

# **DO6R & DO8R XDR Deere-Orthman Completing Max Emerge 5 Row Unit Package**

(Serial No. 000001 - )



**JOHN DEERE**

## **OPERATOR'S MANUAL**

### **DO6R & DO8R XDR Deere-Orthman Max Emerge 5 Row Unit Package**

**OMKK54043    ISSUE F8    (ENGLISH)**

**John Deere Mexico**

Export Edition  
PRINTED IN U.S.A.

# Introduction

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## Foreword

READ THIS MANUAL carefully to learn how to operate and service your machine correctly. Failure to do so could result in personal injury or equipment damage. This manual and safety signs on your machine may also be available in other languages. (See your John Deere dealer to order.)

THIS MANUAL SHOULD BE CONSIDERED a permanent part of your machine and should remain with the machine when you sell it.

MEASUREMENTS in this manual are given in both metric and customary U.S. unit equivalents. Use only correct replacement parts and fasteners. Metric and inch fasteners may require a specific metric or inch wrench.

RIGHT-HAND AND LEFT-HAND sides are determined by facing in the direction the implement will travel when going forward.

WRITE PRODUCT IDENTIFICATION NUMBERS (P.I. N.) in the Specification section. Accurately record all the numbers to help in tracing the machine should it be stolen. Your dealer also needs these numbers when you order parts. File the identification numbers in a secure place off the machine.

WARRANTY is provided as part of John Deere's support

program for customers who operate and maintain their equipment as described in this manual. The warranty is explained on the warranty certificate or statement which you should have received from your dealer

This warranty provides you the assurance that John Deere will back its products where defects appear within the warranty period. In some circumstances, John Deere also provides field improvements, often without charge to the customer, even if the product is out of warranty. Should the equipment be abused, or modified to change its performance beyond the original factory specifications, the warranty will become void and field improvements may be denied. Setting fuel delivery above specifications or otherwise overpowering machines will result in such action.

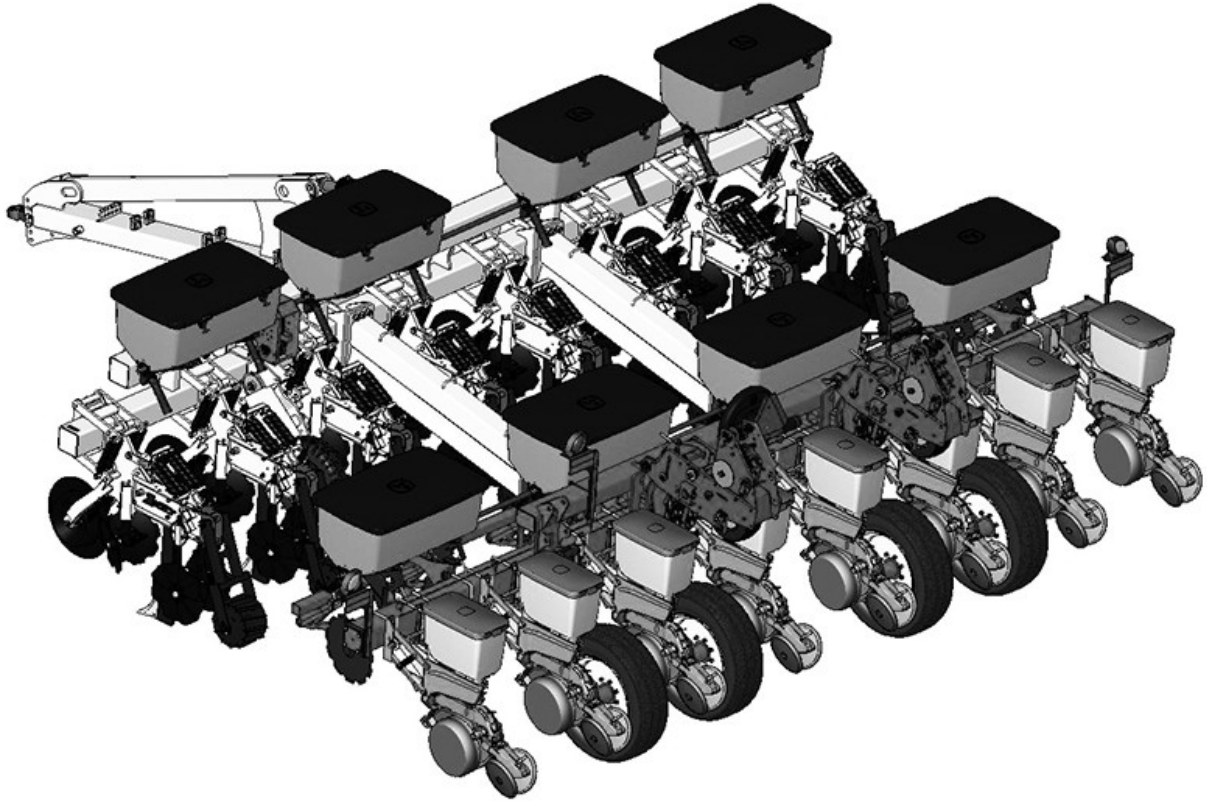
THE TIRE MANUFACTURER'S warranty applicable to your machine may not apply outside the U.S.

If you are not the original owner of this machine, it is in your interest to contact your local John Deere dealer to inform them of this unit's serial number. This will help John Deere notify you of any issues or product improvements.

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DX,IFC2-19-03APR09

## Product View



*Eight Row Planter with Dry Fertilizer Attachment*

P17697—UN—15JUN15

PB21958,0000506-19-28FEB18

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### **A Message to Our Customers**

We appreciate the confidence placed in us by your purchase of this machine. Before this machine was brought to market, countless hours were spent designing and testing to ensure that its performance would be at the highest level. To achieve maximum performance, it is imperative this machine be operated in accordance with the procedures outlined in this manual.

Information in this manual is divided into sections. These sections are identified at the top of each page. Specific information within each section is organized into modules.

These modules are encased in boxes with principle modules identified with a heading at the top left side of the box. Two-part page numbers identify both the section and page of that section.

By reviewing this manual often, one will quickly learn which section to go to for specific information. For instance, machine adjustments would be found in the Operating the Machine section, lubrication intervals in the Lubrication section, seed opener maintenance in the

Service section, etc. A detailed Table of Contents is found immediately behind this page, and an Index is provided at the back of the manual.

Thanks again for purchasing this machine.

PB21958,0000507-19-28FEB18

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## Introduction

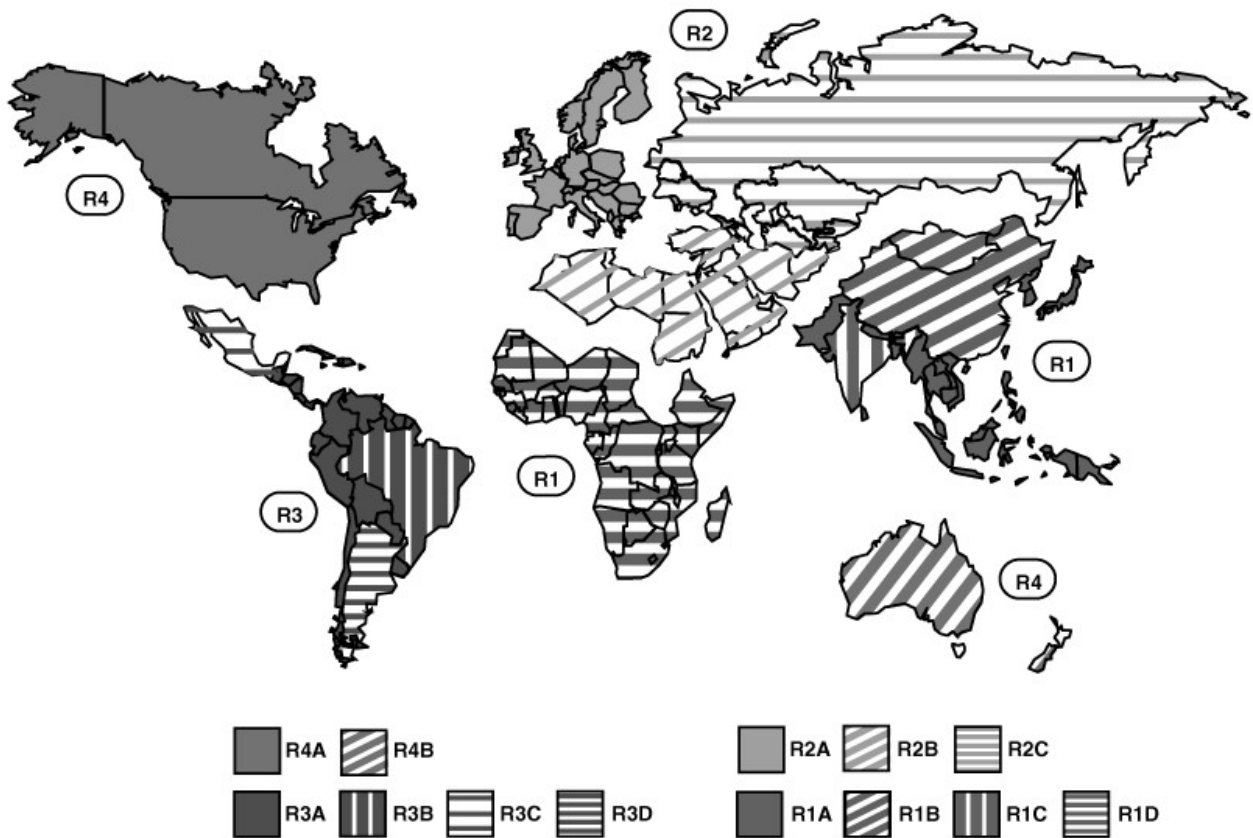
### Preliminary Checks

Use the following list as a reminder to inspect items

before operation. Detailed operation and service information is available in other sections.

| Check and Inspect Equipment                                                                 |                                                                                                                      | OK / Not OK |
|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-------------|
| After final assembly, adjustment, lubrication, and before machine use; conduct inspections. | Review manual and machine for safety signs.                                                                          |             |
|                                                                                             | Review manual for proper operation, adjustment, and service.                                                         |             |
|                                                                                             | Review manual for regular lubrication points and intervals.                                                          |             |
|                                                                                             | Review manual for lighting and devices available when transporting machine.                                          |             |
|                                                                                             | Review manual for attachment / connection process to tractor and control devices (hitch, hydraulic, and electrical). |             |
|                                                                                             | Review additional documentation (instructions, warranty, serial numbers).                                            |             |
|                                                                                             | Machine is assembled according to instructions (nuts and bolts tightened properly).                                  |             |
|                                                                                             | Equipment is lubricated, rotates, or moves freely (without dragging or interference).                                |             |
|                                                                                             | Transport link is adjusted to reach lug when the cylinder fully extended.                                            |             |
|                                                                                             | Paint all unpainted bolts and nuts or any parts scratched in shipment.                                               |             |
|                                                                                             | Properly connect machine to tractor drawbar.                                                                         |             |
|                                                                                             | Axle lift fittings are installed and lubricated.                                                                     |             |
|                                                                                             | All grease fittings are installed.                                                                                   |             |
| During the first season of operation; inspect proper operating conditions.                  | Check entire machine for loose or missing hardware (replace or retorque as necessary).                               |             |
|                                                                                             | Check entire machine for broken, damaged, or missing parts (repair as necessary).                                    |             |
|                                                                                             | If possible; operate machine to check for proper functionality.                                                      |             |
|                                                                                             | Review manual for proper safety, operation, lubrication, and service of machine.                                     |             |
|                                                                                             | Contact John Dealer for assistance (checks, inspections, operation, lubrication, service, or additional equipment).  |             |
| Daily inspect machine lubrication and operation.                                            | Lubricate machine according to service intervals.                                                                    |             |
|                                                                                             | Check for loose or missing hardware or damaged parts.                                                                |             |
|                                                                                             | Check machine connections to tractor (hitch, hydraulic, and electrical).                                             |             |
|                                                                                             | Check machine and tractor operating controls.                                                                        |             |

## Regions and Country Versions



RXA0150915—UN—01FEB16

**R1—Asia and Sub-Saharan Africa**  
**R1A—Far East, Sri Lanka, and Pakistan**  
**R1B—China**  
**R1C—India**  
**R1D—Sub-Saharan Africa**  
**R2—Europe, North Africa, Mid East, CIS**  
**R2A—European Union (EU 28+)**  
**R2B—North Africa and North Middle East (NANME)**  
**R2C—Common Wealth of Independent States (CIS)**

**R3—Central and South America**  
**R3A—Latin America (JDLA)**  
**R3B—Brazil**  
**R3C—Mexico**  
**R3D—Argentina**  
**R4—North America**  
**R4A—USA and Canada**  
**R4B—Oceania (Australia and New Zealand)**

Regions 1, 2 and 3 are equipped with **ECE** (ECONOMIC COMMISSION FOR EUROPE) electrical systems.

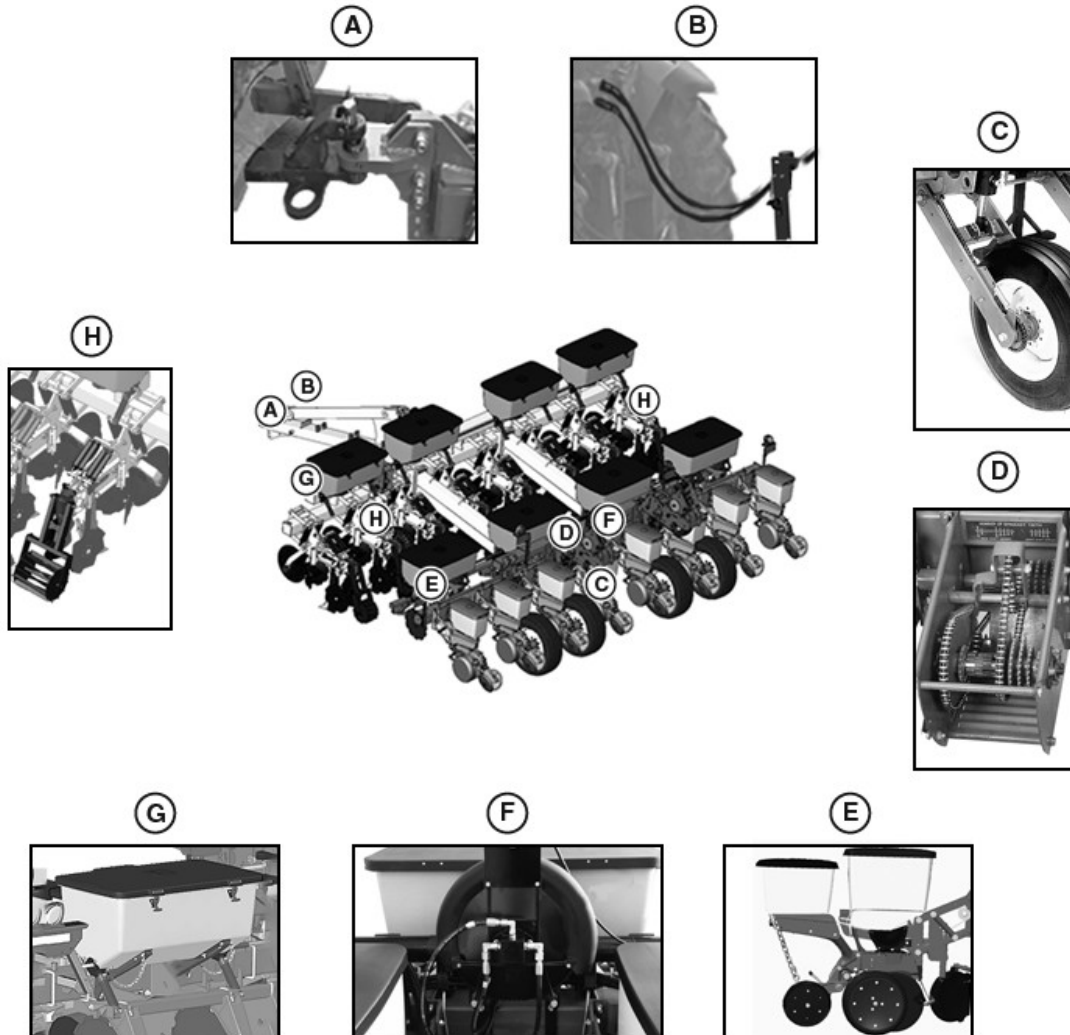
Regions 4 are equipped with **SAE** (SOCIETY OF AUTOMOTIVE ENGINEERS) electrical systems.

**NOTE:** The main difference between ECE and SAE electrical systems is the turn-signal light. The turn-signal lights operate in different ways. With SAE electrics, the turn signal flashes on the side selected, while the light on the opposite side comes on but does not flash. With ECE electrics, all that happens is that the turn signal flashes on the side selected. There is one more difference concerning the lighting system.

## Machine Overview

**IMPORTANT: READ THIS MANUAL carefully to learn how to operate and service your machine correctly. Failure to do so could result in personal injury or equipment damage. This manual and safety signs on your machine may be available in other languages. See your John Deere dealer for specific language requirements and to place an order.**

Review manual Controls and Transporting sections before operation.



A—Hitch  
B—Hydraulic Lines  
C—Drive Wheel Roller Chain  
D—Drive Chain

E—Row Unit  
F—Blower Motor  
G—Dry Fertilizer  
H—Spring Assembly

- Controls
- Transporting
- Operating Machine
- Specifications

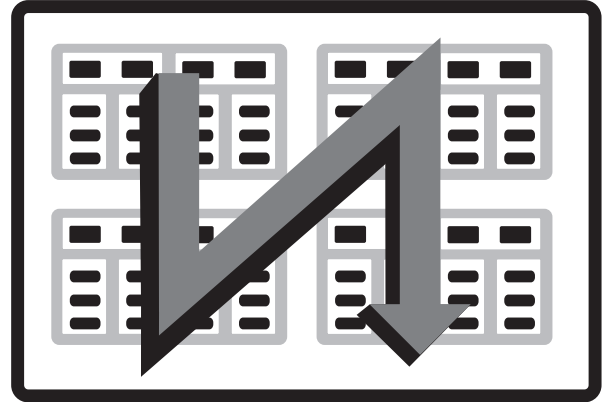
### Operating the Machine Introduction:

See relevant section in the operator manual for operating procedures.

## Preliminary Overview

Inspect the machine before operation, use the following list as a reminder. Detailed operation and service information is available in this operator manual.

- Review manual and machine for safety information and safety signs.
- Review manual for proper operation, adjustment, and service.
- Review manual for control devices (hydraulic and electrical).
- Review manual for regular lubrication points and intervals.
- Check machine mechanical, hydraulic, and electrical connection points.
- Check for visual signs of leaks, damage, and failures.
- Perform machine daily maintenance.



W28329—UN—18OCT17  
PB21958,0000583-19-04MAY18

## Using this Manual:

The information provided in this manual is divided into sections. The sections are organized with the typical machine features or functional systems together. These sections are identified at the top of each page. Specific information within each section is organized into modules. These modules are enclosed in boxes and the main modules are identified with a heading at the top left. Page numbers identify the section as well as the number of the page in the section.

By reviewing this manual frequently you learn which section to turn to for specific information. For example, the safety information is covered at the beginning, the operation of all features and systems is covered in the first half of the manual. Maintenance intervals are in the middle of the manual, the maintenance of all the features and systems is covered in the second half of the manual. The specifications are covered at the end.

A detailed table of contents appears before safety information and there is an alphabetical index at the very end of the manual.

The Operator's Manual content flows as sequential reading down one column of text and graphic then over to the top of the next column as shown.

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**Additional Information Required**

| Required Manual                                                                                                                                                                                                                     | Optional Manuals                                                                                                                                                                                                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>RATE CHARTS AND SETTINGS MANUAL</b><br>This manual is used with the planter operator's manual. This manual contains the following.                                                                                               | The following operator manuals are required when planter is equipped with these options. Some options are not available on every planter model.                                                                                       |
| All setup information for seed meters<br>All setup information for granular chemical<br>All settings for seed transmission<br>All seed rate charts<br>All vacuum settings<br>All meter lubrication information. (Talc and Graphite) | <b>SEEDSTAR 2™ and SEEDSTAR XP™ Monitor, Variable Rate Drive, and Variable Rate Fertilizer Manual:</b><br>This manual is used when planter is equipped with SEEDSTAR™ seed monitor, variable rate drive, or variable rate fertilizer. |
|                                                                                                                                                                                                                                     | <b>COMPUTER TRAK™ Operator's Manual:</b><br>This manual is used when planter is equipped with COMPUTER TRAK™ seed monitor.                                                                                                            |
|                                                                                                                                                                                                                                     | <b>Liquid Fertilizer Block Manifold Operator's Manual:</b><br>This manual is used when planter is equipped with liquid fertilizer delivery system.                                                                                    |

# Contents

|                                                                                  | Page |                                                                       | Page  |
|----------------------------------------------------------------------------------|------|-----------------------------------------------------------------------|-------|
| <b>Safety</b>                                                                    |      | <b>Operating Machine</b>                                              |       |
| Recognize Safety Information .....                                               | 05-1 | General .....                                                         | 35-1  |
| Understand Signal Words .....                                                    | 05-1 | Leveling the Planter .....                                            | 35-1  |
| Follow Safety Instructions .....                                                 | 05-1 | Raising and Lowering Markers .....                                    | 35-1  |
| Park Machine Safely .....                                                        | 05-1 | Adjust Planting Depth of Tru-Vee Planting<br>Units .....              | 35-2  |
| Operate the Machine Safely .....                                                 | 05-2 | Closing Wheel Offset .....                                            | 35-3  |
| Prevent Machine Runaway .....                                                    | 05-2 | Adjust Closing Wheels for Shallow Planting of<br>Small Seeds .....    | 35-3  |
| Prepare for Emergencies .....                                                    | 05-2 | Adjust Closing Wheel Downforce .....                                  | 35-3  |
| Wear Protective Clothing .....                                                   | 05-3 | Closing Wheel<br>Centering .....                                      | 35-4  |
| Keep Riders Off Machine .....                                                    | 05-3 | Installing and Removing Seed Tubes .....                              | 35-4  |
| Use Safety Lights and Devices .....                                              | 05-3 | Changing Input Sprocket Combinations —<br>Seed Transmission .....     | 35-5  |
| Handle Agricultural Chemicals Safely .....                                       | 05-3 | Filling Seed Hoppers .....                                            | 35-5  |
| Use a Safety Chain .....                                                         | 05-4 | Cleanout and Inspection of Seed Hoppers<br>and Vacuum Meters .....    | 35-5  |
| Practice Safe Maintenance .....                                                  | 05-5 | Set Vacuum Level .....                                                | 35-8  |
| Remove Paint Before Welding or Heating .....                                     | 05-5 | Changing Input Sprocket Combinations<br>(Ground Drive) .....          | 35-8  |
| Avoid Heating Near Pressurized Fluid Lines .....                                 | 05-5 | Changing Planting Rate Sprocket<br>Combinations (Ground Drive) .....  | 35-9  |
| Avoid High-Pressure Fluids .....                                                 | 05-6 | Change Input Sprocket Combinations<br>(Contact Drive) .....           | 35-10 |
| Dispose of Waste Properly .....                                                  | 05-6 | Changing Planting Rate Sprocket<br>Combinations (Contact Drive) ..... | 35-11 |
| Store Attachments Safely .....                                                   | 05-6 | Metering Units .....                                                  | 35-11 |
| Releasing Fertilizer Augers Safely .....                                         | 05-7 |                                                                       |       |
| <b>Safety Signs</b>                                                              |      | <b>Population Check</b>                                               |       |
| Pictorial Safety Signs .....                                                     | 10-1 | Check Seed Population .....                                           | 40-1  |
| Replace Safety Signs .....                                                       | 10-1 |                                                                       |       |
| <b>Preparing the Tractor</b>                                                     |      | <b>Preparing Vacuum Seed Metering Unit</b>                            |       |
| Prepare the Tractor .....                                                        | 15-1 | Single Vacuum Connection and Operation .....                          | 45-1  |
| <b>Preparing Machine</b>                                                         |      | Choosing Seed and Selecting Seed Discs .....                          | 45-1  |
| Protecting Hydraulic Motor Seals— Low-<br>Pressure (Case) Drain Connection ..... | 20-1 | Vacuum Seed Metering Discs and Equipment .....                        | 45-2  |
| Tightening Hardware .....                                                        | 20-1 | Installing Seed Disc .....                                            | 45-3  |
| Tire Inflation .....                                                             | 20-1 | Adjust Vacuum Gauge Baffle .....                                      | 45-4  |
| Lubrication .....                                                                | 20-1 | Selecting Correct Vacuum Gauge Brush .....                            | 45-4  |
| Adjusting Seed and/or Fertilizer Transmission<br>Wheel Engagement Point .....    | 20-2 | Change Vacuum Gauge Brush .....                                       | 45-5  |
| <b>Attaching and Detaching</b>                                                   |      | Adjust Meter Hub .....                                                | 45-5  |
| Use the Tractor Operator's Manual .....                                          | 25-1 | Seed Knockout Wheel Operation .....                                   | 45-6  |
| Tractor Requirements .....                                                       | 25-1 | Install Knockout Wheel Assembly .....                                 | 45-7  |
| VacuMeter™ Motor (Case) Drain<br>Requirements .....                              | 25-1 | Operate Double Eliminator .....                                       | 45-8  |
| VacuMeter™ Hydraulic Motor and Variable<br>Rate Drive Return Coupler .....       | 25-1 | Check Tractor Hydraulic System .....                                  | 45-9  |
| Connect ComputerTrak™ Harness .....                                              | 25-2 | Check Hydraulic Connections .....                                     | 45-9  |
| Check Hydraulic System .....                                                     | 25-2 |                                                                       |       |
| Hydraulic Connections Recommendations .....                                      | 25-2 | <b>How to Use Planting Rate Chart (Vacuum)</b>                        |       |
| Attaching to Tractor .....                                                       | 25-4 | How to Use Planting Rate Charts .....                                 | 50-1  |
| Attaching Warning Light Harness .....                                            | 25-5 | Vacuum Gauge Operating Characteristics .....                          | 50-1  |
| <b>Transporting</b>                                                              |      | Metric Seed Population Tables for Vacuum<br>Planter Plates .....      | 50-1  |
| Transport Planter .....                                                          | 30-1 |                                                                       |       |

Continued on next page

*Original Instructions. All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.*

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## Contents

| Page                                                                                                                                | Page  |
|-------------------------------------------------------------------------------------------------------------------------------------|-------|
| Corn ProMax 40 - 40 Cells .....                                                                                                     | 50-2  |
| Corn ProMax 40 - 40 Cells .....                                                                                                     | 50-2  |
| Vacuum Level, Baffle Position, and vacuum<br>gauge Brush for Sweet Maize Seed .....                                                 | 50-3  |
| Maize and Sunflower - 30 Cells .....                                                                                                | 50-4  |
| Maize and Sunflower - 30 Cells .....                                                                                                | 50-4  |
| Vacuum Level, Baffle Position, and vacuum<br>gauge Brush for or Maize Seed .....                                                    | 50-5  |
| Vacuum Level, Baffle Position, and vacuum<br>gauge Brush for Oil Sunflower Seed .....                                               | 50-6  |
| Vacuum Level for Oil Sunflower .....                                                                                                | 50-6  |
| Large Maize - 25 Cells .....                                                                                                        | 50-7  |
| Large Maize - 25 Cells .....                                                                                                        | 50-7  |
| Vacuum Level, Baffle Position, and vacuum<br>gauge Brush for Large Maize Seed .....                                                 | 50-8  |
| Sugar Beets - 45 Cells .....                                                                                                        | 50-8  |
| Sugar Beets - 45 Cells .....                                                                                                        | 50-9  |
| Vacuum Level, Baffle Position, and vacuum<br>gauge Brush for Sugar Beet Seed .....                                                  | 50-10 |
| Virginia Peanut Seed Disc, Part Number<br>H138722 - 46 Cells .....                                                                  | 50-10 |
| Virginia Peanut Seed Disc, Part Number<br>H138722 - 46 Cells .....                                                                  | 50-11 |
| Vacuum Level, Baffle Position, and vacuum<br>gauge Brush for Peanuts .....                                                          | 50-12 |
| High Rate Sorghum - 90 Cells .....                                                                                                  | 50-13 |
| High Rate Sorghum - 90 Cells .....                                                                                                  | 50-13 |
| Vacuum Level, Baffle Position, and vacuum<br>gauge Brush for Sorghum .....                                                          | 50-14 |
| Sorghum - 45 Cells .....                                                                                                            | 50-15 |
| Sorghum - 45 Cells .....                                                                                                            | 50-15 |
| Vacuum Level, Baffle Position, and vacuum<br>gauge Brush for Sorghum .....                                                          | 50-16 |
| Soybeans - 108 Cells .....                                                                                                          | 50-16 |
| Soybeans - 108 Cells .....                                                                                                          | 50-17 |
| Vacuum Level, Baffle Position, and vacuum<br>gauge Brush for Soybeans .....                                                         | 50-18 |
| Cotton - 64 Cells .....                                                                                                             | 50-18 |
| Cotton - 64 Cells .....                                                                                                             | 50-19 |
| Vacuum Level, Baffle Position, and vacuum<br>gauge Brush for Cotton .....                                                           | 50-20 |
| Large Edible Beans Cell Type - 50 Cells .....                                                                                       | 50-20 |
| Large Edible Beans Cell Type - 50 Cells .....                                                                                       | 50-21 |
| Vacuum Level, Baffle Position, and vacuum<br>gauge Brush for Larger Edible Beans .....                                              | 50-22 |
| Medium Edible Beans Cell Type - 56 Cells .....                                                                                      | 50-22 |
| Medium Edible Beans Cell Type - 56 Cells .....                                                                                      | 50-23 |
| Vacuum Level, Baffle Position, and vacuum<br>gauge Brush for Medium Edible Beans .....                                              | 50-24 |
| Small Edible Beans, Cell Type - 108 Cells .....                                                                                     | 50-25 |
| Small Edible Beans, Cell Type - 108 Cells .....                                                                                     | 50-25 |
| Large Edible Beans .....                                                                                                            | 50-27 |
| Large Edible Beans .....                                                                                                            | 50-27 |
| Large Edible Beans .....                                                                                                            | 50-28 |
| Vacuum Level, Baffle Position, and vacuum<br>gauge Brush for Small Edible Beans .....                                               | 50-29 |
| Lower Seed Populations .....                                                                                                        | 50-29 |
| Blank Seed Plate .....                                                                                                              | 50-29 |
| <b>Dry Fertilizer Table - Contact Drive</b>                                                                                         |       |
| Dry Fertilizer Delivery Rates .....                                                                                                 | 55-1  |
| To Change Sprockets .....                                                                                                           | 55-2  |
| Dry Fertilizer Approximate Delivery Rates in<br>Kilogram Per Hectare 27 Tooth Input for<br>Planters with Contact Drive System ..... | 55-3  |
| Dry Fertilizer Approximate Delivery Rates in<br>Kilogram Per Hectare 27 Tooth Input for<br>Planters with Contact Drive System ..... | 55-3  |
| Dry Fertilizer Approximate Delivery Rates in<br>Kilogram Per Hectare 18 Tooth Input for<br>Planters with Contact Drive System ..... | 55-4  |
| Dry Fertilizer Approximate Delivery Rates in<br>Kilogram Per Hectare 18 Tooth Input for<br>Planters with Contact Drive System ..... | 55-4  |
| Dry Fertilizer Approximate Delivery Rates in<br>Kilogram Per Hectare 36-Tooth Input .....                                           | 55-5  |
| Dry Fertilizer Approximate Delivery Rates in<br>Kilogram Per Hectare 36 Tooth Input .....                                           | 55-6  |
| Dry Fertilizer Approximate Delivery Rates in<br>Kilogram Per Hectare 16 - Tooth Input .....                                         | 55-6  |
| Dry Fertilizer Approximate Delivery Rates in<br>Kilogram Per Hectare 16 Tooth Input .....                                           | 55-7  |
| <b>Attachments</b>                                                                                                                  |       |
| Dry Fertilizer .....                                                                                                                | 60-1  |
| Storing Dry Fertilizer .....                                                                                                        | 60-1  |
| Single-Disk Fertilizer Openers .....                                                                                                | 60-1  |
| Positioning the Fertilizer Opener .....                                                                                             | 60-2  |
| Adjust Downforce .....                                                                                                              | 60-2  |
| Unit down Force Springs .....                                                                                                       | 60-3  |
| <b>Troubleshooting</b>                                                                                                              |       |
| Troubleshooting .....                                                                                                               | 65-1  |
| Row Units .....                                                                                                                     | 65-2  |
| Troubleshooting - Vacuum .....                                                                                                      | 65-3  |
| <b>Lubrications and Maintenance</b>                                                                                                 |       |
| Lubrication .....                                                                                                                   | 70-1  |
| Lubrication Symbols .....                                                                                                           | 70-1  |
| Lubrication Intervals .....                                                                                                         | 70-1  |
| <b>Service and Adjustments</b>                                                                                                      |       |
| Metric Bolt and Cap Screw Torque Values .....                                                                                       | 75-1  |
| Install Service Stops .....                                                                                                         | 75-1  |
| Mounting Tires .....                                                                                                                | 75-2  |
| Replacing Drillshaft Cotter Pins .....                                                                                              | 75-2  |
| Ratchet Drive .....                                                                                                                 | 75-3  |
| Single-Disk Fertilizer Opener Maintenance .....                                                                                     | 75-3  |
| Adjust Gauge Wheels .....                                                                                                           | 75-3  |
| Replace Seed Opener Blades and Seed<br>Tube Guard .....                                                                             | 75-4  |
| Replacing Cotter Pins in Dry Fertilizer Drive<br>Shaft .....                                                                        | 75-5  |
| Cleaning Dry Fertilizer Hoppers .....                                                                                               | 75-5  |
| Replacing Auger Sections .....                                                                                                      | 75-6  |
| <b>Service (Vacuum)</b>                                                                                                             |       |
| Cleaning Blower Motor Guard .....                                                                                                   | 80-1  |
| Clean Vacuum System .....                                                                                                           | 80-1  |
| Vacuum Motor Inspection .....                                                                                                       | 80-1  |
| Inspect and Service Vacuum Meter .....                                                                                              | 80-2  |
| Low Rate Milo / Sugar beet Seed Tube .....                                                                                          | 80-4  |
| Cleaning Seed Sensor .....                                                                                                          | 80-4  |
| <b>Storage</b>                                                                                                                      |       |
| Beginning of the Season Service .....                                                                                               | 85-1  |
| Service at the End of the Season .....                                                                                              | 85-1  |

|                                      | Page |
|--------------------------------------|------|
| <b>Storage (Vacuum)</b>              |      |
| Service at Beginning of Season ..... | 90-1 |
| Service at the End of Season .....   | 90-1 |
| <b>Specifications</b>                |      |
| Planter Specification .....          | 95-1 |
| Keep Proof of Ownership .....        | 95-1 |
| Keep Machines Secure .....           | 95-1 |
| Record Serial Number .....           | 95-2 |

# Safety

## Recognize Safety Information



T81389—UN—28JUN13

This is a safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.

DX,ALERT-19-29SEP98

## Understand Signal Words



**⚠ WARNING**

**⚠ CAUTION**

TS187—19—30SEP88

**DANGER;** The signal word DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

**WARNING;** The signal word WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

**CAUTION;** The signal word CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. CAUTION may also be used to alert against unsafe practices associated with events which could lead to personal injury.

A signal word—DANGER, WARNING, or CAUTION—is used with the safety-alert symbol. DANGER identifies the most serious hazards. DANGER or WARNING safety signs are located near specific hazards. General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.

DX,SIGNAL-19-05OCT16

## Follow Safety Instructions



TS201—UN—15APR13

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from your John Deere dealer.

There can be additional safety information contained on parts and components sourced from suppliers that is not reproduced in this operator's manual.

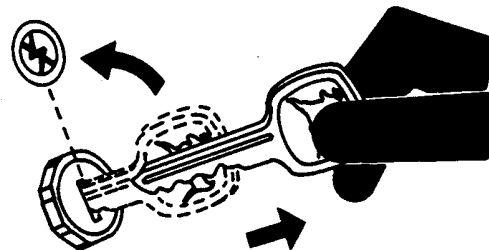
Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.

If you do not understand any part of this manual and need assistance, contact your John Deere dealer.

DX,READ-19-16JUN09

## Park Machine Safely



TS230—UN—24MAY89

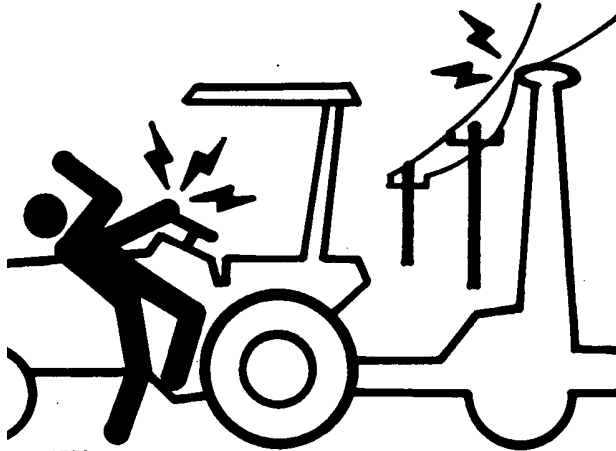
Before working on the machine:

- Lower all equipment to the ground.
- Stop the engine and remove the key.
- Disconnect the battery ground strap.

- Hang a "DO NOT OPERATE" tag in operator station.

DX,PARK-19-04JUN90

## Operate the Machine Safely



A34331—UN—13OCT88

Avoid injury when operating the machine.

Before servicing, verify that the service locks are installed or that the machine is adequately supported.

Serious injury or death can result from contact with electric lines. Use care when moving or operating the machine near electric lines.

When hydraulic components are being used, stand clear of the machine. Mechanical or hydraulic failure can allow the machine components to move rapidly.

Verify that the cylinder and the attaching hoses are fully charged with oil before operating the system.

Be careful when operating the system on hillsides; the tractor can tip sideways if it strikes a hole, ditch, or other irregularity.

Permit only one person, the operator, on the tractor platform while the tractor and the machine are in operation.

AG,OUO6074,1162-19-27APR16

## Prevent Machine Runaway



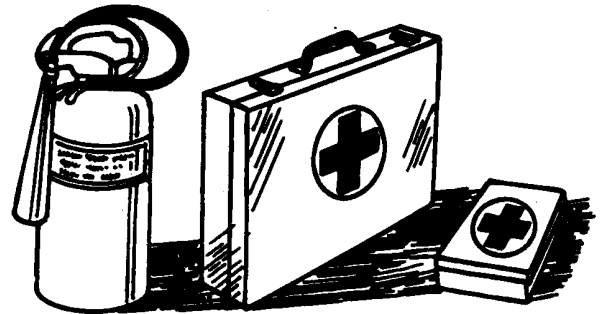
Avoid possible injury or death from machinery runaway.

Do not start engine by shorting across starter terminals. Machine will start in gear if normal circuitry is bypassed.

NEVER start engine while standing on ground. Start engine only from operator's seat, with transmission in neutral or park.

DX,BYPAS1-19-29SEP98

## Prepare for Emergencies



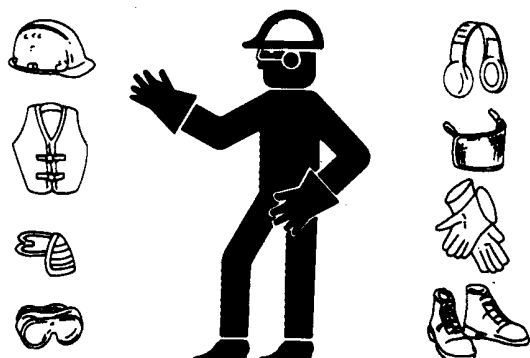
Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.

DX,FIRE2-19-03MAR93

## Wear Protective Clothing



TS206—UN—15APR13

Wear close fitting clothing and safety equipment appropriate to the job.

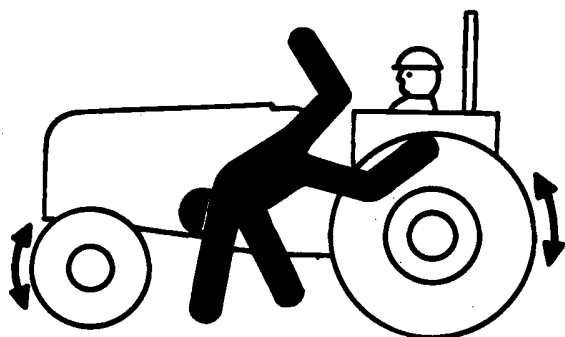
Prolonged exposure to loud noise can cause impairment or loss of hearing.

Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.

Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine.

DX,WEAR-19-10SEP90

## Keep Riders Off Machine



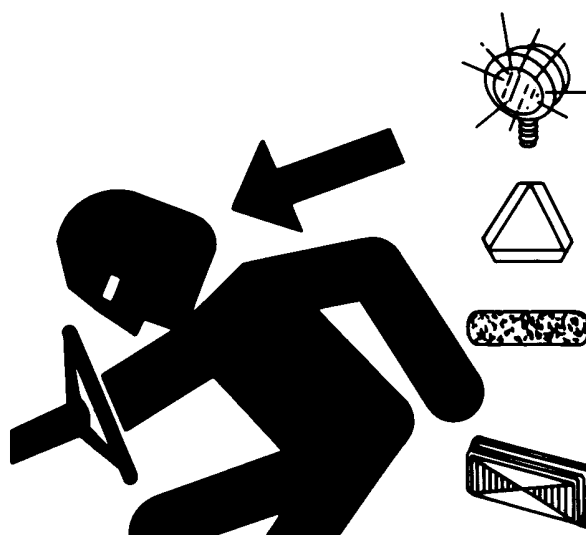
TS290—UN—23AUG88

Only allow the operator on the machine. Keep riders off.

Riders on machine are subject to injury such as being struck by foreign objects and being thrown off of the machine. Riders also obstruct the operator's view resulting in the machine being operated in an unsafe manner.

DX,RIDER-19-03MAR93

## Use Safety Lights and Devices



TS951—UN—12APR90

Prevent collisions between other road users, slow moving tractors with attachments or towed equipment, and self-propelled machines on public roads. Frequently check for traffic from the rear, especially in turns, and use turn signal lights.

Use headlights, flashing warning lights, and turn signals day and night. Follow local regulations for equipment lighting and marking. Keep lighting and marking visible, clean, and in good working order. Replace or repair lighting and marking that has been damaged or lost. An implement safety lighting kit is available from your John Deere dealer.

DX,FLASH-19-07JUL99

## Handle Agricultural Chemicals Safely



TS220—UN—15APR13

A34471



A34471—UN—11OCT88

Chemicals used in agricultural applications such as fungicides, herbicides, insecticides, pesticides, rodenticides, and fertilizers can be harmful to your health or the environment if not used carefully.

Always follow all label directions for effective, safe, and legal use of agricultural chemicals.

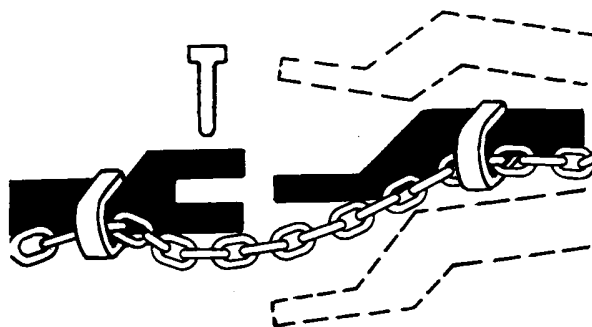
Reduce risk of exposure and injury:

- Wear appropriate personal protective equipment as recommended by the manufacturer. In the absence of manufacturer's instructions, follow these general guidelines:
  - Chemicals labeled '**Danger**': Most toxic. Generally require use of goggles, respirator, gloves, and skin protection.
  - Chemicals labeled '**Warning**': Less toxic. Generally require use of goggles, gloves, and skin protections.
  - Chemicals labeled '**Caution**': Least toxic. Generally require use of gloves and skin protection.
- Avoid inhaling vapor, aerosol or dust.
- Always have soap, water, and towel available when working with chemicals. If chemical contacts skin, hands, or face, wash immediately with soap and water. If chemical gets into eyes, flush immediately with water.
- Wash hands and face after using chemicals and before eating, drinking, smoking, or urination.
- Do not smoke or eat while applying chemicals.
- After handling chemicals, always bathe or shower and change clothes. Wash clothing before wearing again.
- Seek medical attention immediately if illness occurs during or shortly after use of chemicals.
- Keep chemicals in original containers. Do not transfer chemicals to unmarked containers or to containers used for food or drink.
- Store chemicals in a secure, locked area away from human or livestock food. Keep children away.
- Always dispose of containers properly. Triple rinse

empty containers and puncture or crush containers and dispose of properly.

DX,WW,CHEM01-19-24AUG10

## Use a Safety Chain



TS217—UN—23AUG88

A safety chain will help control drawn equipment should it accidentally separate from the drawbar.

Using the appropriate adapter parts, attach the chain to the tractor drawbar support or other specified anchor location. Provide only enough slack in the chain to permit turning.

See your John Deere dealer for a chain with a strength rating equal to or greater than the gross weight of the towed machine. Do not use safety chain for towing.

DX,CHAIN-19-03MAR93

## Practice Safe Maintenance



TS218—UN—23AUG88

Understand service procedure before doing work. Keep area clean and dry.

Never lubricate, service, or adjust machine while it is moving. Keep hands, feet, and clothing away from power-driven parts. Disengage all power and operate controls to relieve pressure. Lower equipment to the ground. Stop the engine. Remove the key. Allow machine to cool.

Securely support any machine elements that must be raised for service work.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.

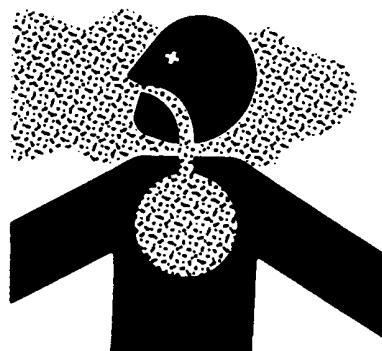
On self-propelled equipment, disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

On towed implements, disconnect wiring harnesses from tractor before servicing electrical system components or welding on machine.

Falling while cleaning or working at height can cause serious injury. Use a ladder or platform to easily reach each location. Use sturdy and secure footholds and handholds.

DX,SERV-19-28FEB17

## Remove Paint Before Welding or Heating



TS220—UN—15APR13

Avoid potentially toxic fumes and dust.

Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

Remove paint before heating:

- Remove paint a minimum of 100 mm (4 in.) from area to be affected by heating. If paint cannot be removed, wear an approved respirator before heating or welding.
- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

Do not use a chlorinated solvent in areas where welding will take place.

Do all work in an area that is well ventilated to carry toxic fumes and dust away.

Dispose of paint and solvent properly.

DX,PAINT-19-24JUL02

## Avoid Heating Near Pressurized Fluid Lines



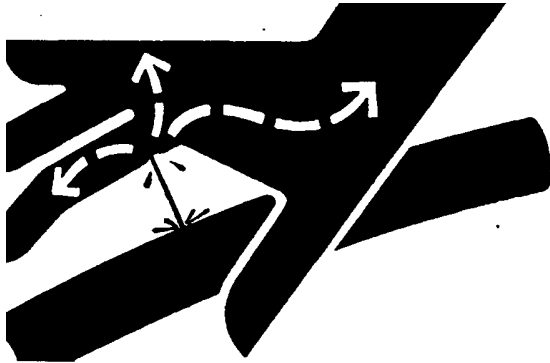
TS953—UN—15MAY90

Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to

yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can accidentally burst when heat goes beyond the immediate flame area.

DX,TORCH-19-10DEC04

## Avoid High-Pressure Fluids



X9811—UN—23AUG88

Inspect hydraulic hoses periodically – at least once per year – for leakage, kinking, cuts, cracks, abrasion, blisters, corrosion, exposed wire braid or any other signs of wear or damage.

Replace worn or damaged hose assemblies immediately with John Deere approved replacement parts.

Escaping fluid under pressure can penetrate the skin causing serious injury.

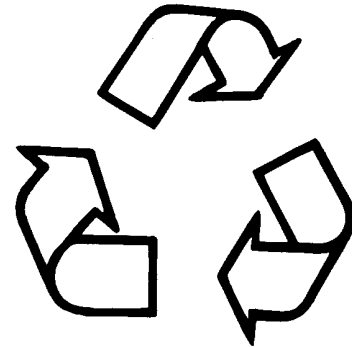
Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high-pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available in English from Deere & Company Medical Department in Moline, Illinois, U.S.A., by calling 1-800-822-8262 or +1 309-748-5636.

DX,FLUID-19-12OCT11

## Dispose of Waste Properly



TS1133—UN—15APR13

Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with John Deere equipment include such items as oil, fuel, coolant, brake fluid, filters, and batteries.

Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

Do not pour waste onto the ground, down a drain, or into any water source.

Air conditioning refrigerants escaping into the air can damage the Earth's atmosphere. Government regulations may require a certified air conditioning service center to recover and recycle used air conditioning refrigerants.

Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center, or from your John Deere dealer.

PX03972,0001278-19-05MAY15

## Store Attachments Safely



TS219—UN—23AUG88

Stored attachments such as dual wheels, cage wheels, and loaders can fall and cause serious injury or death.

Securely store attachments and implements to prevent falling. Keep playing children and bystanders away from storage area.

DX,STORE-19-03MAR93

## Releasing Fertilizer Augers Safely



TS953—UN—15MAY90

Do not use welding torch to remove build-up of dry fertilizer from auger shaft.

Fertilizers trapped inside augers can cause gas to form and, when heated, can explode.

PX03972,000127A-19-05MAY15

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# Safety Signs

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## Pictorial Safety Signs



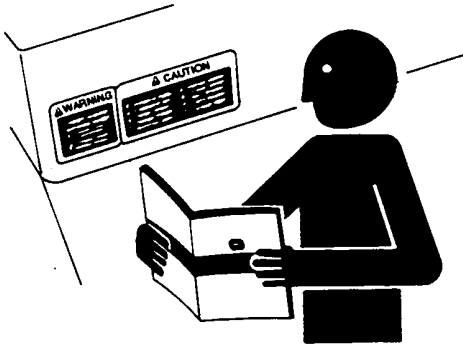
TS231—19—07OCT88

At several important places of this machine, safety signs are affixed intended to signify potential danger. The hazard is identified by a pictorial in a warning triangle. An adjacent pictorial provides information how to avoid personal injury. These safety signs, their placement on the machine and a brief explanatory text are shown.

PB21958,0000518-19-12MAR18

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## Replace Safety Signs



TS201—UN—15APR13

Replace missing or damaged safety signs. Use this operator's manual for correct safety sign placement.

There can be additional safety information contained on parts and components sourced from suppliers that is not reproduced in this operator's manual.

DX,SIGNS-19-18AUG09

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# Preparing the Tractor

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## **Prepare the Tractor**

Refer to Orthman Operator's Manual for information regarding tractor preparation.

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PB21958,0000519-19-05MAR18

# Preparing Machine

## Protecting Hydraulic Motor Seals— Low-Pressure (Case) Drain Connection



A53392—UN—25NOV03  
*Flush Face Case Drain Hose Tip*

**IMPORTANT:** To avoid damage to the fan motors, tractor must be equipped with a low-pressure drain connection (**LESS THAN 172 kPa [1.72 bar] [25 psi]**), compatible with Case Drain Connection Kits. See Case Drain Connection Kits table.

**IMPORTANT:** Only the connection kits listed in the Case Drain Connection Kits table can be used on John Deere tractors. If low-pressure drain connection kit is already installed, ensure that it matches what is listed on table.

Order one of the following kits when a John Deere tractor is used, or see the tractor manufacturers dealer for a suitable connection kit.

**NOTE:** John Deere Connection Kits include Installation Instructions.

| Case Drain Connection Kits                                             |            |
|------------------------------------------------------------------------|------------|
| Tractor Model                                                          | Kit Number |
| 30—60 Series Row Crop and 50 Series 4WD                                | BA30132    |
| 60 and 70 Series 4WD                                                   | BA30133    |
| 6000 and 10 Series 7420 and 7520 Series with serial numbers (- 016498) | BA30216    |
| 6020, 7220, 7320, 7420, 7520 Series                                    | BA30217    |
| 7200, 7400, 7600, 7700, 7800, 10 Series                                | BA30218    |
| 7720, 7820, and 7920 Series                                            | BA30221    |
| 8000, 8000T, 8010, 8010T, 8020, 8020T Series                           | BA30219    |
| 9000, 9000T, 9010, 9010T, 9020, 9020T Series                           | BA30220    |

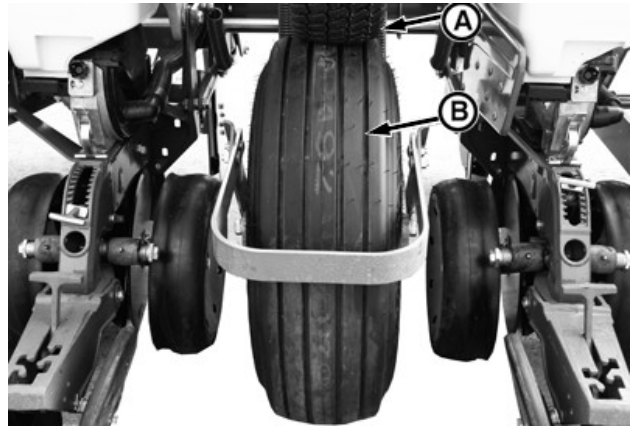
PB21958,000051A-19-05MAR18

## Tightening Hardware

Verify that cap screws and nuts are tight. (See Bolt Torque Chart in Service section.)

PB21958,000051B-19-05MAR18

## Tire Inflation



P17515—UN—11NOV14

**A—6 x 6.50-8 4PR Drive Tire**  
**B—9.5L-15 8PR Frame Tires**

Inflate 9.5L-15 8PR frame tires to (44 psi) of air pressure (B).

Inflate 16 x 6.50-8 4PR seed and/or fertilizer transmission drive tire to (28 psi) of air pressure (A).

PB21958,000051C-19-05MAR18

## Lubrication

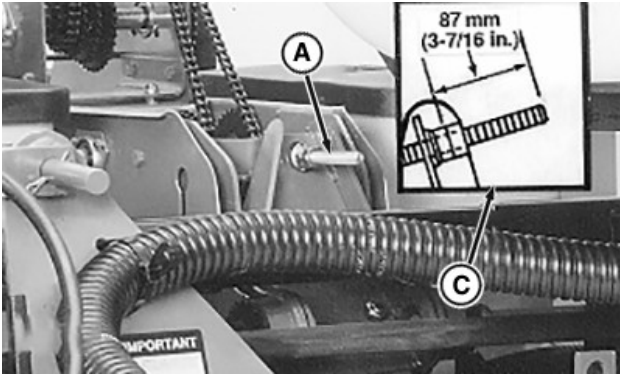
Verify that the planter and planting units have been properly lubricated. (See Lubrication section.)



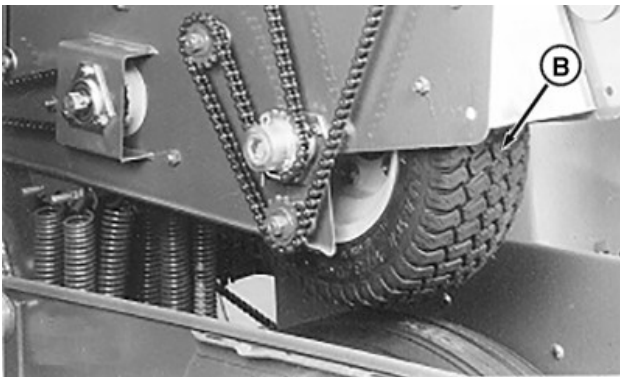
A38257—UN—27NOV95

PB21958,000051D-19-05MAR18

## Adjusting Seed and/or Fertilizer Transmission Wheel Engagement Point



APY04888—UN—01MAR18



APY04887—UN—01MAR18

- A—Bolt  
B—Transmission Wheel

**IMPORTANT:** The factory preset position causes drives to disconnect too early in the lift cycle. This adjustment must be changed from the initial setting. An initial setting would be as shown.

The seed and/ or fertilizer transmission engages when planter is lowered into planting position (transmission wheel contacts drive wheel) and disengages when planter is raised into transport position.

*NOTE: To disconnect drive sooner - increase dimension (C). To disconnect later - shorten dimension (C).*

Adjust bolt (A) 87 mm to establish engagement point of the transmission wheel (B) with drive wheel in the lowering cycle of the planter.

PB21958,000051E-19-05MAR18

# Attaching and Detaching

## Use the Tractor Operator's Manual



TS190—UN—17JAN89

Always refer to tractor operators manual for specific detailed information regarding operation of equipment.

Following tractor-related information uses John Deere tractors to illustrate preparation, attachment, and operational procedures. Use the tractor OM for detailed information, as procedures vary by equipment.

PB21958,000051F-19-05MAR18

## Tractor Requirements

| Horsepower Requirements |                            |                            |
|-------------------------|----------------------------|----------------------------|
| Machine Configuration   | 135—180 kW<br>(180—240 hp) | 180—240 kW<br>(240—320 hp) |
| 6-Row                   | X                          |                            |
| 8-Row                   |                            | X                          |

*NOTE: Tractors with additional horsepower are required when operating with additional planter attachments or when planting in soft seedbeds and rolling ground.*

PB21958,0000520-19-05MAR18

## VacuMeter™ Motor (Case) Drain Requirements

**IMPORTANT:** VacuMeter™ case drain hose (A) must be attached to low-pressure drain connection before any hoses are connected. Case drain must have less than 172 kPa (1.72 bar) (25 psi) or fan motor damage occurs.



A53393—UN—25NOV03

Connect Case Drain First

## A—Motor Seal (Case) Drain Hose

The hydraulic motors used on the VacuMeter™ system are low flow, high-pressure motors, and are designed to operate on a closed center hydraulic system. Connecting the VacuMeter™ to an open-center system is not recommended.

PB21958,0000521-19-05MAR18

## VacuMeter™ Hydraulic Motor and Variable Rate Drive Return Coupler



A53457—UN—02MAR04

All machines are equipped with a special return coupler on the Variable Rate Drive and Vacuum Motor return hoses.

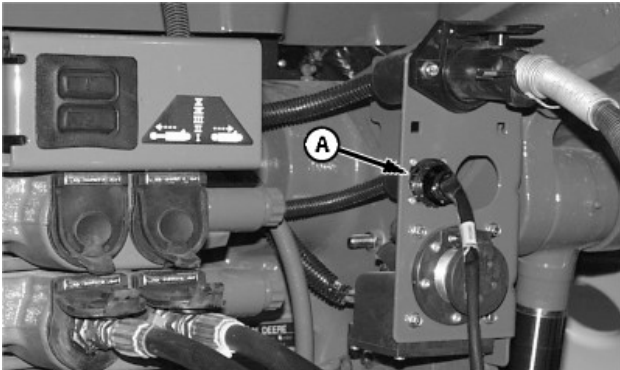
Return couplers are equipped with check valves to eliminate the possibility of turning the motors backwards.

Relieve pressure when shutting off hydraulic motors. Place SCV in "Float" position and allow the motors to stop gradually.

PB21958,0000522-19-05MAR18

## Connect ComputerTrak™ Harness

**NOTE:** Harness locations vary from tractor to tractor.



A53844—UN—11FEB04

**A—Monitor Harness**

Connect machine monitor harness to connector (A).

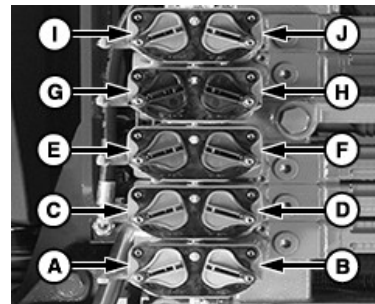
PB21958,0000523-19-15MAR18

After applying pressure to system, check all hydraulic connections and hoses for leaks.

**IMPORTANT:** Tractor hydraulic oil level can drop below operating level when operating machine for the first time. Check tractor hydraulic oil level after filling cylinders with oil for the first time.

PB21958,0000524-19-05MAR18

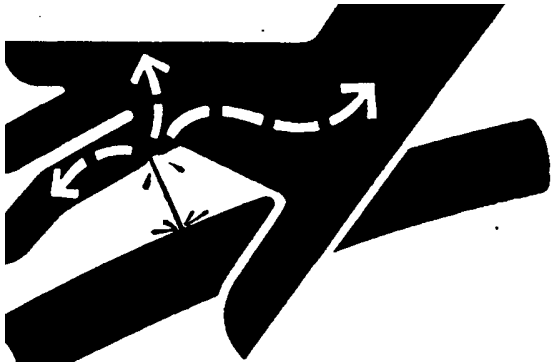
## Hydraulic Connections Recommendations



A82588—UN—23MAY14

*Tractor Valves*

## Check Hydraulic System



X9811—UN—23AUG88

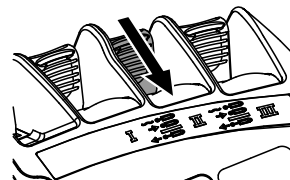
**CAUTION:** Escaping fluid under pressure can penetrate the skin causing serious injury.

Relieve pressure before disconnecting hydraulic or other lines to avoid this hazard. Tighten all connections before applying pressure.

Search for leaks with the piece of cardboard. Protect hands and body from high-pressure fluids.

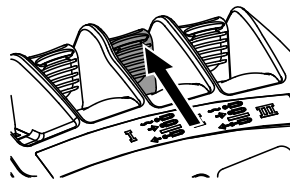
If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene can result. Doctors unfamiliar with this type of injury must reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.

Hydraulic hoses can fail due to physical damage, kinks, age, and exposure. Check hoses regularly. Replace damaged hoses.



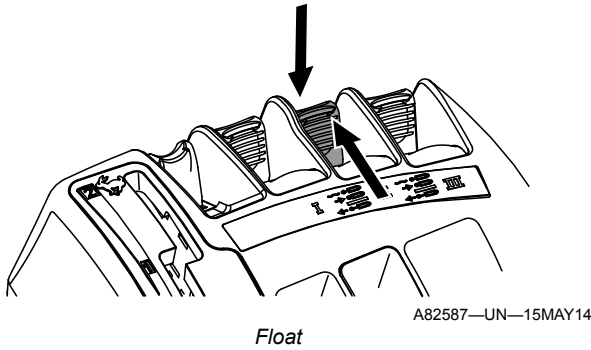
*Extend*

A82585—UN—15MAY14



*Retract*

A82586—UN—15MAY14



Extend and Retract symbols are on the tractor selective control valve (SCV) cover.

Refer to the tractor operator's manual for specific hydraulic operational details.

**CAUTION:** Avoid hydraulic hose failure due to physical damage, kinks, age, and exposure. Inspect hoses regularly. Replace damaged hoses.

**IMPORTANT:** Avoid motor seal damage. Connect the case drain hose before any other hose. Connect vacuum and variable rate drive (VRD) return hoses to a tractor "extend" SCV.

Avoid motor seal damage. Move tractor SCV lever to float (not neutral) position to shutoff vacuum and VRD.

| Hose Connections |              |                 |               |                                                                                                                                                                                                                                                                                                     |                                                                               | Function Settings<br>For John Deere™ Tractors                                                                                                                   |                                                                |
|------------------|--------------|-----------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| Tractor<br>SCV   | SCV<br>Color | SCV<br>Port     | SCV<br>Symbol | Hose Tag                                                                                                                                                                                                                                                                                            | Implement Function                                                            | Flow                                                                                                                                                            | Detent (Time)                                                  |
|                  | Yellow       |                 |               | “Case Drain”                                                                                                                                                                                                                                                                                        | Non-pressurized hydraulic return<br>Connect case drain before any other hose. |                                                                                                                                                                 |                                                                |
| I                | Green        | A               | Extend        | “Frame Press”                                                                                                                                                                                                                                                                                       | Frame Lift<br>Automatic Marker Lift                                           | Start at 5 and<br>adjust as<br>necessary                                                                                                                        | 10 seconds or as<br>required for full<br>extend and<br>retract |
|                  |              | B               | Retract       | “Frame Ret”                                                                                                                                                                                                                                                                                         | Frame Lower<br>Automatic Marker Lower                                         |                                                                                                                                                                 |                                                                |
| II               | Blue         | C               | Extend        | “Mark Press”                                                                                                                                                                                                                                                                                        | Independent Marker Raise (if equipped)                                        | Start at 5 and<br>adjust as<br>necessary                                                                                                                        | 10 seconds or as<br>required for full<br>extend and<br>retract |
|                  |              | D               | Retract       | “Mark Ret”                                                                                                                                                                                                                                                                                          | Independent Marker Lower (if equipped)                                        |                                                                                                                                                                 |                                                                |
| III or<br>Other  | Brown        | E               | Extend        | “Vac Ret”                                                                                                                                                                                                                                                                                           | Vacuum, Hydraulic Return                                                      | With vacuum on<br>separate SCVs,<br>start at 4 and<br>adjust as required<br>to obtain target<br>pressure<br>With 2 or more<br>vacuums on one<br>SCV, 10 Maximum | Continuous “C”                                                 |
|                  |              | F               | Retract       | “Vac Press”                                                                                                                                                                                                                                                                                         | Vacuum, Activate                                                              |                                                                                                                                                                 |                                                                |
|                  |              |                 | Float         |                                                                                                                                                                                                                                                                                                     | Vacuum, Deactivate                                                            |                                                                                                                                                                 |                                                                |
| IV or<br>Other   | Black        | G               | Extend        | “VRD Ret”                                                                                                                                                                                                                                                                                           | VRD, Hydraulic Return                                                         | 10 Maximum                                                                                                                                                      | Continuous “C”                                                 |
|                  |              | H               | Retract       | “VRD Press”                                                                                                                                                                                                                                                                                         | VRD, Activate                                                                 |                                                                                                                                                                 |                                                                |
|                  |              |                 | Float         |                                                                                                                                                                                                                                                                                                     | VRD, Deactivate                                                               |                                                                                                                                                                 |                                                                |
|                  |              |                 |               |                                                                                                                                                                                                                                                                                                     |                                                                               |                                                                                                                                                                 |                                                                |
| Power<br>Beyond  | Red          | “P” Pressure    |               | Port locations for pressure, return, and load-sense vary by tractor model. (See your tractor manual.)<br>Power beyond hydraulic flow is active when the tractor engine is running. Connect vacuum or variable<br>rate drive to the power beyond circuit when an SCV is not available or not chosen. |                                                                               |                                                                                                                                                                 |                                                                |
|                  | Black        | “R” Return      |               |                                                                                                                                                                                                                                                                                                     |                                                                               |                                                                                                                                                                 |                                                                |
|                  | Or-<br>ange  | “LS” Load Sense |               |                                                                                                                                                                                                                                                                                                     |                                                                               |                                                                                                                                                                 |                                                                |

John Deere is a trademark of Deere & Company

SeedStar™ system is used to control variable rate drive.

PB21958,0000525-19-05MAR18

## Attaching to Tractor

Position tractor with drawbar approximately 305 mm ahead of the planter hitch.



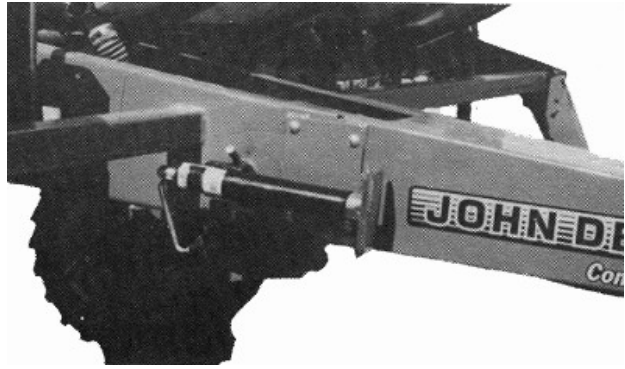
Flush Face Fitting

A53393—UN—25NOV03

### A—Motor Seal (Case) Drain Hose

**IMPORTANT:** Vacuumer case drain hose (A) must be attached to low-pressure drain connection prior to any hoses being connected. Case drain must have less than 172 kPa (1.72 bar) (25 psi) or fan motor is damaged.

The hydraulic motors used on the vacuumer system are a low flow, high-pressure motors and are designed to operate on a closed center hydraulic system. If the vacuumer system is directly connected to an open-center tractor hydraulic system, the open center fixed displacement pump sends most of the hydraulic oil over the relief valve. This produces too much heat for most tractor oil coolers to dissipate. Connecting the vacuumer to an open-center system is not recommended. See your John Deere dealer for more information.



PYM0088—UN—04APR06

2. Secure jack in storage position at rear of hitch with retaining pin and quick-lock pin.

**CAUTION:** To avoid injury from escaping hydraulic oil under pressure, relieve the pressure in the system by shutting off tractor and moving remote cylinder operating levers in both directions before attaching hoses to or detaching hoses from the breakaway couplers.



Flush Face Case Drain Tip

A53393—UN—25NOV03

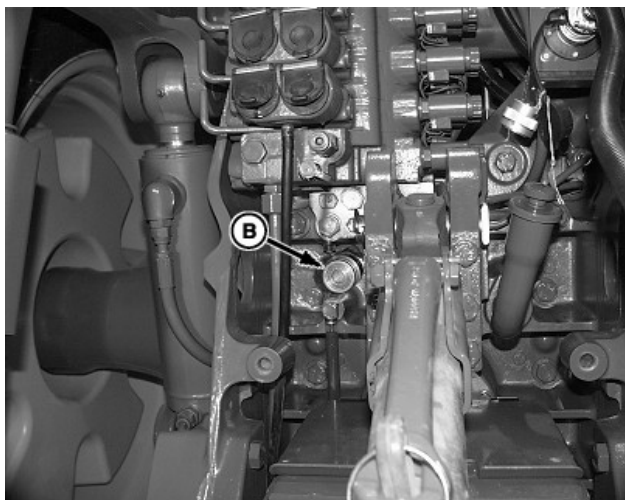


APY04886—UN—01MAR18

### A—Clevis

1. Back tractor up to the planter hitch. Use jack to align clevis with tractor drawbar.

**NOTE:** It is necessary to reposition the clevis (A) to attach the planter to tractor. (See Levering in Operating the Planter section).



A53855—UN—19FEB04

### A—Case Drain Hose B—Low-Pressure Drain Coupler

3. Attach case drain hose (A) to the tractor low-pressure drain coupler (B).

PB21958,00004EC-19-05MAR18

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### **Attaching Warning Light Harness**



RW20845—UN—07MAY92

Attach warning light harness to 7-pin connector.

PB21958,0000526-19-05MAR18

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# Transporting

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## Transport Planter

Refer to Orthman Operator's Manual for information regarding transporting planter.

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PB21958,0000527-19-05MAR18

# Operating Machine

## General

**IMPORTANT:** For proper planter operation, it is important that the planter frame is fully lowered into the correct planting position. Achieving this position can be difficult with some attachment combinations, especially when planting in hard to penetrate soil conditions. If this situation is encountered, the following action must be warranted:

**Reduce attachment down force levels. Avoid using more attachment down force than is required.**

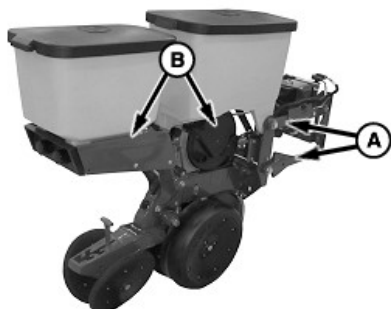
**Add frame ballast when conditions warrant. It must be important if the frame-mounted coulter is being used.**

**If using fertilizer, it must be necessary to NOT empty the fertilizer hoppers to maintain sufficient frame weight to achieve the proper frame planting height.**

**If using fertilizer, it must be necessary to NOT empty the fertilizer hoppers to maintain sufficient frame weight to achieve the proper frame planting height.**

PB21958,0000528-19-05MAR18

## Leveling the Planter



A78645—UN—15NOV13



A41093—UN—12MAY97

A—Parallel Arms  
B—Planting Units

Periodically check that machine planting units (B) and parallel arms (A) are running level.

Lower planter to planting position with the bottom of the main frame tube approximately 510 to 560 mm (20 to 22 in) above level ground.

Parallel arms (A) must be parallel to ground or slightly up the hill towards the planter frame.

Position tractor drawbar or clevis so machine hitch and planting units are parallel to ground with planter in plant position.

Attach safety chain.



P17519—UN—11NOV14

The bottom of the hitch panels must be approximately 360 mm above the ground and parallel to the ground.

Position tractor drawbar as required to obtain the proper planter hitch height.

PB21958,0000529-19-05MAR18

## Raising and Lowering Markers

The marker raises and lowers alternately each time the planter is raised and lowered.

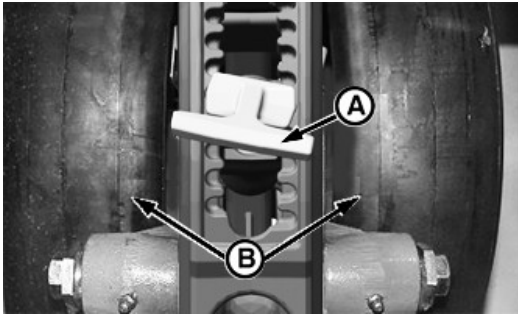
Both markers can be lowered by lowering the planter to the ground, activating the selective control valve lever slightly without raising the planter and lowering again.

This procedure allows the opposite marker to lower. Both markers raise when the planter is raised.

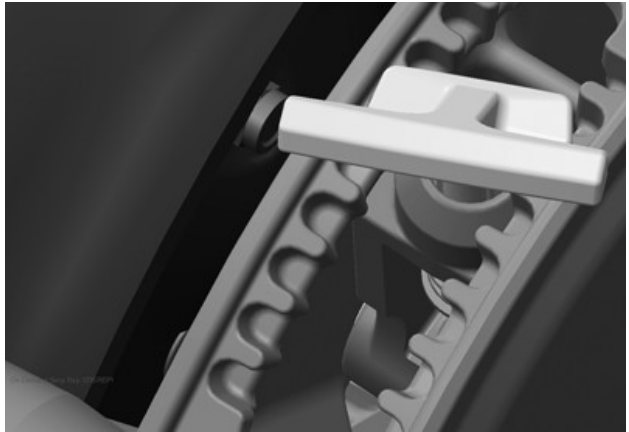
PB21958,000052A-19-05MAR18

## Adjust Planting Depth of Tru-Vee Planting Units

**NOTE:** Closing wheel down force can affect seed placement and depth. Do not apply more force than necessary to close the seed furrow, especially in light soils.



P17151—UN—29OCT13



P17154—UN—29OCT13

"Walking" The Handle in 6 mm (1/4 in) increments

**A—Depth Adjustment Handle**  
**B—Gauge Wheels**

In Tru-Vee Planting Units, gauge wheels (B) regulate seed depth.

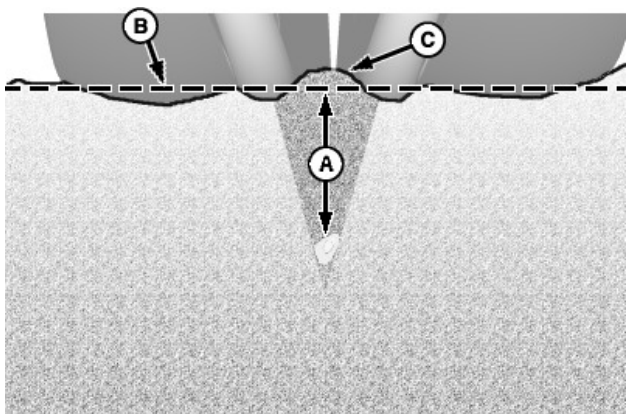
Adjust planting depth as follows:

1. Raise the machine to remove weight from gauge wheels.
2. Lift depth adjustment handle (A). Move it forward to decrease planting depth or backward to increase planting depth. If small-increments are desired, "walk" handle from side to side. Each adjusting position changes planting depth 6 mm (1/4 in)
3. Adjust all rows to the same initial setting.

**IMPORTANT: Prevent seed tubes from plugging.**

**When operating in the field, lower the machine only when tractor is moving forward.**

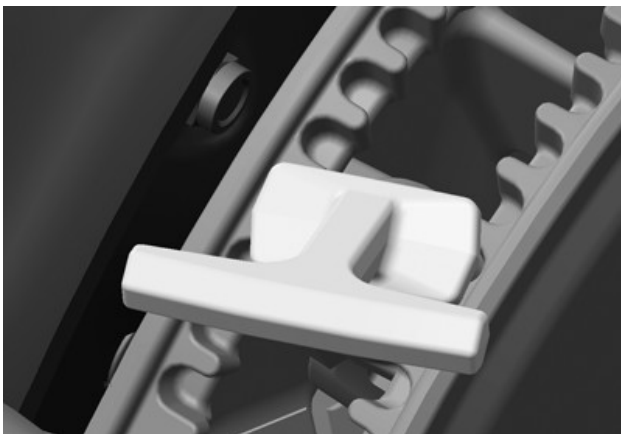
4. Lower machine and drive a short distance at normal planting speed.



A57713—UN—20APR06

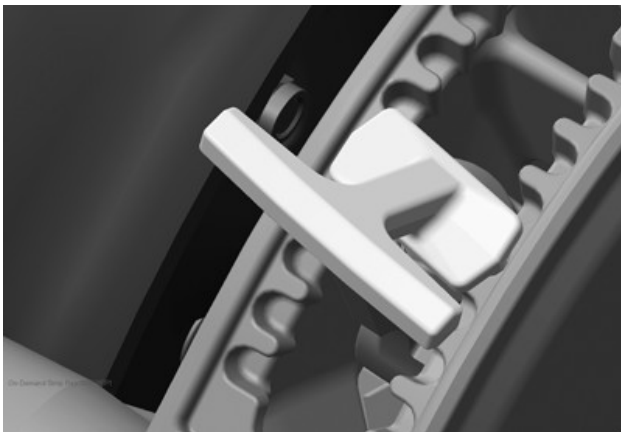
Soil Cross Section

**A—Depth**  
**B—Topsoil Profile**  
**C—Edge**



P17152—UN—29OCT13

"Walking" The Handle in 6 mm (1/4 in) increments



P17153—UN—29OCT13

"Walking" The Handle in 6 mm (1/4 in) increments

5. Check the planting depth in each row.
  - a. Dig vertically into the soil until getting to the seed.
  - b. Measure distance (A) from seed to the topsoil profile (B). Do not measure to the top of the edge (C) formed by the closing wheels.

PB21958,000052B-19-15MAR18

## Closing Wheel Offset

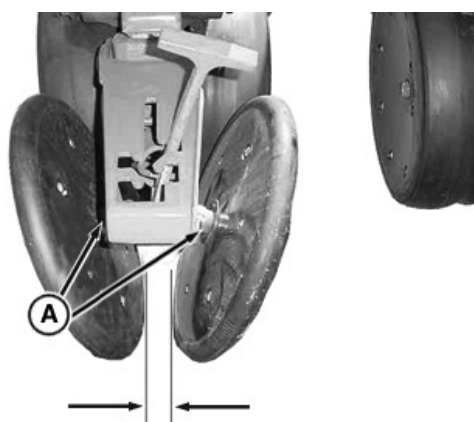


PUM2299—UN—30APR08

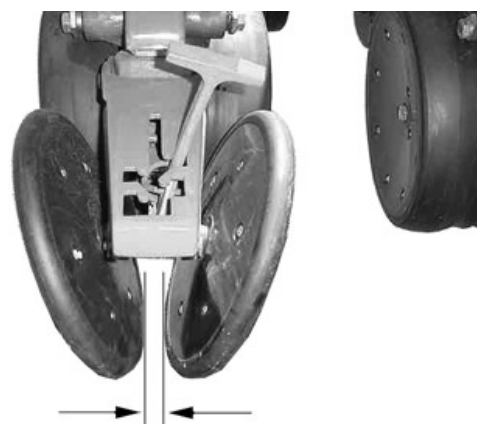
For direct or minimum-till planting, trash or root balls can accumulate between the closing wheels. To reduce the possibility of this occurring, remove one closing wheel from the planter and install it in the rear hole of the casting to offset the closing wheels.

PB21958,000052C-19-05MAR18

## Adjust Closing Wheels for Shallow Planting of Small Seeds



APY04885—UN—01MAR18



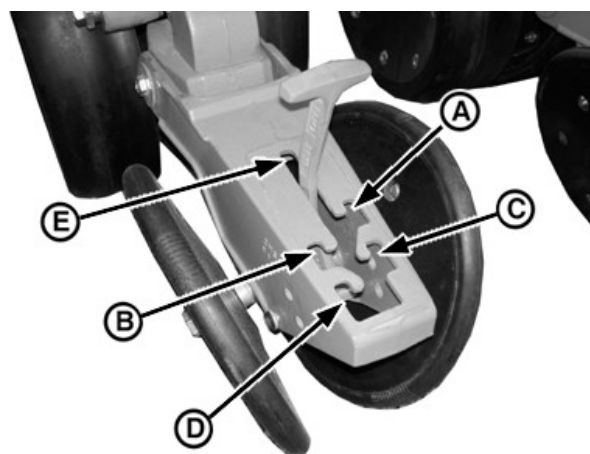
PUM2300—UN—30APR08

### A—Nuts and Spacers

Closing wheel spacing is set so that the closing system can adapt to needs when planting small seeds at a shallow depth. To change spacing, remove the wheels, nuts, and spacers (A) and reinstall with the spacer outboard of the closing wheel.

PB21958,000052D-19-05MAR18

## Adjust Closing Wheel Downforce



PUM3061—UN—02FEB09

- A—Slot A
- B—Slot B
- C—Slot C
- D—Slot D
- E—Slot E

The inclined closing wheels run behind the openers to cover the seed furrow left by the openers. The adjustable spring force permits proper closing of the seed furrow by compacting the soil on each side of the seed, not directly over the seed.

Closing wheel down force can be adjusted by placing the lever in slots (A), (B), (C) or (D), depending on varying soil conditions. Placing the lever in the center slot (E) allows the closing wheels to FLOAT and apply

only the weight of the closing wheel system to the soil surface.

PB21958,000052E-19-05MAR18

## Center Closing Wheels



A46773—UN—12OCT00

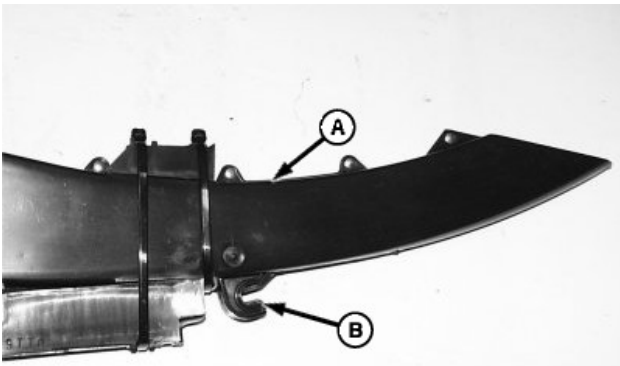
A—Closing Wheels  
B—Cap Screws

If closing wheels (A) are not centered over the seed furrow, proceed as follows:

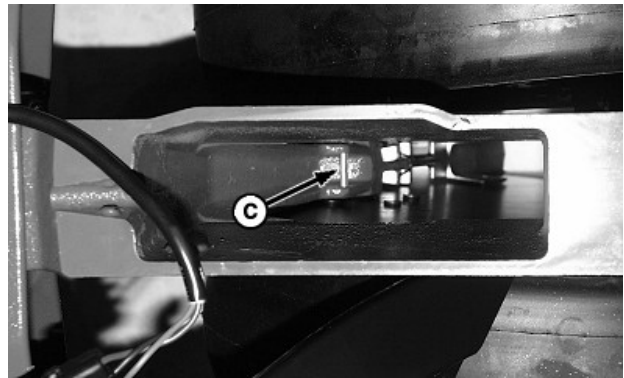
1. Raise machine.
2. Loosen cap screws (B) and adjust closing wheels to right or left. Visually center as required.
3. Tighten cap screws (B).

PB21958,000052F-19-05MAR18

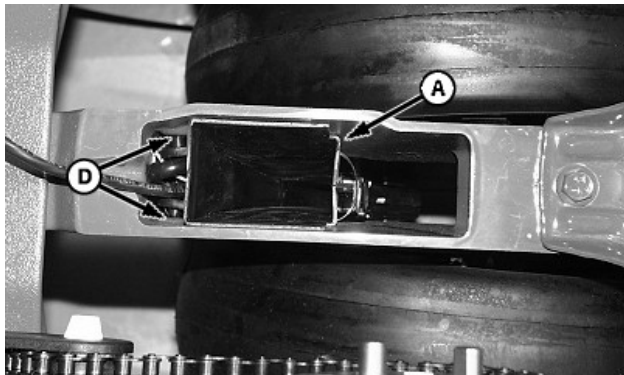
## Installing and Removing Seed Tubes



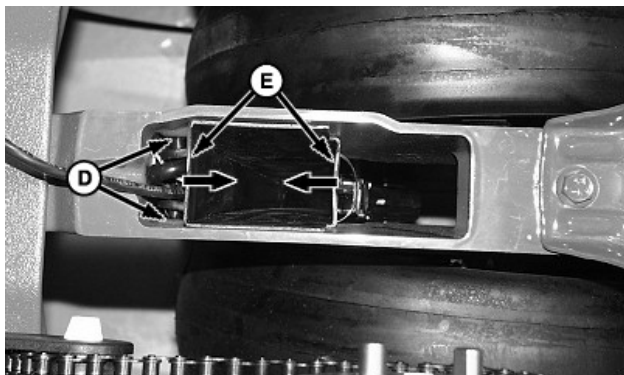
A53216—UN—27OCT03



A53298—UN—03NOV03



A53218—UN—27OCT03



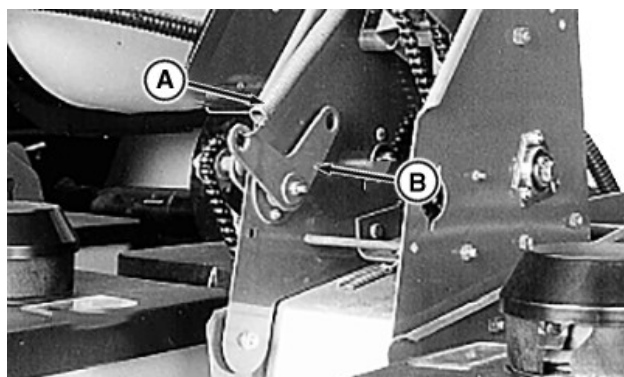
A54328—UN—12MAY04

A—Seed Tube  
B—Hook  
C—Pin  
D—Tabs  
E—Front and Rear

1. To install seed tube, insert seed tube (A) into planting the unit so the hook (B) locks on the alignment pin (C).
2. Position seed tube so tabs (D) lock into holes.
3. Connect monitor harness to sensor harness.
4. To remove seed tube, squeeze front and rear (E) of tube with fingers until tabs (D) release from casting and pull upward.

PB21958,0000530-19-05MAR18

## Changing Input Sprocket Combinations — Seed Transmission



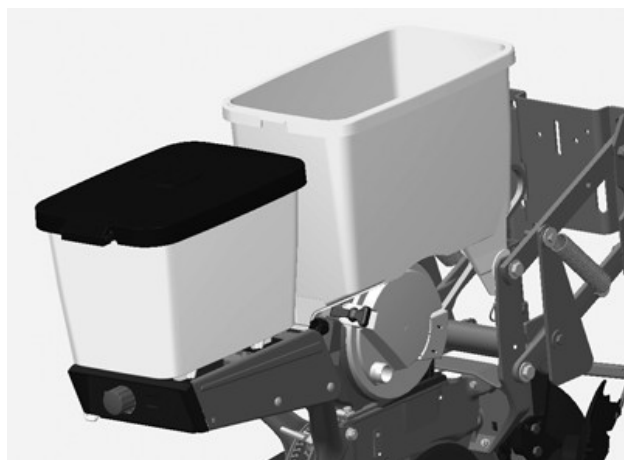
A—Spring  
B—Chain Tightener

APY04884—UN—01MAR18

1. To determine desired sprocket combinations, consult appropriate planting rate chart.
2. Remove spring (A) from the chain tightener (B).

PB21958,0000531-19-05MAR18

## Filling Seed Hoppers



58L Seed Hooper

P17529—UN—12NOV14

If using seed treatment, remove any buildup that may occur on the bottom of the hopper or meter before filling seed hoppers.

Talc lubricant (A52577) is necessary especially when seed treatments and high humidity cause excessive buildup on seed meter components. Which can result in low population.

Talc lubricant minimizes buildup of gummy deposits on seed disks caused by seed treatment or high humidity, aid in smooth seed flow through seed meter, helps prevent bridging in hopper and reduces wear on vacuum meter components.

Spread 1/3 cup of the talc over the top of seeds each

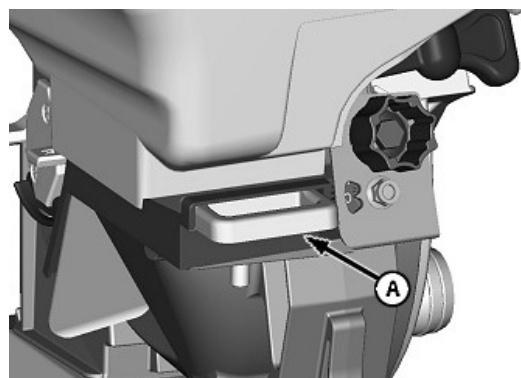
time the hopper is filled. Adjust the amount to meet seed and humidity conditions.

**NOTE:** Using the talc with liquid hopper applied seed treatments which leave a wet coating on the seed is not recommended.

**IMPORTANT:** Replace hopper lids after hoppers have been filled. If lids are left off, dust and dirt can accumulate in the seed metering mechanism causing excessive wear.

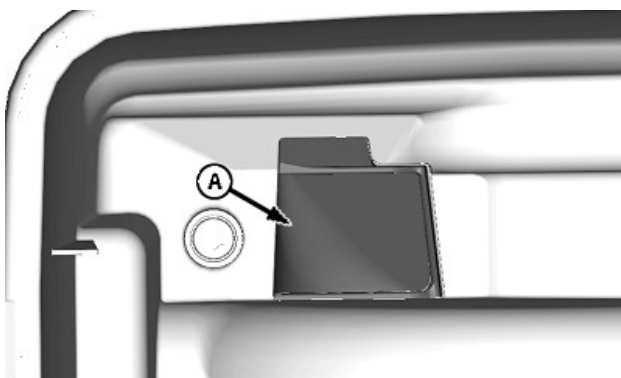
PB21958,0000532-19-05MAR18

## Cleanout and Inspection of Seed Hoppers and Vacuum Meters



Open Position

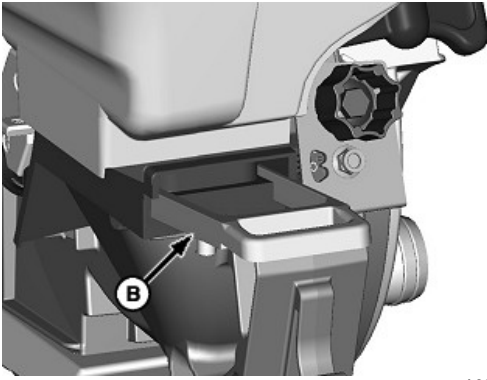
A82646—UN—23MAY14



Open Position

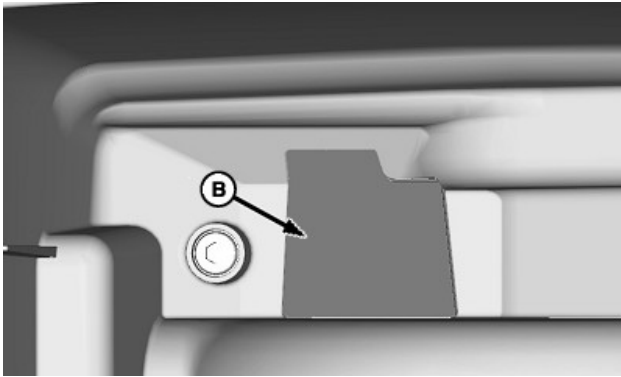
A82647—UN—23MAY14

A—Gate, Open Position



Closed Position

A82648—UN—23MAY14



Closed Position

A82649—UN—23MAY14

**B—Gate, Closed Position**

1. For best operation, empty hoppers thoroughly after each days use to remove the chaff, dust, and other foreign material.

*NOTE: If bridging occurs, ensure that handle is open and add more talc to seed.*

1.6 and 3 bushel hoppers are equipped with shutoff gates. Move gate to the open position (A) when meter is in use.

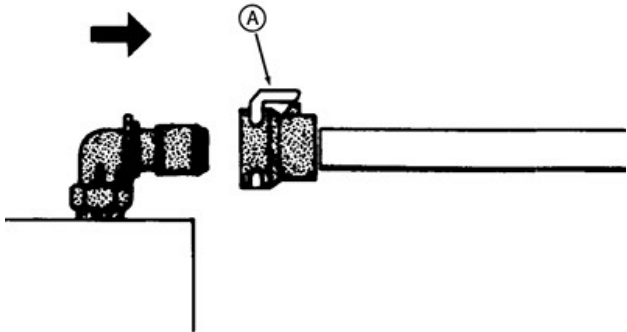
2. Move gate to closed position (B) before opening meter cover for cleanout or inspection.



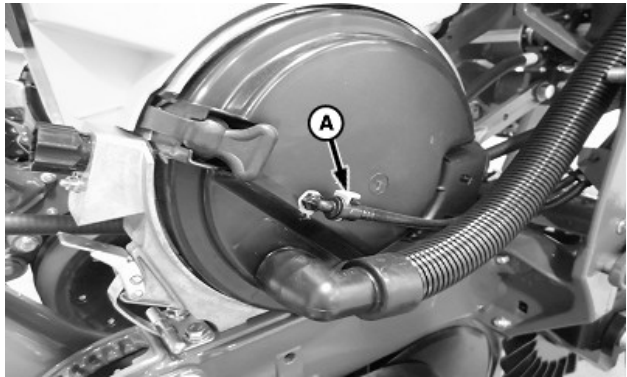
**A—Vacuum Hose**

A77659—UN—06NOV13

3. Remove vacuum hose (A) from vacuum meter.



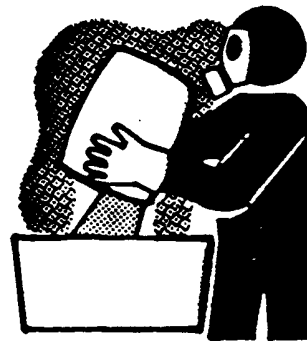
APY03848—UN—08MAR18



A78915—UN—17OCT13

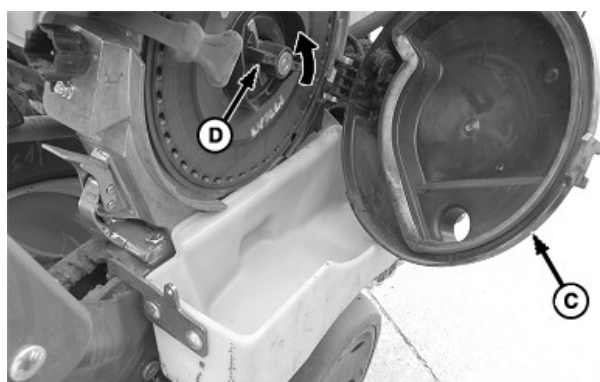
**A—Retainer**

4. On vacuum meters equipped with the vacuum gauge hose, squeeze retainer (A) and disconnect hose.



A34471

A34471—UN—11OCT88

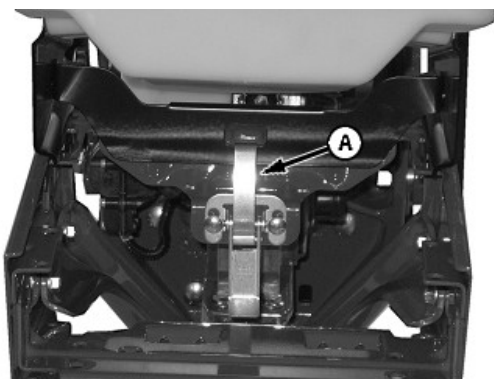


A82665—UN—29MAY14

A—Plastic Edge  
B—Hooked Plate  
C—Meter Cover  
D—Handle

**CAUTION:** Avoid chemical injury to eyes, skin, and lungs when accessing and handling components coated with seed treatment. Wear the appropriate personal protective equipment. Read and follow the safety instructions on the product label.

5. Open meter cover (C), rotate handle (D) into unlocked position, and remove seed disk.



A80234—UN—28FEB14

106 L (3 bu) Seed Hopper



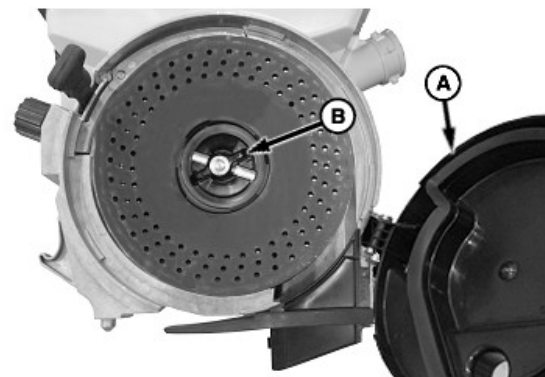
A78914—UN—06NOV13

A—Hopper Latch  
B—Meter Latch

6. To remove seed hopper from planting unit, disengage hopper latch (A) or meter latch (B).

Rotate meter and hopper forward then lift upward to remove.

**NOTE:** If using seed treatments, remove any buildup from bottom of hopper.



A78557—UN—15OCT13

Vacuum Meter

A—Door  
B—Meter Hub

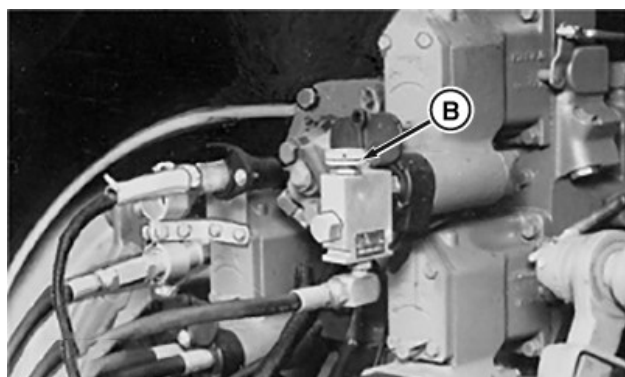
7. To inspect meter, lay hopper on side and turn meter hub (B) by hand to determine if mechanism is free of dirt, chaff, or other foreign material. Inspect brush for gaps, hub seal for cracks, and vacuum seal for cracks and wear areas. If repair is necessary, see meter service procedures in the Service section.
8. Install seed disk back into meter.
9. Install meter and hopper back onto planting unit. Engage hopper latch and meter latch.
10. Return seed meter catch pan to storage position.

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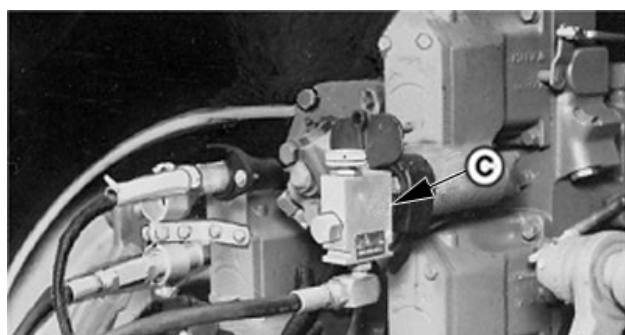
## Set Vacuum Level



P17520—UN—11NOV14



APY04883—UN—01MAR18



PYM0049—UN—27MAR06

A—Vacuum Gauge  
B—Knob  
C—Relief Valve

The vacuum level is indicated on vacuum gauge (A) and controlled by knob (B) on the relief valve (C) (Direct coupled system)

The operating vacuum level must be set for the type of seed and conditions.

A good starting point for maize and similar seeds is 8" - 10" of water. For lighter seeds such as the sunflower start at a lower setting such as 6"

The presence of "doubles" indicates too high a vacuum, "misses" indicate too low a vacuum.

With the correct disk for the seed being planted,

accurate planting is possible over fairly large range of vacuum levels, but field checks must be carried out.

**IMPORTANT:** In cold weather (under 10 deg. C), be sure that tractor is running at low r/min. (800-1000) before engaging blower. A high flow of cold oil could cause damage to the system.

1. Engage PTO lever to start pump or SCV lever to start blower - let oil warm up for 15 minutes.
2. Fill hoppers with seed.
3. Drive tractor forward approximately 10 m to fill seed cells.
4. Readjust control knob (B) until vacuum gauge (A) indicator points to vacuum level desired, at the normal operating engine r/min.

For the PTO pump systems, turning the knob clockwise increases vacuum level. Turning the knob counterclockwise, decreases vacuum level.

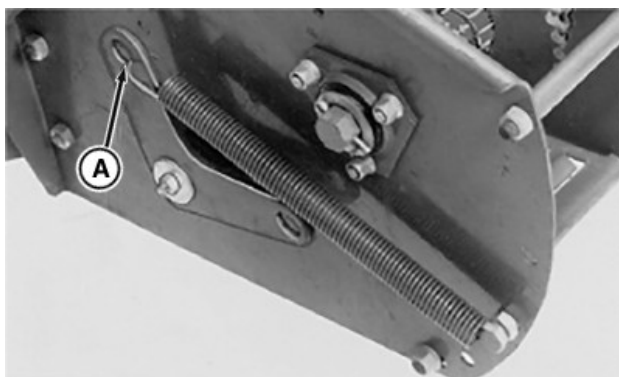
For direct coupled systems, turning knob (B) clockwise decreases vacuum level and turning knob counterclockwise increases vacuum level.

*NOTE: It is not necessary to reset vacuum level daily  
Vacuum level is slightly lower during start-up*

PB21958.0000534-19-15MAR18

## Changing Input Sprocket Combinations (Ground Drive)

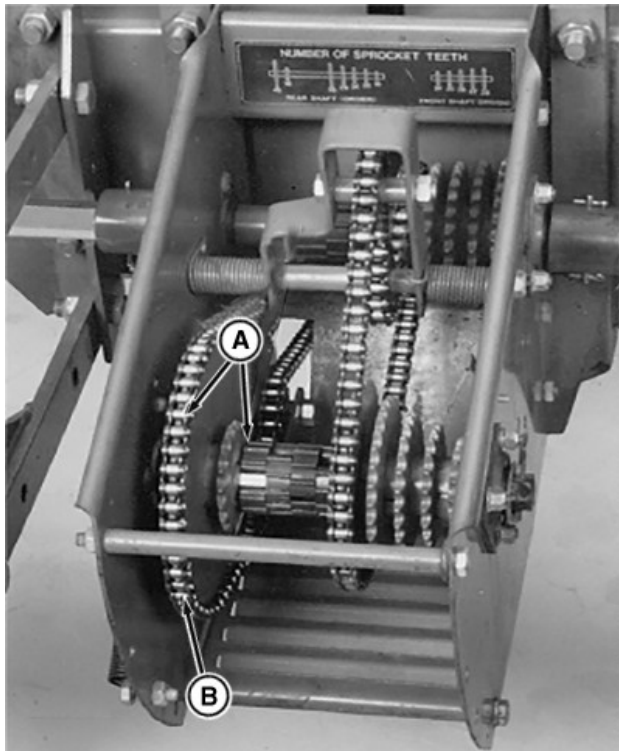
To determine desired sprocket combinations, consult appropriate planting rate chart.



APY04882—UN—01MAR18

A—Chain Tightener

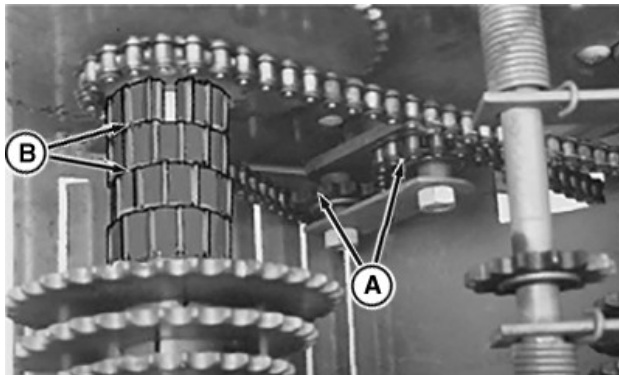
1. Remove spring (A) from the chain tightener.



APY04880—UN—01MAR18

**A—Rubber Sprocket Spacers**  
**B—Tooth - input Sprocket**

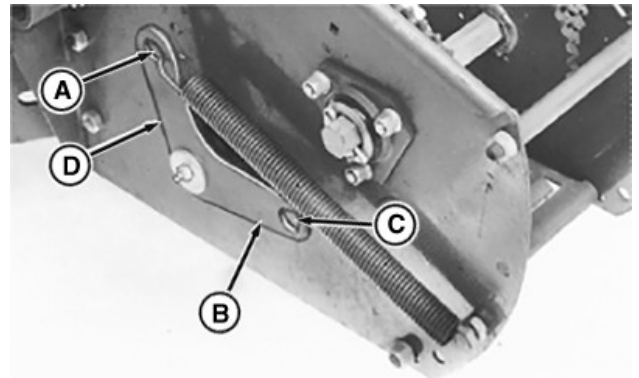
2. Remove required number of rubber sprocket spacers (A).
3. Remove chain from 18- or 48 tooth - input sprocket (B).



APY04878—UN—01MAR18

**A—Chain Tightener Sprockets**  
**B—Rubber Sprocket Spacers**

4. Locate 18- or 48 tooth input sprocket until desired sprocket is aligned with the chain tightener sprockets (A).
5. Replace chain on sprocket. Replace rubber sprocket spacers (B).



APY04881—UN—01MAR18

**A—Hole**  
**B—Arm**  
**C—Hole**  
**D—Arm**

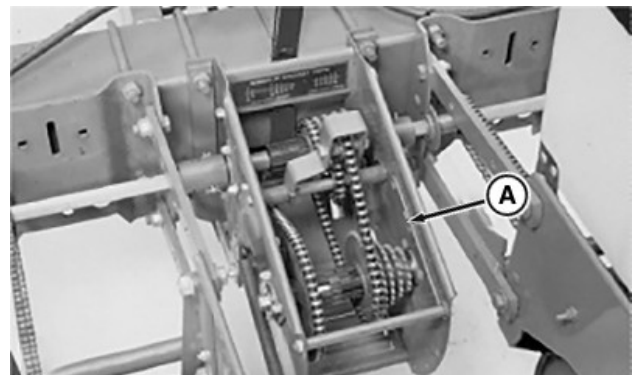
6. If chain is aligned on the high-range input sprocket, locate spring in the hole (A) of the chain tightener. Arm (B) must point rearward as shown.
7. If chain is installed on the low range input sprocket, locate spring in the hole (C) of the chain tightener. Arm (D) must point forward.

PB21958,0000535-19-05MAR18

## Changing Planting Rate Sprocket Combinations (Ground Drive)

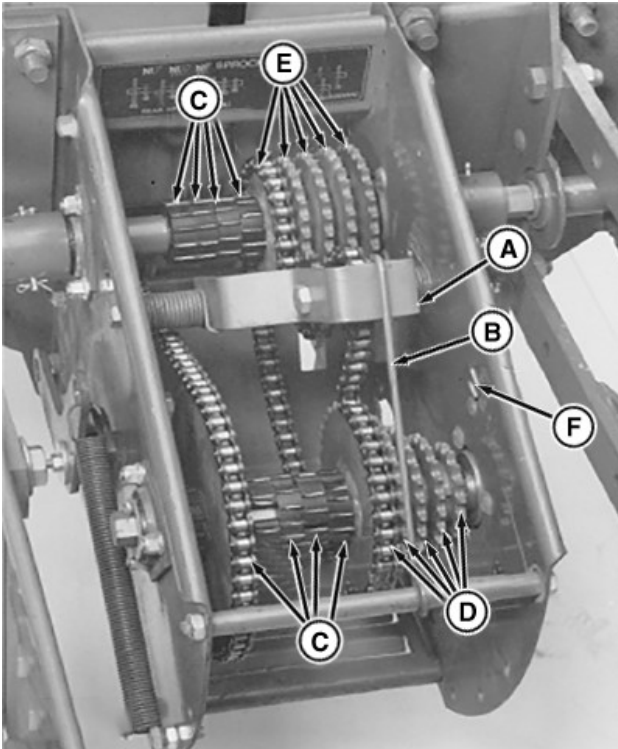
To determine desired sprocket combinations, consult appropriate planting rate chart.

1. Remove retaining hook (A) from storage position.



APY04879—UN—01MAR18

**A—Retaining Hook**



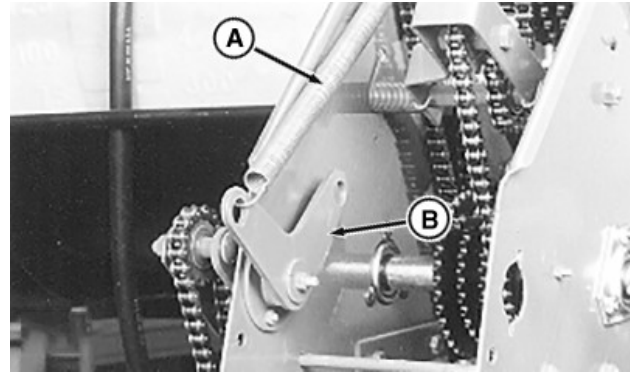
A—Chain Tightener  
B—Retaining Hook  
C—Rubber Sprocket Spacers  
D—Driver Sprockets  
E—Driven Sprockets  
F—Clip

APY04858—UN—02MAR18

2. Pull chain tightener (A) downward and attach hook (B) on tightener.
3. Remove required number of rubber sprocket spaces (C).
4. Remove chain from sprockets. Slide desired driver and driven sprockets (D) and (E) into alignment with the chain tightener and replace chain.
5. Remove hook from the chain tightener. Reposition hook in storage position by pressing it into clip (F)
6. Replace rubber sprocket spacers on upper and lower shafts.

PB21958,0000536-19-05MAR18

## Change Input Sprocket Combinations (Contact Drive)

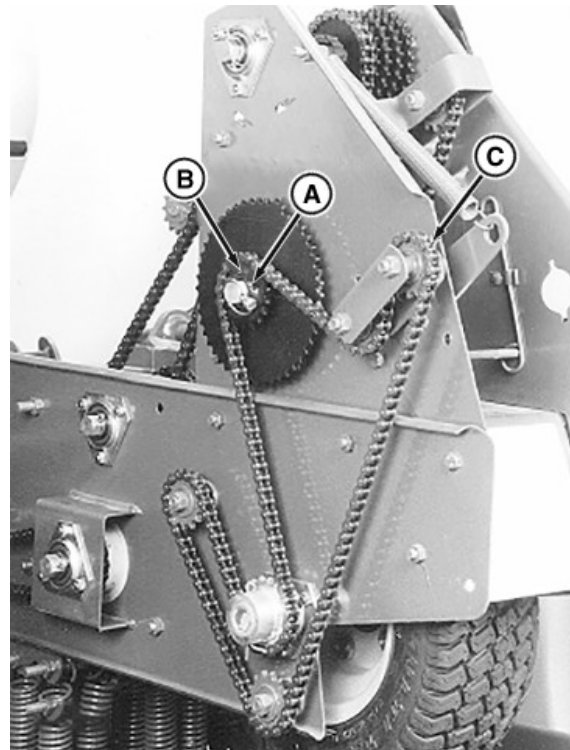


APY04853—UN—01MAR18

A—Spring  
B—Chain Tightener

To determine desired sprocket combinations, consult appropriate planting rate chart.

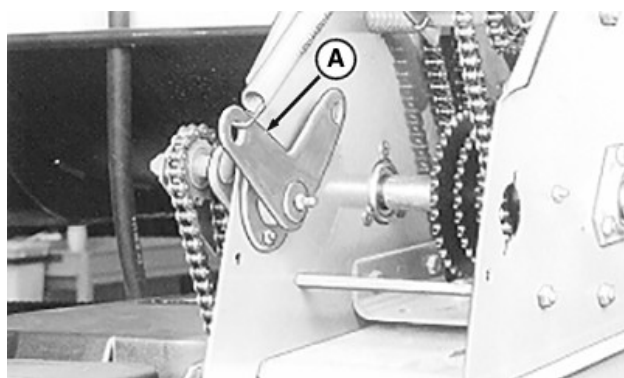
1. Remove spring (A) from the chain tightener (B).
2. Remove quick lock pin (A) from the input shaft.



APY04864—UN—01MAR18

A—Quick Lock Pin  
B—Input Sprocket  
C—Chain Tightener Sprockets

3. Remove chain from the input sprocket (B).
4. Locate input sprocket until desired sprocket is aligned with the chain tightener sprockets (C).
5. Replace chain on sprocket.

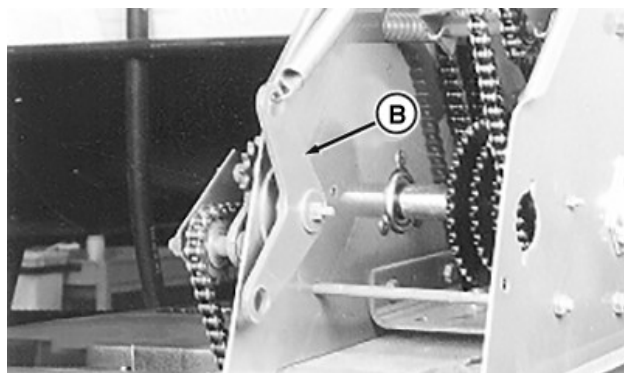


APY04861—UN—01MAR18

High-Range

**A—Hole**

6. If chain is aligned on the high-range input sprocket, locate spring in the hole (A) of the chain tightener.
7. If chain is installed on the low range input sprocket, locate spring in the hole (B) of the chain tightener.

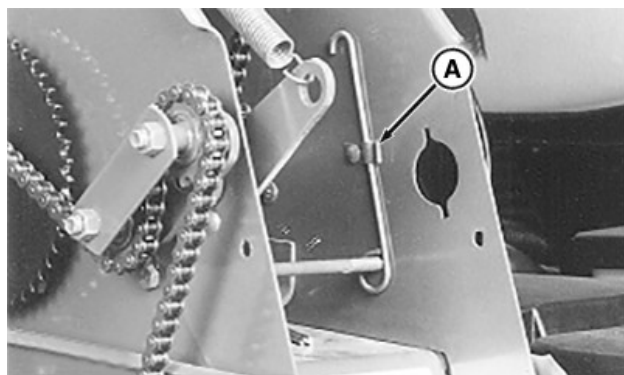


APY04854—UN—12MAR18

Low Range

PB21958,0000537-19-05MAR18

## Changing Planting Rate Sprocket Combinations (Contact Drive)

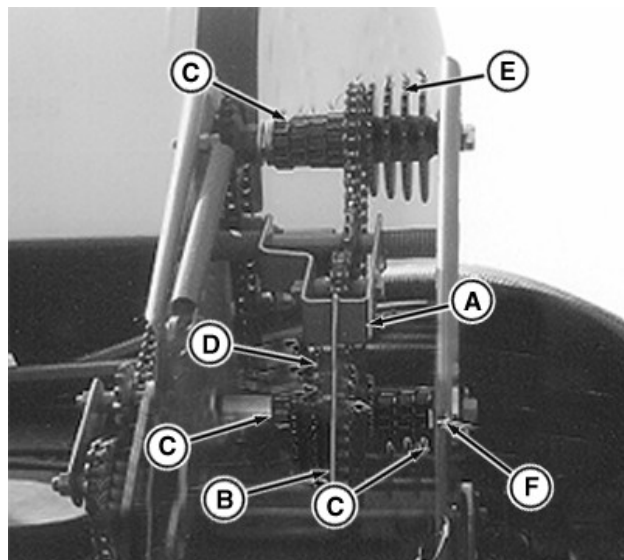


APY04838—UN—01MAR18

**A—Retaining Hook**

To determine desired sprocket combinations, consult appropriate planting rate chart.

1. Remove retaining hook (A) from storage position.
2. Pull chain tightener (A) downward and fasten hook (B) on tightener.



APY04829—UN—14MAR18

- A—Chain Tightener**  
**B—Retainer Hook**  
**C—Rubber Sprocket Spacers**  
**D—Driver Sprockets**  
**E—Driven Sprockets**  
**F—Clip**

3. Remove required number of rubber sprocket spacers (C) .
4. Remove chain from sprockets. Slide desired driver and driven sprockets (D) and (E) into alignment with the chain tightener and replace chain.
5. Remove hook from the chain tightener. Reposition hook in storage position by pressing it into clip (F).
6. Replace rubber sprocket spacers on upper and lower shafts.

PB21958,0000538-19-05MAR18

## Metering Units

For information on planting rates, operation and service of planter and service of plateless and vacuum seed metering units, see Service Sections in this Manual.

PB21958,0000539-19-05MAR18

# Population Check

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## Check Seed Population



P17531—UN—12NOV14

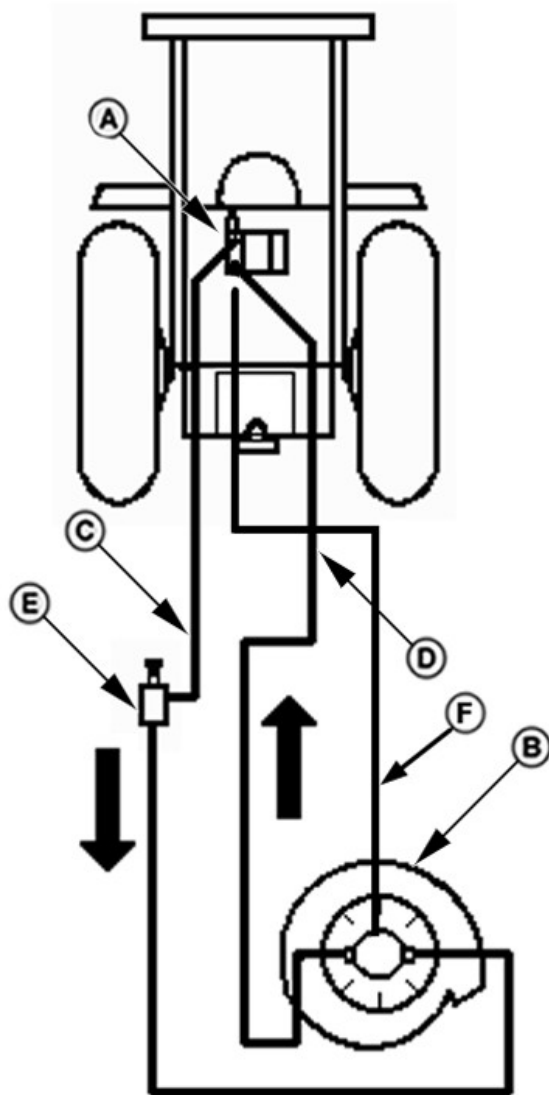
### A—Chain

1. Relieve all pressure from the closing wheels. If possible, place a chain (A) on one or more pairs of closing wheels to allow the furrow to remain open.
2. Set the planting depth to the minimum setting possible.
3. Plant a short distance and check if there are seeds in the furrow. Readjust the depth adjusting handle as needed.
4. Plant a distance of approximately 30 meters.
5. Within these 30 meters, select a row section with 10 meters planted at a distance of more than 5 meters from the planter. Count the number of seeds. If the number does not match the values in the table, perform the adjustments required to achieve the desired population (or number of seeds per meter).

PB21958,000053A-19-12MAR18

# Preparing Vacuum Seed Metering Unit

## Single Vacuum Connection and Operation



A—Series 301 Valve  
B—Hydraulic Vacuum Motor  
C—Pressure Line  
D—Return Line  
E—Control Valve  
F—Case Drain

P16990—UN—23JUN13

**IMPORTANT:** To prevent damage to the hydraulic motor, connect the pressure line (with ISO coupler) to tractor Retract and connect the return line (with return coupler) to tractor Extend.

**IMPORTANT:** On stopping the fan, move the SCV control lever to the FLOAT position and then shutoff the tractor engine. With the engine off, move the control lever to the NEUTRAL position.

**IMPORTANT:** On John Deere tractors equipped with a 301 valve or any tractor equipped with a selective control valve to regulate hydraulic system flow, flow must be set to the **MINIMUM** level required to activate the vacuum system.

### Adjusting Vacuum

1. Open control valve (E).
2. Activate vacuum hydraulics.
3. Adjust tractor hydraulic flow until target vacuum level is reached on indicator.

PB21958,000050F-19-05MAR18

### Choosing Seed and Selecting Seed Discs

The vacuum seed meter will accurately plant most sizes of maize, acid delinted cotton, sorghum, milo, soybean seed, sugar beets, sunflower seed, edible beans, and a variety of vegetable seeds.

Improve the planter's accuracy by choosing the size seed which is most favorably suited to the vacuum gauging system. If possible select the following size seeds.

**MAIZE:** Medium small to medium large rounds and flats. (Small maize can be accurately planted with the Small maize seed disk.)

The planter is equipped with the standard maize disk and the large maize disk.

For most local seeds especially flats, the large maize disk is recommended.

In general, using the "small" disk with large seed causes misses and large disks with small seed cause "doubles". Seed must be checked for a good fit in the disk cells.

**ACID DELINTED COTTON** - All sizes.

**SORGHUM - MILO** - 22000 TO 35300 seeds/kg

**SOYBEANS** - All sizes

**SUGAR BEET** - Mono-germ beet seeds, ranging in sizes from 2,6 mm to 3,9 mm

**SUNFLOWER SEED** - Size 4 (small), 3 (medium) and 2 (large) oil sunflower seeds. Size 1 (extra large) and size 5 (Extra small) and confectionary sunflower seeds are not recommended for use of this seed disk.

The following page gives part numbers of seed disks available.

### Seed Treatments

*NOTE: If hopper box treatments are used, dry powder or fast drying liquid treatments are recommended. Be sure to follow manufacturers recommendations.*

**IMPORTANT: Hopper - applied, Oil based seed treatments may reduce vacuum gauge performance and are not recommended.**

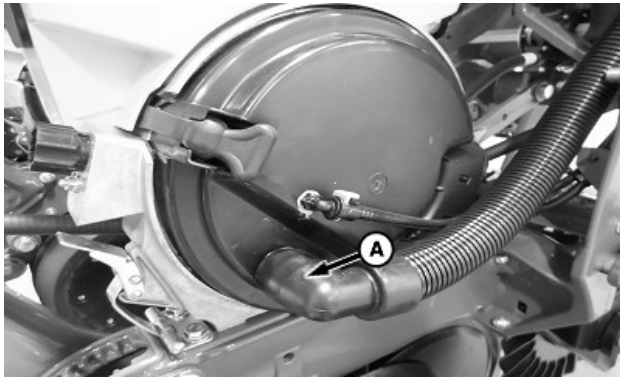
PB21958,0000510-19-05MAR18

## Vacuum Seed Metering Discs and Equipment

| BUNDLE  | CONTAINS X2                                                                                                                                                                |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BA25332 | Small maize Seed Metering Disc (A43215)                                                                                                                                    |
| BA24605 | Standard maize seed metering disk (A50617)                                                                                                                                 |
| AA48362 | Large maize seed metering disk (A63160)                                                                                                                                    |
| BA24607 | Soybean Seed Metering Disc (A42586)                                                                                                                                        |
| BA26686 | Acid-delinted Cotton Seed Metering Disc (A56251)                                                                                                                           |
| BH78546 | Acid-delinted Cotton Hilddrop Seed Metering Disc (H136587)                                                                                                                 |
| BH78652 | Sorghum Seed Metering Disc<br><i>NOTE: BH78724 Seed Tube insert recommended for low-rate applications (A43066)</i>                                                         |
| BH78501 | Sorghum Seed Metering Disc<br><i>NOTE: BH78724 Seed Tube inserts required. Included knock-out assembly (H136445)</i>                                                       |
| BA25772 | Large Sugarbeet Seed Metering Disc<br><i>NOTE: BH78724 Seed Tube insert and Ah 129125 knock-out assembly required (A51713)</i>                                             |
| BH78502 | Sunflower Seed Metering Disc (H136478)                                                                                                                                     |
| BH72728 | Small Edible Bean Seed Metering Disc (H136468)                                                                                                                             |
| BA25683 | Medium Edible Bean Metering Disc (A51696)                                                                                                                                  |
| BA25684 | Large Edible Bean Seed Metering Disc (H136092)                                                                                                                             |
| BA25764 | Virginia Peanut Seed Metering Disc (H138722)                                                                                                                               |
| BA26004 | Large Sweetcorn Seed Metering Disc<br><i>NOTE: Includes knock-out assembly and BA25987 Double Eliminator is required (A52391)</i>                                          |
| BA25887 | Small Sweetcorn Seed Metering Disc<br><i>NOTE: AA37348 knock-out assembly and BA25987 Double Eliminator is required (A52390)</i>                                           |
| BH78724 | Seed tube insert, curved<br><i>NOTE: BH78724 required, recommended for use with BH78652 in low rate application. Required for use with BH78501 or BA25772 or BA258973.</i> |
| BA25893 | Small Sugar beet Metering Disc<br><i>NOTE: BH78724 Seed Tube insert and AH129125 knock-out assembly required (A51712)</i>                                                  |
| BA25917 | Blank Seed Metering Disc for small seeds. Operate to drill holes.<br><i>NOTE: BA25987 Double Eliminator required (A52554)</i>                                              |
| BA25946 | High-rate Sorghum Seed Metering Disc (A52802)                                                                                                                              |
| BA25987 | Double Eliminator assembly. BA25887, BA25917 required with BA26004                                                                                                         |

PB21958,0000511-19-05MAR18

## Installing Seed Disc



A—Vacuum Hose

A77659—UN—06NOV13

1. Remove vacuum hose (A) from the metering unit.

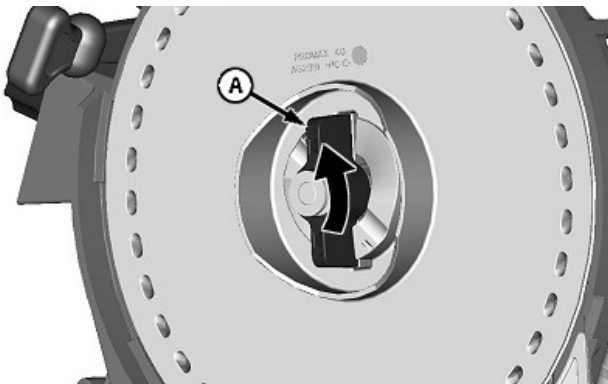
**IMPORTANT:** Use precautions as recommended by chemical manufacturers when handling parts coated with seed treatments. Use proper skin, eye, and respiratory protection.



A—Handle

A77660—UN—06NOV13

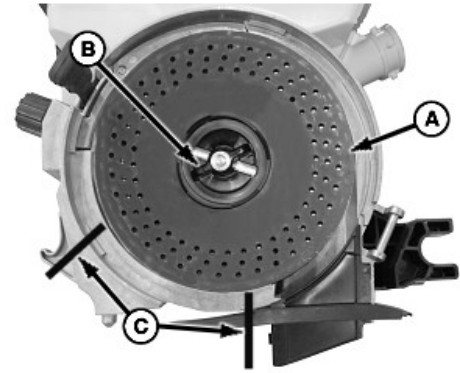
2. Disengage handle (A) and swing vacuum chamber open.



A—Handle

A77779—UN—30APR13

3. Rotate handle (A) into unlocked position and remove seed disk.



A77666—UN—15OCT13

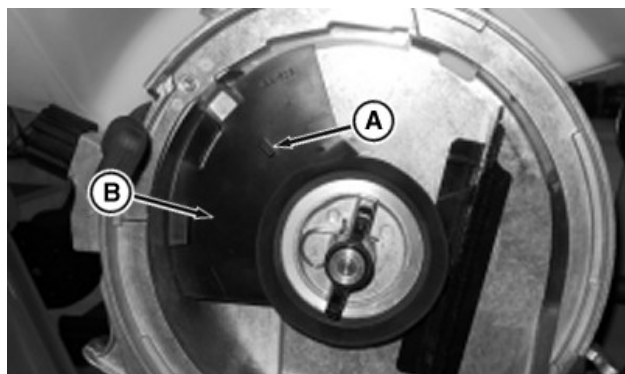
A—Seed Disk  
B—Hub Handle  
C—Section

4. Fit seed disk (A) into housing. Hold seed disk stationary and rotate hub handle (B) into locked position.
5. Inspect hub adjustment. See ADJUST METER HUB in this section if the following conditions are not met.
  - ☐ Verify that the seed disk (A) continues to rotate approximately 1/4 to 1/2 revolution after the hub is spun rapidly by hand and quickly released.
  - ☐ Verify that there is light contact between disk and meter housing in section (C) as disk is rotated.
  - ☐ Verify that no seed loss occurs through any gap in section (C) as disk is rotated.

PB21958,000050D-19-05MAR18

## Adjust Vacuum Gauge Baffle

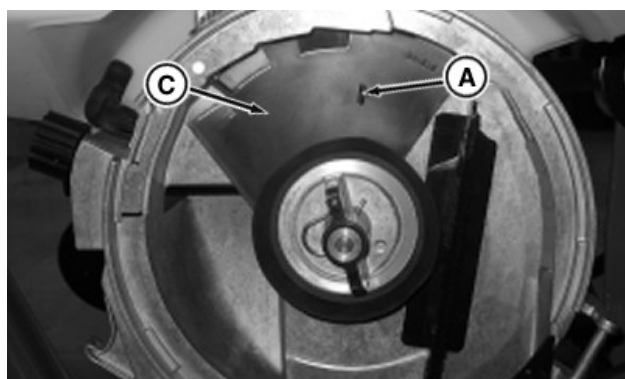
**NOTE:** Baffle is used on all meters except mini hopper meters.



APY04966—UN—19MAR18

Lower Baffle Position

A—Tab  
B—Lower Position



APY04967—UN—19MAR18

Upper Baffle Position

C—Upper Position

1. Open vacuum gauge. (See METER SETTINGS in this section.)

**NOTE:** Lower position (B) is recommended for smaller seeds such as: sugar beets, sorghum, oil sunflower, and popcorn.

Upper position (C) is recommended for larger seeds such as: corn, soybeans, cotton, edible beans, peanuts, sweet corn, and confectionary sunflower.

2. Move tab (A) to the position recommended in the METER SETTINGS table in this section.

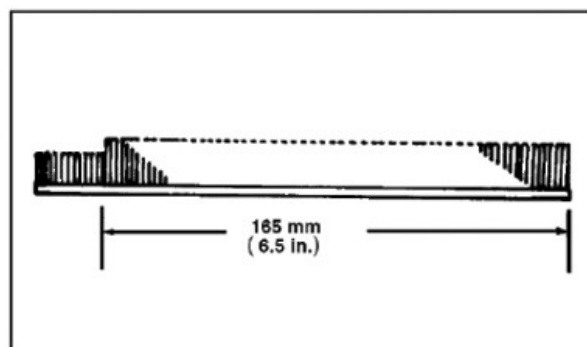
Seed bridging at the meter inlet can result in long skips when planting. If this condition occurs, adjust the baffle to upper position (C) and add talc lubricant generously.

**NOTE:** Lowering the baffle does NOT eliminate an overfilled vacuum gauge caused by rough field conditions. Increase downforce on the row unit and reduce planting speed to avoid overfilling.

If meters overfill or overpopulation occurs when planting on hillsides, reduce planting speed. Overfilled meters can occur when planting on hillsides. Overpopulation can occur on hillsides because the tabs on seed disks can hold and carry seed past the meter brush and into the seed tube. When planting in hillside conditions, use round seeds and, in some conditions, flat seed disks to provide the best performance.

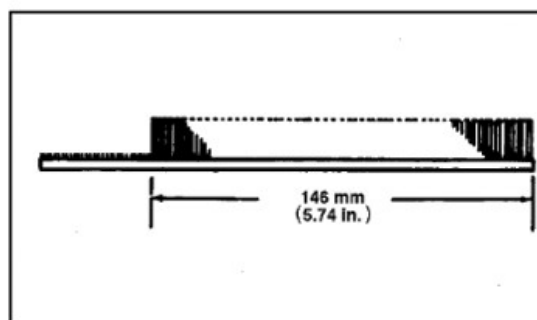
PB21958,0000512-19-20MAR18

## Selecting Correct Vacuum Gauge Brush



PYM0128—UN—24APR06

Regular (Long) Brush



PYM0129—UN—24APR06

Short Brush

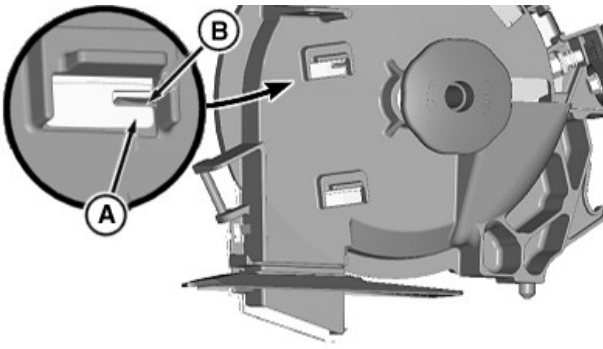
An incorrect vacuum gauge brush causes under population of edible beans, peanuts, and hilltop cotton.

Two vacuum gauge brushes are available:

- Use regular (long) brush for all crops except medium and large edible beans, peanuts, and hilldrop cotton.
- Use short brush for medium and large edible beans, peanuts, and hilldrop cotton.

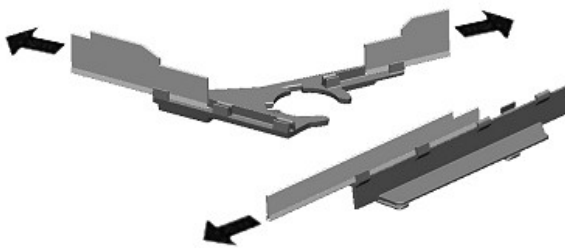
PB21958,0000513-19-05MAR18

## Change Vacuum Gauge Brush



A—Front Brush Tab  
B—Lock

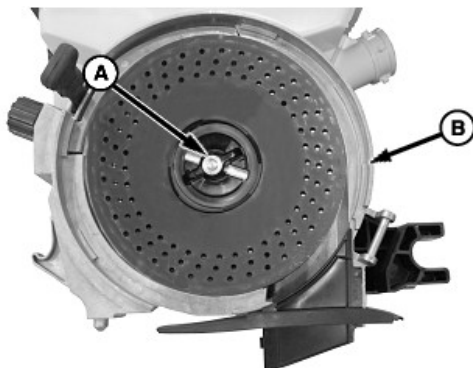
APY04877—UN—01MAR18



1. Open vacuum gauge. (See ACCESS THE vacuum gauge in this section.)
2. Inspect brushes for wear and replace as needed.
3. (See METER SETTINGS in this section for recommended brushes.)
4. Pry the front brush tab (A) over the lock (B) and remove brush holder from meter.

PB21958,000050C-19-15MAR18

## Adjust Meter Hub

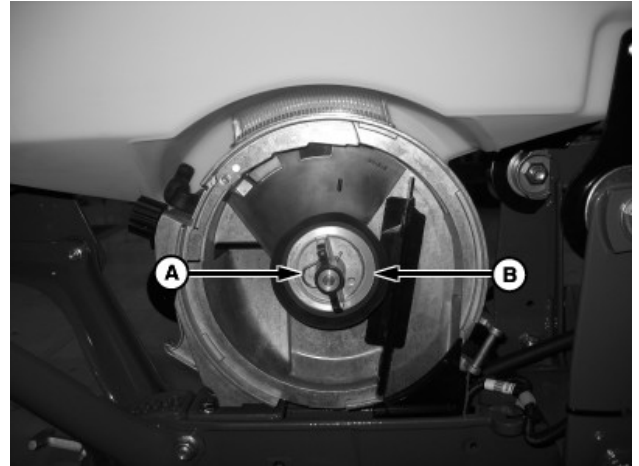


A—Hub Handle  
B—Housing

A77664—UN—15OCT13

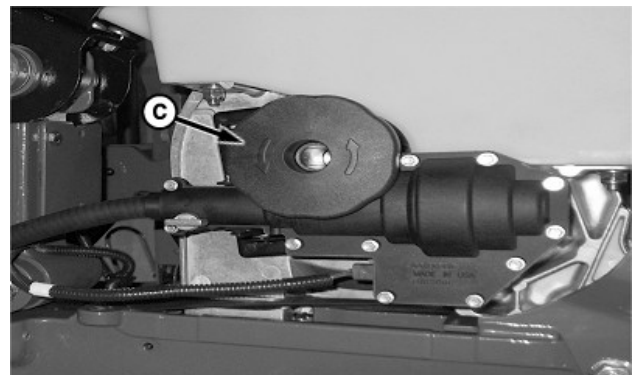
Improve meter accuracy and minimize seed damage with a properly adjusted meter hub. Check this adjustment whenever seed disks are changed. If there is a gap between the seed disk and meter housing (B) or if disk is difficult to turn, adjust meter hub as follows.

1. Open vacuum gauge.
2. Turn hub handle (A) counterclockwise. Remove seed disk.



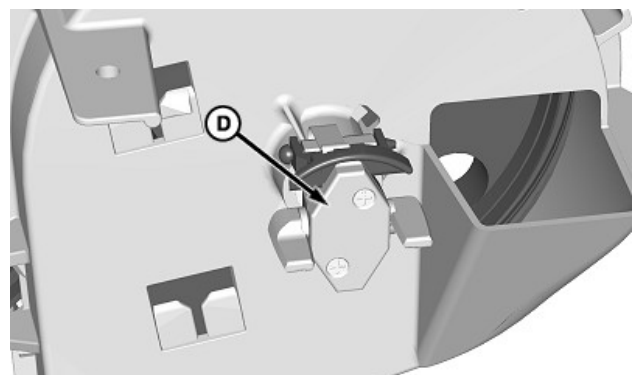
A—Spring Clip  
B—Hub

A78484—UN—30JUL13



C—Meter Handle

A78485—UN—11NOV13

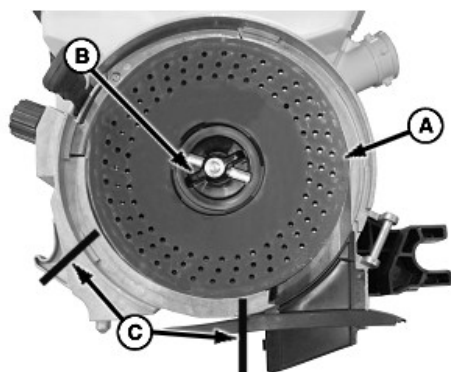


D—Meter Drive

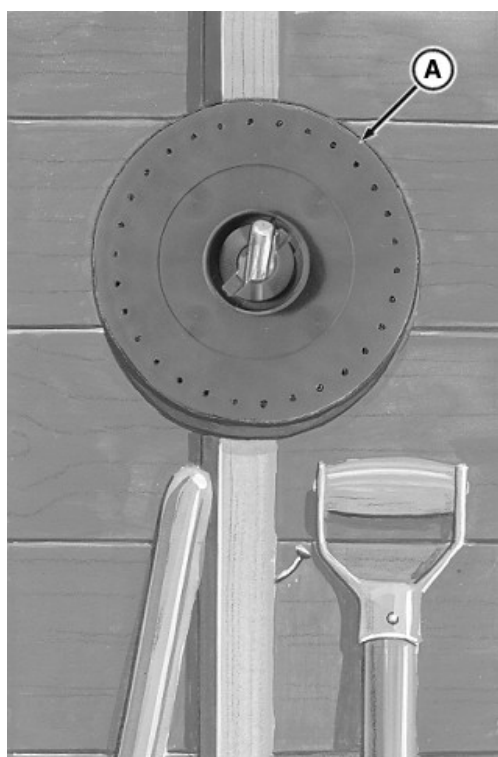
A78490—UN—31JUL13

3. Remove spring clip (A).

4. Adjust hub (B).
  - Make small adjustments.
  - Hold meter handle (C), or meter drive (D).
  - Thread hub (B) clockwise to move seed disk closer to the meter housing.
  - Thread hub (B) counterclockwise to move seed disk away from the meter housing.
5. Align slot with a hole in shaft and install spring clip (A).



A77666—UN—15OCT13



APY04817—UN—01MAR18

Storage

A—Seed Disk  
B—Hub Handle  
C—Area

6. Install seed disk (A) and lock hub handle (B).
7. Inspect adjustment.
  - a. Spin and release disk rapidly by hand.

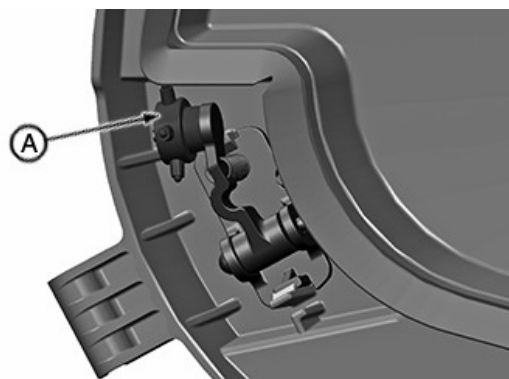
- b. Observe distance disk rotates. If the disk rotates approximately 1/4 to 1/2 revolution and stops, hub is adjusted properly.
- c. Repeat hub adjustment until correct.

**IMPORTANT: Avoid warped disks. Do not store disks in meters. Store disks flat on hub or hang on wall from hub. Do not store under heavy items or hang from the seed hole. Store away from high heat and sunlight.**

8. Rotate disk slowly by hand and observe disk contact with the housing in area (C). If a gap appears as disk is rotated, replace the disk.

PB21958,000050B-19-19MAR18

## Seed Knockout Wheel Operation



CQ297999—UN—26FEB14

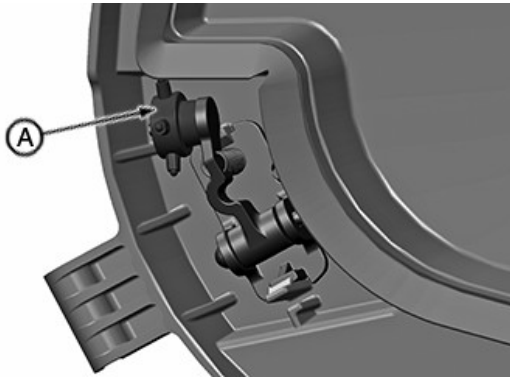
### A—Seed Knockout Wheel

The seed knockout wheel (A) is used to ensure that certain seed types are fully released from the seed cell. Wheel projections engage seed cell holes, forcing all seeds and foreign material to be ejected.

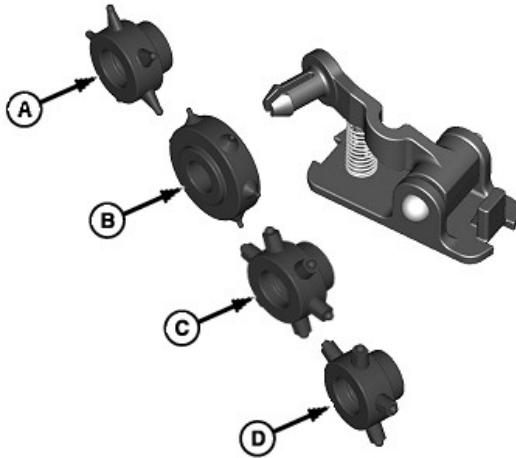
The seed knockout wheel is required when planting sorghum, mono-germ sugar beet, and seed planted with flat type seed disks. Sugar beet and sweet corn seed can have sharp edges and is typically irregular in shape, creating a potential for seeds to become lodged in the seed cell. Some sorghum seed contains large amounts of foreign material which can also become trapped in cell or cell holes.

PB21958,0000514-19-05MAR18

## Install Knockout Wheel Assembly



CQ297999—UN—26FEB14



A86304—UN—08MAY15



Wheel A

A86283—UN—08MAY15



Wheel B

A86264—UN—08MAY15



Wheel C

A82573—UN—09MAY14



Wheel D

A82576—UN—09MAY14

- A—Knockout Wheel (Type A)
- B—Knockout Wheel (Type B)
- C—Knockout Wheel (Type C)
- D—Knockout Wheel (Type D)

**NOTE:** The knockout wheel is used to ensure that irregular shaped seeds are fully released from the vacuum hole. Wheel projections engage vacuum holes to eject all seeds and foreign material from the seed cell.

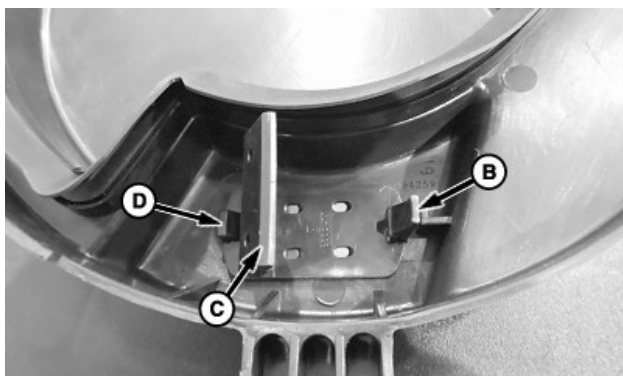
There are four knockout wheels available for use with different seed disks and seed types. (Refer to Seed Meter Settings in this section for knockout wheel recommendations.)

To remove the wheel, squeeze the wheel hub. Press alternate wheel onto the hub.

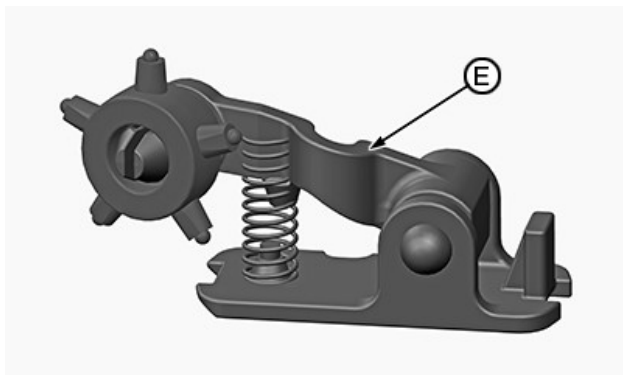
| Knockout Wheel Identification |             |
|-------------------------------|-------------|
| Knockout Wheel                | Part Number |
| Type A                        | A102718     |
| Type B                        | H136448     |
| Type C                        | A52389      |
| Type D                        | A53272      |



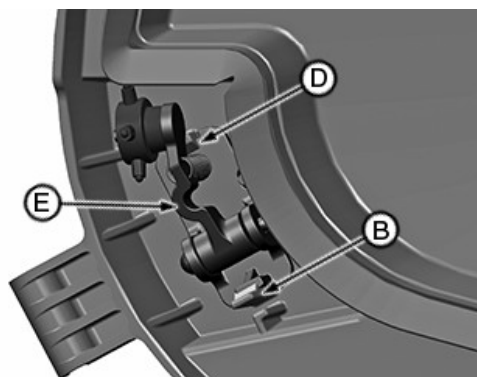
A77660—UN—06NOV13



A77663—UN—27AUG13



CQ298000—UN—26FEB14



CQ298001—UN—26FEB14

- A—Handle
- B—Retaining Clip
- C—Wiper Assembly
- D—Fastener Clip
- E—Knockout Assembly

1. Disengage handle (A) and open vacuum seed meter.

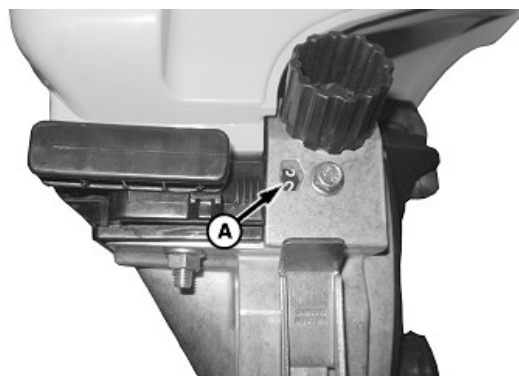
2. To remove wiper assembly (C), push retaining clip (B) and pull wiper assembly away from fastener clip (D).
3. Install knockout assembly (E) between retaining clip (B) and fastener clip (D).

*NOTE: When closing the cover, verify that the wheel is aligned with the row of seed cells on the seed disk.*

Close and latch the meter cover.

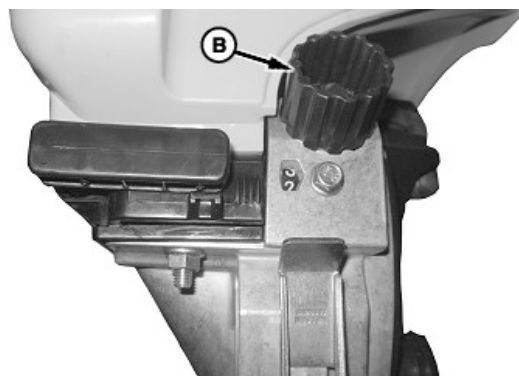
PB21958,0000515-19-15MAR18

## Operate Double Eliminator



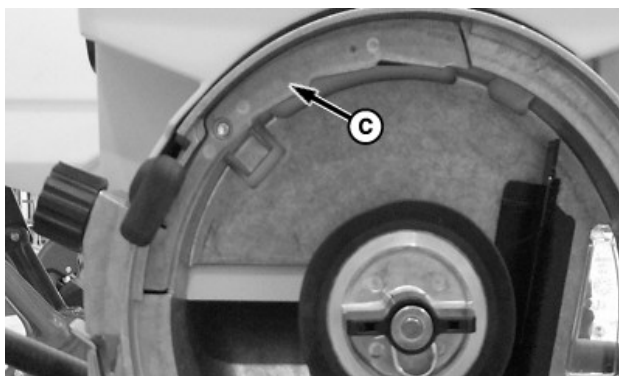
A77692—UN—19APR13

Number Indicator



A77693—UN—19APR13

Adjustment Knob



A77694—UN—19APR13

Eliminator Plate

A—Indicator  
B—Adjustment Knob  
C—Eliminator Plate

*NOTE: Set vacuum level using vacuum chart and disk for seed used.*

*NOTE: Number indicator on meter has a range of 0—10.*

There is a number indicator (A) next to the knob for consistent adjustment.

Lower Numbers on Indicator = Less hole covered.

Middle Numbers on Indicator = 1/2 of hole covered. Detent position.

Higher Numbers on Indicator = More hole covered.

Double Eliminator Operating Tips:

- Use adjustment knob (B) to adjust position of eliminator plate (C) to cover more or less of the holes on the seed disk.

Normal operating position is number 5 on the indicator for flat corn disk.

When in position number 5, the double eliminator plate covers 1/2 of the seed disk hole and provides good seed singulation for a wide variety of seed sizes and shapes.

If seed singulation performance is inconsistent and cannot be corrected by varying the vacuum level, adjust double eliminator to lower setting. If doubles are occurring, adjust double eliminator to a higher setting to cover more of the hole.

- Disk hub height is critical for proper performance. Adjust seed-disk hub, so seed disk is in light contact with the meter housing. Proper adjustment is achieved when the seed disk turns approximately 1/4 to 1/2 turn when the hub is spun rapidly by hand. (See ADJUST METER HUB in this section.)

PB21958,0000516-19-05MAR18

## Check Tractor Hydraulic System

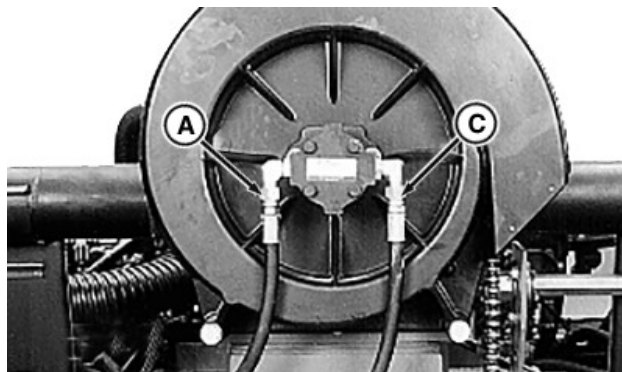
The vacuum gauge blower hydraulic system is designed to be operated with closed center tractor hydraulic systems (tractors with load sensing or pressure on - demand hydraulics are classified as closed center systems) Open center tractor hydraulics are NOT compatible with system.

Minimum tractor standby pressure required to operate the vacuum gauge blower hydraulic system is 12411kPa depending on frame configuration, planting speed and number of rows on planter.

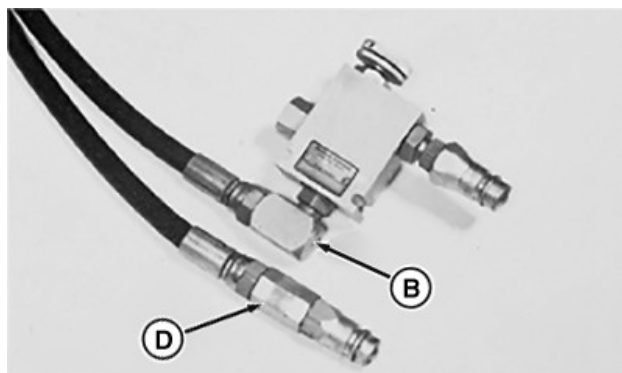
**IMPORTANT: Do not use open center tractor hydraulic system to operate vacuum blower. Permanent damage to the tractor pump may result.**

PB21958,0000517-19-05MAR18

## Check Hydraulic Connections



APY04835—UN—14MAR18



APY04862—UN—12MAR18

A—Hose  
B—Elbow Fitting  
C—Hose  
D—Check Valve

**IMPORTANT: If hydraulic hoses are assembled incorrectly, damage to the blower motor may occur. Check the following hydraulic connections before operating the vacuum motor.**

1. Verify hose (A) connected to left-hand (inlet) side of motor is connected to the elbow fitting (B) in the control valve.
2. Verify hose (C) connected to right-hand outlet side of motor is connected to check valve (D).

PB21958,000050E-19-05MAR18

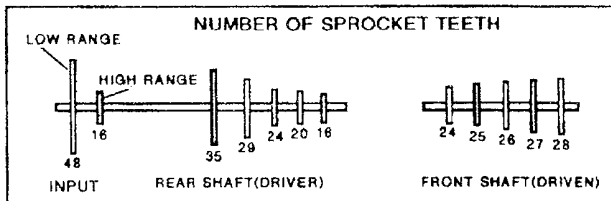
# How to Use Planting Rate Chart (Vacuum)

## How to Use Planting Rate Charts

1. Select the desired row spacing, seed spacing, or seed population under the proper column.
2. Choose the proper input sprocket.  
A high population requires you to use the high range input sprocket and "HIGH RANGE" chart for that particular seed. A lower population requires you to use the low range input sprocket and "LOW RANGE" chart for that particular seed.
3. Determine the correct seed drive transmission sprocket combination.
4. Determine the recommended planting speed range.  
The faster speed in the speed range is for optimum field conditions. Reduce speed if planting in rough conditions.

**NOTE:** All rates in the following charts are based on typical drive wheel slippage. Drive wheel slippage is affected by crop residue, unit down force, tire pressure and / or soil conditions

**IMPORTANT:** Check the actual planting rate in the filed. See **CHECKING SEED POPULATION**.



PYM0121—19—20APR06  
PB21958,000053B-19-05MAR18

**b—Planting rate variations.**

In most cases, the planting accuracy of the vacuum gauge does not decline unless you exceed maximum planting speed.

**NOTE:** Planting speeds are given in the seed charts. The maximums are for a SMOOTH seed bed only. On rough terrain speed must be reduced, otherwise seed may be knocked off the disk.

PB21958,000053C-19-05MAR18

## Metric Seed Population Tables for Vacuum Planter Plates



For 0,814m Rows: 1,123

For 0,864m Rows : 1,058

For 0,964m Rows : 0,940

For 1,000m Rows: 0,910

For 1,500m Rows: 0,607

For 2,300m Rows: 0,396

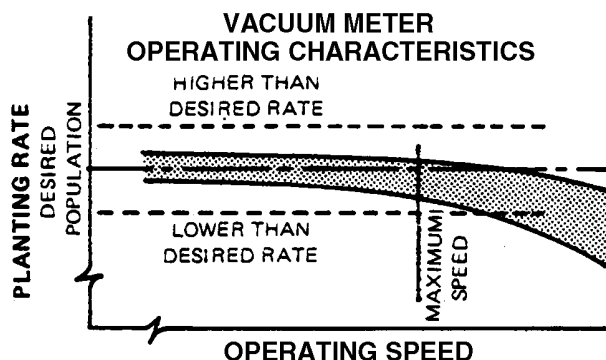
For TRAMLINE ROWS:

0,762 / 2,300 / 0,762 0,595

0,914 / 2,100 / 0,914 0,605

PYM0072—UN—11APR06

## Vacuum Gauge Operating Characteristics



A47087—19—31JAN01

The operating band (gray area) illustrates how the vacuum gauge performs in relation to the desired population (indicated by horizontal line). The width of the band is due to :

**a—Various sizes and shapes of seed.**

Including information on vacuum settings, baffle positions and so on, for various seeds.

Conversion Factors for the calculation of seed population for row widths other than 0.782 m (78 cm) and 0.914 m (91 cm) which are shown in the seed population tables on the following pages.

For determination of other row width population listed below, use 0.914 m row population figures and multiply by:

PB21958,000053D-19-05MAR18

## How to Use Planting Rate Chart (Vacuum)

### Corn ProMax 40 - 40 Cells

Average Seed Spacing and/or Approximate Seed Population Per Hectare of Sweetcorn Seed Planted with vacuum gauge

Using long brush and AA37348 knockout and A52152

double eliminator baffle in up position except for 11000 seeds per kg and smaller.

*NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".*

| HIGH RANGE INPUT SPROCKET                            |        |                               |                 |                 |                                    |
|------------------------------------------------------|--------|-------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                               |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 42                            | 314774          | 262888          | 0.80 to 2.4                        |
| 35                                                   | 25     | 44                            | 302183          | 252372          | 0.80 to 2.4                        |
| 35                                                   | 26     | 45                            | 290560          | 242666          | 0.80 to 2.4                        |
| 35                                                   | 27     | 47                            | 279799          | 233678          | 0.80 to 2.4                        |
| 35                                                   | 28     | 49                            | 269806          | 225332          | 0.80 to 2.4                        |
| 29                                                   | 24     | 50                            | 260812          | 217821          | 0.80 to 3.2                        |
| 29                                                   | 25     | 53                            | 250380          | 209108          | 0.80 to 3.2                        |
| 29                                                   | 26     | 55                            | 240750          | 201066          | 0.80 to 3.2                        |
| 29                                                   | 27     | 57                            | 231833          | 193619          | 0.80 to 3.2                        |
| 29                                                   | 28     | 59                            | 223553          | 186704          | 0.80 to 3.2                        |
| 24                                                   | 24     | 61                            | 215845          | 180266          | 0.80 to 3.2                        |
| 24                                                   | 25     | 64                            | 207211          | 173055          | 0.80 to 4.0                        |
| 24                                                   | 26     | 66                            | 199241          | 166399          | 0.80 to 4.0                        |
| 24                                                   | 27     | 69                            | 191862          | 160236          | 1.6 to 4.0                         |
| 24                                                   | 28     | 71                            | 185010          | 154514          | 1.6 to 4.0                         |
| 20                                                   | 24     | 73                            | 179871          | 150222          | 1.6 to 4.0                         |
| 20                                                   | 25     | 76                            | 172676          | 144213          | 1.6 to 4.8                         |
| 20                                                   | 26     | 79                            | 166034          | 138666          | 1.6 to 4.8                         |
| 20                                                   | 27     | 82                            | 159885          | 133530          | 1.6 to 4.8                         |
| 20                                                   | 28     | 85                            | 154175          | 128761          | 1.6 to 4.8                         |
| 16                                                   | 24     | 91                            | 143896          | 120177          | 1.6 to 5.6                         |
| 16                                                   | 25     | 95                            | 138141          | 115370          | 1.6 to 5.6                         |
| 16                                                   | 26     | 99                            | 132828          | 110933          | 1.6 to 5.6                         |
| 16                                                   | 27     | 103                           | 127908          | 106824          | 2.6 to 6.4                         |
| 16                                                   | 28     | 107                           | 123340          | 103009          | 2.6 to 6.4                         |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate

PB21958,000053E-19-12MAR18

Population Per Hectare of Sweetcorn Seed Planted with vacuum gauge

Using long brush and AA37348 knockout and A52152 double eliminator baffle in up position except for 11000 seeds per kg and smaller.

*NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".*

### Corn ProMax 40 - 40 Cells

Average Seed Spacing and/or Approximate Seed

| LOW RANGE INPUT SPROCKET                             |        |                               |                 |                 |                                    |
|------------------------------------------------------|--------|-------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                               |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 111                           | 118040          | 98583           | 2.4 to 6.4                         |
| 35                                                   | 25     | 116                           | 113318          | 94640           | 2.4 to 7.2                         |
| 35                                                   | 26     | 121                           | 108960          | 91000           | 2.4 to 7.2                         |
| 35                                                   | 27     | 125                           | 104925          | 87629           | 2.4 to 8.0                         |
| 35                                                   | 28     | 130                           | 101177          | 84500           | 2.4 to 8.0                         |
| 29                                                   | 24     | 135                           | 97805           | 81683           | 3.2 to 8.0                         |
| 29                                                   | 25     | 140                           | 93892           | 78416           | 3.2 to 8.8                         |
| 29                                                   | 26     | 146                           | 90281           | 75400           | 3.2 to 8.8                         |
| 29                                                   | 27     | 151                           | 86937           | 72607           | 3.2 to 9.6                         |

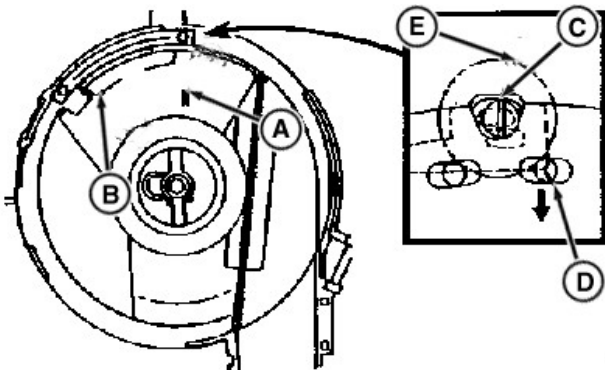
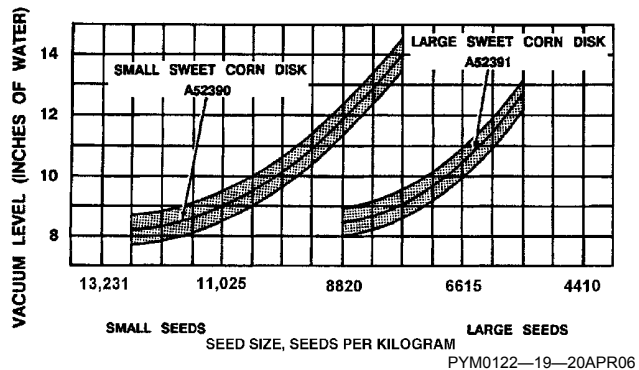
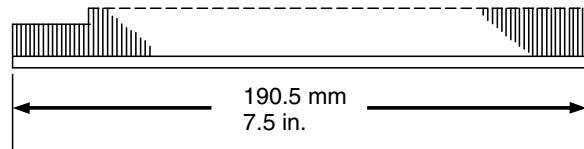
## How to Use Planting Rate Chart (Vacuum)

| LOW RANGE INPUT SPROCKET                             |        |                                  |                 |                 |                                    |
|------------------------------------------------------|--------|----------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                                  |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average<br>Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 29                                                   | 28     | 157                              | 83833           | 70014           | 3.2 to 9.6                         |
| 24                                                   | 24     | 163                              | 80942           | 67600           | 3.2 to 10.4                        |
| 24                                                   | 25     | 169                              | 77704           | 64896           | 4.0 to 10.4                        |
| 24                                                   | 26     | 176                              | 74715           | 62400           | 4.0 to 10.4                        |
| 24                                                   | 27     | 183                              | 71948           | 60089           | 4.0 to 10.4                        |
| 24                                                   | 28     | 190                              | 69379           | 57943           | 4.0 to 10.4                        |
| 20                                                   | 24     | 195                              | 67451           | 56333           | 4.0 to 10.4                        |
| 20                                                   | 25     | 203                              | 64753           | 54080           | 4.8 to 10.4                        |
| 20                                                   | 26     | 211                              | 62263           | 52000           | 4.8 to 10.4                        |
| 20                                                   | 27     | 219                              | 59957           | 50074           | 4.8 to 10.4                        |
| 20                                                   | 28     | 228                              | 57816           | 48286           | 4.8 to 10.4                        |
| 16                                                   | 24     | 244                              | 53961           | 45066           | 5.6 to 10.4                        |
| 16                                                   | 25     | 254                              | 51803           | 43264           | 5.6 to 10.4                        |
| 16                                                   | 26     | 264                              | 49810           | 41600           | 5.6 to 10.4                        |
| 16                                                   | 27     | 274                              | 47965           | 40059           | 6.4 to 10.4                        |
| 16                                                   | 28     | 284                              | 46252           | 38628           | 6.4 to 10.4                        |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate

PB21958,00004ED-19-14MAR18

### Vacuum Level, Baffle Position, and vacuum gauge Brush for Sweet Maize Seed



Upper Baffle Position

APY04857—UN—12MAR18

Regular (Long) Brush

A47009—UN—22JAN01

For sweet maize suppliers' information to calculate the seed size in seeds per kilogram.

EXAMPLE: If seed per kilogram is 8820. Referring to the chart, the vacuum level must be set 12 inch when using the small Sweet maize Disc A52390.

**IMPORTANT:** The 12 inch vacuum level above is an example on how to use the chart. Obtain size in seeds per kilogram. You must calculate the proper vacuum level for each seed variety.

vacuum gauge BAFFLE

Move tab (A).

Sweet maize, upper position (B).

Adjust double eliminator as follows:

Turn cam nut (C) to move top of the double eliminator (D) towards the center of the housing as far as possible. Tighten screw (E).

vacuum gauge BRUSH

## How to Use Planting Rate Chart (Vacuum)

Use regular (long) brush.

Use 120 mL Talc lubricant.

PB21958,000053F-19-05MAR18

### Maize and Sunflower - 30 Cells

Average Seed Spacing and/or Approximate Seed Population Per Hectare of maize (MAIZE) Seed Planted with vacuum gauge

*NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".*

| HIGH RANGE INPUT SPROCKET                            |        |                                  |                 |                 |                                    |
|------------------------------------------------------|--------|----------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                                  |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average<br>Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 56                               | 236080          | 197166          | 3.2 to 4.8                         |
| 35                                                   | 25     | 58                               | 226637          | 189279          | 3.2 to 4.8                         |
| 35                                                   | 26     | 60                               | 217920          | 181999          | 3.2 to 4.8                         |
| 35                                                   | 27     | 63                               | 209849          | 175259          | 3.2 to 5.6                         |
| 35                                                   | 28     | 65                               | 202354          | 168999          | 3.2 to 5.6                         |
| 29                                                   | 24     | 67                               | 195609          | 163366          | 3.2 to 5.6                         |
| 29                                                   | 25     | 70                               | 187785          | 156831          | 3.2 to 5.6                         |
| 29                                                   | 26     | 73                               | 180562          | 150799          | 3.2 to 6.4                         |
| 29                                                   | 27     | 76                               | 173875          | 145214          | 3.2 to 6.4                         |
| 29                                                   | 28     | 78                               | 167665          | 140028          | 3.2 to 6.4                         |
| 24                                                   | 24     | 81                               | 161884          | 135199          | 3.2 to 7.2                         |
| 24                                                   | 25     | 85                               | 155408          | 129791          | 3.2 to 7.2                         |
| 24                                                   | 26     | 88                               | 149431          | 124799          | 3.2 to 7.2                         |
| 24                                                   | 27     | 91                               | 143896          | 120177          | 3.2 to 8.0                         |
| 24                                                   | 28     | 95                               | 138757          | 115885          | 3.2 to 8.0                         |
| 20                                                   | 24     | 98                               | 134903          | 112666          | 3.2 to 8.8                         |
| 20                                                   | 25     | 102                              | 129507          | 108160          | 3.2 to 8.8                         |
| 20                                                   | 26     | 106                              | 124526          | 104000          | 3.2 to 9.6                         |
| 20                                                   | 27     | 110                              | 119914          | 100148          | 3.2 to 9.6                         |
| 20                                                   | 28     | 114                              | 115631          | 96571           | 3.2 to 10.5                        |
| 16                                                   | 24     | 122                              | 107922          | 90133           | 3.2 to 10.5                        |
| 16                                                   | 25     | 127                              | 103605          | 86528           | 3.2 to 11.2                        |
| 16                                                   | 26     | 132                              | 99621           | 83200           | 3.2 to 11.2                        |
| 16                                                   | 27     | 137                              | 95931           | 80118           | 3.2 to 12.0                        |
| 16                                                   | 28     | 142                              | 92505           | 77257           | 3.2 to 12.9                        |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate.

PB21958,00004EE-19-27FEB18

Population Per Hectare of maize (MAIZE) Seed Planted with vacuum gauge

*NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".*

### Maize and Sunflower - 30 Cells

Average Seed Spacing and/or Approximate Seed

| LOW RANGE INPUT SPROCKET                             |        |                                  |                 |                 |                                    |
|------------------------------------------------------|--------|----------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                                  |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average<br>Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 149                              | 88530           | 73937           | 4.8 to 12.9                        |
| 35                                                   | 25     | 155                              | 84989           | 70980           | 4.8 to 12.9                        |
| 35                                                   | 26     | 161                              | 81720           | 68250           | 4.8 to 12.9                        |
| 35                                                   | 27     | 167                              | 78693           | 65722           | 4.8 to 12.9                        |
| 35                                                   | 28     | 173                              | 75883           | 63375           | 4.8 to 12.9                        |
| 29                                                   | 24     | 179                              | 73353           | 61262           | 6.4 to 12.9                        |
| 29                                                   | 25     | 187                              | 70419           | 58812           | 6.4 to 12.9                        |

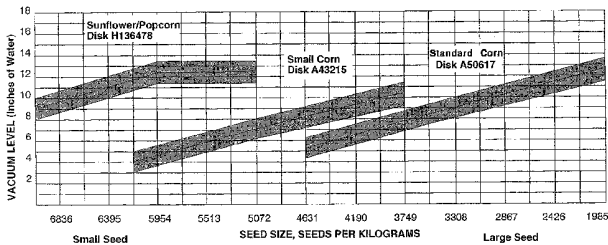
## How to Use Planting Rate Chart (Vacuum)

| LOW RANGE INPUT SPROCKET                             |        |                                  |                 |                 |                                    |
|------------------------------------------------------|--------|----------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                                  |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average<br>Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 29                                                   | 26     | 194                              | 67711           | 56550           | 6.4 to 12.9                        |
| 29                                                   | 27     | 202                              | 65203           | 54455           | 6.4 to 12.9                        |
| 29                                                   | 28     | 209                              | 62874           | 52510           | 6.4 to 12.9                        |
| 24                                                   | 24     | 217                              | 60706           | 50700           | 6.4 to 12.9                        |
| 24                                                   | 25     | 226                              | 58278           | 48672           | 6.4 to 12.9                        |
| 24                                                   | 26     | 235                              | 56037           | 46800           | 6.4 to 12.9                        |
| 24                                                   | 27     | 244                              | 53961           | 45066           | 6.4 to 12.9                        |
| 24                                                   | 28     | 253                              | 52034           | 43457           | 6.4 to 12.9                        |
| 20                                                   | 24     | 260                              | 50589           | 42250           | 6.4 to 12.9                        |
| 20                                                   | 25     | 271                              | 48565           | 40560           | 6.4 to 12.9                        |
| 20                                                   | 26     | 282                              | 46697           | 39000           | 6.4 to 12.9                        |
| 20                                                   | 27     | 293                              | 44968           | 37555           | 6.4 to 12.9                        |
| 20                                                   | 28     | 303                              | 43362           | 36214           | 6.4 to 12.9                        |
| 16                                                   | 24     | 325                              | 40471           | 33800           | 6.4 to 12.9                        |
| 16                                                   | 25     | 339                              | 38852           | 32448           | 6.4 to 12.9                        |
| 16                                                   | 26     | 352                              | 37358           | 31200           | 6.4 to 12.9                        |
| 16                                                   | 27     | 366                              | 35974           | 30044           | 6.4 to 12.9                        |
| 16                                                   | 28     | 379                              | 34689           | 28971           | 6.4 to 12.9                        |

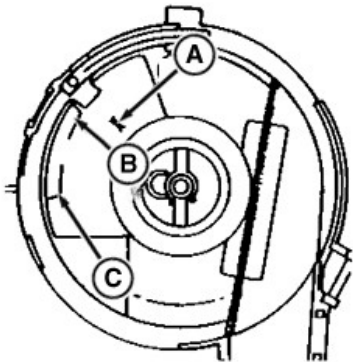
To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate.

PB21958,00004EF-19-14MAR18

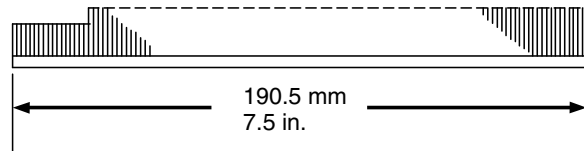
## Vacuum Level, Baffle Position, and vacuum gauge Brush for or Maize Seed



PYM0123—19—20APR06



Upper and Lower Baffle position  
APY04850—UN—12MAR18



A47009—UN—22JAN01

Regular (Long) Brush

For Maize, use the seed maize suppliers information to calculate the seed size in seeds per kilogram.

**EXAMPLE:** If the bag label indicates that there are 85000 kernels in the bag and the bag weight is 20.4 Kg, seed size is 4166 seeds per kilogram (85000 divided by 20.4). Referring to the chart, vacuum level must be set at 7 in when using standard maize Disc or 10 in when using Small maize Disc for seed size of 4166 seeds per kilogram.

**IMPORTANT:** The 7 in or 10 in vacuum level above is an example on how to use the chart. You must calculate proper vacuum level for each maize variety.

vacuum gauge BAFFLE

Move tab (A).

For Sunflower, lower position (B), for maize, upper position (C)

vacuum gauge BRUSH

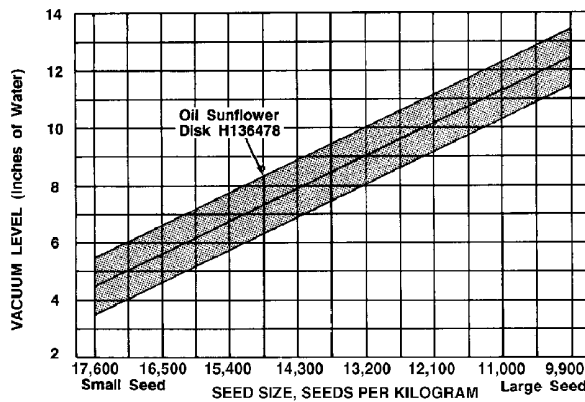
Use regular (long) brush.

Use 120 mL Talc Lubricant

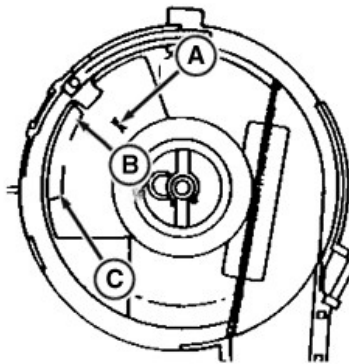
*NOTE: If sweetcorn, double eliminator has been installed, loosen the set screw in the cam nut and rotate the cam nut to move tip of eliminator AWAY from center of the meter housing as far as possible.*

PB21958,0000540-19-05MAR18

## Vacuum Level, Baffle Position, and vacuum gauge Brush for Oil Sunflower Seed

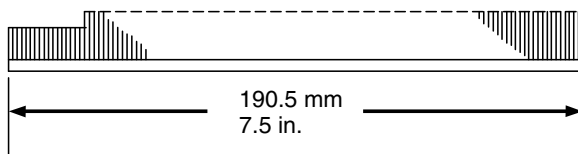


PYM0124—19—20APR06



APY04850—UN—12MAR18

Upper and lower Baffle position



Regular (Long) Brush

A47009—UN—22JAN01

For Oil Sunflower, use the seed suppliers information to calculate the seed size in seeds per kilogram.

EXAMPLE: If seed per kilogram is 12100. Referring to the chart, vacuum level must be set at 10 in when using the Oil Sunflower Disc.

**IMPORTANT: The 10 in vacuum level above is an example on how to use the chart. You must calculate proper vacuum level for each Oil Sun Flower variety.**

vacuum gauge BAFFLE

Move tab (A).

For Sunflower, lower position (B), for maize, upper position (C)

vacuum gauge BRUSH

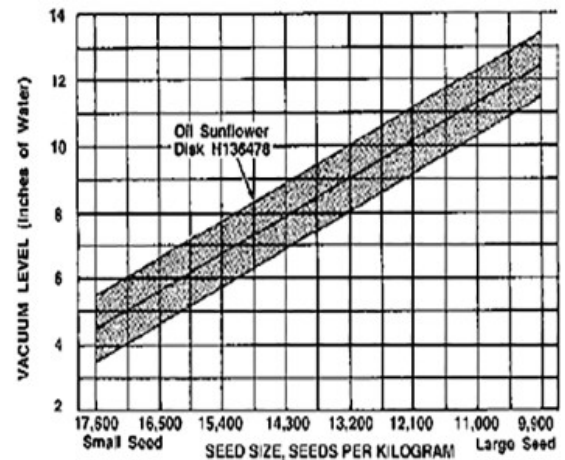
Use regular (long) brush.

Use 120 mL Talc Lubricant

*NOTE: If sweetcorn, double eliminator has been installed, loosen the set screw in the cam nut and rotate the cam nut to move tip of eliminator AWAY from center of the meter housing as far as possible.*

PB21958,0000541-19-05MAR18

## Vacuum Level for Oil Sunflower



P18366—19—12JUN18

EXAMPLE: If seed per kg is 12100. Referring to the chart, the vacuum level must be set at 10 in when using the Oil Sunflower Disc.

**IMPORTANT: The 10 in vacuum level above is an example of how to use the chart. Obtain size in seeds per kg. You must calculate the proper vacuum level for each sunflower variety.**

PB21958,0000542-19-12JUN18

## Large Maize - 25 Cells

Average Seed Spacing and/or Approximate Seed Population Per Hectare of large maize (MAIZE) Seed Planted with vacuum gauge

NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".

| HIGH RANGE INPUT SPROCKET                            |        |                                  |                 |                 |                                    |
|------------------------------------------------------|--------|----------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                                  |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average<br>Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 67                               | 196218          | 163514          | 3.2 to 4.9                         |
| 35                                                   | 25     | 70                               | 188368          | 156973          | 3.2 to 4.9                         |
| 35                                                   | 26     | 72                               | 181123          | 150936          | 3.2 to 4.9                         |
| 35                                                   | 27     | 76                               | 174415          | 145346          | 3.2 to 5.6                         |
| 35                                                   | 28     | 78                               | 168186          | 140155          | 3.2 to 5.6                         |
| 29                                                   | 24     | 80                               | 162580          | 135483          | 3.2 to 5.6                         |
| 29                                                   | 25     | 84                               | 156077          | 130064          | 3.2 to 5.6                         |
| 29                                                   | 26     | 88                               | 150074          | 125429          | 3.2 to 6.4                         |
| 29                                                   | 27     | 91                               | 144516          | 120429          | 3.2 to 6.4                         |
| 29                                                   | 28     | 94                               | 139354          | 116128          | 3.2 to 6.4                         |
| 24                                                   | 24     | 97                               | 134549          | 112124          | 3.2 to 7.2                         |
| 24                                                   | 25     | 102                              | 129167          | 107369          | 3.2 to 7.2                         |
| 24                                                   | 26     | 106                              | 124199          | 103499          | 3.2 to 7.2                         |
| 24                                                   | 27     | 109                              | 119599          | 99666           | 3.2 to 8.0                         |
| 24                                                   | 28     | 114                              | 115328          | 96107           | 3.2 to 8.0                         |
| 20                                                   | 24     | 118                              | 112124          | 93437           | 3.2 to 8.8                         |
| 20                                                   | 25     | 122                              | 107639          | 89699           | 3.2 to 8.8                         |
| 20                                                   | 26     | 127                              | 103499          | 86249           | 3.2 to 9.6                         |
| 20                                                   | 27     | 132                              | 99666           | 83055           | 3.2 to 10.4                        |
| 20                                                   | 28     | 137                              | 96107           | 80088           | 3.2 to 10.4                        |
| 16                                                   | 24     | 146                              | 89699           | 74749           | 3.2 to 10.4                        |
| 16                                                   | 25     | 152                              | 86112           | 71759           | 3.2 to 11.2                        |
| 16                                                   | 26     | 158                              | 82799           | 68999           | 3.2 to 11.2                        |
| 16                                                   | 27     | 164                              | 79733           | 66444           | 3.2 to 12.0                        |
| 16                                                   | 28     | 170                              | 76885           | 64071           | 3.2 to 12.8                        |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate

Population Per Hectare of large maize (MAIZE) Seed Planted with vacuum gauge

PB21958,00004F0-19-15MAR18

NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".

## Large Maize - 25 Cells

Average Seed Spacing and/or Approximate Seed

| LOW RANGE INPUT SPROCKET                             |        |                                  |                 |                 |                                    |
|------------------------------------------------------|--------|----------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                                  |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average<br>Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 179                              | 73582           | 61326           | 4.8 to 12.8                        |
| 35                                                   | 25     | 186                              | 70638           | 58865           | 4.8 to 12.8                        |
| 35                                                   | 26     | 193                              | 67922           | 56601           | 4.8 to 12.8                        |
| 35                                                   | 27     | 200                              | 65406           | 54505           | 4.8 to 12.8                        |
| 35                                                   | 28     | 208                              | 63070           | 52558           | 4.8 to 12.8                        |
| 29                                                   | 24     | 215                              | 60968           | 50806           | 6.4 to 12.8                        |
| 29                                                   | 25     | 224                              | 58529           | 48774           | 6.4 to 12.8                        |
| 29                                                   | 26     | 233                              | 56278           | 46898           | 6.4 to 12.8                        |
| 29                                                   | 27     | 242                              | 54193           | 45161           | 6.4 to 12.8                        |
| 29                                                   | 28     | 251                              | 52258           | 43548           | 6.4 to 12.8                        |
| 24                                                   | 24     | 260                              | 50456           | 42047           | 6.4 to 12.8                        |
| 24                                                   | 25     | 271                              | 48438           | 40365           | 6.4 to 12.8                        |

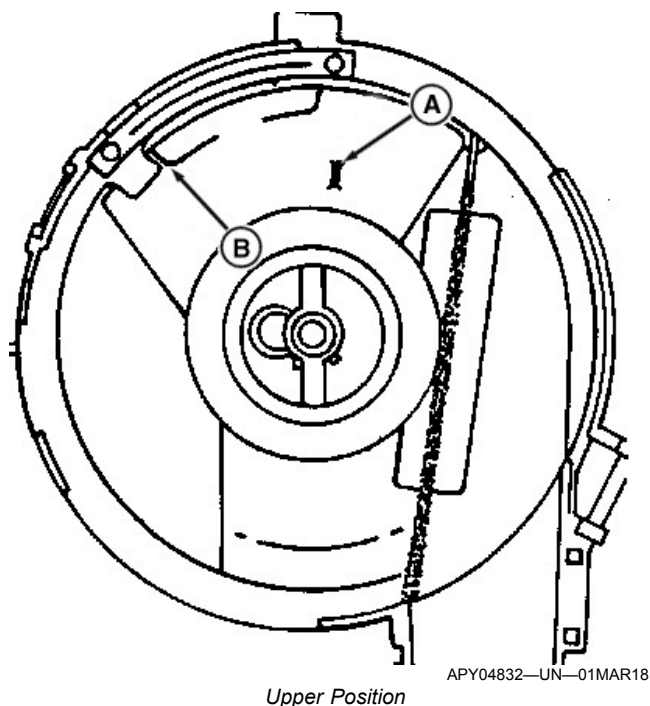
## How to Use Planting Rate Chart (Vacuum)

|    |    |     |       |       |             |
|----|----|-----|-------|-------|-------------|
| 24 | 26 | 282 | 46575 | 38813 | 6.4 to 12.8 |
| 24 | 27 | 292 | 44850 | 37375 | 6.4 to 12.8 |
| 24 | 28 | 304 | 43248 | 36040 | 6.4 to 12.8 |
| 20 | 24 | 312 | 42047 | 35039 | 6.4 to 12.8 |
| 20 | 25 | 325 | 40365 | 33638 | 6.4 to 12.8 |
| 20 | 26 | 338 | 38813 | 32343 | 6.4 to 12.8 |
| 20 | 27 | 325 | 37375 | 31146 | 6.4 to 12.8 |
| 20 | 28 | 365 | 36040 | 30033 | 6.4 to 12.8 |
| 16 | 24 | 390 | 33638 | 28031 | 6.4 to 12.8 |
| 16 | 25 | 407 | 32292 | 26910 | 6.4 to 12.8 |
| 16 | 26 | 422 | 31030 | 25875 | 6.4 to 12.8 |
| 16 | 27 | 439 | 29900 | 24917 | 6.4 to 12.8 |
| 16 | 28 | 455 | 28832 | 24027 | 6.4 to 12.8 |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate

PB21958,0000543-19-05MAR18

### Vacuum Level, Baffle Position, and vacuum gauge Brush for Large Maize Seed

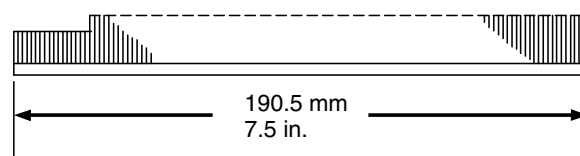


Vacuum level for large maize is set at 8 in.

vacuum gauge BAFFLE

Move tap (A).

For large maize, upper position (B)



Regular (Long) Brush

A47009—UN—22JAN01

vacuum gauge BRUSH

Use the regular (long) brush

Use 120 mL Talc Lubricant.

**NOTE:** If the sweet maize double eliminator has been installed, loosen set screw in cam nut and rotate cam nut to move tip of eliminator AWAY from center of the meter housing as far as possible

PB21958,0000544-19-05MAR18

### Sugar Beets - 45 Cells

Average Seed Spacing and/or Approximate Seed Population Per Hectare of Sugar Beet Seed Planted with vacuum gauge

Using long brush and AA37348 knockout and A52152 double eliminator baffle in up position except for 11000 seeds per kg and smaller

**NOTE:** For information on using planting rate charts, see "How To Use Planting Rate Charts".

## How to Use Planting Rate Chart (Vacuum)

| HIGH RANGE INPUT SPROCKET                            |        |                                  |                 |                 |                                    |
|------------------------------------------------------|--------|----------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                                  |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average<br>Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 37                               | 354120          | 295749          | 3.2 to 4.8                         |
| 35                                                   | 25     | 39                               | 339955          | 283919          | 3.2 to 4.8                         |
| 35                                                   | 26     | 40                               | 326880          | 272999          | 3.2 to 4.8                         |
| 35                                                   | 27     | 42                               | 314774          | 262888          | 3.2 to 5.6                         |
| 35                                                   | 28     | 43                               | 303532          | 253499          | 3.2 to 5.6                         |
| 29                                                   | 24     | 45                               | 293414          | 245049          | 3.2 to 5.6                         |
| 29                                                   | 25     | 47                               | 281677          | 235247          | 3.2 to 6.4                         |
| 29                                                   | 26     | 49                               | 270844          | 226199          | 3.2 to 6.4                         |
| 29                                                   | 27     | 50                               | 260812          | 217821          | 3.2 to 6.4                         |
| 29                                                   | 28     | 52                               | 251498          | 210042          | 3.2 to 6.4                         |
| 24                                                   | 24     | 54                               | 242825          | 202799          | 3.2 to 7.2                         |
| 24                                                   | 25     | 56                               | 233112          | 194687          | 3.2 to 7.2                         |
| 24                                                   | 26     | 59                               | 224146          | 187199          | 3.2 to 7.2                         |
| 24                                                   | 27     | 61                               | 215845          | 180266          | 3.2 to 8.0                         |
| 24                                                   | 28     | 63                               | 208136          | 173828          | 3.2 to 8.0                         |
| 20                                                   | 24     | 65                               | 202354          | 168999          | 3.2 to 8.0                         |
| 20                                                   | 25     | 68                               | 194260          | 162239          | 3.2 to 8.8                         |
| 20                                                   | 26     | 70                               | 186789          | 155999          | 3.2 to 8.8                         |
| 20                                                   | 27     | 73                               | 179871          | 150222          | 3.2 to 9.6                         |
| 20                                                   | 28     | 76                               | 173447          | 144857          | 3.2 to 9.6                         |
| 16                                                   | 24     | 81                               | 161884          | 135199          | 3.2 to 10.4                        |
| 16                                                   | 25     | 85                               | 155408          | 129791          | 3.2 to 10.4                        |
| 16                                                   | 26     | 88                               | 149431          | 124799          | 3.2 to 11.2                        |
| 16                                                   | 27     | 91                               | 143896          | 120177          | 3.2 to 12.0                        |
| 16                                                   | 28     | 95                               | 138757          | 115885          | 3.2 to 12.8                        |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate

PB21958,00004F1-19-15MAR18

Population Per Hectare of Sugar Beet Seed Planted with vacuum gauge

Using long brush and AA37348 knockout and A52152 double eliminator baffle in up position except for 11000 seeds per kg and smaller

*NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".*

## Sugar Beets - 45 Cells

Average Seed Spacing and/or Approximate Seed

| LOW RANGE INPUT SPROCKET                             |        |                                  |                 |                 |                                    |
|------------------------------------------------------|--------|----------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                                  |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average<br>Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 99                               | 132795          | 101906          | 4.8 to 12.9                        |
| 35                                                   | 25     | 103                              | 127483          | 106470          | 4.8 to 12.9                        |
| 35                                                   | 26     | 107                              | 122580          | 102375          | 4.8 to 12.9                        |
| 35                                                   | 27     | 111                              | 118040          | 98583           | 4.8 to 12.9                        |
| 35                                                   | 28     | 116                              | 113824          | 95062           | 4.8 to 12.9                        |
| 29                                                   | 24     | 120                              | 110030          | 91893           | 5.6 to 12.9                        |
| 29                                                   | 25     | 125                              | 105629          | 88218           | 5.6 to 12.9                        |
| 29                                                   | 26     | 130                              | 101566          | 84825           | 5.6 to 12.9                        |
| 29                                                   | 27     | 135                              | 97805           | 81683           | 5.6 to 12.9                        |
| 29                                                   | 28     | 140                              | 94312           | 78766           | 5.6 to 12.9                        |
| 24                                                   | 24     | 144                              | 91059           | 76050           | 5.6 to 12.9                        |
| 24                                                   | 25     | 151                              | 87417           | 73008           | 5.6 to 12.9                        |
| 24                                                   | 26     | 157                              | 84055           | 70200           | 6.4 to 12.9                        |
| 24                                                   | 27     | 163                              | 80942           | 67600           | 6.4 to 12.9                        |
| 24                                                   | 28     | 169                              | 78051           | 65185           | 6.4 to 12.9                        |
| 20                                                   | 24     | 173                              | 75883           | 63375           | 7.2 to 12.9                        |

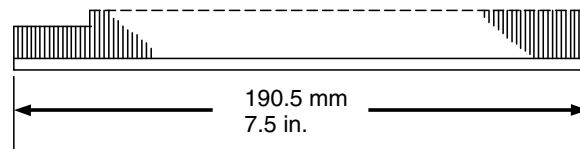
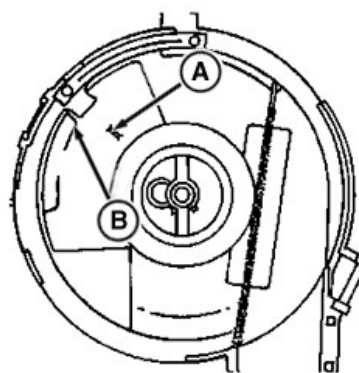
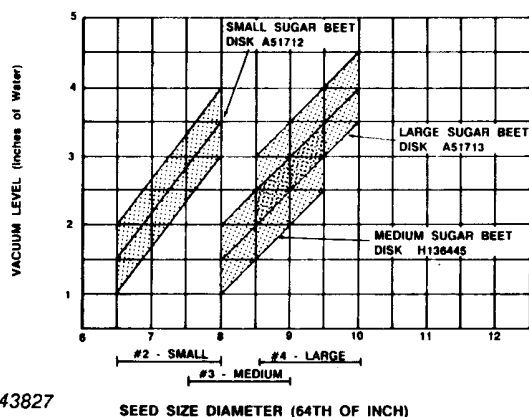
## How to Use Planting Rate Chart (Vacuum)

|    |    |     |       |       |             |
|----|----|-----|-------|-------|-------------|
| 20 | 25 | 181 | 72848 | 60840 | 7.2 to 12.9 |
| 20 | 26 | 188 | 70046 | 58500 | 7.2 to 12.9 |
| 20 | 27 | 195 | 67451 | 56333 | 8.0 to 12.9 |
| 20 | 28 | 202 | 65042 | 54321 | 8.0 to 12.9 |
| 16 | 24 | 217 | 60706 | 50700 | 8.8 to 12.9 |
| 16 | 25 | 226 | 58278 | 48672 | 8.8 to 12.9 |
| 16 | 26 | 235 | 56037 | 46800 | 9.6 to 12.9 |
| 16 | 27 | 244 | 53961 | 45066 | 9.6 to 12.9 |
| 16 | 28 | 253 | 52034 | 43457 | 9.6 to 12.9 |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate

PB21958,0000545-19-05MAR18

## Vacuum Level, Baffle Position, and vacuum gauge Brush for Sugar Beet Seed



A47009—UN—22JAN01

Regular (Long) Brush

EXAMPLE: If the bag label indicates No.3 medium seed. The vacuum level must be a range of between 1-1/2 to 2-1/2 in. When using Medium Sugar Beet Disc.

NOTE: The 1-1/2 to 2-1/2 in. Vacuum level above is an example of how to use the chart. You must calculate the proper vacuum level for each sugar beet seed size.

vacuum gauge Baffle

1. Move tap (A).
2. For Sugar Beet, lower position (B)

vacuum gauge Brush

Use regular (long) brush

Use 120ml Talk Lubricant.

NOTE: If the sweet maize double eliminator has been installed, loosen set screw in cam nut and rotate cam nut to move tip of eliminator AWAY from center of the meter housing as far as possible. .

PB21958,0000546-19-05MAR18

## Virginia Peanut Seed Disc, Part Number H138722 - 46 Cells

Average Seed Spacing and/or Approximate Seed Population Per Hectare of Virginia Peanut Planted with vacuum gauge using AA37206 Brush

NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".

## How to Use Planting Rate Chart (Vacuum)

| HIGH RANGE INPUT SPROCKET                            |        |                                  |                 |                 |                                    |
|------------------------------------------------------|--------|----------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                                  |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average<br>Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 28                               | 361990          | 302321          | 0 to 4.8                           |
| 35                                                   | 25     | 26                               | 347510          | 290228          | 0 to 4.8                           |
| 35                                                   | 26     | 25                               | 334144          | 279066          | 0 to 4.8                           |
| 35                                                   | 27     | 24                               | 321769          | 268730          | 0 to 4.8                           |
| 35                                                   | 28     | 24                               | 310277          | 259132          | 0 to 4.8                           |
| 29                                                   | 24     | 23                               | 299934          | 250495          | 0 to 4.8                           |
| 29                                                   | 25     | 22                               | 287937          | 240475          | 4.8 to 5.6                         |
| 29                                                   | 26     | 21                               | 276862          | 231226          | 4.8 to 5.6                         |
| 29                                                   | 27     | 20                               | 266608          | 222662          | 4.8 to 6.4                         |
| 29                                                   | 28     | 20                               | 257086          | 214710          | 4.8 to 6.4                         |
| 24                                                   | 24     | 19                               | 248281          | 207306          | 4.8 to 6.4                         |
| 24                                                   | 25     | 18                               | 238293          | 199014          | 4.8 to 6.4                         |
| 24                                                   | 26     | 17                               | 229127          | 191359          | 4.8 to 7.2                         |
| 24                                                   | 27     | 17                               | 220641          | 184272          | 4.8 to 7.2                         |
| 24                                                   | 28     | 16                               | 212761          | 177691          | 4.8 to 7.2                         |
| 20                                                   | 24     | 16                               | 206851          | 172755          | 4.8 to 8.0                         |
| 20                                                   | 25     | 15                               | 198577          | 165845          | 4.8 to 8.0                         |
| 20                                                   | 26     | 15                               | 190940          | 159466          | 4.8 to 8.0                         |
| 20                                                   | 27     | 14                               | 183868          | 153560          | 4.8 to 8.8                         |
| 20                                                   | 28     | 13                               | 177301          | 148076          | 4.8 to 9.6                         |
| 16                                                   | 24     | 13                               | 165481          | 138204          | 4.8 to 9.6                         |
| 16                                                   | 25     | 12                               | 158862          | 132676          | 4.8 to 10.4                        |
| 16                                                   | 26     | 12                               | 152752          | 127573          | 4.8 to 10.4                        |
| 16                                                   | 27     | 11                               | 147094          | 122848          | 4.8 to 11.2                        |
| 16                                                   | 28     | 11                               | 141841          | 118460          | 4.8 to 12.0                        |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate.

PB21958,00004F2-19-15MAR18

Population Per Hectare of Virginia Peanut Planted with vacuum gauge using AA37206 Brush

*NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".*

### Virginia Peanut Seed Disc, Part Number H138722 - 46 Cells

Average Seed Spacing and/or Approximate Seed

| LOW RANGE INPUT SPROCKET                             |        |                                  |                 |                 |                                    |
|------------------------------------------------------|--------|----------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                                  |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average<br>Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 10                               | 135746          | 113370          | 4.8 to 12.0                        |
| 35                                                   | 25     | 10                               | 130316          | 108836          | 4.8 to 12.9                        |
| 35                                                   | 26     | 10                               | 125304          | 104650          | 4.8 to 12.9                        |
| 35                                                   | 27     | 9                                | 120663          | 100774          | 4.8 to 12.9                        |
| 35                                                   | 28     | 9                                | 116354          | 97175           | 4.8 to 12.9                        |
| 29                                                   | 24     | 9                                | 112475          | 93935           | 6.4 to 12.9                        |
| 29                                                   | 25     | 8                                | 107976          | 90178           | 6.4 to 12.9                        |
| 29                                                   | 26     | 8                                | 103823          | 86710           | 6.4 to 12.9                        |
| 29                                                   | 27     | 8                                | 99978           | 83498           | 6.4 to 12.9                        |
| 29                                                   | 28     | 7                                | 96407           | 80516           | 6.4 to 12.9                        |
| 24                                                   | 24     | 7                                | 93083           | 77740           | 6.4 to 12.9                        |
| 24                                                   | 25     | 7                                | 89360           | 74630           | 6.4 to 12.9                        |
| 24                                                   | 26     | 7                                | 85923           | 71760           | 6.4 to 12.9                        |
| 24                                                   | 27     | 6                                | 82740           | 69102           | 6.4 to 12.9                        |
| 24                                                   | 28     | 6                                | 79785           | 66634           | 6.4 to 12.9                        |
| 20                                                   | 24     | 6                                | 77569           | 64783           | 6.4 to 12.9                        |

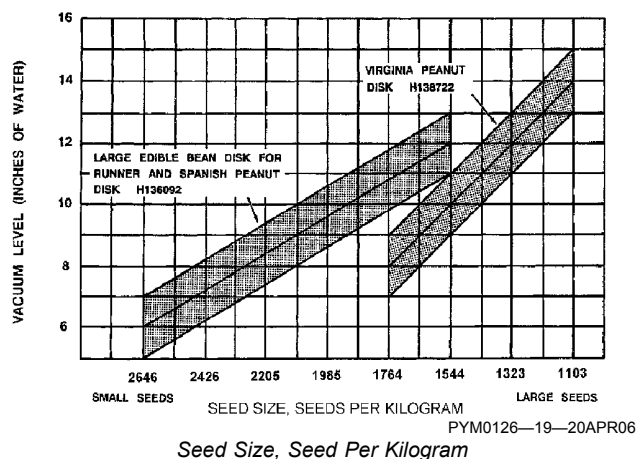
## How to Use Planting Rate Chart (Vacuum)

| LOW RANGE INPUT SPROCKET                             |        |                                  |                 |                 |                                    |
|------------------------------------------------------|--------|----------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                                  |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average<br>Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 20                                                   | 25     | 6                                | 74466           | 62192           | 6.4 to 12.9                        |
| 20                                                   | 26     | 5                                | 71602           | 59800           | 6.4 to 12.9                        |
| 20                                                   | 27     | 5                                | 68950           | 57585           | 6.4 to 12.9                        |
| 20                                                   | 28     | 5                                | 66488           | 55528           | 6.4 to 12.9                        |
| 16                                                   | 24     | 5                                | 62055           | 51826           | 6.4 to 12.9                        |
| 16                                                   | 25     | 5                                | 59573           | 49753           | 6.4 to 12.9                        |
| 16                                                   | 26     | 4                                | 57282           | 47840           | 6.4 to 12.9                        |
| 16                                                   | 27     | 4                                | 55160           | 46068           | 6.4 to 12.9                        |
| 16                                                   | 28     | 4                                | 53190           | 44423           | 6.4 to 12.9                        |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate.

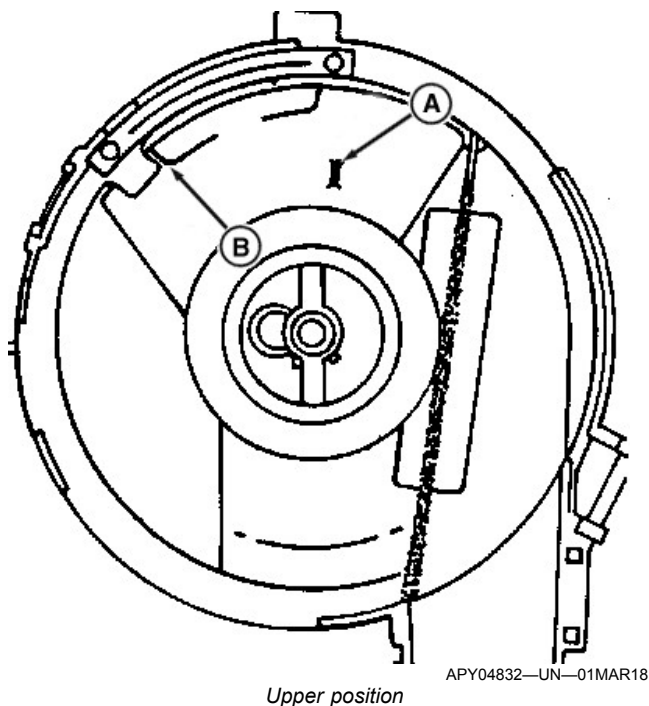
PB21958,0000547-19-15MAR18

### Vacuum Level, Baffle Position, and vacuum gauge Brush for Peanuts



**EXAMPLE:** If seed per kilogram is 1760. Referring to the chart, the vacuum level must be set at 11 in when using the Large Edible Bean disk for Runner Peanuts or 8 in when using the Virginia Peanut Disk.

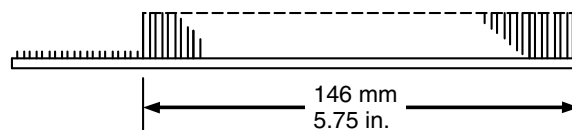
**IMPORTANT:** The 11 in or 8 in vacuum level above is an example of how to use the chart. You must calculate the proper vacuum level for each peanut variety.



vacuum gauge BAFFLE

Move tab (A) .

For peanuts, upper position (B).



Short Brush

A47011—UN—22JAN01

## How to Use Planting Rate Chart (Vacuum)

vacuum gauge BRUSH

Use the short brush.  
Talc Lubricant, 480 mL

*NOTE: If the sweet maize double eliminator has been in stalled, loosen set screw in cam nut and rotate cam nut to move tip of eliminator AWAY from center of the meter housing as far as possible. .*

### High Rate Sorghum - 90 Cells

Average Seed Spacing and/or Approximate Seed Population Per Hectare of High Rate Sorghum Planted with vacuum gauge

*NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".*

PB21958,0000548-19-05MAR18

| HIGH RANGE INPUT SPROCKET                            |        |                               |                 |                 |                                    |
|------------------------------------------------------|--------|-------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                               |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 54                            | 708241          | 591498          | 3.2 to 8.0                         |
| 35                                                   | 25     | 52                            | 679911          | 567838          | 3.2 to 8.0                         |
| 35                                                   | 26     | 50                            | 653760          | 545998          | 3.2 to 8.8                         |
| 35                                                   | 27     | 48                            | 629547          | 525776          | 3.2 to 8.8                         |
| 35                                                   | 28     | 46                            | 607063          | 506998          | 3.2 to 8.8                         |
| 29                                                   | 24     | 45                            | 586828          | 490098          | 3.2 to 8.8                         |
| 29                                                   | 25     | 43                            | 563355          | 470494          | 3.2 to 9.6                         |
| 29                                                   | 26     | 41                            | 541687          | 452398          | 3.2 to 10.4                        |
| 29                                                   | 27     | 40                            | 521625          | 435643          | 3.2 to 10.4                        |
| 29                                                   | 28     | 38                            | 502995          | 420084          | 3.2 to 11.2                        |
| 24                                                   | 24     | 37                            | 485651          | 405598          | 3.2 to 11.2                        |
| 24                                                   | 25     | 35                            | 466225          | 389374          | 3.2 to 12.0                        |
| 24                                                   | 26     | 34                            | 448293          | 374398          | 3.2 to 12.0                        |
| 24                                                   | 27     | 33                            | 431689          | 360532          | 3.2 to 12.9                        |
| 24                                                   | 28     | 32                            | 416272          | 347656          | 3.2 to 12.9                        |
| 20                                                   | 24     | 31                            | 404709          | 337999          | 3.2 to 12.9                        |
| 20                                                   | 25     | 30                            | 388521          | 324479          | 4.8 to 12.9                        |
| 20                                                   | 26     | 28                            | 373577          | 311999          | 4.8 to 12.9                        |
| 20                                                   | 27     | 27                            | 359741          | 300443          | 4.8 to 12.9                        |
| 20                                                   | 28     | 26                            | 346893          | 289713          | 4.8 to 12.9                        |
| 16                                                   | 24     | 25                            | 323767          | 270399          | 4.8 to 12.9                        |
| 16                                                   | 25     | 24                            | 310816          | 259583          | 4.8 to 12.9                        |
| 16                                                   | 26     | 23                            | 298862          | 249599          | 4.8 to 12.9                        |
| 16                                                   | 27     | 22                            | 287793          | 240355          | 4.8 to 12.9                        |
| 16                                                   | 28     | 21                            | 277515          | 231770          | 4.8 to 12.9                        |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate.

Population Per Hectare of High Rate Sorghum Planted with vacuum gauge

*NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".*

PB21958,00004F3-19-27FEB18

### High Rate Sorghum - 90 Cells

Average Seed Spacing and/or Approximate Seed

| LOW RANGE INPUT SPROCKET                             |        |                               |                 |                 |                                    |
|------------------------------------------------------|--------|-------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                               |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 20                            | 265590          | 221812          | 4.8 to 12.9                        |
| 35                                                   | 25     | 19                            | 254967          | 212939          | 4.8 to 12.9                        |
| 35                                                   | 26     | 19                            | 245160          | 204749          | 4.8 to 12.9                        |
| 35                                                   | 27     | 18                            | 236080          | 197166          | 4.8 to 12.9                        |

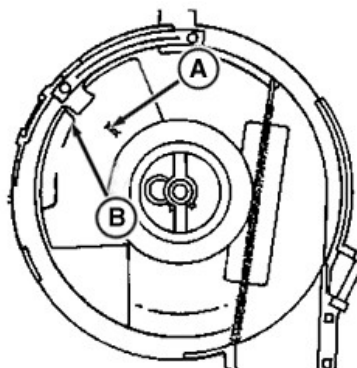
## How to Use Planting Rate Chart (Vacuum)

| LOW RANGE INPUT SPROCKET                             |        |                                  |                 |                 |                                    |
|------------------------------------------------------|--------|----------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                                  |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average<br>Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 28     | 17                               | 227649          | 190124          | 4.8 to 12.9                        |
| 29                                                   | 24     | 17                               | 220060          | 183787          | 4.8 to 12.9                        |
| 29                                                   | 25     | 16                               | 211258          | 176435          | 4.8 to 12.9                        |
| 29                                                   | 26     | 15                               | 203133          | 169649          | 4.8 to 12.9                        |
| 29                                                   | 27     | 15                               | 195609          | 163366          | 4.8 to 12.9                        |
| 29                                                   | 28     | 14                               | 188623          | 157531          | 4.8 to 12.9                        |
| 24                                                   | 24     | 14                               | 182119          | 152099          | 4.8 to 12.9                        |
| 24                                                   | 25     | 13                               | 174834          | 146015          | 4.8 to 12.9                        |
| 24                                                   | 26     | 13                               | 168110          | 140399          | 4.8 to 12.9                        |
| 24                                                   | 27     | 12                               | 161884          | 135199          | 4.8 to 12.9                        |
| 24                                                   | 28     | 12                               | 156102          | 130371          | 4.8 to 12.9                        |
| 20                                                   | 24     | 12                               | 151766          | 126749          | 4.8 to 12.9                        |
| 20                                                   | 25     | 11                               | 145695          | 121680          | 4.8 to 12.9                        |
| 20                                                   | 26     | 11                               | 140092          | 117000          | 4.8 to 12.9                        |
| 20                                                   | 27     | 10                               | 134903          | 112666          | 4.8 to 12.9                        |
| 20                                                   | 28     | 10                               | 130085          | 108642          | 4.8 to 12.9                        |
| 16                                                   | 24     | 9                                | 121413          | 101400          | 4.8 to 12.9                        |
| 16                                                   | 25     | 9                                | 116556          | 97344           | 4.8 to 12.9                        |
| 16                                                   | 26     | 9                                | 112073          | 93600           | 4.8 to 12.9                        |
| 16                                                   | 27     | 8                                | 107922          | 90133           | 4.8 to 12.9                        |
| 16                                                   | 28     | 8                                | 104068          | 86914           | 4.8 to 12.9                        |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate.

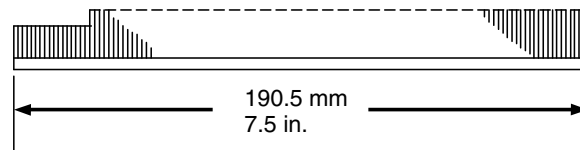
PB21958,00004F4-19-15MAR18

### Vacuum Level, Baffle Position, and vacuum gauge Brush for Sorghum



Lower Baffle position

APY04868—UN—12MAR18



Regular (Long) Brush

A47009—UN—22JAN01

Vacuum level for sorghum is set at 8 in vacuum gauge Baffle

1. Move tab (A) .
2. Sorghum lower position (B)

vacuum gauge Brush

Use the (regular) long brush

Talc lubricant 240 ml.

**NOTE:** If the sweet maize double eliminator has been installed, loosen set screw in cam nut and rotate cam nut to move tip of eliminator AWAY from center of the meter housing as far as possible.

PB21958,0000549-19-05MAR18

## Sorghum - 45 Cells

Average Seed Spacing and/or Approximate Seed Population Per Hectare of Sorghum Planted with vacuum gauge

NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".

| HIGH RANGE INPUT SPROCKET                            |        |                                  |                 |                 |                                    |
|------------------------------------------------------|--------|----------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                                  |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average<br>Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 27                               | 354120          | 295749          | 3.2 to 8.8                         |
| 35                                                   | 25     | 26                               | 339955          | 283919          | 3.2 to 8.8                         |
| 35                                                   | 26     | 25                               | 326880          | 272999          | 3.2 to 9.6                         |
| 35                                                   | 27     | 24                               | 314774          | 262888          | 3.2 to 9.6                         |
| 35                                                   | 28     | 23                               | 303532          | 253499          | 3.2 to 10.4                        |
| 29                                                   | 24     | 22                               | 293414          | 245049          | 3.2 to 10.4                        |
| 29                                                   | 25     | 21                               | 281677          | 235247          | 3.2 to 11.2                        |
| 29                                                   | 26     | 21                               | 270844          | 226199          | 3.2 to 11.2                        |
| 29                                                   | 27     | 20                               | 260812          | 217821          | 3.2 to 12.0                        |
| 29                                                   | 28     | 19                               | 251498          | 210042          | 3.2 to 12.0                        |
| 24                                                   | 24     | 18                               | 242825          | 202799          | 3.2 to 12.9                        |
| 24                                                   | 25     | 18                               | 233112          | 194687          | 3.2 to 12.9                        |
| 24                                                   | 26     | 17                               | 224146          | 187199          | 3.2 to 12.9                        |
| 24                                                   | 27     | 16                               | 215845          | 180266          | 4.8 to 12.9                        |
| 24                                                   | 28     | 16                               | 208136          | 173828          | 4.8 to 12.9                        |
| 20                                                   | 24     | 15                               | 202354          | 168999          | 4.8 to 12.9                        |
| 20                                                   | 25     | 15                               | 194260          | 162239          | 4.8 to 12.9                        |
| 20                                                   | 26     | 14                               | 186789          | 155999          | 4.8 to 12.9                        |
| 20                                                   | 27     | 14                               | 179871          | 150222          | 4.8 to 12.9                        |
| 20                                                   | 28     | 13                               | 173447          | 144857          | 4.8 to 12.9                        |
| 16                                                   | 24     | 12                               | 161884          | 135199          | 4.8 to 12.9                        |
| 16                                                   | 25     | 12                               | 155408          | 129791          | 4.8 to 12.9                        |
| 16                                                   | 26     | 11                               | 149431          | 124799          | 4.8 to 12.9                        |
| 16                                                   | 27     | 11                               | 143896          | 120177          | 4.8 to 12.9                        |
| 16                                                   | 28     | 11                               | 138757          | 115885          | 4.8 to 12.9                        |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate

Population Per Hectare of Sorghum Planted with vacuum gauge

PB21958,00004F5-19-15MAR18

NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".

## Sorghum - 45 Cells

Average Seed Spacing and/or Approximate Seed

| LOW RANGE INPUT SPROCKET                             |        |                                  |                 |                 |                                    |
|------------------------------------------------------|--------|----------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                                  |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average<br>Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 10                               | 132795          | 110906          | 4.8 to 12.9                        |
| 35                                                   | 25     | 10                               | 127483          | 106470          | 4.8 to 12.9                        |
| 35                                                   | 26     | 9                                | 122580          | 102375          | 4.8 to 12.9                        |
| 35                                                   | 27     | 9                                | 118040          | 98583           | 4.8 to 12.9                        |
| 35                                                   | 28     | 9                                | 113824          | 95062           | 4.8 to 12.9                        |
| 29                                                   | 24     | 8                                | 110030          | 91893           | 6.4 to 12.9                        |
| 29                                                   | 25     | 8                                | 105629          | 88218           | 6.4 to 12.9                        |
| 29                                                   | 26     | 8                                | 101566          | 84825           | 6.4 to 12.9                        |
| 29                                                   | 27     | 7                                | 97805           | 81683           | 6.4 to 12.9                        |
| 29                                                   | 28     | 7                                | 94312           | 78766           | 6.4 to 12.9                        |
| 24                                                   | 24     | 7                                | 91059           | 76050           | 6.4 to 12.9                        |
| 24                                                   | 25     | 7                                | 87417           | 73008           | 6.4 to 12.9                        |

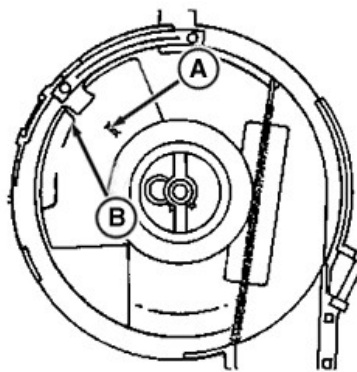
## How to Use Planting Rate Chart (Vacuum)

| LOW RANGE INPUT SPROCKET                             |        |                                  |                 |                 |                                    |
|------------------------------------------------------|--------|----------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                                  |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average<br>Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 24                                                   | 26     | 6                                | 84055           | 70200           | 6.4 to 12.9                        |
| 24                                                   | 27     | 6                                | 80942           | 67600           | 6.4 to 12.9                        |
| 24                                                   | 28     | 6                                | 78051           | 65185           | 6.4 to 12.9                        |
| 20                                                   | 24     | 6                                | 75883           | 63375           | 6.4 to 12.9                        |
| 20                                                   | 25     | 6                                | 72848           | 60840           | 6.4 to 12.9                        |
| 20                                                   | 26     | 5                                | 70046           | 58500           | 6.4 to 12.9                        |
| 20                                                   | 27     | 5                                | 67451           | 56333           | 6.4 to 12.9                        |
| 20                                                   | 28     | 5                                | 65042           | 54321           | 6.4 to 12.9                        |
| 16                                                   | 24     | 5                                | 60076           | 50700           | 6.4 to 12.9                        |
| 16                                                   | 25     | 4                                | 58278           | 48672           | 6.4 to 12.9                        |
| 16                                                   | 26     | 4                                | 56037           | 46800           | 6.4 to 12.9                        |
| 16                                                   | 27     | 4                                | 53961           | 45066           | 6.4 to 12.9                        |
| 16                                                   | 28     | 4                                | 52034           | 43457           | 6.4 to 12.9                        |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate

PB21958,000054A-19-15MAR18

### Vacuum Level, Baffle Position, and vacuum gauge Brush for Sorghum



Lower Baffle Position

APY04868—UN—12MAR18

Vacuum level for sorghum is set at 8 in

vacuum gauge Baffle

Move tab (A) .

Sorghum lower position (B)

vacuum gauge Brush

Use the (regular) long brush

Talc lubricant 240 ml.

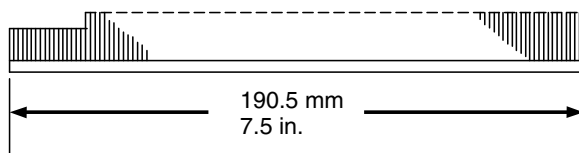
*NOTE: If the sweet maize double eliminator has been installed, loosen set screw in cam nut and rotate cam nut to move tip of eliminator AWAY from center of the meter housing as far as possible.*

PB21958,000054B-19-05MAR18

### Soybeans - 108 Cells

Average Seed Spacing and/or Approximate Seed Population Per Hectare of Soybeans Planted with vacuum gauge

*NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".*



Regular (Long) Brush

A47009—UN—22JAN01

## How to Use Planting Rate Chart (Vacuum)

| HIGH RANGE INPUT SPROCKET                            |        |                               |                 |                 |                                    |
|------------------------------------------------------|--------|-------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                               |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 65                            | 849889          | 709797          | 3.2 to 12.9                        |
| 35                                                   | 25     | 62                            | 815893          | 681405          | 3.2 to 12.9                        |
| 35                                                   | 26     | 60                            | 784513          | 655197          | 3.2 to 12.9                        |
| 35                                                   | 27     | 57                            | 755457          | 630931          | 3.2 to 12.9                        |
| 35                                                   | 28     | 55                            | 728476          | 608398          | 3.2 to 12.9                        |
| 29                                                   | 24     | 54                            | 704193          | 588118          | 3.2 to 12.9                        |
| 29                                                   | 25     | 51                            | 676026          | 564593          | 3.2 to 12.9                        |
| 29                                                   | 26     | 49                            | 650025          | 542878          | 3.2 to 12.9                        |
| 29                                                   | 27     | 48                            | 625950          | 522771          | 3.2 to 12.9                        |
| 29                                                   | 28     | 46                            | 603594          | 504101          | 3.2 to 12.9                        |
| 24                                                   | 24     | 44                            | 582781          | 486718          | 3.2 to 12.9                        |
| 24                                                   | 25     | 43                            | 559470          | 467249          | 3.2 to 12.9                        |
| 24                                                   | 26     | 41                            | 537951          | 449278          | 3.2 to 12.9                        |
| 24                                                   | 27     | 39                            | 518027          | 432638          | 3.2 to 12.9                        |
| 24                                                   | 28     | 38                            | 499526          | 417187          | 3.2 to 12.9                        |
| 20                                                   | 24     | 37                            | 485651          | 405598          | 3.2 to 12.9                        |
| 20                                                   | 25     | 35                            | 466225          | 389374          | 3.2 to 12.9                        |
| 20                                                   | 26     | 34                            | 448293          | 374398          | 3.2 to 12.9                        |
| 20                                                   | 27     | 33                            | 431689          | 360532          | 3.2 to 12.9                        |
| 20                                                   | 28     | 32                            | 416272          | 347656          | 3.2 to 12.9                        |
| 16                                                   | 24     | 30                            | 388521          | 324479          | 4.8 to 12.9                        |
| 16                                                   | 25     | 28                            | 372980          | 311500          | 4.8 to 12.9                        |
| 16                                                   | 26     | 27                            | 358634          | 299519          | 4.8 to 12.9                        |
| 16                                                   | 27     | 26                            | 345352          | 288425          | 4.8 to 12.9                        |
| 16                                                   | 28     | 25                            | 333018          | 278125          | 4.8 to 12.9                        |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate

PB21958,000054C-19-15MAR18

Population Per Hectare of Soybeans Seed Planted with vacuum gauge

*NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".*

## Soybeans - 108 Cells

Average Seed Spacing and/or Approximate Seed

| LOW RANGE INPUT SPROCKET                             |        |                               |                 |                 |                                    |
|------------------------------------------------------|--------|-------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                               |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 24                            | 318708          | 266174          | 4.8 to 12.9                        |
| 35                                                   | 25     | 23                            | 305960          | 255527          | 4.8 to 12.9                        |
| 35                                                   | 26     | 22                            | 294192          | 245699          | 4.8 to 12.9                        |
| 35                                                   | 27     | 22                            | 283296          | 236599          | 4.8 to 12.9                        |
| 35                                                   | 28     | 21                            | 273178          | 228149          | 6.4 to 12.9                        |
| 29                                                   | 24     | 20                            | 264073          | 220544          | 6.4 to 12.9                        |
| 29                                                   | 25     | 19                            | 253510          | 211722          | 6.4 to 12.9                        |
| 29                                                   | 26     | 19                            | 243759          | 203579          | 6.4 to 12.9                        |
| 29                                                   | 27     | 18                            | 244731          | 196039          | 6.4 to 12.9                        |
| 29                                                   | 28     | 17                            | 226348          | 189038          | 6.4 to 12.9                        |
| 24                                                   | 24     | 17                            | 218543          | 182519          | 6.4 to 12.9                        |
| 24                                                   | 25     | 16                            | 209801          | 175218          | 6.4 to 12.9                        |
| 24                                                   | 26     | 15                            | 201732          | 168479          | 6.4 to 12.9                        |
| 24                                                   | 27     | 15                            | 194260          | 162239          | 6.4 to 12.9                        |
| 24                                                   | 28     | 14                            | 187322          | 156445          | 6.4 to 12.9                        |
| 20                                                   | 24     | 14                            | 182119          | 152099          | 6.4 to 12.9                        |

## How to Use Planting Rate Chart (Vacuum)

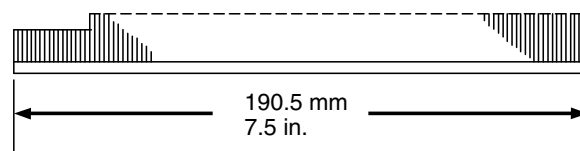
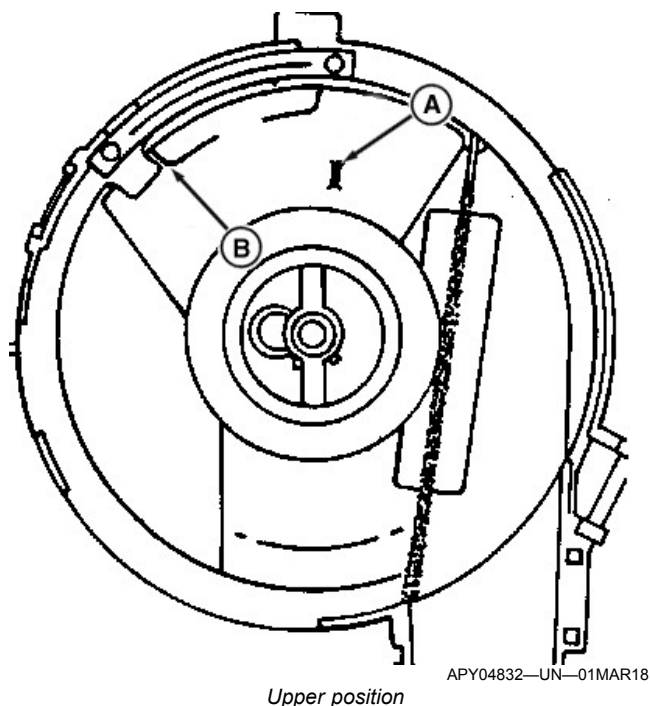
|    |    |    |        |        |             |
|----|----|----|--------|--------|-------------|
| 20 | 25 | 13 | 174834 | 146015 | 6.4 to 12.9 |
| 20 | 26 | 13 | 168110 | 140399 | 6.4 to 12.9 |
| 20 | 27 | 12 | 161884 | 135199 | 6.4 to 12.9 |
| 20 | 28 | 12 | 156102 | 130371 | 6.4 to 12.9 |
| 16 | 24 | 11 | 145695 | 121680 | 6.4 to 12.9 |
| 16 | 25 | 11 | 139867 | 116812 | 6.4 to 12.9 |
| 16 | 26 | 10 | 134488 | 112320 | 6.4 to 12.9 |
| 16 | 27 | 10 | 129507 | 108160 | 6.4 to 12.9 |
| 16 | 28 | 9  | 124882 | 104297 | 6.4 to 12.9 |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate

PB21958,000054D-19-05MAR18

vacuum gauge Brush

### Vacuum Level, Baffle Position, and vacuum gauge Brush for Soybeans



A47009—UN—22JAN01

Regular (Long) Brush

Use the regular (long) brush  
Use 240 mL Talk Lubricant.

**NOTE:** If the sweet maize double eliminator has been installed, loosen set screw in cam nut and rotate cam nut to move tip of eliminator AWAY from center of the meter housing as far as possible.

PB21958,000054E-19-05MAR18

Vacuum level for soybeans is set at 8 in vacuum gauge Baffle

1. Move tab (A) .
2. For Soybeans, lower position (B).

### Cotton - 64 Cells

Average Seed Spacing and/or Approximate Seed Population Per Hectare of Cotton Seed Planted with vacuum gauge

**NOTE:** For information on using planting rate charts, see "How To Use Planting Rate Charts".

| HIGH RANGE INPUT SPROCKET                            |        |                               |              |              |                                    |
|------------------------------------------------------|--------|-------------------------------|--------------|--------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                               |              |              |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average Seed Spacing<br>In mm | 0.762 m Rows | 0.914 m Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 26                            | 503638       | 420620       | 3.2 to 8.8                         |
| 35                                                   | 25     | 27                            | 483492       | 403796       | 3.2 to 8.8                         |
| 35                                                   | 26     | 28                            | 464896       | 388265       | 3.2 to 9.6                         |
| 35                                                   | 27     | 29                            | 447678       | 373885       | 3.2 to 9.6                         |
| 35                                                   | 28     | 30                            | 431689       | 360532       | 3.2 to 10.4                        |
| 29                                                   | 24     | 32                            | 417300       | 348514       | 3.2 to 10.4                        |

## How to Use Planting Rate Chart (Vacuum)

| HIGH RANGE INPUT SPROCKET                            |        |                               |                 |                 |                                    |
|------------------------------------------------------|--------|-------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                               |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 29                                                   | 25     | 33                            | 400608          | 334574          | 3.2 to 11.2                        |
| 29                                                   | 26     | 34                            | 385200          | 321705          | 3.2 to 11.2                        |
| 29                                                   | 27     | 35                            | 370933          | 309790          | 3.2 to 12.0                        |
| 29                                                   | 28     | 37                            | 357686          | 298726          | 3.2 to 12.0                        |
| 24                                                   | 24     | 38                            | 345352          | 288425          | 3.2 to 12.9                        |
| 24                                                   | 25     | 40                            | 331538          | 276888          | 3.2 to 12.9                        |
| 24                                                   | 26     | 41                            | 318786          | 266239          | 3.2 to 12.9                        |
| 24                                                   | 27     | 43                            | 306979          | 256378          | 3.2 to 12.9                        |
| 24                                                   | 28     | 44                            | 296016          | 247222          | 3.2 to 12.9                        |
| 20                                                   | 24     | 46                            | 287793          | 240355          | 3.2 to 12.9                        |
| 20                                                   | 25     | 49                            | 276281          | 230740          | 3.2 to 12.9                        |
| 20                                                   | 26     | 50                            | 265655          | 221866          | 3.2 to 12.9                        |
| 20                                                   | 27     | 51                            | 255816          | 213649          | 3.2 to 12.9                        |
| 20                                                   | 28     | 53                            | 246680          | 206018          | 3.2 to 12.9                        |
| 16                                                   | 24     | 57                            | 230234          | 192284          | 4.8 to 12.9                        |
| 16                                                   | 25     | 60                            | 221025          | 184592          | 4.8 to 12.9                        |
| 16                                                   | 26     | 62                            | 212524          | 177493          | 4.8 to 12.9                        |
| 16                                                   | 27     | 64                            | 204653          | 170919          | 4.8 to 12.9                        |
| 16                                                   | 28     | 67                            | 197344          | 164815          | 4.8 to 12.9                        |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate

Population Per Hectare of Cotton Seed Planted with vacuum gauge

PB21958,00004F6-19-15MAR18

*NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".*

## Cotton - 64 Cells

Average Seed Spacing and/or Approximate Seed

| LOW RANGE INPUT SPROCKET                             |        |                               |                 |                 |                                    |
|------------------------------------------------------|--------|-------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                               |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 70                            | 188864          | 157733          | 4.8 to 12.9                        |
| 35                                                   | 25     | 73                            | 181310          | 151423          | 4.8 to 12.9                        |
| 35                                                   | 26     | 75                            | 174336          | 145599          | 4.8 to 12.9                        |
| 35                                                   | 27     | 78                            | 167879          | 140207          | 4.8 to 12.9                        |
| 35                                                   | 28     | 81                            | 161884          | 135199          | 4.8 to 12.9                        |
| 29                                                   | 24     | 84                            | 156487          | 130693          | 4.8 to 12.9                        |
| 29                                                   | 25     | 88                            | 150228          | 125465          | 6.4 to 12.9                        |
| 29                                                   | 26     | 91                            | 144450          | 120460          | 6.4 to 12.9                        |
| 29                                                   | 27     | 95                            | 139100          | 116171          | 6.4 to 12.9                        |
| 29                                                   | 28     | 98                            | 134132          | 112022          | 6.4 to 12.9                        |
| 24                                                   | 24     | 102                           | 129507          | 108160          | 6.4 to 12.9                        |
| 24                                                   | 25     | 106                           | 124327          | 103833          | 6.4 to 12.9                        |
| 24                                                   | 26     | 110                           | 119545          | 99840           | 6.4 to 12.9                        |
| 24                                                   | 27     | 114                           | 115117          | 96142           | 6.4 to 12.9                        |
| 24                                                   | 28     | 119                           | 111006          | 92708           | 6.4 to 12.9                        |
| 20                                                   | 24     | 122                           | 107922          | 90133           | 6.4 to 12.9                        |
| 20                                                   | 25     | 127                           | 103605          | 86528           | 6.4 to 12.9                        |
| 20                                                   | 26     | 132                           | 99621           | 83200           | 6.4 to 12.9                        |
| 20                                                   | 27     | 137                           | 95931           | 80118           | 6.4 to 12.9                        |
| 20                                                   | 28     | 142                           | 92505           | 77275           | 6.4 to 12.9                        |
| 16                                                   | 24     | 152                           | 86338           | 72106           | 6.4 to 12.9                        |
| 16                                                   | 25     | 159                           | 82884           | 69222           | 6.4 to 12.9                        |

## How to Use Planting Rate Chart (Vacuum)

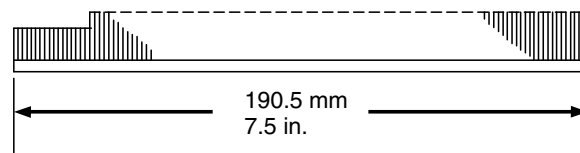
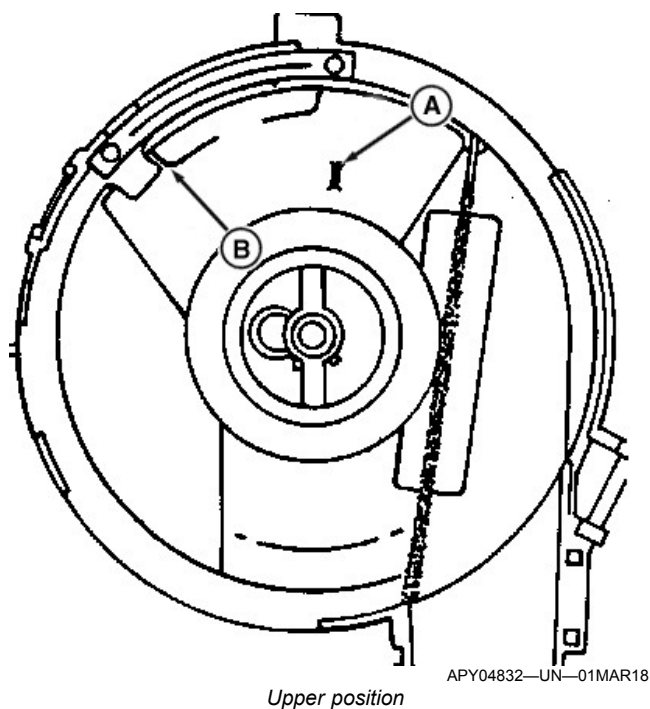
| LOW RANGE INPUT SPROCKET                             |        |                               |                 |                 |                                    |
|------------------------------------------------------|--------|-------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                               |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 16                                                   | 26     | 165                           | 79697           | 66560           | 6.4 to 12.9                        |
| 16                                                   | 27     | 171                           | 76745           | 64095           | 6.4 to 12.9                        |
| 16                                                   | 28     | 178                           | 74004           | 61805           | 6.4 to 12.9                        |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate

vacuum gauge Brush

PB21958,000054F-19-15MAR18

### Vacuum Level, Baffle Position, and vacuum gauge Brush for Cotton



A47009—UN—22JAN01

Regular (Long) Brush

Use regular (long) brush  
Use 240 mL Talk Lubricant.

**NOTE:** If the sweet maize double eliminator has been installed, loosen set screw in cam nut and rotate cam nut to move tip of eliminator AWAY from center of the meter housing as far as possible.

PB21958,0000550-19-05MAR18

Vacuum level for cotton is set at 8 in vacuum gauge Baffle  
Move tab (A) .  
For cotton, lower position (B).

### Large Edible Beans Cell Type - 50 Cells

Average Seed Spacing and/or Approximate Seed Population Per Hectare of Large Edible Beans Planted with vacuum gauge and Using AA37206

**NOTE:** For information on using planting rate charts, see "How To Use Planting Rate Charts".

| HIGH RANGE INPUT SPROCKET                            |        |                               |                 |                 |                                    |
|------------------------------------------------------|--------|-------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                               |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 33                            | 393467          | 328610          | 6.4 to 7.2                         |
| 35                                                   | 25     | 35                            | 377728          | 315465          | 6.4 to 7.2                         |
| 35                                                   | 26     | 36                            | 363200          | 303332          | 6.4 to 7.2                         |
| 35                                                   | 27     | 37                            | 349748          | 292098          | 6.4 to 7.2                         |
| 35                                                   | 28     | 39                            | 337257          | 281666          | 6.4 to 7.2                         |
| 29                                                   | 24     | 40                            | 326015          | 272277          | 6.4 to 8.0                         |

## How to Use Planting Rate Chart (Vacuum)

| HIGH RANGE INPUT SPROCKET                            |        |                               |                 |                 |                                    |
|------------------------------------------------------|--------|-------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                               |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 29                                                   | 25     | 42                            | 312975          | 261386          | 6.4 to 8.8                         |
| 29                                                   | 26     | 44                            | 300937          | 251332          | 6.4 to 8.8                         |
| 29                                                   | 27     | 45                            | 289792          | 242024          | 6.4 to 8.8                         |
| 29                                                   | 28     | 47                            | 279442          | 233380          | 6.4 to 9.6                         |
| 24                                                   | 24     | 49                            | 269806          | 225332          | 6.4 to 9.6                         |
| 24                                                   | 25     | 51                            | 259014          | 216319          | 6.4 to 10.4                        |
| 24                                                   | 26     | 53                            | 249052          | 207999          | 6.4 to 10.4                        |
| 24                                                   | 27     | 55                            | 239827          | 200295          | 6.4 to 11.2                        |
| 24                                                   | 28     | 57                            | 231262          | 193142          | 6.4 to 11.2                        |
| 20                                                   | 24     | 58                            | 224838          | 187777          | 6.4 to 12.0                        |
| 20                                                   | 25     | 61                            | 215845          | 180266          | 6.4 to 12.0                        |
| 20                                                   | 26     | 63                            | 207543          | 173333          | 6.4 to 12.9                        |
| 20                                                   | 27     | 66                            | 199856          | 166913          | 6.4 to 12.9                        |
| 20                                                   | 28     | 68                            | 192719          | 160952          | 6.4 to 12.9                        |
| 16                                                   | 24     | 73                            | 179871          | 150222          | 6.4 to 12.9                        |
| 16                                                   | 25     | 76                            | 172676          | 1442136         | 6.4 to 12.9                        |
| 16                                                   | 26     | 79                            | 166034          | 138666          | 6.4 to 12.9                        |
| 16                                                   | 27     | 82                            | 159885          | 133530          | 6.4 to 12.9                        |
| 16                                                   | 28     | 85                            | 154175          | 128761          | 6.4 to 12.9                        |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate

PB21958,00004F7-19-15MAR18

Population Per Hectare of Large Edible Beans Planted with vacuum gauge and Using AA37206 Brush

*NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".*

## Large Edible Beans Cell Type - 50 Cells

Average Seed Spacing and/or Approximate Seed

| LOW RANGE INPUT SPROCKET                             |        |                               |                 |                 |                                    |
|------------------------------------------------------|--------|-------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                               |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 89                            | 147550          | 123229          | 6.4 to 12.9                        |
| 35                                                   | 25     | 92                            | 141648          | 118300          | 6.4 to 12.9                        |
| 35                                                   | 26     | 96                            | 136200          | 113750          | 6.4 to 12.9                        |
| 35                                                   | 27     | 100                           | 131156          | 109537          | 6.4 to 12.9                        |
| 35                                                   | 28     | 104                           | 126472          | 105625          | 6.4 to 12.9                        |
| 29                                                   | 24     | 107                           | 122256          | 102104          | 6.4 to 12.9                        |
| 29                                                   | 25     | 112                           | 117366          | 98020           | 6.4 to 12.9                        |
| 29                                                   | 26     | 116                           | 112852          | 94250           | 6.4 to 12.9                        |
| 29                                                   | 27     | 121                           | 108672          | 90759           | 6.4 to 12.9                        |
| 29                                                   | 28     | 125                           | 104791          | 87517           | 6.4 to 12.9                        |
| 24                                                   | 24     | 129                           | 101177          | 84500           | 6.4 to 12.9                        |
| 24                                                   | 25     | 135                           | 97130           | 81120           | 6.4 to 12.9                        |
| 24                                                   | 26     | 140                           | 93394           | 78000           | 6.4 to 12.9                        |
| 24                                                   | 27     | 146                           | 89935           | 75111           | 6.4 to 12.9                        |
| 24                                                   | 28     | 151                           | 86723           | 72428           | 6.4 to 12.9                        |
| 20                                                   | 24     | 155                           | 84314           | 70416           | 6.4 to 12.9                        |
| 20                                                   | 25     | 162                           | 80942           | 67600           | 6.4 to 12.9                        |
| 20                                                   | 26     | 168                           | 77829           | 65000           | 6.4 to 12.9                        |
| 20                                                   | 27     | 175                           | 74946           | 62592           | 6.4 to 12.9                        |
| 20                                                   | 28     | 181                           | 72269           | 60357           | 6.4 to 12.9                        |
| 16                                                   | 24     | 194                           | 67451           | 56333           | 6.4 to 12.9                        |
| 16                                                   | 25     | 202                           | 64753           | 54080           | 6.4 to 12.9                        |

## How to Use Planting Rate Chart (Vacuum)

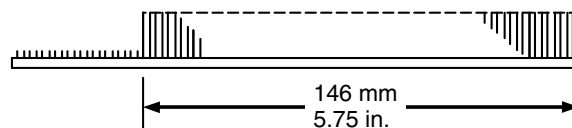
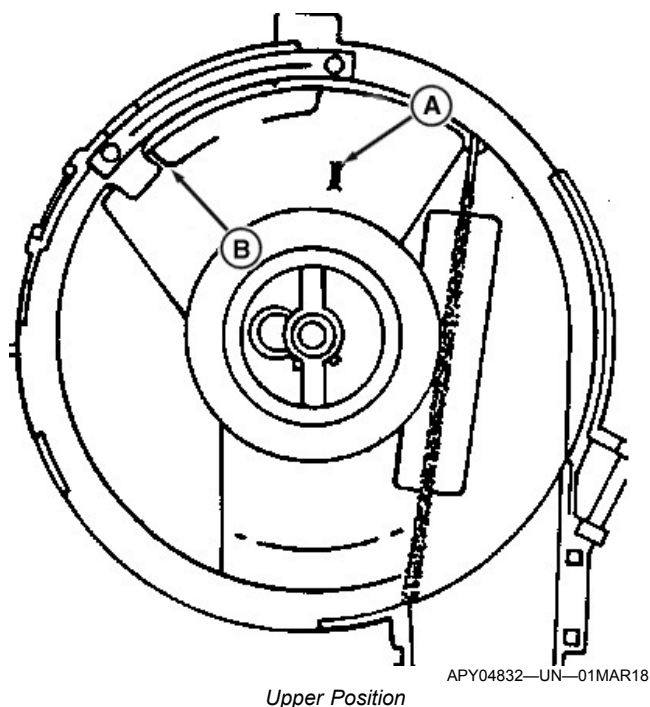
| LOW RANGE INPUT SPROCKET                             |        |                               |                 |                 |                                    |
|------------------------------------------------------|--------|-------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                               |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 16                                                   | 26     | 210                           | 62263           | 52000           | 6.4 to 12.9                        |
| 16                                                   | 27     | 218                           | 59957           | 50074           | 6.4 to 12.9                        |
| 16                                                   | 28     | 227                           | 57816           | 48286           | 6.4 to 12.9                        |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate

vacuum gauge BRUSH

PB21958,0000551-19-19MAR18

### Vacuum Level, Baffle Position, and vacuum gauge Brush for Larger Edible Beans



A47011—UN—22JAN01

Short Brush

Use the short brush  
Talk Lubricant, 120 mL, if treated.

*NOTE: If the sweet maize double eliminator has been installed, loosen set screw in cam nut and rotate cam nut to move tip of eliminator AWAY from center of the meter housing as far as possible.*

PB21958,0000552-19-05MAR18

### Medium Edible Beans Cell Type - 56 Cells

Average Seed Spacing and/or Approximate Seed Population Per Hectare of Medium Edible Beans Planted with vacuum gauge and Using AA37206 Brush

*NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".*

Vacuum level for large edible beans is set at 8 in

vacuum gauge BAFFLE

Move tab (A) .

For large edible beans, upper position (B).

| HIGH RANGE INPUT SPROCKET                            |        |                               |                 |                 |                                    |
|------------------------------------------------------|--------|-------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                               |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 30                            | 440683          | 368043          | 6.4 tot 7.2                        |
| 35                                                   | 25     | 31                            | 423056          | 353321          | 6.4 tot 7.2                        |
| 35                                                   | 26     | 32                            | 406784          | 339732          | 6.4 tot 8.0                        |
| 35                                                   | 27     | 33                            | 391718          | 327149          | 6.4 tot 8.0                        |
| 35                                                   | 28     | 35                            | 377728          | 315465          | 6.4 tot 8.0                        |
| 29                                                   | 24     | 36                            | 365137          | 304950          | 6.4 tot 8.0                        |

## How to Use Planting Rate Chart (Vacuum)

| HIGH RANGE INPUT SPROCKET                            |        |                               |                 |                 |                                    |
|------------------------------------------------------|--------|-------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                               |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 29                                                   | 25     | 37                            | 350532          | 292752          | 6.4 tot 8.4                        |
| 29                                                   | 26     | 39                            | 337050          | 281492          | 6.4 tot 8.4                        |
| 29                                                   | 27     | 40                            | 324567          | 271067          | 6.4 tot 9.6                        |
| 29                                                   | 28     | 42                            | 312975          | 261386          | 6.4 tot 9.6                        |
| 24                                                   | 24     | 43                            | 302183          | 252372          | 6.4 tot 10.4                       |
| 24                                                   | 25     | 45                            | 290095          | 242277          | 6.4 tot 10.4                       |
| 24                                                   | 26     | 47                            | 278938          | 232959          | 6.4 tot 11.2                       |
| 24                                                   | 27     | 49                            | 268607          | 224331          | 6.4 tot 12.0                       |
| 24                                                   | 28     | 51                            | 259014          | 216319          | 6.4 tot 12.0                       |
| 20                                                   | 24     | 52                            | 251819          | 210310          | 6.4 tot 12.9                       |
| 20                                                   | 25     | 54                            | 241746          | 201898          | 6.4 tot 12.9                       |
| 20                                                   | 26     | 56                            | 232448          | 194133          | 6.4 tot 12.9                       |
| 20                                                   | 27     | 59                            | 223839          | 186942          | 6.4 tot 12.9                       |
| 20                                                   | 28     | 61                            | 215845          | 180266          | 6.4 tot 12.9                       |
| 16                                                   | 24     | 61                            | 201455          | 180266          | 6.4 tot 12.9                       |
| 16                                                   | 25     | 65                            | 193397          | 168248          | 6.4 tot 12.9                       |
| 16                                                   | 26     | 68                            | 185959          | 161518          | 6.4 tot 12.9                       |
| 16                                                   | 27     | 70                            | 179071          | 155306          | 6.4 tot 12.9                       |
| 16                                                   | 28     | 73                            | 172676          | 149554          | 6.4 tot 12.9                       |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate

PB21958,00004F8-19-15MAR18

Population Per Hectare of Medium Edible Beans  
Planted with vacuum gauge and Using AA37206 Brush

*NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".*

## Medium Edible Beans Cell Type - 56 Cells

Average Seed Spacing and/or Approximate Seed

| LOW RANGE INPUT SPROCKET                             |        |                               |                 |                 |                                    |
|------------------------------------------------------|--------|-------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                               |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 79                            | 165256          | 138016          | 6.4 tot 12.9                       |
| 35                                                   | 25     | 83                            | 158646          | 132495          | 6.4 tot 12.9                       |
| 35                                                   | 26     | 86                            | 152544          | 127399          | 6.4 tot 12.9                       |
| 35                                                   | 27     | 89                            | 146894          | 122681          | 6.4 tot 12.9                       |
| 35                                                   | 28     | 92                            | 141648          | 118300          | 6.4 tot 12.9                       |
| 29                                                   | 24     | 96                            | 136927          | 114356          | 6.4 tot 12.9                       |
| 29                                                   | 25     | 100                           | 131449          | 109782          | 6.4 tot 12.9                       |
| 29                                                   | 26     | 104                           | 126394          | 105560          | 6.4 tot 12.9                       |
| 29                                                   | 27     | 108                           | 121712          | 101650          | 6.4 tot 12.9                       |
| 29                                                   | 28     | 112                           | 117366          | 98020           | 6.4 tot 12.9                       |
| 24                                                   | 24     | 116                           | 113318          | 94640           | 6.4 tot 12.9                       |
| 24                                                   | 25     | 120                           | 108796          | 90854           | 6.4 tot 12.9                       |
| 24                                                   | 26     | 125                           | 104602          | 87360           | 6.4 tot 12.9                       |
| 24                                                   | 27     | 130                           | 100728          | 84124           | 6.4 tot 12.9                       |
| 24                                                   | 28     | 135                           | 97130           | 81120           | 6.4 tot 12.9                       |
| 20                                                   | 24     | 139                           | 94432           | 78866           | 6.4 tot 12.9                       |
| 20                                                   | 25     | 145                           | 90655           | 75712           | 6.4 tot 12.9                       |
| 20                                                   | 26     | 150                           | 87168           | 72800           | 6.4 tot 12.9                       |
| 20                                                   | 27     | 156                           | 83940           | 70103           | 6.4 tot 12.9                       |
| 20                                                   | 28     | 162                           | 80942           | 67600           | 6.4 tot 12.9                       |
| 16                                                   | 24     | 173                           | 75546           | 63093           | 6.4 tot 12.9                       |
| 16                                                   | 25     | 181                           | 72524           | 60569           | 6.4 tot 12.9                       |

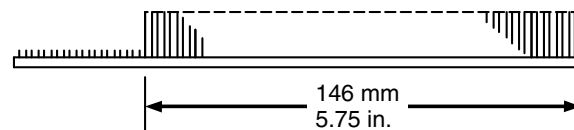
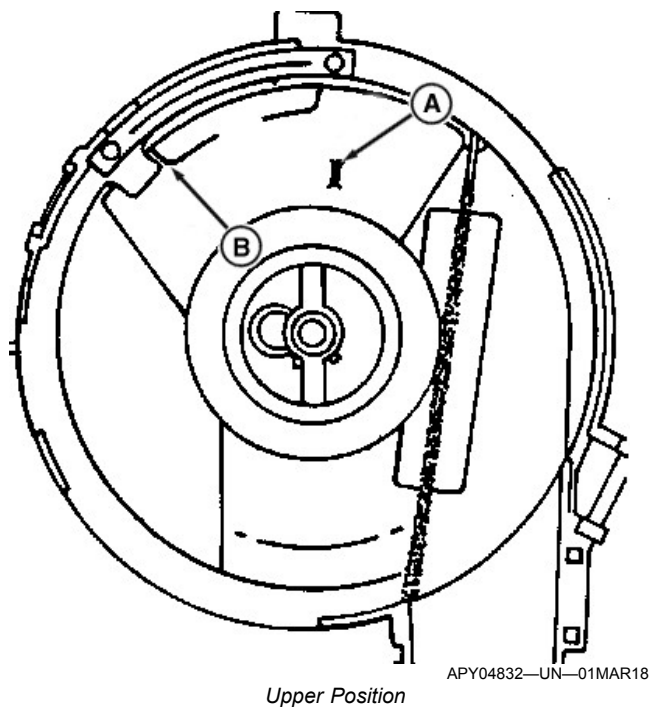
## How to Use Planting Rate Chart (Vacuum)

|    |    |     |       |       |              |
|----|----|-----|-------|-------|--------------|
| 16 | 26 | 188 | 69734 | 58240 | 6.4 tot 12.9 |
| 16 | 27 | 195 | 67152 | 56083 | 6.4 tot 12.9 |
| 16 | 28 | 202 | 64753 | 54080 | 6.4 tot 12.9 |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate

PB21958,0000553-19-05MAR18

### Vacuum Level, Baffle Position, and vacuum gauge Brush for Medium Edible Beans



Short Brush

Use the short brush  
Talk Lubricant, 120 mL, if treated.

**NOTE:** If the sweet maize double eliminator has been installed, loosen set screw in cam nut and rotate cam nut to move tip of eliminator AWAY from center of the meter housing as far as possible.

PB21958,0000554-19-05MAR18

Vacuum level for large edible beans is set at 8 in

**NOTE:** Medium edible beans, for garden beans that have 3970 or more seeds per kilogram, set vacuum level at 6 in.

vacuum gauge Baffle

Move tab (A) .

For large edible beans, upper position (B).

vacuum gauge Brush

## Small Edible Beans, Cell Type - 108 Cells

Average Seed Spacing and/or Approximate Seed Population Per Hectare of Small Edible Beans Planted with vacuum gauge and Using AA37206 Brush

NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".

| HIGH RANGE INPUT SPROCKET                            |        |                                  |                 |                 |                                    |
|------------------------------------------------------|--------|----------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                                  |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average<br>Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 15                               | 849889          | 709797          | 3.2 to 12.9                        |
| 35                                                   | 25     | 16                               | 815893          | 681405          | 3.2 to 12.9                        |
| 35                                                   | 26     | 17                               | 784513          | 655197          | 3.2 to 12.9                        |
| 35                                                   | 27     | 17                               | 755457          | 630931          | 3.2 to 12.9                        |
| 35                                                   | 28     | 18                               | 728476          | 608398          | 3.2 to 12.9                        |
| 29                                                   | 24     | 19                               | 704193          | 588118          | 3.2 to 12.9                        |
| 29                                                   | 25     | 19                               | 676026          | 564593          | 3.2 to 12.9                        |
| 29                                                   | 26     | 20                               | 650025          | 542878          | 3.2 to 12.9                        |
| 29                                                   | 27     | 21                               | 625950          | 522771          | 3.2 to 12.9                        |
| 29                                                   | 28     | 22                               | 603594          | 504101          | 3.2 to 12.9                        |
| 24                                                   | 24     | 22                               | 582781          | 486718          | 3.2 to 12.9                        |
| 24                                                   | 25     | 23                               | 559470          | 467249          | 3.2 to 12.9                        |
| 24                                                   | 26     | 24                               | 537951          | 449278          | 3.2 to 12.9                        |
| 24                                                   | 27     | 25                               | 518027          | 432638          | 3.2 to 12.9                        |
| 24                                                   | 28     | 26                               | 499526          | 417187          | 3.2 to 12.9                        |
| 20                                                   | 24     | 27                               | 485651          | 405598          | 3.2 to 12.9                        |
| 20                                                   | 25     | 28                               | 466225          | 389374          | 3.2 to 12.9                        |
| 20                                                   | 26     | 29                               | 448293          | 374398          | 3.2 to 12.9                        |
| 20                                                   | 27     | 30                               | 431689          | 360532          | 3.2 to 12.9                        |
| 20                                                   | 28     | 31                               | 416272          | 347656          | 3.2 to 12.9                        |
| 16                                                   | 24     | 34                               | 388521          | 324479          | 4.8 to 12.9                        |
| 16                                                   | 25     | 35                               | 372980          | 311500          | 4.8 to 12.9                        |
| 16                                                   | 26     | 37                               | 358634          | 299519          | 4.8 to 12.9                        |
| 16                                                   | 27     | 38                               | 345352          | 288425          | 4.8 to 12.9                        |
| 16                                                   | 28     | 39                               | 333018          | 278125          | 4.8 to 12.9                        |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate

Population Per Hectare of Small Edible Beans Planted with vacuum gauge and Using AA37206 Brush

PB21958,00004F9-19-15MAR18

NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".

## Small Edible Beans, Cell Type - 108 Cells

Average Seed Spacing and/or Approximate Seed

| LOW RANGE INPUT SPROCKET                             |        |                                  |                 |                 |                                    |
|------------------------------------------------------|--------|----------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                                  |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average<br>Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 35                                                   | 24     | 41                               | 318706          | 266174          | 4.8 to 12.9                        |
| 35                                                   | 25     | 43                               | 305960          | 255527          | 4.8 to 12.9                        |
| 35                                                   | 26     | 45                               | 294162          | 245699          | 4.8 to 12.9                        |
| 35                                                   | 27     | 46                               | 283296          | 236599          | 4.8 to 12.9                        |
| 35                                                   | 28     | 48                               | 273178          | 228149          | 6.4 to 12.9                        |
| 29                                                   | 24     | 50                               | 264073          | 220544          | 6.4 to 12.9                        |
| 29                                                   | 25     | 52                               | 253510          | 211722          | 6.4 to 12.9                        |
| 29                                                   | 26     | 54                               | 243759          | 203579          | 6.4 to 12.9                        |
| 29                                                   | 27     | 56                               | 234731          | 196039          | 6.4 to 12.9                        |
| 29                                                   | 28     | 58                               | 226348          | 189038          | 6.4 to 12.9                        |
| 24                                                   | 24     | 60                               | 218543          | 182519          | 6.4 to 12.9                        |
| 24                                                   | 25     | 62                               | 209801          | 175218          | 6.4 to 12.9                        |

# *How to Use Planting Rate Chart (Vacuum)*

| LOW RANGE INPUT SPROCKET                             |        |                                  |                 |                 |                                    |
|------------------------------------------------------|--------|----------------------------------|-----------------|-----------------|------------------------------------|
| Approximate Seed Population Per Hectare              |        |                                  |                 |                 |                                    |
| Sprocket Combinations<br>(Number of Teeth)<br>Driver | Driven | Average<br>Seed Spacing<br>In mm | 0.762 m<br>Rows | 0.914 m<br>Rows | Recommended Speed<br>Range in km/h |
| 24                                                   | 26     | 65                               | 201732          | 168479          | 6.4 to 12.9                        |
| 24                                                   | 27     | 67                               | 194260          | 162239          | 6.4 to 12.9                        |
| 24                                                   | 28     | 70                               | 187322          | 156445          | 6.4 to 12.9                        |
| 20                                                   | 24     | 72                               | 182119          | 152099          | 6.4 to 12.9                        |
| 20                                                   | 25     | 75                               | 174834          | 146015          | 6.4 to 12.9                        |
| 20                                                   | 26     | 78                               | 168110          | 140399          | 6.4 to 12.9                        |
| 20                                                   | 27     | 81                               | 161884          | 135199          | 6.4 to 12.9                        |
| 20                                                   | 28     | 84                               | 156102          | 130371          | 6.4 to 12.9                        |
| 16                                                   | 24     | 90                               | 145695          | 121680          | 6.4 to 12.9                        |
| 16                                                   | 25     | 94                               | 139867          | 116812          | 6.4 to 12.9                        |
| 16                                                   | 26     | 97                               | 134488          | 112320          | 6.4 to 12.9                        |
| 16                                                   | 27     | 101                              | 129507          | 108160          | 6.4 to 12.9                        |
| 16                                                   | 28     | 105                              | 124882          | 104297          | 6.4 to 12.9                        |

To prevent planting miscalculations, make field checks to be sure that you are planting at the desired rate

PB21958,0000555-19-19MAR18

## Large Edible Beans

Average Seed Spacing and/or Approximate Seed Population Per Hectare of Large Edible Beans Planted with vacuum gauge

NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".

|                     | High Range Input Sprocket |                 | Low Range Input Sprocket |                   |                 |
|---------------------|---------------------------|-----------------|--------------------------|-------------------|-----------------|
| Population /0.914 m | Seed per 100 m Row        | Average Spacing | Population /0.914 m      | Seed per 100 Rows | Average Spacing |
| 328610              | 3003.47                   | 33.29           | 123229                   | 1126.30           | 88.79           |
| 315465              | 2883.33                   | 34.68           | 118300                   | 1081.25           | 92.49           |
| 303332              | 2772.43                   | 36.07           | 113750                   | 1039.67           | 96.18           |
| 292098              | 2669.76                   | 37.46           | 109537                   | 1001.16           | 99.88           |
| 281666              | 2574.41                   | 38.84           | 105625                   | 965.41            | 103.58          |
| 272277              | 2488.59                   | 40.18           | 102104                   | 933.22            | 107.16          |
| 261386              | 2389.05                   | 41.86           | 98020                    | 895.90            | 111.62          |
| 251332              | 2297.16                   | 43.53           | 94250                    | 861.44            | 116.08          |
| 242024              | 2212.08                   | 45.21           | 90759                    | 829.53            | 120.55          |
| 233380              | 2133.08                   | 46.68           | 87517                    | 799.90            | 125.02          |
| 225332              | 2059.52                   | 48.56           | 84500                    | 772.32            | 129.48          |
| 216319              | 1977.14                   | 50.58           | 81120                    | 741.43            | 134.87          |
| 207999              | 1901.10                   | 52.60           | 78000                    | 712.91            | 140.27          |
| 200295              | 1830.68                   | 54.62           | 75111                    | 686.51            | 145.66          |
| 193142              | 1765.30                   | 56.65           | 72428                    | 661.99            | 151.06          |
| 187777              | 1716.27                   | 58.27           | 70416                    | 643.60            | 155.38          |
| 180266              | 1647.62                   | 60.69           | 67600                    | 617.86            | 161.85          |
| 173333              | 1584.25                   | 63.12           | 65000                    | 594.10            | 168.32          |
| 166913              | 1525.57                   | 65.55           | 62592                    | 572.09            | 174.80          |
| 160952              | 1471.09                   | 67.98           | 60357                    | 551.66            | 181.27          |
| 150222              | 1373.02                   | 72.83           | 56333                    | 514.88            | 194.22          |
| 144213              | 1318.10                   | 75.87           | 54080                    | 494.29            | 202.31          |
| 138666              | 1267.40                   | 78.90           | 52000                    | 475.28            | 210.40          |
| 133530              | 1220.46                   | 81.94           | 50074                    | 457.67            | 218.50          |
| 128761              | 1176.87                   | 84.97           | 48286                    | 441.33            | 226.59          |

PB21958,00004FA-19-15MAR18

## Large Edible Beans

Average Seed Spacing and/or Approximate Seed Population Per Hectare of Large Edible Beans Planted with vacuum gauge

NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".

|                     | High Range Input Sprocket |                 | Low Range Input Sprocket |                   |                 |
|---------------------|---------------------------|-----------------|--------------------------|-------------------|-----------------|
| Population /0.914 m | Seed per 100 m Row        | Average Spacing | Population /0.914 m      | Seed per 100 Rows | Average Spacing |
| 368043              | 3363.89                   | 29.73           | 138016                   | 1261.46           | 79.27           |
| 353321              | 3229.33                   | 30.97           | 132495                   | 1211.00           | 82.58           |
| 339732              | 3105.13                   | 32.20           | 127399                   | 1164.42           | 85.88           |
| 327149              | 2990.12                   | 33.44           | 122681                   | 1121.30           | 89.18           |
| 315465              | 2883.33                   | 34.68           | 118300                   | 1081.25           | 92.49           |
| 304950              | 2786.22                   | 35.88           | 114356                   | 1045.21           | 95.67           |
| 292752              | 2675.73                   | 37.37           | 109782                   | 1003.40           | 99.66           |
| 281492              | 2572.82                   | 38.87           | 105560                   | 964.81            | 103.65          |
| 271067              | 2477.53                   | 40.36           | 101650                   | 929.07            | 107.63          |
| 261386              | 2389.05                   | 41.86           | 98020                    | 895.90            | 111.62          |
| 252372              | 2306.66                   | 43.35           | 94640                    | 865.00            | 115.61          |
| 242277              | 2214.40                   | 45.16           | 90854                    | 830.40            | 120.42          |
| 232959              | 2129.23                   | 46.97           | 87360                    | 798.46            | 125.24          |
| 224331              | 2050.37                   | 48.77           | 84124                    | 768.89            | 130.06          |
| 216319              | 1977.14                   | 50.28           | 81120                    | 741.43            | 134.87          |

### How to Use Planting Rate Chart (Vacuum)

|                     | High Range Input Sprocket |                 | Low Range Input Sprocket |                   |                 |
|---------------------|---------------------------|-----------------|--------------------------|-------------------|-----------------|
| Population /0.914 m | Seed per 100 m Row        | Average Spacing | Population /0.914 m      | Seed per 100 Rows | Average Spacing |
| 210310              | 1922.22                   | 52.02           | 78866                    | 720.83            | 138.73          |
| 201898              | 1845.33                   | 54.19           | 75712                    | 692.00            | 144.51          |
| 194133              | 1774.36                   | 56.36           | 72800                    | 665.39            | 150.29          |
| 186942              | 1708.64                   | 58.53           | 70103                    | 640.74            | 156.07          |
| 180266              | 1647.62                   | 60.69           | 67600                    | 617.86            | 161.85          |
| 168248              | 1537.78                   | 65.03           | 63093                    | 576.67            | 173.41          |
| 161518              | 1476.26                   | 67.74           | 60569                    | 553.60            | 180.64          |
| 155306              | 1419.49                   | 70.45           | 58240                    | 532.31            | 187.86          |
| 149554              | 1366.91                   | 73.16           | 56083                    | 512.59            | 195.09          |
|                     |                           |                 | 54080                    | 494.29            | 202.31          |

PB21958,0000556-19-15MAR18

### Large Edible Beans

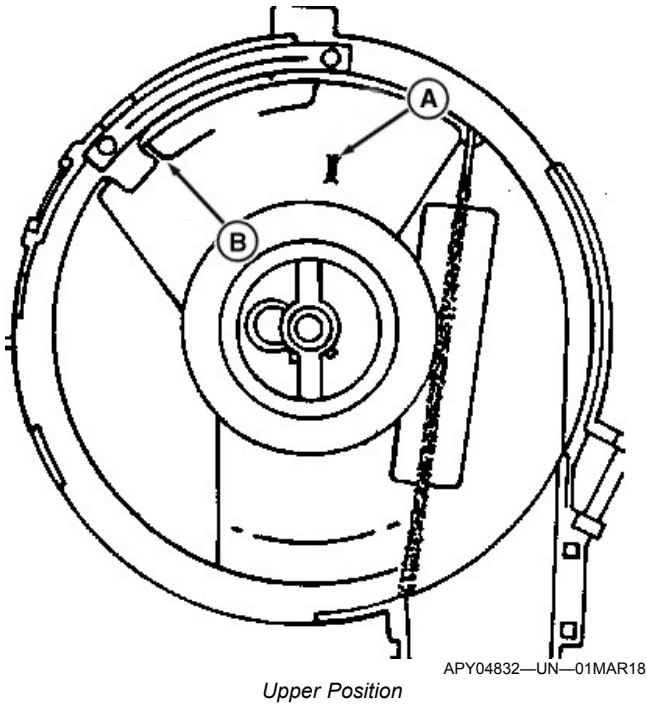
Average Seed Spacing and/or Approximate Seed Population Per Hectare of Large Edible Beans Planted with vacuum gauge

*NOTE: For information on using planting rate charts, see "How To Use Planting Rate Charts".*

|                     | High Range Input Sprocket |                 | Low Range Input Sprocket |                   |                 |
|---------------------|---------------------------|-----------------|--------------------------|-------------------|-----------------|
| Population /0.914 m | Seed per 100 m Row        | Average Spacing | Population /0.914 m      | Seed per 100 Rows | Average Spacing |
| 709797              | 6487.50                   | 15.41           | 266174                   | 2431.81           | 41.10           |
| 681405              | 6228.00                   | 16.06           | 255527                   | 2335.50           | 42.82           |
| 655197              | 5988.46                   | 16.70           | 245699                   | 2245.67           | 44.53           |
| 630931              | 5766.67                   | 17.34           | 236599                   | 2462.50           | 46.24           |
| 608398              | 5560.72                   | 17.98           | 228149                   | 2085.27           | 47.96           |
| 588118              | 5375.36                   | 18.60           | 220544                   | 2015.76           | 49.61           |
| 564593              | 5160.34                   | 19.38           | 211722                   | 1935.12           | 51.68           |
| 542878              | 4961.87                   | 20.15           | 203579                   | 1860.70           | 53.74           |
| 522771              | 4778.09                   | 20.93           | 196039                   | 1791.78           | 55.81           |
| 504101              | 4607.45                   | 21.70           | 189038                   | 1727.79           | 57.88           |
| 486718              | 4448.57                   | 22.48           | 182519                   | 1668.21           | 59.94           |
| 467249              | 4270.62                   | 23.42           | 175218                   | 1601.48           | 62.44           |
| 449278              | 4106.37                   | 24.35           | 168479                   | 1539.89           | 64.94           |
| 432638              | 3954.28                   | 25.29           | 162239                   | 1482.85           | 67.44           |
| 417187              | 3813.06                   | 26.23           | 156445                   | 1429.90           | 69.94           |
| 405598              | 3707.14                   | 26.97           | 152099                   | 1390.17           | 71.93           |
| 389374              | 3558.85                   | 28.10           | 146015                   | 1334.57           | 74.93           |
| 374398              | 3421.97                   | 29.22           | 140399                   | 1283.24           | 77.93           |
| 360532              | 3295.24                   | 30.35           | 135199                   | 1235.71           | 80.93           |
| 347656              | 3177.55                   | 31.47           | 130371                   | 1191.58           | 83.92           |
| 324479              | 2965.72                   | 33.72           | 121680                   | 1112.15           | 89.92           |
| 311500              | 2847.09                   | 35.12           | 116812                   | 1067.65           | 93.66           |
| 399519              | 2737.58                   | 36.53           | 112320                   | 1026.60           | 97.41           |
| 288425              | 2636.18                   | 37.93           | 108160                   | 988.58            | 101.16          |
| 278125              | 2542.04                   | 39.34           | 104297                   | 953.27            | 104.90          |

PB21958,0000557-19-05MAR18

## Vacuum Level, Baffle Position, and vacuum gauge Brush for Small Edible Beans



Vacuum level small edible beans is set at 8 in

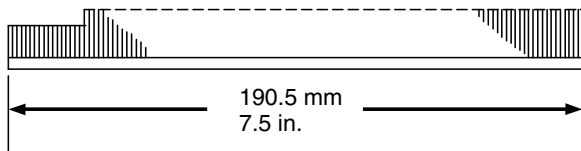
*NOTE: Small edible beans, for Seeds that have 6170 or more seeds per kilogram, set vacuum level at 6 in.*

vacuum gauge Baffle

Move tab (A) .

For small edible beans, upper position (B).

vacuum gauge Brush



Regular (long) Brush

A47009—UN—22JAN01

Use the short brush  
Talk Lubricant, 120 mL, if treated.

*NOTE: If the sweet maize double eliminator has been installed, loosen set screw in cam nut and rotate cam nut to move tip of eliminator AWAY from center of the meter housing as far as possible.*

PB21958,0000558-19-05MAR18

## Lower Seed Populations

Lower seed rates, particularly planting maize with 0.914 row spacing, may be required. A reduction can be achieved but replacing the unit drive 19-tooth sprocket with a cluster having 19, 17 and 15 teeth. By choosing the 17th tooth sprocket, a 10.5% reduction is achieved - with the 15 tooth: 21%. To achieve the desired population settings on the planter, proceed as follows.

1. Determine the actual population to be planted
2. Multiply this by ;
  - a. 1.12 for 17-tooth sprocket.
  - b. 1.27 for 15 tooth sprocket
3. Then read off the sprocket combination given for the population figure obtained in step 2 .

Example:

A farmer wants to plant a population of 20000 plants per hectare with 0.914m row spacing, using the large maize plate and with the 15-tooth sprocket.

$$20\ 000 \times 1.27 = 25\ 400$$

The closest figure on the large maize seed chart for 0.914m rows is 25 875.

The correct sprocket combination is then 16 : 26.

Order : 1 x Ah 133153 for each row.

Should this not be sufficient, leave the standard 19-tooth sprocket in place and blank off every second hole in the seed plate, using a suitable material such as Pratleys Quick Set Putty. Use the standard seed chart, and for every sprocket combination - half the population

PB21958,0000559-19-05MAR18

## Blank Seed Plate

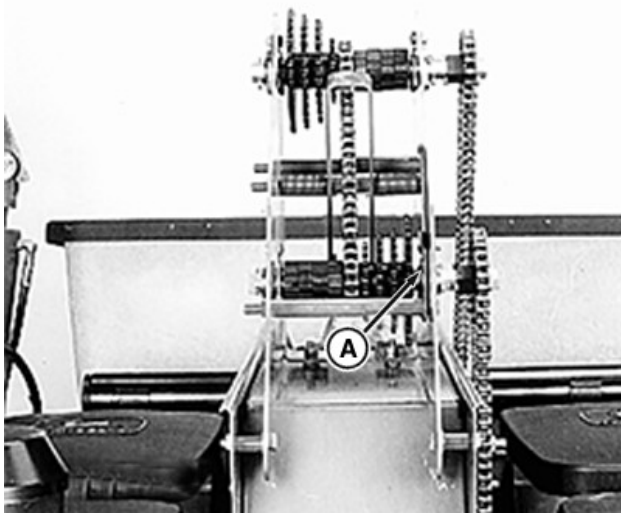
A blank seed plate is available into which holes may be drilled to suit different seeds and spacings. This is useful for planting vegetables and fine seeds, especially where grouping is required. These plates come in a kit containing two plates, including templates for accurate drilling of holes and complete instructions regarding ground speeds and spacings.

Order: 1 x BA25917 for 2 rows.

PB21958,000055A-19-05MAR18

# Dry Fertilizer Table - Contact Drive

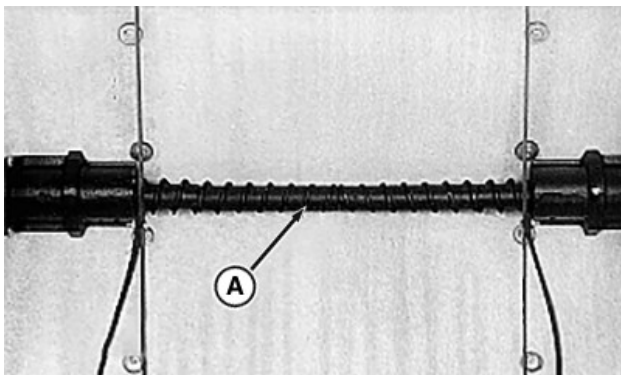
## Dry Fertilizer Delivery Rates



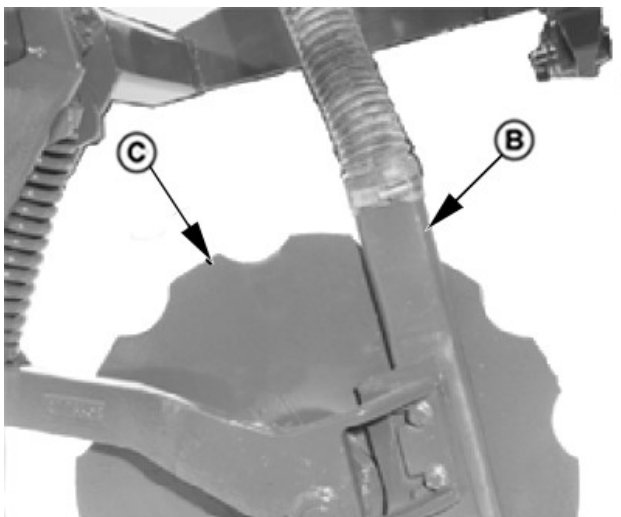
APY04827—UN—19MAR18

A—Retaining Hook

**NOTE:** The rate of fertilizer is determined by the type of augers installed and the driver and driven sprocket combinations.



APY04863—UN—01MAR18



PYM0046—UN—27MAR06

A—Auger  
B—Spout

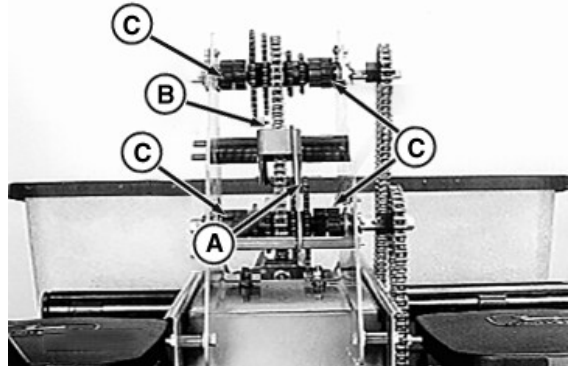
## C—Opener

Each fertilizer hopper holds approximately 249 kg (549 lbs.) of fertilizer.

*The fertilizer is distributed by an auger (A) in the bottom of each hopper.*

*The fertilizer is applied to the ground by the dry fertilizer spout (B) and the fertilizer opener (C).*

- To change the sprocket combinations, remove retaining hook (A) from storage position.

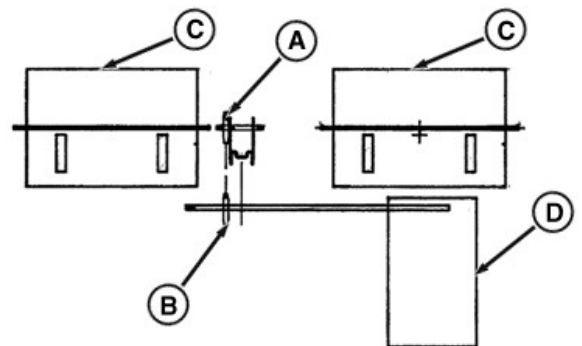


APY04840—UN—02MAR18

A—Tightener  
B—Chain  
C—Spacers

- Pull down on the chain tightener (A) and secure with retaining hook.
- Remove chain (B) from driver and driven sprockets.
- Remove rubber sprocket spacers (C).
- Slide desired driver and driven sprockets into alignment with the chain tightener and replace chain.

**IMPORTANT:** Verify that sprockets are aligned properly with the chain tightener and secured with rubber spacers. Verify chain runs freely on selected sprockets. Improper alignment can cause drive failures.



APY04837—UN—19MAR18

A—Driven Sprocket  
B—Driver Sprocket

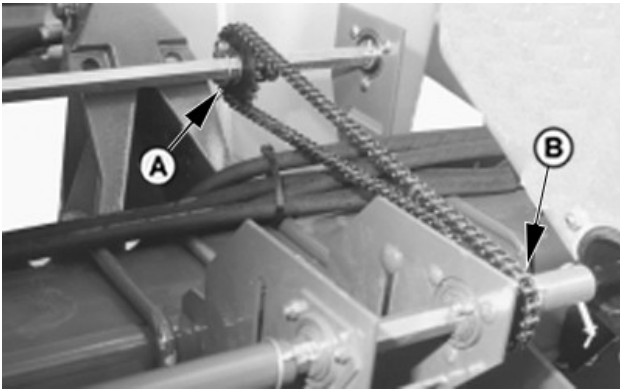
Because the dry fertilizer attachment meters volume and not mass, and because of the differences between the

many brands, analysis of fertilizer, temperature, and humidity, the mass metered out can vary as much as 100% from the mass calculated in the fertilizer rate chart.

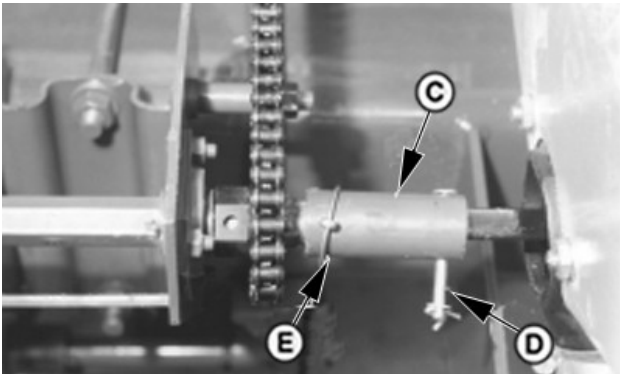
7. Replace rubber sprocket spacers as required.

PB21958,000055B-19-05MAR18

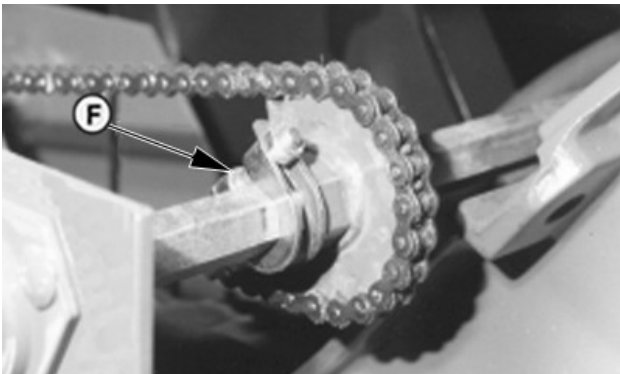
## To Change Sprockets



PYM0027—UN—30MAR06



PYM0029—UN—30MAR06



PYM0028—UN—30MAR06

A—Sprocket  
B—Sprocket  
C—Driver Coupler  
D—Reinstall Pin  
E—Pin  
F—Clamp

Remove chain. Loosen the two clamps (F) on the auger

shaft. Slide the auger shaft out of position and remove the sprocket (A).

Remove pin (D) and (E)

Slide the drive coupler (C) off and remove the sprocket (B).

Put on the correct sprockets on for the required combination.

Slide auger shaft back in position and tighten the two clamps (F).

Place driver coupler (C) back in position and reinstall pin (D) and (E). Secure with the split pin.

PB21958,000055C-19-19MAR18

### Dry Fertilizer Approximate Delivery Rates in Kilogram Per Hectare 27 Tooth Input for Planters with Contact Drive System

Rates based on dry fertilizer with a bulk density of 1041 kg/m<sup>3</sup>

| APPROXIMATE SEED POPULATION |                    |                    |                    |                    |                    |
|-----------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 0.76 m<br>Rye/Rows          | 0.81 m<br>Rye/Rows | 0.86 m<br>Rye/Rows | 0.91 m<br>Rye/Rows | 0.96 m<br>Rye/Rows | 1.00 m<br>Rye/Rows |
| 415                         | 389                | 366                | 346                | 331                | 318                |
| 370                         | 346                | 328                | 309                | 295                | 283                |
| 324                         | 304                | 286                | 271                | 257                | 246                |
| 299                         | 280                | 265                | 250                | 239                | 229                |
| 287                         | 289                | 254                | 240                | 229                | 220                |
| 266                         | 250                | 265                | 222                | 212                | 203                |
| 224                         | 210                | 198                | 187                | 194                | 185                |
| 221                         | 208                | 196                | 185                | 176                | 169                |
| 216                         | 190                | 189                | 180                | 172                | 165                |
| 201                         | 177                | 178                | 168                | 161                | 154                |
| 185                         | 174                | 163                | 154                | 147                | 141                |
| 185                         | 174                | 163                | 154                | 147                | 141                |
| 172                         | 161                | 153                | 143                | 137                | 132                |
| 164                         | 154                | 145                | 136                | 131                | 125                |
| 159                         | 150                | 142                | 133                | 128                | 123                |
| 156                         | 146                | 139                | 131                | 125                | 120                |
| 145                         | 136                | 129                | 121                | 115                | 111                |
| 143                         | 134                | 126                | 120                | 114                | 110                |
| 133                         | 125                | 118                | 111                | 106                | 102                |
| 129                         | 121                | 114                | 108                | 102                | 99                 |
| 118                         | 110                | 103                | 98                 | 93                 | 89                 |
| 108                         | 101                | 96                 | 90                 | 86                 | 82                 |
| 99                          | 92                 | 88                 | 82                 | 79                 | 75                 |
| 89                          | 84                 | 79                 | 75                 | 71                 | 69                 |
| 83                          | 77                 | 73                 | 69                 | 65                 | 83                 |

PB21958,00004FB-19-15MAR18

### Dry Fertilizer Approximate Delivery Rates in Kilogram Per Hectare 27 Tooth Input for Planters with Contact Drive System

Rates based on dry fertilizer with a bulk density of 1041 kg/m<sup>3</sup>

| Sprocket Combination (Number of Teeth) |                |                                          |                                  |                    |                    |
|----------------------------------------|----------------|------------------------------------------|----------------------------------|--------------------|--------------------|
| 1.50 m<br>Rows                         | 2.30 m<br>Rows | Tramline<br>0.76 / 2.30 / 0.76 m<br>Rows | Tramline<br>0.91 / 2.10 / 0.91 m | Driver<br>Sprocket | Driven<br>Sprocket |
| 211                                    | 139            | 250                                      | 209                              | 36                 | 16                 |
| 188                                    | 123            | 222                                      | 187                              | 36                 | 18                 |
| 165                                    | 108            | 194                                      | 163                              | 28                 | 16                 |
| 153                                    | 100            | 180                                      | 151                              | 26                 | 16                 |
| 146                                    | 96             | 173                                      | 145                              | 28                 | 18                 |
| 136                                    | 88             | 161                                      | 134                              | 26                 | 18                 |
| 123                                    | 80             | 145                                      | 113                              | 21                 | 16                 |
| 113                                    | 71             | 133                                      | 112                              | 36                 | 30                 |
| 110                                    | 67             | 129                                      | 109                              | 21                 | 18                 |
| 103                                    | 63             | 121                                      | 101                              | 36                 | 33                 |
| 94                                     | 56             | 111                                      | 94                               | 36                 | 36                 |
| 94                                     | 56             | 111                                      | 94                               | 16                 | 16                 |
| 88                                     | 53             | 103                                      | 87                               | 28                 | 30                 |

*Dry Fertilizer Table - Contact Drive*

|    |    |    |    |    |    |
|----|----|----|----|----|----|
| 84 | 50 | 98 | 82 | 16 | 18 |
| 81 | 48 | 96 | 80 | 26 | 30 |
| 80 | 47 | 95 | 79 | 28 | 33 |
| 75 | 44 | 88 | 74 | 26 | 33 |
| 74 | 44 | 87 | 73 | 28 | 36 |
| 68 | 41 | 80 | 67 | 26 | 36 |
| 66 | 40 | 77 | 65 | 21 | 30 |
| 59 | 36 | 70 | 59 | 21 | 33 |
| 55 | 33 | 65 | 54 | 21 | 36 |
| 51 | 31 | 59 | 49 | 16 | 30 |
| 46 | 29 | 54 | 45 | 16 | 33 |
| 42 | 27 | 50 | 42 | 16 | 36 |

PB21958,00004FC-19-15MAR18

**Dry Fertilizer Approximate Delivery Rates in  
Kilogram Per Hectare 18 Tooth Input for  
Planters with Contact Drive System**

Rates based on dry fertilizer with a bulk density of 1041  
kg/m<sup>3</sup>

| APPROXIMATE SEED POPULATION |                    |                    |                    |                    |                    |
|-----------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 0.76 m<br>Rye/Rows          | 0.81 m<br>Rye/Rows | 0.86 m<br>Rye/Rows | 0.91 m<br>Rye/Rows | 0.96 m<br>Rye/Rows | 1.00 m<br>Rye/Rows |
| 934                         | 877                | 825                | 780                | 745                | 715                |
| 830                         | 779                | 734                | 694                | 662                | 636                |
| 727                         | 682                | 642                | 607                | 579                | 555                |
| 674                         | 632                | 596                | 563                | 538                | 516                |
| 646                         | 606                | 571                | 539                | 516                | 495                |
| 599                         | 562                | 529                | 500                | 477                | 459                |
| 544                         | 510                | 481                | 454                | 434                | 417                |
| 498                         | 467                | 440                | 416                | 397                | 381                |
| 484                         | 454                | 427                | 404                | 386                | 371                |
| 453                         | 426                | 400                | 378                | 361                | 346                |
| 415                         | 389                | 366                | 346                | 331                | 318                |
| 415                         | 389                | 366                | 346                | 331                | 318                |
| 387                         | 363                | 342                | 323                | 309                | 297                |
| 368                         | 345                | 326                | 308                | 294                | 282                |
| 360                         | 338                | 318                | 300                | 288                | 276                |
| 352                         | 330                | 311                | 294                | 282                | 269                |
| 327                         | 307                | 288                | 273                | 261                | 251                |
| 322                         | 302                | 285                | 269                | 257                | 247                |
| 299                         | 280                | 264                | 250                | 239                | 230                |
| 290                         | 273                | 256                | 242                | 231                | 222                |
| 264                         | 247                | 233                | 220                | 210                | 201                |
| 243                         | 228                | 214                | 203                | 194                | 186                |
| 222                         | 209                | 196                | 186                | 177                | 169                |
| 201                         | 189                | 178                | 168                | 162                | 155                |
| 185                         | 174                | 163                | 154                | 146                | 141                |

PB21958,00004FD-19-15MAR18

**Dry Fertilizer Approximate Delivery Rates in  
Kilogram Per Hectare 18 Tooth Input for  
Planters with Contact Drive System**

Rates based on dry fertilizer with a bulk density of 1041  
kg/m<sup>3</sup>

### Dry Fertilizer Table - Contact Drive

| Sprocket Combination (Number of Teeth) |                |                                          |                                  |                    |                    |
|----------------------------------------|----------------|------------------------------------------|----------------------------------|--------------------|--------------------|
| 1.50 m<br>Rows                         | 2.30 m<br>Rows | Tramline<br>0.76 / 2.30 / 0.76 m<br>Rows | Tramline<br>0.91 / 2.10 / 0.91 m | Driver<br>Sprocket | Driven<br>Sprocket |
| 476                                    | 311            | 562                                      | 472                              | 36                 | 16                 |
| 423                                    | 276            | 499                                      | 419                              | 36                 | 18                 |
| 371                                    | 242            | 437                                      | 367                              | 28                 | 16                 |
| 344                                    | 224            | 406                                      | 341                              | 26                 | 16                 |
| 330                                    | 216            | 388                                      | 326                              | 28                 | 18                 |
| 306                                    | 199            | 361                                      | 302                              | 26                 | 18                 |
| 278                                    | 181            | 328                                      | 275                              | 21                 | 16                 |
| 254                                    | 166            | 299                                      | 252                              | 36                 | 30                 |
| 246                                    | 161            | 290                                      | 244                              | 21                 | 18                 |
| 231                                    | 151            | 273                                      | 229                              | 36                 | 33                 |
| 212                                    | 139            | 250                                      | 209                              | 36                 | 36                 |
| 212                                    | 139            | 250                                      | 209                              | 16                 | 16                 |
| 198                                    | 129            | 233                                      | 196                              | 28                 | 30                 |
| 188                                    | 122            | 221                                      | 186                              | 16                 | 18                 |
| 184                                    | 120            | 217                                      | 181                              | 23                 | 30                 |
| 180                                    | 118            | 212                                      | 178                              | 28                 | 33                 |
| 167                                    | 109            | 197                                      | 165                              | 26                 | 33                 |
| 165                                    | 108            | 195                                      | 163                              | 28                 | 36                 |
| 153                                    | 100            | 180                                      | 151                              | 26                 | 36                 |
| 148                                    | 97             | 174                                      | 146                              | 21                 | 30                 |
| 134                                    | 88             | 158                                      | 133                              | 21                 | 33                 |
| 124                                    | 80             | 146                                      | 123                              | 21                 | 36                 |
| 113                                    | 74             | 133                                      | 112                              | 16                 | 30                 |
| 103                                    | 67             | 121                                      | 101                              | 16                 | 33                 |
| 93                                     | 62             | 111                                      | 93                               | 16                 | 36                 |

PB21958,00004FE-19-15MAR18

### Dry Fertilizer Approximate Delivery Rates in Kilogram Per Hectare 36-Tooth Input

Rates based on dry fertilizer with a bulk density of 1041  
kg/m<sup>3</sup>

| APPROXIMATE SEED POPULATION |                    |                    |                    |                    |                    |
|-----------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 0.76 m<br>Rye/Rows          | 0.81 m<br>Rye/Rows | 0.86 m<br>Rye/Rows | 0.91 m<br>Rye/Rows | 0.96 m<br>Rye/Rows | 1.00 m<br>Rye/Rows |
| 377                         | 354                | 333                | 315                | 301                | 289                |
| 336                         | 315                | 296                | 281                | 268                | 257                |
| 294                         | 276                | 260                | 246                | 234                | 224                |
| 272                         | 255                | 241                | 227                | 217                | 208                |
| 261                         | 245                | 231                | 218                | 208                | 200                |
| 242                         | 227                | 214                | 202                | 193                | 185                |
| 204                         | 191                | 180                | 170                | 176                | 168                |
| 201                         | 189                | 178                | 168                | 160                | 154                |
| 196                         | 173                | 172                | 164                | 156                | 150                |
| 183                         | 161                | 162                | 153                | 146                | 140                |
| 168                         | 158                | 148                | 140                | 134                | 128                |
| 168                         | 158                | 148                | 140                | 134                | 128                |
| 156                         | 146                | 139                | 130                | 125                | 120                |
| 149                         | 140                | 132                | 124                | 119                | 114                |
| 145                         | 136                | 129                | 121                | 116                | 112                |
| 142                         | 133                | 126                | 119                | 114                | 109                |
| 132                         | 124                | 117                | 110                | 105                | 101                |
| 130                         | 122                | 115                | 109                | 104                | 100                |
| 121                         | 114                | 107                | 101                | 96                 | 93                 |
| 117                         | 110                | 104                | 98                 | 93                 | 90                 |
| 107                         | 100                | 94                 | 89                 | 85                 | 81                 |
| 98                          | 92                 | 87                 | 82                 | 78                 | 75                 |

### Dry Fertilizer Table - Contact Drive

|    |    |    |    |    |    |
|----|----|----|----|----|----|
| 90 | 84 | 80 | 75 | 72 | 68 |
| 81 | 76 | 72 | 68 | 65 | 63 |
| 75 | 70 | 66 | 63 | 59 | 57 |

PB21958,00004FF-19-15MAR18

### Dry Fertilizer Approximate Delivery Rates in Kilogram Per Hectare 36 Tooth Input

Rates based on dry fertilizer with a bulk density of 1041 kg/m<sup>3</sup>

| APPROXIMATE SEED POPULATION |            |                             |                             |                                |        |
|-----------------------------|------------|-----------------------------|-----------------------------|--------------------------------|--------|
| 1.5 m Rows                  | 2.3 m Rows | Tramline<br>0.76/2.3/0.76 m | Tramline<br>0.91/2.1/0.91 m | Sprocket Combination<br>Driver | Driven |
| 192                         | 126        | 227                         | 190                         | 36                             | 16     |
| 171                         | 112        | 202                         | 170                         | 36                             | 18     |
| 150                         | 98         | 176                         | 148                         | 28                             | 16     |
| 139                         | 91         | 164                         | 137                         | 26                             | 16     |
| 133                         | 87         | 157                         | 132                         | 28                             | 18     |
| 124                         | 80         | 146                         | 122                         | 26                             | 18     |
| 112                         | 73         | 132                         | 103                         | 21                             | 16     |
| 103                         | 65         | 121                         | 102                         | 36                             | 30     |
| 100                         | 61         | 117                         | 99                          | 21                             | 18     |
| 93                          | 56         | 110                         | 92                          | 36                             | 33     |
| 93                          | 56         | 101                         | 85                          | 36                             | 36     |
| 93                          | 56         | 101                         | 85                          | 16                             | 16     |
| 86                          | 52         | 94                          | 79                          | 28                             | 30     |
| 80                          | 49         | 89                          | 75                          | 16                             | 18     |
| 74                          | 48         | 87                          | 73                          | 26                             | 30     |
| 73                          | 48         | 86                          | 72                          | 28                             | 33     |
| 68                          | 44         | 80                          | 67                          | 26                             | 33     |
| 67                          | 44         | 79                          | 66                          | 28                             | 36     |
| 62                          | 40         | 73                          | 61                          | 26                             | 36     |
| 60                          | 39         | 70                          | 59                          | 21                             | 30     |
| 54                          | 36         | 64                          | 54                          | 21                             | 33     |
| 50                          | 32         | 59                          | 49                          | 21                             | 36     |
| 46                          | 30         | 54                          | 45                          | 16                             | 30     |
| 42                          | 27         | 49                          | 41                          | 16                             | 33     |
| 38                          | 25         | 45                          | 38                          | 16                             | 36     |

PB21958,0000500-19-15MAR18

### Dry Fertilizer Approximate Delivery Rates in Kilogram Per Hectare 16 - Tooth Input

Rates based on dry fertilizer with a bulk density of 1041 kg/m<sup>3</sup>

| APPROXIMATE SEED POPULATION |                 |                 |                 |                 |                 |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 0.76 m Rye/Rows             | 0.81 m Rye/Rows | 0.86 m Rye/Rows | 0.91 m Rye/Rows | 0.96 m Rye/Rows | 1.00 m Rye/Rows |
| 849                         | 797             | 750             | 709             | 677             | 650             |
| 755                         | 708             | 667             | 631             | 602             | 578             |
| 661                         | 620             | 584             | 552             | 526             | 505             |
| 613                         | 575             | 542             | 512             | 489             | 469             |
| 587                         | 551             | 519             | 490             | 469             | 450             |
| 545                         | 511             | 481             | 455             | 434             | 417             |
| 495                         | 464             | 437             | 413             | 395             | 379             |

*Dry Fertilizer Table - Contact Drive*

|                   |                   |                   |                   |                   |                   |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 453<br>440        | 425<br>413        | 400<br>388        | 378<br>367        | 361<br>351        | 346<br>337        |
| 412<br>377<br>377 | 387<br>354<br>354 | 364<br>333<br>333 | 344<br>315<br>315 | 328<br>301<br>301 | 315<br>289<br>289 |
| 352<br>335<br>327 | 330<br>314<br>307 | 311<br>296<br>289 | 294<br>280<br>273 | 281<br>267<br>262 | 270<br>256<br>251 |
| 320<br>297<br>293 | 300<br>279<br>275 | 283<br>262<br>259 | 267<br>248<br>245 | 256<br>237<br>234 | 245<br>228<br>225 |
| 272<br>264<br>240 | 255<br>248<br>225 | 240<br>233<br>212 | 227<br>220<br>200 | 217<br>210<br>191 | 209<br>202<br>183 |
| 221<br>202<br>183 | 207<br>190<br>172 | 195<br>178<br>162 | 185<br>169<br>153 | 176<br>161<br>147 | 169<br>154<br>141 |
| 168               | 158               | 148               | 140               | 133               | 128               |

PB21958,0000501-19-15MAR18

### Dry Fertilizer Approximate Delivery Rates in Kilogram Per Hectare 16 Tooth Input

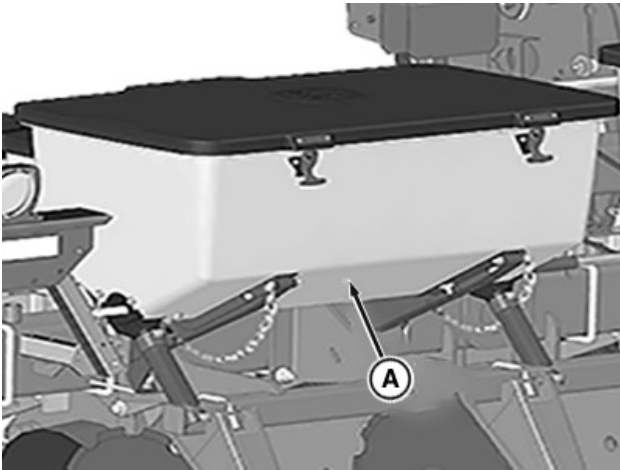
Rates based on dry fertilizer with a bulk density of 1041  
kg/m<sup>3</sup>

| APPROXIMATE SEED POPULATION |                   |                             |                             |                                |                |
|-----------------------------|-------------------|-----------------------------|-----------------------------|--------------------------------|----------------|
| 1.5 m<br>Rows               | 2.3 m<br>Rows     | Tramline<br>0.76/2.3/0.76 m | Tramline<br>0.91/2.1/0.91 m | Sprocket Combination<br>Driver | Driven         |
| 433<br>385<br>337           | 283<br>251<br>220 | 511<br>454<br>397           | 429<br>381<br>334           | 36<br>36<br>28                 | 16<br>18<br>16 |
| 313<br>300<br>278           | 204<br>196<br>181 | 369<br>353<br>328           | 310<br>296<br>275           | 26<br>28<br>26                 | 16<br>18<br>18 |
| 253<br>231<br>224           | 165<br>151<br>146 | 298<br>272<br>264           | 250<br>229<br>222           | 21<br>36<br>21                 | 16<br>30<br>18 |
| 210<br>193<br>193           | 137<br>126<br>126 | 248<br>227<br>227           | 208<br>190<br>190           | 36<br>36<br>16                 | 33<br>36<br>16 |
| 180<br>171<br>167           | 117<br>111<br>109 | 212<br>201<br>197           | 178<br>169<br>165           | 28<br>16<br>23                 | 30<br>18<br>30 |
| 164<br>152<br>150           | 107<br>99<br>98   | 193<br>179<br>177           | 162<br>150<br>148           | 28<br>26<br>28                 | 33<br>33<br>36 |
| 139<br>135<br>122           | 91<br>88<br>80    | 164<br>158<br>144           | 137<br>133<br>121           | 26<br>21<br>21                 | 36<br>30<br>33 |
| 113<br>103<br>94            | 73<br>67<br>61    | 133<br>121<br>110           | 112<br>102<br>92            | 21<br>16<br>16                 | 36<br>30<br>33 |
| 85                          | 56                | 101                         | 85                          | 16                             | 36             |

PB21958,0000502-19-15MAR18

# Attachments

## Dry Fertilizer



APY04856—UN—15MAR18

**A—Fertilizer Hopper**

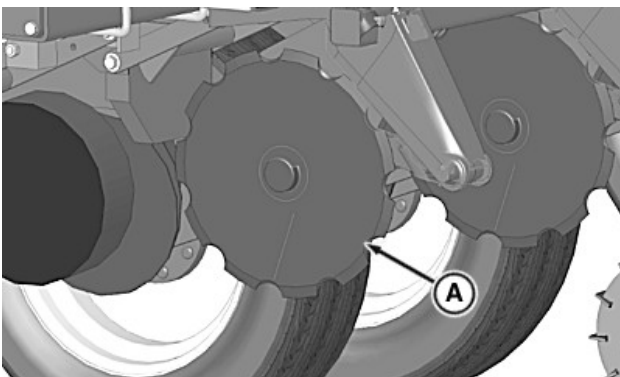
Each fertilizer hopper (A) holds approximately 250 kg (550 lb) of fertilizer.



APY04830—UN—01MAR18

**A—Auger**

Fertilizer is distributed by an auger (A) in the bottom of each hopper.



APY04851—UN—01MAR18

**A—Fertilizer Opener**

Fertilizer is applied to the ground by a fertilizer opener (A).

PB21958,000055D-19-05MAR18

## Storing Dry Fertilizer

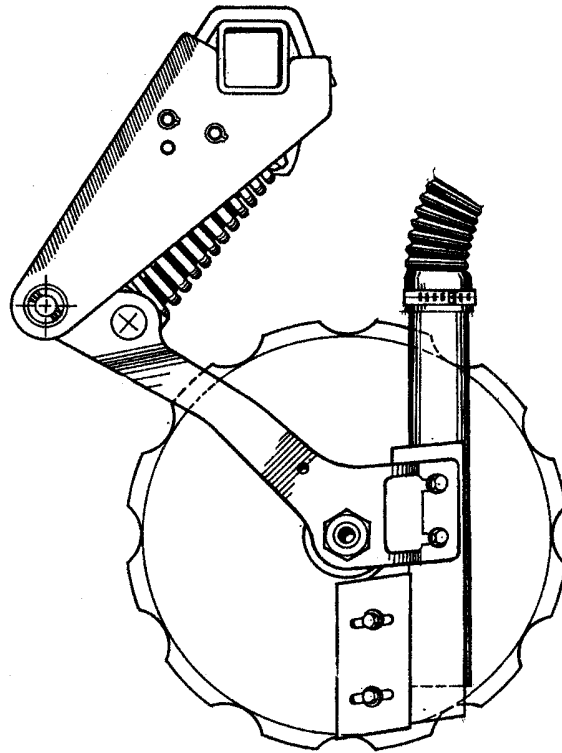
**⚠ CAUTION:** Agricultural chemicals can be dangerous. Improper selection or use can injure persons, animals, plants, soils, or other property. **TO AVOID INJURY,** select the right chemicals for the job. Handle and apply it with care. Follow instructions of the chemical manufacturer.

Keep fertilizer dry. Do not store it in a damp place.

Most fertilizers readily accumulate moisture and cause metal to corrode. This corrosion not only shortens metal life. But leads to unnecessary expense for parts broken because of binding or “freezing”. Deposits of the fertilizer buildup in the hopper and interfere with working parts. Therefore, the hoppers must be cleaned every day of use.

PB21958,000055E-19-05MAR18

## Single-Disk Fertilizer Openers



PYM0062—UN—27MAR06

*Single-Disk Opener with Dry Fertilizer Spout.*

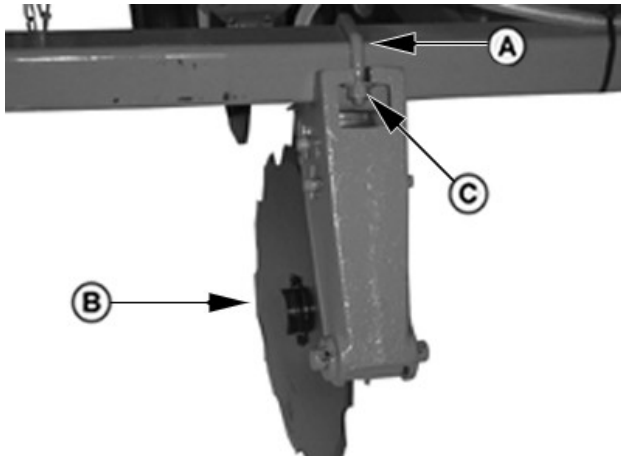
Single-disk fertilizer openers are designed specifically for band application of granular fertilizer in high residue, difficult-to-penetrate conservation seedbeds. The single blade and gauge wheel configuration minimizes disturbance of the seed zone in these conditions and helps preserve seedbed moisture. The gauge wheel helps in maintaining a consistent fertilizer depth.

Because of the single-disk fertilizer openers design, it is also capable of performing well in conventional seedbeds.

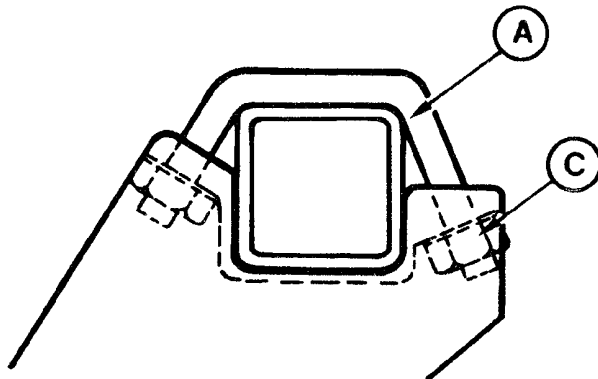
Operating the opener in soils containing many large rocks is not recommended since the openers upper movement limit stop is incapable of supporting the planter frame weight as the opener rides up over large rocks.

PB21958,000055F-19-05MAR18

## Positioning the Fertilizer Opener



PYM0031—UN—27MAR06



PYM0059—UN—27MAR06

A—U-Bolt  
B—Disk  
C—Nut (2 per U-bolt)

In most cases, the opener can be located 50—250 mm (2—10 in) either side of the row. However, some frame structures may either restrict this range or limit the opener location to one side of the row only.

To change location of fertilizer opener, loosen nuts (C) on U-bolt (A) and slide opener to right or left until disk (B) is at desired location.

Secure the opener to the frame as follows:

1. Turn nuts until the opener is square with and touching the bottom of the fertilizer tube. Tighten nuts to specification.

## Specification

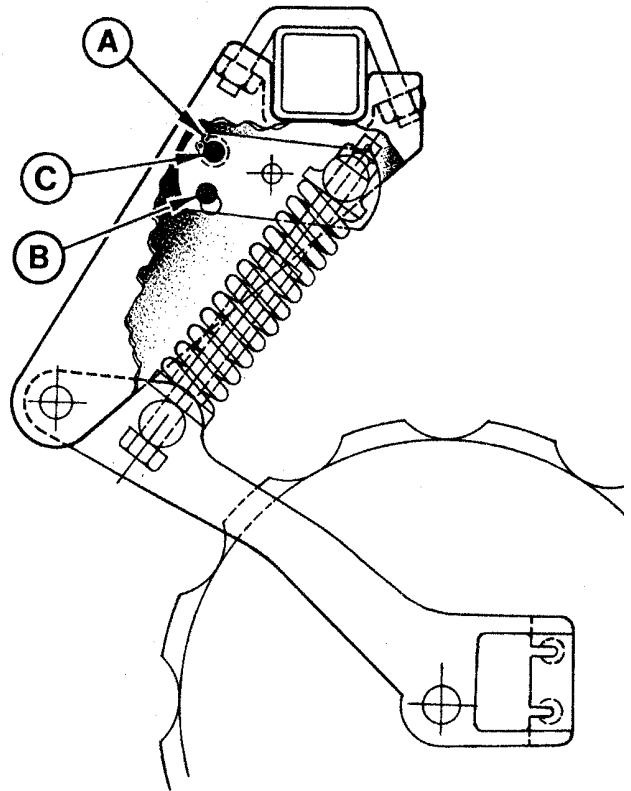
Nuts—Torque. . . . . 175 N·m  
(129 lb·ft)

2. Install spring locking pin on the left-hand side opener, next to hitch on eight-row narrow planter, so pin can be removed if downforce adjustment is required.

PB21958,0000560-19-05MAR18

## Adjust Downforce

### Adjust Downforce



PYM0056—UN—27MAR06

A—Pin  
B—Hole, Bottom  
C—Hole, Top

The opener downforce is adjustable to provide effective penetration for varying field conditions. Use the following criteria when determining the proper downforce setting for the opener:

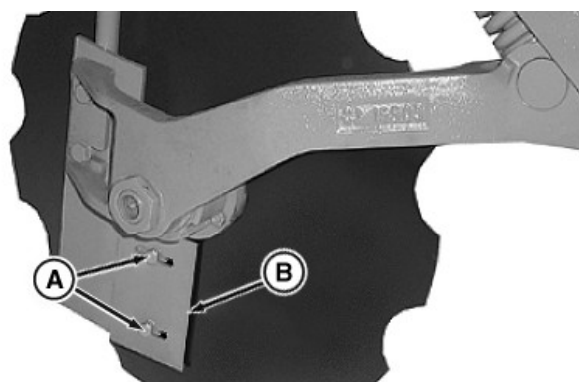
**NOTE:** Use no more downforce than necessary for the conditions.

1. Observe how deeply the gauge wheel is running:
  - If the wheel sinks deeply into the soil, use the minimum spring pressure setting.
  - If the disk does not sufficiently penetrate for the gauge wheel to consistently contact soil surface, use the maximum spring pressure setting.

2. To adjust the downforce, proceed as follows:
  - a. Raise planter and install service locks.
  - b. Remove snap ring from pin (A) and remove pin from the spring housing.
  - c. Position pin through internal strap and top hole (C) for maximum spring pressure. Position pin through strap and hole (B) for minimum spring pressure.
  - d. Secure pin using snap ring.

**NOTE:** Excessive opener downforce may cause planter frame to run higher than is desired or may substantially reduce planter drive wheel traction. Additional frame ballast or reduced spring force may be necessary to maintain adequate planter drive wheel traction.

Bottom hole (B) provides additional depth placing of fertilizer (35 mm [1-3/8 in.]) relative to the top hole.



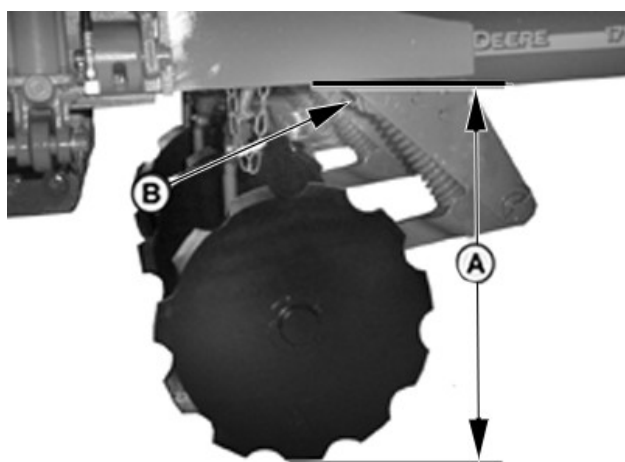
APY04867—UN—01MAR18

**A—Cap Screws**  
**B—Scraper**

Adjust scraper (B), by loosening cap screws (A), repositioning scraper, and tightening cap screws.

PB21958,0000561-19-05MAR18

## Check Downforce Adjustment



PYM0086—UN—04APR06

**A—Dimension**  
Maximum—711 mm (28 in)  
Minimum—635 mm (25 in)  
**B—Jam Nut**

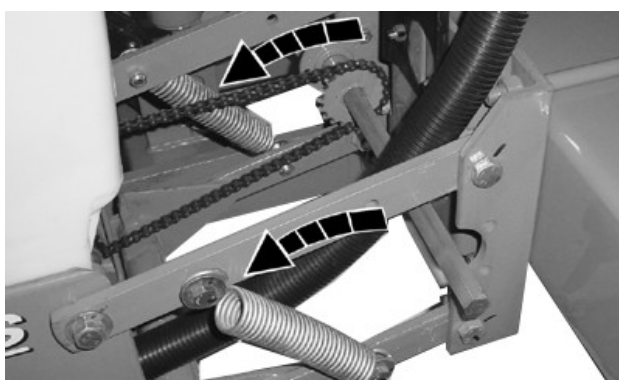
**NOTE:** Verify dimension (A) is not greater than 711 mm (28 in) or fertilizer tube may plug soil as opener engages the ground.

The granular fertilizer spouts are fastened to the single disk fertilizer opener arm and need no adjustment.

Lateral adjustment for placement of fertilizer away from, or towards, the row is achieved by moving entire single disk unit on the mounting frame in the desired direction.

After downforce adjustment has been made, verify dimension (A) is not less than 635 mm (25 in). Loosen jam nut (B) and adjust the spring bolt if necessary. Retighten jam nut.

## Unit down Force Springs



PYM0033—UN—27MAR06

The unit down force springs transfer mass from the main frame to planting unit to increase opener penetration and help to minimize bounce in the rough soil surface conditions.

PB21958,0000562-19-05MAR18

# Troubleshooting

## Troubleshooting

| Symptom                                                         | Problem                                                             | Solution                                                 |
|-----------------------------------------------------------------|---------------------------------------------------------------------|----------------------------------------------------------|
| <b>Planter is not lower</b>                                     | Pressure and return hoses not fully engaged in SCV outlets          | —                                                        |
| <b>Planter frame raises or lowers slowly</b>                    | Lower tractor hydraulic pressure                                    | Tractor standby pressure must be a minimum of 15513 kPa. |
| <b>Erratic or uneven lift</b>                                   | SCV not in HARE position                                            | —                                                        |
| <b>Planter frame unequal</b>                                    | Master cylinder seal leaking                                        | Replace seal                                             |
| <b>Marker floats off ground</b>                                 | Air in hydraulic system                                             | Bleed marker lift cylinder.                              |
|                                                                 | Alternator valve defective.                                         | Replace valve (See your John Deere dealer)               |
|                                                                 | Leaking tractor SCV.                                                | —                                                        |
|                                                                 | Marker cylinder not dropping down into J-Slot (Hose loop too short) | Lengthen marker hydraulic hose loops                     |
| <b>Markers not alternating</b>                                  | Marker hoses not connected to the marker valve correctly.           | —                                                        |
|                                                                 | Air in the marker valve                                             | Bleed marker hydraulic system                            |
|                                                                 | Marker valve defective                                              | Replace valve (See your John Deere dealer)               |
| <b>Marker lowers and disk blade is forced into ground</b>       | Marker cylinder is not floating                                     | Lengthen marker hydraulic hose loops                     |
| <b>Row units on the right-hand side of planter not planting</b> | Right-hand driveshaft pin sheared                                   | Repair cause of pin shearing and replace cotter pin      |
| <b>Row units on the left-hand side of planter not planting</b>  | Left-hand driveshaft pin sheared                                    | Repair cause of pin shearing and replace cotter pin      |
| <b>All row units not planting on planter</b>                    | Bolt in the countershaft sprocket to seed transmission sheared      | Repair cause of bolt shearing and replace bolt           |
| <b>Closing wheels leave the severe imprint in soil</b>          | Too much spring force                                               | Adjust closing wheel spring                              |
| <b>Closing wheels not firming soil around seed</b>              | Insufficient down force                                             | Adjust downforce lever                                   |
| <b>Closing wheel running on top of the seed furrow</b>          | Improper centering                                                  | Realign                                                  |
| <b>Consistent shearing of drillshaft split pin</b>              | Drillshaft not aligned properly                                     | Loosen bearing and align shaft                           |
| <b>Drive wheel chain consistently falls off</b>                 | Chain may not be too long                                           | Remove offset link                                       |

## *Troubleshooting*

| Symptom                                                  | Problem                                            | Solution                               |
|----------------------------------------------------------|----------------------------------------------------|----------------------------------------|
| <b>One fertilizer opener not distributing fertilizer</b> | Chain links stiff                                  | Oil or replace chain                   |
|                                                          | Chain dislodged by trash                           | Add trash guards                       |
|                                                          | Fertilizer tube opener spout plugged               | Inspect, clean, and remove obstruction |
| <b>Dry fertilizer not being uniformly distributed</b>    | Using wrong augers or augers assembled incorrectly | Reassemble with correct augers         |
|                                                          | Augers not centered in hopper                      | Reposition hoppers on center augers    |

PB21958,0000563-19-05MAR18

## **Row Units**

| Symptom                                                          | Problem                                                     | Solution                                                                       |
|------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------|
| <b>Row units on the right-hand side of machine not planting.</b> | Right-hand driveshaft cotter pin sheared.                   | Repair cause of pin shearing and replace cotter pin.                           |
|                                                                  | Half-Width Drive Disconnect is engaged.                     | Move switch to middle position.                                                |
| <b>Row units on the left-hand side of machine not planting.</b>  | Left-hand driveshaft cotter pins sheared.                   | Repair cause of pin shearing and replace cotter pin.                           |
|                                                                  | Half-Width Drive Disconnect is engaged.                     | Move switch to middle position.                                                |
| <b>Closing wheels plugging with crop residue.</b>                | Insufficient clearance for residue flow.                    | Stagger closing wheels. See STAGGER CLOSING WHEELS in Operate Machine section. |
| <b>Closing wheels leave severe imprint in soil.</b>              | Too much closing wheel down force.                          | Decrease closing down wheel force.                                             |
| <b>Closing wheels not firming soil around seed.</b>              | Insufficient closing wheel down force.                      | Increase closing wheel down force.                                             |
| <b>Closing wheel running on top of the seed furrow.</b>          | Improper centering.                                         | Center closing wheels. See CENTER CLOSING WHEELS in Operate Machine section.   |
|                                                                  | Closing wheel arm casting or pivot bushings worn.           | Replace closing wheel arm pivot bushings and or closing wheel arm.             |
| <b>Monitor does not count seeds.</b>                             | Dirt or debris has collected in the seed tube or on sensor. | Clean seed tube and sensor with cleaning brush.                                |

PB21958,0000564-19-05MAR18

## **Troubleshooting - Vacuum**

| <b>Symptom</b>               | <b>Problem</b>                                       | <b>Solution</b>                                                                         |
|------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------------------|
| <b>No Seed being planted</b> | Hoppers empty                                        | Fill hoppers                                                                            |
|                              | No vacuum                                            | See "Low Vacuum"                                                                        |
| <b>Poor seed spacing</b>     | Seed tubes plugged or damaged                        | Inspect seed tubes                                                                      |
|                              | Seed disk vacuum holes plugged                       | Clean seed disks                                                                        |
|                              | Worn meter brushes                                   | Replace brushes                                                                         |
|                              | Low vacuum                                           | See "Low Vacuum"                                                                        |
|                              | Rusty planting unit chains                           | Lubricate chains                                                                        |
|                              | Dirt build-up on herbicide/insecticide drive         | Clean drive                                                                             |
|                              | Worn meter seals                                     | Replace seals                                                                           |
|                              | Seed disk hubs misadjusted                           | Readjust hubs                                                                           |
|                              | High vacuum                                          | Adjust knob on the control valve                                                        |
|                              | Faulty vacuum gauge                                  | Check airline to gauge                                                                  |
|                              |                                                      | Clean if plugged, replace if cut                                                        |
|                              | Worn seed disks                                      | Replace disks                                                                           |
|                              | Seed tubes improperly installed or worn              | Reinstall or replace seed tubes                                                         |
| <b>Low seed population</b>   | Seed disk vacuum holes plugged                       | Clean seed disks. (Sorghum/Beet only) install the knockout or replace the worn knockout |
|                              | "Dirty" seed plugging vacuum holes                   | Use clean seed (Sorghum/Beet only) install the knockout or replace the worn knockout    |
|                              | Seed disk wiper missing                              | Replace wiper                                                                           |
|                              | "Treated" seed sticking in cells                     | Add talc A52577 to the seed hopper                                                      |
|                              | Hopper applied treatment causes buildup, seeds stick | Follow recommended usage                                                                |
|                              | Rusty planting unit chains                           | Lubricate chains                                                                        |
|                              | Low vacuum                                           | See "Low Vacuum"                                                                        |

## *Troubleshooting*

| Symptom                     | Problem                                           | Solution                                                     |
|-----------------------------|---------------------------------------------------|--------------------------------------------------------------|
|                             | Dirt buildup on herbicide/insecticide drives      | Clean drives                                                 |
|                             | Worn meter seals                                  | Replace seals                                                |
|                             | Worn seed disks                                   | Replace seed disks                                           |
|                             | Seed "bridging" in hopper                         | Use smaller seed                                             |
|                             |                                                   | Add Talc A52577 to the seed hopper                           |
|                             |                                                   | Clean vacuum gauge and hopper                                |
|                             | Seed size not compatible with seed disks          | Use correct seed disks                                       |
|                             | Planting too fast for rough field conditions      | Slow down                                                    |
|                             | Meter brush improperly installed                  | Install brush properly                                       |
|                             | Using incorrect transmission sprocket combination | Use sprocket combination recommended in planting rate charts |
| <b>High seed population</b> | High vacuum                                       | Adjust knob on the control valve                             |
|                             | Faulty vacuum gauge                               | Check air line to gauge                                      |
|                             |                                                   | Clean if plugged. Replace if cut                             |
|                             | Worn seed disks                                   | Replace seed disks                                           |
|                             | Seed size not compatible with seed disks          | Use correct seed disks                                       |
|                             | Planting too slow                                 | Plant at speed recommended in planting rate charts           |
|                             | Meter brush improperly installed                  | Install brush properly                                       |
|                             | Seed disk hubs loose                              | Tighten hubs                                                 |
| <b>Excessive slippage</b>   | Using incorrect transmission sprocket combination | Use sprocket combination recommended in planting rate charts |
|                             | Down force too high                               | Use correct down force setting                               |
|                             | Planting too fast                                 | Plant at speed recommended in planting rate charts           |
| <b>Seed tubes plugging</b>  | Planter rolling backward when lowering            | Lower planter while moving forward                           |

## *Troubleshooting*

| <b>Symptom</b>                             | <b>Problem</b>                                       | <b>Solution</b>                                            |
|--------------------------------------------|------------------------------------------------------|------------------------------------------------------------|
| <b>Inconsistent seed depth</b>             | Planting in the rough seed bed                       | Use down pressure springs attachments on planting units    |
|                                            | Seed tubes partially plugged or improperly installed | Inspect seed tubes                                         |
|                                            | Incorrect hydraulic connections                      | Reconnect hydraulic hoses                                  |
| <b>Premature blower motor seal failure</b> | SCV lever stop not installed                         | Install SCV lever stop in the tractor console              |
| <b>Low vacuum</b>                          | Incorrect hydraulic connections                      | Reconnect hydraulic hoses                                  |
|                                            | Planting unit vacuum hoses not connected to meter    | Connect vacuum hoses to meter                              |
|                                            | SCV lever stop not installed                         | Install SCV lever stop in the tractor console              |
|                                            | Control valve misadjusted                            | Adjust control valve knob                                  |
|                                            | Air manifold system clogged                          | Clean air manifold system.                                 |
|                                            | Manifold hoses kinked or pinched                     | Reposition hoses                                           |
|                                            | Blower guard clogged with dust or seed treatments    | Clean blower guard                                         |
|                                            | Meter housing handle not engaged                     | Secure housing handle to chamber                           |
|                                            | Meter seals worn or flipped                          | Inspect seals. Reposition or replace                       |
|                                            | Air manifold system assembled without O-rings        | Add O-rings                                                |
|                                            | SCV lever stop cut to wrong length                   | Recut lever stop                                           |
|                                            | SCV lever stop not installed                         | Install SCV lever stop                                     |
| <b>Erratic vacuum</b>                      | SCV lever stop cut to wrong length                   | Recut lever stop                                           |
|                                            | Tractor SCV linkage is mistimed                      | Tractor SCV linkage must be readjusted                     |
|                                            | Air manifold system clogged with dust                | Clean air manifold system hopper                           |
|                                            | "Flow checking" at SCV prevents return of oil flow   | Install Auxiliary Return Line Coupler Kit (BA25379) in SCV |
|                                            | Control Valve Failed                                 | Replace Control Valve                                      |
|                                            | Tractor oil level low                                | Add oil                                                    |
|                                            |                                                      |                                                            |

*Troubleshooting*

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| Symptom | Problem  | Solution             |
|---------|----------|----------------------|
|         | Oil cold | Allow oil to warm up |

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PB21958,0000503-19-15MAR18

# Lubrications and Maintenance

## Lubrication

Lithium saponified multi-purpose grease (JDM J13C3) or SAE No. 2 multi-purpose grease is recommended for all grease fittings. Grease must be free of dust.

Grease your planter only when stationary.

Clean grease nipples prior to greasing.

PB21958,0000565-19-05MAR18

Lubricate grease nipples at hourly intervals indicated on symbol.

Pack wheel bearings at hourly intervals indicated on the symbol.

Lubricate with SAE 10W oil at hourly interval indicated on the symbol.

Lubricate a commercial spray lubrication as required.

PB21958,0000566-19-05MAR18

## Lubrication Symbols



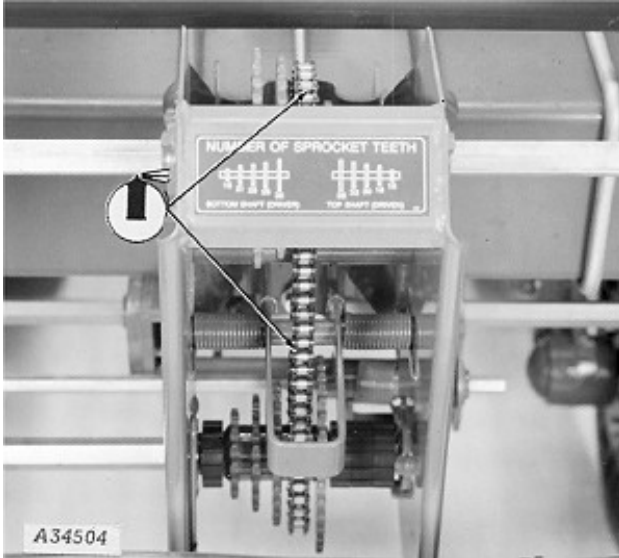
PYM0115—UN—11APR06

## Lubrication Intervals

| Lubrication Intervals                       |                 |             |                   |          |          |           |               |
|---------------------------------------------|-----------------|-------------|-------------------|----------|----------|-----------|---------------|
| Item                                        | Start of Season | As Required | 10 hours or Daily | 25 hours | 50 hours | 200 hours | End of Season |
| All Roller Chains                           | •               | •           |                   |          |          |           | •             |
| Piston Pump Crankcase                       |                 |             | •                 |          |          |           |               |
| Single Disk Fertilizer Opener               | •               |             | •                 |          | •        |           | •             |
| Liquid System Shut Off valves               | •               |             |                   |          |          |           | •             |
| Piston Pump Roller Chains                   | •               | •           |                   |          |          |           | •             |
| Dry or Liquid Fertilizer Drive Roller Chain | •               | •           |                   |          |          |           | •             |
| Seed Transmission Roller Chain              | •               | •           |                   |          |          |           | •             |
| Drive Wheel Roller Chain                    | •               | •           |                   |          |          |           | •             |
| Fertilizer Strainer Screen                  |                 |             | •                 |          |          |           |               |
| Piston Pump Shafts                          |                 |             | •                 |          |          |           |               |
| Drive Ratchet Drive                         |                 |             | •                 |          |          |           |               |
| Gauge Wheels                                |                 |             | •                 |          |          |           |               |
| Drive Wheels                                |                 |             | •                 |          |          |           |               |
| Wheel Bearings                              |                 |             |                   |          | •        |           |               |
| Frame Mounted Coulter                       |                 |             |                   |          |          | •         |               |

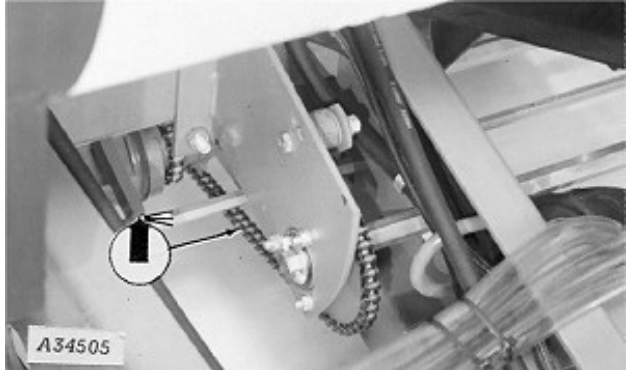
## Lubrications and Maintenance

| Item                                    | Lubrication Intervals |             |                   |          |          |           |               |
|-----------------------------------------|-----------------------|-------------|-------------------|----------|----------|-----------|---------------|
|                                         | Start of Season       | As Required | 10 hours or Daily | 25 hours | 50 hours | 200 hours | End of Season |
| Unit Mounted Coulter                    |                       |             |                   |          |          | •         |               |
| Unit Mounted Row Cleaners               |                       |             |                   |          | •        | •         |               |
| Unit Mounted Row Cleaner Adjustment Arm |                       |             |                   |          |          | •         |               |
| Row Cleaner for Unit Mounted Coulter    |                       |             |                   |          |          | •         |               |



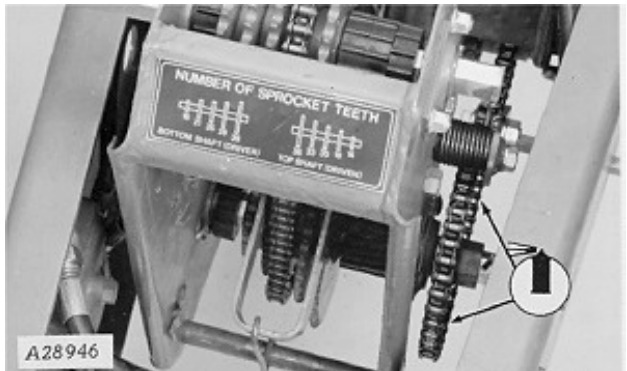
A34504—UN—10OCT88

*Fertilizer Transmission Roller Chains*



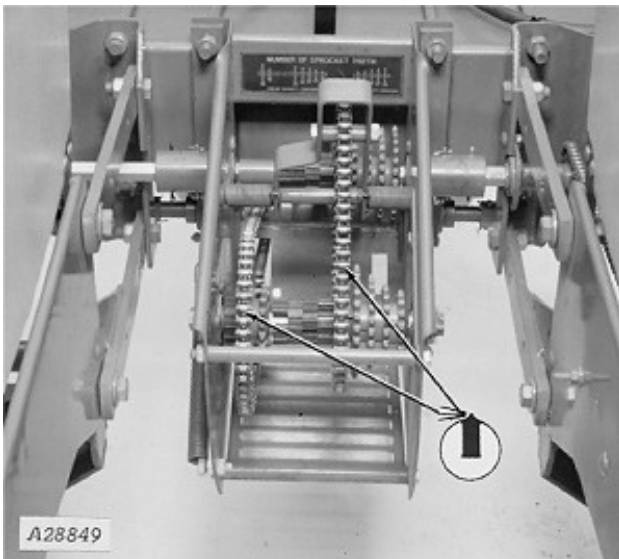
A34505—UN—10OCT88

*Dry/Liquid Fertilizer Attachment*



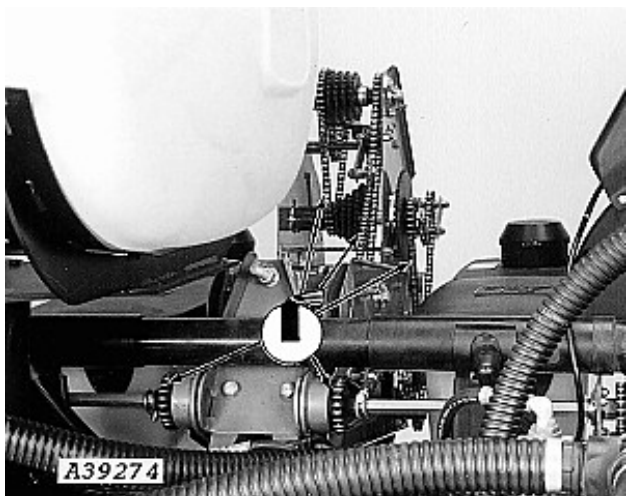
A28946—UN—14OCT88

*Fertilizer Attachment Roller Chains*



A28849—UN—14OCT88

*Seed Transmission Roller Chains*



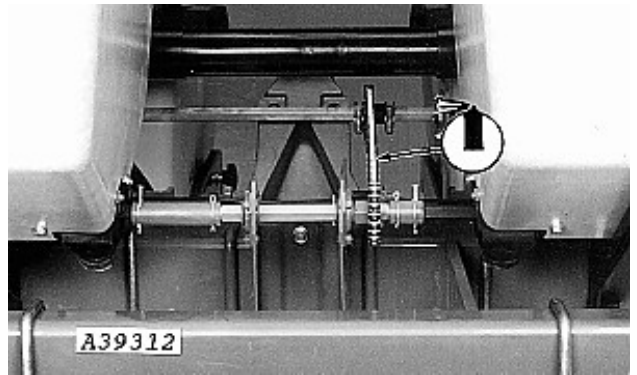
A39274—UN—29FEB96

*Seed Transmission Roller Chains*



A47177—UN—17MAR01

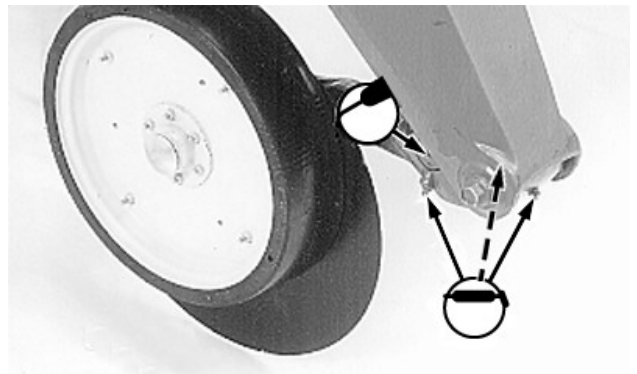
Drive Wheel Roller Chains



A39312—UN—29FEB96

Dry Fertilizer Roller Chain (Right-Hand Side)

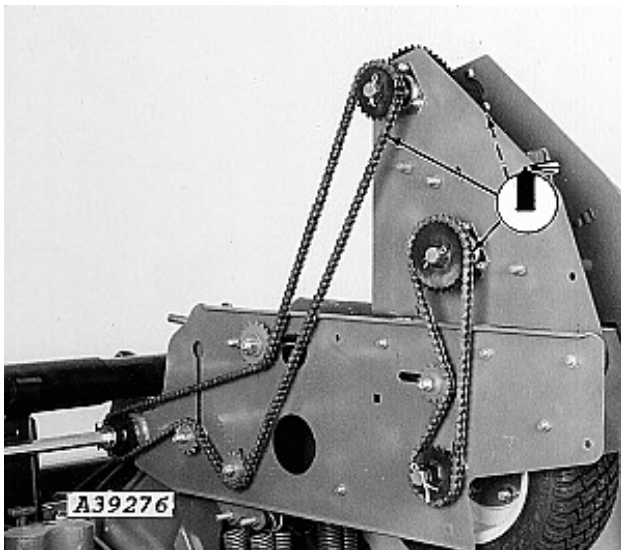
**IMPORTANT:** Do not use chain lube or any other heavy petroleum base lubricant which cause buildup of dust or dirt in sprocket or gear teeth.



A64627—UN—06MAY09

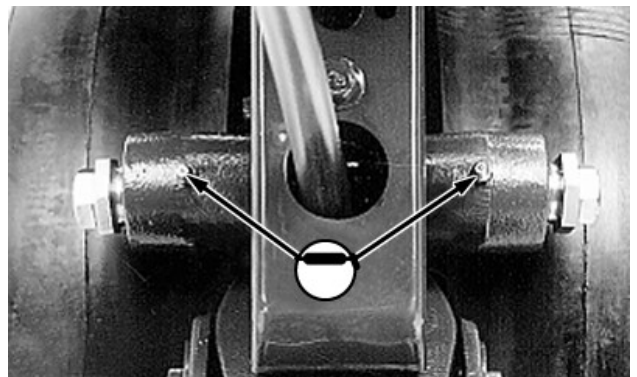
Single-Disk Fertilizer Opener

Oil lower spring pivot pins every 50 hours. Oil prevents top pin from rusting.



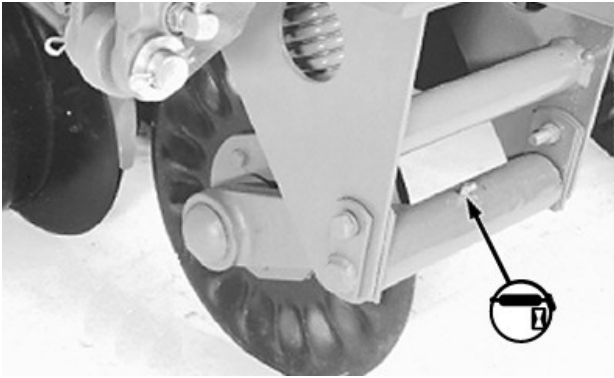
A39276—UN—29FEB96

Dry Fertilizer Transmission Roller Chains



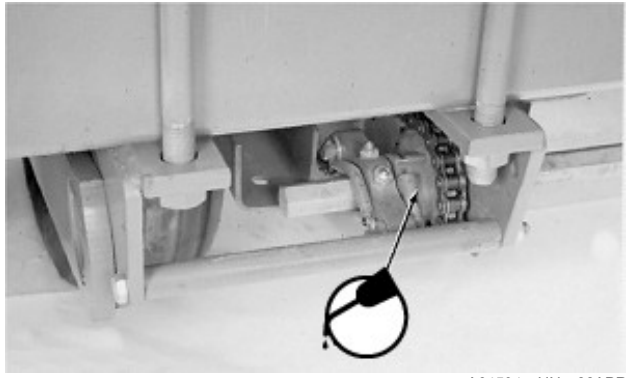
A38363—UN—16JUL08

Gauge Wheels



A64593—UN—22APR09

*Frame Mounted Coulter*



A64594—UN—22APR09

*Drive Wheel Ratchet Drive*

## SPECIFIC INFORMATION

## Wheel Bearings



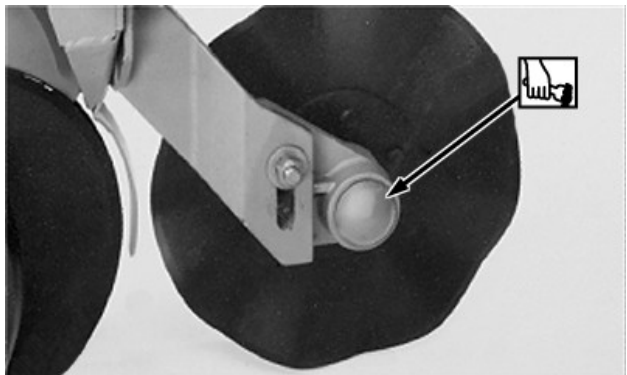
A47176—UN—17MAR01

*Drive Wheels*



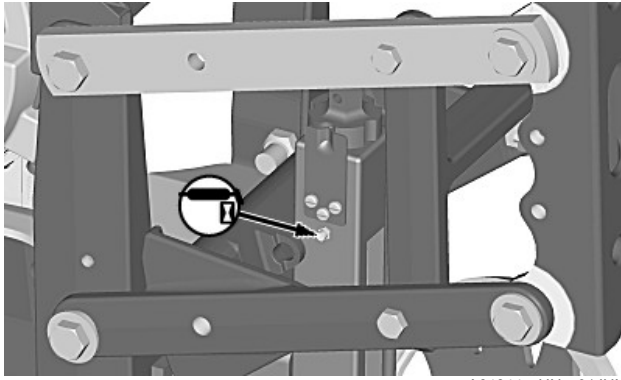
A64628—UN—06MAY09

*Wheel Bearings*



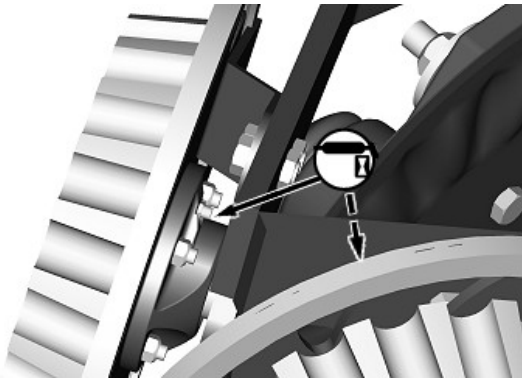
A29983—UN—16JUL08

*Unit Mounted Coulter*



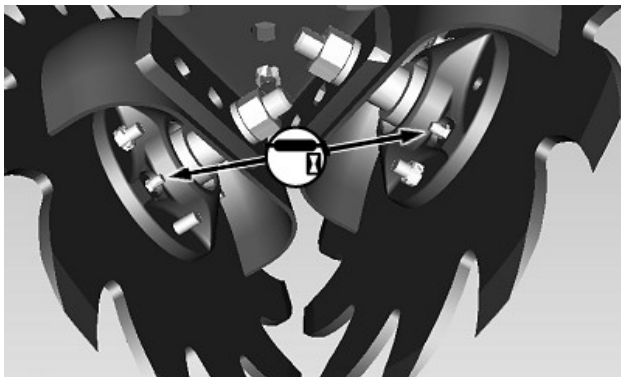
A64844—UN—01JUN09

*Unit Mounted Row Cleaner Adjustment Arm*



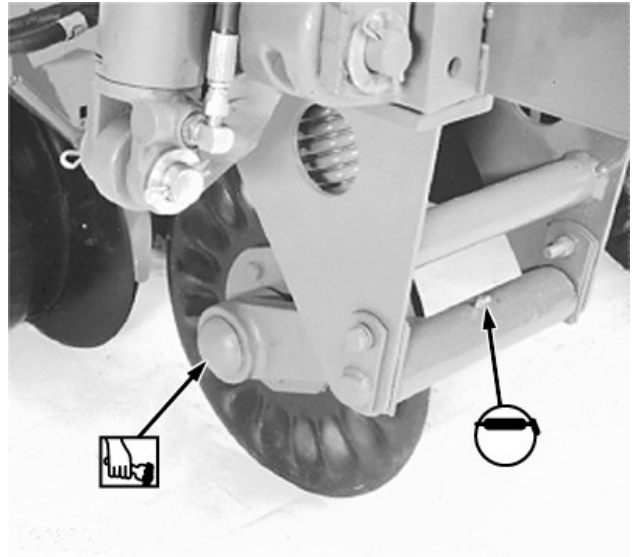
A64845—UN—01JUN09

*Row Cleaner for Unit Mounted Coulter*



A64843—UN—01JUN09

*View From Under Unit Mounted Row Cleaner*



A31244—UN—16JUL08

*Frame Mounted Coulter*

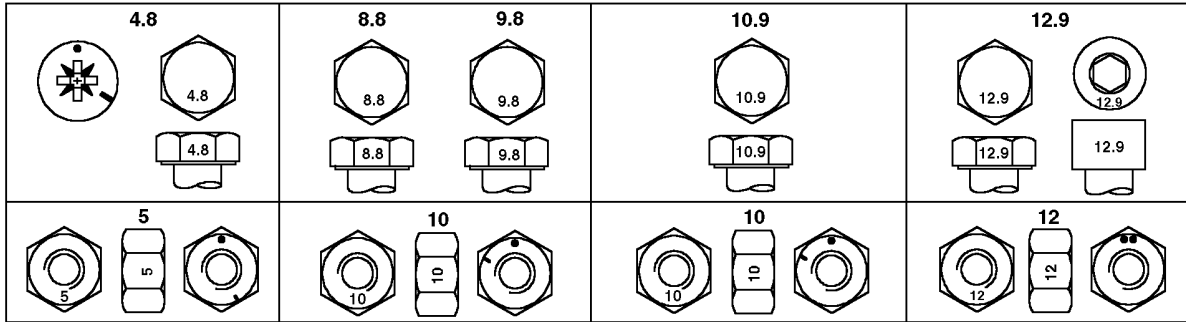
Refer to Service section for additional information on repacking bearings.

PB21958,0000504-19-27FEB18

Row cleaner hubs have sealed bearings factory and regular lubrication is not required. Add grease to hub grease fittings annually or every 200 hours to keep dust away from the bearing seal. Add grease slowly until slight resistance is felt or a small amount of grease comes out between hub and blade. If a non-sealed replacement bearing is installed, grease row cleaner hubs at a 50-hour interval.

# Service and Adjustments

## Metric Bolt and Cap Screw Torque Values



TORQ2—UN—15APR13

Top, Property Class, and Head Markings; Bottom, Property Class, and Nut Markings

|      | Class 4.8                             |                                 | Class 8.8 or 9.8                      |                                 | Class 10.9                            |                                 | Class 12.9                            |                                 |
|------|---------------------------------------|---------------------------------|---------------------------------------|---------------------------------|---------------------------------------|---------------------------------|---------------------------------------|---------------------------------|
| Size | Lubricated <sup>a</sup><br>N·m(lb·ft) | Dry <sup>b</sup> N·m<br>(lb·ft) | Lubricated <sup>a</sup><br>N·m(lb·ft) | Dry <sup>b</sup> N·m<br>(lb·ft) | Lubricated <sup>a</sup><br>N·m(lb·ft) | Dry <sup>b</sup> N·m<br>(lb·ft) | Lubricated <sup>a</sup><br>N·m(lb·ft) | Dry <sup>b</sup> N·m<br>(lb·ft) |
| M6   | 4.7 (3.5)                             | 6 (4.4)                         | 9 (6.6)                               | 11.5 (8.5)                      | 13 (9.5)                              | 16.5 (12.2)                     | 15.5 (11.5)                           | 19.5 (14.5)                     |
| M8   | 11.5 (8.5)                            | 14.5 (10.7)                     | 22 (16)                               | 28 (20.5)                       | 32 (23.5)                             | 40 (29.5)                       | 37 (27.5)                             | 47 (35)                         |
| M10  | 23 (17)                               | 29 (21)                         | 43 (32)                               | 55 (40)                         | 63 (46)                               | 80 (59)                         | 75 (55)                               | 95 (70)                         |
| M12  | 40 (29.5)                             | 50 (37)                         | 75 (55)                               | 95 (70)                         | 110 (80)                              | 140 (105)                       | 130 (95)                              | 165 (120)                       |
| M14  | 63 (46)                               | 80 (59)                         | 120 (88)                              | 150 (110)                       | 175 (130)                             | 220 (165)                       | 205 (150)                             | 260 (190)                       |
| M16  | 100 (74)                              | 125 (92)                        | 190 (140)                             | 240 (175)                       | 275 (200)                             | 350 (255)                       | 320 (235)                             | 400 (300)                       |
| M18  | 135 (100)                             | 170 (125)                       | 265 (195)                             | 330 (245)                       | 375 (275)                             | 475 (350)                       | 440 (325)                             | 560 (410)                       |
| M20  | 190 (140)                             | 245 (180)                       | 375 (275)                             | 475 (350)                       | 530 (390)                             | 675 (500)                       | 625 (460)                             | 790 (580)                       |
| M22  | 265 (195)                             | 330 (245)                       | 510 (375)                             | 650 (480)                       | 725 (535)                             | 920 (680)                       | 850 (625)                             | 1080 (800)                      |
| M24  | 330 (245)                             | 425 (315)                       | 650 (480)                             | 820 (600)                       | 920 (680)                             | 1150 (850)                      | 1080 (800)                            | 1350 (1000)                     |
| M27  | 490 (360)                             | 625 (460)                       | 950 (700)                             | 1200 (885)                      | 1350 (1000)                           | 1700 (1250)                     | 1580 (1160)                           | 2000 (1475)                     |
| M30  | 660 (490)                             | 850 (625)                       | 1290 (950)                            | 1630 (1200)                     | 1850 (1350)                           | 2300 (1700)                     | 2140 (1580)                           | 2700 (2000)                     |
| M33  | 900 (665)                             | 1150 (850)                      | 1750 (1300)                           | 2200 (1625)                     | 2500 (1850)                           | 3150 (2325)                     | 2900 (2150)                           | 3700 (2730)                     |
| M36  | 1150 (850)                            | 1450 (1075)                     | 2250 (1650)                           | 2850 (2100)                     | 3200 (2350)                           | 4050 (3000)                     | 3750 (2770)                           | 4750 (3500)                     |

<sup>a</sup> "Lubricated" means coated with a lubricant such as fasteners with phosphate and oil coatings.

<sup>b</sup> "Dry" means plain or zinc plated without any lubrication.

Tighten all bolts to the torques specified in the chart. Keep bolts tight at all times. Loose bolts can cause breakage of parts.

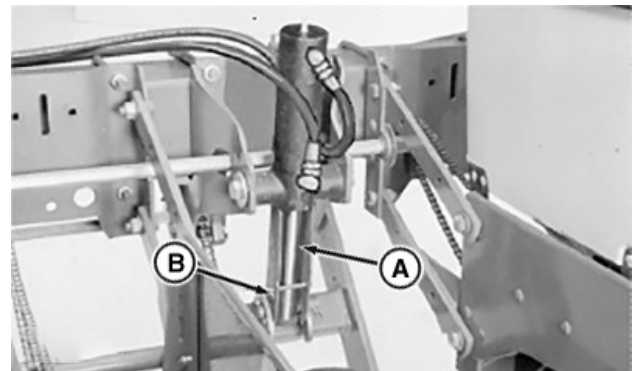
Check the tightness of bolts periodically and keep them tightened to specified torques. When bolts are replaced, be sure that they are replaced with bolts of equal strength.

Metric bolts furnished with the planter are identified by 8.8 or 10.9 on the head. Metric nuts may be identified by 8 or 10 stamped on the top or bottom of the nut.

**NOTE:** Bolts having lock nuts with plated and wax finish must be tightened to approximately 50 percent of amount shown in chart.

**CAUTION:** Use only metric tools on metric hardware. Other tools may not fit properly. They may slip and cause injury.

## Install Service Stops



APY04860—UN—01MAR18

Unit Hopper Removed for Clarity

A—Pivot Service Stop  
B—Drilled Pin

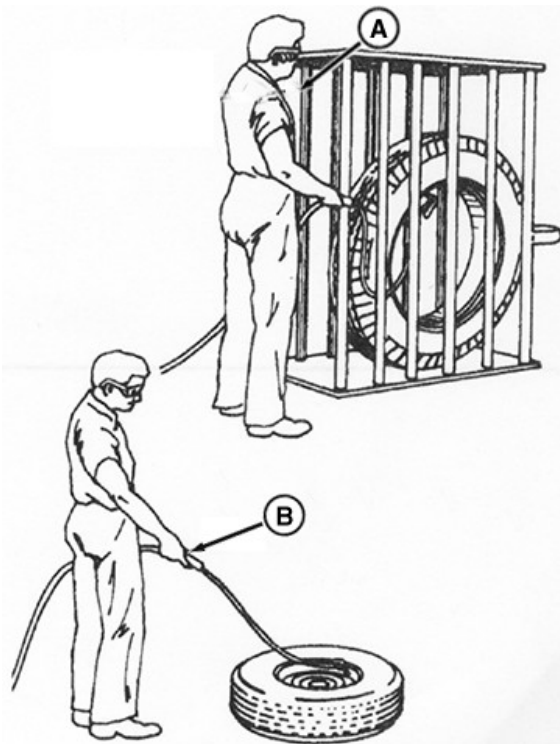
**CAUTION:** Always install service stops when working around or near planter.

Raise planter to transport position with the tractor remote cylinder operating lever. Pivot service stop (A) into position on wheel module cylinder rods and secure with drilled pin (B) and spring locking pin.

*NOTE: Service stops are provided for added safety when performing normal maintenance and adjustments with the planter raised. They are not transport stops. The planter hydraulic system requires that the wheels float up and down in transport to properly distribute frame weight to the individual wheel modules.*

PB21958,0000505-19-05MAR18

## Mounting Tires



APY04845—UN—01MAR18

A—Use a safety cage if available.

B—Do not stand over tire. Use a clip-on chuck and extension hose.

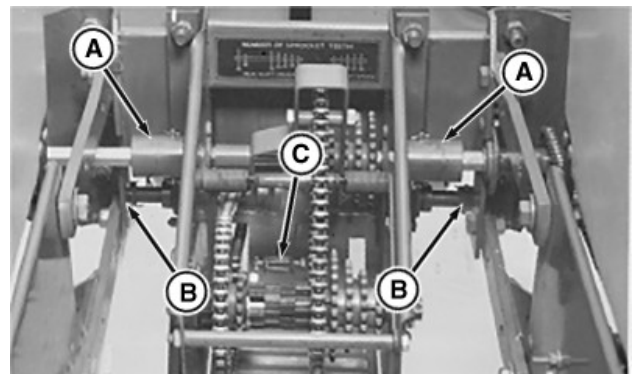
**CAUTION:** Failure to follow proper procedures when mounting a type on a wheel or rim can produce an explosion which may result in serious bodily injury or death. DO NOT attempt to mount a tire unless you have the proper equipment and experience to perform the job safely. Have it done by your John Deere dealer or a qualified tire repair service.

When sealing tire beads on rims, never exceed maximum inflation pressures specified by tire manufacturers for mounting tires. Inflation beyond this maximum pressure may break the bead, or even the rim, with dangerous explosive force. If both beads are not seated when the maximum recommended pressure is reached, deflate, reposition tire, relubricate bead, and reinflate.

Detailed agricultural tire mounting instructions, including necessary safety precautions, are contained in John Deere Fundamentals of Service (FOS) Manual 55, Tires, and Tracks, available through your John Deere dealer. Such information is also available from tire manufacturer agents.

PB21958,0000568-19-05MAR18

## Replacing Drillshaft Cotter Pins



APY04834—UN—01MAR18

A—Shear Pins

The cotter shear pins (A), which connect the drillshaft to the transmission, shears when an excessive load is put on the drillshaft.

*NOTE: If drillshaft binds due to misalignment, loosen bolts on drillshaft bearings on planting units. Verify shaft turns freely and tighten bolts.*

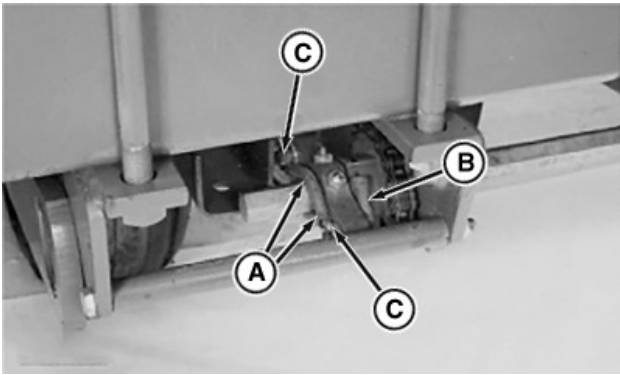
Infrequent or improper lubrication causes “binding” of moving parts within the planter. This “binding” causes the cotter shear pins to shear, thus preventing breakage of planter parts.

If either cotter pin shears, turn the drillshaft by hand to locate where the binding is occurring. When the drillshaft can be turned freely by hand, replace the cotter pin.

*NOTE: Replace the cotter shear pins only with cotter shear pins of the same size. Do not replace with other type pins.*

PB21958,0000569-19-05MAR18

## Ratchet Drive



APY04847—UN—01MAR18

- A—Springs  
B—Bring the Dogs  
C—Cotter Pin

The ratchet assembly must operate freely and the springs (A) must bring back the dogs (B) against the ratchet.

If the springs do not bring back the dogs against the ratchet, push the cotter pins (C) all the way in and spread the cotter pins.

PB21958,000056A-19-05MAR18

repack bearing with John Deere recommended grease or SAE No. 2 multi-purpose grease. Tighten nut (B) until the proper seal drag is achieved.

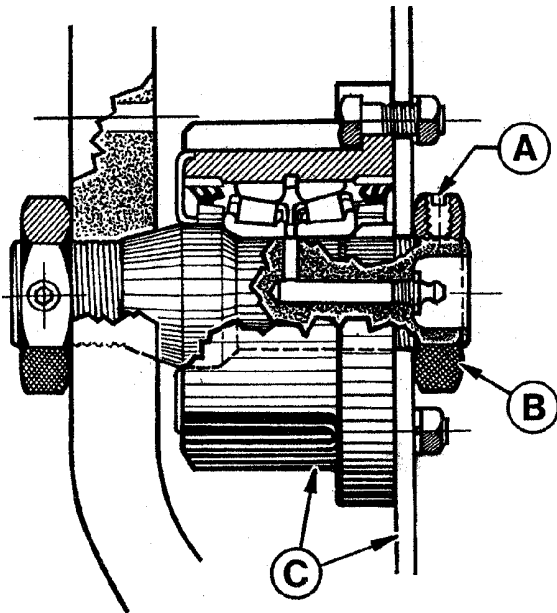
**NOTE:** During reassembly, tighten the nut (B) until 1.6-2.8 N·m of torque is required to rotate the bearing housing and blade assembly (C). This drag assures positive sealing. Be sure to retighten the set screw (A) when adjustment is complete.

Every 100 hours, inspect the bearing and adjust if necessary. Every 200 hours, or before each planting season, whichever comes first, disassemble the bearing, clean, and repack it as outlined above. Check and if necessary replace the seals. Do not use chassis lubricant in antifriction bearings.

Grease must be applied through the nipple on the end of the shaft regularly depending on conditions. In dry and dusty conditions, grease twice a day to push dust away from the sealing area.

PB21958,000056B-19-05MAR18

## Single-Disc Fertilizer Opener Maintenance



PYM0070—UN—27MAR06

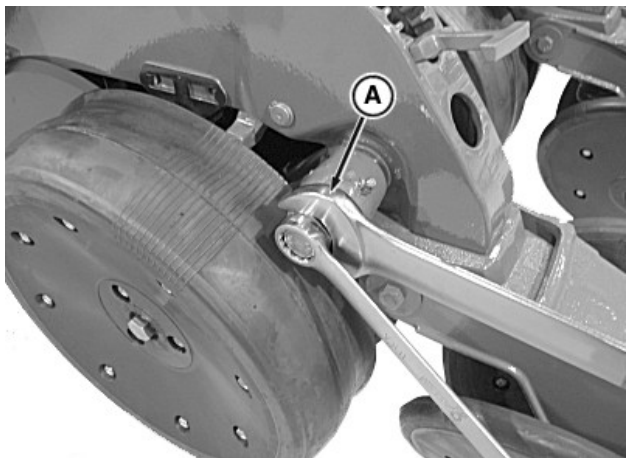
- A—Screw  
B—Nut  
C—Blade Assembly

The antifriction bearing has a face-type seal. The contact of the seal against a machined surface retains grease and excludes dirt. Unless the bearing is in proper adjustment, the seal is ineffective. If there is any looseness in the bearing, loosen set screw (A) and remove nut (B). Disassemble opener and clean and

## Adjust Gauge Wheels



A68170—UN—14JUL10



APY04841—UN—01MAR18

A—Adjusting Wrench

**IMPORTANT:** Avoid excessive wheel wear. Do not overtighten gauge wheel.

**When assembled, gauge wheels and disk blades must be free to turn with minimal resistance.**

To prevent the buildup of soil or residue between gauge wheels and opener blades, adjust gauge wheels.

Rotate gauge wheel. Verify that the wheel is lightly touching disk or less than the maximum specification away from blades at their closest approach.

#### Specification

|                                                                 |                     |
|-----------------------------------------------------------------|---------------------|
| Maximum Gauge Wheel to Opener Blade Clearance—Distance. . . . . | 1.5 mm<br>(1/16 in) |
|-----------------------------------------------------------------|---------------------|

To adjust gauge wheel, hold cap screw with one wrench and turn adjustment nut with another wrench (A). To move the wheel closer to blade, turn the nut counterclockwise. To move the wheel away from blade, turn the nut clockwise.

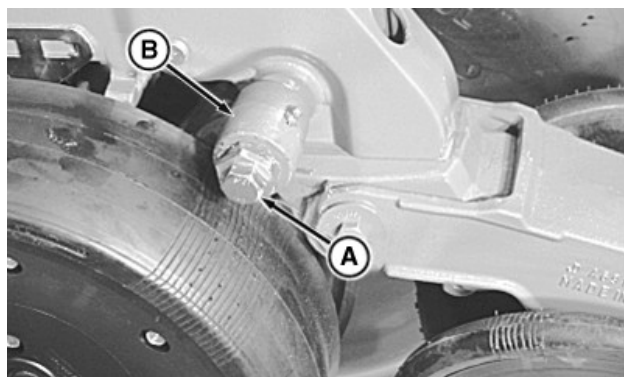
Tighten wheel arm cap screw to specification.

#### Specification

|                                           |                        |
|-------------------------------------------|------------------------|
| Gauge Wheel Arm Cap Screw—Torque. . . . . | 271 N·m<br>(200 lb·ft) |
|-------------------------------------------|------------------------|

PB21958,000056C-19-05MAR18

## Replace Seed Opener Blades and Seed Tube Guard



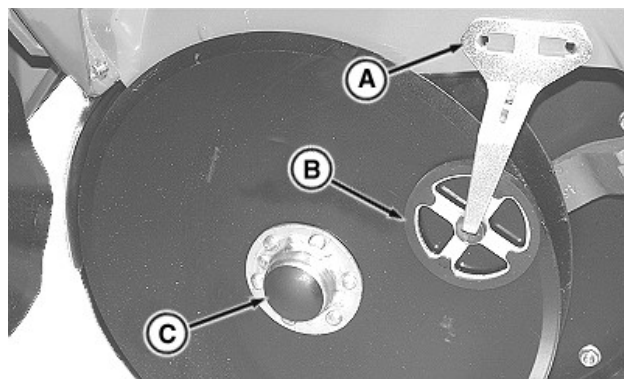
APY04839—UN—01MAR18

A—Cap Screw  
B—Pivot Shaft

**IMPORTANT: Avoid premature wear. Do not use a new blade with a used blade. Install new blades in pairs.**

**NOTE: If replacing seed tube guard only, the right blade is not removed.**

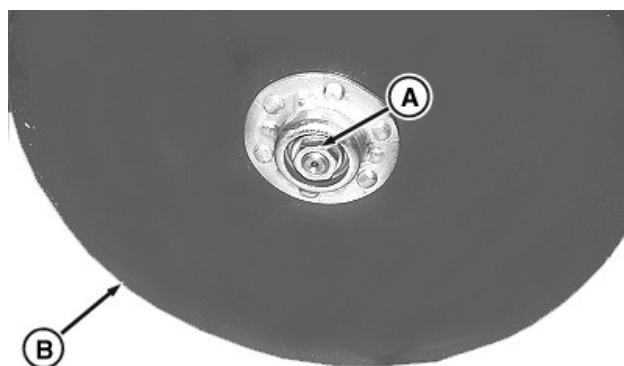
1. Remove cap screw (A), pivot shaft (B) and gauge wheel from the row unit.



APY04831—UN—01MAR18

A—Engagement Pin  
B—Scraper  
C—Hub Cap

2. Planting Units Equipped with Rotary or Rigid Scraper: Pull front engagement pin (A) outward and disengage scraper assembly (B) from shank panels.
3. Remove hub cap (C).



APY04848—UN—01MAR18

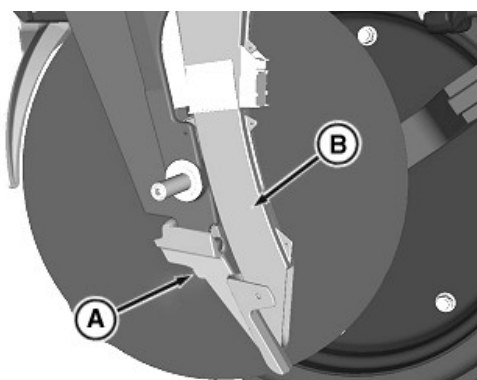
A—Nut and Washer  
B—Disk

**CAUTION: Avoid injury from sharp edged disks. Wear protective gloves and handle disks carefully.**

**IMPORTANT: Avoid spindle damage. Nut (A) on the left-hand blade has left-hand threads. Loosen and tighten in proper directions.**

**NOTE: Do not discard spacer shims.**

4. Remove nut and flat washer (A).
5. Remove blade (B).
6. Remove hardened shims.
7. If replacing blades, remove the blade on the opposite side of the row unit.



A—Seed Tube Guard  
B—Seed Tube

APY04866—UN—01MAR18

**NOTE:** Replace seed tube guard as needed.

8. To remove the seed-tube guard (A), rotate the guard clockwise while sliding forward.
9. Install seed-tube guard (if removed). Install new blades.
10. Adjust blade contact point during reassembly. (See **INSPECT AND ADJUST SEED OPENER BLADES** in this section.)
11. During reassembly, tighten the opener blade nut and gauge wheel arm cap screw to specification.

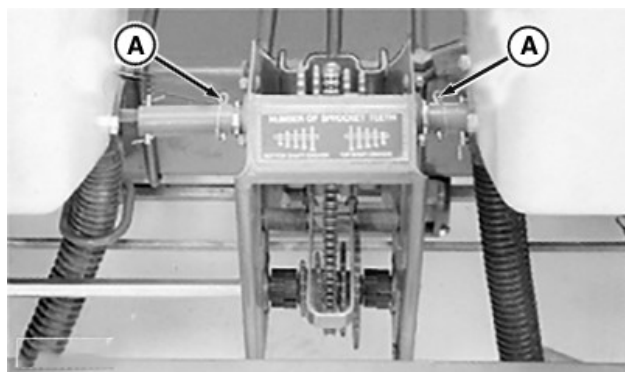
**Specification**

|                                              |                        |
|----------------------------------------------|------------------------|
| Opener Blade Nut—Torque. . . . .             | 122 N·m<br>(90 lb·ft)  |
| Gauge Wheel Arm Cap<br>Screw—Torque. . . . . | 271 N·m<br>(200 lb·ft) |

12. Adjust gauge wheels. (See **ADJUST GAUGE WHEELS** in this section.)

PB21958,000056D-19-05MAR18

## Replacing Cotter Pins in Dry Fertilizer Drive Shaft



APY04844—UN—01MAR18

6-Row Planter Illustrated

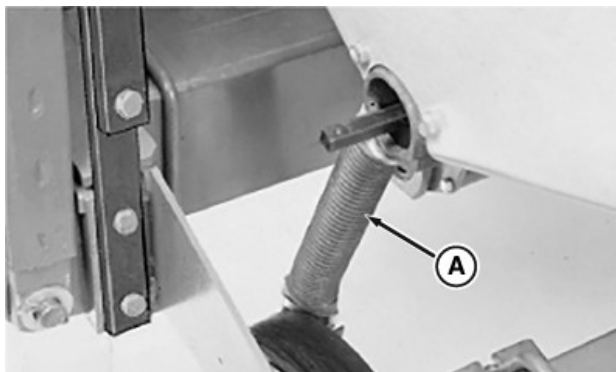
A—Cotter Pin

The 5 x 40 mm cotter pins (A) connecting the auger shaft to the coupler serves as a shear pin. This cotter pin shears when an excessive load is put on the fertilizer driveshaft.

Replace the cotter shear pins only with cotter shear pins of the same size. Do not replace with another type of pin.

PB21958,000056E-19-05MAR18

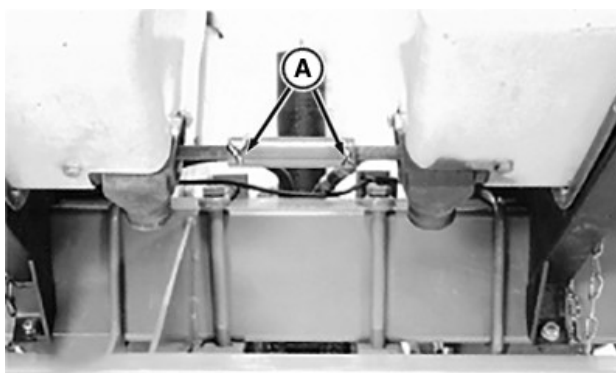
## Cleaning Dry Fertilizer Hoppers



APY04859—UN—01MAR18

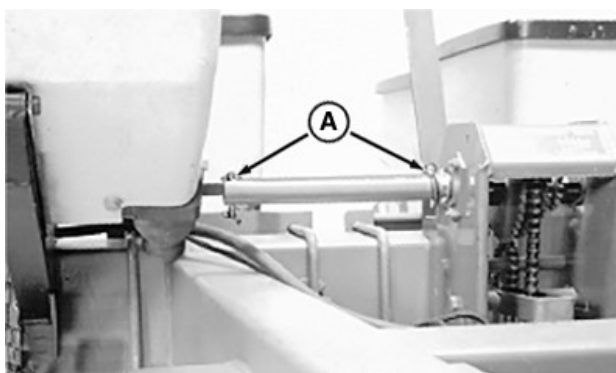
A—Fertilizer Hose

1. Remove clamps and disconnect fertilizer hoses (A) from hoppers.



APY04865—UN—01MAR18

8-Row Planter Illustrated

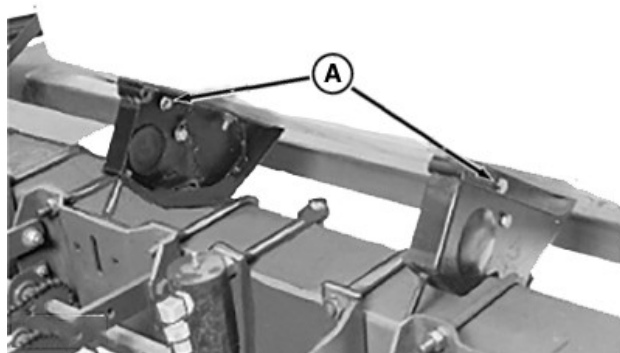


APY04828—UN—01MAR18

8-Row Planter Illustrated

**A—Drilled Pin**

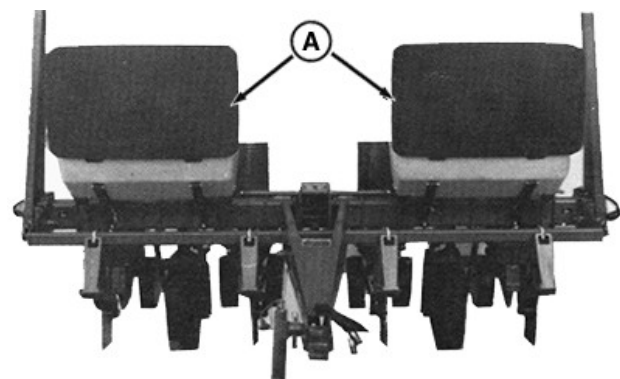
2. Disconnect couplers from augers by removing split pins and drilled pins (A).



APY04855—UN—01MAR18

**A—Bolts**

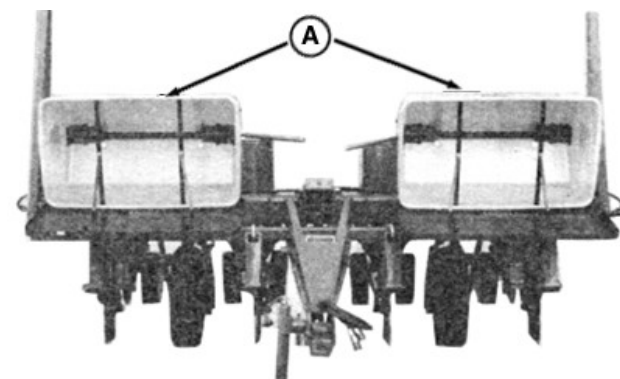
3. Remove hopper lock-down bolts (A).



APY04833—UN—01MAR18

**A—Slide Lids**

4. Release lid fasteners and slide lids (A) forward until they hang on the edge of hoppers.

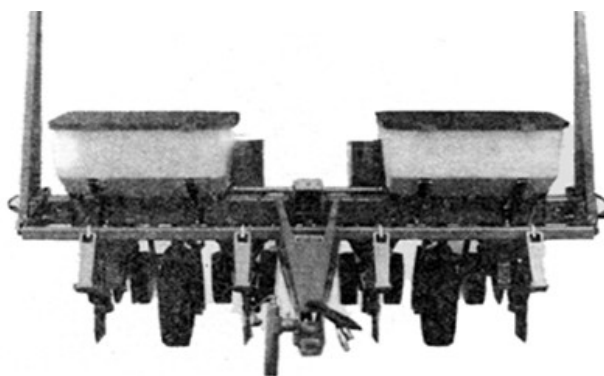


APY04842—UN—01MAR18

**A—Hopper**

5. Tip hoppers (A) forward and flush all loose fertilizer from hoppers and tubes with water. Check inside of each auger housing on ends of tanks.

If necessary, clean with a wire brush.

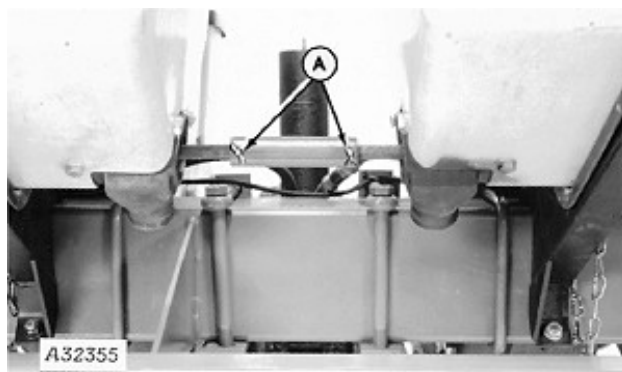


APY04843—UN—01MAR18

6. Pivot hoppers back into operating position and replace lids.
7. Replace couplers on augers and secure with drilled pins and cotter pins.
8. Secure hopper by replacing lock-down bolts and nuts.
9. Secure hoses to hoppers with clamps.

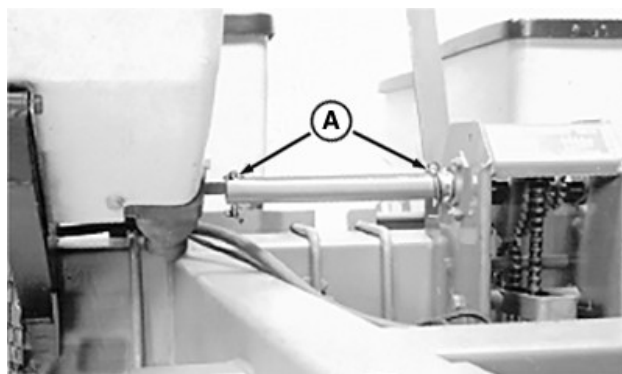
PB21958,000056F-19-05MAR18

## Replacing Auger Sections



A32355—UN—07OCT88

8-Row Planter Illustrated

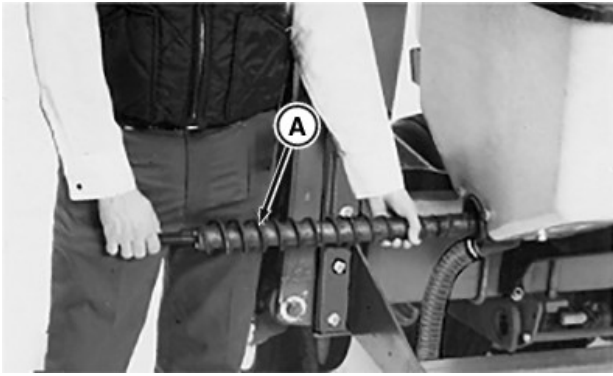


APY04828—UN—01MAR18

8-Row Planter Illustrated

**A—Drilled Pin**

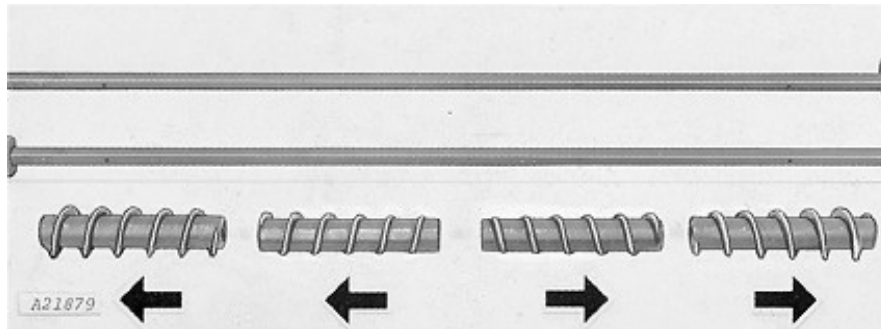
Disconnect couplers from augers by removing split pins and drilled pins (A).



APY04852—UN—01MAR18

**⚠ CAUTION: CAUTION: Do not use the torch to free frozen augers. Certain types of fertilizers may explode when heated.**

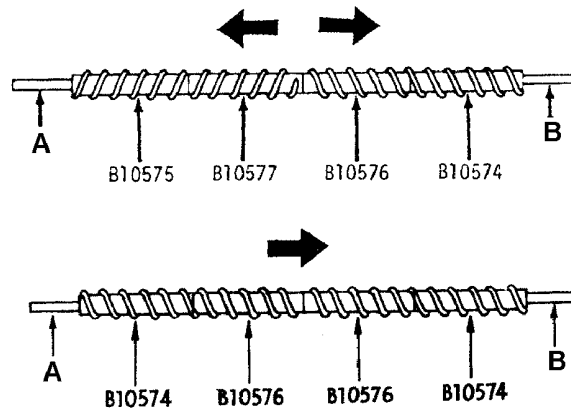
Remove auger sections (A) from hoppers.



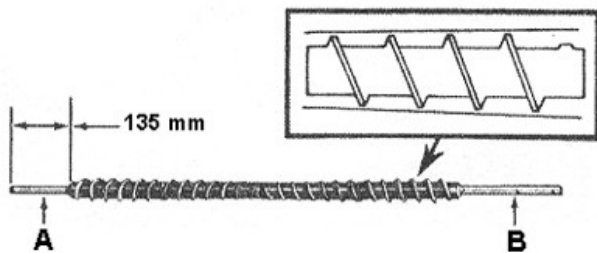
A21879—UN—14OCT88

Position new auger sections on the floor (as illustrated above) so the flights on the auger sections carry the fertilizer to the outside ends in each hopper.

Remove cotter pins holding old auger sections on shafts and slide old auger sections off shafts.



PYM0058—UN—27MAR06



PYM0037—UN—27MAR06

Determine desired fertilizer rate from charts in the Attachment section and install auger sections on 1118 mm (44 in) shaft as shown at right. Secure with 15/16 x 1-3/8 x 0.105 in. washers as required and 5 x 40 mm cotter pins.

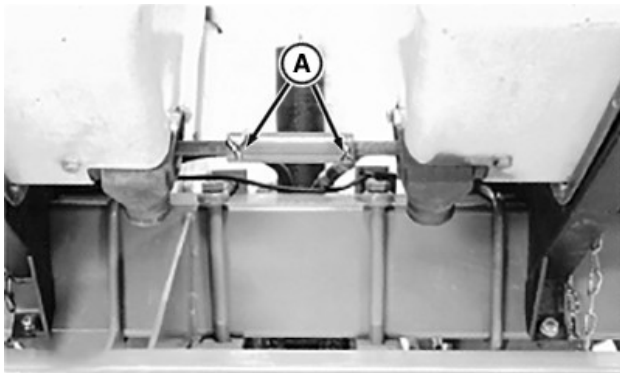
Install augers on shaft so augers move fertilizer to spouts at ends of the hopper when the planter is moving forward. Augers must be positioned with smaller end of the taper toward center of hopper.

In the case of when only one delivery spout in the fertilizer hopper is used, (such as for 1.5 m and 2.3 m planters) only auger sections are used which feed either to the right or to the left as required.

**IMPORTANT:** When replacing auger sections in fertilizer hoppers, verify that auger sections are centered in the hoppers.

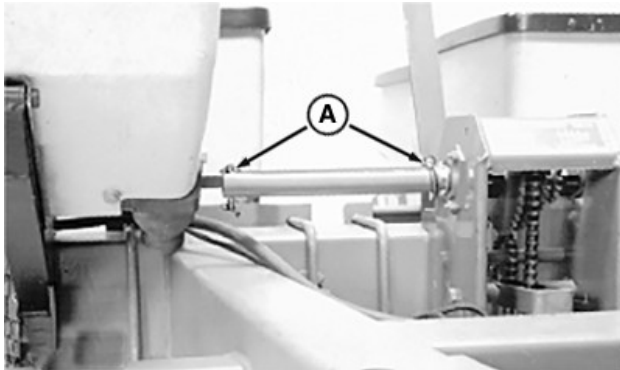


A28618—UN—14OCT88



APY04865—UN—01MAR18

8-Row Planter Illustrated



APY04828—UN—01MAR18

8-Row Planter Illustrated

Replace couplers on auger sections and secure with drilled pins (A) and cotter pins.



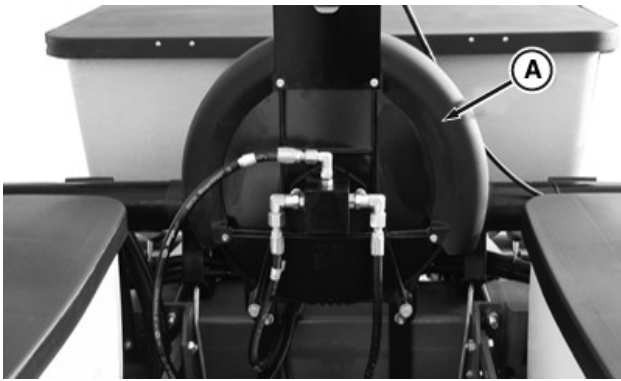
PYM0097—UN—04APR06

Place sealing plug on delivery spout which is not used for delivery. It is only applicable on 1.5 m and 2.3 m row planters.

PB21958,0000570-19-12MAR18

# Service (Vacuum)

## Cleaning Blower Motor Guard



A—Vacuum Blower Guard

APY04876—UN—01MAR18

The vacuum blower guard (A) may become clogged with dust or seed inoculant / treatment. A clogged blower guard could cause loss of vacuum.

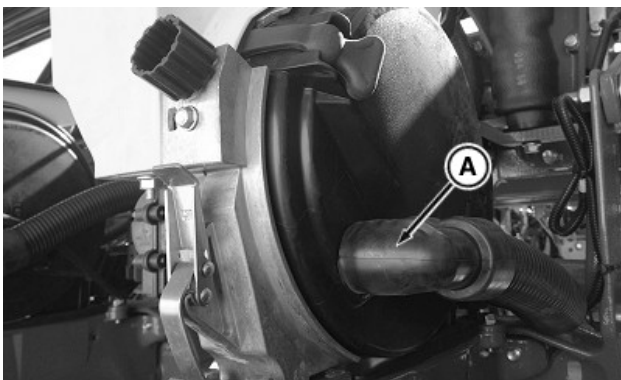
**CAUTION:** Agricultural chemicals can be dangerous. Improper selection or use can injure persons, animals, plants, soil, or other property.

**IMPORTANT:** Handle and apply with care. Follow instructions of the chemical manufacturer.

Clean blower guard with a rag or small brush when necessary

PB21958,0000571-19-07MAR18

## Clean Vacuum System



A—Vacuum Hose

APY04849—UN—01MAR18

Avoid loss of meter accuracy from dust or seed treatment buildup in the vacuum system. Restricted air flow through the vacuum system results in vacuum loss at meters.

**CAUTION:** Avoid injury from chemical exposure. Follow chemical manufacturer label when handling parts coated with seed treatments. Use proper skin, eye, and respiratory protection.

Clean vacuum system at least once a week during operation or more often in severe dusty conditions.

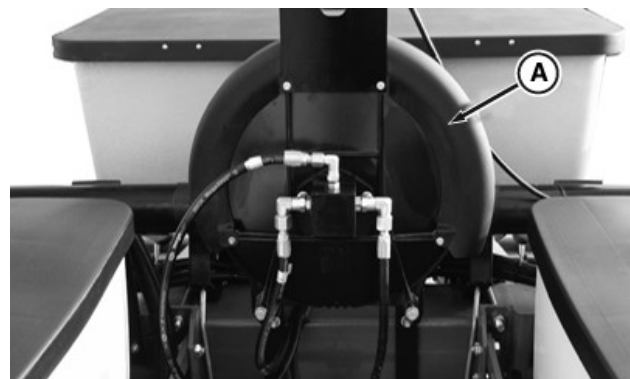
Clean as follows:

**NOTE:** Disconnect vacuum hose (A) at the meter not at the frame.

1. Disconnect one vacuum hose (A) on the outer and inner ends of each vacuum section.
2. Turn on the vacuum fan and set hydraulic flow to 75 percent.
3. One at a time, remove vacuum hoses from meters. Inspect and clean all straw and foreign material from both attaching hose ends. Shake hose for a few seconds and reattach it to meter.
4. Remove end caps from vacuum tubes one at a time, then reinstall.
5. Let vacuum fans run for 10 minutes.
6. Shut off vacuum fans and replace hose on the row units.

PB21958,0000572-19-07MAR18

## Vacuum Motor Inspection



A—Vacuum Motor

APY04876—UN—01MAR18

Check vacuum motor (A) for oil leaks.

A small amount of oil leakage is acceptable but if oil leakage is excessive, or if you are unable to attain necessary vacuum, order Vacuum Motor Repair Kit AA36389 from your John Deere dealer. Installation instructions are provided with the kit. If leakage occurs on the motor housing (A), check for loose hardware on the motor or loose fittings.

**NOTE:** Excessive oil leakage may cause the vacuum blower to become clogged. It causes loss of vacuum.

If necessary, clean blower guard. (See CLEANING VACUUM BLOWER GUARD) in this section.

This leakage occurs inside the blower housing and can be seen on the blower guard.

In extreme cases of excessive seed treatment, dust may pack on the blowers blades, causing a noise and vibration which may damage the vacuum gauge. In this case strip, the fan housing and clean the blades. To prevent further occurrences polish the blades using fine water paper.

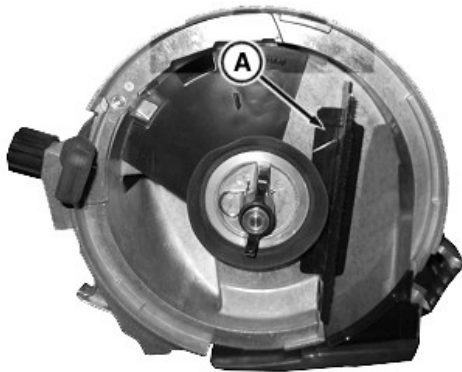
PB21958,0000573-19-07MAR18

## Inspect and Service Vacuum Meter



A34471

A34471—UN—11OCT88



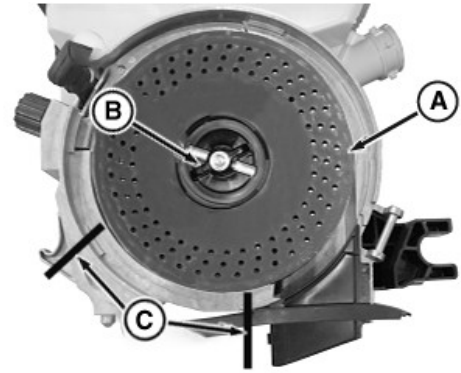
APY04874—UN—01MAR18

A—Plastic

**CAUTION:** Avoid eye, skin, or breathing problems from exposure to seed treatments. If seed treatments are used, use caution when opening meter domes. Read and follow safety instructions on the chemical manufactures label.

Annually inspect seed meter for wear and seed treatment buildup.

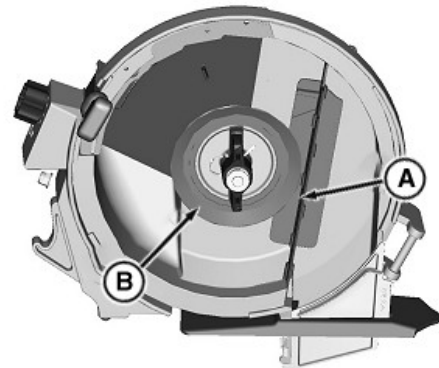
1. Annual cleaning of vacuum gauge and seed the disks is recommended. To remove seed treatment buildup, use mild detergent and a soft brush. Clean behind plastic (A) in vacuum gauge housing.



APY04875—UN—01MAR18

A—Seed the disk  
B—Hub  
C—Inspection Area

2. Install the disk (A). Spin hub (B) rapidly by hand and quickly release hub. If the disk rotates approximately 1/4 to 1/2 revolution after released, hub is properly adjusted. (If adjustments are needed, see ADJUST METER HUB in this section.)
3. With hub properly adjusted, view edge of the disk in inspection area. Rotate hub slowly by hand. If gaps intermittently appear as the disk is rotated (indication of a warped the disk), replace the disk.
4. With hub properly adjusted, hold meter upright with seed in meter. To verify that no seed loss occurs in inspection area (C), rotate the meter. If seed loss occurs, replace the disk.
5. Remove the disk.



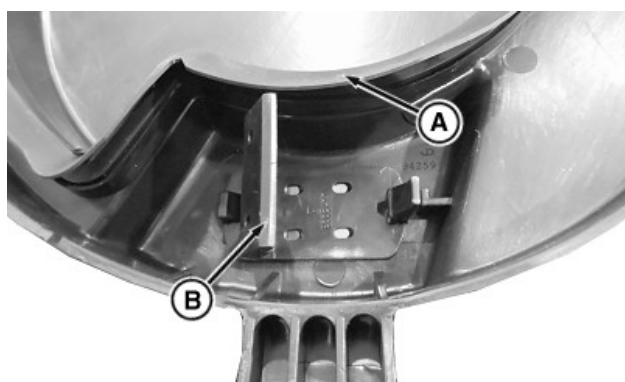
APY04873—UN—01MAR18

All Other Planters

A—Brush  
B—Hub Seal

6. Check brush (A) bristles for separations and gaps. If brush is worn enough to allow seed to pass through, replace brush. (See CHANGE VACUUM METER BRUSH in this section.)
7. Replace hub seal (B) if cracked or weathered.

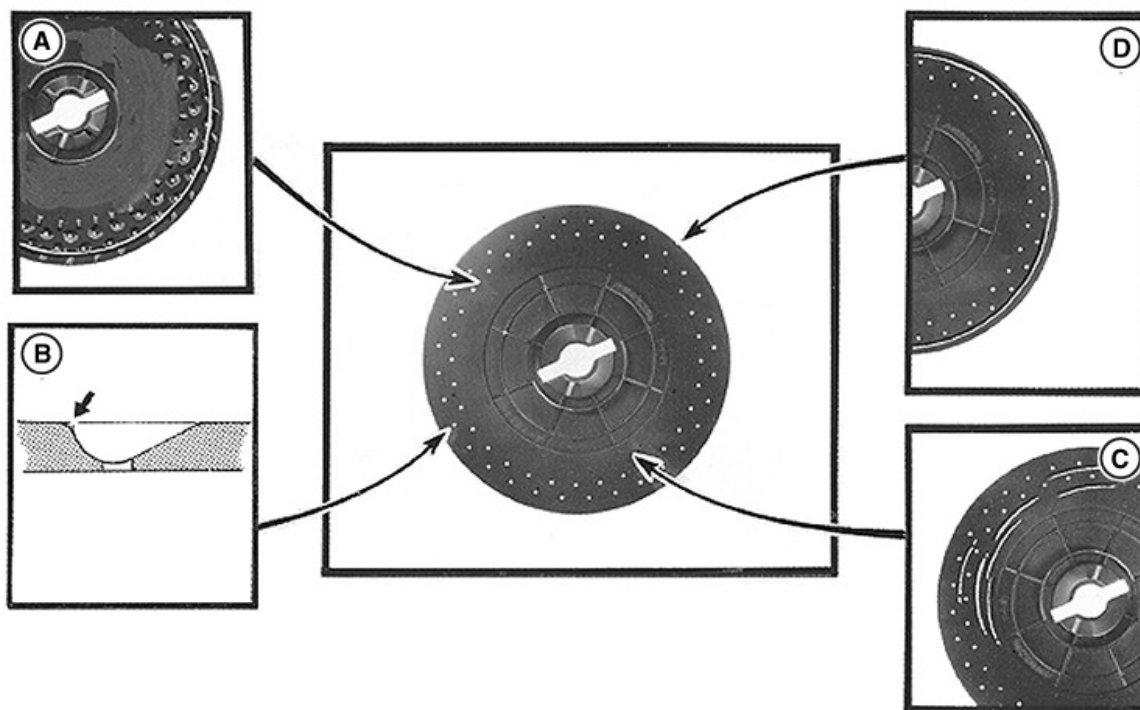
**NOTE:** If vacuum seals are replaced, apply Graphite Spray TY25797 on the vacuum side of used seed the disks. New seed the disks are factory lubricated.



APY04872—UN—01MAR18

A—Seals  
B—Wiper

8. Replace vacuum seals (A) if seed the disks are replaced or when large cracks or wear areas are visible in seal.
9. Replace the disk wiper (B) if edge of wiper is grooved or excessively worn.



APY04871—UN—01MAR18

A—Perimeter, Seed Side  
B—Worn Edge (Seed Cell Side View)

**NOTE:** To verify meter performance before purchasing new the disks, perform a field check. (See Checking Seed Population section.)

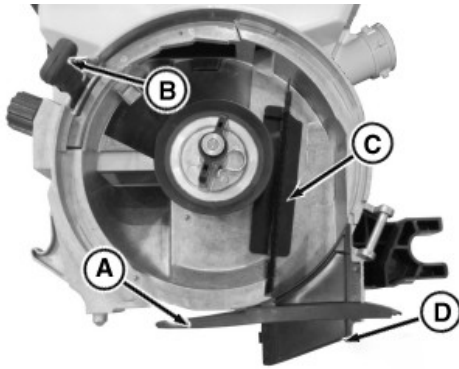
C—Grooves on Vacuum Side  
D—Perimeter, Vacuum Side

scratches are acceptable. Large grooves affect performance.

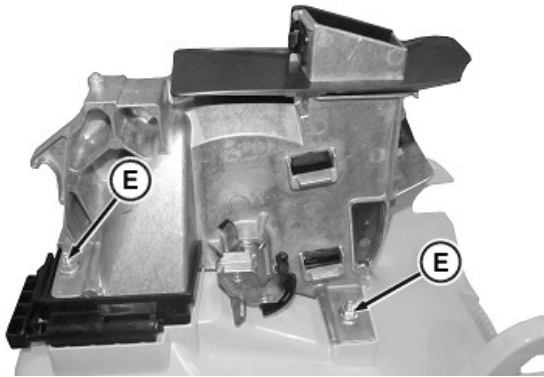
- Perimeter on Vacuum Side (D): A wear depth less than 1.0 mm (3/64 in) is acceptable.

10. Inspect seed the disks for wear in following areas and replace the disks as needed.

- Perimeter on Seed Side (A): A small amount of wear is acceptable. Check for seed loss through gap between the disk and housing.
- Edge (B) of Seed Cell: Seed abrasion removes edges on seed cells and increases cell size. Increased cell size causes overpopulation when planting small seed and causes under-population when planting large seed).
- Grooves (C) on Vacuum Side: Small grooves or



APY04870—UN—01MAR18



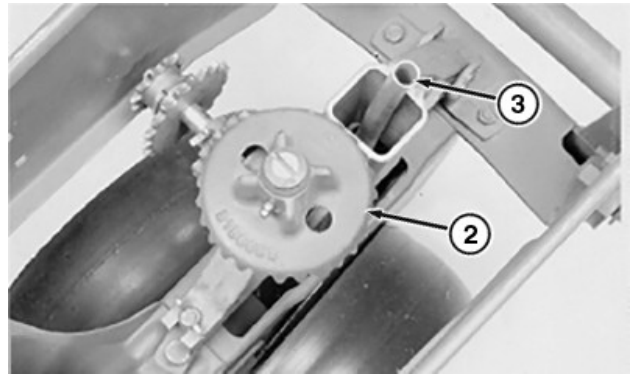
APY04869—UN—01MAR18

A—Dust Cover  
B—Handle  
C—Brush Holder  
D—Chute Cover  
E—Nuts

11. Replace vacuum gauge dust cover (A), if it does not fit properly, is cracked, or is weathered.
12. Replace rubber handle (B), if cracked or broken.
13. Replace brush holders (C), if worn.
14. Replace chute cover (D), if worn.
15. Verify that drive coupler pivots freely. If flex drive does not pivot freely, disassemble, clean, and lubricate drive with grease .
16. Place vacuum gauge assembly on hopper and attach with nuts (E).

PB21958,0000574-19-07MAR18

## Low Rate Milo / Sugar beet Seed Tube



APY04836—UN—01MAR18

If seed tubes must be removed, proceed as follows:

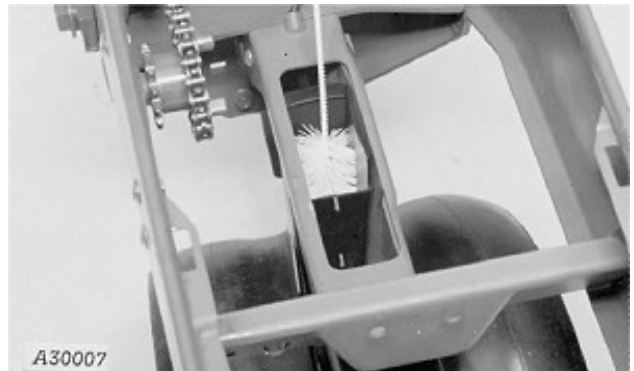
- 1.(Not illustrated) Disconnect drive chain.
- 2.Removed plate-meter gear nest.
- 3.Remove seed tube assembly.

**NOTE:** When installing seed tubes, be certain that hook on the seed tube is on the aligning pin in the shank

**IMPORTANT:** The top of the seed tube must make light contact with the false plate. Too much pressure can cause false plate wear.

PB21958,0000575-19-07MAR18

## Cleaning Seed Sensor



A30007—UN—06OCT88

In an extreme dusty operating conditions, dust can build up on the seed sensor. Even in the normal operating conditions, seed treatments build up in the sensor. Eventually this buildup becomes sufficient to disturb the sensor signal light causing low population counts or low warning lights to come on.

Periodically clean the seed sensor with a dry brush.

The sensor may also be cleaned with a brush, using a mild detergent and water.

**IMPORTANT: Do not plant again until the entire seed tube and sensor surfaces are dry.**

PB21958,0000576-19-05MAR18

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# Storage

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## Beginning of the Season Service

Before using the planter after it has been stored, inspect the seed hoppers for cleanliness to be certain the seed will flow from hoppers freely.

Thoroughly inspect the planter unit for loose parts and adjust as necessary.

Clean any dirt or grease that may have accumulated on moving parts, gears, and chains before operating the planter. It prevents abrasive action that could cause excessive wear.

When roller chains remain unused for several days, moisture in the air accumulates on the chain, causing the chain to rust. It can, and will, become serious enough in time to cause the chain joints to become stiff, restricting their normal free movement. While difficult to detect, this stiffness can encourage the chains to operate abnormally and disturb the smooth rotation of important meter components, causing deterioration in performance.

If the planter is not used for several days, if oil has been removed from chains, and so on, while cleaning the planter, thoroughly lubricate chains with John Deere Multipurpose Spray TY6350 spray lubricant.

**IMPORTANT: Do not use chain lube or any other heavy petroleum base lubricant that may cause a buildup of dust or dirt in the sprocket or gear teeth.**

service can be acquired when the planter is not needed in the field.

Store the planter in a clean, dry place with the planting unit gauge wheels and firming wheels out of the sun and off the floor.

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PB21958,0000578-19-05MAR18

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PB21958,0000577-19-05MAR18

## Service at the End of the Season

When planting is completed for one season, store the planter under cover with all parts in operating condition.

Paint all parts which are chipped or worn and require repainting.

Clean the planter thoroughly to remove dirt and trash which would hold moisture and cause rusting.

Lubricate the planter as outlined in the Lubrication section and grease exposed cylinder rods.

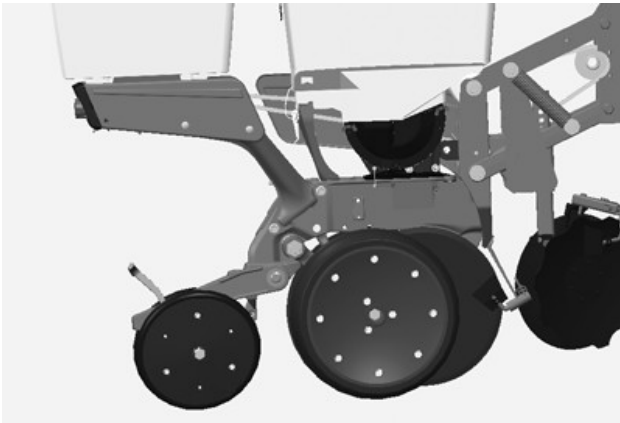
If the planter is not to be used for several days, or if oil has been removed from chains, and so on, while cleaning the planter, thoroughly lubricate chains with a commercial spray lubricant at the beginning of the idle period. If roller chains have become rusty or stiff during the idler period, lubricate prior to continued usage and operate or "work" chains sufficiently to insure all chain joints with John Deere Multipurpose Spray TY6350 before normal planter operation is resumed.

Empty and clean seed hoppers.

Inspect the planter for worn or broken parts. See your John Deere dealer during the off season so that parts or

# Storage (Vacuum)

## Service at Beginning of Season

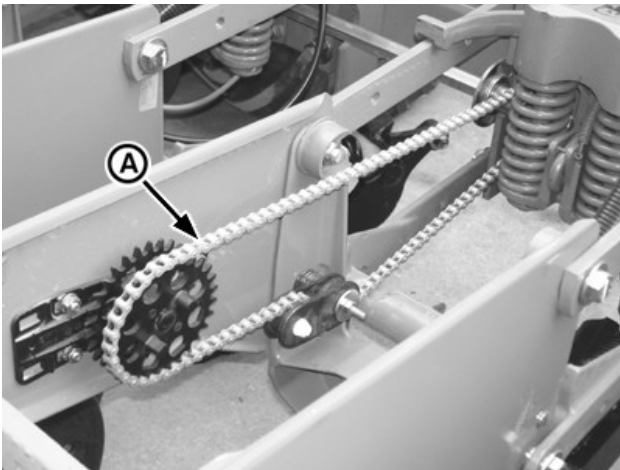


P17530—UN—12NOV14

Before using the planter after it has been stored, inspect the seed hoppers for cleanliness to be certain the seed will flow from hoppers freely.

Thoroughly inspect the planter unit for loose parts and adjust as necessary.

Clean any dirt or grease that may have accumulated on moving parts, gears, and chains before operating the planter. It prevents abrasive action that could cause excessive wear.



PUM3113—UN—02FEB09

### A—Drive Chains

When roller chains remain unused for several days, moisture in the air accumulates on them, causing rust. It can be serious enough to cause the link joints to become stiff, restricting their free movement. While difficult to detect, this stiffness can cause the chains to operate abnormally and disturb the smooth rotation of important metering components, reducing their performance.

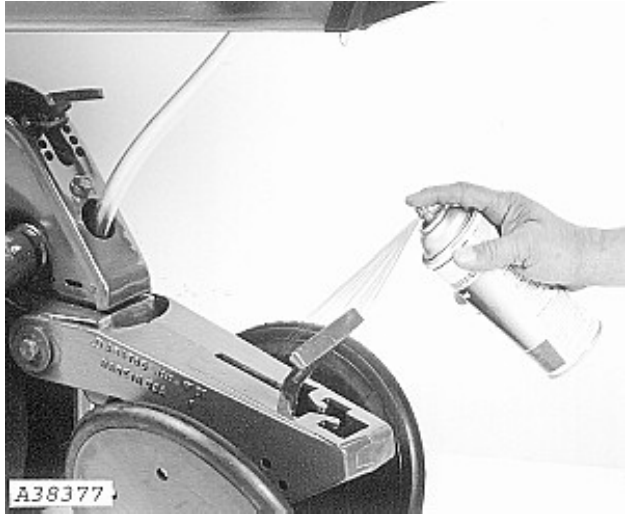
If the planter is not going to be used for several days, or if the oil has been removed from chains, and so on, while cleaning the planter, thoroughly lubricate chains with John Deere TY6350 Multipurpose Spray Lube.

Pay particular attention to proper lubrication of the seed meter drive chains (A).

**IMPORTANT:** Do not use chain lubricant or any other heavy petroleum base lubricant that may cause a buildup of dust or dirt in sprocket or gear teeth.

PB21958,0000579-19-05MAR18

## Service at the End of Season



A38377—UN—08DEC95

When planting is completed for one season, store the planter under cover with all parts in operating condition.

Paint all parts which are chipped or worn and require repainting.

Lubricate the planter as outlined in the Lubrication section.

If the planter is not used for several days, or if oil has been removed from chains, and so on, while cleaning the planter, thoroughly lubricate chains with John Deere Multipurpose Spray TY6350.

Clean the planter thoroughly to remove dirt and trash which would hold moisture and cause rusting.

Empty and clean seed hoppers.

Clean insecticide and / or herbicide hopper thoroughly as various chemicals may deteriorate the system components.

Inspect the planter for worn or broken parts. See your John Deere dealer during the off season so that parts or service can be acquired when the planter is not needed in the field.

Store the planter in a clean, dry place with the planting unit gauge wheels and firming wheels out of the sun and off the floor.

Place handle for closing down wheel force in the long slot to relieve tension on closing wheels.

Thoroughly flush liquid herbicide system with clean water. To prevent damage from the freezing, disconnect

from tractor and completely drain all lines and components.



A30303—UN—13OCT88

1. Clean meter housing, meter chamber, and seed disk with mild detergent and soft brush.
2. Spray vacuum side of seed disks with the spray graphite.

**IMPORTANT: Verify to store seed disks away from extreme heat or direct sunlight. Do not leave disks in meters during the off season. Do not store under heavy parts.**

Clean air manifold system. (See Clean Air Manifold System in Service Section)

Check for hydraulic leaks.

Check and clean out manifolds.

Check and clean vacuum meters.

Check and replace necessary meter seals.

PB21958,000057A-19-07MAR18



APY04817—UN—01MAR18

Remove seed disks from meter. (See Vacuum Meter Inspection and Service in Service section).

# Specifications

## Planter Specification

| Item           | Measurement | Specification                                  |
|----------------|-------------|------------------------------------------------|
| Planting Unit  | Type        | Vaccum                                         |
| Seed           | Openers     | Tru-Vee Double Disk                            |
| Fertilizer     | Openers     | Single Disk                                    |
| Lift           | Type        | Wheel Modules with Hydraulic Cylinders         |
| Drive          | Type        | Sprocket and Chain from the contact drive tire |
| Seed Hoppers   | Capacity    | 58 Litre                                       |
| Dry Fertilizer | Capacity    | 250 Kg                                         |

PB21958,000057B-19-04MAY18

## Keep Proof of Ownership

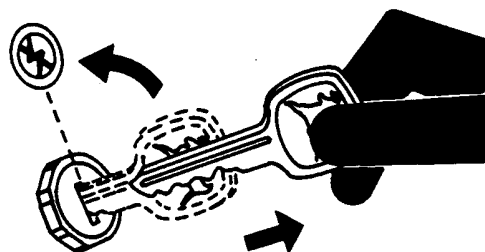


TS1680—UN—09DEC03

1. Maintain in a separate, secure location an up-to-date inventory of all product and component serial numbers.
2. Regularly verify that identification plates have not been removed. Report any evidence of tampering to law enforcement agencies and order duplicate plates.
3. Other steps you can take:
  - Mark your machine with your own numbering system
  - Take color photographs from several angles of each machine

PB21958,000057C-19-05MAR18

## Keep Machines Secure



TS230—UN—24MAY89

1. Install vandal-proof devices.
2. When machine is in storage:
  - Lower equipment to the ground
  - Set wheels to widest position to make loading more difficult
  - Remove any keys and batteries
3. When parking indoors, put large equipment in the front of exits and lock your storage buildings.
4. When parking outdoors, store in a well-lighted and fenced area.
5. Make note of suspicious activity and report any thefts immediately to law enforcement agencies.
6. Notify your John Deere dealer of any losses.

PB21958,000057D-19-05MAR18

## Record Serial Number



P17533—UN—13NOV14

Record the serial number and date of purchase of your planter in the space below:

Serial Number:

Purchase Date:

Furnish the serial number when requesting that your John Deere dealer order spare parts.

PB21958,000057E-19-05MAR18

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# Index

|                                                                                                |                 |  |
|------------------------------------------------------------------------------------------------|-----------------|--|
| <b>A</b>                                                                                       |                 |  |
| Adjust Closing Wheel Down Force .....                                                          | 35-3            |  |
| Adjust Closing Wheels for Shallow Planting of<br>Small Seeds .....                             | 35-3            |  |
| Adjust Planting Depth .....                                                                    | 35-2            |  |
| Adjusting Seed<br>Fertilizer ransmission Wheel Engagement<br>Point .....                       | 20-2            |  |
| Attaching to tractor .....                                                                     | 25-4            |  |
| Attachments<br>Dry fertilizer .....                                                            | 60-1            |  |
| <b>B</b>                                                                                       |                 |  |
| Baffle<br>Vacuum meter<br>Adjust baffle .....                                                  | 45-4            |  |
| Begining of the Season Service .....                                                           | 85-1            |  |
| Blades, seed opener<br>Replace .....                                                           | 75-4            |  |
| Blank Seed Plate .....                                                                         | 50-29           |  |
| Brush<br>Vacuum meter<br>Change.....                                                           | 45-5            |  |
| <b>C</b>                                                                                       |                 |  |
| Case drain<br>VacuMeter motor<br>Requirements.....                                             | 25-1            |  |
| Change Input<br>Sprocket Combination .....                                                     | 35-10           |  |
| Change Input rate<br>Sprocket Combination .....                                                | 35-11           |  |
| Change Sproket - Contact Drive .....                                                           | 55-2            |  |
| Changing Input<br>Sprocket Combinations .....                                                  | 35-8            |  |
| Changing input sprocket Combinations -<br>Seed Transmission .....                              | 35-5            |  |
| Changing Planting Rate<br>Sprocket Combinations .....                                          | 35-9            |  |
| Check<br>Hydraulic Connection .....                                                            | 45-9            |  |
| Check Tractor<br>Hydraulic System .....                                                        | 45-9            |  |
| Choosing Seed<br>Selecting seed Discs .....                                                    | 45-1            |  |
| Cleaning Blower Motor Guard .....                                                              | 80-1            |  |
| Cleaning Dry Fertilizer Hoppers .....                                                          | 75-5            |  |
| Cleaning Seed Sensor .....                                                                     | 80-4            |  |
| Cleanout and inspection of seed hoppers and<br>meters .....                                    | 35-5            |  |
| Closing Wheel Offset .....                                                                     | 35-3            |  |
| Closing wheels<br>Alignment .....                                                              | 35-4            |  |
| COMPUTER TRAK<br>Connect harness .....                                                         | 25-2            |  |
| ComputerTrak<br>Attach harness .....                                                           | 25-2            |  |
| Connections<br>Hose to tractor .....                                                           | 25-2            |  |
| Corn ProMax<br>40 - 40 Cells .....                                                             | 50-2            |  |
| Cotton<br>64 Cells .....                                                                       | 50-18, 50-19    |  |
| <b>D</b>                                                                                       |                 |  |
| Detent<br>Time, settings .....                                                                 | 25-2            |  |
| Double eliminator<br>Vacuum meters<br>Operation .....                                          | 45-8            |  |
| Downforce, adjust .....                                                                        | 60-2            |  |
| Dry Fertilizer Delivery Rates .....                                                            | 55-1            |  |
| Dry Fertilizer Delivery Rates per Hectare 18<br>Tooth Input for Planters With Contact Drive .. | 55-4            |  |
| Dry Fertilizer Delivery Rates per Hectare 27<br>Tooth Input for Planters With Contact Drive    | <del>55-3</del> |  |
| Dry Fertilizer Delivery Rates per Hectare 36<br>Tooth Input .....                              | 55-5, 55-7      |  |
| <b>E</b>                                                                                       |                 |  |
| Empty<br>Meter and seed hopper .....                                                           | 35-5            |  |
| <b>F</b>                                                                                       |                 |  |
| Filling<br>Seed Hoppers .....                                                                  | 35-5            |  |
| Flow<br>Tractor hydraulics, settings .....                                                     | 25-2            |  |
| <b>G</b>                                                                                       |                 |  |
| Gauge wheels<br>Adjust .....                                                                   | 75-3            |  |
| General .....                                                                                  | 35-1            |  |
| Guard, seed tube<br>Replace .....                                                              | 75-4            |  |
| <b>H</b>                                                                                       |                 |  |
| Harness<br>Attach<br>ComputerTrak .....                                                        | 25-2            |  |
| High Rate<br>Sorghum<br>90 Cells .....                                                         | 50-13           |  |
| Hoppers, cleanout .....                                                                        | 35-5            |  |
| Hose<br>Connections .....                                                                      | 25-2            |  |
| How to Use<br>Planting Rate Chart .....                                                        | 50-1            |  |
| Hub, meter<br>Adjust .....                                                                     | 45-5            |  |

|                                         |              |                                                 |              |
|-----------------------------------------|--------------|-------------------------------------------------|--------------|
| Hydraulic connections                   |              | <b>P</b>                                        |              |
| Tractor                                 |              | Planting Depth .....                            | 35-2         |
| Recommendations.....                    | 25-2         | Planting Units                                  |              |
| Hydraulic hook-up                       |              | Depth .....                                     | 35-2         |
| Return coupler                          |              | Positioning the Fertilizer Opener .....         | 60-2         |
| VacuMeter motor.....                    | 25-1         | Protecting                                      |              |
| Hydraulic system                        |              | Hydraulic Motor Seal                            |              |
| Check .....                             | 25-2         | Low pressure Drain Connection.....              | 20-1         |
|                                         |              | <b>R</b>                                        |              |
| <b>I</b>                                |              | Raising and lowering                            |              |
| Install Service Stops .....             | 75-1         | Markers .....                                   | 35-1         |
| Installing                              |              | Ratchet Drive .....                             | 75-3         |
| Seed Disc .....                         | 45-3         | Replacing Auger Sections .....                  | 75-6         |
| Instlling and removing seed tube .....  | 35-4         | Replacing Cotter Pins in Dry Fertilizer Drive   |              |
|                                         |              | Shaft .....                                     | 75-5         |
| <b>K</b>                                |              | Replacing Drill Shaft Cotter Pins .....         | 75-2         |
| Knockout wheel                          |              | Return coupler                                  |              |
| Install, vacuum seed meter .....        | 45-7         | Hydraulic motor and variable rate drive .....   | 25-1         |
| Operation .....                         | 45-6         |                                                 |              |
| Knockout wheel identification .....     | 45-7         | <b>S</b>                                        |              |
|                                         |              | Safety                                          |              |
| <b>L</b>                                |              | Safe maintenance, practice .....                | 05-5         |
| Large Edible Beans .....                | 50-27, 50-28 | Safety, Avoid High-Pressure Fluids              |              |
| 50 Cells .....                          | 50-20, 50-21 | Avoid High-Pressure Fluids .....                | 05-6         |
| Large Maize                             |              | Seed hoppers                                    |              |
| 25 Cells .....                          | 50-7         | Cleanout and inspection .....                   | 35-5         |
| Leveling                                |              | Emptying .....                                  | 35-5         |
| Planter .....                           | 35-1         | Seed population, check .....                    | 40-1         |
| Low Rate Milo/Sugarbeet Seed Tube ..... | 80-4         | Seed tube guard                                 |              |
| Lower                                   |              | Replace .....                                   | 75-4         |
| Seed Population .....                   | 50-29        | Selective control valve                         |              |
| Lubrication .....                       | 20-1, 70-1   | Hose connection .....                           | 25-2         |
| Lubrication Symbols .....               | 70-1         | Service at Beginning of Season - Storage        |              |
|                                         |              | (Vacuum) .....                                  | 90-1         |
| <b>M</b>                                |              | Service at the End of Season - Storage          |              |
| Maize and Sunflower                     |              | (Vacuum) .....                                  | 90-1         |
| 30 Cells .....                          | 50-4         | Service at the End of the Season .....          | 85-1         |
| Medium Edible Beans                     |              | Set                                             |              |
| 56 Cells .....                          | 50-22, 50-23 | Vacuum Level .....                              | 35-8         |
| Meter                                   |              | Signal words, understand .....                  | 05-1         |
| Double eliminator                       |              | Single Disk Fertilizer Openers .....            | 60-1         |
| Operation.....                          | 45-8         | Single-Disc Fertilizer Opener Maintenance ..... | 75-3         |
| Meter hub                               |              | Small Edible Beans                              |              |
| Adjust .....                            | 45-5         | 108 Cells .....                                 | 50-25        |
| Metering Seed                           |              | Sorghum                                         |              |
| Population Tables                       |              | 45 Cells .....                                  | 50-15        |
| Vacuum Planter plates .....             | 50-1         | Soyabeans                                       |              |
| Metric torque values .....              | 75-1         | 108 Cells .....                                 | 50-16, 50-17 |
| Mounting Tires .....                    | 75-2         | Storing Dry Fertilizer .....                    | 60-1         |
|                                         |              | Suger Beets                                     |              |
| <b>O</b>                                |              | 45 Cells .....                                  | 50-8, 50-9   |
| Opener                                  |              |                                                 |              |
| Row unit blades                         |              |                                                 |              |
| Replace.....                            | 75-4         |                                                 |              |
| Operator's manual, tractor, use .....   | 25-1         |                                                 |              |

**T**

|                                |      |
|--------------------------------|------|
| Tightning                      |      |
| Hardware .....                 | 20-1 |
| Tire                           |      |
| Inflation .....                | 20-1 |
| Torque value                   |      |
| Metric .....                   | 75-1 |
| Tractor                        |      |
| Hydraulic connections          |      |
| Recommendations .....          | 25-2 |
| Tractor operator's manual      |      |
| use .....                      | 25-1 |
| Tractor requirements .....     | 25-1 |
| Troubleshooting .....          | 65-1 |
| Row units .....                | 65-2 |
| Troubleshooting - Vacuum ..... | 65-3 |
| Tru-vee opener                 |      |
| Blades and seed tube guard     |      |
| Replace .....                  | 75-4 |

**U**

|                               |      |
|-------------------------------|------|
| Unit Down Force Springs ..... | 60-3 |
|-------------------------------|------|

**V**

|                                     |              |
|-------------------------------------|--------------|
| VacuMeter motor                     |              |
| Hydraulic requirements              |              |
| Case drain .....                    | 25-1         |
| Return coupler .....                | 25-1         |
| Vacuum                              |              |
| Connection and settings, hose ..... | 25-2         |
| Vacuum Level                        |              |
| Baffle Position                     |              |
| Vacuum Meter Brush                  |              |
| Cotton .....                        | 50-20        |
| Large Maize Seed .....              | 50-8         |
| Larger Edible Beans .....           | 50-22        |
| Maize Seed .....                    | 50-5         |
| Medium Edible Beans .....           | 50-24        |
| Peanuts .....                       | 50-12        |
| Small Edible Beans .....            | 50-29        |
| Sorghum .....                       | 50-14, 50-16 |
| Soyabeans .....                     | 50-18        |
| Sugar Beet Seed .....               | 50-10        |
| Sunflower Seed .....                | 50-6         |
| Sweet Maize Seed .....              | 50-3         |
| Oil Sunflower .....                 | 50-6         |
| Vacuum meter                        |              |
| Adjust baffle .....                 | 45-4         |
| Adjust meter hub .....              | 45-5         |
| Brush                               |              |
| Change .....                        | 45-5         |
| Double eliminator                   |              |
| Operation .....                     | 45-8         |
| Inspect and service .....           | 80-2         |
| Knockout wheel                      |              |
| Operation .....                     | 45-6         |

|                                     |              |
|-------------------------------------|--------------|
| Vacuum Meter                        |              |
| Operating Characteristics .....     | 50-1         |
| Vacuum Motor Inspection .....       | 80-1         |
| Vacuum seed meter                   |              |
| Knockout wheel assembly             |              |
| Install .....                       | 45-7         |
| Vacuum system                       |              |
| Clean .....                         | 80-1         |
| VacuumSeed                          |              |
| Metering Discs                      |              |
| Equipment .....                     | 45-2         |
| Variable rate drive                 |              |
| Connection and settings, hose ..... | 25-2         |
| Return coupler .....                | 25-1         |
| Virginia Peanut Seed Disc           |              |
| Part Number H138722                 |              |
| 46 Cells .....                      | 50-10, 50-11 |

**W**

|                                        |      |
|----------------------------------------|------|
| Warning light harness, attaching ..... | 25-5 |
|----------------------------------------|------|

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