

MODEL 3000
RIGID FRAME PLANTER
(Mechanical Seed Metering)

OPERATOR MANUAL

M0188-01 Rev. 5/19

This manual applies to: Model: 3000 Rigid Frame Planters
Serial Number: 643579 and later

Record serial number of your planter and 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 frame as shown below. The serial number provides important information about your planter and is needed to obtain correct replacement parts. Always provide model number and serial number to your Kinze Dealer when ordering parts or when contacting Kinze Manufacturing, Inc.



Prior to 2009 production



2009 production and later



2013 production and later

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TO THE DEALER

Predelivery service includes assembly, lubrication, adjustment, and test. This service makes sure planter is delivered to the retail customer/end user ready for field use.

PREDELIVERY CHECKLIST

Use the following checklist and inspect planter after it is completely assembled. Check off each item found satisfactory or after proper adjustment is made.

- ☐ Row units properly spaced and optional attachments correctly assembled.
- ☐ All grease fittings in place and lubricated.
- ☐ All working parts are moving freely. Bolts are tight and cotter pins are spread.
- ☐ All drive chains properly tensioned and aligned.
- ☐ Check for oil leaks and proper hydraulic operation.
- ☐ Hydraulic hoses are routed correctly to prevent damage to hoses.
- ☐ Inflate tires to specified air pressure. Tighten wheel lug bolts to specified torque.
- ☐ All safety decals correctly located and legible as shown in Parts Manual. Replace if damaged.
- ☐ All reflective decals and SMV sign correctly located as shown in Parts Manual and visible when the planter is in transport position.
- ☐ Safety/warning lights correctly installed and working properly.
- ☐ Paint all parts scratched in shipment or assembly.
- ☐ All safety lockup devices are on planter and correctly located.
- ☐ Seed meters performance checked on test stand.
- ☐ Auxiliary safety chain properly installed and hardware torqued to specification.

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

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

RETAIL CUSTOMER/END USER

Name _____ Delivery Date _____
Street Address _____ Model No. 3000 Serial No. _____
City, State/Province _____ Dealer Name _____
ZIP/Postal Code _____ Dealer No. _____

DELIVERY CHECKLIST

Use the following checklist when planter is delivered as a reminder of very important information which should be conveyed to the retail customer/end user. Check off each item as it is fully explained to the customer.

- ☐ Life expectancy of this or any other machine is dependent on regular lubrication as directed in the Operator Manual.
- ☐ All applicable safety precautions.
- ☐ Along with retail customer/end user, check reflective decals and SMV sign are clearly visible with planter in transport position and attached to tractor. Check safety/warning lights are in working condition. Tell retail customer/end user to check federal, state/provincial, and local regulations before towing or transporting on a road or highway.
- ☐ Give Operator Manual, Parts Manual, and all Instruction Sheets 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 retail customer/end user 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 planter performance with retail customer/end user.
- ☐ Review importance of proper maintenance and adherence to all safety precautions with retail customer/end user.
- ☐ Check for parts that may need to be adjusted or replaced.
- ☐ Check all safety decals, reflective decals, and SMV sign are correctly located as shown in the Parts Manual and that decals are legible. Replace if damaged or missing.
- ☐ Check safety/warning lights are working properly.

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

**All registrations must be submitted online at "business.kinze.com" within 5 business days of delivery.
Retain a copy of this form for auditing purposes.**

Tear Along Perforation



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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.

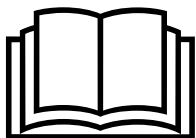
This manual has been prepared to aid you in planter operation and maintenance. It should be considered a permanent part of the machine and remain with the machine when you sell it.

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

Throughout this manual the symbol  and the words **DANGER**, **WARNING**, and **CAUTION** are used to call attention to safety information that if not followed, will or could result in death or injury. **NOTICE** and **NOTE** are used to call your attention to important information. The definition of each of these terms follows:

	Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations, typically for machine components which, for functional purposes, cannot be guarded.
	Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.
	Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.
	Used to address safety practices not related to personal injury.

NOTE: Special point of information or machine adjustment instructions.

**WARNING**

Improperly operating or working on this equipment could result in death or serious injury. Read and follow all instructions in Operator Manual before operating or working on this equipment.

**WARNING**

Some photos in this manual may show safety covers, shields, or lockup devices removed for visual clarity. **NEVER OPERATOR OR WORK ON** machine without all safety covers, shields, and lockup device in place as required.

NOTE: Photos in this manual may be 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.

The Kinze Limited Warranty for your new machine is stated on the retail purchaser's copy of the Warranty And Delivery Receipt 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 Receipt form must be completed by the Kinze Dealer and signed by the retail purchaser, with copies to the Dealer, and to the retail purchaser. Registration must be completed and submitted to Kinze Manufacturing, Inc. within 5 business 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 Receipt 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.



3000 Double Frame with Interplant, liquid fertilizer, and dry chemical options

GENERAL INFORMATION

This manual covers all production years of the Model 3000 planter. Contact your Kinze dealer for additional options which may be available for your specific model year planter.

Information in this manual was current at time of printing. However, due to Kinze's ongoing product improvement, production changes may cause your machine to appear slightly different in detail. Kinze Manufacturing, Inc. reserves the right to change specifications or design without notice and without incurring obligation to install the same on machines previously manufactured. To obtain the most recent version of your publication, please contact your Kinze dealer.

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.

TOOLS REQUIRED

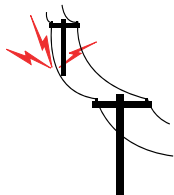
Hardware Size / Tool Required			
$\frac{1}{4}" = \frac{7}{16}"$	$\frac{7}{16}" = \frac{5}{8}"$ (nut for $\frac{7}{16}"$ hardware uses $\frac{11}{16}"$ tool)	$\frac{3}{4}" = 1\frac{1}{8}"$	$1\frac{1}{4}" = 1\frac{7}{8}"$
$\frac{5}{16}" = \frac{1}{2}"$	$\frac{1}{2}" = \frac{3}{4}"$	$\frac{7}{8}" = 1\frac{5}{16}"$	$1\frac{1}{2}" = 2\frac{1}{4}"$
$\frac{3}{8}" = \frac{9}{16}"$	$\frac{5}{8}" = 1\frac{5}{16}"$	$1" = 1\frac{1}{2}"$	

SPECIFICATIONS			
Planter Size	4 Row 30"	6 Row 30"	8 Row 30"
Single Frame Length	11'4" (3.5M)	11'4" (3.5M)	11'4" (3.5M)
Double Frame Length	13'8" (4.2M)	13'8" (4.2M)	13'8" (4.2M)
Width	12'8" (3.9M)	17'8" (5.4M)	21'10" (6.7M)
Single Frame Weight*	2538 lb (1151.22 kg)	3864 lb (1752.68 kg)	4874 lb (2210.81 kg)
Double Frame Weight*	2948 lb (1337.19 kg)	4398 lb (1994.90 kg)	5548 lb (2516.53 kg)
* Base machine weights include planter frame including row markers, drive components, tires and wheels, hydraulic cylinders, transport safety chain and Kinze pull row units (closing wheel arms less wheels) with seed hopper and lid and dual quick adjustable down force springs.			
Axle Weight Empty**	N/A	N/A	4950 lb (2245.2 kg)
Tongue Weight Empty**	N/A	N/A	1,310 lb (594.2 kg)
**Weight based off a typical configuration of a complete machine.			
Seed Capacity	1.90 bu. (Mechanical / Hopper)		
Transport/Field Tire	7.50" x 20" 8 ply rib implement tires with center groove Inflate to 40 psi (275.7 kPa)		
Contact Drive Tire	4.10" x 6" Inflate to 50 psi (344.7 kPa)		
Field Lift	Master / slave rephasing cylinders		
Row Markers	Hydraulic alternating sequence valve (dual valve optional), single fold, depth bands.		

TRACTOR HYDRAULIC REQUIREMENTS			
Configuration	Requirements		Description
Base machine with mechanical meters and row markers	1 SCV	10 gpm (38 L/min)	#1 SCV: Planter lift and row marker auto sequencing
Base machine with mechanical meters and row marker dual valve conversion	2 SCV	10 gpm (38 L/min)	#1 SCV: Planter lift
			#2 SCV: Row markers with optional dual valve

1. Read and understand instructions provided in this manual and warning labels. Review these instructions frequently!
 2. This machine is designed and built with your safety in mind. Do not make any alterations or changes to this machine. Any alteration to design or construction may create safety hazards.
 3. A large portion of farm accidents happen from fatigue or carelessness. Safe and careful operation of tractor and planter will help prevent accidents.
 4. Never allow planter to be operated by anyone unfamiliar with operation of all functions of the unit. Operators must read and thoroughly understand all instructions given in this manual before operating or working on equipment.
 5. Be aware of bystanders, particularly children! Always look around to make sure it is safe to start tow vehicle engine or move planter. This is particularly important with higher noise levels and quiet cabs, as you may not hear people shouting.
 6. Make sure planter weight does not exceed towing capacity of tractor, or bridge and road limits. This is critical to maintain safe control and prevent death or injury, or property and equipment damage.
 7. Never ride or allow others to ride on planter.
 8. Store planter in an area away from human activity. DO NOT permit children to play on or around the stored unit.
 9. Keep hands, feet, and clothing away from moving parts. Do not wear loose-fitting clothing which may catch in moving parts.
 10. Always wear protective clothing, shoes, gloves, hearing, and eye protection applicable for the situation.
 11. Do not allow anyone to stand between tongue or hitch and towing vehicle when backing up to planter.
 13. Prevent electrocution, other injuries, or property and equipment damage. Watch for obstructions such as wires, tree limbs, etc. when operating machine. Be aware of clearances during turns and when folding/unfolding planter.
 14. Reinstall all guards removed for maintenance activities. Never leave guards off during operation.
 15. Use of aftermarket hydraulic, electric, or PTO drives may create serious safety hazards to you and people nearby. If you install such drives, follow all appropriate safety standards and practices to protect you and others near this planter from injury.
 16. Follow all federal, state/provincial, and local regulations when towing farm equipment on a public highway. Use safety chain (not an elastic or nylon/plastic tow strap) to retain connection between towing and towed machines in the event of primary attaching system separation.
 17. Make sure all safety/warning lights, SMV sign, and reflective decals are in place and working properly before transporting the machine on public roads.
 18. Limit towing speed to 15 MPH (24.14 km/h). Tow only with farm tractor of a minimum 90 HP. Allow for unit length when making turns.
 19. Reduce speed prior to turns to avoid the risk of overturning. Always drive at a safe speed relative to local conditions and ensure your speed is slow enough for a safe emergency stop.
 20. Chemical application is often an integral part of planting. Follow label instructions for proper chemical mixing, handling and container disposal methods.
 21. Be familiar with safety procedures for immediate first aid should you accidentally contact chemical substances.
 22. Use the proper protective clothing and safety equipment when handling chemicals.
 23. Chemicals are supplied with Material Safety Data Sheets (MSDS) that provide full information about the chemical, its effects on exposure, and first aid needs in the event of an emergency. Keep your MSDS file up-to-date and available for first responders in case of emergency.
 24. When servicing ground engaging components such as opening disks and firming points, use special care to avoid points and edges worn sharp during use.
 25. Use professional help if you are unfamiliar with working on hydraulic systems. Pressurized hydraulic fluid can penetrate body tissue and result in death, serious infection, or other injuries.
 26. Disposing of waste improperly can threaten the environment. To dispose of your equipment properly contact your local environmental or recycling center.
- Never pour waste onto the ground, down a drain, or into any water source.
- When disposing of waste such as oil, use leakproof containers. Be sure to use containers that do not resemble food or beverage which may mislead someone into consuming them. Dispose of oil per your local, regional requirements.
- When disposing of any fertilizer chemicals used, contact the supplier of the chemicals.
- Model 3000 planter consists of 85% recyclable metals, 10% recyclable plastic and rubber, and 5% waste.

Following are some common hazard warnings associated with this equipment. Pay close attention to all safety, operating, and maintenance information in this manual and decals applied to your equipment.

**DANGER**

Contacting or coming close to power lines or other high energy sources will cause death or serious injury.

Keep away from power lines or high energy sources at all times.

**WARNING**

Loss of control can cause death or serious injury, or damage to property and equipment. Tow only with farm tractor weight rated and configured for this equipment. Use safety chains and transport as specified in the Operator and Parts Manual.

**WARNING**

Improperly operating or working on this equipment could result in death or serious injury. Read and follow all instructions in Operator Manual before operating or working on this equipment.

**WARNING**

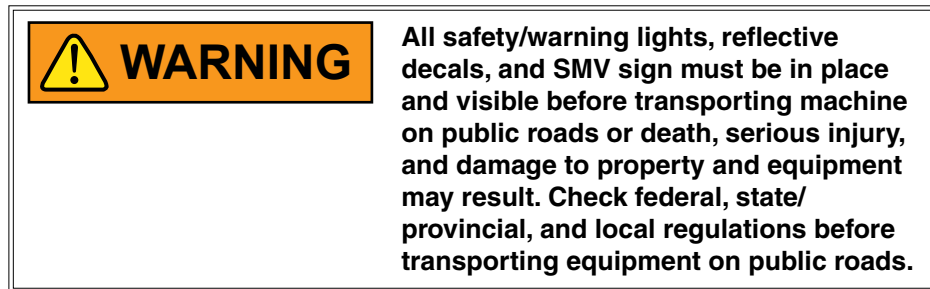
Contact with rotating driveline will cause death or serious injury. Keep away at all times when operating.

Never operate without all guards and equipment shields properly installed.

**WARNING**

Explosive separation of rim and tire parts can cause death or serious injury. Overinflation, rim and tire servicing, improper use of rims and tires, or worn or improperly maintained tires could result in a tire explosion.

Safety Signs And Decals





Safety signs and decals are placed on the machine to warn of hazards and provide important operating and maintenance instructions. Information on these signs are for your personal safety and the safety of those around you. FOLLOW ALL SAFETY INSTRUCTIONS!

- **Keep signs clean so they can be easily seen. Wash with soap and water or cleaning solution as required.**
- **Replace safety signs if damaged, painted over, or missing.**
- **Check reflective decals and SMV sign periodically. Replace if they show any loss of reflective properties.**
- **When replacing decals, clean machine surface thoroughly with soap and water or cleaning solution to remove all dirt and grease.**



NOTE: Safety sign and decal locations are shown in the Parts Manual for this machine.



NOTE: Style and locations of SMV sign, reflective decals, and safety/warning lights conform to ANSI/ASABE S279.14 JUL 2008 and ANSI/ASABE S276.6 JAN 2005.

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

 WARNING	Improperly operating or working on this equipment could result in death or serious injury. Read and follow all instructions in Operator Manual before operating or working on this equipment.
	

INITIAL PREPARATION

 WARNING	Loose transport wheel lug bolts can result in wheel separation from planter and cause death, serious injury, and damage to property and equipment. Torque transport wheel $\frac{9}{16}$"- 18 lug bolts to 180 ft-lb (244 N-m) before operating planter for the first time and periodically after.
	

 WARNING	Explosive separation of rim and tire parts can cause death or serious injury. Overinflation, rim and tire servicing, improper use of rims and tires, or worn or improperly maintained tires could result in a tire explosion.
	

1. Torque transport wheel $\frac{9}{16}$ "- 18 lug bolts to 90 ft-lb (122 N-m).
2. Inflate transport/ground drive tires to 40 psi (275.7 kPa).
3. Inflate contact drive tires to 50 psi (344.7 kPa).



TRACTOR REQUIREMENTS

NOTICE

All Hydraulic Requirements: Minimum Pressure 2350 PSI (16202.6 kPa); Maximum Pressure 3000 PSI (20684.2 kPa). Check tractor hydraulics to ensure that maximum pressure cannot be exceeded.

Consult your dealer for information on horsepower requirements and tractor compatibility. Requirements vary with planter options, tillage, and terrain.

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

One dual remote hydraulic outlet (SCV) is required for machines equipped with a standard single valve hydraulic system. Two dual remote hydraulic outlets (SCV) are required for machines equipped with the optional dual valve hydraulic system.

TRACTOR PREPARATION AND HOOKUP

1. Adjust tractor drawbar 13 to 17 inches (33 to 43 cm) above ground. Adjust drawbar so hitch pin hole is directly below center line of PTO shaft. Make sure drawbar is in a stationary position.
2. Back tractor to planter and connect with a minimum $\frac{3}{4}$ " (19 mm) diameter hitch pin. Secure with a locking or cotter pin.

NOTE: DO NOT install safety chain using clevis mounting hardware. Safety chain MUST be installed separately.

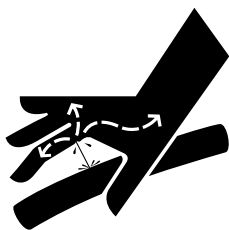
3. Provided transport safety chain must be used to keep planter and tractor connected in case of a hitch pin/drawbar failure. Attach safety chain at an unused clevis mounting hole on the planter hitch. Torque hardware to 840 ft-lb (1138.8 N-m).



**Drawbar and safety chain connection
(Prior to 2019 Production)**



**Drawbar and safety chain connection
(2019 Production and on)**

**WARNING**

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

NOTICE

Wipe hose ends to remove any dirt before connecting couplers to tractor ports or contamination may cause equipment failure.

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

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

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




Jack stand installed




Jack stand stored

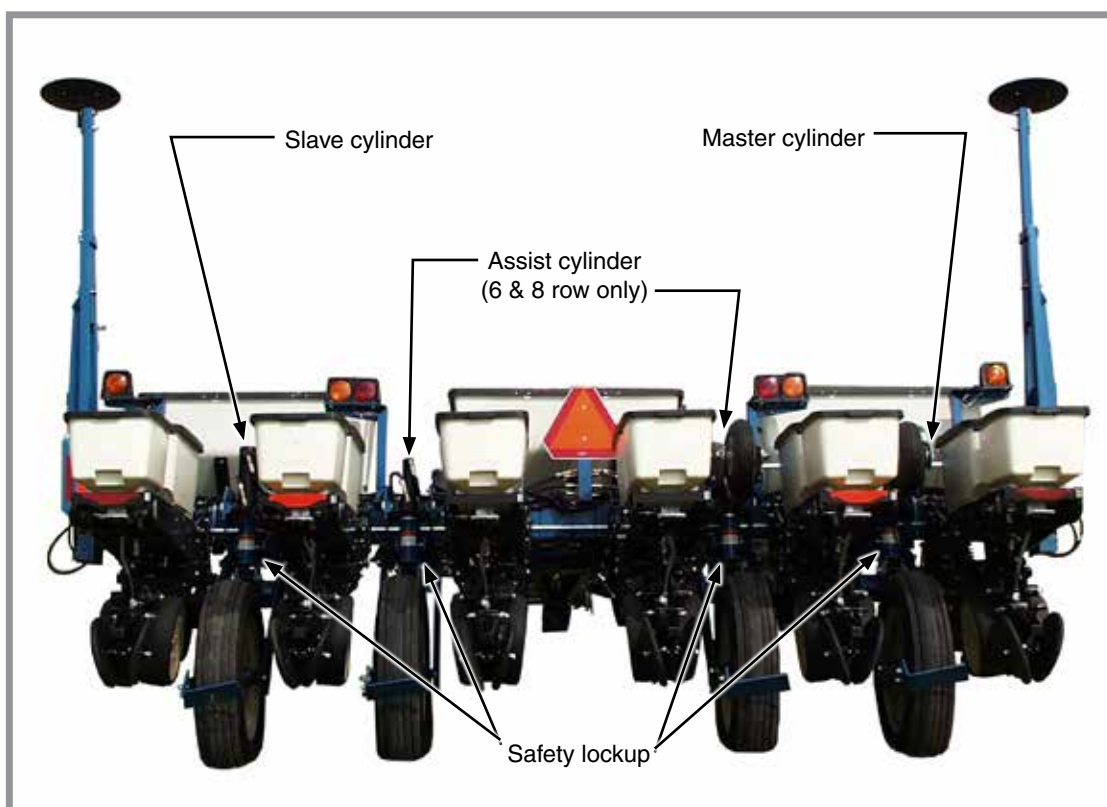
6. Raise jack stand and remount horizontally on storage bracket.

HYDRAULIC LIFT OPERATION

**WARNING**



Uncontrolled movement of equipment can cause loss of control and could result in death, serious injury, or damage to property and equipment. Install all safety pins before transporting equipment.



Lift cylinder locations (6 row shown)

The planter lift system consists of a master cylinder on outer R.H. side of planter and a slave cylinder on outer L.H. side of planter. Lift assist cylinders are used on inner wheel modules of 6 and 8 row sizes.

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

Assist cylinders on 6 and 8 row planters are plumbed in parallel in the lift circuit with master/slave cylinders to provide additional lift capacity.

Hydraulic schematics are located in the maintenance section of this manual.

Note: Planter lifts unevenly if lift cylinders are out of phase. A valve in the piston of each master and slave cylinder allows system to rephase when cylinders are cycled by lowering planter to ground and holding hydraulic lever for 5-10 seconds. Cycle system until planter lifts and lowers evenly.

SAFETY LOCKUPS

Safety lockups are provided for each cylinder (including optional Interplant self-leveling hitch) and must be in place when working on a raised planter, transporting, or during storage.



Safety lockup installed



Safety lockup in storage location

Place a safety lockup on each cylinder rod and secure in place with pin. Keep safety lockups in storage locations on planter when not in use.

LEVEL PLANTER

Lateral adjustment is maintained by tire pressure. Check tires are inflated to specification.

Front and rear level adjustment is maintained by hitch clevis position unless tractor drawbar is adjustable for height. Planter frame and row unit parallel arms must be level for proper planter and row unit operation. Bottom of toolbar should be 20" to 22" (50.8 to 56.88 cm) from planting surface.

1. Lower planter to planting position and check planter is level front to rear. Go to step 2 if hitch is too high or low.

NOTE: DO NOT install safety chain using clevis hardware. Move safety chain location if necessary.

2. Remove clevis hitch hex head cap screw and lock nut using a torque wrench. Replace if off-torque is below 75 ft-lb (101.6 N-m) or there is corrosion or damage.

NOTE: Clevis must be free to move on hitch. DO NOT OVERTIGHTEN hardware.

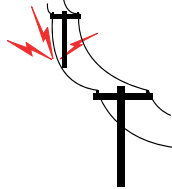
3. Align clevis to hitch holes at new location and install hex head cap screw and lock nut. Tighten lock nut until threads are fully engaged and hex head cap screw and lock nut are firmly against hitch bracket.
4. Recheck with planter in field.

INTERPLANT SELF-LEVELING HITCH EXTENSION

Interplant self-leveling hitch extension raises planter to raise level front to rear when Interplant push row units are used.



Interplant self-leveling hitch extension

TRANSPORTING PLANTER

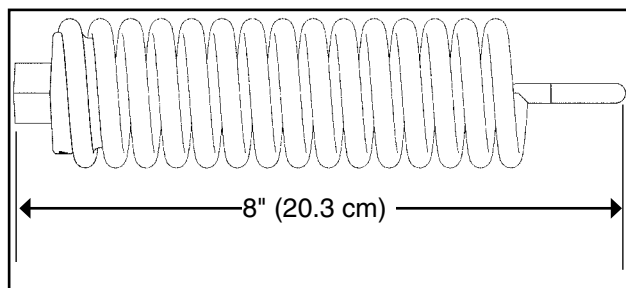
Contacting or coming close to power lines or other high energy sources will cause death or serious injury.

Keep away from power lines or high energy sources at all times.



All safety/warning lights, reflective decals, and SMV sign must be in place and visible before transporting machine on public roads or death, serious injury, and damage to property and equipment may result. Check federal, state/provincial, and local regulations before transporting equipment on public roads.

- Tow only with farm tractor rated and configured for equipment.
 - Know your route and be aware of any obstructions.
 - Follow all road and bridge load limit restrictions.
 - Never exceed maximum transport towing speed of 20 mph (32 kph).
1. Raise planter to full turn around height.
 2. Install safety lockups. See “Safety Lockups” in Machine Operation.
 3. Turn on hazard lights.

CONTACT DRIVE SPRING ADJUSTMENT

Spring length measurement (Factory setting)



Down pressure spring location

There are two down pressure springs on each contact drive wheel. Spring tension is factory preset and normally requires no adjustment.

Basic setting for spring tension is approximately 200 lb (90.72 kg) of down force at tire contact point.

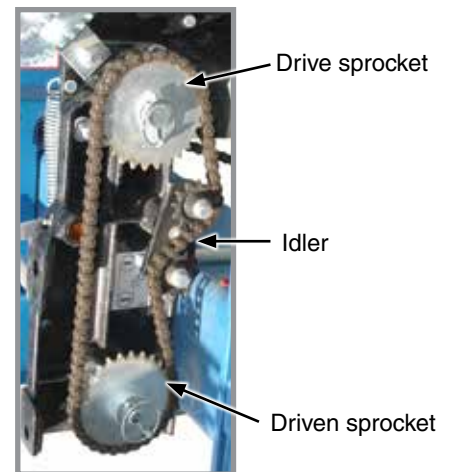
NOTE: Measurement must be taken in planting position with proper tire pressure.

SEED RATE TRANSMISSION ADJUSTMENT

Seed rate transmissions allow simple, rapid changes of sprockets to obtain desired planting population. By removing lynch pins on hexagon shafts, sprockets can be interchanged with those from the sprocket storage rod bolted to the transmission.

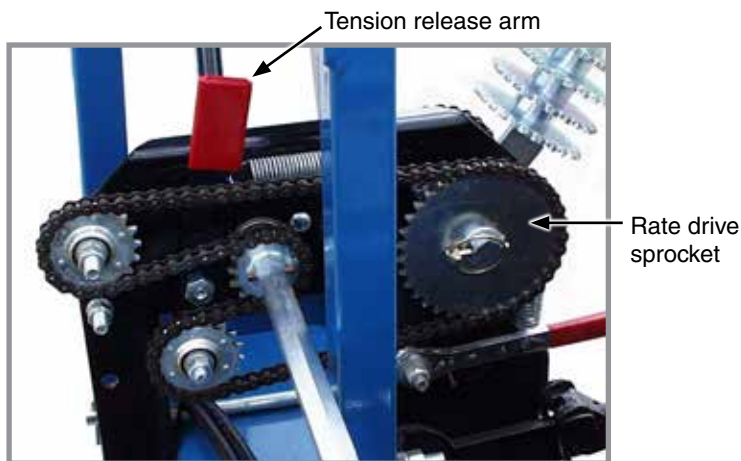
Chain tension is controlled by a spring-loaded dual-sprocket idler. The idler assembly is equipped with an easy-release idler arm to remove spring tension for replacing sprockets.

Planting rate charts in the Seed Meter Operation section will aid you in selecting correct sprocket combinations.

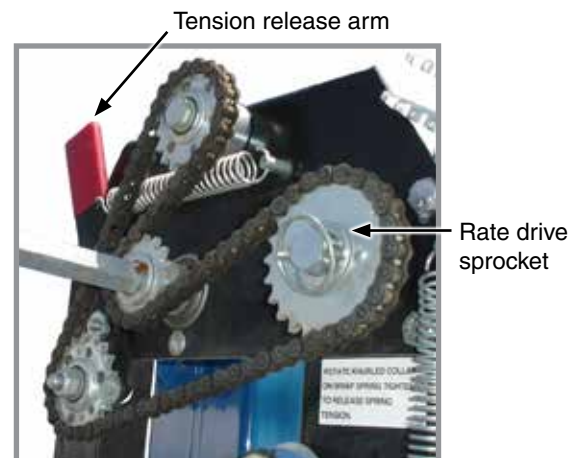


Seed rate transmission chain tension

STANDARD AND HALF RATE (2 TO 1) DRIVES



Old style transmission



New style transmission

Seed planting rate charts are based on the standard rate drive using a 17 tooth sprocket unless otherwise specified.

NOTE: Half rate (2 to 1) drive is recommended only when desired population falls below that on planting rate charts.

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

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

SHEAR PROTECTION

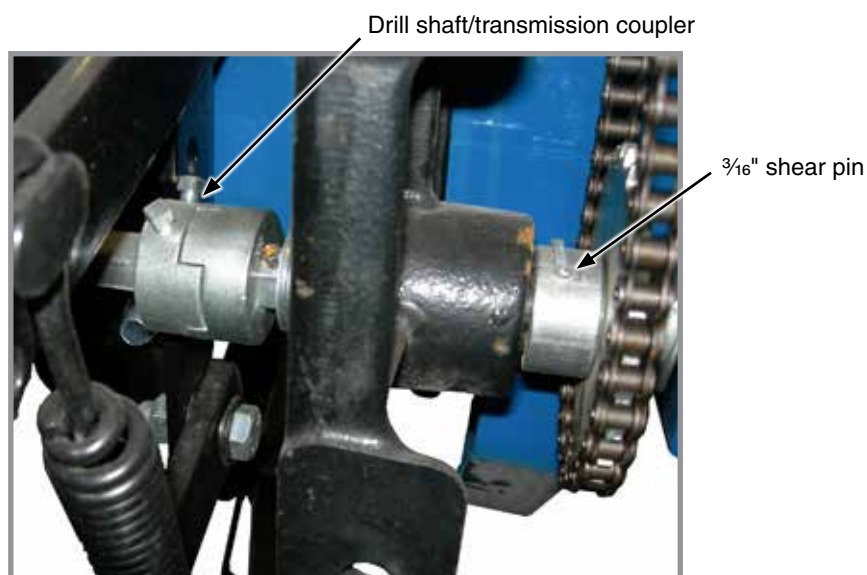
Shear pins protect the planter driveline and row unit components from damage.

1. Determine where binding has occurred before replacing a pin. Turn shaft by hand (with the aid of a wrench) and check for misalignment and seized parts.
2. When shaft can be turned by hand (with the aid of a wrench) replace shear pins with same size and type. Spare shear pins are in wheel module storage area.

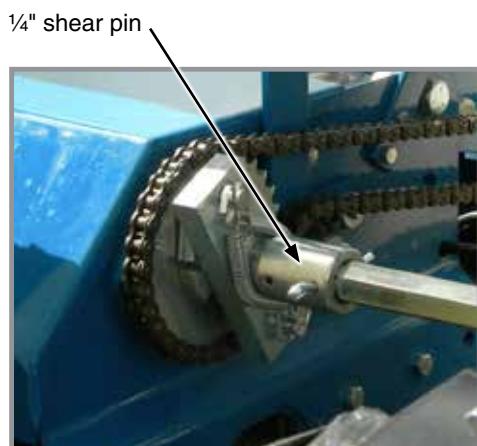
NOTICE

Misaligned drill shaft/transmission coupler can cause equipment damage.

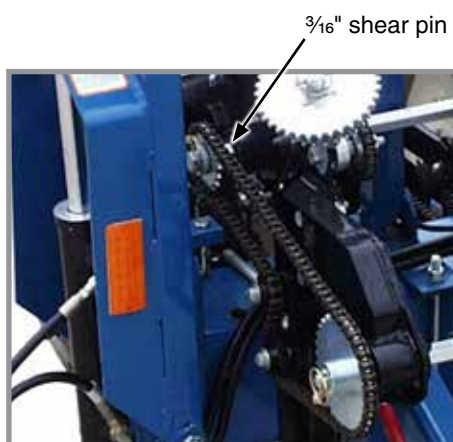
3. Check driveline alignment and follow prescribed lubrication schedules to prevent component binding or breakage.



Transmission shaft and drill shaft coupler



Liquid fertilizer driveline

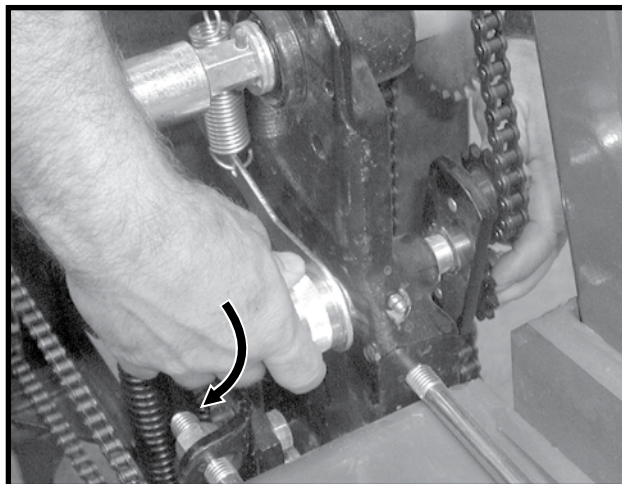


Dry fertilizer driveline

WRAP SPRING WRENCH

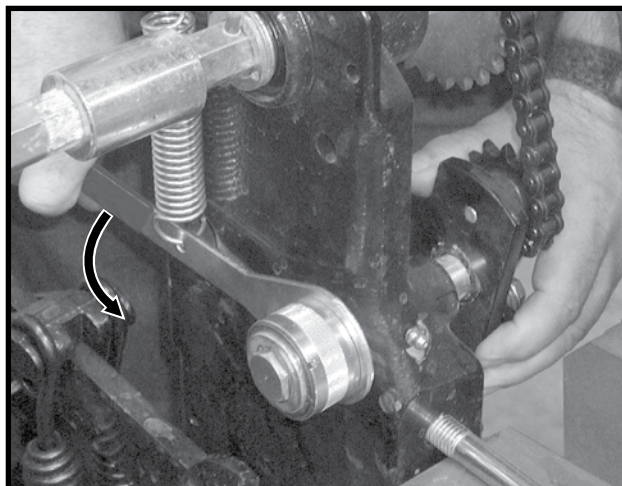
Chain idlers use wrap spring wrenches to release and adjust transmission chain tension.

Rotate wrap spring wrench knurled collar while rotating chain idler away from chain to release chain tension.



Release chain tension

Rotate chain idler into chain while rotating handle to tension idler spring.



Increase chain tension

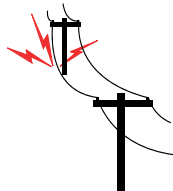
TIRE SCRAPER

A tire scraper prevents buildup of dirt and mud between wheel arm assembly and tire.

Adjust scraper so it does not contact tire.



Tire scraper

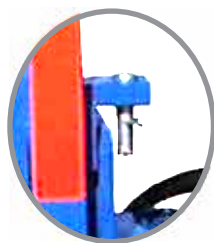
HYDRAULIC ROW MARKER OPERATION**DANGER**

Contacting or coming close to power lines or other high energy sources will cause death or serious injury.

Keep away from power lines or high energy sources at all times.

**WARNING**

Row marker can lower at any time and could cause death or serious injury. Stay away from row markers! Install safety lockup device when not in use.



Marker arm safety lockup pin location

Row markers have a safety lockup pin and hairpin clip located behind each arm. Keep pin in place whenever row markers are not used.

Model 3000 planters are equipped with a single or optional dual valve hydraulic system to control row markers.

A single valve system lifts a row marker when the planter is raised. Row markers lower on alternate sides each time planter is lowered. If a planter is raised to cross a waterway, the row marker on opposite side of the one just raised lowers when planter is lowered back to ground. Stop, raise, and lower planter again to lower marker on side raised when crossing waterway.

NOTE: Install safety lockup pins If row markers are not used during planting to prevent markers from lowering.

An optional dual valve hydraulic system allows planter to be raised and lowered without operating row markers. Row markers are controlled on alternating sides through a tractor SCV. The sequencing valve directs flow to marker on opposite side each time a row marker is raised. When lower row marker is selected, row marker on opposite side of row marker last raised is lowered. When raising planter for a waterway the row marker stays down, clears the ground, does not disturb the waterway, and continues to mark when planter is lowered.

Both row markers can be down at the same time. Lower planter and row marker. Move tractor lift control (single valve) or marker control (dual valve) to raise and immediately return it to lower. This shifts the row marker control valve and lowers remaining row marker.

ROW MARKER SPEED ADJUSTMENT

NOTICE

Excessive row marker travel speed can damage row markers. Adjust flow controls before row markers are first used.



Row marker flow control valves

Two flow control valves determine amount of oil flow restriction controlling row marker travel speeds. One flow control valve controls lowering speed and one controls raising speed of both markers.

NOTE 1: Hydraulics operate slowly when oil is cold. Make all adjustments with oil warm.

NOTE 2: On a tractor where oil flow cannot be controlled, tractor flow rate may be greater than rate marker cylinder can accept. Hold tractor hydraulic control lever until cylinder reaches end of its stroke. This occurs most often on tractors with an open center hydraulic system.

NOTE 3: On tractors with a closed center hydraulic system, set hydraulic flow control so detent functions properly.

1. Loosen jam nut and turn control clockwise (IN) to slow speed or counterclockwise (OUT) to increase speed.
2. Tighten jam nut after adjustments are made.

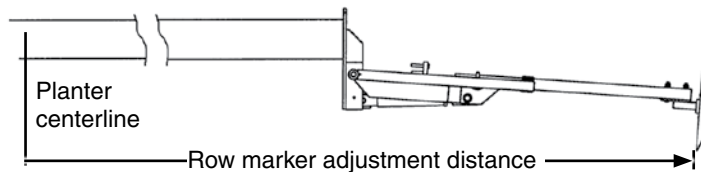
ROW MARKER ADJUSTMENTS

1. Multiply number of rows by the average row spacing in inches to determine total planting width.

NOTE: Refer to IS622 for Interplant option adjustments.

Row Marker Lengths	
4 Row 30"	120" (304.8 cm)
4 Row 36"	144" (365.8 cm)
4 Row 38"	152" (386.1 cm)
6 Row 30"	180" (457.2 cm)
6 Row 36"	216" (548.6 cm)
6 Row 38"	228" (579.1 cm)
8 Row 30"	240" (609.6 cm)

2. Lower planter and row marker assembly to ground.
3. Measure from planter center line to a point where blade contacts ground.
4. Adjust row marker extension so distance from marker disc blade to center line of planter is equal to total planting width. Adjust right and left row marker assemblies equally and securely tighten clamping bolts.



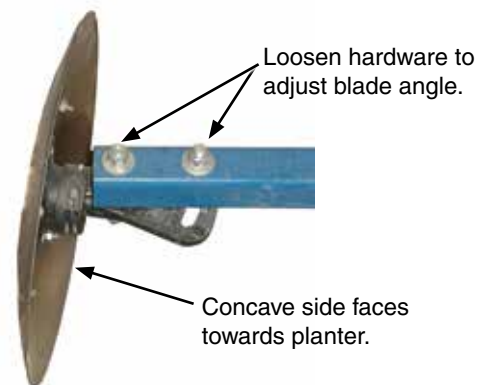
NOTICE

Setting marker disc blade assembly at a sharper angle than needed adds stress to row marker assembly and shortens bearing and blade life. Set blade angle only as needed to leave a clear mark.

Marker disc blade is installed with concave side facing inward. Spindle assembly is slotted so hub and blade can be angled to throw more or less dirt.

5. Loosen hardware and move assembly as required.
6. Tighten bolts to specified torque. See "Torque Values Chart" in Maintenance Section.
7. Do a field test to ensure markers are properly adjusted.

NOTE: A notched marker blade is available from Kinze through your Kinze Dealer for use in more severe no till conditions.



Row marker disc blade angle adjustment

RIDGE PLANTING

Planter toolbar height can be raised 3" (8 cm) for ridge planting.

1. Relocate 20" transport axles to lower rear holes in ground drive wheel arm.



New axle location.

Transport axle

2. Mount contact drive wheel arm and springs to lower set of mounting holes in wheel module mount.
3. Raise hitch height to keep planter level front and rear.

Move contact drive wheel arm here.



Move springs here.

Wheel module mount

PLANTING SPEED

Planters are designed to operate within a speed range of 2 to 8 mph (3.2 - 12.8 kph). See "Rate Charts". Variations in ground speed produce variations in rates. Finger pickup seed meter populations tend to be disproportionately higher at high ground speeds.

NOTE: Seed spacing can be adversely affected at speeds above 5.5 mph (8.8 kph).

FIELD TEST

Perform a field test with any change of field and/or planting conditions, seed size or planter adjustment to ensure proper seed placement and operation of row units. See “Rate Charts”, “Checking Seed Population” and “Checking Granular Chemical Application Rate”.

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

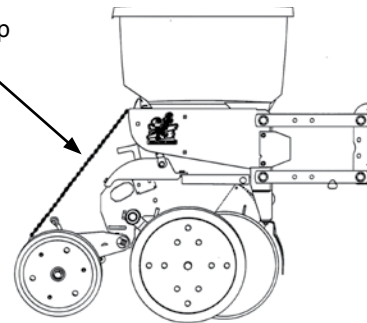
Reinspect machine after field testing.

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

CHECK 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.

Chain, rubber tarp strap, or similar.



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.

Planting depth adjustment handle



Planting depth adjustment

3. Measure $\frac{1}{1000}$ of an acre (hectare). See chart for correct distance for row width being planted. For example, if planting 30" (76 cm) rows $\frac{1}{1000}$ of an acre (hectare) would be 17' 5" (13.12 m).

$\frac{1}{1000}$ Hectare Seed Population Count Row Width/Distance						
Row Width	15" (38 cm)	18" (46 cm)	19" (48 cm)	30" (70 cm)	36" (91 cm)	38" (97 cm)
Distance	34'10" (6.56 m)	29'0" (5.46 m)	27'8" (5.18 m)	17'5" (14.28 m)	14'6" (10.93 m)	13'10" (10.36 m)

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

4. Count seeds in measured distance.
5. Multiply number of seeds placed in $\frac{1}{1000}$ of an acre (hectare) by 1000. This gives total population.

EXAMPLE: 30" (70 cm) row spacing 17' 5" (14.28 m) equals $\frac{1}{1000}$ acre.

26 seeds counted x 1000 = 26,000 seeds per acre

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

1. If seed check shows average distance between seeds in inches is significantly different than 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(s) for proper selection.
2. Check for seed meter malfunction. For example, if spacing between kernels of corn at the transmission setting being used is 8" (20 cm) and a gap of 16" (40 cm) is observed, a finger has lost its seed and not functioned properly. If two seeds are found within a short distance of each other, the finger has metered two seeds instead of one.
3. See "Finger Pickup Seed Meter Troubleshooting" and/or "Brush-Type Seed Meter Troubleshooting" in the Troubleshooting Section of this manual.

DETERMINING POUNDS PER ACRE (BRUSH-TYPE METER)

Seeds per acre ÷ Seeds per pound (from label) = Pounds per acre

If seeds per pound information is not available use the following averages:

2,600 seeds per pound for medium size soybeans

15,000 seeds per pound for medium size milo/grain sorghum

4,500 seeds per pound for medium size cotton

DETERMINING BUSHELS PER ACRE

Pounds per acre ÷ Seed unit weight = Bushels per acre

Average Unit Weight of:

1 Bushel Soybeans = 60 Pounds

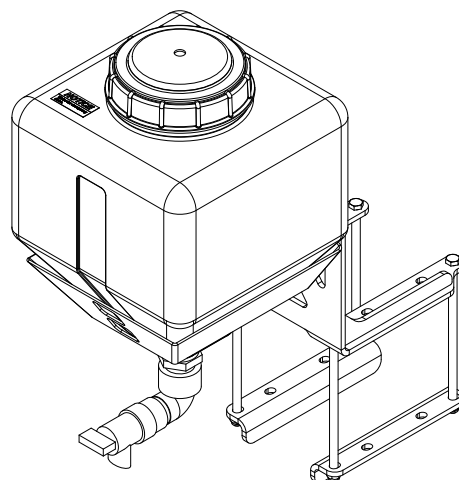
1 Bushel Milo/Grain Sorghum = 56 Pounds

1 Bushel Cotton = 32 Pounds

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

WATER TANK

The water tank is to only be filled with clean water or preferably potable water (water meeting local standards for drinking). The tank holds 4 gallons (15 L) of water. Be sure to check for regulations pertaining to this use. Tank should be filled with new water at the beginning of each planting season and drained at the end of each planting season.



NOTICE

Drain tank if environmental conditions are 32° Fahrenheit (0° Celsius) or below to prevent tank from cracking.

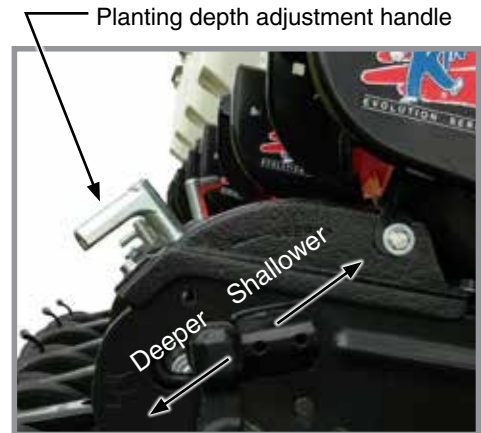
The water tank is to be used in the event of an accidental exposure to chemical. Chemicals are supplied with Material Safety Data Sheets (MSDS) that provide full information about the chemical, its effects on exposure, and first aid needs in the event of an emergency. Keep your MSDS file up-to-date and available for first responders in case of emergency.

If the water tank is used seek medical assistance immediately for further treatment.

PLANTING DEPTH

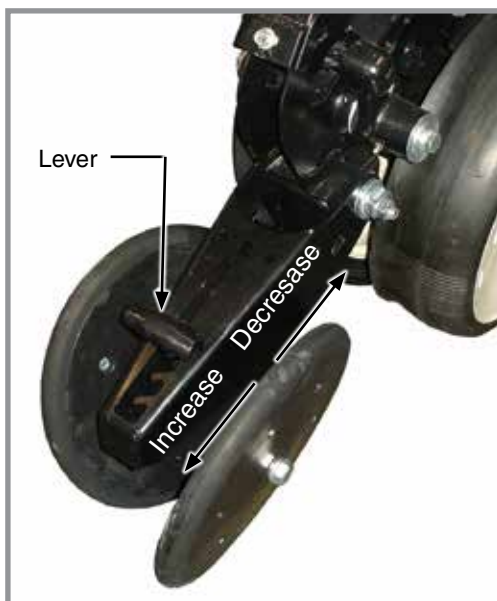
Planting depth is maintained by adjustable row unit gauge wheels. Depth adjustment range is approximately $\frac{1}{2}$ " to $3\frac{1}{2}$ " (1.27 to 8.89 cm).

1. Raise planter to remove weight from wheels.
2. Push down on depth adjustment handle and reposition it forward to decrease or rearward to increase planting depth. Initially adjust all units to the same setting.
3. Lower planter and check operation and planting depth of all row units. Readjust individual rows as needed for uniform operation.

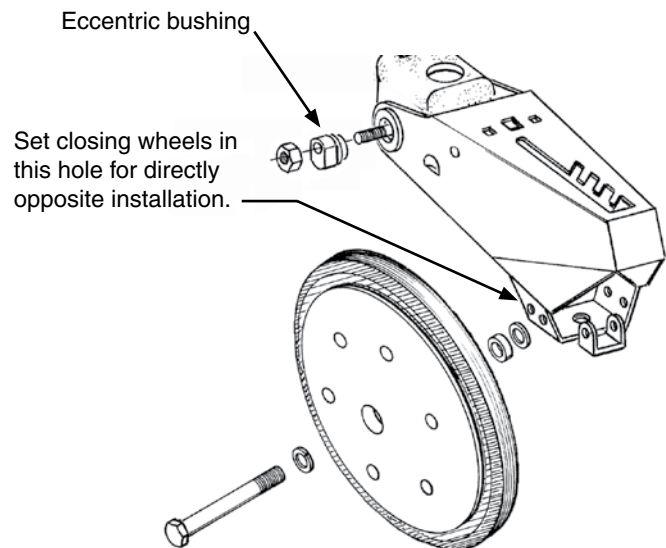


Planting depth adjustment

"V" CLOSING WHEEL ADJUSTMENT (RUBBER OR CAST IRON)



"V" Closing wheels installed offset



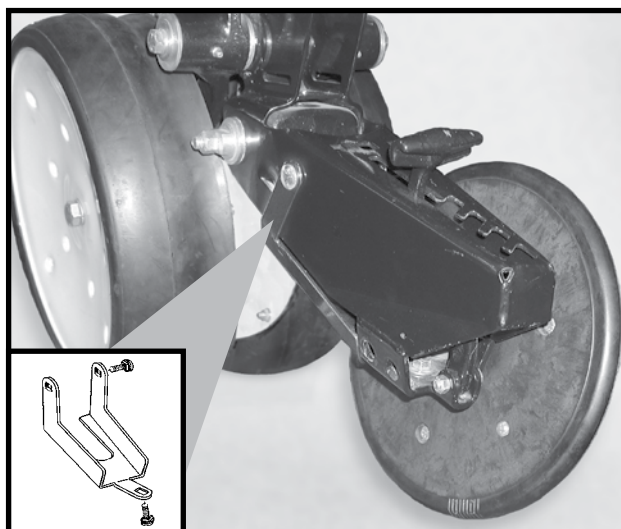
"V" closing wheels should have enough down pressure to close the seed trench and ensure good soil to seed contact. Move 5-position quick adjustable down force lever on the top of closing wheel arm to the rear to increase closing wheel spring pressure. Move lever forward to decrease pressure. Adjust all row units to a similar setting. Light soil usually requires less down force at average depth (approximately 2" (5 cm)) while heavy soil requires increased down force.

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

Closing wheels can be installed "offset" (to improve residue flow) or "directly" opposite. Use forward installation holes if set "directly" opposite.

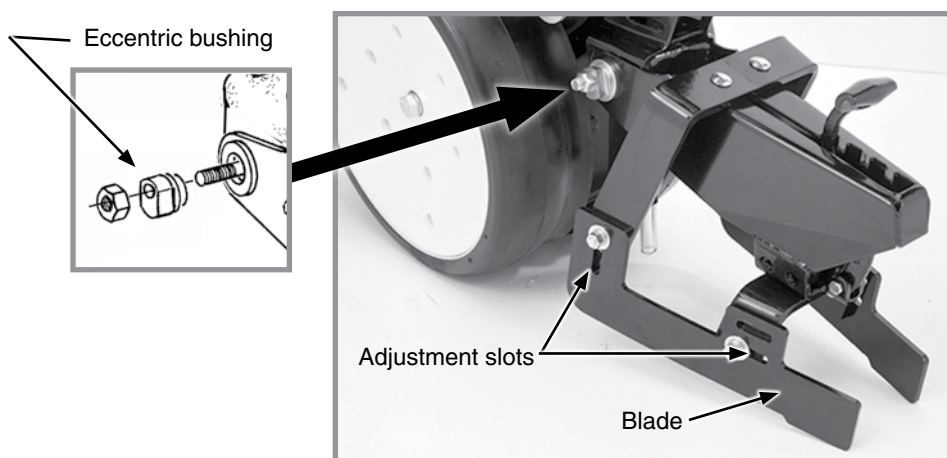
CLOSING WHEEL SHIELD (RUBBER OR CAST IRON “V” CLOSING WHEELS)

Optional closing wheel shield is installed on underside of closing wheel arm to help prevent root balls and stalks from clogging closing wheels.



Closing wheel shield
(Shown with closing wheel removed)

DRAG CLOSING ATTACHMENT



Drag closing attachment

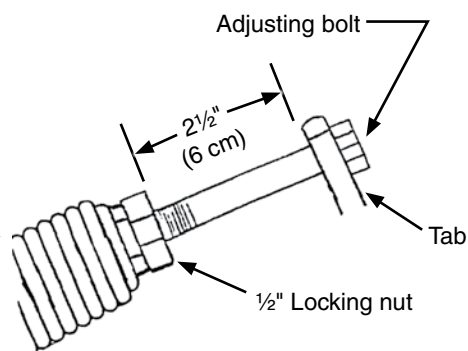
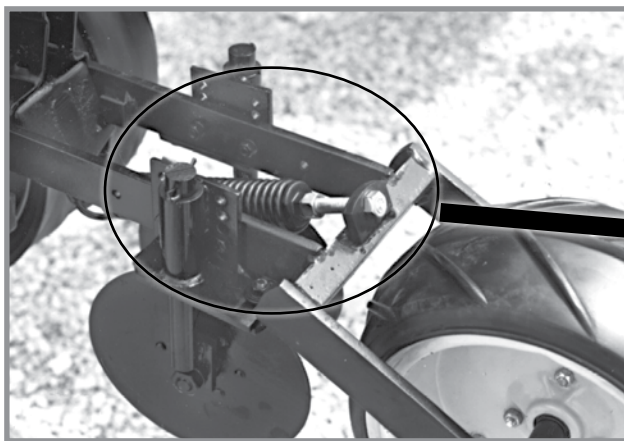
Drag closing attachment pulls loose soil over the seed trench.

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

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

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

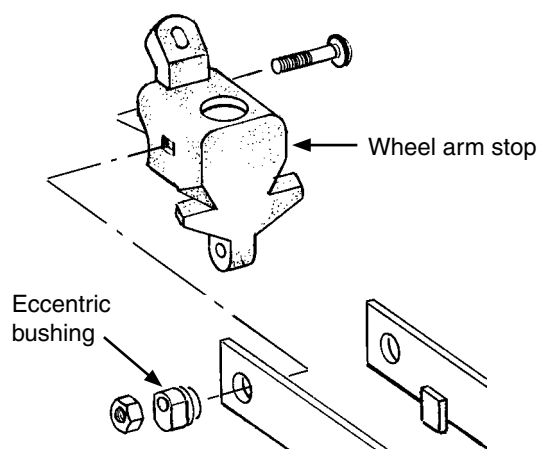
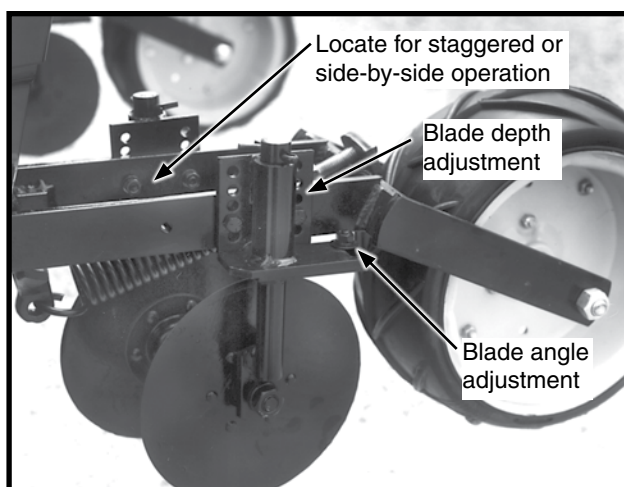
COVERING DISCS/SINGLE PRESS WHEEL ADJUSTMENT



Press wheel down force adjustment

Check operation of covering discs/single press wheels after adjusting planting depth. Initial press wheel down force spring setting is 2 1/2" (6 cm) between mounting arm tab and locking nut.

1. Loosen 1/2" locking nut and turn adjusting bolt in to increase down force or out to decrease down force.
2. Tighten locking nut against spring plug. Adjust all row units to a similar setting.



Covering disc adjustments

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












Two sets of holes in mounting arm locate covering discs for staggered or side-by-side operation.

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

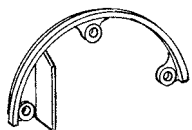
Slotted holes in disc mount and bracket allow for 0° - 15° blade angle adjustment.

Adjust covering discs on all row units to similar settings.

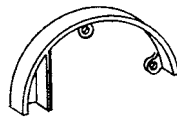
BRUSH-TYPE SEED METER

	Crop	Disc Color-Code (Disc Part No.)	Upper Brush Retainer	Cells	Seed Size Range	*Lubricant
	Soybean	Black (GA5794)	GD11122	60	2200 to 4000 seeds/lb. (4,840 to 8,800 seeds/kg)	Graphite Talc
	Specialty Soybean	Dark Blue (GA6184)	GD11122	48	1400 to 2200 seeds/lb. (3,080 to 4,840 seeds/kg)	Graphite Talc
	Small Milo/Grain Sorghum	Red (GA5982)	GD8237	30	14,000 to 20,000 seeds/lb. (30,800 to 44,000 seeds/kg)	Talc
	Large Milo Grain Sorghum	Light Blue (GA6187)	GD8237	30	10,000 to 16,000 seeds/lb. (22,000 to 35,200 seeds/kg)	Talc
	High-Rate Small Milo/Grain Sorghum	Red (GA5795)	GD8237	60	12,000 to 18,000 seeds/lb. (26,400 to 39,600 seeds/kg)	Talc
	High-Rate Large Milo/Grain Sorghum	Yellow (GA6633)	GD8237	60	10,000 to 14,000 seeds/lb. (22,000 to 30,800 seeds/kg)	Talc
	Cotton, Acid-Delinted	White (GA5796)	GD11122	30	4200 to 5200 seeds/lb. (9,240 to 11,440 seeds/kg)	Talc
	Large Cotton, Acid Delinted	Tan (GA6168)	GD11122	36	3800 to 4400 seeds/lb. (8,360 to 9,680 seeds/kg)	Talc
	High-Rate Cotton, Acid-Delinted	Light Green (GA6478)	GD11122	48	4200 to 5200 seeds/lb. (9,240 to 11,440 seeds/kg)	Talc
	Hill-Drop Cotton, Acid-Delinted	Brown (GA6182)	GD11122	12 (3 to 6 seeds/ cell)	4000 to 5200 seeds/lb. (8,800 to 11,400 seeds/kg)	Talc
	Small Hill-Drop Cotton, Acid-Delinted	Dark Green (GA7255)	GD11122	12 (3 to 6 seeds/ cell)	5000 to 6200 seeds/lb. (11,000 to 13,640 seeds/kg)	Talc

*For More information on application rate see Additives section.











Use GD11122 upper brush retainer
when using cotton and soybean discs.

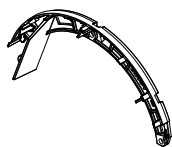


Use GD8237 upper brush retainer when
using milo/grain sorghum discs.

BRUSH-TYPE SEED METER 2.0

	Crop	Disc Color-Code (Disc Part No.)	Upper Brush Retainer	Cells	Seed Size Range	*Lubricant
	Soybean	Black (GB1123)	GB1084	60	2200 to 4000 seeds/lb.	Graphite Talc
	Soybean	Dark Gray (GB1171)	GB1084	54	2000 to 3000 seeds/lb.	Graphite Talc
	Specialty Soybean	Dark Blue (GB1124)	GB1084	48	1400 to 2200 seeds/lb.	Graphite Talc
	Small Milo/Grain Sorghum	Orange (GB1130)	GB1107	30	14,000 to 20,000 seeds/lb.	Talc
	Large Milo Grain Sorghum	Light Blue (GB1131)	GB1107	30	10,000 to 16,000 seeds/lb.	Talc
	High-Rate Small Milo/Grain Sorghum	Red (GB1132)	GB1107	60	12,000 to 18,000 seeds/lb.	Talc
	High-Rate Large Milo/Grain Sorghum	Yellow (GB1133)	GD8237	60	10,000 to 14,000 seeds/lb.	Talc
	Wheat	Purple (GB1134)	GB1084	54	N/A Volumetric	Graphite Talc

*For More information on application rate see Additives section.



Use GB1084 upper brush retainer when using wheat and soybean discs.



Use GB1107 milo insert when using milo/ grain sorghum discs.

Turn seed disc counterclockwise when installing on meter hub while tightening two wing nuts that retain disc. Seed disc should have slight resistance when rotated counterclockwise after wing nuts are tight.

Brush-type seed meter attaches to seed hopper same as finger pickup seed meter. Secure to bottom of seed hopper with two $\frac{5}{16}$ " thumbscrews. Tighten thumbscrews slightly with pliers. **DO NOT OVER TIGHTEN.**

Misalignment between drive coupler and seed meter input shaft may cause erratic seed spacing from momentary stoppage of seed disc. Check alignment and adjust as needed.

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



Shown without seed disc installed

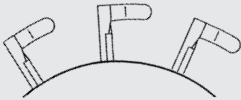
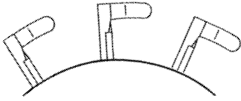
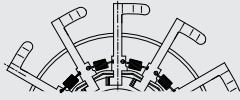

NOTE: Clean seed is required to ensure accurate seed metering from brush-type seed meters. Remove seed discs daily and check seed meter or brushes for buildup of foreign material, such as hulls, stems, etc.

NOTICE

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

FINGER PICKUP SEED METER



Crop	Fingers	*Lubricant
Corn	 Part No.: GR1848 - Finger Assembly, Corn	Graphite Talc
No. 1 and/or No. 2 size Confectionery Sunflower Seeds	 Part No.: GR1848 - Finger Assembly, Corn	Talc
No. 3 and/or No. 4 size Oil Sunflower Seeds	 Part No.: GR2154 - Finger Assembly, Oil	Talc
Blank fingers replace alternate fingers to reduce planting rate by half while allowing the finger wheel to maintain a minimum of 40 RPM when planting low rates.	 Part No.: GD11787 - Half Rate Blank Finger	Graphite Talc

*For More information on application rate see Additives section.

NOTE: Always field check seed population to verify planting rates.

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

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ADDITIVES

Lubricant Application Rate	
Graphite	
Conventional Hoppers	1 Tbs./Hopper Fill
80/20 Talc-Graphite	
Conventional Hoppers	½ C.**
**Must be evenly mixed during fill.	
Talc	
Conventional Hoppers	¼ C.*
*Double amount of talc for sunflowers.	

GRAPHITE

The use of graphite is the primary recommendation to promote seed flow, provide lubrication for the seed meter and to help dissipate static charge buildup. Among the available dry seed lubricants graphite is the most effective and easiest to use and it requires no mechanical agitation

Conventional Hoppers

Mix one tablespoon of **powdered graphite** with seed each time hoppers are filled. Regular graphite use prolongs life of the seed meter components, improves seed spacing, and may reduce buildup of seed treatments.

NOTE: DO NOT apply graphite only in center of hopper. It will filter too quickly through the seed and not distribute as evenly as desired.

Apply graphite around outer perimeter of hopper.



Adding graphite to conventional hopper

NOTE: Additional graphite 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.

80/20 TALC-GRAPHITE

Talc-Graphite lubricant is to be used for treated seed, providing benefits of both talc and graphite. It absorbs moisture to prevent bridging, minimizes static electricity for improved seed flow, and lubricates seed and meters.

Conventional Hoppers

Mix ½ C. of 80/20 talc-graphite evenly with seed each time hoppers are filled. Regular graphite use prolongs life of the seed meter components, improves seed spacing, and may reduce buildup of seed treatments.

NOTE: Talc-Graphite lubricant MUST be mixed evenly during fill.

TALC

Talc seed lubricant may be used as a drying agent in addition to graphite lubrication. The drying agent may improve seed release and/or **to retard buildup of seed treatments on meter components.**

1. Fill hopper ½ full of seed, add ¼ cup (conventional) of talc and **mix thoroughly.**
2. Finish filling hopper, add another ¼ cup (conventional) of talc and **mix thoroughly.**
3. Adjust rate of talc use as needed so all seeds are coated, while avoiding a buildup of talc in bottom of hopper.

Humid conditions and/or small sized seeds with extra seed treatment may require additional talc to maintain meter performance.

NOTE: 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.

Completely mix all treatments with seed following manufacturers' recommendations. Seed treatment dumped on top of seed after hopper is filled may not mix properly and cause seed bridging, reducing population or stopping meter from planting.

SEED METER CLEANOUT

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.

Thorough seed meter cleanout is important to maintain genetic purity.

1. Disengage seed drive and remove seed hopper and meter.
2. Dump seed from right rear corner of hopper into a container.
3. Disassemble seed disc by removing wing nuts.
4. Empty Meter.
4. Thoroughly inspect brushes in meter to ensure all seed is removed.
5. Replace seed disc. Install wing nuts.

SEED HOPPER

Seed hopper has a capacity of 1.9 bushels.

Use clean seed and make certain there are no foreign objects inside when filling seed hopper. **Replace hopper lids after hoppers are filled to prevent accumulation of dust or dirt in seed meter which can cause premature wear.** See “Finger Pickup Seed Meter” and/or “Brush-Type Seed Meter”.

Periodically empty hoppers completely to remove any foreign objects and to ensure proper seed meter operation.

Disengage meter drive and hopper latch and lift hopper off hopper support. See “Seed Meter Drive Release”.

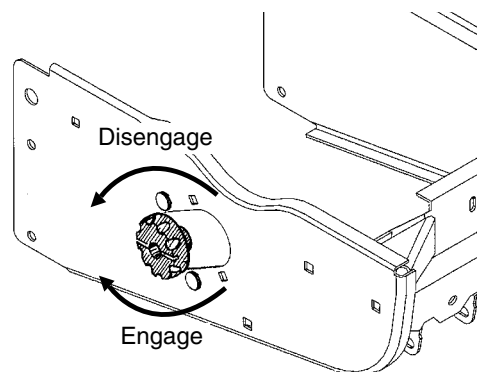


Seed hopper

SEED METER DRIVE RELEASE

A clutch release mechanism disengages seed meter drive from seed meter to remove seed hopper. Disconnecting drive allows operator to check granular chemical application rates without dropping seed. It also allows one or more rows to be disconnected when finishing fields.

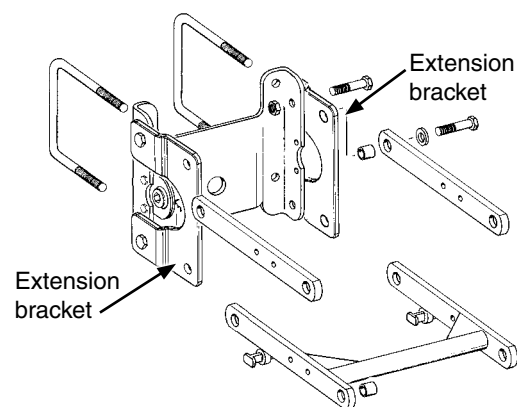
Turn knob $\frac{1}{4}$ turn counterclockwise to disengage or $\frac{1}{4}$ turn clockwise to engage.



Seed meter drive release

ROW UNIT EXTENSION BRACKETS

Row unit extension brackets extend row units rearward 4" (10.2 cm) to provide clearance for coulter mounted residue wheels and HD single disc fertilizer openers.

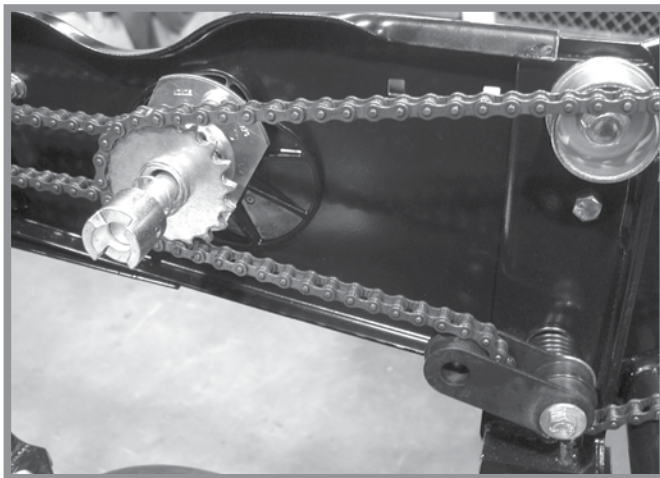


Row unit extension brackets

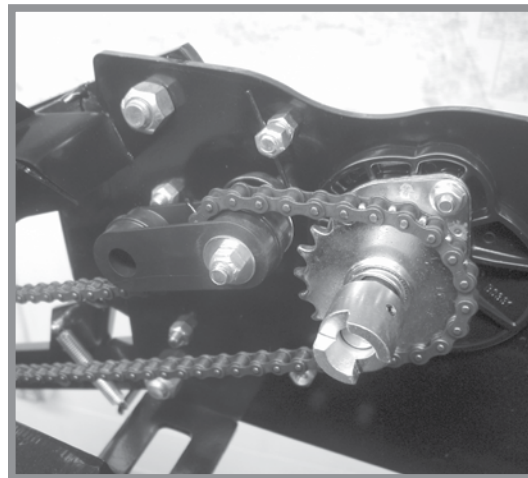
ROW UNIT CHAIN ROUTING

Row unit drive chains must be properly tensioned and aligned for proper operation and to minimize wear.

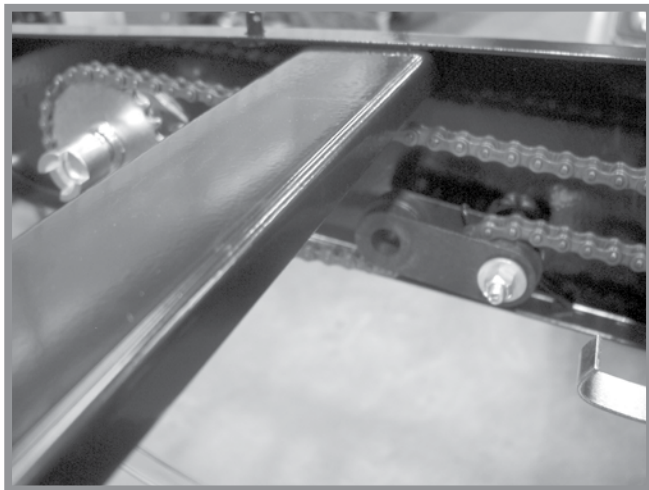
Inspect and replace weak, worn or broken springs, idlers, and idler bushings.



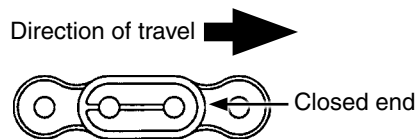
Pull row unit meter drive



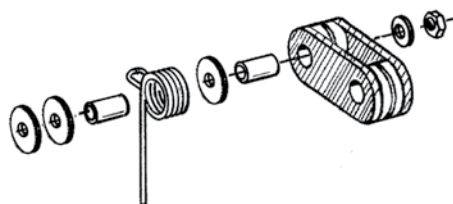
Push row unit meter drive



Row unit granular chemical drive



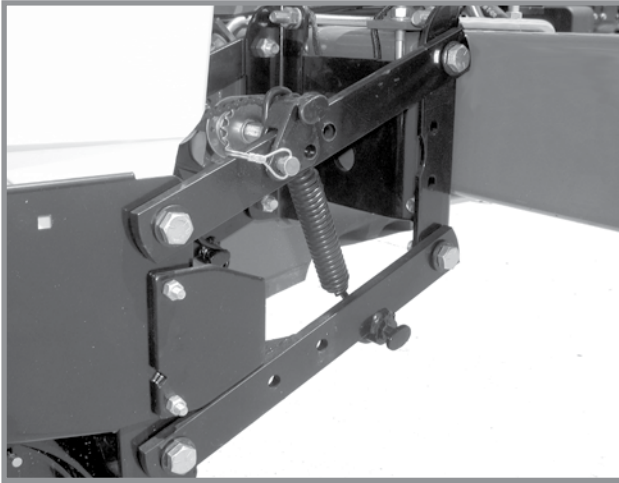
NOTE: Install connector link with closed end facing direction of travel.



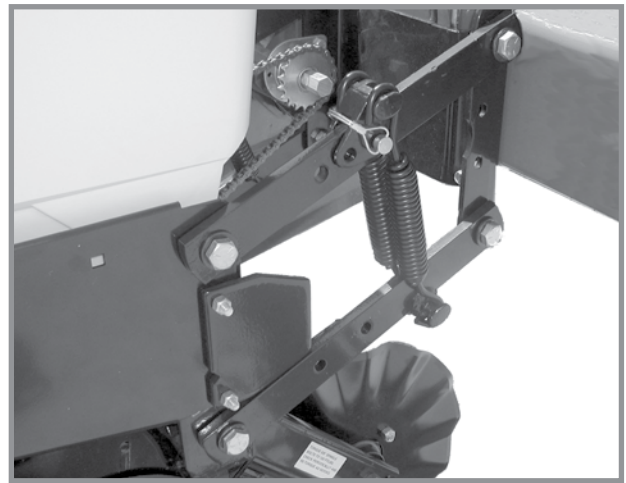
NOTE: Reverse idler when worn on one side for extended use.

QUICK ADJUSTABLE DOWN FORCE SPRINGS OPTION

Quick adjustable down force springs increase penetration in hard soil and keep row unit from bouncing in rough field conditions. Two springs per row, one on each side 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.

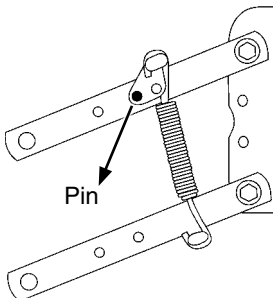


Two Springs Per Row (Dual)

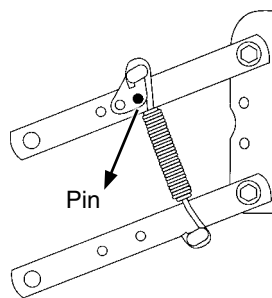


**Four Springs Per Row (Quad)
(Row Unit Mounted No Till Coulters Only)**

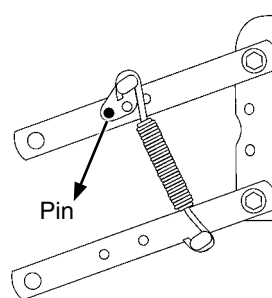
There are four positions for spring tension adjustment. Position 1 sets minimum down pressure and position 4 sets maximum down pressure.



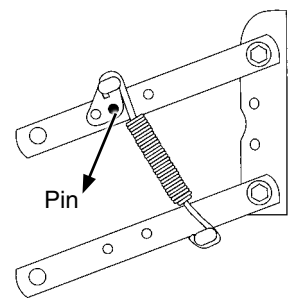
Position 1 (Least)



Position 2



Position 3



Position 4 (Most)

NOTICE

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

1. Raise planter and remove spring mount pin at top of spring.
2. Slide mount to desired position and install pin.

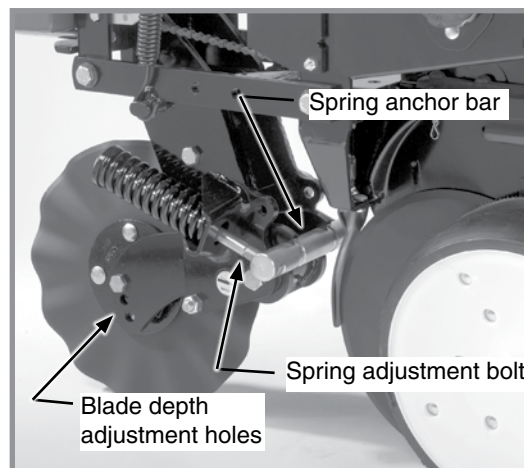
NOTE: Adjust springs for field conditions. Too much down pressure in hard field conditions can cause row units to lift planter and keep drive wheels from making contact. Too much down pressure in soft field conditions can cause row unit to run too deep.

FRAME MOUNTED COULTER (PULL ROW ONLY)

Frame mounted coulters with 1" bubbled, 1" fluted (8 flutes) or ¾" fluted (13 flutes) blades are used on pull row units only.

Springs provide down pressure on coulters for maximum penetration while exerting less shock load on row unit.

Initial coulters blade location is in top hole. Relocate blade to one of lower two holes (1" (2.5 cm) increments) as wear occurs or for deeper blade operation.



Frame mounted coulters adjustment

DOWN PRESSURE ADJUSTMENT

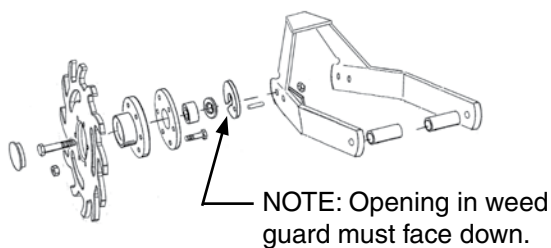
NOTICE

Excessive down pressure can damage coulters components when coulter strikes an obstacle. Do not set down pressure higher than needed for consistent soil penetration.

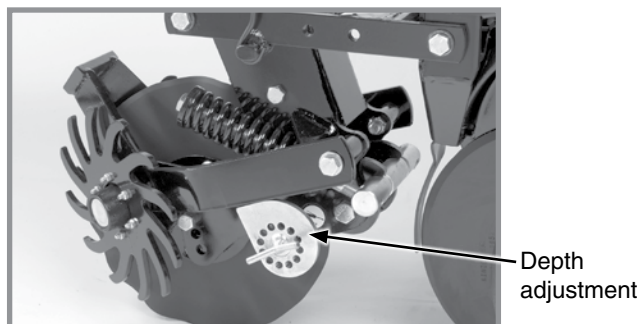
Raise planter. Turn spring adjustment bolts clockwise to increase or counterclockwise to decrease down pressure. Set both springs to specification shown in following table:

Frame Mounted Coulter Spring Downpressure Settings		
End flush with spring anchor bar	Extended ½" (1 cm) through spring anchor bar	All threads used
275 lb (124.7 kg)	400 lb (181.4 kg)	500 lb (226.8 kg)

RESIDUE WHEELS (FOR FRAME MOUNTED COULTER)



Style B residue wheel shown



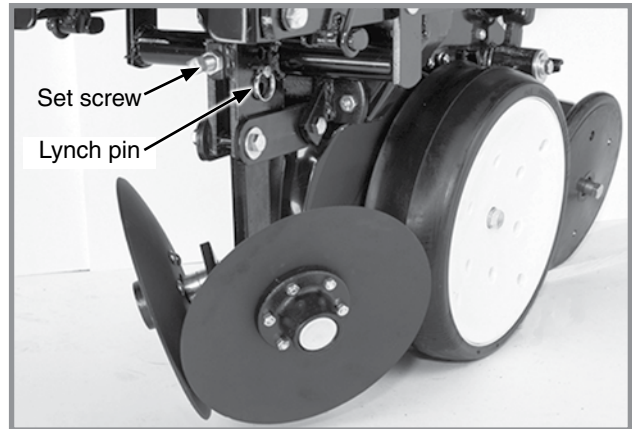
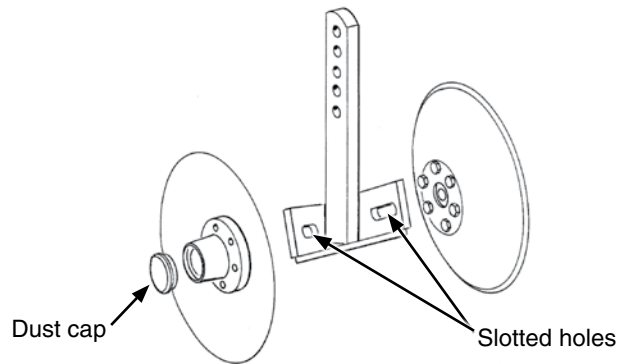
Style A residue wheel shown

Residue wheels attach to frame mounted coulters with two cap screws and sleeves allowing the unit to free-float. A 2-position spindle bolt mounting positions wheels interlocked or staggered. Depth adjustment is made with a spring-loaded cam and pin with 11 positions in ¼" (6 mm) increments. A high point on the cam allows wheels to be locked up.

A weed guard on the inboard side of each wheel helps prevent weed wrap which can cause premature bearing failure.

ROW UNIT MOUNTED DISC FURROWER (PULL ROW ONLY)

Disc furrowers are used to clear crop residue, dirt clods, and dry soil from in front of row units for a clean and smooth seed bed. The disc furrower may be equipped with 12" solid blades or 12" notched blades. Notched blades are for heavier residue conditions and cut crop residue and move it aside to prevent plugging or pushing.



Disc furrower adjustment

Vertical adjustment can be made in $\frac{1}{8}$ " (8 mm) increments. Remove lynch pin in vertical support arm and move arm up or down. Reinstall lynch pin. Finer adjustment can be made by removing lynch pin and using $\frac{5}{8}$ " x $2\frac{1}{4}$ " set screw to clamp support arm in position.

Slotted holes in support arm allow front to rear disc blade adjustment. Blades can be adjusted so front edges meet or cutting edge of one blade overlaps edge of other blade.

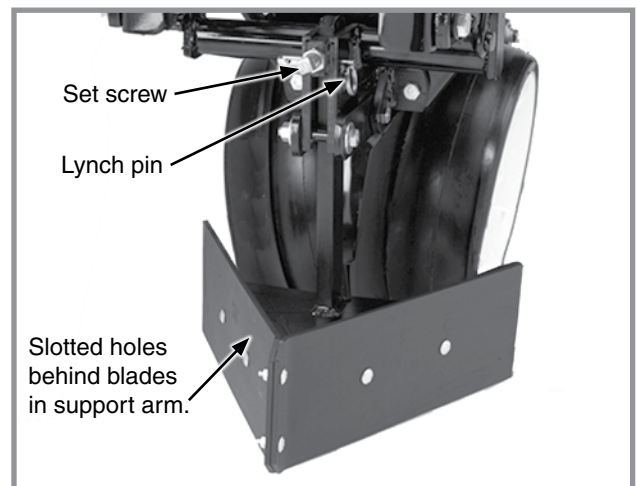
NOTE: Dust cap must be removed to make adjustments.

ROW UNIT MOUNTED BED LEVELER (PULL ROW ONLY)

NOTE: Row unit mounted bed leveler is not compatible with row spacings less than 36" (91 cm).

Vertical adjustment can be made in $\frac{1}{8}$ " (8 mm) increments. Remove lynch pin in vertical support arm and move arm up or down. Reinstall lynch pin. Finer adjustment can be made by removing lynch pin and using $\frac{5}{8}$ " x $2\frac{1}{4}$ " set screw to clamp support arm in position.

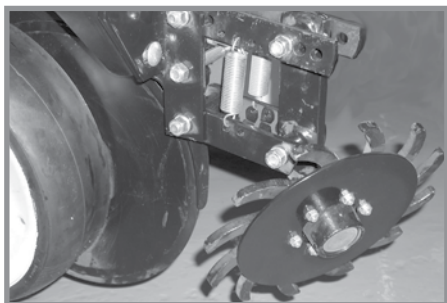
Slotted holes in support arm allow blade adjustment. Blades can be tilted up or down.



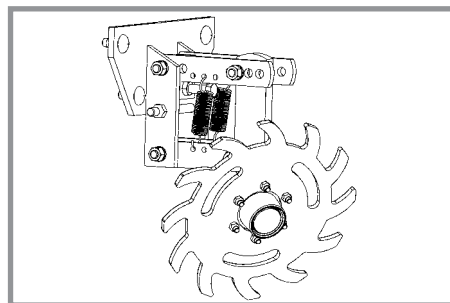
Bed leveler adjustment

ROW UNIT MOUNTED RESIDUE WHEEL

Row unit mounted residue wheel are used on pull and push row units.

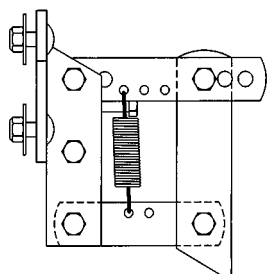


Style A

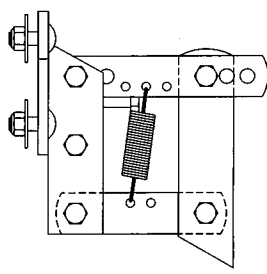


Style B

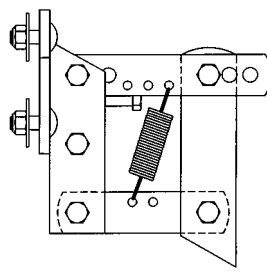
Two adjustable springs on each residue wheel parallel links provide down force adjustment. Position 1 provides minimum down pressure and position 3 maximum down pressure.



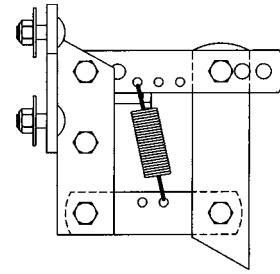
Position 1 (Least)



Position 2

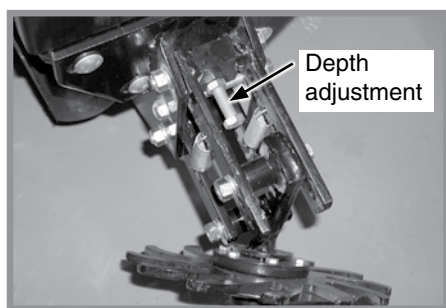


Position 3 (Most)

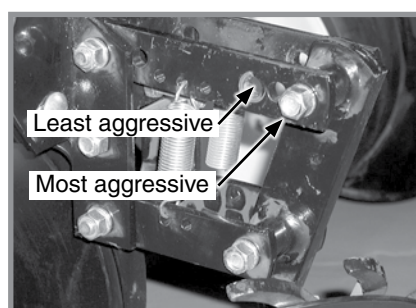


Additional uplift or float

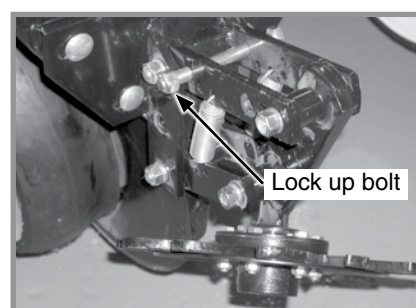
Raise row unit and reposition springs to adjust down pressure.



Wheel depth adjustment



Wheel angle adjustment



Wheel lock up

A full threaded bolt and jam nut located on the upper link sets maximum depth for loose soil conditions. Initial setting is 1 $\frac{3}{4}$ " (4 cm) above row unit double disc opener depth.

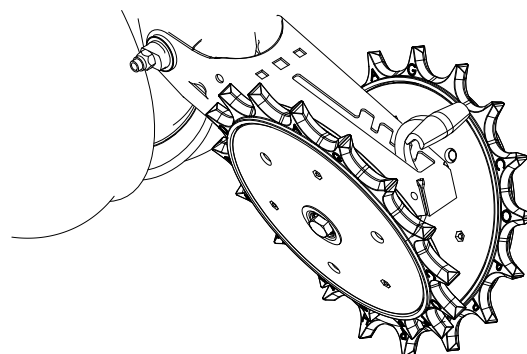
Three holes in upper link adjust wheel angle. With wheel mount in most vertical position, using the rear hole in the upper link, the residue wheel is most aggressive. Moving wheel mount to a forward hole reduces aggressiveness of residue wheel for use in mulch till applications where soil is loose.

To lock residue wheel up, remove $\frac{1}{2}$ " x 5" lockup bolt, raise residue wheel and install bolt.

SPIKED CLOSING WHEEL

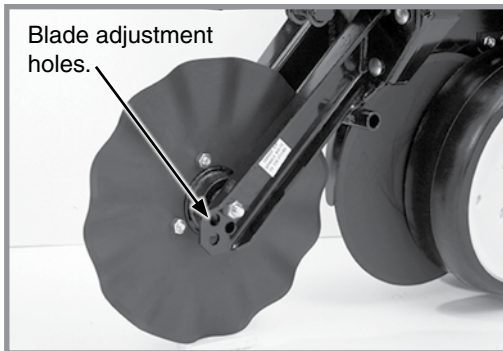
Spiked closing wheels crumble the sidewall, allowing roots to penetrate soil. They can be used on pull row units and push row units.

Align spiked closing wheels straight across from each other, in most rearward holes on closing wheel arm. Set the wheels 1" - 1¼" (2.5 - 3.1 cm) apart at the closest point. If large amounts of contouring is being done, mount wheels in the forward most hole. This will reduce drifting of row unit.



Row Unit Spiked Closing Wheel

ROW UNIT MOUNTED NO TILL COULTER



Style A (Two sleeves for installing coulters mounted residue wheels)



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 Options".

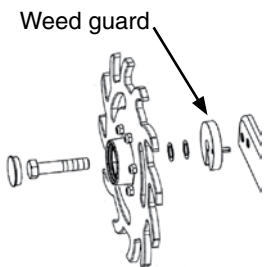
Align coulters in relation to row unit double disc openers. Adjust by loosening four attaching bolts, moving coulters arm, and tightening four attaching bolts. Coulters blade can be adjusted to one of four $\frac{1}{2}$ " (13 mm) incremental settings in the forked arm. Initial location is the top hole. Move blade as it wears to one of the three lower hole to maintain coulters blade at or slightly above opener discs as needed. Adjust coulters below depth of double disc opener blades in very hard soil conditions such as compacted wheel tracks to improve opener penetration and cutting of surface residue.

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

NOTE: Torque $\frac{5}{8}$ " spindle hardware to 120 ft-lb (162.7 N-m).

COULTER MOUNTED RESIDUE WHEELS

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



NOTE: Opening in weed guard must face down.



Style A (Used with Style A row unit mounted no till coulters)



Style B (Used with Style B row unit mounted no till coulters)

Residue wheels attach to row unit mounted coulters with two cap screws and sleeves allowing unit to free-float. A 2-position spindle bolt mounting positions wheels interlocked or staggered. Depth adjustment is made with a spring-loaded cam and pin with 11 positions in $\frac{1}{4}$ " (6 mm) increments. A high point on the cam allows wheels to be locked up.

A weed guard on the inboard side of each wheel helps prevent weed wrap which can cause premature bearing failure.

GRANULAR CHEMICAL HOPPER AND DRIVE



WARNING Agricultural chemicals can cause death or serious injury to persons, animals, and plants or seriously damage soil, equipment, or property. Read and follow all chemical and equipment manufacturers labels and instructions.

The granular chemical hopper has a 1.4 cubic feet capacity.

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

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

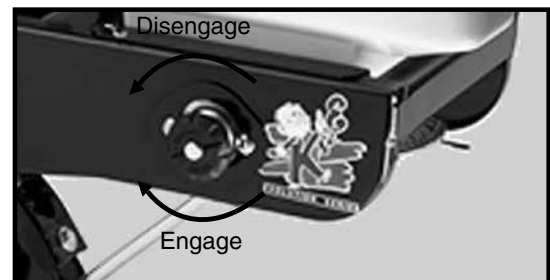


Granular chemical hopper

Granular chemical clutch drive coupler and meter shaft can be disengaged and engaged by turning throwout knob at rear of hopper support panel.

Rotate knob ¼ turn counterclockwise to disengage and ¼ turn clockwise to engage.

Slotted holes in hopper support panel and clutch housing allow for alignment adjustment between clutch drive coupler and meter shaft.



Granular chemical drive release

SPRING TOOTH INCORPORATOR

Spring tooth incorporator smooths soil behind row unit and incorporates granular chemicals.

Adjust two mounting chains on each spring tooth incorporator so there is approximately ⅛" (3 mm) slack in chain when unit is lowered to planting position.

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

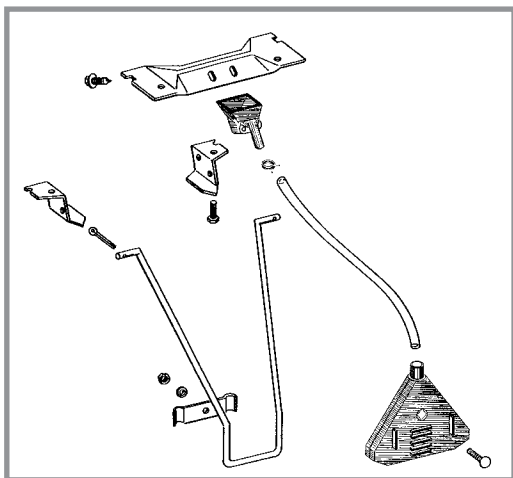


Spring tooth incorporator

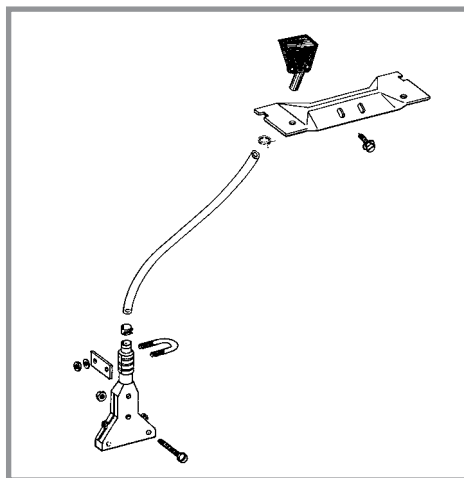
GRANULAR CHEMICAL BANDING OPTIONS

Granular chemical banding options allow 4½" slope-compensating banding, straight drop in-furrow placement or 14" rear banding.

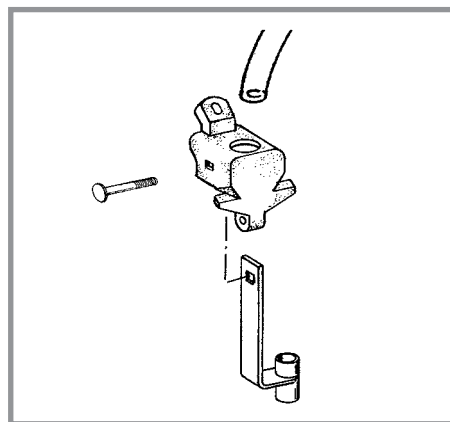
NOTE: Granular chemical rear bander is not compatible with covering discs/single press wheel option.



14" Rear Banding



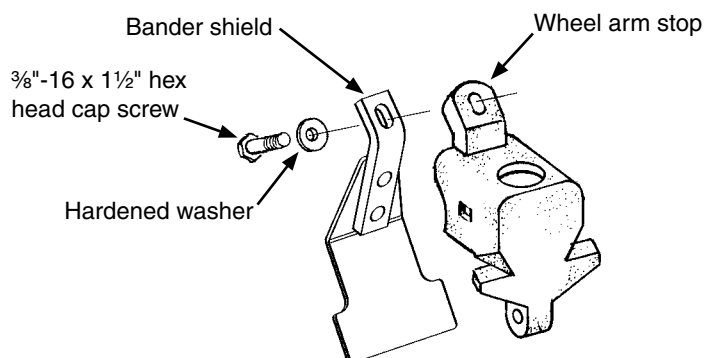
4½" Slope-Compensating Bander



Straight Drop In-Furrow Placement

GRANULAR CHEMICAL BANDER SHIELD



Optional granular chemical bander shield is installed on underside of wheel arm stop to shield crop residue from lodging in granular chemical bander.

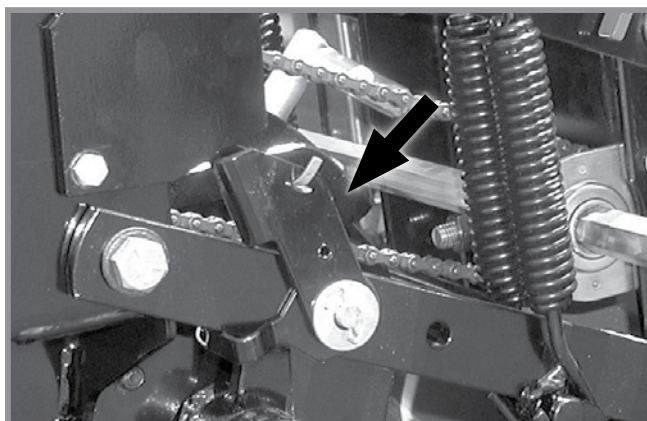


Granular chemical bander shield installation

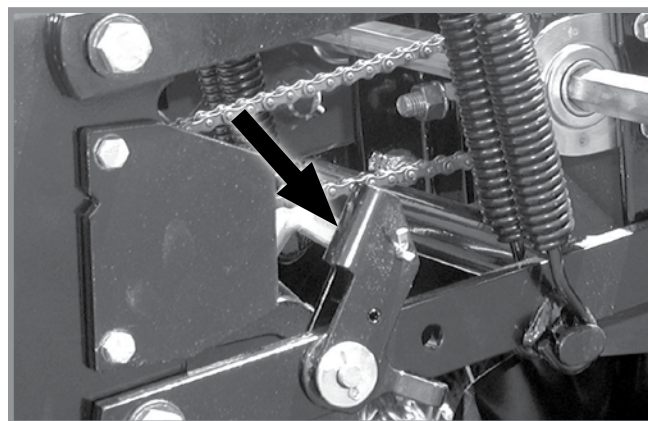
INTERPLANT PUSH ROW UNIT LOCKUPS

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

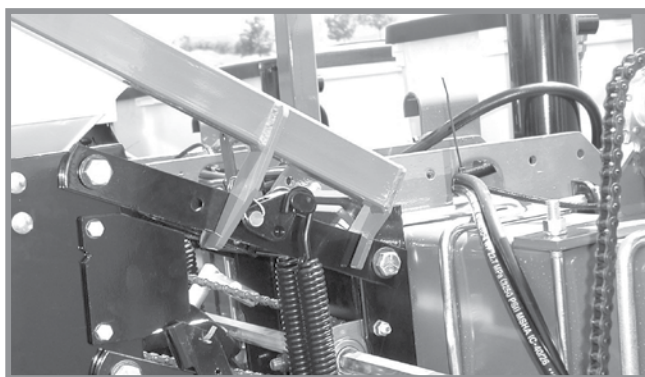
 CAUTION	<p>Improper lifting of row units can cause serious injury. An empty row unit requires minimum 84 lb (38.1 kg) lift. Set down pressure springs to minimum, lower planter to ground, and empty seed hopper before attempting to lift with this lever.</p>
	



Push Row Unit Locked In Raised Position



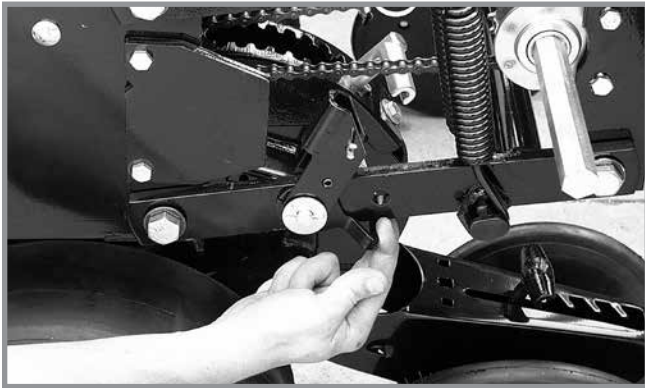
Lockup Released For Field Operation



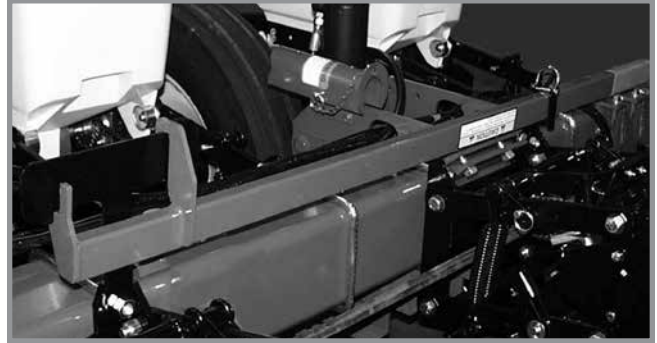
Lift lever positioned on push row unit

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.



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.

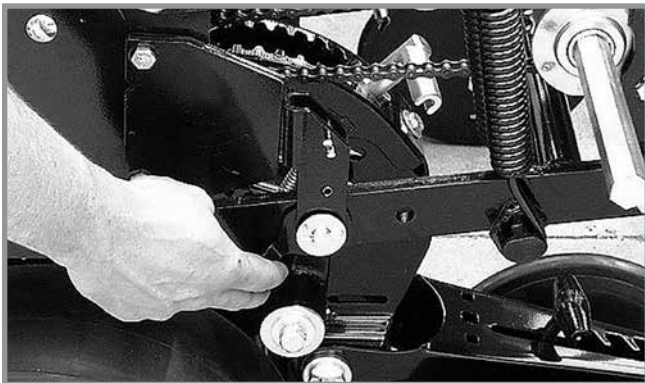


Lift lever in storage location

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.



INTERPLANT PUSH ROW UNIT CLUTCH SPROCKET

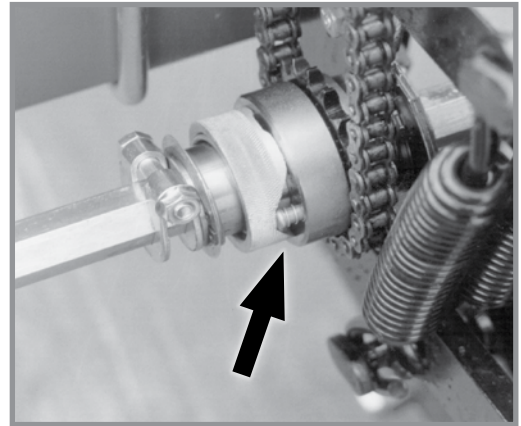
Push row unit clutch sprocket disengages interplant drive from push row unit drill shaft when only pull row units are used.

DISENGAGE

Rotate knurled collar $\frac{1}{4}$ turn. Rock drill shaft slightly using a $\frac{7}{8}$ " wrench to take pressure off of spring loaded pins in clutch to allow pins to "pop" out, disengaging drive.

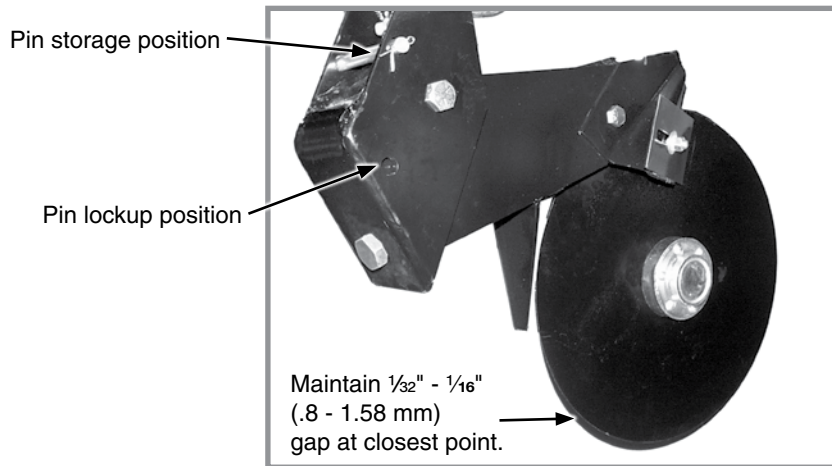
ENGAGE

Rotate knurled collar $\frac{1}{4}$ turn and turn drill shaft with a $\frac{7}{8}$ " wrench until drive pins engage drive sprocket.



Interplant clutch sprocket

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DOUBLE DISC FERTILIZER OPENER**Double disc fertilizer opener**

Position double disc fertilizer openers **to place fertilizer no closer than 2" (5 cm) to either side of row.** Fertilizer depth is approximately 4" (10 cm) If planter frame is level and at proper 20" (51 cm) operating height. Soil conditions can affect depth slightly.

NOTE: Do not set opener depth with spring pressure. Opener is designed to operate against a depth stop and spring up when encountering a foreign object or hard ground.

Down pressure spring is factory preset at 250 lb (113.4 kg) but can be adjusted for various soil conditions.

1. Loosen jam nut with a $1\frac{5}{16}$ " wrench.
2. Use a 1" wrench to turn adjustment bolt clockwise to increase tension or counterclockwise to decrease tension.
3. Tighten jam nut.

NOTICE

Do not operate double disc openers at full down pressure tension on rocky ground or disc blades will chip.

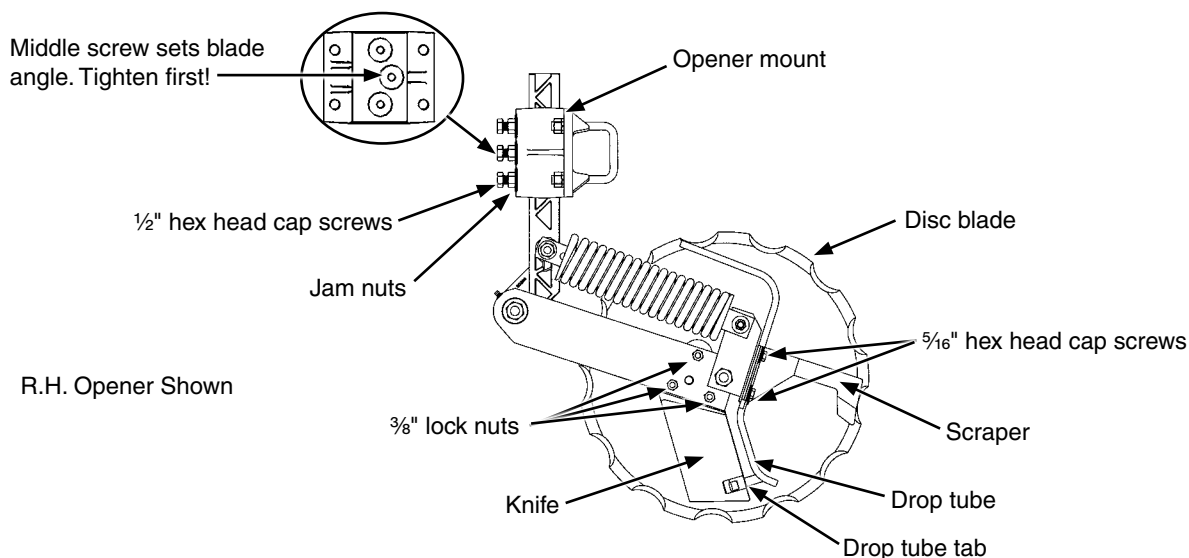
Maintain a gap of $\frac{1}{32}$ " to $\frac{1}{16}$ " (.8 - 1.58 mm) between opener blades at the closest point. Blade adjustment is made by moving inside spacer washers to outer side of blade. Check bearing assembly rivets are not contacting shank after making adjustment.

Outer scrapers on each disc blade can be adjusted for wear. Make sure scrapers are adjusted to allow only slight blade contact.

Opener assembly is designed to be locked in a raised position when fertilizer attachment is not in use or during storage.

1. Raise planter and place blocks under openers.
2. Lower planter until pivot section hole aligns with mounting bracket hole.
3. Remove lockup pin from mounting bracket storage position and install through lockup hole.
4. Secure with cotter pins.

NOTCHED SINGLE DISC OPENERS (STYLE A & B)



Notched single disc opener adjustments



CAUTION

Compressed spring may fly out of this assembly if attempting to disassemble and cause injury. Do not take apart this assembly.

Disc blades are sharp and can cut causing serious injury. Wear gloves when working on or turning disc blades by hand.

NOTICE

Never strike knife with heavy object. Damage to knife will occur.

If knife to disc blade clearance is too large, soil or residue can wedge between knife and blade, and blade will not turn.

1. Adjust knife to disc blade contact. Loosen or tighten $\frac{3}{8}$ " lock nuts to adjust knife's entire leading edge against disc blade. Turn blade and check for slight resistance without freewheeling. Readjust knife to blade's tight spot as needed.

NOTICE

Adjust liquid drop tube out of path of soil flow across knife. Drop tube and tab wear quickly if not correctly adjusted.

2. Adjust scraper and drop tube. Loosen two $\frac{5}{16}$ " hex head cap screws. Adjust scraper until just touching disc blade. Adjust drop tube until it is centered between knife and disc blade. Tighten screws. Turn blade and check for slight resistance without freewheeling. Repeat as needed. Insert flat bladed pry bar or screwdriver between knife and drop tube above drop tube tab. Carefully bend tube until $\frac{1}{4}$ "- $\frac{3}{8}$ " (6.35 - 9.5 mm) from disc blade.

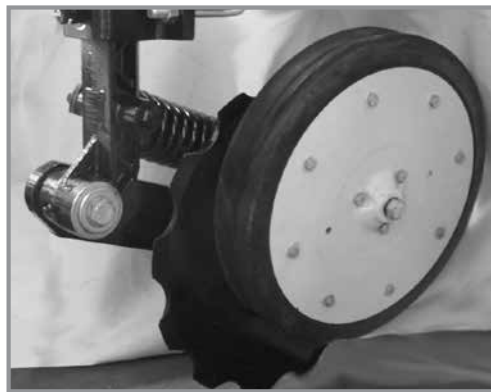
NOTE: Maximum disc blade depth 4" (10.2 cm).

3. Adjust blade depth. Loosen three $\frac{1}{2}$ " hex head cap screws and jam nuts in opener mount. Adjust opener assembly up or down to desired blade depth. Tighten center hex head cap screw and jam nut first to set proper disc blade angle. Tighten remaining hex head cap screws and jam nuts. Torque hex head cap screws and jam nuts to 57 ft-lb (77.29 N-m). Check fertilizer hose clearance and adjust as necessary.

RESIDUE WHEEL ATTACHMENT FOR NOTCHED SINGLE DISC FERTILIZER OPENER**Notched single disc opener residue wheel attachment**

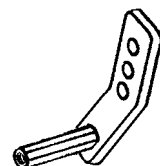
Residue wheel attachment for notched single disc fertilizer opener is used where row unit mounted residue wheel attachments cannot be installed. Residue wheel is attached to notched single disc fertilizer opener with $\frac{5}{8}$ " x $7\frac{1}{2}$ " and $\frac{1}{2}$ " x $6\frac{1}{2}$ " hardware.

Maximum depth is set by lifting residue wheel and moving adjustment lever down to increase depth or up to decrease depth in 1" (2.5 cm) increments (in relation to blade depth setting). Adjust all rows the same. Residue wheel down force is maintained by a torsion spring and is not adjustable.

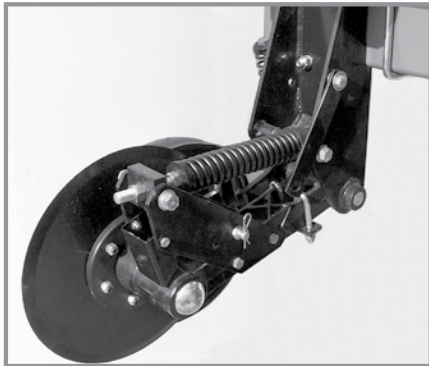
DEPTH/GAUGE WHEEL ATTACHMENT FOR NOTCHED SINGLE DISC FERTILIZER OPENER**Notched single disc opener depth/gauge wheel**

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

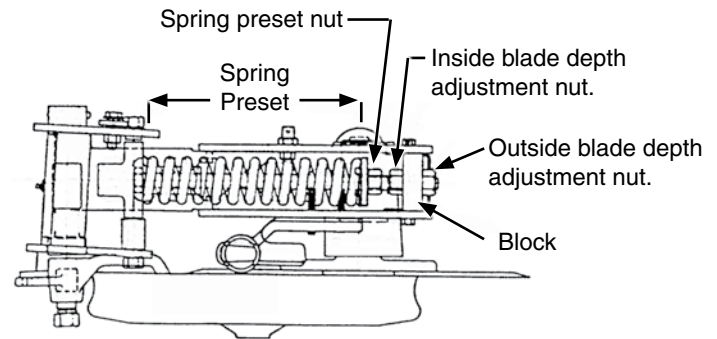
Depth adjustment is made using 3 adjustment holes in depth/gauge wheel mounting block. Moving depth/gauge wheel increases/decreases depth in approximate 1" (2.5 cm) increments in relation to blade depth setting made at vertical mounting post.



HD SINGLE DISC FERTILIZER OPENER



HD single disc opener



R.H. configuration shown (Overhead view)

Recommended placement of fertilizer with HD single disc fertilizer opener is 3½" - 4" (8.8 - 10.1 cm) from row.

NOTICE

Never place fertilizer closer than 2" (5 cm) to row or seeds may be damaged.

Maximum blade depth is approximately 5" (12.7 cm) with planter frame level and at 20" (50.8 cm) operating height. Soil conditions can affect depth slightly.

Raise planter to remove weight from fertilizer opener. Loosen inside adjustment nut with 1½" wrench. Turn outside nut clockwise to decrease or counterclockwise to increase blade depth. One full turn of blade depth adjustment nut changes blade depth ⅜". Tighten inside nut tight against block. Adjust all fertilizer openers to same depth.

Fertilizer opener down pressure can be adjusted from 250 lb (113.4 kg) to 640 lb (290.3 kg).

NOTICE

Do not operate HD single disc fertilizer openers at full down pressure tension on rocky ground or disc blades will chip.

NOTE: DO NOT adjust spring preset dimension less than 9½" (24.13 cm).

NOTE: Excessive down pressure can cause planter frame up-lift and affect machine performance. Planter frame should be 20" (50.8 cm) from ground in planting position. Excessive down pressure in loose soil conditions can cause openers to run too deep and push dirt ahead of opener and may stop soil press wheel and opener blade from turning.

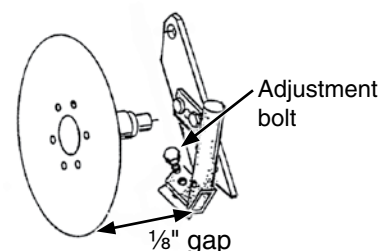
Raise planter to remove weight from fertilizer opener. Turn spring preset nut clockwise to increase and counterclockwise to decrease down pressure. Adjust all rows to a similar setting. Minimal spring pressure for acceptable operation is recommended. See chart for spring length setting specifications.

Adjust spring loaded dry fertilizer drop tube/scrapper periodically to maintain ⅛" (3 mm) gap between drop tube and opener blade. If this dimension is not maintained fertilizer may not drop in proper location.

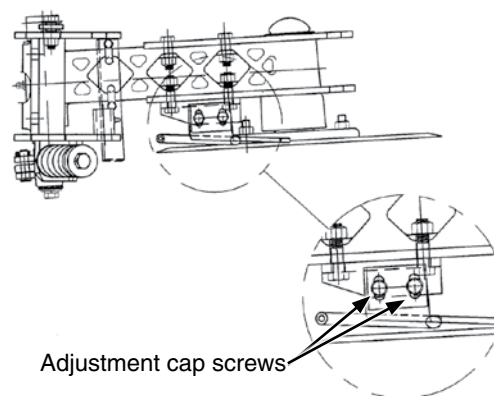
Loosen scraper adjustment bolt. Slotted hole in scraper allows up or down adjustment.

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Length	Down Pressure
11" (27.9 cm)	250 lb (113.4 kg)
10¾" (27.3 cm)	320 lb (145.1 kg)
*10½" (26.7 cm)	370 lb (167.8 kg)
10¼" (26 cm)	450 lb (204.1 kg)
10" (25.4 cm)	520 lb (235.8 kg)
9¾" (24.8 cm)	580 lb (263.1 kg)
9½" (24.1 cm)	640 lb (290.3 kg)
*Initial setting	

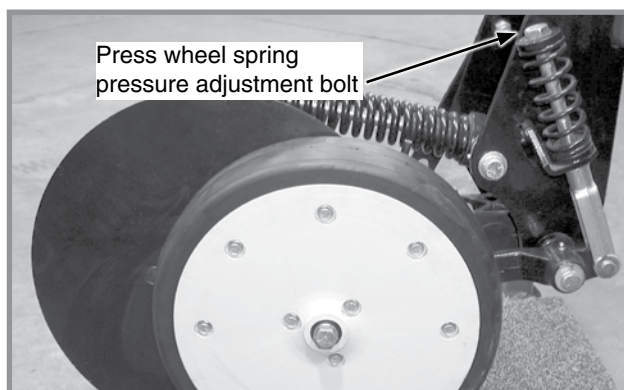


Adjust liquid drop tube/scrapper so there is slight contact between blade and scraper lower leading edge, and 1/4" (6.35 mm) clearance between liquid drop tube trailing edge and blade. Blade should turn with minimum amount of drag.



NOTE: Soil press wheel is not for gauging fertilizer opener operating depth.

Additional press wheel down pressure may be desirable in heavy moist soils. Turn press wheel spring adjustment bolt clockwise to increase down pressure.

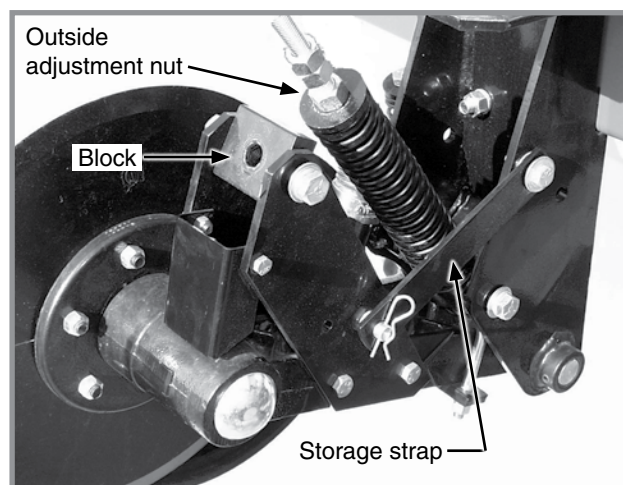


Soil press wheel down pressure adjustment

HD single disc fertilizer opener can be raised and locked up when fertilizer attachment is not used or during storage.

NOTE: A lockup bar automatically raises and locks soil press wheel when blade assembly is raised.

1. Place planter in planting position.
2. Remove outside blade depth adjustment.
3. Raise planter until adjustment bolt clears adjustment block.
4. Raise spring to clear blade assembly and raise blade assembly until storage strap can be positioned on lockup pin. Install hair pin clip.
5. Reinstall depth adjustment nut and tighten



Locking up HD single disc opener

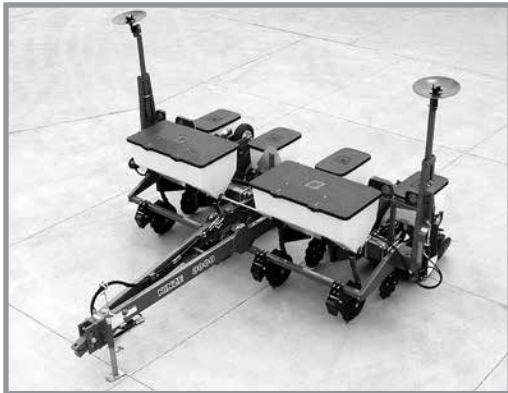
DRY FERTILIZER ATTACHMENT



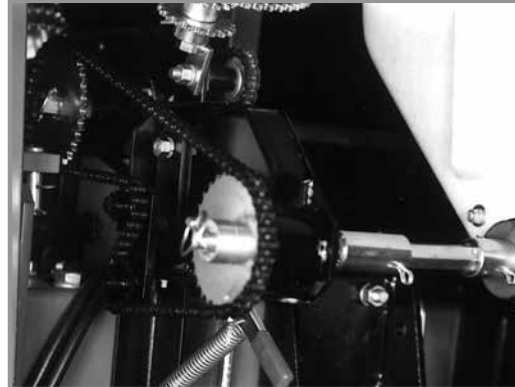
WARNING



Agricultural chemicals can cause death or serious injury to persons, animals, and plants or seriously damage soil, equipment, or property. Read and follow all chemical and equipment manufacturers labels and instructions.



Dry fertilizer option installed



Fertilizer drive rate transmission

Rate of fertilizer application is determined by drive/driven sprocket combination on fertilizer drive rate transmission and auger position in the hoppers.



Augers positioned for high rate delivery



Augers positioned for low rate delivery

NOTE: Uneven delivery of fertilizer will occur if high rate auger position is used at too low a rate setting.

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

A fertilizer transmission is located directly ahead of row unit transmission on right side of planter and allows simple, rapid changes in sprockets to obtain desired fertilizer application rates. Chain tension is controlled by a spring loaded idler adjusted with a ratchet arm located to inside of transmission. Sprockets can be changed with those on the sprocket storage rod by removing hexagon shaft pins. Fertilizer rate charts in Rate Chart section will help you select correct sprocket combinations.

NOTE: Make a field check after each sprocket combination adjustment to be sure you are applying fertilizer at desired rate.

NOTICE


Placing fertilizer too close to seeds or in excessive amounts can cause germination or seedling damage. Check with your fertilizer dealer or manufacturer for correct amount and placement.

Because dry fertilizer attachment meters granules by volume rather than weight, differences in brands, and fertilizer analysis, weight metered during actual application may vary considerably. Use chart for reference only. Use a container to catch and measure application for a better estimate.


Keep fertilizer dry during use and storage since most fertilizers easily absorb moisture. In addition to waste, deposits of fertilizer left in hopper can cause metal corrosion. Empty hoppers at end of each day.

GRANULAR CHEMICAL APPLICATION FIELD CHECK

Temperature, humidity, speed, ground conditions, flowability of different material, or meter obstructions can affect granular chemical rate of delivery.

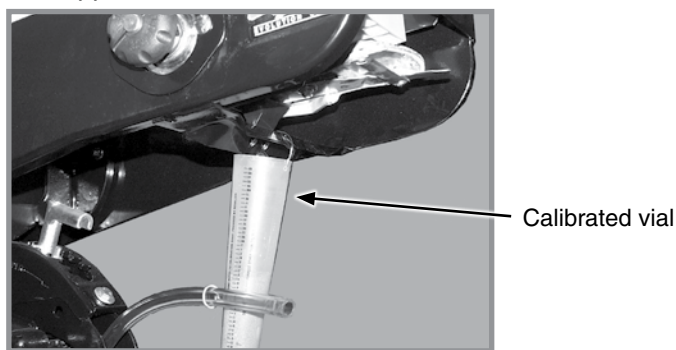


WARNING



Agricultural chemicals can cause death or serious injury to persons, animals, and plants or seriously damage soil, equipment, or property. Read and follow all chemical and equipment manufacturers labels and instructions.

Perform a field check to determine application rates.



Granular chemical field check

1. Fill insecticide and/or herbicide hoppers.
2. Attach a calibrated vial to each granular chemical meter.

NOTE: Disengage clutch to avoid dropping seed during test.

3. Lower planter and drive 1320 feet (402.336 meters) at planting speed.
4. Weigh chemical in ounces caught in one vial.
5. Multiply that amount by factor shown to determine pounds per acre.

Pounds Per Acre	
Row Width	Factor
30"	.83
36"	.69
38"	.65

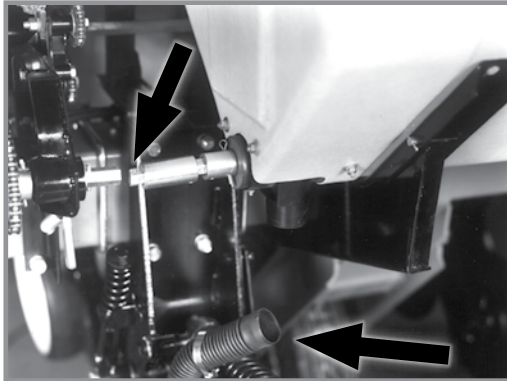
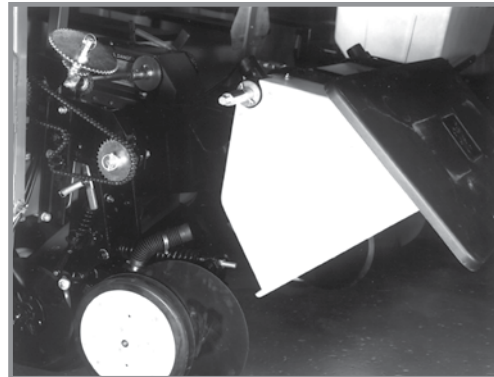
EXAMPLE: You are planting 30" rows. You have planted for 1320 feet at the desired planting speed. You caught 12.0 ounces of chemical in one vial. 12.0 ounces times 0.83 equals 9.96 pounds per acre.

NOTE: Check calibration of all rows.

METERING GATE

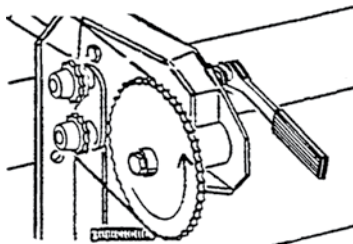
Use metering gate setting as a starting point for distributing insecticide or herbicide. Charts are based on 5 mph (8 kph) planting speed. Use a higher gate setting for speeds faster than 5 mph (8 kph) and a lower setting for speeds slower than 5 mph (8 kph).

CLEANING

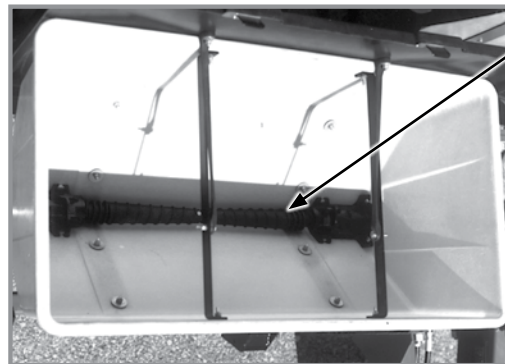
**Disconnect drive shaft and hoses****Rotate lid to back and rotate hopper forward**

Dry fertilizer hoppers tip forward for dumping and ease of cleaning. Disconnect drive shaft from transmission and/or adjacent hopper. LOOSEN HOSE CLAMPS AND REMOVE HOSES FROM EACH HOPPER. Remove rear $\frac{1}{2}$ " x $1\frac{1}{4}$ " cap screw from between each hopper saddle and hopper mount. Rotate each hopper lid to back side of hopper and carefully tip hopper forward. Flush all loose fertilizer from hoppers and hoses after dumping contents.

At end of planting season or when fertilizer attachment is not used for a period of time, hoppers should be disassembled, cleaned, and metal surfaces coated with a rust preventative. Remove $\frac{1}{4}$ " cotter pin and bearing from one end of 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 low or high rate position.



Transmission direction of rotation



Flighting must move chemicals from center to outside of hopper.

Auger installation

NOTE: Install auger assembly so the flighting moves material to outer openings in hopper when augers rotate in direction they turn during operation.

Slide auger assembly through outlet housing into hopper. Secure in place by reinstalling bearing and cotter pin. Rotating shaft in direction shown to see if flighting (spirals) on auger move toward ends of hopper. If not, remove auger assembly, turn 180° , and reinstall.

NOTE: Frequent lubrication of auger bearings is critical to ensure augers turn freely. Check lubrication section for frequency.

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

NOTE: Do not operate fertilizer attachment without auger baffles in place.

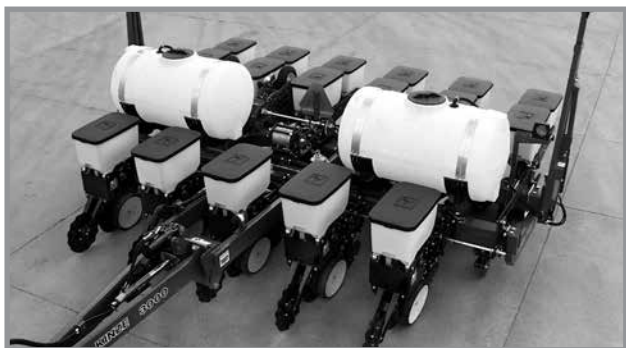
Install auger baffles over augers and secure in place with two hair pin clips in each hopper.

LIQUID FERTILIZER ATTACHMENT**WARNING**

Agricultural chemicals can cause death or serious injury to persons, animals, and plants or seriously damage soil, equipment, or property. Read and follow all chemical and equipment manufacturers labels and instructions.

**CAUTION**

Overfilling tank can cause siphoning, tank collapse, personal injury, and damage to property and equipment. Do not overfill tank. Do not leave planter unattended when filling tank. Close fill valve and open tank lid if siphoning occurs. Follow all chemical manufacturers first aid, cleanup, and handling instructions.



Liquid fertilizer option installed



Old style non-reparable
check valve



New style reparable
check valve

NOTE: Optional low rate check valves are available for in-line installation between liquid fertilizer squeeze or piston pump and openers to ensure equal distribution of product at low rates. Check valves also eliminate anti-siphon loops.

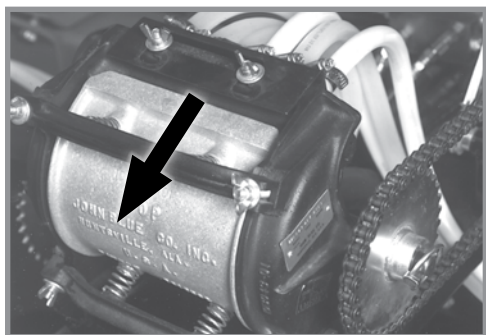
NOTICE

Placing fertilizer too close to seeds or in excessive amounts can cause germination or seedling damage. Check with your fertilizer dealer or manufacturer for correct amount and placement.

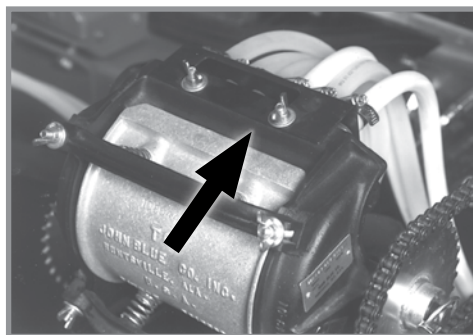
OPTIONAL SQUEEZE PUMP

Squeeze pump rate of liquid fertilizer application is determined by combination of sprockets on squeeze pump drive and driven shafts. Make sure sprockets are in alignment, sprocket retaining collars are tight, and chain is properly tensioned is when changing sprocket combinations. Close all shut-off valves when planter sits overnight or for extended periods of time. It is also important to close tank valves when servicing on pump or hoses.

NOTE: Delivery rate chart in Rate Chart section of this manual provides approximate application rate only. Delivery varies with temperature and fertilizer.



Discharge manifold rearward



Discharge manifold forward

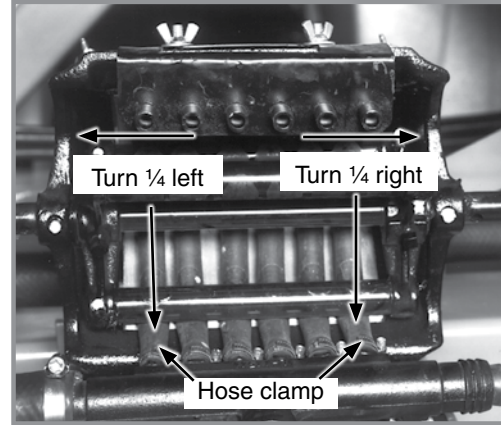
Discharge manifold must be repositioned rearward when not in use to prevent hose distortion and prolong hose life. Discharge manifold must be forward when pump is in operation. Loosen wing nuts and slide manifold forward and sideways or rearward as required and retighten wing nuts.

NOTICE

Avoid excessive pressure using quick fill attachment or rubber plugs installed in manifold may be forced out.

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

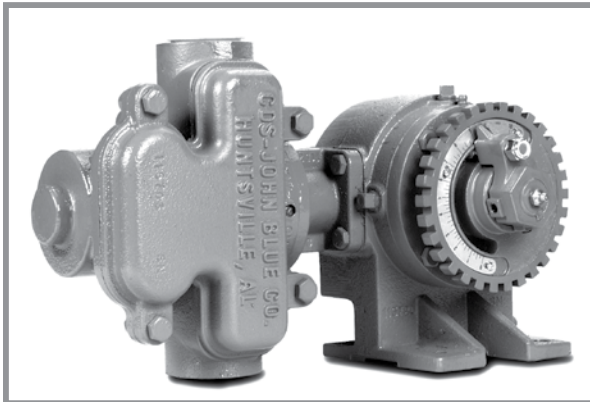
1. For right hand hose (facing pump from front of planter as shown) twist hose ¼ turn to right.
2. For left hand hose (facing front of pump) twist hose ¼ turn to left.
3. Retighten hose clamps.



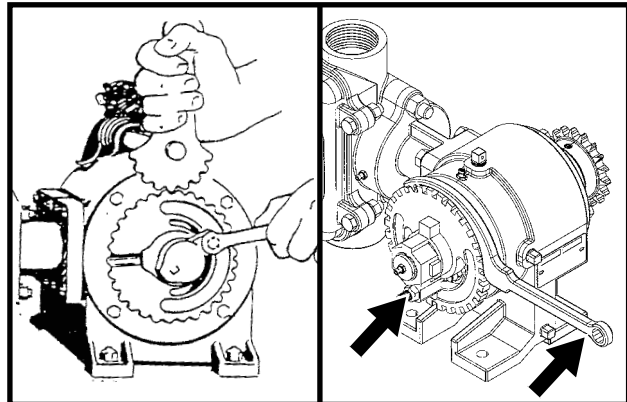
Adjusting squeeze pump end hoses

OPTIONAL PISTON PUMP

NOTE: Keep manuals shipped with pump and flow divider with this manual.



Piston pump



Adjusting delivery rate

NOTE: Delivery rate chart in Rate Chart section of this manual provides approximate application rate only. Delivery varies with temperature and fertilizer.

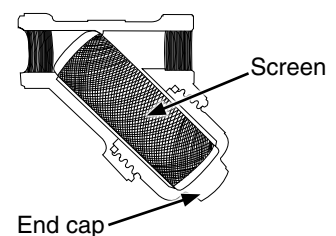
Loosen ⅝" lock nut that secures arm with pointer and rotate scale flange with adjustment wrench until pointer is over desired scale setting. Tighten ⅝" lock nut. **DO NOT OVERTIGHTEN.**

NOTE: Periodically check flow to all rows. Set rate is delivered to remaining rows if one or more lines are plugged.

CLEANING

Clean tanks, hoses, and metering pump thoroughly with water at end of planting season or prior to an extended period of non-use. Do not allow fertilizer to crystallize from cold temperature or evaporation.

On machines equipped with piston pump, take apart and clean strainer located between piston pump and ball valve daily. Remove the end cap to clean the screen. See Piston Pump Storage in Maintenance Section of this manual.



GENERAL PLANTING RATE INFORMATION

These planting rate charts apply to Kinze Model 3000 Rigid Frame Planters.

NOTICE

Sprocket combinations in these charts are for average conditions. Changes in sprocket combinations may be required for desired planting population. **ALWAYS MAKE FIELD CHECKS TO BE SURE YOU ARE PLANTING AT THE DESIRED RATE.**

NOTICE

Seed additives added in the hopper may affect finger pickup seed meter performance and accelerate wear.

NOTE: Seed size and shape may affect planting rate.

NOTE: Not all row spacings listed apply to all size planters.

Finger Pickup Corn Meter

Larger grades generally plant more accurately at the high end of the ground speed range than smaller grades. Higher than optimum speeds may result in population rate increase or higher incidence of doubles, particularly with small seed. Medium round corn seed is most desirable for planting accuracy at optimum speed.

Finger Pickup Oil Sunflower Meter

Larger grades generally plant more accurately at the high end of the ground speed range than smaller grades. Higher than optimum speeds may result in population rate increase or higher incidence of doubles, particularly with small seed. No. 3 and/or No. 4 size oil sunflower seeds are recommended for use in finger pickup seed meters equipped with oil sunflower fingers. No. 1 and/or No. 2 size confectionery sunflower seeds are recommended for use in finger pickup seed meters equipped with corn fingers.

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

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

NOTE: Speeds above 6.0 MPH (10 KPH) can adversely affect seed spacing.

NOTE: Planting speed can affect actual seeding rate. Make a field check and adjust transmission setting to obtain desired seed drop.

Standard Rate (1 To 1) 17 Tooth Drive Sprocket

When planting 30"/36"/38" (70/91/97 cm) rows with brush-type seed meters using 17 tooth standard rate (1 to 1) sprocket, use charts on page 5-3, 5-5, and 5-6. When planting 15"/18"/19" (38/46/48 cm) rows using 17 tooth sprocket, use chart on page 5-4.

Half Rate (2 To 1) 34 Tooth Drive Sprocket

When using 34 tooth half rate (2 to 1) sprocket with brush-type seed meters, seeding rate is approximately 50% of chart readings. ***Half rate (2 to 1) drive is recommended only when Interplant push units are used and desired population falls below that shown on planting rate charts.***

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

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

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

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

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

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

NOTE: Half Rate (2 To 1) Drive Reduction rates are approximately 50% of given numbers.

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

**PLANTING RATES FOR BRUSH-TYPE SEED METER (STANDARD DRIVE)
APPROXIMATE SEEDS/ACRE FOR 15"/18"/19" ROW WIDTHS**

Transmission Sprockets		60 Cell Soybean Or High-Rate Milo/ Grain Sorghum			Average Seed Spacing in Inches	48 Cell Specialty Soybean Or High-Rate Acid-Delinted Cotton			Average Seed Spacing in Inches	Speed Range (MPH)
Drive	Driven	15" Rows	18" Rows	19" Rows		15" Rows	18" Rows	19" Rows		
17	28	161,856	134,880	127,782	2.6	129,484	107,904	102,226	3.2	2 to 8
17	27	167,852	139,876	132,514	2.5	134,282	111,900	106,012	3.1	2 to 8
17	26	174,308	145,256	137,610	2.4	139,446	116,204	110,088	3.0	2 to 8
19	28	180,898	150,748	142,814	2.3	144,718	120,598	114,252	2.9	2 to 8
19	27	187,598	156,332	148,104	2.2	150,078	125,066	118,484	2.8	2 to 8
17	24	188,832	157,360	149,078	2.2	151,066	125,888	119,262	2.8	2 to 8
17	23	197,042	164,202	155,560	2.1	157,634	131,362	124,448	2.7	2 to 8
19	25	202,606	168,838	159,952	2.1	162,084	135,070	127,962	2.6	2 to 8
19	24	211,048	175,874	166,618	2.0	168,838	140,700	133,294	2.5	2 to 8
23	28	218,982	182,486	172,880	1.9	175,186	145,988	138,304	2.4	2 to 8
19	23	220,224	183,520	173,862	1.9	176,180	146,816	139,090	2.4	2 to 8
24	28	228,504	190,420	180,398	1.8	182,804	152,336	144,318	2.3	2 to 8
24	27	236,966	197,472	187,078	1.8	189,572	157,978	149,662	2.2	2 to 8
17	19	238,526	198,772	188,310	1.8	190,820	159,018	150,648	2.2	2 to 8
24	26	246,080	205,068	194,274	1.7	196,864	164,054	155,420	2.1	2 to 8
26	28	247,546	206,288	195,430	1.7	198,036	165,030	156,344	2.1	2 to 8
24	25	255,924	213,270	202,046	1.6	204,740	170,616	161,636	2.0	2 to 8
26	27	256,714	213,928	202,668	1.6	205,372	171,142	162,134	2.0	2 to 8
23	23	266,588	222,156	210,464	1.6	213,270	177,724	168,372	2.0	2 to 8
27	26	276,840	230,700	218,558	1.5	221,472	184,560	174,846	1.9	2 to 8
24	23	278,178	231,814	219,614	1.5	222,542	185,452	175,692	1.9	2 to 8
25	23	289,768	241,474	228,764	1.4	231,814	193,180	183,012	1.8	2 to 8
19	17	297,950	248,292	235,224	1.4	238,360	198,634	188,180	1.8	2 to 8
27	24	299,910	249,926	236,772	1.4	239,928	199,940	189,418	1.7	2 to 8
28	24	311,018	259,182	245,540	1.3	248,814	207,346	196,432	1.7	2 to 8
23	19	322,710	268,926	254,772	1.3	258,168	215,140	203,818	1.6	2 to 8
28	23	324,540	270,450	256,216	1.3	259,632	216,360	204,966	1.6	2 to 8
24	19	336,742	280,618	265,848	1.2	269,392	224,494	212,678	1.6	2 to 8
25	19	350,772	292,310	276,926	1.2	280,618	233,848	221,540	1.5	2 to 8
23	17	360,676	300,564	284,744	1.2	288,540	240,452	227,796	1.5	2 to 8
26	19	364,804	304,002	288,002	1.1	291,844	243,202	230,402	1.4	2 to 7
27	19	378,834	315,756	297,080	1.1	303,068	252,556	237,664	1.4	2 to 7
28	19	392,866	327,388	310,156	1.1	314,292	261,910	248,124	1.3	2 to 7
26	17	407,722	339,768	321,886	1.0	326,178	271,814	257,508	1.3	2 to 7
27	17	423,404	352,836	334,266	0.9	338,724	282,268	267,412	1.2	2 to 7
28	17	439,084	365,904	346,646	0.9	351,268	292,724	277,316	1.2	2 to 7

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

NOTE: Half Rate (2 To 1) Drive Reduction rates are approximately 50% of given numbers.

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

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

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

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

NOTE: Half Rate (2 To 1) Drive Reduction rates are approximately 50% of given numbers.

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

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

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

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

To determine population per acre, determine average seeds per hill and hills per acre by doing a field check. Measure $\frac{1}{1000}$ of an acre ($\frac{1}{1000}$ acre = Length of row 17' 5" for 30" row widths, 14' 6" for 36" row widths and 13' 10" for 38" row widths). Multiply average seeds per hill by hills per acre. EXAMPLE: 4 seeds per hill x (13 hills x 1000) = 52,000

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

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

NOTE: Half Rate (2 To 1) Drive Reduction rates are approximately 50% of given numbers.

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

PLANTING RATES FOR BRUSH-TYPE SEED METERS (HALF RATE DRIVE)
APPROXIMATE SEEDS/ACRE FOR 15" ROW WIDTH

Transmission Sprockets		Population Factor	Rye 400 SDS/REV, 35.9 SDS/GRAM		Wheat 465 SDS/REV, 39.6 SDS/GRAM		Speed Range (MPH)
Drive	Driven		Population (sds/acre)	Population (lbs/acre)	Population (sds/acre)	Population (lbs/acre)	
19	17	2482.92	993,399	61	1,155,079	64	4 to 6
28	25	2488.15	995,490	61	1,157,511	64	4 to 6
27	24	2499.26	999,934	61	1,162,678	65	4 to 6
26	23	2511.33	1,004,765	62	1,168,295	65	4 to 6
17	15	2517.77	1,007,341	62	1,171,291	65	4 to 6
28	24	2591.82	1,036,969	64	1,205,741	67	4 to 6
27	23	2607.92	1,043,409	64	1,213,230	68	4 to 6
23	19	2689.26	1,075,952	66	1,251,069	70	4 to 6
28	23	2704.51	1,082,054	67	1,258,164	70	4 to 6
24	19	2806.18	1,122,733	69	1,305,464	73	4 to 6
19	15	2813.98	1,125,852	69	1,309,090	73	4 to 6
25	19	2923.10	1,169,513	72	1,359,857	76	4 to 6
23	17	3005.64	1,202,535	74	1,398,254	78	4 to 6
26	19	3040.03	1,216,294	75	1,414,252	79	4 to 6
24	17	3136.32	1,254,820	77	1,459,048	81	4 to 6
27	19	3156.95	1,263,075	78	1,468,647	82	4 to 6
25	17	3267.00	1,307,103	80	1,519,841	85	4 to 6
28	19	3273.88	1,309,855	81	1,523,041	85	4 to 6
26	17	3397.68	1,359,388	84	1,580,635	88	4 to 6
23	15	3406.39	1,362,873	84	1,584,687	88	4 to 6
27	17	3528.36	1,411,671	87	1,641,428	91	4 to 6
24	15	3554.50	1,422,128	87	1,653,587	92	4 to 6
28	17	3659.04	1,463,956	90	1,702,222	95	4 to 6
25	15	3702.60	1,481,384	91	1,722,487	96	4 to 6
26	15	3850.70	1,540,639	95	1,791,386	100	4 to 6
27	15	3998.81	1,599,895	98	1,860,286	104	4 to 6
28	15	4146.91	1,659,150	102	1,929,185	107	4 to 6

NOTE: Seed size and type affect the output rate of the meter. For a method to improve the population accuracy with your desired seed, please see the following pages.

NOTE: See "Mechanical Meter General Planting Rate Information" and "Check Seed Population" pages for additional information.

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

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

To more accurately predict population when using the 54 Cell Wheat disc, two things are needed:

1. Seeds/gram
2. Grams/revolution of seed disc

Seeds per gram can be found by weighing a small sample of desired seed (a cup or less) and counting number of seeds in sample.

$$\frac{\text{Seeds}}{\text{Grams}} = \frac{\text{number of seeds in sample}}{\text{weight of sample in grams}} \quad \frac{396 \text{ Seeds}}{10 \text{ Grams}} = 39.6 \frac{\text{seeds}}{\text{gram}}$$

To find grams/revolution a gram scale, a stopwatch, a small container to catch seed, and a method for spinning the meter at a constant, known rpm (see your local Kinze dealer with a T4000 Seed Meter Test Stand) are needed.

1. Zero gram scale with the small container on it.
2. Load meter with correct disc.
3. Load meter with desired seed.
4. Start spinning meter at a known, constant rpm.
5. Start stopwatch as you place container under meter.
6. Catch seed with container for 10-30 seconds.
7. Stop the stopwatch as you remove container from underneath meter.
8. Weigh container.
9. Enter meter rpm, weight of sample, and duration of sample collection into the equation below:

$$\frac{\text{Grams}}{\text{Rev}} = \frac{\text{Sample Weight} * 60}{\text{Disc RPM} * \text{Sample Duration}}$$

EX: For a sample taken for 30 seconds with meter spinning at 50rpm and weighs 293 grams

$$\frac{293 \text{ Grams} * 60}{50 \text{ RPM} * 30 \text{ Seconds}} = 11.7 \frac{\text{Grams}}{\text{Rev}}$$

10. Find desired output rate. For seeds per acre, use seeds/rev. For pounds per acre, use lbs/rev.

a. Seeds/rev:

$$\frac{\text{Seeds}}{\text{Rev}} = \frac{\text{Seeds}}{\text{Grams}} * \frac{\text{Grams}}{\text{Rev}} \quad 39.6 \frac{\text{Seeds}}{\text{Grams}} * 11.7 \frac{\text{Grams}}{\text{Rev}} = 465 \frac{\text{Seeds}}{\text{Rev}}$$

b. Lbs./rev:

$$\frac{\text{Pounds}}{\text{Rev}} = \frac{\frac{\text{Grams}}{\text{Rev}}}{453.6 \frac{\text{Grams}}{\text{Pound}}} \quad \frac{11.7 \frac{\text{Grams}}{\text{Rev}}}{453.6 \frac{\text{Grams}}{\text{Pound}}} = 0.0258 \frac{\text{Pounds}}{\text{Rev}}$$

11. Find the correct population factor by dividing the desired population by the measured output rate.

Seeds/acre:

$$\frac{\text{Target Population}}{\text{Output Rate}} = \text{Population Factor} \quad \left| \quad \frac{1,000,000 \frac{\text{Seeds}}{\text{Acre}}}{465 \frac{\text{Seeds}}{\text{Rev.}}} = 2150.54 \right.$$

pounds/acre:

$$\frac{\text{Target Population}}{\text{Output Rate}} = \text{Population Factor} \quad \left| \quad \frac{56 \frac{\text{lbs}}{\text{Acre}}}{0.0258 \frac{\text{lbs}}{\text{rev}}} = 2170.54 \right.$$

12. Find the closest Population Factor in the Rate Chart to identify the correct transmission sprockets.
For the examples list above, the closest Population Factor is 2142.22 which corresponds to a 27 tooth Drive sprocket and 28 tooth Driven sprocket.

NOTE: Multiple trials are recommended to increase the accuracy of the predicted rate.

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: Above chart represents average values and should be used only as a starting point. Granular chemical flows through given meter opening at a nearly uniform rate regardless of roller speed. Your actual rate will vary with specific insecticide, planting speed, and plant population. Planting speed/ground speed has the greatest effect on application rate.

Your actual rate must be field checked with actual insecticide you are using at speed and population you are planting. See "Checking Granular Chemical Application Rate" for additional information.

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: Above chart represents average values and should be used only as a starting point. Granular chemical flows through given meter opening at a nearly uniform rate regardless of roller speed. Your actual rate will vary depending on specific herbicide, planting speed, and plant population. Planting speed/ground speed has the greatest effect on application rate.

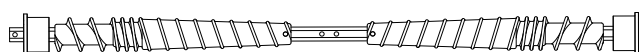
Your actual rate must be field checked with actual herbicide you are using at speed and population you are planting. See "Checking Granular Chemical Application Rate" page for additional information.

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



High rate setting



Low rate setting

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

Above chart is for planters equipped with contact drive. Check tires for correct operating pressure.

Chart calculated with a bulk density of 65 pounds per cubic foot.

NOTE: Fertilizer application rates can vary from weights calculated in above chart. Make field checks to be sure you are applying fertilizer at desired rate.

To check exact number of pounds your fertilizer attachment will actually deliver on a 30" row spacing:

1. Remove one spout from one fertilizer hopper and attach a container under opening.
2. Engage fertilizer attachment and drive forward 174'.
3. Weigh amount of fertilizer caught in container and multiply by 100. Result is pounds of fertilizer delivered per acre when planting in 30" rows. To convert this delivery rate for wider rows, multiply by following conversion factors:

36" multiply by 0.83

38" multiply by 0.79

LIQUID FERTILIZER SQUEEZE PUMP APPLICATION RATES**GALLONS PER ACRE**

Drive	Driven	30" 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.

Above chart is for planters equipped with contact drive. Check tires for correct operating pressure.

Chart 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:

1. Remove hose from one fertilizer opener and insert it into a collection container secured planter frame.
2. Engage fertilizer attachment and drive forward for 174'.
3. Measure fluid ounces caught in container and multiply by 100. Divide that amount by 128. Result is gallons of fertilizer delivered per acre when planting in 30" rows.
4. Rinse collection container and repeat test on other rows if necessary. To convert delivery rate for wider rows, multiply by following conversion factors:

36" multiply by 0.83

38" multiply by 0.79

LIQUID FERTILIZER PISTON PUMP APPLICATION RATES GALLONS PER ACRE

Applies to Model LM-2455-R And NGP-6055 Pump 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

Above chart is for planters equipped with contact drive. Check tires for correct operating pressure.

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: Periodically check flow to all rows. Desired rate is delivered to remaining rows keeping total application rate at desired rate if one or more lines are plugged.

To check exact number of gallons your fertilizer attachment delivers on a 30" row spacing:

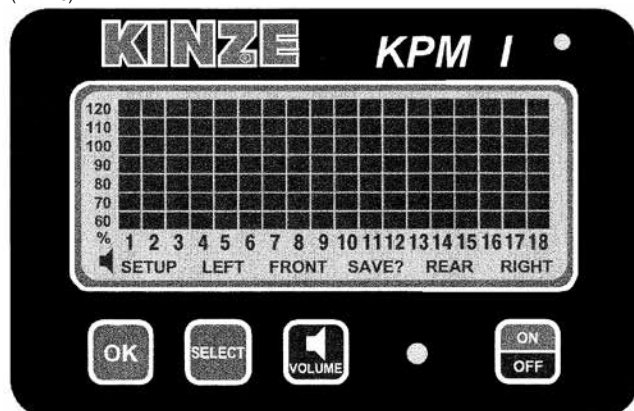
1. Remove hose from one fertilizer opener and insert it into a collection container secured to planter frame.
2. Engage fertilizer attachment and drive forward for 174'.
3. Measure fluid ounces caught in container and multiply by 100. Divide that by 128. Result is gallons of fertilizer delivered per acre when planting in 30" rows.
4. Rinse collection container and repeat test on other rows if necessary. To convert delivery rate for wider rows, multiply by following conversion factors:

36" multiply by 0.83

38" multiply by 0.79

KPM I ELECTRONIC SEED MONITOR

(MTR28)



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

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, number of monitored rows per section, relative seed rate for each row (using a bar graph display) and scrolls various alarm and warning messages. A continuous audible alarm sounds upon system malfunction or underflow conditions for any monitored row. Alarms must be acknowledged by the user.

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

NOTE: All 3000 Series primary harnesses are hard-wired into the safety/warning light harness or control console harness included as standard equipment with the planter.

Changing Audible Alarm Volume	6-2
Field Operation	6-4
LCD Functions	6-1
Monitor Key Functions	6-1
Programming/Connecting Seed Tubes	6-4
Replacing a Faulty Sensor	6-3
Warnings and Alarms	6-2

MONITOR KEY FUNCTIONS

Each key press is acknowledged with a short beep.

OK

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

SELECT

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

VOLUME

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

ON/OFF

- Powers unit on and off.

LCD FUNCTIONS

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

Information about 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 not selected. The selected section continuously displays on the LCD.

EXAMPLE: System is setup to display rear/front sections. Press SELECT key. FRONT icon flashes and REAR section displays on the bar graph. After 1 minute FRONT icon stops flashing. The monitor stays in REAR only display through power down and power up. Each time the monitor is turned on while in REAR only mode, FRONT icon flashes for 1 minute. If seed flow is sensed in the FRONT section while planting, FRONT icon resumes flashing.

STEP 2 Press SELECT key again to activate both sections.

EXAMPLE: Press SELECT key a second time. Information about each section displays alternately every 5 seconds.

For simple applications, where only one section is programmed, the display automatically locks on that section. Pressing SELECT key has 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 AUDIBLE ALARM VOLUME

STEP 1 Press and hold down the VOLUME key.

STEP 2 SETUP and VOLUME icons turn on and alarm sounds continuously. Sound intensity changes every 2 seconds. After maximum volume is reached, the next change sets the volume to minimum and continues to get louder every 2 seconds. When 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 turns audible alarm off. The row number continues 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. Three data communication bus errors are:

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

- 2. Under Flow Alarms** - If seed rate for one or more rows is less than 55% of the calculated average, the corresponding 60% segment stays 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 displays. 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" displays if any one or more rows is between 0% and 10%. This allows the user to identify and fix problem rows.

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

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

3. Multiple Alarms - If more than one alarm condition occurs at the same time, pushing the OK key acknowledges all alarms currently displayed. For example, if one row on the front and one row on the rear are alarming, pushing the OK key only acknowledges 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 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 alarms are acknowledged and if alarm condition is still present, LCD continues to display alarm condition.

REPLACING A FAULTY SENSOR

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

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

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

FIELD OPERATION

(MTR28e/MTR28c/MTR28d/MTR28b)

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



Information regarding each section is displayed alternately every 5 seconds.

REAR/FRONT CONFIGURATION

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



LEFT/RIGHT CONFIGURATION

- Press SELECT key once to show LEFT section only.
- Press SELECT key a second time to show RIGHT section only.
- Press 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 VOLUME key to increase or decrease volume. See "Changing The Audible Alarm Volume".



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



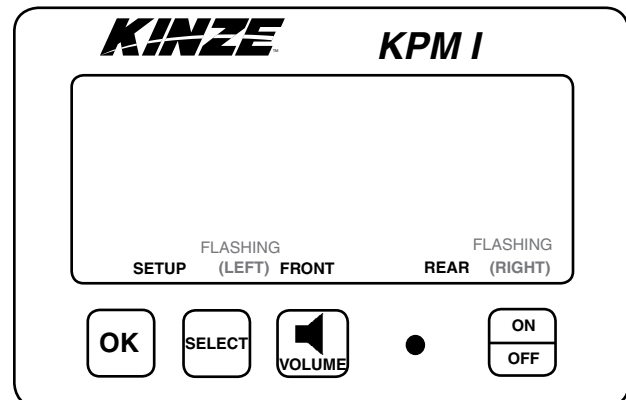
PROGRAMMING/CONNECTING SEED TUBES

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

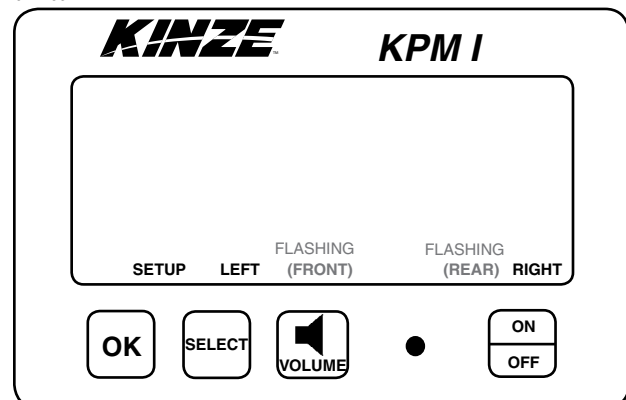
STEP 2 Press ON key. The monitor automatically enters the setup procedure. If the monitor was accidentally powered on with no sensors attached, the user can turn the monitor off at this point and the previous configuration is not lost.

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

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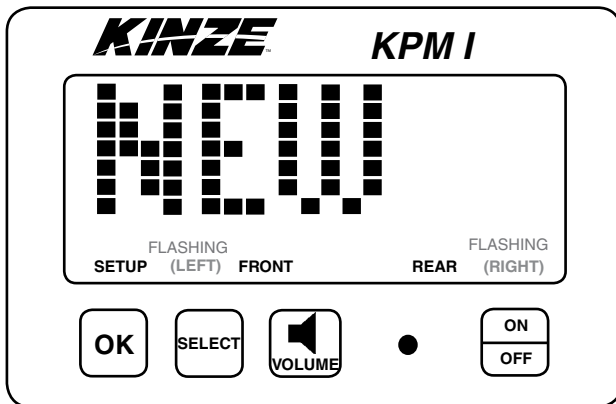
01229911



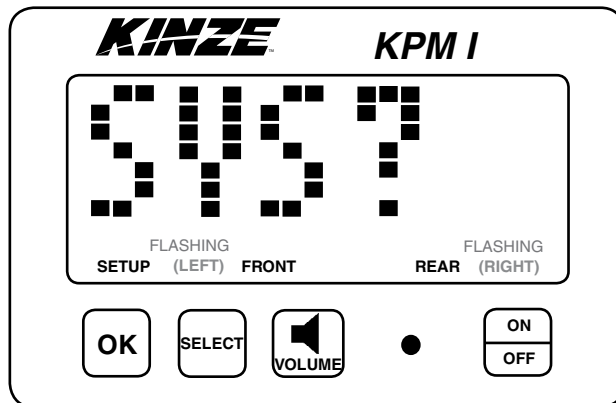
NOTE: Model 3000 planters use rear configuration only. When Interplant® Package rows are in use, select rear/front configurations. When all rows can be viewed on a single display (rear), pressing the select key has no function.

STEP 4 Press and hold the OK key to confirm selection and continue holding until row numbers display. During confirmation, the display alternates between “NEW” and “SYS” to alert the user that the previous configuration will be lost. With 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.

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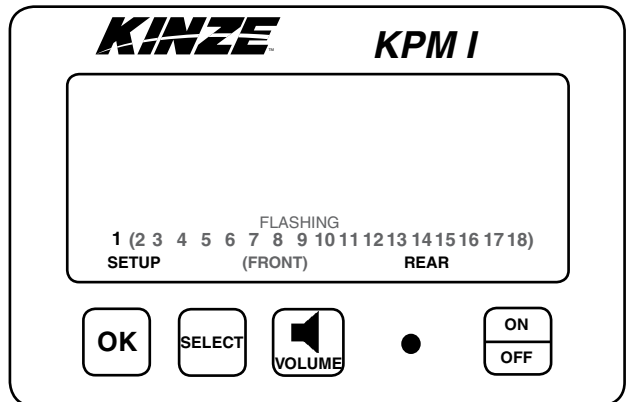


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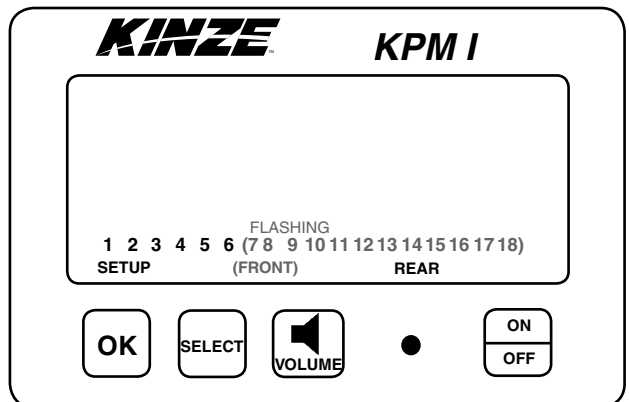
STEP 5 Plug each seed tube w/sensor into the harness in a predetermined order. Row 1 first, row 2 second and so on up to 18 rows. When a sensor is plugged in, the corresponding row number on the LCD display will stay solid, the monitor will chirp twice and the LED (Light Emitting Diode) on the seed tube 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.

01229915



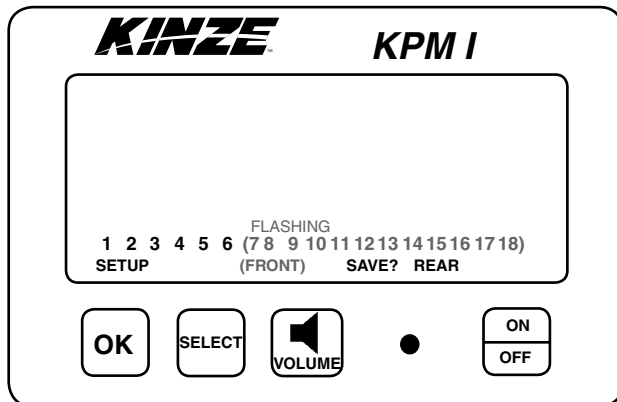
STEP 6 When all the seed tubes w/sensors for the current section are installed, check to be sure the monitor displays solid numbers for the number of sensors connected.

01229916

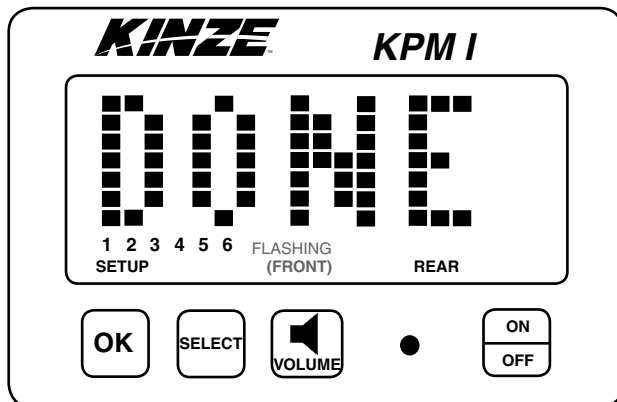


STEP 7 If this condition is satisfied, press and hold the OK key to save the setup for the current section. The SAVE? icon shows followed by continuous short beeps indicating monitor is preparing to save. The installer has 5 seconds to decide to save the current configuration. During this time the short 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 continues with the second section installation.

01229917

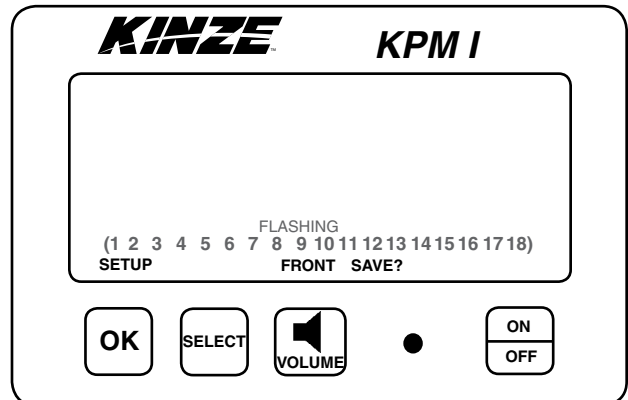


01229918

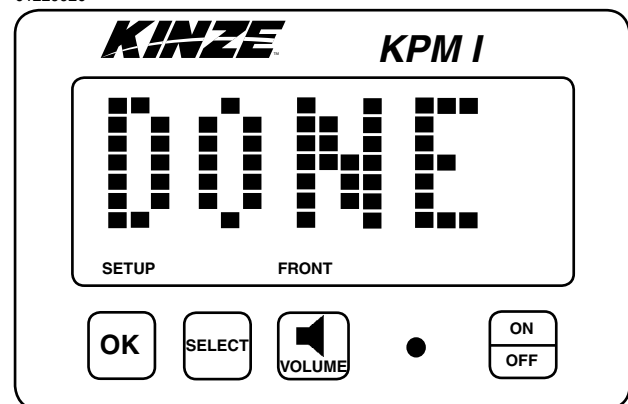


STEP 8 Follow STEPS 5 through 7 to install the second section. If no seed tubes are installed on the second section, press and hold the OK key until “DONE” shows on the screen followed by a long beep and the SAVE? icon turns off.

01229919



01229920

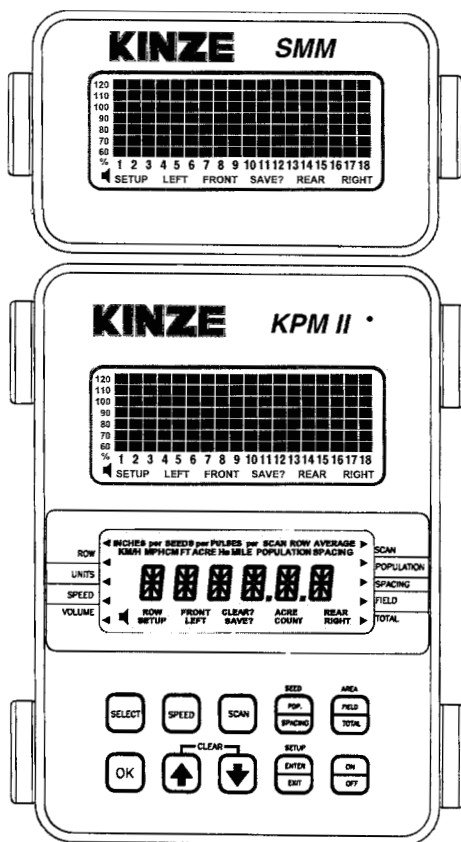


NOTE: Individual seed tubes may be unplugged for special situations. An alarm sounds which can be silenced by touching the OK key. The monitor recognizes each seed tube when reconnected.

See “KPM I/KPM II Stack-Mode Electronic Seed Monitor Troubleshooting” in the Troubleshooting section of this manual.

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 tractor mounted KPM II Stack-Mode console; (b) seed tubes with sensors installed in each row unit; (c) a magnetic distance sensor installed on the planter, or a radar distance sensor installed on the tractor; (d) shaft rotation sensors installed on drill shafts; and (e) a planter harness (junction Y-harness and/or extension harness where applicable), connected to individual seed tube sensors. The primary harness connecting 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 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 software design of the KPM II Stack-Mode console allows use of an add-on SMM console for simultaneous viewing of 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 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 powers down if no activity is detected within one hour. No activity means there has been no new seed flow and no operator push key input.

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MONITOR KEY FUNCTIONS

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

SELECT

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

SPEED

- Immediately displays 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 display shows functions other than average seed population or spacing, pressing SCAN sequentially displays speed, average seed population and average seed spacing.
- Pressing a second time freezes display on the current row.
- Pressing a third time restarts 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

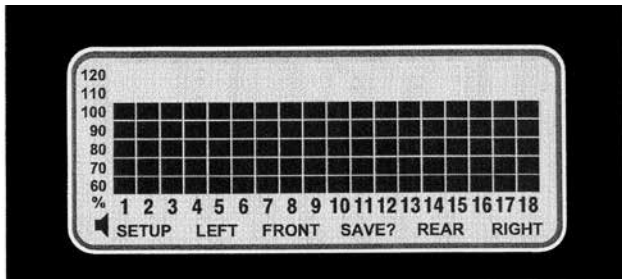
- Enters and exits the programming mode.

ON/OFF

- Powers 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 alternates every 5 seconds between a pair of sections. The select key locks 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.

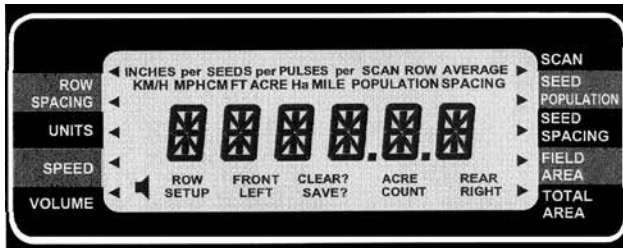
STEP 2 Press SELECT key again to activate both sections.

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

NOTE: When alternating between two sections, the display locks 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)



- UP and DOWN arrow keys sequentially change what is displayed on the lower LCD. Pressing UP or DOWN arrow keys 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 is displayed on the LCD. Pressing the UP arrow key moves the icon to UNITS. The display changes to display all 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 causes a sequential display of each individual row. Pressing the SCAN key a second time freezes the display on the currently displayed row. UP or DOWN arrow keys can be used to change the currently displayed row. Pressing the SCAN key restarts automatic advancing of the scan function.
- Pressing the SCAN key while displaying speed causes a sequential display of speed, average planter population, and average seed spacing. Pressing the SCAN key a second time freezes 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.

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 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 appears as follows:

092597-21



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

**PROGRAMMING - CHANGING AUDIBLE
ALARM VOLUME**

STEP 1 To enter programming mode, press and hold the SETUP key. The monitor emits 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: 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 UP or DOWN arrow keys to move the flashing arrow to VOLUME. As the arrow icon moves, the lower LCD displays the current setting of the selected item.

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

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

- Use 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 restores the lower LCD to show the item setting and the arrow icon flashes, allowing the user to select another item to program.

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

NOTE: Programming mode may be exited at any time, by pressing the SETUP key. Pressing this key returns 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 - UNITS (METRIC OR ENGLISH)

STEP 1 Press and hold SETUP key to enter programming mode. The monitor emits 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 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 audible alarm sounds.

NOTE: Lower LCD alternately displays Metric or English icons, indicating Metric or English mode.

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

STEP 4 Press and release the OK key to exit without saving. The monitor restores lower LCD to show item setting, and the arrow icon flashes, allowing user to select another item to program.

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

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

PROGRAMMING - ROW SPACING

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

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

When monitor is in normal field operation mode, disabling the front section automatically changes 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: 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 UP or DOWN arrow keys to move flashing arrow to ROW SPACING. As arrow icon moves, lower LCD displays current setting of selected item.

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

NOTE: Lower LCD displays current row spacing (in inches or centimeters) and ROW SPACING icon is turned on.

- Least significant digit of displayed value blinks.
- This value can be changed by pressing UP or DOWN arrow keys.
- Once digit is correct, press MODE SELECT key and blinking digit moves to next significant digit, where process can be repeated.

NOTE: The monitor limits entry of row spacing from 10.0 inches (25.4 cm) to 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 restores 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 revert to original programmed value.

PROGRAMMING - SPEED

STEP 1 Press and hold SETUP key to enter programming mode. Monitor emits 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 the user can select an item to program.

NOTE: 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 UP or DOWN arrow keys to move flashing arrow to SPEED. As arrow icon moves, lower LCD displays selected item current setting.

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 PPM/PPKM in the monitor to make speed agree can cause serious errors in acre/hectare and population counts.* Do field checks to verify populations and seed spacings.

NOTE: Monitor defaults to 500 PPM (310 PPKM) on new system installations. This must be changed to obtain accurate readings.

- 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 UP and DOWN arrow keys at the same time and hold them down until CLEAR? icon displays and monitor beeps several times. Monitor emits a long beep and 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 emits several short beeps and SAVE? icon is turned on. After a short time a long beep is heard, and the lower LCD displays "DONE". Release the OK key. If the OK key is released BEFORE "DONE" is displayed, changes WILL NOT BE SAVED. "DONE" MUST be displayed for save to have occurred.

NOTE: Programming mode may be exited at any time by pressing the SETUP key. Pressing this key returns monitor normal operation. All items changed and saved come into effect immediately. Any items changed, but not saved revert to 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 UP or DOWN arrow keys.
- Once digit is correct, press the SELECT key and the blinking digit moves to the next significant digit, where the process can be repeated.

Pulses per mile or kilometer are limited to a range from 500 PPM (310 PPKM) to 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: 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 tUP or DOWN arrow keys to move 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 flashing arrow becomes solid and audible alarm sounds.

- 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 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 emits 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: Programming mode may be exited at any tim by pressing the SETUP key. Pressing this key returns the monitor to its normal operation. All items changed and saved come into effect immediately. Any items changed, but not saved revert to 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) signal cable from back of console is connected to a sensing switch (Part No. G1K249 Acre Counter Switch Kit) instead of seed tubes and (c) implement width in feet (or meters) is programmed into monitor, monitor functions as an area counter.

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 again shows 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 displays "PICKUP" or "RADAR", depending on type of sensor installed, and the audible alarm sounds. The user can push the OK key to acknowledge the alarm. When the distance sensor is faulty, the monitor changes to a bar graph only mode where 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" displays.

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	Data communication lead (green) shorted to power lead (white).
SYS LO	Data communication lead (green) shorted to ground lead (black).
SYS EC	Internal error detected.
COP	Power cycled ON/OFF too quickly.

- 2. Under Flow Alarms** - If seed rate for one or more rows is less than 55% of calculated average, 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: Alarms present before planting stops are frozen on screen and LOW or FAIL displays on the LCD. If under flow is between 0% and 10%, this warrants a "FAIL" condition. If under flow is between 10% and 55%, a "LOW" condition is generated. If multiple rows have an under flow condition, "FAIL" displays if one or more rows is between 0% and 10%. This allows the user to identify and fix problem rows.

NOTE: 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 acknowledges all alarms. For example, if one row on the front and one row on the rear are alarming, pushing the OK key only acknowledges 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.

FIELD OPERATION

Press ON/OFF key to turn monitor on. Information regarding each section is displayed alternately every 5 seconds.



(MTR28e)

REAR/FRONT CONFIGURATION (Without SMM Console Installed)

- Press SELECT key once to show REAR section only. (Monitor sets correct row spacing.)
- Press 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 SELECT key a third time to show REAR section only.



(MTR28c)

REAR/FRONT CONFIGURATION (With SMM Console Installed)

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



(MTR28c)

FOUR SECTION CONFIGURATION (With SMM Console Installed)

- Press 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 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 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.

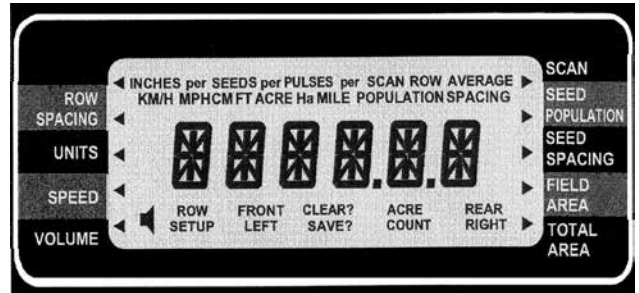


(MTR28c)

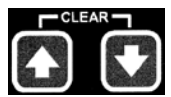
NOTE: SELECT key has no function when a single section is used.

Lower LCD shows speed (MPH or KM/H) at power up.

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



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



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



(MTR29c/MTR29d/MTR29b/MTR29c)

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



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



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

Press SCAN key again to lock on current row.



Press SCAN key again to resume scrolling.

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



Press 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 UP and DOWN arrow keys at the same time and hold them down for a short period of time to clear data. The CLEAR? icon displays and the monitor beeps several times. When data is actually cleared, the monitor emits 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”.



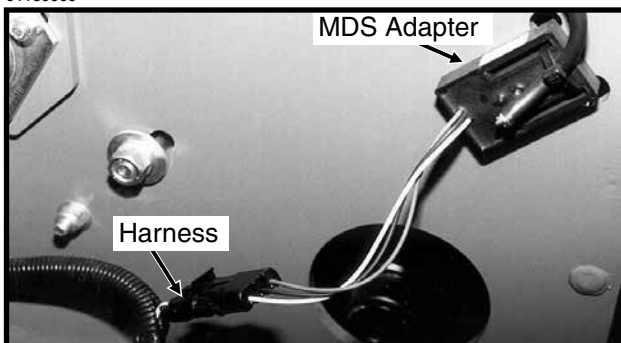
PROGRAMMING/CONNECTING SMM CONSOLE, SHAFT ROTATION SENSORS, SEED TUBES AND/OR RADAR/MAGNETIC DISTANCE SENSORS

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



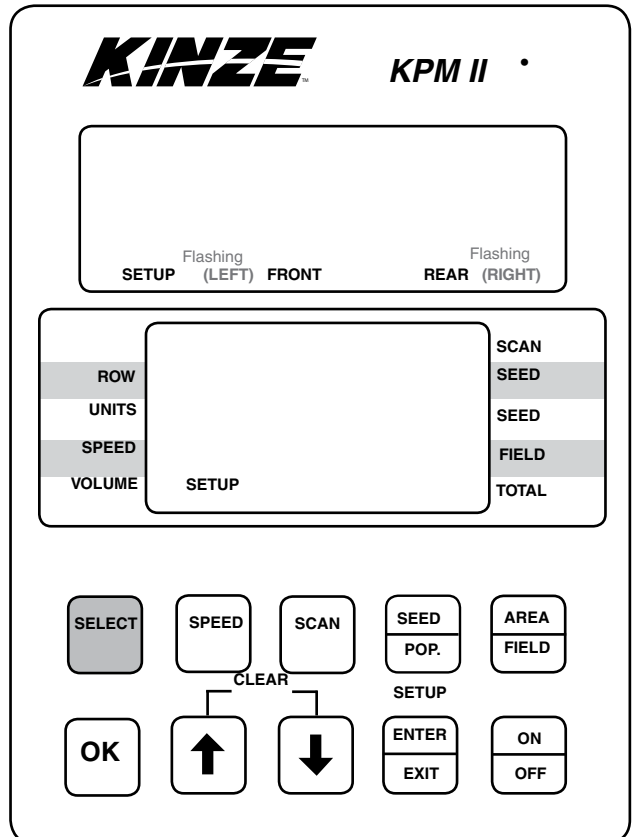
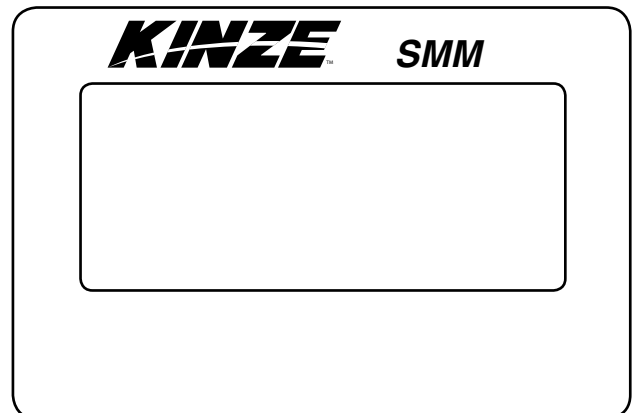
01189910



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

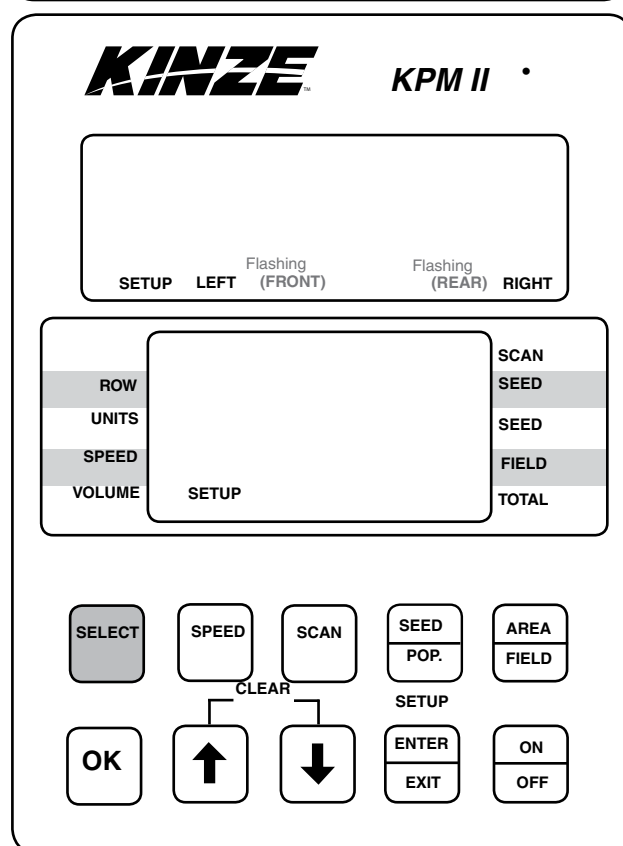
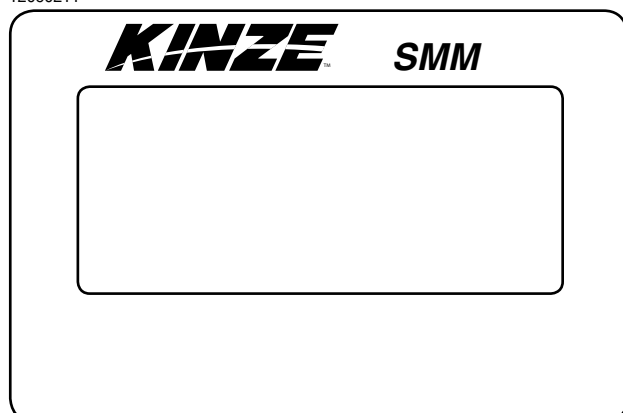
STEP 3 The monitor automatically defaults to rear/front. Press **SELECT** key once for left/right and twice for four sections (front right/front left/rear right/rear left). The selected display will be solid and configuration not currently selected will be flashing.

12060211



NOTE: SMM console may not apply to all models.

12060211



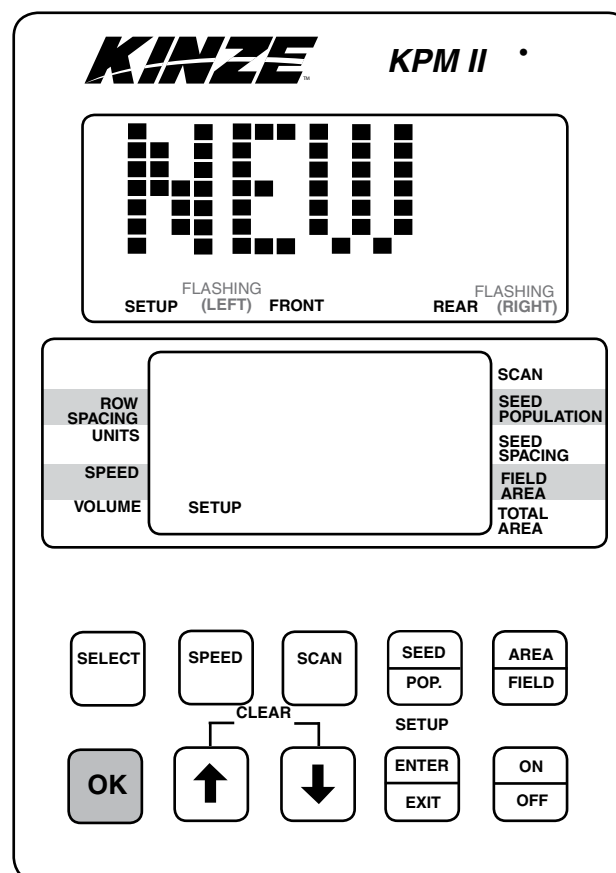
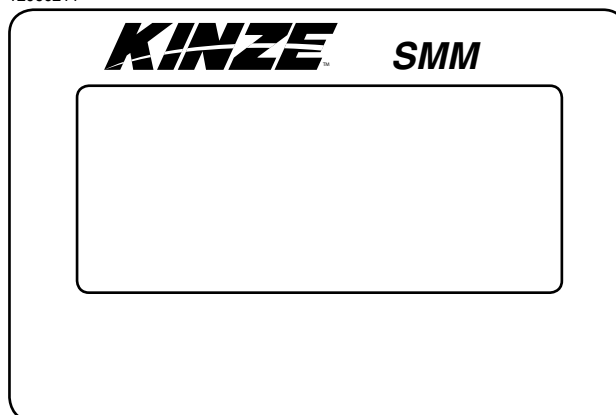
NOTE: SMM console may not be applicable to all models.

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

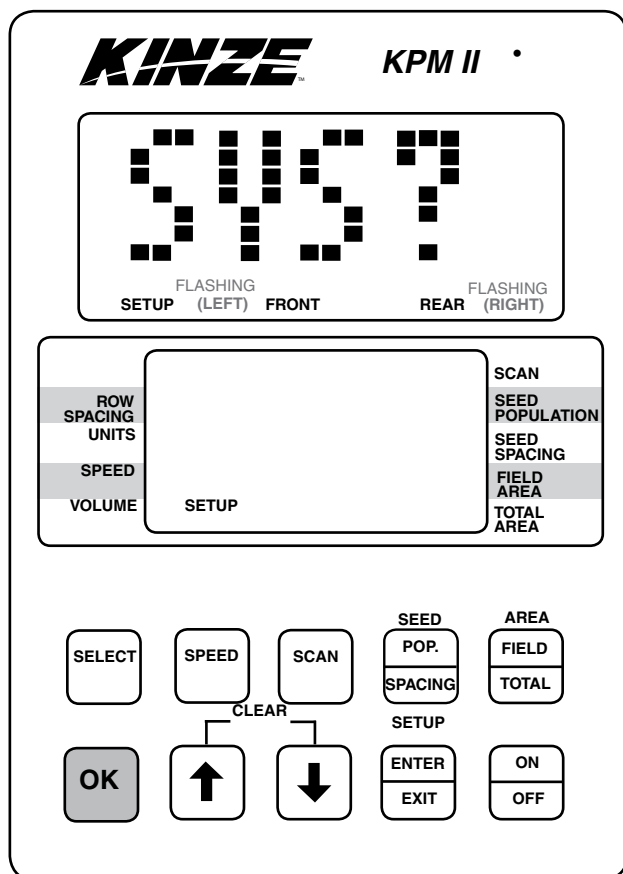
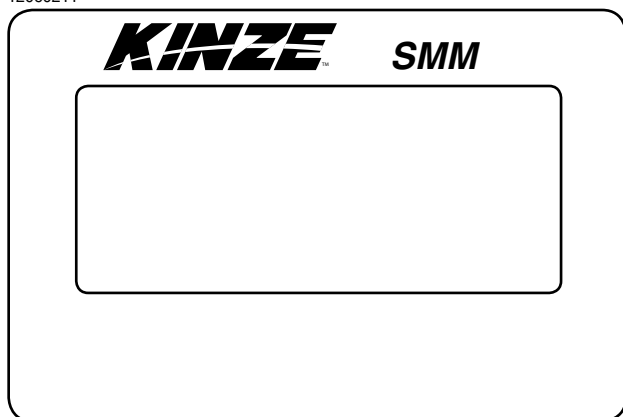


NOTE: SMM console may not be applicable to all models.

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.

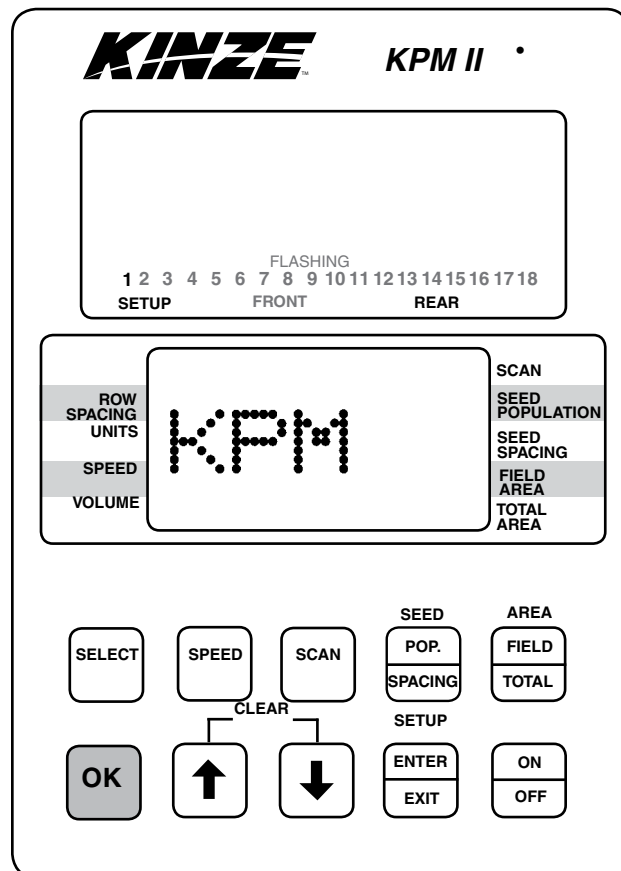
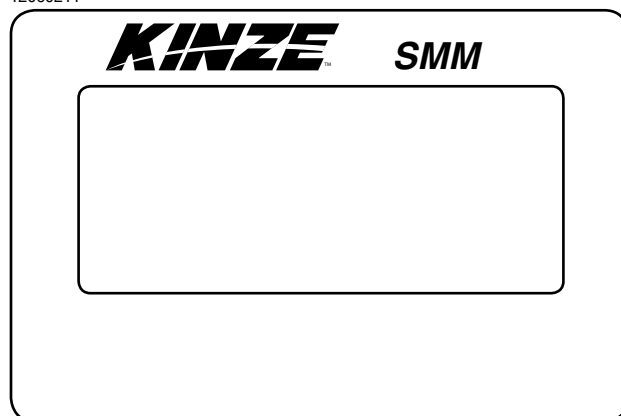
STEP 5 (If Applicable) Connect SMM console into junction Y-harness which was installed between the KPM II Stack-Mode console and the primary harness. The SMM console will show a lighted screen and KPM will show on the lower LCD.

12060211



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

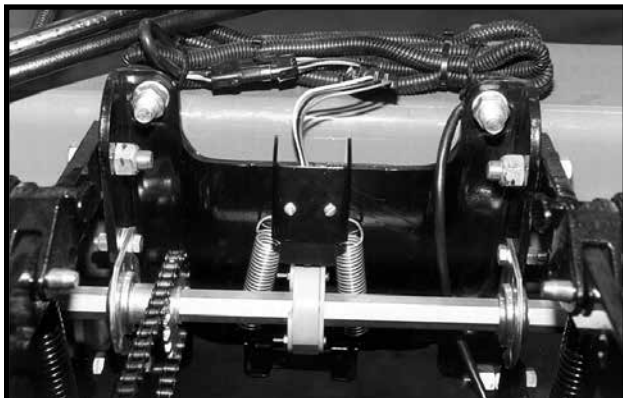
12060211



NOTE: SMM console may not apply to all models.

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



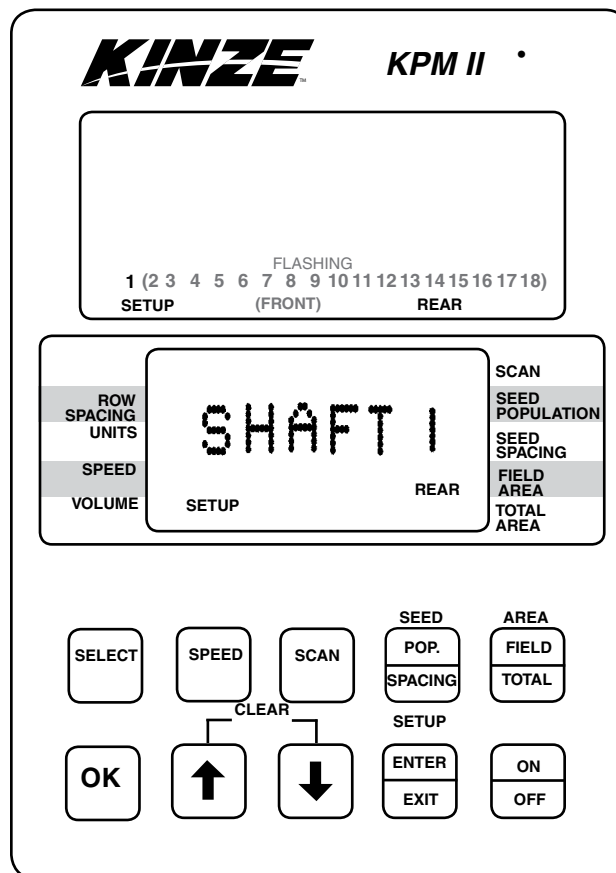
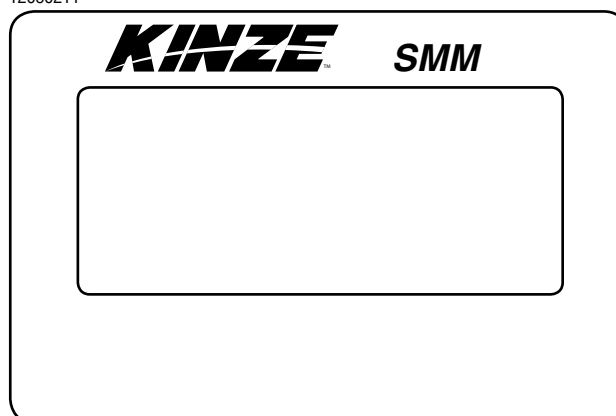
D12140713



“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.

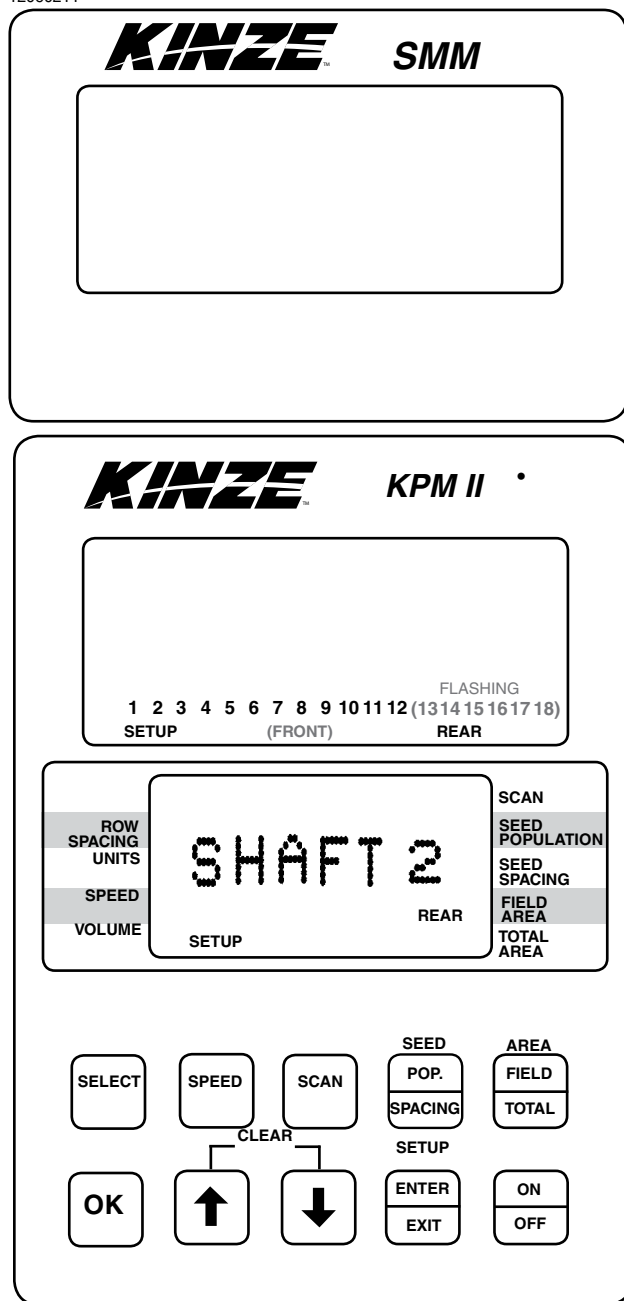
12060211



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

STEP 6 (Continued)

12060211

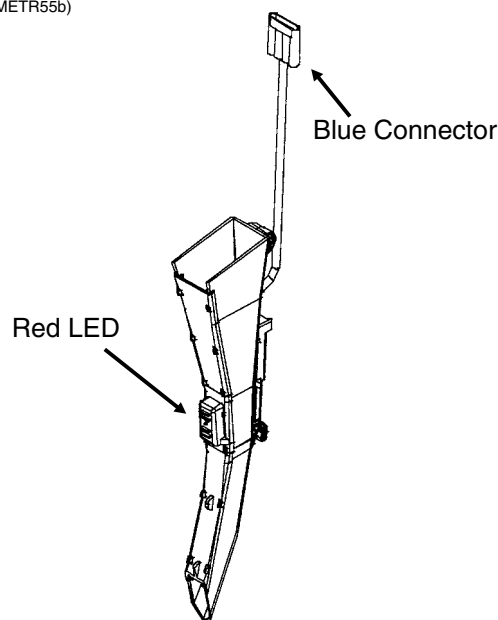


NOTE: SMM console may not be applicable to all models.

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

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

(METR55b)



STEP 7 (Continued)

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

12060211

KINZE SMM

KINZE KPM II

Row Installed

FLASHING

1 (2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18)

SETUP (FRONT) REAR

ROW SPACING UNITS

SPEED

VOLUME

02

Row Waiting To Be Connected

ROW SETUP REAR

SCAN

SEED POPULATION

SEED SPACING

FIELD AREA

TOTAL AREA

SELECT

SPEED

SCAN

SEED POP. SPACING

AREA FIELD TOTAL

OK

CLEAR

ENTER

ON

↑

↓

EXIT

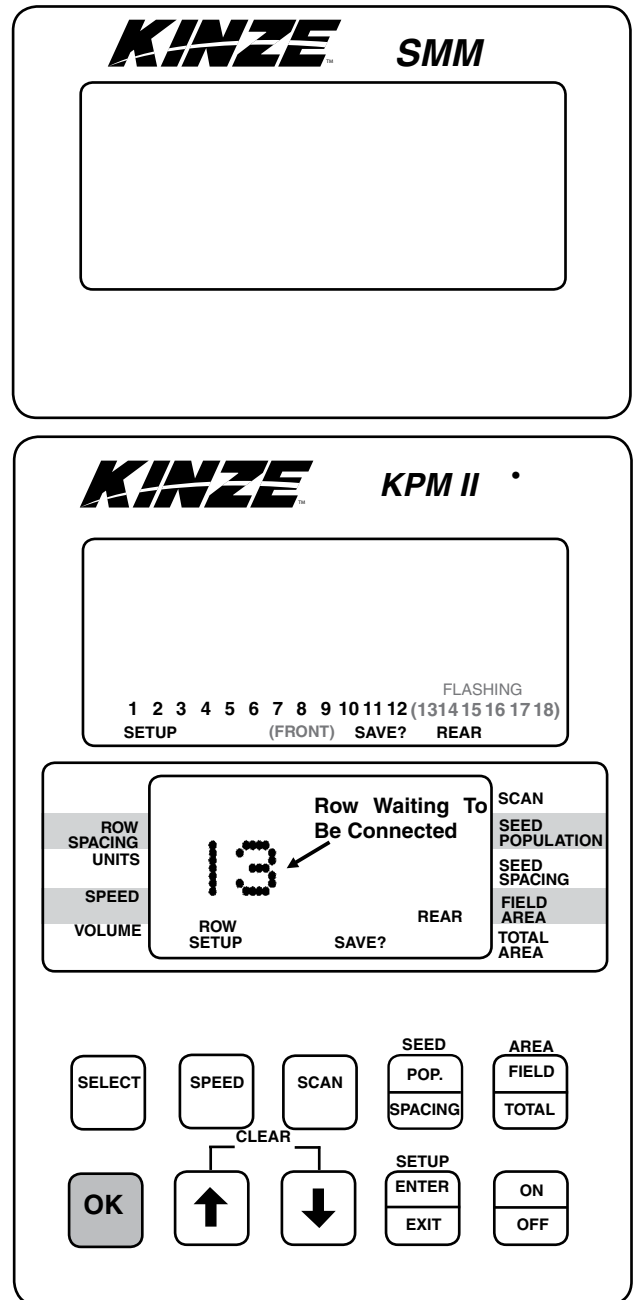
OFF

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

STEP 8 When all 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 OK key to save current section setup. 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.

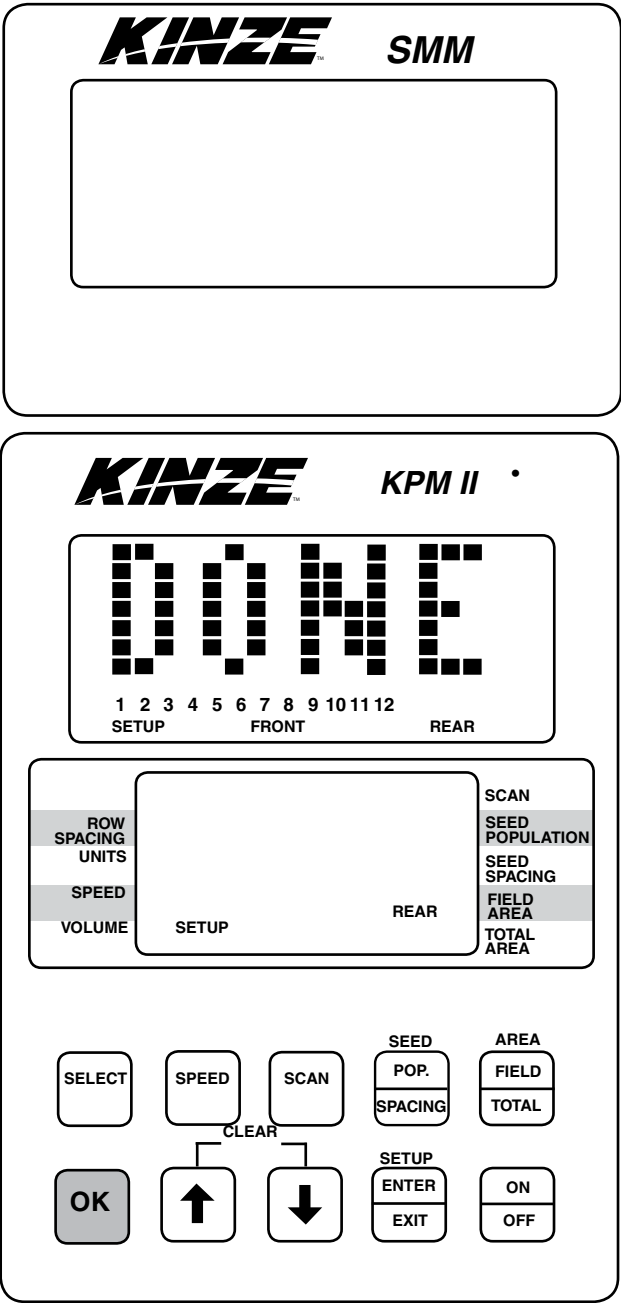
12060211



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

STEP 8 (Continued)

12060211



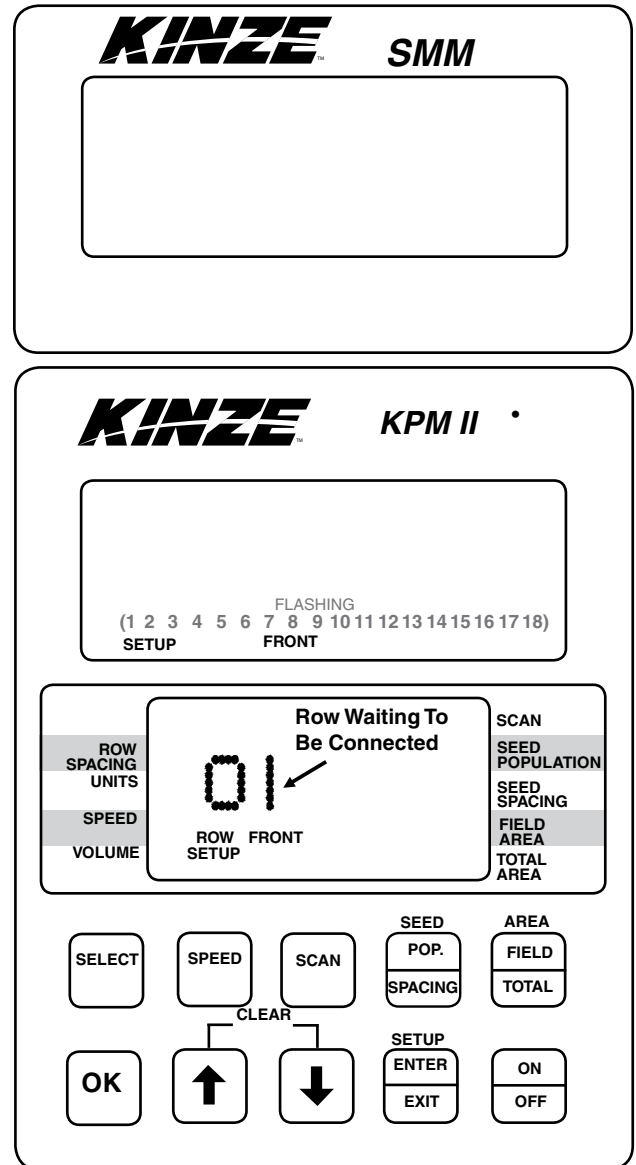
NOTE: SMM console may not be applicable to all models.

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. "DONE" appears on upper display. Alarm sounds four short beeps followed by one long beep and SAVE? icon turns off. The monitor has exited the setup mode. When you release the OK key upper display scrolls "WAITING CALIBRATION". Lower display shows "GNDSPD" and alarm sounds continually until distance sensor is connected. See STEP 10.

NOTE: SMM console LCD remains blank (except the backlighted screen) until 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.

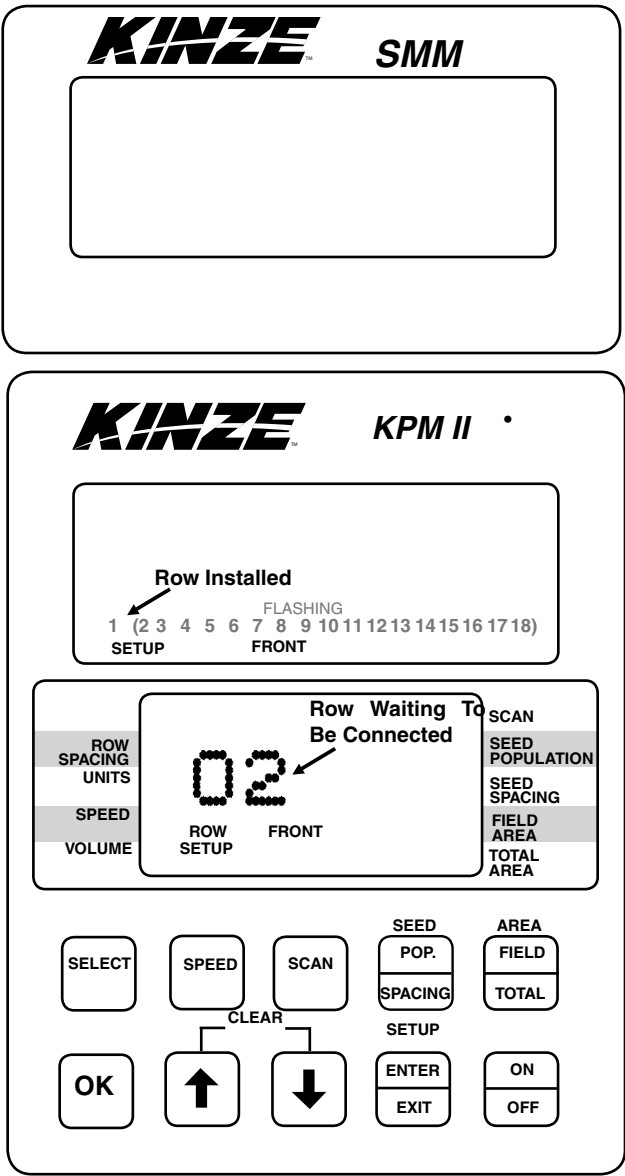
12060212



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

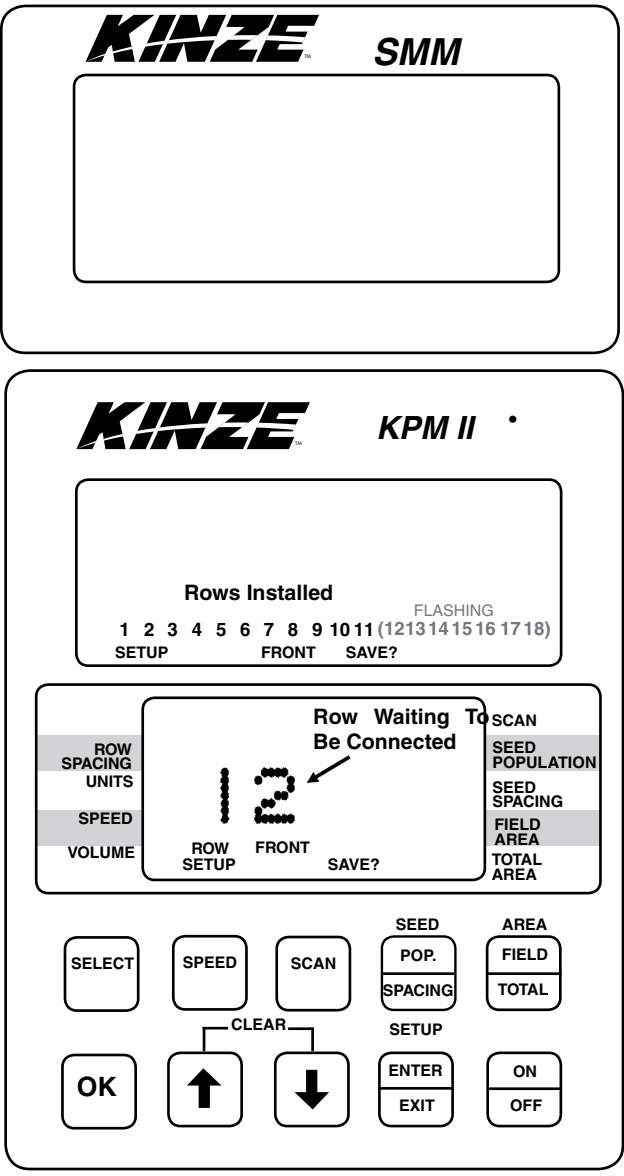
STEP 9 (Continued)

12060213



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

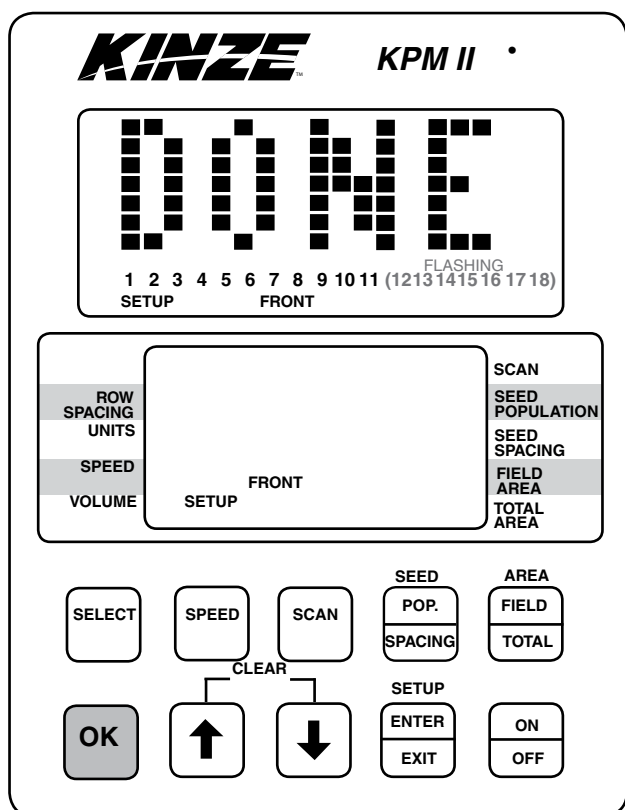
12060214



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

STEP 9 (Continued)

12060215



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

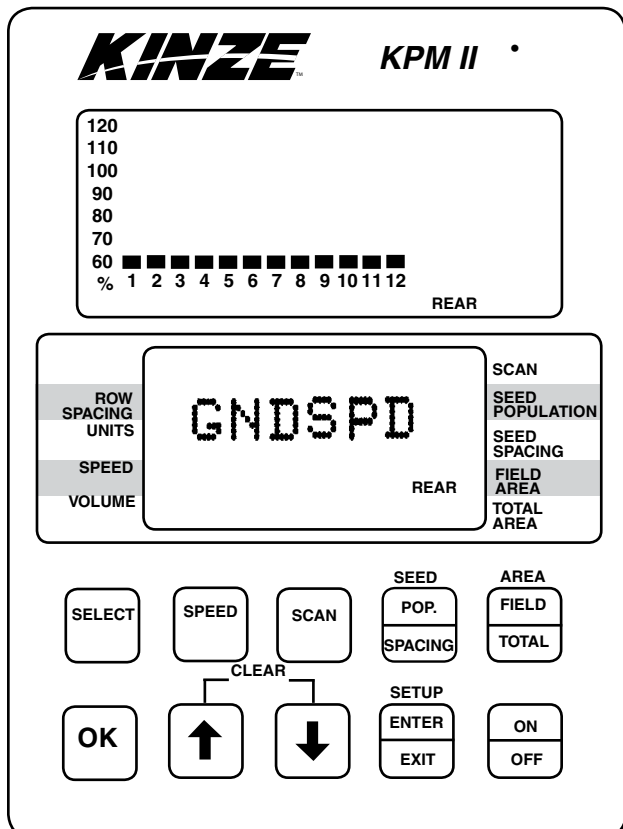
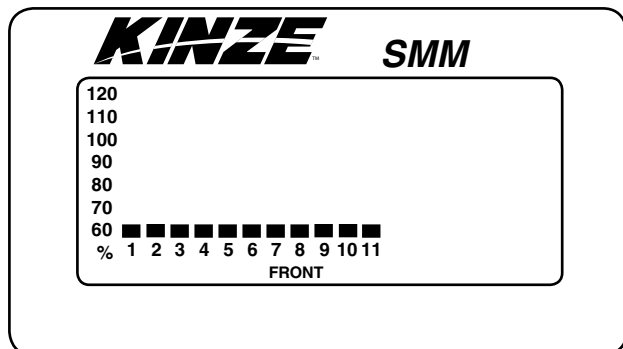
NOTE: To connect the radar distance sensor, install the 10" monitor/radar adapter between the console and radar distance sensor to adapt the monitor system to various tractor radar systems. **DO NOT CONNECT 10" MONITOR/RADAR ADAPTER PRIOR TO THIS STEP.**

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

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 10 (Continued)

12060216

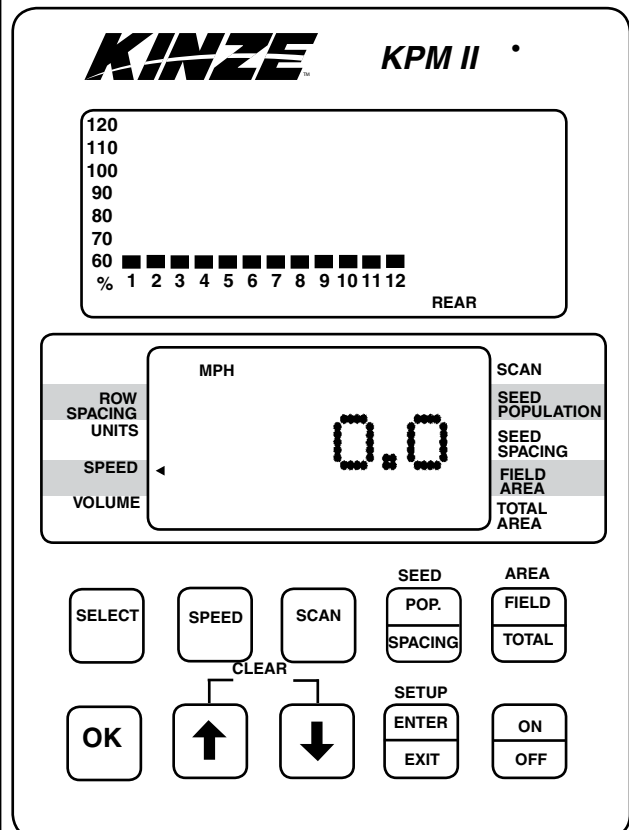
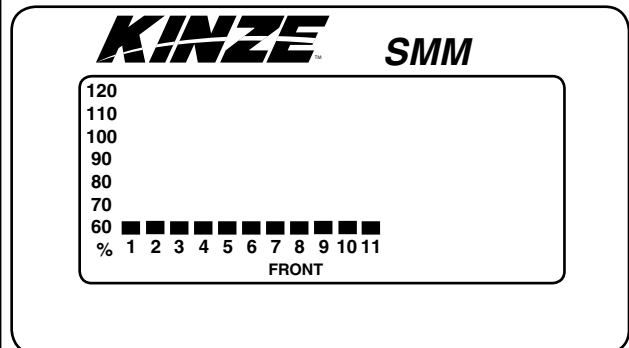


NOTE: SMM console may not be applicable to all models.

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

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

12060217



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

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: Program system to monitor all planter rows before performing these steps.

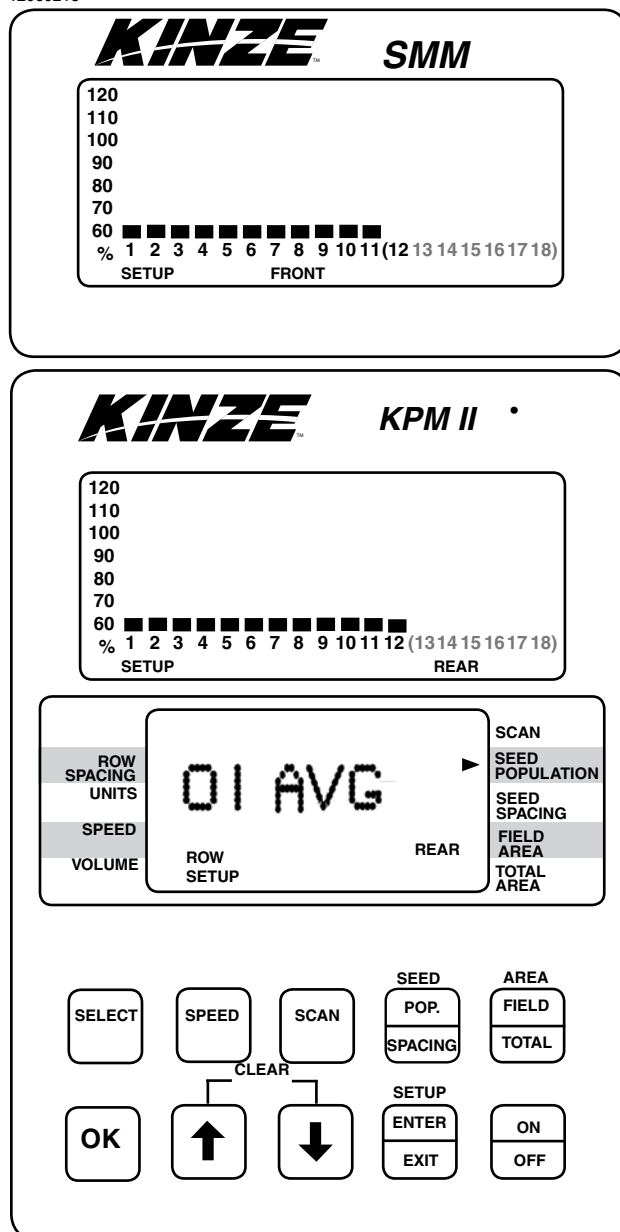
STEP 1 Enter programming mode by pressing and holding SETUP key. Monitor emits several short beeps, followed by a long beep. On the lower LCD, SETUP icon turns on and arrow head icon flashes, indicating the user can select an item to program.

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

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

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

12060218



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

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

STEP 4 Arrow UP or DOWN to desired row.

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

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

HIGH - For Early Alarm (70%)

AVG - For Standard Alarm Setting (55%)

LOW - For Failed Alarm Only (25%)

OFF - To Disable Row Alarm

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

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

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

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

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

NOTE:

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

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

KPM III ELECTRONIC SEED MONITOR VER. 3.01

INTRODUCTION



The KPM III electronic seed monitor system consists of:

- A tractor mounted KPM III console powered by tractor 12 VDC battery receives and displays information from planter mounted sensors.
- Seed tube and sensor installed in each planter row unit.
- A magnetic distance sensor installed on planter or a radar distance sensor installed on tractor.
- Shaft rotation sensors (if applicable) installed on planter drill shafts.
- Vacuum, pneumatic down pressure, ASD, and hydraulic level/temperature (If applicable), installed on planter.
- Planter harnesses (junction Y-harness and 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 KPM III console uses a backlit Liquid Crystal Display (LCD) to show number of monitored rows, relative seed rate for each row (using bargraph displays), and alarm and warning messages. A continuous audible alarm sounds upon system malfunction or underflow conditions for any monitored row. Alarms must be acknowledged. Various warnings also sound an alarm or flash one or more messages. The LCD displays row spacing, units (Metric or English), speed (MPH or KM/H), volume, seed population, seed spacing, field area, and total area.

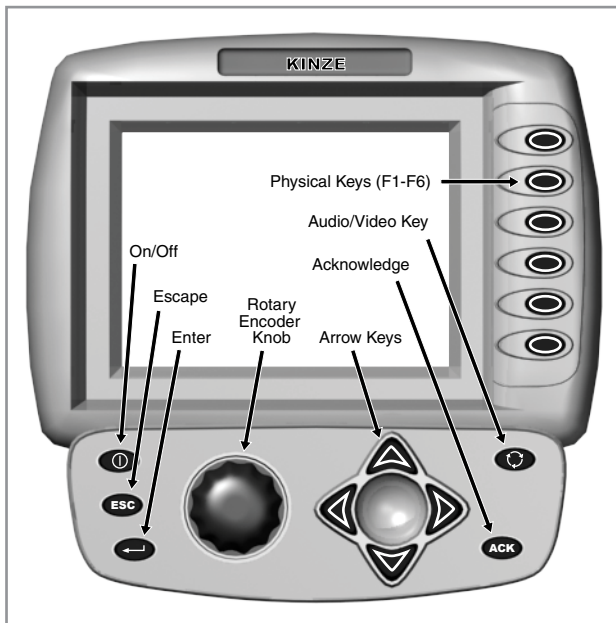
KPM III software allows simultaneous viewing of seed flow bargraphs for standard and Interplant System rows (up to 36 rows).

The monitor system powers down if there is no new seed flow or operator push key input within one hour.

Acre Count Mode.	6-50	General Settings (Programming Interplant condition, row spacing and units) (Metric or English)	6-39
Adding Even-Row Package (Front Rows Previously Programmed)	6-44	Monitor Key Functions.	6-36
Adding Interplant Rows (Rear Rows Previously Programmed Only)	6-43	Programming/Connecting Seed Tubes, Shaft Rotation Sensors, and/or Radar/Magnetic Distance Sensors	6-47
Area Counters	6-59	Programming Row Unit Alarm Levels	6-41
Area Management.	6-58	Replacing Faulty Sensor(s)	6-60
Changing Volume, Contrast, and Backlighting with AV Key	6-37	Reprogramming Speed Sensor.	6-45
Clearing Field Area	6-60	Seed Meter Settings	6-40
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Data Logging Mode	6-42	Test Mode	6-51
Enabling/Disabling Interplant Rows.	6-51	Warnings and Alarms	6-55
Field Operation	6-57		

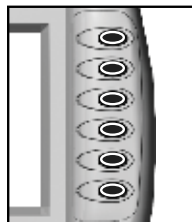
MONITOR KEY FUNCTIONS

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



PHYSICAL KEYS

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



ON/OFF KEY

- Powers the unit on and off.



ESC KEY

- Used as the CANCEL (escape) key.



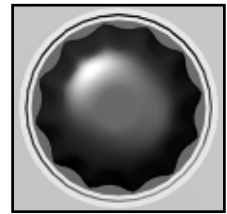
ENTER KEY

- Confirms or accepts the highlighted selection.



ROTARY ENCODER KNOB

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



AV (AUDIO/VIDEO) KEY

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



ACK (ACKNOWLEDGE) KEY

- Used to silence (acknowledge) the warning alarm when various error conditions occur.

NOTE: Alarms can be viewed by pressing the STATUS key.

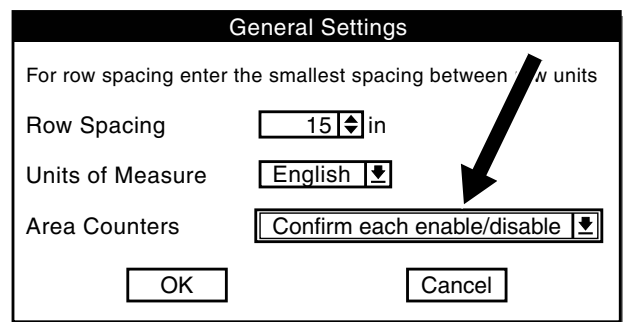


ARROW KEYS

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



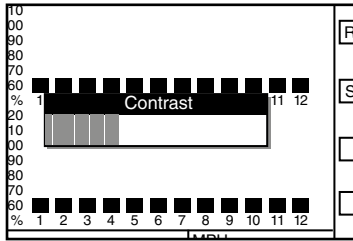
NOTE: Within the LCD, the black box around the smaller box as shown below indicates which field is selected/highlighted. Turning the rotary encoder knob or pressing the UP or DOWN arrow keys moves the black box. When the black box is positioned on a programmable item, such as Shaft Sensors, Speed Sensor,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



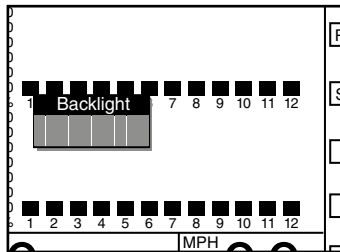
CHANGING VOLUME, CONTRAST, AND BACKLIGHTING WITH AV KEY

Alarm, volume, LCD screen contrast, and backlighting may be adjusted at any time, regardless of what is displayed on screen.

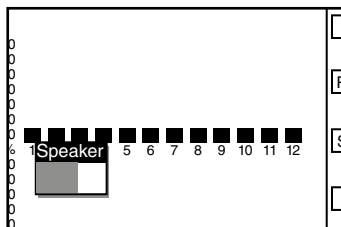
- STEP 1 Press AV key. Contrast adjustment dialog box appears in center of display.



- STEP 2 Use arrow keys or turn rotary encoder knob to adjust contrast. Adjustment will be visible on the screen.
- STEP 3 To adjust speaker or backlight, go to STEP 4. If finished press Enter key to save and exit.
- STEP 4 Press AV button a second time. The Backlight adjustment dialog box will appear in center of the display.
- STEP 5 Use arrow keys or turn knob to adjust backlighting. The effect of the adjustment will be visible on display.



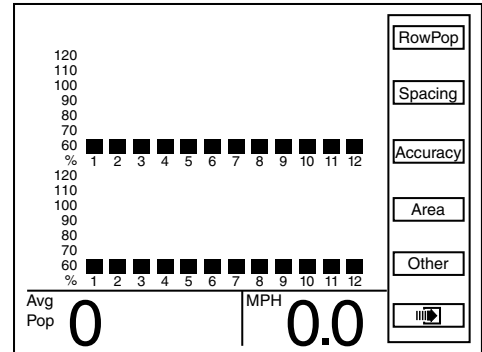
- STEP 6 To adjust speaker go to STEP 7. If finished press Enter key to save and exit.
- STEP 7 Press AV button a third time. Speaker adjustment dialog box will appear in center of display.



- STEP 8 Use arrow keys or turn knob to adjust speaker volume. Volume of sound emitted from speaker changes as adjustment is made.
- STEP 9 Press knob, Enter key or press AV button a fourth time to save volume, contrast, and backlight settings.

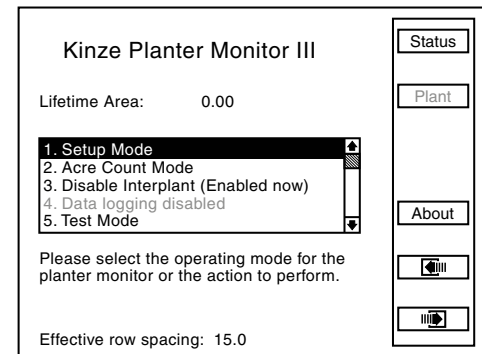
CONFIGURING PLANTER MONITOR

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



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

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



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

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

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

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

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

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

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

Setup Mode

Configuration: Front / Rear

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

Effective row spacing: 15.0

Status
Plant
Logdata
About

NOTE: Planter monitor cannot be reconfigured while planting.

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

Kinze Planter Configuration

Planter Type	Sensors Installed
Front Rows: 0	Speed: Radar
Rear Rows: [1][2][3][4][5][6][7][8][9][0][C]	Vacuum: 0
Shafts: [7][8][9][0][C]	SDS: 0
<input type="checkbox"/> Hydraulic Level/Temp <input type="checkbox"/> Downpressure Level SDS = Seed Delivery System	

There should be one sensor for each Row and each Shaft.

OK Cancel

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

Kinze Planter Configuration

Planter Type	Sensors Installed
Front Rows: [1][2][3][4][5][6][7][8][9][0][C]	Speed: Radar
Rear Rows: 0	Vacuum: 0
Shafts: [7][8][9][0][C]	SDS: 0
<input type="checkbox"/> Hydraulic Level/Temp <input type="checkbox"/> Downpressure Level SDS = Seed Delivery System	

There should be one sensor for each Row and each Shaft.

OK Cancel

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

Kinze Planter Configuration

Planter Type	Sensors Installed
Front Rows: [1][2][3][4][5][6][7][8][9][0][C]	Speed: Radar
Rear Rows: [1][2][3][4][5][6][7][8][9][0][C]	Vacuum: 0
Shafts: 2	SDS: 0
<input type="checkbox"/> Hydraulic Level/Temp <input type="checkbox"/> Downpressure Level SDS = Seed Delivery System	

There should be one sensor for each Row and each Shaft.

OK Cancel

STEP 7 Turn knob or use arrow keys to move to “Speed” field. Press knob or Enter key and a drop down menu displays. Select “Radar” or “Coil Pick-Up” (MDS) by turning knob or using arrow keys. When desired selection is highlighted press knob or Enter key.

Kinze Planter Configuration

Planter Type	Sensors Installed
Front Rows: [1][2][3][4][5][6][7][8][9][0][C]	Speed: Radar
Rear Rows: [1][2][3][4][5][6][7][8][9][0][C]	Vacuum: 0
Shafts: 2	SDS: 0
<input type="checkbox"/> Hydraulic Level/Temp <input type="checkbox"/> Downpressure Level SDS = Seed Delivery System	

There should be one sensor for each Row and each Shaft.

OK Cancel

- STEP 8** If applicable, turn knob or use arrow keys to advance to "Vacuum". Press knob or Enter key and a drop down menu will appear. Select correct number of vacuum sensors by turning knob or using arrow keys. Confirm selection by pressing knob or Enter key.
- STEP 9** If applicable, turn knob or use arrow keys to advance to "SDS" (Seed Delivery System), Press knob or Enter key. A drop down menu will appear. Select correct number of SDS Sensors by turning knob or using arrow keys. Press knob or Enter key to confirm selection.
- STEP 10** If applicable, turn knob or use arrow keys to advance to "Hydraulic Level/Temp". Press knob or Enter key to select or deselect. When selected, a check mark will appear in the box.
- STEP 11** If applicable, turn knob or use arrow keys to advance to "Downpressure Level". Press knob or Enter key to select or deselect. When selected, a check mark will appear in the box.
- STEP 12** Advance to "OK" by using knob or arrow keys. Press knob or the Enter key to save information.

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

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

NOTE: When OK is selected monitor automatically advances to Sensor Setup screen. Sensor Setup can also be selected from Setup Mode screen. Go to page 6-13 (PROGRAMMING/CONNECTING SEED TUBES, SHAFT ROTATION SENSORS AND/OR RADAR/MAGNETIC DISTANCE SENSORS)

GENERAL SETTINGS (PROGRAMMING INTERPLANT CONDITION, ROW SPACING AND UNITS) (METRIC OR ENGLISH)

- STEP 1** Turn knob or use arrow keys to highlight "1. General Settings". Press knob or Enter key to display highlighted item.

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

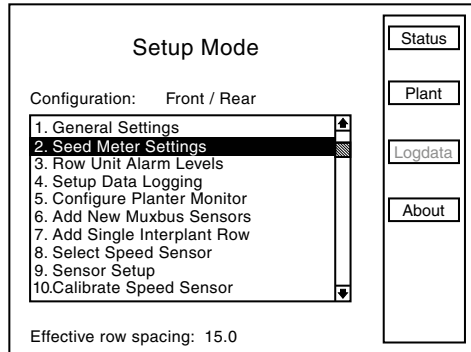
- STEP 2** Press knob or Enter key to enter correct value for "Row Spacing". A drop down number pad will appear. Turn knob or use arrow keys to highlight first digit of desired number and press knob. The number will appear in "Row Spacing" line. Turn knob or arrow keys to highlight next digit of number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

NOTE: Enter narrowest row spacing planter is equipped to plant for "Row Spacing". Example: 12 Row 30 with Interplant, row spacing would be set to 15.

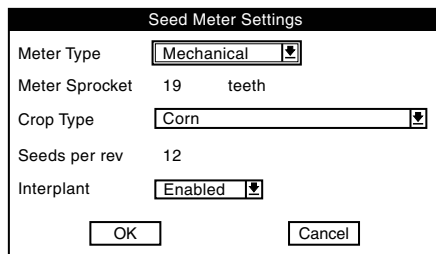
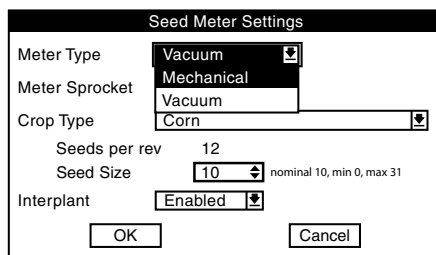
- STEP 3** Turn knob or use arrow keys to highlight "Units of Measure" field. Select "Units of Measure" field by pressing knob or Enter key, a drop down menu will appear. Highlight "English" or "Metric" by turning knob or using arrow keys. When correct entry is highlighted, press knob or Enter key to accept unit of measure entry and return to "General Settings" screen.
- STEP 4** Turn knob or use arrow keys to highlight "Area Counters" field. Select "Area Counters" field by pressing knob or Enter key, a drop down menu will appear. Turn knob or use arrow keys to highlight "Confirm each enable/disable", "Don't confirm again today", or "Don't confirm enable/disable". When desired selection is highlighted, press knob or Enter key to accept selection and return to "General Settings" screen.
- STEP 5** Once correct values are inputted into "General Settings" screen "OK" button can be selected to save changes, or "Cancel" button can be selected to discard changes. Turn knob or use arrow keys to highlight either "OK" or "Cancel" and press knob or Enter key to return to "Setup Mode" screen.

SEED METER SETTINGS

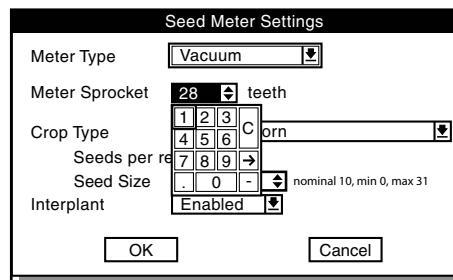
- STEP 1 Scroll to "2. Seed Meter Settings" by turning rotary encoder knob or using arrow keys. Press knob or Enter key to display highlighted item.



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

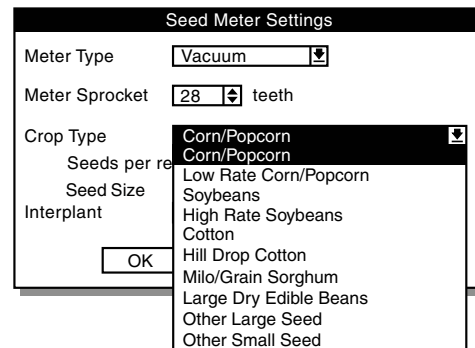


NOTE: When Mechanical "Meter Type" is selected "Meter Sprocket" automatically sets.



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

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



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

A sensitivity threshold (Seed Size) ensures dust and other debris are filtered out and only actual seeds are counted. Sensitivity threshold is set to a default for a selected crop which is adequate for most conditions.

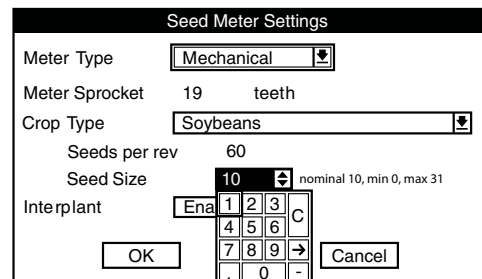
Sensitivity can be set between 0 and 31, 0 being most sensitive (counts smallest particles) and 31 least sensitive (counts large particles). Adjust threshold one value at a time until desired result is achieved. Once value is changed it becomes default for that crop.

NOTE: Adjusting threshold too high can cause monitor to miss seeds and provide inaccurate information. Always do a ground check to ensure monitor is reading accurately.

- STEP 5 Select "Seed Size" and press ENTER key. A drop down number pad displays.

- STEP 6 Turn knob or use arrow keys to highlight first digit of desired number. Press knob. When correct number is obtained, press knob or Enter key.

- STEP 7 Turn knob or use arrow keys to highlight "Crop Type". Press knob or Enter key to display the crop drop down menu.



- STEP 8 Turn knob or use arrows keys to highlight a crop for planting then press knob or Enter key. Once crop type is entered, the "Seeds per rev" is set automatically.

- STEP 9 (If Applicable) Turn knob or use arrow keys to highlight "Interplant". Press knob or Enter key to display Interplant drop down menu.

Seed Meter Settings

Meter Type: Vacuum

Meter Sprocket: 28 teeth

Crop Type: Corn/Popcorn

Seeds per rev: 39

Seed Size: 10 nominal 10, min 0, max 31

Interplant: Enabled

OK Disabled Cancel

- STEP 10 Turn knob or use arrow keys to highlight "enable" or "disable" and press the knob or Enter key.

- STEP 11 When all changes have been made, highlight "OK" and press knob or Enter key to return to "Setup Mode" screen.

PROGRAMMING ROW UNIT ALARM LEVELS

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

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

Setup Mode

Configuration: Front / Rear

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

Effective row spacing: 15.0

Status Plant Logdata About

Alarm thresholds can be set for whole planter, any planter section, or individual rows.

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

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

Row Unit Alarm Levels

[Whole Planter]	50%
Rear Row 1	50%
Rear Row 2	50%
Rear Row 3	50%
Rear Row 4	50%
Rear Row 5	50%
Rear Row 6	50%
Rear Row 7	50%
Rear Row 8	50%
Front Row 1	50%
Front Row 2	50%
Front Row 3	50%
Front Row 4	50%

10% 50% 70% Disable Other Done

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

NOTE: Only configured rows appear on screen.

To set alarm thresholds for all rows in one section, highlight desired section. Press key next to desired threshold. When desired threshold is specified for all row units, press F6 key next to "Done".

To set alarm thresholds for individual rows, highlight desired row. Press key next to desired threshold. When desired threshold is specified for all row units, press F6 key next to "Done".

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

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

Set Alarm Threshold

Enter Alarm Threshold: 0

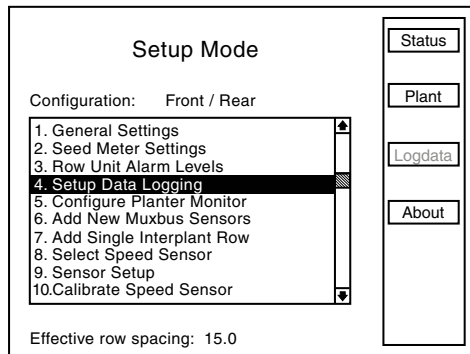
OK Cancel

Rear Row 6	50%
Rear Row 7	50%
Rear Row 8	50%
Front Row 1	50%
Front Row 2	50%
Front Row 3	50%
Front Row 4	50%

10% 50% 70% Disable Other Done

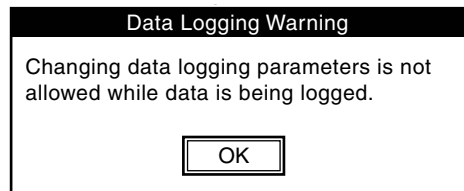
DATA LOGGING MODE

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

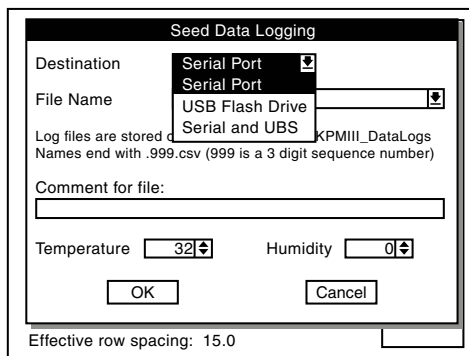


NOTE: Data logging changes cannot be made while data is being logged. If the monitor is logging data the following warning will appear. To stop data logging and continue.

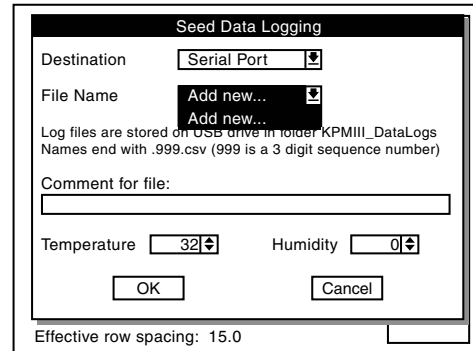
- Press the knob or Enter key to close the warning.
- Then in the “Setup Mode” press the F3 key next to “StopLog”.



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

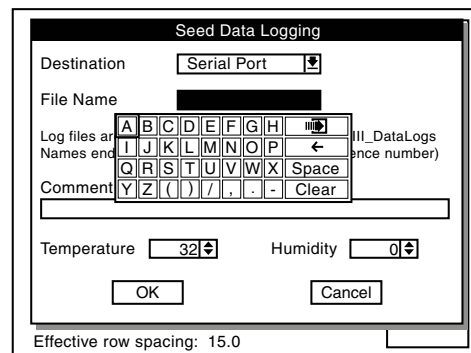


STEP 3 Use the knob or arrow keys to highlight the “File Name” box. Press the knob or Enter key and a drop down list of the files will be displayed. Select “Add new...” to enter a file name and press the knob or enter key to display a keyboard.

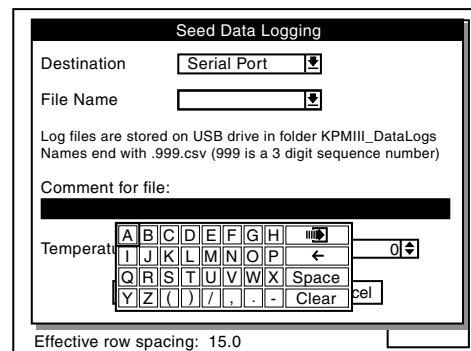


STEP 4 Select “Add new...” to enter a file name and press the knob or enter key to display a keyboard.

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



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



- STEP 7 Use knob or arrow keys to scroll to Temperature box. Press knob or Enter key to display drop down keyboard. Use keyboard to enter temperature then press Enter key.
- STEP 8 Use knob or arrow keys to scroll to Humidity box. Press knob or Enter key to display drop down keyboard. Use keyboard to enter humidity then press Enter key.

Seed Data Logging

Destination: Serial Port

File Name:

Log files are stored on USB drive in folder KPMIII_DataLogs
Names end with .999.csv (999 is a 3 digit sequence number)

Comment for file:

Temperature: 32

Humidity: 0

OK Cancel

Effective row spacing: 15.0

- STEP 9 Use knob or arrow keys to scroll to the "OK" button and press knob or Enter key. Display returns to Setup Mode screen.

Seed Data Logging

Destination: Serial Port

File Name:

Log files are stored on USB drive in folder KPMIII_DataLogs
Names end with .999.csv (999 is a 3 digit sequence number)

Comment for file:

Temperature: 32

Humidity: 0

OK Cancel

Effective row spacing: 15.0

- STEP 10 Press F2 key next to Plant to return to Planter configuration screen.
- STEP 11 Press F3 key next to "Logdata" to begin logging.
- STEP 12 Press F3 key next to "Stoplog" to end logging.

ADDING INTERPLANT ROWS (REAR ROWS PREVIOUSLY PROGRAMMED ONLY)

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

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

Setup Mode

Configuration: Front / Rear

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

Effective row spacing: 15.0

Status Plant Logdata About

- STEP 2 Note shown below displays. Highlight "OK" by turning knob or using the arrow keys. Press knob or Enter key to make selection.

Warning

The planter monitor is already configured.

Select and press OK if you wish to change the monitor configuration. You must then learn each of the new sensors.

Select and press Cancel if you do not wish to change the monitor configuration.

OK Cancel

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

- STEP 3 Turn knob or use arrow keys to highlight "Front Rows" field and press knob or Enter key. A drop down number pad appears.
- STEP 4 Turn knob or use arrow keys to highlight first digit of desired number and press knob to select the number. For numbers containing more than one digit select one digit at a time. The number will appear in the "Front Rows" line. When correct number is displayed on "Front Rows" line, press Enter key to return to "Kinze Planter Configuration" screen.

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

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

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

Note
Rear Rows may not be added via the Add New Muxbus Sensors option.
Sensors may not be removed via the Add New Muxbus Sensors option.
When adding front rows the number of front rows must be equal to or one less than the number of rear rows.
A single front row may not be added via Add New Muxbus Sensors.
<input type="button" value="OK"/>

STEP 5 Sensor configuration screen displays. With "[Auto Detect]" highlighted press F1 key next to "Install". Install sensors from left to right the same way rear unit sensors were installed.

Auto Learn Mode
Looking for first...
Plug in sensors one at a time, any kind, but do same type in order 1, 2, 3,...
Done press to end Auto Learn Mode

STEP 6 When all sensors are learned select F1 to end installation. "Auto Learn Mode" box displays. Press F6 key next to "Done".

STEP 7 Scroll down to verify front rows are learned. Select "OK" by pressing knob or Enter key. Press F6 key next to "Done". Display returns to "Setup Mode Screen".

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

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

Setup Mode
Configuration: Front / Rear
1. General Settings 2. Seed Meter Settings 3. Row Unit Alarm Levels 4. Setup Data Logging 5. Configure Planter Monitor 6. Add New Muxbus Sensors 7. Add Single Interplant Row 8. Select Speed Sensor 9. Sensor Setup 10. Calibrate Speed Sensor
Effective row spacing: 15.0
<input type="button" value="Status"/> <input type="button" value="Plant"/> <input type="button" value="Logdata"/> <input type="button" value="About"/>

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

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

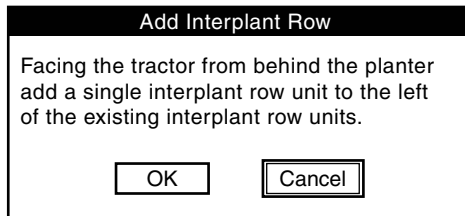
STEP 10 Turn knob or use arrow keys to advance to "OK" button. Press knob or Enter key to save the row spacing and return to "Setup Mode" screen.

ADDING EVEN-ROW PACKAGE (FRONT ROWS PREVIOUSLY PROGRAMMED)

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

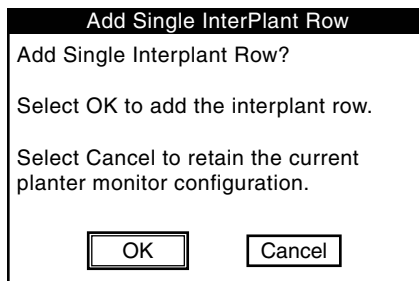
Setup Mode
Configuration: Front / Rear
1. General Settings 2. Seed Meter Settings 3. Row Unit Alarm Levels 4. Setup Data Logging 5. Configure Planter Monitor 6. Add New Muxbus Sensors 7. Add Single Interplant Row 8. Select Speed Sensor 9. Sensor Setup 10. Calibrate Speed Sensor
Effective row spacing: 15.0
<input type="button" value="Status"/> <input type="button" value="Plant"/> <input type="button" value="Logdata"/> <input type="button" value="About"/>

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

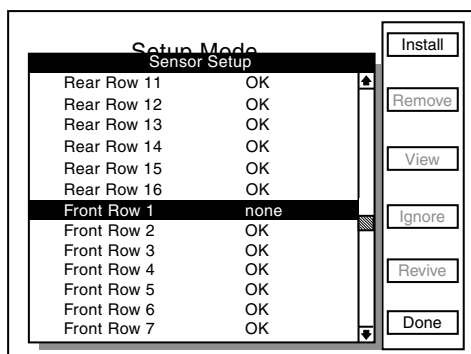


- STEP 3** To "Add Single Interplant Row" following screen displays.

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



- STEP 4** "Sensor Setup" screen displays. Plug in new sensor then scroll down to highlight "Front Row 1" by turning knob or using arrow keys. Press F1 key next to Install to learn new sensor.



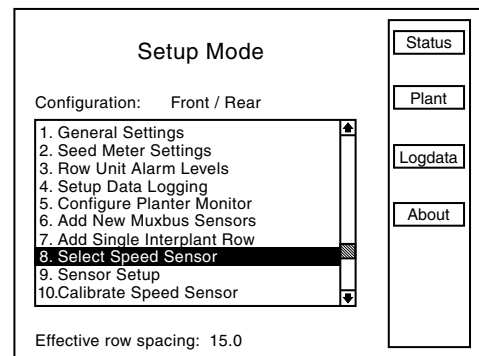
REPROGRAMMING SPEED SENSOR

This setting must be specified when monitor is first configured. It must be reprogrammed to use an alternate speed sensor.

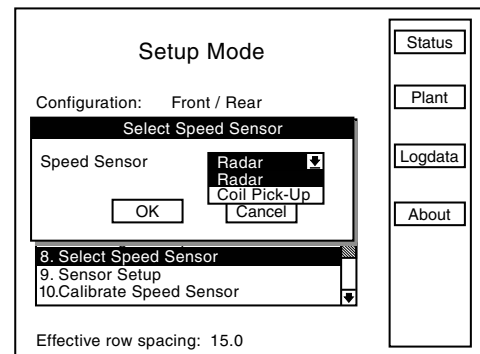
NOTE: Speed sensors may not be changed while planting.

RADAR TO MAGNETIC DISTANCE SENSOR

- STEP 1** Turn knob or use arrow keys to highlight "8. Select Speed Sensor". Press knob or Enter key to display highlighted item.



- STEP 2** Press knob or Enter key, a drop down menu appears. Highlight "Coil Pick-Up" and press knob or Enter key.



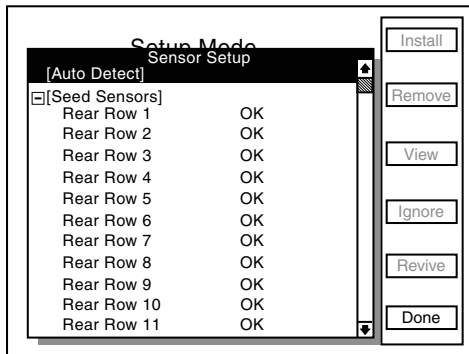
- STEP 3** Turn knob or use arrow keys to highlight "OK" button and press knob or Enter key to return to "Setup Mode" screen.

- STEP 4** Turn knob or use arrow keys to highlight "9. Sensor Setup" and press knob or Enter key.

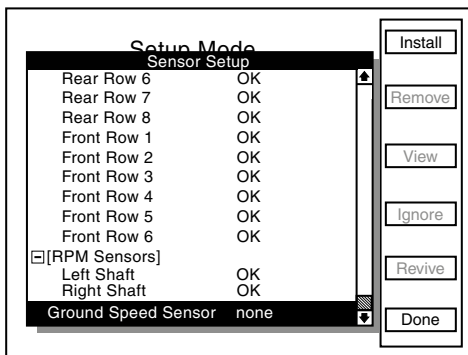
- STEP 5** Unplug radar from tractor.

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

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



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



STEP 8 Press F1 key next to Install. Monitor beeps twice to confirm selection.

STEP 9 Press F6 key next to Done. Display will return to Setup Mode screen.

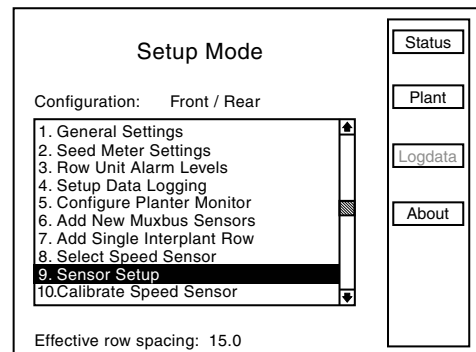
STEP 10 Press F2 key by “Plant” to return to Planter Configuration screen.

NOTE: , verify distance pulse count is correct for chosen sensor. There will be significant distance pulse count variation between radar and coil pickup sensors.

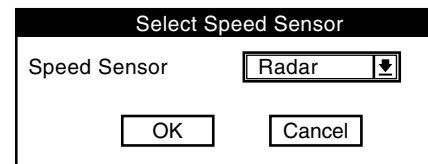
MAGNETIC DISTANCE SENSOR (MDS) TO RADAR

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

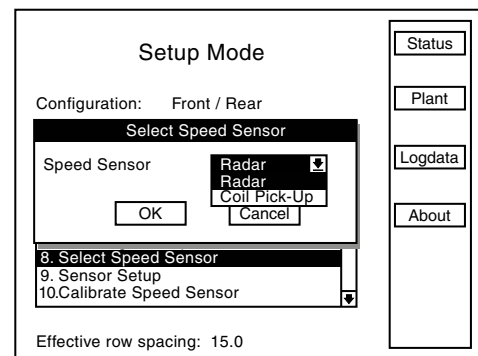
STEP 2 Press F6 key next to Done. Display will return to Setup Mode screen.



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



STEP 4 Press knob or Enter key to select “Speed Sensor” field. A drop down menu appears.



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

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

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

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

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

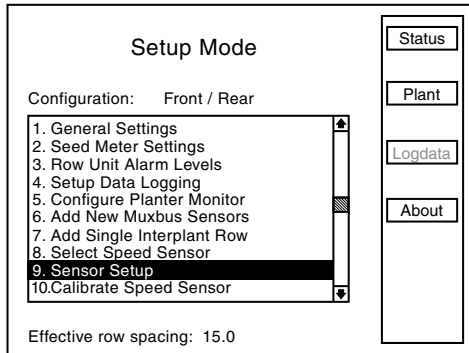
NOTE: Verify distance pulse count is correct for chosen sensor when switching between speed sensors. There is a significant distance pulse count variation between radar and magnetic distance sensors.

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

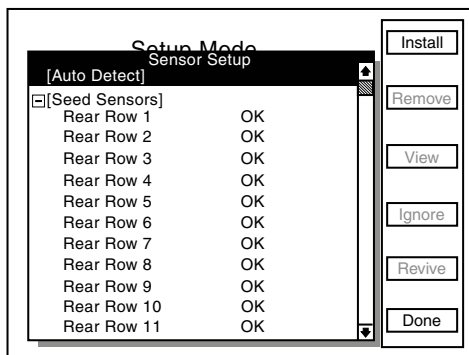
NOTE: Sensor Setup screen automatically displays after Planter Monitor is configured in Configure Planter Monitor selection in Setup Mode screen.

IMPORTANT: All sensors **MUST** be unplugged before programming begins.

- STEP 1** To access Mode Selection, press F6 key until Mode Selection screen appears.
- STEP 2** Select "1. Setup Mode" by turning rotary encoder knob or press arrow keys. Press knob or Enter key to display highlighted item.
- STEP 3** Select "9. Sensor Setup" by turning knob or using arrow keys. Press knob or Enter key to display highlighted item.



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



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

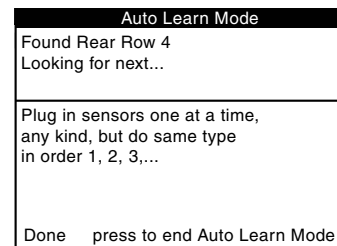
NOTE: If monitor fails to acknowledge a sensor disconnect sensor temporarily then reconnect sensor and wait for monitor to acknowledge sensor with two beeps. If monitor still fails to acknowledge sensor try connecting a different sensor in this location.

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

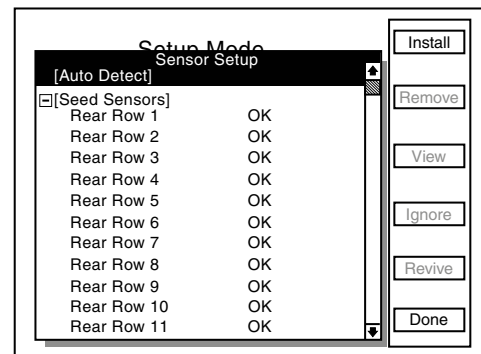
(If applicable) plug in SDS, vacuum or PDP (pneumatic down pressure) sensors the same way seed sensors were connected.

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

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

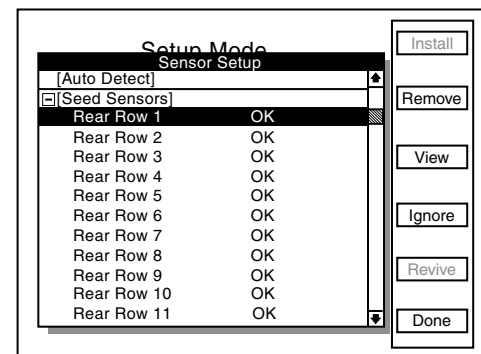


NOTE: After each sensor has been installed "OK" appears after sensor name on LCD screen.



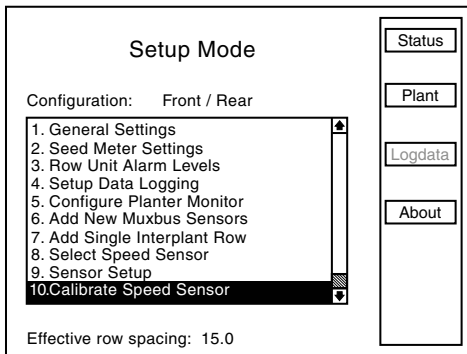
- STEP 6** When "OK" appears behind ALL sensors, press F6 key next to Done. 'Setup Mode' menu displays.

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



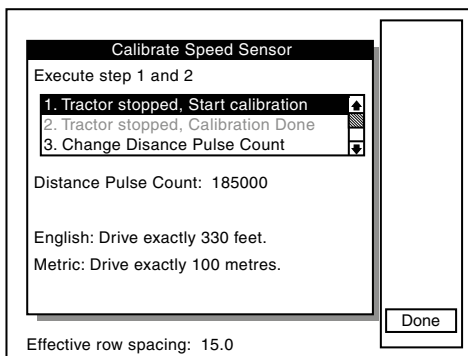
SPEED SENSOR CALIBRATION/PROGRAMMING

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

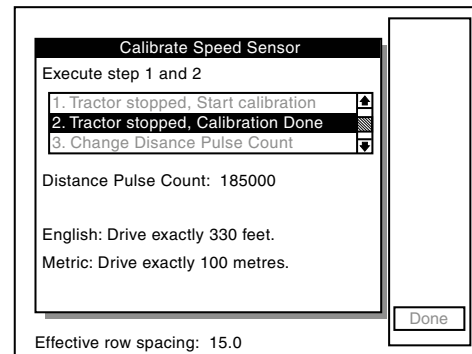


Distance Pulse Count records how many pulses are generated per mile/kilometer from the ground speed sensor.

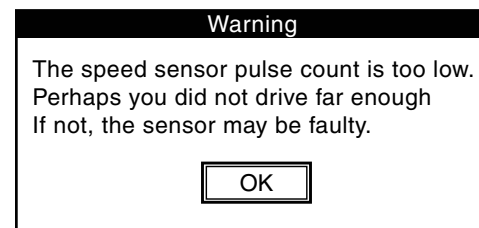
NOTE: A field calibration must be performed to establish Distance Pulse Count number. Several factors can affect this value, such as wheel slip on the magnetic distance sensor. IT IS NOT UNCOMMON FOR MONITOR SPEED TO VARY SLIGHTLY FROM TRACTOR SPEEDOMETER. *Adjusting Distance Pulse Count in the monitor to make speed agree with 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 tractor up to starting point.
- Turn knob or use arrow keys to highlight "1. Tractor stopped, Start calibration" and press knob or Enter key.
- Drive tractor for 330 feet or 100 meters.
- Monitor will count number of pulses and display them.
- Stop tractor at end point.
- Turn knob or use arrow keys to highlight "2. Tractor stopped, Calibration Done" and press knob or Enter key.



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

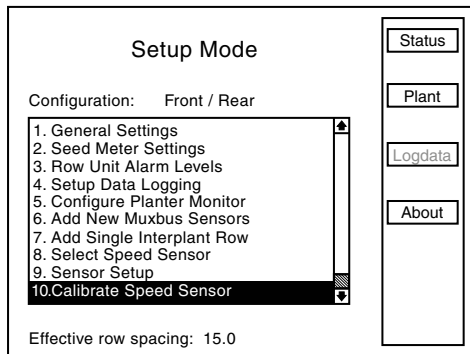


NOTE: Repeat above steps multiple times. Record and average values. Use average for Distance Pulse Count number constant.

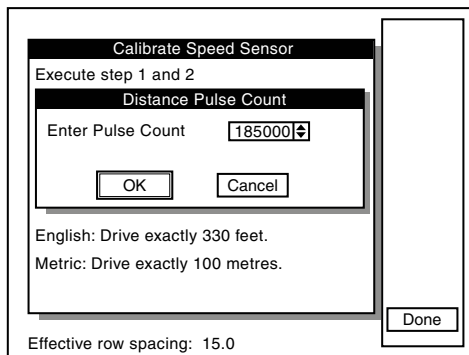
NOTE: Distance Pulse Count will vary from above example.

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

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



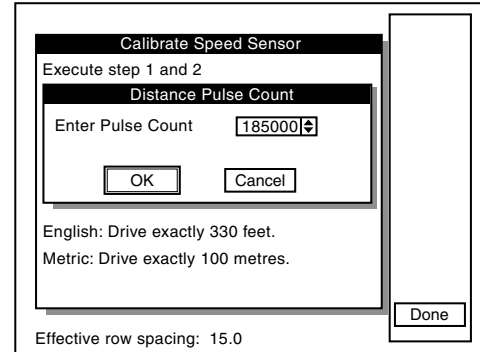
- STEP 2 Turn knob or use arrow keys to highlight "3. Change Distance Pulse Count" and press knob or Enter key. Highlight "Enter Pulse Count" line and press knob or Enter key and a drop down key pad will appear.



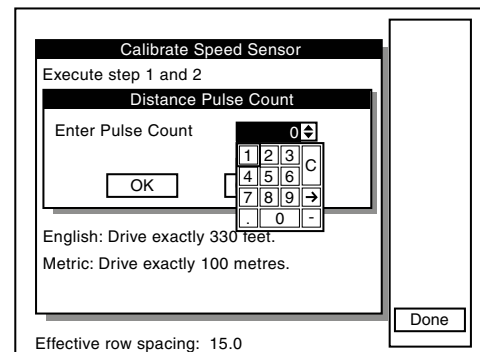
NOTE: Distance Pulse Count will vary from above example.

- STEP 3 Turn knob or use arrow keys to highlight the first digit of the average pulse count and press the knob. The number will appear in the "Enter Pulse Count" line. Highlight the next digit of the number and press the knob. Repeat this procedure until the entire number is entered then press Enter key.
- STEP 4 Turn knob or use arrow keys to highlight "OK" then press knob or Enter key to return to the "Calibrate Speed Sensor" screen.
- STEP 5 Press F6 key next to "Done" to return to "Setup Mode" screen.

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



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



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

ACRE COUNT MODE

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

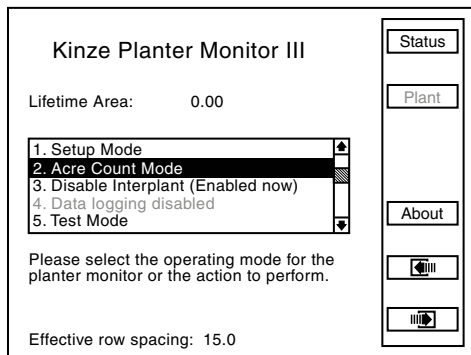
STEP 1 Install an "Acre Count Switch Kit".

STEP 2 Enter into "Acre Count Mode".

Acre Count Switch Kit

STEP 1 With monitor OFF, attach an Acre Count Switch Kit to Muxbus connector, then turn monitor "ON".

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

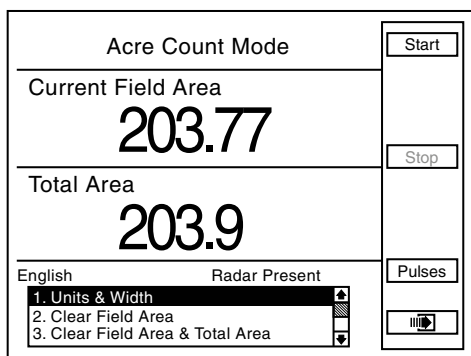


NOTE: If radar unit is not detected a warning displays.

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

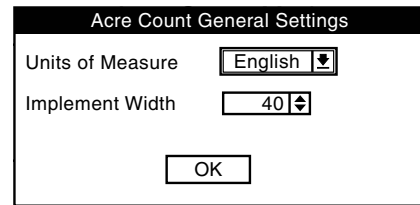
NOTE: DO NOT BEGIN ACCUMULATING AREA IF RADAR UNIT HAS NOT BEEN CALIBRATED. Always check distance pulse count value immediately after entering acre count mode and before pressing start.

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



STEP 4 A box named "Acre Count General Settings" will appear. Highlight "English" or "Metric" by turning knob or using arrow keys. Press knob or Enter key to make selection.

STEP 5 Turn knob or use arrow keys to highlight "Implement Width" box and press knob or Enter key and a drop down number pad displays.



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

STEP 7 Turn knob or use arrow keys to highlight "OK" button. Press knob or Enter key to save changes.

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

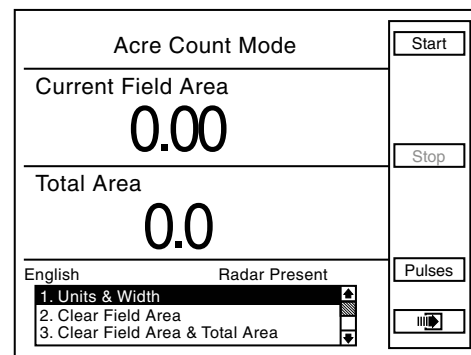
NOTE: Tractor should be at a complete stop before starting.

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

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

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

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

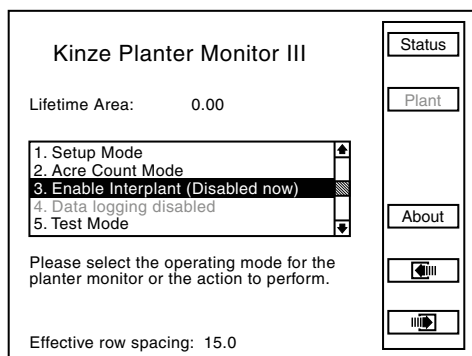
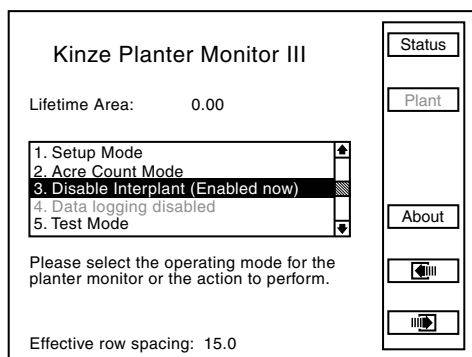


• To Clear Field Area And Total Area. highlight "Clear Field Area & Total Area" and press knob or Enter key. A note will appear to verify decision to reset field area and total area to zero. Highlight "OK" and press knob or Enter key to clear field. Highlight "Cancel" and press knob or Enter key to retain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

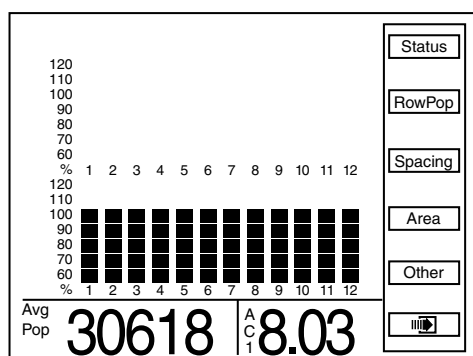
ENABLING/DISABLING INTERPLANT ROWS

To Enable or Disable Interplant

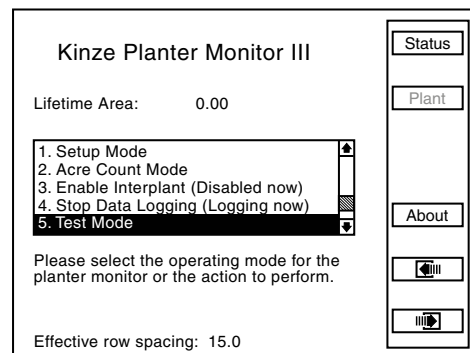
- STEP 1** Return to "Planter Configuration" screen by pressing F2 key next to "Plant".
- STEP 2** Press F6 key until "Kinze Planter Monitor III" screen appears.
- STEP 3** Turn rotary encoder knob or use arrow keys to highlight "3. Disable Interplant (Enabled now)" or Enable Interplant (Disabled now).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



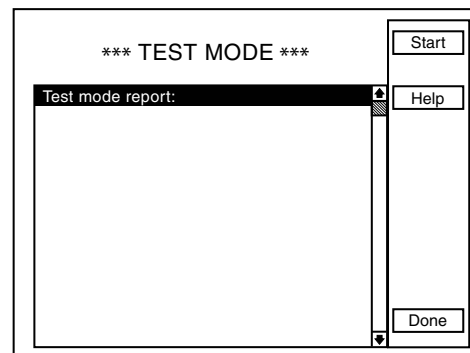
Press F6 to return to Plant screen.

**TEST MODE**

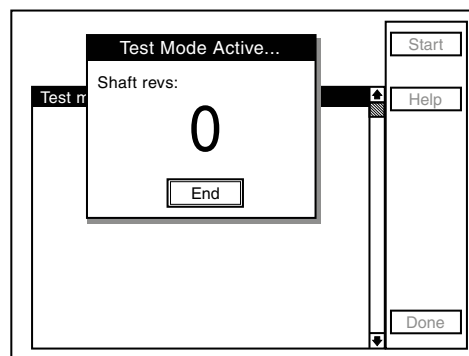
- STEP 1** Press F6 key until Mode Selection screen appears.
- STEP 2** Select "5. Test Mode" by turning rotary encoder knob or using arrow keys. Press knob or Enter key to display highlighted item.



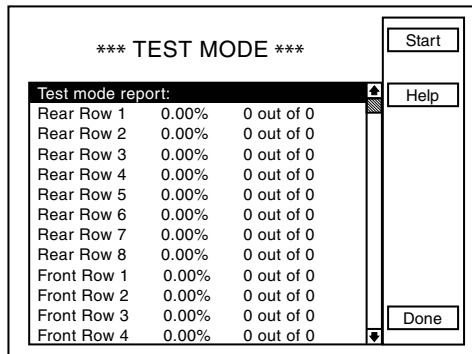
- STEP 3** Press F1 key next to Start.



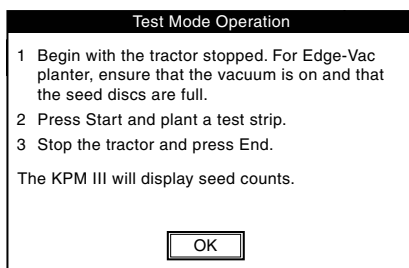
- STEP 4** "Test Mode Active" box displays showing number of shaft revolutions. "End" box is highlighted. Press knob or Enter key. "Test Mode Active" box displays showing drill shaft revolutions.



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



- STEP 6 Begin test with tractor stopped. For EdgeVac planters, ensure vacuum is on and seed discs are full.
- STEP 7 Press F1 key next to Start and plant a test strip.
- STEP 8 Stop tractor and press "End". KPM III displays seed counts by row and percentage.

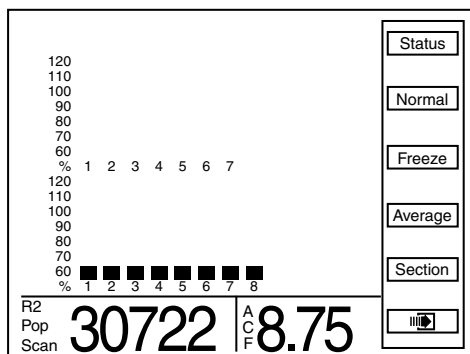


NOTE: Above instructions display on screen when F2 key next to "Help" is pressed.

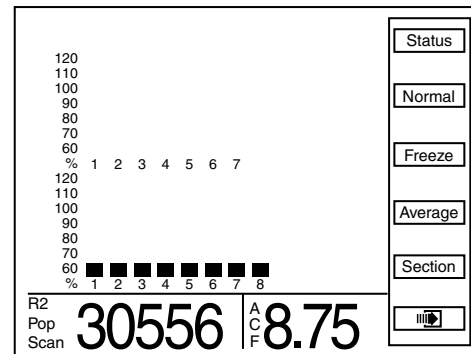
- STEP 9 Press F6 key next to Done. Display returns to Mode Selection screen.

ROW POPULATION

Press F1 key next to "RowPop" to display row population. Average planter population is shown in lower L.H. corner of display.

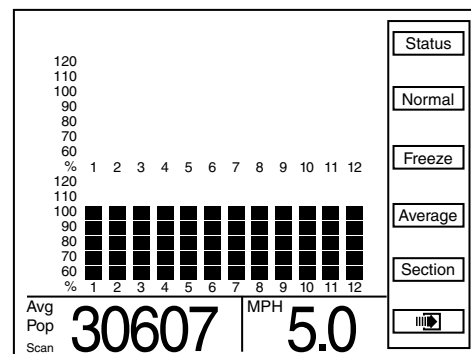


- Press F3 key next to Scan. Monitor scans through each row in ascending order displaying average seed population for each row. After all rows have been scanned, average population displays and scan function continues with first rear row.



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

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



- When "Scan" or "Frzn" is displayed in L.H. corner, Section and arrow keys function as follows:

- Section, Right arrow key, or Left arrow key advances to the first rear row.

- Up arrow key moves forward to the next row of the planter, wrapping around to the first row when moving past the last row.

- Down arrow key moves backward to the previous row of the planter, wrapping around to the last row of the planter when moving past the first row.

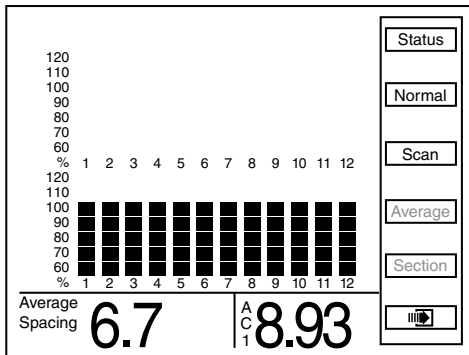
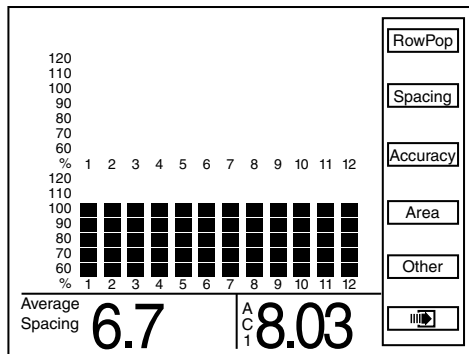
- Press F4 key next to Average to display average population in bottom L.H. corner.

- Press F2 key next to Normal to display normal screen for Planter Configuration screen.

NOTE: If rows are being scanned and F4 key next to Average is pressed, scan function stops.

ROW SPACING

- Press F2 key next to Spacing to display seed spacing keys. "Average Spacing" will appear in bottom L.H. corner of display.



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

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

- When "Scan" or "Frzn" is displayed in left display item, Section and arrow keys function as follows:

- Section, Right arrow key, or Left arrow key advance to first rear row.

- Up arrow key moves forward to next row of planter, wrapping around to first row when moving past last row.

- Down arrow key moves backward to previous row of planter, wrapping around to last row of the planter when moving past the first row.

- Press F4 key next to Average to display average seed spacing in bottom L.H. corner.

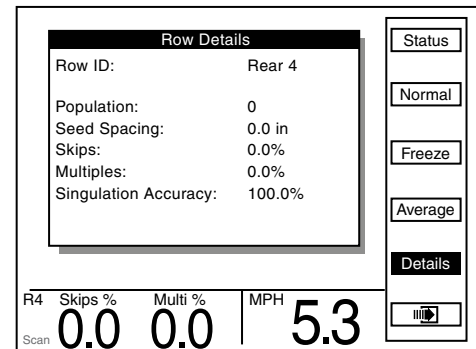
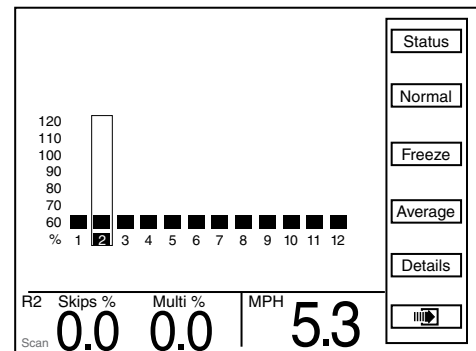
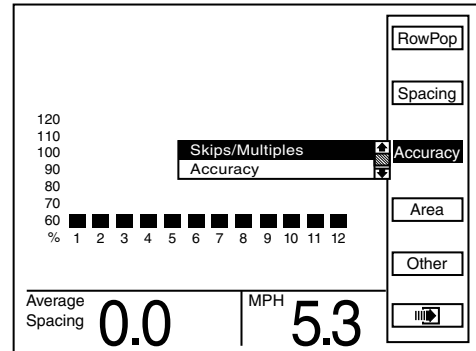
- Press F2 key next to Normal to display Planter Configuration screen.

NOTE: If rows are being scanned and F4 key next to Average is selected, scan function stops.

ACCURACY

NOTE: Soybeans will not show Skips/Multiples.

- Press F3 key next to Accuracy to display drop down menu. Select either "Skips/Multiples" or "Accuracy"



- When "Skips/Multiples" is selected average "Skips" and "Multiples" appears in the bottom L.H. corner.

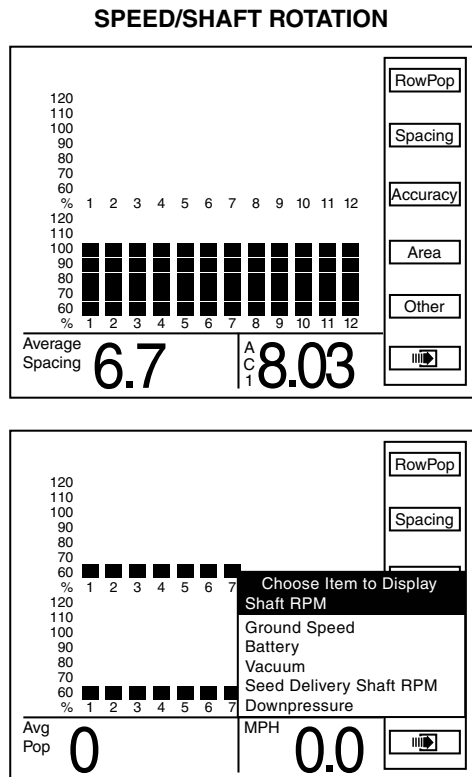
- When "Accuracy" is selected average "Average Accuracy %" appears in the bottom L.H. corner.

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

- Press F3 key next to Scan. Monitor scans through each row in ascending order displaying average Skips and Multiples for each row. "Scan" appears in lower L.H. corner to indicate display is scanning.

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

- Press F5 key next to Details to display "Row Details".



- Press F5 key next to Other for items available to display in bottom R.H. corner. Turn knob or use arrow keys to highlight “Shaft RPM”. Value appears in bottom R.H. corner of display as “RPM”.

NOTE: Applies to planters with shaft rotation sensors installed.

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

NOTE: Selected units of measure display as (English or Metric).

- Press F5 key next to “Other” for items available to display in bottom R.H. corner. Turn knob or use arrows keys to advance to “Battery” to view battery condition. Value appears in bottom R.H. corner of display as “Bat V”.

- Press F5 key next to “Other” for items available to display in bottom R.H. corner. Turn knob or use arrows keys to advance to “Vacuum” to view vacuum. Inches of vacuum appears in bottom R.H. corner of display as “VAC”.

- Press F5 key next to “Other” for items available to display in the bottom R.H. corner. Turn knob or use arrows keys to advance to “Seed Delivery Shaft RPM” to view shaft RPM. Shaft RPM appears in bottom R.H. corner of display as “RPM SDS”.

- Press F5 key next to “Other” for items available to display in bottom R.H. corner. Turn knob or use arrows keys to advance to “Downpressure” to view lbs. of down pressure. Lbs. of down pressure appears in bottom R.H. corner of the display as “LBS”.

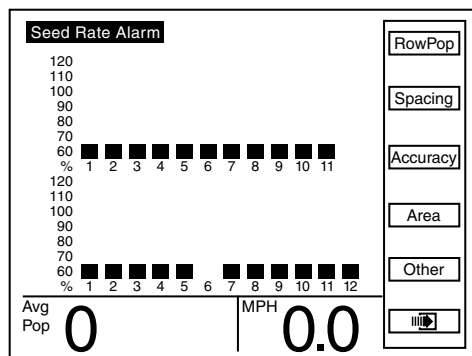
WARNINGS AND ALARMS

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

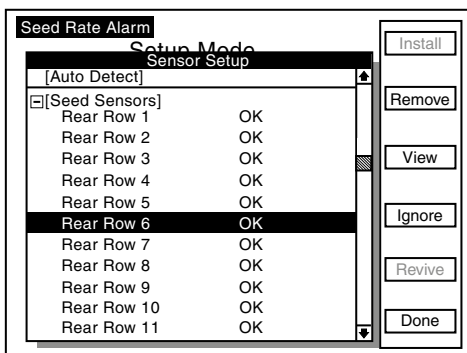
Corresponding row on bargraph starts flashing and monitor emits a series of beeps that persist until alarm is cleared or ACK button is pressed. "Seed Rate Alarm" appears in upper left corner of screen. Bargraph for row drops down based on threshold set for alarm.

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

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



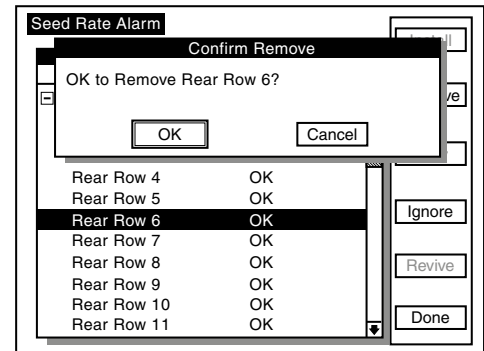
If sensor detects no seed flow it displays which row is not functioning. Alarm may be caused by a mechanical problem reducing seed flow or an electrical problem causing an incorrect seed count.



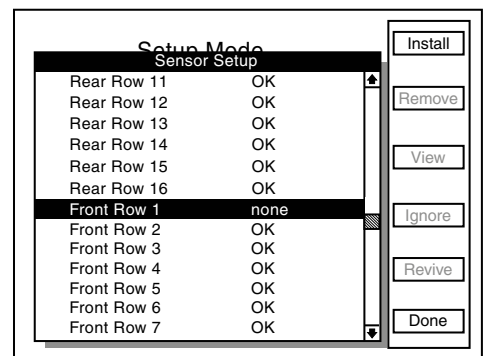
NOTE: Only way to remove an alarm is to find problem and correct it. Alarms are not reported for rows with seed rate alarm thresholds disabled.

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

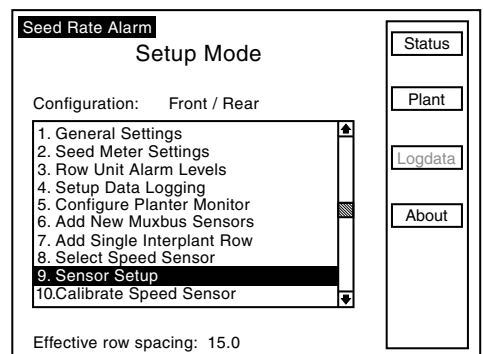
Row can be removed by pressing F2 key next to Remove. A box appears asking for confirmation to remove row. "OK" box is highlighted in box.



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



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



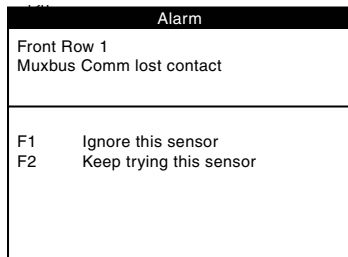
STEP 2

Section Not Planting - If monitor detects an entire section not planting, three beeps sound. Affected section bargraph flashes and is reduced to lowest segment. An alarm message is added to list of "Status Messages". Press F1 key next to Status to view alarm message.

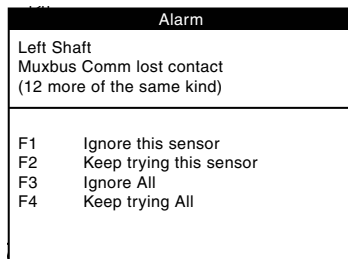
STEP 3 Counting Sensors Not Communicating With Monitor - If monitor detects a communication error between sensor and monitor, monitor beeps twice.

• Try to reestablish communication with sensor(s) by pressing F2.

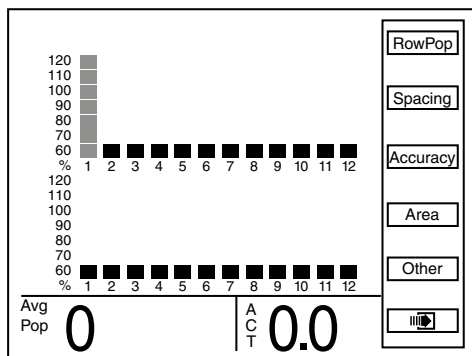
• If monitor is unable to establish communication there may be a faulty sensor, poor electrical connection, or a cut or pinched wire harness.



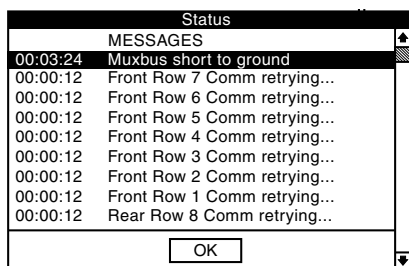
Message below shows multiple sensors with lost contact.



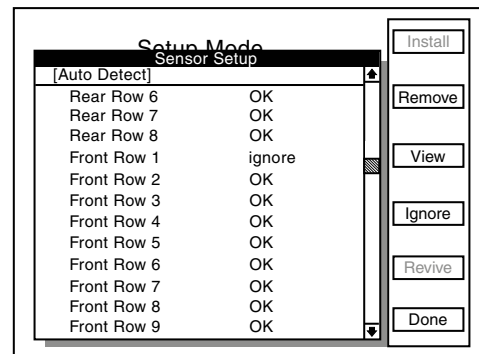
NOTE: When a known sensor or group of sensors are faulty, press F1 or F3. Monitor stops communication with affected sensors and corresponding bargraphs are grayed out on main "Planter Configuration" screen.



NOTE: Press F2 or F4 if sensors are not faulty. After pressing F2 or F4 a message similar to the one below appears when "Status" button F1 is pressed.



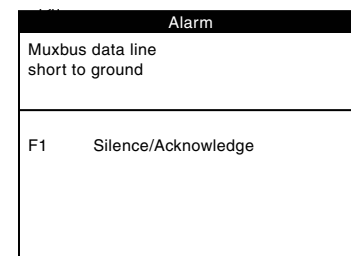
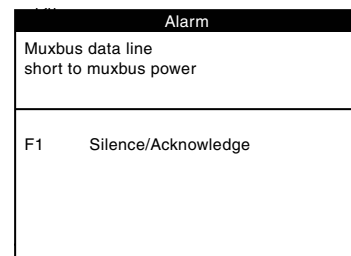
NOTE: If a sensor has been ignored, sensor configuration screen displays as shown below.



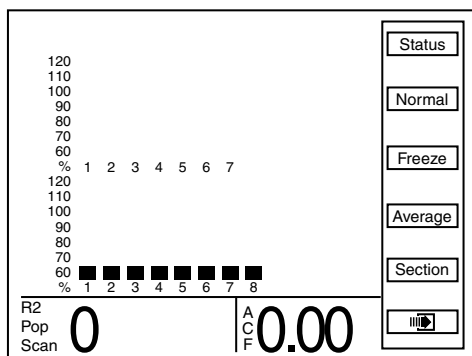
STEP 4 Seed Counting Sensors Too Dirty Warning - When powering on KPM III, seed sensor performs a self check. If a seed tube is too dirty, the message "Clean or Replace Sensor as Necessary" displays and bargraph for that row will flash.. Sensor will not function until problem is corrected.

NOTE: LCD screen continues to display alarm condition after alarms are acknowledged if alarm condition is still present.

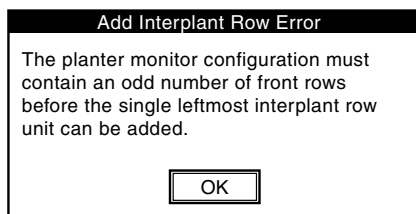
STEP 5 Wire Shorts - When a wire is shorted, one of the messages below displays, indicating which wires are shorted. Short must be located and repaired to continue planting. Turn off and restart monitor to clear alarm.



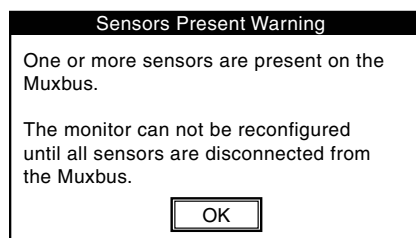
- STEP 6** Add Interplant Row Error – Planter monitor configuration must contain an odd number of front rows before single Interplant row unit can be added.



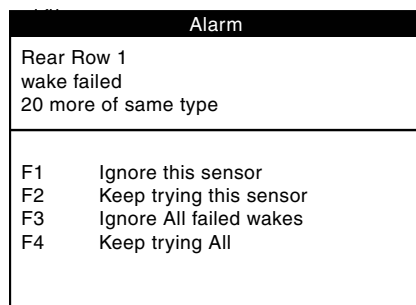
NOTE: Planter monitor configuration above has an even number of front (Interplant) rows (8).



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



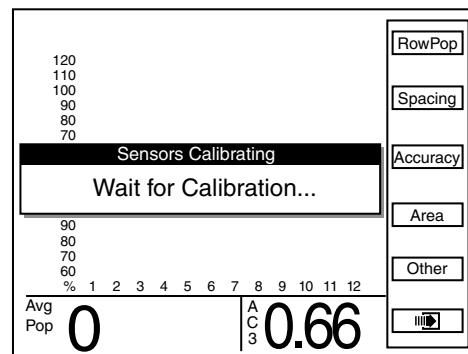
- STEP 8** Alarm: Rear Row 1 wake failed – Select an option from warning box and press key next to selection.



FIELD OPERATION

Press ON/OFF key to turn monitor ON.

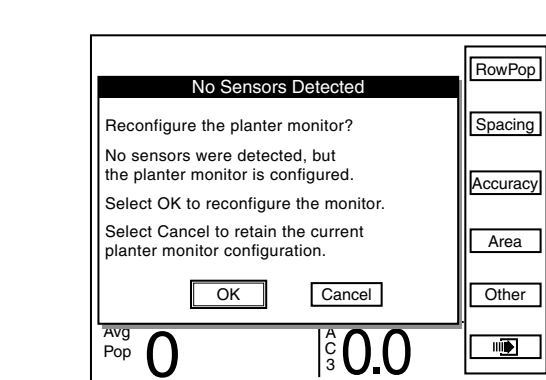
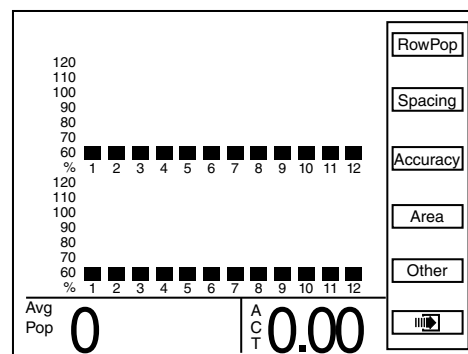
If monitor has been configured, it will show Planter Configuration screen and attempt to communicate with seed sensors.



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

NOTE: If monitor can communicate with sensors Planter Configuration screen displays.

If monitor does not detect sensors message below displays.



NOTE: Selecting OK reconfigures monitor requiring all sensors to be re-learned. Selecting Cancel keeps current configuration and monitor continues trying to communicate with sensors.

AREA MANAGEMENT

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

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

Press F6 key until "Area Management" screen displays.

Area Management

☒ Total Area

31.3 K

488.37

☒ Field Area

31.3 K

488.37

☒ Area Counter 1

31.3 K

486.02

☐ Area Counter 2

0.0 K

0.0

☐ Area Counter 3

0.0 K

0.0

☐ Area Counter 4

0.0 K

0.0

☐ Area Counter 5

0.0 K

0.0

☐ Area Counter 6

0.0 K

0.0

☐ Area Counter 7

0.0 K

0.0

☐ Area Counter 8

0.0 K

0.0

Status

Rename

Clear

Clr All

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

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

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

- Turn knob or use arrow keys to highlight desired area counter.
- Press F2 key next to Rename to name area. A drop down keyboard displays. Use keyboard to enter area name. Press knob or enter key to save information.

Area Management

☒ Total Area

0.0 K

0.0

☐ Field Area

0.0 K

0.0

☐ 1 Area Counter 1

0.0 K

0.0

A B C D E F G H

I J K L M N O P

Q R S T U V W X

Y Z () / , . -

Clear

Status

Rename

Clear

Clr All

NOTE: When a key is dimmed it does not perform any operation on highlighted area counter. • Use knob or arrow keys to highlight the "OK" button, press knob or Enter key.

Enable Area Counter

- Highlight desired "Area Counter" by turning rotary encoder knob or using arrow keys.
- Press knob or Enter key. A "Confirm Area Counter Enable" box displays.

Area Management

☒ Total Area

31.3 K

488.37

☒ Field Area

31.3 K

488.37

☒ Area Counter 1

31.3 K

486.02

☐ Area Counter 8

0.0 K

0.0

Confirm Area Counter Enable

Enable this area counter?

OK

Cancel

Status

Rename

Clear

Clr All

- Use knob or arrow keys to highlight "OK" button and press knob or Enter key. Enabled "Area Counter" starts accumulating area.

Disable Area Counter

All area counters may be disabled, except Total Area Counter.

- Highlight desired "Area Counter" by turning rotary encoder knob or using arrow keys.
- Press knob or Enter key. A "Confirm Area Counter Disable" box displays. • Use knob or arrow keys to highlight "OK" button and press knob or Enter key. Disabled "Area Counter" no longer accumulates area.

Area Management

☒ Total Area

31.3 K

488.37

☒ Field Area

31.3 K

488.37

☐ Area Counter 7

0.0 K

0.0

☐ Area Counter 8

0.0 K

0.0

Confirm Area Counter Disable

Disable this area counter?

OK

Cancel

Status

Rename

Clear

Clr All

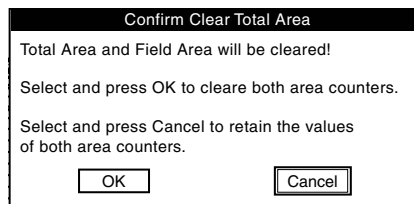
NOTE: Attempts to disable an Area Counter that is planting will cause the following alarm.

Note

This counter may not be disabled as it is currently being displayed and seeds are being planted.

OK

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



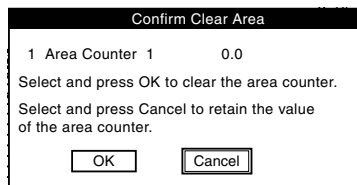
Clear Area Counter

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

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

Clearing an Area Counter

- STEP 1 Turn knob or use arrow keys to highlight desired area counter.
- STEP 2 Press F3 key next to “Clear”. Request for confirmation shown below displays

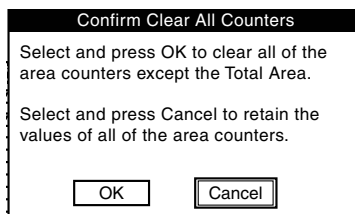


- STEP 3 Turn knob or use arrow keys to highlight “OK” or “Cancel” and press knob or Enter key to confirm selection.

Clearing All Area Counters

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

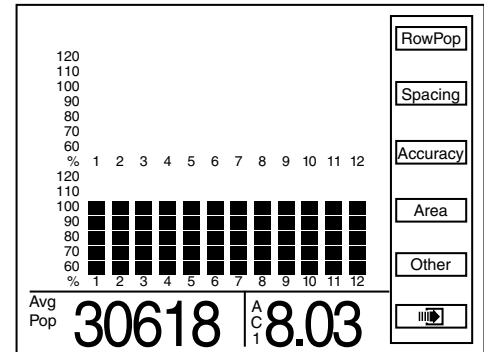
- STEP 1 Press F4 key next to “CLR All”. A request for confirmation displays.



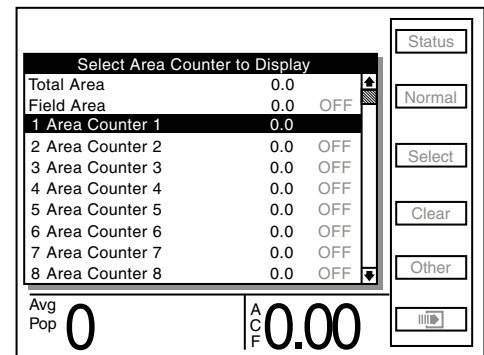
- STEP 2 Turn knob or use arrow keys to select “OK” or “Cancel” and press knob or Enter key to confirm selection.

AREA COUNTERS

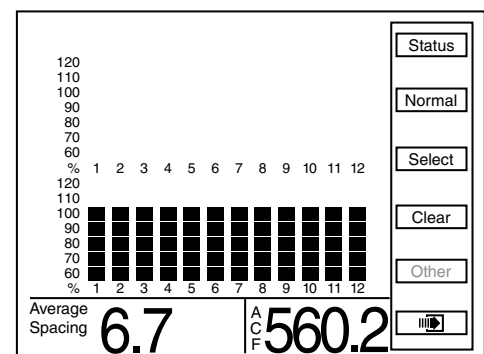
- STEP 1 On Planter Configuration screen press F4 key next to “Area”.



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



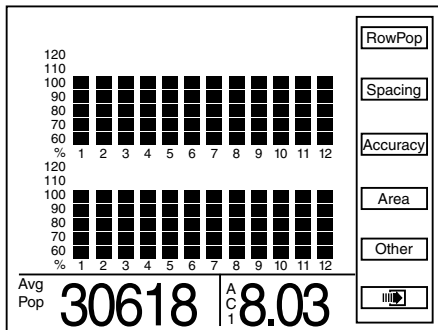
- STEP 3 Use arrow keys to highlight desired area counter to be displayed.
- STEP 4 Press knob or Enter key and “Planter Configuration” screen displays.



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

CLEARING FIELD AREA

STEP 1 Display Plant screen to reset counter.



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

STEP 2 Press F4 key next to Area then press F4 key next to Clear. A dialog box displays requesting confirmation to clear.

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

NOTE: Only displayed area counter can be cleared.

REPLACING FAULTY SENSOR(S)

NOTE: Monitor beeps twice when new sensors are learned.

STEP 1 Press F6 key until Mode Selection screen appears.

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

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

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

STEP 5 The following message displays. Select OK to confirm by pressing knob or Enter key. Select Cancel to exit.

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


NOTE: Monitor beeps twice when new sensors are learned.

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

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


LUBRICATION

Following pages show locations of all lubrication points. Proper lubrication of moving parts helps ensure efficient operation of your Kinze planter and prolongs the life of friction producing parts.

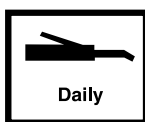


WARNING

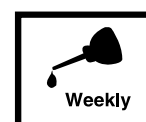
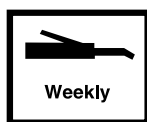
Uncontrolled machine can crush or cause loss of control resulting in death, serious injury, or damage to property and equipment. Install all safety lockup devices before working under or transporting equipment.



LUBRICATION SYMBOLS



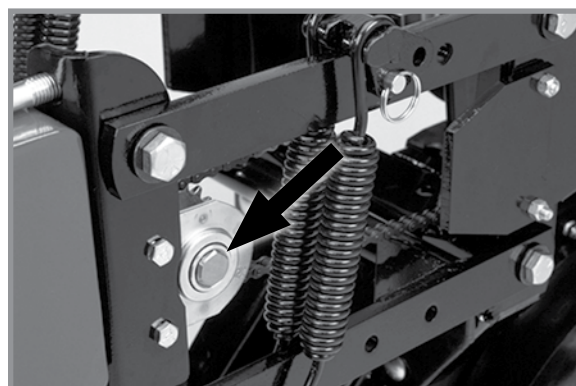
Lubricate at frequency indicated with an SAE multipurpose grease.



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

SEALED BEARINGS

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



WRAP SPRING WRENCH ASSEMBLY

Components may require occasional lubrication to operate correctly. Disassembly is required to lubricate.

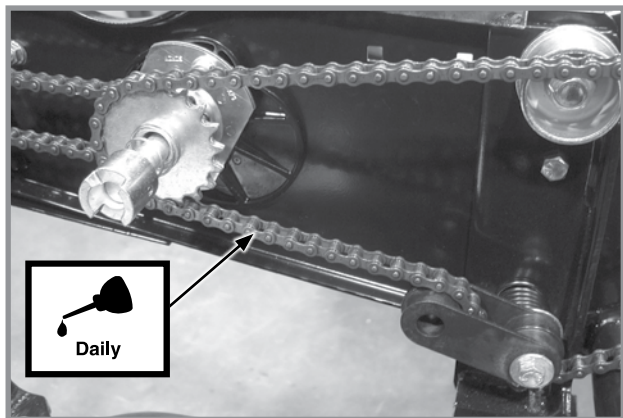
1. Remove 1/4"-20 x 1/2" cap screw that secures idler assembly to wrap spring wrench tightener shaft.
2. Remove wrap spring wrench from planter.
3. Tip wrap spring wrench on its side and lubricate with a high quality spray lubricant. Lubricant must be absorbed into wrap spring area.
4. Reinstall wrap spring wrench on planter.



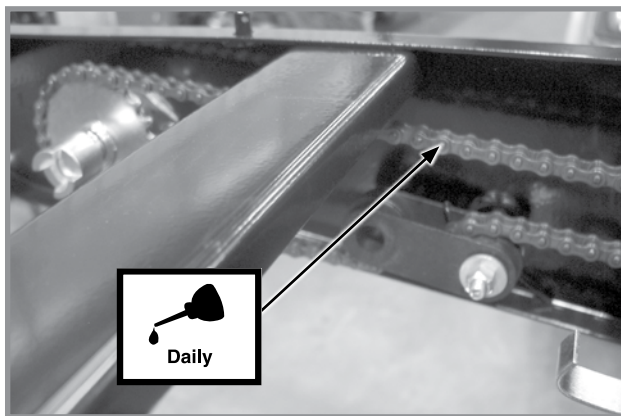
Wrap Spring Wrench Lubrication

DRIVE CHAINS

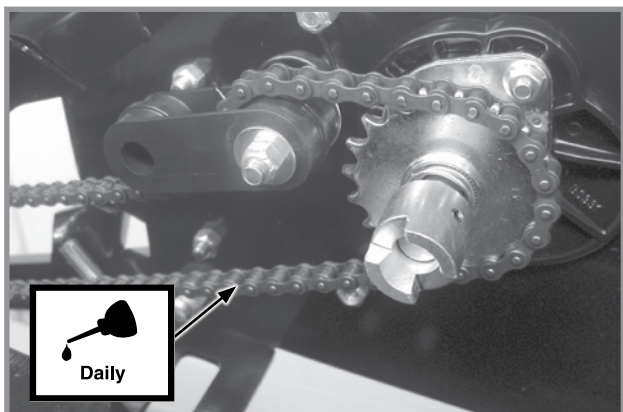
Lubricate all transmission and drive chains daily with a high quality chain lubricant. Extreme operating conditions such as dirt, temperature, or speed may require more frequent lubrication. If a chain becomes stiff, it should be removed, soaked, and washed in solvent to loosen and remove dirt from joints.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



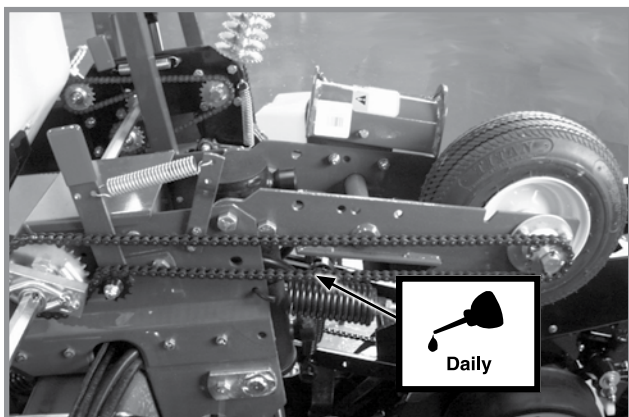
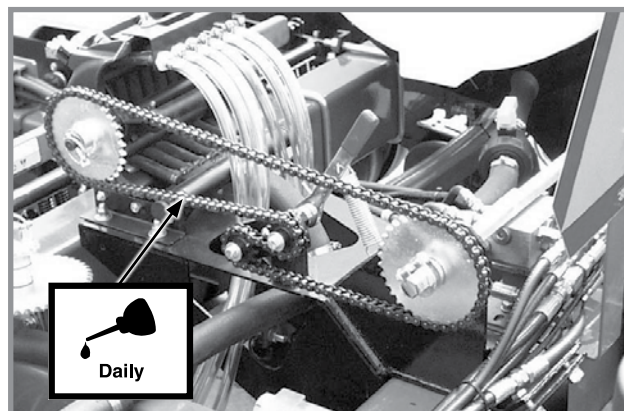
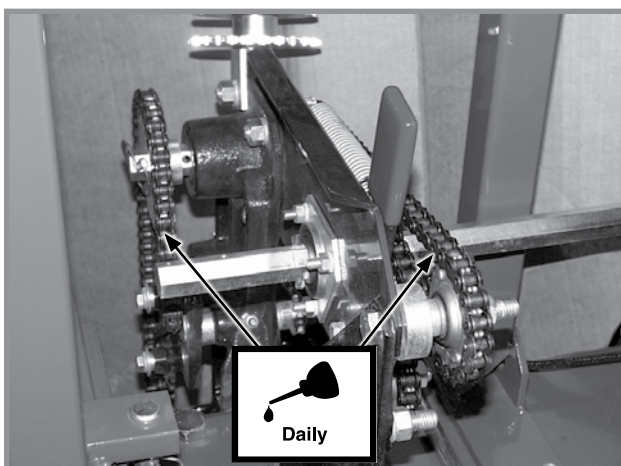
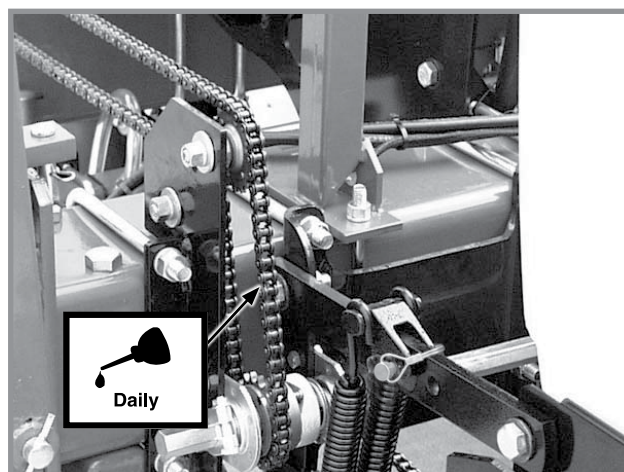
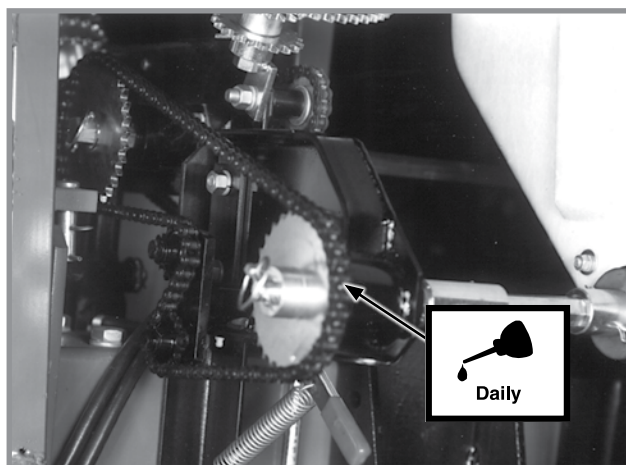
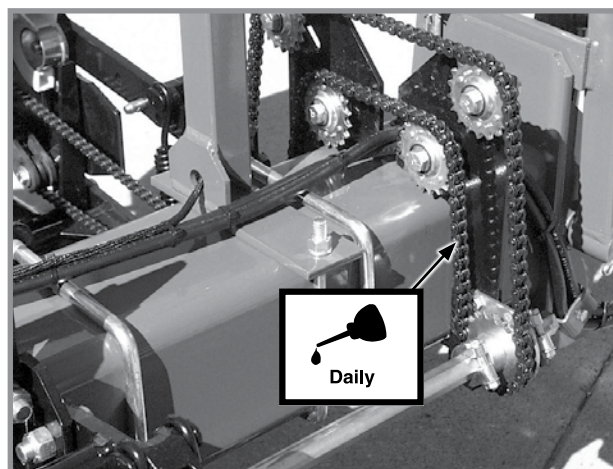
Pull Row Unit Drive Chains



Row Unit Granular Chemical Drive Chains



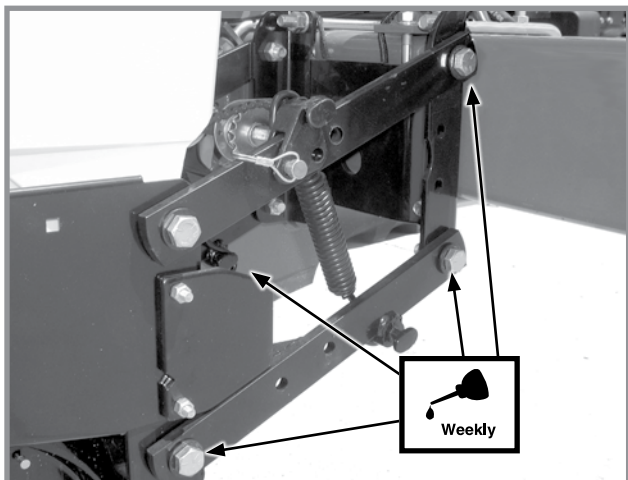
Push Row Unit Drive Chains

DRIVE CHAINS (CONTINUED)**Contact Wheel Drive Chains****Liquid Fertilizer Drive Chain
(Squeeze Pump Shown)****Seed Rate Transmission Assembly and Reverser
Plate Chains****Interplant Drive Chain (Double Frame)****Dry Fertilizer Drive Chain****Interplant Drive Chain (Single Frame)**

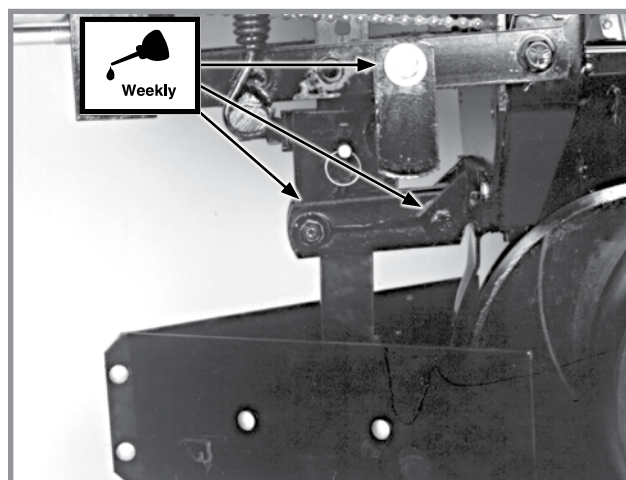
BUSHINGS

Lubricate bushings at frequency indicated.

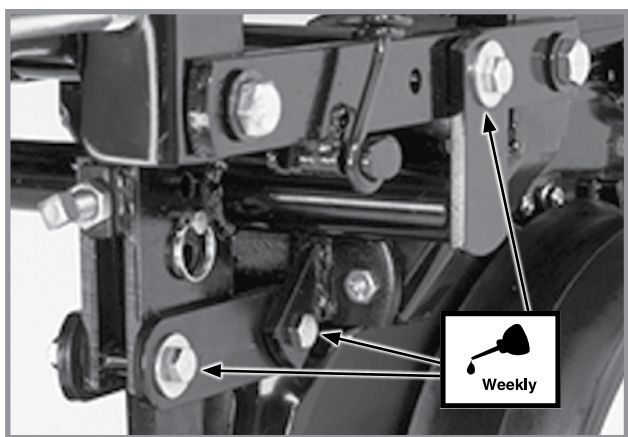
Check each bolt for proper torque. If bolt is loose, removed it and inspect bushing for cracks and wear. Replace bushing if necessary. Use **only hardened flat washers**. Replace damaged flat washers with proper part. Torque hardware to 130 ft-lb (176.2 N-m).



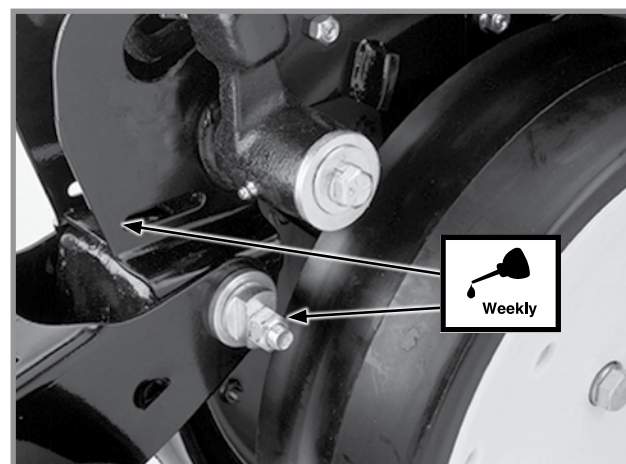
Pull Row Unit And/Or Push Row Unit Parallel Linkages (8 Per Row)



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

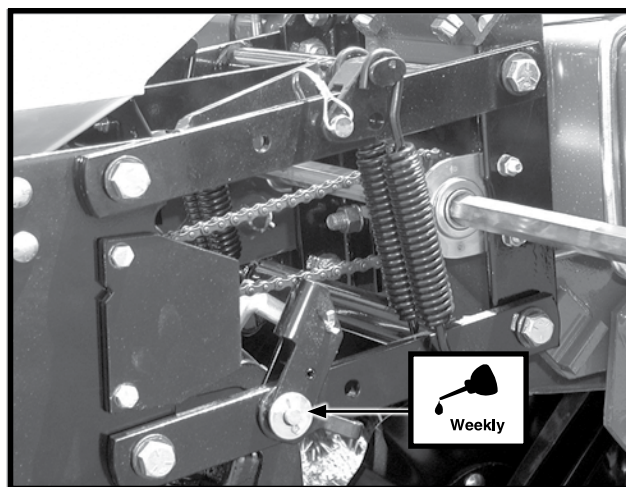


Row Unit Mounted Disc Furrower Parallel Linkages (6 Per Row)



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

INTERPLANT PUSH ROW UNIT LOCKUPS

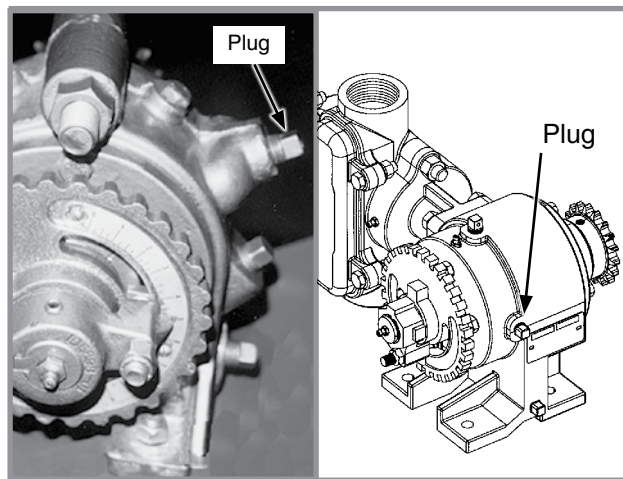


2 Per Row

LIQUID FERTILIZER PISTON PUMP CRANKCASE OIL LEVEL

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 pump and flow divider for additional information.



Piston pump oil fill plug location

WHEEL BEARINGS

Inspect all drive, transport, and marker hub wheel bearings annually and repack/replace as needed.

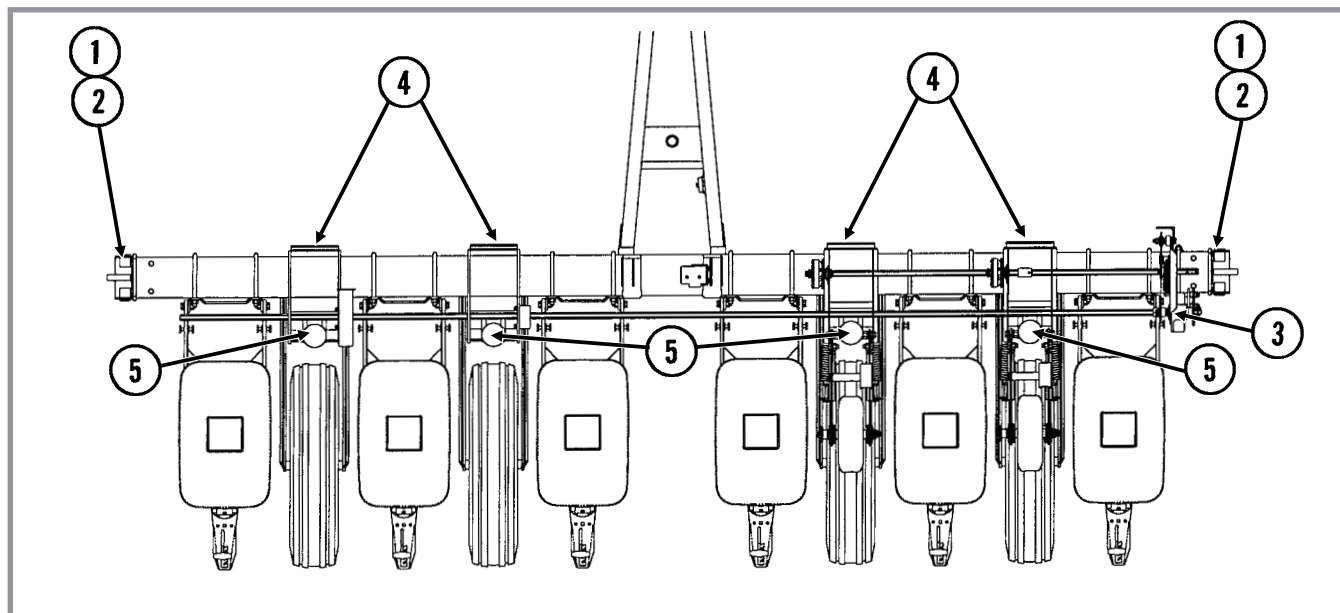
1. Raise wheel off ground.
2. Check bearing endplay by moving wheel side to side.
3. Rotate wheel to check bearing roughness. If bearings sound rough, hub should be removed and bearings inspected and replaced as needed.

To repack wheel hubs, follow procedure outlined for wheel bearing replacement except bearings and bearing cups are reused.

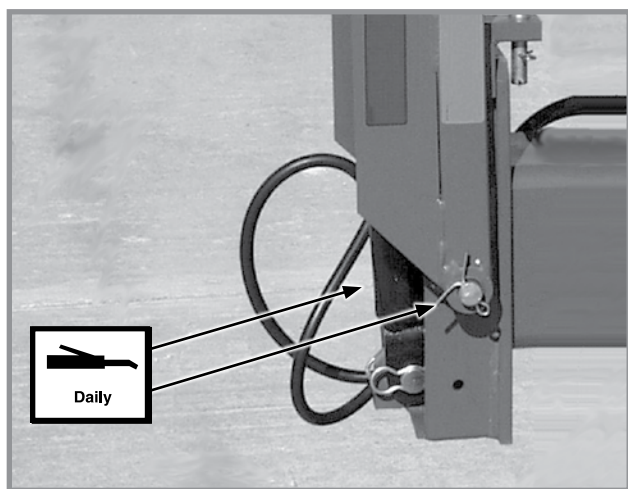
GREASE FITTINGS

Lubricate parts with grease fittings at frequency indicated with an SAE multipurpose grease. Clean fitting thoroughly before greasing. Frequency of lubrication is based on normal operating conditions. Severe or unusual conditions may require more frequent attention.

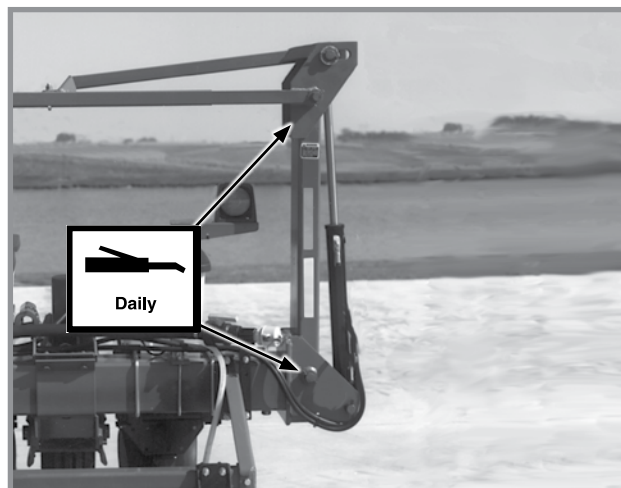
NOTE: Numbers on illustration below correspond to photos on following pages showing lubrication frequencies.



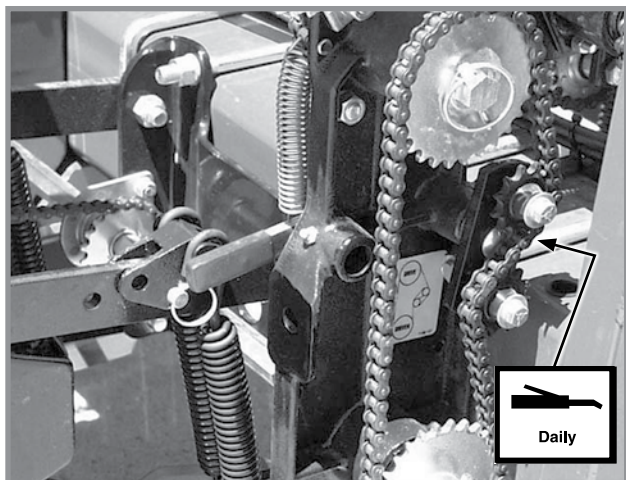
Model 3000 6 Row 30" (70 cm) Planter Shown



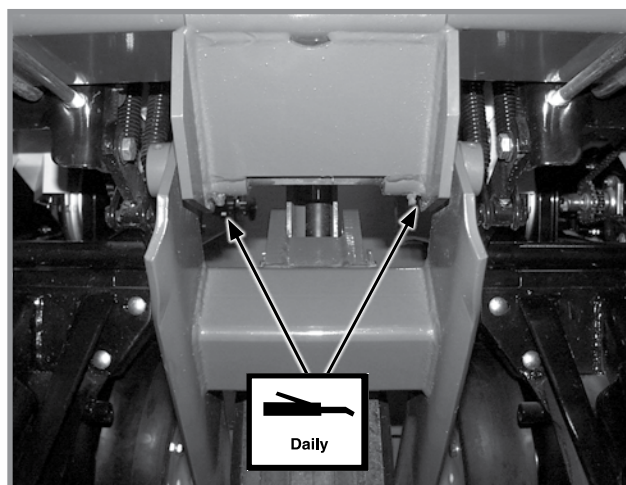
1. Conventional Row Marker Assembly - 4 Per Assembly



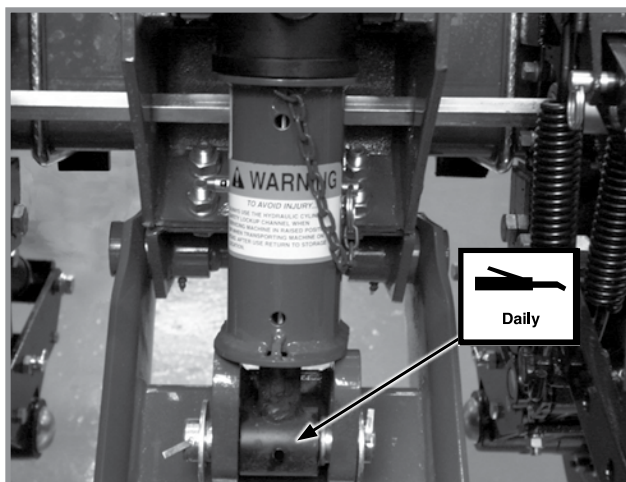
2. Low Profile Row Marker Assembly - 2 Per Assembly



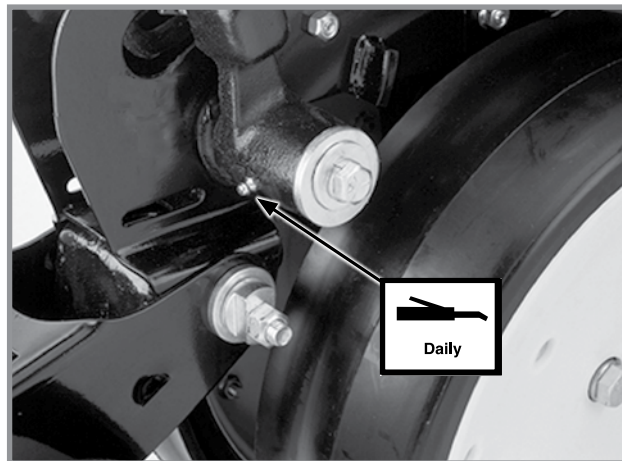
3. Seed Rate Transmission Assembly - 1 (Idler)



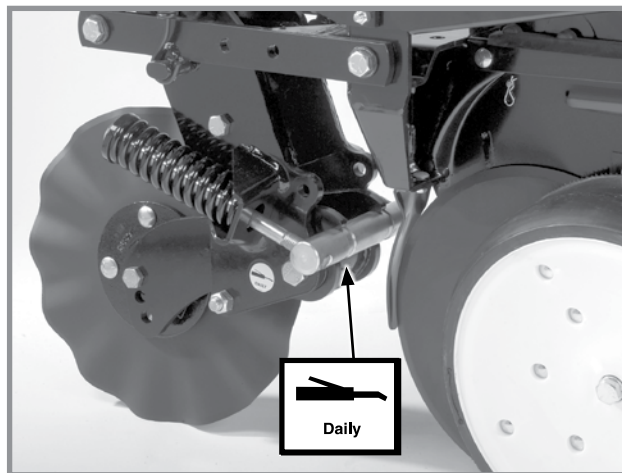
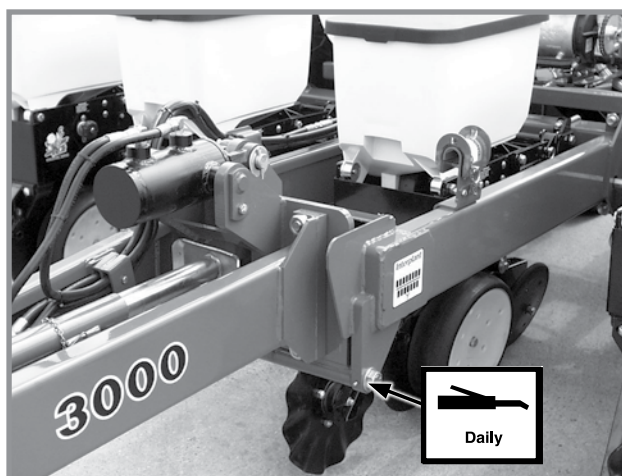
4. Wheel Module Assembly - 2 Per Module



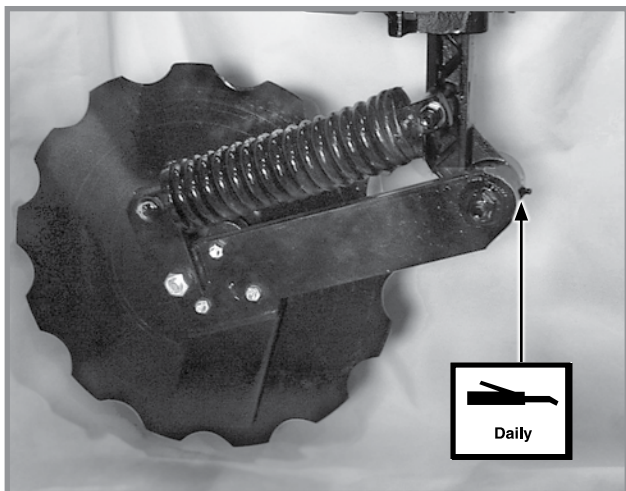
5. Lift Cylinders (Master, Slave And Assist) - 1 Per Cylinder.

Row Unit**Gauge Wheel Arms - 1 Per Arm**

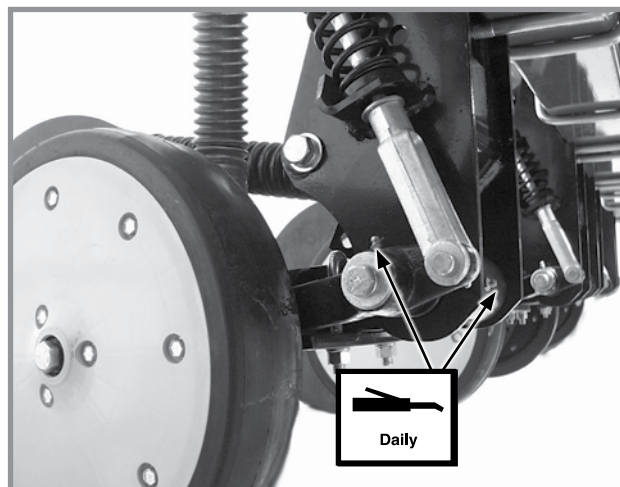
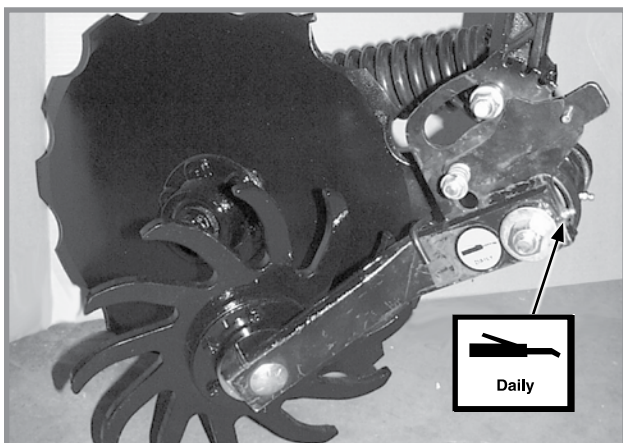
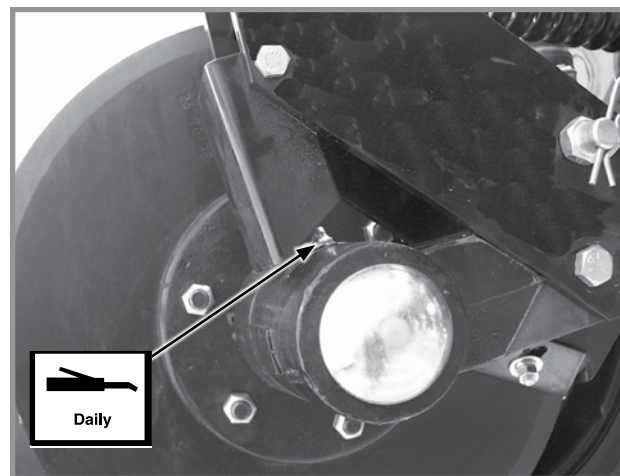
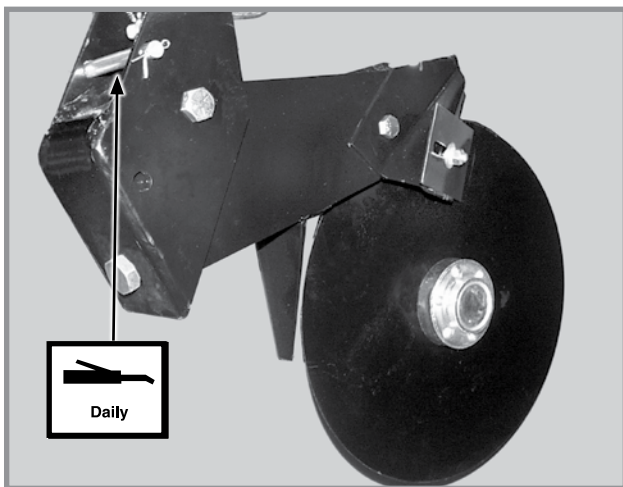
(Seals installed with lip facing out to allow grease to purge dirt from seal. Pump grease into arm until fresh grease appears between washers and arm.)

**Frame Mounted Coulter - 1 Per Arm****Interplant Attachment****Interplant Self-Leveling Hitch Extension - 2**

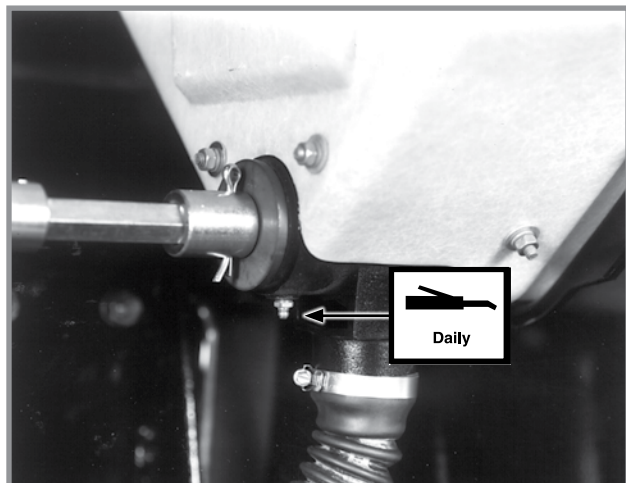
Fertilizer Openers



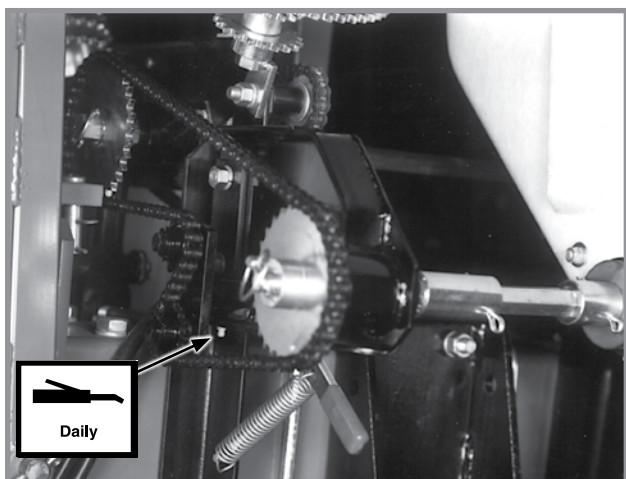
Notched Single Disc Fertilizer Opener - 1

HD Single Disc Fertilizer Opener - 2
(Located On Wheel Arm And Opener Mount)Residue Wheel Attachment For Use With Notched
Single Disc Fertilizer Opener - 1HD Single Disc Fertilizer Opener - 1
(Located On Disc Opener Spindle Hub)

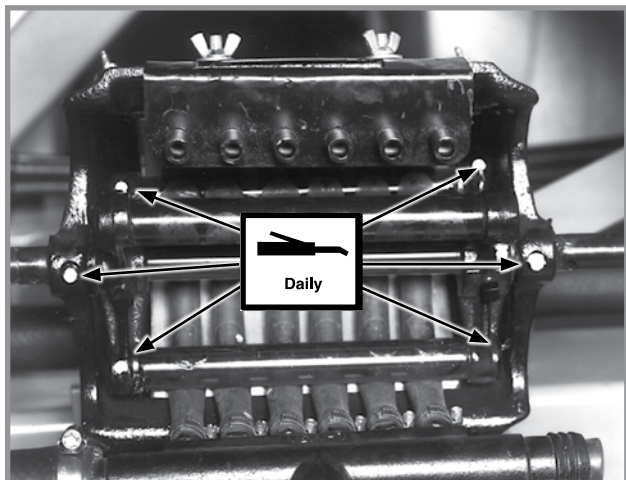
Double Disc Fertilizer Opener - 1

Dry Fertilizer Attachment

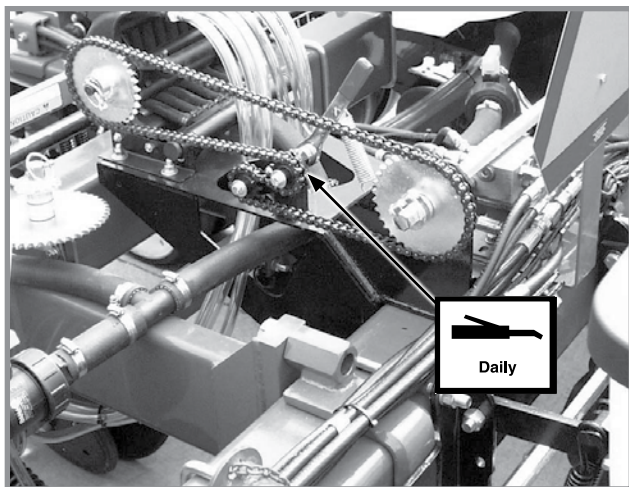
Dry Fertilizer Hopper - 2 Per Hopper



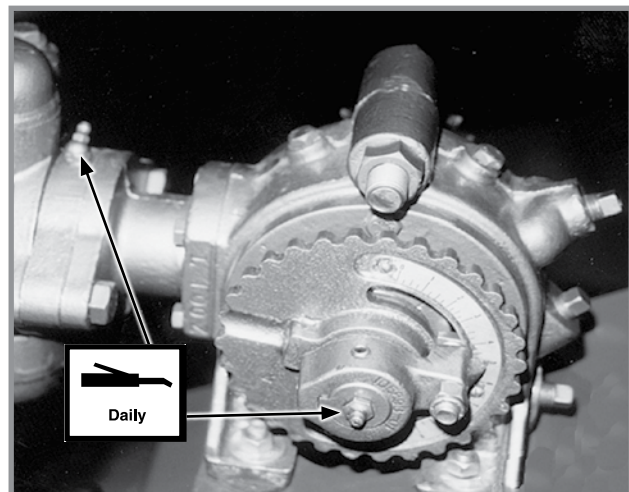
Dry Fertilizer Transmission - 1 Per Transmission

Liquid Fertilizer Attachment

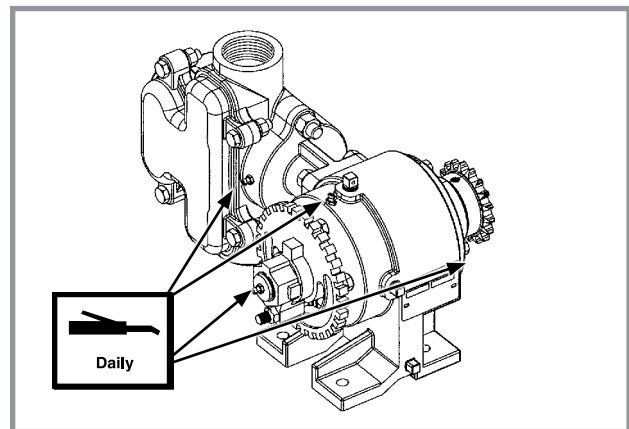
Squeeze Pump - 8 Per Pump



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



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



Liquid Fertilizer Piston Pump - 4 (Fill on outboard stuffing box until lubricant seeps out of drain hole in bottom.)

MOUNTING BOLTS AND HARDWARE

Before operating planter for the first time, check all hardware is tight. Check all hardware again after first 50 hours of operation and beginning of each planting season.

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. Hardware must be replaced with equal size, strength, and thread type.

WARNING






Loose transport wheel lug bolts can result in wheel separation from planter and result in death, serious injury, and damage to property and equipment. Check transport wheel lug nut torque before operating planter for the first time and periodically thereafter.

NOTICE

Over-tightening hardware can reduce its shock load capacity and cause equipment failure.

TORQUE VALUES CHART - PLATED HARDWARE

	Grade 2 (No marks) 		Grade 5 (3 marks) 		Grade 8 (6 marks) 	
Diameter	Coarse	Fine	Coarse	Fine	Coarse	Fine
1/4"	50 in-lb	56 in-lb	76 in-lb	87 in-lb	9 ft-lb (12 N-m)	10 ft-lb (14 N-m)
5/16"	8 ft-lb (11 N-m)	9 ft-lb (12 N-m)	13 ft-lb (18 N-m)	14 ft-lb (19 N-m)	18 ft-lb (24 N-m)	20 ft-lb (27 N-m)
3/8"	15 ft-lb (20 N-m)	17 ft-lb (23 N-m)	23 ft-lb (31 N-m)	26 ft-lb (35 N-m)	33 ft-lb (45 N-m)	37 ft-lb (50 N-m)
7/16"	25 ft-lb (34 N-m)	27 ft-lb (37 N-m)	37 ft-lb (50 N-m)	41 ft-lb (56 N-m)	52 ft-lb (71 N-m)	58 ft-lb (79 N-m)
1/2"	35 ft-lb (48 N-m)	40 ft-lb (54 N-m)	57 ft-lb (77 N-m)	64 ft-lb (87 N-m)	80 ft-lb (108 N-m)	90 ft-lb (122 N-m)
9/16"	50 ft-lb (68 N-m)	60 ft-lb (81 N-m)	80 ft-lb (108 N-m)	90 ft-lb (122 N-m)	115 ft-lb (156 N-m)	130 ft-lb (176 N-m)
5/8"	70 ft-lb (95 N-m)	80 ft-lb (108 N-m)	110 ft-lb (149 N-m)	125 ft-lb (169 N-m)	160 ft-lb (217 N-m)	180 ft-lb (244 N-m)
3/4"	130 ft-lb (176 N-m)	145 ft-lb (197 N-m)	200 ft-lb (271 N-m)	220 ft-lb (298 N-m)	280 ft-lb (380 N-m)	315 ft-lb (427 N-m)
7/8"	125 ft-lb (169 N-m)	140 ft-lb (190 N-m)	320 ft-lb (434 N-m)	350 ft-lb (475 N-m)	450 ft-lb (610 N-m)	500 ft-lb (678 N-m)
1"	190 ft-lb (258 N-m)	205 ft-lb (278 N-m)	480 ft-lb (651 N-m)	530 ft-lb (719 N-m)	675 ft-lb (915 N-m)	750 ft-lb (1017 N-m)
1 1/8"	265 ft-lb (359 N-m)	300 ft-lb (407 N-m)	600 ft-lb (814 N-m)	670 ft-lb (908 N-m)	960 ft-lb (1302 N-m)	1075 ft-lb (1458 N-m)
1 1/4"	375 ft-lb (508 N-m)	415 ft-lb (563 N-m)	840 ft-lb (1139 N-m)	930 ft-lb (1261 N-m)	1360 ft-lb (1844 N-m)	1500 ft-lb (2034 N-m)
1 3/8"	490 ft-lb (664 N-m)	560 ft-lb (759 N-m)	1100 ft-lb (1491 N-m)	1250 ft-lb (1695 N-m)	1780 ft-lb (2413 N-m)	2030 ft-lb (2752 N-m)
1 1/2"	650 ft-lb (881 N-m)	730 ft-lb (990 N-m)	1450 ft-lb (1966 N-m)	1650 ft-lb (2237 N-m)	2307 ft-lb (3128 N-m)	2670 ft-lb (3620 N-m)

NOTE: Torque unplated hardware and bolts with lock nuts approximately 1/3 higher than above values. Torque bolts lubricated prior to installation to 70% of value shown in chart.


5/8" No Till Coulter Spindle Bolt - 120 Ft. Lbs.
(162.7 N-m)


Row Unit Parallel Linkage Bushing Bolts -
130 Ft. Lbs. (176.3 N-m) (See "Bushings" in
Lubrication of this section.)

SPECIAL TORQUE VALUES & INSTRUCTIONS

Row unit parallel linkage bushing hardware	130 ft-lb (176 Nm)
5/8" No till coulter spindle hardware	120 ft-lb (162 Nm)
Transport Tire Inner Budd Nuts	315 ft-lb (427 Nm)
Transport Tire Outer Budd Nuts	1075 ft-lb (1458 Nm)
Row Unit Disc Opener Blade Bolt**	110 ft-lb (149 Nm) **Left hand side is left hand thread.
5/8" - 18 Wheel Lug Nuts and Lug Bolts	200 ft-lb (271 Nm)
9/16" - 18 Wheel Lug Nuts and Lug Bolts	125 ft-lb (169 Nm)

TIRE PRESSURE

**WARNING**



Explosive separation of rim and tire parts can cause death or serious injury. Overinflation, rim and tire servicing, improper use of rims and tires, or worn or improperly maintained tires could result in a tire explosion.

To prevent tire explosion:

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

MODEL 3000 OPERATING TIRE PRESSURE

Transport/ground drive - 7.50" x 20" Inflate to 40 psi (275.7 kPa)

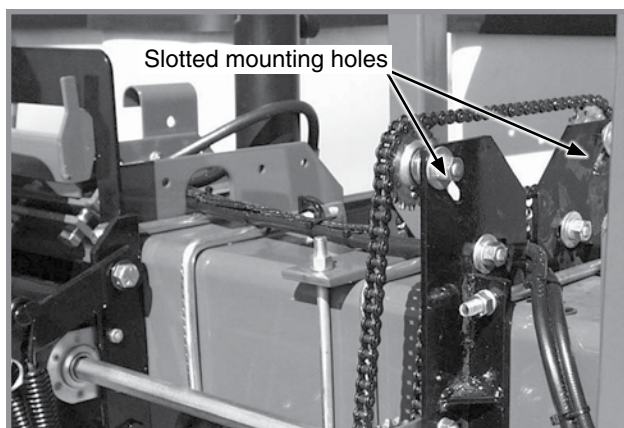
Contact drive - 4.10" x 6" Inflate to 50 psi (344.7 kPa)



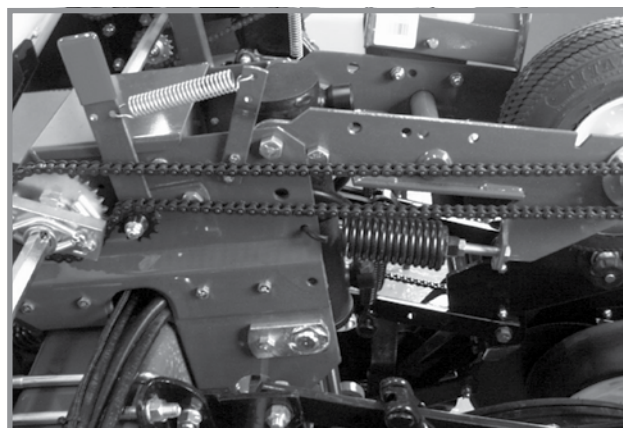
CHAIN TENSION ADJUSTMENT

Drive chains equipped with a spring loaded idler are self-adjusting. The only adjustment is to shorten chain if wear stretches chain and reduces spring tension. Check idler pivot periodically to ensure they rotate freely.

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

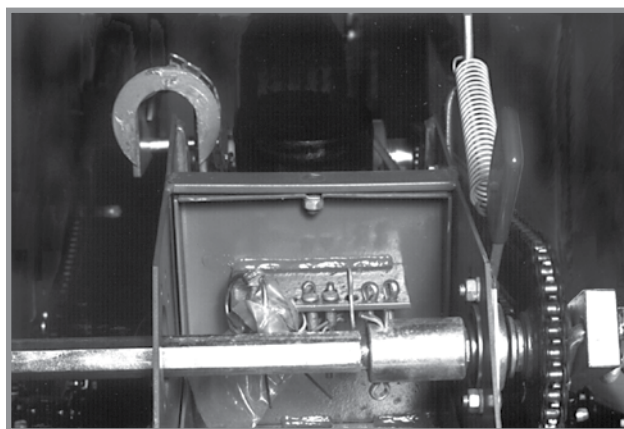


Interplant drive chain tension adjustment



Drive chain tension adjustment

Additional chain links are in the storage box inside wheel module.

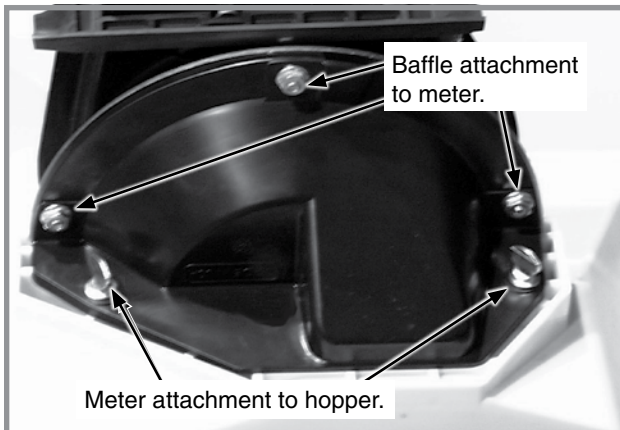


Chain link storage

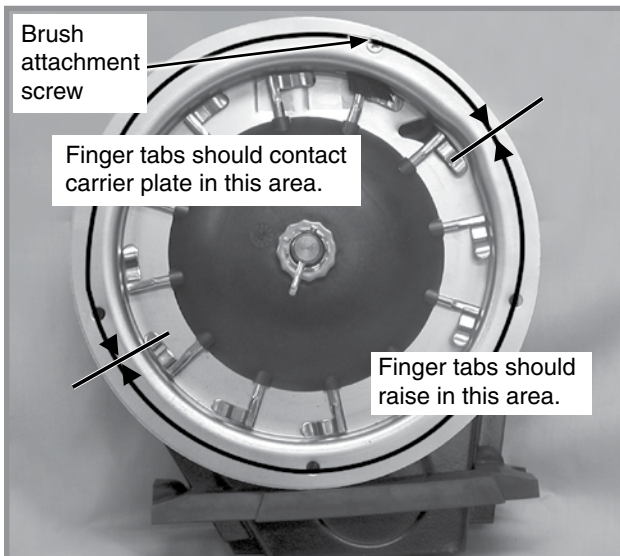
See "Wrap Spring Wrench Assembly" in Lubrication of this section for additional information.

FINGER PICKUP SEED METER INSPECTION/ADJUSTMENT

Remove meter from seed hopper by removing two thumbscrews which secure mechanism to hopper. Remove baffle from meter assembly by removing three cap screws.

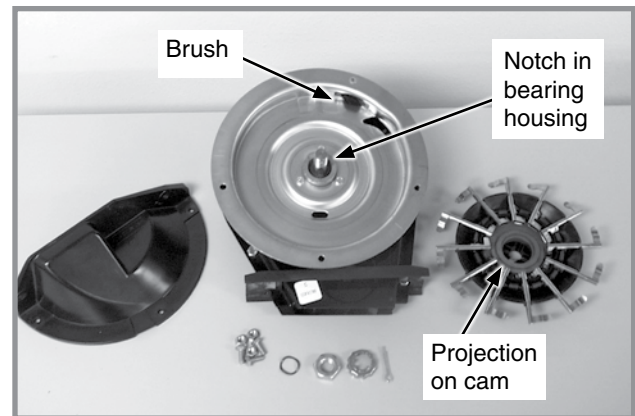


Rotate seed meter drive by hand to ensure springs are holding tabs of fingers against carrier plate where indicated in photo and that fingers are being raised in correct area.



A buildup of debris or chaff may prevent proper finger operation and requires disassembly and cleaning of finger pickup meter.

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

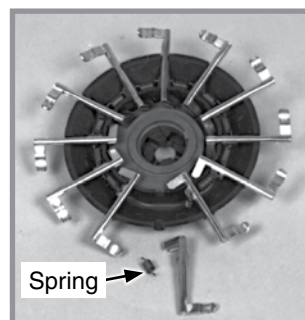


3. Check brush for wear and replace if necessary or after every 100 acres (41 hectares) per row of operation.

EXAMPLE: Approximately 800 acres (324 hectares) of corn or sunflowers on a 8 row machine or 1200 acres (486 hectares) on an 12 row machine.

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

4. Remove springs from fingers and remove finger from holder by lifting it out of friction fit slot. Under average conditions, life expectancy of these parts should be 600-900 acres (243-364 hectares) per row of operation.
5. After cleaning and/or replacing defective parts, reassemble meter in reverse order. When replacing fingers, make sure open end of spring loop is toward inside of finger holder.

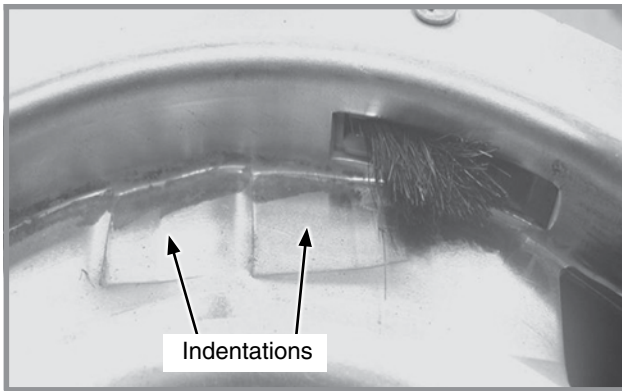


Corn Finger Assembly
(Position Spring Opening
Toward Holder)



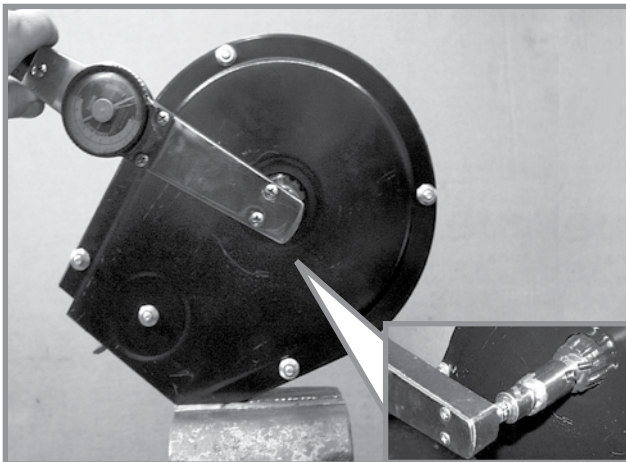
**Oil Sunflower Finger
Assembly**

6. Make sure fingers are installed in holder so holder is flush with carrier plate when assembled. A cam projection aligns with a mating notch in bearing housing to ensure proper operation when assembled.



Worn Carrier Plate

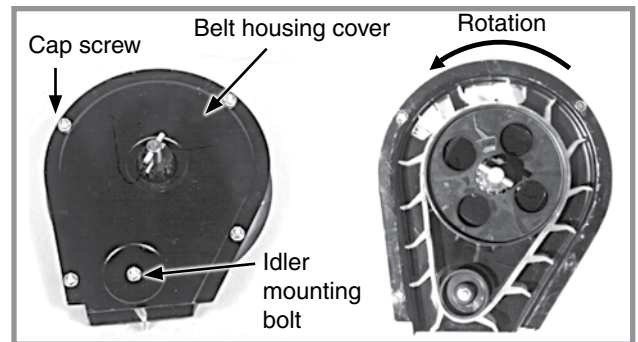
7. Before installing finger holder on carrier plate, check indentations on carrier plate for wear. Excessive wear of carrier plate at indentations will cause over planting especially when using small sizes of seed. Inspect carrier plate annually. Life expectancy should be 250-300 acres (100-125 hectares) per row of operation under average conditions.
8. With finger holder flush against carrier, install wave washer and adjusting nut. Tighten adjusting nut to fully compress wave washer. Back off nut $\frac{1}{2}$ to 2 flats ($\frac{1}{12}$ to $\frac{1}{3}$ turn) to obtain rolling torque of 22 to 25 inch pounds (2.5 to 2.8 N-m).



9. Turn finger holder by hand to make sure it is positioned firmly against carrier plate, but can be rotated with moderate force.
10. Install cover nut and cotter pin and reinstall baffle.

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

Remove four cap screws around edge of housing cover and nut from belt idler mounting bolt.



If belt is replaced, make sure paddles are correctly oriented as shown. A diagram molded into the drive sprocket also shows correct orientation.

Reinstall housing cover. DO NOT TIGHTEN hardware. Wedge a screwdriver between sprocket hub and housing cover as shown below. Pry cover down until centered on belt housing and tighten hardware. Check idler alignment by rotating meter drive shaft. Seed belt should "run" centered on idler or with only slight contact with belt housing or cover.

NOTICE

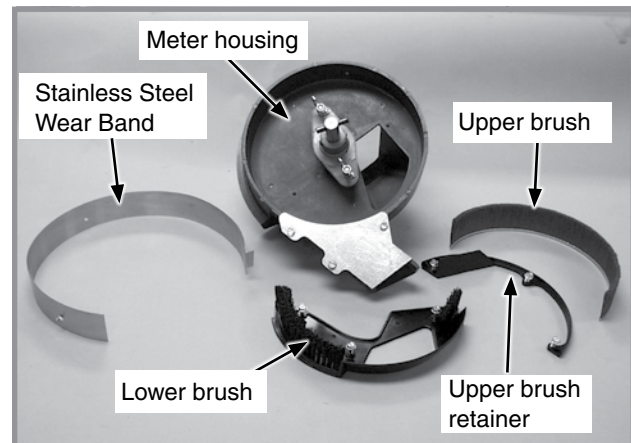
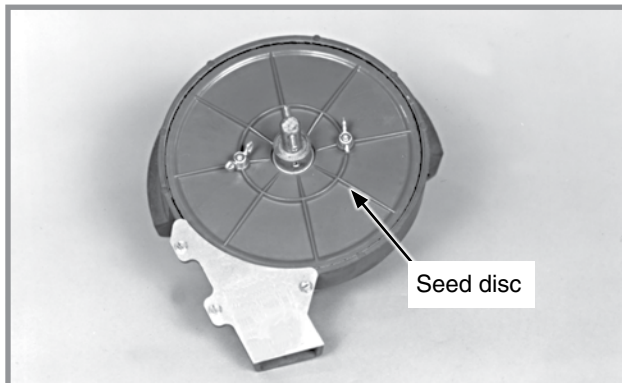
Do not over-tighten hardware or components may be damaged.



FINGER PICKUP SEED METER CLEANING

1. Disassemble meter.
2. Blow out any foreign material.
3. Wash in mild soap and water. DO NOT USE GASOLINE, KEROSENE OR ANY OTHER PETROLEUM BASED PRODUCT.
4. Dry thoroughly.
5. Coat lightly with a rust inhibitor.
6. Rotate finger assembly so finger does not touch brush.
7. Reassemble and store in a dry rodent-free place.

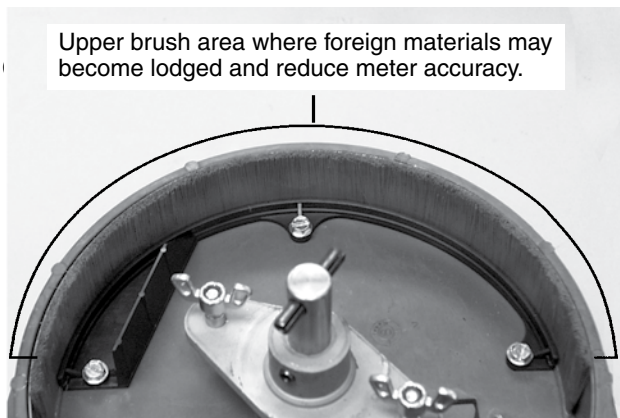
BRUSH-TYPE SEED METER MAINTENANCE



Use clean, high quality seed. Damaged or cracked Seed, hulls, or foreign materials can become lodged in upper brush and greatly reduce meter accuracy. Remove seed disc daily and check for buildup of foreign material on seed disc, particularly in seed loading slots. Clean disc by washing it with soap and water. Check for cracked seed, hulls, etc. lodged between brush retainer and stainless steel wear band which can greatly reduce accuracy of the meter because upper brush will not be able to retain seed in seed disc pocket. Thoroughly clean brush areas of meter housing.

NOTICE

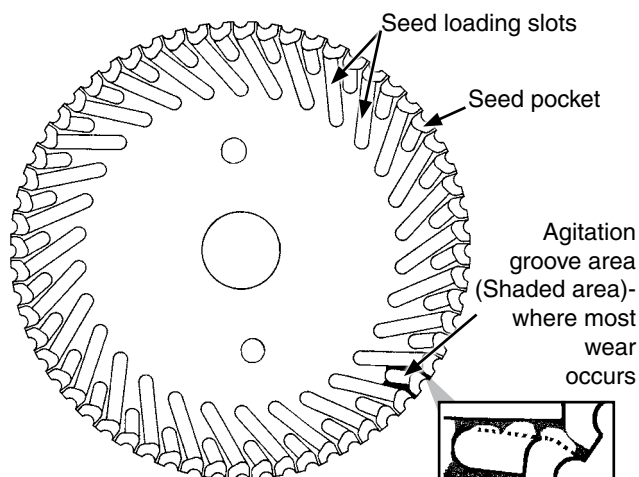
Replace hopper lids after hoppers are filled to prevent accumulation of dust or dirt in seed meter which will cause premature wear.



Cleaning brush-type seed meter for storage:

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

Seed Disc Wear



Most seed disc wear is found in the agitation groove area (area between seed loading slots). Wear affects planting accuracy at high RPM. Lay a straight edge across disc surface at agitation groove area and measure gap between disc and straight edge. If agitation groove areas are worn in excess of .030" (7.6 mm) and accuracy starts to drop off at higher meter RPM, replace seed disc.

Estimated seed disc life expectancy under normal operating conditions is approximately 200 acres (81 hectares) per row. Severe operating conditions such as dust, lack of lubrication or abrasive seed coating could reduce seed disc life expectancy to under 100 acres (40.5 hectares) per row.

Upper Brush

Upper brush holds seed in seed disc pocket in seed retention area.

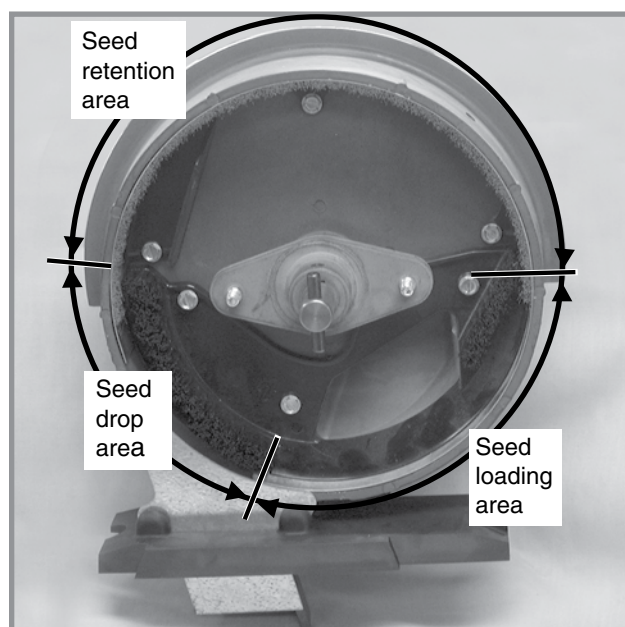
Brush must apply enough pressure against seed in seed disc pocket as disc rotates through seed retention area to prevent seed from dropping out of disc pocket. A damaged spot, excessive brush wear, or foreign material lodged in brush may greatly reduce meter performance.

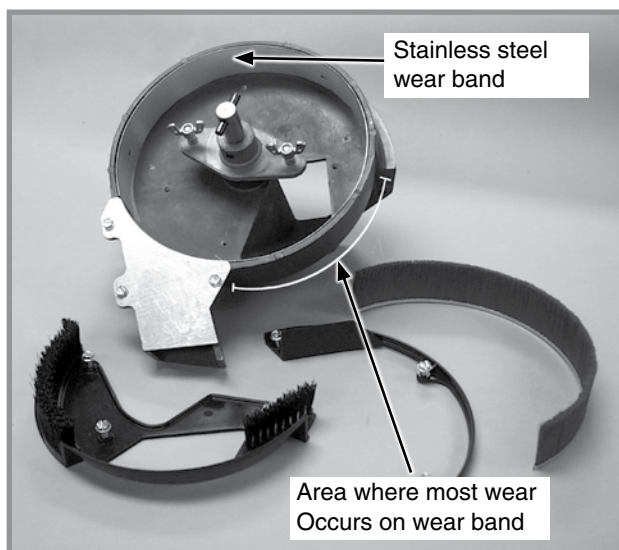
Replace upper brush at 120-400 acres (49-162 hectares) per row of use or sooner if damage or excessive wear is found.

Installation Of Upper Brush

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

NOTE: Use GD11122 upper brush retainer for soybean and cotton discs. Use GD8237 upper brush retainer for milo/grain sorghum discs. GD11122 brush retainer shown.



Stainless Steel Wear Band**NOTICE**

If wear band wears through or if meter is used without wear band in place, meter housing may be damaged.

Stainless steel wear band protects meter housing from wear and is .030" (7.6 mm) thick. Replace wear band when there is approximately .020" (5.08 mm) of wear in primary wear area. Estimated life expectancy of stainless steel wear band is 240-800 acres (97-324 hectares) per row.

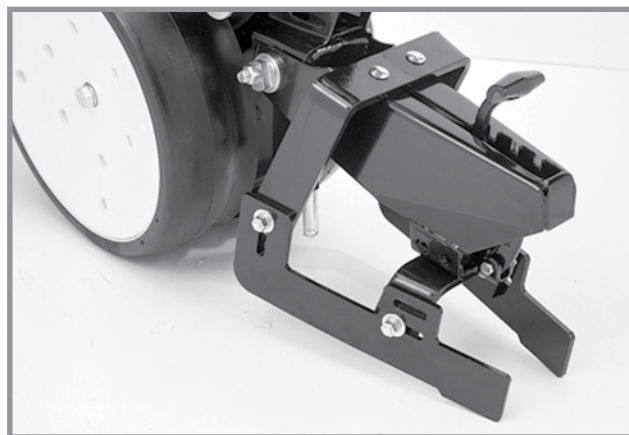
Lower Brush

Lower brush moves seed down seed loading slots to seed pockets, isolates seed in reservoir from entering seed tube, and cleans seed loading slots.

Estimated lower brush life expectancy is 240-800 acres (97-324 hectares) per row. Replace lower brush if bristles are deformed or missing, or if there are cracks in brush retainer.

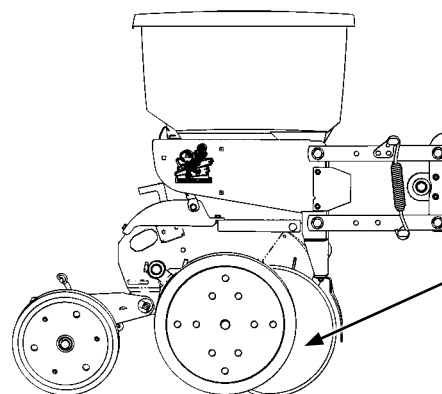
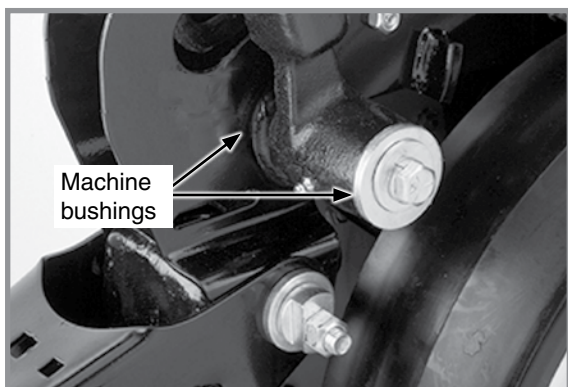
DRAG CLOSING ATTACHMENT

Inspect each drag closing attachment and replace any worn or broken parts before storing planter. Check for loose hardware and tighten as needed.



Drag Closing Attachment

GAUGE WHEEL ADJUSTMENT



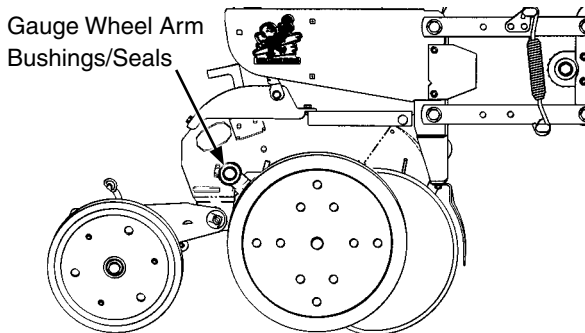
Gauge wheel adjustment

Gauge wheels should lightly contact opener blades to prevent accumulation of dirt or trash. Gauge wheels and opener blades should turn with only slight resistance.

Add or remove machine bushings between shank and gauge wheel arm to adjust clearance between gauge wheels and opener blades. Store remaining machine bushings between gauge wheel arm and flat washer on outer side of gauge wheel arm.

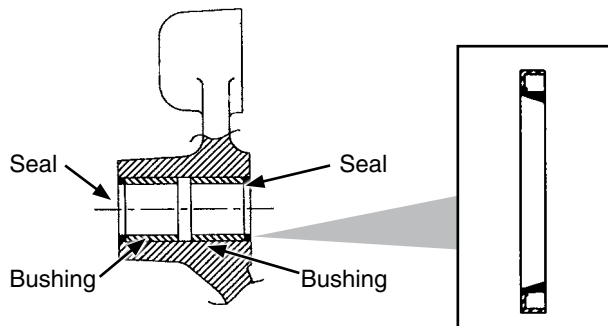
NOTE: It may be desirable to space gauge wheel further from blade when operating in sticky soils.

GAUGE WHEEL ARM BUSHING AND/OR SEAL REPLACEMENT



NOTE: Gauge Wheel Arm Bushing and Seal Driver Kit (G1K296) is available through your Kinze Dealer.

1. Remove gauge wheel from arm.
2. Remove gauge wheel arm from shank assembly.
3. Remove seal and bushing and discard. Clean and dry inner bore.



4. Drive/press replacement bushing inside bore of arm to a depth of .125" (3.2 mm) below flush.
5. Coat wiping edge of seal with grease.
6. Drive/press seal into place with lip to outside.

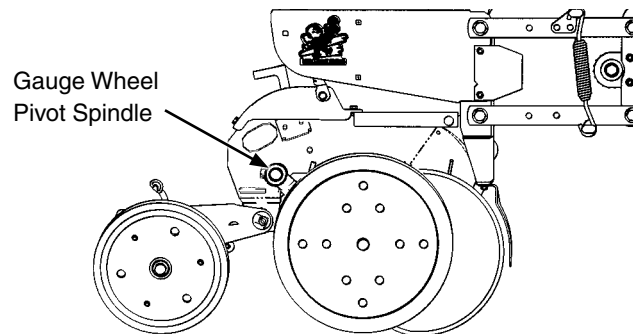
NOTE: Use extra care to protect the sealing lip during installation. Apply uniform pressure to assemble the seal into the bore of the arm. Never apply a direct hammer blow to the seal surface.

7. Inspect gauge wheel pivot spindle.
8. Reinstall gauge wheel arm assembly and gauge wheel.

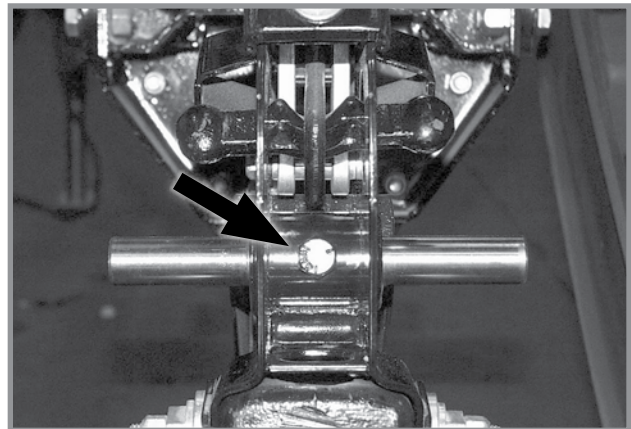
NOTE: Use special machine bushing between gauge wheel arm and gauge wheel.

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

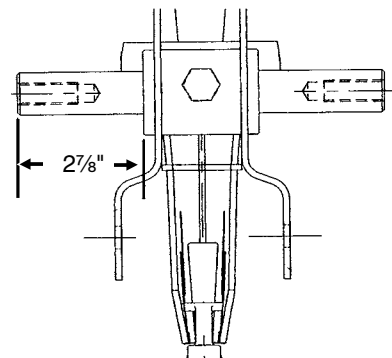
GAUGE WHEEL ARM PIVOT SPINDLE REPLACEMENT



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



3. Install replacement spindle and position as shown below. Exact centering is critical.



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.

15" SEED OPENER DISC BLADE/ BEARING ASSEMBLY

Approximately $1" \pm \frac{1}{2}"$ ($3 \pm .5$ cm) of blade-to-blade contact should be maintained to properly open and form seed trench. As blade diameter decreases due to wear, it is necessary to relocate machine bushings from inside to outside to maintain $1" \pm \frac{1}{2}"$ ($3 \pm .5$ cm) of contact.

NOTE: Proper blade clearance is critical. Blades should have $1" \pm \frac{1}{2}"$ ($3 \pm .5$ cm) contact in this area. When blades are turned by hand in opposite directions against each other, there should be only light resistance to turning. Re-adjust blade scraper if necessary to center it between the blades.

NOTE: If proper blade-to-blade contact cannot be maintained after relocating machine bushings or if blade diameter wears below $14\frac{1}{2}"$ (37 cm), blades should be replaced.

NOTICE

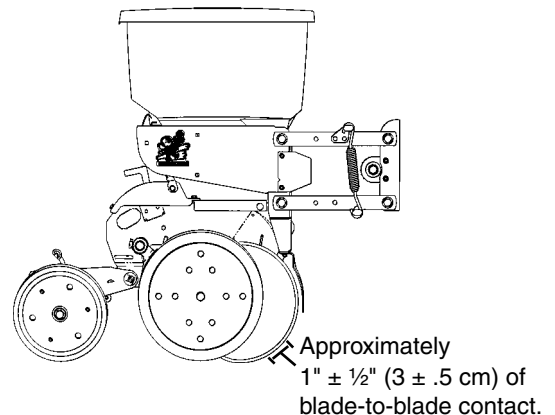
Excessive blade contact may result in premature disc opener bearing/hub failures and excessive wear on seed tube guard/inner scraper. When properly adjusted, if one blade is held in fixed position, opposite blade should rotate with less than 5 pounds force (22 newtons) at outer edge of blade.

NOTICE

Left hand side of opener uses a left hand threaded cap screw. **DO NOT OVER TIGHTEN.** Damage to shank threads require replacement of row unit shank assembly.

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. Machine bushings between shank and disc blade are used to maintain approximately $1" \pm \frac{1}{2}"$ ($3 \pm .5$ cm) of blade-to-blade contact.
5. Install machine bushing(s), new disc blade bearing assembly, washer and cap screw. Torque $\frac{5}{8}"$ -11 Grade 5 cap screw to value shown in "Torque Values Chart".



NOTE: Replace disc blades only with disc blades of equal thickness.

6. Replace bearing dust cap.
7. Install scraper.
8. Install gauge wheel. It may be necessary to replace bearing only if there is excessive endplay or if bearing sounds or feels rough when disc blade is rotated.

REPLACE BEARING ONLY

1. Remove gauge wheel, scraper, bearing cap, cap screw, washer and disc blade/bearing assembly.
2. Remove $\frac{1}{4}$ " rivets from bearing housing to expose bearing.
3. After installing new bearing, install three evenly spaced $\frac{1}{4}$ " cap screws into three of six holes in bearing housing to hold bearing and bearing housing in place. Install rivets in other three holes. Remove $\frac{1}{4}$ " cap screws and install rivets in those three holes.
4. Reinstall disc blade/bearing assembly, washer and cap screw. Torque $\frac{5}{8}$ "-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.

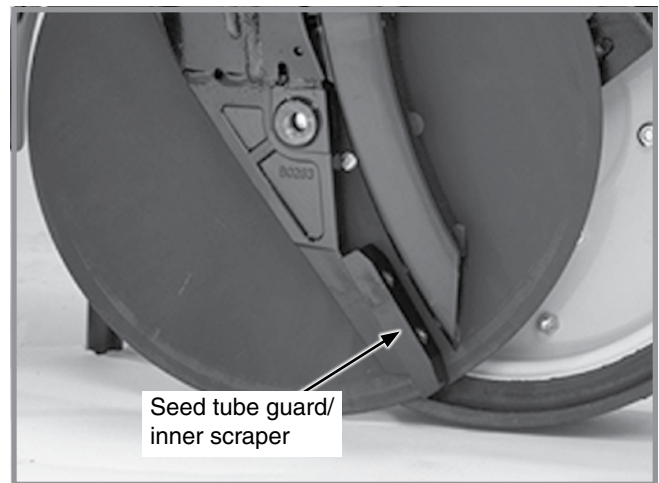
SEED TUBE GUARD/INNER SCRAPER

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

Remove seed tube and check for wear. Excessive wear on seed tube indicates a worn seed tube guard. Replace seed tube guard if it measures $\frac{5}{8}$ " (16 mm) or less at lower end. A new seed tube guard measures approximately $\frac{7}{8}$ " (22.2 mm).

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

Remove seed tube and two hex socket head cap screws that attach seed tube guard. Hold replacement seed tube guard centered between seed opener disc blades. Install hex socket head cap screws. DO NOT TIGHTEN. Using a clamp or vise-grip, squeeze opener blades together in front of seed tube guard. Tighten seed tube guard retaining screws. Remove clamps. Distance between seed tube guard and opener blades should be equal on both sides. Reinstall seed tube.



Shown with gauge wheel and seed opener disc blade removed

NOTICE

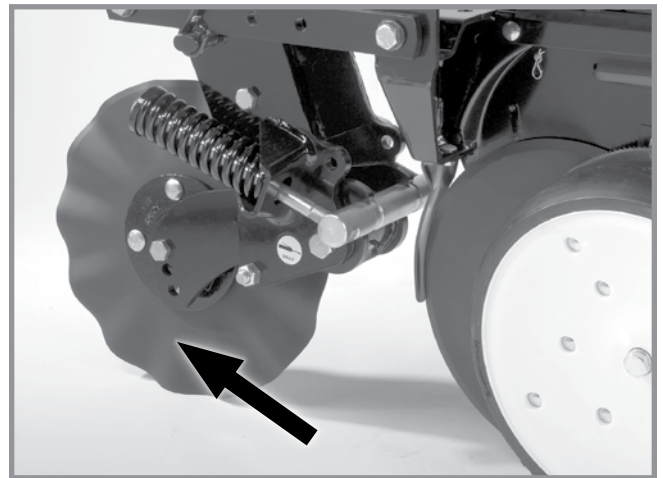
Over tightening hex socket head cap screws may damage shank threads and require replacement of shank. An excessively worn seed tube guard may allow blades to wear into row unit shank, also requiring replacement of shank.

FRAME MOUNTED COULTER

NOTE: Torque $\frac{5}{8}$ " spindle hardware to 120 ft. lbs. (162.7 N-m)

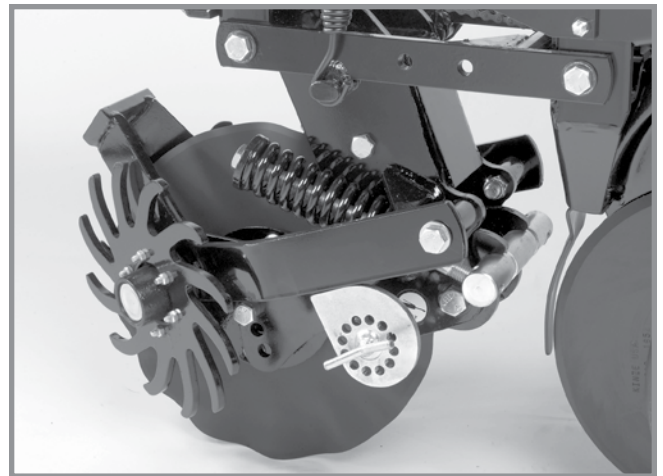
See "Frame Mounted Coulter" in Row Unit Operation section of this manual for depth and spring adjustment.

Replace 16" diameter coulter blade (1" fluted, 1" bubbled or $\frac{3}{4}$ " fluted) when worn to 14½" (37 cm) (maximum allowable wear).

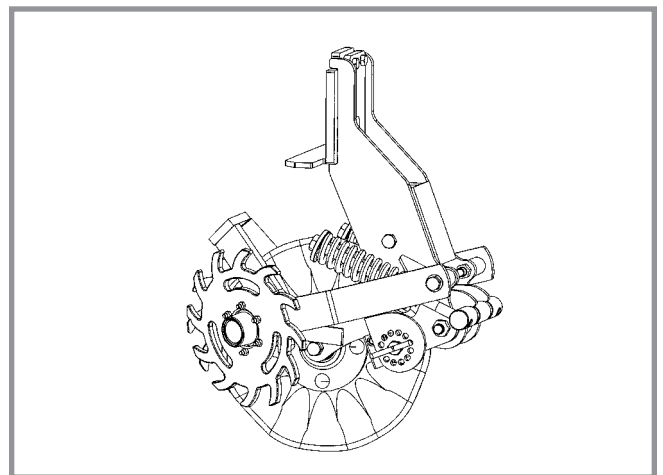


RESIDUE WHEELS (FOR USE WITH FRAME MOUNTED COULTER)

Wheel hub is equipped with sealed bearings. Replace bearings if a bearing sounds or feels rough when wheel is rotated.



STYLE A



STYLE B

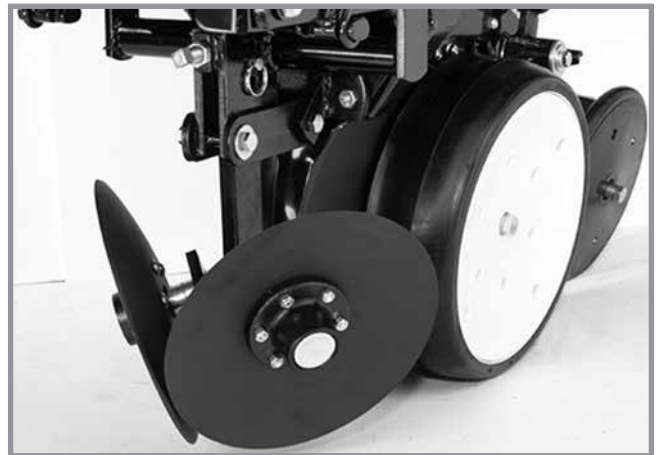
ROW UNIT MOUNTED DISC FURROWER

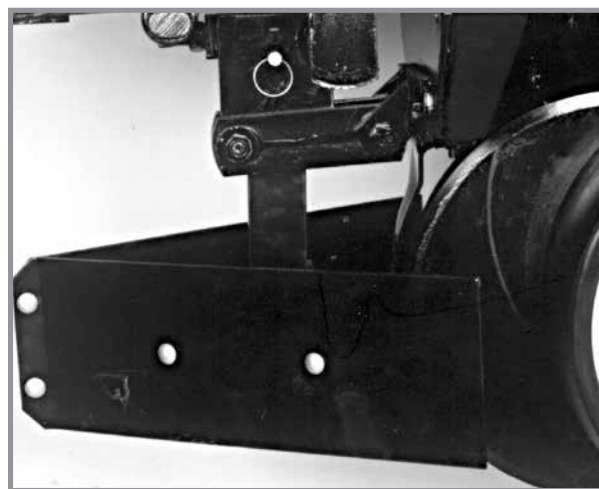
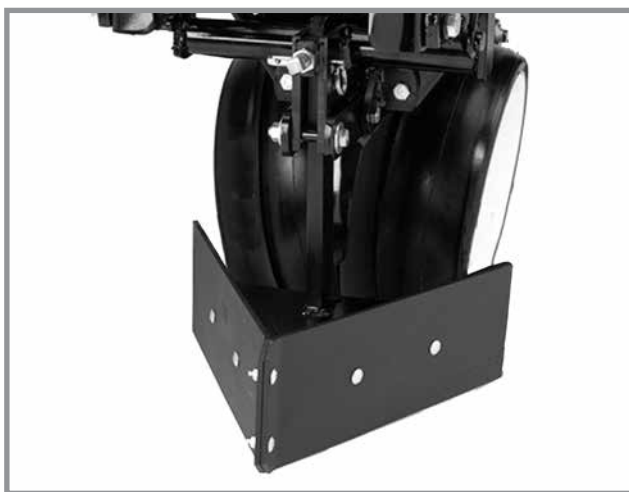
Lubricate bushings in support arm mounting bracket at frequency indicated in Lubrication of this section. Check each bolt for proper torque. If bolt is loose, it should be removed and bushing inspected for cracks and wear. Replace bushings as necessary.

NOTE: Use only hardened flat washers. Replace damaged flat washers with proper part. Torque bolts to 130 ft. lbs. (176.3 N-m).

Blade hubs are equipped with sealed bearings. Replace bearings if a bearing sounds or feels rough when wheel is rotated.

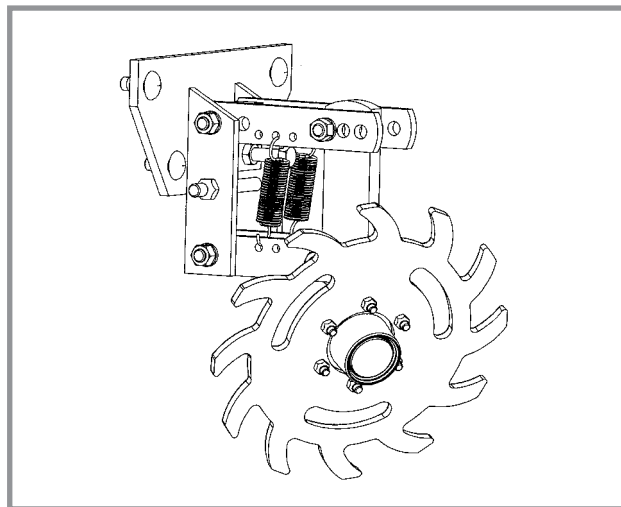
When 12" diameter blades (solid or notched) are worn to 11", they should be replaced.



ROW UNIT MOUNTED BED LEVELER

Lubricate bushings in mounting bracket and links at frequency indicated in Lubrication of this section. Check each bolt for proper torque. If bolt is loose, it should be removed and bushing inspected for cracks and wear. Replace bushing if necessary.

NOTE: Use only hardened flat washers. Replace damaged flat washers with proper part. Torque bolts to 130 ft. lbs. (176.3 N-m).

ROW UNIT MOUNTED RESIDUE WHEEL**STYLE A****STYLE B**

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

ROW UNIT MOUNTED NO TILL COULTER**STYLE A****(Two sleeves for coulter mounted residue wheels)****STYLE B****(One sleeve for coulter mounted residue wheels)**

Check nuts and hardware periodically for proper torque.

NOTE: Torque $\frac{5}{8}$ " spindle hardware to 120 ft-lb (162 N-m).

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

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

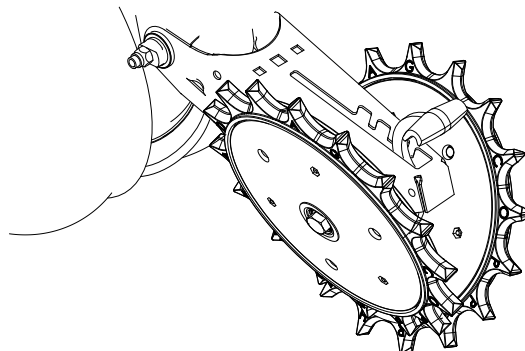
Replace 16" diameter coulter blade when worn to 14½" (37 cm).

COULTER MOUNTED RESIDUE WHEELS**STYLE A - Used With Style A Row Unit Mounted No Till Coulter****STYLE B - Used With Style B Row Unit Mounted No Till Coulter**

Wheel hubs are equipped with sealed bearings. If bearings sound or feel rough when wheel is rotated, replace them.

SPIKED CLOSING WHEEL

Inner parts of spiked closing wheel will begin to wear at approximately 70% of life. Flip/reverse wheel to utilize remaining life of wheel.

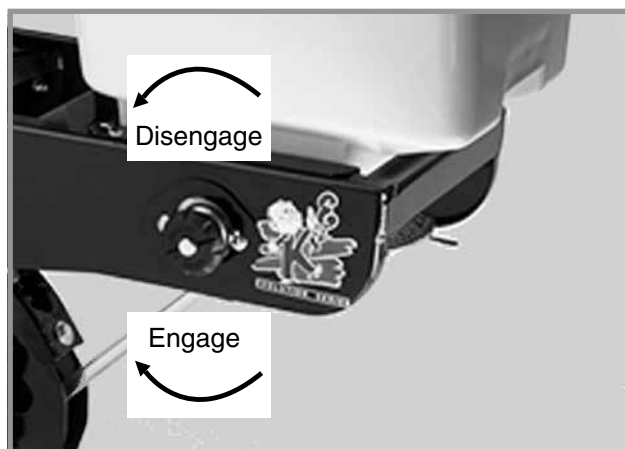


Row Unit Spiked Closing Wheel

GRANULAR CHEMICAL ATTACHMENT

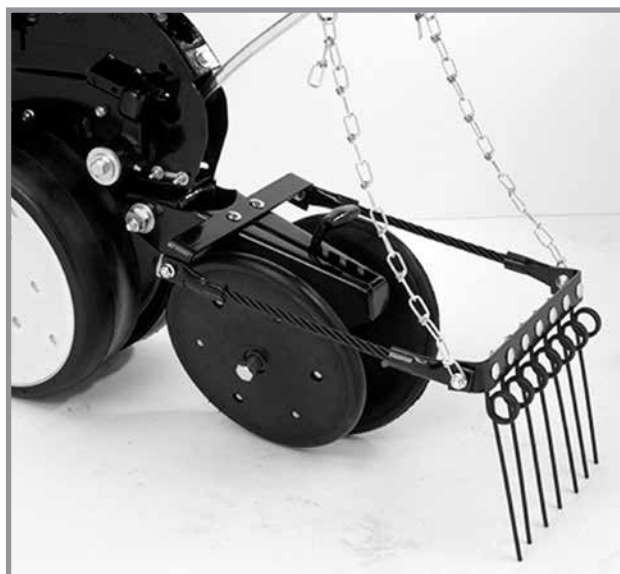
Before storing planter, disengage granular chemical drive by rotating throwout knob $\frac{1}{4}$ turn counterclockwise. Remove drive chain and empty and clean all granular chemical hoppers. Clean drive chains and coat them with a rust preventive spray or submerge chains in oil. Inspect and replace worn or broken parts.

Install hoppers and chains. Check chain alignment.





SPRING TOOTH INCORPORATOR

Before storing planter, inspect each spring tooth incorporator and replace worn or broken parts. Check for loose hardware and tighten as needed.

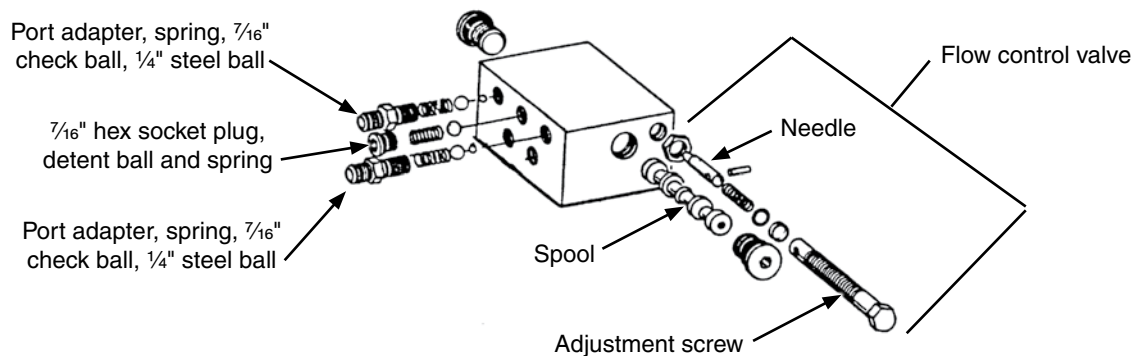


ROW MARKER SEQUENCING/FLOW CONTROL VALVE INSPECTION


WARNING



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



The valve block assembly consists of the row marker sequencing and flow control valves in one assembly. Sequencing valve portion consists of a chambered body containing a spool and series of check valves to direct hydraulic oil flow.

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

NOTICE

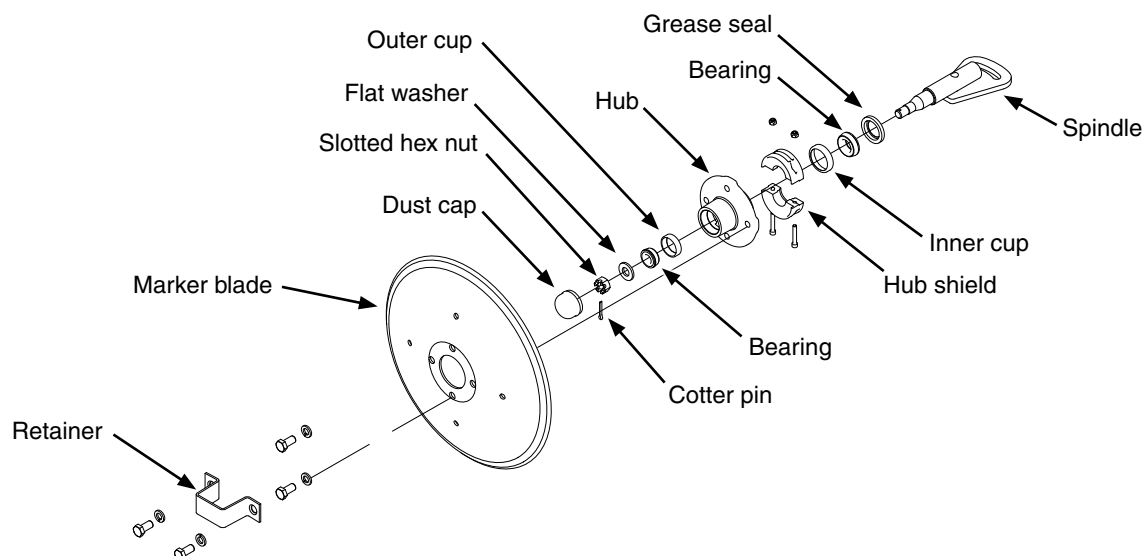
Damage to spool may occur if detent assembly and port adapter assemblies are not removed prior to removal of spool.

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

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

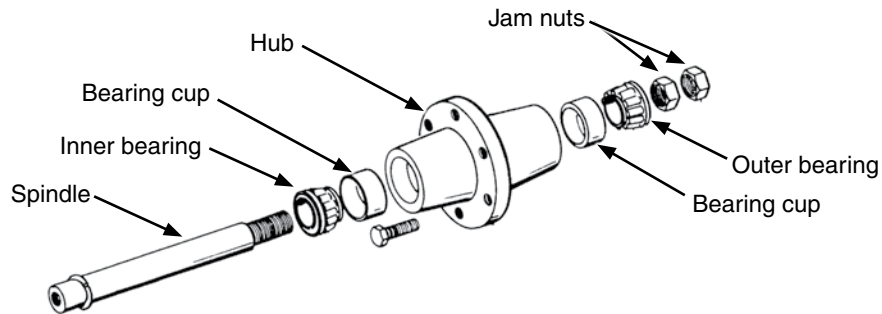
A flow control valve is located on each side of block assembly. Adjust flow control valves for raise and lower speed as part of assembly procedure or upon initial operation. If valve fails to function properly or requires frequent adjustment, remove needle valve for inspection. Check for foreign material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

NOTE: Hydraulics operate slowly when oil is cold. Make all adjustments with warm oil.

ROW MARKER BEARING LUBRICATION OR REPLACEMENT

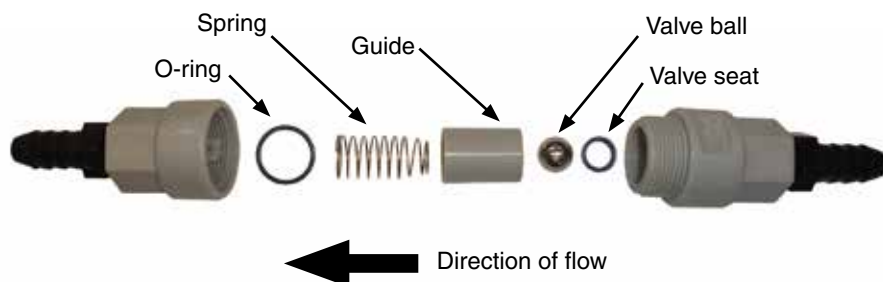
1. Remove retainer and marker blade.
2. Remove dust cap from hub.
2. Remove hub shield. Note direction of installation.
3. Remove cotter pin, slotted hex nut, and washer.
4. Slide hub from spindle.
5. Remove bearings and cups and discard if bearings are being replaced. Clean hub and dry. Remove bearings 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. 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 ensures 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 hub shield.
13. Install marker blade and retainer on hub. Tighten hardware evenly.

WHEEL BEARING REPACK OR REPLACEMENT

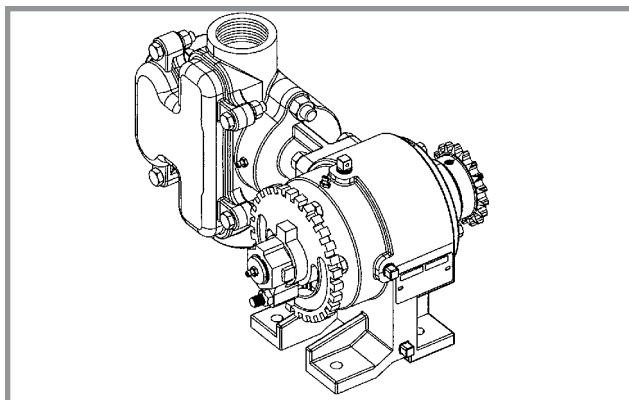


1. Raise tire clear of ground and remove wheel.
2. Remove double jam nuts and slide hub from spindle.
3. Remove bearings and cups and discard if bearings are being replaced. Clean hub and dry. Remove bearings only and not cups if repacking.
4. Press in new bearing cups with thickest edge facing in. (Bearing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

FERTILIZER CHECK VALVE CLEANING AND REPAIR



1. Unscrew valve body and separate halves. Note direction and location of parts.
2. Clean and inspect parts. Flush with clean water. Replace damaged parts.
3. Reassemble exactly as shown. O-ring and valve seat must be firmly in place inside each half of valve body.



Liquid fertilizer piston pump

PISTON PUMP STORAGE

NOTICE

Entrance of air into pump will cause rapid and severe corrosion. **KEEP AIR OUT OF PUMP!**

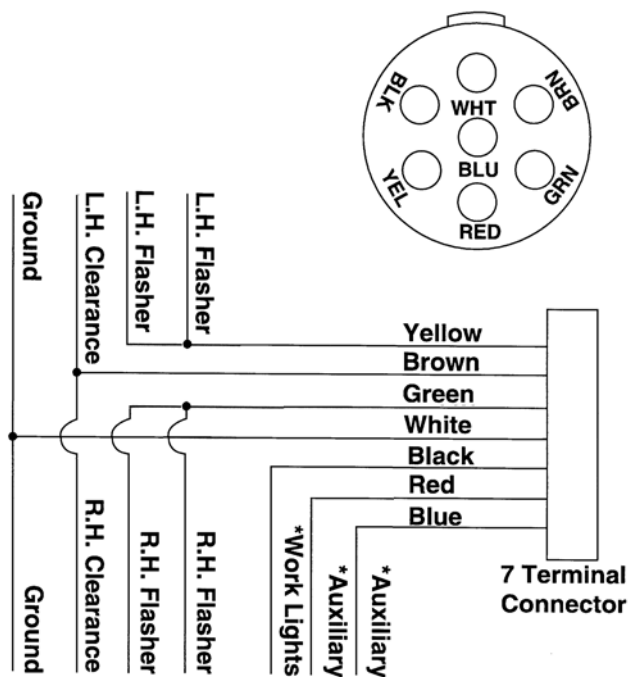
NOTE: SUSPENSION FERTILIZER must be flushed from pump for ANY storage period.

1. Flush pump with 5 to 10 gallons (19 to 38 liters) of fresh water and circulate until all corrosive salts are dissolved in pump.
2. Set pump on 10. Draw in a mixture of half diesel fuel and 10 weight oil until discharge is clean. Plug inlet and outlet.

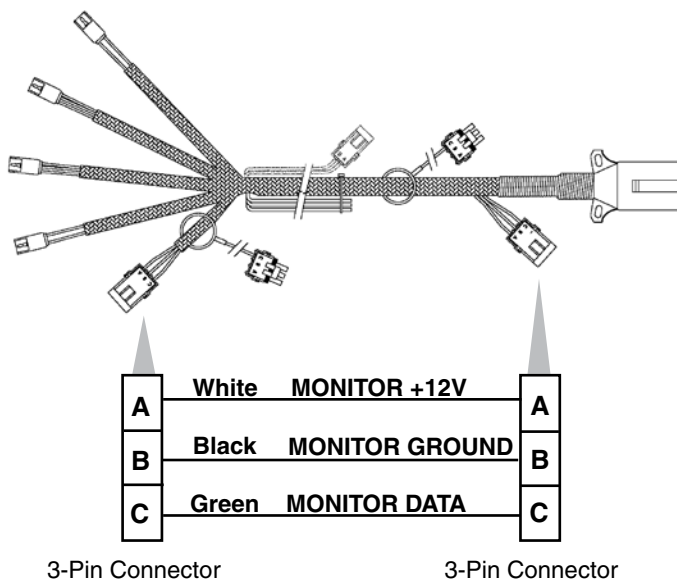
PREPARING PLANTER FOR STORAGE

- Store planter in a dry sheltered area if possible. Refer to “Safety Lockups” in Machine Operation section for proper safety lockup installation during storage.
- 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 planter for parts that are in need of replacement and order during “off” season.
- Make sure seed and granular chemical hoppers are empty and clean.
- Clean seed meters and store in a dry, rodent-free area.
- Remove seed discs from brush-type seed meters, clean and store meters with discs removed.
- Grease or paint disc openers/blades and row marker disc blades to prevent rust.
- Flush liquid fertilizer tanks, hoses and metering pump with clean water. See “Piston Pump Storage” if applicable.
- Empty and clean dry fertilizer hoppers. Disassemble and clean metering augers. Reassemble and coat all metal parts with rust preventative.

ELECTRICAL WIRING DIAGRAM FOR LIGHT PACKAGE





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



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

HYDRAULIC HOSE LIFE

**WARNING**



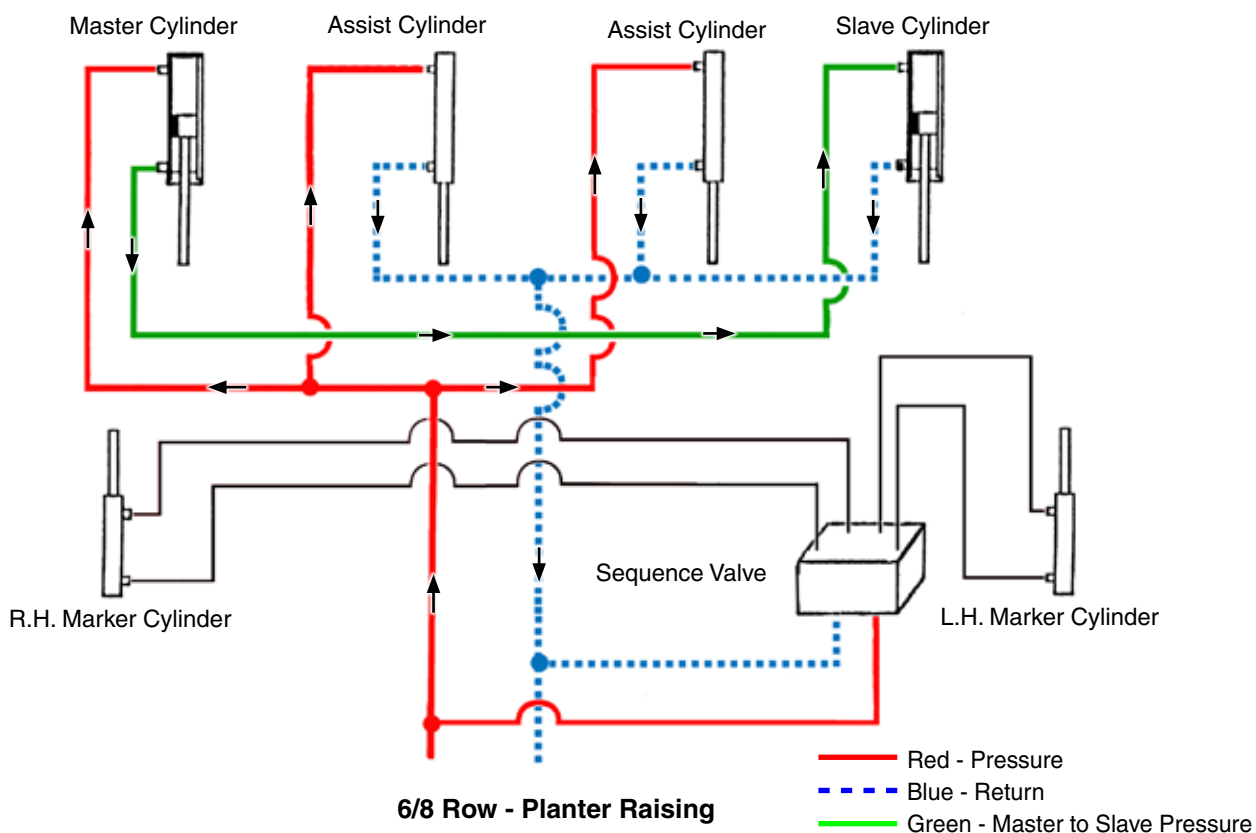
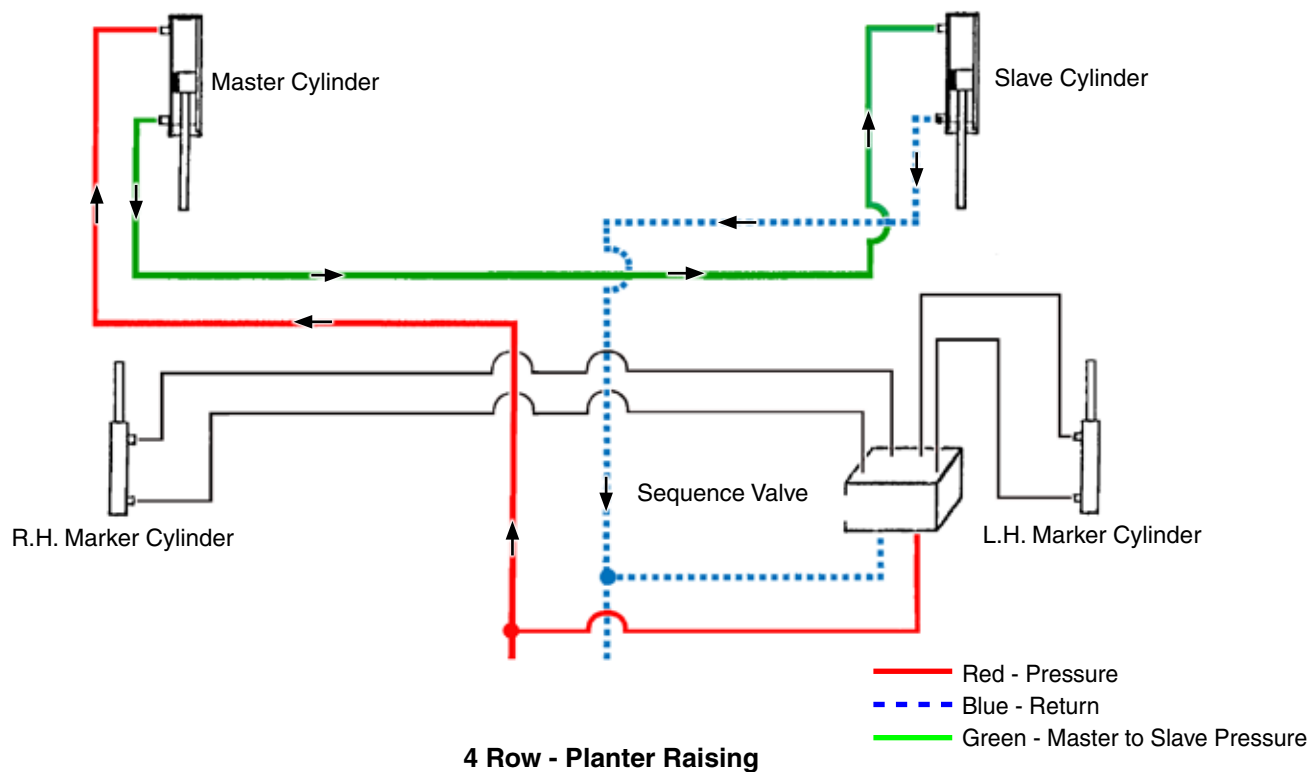
Pressurized hydraulic fluid can penetrate body tissue and result in death, serious infection, or other injuries. Fluid injected under skin must be **IMMEDIATELY** removed by a surgeon familiar with this type of injury. Make sure connections are tight and hoses and fittings are not damaged before applying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

Proper storage of hydraulic hoses can significantly increase the life of the hoses, for a period of three to five years. After this period, service life of hoses may decrease, depending on variables such as variances in rubber materials and storage environment. Refer to the guidelines below for best practices when storing.

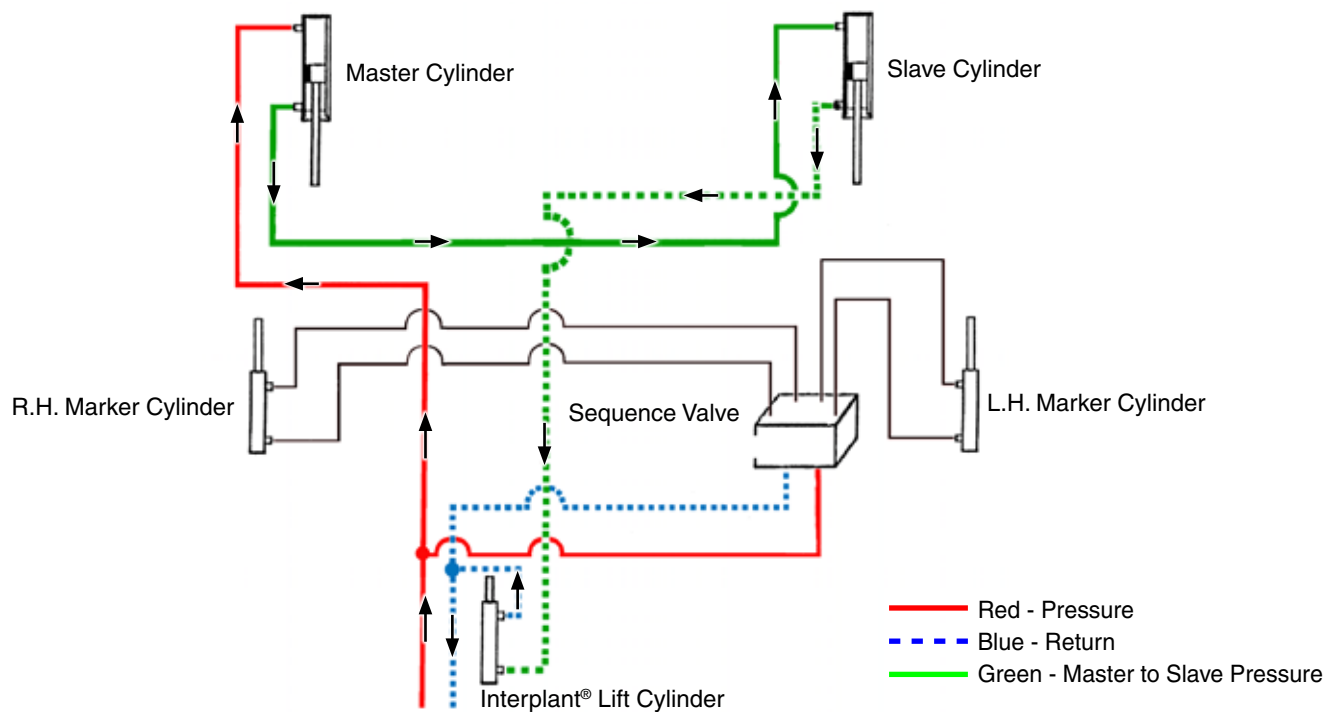
- Store in a clean, cool and dry area
- Avoid direct sunlight or moisture
- Do not store near high power electrical equipment
- Avoid contact with corrosive chemicals
- Avoid ultraviolet light
- Avoid areas with obvious signs of insects or rodents

Unusually long periods of storage or poor storage environment may lead to performance issues or premature failure. Always inspect all hoses prior to use for extensive wear, cuts, or holes. If such flaws are identified, replace immediately to avoid potential failure, property damage or bodily injury.

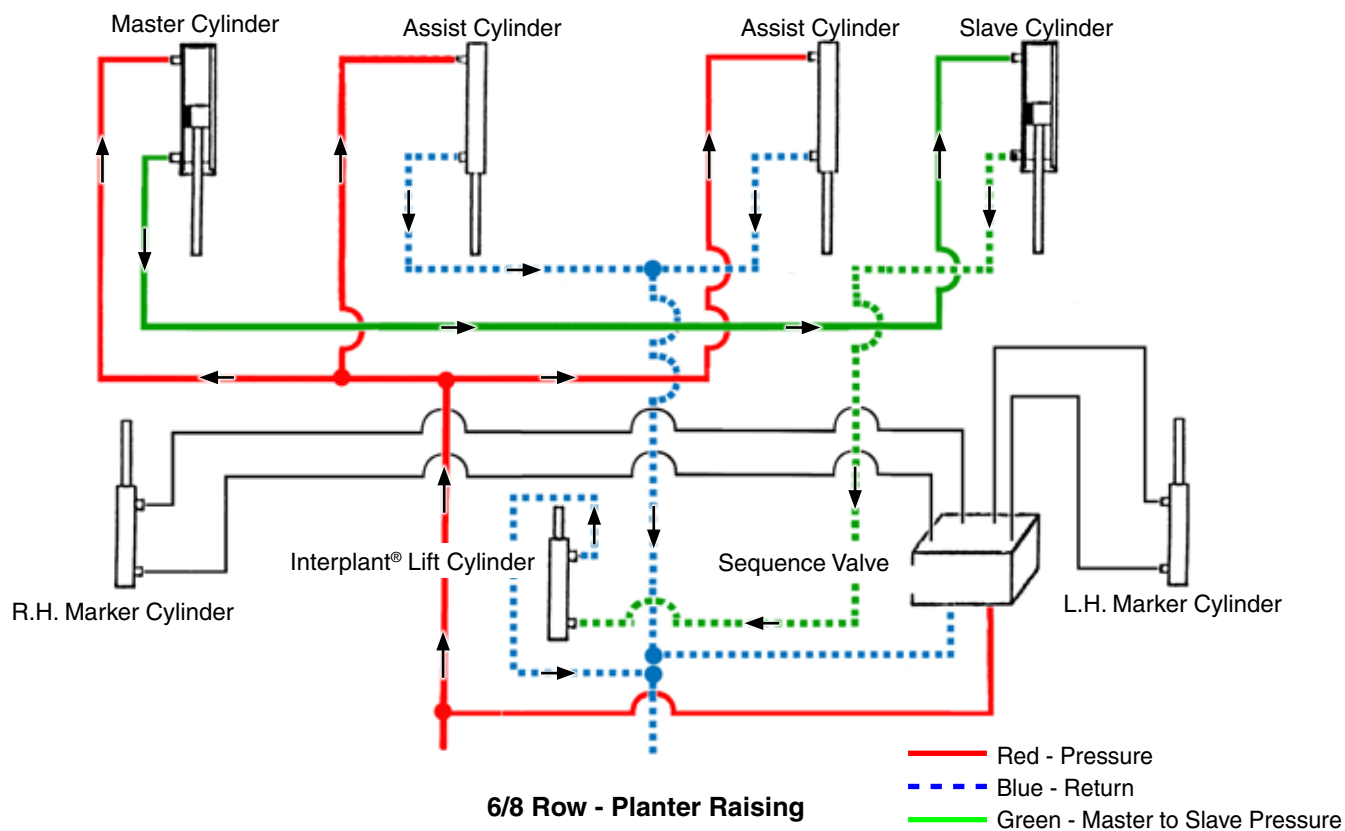
HYDRAULIC SYSTEM SCHEMATIC



HYDRAULIC SYSTEM SCHEMATIC (WITH INTERPLANT SELF-LEVELING HITCH)



4 Row - Planter Raising



6/8 Row - Planter Raising

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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”.

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 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 harness just after monitor.	Inspect for break in harness and repair. If no break 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 harness.	Inspect for break in harness and repair. If no break found, replace section with alarming sensors.
	Dirty or corroded connector.	Clean connector.
Faulty monitor values (such as speed, area, etc.) 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 seed tube sensor will not come on.	Faulty seed tube sensor.	Replace sensor.
	Dirty or corroded connector.	Clean connector.
	Break in harness just before sensor.	Repair harness.
Erroneous MPH readings at idle. (Radar Distance Sensor Only)	Radar sensor not located in stable location.	Relocate to a stable location.

LIFT CIRCUIT OPERATION TROUBLESHOOTING

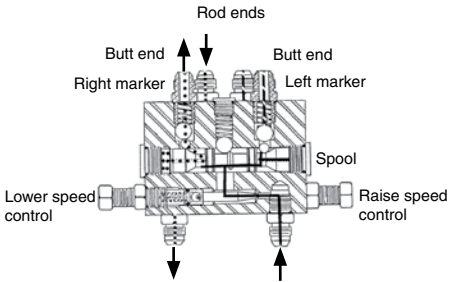
PROBLEM	POSSIBLE CAUSE	TROUBLESHOOTING*	SOLUTION
Planter raising uneven.	Master cylinder leaking.	Raise planter slowly until master cylinder reaches end of stroke. If master cylinder is leaking it will lag behind the slave cylinder, causing the tire to squat less. If planter settles when hydraulic lever is released, check assist cylinders.	Check piston rephasing valve for contamination. Before removing rephasing valve, measure set screw setting by turning 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 leaking.	Raise and lower planter. As planter lowers, 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 piston rephasing valve for contamination. 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 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.

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.

ROW MARKER OPERATION TROUBLESHOOTING

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

SEED METER (BRUSH-TYPE) TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Low count.	Meter RPM too high.	Reduce planting speed.
	Seed sensor not picking up all seeds dropped.	Clean seed tube. Switch meter to different row. If problem stays with same row, replace sensor.
	Lack of lubrication causing seeds not to release from disc properly.	Use graphite or talc as recommended.
	Seed size too large for seed disc.	Switch to smaller seed or appropriate seed disc. See "Brush-Type Seed Meter" for proper seed disc for size of seed being used.
	Seed treatment buildup in meter.	Reduce amount of treatment used and/or thoroughly mix treatment with seed. Add talc.
Low count at low RPM and higher count at higher RPM.	Foreign material lodged in upper brush.	Remove seed disc and remove foreign material from between brush retainer and bristles. Clean thoroughly.
	Worn upper brush.	Replace. See "Maintenance".
Low count at higher RPM and normal count at low RPM.	Seed disc worn in the agitation groove area.	Replace disc. See "Maintenance".
High count.	Seed size too small for seed disc.	Switch to larger seed or appropriate seed disc.
	Incorrect seed rate transmission setting.	Reset transmission. Refer to proper rate chart in "Machine Operation" section of manual.
	Upper brush too wide (fanned out) for small seed size.	Replace upper brush.
High count. (Milo/Grain Sorghum)	Incorrect brush retainer.	Make sure GD8237 brush retainer is installed to keep upper brush from fanning out.
Upper brush laid back.	Seed treatment buildup on brush.	Remove brush. Wash with soap and water. Dry thoroughly before reinstalling. See "Maintenance".
	Buildup of foreign material at base of brush.	Remove brush retainer and brush. Clean thoroughly. Reinstall.

SEED METER (FINGER PICKUP) TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
One row not planting seed.	Drive release not engaged.	Engage drive release mechanism.
	Foreign material in hopper.	Clean hopper and finger carrier mechanism.
	Seed hopper empty.	Fill seed hopper.
	Row unit drive chain off of sprocket or broken.	Check drive chain.
Drive release does not engage properly.	Drive release shaft is not aligned properly with meter drive shaft.	Align drive mechanism.
Unit is skipping.	Foreign material or obstruction in meter.	Clean and inspect.
	Finger holder improperly adjusted.	Adjust to specifications. (22 to 25 in. lbs. rolling torque)
	Broken fingers.	Replace fingers and/or springs as required.
	Planting too slowly.	Increase planting speed to within recommended range.
Planting too many doubles.	Planting too fast.	Stay within recommended speed range.
	Loose finger holder.	Adjust to specifications. (22 to 25 in. lbs. rolling torque)
	Worn brush in carrier plate.	Inspect and replace if necessary.
Overplanting.	Worn carrier plate.	Inspect and replace if necessary.
	Seed hopper additive being used.	Reduce or eliminate additive or increase graphite.
Underplanting.	Seed belt installed backwards.	Remove and install correctly.
	Weak or broken springs.	Replace.
	Spring not properly installed.	Remove finger holder and correct.
	Seed belt catching or dragging.	Replace belt.
	Brush dislodging seed.	Replace brush.
Irregular or incorrect seed spacing.	Driving too fast.	Check chart for correct speed.
	Wrong tire pressure.	Inflate tires to correct air pressure.
	Drive wheels slipping.	Reduce down pressure on row unit down force springs.
	Wrong sprockets.	Check seed rate charts for correct sprocket combinations.
Seed spacing not as indicated in charts.	Wrong tire pressure.	Inflate tires to correct air pressure.
	Inconsistent seed size.	Perform field check and adjust sprockets accordingly.
	Wrong sprockets.	Check chart for correct sprocket combination.
	Charts are approximate.	Slight variations due to wear in meter components and tire slippage due to field conditions may produce seed spacing variations.
	Stiff or worn drive chains.	Replace chains.
Scattering of seeds.	Planting too fast.	Reduce planting speed.
	Seed tube improperly installed.	Check seed tube installation.
	Seed tube worn or damaged.	Replace seed tube.
Seed tubes and/or openers plugging.	Allowing planter to roll backward when lowering.	Lower planter only when tractor is moving forward.
Inconsistent seed depth.	Rough seed bed.	Adjust down pressure springs. Reduce planting speed.
	Partially plugged seed tube.	Inspect and clean.
	Seed tube improperly installed.	Install properly.