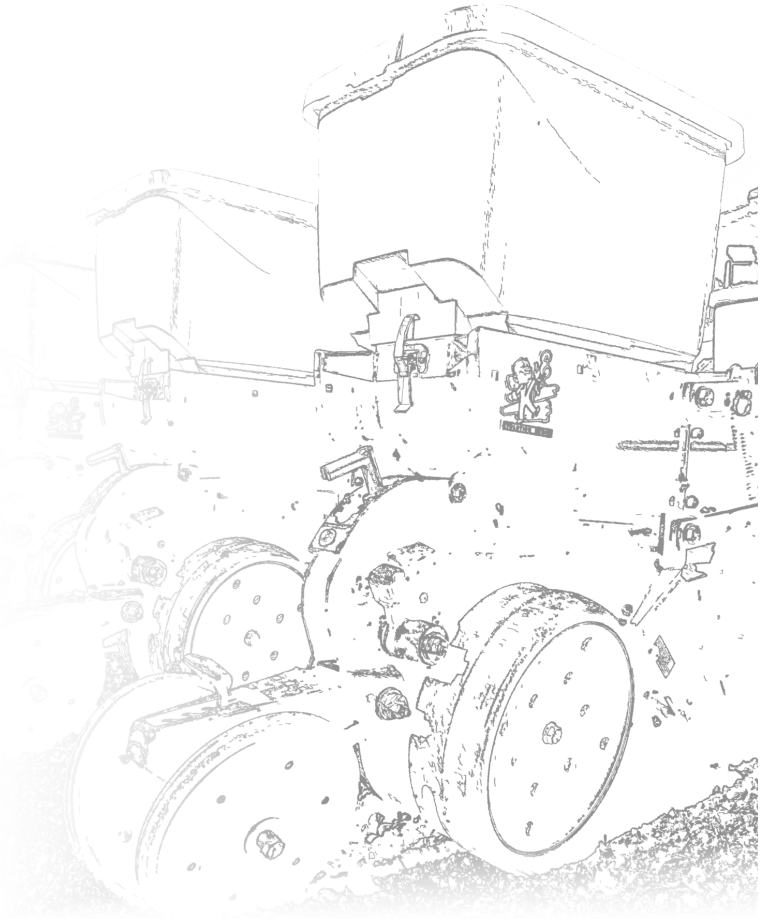
OPERATOR'S MANUAL



M0291-01

MODEL 3500 70 CM PIVOT FOLD PLANTER

Rev. 05/19

MODEL 3500 70 CM
PIVOT FOLD PLANTER

OPERATOR'S MANUAL

M0291-01 Rev. 05/19

This manual applies to: Model: 3500 Pivot Fold Planters (Conventional and Bulk Fill)
2018 production and on

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

Model Number 3500

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.

EUROPEAN DECLARATION OF CONFORMITY

Kinze Manufacturing
2172 M Avenue
Williamsburg, IA 53261

Kinze Europe UAB
Guopstu k., Senuju Traku sen
LT-21148 Traku r., Lithuania

We, Kinze Manufacturing and Kinze Europe UAB declare, under our sole responsibility, the following products – agricultural planter models 3000, 3110, 3140, 3200, 3500, 3600, 3700 and 4900 – to which this declaration relates, are in conformity with the following standards, other normative documents and Directives, as applicable by version and model:

2006/42/EC; EN 1037:1995+A1:2008; EN ISO 13850:2008; EN ISO 13857:2008; EN 349:1993+A1:2008; EN 547-1:1996+A1:2008; EN 547-2:1996+A1:2008; EN 547-3:1996+A1:2008; EN ISO 13732-1:2008; EN 614-1:2006+A1:2009; EN 614-2:2000+A1:2008; EN 953:1997+A1:2009; EN ISO 13849-1:2008; EN ISO 13849-2:2012; EN ISO 4254-1; EN ISO 12100:2010; EN ISO 4413:2010.

The Technical Construction File is maintained at: Kinze Manufacturing, Inc., 2172 M Avenue, Williamsburg, Iowa, USA, 52361-0806.

The authorized representative located within the community is: Edvardas Melys, Kinze Europe UAB, Guopstu k., Senuju Traku sen, LT-21148 Traku r., Lithuania.

Place of Issue: Kinze Manufacturing Inc., Williamsburg, Iowa, USA.

Date of Issue: 20160525 | May 25, 2016

Signed on behalf of Kinze Manufacturing Inc. and Kinze Europe UAB:

Jay D. Grimes

Corporate Counsel
Williamsburg, IA, USA

"KINZE EUROPE", UAB KINZE 2013 2 REPUBLIC OF LITHUANIA

KINZE MANUFACTURING, INC. KINZE 1971 STATE OF IOWA

ТАМОЖЕННЫЙ СОЮЗ

СЕРТИФИКАТ СООТВЕТСТВИЯ

№ ТС RU C-US.A301.B.01215

Серия RU № 0389450

ОРГАН ПО СЕРТИФИКАЦИИ Общество с ограниченной ответственностью «АЛЬЯНС ЮГО-ЗАПАД». Место нахождения: 117461, Россия, город Москва, улица Каховка, дом 30, помещение I, комната 13. Фактический адрес: 119049, Россия, город Москва, 1-й Добрынинский переулок, дом 15/7, помещение 27.Телефон: +7 (495) 268-13-26, факс: +7 (495) 268-13-26, адрес электронной почты: info@alliance-sw.ru. Аттестат аккредитации регистрационный № RA.RU.11A301 выдан 27.10.2015 года Федеральной службой по аккредитации

ЗАЯВИТЕЛЬ Общество с ограниченной ответственностью «ДС Компания».
Место нахождения: 105037, Российская Федерация, город Москва, улица 3-я Парковая, дом 9, офис 18
Фактический адрес: 105037, Российская Федерация, город Москва, улица 3-я Парковая, дом 9, офис 18
Телефон: 79660273663, факс: 79660273663, адрес электронной почты: dc.company2000@gmail.com

ИЗГОТОВИТЕЛЬ KINZE Manufacturing, Inc.
Место нахождения: СОЕДИНЕННЫЕ ШТАТЫ, 2172 M Ave., Williamsburg, IA 52631-0806
Фактический адрес: СОЕДИНЕННЫЕ ШТАТЫ, 2172 M Ave., Williamsburg, IA 52631-0806
Филиал изготовителя: KINZE Europe, UAB.
Место нахождения филиала изготовителя: ЛИТВА, Guopstu k. 1B, Senuji Traku sen., LT-21148 Traku r.
Фактический адрес филиала изготовителя: ЛИТВА, Guopstu k. 1B, Senuji Traku sen., LT-21148 Traku r.

ПРОДУКЦИЯ Машины сельскохозяйственные: сеялки, модели: 3000, 3110, 3140, 3200, 3500, 3600, 3660, 3700, 4900.
Продукция изготовлена в соответствии с Директивой 2006/42/ЕС.
Серийный выпуск

КОД ТН ВЭД ТС 8432 30 110 0

СООТВЕТСТВУЕТ ТРЕБОВАНИЯМ Технического регламента Таможенного союза ТР ТС 010/2011 "О безопасности машин и оборудования"

СЕРТИФИКАТ ВЫДАН НА ОСНОВАНИИ протокола испытаний № 1666M-LAB04/16 от 12.04.2016 года. Испытательная лаборатория Общество с ограниченной ответственностью «Инвестиционная корпорация», аттестат аккредитации регистрационный № RA.RU.21МЭ64 от 17.12.2015 года; акта анализа состояния производства от 29.03.2016 года органа по сертификации продукции Общества с ограниченной ответственностью «Альянс Юго-Запад».

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ Срок службы 10 лет согласно технической документации. Срок и условия хранения указаны в эксплуатационной документации, приложенной к изделию.

СРОК ДЕЙСТВИЯ С 12.04.2016 **ПО** 11.04.2021 **ВКЛЮЧИТЕЛЬНО**

М.П.

Руководитель (уполномоченное лицо) органа по сертификации (подпись) А.А. Звягин (инициалы, фамилия)

Эксперт (эксперт-аудитор) (эксперты (эксперты-аудиторы)) (подпись) К.Б. Киреенко (инициалы, фамилия)

Бланк изготовлен ЗАО "ОПЦИОН", www.opcion.ru (лицензия № 05-05-09/003 ФНС РФ) , тел. (495) 726 4742, Москва, 2013

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TO THE DEALER

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

PREDELIVERY CHECKLIST

Use the following checklist after planter is completely assembled to inspect planter. Check off each item as it is 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 located as shown in Parts Manual and visible when 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. Vacuum fan, analog gauge, control box, and hoses installed.
- ❑ Auxiliary safety chain is properly installed and hardware is torqued to specification.
- ❑ Vacuum fan PTO-driven pump is attached correctly to the tractor. Oil reservoir is filled to capacity and system is inspected for leaks. (If Applicable)

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

_____

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

OWNER REGISTER

Name _____ Delivery Date _____

Street Address _____ Model No. 3500 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 important information which should be conveyed to retail customer/end user. Check off each item as it is fully explained.

❑ Check for proper operation of vacuum fan and PTO driven pump (If Applicable) with tractor to be used with planter.

❑ 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 retail customer/end user and explain all operating adjustments.

❑ Read warranty to retail customer/end user.

❑ Complete Warranty and Delivery Report form.

To the best of my knowledge this machine has been delivered ready for field use and customer has been fully informed as to proper care and operation.

(Signature Of Delivery Person/Dealer Name/Date)

AFTER DELIVERY CHECKLIST

The following is a list of items we suggest to check during the first season of use of the equipment.

❑ Check planter performance with retail customer/end user.

❑ Check performance of vacuum or mechanical seed metering system 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

Contents

TROUBLESHOOTING

Kinze Manufacturing, Inc. thanks you for your patronage. We appreciate your confidence in Kinze farm machinery. Your Kinze planter has been carefully designed to provide dependable operation in return for your investment.

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

It is the responsibility of the user to read and understand the Operator Manual in regards to safety, operation, lubrication and maintenance before operation of this equipment. It is the user's responsibility to inspect and service the machine routinely as directed in the Operator 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:

DANGER	**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.**
WARNING	**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.**
CAUTION	**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.**
NOTICE	**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: Some photos in this manual may have been taken of prototype machines. Production machines may vary in appearance.

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

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.

Model 3500 with Conventional Hoppers and Dry Fertilizer tanks

Model 3500 Bulk Fill

GENERAL INFORMATION

This manual covers all production years of the Model 3500 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 direction machine travels in use, unless otherwise stated.

TOOLS REQUIRED

Hardware Size / Tool Required			
1/4" = 7/16"	7/16" = 5/8" (nut for 7/16" hardware uses 11/16" tool)	3/4" = 1 1/8"	1 1/4" = 1 7/8"
5/16" = 1/2"	1/2" = 3/4"	7/8" = 1 5/16"	1 1/2" = 2 1/4"
3/8" = 9/16"	5/8" = 15/16"	1" = 1 1/2"	

Planter	3500 70cm 8 Row Y Hitch			
Specifications	Mechanical	Mechanical- Bulk Fill	Vacuum	Vacuum Bulk Fill
Number of rows	8	8	8	8
Row spacing	70 cm	70 cm	70 cm	70 cm
Weight Empty	3100 kg	3600 kg	3200 kg	3700 kg
Transport Height	3,4 m	3,7 m	3,4 m	3,7 m
Transport Length	7,6 m	7,6 m	7,6 m	7,6 m
Transport Width	3,1 m	3,1 m	3,1 m	3,1 m
Planting Height	2,5 m	2,6 m	2,5 m	2,6 m
Planting Length	6,1 m			
Planting Width	6,1 m			
Seed Capacity	536 l	1762 l	496 l	1762 l
Transport Tires	Four 7.50" x 20" 8 ply rib implement tires w/center groove - Inflate to 40 PSI (~276 kPa)			
Contact Drive Tires	Two 4.10" x 6" spring-loaded contact drive tires. - Inflate to 50 PSI (~345 kPa)			
Field Lift	One center post lift cylinder. (Front or rear mount.)			
Row Markers	Two-fold low profile with 41 cm concave, solid blades and cast iron hubs.			
NOTE: Specifications are for base machine. Additional options could affect the figures.				

Planter	3500 70cm 8 Row T Hitch			
Specifications	Mechanical	Mechanical- Bulk Fill	Vacuum	Vacuum Bulk Fill
Number of rows	8	8	8	8
Row spacing	70 cm	70 cm	70 cm	70 cm
Weight Empty	3200 kg	3700 kg	3300 kg	3800 kg
Transport Height	3,4 m	3,7 m	3,4 m	3,7 m
Transport Length	7,6 m	7,6 m	7,6 m	7,6 m
Transport Width	3,1 m	3,1 m	3,1 m	3,1 m
Planting Height	2,5 m	2,6 m	2,5 m	2,6 m
Planting Length	6,1 m			
Planting Width	6,1 m			
Seed Capacity	536 l	1762 l	496 l	1762 l
Transport Tires	Four 7.50" x 20" 8 ply rib implement tires w/center groove - Inflate to 40 PSI (~276kPa)			
Contact Drive Tires	Two 4.10" x 6" spring-loaded contact drive tires. - Inflate to 50 PSI (~345 kPa)			
Field Lift	One center post lift cylinder. (Front or rear mount.)			
Row Markers	Two-fold low profile with 41 cm concave, solid blades and cast iron hubs.			
NOTE: Specifications are for base machine. Additional options could affect the figures.				

Tractor Hydraulic Requirements - 8 Row Planters (Conventional)			
Configuration	**Requirements**		**Description**
Base machine with mechanical meters	2 SCV	15 gpm (~57 l/min)	#1 SCV: Planter lift
			#2 SCV: Markers/fold (manual selector valve)
Base machine with vacuum meters	3 SCV	20 gpm (~76 l/min)	#1 SCV: Planter lift
			#2 SCV: Markers/fold (manual selector valve)
			#3 SCV: Vacuum fan
Base machine with vacuum meters and tractor mounted PTO pump	2 SCV	15 gpm (~57 l/min)	#1 SCV: Planter lift
			#2 SCV: Markers/fold (manual selector valve)

Tractor Hydraulic Requirements - 8 Row Planters (Bulk Fill)			
Configuration	**Requirements**		**Description**
Base machine with mechanical meters	2 SCV	15 gpm (57 l/min)	#1 SCV: Planter lift/Bulk Fill fan
			#2 SCV: Markers/fold (manual selector valve)
Base machine with mechanical meters and tractor mounted PTO pump	2 SCV	15 gpm (57 l/min)	#1 SCV: Planter lift
			#2 SCV: Markers/fold (manual selector valve)
Base machine with vacuum meters	3 SCV	20 gpm (~76 l/min)	#1 SCV: Planter lift/Bulk Fill fan
			#2 SCV: Markers/fold (manual selector valve)
			#3 SCV: Vacuum fan
Base machine with vacuum meters and tractor mounted PTO pump	2 SCV	15 gmp (~57 l/min)	#1 SCV: Planter lift
			#2 SCV: Markers/fold (manual selector 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 24 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. Transporting planter with hoppers over half full or unevenly loaded can cause loss of control and could result in death, serious injury, or damage to property and equipment.

26. 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.

Never pour waste onto the ground, down a drain, or into any water source.

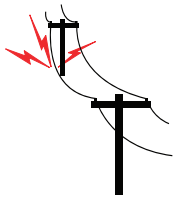
When disposing of waste such as oil, use leakproof containers. Be sure to use containers that do not resemble food or beverage which may mislead someone into consuming them. Dispose of oil per your local, regional requirements.

When disposing of any fertilizer chemicals used, contact the supplier of the chemicals.

Model 3500 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

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

Falling equipment can cause death or serious injury. Install all lockup devices or lower planter to ground before working on equipment.

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

WARNING

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.

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 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.

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INITIAL PREPARATION

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.

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 ⅝"- 18 lug bolts to 180 ft-lb (~244 Nm) 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.

TIRES PREPARATION

1. Torque transport wheel 9/16"- 18 lug bolts to 90 ft-lb (~122 Nm).
2. Inflate transport/ground drive tires to 40 PSI (2,76 bar).
3. Inflate contact drive tires to 50 PSI (3,45 bar).

TRACTOR REQUIREMENTS

NOTICE

All Hydraulic Requirements: Minimum Pressure 2350 PSI (~16203 kPa); Maximum Pressure 3000 PSI (~20684 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 VDC electrical system is required to operate planter safety/warning lights, digital vacuum gauge, and optional pneumatic down pressure system or work lights.

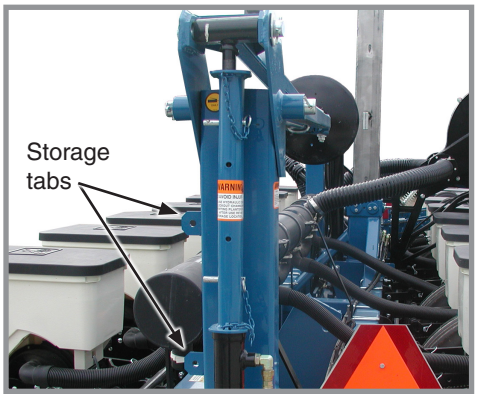
Two dual remote hydraulic outlets (SCV) are required on all models. An additional SCV and zero pressure case drain, or PTO pump is required for vacuum and bulk fill equipped planters.

Hydraulic maximum flow rate is required to operate vacuum fan motor:
8 Row = 5 GPM @ 2350 PSI (~19 l/min@16203 kPa)

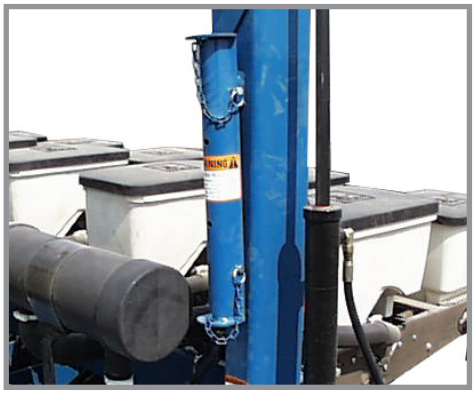
WARNING

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.

ROW MARKER SAFETY LOCKUP



Row marker lockup installed



Row marker lockup in storage location

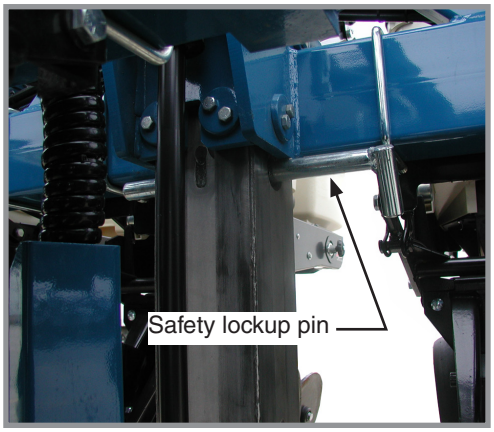
Install row marker safety lockup devices over marker cylinder rods whenever markers are not being used. Keep in storage position on front side of row marker arms when removed. Secure in either location with attached clevis pins.

SAFETY LOCKUP PIN

For conventional planters, safety lockup pin is inserted through the center post and kept in place by a hairpin clip.

For planters with bulk fill, safety lockup pin is stored on pin holder on front latch post.

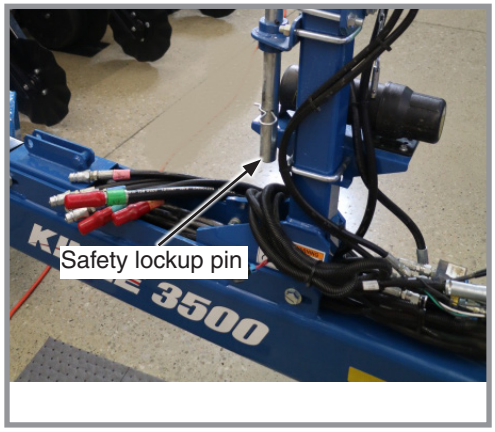
Pin must be installed under planter frame during transport or when working on equipment when raised.



Conventional Hoppers

STROKE LIMITER PIN (CONVENTIONAL ONLY)

Pin must be installed above planter frame during normal operation to contact stroke limiter valve and prevent lift cylinder from overextending. Refer to Hydraulic Operation in this section.

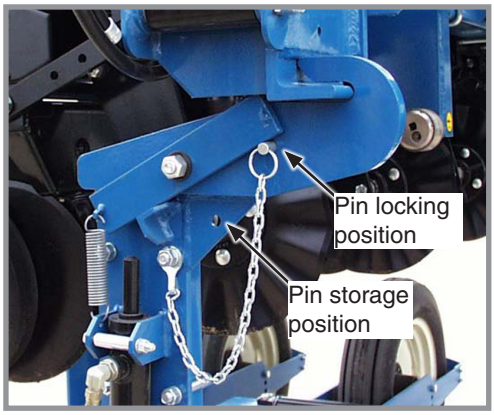


Bulk Fill

TRANSPORT LATCH LOCKING PIN

Spring loaded transport latch on planter hitch locks in place under toolbar when planter is rotated to transport position.

Always install transport latch locking pin to lock transport latch before transporting planter.



Transport latch locking pin locations

JACK STAND

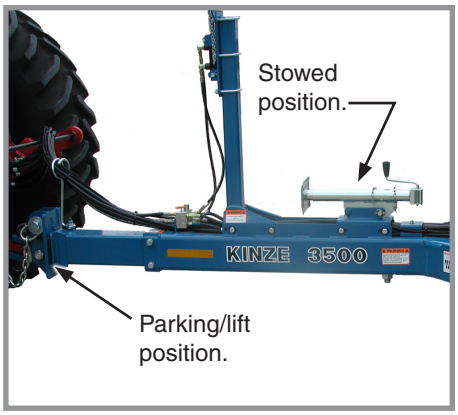
NOTICE

Install jack stand in stowed position during transport and field operation to prevent equipment damage.

An easily removable jack stand is provided to aid in connecting and disconnecting planter from tractor.

Slide notched end of jack stand over mount round bar at parking/lift or stowed position.

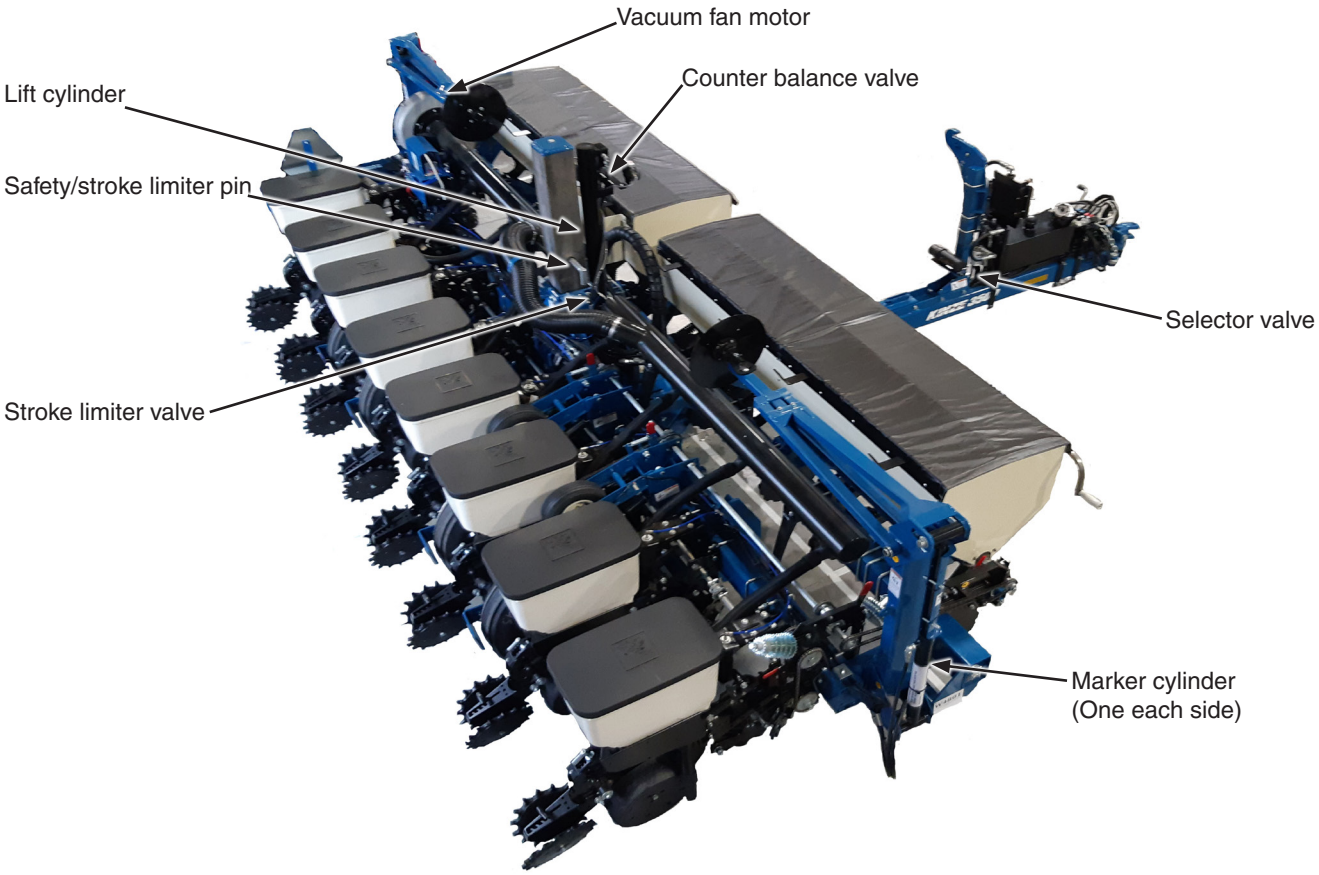
Install pin through mount and jack stand. Secure with lynch pin.



Jack stand locations

HYDRAULIC OPERATION - CONVENTIONAL

NOTE: PTO pump drive and oil cooler package is available from Kinze through your Kinze Dealer to increase your tractor's operating capabilities.



3500 hydraulic system (schematic located in Lubrication and Maintenance section)

HYDRAULIC OPERATION - CONVENTIONAL (CONTINUED)

PLANTER LIFT SYSTEM

Planter lift system consists of one lift cylinder located at center of machine. Cylinder mounts are located front and rear side of center post. Install cylinder in rear position for planters with rear mounted row units only. Cylinder must be installed in front position for planters with front mounted options (push row units, fertilizer, etc.). A stroke limiter valve shuts off hydraulic flow when the planter lifts to raised field position and contacts safety/stroke limiter pin. A counter balance valve holds planter in position until reverse pressure is applied.

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

SELECTOR VALVE, ROTATE AND MARKER CYLINDERS

A hitch mounted, hand operated selector valve selects row marker or fold functions. Rotate cylinder is mounted on the frame and rotates planter to/from transport position. Row marker cylinders raise and lower row markers.

NOTE: Hydraulic pressure will prevent valve from moving. Release hydraulic pressure from system before attempting to move selector valve handle.

VACUUM FAN MOTOR AND VALVE BLOCK ASSEMBLY (If equipped)

Hydraulically operated motor requires maximum flow rate of 5 GPM @ 2000 PSI (~19 l/min @16202 kPa) to operate properly. It must be connected to a zero pressure case drain and connected to the correct pressure and return SCV's or PTO fittings.

A pressure relief valve in the valve block assembly prevents build up of oil pressure over 35 PSI in case drain line when vacuum fan motor is in operation. This valve vents oil outside of valve block through a drain hole in the aluminum valve block. This can occur whenever the case drain is improperly connected or motor circuit pressure is too high.

"Hydraulic Diagram - Vacuum Fan Motor System" on page 6-40.

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

NOTE: Fan turns at a reduced speed if reverse pressure is applied.

HYDRAULIC OPERATION - CONVENTIONAL (CONTINUED)

RAISED FIELD POSITION

Row units raise approximately 14 inches (~36 cm) and toolbar approximately 40 inches (~102 cm) off ground. This position is used in making turns or passing over waterways during field operation.

Install safety/stroke limiter pin above frame assembly to make contact with stroke limiter valve. Secure with hairpin clip.

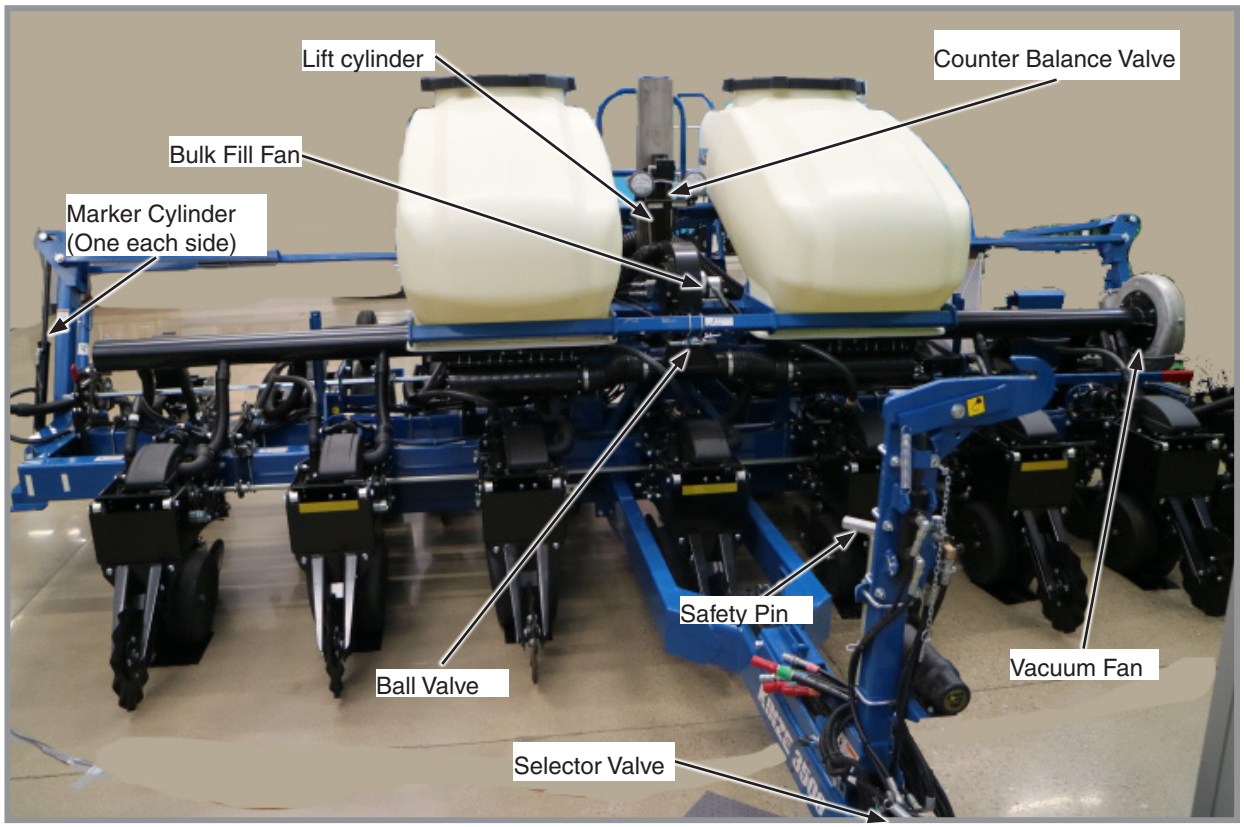
RAISED TRANSPORT POSITION

Planter raises high enough to permit row units to clear transport wheels as planter is rotated.

1. Remove hairpin clip and safety lockup pin.
2. Raise planter until lift cylinder is fully extended.
3. Reinstall safety lockup pin and hairpin clip in same hole which is now below frame assembly.
4. Lower planter onto safety lockup pin.

HYDRAULIC OPERATION - BULK FILL

NOTE: PTO pump drive and oil cooler package is available from Kinze through your Kinze Dealer to increase your tractor's operating capabilities.



3500 hydraulic system (schematic located in Lubrication and Maintenance section)

HYDRAULIC OPERATION - BULK FILL (CONTINUED)

PLANTER LIFT SYSTEM

Planter lift system consists of one lift cylinder located at center of machine. A counterbalance valve holds planter in position until reverse pressure is applied. A lift limiter valve closes when the bearing contacts the hole for the safety pin at field turn height. A ball valve located on the front of the bulk fill mount is opened to bypass the lift limiter and allow full lift for transport.

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

SELECTOR VALVE, ROTATE AND MARKER CYLINDERS

A hitch mounted, hand operated selector valve selects row marker or fold functions. Rotate cylinder is mounted on the frame and rotates planter to/from transport position. Row marker cylinders raise and lower row markers.

NOTE: Hydraulic pressure will prevent valve from moving. Release hydraulic pressure from system before attempting to move selector valve handle.

VACUUM FAN AND BULK FILL MOTOR AND VALVE BLOCK ASSEMBLY (If equipped)

Hydraulically operated motor requires maximum flow rate of 5 GPM @ 2350 PSI (~19 l/min @ 16202 kPa) to operate properly. It must be connected to a zero pressure case drain and connected to the correct pressure and return SCV's or PTO fittings. See "Hydraulic Diagram - Vacuum Fan Motor System" on page 6-40 for more details.

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

Bulkfill air pressure is controlled by a mechanical flow control valve located on the transport catch post on hitch of planter. Hydraulic pressure from the lift circuit operates the fan when the planter is lowered and SCV is left in detent. When the planter is lifted, the fan will shut off until the unit is again lowered.

NOTE: Fan turns at a reduced speed if reverse pressure is applied.

HYDRAULIC OPERATION - BULK FILL (CONTINUED)

RAISED FIELD POSITION

Row units raise approximately 14 inches (~36 cm) and toolbar approximately 40 inches (~102 cm) off ground. This position is used in making turns or passing over waterways during field operation.

Close ball valve to limit lift height for field operation.

RAISED TRANSPORT POSITION

Planter raises high enough to permit row units to clear transport wheels as planter is rotated.

1. Open ball valve.
2. Raise planter until lift cylinder is fully extended.
3. Install safety lockup pin and hairpin clip in same hole which is now below frame assembly.
4. Lower planter onto safety lockup pin.

OIL SPECIFICATION

Hydraulic transmission oil is used in the planter and PTO. The oil chemical properties:

Viscosity, mm2/s @ 100 ºC. ASTM D-445	10
Viscosity, mm2/s @ 40 ºC. ASTM D-445	63
Viscosity Index ASTM D-2270	143
TBN, mg KOH/g ASTM D-2896	9
TAN, mg KOH/g (ASTM D-664)	2
Pour Point, ºC ASTM D-5950	-42
Specific Gravity @ 15.6°C. ASTM D-4052	0,876
Flash Point, COC, ºC. ASTM D-92	220

NOTE: Factory filled with VALVOLINE ™ UNITRAC SAE 80W.

PTO PUMP DRIVE AND OIL COOLER OPTION

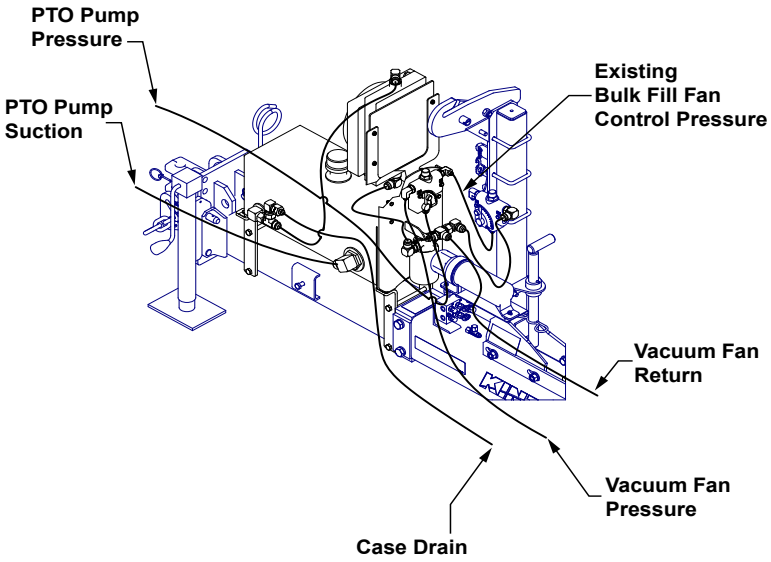
The PTO pump drive and oil cooler option is for tractors with less than required hydraulic output needed to operate hydraulic-driven vacuum fan and other planter hydraulic requirements.

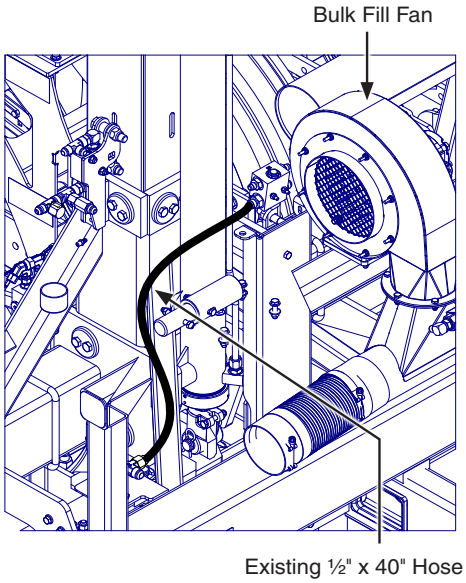
A 1000 RPM PTO is required to operate the PTO-driven hydraulic pump.

PTO pump option fits to a 1⅜21 or 1¾"-20 spline with mount option from Ag Power Systems (www.agpowersystems.com),13.5 GPM 2000 PSI pump (~49 l/min @13790 kPa), 10 gallon (~38 l) capacity hydraulic reservoir, 15 GPM 2000 PSI (~57 l/min @13790 kPa)-rated oil cooler, spin-on 10-micron oil filter, and required hydraulic valves and fittings.

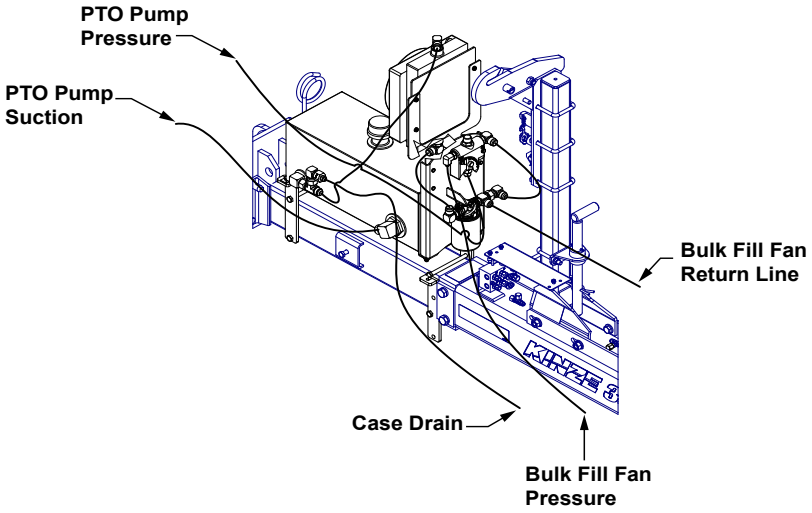
PTO PUMP DRIVE AND OIL COOLER OPTION (CONTINUED)

Vacuum/Bulk Fill

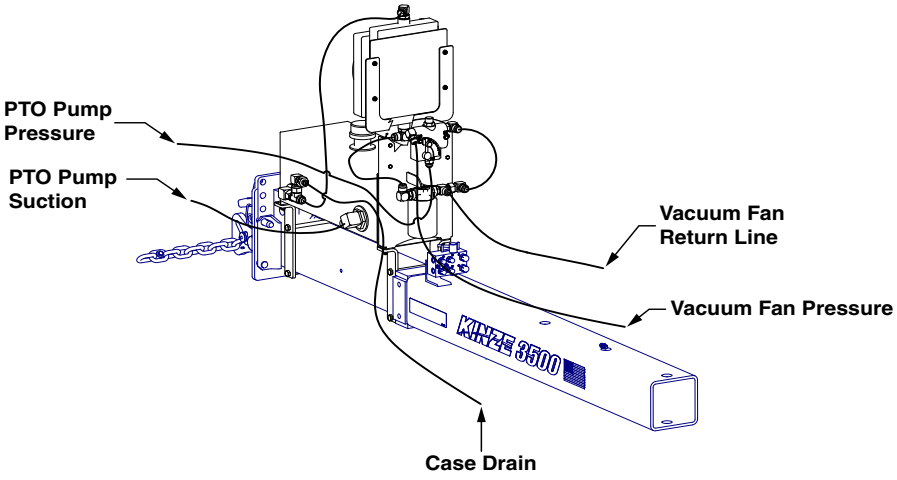




Mechanical/Bulk Fill



Vacuum/Conventional

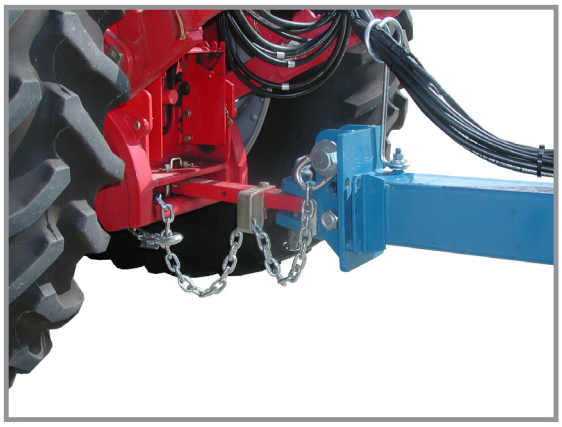


TRACTOR PREPARATION AND HOOKUP

NOTE: A 2-Point Hitch option is available for use with Category 3N or 3 three-point hitch designs to convert planter from drawn to semi-mounted. Safety chain is not used with 2-point hitch.

1. Adjust tractor drawbar 13 to 17 inches (~33- 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 ¾" diameter hitch pin. Secure with a locking or cotter pin.

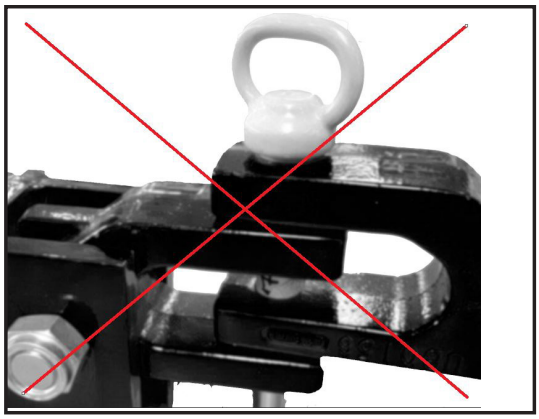


Drawbar and safety chain connection

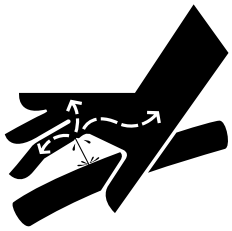
NOTE: DO NOT install safety chain using clevis mounting hardware. Safety chain MUST be installed separately.

3. 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 (~1139 Nm).

NOTE: Improper connection could damage planter or tractor.



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.

NOTICE

Vacuum and bulk fill fan motor hydraulic hoses and case drain must be installed correctly. Motor can be damaged or equipment will not operate properly.

NOTE: If tractor is equipped with an adjustable flow outlet (SCV), set to full flow position. For tractors not equipped with a method for finite adjustment of hydraulic flow, Flow Control Needle Valve Kit G1K426 is available from Kinze Repair Parts through your Kinze Dealer.

G1K426 needle valve kit

Function	Hose Color	Pressure	Return
Lift/Bulk Fill	Red	A	B
Fold/Marker	Blue	A	B
Vacuum	Green	A	B
Case Drain	Orange/Green	---	CD

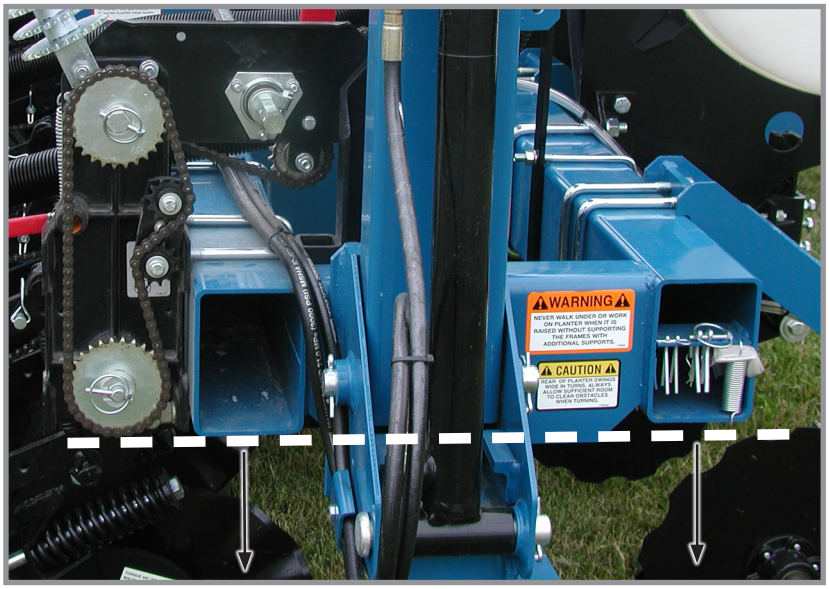
TRACTOR PREPARATION AND HOOKUP (CONTINUED)

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.

NOTE: A 12 VDC battery connection is required to power the vacuum fan digital gauge. Connect "red" wire to positive (+) battery terminal and "black" wire to negative (-) battery terminal.

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

LEVEL PLANTER



Bottom of toolbars 20" - 22" (~51- 56 cm) from planting surface

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" (~51- 56 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 (~102 Nm) 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.

CYLINDER INFORMATION

Description	Row Marker Cylinder	Transport Latch Cylinder	Lift Cylinder (Bulk Fill)	Rotation Cylinder
Intended Use	Double Acting Applications	Double acting applications	Double Acting Applications	Double Acting Applications
Piston	Ductile Iron	Ductile iron	Ductile Iron	Ductile Iron
Gland	Ductile Iron	Ductile iron	Ductile Iron	Ductile Iron
Tube	ST 52 DOM Tubing	Cast	ST 52 DOM Tubing	ST 52 DOM Tubing
Rod	1045 Nitro Rod	1045 Nitro rod	1045 Nitro Rod	1045 Nitro Rod
End Mounts	U-Brackets	None	Trunnion	Tang
Tube Seal	Buna O-Ring with Polytemp Back-up	O-Ring with polytemp back-up	Buna O-Ring with Poly-temp Back-up	Buna O-Ring with Polytemp Back-up
Rod Seal	Polyester Alloy U-cup	Polyester alloy u-cup	Polyester Alloy U-cup	Polyester Alloy U-cup
Rod Wiper	Polyester Alloy Snap In	Polyester alloy snap in	Polyester Alloy Snap In	Polyester Alloy Snap In
Piston Seal	T-Seal HNBR	T-Seal HNBR	PTFE Seal	T-Seal HNBR
Product Category	Hydraulic Cylinder	Hydraulic Cylinder	Hydraulic Cylinder	Hydraulic Cylinder
Maximum Stroke	8" (~20,32 cm)	2.5" (~6,35 cm)	48" (~121,90 cm)	16" (~40,60 cm)
Working Pressure	2350-3000 PSI (~16203-20684 KPa)	3000 PSI (~20684 kPa)	3000 PSI (~20684 kPa)	3000 PSI (~20684 kPa)
Bore Size	2" (~5,08 cm)	1.5" (~3,81 cm)	3.25" (~8,25 cm)	3" (~7,60 cm)
Shaft Diameter	1" (~2,54 cm)	.750" (~1,91 cm)	1.5" (~3,81 cm)	1.25" (~3,10 cm)
Cylinder Configuration	Simple	Simple	Simple	Simple
Cylinder Action	Double	Double	Double	Double
Material	Steel, Ductile Iron	Steel, Ductile Iron, Cast	Steel, Ductile Iron	Steel, Ductile Iron
Mounting Method	U-Bracket	None	Trunnion	Tang
Mount Location	End Cap	End Cap	Barrel	End Cap
Cylinder Style	Welded	Machined	Welded	Welded

HYDRAULIC HOSE INFORMATION

Part Number	A1078	A1153	A1090	A1121	A11447	A1154
Description	Hose Assembly, 3/8" x 174" (~441,96 cm)	Hose Assembly, ¼" x 56" (~142,24 cm)	Hose Assembly, ¼" x 162" (~411,48 cm)	Hose Assembly, ¼" x 180" (~457,20 cm)	Hose Assembly, ¼" x 45" (~114,30 cm)	Hose Assembly, 3/8" x 162" (~411,48 cm)
Product Category	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose
Product Form	Hose:Assembly	Hose:Assembly	Hose:Assembly	Hose:Assembly	Hose:Assembly	Hose; Assembly
I.D.	3/8" (~9,53 mm)	¼" (~6,35 mm)	3/8" (~9,53 mm)	¼" (~6,35 mm)	5/8" (~15,88 mm)	¼" (~6,35 mm)
O.D.	.69" (~17,46 mm)	.53" (~13,49 mm)	.69" (~17,46 mm)	.53" (~13,49 mm)	.94" (~23,81 mm)	.53" (~13,49 mm)
Minimum Bend Radius	2 ½" (~63,50 mm)	4" (~100,60 mm)	2 ½" (~63,50 mm)	2" (~50,80 mm)	4" (~101,60 mm)	4" (~101,60 mm)
Working Pressure	3000 PSI (~20685 kPa)	3275 PSI (~22580 kPa)	3000 PSI (~20684 kPa)	3250 PSI (~22408 kPa)	2750 PSI (~18961 kPa)	3275 PSI (~22580 kPa)
Temperature Range	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)
Material	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2
Specialized Construction	High tensile steel wire	High tensile steel wire	High tensile steel wire	High tensile steel wire	High tensile steel wire	High tensile steel wire
Media	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid
Application	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction

Part Number	A12080	A12767	A1434	A1465	A15000	A8213
Description	Hose Assembly, 3/8" x 272" (~690,88 cm)	Hose Assembly, 3/8" x 152" (~386,08 cm)	Hose Assembly, 3/8" x 20" (~50,80 cm)	Hose Assembly, 3/8" x 146" (~370,84 cm)	Hose Assembly, 3/8" x 174" (~441,96 cm)	Hose Assembly, 3/8" x 29" (~73,66 cm)
Product Category	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose
Product Form	Hose:Assembly	Hose:Assembly	Hose:Assembly	Hose; Assembly	Hose:Assembly	Hose; Assembly
I.D.	3/8" (~9,53 mm)	½" (~12,70 mm)	½" (~12,70 mm)	½" (~12,70 mm)	3/8" (~9,53 mm)	½" (~12,70 mm)
O.D.	.69" (~17,46 mm)	.81" (~20,64 mm)	.81" (~20,64 mm)	.81" (~20,64 mm)	.69" (~17,46 mm)	.81" (~20,64 mm)
Minimum Bend Radius	2 ½" (~63,5 mm)	3 ½" (~88,90 mm)	3 ½" (~88,90 mm)	3 ½" (~88,90 mm)	2 ½" (~63,50 mm)	3 ½" (~88,90 mm)
Working Pressure	3000 PSI (~20684 kPa)	3000 PSI (~20684 kPa)	3000 PSI (~20684 kPa)	3000 PSI (~20684 kPa)	3000 PSI (~20684 kPa)	3000 PSI (~20684 kPa)
Temperature Range	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)
Material	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2
Specialized Construction	High tensile steel wire	High tensile steel wire	High tensile steel wire	High tensile steel wire	High tensile steel wire	High tensile steel wire
Media	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid
Application	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction

HYDRAULIC HOSE INFORMATION (CONTINUED)

Part Number	A15026	A15064	A1018	A15076-140	A15077-260
Description	Hose Assembly, 3/8" x 56" (~142,24 cm)	Hose Assembly, 3/8" x 66" (~167,64 cm)	Hose Assembly, 3/8" x 40" (~101,60 cm)	Hose Assembly, 3/8" x 140" (~355,60 cm)	Hose Assembly, 3/8" x 260" (~660,40 cm)
Product Category	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose
Product Form	Hose; Assembly	Hose; Assembly	Hose; Assembly	Hose; Assembly	Hose; Assembly
I.D.	3/8" (~9,53 mm)	3/8" (~9,53 mm)	3/8" (~9,53 mm)	3/8" (~9,53 mm)	3/8" (~9,53 mm)
O.D.	.69" (17,46 mm)	.69" (17,46 mm)	.69" (17,46 mm)	.62" (15,75 mm)	.62" (15,75 mm)
Minimum Bend Radius	2 ½" (~63,50 mm)	2 ½" (~63,50 mm)	2 ½" (~63,50 mm)	2 ½" (~63,50 mm)	2 ½" (~63,50 mm)
Working Pressure	3000 PSI (~20684 kPa)	3000 PSI (~20684 kPa)	3000 PSI (~20684 kPa)	3000 PSI (~22407 kPa)	3000 PSI (~22407 kPa)
Temperature Range	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)
Material	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2
Specialized Construction	High tensile steel wire	High tensile steel wire	High tensile steel wire	High tensile steel wire	High tensile steel wire
Media	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid
Application	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction
Part Number	A15081-128	A15081-24	A15082-140	A15082-154	A15082-77
Description	Hose Assembly, 3/8" x 128" (~325,12 cm)	Hose Assembly, 3/8" x 24" (~60,94 cm)	Hose Assembly, 3/8" x 140" (355,60 cm)	Hose Assembly, 3/8" x 154" (~391,16 cm)	Hose Assembly, 3/8" x 77" (~195,58 cm)
Product Category	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose
Product Form	Hose; Assembly	Hose; Assembly	Hose; Assembly	Hose; Assembly	Hose; Assembly
I.D.	3/8" (~9,53 mm)	3/8" (~9,53 mm)	3/8" (~9,53 mm)	3/8" (~9,53 mm)	3/8" (~9,53 mm)
O.D.	.62" (~15,75 mm)	.62" (~15,75 mm)	.62" (~15,75 mm)	.62" (~15,75 mm)	.62" (~15,75 mm)
Minimum Bend Radius	2 ½" (~63,50 mm)	2 ½" (~63,50 mm)	2 ½" (~63,50 mm)	2 ½" (~63,50 mm)	2 ½" (~63,50 mm)
Working Pressure	3000 PSI (~22408 kPa)	3000 PSI (~22408 kPa)	3000 PSI (~22408 kPa)	3000 PSI (~22408 kPa)	3000 PSI (~22408 kPa)
Temperature Range	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)
Material	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2
Specialized Construction	High tensile steel wire	High tensile steel wire	High tensile steel wire	High tensile steel wire	High tensile steel wire
Media	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid
Application	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction

HYDRAULIC HOSE INFORMATION (CONTINUED)

Part Number	A15084-145	A15085-112	A15092-106	A15092-155	A15092-98
Description	Hose Assembly, 3/8" x 145" (~368,30 cm)	Hose Assembly, 3/8" x 112" (~284,48 cm)	Hose Assembly, 3/8" x 106" (~269,24 cm)	Hose Assembly, 3/8" x 155" (~393,70 cm)	Hose Assembly, 3/8" x 98" (~248,92 cm)
Product Category	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose
Product Form	Hose; Assembly	Hose; Assembly	Hose; Assembly	Hose; Assembly	Hose; Assembly
I.D.	3/8" (~9,53 mm)	3/8" (~9,53 mm)	3/8" (~9,53 mm)	3/8" (~9,53 mm)	3/8" (~9,53 mm)
O.D.	.62" (15,75 mm)	.62" (15,75 mm)	.62" (15,75 mm)	.62" (15,75 mm)	.62" (15,75 mm)
Minimum Bend Radius	2 ½" (~63,50 mm)	2 ½" (~63,50 mm)	2 ½" (~63,50 mm)	2 ½" (~63,50 mm)	2 ½" (~63,50 mm)
Working Pressure	3000 PSI (~22408 kPa)	3000 PSI (~22408 kPa)	3000 PSI (~22408 kPa)	3000 PSI (~22408 kPa)	3000 PSI (~22408 kPa)
Temperature Range	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)
Material	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2
Specialized Construction	High tensile steel wire	High tensile steel wire	High tensile steel wire	High tensile steel wire	High tensile steel wire
Media	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid
Application	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction
Part Number	A3292	A3351	A3371	A3393	A6206
Description	Hose Assembly, 3/8" x 22" (~55,88 cm)	Hose Assembly, 3/4" x 20" (~50,80 cm)	Hose Assembly, 3/4" x 25" (~63,50 cm)	Hose Assembly, 3/4" x 30" (~76,20 cm)	Hose Assembly, 1" x 56" (~142,24 cm)
Product Category	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose
Product Form	Hose:Assembly	Hose; Assembly	Hose; Assembly	Hose; Assembly	Hose; Assembly
I.D.	3/8" (~9,53 mm)	3/4" (~19,05 mm)	3/4" (~19,05 mm)	3/4" (~19,05 mm)	1" (~25,40 mm)
O.D.	.69" (~17,46 mm)	1.06" (~26,92 mm)	1.06" (~26,92 mm)	1.06" (~26,92 mm)	1.44" (~36,51 mm)
Minimum Bend Radius	2 ½" (~63,50 mm)	4 ¾" (~120,65 mm)	4 ¾" (~120,65 mm)	4 ¾" (~120,65 mm)	6" (~152,40 mm)
Working Pressure	3000 PSI (~20684 kPa)	2250 PSI (~15513 kPa)	2250 PSI (~15513 kPa)	2250 PSI (~15513 kPa)	2000 PSI (~13790 kPa)
Temperature Range	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)
Material	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2
Specialized Construction	High tensile steel wire	High tensile steel wire	High tensile steel wire	High tensile steel wire	High tensile steel wire
Media	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid
Application	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction

HYDRAULIC HOSE INFORMATION (CONTINUED)

Part Number	A15094-175	A15098-150	A18668-152	A21518-120	A21525-77	A21530-140
Description	Hose Assembly, ⅜" x 175"	Hose Assembly, ⅜" x 150"	Hose Assembly, ⅜" x 152"	Hose Assembly, ⅜" x 120"	Hose Assembly, ⅜" x 77"	Hose Assembly, ⅜" x 140"
Product Category	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose	Hydraulic Hose
Product Form	Hose; Assembly	Hose; Assembly	Hose; Assembly	Hose; Assembly	Hose; Assembly	Hose; Assembly
I.D.	⅜" (9,53 mm)	⅜" (9,53 mm)	⅜" (9,53 mm)	⅝" (15,88 mm)	⅝" (15,88 mm)	⅝" (15,88 mm)
O.D.	.69" (17,46 mm)	.62" (15,75 mm)	.81" (20,64 mm)	.94" (23,81 mm)	.94" (23,81 mm)	.94" (23,81 mm)
Minimum Bend Radius	2 ½" (63,50 mm)	2 ½" (63,50 mm)	3 ½" (88,90 mm)	4" (101,60 mm)	4" (101,60 mm)	4" (101,60 mm)
Working Pressure	3000 PSI (22407,96 kPa)	3000 PSI (22407,96 kPa)	3000 PSI (22407,96 kPa)	2750PSI (18960,58 kPa)	2750PSI (18960,58 kPa)	2750PSI (18960,58 kPa)
Temperature Range	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)	-40°F - +212°F (-40°C - +100°C)
Material	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2	Modified Nitrile Type C2
Specialized Construction	High tensile steel wire	High tensile steel wire	High tensile steel wire	High tensile steel wire	High tensile steel wire	High tensile steel wire
Media	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid	Hydraulic Fluid
Application	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction	Agricultural; Construction

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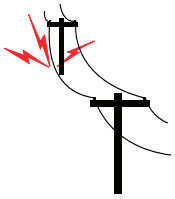
TOWING PLANTER

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

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.

WARNING

Transporting planter with hoppers over half full or unevenly loaded can cause loss of control and could result in death, serious injury, or damage to property and equipment. Properly load planter when transporting. Be aware of extra transport weight, and road conditions and limits.

- 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 15 mph (~25 km/h).

PLANTING SPEED

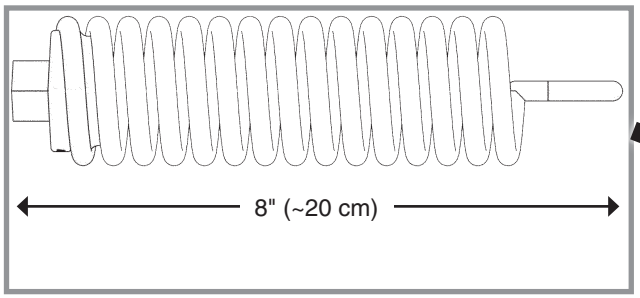
NOTICE

Raise planter out of ground when making sharp turns or backing up or equipment damage may result.

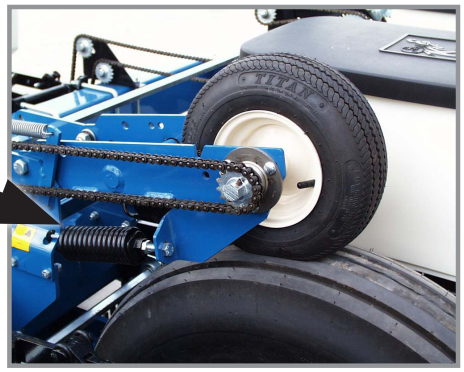
Planters are designed to operate within a speed range of 2 to 8 mph (~3 - 13 km/h). See “General Planting Rate Information” on page 5-1. Variations in ground speed produce variations in rates. Finger pickup seed meter populations tend to be disproportionately higher at high ground speeds.

NOTE: Seed spacing can be adversely affected at speeds above 5.5 mph (~9 km/h).

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 (~91 kg) of down force at tire contact point.

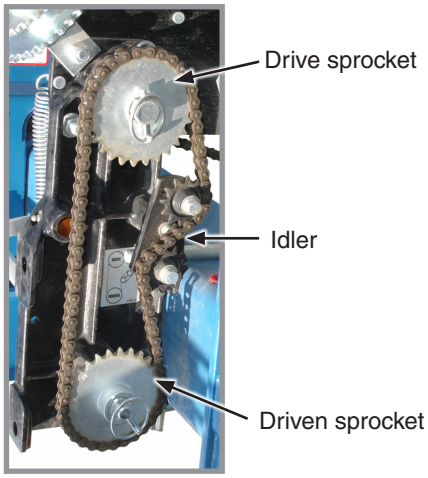
NOTE: Measurement must be taken in planting position with proper tire pressure.

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.

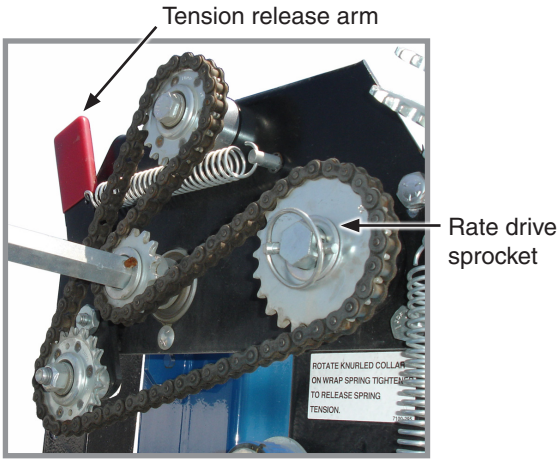
Chain tension is controlled by a spring-loaded dual-sprocket idler. The idler assembly is equipped with an easy-release idler arm to remove spring tension for replacing sprockets.

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



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.

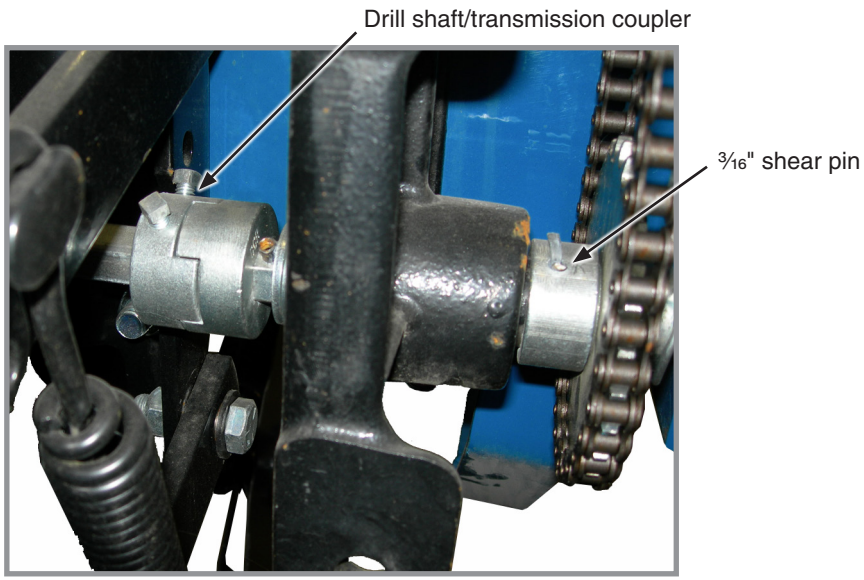
1. Determine where binding has occurred before replacing a pin. Turn shaft by hand (with the aid of a wrench) and check for misalignment and seized parts.

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.

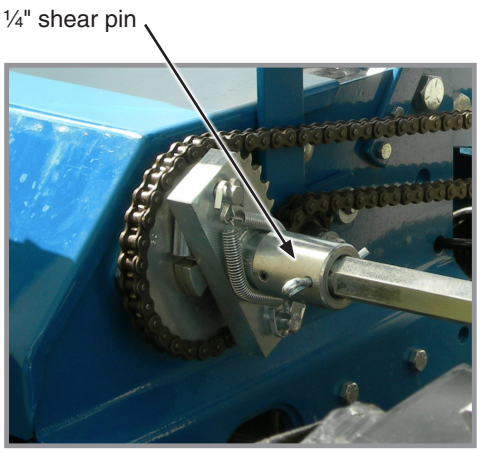
NOTICE

Misaligned drill shaft/transmission coupler can cause equipment damage.

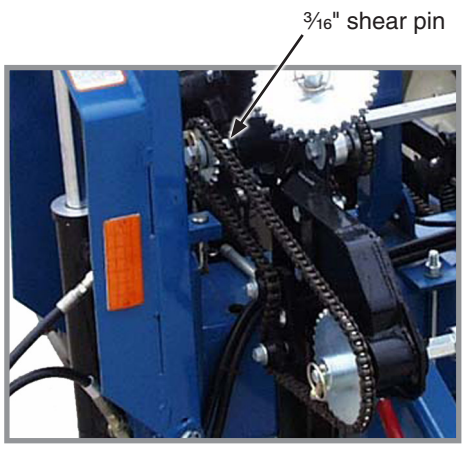
3. Check driveline alignment and follow prescribed lubrication schedules to prevent component binding or breakage.



Transmission shaft and drill shaft coupler



Liquid fertilizer driveline

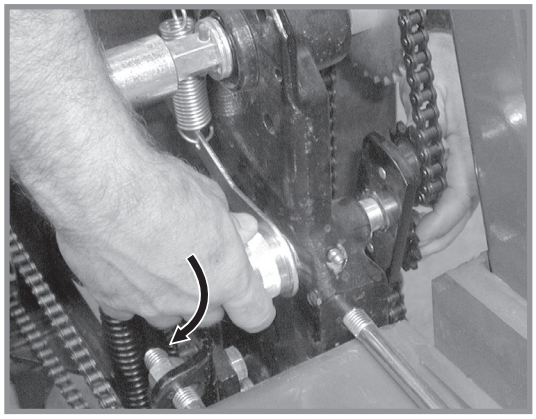


Dry fertilizer driveline

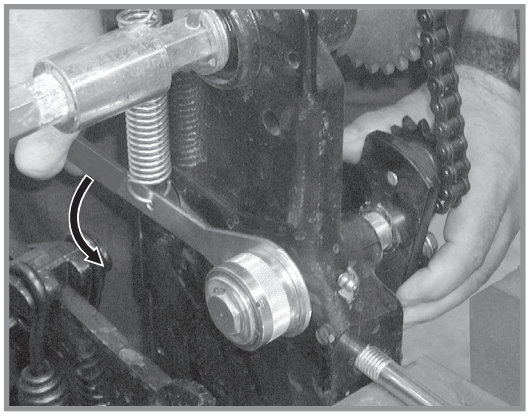
WRAP SPRING WRENCH

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

NOTE: Wrap spring wrenches are L.H. and R.H. specific. L.H. styles have silver metal or grey plastic release collars. R.H. styles have gold metal or blue plastic release collars.



Release chain tension

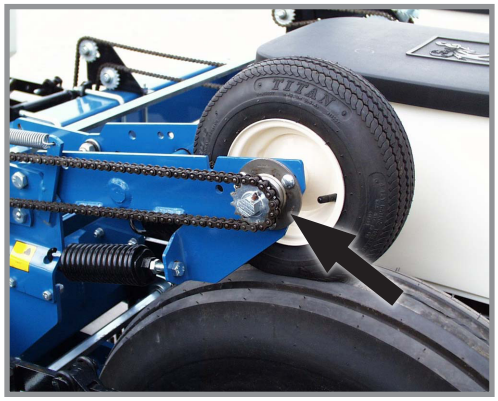


Increase chain tension

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

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

CONTACT WHEEL DRIVE SPROCKETS



Contact wheel drive sprocket

NOTE: 15 tooth, 19 tooth or 30 tooth drive sprockets at each contact drive wheel can be interchanged from sprocket storage rod bolted to each transmission. 30 tooth sprockets require use of 124 pitch chains instead of standard 116 pitch No. 40 chains.

Chain tension is controlled by a spring-loaded sprocket idler. Amount of spring tension on chain is controlled by idler arm. Planting rate chart in Rate Chart section will aid you in selecting correct sprocket.

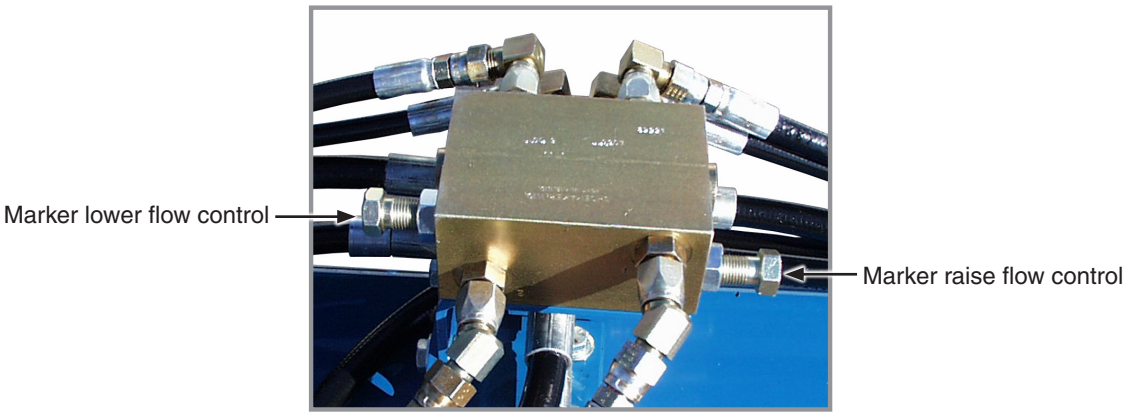
NOTE: 15, 19, and 30 tooth drive sprockets are NOT applicable to all rate charts. 23 tooth driven sprocket at reverser plate is changed to a 17 tooth sprocket when using 60 cell soybean seed disc. Check chart titles to ensure proper rate chart is selected.

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

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.

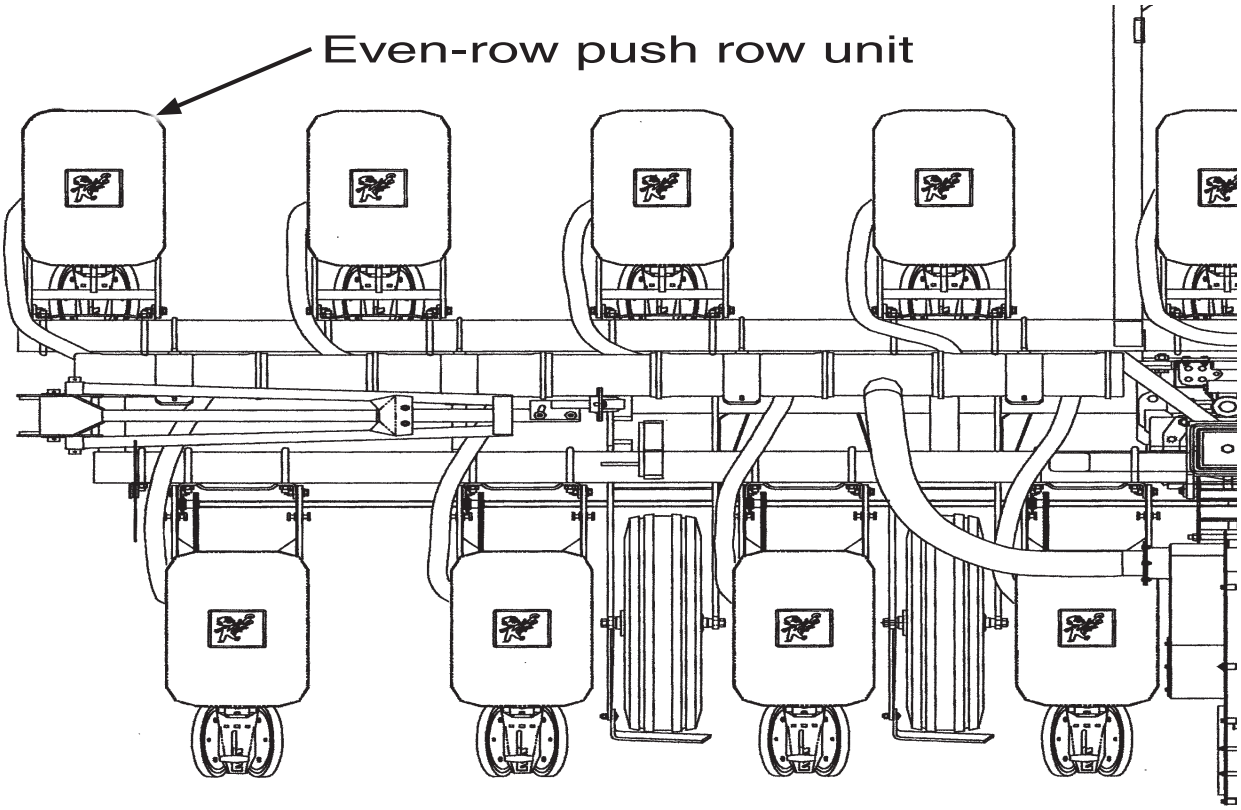
1. Loosen jam nut and turn control clockwise (IN) to slow speed or counterclockwise (OUT) to increase speed.

2. Tighten jam nut after adjustments are made.

EVEN-ROW PUSH ROW UNIT

An Even-Row Push Row Unit Package is available to add one additional push row unit on outer L.H. side of front toolbar for use with Solid Row Split Row Package.

NOTE: See “Row Marker Adjustments” on page 2-28 for determining correct length to set row marker assemblies when planting with even-row push row unit option.



ROW MARKER ADJUSTMENTS

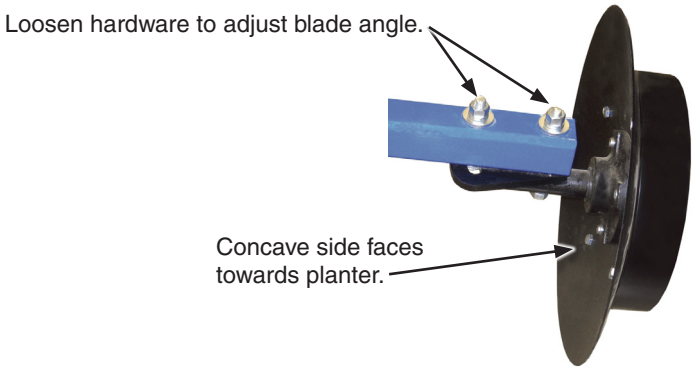
1. Multiply number of rows by the average row spacing in inches to determine total planting width.

Row Marker Lengths	
8 Row 70 cm	560 cm
8 Row 35 cm	525 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.



Row marker disc blade angle adjustment

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.

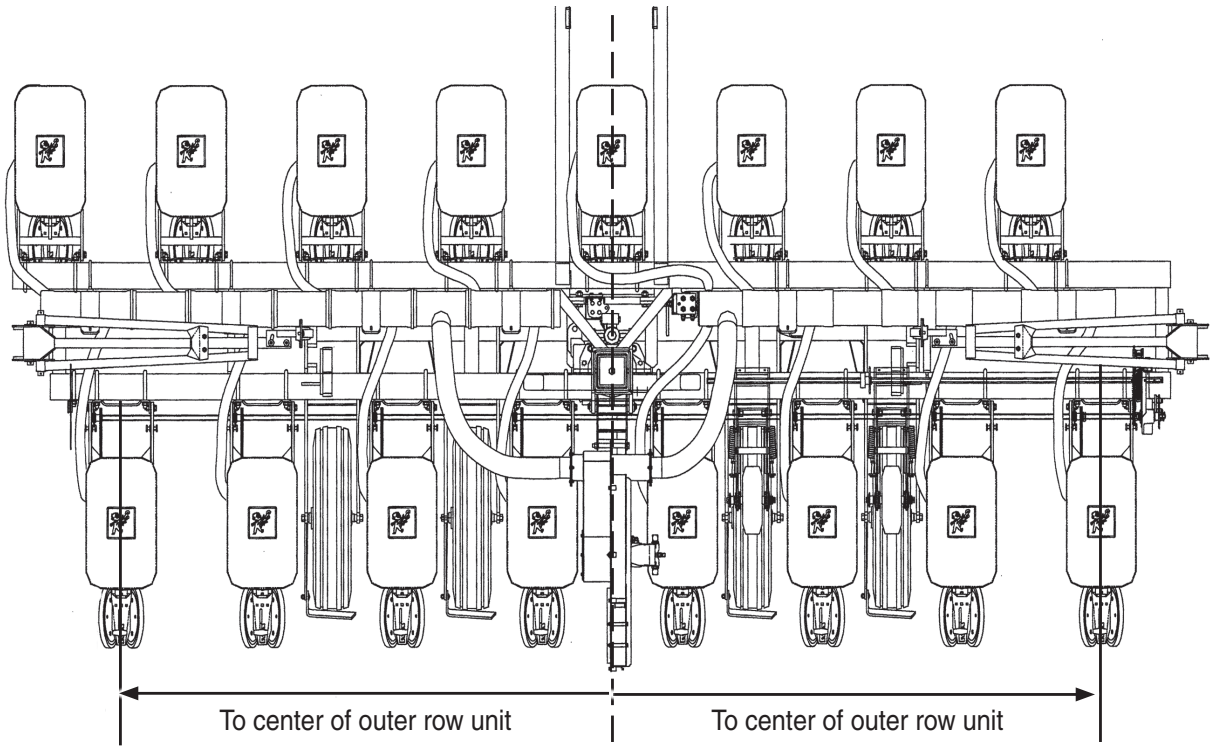
5. Loosen hardware and move assembly as required.

6. Tighten bolts to specified torque.

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 EVEN-ROW LENGTH ADJUSTMENT



Center of planter to center of outer row unit.	x	2	+	35 cm Row spacing.	=	Dimension between planter center line and marker blade

8 Row 70 cm with 8 interplant push row units
(L.H. marker 280 cm x 2 + 35 cm = 595 cm)
(R.H. marker 245 cm x 2 + 35 cm = 525 cm)

NOTE: Readjust markers when planting 70 cm rows

Number of rows x row spacing (Centimeters)

=

Dimension between planter center line and marker blade

8 Rows x 70 cm Spacing = 560 cm Marker Dimension

VACUUM METER SYSTEM

Kinze vacuum meter seed metering system includes seed meters, seed discs, and an air system consisting of a hydraulic driven vacuum fan which draws air through manifolds, hoses, and seed meters on each row unit.

WARNING

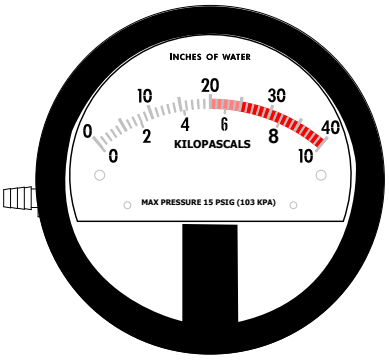
Moving fan blades can cause amputation or severe injury. Never operate vacuum fan with cover removed.

ANALOG VACUUM OR PRESSURE GAUGE

Analog vacuum or pressure gauge connects directly to vacuum meter (vacuum) or bulk fill (pressure) manifold and is teed into digital sending units.

Only adjustment is to “zero” needle with no vacuum or pressure present. If there is a significant difference between gauge and a reading taken at meters, a different manifold location should be found to connect hose to gauge and digital sending unit.

NOTE: Analog gauges are identical EXCEPT for plug and hose barb locations in side of gauge housing. DO NOT connect vacuum meter or bulk fill hose to wrong gauge. Check plug and hose barb installation if readout is erratic or appears inaccurate.



Analog Gauge

BULK FILL SYSTEM

CAUTION **Seed flying out of disconnected delivery tube at high velocity can cause injury. Do not disconnect delivery tubes when system is operating.**

NOTICE **Foreign materials can plug system. Make sure seed is clean and free of debris when filling bulk fill hoppers.**

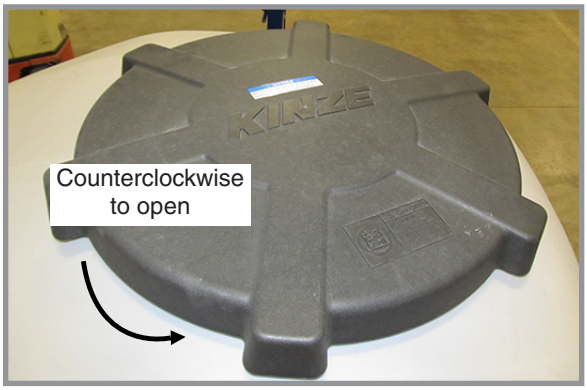
NOTICE **Do not turn on system with tractor engine at full speed or system damage may occur.**

NOTICE **Do not operate bulk fill system above maximum system operating pressure of 20 inches (~51 cm) of water or seed bridging may occur.**

1. **Before filling hoppers refer to "Row Unit Operation" for additives information.** Fill hoppers with seed, latch lids, and secure with pin.
2. Start bulk fill system with tractor engine at idle.
3. Increase engine speed to full and set initial system pressure using flow control valve.
4. Allow system to warm up and adjust pressure if necessary.

Recommended pressures:

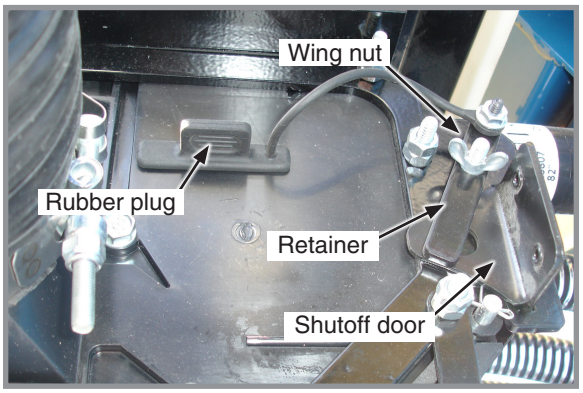
- Corn – 12" (~30 cm) of water
- Soybeans – 10" (~25 cm) of water
- Actual pressure needed is affected by seed size, shape, and coating.



Bulk fill tank lid latch

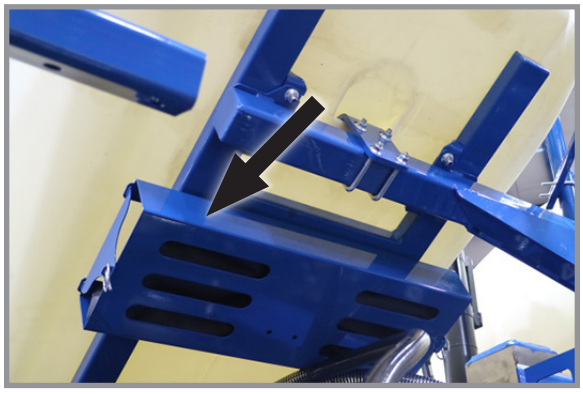
BULK FILL ENTRAINER ACCESS

1. Shut down bulk fill system.
2. Loosen wing nut and turn retainer holding shutoff door in its storage location.
3. Remove rubber plug closest to area in entrainer needing attention.
4. Insert shutoff door into open slot and push into entrainer at a slight upward angle.
5. When work is complete, remove shutoff door, return door to storage location, and plug open slot.

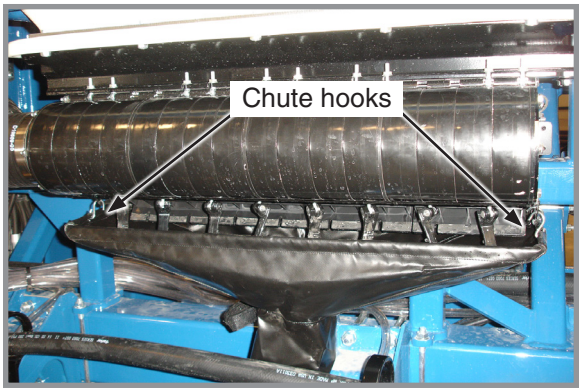


Bulk fill entrainer (end view)

BULK FILL TANKS - CLEAN OUT



Cleanout chute storage bracket



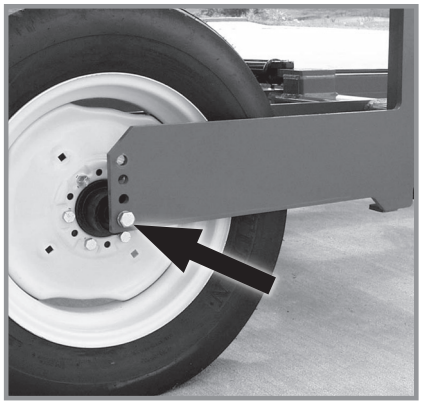
Cleanout chute installed

1. Remove bulk fill tank cleanout chute from storage location beneath catwalk.
2. Position tube of chute under entrainer and attach hooks on each end of entrainment assembly.
3. Open cleanout doors and empty tank.
4. Close all cleanout doors and return cleanout chute to storage location.

RIDGE PLANTING

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

Relocate 20" (~51 cm) transport axles to lower hole in wheel arm.

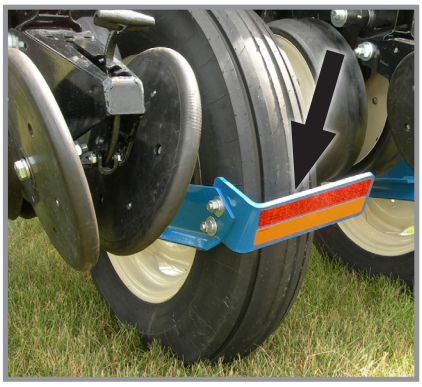


Transport axle in lowest position

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

AUXILIARY WORK LIGHTS PACKAGE

Auxiliary Work Lights Package includes two LED flood lamps, brackets, and hardware to mount lights and a wiring harness to plug into existing planter light harness.

Auxiliary work lights

REAR TRAILER HITCH

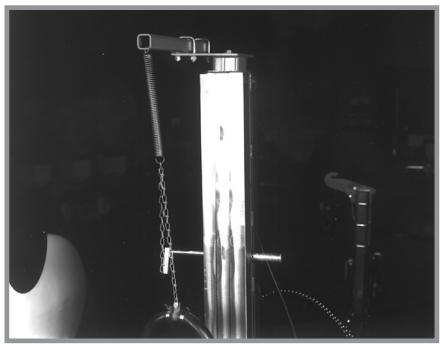
NOTICE

Rear trailer hitch is designed for use with piston pump only. Maximum allowable hitch weight is 200 lb (~91 kg). Do not exceed 6,000 lb (~2722 kg) gross towing weight or the equivalent of a loaded 500 gal (~1893 l) tank and running gear or equipment can be damaged.

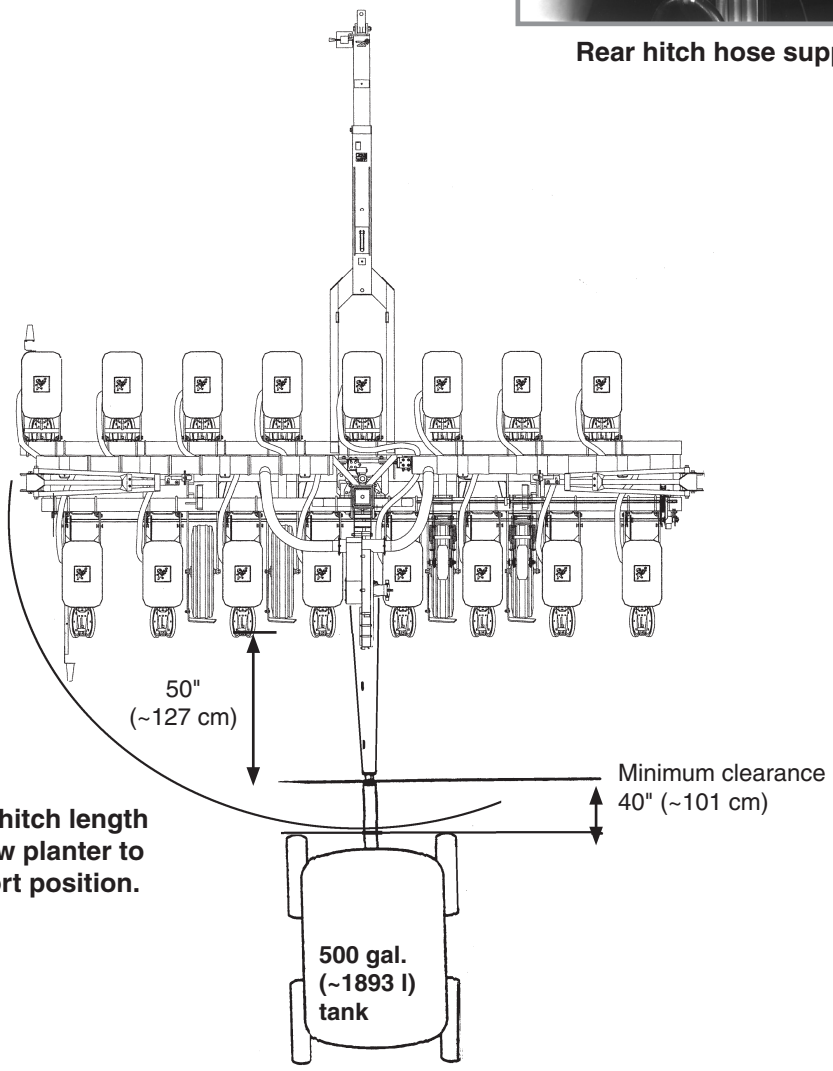
Rear Trailer Hitch is used to tow a 3 or 4 wheel wagon behind planter.

A spring, chain and mounting bracket are used to support the 1¼" (~4 cm) feed hose from hitch to piston pump. This extra length or loop is required to allow planter to be moved into transport position without stretching or breaking hose.

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



Rear hitch hose support



Note: minimum tank hitch length 50" (~127 cm) to allow planter to be rotated to transport position.

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 “Cylinder Information” on page 2-15 , “Granular chemical field check” on page 2-37

❒ Check planter for front to rear and lateral level operation. See “Level Planter” on page 2-14

❒ 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 Adjustments” on page 2-28, “Row Marker Speed Adjustment” on page 2-26.

❒ Check for proper application rates and placement of granular chemicals on **all** rows. See “Granular Chemical Application Field Check” on page 2-37.

❒ Check for desired depth placement and seed population on **all** rows. See “Check Seed Population” on page 2-35.

❒ Check for proper application rates of fertilizer on **all** rows. See “Dry Fertilizer Application Rates Approximate Rate in KG Per hectare” on page 5-18

Reinspect machine after field testing.

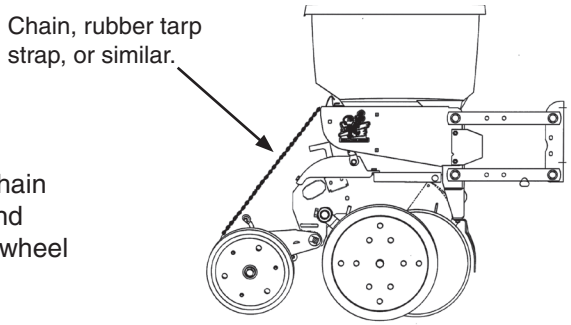
❒ Hoses And Fittings

❒ Bolts And Nuts

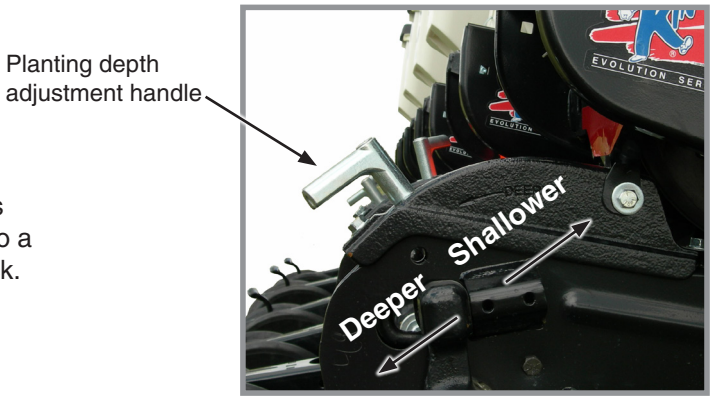
❒ Cotter Pins And Spring Pins

❒ 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.



Planting depth adjustment

2. Plant a short distance and check to see if seed is visible in the seed trench. Adjust planting depth to a shallower setting if seed is not visible and recheck.

3. Measure 1/1000 of a hectare. See chart for correct distance for row width being planted. For example, if planting 70 cm rows 1/1000 of a hectare would be 14,28 m.

1/1000 Hectare Seed Population Count Row Width/Distance		
Row Width	35 cm	70 cm
Distance	28,56 m	14,28 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 1/1000 of a hectare by 1000. This gives total population.

EXAMPLE: 70 cm row spacing 14,28 m equals 1/1000 hectare.

26 seeds counted x 1000 = 26000 seeds per hectare

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 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 "Seed Meter (Finger Pickup) Troubleshooting" on page 7-5 and "Seed Meter (Brush-Type) Troubleshooting" on page 7-4.

DETERMING KILOGRAMS PER HECTARE (BRUSH-TYPE METER)

Seeds per hectare ÷ Seeds per kilogram (from label) = Kilograms per hectare

If seeds per kilogram information is not available use the following averages:
5700 seeds per kilogram for medium size soybeans
33000 seeds per kilogram for medium size milo/grain sorghum
9900 seeds per kilogram for medium size cotton

DETERMING LITERS PER HECTARE

kilograms per hectare ÷ Seed unit weight = Liters per hecture

Average Unit Weight of:
Soybeans unit weight = 0,773 kg/l
Milo/Grain Sorghum unit weight = 0,757 kg/l
Cotton unit weight = 0,412 kg/l

If seed population check shows planting rate is significantly different than seed rate chart shows or if a particular meter is not planting accurately, see "Seed Meter (Brush-Type) Troubleshooting" on page 7-4 and "Brush-Type Seed Meter Maintenance" on page 6-14.

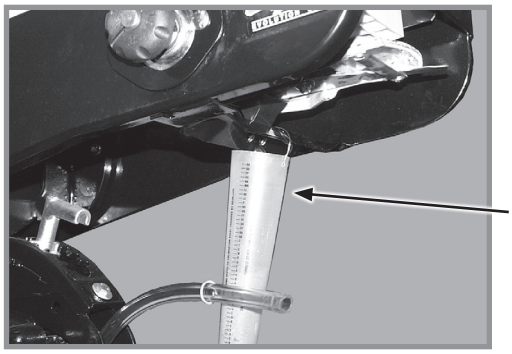
GRANULAR CHEMICAL APPLICATION FIELD CHECK

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 (~400 meters) at planting speed.

4. Weigh chemical in grams caught in one vial.

5. Multiply that amount by factor shown to determine kilograms per hectare.

Kg per hectare	
Row Width	**Factor**
70 cm	0,0301
35 cm	0,0150

EXAMPLE: You are planting 70 cm rows. You have planted for 400 meters at the desired planting speed. You caught 337 grams of chemical in one vial. 337 grams times 0,0301 equals 10,144 kilograms per hectare.

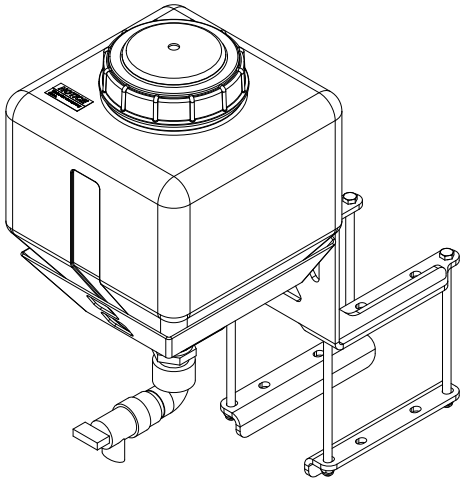
NOTE: Check calibration of all rows.

METERING GATE

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

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.

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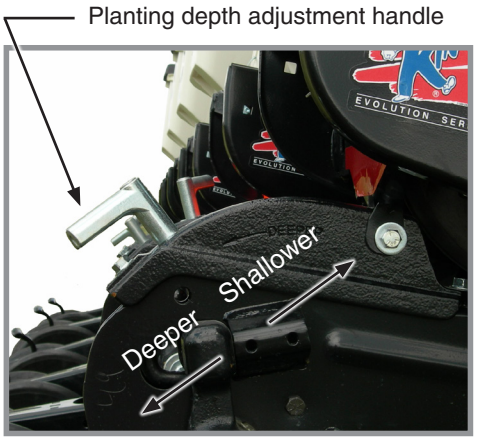
PLANTING DEPTH

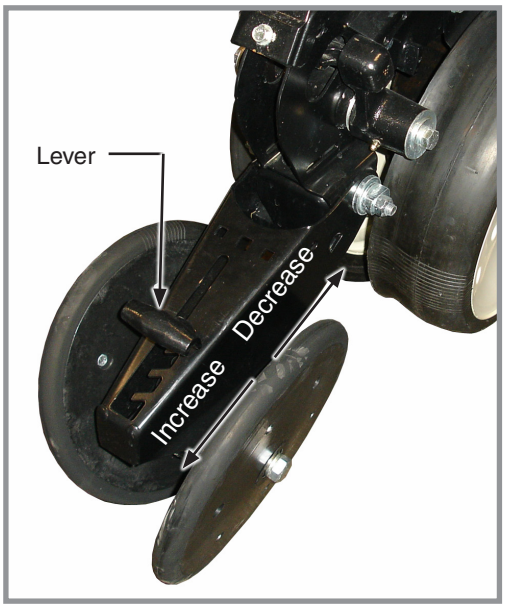
Planting depth is maintained by adjustable row unit gauge wheels. Depth adjustment range is approximately ½" to 3½" (~1,2 to 8,8 cm).

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.

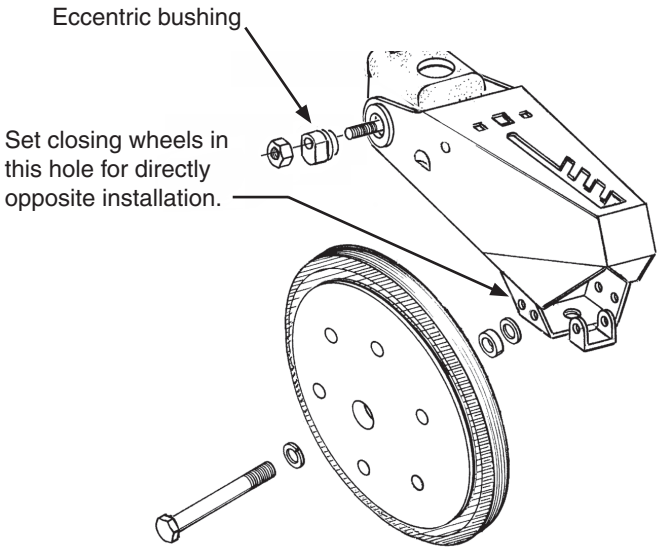


Planting depth adjustment

"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 ¾" wrench to loosen hardware attaching closing wheel arm to wheel arm stop. Use another ¾" 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.

SEED HOPPERS

Mechanical seed hopper has a capacity of 1.9 bushels (~69 liters).

Vacuum seed hopper has a capacity of 1.75 bushels (~64 liters).

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”, “Brush-Type Seed Meter”, or “Vacuum Seed Meter”.

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

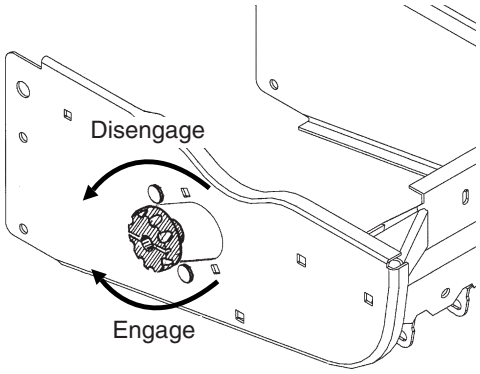
Disengage meter drive and hopper latch and lift hopper off hopper support. See “Seed Meter Drive Release”.

Mechanical 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 ¼ turn counterclockwise to disengage or ¼ turn clockwise to engage.

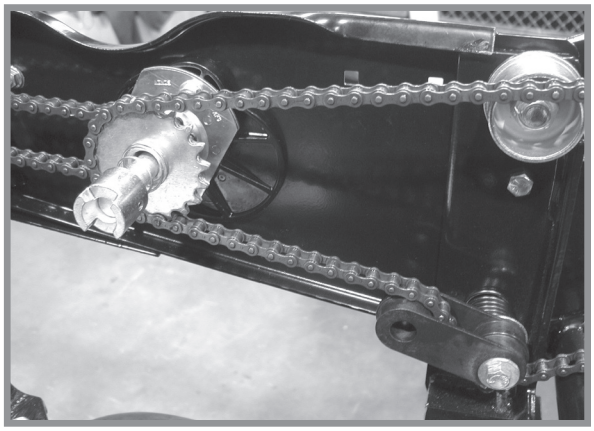


Seed meter drive release

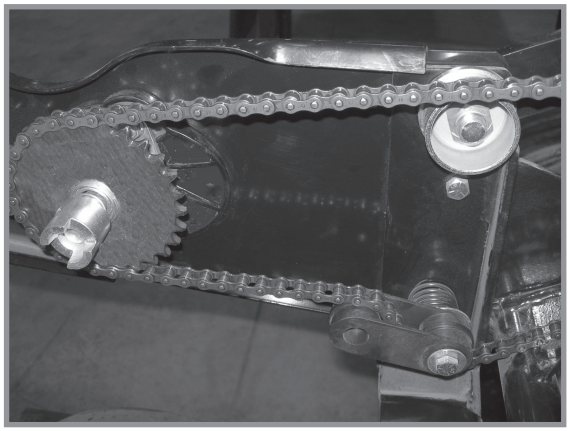
ROW UNIT CHAIN ROUTING

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

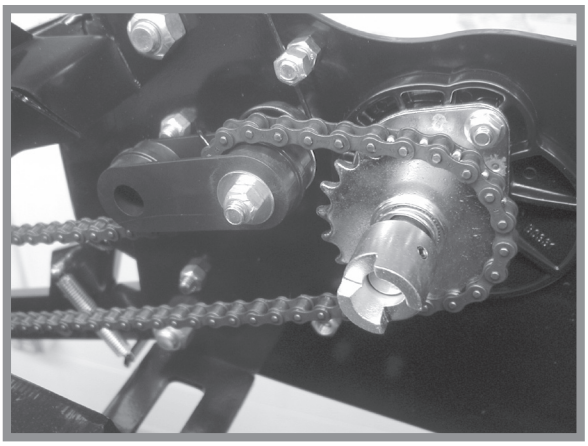
Inspect and replace weak, worn or broken springs, idlers, and idler bushings.



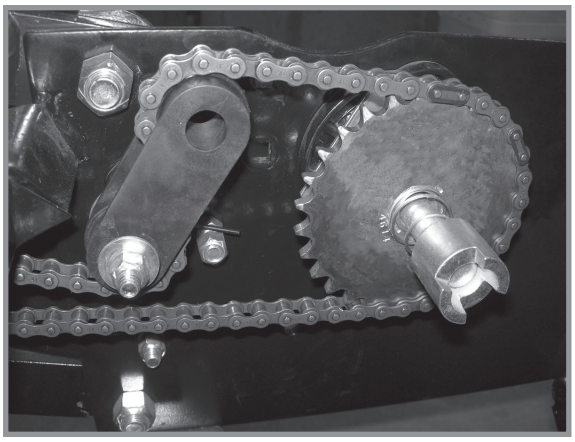
Mechanical pull row unit meter drive



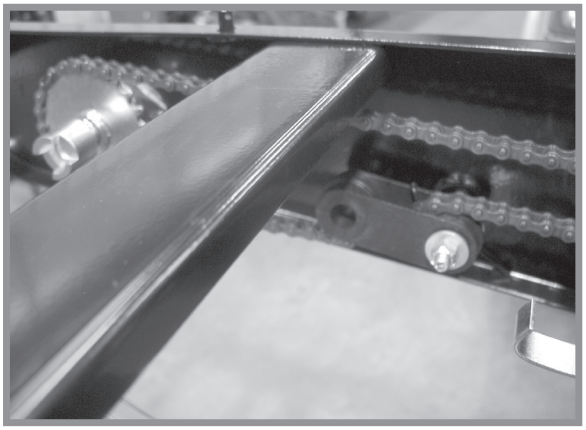
Vacuum pull row unit meter drive



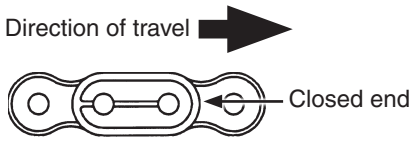
Mechanical push row unit meter drive



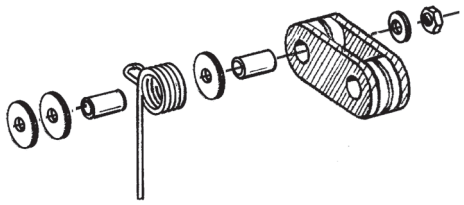
Vacuum push row unit meter drive



Row unit granular chemical drive



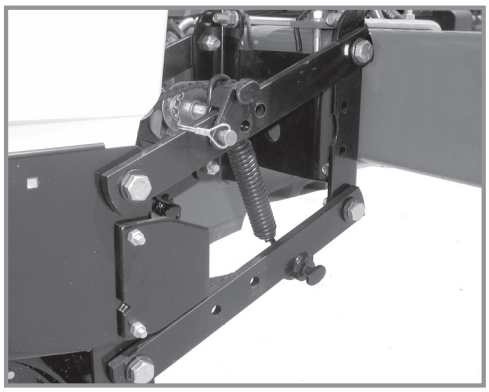
NOTE: Install connector link with closed end facing direction of travel.



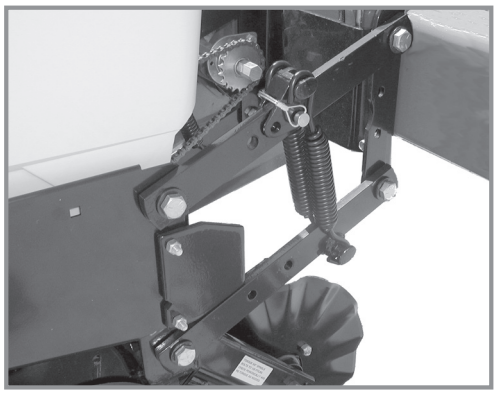
NOTE: Reverse idler when worn on one side for extended use.

QUICK ADJUSTABLE DOWN FORCE SPRINGS OPTION (STANDARD OR HEAVY DUTY)

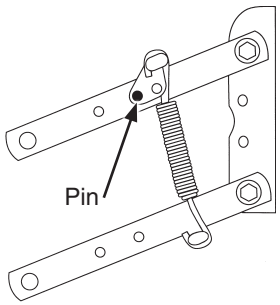
Standard and heavy duty quick adjustable down force springs are available in increase penetration in hard soil and keep row unit from bouncing in rough field conditions. Two springs per row, one on each side parallel arms, are used unless equipped with row unit mounted no till coulters. Row unit mounted no till coulters require four springs per row.



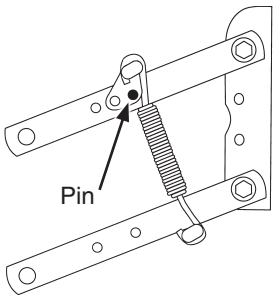
Two Springs Per Row (Dual)



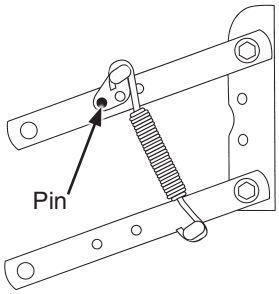
Four Springs Per Row (Quad)



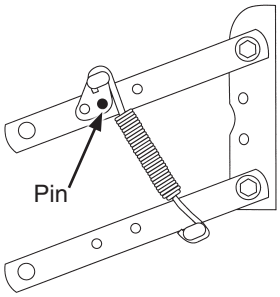
Position 1 (Least)



Position 2



Position 3



Position 4 (Most)

There are four positions to set down pressure spring tension.

Standard and Heavy Duty Spring Down Force Pressure*		
	2 Springs	4 Springs
Position	Heavy Duty D21337	Heavy Duty D21337
1	43 lb (~20 kg)	80 lb (~36kg)
2	86 lb (~39 kg)	144 lb (~65 kg)
3	167 lb (~76 kg)	307 lb (~139 kg)
4	249 lb (~113 kg)	470 lb (~213 kg)
*Pressure does not include weight of row unit, seed, or options.		

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.

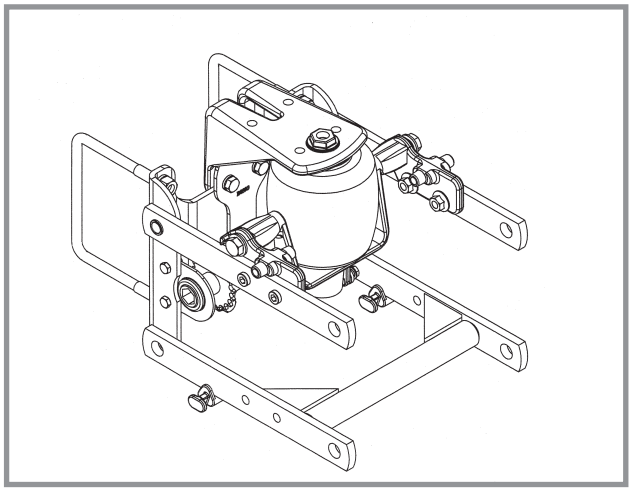
NOTE: Adjust springs for field conditions. Too much down pressure in hard field conditions can cause row units to lift planter and keep drive wheels from making contact. Too much down pressure in soft field conditions can cause row unit to run too deep.

PNEMATIC DOWN PRESSURE PACKAGE OPTION

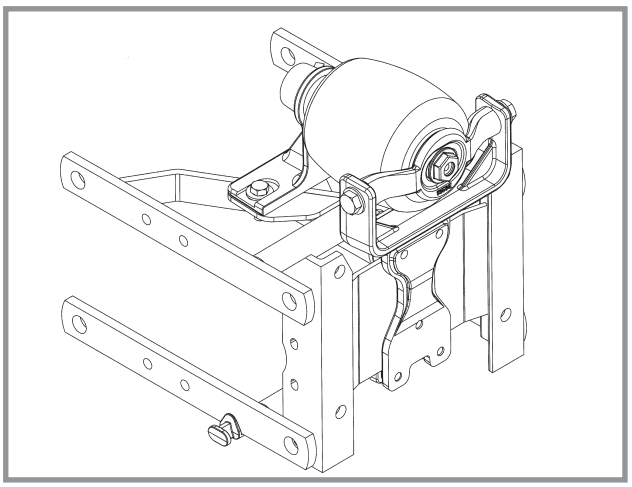
Row unit down pressure can be adjusted on-the-go as field conditions change with pneumatic down pressure option. A cab-mounted control box adjusts pressure. A planter-mounted 12 VDC air compressor with 3 gallon (~11 liters) capacity air tank supplies air for the down pressure system.

Packages include upper and lower air spring mounting castings for pull row units (front and rear air spring mounting castings for push row units), 150 PSI rated air springs, ⅜" O.D. nylon hoses, dual solenoid air valve and stainless steel, 160 PSI, 2" liquid-filled gauge and planter wiring harness.

Pneumatic down pressure row unit extension brackets are required in some applications.

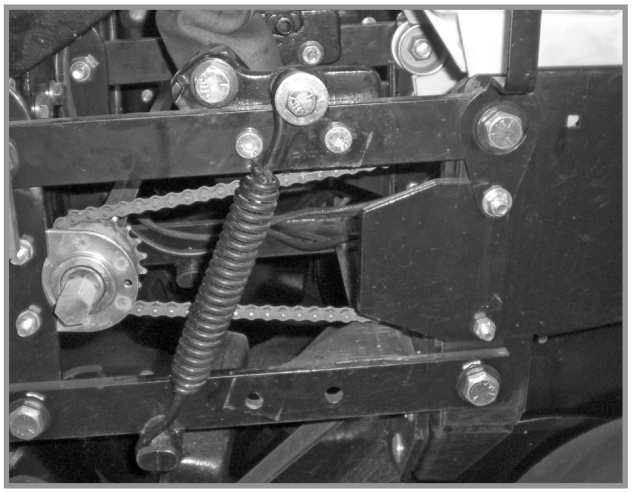


Pull Row Unit Air Spring

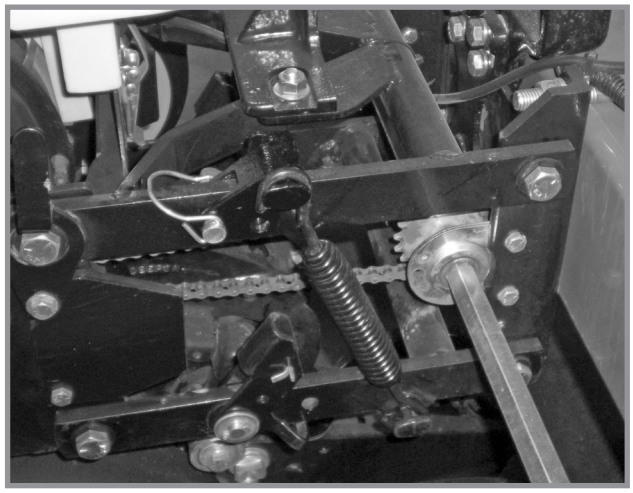


Push Row Unit Air Spring

NOTE: If additional down pressure is needed with the Pneumatic Down Pressure Package, assist springs are available through your Kinze dealer. One spring is installed on the outer side of the parallel arms on each side of the row unit as shown below.



Pull Row Unit Assist Springs

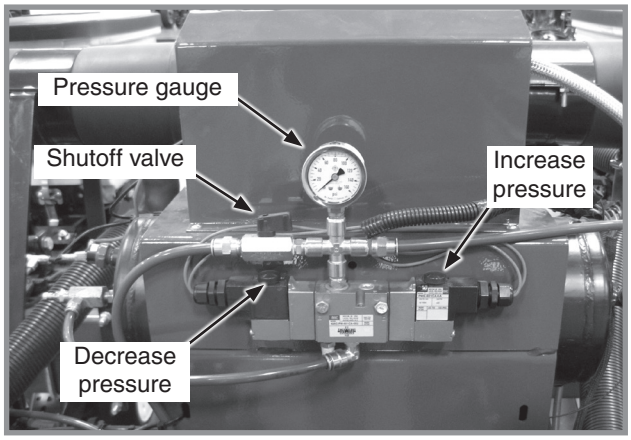


Push Row Unit Assist Springs

FIELD OPERATION

NOTE: Adjust down pressure with planter lowered and row openers in ground for most accurate adjustment. Pressure can be adjusted from tractor using control console, or at planter using manual control valves on compressor assembly.

Control console



Air compressor assembly controls

ADJUST DOWN PRESSURE FROM CAB

Push toggle switch left to increase or right to decrease pressure.

ADJUST DOWN PRESSURE AT PLANTER

Push and hold decrease or increase button on compressor assembly to decrease or increase pressure.

NOTE: Value on the air pressure gauge is NOT down pressure force. Multiply air pressure (PSI) by four (4) to calculate down pressure.

LOCK UP PUSH ROW UNITS EQUIPPED WITH PNEUMATIC DOWN PRESSURE SPRINGS

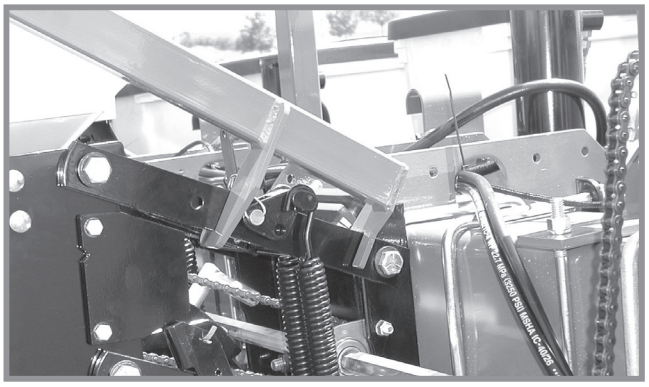
1. Press and hold button on solenoid until pressure gauge reads 5 PSI.
2. Lock up units. See “Split Row Push Unit Lockups” on page 6-3 for instructions.
3. Turn shutoff valve handle perpendicular to valve body to turn off push row unit air supply.

SPLIT ROW PUSH ROW UNIT LOCKUPS

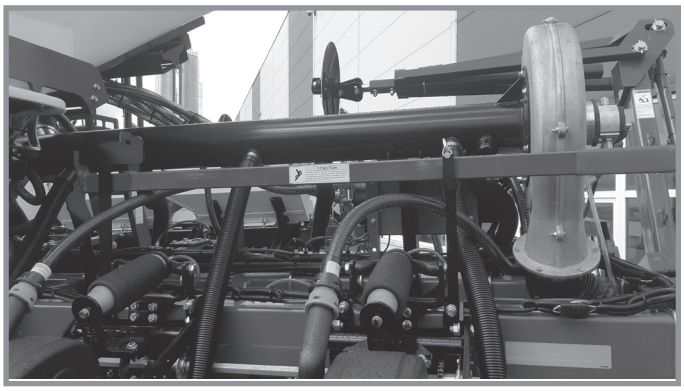
Push row unit lockups lock Split Row row units in the raised position.

⚠ CAUTION

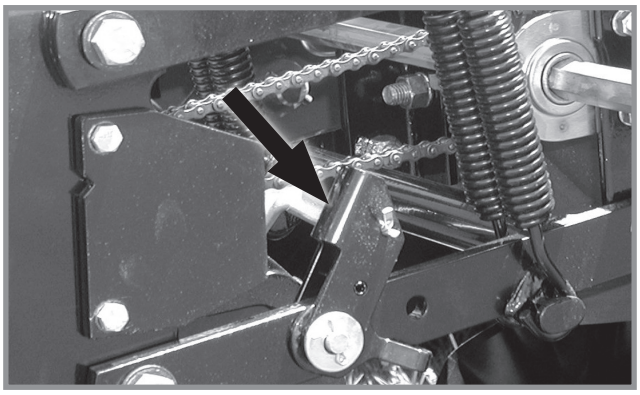
Improper lifting of row units can cause serious injury. An empty row unit requires minimum 90 lb (~41 kg) lift. Set down pressure springs to minimum, lower planter to ground, and empty seed hopper before attempting to lift with this lever.



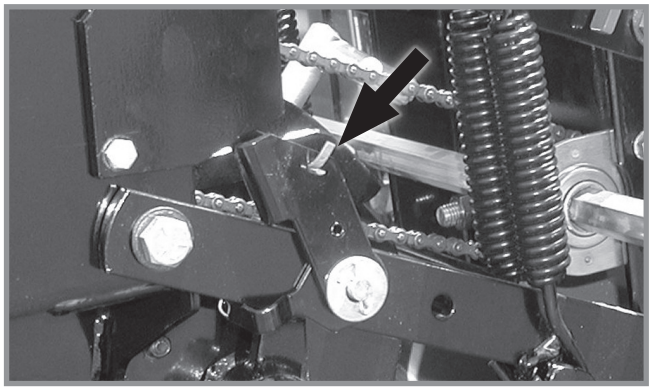
Lift lever positioned on push row unit



Lift lever in storage location



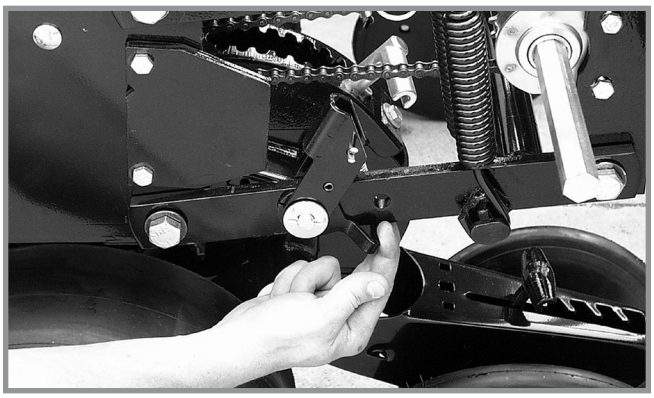
Lockup released for field operation



Push row unit locked in raised position

To lock in raised position:

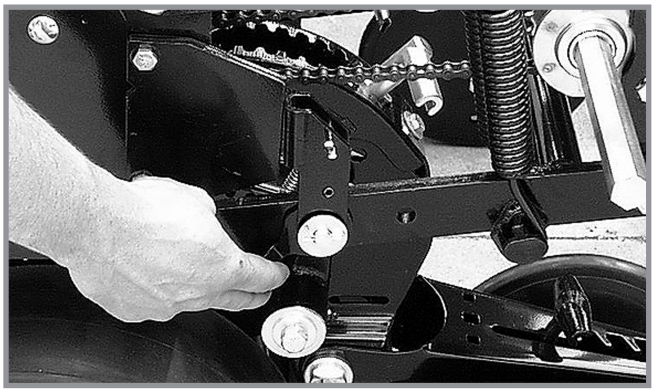
1. Set row unit down pressure springs to minimum setting.
2. Lower the planter to the planting position.
3. Empty seed hoppers.
4. On each push row unit lockup, flip the spring tab forward.



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.



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.

SPLIT ROW PUSH ROW UNIT CLUTCH SPROCKET

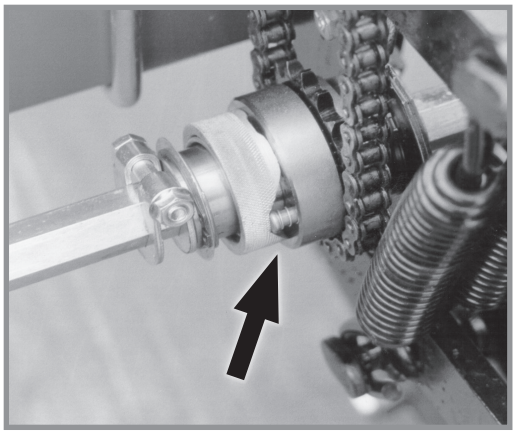
Push row unit clutch sprocket disengages Split Row drive from push row unit drill shaft when only pull row units are used.

DISENGAGE

Rotate knurled collar ¼ turn. Rock drill shaft slightly using a ⅞" wrench to take pressure off of spring loaded pins in clutch to allow pins to “pop” out, disengaging drive.

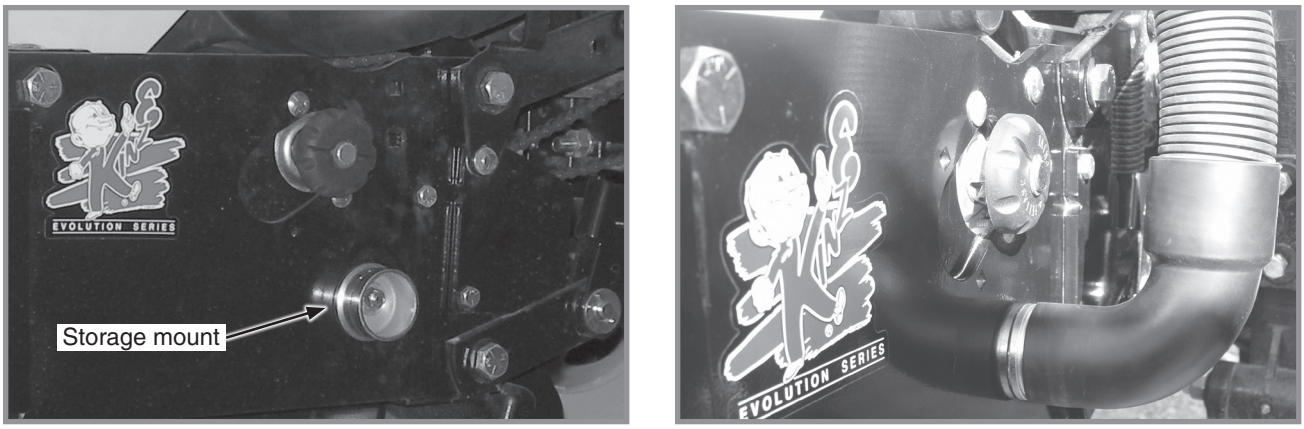
ENGAGE

Rotate knurled collar ¼ turn and turn drill shaft with a ⅞" wrench until drive pins engage drive sprocket.



Split Row clutch sprocket

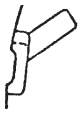
SPLIT ROW PUSH ROW UNIT VACUUM HOSE SHUTOFF



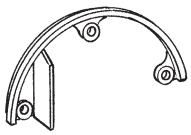
Split Row vacuum hose shutoff

When push row units are not used, move row unit end of 2" (~5 cm) vacuum hose on each push row unit to storage mount located on side of shank.

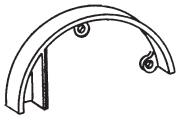
BRUSH-TYPE SEED METER

	Crop	Disc Color-Code (Disc Part No.)	Upper Brush Retainer	Cells	Seed Size Range	*Lubricant
	Soybean	Black (GA5794)	GD11122	60	4840 to 8800 seeds/kg	**Graphite** Talc
	Specialty Soybean	Dark Blue (GA6184)	GD11122	48	3080 to 4840 seeds/kg	**Graphite** Talc
	Small Milo/Grain Sorghum	Red (GA5982)	GD8237	30	30800 to 44000 seeds/kg	Talc
	Large Milo Grain Sorghum	Light Blue (GA6187)	GD8237	30	22000 to 35200 seeds/kg	Talc
	High-Rate Small Milo/Grain Sorghum	Red (GA5795)	GD8237	60	26400 to 39600 seeds/kg	Talc
	High-Rate Large Milo/Grain Sorghum	Yellow (GA6633)	GD8237	60	22000 to 30800 seeds/kg	Talc
	Cotton, Acid-Delinted	White (GA5796)	GD11122	30	9240 to 11440 seeds/kg	Talc
	Large Cotton, Acid Delinted	Tan (GA6168)	GD11122	36	8360 to 9680 seeds/kg	Talc
	High-Rate Cotton, Acid-Delinted	Light Green (GA6478)	GD11122	48	9240 to 11440 seeds/kg	Talc
	Hill-Drop Cotton, Acid-Delinted	Brown (GA6182)	GD11122	12 (3 to 6 seeds/ cell)	8800 to 11400 seeds/kg	Talc
	Small Hill-Drop Cotton, Acid-Delinted	Dark Green (GA7255)	GD11122	12 (3 to 6 seeds/ cell)	11000 to 13640 seeds/kg	Talc

***For More information on application rate see** "Additives" on page 3-16.



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



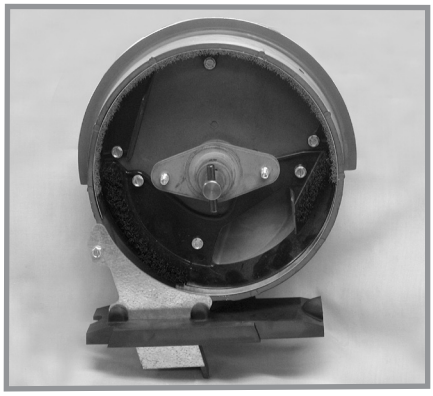
Use GD8237 upper brush retainer when using milo/grain sorghum discs.

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 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.



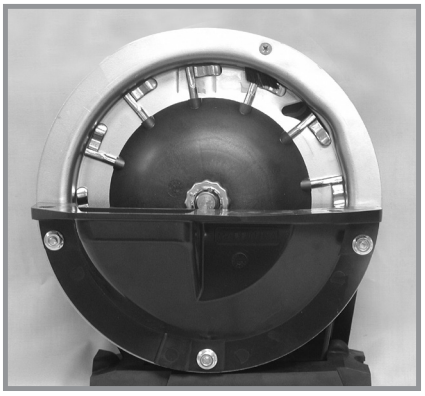
Shown without seed disc installed

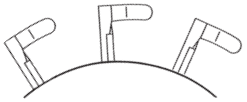
NOTICE

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

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.

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.		

VACUUM SETTINGS

Crop		**Seed Disc Kit	Seed Disc Part No.	Ejector Wheel (Color)	Cells	Seed Size Range	Singulator Zone Setting	Vacuum Setting Inches of Water (cm)	Lubricant
	Corn ‡ Large Sweet Corn	G10276X	B1219 (Light Blue)	1 row 5 punches (Light Blue)	40	2500-5000 seeds/kg	2	18-20 (46-51)	**Graphite* Talc***
	Soybean	G10277X	B1232 (Black)	2 rows 6 punches (Black)	120	4850-8820 seeds/kg	0	10-14 (25-36)	**Graphite* Talc***
	Sugar Beet	G10279X	B1229 (Dark Orange)	1 row 6 punches (Dark Orange)	60	Pelletized	2	15 (38)	**Graphite***
	Milo	G10279X	B1229 (Dark Orange)	1 row 6 punches (Dark Orange)	60	22000-44000 seeds/kg	2	15 (38)	**Graphite* Talc***
	Sunflower ‡ Small Sweet Corn	G10278X	B1230 (Gray)	1 row 5 punches (Gray)	40	Oil seeds #2, 3, 4	2	12-18 (30-46)	**Graphite* Talc***
	Sunflower	G10278X	B1230 (Gray)	1 row 5 punches (Gray)	40	Oil seeds #5	2	5-8 (13-20)	**Graphite* Talc***
	Specialty Disc 1	G10280X	B1233 (Green)	1 row 6 punches (Green)	60	Cotton	2	15-20 (38-51)	**Graphite* Talc as needed***
	Specialty Disc 2	G10281X	B1235 (Brown)	1 row 6 punches (Green)	60	Black turtle & navy edible beans	2	15-20 (38-51)	**Graphite* Talc as needed***
	Specialty Disc 3	G10282X	B1234 (Dark Blue)	1 row 6 punches (Green)	60	Pinto & Great Northern edible beans & low-rate soybean	2	15-20 (38-51)	**Graphite* Talc as needed***

Install selected seed disc. Position vacuum cover on meter by aligning keyhole slots over bolt heads. Push cover on meter and turn counter clockwise to lock in place.

***For More information on application rate see** "Additives" on page 3-16.
****Includes seed disc, ejector wheel, and spring.**
‡ With conventional hoppers only. Not applicable with bulk fill.

VACUUM SETTINGS

Crop		**Seed Disc Kit	Seed Disc Part No.	Ejector Wheel (Color)	Cells	Seed Size Range	Singulator Zone Setting	Vacuum Setting Inches of Water (cm)	Lubricant
	Wheat disc	G10274X	B1239 (Purple)	Brush type	54	N/A Volumetric	0	6-16 (15-41)	**Graphite* Talc***
	Rapeseed disc	G10283X	B1239 (Dark Gray)	1 row 10 punches (Dark Gray)	83	See Rapeseed Planting Section	0	"Rapeseed Planting Section" on page 3-18	**Graphite* Talc***

Install selected seed disc. Position vacuum cover on meter by aligning keyhole slots over bolt heads. Push cover on meter and turn counter clockwise to lock in place.

***For More information on application rate see** "Additives" on page 3-16.

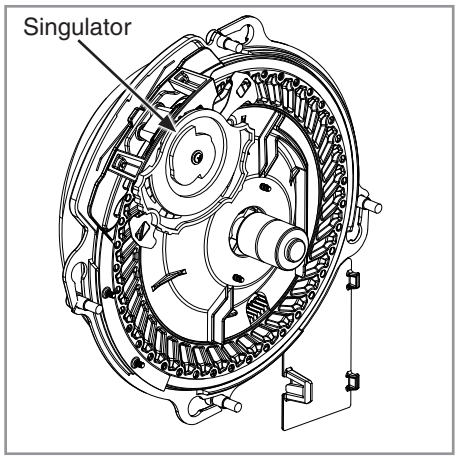
NOTE: See "Check Seed Population" on page 2-35 for more information. Always field check seed population to ensure planting rates are correct.

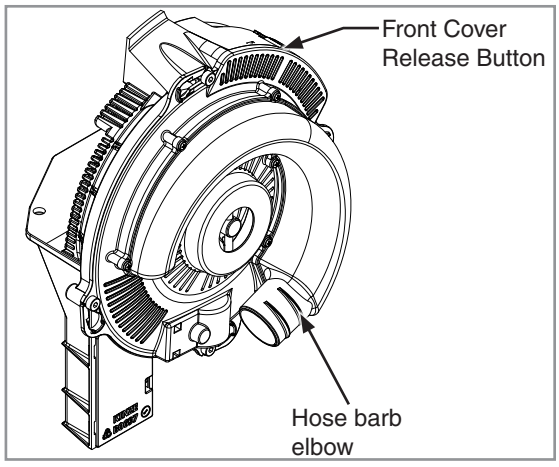
NOTE: Singulator settings are marked from 0 - 3.

NOTE: Mixing seed sizes and shapes affects meter performance. Use consistent seed size and shape.

NOTE: Use 1 tablespoon powdered graphite with each standard hopper fill of seed. Seed treatment, foreign material, dirt or seed chaff may cause gradual reduction of seed disc fill (population). See " "Additives" on page 3-16.

NOTE: Excessive seed treatment, humidity, and light-weight seed can affect meter performance. Use ½ cup (~118 ml) of talc with each standard hopper fill of seed and mix thoroughly to coat all seeds and adjust rates as needed. Use of talc aids seed flow into meter, singulation, and disc seed drop.

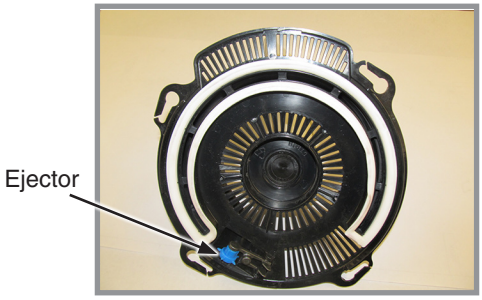




NOTE: Foreign material in seed disc orifices, such as seed chips, hulls, stems, etc., may affect seed delivery. Clean seed ensures accurate seed metering from vacuum seed meter. Remove Seed discs daily to check for buildup of foreign material in seed disc orifices.

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

See "Vacuum Seed Meter Maintenance" on page 6-16 and "Preparing Planter for Storage" on page 6-30 in Lubrication and Maintenance section for more information.



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

Wheel-Type Ejectors

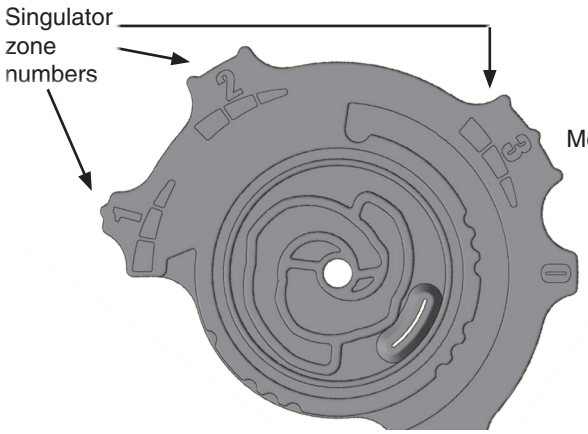
Wheel-type ejectors expel seed remants from seed disc orifices. These ejectors are disc specific and colored coded to match disc.

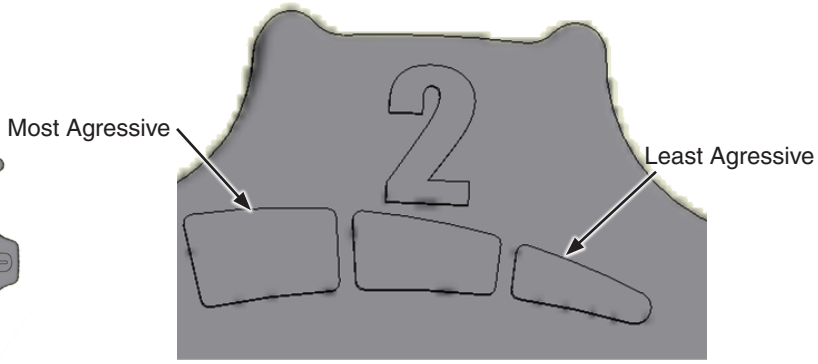
NOTICE

Replace hopper or tank lids after filling to prevent accumulation of dust or dirt in seed meter resulting in premature wear.

NOTE: Seed size, seed shape, seed treatments, travel speed, and planting rate affect meter performance.

1. Select seed disc and ejector to match crop and population.





Singulator Adjustment Wheel

2. Adjust singulator wheel to initial setting. Seed size, seed shape, seed treatments, travel speed and planting rate all affect meter performance.

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

4. Adjust vacuum level to initial setting according to tables on page.

NOTE: Vacuum reading will be much lower when seed disc cells are empty. Load all seed cells before setting vacuum level.

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

5. Adjust vacuum level to initial setting according to tables on page.

NOTE: Vacuum reading will be much lower when seed disc cells are empty. Load all seed cells before setting vacuum level.

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

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. Lay hopper on its right side. Push release button and rotate seed meter vacuum cover clockwise to align keyhole slots with bolt heads. Lift off cover.

4. Rotate seed disc hub clockwise to unlock and remove seed disc.

5. Empty meter.

6. Thoroughly inspect meter to ensure all seed is removed.

7. Replace seed disc. Install vacuum cover.

ADDITIVES

Lubricant Application Rate	
Graphite	
Conventional Hoppers	1 Tbs. (~15 ml)/Hopper Fill
Bulk Fill Hoppers	1 Pound (~0,5 kg) Bottle/Hopper
Talc	
Conventional Hoppers	¼" C. (~59 ml*)
Bulk Fill Hoppers	4 Pounds (~2 kg)/Hopper*
*Double amount of talc for sunflowers.	

The use of graphite is recommended 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.

ASD HOPPERS
Mix 1 pound (~0,5 kg) bottle of powdered graphite each time the bulk seed hopper is filled. Graphite should be added in layers as the bulk seed hoppers are filled. Regular graphite use prolongs life of the seed meter components, improves seed spacing, and may reduce buildup of seed treatments.

Adding graphite to conventional hopper

Adding graphite bulk fill 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.

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 (~59 ml) (conventional); 2 pounds (~1 kg) (bulk fill) of talc and **mix thoroughly**.

2. Finish filling hopper, add another ¼ cup (~59 ml) (conventional); 2 pounds (~1 kg) (bulk fill) 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 innoculants 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.

RAPESEED PLANTING SECTION

DUE TO POTENTIAL SEED LOSS THROUGH THE AIR DISSIPATOR SCREEN, RAPESEED PLANTING WITH BULK FILL EQUIPPED PLANTERS IS NOT RECOMMENED BY KINZE.

MONITOR SETTINGS

KPM III	
Meter Type:	Vacuum
Meter Sprocket:	28 Tooth
Crop Type:	Other Small Seed
Seeds Per Rev:	83
Seed Size:	1
Interplant:	Enable

See KPM III Electronic Seed Monitor Operator Manual for more details.

NOTE Set sensitivity value to 1 for Ag Leader InCommand and Integra monitors. See Monitor Operator manual for more information.

NOTE: Because of small seed size and high seeding populations, it is possible in certain planting conditions that not all seeds will be detected by the row unit seed sensor. So it is possible KPM III and Ag Leader InCommand or Integra monitors might not show correct seeding accuracy. Monitor planting accuarcy alarm may be required to be adjusted to lower accuracy (or muted) due to false accuracy alarms. Frequent field checks are recommended.

VACUUM SETTINGS

Due to rapeseed size and weight variations planting settings may vary. Testing with a Kinze T4000 test stand is recommended to verify vacuum level setting and to achieve best planting accuracy. See your Kinze dealer for testing.

Set desired vacuum to value found during testing (recommended) or use preliminary values provided in chart below.

If testing is unavailable measure 20 - 50 seed samples and find average seed diameter (largest - width/length/height seed dimension).

Target Speed (km/h)	Target Population	Target Vacum (inches (cm) of water)		
		Small Seed Diameter Range: 1,2 - 2,0 mm (Average: 1,6 mm)	Medium Seed Diameter Range: 1,5-2,5 mm (Average: 2,0 mm)	Large Seed Diameter Range: 1,6-3,1 mm (Average: 2,6 mm)
8	350000	4 (10)	4 (10)	6 (15)
8	500000	4 (10)	6 (15)	8 (20)
8	650000	4 (10)	8 (20)	12 (30)
8	800000	4 (10)	12 (30)	16 (40)
10	350000	4 (10)	6 (15)	8 (20)
10	500000	4 (10)	8 (20)	12 (30)
10	650000	4 (10)	10 (25)	14 (35)
10	800000	6 (15)	12 (30)	16 (40)

ADDITIVES

Rapeseed
It is essential to use graphite to neutralize electrostatic rapeseed properties.

Mix rapeseed with Kinze graphite thoroughly in a closed container. Keep mixing until all seed becomes evenly coated. Excessive graphite will stay on the bottom of container. It is recommended to prepare an even amount of seed-graphite mix for each hopper separately. This will help to monitor each row performance while planting.

Use approximately 1Tbs (~15ml) of graphite per 3-4 l of seed.

NOTE: For best performance Kinze brand graphite MUST be used.

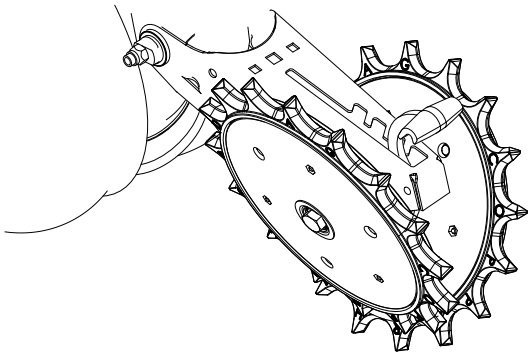
RATE CHARTS

For Rapeseed Rate Charts, See “General Planting Rate Information” on page 5-1 section of this manual.

SPIKED CLOSING WHEEL

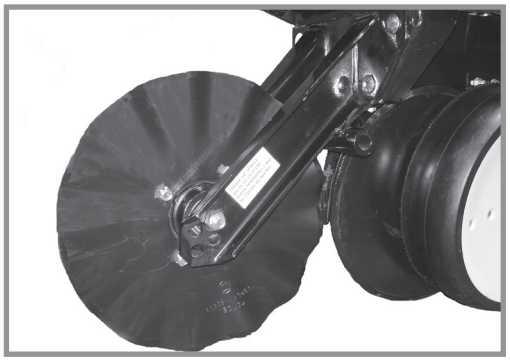
Spiked closing wheels crumble the sidewall, allowing roots to pentrate soil. They can be used on pull row units and push row units.

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



Row unit mounted no till coulters with 1" bubbled, 1" fluted (8 flutes) or ¾" fluted (13 flutes) blades may be used on pull row units and push row units (¾" 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”.

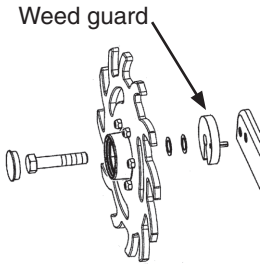
Align coulter blade in relation to row unit double disc openers. Adjust by loosening four attaching bolts, moving coulter arm, and tightening four attaching bolts. Coulter blade can be adjusted to one of four ½" incremental settings in the forked arm. Initial location is the top hole. Move blade as it wears to one of the three lower hole to maintain coulter blade at or slightly above opener discs as needed. Adjust coulter 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 coulter blade and row unit opener blade. Make sure planter is level and coulter is square with planter frame and aligned with row unit disc opener.

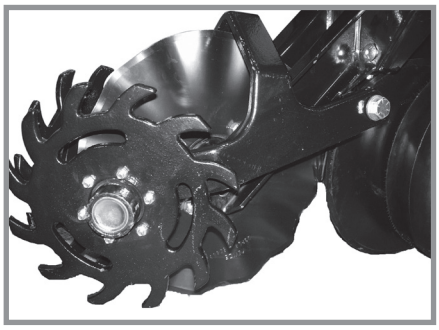
NOTE: Torque ⅝" spindle hardware to 120 ft-lb (~163 Nm).

COULTER MOUNTED RESIDUE WHEELS

Coulter 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 coulter mounted residue wheels.



NOTE: Opening in weed guard must face down.



Residue wheels attach to row unit mounted coulter 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 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.

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 (~0,04 m^3) 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.

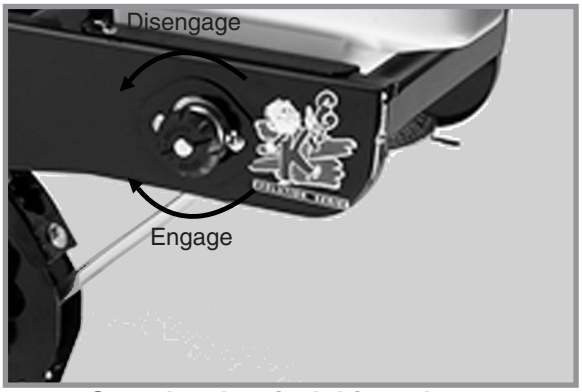
A metering gate on bottom of hopper regulates the application rate. See “Dry Insecticide and Dry Herbicide Application Rate Charts” in this manual. Calibrate using chemical manufacturers’ instructions.

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.

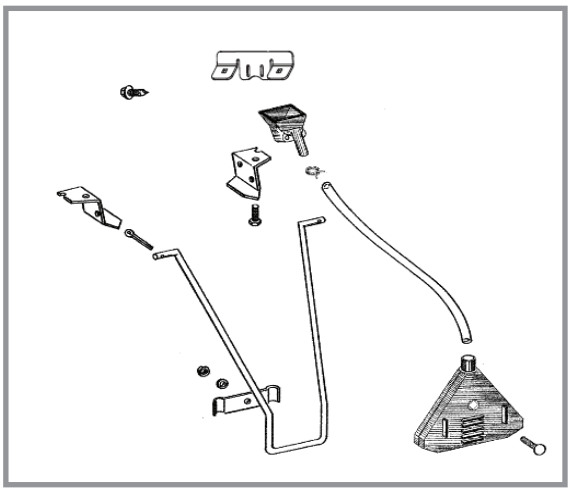


Granular chemical drive release

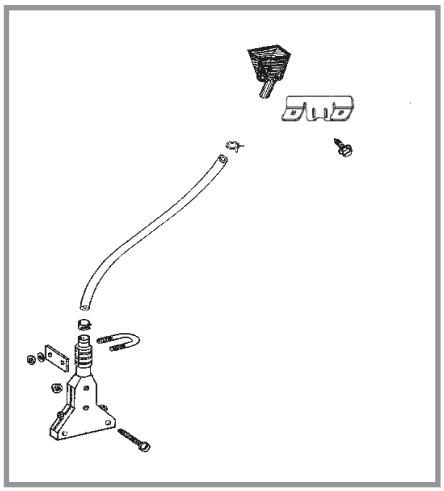
GRANULAR CHEMICAL BANDING OPTIONS

Granular chemical banding options allow 4½" (~12 cm) slope-compensating banding, straight drop in-furrow placement or 14" (~36 cm) rear banding.

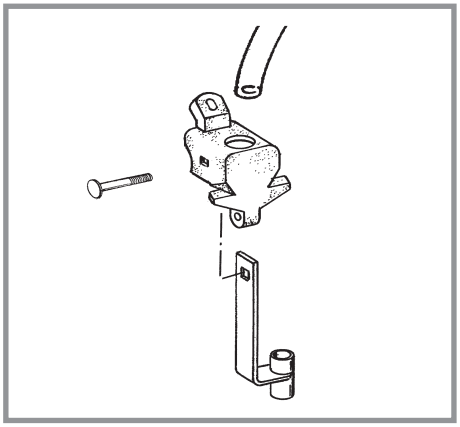
NOTE: Granular chemical rear bander is not compatible with covering discs/single press wheel option.



14" (~36 cm) Rear Banding



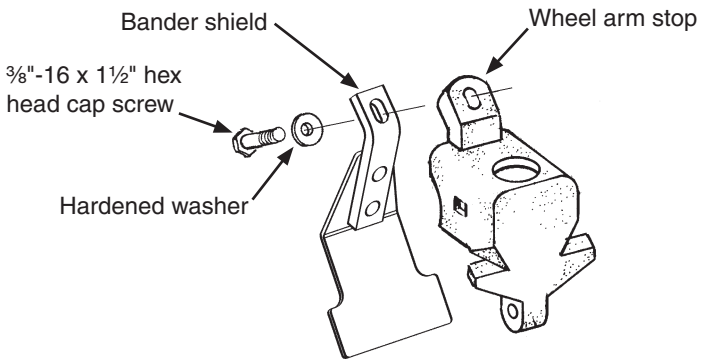
4½" (~11 cm) Slope-Compensating Bander



Straight Drop In-Furrow Placement

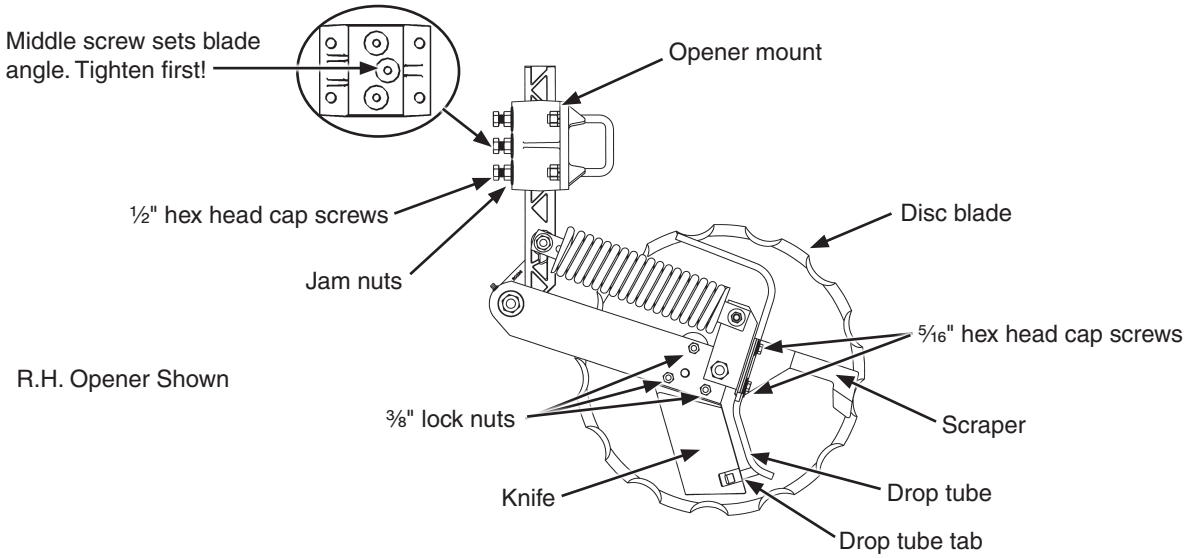
GRANULAR CHEMICAL BANDER SHIELD

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

NOTCHED SINGLE DISC OPENERS



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 ⅜" 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 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 ¼"-⅜" (~6 - 10 mm) from disc blade.

NOTE: Maximum disc blade depth 4" (~10 cm).

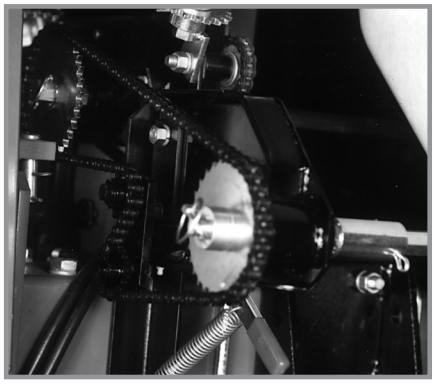
3. Adjust blade depth. Loosen three ½" hex head cap screws and jam nuts in opener mount. Adjust opener assembly up or down to desired blade depth. Tighten center hex head cap screw and jam nut first to set proper disc blade angle. Tighten remaining hex head cap screws and jam nuts. Torque hex head cap screws and jam nuts to 57 ft-lb (~77 Nm). Check fertilizer hose clearance and adjust as necessary.

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 ¼" (~0,6 cm) 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.

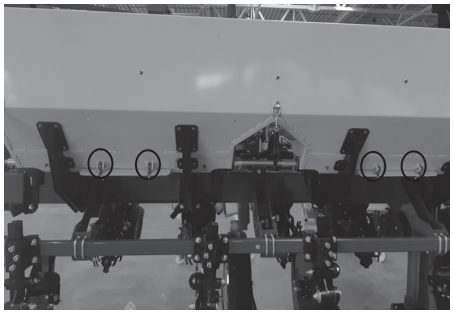
NOTICE

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.

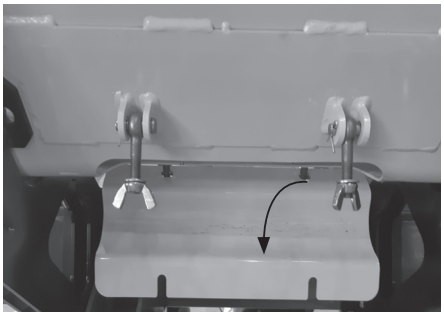
Because dry fertilizer attachment meters granules by volume rather than weight, differences in brands, and fertilizer analysis, weight metered during actual application may vary considerably. Use chart for reference only. Use a container to catch and measure application for a better estimate.

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.

CLEANING



Unbolt screws under the Fertilizer hopper

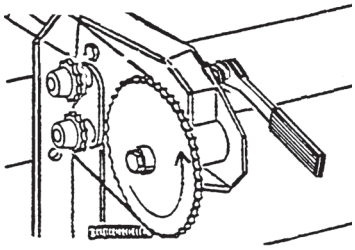


Open the Fertilizer cleaning doors

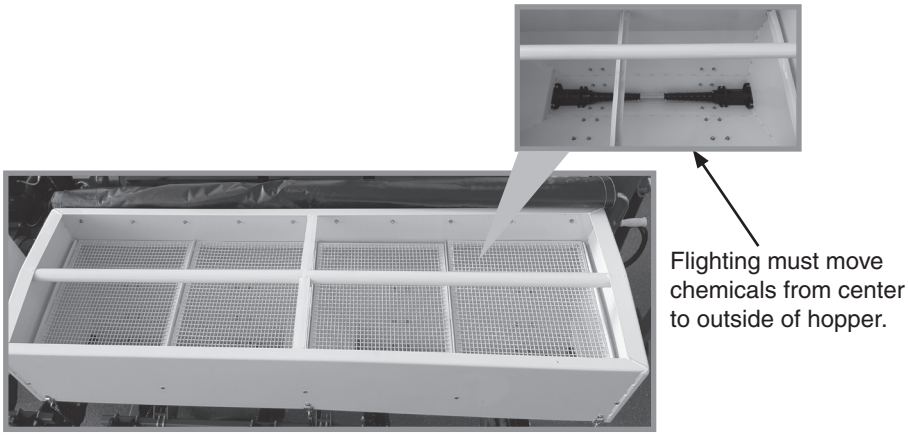
Cleanout Chute installed

Dry fertilizer hoppers are easy to clean. Unbolt screws under the hoppers and open Fertilizer cleaning doors. Use cleanout chute.

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 ¼" 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



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 and Maintenance" on page 6-1 Be certain augers turn freely. If not, loosen 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

Check valve

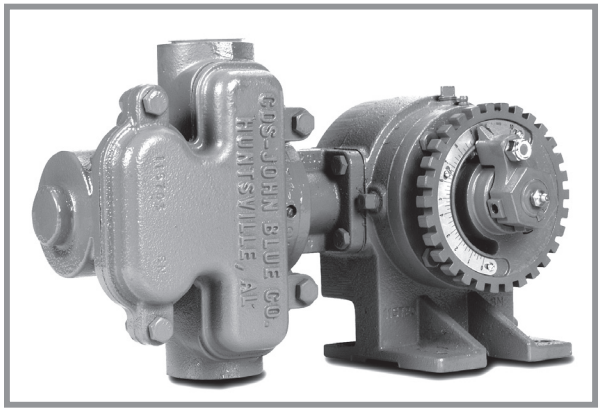
NOTE: Optional low rate check valves are available for in-line installation between liquid fertilizer squeeze or piston pump and openers to ensure equal distribution of product at low rates. Check valves also eliminate anti-siphon loops.

NOTICE

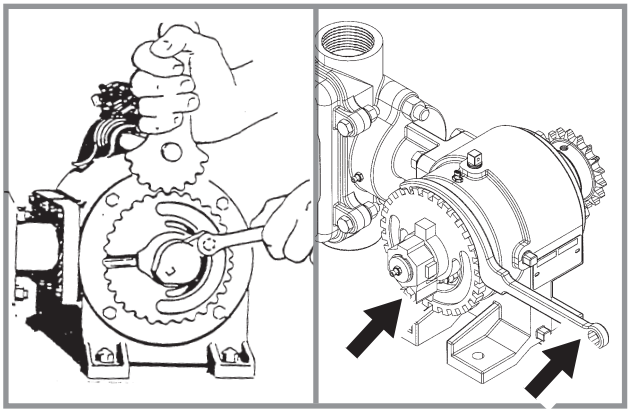
Placing fertilizer too close to seeds or in excessive amounts can cause germination or seedling damage. Check with your fertilizer dealer or manufacturer for correct amount and placement.

OPTIONAL 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 see "Liquid Fertilizer Piston Pump Application Rates liters Per hectare" on page 5-19 **Delivery varies with temperature and fertilizer.**

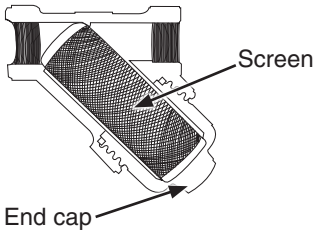
Loosen ⅜" lock nut that secures arm with pointer and rotate scale flange with adjustment wrench until pointer is over desired scale setting. Tighten ⅜" lock nut. DO NOT OVERTIGHTEN.

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" on page 6-30.



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GENERAL PLANTING RATE INFORMATION

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.

NOTE: Speeds above 6.0 MPH (~10 km/h) can adversely affect seed spacing.

MECHANICAL

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 hectare as well as seed spacing in centimeters rounded to the nearest tenth of an centimeter. Because of the large range in seed size, kilograms per hectare is not a suggested method of selecting transmission settings. Smaller size seed pounds per hectare may be below what was expected and large seed kilograms per hectare may appear above expectations. To determine kilograms per hectare, use the formula given in "Determing Kilograms Per Hectare (Brush-Type Meter)" on page 2-36.

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

Continue on the next page.

Standard Rate (1 To 1) 17 Tooth Drive Sprocket
When planting 70 cm rows with brush-type seed meters using 17 tooth standard rate (1 to 1) sprocket, use charts on page 5-4, 5-6, and 5-7. When planting 35 cm rows using 17 tooth sprocket, use chart on page 5-5.

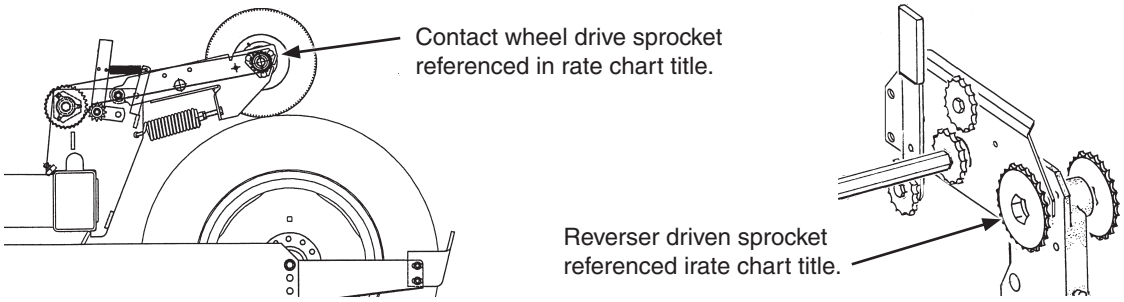
Half Rate (2 To 1) 34 Tooth Drive Sprocket
When using 34 tooth half rate (2 to 1) sprocket with brush-type seed meters, seeding rate is approximately 50% of chart readings. ***Half rate (2 to 1) drive is recommended only when Split row push units are used and desired population falls below that shown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

VACUUM

NOTE: Contact wheel drive sprocket references are located in each chart title.

NOTE: DO NOT USE 44 tooth sprockets (60 cell soybean discs) with dry fertilizer.

NOTE: 15, 19, and 30 tooth drive sprockets are NOT applicable to all rate charts. Check chart titles to ensure proper rate chart is selected. 15 and 19 tooth sprockets requires 116 pitch No. 40 chain and 30 tooth sprocket requires 124 pitch No. 40 chain.



PLANTING RATES FOR FINGER PICKUP SEED METERS (STANDARD DRIVE) APPROXIMATE SEEDS/ HECTARE FOR 70 CM ROW WIDTH

70 cm Rows	Transmission Sprockets Drive	Driven	Recomm. Speed Range (km/h)	Average Seed Spacing In Centimeters
43539	17	28	6 to 10	32,7
45150	17	27	6 to 10	31,7
46888	17	26	6 to 10	30,4
48661	19	28	6 to 10	29,4
48763	17	25	6 to 10	29,2
50463	19	27	6 to 10	28,1
50794	17	24	6 to 10	28,1
52402	19	26	6 to 10	27,1
53002	17	23	6 to 10	26,9
54500	19	25	6 to 10	26,1
56768	19	24	6 to 10	25,1
58904	23	28	6 to 10	24,1
59237	19	23	6 to 10	24,1
61085	23	27	6 to 10	23,3
61465	24	28	6 to 10	23,3
63436	23	26	6 to 10	22,6
63743	24	27	6 to 10	22,3
64025	25	28	6 to 10	22,3
64163	17	19	6 to 10	22,3
65973	23	25	6 to 10	21,5
66194	24	26	6 to 10	21,5
66398	25	27	6 to 10	21,5
66589	26	28	6 to 10	21,3
68722	23	24	6 to 10	20,8
68840	24	25	6 to 10	20,8
68951	25	26	6 to 10	20,8
69053	26	27	6 to 10	20,5
69150	27	28	6 to 10	20,5
71711	23	23	6 to 10	19,8
74366	28	27	6 to 10	19,3
74468	27	26	6 to 10	19,3
74699	25	24	6 to 10	19,0
74828	24	23	6 to 10	19,0
77225	28	26	6 to 10	18,5
77445	27	25	6 to 10	18,5
77946	25	23	6 to 10	18,3
80146	19	17	6 to 10	17,7
80316	28	25	6 to 10	17,7
80673	27	24	6 to 10	17,7
81063	26	23	6 to 10	17,7
83662	28	24	5 to 10	17,0
84181	27	23	5 to 10	17,0
86806	23	19	5 to 9	16,5
87299	28	23	5 to 9	16,5
90580	24	19	5 to 9	15,7
94354	25	19	4 to 8	15,2
97020	23	17	4 to 8	14,7
98128	26	19	4 to 8	14,4
101238	24	17	4 to 8	14,2
101902	27	19	4 to 8	13,9
105456	25	17	5 to 7	13,4
105679	28	19	5 to 7	13,4
109673	26	17	5 to 7	12,9
113891	27	17	5 to 7	12,4
118109	28	17	5 to 7	12,2

NOTE: See "General Planting Rate Information" on page 5-1.

PLANTING RATES FOR BRUSH-TYPE SEED METERS (STANDARD DRIVE) APPROXIMATE SEEDS/ HECTARE FOR 70 CM ROW WIDTH

Transmission Sprockets		60 Cell Soybean Or High-Rate Milo/Grain Sorghum	Average Seed Spacing in Centimeters	48 Cell Specialty Soybean Or High-Rate Acid-Delinted Cotton	Average Seed Spacing in Centimeters	Speed Range (km/h)
Drive	Driven	70 cm Rows		70 cm Rows		
17	28	217521	6,6	174016	8,1	3 to 13
17	27	225579	6,3	180464	7,8	3 to 13
17	26	234255	6,0	187404	7,6	3 to 13
19	28	243112	5,8	194489	7,3	3 to 13
19	27	252116	5,5	201692	7,1	3 to 13
17	24	253774	5,5	203020	7,1	3 to 13
17	23	264808	5,3	211847	6,8	3 to 13
19	25	272285	5,3	217827	6,6	3 to 13
19	24	283631	5,0	226904	6,6	3 to 13
23	28	294293	4,8	235435	6,0	3 to 13
19	23	295962	4,8	236771	6,0	3 to 13
24	28	307090	4,5	245673	5,8	3 to 13
24	27	318462	4,5	254769	5,5	3 to 13
17	19	320559	4,5	256446	5,5	3 to 13
24	26	330711	4,3	264569	5,3	3 to 13
26	28	332681	4,3	266144	5,3	3 to 13
24	25	343940	4,0	275153	5,0	3 to 13
26	27	345002	4,0	276003	5,0	3 to 13
23	23	358272	4,0	286617	5,0	3 to 13
27	26	372050	3,8	297640	4,8	3 to 13
24	23	373848	3,8	299078	4,8	3 to 13
25	23	389424	3,5	311538	4,5	3 to 13
19	17	400420	3,5	320336	4,5	3 to 13
27	24	403054	3,5	322443	4,3	3 to 13
28	24	417982	3,3	334385	4,3	3 to 13
23	19	433695	3,3	346956	4,0	3 to 13
28	23	436154	3,3	348923	4,0	3 to 13
24	19	452553	3,0	362040	4,0	3 to 13
25	19	471408	3,0	377127	3,8	3 to 13
23	17	484718	3,0	387773	3,8	3 to 13
26	19	490266	2,7	392214	3,5	3 to 11
27	19	509121	2,7	407298	3,5	3 to 11
28	19	527979	2,7	422382	3,3	3 to 11
26	17	547944	2,5	438356	3,3	3 to 11
27	17	569019	2,2	455216	3,0	3 to 11
28	17	590092	2,2	472074	3,0	3 to 11

NOTE: See "General Planting Rate Information" on page 5-1.

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/ HECTARE FOR 35 CM ROW WIDTH

Transmission Sprockets		60 Cell Soybean Or High-Rate Milo/ Grain Sorghum	Average Seed Spacing in Centimeters	48 Cell Specialty Soybean Or High-Rate Acid-Delinted Cotton	Average Seed Spacing in Centimeters	Speed Range (km/h)
Drive	Driven	35 cm Rows		35 cm Rows		
17	28	435042	6,6	348031	8,1	3 to 13
17	27	451158	6,3	360927	7,8	3 to 13
17	26	468510	6,0	374807	7,6	3 to 13
19	28	486223	5,8	388977	7,3	3 to 13
19	27	504232	5,5	403384	7,1	3 to 13
17	24	507548	5,5	406040	7,1	3 to 13
17	23	529616	5,3	423694	6,8	3 to 13
19	25	544571	5,3	435654	6,6	3 to 13
19	24	567261	5,0	453808	6,6	3 to 13
23	28	588587	4,8	470870	6,0	3 to 13
19	23	591925	4,8	47354	6,0	3 to 13
24	28	614180	4,5	491346	5,8	3 to 13
24	27	636924	4,5	509537	5,5	3 to 13
17	19	641118	4,5	512892	5,5	3 to 13
24	26	661421	4,3	529137	5,3	3 to 13
26	28	665362	4,3	532287	5,3	3 to 13
24	25	687880	4,0	55031	5,0	3 to 13
26	27	690004	4,0	552005	5,0	3 to 13
23	23	716543	4,0	57323	5,0	3 to 13
27	26	744099	3,8	595279	4,8	3 to 13
24	23	747695	3,8	598155	4,8	3 to 13
25	23	778847	3,5	623077	4,5	3 to 13
19	17	800839	3,5	640671	4,5	3 to 13
27	24	806107	3,5	644886	4,3	3 to 13
28	24	835964	3,3	668770	4,3	3 to 13
23	19	867390	3,3	693912	4,0	3 to 13
28	23	872309	3,3	697847	4,0	3 to 13
24	19	905105	3,0	724080	4,0	3 to 13
25	19	942816	3,0	754254	3,8	3 to 13
23	17	969436	3,0	775547	3,8	3 to 13
26	19	980531	2,7	784427	3,5	3 to 11
27	19	1018242	2,7	814595	3,5	3 to 11
28	19	1055957	2,7	844764	3,3	3 to 11
26	17	1095888	2,5	876711	3,3	3 to 11
27	17	1138038	2,2	910433	3,0	3 to 11
28	17	1180183	2,2	944149	3,0	3 to 11

NOTE: See "General Planting Rate Information" on page 5-1.

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/ HECTARE FOR 70 CM ROW WIDTH

Transmission Sprockets		36 Cell Acid-Delinted Large Cotton	Average Seed Spacing In Centimeters	30 Cell Milo / Grain Sorghum or Acid-Delinted Cotton	Average Seed Spacing in Centimeters	Speed Range (km/h)
Drive	Driven	70 cm Rows		70 cm Rows		
17	28	130513	10,9	108760	13,2	3 to 13
17	27	135348	10,6	112789	12,7	3 to 13
17	26	140552	10,1	117128	12,1	3 to 13
19	28	145866	9,9	121557	11,6	3 to 13
19	27	151268	9,3	126059	11,4	3 to 13
17	24	152266	9,3	126887	11,1	3 to 13
17	23	158886	8,8	132405	10,6	3 to 13
19	25	163372	8,8	136144	10,4	3 to 13
19	24	170177	8,3	141815	10,1	3 to 13
23	28	176577	8,1	147148	9,5	3 to 13
19	23	177577	8,1	147981	9,5	3 to 13
24	28	184253	7,6	153545	9,3	3 to 13
24	27	191078	7,3	159232	8,8	3 to 13
17	19	192336	7,3	160278	8,8	3 to 13
24	26	198426	7,1	165355	8,6	3 to 13
26	28	199609	7,1	166339	8,6	3 to 13
24	25	206350	6,8	171970	8,3	3 to 13
26	27	207001	6,8	172500	8,3	3 to 13
23	23	214962	6,6	179136	7,8	3 to 13
27	26	223230	6,3	186025	7,6	3 to 13
24	23	224308	6,3	186922	7,6	3 to 13
25	23	233653	6,0	194712	7,3	3 to 13
19	17	240252	5,8	200211	7,1	3 to 13
27	24	241832	5,8	201528	7,1	3 to 13
28	24	250788	5,5	208992	6,8	3 to 13
23	19	260217	5,5	216849	6,6	3 to 13
28	23	261693	5,3	218077	6,6	3 to 13
24	19	271533	5,3	226275	6,3	3 to 13
25	19	282846	5,0	235704	6,0	3 to 13
23	17	290912	4,8	242359	5,8	3 to 13
26	19	294159	4,8	245133	5,8	3 to 11
27	19	305472	4,5	254562	5,5	3 to 11
28	19	316788	4,5	263988	5,3	3 to 11
26	17	328767	4,3	273971	5,3	3 to 11
27	17	341411	4,0	284510	5,0	3 to 11
28	17	354054	4,0	295046	4,8	3 to 11

NOTE: See "General Planting Rate Information" on page 5-1.

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/HECTARE FOR 70 CM ROW WIDTH

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 centimeters on chart. To decrease population, increase spacing. To Increase population decrease spacing.**

To determine population per hectare, **determine average seeds per hill and hills per hectare by doing a field check. Measure 1/1000 of an hectare (1/10 hectare = Length of row 14,28 meters for 70cm row widths). Multiply average seeds per hill by hills per hectare. Example: 4 seeds per hill x (13 hills x 1000) = 52000.**

Transmission Sprockets		NUMBER OF HILLS PER HECTARE 12 Cell Hill-Drop Cotton, Acid-Delinted	Average Hill Spacing In Centimeters	Speed Range (km/h)
Drive	Driven	70 cm Rows		
17	28	43505	32,7	3 to 13
17	27	45115	31,7	3 to 13
17	26	46852	30,4	3 to 13
19	28	48623	29,4	3 to 13
19	27	50424	28,1	3 to 13
17	24	50754	28,1	3 to 13
17	23	52961	26,9	3 to 13
19	25	54458	26,1	3 to 13
19	24	56727	25,1	3 to 13
23	28	58858	24,1	3 to 13
19	23	59191	24,1	3 to 13
24	28	61417	23,3	3 to 13
24	27	63694	22,3	3 to 13
17	19	64113	22,3	3 to 13
24	26	66142	21,5	3 to 13
26	28	66537	21,3	3 to 13
24	25	68787	20,8	3 to 13
26	27	68999	20,5	3 to 13
23	23	71655	19,8	3 to 13
27	26	74410	19,3	3 to 13
24	23	74770	19,0	3 to 13
25	23	77885	18,2	3 to 13
19	17	80084	17,7	3 to 13
27	24	80611	17,7	3 to 13
28	24	83597	17,0	3 to 13
23	19	86739	16,5	3 to 13
28	23	87231	16,5	3 to 13
24	19	90510	15,7	3 to 13
25	19	94281	15,2	3 to 13
23	17	96945	14,7	3 to 13
26	19	98052	14,4	3 to 11
27	19	101823	13,9	3 to 11
28	19	105597	13,4	3 to 11
26	17	109588	12,9	3 to 11
27	17	113803	12,4	3 to 11
28	17	118017	12,1	3 to 11

NOTE: See "General Planting Rate Information" on page 5-1.

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 (VACUUM) CORN/SUNFLOWER 40 CELL DISC
15 TOOTH CONTACT WHEEL DRIVE/23 TOOTH REVERSER DRIVEN SPROCKETS (SEE PAGE 5-1)
APPROXIMATE SEEDS/HECTARE FOR VARIOUS ROW WIDTHS

35 cm Rows (Seeds/Hectare)	70 cm Rows (Seeds/Hectare)	Transmission Sprockets Drive	Transmission Sprockets Driven	Recomm. Speed (km/h)	Average Spacing In Centimeters
127951	63976	15	28	6 to 10	22,4
132690	66344	15	27	6 to 10	21,6
137794	68897	15	26	6 to 10	20,8
143304	71652	15	25	6 to 10	19,8
145011	72504	17	28	6 to 10	19,6
149274	74638	15	24	6 to 10	19,1
150381	75189	17	27	6 to 10	19,1
155765	77883	15	23	6 to 10	18,3
156166	78081	17	26	6 to 10	18,3
162071	81035	19	28	6 to 10	17,5
162412	81205	17	25	6 to 10	17,5
168073	84038	19	27	6 to 10	17,0
169180	84591	17	24	6 to 10	16,8
174537	87268	19	26	6 to 10	16,3
176534	88268	17	23	6 to 10	16,0
181517	90760	19	25	6 to 10	15,7
188559	94278	15	19	6 to 10	15,0
189084	94539	19	24	6 to 10	15,0
196190	98095	23	28	6 to 10	14,7
197303	98654	19	23	6 to 10	14,5
203455	101729	23	27	6 to 10	14,2
204721	102361	24	28	6 to 10	14,0
210742	105371	15	17	6 to 10	13,7
212304	106150	24	27	6 to 10	13,5
213701	106849	17	19	6 to 10	13,5
219736	109868	23	25	6 to 10	13,0
221781	110889	26	28	6 to 10	13,0
228890	114442	23	24	6 to 10	12,4
229288	114644	24	25	6 to 10	12,4
230309	115155	27	28	6 to 10	12,4
238843	119420	23	23	6 to 10	11,9
247689	123844	28	27	6 to 10	11,7
248028	124011	27	26	6 to 10	11,4
249226	124613	24	23	6 to 10	11,4
257212	128607	28	26	6 to 10	11,2
257948	128976	27	25	6 to 10	11,2
259610	129803	25	23	6 to 10	10,9
266939	133470	19	17	6 to 10	10,7
268697	134349	27	24	6 to 10	10,7
26999	134999	26	23	6 to 10	10,7
27865	139324	28	24	6 to 10	10,2
280378	140189	27	23	6 to 10	10,2
289122	144562	23	19	6 to 10	9,9
290761	145382	28	23	6 to 10	9,9
301693	150846	24	19	6 to 10	9,4
314264	157133	25	19	6 to 10	9,1
323139	161571	23	17	6 to 10	8,9
326835	163417	26	19	6 to 10	8,6
337186	168594	24	17	6 to 10	8,4
339406	169702	27	19	6 to 10	8,4
351238	175617	25	17	6 to 10	8,1
351977	175988	28	19	6 to 10	8,1
365287	182643	26	17	6 to 10	7,9
366222	183111	23	15	6 to 10	7,6
379336	189667	27	17	6 to 10	7,4

NOTE: See "General Planting Rate Information" on page 5-1.

PLANTING RATES FOR (VACUUM) CORN/SUNFLOWER 40 CELL DISC
19 TOOTH CONTACT WHEEL DRIVE/23 TOOTH REVERSER DRIVEN SPROCKETS (SEE PAGE 5-1)
APPROXIMATE SEEDS/HECTARE FOR VARIOUS ROW WIDTHS

35 cm Rows (Seeds/Hectare)	70 cm Rows (Seeds/Hectare)	Transmission Sprockets Drive	Driven	Recomm. Speed (km/h)	Average Spacing In Centimeters
162071	81035	15	28	6 to 10	17,5
168073	84038	15	27	6 to 10	17,0
174537	87268	15	26	6 to 10	16,3
181517	90760	15	25	6 to 10	15,7
183678	91840	17	28	6 to 10	15,5
189084	94539	15	24	6 to 10	15,0
190484	95243	17	27	6 to 10	15,0
197303	98654	15	23	6 to 10	14,5
197811	98904	17	26	6 to 10	14,5
205288	102646	19	28	6 to 10	14,0
205721	102861	17	25	6 to 10	14,0
212892	106446	19	27	6 to 10	13,5
214293	107148	17	24	6 to 10	13,5
221079	110540	19	26	6 to 10	13,0
223611	111806	17	23	6 to 10	13,0
229925	114961	19	25	6 to 10	12,4
238843	119420	15	19	6 to 10	11,9
239505	119754	19	24	6 to 10	11,9
248506	124256	23	28	6 to 10	11,4
249920	124957	19	23	6 to 10	11,4
257712	128857	23	27	6 to 10	11,2
259314	129656	24	28	6 to 10	10,9
266939	133470	15	17	6 to 10	10,7
26892	134459	24	27	6 to 10	10,7
270689	135343	17	19	6 to 10	10,7
278330	139162	23	25	6 to 10	10,2
280924	140461	26	28	6 to 10	10,2
289928	144963	23	24	6 to 10	9,9
290431	145215	24	25	6 to 10	9,9
291726	145863	27	28	6 to 10	9,9
302531	151266	23	23	6 to 10	9,4
313737	156867	28	27	6 to 10	9,1
314167	157085	27	26	6 to 10	9,1
31569	157843	24	23	6 to 10	9,1
325803	162901	28	26	6 to 10	8,6
326735	163369	27	25	6 to 10	8,6
328840	164420	25	23	6 to 10	8,6
338124	169062	19	17	6 to 10	8,4
340349	170175	27	24	6 to 10	8,4
341994	170994	26	23	6 to 10	8,4
352955	176475	28	24	6 to 10	8,1
355146	177574	27	23	6 to 10	7,9
366222	183111	23	19	6 to 10	7,6
368300	184151	28	23	6 to 10	7,6
382145	191129	24	19	6 to 10	7,4
398070	199034	25	19	6 to 10	7,1
409308	204654	23	17	6 to 10	6,9
413993	206995	26	19	6 to 10	6,9
427104	213551	24	17	6 to 10	6,6
429916	214957	27	19	6 to 10	6,6
444900	222450	25	17	6 to 10	6,4
445839	222918	28	19	6 to 10	6,4
462697	231350	26	17	6 to 10	6,1
463885	231941	23	15	6 to 10	6,1
480493	240246	27	17	6 to 10	5,8

NOTE: See "General Planting Rate Information" on page 5-1.

PLANTING RATES FOR (VACUUM) MILO/SUGAR BEET/SPECIALTY 60 CELL DISCS
15 TOOTH CONTACT WHEEL DRIVE/23 TOOTH REVERSER DRIVEN SPROCKETS (SEE PAGE 5-1)
APPROXIMATE SEEDS/HECTARE FOR VARIOUS ROW WIDTHS

35 cm Rows (Seeds/Hectare)	70 cm Rows (Seeds/Hectare)	Transmission Sprockets Drive	Driven	Recomm. Speed (km/h)	Average Spacing In Centimeters
191927	95964	15	28	6 to 10	15,0
199030	99517	15	27	6 to 10	14,2
206689	103344	15	26	6 to 10	13,7
214957	107478	15	25	6 to 10	13,2
217515	108758	17	28	6 to 10	13,2
223912	111956	15	24	6 to 10	12,7
225574	112787	17	27	6 to 10	12,7
233648	116824	15	23	6 to 10	12,2
234247	117125	17	26	6 to 10	12,2
243106	121552	19	28	6 to 10	11,7
243617	121810	17	25	6 to 10	11,7
252110	126054	19	27	6 to 10	11,4
253769	126884	17	24	6 to 10	11,2
261805	130903	19	26	6 to 10	10,9
264802	132400	17	23	6 to 10	10,7
272280	13614	19	25	6 to 10	10,4
282838	141420	15	19	6 to 10	10,2
283623	141813	19	24	6 to 10	10,2
294285	147143	23	28	6 to 10	9,7
295954	147979	19	23	6 to 10	9,7
305187	152594	23	27	6 to 10	9,4
307082	153540	24	28	6 to 10	9,4
316113	158058	15	17	6 to 10	9,1
31845	15923	24	27	6 to 10	8,9
32055	16028	17	19	6 to 10	8,9
329601	164802	23	25	6 to 10	8,6
33267	166336	26	28	6 to 10	8,6
343335	171666	23	24	6 to 10	8,4
343932	171965	24	25	6 to 10	8,4
34547	172733	27	28	6 to 10	8,4
35826	179130	23	23	6 to 10	7,9
371531	185764	28	27	6 to 10	7,6
372041	186019	27	26	6 to 10	7,6
373840	186920	24	23	6 to 10	7,6
385819	192911	28	26	6 to 10	7,4
386924	193462	27	25	6 to 10	7,4
389416	19471	25	23	6 to 10	7,4
400409	200206	19	17	6 to 10	7,1
403046	201523	27	24	6 to 10	7,1
404992	202496	26	23	6 to 10	7,1
417971	208987	28	24	6 to 10	6,9
420568	210285	27	23	6 to 10	6,9
433684	216843	23	19	6 to 10	6,6
436144	218072	28	23	6 to 10	6,6
452542	226270	24	19	6 to 10	6,4
471397	235699	25	19	6 to 10	6,1
484707	242354	23	17	6 to 10	5,8
490252	245127	26	19	6 to 10	5,8
505783	252890	24	17	6 to 10	5,6
509110	254554	27	19	6 to 10	5,6
526855	263429	25	17	6 to 10	5,3
527965	263983	28	19	6 to 10	5,3
547930	273965	26	17	6 to 10	5,3
549333	274667	23	15	6 to 10	5,1
569003	284502	27	17	6 to 10	5,1

NOTE: See "General Planting Rate Information" on page 5-1.

PLANTING RATES FOR (VACUUM) MILO/SUGAR BEET/ SPECIALTY 60 CELL DISCS
19 TOOTH CONTACT WHEEL DRIVE/23 TOOTH REVERSER DRIVEN SPROCKETS (SEE PAGE 5-1)
APPROXIMATE SEEDS/HECTARE FOR VARIOUS ROW WIDTHS

35 cm Rows (Seeds/Hectare)	70 cm Rows (Seeds/Hectare)	Transmission Sprockets Drive	Transmission Sprockets Driven	Recomm. Speed (km/h)	Average Spacing In Centimeters
243106	121552	15	28	4 to 6	11,7
252110	126054	15	27	4 to 6	11,4
261805	130903	15	26	4 to 6	10,9
272280	136139	15	25	4 to 6	10,4
275521	137759	17	28	4 to 6	10,4
283623	141813	15	24	4 to 6	10,2
285724	142864	17	27	4 to 6	9,9
295954	147979	15	23	4 to 6	9,7
296715	148358	17	26	4 to 6	9,7
307934	153967	19	28	4 to 6	9,4
308582	154292	17	25	4 to 6	9,1
319338	159671	19	27	4 to 6	8,9
321440	160722	17	24	4 to 6	8,9
331622	165810	19	26	4 to 6	8,6
335417	167707	17	23	4 to 6	8,6
344886	172443	19	25	4 to 6	8,4
35826	179130	15	19	4 to 6	7,9
359258	17963	19	24	4 to 6	7,9
372762	186382	23	28	4 to 6	7,6
374877	187439	19	23	4 to 6	7,6
386569	193285	23	27	4 to 6	7,4
388969	194486	24	28	4 to 6	7,4
400409	200206	15	17	4 to 6	7,1
403376	201687	24	27	4 to 6	7,1
406029	203015	17	19	4 to 6	7,1
417495	208748	23	25	4 to 6	6,9
421385	210691	26	28	4 to 6	6,9
434891	217446	23	24	4 to 6	6,6
435646	217822	24	25	4 to 6	6,6
437592	218795	27	28	4 to 6	6,6
453797	226899	23	23	4 to 6	6,4
470604	235303	28	27	4 to 6	6,1
471252	235626	27	26	4 to 6	6,1
473529	236763	24	23	4 to 6	6,1
488707	244353	28	26	4 to 6	5,8
490102	245052	27	25	4 to 6	5,8
493260	246630	25	23	4 to 6	5,8
507186	253594	19	17	4 to 6	5,6
510524	255261	27	24	4 to 6	5,6
512989	256494	26	23	4 to 6	5,6
529430	264716	28	24	4 to 6	5,3
532720	266359	27	23	4 to 6	5,3
549333	274667	23	19	4 to 6	5,1
552449	276226	28	23	4 to 6	5,1
573218	286609	24	19	4 to 6	5,1
59710	298551	25	19	4 to 6	4,8
613962	306980	23	17	4 to 6	4,6
620986	310493	26	19	4 to 6	4,6
640655	320328	24	17	4 to 6	4,6
644872	322435	27	19	4 to 6	4,3
667351	333675	25	17	4 to 6	4,3
668756	334377	28	19	4 to 6	4,3
	347023	26	17	4 to 6	4,1
	347913	23	15	4 to 6	4,1
	360368	27	17	4 to 6	4,1

NOTE: See "General Planting Rate Information" on page 5-1.

PLANTING RATES FOR (VACUUM) SPECIALTY 60 CELL DISC
30 TOOTH CONTACT WHEEL DRIVE/17 TOOTH REVERSER DRIVEN SPROCKETS (SEE PAGE 5-1)
APPROXIMATE SEEDS/HECTARE FOR VARIOUS ROW WIDTHS

35 cm Rows (Seeds/Hectare)	70 cm Rows (Seeds/Hectare)	Transmission Sprockets Drive	Transmission Sprockets Driven	Recomm. Speed (km/h)	Average Spacing In Centimeters
519335	259666	15	28	6 to 10	5,6
538569	269283	15	27	6 to 10	5,3
559281	27964	15	26	6 to 10	5,1
581655	290826	15	25	6 to 10	4,8
588578	294288	17	28	6 to 10	4,8
605888	30295	15	24	6 to 10	4,8
610377	305190	17	27	6 to 10	4,6
63223	31612	15	23	6 to 10	4,6
633852	316927	17	26	6 to 10	4,6
657822	328913	19	28	6 to 10	4,3
659207	329603	17	25	6 to 10	4,3
NOTE: Planting rates over 670,000 seeds/hectare are not recommended with subject seed disc and/or drive ratio.	341094	19	27	6 to 10	4,1
	343338	17	24	6 to 10	4,1
	354213	19	26	6 to 10	4,1
	358264	17	23	6 to 10	4,1
	368381	19	25	6 to 10	3,8
	38267	15	19	6 to 10	3,8
	383731	19	24	6 to 10	3,8
	398156	23	28	6 to 10	3,6
	400414	19	23	6 to 10	3,6
	412902	23	27	6 to 10	3,6
	415466	24	28	6 to 10	3,6
	42769	15	17	6 to 10	3,3
	430854	24	27	6 to 10	3,3
	433690	17	19	6 to 10	3,3
	445935	23	25	6 to 10	3,3
	450088	26	28	6 to 10	3,0
	464516	23	24	6 to 10	3,0
	465323	24	25	6 to 10	3,0
	467400	27	28	6 to 10	3,0
	484713	23	23	6 to 10	3,0
	502665	28	27	6 to 10	2,8
	503355	27	26	6 to 10	2,8
	505785	24	23	6 to 10	2,8
	521996	28	26	6 to 10	2,8
	523487	27	25	6 to 10	2,8
	526861	25	23	6 to 10	2,8
	541735	19	17	6 to 10	2,5
	545299	27	24	6 to 10	2,5
	547936	26	23	6 to 10	2,5
	565495	28	24	6 to 10	2,5
	569008	27	23	6 to 10	2,5
	586756	23	19	6 to 10	2,5
	590084	28	23	6 to 10	2,5
	612266	24	19	6 to 10	2,3
	637779	25	19	6 to 10	2,3
	655785	23	17	6 to 10	2,3
	663289	26	19	6 to 10	2,0
		24	17	6 to 10	2,0
		27	19	6 to 10	2,0
		25	17	6 to 10	2,0
		28	19	6 to 10	2,0
		26	17	6 to 10	2,0
		23	15	6 to 10	2,0
		27	17	6 to 10	1,8

NOTE: See "General Planting Rate Information" on page 5-1.

PLANTING RATES FOR (VACUUM) SOYBEAN 120 CELL DISC
15 TOOTH CONTACT WHEEL DRIVE/23 TOOTH REVERSER DRIVEN SPROCKETS (SEE PAGE 5-1)
APPROXIMATE SEEDS/HECTARE FOR VARIOUS ROW WIDTHS

35 cm Rows (Seeds/Hectare)	70 cm Rows (Seeds/Hectare)	Transmission Sprockets Drive	Transmission Sprockets Driven	Recomm. Speed (km/h)	Average Spacing In Centimeters
383852	191927	15	28	4 to 6	7,4
398068	199034	15	27	4 to 6	7,1
413378	206689	15	26	4 to 6	6,9
429913	214957	15	25	4 to 6	6,6
435031	217515	17	28	4 to 6	6,6
447828	223912	15	24	4 to 6	6,4
451144	225574	17	27	4 to 6	6,4
467298	233648	15	23	4 to 6	6,1
468497	234247	17	26	4 to 6	6,1
486212	243106	19	28	4 to 6	5,8
487237	243617	17	25	4 to 6	5,8
504221	252110	19	27	4 to 6	5,6
507538	253769	17	24	4 to 6	5,6
523614	261805	19	26	4 to 6	5,3
529605	264802	17	23	4 to 6	5,3
544557	272280	19	25	4 to 6	5,3
565675	282838	15	19	4 to 6	5,1
567248	283623	19	24	4 to 6	5,1
588573	294285	23	28	4 to 6	4,8
591911	295954	19	23	4 to 6	4,8
610371	305187	23	27	4 to 6	4,6
614164	307082	24	28	4 to 6	4,6
632226	316113	15	17	4 to 6	4,6
636911	318454	24	27	4 to 6	4,6
641099	320551	17	19	4 to 6	4,6
659201	329601	23	25	4 to 6	4,3
665343	332673	26	28	4 to 6	4,3
	343335	23	24	4 to 6	4,1
NOTE: Planting rates over 670,000 seeds/hectare are not recommended with subject seed disc and/or drive ratio.	343932	24	25	4 to 6	4,1
	345467	27	28	4 to 6	4,1
	358261	23	23	4 to 6	4,1
	371531	28	27	4 to 6	3,8
	372041	27	26	4 to 6	3,8
	373840	24	23	4 to 6	3,8
	385819	28	26	4 to 6	3,8
	386924	27	25	4 to 6	3,8
	389416	25	23	4 to 6	3,6
	400409	19	17	4 to 6	3,6
	403046	27	24	4 to 6	3,6
	404992	26	23	4 to 6	3,6
	417971	28	24	4 to 6	3,3
	420568	27	23	4 to 6	3,3
	433684	23	19	4 to 6	3,3
	436144	28	23	4 to 6	3,3
	452542	24	19	4 to 6	3,0
	471397	25	19	4 to 6	3,0
	484707	23	17	4 to 6	3,0
	490252	26	19	4 to 6	2,8
	505783	24	17	4 to 6	2,8
	509110	27	19	4 to 6	2,8
	526855	25	17	4 to 6	2,8
	527965	28	19	4 to 6	2,8
	547930	26	17	4 to 6	2,5
	549333	23	15	4 to 6	2,5
	569003	27	17	4 to 6	2,5

NOTE: See "General Planting Rate Information" on page 5-1.

PLANTING RATES FOR (VACUUM) SOYBEAN 120 CELL DISC
19 TOOTH CONTACT WHEEL DRIVE/23 TOOTH REVERSER DRIVEN SPROCKETS (SEE PAGE 5-1)
APPROXIMATE SEEDS/HECTARE FOR VARIOUS ROW WIDTHS

35 cm Rows (Seeds/Hectare)	70 cm Rows (Seeds/Hectare)	Transmission Sprockets Drive	Driven	Recomm. Speed (km/h)	Average Spacing In Centimeters
486212	243106	15	28	6 to 10	5,8
504221	252110	15	27	6 to 10	5,6
523614	261805	15	26	6 to 10	5,3
544557	272280	15	25	6 to 10	5,3
551040	275521	17	28	6 to 10	5,1
567248	283623	15	24	6 to 10	5,1
571449	285724	17	27	6 to 10	5,1
591911	295954	15	23	6 to 10	4,8
593427	296715	17	26	6 to 10	4,8
615868	307934	19	28	6 to 10	4,6
617166	308582	17	25	6 to 10	4,6
638680	319338	19	27	6 to 10	4,6
642881	321440	17	24	6 to 10	4,3
663244	331622	19	26	6 to 10	4,3
670831	335417	17	23	6 to 10	4,3
NOTE: Planting rates over 670,000 seeds/hectare are not recommended with subject seed disc and/or drive ratio.	344886	19	25	6 to 10	4,1
	35826	15	19	6 to 10	4,1
	359258	19	24	6 to 10	4,1
	372762	23	28	6 to 10	3,8
	374877	19	23	6 to 10	3,8
	386569	23	27	6 to 10	3,8
	388969	24	28	6 to 10	3,6
	400409	15	17	6 to 10	3,6
	403376	24	27	6 to 10	3,6
	406029	17	19	6 to 10	3,6
	417495	23	25	6 to 10	3,3
	421385	26	28	6 to 10	3,3
	4349	23	24	6 to 10	3,3
	435646	24	25	6 to 10	3,3
	437592	27	28	6 to 10	3,3
	453797	23	23	6 to 10	3,0
	470604	28	27	6 to 10	3,0
	471252	27	26	6 to 10	3,0
	473529	24	23	6 to 10	3,0
	488707	28	26	6 to 10	2,8
	490102	27	25	6 to 10	2,8
	493260	25	23	6 to 10	2,8
	507186	19	17	6 to 10	2,8
	510524	27	24	6 to 10	2,8
	512989	26	23	6 to 10	2,8
	529430	28	24	6 to 10	2,8
	532720	27	23	6 to 10	2,8
	549333	23	19	6 to 10	2,5
	552449	28	23	6 to 10	2,5
	573218	24	19	6 to 10	2,5
	59710	25	19	6 to 10	2,3
	613962	23	17	6 to 10	2,3
	620986	26	19	6 to 10	2,3
	640655	24	17	6 to 10	2,3
	644872	27	19	6 to 10	2,3
	667351	25	17	6 to 10	2,0
	668756	28	19	6 to 10	2,0
		26	17	6 to 10	2,0
		23	15	6 to 10	2,0
		27	17	6 to 10	2,0

NOTE: See "General Planting Rate Information" on page 5-1.

PLANTING RATES FOR (VACUUM) RAPESSED 83 CELL DISCS
15 TOOTH CONTACT WHEEL DRIVE/23 TOOTH REVERSER DRIVEN SPROCKETS
(SEE PAGE 5-1)
APPROXIMATE SEEDS/HECTARE FOR VARIOUS ROW WIDTHS

35 cm Rows (Seeds/Hectare)	Transmission Sprockets Drive	Driven	Recomm. Speed (km/h)	Average Spacing In Centimeters
265499	15	28	6 to 10	10,1
275330	15	27	6 to 10	9,7
285920	15	26	6 to 10	9,4
297357	15	25	6 to 10	9,0
300896	17	28	6 to 10	8,9
309746	15	24	6 to 10	8,6
312043	17	27	6 to 10	8,6
323213	15	23	6 to 10	8,3
324042	17	26	6 to 10	8,3
336297	19	28	6 to 10	8,0
337003	17	25	6 to 10	7,9
348753	19	27	6 to 10	7,7
351047	17	24	6 to 10	7,6
362164	19	26	6 to 10	7,4
366310	17	23	6 to 10	7,3
376654	19	25	6 to 10	7,1
391259	15	19	6 to 10	6,8
392345	19	24	6 to 10	6,8
407095	23	28	6 to 10	6,6
409404	19	23	6 to 10	6,5
422175	23	27	6 to 10	6,3
424797	24	28	6 to 10	6,3
437290	15	17	6 to 10	6,1
440528	24	27	6 to 10	6,1
443428	17	19	6 to 10	6,0
455948	23	25	6 to 10	5,9
460197	26	28	6 to 10	5,8
474947	23	24	6 to 10	5,6
475773	24	25	6 to 10	5,6
477896	27	28	6 to 10	5,6
495594	23	23	6 to 10	5,4
513951	28	27	6 to 10	5,2
514657	27	26	6 to 10	5,2
517145	24	23	6 to 10	5,2
533717	28	26	6 to 10	5,0
535245	27	25	6 to 10	5,0
538692	25	23	6 to 10	5,0
553899	19	17	6 to 10	4,8
557546	27	24	6 to 10	4,8
560238	26	23	6 to 10	4,8
578193	28	24	6 to 10	4,6
581785	27	23	6 to 10	4,6
599930	23	19	6 to 10	4,5
603332	28	23	6 to 10	4,4
626016	24	19	6 to 10	4,3
652099	25	19	6 to 10	4,1
670512	23	17	6 to 10	4,0
678182	26	19	6 to 10	3,9
699666	24	17	6 to 10	3,8
704269	27	19	6 to 10	3,8
728816	25	17	6 to 10	3,7
730352	28	19	6 to 10	3,7
757970	26	17	6 to 10	3,5
759911	23	15	6 to 10	3,5
787121	27	17	6 to 10	3,4

NOTE: See "General Planting Rate Information" on page 5-1.

PLANTING RATES FOR (VACUUM) RAPESSED 83 CELL DISCS
19 TOOTH CONTACT WHEEL DRIVE/23 TOOTH REVERSER DRIVEN SPROCKETS
(SEE PAGE 5-1)
APPROXIMATE SEEDS/HECTARE FOR VARIOUS ROW WIDTHS

35 cm Rows (Seeds/Hectare)	Transmission Sprockets Drive	Driven	Recomm. Speed (km/h)	Average Spacing In Centimeters
336297	15	28	4 to 6	8,0
348753	15	27	4 to 6	7,7
362164	15	26	4 to 6	7,5
376654	15	25	4 to 6	7,2
381138	17	28	4 to 6	7,1
392345	15	24	4 to 6	6,9
395252	17	27	4 to 6	6,8
409404	15	23	4 to 6	6,6
410456	17	26	4 to 6	6,6
425975	19	28	4 to 6	6,3
426871	17	25	4 to 6	6,3
441752	19	27	4 to 6	6,1
444659	17	24	4 to 6	6,1
458744	19	26	4 to 6	5,9
463994	17	23	4 to 6	5,8
477093	19	25	4 to 6	5,7
495594	15	19	4 to 6	5,4
496974	19	24	4 to 6	5,4
515654	23	28	4 to 6	5,2
518580	19	23	4 to 6	5,2
534754	23	27	4 to 6	5,0
538074	24	28	4 to 6	5,0
553899	15	17	4 to 6	4,9
558004	24	27	4 to 6	4,8
561674	17	19	4 to 6	4,8
577535	23	25	4 to 6	4,7
582915	26	28	4 to 6	4,6
601599	23	24	4 to 6	4,5
602644	24	25	4 to 6	4,5
605336	27	28	4 to 6	4,5
627753	23	23	4 to 6	4,3
651002	28	27	4 to 6	4,1
651899	27	26	4 to 6	4,1
655048	24	23	4 to 6	4,1
676044	28	26	4 to 6	4,0
677974	27	25	4 to 6	4,0
682343	25	23	4 to 6	4,0
701607	19	17	4 to 6	3,8
706225	27	24	4 to 6	3,8
709634	26	23	4 to 6	3,8
732378	28	24	4 to 6	3,7
736929	27	23	4 to 6	3,7
759911	23	19	4 to 6	3,6
764221	28	23	4 to 6	3,5
792951	24	19	4 to 6	3,4
825991	25	19	4 to 6	3,3
849315	23	17	4 to 6	3,2
859030	26	19	4 to 6	3,1
886240	24	17	4 to 6	3,0
892073	27	19	4 to 6	3,0
923169	25	17	4 to 6	2,9
925113	28	19	4 to 6	2,9
	26	17	4 to 6	2,8
	23	15	4 to 6	2,8
	27	17	4 to 6	2,7

NOTE: See "General Planting Rate Information" on page 5-1.

DRY INSECTICIDE APPLICATION RATES
APPROXIMATE KILOGRAMS/HECTARE AT 8 KM/H FOR 70 CM ROW WIDTH

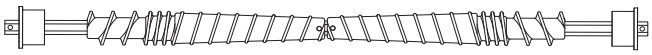
Meter Setting	70 cm Rows
CLAY GRANULES	
10	6,0
11	6,0
12	7,4
13	8,4
14	9,4
15	10,4
16	11,7
17	13,1
18	13,9
19	16,0
20	17,3
21	18,9
22	20,0
23	21,0
24	22,9
25	25,5
26	28,1
27	29,4
28	31,0
29	33,9
30	36,1
SAND GRANULES	
5	3,5
6	6,0
7	6,5
8	7,7
9	9,5
10	10,9
11	12,4
12	13,7
13	15,4
14	17,6
15	18,9
16	21,4
17	23,7
18	26,6
19	29,6
20	31,4
21	33,7
22	36,1
23	39,0
24	42,0
25	45,0

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,

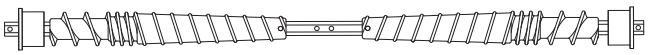
Your actual rate must be field checked with actual insecticide you are using at speed and population you are planting, See "Granular Chemical Application Field Check" on page 2-37 for additional information.

DRY FERTILIZER APPLICATION RATES
APPROXIMATE RATE IN KG PER HECTARE

Drive Sprocket	Driven Sprocket	Low Rate Position	High Rate Position
		70 cm Rows	70 cm Rows
15	35	39	115
15	33	44	133
15	30	48	147
19	33	55	165
19	30	61	187
15	19	71	213
30	35	75	230
30	33	82	245
33	35	84	252
35	33	93	262
33	30	99	295
19	15	114	340
30	19	142	424
33	19	155	467
35	19	163	492
30	15	179	538
33	15	197	589
35	15	205	624



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 1041 kilograms per cubic meter.

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 kilograms your fertilizer attachment will actually deliver on 70 cm row spacing:

1. Remove one spout from one fertilizer hopper and attach a container under opening.
2. Engage fertilizer attachment and drive forward 14.28 m.
3. Weigh amount of fertilizer caught in container and multiply by 1000. Result is kilograms of fertilizer delivered per hectare when planting in 70 cm rows.

LIQUID FERTILIZER PISTON PUMP APPLICATION RATES
LITERS PER HECTARE

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
8 Row 70 cm	41,7	84,3	126,0	168,0	209,0	252,0	293,7	335,0	377,0	419,7

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 kilogram of actual fertilizer solution to determine exact application rate.

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 the exact number of liters your fertilizer attachment will actually deliver on a 70 cm 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 14,28 m.
3. Measure fluid milliliters caught in container. Result is liters of fertilizer delivered per hectare when planting in 70 cm rows (e.g. 2ml = 2 l ; 5 ml= 5 l; 10 ml = 10 l)
4. Rinse collection container and repeat test on other rows if necessary.

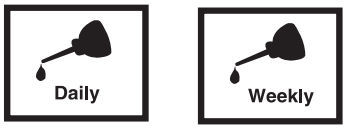
LUBRICATION

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.

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.

LUBRICATION SYMBOLS

Lubricate at frequency indicated with SAE multipurpose grease.

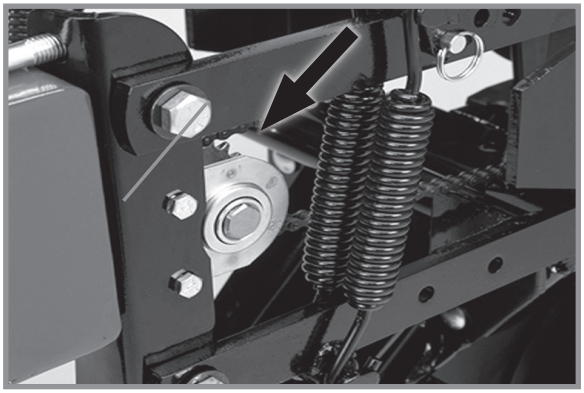


Lubricate at frequency indicated with high quality SAE 10 weight oil or spray lubricant.

SEALED BEARINGS

Sealed bearings are used on your Kinze planter to provide trouble free operation.

These are located on drive shafts, row units, and transmission bearings. Sealed bearings are lubricated for life and are not serviceable.



Sealed bearing (Typical)

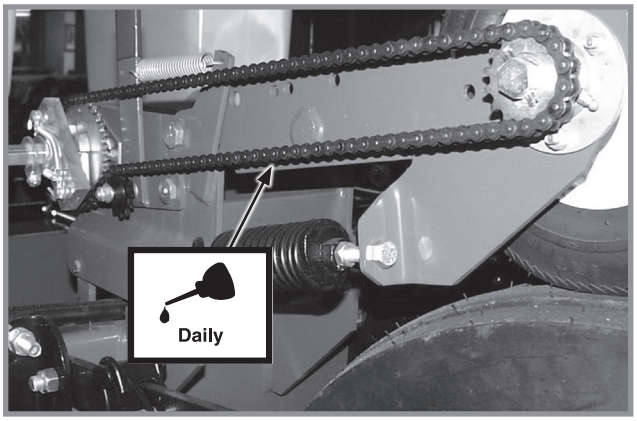
WRAP SPRING WRENCH ASSEMBLY

1. Remove ¼"-20 x ½" cap screw securng idler assembly to wrap spring wrench tightener shaft and
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.

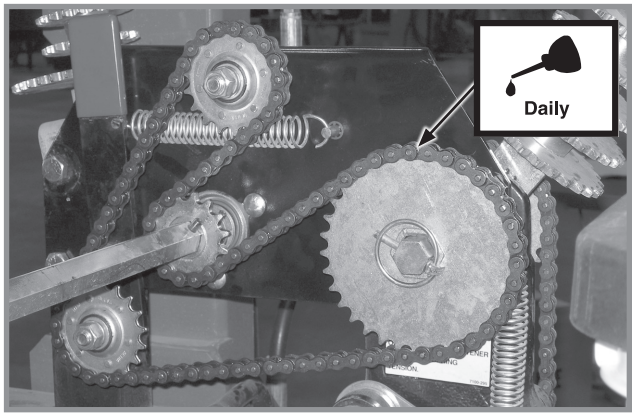
Wrap spring wrench lubrication

DRIVE CHAINS

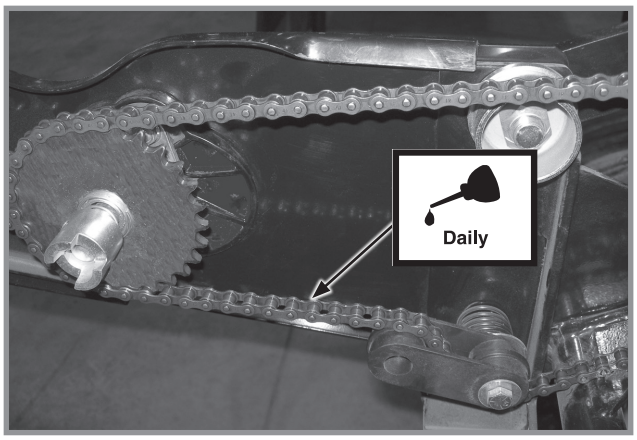
Lubricate all transmission and drive chains daily with a high quality chain lubricant. Extreme operating conditions such as dirt, temperature, or speed may require more frequent lubrication. If a chain becomes stiff, it should be removed, soaked, and washed in solvent to loosen and remove dirt from joints.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



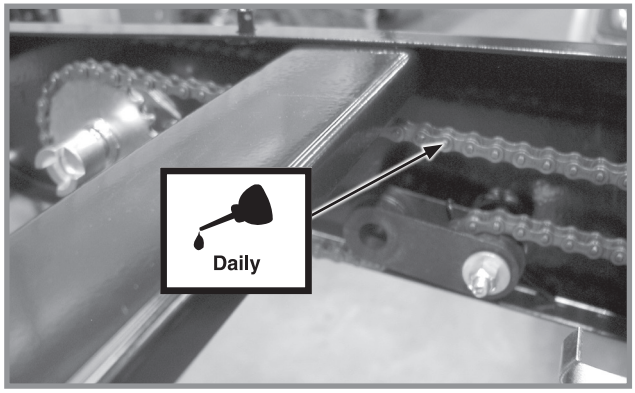
Contact Wheel Drive Chain



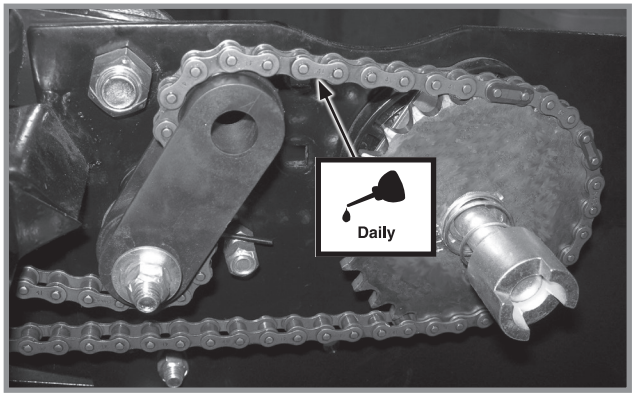
Reverser Plate Chain Drive



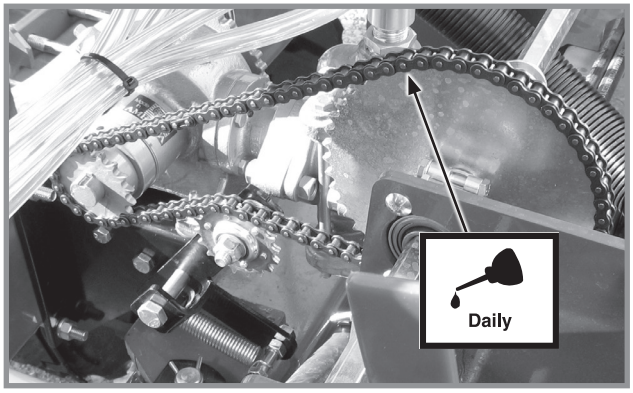
Pull Row Unit Drive Chain



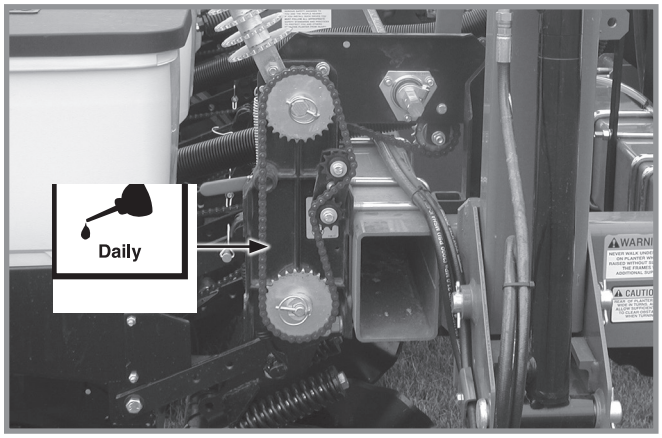
Row Unit Granular Chemical Drive Chains



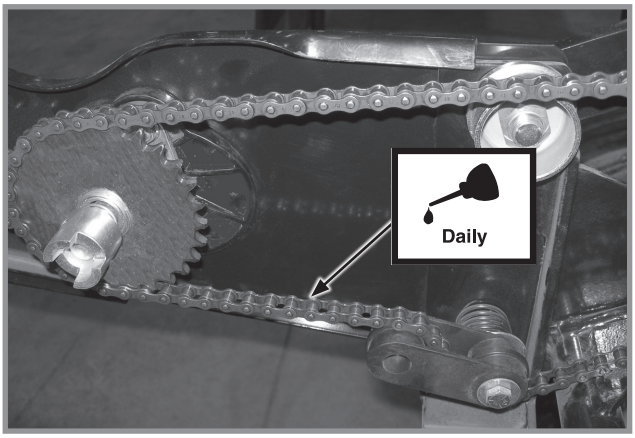
Push Row Unit Drive Chains



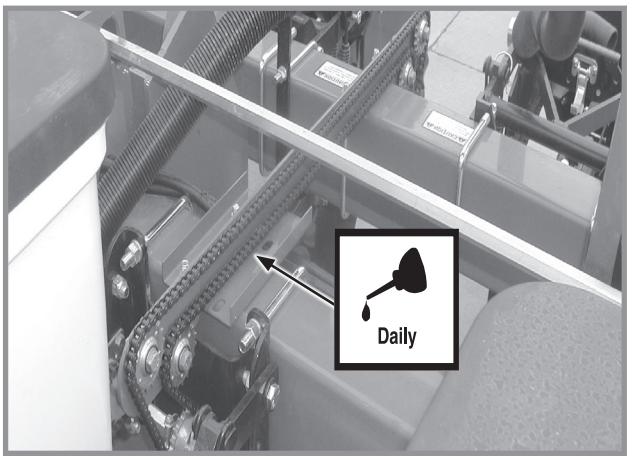
Liquid Fertilizer Piston Pump Drive Chain



Planter Seed Rate Transmission Drive Chain

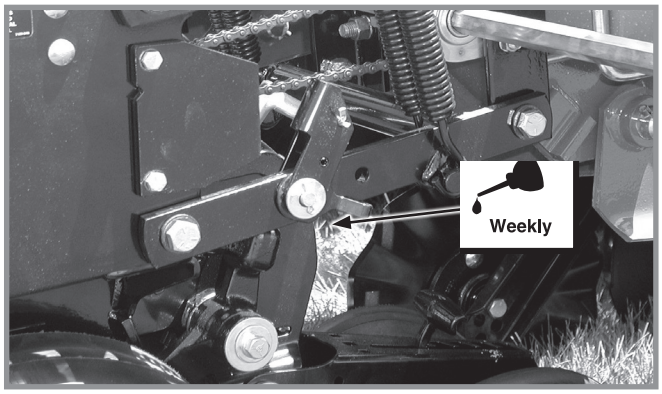


Pull Row Unit Drive Chain

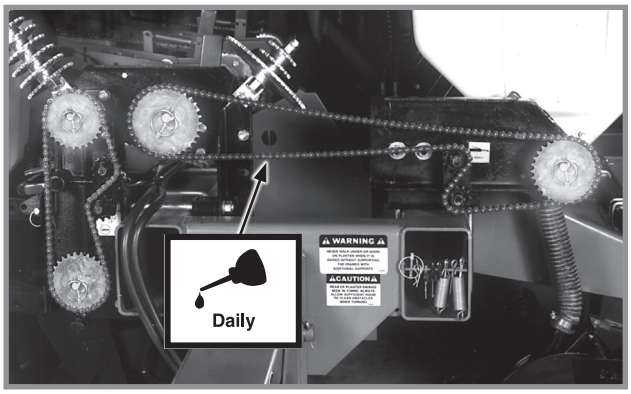


Split Row Package Drive Chain

SPLIT ROW PUSH UNIT LOCKUPS



2 Per Row

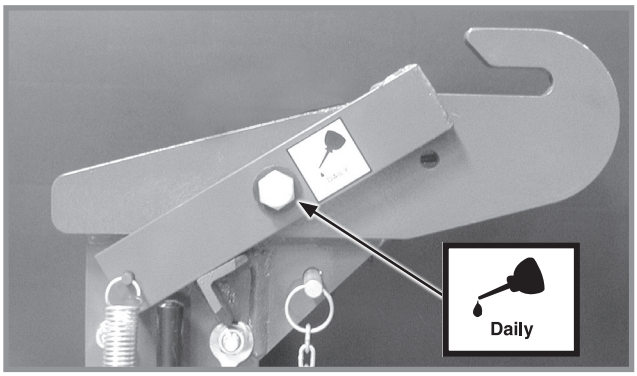


Dry Fertilizer Drive Chain

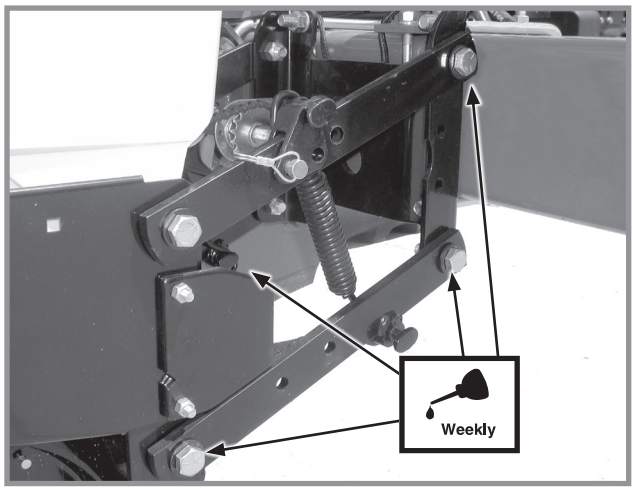
BUSHINGS

Lubricate bushings at frequency indicated.

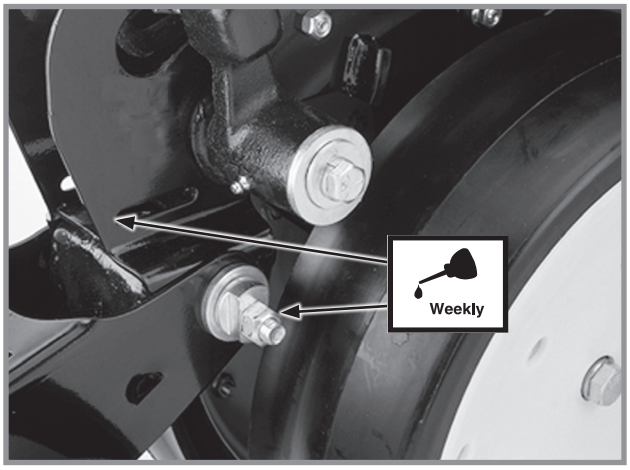
Check each bolt for proper torque. If bolt is loose, removed it and inspect bushing for cracks and wear. Replace bushing if necessary. Use **only hardened flat washers. Replace damaged flat washers with proper part. Torque hardware to 130 ft-lb (~176 Nm).**



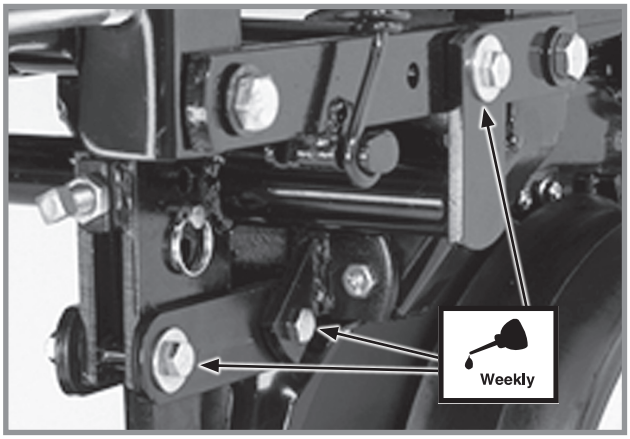
Transport Catch Pivot



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



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

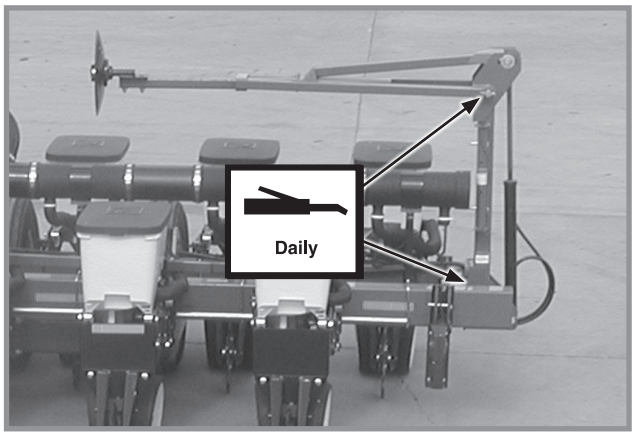


Row Unit Mounted Disc Furrower Parallel Linkages (6 Per Row)

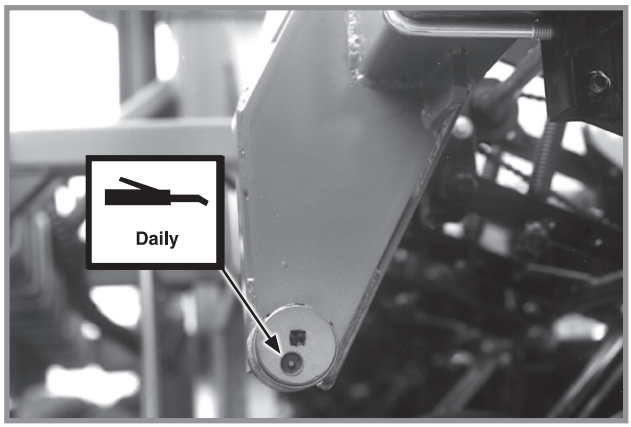
GREASE FITTINGS

Lubricate parts with grease fittings at frequency indicated with an SAE multipurpose grease. Clean fitting thoroughly before using grease gun. Frequency of lubrication recommended is based on normal operating conditions. Severe or unusual conditions may require more frequent attention.

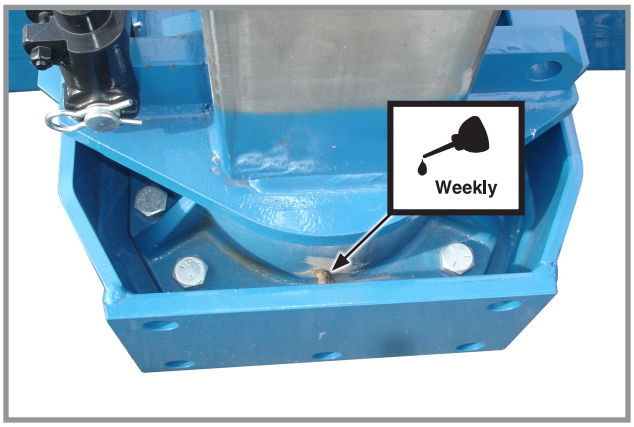
BASE MACHINE



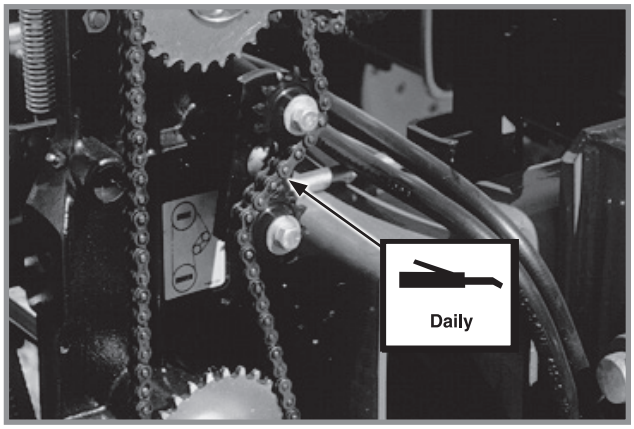
Row marker assembly - 2 per assembly



Cam follower - 1 per cam follower

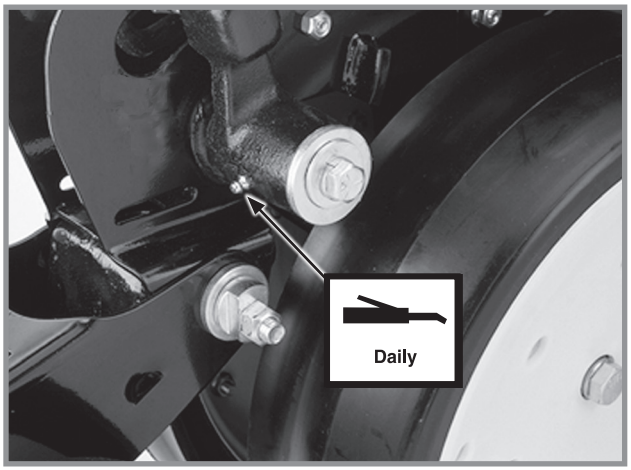


Center Pivot - 1



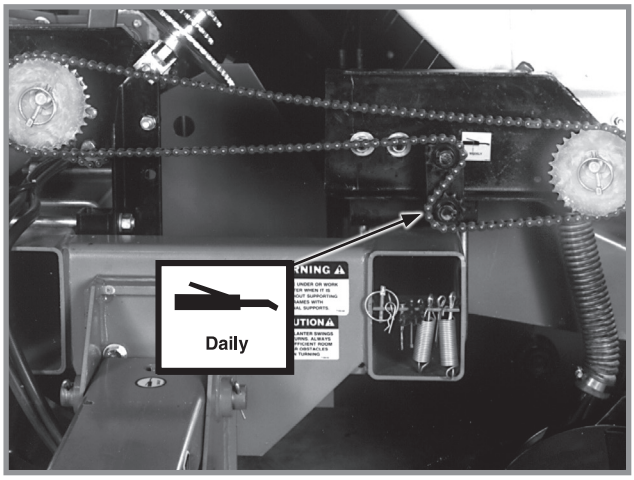
Seed rate transmission assembly - 1 (Idler)

ROW UNIT

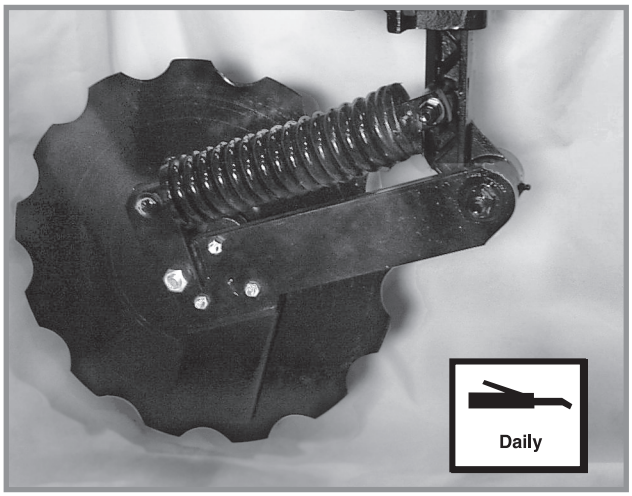


Gauge wheel arms - 1 per arm
NOTE: Seals in gauge wheel arm are installed with lip facing out to allow grease to purge dirt away from seal. Pump grease into arm until fresh grease appears between washers and arm.)

FERTILIZER OPENERS

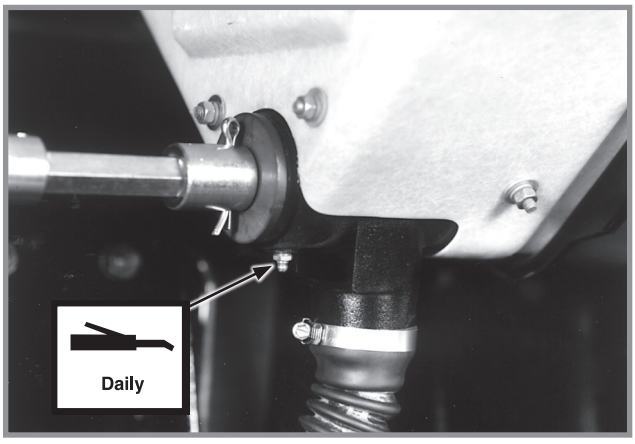


Fertilizer transmission - 1 per transmission (Idler)



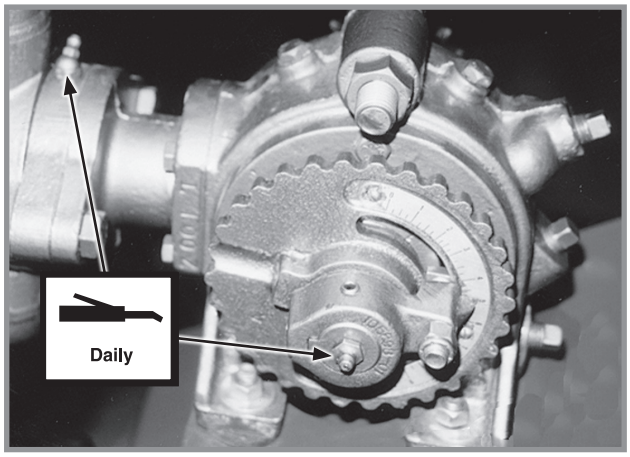
Notched Single Disc Fertilizer Opener - 1

DRY FERTILIZER ATTACHMENT

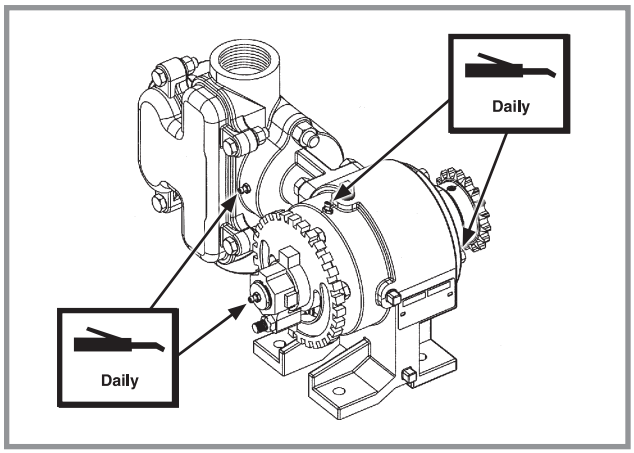


Fertilizer hopper - 4 per hopper

LIQUID FERTILIZER PISTON PUMP



Piston Pump -2
NOTE: Fill on outboard stuffing box until lubricant seeps out of drain hole in bottom.



Liquid Fertilizer Piston Pump - 4
NOTE: Fill on outboard stuffing box until lubricant seeps out of drain hole in bottom.

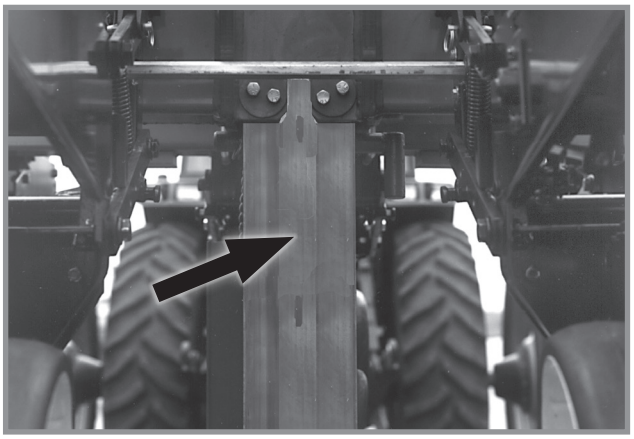
CENTER POST

NOTICE

Any oil or grease on center post and poly wear pads will attract dirt and accelerate wear. Do not lubricate center post and poly wear pads.

Center post is clad with stainless steel. Keep stainless steel surface clean and free of any lubrication to prolong service life.

See"Wear Pad Adjustment/Replacement" on page 6-25 for more information.



Center post

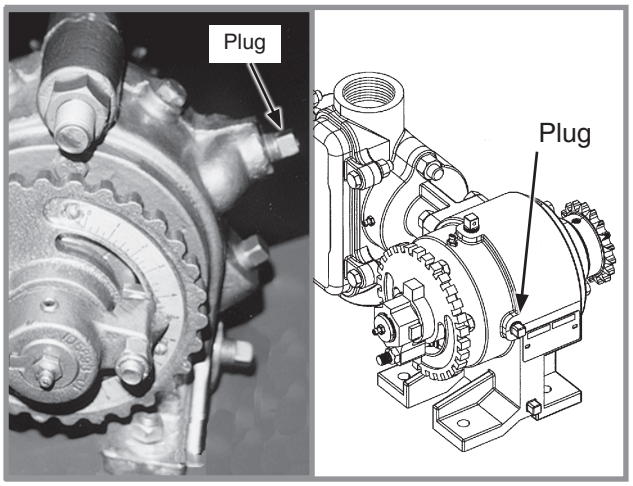
WHEEL BEARINGS

All drive, transport, and marker hub wheel bearings should be repacked annually and checked for wear.

1. Raise wheel off ground.
2. Check for bearing endplay by moving wheel side to side.
3. Rotate wheel to check for bearing roughness. If bearings sound rough, remove hub and inspect bearings.

NOTE: To repack wheel hubs, follow procedure outlined for wheel bearing replacement with exception that bearings and bearing cups are reused.

LIQUID FERTILIZER PISTON PUMP CRANKCASE OIL LEVEL



Piston pump oil fill plug location

Check crankcase oil daily and maintain at plug level. Fill as needed with EP 90W gear oil. Total oil capacity is approximately ¾ pint.

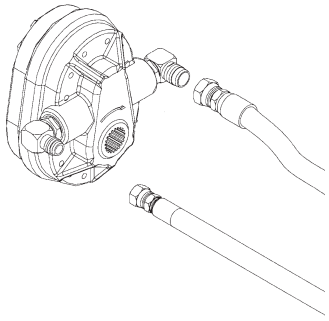
Refer to operator and instruction manual supplied with pump and flow divider for more information.

PTO PUMP SHAFT COUPLING (PTO PUMP DRIVE AND OIL COOLER OPTION)

NOTE: Clean and grease PTO shaft coupling each time pump is installed.

NOTE: Apply coating of high-speed industrial coupling grease, such as Chevron® Coupling Grease, that meets AGMA CG-1 and CG-2 Standards to extend shaft spline life.

Chevron® trademark is owned by Chevron Products Company. AGMA is the acronym for the American Gear Manufacturers Association.



1⅜"-21 spline PTO pump shown

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
¼"	50 in-lb	56 in-lb	76 in-lb	87 in-lb	9 ft-lb (~12 Nm)	10 ft-lb (~14 Nm)
5⁄16"	8 ft-lb (~11 Nm)	9 ft-lb (~12 Nm)	13 ft-lb (~18 Nm)	14 ft-lb (~19 Nm)	18 ft-lb (~24 Nm)	20 ft-lb (~27 Nm)
⅜"	15 ft-lb (~20 Nm)	17 ft-lb (~23 Nm)	23 ft-lb (~31 Nm)	26 ft-lb (~35 Nm)	33 ft-lb (~45 Nm)	37 ft-lb (~50 Nm)
7⁄16"	25 ft-lb (~34 Nm)	27 ft-lb (~37 Nm)	37 ft-lb (~50 Nm)	41 ft-lb (~56 Nm)	52 ft-lb (~71 Nm)	58 ft-lb (~79 Nm)
½"	35 ft-lb (~48 Nm)	40 ft-lb (~54 Nm)	57 ft-lb (~77 Nm)	64 ft-lb (~87 Nm)	80 ft-lb (~108 Nm)	90 ft-lb (~122 Nm)
9⁄16"	50 ft-lb (~68 Nm)	60 ft-lb (~81 Nm)	80 ft-lb (~108 Nm)	90 ft-lb (~122 Nm)	115 ft-lb (~156 Nm)	130 ft-lb (~176 Nm)
⅝"	70 ft-lb (~95 Nm)	80 ft-lb (~108 Nm)	110 ft-lb (~149 Nm)	125 ft-lb (~169 Nm)	160 ft-lb (~217 Nm)	180 ft-lb (~244 Nm)
¾"	130 ft-lb (~176 Nm)	145 ft-lb (~197 Nm)	200 ft-lb (~271 Nm)	220 ft-lb (~298 Nm)	280 ft-lb (~380 Nm)	315 ft-lb (~427 Nm)
⅞"	125 ft-lb (~169 Nm)	140 ft-lb (~190 Nm)	320 ft-lb (~434 Nm)	350 ft-lb (~475 Nm)	450 ft-lb (~610 Nm)	500 ft-lb (~678 Nm)
1"	190 ft-lb (~258 Nm)	205 ft-lb (~278 Nm)	480 ft-lb (~651 Nm)	530 ft-lb (~719 Nm)	675 ft-lb (~915 Nm)	750 ft-lb (~1017 Nm)
1⅛"	265 ft-lb (~359 Nm)	300 ft-lb (~407 Nm)	600 ft-lb (~814 Nm)	670 ft-lb (~908 Nm)	960 ft-lb (~1302 Nm)	1075 ft-lb (~1458 Nm)
1¼"	375 ft-lb (~508 Nm)	415 ft-lb (~563 Nm)	840 ft-lb (~1139 Nm)	930 ft-lb (~1261 Nm)	1360 ft-lb (~1844 Nm)	1500 ft-lb (~2034 Nm)
1⅜"	490 ft-lb (~664 Nm)	560 ft-lb (~759 Nm)	1100 ft-lb (~1491 Nm)	1250 ft-lb (~1695 Nm)	1780 ft-lb (~2413 Nm)	2030 ft-lb (~2752 Nm)
1½"	650 ft-lb (~881 Nm)	730 ft-lb (~990 Nm)	1450 ft-lb (~1966 Nm)	1650 ft-lb (~2237 Nm)	2307 ft-lb (~3128 Nm)	2670 ft-lb (~3620 Nm)

NOTE: Torque unplated hardware and bolts with lock nuts approximately ⅓ higher than above values. Torque bolts lubricated prior to installation to 70% of value shown in chart.

Torque Values - Pneumatic Down Pressure

Diameter	Torque Value
⅛" NPT	120 in-lb Maximum
½"-13	180 in-lb Maximum
¾"-16	180 in-lb Maximum

NOTE: Use these torque values with pneumatic down pressure components.

Special Torque Values & Instructions

Row unit parallel linkage bushing hardware	130 ft-lb (~176 Nm)
⅝" No till coulter spindle hardware	120 ft-lb (~162 Nm)
Transport/ground drive lug bolts	90 ft-lb (~122 Nm)
Vacuum/bulk fill fan impeller assembly to motor shaft ⅝"-18 hex jam nut (6 Row Only)	90 in-lb (~10 Nm)
Vacuum fan impeller assembly to motor shaft ⅝"-18 hex jam nut (8 Row Only)	50 ft-lb (~68 Nm)

Cylinder Rod Piston Retaining Nut Torque Chart

	Non-Nylock Nut	Nylock Nut
½"-20	55-70 ft-lb (~75-95 Nm)	45-55 ft-lb (~61-75 Nm)
¾"-16	115-125 ft-lb (~156-169 Nm)	100-115 ft-lb (~136-156 Nm)
⅞"-14	150-180 ft-lb (~203-244 Nm)	130-150 ft-lb (~176-203 Nm)
1"-14	275-330 ft-lb (~373-447 Nm)	250-275 ft-lb (~339-373 Nm)
1⅛"-12	300-375 ft-lb (~407-508 Nm)	275-300 ft-lb (~373-407 Nm)
1¼"-12	300-375 ft-lb (~407-508 Nm)	275-300 ft-lb (~373-407 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 explosions:

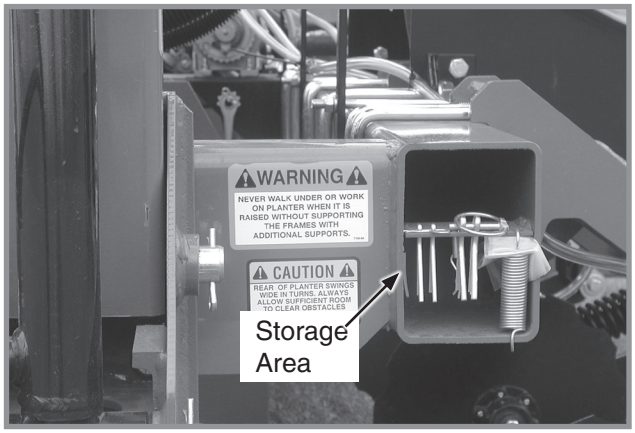
- Maintain proper tire pressure. Inflating a tire above or below the recommended pressure can cause tire damage.
- Mount tires only by properly trained personnel using proper equipment.
- Replace tires with cuts or bubbles. Replace damaged rims. Replace missing lug bolts and nuts.
- Do not weld or heat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

See “Tires Preparation” on page 2-2 for more information.

CHAIN TENSION ADJUSTMENT

Drive chains are equipped with spring loaded idlers and are self-adjusting. The only adjustment needed is to shorten the chains if wear stretches the chains and reduces spring tension. The pivot point of these idlers should be checked periodically to ensure they rotate freely. See "Wrap Spring Wrench Assembly" on page 6-1 'for more information.

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



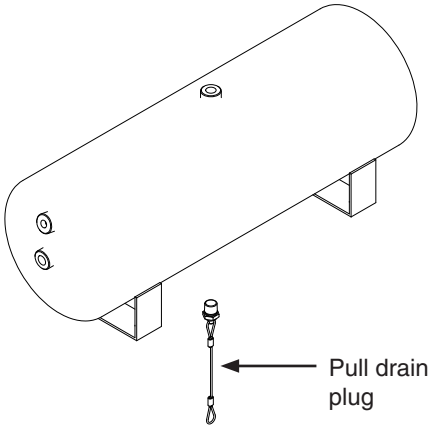
Spare chain link storage

PNEUMATIC DOWN PRESSURE AIR COMPRESSOR TANK

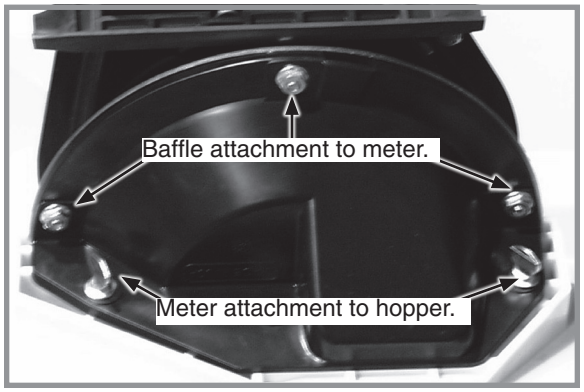
Moisture should be drained daily from the tank. Tank should be drained completely for storage.

To drain tank, locate drain plug on the bottom of tank. Stand off to the side of tank and pull cable attached to drain.

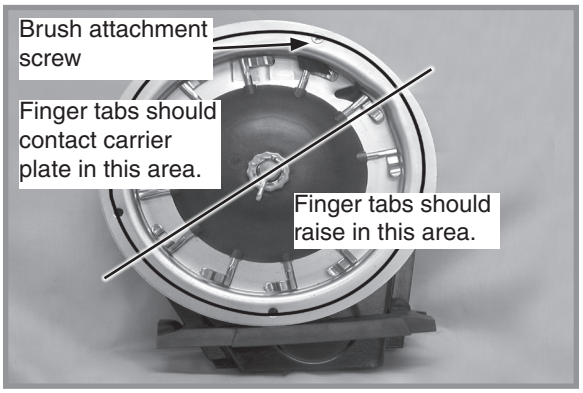
NOTE: If mositure is not drained from tank rust particles will form inside tank.



FINGER PICKUP SEED METER INSPECTION/ADJUSTMENT

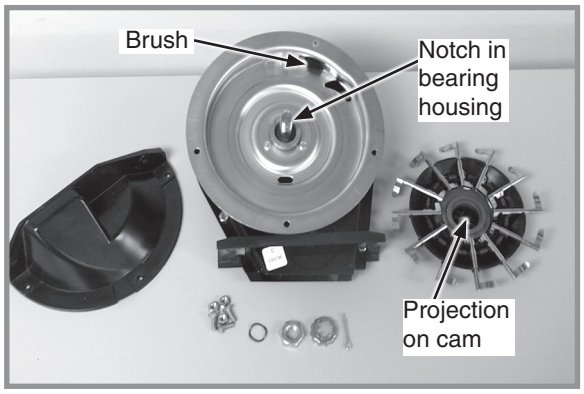


Removing meter and baffle

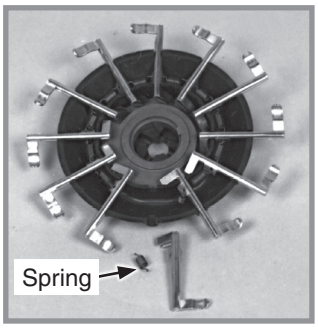


Proper finger operation

1. Remove two thumbscrews and meter from seed hopper and remove three cap screws and baffle from meter assembly.
2. Rotate seed meter drive by hand to ensure springs are holding tabs of fingers against carrier plat and fingers raise in correct area as shown in above photo.



Finger pickup meter parts



Corn Finger Assembly (Position Spring Opening Toward Holder)

Oil Sunflower Finger Assembly

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 with fingers and cam off shaft and clean.
3. Check brush for wear and replace if necessary or after every 100 acres (~41 hectares) per row of operation (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.

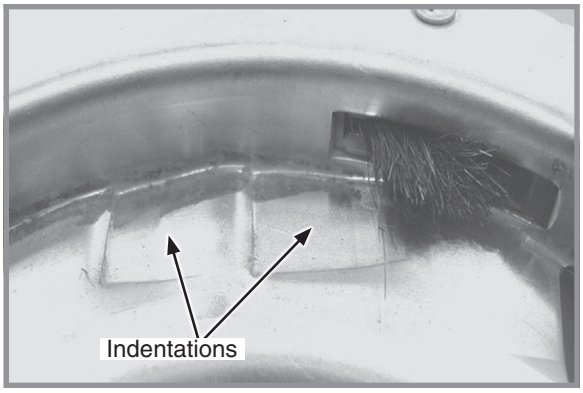
4. Remove springs from fingers and remove finger from holder by lifting it out of friction fit slot. Life expectancy of these parts is about 600-900 acres (~243-364 hectares) per row of operation under average conditions.
5. Reassemble meter in reverse order after cleaning and replacing defective parts. Make sure open end of spring loop is toward inside of finger holder when replacing fingers.
6. Install fingers 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.

7. Check indentations on carrier plate for wear before installing finger holder on carrier plate. Excessive wear of carrier plate at indentations will cause over planting especially with 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. Install wave washer and adjusting nut with finger holder flush against carrier. Tighten adjusting nut to fully compress wave washer. Back off nut ½ to 2 flats to obtain rolling torque of 22 to 25 inch pounds (~2,5 Nm to 2,8 Nm).

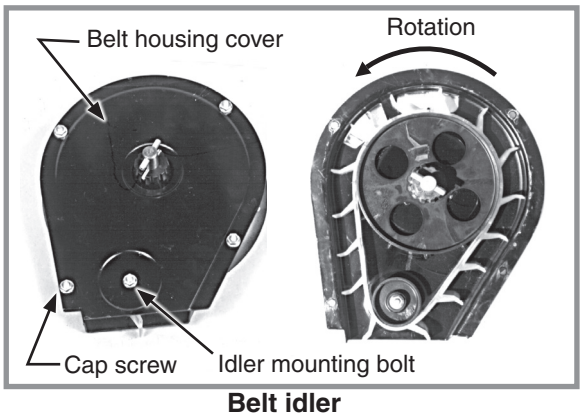
9. Turn finger holder by hand to make sure it is firmly against carrier plate, but can be rotated with moderate force.

10. Install cover nut and cotter pin. Reinstall baffle.

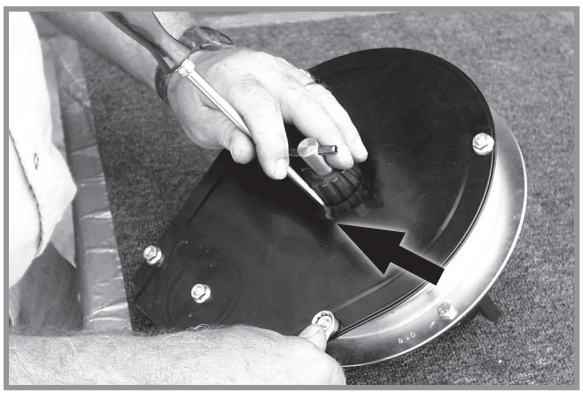


Worn carrier plate

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



Belt idler



Centering belt housing cover

Remove four cap screws around edge of housing cover and nut from belt idler mounting bolt. Paddles must be correctly oriented as shown above If belt is replaced. A diagram molded into drive sprocket shows correct orientation.

NOTICE

Do not over-tighten hardware or components may be damaged.

Reinstall housing cover. DO NOT TIGHTEN hardware. Wedge a screwdriver between sprocket hub and housing cover as shown above. Pry cover down until centered on belt housing and tighten hardware. Rotate meter drive shaft and check idler alignment. Seed belt should “run” centered on idler or with only slight contact with belt housing or cover.

CLEANING FINGER PICKUP SEED METER FOR STORAGE

1. Disassemble meter and blow out any foreign material.

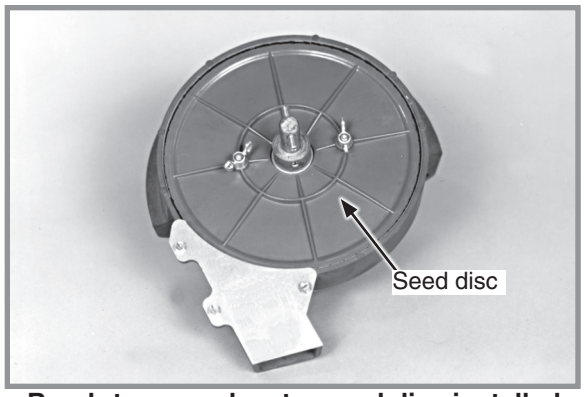
2. Wash ONLY in mild soap and water. Do not use gasoline, kerosene, or any other petroleum based product. Dry thoroughly.

3. Coat lightly with a rust inhibiter.

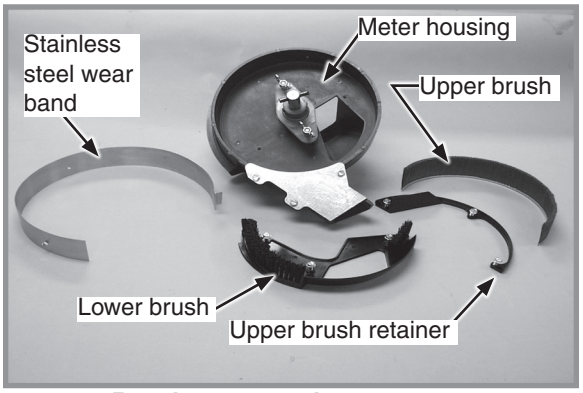
4. Rotate finger assembly so finger does not touch brush.

5. Reassemble and store in a dry, rodent-free location.

BRUSH-TYPE SEED METER MAINTENANCE



Brush-type seed meter seed disc installed

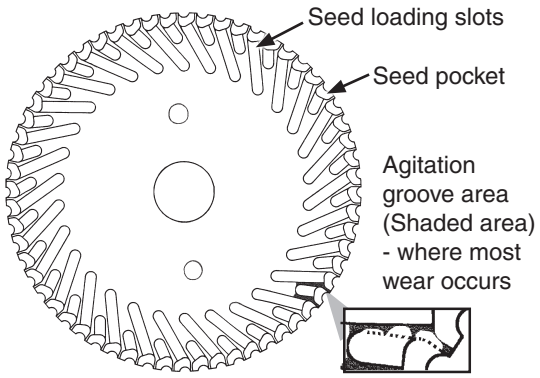


Brush-type seed meter parts

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.

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" (~0,8 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 (~41 hectares) per row.

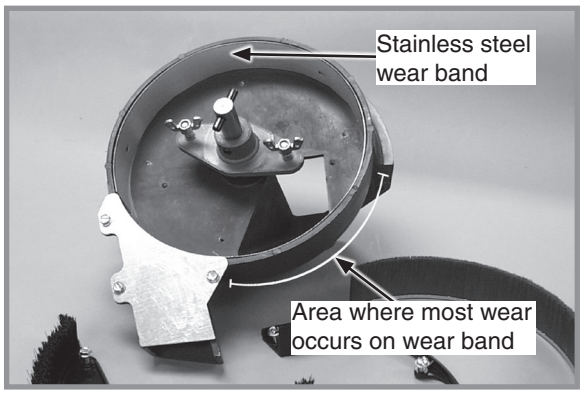


STAINLESS STEEL WEAR BAND

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" (~8 mm) thick. Replace wear band when there is approximately .020" (~0,5 mm) of wear in primary wear area. Estimated life expectancy of stainless steel wear band is 240-800 acres (~97-324 hectares) per row.

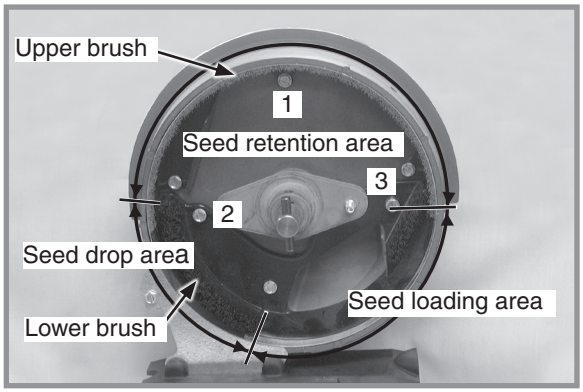


Stainless steel wear band

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. 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 screws in sequence shown in photo at right.



Upper brush installation

NOTE: Use GD11122 upper brush retainer for soybean and cotton discs. Use GD8237 upper brush retainer for milo/grain sorghum discs.

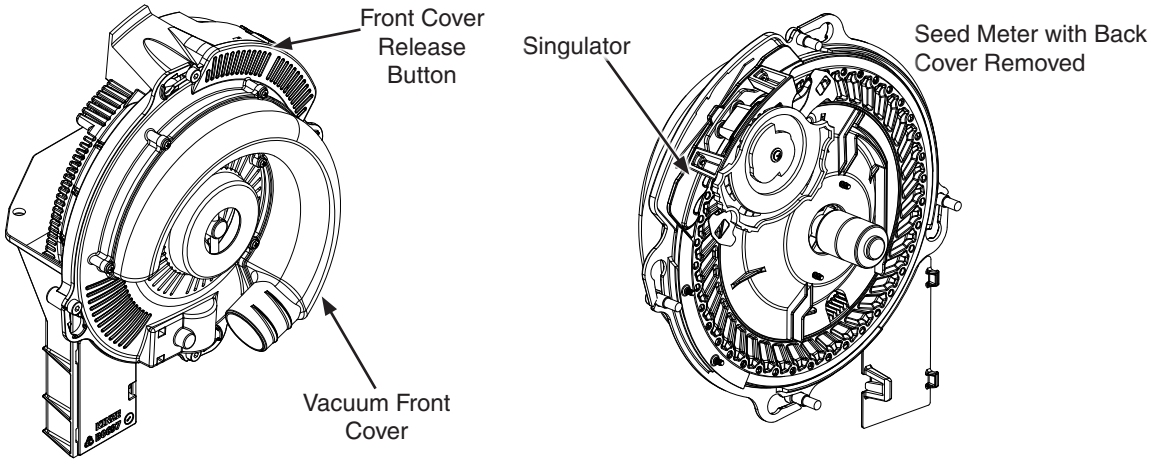
LOWER BRUSH

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.

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 three hex head screws from brush retainer. Remove brush retainer and upper brush.
4. Remove three hex head screws from lower brush. 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.

VACUUM SEED METER MAINTENANCE



Before each planting season inspect seed discs and singulator and clean or replace as needed.

Use clean, high quality seed for maximum meter accuracy. Damaged or cracked seed, hulls, and foreign material may become lodged in seed disc orifices and greatly reduce meter accuracy.

Inspect and clean seed discs daily checking for any buildup of foreign material and blocked orifices. If seed disc orifices are plugged frequently with seed remnants, remants ejector wheel may need to be replaced. Clean seed disc by washing it with soap and water. Dry thoroughly.

Inspect singulator blades and guide for wear after every 200 acres (~81 hectares) per row of operation. If adjustment of singulator blade does not affect meter performance or if blades appear worn, singulator blade may need to be replaced.

Replace seed disc or vacuum seal if abnormally high vacuum is required or if consistent operation cannot be achieved.

See “Preparing Planter for Storage” on page 6-30 for additional Vacuum Seed Metering System maintenance.

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

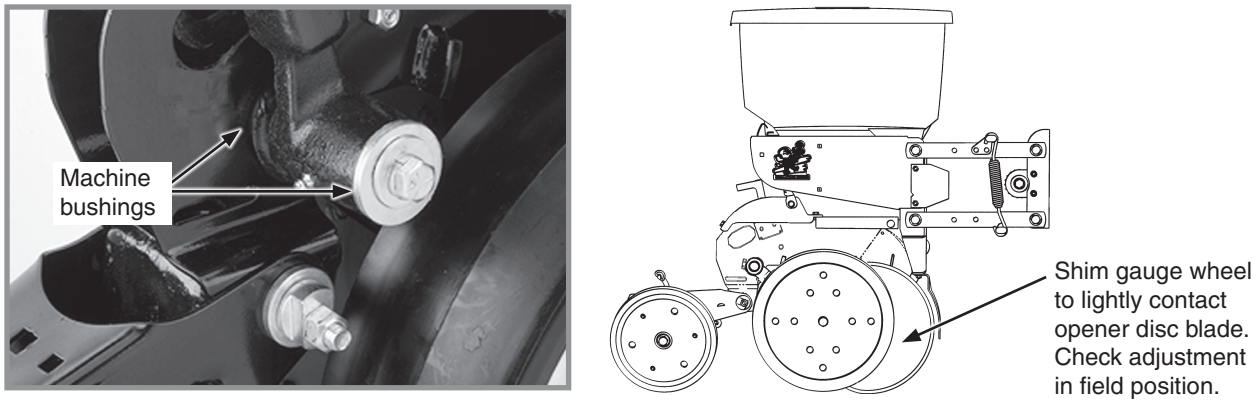
SEED METER CLEANOUT

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. Lay hopper on its right side. Push release button and rotate seed meter vacuum cover clockwise to align keyhole slots with bolt heads. Lift off cover.
4. Rotate seed disc hub clockwise to unlock and remove seed disc.
5. Empty meter.
6. Thoroughly inspect meter to ensure all seed is removed.
7. Replace seed disc. Install vacuum cover.

GAUGE WHEEL ADJUSTMENT



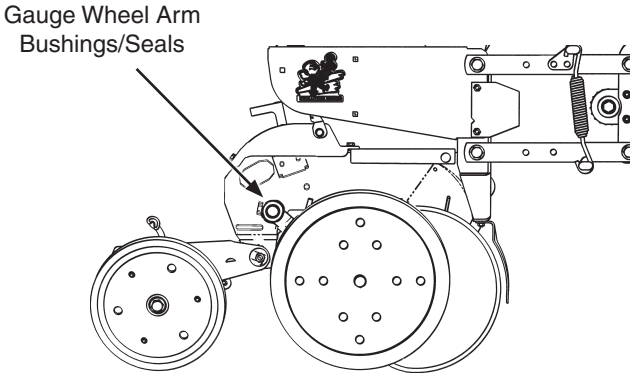
Gauge wheel adjustment

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.

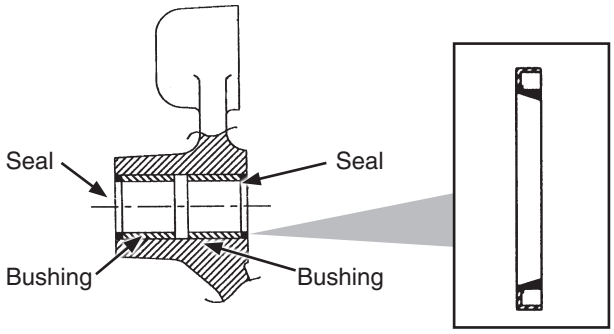
NOTE: It may be desirable to space gauge wheel further from blade when operating in sticky soils.

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.

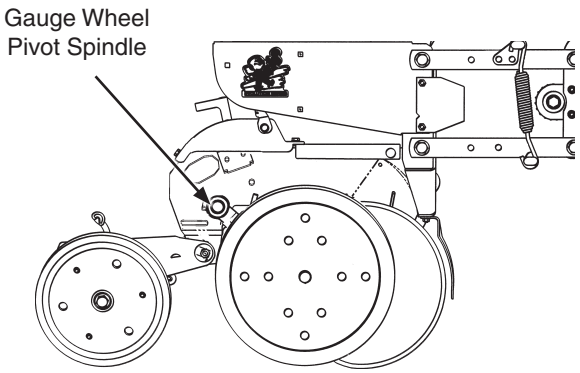
NOTE: Use extra care to protect the sealing lip during installation. Apply uniform pressure to assemble the seal into the bore of the arm. Never apply a direct hammer blow to the seal surface.

7. Inspect gauge wheel pivot spindle.
8. Reinstall gauge wheel arm assembly and gauge wheel.

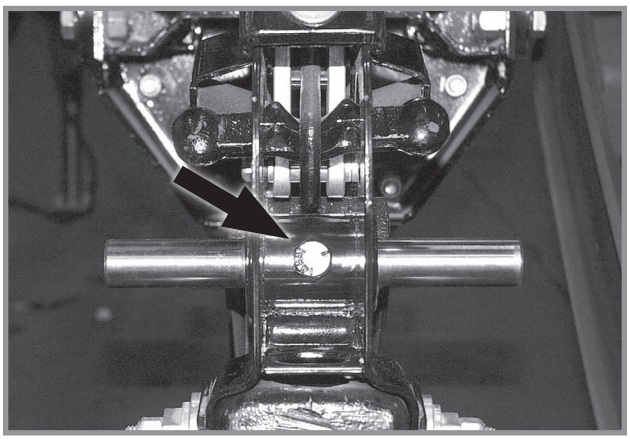
NOTE: Use special machine bushing between gauge wheel arm and gauge wheel.

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

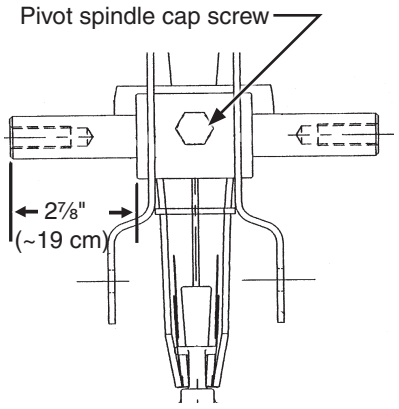
GAUGE WHEEL ARM PIVOT SPINDLE REPLACEMENT



1. Remove gauge wheel and arm assemblies from shank assembly.
2. Remove ½" x ¾" 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 ½" x ¾" 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.

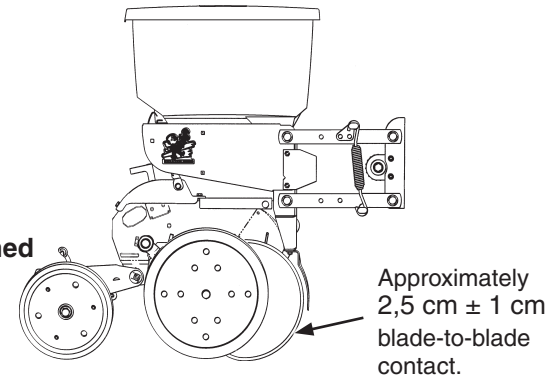
15" SEED OPENER DISC BLADE/BEARING ASSEMBLY

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 N) at outer edge of blade.

Maintain approximately 1" ± ½" (~2.5 ± 1 cm) of blade-to-blade contact 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" ± ½" (~2,5 ± 1 cm) of contact.

NOTE: Proper blade clearance is critical. Blades should have 1" ± ½" (~2,5 ± 1 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: Replace blades If proper blade-to-blade contact cannot be maintained after relocating machine bushings or if blade diameter wears below 14½" (~37 cm).

REPLACE DISC BLADE/BEARING ASSEMBLY

NOTE: Only bearing may need to be replaced if there is excessive endplay or if bearing sounds or feels rough when disc blade is rotated.

1. Remove gauge wheel, scraper, and bearing dust cap.
2. Remove cap screw, washer and disc blade/bearing assembly. Machine bushings between shank and disc blade are used to maintain approximate 1" ± ½" (~2,5 ± 1 cm) of blade-to-blade contact.

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.**

3. Install machine bushing(s), new disc blade bearing assembly, washer and cap screw. Torque ⅝"-11 Grade 5 cap screw to 110 ft-lb (~149 Nm).

NOTE: Replace disc blades only with disc blades of equal thickness.

4. Install bearing dust cap, scraper, and gauge wheel.

REPLACE BEARING ONLY

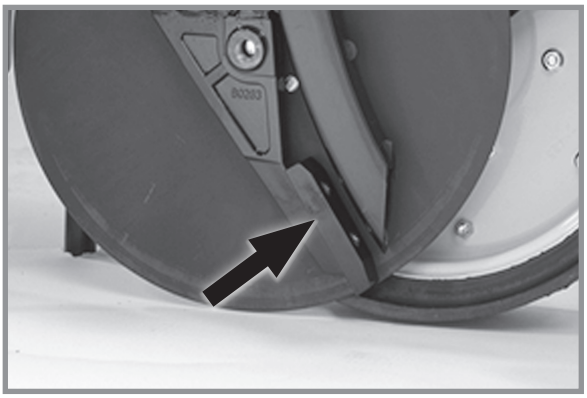
1. Remove gauge wheel, scraper, bearing cap, cap screw, washer and disc blade/bearing assembly.
2. Remove ¼" rivets from bearing housing to expose bearing.
3. Installing new bearing. install three evenly spaced ¼" cap screws into three of six holes in bearing housing to hold bearing and bearing housing in place. Install rivets in other three holes. Remove ¼" cap screws and install rivets in those three holes.
4. Reinstall disc blade/bearing assembly, washer and cap screw. Torque ⅝"-11 cap screw to 110 ft-lb (~149 Nm).
5. Install bearing dust cap, 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 5⁄8" (~16 mm) or less at lower end. A new seed tube guard measures approximately 7⁄8" (~22 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.



Seed tube guard/inner scraper (Gauge wheel/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.

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.

ROW UNIT MOUNTED NO TILL COULTER

(One sleeve for coulter mounted residue wheels)

Check nuts and hardware periodically for proper torque.

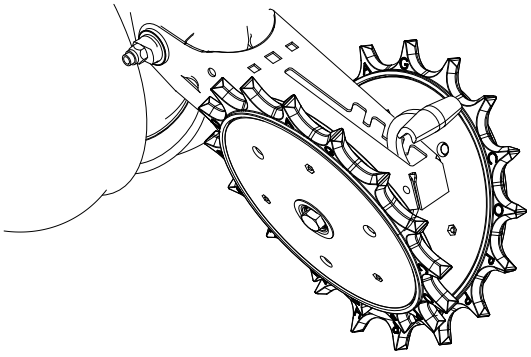
NOTE: Torque ⅝" spindle hardware to 120 ft-lb (~162 Nm).

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).

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.

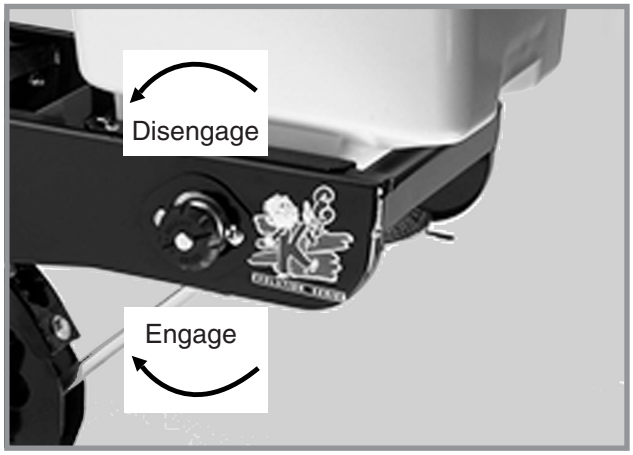


Row Unit Spiked Closing Wheel

GRANULAR CHEMICAL ATTACHMENT

Before storing planter, disengage granular chemical drive by rotating throwout knob ¼ 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.

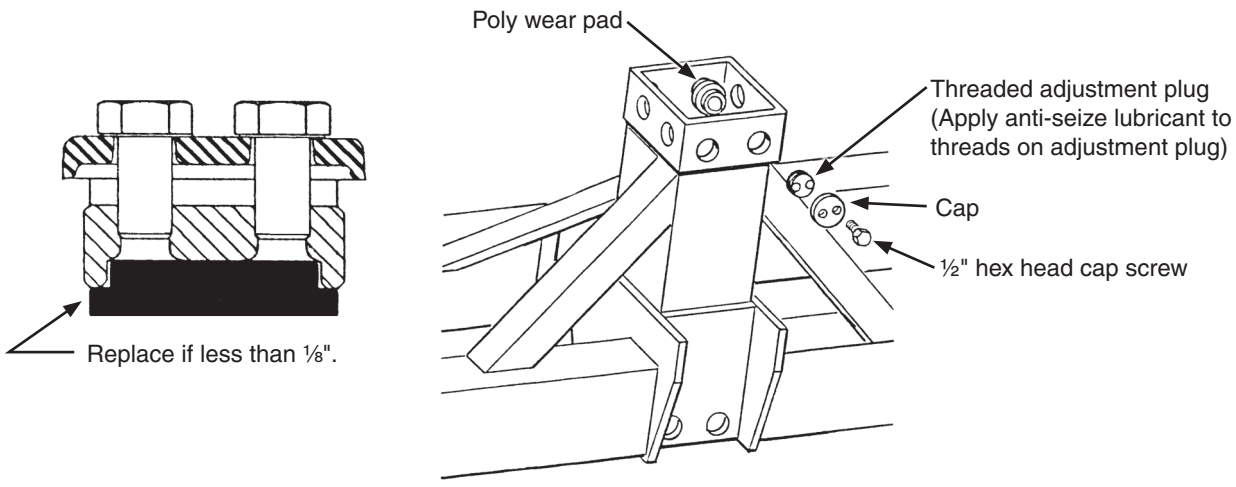
Install hoppers and chains. Check chain alignment.



COULTER MOUNTED RESIDUE WHEELS

Wheel hubs are equipped with sealed bearings. If bearings sound or feel rough when wheel is rotated, replace them.

WEAR PAD ADJUSTMENT/REPLACEMENT



Planter center section consists of a steel tubular frame and 16 adjustable wear pad assemblies that travel up and down against a stainless steel clad center post. Each adjustable wear pad assembly consists of a poly wear pad, threaded adjustment plug, and cap. Assembly is held in place by the threaded adjustment plug and locked in place by the cap and two ½" hex head cap screws.

Check pad adjustment and wear annually on all wear pad assemblies.

1. Support frame with appropriate weight-rated safety stands at a comfortable working height with all row units off ground.

2. Level planter frame side to side and front to rear. with planter axle.

3. Remove two ½" hex head cap screws and cap. Reinstall hex head cap screws into adjustment pad and remove threaded adjustment plug and poly wear pad using hex head cap screws as a handle.

4. Replace poly wear pad if worn to less than ⅛".

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.

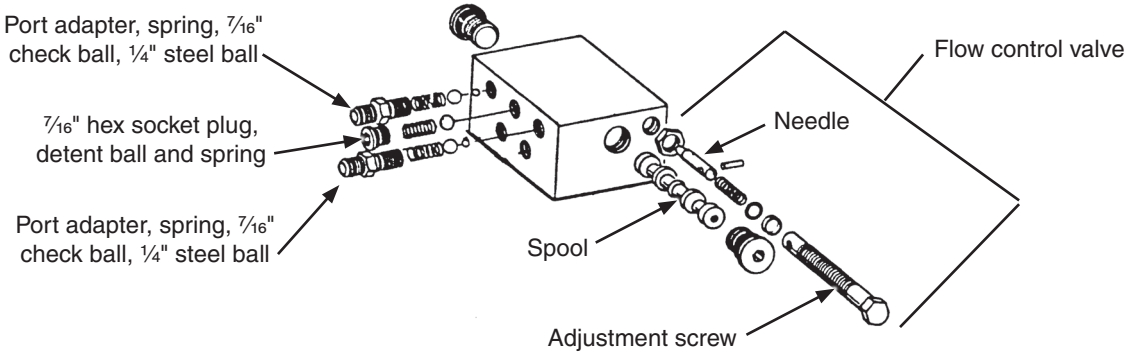
5. Apply anti-seize lubricant to threads of adjustment plug ONLY. Hand tighten poly wear pad and adjustment plug until poly wear pad lightly contacts stainless steel clad center post. Maximum allowable gap is no more than .060".

6. Install cap with two ½" cap screws. Torque cap screws to 25-30 ft-lb (~34 - 41 Nm).

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.

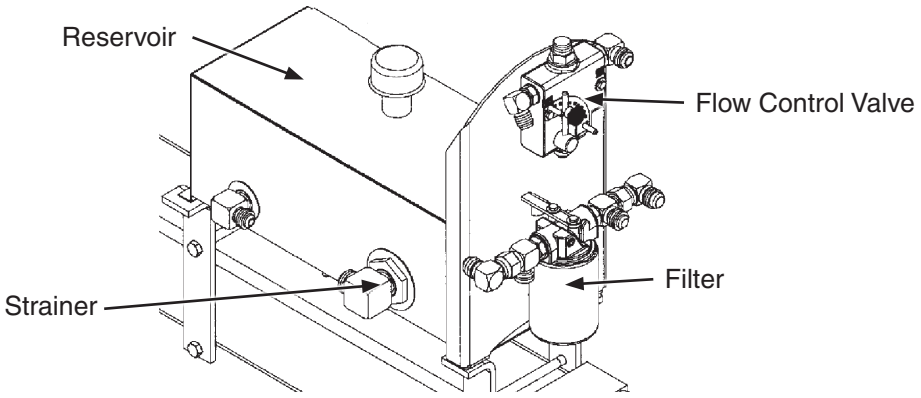
5. Lubricate spool with a light oil and reinstall. Check spool moves freely in valve body.

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.

PTO PUMP DRIVE AND OIL COOLER OPTION



Drain reservoir, clean strainer and change filter annually.

1. Disconnect suction line (hose between reservoir and pump) from reservoir and drain. To fully drain tank, raise planter to field raised position.

2. Replace filter with good quality 10 micron filter.

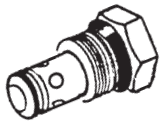
3. Fill system with multigrade wide temperature range transmission hydraulic fluid. Reservoir capacity is approximately 10 gallons (38 l). See “OIL specification” on page 2-10 for more information.

4. Start system and run with tractor at idle and fan turned off for 1-2 minutes. Switch fan to full speed and run with tractor at idle for 1-2 minutes.

5. Check reservoir fluid level and fill as required. Hydraulic fluid level should be within 1"-2" (~3 cm - 5 cm) from top of reservoir after pump has run and hydraulic hoses have been primed to allow fluid to expand when heated.

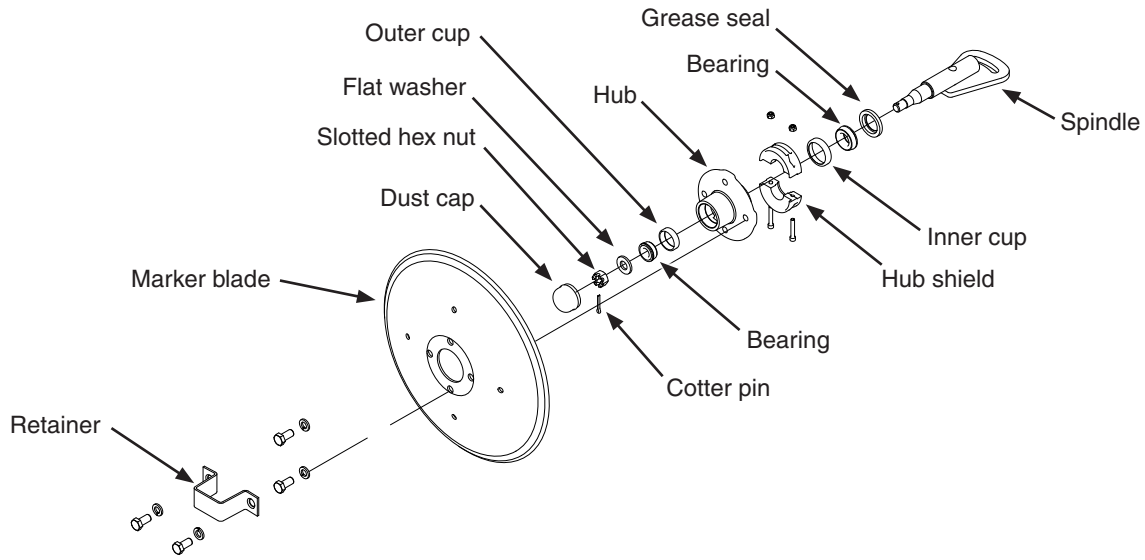
6. Bring tractor to PTO speed and adjust flow control to the desired vacuum level using the flow control valve lever.

CHECK VALVE INSPECTION
(In valve block below vacuum fan motor assembly)



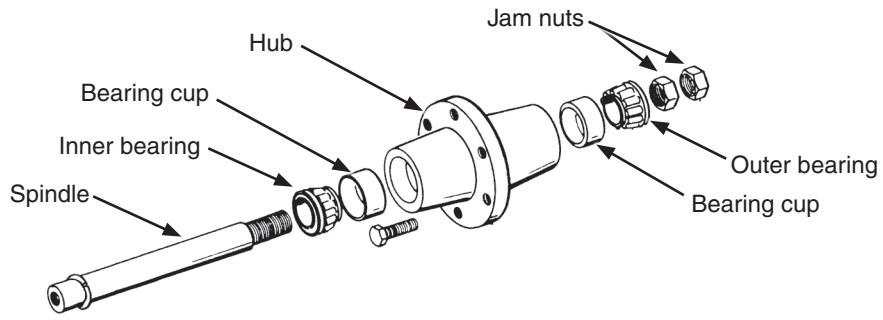
Check valve return prevents reverse operation of vacuum fan motor. Remove and check for foreign material or if O-ring is leaking internally. Clean or replace if defective.

ROW MARKER BEARING LUBRICATION OR REPLACEMENT



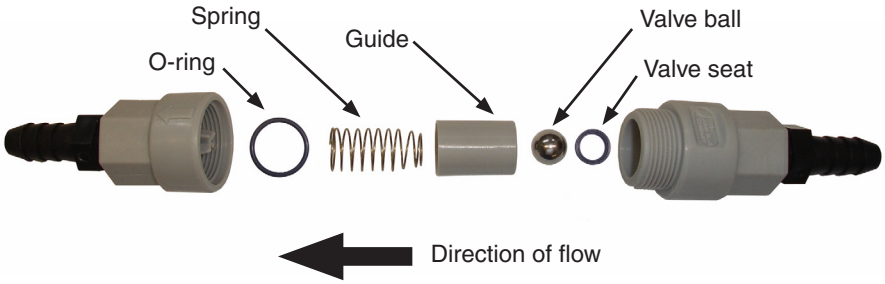
1. Remove retainer and marker blade.
2. Remove dust cap from hub.
2. Remove hub shield. Note direction of installation.
3. Remove cotter pin, slotted hex nut, and washer.
4. Slide hub from spindle.
5. Remove bearings and cups and discard if bearings are being replaced. Clean hub and dry. Remove bearings 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 ¾ 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

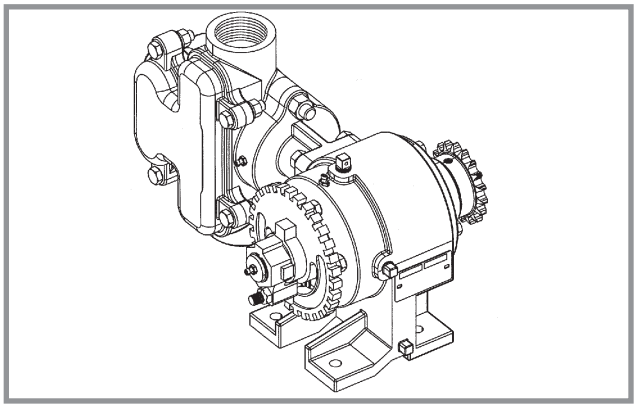


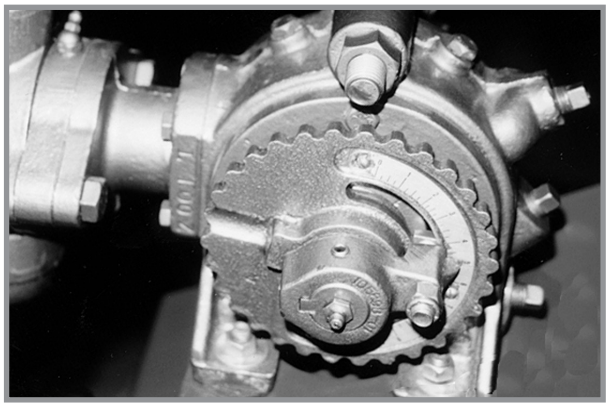
1. Raise tire clear of ground and remove wheel.
2. Remove double jam nuts and slide hub from spindle.
3. Remove bearings and cups and discard if bearings are being replaced. Clean hub and dry. Remove bearings only and not cups if repacking.
4. Press in new bearing cups with thickest edge facing in. (Bearing 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 ¼ 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. Reasemble 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.

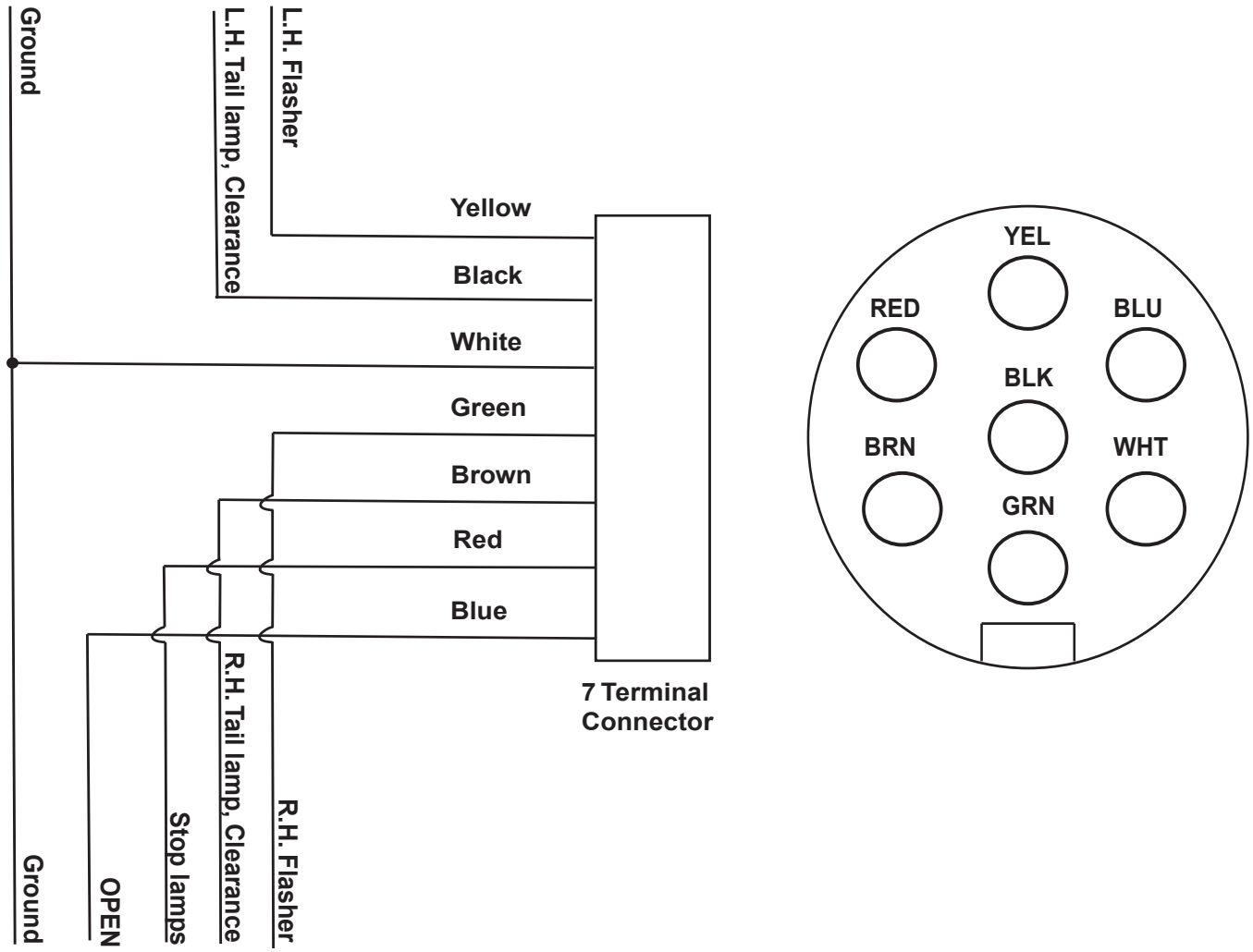
1. Flush pump with 5 to 10 gallons (~19 to 38 liters) of fresh water and circulate until all corrosive salts are dissolved in pump.

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.

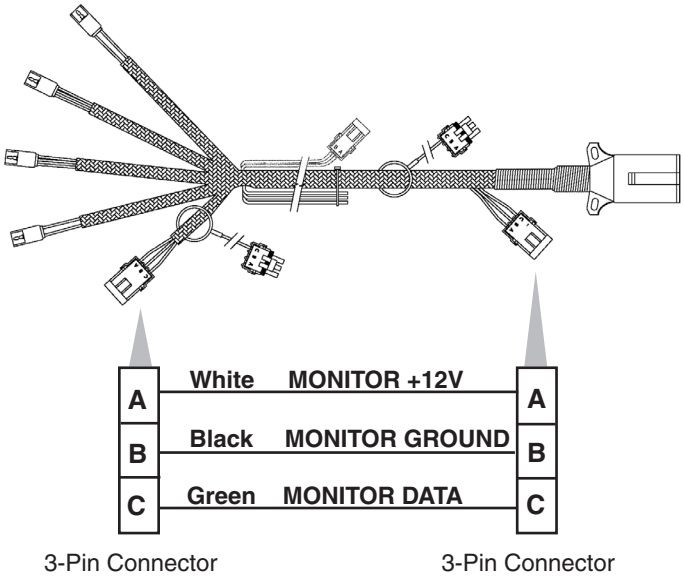
PREPARING PLANTER FOR STORAGE

- Store planter in a dry sheltered area if possible.
- 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 meets ISO 1724 Standards. For correct wiring harness to be wired into lights on your tractor, check with tractor manufacturer.

HYDRAULIC HOSE LIFE

WARNING

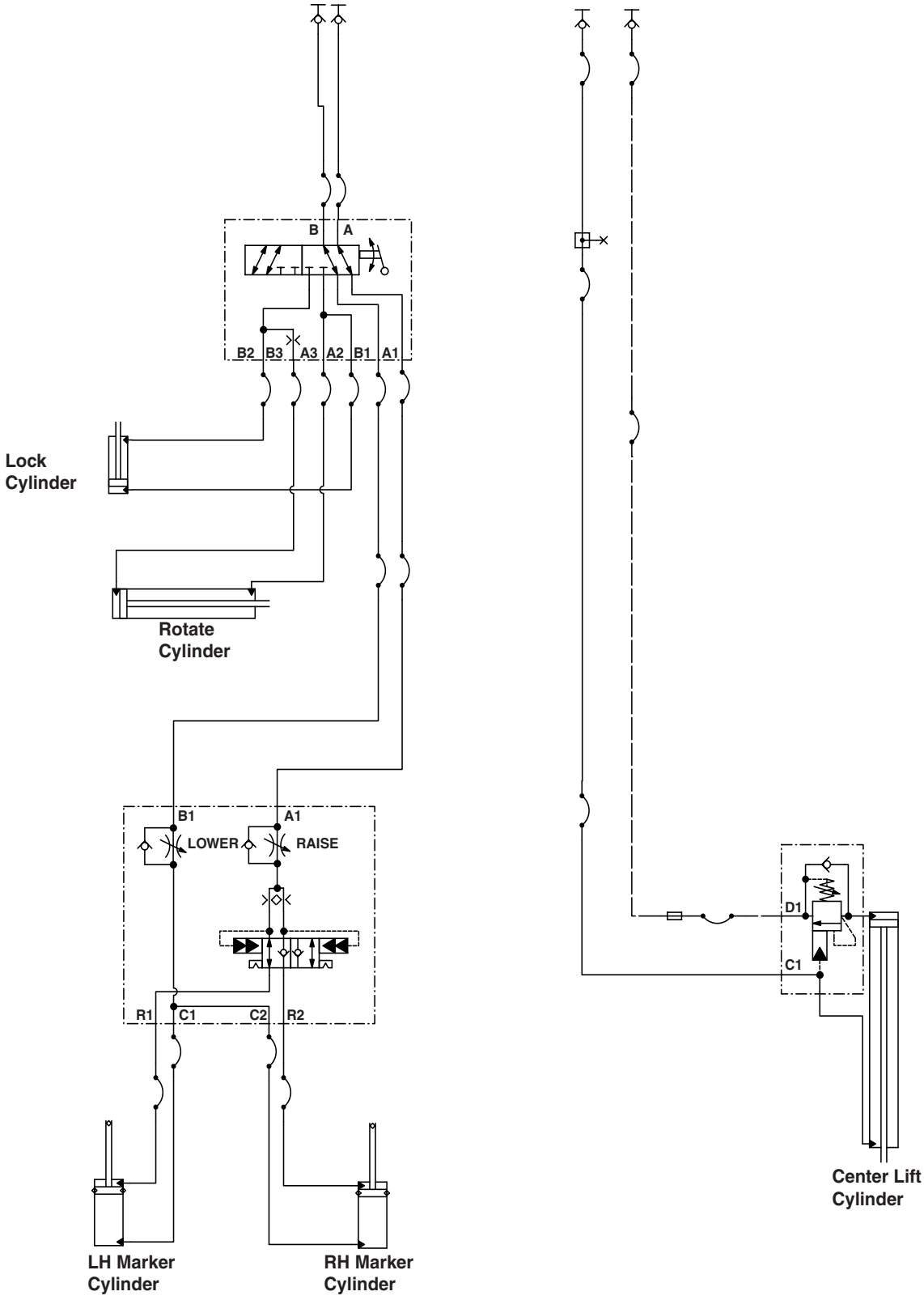
Pressurized hydraulic fluid can penetrate body tissue and result in death, serious infection, or other injuries. Fluid injected under skin must be IMMEDIATELY removed by a surgeon familiar with this type of injury. Make sure connections are tight and hoses and fittings are not damaged before applying 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.

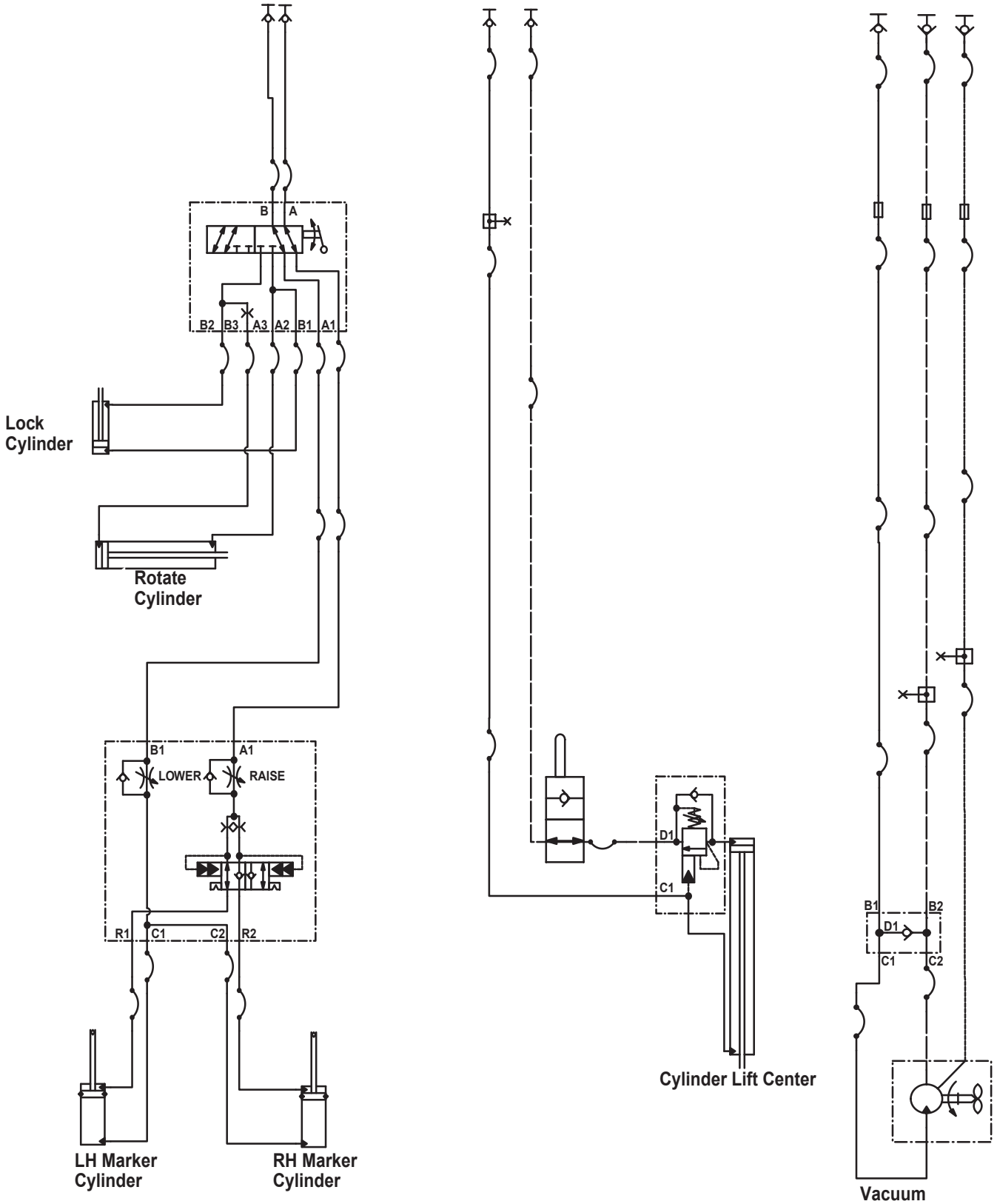
- Store in a clean, cool and dry area
- Avoid direct sunlight or moisture
- Do not store near high power electrical equipment
- Avoid contact with corrosive chemicals
- Avoid ultraviolet light
- Avoid areas with obvious signs of insects or rodents

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.

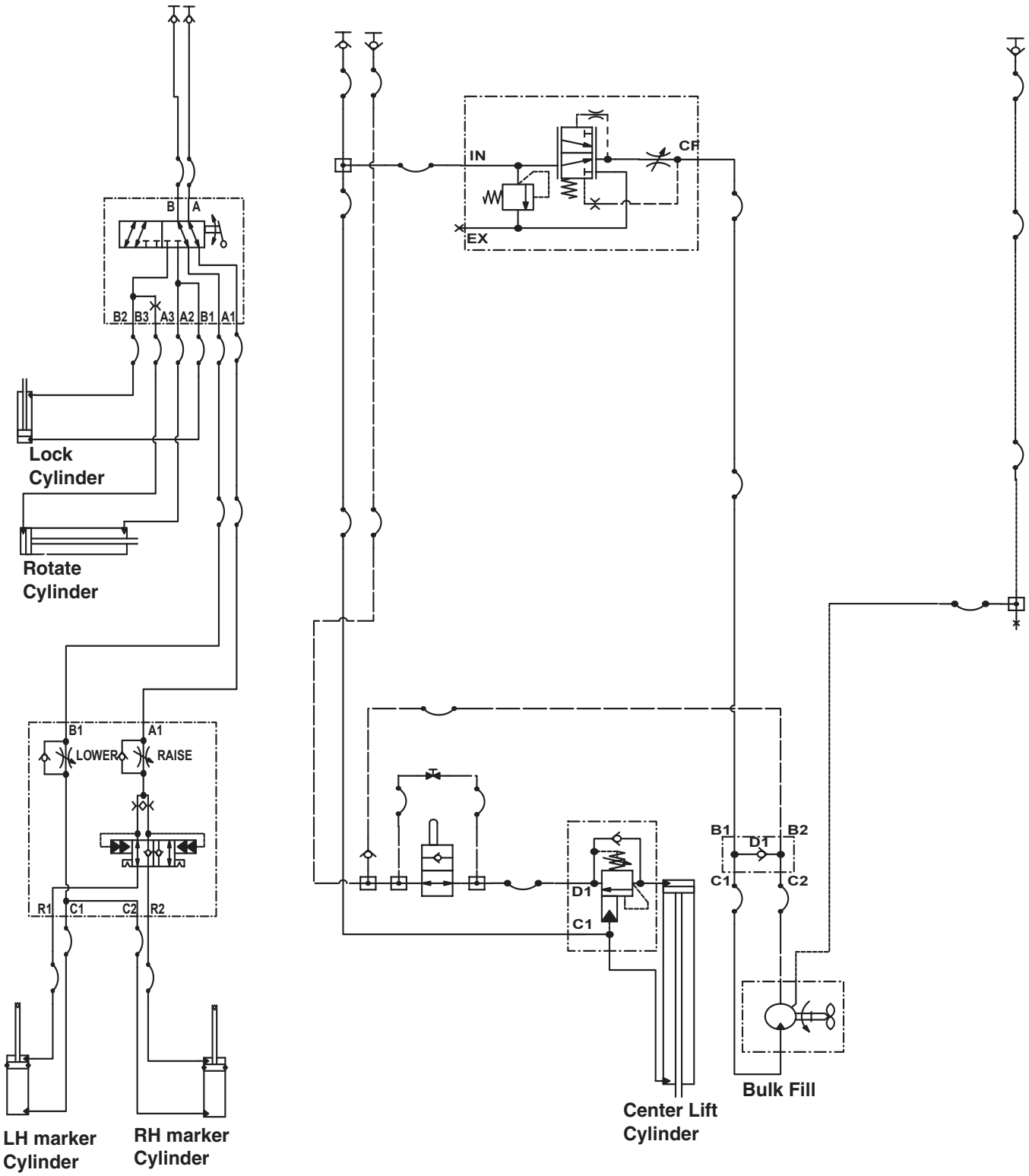
MECHANICAL PLANTER HYDRAULIC SYSTEM



VACUUM PLANTER HYDRAULIC SYSTEM



BULK FILLHYDRAULIC SYSTEM



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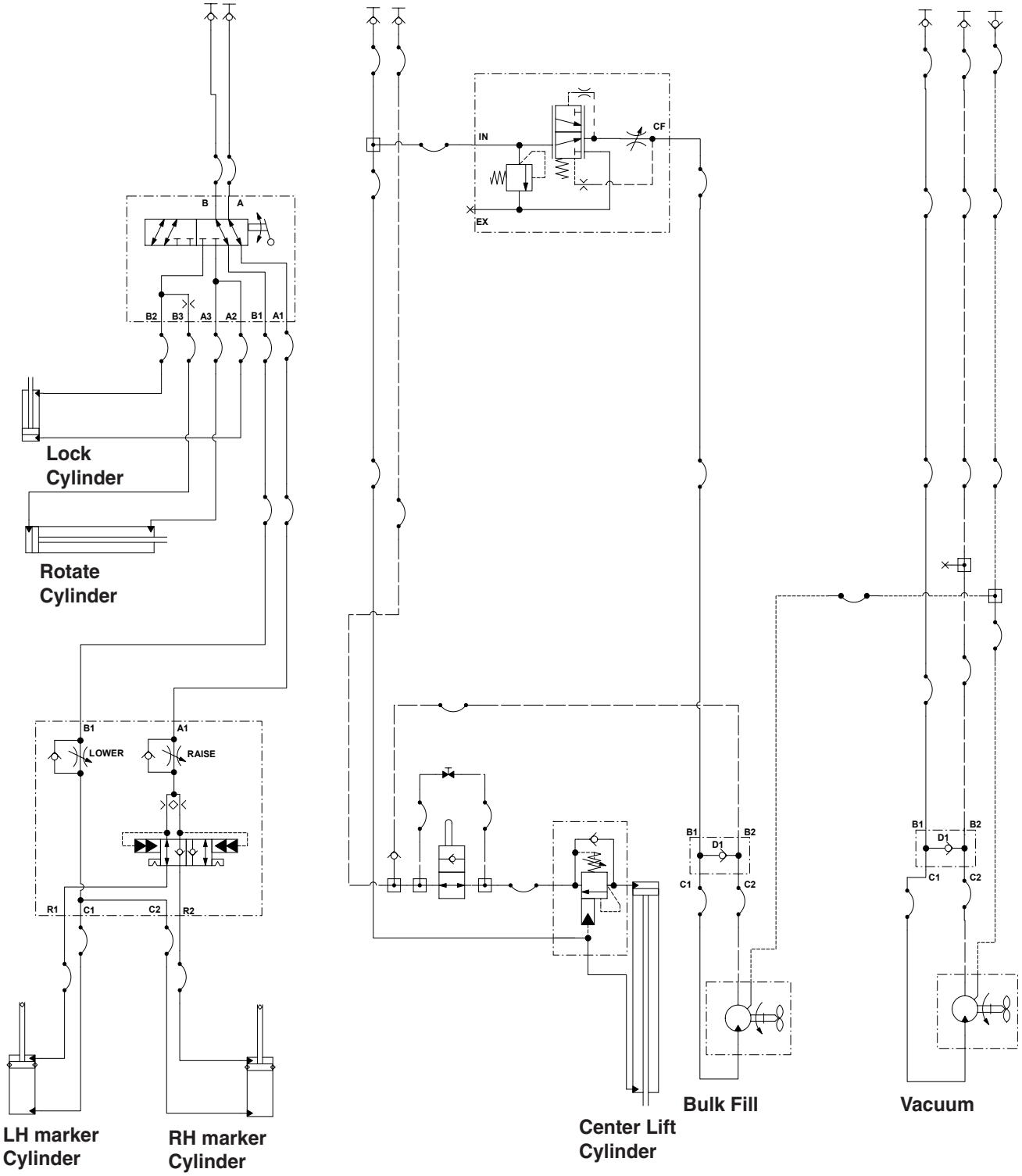
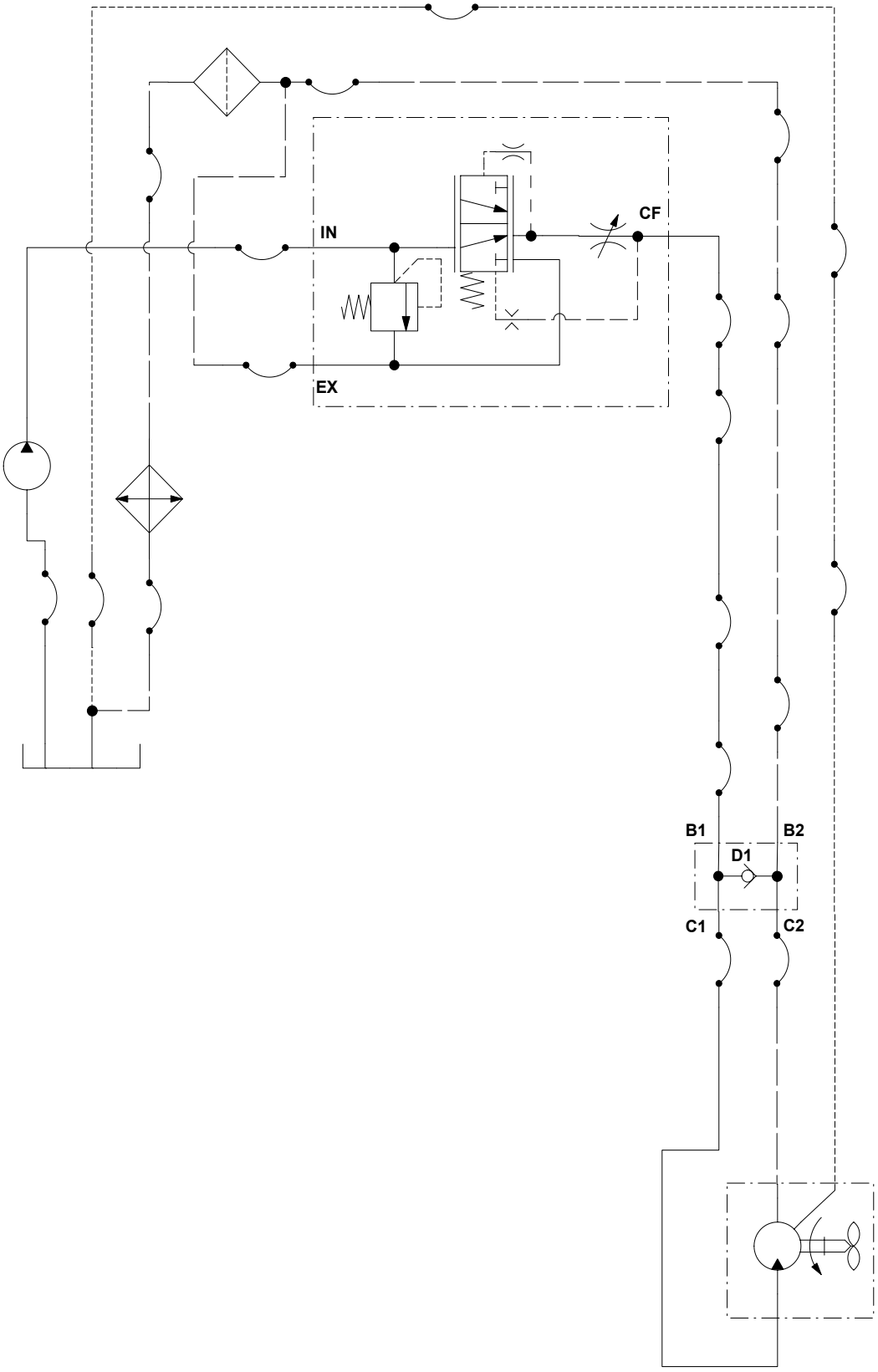
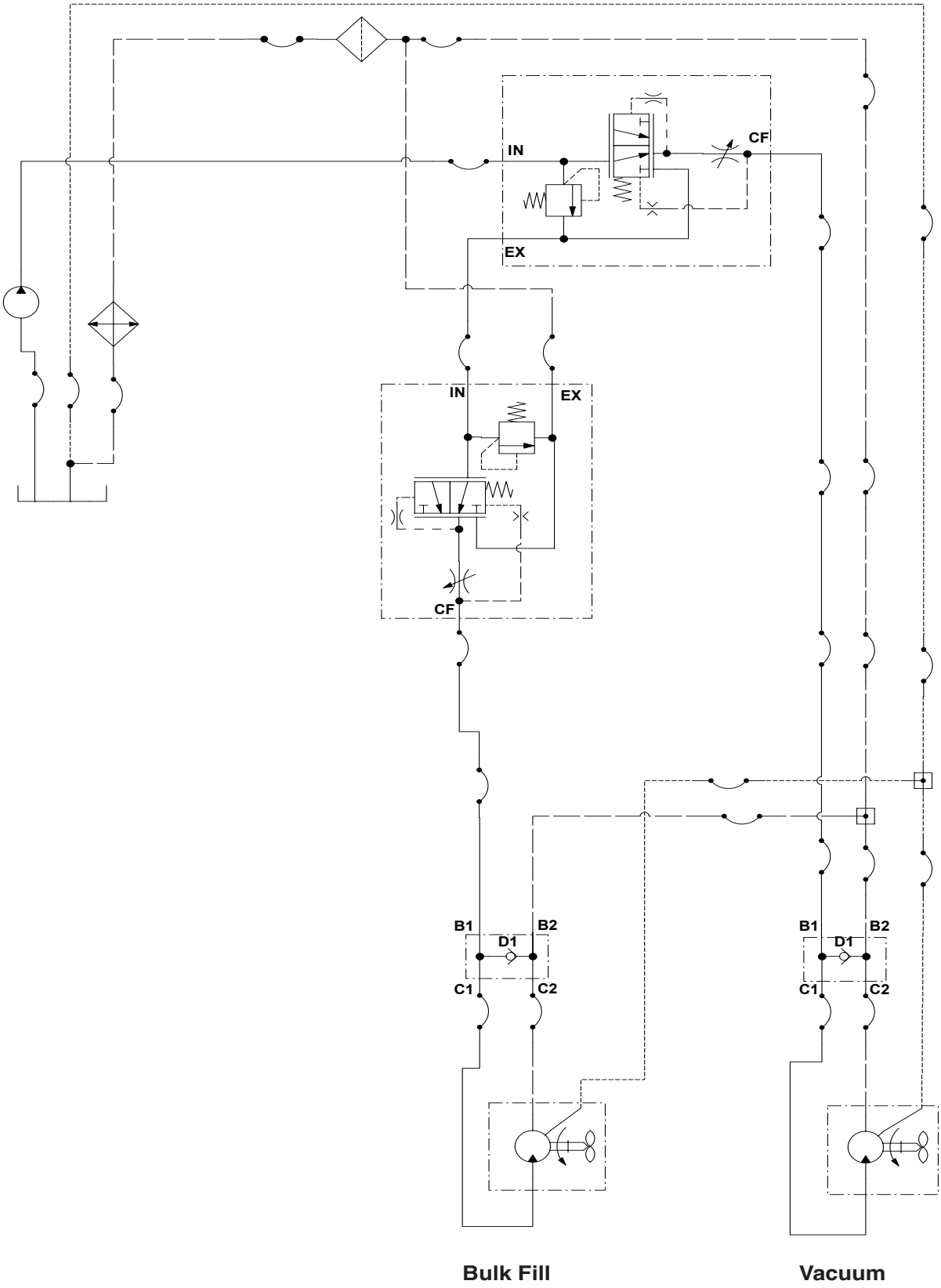


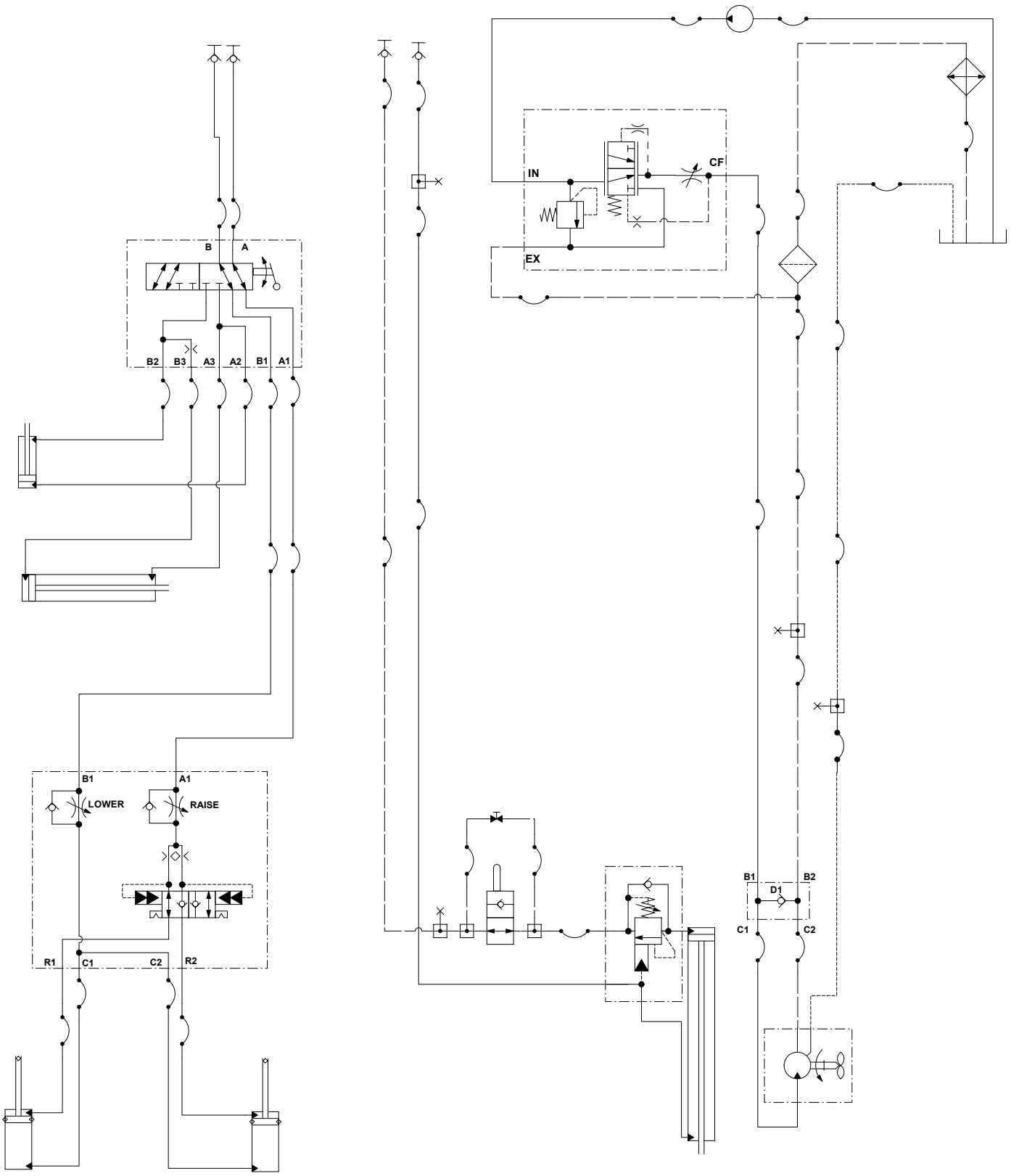
VACUUM PLANTER WITH PTO OPTION HYDRAULIC SYSTEM



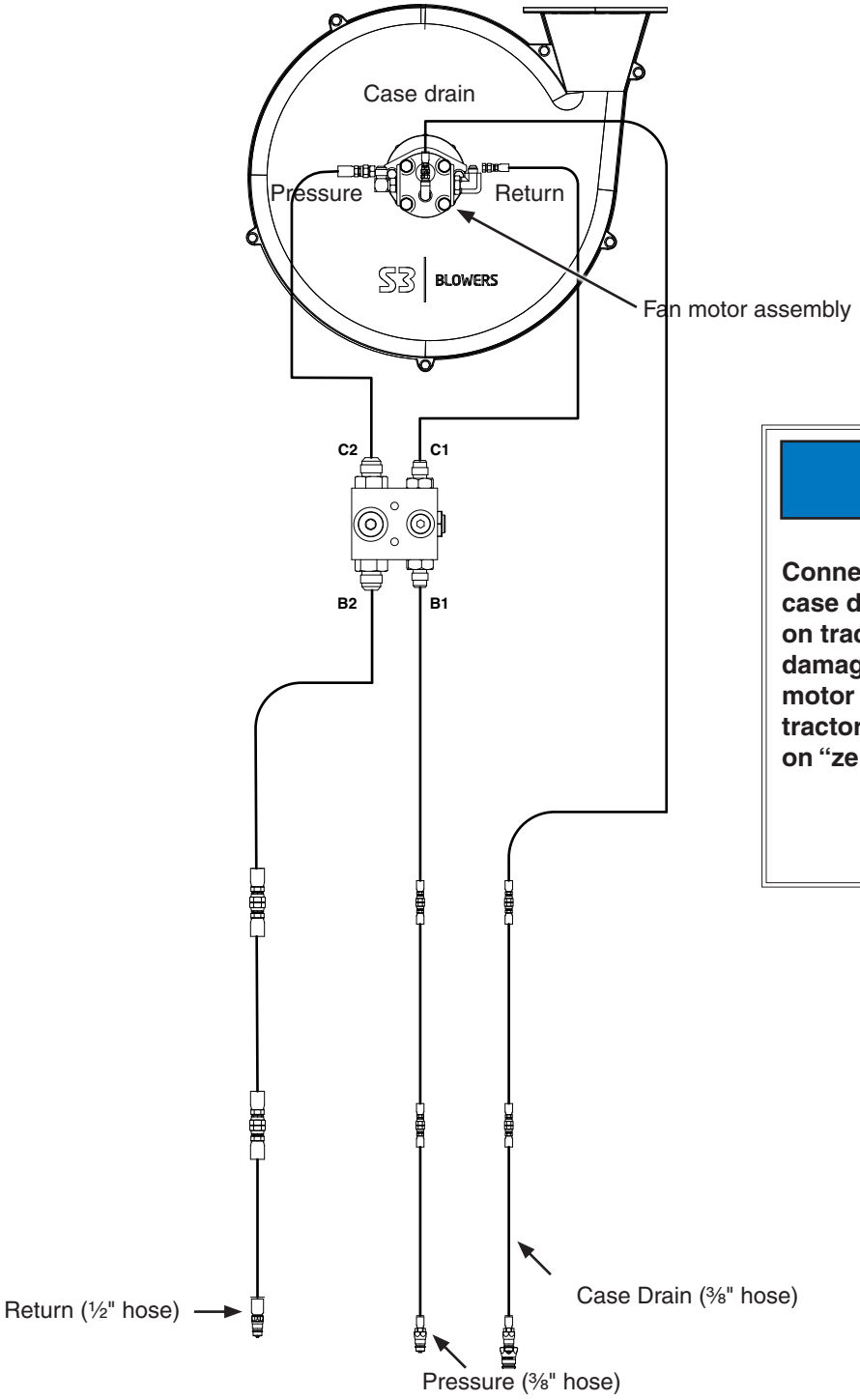
VACUUM BULK FILL PLANTER WITH PTO OPTION HYDRAULIC SYSTEM



MECHANICAL BULK FILL PLANTER WITH PTO OPTION HYDRAULIC SYSTEM



HYDRAULIC DIAGRAM - VACUUM FAN MOTOR SYSTEM



NOTICE

Connect hydraulic motor case drain to a case drain return line with zero pressure on tractor or hydraulic motor will be damaged. DO NOT connect hydraulic motor case drain to SCV outlet. Contact tractor manufacturer for specific details on “zero pressure return”.

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BULK FILL TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Seed does not travel through delivery tubes.	System pressure set too low.	Increase system pressure.
Seed stops flowing to row unit during planting.	Seed surging.	Shut down bulk fill system and restart system from idle; seed should start flowing.
	Debris in system.	Insert shutoff door, open cleanout door. remove plug.
Seed does not move from entrainer at startup after exposure to water.	Seed swelled in entrainer.	Insert shutoff door, open cleanout door. remove swelled seed.

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”.

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.

PTO PUMP DRIVE AND OIL COOLER OPTION TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Pump squealing.	Lack of oil to pump.	Check for plugged suction strainer.
	Air leak in suction line.	Check oil level.
Oil temperature is high.	Low oil level.	Check oil level and add as required.
Desired fan speed cannot be achieved.	Low oil level.	Check oil level and add as required.
	Plugged filter.	Check and change as required.
Vacuum level not displayed.	Digital vacuum gauge console power OFF.	Turn ON.
	Cable not plugged in.	Check connection.
	Digital vacuum gauge console has no power.	Check fuse.

ROW MARKER OPERATION TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Both markers lowering and only one raising at a time.	Hoses from cylinders to valve connected backwards.	Check hosing diagram in manual and correct.
Same marker always operating.	Spool in sequencing valve not shifting.	Remove spool, inspect for foreign material, making sure all ports in spool are open. Clean and reinstall.
Both markers lower and raise at same time.	Foreign material under check ball in sequencing valve.	Remove hose fitting, spring and balls and clean. May be desirable to remove spool and clean as well.
	Check ball missing or installed incorrectly in sequencing valve.	Disassemble and correct. Refer to Lubrication and Maintenance section of this manual.
Marker (in raised position) settling down.	Damaged O-ring in marker cylinder or cracked piston.	Disassemble cylinder, 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 moves.	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 out 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.

VACUUM SEED METER

PROBLEM	POSSIBLE CAUSE	SOLUTION
Low seed count.	Meter RPM too high.	Reduce planting rate or planting speed.
	Singulator blade setting too aggressive.	Adjust singulator blade.
	Vacuum level too low.	Increase fan speed.
	Seed sensor not picking up all seeds dropped.	Clean seed tube. Move meter to different row.
	Seeds sticking to seed disc.	Use graphite or talc to aid release.
	Seed treatment buildup in seed disc recesses.	Reduce amount of treatment used and or mix thoroughly. Add talc.
	Seed size too large for disc used.	Use appropriate disc for seed size.
	Wrong seed disc.	Use appropriate disc for seed type and size.
	Failed/worn drive components.	Inspect and replace parts as required.
	Plugged orifices in seed disc.	Inspect and clean disc. Check remnant ejector.
	Loss of vacuum at meter.	Check for foreign material between vacuum cover and disc. Inspect parts for wear/damage. Clean or replace as required.
	Seed bridging in hopper.	Add graphite to improve seed flow.
	Faulty vacuum gauge reading.	Repair/replace gauge.
	Dirt in vacuum manifold.	Check vacuum manifold for dirt and clean.
	Seed baffle (If applicable) not allowing seed flow due to bridging of seed.	Mix talc thoroughly to coat all seeds. Remove seed baffle. See Row Unit Operation section.
	Seed disc worn.	Replace.
	Vacuum seal worn.	Replace.
Not planting seed.	Seed hoppers empty.	Fill seed hopper.
	Seed tube plugged/damaged.	Clean or replace tube.
	Meter drive damaged.	Repair/replace drive components.
	Low/no vacuum.	Inspect vacuum system and repair as necessary.
	Singulator blade setting too aggressive.	Adjust singulator blade.
	Faulty vacuum gauge.	Repair/replace vacuum gauge.
	Seed bridging in hopper.	Add graphite to improve seed flow.
	Loss of vacuum at meter.	Check for foreign material between vacuum cover and disc. Inspect parts for wear/ damage. Clean and/or replace as required.
	Wrong seed disc.	Use appropriate disc for seed type and size.
	Meter drive clutch not engaged.	Engage drive clutch.
	Fan not running.	Start fan.
	Dirt in vacuum manifold.	Check vacuum manifold for dirt and clean.

Continued on next page.

VACUUM SEED METER - Continued

PROBLEM	POSSIBLE CAUSE	SOLUTION
Not planting seed. (Continued)	Seed baffle (if applicable) not allowing seed flow due to bridging of seed.	Mix talc thoroughly to coat all seeds. Remove seed baffle. Row Unit Operation section.
	High vacuum.	Adjust vacuum level to appropriate level.
	Wrong seed disc.	Replace seed disc.
	Singulator setting not aggressive enough.	Adjust singulator.
	Faulty vacuum gauge.	Check gauge line for dirt/obstruction. Repair/replace vacuum gauge.
Poor seed spacing.	Obstruction in seed tube.	Clean seed tube.
	Dirty/damaged seed disc.	Inspect seed disc for damage, foreign material in orifices or seed treatment buildup in recesses. Clean or replace.
	Wrong vacuum setting.	Adjust vacuum to appropriate level.
	Excess foreign material in seed.	Inspect and clean meter and seed discs. Use clean, undamaged seed.
	Incorrect singulator setting.	Adjust singulator to appropriate setting.
	Inconsistent driveline.	Inspect drive components for rust, misalignment, worn or damaged parts. Replace/repair as required.
	Toolbar not level or wrong height.	Adjust hitch to level toolbar and row units.
	Planting too fast for conditions.	Reduce speed.
	Rough field conditions.	Reduce speed.
Irregular seed population.	Driving too fast.	Reduce speed.
Unable to achieve desired vacuum level.	Tractor hydraulic flow set too low.	Increase flow to fan motor.
	Incorrect hydraulic connections.	Check all hydraulic connections and hose routings.
	Damaged fan components.	Inspect motor and impeller for wear/damage and repair/replace as necessary.
	Vacuum hose pinched/kinked/blocked.	Inspect air lines for any damage or obstruction. Clean air lines and manifold by removing end cap from manifold and running fan at high speed.
	Vacuum hose loose/disconnected.	Inspect and reattach all air hoses.
	Tractor not producing required hydraulic flow/ pressure.	Have tractor serviced by qualified technician.
	Dirt in vacuum gauge line.	Check gauge line for dirt/obstruction and clean.

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