Hose Assembly, 3/8" x 100"
12.	G2603-08-08-06	2	Tee, 3/4"-16 Male JIC To 9/16"-18 JIC
13.	G6500-06	-	Swivel Elbow, 90°, 9/16"-18 Male JIC To Female
14.	*A1138	2	Hose Assembly, 1/4" x 29"
15.	G6502-06	2	Swivel Elbow, 45°, 9/16"-18 Male JIC To Female
16.		-	See "Row Marker Sequencing/Flow Control Valve", Pages P62 And P63
17.	G6801-08	2	Elbow W/O-Ring, 90°, 3/4"-16 Male JIC To O-Ring
	GR1037	-	O-Ring
18.	*A3211	1	Hose Assembly, 3/8" x 66", W/Interplant® Package
19.	*A1020	1	Hose Assembly, 3/8" x 48", W/Interplant® Package
20.		-	See "Row Marker Cylinder", Page P60
21.	G6801-06-08	4	Elbow W/O-Ring, 90°, 9/16"-18 Male JIC To 3/4"-16 O-Ring
	GR1037	-	O-Ring
22.	*A1102	2	Hose Assembly, 1/4" x 95", 4 Row 30"
	*A1171	-	Hose Assembly, 1/4" x 108", 4 Row 36"/38"
23.	*A1170	2	Hose Assembly, 1/4" x 90", 4 Row 30"
	*A1150	-	Hose Assembly, 1/4" x 103", 4 Row 36"/38"
24.	*A1076	1	Hose Assembly, 3/8" x 30", W/Interplant® Package
25.	*A1182	-	Hose Assembly, 1/4" x 30", W/Double Frame® Package
	*A1177	-	Hose Assembly, 1/4" x 24", W/Hitch Extensions
26.	*A3142	-	Hose Assembly, 3/8" x 30", W/Double Frame® Package
	*A3147	-	Hose Assembly, 3/8" x 24", W/Hitch Extensions
27.	G2403-08	2	Union, 3/4"-16 Male JIC
28.	*A1173	2	Hose Assembly, 1/4" x 100"
29.		-	See "Interplant® Lift Cylinder", Page P61
30.	*A1179	2	Hose Assembly, 1/4" x 56", W/Interplant® Package
31.	*A1182	1	Hose Assembly, 1/4" x 30", W/Double Frame® Package
32.	*A1153	1	Hose Assembly, 1/4" x 56", W/Interplant® Package
33.	G2403-06	1	Union, 9/16"-18 Male JIC, W/Interplant® Package
34.	G2403-08	1	Union, 3/4"-16 Male JIC, W/Interplant® Package

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

HYDRAULIC SYSTEM, 6 ROW 30" CONVENTIONAL ROW MARKER

PHS001/PHS002/PHS003(PT15k/PT16j)



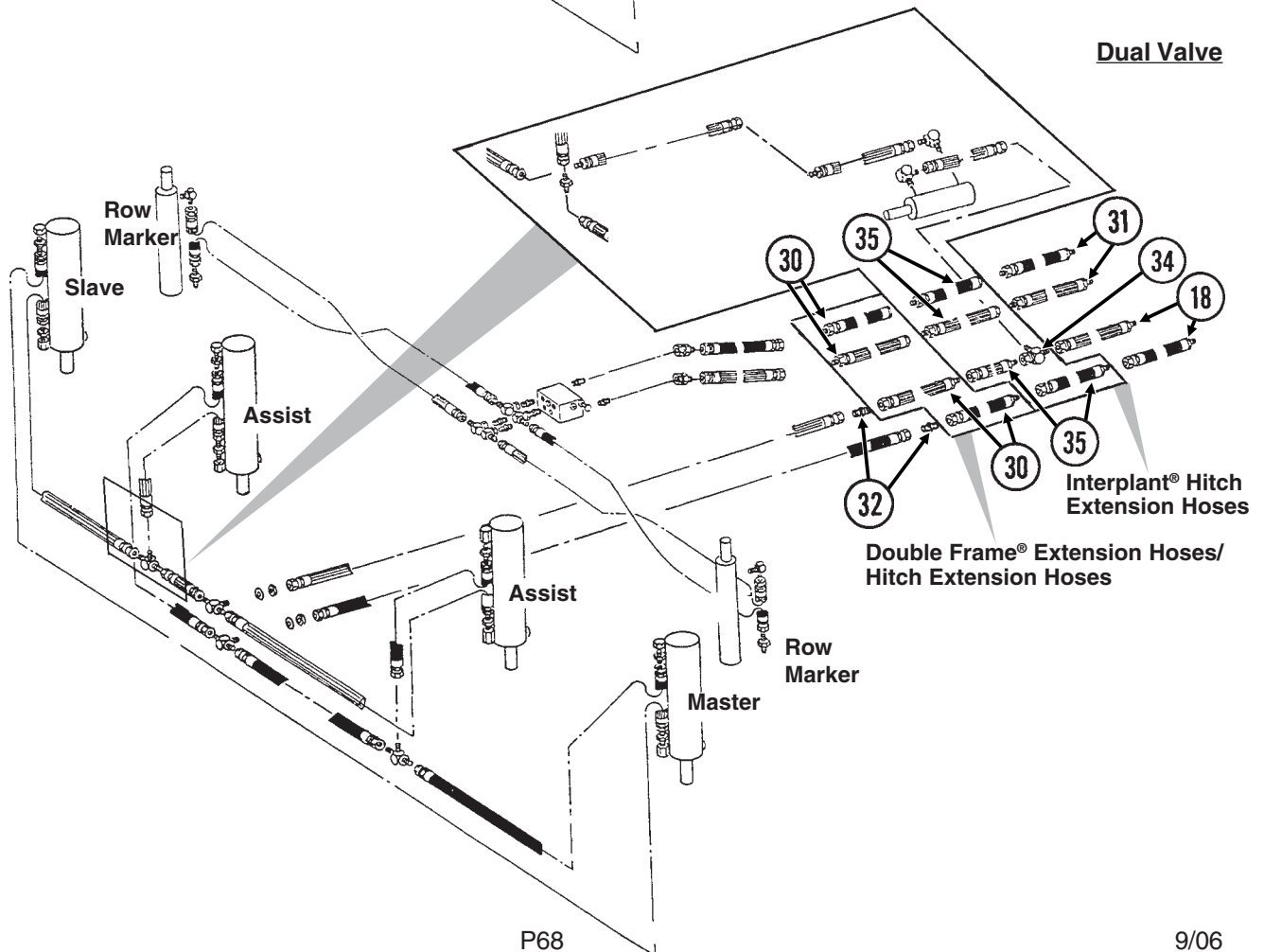
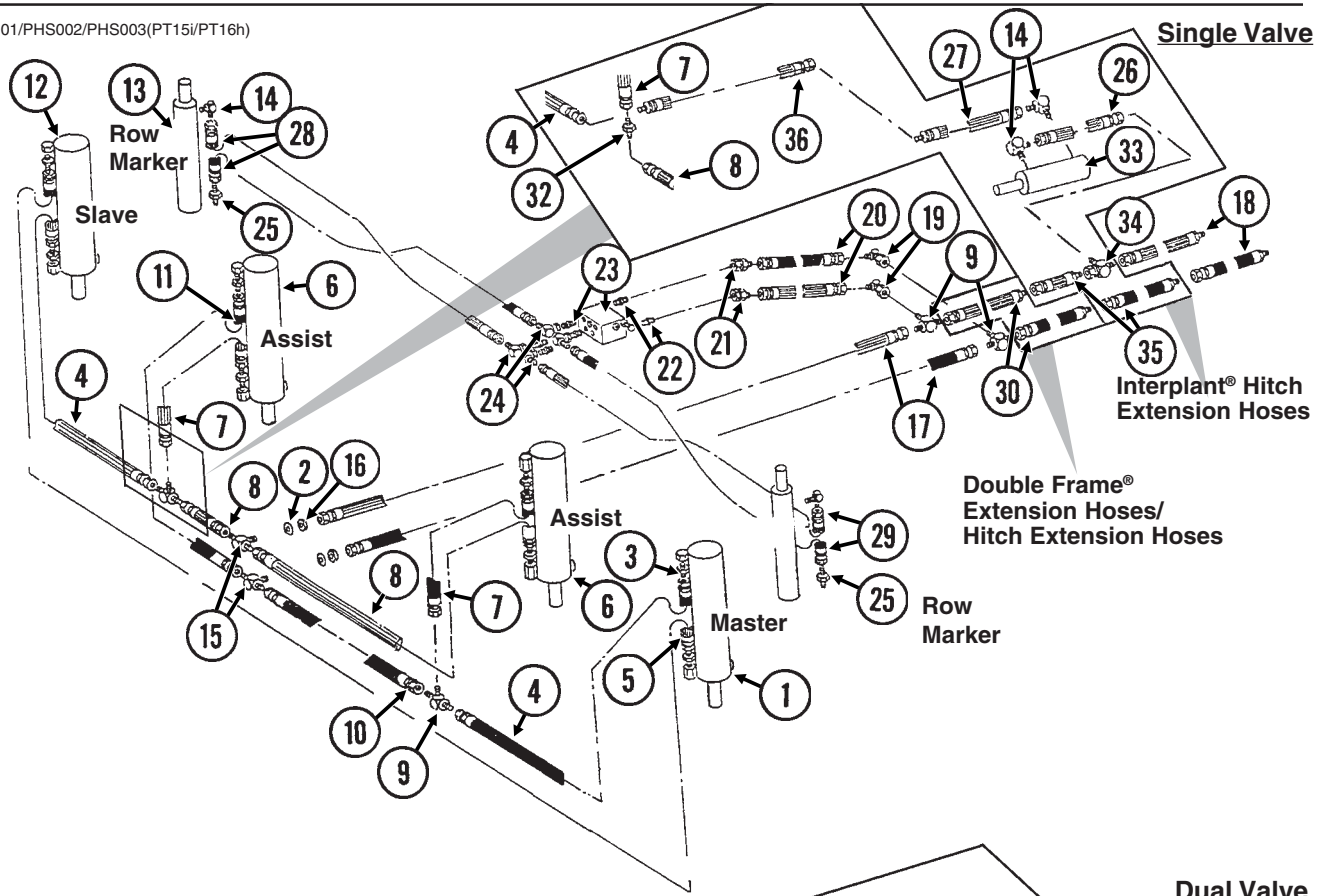
HYDRAULIC SYSTEM, 6 ROW 30" CONVENTIONAL ROW MARKER

ITEM	PART NO.	QTY.	DESCRIPTION
1.		-	See "Master Lift Cylinder", Page P58
2.	G10215	2	Machine Bushing, $\frac{3}{4}$ ", 14 Gauge
3.	G6400-08	8	Connector W/O-Ring, $\frac{3}{4}$ "-16 Male JIC To O-Ring
	GR1037	-	O-Ring
4.	*A1018	2	Hose Assembly, $\frac{3}{8}$ " x 40"
5.	*A3115	1	Hose Assembly, $\frac{3}{8}$ " x 146"
6.		-	See "Lift Assist Cylinder", Page P59
7.	*A1000	2	Hose Assembly, $\frac{3}{8}$ " x 15"
8.	*A3119	1	Hose Assembly, $\frac{3}{8}$ " x 36"
9.	G2603-08	2	Tee, $\frac{3}{4}$ "-16 Male JIC
10.	*A1086	1	Hose Assembly, $\frac{3}{8}$ " x 28"
11.	*A1019	1	Hose Assembly, $\frac{3}{8}$ " x 44"
12.		-	See "Slave Lift Cylinder", Page P58
13.		-	See "Row Marker Cylinder", Page P60
14.	G6801-06-08	4	Elbow W/O-Ring, 90°, $\frac{9}{16}$ "-18 Male JIC To $\frac{3}{4}$ "-16 O-Ring
	GR1037	-	O-Ring
15.	G2703-08	2	Bulkhead Tee, $\frac{3}{4}$ "-16 Male JIC
16.	G306-08	2	Lock Nut, $\frac{3}{4}$ "-16
17.	*A1076	2	Hose Assembly, $\frac{3}{8}$ " x 30"
18.	*A3135	2	Hose Assembly, $\frac{3}{8}$ " x 100"
19.	G2603-08-08-06	2	Tee, $\frac{3}{4}$ "-16 Male JIC To $\frac{9}{16}$ "-18 JIC
20.	G6500-06	2	Swivel Elbow, 90°, $\frac{9}{16}$ "-18 Male JIC To Female
21.	*A1138	2	Hose Assembly, $\frac{1}{4}$ " x 29"
22.	G6502-06	2	Swivel Elbow, 45°, $\frac{9}{16}$ "-18 Male JIC To Female
23.		-	See "Row Marker Sequencing/Flow Control Valve", Pages P62 And P63
24.	G2403-08	1	Union, $\frac{3}{4}$ "-16 Male JIC
25.	G6602-08	1	Swivel Tee, $\frac{3}{4}$ "-16 JIC
26.	*A3208	1	Hose Assembly, $\frac{3}{8}$ " x 140", W/Interplant® Package
27.	*A1168	2	Hose Assembly, $\frac{1}{4}$ " x 120"
28.	*A1105	2	Hose Assembly, $\frac{1}{4}$ " x 125"
29.	*A1182	-	Hose Assembly, $\frac{1}{4}$ " x 30", W/Double Frame® Package
	*A1177	-	Hose Assembly, $\frac{1}{4}$ " x 24", W/Hitch Extensions
30.	*A3142	-	Hose Assembly, $\frac{3}{8}$ " x 30", W/Double Frame® Package
	*A3147	-	Hose Assembly, $\frac{3}{8}$ " x 24", W/Hitch Extensions
31.	*A1173	2	Hose Assembly, $\frac{1}{4}$ " x 100"
32.		-	See "Interplant® Lift Cylinder", Page P61
33.	G6801-08	2	Elbow W/O-Ring, 90°, $\frac{3}{4}$ "-16 Male JIC To O-Ring
	GR1037	-	O-Ring
34.	*A1076	1	Hose Assembly, $\frac{3}{8}$ " x 30", W/Interplant® Package
35.	*A3150	2	Hose Assembly, $\frac{3}{8}$ " x 56", W/Interplant® Package
36.	*A1179	2	Hose Assembly, $\frac{1}{4}$ " x 56", W/Interplant® Package
37.	*A3142	1	Hose Assembly, $\frac{3}{8}$ " x 30", W/Interplant® Package (Double Frame® Only)
38.	*A3175	1	Hose Assembly, $\frac{3}{8}$ " x 38"

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

HYDRAULIC SYSTEM, 6 ROW 36"/38" AND 8 ROW 30", TWO-FOLD LOW PROFILE ROW MARKER

PHS001/PHS002/PHS003(PT15/PT16h)



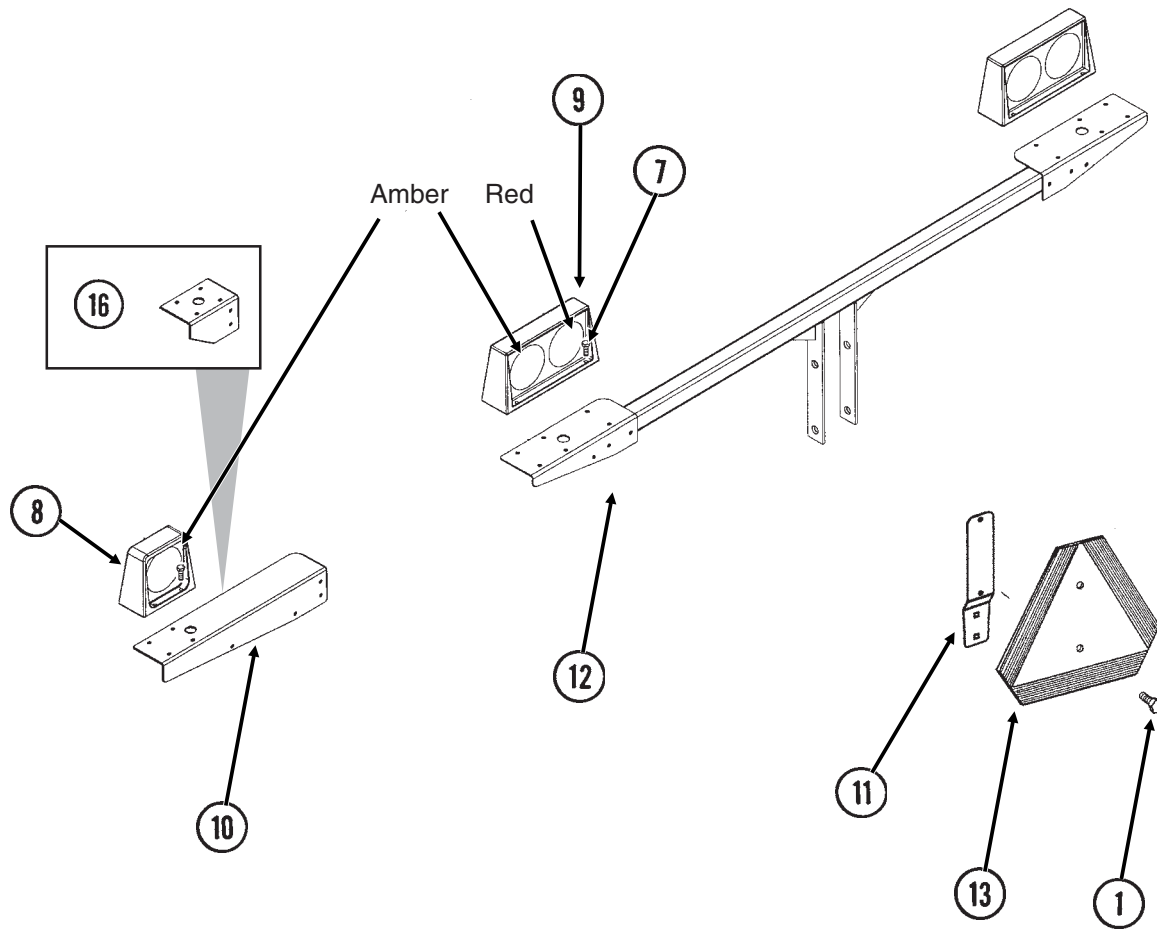
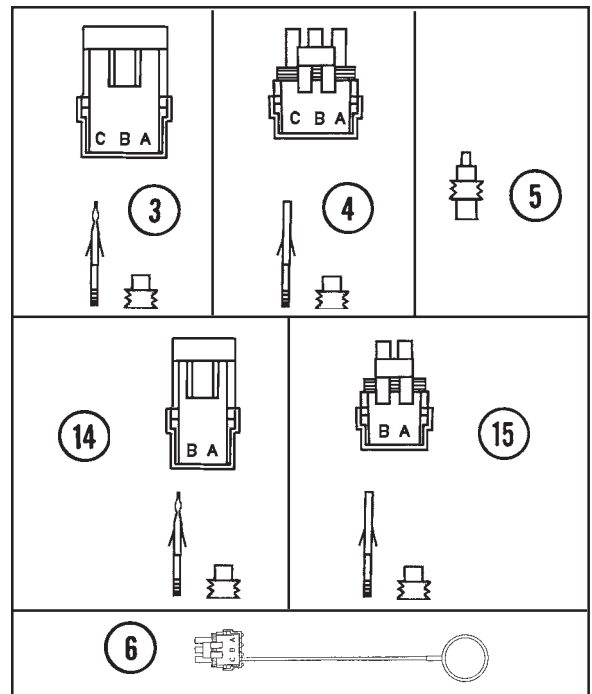
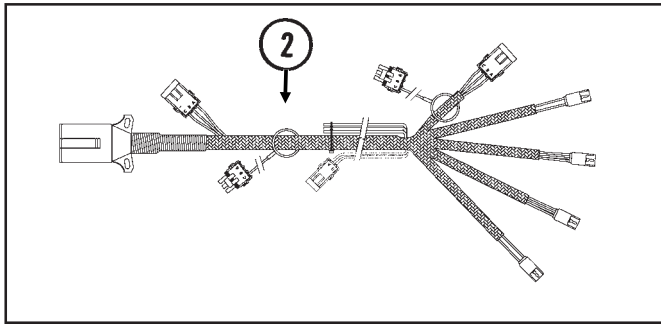
HYDRAULIC SYSTEM, 6 ROW 36"/38" AND 8 ROW 30", TWO-FOLD LOW PROFILE ROW MARKER

ITEM	PART NO.	QTY.	DESCRIPTION
1.		-	See "Master Lift Cylinder", Page P58
2.	G10215	2	Machine Bushing, 3/4", 14 Gauge
3.	G6400-08	8	Connector W/O-Ring, 3/4"-16 Male JIC To O-Ring
	GR1037	-	O-Ring
4.	*A1020	2	Hose Assembly, 3/8" x 48", 6 Row 36"/38"
	*A1018	-	Hose Assembly, 3/8" x 40", 8 Row 30"
5.	*A3132	1	Hose Assembly, 3/8" x 178", 6 Row 36"/38"
	*A1054	-	Hose Assembly, 3/8" x 204", 8 Row 30"
6.		-	See "Lift Assist Cylinder", Page P59
7.	*A1000	2	Hose Assembly, 3/8" x 15"
8.	*A1019	2	Hose Assembly, 3/8" x 44", 6 Row 36"/38"
	*A1055	-	Hose Assembly, 3/8" x 66", 8 Row 30"
9.	G2603-08	2	Tee, 3/4"-16 Male JIC
10.	*A1044	1	Hose Assembly, 3/8" x 34", 6 Row 36"/38"
	*A1021	-	Hose Assembly, 3/8" x 56", 8 Row 30"
11.	*A3128	1	Hose Assembly, 3/8" x 52", 6 Row 36"/38"
	*A1039	-	Hose Assembly, 3/8" x 76", 8 Row 30"
12.		-	See "Slave Lift Cylinder", Page P58
13.		-	See "Row Marker Cylinder", Page P60
14.	G6801-08	2	Elbow W/O-Ring, 90°, 3/4"-16 Male JIC To O-Ring
	GR1037	-	O-Ring
15.	G2703-08	2	Bulkhead Tee, 3/4"-16 Male JIC
16.	G306-08	2	Lock Nut, 3/4"-16
17.	*A1076	2	Hose Assembly, 3/8" x 30"
18.	*A3135	2	Hose Assembly, 3/8" x 100"
19.	G6500-08	2	Swivel Elbow, 90°, 3/4"-16 Male JIC To Female
20.	*A1079	2	Hose Assembly, 3/8" x 24"
21.	G6502-08	2	Swivel Elbow, 45°, 3/4"-16 Male JIC To Female
22.	G6400-08-06	2	Connector W/O-Ring, 3/4"-16 Male JIC To 9/16"-18 O-Ring
	GR1045	-	O-Ring
23.		-	See "Row Marker Sequencing/Flow Control Valve", Pages P62 And P63
24.	G6500-08-06	2	Swivel Elbow, 90°, 3/4"-16 Male JIC To 9/16"-18 Female
25.	G6400-08	2	Connector W/O-Ring, 3/4"-16 Male JIC To O-Ring
	GR1037	-	O-Ring
	G6400-08-04	-	Connector W/O-Ring, 3/4"-16 Male JIC To 7/16"-20 O-Ring
	GR1465	-	O-Ring
26.	*A1076	1	Hose Assembly, 3/8" x 30", W/Interplant® Package
27.	*A3208	1	Hose Assembly, 3/8" x 140", W/Interplant® Package, 6 Row 36"/38"
	*A3209	1	Hose Assembly, 3/8" x 170", W/Interplant® Package, 8 Row 30"
28.	*A1013	2	Hose Assembly, 3/8" x 150", 6 Row 36"/38"
	*A1090	-	Hose Assembly, 3/8" x 162", 8 Row 30"
29.	*A3137	2	Hose Assembly, 3/8" x 140", 6 Row 36"/38"
	*A3114	-	Hose Assembly, 3/8" x 156", 8 Row 30"
30.	*A3142	-	Hose Assembly, 3/8" x 30", W/Double Frame® Package
	*A3147	-	Hose Assembly, 3/8" x 24", W/Hitch Extensions
31.	*A3143	2	Hose Assembly, 3/8" x 100"
32.	G2403-08	-	Union, 3/4"-16 Male JIC
33.		-	See "Interplant® Lift Cylinder", Page P61
34.	G6602-08	1	Swivel Tee, 3/4"-16 JIC
35.	*A3150	2-4	Hose Assembly, 3/8" x 56", W/Interplant® Package
36.	*A3142	1	Hose Assembly, 3/8" x 30", W/Interplant® Package (Double Frame® Only)

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

ELECTRICAL COMPONENTS AND SMV SIGN

(ELC9/A9206a/MTR27a/ELC8/PT86)

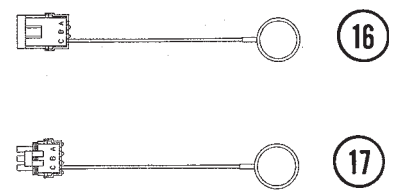
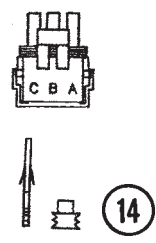
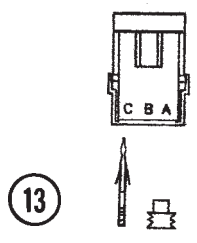
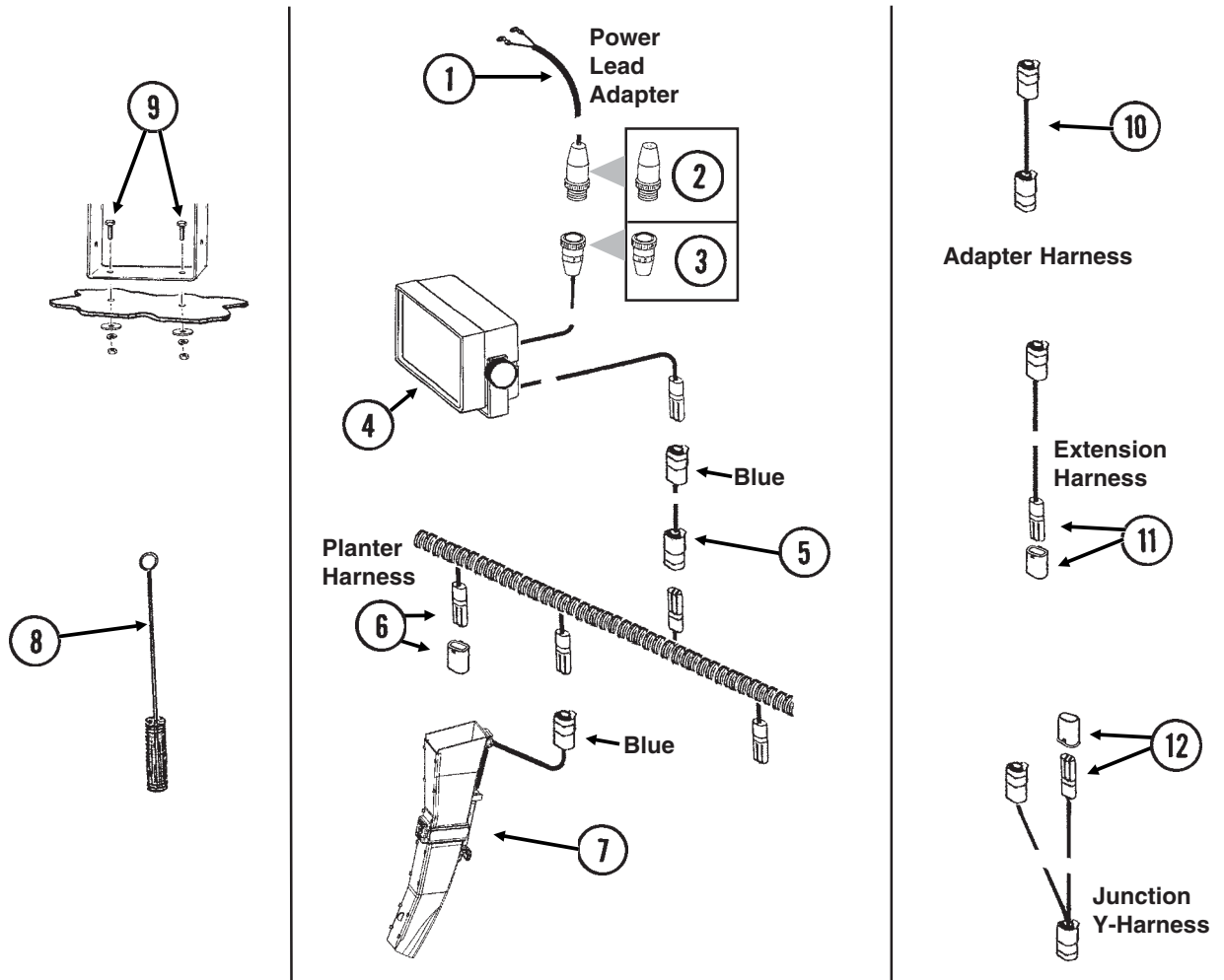


ELECTRICAL COMPONENTS AND SMV SIGN

ITEM	PART NO.	QTY.	DESCRIPTION
1.	G10022	2	Hex Head Cap Screw, 1/4"-20 x 1/2"
	G10227	2	Lock Washer, 1/4"
	G10103	2	Hex Nut, 1/4"-20
2.	GA9207	-	Wiring Harness W/7 Terminal Female Connector, 329", 4 Row 30"/36"/38" And 6 Row 30" (4 Light Connections)
	GA9206	-	Wiring Harness W/7 Terminal Female Connector, 396", 6 Row 36"/38" And 8 Row 30" (4 Light Connections)
	GA5385	-	7 Terminal Female Connector
3.	G1K248	-	3-Pin Female Connector Kit (Black), Includes: (3) 3-Pin Female Housings, (9) Pin Contacts, (9) Seals
4.	G1K252	-	3-Pin Male Connector Kit (Black), Includes: (3) 3-Pin Male Housings, (9) Socket Contacts, (9) Seals
5.	GD11089	-	Sealing Plug
6.	GA8047	-	Dust Plug (Black)
7.	G10064	8-16	Hex Head Cap Screw, 1/4"-20 x 1"
	G10209	8-16	Washer, 1/4" USS
	G10110	8-16	Lock Nut, 1/4"-20
8.	GA6701	1	Single Amber Light Assembly
	GR1204	-	Amber Lens
	GR1206	-	Rubber Grommet (2)
	GR1207	-	Lamp Unit
	GR1208	-	Bulb
9.	GA6699	1	Double Light Assembly
	GA6700	1	Double Light Assembly (Shown)
	GR1203	-	Red Lens
	GR1204	-	Amber Lens
	GR1205	-	Cover
	GR1206	-	Rubber Grommet (4)
	GR1207	-	Lamp Unit
10.	GD17129	1	Bracket, L.H., 4 Row 36"/38", 6 Row 30"/36"/38" And 8 Row 30" (Shown)
	GD17128	-	Bracket, R.H., 4 Row 36"/38", 6 Row 30"/36"/38" And 8 Row 30"
	GD17286	-	Bracket, R.H., 4 Row 30"
11.	GD2200	1	SMV Mount
12.	GA11930	1	Light Mount, 60", 4 Row 30"/36"/38", 6 Row 30" And 8 Row 30"
	GA11996	-	Light Mount, 52", 6 Row 36"/38"
13.	GD2199	1	SMV Sign
14.	G1K321	-	2-Pin Female Connector Kit (Black), Includes: (3) 2-Pin Female Housings, (6) Pin Contacts, (6) Seals
15.	G1K320	-	2-Pin Male Connector Kit (Black), Includes: (3) 2-Pin Male Housings, (6) Socket Contacts, (6) Seals
16.	GD17140	1	Bracket, L.H., 4 Row 30"

KPM I ELECTRONIC SEED MONITOR

(MTR46b/A11948)



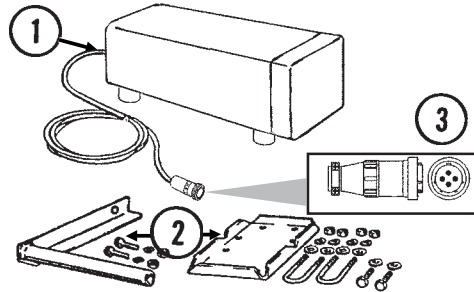
KPM I ELECTRONIC SEED MONITOR

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.		-	Included In Planter Wiring Harness, See Item 2, Pages P70 And P71
6.	GA8021	-	Planter Harness W/Dust Caps, 4 Row (7 Connectors)
	GA8022	-	Planter Harness W/Dust Caps, 6 Row (9 Connectors)
	GA7850	-	Planter Harness W/Dust Caps, 8 Row (12 Connectors)
	GD11993	-	Dust Cap
7.	GA11948	-	Seed Tube W/Computerized Sensor
	GR1737	-	Sensor Only
	GA11947	-	Seed Tube (With Holes For Sensor Installation)
8.	GR0594	-	Brush
9.	G10022	2	Hex Head Cap Screw, 1/4"-20 x 1/2"
	G10211	2	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.	GA7853	-	Junction Y-Harness W/Dust Cap
	GD11993	-	Dust Cap
13.	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
14.	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
15.	GD11089	-	Sealing Plug
16.	GA8046	-	Dust Plug (Black)
	GA9978	-	Dust Plug (Blue)
17.	GA8047	-	Dust Plug (Black)
	GA9979	-	Dust Plug (Blue)

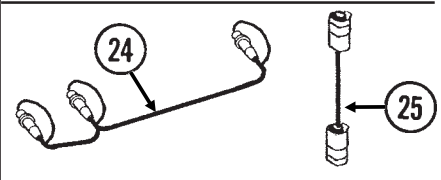
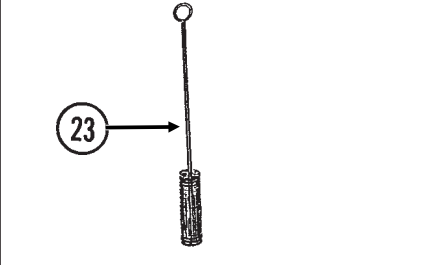
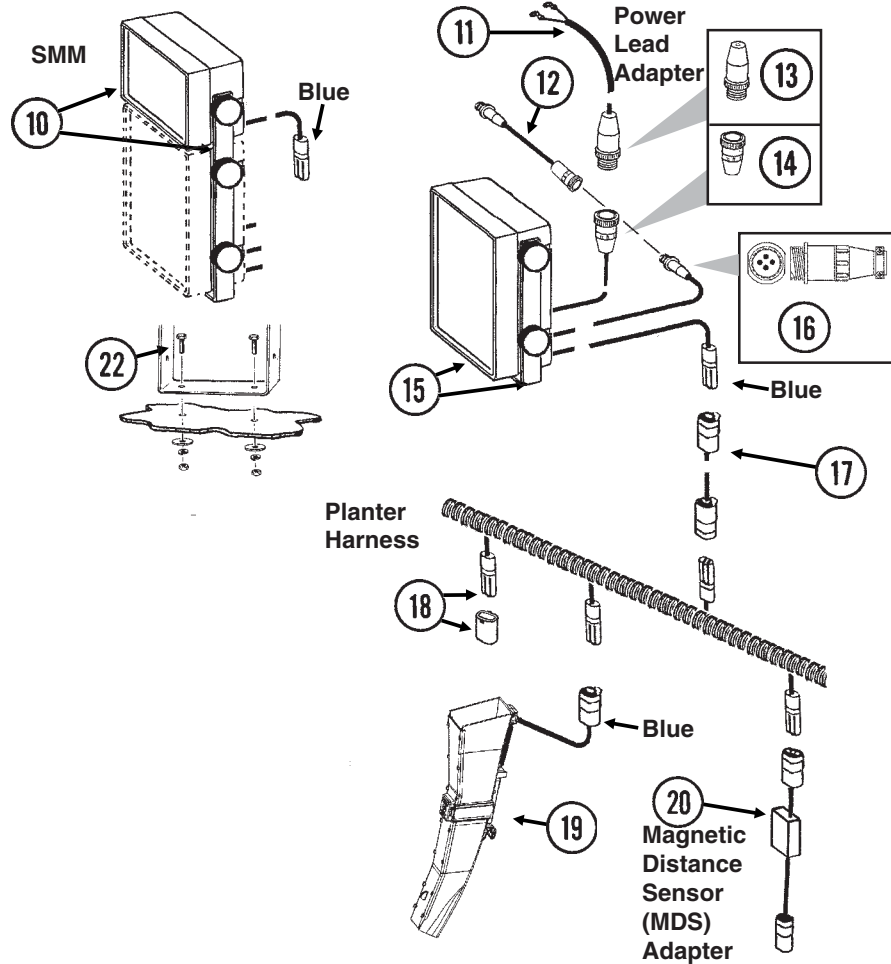
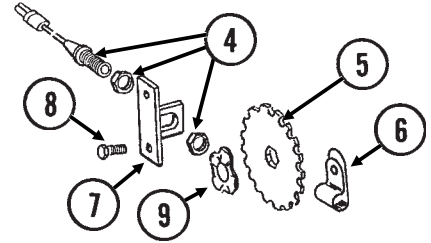
KPM II STACK-MODE ELECTRONIC SEED MONITOR

(MTR46d)

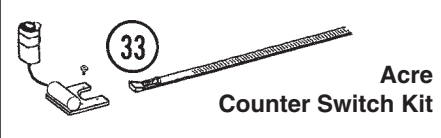
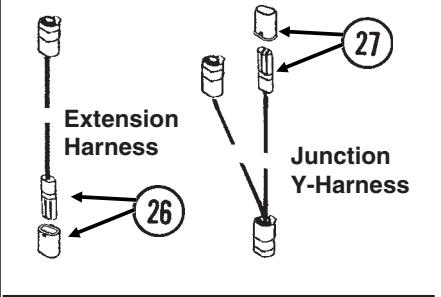
Radar Distance Sensor



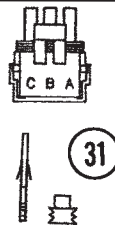
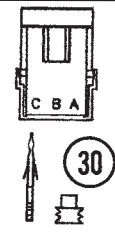
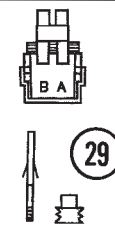
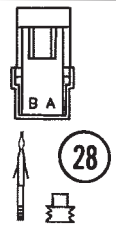
Magnetic Distance Sensor (MDS)



Radar Y-Cable Adapter 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, (4) Pins And (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

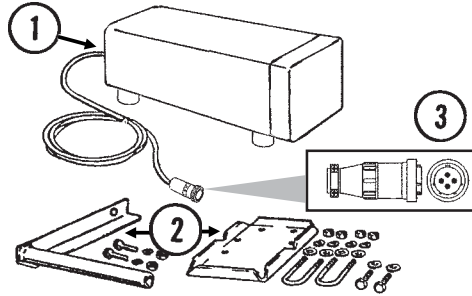
KPM II STACK-MODE ELECTRONIC SEED MONITOR

ITEM	PART NO.	QTY.	DESCRIPTION
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
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 1/4" 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 23), Dust Plug (Item 34) And Monitor/Radar Adapter, 10" (Item 12)
	GR1391	-	Mounting Bracket, KPM II
	GR1393	-	Console Mounting Bracket Hardware Package (Includes 4 Knobs And 1/4" Hardware)
	GA10601	-	Fuse Holder
	GD7639	-	Fuse
16.	G1K322	-	4-Pin Connector Kit W/Male Housing, (4) Female Socket Contacts And (1) Cable Clamp
17.		-	Included In Planter Wiring Harness, See Item 2, Pages P70 And P71
18.	GA8021	-	Planter Harness W/Dust Caps, 4 Row (7 Connectors)
	GA8022	-	Planter Harness W/Dust Caps, 6 Row (9 Connectors)
	GA7850	-	Planter Harness W/Dust Caps, 8 Row (12 Connectors)
	GD11993	-	Dust Cap
19.	GA11948	-	Seed Tube W/Computerized Sensor
	GR1737	-	Sensor Only
	GA11947	-	Seed Tube (With Holes For Sensor Installation)
20.	GA7859	1	Magnetic Distance Sensor Adapter (Analog To Digital)
21.	GA8047	-	Dust Plug (Black)
	GA9979	-	Dust Plug (Blue)
22.	G10022	2	Hex Head Cap Screw, 1/4"-20 x 1/2"
	G10211	2	Washer, 1/4" SAE
	G10227	2	Lock Washer, 1/4"
	G10103	2	Hex Nut, 1/4"-20
23.	GR0594	-	Brush
24.	GR0586	1	Radar Y-Cable (Used To Connect Radar Distance Sensor For Multiple Functions)
25.	GA7857	-	Adapter Harness, 1'
26.	GA7854	-	Extension Harness W/Dust Cap, 15'
	GA7855	-	Extension Harness W/Dust Cap, 30'
	GD11993	-	Dust Cap
27.	GA7853	-	Junction Y-Harness W/Dust Cap
	GD11993	-	Dust Cap
28.	G1K321	-	2-Pin Female Connector Kit (Black), Includes: (3) 2-Pin Female Housings, (6) Pin Contacts, (6) Seals
29.	G1K320	-	2-Pin Male Connector Kit (Black), Includes: (3) 2-Pin Male Housings, (6) Socket Contacts, (6) Seals
30.	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
31.	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
32.	GD11089	-	Sealing Plug
33.	G1K249	-	Acre Counter Switch Kit
34.	GA8046	-	Dust Plug (Black)
	GA9978	-	Dust Plug (Blue)
A.	GA6147	-	Magnetic Distance Sensor And Mounting Package (Items 4-9)

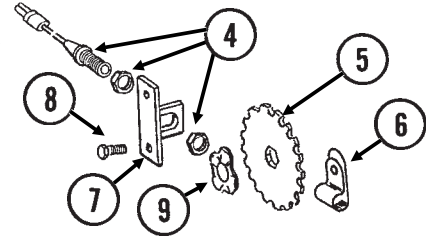
KPM III ELECTRONIC SEED MONITOR

(MTR46dd)

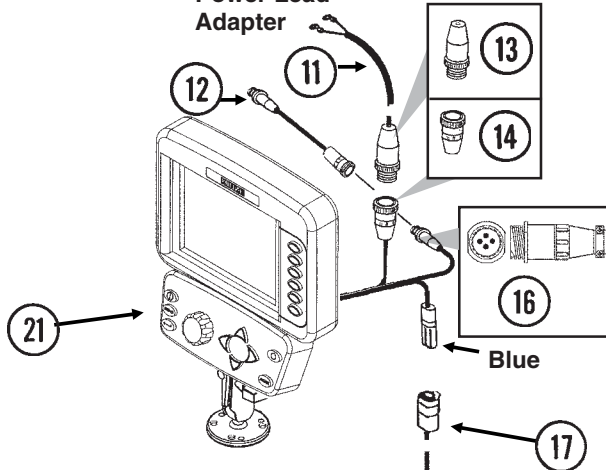
Radar Distance Sensor



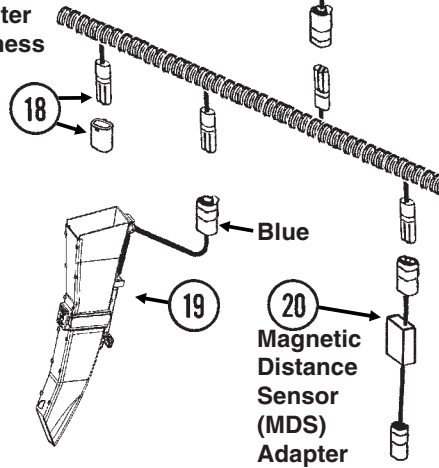
Magnetic Distance Sensor (MDS)



Power Lead Adapter

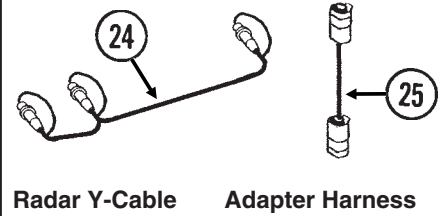
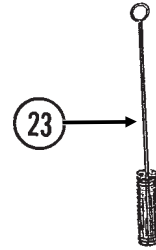


Planter Harness



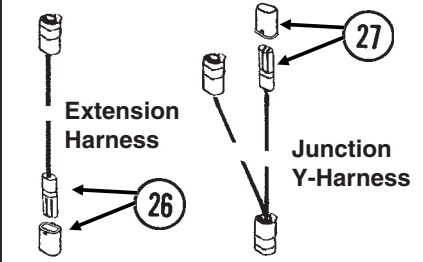
Blue

Magnetic Distance Sensor (MDS) Adapter



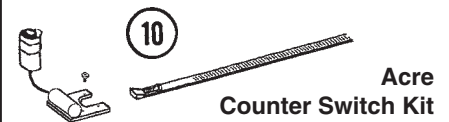
Radar Y-Cable

Adapter Harness

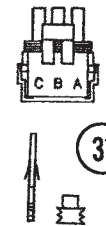
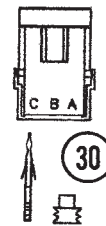
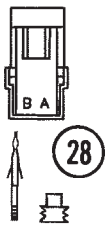


Extension Harness

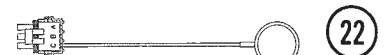
Junction Y-Harness



Acre Counter Switch Kit



32



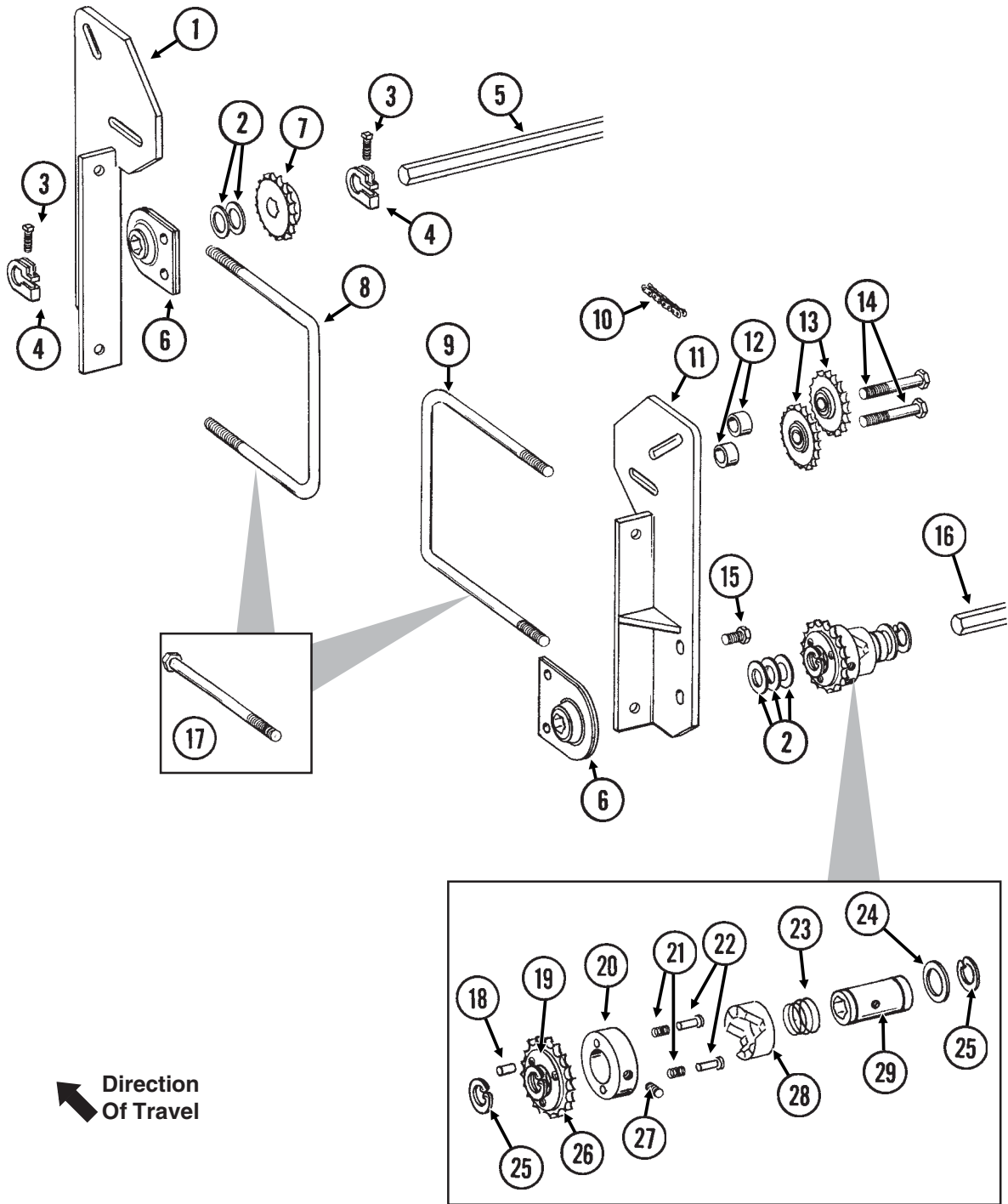
ITEM	PART NO.	QTY.	DESCRIPTION
1.	GA7858	-	Radar Distance Sensor W/20' Cable
2.	GA8026	-	Radar Sensor Pipe/Mounting Bracket Package
3.	G1K323	-	4-Pin Connector Kit W/Female Housing, (4) Pins And (1) Cable Clamp
4.	GA5600	1	Magnetic Distance Sensor

KPM III ELECTRONIC SEED MONITOR

ITEM	PART NO.	QTY.	DESCRIPTION
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
10.	G1K249	-	Acre Counter Switch Kit
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.	GA8046	-	Dust Plug (Black)
	GA9978	-	Dust Plug (Blue)
16.	G1K322	-	4-Pin Connector Kit W/Male Housing, (4) Female Socket Contacts And (1) Cable Clamp
17.		-	Included In Planter Wiring Harness, See Item 2, Pages P70 And P71
18.	GA8021	-	Planter Harness W/Dust Caps, 4 Row (7 Connectors)
	GA8022	-	Planter Harness W/Dust Caps, 6 Row (9 Connectors)
	GA7850	-	Planter Harness W/Dust Caps, 8 Row (12 Connectors)
	GD11993	-	Dust Cap
19.	GA12650	-	Seed Tube W/Computerized Sensor
	GR1737	-	Sensor Only
	GA12636	-	Seed Tube (With Holes For Sensor Installation)
20.	GA7859	1	Magnetic Distance Sensor Adapter (Analog To Digital)
21.	GA11039	1	KPM III Backlit Console W/Brush (Item 23), Dust Plug (Item 34), Mounting Bracket Assembly, Console Mounting Bracket Hardware And Power Harness
	GR1761	-	Mounting Bracket Assembly, Includes: (2) Mounting Brackets, (2) Connector Halves, (1) Compression Spring, (1) Tension Knob, (1) 1/4"-20 x 1 3/4" Hex Head Cap Screw, (1) 1/4" Plastic Washer, (1) 1/4" Steel Washer
	GR1762	-	Console Mounting Bracket Hardware Package, Includes: (3) No. 10-32 x 5/8" Hex Socket Pan Head Plated Screws, (3) 1/4" Plated Lock Washers
	GR1764	-	Power Harness
22.	GA8047	-	Dust Plug (Black)
	GA9979	-	Dust Plug (Blue)
23.	GR0594	-	Brush
24.	GR0586	1	Radar Y-Cable (Used To Connect Radar Distance Sensor For Multiple Functions)
25.	GA7857	-	Adapter Harness, 1'
26.	GA7854	-	Extension Harness W/Dust Cap, 15'
	GA7855	-	Extension Harness W/Dust Cap, 30'
	GD11993	-	Dust Cap
27.	GA7853	-	Junction Y-Harness W/Dust Cap
	GD11993	-	Dust Cap
28.	G1K321	-	2-Pin Female Connector Kit (Black), Includes: (3) 2-Pin Female Housings, (6) Pin Contacts, (6) Seals
29.	G1K320	-	2-Pin Male Connector Kit (Black), Includes: (3) 2-Pin Male Housings, (6) Socket Contacts, (6) Seals
30.	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
31.	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
32.	GD11089	-	Sealing Plug
A.	GA6147	-	Magnetic Distance Sensor And Mounting Package (Items 4-9)

INTERPLANT® PUSH ROW UNIT DRIVE

PTD093(PT75e)

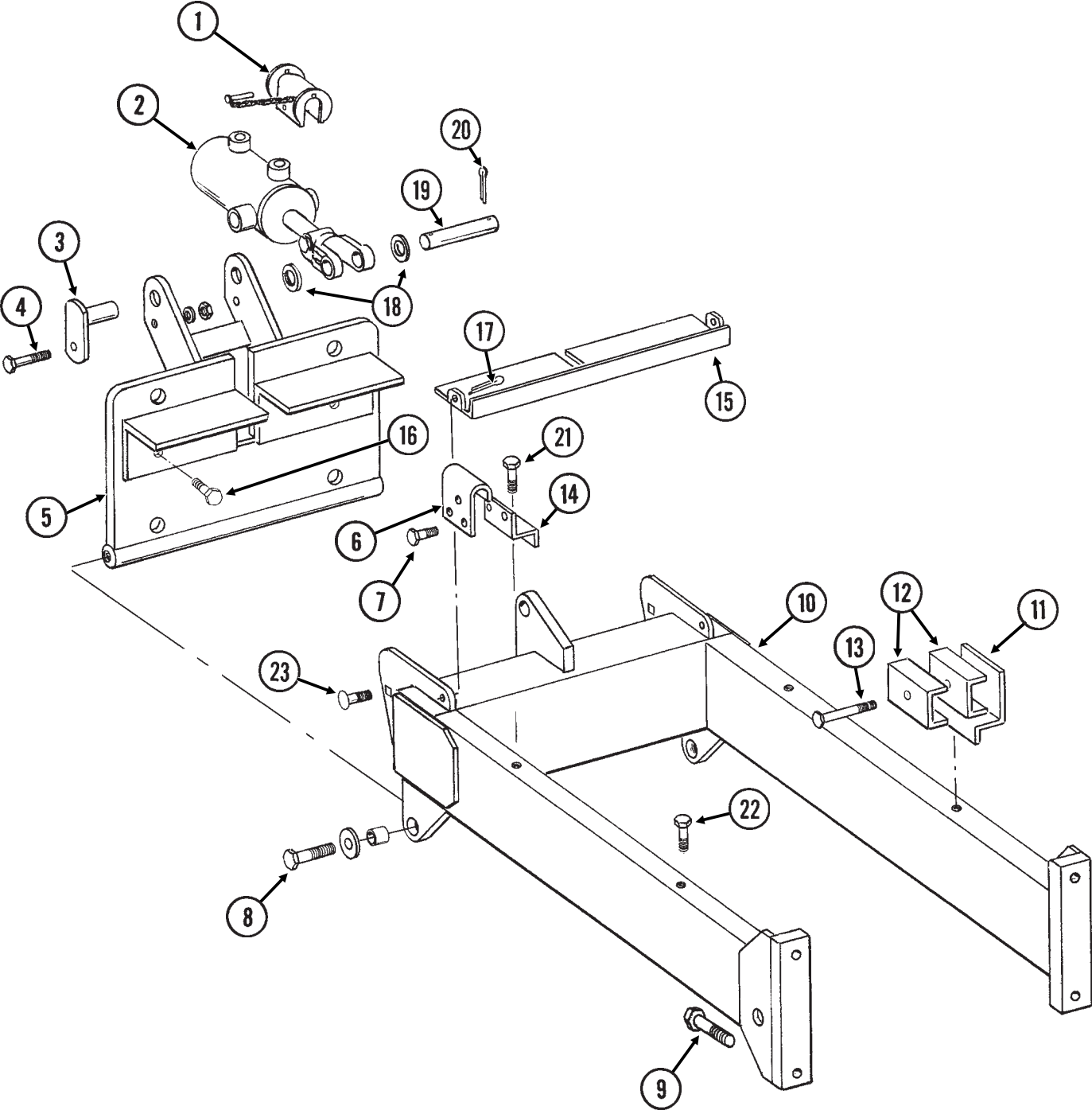


INTERPLANT® PUSH ROW UNIT DRIVE

ITEM	PART NO.	QTY.	DESCRIPTION
1.	GA8717	1	Front Mount
2.	G10233	5	Machine Bushing, 1", 10 Gauge
3.	G10130	2	Square Head Machine Bolt, $\frac{5}{16}$ "-18 x 1 $\frac{3}{4}$ "
	G10923	2	Flange Nut, $\frac{5}{16}$ "-18, No Serration
4.	GD11045	2	Lock Clamp
5.	GD0914-84	1	Hex Shaft, $\frac{7}{8}$ " x 84" (No Holes), 4 Row 30"
	GD0914-105	-	Hex Shaft, $\frac{7}{8}$ " x 105" (No Holes), 4 Row 36"/38"
	GD0914-144	-	Hex Shaft, $\frac{7}{8}$ " x 144" (No Holes), 6 Row 30"
	GD0914-180	-	Hex Shaft, $\frac{7}{8}$ " x 180" (No Holes), 6 Row 36"/38"
	GD0914-205	-	Hex Shaft, $\frac{7}{8}$ " x 205" (No Holes), 8 Row 30"
6.	GA2180	2	Hanger Bearing, $\frac{7}{8}$ " Hex Bore
7.	GA5107	1	Sprocket, 19 Tooth
8.	GD11721	1	U-Bolt, 5" x 7" x $\frac{1}{2}$ "-13 (Double Frame® Planters)
	G10228	2	Lock Washer, $\frac{1}{2}$ "
	G10102	2	Hex Nut, $\frac{1}{2}$ "-13
9.	GD7145	1	U-Bolt, 7" x 7" x $\frac{1}{2}$ "-13 (Double Frame® Planters)
	G10228	2	Lock Washer, $\frac{1}{2}$ "
	G10102	2	Hex Nut, $\frac{1}{2}$ "-13
10.	G3310-138	1	Chain, No. 40, 138 Pitch Including Connector Link (Single Frame Planters)
	G3310-252	-	Chain, No. 40, 252 Pitch Including Connector Link (Double Frame® Planters)
	GR0912	-	Connector Link, No. 40
11.	GA8716	1	Rear Mount
12.	GD9229	4	Spacer, 1 $\frac{1}{4}$ " O.D. x $\frac{1}{2}$ " Long
13.	GA7154	4	Sprocket W/Bearing, 18 Tooth
14.	G10581	4	Hex Head Cap Screw, $\frac{1}{2}$ "-13 x 2 $\frac{1}{4}$ "
	G10168	4	Machine Bushing, $\frac{1}{2}$ ", 7 Gauge
	G10228	4	Lock Washer, $\frac{1}{2}$ "
	G10102	4	Hex Nut, $\frac{1}{2}$ "-13
15.	G10001	-	Hex Head Cap Screw, $\frac{3}{8}$ "-16 x 1"
	G10229	-	Lock Washer, $\frac{3}{8}$ "
	G10101	-	Hex Nut, $\frac{3}{8}$ "-16
16.		-	See "Driveline", Pages P48 And P49
17.	G10909	2	Hex Head Cap Screw, $\frac{1}{2}$ "-13 x 9" (Single Frame Planters)
	G10228	2	Lock Washer, $\frac{1}{2}$ "
	G10102	2	Hex Nut, $\frac{1}{2}$ "-13
18.	G10968	1	Spring Pin, $\frac{5}{32}$ " x $\frac{7}{16}$ "
19.	GR1406	1	Bushing
20.	GR1405	1	Lock Collar
21.	GR1413	2	Spring
22.	GR1410	2	Pin
23.	GR1408	1	Compression Spring
24.	GR1411	1	Shim
25.	G10496	2	External Inverted Snap Ring, 1 $\frac{1}{2}$ "
26.	GR1412	1	Sprocket, 19 Tooth
27.	G10535	1	Hex Socket Set Screw, $\frac{3}{8}$ "-16 x $\frac{3}{4}$ "
28.	GR1409	1	Knurled Collar
29.	GR1407	1	Drive Shaft
A.	GA8092	-	Clutch Sprocket Assembly, 19 Tooth (Items 18-29)
B.	G1K269	-	Lock Clamp Kit (Items 3 And 4)
C.	G1K331	-	Clutch Sprocket Kit (Items 18, 19 And 26)

INTERPLANT® SELF-LEVELING HITCH EXTENSION

(PT73d)

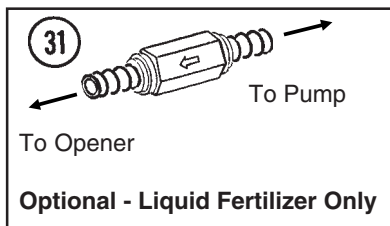
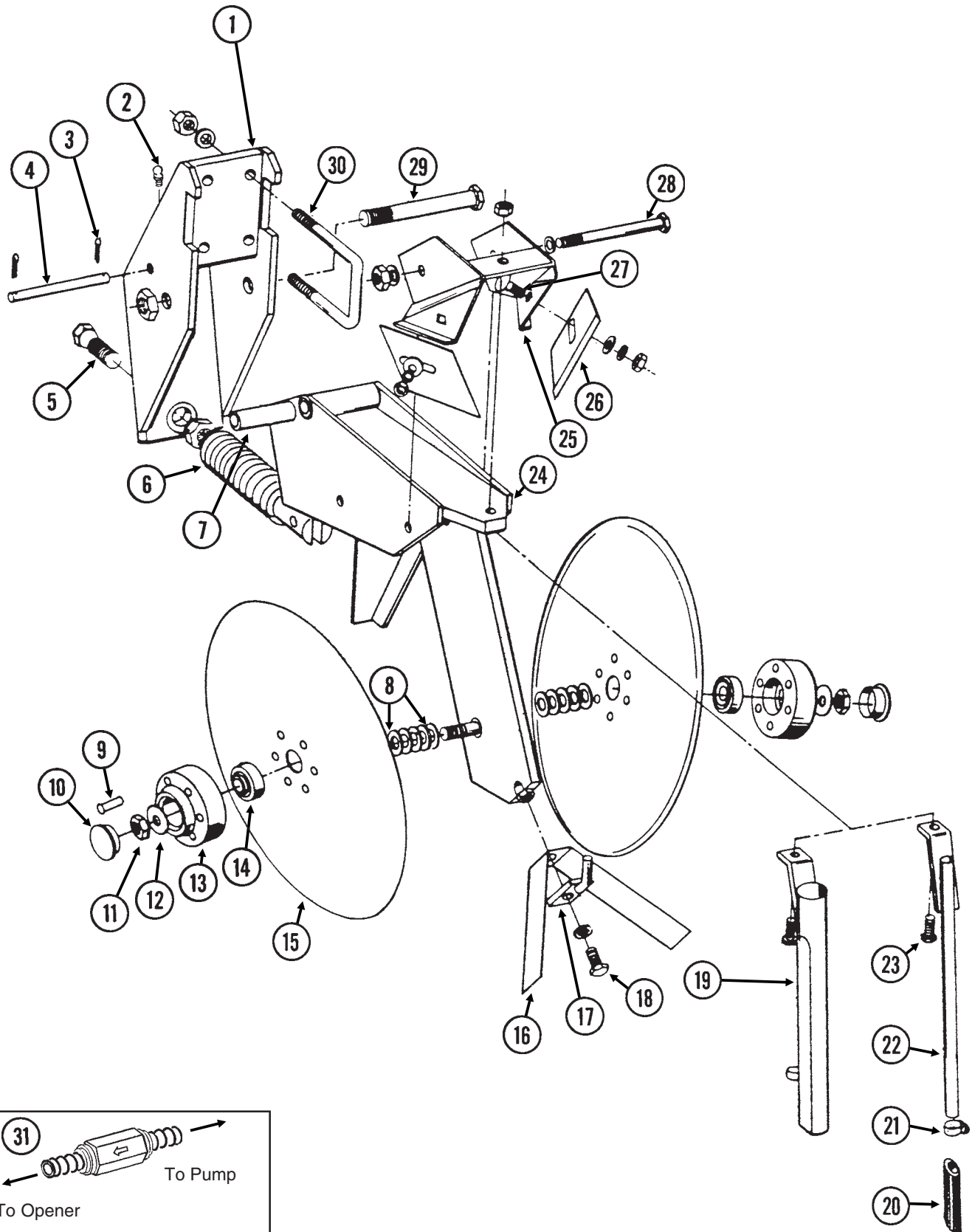


INTERPLANT® SELF-LEVELING HITCH EXTENSION

ITEM	PART NO.	QTY.	DESCRIPTION
1.	GA9872	1	Lockup W/Pin
2.		-	See "Interplant® Lift Cylinder", Page P61
3.	GA6761	2	Pin
4.	G10581	2	Hex Head Cap Screw, 1/2"-13 x 2 1/4"
	G10206	2	Washer, 1/2" SAE
	G10111	2	Lock Nut, 1/2"-13
5.	GA8487	1	Hinge
6.	GD7944	1	Mount
7.	G10001	2	Hex Head Cap Screw, 3/8"-16 x 1"
	G10229	2	Lock Washer, 3/8"
	G10101	2	Hex Nut, 3/8"-16
8.	G10645	2	Hex Head Cap Screw, 1"-8 x 3", Grade 8
	GD10231	2	Special Washer, 1 1/16" I.D. x 2" O.D.
	GD11535	2	Bushing, 1 1/2" O.D.
9.		-	See "Hitch And Frame Assembly/Safety Chain", Pages P42 And P43
10.	GA8488	1	Hitch Extension W/Grease Fittings, 4 Row 30", 6 Row 30" And 8 Row 30" (Shown)
	GA8656	-	Hitch Extension W/Grease Fittings, 4 Row 36"/38" And 6 Row 36"/38"
	G10640	-	Grease Fitting, 1/4"-28
11.	GD11657	2	Mount
12.	GD6027	4	Hose Clamp, 3/4" x 2 1/2" x 2 1/2"
13.	G10325	2	Hex Head Cap Screw, 3/8"-16 x 2 3/4"
	G10108	2	Lock Nut, 3/8"-16
14.	GD11662	1	Mounting Bracket
15.	GA8676	1	Shield
16.	G10428	2	Hex Head Cap Screw, 5/8"-11 x 3/4"
17.	G10451	2	Cotter Pin, 1/8" x 1"
18.	G10226	2	Washer, 1 1/4" SAE
19.	GD11559	1	Pin, 1 1/4" x 4 7/8"
20.	G10460	2	Cotter Pin, 1/4" x 2"
21.	G10001	3	Hex Head Cap Screw, 3/8"-16 x 1"
	G10229	3	Lock Washer, 3/8"
	G10210	3	Washer, 3/8" USS
22.	G10001	1	Hex Head Cap Screw, 3/8"-16 x 1"
23.	G10574	2	Carriage Bolt, 1/2"-13 x 1 1/4"
	G10206	2	Washer, 1/2" SAE
	G10111	2	Lock Nut, 1/2"-13

DOUBLE DISC FERTILIZER OPENER

FOC007(PT25e/FRTZ208)

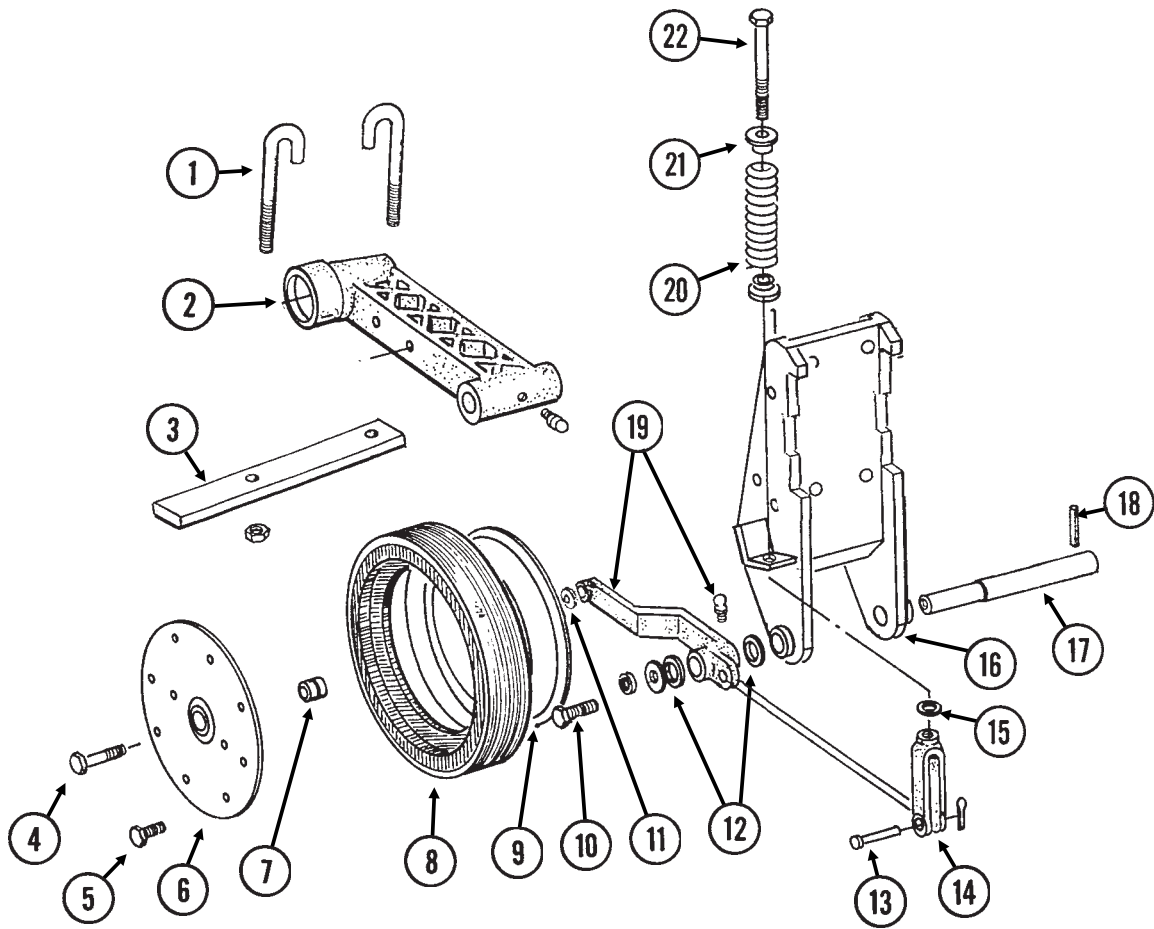


DOUBLE DISC FERTILIZER OPENER

ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Assy.)	
1.	GA8483	1	Bracket
2.	G10938	1	Grease Fitting, 1/4"-28, Taper Threads
3.	G10451	2	Cotter Pin, 1/8" x 1"
4.	GD1657	1	Lockup Pin
5.	GD0962	1	Hex Head Adjusting Bolt, 5/8"-18 x 3 1/4"
	G10499	1	Hex Jam Nut, 5/8"-18, Grade 2
6.	GA0328	1	Spring
7.	GD0487	1	Bushing, 41/64" I.D. x 3 1/2" Long
8.	G10213	-	Machine Bushing, 5/8" (.030" Thick)
9.	G10542	12	Rivet, 1/4" x 1 5/16"
10.	GD1132	2	Dust Cap
11.	G10503	1	Hex Jam Nut, 5/8"-11, Grade 2
	G10504	1	Hex Jam Nut, 5/8"-11, L.H. Threads, Grade 2
12.	G10204	2	Special Machine Bushing, 5/8" x 1" O.D.
13.	GB0134	2	Hub
14.	GA2014	2	Bearing
15.	GD11306	2	Disc Blade, 3.5 mm x 15"
16.	GD2589	1	Inner Scraper
17.	GA0312	1	Mount
18.	G10019	1	Hex Head Cap Screw, 5/16"-18 x 1"
	G10232	1	Lock Washer, 5/16"
19.	GA1369	-	Drop Tube, Dry Fertilizer
20.	GD11705	-	Extension
21.	G10681	-	Hose Clamp, No. 6
22.	GA8685	-	Drop Tube, Liquid Fertilizer
23.	G10133	1	Hex Head Cap Screw, 5/16"-18 x 1 1/2"
	G10221	1	Washer, 5/16" SAE
	G10109	1	Lock Nut, 5/16"-18, Grade 8
24.	GA9195	1	Shank
25.	GA0810	1	Scraper Mount
26.	GD1673	2	Scraper
27.	G10305	2	Carriage Bolt, 3/8"-16 x 1"
	G10210	2	Washer, 3/8" USS
	G10229	2	Lock Washer, 3/8"
	G10101	2	Hex Nut, 3/8"-16
28.	G10045	1	Hex Head Cap Screw, 1/2"-13 x 4 1/2"
	G10111	1	Lock Nut, 1/2"-13
29.	G10046	1	Hex Head Cap Screw, 5/8"-11 x 5"
	G10107	1	Lock Nut, 5/8"-11
30.	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
31.	GA8983	-	Check Valve, Low Rate
A.	GA8845	-	Disc Blade And Bearing Assembly (Items 9 And 13-15)

HD SINGLE DISC FERTILIZER OPENER (Soil Press Wheel)

(TWL35d)

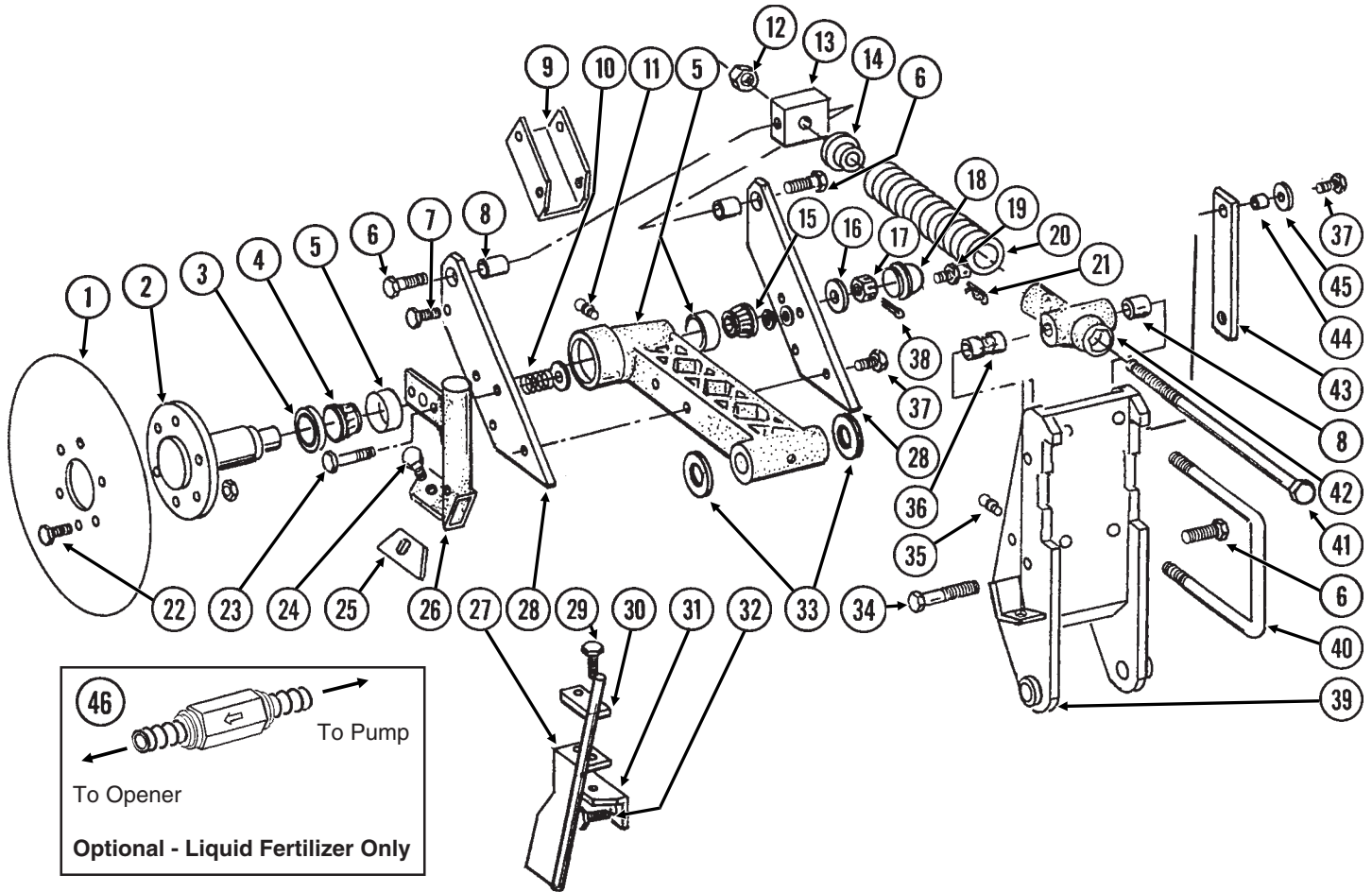


HD SINGLE DISC FERTILIZER OPENER (Soil Press Wheel)

ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Assy.)	
1.	GD9705	2	J-Bolt, 1/2"-13
	G10228	2	Lock Washer, 1/2"
	G10102	2	Hex Nut, 1/2"-13
2.		-	See "HD Single Disc Fertilizer Opener (Blade And Drop Tube)", Pages P86 And P87
3.	GD9706	1	Lockup Bar
4.	G10010	1	Hex Head Cap Screw, 5/8"-11 x 3"
5.	G10961	11	Flanged Whiz Lock Screw, 5/16"-18 x 3/4", No Serration
	G10620	11	Serrated Flange Nut, 5/16"-18
6.	GD11954	1	Half Wheel Cover, Nylon
7.	GA6171	1	Bearing
8.	GD11953	1	Offset Tire
9.	GD11423	1	Half Wheel
10.	G10438	1	Hex Head Cap Screw, 1/2"-13 x 3/4"
	G10228	1	Lock Washer, 1/2"
	G10216	1	Washer, 1/2" USS
11.	G10230	1	Lock Washer, 5/8"
12.	G10526	10	Machine Bushing, 1" (.048" Thick)
13.	G10560	1	Clevis Pin, 1/2" x 1 3/4"
	G10456	1	Cotter Pin, 1/8" x 3/4"
14.	GD8218	1	Yoke
15.	G10205	1	Washer, 5/8" SAE
16.		-	See "HD Single Disc Fertilizer Opener (Blade And Drop Tube)", Pages P86 And P87
17.	GD7911	1	Pivot Pin
18.	G10610	1	Spring Pin, 3/8" x 2"
19.	GA8306	-	Wheel Arm W/Grease Fitting, R.H.
	GA8305	1	Wheel Arm W/Grease Fitting, L.H. (Shown)
	G10640	1	Grease Fitting, 1/4"-28
20.	GD8308	1	Spring
21.	GB0212	2	Washer
22.	GD9709	1	Special Bolt
A.	G1K215	-	Lockup Kit (Items 1 And 3)
B.	GA8877	-	Gauge Wheel Complete (Items 5-9)

HD SINGLE DISC FERTILIZER OPENER (Blade And Drop Tube)

FOC016/FOC007/FOC019(PT27c/FRTZ208)



ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Assy.)	
1.	GD7900	1	Disc Blade, 18"
	GD8247	-	Disc Blade, 20" (Optional)
2.	GB0205	1	Spindle
3.	GA4286	1	Seal
4.	GA4287	1	Bearing
5.	GA5887	1	Arm W/Cups And Washers
	GD6553	-	Inner Cup
	GR0188	-	Outer Cup
	G10205	3	Washer, 5/8" SAE
6.	G10007	3	Hex Head Cap Screw, 5/8"-11 x 1 1/2"
7.	G10001	2	Hex Head Cap Screw, 3/8"-16 x 1"
	G10108	2	Lock Nut, 3/8"-16
8.	GB0218	3	Bushing, 21/32" I.D. x 7/8" O.D. x 19/32" Long
9.	GD8238	1	Channel
10.	GD7962	2	Spring
11.	G10641	2	Grease Fitting, 1/8" NPT
12.	G10105	3	Hex Nut, 3/4"-10
13.	GD7908	1	Tap Block
14.	GB0213	1	Spring Seat
15.	GA0237	1	Bearing
16.	G10220	1	Machine Bushing, 1 1/16", 10 Gauge
17.	G10507	1	Slotted Nut, 1"-14
18.	GD1104	1	Dust Cap

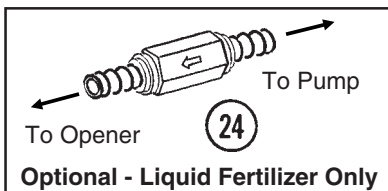
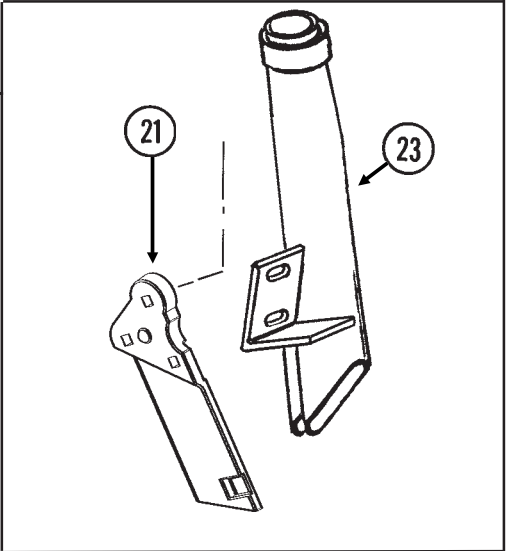
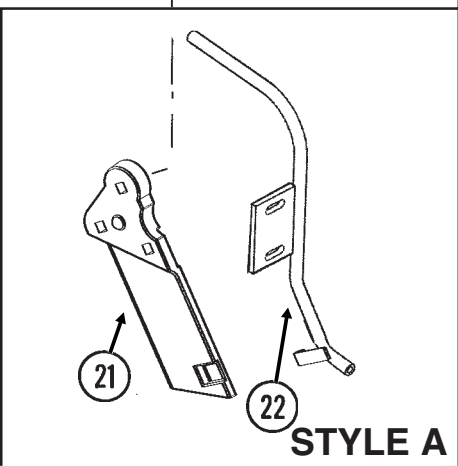
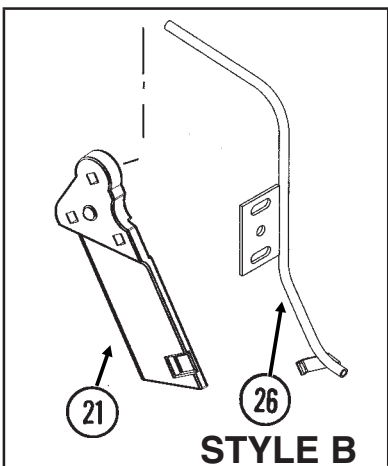
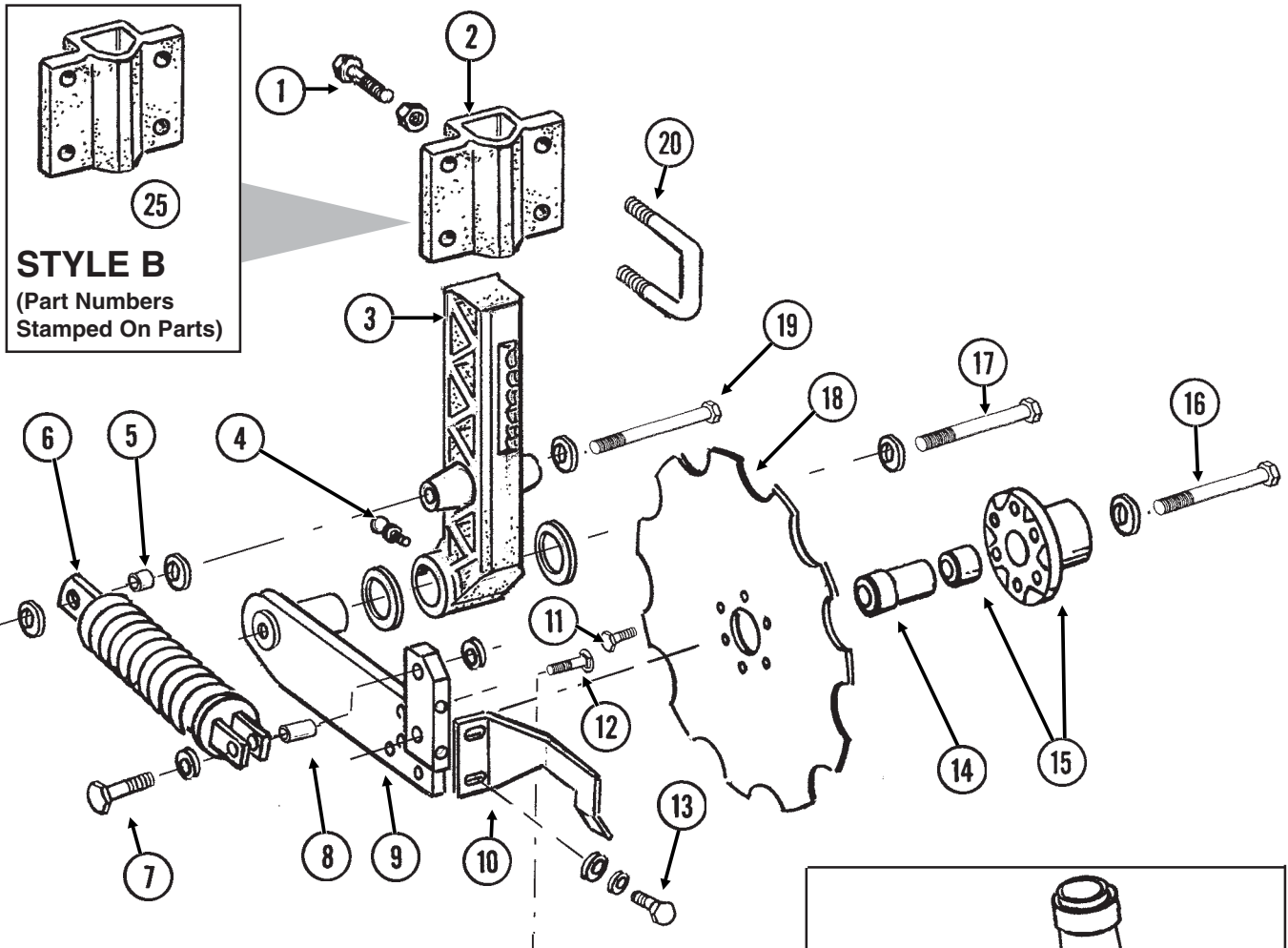
HD SINGLE DISC FERTILIZER OPENER (Blade And Drop Tube)

ITEM	PART NO.	QTY.	DESCRIPTION
(Per Assy.)			
19.	GD8276	1	Pin
	G10237	1	Lock Washer, 7/16"
	G10100	1	Hex Nut, 7/16"-14
20.	GD10273	1	Compression Spring
21.	G10592	1	Hair Pin Clip, No. 11
22.	G10594	6	Bolt, 1/2"-13 x 1 1/2"
	G10111	6	Lock Nut, 1/2"-13
23.	G10049	2	Hex Head Cap Screw, 3/8"-16 x 2 1/2"
	G10210	2	Washer, 3/8" USS
	G10108	2	Lock Nut, 3/8"-16
24.	G10599	1	Carriage Bolt, 3/8"-16 x 1 1/4"
	G10210	1	Washer, 3/8" USS
	G10229	1	Lock Washer, 3/8"
	G10101	1	Hex Nut, 3/8"-16
25.	GD7912	1	Scraper
26.	GB0210	-	Drop Tube, R.H., Dry Fertilizer
	GB0209	1	Drop Tube, L.H., Dry Fertilizer (Shown)
27.	GA8689	1	Drop Tube, L.H., Liquid Fertilizer (Shown)
	GA8688	-	Drop Tube, R.H., Liquid Fertilizer
28.	GD8224	2	Bar
29.	G10004	2	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	G10229	2	Lock Washer, 3/8"
30.	GD10487	1	Clamp
31.	GD10304	-	Angle, R.H.
	GD10303	1	Angle, L.H. (Shown)
32.	G10016	2	Hex Head Cap Screw, 1/2"-13 x 2"
	G10111	2	Lock Nut, 1/2"-13
33.	G10322	-	Machine Bushing, 1 1/4", 18 Gauge (As Required)
34.	G10862	1	Hex Head Cap Screw, 5/8"-11 x 3 1/4"
	G10205	2	Washer, 5/8" SAE
	G10230	1	Lock Washer, 5/8"
35.	G10640	1	Grease Fitting, 1/4"-28
36.	GD10242	1	Bushing, 2 1/4"
37.	G10039	5	Hex Head Cap Screw, 1/2"-13 x 1 3/4"
	G10111	5	Lock Nut, 1/2"-13
38.	G10459	1	Cotter Pin, 3/16" x 1 1/2"
39.	GA7240	-	Opener Mount, R.H.
	GA7239	1	Opener Mount, L.H. (Shown)
40.	GD1114	2	U-Bolt, 7" x 7" x 5/8"-11 (8 1/2" Long)
	GD14559	-	U-Bolt, 7" x 7" x 5/8"-11 (9" Long)
	G10230	4	Lock Washer, 5/8"
	G10104	4	Hex Nut, 5/8"-11
41.	GD7907	1	Special Bolt
42.	GB0206	1	Rod Guide
43.	GD8239	1	Storage Strap
44.	GD7904-02	1	Sleeve, 1/2" x 1 1/2" Long
45.	G10216	3	Washer, 1/2" USS
46.	GA8983	-	Check Valve, Low Rate

NOTCHED SINGLE DISC FERTILIZER OPENER

(B0405/FRTZ268/A12108/FRTZ208)

STYLE A (Part Number Stamped On Part)

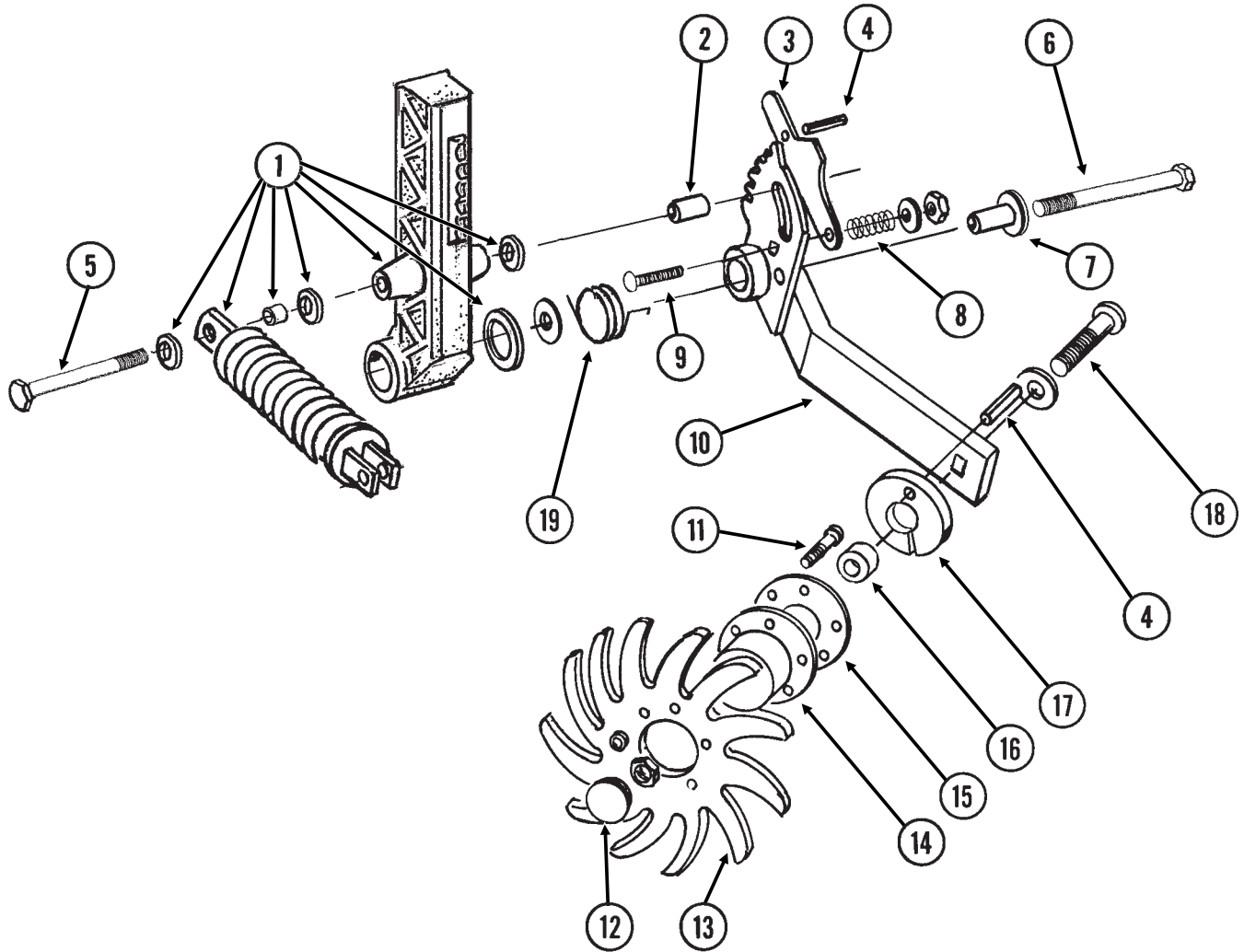


NOTCHED SINGLE DISC FERTILIZER OPENER

ITEM	PART NO.	QTY.	DESCRIPTION
(Per Assy.)			
1.	G10017	3	Hex Head Cap Screw, 1/2"-13 x 1 1/2"
	G10102	3	Hex Nut, 1/2"-13
2.	GB0297	1	Mount
3.	GB0296	1	Arm, 13 1/2"
4.	G10640	1	Grease Fitting, 1/4"-28
5.	GD12685	1	Bushing, 3/4" O.D. x 1/2" Long
6.	GA6966	1	Compression Spring Assembly
7.	G10047	1	Hex Head Cap Screw, 3/8"-16 x 1 3/4"
	G10210	2	Washer, 3/8" USS
	G10108	1	Lock Nut, 3/8"-16
8.	GD1026	1	Sleeve, 1 3/16" Long
9.	GA9433	1	Pivot Arm, L.H. (Shown)
	GA9434	-	Pivot Arm, R.H.
10.	GD11557	1	Scraper, L.H. (Shown)
	GD11558	-	Scraper, R.H.
11.	G10002	6	Hex Head Cap Screw, 3/8"-16 x 3/4"
12.	G10306	3	Carriage Bolt, 3/8"-16 x 2"
	G10108	3	Lock Nut, 3/8"-16
13.	G10991	2	Hex Head Cap Screw, 5/16"-18 x 7/8"
	G10232	2	Lock Washer, 5/16"
	G10219	6	Washer, 5/16" USS
14.	GD12679	1	Stepped Spacer, 3" Long
15.	GA9437	1	Hub W/Bearing
	GA8603	-	Bearing, Double Row
16.	G10011	1	Hex Head Cap Screw, 5/8"-11 x 5 1/2"
	GD12677	1	Washer, 1 1/2" O.D., 7 Gauge, Hardened
	G10107	1	Lock Nut, 5/8"-11
17.	G10046	1	Hex Head Cap Screw, 5/8"-11 x 5"
	G10217	1	Washer, 5/8" USS
	G10450	2	Machine Bushing, 1 1/2", 18 Gauge (As Required)
	G10107	1	Lock Nut, 5/8"-11
18.	GD12676	1	Disc Blade, Notched, 16 3/4"
19.	G10871	1	Hex Head Cap Screw, 1/2"-13 x 6"
	G10206	3	Washer, 1/2" SAE
	G10111	1	Lock Nut, 1/2"-13
20.	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
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.	GB0405	1	Mount, L.H. (Shown)
	GB0400	-	Mount, R.H.
26.	GA12108	1	Drop Tube, Liquid Fertilizer (Shown)
	GA12109	-	Drop Tube, Liquid Fertilizer

RESIDUE WHEEL ATTACHMENT FOR NOTCHED SINGLE DISC FERTILIZER OPENER

DFC024(FRTZ165I)

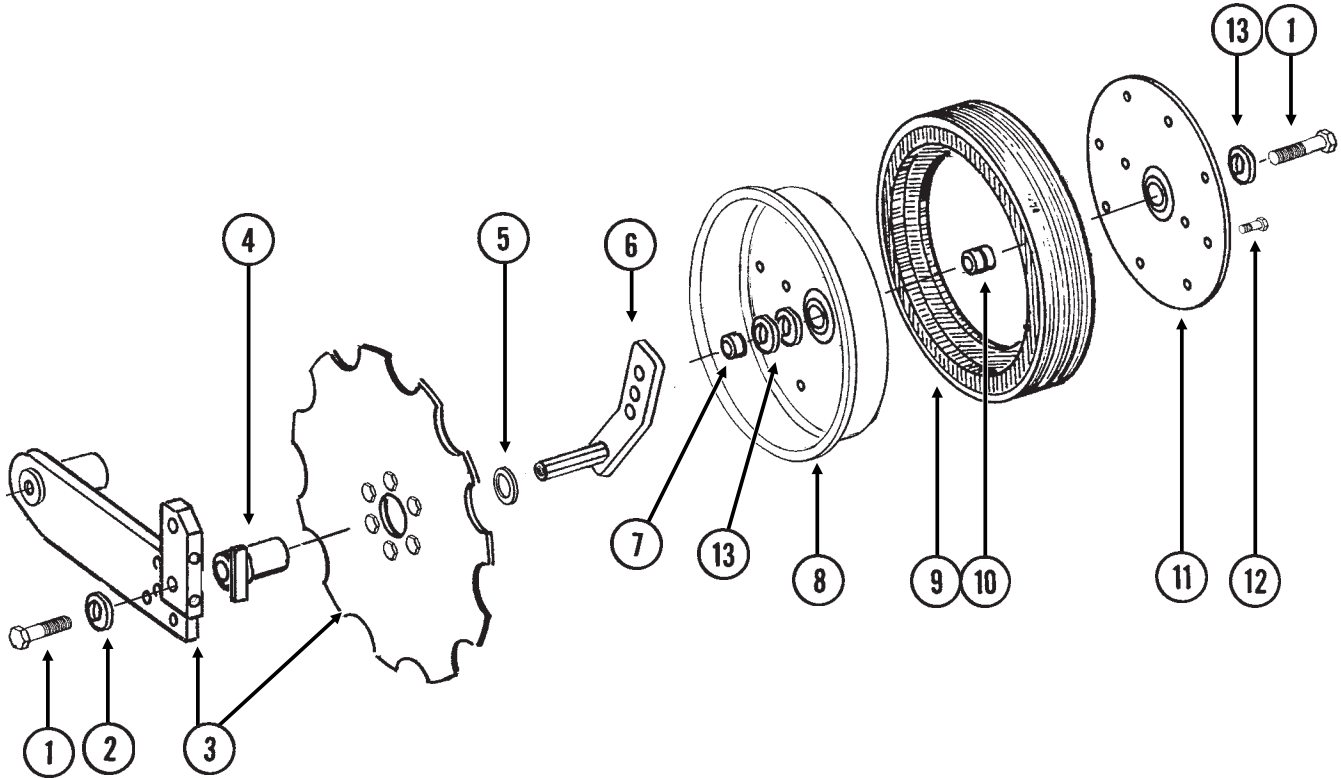


RESIDUE WHEEL ATTACHMENT FOR NOTCHED SINGLE DISC FERTILIZER OPENER

ITEM	PART NO.	QTY. (Per Assy.)	DESCRIPTION
1.		-	See "Notched Single Disc Fertilizer Opener", Pages P88 And P89
2.	GD12684	1	Bushing, 1 1/3" Long
3.	GD11178	1	Adjustment Lever
4.	G10603	2	Spring Pin, 1/4" x 1 1/4"
5.	G11034	1	Hex Head Cap Screw, 1/2"-13 x 7"
	G10111	1	Lock Nut, 1/2"-13
6.	G10830	1	Hex Head Cap Screw, 5/8"-11 x 7 1/2"
	GD7805	1	Special Washer, 5/8", Hardened
	G10107	1	Lock Nut, 5/8"-11
7.	GD11836	1	Sleeve, 2 1/8" Long
8.	GD7962	1	Spring
9.	G10306	1	Carriage Bolt, 3/8"-16 x 2"
	G10203	1	Washer, 3/8" SAE
	G10108	1	Lock Nut, 3/8"-16
10.	GA7999	1	Mount W/Grease Fitting, L.H. (Shown)
	GA7998	-	Mount W/Grease Fitting, R.H.
	G10640	-	Grease Fitting, 1/4"-28
11.	G10133	6	Hex Head Cap Screw, 5/16"-18 x 1 1/2"
	G10109	6	Lock Nut, 5/16"-18, Grade 8
12.	GD1132	2	Dust Cap
13.	GD10552	2	Wheel, 12 Tine, 3/8" x 12"
14.	GA5654	1	Hub W/Bearings
	GA2014	-	Bearing
15.	GD9724	1	Backing Plate
16.	GD7817-04	1	Spacer, 1 1/16" I.D. x 1/2" Long
17.	GD11188	1	Spacer
18.	G10908	1	Carriage Bolt, 5/8"-11 x 3"
	G10503	1	Hex Jam Nut, 5/8"-11, Grade 2
19.	GD11265	1	Spring, L.H. (Shown)
	GD11266	-	Spring, R.H.
A.	GA7445	-	Wheel Assembly, 12 Tine, L.H. (Items 11 And 13-15)(Shown)
	GA7446	-	Wheel Assembly, 12 Tine, R.H. (Items 11 And 13-15)

DEPTH/GAUGE WHEEL ATTACHMENT FOR NOTCHED SINGLE DISC FERTILIZER OPENER

(FRTZ256)

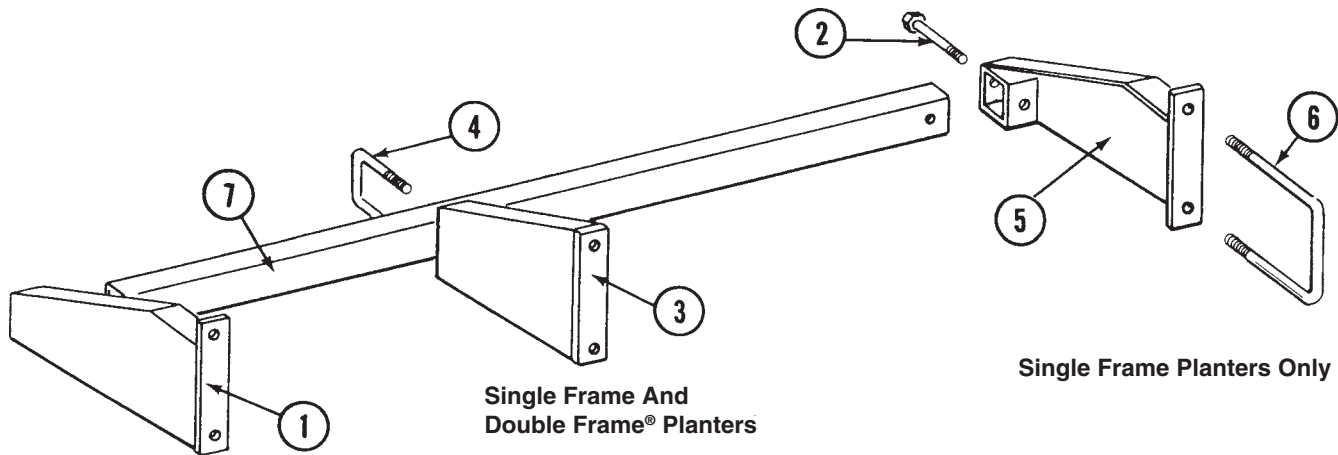


ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Assy.)	
1.	G10010	2	Hex Head Cap Screw, 5/8"-11 x 3"
2.	GD7805	1	Special Washer, 5/8", Hardened
3.		-	See "Notched Single Disc Fertilizer Opener", Pages P88 And P89
4.	GA9472	1	Blade Mount
5.	G10233	1	Machine Bushing, 1", 10 Gauge
6.	GA10037	1	Wheel Mount, L.H. (Shown)
	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)

FERTILIZER OPENER MOUNTING BAR

(Double Disc And Notched Single Disc Fertilizer Openers)

FOC008(PT28)

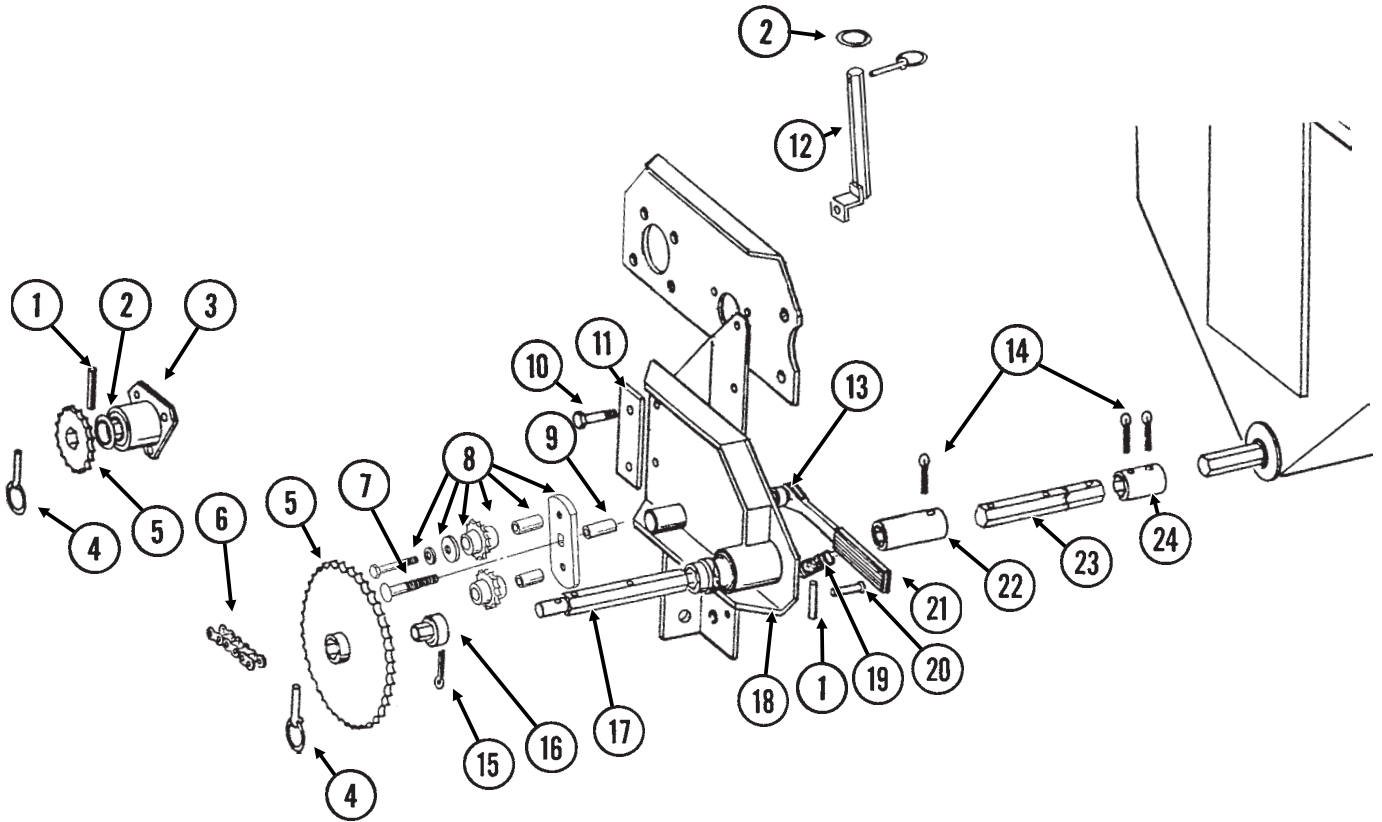


Single Frame Planters Only

ITEM	PART NO.	QTY.	DESCRIPTION
1.	GA5231	1	Support, L.H., Single Frame Planters Only
2.	G10035	2	Hex Head Cap Screw, 1/2"-13 x 4"
	G10228	2	Lock Washer, 1/2"
	G10102	2	Hex Nut, 1/2"-13
3.	GA5237	1	Support, 19" Long, L.H. (Shown), 8 Row 30" Single Frame Planters
	GA5236	1	Support, 19" Long, R.H., 8 Row 30" Single Frame Planters
	GA9431	1	Support, 18 1/8" Long, L.H., 8 Row 30" Double Frame® Planters
	GA9430	1	Support, 18 1/8" Long, R.H., 8 Row 30" Double Frame® Planters
4.	GD1138	2	U-Bolt, 2 1/2" x 2 1/2" x 1/2"-13
	G10228	4	Lock Washer, 1/2"
	G10102	4	Hex Nut, 1/2"-13
5.	GA5230	1	Support, R.H., Single Frame Planters Only
6.	GD1114	2	U-Bolt, 7" x 7" x 5/8"-11
	G10230	4	Lock Washer, 5/8"
	G10104	4	Hex Nut, 5/8"-11
7.	GD1685-14	1	Toolbar, 2 1/2" x 2 1/2" x 105", 4 Row 30"
	GD1685-15	-	Toolbar, 2 1/2" x 2 1/2" x 129", 4 Row 36"/38"
	GD1685-13	-	Toolbar, 2 1/2" x 2 1/2" x 165", 6 Row 30"
	GD1685-12	-	Toolbar, 2 1/2" x 2 1/2" x 205", 6 Row 36"/38"
	GD1685-16	-	Toolbar, 2 1/2" x 2 1/2" x 225", 8 Row 30"
A.	G6795X	-	Support Bundle (Items 1, 2, 4, 5 And 6)

DRY FERTILIZER TRANSMISSION ASSEMBLY

DFC008rev(PT29e)

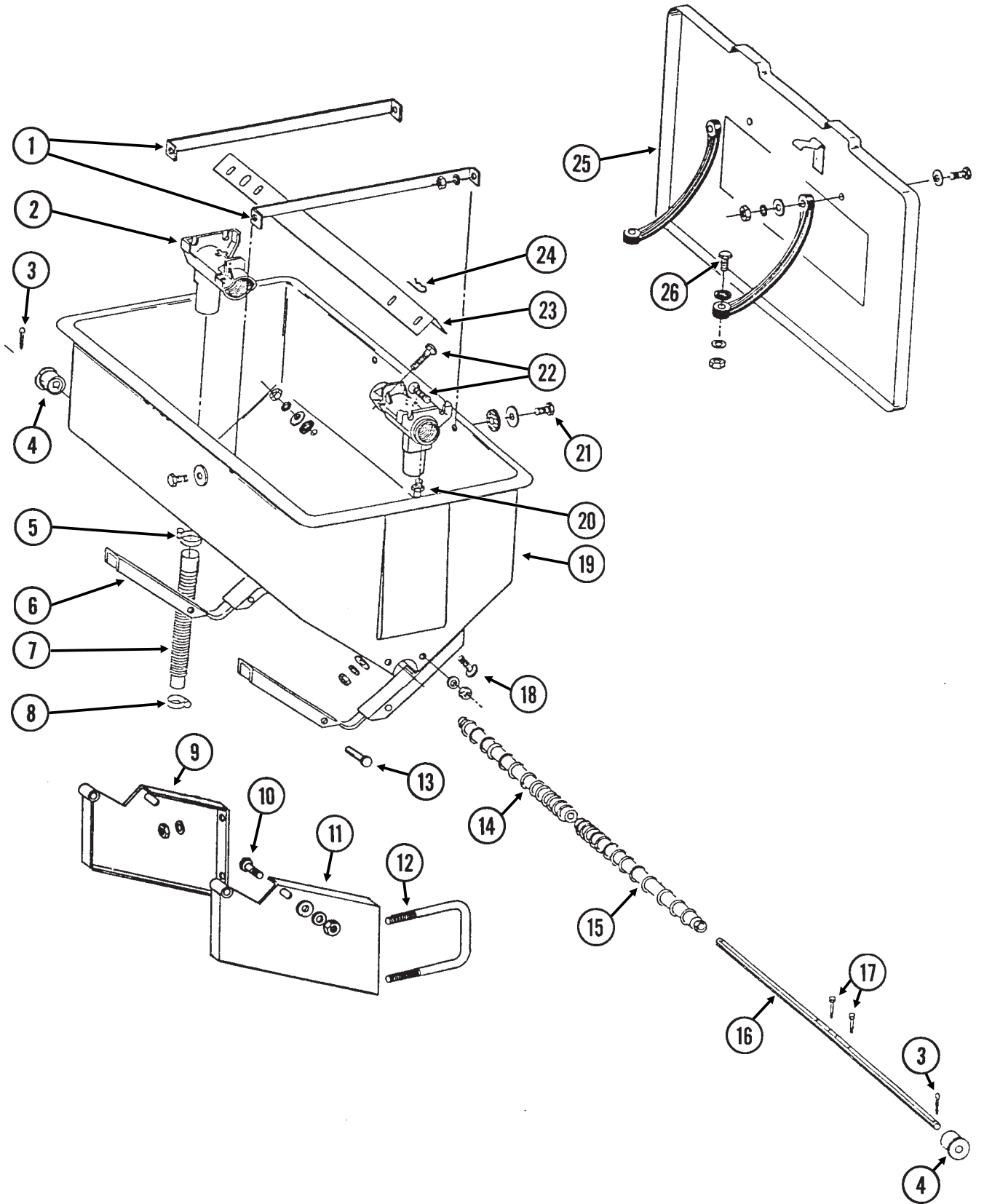


DRY FERTILIZER TRANSMISSION ASSEMBLY

ITEM	PART NO.	QTY.	DESCRIPTION
1.	G10602	2	Spring Pin, 1/4" x 1 1/2"
2.	G10233	2	Machine Bushing, 1", 10 Gauge
3.	GA5223	1	Spacer W/Bearing
	GA5116	-	Bearing, 7/8" Hex Bore, Cylindrical
4.	GD2558	3	Lynch Pin, 1/4"
5.	GA5105	1	Sprocket, 15 Tooth
	GA5107	1	Sprocket, 19 Tooth
	GA5114	1	Sprocket, 30 Tooth
	GA5115	1	Sprocket, 33 Tooth
	GA6337	1	Sprocket, 35 Tooth
6.	G3310-98	1	Chain, No. 40, 98 Pitch Including Connector Link
	GR0912	-	Connector Link, No. 40
7.	G10419	1	Carriage Bolt, 1/2"-13 x 4 1/2"
	G10111	1	Lock Nut, 1/2"-13
8.	GA7336	1	Idler W/Bolt-On Sprockets
	GD7426	-	Sprocket, 12 Tooth
	GD1026	-	Sleeve, 1 3/16" Long
	G10210	-	Washer, 3/8" USS
	G10229	-	Lock Washer, 3/8"
	G10047	-	Hex Head Cap Screw, 3/8"-16 x 1 3/4"
9.	GD3180-17	1	Sleeve, 5/8" I.D. x 7/8" O.D. x 2 5/16" Long
10.	G10053	2	Hex Head Cap Screw, 1/2"-13 x 2 1/2"
	G10585	1	Hex Head Cap Screw, 1/2"-13 x 3 1/4"
	G10033	1	Hex Head Cap Screw, 1/2"-13 x 3 1/2"
	G10016	2	Hex Head Cap Screw, 1/2"-13 x 2"
	G10228	2	Lock Washer, 1/2"
	G10102	2	Hex Nut, 1/2"-13
11.	GD8246	1	Overlay
12.	GA7313	1	Sprocket Storage Rod
13.	GD10161	1	Spacer, 3/8"
14.	G10460	-	Cotter Pin, 1/4" x 2"
15.	G10462	1	Cotter Pin, 3/16" x 2"
16.	GD7127	1	Shear Coupler
17.	GD7870	1	Shaft, 7"
18.	GA5678	1	Plate W/Bearings And Grease Fitting
	GA5116	-	Bearing, 7/8" Hex Bore, Cylindrical
	GA5624	-	Special Bearing, 7/8" Hex Bore x 1.6"
	G10640	-	Grease Fitting, 1/4"-28
19.	GD5857	1	Spring
20.	G10408	1	Clevis Pin, 5/16" x 3/4"
	G10409	1	Retaining Ring, 5/16"
21.	GA4235	1	Ratchet Arm W/Protective Closure
	G10445	-	Protective Closure
22.	GD7867	-	Coupler, 3", 4 Row 36"/38" And 6 Row 36"/38" Only
23.	GD7871	-	Hex Shaft, 7/8" x 6" (3 Holes), 4 Row 36"/38" And 6 Row 36"/38" Only
24.	GD5886	-	Coupler, 1 3/4"

DRY FERTILIZER HOPPER AND MOUNTS

DFC009/DFC014/DFC018(PT30a)



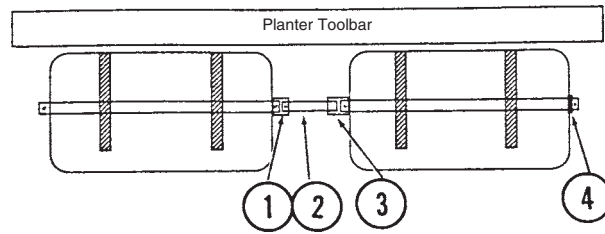
DRY FERTILIZER HOPPER AND MOUNTS

ITEM	PART NO.	QTY.	DESCRIPTION
		(Per Hopper)	
1.	GD1209	2	Strap
2.	GD1200	2	Outlet Housing
3.	G10460	2	Cotter Pin, 1/4" x 2"
4.	GB0200	2	Bearing
5.	G10676	2	Hose Clamp, No. 36, Stainless Steel
6.	GA5652	2	Saddle
7.	GD3790	2	Rubber Tube
8.	G10672	2	Hose Clamp, No. 28
9.	GA0864	1	Hopper Mount, R.H.
10.	G10037	2	Hex Head Cap Screw, 1/2"-13 x 1 1/4"
	G10206	2	Washer, 1/2" SAE
	G10228	2	Lock Washer, 1/2"
	G10102	2	Hex Nut, 1/2"-13
11.	GA0863	1	Hopper Mount, L.H.
12.	GD1114	2	U-Bolt, 7" x 7" x 5/8"-11
	G10177	-	Hex Head Cap Screw, 5/8"-11 x 9 1/2"
	G10230	4	Lock Washer, 5/8"
	G10104	4	Hex Nut, 5/8"-11
13.	G10561	2	Clevis Pin, 1/2" x 3"
	G10451	2	Cotter Pin, 1/8" x 1"
14.	GB0198	1	Auger, R.H.
15.	GB0199	1	Auger, L.H.
16.	GD7848	1	Shaft
17.	G10587	2	Hex Head Cap Screw, 1/4"-20 x 2", Stainless Steel
	G10588	2	Hex Nut, 1/4"-20, Stainless Steel
18.	G10303	8	Carriage Bolt, 5/16"-18 x 1"
	G10201	8	Special Washer, 3/8" x 1 1/2" O.D.
	GD1213	8	Rubber Washer
	G10232	8	Lock Washer, 5/16"
	G10106	8	Hex Nut, 5/16"-18
19.	GD1379	1	Hopper
20.	G10641	2	Grease Fitting, 1/8" NPT
21.	G10171	4	Hex Head Cap Screw, 5/16"-18 x 1 1/4"
	G10201	4	Special Washer, 3/8" x 1 1/2" O.D.
	GD1213	4	Rubber Washer
	G10232	4	Lock Washer, 5/16"
	G10106	4	Hex Nut, 5/16"-18
22.	G10303	8	Carriage Bolt, 5/16"-18 x 1"
	G10219	8	Washer, 5/16" USS
	G10232	8	Lock Washer, 5/16"
	G10106	8	Hex Nut, 5/16"-18
23.	GD1207	1	Baffle
24.	G10670	2	Hair Pin Clip, No. 3
25.	GA0898	1	Lid W/Retainers, Clips, Rivets, Rubber Straps And Hardware
	GD1380	-	Front Clip
	GD2412	-	Rear Retainer
	G10655	-	Rivet, 3/16" x 13/32"
	GD1210	-	Rubber Strap
	G10171	-	Hex Head Cap Screw, 5/16"-18 x 1 1/4"
	G10219	-	Washer, 5/16" USS
	G10232	-	Lock Washer, 5/16"
	G10106	-	Hex Nut, 5/16"-18
26.	G10133	2	Hex Head Cap Screw, 5/16"-18 x 1 1/2"
	G10219	2	Washer, 5/16" USS
	G10232	2	Lock Washer, 5/16"
	G10106	2	Hex Nut, 5/16"-18
A.	GA5666	-	Hopper Sub-Assembly (Items 2,6,18,19, 22 And 24)
B.	GA5667	-	Hopper Hardware Box (Items 1, 3, 4, 14-17, 21, 23 And 26)

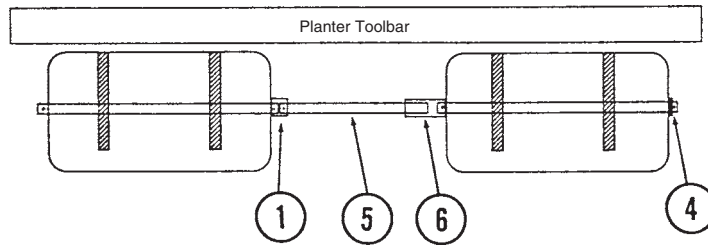
DRY FERTILIZER COUPLERS/SHAFTS

RH101190(PT31/PT32/PT33/PT34/PT35)

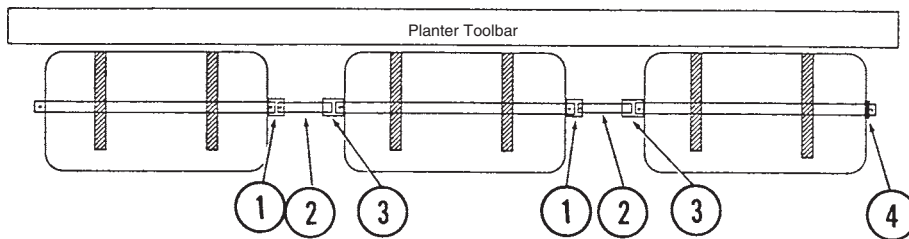
4 Row 30"



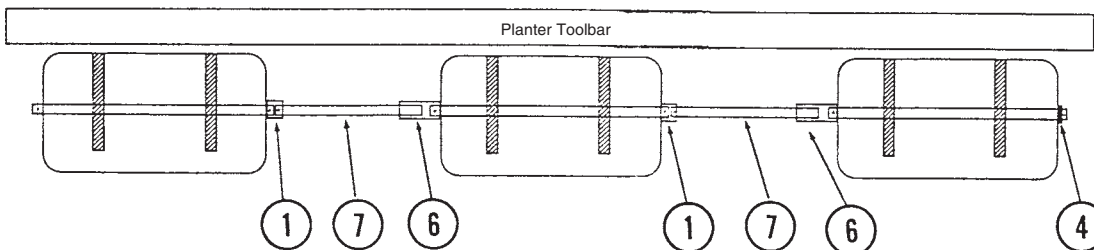
4 Row 36"/38"



6 Row 30"

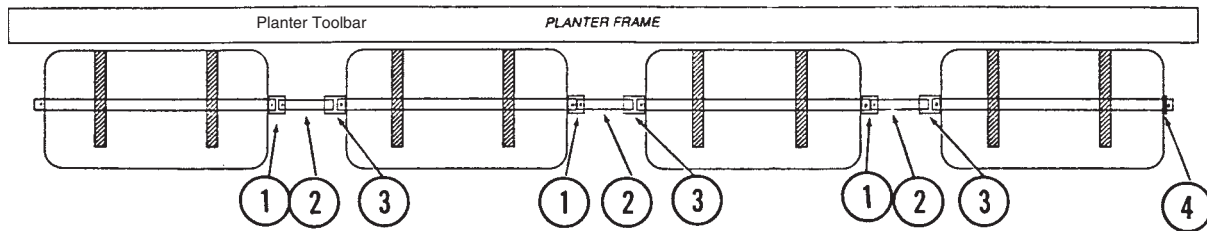


6 Row 36"/38"



DRY FERTILIZER COUPLERS/SHAFTS

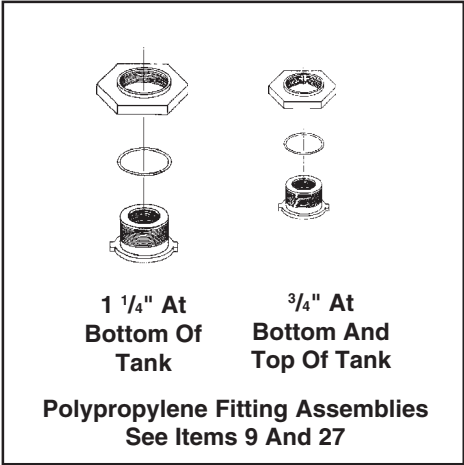
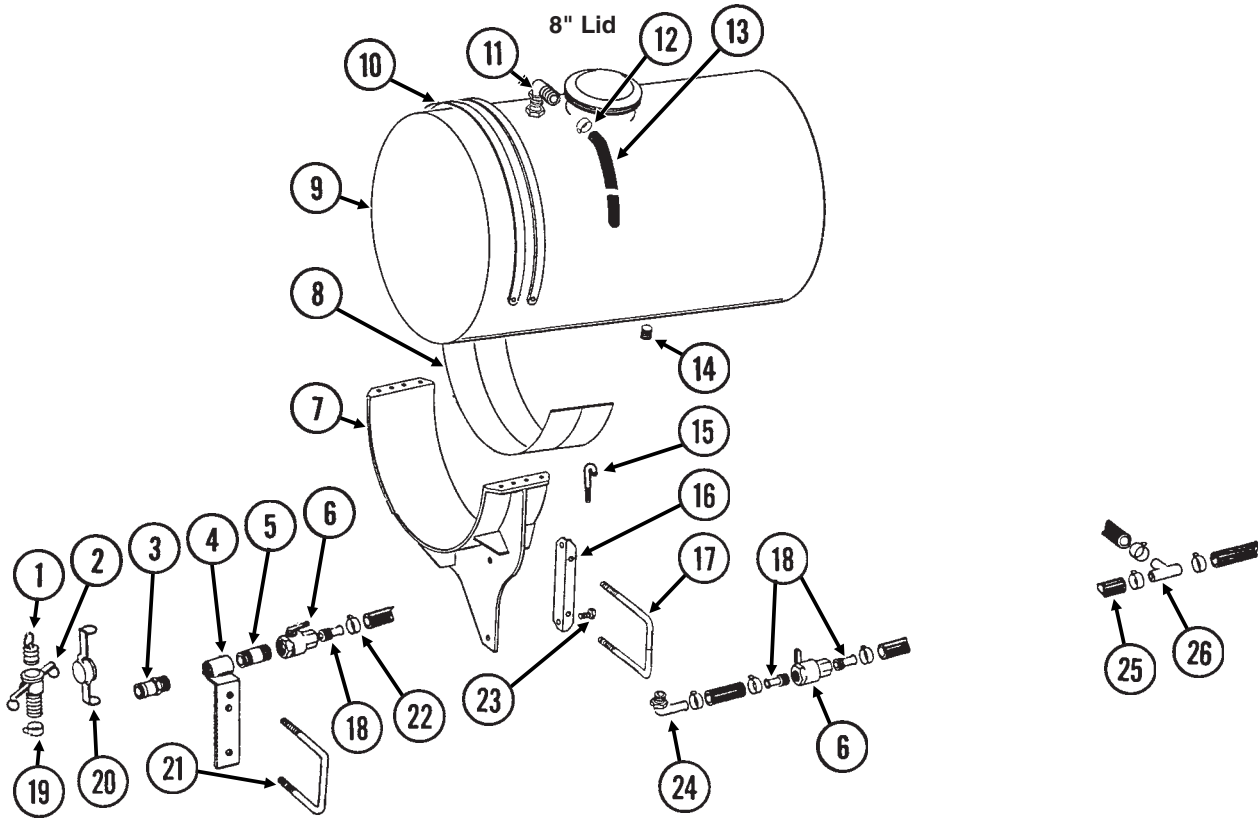
8 Row 30"



ITEM	PART NO.	QTY.	DESCRIPTION
1.	GD5886	-	Coupler, 1 3/4"
2.	GD2548-15.5	-	Hex Shaft, 7/8" x 15 1/2" (1 Hole)
3.	GD7867	-	Coupler, 3"
4.	G10233	2	Machine Bushing, 1", 10 Gauge
5.	GD2548-25.5	-	Hex Shaft, 7/8" x 25 1/2" (1 Hole)
6.	GD7868	-	Coupler, 7"
7.	GD2548-27.5	-	Hex Shaft, 7/8" x 27 1/2" (1 Hole)

LIQUID FERTILIZER TANKS, SADDLES, MOUNTS, HOSES AND FITTINGS

LFC012rev(PT36d/PT51)



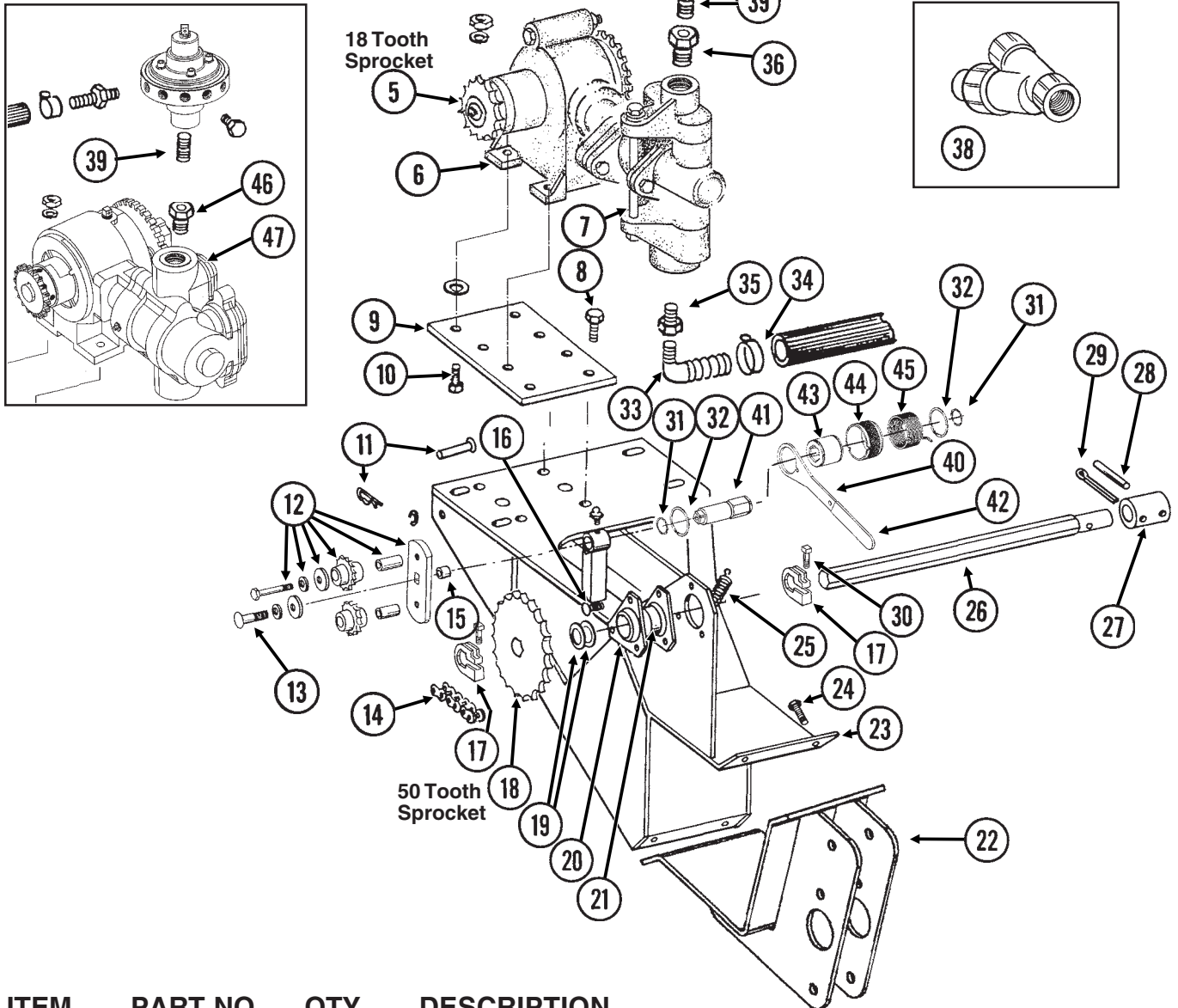
LIQUID FERTILIZER TANKS, SADDLES, MOUNTS, HOSES AND FITTINGS

ITEM	PART NO.	QTY.	DESCRIPTION
1.	GD1517	1	Dust Plug, 1 1/4" Male Cam Lock
2.	GD1516	1	Adapter, 1 1/4" Barb To Female Cam Lock
3.	GD1514	1	Adapter, 1 1/4" Male NPT To Cam Lock
4.	GA5917	1	Quick Fill Mount
5.	G10619	1	Close Nipple, 1 1/4" NPT
6.	GA4976	-	Shutoff Valve, 1 1/4" NPT
	GR1015	-	Body O-Ring
	GR1016	-	Stem O-Ring
	GR1017	-	Teflon Seat
	GR1018	-	Ball
	GR1019	-	Handle
7.	GA7375	-	Tank Mount (2 Per Tank)
8.	GD1862	-	Pad, 8" x 14" (For Two 30" Tanks)
9.	GA9900	-	Tank W/Lid And Fittings, 30" x 110 Gallon, 4 Row
	GA9905	-	Tank W/Lid And Fittings, 30" x 150 Gallon, 6 And 8 Row
	GR1678	-	Lid W/Vent, 8" (Top Of Tank)
	GR0513	-	3/4" Polypropylene Fitting Assembly (Overflow Fitting, Nut, Bushing And O-Ring) (Top And Bottom Of Tank)
	GR1397	-	Overflow Fitting
	GR0508	-	1 1/4" Polypropylene Fitting Assembly (Nut, Bushing And O-Ring) (Bottom Of Tank)
10.	GD1520	-	Band, 30"
11.	G10917	2	Elbow, 90°, 3/4" NPT To Barb
12.	G10278	2	Hose Clamp, No. 16
13.	G4205-11	1	Hose, 3/4" x 72" (1 Per Tank)
14.	G10096	-	Pipe Plug, 3/4" NPT
15.	GD1337	-	J-Bolt, 5/16"-18
	G11182	-	Lock Nut W/Nylon Insert, 5/16"-18
16.	GD10110	-	Mounting Angle (2 Per Tank)
17.	GD1748	-	U-Bolt, 7" x 7" x 3/4"-10
	G10231	-	Lock Washer, 3/4"
	G10105	-	Hex Nut, 3/4"-10
18.	G10626	-	Adapter, 1 1/4" NPT To Barb
19.	G10672	1	Hose Clamp, No. 28
20.	GD1515	1	Dust Cap, 1 1/4" Cam Lock
21.	GD7145	1	U-Bolt, 7" x 7" x 1/2"-13
	GD11721	1	U-Bolt, 5" x 7" x 1/2"-13
	G10228	2	Lock Washer, 1/2"
	G10102	2	Hex Nut, 1/2"-13
22.	G10674	-	Hose Clamp, No. 24
23.	G10007	-	Hex Head Cap Screw, 5/8"-11 x 1 1/2"
	G10230	-	Lock Washer, 5/8"
	G10104	-	Hex Nut, 5/8"-11
24.	G10629	-	Elbow, 90°, 1 1/4" NPT To Barb
25.	G4200-01	1	Hose, 1 1/4" x 22', 4 Row
	G4200-02	-	Hose, 1 1/4" x 27', 6 Row
	G4200-03	-	Hose, 1 1/4" x 32', 8 Row
26.	G10633	-	Tee, 1 1/4" Barb

LIQUID FERTILIZER PISTON PUMP DRIVE

(FRTZ31gg/FRTZ269a)

50 Tooth Drive Sprocket And 18 Tooth Driven Sprocket



ITEM	PART NO.	QTY.	DESCRIPTION
1.		-	See "Liquid Fertilizer Piston Pump Flow Divider", Pages P110 And P111
2.	GD11700	-	Adapter, 1/4" NPT To 3/8" Barb
3.	G10681	-	Hose Clamp, No. 6
4.	G4301-01	1	Hose, 3/8" x 30', 4 Row
	G4301-03	-	Hose, 3/8" x 60', 6 Row
	G4301-04	-	Hose, 3/8" x 100', 8 Row
5.		-	See "Liquid Fertilizer Piston Pump W/18 Tooth Sprocket (Crankcase Assembly)", Pages P104 And P105
6.		-	See "Liquid Fertilizer Piston Pump W/18 Tooth Sprocket (Crankcase Assembly)", Pages P104 And P105
7.		-	See "Liquid Fertilizer Piston Pump W/18 Tooth Sprocket (Cylinder Assembly)", Pages P106 And P107
8.	G10004	4	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	G10229	4	Lock Washer, 3/8"
	G10101	4	Hex Nut, 3/8"-16
9.	GD11180	1	Plate

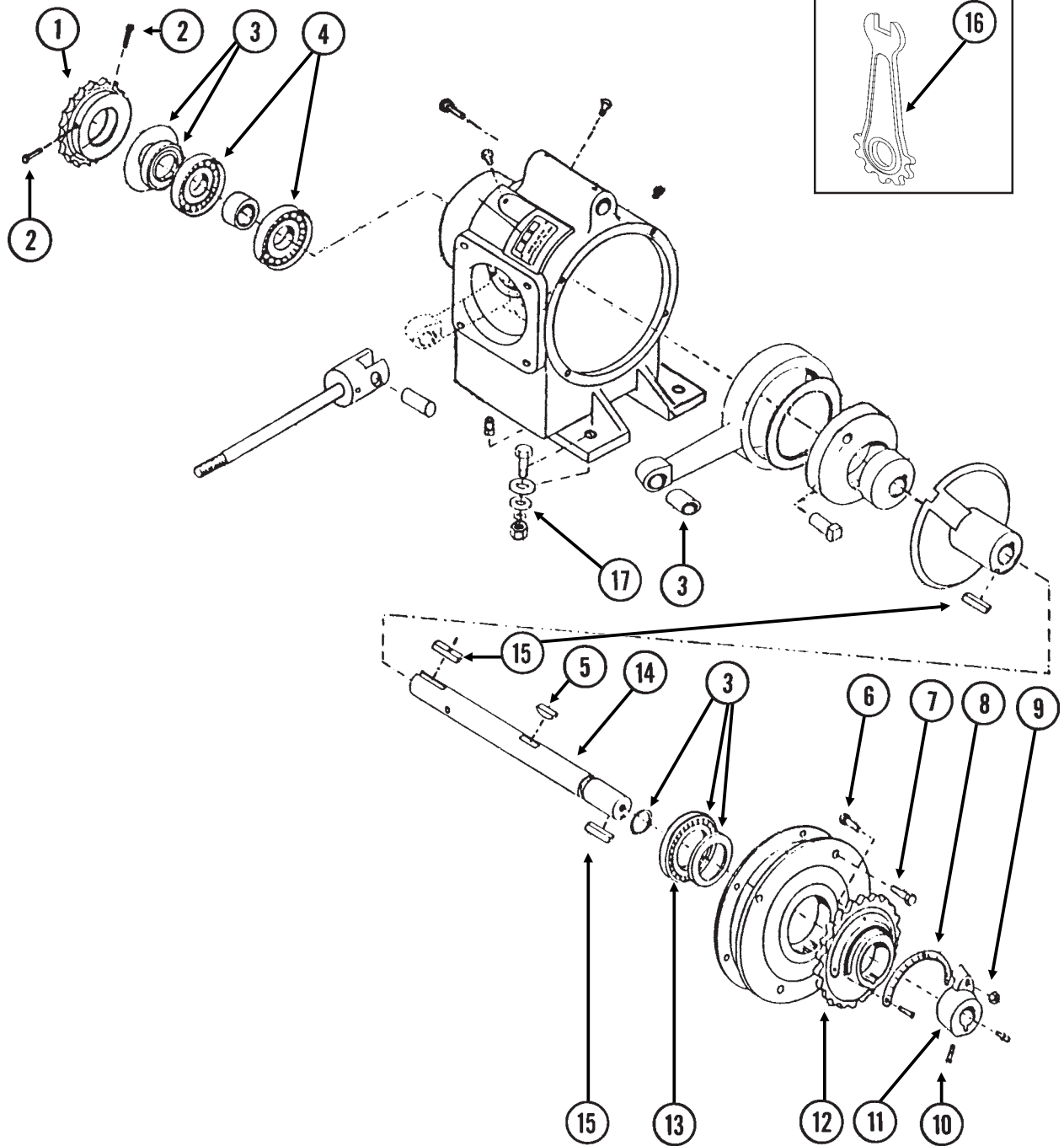
LIQUID FERTILIZER PISTON PUMP DRIVE

ITEM	PART NO.	QTY.	DESCRIPTION
10.	G10003	4	Hex Head Cap Screw, $\frac{3}{8}$ "-16 x 1 $\frac{1}{2}$ "
	G10210	4	Washer, $\frac{3}{8}$ " USS
	GR1122	4	Mounting Pad
	G10229	4	Lock Washer, $\frac{3}{8}$ "
	G10101	4	Hex Nut, $\frac{3}{8}$ "-16
11.	G10478	1	Clevis Pin, $\frac{5}{16}$ " x 1"
	G10409	1	Retaining Ring, $\frac{5}{16}$ "
	G10670	1	Hair Pin Clip, No. 3
12.	GA7336	1	Idler W/Bolt-On Sprockets
	GD7426	-	Sprocket, 12 Tooth
	GD1026	-	Sleeve, 1 $\frac{3}{16}$ " Long
	G10210	-	Washer, $\frac{3}{8}$ " USS
	G10229	-	Lock Washer, $\frac{3}{8}$ "
	G10047	-	Hex Head Cap Screw, $\frac{3}{8}$ "-16 x 1 $\frac{3}{4}$ "
13.	G11100	1	Hex Socket Button Head Cap Screw, $\frac{1}{4}$ "-20 x $\frac{1}{2}$ ", Grade 8
	G10227	1	Lock Washer, $\frac{1}{4}$ "
	G10209	1	Washer, $\frac{1}{4}$ " USS
14.	G3310-126	1	Chain, No. 40, 126 Pitch Including Connector Link
	GR0912	-	Connector Link, No. 40
15.	GD2734-08	1	Sleeve, 1 $\frac{1}{4}$ " O.D. x $\frac{5}{8}$ " Long
16.	G10303	3	Carriage Bolt, $\frac{5}{16}$ "-18 x 1"
	G10232	3	Lock Washer, $\frac{5}{16}$ "
	G10106	3	Hex Nut, $\frac{5}{16}$ "-18
17.	GD11045	2	Lock Clamp
	G10130	-	Square Head Machine Bolt, $\frac{5}{16}$ "-18 x 1 $\frac{3}{4}$ "
	G10923	-	Flange Nut, $\frac{5}{16}$ "-18, No Serration
18.	GA5194	1	Sprocket, 50 Tooth
19.	G10233	2	Machine Bushing, 1", 10 Gauge
20.	G3400-01	2	Flangette
21.	G2100-03	1	Bearing, $\frac{7}{8}$ " Hex Bore, Spherical
22.	GA11928	1	Clamp
23.	GA6501	1	Drive Plate W/Grease Fitting
	G10641	-	Grease Fitting, $\frac{1}{8}$ " NPT
	G10640	-	Grease Fitting, $\frac{1}{4}$ "-28
24.	G10017	4	Hex Head Cap Screw, $\frac{1}{2}$ "-13 x 1 $\frac{1}{2}$ "
	G10228	4	Lock Washer, $\frac{1}{2}$ "
	G10102	4	Hex Nut, $\frac{1}{2}$ "-13
25.	GD5857	1	Spring
26.	GD5990	1	Shaft, 74"
27.	GD3839	1	Coupler, 2"
28.	G10602	1	Spring Pin, $\frac{1}{4}$ " x 1 $\frac{1}{2}$ "
29.	G10460	1	Cotter Pin, $\frac{1}{4}$ " x 2"
30.	G10130	-	Square Head Machine Bolt, $\frac{5}{16}$ "-18 x 1 $\frac{3}{4}$ "
	G10923	-	Flange Nut, $\frac{5}{16}$ "-18, No Serration
31.	G11075	2	Internal Inverted Snap Ring, $\frac{7}{8}$ "
32.	G10496	2	External Inverted Snap Ring, 1 $\frac{1}{2}$ "
33.	G10629	1	Elbow, 90°, 1 $\frac{1}{4}$ " NPT To Barb
34.		-	See "Liquid Fertilizer Tanks, Saddles, Mounts, Hoses And Fittings", Pages P100 And P101
35.	G10615	1-2	Reducing Bushing, 1 $\frac{1}{2}$ " Male NPT To 1 $\frac{1}{4}$ " Female
36.	G10995	1	Reducing Bushing, 1" Male NPT To $\frac{3}{4}$ " Female, Stainless Steel
37.	G10292	-	Pipe Plug, $\frac{1}{4}$ " NPT
38.	GA3893	1	Strainer Complete
	GR0880	-	Screen, No. 40 Mesh
	GR0881	-	Gasket
	GR0882	-	Y-Body
	GR0883	-	End Cap
39.	G10994	1	Close Nipple, $\frac{3}{4}$ " NPT, Stainless Steel
40.	GD14431	1	Handle
41.	GD14427	1	Tightener Shaft, 4 $\frac{7}{8}$ "
42.	G11078	1	Vinyl Cap
43.	GD14432	1	Sleeve, 1 $\frac{1}{4}$ "
44.	GD14430	1	Release Collar, Gold, R.H.
45.	GD14413	1	Torsion Spring, L.H.
46.	G11237	1	Reducing Bushing, 1 $\frac{1}{2}$ " Male NPT To $\frac{3}{4}$ " Female
47.		-	See "Liquid Fertilizer Piston Pump W/18 Tooth Sprocket", Pages P108 And P109
A.	G1K269	-	Lock Clamp Kit (Items 17 And 30)
B.	G1K378	-	Wrap Spring Wrench Replacement Kit, Gold Collar, R.H., (Items 13, 15, 31, 32 And 41-46)

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

JB-L4400-991/CCU077(FRTZ172a)

Model LM-2455-R



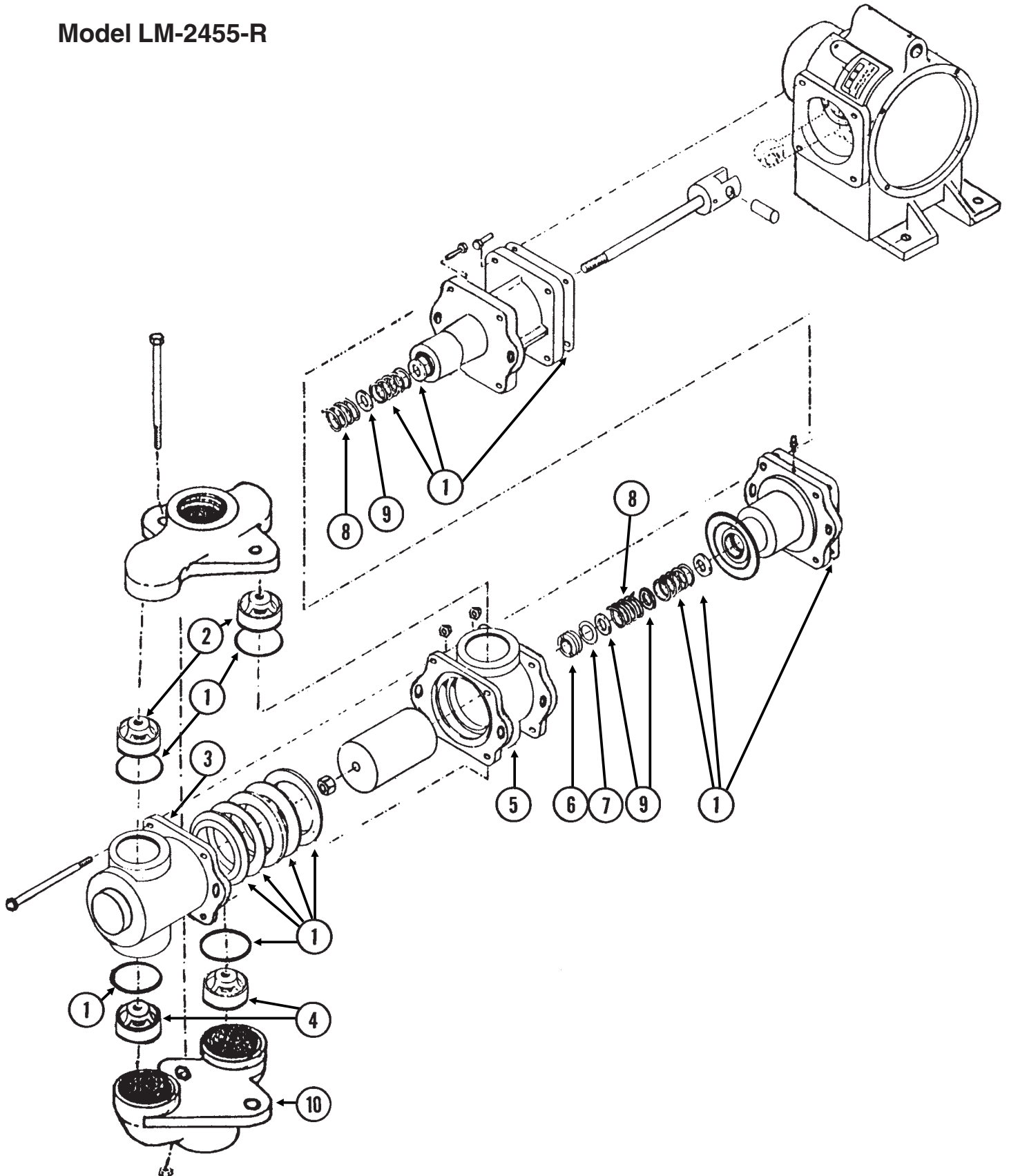
LIQUID FERTILIZER PISTON PUMP (Crankcase Assembly) Uses 18 Tooth Sprocket

ITEM	PART NO.	QTY.	DESCRIPTION
1.	GR1389	1	Sprocket, 18 Tooth
2.	G10688	2	Square Head Set Screw, $\frac{3}{8}$ "-16 x $\frac{5}{8}$ "
3.	GR1425	1	Repair Kit, Includes Item 1 On Pages P106 And P107
4.	GR1427	2	Bearing
5.	GR1420	1	Woodruff Key, $\frac{3}{8}$ "-16 x 1 $\frac{3}{4}$ "
6.	GR1167	1	Square Head Bolt, $\frac{3}{8}$ "-16 x 1 $\frac{3}{4}$ "
7.	G10043	4	Hex Head Cap Screw, $\frac{5}{16}$ "-18 x $\frac{3}{4}$ "
8.	GR1168	1	Scale
9.	G10108	1	Lock Nut, $\frac{3}{8}$ "-16
10.	G10693	3	Hex Socket Head Set Screw, $\frac{5}{16}$ "-18 x $\frac{3}{8}$ "
11.	GR1165	1	Arm
12.	GR1114	1	Flange
13.	GR1116	1	Bearing
14.	GR1421	1	Crankshaft
15.	GR1118	2	Setting Arm Key
16.	GR1424	1	Adjustment Wrench
17.		-	See "Liquid Fertilizer Piston Pump Drive", Pages P110 And P111
A.	GA8069	-	Piston Pump Complete W/18 Tooth Sprocket (Model LM-2455-R), Includes: Crankcase Assembly (Items 1-16) On This Page And Cylinder Assembly (Items 1-10) On Pages P106 And P107

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

JB-L2190-991(FRTZ171)

Model LM-2455-R



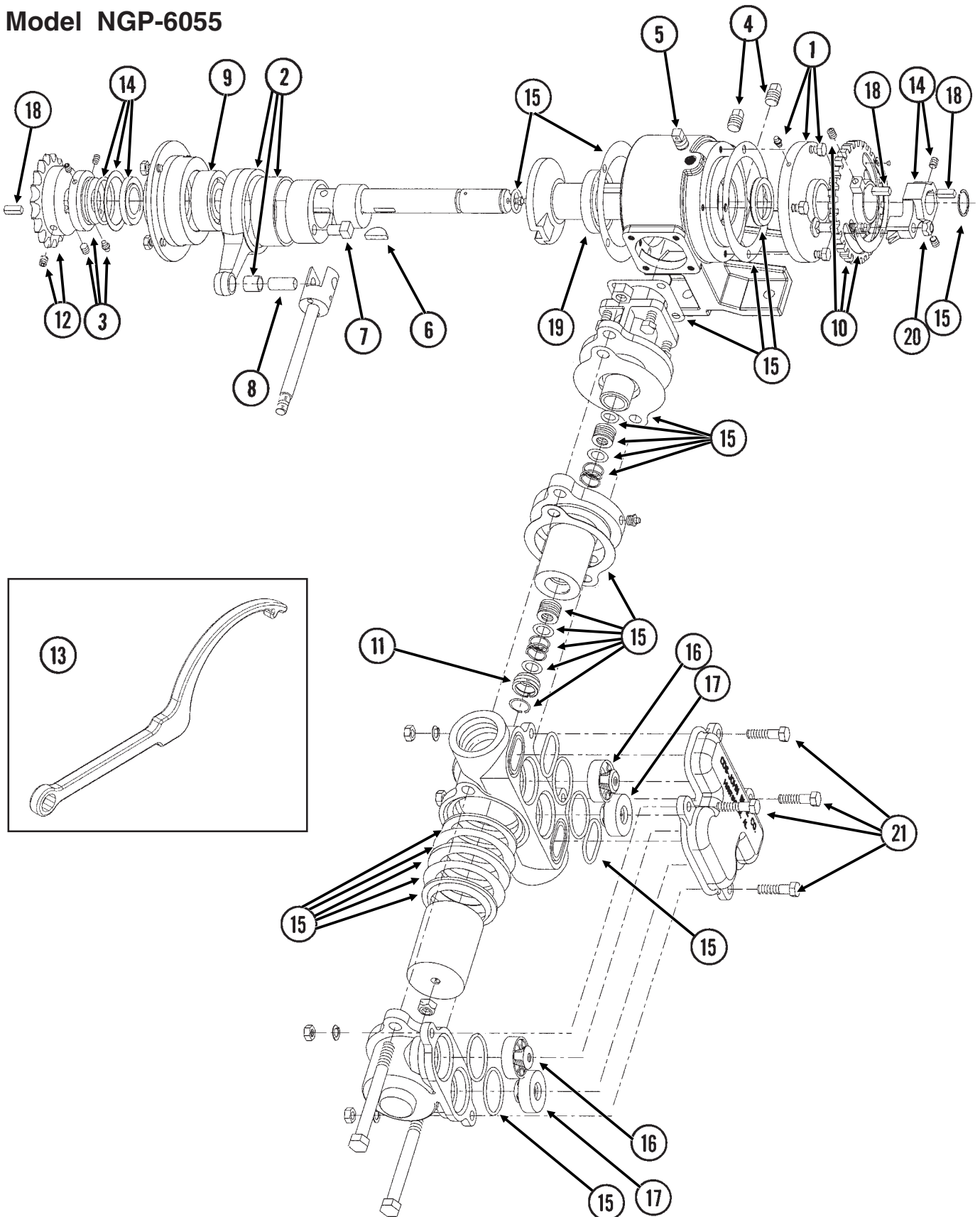
LIQUID FERTILIZER PISTON PUMP (Cylinder Assembly) Uses 18 Tooth Sprocket

ITEM	PART NO.	QTY.	DESCRIPTION
1.	GR1425	1	Repair Kit, Includes Item 3 On Pages P104 And P105
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

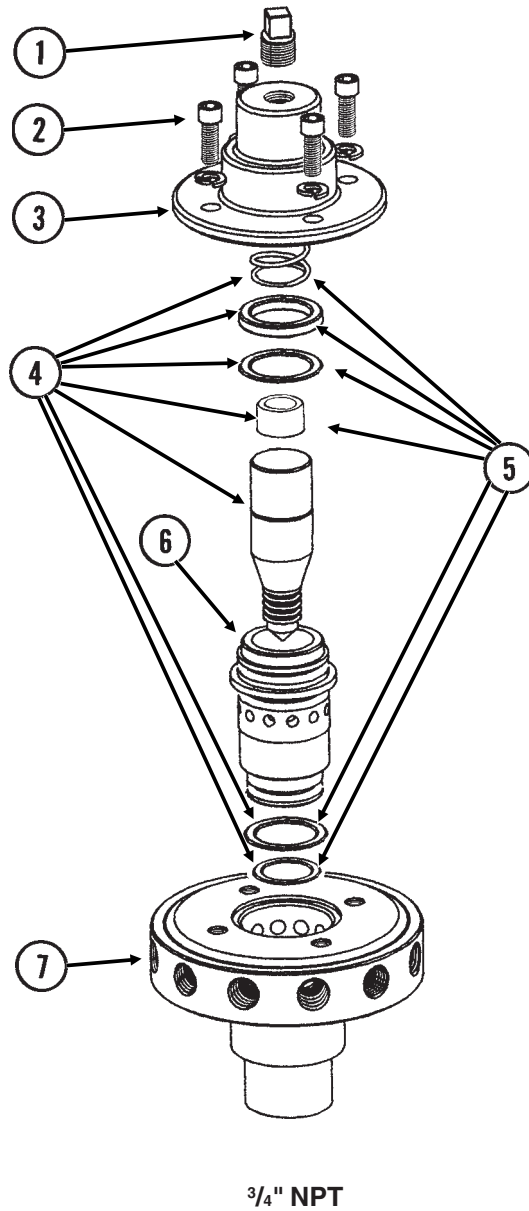
Uses 18 Tooth Sprocket

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 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 Head Cap Screw, $\frac{3}{8}$ "-16 x 1 $\frac{1}{2}$ "
	G10210	4	Washer, $\frac{3}{8}$ " USS
	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)

LIQUID FERTILIZER PISTON PUMP FLOW DIVIDER

(FRTZ159/PT40a/FRTZ202c)

Model FD-1200 Flow Divider, 12 Outlet

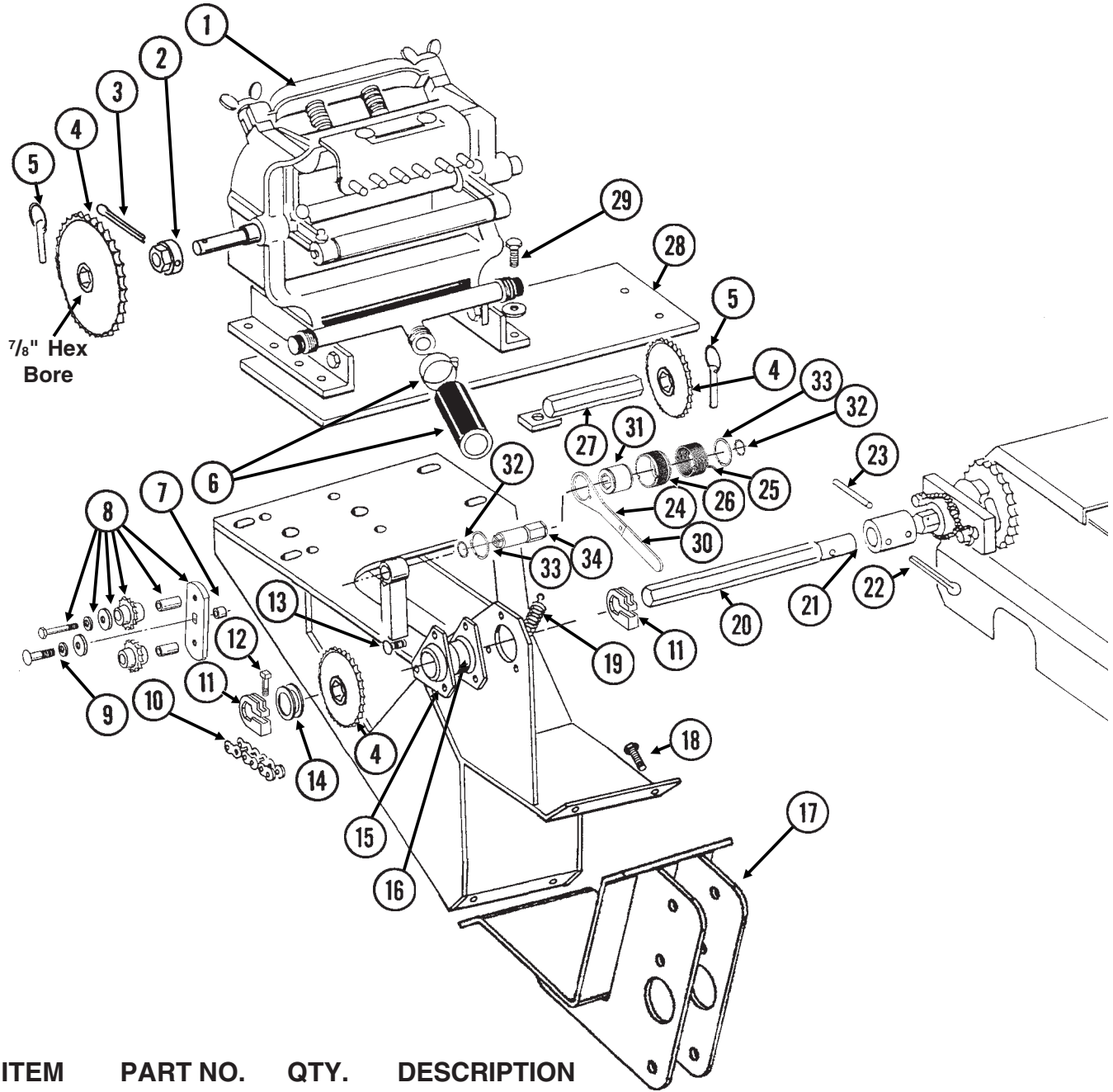


LIQUID FERTILIZER PISTON PUMP FLOW DIVIDER

ITEM	PART NO.	QTY.	DESCRIPTION
1.	GR1543	1	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, (1) Stainless Steel Sleeve
6.	GR1535	1	Sleeve
7.	GR1533	1	Body, 12 Outlets
A.	GA8931	1	Liquid Fertilizer Piston Pump Flow Divider Complete, 12 Outlet (ModelFD-1200)

LIQUID FERTILIZER SQUEEZE PUMP MOUNTING BRACKET AND DRIVE

(FRTZ270a)



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

1.		-	See "Liquid Fertilizer Squeeze Pump", Pages P114-P116
2.	GD7127	1	Shear Coupler
3.	G10462	1	Cotter Pin, 3/16" x 2"
4.	GA5105	1	Sprocket, 15 Tooth
	GA5107	1	Sprocket, 19 Tooth
	GA6513	1	Sprocket, 32 Tooth
	GA5202	1	Sprocket, 34 Tooth
	GA6514	1	Sprocket, 46 Tooth
	GA6515	-	Sprocket, 62 Tooth (Optional)
5.	GD2558	2	Lynch Pin, 1/4"
6.		-	See "Liquid Fertilizer Tanks, Saddles, Mounts, Hoses And Fittings", Pages P100 And P101

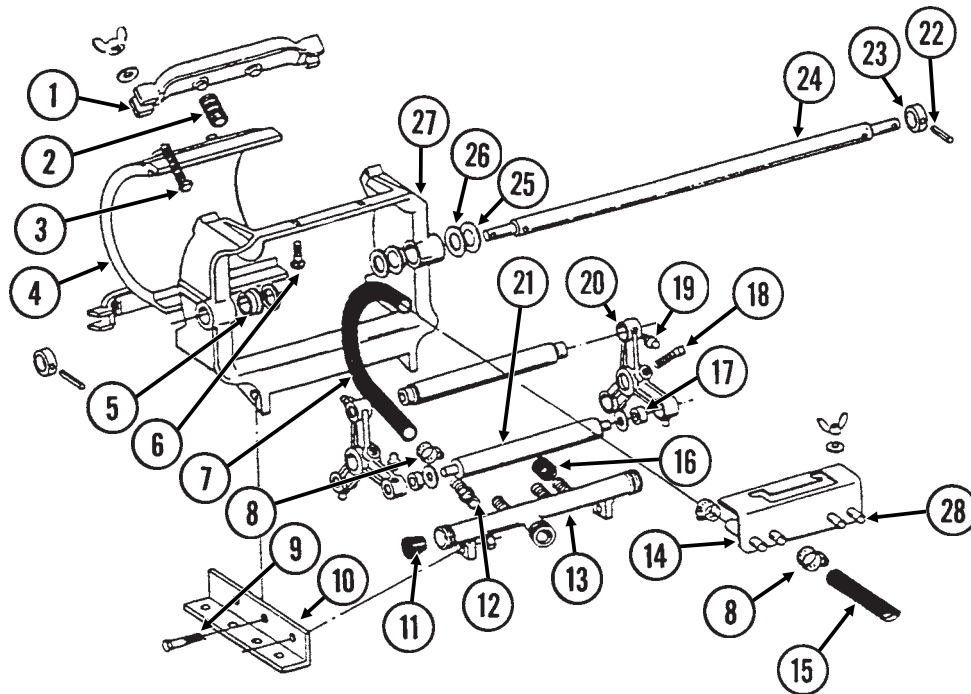
LIQUID FERTILIZER SQUEEZE PUMP MOUNTING BRACKET AND DRIVE

ITEM	PART NO.	QTY.	DESCRIPTION
7.	GD2734-08	1	Sleeve, 1 1/4" O.D. x 5/8" Long
8.	GA7336	1	Idler W/Bolt-On Sprockets
	GD7426	-	Sprocket, 12 Tooth
	GD1026	-	Sleeve, 1 3/16" Long
	G10210	-	Washer, 3/8" USS
	G10229	-	Lock Washer, 3/8"
	G10047	-	Hex Head Cap Screw, 3/8"-16 x 1 3/4"
9.	G11100	1	Hex Socket Button Head Cap Screw, 1/4"-20 x 1/2", Grade 8
	G10227	1	Lock Washer, 1/4"
	G10209	1	Washer, 1/4" USS
10.	G3310-140	1	Chain, No. 40, 140 Pitch Including Connector Link
	GR0912	-	Connector Link, No. 40
11.	GD11045	2	Lock Clamp
12.	G10130	2	Square Head Machine Bolt, 5/16"-18 x 1 3/4"
	G10923	2	Flange Nut, 5/16"-18, No Serration
13.	G10303	3	Carriage Bolt, 5/16"-18 x 1"
	G10232	3	Lock Washer, 5/16"
	G10106	3	Hex Nut, 5/16"-18
14.	G10233	-	Machine Bushing, 1", 10 Gauge
15.	G3400-01	2	Flangette
16.	G2100-03	1	Bearing, 7/8" Hex Bore, Spherical
17.	GA11928	1	Clamp
18.	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
19.	GD5857	1	Spring
20.	GD5988	-	Shaft, 36", 4 Row 30"/36"/38" And 6 Row 30"/36"/38"
	GD5990	-	Shaft, 74", 8 Row 30"
21.	GD3839	1	Coupler, 2"
22.	G10460	1	Cotter Pin, 1/4" x 2"
23.	G10602	1	Spring Pin, 1/4" x 1 1/2"
24.	GD14431	1	Handle
25.	GD14413	1	Torsion Spring, L.H.
26.	GD14430	1	Release Collar, Gold, R.H.
27.	GA5229	1	Sprocket Storage Rod
28.	GD6165	-	Plate, 8 Row 30" Only
29.	G10004	4	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	G10210	4	Washer, 3/8" USS
	G10229	4	Lock Washer, 3/8"
	G10101	4	Hex Nut, 3/8"-16
30.	G11078	1	Vinyl Cap
31.	GD14432	1	Sleeve, 1 1/4"
32.	G11075	2	Internal Inverted Snap Ring, 7/8"
33.	G10496	2	External Inverted Snap Ring, 1 1/2"
34.	GD14427	1	Tightener Shaft, 4 7/8"
A.	G1K269	-	Lock Clamp Kit (Items 11 And 12)
B.	G1K378	-	Wrap Spring Wrench Replacement Kit, Gold Collar, R.H., (Items 7, 9, 24-26 And 32-36)

LIQUID FERTILIZER SQUEEZE PUMP

4 ROW

LFC011(PT46a)

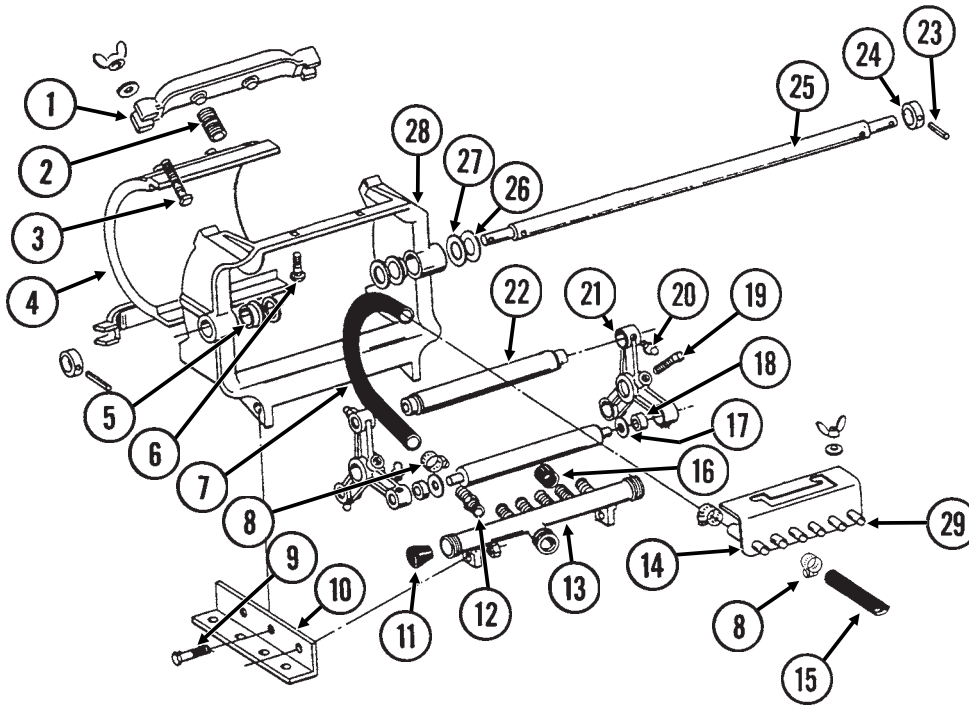


ITEM	PART NO.	QTY.	DESCRIPTION
1.	GR0216	2	Spring Anchor Bar
2.	GR0214	4	Spring
3.	G10130	4	Square Head Machine Bolt, $\frac{5}{16}$ "-18 x 1 $\frac{3}{4}$ "
	G10219	4	Washer, $\frac{5}{16}$ " USS
	G10144	4	Wing Nut, $\frac{5}{16}$ "-18
4.	GR0212	1	Plate
5.	GR0207	2	Nylon Bushing
6.	G10303	2	Carriage Bolt, $\frac{5}{16}$ "-18 x 1"
	G10219	2	Washer, $\frac{5}{16}$ " USS
	G10144	2	Wing Nut, $\frac{5}{16}$ "-18
7.	GR0215	4	Metering Hose, $\frac{1}{2}$ " x 13"
8.	G10681	-	Hose Clamp, No. 6
9.	G10004	4	Hex Head Cap Screw, $\frac{3}{8}$ "-16 x 1 $\frac{1}{4}$ "
	G10101	4	Hex Nut, $\frac{3}{8}$ "-16
10.	GR0213	2	Angle
11.	GR0217	2	Manifold Plug
12.	GR0232	4	Adapter
13.	GR0228	1	Intake Manifold
14.	GR1484	1	Discharge Manifold Less Hose Barbs
15.	G4301-01	1	Hose, $\frac{3}{8}$ " x 30'
16.	GR0211	2	Rubber Cap
17.	GR0227	6	Nylon Washer
18.	G10131	2	Square Head Set Screw, $\frac{5}{16}$ "-18 x $\frac{3}{4}$ "
19.	G10640	2	Grease Fitting, $\frac{1}{4}$ "-28
20.	GR0223	2	Roller Arm
21.	GR0209	3	Roller
22.	G10718	2	Spring Pin, $\frac{5}{16}$ " x 1 $\frac{1}{8}$ "
23.	GD9109	2	Sleeve
24.	GD9107	1	Shaft
25.	GR0226	2	Shim, $\frac{3}{64}$ "
26.	GR0225	2	Shim, $\frac{1}{32}$ "
27.	GR0208	1	Frame
28.	GR1577	4	Nylon Hose Barb, $\frac{1}{2}$ " x $\frac{3}{8}$ " (If Applicable)
A.	GA8690	-	Squeeze Pump Complete, 4 Row (Items 1-14, 16-21 And 24-28)

LIQUID FERTILIZER SQUEEZE PUMP

6 ROW

LFC011/LFC011(PT47a)

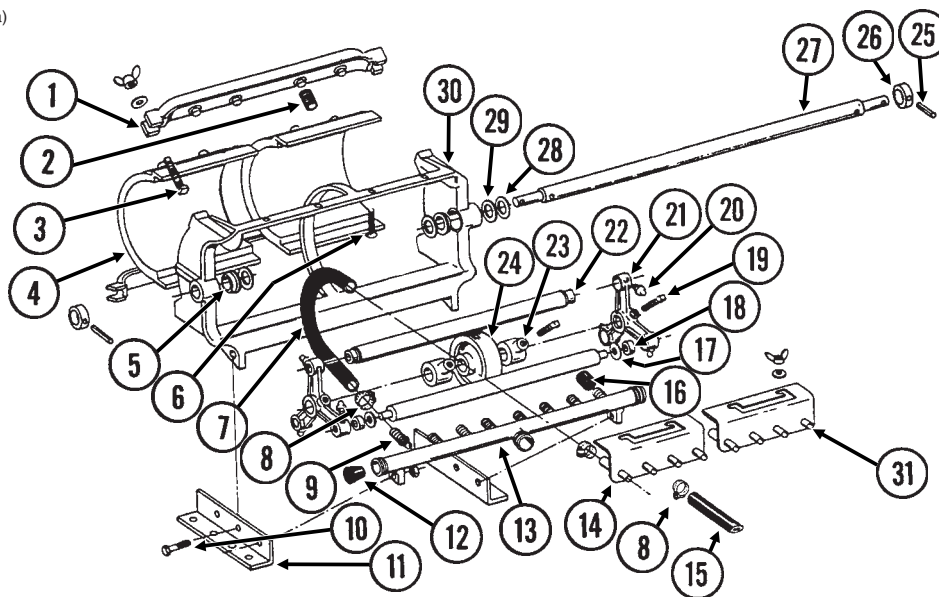


ITEM	PART NO.	QTY.	DESCRIPTION
1.	GR0216	2	Spring Anchor Bar
2.	GR0214	4	Spring
3.	G10130	4	Square Head Machine Bolt, $\frac{5}{16}$ "-18 x 1 $\frac{3}{4}$ "
	G10219	4	Washer, $\frac{5}{16}$ " USS
	G10144	4	Wing Nut, $\frac{5}{16}$ "-18
4.	GR0212	1	Plate
5.	GR0207	2	Nylon Bushing
6.	G10303	2	Carriage Bolt, $\frac{5}{16}$ "-18 x 1"
	G10219	2	Washer, $\frac{5}{16}$ " USS
	G10144	2	Wing Nut, $\frac{5}{16}$ "-18
7.	GR0215	6	Metering Hose, $\frac{1}{2}$ " x 13"
8.	G10681	-	Hose Clamp, No. 6
9.	G10004	4	Hex Head Cap Screw, $\frac{3}{8}$ "-16 x 1 $\frac{1}{4}$ "
	G10101	4	Hex Nut, $\frac{3}{8}$ "-16
10.	GR0213	2	Angle
11.	GR0217	2	Manifold Plug
12.	GR0232	6	Adapter
13.	GR0228	1	Intake Manifold
14.	GR1484	1	Discharge Manifold Less Hose Barbs
15.	G4301-03	1	Hose, $\frac{3}{8}$ " x 60'
16.	GR0211	-	Rubber Cap
17.	GR0229	6	Nylon Washer
18.	GR1626	6	Bushing
19.	G10131	2	Square Head Set Screw, $\frac{5}{16}$ "-18 x $\frac{3}{4}$ "
20.	G10640	8	Grease Fitting, $\frac{1}{4}$ "-28
21.	GR0231	2	Roller Arm
22.	GR0233	3	Roller
23.	G10718	2	Spring Pin, $\frac{5}{16}$ " x 1 $\frac{1}{8}$ "
24.	GD9109	2	Sleeve
25.	GD9107	1	Shaft
26.	GR0226	2	Shim, $\frac{3}{64}$ "
27.	GR0225	2	Shim, $\frac{1}{32}$ "
28.	GR0208	1	Frame
29.	GR1577	6	Nylon Hose Barb, $\frac{1}{2}$ " x $\frac{3}{8}$ " (If Applicable)
A.	GA8691	-	Squeeze Pump Complete, 6 Row (Items 1-13, 15-22 And 25-29)

LIQUID FERTILIZER SQUEEZE PUMP

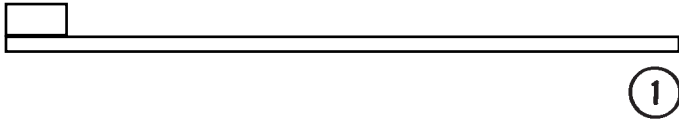
8 ROW

LFC010(PT48a)



ITEM	PART NO.	QTY.	DESCRIPTION
1.	GR0221	2	Spring Anchor Bar
2.	GR0214	8	Spring
3.	G10130	4	Square Head Machine Bolt, 5/16"-18 x 1 3/4"
	G10219	4	Washer, 5/16" USS
	G10144	4	Wing Nut, 5/16"-18
4.	GR0212	2	Plate
5.	GR0207	2	Nylon Bushing
6.	G10303	4	Carriage Bolt, 5/16"-18 x 1"
	G10219	4	Washer, 5/16" USS
	G10144	4	Wing Nut, 5/16"-18
7.	GR0215	8	Metering Hose, 1/2" x 13"
8.	G10681	-	Hose Clamp, No. 6
9.	GR0232	8	Adapter
10.	G10004	4	Hex Head Cap Screw, 3/8"-16 x 1 1/4"
	G10101	4	Hex Nut, 3/8"-16
11.	GR0279	1	Angle, L.H.
	GR0280	1	Angle, R.H.
12.	GR0217	2	Manifold Plug
13.	GR0284	1	Intake Manifold
14.	GR1485	2	Discharge Manifold Less Hose Barbs
15.	G4301-04	1	Hose, 3/8" x 100'
16.	GR0211	-	Rubber Cap
17.	GR0229	6	Nylon Washer
18.	GR1626	6	Bushing
19.	G10131	2	Square Head Set Screw, 5/16"-18 x 3/4"
20.	G10640	8	Grease Fitting, 1/4"-28
21.	GR0231	2	Roller Arm
22.	GR0283	3	Roller
23.	GR0282	2	Set Collar
24.	GR0281	1	Back Up Roller
25.	G10718	2	Spring Pin, 5/16" x 1 1/8"
26.	GD9109	2	Sleeve
27.	GD9108	1	Shaft
28.	GR0226	4	Shim, 3/64"
29.	GR0225	4	Shim, 1/32"
30.	GR0222	1	Frame
31.	GR1577	8	Nylon Hose Barb, 1/2" x 3/8" (If Applicable)
A.	GA8692	-	Squeeze Pump Complete, 8 Row (Items 1-14, 16-24 And 27-31)

DECALS, PAINT AND MISCELLANEOUS



ROTATE KNURLED COLLAR ON WRAP SPRING TIGHTENER TO RELEASE SPRING TENSION

7100-295

! 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

! 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

! 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

KINZE

Double Frame

! WARNING !

USE SAFETY CHAINS PROVIDED. TOW ONLY WITH FARM TRACTOR.

7100-302

3000

! 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

! WARNING !

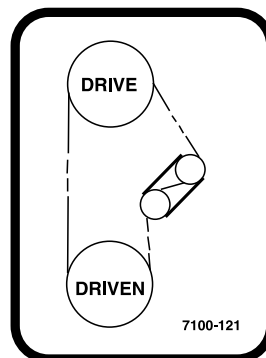
THIS MACHINE HAS BEEN DESIGNED AND BUILT WITH YOUR SAFETY IN MIND. DO NOT MAKE ANY ALTERATIONS OR CHANGES TO THIS MACHINE. ANY ALTERATION TO THE DESIGN OR CONSTRUCTION MAY CREATE SAFETY HAZARDS.

7100-90

! 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



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

DECALS, PAINT AND MISCELLANEOUS



15



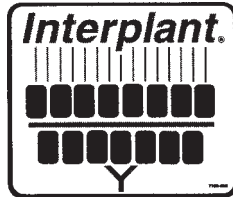
16



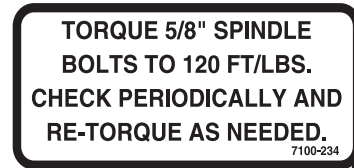
17



18



19



20

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.

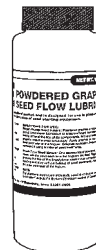
AN OPERATOR & PARTS MANUAL IS AVAILABLE FOR THIS MACHINE.

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

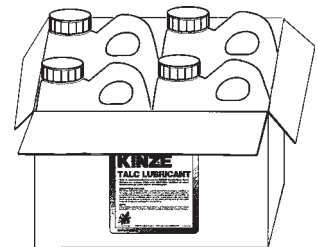
21



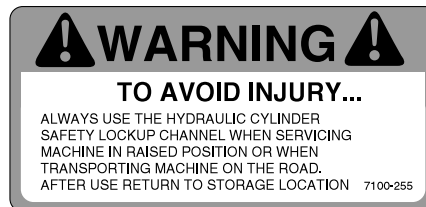
22



23



24



26



25

KINZE 3000

27



28



29



30

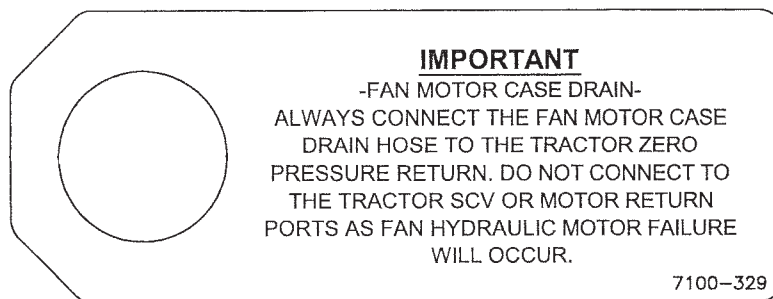


31



32

DECALS, PAINT AND MISCELLANEOUS



33

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	2-4	Decal, Warning
6.	G7100-104	1	Decal, KINZE®, 3" x 12"
7.	G7100-302	1	Decal, Warning
8.	G7100-60	1	Decal, Double Frame®
9.	G7100-238	1	Decal, 3000
10.	G7100-89	2-4	Decal, Danger
11.	G7100-90	1	Decal, Warning
12.	G7100-115	-	Decal, Warning (1 Per Granular Chemical Hopper)
13.	G7100-121	1	Decal, Transmission
14.	G7100-153	-	Decal, Information (1 Per Seed Meter)
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.	G7100-249	-	Decal, Caution
17.	G7100-116	-	Decal, Grease Daily
18.	G7100-111	-	Decal, Oil Daily
19.	G7100-208	2	Decal, Interplant®
20.	G7100-234	-	Decal, Bolt Torque
21.	G7100-217	1	Decal, Note
22.	GR0155MPP	-	Blue Paint, Twelve Aerosol Cans
23.	GR0146MPP	-	Powdered Graphite, Twenty-Four 1 Pound Containers
24.	GR1570MPP	-	Talc Lubricant, Four 8 Pound Containers
25.	G7100-253	-	Decal, Warning
26.	G7100-255	-	Decal, Warning
27.	G7100-292	-	Decal, KINZE® 3000
28.	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)
29.	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)
30.	GM0208	-	Operator & Parts Manual, Model 3000 (EdgeVac® Seed Metering)
31.	G7100-301	-	Decal, Warning
32.	G7100-311	-	Decal, EdgeVac®
33.	G7100-329	-	Tag, Fan Motor Case Drain

NUMERICAL INDEX

Part No.	Page	Part No.	Page	Part No.	Page
A1000	P67, P69	A8012	P43	G10047	P3, P43, P51, P89, P95, P103, P113
A1013	P69	A8013	P43	G10048	P43
A1018	P65, P67, P69	A8014	P43	G10049	P87
A1019	P67, P69	A8015	P43	G10053	P50, P95
A1020	P65, P69	A8016	P43	G10055	P47
A1021	P65, P69	A8017	P43	G10061	P12, P43
A1039	P69	A8018	P43	G10063	P35
A1044	P69	A8019	P43	G10064	P10, P40, P47, P71
A1054	P69	A8020	P43	G10096	P101
A1055	P69	A8261	P37	G10100	P87
A10759	P17	A8271	P37	G10101	P4, P10, P11, P19, P33, P35, P47, P61, P63, P75, P77, P79, P81, P83, P87, P102, P103, P109, P113, P114, P115, P116
A1076	P65, P67, P69	A8292	P37	G10102	P9, P27, P31, P41, P42, P45, P50, P51, P53, P55, P57, P79, P83, P85, P89, P93, P95, P97, P101, P103, P113
A1079	P69	A8293	P37	G10103	P19, P46, P47, P71, P73, P75
A1086	P67	A8775	P60	G10104	P4, P11, P33, P41, P43, P45, P50, P87, P93, P97, P101
A1090	P69	A8827	P59	G10105	P45, P86, P101
A1102	P65	A8923	P61	G10106	P9, P25, P46, P47, P50, P97, P103, P113
A1105	P67	A9442	P60	G10107	P9, P10, P21, P25, P31, P43, P47, P83, P89, P91
A1138	P65, P67	G10001	P4, P9, P10, P33, P35, P41, P47, P63, P75, P77, P79, P81, P86	G10108	P3, P12, P17, P33, P35, P43, P46, P81, P86, P87, P89, P91, P105, P109
A1150	P65	G10002	P17, P89	G10109	P7, P9, P10, P23, P27, P29, P31, P53, P55, P83, P91
A1153	P65	G10003	P3, P19, P29, P103, P109	G10110	P19, P40, P71
A1168	P67	G10004	P33, P51, P87, P102, P113, P114, P115, P116	G10111	P10, P21, P23, P25, P27, P31, P43, P45, P51, P81, P83, P87, P89, P91, P95
A1170	P65	G10005	P31	G10112	P31, P43
A1171	P65	G10006	P9, P27	G10128	P50
A1173	P65, P67	G10007	P4, P5, P11, P31, P41, P43, P86, P101	G10130	P48, P49, P79, P103, P113, P114, P115, P116
A1177	P65, P67	G10008	P45, P53	G10131	P48, P49, P114, P115, P116
A1179	P65, P67	G10009	P45	G10133	P10, P27, P29, P31, P53, P55, P83, P91, P97
A1182	P65, P67	G10010	P7, P29, P31, P85, P92		
A12004	P37	G10011	P31, P89		
A12005	P37	G10013	P10		
A12006	P37	G10014	P7, P31		
A12015	P37	G10015	P9		
A3113	P65	G10016	P87, P95		
A3114	P69	G10017	P23, P25, P41, P43, P51, P89, P103, P113		
A3115	P67	G10018	P7, P9		
A3119	P67	G10019	P83		
A3128	P69	G10022	P71, P73, P75		
A3132	P69	G10023	P17, P41, P46		
A3135	P65, P67, P69	G10025	P45		
A3136	P65	G10026	P45		
A3137	P69	G10033	P27, P95		
A3142	P65, P67, P69	G10035	P93		
A3143	P69	G10036	P21		
A3147	P65, P67, P69	G10037	P50, P97		
A3150	P67, P69	G10038	P50		
A3175	P67	G10039	P23, P25, P31, P87		
A3208	P67, P69	G10043	P105		
A3209	P69	G10045	P27, P83		
A3211	P65	G10046	P31, P41, P83, P89		
A3352	P37				
A3364	P37				
A3393	P37				
A3394	P37				
A4295	P58				
A7370	P47				
A7538	P58				
A8011	P43				

NUMERICAL INDEX

Part No.	Page	Part No.	Page	Part No.	Page
G10139	P45	G10230	P4, P7, P10, P11, P33, P41, P43, P45, P50, P53, P85, P87, P93, P97, P101	G10460	P45, P48, P49, P51, P53, P55, P81, P95, P97, P103, P113
G10144	P114, P115, P116	G10231	P45, P101	G10462	P51, P95, P112
G10152	P9	G10232	P9, P15, P41, P46, P47, P50, P83, P89, P97, P103, P113	G10463	P9, P33
G10157	P42, P43	G10233	P47, P48, P79, P50, P79, P92, P95, P99, P103, P113	G10478	P103
G10159	P45	G10235	P47	G10496	P50, P79, P103, P113
G10168	P57, P79	G10237	P87	G10499	P35, P83
G10169	P42	G10257	P18	G10501	P27, P47
G10171	P9, P97	G10260	P15	G10503	P23, P25, P29, P31, P83, P91
G10177	P97	G10278	P101	G10504	P83
G10187	P53	G10284	P33	G10507	P86
G10194	P29	G10292	P103	G10523	P19
G10201	P3, P17, P33, P97	G10303	P9, P23, P46, P47, P50, P97, P103, P113, P114, P115, P116	G10526	P85
G10203	P3, P33, P35, P46, P51, P63, P91	G10304	P3	G10527	P51
G10204	P5, P7, P83, P92	G10305	P20, P83	G10529	P20
G10205	P31, P35, P85, P86, P87	G10306	P19, P46, P89, P91, P109	G10535	P79
G10206	P29, P43, P81, P89, P97	G10308	P10, P20	G10536	P23, P25
G10207	P3	G10309	P12	G10542	P83
G10209	P18, P19, P40, P47, P51, P71, P103, P113	G10310	P19	G10544	P57
G10210	P3, P9, P10, P11, P12, P17, P33, P41, P43, P46, P51, P81, P83, P87, P89, P95, P103, P109, P113	G10312	P3, P17, P40	G10546	P12, P18
G10211	P73, P75	G10315	P9, P10, P19	G10551	P3
G10213	P5, P29, P31, P83	G10318	P25	G10560	P85
G10215	P65, P67, P69	G10322	P87	G10561	P97
G10216	P7, P23, P25, P33, P42, P43, P45, P85, P87	G10323	P15	G10567	P12, P17, P18
G10217	P89	G10325	P5, P17, P81	G10570	P18
G10219	P9, P23, P46, P89, P97, P114, P115, P116	G10326	P3	G10572	P25
G10220	P86	G10328	P5	G10574	P21, P27, P31, P81
G10221	P83	G10338	P7, P12	G10581	P45, P79, P81
G10226	P55, P81	G10348	P27, P42	G10583	P41
G10227	P19, P41, P46, P47, P51, P71, P73, P75, P103, P113	G10370	P47	G10585	P23, P25, P41, P95
G10228	P7, P27, P41, P42, P45, P50, P51, P53, P55, P57, P79, P83, P85, P89, P93, P95, P97, P101, P103, P113	G10371	P27	G10587	P97
G10229	P4, P10, P11, P17, P19, P29, P33, P35, P41, P47, P51, P63, P75, P77, P79, P81, P83, P87, P95, P102, P103, P109, P113	G10400	P31	G10588	P97
		G10408	P51, P95	G10592	P87
		G10409	P51, P95, P103	G10594	P87
		G10412	P4, P12, P33, P47	G10597	P23, P25
		G10419	P95	G10599	P10, P11, P33, P35, P87
		G10427	P5, P9	G10602	P12, P15, P17, P18, P47, P48, P49, P51, P95, P103, P113
		G10428	P81	G10603	P15, P91
		G10430	P49	G10610	P45, P85
		G10438	P3, P85	G10615	P103
		G10445	P95	G10619	P101
		G10449	P58	G10620	P3, P7, P12, P17, P40, P85, P92
		G10450	P89	G10621	P12, P17, P20
		G10451	P81, P83, P97	G10622	P5, P20
		G10452	P19	G10626	P101
		G10453	P49	G10629	P101, P103
		G10456	P33, P85, P87	G10633	P101
				G10636	P45
				G10640	P7, P45, P53, P55, P59, P81, P85,

NUMERICAL INDEX

Part No.	Page	Part No.	Page	Part No.	Page
10640	P87, P89, P91, P95, ... P103, P114, P115, P116	G10991	P89, P109	G2403-08	P65, P67, P69
G10641	P51, P86, P97, P103	G10993	P43	G2603-08	P67, P69
G10643	P31	G10994	P103	G2603-08-08-06	P65, P67
G10645	P81	G10995	P103	G2701-08	P65
G10647	P43	G11007	P3	G2703-08	P67, P69
G10655	P97	G11008	P3	G306-08	P65, P67, P69
G10660	P18	G11009	P15	G3303-100	P33
G10669	P3	G11010	P31	G3303-108	P3, P19
G10670	P17, P53, P97, P103	G11015	P3	G3303-16	P3
G10672	P97, P101	G11034	P91	G3305-01	P20
G10674	P101	G11058	P43	G3310-126	P103
G10676	P41, P97	G11073	P18	G3310-132	P47
G10681	P39, P83, P102, ... P114, P115, P116	G11075	P50, P103, P113	G3310-134	P47
G10688	P105	G11078	P51, P103, P113	G3310-138	P79
G10693	P105, P109	G11081	P45	G3310-140	P47, P113
G10718	P33, P114, P115, P116	G11085	P43	G3310-252	P79
G10722	P57	G11098	P29	G3310-80	P51
G10724	P57	G11100	P51, P103, P113	G3310-92	P50
G10725	P57	G11124	P35	G3310-98	P95
G10732	P4, P33	G11133	P35	G3400-01	P47, P51, P103, P113
G10751	P12, P33, P47	G11145	P40	G4100-02	P42
G10752	P12	G11147	P41	G4200-01	P101
G10753	P33	G11166	P35	G4200-02	P101
G10757	P19	G11172	P15	G4200-03	P101
G10758	P19	G11173	P15	G4205-11	P101
G10765	P29, P31	G11182	P101	G4301-01	P102, P114
G10801	P9, P10	G11209	P19	G4301-03	P102, P115
G10809	P35	G11210	P15	G4301-04	P102, P116
G10830	P91	G11213	P15	G6326X	P4
G10844	P57	G11215	P35	G6400-06	P38, P39, P63
G10862	P87	G11228	P29	G6400-08	P65, P67, P69
G10864	P19	G11236	P29	G6400-08-04	P69
G10871	P89	G11237	P103	G6400-08-06	P69
G10879	P55	G1K215	P85	G6400-10	P39
G10890	P47	G1K248	P71, P73, P75, P77	G6400-12	P39
G10895	P43	G1K249	P75, P77	G6408-06	P39
G10903	P43	G1K252	P71, P73, P75, P77	G6408-12	P39
G10908	P91	G1K253	P47	G6500-06	P38, P65, P67
G10909	P79	G1K267	P73, P75, P77	G6500-08	P69
G10912	P5, P33	G1K268	P35, P73, P75, P77	G6500-08-06	P69
G10917	P101	G1K269	P48, P49, P79, P103, P113	G6502-06	P65, P67
G10921	P18	G1K296	P7	G6502-08	P69
G10923	P48, P49, P79, ... P103, P113	G1K320	P71, P75, P77	G6602-08	P67, P69
G10924	P7	G1K321	P71, P75, P77	G6795X	P93
G10938	P83	G1K322	P75, P77	G6801-06-08	P65, P67
G10939	P61	G1K323	P74, P76	G6801-08	P65, P67, P69
G10940	P7	G1K331	P79	G6801-10-12	P38
G10957	P61	G1K345	P10	G6801-12	P38
G10958	P58, P59, P61	G1K362	P73, P75, P77	G7100-104	P119
G10961	P85, P92	G1K363	P73, P75, P77	G7100-111	P119
G10967	P60	G1K378	P51, P103, P113	G7100-115	P119
G10968	P79	G1K385	P19	G7100-116	P119
G10974	P29, P31	G1K411	P42	G7100-121	P119
		G1K426	P38	G7100-153	P119
		G2100-03	P47, P103, P113	G7100-208	P119
		G2403-06	P65	G7100-217	P119

NUMERICAL INDEX

Part No.	Page	Part No.	Page	Part No.	Page
G7100-234	P119	GA11039	P77	GA2007	P12
G7100-238	P119	GA11085	P35	GA2012L	P5
G7100-247	P119	GA11086	P35	GA2012R	P5
G7100-249	P119	GA11087	P35	GA2014	P5, P9, P25, P27, P29, P31, P83, P91
G7100-252	P119	GA11154	P35	GA2054	P9
G7100-253	P119	GA11155	P35	GA2068	P47
G7100-255	P119	GA11156	P35	GA2075	P19
G7100-258	P119	GA11397	P89	GA2094	P20
G7100-259	P119	GA11398	P89	GA2142	P45
G7100-260	P119	GA11520	P21	GA2147	P45
G7100-261	P119	GA11591	P55	GA2148	P45
G7100-262	P119	GA11699	P35	GA2180	P79
G7100-263	P119	GA11766	P55	GA2558	P45
G7100-292	P119	GA11767	P55	GA3893	P103
G7100-295	P119	GA11911	P15	GA4235	P95
G7100-301	P119	GA11917	P35	GA4265	P43
G7100-302	P119	GA11928	P41, P103, P113	GA4286	P86
G7100-311	P119	GA11929	P41	GA4287	P86
G7100-329	P119	GA11930	P71	GA4293	P39
G7100-42	P119	GA11931	P41	GA4444	P17
G7100-46	P119	GA11932	P41	GA4774	P42
G7100-47	P119	GA11933	P41	GA4976	P101
G7100-60	P119	GA11934	P39	GA5090	P47
G7100-89	P119	GA11935	P15	GA5105	P47, P50, P51, P95, P112
G7100-90	P119	GA11947	P73, P75	GA5106	P51
G7566X	P11	GA11948	P73, P75	GA5107	P47, P51, P79, P95, P112
GA0167	P57	GA11963	P41	GA5108	P51
GA0237	P86	GA11969	P33	GA5109	P51
GA0243	P57	GA11971	P33	GA5110	P51
GA0245	P57	GA11981	P41	GA5111	P51
GA0257	P57	GA11983	P40	GA5112	P51
GA0312	P83	GA11984	P40	GA5113	P51
GA0328	P83	GA11985	P40	GA5114	P47, P48, P95
GA0378	P49	GA11987	P35	GA5115	P95
GA0810	P83	GA11996	P71	GA5116	P51, P95
GA0863	P97	GA12108	P89	GA5118	P47
GA0864	P97	GA12109	P89	GA5121	P45
GA0895	P45	GA12117	P33	GA5122	P45
GA0898	P97	GA12133	P15	GA5130	P55
GA0899	P57	GA12143	P12	GA5146	P51
GA10036	P92	GA12144	P12	GA5157	P46
GA10037	P92	GA12154	P15	GA5158	P46
GA10047	P89	GA12178	P51	GA5164	P49
GA10048	P89	GA12194	P40	GA5165	P49
GA10149	P38	GA12235	P29, P31	GA5175	P53
GA10155	P12	GA12236	P27, P29, P31	GA5177	P53
GA10157	P3	GA12256	P29	GA5178	P53
GA10161	P33	GA12330	P109	GA5182	P46
GA10570	P73	GA12636	P77	GA5183	P53
GA10575	P75	GA12650	P77	GA5184	P53
GA10601	P73, P75	GA1369	P83	GA5188	P55
GA10634	P13	GA1676	P57	GA5190	P55
GA10635	P35	GA1677	P57	GA5194	P103
GA10755	P15	GA1678	P57		
GA10765	P35	GA1679	P57		
GA10799	P35	GA1720	P4, P33		

NUMERICAL INDEX

Part No.	Page	Part No.	Page	Part No.	Page
GA5197	P43	GA7240	P87	GA8692	P116
GA5202	P112	GA7271	P29	GA8716	P79
GA5223	P95	GA7313	P95	GA8717	P79
GA5229	P113	GA7336	P51, P95, P103, P113	GA8760	P29
GA5230	P93	GA7375	P101	GA8828	P59
GA5231	P93	GA7376	P45	GA8831	P59
GA5236	P93	GA7409	P45	GA8839	P45
GA5237	P93	GA7412	P29	GA8845	P83
GA5385	P71	GA7434	P45	GA8877	P85, P92
GA5552	P63	GA7445	P29, P31, P91	GA8897	P61
GA5572	P63	GA7446	P27, P29, P31, P91	GA8912	P58
GA5600	P74, P76	GA7841	P51	GA8914	P58
GA5624	P51, P95	GA7850	P73, P75, P77	GA8915	P58
GA5625	P21	GA7853	P73, P75, P77	GA8916	P58
GA5629	P51	GA7854	P73, P75, P77	GA8917	P58
GA5651	P4	GA7855	P73, P75, P77	GA8918	P60
GA5652	P97	GA7856	P35, P73, P75, P77	GA8919	P60
GA5654	P25, P27, P29, P31, P91	GA7857	P73, P75, P77	GA8924	P61
GA5667	P97	GA7858	P74, P76	GA8930	P33
GA5678	P95	GA7859	P75, P77	GA8931	P111
GA5698	P15	GA7909	P43	GA8983	P83, P87, P89
GA5715	P23, P25	GA7949	P7	GA9007	P43
GA5718	P25	GA7975	P7	GA9131	P31
GA5719	P23, P25	GA7976	P7	GA9144	P75, P77
GA5786	P33	GA7998	P91	GA9195	P83
GA5787	P33, P86	GA7999	P91	GA9206	P71
GA5892	P23	GA8021	P73, P75, P77	GA9207	P71
GA5917	P101	GA8022	P73, P75, P77	GA9426	P43
GA6147	P75, P77	GA8026	P74, P76	GA9427	P43
GA6171	P7, P9, P10, P85, P92	GA8046	P73, P75, P77	GA9428	P42
GA6337	P95	GA8047	P71, P73, P75, P77	GA9429	P42
GA6434	P10	GA8069	P105	GA9430	P93
GA6501	P103	GA8092	P79	GA9431	P93
GA6513	P112	GA8130	P61	GA9433	P89
GA6514	P112	GA8305	P85	GA9434	P89
GA6515	P112	GA8306	P85	GA9437	P89
GA6597	P10	GA8322	P10	GA9438	P43
GA6618	P9	GA8324	P5	GA9439	P43
GA6619	P9	GA8326	P18	GA9440	P60
GA6620	P9	GA8328	P35	GA9443	P60
GA6699	P71	GA8329	P35	GA9472	P92
GA6700	P71	GA8364	P18	GA9844	P31
GA6701	P71	GA8371	P17	GA9845	P31
GA6733	P9	GA8483	P83	GA9846	P47
GA6741	P19	GA8487	P81	GA9857	P75
GA6761	P81	GA8488	P81	GA9861	P31
GA6801	P9	GA8603	P21, P31, P89	GA9862	P31
GA6832	P27	GA8641	P21, P31	GA9864	P31
GA6833	P27	GA8656	P81	GA9865	P31
GA6834	P27	GA8670	P43	GA9870	P47
GA6838	P27	GA8676	P81	GA9872	P81
GA6907	P19	GA8685	P83	GA9877	P45
GA6966	P89	GA8688	P87	GA9900	P101
GA7154	P50, P79	GA8689	P87	GA9905	P101
GA7235	P47	GA8690	P114	GA9964	P35
GA7239	P87	GA8691	P115	GA9978	P73, P75, P77

NUMERICAL INDEX

Part No.	Page	Part No.	Page	Part No.	Page
GA9978	P75, P77	GD0746	P57	GD1109	P9, P10
GA9979	P73, P75, P77	GD0752-41	P55	GD1113	P33, P43
GB0115	P18	GD0840	P57	GD1114	P4, P33, P41, P43, P87, P93, P97
GB0116	P18	GD0914-105	P79	GD1115L	P19
GB0134	P83	GD0914-109	P48	GD1115R	P19
GB0156	P42	GD0914-134	P48	GD1116	P19
GB0186	P4	GD0914-144	P79	GD11178	P91
GB0198	P97	GD0914-170	P49	GD1118	P19
GB0199	P97	GD0914-180	P79	GD11180	P102
GB0200	P97	GD0914-205	P79	GD11188	P91
GB0205	P86	GD0914-210	P49	GD11218	P33
GB0206	P87	GD0914-230	P49	GD11219	P17
GB0209	P87	GD0914-84	P79	GD11239	P12, P17, P18
GB0210	P87	GD0962	P83	GD11240	P18
GB0212	P85	GD10010	P45	GD11259	P3, P5
GB0213	P86	GD10036	P4	GD11263	P33
GB0218	P4, P12, P31, P33, P47, P86	GD10110	P101	GD11264	P33
GB0239	P9, P10	GD10161	P95	GD11265	P91
GB0254	P10	GD10223	P63	GD11266	P91
GB0259	P51	GD10224	P63	GD11279	P13
GB0265	P3	GD10231	P81	GD11297	P18
GB0266	P3	GD10242	P87	GD11305	P17
GB0267	P3	GD1026	P3, P17, P33, P46, P51, P89, P95, P103, P113	GD11306	P5, P83
GB0268	P9, P10	GD10273	P87	GD11313	P11
GB0274	P3	GD10283	P57	GD113	P25, P27, P29, P31, P83, P91
GB0276	P7	GD10303	P87	GD1138	P83, P89, P93
GB0278	P12, P18	GD10304	P87	GD11413	P12, P18
GB0282	P10	GD1033	P3	GD11422	P4
GB0285	P3	GD10473	P5, P9	GD11423	P7, P85, P92
GB0287	P48, P49	GD10487	P87	GD11424	P17
GB0296	P89	GD10519	P29	GD1143	P20
GB0297	P89	GD10519	P31	GD1144	P20
GB0301	P5, P33	GD10526	P29	GD11447	P33
GB0314	P12, P33	GD10552	P27, P29, P31, P91	GD1145	P20
GB0319	P15	GD1059L	P17	GD11453	P7
GB0322	P89	GD1059R	P17	GD11490	P45
GB0323	P89	GD1060	P17	GD11508	P11
GB0328	P15	GD1061	P18	GD11509	P11
GB0329	P43	GD1063	P18	GD11535	P81
GB0331	P12	GD10646	P43	GD11557	P89
GB0358	P15	GD1065	P3	GD11558	P89
GB0366	P4	GD1085	P10	GD11559	P81
GB0383	P29	GD1086	P7	GD1162	P119
GB0386	P31	GD10867	P3, P33	GD11649	P33
GB0387	P27, P29	GD10963	P19	GD11652	P21, P31
GB0400	P89	GD10984	P19	GD11657	P81
GB0401	P29	GD10991	P7	GD11662	P81
GB0405	P89	GD10993	P3	GD11677	P21
GD0438	P53	GD11001	P3	GD11695	P45
GD0453-02	P53	GD11017	P5	GD11700	P39, P102
GD0453-03	P55	GD1104	P86	GD11705	P83
GD0453-06	P53	GD11045	P48, P49, P79, P103, P113	GD11721	P79, P101
GD0453-07	P53	GD11089	P71, P73, P75, P77	GD11836	P91
GD0462	P53			GD11845	P3, P5, P9
GD0487	P83				

NUMERICAL INDEX

Part No.	Page	Part No.	Page	Part No.	Page
GD11926	P59	GD1515	P101	GD17152	P15
GD11953	P85, P92	GD1516	P101	GD17162	P15
GD11954	P85, P92	GD1517	P101	GD17186	P15
GD11962	P3, P17, P33	GD1520	P101	GD17187	P15
GD11993	P73, P75, P77	GD15386	P55	GD17282	P63
GD11995	P61	GD15538	P51	GD17286	P71
GD1200	P97	GD15663	P15	GD1748	P101
GD1207	P97	GD15700	P15	GD18073	P33
GD1209	P97	GD15747	P12	GD18075	P33
GD1210	P97	GD15789	P35	GD1862	P101
GD1213	P97	GD15790	P35	GD2117	P119
GD12505	P58	GD15792-04	P41	GD2161	P55
GD12507	P58	GD15792-23	P41	GD2199	P71
GD12510	P60	GD15792-25	P41	GD2200	P71
GD12511	P60	GD15799	P41	GD2412	P97
GD12513	P61	GD15803	P35	GD2423	P19
GD12534	P27	GD15804	P35	GD2460	P20
GD1255	P49	GD15849-02	P35	GD2548-15.5	P99
GD1256	P49	GD15850	P40	GD2548-25.5	P99
GD12676	P89	GD15854	P40	GD2548-27.5	P99
GD12677	P89	GD15856-01	P41	GD2558	P47, P51, P95, P112
GD12679	P89	GD15856-03	P41	GD2589	P83
GD12684	P91	GD15856-04	P41	GD2597	P57
GD12685	P89	GD15856-05	P41	GD2721	P53, P55
GD12817	P31	GD15856-14	P41	GD2734-08	P103, P113
GD12826	P31	GD15856-19	P41	GD2947	P19
GD12827	P31	GD15863	P35	GD2971-10	P17
GD12829	P31	GD15970	P3	GD2984	P119
GD13309	P92	GD16188	P39	GD3180-12	P9
GD13361	P3	GD16233	P35	GD3180-17	P95
GD1337	P101	GD16241	P35	GD3612	P3
GD13401	P45	GD16245	P3	GD3790	P97
GD1379	P97	GD16302	P51	GD3839	P103, P113
GD1380	P97	GD16324-01	P35	GD4086	P37
GD14170	P31	GD16328	P42	GD4887-01	P50
GD14217	P4	GD1657	P83	GD5752	P47
GD14258	P35	GD1673	P83	GD5753	P47
GD14398	P21	GD1685-12	P93	GD5756	P47, P51
GD14413	P51, P103, P113	GD1685-13	P93	GD5789	P46
GD14427	P51, P103, P113	GD1685-14	P93	GD5790	P46
GD14430	P51, P103, P113	GD1685-15	P93	GD5827	P46, P50
GD14431	P50, P103, P113	GD1685-16	P93	GD5829	P50
GD14432	P51, P103, P113	GD17014	P3, P33	GD5830	P51
GD14467	P15	GD17021	P15	GD5835	P51
GD14468	P15	GD17028	P15	GD5841	P45
GD14477	P15	GD17047	P15	GD5857	P27, P46, P51, P95, P103, P113
GD14541	P15	GD17048	P15	GD5860	P47
GD14559	P87	GD17049	P15	GD5875	P43, P55
GD14592	P15	GD17050	P15	GD5884-01	P49
GD14626	P41	GD17052	P33	GD5885-01	P49
GD14627	P41	GD17090	P41	GD5885-02	P48
GD14659	P19	GD17099	P15	GD5885-03	P48
GD14660	P35	GD17104	P15	GD5886	P95, P99
GD14674	P23, P25, P29	GD17128	P71	GD5888	P43
GD1512	P119	GD17129	P71	GD5892	P53
GD1514	P101	GD17140	P71		

NUMERICAL INDEX

Part No.	Page	Part No.	Page	Part No.	Page
GD5956	P59	GD8276	P87	GR0270	P45
GD5958	P48	GD8307	P25	GR0279	P116
GD5960	P49	GD8308	P85	GR0280	P116
GD5961	P48, P49	GD8460	P10	GR0281	P116
GD5988	P113	GD8751	P74, P77	GR0282	P116
GD5990	P103, P113	GD8770	P74, P77	GR0283	P116
GD6027	P43, P81	GD8771	P75, P77	GR0284	P116
GD6165	P113	GD8893-01	P33	GR0367	P53
GD6182	P41	GD9047	P51	GR0375	P53
GD6279-05	P39	GD9107	P114, P115	GR0434	P45
GD6291	P74, P77	GD9108	P116	GR0508	P101
GD6551	P51	GD9109	P114, P115, P116	GR0513	P101
GD6553	P86	GD9120	P10	GR0586	P75, P77
GD6793	P50	GD9229	P79	GR0594	P73, P75, P77
GD6825-10.375	P47	GD9254	P21, P31	GR0764	P39
GD7127	P51, P95, P112	GD9290	P9	GR0880	P103
GD7145	P41, P79, P101	GD9305	P9	GR0881	P103
GD7148	P18	GD9562	P9	GR0882	P103
GD7258	P18	GD9695	P33	GR0883	P103
GD7318	P3	GD9705	P85	GR0912	P47, P50, P51, P79, P95, P103, P113
GD7426	P46, P51, P95, P103, P113	GD9706	P85	GR1015	P101
GD7639	P73, P75	GD9709	P85	GR1016	P101
GD7803	P21, P31	GD9715	P27	GR1017	P101
GD7804	P21, P31	GD9720	P27	GR1018	P101
GD7805	P4, P10, P12, P25, P33, P45, P47, P91, P92	GD9724	P27, P29, P31, P91	GR1019	P101
GD7817-01	P25	GM0208	P119	GR1032	P63
GD7817-04	P25, P91	GR0146MPP	P119	GR1033	P63
GD7819	P48	GR0150	P57	GR1034	P63
GD7822	P51	GR0151	P57	GR1035	P63
GD7823	P25	GR0155MPP	P119	GR1036	P63
GD7848	P97	GR0188	P86	GR1037	P63, P65, P67, P69
GD7867	P95, P99	GR0193	P53	GR1038	P63
GD7868	P99	GR0196	P3, P18, P33	GR1039	P63
GD7870	P95	GR0202	P33	GR1040	P63
GD7871	P95	GR0207	P114, P115, P116	GR1041	P63
GD7889	P23, P25	GR0208	P114, P115	GR1042	P63
GD7890	P23, P25	GR0209	P114	GR1043	P63
GD7900	P86	GR0211	P114, P115, P116	GR1044	P63
GD7904-02	P87	GR0212	P114, P115, P116	GR1045	P38, P39, P63, P69
GD7907	P87	GR0213	P114, P115	GR1046	P63
GD7908	P86	GR0214	P114, P115, P116	GR1047	P63
GD7911	P85	GR0215	P114, P115, P116	GR1048	P63
GD7912	P87	GR0216	P114, P115	GR1104	P109
GD7944	P47, P81	GR0217	P114, P115, P116	GR1112	P109
GD7962	P86, P91	GR0221	P116	GR1114	P105
GD8218	P85	GR0222	P116	GR1116	P105, P109
GD8224	P87	GR0223	P114	GR1118	P105, P109
GD8238	P86	GR0225	P114, P115, P116	GR1120	P109
GD8239	P87	GR0226	P114, P115, P116	GR1122	P103
GD8246	P95	GR0227	P114	GR1123	P109
GD8247	P86	GR0228	P114, P115	GR1124	P109
GD8249	P4	GR0229	P115, P116	GR1129	P107
GD8266	P23	GR0231	P115, P116	GR1130	P107
		GR0232	P114, P115, P116	GR1133	P107
		GR0233	P115	GR1134	P107, P109
		GR0255	P42		

NUMERICAL INDEX

Part No.	Page	Part No.	Page	Part No.	Page
GR1142	P107	GR1631	P75		
GR1144	P107	GR1632	P75		
GR1165	P105	GR1678	P101		
GR1167	P105	GR1734	P38		
GR1168	P105	GR1736	P35		
GR1169	P58, P61	GR1737	P73, P75, P77		
GR1203	P71	GR1761	P77		
GR1204	P71	GR1762	P77		
GR1205	P71	GR1764	P77		
GR1206	P71	GR1777	P35		
GR1207	P71	GR1795	P109		
GR1208	P71	GR1797	P109		
GR1389	P105, P109	GR1799	P109		
GR1390	P73	GR1801	P109		
GR1391	P75	GR1802	P109		
GR1392	P73	GR1804	P109		
GR1393	P75	GR1805	P109		
GR1397	P101	GR1806	P109		
GR1401	P61	GR1808	P109		
GR1405	P79				
GR1406	P79				
GR1407	P79				
GR1408	P79				
GR1409	P79				
GR1410	P79				
GR1411	P79				
GR1412	P79				
GR1413	P79				
GR1420	P105				
GR1421	P105				
GR1422	P107				
GR1423	P107				
GR1424	P105				
GR1425	P105, P107				
GR1427	P105				
GR1451	P107				
GR1465	P69				
GR1466	P39				
GR1467	P38, P39				
GR1484	P114, P115, P116				
GR1522	P59				
GR1523	P61				
GR1527	P58				
GR1528	P58				
GR1529	P60				
GR1533	P111				
GR1535	P111				
GR1540	P111				
GR1541	P111				
GR1542	P111				
GR1543	P109, P111				
GR1544	P111				
GR1545	P111				
GR1570MPP	P119				
GR1577	P114, P115, P116				
GR1626	P115, P116				

NUMERICAL INDEX

Part No.	Page	Part No.	Page	Part No.	Page