

Deere/Bauer Planters John Deere Components



DCY

OPERATOR'S MANUAL Deere/Bauer Planters John Deere Components

OMA84699 Issue F6 (ENGLISH)

CALIFORNIA Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

If this product contains a gasoline engine:

WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

The State of California requires the above two warnings.

John Deere Seeding Group
North American Edition
LITHO IN U.S.A.



OMA84699

Introduction

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 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.

DX,IFC2 -19-17SEP92-1/1

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, 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.

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A John Deere ILLUSTRATION Manual

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Safety

Recognize Safety Information

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 -19-29SEP98-1/1

T81389 -UN-07DEC88

Understand Signal Words

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 -19-03MAR93-1/1

TS187 -19-30SEP88

Follow Safety Instructions

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.

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 -19-03MAR93-1/1

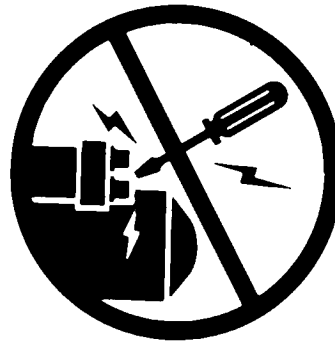
TS201 -UN-23AUG88

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.



TS177 -UN-11JAN89

DX,BYPAS1 -19-29SEP98-1/1

Operate the Machine Safely

Be careful when operating machine to avoid injury.

If the machine must be in a raised position while working on or near it, be certain service locks are installed or machine is adequately supported. Anytime hydraulic work must be done, lower the machine.

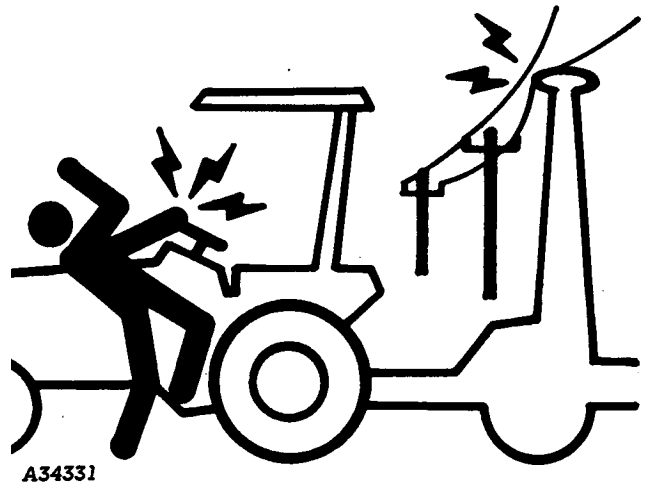
Serious injury or death can result from contact with electric lines. Use care when moving or operating this machine near electric lines to avoid contact.

Stand clear of machine when hydraulic components are being used. Mechanical or hydraulic failure can allow machine components to move rapidly.

Be sure cylinder and attaching hoses are fully charged with oil before operating system.

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

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



A34331

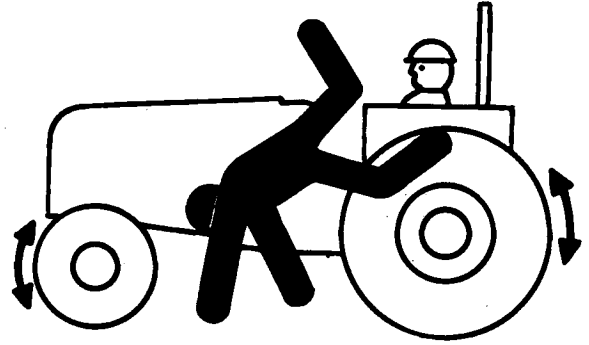
A34331 -UN-13OCT88

AG,OUO6074,1162 -19-22OCT03-1/1

Keep Riders Off Machine

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.



TS290 -UN-23AUG88

DX,RIDER -19-03MAR93-1/1

Avoid Tip-Overs

Use a seat belt when present.

Avoid holes, ditches, and obstructions which may cause the machine to tip, especially on hillsides.

Never drive near the edge of a ditch, creek, gully or steep embankment.

Slow down when turning or traveling over rough ground, and when turning on hillsides.



N39084 -UN-30MAR89

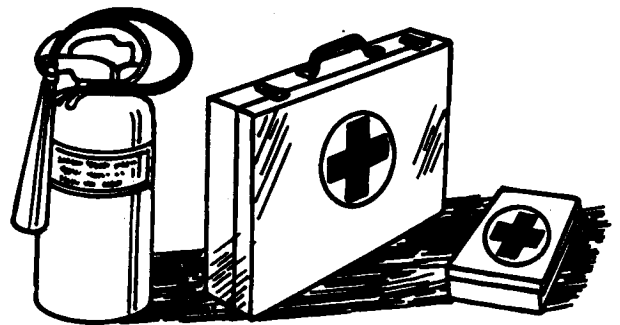
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Prepare for Emergencies

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.



TS291 -UN-23AUG88

DX,FIRE2 -19-03MAR93-1/1

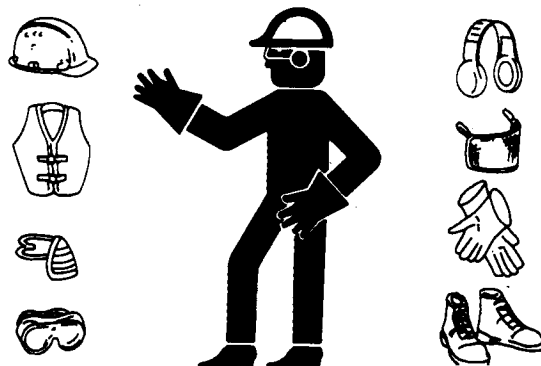
Wear Protective Clothing

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.



TS206 -UN-23AUG88

DX,WEAR -19-10SEP90-1/1

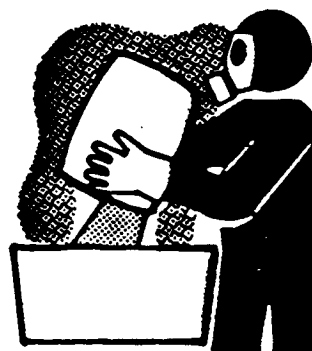
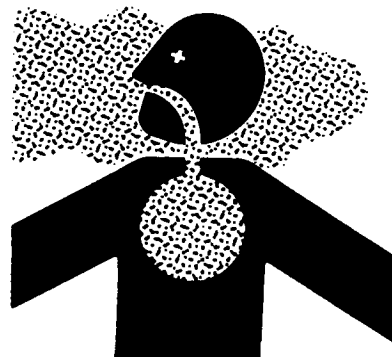
Handle Agricultural Chemicals Safely

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 spray or dusts.
- 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 way 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.



A34471

TS220 –UN-23AUG88

A34471 –UN-11OCT88

Granular Chemical Lid Fill Closed Handling System

CAUTION: Chemicals may cause eye, skin, or breathing problems. Wear long sleeve shirt, gloves and goggles. Refer to and follow safety instruction on the chemical supplier's label.

Chemical residue should be placed in the original or accepted container and disposed of in an approved manner. Follow instruction of the chemical manufacturers for disposal methods.

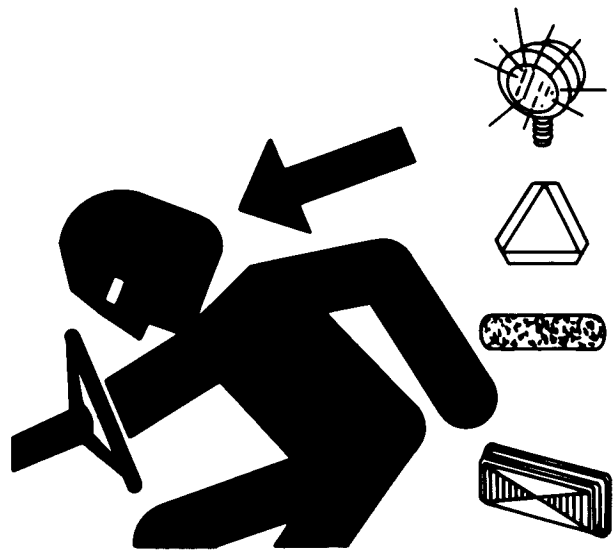
If hoppers are not washed, chemically treated dust may be on the hopper walls, resulting in exposure.

AG,OUO6074,1164 -19-04AUG00-1/1

Use Safety Lights and Devices

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.



TS951 -UN-12APR90

DX,FLASH -19-07JUL99-1/1

Transport Safely

Install marker lockup straps (if equipped), to prevent injury from lowered marker.

The maximum transport speed for this machine is 20 mph (32 km/h). **DO NOT EXCEED.** Never travel at any speed which does not permit adequate control of steering and stopping.

Reduce speed over rough ground.

Never tow this implement behind a truck or other motor vehicle.

The construction of this implement may not meet all local or national requirements for transport on a public roadway. In regions or countries that have national certification requirements for roadway transport, it may be impossible for this implement to be approved for such roadway transport. The customer is responsible for understanding and complying with all local, regional, and national requirements regarding roadway transport.



A34333 -UN-13OCT88

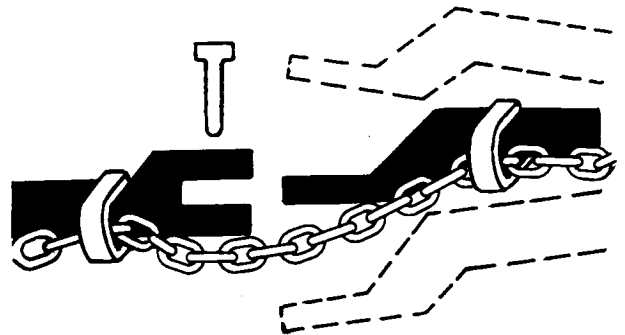
AG,OUO6074,1165 -19-06APR06-1/1

Use a Safety Chain

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.



TS217 -UN-23AUG88

DX,CHAIN -19-03MAR93-1/1

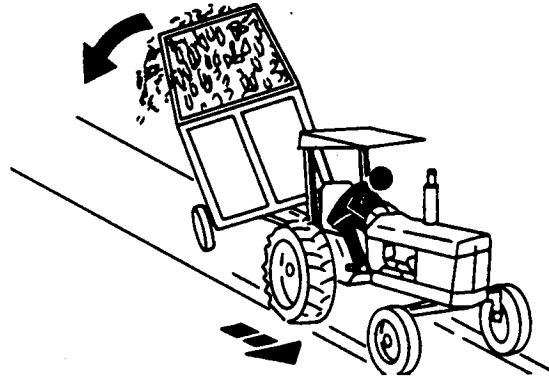
Tow Loads Safely

Stopping distance increases with speed and weight of towed loads, and on slopes. Towed loads with or without brakes that are too heavy for the tractor or are towed too fast can cause loss of control. Consider the total weight of the equipment and its load.

Observe these recommended maximum road speeds, or local speed limits which may be lower:

- If towed equipment does not have brakes, do not travel more than 32 km/h (20 mph) and do not tow loads more than 1.5 times the tractor weight.
- If towed equipment has brakes, do not travel more than 40 km/h (25 mph) and do not tow loads more than 4.5 times the tractor weight.

Ensure the load does not exceed the recommended weight ratio. Add ballast to recommended maximum for tractor, lighten the load, or get a heavier towing unit. The tractor must be heavy and powerful enough with adequate braking power for the towed load. Use additional caution when towing loads under adverse surface conditions, when turning, and on inclines.



TS216 -UN-23AUG88

DX,TOW -19-02OCT95-1/1

Observe Maximum Transport Speed

The maximum transport speed for this implement is 32 km/h (20 mph).

Some tractors are capable of operating at speeds that exceed the maximum transport speed of this implement. Regardless of the maximum speed capability of the tractor being used to tow this implement, do not exceed the implement's maximum transport speed.

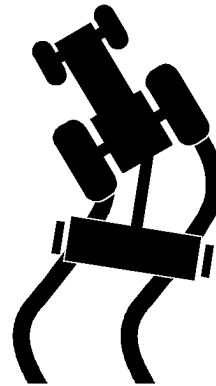
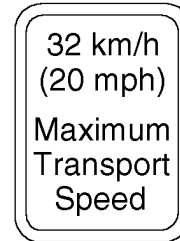
Exceeding the implement's maximum transport speed can result in:

- Loss of control of the tractor/implement combination
- Reduced or no ability to stop during braking
- Implement tire failure
- Damage to the implement structure or its components

Use additional caution and reduce speed when towing under adverse surface conditions, when turning, and when on inclines.

Do not attempt transport if the implement weighs more than 1.5 times the weight of the tractor.

Never tow this implement with a motor vehicle.



A46805 -19-12JUN01

AX,TOW2 -19-21JUN06-1/1

Practice Safe Maintenance

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 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.



TS218 -UN-23AUG88

DX,SERV -19-17FEB99-1/1

Remove Paint Before Welding or Heating

Avoid potentially toxic fumes and dust.

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

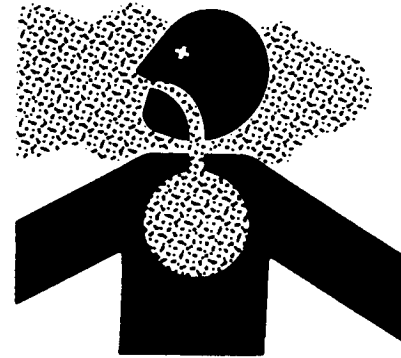
Remove paint before heating:

- 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.



TS220 -UN-23AUG88

DX,PAINT -19-24JUL02-1/1

Avoid Heating Near Pressurized Fluid Lines

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.



TS953 -UN-15MAY90

DX,TORCH -19-10DEC04-1/1

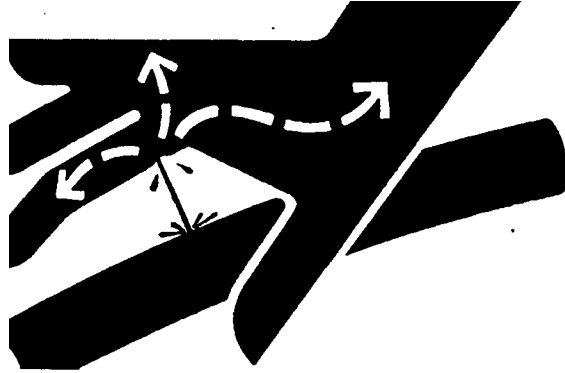
Avoid High-Pressure Fluids

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 from Deere & Company Medical Department in Moline, Illinois, U.S.A.



X9611 -UN-23AUG88

DX,FLUID -19-03MAR93-1/1

Store Attachments Safely

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.



TS219 -UN-23AUG88

DX,STORE -19-03MAR93-1/1

Charge Row Marker Hydraulic System

Falling row markers can cause personal injury. Be sure cylinders and attaching hoses are fully charged with oil before operating. Failure to do so will allow markers to fall rapidly.

ALWAYS stay clear of markers when raising or lowering.



N39213 -UN-22SEP88

NX,515,C9 -19-05APR91-1/1

Dispose of Waste Properly

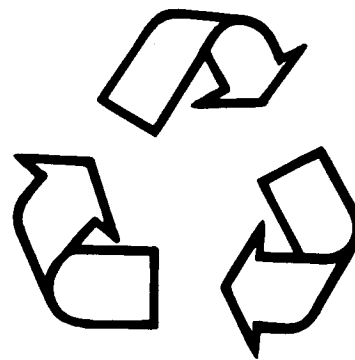
Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with John Deere equipment include such items as oil, fuel, coolant, brake fluid, filters, and batteries.

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.



TS1133 -UN-26NOV90

DX, DRAIN -19-03MAR93-1/1

Safety Signs

Safety Signs



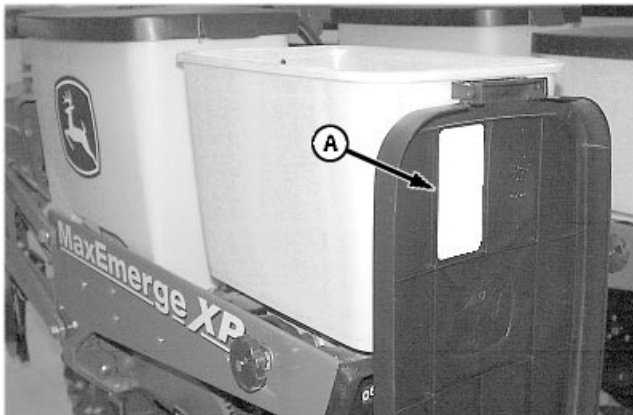
A57677 -UN-30MAR06



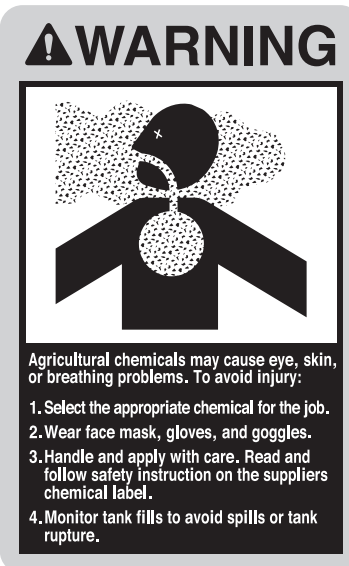
SSA77821 -19-01NOV04

A—Warning

OUO6435,0001FED -19-31MAR06-1/4



A57696 -UN-30MAR06



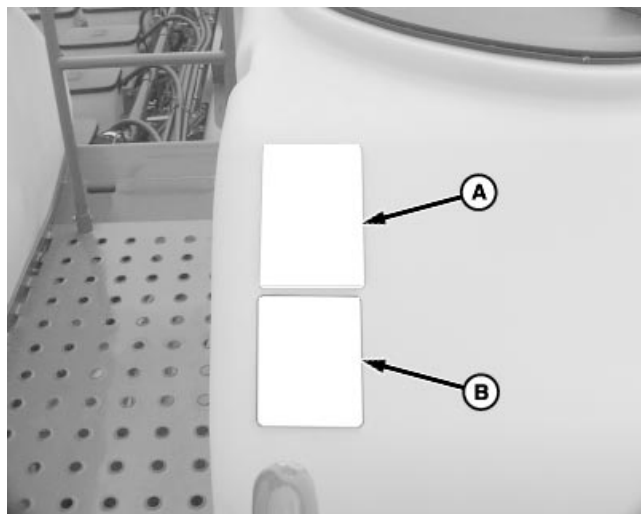
SSA77616 -19-30MAR06

A—Warning

Non CCS machines only.

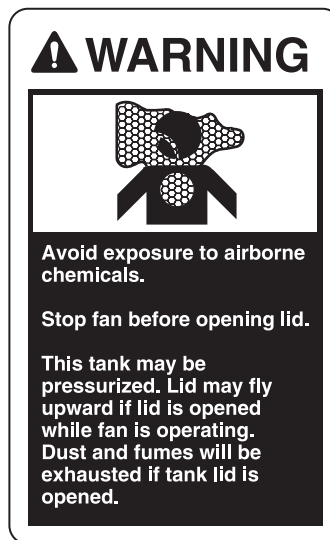
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OUO6435,0001FED -19-31MAR06-2/4



A57675 -UN-30MAR06

CCS machines only.



SSA74150 -19-30MAR06

A—Warning

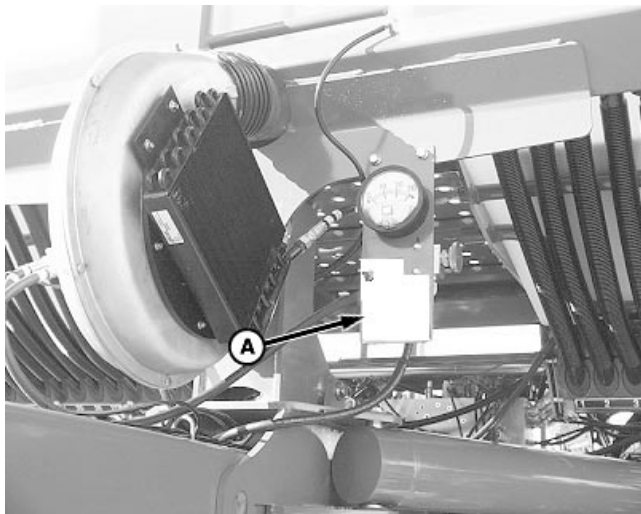


SSA74597 -19-30MAR06

B—Warning

Continued on next page

OUC6435,0001FED -19-31MAR06-3/4



A57676 -UN-30MAR06

PURGE HOSES WITH PLANTER RAISED
(Fan on with machine raised)

PLANT/TANK CLEANOUT
(Fan runs only when machine is lowered)



⚠ WARNING

Avoid serious injury from crushing.

Always install service locks before performing service or maintenance on raised planter.

Refer to Operator's Manual for cleanout procedure.

SSA81341 -19-30MAR06

A81341

A—Warning

CCS machines only.

OUO6435,0001FED -19-31MAR06-4/4

Preparing Tractor

Use Your Tractor Operator's Manual

Always refer to YOUR tractor operator's manual for specific detailed information regarding operation of YOUR equipment.

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



TS190 -UN-17JAN89

NX,1200V,A1 -19-18MAR99-1/1

Calculating Minimum Tractor Weight for Safe Road Transport



CAUTION: Use of a tractor ballasted to less than the minimum tractor weight can result in loss of control and serious injury or death.



CAUTION: Do not transport a planter in folded position with product in tanks. Do not transport a towed load (such as a fertilizer tank) unless it is empty.

IMPORTANT: Always refer to the tractor operator's manual for further safe transport information.

If a towed load is attached to the rear of the implement, add the towed load's weight to the total weight of the implement before dividing by 1.5.

FORMULA: Total Weight of Implement $\div 1.5 =$ Minimum Tractor Weight for Safe Transport

OUC1074,00013A6 -19-21JUN06-1/1

Checking Tractor Hydraulic System

IMPORTANT: Do not use an open center tractor hydraulic system to operate machine. Permanent damage to tractor pump may result.

For complete tractor operating instructions, refer to the tractor operator's manual.

The vacuum motor and variable rate drive hydraulic systems are 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 meter pump and variable rate drive hydraulic systems is approximately 15 513 kPa (155 bar) (2250 psi) depending on frame configuration, planting speed and number of rows on machine.

Hydraulic system working pressure is 20 684 kPa (207 bar) (3000 PSI). Hydraulic system burst pressure is 82 737 kPa (827 bar) (12 000 PSI).

OUC6074,0000A10 -19-23JUN06-1/1

Tractor Requirements

NOTE: Tractors with additional horsepower may be required when operating with additional machine attachments or when planting in soft seedbeds and rolling ground.

MACHINE	ENGINE Kilowatt (Horsepower)
DB44 24 Row 56 cm (22 in.)	175 kW (235)
DB58 32 Row 56 cm (22 in.)	175 kW (235)
DB60 36 Row 51 cm (20 in.)	175 kW (235)
DB66 36 Row 56 cm (22 in.)	175 kW (235)
DB80 32 Row 76 cm (30 in.)	175 kW (235)
DB80 48 Row 51 cm (20 in.)	186 kW (250)
DB88 48 Row 56 cm (22 in.)	186 kW (250)
DB90 36 Row 76 cm (30 in.)	209 kW (280)

OUC6074,0000C41 -19-02JUN06-1/1

Hitch Loads

IMPORTANT: Product tanks should always be empty when machine is in folded position.

*NOTE: Weights are with typical optional equipment.
Weights with other optional equipment will vary.*

The maximum static vertical load for this implement occurs when the implement is folded in road transport position.

Static Vertical Load on Tractor Drawbar		
Machine	Maximum Empty Weight kg (lb)	Maximum Fully Loaded Weight kg (lb)
DB44 Non CCS	2313 (5100)	2521 (5559)
DB44 CCS	2177 (4800)	2001 (4413)
DB58 Non CCS	3405 (7508)	3872 (8538)
DB58 CCS	3220 (7100)	3097 (6828)
DB60 Non CCS	3583 (7900)	4167 (9187)
DB60 CCS	3061 (6750)	2938 (6478)
DB66 Non CCS	3810 (8400)	4409 (9722)
DB66 CCS	3239 (7141)	3132 (6905)
DB80 Non CCS	4571 (10 078)	5312 (11 711)
DB80 CCS	4309 (9500)	4212 (9287)
DB88 Non CCS	6376 (14 058)	7526 (16 594)
DB88 CCS	5956 (13 131)	5903 (13 014)
DB90 Non CCS	5876 (12 955)	6739 (14 857)
DB90 CCS	5579 (12 300)	5492 (12 109)

OUC6074,0000ECC -19-22JUN06-1/1

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

IMPORTANT: To avoid damage to 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 it matches what is listed on table.

Order one of the following kits when a John Deere tractor is used, or see 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 Ten Series 7420 and 7520 Series with serial numbers (- 016498)	BA30216
6020, 7220, 7320, 7420, 7520 Series	BA30217
7200, 7400, 7600, 7700, 7800, Ten Series	BA30218
7720, 7820, and 7920 Series	BA30221
8000, 8000T, 8010, 8010T, 8020, 8020T Series	BA30219
9000, 9000T, 9010, 9010T, 9020, 9020T Series	BA30220



Flush Face Case Drain Hose Tip

A53392 -JUN-25NOV03

OOU6074,0000968 -19-15JUN05-1/1

Selective Control Valve Lever Stop (30—60 Series Row Crop Tractors)

IMPORTANT: Damage to vacuum pump motor may occur if operated without lever stop (A).

NOTE: To operate the vacuum system with a 30—60 series tractor, the vacuum system must be converted to use an in-line flow control valve to adjust vacuum levels. See your John Deere dealer.

Operation of vacuum meter hydraulic system requires continuous hydraulic system flow. A selective-control-valve (SCV) lever stop must be used to prevent selective-control-valve (SCV) lever from returning to neutral position.

Pump motor will operate when SCV lever is in forward (detent) position. To shut off pump motor, move lever forward into FLOAT position.

Flow control valve must be plugged into retract port on tractor SCV.

To install SCV lever stop, proceed as follows:



A—Lever Stop

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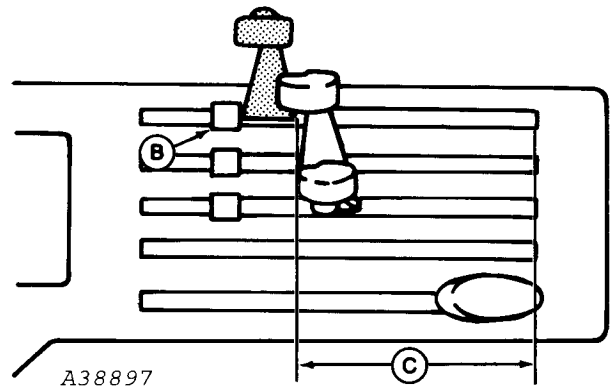
OUO6074,0000A04 -19-22JUN05-1/3

1. Push SCV lever (A) forward against float stop (B).
2. Measure dimension (C).
3. Cut rubber stop to dimension (C).

A—SCV Lever
B—Float Stop
C—Dimension



A29895 -UN-06OCT88



A38897 -UN-26JAN96

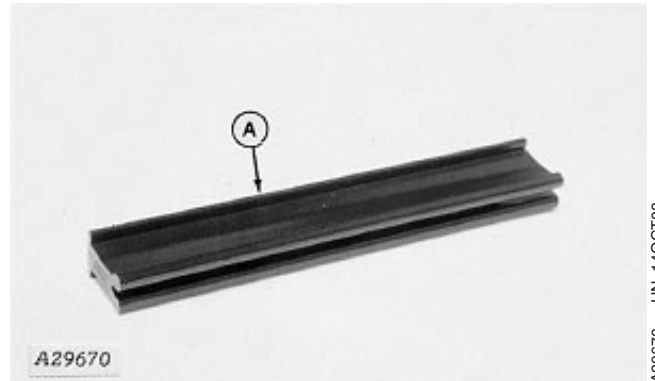
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OVO6074,0000A04 -19-22JUN05-2/3

4. Insert rubber stop (A) in slot behind selective control lever with V-groove side down.
5. Move lever from FLOAT to detent position, against rubber stop (A) and release lever. The hydraulics should activate and lever should remain in detent position.

If lever moves back into float position, rubber stop is too long.

A—Rubber Stop



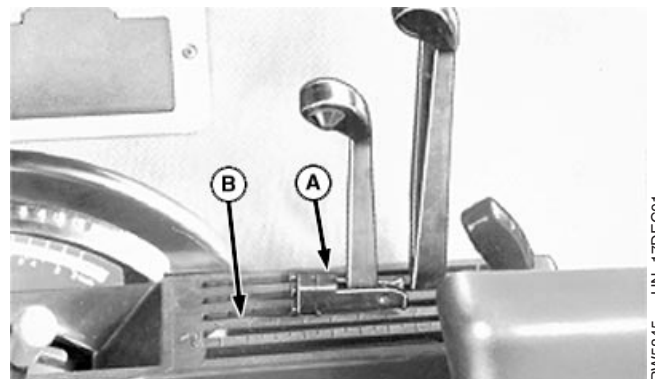
OUO6074.0000A04 -19-22JUN05-3/3

CCS SCV Lever Lock Clip (30—60 Series Row Crop Tractors)

NOTE: The clip holds lever in continuous running position to operate CCS fan.

When constant hydraulic pressure is required, lever lock clip R52667 (A) must be installed over lock-out stop (B).

A—Lock Clip
B—Lock-Out Stop



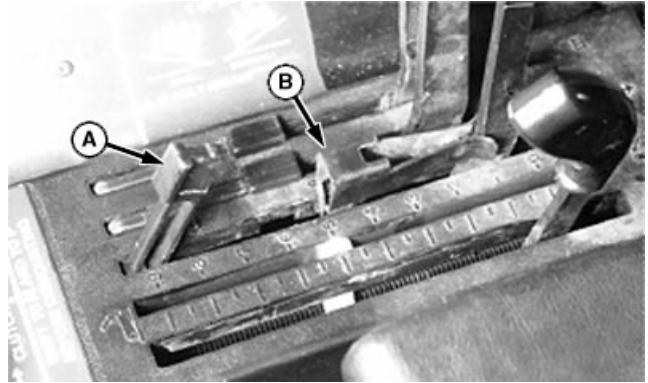
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OUO6074.0000982 -19-11FEB04-1/3

Preparing Tractor

1. Lift float lock-out stop (A).
2. Squeeze sides of lock clip (B) and insert into groove as shown.

A—Lock-Out Stop
B—Lock Clip

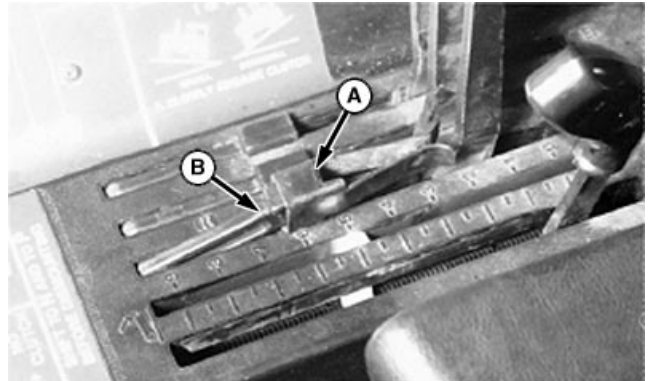


N42122FD -UN-18DEC01

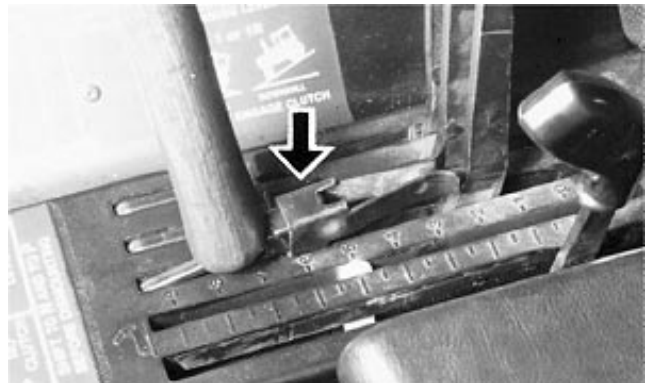
OUO6074,0000982 -19-11FEB04-2/3

3. Slide lock clip (A) over lock-out stop (B).
4. Push lock-out stop and lock clip down.
5. Push handle forward into lock-clip when constant hydraulic pressure is needed.

A—Lock Clip
B—Lock-Out Stop



N42122FE -UN-18DEC01



N42122FG -UN-06JAN92



N42122FH -UN-06JAN92

OUO6074,0000982 -19-11FEB04-3/3

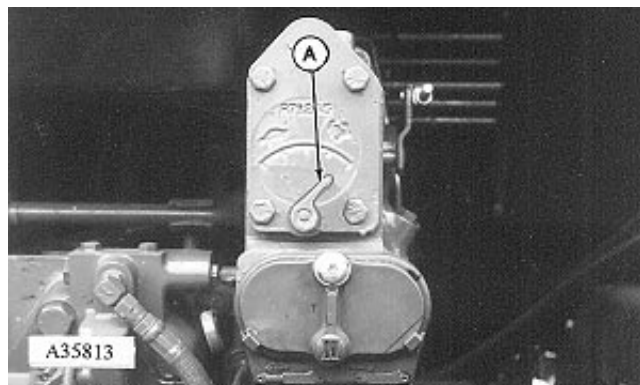
Setting Selective Control Valve for (30—60 Series Row Crop Tractors)

NOTE: For non John Deere tractors, see dealer for hook-up.

To operate the vacuum system, vacuum pressure hose must be equipped with an in-line flow control valve to adjust vacuum level and tractor SCV lever must have a lever stop installed. SCV lever should be moved to “float” position to deactivate vacuum. See your John Deere dealer.

To operate the CCS system, tractor SCV lever must be equipped with a lever lock clip to maintain constant oil flow. See your John Deere dealer.

Function	Valve (A) Setting	Control
Frame, Raise/Lower/Fold/CCS	Fast (Rabbit)	SCV Lever CCS Flow Control Valve
Vacuum Level	Fast (Rabbit)	In-Line Valve
Variable Rate Drive	Fast (Rabbit)	VRD Monitor
Independent Marker	Middle	SCV Lever



A35813 -UN-25OCT94



A53322 -UN-12NOV03

A—Tractor Flow Control Valve
B—CCS Flow Control Valve

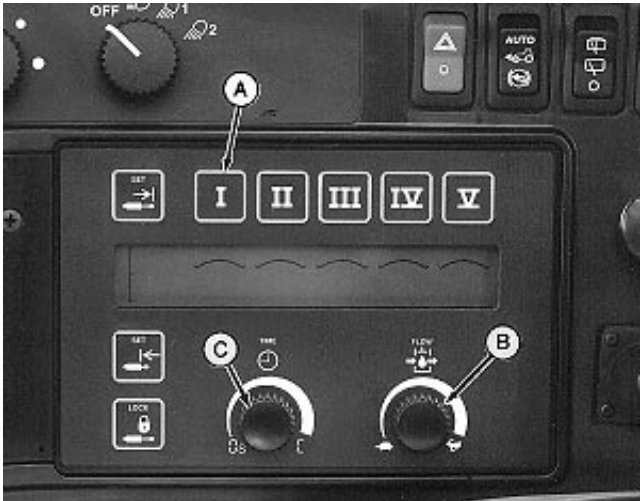
OUO6435,0001FD9 -19-10MAR06-1/1

Setting Selective Control Valves—8000 and 9000 Series Tractors

NOTE: If tractor is not equipped with enough SCV outlets, a Power Beyond Kit is available to power hydraulic motors. An in-line flow control valve kit must be installed to control vacuum level when more than one vacuum is connected to one SCV. See your John Deere dealer.

NOTE: If vacuum is attached to power beyond, no cab controls are used. Vacuum level is then controlled by the in-line flow control valve. Shut off tractor engine to turn off vacuum motor.

Press appropriate touch control switch (A) I through V to program each SCV. Adjust flow rate with flow control knob (B). Set detent time with time detent knob (C).



A—Touch Control Switch
B—Flow Control Knob
C—Time Detent Knob

FUNCTION	FLOW	DETENT (TIME)
Machine Raise/Lower/Fold/CCS	10	SCV set Constant "C" CCS level controlled with CCS valve.
Independent Markers/Drawbar	Start at 5	10 seconds or as required for full extend/retract
Variable Rate Drive (If equipped)	10	Constant "C"
Vacuum Motors (Connected to Separate SCV's and Controlled with Cab Functions)	Start at 4.0 and adjust as required to obtain desired vacuum pressure	Constant "C"
Vacuum Motors (Connected to One SCV or Power Beyond and Controlled with In Line Valve)	10	Constant "C"

Preparing Machine

Initial Use of CCS System

The very first time a new seed tank is used, coat the inside bottom of bulk seed tanks with a thin layer of talc. Mix triple the amount of talc into the first two or three bushels of seed placed in bulk tank (See USE OF TALC AND GRAPHITE LUBRICANTS section). This will coat the inside of CCS system and hoses with a protective layer of talc to help resist buildup of seed coatings.

OUO6074,0000EC8 -19-01JUN06-1/1

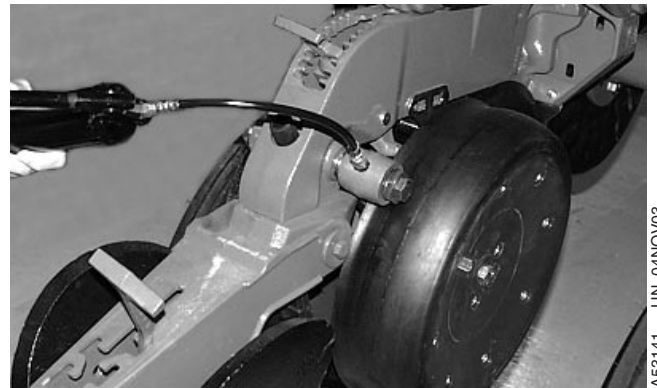
Tightening Hardware

Tighten all cap screws and nuts. See bolt torque charts in Service section.

OUO6023,000139A -19-06MAR01-1/1

Lubrication

Properly lubricate machine and planting units. See Lubrication section.



AG,OUO6074,1171 -19-17MAR04-1/1

Checking Tire Inflation

Tire Pressures	
Tires	Pressure
Transmission drive, turf tire	165 kPa (1.65 bar) (24 psi)

OUO1074,00013F0 -19-04NOV03-1/1

Pro-Series *XP* Vacuum Meter Setup

Vacuum Meter Operating Characteristics

The operating band (gray area) illustrates how vacuum meter performs in relation to desired population (indicated by horizontal line).

Width of band is due to:

- Various sizes and shapes of seeds
- Planting rate variations
- Field Conditions

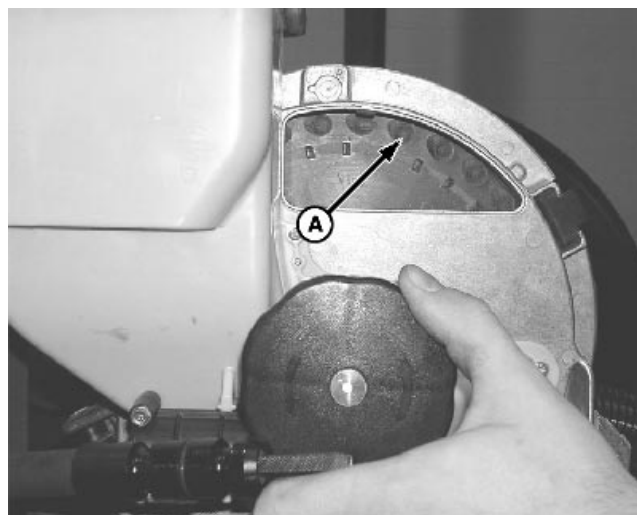
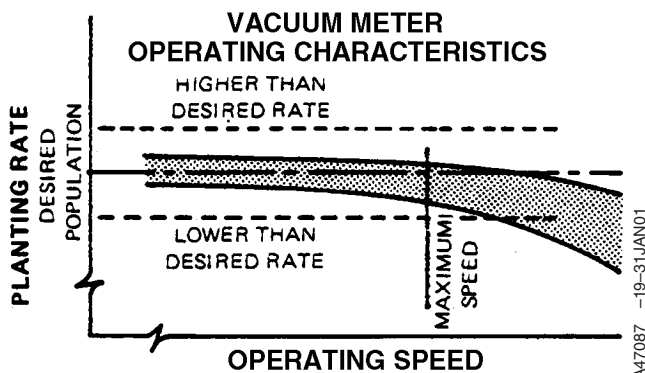
In most cases, vacuum meter planting accuracy does not decline unless maximum planting speed is exceeded.

On the vacuum meter, maximum speed is often a result of field conditions. Rough field conditions can knock seed off seed disks and can cause row unit bounce which can severely affect seed placement. Adding attachments like pneumatic down-force can improve seed placement in rough field conditions.

Always verify the correct seed disk is used for seed being planted. If the seed is unusually sized or shaped, a disk for a different crop may work better. See **SEED DISK RECOMMENDATIONS** in this Section or your John Deere dealer.

If seed varies widely in size and shape, a flat disk and doubles eliminator may provide better population control.

A good way to check for proper seed disk is to remove meter from seed hopper, place seed in meter, connect vacuum hose to meter dome, activate vacuum to recommended level for crop, and turn meter by hand to verify only one seed (A) fits into each cell.



A—Seed

CROP STAND = SEED SINGULATION + SEED PLACEMENT + AGRONOMIC FACTORS

Seed Singulation = Seed Selection + Seed Disk Selection + Vacuum Level + Field Conditions + Maintenance

Seed Placement = Row Unit Maintenance + Speed + Field Conditions + Planter Attachments + Observation & Adjustment

Agonomic Factors = Seed Germination + Soil Temperature + Moisture + Nutrients + Pest Control + Weather

Meter Settings

Crop and disk variations require different brush and double eliminator setup. See following table and

USING DOUBLE ELIMINATOR or CHANGING VACUMETER BRUSH in this section.

Crop	Disk	Single Notch Brush	Double Notch Brush	Double Eliminator Used
Corn	Corn	Yes	No	No
Corn	Sweet Corn	No	Yes	Yes
Sweet Corn	Sweet Corn	No	Yes	Yes
Popcorn	Sunflower /Popcorn or Sorghum	Yes	No	No
Oil Sunflower	Sunflower /Popcorn	Yes	No	No
Confectionary Sunflower	Sweet Corn	No	Yes	Yes
Cotton	Delinted or Hilldrop Cotton	Yes	No	No
Cotton	Edible Bean	No	Yes	Yes
Soybeans	Soybean or Cotton	Yes	No	No
Sorghum or Sugar Beet	Sorghum or Sugar Beet	Yes	No	No

OUO6045,0000708 -19-12JAN06-1/1

Seed Disk Selection Guidelines

IMPORTANT: These seed disk recommendations are based on seed testing from a variety of sources. Because seed size and shape changes from year to year, there is always a possibility that an alternative disk will provide better performance. Consult your John Deere dealer for the most complete and up to date listing of available seed disks and recommendations.

The following seed disk recommendations show a seed size range where optimum performance can be expected with each seed disk. Select a disk which best handles the seed to be planted or best represents the majority of seed sizes to be planted.

If several seed sizes are to be planted and their seed size falls within overlapping areas of two seed disks, it is recommended that BOTH seed disks be ordered to optimize performance to individual seed shape.

The easiest way to determine the proper disk is to place a sample of the seed into the cells of the seed disk. If two seeds easily fit in the cell, a smaller disk should be used. If one seed does not fit properly in the cell, a larger disk should be used. If two disks work well for a particular seed size, always use the smaller disk. It's much easier to increase vacuum to compensate for skips (and rough fields) than to lower vacuum to eliminate doubles as sometimes this can result in doubles and skips.

For seed sizes outside the ranges listed, seed disks for other crops can be used. As with any seed disk change, population and spacing should always be checked in the field.

OUO6074,0000ECD -19-19JUN06-1/1

OPTIMIZING SEED SPACING

Choosing the correct seed disk for the seed being planted is the first step in optimal meter performance. Seed spacing is also dependent on ground conditions, meter speed and ground speed.

IMPORTANT: The row unit can meter seeds in rough ground conditions, at higher metering speeds and higher ground speeds, but at a reduced rate of seed spacing performance. The operator needs to determine if the planting timeline for getting the seed in the ground is more important than achieving optimal spacing.

GROUND CONDITIONS

The rougher the ground conditions during planting, the more seed spacing will vary. Slow down in rougher ground conditions to achieve optimal spacing.

METER SPEED

The higher the meter speed, the more difficult it is to meter the seed at optimal spacing. For higher populations, reduce ground speed to reduce meter speed.

GROUND SPEED

Ground speed directly affects in-ground seed spacing performance. As ground speeds are increased above 8 km/h (5 mph), seed spacing performance will decrease.

OUC6074,0000ED1 -19-20JUN06-1/1

CHECKING METER PERFORMANCE

IMPORTANT: After a Seed Disk is selected, seed singulation checks in the meter and in ground spacing checks are required for determining the level of metering performance. See Checking Seed Population section.

The seed disk selection guidelines are recommendations based on seed testing from a variety of sources. Because of the changes in shape and size from year to year, there is always the possibility that an alternative disk will provide better performance.

OUO6074,0000ED0 -19-21JUN06-1/1

SELECTING THE CORRECT FIELD CORN SEED DISK FOR OPTIMUM PERFORMANCE

Corn Seed Disk Selection Guide					
Seed Shape	Seed/kg (Seed/lb)	Disk Name	Part Number	Number of Cells (Hole Diameter (mm))	If population is hard to control
Non-Uniform (mixed shapes)	Mixed Sizes (Mixed Sizes)	Large Sweet Corn With Double Eliminator	A52391	40 (4.5)	If over or under populating with starting disk, adjust double eliminator
Uniform Flat	Less than 3308 (1500)	Large Sweet Corn With Double Eliminator	A52391	40 (4.5)	If over or under populating with starting disk, adjust double eliminator
Uniform Flat	3308-6175 (1500-2800)	Small Corn Disk	A43215	30 (3.6)	Adjust vacuum first, if unsuccessful, switch to overlapping disk shown in vacuum level chart ^a
Uniform Flat	Greater than 6175 (2800)	Sunflower/ Popcorn	H136478	30 (2.6)	Adjust vacuum first, if unsuccessful, switch to Small Corn Disk (A43215)
Uniform Round	Less than 3308 (1500)	Standard Corn Disk	A52391	30 (3.6)	Adjust vacuum
Uniform Round	3308-6175 (1500-2800)	Small Corn Disk	A43215	30 (3.6)	Adjust vacuum first. if unsuccessful, switch to Standard Corn Disk (A50617)
Uniform Round	Greater than 6175 (2800)	Sunflower/ Popcorn	H136478	30 (2.6)	Adjust vacuum first, if unsuccessful, switch to Small Corn Disk (A43215)

^aFor larger seed sizes that are less than 3970 seeds/kg (1800 seeds/lb), switch to Standard Corn Disk (A50617). If population control problems persists, switch to Large Sweet Corn Disk (A52391) with double eliminator. For smaller seed sizes that are greater than 5072 seeds/kg (2300 seeds/lb), switch to Sunflower/Popcorn Disk (H136478). If population control problem persists, switch to Large Sweet Corn Disk (A52391) with double eliminator.

Use the above **Corn Seed Disk Selection Guide** to determine the recommended seed disk first, and then refer to vacuum level chart for initial vacuum setting.

Most corn seed can be planted near 100 percent of desired population when using small corn or standard corn seed disks (WHICH HAVE SEED CELLS) and properly adjusted vacuum level.

Using cell-type disks (Small and Standard Corn Seed Disks) requires careful selection for proper performance.

Metering performance is directly dependent on the consistency of seed sizing. Seeds that are mixed in shape and size will not perform optimally with cell-type disks. The Large Sweet Corn Disk (A52391) with double eliminator will be required for optimum seed singulation and seed release for seed sizing that is variable.

For seed sizes that overlap the Small Corn Disk (A43215) and the Standard Corn Disk (A50617), choose the Small Corn Disk for initial setting. If population is difficult to control, switch to Standard Corn Disk.

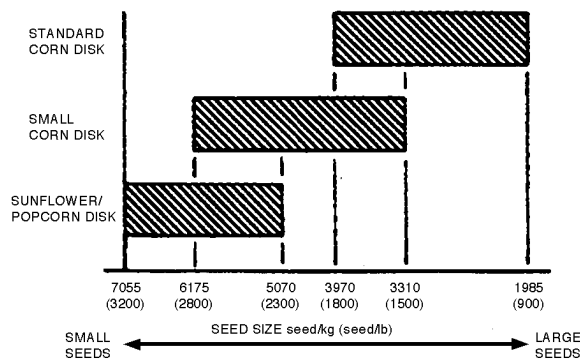
DIFFICULT TO PLANT SEEDS

- Difficult seeds to plant include varieties with mixed sizes, mixed shapes, combinations of sizes and shapes, long and slender seeds, seeds with a sharp point (germ) and others.
- Large Sweet Corn disk and Small Sweet Corn disk are two flat-seed disks which can be used for improved seed singulation with difficult to plant seeds. Sweet corn disks require higher vacuum levels than cell type disks and require the installation of a double eliminator and knockout wheel in each meter assembly.
- Sweet corn disks have 40 holes per revolution. Set seed transmission according to population rate charts for Sweet Corn when using either Sweet Corn Disk. Overpopulating will result if cell-type corn charts are used, as those disks have 30 cells.
- Well graded seed also requires proper seed disk selection for optimal performance.

PLANTING CORN IN HILLSIDE CONDITIONS

In hillside conditions, changing direction of planting can affect performance. Planting with the left side of the machine on the downhill can result in skips due to the seeds being pulled away from the seed disk and a smaller seed puddle next to the seed disk. With the right side of the machine downhill, overpopulation can result due to the seed being pushed against the seed disk and a larger seed puddle next to the seed disk. To maximize vacuum meter performance on hillsides, follow these steps:

- Use the smallest seed disk possible. By using a smaller seed disk there is less opportunity for doubles.
- Use round seed. By using round seed instead of flats, there is a better chance for seed to stay in the cell and reduced chances for doubles.



Overlapping Seed Disk Chart

A58156 -19-13JUN06

- Use a flat disk with double eliminator. In some cases, round seed may not be available for the preferred seed variety or hillsides may be steep enough to require a flat type seed disk. The flat disk HAS NO SEED CELLS and requires the use of higher vacuum levels, a double eliminator and a knockout wheel. The double eliminator is used to knock off excess seed while knockout wheel is used to keep vacuum holes free of debris.
- Set seed transmission according to population rate charts for Sweet Corn when using the Sweet Corn disk. Overpopulating will result if cell-type corn charts are used as those disks have 30 cells.

OUO6074,0000ECE -19-22JUN06-3/3

Seed Disk Recommendations For Crops Other Than Field Corn

SWEET CORN (Flat Disk)

Disk Name	Part Number	Seed/kg	Seed/lb	Number of Cells	Hole Diameter (mm)
Large Sweet Corn	A52391	<8600	<3900	40	4.5
Small Sweet Corn	A52390	>7700	>3500	40	3.75

POPCORN

Disk Name	Part Number	Seed/kg	Seed/lb	Number of Cells	Hole Diameter (mm)
Sunflower/ Popcorn	H136478	5500 to 9900	2500 to 4500	30	2.6
Sorghum	A43066	>9900	>4500	45	1.5

On difficult to plant seeds use of the Small Sweet Corn disk (Part No. A52390) may improve performance.

In some cases a Small Corn (Part No. A43215) or Sunflower (Part No. H136478) cell type disk may provide satisfactory performance depending upon seed size and shape.

CONFECTIONARY SUNFLOWER

Disk Name	Part Number	Seed/kg	Seed/lb	Number of Cells	Hole Diameter (mm)
Large Sweet Corn Flat Type with Double Eliminator	A52391	5000 to 7200	2250 to 3250	40	4.5
Small Sweet Corn Flat Type with Double Eliminator	A52390	7200 to 11 600	3250 to 5250	40	3.75

OIL SUNFLOWER

Disk Name	Part Number	Seed Sizes	Number of Cells	Hole Diameter (mm)
Sunflower/ Popcorn	H136478	4 (Small) 3 (Medium) 2 (Large)	30	2.6

For oil sunflower seed sizes 1 (Extra Large) and 5 (Extra Small) see the recommendations above for confectionary sunflowers. Part No. H136478 is recommended for oil sunflower seed sizes 4 (small), 3 (medium) and 2 (large). This disk is NOT recommended for oil sunflower seed sizes 1 (extra large) and 5 (extra small) or confectionary sunflower seeds.

DRILLED COTTON

Disk Name	Part Number	Seed/kg	Seed/lb	Number of Cells	Hole Diameter (mm)
Acid Delinted Cotton	A56251	8800 to 13 200	4000 to 6000	64	2.5

For small seeds that result in doubles on the Acid-Delinted Cotton disk, using a Small Edible Bean Disk (Part No. A52903) with Double Eliminator is recommended.

4-CELL HILLDROP COTTON

Disk Name	Part Number	Seed/kg	Seed/lb	Number of Cells	Hole Diameter (mm)
4-Cell Hilldrop	A65622	8800 to 13 200	4000 to 6000	48	2.5

For small seeds that result in dropping more than four seeds, use of the 2-Cell Hilldrop Cotton disk is recommended.

Continued on next page

OUO6074,0000C40 -19-22JUN06-2/4

2-CELL HILLDROP COTTON

Disk Name	Part Number	Seed/kg	Seed/lb	Number of Cells	Hole Diameter (mm)
2-Cell Hilldrop	A74961	8800 to 13 200	4000 to 6000	64	2.5

COTTON USING EDIBLE BEAN - Flat Disk A52903 Small

Cotton Seed	Seeds/kg	Seeds/lb	Number of Cells	Hole Diameter (mm)
Small	3520 to 7260	1600 to 3300	50	3.75

Small cotton seed can also be planted using this disk when cotton disks result in doubles (double eliminator is recommended).

SOYBEANS

Disk Name	Part Number	Seed/kg	Seed/lb	Number of Cells	Hole Diameter (mm)
Soybean	A42586	Below 7700	Below 3500	108	4.4
Cotton	A56251	Above 7700	Above 3500	64	2.5

For smaller seed sizes that result in doubles, a Cotton Seed disk (Part No. A56251) can provide improved performance.

LOW-RATE SORGHUM

Disk Name	Part Number	Seed/kg	Seed/lb	Number of Cells	Hole Diameter (mm)
Low-Rate Sorghum	A43066	22 000 to 35 300	10 000 to 16 000	45	1.5

For smaller seed sizes that result in doubles, a Medium Sugar Beet disk (Part No. H136445) or a Small Sugar Beet disk (Part No. A51712) can provide improved performance.

HIGH-RATE SORGHUM

Disk Name	Part Number	Seed/kg	Seed/lb	Number of Cells	Hole Diameter (mm)
High-Rate Sorghum	A52802	22 000 to 35 300	10 000 to 16 000	90	1.5

SORGHUM USING SUGAR BEET DISK

Disk Name	Part Number	Seed Size	Number of Cells	Hole Diameter (mm)
Small Sugar Beet	A51712	2.6—3.2 mm Seed	45	1.5
Small and Medium Sugar Beet	H136445	3.0—4.0 mm Seed	45	1.5

BLANK SEED DISK

Part No. A52554

The blank seed disk allows custom drilling of specific hole sizes for specialty crops. See your John Deere dealer for details.

OUO6074,0000C40 -19-22JUN06-4/4

Install Hopper Extensions

NOTE: When sugar beets are used or when using seed not approved for CCS bulk tank delivery, the seed must be added to the hoppers not the CCS tanks. The extensions allow for more seeds to be planted. Extensions can be used when planting seed plots.

Disable CCS fan when using the mini-hopper.

1. Turn CCS fan flow control valve handle (A) (clockwise) to disable CCS fan.

A—Flow Control Valve Handle



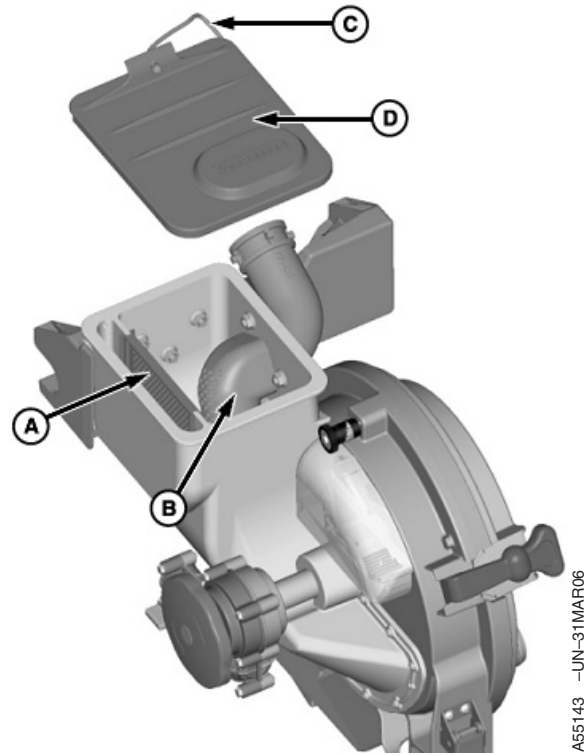
A54384 -UN-28MAY04

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OUO6435,0001DC1 -19-10MAR06-1/3

2. Remove screened divider (A), discharge elbow (B) and tether (C) from lid (D).

A—Screened Divider
B—Discharge Elbow
C—Tether
D—Lid



A55143 -UN-31MAR06

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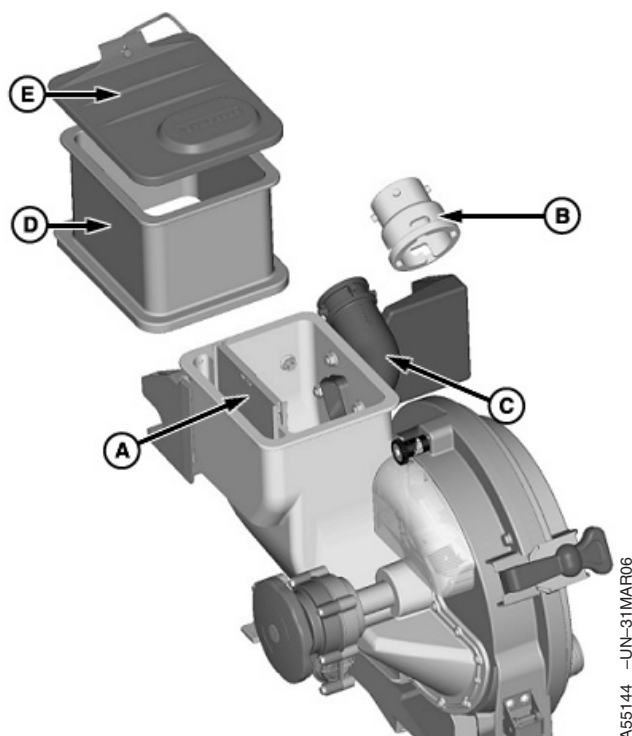
OOU6435,0001DC1 -19-10MAR06-2/3

NOTE: Do not install more than two extensions onto a mini-hopper. If two extensions are added, cap (B) should be ordered from parts and installed onto the CCS elbow (C). The cap will prevent seed from flowing back into the CCS hose.

3. Install non-screened divider (A), one or two extensions (D) onto the mini-hopper, and lid (E) onto the upper extension.

NOTE: Hopper extensions can be left on the mini-hopper when using CCS delivery system. To use the CCS system, install vented screen removed in step 2 and reset CCS fan speed. If solid screen is not replaced, the mini-hopper will be overfilled by the CCS system and seed will spill out of the mini-hopper.

A—Non-Screened Divider
B—Cap
C—Elbow
D—Extension
E—Lid



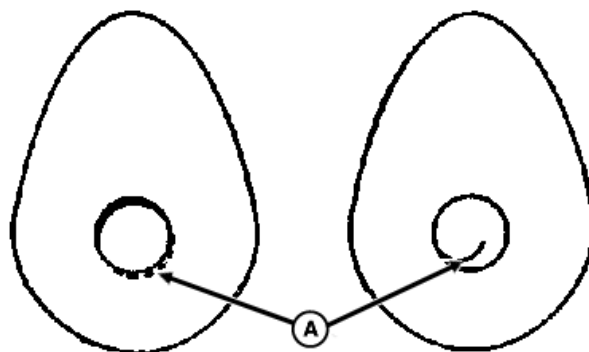
OQO6435,0001DC1 -19-10MAR06-3/3

Checking Seed Disk Cell

NOTE: Perform a field check to determine seed meter accuracy. It is not necessary to replace any seed disk if metering performance is satisfactory.

Check seed cell and hole for flash (A) (particles of material left behind in molding process). Remove any flash before installing seed disk. If flash can not be easily removed, disk should be replaced.

A—Flash

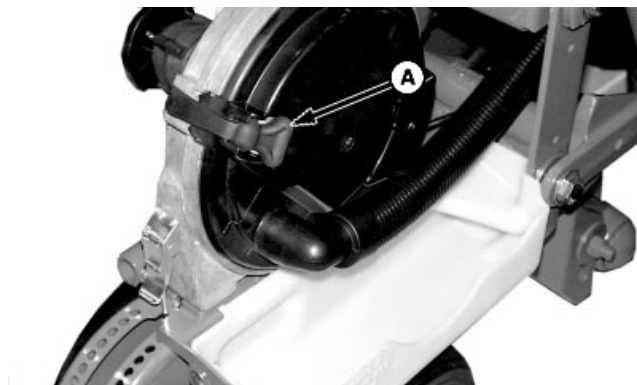


OQO6045,00006D2 -19-12JAN06-1/1

Accessing The Vacuum Meter

With PRO-SERIES XP Row Units, the vacuum meter is already exposed. Unhook rubber strap (A) and open meter door.

A—Rubber Strap



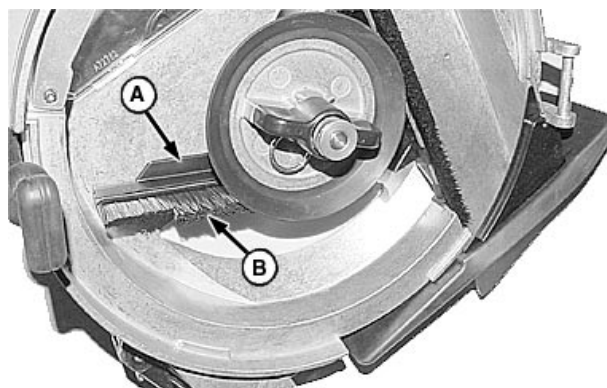
A49693 —UN-03DEC02

OUC6045,00006D3 —19-12JAN06-1/1

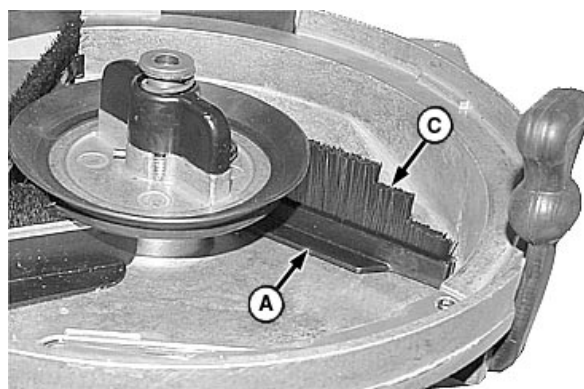
Changing Vacuum Meter Brush

1. Open vacuum meter and remove seed disk.
2. Firmly hold brush holder (A) against meter housing with one hand while pulling brush from holder with other hand.
3. Install appropriate brush.
 - Install single notch brush (B) when double eliminator is NOT used.
 - Install double notch brush (C) when double eliminator IS used.

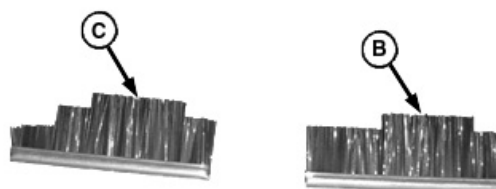
A—Brush Holder
B—Single Notch Brush
C—Double Notch Brush



A53448 —UN-05DEC03



A53449 —UN-05DEC03



A53450 —UN-05DEC03

OUC6045,00006D4 —19-12JAN06-1/1

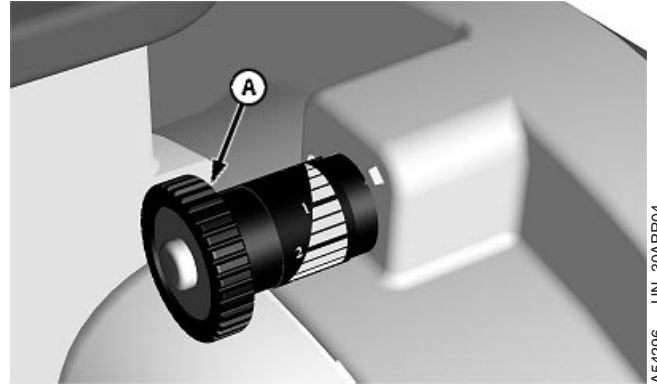
Using Double Eliminator

NOTE: When using the Double Eliminator, set vacuum level to approximately 15 and install double notch brush (B). See *CHANGING VACUUM METER BRUSH* in this section.

The double eliminator “saw-tooth design” gradually covers part of hole and removes any extra seeds (doubles) on the seed disk. Double eliminator should be used with flat-type seed disks. There are two classifications of flat type seed disks, Sweet Corn and Edible Bean disks. Use the following table for initial dial (A) setting.

Double Eliminator Initial Setting	
Seed Disk Classification	Double Eliminator Initial Setting
Sweet Corn Disks: A52390 A52391	1
Edible Bean Disks: A52878 A52904 A52903	2

A—Dial
B—Double Notch Brush



Double Eliminator Dial

A54296 –UN–30APR04



Double Notch Brush

A54299 –UN–30APR04

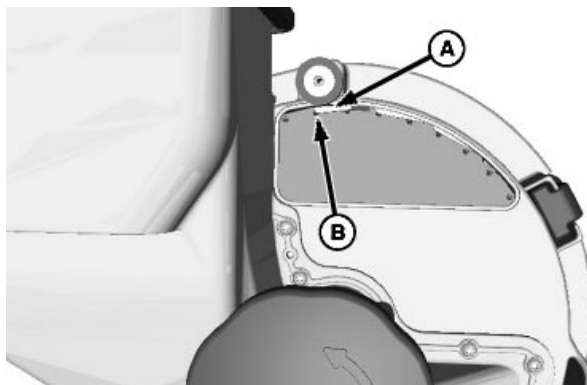
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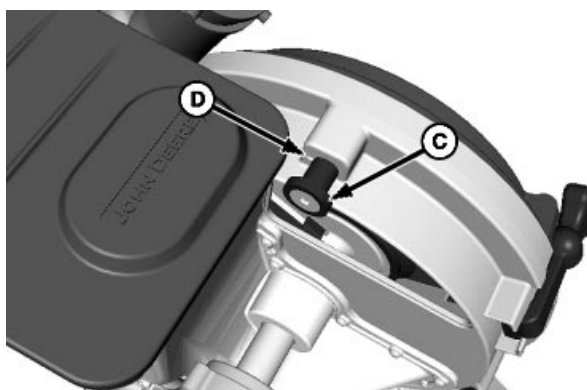
1. Verify that double eliminator (A) is covering 50 percent of seed disk hole (B).

NOTE: Make initial adjustments to one row and adjust all other rows the same.

2. To adjust double eliminator, apply outward pressure and turn double eliminator adjusting knob (C) until double eliminator is covering 50 percent of seed disk hole.
3. With vacuum running, disconnect the pro shaft drive cable and rotate the meter by hand. Verify only one seed remains on each hole of the seed disk after passing the double eliminator. Adjust accordingly.
4. Note decal setting (D) and adjust other rows accordingly.
5. Using a seed monitor, plant a distance long enough to get an average row population for every row.
6. If there is a row with a high population, adjust double eliminator to cover a little more of seed disk hole. If there is a row with a low population, adjust double eliminator to cover a little less of seed disk hole.
7. Repeat process until row population is relatively even across rows.



A52494 -UN-29JUL03



A52493 -UN-29JUL03

A—Double Eliminator
B—Seed Disk Hole
C—Adjusting Knob
D—Decal Setting

OUO6045,00006D5 -19-12JAN06-2/2

Seed Knockout Wheel

The seed knockout wheel (A) is used to ensure that certain seed types are fully released from 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. Some sorghum seed contains large amounts of foreign material which can also become trapped in cell or cell holes.

A—Seed Knockout Wheel



A51650 -UN-04FEB03

OUO6045,00006D6 -19-12JAN06-1/1

Installing Knockout Wheel Assembly

NOTE: The knockout wheel (A) is used to insure that irregular shaped seeds are fully released from vacuum hole. Wheel projections engage vacuum holes, forcing all seeds and foreign material to be ejected.

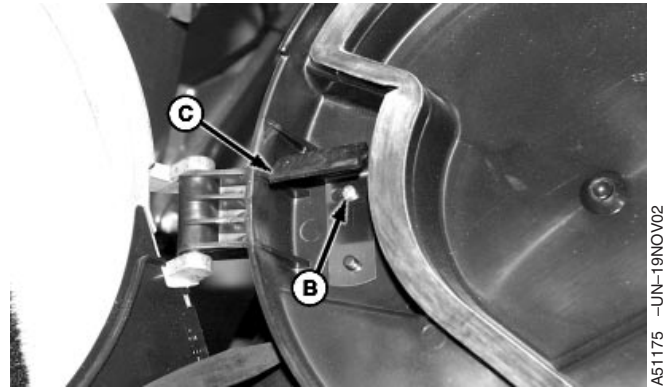
1. Open vacuum meter. See ACCESSING THE VACUUM METER in this section.
2. Loosen screw (B) and remove wiper assembly (C).
3. Install knockout assembly (D) with screw (B).

NOTE: When closing dome, verify wheel is running in the track on seed disk.

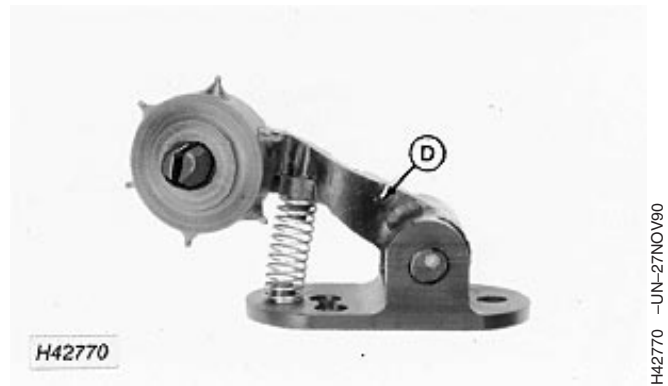
A—Knockout Wheel
B—Screw
C—Wiper Assembly
D—Knockout Assembly



A51650 -UN-04FEB03

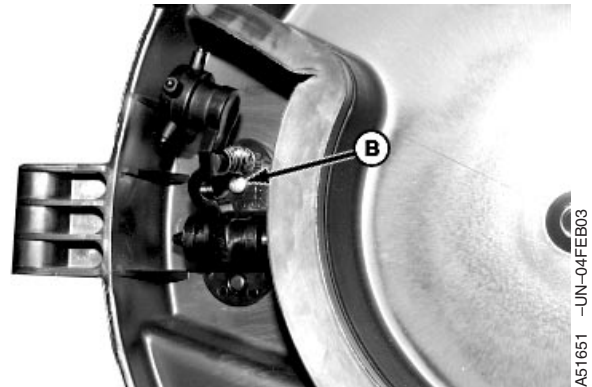


A51175 -UN-19NOV02



H42770 -UN-27NOV90

Knockout Assembly For Corn and Sorghum Shown



A51651 -UN-04FEB03

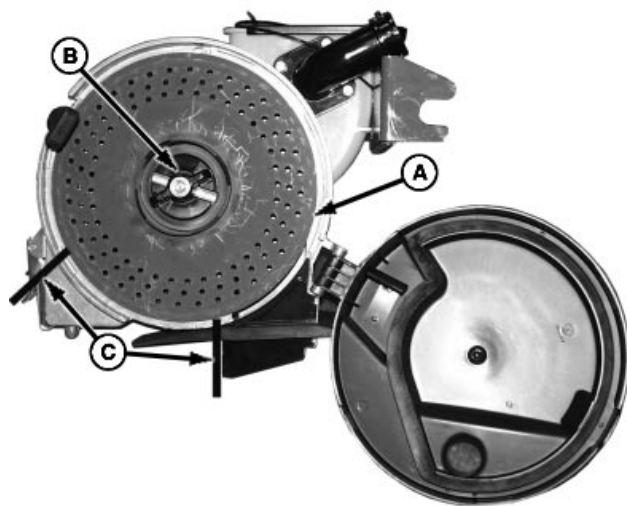
Installing Seed Disk

1. Open vacuum meter.
2. Fit seed disk (A) into housing. Hold seed disk stationary and rotate hub handle (B).

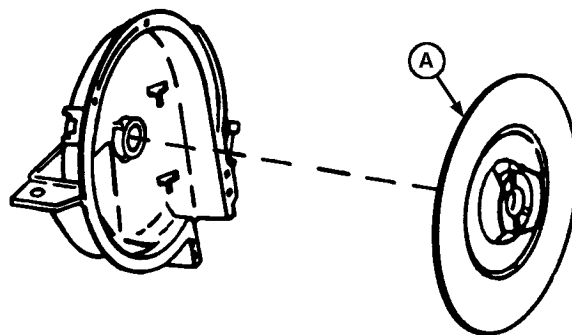
NOTE: Seed disk should turn smoothly with light contact between seed disk (A) and meter housing. Seed should not leak around circumference of meter. When planting small seed, such as sorghum, seed disk must lightly contact housing to prevent seed leakage.

3. Turn seed disk by hand and check gap between seed disk and meter housing in section (C). If disk rubs too hard against housing, or if seed leaks through gap, adjust hub position. See ADJUSTING METER HUB in this section.

A—Seed Disk
B—Hub Handle
C—Section



A50297 -UN-11OCT02



A46247 -UN-13JUN00

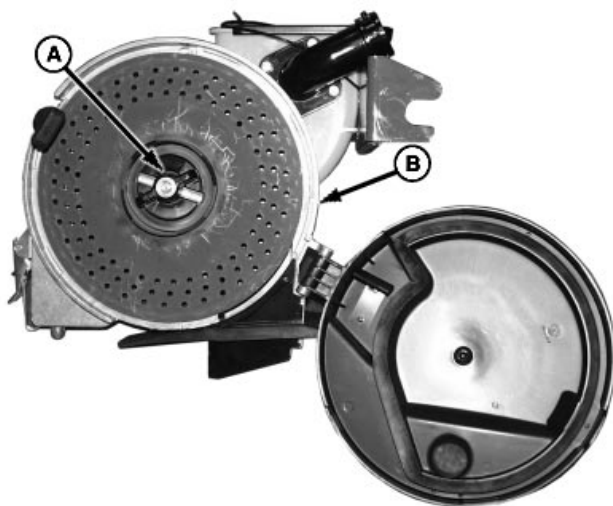
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Adjusting Meter Hub

If gap is too large or disk turns too hard, adjust meter hub as follows:

1. Open vacuum meter.
2. Turn hub handle (A) counterclockwise. Remove seed disk (B) from housing.

A—Hub Handle
B—Seed Disk



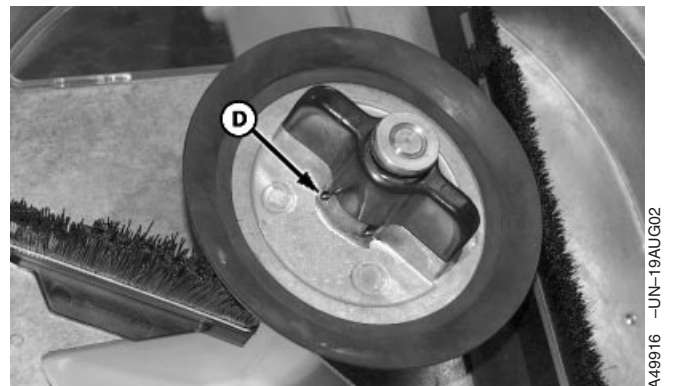
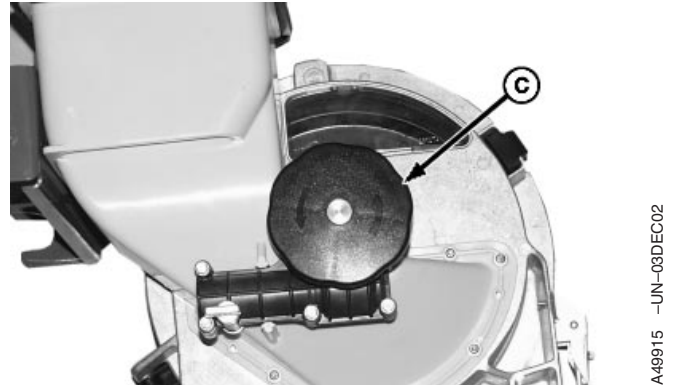
A50298 -UN-11OCT02

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OUO6045,00006D9 -19-12JAN06-1/3

3. Remove spring locking pin (A).
4. Adjust hub (B) as follows:
 - a. Hold meter hub handle (C).
 - b. Turn hub (B) clockwise to move seed disk closer to meter housing or counterclockwise to move seed disk further from meter housing.
5. Turn hub until slot (D) aligns with hole in shaft and install spring locking pin (A).

A—Spring Locking Pin
B—Hub
C—Meter Hub Handle
D—Slot



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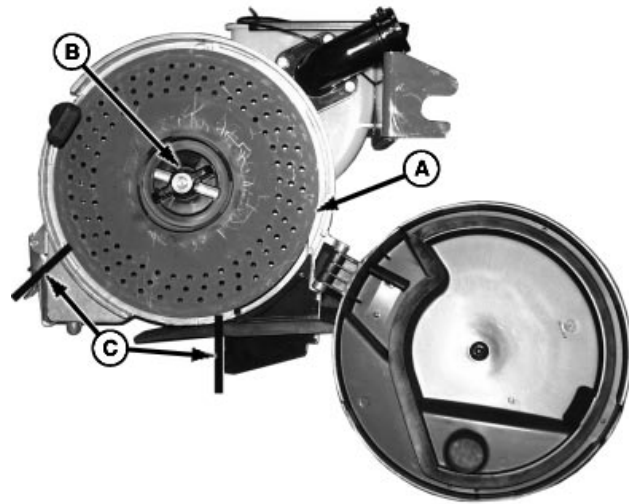
OUO6045.00006D9 -19-12JAN06-2/3

6. Fit seed disk (A) into housing. Hold seed disk stationary and rotate hub handle (B).

NOTE: Seed disk should turn smoothly with light contact between seed disk (A) and meter housing. Seed should not leak around circumference of meter. When planting small seed such as sorghum or sugar beets, seed disk must lightly contact meter housing to prevent seed leakage.

7. Turn seed disk by hand and check gap between seed disk and meter housing in section (C). If disk turns too hard or if seed leaks through gap, repeat procedure.

A—Seed Disk
B—Hub Handle
C—Section



A50297 -JUN-11OCT02

OUO6045,00006D9 -19-12JAN06-3/3

MaxEmerge *XP* Vacuum Meter Setup

Vacuum Meter Operating Characteristics

The operating band (gray area) illustrates how vacuum meter performs in relation to desired population (indicated by horizontal line).

Width of band is due to:

- Various sizes and shapes of seeds
- Planting rate variations
- Field Conditions

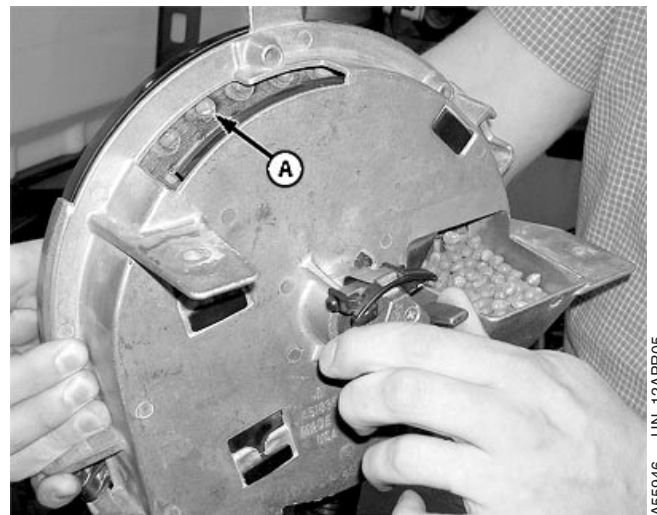
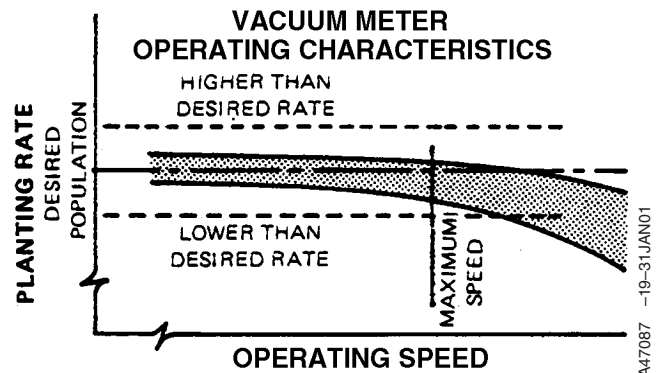
In most cases, vacuum meter planting accuracy does not decline unless maximum planting speed is exceeded.

On the vacuum meter, maximum speed is often a result of field conditions. Rough field conditions can knock seed off seed disks and can cause row unit bounce which can severely affect seed placement. Adding attachments like pneumatic down-force can improve seed placement in rough field conditions.

Always verify the correct seed disk is used for seed being planted. If the seed is unusually sized or shaped, a disk for a different crop may work better. See **SEED DISK RECOMMENDATIONS** in this Section or your John Deere dealer.

If seed varies widely in size and shape, a flat disk and doubles eliminator may provide better population control.

A good way to check for proper seed disk is to remove meter from seed hopper, place seed in meter, connect vacuum hose to meter dome, activate vacuum to recommended level for crop, and turn meter by hand to verify only one seed (A) fits into each cell.



A—Seed

CROP STAND = SEED SINGULATION + SEED PLACEMENT + AGRONOMIC FACTORS

Seed Singulation = Seed Selection + Seed Disk Selection + Vacuum Level + Field Conditions + Maintenance

Seed Placement = Row Unit Maintenance + Speed + Field Conditions + Planter Attachments + Observation & Adjustment

Agronomic Factors = Seed Germination + Soil Temperature + Moisture + Nutrients + Pest Control + Weather

Meter Settings

This table can be used as a quick reference for some common settings. For additional recommendations and adjustment information, see recommendations and adjustment procedures outlined in this section.

Crop	Disk	Brush	Baffle Position	Doubles Eliminator Initial Setting	Knockout Wheel
Corn	Corn	Long	Upper	See Footnote ^a	No
Corn	Sweet Corn	Long	Upper	Use inner cam slot. See Footnote ^b	Yes
Sweet Corn	Sweet Corn	Long	Upper	Use inner cam slot. See Footnote ^a	Yes
Oil Sunflower	Sunflower / Popcorn	Long	Lower	See Footnote ^a	No
Confectionary Sunflower	Sweet Corn	Long	Upper	Use inner cam slot. See Footnote ^a	Yes
Low Rate Cotton	Cotton 32 Cell	Long	Upper	See Footnote ^a	No
Cotton	Cotton 64 Cell	Long	Upper	See Footnote ^a	No
Cotton	Edible Bean Flat Type	Long	Upper	Use outer cam slot. See Footnote ^a	Yes
Four Seed Cotton Hilldrop	Cotton 48 Cell (4 seed drop)	Short	Upper	See Footnote ^a	No
Two Seed Cotton Hilldrop	Cotton 64 Cell (2 seed drop)	Long	Upper	See Footnote ^a	No
Low Rate Sorghum	Sorghum 45 Cell	Long	Lower	See Footnote ^a	Yes
High Rate Sorghum	Sorghum 90 Cell	Long	Lower	See Footnote ^a	Yes
Sorghum	Sugar Beet	Long	Lower	See Footnote ^a	Yes
Soybean	Soybean	Long	Upper	See Footnote ^a	No
Soybean	Cotton 64 Cell	Long	Upper	See Footnote ^a	No
Sugar Beet	Sugar Beet	Long	lower	See Footnote ^a	Yes
Small Edible Bean	Small Edible Bean Cell Type	Long	Upper	See Footnote ^a	No
Medium Edible Bean	Medium Edible Bean Cell Type	Short	Upper	See Footnote ^a	No
Large Edible Bean	Large Edible Bean Cell Type	Short	Upper	See Footnote ^a	No
Small, Medium and Large Edible Beans	Edible Bean Flat Type	Long	Upper	Use outer cam slot. See Footnote ^a	Yes
Runner and Spanish Peanut	Large Edible Bean Cell Type	Short	Upper	See Footnote ^a	No
Virginia Peanut	Virginia Peanut	Short	Upper	See Footnote ^a	No

^aDouble eliminator not used with this disk. If installed, move tip of eliminator away from center of meter as far as possible.

^bSet eliminator with far right tooth (the one under adjusting screw) covering hole as follows. For seeds between 1980-4400 seeds/kg (900-2000 seeds/lb), set eliminator with tooth covering one quarter of hole. For seeds between 4400-7040 seeds/kg (2000-3200 seeds/lb), set eliminator with tooth covering one half of hole.

Seed Disk Selection Guidelines

IMPORTANT: These seed disk recommendations are based on seed testing from a variety of sources. Because seed size and shape changes from year to year, there is always a possibility that an alternative disk will provide better performance. Consult your John Deere dealer for the most complete and up to date listing of available seed disks and recommendations.

The following seed disk recommendations show a seed size range where optimum performance can be expected with each seed disk. Select a disk which best handles the seed to be planted or best represents the majority of seed sizes to be planted.

If several seed sizes are to be planted and their seed size falls within overlapping areas of two seed disks, it is recommended that BOTH seed disks be ordered to optimize performance to individual seed shape.

The easiest way to determine the proper disk is to place a sample of the seed into the cells of the seed disk. If two seeds easily fit in the cell, a smaller disk should be used. If one seed does not fit properly in the cell, a larger disk should be used. If two disks work well for a particular seed size, always use the smaller disk. It's much easier to increase vacuum to compensate for skips (and rough fields) than to lower vacuum to eliminate doubles as sometimes this can result in doubles and skips.

For seed sizes outside the ranges listed, seed disks for other crops can be used. As with any seed disk change, population and spacing should always be checked in the field.

OUC6074,0000ECD -19-19JUN06-1/1

OPTIMIZING SEED SPACING

Choosing the correct seed disk for the seed being planted is the first step in optimal meter performance. Seed spacing is also dependent on ground conditions, meter speed and ground speed.

IMPORTANT: The row unit can meter seeds in rough ground conditions, at higher metering speeds and higher ground speeds, but at a reduced rate of seed spacing performance. The operator needs to determine if the planting timeline for getting the seed in the ground is more important than achieving optimal spacing.

GROUND CONDITIONS

The rougher the ground conditions during planting, the more seed spacing will vary. Slow down in rougher ground conditions to achieve optimal spacing.

METER SPEED

The higher the meter speed, the more difficult it is to meter the seed at optimal spacing. For higher populations, reduce ground speed to reduce meter speed.

GROUND SPEED

Ground speed directly affects in-ground seed spacing performance. As ground speeds are increased above 8 km/h (5 mph), seed spacing performance will decrease.

OUO6074,0000ED1 -19-20JUN06-1/1

CHECKING METER PERFORMANCE

IMPORTANT: After a Seed Disk is selected, seed singulation checks in the meter and in ground spacing checks are required for determining the level of metering performance. See Checking Seed Population section.

The seed disk selection guidelines are recommendations based on seed testing from a variety of sources. Because of the changes in shape and size from year to year, there is always the possibility that an alternative disk will provide better performance.

OUO6074,0000ED0 -19-21JUN06-1/1

SELECTING THE CORRECT FIELD CORN SEED DISK FOR OPTIMUM PERFORMANCE

Corn Seed Disk Selection Guide					
Seed Shape	Seed/kg (Seed/lb)	Disk Name	Part Number	Number of Cells (Hole Diameter (mm))	If population is hard to control
Non-Uniform (mixed shapes)	Mixed Sizes (Mixed Sizes)	Large Sweet Corn With Double Eliminator	A52391	40 (4.5)	If over or under populating with starting disk, adjust double eliminator
Uniform Flat	Less than 3308 (1500)	Large Sweet Corn With Double Eliminator	A52391	40 (4.5)	If over or under populating with starting disk, adjust double eliminator
Uniform Flat	3308-6175 (1500-2800)	Small Corn Disk	A43215	30 (3.6)	Adjust vacuum first, if unsuccessful, switch to overlapping disk shown in vacuum level chart ^a
Uniform Flat	Greater than 6175 (2800)	Sunflower/ Popcorn	H136478	30 (2.6)	Adjust vacuum first, if unsuccessful, switch to Small Corn Disk (A43215)
Uniform Round	Less than 3308 (1500)	Standard Corn Disk	A52391	30 (3.6)	Adjust vacuum
Uniform Round	3308-6175 (1500-2800)	Small Corn Disk	A43215	30 (3.6)	Adjust vacuum first. if unsuccessful, switch to Standard Corn Disk (A50617)
Uniform Round	Greater than 6175 (2800)	Sunflower/ Popcorn	H136478	30 (2.6)	Adjust vacuum first, if unsuccessful, switch to Small Corn Disk (A43215)

^aFor larger seed sizes that are less than 3970 seeds/kg (1800 seeds/lb), switch to Standard Corn Disk (A50617). If population control problems persists, switch to Large Sweet Corn Disk (A52391) with double eliminator. For smaller seed sizes that are greater than 5072 seeds/kg (2300 seeds/lb), switch to Sunflower/Popcorn Disk (H136478). If population control problem persists, switch to Large Sweet Corn Disk (A52391) with double eliminator.

Use the above **Corn Seed Disk Selection Guide** to determine the recommended seed disk first, and then refer to vacuum level chart for initial vacuum setting.

Most corn seed can be planted near 100 percent of desired population when using small corn or standard corn seed disks (WHICH HAVE SEED CELLS) and properly adjusted vacuum level.

Using cell-type disks (Small and Standard Corn Seed Disks) requires careful selection for proper performance.

Metering performance is directly dependent on the consistency of seed sizing. Seeds that are mixed in shape and size will not perform optimally with cell-type disks. The Large Sweet Corn Disk (A52391) with double eliminator will be required for optimum seed singulation and seed release for seed sizing that is variable.

For seed sizes that overlap the Small Corn Disk (A43215) and the Standard Corn Disk (A50617), choose the Small Corn Disk for initial setting. If population is difficult to control, switch to Standard Corn Disk.

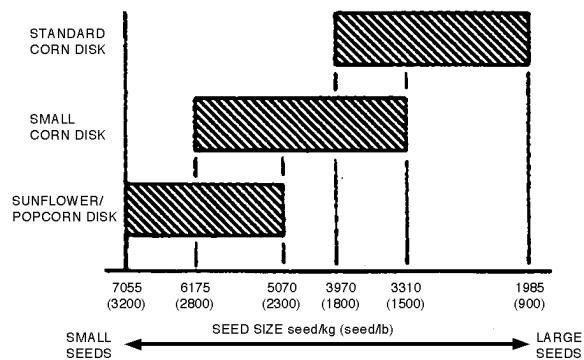
DIFFICULT TO PLANT SEEDS

- Difficult seeds to plant include varieties with mixed sizes, mixed shapes, combinations of sizes and shapes, long and slender seeds, seeds with a sharp point (germ) and others.
- Large Sweet Corn disk and Small Sweet Corn disk are two flat-seed disks which can be used for improved seed singulation with difficult to plant seeds. Sweet corn disks require higher vacuum levels than cell type disks and require the installation of a double eliminator and knockout wheel in each meter assembly.
- Sweet corn disks have 40 holes per revolution. Set seed transmission according to population rate charts for Sweet Corn when using either Sweet Corn Disk. Overpopulating will result if cell-type corn charts are used, as those disks have 30 cells.
- Well graded seed also requires proper seed disk selection for optimal performance.

PLANTING CORN IN HILLSIDE CONDITIONS

In hillside conditions, changing direction of planting can affect performance. Planting with the left side of the machine on the downhill can result in skips due to the seeds being pulled away from the seed disk and a smaller seed puddle next to the seed disk. With the right side of the machine downhill, overpopulation can result due to the seed being pushed against the seed disk and a larger seed puddle next to the seed disk. To maximize vacuum meter performance on hillsides, follow these steps:

- Use the smallest seed disk possible. By using a smaller seed disk there is less opportunity for doubles.
- Use round seed. By using round seed instead of flats, there is a better chance for seed to stay in the cell and reduced chances for doubles.



Overlapping Seed Disk Chart

A58156 -19-13JUN06

- Use a flat disk with double eliminator. In some cases, round seed may not be available for the preferred seed variety or hillsides may be steep enough to require a flat type seed disk. The flat disk HAS NO SEED CELLS and requires the use of higher vacuum levels, a double eliminator and a knockout wheel. The double eliminator is used to knock off excess seed while knockout wheel is used to keep vacuum holes free of debris.
- Set seed transmission according to population rate charts for Sweet Corn when using the Sweet Corn disk. Overpopulating will result if cell-type corn charts are used as those disks have 30 cells.

OUO6074,0000ECE -19-22JUN06-3/3

Seed Disk Recommendations For Crops Other Than Field Corn

SWEET CORN (Flat Disk)

Disk Name	Part Number	Seed/kg	Seed/lb	Number of Cells	Hole Diameter (mm)
Large Sweet Corn	A52391	<8600	<3900	40	4.5
Small Sweet Corn	A52390	>7700	>3500	40	3.75

POPCORN

Disk Name	Part Number	Seed/kg	Seed/lb	Number of Cells	Hole Diameter (mm)
Sunflower/ Popcorn	H136478	5500 to 9900	2500 to 4500	30	2.6
Sorghum	A43066	>9900	>4500	45	1.5

On difficult to plant seeds use of the Small Sweet Corn disk (Part No. A52390) may improve performance.

In some cases a Small Corn (Part No. A43215) or Sunflower (Part No. H136478) cell type disk may provide satisfactory performance depending upon seed size and shape.

CONFECTIONARY SUNFLOWER

Disk Name	Part Number	Seed/kg	Seed/lb	Number of Cells	Hole Diameter (mm)
Large Sweet Corn Flat Type with Double Eliminator	A52391	5000 to 7200	2250 to 3250	40	4.5
Small Sweet Corn Flat Type with Double Eliminator	A52390	7200 to 11 600	3250 to 5250	40	3.75

OIL SUNFLOWER

Disk Name	Part Number	Seed Sizes	Number of Cells	Hole Diameter (mm)
Sunflower/ Popcorn	H136478	4 (Small) 3 (Medium) 2 (Large)	30	2.6

For oil sunflower seed sizes 1 (Extra Large) and 5 (Extra Small) see the recommendations above for confectionary sunflowers. Part No. H136478 is recommended for oil sunflower seed sizes 4 (small), 3 (medium) and 2 (large). This disk is NOT recommended for oil sunflower seed sizes 1 (extra large) and 5 (extra small) or confectionary sunflower seeds.

DRILLED COTTON

Disk Name	Part Number	Seed/kg	Seed/lb	Number of Cells	Hole Diameter (mm)
Acid Delinted Cotton	A56251	8800 to 13 200	4000 to 6000	64	2.5

For small seeds that result in doubles on the Acid-Delinted Cotton disk, using a Small Edible Bean Disk (Part No. A52903) with Double Eliminator is recommended.

4-CELL HILLDROP COTTON

Disk Name	Part Number	Seed/kg	Seed/lb	Number of Cells	Hole Diameter (mm)
4-Cell Hilldrop	A65622	8800 to 13 200	4000 to 6000	48	2.5

For small seeds that result in dropping more than four seeds, use of the 2-Cell Hilldrop Cotton disk is recommended.

Continued on next page

OUO6074.0000ECF -19-22JUN06-2/8

2-CELL HILLDROP COTTON

Disk Name	Part Number	Seed/kg	Seed/lb	Number of Cells	Hole Diameter (mm)
2-Cell Hilldrop	A74961	8800 to 13 200	4000 to 6000	64	2.5

COTTON USING EDIBLE BEAN - Flat Disk A52903 Small

Cotton Seed	Seeds/kg	Seeds/lb	Number of Cells	Hole Diameter (mm)
Small	3520 to 7260	1600 to 3300	50	3.75

Small cotton seed can also be planted using this disk when cotton disks result in doubles (double eliminator is recommended).

SOYBEANS

Disk Name	Part Number	Seed/kg	Seed/lb	Number of Cells	Hole Diameter (mm)
Soybean	A42586	Below 7700	Below 3500	108	4.4
Cotton	A56251	Above 7700	Above 3500	64	2.5

For smaller seed sizes that result in doubles, a Cotton Seed disk (Part No. A56251) can provide improved performance.

LOW-RATE SORGHUM

Disk Name	Part Number	Seed/kg	Seed/lb	Number of Cells	Hole Diameter (mm)
Low-Rate Sorghum	A43066	22 000 to 35 300	10 000 to 16 000	45	1.5

For smaller seed sizes that result in doubles, a Medium Sugar Beet disk (Part No. H136445) or a Small Sugar Beet disk (Part No. A51712) can provide improved performance.

HIGH-RATE SORGHUM

Disk Name	Part Number	Seed/kg	Seed/lb	Number of Cells	Hole Diameter (mm)
High-Rate Sorghum	A52802	22 000 to 35 300	10 000 to 16 000	90	1.5

MONO-GERM SUGAR BEETS

Disk Name	Part Number	Seed Size	Number of Cells	Hole Diameter (mm)
Small Sugar Beet	A51712	2.6—3.2 mm Seed	45	1.5
Small and Medium Sugar Beet	H136445	3.0—3.6 mm Seed	45	1.5
Large Sugar Beet	A51713	3.4—4.0 mm Seed	45	1.6

PELLETED SUGAR BEETS

Disk Name	Part Number	Seed Size	Number of Cells	Hole Diameter (mm)
Small and Medium Sugar Beet	H136445	3.2—4.0 mm Seed	45	1.5
Large Sugar Beet	A51713	3.6—4.6 mm Seed	45	1.5
Sorghum	A43066	3.6—4.6 mm Seed	45	1.5

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OUO6074,0000ECF -19-22JUN06-4/8

SMALL EDIBLE BEAN - Cell Disk H136468

Seed	Seeds/kg	Seeds/lb	Number of Cells	Hole Diameter (mm)
Black Turtle	4180 to 5720	1900 to 2600	108	3.5
Navy	3960 to 5500	1800 to 2500	108	3.5
Pink Viva	3740 to 4290	1700 to 1950	108	3.5
Small White	5280 to 6600	2400 to 3000	108	3.5
Smooth Pea	6160 to 7040	2800 to 3200	108	3.5

MEDIUM EDIBLE BEAN - Cell Disk A51696

Seed	Seeds/kg	Seeds/lb	Number of Cells	Hole Diameter (mm)
Blackeyed Pea	3520 to 4400	1600 to 2000	56	4
Green Beans (Garden)	2200 to 4840	1000 to 2200	56	4
Kidney (Small)	2530 to 3080	1150 to 1400	56	4
Pinto	1760 to 3080	800 to 1400	56	4
Red Mexican (Small)	2640 to 3300	1200 to 1500	56	4
Wrinkle Pea	3960 to 5060	1800 to 2300	56	4

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OUC6074,0000ECF -19-22JUN06-5/8

LARGE EDIBLE BEAN - Cell Disk H136092

Seed	Seeds/kg	Seeds/lb	Number of Cells	Hole Diameter (mm)
Cranberry Bean	1760 to 2640	800 to 1200	50	4.8
Kidney (Medium)	2090 to 2530	950 to 1150	50	4.8
Great Northern	1980 to 2860	900 to 1300	50	4.8
Garbanzo	1650 to 1980	750 to 900	50	4.8
Peanuts (Runner)	1430 to 1760	650 to 800	50	4.8
Peanuts (Spanish)	2200 to 2750	1000 to 1250	50	4.8

EDIBLE BEAN - Flat Disk A52903 Small

Edible Bean Seed - Small	Seeds/kg	Seeds/lb	Number of Cells	Hole Diameter (mm)
Green Garden, Small	3520 to 5280	1600 to 2400	50	3.75
Black Turtle	4180 to 5720	1900 to 2600	50	3.75
Navy	3960 to 5720	1800 to 2600	50	3.75
Small White	5280 to 7260	2400 to 3300	50	3.75
Edible Peas	Seeds/kg	Seeds/lb	Number of Cells	Hole Diameter (mm)
Wrinkle	3740 to 5060	1700 to 2300	50	4.75

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OUO6074.0000ECF -19-22JUN06-6/8

EDIBLE BEAN - Flat Disk A52904 Medium

Edible Bean Seed - Medium	Seeds/kg	Seeds/lb	Number of Cells	Hole Diameter (mm)
Green Garden, Medium	2640 to 3520	1200 to 1600	50	4.5
Small Red	2640 to 3300	1200 to 1500	50	4.5
Pinto	All Sizes		50	4.5
Medium Kidney	2530 to 3080	1150 to 1400	50	4.5
Lima	2640 to 3520	1200 to 1600	50	4.5
Corn Seed	3300 to 7040	1500 to 3200	50	4.5
Pink Viva	3740 to 4180	1700 to 1900	50	4.5
Edible Peas	Seeds/kg	Seeds/lb	Number of Cells	Hole Diameter (mm)
Blackeyed	3520 to 4400	1600 to 2000	50	4.5
Smooth	6160 to 7040	2800 to 3200	50	4.5

EDIBLE BEAN - Flat Disk A52878 Large

Edible Bean Seed - Large	Seeds/kg	Seeds/lb	Number of Cells	Hole Diameter (mm)
Green Garden, Large	1540 to 2640	700 to 1200	50	5.0
Cranberry	1760 to 2640	800 to 1200	50	5.0
Large Kidney	1870 to 2530	850 to 1150	50	5.0
Great Northern	1980 to 2860	900 to 1300	50	5.0
Garbanzo	1650 to 1980	750 to 900	50	5.0

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OUO6074,0000ECF -19-22JUN06-7/8

VIRGINIA PEANUT

Part No. H138722 is recommended for seed sizes ranging from 1100 seeds/kg to 1760 seeds/kg (500 seeds/lb to 800 seeds/lb). It has 46 cells with 5.3 mm diameter holes.

BLANK SEED DISK

Part No. A52554

The blank seed disk allows custom drilling of specific hole sizes for specialty crops. See your John Deere dealer for details.

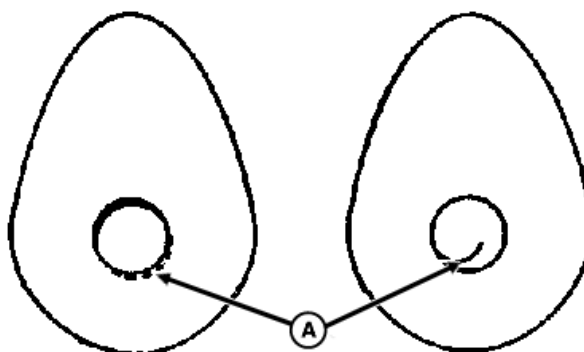
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Checking Seed Disk Cell

NOTE: Perform a field check to determine seed meter accuracy. It is not necessary to replace any seed disk if metering performance is satisfactory.

Check seed cell and hole for flash (A) (particles of material left behind in molding process). Remove any flash before installing seed disk. If flash can not be easily removed, disk should be replaced.

A—Flash



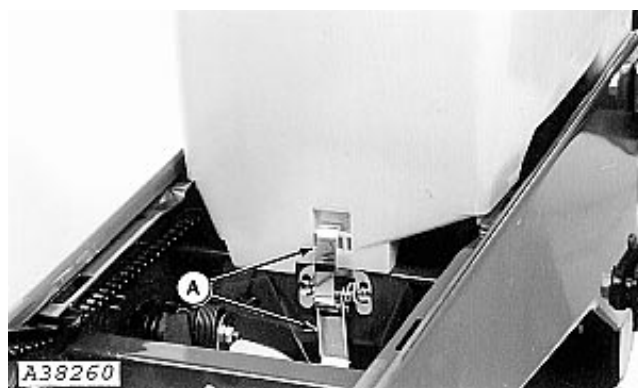
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Accessing The Vacuum Meter

1. Disengage hopper latch (A). Lift hopper upward then rearward to remove from planting unit.

A—Hopper Latch



A38260 -UN-27NOV95

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2. Remove vacuum hose (A) from metering unit.

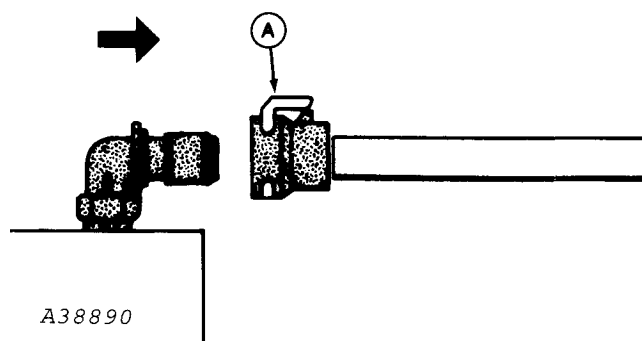
A—Vacuum Hose



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3. Squeeze retainer (A) and pull vacuum monitoring hose out of connector on units attached to monitor.

A—Retainer

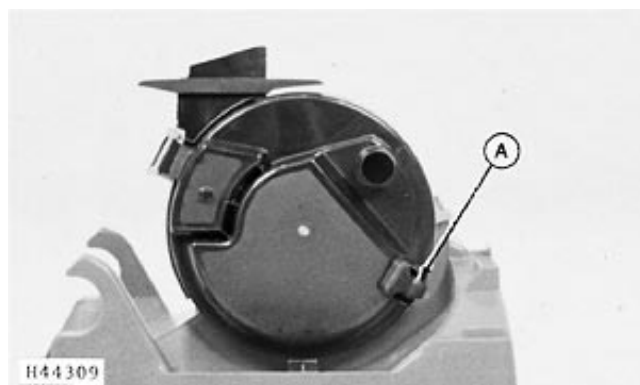


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IMPORTANT: Use precautions as recommended by chemical manufacturers when handling parts coated with seed treatments. Use proper skin, eye and respiratory protection.

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

A—Handle



AG,OUO6074,1177 -19-26JUN06-4/4

Adjusting Vacuum Meter Baffle

1. Open vacuum meter. See ACCESSING THE VACUUM METER in this section.

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

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

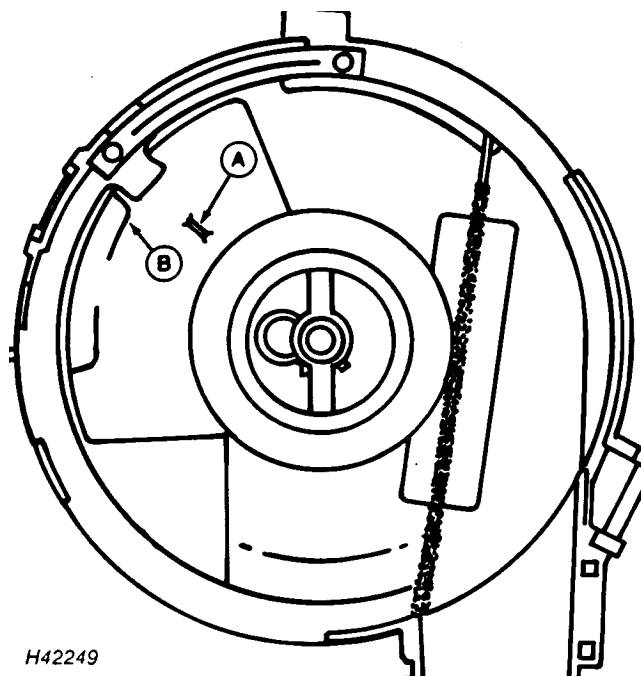
2. Move tab (A) to the position recommended in the Vacuum Meter Rate Charts section.

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

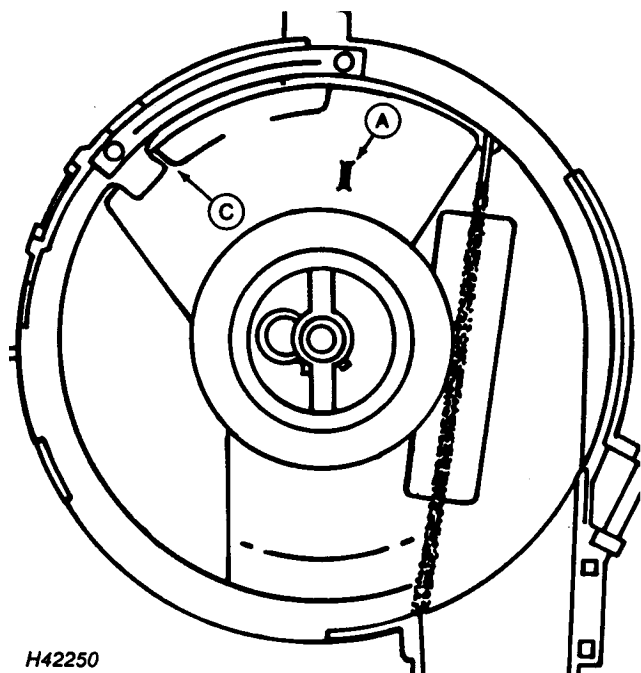
NOTE: Lowering the baffle will NOT eliminate overfilling of vacuum meter caused by extremely rough field conditions. Increase down force on row unit and reduce planting speed.

Overfilling of meter may occur if planting on hillsides. This may cause seed disk fins to carry seed over brush into seed tube and result in high population. When planting in hillside conditions, use of round seeds and in some cases flat disks will provide the best performance. If these conditions occur, reduce planting speed.

A—Tab
B—Lower Position
C—Upper Position



Lower Baffle Position



Upper Baffle Position

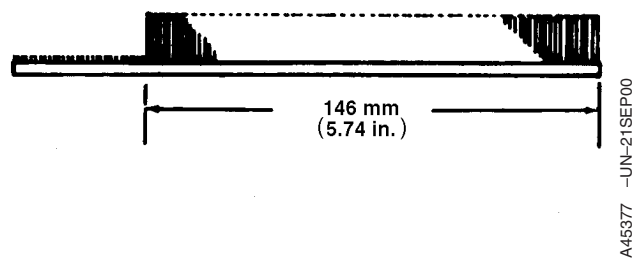
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Selecting Correct Vacuum Meter Brush

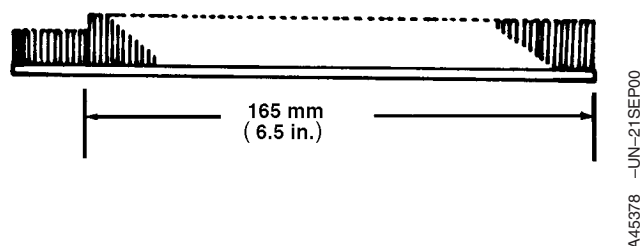
An incorrect vacuum meter brush will cause under population of edible beans, peanuts and hilldrop cotton.

Two vacuum meter brushes are available:

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



Short Brush



Regular (Long) Brush

OUO6074.0000C02 -19-12JAN06-1/1

Changing Vacuum Meter Brush

1. Open vacuum meter. See ACCESSING THE VACUUM METER in this section.
2. Remove existing brush.
3. Install either the long or short brush as recommended in the Vacuum Meter Rate Charts section.

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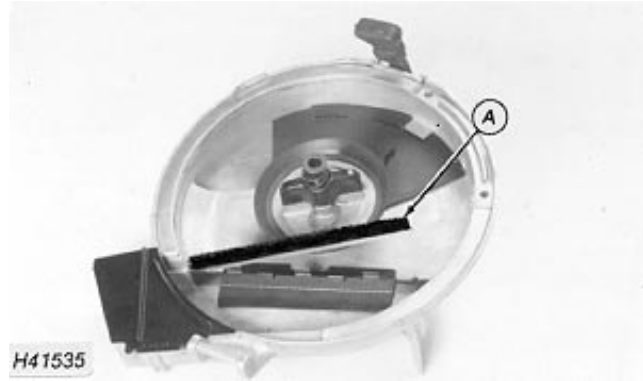
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NOTE: Brush must be installed with notch (A) on side shown for proper operation.

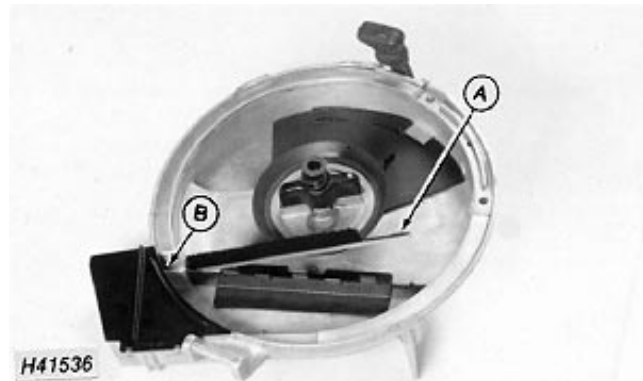
4. Snap brush into slot until it contacts side of meter housing (B).

A—Notch

B—Meter Housing



Long Brush Shown



Short Brush Shown

AG,OUO6074,1186 -19-12JAN06-2/2

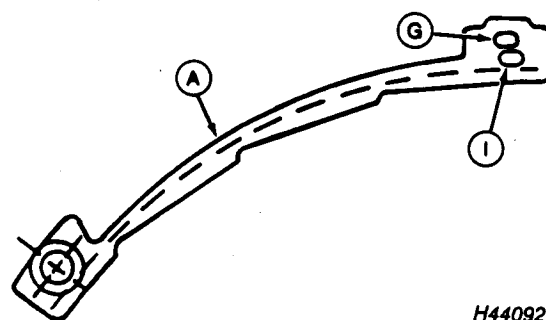
Installing Double Eliminator for Sweet Corn and Edible-Bean—Flat Type Seed Disks

NOTE: Double eliminator (A) is used to displace any extra seeds carried in vacuum hole. “Saw-tooth design” gradually covers part of vacuum hole.

Hole (I) is used for sweet corn disk. Hole (G) is used for the edible bean disk.

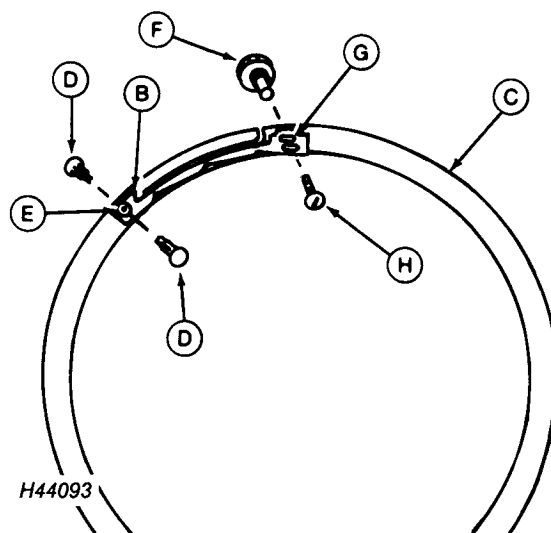
1. Open vacuum meter. See ACCESSING THE VACUUM METER in this section.
2. Remove meter from hopper. Save wing nuts for reassembly of meter.
3. Install double eliminator (B) in housing (C).
4. Insert dual-lock fasteners (D) through housing and hole (E) of double eliminator (B).
5. Insert cam nut (F) and screw (H) through hole (I) or (G) (depending on seed disk). DO NOT tighten.

A—Double Eliminator
B—Double Eliminator
C—Housing
D—Fasteners
E—Hole, Dual-Lock Fastener
F—Cam Nut
G—Hole
H—Screw
I—Hole, Sweet Corn



H44092

H44092 -UN-27APR93



H44093

H44093 -UN-27APR93

Continued on next page

OUC6074.000083C -19-12JAN06-1/2

6. Install sweet corn or edible-bean disk (A) and attach with hub handle.

NOTE: Seed disk should turn smoothly with light contact or small gap between seed disk and housing. Turn seed disk by hand and check gap between seed disk and housing. Seed should NOT leak around circumference of meter.

7. Turn seed disk by hand and check gap between seed disk and meter housing in section (B). If disk turns too hard or if seed leaks through gap, adjust hub position. See ADJUSTING METER HUB in this section.

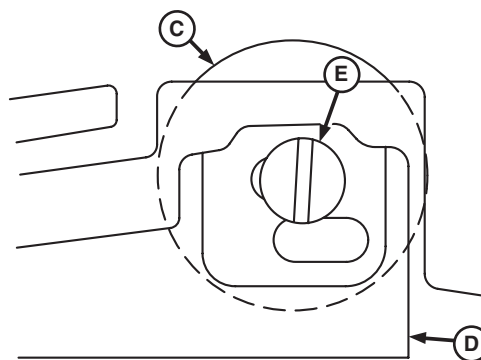
8. Turn cam nut (C) to increase or decrease vacuum hole coverage. The object is to cause double eliminator (D) to knock doubles off disk but not knock singles off. When double eliminator is in position, tighten screw (E). Set all rows the same.

9. Close meter and attach to hopper using wing nuts previously removed.

A—Disk
B—Gap
C—Cam Nut
D—Double Eliminator
E—Screw



A51174 -UN-19NOV02



A47075 -UN-31JAN01

OUO6074,000083C -19-12JAN06-2/2

Seed Knockout Wheel

The seed knockout wheel (A) is used to ensure that certain seed types are fully released from 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.



A51650 -UN-04FEB03

A—Seed Knockout Wheel

AG,OUO6074,1180 -19-12JAN06-1/1

Installing Knockout Wheel Assembly

NOTE: The knockout wheel (A) is used to insure that irregular shaped seeds are fully released from vacuum hole. Wheel projections engage vacuum holes, forcing all seeds and foreign material to be ejected.

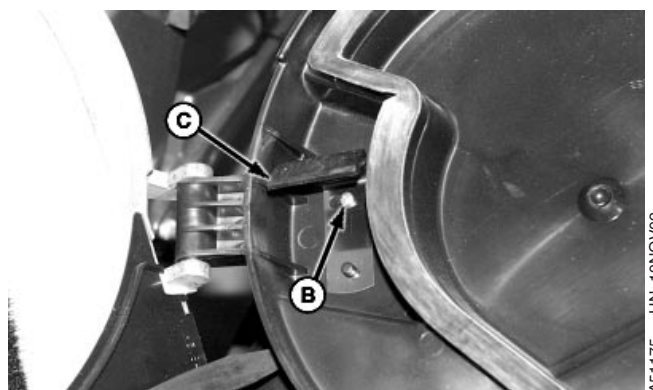
1. Open vacuum meter. See ACCESSING THE VACUUM METER in this section.
2. Loosen screw (B) and remove wiper assembly (C).
3. Install knockout assembly (D) with screw (B).

NOTE: When closing dome, verify wheel is running in the track on seed disk.

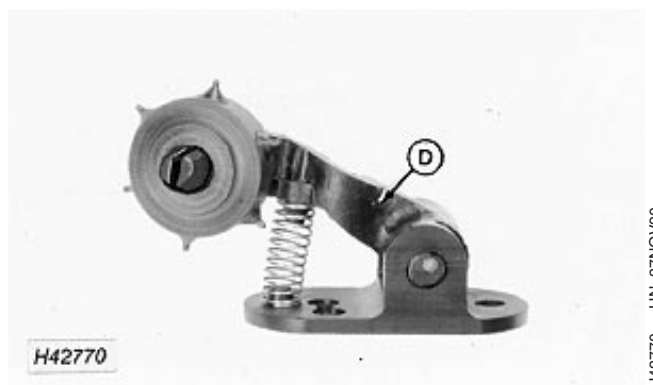
A—Knockout Wheel
B—Screw
C—Wiper Assembly
D—Knockout Assembly



A51650 -UN-04FEB03



A51175 -UN-19NOV02



H42770 -UN-27NOV90

Knockout Assembly For Corn and Sorghum Shown



A51651 -UN-04FEB03

Installing Seed Disk

1. Open vacuum meter. See ACCESSING THE VACUUM METER in this section.

2. Fit seed disk into housing (A). Hold seed disk stationary and rotate hub handle (B).

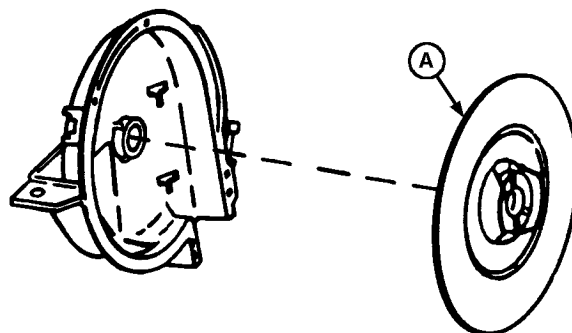
NOTE: Seed disk should turn smoothly with little or light contact between seed disk (A) and meter housing. Seed should not leak around circumference of meter. When planting small seed, such as sorghum, seed disk must lightly contact housing to prevent seed leakage.

3. Turn seed disk by hand and check gap between seed disk and meter housing in section (C). If disk rubs too hard against housing or if seed leaks through gap, adjust hub position. See ADJUSTING METER HUB in this section.

A—Housing
B—Hub Handle
C—Section



A51177 -UN-19NOV02



A46247 -UN-13JUN00

OUO6074,0000C2E -19-12JAN06-1/1

Adjusting Meter Hub

If gap is too large or disk turns too hard, adjust meter hub as follows:

1. Open vacuum meter. See ACCESSING THE VACUUM METER in this section.
2. Turn hub handle (A) counterclockwise. Remove seed disk from housing (B).

A—Hub Handle
B—Housing



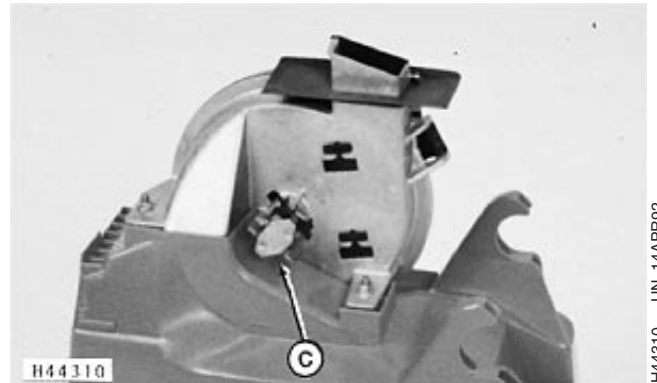
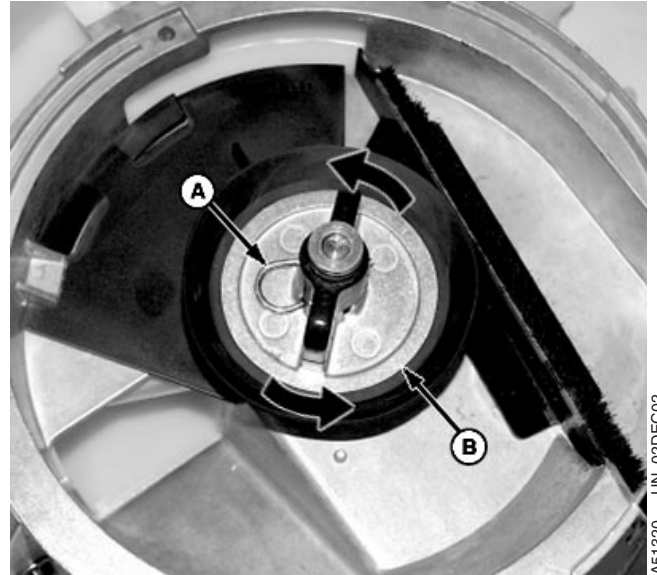
A51176 -UN-19NOV02

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OUO6074,00008A0 -19-12JAN06-1/3

3. Remove spring locking pin (A).
4. Adjust hub (B) as follows:
 - a. Hold meter drive (C).
 - b. Turn hub clockwise to move seed disk closer to meter housing or counterclockwise to move seed disk further from meter housing.
5. Turn hub until slot aligns with hole in shaft and install spring locking pin (A).

A—Pin
B—Hub
C—Meter Drive



Continued on next page

OUO6074,00008A0 -19-12JAN06-2/3

6. Fit seed disk into housing (A). Hold seed disk stationary and rotate hub handle (B).

NOTE: Seed disk should turn smoothly with light contact between seed disk and meter housing (A). Seed should not leak around circumference of meter. When planting small seed such as sorghum or sugar beets, seed disk must lightly contact meter housing to prevent seed leakage.

7. Turn seed disk by hand and check gap between seed disk and meter housing in section (C). If disk turns too hard or if seed leaks through gap, repeat procedure.

A—Meter Housing
B—Hub Handle
C—Section



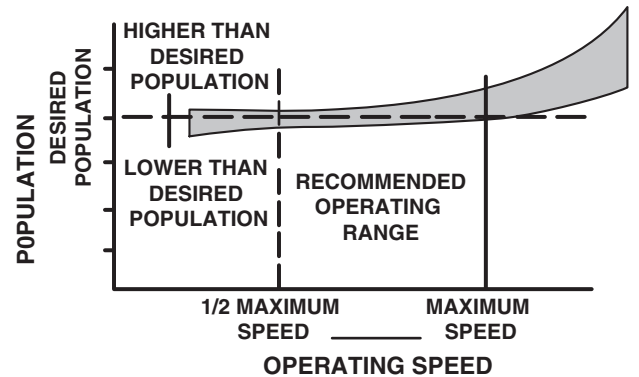
A51177 -JUN-19NOV02

OUO6074,00008A0 -19-12JAN06-3/3

Plateless Meter Setup

Finger Pick-Up Metering Unit Operating Characteristics

IMPORTANT: Graph at right shows performance characteristics of finger pick-up metering unit relative to operating speed. An increase in operating speed above maximum speed will cause overpopulation. The population is shown as a band on the graph, since slight variations in population may result from differences in seed size and shape.



A53565 -19-07JAN04

The most accurate population will be obtained when machine is operated between one-half maximum speed and maximum speed. Planting too fast may result in doubles and triples. Planting too slow may result in skips.

Maximum speeds, shown in planting rate charts, are for optimum conditions. Slower speeds should always be used when planting in rough seedbeds to insure satisfactory machine performance. Poor depth control and erratic seed spacing may result from planting too fast for conditions.

See HOW TO USE PLANTING RATE CHARTS in Plateless Meter Rate Charts section for instructions on setting sprockets for desired planting rate.

Continued on next page

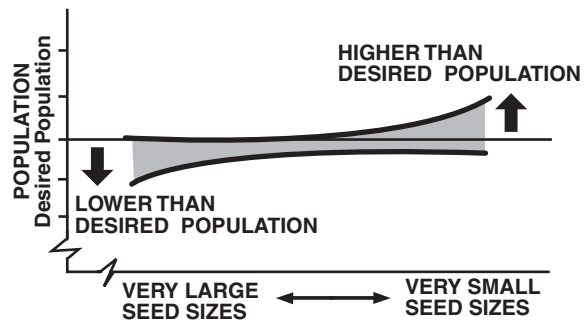
OUC6074,0000BDA -19-05JAN06-1/2

IMPORTANT: The chart at the right illustrates how seed size effects population.

This meter provides consistent seed spacing and population control when planting corn. It also has good performance in metering confectionary (large) sunflower seeds.

The meter handles all normal sizes of U.S. seed corn (except popcorn).

The finger pick-up planting accuracy will be influenced by seedbed conditions, seed size and operating characteristics of seed meter. Rough seedbed and fast planting speeds typically deteriorate seed placement accuracy.



A46041 -19-30MAR00

CROP STAND = SEED SINGULATION + SEED PLACEMENT + AGRONOMIC FACTORS

Seed Singulation = Seed Selection + Field Conditions + Maintenance

Seed Placement = Row Unit Maintenance + Speed + Field Conditions + Planter Attachments + Observation & Adjustment

Agonomic Factors = Seed Germination + Soil Temperature + Moisture + Nutrients + Pest Control + Weather

OUO6074,0000BDA -19-05JAN06-2/2

Feed-Cup Operating Characteristics

IMPORTANT: The graph shows operating characteristics of feed-cup metering unit.

The operating band illustrates how the feed-cup metering unit performs with regard to desired population (indicated by horizontal line). The width of the band is due to various sizes and shapes of seeds.

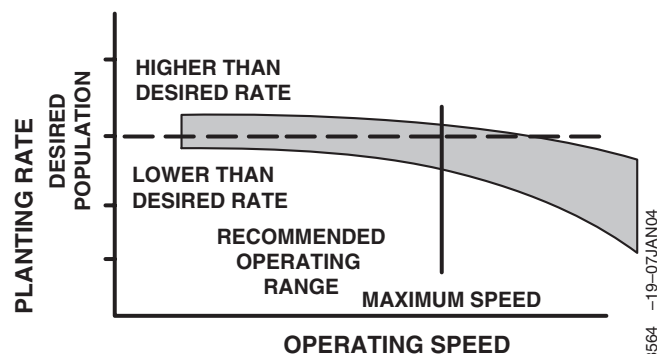
IMPORTANT: To prevent planting miscalculations, make field checks to verify desired rate is being planted.

Best results are obtained when machine is operated below maximum speed.

IMPORTANT: Soybeans vary in size from about 815 seeds/kg to about 1600 seeds/kg (from about 1800 seeds/lb to about 3500 seeds/lb). Consequently, planting rates can vary widely. The following charts were developed using uniform soybeans sized to 1600 seeds/kg (2600 seeds/lb) and should be used only as a guide for initial planter settings.

Large beans will generally result in lower rates than those in the chart and small beans will give somewhat higher rates. Actual rates **MUST** be checked in the field at planting speed and planter settings changed accordingly.

If desired rate cannot be obtained when planting large soybeans, edible-bean cup may be used. The Medium Size Beans section of the chart should be used as a guide for initial planter settings.



A53564 -19-07JAN04

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OUO6074,0000BDB -19-12JAN06-1/2

Feed-cup rates can also vary depending upon surface texture of beans as well as whether or not beans are coated with seed treatment. These factors, in combination with variations in seed size can result in significant differences between rates given in charts versus what is actually planted. Further, in order to reduce rates by changing sprocket combinations, it may be necessary to increase ground speed slightly in order to maintain feed-cup rpm. If feed-cup rpm drops due to a change in transmission setting, cup may actually collect more seeds per revolution, and consequently not reduce planting rate by amount expected unless ground speed is correspondingly increased to maintain feed-cup rpm.

The best way to determine if feed cup is delivering correct rate is to actually check population in the field. Refer to Checking Seed Population section.

After determining correct sprocket combination for your desired planting rate, be certain to plant at a speed no greater than the maximum speed shown for the sprocket combination. This will help ensure accurate planting rates.

CROP STAND = SEED SINGULATION + SEED PLACEMENT + AGRONOMIC FACTORS

Seed Singulation = Seed Selection + Field Conditions + Maintenance

Seed Placement = Row Unit Maintenance + Speed + Field Conditions + Planter Attachments + Observation & Adjustment

Agonomic Factors = Seed Germination + Soil Temperature + Moisture + Nutrients + Pest Control + Weather

OUO6074,0000BDB -19-12JAN06-2/2

Plateless Metering Units

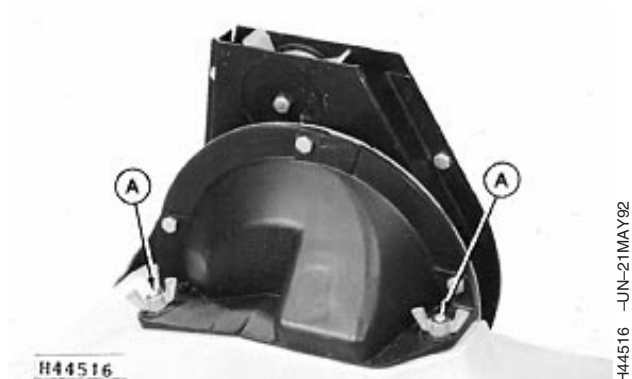
IMPORTANT: Always keep lids on seed hoppers when planting. If lids are left off, dust and dirt can accumulate in seed metering mechanism, causing excessive wear.

IMPORTANT: Always clean out seed after use.

Store metering assemblies in a clean place while not in use.

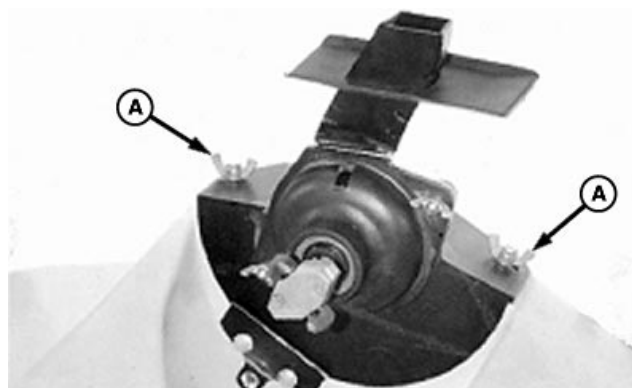
1. Meter assemblies can easily be interchanged with finger pick-up seed meters.
2. Replace meters as follows:
 - a. Remove seed hopper from row unit.
 - b. Turn hopper upside down and remove two wing nuts (A).
 - c. Pull meter assembly straight up.
 - d. Position desired meter on hopper and attach with wing nuts (A).
- Equip machine with finger pick-up metering units to plant all sizes (or mixed sizes) of corn and sunflower seeds. Performance in sunflowers is optimized with use of sunflower finger assembly.
- Equip machine with feed-cup metering units to plant soybeans, edible beans, sorghum or acid-delinted cotton.
- Equip machine with radial bean metering units to plant soybeans.

A—Wing Nuts



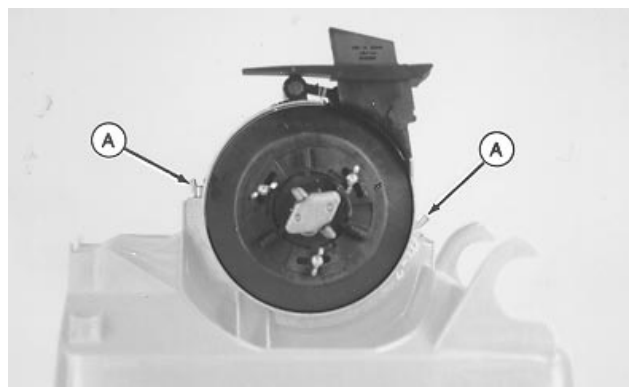
Finger Pick-Up Metering Unit

H44516 -UN-21MAY92



Feed-Cup Metering Unit

A46930 -UN-21NOV00



Radial Bean Metering Unit

A40459 -UN-06NOV96

Feed-Cup Metering Unit

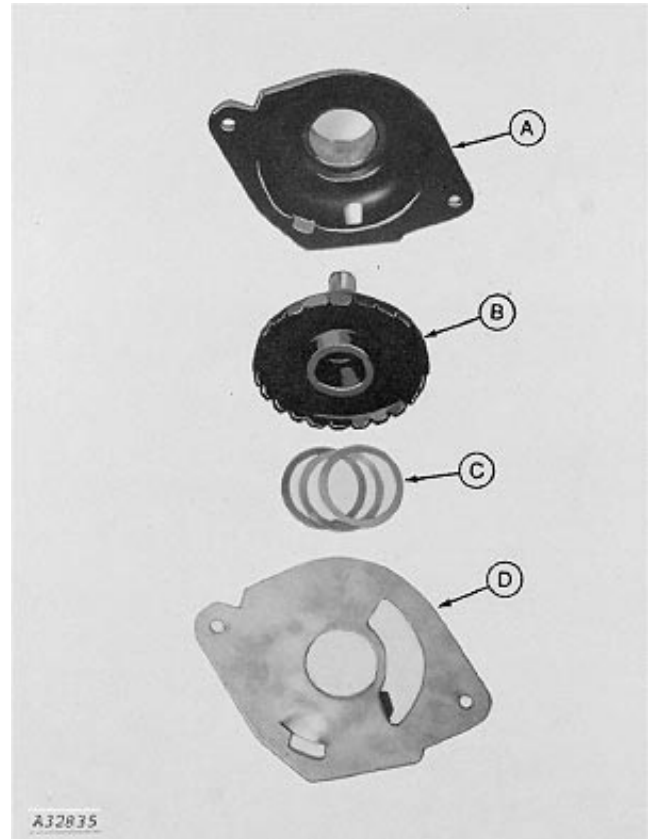
IMPORTANT: Store feed-cup metering assemblies in a clean, dry place while not in use.

The feed-cup metering unit consists of a feed-cup housing (A), feed cup (B), washer shims (C) (used with low-rate sorghum metering units only) and corresponding seed guide (D).

Use feed-cup metering units to plant the following types of seed:

- Soybeans
- Sorghum, Regular-Rate¹
- Sorghum, Low-Rate¹
- Edible Beans¹
- Acid-Delinted Cotton¹

A—Cup Housing
B—Feed-Cup
C—Washer Shims
D—Seed Guide



¹ Available through service parts only.

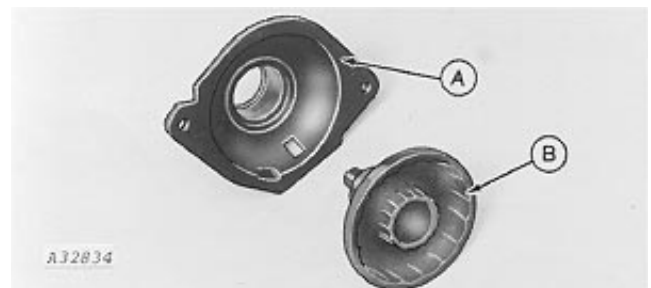
AG,OUO6074,439 -19-03APR00-1/1

Soybean Feed-Cup

IMPORTANT: Store feed-cup metering assemblies in a clean, dry place while they are not in use.

Assemble feed-cup housing (A) with desired feed-cup (B).

A—Feed-Cup Housing
B—Feed-Cup

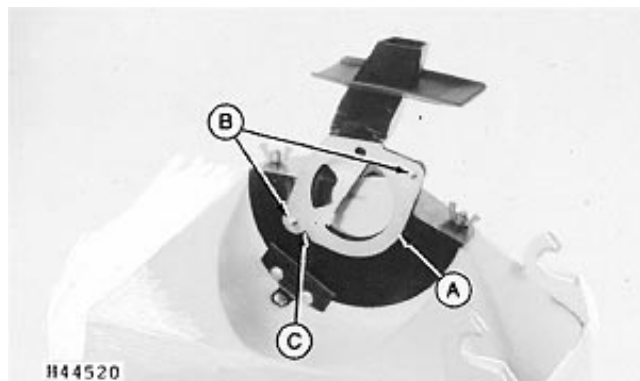


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AG,OUO6074,440 -19-12JAN06-1/3

Install seed guide (A) on feed-cup adapter so it seats properly on mounting studs (B). Align notch (C) (in seed guide) with projection on adapter.

- A—Seed Guide
- B—Studs
- C—Notch



H44520 -UN-29MAY92

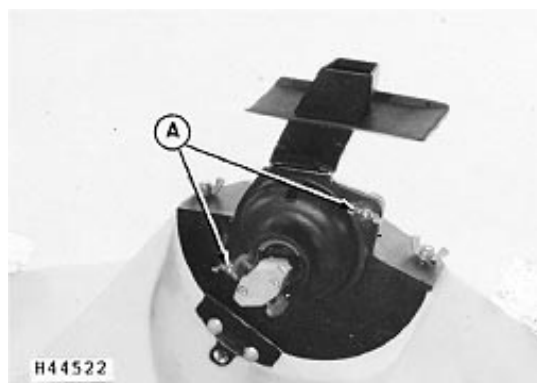
AG,OUO6074,440 -19-12JAN06-2/3

NOTE: Aligning notch must be positioned correctly so feed-cup housing seats properly.

Attach feed-cup and housing to adapter with wing nuts (A).

Wipe off feed-cup bushings periodically to help reduce wear.

- A—Wing Nut



H44522 -UN-21MAY92

AG,OUO6074,440 -19-12JAN06-3/3

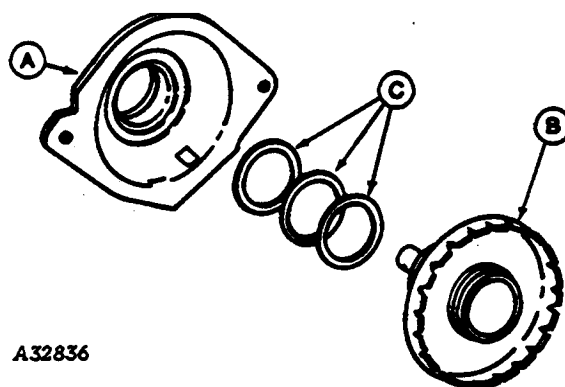
Low-Rate Sorghum Feed-Cup¹

IMPORTANT: Store feed-cup metering assemblies in a clean, dry place while they are not in use.

NOTE: Three washer shims must be used with low-rate feed-cup. Do not operate without all three shims.

For small seed or if population is high, use three washer shims (C) between feed-cup (B) and housing (A) only.

- A—Housing
- B—Feed-Cup
- C—Washer Shims



A32836

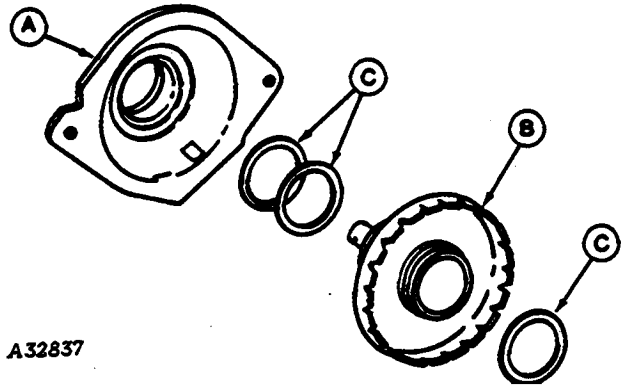
A32836 -UN-11OCT88

¹Available through service parts only.

Plateless Meter Setup

For medium size seed, use two washer shims (C) between feed-cup (B) and housing (A) and one washer shim (C) between feed-cup and seed guide.

- A—Housing
- B—Feed-Cup
- C—Washer Shims



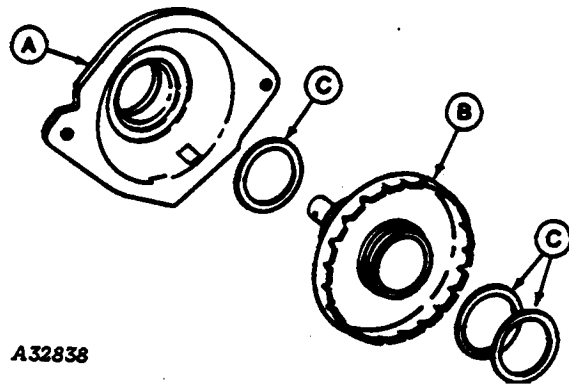
A32837

AG,OUO6074,441 -19-12JAN06-2/6

A32837 -UN-11OCT88

For larger seed, use one washer shim (C) between feed-cup (B) and housing (A) and two washer shims (C) between feed-cup and seed guide.

- A—Housing
- B—Feed-Cup
- C—Washer Shim



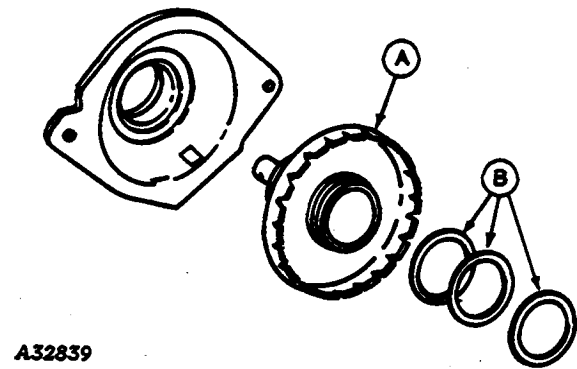
A32838

AG,OUO6074,441 -19-12JAN06-3/6

A32838 -UN-11OCT88

For large seed use three washer shims (B) between feed-cup (A) and seed guide.

- A—Feed-Cup
- B—Washer Shims



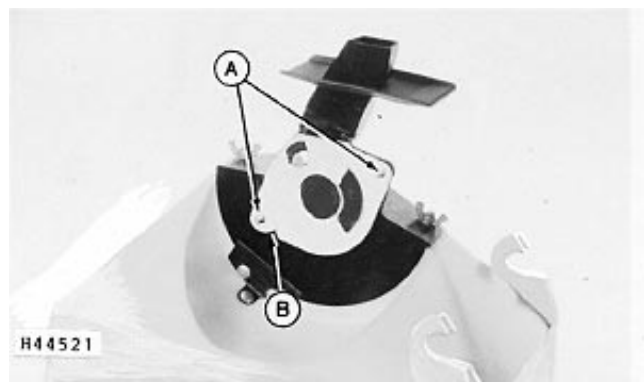
A32839

AG,OUO6074,441 -19-12JAN06-4/6

A32839 -UN-11OCT88

Assemble feed-cup housing with low-rate sorghum feed cup and correct number of washer shims. Install seed guide on feed-cup adapter so it seats properly on mounting studs (A). Align notch (B) in seed guide with projection on adapter.

- A—Studs
- B—Notch



H44521

H44521 -UN-29MAY92

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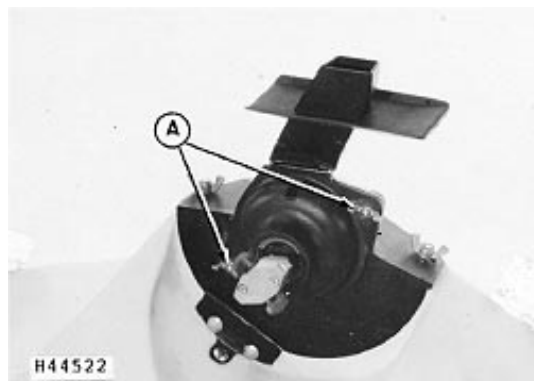
AG,OUO6074,441 -19-12JAN06-5/6

NOTE: Aligning notch must be positioned correctly so feed-cup housing seats properly.

Attach feed-cup and housing to adapter with wing nuts (A).

Wipe off feed-cup bushings periodically to help reduce wear.

A—Wing Nut



H44522 -UN-21MAY92

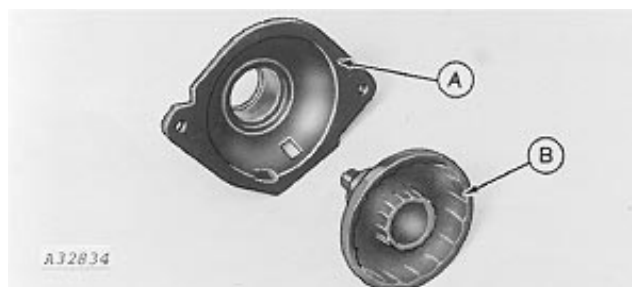
AG,OUO6074,441 -19-12JAN06-6/6

Acid-Delinted Cotton and Small Soybeans¹

IMPORTANT: Store feed-cup metering assemblies in a clean, dry place while they are not in use.

Assemble feed-cup housing (A) with desired feed-cup (B).

A—Feed-Cup Housing
B—Feed-Cup



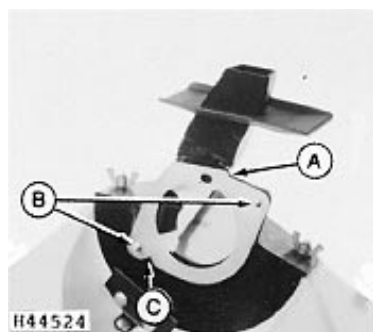
A32834 -UN-11OCT88

¹ Available through service parts only.

AG,OUO6074,442 -19-12JAN06-1/3

Install seed guide (A) on feed-cup adapter so it seats properly on mounting studs (B). Align notch (C) in seed guide with projection on adapter.

A—Seed Guide
B—Studs
C—Notch



H44524 -UN-27MAY92

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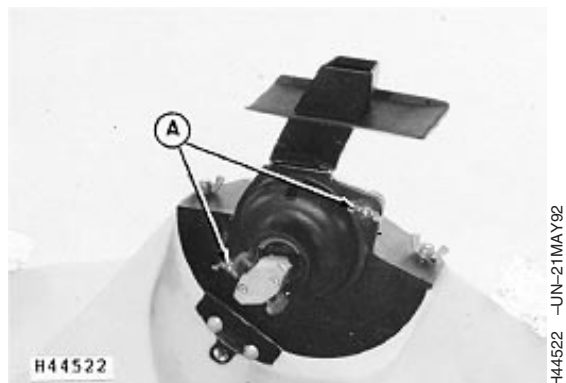
AG,OUO6074,442 -19-12JAN06-2/3

NOTE: *Aligning notch must be positioned correctly so feed-cup housing seats properly.*

Attach feed-cup and housing to adapter with wing nuts (A).

Wipe off feed-cup bushings periodically to help reduce wear.

A—Wing Nut



AG,OUO6074,442 -19-12JAN06-3/3

Attaching Machine

Use Your Tractor Operator's Manual

Always refer to YOUR tractor operator's manual for specific detailed information regarding operation of YOUR equipment.

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



TS190 -UN-17JAN89

OUC1074,00014B5 -19-21JUL03-1/1

CCS Fan and VACUMETER Motor (Case) Drain Requirements

IMPORTANT: CCS fan and VACUMETER 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 will be **damaged**.

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



Flush Face Fitting

A—Motor Seal (Case) Drain Hose

A53393 -UN-25NOV03

VACUMETER is a trademark of Deere & Company

OUC6074,0000984 -19-11FEB04-1/1

VACUMETER Hydraulic Motor and Variable Rate Drive Return Coupler

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

The check valve is intended to eliminate the possibility of turning the motors backwards.

Place SCV in FLOAT position, when shutting off, to relieve pressure. Cap coupler end to prevent dripping and contamination when machine is stored.

(40 Series and older John Deere tractors) Replace this coupler with check valve and John Deere tip or install ISO coupler to John Deere tip adapter.



A53457 -UN-02MAR04

OUO6074,000098A -19-11FEB04-1/1

Checking Hydraulic System



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

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

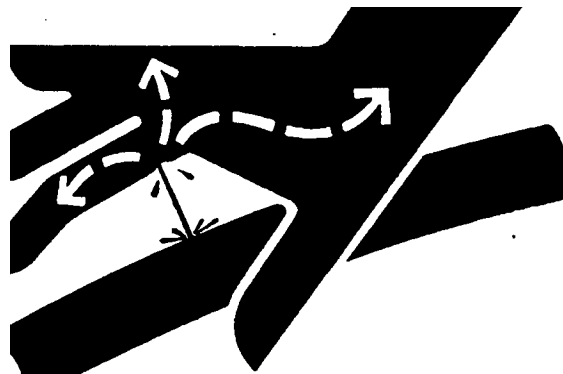
Search for leaks with piece of cardboard. Protect hands and body from high-pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into 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 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.

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

IMPORTANT: Tractor hydraulic oil level may 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.



X9811 -UN-23AUG88

OUO6074,000080D -19-04NOV03-1/1

Attaching Warning Light Harness

NOTE: Prior to connecting 7-pin connector, make sure pins and connectors are clean and in good condition.

NOTE: Harness locations will vary from tractor to tractor.

Attach light harness to 7-pin connector.



RW20845 -UN-07MAY92

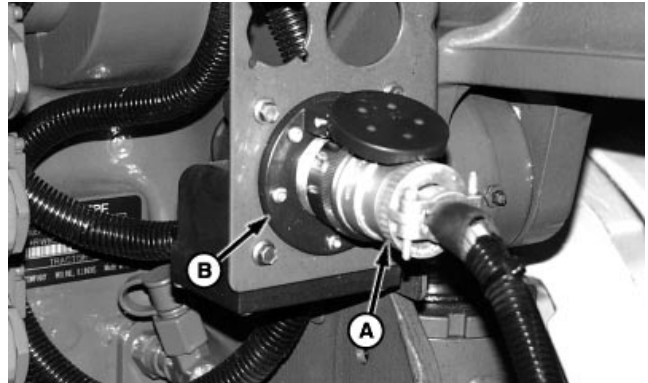
OOU01074,0000042 -19-22JAN01-1/1

Connecting SEEDSTAR Harness

NOTE: Harness locations will vary from tractor to tractor.

Connect SEEDSTAR monitor harness (A) to connector (B).

- A—Monitor Harness
- B—Connector



A47096 -UN-02FEB01

SEEDSTAR is a trademark of Deere & Company

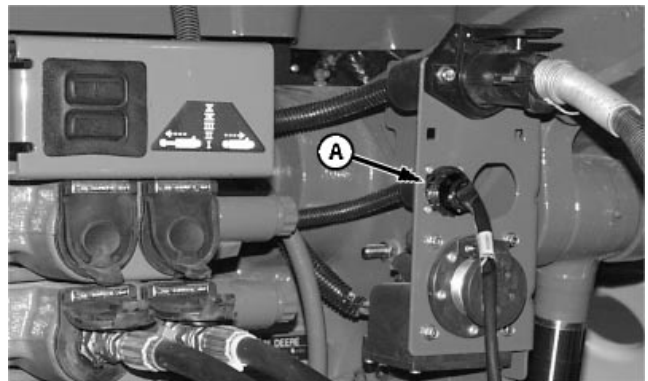
OOU06074,0000988 -19-19JAN06-1/1

Connecting COMPUTER TRAK Harness

NOTE: Harness locations will vary from tractor to tractor.

Connect machine monitor harness to connector (A).

- A—Monitor Harness



A53844 -UN-11FEB04

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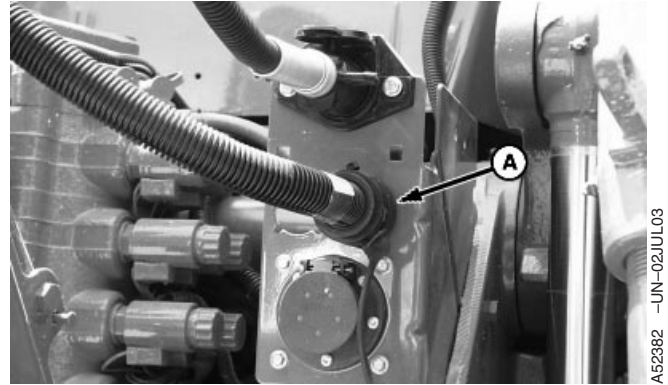
OOU06074,0000986 -19-19JAN06-1/1

Connecting Frame Control Harness

NOTE: Harness locations will vary from tractor to tractor.

Connect frame control harness (A).

A—Frame Control Harness



OUO6074,0000987 -19-11FEB04-1/1

A52382 -UN-02JUL03

Connecting Hydraulics—30—60 Series Row-Crop Tractors (General Information)

CAUTION: Escaping fluid under pressure can penetrate the skin, causing serious injury to you or others. 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 hand 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.

CAUTION: Hydraulic hoses can fail due to physical damage, kinks, age and exposure. Check hoses regularly and replace as necessary.

IMPORTANT: Fan motor case drain hose (A) **MUST** be attached to low-pressure drain connection **PRIOR** to other hoses being connected. Case drain **MUST** have **LESS THAN 172 kPa (1.72 bar) (25 psi)** or fan motor will be damaged.

IMPORTANT: Installation of a Low-Pressure Drain Line Kit is required if towing tractor is not so equipped.

All 30—60 series tractors should be equipped with selective control valve lever stops to hold SCV levers in forward position when running continuous flow planter functions.

SCV lever should be pushed into “float” position to turn vacuum and variable rate drive off, not to neutral. The tractor flow control valve must be set to maximum. The in-line planter flow control valve is used to control vacuum level and SEEDSTAR system is used to control variable rate drive.



Flush Face Fitting

A—Case Drain Hose

A53393 —JUN-25NOV03

30—60 Series Tractor with 3 SCV's and Power Beyond

Planters Equipped with Vacuum and Variable Rate Drive Hose Connections

Case Drain ^a	C—Must Be Connected First	
Hose Identification	Pressure	Return
Frame Functions and CCS	Extend Port	Retract Port
Independent Markers/Drawbar	Extend Port	Retract Port
Vacuum System	Retract Port	Extend Port
Variable Rate Drive on Power Beyond	Power Beyond Pressure	Power Beyond Return

^aCase drain hose MUST be attached PRIOR to any hose being connected.

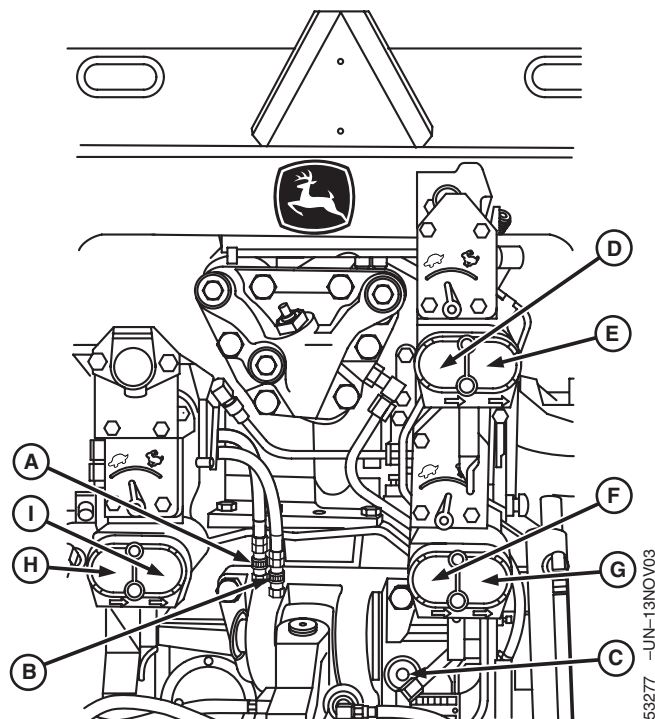


CAUTION: Hydraulic hoses can fail due to physical damage, kinks, age and exposure. Check hoses regularly. Replace damaged hoses.

IMPORTANT: Vacuum RETURN hose, with special tip, MUST be connected to tractor EXTEND port. This allows the motor to be shut off by placing SCV lever directly into “float” position, avoiding damaging pressure spikes. This also applies to variable rate drive when connected to an SCV.

NOTE: Planter flow control valve is used to control vacuum level.

If planter is not equipped with either independent markers or vacuum, variable rate drive can be moved from power beyond to an SCV.



30—60 Series Tractor with 3 SCV's and Power Beyond

- A—Auxiliary Pressure Port (Power Beyond Pressure)
- B—Return Port (Power Beyond Return)
- C—Sump Port (Fan Motor Case Drain Connection)
- D—SCV I (Extend)
- E—SCV I (Retract)
- F—SCV II (Extend)
- G—SCV II (Retract)
- H—SCV III (Extend)
- I—SCV III (Retract)

30—60 Series Tractor with 3 SCV's Less Power Beyond

Planters Equipped with Vacuum and Variable Rate Drive Hose Connections

Case Drain ^a	A—Must Be Connected First	
Hose Identification	Pressure	Return
Independent Markers/Drawbar	Extend Port	Retract Port
Frame Functions and CCS	Extend Port	Retract Port
Vacuum System	Retract Port	Extend Port
Variable Rate Drive	Retract Port	Extend Port

^aCase drain hose MUST be attached PRIOR to any hose being connected.

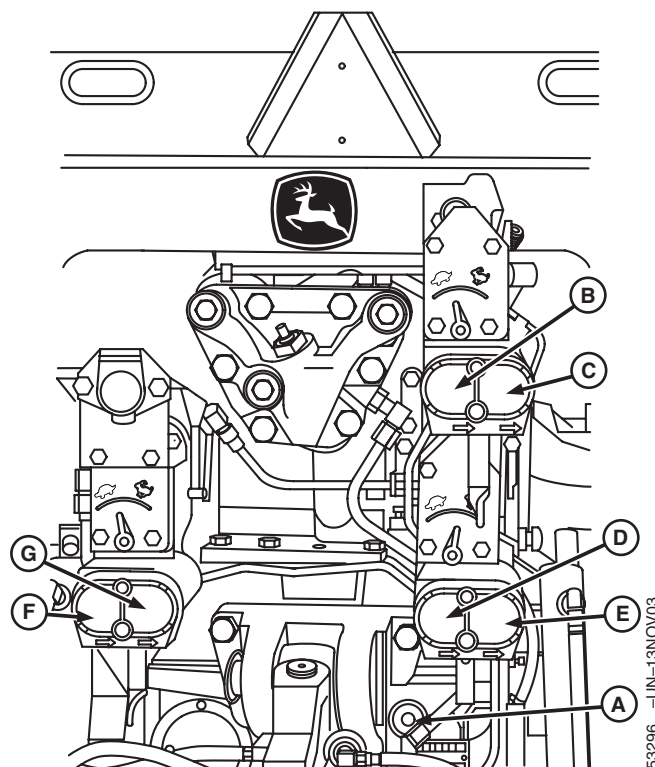


CAUTION: Hydraulic hoses can fail due to physical damage, kinks, age and exposure. Check hoses regularly. Replace damaged hoses.

IMPORTANT: Vacuum and Variable Rate Drive RETURN hoses, with special tip, MUST be connected to tractor EXTEND port. This allows the motor to be shut off by placing SCV lever directly into “float” position, avoiding damaging pressure spikes.

NOTE: Planter flow control valve is used to control vacuum level.

If planter is equipped with independent markers and vacuum, VRD would not be an option. Power beyond kits are available to control a fourth function.



30-60 Series Tractor with 3 SCV's Less Power Beyond

- A—Sump Port (Fan Motor Case Drain Connection)
- B—SCV I (Extend)
- C—SCV I (Retract)
- D—SCV II (Extend)
- E—SCV II (Retract)
- F—SCV III (Extend)
- G—SCV III (Retract)

A53296 -UN-13NOV03

OUO6074.0000ACA -19-05APR05-1/1

30—60 Series Tractor with 4 SCV's and Power Beyond

Planters Equipped with Vacuum and Power Beyond Hose Connections

Case Drain ^a	C—Must Be Connected First	
Hose Identification	Pressure	Return
Frame/Marker Fold	Extend Port	Retract Port
Hitch	Extend Port	Retract Port
Frame Lift	Extend Port	Retract Port
Vacuum System	Retract Port	Extend Port
Variable Rate Drive on power beyond	Power Beyond Pressure	Power Beyond Return

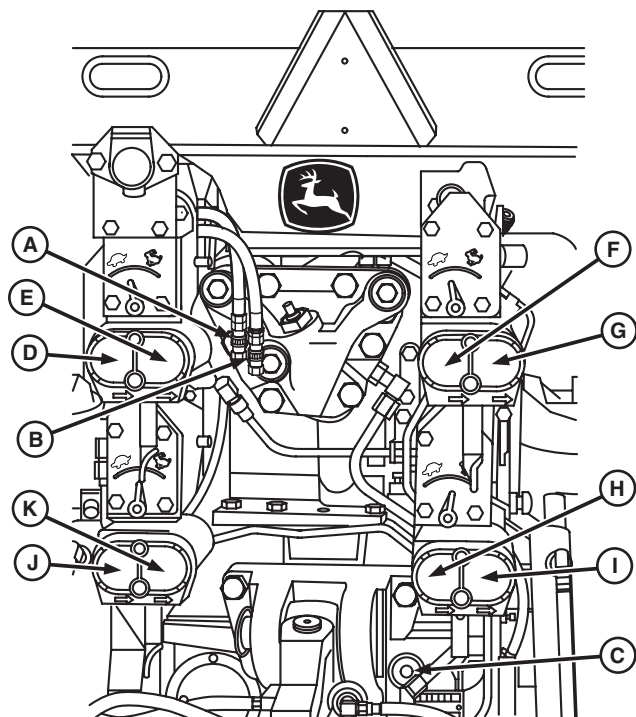
^aCase drain hose MUST be attached PRIOR to inlet and return hoses being connected.



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

IMPORTANT: Vacuum and Variable Rate Drive RETURN hoses, with special tip, MUST be connected to tractor EXTEND port. This allows the motor to be shut off by placing SCV lever directly into “float” position, avoiding damaging pressure spikes.

NOTE: It is recommended to connect VRD to an SCV if one is available.



30—60 Series Tractor with 4 SCV's and Power Beyond

- A—Auxiliary Pressure Port (Power Beyond Pressure)
- B—Return Port (Power Beyond Return)
- C—Sump Port (Fan Motor Case Drain Connection)
- D—SCV I (Extend)
- E—SCV I (Retract)
- F—SCV II (Extend)
- G—SCV II (Retract)
- H—SCV III (Extend)
- I—SCV III (Retract)
- J—SCV IV (Extend)
- K—SCV IV (Retract)

30—60 Series Tractor with 4 SCV's Less Power Beyond

Planters Equipped with Vacuum and Variable Rate Drive Hose Connections

Case Drain ^a	A—Must Be Connected First	
Hose Identification	Pressure	Return
Frame Functions and CCS	Extend Port	Retract Port
Independent Markers/Drawbar	Extend Port	Retract Port
Vacuum System	Retract Port	Extend Port
Variable Rate Drive	Retract Port	Extend Port

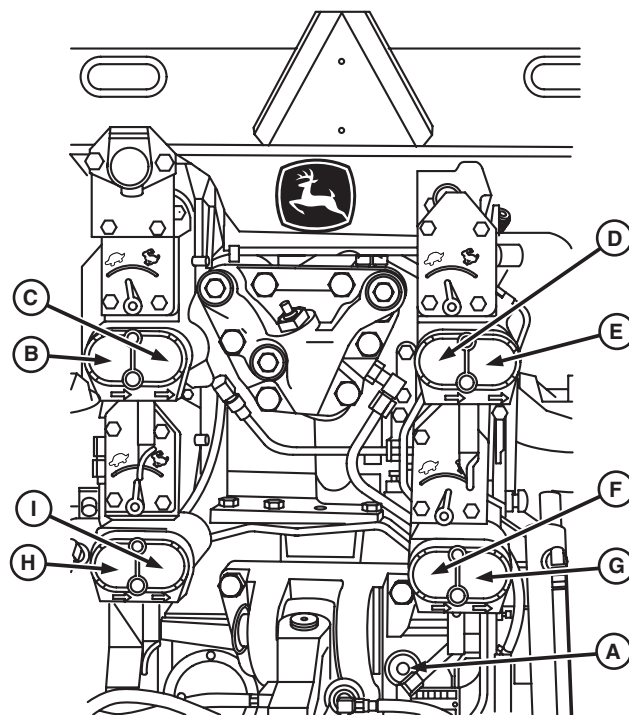
^aCase drain hose **MUST** be attached **PRIOR** to any hose being connected.



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

IMPORTANT: Vacuum and Variable Rate Drive **RETURN** hoses, with special tip, **MUST** be connected to tractor **EXTEND** port. This allows the motor to be shut off by placing SCV lever directly into “float” position, avoiding damaging pressure spikes.

NOTE: Planter flow control valve is used to control vacuum level.



30—60 Series Tractor with 4 SCV's Less Power Beyond

- A—Sump Port (Fan Motor Case Drain Connection)
- B—SCV I (Extend)
- C—SCV I (Retract)
- D—SCV II (Extend)
- E—SCV II (Retract)
- F—SCV III (Extend)
- G—SCV III (Retract)
- H—SCV IV (Extend)
- I—SCV IV (Retract)

A53297 —UN—13NOV03

Connecting Hydraulic Hoses—8000 Series Row-Crop Tractors (General Information)

CAUTION: Escaping fluid under pressure can penetrate the skin, causing serious injury to you or others. 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 hand 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.

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

IMPORTANT: Fan motor/vacuum motor case drain hose (A) **MUST** be attached **PRIOR** to inlet and return hoses being connected. Case drain **MUST** have **LESS THAN 172 kPa (1.72 bar) (25 psi)** or fan motor will be damaged.

IMPORTANT: **DO NOT USE** other ports at the rear of the tractor (such as power-beyond ports) which may be similar in appearance and size to low-pressure drain port. Due to high back-pressure (over 172 kPa [1.72 bar] [25 psi]), drain connection to these ports **WILL RESULT** in fan motor damage.

Vacuum and variable rate drive systems should always be shut off by pushing SCV into “float” position. This will avoid damaging pressure spikes in hydraulic system.



Flush Face Fitting

A—Case Drain Hose

A53393 -UN-25NOV03

Attaching Machine

The in-line planter flow control valve must be set to maximum when tractor flow control valve is used to control vacuum level. SEEDSTAR system is used to control variable rate drive.

SEEDSTAR is a trademark of Deere & Company

OUO6074,0000ACD -19-05APR05-2/2

8000 Series Tractor with 3 SCV's

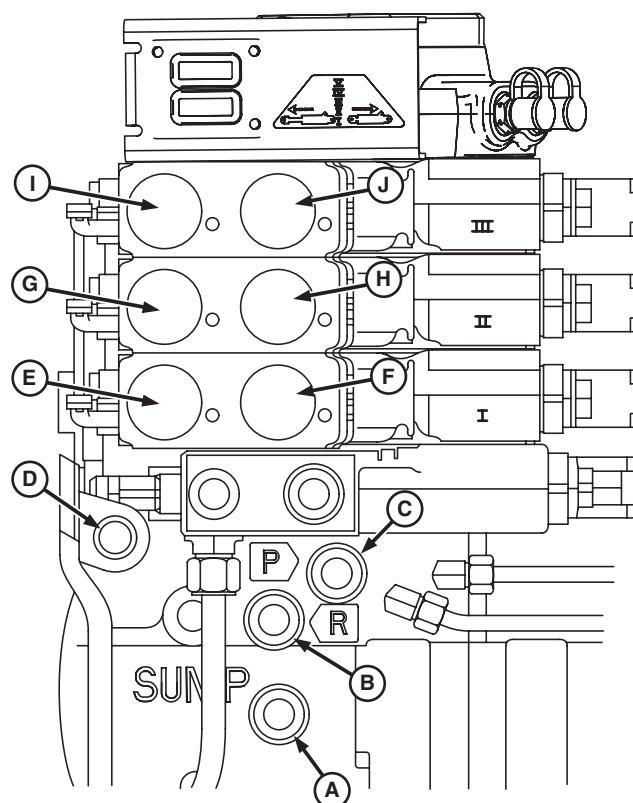
Planters Equipped with Vacuum and Variable Rate Drive Hose Connections		
Case Drain ^a	A—Must Be Connected First	
Hose Identification	Pressure	Return
Frame Functions and CCS	Extend Port	Retract Port
Independent Markers/Drawbar	Extend Port	Retract Port
Vacuum System	Retract Port	Extend Port
Variable Rate Drive on Power Beyond with Load Sense (D)	Power Beyond Pressure	Power Beyond Return

^aCase drain hose MUST be attached PRIOR to any hose being connected.

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

IMPORTANT: Vacuum RETURN hose, with special tip, MUST be connected to tractor EXTEND port. This allows the motor to be shut off by placing SCV lever directly into “float” position, avoiding damaging pressure spikes. This also applies to variable rate drive when connected to an SCV.

If planter is not equipped with either independent markers or vacuum, variable rate drive can be moved from power beyond to an SCV.



8000 Series Tractor with 3 SCV's

- A—Sump Port (Fan Motor Case Drain Connection)
- B—Return Port (Power Beyond Return)
- C—Pressure Port (Power Beyond Pressure)
- D—Load Sense Coupler (Power Beyond Load Sense)
- E—SCV I (Extend)
- F—SCV I (Retract)
- G—SCV II (Extend)
- H—SCV II (Retract)
- I—SCV III (Extend)
- J—SCV III (Retract)

A53231 -UN-07NOV03

8000 Series Tractor with 4 or 5 SCV's

Planters Equipped with Vacuum and Variable Rate Drive Hose Connections

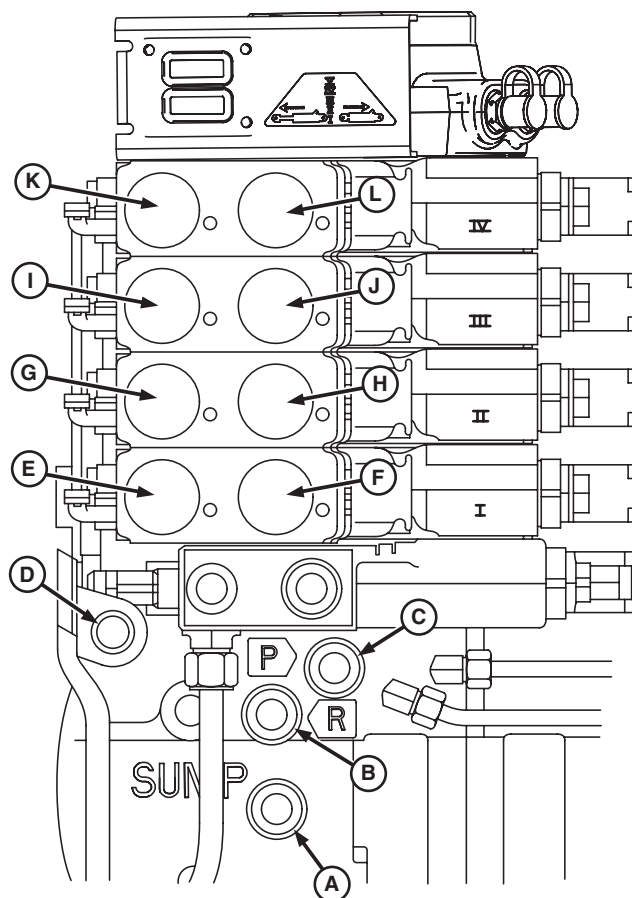
Case Drain ^a	A—Must Be Connected First	
Hose Identification	Pressure	Return
Frame Functions and CCS	Extend Port	Retract Port
Independent Markers/Drawbar	Extend Port	Retract Port
Vacuum System	Retract Port	Extend Port
Variable Rate Drive	Retract Port	Extend Port

^aCase drain hose MUST be attached PRIOR to any hose being connected.



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

IMPORTANT: Vacuum and Variable Rate Drive RETURN hoses, with special tip, MUST be connected to tractor EXTEND port. This allows the motor to be shut off by placing SCV lever directly into "float" position, avoiding damaging pressure spikes.



8000 Series Tractor with 4 SCV's Shown

- A—Sump Port (Fan Motor Case Drain Connection)
- B—Auxiliary Return Port (Power Beyond Return)
- C—Auxiliary Pressure Port (Power Beyond Pressure)
- D—Load Sense Coupler (Power Beyond Load Sense)
- E—SCV I (Extend)
- F—SCV I (Retract)
- G—SCV II (Extend)
- H—SCV II (Retract)
- I—SCV III (Extend)
- J—SCV III (Retract)
- K—SCV IV (Extend)
- L—SCV IV (Retract)

A53230 -JUN-07NOV03

OUO6435,0001F34 -19-24JAN06-1/1

Connecting Hydraulic Hoses—8000T Series Row-Crop Tractors (General Information)

CAUTION: Escaping fluid under pressure can penetrate the skin, causing serious injury to you or others. 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 hand 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.

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

IMPORTANT: Fan motor/vacuum motor case drain hose (A) **MUST** be attached **PRIOR** to inlet and return hoses being connected. Case drain **MUST** have **LESS THAN 172 kPa (1.72 bar) (25 psi)** or fan motor will be damaged.

IMPORTANT: **DO NOT USE** other ports at the rear of the tractor (such as power-beyond ports) which may be similar in appearance and size to low-pressure drain port. Due to high back-pressure (over 172 kPa [1.72 bar] [25 psi]), drain connection to these ports **WILL RESULT** in fan motor damage.

Vacuum and variable rate drive systems should always be shut off by pushing SCV into “float” position. This will avoid damaging pressure spikes in hydraulic system.



Flush Face Fitting

A—Case Drain Hose

A53393 -UN-25NOV03

Attaching Machine

The in-line planter flow control valve must be set to maximum when tractor flow control valve is used to control vacuum level. SEEDSTAR system is used to control variable rate drive.

SEEDSTAR is a trademark of Deere & Company

OUO6074,0000ACE -19-05APR05-2/2

8000T Series Tractor with 3 SCV's

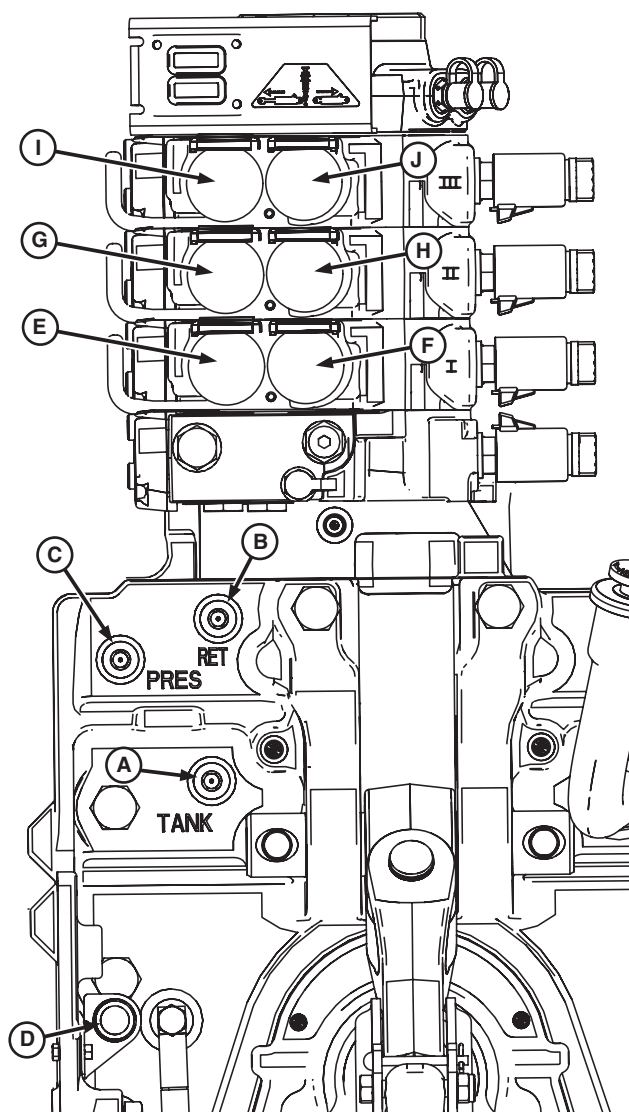
Planters Equipped with Vacuum and Variable Rate Drive Hose Connections		
Case Drain ^a	A—Must Be Connected First	
Hose Identification	Pressure	Return
Frame Functions and CCS	Extend Port	Retract Port
Independent Markers/Drawbar	Extend Port	Retract Port
Vacuum System	Retract Port	Extend Port
Variable Rate Drive on Power Beyond with Load Sense (D)	Power Beyond Pressure	Power Beyond Return

^aCase drain hose MUST be attached PRIOR to any hose being connected.

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

IMPORTANT: Vacuum RETURN hose, with special tip, MUST be connected to tractor EXTEND port. This allows the motor to be shut off by placing SCV lever directly into “float” position, avoiding damaging pressure spikes. This also applies to variable rate drive when connected to an SCV.

If planter is not equipped with either independent markers or vacuum, variable rate drive can be moved from power beyond to an SCV.



8000T Series Tractor with 3 SCV's

- A—Tank Port (Fan Motor Case Drain Connection)
- B—Return Port (Power Beyond Return)
- C—Pressure Port (Power Beyond Pressure)
- D—Load Sense Coupler (Power Beyond Load Sense)
- E—SCV I (Extend)
- F—SCV I (Retract)
- G—SCV II (Extend)
- H—SCV II (Retract)
- I—SCV III (Extend)
- J—SCV III (Retract)

A53229 -UN-07NOV03

8000T Series Tractor with 4 or 5 SCV's

Planters Equipped with Vacuum and Variable Rate Drive Hose Connections

Case Drain ^a	A—Must Be Connected First	
Hose Identification	Pressure	Return
Frame Functions and CCS	Extend Port	Retract Port
Independent Markers/Drawbar	Extend Port	Retract Port
Vacuum System	Retract Port	Extend Port
Variable Rate Drive	Retract Port	Extend Port

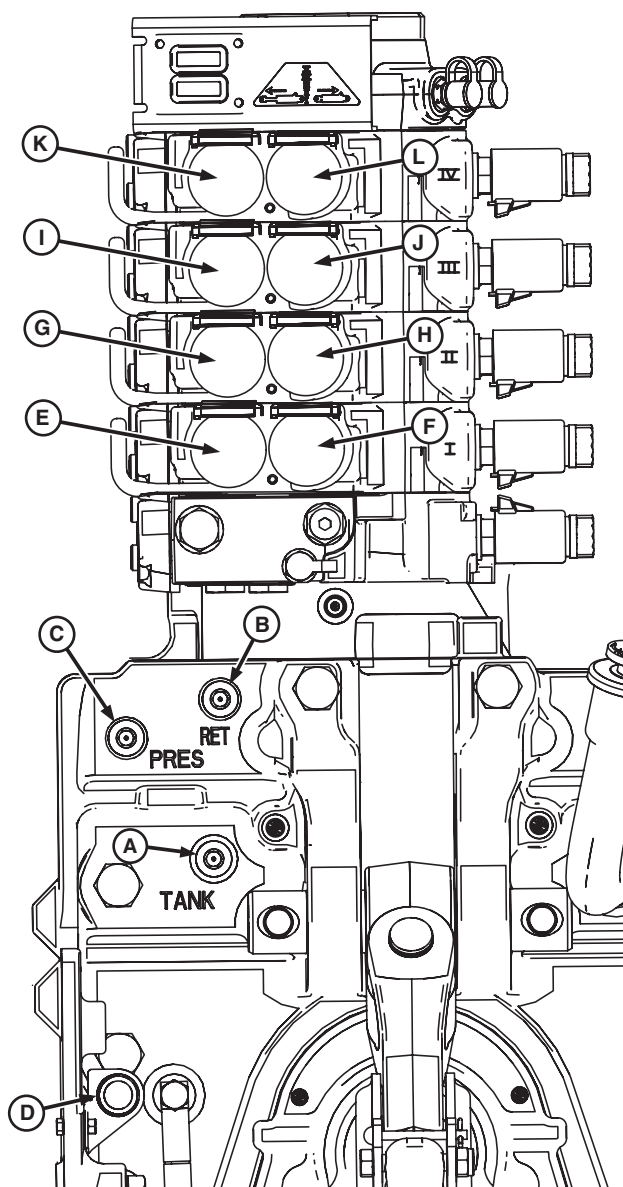
^aCase drain hose MUST be attached PRIOR to any hose being connected.



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

IMPORTANT: Vacuum and Variable Rate Drive RETURN hoses, with special tip, MUST be connected to tractor EXTEND port. This allows the motor to be shut off by placing SCV lever directly into “float” position, avoiding damaging pressure spikes.

- A—Tank Port (Fan Motor Case Drain Connection)
- B—Auxiliary Return Port (Power Beyond Return)
- C—Auxiliary Pressure Port (Power Beyond Pressure)
- D—Load Sense Coupler (Power Beyond Load Sense)
- E—SCV I (Extend)
- F—SCV I (Retract)
- G—SCV II (Extend)
- H—SCV II (Retract)
- I—SCV III (Extend)
- J—SCV III (Retract)
- K—SCV IV (Extend)
- L—SCV IV (Retract)



8000T Series Tractor with 4 SCV's Shown

A53228 —UN-07NOV03

Connecting Hydraulic Hoses—9000 Series Tractors (General Information)

CAUTION: Escaping fluid under pressure can penetrate the skin, causing serious injury to you or others. 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 hand 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.

CAUTION: Hydraulic hoses can fail due to physical damage, kinks, age and exposure. Check hoses regularly and replace as necessary.

- Fan motor/vacuum motor case drain hose (A) **MUST** be attached to low-pressure drain connection **PRIOR** to inlet and return hoses being connected. Case drain **MUST** have **LESS THAN 172 kPa (1.72 bar) (25 psi)** or fan motor will be damaged.
- Installation of a Low-Pressure Drain Line Kit is required if towing tractor is not so equipped. Refer to **PROTECTING HYDRAULIC MOTOR SEALS—LOW-PRESSURE (CASE) DRAIN CONNECTION** in **Preparing Tractor** section for appropriate kit.

Vacuum and variable rate drive systems should always be shut off by pushing SCV into “float” position. This will avoid damaging pressure spikes in hydraulic system.

When each vacuum motor is connected to it's own SCV the tractor cab controls are used to adjust vacuum. The in-line flow control valves must be set to maximum.

When both vacuums are connected to one SCV or to power beyond, the in-line planter flow control valve is used to adjust vacuum. Tractor flow control must be set to maximum.



A—Case Drain Hose

A53393 -UN-25NOV03

SEEDSTAR system is used to control variable rate drive.

SEEDSTAR is a trademark of Deere & Company

OUC6435,0001AA2 -19-18MAR04-2/2

9000 Series Tractor with 3 SCV's Less Hitch

Planters Equipped with Vacuum and Variable Rate Drive Hose Connections

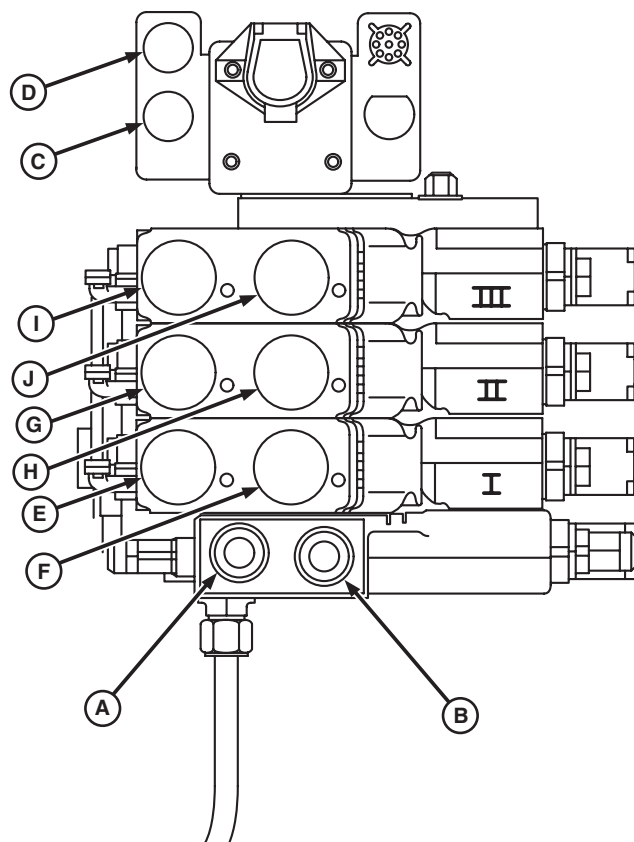
Case Drain ^a	D—Must Be Connected First	
Hose Identification	Pressure	Return
Frame Functions and CCS	Extend Port	Retract Port
Independent Markers/Drawbar	Extend Port	Retract Port
Vacuum System	Retract Port	Extend Port
Variable Rate Drive on Power Beyond with Load Sense (C)	Power Beyond Pressure	Power Beyond Return

^aCase drain hose MUST be attached PRIOR to inlet and return hoses being connected.

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

IMPORTANT: Vacuum RETURN hose, with special tip, MUST be connected to tractor EXTEND port. This allows the motor to be shut off by placing SCV lever directly into “float” position, avoiding damaging pressure spikes. This also applies to variable rate drive when connected to an SCV.

NOTE: With two vacuum motors connected to a single tractor SCV, planter flow control valves must be used to control vacuum level.



9000 Series Tractor with 3 SCV's Less Hitch

- A—Pressure Port (Power Beyond Pressure)
- B—Return Port (Power Beyond Return)
- C—Load Sense Coupler (Power Beyond Load Sense)
- D—Motor Seal Drain Port (Fan Motor Case Drain Connection)
- E—SCV I (Extend)
- F—SCV I (Retract)
- G—SCV II (Extend)
- H—SCV II (Retract)
- I—SCV III (Extend)
- J—SCV III (Retract)

A53290 -UN-07NOV03

OUC6074,0000C6B -19-10MAR06-1/1

9000 Series Tractor with 3 SCV's With Hitch

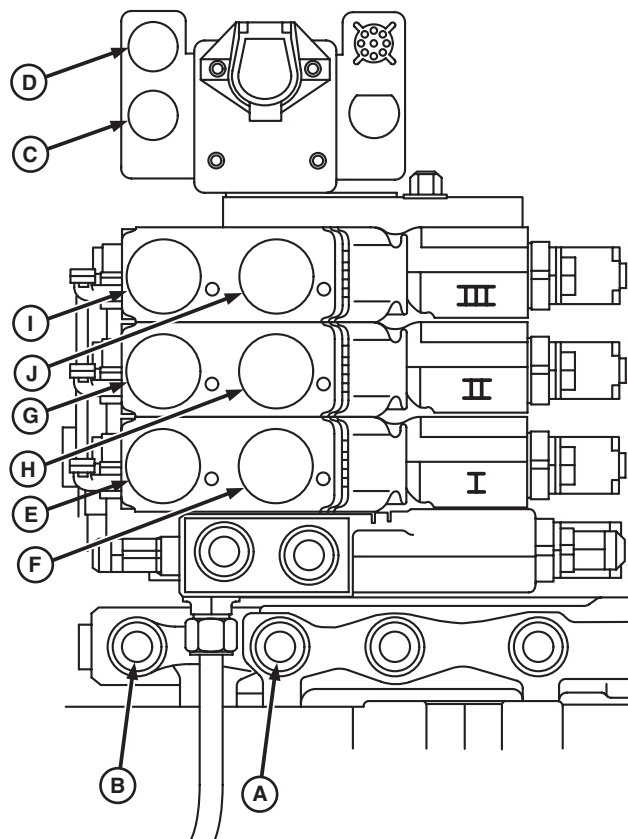
Planters Equipped with Vacuum and Variable Rate Drive Hose Connections		
Case Drain ^a	D—Must Be Connected First	
Hose Identification	Pressure	Return
Frame Functions and CCS	Extend Port	Retract Port
Independent Markers/Drawbar	Extend Port	Retract Port
Vacuum System	Retract Port	Extend Port
Variable Rate Drive on Power Beyond with Load Sense (C)	Power Beyond Pressure	Power Beyond Return

^aCase drain hose MUST be attached PRIOR to inlet and return hoses being connected.

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

IMPORTANT: Vacuum RETURN hose, with special tip, MUST be connected to tractor EXTEND port. This allows the motor to be shut off by placing SCV lever directly into “float” position, avoiding damaging pressure spikes. This also applies to variable rate drive when connected to an SCV.

NOTE: With two vacuum motors connected to a single tractor SCV, planter flow control valves must be used to control vacuum level.



9000 Series Tractor with 3 SCV's With Hitch

- A—Return Port (Power Beyond Return)
- B—Pressure Port (Power Beyond Pressure)
- C—Load Sense Coupler (Power Beyond Load Sense)
- D—Motor Seal Drain Port (Fan Motor Case Drain Connection)
- E—SCV I (Extend)
- F—SCV I (Retract)
- G—SCV II (Extend)
- H—SCV II (Retract)
- I—SCV III (Extend)
- J—SCV III (Retract)

9000 Series Tractor with 4 or 5 SCV's Less Hitch

Planters Equipped with Vacuum and Variable Rate Drive Hose Connections

Case Drain ^a	D—Must Be Connected First	
Hose Identification	Pressure	Return
Frame Functions and CCS	Extend Port	Retract Port
Independent Markers/Drawbar	Extend Port	Retract Port
Vacuum (Left Motor)	Retract Port	Extend Port
Vacuum (Right Motor)	Retract Port	Extend Port
Variable Rate Drive on Power Beyond with Load Sense (C)	Power Beyond Pressure	Power Beyond Return

^aCase drain hose MUST be attached PRIOR to inlet and return hoses being connected.

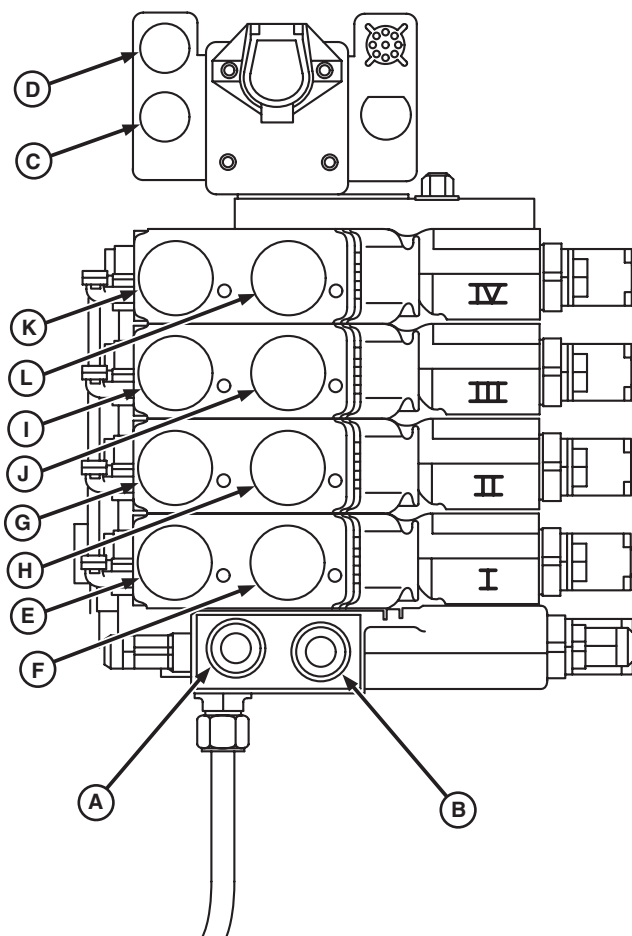


CAUTION: Hydraulic hoses can fail due to physical damage, kinks, age and exposure. Check hoses regularly. Replace damaged hoses.

IMPORTANT: Vacuum RETURN hose, with special tip, MUST be connected to tractor EXTEND port. This allows the motor to be shut off by placing SCV lever directly into “float” position, avoiding damaging pressure spikes. This also applies to variable rate drive when connected to an SCV.

NOTE: With two vacuum motors connected to a single tractor SCV, planter flow control valves must be used to control vacuum level.

It is recommended to connect VRD to an SCV, if one is available.



9000 Series Tractor with 4 SCV's Less Hitch

- A—Auxiliary Pressure Port (Power Beyond Pressure)
- B—Return Port (Power Beyond Return)
- C—Load Sense Coupler (Power Beyond Load Sense)
- D—Motor Seal Drain Port (Fan Motor Case Drain Connection)
- E—SCV I (Extend)
- F—SCV I (Retract)
- G—SCV II (Extend)
- H—SCV II (Retract)
- I—SCV III (Extend)
- J—SCV III (Retract)
- K—SCV IV (Extend)
- L—SCV IV (Retract)

A53289 -UN-07NOV03

9000 Series Tractor with 4 or 5 SCV's With Hitch

Planters Equipped with Vacuum and Variable Rate Drive Hose Connections

Case Drain ^a	D—Must Be Connected First	
Hose Identification	Pressure	Return
Frame Functions and CCS	Extend Port	Retract Port
Independent Markers/Drawbar	Extend Port	Retract Port
Vacuum (Left Motor)	Retract Port	Extend Port
Vacuum (Right Motor)	Retract Port	Extend Port
Variable Rate Drive on Power Beyond with Load Sense (C)	Power Beyond Pressure	Power Beyond Return

^aCase drain hose MUST be attached PRIOR to inlet and return hoses being connected.

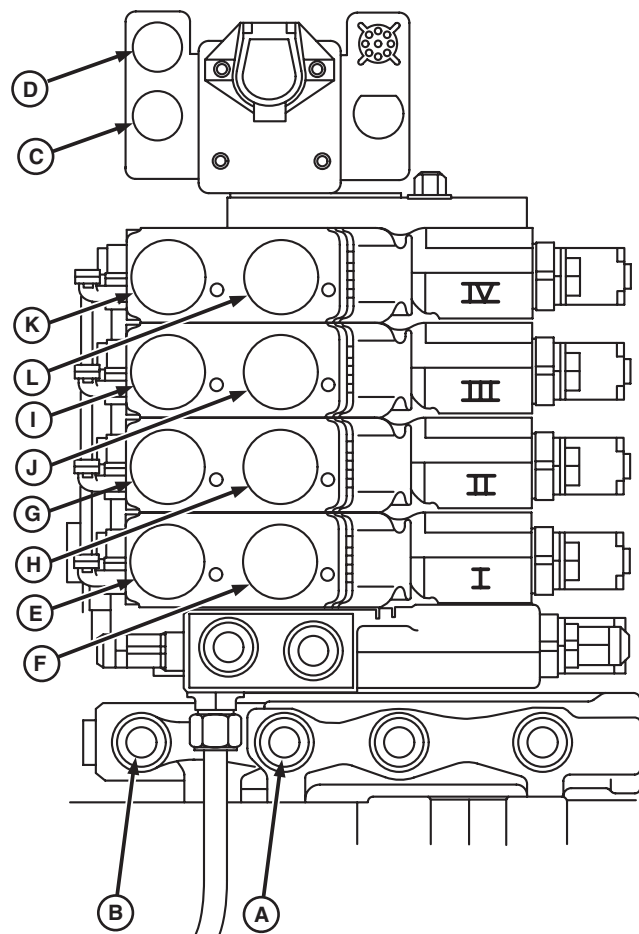


CAUTION: Hydraulic hoses can fail due to physical damage, kinks, age and exposure. Check hoses regularly. Replace damaged hoses.

IMPORTANT: Vacuum RETURN hose, with special tip, MUST be connected to tractor EXTEND port. This allows the motor to be shut off by placing SCV lever directly into “float” position, avoiding damaging pressure spikes. This also applies to variable rate drive when connected to an SCV.

NOTE: With two vacuum motors connected to a single tractor SCV, planter flow control valves must be used to control vacuum level.

It is recommended to connect VRD to an SCV, if one is available.



9000 Series Tractor with 4 SCV's With Hitch

- A—Return Port (Power Beyond Return)
- B—Auxiliary Pressure Port (Power Beyond Pressure)
- C—Load Sense Coupler (Power Beyond Load Sense)
- D—Motor Seal Drain Port (Fan Motor Case Drain Connection)
- E—SCV I (Extend)
- F—SCV I (Retract)
- G—SCV II (Extend)
- H—SCV II (Retract)
- I—SCV III (Extend)
- J—SCV III (Retract)
- K—SCV IV (Extend)
- L—SCV IV (Retract)

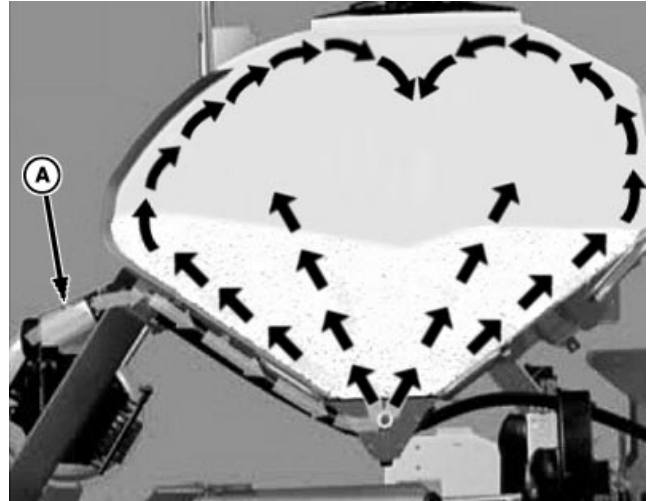
A53292 -UN-07NOV03

Pro-Series *XP* Central Commodity System

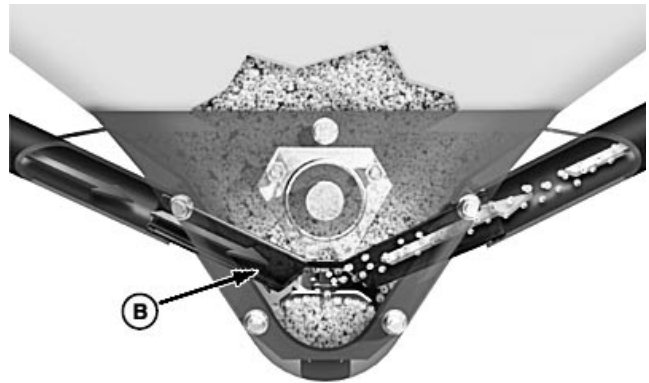
CCS Description

CCS Seed Delivery acts as a tender to the row unit; it provides a small pool of seed at each row unit at all times to supply the meter. The CCS Seed Delivery system has two tanks centrally located for easy filling. Inside of seed tanks is an agitator shaft which prevents treated seed from bridging at the bottom of the tanks. A hydraulically driven fan (A) provides airflow for seed delivery. A plenum within the tank support frame distributes airflow to pressurize the tanks. At the bottom of the bulk seed tanks, there is a manifold. The manifold has one nozzle (B) for each row unit which pulls seed into the air stream and delivers to the row unit hopper. Inside the row unit hopper is a discharge elbow (C) which acts as the on/off switch for seed delivery. Seed flow stops when the seed puddle reaches the bottom of the elbow inside of the hopper. The airflow isn't great enough to overcome this restriction and the delivery process stops. The metering of the seed is still handled by a meter at the row unit to maintain consistent and accurate seed spacing.

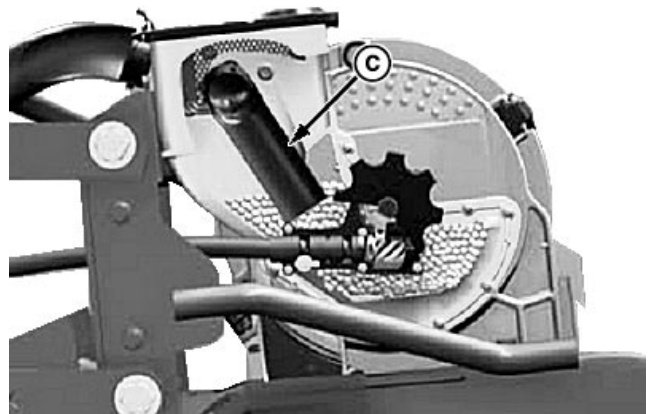
- A—Fan
- B—Nozzle
- C—Elbow



A53376 —UN-20NOV03



A53377 —UN-20NOV03



A53378 —UN-20NOV03

Vacuum Meter Shown

OUO6074.0000B1F —19-26MAR04-1/1

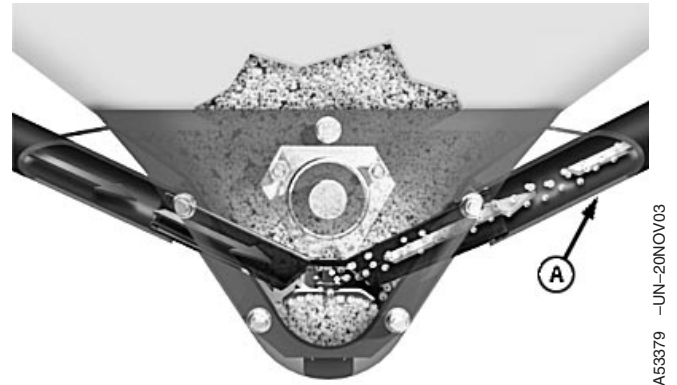
CCS System Theory of Operation

Seed treatments, field conditions, humidity and seed size may alter CCS pressures required to properly deliver seed to all rows. Talc is required on ALL crops to properly lubricate seed. Chemically treated seed may require twice the rate of lubrication to avoid plugging. When changing crops, it is recommended to use the initial setting found in SETTING CCS TANK PRESSURE in this section before adjusting for field conditions.

Generally, the CCS system performs best when using the lowest possible pressure setting to reliably deliver seed to all row units. There will be very little seed flowing in the delivery hoses (A) when operating at optimum performance (the system will run lean). However, if the system pressure is too low, the nozzles will not pick up enough seed. Increasing CCS pressure will help nozzles pick up seed more aggressively. If seed is picked up too easily or aggressively, it may begin to collect in the delivery hoses which can lead to system **plugging**. In general, increasing CCS pressure too much will contribute to delivery hose plugging and hopper elbow plugging.

Another condition called **bridging** also results in poor seed delivery. Bridging occurs when seed does not flow to the nozzle inlets where it can be picked up by the air stream. Generally, the size or shape of the seed and/or sticky seed treatments are the cause. Increasing pressure will often take care of this condition but in some cases running the agitator is required.

Some light weight varieties of seed, such as sorghum/milo, are picked up too easily by the nozzles. Nozzle inserts can be installed over the nozzles to restrict the opening slightly, limiting the amount of seed a nozzle can pick up. Nozzle inserts allow light weight seeds to flow at optimum rates and reasonable pressures ensuring reliable seed delivery to all rows.



A—Delivery Hose

Continued on next page

OOU6074,0000C4C -19-29JUN05-1/4

IMPORTANT: DO NOT exceed 24 in. of tank pressure or damage can occur to the hydraulic motor and seed tank lids.

Random drops in population on the seed monitor that last only short periods (5 to 20 seconds) may indicate the CCS system is not maintaining adequate seed flow to the meters. Make sure meters and/or vacuum system is functioning properly before adjusting CCS system. Increase CCS pressure in 2 inch increments until random population drops stop, indicating adequate seed flow.

Continued on next page

OUO6074,0000C4C -19-29JUN05-2/4

If seed monitor issues a “Row Failed” warning, first determine if the failure is caused by bridging or plugging. To determine this, with the CCS fan running, remove the hopper lid from the failed row and observe the amount of air flowing through the hopper discharge elbow (A).

Bridging

- When CCS fan is running, there will be **high air flow** into the hopper and no seed present.
- Seed is not being picked up by the tank nozzle.

Plugging

- When CCS fan is running, there will be **low air flow** into the hopper.
- Seed may be plugging in delivery hoses between central tanks and meters.
- Seed may be plugging in the discharge elbow. This usually only occurs with large, flat or heavily treated seed, using high CCS pressures and traveling over smooth ground.

Correcting Nozzle Bridging

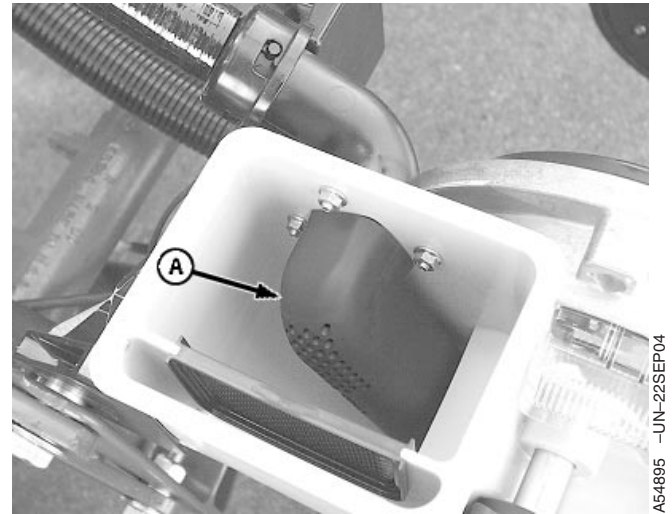
1. Set CCS pressure to recommended level for selected crop.
2. Make sure tank agitator is turning while CCS fan is running.
3. Make sure nozzle inserts are installed as recommended. Most crops do not require inserts. Bridging will occur if inserts are installed when not recommended.

IMPORTANT: DO NOT exceed 24 in. of tank pressure or damage can occur to the hydraulic motor and seed tank lids.

4. If the first three conditions are addressed and bridging still occurs, increase CCS pressure in 2 inch increments until seed flows properly to all rows.

Correcting Hose Plugging

1. Set CCS pressure to recommended setting for crop.
2. Avoid running CCS fan for extended periods when not seeding.



Vacuum Meter Elbow

A—Hopper Discharge Elbow

3. Install nozzle inserts, if recommended for crop.
4. Unplug tank agitator to help nozzles pick up less seed.
5. Generally, increasing CCS pressure contributes to plugging. Do not increase pressure unless necessary, such as when planting on hills.
6. Eliminate large sagging areas in delivery hoses where seed can collect. When seed collects, it can cause surges of seed arriving at meters.
7. As a last resort, install nozzle inserts. These inserts are typically recommended for small seed and light seed treatments

Correcting Hopper Discharge Elbow Plugging

This style of plugging usually only occurs with large, flat or heavily treated seed in very smooth field conditions.

Reduce CCS pressure as much as possible. High CCS pressures complicate elbow plugging. Do not lower CCS pressure too much or seed will not be picked up in nozzles.

Make sure 36 row and larger machines have grey discharge elbows installed on rows with splitter inlet elbows and rows fed by a hose from a splitter inlet elbow.

OUO6074,0000C4C -19-29JUN05-4/4

Operating CCS Tank Fill Lights—Optional

IMPORTANT: Tractor field lights must be on for fill lights to be used.

IMPORTANT: Never transport with field or fill lights on.

With tractor field lights on, fill lights (A) can be operated at the fill light switch (B).

A—Fill Lights
B—Fill Light Switch



A53001 -UN-03OCT03

OUO6074,0000B21 -19-28JUN05-1/1

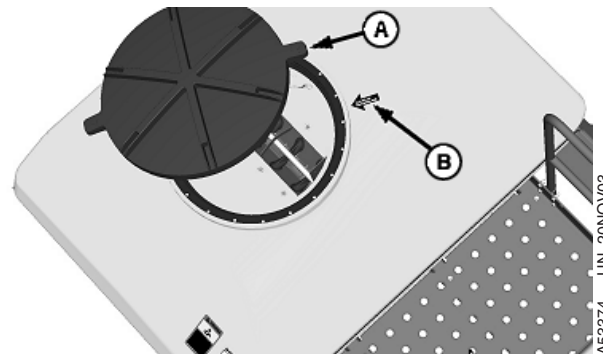
Operating Tank Lids



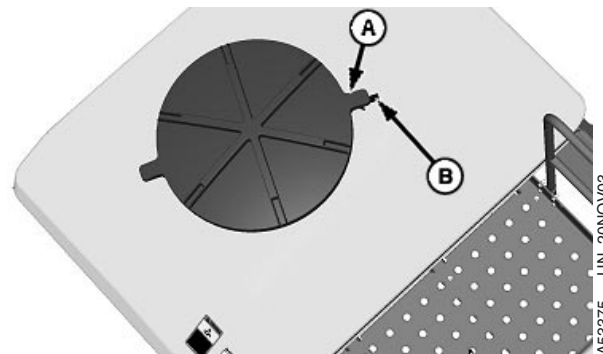
CAUTION: Do not open lids when CCS blower is running. Lids and harmful chemicals may be blown into face and seed lines will plug.

To open, turn lid counterclockwise. To close lid, line up handle (A) with arrow (B) and turn clockwise.

A—Handle
B—Arrow



A53374 -UN-20NOV03



A53375 -UN-20NOV03

OUO6074,0000B22 -19-26MAR04-1/1

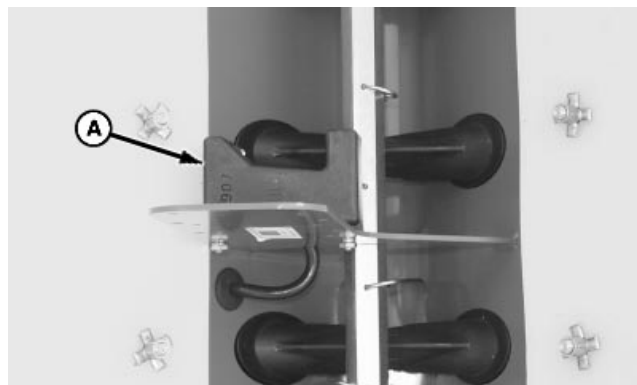
Tank Level Sensors

IMPORTANT: Clean tank level sensors prior to filling CCS tanks. Use “brush” to clean seed level sensor.

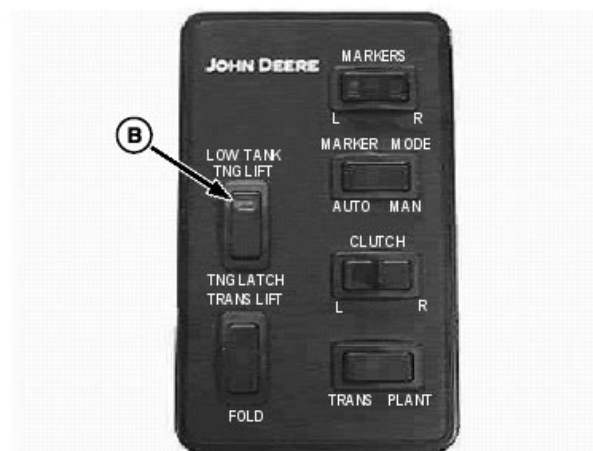
NOTE: Tank level sensor is factory installed at the lowest setting. Sensor can be moved higher up on bracket to receive an earlier warning.

Tank level sensors (A) are optical sensors. When the sensor is exposed in either tank, the tank low warning light (B) on the frame control console will come on.

- A—Tank Level Sensor
- B—Tank Low Warning Light



A49868 -UN-12AUG02



A53315 -UN-12NOV03

OUO6074,0000B23 -19-26MAR04-1/1

Filling CCS Tanks



CAUTION: When transporting machine on roadways, CCS tanks should be empty.

Do not open lids when CCS blower is running. Lids and harmful chemicals may be blown into face and seed lines will plug.

Follow chemical manufacturers precautions when handling parts coated with seed treatments. Use proper skin, eye and respiratory protection.

IMPORTANT: Cleanout any buildup of seed treatments or talc between CCS tank fills.

Keep seed free of debris. Debris will cause blockage at CCS nozzles. Optional fill screen is available, see your John Deere dealer.

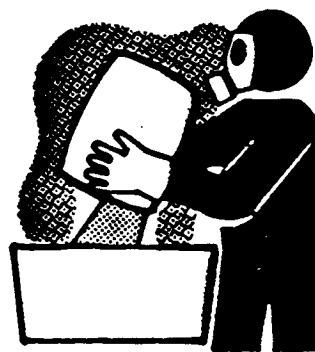
Clean seed level sensor prior to filling of seed tanks

The very first time a new tank is used, coat the inside bottom of bulk tanks with a thin layer of talc. Mix triple the amount of talc into the first two or three bushels of seed placed in bulk tank (See USE OF TALC LUBRICANT in your Rate Charts and Settings Operator's Manual). This will coat the inside of CCS system and hoses with a protective layer of talc to help resist buildup of seed coatings.

Avoid plugging delivery hoses at CCS tank. Tank agitators will run when machine is lowered and tractor key is on. Agitator operation without CCS fan air flow may cause some seed types to plug in hoses at tank. If machine is lowered for extended periods with seed in CCS tank, turn tractor key off or unplug agitator.

Add talc when machine is equipped with vacuum meters. See USE OF TALC LUBRICANT in Operating Vacuum Meter section.

A34471



A34471 -UN-11OCT88



A49921 -UN-20AUG02

For best performance, level off seed in tanks after filling to minimize amount of seed remaining in tanks when planting ends. Recommend using an 203 mm (8 in.) wide, stiff bristled broom with 1372 mm (4.5 ft) handle to level seed when CCS tanks are full and after low tank level sensor warning light comes on.

Close lids tightly after filling to avoid plugging of delivery lines when CCS system is activated.

OUO6435,0001FE4 -19-21JUN06-2/2

Leveling Seed in CCS Tanks



CAUTION: Do not open lids when CCS blower is running. Lids and harmful chemicals may be blown into face and seed lines will plug.

Follow chemical manufacturers precautions when handling parts coated with seed treatments. Use proper skin, eye and respiratory protection.

When a row unit, low rate warning occurs or a low tank level sensor light comes on, use an 203 mm (8 in.) wide, stiff bristled broom with 1372 mm (4.5 ft) handle to evenly distribute seed in CCS tanks. Also use this brush to level seed after filling CCS tanks, and to periodically clean tank level sensor.

OUO6074,0000B25 -19-26MAR04-1/1

Filling Row Unit Hoppers



CAUTION: Do not operate CCS blower without tank lids installed. Harmful chemicals can be blown into face and seed lines will plug.

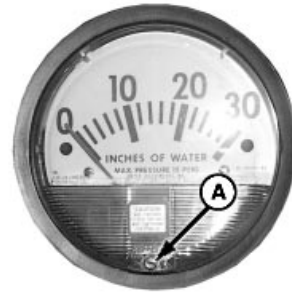
Lower machine until CCS fan starts operating and begins to fill row units. Row unit hoppers will usually be at operating level in under 30 seconds, however large seeds and wide planters may increase this time to 2 minutes.

OUO6074,0000B26 -19-26MAR04-1/1

Zeroing CCS Fan Pressure Gauge

With CCS fan shut off and CCS gauge in a vertical position, disconnect CCS fan monitor line to vent gauge to atmosphere. Use the zero adjusting screw (A) to set the gauge pointer exactly on zero mark. Connect monitor line.

A—Zero Adjusting Screw



OUO6074,0000B27 -19-26MAR04-1/1

A51170 -UN-18NOV02

Setting CCS Tank Pressure

To set the tank pressure proceed as follows:

1. Make sure tank lids are closed.

IMPORTANT: Warm oil by running vacuum blowers (if equipped) or install a hose loop in SCV per tractor operator's manual. **DO NOT** use CCS fan to warm oil or seed delivery hoses can plug.

2. Warm up tractor oil for 15 minutes.
3. Lower machine, leave SCV in constant retract detent position.
4. Open flow control valve (A) counterclockwise until seed starts flowing to hoppers.

IMPORTANT: **DO NOT** exceed 24 inches of tank pressure or damage to hydraulic motor and seed tank lids can occur.

NOTE: If lower warnings are received while planting and row meters are empty, increase tank pressure by 2 inches until meters stay full.

5. When row hoppers are full and machine is not moving, adjust pressure as follows:



A—Flow Control Valve

A54380 -UN-28JUL04

Continued on next page

OUO6074,0000B28 -19-02JUN06-1/3

DB44			
Product	Pressure in Inches of Water	Nozzle Insert Required	Small Seed Discharge Elbow (Vacuum Only)
Soybeans	12	No	No
Small Corn (Over 2000 seeds/lb)	10	No	No
Medium Corn (Between 2000 and 1200 seeds/lb)	12	No	No
Large Corn (Less than 1200 seeds/lb)	14	No	No
Cotton	10	No	No
Sorghum	8	Yes	Yes
Sunflowers	6	No	No

DB58, DB60, and DB66			
Product	Pressure in Inches of Water	Nozzle Insert Required	Small Seed Discharge Elbow (Vacuum Only)
Soybeans	14	No	No
Small Corn (Over 2000 seeds/lb)	12	No	No
Medium Corn (Between 2000 and 1200 seeds/lb)	14	No	No
Large Corn (Less than 1200 seeds/lb)	16	No	No
Cotton	12	Yes	Optional
Sorghum	10	Yes	Yes
Sunflowers	6	No	No

Continued on next page

OUO6074,0000B28 -19-02JUN06-2/3

DB80, DB88, and DB90			
Product	Pressure in Inches of Water	Nozzle Insert Required	Small Seed Discharge Elbow (Vacuum Only)
Soybeans	16	No	No
Small Corn (Over 2000 seeds/lb)	14	No	No
Medium Corn (Between 2000 and 1200 seeds/lb)	16	No	No
Large Corn (Less than 1200 seeds/lb)	18	No	No
Cotton	12	Yes	Optional
Sorghum	10	Yes	Yes
Sunflowers	6	No	No

OUO6074,0000B28 -19-02JUN06-3/3

Operating CCS System—Heavily Treated Seed or Very Large Seed Corn

IMPORTANT: Talc or graphite must be mixed thoroughly during filling of tanks.

IMPORTANT: Remove any buildup of seed treatment or talc with stiff bristled 1372 mm (4.5 ft) handle 203 mm (8 in.) wide broom.

VACUUM METERS: When operating CCS system with heavily treated seed or very large seed corn, DOUBLE the rate of talc. See SEED TREATMENT RECOMMENDATIONS in Operating Vacuum Meter section.

PLATELESS METERS: When operating CCS system with heavily treated seed or very large seed corn, DOUBLE the rate of graphite. See USING POWDERED GRAPHITE in Operating Plateless Meter section.

OUO6074,0000B29 -19-26MAR04-1/1

Operating CCS System When Planting Sorghum and Small Cotton

IMPORTANT: Remove nozzle inserts (A) before switching to crop with larger seed. Larger seed will not come out of tanks with nozzle inserts installed. Tanks will then have to be drained, nozzle inserts removed, and refilled.

NOTE: Nozzle is recommended for sorghum and small popcorn.

1. Install nozzle inserts (A) over all nozzles prior to filling tank.

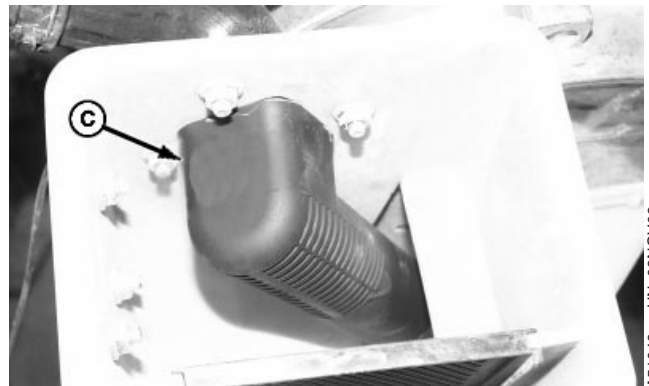
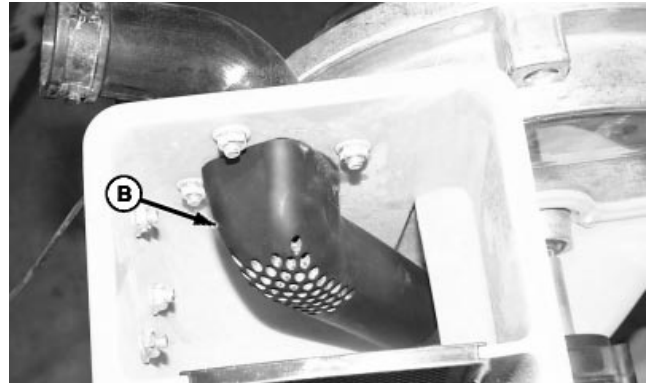
NOTE: Changing elbows is optional for small popcorn.

2. Remove elbow (B) with small holes from mini hoppers.
3. Install elbow (C) with slotted holes in mini hoppers.

A—Nozzle Inserts (A73214)
B—Elbow (A75164)
C—Elbow (Sorghum) (A75165)



Nozzle Inserts



Elbow - Sorghum

OUO6074,0000B2A -19-30JUN05-1/1

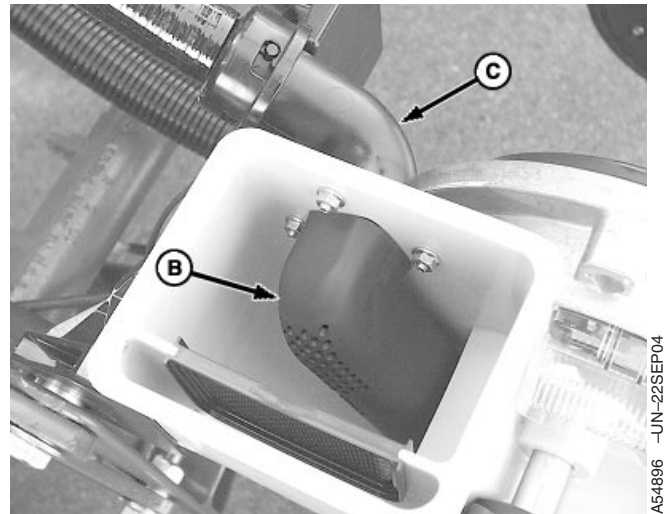
Operating CCS System When Planting Standard Seed Sizes

1. Remove covers (A). Larger seeds will not come out of tanks with covers installed.
2. Install black discharge elbow (with small holes) (B) on rows with single inlet elbow (C).
3. **36 Row or Larger Machines Only:** Install grey discharge elbow (with small holes) (D) on rows with splitter inlet elbows (E) and rows fed by hose from splitter inlet elbows.

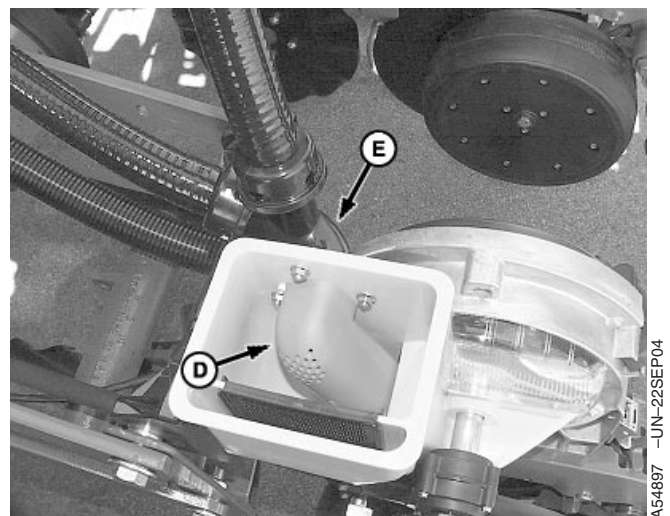
A—Cover
 B—Black Discharge Elbow (Standard)
 C—Single Inlet Elbow
 D—Grey Discharge Elbow (Splitter)
 E—Splitter Inlet Elbow



Covers



Black Discharge Elbow



Grey Discharge Elbow

OUO6074.0000D5A -19-29JUN05-1/1

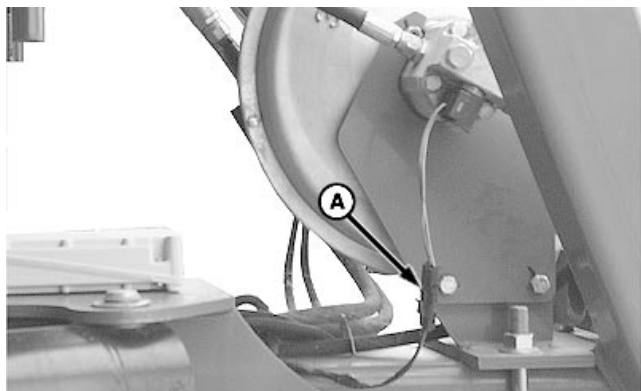
Planting Seed Plots with CCS Systems

NOTE: Due to the small quantity of seed being planted, removing the CCS system from operation and filling row units individually is recommended.

Disconnect harness connector (A) from CCS fan.

Fill row units individually instead of using CCS tanks.

A—CCS Fan Harness Connector



AS4350 -UN-18MAY04

OUO6074,0000D2C -19-27JUL04-1/1

Partially Cleaning Out CCS Tanks

To remove only a portion of seed from CCS tanks, there is a small variable cleanout door that can be opened or closed to control the amount of seed being removed.

Slide door (A) until desired amount of seed is coming out.

A—Door



AS2501 -UN-01JUN04

OUO6074,0000B2B -19-26MAR04-1/1

Cleaning Out CCS Tanks

IMPORTANT: When cleaning tank for certified seed, remove all seed from tank with stiff bristled 1372 mm (4.5 ft) handle 203 mm (8 in.) wide broom.

IMPORTANT: Remove any buildup of seed treatment or talc with stiff bristled 1372 mm (4.5 ft) handle 203 mm (8 in.) wide broom.

IMPORTANT: Make sure cleanout doors on CCS tanks are closed prior to folding machine or they can be damaged.

NOTE: Purge/Plant switch must be in PLANT / TANK CLEANOUT position or CCS fan will forcefully expel seed from cleanout doors.

1. Open cleanout door (A) on bottom of CCS tank.
2. Place a bucket (B) or container under cleanout door to catch remaining seed from tank.
3. Close cleanout door.
4. Repeat for all other cleanout doors.

A—Cleanout Door
B—Bucket



A49927 -UN-20AUG02



A49926 -UN-20AUG02

OUO6074,0000B2C -19-27JUL04-1/1

Operating Machine

General

IMPORTANT: DO NOT put SCV lever in FLOAT when raising and lowering machine. Correct procedure for raising and lowering machine is to POWER completely UP or DOWN.

To prevent plugging of seed tubes or seed openers, lower the machine when moving forward.

DO NOT back up with machine lowered.

For proper machine operation, it is important that the machine frame be fully lowered into 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 may be warranted:

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

1. Use recommended size tractor.
2. Be sure tractor and machine have been properly prepared. See Preparing Tractor and Preparing Machine sections.
3. Check seed rates carefully.
4. Check tire pressure before seeding.
5. Allow tractor hydraulic oil to warm up thoroughly prior to seeding. Cold oil will cause slower fan speeds.
6. Run CCS fan at recommended speed; excessive speed will cause increased wear on air system and damage seed.
7. Whenever machine has been standing for an hour or more during period of high humidity or damp, rainy days, or after sitting overnight, run CCS fan at recommended rpm, with machine stationary for 10 minutes.
8. Use clean seed for best results.

OUO6074,00009A1 -19-26JAN06-1/1

Operating VACUMETER Hydraulic System

The vacuum motor hydraulic hoses should be connected to the tractor such that the pressure hose is connected to the retract coupler on the tractor.

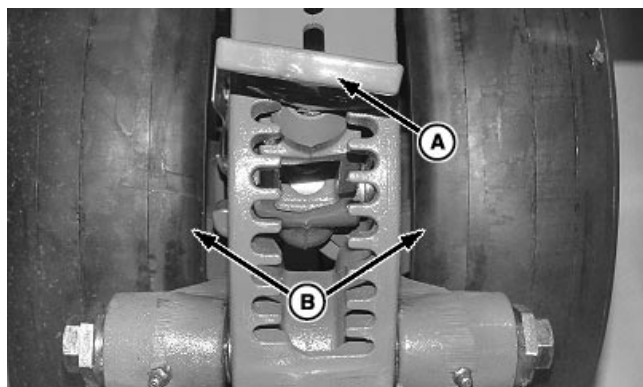
To engage the vacuum system, push the SCV lever forward and lock it into forward (retract) detent.

To stop the vacuum system, push the SCV lever forward into "float" position, not to neutral. This will avoid damaging pressure spikes in the hydraulic system.

Once the hydraulic vacuum motors/fans have come to a stop, the SCV lever can be returned to the neutral position.

OUO6045,00008B4 -19-20JUN06-1/1

Adjusting Planting Depth



A53159 -UN-23OCT03

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

Gauge wheels (B) control seed depth. Adjust planting depth as follows:

1. Raise machine to remove weight from gauge wheels.
2. Lift depth-adjusting handle (A). Move it forward to decrease planting depth or rearward 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.

NOTE: When operating in the field, lower machine when tractor is moving forward. This will prevent the openers and seed tubes from plugging with soil.

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



A57709 -UN-05APR06

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



A57710 -UN-05APR06

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



A57711 -UN-05APR06

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

A—Depth-Adjusting Handle
B—Gauge Wheels

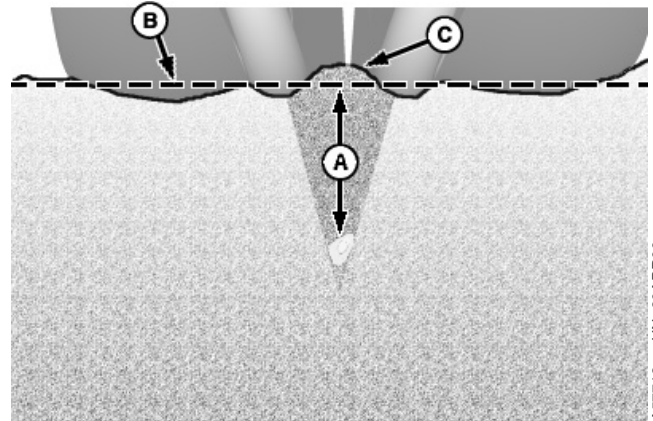
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OUC6074,00009B4 -19-20APR06-1/2

5. Check planting depth on each row.

- a. Dig down vertically through soil to locate seed.
- b. Measure the depth (A) from seed to top of soil profile (B). Do not measure to top of ridge (C) created by closing wheels.

A—Depth
B—Top of Soil Profile
C—Ridge



Soil Cross Section

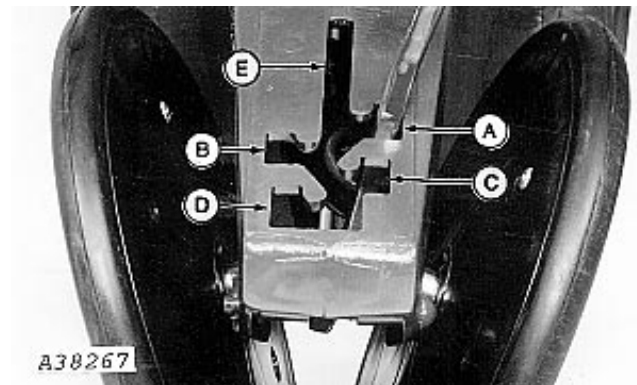
A57713 -UN-20APR06

OUC6074,00009B4 -19-20APR06-2/2

Adjusting Closing Wheel Down Force

Angled closing wheels trail behind seed opener and close the seed trench created by openers. The closing wheels firm soil on each side of seed, not directly over seed. Adjustable spring-force permits proper closing of seed trench.

Place handle in slots (A), (B), (C) and (D) to adjust down force for varying ground conditions. Placing handle in middle slot (E) will allow closing wheels to FLOAT with only the weight of closing wheel system on soil surface.



A—Slot A (Minimum)
B—Slot B
C—Slot C
D—Slot D (Maximum)
E—Slot E (Float)

A38267 -UN-27NOV95

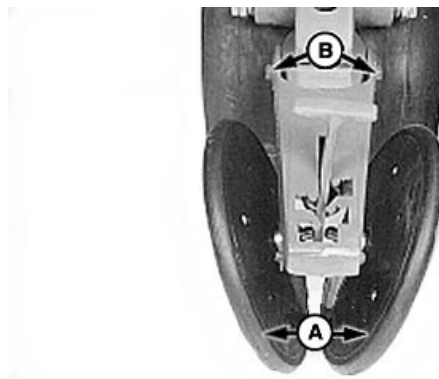
OUC6074,0000A50 -19-17MAR04-1/1

Centering Closing Wheels

If closing wheels (A) are not centered over 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).

A—Closing Wheels
B—Cap Screws



A46773 -UN-12OCT00

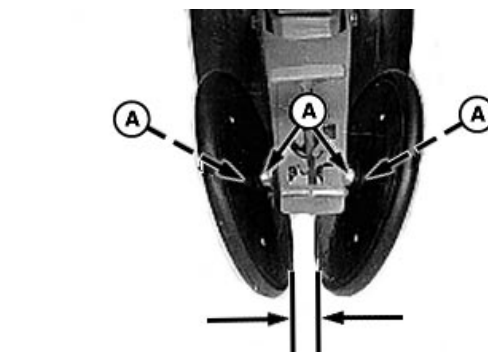
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Adjusting Closing Wheel Spacing

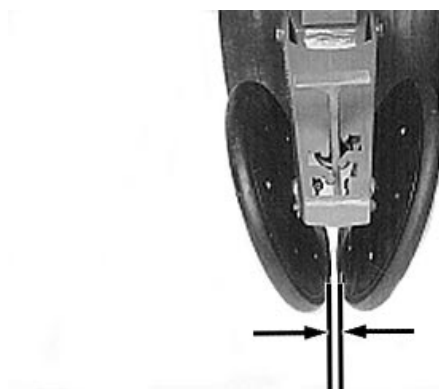
NOTE: Spacing between closing wheels is adjustable, so closing system can be tailored to meet the requirements of planting small seeds at shallow depths.

To change spacing, remove nuts and spacers (A). Install closing wheels with spacers located to the outside (for narrow spacing) or to the inside (for wide spacing).

A—Nuts and Spacers



A46774 -UN-13OCT00



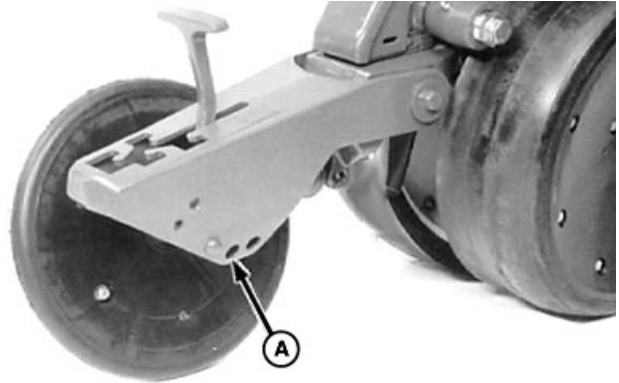
A46775 -UN-12OCT00

AG,OUO6074,1205 -19-04AUG00-1/1

Staggering Closing Wheels

In mulch till or no-till conditions, residue or root balls may get lodged between closing wheels. To reduce the chance of this happening, remove one closing wheel from planting unit and install in rear hole (A) of casting.

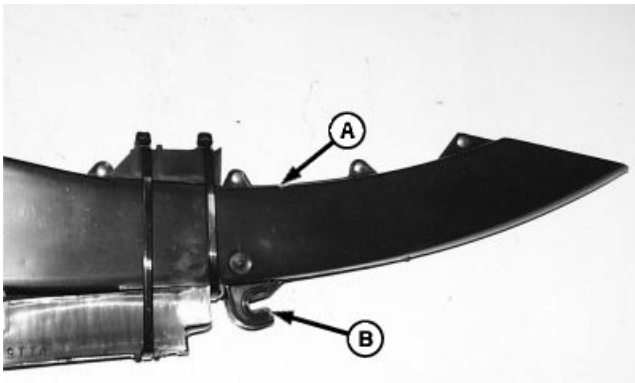
A—Rear Hole



A46776 -UN-12OCT00

AG,OUO6074,1206 -19-04AUG00-1/1

Installing and Removing Seed Tubes



A53216 -UN-27OCT03



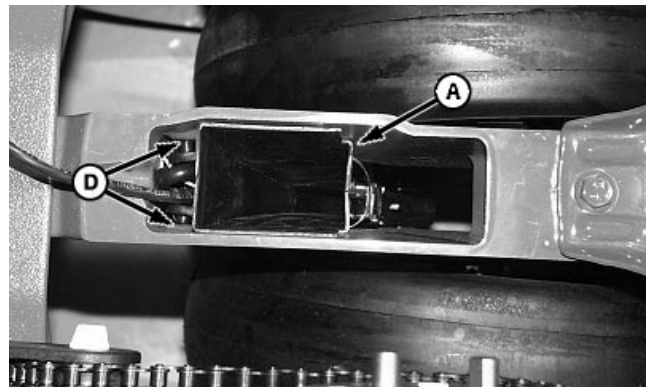
A53298 -UN-03NOV03

1. Connect monitor harness to sensor harness.

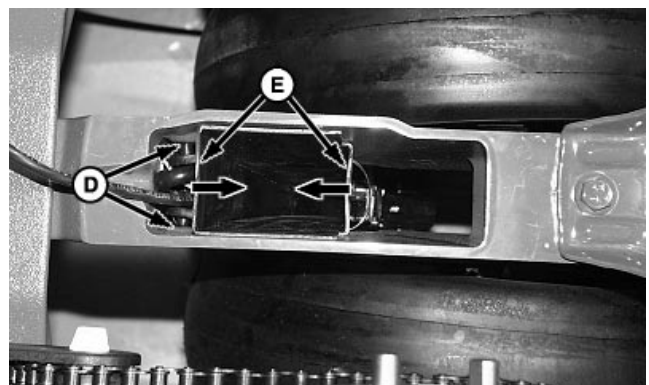
NOTE: Place harness connector inside planting unit at same time as seed tube.

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

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



A53218 -UN-27OCT03



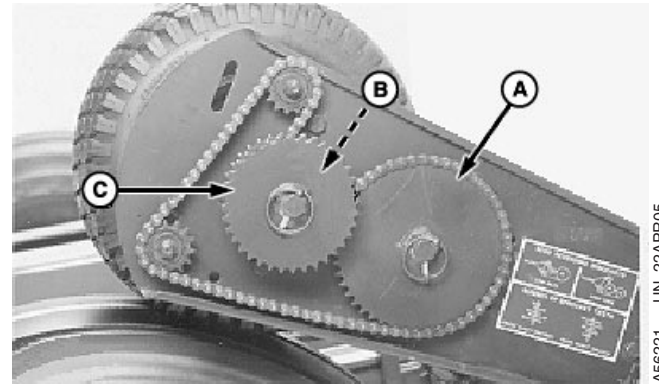
A54328 -UN-12MAY04

OUO6074,0000C7F -19-12JUN06-1/1

Changing Input Sprocket Combinations—Seed Transmission

Consult appropriate planting rate chart to determine desired input sprocket combinations.

1. Install sprockets (A and B) per table and attach with quick-lock pin .
2. Install chain around sprockets and tighten idlers.
3. Store non-used sprockets (C) in front of drive sprocket and attach with quick-lock pin.



A56221 -UN-22APR05

A—Sprocket, Driven
B—Sprocket, Drive
C—Sprocket, Storage

Sprocket Combinations				
Meters	Low Range		High Range	
Drive Sprocket (B)	Driven Sprocket (A)	Drive Sprocket (B)	Driven Sprocket (A)	
Chain Driven	18-Tooth Sprocket	48-Tooth Sprocket	36-Tooth Sprocket	36-Tooth Sprocket
Proshaft Driven Vacuum	18-Tooth Sprocket	48-Tooth Sprocket	36-Tooth Sprocket	36-Tooth Sprocket
Proshaft Driven Mechanical	21-Tooth Sprocket	36-Tooth Sprocket	29-Tooth Sprocket	19-Tooth Sprocket

OUO6074,000021C -19-22APR05-1/1

Changing Planting Rate Sprocket Combinations—Seed Transmission

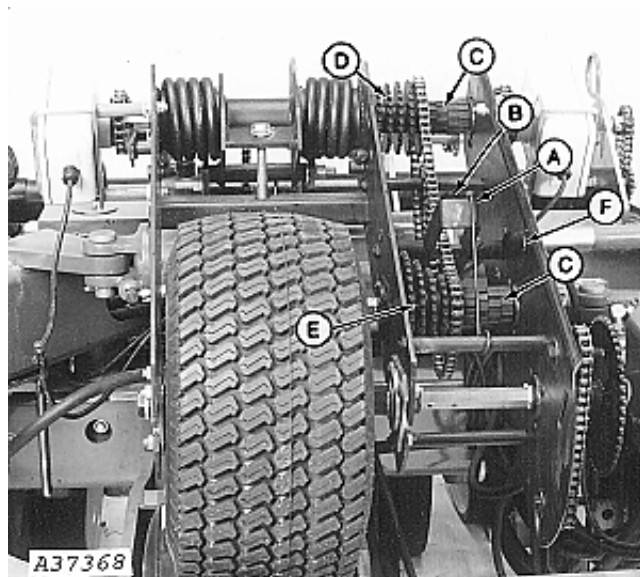
NOTE: Rate charts are based on average planter wheel slip in tilled soil conditions. No-till conditions will likely result in a higher population than what is shown in rate charts. Adjust accordingly. Always verify population and spacing with a field check.

Consult appropriate planting rate chart to determine desired sprocket combinations.

1. Remove retaining hook (A) from storage position.
2. Pull chain tightener (B) downward and place hook (A) on tightener.
3. Remove required number of rubber sprocket spacers (C).
4. Remove chain from sprockets. Slide desired drive sprocket (E) and driven sprockets (D) into alignment with chain tightener and replace chain.

NOTE: 35-tooth drive sprocket will NOT clear chain tightener unless it is unhooked.

5. Remove hook from chain tightener. Reposition hook in storage position by pressing into clip (F).
6. Replace rubber sprocket spacers on upper and lower shafts.



A—Hook
B—Chain Tightener
C—Spacers
D—Driven Sprocket
E—Drive Sprocket
F—Clip

OUC1074,00000B1 -19-03JUN05-1/1

Finding Transmission Sprocket Settings for Row Widths Not Shown in Operator's Manual

When desired population is known, use the following formula to find transmission sprocket settings for row widths not shown in seed charts.

FORMULA:

$$(A \div B) \times C = D$$

A = Desired row width in inches.

B = Row width column in the seed chart (for crop being planted) nearest to desired row width.

C = Seed population desired.

D = Calculated comparison population value.

The following example assumes corn will be planted (using vacuum meters with corn-30 cell disks) with

planting units set on 28 in. rows and a desired seed population of 28 000. Using seed chart for corn-30 cells, the row width nearest the desired row width is 30 in.

EXAMPLE:

$$(28 \div 30) \times 28\,000 = 26\,133$$

Find population value in chart nearest to calculated comparison population value (26 318 for this example).

Use the sprocket combinations in the corresponding rows (29-tooth driver and 27-tooth driven for this example) to achieve desired population (28 000 for this example).

Continued on next page

AG,OUO6074,1207 -19-12JAN06-1/2

{Decal No. DB1083}

CORN - 30 CELLS

**AVERAGE SEED SPACING AND/OR APPROXIMATE SEED POPULATION PER ACRE OF
CORN SEED PLANTED WITH VACUUM METER**

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing in In.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	2-3/16	95,288	79,406	75,227	71,466	2 to 3
35	25	2-5/16	91,476	76,230	72,218	68,607	2 to 3
35	26	2-3/8	87,958	73,298	69,440	65,968	2 to 3
35	27	2-1/2	84,700	70,583	66,868	63,525	2 to 3-1/2
35	28	2-9/16	81,675	68,063	64,480	61,256	2 to 3-1/2
29	24	2-5/8	78,593	65,794	62,331	59,214	2 to 3-1/2
29	25	2-3/4	75,794	63,162	59,383	56,846	2 to 3-1/2
29	26	2-7/8	72,879	60,733	57,536	54,659	2 to 4
29	27	3-1/16	70,180	58,483	55,405	52,635	2 to 4
29	28	3-1/8	67,674	56,395	53,427	50,755	2 to 4
24	24	3-1/4	65,340	54,450	51,584	49,005	2 to 4-1/2
24	25	3-5/16	62,726	52,272	49,521	47,045	2 to 4-1/2
24	26	3-1/2	60,314	50,262	47,616	45,235	2 to 4-1/2
24	27	3-5/8	58,080	48,400	45,853	43,560	2 to 5
24	28	3-3/4	56,006	46,671	44,215	42,004	2 to 5
20	24	3-13/16	54,450	45,375	42,987	40,838	2 to 5-1/2
20	25	4	52,272	43,560	41,267	39,204	2 to 5-1/2
20	26	4-3/16	50,262	41,885	39,680	37,696	2 to 6
20	27	4-5/16	48,400	40,333	38,211	36,300	2 to 6
20	28	4-1/2	46,671	38,893	36,846	35,004	2 to 6-1/2
16	24	4-7/8	43,560	36,300	34,389	32,670	2 to 6-1/2
16	25	5	41,818	34,484	33,014	31,363	2 to 7
16	26	5-3/16	40,209	33,508	31,744	30,157	2 to 7
16	27	5-3/8	38,720	32,267	30,568	29,040	2 to 7-1/2
16	28	5-5/8	37,337	31,114	29,477	28,003	2 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven			Approximate Seed Population Per Acre				Recommended Speed Range in mph
Average Seed Spacing in In.			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	5-13/16	35,733	29,777	28,210	26,800	3 to 8
35	25	6-1/8	34,304	28,586	27,082	25,728	3 to 8
35	26	6-3/8	32,984	27,487	26,040	24,738	3 to 8
35	27	6-9/16	31,763	26,469	25,076	23,822	3 to 8
35	28	6-13/16	30,628	25,523	24,180	22,971	3 to 8
29	24	7-1/16	29,607	24,673	23,374	22,205	4 to 8
29	25	7-3/8	28,423	23,686	22,439	21,317	4 to 8
29	26	7-5/8	27,330	22,775	21,576	20,497	4 to 8
29	27	7-15/16	26,318	21,931	20,777	19,738	4 to 8
29	28	8-1/4	25,378	21,148	20,035	19,033	4 to 8
24	24	8-9/16	24,503	20,419	19,344	18,377	4 to 8
24	25	8-7/8	23,522	19,602	18,570	17,642	4 to 8
24	26	9-1/4	22,618	18,848	17,856	16,963	4 to 8
24	27	9-5/8	21,780	18,150	17,195	16,335	4 to 8
24	28	9-15/16	21,002	17,502	16,581	15,752	4 to 8
20	24	10-1/4	20,419	17,016	16,120	15,314	4 to 8
20	25	10-11/16	19,602	16,335	15,475	14,702	4 to 8
20	26	11-1/16	18,848	15,707	14,880	14,136	4 to 8
20	27	11-1/2	18,150	15,125	14,329	13,613	4 to 8
20	28	11-15/16	17,502	14,585	13,817	13,126	4 to 8
16	24	12-13/16	16,335	13,613	12,896	12,251	4 to 8
16	25	13-5/16	15,682	13,068	12,380	11,761	4 to 8
16	26	13-7/8	15,078	12,565	11,904	11,309	4 to 8
16	27	14-3/8	14,520	12,100	11,463	10,890	4 to 8
16	28	14-15/16	14,001	11,668	11,054	10,501	4 to 8

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

A46884 -19-15NOV00

Adjusting Seed Transmission Wheel Engagement Point

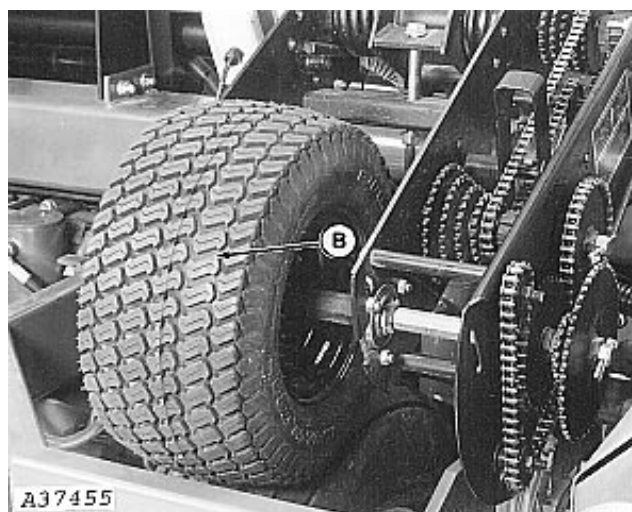
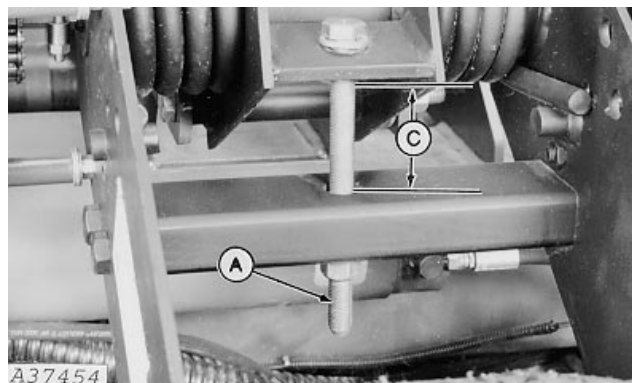
NOTE: To adjust SEEDSTAR Variable Rate Drive engagement point, see your SEEDSTAR Operator's Manual.

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

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

Adjust cap screw (A) to dimension (C) of 114 mm (4-1/2 in.) to establish engagement point of transmission wheel (B) with drive wheel in the lowering cycle of the machine.

- A—Cap Screw
- B—Transmission Wheel
- C—Dimension, 114 mm (4.5 in.)



SEEDSTAR is a trademark of Deere & Company

AG,OUO1074,1071 -19-24MAR04-1/1

Removing Pro-Series XP Seed Hopper Assembly From Row Unit

1. Rotate CCS seed delivery hose (A) counterclockwise until it unsnaps from hopper fill neck (B) and pull hose off.

2. Push down on clip (C) while lifting up on latch (D) to unlock meter assembly from row unit.

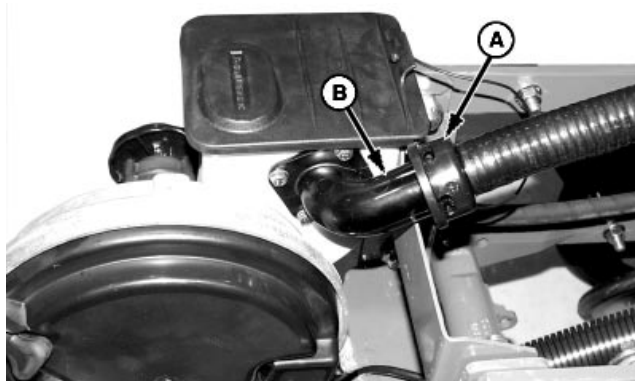
If equipped with vacuum, remove vacuum hose (E).

If row is monitored for vacuum pressure, pull clip (F) sideways to unlock and pull sensor hose off fitting.

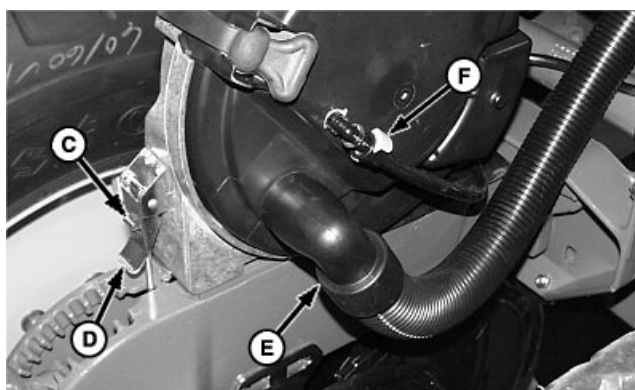
3. Rotate lock pin (G) 180 degrees until the word "locked" is on bottom.

4. Pull Pro-Shaft Drive cable (H) from gearbox housing (I) while raising rear of meter upward and rearward.

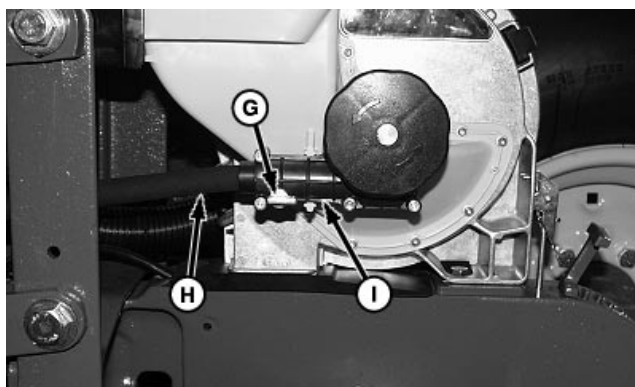
A—Delivery Hose
B—Fill Neck
C—Clip
D—Latch
E—Vacuum Hose
F—Clip
G—Lock Pin
H—Drive Cable
I—Gearbox Housing



A49955 -UN-03DEC02



A53366 -UN-20NOV03



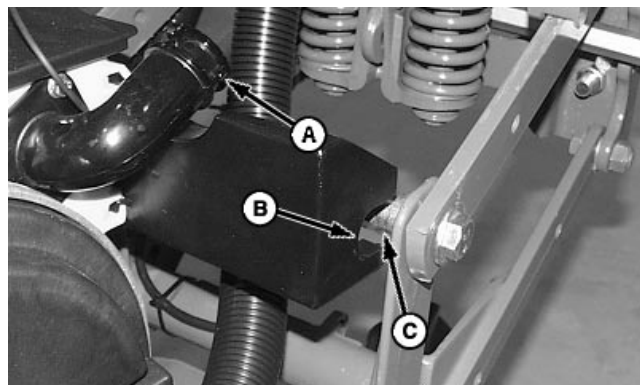
A53367 -UN-20NOV03

OUC6074,0000B2D -19-26MAR04-1/1

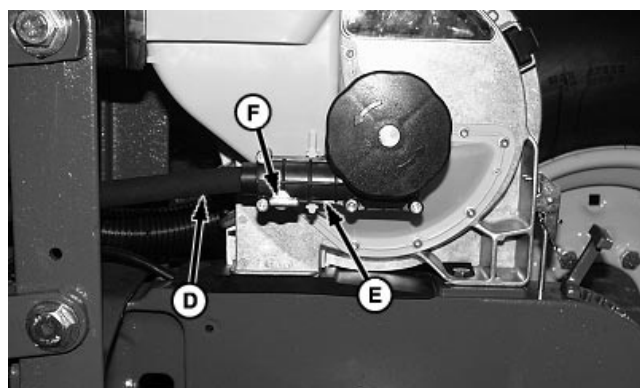
Installing Pro-Series XP Seed Hopper Assembly on Row Unit

1. Push hopper alignment notch (B) over cap screw (C) (both sides).
2. Push CCS seed delivery hose onto hopper fill neck (A) and rotate clockwise until it snaps into place.
3. Push Pro-Shaft Drive cable (D) into gearbox housing (E) while rotating meter down.
4. Rotate lock pin (F) 180 degrees until the word "locked" is on top.
5. Make sure alignment pin (G) on bottom of meter is aligned with hole on row unit and hook (H) is latched into row unit.
6. Position hook (H) as shown and lower latch (I) until clip (J) snaps, securing latch.
7. If equipped with vacuum, install vacuum hose (K).
8. If row is monitored for vacuum pressure, push sensor hose on fitting and push clip (L) sideways to lock hose onto fitting.

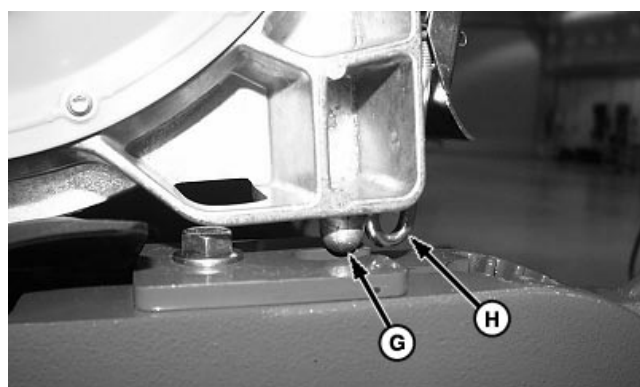
A—Hopper Fill Neck
B—Alignment Notch
C—Cap Screw
D—Drive Cable
E—Gearbox Housing
F—Lock Pin
G—Alignment Pin
H—Hook
I—Latch
J—Clip
K—Vacuum Hose
L—Clip



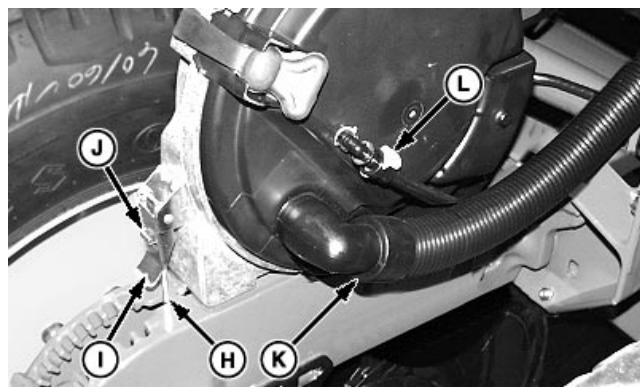
A53368 -UN-20NOV03



A53369 -UN-20NOV03



A53370 -UN-20NOV03



A53371 -UN-22DEC03

Cleaning Out Pro-Series XP Seed Hoppers and Vacuum Metering Units



CAUTION: Avoid injury from crushing. Frame control box PLANT/TRANS switch must be in TRANS position, service locks must be installed and the following procedure must be followed as outlined.

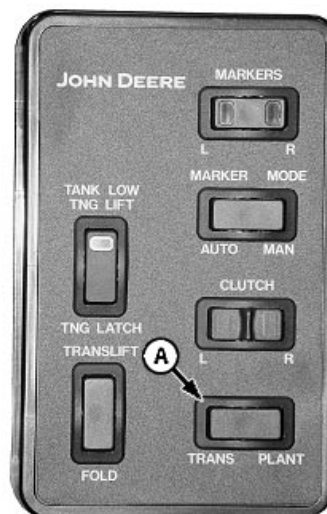
Avoid injury from crushing. When procedure is complete, place tractor selective control valve (SCV) in Neutral position before PLANT/TRANS switch is moved to PLANT position.

The Purge/Plant switch (C) allows the fan to operate while machine is in a raised position. This enables the operator to clean out the CCS tanks and purge the hoses without climbing in and out of the tractor cab. The following procedure must be completed in the order given to avoid possible injury and machine damage.

1. Raise machine.
2. Place tractor in park and apply parking brake.
3. Install wing and centerframe service locks (B).
4. Place (frame control box) Plant/Transport switch (A) in Transport position.

NOTE: With frame in raised position, the CCS row unit switch disables CCS fan.

5. Place SCV lever into frame lower-detent position.
6. Purge/Plant switch should already be in PLANT / TANK CLEANOUT position and should remain in that position for tank cleanout.



A54595 -UN-27JUL04



A54596 -UN-27JUL04



A54397 -UN-28JUL04

A—PLANT/TRANS Switch
B—Service Locks
C—Purge/Plant Switch

Continued on next page

OUO6074.0000D2D -19-22SEP04-1/6

CAUTION: Use caution if using seed treatments when opening meter doors. Chemical can cause eye, skin, or breathing problems. Wear mask, gloves, and goggles. Read and follow safety instructions on the chemical supplier's label.

IMPORTANT: When cleaning tank for certified seed, remove all seed from tank with stiff bristled 1372 mm (4.5 ft) handle 203 mm (8 in.) wide broom.

IMPORTANT: Remove any buildup of seed treatment or talc with stiff bristled 1372 mm (4.5 ft) handle 203 mm (8 in.) wide broom.

IMPORTANT: Make sure cleanout doors on CCS tanks are closed prior to folding machine or they can be damaged.

7. If tanks contain large amounts of seed, use slide door (A) to reduce seed to a manageable level. Once cleanout doors (B) are open they can not be closed completely until seed stops flowing. Repeat on each tank.

NOTE: Purge/Plant switch must be in PLANT / TANK CLEANOUT position or CCS fan will forcefully expel seed from cleanout doors.

8. Place a bucket (C) or other container under cleanout door (B) and open door to clean out remaining seed.

9. Close cleanout door.

10. Repeat on remaining cleanout doors.

A—Slide Door
B—Cleanout Door
C—Bucket

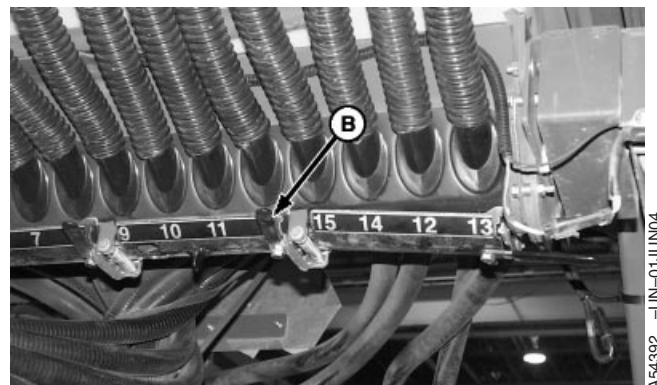


A34471

A34471 -UN-11OCT88



A52501 -UN-01JUN04



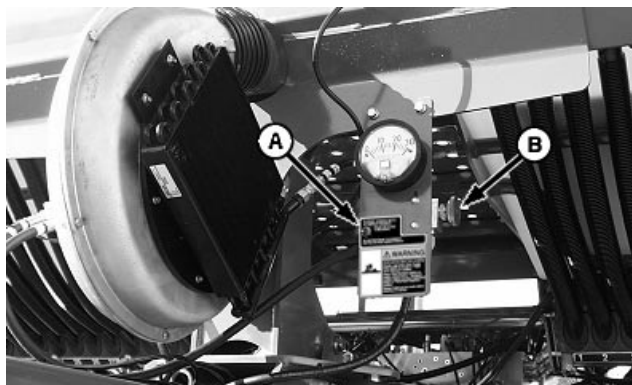
A54392 -UN-01JUN04



A54393 -UN-01JUN04

11. Place Purge/Plant switch (A) in PURGE HOSES position.
12. Adjust CCS fan control knob (B) until 20 inches of tank pressure is achieved for good delivery hose cleanout.

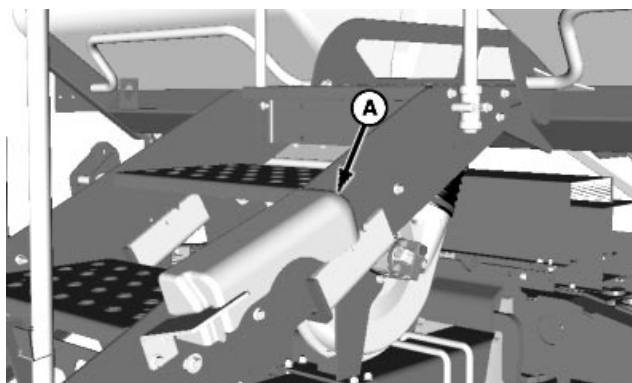
A—Purge/Plant Switch
B—CCS Fan Control Knob



OUO6074,0000D2D -19-22SEP04-3/6

13. Remove seed meter catch pan (A) from storage location.

A—Storage Location



OUO6074,0000D2D -19-22SEP04-4/6

CAUTION: Use caution if using seed treatments when opening meter doors. Chemical can cause eye, skin, or breathing problems. Wear mask, gloves, and goggles. Read and follow safety instructions on the chemical supplier's label.

14. Install seed meter catch pan (A) on row unit as shown, open vacuum meter dome and slowly remove seed disk to purge seed from hose and meter housing. Repeat for all rows.

15. Return seed meter catch pan to storage position.

A—Seed Meter Catch Pan



A34471

A34471 -UN-11OCT88



A49902 -UN-03DEC02

Continued on next page

OUO6074,0000D2D -19-22SEP04-5/6

CAUTION: Avoid injury from sudden fan start-ups. If switch is left in PURGE HOSES position, fan will operate any time SCV is activated, even in folded position.

NOTE: The Purge/Plant switch must be returned to the PLANT / TANK CLEANOUT position for best planter performance.

16. Place Purge/Plant switch (C) in PLANT/TANK CLEANOUT position.

CAUTION: Avoid injury from crushing. Place tractor selective control valve (SCV) in Neutral position before PLANT/TRANS switch (A) is moved to PLANT position.

17. Place tractor SCV's in Neutral position.
18. Remove service locks (B).
19. Place PLANT/TRANS switch (A) in desired position and resume operation.

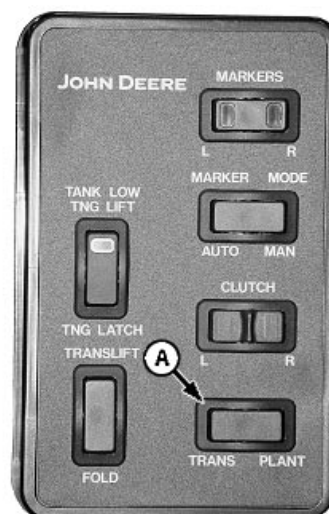
A—PLANT/TRANS Switch
B—Service Locks
C—Purge/Plant Switch



A54397 -UN-28JUL04



A54596 -UN-27JUL04



A54595 -UN-27JUL04

OUC6074.0000D2D -19-22SEP04-6/6

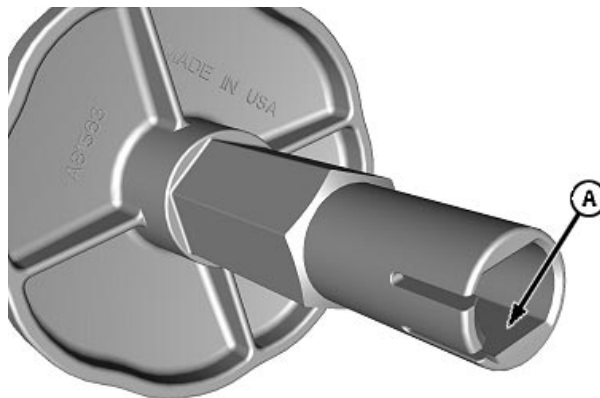
Replacing Pro-Series XP Meter Shear Handle

Infrequent or improper lubrication causes “binding” of moving parts within the machine. This “binding” can cause the shear points to fail, preventing breakage of machine parts. Other common causes of binding include compaction of field residue on row unit drives, jammed or misaligned seed meters.

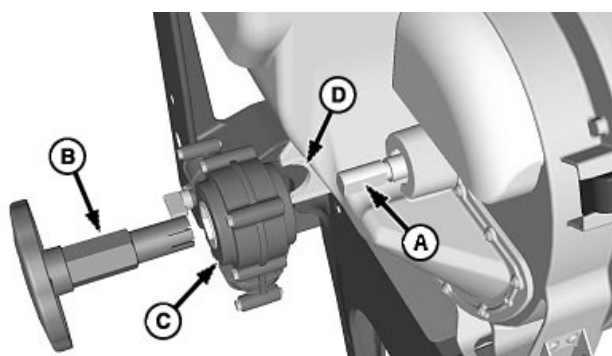
NOTE: A replacement meter handle is located near the mechanical transmission or one of the variable rate drive motors (if equipped).

If meter handle breaks; remove broken pieces, align flat surfaces (A) and insert new handle (B) through gearbox (C) until handle snaps into groove on shaft. Gearbox must seat into cutout (D).

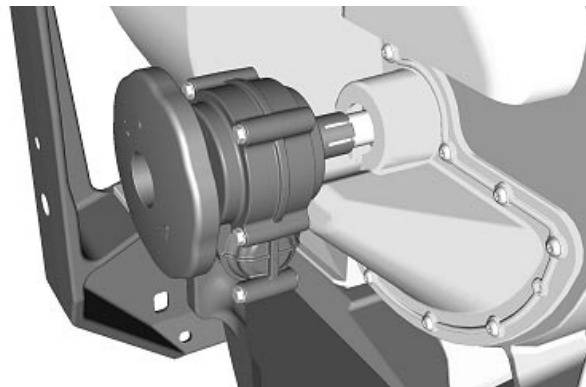
- A—Flat Surfaces, Aligned
- B—New Handle
- C—Gearbox
- D—Cutout



A57648 —UN-13MAR06



A57649 —UN-13MAR06



A57650 —UN-13MAR06

Assembled

OUC6074,0000C4E —19-26JUN06-1/1

Inspecting Pro-Series XP Metering Units

Inspecting Vacuum Meter

NOTE: If using seed treatments, remove any buildup that may occur in bottom of hopper.

To inspect meter, lay hopper on side and open door (A) to remove seed disk. 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 replacement is necessary, see Service—End of Season section.

A—Door
B—Meter Hub



Vacuum Meter

A51186 -UN-19NOV02

OUO6074,0000C4F -19-30APR04-1/1

Filling MaxEmerge XP Seed Hoppers



CAUTION: When transporting machine on roadways, all product tanks must be empty.

Follow chemical manufacturer's precautions when handling parts coated with seed treatments. Use proper skin, eye and respiratory protection.

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

If using 58 L (1.6 bu) hoppers, remove lid (A) and latch it to front of hopper.

A—Lid



58 L (1.6 bu) Seed Hopper

A52079 -UN-24MAR03

Continued on next page

OUO6074,0000B34 -19-21JUN06-1/2

If using 106 L (3 bu) hoppers, unlatch rubber strap (A) and lift lid (B) up and back to slide lid rearward. Tabs on front of lid will hold lid in place while filling hopper.

IMPORTANT: Apply seed treatment to seed **BEFORE** applying talc lubricant to insure that treatment adheres to seed properly while minimizing buildup on meter components. If buildup of treatment still occurs, contact the chemical manufacturer for assistance.

Remove any build-up of trash, dust or seed treatment from bottom of hopper and seed meter before filling hopper with seed.

For more information, see USE OF TALC LUBRICANT in Operating Vacuum Meter section or USING POWDERED GRAPHITE in Operating Plateless Meter section.

A—Rubber Strap
B—Lid



A48634 -UN-31JAN02

106 L (3 bu) Seed Hopper



A54038 -UN-09MAR04

106 L (3 bu) Seed Hopper

OUC6074,0000B34 -19-21JUN06-2/2

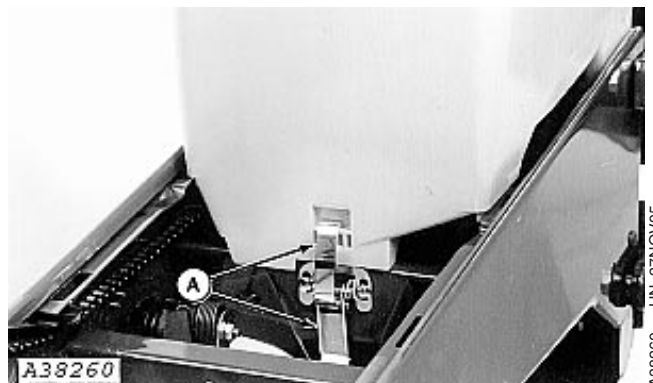
Cleanout and Inspection of MaxEmerge XP Seed Hoppers and Metering Units

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

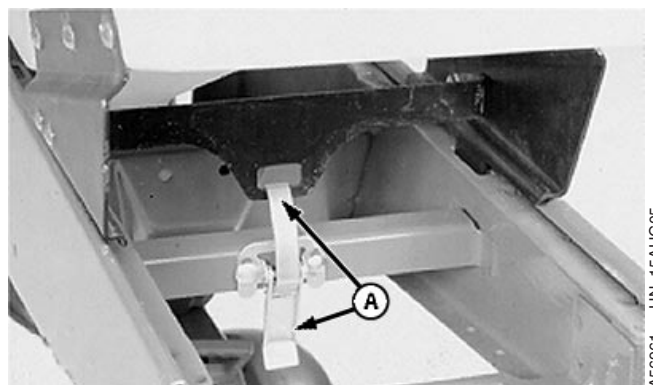
For best operation, empty hoppers thoroughly after each days use to remove chaff, dust and other foreign material.

To remove seed hopper from planting unit, disengage hopper latch (A) and lift hopper upward then rearward.

A—Hopper Latch



58 L (1.6 bu) Seed Hopper



106 L (3 bu) Seed Hopper

OUO6435,0001E05 -19-15SEP05-1/7

Emptying Vacuum Meter

Remove vacuum hose (A) from vacuum meter.

A—Vacuum Hose



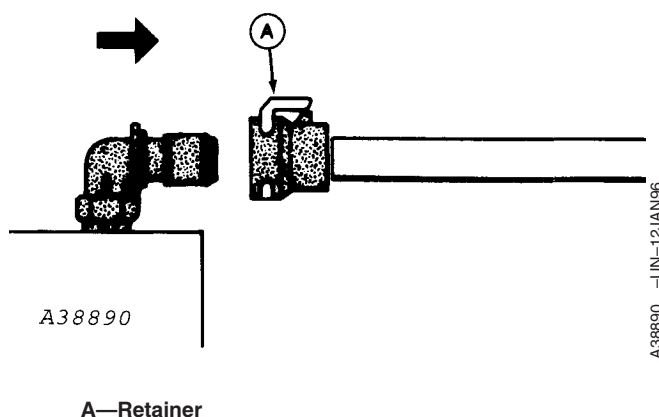
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OUO6435,0001E05 -19-15SEP05-2/7

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

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

Empty hopper and vacuum seed meter by inverting hopper. Rotate hopper so seed is slowly poured from LEFT-HAND REAR CORNER. When hopper is empty, some seed will remain in meter housing. To empty this seed, rotate hopper back to operating position. Invert hopper again and pour from LEFT-HAND REAR CORNER to empty seed from meter housing.



Emptying Plateless Meters

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

FINGER PICK-UP—Remove and invert hopper. Rotate hopper so seed is slowly poured from RIGHT-HAND REAR CORNER. When hopper is empty, some seed will remain in meter housing. To empty this seed, rotate hopper back to operating position. Invert hopper again and pour from RIGHT-HAND REAR CORNER to empty seed from meter housing and rotate meter flex drive to remove seeds from fingers and seed belt.

RADIAL BEAN METER—Remove and invert hopper. Return hopper to upright position and rotate meter flex drive to empty remaining seed from metering cells.

FEED-CUP—Remove and invert hopper. Rotate meter shaft to empty remaining seed from meter.

Continued on next page

OU06435,0001E05 -19-15SEP05-3/7

Inspecting Plateless Meters

NOTE: *If using seed treatments, remove any buildup that may occur in bottom of hopper.*

FINGER PICK-UP—Remove two wing nuts (A) and pull finger pick-up unit straight up to disengage it from two mounting studs and retainer ring.

IMPORTANT: **Avoid damage to meter brush. Do not turn finger pick-up mechanism backwards.**

Turn meter shaft by hand to determine if mechanism is free of dirt, chaff, or other foreign material. If mechanism is obstructed or further disassembly of finger pick-up unit is required, see Service—Every 50 Hours section.



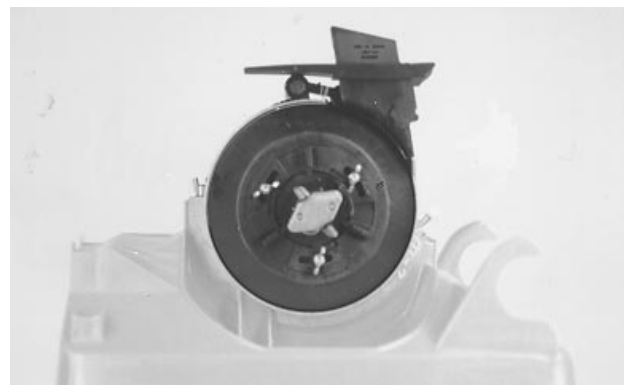
Finger Pick-Up

A—Wing Nuts

H44516 -UN-21MAY92

OUO6435,0001E05 -19-15SEP05-4/7

RADIAL BEAN METER—Turn metering assembly by hand to determine if mechanism is free of dirt, chaff or other foreign material. If mechanism is obstructed and further disassembly of seed meter is required, see Service—End of Season section.



Radial Bean Meter

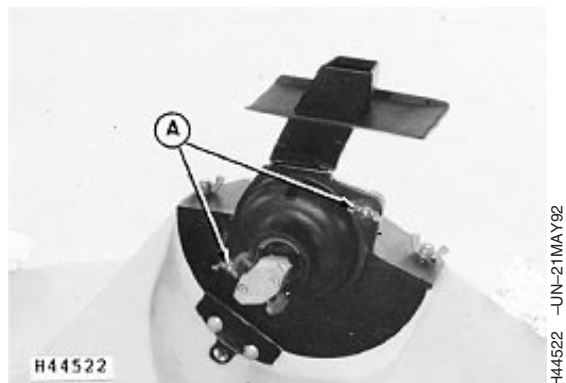
A40460 -UN-06NOV96

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OUO6435,0001E05 -19-15SEP05-5/7

FEED-CUP—Turn metering assembly by hand to determine if mechanism is free of dirt, chaff or other foreign material. If mechanism is obstructed, remove wing nuts (A) then remove feed-cup housing and feed cup from adapter. Clean feed-cup with soap and water.

A—Wing Nuts



Feed-Cup

OUO6435,0001E05 -19-15SEP05-6/7

Inspecting Vacuum Meter

NOTE: If using seed treatments, remove any buildup that may occur in bottom of hopper.

To inspect meter, lay hopper on side and open door (A) to remove seed disk. 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 replacement is necessary, see Service—End of Season section.

A—Door
B—Meter Hub



Vacuum Meter

OUO6435,0001E05 -19-15SEP05-7/7

Use of Talc and Graphite Lubricants

Use of Talc Lubricant



CAUTION: Follow chemical manufacturers precautions when handling parts coated with seed treatments. Use proper skin, eye and respiratory protection.

Talc lubricant is required for optimum performance of the vacuum meter and CCS system. Seed properly treated with talc releases from the seed disk more consistently, leading to more accurate spacing when the seed is placed in the ground.

A34471



A34471 -UN-11OCT88

FARMER APPLIED SEED TREATMENT

For best performance, use of farmer-applied seed treatments is **not** recommended. If they must be used, apply any seed treatment to seed and allow to fully dry before placing in tanks.

Apply seed treatment to seed **BEFORE** applying talc lubricant to insure that treatment adheres to seed properly while minimizing buildup on meter components. If buildup of treatment still occurs, contact the chemical manufacturer for assistance.

When using seed treatments, meters and seed disks should be cleaned as needed. Seed disks can be cleaned with warm, soapy water. Reapply spray on graphite as needed to vacuum seal side of disk.

IMPORTANT: If farmer-applied treatments are used, follow chemical manufacturers recommendations carefully. **HIGH-OIL-CONTENT TREATMENTS ARE NOT RECOMMENDED.**

Chemical reaction between farmer-applied seed treatments and treatments commercially applied to seed can cause seed treatments to become sticky. Certain temperature and humidity levels can further complicate material compatibility.

Seed and treatment mixes must be free of clumps.

IMPORTANT: Talc needs to be thoroughly incorporated in tanks and hoppers, so all seeds are evenly coated.

COMMERCIALY TREATED SEED

Refer to the following talc application rate charts for planting commercially-treated seeds with no farmer-applied seed treatments.

Some insecticide-treated seed is coated with commercially applied talc. Even if talc is commercially applied, the required amount of talc shown in the following tables must be added to maintain metering performance.

Use this table when using CCS system to deliver seed to seed meters:

CCS Talc Application Rate	
<i>Note: Talc should be mixed proportionately and thoroughly with seed to ensure movement through the CCS system and proper metering.</i>	
CCS Tank Size	Amount of Talc
1233 L (35 bu.) Bulk Tank	2.6 L (11 cups)
1762 L (50 bu.) Bulk Tank	3.8 L (16 cups)
Per 80,000 kernel seed corn unit	74 mL (5 Tbls.) (2.5 oz)

Use this table when using 1.6 or 3.0 bushel hoppers (without CCS tanks) to deliver seed to seed meters:

MaxEmerge Hopper Talc Application Rate	
<i>Note: Talc should be sprinkled over top of seeds in hoppers and thoroughly incorporated, so all seeds have talc coating.</i>	
Hopper Size	Amount of Talc
58 L (1.6 bu.)	120 ml (1/2 cup)
106 L (3 bu.)	240 ml (1 cup)

Adjust these rates as necessary so all seeds become coated with talc, while avoiding an accumulation of talc in bottom of tank.

Double talc application is required for small seed, very large seed, seeds with heavy treatment, or humid planting conditions.

In certain situations, combinations of extremely sticky seed treatments, large or small seed, and high humidity, it may be necessary to add up to three times the amount of talc shown in the tables above.

IMPORTANT: It may be necessary to clean any build-up of seed treatments and talc out of hoppers between fills.

If talc builds up in bottom of hopper and vacuum manifolds require frequent cleanout, reduce talc rate accordingly. If a coating of seed treatment is found on seed disks, increase the amount of talc.

When using seed treatments, meters and seed disks should be cleaned as needed. Seed disks can be cleaned with warm, soapy water. Reapply spray on graphite as needed to vacuum seal side of disk.

OUO6045,00006CD -19-15JUN06-3/3

Use of Powdered Graphite with Radial Bean Meter

IMPORTANT: Some insecticide-treated seed is coated with commercially applied graphite. It is important that the recommended amount of graphite be added in addition to graphite already on the seed.

IMPORTANT: Regular use of powdered graphite reduces wear of metering components and prolongs life of meter. Graphite will filter down into radial bean meter and insure proper lubrication. John Deere Graphite provides a dry lubrication. Some types have an oil base and will form a gummy residue on parts. Graphite does not eliminate need for proper and regular lubrication indicated in lubrication charts.

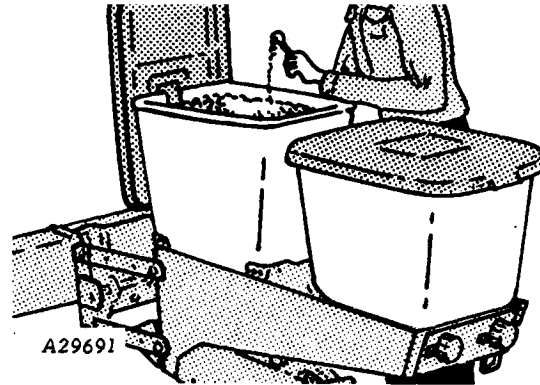
NOTE: Any additives other than John Deere powdered graphite in radial bean meters may leave residue on parts that could affect planting rates.

NOTE: If graphite is building up in bottom of hopper, reduce amount accordingly.

Add powdered graphite into each hopper of soybeans at the following rate per fill.

Max Emerge Hopper Graphite Application Rate	
Hopper Size	Amount of Graphite
58 L (1.6 bu.)	15 mL (1 Tbls.)
106 L (3 bu.)	30 mL (2 Tbls.)
22.7 kg (50 lb) Soybean Bag	15 mL (1 Tbls.) or (0.5 oz)

With rough-textured soybeans or treated soybeans, extra graphite added regularly with seed will improve seed flow into meter.



A29691 -JUN-13OCT88

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OUO6045,00006CE -19-12JAN06-1/2

IMPORTANT: When using the meters the first time each season, in addition to adding graphite to CCS tanks, add 9 mL (0.6 Tbls.) or (0.3 oz) to each row unit.

Add powdered graphite to each bulk hopper of soybeans at the following rate per fill:

CCS Graphite Application Rate	
CCS Tank Size	Amount of Graphite Per Fill
1233 L (35 bu.) Bulk Tank	328 mL (22 Tbls.) or (11 oz)
1762 L (50 bu.) Bulk Tank	470 mL (32 Tbls.) or (16 oz)
22.7 kg (50 lb) Soybean Bag	9 mL (0.6 Tbls.) or (0.3 oz)

NOTE: Every seed should be visibly grey when coated properly.

OUO6045,00006CE -19-12JAN06-2/2

Use of Powdered Graphite with Finger Pick-Up

IMPORTANT: Some insecticide-treated seed is coated with commercially applied graphite. It is important that the recommended amount of graphite be added in addition to graphite already on the seed.

IMPORTANT: Graphite will filter down into finger pick-up mechanism and insure proper lubrication. John Deere Graphite provides a dry lubrication. Some types have an oil base and will form a gummy residue on parts. Graphite does not eliminate need for proper and regular lubrication indicated in lubrication charts.

IMPORTANT: When using the meters the first time each season, in addition to adding graphite to CCS tanks, add 9 mL (0.6 Tbls.) or (0.3 oz) to each row unit.

Add powdered graphite to each bulk hopper at the following rate per fill:

CCS Graphite Application Rate	
CCS Tank Size	Amount of Graphite Per Fill
1233 L (35 bu.) Bulk Tank	328 mL (22 Tbls.) or (11 oz)
1762 L (50 bu.) Bulk Tank	470 mL (32 Tbls.) or (16 oz)
80,000 Kernel Seed Corn Unit	15 mL (1 Tbls.) or (0.5 oz)

CCS Insecticide Treated Seed	
CCS Tank Size	Amount of Graphite Per Fill
1233 L (35 bu.) Bulk Tank	500 mL (2 Cups) or (17 oz)
1762 L (50 bu.) Bulk Tank	740 mL (3 cups) or (25 oz)
80,000 Kernel Seed Corn Unit	15 mL (1 Tbls.) or (0.5 oz)

NOTE: If graphite is building up in bottom of hopper, reduce amount accordingly.

Add powdered graphite into each hopper at the following rate per fill.

Use of Talc and Graphite Lubricants

Max Emerge Hopper Graphite Application Rate	
Hopper Size	Amount of Graphite
58 L (1.6 bu.)	15 mL (1 Tbls.)
106 L (3 bu.)	30 mL (2 Tbls.)
80,000 Kernel Seed Corn Unit	15 mL (1 Tbls.) or (0.5 oz)
Insecticide Treated Seed	
80,000 Kernel Seed Corn Unit	15 mL (1 Tbls.) or (0.5 oz)

NOTE: Every seed should be visibly gray when coated properly.

OUO6045.00006D0 -19-12JAN06-2/2

Setting Vacuum Levels

Use of Talc Lubricant

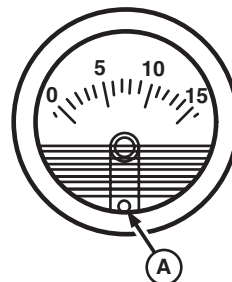
See Use Of Talc and Graphite Lubricants section.

OUC6045,0000705 -19-06JAN06-1/1

Zeroing Vacuum Gauge

NOTE: To zero monitor vacuum gauge, see your monitor's operator's manual.

With vacuum pump system shut off and vacuum gauge in a vertical position, disconnect vacuum gauge hose to vent gauge to atmosphere. Use the zero adjusting screw (A) to set the gauge pointer exactly on zero mark. Connect gauge hose, activate vacuum pump hydraulics, fill seed-disk cells with seed by driving forward with planter lowered and adjust vacuum level to recommended setting.



A53396 -UN-26NOV03

A—Zero Adjusting Screw

OUC6074,00009C3 -19-05JAN06-1/1

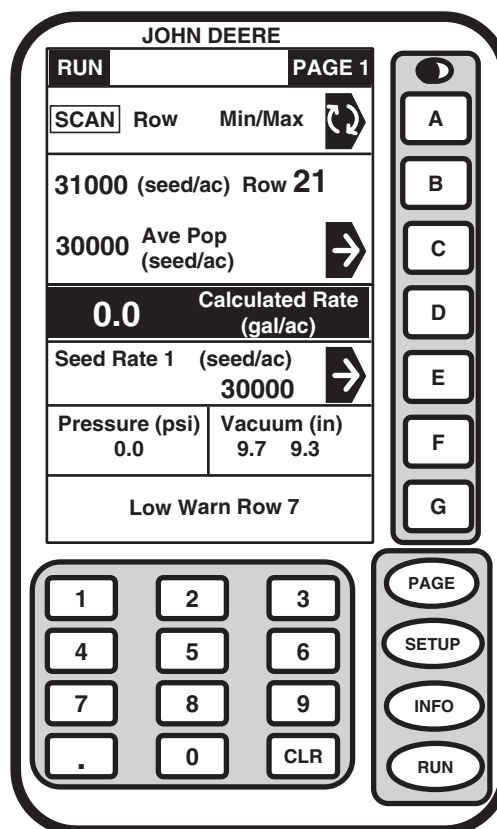
Setting Vacuum Level

IMPORTANT: For some very small or large seed sizes and shapes, it may be necessary to adjust vacuum levels up or down slightly from settings shown. Always verify vacuum level with field check. The charts provided in this section are intended to be used as a guide and are accurate in most conditions. Some situations may warrant a higher or lower vacuum setting.

IMPORTANT: When using CCS Seed Delivery system, the only crops that can be delivered are corn, soybeans, sorghum, sunflower and cotton.

Vacuum level is indicated on vacuum gauge or on monitor display if equipped.

Vacuum (in) — Vacuum (in)



A57873 -UN-25APR06

Continued on next page

OUC6074,00009CC -19-25APR06-1/3

VACUUM LEVEL CHART	
Crop	Vacuum Level
Sugar Beets	See Chart
Corn	See Chart
Sweet Corn	See Chart
Popcorn	See Chart
Small, Medium and Large Edible Beans—Cell Type Seed Disk	8 in. ^a
Small, Medium and Large Edible Beans—Flat-Type Seed Disk	See Chart
Cotton	8 in.
Cotton Hilldrop	8 in.
Cotton Using Flat Edible Bean Disk	See Chart
Peanuts (Runner, Spanish and Virginia)	See Chart
Sorghum	8 in.
High Rate Sorghum	8 in.
Oil Sunflower	See Chart
Confectionary Sunflower	See Chart
Soybeans	8 in.
Soybeans Using Cotton Disk	5 to 7 in.
Acid-Delinted Cotton	8 in.
^a Small edible beans—For seeds that have 6160 seeds/kg (2800 seeds/lb) or more, set vacuum level at 6 in. Medium edible beans—for garden beans that have 3960 seeds/kg (1800 seeds/lb) or more, set vacuum level at 6 in.	

Gauge indicator¹ should point to vacuum level listed above, AT PLANTING SPEED.

NOTE: *The vacuum level will be slightly lower during tractor and pump start-up.*

Set vacuum level as follows:

1. Electro/Hydraulic SCV's: Push SCV lever to forward detent position to start blower. Let oil warm up for 15 minutes.

¹ Order Sugar Beet Vacuum Gauge through service parts only.

Mechanical SCV's: Pull lever back against rubber stop.
Let oil warm up for 15 minutes.

2. Fill hoppers or CCS bulk tanks with seed.
3. With machine lowered in plant position, drive tractor forward approximately 5 m (15 ft) to fill seed cells.

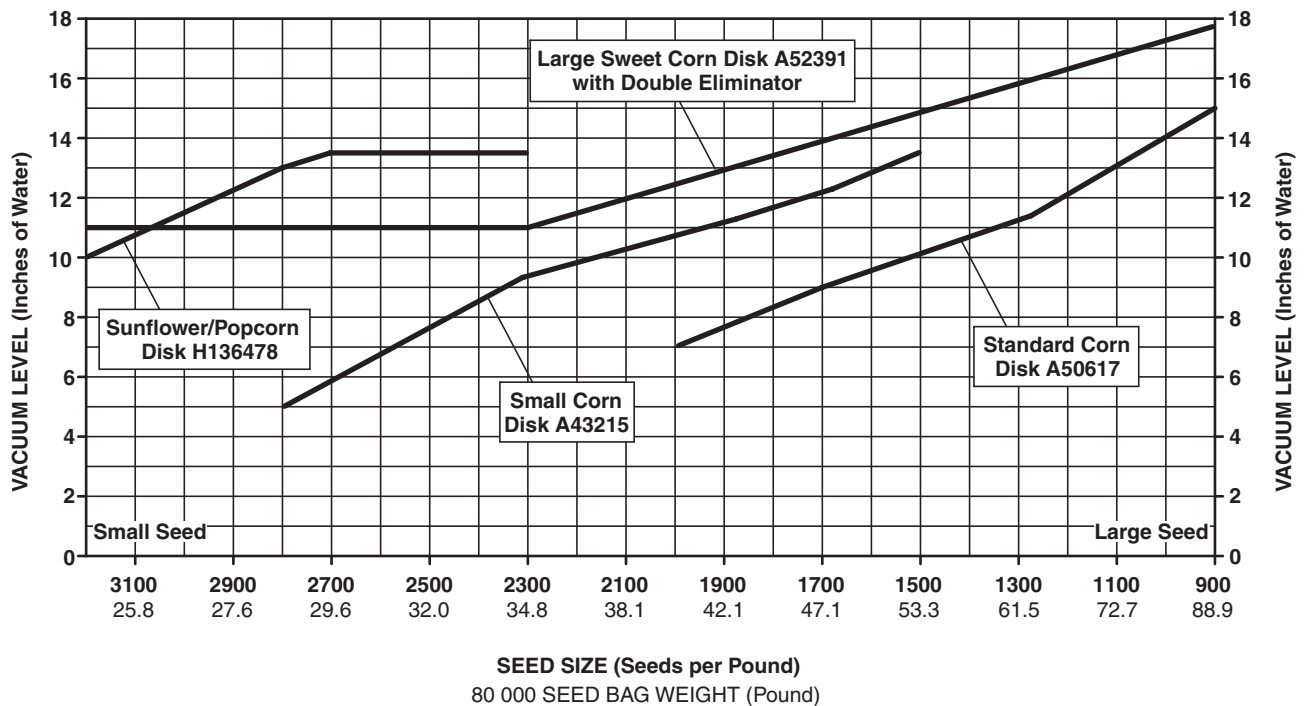
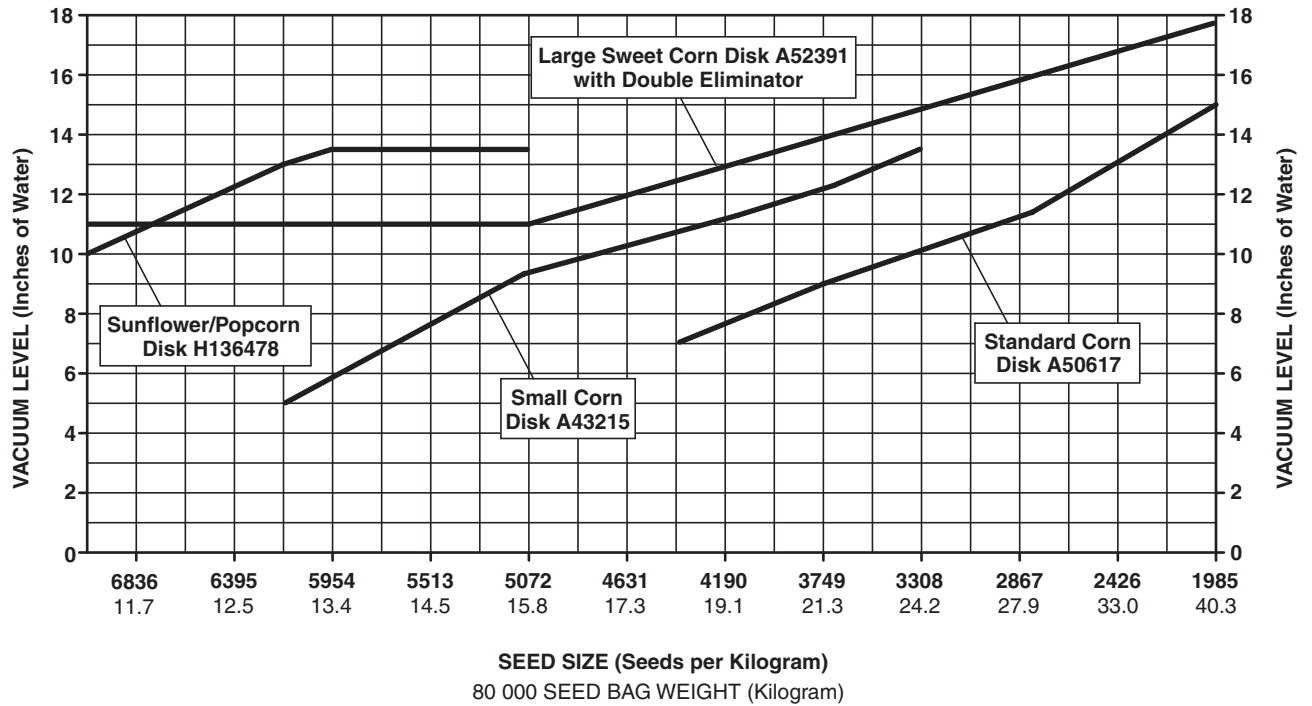
IMPORTANT: The hydraulic hook-up procedure will determine whether the tractor flow control valve or planter flow control valve will be used to control vacuum level. See Attaching Machine section in machine operator's manual.

4. Turn hydraulic control knob to adjust oil flow until vacuum-gauge indicator points to vacuum level listed in chart above, AT CHOSEN PLANTING SPEED.

See Attaching Machine section in machine operator's manual for more information.

OUO6074,00009CC -19-25APR06-3/3

Vacuum Level for Corn Using H136478, A43215, A50617 or A52391 Seed Disks



Continued on next page

OUC6045.000076E -19-15FEB06-1/2

Use seed supplier's information to calculate seed size in seeds/kg or seeds/lb.

IMPORTANT: The proper vacuum level must be calculated for each corn variety. Obtain size in seeds/kg or seeds/lb by dividing number of seeds in the bag by the weight of the bag.

EXAMPLE: If there are 4156 seeds/kg (1889 seeds/lb), according to the chart, vacuum level should be set at 7 in. when using a Standard Corn Disk or 10 in. when using a Small Corn Disk.

EXAMPLE: If there are 5637 seeds/kg (2556 seeds/lb), according to the chart, vacuum level should be set at 10 in. when using Large Sweet Corn Disk.

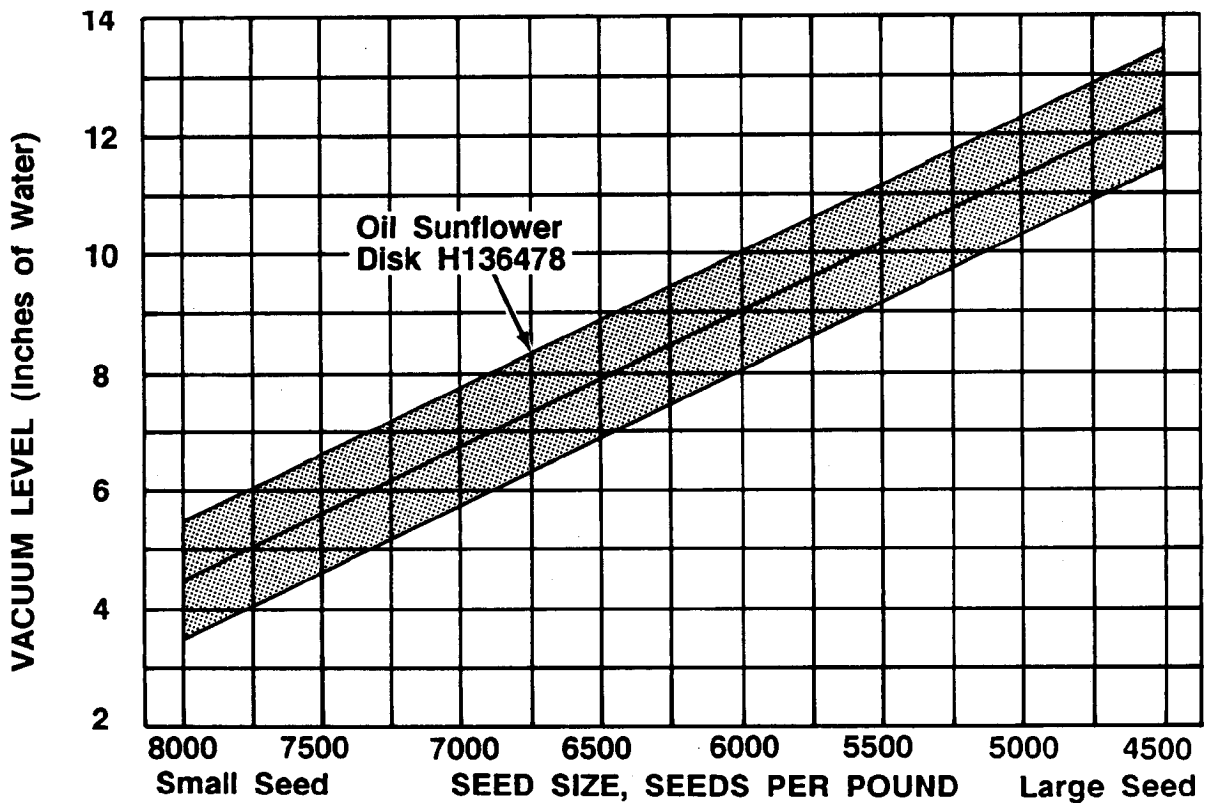
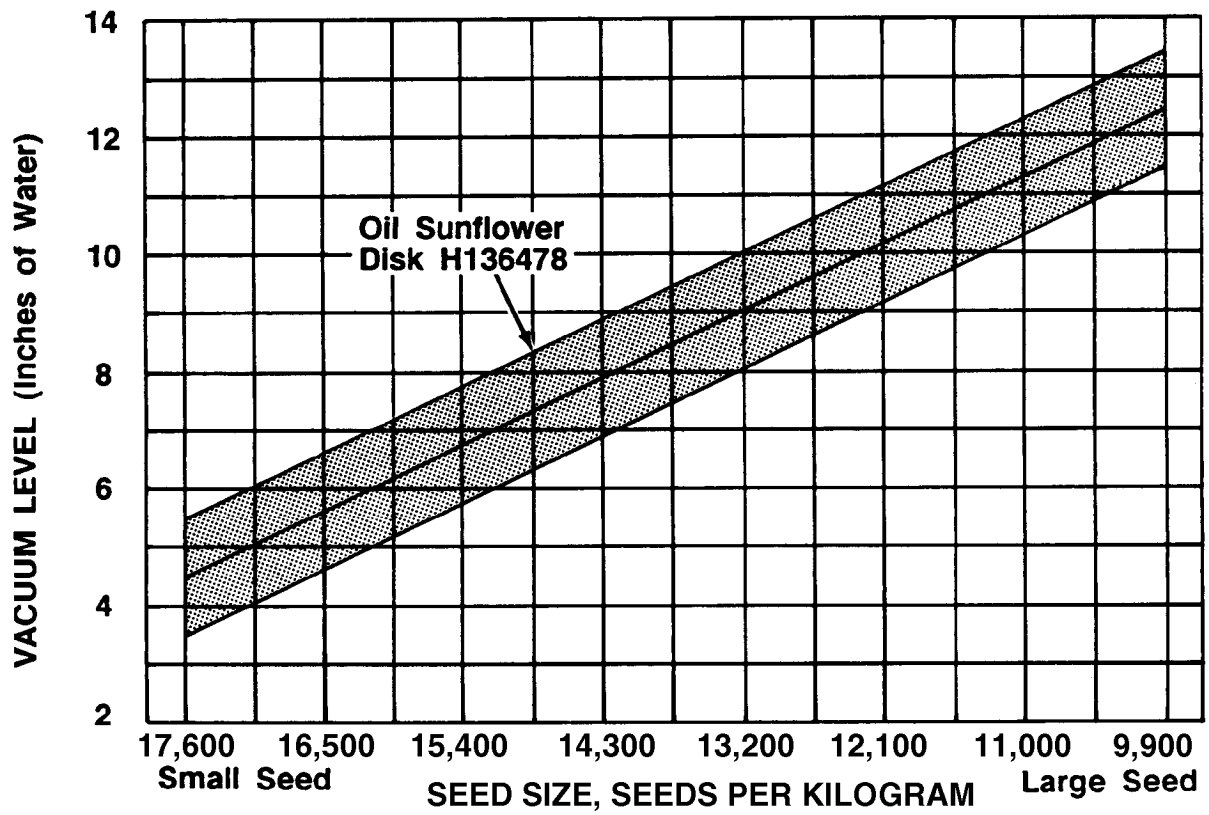
IMPORTANT: Vacuum levels are a starting point for setting the meters and may require adjustment to obtain proper population.

Sticky seed treatments, rougher ground conditions and high ground speeds will require vacuum level to be increased.

For seed sizes that overlap the Small Corn Disk (A43215) and the Standard Corn Disk (A50617), choose the Small Corn Disk for initial setting. If population is difficult to control, switch to Standard Corn Disk.

OUO6045,000076E -19-15FEB06-2/2

Vacuum Level for Oil Sunflower



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AG,OUO6074,1217 -19-05JAN06-1/2

Setting Vacuum Levels

Use seed supplier's information to calculate seed size in seeds/kg or seeds/lb.

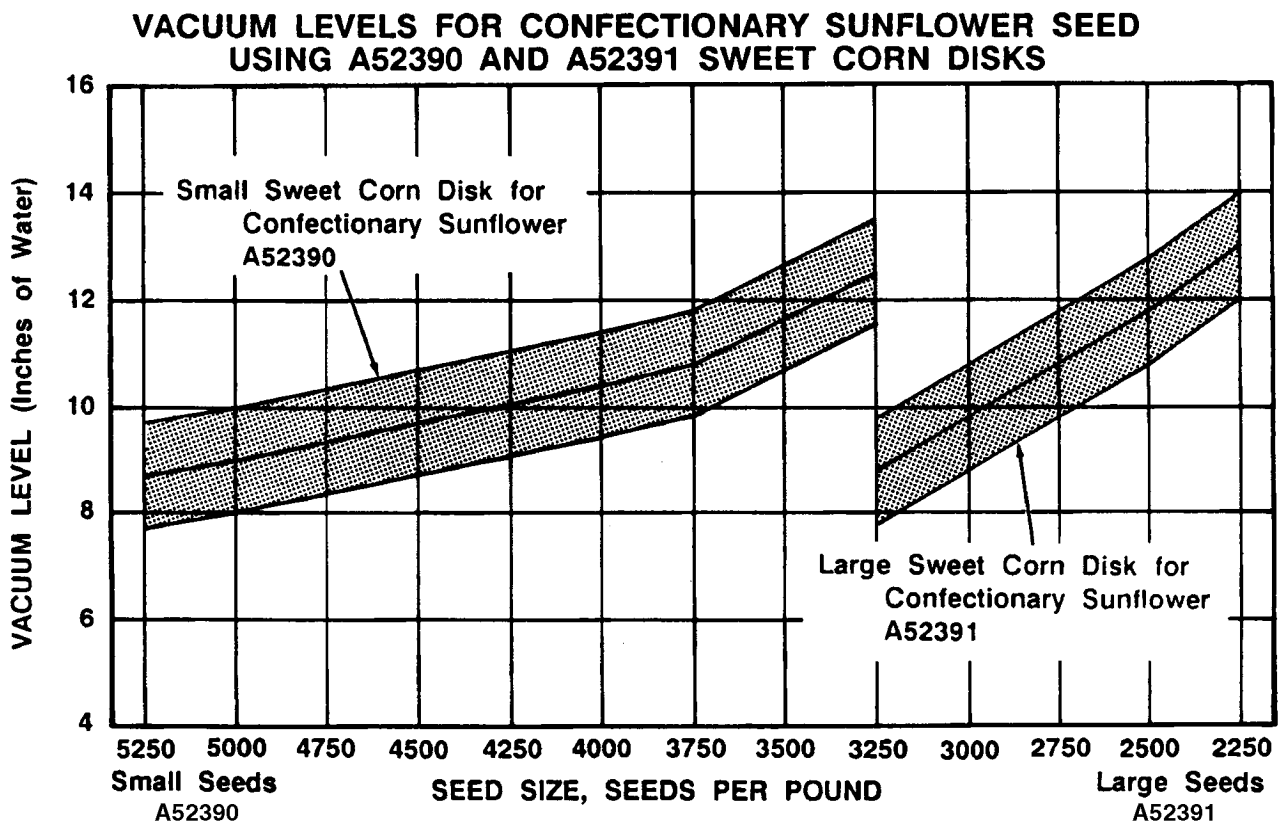
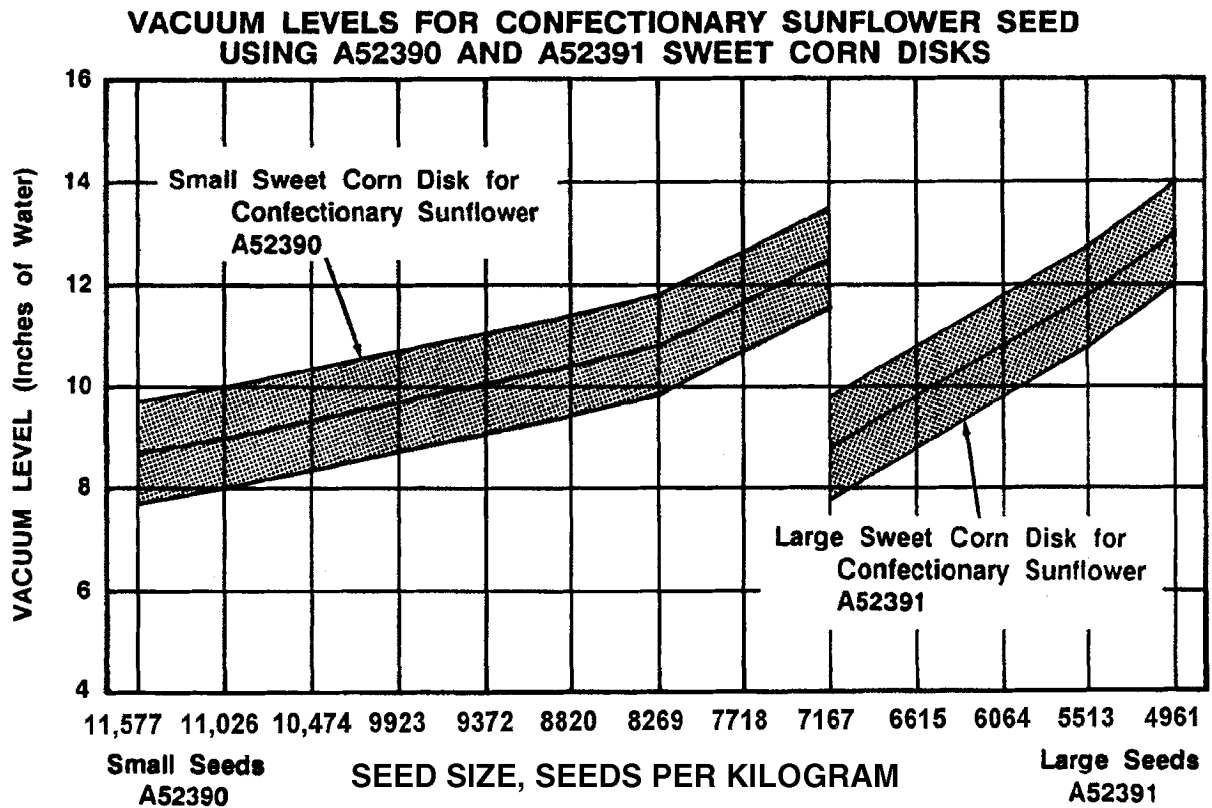
IMPORTANT: The proper vacuum level must be calculated for each sunflower variety. Obtain size in seeds/kg or seeds/lb by dividing number of

seeds in the bag by the weight of the bag.

EXAMPLE: If there are 12 100 seeds/kg (5500 seeds/lb), according to the chart, vacuum level should be set at 10 in. when using oil sunflower disk.

AG,OUO6074,1217 -19-05JAN06-2/2

Vacuum Level for Confectionary Sunflower



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AG.OUO6074,1218 -19-05JAN06-1/2

Setting Vacuum Levels

Use seed supplier's information to calculate seed size in seeds/kg or seeds/lb.

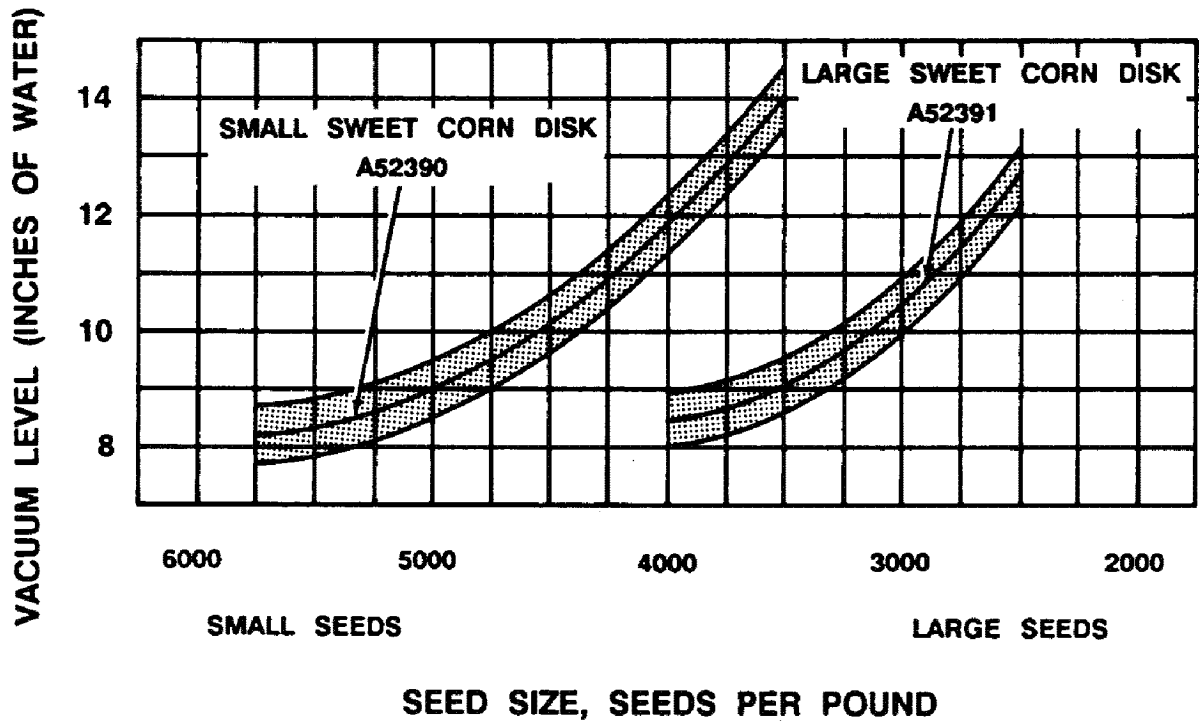
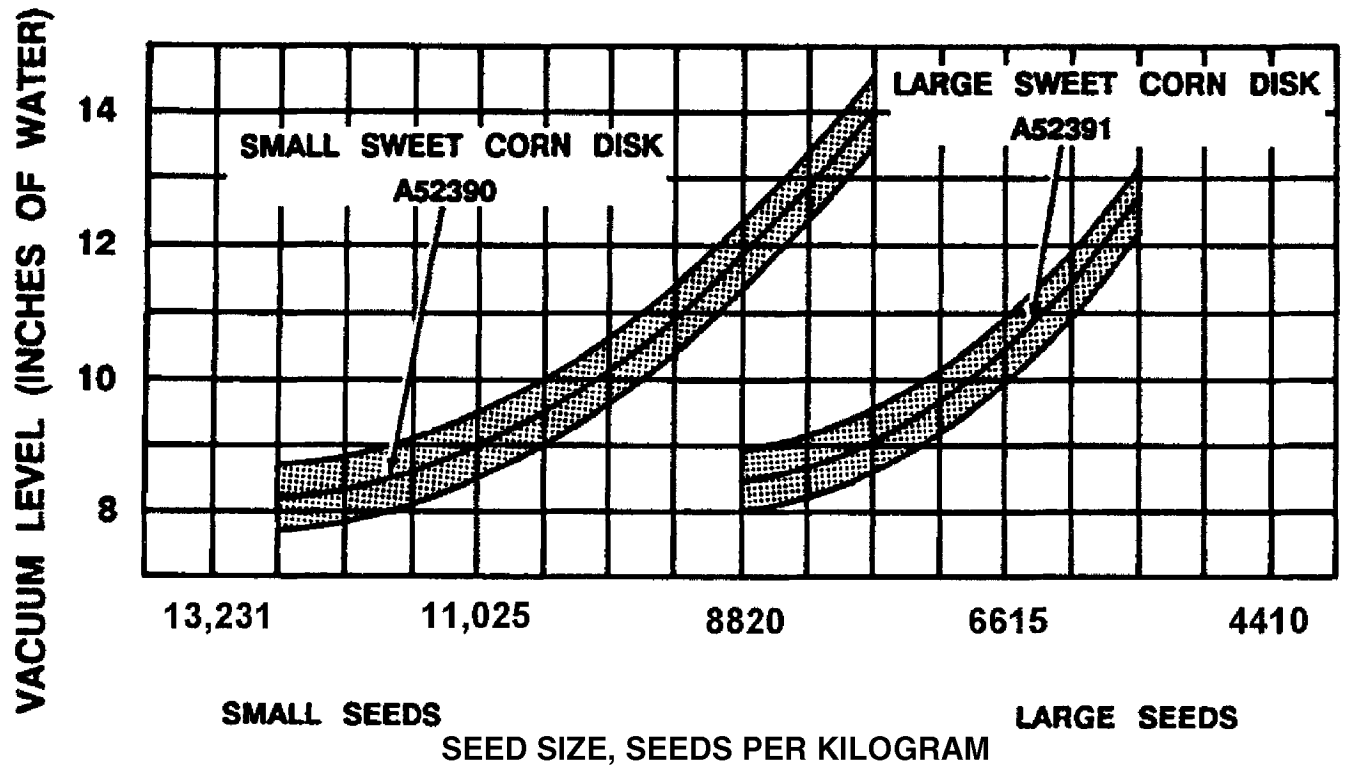
IMPORTANT: The proper vacuum level must be calculated for each sunflower variety. Obtain size in seeds/kg or seeds/lb by dividing number of

seeds in the bag by the weight of the bag.

EXAMPLE: If there are 9350 seeds/kg (4250 seeds/lb), according to the chart, vacuum level should be set at 10 in. when using sweet corn seed disk with confectionary sunflower.

AG,OUO6074,1218 -19-05JAN06-2/2

Vacuum Level for Sweet Corn



Continued on next page

AG.OUO6074,1219 -19-05JAN06-1/2

Setting Vacuum Levels

Use seed supplier's information to calculate seed size in seeds/kg or seeds/lb.

IMPORTANT: The proper vacuum level must be calculated for each corn variety. Obtain size in seeds/kg or seeds/lb

by dividing the number of seeds in the bag by the weight of the bag.

EXAMPLE: If there are 9350 seeds/kg (4250 seeds/lb), according to the chart, vacuum level should be set at 11 in. when using small sweet corn disk.

AG,OUO6074,1219 -19-05JAN06-2/2

Vacuum Level Seed Chart—Flat Edible-Bean Disk

Vacuum Seed Chart Using Flat Edible Bean Disk						
	Edible Bean Flat Type Disks			Vacuum	Doubles Eliminator	Seed Size
Crop Types	Small A52903	Medium A52904	Large A52878	Inches of Water	% of Hole Covered	Recommendations
Small Edible Beans						
Small Green Garden	X			16 - 18	0 - 50	3528 - 5292 Seeds/kg (1600 - 2400 Seeds/lb)
Black Turtle	X			16 - 18	0 - 50	4190 - 5733 Seeds/kg (1900 - 2600 Seeds/lb)
Navy	X			16 - 18	0 - 50	3969 - 5733 Seeds/kg (1800 - 2600 Seeds/lb)
Small Whites	X			12 - 14	0 - 50	5292 - 7277 Seeds/kg (2400 - 3300 Seeds/lb)
Pink Viva		X		18 - 20	0 - 50	3749 - 4190 Seeds/kg (1700 - 1900 Seeds/lb)
Medium Edible Beans						
Medium Green Garden		X		18 - 20	0 - 50	2649 - 3528 Seeds/kg (1200 - 1600 Seeds/lb)
Small Red		X		18 - 20	0 - 50	2649 - 3308 Seeds/kg (1200 - 1500 Seeds/lb)
Pinto		X		20 - 22	0 - 50	All Sizes
Medium Kidney		X		14 - 16	0 - 50	2536 - 3087 Seeds/kg (1150 - 1400 Seeds/lb)
Lima		X		18 - 20	0 - 50	2649 - 3528 Seeds/kg (1200 - 1600 Seeds/lb)
Large Edible Beans						
Large Green Garden			X	20 - 22	0 - 25	1544 - 2649 Seeds/kg (700 - 1200 Seeds/lb)
Cranberry			X	20 - 22	0 - 50	1764 - 2649 Seeds/kg (800 - 1200 Seeds/lb)
Large Kidney			X	18 - 20	0 - 50	1874 - 2536 Seeds/kg (850 - 1150 Seeds/lb)
Great Northern			X	18 - 20	0 - 50	1985 - 2867 Seeds/kg (900 - 1300 Seeds/lb)
Garbanzo			X	16 - 18	0 - 50	1654 - 1985 Seeds/kg (750 - 900 Seeds/lb)
Edible Peas						
Blackeye		X		16 - 18	0 - 50	3528 - 4410 Seeds/kg (1600 - 2000 Seeds/lb)
Smooth		X		14 - 16	0 - 50	6174 - 7056 Seeds/kg (2800 - 3200 Seeds/lb)

Setting Vacuum Levels

Vacuum Seed Chart Using Flat Edible Bean Disk						
	Edible Bean Flat Type Disks			Vacuum	Doubles Eliminator	Seed Size
Crop Types	Small A52903	Medium A52904	Large A52878	Inches of Water	% of Hole Covered	Recommendations
Wrinkle	X			12 - 14	0 - 50	3749 - 5072 Seeds/kg (1700 - 2300 Seeds/lb)
Small Cotton	X			12 - 18	0 - 50	3520 - 7260 Seeds/kg (1600 - 3300 Seeds/lb)

NOTE: To maintain vacuum levels when using flat edible-bean disk, do not exceed eight row units per blower motor.

Due to differences in seed sizes and shapes within a seed variety, actual populations will vary at the same vacuum level. Vacuum levels in the Vacuum Level Seed Chart—Flat Edible Bean Disk, are a starting point and may be adjusted up or down to improve population.

Order the Flat Edible-Bean Vacuum Gauge (AA38407) through your John Deere dealer.

AG,OUO6074,1222 -19-05JAN06-2/2

Vacuum Level for Cotton, Using Flat Edible-Bean Disk

Vacuum Seed Chart Using Flat Edible Bean Disk						
	Edible Bean Flat Type Disks			Vacuum	Doubles Eliminator	Seed Size
Crop Types	Small A52903	Medium A52904	Large A52878	Inches of Water	% of Hole Covered	Recommendations
Small Cotton	X			12 - 18	0 - 50	3520 - 7260 Seeds/kg (1600 - 3300 Seeds/lb)

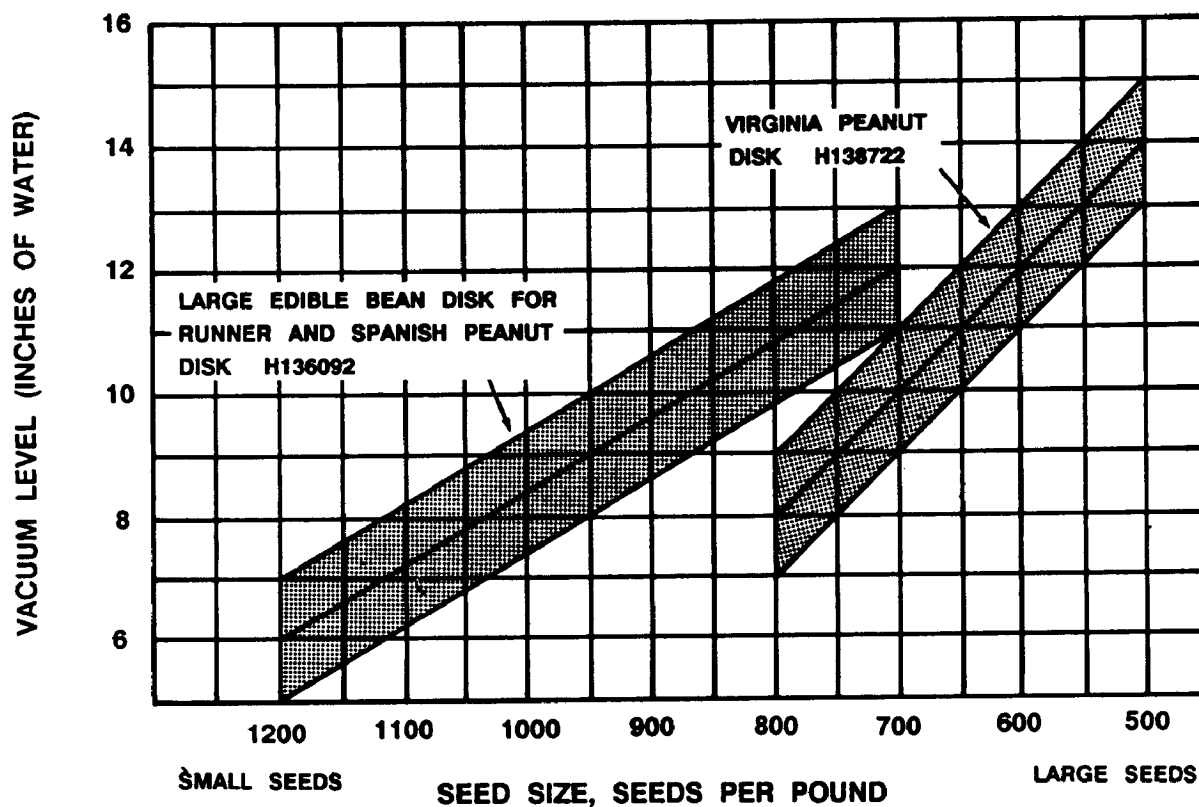
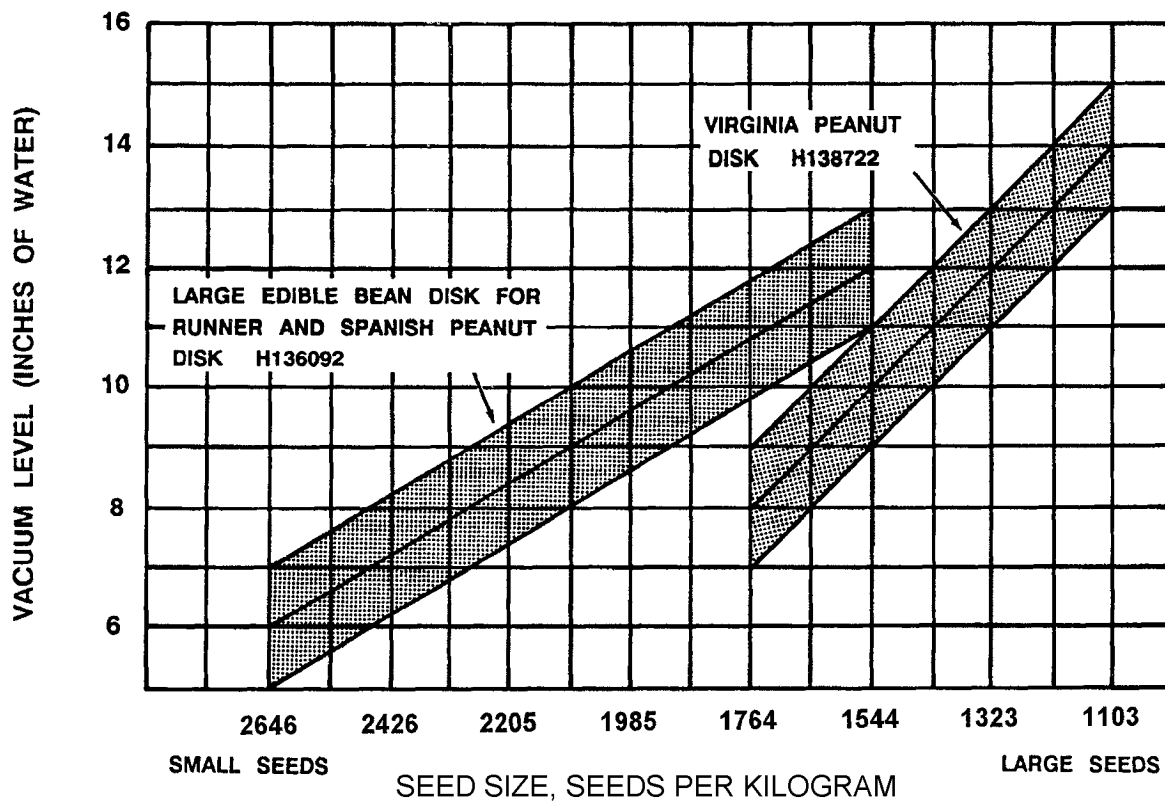
NOTE: To maintain vacuum levels when using flat edible-bean disk, do not exceed eight row units per blower motor.

When planting cotton, use seed size recommendation column to determine settings. Due to differences in seed sizes and shapes within a seed variety, actual populations will vary at the same vacuum level. Vacuum levels in the Vacuum Level Seed Chart—Flat Edible Bean Disk, are a starting point and may be adjusted up or down to improve population.

Order the Flat Edible-Bean Vacuum Gauge (AA38407) through your John Deere dealer.

OUO6074,0000B3F -19-05JAN06-1/1

Vacuum Level for Peanuts



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AG,OUO6074,1220 -19-05JAN06-1/2

Setting Vacuum Levels

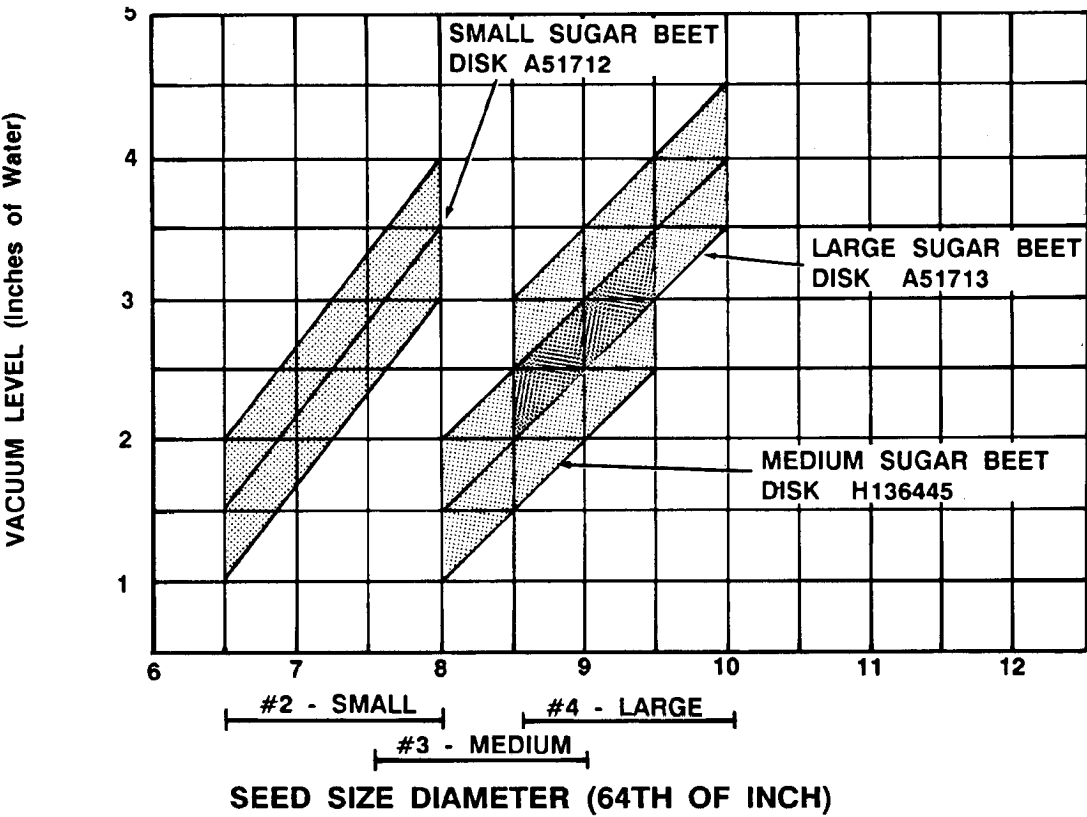
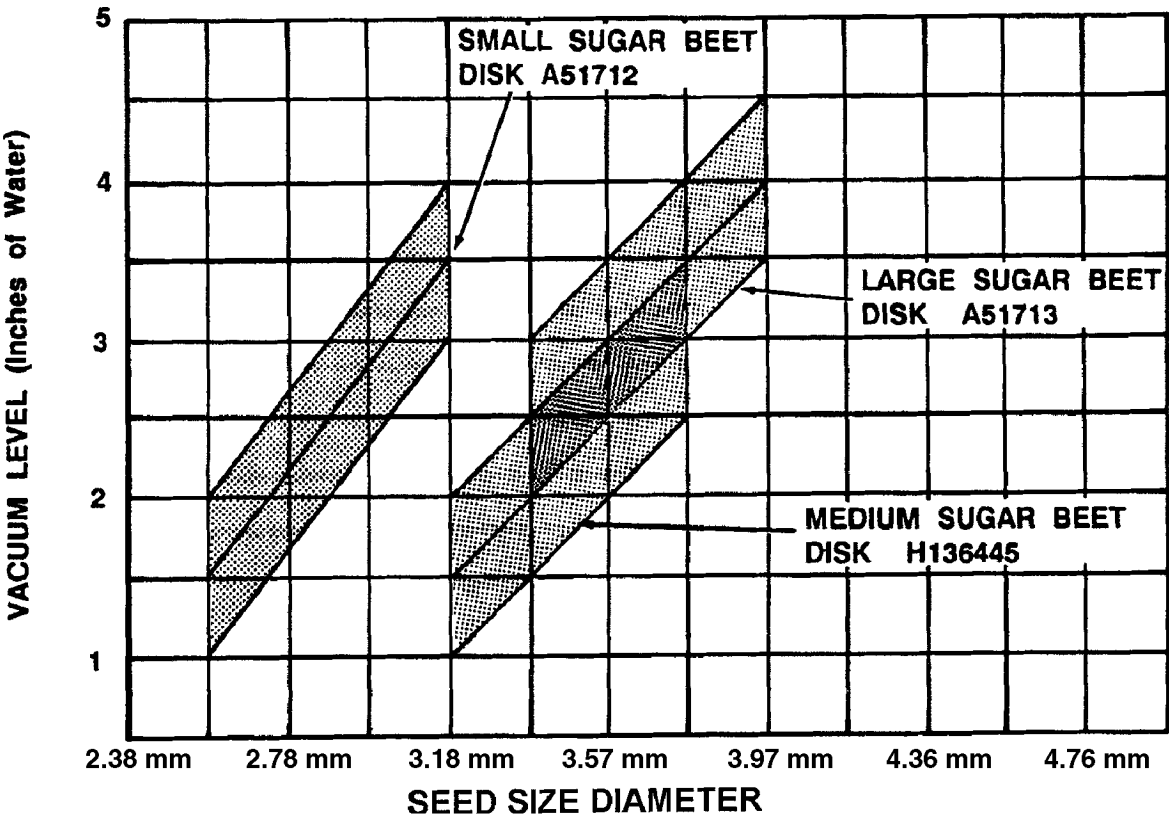
Use seed supplier's information to calculate seed size in seeds/kg or seeds/lb.

IMPORTANT: The proper vacuum level must be calculated for each peanut variety. Obtain size in seeds/kg or seeds/lb by dividing the number of seeds in the bag by the weight of the bag.

EXAMPLE: If there are 1760 seeds/kg (800 seeds/lb), according to the chart, vacuum level should be set at 11 in. when using Large Edible-Bean Disk for Runner Peanuts or 8 in. when using Virginia Peanut Disk.

AG,OUO6074,1220 -19-05JAN06-2/2

Vacuum Level for Sugar Beet Seed



Continued on next page

AG,OUO6074,1221 -19-05JAN06-1/2

Setting Vacuum Levels

IMPORTANT: The proper vacuum level must be calculated for each sugar-beet seed size.

mm in diameter). Vacuum level should be a range of between 1.5 in. to 2.5 in. when using Medium Sugar Beet Disk.

EXAMPLE: If bag label indicates medium seed (size 7.5/64 in. to 9/64 in. diameter) (size 2.98 mm to 3.57

AG,OUO6074,1221 -19-05JAN06-2/2

Vacuum Meter Rate Charts

How to Use Planting Rate Charts

IMPORTANT: Actual planting rate must be checked in the field. See **Checking Seed Population** section.

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

1. Select desired row spacing and seed population under proper column.
2. Choose proper input sprocket:

A higher population will require the use of the high-range input sprocket and HIGH RANGE chart for that particular seed.

A lower population will require the use of the low range input sprocket and LOW RANGE chart for that particular seed.

3. Determine correct seed drive transmission sprocket combination.
4. Determine recommended planting speed range. The faster speed, in the speed range, is for optimum field conditions. Reduce speed and increase unit downforce if planting in rough conditions.

AG,OUO6074,1224 -19-12JAN06-1/1

Finding Transmission Sprocket Settings for Row Widths Not Shown in Operator's Manual

When desired population is known, use the following formula to find transmission sprocket settings for row widths not shown in seed charts.

FORMULA:

$$(A \div B) \times C = D$$

A = Desired row width in inches.

B = Row width column in the seed chart (for crop being planted) nearest to desired row width.

C = Seed population desired.

D = Calculated comparison population value.

The following example assumes corn will be planted (using vacuum meters with corn-30 cell disks) with

planting units set on 28 in. rows and a desired seed population of 28 000. Using seed chart for corn-30 cells, the row width nearest the desired row width is 30 in.

EXAMPLE:

$$(28 \div 30) \times 28\,000 = 26\,133$$

Find population value in chart nearest to calculated comparison population value (26 318 for this example).

Use the sprocket combinations in the corresponding rows (29-tooth driver and 27-tooth driven for this example) to achieve desired population (28 000 for this example).

Continued on next page

AG,OUO6074,1207 -19-12JAN06-1/2

{Decal No. DB1083}

CORN - 30 CELLS

**AVERAGE SEED SPACING AND/OR APPROXIMATE SEED POPULATION PER ACRE OF
CORN SEED PLANTED WITH VACUUM METER**

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing in In.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	2-3/16	95,288	79,406	75,227	71,466	2 to 3
35	25	2-5/16	91,476	76,230	72,218	68,607	2 to 3
35	26	2-3/8	87,958	73,298	69,440	65,968	2 to 3
35	27	2-1/2	84,700	70,583	66,868	63,525	2 to 3-1/2
35	28	2-9/16	81,675	68,063	64,480	61,256	2 to 3-1/2
29	24	2-5/8	78,593	65,794	62,331	59,214	2 to 3-1/2
29	25	2-3/4	75,794	63,162	59,383	56,846	2 to 3-1/2
29	26	2-7/8	72,879	60,733	57,536	54,659	2 to 4
29	27	3-1/16	70,180	58,483	55,405	52,635	2 to 4
29	28	3-1/8	67,674	56,395	53,427	50,755	2 to 4
24	24	3-1/4	65,340	54,450	51,584	49,005	2 to 4-1/2
24	25	3-5/16	62,726	52,272	49,521	47,045	2 to 4-1/2
24	26	3-1/2	60,314	50,262	47,616	45,235	2 to 4-1/2
24	27	3-5/8	58,080	48,400	45,853	43,560	2 to 5
24	28	3-3/4	56,006	46,671	44,215	42,004	2 to 5
20	24	3-13/16	54,450	45,375	42,987	40,838	2 to 5-1/2
20	25	4	52,272	43,560	41,267	39,204	2 to 5-1/2
20	26	4-3/16	50,262	41,885	39,680	37,696	2 to 6
20	27	4-5/16	48,400	40,333	38,211	36,300	2 to 6
20	28	4-1/2	46,671	38,893	36,846	35,004	2 to 6-1/2
16	24	4-7/8	43,560	36,300	34,389	32,670	2 to 6-1/2
16	25	5	41,818	34,484	33,014	31,363	2 to 7
16	26	5-3/16	40,209	33,508	31,744	30,157	2 to 7
16	27	5-3/8	38,720	32,267	30,568	29,040	2 to 7-1/2
16	28	5-5/8	37,337	31,114	29,477	28,003	2 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven			Average Seed Spacing in In.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows		
35	24	5-13/16	35,733	29,777	28,210	26,800	3 to 8	
35	25	6-1/8	34,304	28,586	27,082	25,728	3 to 8	
35	26	6-3/8	32,984	27,487	26,040	24,738	3 to 8	
35	27	6-9/16	31,763	26,469	25,076	23,822	3 to 8	
35	28	6-13/16	30,628	25,523	24,180	22,971	3 to 8	
29	24	7-1/16	29,607	24,673	23,374	22,205	4 to 8	
29	25	7-3/8	28,423	23,686	22,439	21,317	4 to 8	
29	26	7-5/8	27,330	22,775	21,576	20,497	4 to 8	
29	27	7-15/16	26,318	21,931	20,777	19,738	4 to 8	
29	28	8-1/4	25,378	21,148	20,035	19,033	4 to 8	
24	24	8-9/16	24,503	20,419	19,344	18,377	4 to 8	
24	25	8-7/8	23,522	19,602	18,570	17,642	4 to 8	
24	26	9-1/4	22,618	18,848	17,856	16,963	4 to 8	
24	27	9-5/8	21,780	18,150	17,195	16,335	4 to 8	
24	28	9-15/16	21,002	17,502	16,581	15,752	4 to 8	
20	24	10-1/4	20,419	17,016	16,120	15,314	4 to 8	
20	25	10-11/16	19,602	16,335	15,475	14,702	4 to 8	
20	26	11-1/16	18,848	15,707	14,880	14,136	4 to 8	
20	27	11-1/2	18,150	15,125	14,329	13,613	4 to 8	
20	28	11-15/16	17,502	14,585	13,817	13,126	4 to 8	
16	24	12-13/16	16,335	13,613	12,896	12,251	4 to 8	
16	25	13-5/16	15,682	13,068	12,380	11,761	4 to 8	
16	26	13-7/8	15,078	12,565	11,904	11,309	4 to 8	
16	27	14-3/8	14,520	12,100	11,463	10,890	4 to 8	
16	28	14-15/16	14,001	11,668	11,054	10,501	4 to 8	

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

Corn—15 in. to 22 in. Rows

{Decal No. DB 1417}

CORN - 30 CELLS

AVERAGE SEED SPACING AND/OR APPROXIMATE SEED POPULATION PER ACRE OF
CORN SEED PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed spacing (in.)	Approximate Seed Population Per Acre			Recommended Speed Range in mph
Driver	Driven		15 in. Rows	20 in. Rows	22 in. Rows	
35	24	2-3/16	190 575	142 931	129 938	2 to 3
35	25	2-5/16	182 952	137 214	124 740	2 to 3
35	26	2-3/8	175 915	131 937	119 942	2 to 3
35	27	2-1/2	169 400	127 050	115 500	2 to 3-1/2
35	28	2-9/16	163 350	122 513	111 375	2 to 3-1/2
29	24	2-5/8	157 905	118 429	107 663	2 to 3-1/2
29	25	2-3/4	151 589	113 692	103 356	2 to 3-1/2
29	26	2-7/8	145 758	109 319	99 381	2 to 4
29	27	3-1/16	140 360	105 270	95 700	2 to 4
29	28	3-1/8	135 347	101 510	92 282	2 to 4
24	24	3-1/4	130 680	98 010	89 100	2 to 4-1/2
24	25	3-5/16	125 453	94 090	85 536	2 to 4-1/2
24	26	3-1/2	120 628	90 471	82 246	2 to 4-1/2
24	27	3-5/8	116 160	87 120	79 200	2 to 5
24	28	3-3/4	112 011	84 009	76 371	2 to 5
20	24	3-13/16	108 900	81 675	74 250	2 to 5-1/2
20	25	4	104 544	78 408	71 280	2 to 5-1/2
20	26	1-3/16	100 523	75 392	68 538	2 to 6
20	27	4-5/16	96 800	72 600	66 000	2 to 6
20	28	4-1/2	93 343	70 007	63 643	2 to 6-1/2
16	24	4-7/8	87 120	65 340	59 400	2 to 6-1/2
16	25	5	83 635	62 726	57 024	2 to 7
16	26	5-3/16	80 418	60 314	54 831	2 to 7
16	27	5-3/8	77 440	58 080	52 800	2 to 7-1/2
16	28	5-5/8	74 674	56 006	50 914	2 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed Spacing (in.)	Approximate Seed Population Per Acre			Recommended Speed Range in mph
Driver	Driven		15 in. Rows	20 in. Rows	22 in. Rows	
35	24	5-13/16	71 466	53 599	48 727	3 to 8
35	25	6-1/8	68 607	51 455	46 778	3 to 8
35	26	6-3/8	65 968	49 476	44 978	3 to 8
35	27	6-9/16	63 525	47 644	43 313	3 to 8
35	28	6-13/16	61 256	45 942	41 766	3 to 8
29	24	7-1/16	59 214	44 411	40 373	4 to 8
29	25	7-3/8	56 846	42 634	38 759	4 to 8
29	26	7-5/8	54 659	40 995	37 268	4 to 8
29	27	7-15/16	52 635	39 476	35 888	4 to 8
29	28	8-1/4	50 755	38 066	34 606	4 to 8
24	24	8-9/16	49 005	36 754	33 413	4 to 8
24	25	8-7/8	47 045	35 284	32 076	4 to 8
24	26	9-1/4	45 235	33 927	30 842	4 to 8
24	27	9-5/8	43 560	32 670	29 700	4 to 8
24	28	9-15/16	42 004	31 503	28 639	4 to 8
20	24	10-1/4	40 838	30 628	27 844	4 to 8
20	25	10-11/16	39 204	29 403	26 730	4 to 8
20	26	11-1/16	37 696	28 272	25 702	4 to 8
20	27	11-1/2	36 300	27 225	24 750	4 to 8
20	28	11-15/16	35 004	26 253	23 866	4 to 8
16	24	12-13/16	32 670	24 503	22 275	4 to 8
16	25	13-5/16	31 363	23 522	21 384	4 to 8
16	26	13-7/8	30 157	22 618	20 562	4 to 8
16	27	14-3/8	29 040	21 780	19 800	4 to 8
16	28	14-15/16	28 003	21 002	19 093	4 to 8

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

A50400 -19-02OCT02

Corn—30 in. to 40 in. Rows

{Decal No. DB1083}

CORN - 30 CELLS

AVERAGE SEED SPACING AND/OR APPROXIMATE SEED POPULATION PER ACRE OF
CORN SEED PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS"

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing in In.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	2-3/16	95,288	79,406	75,227	71,466	2 to 3
35	25	2-5/16	91,476	76,230	72,218	68,607	2 to 3
35	26	2-3/8	87,958	73,298	69,440	65,968	2 to 3
35	27	2-1/2	84,700	70,583	66,868	63,525	2 to 3-1/2
35	28	2-9/16	81,675	68,063	64,480	61,256	2 to 3-1/2
29	24	2-5/8	78,593	65,794	62,331	59,214	2 to 3-1/2
29	25	2-3/4	75,794	63,162	59,383	56,846	2 to 3-1/2
29	26	2-7/8	72,879	60,733	57,536	54,659	2 to 4
29	27	3-1/16	70,180	58,483	55,405	52,635	2 to 4
29	28	3-1/8	67,674	56,395	53,427	50,755	2 to 4
24	24	3-1/4	65,340	54,450	51,584	49,005	2 to 4-1/2
24	25	3-5/16	62,726	52,272	49,521	47,045	2 to 4-1/2
24	26	3-1/2	60,314	50,262	47,616	45,235	2 to 4-1/2
24	27	3-5/8	58,080	48,400	45,853	43,560	2 to 5
24	28	3-3/4	56,006	46,671	44,215	42,004	2 to 5
20	24	3-13/16	54,450	45,375	42,987	40,838	2 to 5-1/2
20	25	4	52,272	43,560	41,267	39,204	2 to 5-1/2
20	26	4-3/16	50,262	41,885	39,680	37,696	2 to 6
20	27	4-5/16	48,400	40,333	38,211	36,300	2 to 6
20	28	4-1/2	46,671	38,893	36,846	35,004	2 to 6-1/2
16	24	4-7/8	43,560	36,300	34,389	32,670	2 to 6-1/2
16	25	5	41,818	34,484	33,014	31,363	2 to 7
16	26	5-3/16	40,209	33,508	31,744	30,157	2 to 7
16	27	5-3/8	38,720	32,267	30,568	29,040	2 to 7-1/2
16	28	5-5/8	37,337	31,114	29,477	28,003	2 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing in In.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	5-13/16	35,733	29,777	28,210	26,800	3 to 8
35	25	6-1/8	34,304	28,586	27,082	25,728	3 to 8
35	26	6-3/8	32,984	27,487	26,040	24,738	3 to 8
35	27	6-9/16	31,763	26,469	25,076	23,822	3 to 8
35	28	6-13/16	30,628	25,523	24,180	22,971	3 to 8
29	24	7-1/16	29,607	24,673	23,374	22,205	4 to 8
29	25	7-3/8	28,423	23,686	22,439	21,317	4 to 8
29	26	7-5/8	27,330	22,775	21,576	20,497	4 to 8
29	27	7-15/16	26,318	21,931	20,777	19,738	4 to 8
29	28	8-1/4	25,378	21,148	20,035	19,033	4 to 8
24	24	8-9/16	24,503	20,419	19,344	18,377	4 to 8
24	25	8-7/8	23,522	19,602	18,570	17,642	4 to 8
24	26	9-1/4	22,618	18,848	17,856	16,963	4 to 8
24	27	9-5/8	21,780	18,150	17,195	16,335	4 to 8
24	28	9-15/16	21,002	17,502	16,581	15,752	4 to 8
20	24	10-1/4	20,419	17,016	16,120	15,314	4 to 8
20	25	10-11/16	19,602	16,335	15,475	14,702	4 to 8
20	26	11-1/16	18,848	15,707	14,880	14,136	4 to 8
20	27	11-1/2	18,150	15,125	14,329	13,613	4 to 8
20	28	11-15/16	17,502	14,585	13,817	13,126	4 to 8
16	24	12-13/16	16,335	13,613	12,896	12,251	4 to 8
16	25	13-5/16	15,682	13,068	12,380	11,761	4 to 8
16	26	13-7/8	15,078	12,565	11,904	11,309	4 to 8
16	27	14-3/8	14,520	12,100	11,463	10,890	4 to 8
16	28	14-15/16	14,001	11,668	11,054	10,501	4 to 8

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

Corn Using Sweet Corn Disk—30 in. to 40 in. Rows

CORN SEED USING THE SWEET CORN DISK - 40 CELLS

AVERAGE SEED SPACING AND/OR APPROXIMATE SEED POPULATION PER ACRE OF
CORN SEED PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Seeds per Acre Row Spacing in Inches		Average Seed Spacing in In.		30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	Min. mph	Max. mph
35	24	1.6	127,050	105,875	100,303	95,288	0.5	1.5			
35	25	1.7	121,968	101,640	96,291	91,476	0.5	1.5			
35	26	1.8	117,277	97,731	92,587	87,958	0.5	1.5			
35	27	1.9	112,933	94,111	89,158	84,700	0.5	1.5			
35	28	1.9	108,900	90,750	85,974	81,675	0.5	1.5			
29	24	2.0	105,270	87,725	83,108	78,953	0.5	2.0			
29	25	2.1	101,059	84,216	79,784	75,794	0.5	2.0			
29	26	2.2	97,172	80,977	76,715	72,879	0.5	2.0			
29	27	2.2	93,573	77,978	73,874	70,180	0.5	2.0			
29	28	2.3	90,231	75,193	71,235	67,674	0.5	2.0			
24	24	2.4	87,120	72,600	68,779	65,340	0.5	2.0			
24	25	2.5	83,635	69,696	66,028	62,726	0.5	2.5			
24	26	2.6	80,418	67,015	63,488	60,314	0.5	2.5			
24	27	2.7	77,440	64,533	61,137	58,080	1.0	2.5			
24	28	2.8	74,674	62,229	58,953	56,006	1.0	2.5			
20	24	2.9	72,600	60,500	57,316	54,450	1.0	2.5			
20	25	3.0	69,696	58,080	55,023	52,272	1.0	3.0			
20	26	3.1	67,015	55,846	52,907	50,262	1.0	3.0			
20	27	3.2	64,533	53,778	50,947	48,400	1.0	3.0			
20	28	3.4	62,229	51,857	49,128	46,671	1.0	3.0			
16	24	3.6	58,080	48,400	45,853	43,560	1.0	3.5			
16	25	3.8	55,757	46,464	44,019	41,818	1.0	3.5			
16	26	3.9	53,612	44,677	42,326	40,209	1.0	3.5			
16	27	4.1	51,627	43,022	40,758	38,720	1.5	4.0			
16	28	4.2	49,783	41,486	39,302	37,337	1.5	4.0			

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Seeds per Acre Row Spacing in Inches		Average Seed Spacing in In.		30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	Min. mph	Max. mph
35	24	4.4	47,644	39,703	37,613	35,733	1.5	4.0			
35	25	4.6	45,738	38,115	36,109	34,304	1.5	4.5			
35	26	4.8	43,979	36,649	34,720	32,984	1.5	4.5			
35	27	4.9	42,350	35,292	33,434	31,763	1.5	5.0			
35	28	5.1	40,838	34,031	32,240	30,628	1.5	5.0			
29	24	5.3	39,476	32,897	31,165	29,607	2.0	5.0			
29	25	5.5	37,897	31,581	29,919	28,423	2.0	5.5			
29	26	5.7	36,440	30,366	28,768	27,330	2.0	5.5			
29	27	6.0	35,090	29,242	27,703	26,317	2.0	6.0			
29	28	6.2	33,837	28,197	26,713	25,378	2.0	6.0			
24	24	6.4	32,670	27,225	25,792	24,503	2.0	6.5			
24	25	6.7	31,363	26,136	24,760	23,522	2.5	6.5			
24	26	6.9	30,157	25,131	23,808	22,618	2.5	6.5			
24	27	7.2	29,040	24,200	22,926	21,780	2.5	6.5			
24	28	7.5	28,003	23,336	22,108	21,002	2.5	6.5			
20	24	7.7	27,225	22,688	21,493	20,419	2.5	6.5			
20	25	8.0	26,136	21,780	20,634	19,602	3.0	6.5			
20	26	8.3	25,131	20,942	19,840	18,848	3.0	6.5			
20	27	8.6	24,200	20,167	19,105	18,150	3.0	6.5			
20	28	9.0	23,336	19,446	18,423	17,502	3.0	6.5			
16	24	9.6	21,780	18,150	17,195	16,335	3.5	6.5			
16	25	10.0	20,909	17,424	16,507	15,682	3.5	6.5			
16	26	10.4	20,105	16,754	15,872	15,078	3.5	6.5			
16	27	10.8	19,360	16,133	15,284	14,520	4.0	6.5			
16	28	11.2	18,669	15,557	14,738	14,001	4.0	6.5			

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

A50406 -19-02OCT02

Sweet Corn—15 in. to 22 in. Rows

{Decal No. DB 1382}

SWEET CORN - 40 CELLS

AVERAGE SEEDS SPACING AND/OR APPROXIMATE SEED POPULATION PER ACRE OF
SWEET CORN SEED PLANTED WITH VACUUM METERUSING THE LONG BRUSH AND AA37348 KNOCKOUT AND A52152 DOUBLE ELIMINATOR
BAFFLE IN UP POSITION EXCEPT FOR 5000 SEEDS PER POUND AND SMALLER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed Spacing (in.)	Seeds per Acre Row Spacing in Inches			Min. mph	Max. mph
Driver	Driven		15 In. Rows	20 In. Rows	22 In. Rows		
35	24	1.6	254 100	190 575	173 250	0.5	1.5
35	25	1.7	243 336	182 962	166 320	0.5	1.5
35	26	1.8	234 554	175 915	159 923	0.5	1.5
35	27	1.9	225 867	169 400	154 000	0.5	1.5
35	28	1.9	217 800	163 350	148 500	0.5	1.5
29	24	2.0	210 540	157 905	143 550	0.5	2.0
29	25	2.1	202 118	151 589	137 808	0.5	2.0
29	26	2.2	194 345	145 758	132 508	0.5	2.0
29	27	2.2	187 147	140 360	127 600	0.5	2.0
29	28	2.3	183 463	135 347	123 043	0.5	2.0
24	24	2.4	174 240	130 680	116 800	0.5	2.0
24	25	2.5	167 270	125 453	114 048	0.5	2.5
24	26	2.6	160 837	120 628	109 662	0.5	2.5
24	27	2.7	154 380	116 160	105 600	1.0	2.5
24	28	2.8	149 349	112 011	101 829	1.0	2.5
20	24	2.9	145 200	108 900	99 000	1.0	2.5
20	25	3.0	139 392	104 544	95 040	1.0	3.0
20	26	3.1	134 031	100 523	91 385	1.0	3.0
20	27	3.2	129 067	96 800	88 600	1.0	3.0
20	28	3.4	124 457	93 343	84 867	1.0	3.0
16	24	3.6	116 160	87 120	79 200	1.0	3.5
16	25	3.8	111 514	83 635	76 032	1.0	3.5
16	26	3.9	107 225	80 418	73 068	1.0	3.5
16	27	4.1	103 253	77 440	70 400	1.5	4.0
16	28	4.2	99 566	74 674	67 886	1.5	4.0

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed Spacing (in.)	Seeds per Acre Row Spacing in Inches			Min. mph	Max. mph
Driver	Driven		15 In. Rows	20 In. Rows	22 In. Rows		
35	24	4.4	95 288	71 466	64 969	1.5	4.0
35	25	4.6	91 476	68 607	62 370	1.5	4.5
35	26	4.8	87 958	65 988	59 971	1.5	4.5
35	27	4.9	84 700	63 525	57 750	1.5	5.0
35	28	5.1	81 676	61 256	55 583	1.5	5.0
29	24	5.3	78 963	59 214	63 831	2.0	5.0
29	25	5.5	75 794	56 846	51 678	2.0	5.5
29	26	5.7	72 879	54 659	49 690	2.0	5.5
29	27	6.0	70 180	52 636	47 850	2.0	6.0
29	28	6.2	67 674	50 765	46 141	2.0	6.0
24	24	6.4	65 340	49 005	44 560	2.0	6.5
24	25	6.7	62 726	47 045	42 768	2.5	6.5
24	26	6.9	60 314	45 235	41 123	2.5	6.5
24	27	7.2	58 080	43 560	39 600	2.5	6.5
24	28	7.5	56 006	42 004	38 186	2.5	6.5
20	24	7.7	54 450	40 838	37 126	2.5	6.5
20	25	8.0	52 272	39 204	35 640	3.0	6.5
20	26	8.3	50 262	37 696	34 269	3.0	6.5
20	27	8.6	48 400	36 380	33 000	3.0	6.5
20	28	9.0	46 871	35 004	31 821	3.0	6.5
16	24	9.6	43 580	32 670	29 700	3.5	6.5
16	25	10.0	41 818	31 363	28 512	3.5	6.5
16	26	10.4	40 209	30 157	27 415	3.5	6.5
16	27	10.8	38 720	29 040	26 400	4.0	6.5
16	28	11.2	37 337	28 003	25 457	4.0	6.5

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

Sweet Corn—30 in. to 40 in. Rows

{Decal No. DB1133}

SWEET CORN - 40 CELLS

AVERAGE SEED SPACING AND/OR APPROXIMATE SEED POPULATION PER ACRE OF
SWEET CORN SEED PLANTED WITH VACUUM METER
USING THE LONG BRUSH AND AA37348 KNOCKOUT AND A52162 DOUBLE ELIMINATOR
BAFFLE IN UP POSITION EXCEPT FOR 5000 SEEDS PER POUND AND SMALLER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing in In.	Seeds per Acre Row Spacing in Inches				Min. mph	Max. mph
			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows		
35	24	1.6	127,050	105,875	100,303	95,288	0.5	1.5
35	25	1.7	121,968	101,640	96,291	91,476	0.5	1.5
35	26	1.8	117,277	97,731	92,587	87,958	0.5	1.5
35	27	1.9	112,933	94,111	89,158	84,700	0.5	1.5
35	28	1.9	108,900	90,750	85,974	81,675	0.5	1.5
29	24	2.0	105,270	87,725	83,108	78,953	0.5	2.0
29	25	2.1	101,059	84,216	79,784	75,794	0.5	2.0
29	26	2.2	97,172	80,977	76,715	72,879	0.5	2.0
29	27	2.2	93,573	77,978	73,874	70,180	0.5	2.0
29	28	2.3	90,231	75,193	71,235	67,674	0.5	2.0
24	24	2.4	87,120	72,600	68,779	65,340	0.5	2.0
24	25	2.5	83,635	69,696	66,028	62,726	0.5	2.5
24	26	2.6	80,418	67,015	63,488	60,314	0.5	2.5
24	27	2.7	77,440	64,533	61,137	58,080	1.0	2.5
24	28	2.8	74,674	62,229	58,953	56,006	1.0	2.5
20	24	2.9	72,600	60,500	57,316	54,450	1.0	2.5
20	25	3.0	69,696	58,080	55,023	52,272	1.0	3.0
20	26	3.1	67,015	55,846	52,907	50,262	1.0	3.0
20	27	3.2	64,533	53,778	50,947	48,400	1.0	3.0
20	28	3.4	62,229	51,857	49,128	46,671	1.0	3.0
16	24	3.6	58,080	48,400	45,853	43,560	1.0	3.5
16	25	3.8	55,757	46,464	44,019	41,818	1.0	3.5
16	26	3.9	53,612	44,677	42,326	40,209	1.0	3.5
16	27	4.1	51,627	43,022	40,758	38,720	1.5	4.0
16	28	4.2	49,783	41,486	39,302	37,337	1.5	4.0

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing in In.	Seeds per Acre Row Spacing in Inches				Min. mph	Max. mph
			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows		
35	24	4.4	47,644	39,703	37,613	35,733	1.5	4.0
35	25	4.6	45,738	38,115	36,109	34,304	1.5	4.5
35	26	4.8	43,979	36,649	34,720	32,984	1.5	4.5
35	27	4.9	42,350	35,292	33,434	31,763	1.5	5.0
35	28	5.1	40,838	34,031	32,240	30,628	1.5	5.0
29	24	5.3	39,476	32,897	31,165	29,607	2.0	5.0
29	25	5.5	37,897	31,581	29,919	28,423	2.0	5.5
29	26	5.7	36,440	30,366	28,768	27,330	2.0	5.5
29	27	6.0	35,090	29,242	27,703	26,317	2.0	6.0
29	28	6.2	33,837	28,197	26,713	25,378	2.0	6.0
24	24	6.4	32,670	27,225	25,792	24,503	2.0	6.5
24	25	6.7	31,363	26,136	24,760	23,522	2.5	6.5
24	26	6.9	30,157	25,131	23,808	22,618	2.5	6.5
24	27	7.2	29,040	24,200	22,926	21,780	2.5	6.5
24	28	7.5	28,003	23,336	22,108	21,002	2.5	6.5
20	24	7.7	27,225	22,688	21,493	20,419	2.5	6.5
20	25	8.0	26,136	21,780	20,634	19,602	3.0	6.5
20	26	8.3	25,131	20,942	19,840	18,848	3.0	6.5
20	27	8.6	24,200	20,167	19,105	18,150	3.0	6.5
20	28	9.0	23,336	19,446	18,423	17,502	3.0	6.5
16	24	9.6	21,780	18,150	17,195	16,335	3.5	6.5
16	25	10.0	20,909	17,424	16,507	15,682	3.5	6.5
16	26	10.4	20,105	16,754	15,872	15,078	3.5	6.5
16	27	10.8	19,360	16,133	15,284	14,520	4.0	6.5
16	28	11.2	18,669	15,557	14,738	14,001	4.0	6.5

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

A50418 -19-02OCT02

Oil Sunflower—15 in. to 22 in. Rows

{Decal No. DB 1384}

OIL SUNFLOWER - 30 CELLS

AVERAGE SEED SPACING AND/OR APPROXIMATE SEED POPULATION PER ACRE OF
OIL SUNFLOWER SEED PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed spacing (in.)	Approximate Seed Population Per Acre			Recommended Speed Range in mph
Driver	Driven		15 In. Rows	20 In. Rows	22 In. Rows	
35	24	2-3/16	190 575	142 931	129 938	2 to 3
35	25	2-5/16	182 952	137 214	124 740	2 to 3
35	26	2-3/8	175 915	131 937	119 942	2 to 3
35	27	2-1/2	169 400	127 050	115 500	2 to 3-1/2
35	28	2-9/16	163 350	122 513	111 375	2 to 3-1/2
29	24	2-5/8	157 905	118 429	107 663	2 to 3-1/2
29	25	2-3/4	151 589	113 692	103 356	2 to 3-1/2
29	26	2-7/8	145 758	109 319	99 381	2 to 4
29	27	3-1/16	140 360	105 270	95 700	2 to 4
29	28	3-1/8	135 347	101 510	92 282	2 to 4
24	24	3-1/4	130 680	98 010	89 100	2 to 4-1/2
24	25	3-5/16	125 453	94 090	85 536	2 to 4-1/2
24	26	3-1/2	120 628	90 471	82 246	2 to 4-1/2
24	27	3-5/8	116 160	87 120	79 200	2 to 5
24	28	3-3/4	112 011	84 009	76 371	2 to 5
20	24	3-13/16	108 900	81 675	74 250	2 to 5-1/2
20	25	4	104 544	78 408	71 280	2 to 5-1/2
20	26	1-3/16	100 523	75 392	68 538	2 to 6
20	27	4-5/16	96 800	72 600	66 000	2 to 6
20	28	4-1/2	93 343	70 007	63 643	2 to 6-1/2
16	24	4-7/8	87 120	65 340	59 400	2 to 6-1/2
16	25	5	83 635	62 726	57 024	2 to 7
16	26	5-3/16	80 418	60 314	54 831	2 to 7
16	27	5-3/8	77 440	58 080	52 800	2 to 7-1/2
16	28	3-5/8	74 674	56 006	50 914	2 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed Spacing (in.)	Approximate Seed Population Per Acre			Recommended Speed Range in mph
Driver	Driven		15 In. Rows	20 In. Rows	22 In. Rows	
35	24	5-13/16	71 466	53 599	48 727	3 to 8
35	25	6-1/8	68 607	51 455	46 778	3 to 8
35	26	6-3/8	65 968	49 476	44 978	3 to 8
35	27	6-9/16	63 525	47 644	43 313	3 to 8
35	28	6-13/16	61 256	45 942	41 766	3 to 8
29	24	7-1/16	59 214	44 411	40 373	4 to 8
29	25	7-3/8	56 846	42 634	38 759	4 to 8
29	26	7-5/8	54 659	40 995	37 268	4 to 8
29	27	7-15/16	52 635	39 476	35 888	4 to 8
29	28	8-1/4	50 755	38 066	34 606	4 to 8
24	24	8-9/16	49 005	36 754	33 413	4 to 8
24	25	8-7/8	47 045	35 284	32 076	4 to 8
24	26	9-1/4	45 235	33 927	30 842	4 to 8
24	27	9-5/8	43 560	32 670	29 700	4 to 8
24	28	9-15/16	42 004	31 503	28 639	4 to 8
20	24	10-1/4	40 838	30 628	27 844	4 to 8
20	25	10-11/16	39 204	29 403	26 730	4 to 8
20	26	11-1/16	37 696	28 272	25 702	4 to 8
20	27	11-1/2	36 300	27 225	24 750	4 to 8
20	28	11-15/16	35 004	26 253	23 866	4 to 8
16	24	12-13/16	32 670	24 503	22 275	4 to 8
16	25	13-5/16	31 363	23 522	21 384	4 to 8
16	26	13-7/8	30 157	22 618	20 562	4 to 8
16	27	14-3/8	29 040	21 780	19 800	4 to 8
16	28	14-15/16	28 003	21 002	19 093	4 to 8

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

Oil Sunflower—30 in. to 40 in. Rows

{Decal No. DB1138}

OIL SUNFLOWER - 30 CELLS

AVERAGE SEED SPACING AND/OR APPROXIMATE SEED POPULATION PER ACRE OF
OIL SUNFLOWER SEED PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing in In.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	2-3/16	95,288	79,406	75,227	71,466	2 to 3
35	25	2-5/16	91,476	76,230	72,218	68,607	2 to 3
35	26	2-3/8	87,958	73,298	69,440	65,968	2 to 3
35	27	2-1/2	84,700	70,583	66,868	63,525	2 to 3-1/2
35	28	2-9/16	81,675	68,063	64,480	61,256	2 to 3-1/2
29	24	2-5/8	78,593	65,794	62,331	59,214	2 to 3-1/2
29	25	2-3/4	75,794	63,162	59,383	56,846	2 to 3-1/2
29	26	2-7/8	72,879	60,733	57,536	54,659	2 to 4
29	27	3-1/16	70,180	58,483	55,405	52,635	2 to 4
29	28	3-1/8	67,674	56,395	53,427	50,755	2 to 4
24	24	3-1/4	65,340	54,450	51,584	49,005	2 to 4-1/2
24	25	3-5/16	62,726	52,272	49,521	47,045	2 to 4-1/2
24	26	3-1/2	60,314	50,262	47,616	45,235	2 to 4-1/2
24	27	3-5/8	58,080	48,400	45,853	43,560	2 to 5
24	28	3-3/4	56,006	46,671	44,215	42,004	2 to 5
20	24	3-13/16	54,450	45,375	42,987	40,838	2 to 5-1/2
20	25	4	52,272	43,560	41,267	39,204	2 to 5-1/2
20	26	4-3/16	50,262	41,885	39,680	37,696	2 to 6
20	27	4-5/16	48,400	40,333	38,211	36,300	2 to 6
20	28	4-1/2	46,671	38,893	36,846	35,004	2 to 6-1/2
16	24	4-7/8	43,560	36,300	34,389	32,670	2 to 6-1/2
16	25	5	41,818	34,484	33,014	31,363	2 to 7
16	26	5-3/16	40,209	33,508	31,744	30,157	2 to 7
16	27	5-3/8	38,720	32,267	30,568	29,040	2 to 7-1/2
16	28	5-5/8	37,337	31,114	29,477	28,003	2 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing in In.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	5-13/16	35,733	29,777	28,210	26,800	3 to 8
35	25	6-1/8	34,304	28,586	27,082	25,728	3 to 8
35	26	6-3/8	32,984	27,487	26,040	24,738	3 to 8
35	27	6-9/16	31,763	26,469	25,076	23,822	3 to 8
35	28	6-13/16	30,628	25,523	24,180	22,971	3 to 8
29	24	7-1/16	29,607	24,673	23,374	22,205	4 to 8
29	25	7-3/8	28,423	23,686	22,439	21,317	4 to 8
29	26	7-5/8	27,330	22,775	21,576	20,497	4 to 8
29	27	7-15/16	26,318	21,931	20,777	19,738	4 to 8
29	28	8-1/4	25,378	21,148	20,035	19,033	4 to 8
24	24	8-9/16	24,503	20,419	19,344	18,377	4 to 8
24	25	8-7/8	23,522	19,602	18,570	17,642	4 to 8
24	26	9-1/4	22,618	18,848	17,856	16,963	4 to 8
24	27	9-5/8	21,780	18,150	17,195	16,335	4 to 8
24	28	9-15/16	21,002	17,502	16,581	15,752	4 to 8
20	24	10-1/4	20,419	17,016	16,120	15,314	4 to 8
20	25	10-11/16	19,602	16,335	15,475	14,702	4 to 8
20	26	11-1/16	18,848	15,707	14,880	14,136	4 to 8
20	27	11-1/2	18,150	15,125	14,329	13,613	4 to 8
20	28	11-15/16	17,502	14,585	13,817	13,126	4 to 8
16	24	12-13/16	16,335	13,613	12,896	12,251	4 to 8
16	25	13-5/16	15,682	13,068	12,380	11,761	4 to 8
16	26	13-7/8	15,078	12,565	11,904	11,309	4 to 8
16	27	14-3/8	14,520	12,100	11,463	10,890	4 to 8
16	28	14-15/16	14,001	11,668	11,054	10,501	4 to 8

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

A50410 -19-04OCT02

Confectionary Sunflower—15 in. to 22 in. Rows

{Decal No. DB 1383}

CONFECTIONARY SUNFLOWER - 40 CELLS

AVERAGE SEEDS SPACING AND/OR APPROXIMATE SEED POPULATION PER ACRE OF
CONFECTIONARY SUNFLOWER SEED PLANTED WITH VACUUM METER
USING THE LONG BRUSH AND AA37348 KNOCKOUT AND AS2152 DOUBLE ELIMINATOR
BAFFLE IN UP POSITION EXCEPT FOR 5000 SEEDS PER POUND AND SMALLER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed Spacing (in.)	Seeds per Acre Row Spacing in Inches			Min. mph	Max. mph
Driver	Driven		15 In. Rows	20 In. Rows	22 In. Rows		
35	24	1.6	254 100	190 575	173 250	0.5	1.5
35	25	1.7	243 336	182 962	166 320	0.5	1.5
35	26	1.8	234 554	175 915	159 923	0.5	1.5
35	27	1.9	225 867	169 400	154 000	0.5	1.5
35	28	1.9	217 800	163 350	148 500	0.5	1.5
29	24	2.0	210 540	157 905	143 550	0.5	2.0
29	25	2.1	202 118	151 589	137 808	0.5	2.0
29	26	2.2	194 345	145 758	132 508	0.5	2.0
29	27	2.2	187 147	140 360	127 600	0.5	2.0
29	28	2.3	183 463	135 347	123 043	0.5	2.0
24	24	2.4	174 240	130 680	116 800	0.5	2.0
24	25	2.5	167 270	125 453	114 048	0.5	2.5
24	26	2.6	160 837	120 628	109 662	0.5	2.5
24	27	2.7	154 380	116 160	105 600	1.0	2.5
24	28	2.8	149 349	112 011	101 829	1.0	2.5
20	24	2.9	145 200	108 900	99 000	1.0	2.5
20	25	3.0	139 392	104 544	95 040	1.0	3.0
20	26	3.1	134 031	100 523	91 385	1.0	3.0
20	27	3.2	129 067	96 800	88 600	1.0	3.0
20	28	3.4	124 457	93 343	84 867	1.0	3.0
16	24	3.6	116 160	87 120	79 200	1.0	3.5
16	25	3.8	111 514	83 635	76 032	1.0	3.5
16	26	3.9	107 225	80 418	73 068	1.0	3.5
16	27	4.1	103 253	77 440	70 400	1.5	4.0
16	28	4.2	99 566	74 674	67 886	1.5	4.0

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed Spacing (in.)	Seeds per Acre Row Spacing in Inches			Min. mph	Max. mph
Driver	Driven		15 In. Rows	20 In. Rows	22 In. Rows		
35	24	4.4	95 288	71 466	64 969	1.5	4.0
35	25	4.6	91 476	68 607	62 370	1.5	4.5
35	26	4.8	87 958	65 988	59 971	1.5	4.5
35	27	4.9	84 700	63 525	57 750	1.5	5.0
35	28	5.1	81 676	61 256	55 583	1.5	5.0
29	24	5.3	78 963	59 214	63 831	2.0	5.0
29	25	5.5	75 794	56 846	51 678	2.0	5.5
29	26	5.7	72 879	54 659	49 690	2.0	5.5
29	27	6.0	70 180	52 636	47 850	2.0	6.0
29	28	6.2	67 674	50 765	46 141	2.0	6.0
24	24	6.4	65 340	49 005	44 560	2.0	6.5
24	25	6.7	62 726	47 045	42 768	2.5	6.5
24	26	6.9	60 314	45 235	41 123	2.5	6.5
24	27	7.2	58 080	43 560	39 600	2.5	6.5
24	28	7.5	56 006	42 004	38 186	2.5	6.5
20	24	7.7	54 450	40 838	37 126	2.5	6.5
20	25	8.0	52 272	39 204	35 640	3.0	6.5
20	26	8.3	50 262	37 696	34 269	3.0	6.5
20	27	8.6	48 400	36 380	33 000	3.0	6.5
20	28	9.0	46 871	35 004	31 821	3.0	6.5
16	24	9.6	43 580	32 670	29 700	3.5	6.5
16	25	10.0	41 818	31 363	28 512	3.5	6.5
16	26	10.4	40 209	30 157	27 415	3.5	6.5
16	27	10.8	38 720	29 040	26 400	4.0	6.5
16	28	11.2	37 337	28 003	25 457	4.0	6.5

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

Confectionary Sunflower—30 in. to 40 in. Rows

{Decal No. DB1143}

CONFECTIONARY SUNFLOWER - 40 CELLS

AVERAGE SEED SPACING AND/OR APPROXIMATE SEED POPULATION PER ACRE OF
CONFECTIONARY SUNFLOWER SEED PLANTED WITH VACUUM METER
USING THE LONG BRUSH AND AA37348 KNOCKOUT AND A52152 DOUBLE ELIMINATOR
BAFFLE IN UP POSITION EXCEPT FOR 5000 SEEDS PER POUND AND SMALLER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed Spacing in In.	Seeds per Acre Row Spacing in Inches				Min. mph	Max. mph
Driver	Driven		30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows		
35	24	1.6	127,050	105,875	100,303	95,288	0.5	1.5
35	25	1.7	121,968	101,640	96,291	91,476	0.5	1.5
35	26	1.8	117,277	97,731	92,587	87,958	0.5	1.5
35	27	1.9	112,933	94,111	89,158	84,700	0.5	1.5
35	28	1.9	108,900	90,750	85,974	81,675	0.5	1.5
29	24	2.0	105,270	87,725	83,108	78,953	0.5	2.0
29	25	2.1	101,059	84,216	79,784	75,794	0.5	2.0
29	26	2.2	97,172	80,977	76,715	72,879	0.5	2.0
29	27	2.2	93,573	77,978	73,874	70,180	0.5	2.0
29	28	2.3	90,231	75,193	71,235	67,674	0.5	2.0
24	24	2.4	87,120	72,600	68,779	65,340	0.5	2.0
24	25	2.5	83,635	69,696	66,028	62,726	0.5	2.5
24	26	2.6	80,418	67,015	63,488	60,314	0.5	2.5
24	27	2.7	77,440	64,533	61,137	58,080	1.0	2.5
24	28	2.8	74,674	62,229	58,953	56,006	1.0	2.5
20	24	2.9	72,600	60,500	57,316	54,450	1.0	2.5
20	25	3.0	69,696	58,080	55,023	52,272	1.0	3.0
20	26	3.1	67,015	55,846	52,907	50,262	1.0	3.0
20	27	3.2	64,533	53,778	50,947	48,400	1.0	3.0
20	28	3.4	62,229	51,857	49,128	46,671	1.0	3.0
16	24	3.6	58,080	48,400	45,853	43,560	1.0	3.5
16	25	3.8	55,757	46,464	44,019	41,818	1.0	3.5
16	26	3.9	53,612	44,677	42,326	40,209	1.0	3.5
16	27	4.1	51,627	43,022	40,758	38,720	1.5	4.0
16	28	4.2	49,783	41,486	39,302	37,337	1.5	4.0

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed Spacing in In.	Seeds per Acre Row Spacing in Inches				Min. mph	Max. mph
Driver	Driven		30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows		
35	24	4.4	47,644	39,703	37,613	35,733	1.5	4.0
35	25	4.6	45,738	38,115	36,109	34,304	1.5	4.5
35	26	4.8	43,979	36,649	34,720	32,984	1.5	4.5
35	27	4.9	42,350	35,292	33,434	31,763	1.5	5.0
35	28	5.1	40,838	34,031	32,240	30,628	1.5	5.0
29	24	5.3	39,476	32,897	31,165	29,607	2.0	5.0
29	25	5.5	37,897	31,581	29,919	28,423	2.0	5.5
29	26	5.7	36,440	30,366	28,768	27,330	2.0	5.5
29	27	6.0	35,090	29,242	27,703	26,317	2.0	6.0
29	28	6.2	33,837	28,197	26,713	25,378	2.0	6.0
24	24	6.4	32,670	27,225	25,792	24,503	2.0	6.5
24	25	6.7	31,363	26,136	24,760	23,522	2.5	6.5
24	26	6.9	30,157	25,131	23,808	22,618	2.5	6.5
24	27	7.2	29,040	24,200	22,926	21,780	2.5	6.5
24	28	7.5	28,003	23,336	22,108	21,002	2.5	6.5
20	24	7.7	27,225	22,688	21,493	20,419	2.5	6.5
20	25	8.0	26,136	21,780	20,634	19,602	3.0	6.5
20	26	8.3	25,131	20,942	19,840	18,848	3.0	6.5
20	27	8.6	24,200	20,167	19,105	18,150	3.0	6.5
20	28	9.0	23,336	19,446	18,423	17,502	3.0	6.5
16	24	9.6	21,780	18,150	17,195	16,335	3.5	6.5
16	25	10.0	20,909	17,424	16,507	15,682	3.5	6.5
16	26	10.4	20,105	16,754	15,872	15,078	3.5	6.5
16	27	10.8	19,360	16,133	15,284	14,520	4.0	6.5
16	28	11.2	18,669	15,557	14,738	14,001	4.0	6.5

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

A50414 -19-02OCT02

Low-Rate Cotton—15 in. to 40 in. Rows

COTTON - 32 CELLS

AVERAGE SEED SPACING AND/OR APPROXIMATE SEED POPULATION PER ACRE OF COTTON PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING CHARTS."

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing in In.	Approximate Seed Population Per Acre						Recommended Speed Range in MPH
			15 In. Rows	30 In. Rows	32 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	2.06	203280	101640	95288	84700	80242	76230	2 to 8
35	25	2.14	195149	97574	91476	81312	77032	73181	2 to 8
35	26	2.23	187643	93822	87958	78185	74070	70366	2 to 8
35	27	2.31	180693	90347	84700	75289	71326	67760	2 to 8
35	28	2.40	174240	87120	81675	72600	68779	65340	2 to 8
29	24	2.48	168432	84216	78953	70180	66486	63162	2 to 8
29	25	2.59	161695	80847	75794	67373	63827	60636	2 to 8
29	26	2.69	155476	77738	72879	64782	61372	58303	2 to 8
29	27	2.79	149717	74859	70180	62382	59099	56144	2 to 8
29	28	2.90	144370	72185	67674	60154	56988	54139	2 to 8
24	24	3.00	139392	69696	65340	58080	55023	52272	2 to 8
24	25	3.13	133816	66908	62726	55757	52822	50181	2 to 8
24	26	3.25	128670	64335	60314	53612	50791	48251	2 to 8
24	27	3.38	123904	61952	58080	51627	48909	46464	2 to 8
24	28	3.50	119479	59739	56006	49783	47163	44805	2 to 8
20	24	3.60	116160	58080	54450	48400	45853	43560	2 to 8
20	25	3.75	111514	55757	52272	46464	44019	41818	2 to 8
20	26	3.90	107225	53612	50262	44677	42326	40209	2 to 8
20	27	4.05	103253	51627	48400	43022	40758	38720	2 to 8
20	28	4.20	99566	49783	46671	41486	39302	37337	2 to 8
16	24	4.50	92928	46464	43560	38720	36682	34848	3 to 8
16	25	4.69	89211	44605	41818	37171	35215	33454	3 to 8
16	26	4.88	85780	42890	40209	35742	33860	32167	3 to 8
16	27	5.06	82603	41301	38720	34418	32606	30976	3 to 8
16	28	5.25	79653	39826	37337	33189	31442	29870	3 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing in In.	Approximate Seed Population Per Acre						Recommended Speed Range in MPH
			15 In. Rows	30 In. Rows	32 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	5.49	76230	38115	35733	31763	30091	28586	3 to 8
35	25	5.71	73181	36590	34304	30492	28887	27443	3 to 8
35	26	5.94	70366	35183	32984	29319	27776	26387	3 to 8
35	27	6.17	67760	33880	31763	28233	26747	25410	3 to 8
35	28	6.40	65340	32670	30628	27225	25792	24503	3 to 8
29	24	6.62	63162	31581	29607	26318	24932	23686	3 to 8
29	25	6.90	60636	30318	28423	25265	23935	22738	4 to 8
29	26	7.17	58303	29152	27330	24293	23014	21864	4 to 8
29	27	7.45	56144	28072	26318	23393	22162	21054	4 to 8
29	28	7.72	54139	27069	25378	22558	21371	20302	4 to 8
24	24	8.00	52272	26136	24503	21780	20634	19602	4 to 8
24	25	8.33	50181	25091	23522	20909	19808	18818	4 to 8
24	26	8.67	48251	24126	22618	20105	19046	18094	4 to 8
24	27	9.00	46464	23232	21780	19360	18341	17424	4 to 8
24	28	9.33	44805	22402	21002	18669	17686	16802	4 to 8
20	24	9.60	43560	21780	20419	18150	17195	16335	4 to 8
20	25	10.00	41818	20909	19602	17424	16507	15682	4 to 8
20	26	10.40	40209	20105	18848	16754	15872	15078	4 to 8
20	27	10.80	38720	19360	18150	16133	15284	14520	4 to 8
20	28	11.20	37337	18669	17502	15557	14738	14001	4 to 8
16	24	12.00	34848	17424	16335	14520	13756	13068	4 to 8
16	25	12.50	33454	16727	15682	13939	13206	12545	4 to 8
16	26	13.00	32167	16084	15078	13403	12698	12063	4 to 8
16	27	13.50	30976	15488	14520	12907	12227	11616	4 to 8
16	28	14.00	29870	14935	14001	12446	11791	11201	4 to 8

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

A57366 -19-06JAN06

Cotton—30 in. to 40 in. Rows

{Decal No. DB1084}

COTTON - 64 CELLS

AVERAGE SEED SPACING AND/OR APPROXIMATE SEED POPULATION PER ACRE OF COTTON PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing in In.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	1	203,280	169,400	160,484	152,460	2 to 5-1/2
35	25	1-1/16	195,149	162,624	154,065	146,362	2 to 5-1/2
35	26	1-1/8	187,643	156,369	148,139	140,732	2 to 6
35	27	1-1/8	180,693	150,578	142,653	135,520	2 to 6
35	28	1-3/16	174,240	145,200	137,558	130,680	2 to 6-1/2
29	24	1-1/4	168,432	140,360	132,973	126,324	2 to 6-1/2
29	25	1-5/16	161,695	134,746	127,654	121,271	2 to 7
29	26	1-3/8	155,476	129,563	122,744	116,607	2 to 7
29	27	1-7/16	149,717	124,764	118,198	112,288	2 to 7-1/2
29	28	1-7/16	144,370	120,309	113,977	108,278	2 to 7-1/2
24	24	1-1/2	139,392	116,160	110,046	104,544	2 to 8
24	25	1-9/16	133,816	111,514	105,644	100,362	2 to 8
24	26	1-5/8	128,670	107,225	101,581	96,502	2 to 8
24	27	1-11/16	123,904	103,253	97,819	92,928	2 to 8
24	28	1-3/4	119,479	99,566	94,325	89,609	2 to 8
20	24	1-13/16	116,160	96,800	91,705	87,120	2 to 8
20	25	1-7/8	111,514	92,928	88,037	83,635	2 to 8
20	26	1-15/16	107,225	89,354	84,651	80,418	2 to 8
20	27	2	103,253	86,044	81,516	77,440	2 to 8
20	28	2-1/8	99,566	82,971	78,605	74,674	2 to 8
16	24	2-1/4	92,928	77,440	73,364	69,696	3 to 8
16	25	2-5/16	89,211	74,342	70,430	66,908	3 to 8
16	26	2-7/16	85,780	71,483	67,721	64,335	3 to 8
16	27	2-1/2	82,603	68,836	65,213	61,952	3 to 8
16	28	2-5/8	79,653	66,377	62,884	59,739	3 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing in In.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	2-3/4	76,230	63,525	60,182	57,173	3 to 8
35	25	2-7/8	73,181	60,984	57,774	54,886	3 to 8
35	26	2-15/16	70,366	58,638	55,552	52,775	3 to 8
35	27	3-1/16	67,760	56,467	53,495	50,820	3 to 8
35	28	3-3/16	65,340	54,450	51,584	49,005	3 to 8
29	24	3-5/16	63,162	52,635	49,865	47,372	3 to 8
29	25	3-7/16	60,636	50,530	47,870	45,477	4 to 8
29	26	3-9/16	58,303	48,586	46,029	43,728	4 to 8
29	27	3-3/4	56,144	46,787	44,324	42,108	4 to 8
29	28	3-7/8	54,139	45,116	42,741	40,604	4 to 8
24	24	4	52,272	43,560	41,267	39,204	4 to 8
24	25	4-3/16	50,181	41,818	39,617	37,636	4 to 8
24	26	4-5/16	48,251	40,209	38,093	36,188	4 to 8
24	27	4-1/2	46,464	38,720	36,682	34,848	4 to 8
24	28	4-11/16	44,805	37,337	35,372	33,603	4 to 8
20	24	4-13/16	43,560	36,300	34,389	32,670	4 to 8
20	25	5	41,818	34,848	33,014	31,363	4 to 8
20	26	5-3/16	40,209	33,508	31,744	30,157	4 to 8
20	27	5-7/16	38,720	32,267	30,568	29,040	4 to 8
20	28	5-5/8	37,337	31,114	29,477	28,003	4 to 8
16	24	6	34,848	29,040	27,512	26,136	4 to 8
16	25	6-1/4	33,454	27,878	26,411	25,091	4 to 8
16	26	6-1/2	32,167	26,806	25,395	24,126	4 to 8
16	27	6-3/4	30,976	25,813	24,455	23,232	4 to 8
16	28	7	29,870	24,891	23,581	22,402	4 to 8

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

Cotton Using Edible Bean Flat-Type Seed Disk and Double Eliminator—30 in. to 40 in. Rows

{Decal No. DB1232} EDIBLE BEANS - FLAT TYPE DISK - 50 HOLES

AVERAGE SEED SPACING, AVERAGE SEEDS PER FT. AND/OR APPROXIMATE SEED POPULATION PER ACRE
OF EDIBLE BEANS PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS"

HIGH RANGE INPUT SPROCKET

Approximate Seed Population Per Acre

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing In Inches	Average Seeds Per Foot	30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	Recommended Speed Range in mph
35	24	1-5/16	9.11	158,813	132,344	125,378	119,109	3 to 4
35	25	1-3/8	8.75	152,460	127,050	120,363	114,345	3 to 4
35	26	1-7/16	8.41	146,596	122,163	115,734	109,947	3 to 4
35	27	1-1/2	8.10	141,167	117,639	111,447	108,875	3 to 4
35	28	1-1/2	7.81	136,125	113,438	109,467	102,094	3 to 4.5
29	24	1-5/8	7.55	131,588	109,656	103,885	98,691	3 to 4.5
29	25	1-11/16	7.25	126,324	105,270	99,729	94,743	3 to 4.5
29	26	1-3/4	6.97	121,465	101,221	95,894	91,099	3 to 4.5
29	27	1-3/4	6.71	116,967	97,472	92,342	87,725	3 to 4.5
29	28	1-13/16	6.49	112,789	93,991	89,044	84,592	3 to 4.5
24	24	1-7/8	6.25	108,900	90,750	85,974	81,675	3 to 4.5
24	25	2	6.00	104,544	87,120	82,535	78,408	3 to 4.5
24	26	2	5.77	100,523	83,769	79,360	75,392	4 to 5
24	27	2-1/8	5.56	96,800	80,667	76,421	72,600	4 to 5
24	28	2-1/4	5.36	93,343	77,786	73,692	70,007	4 to 5
20	24	2-3/8	5.21	90,750	75,625	71,645	68,063	4 to 5
20	25	2-7/16	5.00	87,120	72,600	68,779	65,340	4 to 5
20	26	2-1/2	4.81	83,769	69,808	66,134	62,827	4 to 5
20	27	2-1/2	4.62	80,667	67,222	63,684	60,500	4 to 6
20	28	2-9/16	4.46	77,786	64,821	61,410	58,339	4 to 6
16	24	2-7/8	4.17	72,600	60,500	57,316	54,450	4 to 6
16	25	3	4.00	69,696	58,080	55,023	52,272	4 to 6
16	26	3-1/8	3.85	67,015	55,846	52,907	50,262	4 to 6
16	27	3-1/4	3.70	64,533	53,778	50,947	48,400	4 to 6
16	28	3-3/8	3.50	62,229	51,857	49,128	46,671	4 to 6

LOW RANGE INPUT SPROCKET

Approximate Seed Population Per Acre

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing In Inches	Average Seeds Per Foot	30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	Recommended Speed Range in mph
35	24	3-1/2	3.42	59,555	49,629	47,017	44,666	4 to 6
35	25	3-5/8	3.26	57,173	47,644	45,136	42,879	4 to 6
35	26	3-3/4	3.16	54,974	45,811	43,400	41,230	4 to 6
35	27	4	3.04	52,938	44,115	41,793	39,703	4 to 6
35	28	4-1/8	2.93	51,047	42,539	40,300	38,285	4 to 6
29	24	4-1/2	2.83	49,345	41,121	38,957	37,009	4 to 6
29	25	4-3/8	2.72	47,372	39,476	37,399	35,529	4 to 6
29	26	4-5/8	2.61	45,550	37,958	35,960	34,162	4 to 6
29	27	4-3/4	2.52	43,863	36,552	34,638	32,897	4 to 6
29	28	4-15/16	2.43	42,296	35,247	33,392	31,722	4 to 6
24	24	5-1/8	2.34	40,838	34,031	32,240	30,628	4 to 6
24	25	5-5/16	2.25	39,204	32,670	30,951	29,403	4 to 6
24	26	5-1/2	2.16	37,696	31,413	29,760	28,272	4 to 6
24	27	5-3/4	2.08	36,300	30,250	28,658	27,225	4 to 6
24	28	5-15/16	2.01	35,004	29,170	27,634	26,253	4 to 6
20	24	6-1/8	1.95	34,031	28,359	26,867	25,523	4 to 6
20	25	6-3/8	1.88	32,670	27,225	25,792	24,503	4 to 6
20	26	6-5/8	1.80	31,413	26,178	24,800	23,560	4 to 6
20	27	6-15/16	1.74	30,250	25,208	23,882	22,688	4 to 6
20	28	7-1/8	1.67	29,170	24,308	23,029	21,877	4 to 6
16	24	7-5/8	1.56	27,225	22,688	21,493	20,419	4 to 6
16	25	8	1.50	26,136	21,780	20,634	19,602	4 to 6
16	26	8-3/8	1.44	25,131	20,942	19,840	18,848	4 to 6
16	27	8-5/8	1.39	24,200	20,167	19,105	18,150	4 to 6
16	28	9	1.34	23,336	19,446	18,423	17,502	4 to 6

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

Four Seed Cotton Hilldrop—30 in. to 40 in. Rows

COTTON HILLDROP - 48 CELLS
HILL SPACING IN IN. AND/OR APPROXIMATE SEED POPULATION PER ACRE OF
COTTON HILLDROP PLANTED WITH VACUUM METER AND USING AA37206 BRUSH

[Decal No. DB1085]

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET
APPROXIMATE SEED POPULATION PER ACRE

Sprocket Combinations (Number of Teeth) Driver Driven		Hill Spacing in In.	30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	Recommended Speed Range in mph
35	24	5.49	152,460	127,052	120,364	114,344	2 to 3
35	25	5.71	146,360	121,968	115,548	109,772	2 to 3
35	26	5.94	140,732	117,276	111,104	105,548	2 to 3.5
35	27	6.17	135,520	112,932	106,888	101,640	2 to 3.5
35	28	6.40	130,680	108,900	103,168	98,012	2 to 4
29	24	6.62	126,324	105,272	99,728	94,744	2 to 4
29	25	6.90	121,272	101,060	95,740	90,952	2 to 4
29	26	7.17	116,608	97,172	92,056	87,456	2 to 4.5
29	27	7.45	112,288	93,572	88,648	84,216	2 to 4.5
29	28	7.72	108,276	90,232	85,484	81,208	2 to 4.5
24	24	8.00	104,544	87,120	82,536	78,408	2 to 5
24	25	8.33	100,364	83,636	79,232	75,272	2 to 5
24	26	8.67	96,504	80,420	76,184	72,376	2 to 5.5
24	27	9.00	92,928	77,440	73,364	69,696	2 to 5.5
24	28	9.33	89,608	74,676	70,744	67,208	2 to 5.5
20	24	9.60	87,120	72,600	68,760	65,340	2 to 6
20	25	10.00	83,636	69,696	66,028	62,728	2 to 6
20	26	10.40	80,420	67,016	63,488	60,312	2 to 6.5
20	27	10.80	77,440	64,532	61,136	58,080	2 to 6.5
20	28	11.20	74,676	62,228	58,952	56,004	2 to 7
16	24	12.00	69,696	58,080	55,024	52,272	3 to 7.5
16	25	12.50	66,908	55,756	52,824	50,180	3 to 8
16	26	13.00	64,336	53,612	50,792	48,252	3 to 8
16	27	13.50	61,952	51,628	48,908	46,464	3 to 8
16	28	14.00	59,740	49,784	47,164	44,804	3 to 8

LOW RANGE INPUT SPROCKET
Approximate Seed Population Per Acre

Sprocket Combinations (Number of Teeth) Driver Driven		Hill Spacing in In.	30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	Recommended Speed Range in mph
35	24	14.63	57,172	47,644	45,136	42,880	3 to 8
35	25	15.24	54,884	45,740	43,332	41,164	3 to 8
35	26	15.85	52,776	43,980	41,664	39,580	3 to 8
35	27	16.46	50,820	42,352	40,120	38,116	3 to 8
35	28	17.07	49,004	40,836	38,688	36,752	3 to 8
29	24	17.66	47,372	39,476	37,400	35,528	3 to 8
29	25	18.39	45,476	37,896	35,904	34,108	4 to 8
29	26	19.13	43,728	36,440	34,520	32,796	4 to 8
29	27	19.86	42,108	35,092	33,244	31,580	4 to 8
29	28	20.60	40,604	33,836	32,056	30,452	4 to 8
24	24	21.33	39,204	32,672	30,952	29,404	4 to 8
24	25	22.22	37,636	31,364	29,712	28,208	4 to 8
24	26	23.11	36,188	30,156	28,568	27,140	4 to 8
24	27	24.00	34,848	29,040	27,512	26,136	4 to 8
24	28	24.89	33,604	28,004	26,528	25,204	4 to 8
20	24	25.60	32,632	27,224	25,792	24,504	4 to 8
20	25	26.67	31,364	26,136	24,760	23,524	4 to 8
20	26	27.73	30,156	25,132	23,808	22,616	4 to 8
20	27	28.80	29,040	24,200	22,928	21,780	4 to 8
20	28	29.87	28,004	23,336	22,108	21,004	4 to 8
16	24	32.00	26,136	21,780	20,632	19,604	4 to 8
16	25	33.33	25,092	20,908	19,808	18,816	4 to 8
16	26	34.67	24,124	20,104	19,048	18,096	4 to 8
16	27	36.00	23,232	19,360	18,340	17,424	4 to 8
16	28	37.33	22,404	18,668	17,688	16,800	4 to 8

Two Seed Cotton Hilldrop—30 in. to 40 in. Rows

TWO SEED HILLDROP COTTON - 64 CELLS
HILL SPACING IN IN. AND/OR APPROXIMATE SEED POPULATION PER ACRE OF
HILLDROP COTTON PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET
APPROXIMATE SEED POPULATION PER ACRE

Sprocket Combinations (Number of Teeth) Driver Driven		Hill Spacing in In.	30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	Recommended Speed Range in mph
35	24	2.00	203,280	169,400	160,484	152,460	2 to 5-1/2
35	25	2.13	195,149	162,624	154,065	146,362	2 to 5-1/2
35	26	2.25	187,643	156,369	148,139	140,732	2 to 6
35	27	2.25	180,693	150,578	142,653	135,520	2 to 6
35	28	2.38	174,240	145,200	137,558	130,680	2 to 6-1/2
29	24	2.50	168,432	140,360	132,973	126,324	2 to 6-1/2
29	25	2.63	161,695	134,746	127,654	121,271	2 to 7
29	26	2.75	155,476	129,563	122,744	116,607	2 to 7
29	27	2.88	149,717	124,764	118,198	112,288	2 to 7-1/2
29	28	2.88	144,370	120,309	113,977	108,278	2 to 7-1/2
24	24	3.00	139,392	116,160	110,046	104,544	2 to 8
24	25	3.13	133,816	111,514	105,644	100,362	2 to 8
24	26	3.25	128,670	107,225	101,581	96,502	2 to 8
24	27	3.38	123,904	103,253	97,819	92,928	2 to 8
24	28	3.50	119,479	99,566	94,325	89,609	2 to 8
20	24	3.63	116,160	96,800	91,705	87,120	2 to 8
20	25	3.75	111,514	92,928	88,037	83,635	2 to 8
20	26	3.88	107,225	89,354	84,651	80,418	2 to 8
20	27	4.00	103,253	86,044	81,516	77,440	2 to 8
20	28	4.25	99,566	82,971	78,605	74,674	2 to 8
16	24	4.50	92,928	77,440	73,364	69,696	3 to 8
16	25	4.63	89,211	74,342	70,430	66,908	3 to 8
16	26	4.88	85,780	71,483	67,721	64,335	3 to 8
16	27	5.00	82,603	68,836	65,213	61,952	3 to 8
16	28	5.25	79,653	66,377	62,884	59,739	3 to 8

LOW RANGE INPUT SPROCKET
APPROXIMATE SEED POPULATION PER ACRE

Sprocket Combinations (Number of Teeth) Driver Driven		Hill Spacing in In.	30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	Recommended Speed Range in mph
35	24	5.50	76,230	63,525	60,182	57,173	3 to 8
35	25	5.75	73,181	60,984	57,774	54,886	3 to 8
35	26	5.88	70,366	58,636	55,552	52,775	3 to 8
35	27	6.13	67,760	56,467	53,495	50,820	3 to 8
35	28	6.13	65,340	54,450	51,584	49,005	3 to 8
29	24	6.63	63,162	52,635	49,865	47,372	3 to 8
29	25	6.88	60,636	50,530	47,870	45,477	4 to 8
29	26	7.13	58,303	48,586	46,029	43,728	4 to 8
29	27	7.50	56,144	46,787	44,324	42,108	4 to 8
29	28	7.75	54,139	45,116	42,741	40,604	4 to 8
24	24	8.00	52,272	43,560	41,267	39,204	4 to 8
24	25	8.38	50,181	41,818	39,617	37,636	4 to 8
24	26	8.63	48,251	40,209	38,093	36,188	4 to 8
24	27	9.00	46,464	38,720	36,682	34,848	4 to 8
24	28	9.38	44,805	37,337	35,372	33,603	4 to 8
20	24	9.63	43,560	36,300	34,389	32,670	4 to 8
20	25	10.00	41,818	34,848	33,014	31,363	4 to 8
20	26	10.38	40,209	33,508	31,744	30,157	4 to 8
20	27	10.88	38,720	32,267	30,568	29,040	4 to 8
20	28	11.25	37,337	31,114	29,477	28,003	4 to 8
16	24	12.00	34,848	29,040	27,512	26,136	4 to 8
16	25	12.50	33,454	27,878	26,411	25,091	4 to 8
16	26	13.00	32,167	26,806	25,395	24,126	4 to 8
16	27	13.50	30,976	25,813	24,455	23,232	4 to 8
16	28	14.00	29,870	24,891	23,581	22,402	4 to 8

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Sorghum—15 in. to 22 in. Rows

SORGHUM - 45 CELLS

AVERAGE SEED SPACING, AVERAGE SEEDS PER FT. AND/OR APPROXIMATE SEED POPULATION
PER ACRE OF SORGHUM PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing (in.)	Average Seeds Per Ft.	Approximate Seed Population Per Acre			Recommended Speed Range in mph
				15 In. Rows	20 In. Rows	22 In. Rows	
35	24	1-1/2	8.2	285 863	214 397	194 906	2 to 5-1/2
35	25	1-1/2	7.9	274 428	205 821	187 110	2 to 5-1/2
35	26	1-9/16	7.6	263 873	197 985	179 913	2 to 6
35	27	1-11/16	7.2	254 100	190 575	173 250	2 to 6
35	28	1-3/4	7.0	245 025	183 769	167 063	2 to 6-1/2
29	24	1-3/4	6.8	236 858	177 643	161 494	2 to 6-1/2
29	25	1-13/16	6.5	227 383	170 537	156 034	2 to 7
29	26	1-7/8	6.3	218 638	163 978	149 071	2 to 7
29	27	2	6.0	210 640	157 905	143 650	2 to 7-1/2
29	28	2	5.8	203 021	152 266	138 423	2 to 7-1/2
24	24	2-1/8	5.6	196 020	147 015	133 860	2 to 8
24	25	2-1/4	5.4	188 179	141 134	128 304	2 to 8
24	26	2-3/8	5.2	180 942	135 706	123 369	2 to 8
24	27	2-7/16	5.0	174 240	130 680	118 860	2 to 8
24	28	2-1/2	4.8	168 017	126 013	114 557	2 to 8
20	24	2-1/2	4.7	163 360	122 513	111 375	2 to 8
20	25	2-9/16	4.5	158 316	117 612	106 920	2 to 8
20	26	2-3/4	4.3	150 785	113 088	102 808	2 to 8
20	27	2-7/8	4.2	145 200	108 900	99 000	2 to 8
20	28	3	4.0	140 014	105 011	95 464	2 to 8
16	24	3-3/16	3.8	130 680	98 010	89 100	3 to 8
16	25	3-5/16	3.6	125 453	94 090	85 536	3 to 8
16	26	3-1/2	3.5	120 628	90 471	82 246	3 to 8
16	27	3-5/8	3.3	116 160	87 120	79 200	3 to 8
16	28	3-3/4	3.2	112 011	84 089	76 371	3 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing (in.)	Average Seeds Per Ft.	Approximate Seed Population Per Acre			Recommended Speed Range in mph
				15 In. Rows	20 In. Rows	22 In. Rows	
35	24	3-15/16	3.1	107 198	80 399	73 090	3 to 8
35	25	4-1/16	3.0	102 911	77 183	70 166	3 to 8
35	26	4-1/4	2.8	98 952	74 214	67 468	3 to 8
35	27	4-3/8	2.7	95 288	71 466	64 969	3 to 8
35	28	4-9/16	2.6	91 884	68 913	62 648	3 to 8
29	24	4-3/4	2.5	88 822	66 616	60 560	4 to 8
29	25	4-15/16	2.4	85 269	63 952	58 138	4 to 8
29	26	5-1/8	2.3	81 989	61 492	55 902	4 to 8
29	27	5-5/16	2.3	78 953	59 214	53 831	4 to 8
29	28	5-1/2	2.2	75 133	57 100	51 909	4 to 8
24	24	5-11/16	2.1	73 508	55 131	50 119	4 to 8
24	25	5-15/16	2.0	70 567	52 925	48 114	4 to 8
24	26	6-3/16	1.9	67 853	50 890	46 263	4 to 8
24	27	6-3/8	1.9	65 340	49 006	44 560	4 to 8
24	28	6-5/8	1.8	63 006	47 255	42 959	4 to 8
20	24	6-13/16	1.8	61 256	45 942	41 766	4 to 8
20	25	7-1/8	1.7	58 806	44 105	40 095	4 to 8
20	26	7-3/8	1.6	56 544	42 408	38 553	4 to 8
20	27	7-11/16	1.6	54 450	40 838	37 125	4 to 8
20	28	8-15/16	1.5	52 605	39 379	35 799	4 to 8
16	24	8-9/16	1.4	49 805	36 754	33 413	4 to 8
16	25	8-7/8	1.3	47 045	35 284	32 076	4 to 8
16	26	9-1/4	1.3	45 235	33 927	30 842	4 to 8
16	27	9-5/8	1.2	43 560	32 670	29 700	4 to 8
16	28	10	1.2	42 094	31 503	28 639	4 to 8

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

Sorghum—30 in. to 40 in. Rows

{Decal No. DB1086}

SORGHUM - 45 CELLS

AVERAGE SEED SPACING, AVERAGE SEEDS PER FT. AND/OR APPROXIMATE SEED POPULATION
PER ACRE OF SORGHUM PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing in In.	Average Seeds Per Ft.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
				30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	1-1/2	8.2	142,931	119,109	112,840	107,198	2 to 5-1/2
35	25	1-1/2	7.9	137,214	114,345	108,327	102,911	2 to 5-1/2
35	26	1-9/16	7.6	131,937	109,947	104,160	98,952	2 to 6
35	27	1-11/16	7.2	127,050	105,875	100,303	95,288	2 to 6
35	28	1-3/4	7.0	122,512	102,094	96,720	91,884	2 to 6-1/2
29	24	1-3/4	6.8	118,429	98,691	93,496	88,822	2 to 6-1/2
29	25	1-13/16	6.5	113,692	94,743	89,757	85,269	2 to 7
29	26	1-7/8	6.3	109,319	91,099	86,304	81,989	2 to 7
29	27	2	6.0	105,270	87,725	83,108	78,953	2 to 7-1/2
29	28	2	5.8	101,510	84,592	80,140	76,133	2 to 7-1/2
24	24	2-1/8	5.6	98,010	81,675	77,376	73,508	2 to 8
24	25	2-1/4	5.4	94,090	78,408	74,281	70,567	2 to 8
24	26	2-3/8	5.2	90,471	75,392	71,424	67,853	2 to 8
24	27	2-7/16	5.0	87,120	72,600	68,779	65,340	2 to 8
24	28	2-1/2	4.8	84,009	70,007	66,323	63,006	2 to 8
20	24	2-1/2	4.7	81,675	68,063	64,480	61,256	2 to 8
20	25	2-9/16	4.5	78,408	65,340	61,901	58,806	2 to 8
20	26	2-3/4	4.3	75,392	62,827	59,520	56,544	2 to 8
20	27	2-7/8	4.2	72,600	60,500	57,316	54,450	2 to 8
20	28	3	4.0	70,007	58,339	55,269	52,505	2 to 8
16	24	3-3/16	3.8	65,340	54,450	51,584	49,005	3 to 8
16	25	3-5/16	3.6	62,726	52,272	49,521	47,045	3 to 8
16	26	3-1/2	3.5	60,314	50,262	47,616	45,235	3 to 8
16	27	3-5/8	3.3	58,080	48,400	45,853	43,560	3 to 8
16	28	3-3/4	3.2	56,006	46,671	44,215	42,004	3 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing in In.	Average Seeds Per Ft.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
				30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	3-15/16	3.1	53,599	44,666	42,315	40,199	3 to 8
35	25	4-1/16	3.0	51,455	42,879	40,623	38,591	3 to 8
35	26	4-1/4	2.8	49,476	41,230	39,060	37,107	3 to 8
35	27	4-3/8	2.7	47,644	39,703	37,613	35,733	3 to 8
35	28	4-9/16	2.6	45,942	38,285	36,270	34,457	3 to 8
29	24	4-3/4	2.5	44,411	37,009	35,061	33,308	4 to 8
29	25	4-15/16	2.4	42,634	35,529	33,659	31,976	4 to 8
29	26	5-1/8	2.3	40,995	34,162	32,364	30,746	4 to 8
29	27	5-5/16	2.3	39,476	32,897	31,165	29,607	4 to 8
29	28	5-1/2	2.2	38,066	31,722	30,052	28,550	4 to 8
24	24	5-11/16	2.1	36,754	30,628	29,016	27,565	4 to 8
24	25	5-15/16	2.0	35,284	29,403	27,855	26,463	4 to 8
24	26	6-3/16	1.9	33,927	28,272	26,784	25,445	4 to 8
24	27	6-3/8	1.9	32,670	27,225	25,792	24,503	4 to 8
24	28	6-5/8	1.8	31,503	26,253	24,871	23,627	4 to 8
20	24	6-13/16	1.8	30,628	25,523	24,180	22,971	4 to 8
20	25	7-1/8	1.7	29,403	24,503	23,213	22,052	4 to 8
20	26	7-3/8	1.6	28,272	23,560	22,320	21,204	4 to 8
20	27	7-11/16	1.6	27,225	22,688	21,493	20,419	4 to 8
20	28	8-15/16	1.5	26,253	21,877	20,726	19,690	4 to 8
16	24	8-9/16	1.4	24,503	20,419	19,344	18,377	4 to 8
16	25	8-7/8	1.3	23,522	19,602	18,570	17,642	4 to 8
16	26	9-1/4	1.3	22,618	18,848	17,856	16,963	4 to 8
16	27	9-5/8	1.2	21,780	18,150	17,195	16,335	4 to 8
16	28	10	1.2	21,002	17,502	16,581	15,752	4 to 8

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

Sorghum Using Sugar Beet Disk—22 in. to 38 in. Rows

{Decal No. DB1089}

SUGAR BEETS - 45 CELLS

AVERAGE SEED SPACING AND/OR APPROXIMATE SEED POPULATION PER ACRE OF
SUGAR BEETS PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed Spacing in in.	Approximate Seed Population Per Acre			Recommended Speed Range in mph
Driver	Driven		22 in. Rows	30 in. Rows	38 in. Rows	
35	24	1-1 2	194 906	142 931	112 840	2 to 3
35	25	1-1 2	187 110	137 214	108 327	2 to 3
35	26	1-9 16	179 913	131 937	104 160	2 to 3.5
35	27	1-5 8	173 250	127 050	100 303	2 to 3.5
35	28	1-11 16	167 063	122 513	96 720	2 to 4
29	24	1-3 4	161 494	118 429	93 496	2 to 4
29	25	1-13 16	155 034	113 692	89 757	2 to 4
29	26	1-15 16	149 071	109 319	86 304	2 to 4.5
29	27	2	143 550	105 270	83 108	2 to 4.5
29	28	2-1 16	138 423	101 510	80 140	2 to 4.5
24	24	2-1 8	133 650	98 010	77 376	2 to 5
24	25	2-1 4	128 304	94 090	74 281	2 to 5
24	26	2-5 16	123 369	90 471	71 424	2 to 5
24	27	2-3 8	118 800	87 120	68 779	2 to 5.5
24	28	2-1 2	114 557	84 009	66 323	2 to 5.5
20	24	2-9 16	111 375	81 675	64 480	2 to 6
20	25	2-11 16	106 920	78 408	61 901	2 to 6
20	26	2-3 4	102 808	75 392	59 520	2 to 6.5
20	27	2-7 8	99 000	72 600	57 316	2 to 6.5
20	28	3	95 464	70 007	55 269	2 to 7
16	24	3-1 4	89 100	65 340	51 584	3 to 7.5
16	25	3-5 16	85 536	62 726	49 521	3 to 7.5
16	26	3-1 2	82 246	60 314	47 616	3 to 8
16	27	3-5 8	79 200	58 080	45 853	3 to 8
16	28	3-3 4	76 371	56 006	44 215	3 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed Spacing in in.	Approximate Seed Population Per Acre			Recommended Speed Range in mph
Driver	Driven		22 in. Rows	30 in. Rows	38 in. Rows	
35	24	3-7 8	73 090	53 599	42 315	3 to 8
35	25	4-1 16	70 166	51 455	40 623	3 to 8
35	26	4-1 4	67 468	49 476	39 060	3 to 8
35	27	4-3 8	64 969	47 644	37 613	3 to 8
35	28	4-9 16	62 648	45 942	36 270	3 to 8
29	24	4-11 16	60 560	44 411	35 061	4 to 8
29	25	4-7 8	58 138	42 634	33 659	4 to 8
29	26	5-1 8	55 902	40 995	32 364	4 to 8
29	27	5-5 16	53 831	39 476	31 165	4 to 8
29	28	5-1 2	51 909	38 066	30 052	4 to 8
24	24	5-11 16	50 119	36 754	29 016	4 to 8
24	25	5-15 16	48 114	35 284	27 855	4 to 8
24	26	6-3 16	46 263	33 927	26 784	4 to 8
24	27	6-3 8	44 550	32 670	25 792	4 to 8
24	28	6-5 8	42 959	31 503	24 871	4 to 8
20	24	6-13 16	41 766	30 628	24 180	4 to 8
20	25	7-1 8	40 095	29 403	23 213	4 to 8
20	26	7-3 8	38 553	28 272	22 320	4 to 8
20	27	7-11 16	37 125	27 225	21 493	4 to 8
20	28	7-15 16	35 799	26 253	20 726	4 to 8
16	24	8-1 2	33 413	24 503	19 344	4 to 8
16	25	8-7 8	32 076	23 522	18 570	4 to 8
16	26	9-1 4	30 842	22 618	17 856	4 to 8
16	27	9-15 16	29 700	21 780	17 195	4 to 8
16	28	10	28 639	21 002	16 581	4 to 8

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

A50440 -19-04OCT02

High-Rate Sorghum—15 in. to 22 in. Rows

{Decal No. DB 1380}

HIGH RATE SORGHUM - 90 CELLS

AVERAGE SEED SPACING, AVERAGE SEEDS PER FT. AND/OR APPROXIMATE SEED POPULATION
PER ACRE OF HIGH RATE SORGHUM PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed Spacing (in.)	Average Seeds Per Ft.	Approximate Seed Population Per Acre			Recommended Speed Range in mph
Driver	Driven			15 In. Rows	20 In. Rows	22 In. Rows	
35	24	3/4	16.4	571 725	428 794	389 813	2 to 5
35	25	3/4	15.8	548 856	411 642	374 220	2 to 5
35	26	13/16	15.2	527 746	395 810	358 827	2 to 5-1/2
35	27	13/16	14.6	508 200	381 150	346 500	2 to 5-1/2
35	28	7/8	14.1	490 060	367 533	334 126	2 to 5-1/2
29	24	7/8	13.6	473 715	355 286	322 988	2 to 5-1/2
29	25	15/16	13.0	454 768	341 075	310 968	2 to 6
29	26	15/16	12.5	437 275	327 957	296 142	2 to 6-1/2
29	27	1	12.1	421 080	315 810	287 100	2 to 6-1/2
29	28	1	11.6	406 041	304 531	276 846	2 to 7
24	24	1-1/16	11.2	392 040	294 030	267 300	2 to 7
24	25	1-1/8	10.8	378 358	282 269	258 608	2 to 7-1/2
24	26	1-3/16	10.3	361 883	271 412	246 738	2 to 7-1/2
24	27	1-3/16	10.0	348 480	261 360	237 680	2 to 8
24	28	1-1/4	9.6	336 034	252 026	229 114	2 to 8
20	24	1-1/4	9.3	326 700	245 025	222 750	2 to 8
20	25	1-5/16	9.0	313 632	235 224	213 840	3 to 8
20	26	1-3/8	8.6	301 569	226 177	205 615	3 to 8
20	27	1-7/16	8.3	290 400	217 800	198 000	3 to 8
20	28	1-1/2	8.0	280 029	210 021	190 929	3 to 8
16	24	1-5/8	7.5	261 360	196 020	178 200	3 to 8
16	25	1-11/16	7.1	250 306	188 179	171 072	3 to 8
16	26	1-3/4	6.9	241 235	180 942	164 492	3 to 8
16	27	1-13/16	6.6	232 320	174 240	158 400	3 to 8
16	28	1-7/8	6.4	224 023	168 017	152 743	3 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed Spacing (in.)	Average Seeds Per Ft.	Approximate Seed Population Per Acre			Recommended Speed Range in mph
Driver	Driven			15 In. Rows	20 In. Rows	22 In. Rows	
35	24	2	6.1	214 397	160 798	146 180	3 to 8
35	25	2	5.9	206 821	154 366	140 333	3 to 8
35	26	2-1/8	5.6	197 905	148 429	134 936	3 to 8
35	27	2-3/16	5.4	190 575	142 931	129 338	3 to 8
35	28	2-1/4	5.2	183 769	137 827	125 297	3 to 8
29	24	2-3/8	5.1	177 643	133 232	121 120	3 to 8
29	25	2-7/16	4.9	170 537	127 903	116 276	3 to 8
29	26	2-9/16	4.7	163 978	122 984	111 803	3 to 8
29	27	2-5/8	4.5	157 905	118 429	107 663	3 to 8
29	28	2-3/4	4.3	152 266	114 199	103 817	3 to 8
24	24	2-7/8	4.2	147 015	110 261	100 233	3 to 8
24	25	2-15/16	4.0	141 134	105 851	96 228	3 to 8
24	26	3-1/16	3.9	135 706	101 780	92 527	3 to 8
24	27	3-3/16	3.7	130 680	98 010	89 100	3 to 8
24	28	3-5/16	3.6	126 013	94 510	85 918	3 to 8
20	24	3-7/16	3.5	122 513	91 884	83 631	3 to 8
20	25	3-9/16	3.3	117 612	88 209	80 190	3 to 8
20	26	3-11/16	3.2	113 683	84 816	77 106	3 to 8
20	27	3-7/8	3.1	108 900	81 675	74 250	3 to 8
20	28	4	3.0	106 011	78 758	71 598	3 to 8
16	24	4-1/4	2.8	98 010	73 508	66 825	3 to 8
16	25	4-7/16	2.7	94 090	70 587	64 152	3 to 8
16	26	4-5/8	2.6	90 471	67 853	61 635	3 to 8
16	27	4-13/16	2.5	87 120	65 340	59 430	3 to 8
16	28	5	2.4	84 009	63 806	57 279	3 to 8

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

High-Rate Sorghum—30 in. to 40 in. Rows

{Decal No. DB1214}

HIGH RATE SORGHUM - 90 CELLS

AVERAGE SEED SPACING, AVERAGE SEEDS PER FT. AND/OR APPROXIMATE SEED POPULATION
PER ACRE OF HIGH RATE SORGHUM PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing in in.	Average Seeds Per Ft.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
				30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	3/4	16.4	285,863	238,219	225,681	214,397	2 to 5
35	25	3/4	15.8	274,428	228,690	216,654	205,821	2 to 5
35	26	13/16	15.2	263,873	219,894	208,321	197,905	2 to 5-1/2
35	27	13/16	14.6	254,100	211,750	200,605	190,575	2 to 5-1/2
35	28	7/8	14.1	245,025	204,188	193,441	183,769	2 to 5-1/2
29	24	7/8	13.6	236,858	197,381	186,993	177,643	2 to 5-1/2
29	25	15/16	13.0	227,383	189,486	179,513	170,537	2 to 6
29	26	15/16	12.5	218,638	182,198	172,609	163,978	2 to 6-1/2
29	27	1	12.1	210,540	175,450	166,216	157,905	2 to 6-1/2
29	28	1	11.6	203,021	169,184	160,280	152,266	2 to 7
24	24	1-1/16	11.2	196,020	163,350	154,753	147,015	2 to 7
24	25	1-1/8	10.8	188,179	156,816	148,563	141,134	2 to 7-1/2
24	26	1-3/16	10.3	180,942	150,785	142,849	135,706	2 to 7-1/2
24	27	1-3/16	10.0	174,240	145,200	137,558	130,680	2 to 8
24	28	1-1/4	9.6	168,017	140,014	132,645	126,013	2 to 8
20	24	1-1/4	9.3	163,350	136,125	128,961	122,513	2 to 8
20	25	1-5/16	9.0	156,816	130,680	123,802	117,612	3 to 8
20	26	1-3/8	8.6	150,785	125,654	119,040	113,088	3 to 8
20	27	1-7/16	8.3	145,200	121,000	114,632	108,900	3 to 8
20	28	1-1/2	8.0	140,014	116,679	110,538	105,011	3 to 8
16	24	1-5/8	7.5	130,680	108,900	103,168	90,010	3 to 8
16	25	1-11/16	7.1	125,453	104,544	99,042	94,090	3 to 8
16	26	1-3/4	6.9	120,628	100,523	95,232	90,471	3 to 8
16	27	1-13/16	6.6	116,160	96,800	91,705	87,120	3 to 8
16	28	1-7/8	6.4	112,011	93,343	88,430	84,009	3 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing in in.	Average Seeds Per Ft.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
				30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	2	6.1	107,198	89,332	84,630	80,399	3 to 8
35	25	2	5.9	102,911	85,759	81,245	77,183	3 to 8
35	26	2-1/8	5.6	98,952	82,460	78,120	74,214	3 to 8
35	27	2-3/16	5.4	95,288	79,406	75,227	71,466	3 to 8
35	28	2-1/4	5.2	91,884	76,570	72,540	68,913	3 to 8
29	24	2-3/8	5.1	88,822	74,018	70,122	66,616	3 to 8
29	25	2-7/16	4.9	85,269	71,057	67,317	63,952	3 to 8
29	26	2-9/16	4.7	81,989	68,324	64,728	61,492	3 to 8
29	27	2-5/8	4.5	78,953	65,794	62,331	59,214	3 to 8
29	28	2-3/4	4.3	76,133	63,444	60,105	57,100	3 to 8
24	24	2-7/8	4.2	73,508	61,256	58,032	55,131	3 to 8
24	25	2-15/16	4.0	70,567	58,806	55,711	52,925	3 to 8
24	26	3-1/16	3.9	67,853	56,544	53,568	50,890	3 to 8
24	27	3-3/16	3.7	65,340	54,450	51,584	49,005	3 to 8
24	28	3-5/16	3.6	63,006	52,505	49,742	47,255	3 to 8
20	24	3-7/16	3.5	61,256	51,047	48,360	45,942	3 to 8
20	25	3-9/16	3.3	58,806	49,005	46,426	44,105	3 to 8
20	26	3-11/16	3.2	56,544	47,120	44,640	42,408	3 to 8
20	27	3-7/8	3.1	54,450	45,375	42,987	40,838	3 to 8
20	28	4	3.0	52,505	43,754	41,452	39,379	3 to 8
16	24	4-1/4	2.8	49,005	40,838	38,688	36,754	3 to 8
16	25	4-7/16	2.7	47,045	39,204	37,141	35,284	3 to 8
16	26	4-5/8	2.6	45,235	37,696	35,712	33,927	3 to 8
16	27	4-13/16	2.5	43,560	36,300	34,389	32,670	3 to 8
16	28	5	2.4	42,004	35,004	33,161	31,503	3 to 8

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

A50432 -19-04OCT02

Soybeans—15 in. to 20 in. Rows

{Decal No. DB1087}

SOYBEANS - 108 CELLS

AVERAGE SEEDS PER FT. AND/OR APPROXIMATE SEED POPULATION PER ACRE OF SOYBEANS PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seeds Per Ft.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
Driver	Driven		15 In. Rows	18 In. Rows	19 In. Rows	20 In. Rows	
35	24	19.6	686,070	571,725	541,634	514,552	2 to 8
35	25	19.0	658,627	548,856	519,969	493,970	2 to 8
35	26	18.2	633,295	527,746	499,970	474,972	2 to 8
35	27	17.4	609,840	508,200	481,453	457,380	2 to 8
35	28	16.9	588,060	490,050	464,258	441,045	2 to 8
29	24	16.2	568,458	473,715	448,783	426,344	2 to 8
29	25	15.6	545,720	454,766	430,831	409,290	2 to 8
29	26	15.0	524,730	437,275	414,261	393,548	2 to 8
29	27	14.5	505,296	421,080	398,918	378,972	2 to 8
29	28	14.0	487,250	406,041	384,671	365,437	2 to 8
24	24	13.5	470,448	392,040	371,406	352,836	2 to 8
24	25	12.9	451,630	376,358	356,550	338,723	2 to 8
24	26	12.5	434,260	361,883	342,837	325,695	2 to 8
24	27	12.0	418,176	348,480	330,139	313,632	2 to 8
24	28	11.5	403,241	336,034	318,348	302,431	2 to 8
20	24	11.2	392,040	326,700	309,505	294,030	2 to 8
20	25	10.8	376,358	313,632	297,125	282,269	2 to 8
20	26	10.4	361,883	301,569	285,697	271,412	2 to 8
20	27	10.0	348,480	290,400	275,116	261,360	2 to 8
20	28	9.7	336,034	280,029	265,290	252,026	2 to 8
16	24	9.0	313,632	261,360	247,604	235,224	3 to 8
16	25	8.6	301,087	250,906	237,700	225,815	3 to 8
16	26	8.3	289,506	241,255	228,558	217,130	3 to 8
16	27	8.0	278,784	232,320	220,093	209,088	3 to 8
16	28	7.7	268,827	224,023	212,232	201,621	3 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seeds Per Ft.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
			15 In. Rows	18 In. Rows	19 In. Rows	20 In. Rows	
35	24	7.4	257,276	214,397	203,113	192,957	3 to 8
35	25	7.1	246,985	205,821	194,988	185,239	3 to 8
35	26	6.8	237,486	197,905	187,489	178,114	3 to 8
35	27	6.6	228,690	190,575	180,545	171,518	3 to 8
35	28	6.3	220,523	183,769	174,097	165,392	4 to 8
29	24	6.1	213,172	177,643	168,293	159,879	4 to 8
29	25	5.9	204,645	170,537	161,562	153,484	4 to 8
29	26	5.6	196,774	163,978	155,348	147,580	4 to 8
29	27	5.4	189,486	157,905	149,594	142,115	4 to 8
29	28	5.2	182,719	152,266	144,252	137,039	4 to 8
24	24	5.1	176,418	147,015	139,277	132,314	4 to 8
24	25	4.9	169,361	141,134	133,706	127,021	4 to 8
24	26	4.7	162,847	135,706	128,564	122,136	4 to 8
24	27	4.5	156,816	130,680	123,802	117,612	4 to 8
24	28	4.3	151,215	126,013	119,381	113,412	4 to 8
20	24	4.2	147,015	122,513	116,064	110,261	4 to 8
20	25	4.1	141,134	117,612	111,422	105,851	4 to 8
20	26	3.9	135,706	113,088	107,136	101,780	4 to 8
20	27	3.8	130,680	108,900	103,168	98,010	4 to 8
20	28	3.6	126,013	105,011	99,484	94,510	4 to 8
16	24	3.4	117,612	98,010	92,852	88,209	4 to 8
16	25	3.2	112,908	94,090	89,138	84,681	4 to 8
16	26	3.1	108,565	90,471	85,709	81,424	4 to 8
16	27	3.0	104,544	87,120	82,535	78,408	4 to 8
16	28	2.9	100,810	84,009	79,587	75,608	4 to 8

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

Soybeans—22 in. Rows

{Decal No. DB1110}

SOYBEANS - 108 CELLS

AVERAGE SEEDS PER FT. AND/OR APPROXIMATE SEED POPULATION PER ACRE OF SOYBEANS PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Approximate Seed Population Per Acre		Recommended Speed Range in mph
		Average Seeds Per Ft.	22 In. Rows	
35	24	19.6	467,775	2 to 8
35	25	19.0	449,064	2 to 8
35	26	18.2	431,792	2 to 8
35	27	17.4	415,800	2 to 8
35	28	16.9	400,950	2 to 8
29	24	16.2	387,585	2 to 8
29	25	15.6	372,082	2 to 8
29	26	15.0	357,771	2 to 8
29	27	14.5	344,520	2 to 8
29	28	14.0	332,216	2 to 8
24	24	13.5	320,760	2 to 8
24	25	12.9	307,930	2 to 8
24	26	12.1	296,086	2 to 8
24	27	12.0	285,120	2 to 8
24	28	11.5	274,937	2 to 8
20	24	11.2	267,300	2 to 8
20	25	10.8	256,608	2 to 8
20	26	10.4	246,738	2 to 8
20	27	10.0	237,600	2 to 8
20	28	9.7	229,114	2 to 8
16	24	9.0	213,840	3 to 8
16	25	8.6	205,286	3 to 8
16	26	8.3	197,391	3 to 8
16	27	8.0	190,080	3 to 8
16	28	7.7	183,291	3 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Approximate Seed Population Per Acre		Recommended Speed Range in mph
		Average Seeds Per Ft.	22 In. Rows	
35	24	7.4	175,416	2 to 8
35	25	7.1	168,399	2 to 8
35	26	6.8	161,922	2 to 8
35	27	6.6	155,925	2 to 8
35	28	6.3	150,356	2 to 8
29	24	6.1	145,344	3 to 8
29	25	5.9	139,531	3 to 8
29	26	5.6	134,164	3 to 8
29	27	5.4	129,195	3 to 8
29	28	5.2	124,581	4 to 8
24	24	5.1	120,285	4 to 8
24	25	4.9	115,474	4 to 8
24	26	4.7	111,032	4 to 8
24	27	4.5	106,920	4 to 8
24	28	4.3	103,101	4 to 8
20	24	4.2	100,238	4 to 8
20	25	4.1	96,228	4 to 8
20	26	3.9	92,527	4 to 8
20	27	3.8	89,100	4 to 8
20	28	3.6	85,918	4 to 8
16	24	3.4	80,190	4 to 8
16	25	3.2	76,982	4 to 8
16	26	3.1	74,022	4 to 8
16	27	3.0	71,280	4 to 8
16	28	2.9	68,734	4 to 8

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

A52099 -19-26MAR03

Soybeans—30 in. to 40 in. Rows

{Decal No. DB1088}

SOYBEANS - 108 CELLS

AVERAGE SEEDS PER FT. AND/OR APPROXIMATE SEED POPULATION PER ACRE OF SOYBEANS PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seeds Per Ft.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	19.6	343,035	285,863	270,817	257,276	2 to 8
35	25	19.0	329,314	274,428	259,984	246,985	2 to 8
35	26	18.2	316,648	263,873	249,985	237,486	2 to 8
35	27	17.4	304,920	254,100	240,726	228,690	2 to 8
35	28	16.9	294,030	245,025	232,129	220,523	2 to 8
29	24	16.2	284,229	236,858	224,391	213,172	2 to 8
29	25	15.6	272,860	227,383	215,416	204,645	2 to 8
29	26	15.0	262,365	218,638	207,130	196,774	2 to 8
29	27	14.5	252,648	210,540	199,459	189,486	2 to 8
29	28	14.0	243,625	203,021	192,335	182,719	2 to 8
24	24	13.5	235,224	196,020	185,703	176,418	2 to 8
24	25	12.9	225,815	188,179	178,275	169,361	2 to 8
24	26	12.5	217,130	180,942	171,418	162,847	2 to 8
24	27	12.0	209,088	174,240	165,069	156,816	2 to 8
24	28	11.5	201,621	168,017	159,174	151,215	2 to 8
20	24	11.2	196,020	163,350	154,753	147,015	2 to 8
20	25	10.8	188,179	156,816	148,563	141,134	2 to 8
20	26	10.4	180,942	150,785	142,849	135,706	2 to 8
20	27	10.0	174,240	145,200	137,558	130,680	2 to 8
20	28	9.7	168,017	140,014	132,645	126,013	2 to 8
16	24	9.0	156,816	130,680	123,802	117,612	3 to 8
16	25	8.6	150,543	125,453	118,850	112,908	3 to 8
16	26	8.3	144,753	120,628	114,279	108,565	3 to 8
16	27	8.0	139,392	116,160	110,046	104,544	3 to 8
16	28	7.7	134,414	112,011	106,116	100,810	3 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seeds Per Ft.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
Driver	Driven		30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	7.4	128,638	107,198	101,556	96,479	3 to 8
35	25	7.1	123,493	102,911	97,494	92,619	3 to 8
35	26	6.8	118,743	98,952	93,744	89,057	3 to 8
35	27	6.6	114,345	95,288	90,272	85,759	3 to 8
35	28	6.3	110,261	91,884	87,048	82,696	4 to 8
29	24	6.1	106,586	88,822	84,147	79,939	4 to 8
29	25	5.9	102,322	85,269	80,781	76,742	4 to 8
29	26	5.6	98,387	81,989	77,674	73,790	4 to 8
29	27	5.4	94,743	78,953	74,797	71,057	4 to 8
29	28	5.2	91,359	76,133	72,126	68,519	4 to 8
24	24	5.1	88,209	73,508	69,639	66,157	4 to 8
24	25	4.9	84,681	70,567	66,853	63,510	4 to 8
24	26	4.7	81,424	67,853	64,282	61,068	4 to 8
24	27	4.5	78,408	65,340	61,901	58,806	4 to 8
24	28	4.3	75,608	63,006	59,690	56,706	4 to 8
20	24	4.2	73,508	61,256	58,032	55,131	4 to 8
20	25	4.1	70,567	58,806	55,711	52,925	4 to 8
20	26	3.9	67,853	56,544	53,568	50,890	4 to 8
20	27	3.8	65,340	54,450	51,584	49,005	4 to 8
20	28	3.6	63,006	52,505	49,742	47,255	4 to 8
16	24	3.4	58,806	49,005	46,426	44,105	4 to 8
16	25	3.2	56,454	47,045	44,569	42,340	4 to 8
16	26	3.1	54,282	45,235	42,855	40,712	4 to 8
16	27	3.0	52,272	43,560	41,267	39,204	4 to 8
16	28	2.9	50,405	42,004	39,794	37,804	4 to 8

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

Soybeans Using Cotton Disk—15 in. to 22 in. Rows

SOYBEANS USING COTTON DISK - 64 CELLS

AVERAGE SEED SPACING AND/OR APPROXIMATE SEED POPULATION PER ACRE OF
SOYBEAN SEED PLANTED WITH VACUUM METER.

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing in Inches	Approximate Seed Population Per Acre			Recommended Speed Range in mph
			15 In. Rows	20 In. Rows	22 In. Rows	
35	24	1	406,560	304,920	277,200	2 to 5
35	25	1-1/16	390,297	292,723	266,112	2 to 5
35	26	1-1/8	375,286	281,465	255,877	2 to 5
35	27	1-1/8	361,386	271,040	246,400	2 to 5
35	28	1-3/16	348,480	261,360	237,600	2 to 5
29	24	1-1/4	336,864	252,648	229,680	2 to 6
29	25	1-5/16	323,390	242,542	220,493	2 to 6
29	26	1-3/8	311,637	233,214	212,013	2 to 6
29	27	1-7/16	300,463	224,576	204,160	2 to 6
29	28	1-7/16	288,741	216,558	196,869	2 to 6
24	24	1-1/2	278,786	209,099	190,080	2 to 7
24	25	1-9/16	267,633	200,725	181,357	2 to 7
24	26	1-5/8	257,339	193,005	186,887	2 to 7
24	27	1-11/16	247,808	185,856	168,731	2 to 7
24	28	1-3/4	238,949	179,218	162,926	2 to 7
20	24	1-13/16	232,320	174,240	158,400	2 to 7-1/2
20	25	1-7/8	224,170	167,271	152,064	2 to 7-1/2
20	26	1-15/16	214,449	160,837	146,215	2 to 8
20	27	2	206,506	154,994	140,800	2 to 8
20	28	2-1/8	199,131	149,349	135,771	2 to 8
16	24	2-1/4	185,856	139,392	126,720	3 to 8
16	25	2-5/16	178,422	133,816	121,651	3 to 8
16	26	2-7/16	171,559	128,670	116,973	3 to 8
16	27	2-1/2	165,217	123,904	112,640	3 to 8
16	28	2-5/8	159,305	119,479	108,960	3 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing in Inches	Approximate Seed Population Per Acre			Recommended Speed Range in mph
			15 In. Rows	20 In. Rows	22 In. Rows	
35	24	2-3/4	152,461	114,345	103,950	3 to 8
35	25	2-7/8	146,361	109,771	99,792	3 to 8
35	26	2-15/16	140,733	105,550	95,954	3 to 8
35	27	3-1/16	135,520	101,640	92,400	3 to 8
35	28	3-3/16	130,680	98,022	89,101	3 to 8
29	24	3-5/16	126,325	94,743	87,273	3 to 8
29	25	3-7/16	121,271	91,067	82,685	4 to 8
29	26	3-9/16	116,607	87,455	79,505	4 to 8
29	27	3-3/4	112,288	84,216	76,446	4 to 8
29	28	3-7/8	108,278	81,219	73,826	4 to 8
24	24	4	104,544	78,511	71,280	4 to 8
24	25	4-3/16	100,362	75,272	68,429	4 to 8
24	26	4-5/16	96,502	72,377	65,797	4 to 8
24	27	4-1/2	92,928	69,696	63,360	4 to 8
24	28	4-11/16	89,609	67,207	61,097	4 to 8
20	24	4-13/16	87,120	65,341	59,400	4 to 8
20	25	5	83,635	62,727	57,024	4 to 8
20	26	5-3/16	80,418	60,314	54,831	4 to 8
20	27	5-7/16	77,440	58,080	52,800	4 to 8
20	28	5-5/8	75,817	56,920	50,914	4 to 8
16	24	6	69,696	52,272	47,523	4 to 8
16	25	6-1/4	66,909	50,181	45,619	4 to 8
16	26	6-1/2	64,335	48,251	43,865	4 to 8
16	27	6-3/4	62,021	46,464	42,240	4 to 8
16	28	7	59,739	44,805	40,731	4 to 8

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

A53818 -19-19DEC05

Soybeans Using Cotton Disk—30 in. to 40 in. Rows

{Decal No. DB1084}

COTTON - 64 CELLS

AVERAGE SEED SPACING AND/OR APPROXIMATE SEED POPULATION PER ACRE OF COTTON PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing in In.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	1	203,280	169,400	160,484	152,460	2 to 5-1/2
35	25	1-1/16	195,149	162,624	154,065	146,362	2 to 5-1/2
35	26	1-1/8	187,643	156,369	148,139	140,732	2 to 6
35	27	1-1/8	180,693	150,578	142,653	135,520	2 to 6
35	28	1-3/16	174,240	145,200	137,558	130,680	2 to 6-1/2
29	24	1-1/4	168,432	140,360	132,973	126,324	2 to 6-1/2
29	25	1-5/16	161,695	134,746	127,654	121,271	2 to 7
29	26	1-3/8	155,476	129,563	122,744	116,607	2 to 7
29	27	1-7/16	149,717	124,764	118,198	112,288	2 to 7-1/2
29	28	1-7/16	144,370	120,309	113,977	108,278	2 to 7-1/2
24	24	1-1/2	139,392	116,160	110,046	104,544	2 to 8
24	25	1-9/16	133,816	111,514	105,644	100,362	2 to 8
24	26	1-5/8	128,670	107,225	101,581	96,502	2 to 8
24	27	1-11/16	123,904	103,253	97,819	92,928	2 to 8
24	28	1-3/4	119,479	99,566	94,325	89,609	2 to 8
20	24	1-13/16	116,160	96,800	91,705	87,120	2 to 8
20	25	1-7/8	111,514	92,928	88,037	83,635	2 to 8
20	26	1-15/16	107,225	89,354	84,651	80,418	2 to 8
20	27	2	103,253	86,044	81,516	77,440	2 to 8
20	28	2-1/8	99,566	82,971	78,605	74,674	2 to 8
16	24	2-1/4	92,928	77,440	73,364	69,696	3 to 8
16	25	2-5/16	89,211	74,342	70,430	66,908	3 to 8
16	26	2-7/16	85,780	71,483	67,721	64,335	3 to 8
16	27	2-1/2	82,603	68,836	65,213	61,952	3 to 8
16	28	2-5/8	79,653	66,377	62,884	59,739	3 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing in In.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	2-3/4	76,230	63,525	60,182	57,173	3 to 8
35	25	2-7/8	73,181	60,984	57,774	54,886	3 to 8
35	26	2-15/16	70,366	58,638	55,552	52,775	3 to 8
35	27	3-1/16	67,760	56,467	53,495	50,820	3 to 8
35	28	3-3/16	65,340	54,450	51,584	49,005	3 to 8
29	24	3-5/16	63,162	52,635	49,865	47,372	3 to 8
29	25	3-7/16	60,636	50,530	47,870	45,477	4 to 8
29	26	3-9/16	58,303	48,586	46,029	43,728	4 to 8
29	27	3-3/4	56,144	46,787	44,324	42,108	4 to 8
29	28	3-7/8	54,139	45,116	42,741	40,604	4 to 8
24	24	4	52,272	43,560	41,267	39,204	4 to 8
24	25	4-3/16	50,181	41,818	39,617	37,636	4 to 8
24	26	4-5/16	48,251	40,209	38,093	36,188	4 to 8
24	27	4-1/2	46,464	38,720	36,682	34,848	4 to 8
24	28	4-11/16	44,805	37,337	35,372	33,603	4 to 8
20	24	4-13/16	43,560	36,300	34,389	32,670	4 to 8
20	25	5	41,818	34,848	33,014	31,363	4 to 8
20	26	5-3/16	40,209	33,508	31,744	30,157	4 to 8
20	27	5-7/16	38,720	32,267	30,568	29,040	4 to 8
20	28	5-5/8	37,337	31,114	29,477	28,003	4 to 8
16	24	6	34,848	29,040	27,512	26,136	4 to 8
16	25	6-1/4	33,454	27,878	26,411	25,091	4 to 8
16	26	6-1/2	32,167	26,806	25,395	24,126	4 to 8
16	27	6-3/4	30,976	25,813	24,455	23,232	4 to 8
16	28	7	29,870	24,891	23,581	22,402	4 to 8

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

Sugar Beets—22 in. to 38 in. Rows

{Decal No. DB1089}

SUGAR BEETS - 45 CELLS

AVERAGE SEED SPACING AND/OR APPROXIMATE SEED POPULATION PER ACRE OF
SUGAR BEETS PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed Spacing in in.	Approximate Seed Population Per Acre			Recommended Speed Range in mph
Driver	Driven		22 in. Rows	30 in. Rows	38 in. Rows	
35	24	1-1 2	194 906	142 931	112 840	2 to 3
35	25	1-1 2	187 110	137 214	108 327	2 to 3
35	26	1-9 16	179 913	131 937	104 160	2 to 3.5
35	27	1-5 8	173 250	127 050	100 303	2 to 3.5
35	28	1-11 16	167 063	122 513	96 720	2 to 4
29	24	1-3 4	161 494	118 429	93 496	2 to 4
29	25	1-13 16	155 034	113 692	89 757	2 to 4
29	26	1-15 16	149 071	109 319	86 304	2 to 4.5
29	27	2	143 550	105 270	83 108	2 to 4.5
29	28	2-1 16	138 423	101 510	80 140	2 to 4.5
24	24	2-1 8	133 650	98 010	77 376	2 to 5
24	25	2-1 4	128 304	94 090	74 281	2 to 5
24	26	2-5 16	123 369	90 471	71 424	2 to 5
24	27	2-3 8	118 800	87 120	68 779	2 to 5.5
24	28	2-1 2	114 557	84 009	66 323	2 to 5.5
20	24	2-9 16	111 375	81 675	64 480	2 to 6
20	25	2-11 16	106 920	78 408	61 901	2 to 6
20	26	2-3 4	102 808	75 392	59 520	2 to 6.5
20	27	2-7 8	99 000	72 600	57 316	2 to 6.5
20	28	3	95 464	70 007	55 269	2 to 7
16	24	3-1 4	89 100	65 340	51 584	3 to 7.5
16	25	3-5 16	85 536	62 726	49 521	3 to 7.5
16	26	3-1 2	82 246	60 314	47 616	3 to 8
16	27	3-5 8	79 200	58 080	45 853	3 to 8
16	28	3-3 4	76 371	56 006	44 215	3 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed Spacing in in.	Approximate Seed Population Per Acre			Recommended Speed Range in mph
Driver	Driven		22 in. Rows	30 in. Rows	38 in. Rows	
35	24	3-7 8	73 090	53 599	42 315	3 to 8
35	25	4-1 16	70 166	51 455	40 623	3 to 8
35	26	4-1 4	67 468	49 476	39 060	3 to 8
35	27	4-3 8	64 969	47 644	37 613	3 to 8
35	28	4-9 16	62 648	45 942	36 270	3 to 8
29	24	4-11 16	60 560	44 411	35 061	4 to 8
29	25	4-7 8	58 138	42 634	33 659	4 to 8
29	26	5-1 8	55 902	40 995	32 364	4 to 8
29	27	5-5 16	53 831	39 476	31 165	4 to 8
29	28	5-1 2	51 909	38 066	30 052	4 to 8
24	24	5-11 16	50 119	36 754	29 016	4 to 8
24	25	5-15 16	48 114	35 284	27 855	4 to 8
24	26	6-3 16	46 263	33 927	26 784	4 to 8
24	27	6-3 8	44 550	32 670	25 792	4 to 8
24	28	6-5 8	42 959	31 503	24 871	4 to 8
20	24	6-13 16	41 766	30 628	24 180	4 to 8
20	25	7-1 8	40 095	29 403	23 213	4 to 8
20	26	7-3 8	38 553	28 272	22 320	4 to 8
20	27	7-11 16	37 125	27 225	21 493	4 to 8
20	28	7-15 16	35 799	26 253	20 726	4 to 8
16	24	8-1 2	33 413	24 503	19 344	4 to 8
16	25	8-7 8	32 076	23 522	18 570	4 to 8
16	26	9-1 4	30 842	22 618	17 856	4 to 8
16	27	9-15 16	29 700	21 780	17 195	4 to 8
16	28	10	28 639	21 002	16 581	4 to 8

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

A50440 -19-04OCT02

Small Edible Beans (Cell Type Seed Disk)—15 in. to 22 in. Rows

{Decal No. DB 1379} SMALL EDIBLE BEANS, CELL TYPE - 108 CELLS

AVERAGE SEEDS [ER FT/ AN D/OR APPROXIMATE SEED POPULATION PER ACRE
OF SMALL EDIBLE BEANS PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seeds Per Ft.	Approximate Seed Population Per Acre			Recommended Speed Range in mph
			15 In. Rows	20 In. Rows	22 In. Rows	
35	24	19.6	686 080	514 552	467 775	2 to 4
35	25	19.0	658 627	493 970	449 064	2 to 4
35	26	18.2	633 295	474 972	431 792	2 to 4
35	27	17.4	609 840	457 380	415 800	2 to 4
35	28	16.9	588 060	441 045	400 950	2 to 4
29	24	16.2	568 458	426 344	387 585	2 to 4.5
29	25	15.6	545 720	409 290	372 082	2 to 4.5
29	26	15.0	524 730	393 548	357 771	2 to 5
29	27	14.5	505 296	378 972	344 520	2 to 5
29	28	14.0	487 250	365 437	332 216	2 to 5.5
24	24	13.5	470 448	352 836	320 760	2 to 5.5
24	25	12.9	451 630	338 723	307 930	3 to 6
24	26	12.5	434 260	325 695	296 086	3 to 6
24	27	12.0	418 176	313 632	285 120	3 to 6
24	28	11.5	403 241	302 431	274 937	3 to 6.5
20	24	11.2	392 040	294 030	267 300	3 to 6.5
20	25	10.8	376 358	282 269	256 608	4 to 7
20	26	10.4	361 883	271 412	246 738	4 to 7
20	27	10.0	348 480	261 360	237 600	4 to 7.5
20	28	9.7	336 034	252 026	229 114	4 to 7.5
16	24	9.0	313 632	235 224	213 840	4 to 8
16	25	8.6	301 087	225 815	205 286	4 to 8
16	26	8.3	289 506	217 130	197 391	4 to 8
16	27	8.0	278 784	209 088	190 080	4 to 8
16	28	7.7	268 827	201 621	183 291	4 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seeds Per Ft.	Approximate Seed Population Per Acre			Recommended Speed Range in mph
			15 In. Rows	20 In. Rows	22 In. Rows	
35	24	7.4	257 276	192 957	175 416	4 to 8
35	25	7.1	246 985	185 239	168 399	4 to 8
35	26	6.8	237 486	178 114	161 922	4 to 8
35	27	6.6	228 690	171 518	155 925	4 to 8
35	28	6.3	220 523	165 392	150 356	4 to 8
29	24	6.1	213 172	159 879	145 344	4 to 8
29	25	5.9	204 645	153 484	139 531	4 to 8
29	26	5.6	196 774	147 580	134 164	4 to 8
29	27	5.4	189 486	142 115	129 195	4 to 8
29	28	5.2	182 719	137 039	124 581	4 to 8
24	24	5.1	176 418	132 314	120 285	4 to 8
24	25	4.9	169 361	127 021	115 474	4 to 8
24	26	4.7	162 847	122 136	111 032	4 to 8
24	27	4.5	156 816	117 612	106 920	4 to 8
24	28	4.3	151 215	113 412	103 101	4 to 8
20	24	4.2	147 015	110 261	100 238	4 to 8
20	25	4.1	141 134	105 851	96 228	4 to 8
20	26	3.9	135 706	101 780	92 527	4 to 8
20	27	3.8	130 680	98 010	89 100	4 to 8
20	28	3.6	126 013	94 510	85 918	4 to 8
16	24	3.4	117 612	88 209	80 190	4 to 8
16	25	3.2	112 908	84 681	76 982	4 to 8
16	26	3.1	108 565	81 424	74 022	4 to 8
16	27	3.0	104 544	78 408	71 280	4 to 8
16	28	2.9	100 810	75 608	68 734	4 to 8

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

Small Edible Beans (Cell Type Seed Disk)—30 in. to 40 in. Rows

{Decal No. DB1090}

SMALL EDIBLE BEANS, CELL TYPE - 108 CELLS

AVERAGE SEEDS PER FT. AND/OR APPROXIMATE SEED POPULATION PER ACRE OF
SMALL EDIBLE BEANS PLANTED WITH VACUUM METER AND USING AA37206 BRUSH

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seeds Per Ft.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	19.6	343,035	285,863	270,817	257,276	2 to 4
35	25	19.0	329,314	274,428	259,984	246,985	2 to 4
35	26	18.2	316,648	263,873	249,985	237,486	2 to 4
35	27	17.4	304,920	254,100	240,726	228,690	2 to 4
35	28	16.9	294,030	245,025	232,129	220,523	2 to 4
29	24	16.2	284,229	236,858	224,391	213,172	2 to 4-1/2
29	25	15.6	272,860	227,383	215,416	204,645	2 to 4-1/2
29	26	15.0	262,365	218,638	207,130	196,774	2 to 5
29	27	14.5	252,648	210,540	199,459	189,486	2 to 5
29	28	14.0	243,625	203,021	192,335	182,719	2 to 5-1/2
24	24	13.5	235,224	196,020	185,703	176,418	2 to 5-1/2
24	25	12.9	225,815	188,179	178,275	169,361	3 to 6
24	26	12.5	217,130	180,942	171,418	162,847	3 to 6
24	27	12.0	209,088	174,240	165,069	156,816	3 to 6
24	28	11.5	201,621	168,017	159,174	151,215	3 to 6-1/2
20	24	11.2	196,020	163,350	154,753	147,015	3 to 6-1/2
20	25	10.8	188,179	156,816	148,563	141,134	4 to 7
20	26	10.4	180,942	150,785	142,849	135,706	4 to 7
20	27	10.0	174,240	145,200	137,558	130,680	4 to 7-1/2
20	28	9.7	168,017	140,014	132,645	126,013	4 to 7-1/2
16	24	9.0	156,816	130,680	123,802	117,612	4 to 8
16	25	8.6	150,543	125,453	118,850	112,908	4 to 8
16	26	8.3	144,753	120,628	114,279	108,565	4 to 8
16	27	8.0	139,392	116,160	110,046	104,544	4 to 8
16	28	7.7	134,414	112,011	106,116	100,810	4 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seeds Per Ft.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	7.4	128,638	107,198	101,556	96,479	4 to 8
35	25	7.1	123,493	102,911	97,494	92,619	4 to 8
35	26	6.8	118,743	98,952	93,744	89,057	4 to 8
35	27	6.6	114,345	95,288	90,272	85,759	4 to 8
35	28	6.3	110,261	91,884	87,048	82,696	4 to 8
29	24	6.1	106,586	88,822	84,147	79,939	4 to 8
29	25	5.9	102,322	85,269	80,781	76,742	4 to 8
29	26	5.6	98,387	81,989	77,674	73,790	4 to 8
29	27	5.4	94,743	78,953	74,797	71,057	4 to 8
29	28	5.2	91,359	76,133	72,126	68,519	4 to 8
24	24	5.1	88,209	73,508	69,639	66,157	4 to 8
24	25	4.9	84,681	70,567	66,853	63,510	4 to 8
24	26	4.7	81,424	67,853	64,282	61,068	4 to 8
24	27	4.5	78,408	65,340	61,901	58,806	4 to 8
24	28	4.3	75,608	63,006	59,690	56,706	4 to 8
20	24	4.2	73,508	61,256	58,032	55,131	4 to 8
20	25	4.1	70,567	58,806	55,711	52,925	4 to 8
20	26	3.9	67,853	56,544	53,568	50,890	4 to 8
20	27	3.8	65,340	54,450	51,584	49,005	4 to 8
20	28	3.6	63,006	52,505	49,742	47,255	4 to 8
16	24	3.4	58,806	49,005	46,426	44,105	4 to 8
16	25	3.2	56,454	47,045	44,569	42,340	4 to 8
16	26	3.1	54,282	45,235	42,855	40,712	4 to 8
16	27	3.0	52,272	43,560	41,267	39,204	4 to 8
16	28	2.9	50,405	42,004	39,794	37,804	4 to 8

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

A50444 -19-04OCT02

Medium Edible Beans (Cell Type Seed Disk)—15 in. to 22 in. Rows

{Decal No. DB 1377}

MEDIUM EDIBLE BEANS, CELL TYPE - 56 CELLS

AVERAGE SEEDS PER FT. AND/OR APPROXIMATE SEED POPULATION PER ACRE OF MEDIUM EDIBLE BEANS
PLANTED WITH VACUUM METER AND USING AA37206 BRUSH

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seeds Per Ft.	Approximate Seed Population Per Acre			Recommended Speed Range in mph
			15 In. Rows	20 In. Rows	22 In. Rows	
35	24	10.21	355 740	266 805	242 550	4 to 4.5
35	25	9.80	341 510	256 133	232 848	4 to 4.5
35	26	9.42	328 375	246 282	223 892	4 to 5
35	27	9.07	316 213	237 160	215 600	4 to 5
35	28	8.75	304 920	228 690	207 900	4 to 5
29	24	8.46	294 756	221 067	200 970	4 to 5
29	25	8.12	282 966	212 224	192 931	4 to 5.5
29	26	7.80	272 682	204 062	185 511	4 to 4.5
29	27	7.52	262 905	196 504	178 640	4 to 6
29	28	7.25	252 648	189 488	172 260	4 to 6
24	24	7.00	243 938	182 962	166 320	4 to 6.5
24	25	6.72	234 179	175 634	158 687	4 to 6.5
24	26	6.46	225 172	168 879	163 526	4 to 7
24	27	6.22	216 832	162 624	147 640	4 to 7
24	28	6.00	209 080	156 816	142 560	4 to 7.5
20	24	5.83	203 280	152 460	138 600	4 to 8
20	25	5.60	196 149	146 362	133 056	4 to 8
20	26	5.38	187 643	140 732	127 938	4 to 8
20	27	5.19	180 693	135 620	123 200	4 to 8
20	28	5.00	174 240	130 680	118 800	4 to 8
16	24	4.67	162 624	121 968	110 880	4 to 8
16	25	4.48	156 119	117 089	106 445	4 to 8
16	26	4.31	150 114	112 586	102 351	4 to 8
16	27	4.15	144 565	108 416	98 560	4 to 8
16	28	4.00	139 392	104 544	95 340	4 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seeds Per Ft.	Approximate Seed Population Per Acre			Recommended Speed Range in mph
			15 In. Rows	20 In. Rows	22 In. Rows	
35	24	3.83	133 403	100 052	90 956	4 to 8
35	25	3.68	128 066	96 050	87 318	4 to 8
35	26	3.53	123 141	92 356	83 960	4 to 8
35	27	3.40	118 580	88 935	80 850	4 to 8
35	28	3.28	114 345	85 769	77 963	4 to 8
29	24	3.17	110 534	82 900	76 364	4 to 8
29	25	3.05	106 112	79 684	72 349	4 to 8
29	26	2.93	102 031	76 523	69 567	4 to 8
29	27	2.82	98 252	73 689	66 890	4 to 8
29	28	2.72	94 743	71 067	64 598	4 to 8
24	24	2.63	91 476	68 697	62 370	4 to 8
24	25	2.52	87 817	65 863	59 875	4 to 8
24	26	2.42	84 439	63 330	57 572	4 to 8
24	27	2.33	81 312	60 984	55 440	4 to 8
24	28	2.25	78 408	58 806	53 460	4 to 8
20	24	2.19	76 230	57 173	51 975	4 to 8
20	25	2.10	73 181	54 886	49 896	4 to 8
20	26	2.02	70 366	52 775	47 977	4 to 8
20	27	1.94	67 760	50 820	46 200	4 to 8
20	28	1.88	66 340	49 805	44 550	4 to 8
16	24	1.75	60 984	45 738	41 583	4 to 8
16	25	1.68	58 545	43 908	39 917	4 to 8
16	26	1.62	56 293	42 220	38 382	4 to 8
16	27	1.56	54 268	40 656	36 960	4 to 8
16	28	1.50	52 272	39 204	35 640	4 to 8

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

Medium Edible Beans (Cell Type Seed Disk)—30 in. to 40 in. Rows

{Decal No. DB1091}

MEDIUM EDIBLE BEANS

AVERAGE SEEDS PER FT. AND/OR APPROXIMATE SEED POPULATION PER ACRE OF MEDIUM EDIBLE BEANS
PLANTED WITH VACUUM METER AND USING AH132233 BRUSH

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seeds Per Ft.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	10.21	177,870	148,225	140,424	133,403	4 to 4.5
35	25	9.80	170,755	142,296	134,807	128,066	4 to 4.5
35	26	9.42	164,188	136,823	129,622	123,141	4 to 5
35	27	9.07	158,107	131,756	124,821	118,580	4 to 5
35	28	8.75	152,460	127,050	120,363	114,345	4 to 5
29	24	8.46	147,378	122,815	116,351	110,534	4 to 5
29	25	8.12	141,483	117,902	111,697	106,112	4 to 5.5
29	26	7.81	136,041	113,368	107,401	102,031	4 to 5.5
29	27	7.52	131,003	109,169	103,423	98,252	4 to 6
29	28	7.25	126,324	105,270	99,729	94,743	4 to 6
24	24	7.00	121,968	101,640	96,291	91,476	4 to 6.5
24	25	6.72	117,089	97,574	92,439	87,817	4 to 6.5
24	26	6.46	112,586	93,822	88,884	84,439	4 to 7
24	27	6.22	108,416	90,347	85,592	81,312	4 to 7
24	28	6.00	104,544	87,120	82,535	78,408	4 to 7.5
20	24	5.83	101,640	84,700	80,242	76,230	4 to 8
20	25	5.60	97,574	81,312	77,032	73,181	4 to 8
20	26	5.38	93,822	78,185	74,070	70,366	4 to 8
20	27	5.19	90,347	75,289	71,326	67,760	4 to 8
20	28	5.00	87,120	72,600	68,779	65,340	4 to 8
16	24	4.67	81,312	67,760	64,194	60,984	4 to 8
16	25	4.48	78,060	65,050	61,626	58,545	4 to 8
16	26	4.31	75,057	62,548	59,256	56,293	4 to 8
16	27	4.15	72,277	60,231	57,061	54,208	4 to 8
16	28	4.00	69,696	58,080	55,023	52,272	4 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seeds Per Ft.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	3.83	66,701	55,584	52,659	50,026	4 to 8
35	25	3.68	64,033	53,361	50,553	48,025	4 to 8
35	26	3.53	61,570	51,309	48,608	46,178	4 to 8
35	27	3.40	59,290	49,408	46,808	44,468	4 to 8
35	28	3.28	57,173	47,644	45,136	42,879	4 to 8
29	24	3.17	55,265	46,056	43,632	41,450	4 to 8
29	25	3.05	53,056	44,213	41,886	39,792	4 to 8
29	26	2.93	51,015	42,513	40,275	38,262	4 to 8
29	27	2.82	49,126	40,938	38,784	36,845	4 to 8
29	28	2.72	47,372	39,476	37,399	35,529	4 to 8
24	24	2.63	45,738	38,115	36,109	34,304	4 to 8
24	25	2.52	43,908	36,590	34,665	32,931	4 to 8
24	26	2.42	42,220	35,183	33,331	31,665	4 to 8
24	27	2.33	40,656	33,880	32,097	30,492	4 to 8
24	28	2.25	39,204	32,670	30,951	29,403	4 to 8
20	24	2.19	38,115	31,763	30,091	28,586	4 to 8
20	25	2.10	36,590	30,492	28,887	27,443	4 to 8
20	26	2.02	35,183	29,319	27,776	26,387	4 to 8
20	27	1.94	33,880	28,233	26,747	25,410	4 to 8
20	28	1.88	32,670	27,225	25,792	24,503	4 to 8
16	24	1.75	30,492	25,410	24,073	22,869	4 to 8
16	25	1.68	29,272	24,394	23,110	21,954	4 to 8
16	26	1.62	28,146	23,455	22,221	21,110	4 to 8
16	27	1.56	27,104	22,587	21,398	20,328	4 to 8
16	28	1.50	26,136	21,780	20,634	19,602	4 to 8

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

A50448 -19-04OCT02

Large Edible Beans (Cell Type Seed Disk)—15 in. to 22 in. Rows

{Decal No. DB 1378} LARGE EDIBLE BEANS, CELL TYPE - 50 CELLS

AVERAGE SEEDS PER FT. AND/OR APPROXIMATE SEED POPULATION PER ACRE OF LARGE EDIBLE BEANS
PLANTED WITH VACUUM METER AND USING AA37206 BRUSH

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seeds Per Ft.	Approximate Seed Population Per Acre			Recommended Speed Range in mph
Driver	Driven		15 In. Rows	20 In. Rows	22 In. Rows	
35	24	9.11	317 626	238 218	216 563	4 to 4.5
35	25	8.75	304 920	228 690	207 900	4 to 4.5
35	26	8.41	293 192	219 894	199 904	4 to 4.5
35	27	8.10	282 334	211 750	192 500	4 to 4.5
35	28	7.81	272 250	204 188	185 625	4 to 4.5
29	24	7.55	263 176	197 382	179 438	4 to 5
29	25	7.25	252 648	189 486	172 260	4 to 5.5
29	26	6.97	242 930	182 198	165 635	4 to 5.5
29	27	6.71	233 934	175 450	159 500	4 to 5.5
29	28	6.47	225 578	169 184	153 804	4 to 6
24	24	6.25	217 800	163 350	148 500	4 to 6
24	25	6.00	209 088	156 618	142 560	4 to 6.5
24	26	5.77	201 046	150 748	137 077	4 to 6.5
24	27	5.56	193 600	145 200	132 000	4 to 7
24	28	5.36	186 686	140 014	127 286	4 to 7
20	24	5.21	181 500	136 126	123 750	4 to 7.5
20	25	5.00	174 240	130 680	118 800	4 to 7.5
20	26	4.81	167 538	125 654	114 231	4 to 8
20	27	4.63	161 344	121 000	110 000	4 to 8
20	28	4.46	155 572	116 678	106 071	4 to 8
16	24	4.17	145 200	108 900	99 000	4 to 8
16	25	4.00	139 392	104 544	95 040	4 to 8
16	26	3.85	134 030	100 524	91 385	4 to 8
16	27	3.70	129 066	96 800	88 000	4 to 8
16	28	3.57	124 458	93 342	84 857	4 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seeds Per In.	Approximate Seed Population Per Acre			Recommended Speed Range in mph
Driver	Driven		15 In. Rows	20 In. Rows	22 In. Rows	
35	24	3.42	119 110	89 332	81 211	4 to 8
35	25	3.28	114 346	85 758	77 963	4 to 8
35	26	3.16	109 948	82 460	74 964	4 to 8
35	27	3.04	105 876	79 406	72 188	4 to 8
35	28	2.93	102 094	76 570	69 609	4 to 8
29	24	2.83	98 690	74 018	67 289	4 to 8
29	25	2.72	94 744	71 058	62 113	4 to 8
29	26	2.61	91 100	68 324	59 813	4 to 8
29	27	2.52	87 726	65 794	57 676	4 to 8
29	28	2.43	84 592	63 444	55 688	4 to 8
24	24	2.34	81 676	61 254	53 460	4 to 8
24	25	2.25	78 408	58 806	51 404	4 to 8
24	26	2.16	75 392	56 544	49 500	4 to 8
24	27	2.08	72 600	54 450	47 732	4 to 8
24	28	2.01	70 008	52 506	46 406	4 to 8
20	24	1.95	68 062	51 046	44 550	4 to 8
20	25	1.88	65 340	49 006	42 837	4 to 8
20	26	1.80	62 826	47 120	41 250	4 to 8
20	27	1.74	60 500	45 376	39 777	4 to 8
20	28	1.67	58 340	43 754	37 125	4 to 8
16	24	1.56	54 450	40 298	35 640	4 to 8
16	25	1.50	52 272	39 204	34 269	4 to 8
16	26	1.44	50 262	37 696	33 000	4 to 8
16	27	1.39	48 400	36 300	31 821	4 to 8
16	28	1.34	46 672	35 004	29 700	4 to 8

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

Large Edible Beans (Cell Type Seed Disk)—30 in. to 40 in. Rows

{Decal No. DB1092}

LARGE EDIBLE BEANS, CELL TYPE - 50 CELLS

AVERAGE SEEDS PER FT. AND/OR APPROXIMATE SEED POPULATION PER ACRE OF LARGE EDIBLE BEANS
PLANTED WITH VACUUM METER AND USING AA37206 BRUSH

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seeds Per Ft.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
Driver	Driven		30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	9.11	158,813	132,344	125,378	119,109	4 to 4.5
35	25	8.75	152,460	127,050	120,363	114,345	4 to 4.5
35	26	8.41	146,596	122,163	115,734	109,947	4 to 4.5
35	27	8.10	141,167	117,639	111,447	105,875	4 to 4.5
35	28	7.81	136,125	113,438	107,467	102,094	4 to 4.5
29	24	7.55	131,588	109,656	103,885	98,691	4 to 5
29	25	7.25	126,324	105,270	99,729	94,743	4 to 5.5
29	26	6.97	121,465	101,221	95,894	91,099	4 to 5.5
29	27	6.71	116,967	97,472	92,342	87,725	4 to 5.5
29	28	6.47	112,789	93,991	89,044	84,592	4 to 6
24	24	6.25	108,900	90,750	85,974	81,675	4 to 6
24	25	6.00	104,544	87,120	82,535	78,408	4 to 6.5
24	26	5.77	100,523	83,769	79,360	75,392	4 to 6.5
24	27	5.56	96,800	80,667	76,421	72,600	4 to 7
24	28	5.36	93,343	77,786	73,692	70,007	4 to 7
20	24	5.21	90,750	75,625	71,645	68,063	4 to 7.5
20	25	5.00	87,120	72,600	68,779	65,340	4 to 7.5
20	26	4.81	83,769	69,808	66,134	62,827	4 to 8
20	27	4.63	80,667	67,222	63,684	60,500	4 to 8
20	28	4.46	77,786	64,821	61,410	58,339	4 to 8
16	24	4.17	72,600	60,500	57,316	54,450	4 to 8
16	25	4.00	69,696	58,080	55,023	52,272	4 to 8
16	26	3.85	67,015	55,846	52,907	50,262	4 to 8
16	27	3.70	64,533	53,778	50,947	48,400	4 to 8
16	28	3.57	62,229	51,857	49,128	46,671	4 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seeds Per Ft.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
Driver	Driven		30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	3.42	59,555	49,629	47,017	44,666	4 to 8
35	25	3.28	57,173	47,644	45,136	42,879	4 to 8
35	26	3.16	54,974	45,811	43,400	41,230	4 to 8
35	27	3.04	52,938	44,115	41,793	39,703	4 to 8
35	28	2.93	51,047	42,539	40,300	38,285	4 to 8
29	24	2.83	49,345	41,121	38,957	37,009	4 to 8
29	25	2.72	47,372	39,476	37,399	35,529	4 to 8
29	26	2.61	45,550	37,958	35,960	34,162	4 to 8
29	27	2.52	43,863	36,552	34,638	32,897	4 to 8
29	28	2.43	42,296	35,247	33,392	31,722	4 to 8
24	24	2.34	40,838	34,031	32,240	30,628	4 to 8
24	25	2.25	39,204	32,670	30,951	29,403	4 to 8
24	26	2.16	37,696	31,413	29,760	28,272	4 to 8
24	27	2.08	36,300	30,250	28,658	27,225	4 to 8
24	28	2.01	35,004	29,170	27,634	26,253	4 to 8
20	24	1.95	34,031	28,359	26,867	25,523	4 to 8
20	25	1.88	32,670	27,225	25,792	24,503	4 to 8
20	26	1.80	31,413	26,178	24,800	23,560	4 to 8
20	27	1.74	30,250	25,208	23,882	22,688	4 to 8
20	28	1.67	29,170	24,308	23,029	21,877	4 to 8
16	24	1.56	27,225	22,688	21,493	20,419	4 to 8
16	25	1.50	26,136	21,780	20,634	19,602	4 to 8
16	26	1.44	25,131	20,942	19,840	18,848	4 to 8
16	27	1.39	24,200	20,167	19,105	18,150	4 to 8
16	28	1.34	23,336	19,446	18,423	17,502	4 to 8

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

A50452 -19-04OCT02

Peanuts (Runner and Spanish)—30 in. to 40 in. Rows

{Decal No. DB1093}

RUNNER AND SPANISH PEANUTS

LARGE EDIBLE BEAN SEED DISK, PART NUMBER H136092 - 50 CELL

AVERAGE SEEDS PER FT. AND/OR APPROXIMATE SEED POPULATION PER ACRE OF RUNNER PEANUTS
PLANTED WITH VACUUM METER AND USING AA37206 BRUSH

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seeds Per Ft.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	9.11	158,813	132,344	125,378	119,109	3-1/2
35	25	8.75	152,460	127,050	120,363	114,345	3-1/2
35	26	8.41	146,596	122,163	115,734	109,947	3-1/2
35	27	8.10	141,167	117,639	111,447	105,875	3-1/2 to 4
35	28	7.81	136,125	113,438	107,467	102,094	3-1/2 to 4
29	24	7.55	131,588	109,656	103,885	98,691	3-1/2 to 4
29	25	7.25	126,324	105,270	99,729	94,743	3-1/2 to 4-1/2
29	26	6.97	121,465	101,221	95,894	91,099	3-1/2 to 4-1/2
29	27	6.71	116,967	97,472	92,342	87,725	3-1/2 to 4-1/2
29	28	6.47	112,789	93,991	89,044	84,592	3-1/2 to 5
24	24	6.25	108,900	90,750	85,974	81,675	3-1/2 to 5
24	25	6.00	104,544	87,120	82,535	78,408	3-1/2 to 5-1/2
24	26	5.77	100,523	83,769	79,360	75,392	3-1/2 to 5-1/2
24	27	5.56	96,800	80,667	76,421	72,600	3-1/2 to 5-1/2
24	28	5.36	93,343	77,786	73,692	70,007	3-1/2 to 6
20	24	5.21	90,750	75,625	71,645	68,063	3-1/2 to 6
20	25	5.00	87,120	72,600	68,779	65,340	3-1/2 to 6-1/2
20	26	4.81	83,769	69,808	66,134	62,827	3-1/2 to 6-1/2
20	27	4.63	80,667	67,222	63,684	60,500	3-1/2 to 7
20	28	4.46	77,786	64,821	61,410	58,339	3-1/2 to 7
16	24	4.17	72,600	60,500	57,316	54,450	4 to 7-1/2
16	25	4.00	69,696	58,080	55,023	52,272	4 to 8
16	26	3.85	67,015	55,846	52,907	50,262	4 to 8
16	27	3.70	64,533	53,778	50,947	48,400	4 to 8
16	28	3.57	62,229	51,857	49,128	46,671	4 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seeds Per Ft.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	3.42	59,555	49,629	47,017	44,666	4 to 8
35	25	3.28	57,173	47,644	45,136	42,879	4 to 8
35	26	3.16	54,974	45,811	43,400	41,230	4 to 8
35	27	3.04	52,938	44,115	41,793	39,703	4 to 8
35	28	2.93	51,047	42,539	40,300	38,285	4 to 8
29	24	2.83	49,345	41,121	38,957	37,009	4 to 8
29	25	2.72	47,372	39,476	37,399	35,529	4 to 8
29	26	2.61	45,550	37,958	35,960	34,162	4 to 8
29	27	2.52	43,863	36,552	34,638	32,897	4 to 8
29	28	2.43	42,296	35,247	33,392	31,722	4 to 8
24	24	2.34	40,838	34,031	32,240	30,628	4 to 8
24	25	2.25	39,204	32,670	30,951	29,403	4 to 8
24	26	2.16	37,696	31,413	29,760	28,272	4 to 8
24	27	2.08	36,300	30,250	28,658	27,225	4 to 8
24	28	2.01	35,004	29,170	27,634	26,253	4 to 8
20	24	1.95	34,031	28,359	26,867	25,523	4 to 8
20	25	1.88	32,670	27,225	25,792	24,503	4 to 8
20	26	1.80	31,413	26,178	24,800	23,560	4 to 8
20	27	1.74	30,250	25,208	23,882	22,688	4 to 8
20	28	1.67	29,170	24,308	23,029	21,877	4 to 8
16	24	1.56	27,225	22,688	21,493	20,419	4 to 8
16	25	1.50	26,136	21,780	20,634	19,602	4 to 8
16	26	1.44	25,131	20,942	19,840	18,848	4 to 8
16	27	1.39	24,200	20,167	19,105	18,150	4 to 8
16	28	1.34	23,336	19,446	18,423	17,502	4 to 8

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

Peanuts (Virginia)—30 in. to 40 in. Rows

{Decal No. DB1094}

VIRGINIA PEANUTS

VIRGINIA PEANUT SEED DISK PART NUMBER H138722 - 46 CELL

AVERAGE SEEDS PER FT. AND/OR APPROXIMATE SEED POPULATION PER ACRE OF VIRGINIA PEANUTS
PLANTED WITH VACUUM METER AND USING AA37206 BRUSH

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seeds Per Ft.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	8.4	146,108	121,756	115,348	109,581	3
35	25	8.1	140,263	116,886	110,734	105,197	3
35	26	7.7	134,868	112,390	106,475	101,151	3
35	27	7.5	129,873	108,228	102,532	97,405	3
35	28	7.2	125,235	104,363	98,870	93,926	3
29	24	6.9	121,061	100,884	95,574	90,795	3
29	25	6.7	116,218	96,848	91,751	87,164	3 to 3-1/2
29	26	6.4	111,748	93,123	88,222	83,811	3 to 3-1/2
29	27	6.2	107,609	89,674	84,955	80,707	3 to 4
29	28	6.0	103,766	86,472	81,921	77,825	3 to 4
24	24	5.8	100,188	83,490	79,096	75,141	3 to 4
24	25	5.5	96,180	80,150	75,932	72,135	3 to 4
24	26	5.3	92,481	77,068	73,011	69,361	3 to 4-1/2
24	27	5.1	89,056	74,213	70,307	66,792	3 to 4-1/2
24	28	4.9	85,875	71,563	67,796	64,407	3 to 4-1/2
20	24	4.8	83,490	69,575	65,913	62,618	3 to 5
20	25	4.6	80,150	66,792	63,277	60,113	3 to 5
20	26	4.4	77,068	64,223	60,843	57,801	3 to 5
20	27	4.3	74,213	61,844	58,589	55,660	3 to 5-1/2
20	28	4.1	71,563	59,636	56,497	53,672	3 to 6
16	24	3.8	66,792	55,660	52,731	50,094	3 to 6
16	25	3.7	64,120	53,434	50,621	48,090	3 to 6-1/2
16	26	3.5	61,654	51,378	48,674	46,241	3 to 6-1/2
16	27	3.4	59,371	49,476	46,872	44,528	3 to 7
16	28	3.3	57,250	47,709	45,198	42,938	3 to 7-1/2

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seeds Per Ft.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
Driver	Driven		30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	3.1	54,790	45,659	43,256	41,093	3 to 7-1/2
35	25	3.0	52,599	43,832	41,525	39,449	3 to 8
35	26	2.9	50,576	42,146	39,928	37,932	3 to 8
35	27	2.8	48,703	40,585	38,449	36,527	3 to 8
35	28	2.7	46,963	39,136	37,076	35,222	3 to 8
29	24	2.6	45,398	37,831	35,840	34,048	4 to 8
29	25	2.5	43,582	36,318	34,407	32,686	4 to 8
29	26	2.4	41,906	34,921	33,083	31,429	4 to 8
29	27	2.3	40,354	33,628	31,858	30,265	4 to 8
29	28	2.2	38,912	32,427	30,720	29,184	4 to 8
24	24	2.2	37,571	31,309	29,661	28,178	4 to 8
24	25	2.1	36,068	30,056	28,474	27,051	4 to 8
24	26	2.0	34,680	28,900	27,379	26,010	4 to 8
24	27	1.9	33,396	27,830	26,365	25,047	4 to 8
24	28	1.8	32,203	26,836	25,424	24,152	4 to 8
20	24	1.8	31,309	26,091	24,717	23,482	4 to 8
20	25	1.7	30,056	25,047	23,729	22,542	4 to 8
20	26	1.7	28,900	24,084	22,816	21,675	4 to 8
20	27	1.6	27,830	23,192	21,971	20,873	4 to 8
20	28	1.5	26,836	22,363	21,186	20,127	4 to 8
16	24	1.4	25,047	20,873	19,774	18,785	4 to 8
16	25	1.4	24,045	20,038	18,983	18,034	4 to 8
16	26	1.3	23,120	19,267	18,253	17,340	4 to 8
16	27	1.3	22,265	18,553	17,577	16,698	4 to 8
16	28	1.2	21,469	17,891	16,949	16,102	4 to 8

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

A50456 -19-04OCT02

Edible Beans (Flat-Type Seed Disk)—15 in. to 20 in. Rows

{Decal No. DB1420}

EDIBLE BEANS - FLAT TYPE DISK - 50 HOLES

AVERAGE SEED SPACING, AVERAGE SEEDS PER FT. AND/OR APPROXIMATE SEED POPULATION PER ACRE
OF EDIBLE BEANS PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing In Inches	Average Seeds Per Foot	Approximate Seed Population Per Acre		Recommended Speed Range in mph
				15 In. Rows	20 In. Rows	
35	24	1-5/16	9.11	317 626	238 218	3 to 4
35	25	1-3/8	8.75	304 920	228 690	3 to 4
35	26	1-7/16	8.41	293 192	219 894	3 to 4
35	27	1-1/2	8.10	282 334	211 750	3 to 4
35	28	1-1/2	7.81	272 250	204 188	3 to 4.5
29	24	1-5/8	7.55	263 176	197 382	3 to 4.5
29	25	1-11/16	8.25	252 648	189 486	3 to 4.5
29	26	1-3/4	6.97	242 930	182 198	3 to 4.5
29	27	1-3/4	6.71	233 934	175 450	3 to 4.5
29	28	1-13/16	6.49	225 578	169 184	3 to 4.5
24	24	1-7/8	6.25	217 800	163 350	3 to 4.5
24	25	2	6.00	209 088	156 618	3 to 4.5
24	26	2	5.77	201 046	150 748	4 to 5
24	27	2-1/8	5.56	193 600	145 200	4 to 5
24	28	2-1/4	5.36	186 686	140 014	4 to 5
20	24	2-3/8	5.21	181 500	136 126	4 to 5
20	25	2-7/16	5.00	174 240	130 680	4 to 5
20	26	2-1/2	4.81	167 538	125 654	4 to 5
20	27	2-1/2	4.62	161 344	121 000	4 to 6
20	28	2-9/16	4.46	155 572	116 678	4 to 6
16	24	2-7/8	4.17	145 200	108 900	4 to 6
16	25	3	4.00	139 392	104 544	4 to 6
16	26	3-1/8	3.85	134 030	100 524	4 to 6
16	27	3-1/4	3.70	129 066	96 800	4 to 6
16	28	3-3/8	3.50	124 458	93 342	4 to 6

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing In Inches	Average Seeds Per Foot	Approximate Seed Population Per Acre		Recommended Speed Range in mph
				15 In. Rows	20 In. Rows	
35	24	3-1/2	3.42	119 110	89 332	4 to 6
35	25	3-5/8	3.26	114 346	85 758	4 to 6
35	26	3-3/4	3.16	109 948	82 460	4 to 6
35	27	4	3.04	105 876	79 406	4 to 6
35	28	4-1/8	2.93	102 094	76 570	4 to 6
29	24	4-1/2	2.83	98 690	74 018	4 to 6
29	25	4-3/8	2.72	94 744	71 058	4 to 6
29	26	4-5/8	2.61	91 100	68 324	4 to 6
29	27	4-3/4	2.52	87 726	65 794	4 to 6
29	28	4-15/16	2.43	84 592	63 444	4 to 6
24	24	5-1/8	2.34	81 676	61 254	4 to 6
24	25	5-5/16	2.25	78 408	58 806	4 to 6
24	26	5-1/2	2.16	75 392	56 544	4 to 6
24	27	5-3/4	2.08	72 600	54 450	4 to 6
24	28	5-15/16	2.01	70 008	52 506	4 to 6
20	24	6-1/8	1.95	68 062	51 046	4 to 6
20	25	6-3/8	1.88	65 340	49 006	4 to 6
20	26	6-5/8	1.80	62 826	47 120	4 to 6
20	27	6-15/16	1.74	60 500	45 376	4 to 6
20	28	7-1/8	1.67	58 340	43 754	4 to 6
16	24	7-5/8	1.56	54 450	40 298	4 to 6
16	25	8	1.50	52 277	39 204	4 to 6
16	26	8-3/8	1.44	50 262	37 696	4 to 6
16	27	8-5/8	1.39	48 400	36 300	4 to 6
16	28	9	1.34	46 672	35 004	4 to 6

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

Edible Beans (Flat-Type Seed Disk)—22 in. Rows

{Decal No. DB1231} EDIBLE BEANS - FLAT TYPE DISK - 50 HOLES

AVERAGE SEED SPACING, AVERAGE SEEDS PER FT. AND/OR APPROXIMATE SEED POPULATION PER ACRE
OF EDIBLE BEANS PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing In Inches	Approximate Seed Population Per Acre		Recommended Speed Range in mph
			Average Seeds Per Foot	22 In. Rows	
35	24	1-5/16	9.11	216,563	3 to 4
35	25	1-3/8	8.75	207,900	3 to 4
35	26	1-7/16	8.41	199,904	3 to 4
35	27	1-1/2	8.10	192,500	3 to 4
35	28	1-1/2	7.81	185,625	3 to 4.5
29	24	1-5/8	7.55	179,438	3 to 4.5
29	25	1-11/16	7.25	172,260	3 to 4.5
29	26	1-3/4	6.97	165,635	3 to 4.5
29	27	1-3/4	6.71	159,500	3 to 4.5
29	28	1-13/16	6.49	153,804	3 to 4.5
24	24	1-7/8	6.25	148,500	3 to 4.5
24	25	2	6.00	142,560	3 to 4.5
24	26	2	5.77	137,077	4 to 5
24	27	2-1/8	5.56	132,000	4 to 5
24	28	2-1/4	5.36	127,286	4 to 5
20	24	2-3/8	5.21	123,750	4 to 5
20	25	2-7/16	5.00	118,800	4 to 5
20	26	2-1/2	4.81	114,231	4 to 5
20	27	2-1/2	4.62	110,000	4 to 6
20	28	2-9/16	4.46	106,071	4 to 6
16	24	2-7/8	4.17	99,000	4 to 6
16	25	3	4.00	95,040	4 to 6
16	26	3-1/8	3.85	91,385	4 to 6
16	27	3-1/4	3.70	88,000	4 to 6
16	28	3-3/8	3.50	84,857	4 to 6

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing In Inches	Approximate Seed Population Per Acre		Recommended Speed Range in mph
			Average Seeds Per Foot	22 In. Rows	
35	24	3-1/2	3.42	81,211	4 to 6
35	25	3-5/8	3.26	77,963	4 to 6
35	26	3-3/4	3.16	74,964	4 to 6
35	27	4	3.04	72,188	4 to 6
35	28	4-1/8	2.93	69,609	4 to 6
29	24	4-1/2	2.83	67,289	4 to 6
29	25	4-3/8	2.72	62,113	4 to 6
29	26	4-5/8	2.61	59,813	4 to 6
29	27	4-3/4	2.52	57,676	4 to 6
29	28	4-15/16	2.43	55,688	4 to 6
24	24	5-1/8	2.34	53,460	4 to 6
24	25	5-5/16	2.25	51,404	4 to 6
24	26	5-1/2	2.16	49,500	4 to 6
24	27	5-3/4	2.08	47,732	4 to 6
24	28	5-15/16	2.01	46,406	4 to 6
20	24	6-1/8	1.95	44,550	4 to 6
20	25	6-3/8	1.88	42,837	4 to 6
20	26	6-5/8	1.80	41,250	4 to 6
20	27	6-15/16	1.74	39,777	4 to 6
20	28	7-1/8	1.67	37,125	4 to 6
16	24	7-5/8	1.56	35,640	4 to 6
16	25	8	1.50	34,269	4 to 6
16	26	8-3/8	1.44	33,000	4 to 6
16	27	8-5/8	1.39	31,821	4 to 6
16	28	9	1.34	30,640	4 to 6

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

A52100 -19-28/MAR03

Edible Beans (Flat-Type Seed Disk)—30 in. to 40 in. Rows

{Decal No. DB1232} EDIBLE BEANS - FLAT TYPE DISK - 50 HOLES

AVERAGE SEED SPACING, AVERAGE SEEDS PER FT. AND/OR APPROXIMATE SEED POPULATION PER ACRE
OF EDIBLE BEANS PLANTED WITH VACUUM METER

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS"

HIGH RANGE INPUT SPROCKET

Approximate Seed Population Per Acre

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing In Inches	Average Seeds Per Foot	30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	Recommended Speed Range in mph
35	24	1-5/16	9.11	158,813	132,344	125,378	119,109	3 to 4
35	25	1-3/8	8.75	152,460	127,050	120,363	114,345	3 to 4
35	26	1-7/16	8.41	146,596	122,163	115,734	109,947	3 to 4
35	27	1-1/2	8.10	141,167	117,639	111,447	108,875	3 to 4
35	28	1-1/2	7.81	136,125	113,438	109,467	102,094	3 to 4.5
29	24	1-5/8	7.55	131,588	109,656	103,885	98,691	3 to 4.5
29	25	1-11/16	7.25	126,324	105,270	99,729	94,743	3 to 4.5
29	26	1-3/4	6.97	121,465	101,221	95,894	91,099	3 to 4.5
29	27	1-3/4	6.71	116,967	97,472	92,342	87,725	3 to 4.5
29	28	1-13/16	6.49	112,789	93,991	89,044	84,592	3 to 4.5
24	24	1-7/8	6.25	108,900	90,750	85,974	81,675	3 to 4.5
24	25	2	6.00	104,544	87,120	82,535	78,408	3 to 4.5
24	26	2	5.77	100,523	83,769	79,360	75,392	4 to 5
24	27	2-1/8	5.56	96,800	80,667	76,421	72,600	4 to 5
24	28	2-1/4	5.36	93,343	77,786	73,692	70,007	4 to 5
20	24	2-3/8	5.21	90,750	75,625	71,645	68,063	4 to 5
20	25	2-7/16	5.00	87,120	72,600	68,779	65,340	4 to 5
20	26	2-1/2	4.81	83,769	69,808	66,134	62,827	4 to 5
20	27	2-1/2	4.62	80,667	67,222	63,684	60,500	4 to 6
20	28	2-9/16	4.46	77,786	64,821	61,410	58,339	4 to 6
16	24	2-7/8	4.17	72,600	60,500	57,316	54,450	4 to 6
16	25	3	4.00	69,696	58,080	55,023	52,272	4 to 6
16	26	3-1/8	3.85	67,015	55,846	52,907	50,262	4 to 6
16	27	3-1/4	3.70	64,533	53,778	50,947	48,400	4 to 6
16	28	3-3/8	3.50	62,229	51,857	49,128	46,671	4 to 6

LOW RANGE INPUT SPROCKET

Approximate Seed Population Per Acre

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing In Inches	Average Seeds Per Foot	30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	Recommended Speed Range in mph
35	24	3-1/2	3.42	59,555	49,629	47,017	44,666	4 to 6
35	25	3-5/8	3.26	57,173	47,644	45,136	42,879	4 to 6
35	26	3-3/4	3.16	54,974	45,811	43,400	41,230	4 to 6
35	27	4	3.04	52,938	44,115	41,793	39,703	4 to 6
35	28	4-1/8	2.93	51,047	42,539	40,300	38,285	4 to 6
29	24	4-1/2	2.83	49,345	41,121	38,957	37,009	4 to 6
29	25	4-3/8	2.72	47,372	39,476	37,399	35,529	4 to 6
29	26	4-5/8	2.61	45,550	37,958	35,960	34,162	4 to 6
29	27	4-3/4	2.52	43,863	36,552	34,638	32,897	4 to 6
29	28	4-15/16	2.43	42,296	35,247	33,392	31,722	4 to 6
24	24	5-1/8	2.34	40,838	34,031	32,240	30,628	4 to 6
24	25	5-5/16	2.25	39,204	32,670	30,951	29,403	4 to 6
24	26	5-1/2	2.16	37,696	31,413	29,760	28,272	4 to 6
24	27	5-3/4	2.08	36,300	30,250	28,658	27,225	4 to 6
24	28	5-15/16	2.01	35,004	29,170	27,634	26,253	4 to 6
20	24	6-1/8	1.95	34,031	28,359	26,867	25,523	4 to 6
20	25	6-3/8	1.88	32,670	27,225	25,792	24,503	4 to 6
20	26	6-5/8	1.80	31,413	26,178	24,800	23,560	4 to 6
20	27	6-15/16	1.74	30,250	25,208	23,882	22,688	4 to 6
20	28	7-1/8	1.67	29,170	24,308	23,029	21,877	4 to 6
16	24	7-5/8	1.56	27,225	22,688	21,493	20,419	4 to 6
16	25	8	1.50	26,136	21,780	20,634	19,602	4 to 6
16	26	8-3/8	1.44	25,131	20,942	19,840	18,848	4 to 6
16	27	8-5/8	1.39	24,200	20,167	19,105	18,150	4 to 6
16	28	9	1.34	23,336	19,446	18,423	17,502	4 to 6

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

Plateless Meter Rate Charts

How to Use Planting Rate Charts

IMPORTANT: The actual planting rate must be checked in the field. See **Checking Seed Population** section.

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

1. Select desired row spacing and seed population under proper column.
2. Choose proper input sprocket:

A higher population will require the use of the high-range input sprocket and HIGH RANGE chart for that particular seed.

A lower population will require the use of the low range input sprocket and LOW RANGE chart for that particular seed.

3. Determine correct seed drive transmission sprocket combination.
4. Determine recommended planting speed range. The faster speed, in the speed range, is for optimum field conditions. Reduce speed and increase unit downforce if planting in rough conditions.

AG,OUO6074,1262 -19-04AUG00-1/1

Use of Powdered Graphite

See Use of Talc and Graphite Lubricants section.

OUO6074,0000E67 -19-11JAN06-1/1

Corn—Finger Pick-Up—15 in. to 20 in. Rows

{Decal No. DB 1381} FINGER PICK-UP

AVERAGE SEED POPULATION PER ACRE AND AVERAGE SEED SPACING
OF CORN PLANTED WITH FINGER PICK-UP METERING UNIT

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed Spacing in In.	Approximate Seed Population Per Acre		Recommended Speed Range in mph
Driver	Driven		15 In. Rows	20 In. Rows	
35	24	3-3/4	112 338	84 254	2 to 3
35	25	3-7/8	107 846	80 848	2 to 3
35	26	4	103 689	77 774	2 to 3
35	27	4-1/4	99 856	74 892	2 to 4
35	28	4-3/8	96 290	72 218	2 to 4
29	24	4-1/2	93 080	69 810	3 to 4
29	25	4-5/8	89 358	67 018	3 to 4
29	26	4-7/8	85 920	64 440	3 to 4
29	27	5	82 738	62 054	3 to 4
29	28	5-1/4	66 486	59 838	3 to 4
24	24	5-1/2	77 032	57 774	3 to 5
24	25	5-5/8	73 952	55 464	3 to 5
24	26	5-7/8	71 106	53 330	3 to 5
24	27	6-1/8	68 654	51 334	3 to 5
24	28	6-3/8	66 028	49 520	3 to 5
20	24	6-1/2	64 194	48 146	4 to 6
20	25	6-3/4	61 626	46 220	4 to 6
20	26	7	59 256	44 442	4 to 6
20	27	7-3/8	57 062	42 796	4 to 7
20	28	7-5/8	55 024	41 268	4 to 7
16	24	8-1/8	51 334	38 516	4 to 7
16	25	8-1/2	49 300	36 976	5 to 8
16	26	8-7/8	47 404	35 554	5 to 8
16	27	9-1/8	45 648	34 236	5 to 8
16	28	9-1/2	44 018	33 014	5 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed Spacing in In.	Approximate Seed Population Per Acre		Recommended Speed Range in mph
Driver	Driven		15 In. Rows	20 In. Rows	
35	24	9-7/8	42 128	31 596	5 to 8
35	25	10-3/8	40 442	30 332	5 to 8
35	26	10-3/4	38 886	29 164	5 to 8
35	27	11-1/8	37 446	28 084	6 to 8
35	28	11-5/8	36 108	27 082	6 to 8
29	24	12	34 906	26 178	6 to 8
29	25	12-1/2	33 510	25 132	6 to 8
29	26	13	32 220	24 166	6 to 8
29	27	13-1/2	31 026	23 270	7 to 8
29	28	14	29 918	22 440	7 to 8
24	24	14-1/2	28 888	21 666	7 to 8
24	25	15	27 732	20 798	7 to 8
24	26	15-5/8	26 666	19 948	8
24	27	16-1/4	25 678	19 258	8
24	28	16-7/8	24 760	18 570	8
20	24	17-3/8	24 072	18 054	8

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

Corn—Finger Pick-Up—30 in. to 40 in. Rows

{Decal No. DB1095}

FINGER PICK-UP

AVERAGE SEED POPULATION PER ACRE AND AVERAGE SEED SPACING
OF CORN PLANTED WITH FINGER PICK-UP METERING UNIT

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) DriverDriven		Average Seed Spacing in In.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
			30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	3-3/4	56,169	46,808	44,344	42,127	2 to 3
35	25	3-7/8	53,923	44,936	42,571	40,442	2 to 3
35	26	4	51,849	43,207	40,933	38,887	2 to 3
35	27	4-1/4	49,928	41,607	39,417	37,446	2 to 4
35	28	4-3/8	48,145	40,121	39,009	36,109	2 to 4
29	24	4-1/2	46,540	38,784	36,742	34,905	3 to 4
29	25	4-5/8	44,679	37,232	35,273	33,509	3 to 4
29	26	4-7/8	42,960	35,800	33,916	32,220	3 to 4
29	27	5	41,369	34,474	32,660	31,027	3 to 4
29	28	5-1/4	39,892	33,243	31,494	29,919	3 to 4
24	24	5-1/2	38,516	32,097	30,408	28,887	3 to 5
24	25	5-5/8	36,976	30,813	29,191	27,732	3 to 5
24	26	5-7/8	35,553	29,628	28,068	26,665	3 to 5
24	27	6-1/8	34,237	28,531	27,029	25,677	3 to 5
24	28	6-3/8	33,014	27,512	26,064	24,760	3 to 5
20	24	6-1/2	32,097	26,747	25,340	24,073	4 to 6
20	25	6-3/4	30,813	25,677	24,326	23,110	4 to 6
20	26	7	29,628	24,690	23,390	22,221	4 to 6
20	27	7-3/8	28,531	23,775	22,524	21,398	4 to 7
20	28	7-5/8	27,512	22,926	21,720	20,634	4 to 7
16	24	8-1/8	25,677	21,398	20,272	19,258	4 to 7
16	25	8-1/2	24,650	20,542	19,461	18,488	5 to 8
16	26	8-7/8	23,702	19,752	18,712	17,777	5 to 8
16	27	9-1/8	22,824	19,020	18,019	17,118	5 to 8
16	28	9-1/2	22,009	18,341	17,376	16,507	5 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed Spacing in In.	Approximate Seed Population Per Acre				Recommended Speed Range in mph
Driver	Driven		30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	9-7/8	21,064	17,553	16,629	15,798	5 to 8
35	25	10-3/8	20,221	16,851	15,964	15,166	5 to 8
35	26	10-3/4	19,443	16,203	15,350	14,582	5 to 8
35	27	11-1/8	18,723	15,603	14,781	14,042	6 to 8
35	28	11-5/8	18,054	15,045	14,254	13,541	6 to 8
29	24	12	17,453	14,544	13,778	13,089	6 to 8
29	25	12-1/2	16,755	13,962	13,227	12,566	6 to 8
29	26	13	16,110	13,425	12,719	12,083	6 to 8
29	27	13-1/2	15,513	12,928	12,247	11,635	7 to 8
29	28	14	14,959	12,466	11,810	11,220	7 to 8
24	24	14-1/2	14,444	12,036	11,403	10,833	7 to 8
24	25	15	13,866	11,555	10,947	10,399	7 to 8
24	26	15-5/8	13,333	11,110	10,526	9,999	8
24	27	16-1/4	12,839	10,699	10,136	9,629	8
24	28	16-7/8	12,380	10,317	9,774	9,285	8
20	24	17-3/8	12,036	10,030	9,502	9,027	8

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

A50475 -19-04OCT02

Soybeans With Soybean Feed-Cup—15 in. to 20 in. Rows

{Decal No. DB1096}

SOYBEANS WITH SOYBEAN FEED CUP

APPROXIMATE LB. PER ACRE OF SOYBEANS PLANTED USING SOYBEAN FEED CUP

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Approximate Seed Population Per Acre				Recommended Speed Range in mph
		15 In. Rows	18 In. Rows	19 In. Rows	20 In. Rows	
35	24	268	224	206	201	2 to 4
35	25	258	214	204	194	2 to 4
35	26	248	206	196	186	2 to 4
35	27	238	200	188	178	2 to 4
35	28	230	192	182	172	2 to 4
29	24	222	186	176	166	2 to 5
29	25	214	178	168	160	2 to 5
29	26	206	172	162	154	2 to 5
29	27	198	164	156	148	2 to 5
29	28	190	160	150	142	2 to 5
24	24	184	154	146	138	2 to 6
24	25	176	148	140	132	2 to 6
24	26	170	142	134	128	2 to 6
24	27	164	136	130	123	2 to 6
24	28	158	132	124	118	2 to 7
20	24	154	128	122	116	2 to 7
20	25	148	122	116	111	2 to 7
20	26	142	118	112	106	2 to 8
20	27	136	114	108	102	2 to 8
20	28	132	110	104	99	2 to 8
16	24	122	102	96	92	2 to 8
16	25	118	98	94	88	2 to 8
16	26	114	94	90	86	2 to 8
16	27	110	90	86	82	2 to 8
16	28	106	88	84	80	2 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Approximate Seed Population Per Acre				Recommended Speed Range in mph
		15 In. Rows	18 In. Rows	19 In. Rows	20 In. Rows	
35	24	100	84	80	75	2 to 8
35	25	96	80	76	72	2 to 8
35	26	94	78	74	70	2 to 8
35	27	90	74	70	68	2 to 8
35	28	86	72	68	64	2 to 8
29	24	84	70	66	63	2 to 8
29	25	80	66	64	60	2 to 8
29	26	78	64	60	58	2 to 8
29	27	74	62	58	56	2 to 8
29	28	72	60	56	54	2 to 8
24	24	70	58	54	52	2 to 8
24	25	66	56	52	50	2 to 8
24	26	64	54	50	48	2 to 8
24	27	62	52	48	46	2 to 8
24	28	60	50	46	45	2 to 8
20	24	58	48	46	44	2 to 8
20	25	56	46	44	42	2 to 8
20	26	54	44	42	40	2 to 8
20	27	52	42	40	39	2 to 8
20	28	50	42	38	38	2 to 8
16	24	46	38	36	34	2 to 8
16	25	44	36	34	33	2 to 8
16	26	42	36	34	32	2 to 8
16	27	40	34	32	30	2 to 8
16	28	40	32	32	30	2 to 8

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

Soybeans With Soybean Feed-Cup—30 in. to 40 in. Rows

{Decal No. DB1097}

SOYBEANS WITH SOYBEAN FEED CUP

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Approximate Seed Population Per Acre				Recommended Speed Range in mph
		30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	134	112	106	101	2 to 4
35	25	129	107	102	97	2 to 4
35	26	124	103	98	93	2 to 4
35	27	119	100	94	89	2 to 4
35	28	115	96	91	86	2 to 4
29	24	111	93	88	83	2 to 5
29	25	107	89	84	80	2 to 5
29	26	103	86	81	77	2 to 5
29	27	99	82	78	74	2 to 5
29	28	95	80	75	71	2 to 5
24	24	92	77	73	69	2 to 6
24	25	88	74	70	66	2 to 6
24	26	85	71	67	64	2 to 6
24	27	82	68	65	62	2 to 6
24	28	79	66	62	59	2 to 7
20	24	77	64	61	58	2 to 7
20	25	74	61	58	56	2 to 7
20	26	71	59	56	53	2 to 8
20	27	68	57	54	51	2 to 8
20	28	66	55	52	50	2 to 8
16	24	61	51	48	46	2 to 8
16	25	59	49	47	44	2 to 8
16	26	57	47	45	43	2 to 8
16	27	55	45	43	41	2 to 8
16	28	53	44	42	40	2 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Approximate Seed Population Per Acre				Recommended Speed Range in mph
		30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	50	42	40	38	2 to 8
35	25	48	40	38	36	2 to 8
35	26	47	39	37	35	2 to 8
35	27	45	37	35	34	2 to 8
35	28	43	36	34	32	2 to 8
29	24	42	35	33	32	2 to 8
29	25	40	33	32	30	2 to 8
29	26	39	32	30	29	2 to 8
29	27	37	31	29	28	2 to 8
29	28	36	30	28	27	2 to 8
24	24	35	29	27	26	2 to 8
24	25	33	28	26	25	2 to 8
24	26	32	27	25	24	2 to 8
24	27	31	26	24	23	2 to 8
24	28	30	25	23	23	2 to 8
20	24	29	24	23	22	2 to 8
20	25	28	23	22	21	2 to 8
20	26	27	22	21	20	2 to 8
20	27	26	21	20	20	2 to 8
20	28	25	21	19	19	2 to 8
16	24	23	19	18	17	2 to 8
16	25	22	18	17	17	2 to 8
16	26	21	18	17	16	2 to 8
16	27	20	17	16	15	2 to 8
16	28	20	16	16	15	2 to 8

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

A50476 -19-07OCT02

Converting Edible Beans Per Foot to Pounds Per Acre—Various Seed Sizes—15 in. to 20 in. Rows

APPROXIMATE NUMBER OF LB. PER ACRE FOR VARIOUS SOYBEAN SEED SIZES												
Seeds per Ft.	15 In. Rows			18 In. Rows			19 In. Rows			20 In. Rows		
	Small	Medium	Large	Small	Medium	Large	Small	Medium	Large	Small	Medium	Large
	Approx. 3200 per Lb.	Approx. 2600 per Lb.	Approx. 2200 per Lb.	Approx. 3200 per Lb.	Approx. 2600 per Lb.	Approx. 2200 per Lb.	Approx. 3200 per Lb.	Approx. 2600 per Lb.	Approx. 2200 per Lb.	Approx. 3200 per Lb.	Approx. 2600 per Lb.	Approx. 2200 per Lb.
5	54	68	80	46	56	66	42	52	62	40	51	60
6	66	80	96	54	68	80	52	64	74	50	60	72
7	76	94	110	64	78	92	60	74	88	57	70	82
8	88	108	126	72	90	106	64	84	100	66	81	94
9	98	120	144	82	100	118	78	96	112	74	90	108
10	108	134	158	90	112	132	86	106	126	81	100	118
11	120	148	174	100	122	146	94	116	138	90	111	130
12	130	160	190	108	134	158	104	126	150	98	120	142
13	142	174	206	118	146	172	112	138	162	106	130	154
14	152	188	222	128	156	184	120	148	176	114	141	166
15	164	202	238	136	168	198	128	158	188	123	152	178
16	174	214	254	146	178	212	138	170	200	130	160	190
17	186	228	270	154	190	224	146	180	212	140	171	202
18	196	242	286	164	202	238	154	190	226	147	182	214
19	206	254	300	172	212	250	164	202	238	154	190	225
20	218	268	316	182	224	264	172	212	250	164	201	237

A32845

A32845 -19-31JAN89

Refer to above chart to convert beans per foot into pounds per acre so a sprocket combination can be determined from seed charts.

EXAMPLE:

Desired seed spacing is approximately 11 beans/ft on 19 in. rows with an approximate soybean seed size of 2600 seeds/lb (medium size).

Referring to above chart, to achieve approximately 11 beans/ft on 19 in. rows with approximately 2600 seeds/lb (medium size soybeans), a sprocket combination for 116 lb/acre will be needed.

Refer to EDIBLE BEAN WITH SOYBEAN FEED-CUP chart. A 19 in. row spacing will require the high range input sprocket with a 16-tooth driver and 25-tooth driven sprocket to produce approximately 116 lb/acre.

Rates in the chart are based on a uniform seed size sample of approximately 2600 seeds/lb and should only be used as a starting point for determining actual planting rate. Actual rate must be checked in the field at desired planting speed. See Checking Seed Population section.

Converting Edible Beans Per Foot to Pounds Per Acre—Various Seed Sizes—30 in. to 40 in. Rows

APPROXIMATE NUMBER OF LB. PER ACRE FOR VARIOUS SOYBEAN SEED SIZES												
Seeds per Ft.	30 In. Rows			36 In. Rows			38 In. Rows			40 In. Rows		
	Small	Medium	Large	Small	Medium	Large	Small	Medium	Large	Small	Medium	Large
	Approx. 3200 per Lb.	Approx. 2600 per Lb.	Approx. 2200 per Lb.	Approx. 3200 per Lb.	Approx. 2600 per Lb.	Approx. 2200 per Lb.	Approx. 3200 per Lb.	Approx. 2600 per Lb.	Approx. 2200 per Lb.	Approx. 3200 per Lb.	Approx. 2600 per Lb.	Approx. 2200 per Lb.
5	27	34	40	23	28	33	21	26	31	20	26	30
6	33	40	48	27	34	40	26	32	38	25	30	36
7	38	47	55	32	39	46	30	37	44	29	35	41
8	44	54	63	36	45	53	34	42	50	33	41	47
9	49	60	72	41	50	59	39	48	56	37	45	53
10	54	67	79	45	56	66	43	53	63	40	50	59
11	60	74	87	50	61	73	47	58	69	45	56	65
12	65	80	95	54	67	79	52	63	75	49	60	71
13	71	87	103	59	73	86	56	69	81	53	65	77
14	76	94	111	64	78	92	60	74	88	57	71	83
15	82	101	119	68	84	99	64	79	94	62	76	89
16	87	107	127	73	89	106	69	85	100	65	80	95
17	93	114	135	77	95	112	73	90	106	70	86	101
18	98	121	143	82	101	119	77	95	113	74	91	107
19	103	127	150	86	106	125	82	101	119	77	95	113
20	109	134	158	91	112	132	86	106	125	82	100	118

A28571

A28571 -19-31JAN89

Refer to above chart to convert beans per foot into pounds per acre so a sprocket combination can be determined from seed charts.

EXAMPLE:

Desired seed spacing is approximately 11 beans/ft on 38 in. rows with an approximate soybean seed size of 2600 seeds/lb (medium size).

Referring to above chart, to achieve approximately 11 beans/ft on 38 in. rows with approximately 2600 seeds/lb (medium size soybeans), a sprocket combination for 58 lb/acre will be needed.

Refer to EDIBLE BEAN WITH SOYBEAN FEED-CUP chart. A 38 in. row spacing will require the high range input sprocket with a 16-tooth driver and 25-tooth driven sprocket to produce approximately 58 lb/acre.

Rates in the chart are based on a uniform seed size sample of approximately 2600 seeds/lb and should only be used as a starting point for determining actual planting rate. Actual rate must be checked in the field at desired planting speed. See Checking Seed Population section.

OUO6074,0000023 -19-05SEP00-1/1

Edible Beans With Soybean Feed-Cup—15 in. to 20 in. Rows

{Decal No. DB1098}

EDIBLE BEANS WITH SOYBEAN FEED CUP

APPROXIMATE LB. PER ACRE OF EDIBLE BEANS PLANTED USING SOYBEAN FEED CUP

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Lb. of Small Beans* Per Acre				Lb. of Medium Beans** Per Acre				Recommended Speed Range in mph
Driver	Driven	15 In. Rows	18 In. Rows	19 In. Rows	20 In. Rows	15 In. Rows	18 In. Rows	19 In. Rows	20 In. Rows	
35	24	428	356	338	321	336	280	264	252	2 to 4
35	25	410	342	324	308	322	268	254	242	2 to 4
35	26	394	330	312	296	310	258	244	232	2 to 4
35	27	380	316	300	285	298	248	236	224	2 to 4
35	28	366	306	290	274	288	240	226	216	2 to 4
29	24	354	296	280	266	278	232	220	208	2 to 5
29	25	340	284	268	255	266	222	210	200	2 to 5
29	26	328	272	258	246	256	214	202	192	2 to 5
29	27	316	262	248	237	246	206	194	184	2 to 5
29	28	304	254	240	228	238	198	188	178	2 to 5
24	24	297	244	232	223	230	192	182	172	2 to 6
24	25	282	234	222	212	220	184	174	165	2 to 6
24	26	270	226	214	202	212	176	168	159	2 to 6
24	27	260	218	206	195	204	170	162	153	2 to 6
24	28	252	210	198	189	196	164	156	147	2 to 7
20	24	244	204	194	183	192	160	152	144	2 to 7
20	25	234	196	186	176	184	154	146	138	2 to 7
20	26	226	188	178	170	176	148	140	132	2 to 8
20	27	219	182	172	164	170	142	134	128	2 to 8
20	28	210	174	166	158	164	136	130	123	2 to 8
16	24	196	162	154	147	154	128	120	116	2 to 8
16	25	188	156	148	141	148	122	116	111	2 to 8
16	26	180	150	142	135	142	118	112	106	2 to 8
16	27	174	144	138	130	136	114	108	102	2 to 8
16	28	168	140	132	126	132	110	104	99	2 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Lb. of Small Beans* Per Acre				Lb. of Medium Beans** Per Acre				Recommended Speed Range in mph
Driver	Driven	15 In. Rows	18 In. Rows	19 In. Rows	20 In. Rows	15 In. Rows	18 In. Rows	19 In. Rows	20 In. Rows	
35	24	160	134	126	120	126	104	100	94	2 to 8
35	25	154	128	122	116	120	100	96	90	2 to 8
35	26	148	124	116	111	116	96	92	87	2 to 8
35	27	142	118	112	106	112	94	88	84	2 to 8
35	28	138	114	108	104	108	90	86	81	2 to 8
29	24	132	110	104	99	104	86	82	78	2 to 8
29	25	128	106	100	96	100	84	78	75	2 to 8
29	26	122	102	96	92	96	80	76	72	2 to 8
29	27	118	98	94	88	92	78	74	69	2 to 8
29	28	114	94	90	86	90	74	70	68	2 to 8
24	24	110	92	86	82	86	72	68	64	2 to 8
24	25	106	88	84	80	82	68	66	62	2 to 8
24	26	102	84	80	76	80	66	62	60	2 to 8
24	27	98	82	78	74	76	64	60	57	2 to 8
24	28	94	78	74	70	74	62	58	56	2 to 8
20	24	92	76	72	69	72	60	56	54	2 to 8
20	25	88	74	70	66	68	58	54	51	2 to 8
20	26	84	70	66	63	66	56	52	50	2 to 8
20	27	82	68	64	62	64	54	50	48	2 to 8
20	28	78	66	62	58	62	52	48	46	2 to 8
16	24	74	62	58	56	58	48	46	44	2 to 8
16	25	70	58	56	52	56	46	44	42	2 to 8
16	26	68	56	54	51	54	44	42	40	2 to 8
16	27	66	54	52	50	52	42	40	39	2 to 8
16	28	62	52	50	46	50	42	38	38	2 to 8

* Small beans include varieties which run approximately 2500 seeds/lb., such as navy beans.

** Medium beans include kidney beans at approximately 1000 seeds/lb., pinto beans at approximately 1100 seeds/lb., pink beans at approximately 1400 seeds/lb., or other beans of similar size and shape.

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

Edible Beans With Soybean Feed-Cup—30 in. to 40 in. Rows

{Decal No. DB1099}

EDIBLE BEANS WITH SOYBEAN FEED CUP

APPROXIMATE LB. PER ACRE OF EDIBLE BEANS PLANTED USING SOYBEAN FEED CUP

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Lb. of Small Beans* Per Acre				Lb. of Medium Beans** Per Acre				Recommended Speed Range in mph
Driver	Driven	30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	214	178	169	161	168	140	132	126	2 to 4
35	25	205	171	162	154	161	134	127	121	2 to 4
35	26	197	165	156	148	155	129	122	116	2 to 4
35	27	190	158	150	143	149	124	118	112	2 to 4
35	28	183	153	145	137	144	120	113	108	2 to 4
29	24	177	148	140	133	139	116	110	104	2 to 5
29	25	170	142	134	128	133	111	105	100	2 to 5
29	26	164	136	129	123	128	107	101	96	2 to 5
29	27	158	131	124	118	123	103	97	92	2 to 5
29	28	152	127	120	114	119	99	94	89	2 to 5
24	24	147	122	116	110	115	96	91	86	2 to 6
24	25	141	117	111	106	110	92	87	83	2 to 6
24	26	135	113	107	101	106	88	84	80	2 to 6
24	27	130	109	103	98	102	85	81	77	2 to 6
24	28	126	105	99	95	98	82	78	74	2 to 7
20	24	122	102	97	92	96	80	76	72	2 to 7
20	25	117	98	93	88	92	77	73	69	2 to 7
20	26	113	94	89	85	88	74	70	66	2 to 8
20	27	109	91	86	82	85	71	67	64	2 to 8
20	28	105	87	83	79	82	68	65	62	2 to 8
16	24	98	81	77	74	77	64	60	58	2 to 8
16	25	94	78	74	70	74	61	58	56	2 to 8
16	26	90	75	71	68	71	59	56	53	2 to 8
16	27	87	72	69	65	68	57	54	51	2 to 8
16	28	84	70	66	63	66	55	52	50	2 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Lb. of Small Beans* Per Acre				Lb. of Medium Beans** Per Acre				Recommended Speed Range in mph
Driver	Driven	30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	80	67	63	60	63	52	50	47	2 to 8
35	25	77	64	61	58	60	50	48	45	2 to 8
35	26	74	62	58	56	58	48	46	44	2 to 8
35	27	71	59	56	53	56	47	44	42	2 to 8
35	28	69	57	54	52	54	45	43	40	2 to 8
29	24	66	55	52	50	52	43	41	39	2 to 8
29	25	64	53	50	48	50	42	39	38	2 to 8
29	26	61	51	48	46	48	40	38	36	2 to 8
29	27	59	49	47	44	46	39	37	35	2 to 8
29	28	57	47	45	43	45	37	35	34	2 to 8
24	24	55	46	43	41	43	36	34	32	2 to 8
24	25	53	44	42	40	41	34	33	31	2 to 8
24	26	51	42	40	38	40	33	31	30	2 to 8
24	27	49	41	39	37	38	32	30	28	2 to 8
24	28	47	39	37	35	37	31	29	28	2 to 8
20	24	46	38	36	35	36	30	28	27	2 to 8
20	25	44	37	35	33	34	29	27	26	2 to 8
20	26	42	35	33	32	33	28	26	25	2 to 8
20	27	41	34	32	31	32	27	25	24	2 to 8
20	28	39	33	31	29	31	26	24	23	2 to 8
16	24	37	31	29	28	29	24	23	22	2 to 8
16	25	35	29	28	26	28	23	22	21	2 to 8
16	26	34	28	27	26	27	22	21	20	2 to 8
16	27	33	27	26	25	26	21	20	20	2 to 8
16	28	31	26	25	23	25	21	19	19	2 to 8

* Small beans include varieties which run approximately 2500 seeds/lb., such as navy beans.

** Medium beans include kidney beans at approximately 1000 seeds/lb., pinto beans at approximately 1100 seeds/lb., pink beans at approximately 1400 seeds/lb., or other beans of similar size and shape.

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

A50477 -19-16OCT02

Planting Small Soybeans with Soybean Feed Cup

NOTE: Extra small soybeans vary in size from approximately 9000 seeds/kg to 12 000 seeds/kg (4000 seeds/lb to 5400 seeds/lb). Varying seed sizes may cause planting rates to vary widely.

The following charts were developed using uniform soybeans sized to 9300 seeds/kg (4200 seeds/lb). Use charts as a guide for initial machine settings only.

Large beans will generally result in lower rates than those in charts.

Actual rates MUST be checked in the field at planting speed. See Checking Seed Population section.

OUO6074.0000028 -19-11APR05-1/1

Converting Beans Per Foot to Pounds Per Acre—Small Soybeans—15 in. to 20 in. Rows

APPROXIMATE NUMBER OF LB. PER ACRE FOR EXTRA SMALL SOYBEAN SEEDS

Seeds per Ft.	15 In. Rows	18 In. Rows	19 In. Rows	20 In. Rows
	Approximately 4200 Seeds per Lb.	Approximately 4200 Seeds per Lb.	Approximately 4200 Seeds per Lb.	Approximately 4200 Seeds per Lb.
5	42	34	32	31
6	50	42	40	38
7	58	48	46	44
8	66	56	52	50
9	74	62	58	56
10	82	70	66	62
11	92	76	72	69
12	100	82	78	75
13	108	90	86	81
14	116	96	92	87
15	124	104	98	93
16	132	110	104	99
17	142	118	112	106
18	150	124	118	112
19	158	132	124	118
20	166	138	132	124

A32855

A32855 -19-31JAN89

Refer to above chart to convert beans per foot into pounds per acre so a sprocket combination can be determined from seed charts.

EXAMPLE:

Desired seed spacing is approximately 10 beans/ft on 19 in. rows with an approximate soybean seed size of 4200 seeds/lb.

Referring to above chart, to achieve approximately 10 beans/ft on 19 in. rows with approximately 4200 seeds/lb, a sprocket combination for 66 lb/acre will be needed.

Refer to SMALL SOYBEAN WITH SOYBEAN FEED-CUP chart. A 19 in. row spacing will require the high range input sprocket with a 20-tooth driver and 28-tooth driven sprocket to produce approximately 66 lb/acre.

Rates in the chart are based on a uniform seed size sample of approximately 4200 seeds/lb and should only be used as a starting point for determining actual planting rate. Actual rate must be checked in the field at desired planting speed. See Checking Seed Population section.

OUO6074,0000026 -19-05SEP00-1/1

Converting Beans Per Foot to Pounds Per Acre—Small Soybeans—30 in. to 40 in. Rows

APPROXIMATE NUMBER OF LB. PER ACRE FOR EXTRA SMALL SOYBEAN SEEDS

Seeds per Ft.	30 in. Rows	36 in. Rows	38 in. Rows	40 in. Rows
	Approximately 4200 Seeds per Lb.	Approximately 4200 Seeds per Lb.	Approximately 4200 Seeds per Lb.	Approximately 4200 Seeds per Lb.
5	21	17	16	15
6	25	21	20	19
7	29	24	23	22
8	33	28	26	25
9	37	31	29	28
10	41	35	33	31
11	46	38	36	34
12	50	41	39	38
13	54	45	43	40
14	58	48	46	44
15	62	52	49	46
16	66	55	52	50
17	71	59	56	53
18	75	62	59	56
19	79	66	62	59
20	83	69	66	62

A30239

A30239 -19-02FEB89

Refer to above chart to convert beans per foot into pounds per acre so a sprocket combination can be determined from seed charts.

EXAMPLE:

Desired seed spacing is approximately 10 beans/ft on 38 in. rows with an approximate soybean seed size of 4200 seeds/lb.

Referring to above chart, to achieve approximately 10 beans/ft on 38 in. rows with approximately 4200 seeds/lb, a sprocket combination for 33 lb/acre will be needed.

Refer to SMALL SOYBEAN WITH SOYBEAN FEED-CUP chart. A 38 in. row spacing will require the high range input sprocket with a 20-tooth driver and 28-tooth driven sprocket to produce approximately 33 lb/acre.

Rates in the chart are based on a uniform seed size sample of approximately 4200 seeds/lb and should only be used as a starting point for determining actual planting rate. Actual rate must be checked in the field at desired planting speed. See Checking Seed Population section.

OUO6074.0000027 -19-05SEP00-1/1

Small Soybeans With Soybean Feed-Cup—15 in. to 20 in. Rows

{Decal No. DB1100} SMALL SOYBEANS WITH SOYBEAN FEED CUP AND A48005 SEED GUIDE

APPROXIMATE LB. PER ACRE OF SMALL SOYBEANS PLANTED
USING SOYBEAN FEED CUP WITH A48005 SEED GUIDE

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

(Based on 4,200 Seeds Per Lb.)

Sprocket Combinations (Number of Teeth) Driver Driven		Lb. Per Acre 15 In. 18 In. 19 In. 20 In. Rows Rows Rows Rows				Recommended Speed Range in mph
35	24	172	144	138	129	3 to 5
35	25	166	138	132	124	3 to 5
35	26	158	132	128	118	3 to 5
35	27	154	128	122	116	3 to 5
35	28	148	124	118	111	3 to 5
29	24	142	118	114	106	3 to 5
29	25	136	114	110	102	3 to 5-1/2
29	26	132	110	106	99	3 to 6
29	27	126	106	102	94	3 to 6
29	28	122	102	100	92	3 to 6
24	24	118	98	94	88	4 to 6-1/2
24	25	114	94	90	86	4 to 7
24	26	110	90	88	82	4 to 7-1/2
24	27	104	88	84	78	4 to 8
24	28	102	84	82	76	4 to 8
20	24	98	82	78	74	4 to 8
20	25	94	78	76	70	4 to 8
20	26	90	76	72	68	4 to 8
20	27	88	72	70	66	4 to 8
20	28	84	70	68	63	4 to 8
16	24	78	66	64	58	4 to 8
16	25	76	64	60	57	4 to 8
16	26	72	60	58	54	4 to 8
16	27	70	58	56	52	4 to 8
16	28	68	56	54	51	4 to 8

LOW RANGE INPUT SPROCKET

(Based on 4,200 Seeds Per Lb.)

Sprocket Combinations (Number of Teeth) Driver Driven		Lb. Per Acre 15 In. 18 In. 19 In. 20 In. Rows Rows Rows Rows				Recommended Speed Range in mph
35	24	64	54	52	48	3 to 5
35	25	62	52	50	46	3 to 5
35	26	60	50	48	45	3 to 5
35	27	58	48	46	44	3 to 5
35	28	56	46	44	42	3 to 5
29	24	54	44	42	40	3 to 5
29	25	52	42	42	39	3 to 5-1/2
29	26	50	42	40	38	3 to 6
29	27	48	40	38	36	3 to 6
29	28	46	38	36	34	3 to 6
24	24	44	36	36	33	4 to 6-1/2
24	25	42	36	34	32	4 to 7
24	26	40	34	32	30	4 to 7-1/2
24	27	40	32	32	30	4 to 8
24	28	38	32	30	28	4 to 8
20	24	36	30	30	27	4 to 8
20	25	36	30	28	27	4 to 8
20	26	34	28	28	26	4 to 8
20	27	32	28	26	24	4 to 8
20	28	30	26	26	22	4 to 8
16	24	30	24	24	22	4 to 8
16	25	28	24	22	21	4 to 8
16	26	28	22	22	21	4 to 8
16	27	26	22	22	20	4 to 8
16	28	26	22	20	20	4 to 8

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

A50474 -19-04OCT02

Small Soybeans With Soybean Feed-Cup—30 in. to 40 in. Rows

{Decal No. DB1101} SMALL SOYBEANS WITH SOYBEAN FEED CUP AND A48005 SEED GUIDE

APPROXIMATE LB. PER ACRE OF SMALL SOYBEANS PLANTED
USING SOYBEAN FEED CUP A48005 SEED GUIDE

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		(Based on 4,200 Seeds Per Lb.) Lb. Per Acre				Recommended Speed Range in mph
		30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	86	72	69	65	3 to 5
35	25	83	69	66	62	3 to 5
35	26	79	66	64	59	3 to 5
35	27	77	64	61	58	3 to 5
35	28	74	62	59	56	3 to 5
29	24	71	59	57	53	3 to 5
29	25	68	57	55	51	3 to 5-1/2
29	26	66	55	53	50	3 to 6
29	27	63	53	51	47	3 to 6
29	28	61	51	50	46	3 to 6
24	24	59	49	47	44	4 to 6-1/2
24	25	57	47	45	43	4 to 7
24	26	55	45	44	41	4 to 7-1/2
24	27	52	44	42	39	4 to 8
24	28	51	42	41	38	4 to 8
20	24	49	41	39	37	4 to 8
20	25	47	39	38	35	4 to 8
20	26	45	38	36	34	4 to 8
20	27	44	36	35	33	4 to 8
20	28	42	35	34	32	4 to 8
16	24	39	33	32	29	4 to 8
16	25	38	32	30	28	4 to 8
16	26	36	30	29	27	4 to 8
16	27	35	29	28	26	4 to 8
16	28	34	28	27	26	4 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		(Based on 4,200 Seeds Per Lb.) Lb. Per Acre				Recommended Speed Range in mph
		30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	32	27	26	24	3 to 5
35	25	31	26	25	23	3 to 5
35	26	30	25	24	23	3 to 5
35	27	29	24	23	22	3 to 5
35	28	28	23	22	21	3 to 5
29	24	27	22	21	20	3 to 5
29	25	26	21	21	20	3 to 5-1/2
29	26	25	21	20	19	3 to 6
29	27	24	20	19	18	3 to 6
29	28	23	19	18	17	3 to 6
24	24	22	18	18	17	4 to 6-1/2
24	25	21	18	17	16	4 to 7
24	26	20	17	16	15	4 to 7-1/2
24	27	20	16	16	15	4 to 8
24	28	19	16	15	14	4 to 8
20	24	18	15	15	14	4 to 8
20	25	18	15	14	14	4 to 8
20	26	17	14	14	13	4 to 8
20	27	16	14	13	12	4 to 8
20	28	15	13	13	11	4 to 8
16	24	15	12	12	11	4 to 8
16	25	14	12	11	10	4 to 8
16	26	14	11	11	10	4 to 8
16	27	13	11	11	10	4 to 8
16	28	13	11	10	10	4 to 8

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

A50479 -19-07OCT02

Planting Acid-Delinted Cotton with Soybean Feed-Cup

NOTE: Acid-delinted cotton seeds vary in size from approximately 9000 seeds/kg to 12 000 seeds/kg (4100 seeds/lb to 5400 seeds/lb). Varying cotton seed sizes may cause planting rates to vary widely.

The above chart was developed using uniform cotton seed sized to 10 000 seeds/kg (4500 seeds/lb). Use the chart as a guide for initial machine settings only.

Large cotton seed will generally result in lower rates than those in chart. Small cotton seed will give somewhat higher rates than those in chart.

Actual rates MUST be checked in the field at planting speed. See Checking Seed Population section.

OUO6074,000002A -19-11APR05-1/1

Acid-Delinted Cotton With Soybean Feed-Cup—15 in. to 20 in. Rows

{Decal No. DB1102} ACID-DELINTED COTTON WITH SOYBEAN FEED CUP AND A48005 SEED GUIDE

APPROXIMATE LB. PER ACRE OF ACID-DELINTED COTTON
PLANTED USING SOYBEAN FEED CUP WITH A48005 SEED GUIDE

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		(Based on 4,500 Seeds Per Lb.) Lb. Per Acre				Recommended Speed Range in mph
Driver	Driven	15 In. Rows	18 In. Rows	19 In. Rows	20 In. Rows	
35	24	126	108	98	94	3 to 5
35	25	120	104	96	90	3 to 5
35	26	116	100	92	87	3 to 5
35	27	112	96	88	84	3 to 5
35	28	108	94	84	81	3 to 5
29	24	104	90	82	78	3 to 5
29	25	100	86	78	75	3 to 5-1/2
29	26	96	84	76	72	3 to 6
29	27	92	80	72	69	3 to 6
29	28	90	78	70	68	3 to 6
24	24	86	76	68	64	4 to 6-1/2
24	25	82	72	66	62	4 to 7
24	26	80	68	62	60	4 to 7-1/2
24	27	76	66	60	57	4 to 8
24	28	74	64	58	56	4 to 8
20	24	72	62	56	54	4 to 8
20	25	68	60	54	51	4 to 8
20	26	66	58	52	50	4 to 8
20	27	64	54	50	48	4 to 8
20	28	62	54	48	46	4 to 8
16	24	58	50	46	44	4 to 8
16	25	56	48	44	42	4 to 8
16	26	54	46	42	40	4 to 8
16	27	52	44	40	39	4 to 8
16	28	50	42	38	38	4 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		(Based on 4,500 Seeds Per Lb.) Lb. Per Acre				Recommended Speed Range in mph
Driver	Driven	15 In. Rows	18 In. Rows	19 In. Rows	20 In. Rows	
35	24	46	38	36	34	3 to 5
35	25	46	38	36	34	3 to 5
35	26	44	36	34	33	3 to 5
35	27	42	34	34	32	3 to 5
35	28	40	34	32	30	3 to 5
29	24	40	32	30	30	3 to 5
29	25	38	32	30	28	3 to 5-1/2
29	26	36	30	28	27	3 to 6
29	27	34	28	28	26	3 to 6
29	28	34	28	26	26	3 to 6
24	24	32	26	26	24	4 to 6-1/2
24	25	32	26	24	24	4 to 7
24	26	30	24	24	22	4 to 7-1/2
24	27	28	24	22	21	4 to 8
24	28	28	24	22	21	4 to 8
20	24	26	22	22	20	4 to 8
20	25	26	22	20	20	4 to 8
20	26	24	20	20	18	4 to 8
20	27	24	20	18	18	4 to 8
20	28	24	20	18	18	4 to 8
16	24	22	18	18	16	4 to 8
16	25	20	18	16	15	4 to 8
16	26	20	16	16	15	4 to 8
16	27	20	16	16	15	4 to 8
16	28	18	16	14	14	4 to 8

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

Acid-Delinted Cotton With Soybean Feed-Cup—30 in. to 40 in. Rows

{Decal No. DB1103} ACID DELINTED COTTON WITH SOYBEAN FEED CUP AND A48005 SEED GUIDE

APPROXIMATE LB. PER ACRE OF ACID-DELINTED COTTON
PLANTED USING SOYBEAN FEED CUP AND A48005 SEED GUIDE

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

(Based on 4,500 Seeds Per Lb.)

Sprocket Combinations (Number of Teeth)		Lb. Per Acre				Recommended Speed Range in mph
Driver	Driven	30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	63	54	49	47	3 to 5
35	25	60	52	48	45	3 to 5
35	26	58	50	46	44	3 to 5
35	27	56	48	44	42	3 to 5
35	28	54	47	42	40	3 to 5
29	24	52	45	41	39	3 to 5
29	25	50	43	39	38	3 to 5-1/2
29	26	48	42	38	36	3 to 6
29	27	46	40	36	34	3 to 6
29	28	45	39	35	34	3 to 6
24	24	43	38	34	32	4 to 6-1/2
24	25	41	36	33	31	4 to 7
24	26	40	34	31	30	4 to 7-1/2
24	27	38	33	30	28	4 to 8
24	28	37	32	29	28	4 to 8
20	24	36	31	28	27	4 to 8
20	25	34	30	27	26	4 to 8
20	26	33	29	26	25	4 to 8
20	27	32	27	25	24	4 to 8
20	28	31	27	24	23	4 to 8
16	24	29	25	23	22	4 to 8
16	25	28	24	22	21	4 to 8
16	26	27	23	21	20	4 to 8
16	27	26	22	20	20	4 to 8
16	28	25	21	19	19	4 to 8

LOW RANGE INPUT SPROCKET

(Based on 4,500 Seeds Per Lb.)

Sprocket Combinations (Number of Teeth)		Lb. Per Acre				Recommended Speed Range in mph
Driver	Driven	30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	23	19	18	17	3 to 5
35	25	23	19	18	17	3 to 5
35	26	22	18	17	16	3 to 5
35	27	21	17	17	16	3 to 5
35	28	20	17	16	15	3 to 5
29	24	20	16	15	15	3 to 5
29	25	19	16	15	14	3 to 5-1/2
29	26	18	15	14	14	3 to 6
29	27	17	14	14	13	3 to 6
29	28	17	14	13	13	3 to 6
24	24	16	13	13	12	4 to 6-1/2
24	25	16	13	12	12	4 to 7
24	26	15	12	12	11	4 to 7-1/2
24	27	14	12	11	10	4 to 8
24	28	14	12	11	10	4 to 8
20	24	13	11	11	10	4 to 8
20	25	13	11	10	10	4 to 8
20	26	12	10	10	9	4 to 8
20	27	12	10	9	9	4 to 8
20	28	12	10	9	9	4 to 8
16	24	11	9	9	8	4 to 8
16	25	10	9	8	8	4 to 8
16	26	10	8	8	8	4 to 8
16	27	10	8	8	8	4 to 8
16	28	9	8	7	7	4 to 8

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

A50484 -19-07OCT02

Sorghum With Low-Rate Feed-Cup—15 in. to 20 in. Rows

{Decal No. DB1104} **SORGHUM WITH LOW-RATE SORGHUM FEED CUP**
 APPROXIMATE LB. PER ACRE OF SORGHUM PLANTED USING LOW-RATE SORGHUM FEED CUP
 NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		(Based on 18,000 Seeds Per Pound) Lb. Per Acre				Recommended Speed Range in mph
Driver	Driven	15 In. Rows	18 In. Rows	19 In. Rows	20 In. Rows	
35	24	12.2	10.2	9.6	9.2	2 to 4
35	25	11.6	9.8	9.2	8.7	2 to 4
35	26	11.2	9.4	8.8	8.4	2 to 4
35	27	10.8	9.0	8.6	8.1	2 to 4
35	28	10.4	8.6	8.2	7.8	2 to 4
29	24	10.0	8.4	8.0	7.5	2 to 5
29	25	9.6	8.0	7.6	7.2	2 to 5
29	26	9.4	7.8	7.4	7.0	2 to 5
29	27	9.0	7.4	7.0	6.8	2 to 5
29	28	8.8	7.2	6.8	6.4	2 to 5
24	24	8.4	7.0	6.6	6.3	2 to 6
24	25	8.0	6.6	6.4	6.0	2 to 6
24	26	7.8	6.4	6.0	5.8	2 to 6
24	27	7.4	6.2	5.8	5.6	2 to 6
24	28	7.2	6.0	5.6	5.4	2 to 7
20	24	7.0	5.8	5.4	5.2	2 to 7
20	25	6.6	5.6	5.2	5.0	2 to 7
20	26	6.4	5.4	5.0	4.8	2 to 8
20	27	6.2	5.2	4.8	4.6	2 to 8
20	28	6.0	5.0	4.8	4.5	2 to 8
16	24	5.6	4.6	4.4	4.2	2 to 8
16	25	5.4	4.4	4.2	4.0	2 to 8
16	26	5.2	4.2	4.0	3.9	2 to 8
16	27	5.0	4.2	4.0	3.8	2 to 8
16	28	4.8	4.0	3.8	3.6	2 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		(Based on 18,000 Seeds Per Pound) Lb. Per Acre				Recommended Speed Range in mph
Driver	Driven	15 In. Rows	18 In. Rows	19 In. Rows	20 In. Rows	
35	24	4.6	3.8	3.6	3.4	2 to 8
35	25	4.4	3.6	3.4	3.3	2 to 8
35	26	4.2	3.6	3.4	3.2	2 to 8
35	27	4.0	3.4	3.2	3.0	2 to 8
35	28	4.0	3.2	3.0	3.0	2 to 8
29	24	3.8	3.2	3.0	2.8	2 to 8
29	25	3.6	3.0	2.8	2.7	2 to 8
29	26	3.4	3.0	2.8	2.6	2 to 8
29	27	3.4	2.8	2.6	2.6	2 to 8
29	28	3.2	2.8	2.6	2.4	2 to 8
24	24	3.2	2.6	2.4	2.4	2 to 8
24	25	3.0	2.6	2.4	2.2	2 to 8
24	26	2.8	2.4	2.2	2.1	2 to 8
24	27	2.8	2.4	2.2	2.1	2 to 8
24	28	2.6	2.2	2.2	2.0	2 to 8
20	24	2.6	2.2	2.0	2.0	2 to 8
20	25	2.6	2.0	2.0	2.0	2 to 8
20	26	2.4	2.0	2.0	1.8	2 to 8
20	27	2.4	2.0	1.8	1.8	2 to 8
20	28	2.2	1.8	1.8	1.6	2 to 8
16	24	2.0	1.8	1.6	1.5	2 to 8
16	25	2.0	1.6	1.6	1.5	2 to 8
16	26	2.0	1.6	1.6	1.5	2 to 8
16	27	1.8	1.6	1.4	1.4	2 to 8
16	28	1.8	1.4	1.4	1.4	2 to 8

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

Sorghum With Low-Rate Feed-Cup—30 in. to 40 in. Rows

{Decal No. DB1105}

SORGHUM WITH LOW-RATE SORGHUM FEED CUP

APPROXIMATE LB. PER ACRE OF SORGHUM PLANTED USING LOW-RATE SORGHUM FEED CUP

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		(Based on 18,000 Seeds Per Pound) Lb. Per Acre				Recommended Speed Range in mph
		30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	6.1	5.1	4.8	4.6	2 to 4
35	25	5.8	4.9	4.6	4.4	2 to 4
35	26	5.6	4.7	4.4	4.2	2 to 4
35	27	5.4	4.5	4.3	4.1	2 to 4
35	28	5.2	4.3	4.1	3.9	2 to 4
29	24	5.0	4.2	4.0	3.8	2 to 5
29	25	4.8	4.0	3.8	3.6	2 to 5
29	26	4.7	3.9	3.7	3.5	2 to 5
29	27	4.5	3.7	3.5	3.4	2 to 5
29	28	4.3	3.6	3.4	3.2	2 to 5
24	24	4.2	3.5	3.3	3.2	2 to 6
24	25	4.0	3.3	3.2	3.0	2 to 6
24	26	3.9	3.2	3.0	2.9	2 to 6
24	27	3.7	3.1	2.9	2.8	2 to 6
24	28	3.6	3.0	2.8	2.7	2 to 7
20	24	3.5	2.9	2.7	2.6	2 to 7
20	25	3.3	2.8	2.6	2.5	2 to 7
20	26	3.2	2.7	2.5	2.4	2 to 8
20	27	3.1	2.6	2.4	2.3	2 to 8
20	28	3.0	2.5	2.4	2.2	2 to 8
16	24	2.8	2.3	2.2	2.1	2 to 8
16	25	2.7	2.2	2.1	2.0	2 to 8
16	26	2.6	2.1	2.1	2.0	2 to 8
16	27	2.5	2.1	2.0	1.9	2 to 8
16	28	2.4	2.0	1.9	1.8	2 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		(Based on 18,000 Seeds Per Pound) Lb. Per Acre				Recommended Speed Range in mph
		30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	2.3	1.9	1.8	1.7	2 to 8
35	25	2.2	1.8	1.7	1.6	2 to 8
35	26	2.1	1.8	1.7	1.6	2 to 8
35	27	2.0	1.7	1.6	1.5	2 to 8
35	28	2.0	1.6	1.5	1.5	2 to 8
29	24	1.9	1.6	1.5	1.4	2 to 8
29	25	1.8	1.5	1.4	1.4	2 to 8
29	26	1.7	1.5	1.4	1.3	2 to 8
29	27	1.7	1.4	1.3	1.3	2 to 8
29	28	1.6	1.4	1.3	1.2	2 to 8
24	24	1.6	1.3	1.2	1.2	2 to 8
24	25	1.5	1.3	1.2	1.1	2 to 8
24	26	1.4	1.2	1.1	1.1	2 to 8
24	27	1.4	1.2	1.1	1.1	2 to 8
24	28	1.3	1.1	1.1	1.0	2 to 8
20	24	1.3	1.1	1.0	1.0	2 to 8
20	25	1.3	1.0	1.0	1.0	2 to 8
20	26	1.2	1.0	1.0	.9	2 to 8
20	27	1.2	1.0	.9	.9	2 to 8
20	28	1.1	.9	.9	.8	2 to 8
16	24	1.0	.9	.8	.8	2 to 8
16	25	1.0	.8	.8	.8	2 to 8
16	26	1.0	.8	.8	.8	2 to 8
16	27	.9	.8	.7	.7	2 to 8
16	28	.9	.7	.7	.7	2 to 8

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

A50488 -19-07OCT02

Sorghum With Regular-Rate Feed-Cup—15 in. to 20 in. Rows

{Decal No. DB1106} SORGHUM WITH REGULAR-RATE SORGHUM FEED CUP

APPROXIMATE LB. PER ACRE OF SORGHUM PLANTED USING REGULAR-RATE SORGHUM FEED CUP

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		(Based on 15,000 Seeds Per Pound) Lb. Per Acre				Recommended Speed Range in mph
		15 In. Rows	18 In. Rows	19 In. Rows	20 In. Rows	
35	24	65.0	54.2	51.2	48.8	2 to 4
35	25	62.4	52.0	49.2	46.8	2 to 4
35	26	60.0	50.0	47.4	45.0	2 to 4
35	27	57.8	48.2	45.6	43.4	2 to 4
35	28	55.6	46.4	44.0	41.7	2 to 4
29	24	53.8	44.8	42.4	40.4	2 to 5
29	25	51.6	43.0	40.8	38.7	2 to 5
29	26	49.6	41.4	39.2	37.2	2 to 5
29	27	47.8	39.8	37.8	35.8	2 to 5
29	28	46.2	38.4	36.4	34.6	2 to 5
24	24	44.3	37.2	35.2	33.2	2 to 6
24	25	42.8	35.6	33.8	32.1	2 to 6
24	26	41.2	34.2	32.4	30.9	2 to 6
24	27	39.6	33.0	31.2	29.7	2 to 6
24	28	38.2	31.8	30.2	28.6	2 to 7
20	24	37.2	31.0	29.4	27.9	2 to 7
20	25	35.6	29.8	28.2	26.7	2 to 7
20	26	34.2	28.6	27.0	25.6	2 to 8
20	27	33.0	27.6	26.0	24.8	2 to 8
20	28	31.8	26.6	25.2	23.8	2 to 8
16	24	29.8	24.8	23.4	22.4	2 to 8
16	25	28.6	23.8	22.6	21.4	2 to 8
16	26	27.4	22.8	21.6	20.6	2 to 8
16	27	26.4	22.0	20.8	19.8	2 to 8
16	28	25.4	21.2	20.0	19.0	2 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		(Based on 15,000 Seeds Per Pound) Lb. Per Acre				Recommended Speed Range in mph
		15 In. Rows	18 In. Rows	19 In. Rows	20 In. Rows	
35	24	24.4	20.4	19.2	18.3	2 to 8
35	25	23.4	19.4	18.4	17.6	2 to 8
35	26	22.4	18.8	17.8	16.8	2 to 8
35	27	21.6	18.0	17.0	16.2	2 to 8
35	28	20.8	17.4	16.4	15.6	2 to 8
29	24	20.2	16.8	16.0	15.2	2 to 8
29	25	19.4	16.2	15.2	14.6	2 to 8
29	26	18.6	15.6	14.8	14.0	2 to 8
29	27	18.0	15.0	14.2	13.5	2 to 8
29	28	17.4	14.4	13.6	13.0	2 to 8
24	24	16.8	14.0	13.2	12.6	2 to 8
24	25	16.0	13.4	12.6	12.0	2 to 8
24	26	15.4	12.8	12.2	11.6	2 to 8
24	27	14.8	12.4	11.8	11.1	2 to 8
24	28	14.4	12.0	11.4	10.8	2 to 8
20	24	14.0	11.6	11.0	10.5	2 to 8
20	25	13.4	11.2	10.6	10.0	2 to 8
20	26	12.8	10.8	10.2	9.6	2 to 8
20	27	12.4	10.4	9.8	9.3	2 to 8
20	28	12.0	10.0	9.4	9.0	2 to 8
16	24	11.2	9.2	8.8	8.4	2 to 8
16	25	10.6	9.0	8.4	8.0	2 to 8
16	26	10.2	8.6	8.2	7.6	2 to 8
16	27	10.0	8.2	7.8	7.5	2 to 8
16	28	9.6	8.0	7.6	7.2	2 to 8

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

Sorghum With Regular-Rate Feed-Cup—30 in. to 40 in. Rows

(DB1107) **SORGHUM WITH REGULAR-RATE SORGHUM FEED CUP**
AVERAGE LB. PER ACRE OF SORGHUM PLANTED USING REGULAR RATE SORGHUM FEED CUP
 NOTE: For Information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS."

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		(Based on 15,000 Seeds Per Pound) Lb. Per Acre				Recommended Speed Range in mph
Driver	Driven	30 in Rows	36 in Rows	38 in Rows	40 in Rows	
35	24	32.5	27.1	25.6	24.4	2 to 6
35	25	31.2	26.0	24.6	23.4	2 to 6
35	26	30.0	25.0	23.7	22.5	2 to 6
35	27	28.9	24.1	22.8	21.7	2 to 6
35	28	27.8	23.2	22.0	20.9	2 to 6
29	24	26.9	22.4	21.2	20.2	2 to 7
29	25	25.8	21.5	20.4	19.4	2 to 7
29	26	24.8	20.7	19.6	18.6	2 to 7
29	27	20.6	19.9	18.9	17.9	2 to 7
29	28	23.1	19.2	18.2	17.3	2 to 6
24	24	22.2	18.6	17.6	16.6	2 to 8
24	25	21.4	17.8	16.9	16.1	2 to 8
24	26	20.6	17.1	16.2	15.5	2 to 8
24	27	19.8	16.5	15.6	14.9	2 to 8
24	28	19.1	15.9	15.1	14.3	2 to 8
20	24	18.6	15.5	14.7	14.0	2 to 8
20	25	17.9	14.9	14.1	13.4	2 to 8
20	26	17.1	14.2	13.5	12.8	2 to 8
20	27	16.5	13.8	13.0	12.4	2 to 8
20	28	15.9	13.3	12.6	11.9	2 to 8
16	24	14.9	12.4	11.7	11.2	2 to 8
16	25	14.3	11.9	11.3	10.7	2 to 8
16	26	13.7	11.4	10.8	10.3	2 to 8
16	27	13.2	11.0	10.4	9.9	2 to 8
16	28	12.7	10.6	10.0	9.5	2 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		(Based on 15,000 Seeds Per Pound) Lb. Per Acre				Recommended Speed Range in mph
Driver	Driven	30 in Rows	36 in Rows	38 in Rows	40 in Rows	
35	24	12.2	10.2	9.6	9.2	2 to 8
35	25	11.7	9.7	9.2	8.8	2 to 8
35	26	11.2	9.4	8.9	8.4	2 to 8
35	27	10.8	9.0	8.5	8.1	2 to 8
35	28	10.4	8.7	8.2	7.8	2 to 8
29	24	10.1	8.4	8.0	7.6	2 to 8
29	25	9.7	8.1	7.6	7.3	2 to 8
29	26	9.3	7.8	7.4	6.8	2 to 8
29	27	9.0	7.5	7.1	6.8	2 to 8
29	28	8.7	7.2	6.8	6.5	2 to 8
24	24	8.4	7.0	6.6	6.3	2 to 8
24	25	8.0	6.7	6.3	6.0	2 to 8
24	26	7.7	6.4	6.1	5.8	2 to 8
24	27	7.4	6.2	5.9	5.6	2 to 8
24	28	7.2	6.0	5.7	5.4	2 to 8
20	24	7.0	5.8	5.5	5.2	2 to 8
20	25	6.7	5.6	5.3	5.0	2 to 8
20	26	6.4	5.4	5.1	4.8	2 to 8
20	27	6.2	5.2	4.9	4.6	2 to 8
20	28	6.0	5.0	4.7	4.5	2 to 8
16	24	5.6	4.6	4.4	4.2	2 to 8
16	25	5.3	4.5	4.2	4.0	2 to 8
16	26	5.1	4.3	4.1	3.8	2 to 8
16	27	5.0	4.1	3.9	3.8	2 to 8
16	28	4.8	4.0	3.8	3.6	2 to 8

Edible Beans or Large Soybeans With Edible Bean Feed-Cup—15 in. to 20 in. Rows

{Decal No. DB1108} EDIBLE BEANS OR LARGE SOYBEANS WITH EDIBLE BEAN FEED CUP

APPROXIMATE LB. PER ACRE OF EDIBLE BEANS OR LARGE SOYBEANS PLANTED USING EDIBLE BEAN FEED CUP

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Lb. of Medium Beans* Per Acre				Lb. of Large Beans** Per Acre				Recommended Speed Range in mph
		15 In. Rows	18 In. Rows	19 In. Rows	20 In. Rows	15 In. Rows	18 In. Rows	19 In. Rows	20 In. Rows	
35	24	708	590	558	531	548	456	432	411	2 to 4
35	25	680	566	536	510	526	438	416	395	2 to 4
35	26	654	544	516	491	506	422	400	368	2 to 4
35	27	630	524	496	473	486	406	384	365	2 to 4
35	28	606	506	478	455	470	392	370	353	2 to 4
29	24	586	488	462	440	454	378	358	341	2 to 5
29	25	562	470	444	422	436	364	344	327	2 to 5
29	26	542	452	428	407	418	350	330	314	2 to 5
29	27	522	434	412	392	404	336	318	303	2 to 5
29	28	502	418	396	377	388	324	308	291	2 to 5
24	24	486	404	384	365	376	312	296	282	2 to 6
24	25	466	388	368	350	360	300	284	270	2 to 6
24	26	448	374	354	336	346	288	274	260	2 to 6
24	27	432	360	340	324	334	278	264	251	2 to 6
24	28	416	346	328	312	322	268	254	242	2 to 7
20	24	404	338	320	303	312	260	248	234	2 to 7
20	25	388	324	306	291	300	250	238	225	2 to 7
20	26	374	312	294	281	288	240	228	216	2 to 8
20	27	360	300	284	270	278	232	220	209	2 to 8
20	28	346	288	274	260	268	224	212	201	2 to 8
16	24	334	270	256	251	250	208	198	188	2 to 8
16	25	310	258	246	233	240	200	190	180	2 to 8
16	26	298	248	236	224	232	192	182	174	2 to 8
16	27	288	240	228	216	222	186	176	167	2 to 8
16	28	278	232	218	208	214	178	170	161	2 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Lb. of Medium Beans* Per Acre				Lb. of Large Beans** Per Acre				Recommended Speed Range in mph
		15 In. Rows	18 In. Rows	19 In. Rows	20 In. Rows	15 In. Rows	18 In. Rows	19 In. Rows	20 In. Rows	
35	24	266	222	210	200	206	172	162	155	2 to 4
35	25	254	212	202	191	198	164	156	149	2 to 4
35	26	244	204	194	183	190	158	150	119	2 to 4
35	27	236	196	186	177	182	152	144	137	2 to 4
35	28	228	190	180	171	176	146	138	132	2 to 4
29	24	220	184	174	165	170	142	134	128	2 to 5
29	25	212	176	166	159	164	136	128	123	2 to 5
29	26	202	170	160	152	158	130	122	119	2 to 5
29	27	196	162	154	147	152	126	120	114	2 to 5
29	28	188	158	148	141	146	122	116	110	2 to 5
24	24	182	152	144	137	140	118	112	105	2 to 6
24	25	174	146	138	131	136	112	106	102	2 to 6
24	26	168	140	132	126	130	108	102	98	2 to 6
24	27	162	134	128	122	126	104	98	95	2 to 6
24	28	156	130	124	117	120	100	96	90	2 to 7
20	24	152	126	120	114	118	98	92	89	2 to 7
20	25	146	122	114	110	112	94	88	84	2 to 7
20	26	140	116	111	105	108	90	86	81	2 to 8
20	27	134	112	106	101	104	86	82	78	2 to 8
20	28	130	108	102	98	100	84	80	75	2 to 8
16	24	122	102	96	92	94	78	74	71	2 to 8
16	25	116	98	92	87	90	76	72	68	2 to 8
16	26	112	94	88	84	86	72	68	65	2 to 8
16	27	108	90	86	81	84	70	66	63	2 to 8
16	28	104	86	82	78	80	68	64	60	2 to 8

* Medium beans include kidney beans at approximately 1000 seeds/lb., pinto beans at approximately 1100 seeds/lb., pink beans at approximately 1400 seeds/lb., or other beans of similar size and shape.

** Large beans include varieties which run approximately 400 seeds per lb., such as lima beans.

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

Edible Beans or Large Soybeans With Edible Bean Feed-Cup—30 in. to 40 in. Rows

{Decal No. DB1109} EDIBLE BEAN FEED CUP (EDIBLE BEANS OR LARGE SOYBEANS)

APPROXIMATE LB. PER ACRE OF EDIBLE BEANS OR LARGE SOYBEANS PLANTED WITH FINGER PICKUP WHEN USING EDIBLE BEAN FEED CUP

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Lb. of Medium Beans* Per Acre				Lb. of Large Beans** Per Acre				Recommended Speed Range in mph
		30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	354	295	279	266	274	228	216	206	2 to 4
35	25	340	283	268	255	263	219	208	197	2 to 4
35	26	327	272	258	245	253	211	200	190	2 to 4
35	27	315	262	248	236	243	203	192	182	2 to 4
35	28	303	253	239	227	235	196	185	176	2 to 4
29	24	293	244	231	220	227	189	179	170	2 to 5
29	25	281	235	222	211	218	182	172	164	2 to 5
29	26	271	226	214	203	209	175	165	157	2 to 5
29	27	261	217	206	196	202	168	159	152	2 to 5
29	28	251	209	198	188	194	162	154	146	2 to 5
24	24	243	202	192	182	188	156	148	141	2 to 6
24	25	233	194	184	175	180	150	142	135	2 to 6
24	26	224	187	177	168	173	144	137	130	2 to 6
24	27	216	180	170	162	167	139	132	125	2 to 6
24	28	208	173	164	156	161	134	127	121	2 to 7
20	24	202	169	160	152	156	130	124	117	2 to 7
20	25	194	162	153	146	150	125	119	113	2 to 7
20	26	187	156	147	140	144	120	114	108	2 to 8
20	27	180	150	142	135	139	116	110	104	2 to 8
20	28	173	144	137	130	134	112	106	100	2 to 8
16	24	162	135	128	122	125	104	99	94	2 to 8
16	25	155	129	123	116	120	100	95	90	2 to 8
16	26	149	124	118	112	116	96	91	87	2 to 8
16	27	144	120	114	108	111	93	88	83	2 to 8
16	28	139	116	109	104	107	89	85	80	2 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Lb. of Medium Beans* Per Acre				Lb. of Large Beans** Per Acre				Recommended Speed Range in mph
		30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	30 In. Rows	36 In. Rows	38 In. Rows	40 In. Rows	
35	24	133	111	105	100	103	86	81	77	2 to 4
35	25	127	106	101	95	99	82	78	74	2 to 4
35	26	122	102	97	92	95	79	75	71	2 to 4
35	27	118	98	93	89	91	76	72	68	2 to 4
35	28	114	95	90	86	88	73	69	66	2 to 4
29	24	110	92	87	82	85	71	67	64	2 to 5
29	25	106	88	83	80	82	68	64	62	2 to 5
29	26	101	85	80	76	79	65	62	59	2 to 5
29	27	98	81	77	74	76	63	60	57	2 to 5
29	28	94	79	74	70	73	61	58	55	2 to 5
24	24	91	76	72	68	70	59	56	52	2 to 6
24	25	87	73	69	65	68	56	53	51	2 to 6
24	26	84	70	66	63	65	54	51	49	2 to 6
24	27	81	67	64	61	63	52	49	47	2 to 6
24	28	78	65	62	58	60	50	48	45	2 to 7
20	24	76	63	60	57	59	49	46	44	2 to 7
20	25	73	61	57	55	56	47	44	42	2 to 7
20	26	70	58	55	52	54	45	43	40	2 to 8
20	27	67	56	53	50	52	43	41	39	2 to 8
20	28	65	54	51	49	50	42	40	38	2 to 8
16	24	61	51	48	46	47	39	37	35	2 to 8
16	25	58	49	46	44	45	38	36	34	2 to 8
16	26	56	47	44	42	43	36	34	32	2 to 8
16	27	54	45	43	41	42	35	33	32	2 to 8
16	28	52	43	41	39	40	34	32	30	2 to 8

* Medium beans include kidney beans at approximately 1000 seeds/lb., pinto beans at approximately 1100 seeds/lb., pink beans at approximately 1400 seeds/lb., or other beans of similar size and shape.

** Large beans include varieties which run approximately 400 seeds per lb., such as lima beans.

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

A50499 -19-16MAR04

Radial Bean Meter Rate Charts

Radial Bean Meter Operating Characteristics

IMPORTANT: The graph shows operating characteristics of radial bean metering units.

The operating band illustrates how a radial bean metering unit performs with regard to desired population (indicated by the horizontal line). The width of the band is due to various sizes and shapes of seeds.

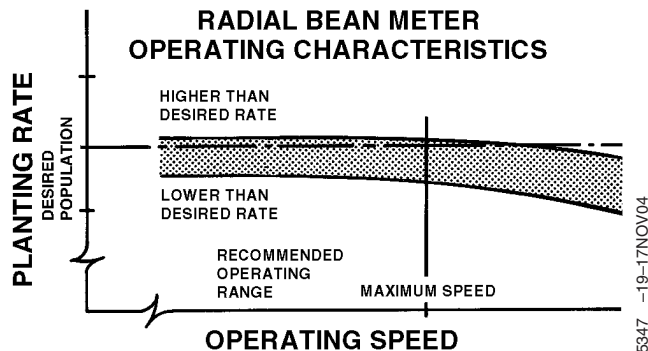
IMPORTANT: To prevent planting miscalculations, perform field checks to determine if the desired rate is being planted.

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

Best results are obtained when machine is operated below maximum speed.

Large beans may result in lower rates than those in the chart at higher planting speeds. Small beans may give somewhat higher rates at lower planting speeds. Actual rates **MUST** be checked in the field at planting speed, and machine settings changed accordingly.

The radial bean meter performs best with uniform seed sizes. Mixing seed sizes can cause high drive-torque, increased wear, or meter damage. If mixed seed must be used, always use setting for smallest seed size.



Continued on next page

AG,OUO6074,1266 -19-28JUN05-1/3

IMPORTANT: If farmer-applied treatments are used, follow chemical manufacturer's recommendations carefully. Dry powder or fast drying liquid treatments are generally recommended. **HIGH-OIL-CONTENT TREATMENTS ARE NOT RECOMMENDED.**

Chemical reaction between farmer-applied seed treatments and treatments commercially applied to seed can cause seed treatments to become sticky. Certain temperature and humidity levels can further complicate material compatibility. Treatments which adhere to radial bean meter components can cause reduced population and spacing control.

Check with the chemical and seed supplier for treatment compatibility.

NOTE: Using liquid hopper-applied seed treatments which leave a wet coating on seed is not recommended.

Metering rates can vary depending upon surface texture of beans as well as whether or not beans are coated with seed treatment. These factors, in combination with variations in seed size, can result in differences between rates given in charts versus what is actually planted.

Increasing amount of graphite per 35.2 L (1 bu) of seed added into hopper may improve metering rate of rough-textured or treated seed.

The best way to determine if a radial bean meter is delivering the correct rate is to actually check population in the field. See Checking Seed Population section.

After determining correct sprocket combinations for the desired planting rate, plant at a speed no greater than maximum speed shown for the sprocket combination being used. This will help ensure accurate planting rates.

CROP STAND = SEED SINGULATION + SEED PLACEMENT + AGRONOMIC FACTORS

Seed Singulation = Seed Selection + Field Conditions + Maintenance

Seed Placement = Row Unit Maintenance + Speed + Field Conditions + Planter Attachments + Observation & Adjustment

Agonomic Factors = Seed Germination + Soil Temperature + Moisture + Nutrients + Pest Control + Weather

AG,OUO6074,1266 -19-28JUN05-3/3

How to Use Planting Rate Charts

IMPORTANT: The actual planting rate must be checked in the field. See CHECKING SEED POPULATION section.

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

1. Select desired row spacing and seed population under proper column.

2. Choose proper input sprocket:

A higher population will require the use of the high-range input sprocket and HIGH RANGE chart for that particular seed.

A lower population will require the use of the low range input sprocket and LOW RANGE chart for that particular seed.

3. Determine correct seed drive transmission sprocket combination.

4. Determine recommended planting speed range. The faster speed, in the speed range, is for optimum field conditions. Reduce speed and increase unit downforce if planting in rough conditions.

AG,OUO6074,1267 -19-12JAN06-1/1

Use of Powdered Graphite

See Use of Talc and Graphite Lubricants section.

OUO6074,0000E67 -19-11JAN06-1/1

Setting Radial Bean Meter

IMPORTANT: Meter cannot be adjusted when bowl is full. Seed inside bowl prevents bowl cover from moving in. Hopper/meter should be placed on its side and seed shaken down to create room for bowl cover.

Bowl should turn with minimal resistance when cells are filled with seed. If bowl is difficult to turn, soybeans may be passing beneath bowl. Reduce setting by one position (C to B, or B to A), and check population in the field. See Checking Seed Population section.

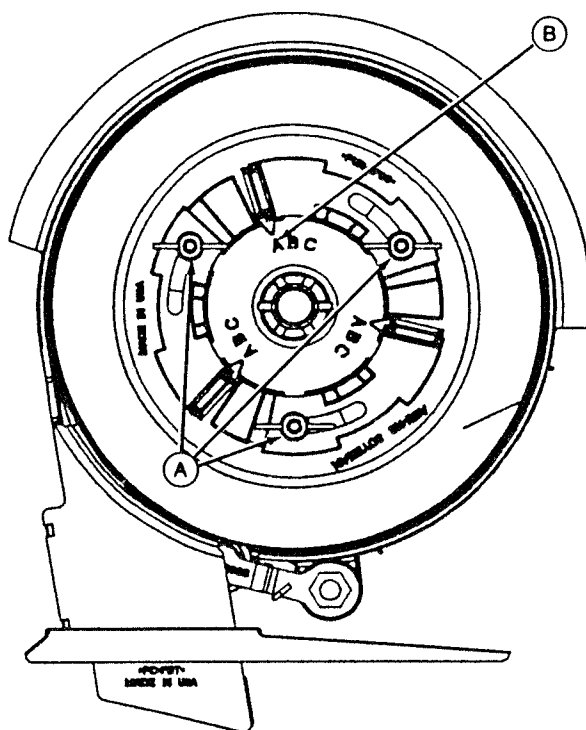
Loosen nuts (A) and align indicator with the corresponding letter (B) listed according to soybean size.

Position	Seed Size in Seeds/kg	Seed Size in Seeds/lb	Description
A	8158 to 9923	3700 to 4500	Small
B	6174 to 8159	2800 to 3700	Medium Small
C	4410 to 6174	2000 to 2800	Large

Settings above are approximate for a given seed size. Operator should check population, and adjust setting to get best population control. Selecting next larger seed size will result in a slightly greater population. Selecting next smaller seed size will result in a slightly lower population.

NOTE: If a combination of seed sizes exists, meter should be set for smaller instead of larger sized seed. This will prevent damage to seed meter and hub caused by seeds wedged between bowl and meter housing.

For non-commercial or "bin run" seed, use the following method to determine proper A-B-C setting.



A—Nut
B—Letter Indicator

A40338 -UN-17OCT96

Remove meter from bottom of hopper. Fill meter with seed and spin meter for one full revolution. Scribe a mark on meter bowl and meter housing. Turn meter five full revolutions until scribed marks line up again. Count seeds that have been metered.

Setting Meter for "Bin Run" Seed	
Correct A-B-C Setting	270 to 290 Seeds
Low A-B-C Setting	269 Seeds or Below (Move to Next Highest Setting)
High A-B-C Setting	291 Seeds or Above (Move to Next Lowest Setting)

Addition of a 15 mL (1 Tbls.) of graphite per 58 L (1.6 bu) hopper is recommended for extending life of meter.

Addition of 120 mL (1/2 cup) of talc over top of each hopper full of seeds may improve population during humid planting conditions.

AG,OUO6074,1268 -19-12JAN06-2/2

Soybeans—18 in. to 22 in. Rows

SOYBEANS WITH RADIAL BEAN METER
AVERAGE SEED SPACING IN INCHES AND/OR APPROXIMATE
SEED POPULATION PER ACRE OF SOYBEANS

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS."

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing Inches	Approximate Seed Population Per Acre			Recommended Speed Range in mph
			18 in Rows	19 in Rows	22 in Rows	
35	24	0.80	436 874	413 880	357 442	2 to 6
35	25	0.83	419 399	397 325	343 144	2 to 6
35	26	0.86	403 268	382 043	329 947	2 to 6
35	27	0.90	388 332	367 894	317 726	2 to 6
35	28	0.93	374 463	354 755	306 379	2 to 6
29	24	0.96	361 981	342 929	296 166	2 to 7
29	25	1.00	347 502	329 212	284 320	2 to 7
29	26	1.04	334 136	316 650	273 384	2 to 7
29	27	1.08	321 761	304 826	263 259	2 to 7
29	28	1.12	310 269	293 940	253 857	2 to 8
24	24	1.16	299 571	283 804	245 103	2 to 8
24	25	1.21	287 588	272 452	235 299	2 to 8
24	26	1.26	276 527	261 973	226 249	2 to 8
24	27	1.31	266 285	252 270	217 869	2 to 8
24	28	1.36	256 776	243 260	210 088	2 to 8
20	24	1.40	249 642	236 503	204 253	2 to 8
20	25	1.45	239 656	227 043	196 083	2 to 8
20	26	1.51	230 439	218 311	188 541	2 to 8
20	27	1.57	221 904	210 225	181 558	2 to 8
20	28	1.63	213 979	202 717	175 074	2 to 8
16	24	1.74	198 714	189 202	163 402	2 to 8
16	25	1.82	191 725	181 634	156 866	2 to 8
16	26	1.89	184 351	174 648	150 833	2 to 8
16	27	1.96	177 523	168 180	145 246	2 to 8
16	28	2.04	171 183	162 174	140 059	2 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth) Driver Driven		Average Seed Spacing Inches	Approximate Seed Population Per Acre			Recommended Speed Range in mph
			18 in Rows	19 in Rows	22 in Rows	
35	24	2.13	163 828	155 205	134 041	2 to 8
35	25	2.22	157 275	148 997	128 679	2 to 8
35	26	2.30	151 226	143 286	123 730	2 to 8
35	27	2.39	145 625	137 960	119 147	2 to 8
35	28	2.48	140 240	133 033	114 892	2 to 8
29	24	2.57	135 743	128 599	111 062	2 to 8
29	25	2.67	130 313	123 455	106 620	2 to 8
29	26	2.78	125 301	118 706	102 519	2 to 8
29	27	2.89	120 660	114 310	98 722	2 to 8
29	28	3.00	116 351	110 227	95 196	2 to 8
24	24	3.10	112 339	106 426	91 914	2 to 8
24	25	3.23	107 845	102 169	88 237	2 to 8
24	26	3.36	103 697	98 240	84 843	2 to 8
24	27	3.49	99 857	94 601	81 701	2 to 8
24	28	3.62	96 291	91 223	78 783	2 to 8
20	24	3.72	93 616	88 689	76 595	2 to 8
20	25	3.88	89 871	85 141	73 531	2 to 8
20	26	4.03	86 415	81 866	70 703	2 to 8
20	27	4.19	83 214	78 834	68 084	2 to 8
20	28	4.34	80 242	76 019	65 653	2 to 8
16	24	4.65	74 893	70 951	61 276	2 to 8
16	25	4.85	71 897	68 113	58 825	2 to 8
16	26	5.04	69 132	65 493	56 562	2 to 8
16	27	5.23	66 571	63 067	54 467	2 to 8
16	28	5.43	64 194	60 815	52 522	2 to 8

A50504 -19-07OCT02

Soybeans—15 in. to 30 in. Rows

{Decal No. DB 1328}

SOYBEANS WITH RADIAL BEAN METER - 56 CELLS

AVERAGE SEEDS SPACING IN INCHES AND/OR APPROXIMATE
SEED POPULATION PER ACRE OF SOYBEANS

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed Spacing Inches	Approximate Seed Population Per Acre			Recommended Speed Range in mph
Tran Driver	Tran Driven		15 in Rows	20 in Rows	30 in Rows	
35	24	0.80	524 248	393 186	262 124	2 to 6
35	25	0.83	503 278	377 459	251 639	2 to 6
35	26	0.86	483 922	362 941	241 961	2 to 6
35	27	0.90	465 999	349 499	232 999	2 to 6
35	28	0.93	449 356	337 017	224 678	2 to 6
29	24	0.96	434 377	325 783	217 189	2 to 7
29	25	1.00	417 002	312 752	208 501	2 to 7
29	26	1.04	400 964	300 723	200 482	2 to 7
29	27	1.08	386 113	289 585	193 057	2 to 7
29	28	1.12	372 323	279 243	186 162	2 to 8
24	24	1.16	359 485	269 613	179 742	2 to 8
24	25	1.21	345 105	258 829	172 553	2 to 8
24	26	1.26	331 832	248 874	165 916	2 to 8
24	27	1.31	319 542	239 656	159 771	2 to 8
24	28	1.36	308 130	231 097	154 065	2 to 8
20	24	1.40	299 571	224 678	149 785	2 to 8
20	25	1.45	287 588	215 691	143 794	2 to 8
20	26	1.51	276 527	207 395	138 263	2 to 8
20	27	1.57	266 285	199 714	133 142	2 to 8
20	28	1.63	256 775	192 581	128 387	2 to 8
16	24	1.74	239 656	179 742	119 828	2 to 8
16	25	1.82	230 070	172 553	115 035	2 to 8
16	26	1.89	221 221	165 916	110 611	2 to 8
16	27	1.96	213 028	159 771	106 514	2 to 8
16	28	2.04	205 420	154 065	102 710	2 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed Spacing Inches	Approximate Seed Population Per Acre			Recommended Speed Range in mph
Tran Driver	Tran Driven		15 in Rows	20 in Rows	30 in Rows	
35	24	2.13	196 593	147 445	98 297	2 to 8
35	25	2.22	188 729	141 547	94 365	2 to 8
35	26	2.30	181 471	136 103	90 735	2 to 8
35	27	2.39	174 749	131 062	87 375	2 to 8
35	28	2.48	168 508	126 381	84 254	2 to 8
29	24	2.57	162 891	122 169	81 446	2 to 8
29	25	2.67	156 376	117 282	78 188	2 to 8
29	26	2.78	150 361	112 771	75 181	2 to 8
29	27	2.89	144 792	108 594	72 396	2 to 8
29	28	3.00	139 621	104 716	69 811	2 to 8
24	24	3.10	134 807	101 105	67 403	2 to 8
24	25	3.23	129 414	97 061	64 707	2 to 8
24	26	3.36	124 437	93 328	62 218	2 to 8
24	27	3.49	119 828	89 871	59 914	2 to 8
24	28	3.62	115 549	86 661	57 774	2 to 8
20	24	3.72	112 339	84 254	56 169	2 to 8
20	25	3.88	107 845	80 884	53 923	2 to 8
20	26	4.03	103 697	77 773	51 849	2 to 8
20	27	4.19	99 857	74 893	49 928	2 to 8
20	28	4.34	96 291	72 218	48 145	2 to 8
16	24	4.65	89 871	67 403	44 936	2 to 8
16	25	4.85	86 276	64 707	43 138	2 to 8
16	26	5.04	82 958	62 218	41 479	2 to 8
16	27	5.23	79 885	59 914	39 943	2 to 8
16	28	5.43	77 032	57 774	38 516	2 to 8

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

Soybeans—36 in. to 40 in. Rows

{Decal No. DB 1329}

SOYBEANS WITH RADIAL BEAN METER - 56 CELLS

AVERAGE SEEDS SPACING IN INCHES AND/OR APPROXIMATE
SEED POPULATION PER ACRE OF SOYBEANS

NOTE: For information on using planting rate charts, see "HOW TO USE PLANTING RATE CHARTS".

HIGH RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed Spacing Inches	Approximate Seed Population Per Acre			Recommended Speed Range in mph
Tran Driver	Tran Driven		36 in Rows	38 in Rows	40 in Rows	
35	24	0.80	218 437	206 940	196 593	2 to 6
35	25	0.83	209 699	198 663	188 729	2 to 6
35	26	0.86	201 634	191 022	181 471	2 to 6
35	27	0.90	194 166	183 947	174 749	2 to 6
35	28	0.93	187 232	177 377	168 508	2 to 6
29	24	0.96	180 991	171 465	162 891	2 to 7
29	25	1.00	173 751	164 606	156 376	2 to 7
29	26	1.04	167 068	158 275	150 361	2 to 7
29	27	1.08	160 880	152 413	144 792	2 to 7
29	28	1.12	155 135	146 970	139 621	2 to 8
24	24	1.16	149 785	141 902	134 807	2 to 8
24	25	1.21	143 794	136 226	129 414	2 to 8
24	26	1.26	138 263	130 986	124 437	2 to 8
24	27	1.31	133 142	126 135	119 828	2 to 8
24	28	1.36	128 387	121 630	115 549	2 to 8
20	24	1.40	124 821	118 252	112 339	2 to 8
20	25	1.45	119 828	113 521	107 845	2 to 8
20	26	1.51	115 219	109 155	103 697	2 to 8
20	27	1.57	110 952	105 112	99 857	2 to 8
20	28	1.63	106 989	101 358	96 291	2 to 8
16	24	1.74	99 857	94 601	89 871	2 to 8
16	25	1.82	95 863	90 817	86 276	2 to 8
16	26	1.89	92 176	87 324	82 958	2 to 8
16	27	1.96	88 762	84 090	79 885	2 to 8
16	28	2.04	85 592	81 087	77 032	2 to 8

LOW RANGE INPUT SPROCKET

Sprocket Combinations (Number of Teeth)		Average Seed Spacing Inches	Approximate Seed Population Per Acre			Recommended Speed Range in mph
Tran Driver	Tran Driven		36 in Rows	38 in Rows	40 in Rows	
35	24	2.13	81 914	77 603	73 722	2 to 8
35	25	2.22	78 637	74 498	70 774	2 to 8
35	26	2.30	75 613	71 633	68 051	2 to 8
35	27	2.39	72 812	68 980	65 531	2 to 8
35	28	2.48	70 212	66 516	63 191	2 to 8
29	24	2.57	67 871	64 299	61 084	2 to 8
29	25	2.67	65 157	61 727	58 641	2 to 8
29	26	2.78	62 651	59 353	56 386	2 to 8
29	27	2.89	60 330	57 155	54 297	2 to 8
29	28	3.00	58 176	55 114	52 358	2 to 8
24	24	3.10	56 169	53 213	50 553	2 to 8
24	25	3.23	53 923	51 085	48 530	2 to 8
24	26	3.36	51 849	49 120	46 664	2 to 8
24	27	3.49	49 928	47 301	44 936	2 to 8
24	28	3.62	48 145	45 611	43 331	2 to 8
20	24	3.72	46 808	44 344	42 127	2 to 8
20	25	3.88	44 936	42 571	40 442	2 to 8
20	26	4.03	43 207	40 933	38 887	2 to 8
20	27	4.19	41 607	39 417	37 446	2 to 8
20	28	4.34	40 121	38 009	36 109	2 to 8
16	24	4.65	37 446	35 475	33 702	2 to 8
16	25	4.85	35 948	34 056	32 354	2 to 8
16	26	5.04	34 566	32 747	31 109	2 to 8
16	27	5.23	33 286	31 534	29 957	2 to 8
16	28	5.43	32 097	30 408	28 887	2 to 8

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

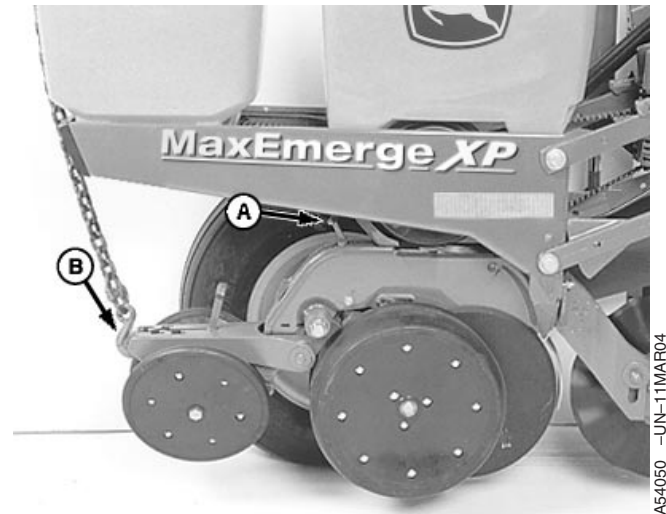
A50501 -19-04OCT02

Checking Seed Population

Checking Seed Population

NOTE: When planting at a shallow depth with the closing wheels raised, seeds may tend to roll or bounce. This will affect seed spacing accuracy.

1. Attach chain (B) to one or more sets of closing wheels, so seed trench remains open.
2. Set depth-adjusting handle (A) two settings from minimum setting.
3. Plant a short distance and check to see if seeds are visible in trench. Adjust depth-adjusting handle if necessary.
4. Plant approximately 91 m (100 yd).
5. Consult charts and determine what distance equals 1/1000 of a hectare, 1/1000 of an acre or 1/200 of an acre as it relates to the row width being planted.



A—Depth-Adjusting Handle
B—Chain

Distance to Plant for Population Check									
	Row Width Being Planted								
Fraction of Acre	15 in.	18 in.	19 in.	20 in.	22 in.	30 in.	36 in.	38 in.	40 in.
1/1000 if population is more than 100 000 seeds/acre	34.8 ft	24.0 ft	27.6 ft	26.1 ft	23.8 ft	17.4 ft	14.5 ft	13.8 ft	13.1 ft
1/200 if population is less than 100 000 seeds/acre	174 ft	145 ft	138 ft	131 ft	119 ft	87 ft	72.5 ft	69 ft	66 ft

Distance to Plant for Population Check										
	Row Width Being Planted									
Fraction of Hectare	38 cm	46 cm	48 cm	51 cm	56 cm	70 cm	76 cm	91 cm	97 cm	101 cm
1/1000	26.24 m	21.88 m	20.72 m	19.68 m	17.90 m	14.29 m	13.12 m	10.94 m	10.36 m	9.84 m

Continued on next page

OUC6074,0000A0B -19-19APR05-1/2

6. Mark distance selected with flags (A).

NOTE: When planting at a shallow depth with closing wheels raised, seeds may tend to roll or bounce. This will affect seed spacing accuracy.

7. Count seeds (B) between flags.

8. If 1/1000 of an acre was marked off, multiply number of seeds counted by 1000.

If 1/200 of an acre was marked off, multiply number of seeds counted by 200.

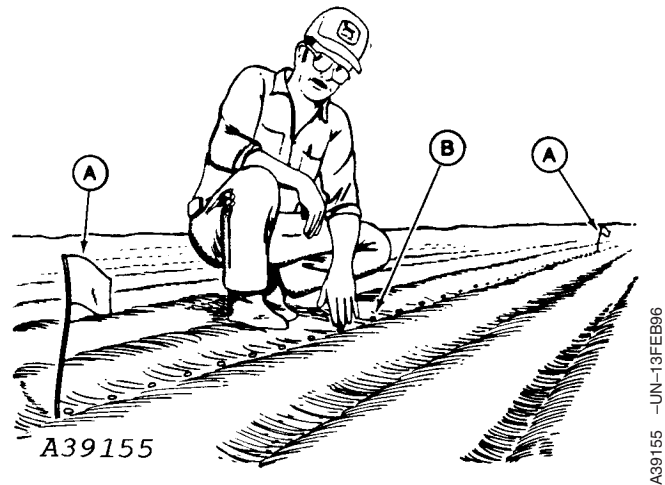
If 1/1000 of a hectare was marked off, multiply number of seeds counted by 1000.

If in-field checks indicate that machine is planting at a rate significantly different than seed transmission rate chart indicates, investigate the following in the order listed:

1. Ensure that ALL transmission sprockets are set according to rate chart.
2. Excessive unit bounce can cause low population and reduced spacing control. Increase unit down force or drive slower to reduce excessive unit bounce.
3. Ensure that machine drive-wheel slippage is close to normal. Crop residue, tire inflation pressure, soil conditions and unit down force can cause variations in drive-wheel slippage.

FOR VACUUM METER ONLY:

If all other settings are correct and if population is too high, vacuum level can be reduced in one inch increments until correct population is achieved. If actual population is too low, vacuum level can be increased in half inch to one inch increments until correct population is achieved.



A—Flag
B—Seeds

A39155 -UN-13FEB96

Drive-Wheel Slippage—Machines with Seed Transmission

Another item that may cause actual rates of seed or fertilizer to differ from delivery rates shown in the operator's manual is the amount of drive-wheel slippage.

While a certain amount of wheel slippage is normal, excessive drive-wheel slippage may cause undesirable changes in actual rates.

The rates shown in the operator's manual are based on approximately 12 percent drive wheel slippage.

Excessive drive-wheel slippage may be caused by binding or poorly lubricated parts, misaligned bearings or caked material in pesticide or fertilizer hoppers.

Down pressure springs, coulters, tine tooth attachments, or any other attachment that removed weight from drive wheels, may contribute to drive-wheel slippage and lower than expected rates.

Continued on next page

AG,OUO6074,1270 -19-04AUG00-1/2

The amount of excessive drive-wheel slippage can be calculated.

1. Mark a length of field that would normally represent 30 drive wheel revolutions. Use the following formula to calculate the length of field to drive.

FORMULA:

Revolutions x Drive Wheel Rolling Circumference =
Length of Field to Drive

EXAMPLE:

- 30 revolutions x 2.5 m = 75 m
- 30 revolutions x 8.3 ft = 250 ft

2. Mark drive wheel with a rubber hold-down strap, reflective tape or duct tape. This will help to count wheel revolutions.
3. With all rows planting under normal field conditions, drive a 76 m (250 ft) course at normal planting speed while another person counts drive-wheel revolutions.
4. Subtract number of revolutions observed over the course length from 30. Then divide this difference by 30.

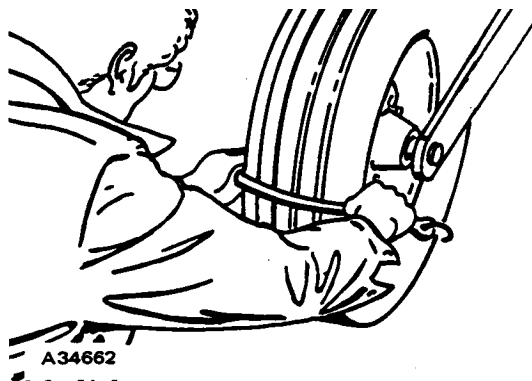
EXAMPLE:

If 28 wheel revolutions are observed, there is 6.6 percent drive-wheel slippage.

$$30 - 28 = 2$$

$$2 \div 30 = 0.066$$

If drive-wheel slippage is greater than or less than 12 percent (baseline slippage), adjust seed transmission to obtain desired population.



A34662 -JUN-10OCT88

General Attachments

General

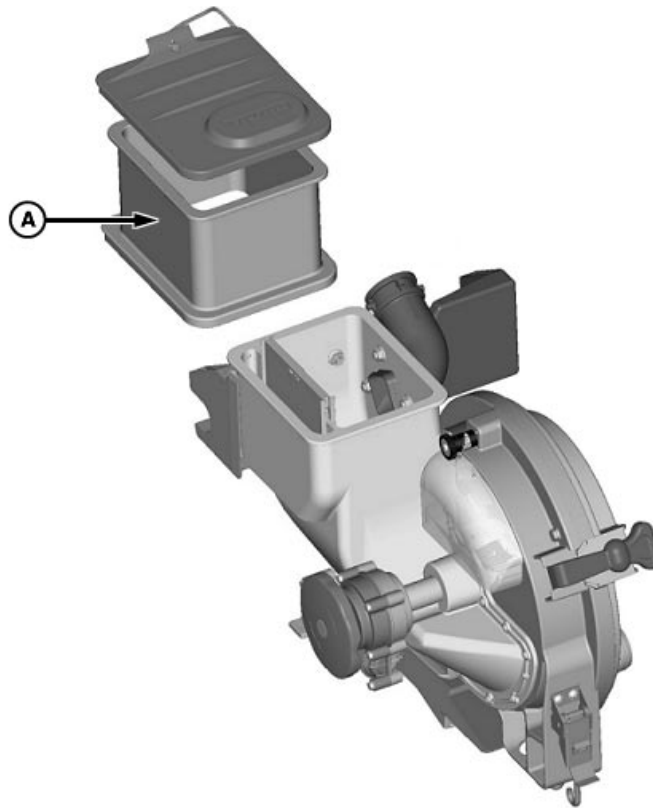
IMPORTANT: For proper machine operation, it is important that machine frame be fully lowered into correct planting position. Achieving this position can be difficult with some attachment combinations, especially when planting in hard to penetrate soil conditions. If this situation is encountered, the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

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

Add frame ballast when conditions warrant. This may be particularly important if the frame mounted coulter is being used.

AG,OUO6074,1609 –19–07AUG00–1/1

Hopper Extensions for the Pro-Series Row Unit



A56609 -UN-27JUN05

A—Extension

Hopper extensions are available for the Pro-Series row unit seed hopper. These extensions are intended to be used with small-seed crops like sugar beets that are not used in the CCS system or when planting test plots with any seed. They provide additional capacity for the small seeds and provide easier cleanout when

changing crop varieties on a frequent basis. The hopper extensions slide onto the existing hopper and form a tight seal between the hopper and the extension. A maximum of two extensions can be stacked onto the existing hopper.

OUO6074,0000E2F -19-27JUN05-1/1

SEEDSTAR Variable Rate Drive System

SEEDSTAR Variable Drive system provides electrical/hydraulic versus mechanical means of driving seed meters. The system uses radar to obtain machine speed information and has a wheel motion sensor to verify machine motion.

With SEEDSTAR variable drive, the operator can manually change the seeding rate “on-the-go” from the tractor cab.

- Operator can match seed population to differing soil types or to irrigated versus dry land soils.
- Operator can program up to six different seed rates in the system. Then, during the planting operation, the operator can select any of the programmed rates and change seed rates.

For more information, see SEEDSTAR Seed Monitor and Variable Rate Drive Operator's Manual.

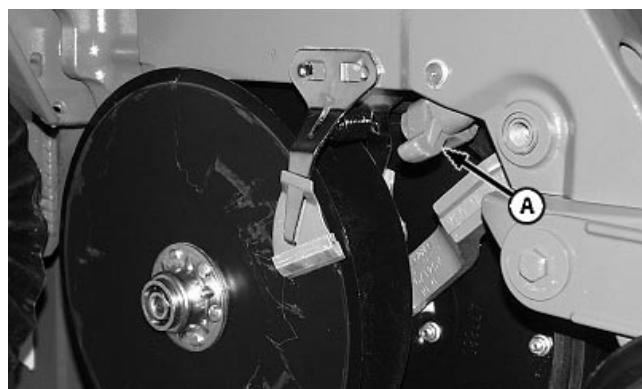
AG,OUO6074,1271 –19–04AUG00–1/1

Walking Gauge Wheels

The walking gauge-wheel attachment (A) should be used in rocky conditions or in fields with rough surface conditions due to soil clods or residue. In these conditions, the walking gauge-wheel reduces vertical movement of opener when one gauge wheel rolls over a solid obstacle. Reduced opener movement increases seed depth control.

Walking action is reduced when planting very deep or very shallow.

Walking gauge wheels are not for light soil or well-tilled soil conditions. In these conditions, gauge wheels can run at different heights relative to each other. This results in poor seed-depth consistency and possible poor closing action which may affect emergence.



A—Walking Gauge Wheels Attachment

A54018 –UN–08MAR04

OUO6074,00009D9 –19–08MAR04–1/1

106 L (3.0 Bu) Hopper

106 L (3.0 bu) hoppers are available as an option for plateless and vacuum seed meters.



A54025 -UN-08MAR04

OUO6074,0000C50 -19-30APR04-1/1

Seed Tubes

Large curved, regular curved, regular straight, and small straight seed tubes are available for all seed metering systems.

Large curved seed tubes are recommended for planting large edible beans, large peanuts and other large seeds.

NOTE: *ACCUCOUNT seed tube sensors are available as an option for all machines equipped with the regular curved seed tubes. The ACCUCOUNT sensor is a more accurate sensor than the standard sensor and is designed for high-volume crops, specifically soybeans. See your John Deere dealer for more information.*

Regular curved seed tubes are recommended for planting acid-delinted cotton, corn, soybeans, sorghum, small edible beans, sugar beets and other small seeds.

Regular straight seed tube will plant the same seeds as the regular curved seed tube except it deposits the seed closer to the opener. It is recommended in light, sandy soils which tend to close quickly behind the opener or when planting small, light seeds.

Small straight seed tube is for small seeds such as sorghum. Used with the small seed tube runner it will provide better depth control in light, fluffy soils.

All seed tubes have snap-in tabs for quick seed tube placement.

To Remove, see INSTALLING AND REMOVING SEED TUBES in Operating the Machine section.

A46559 -UN-23AUG00



Seed Tubes

ACCUCOUNT is a trademark of Deere & Company

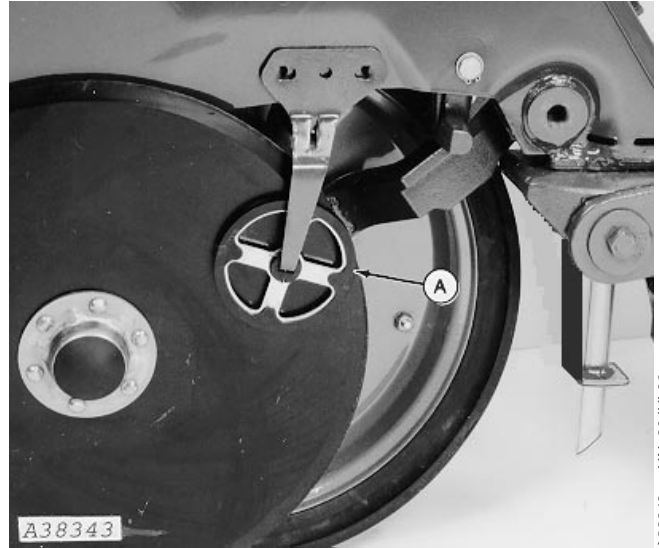
AG,OUO6074,1275 -19-24JUN05-1/1

Rotary Scraper

The rotary scraper (A) is recommended for use in moist-sticky soils to clean TRU-VEE opener blades.

Inspect scraper insert for wear at beginning of season and periodically during season.

A—Rotary Scraper



Rotary Scraper

TRU-VEE is a trademark of Deere & Company

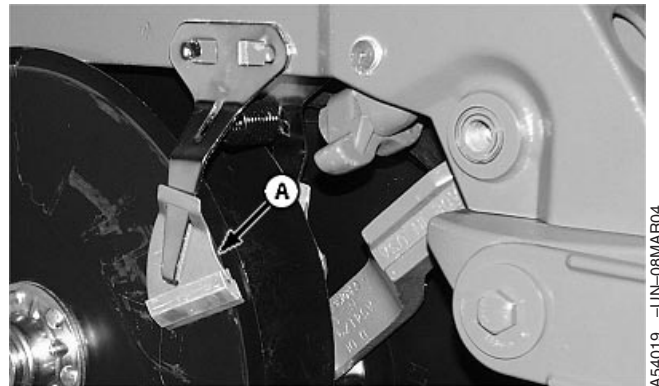
AG,OUO6074,1276 -19-04AUG00-1/1

Rigid Scraper

The rigid scraper (A) is recommended for use in moist-sticky soils to clean TRU-VEE opener blades.

Inspect scraper insert for wear at beginning of season and periodically during season.

A—Rigid Scraper



Rigid Scraper

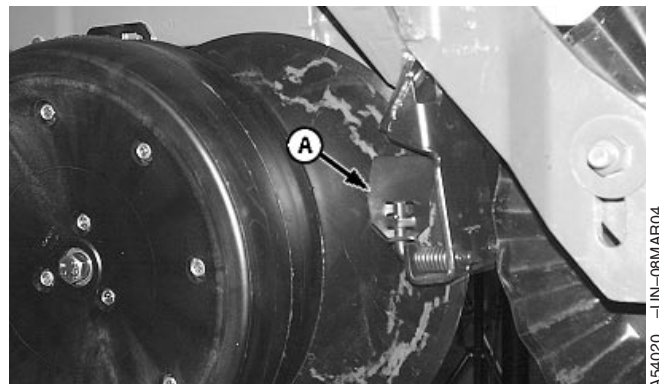
OUO6074,00009D8 -19-08MAR04-1/1

Heavy-Duty Scraper

NOTE: Heavy-duty scrapers can also be used with rotary scrapers.

The heavy duty scraper (A) is recommended for extremely sticky soils to clean TRU-VEE opener blades.

A—Heavy Duty Scraper

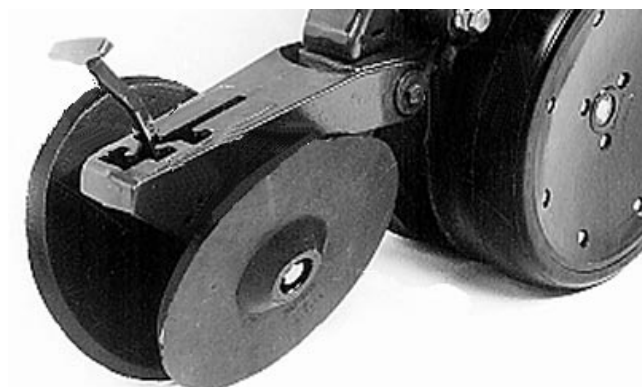


OUO6074,00009DA -19-08MAR04-1/1

Heavy-Duty Closing Wheels

NOTE: The heavy-duty closing wheels are not recommended for conventional planting conditions.

In hard to penetrate soils or seed beds with considerable residue, it may be difficult to completely close the seed furrow with regular closing-wheels. Heavy-duty closing wheels are made of heavy cast material and have an aggressive edge to more effectively close the seed furrow in severe soil conditions.



Heavy-Duty Closing Wheels

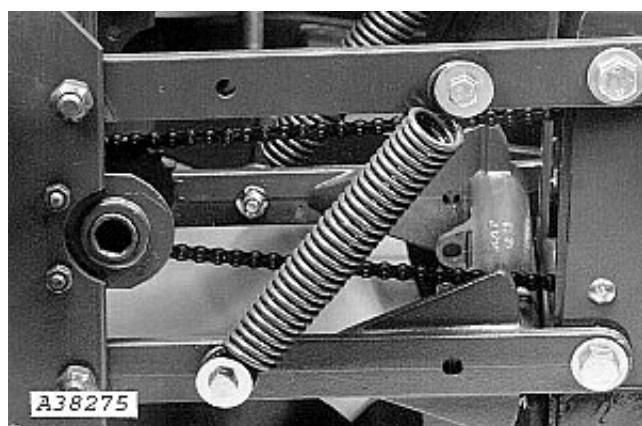
AG,OUO6074,1278 -19-04AUG00-1/1

Unit Down Force Springs

NOTE: If machine is configured with 38 cm (15 in.) row spacing, springs must be mounted on inside of parallel arms.

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

Springs are non-adjustable with 40 kg (90 lb) of down force when parallel arms are in horizontal position. Two sets per row may be used for 80 kg (180 lb) of down force.



Single Unit Down Force Springs

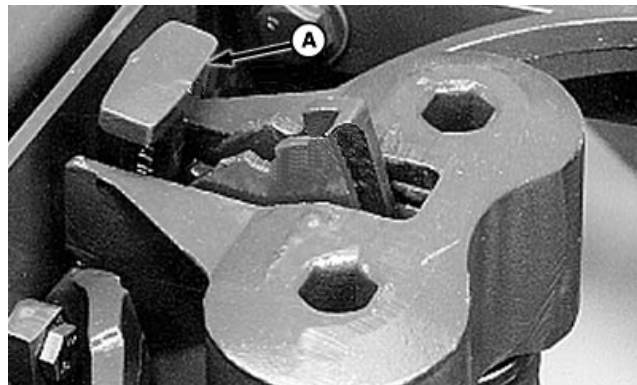
OUO6074,00009FD -19-09MAR04-1/1

Heavy-Duty Down Force Springs

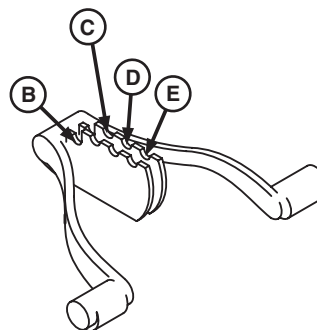
The adjustable heavy-duty down force spring system is recommended when planting in rough field conditions and when soil or soil residue is difficult to penetrate. Spring system will transfer main frame weight to planting unit, to minimize bounce and to assist opener in penetrating hard soil conditions. The amount of force transfer is adjustable from 0 to 181 kg (0 to 400 lb). Never use more down force than necessary to prevent excessive drive wheel slip. In tough conditions, ballast weight may be required.

To adjust down force springs, proceed as follows:

1. Raise machine.
2. Lift spring-adjusting handle (A) and place into notch (B), (C), (D) or (E) for desired amount of down force.
 - Use notch (B) for Zero kg (lb) of down force.
 - Use notch (C) for 57 kg (125 lb) of down force.
 - Use notch (D) for 113 kg (250 lb) of down force.
 - Use notch (E) for 181 kg (400 lb) of down force.



Handle In Minimum Position



- A—Spring-Adjusting Handle**
B—Notch
C—Notch
D—Notch
E—Notch

OOU6074,0000887 -19-17JAN06-1/1

Pneumatic Down Force



CAUTION: Avoid serious injury from exploding parts due to overpressurization or operating the system without all components in place.

- Do not inflate system above 827 kPa (8.2 bar) (120 psi).
- Do not remove pressure relief valve.
- Do not pressurize system unless all row unit components are in place.

IMPORTANT: Do not lower machine with zero air pressure in system. Maintain 34 kPa to 55 kPa (0.3 bar to 0.5 bar) (5 psi to 8 psi) in system or air bags may kink. If air bag kinks, raise machine and pressurize the system until air bags straighten out.

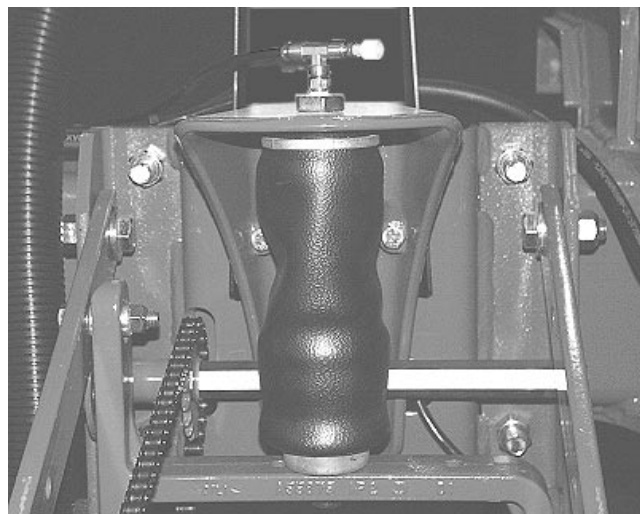
IMPORTANT: Do not operate a pinched or unrolled air spring. Should this occur, lower system pressure until springs can be rolled by hand. Roll spring back over lower piston. Incremental lowering of machine may be required to start air spring rolling over lower piston.

NOTE: It is normal for system air pressure to drop when frame is raised and increase when frame is lowered.

NOTE: Row units that follow in tractor tire tracks may require additional down force. To accomplish this without affecting other row units, an extra single down force spring can be installed on those row units.

1. With machine in planting position, apply shop air to valve stem (A) to pre-set down force to desired setting.

A—Valve Stem



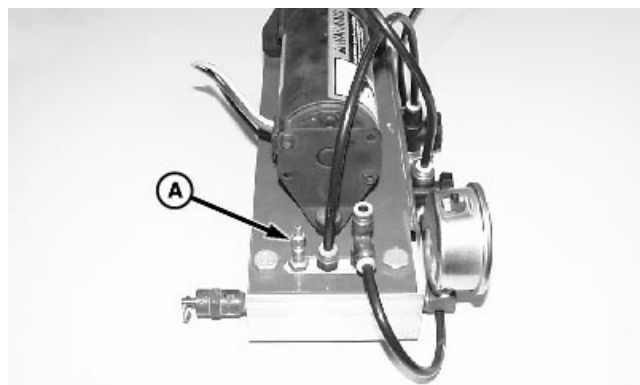
Properly Rolled Spring

A48706 -UN-15FEB02

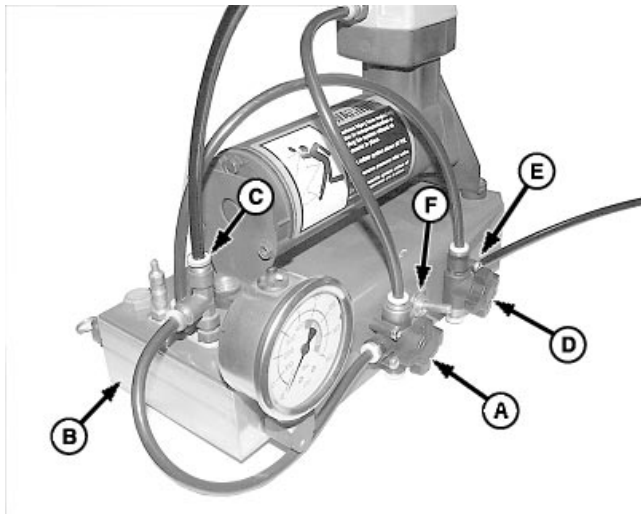


Improperly Rolled Air Spring

A48850 -UN-01MAR02

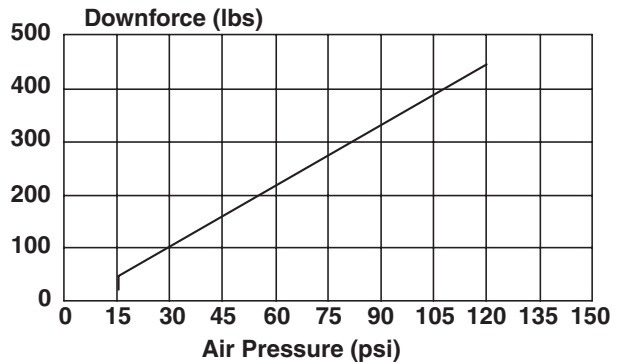


A56324 -UN-18MAY05



A56427 -UN-09JUN05

Air Pressure/Downforce



Note: force values recorded when parallel arms are level.

A48647 -19-20FEB02

A—Valve
B—Manifold

C—T-Fitting
D—Valve

E—Fitting

F—Toggle Switch

- If equipped with split rows, attach hose with white mark to fitting (E). Attach hose without white mark, for primary rows, to T-fitting (C). Turn valve (A) counter clockwise to allow compressor pressure to entire system. Turn valve (D) counter clockwise to allow system pressure to split rows, if equipped. Turn valve (D) clockwise to release pressure from split rows, if equipped. Turn valve (A) clockwise to release pressure from entire system.

IMPORTANT: Do not leave compressor on while planting. Compressor may be damaged if allowed to run more than 7 minutes. Allow 30 minutes for compressor to cool down before operating again. Use shop air to preset down force and use compressor for small in-field adjustments.

NOTE: Power to compressor is tied to tractor ignition switch. Compressor will not run if ignition switch is in "off" position.

- To increase system pressure (increase down force), turn compressor on using toggle switch (F) and open appropriate valve(s) as described in preceding step. When desired setting is reached, turn compressor off.

- Pressure drop in excess of 83 kPa (0.8 bar) (12 psi) in 10 hours is considered excessive and could indicate a fitting leak.

NOTE: Using a spray bottle, spray soap and water on fittings. Bubbles will be present, if air is leaking.

In the event of excessive pressure drops, check all connections with soap and water in the following order:

- Threaded Compressor Fittings—If leaking, tighten or tape threads with thread tape and install fittings.
- Hose Compression Fittings—If leaking, push hose completely into coupler.

If leak persists, first relieve system pressure, then simultaneously push in green compression ring and gently pull air line out of fitting. Cut off hose tip squarely, clean and reinstall hose in coupler.

- Threaded Swivel On Row Unit Where Fitting Screws Into Top Of Air Spring—If leaking, tighten fitting or remove fitting, apply thread tape and install fitting.

Unit Mounted Coulter



CAUTION: Raise machine and install service locks.



CAUTION: Coulter blades are very sharp. Use caution to avoid being cut.

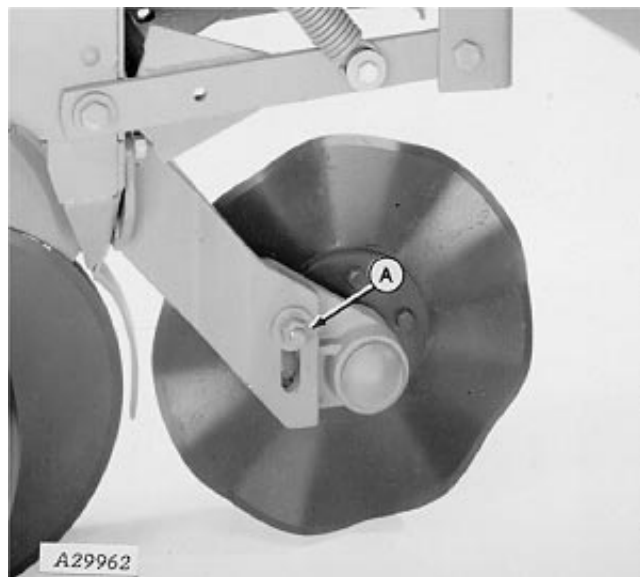
IMPORTANT: Bottom edge of coulter blade should be approximately 10 mm (3/8 in.) above bottom edge of seed openers in normal conditions. (Check this dimension with machine in planting position on any level surface.) This dimension will minimize the force required for penetration and help maintain a constant seed depth. In heavy straw, penetration and cutting action may be improved if bottom edge of coulter blade is positioned slightly below bottom edge of seed openers.

NOTE: Do not operate coulter deeper than seed opener, as this can affect seed depth.

The unit mounted coulter can be used to assist the TRU-VEE opener to penetrate tough soil conditions and to cut or displace residue commonly found in reduced tillage conditions.

The coulter blade penetration depth is controlled with the opener gauge wheels, weight adjustment and cap screw (A). As blade wear occurs, loosen cap screw (A), lower arm to next notch and tighten nut.

A row unit down force system is recommended with this attachment.



A—Cap Screw

A29962 -UN-06OCT88

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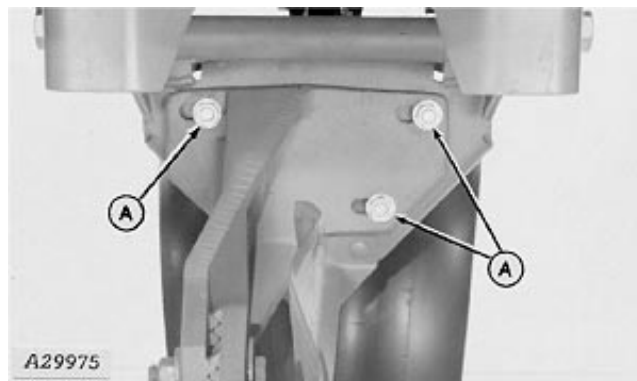
OUC6074,00008D4 -19-03JUN05-1/2

Adjust coulter blade so it is directly in front of TRU-VEE opener and is not running at an angle to direction of travel.

To align side-to-side, loosen cap screws (A) and slide coulter.

If coulter blade is running at an angle different than the direction of travel, remove cap screws (A) and add washers, as required, between back surface of coulter casting and front of planting unit.

A—Cap Screws



OUO6074,00008D4 -19-03JUN05-2/2

Vacuum Meter Gauges

There are three vacuum level gauges available, covering different psi ranges (0 to 5, 0 to 15, 0 to 30), to help the operator clearly distinguish vacuum level from operator's station.

AG,OUO6074,1288 -19-04AUG00-1/1

Unit Mounted Row Cleaners

The function of the row cleaner is to sweep aside residue without moving soil.

When using pre-plant herbicide, adjust row cleaner depth to minimize soil disturbance, so cleaner will not reduce effectiveness of herbicide.

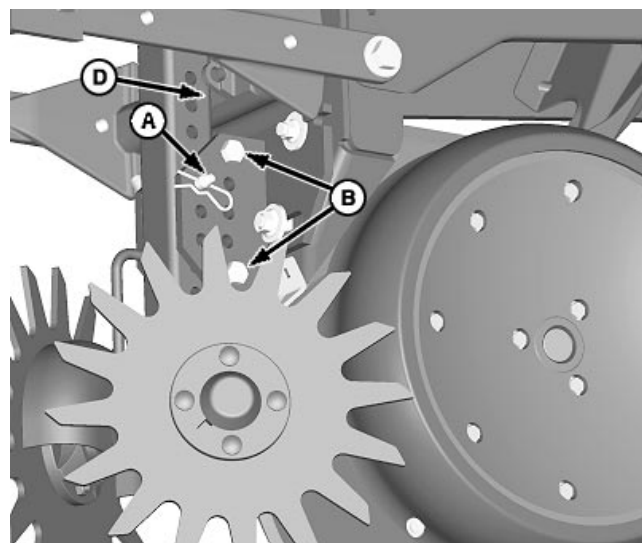
Two sets of height adjustment holes are provided. Row cleaner must be positioned so it clears parallel arm cross brace (D).

IMPORTANT: Do not use upper and lower holes (C) for height adjustment.

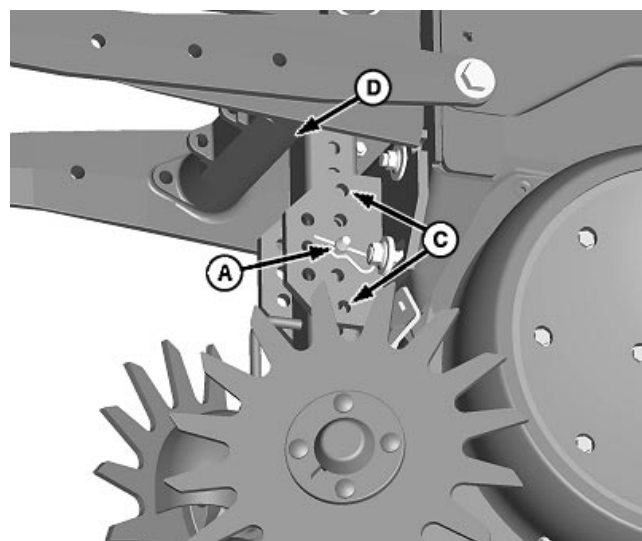
Short Parallel Arms: Use alignment pin (A) in any of the three adjustment holes (E). Install cap screws (B) in upper and lower holes (C).

Long Parallel Arms: Use alignment pin (A) in any of the three adjustment holes (F). Do not use upper or lower holes (C). Cap screws (B) are not used in this configuration.

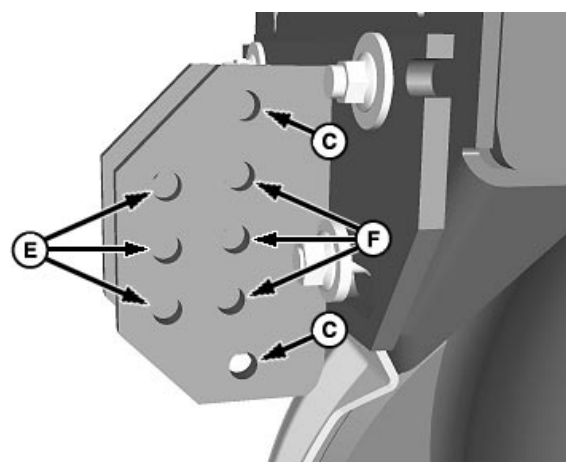
- A—Pin
- B—Cap Screws
- C—Upper and Lower Holes
- D—Cross Brace
- E—Adjustment Holes, Short Arms
- F—Adjustment Holes, Long Arms



Short Parallel Arms



Long Parallel Arms

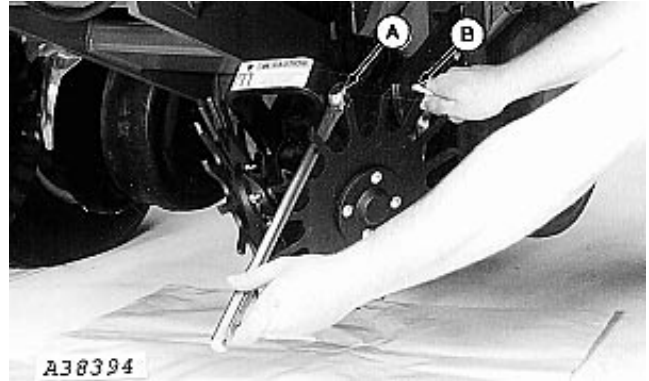


Row Cleaner for Unit Mounted Coulter



CAUTION: DO NOT use spacer strap on arm as a handle. Fingers may be seriously injured on sharp edge of coulter blade. Use a 1/2 in. drive socket tool to adjust height.

1. Insert the 1/2 in. drive socket tool into square hole (A) on arm.
2. Lift socket tool and remove pin (B). Insert pin (B) in hole at desired height of row cleaner attachment.



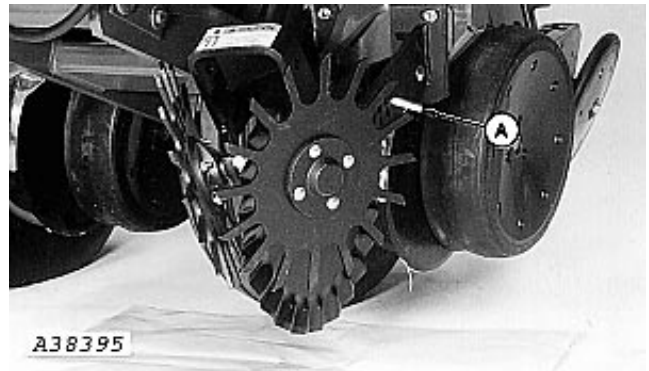
A—Square Hole
B—Pin

A38394 —UN-05FEB96

AG,OUO6074,1290 —19-31JAN06-1/2

3. If row cleaner is NOT needed, raise row cleaner up and locate pin (A) to highest position.

A—Pin



A38395 —UN-05FEB96

AG,OUO6074,1290 —19-31JAN06-2/2

Row Leveler Chain

The row leveler chain smooths the slight “W” effect created by the firming wheels and reduces tendency of some soils to crust.



A38344 —UN-27NOV95

AG,OUO6074,1293 —19-04AUG00-1/1

MaxEmerge *XP* Granular Chemical Attachment

Granular Chemical Attachment

The granular chemical attachment can be used to deliver granular chemicals.

The granular hopper (A) holds 32 kg (70 lb) of insecticide and/or herbicide.

The application rate is determined by:

- Size of opening in meter housing assembly
- Planting speed

Turn knob on rear of granular meter to adjust the opening size. There are 80 increments which indicate the relative application rate. The delivery rate will increase from 1 through 79. Setting 00 closes the opening completely. A fluted roller or CHEMMIZER meter delivers the granular chemical to the adjustable opening.

The granular chemical flows through a given opening size at a nearly uniform rate regardless of rotor rpm. Therefore, SPEED has the greatest impact on application rate and resulting chemical concentration in the row.

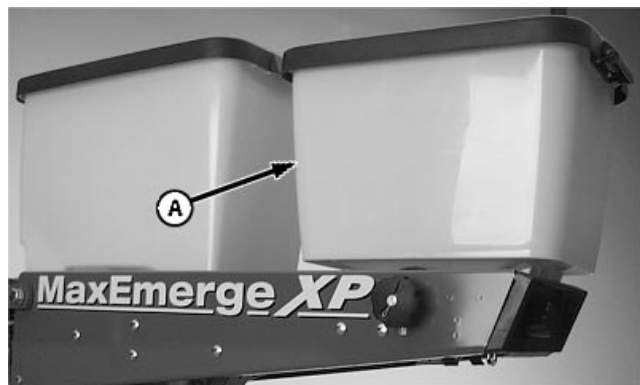
EXAMPLE:

If planting speed is reduced from 10 km/h to 5 km/h (6 mph to 3 mph), chemical concentration will nearly double, since the delivery rate through the orifice remains nearly the same, while distance traveled in a given period of time has been cut in half. Therefore, twice as much chemical is placed on the ground due to the decrease in ground speed.

Rotor rpm will not change the chemical meter delivery rate unless the seed population is changed significantly (25 percent or more from the original setting).

The rate charts in this section are approximate and based on a planting speed of 8 km/h (5 mph). They are to be used only as a guide to determine a starting point for the meter dial setting.

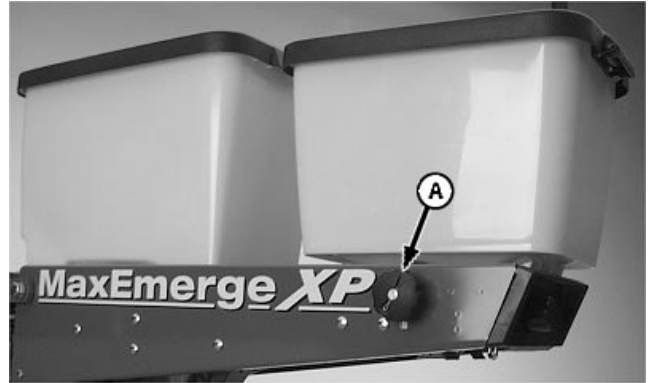
Always check rate of application as outlined in this section to confirm desired rate.



A—Granular Hopper

To engage insecticide and/or herbicide drive, rotate knob (A) until spring-loaded knob engages spring pin in insecticide/herbicide drive shaft.

CAUTION: Agricultural chemicals can be dangerous. Improper selection or use can injure persons, animals, plants, soils, or other property. **BE SAFE:** Select the right chemical for the job. Use rubber gloves and respirator and apply the chemical with care. Follow instructions of the chemical manufacturer.



A—Knob

Most insecticides and herbicides readily accumulate moisture and may damage the granular attachment if allowed to remain in the hopper when the machine is not in use. Even during periods of operation, deposits of insecticide may build up in the hopper and interfere with working parts. Therefore, the hoppers should be checked every day for any material buildup and thoroughly cleaned if the machine is not to be used for a period greater than two days.

See Service—End of Season section for cleaning instructions.

IMPORTANT: Because the available chemical materials vary widely in consistency and composition, their “flow-ability” is affected by temperature and humidity conditions. It is important to calibrate each individual meter to the particular chemical being used.

NOTE: Application rates greater than 227 gm (8 oz) per 305 m (1000 ft) at 10 km/h (6 mph) require installation of the high rate fluted roller in meter.

Follow chemical manufacturer’s application rate and meter setting recommendations as a starting point for the meter dial setting.

If meter setting is not available from chemical manufacturer, use the charts in this section as a starting point for meter dial setting.

To determine application rate and initial meter setting,
proceed to DETERMINING APPLICATION RATE AND
INITIAL METER SETTING in this section.

OUO6074,0000BB4 -19-29JUN05-3/3

Determining Application Rate and Initial Meter Setting

The chemical manufacturer may recommend the rate of application for granular chemicals in the following ways:

- Grams per 305 linear row meters
- Ounces per 1000 linear row feet
- Kilograms per hectare for a given band width and row spacing
- Pounds per acre for a given band width and row spacing
- Kilograms per hectare for complete (broadcast) coverage
- Pounds per acre for complete (broadcast) coverage

When the chemical manufacturer recommends a rate (linear distance or area) for a given band width and row spacing, proceed to the chemical manufacturer's recommended meter setting or to the meter setting recommended in the rate charts in this section.

When the chemical manufacturer recommends a rate (area) for complete (broadcast) coverage only, it is necessary to calculate the appropriate rate for band width and row spacing being planted. This will give the same chemical concentration in the band area as the chemical manufacturer recommends for complete (broadcast) coverage.

NOTE: We recommend measuring the actual band width applied and using this width in application rate calculations.

Use the following formula to convert broadcast coverage into specific band width and row spacing coverage.

FORMULA:

$(A \times B) \div C = \text{Delivery rate per area for a given band width and row spacing}$

A—Chemical manufacturers recommended rate in kilograms per hectare or pounds per acre for complete (broadcast) coverage

B—Band width in cm or in.

C—Row spacing in cm or in.

EXAMPLE:

The chemical manufacturer recommends 5 kg/ha (20 lb/acre) for complete broadcast coverage. The band width is 36 cm (14 in.). The row spacing is 76 cm (30 in.).

$$(5 \text{ kg} \times 36 \text{ cm}) \div 76 \text{ cm} = 2.4 \text{ kg/ha}$$

$$(20 \text{ lb} \times 14 \text{ in.}) \div 30 \text{ in.} = 9.3 \text{ lb/acre}$$

The required delivery rate for 36 cm (14 in.) bands and 76 cm (30 in.) row spacings would be 2.4 kg/ha (9.3 lb/acre).

Delivery of 2.4 kg/ha (9.3 lb/acre) of chemical in a 36 cm (14 in.) band area will provide the same chemical concentration on the soil surface as delivery of 5 kg/ha (20 lb/acre) broadcast coverage.

Proceed to chemical manufacturer's recommended meter setting or to meter setting recommended in the rate charts in this section which will deliver 2.4 kg/ha (9.3 lb/acre).

To check exact number of kilograms per hectare or pounds per acre of chemical that will be delivered, attach a plastic bag to each chemical diffuser, lower machine, and proceed as follows:

Drive 150 m (500 ft) at planting speed. Weigh chemical (in ounces) that was caught in one bag. Multiply amount caught by factor in table, to determine kilograms per hectare or pounds per acre.

Check the chemical caught in each bag in the same manner.

Pounds Per Acre Factor for Given Row Width

Row Width	Factor
20 in.	3.3
22 in.	3.0
30 in.	2.2
36 in.	1.8
38 in.	1.7

Kilograms Per Hectare Factor for Given Row Width

Row Width	Factor
51 cm	0.131
56 cm	0.119
70 cm	0.095
76 cm	0.086
91 cm	0.071
97 cm	0.067

EXAMPLES:

- Assume row width is 76 cm and 160 grams are caught in one bag (one row). 160 grams times 0.086 (factor for 76 cm rows) equals 13.8 kg/ha.
- Assume row width is 30 in. and 5.6 ounces is caught in one bag (one row). 5.6 ounces times 2.2 (factor for 30 in rows) equals 12.3 lb/acre.

NOTE: If a significant difference in rate is observed between rows, the meter dial mechanism may require recalibration. See CALIBRATING INSECTICIDE/HERBICIDE METER in this section.

If desired amount is not obtained for each row unit with the first setting, turn metering knob and repeat check until desired amount is delivered.

OUO6074,0000BB5 -19-26MAR04-2/2

Insecticide Rate Chart—Clay Granules—56 cm Rows

INSECTICIDE APPLICATION RATES (Clay Granules)

METER SETTING	Approximate Rate in kg/hectare 56 cm Rows			KILOGRAMS PER 305 Row M		
	6.4	9.6	12.8	6.4	9.6	12.8
10	3.8	2.6	1.9	.07	.04	.03
11	4.7	3.1	2.3	.08	.05	.04
12	5.5	3.6	2.8	.09	.06	.05
13	6.6	4.5	3.3	.10	.08	.06
14	8.0	5.4	4.0	.14	.09	.07
15	9.2	6.1	4.6	.16	.10	.08
16	10.4	6.9	5.3	.08	.12	.08
17	11.7	7.8	5.8	.20	.18	.10
18	12.5	8.4	6.3	.21	.14	.11
19	13.4	9.0	6.7	.23	.15	.12
20	14.2	9.5	7.2	.24	.16	.12
21	15.0	10.0	7.5	.26	.17	.13
22	15.7	10.4	7.8	.27	.18	.13
23	16.5	10.9	8.3	.28	.19	.18
24	17.1	16.5	8.6	.29	.19	.15
25	17.8	11.8	8.9	.30	.20	.15
26	18.3	12.1	9.2	.31	.20	.15
27	19.0	12.8	9.5	.32	.21	.16
28	19.5	13.0	9.9	.33	.22	.16
29	20.3	13.6	10.1	.34	.23	.17
30	20.7	13.8	10.4	.35	.24	.18
31	21.2	14.1	10.6	.36	.24	.18
32	21.8	14.6	10.9	.37	.25	.18
33	22.4	14.8	11.2	.38	.25	.19
34	23.2	15.5	11.7	.39	.26	.20
35	24.0	15.9	12.0	.41	.27	.20
36	24.8	16.5	12.3	.42	.28	.21
37	25.3	16.9	12.5	.43	.29	.22
38	26.1	17.4	13.0	.44	.30	.22
39	26.8	17.9	13.3	.46	.30	.23
40	27.7	18.4	13.8	.47	.31	.23
41	28.2	18.9	14.0	.48	.32	.24
42	28.3	19.5	14.8	.50	.33	.24
43	30.7	20.4	15.3	.52	.35	.26
44	32.3	21.5	16.1	.55	.37	.27
45	33.9	22.7	17.0	.58	.38	.29
46	36.0	24.0	17.9	.61	.41	.30
47	37.6	25.0	18.8	.64	.43	.32
48	39.3	26.2	19.6	.67	.45	.35
49	41.1	27.3	25.5	.70	.47	.35
50	42.8	28.6	21.3	.73	.49	.36
51	44.5	29.6	22.3	.75	.51	.38
52	46.5	32.4	24.2	.82	.55	.41
53	48.5	32.4	24.2	.82	.55	.41
54	50.6	33.7	25.3	.86	.57	.43
55	53.0	35.5	26.5	.90	.60	.45
56	55.2	36.9	27.7	.94	.62	.47
57	57.3	38.2	28.7	.97	.65	.48
58	58.7	39.8	29.8	1.01	.68	.51
59	61.9	41.2	31.0	1.05	.70	.63
60	63.8	42.7	31.9	1.08	.72	.54

A47079 -19-31JAN01

Insecticide Rate Chart—Clay Granules—22 in. Rows**INSECTICIDE APPLICATION RATES (Clay Granules)**

METER SETTING	Approximate Rate in Lbs/Acre 22 INCH ROWS MPH			OUNCES PER 1000 ROW FT. MPH		
	4	6	8	4	6	8
10	3.4	2.3	1.8	2.3	1.5	1.1
11	4.1	2.7	2.1	2.8	1.8	1.4
12	4.9	3.3	2.5	3.3	2.2	1.7
13	6.0	4.0	3.0	4.0	2.7	2.0
14	7.3	4.8	3.6	4.8	3.2	2.4
15	8.2	5.5	4.1	5.5	3.7	2.8
16	9.3	6.2	4.7	6.3	4.2	3.1
17	10.4	7.0	5.2	7.0	4.7	3.5
18	11.2	7.5	5.6	7.5	5.0	3.8
19	12.0	8.0	6.0	8.0	5.3	4.0
20	12.7	8.5	6.4	8.6	5.7	4.3
21	13.4	8.9	6.7	9.0	6.0	4.5
22	14.0	9.3	7.0	9.4	6.3	4.7
23	14.7	9.7	7.4	9.8	6.6	4.9
24	15.3	10.3	7.7	10.3	6.8	5.1
25	15.9	10.5	7.9	10.6	7.1	5.3
26	16.3	10.8	8.2	10.9	7.3	5.5
27	17.0	11.4	8.5	11.4	7.6	5.7
28	17.4	11.6	8.8	11.7	7.8	5.8
29	18.1	12.1	9.0	12.1	8.1	6.1
30	18.5	12.3	9.3	12.4	8.3	6.2
31	18.9	12.6	9.5	12.6	8.4	6.3
32	19.5	13.0	9.7	13.1	8.7	6.5
33	20.0	13.2	10.0	13.4	8.9	6.7
34	20.7	13.8	10.4	13.9	9.2	6.9
35	21.4	14.2	10.7	14.3	9.6	7.2
36	22.1	14.7	11.0	14.8	9.8	7.4
37	22.6	15.1	11.2	15.1	10.1	7.6
38	23.3	15.5	11.6	15.6	10.4	7.8
39	23.9	16.0	11.9	16.1	10.7	8.0
40	24.7	16.4	12.3	16.5	11.0	8.2
41	25.2	16.9	12.5	16.9	11.3	8.4
42	26.2	17.4	13.2	17.6	11.7	8.8
43	27.4	18.2	13.7	18.4	12.2	9.2
44	28.8	19.2	14.4	19.3	12.9	9.6
45	30.3	20.3	15.2	20.3	13.5	10.2
46	32.1	21.4	16.0	21.5	14.3	10.7
47	33.6	22.3	16.8	22.5	15.0	11.2
48	35.1	23.4	17.5	23.5	15.7	11.8
49	36.7	24.4	22.8	24.6	16.4	12.3
50	38.2	25.5	19.0	25.6	17.1	12.8
51	39.7	26.4	19.9	26.6	17.8	13.3
52	41.5	27.7	20.7	27.8	18.5	13.9
53	43.3	28.9	21.6	29.0	19.4	14.5
54	45.2	30.1	22.6	30.3	20.2	15.2
55	47.3	31.5	23.7	31.7	21.1	15.8
56	49.3	32.9	24.7	33.1	22.0	16.5
57	51.2	34.1	25.6	34.3	22.9	17.2
58	53.3	35.5	26.6	35.7	23.8	17.8
59	55.3	36.8	27.7	37.1	24.7	18.5
60	57.0	38.1	28.5	38.2	25.5	19.1

Insecticide Rate Chart—Clay Granules—70 cm Rows

Metric Units of Measure - Meter Setting			
Insecticide Application Rates (Clay Granules)			
Approximate Rate in Kilograms/Hectare			
	70 cm ROWS		
	KM/HOUR		
Meter Setting	6.4	9.7	12.9
10	3.1	2.1	1.6
11	3.7	2.4	1.8
12	4.4	2.9	2.2
13	5.4	3.5	2.7
14	6.5	4.3	3.2
15	7.3	4.9	3.7
16	8.3	5.5	4.1
17	9.3	6.2	4.6
18	10.0	6.7	5.0
19	10.6	7.1	5.4
20	11.3	7.6	5.7
21	12.0	7.9	6.0
22	12.6	8.3	6.2
23	13.1	8.7	6.6
24	13.7	9.2	6.8
25	14.2	9.4	7.1
26	14.5	9.6	7.3
27	15.1	10.1	7.6
28	15.5	10.4	7.8
29	16.1	10.7	8.1
30	16.5	11.0	8.3
31	16.8	11.2	8.4
32	17.3	11.6	8.7
33	17.8	11.8	8.9
34	18.4	12.3	9.3
35	19.0	12.7	9.5
36	19.6	13.1	9.8
37	20.1	13.4	10.0
38	20.7	13.8	10.4
39	21.4	14.3	10.6
40	22.0	14.6	11.0
41	22.4	15.0	11.2
42	23.3	15.5	11.7

Continued on next page

OUO6074.0000BB8 -19-26MAR04-1/2

MaxEmerge XP Granular Chemical Attachment

Metric Units of Measure - Meter Setting			
Insecticide Application Rates (Clay Granules)			
Approximate Rate in Kilograms/Hectare			
	70 cm ROWS		
	KM/HOUR		
Meter Setting	6.4	9.7	12.9
43	24.4	16.2	12.2
44	25.6	17.1	12.8
45	27.0	18.1	13.5
46	28.6	19.0	14.3
47	29.9	19.9	15.0
48	31.2	20.9	15.6
49	32.7	21.7	16.3
50	34.0	22.7	17.0
51	35.4	23.5	17.7
52	37.0	24.6	18.4
53	38.6	25.7	19.3
54	40.3	26.8	20.1
55	42.1	28.1	21.1
56	43.9	29.3	22.0
57	45.6	30.4	22.8
58	47.5	31.6	23.7
59	49.3	32.8	24.6
60	50.8	33.9	25.4

OUC6074,0000BB8 -19-26MAR04-2/2

Insecticide Rate Chart—Sand Granules—56 cm Rows

METER SETTING INSECTICIDE APPLICATION RATES (Sand Granules)						
METER SETTING	APPROXIMATE RATE IN KG/HECTARE 56 CM ROWS			GRAMS PER 305 M		
	KM/H			KM/H		
	6.4	9.7	12.9	6.4	9.7	12.9
6	1.3	1.7	1.2	42.5	28.3	19.8
7	3.6	2.4	1.8	59.5	39.7	31.2
8	4.7	3.2	2.5	79.4	53.9	39.7
9	5.9	4.0	3.0	102.1	68.0	51.0
10	7.4	4.9	3.7	124.7	82.2	62.4
11	8.7	5.8	4.5	147.4	99.2	73.7
12	10.3	6.9	5.3	175.8	116.2	87.9
13	11.8	7.8	5.9	201.3	133.2	99.2
14	13.5	9.1	6.7	229.6	153.1	113.4
15	15.1	10.0	7.5	255.1	170.1	127.6
16	16.5	10.9	8.3	277.8	187.1	138.9
17	17.8	11.8	8.8	303.3	201.3	150.3
18	19.1	12.8	9.6	326.0	218.3	161.6
19	20.4	13.7	10.3	345.9	229.6	172.9
20	21.8	14.6	10.9	368.5	246.6	184.3
21	23.2	15.5	11.6	394.1	260.8	195.6
22	24.5	16.5	12.3	416.7	277.8	207.0
23	26.0	17.4	13.0	439.4	292.0	221.1
24	27.3	18.3	13.7	462.1	309.0	232.5
25	28.7	19.1	14.4	487.6	323.2	243.8
26	30.2	20.1	15.2	513.1	343.0	255.1
27	31.6	21.1	15.8	535.8	357.2	269.3
28	33.1	22.1	16.6	561.3	374.2	280.7
29	34.7	23.2	17.4	589.7	391.2	294.8
30	36.1	24.1	18.1	615.2	408.2	306.2
31	37.8	25.3	19.0	643.5	428.1	320.3
32	34.4	26.2	19.8	669.0	445.1	334.5
33	41.1	27.4	20.6	697.4	464.9	348.7
34	42.8	28.6	21.5	725.7	484.8	362.9
35	44.5	29.6	22.3	754.1	504.6	377.0
36	46.2	30.8	23.2	785.3	524.5	394.1
37	48.2	32.0	24.1	816.5	544.3	408.2
38	50.1	33.3	25.0	847.7	567.0	425.2
39	51.8	34.5	26.0	878.8	586.8	439.4
40	53.6	35.7	26.9	910.0	606.7	456.4
41	55.7	37.2	27.9	944.0	629.4	473.4
42	57.7	38.2	28.9	978.1	652.0	490.4
43	59.7	39.8	29.9	1012.1	674.7	507.5
44	61.7	41.1	30.8	1046.1	697.4	524.5
45	63.8	42.4	31.9	1083.0	722.9	541.5
46	65.0	44.0	33.0	1119.8	745.6	558.5
47	68.1	45.5	34.0	1156.7	771.1	578.3
48	70.4	46.9	35.3	1193.5	796.6	598.2
49	72.6	48.4	36.4	1230.4	822.1	615.2
50	75.0	50.1	37.6	1272.9	847.7	637.9

A47087DS -19-08FEB01

Insecticide Rate Chart—Sand Granules—22 in. Rows

U.S. UNITS OF MEASURE - METER SETTING
INSECTICIDE APPLICATION RATES (Sand Granules)

METER SETTING	Approximate Rate in Lbs/Acre 22 INCH ROWS MPH			OUNCES PER 1000 ROW FT. MPH		
	4	6	8	4	6	8
6	1.2	1.5	1.1	1.5	1.0	0.7
7	3.2	2.1	1.6	2.1	1.4	1.1
8	4.2	2.9	2.2	2.8	1.9	1.4
9	5.3	3.6	2.7	3.6	2.4	1.8
10	6.6	4.4	3.3	4.4	2.9	2.2
11	7.8	5.2	4.0	5.2	3.5	2.6
12	9.2	6.2	4.7	6.2	4.1	3.1
13	10.5	7.0	5.3	7.1	4.7	3.5
14	12.1	8.1	6.0	8.1	5.4	4.0
15	13.5	8.9	6.7	9.0	6.0	4.5
16	14.7	9.7	7.4	9.8	6.6	4.9
17	15.9	10.5	7.9	10.7	7.1	5.3
18	17.1	11.4	8.6	11.5	7.7	5.7
19	18.2	12.2	9.2	12.2	8.1	6.1
20	19.5	13.0	9.7	13.0	8.7	6.5
21	20.7	13.8	10.4	13.9	9.2	6.9
22	21.9	14.7	11.0	14.7	9.8	7.3
23	23.2	15.5	11.6	15.5	10.3	7.8
24	24.4	16.3	12.2	16.3	10.9	8.2
25	25.6	17.1	12.9	17.2	11.4	8.6
26	27.0	17.9	13.6	18.1	12.1	9.0
27	28.2	18.8	14.1	18.9	12.6	9.5
28	29.6	19.7	14.8	19.8	13.2	9.9
29	31.0	20.7	15.5	20.8	13.8	10.4
30	24.9	21.5	16.2	21.7	14.4	10.8
31	33.8	22.6	17.0	22.7	15.1	11.3
32	35.2	23.4	17.7	23.6	15.7	11.8
33	36.7	24.5	18.4	24.6	16.4	12.3
34	38.2	25.5	19.2	25.6	17.1	12.8
35	39.7	26.4	19.9	26.6	17.8	13.3
36	41.3	27.5	20.7	27.7	18.5	13.9
37	43.0	28.6	21.5	28.8	19.2	14.4
38	44.7	29.7	22.3	29.9	20.0	15.0
39	46.3	30.8	23.2	31.0	20.7	15.5
40	47.9	31.9	24.0	32.1	21.4	16.1
41	49.7	33.2	24.9	33.3	22.2	16.7
42	51.5	34.1	25.8	34.5	23.0	17.3
43	53.3	35.5	26.7	35.7	23.8	17.9
44	55.1	36.7	27.5	36.9	24.6	18.5
45	57.0	37.9	28.5	38.2	25.5	19.1
46	58.9	39.3	29.5	39.5	26.3	19.7
47	60.8	40.6	30.4	40.8	27.2	20.4
48	62.9	41.9	31.5	42.1	28.1	21.1
49	64.8	43.2	32.5	43.4	29.0	21.7
50	67.0	44.7	33.6	44.9	29.9	22.5

A47086 -19-19DEC05

Insecticide Rate Chart—Sand Granules—70 cm Rows

Metric Units of Measure - Meter Setting			
Insecticide Application Rates (Sand Granules)			
Approximate Rate in Kilograms/Hectare			
	70 cm ROWS		
	KM/HOUR		
Meter Setting	6.4	9.7	12.9
6	2.0	1.3	1.0
7	2.8	1.8	1.5
8	3.8	2.6	2.0
9	4.8	3.2	2.4
10	5.9	3.9	2.9
11	7.0	4.6	3.5
12	8.2	5.5	4.1
13	9.4	6.2	4.8
14	10.7	7.2	5.4
15	12.0	7.9	6.0
16	13.1	8.7	6.6
17	14.2	9.4	7.1
18	15.3	10.1	7.7
19	16.2	10.9	8.2
20	17.3	11.6	8.7
21	18.4	12.3	9.3
22	19.5	13.1	9.8
23	20.6	13.8	10.4
24	21.7	14.5	10.9
25	22.8	15.3	11.5
26	24.0	16.0	12.1
27	25.1	16.7	12.6
28	26.4	17.6	13.2
29	27.6	18.4	13.8
30	28.8	19.2	14.4
31	30.1	20.1	15.1
32	31.4	20.9	15.7
33	32.7	21.8	16.3
34	34.0	22.7	17.1
35	35.4	23.5	17.7
36	36.8	24.5	18.4
37	38.3	25.5	19.2
38	39.8	26.5	19.9

Continued on next page

OUO6074,0000BBB -19-26MAR04-1/2

MaxEmerge XP Granular Chemical Attachment

Metric Units of Measure - Meter Setting			
Insecticide Application Rates (Sand Granules)			
Approximate Rate in Kilograms/Hectare			
	70 cm ROWS		
	KM/HOUR		
Meter Setting	6.4	9.7	12.9
39	41.2	27.5	20.6
40	42.7	28.4	21.4
41	44.3	29.5	22.2
42	45.9	30.6	22.9
43	47.5	31.6	23.8
44	49.0	32.7	24.5
45	50.8	33.8	25.4
46	52.5	35.0	26.2
47	54.2	36.1	27.1
48	56.0	37.3	28.1
49	57.7	38.4	28.9
50	59.7	39.8	29.9

OUO6074,0000BBB -19-26MAR04-2/2

Insecticide Rate Chart—Clay Granules—76 cm to 97 cm Rows

METRIC UNITS OF MEASURE - METER SETTING
INSECTICIDE APPLICATION RATES (Clay Granules)

METER SETTING	Approximate Rate in kg/hectare									KILOGRAMS PER 305 Row M		
	76 cm Rows			91 cm Rows			97 cm Rows					
	km/h			km/h			km/h			km/h		
	6.4	9.6	12.8	6.4	9.6	12.8	6.4	9.6	12.8	6.4	9.6	12.8
10	2.8	1.9	1.4	2.3	1.6	1.2	2.2	1.5	1.1	.07	.04	.03
11	3.4	2.2	1.7	2.8	1.9	1.4	2.7	1.8	1.3	.08	.05	.04
12	4.1	2.7	2.0	3.4	2.3	1.7	3.2	2.1	1.6	.09	.06	.05
13	4.9	3.3	2.5	4.1	2.7	2.0	3.9	2.6	1.9	.10	.08	.07
14	5.9	3.9	2.9	4.9	3.3	2.5	4.6	3.1	2.3	.14	.09	.07
15	6.7	4.5	3.4	5.6	3.7	2.8	5.3	3.5	2.7	.16	.10	.08
16	7.6	5.1	3.8	6.4	4.2	3.2	6.0	4.0	3.0	.18	.12	.08
17	8.5	5.7	4.3	7.1	4.7	3.6	6.7	4.5	3.4	.20	.18	.10
18	9.2	6.1	4.6	7.6	5.1	3.8	7.2	4.8	3.6	.21	.14	.11
19	9.8	6.5	4.9	8.1	5.4	4.1	7.7	5.1	3.9	.23	.15	.12
20	10.4	7.0	5.2	8.7	5.8	4.4	8.2	5.5	4.1	.24	.16	.12
21	11.0	7.3	5.5	9.1	6.1	4.6	8.7	5.8	4.3	.26	.17	.13
22	11.5	7.7	5.8	9.6	6.4	4.8	9.1	6.1	4.5	.27	.18	.13
23	12.0	8.0	6.0	10.0	6.7	5.0	9.5	6.3	4.7	.28	.19	.13
24	12.5	8.3	6.3	10.4	7.0	5.2	9.9	6.6	4.9	.29	.19	.15
25	12.9	8.6	6.5	10.8	7.2	5.4	10.2	6.8	5.1	.30	.20	.15
26	13.3	8.9	6.7	11.1	7.4	5.6	10.5	7.0	5.3	.31	.21	.16
27	13.9	9.2	6.9	11.6	7.7	5.8	10.9	7.3	5.5	.32	.21	.16
28	14.3	9.5	7.1	11.9	7.9	5.9	11.3	7.5	5.6	.33	.22	.16
29	14.8	9.9	7.4	12.3	8.2	6.2	11.7	7.8	5.8	.34	.23	.17
30	15.2	10.1	7.6	12.6	8.4	6.3	12.0	8.0	6.0	.35	.24	.18
31	15.4	10.3	7.7	12.9	8.6	6.4	12.2	8.1	6.1	.36	.24	.18
32	15.9	10.6	8.0	13.3	8.9	6.6	12.6	8.4	6.3	.37	.25	.18
33	16.4	10.9	8.2	13.6	9.1	6.8	12.9	8.6	6.5	.38	.25	.19
34	16.9	11.3	8.5	14.1	9.4	7.0	13.4	8.9	6.7	.39	.26	.20
35	17.5	11.6	8.7	14.6	9.7	7.3	13.8	9.2	6.9	.41	.27	.20
36	18.0	12.0	9.0	15.0	10.0	7.5	14.2	9.5	7.1	.42	.28	.21
37	18.5	12.3	9.2	15.4	10.3	7.7	14.6	9.7	7.3	.43	.29	.22
38	19.0	12.7	9.5	15.9	10.6	7.9	15.0	10.0	7.5	.44	.30	.22
39	19.6	13.1	9.8	16.3	10.9	8.2	15.5	10.3	7.7	.46	.30	.23
40	20.1	13.4	10.1	16.8	11.2	8.4	15.9	10.6	7.9	.47	.31	.23
41	20.6	13.7	10.3	17.2	11.4	8.6	16.3	10.8	8.1	.48	.32	.24
42	21.4	14.3	10.7	17.8	11.9	8.9	16.9	11.3	8.5	.50	.33	.25
43	22.4	14.9	11.2	18.7	12.4	9.3	17.7	11.8	8.8	.52	.35	.26
44	23.5	15.7	11.8	19.6	13.1	9.8	18.6	12.4	9.3	.55	.37	.27
45	24.8	16.5	12.4	20.7	13.8	10.3	19.6	13.0	9.8	.58	.38	.29
46	26.2	17.5	13.1	21.8	14.5	10.9	20.7	13.8	10.3	.61	.41	.30
47	27.4	18.3	13.7	22.9	15.2	11.4	21.7	14.4	10.8	.64	.43	.32
48	28.7	19.1	14.4	23.9	15.9	12.0	22.7	15.1	11.3	.67	.45	.33
49	30.0	20.0	15.0	25.0	16.6	12.5	23.7	15.8	11.8	.70	.47	.35
50	31.2	20.8	15.6	26.0	17.3	13.0	24.6	16.4	12.3	.73	.49	.36
51	32.5	21.7	16.2	27.1	18.0	13.5	25.6	17.1	12.8	.75	.51	.38
52	33.9	22.6	16.9	28.2	18.8	14.1	26.7	17.8	13.4	.79	.53	.39
53	35.4	23.6	17.7	29.5	19.7	14.8	28.0	18.6	14.0	.82	.55	.41
54	37.0	24.6	18.5	30.8	20.5	15.4	29.2	19.5	14.6	.86	.57	.43
55	38.6	25.8	19.3	32.2	21.5	16.1	30.5	20.3	15.3	.90	.60	.45
56	40.3	26.9	20.2	33.6	22.4	16.8	31.8	21.2	15.9	.94	.62	.47
57	41.9	27.9	20.9	34.9	23.3	17.4	33.0	22.0	16.5	.97	.65	.48
58	43.5	29.0	21.8	26.3	24.2	18.1	34.4	22.9	17.2	1.08	.68	.51
59	45.2	30.1	22.6	37.7	25.1	18.8	35.7	23.8	17.9	1.05	.70	.53
60	46.2	31.1	23.3	38.9	25.9	19.4	36.8	24.5	18.4	1.08	.72	.54

A47082 -19-01FEB01

Insecticide Rate Chart—Clay Granules—30 in. to 38 in. Rows

U.S. UNITS OF MEASURE -- METER SETTING
INSECTICIDE APPLICATION RATES (Clay Granules)

METER SETTING	Approximate Rate in Lbs/Acre									OUNCES PER 1000 ROW FT. MPH		
	30 INCH ROWS MPH			36 INCH ROWS MPH			38 INCH ROWS MPH			4	6	8
	4	6	8	4	6	8	4	6	8			
10	2.5	1.7	1.3	2.1	1.4	1.0	2.0	1.3	1.0	2.3	1.5	1.1
11	3.0	2.0	1.5	2.5	1.7	1.3	2.4	1.6	1.2	2.8	1.8	1.4
12	3.6	2.4	1.8	3.0	2.0	1.5	2.9	1.9	1.4	3.3	2.2	1.7
13	4.4	2.9	2.2	3.6	2.4	1.8	3.5	2.3	1.7	4.0	2.7	2.0
14	5.3	3.5	2.6	4.4	2.9	2.2	4.1	2.8	2.1	4.8	3.2	2.4
15	6.0	4.0	3.0	5.0	3.3	2.5	4.7	3.2	2.4	5.5	3.7	2.8
16	6.8	4.5	3.4	5.7	3.8	2.8	5.4	3.6	2.7	6.3	4.2	3.1
17	7.6	5.1	3.8	6.3	4.2	3.2	6.0	4.0	3.0	7.0	4.7	3.5
18	8.2	5.5	4.1	6.8	4.6	3.4	6.5	4.3	3.2	7.5	5.0	3.8
19	8.7	5.8	4.4	7.3	4.8	3.6	6.9	4.6	3.4	8.0	5.3	4.0
20	9.3	6.2	4.7	7.8	5.2	3.9	7.4	4.9	3.7	8.6	5.7	4.3
21	9.8	6.5	4.9	8.2	5.4	4.1	7.7	5.2	3.9	9.0	6.0	4.5
22	10.3	6.8	5.1	8.6	5.7	4.3	8.1	5.4	4.1	9.4	6.3	4.7
23	10.7	7.1	5.4	8.9	6.0	4.5	8.5	5.6	4.2	9.8	6.6	4.9
24	11.2	7.5	5.6	9.3	6.2	4.7	8.8	5.9	4.4	10.3	6.8	5.1
25	11.6	7.7	5.8	9.6	6.4	4.8	9.1	6.1	4.6	10.6	7.1	5.3
26	11.9	7.9	6.0	9.9	6.6	5.0	9.4	6.3	4.7	10.9	7.3	5.5
27	12.4	8.3	6.2	10.3	6.9	5.2	9.8	6.5	4.9	11.4	7.6	5.7
28	12.7	8.5	6.4	10.6	7.1	5.3	10.1	6.7	5.0	11.7	7.8	5.8
29	13.2	8.8	6.6	11.0	7.3	5.5	10.4	6.9	5.2	12.1	8.1	6.1
30	13.5	9.0	6.8	11.3	7.5	5.6	10.7	7.1	5.3	12.4	8.3	6.2
31	13.8	9.2	6.9	11.5	7.6	5.7	10.9	7.2	5.4	12.6	8.4	6.3
32	14.2	9.5	7.1	11.9	7.9	5.9	11.2	7.5	5.6	13.1	8.7	6.5
33	14.6	9.7	7.3	12.2	8.1	6.1	11.5	7.7	5.8	13.4	8.9	6.7
34	15.1	10.1	7.6	12.6	8.4	6.3	11.9	7.9	6.0	13.9	9.2	6.9
35	15.6	10.4	7.8	13.0	8.7	6.5	12.3	8.2	6.2	14.3	9.6	7.2
36	16.1	10.7	8.0	13.4	8.9	6.7	12.7	8.5	6.3	14.8	9.8	7.4
37	16.5	11.0	8.2	13.7	9.2	6.9	13.0	8.7	6.5	15.1	10.1	7.6
38	17.0	11.3	8.5	14.2	9.4	7.1	13.4	8.9	6.7	15.6	10.4	7.8
39	17.5	11.7	8.7	14.6	9.7	7.3	13.8	9.2	6.9	16.1	10.7	8.0
40	18.0	12.0	9.0	15.0	10.0	7.5	14.2	9.5	7.1	16.5	11.0	8.2
41	18.4	12.3	9.2	15.3	10.2	7.7	14.5	9.7	7.3	16.9	11.3	8.4
42	19.1	12.7	9.6	15.9	10.6	8.0	15.1	10.1	7.5	17.6	11.7	8.8
43	20.0	13.3	10.0	16.7	11.1	8.3	15.8	10.5	7.9	18.4	12.2	9.2
44	21.0	14.0	10.5	17.5	11.7	8.8	16.6	11.1	8.3	19.3	12.9	9.6
45	22.1	14.8	11.1	18.4	12.3	9.2	17.5	11.6	8.7	20.3	13.5	10.2
46	23.4	15.6	11.7	19.5	13.0	9.7	18.5	12.3	9.2	21.5	14.3	10.7
47	24.5	16.3	12.3	20.4	13.6	10.2	19.3	12.9	9.7	22.5	15.0	11.2
48	25.6	17.1	12.8	21.4	14.2	10.7	20.2	13.5	10.1	23.5	15.7	11.8
49	26.8	17.8	13.4	22.3	14.9	11.1	21.1	14.1	10.6	24.6	16.4	12.3
50	27.9	18.6	13.9	23.2	15.5	11.6	22.0	14.7	11.0	25.6	17.1	12.8
51	29.0	19.3	14.5	24.2	16.1	12.1	22.9	15.3	11.4	26.6	17.8	13.3
52	30.3	20.2	15.1	25.2	16.8	12.6	23.9	15.9	11.9	27.8	18.5	13.9
53	31.6	21.1	15.8	26.4	17.6	13.2	25.0	16.6	12.5	29.0	19.4	14.5
54	33.0	22.0	16.5	27.5	18.3	13.8	26.1	17.4	13.0	30.3	20.2	15.2
55	34.5	23.0	17.3	28.8	19.2	14.4	27.2	18.2	13.6	31.7	21.1	15.8
56	36.0	24.0	18.0	30.0	20.0	15.0	28.4	18.9	14.2	33.1	22.0	16.5
57	37.4	24.9	18.7	31.1	20.8	15.6	29.5	19.7	14.8	34.3	22.9	17.2
58	38.9	25.9	19.4	32.4	21.6	16.2	30.7	20.5	15.3	35.7	23.8	17.8
59	40.4	26.9	20.2	33.6	22.4	16.8	31.9	21.2	15.9	37.1	24.7	18.5
60	41.6	27.8	20.8	34.7	23.1	17.3	32.9	21.9	16.4	38.2	25.5	19.1

Insecticide Rate Chart—Sand Granules—76 cm to 97 cm Rows

METRIC UNITS OF MEASURE - METER SETTING
INSECTICIDE APPLICATION RATES (Sand Granules)

METER SETTING	Approximate Rate in kg/hectare									KILOGRAMS PER 305 Row M		
	76 cm Rows			91 cm Rows			97 cm Rows					
	km/h			km/h			km/h			km/h		
	6.4	9.6	12.8	6.4	9.6	12.8	6.4	9.6	12.8	6.4	9.6	12.8
6	1.8	1.2	0.9	1.5	1.0	0.7	1.4	0.9	0.7	0.04	0.03	0.02
7	2.6	1.7	1.3	2.1	1.4	1.1	2.0	1.4	1.0	0.06	0.04	0.03
8	3.5	2.3	1.7	2.9	1.9	1.4	2.7	1.8	1.4	0.08	0.05	0.04
9	4.4	2.9	2.2	3.6	2.4	1.8	3.4	2.3	1.7	0.10	0.07	0.05
10	5.4	3.6	2.7	4.5	3.0	2.2	4.2	2.8	2.1	0.12	0.08	0.06
11	6.4	4.3	3.2	5.3	3.5	2.7	5.0	3.4	2.5	0.05	0.10	0.07
12	7.5	5.0	3.8	6.3	4.2	3.1	5.9	3.9	3.0	0.18	0.12	0.09
13	8.6	5.7	4.3	7.2	4.8	3.6	6.8	4.5	3.4	0.20	0.13	0.10
14	9.9	6.6	4.9	8.2	5.5	4.1	7.8	5.2	3.9	0.23	0.15	0.11
15	11.0	7.3	5.5	9.1	6.1	4.6	8.7	5.8	4.3	0.26	0.17	0.13
16	12.0	8.0	6.0	10.0	6.7	5.0	9.5	6.3	4.7	0.28	0.19	0.14
17	13.0	8.7	6.5	10.8	7.2	5.4	10.3	6.8	5.1	0.30	0.20	0.15
18	14.0	9.3	7.0	11.7	7.8	5.8	11.1	7.4	5.5	0.33	0.22	0.16
19	14.9	9.9	7.4	12.4	8.3	6.2	11.8	7.8	5.9	0.35	0.23	0.17
20	15.9	10.6	8.0	13.3	8.8	6.6	12.6	8.4	6.3	0.37	0.25	0.18
21	16.9	11.3	8.5	14.1	9.4	7.0	13.4	8.9	6.7	0.39	0.26	0.20
22	17.9	11.9	9.0	14.9	10.0	7.5	14.1	9.4	7.1	0.42	0.28	0.21
23	18.9	12.6	9.5	15.8	10.5	7.9	14.9	10.0	7.5	0.44	0.29	0.22
24	19.9	13.3	10.0	16.6	11.1	8.3	15.7	10.5	7.9	0.46	0.31	0.23
25	20.9	14.0	10.5	17.5	11.6	8.7	16.5	11.0	8.3	0.49	0.32	0.24
26	22.1	14.7	11.0	18.4	12.3	9.2	17.4	11.6	8.7	0.51	0.34	0.26
27	23.1	15.4	11.5	19.2	12.8	9.6	18.2	12.1	9.1	0.54	0.36	0.27
28	24.2	16.1	12.1	20.2	13.4	10.1	19.1	12.7	9.5	0.56	0.37	0.28
29	25.3	16.9	12.7	21.1	14.1	10.5	20.0	13.3	10.0	0.59	0.39	0.29
30	26.4	17.6	13.2	22.0	14.7	11.0	20.9	13.9	10.4	0.62	0.41	0.31
31	27.7	18.4	13.8	23.1	15.4	11.5	21.8	14.6	10.9	0.64	0.43	0.32
32	28.8	19.2	14.4	24.0	16.0	12.0	22.7	15.1	11.4	0.67	0.45	0.33
33	30.0	20.0	15.0	25.0	16.7	12.5	23.7	15.8	11.8	0.70	0.46	0.35
34	31.2	20.8	15.6	26.0	17.4	13.0	24.7	16.4	12.3	0.73	0.48	0.36
35	32.5	21.7	16.2	27.1	18.0	13.5	25.6	17.1	12.8	0.75	0.50	0.38
36	33.8	22.5	16.9	28.2	18.8	14.1	26.7	17.8	13.4	0.79	0.52	0.39
37	35.2	23.4	17.6	29.3	19.5	14.7	27.8	18.5	13.9	0.82	0.54	0.41
38	36.5	24.3	18.3	30.4	20.3	15.2	28.8	19.2	14.4	0.85	0.57	0.43
39	37.9	25.2	18.9	31.5	21.0	15.2	29.9	19.9	14.9	0.88	0.59	0.44
40	39.2	26.1	19.6	32.7	21.8	16.3	30.9	20.6	15.5	0.91	0.61	0.46
41	40.7	27.1	20.3	33.9	22.6	16.9	32.1	21.4	16.0	0.94	0.63	0.47
42	42.1	28.1	21.1	35.1	23.4	17.5	33.2	22.2	16.6	0.98	0.65	0.49
43	43.6	29.0	21.8	36.3	24.2	18.2	34.4	22.9	17.2	1.01	0.67	0.51
44	45.0	30.0	22.5	37.5	25.0	18.8	35.5	23.7	17.8	1.05	0.70	0.52
45	46.6	31.1	23.3	38.8	25.9	19.4	36.8	24.5	18.4	1.08	0.72	0.54
46	48.2	32.1	24.1	40.1	26.8	20.1	38.0	25.3	19.0	1.12	0.75	0.56
47	49.7	33.2	24.9	41.4	27.6	20.7	39.3	26.2	19.6	1.16	0.77	0.58
48	51.4	34.3	25.7	42.8	28.6	21.4	40.6	27.1	20.3	1.19	0.80	0.60
49	53.0	35.3	26.5	44.1	29.4	22.1	41.8	27.9	20.9	1.23	0.82	0.62
50	54.8	36.5	27.4	45.6	30.4	22.8	43.2	28.8	21.6	1.27	0.85	0.64

A47084 -19-16MAR01

Insecticide Rate Chart—Sand Granules—30 in. to 38 in. Rows

U.S. UNITS OF MEASURE – METER SETTING
INSECTICIDE APPLICATION RATES (Sand Granules)

METER SETTING	Approximate Rate in Lbs/Acre									OUNCES PER 1000 ROW FT.		
	30 INCH ROWS MPH			36 INCH ROWS MPH			38 INCH ROWS MPH			MPH		
	4	6	8	4	6	8	4	6	8	4	6	8
6	1.6	1.1	0.8	1.3	0.9	0.7	1.3	0.8	0.6	1.5	1.0	0.7
7	2.3	1.5	1.2	1.9	1.3	1.0	1.8	1.2	0.9	2.1	1.4	1.1
8	3.1	2.1	1.6	2.6	1.7	1.3	2.4	1.6	1.2	2.8	1.9	1.4
9	3.9	2.6	2.0	3.3	2.2	1.6	3.1	2.1	1.5	3.6	2.4	1.8
10	4.8	3.2	2.4	4.0	2.7	2.0	3.8	2.5	1.9	4.4	2.9	2.2
11	5.7	3.8	2.9	4.8	3.2	2.4	4.5	3.0	2.3	5.2	3.5	2.6
12	6.7	4.5	3.4	5.6	3.7	2.8	5.3	3.5	2.6	6.2	4.1	3.1
13	7.7	5.1	3.9	6.4	4.3	3.2	6.1	4.1	3.0	7.1	4.7	3.5
14	8.8	5.9	4.4	7.3	4.9	3.7	6.9	4.6	3.5	8.1	5.4	4.0
15	9.8	6.5	4.9	8.2	5.4	4.1	7.7	5.2	3.9	9.0	6.0	4.5
16	10.7	7.1	5.4	8.9	5.9	4.5	8.4	5.6	4.2	9.8	6.6	4.9
17	11.6	7.7	5.8	9.7	6.4	4.8	9.2	6.1	4.6	10.7	7.1	5.3
18	12.5	8.3	6.3	10.4	6.9	5.2	9.9	6.6	4.9	11.5	7.7	5.7
19	13.3	8.9	6.7	11.1	7.4	5.5	10.5	7.0	5.3	12.2	8.1	6.1
20	14.2	9.5	7.1	11.8	7.9	5.9	11.2	7.5	5.6	13.0	8.7	6.5
21	15.1	10.1	7.6	12.6	8.4	6.3	11.9	7.9	6.0	13.9	9.2	6.9
22	16.0	10.7	8.0	13.3	8.9	6.7	12.6	8.4	6.3	14.7	9.8	7.3
23	16.9	11.3	8.5	14.1	9.4	7.0	13.3	8.9	6.7	15.5	10.3	7.8
24	17.8	11.9	8.9	14.8	9.9	7.4	14.1	9.4	7.0	16.3	10.9	8.2
25	18.7	12.5	9.4	15.6	10.4	7.8	14.8	9.8	7.4	17.2	11.4	8.6
26	19.7	13.1	9.9	16.4	10.9	8.2	15.6	10.4	7.8	18.1	12.1	9.0
27	20.6	13.7	10.3	17.2	11.4	8.6	16.3	10.8	8.1	18.9	12.6	9.5
28	21.6	14.4	10.8	18.0	12.0	9.0	17.1	11.4	8.5	19.8	13.2	9.9
29	22.6	15.1	11.3	18.8	12.6	9.4	17.8	11.9	8.9	20.8	13.8	10.4
30	23.6	15.7	11.8	19.7	13.1	9.8	18.6	12.4	9.3	21.7	14.4	10.8
31	24.7	16.5	12.4	20.6	13.7	10.3	19.5	13.0	9.8	22.7	15.1	11.3
32	25.7	17.1	12.9	21.4	14.3	10.7	20.3	13.5	10.1	23.6	15.7	11.8
33	26.8	17.9	13.4	22.3	14.9	11.2	21.2	14.1	10.6	24.6	16.4	12.3
34	27.9	18.6	14.0	23.3	15.5	11.6	22.0	14.7	11.0	25.6	17.1	12.8
35	29.0	19.3	14.5	24.2	16.1	12.1	22.9	15.3	11.4	26.6	17.8	13.3
36	30.2	20.1	15.1	25.2	16.8	12.6	23.8	15.9	11.9	27.7	18.5	13.9
37	31.4	20.9	15.7	26.2	17.4	13.1	24.8	16.5	12.4	28.8	19.2	14.4
38	32.6	21.7	16.3	27.2	18.1	13.6	25.7	17.2	12.9	29.9	20.0	15.0
39	33.8	22.5	16.9	28.2	18.8	14.1	26.7	17.8	13.3	31.0	20.7	15.5
40	35.0	23.3	17.5	29.2	19.4	14.6	27.6	18.4	13.8	32.1	21.4	16.1
41	36.3	24.2	18.2	30.3	20.2	15.1	28.7	19.1	14.3	33.3	22.2	16.7
42	37.6	25.1	18.8	31.3	20.9	15.7	29.7	19.8	14.8	34.5	23.0	17.3
43	38.9	25.9	19.5	32.4	21.6	16.2	30.7	20.5	15.4	35.7	23.8	17.9
44	40.2	26.8	20.1	33.5	22.3	16.8	31.7	21.2	15.9	36.9	24.6	18.5
45	41.6	27.7	20.8	34.7	23.1	17.3	32.8	21.9	16.4	38.2	25.5	19.1
46	43.0	28.7	21.5	35.8	23.9	17.9	33.9	22.6	17.0	39.5	26.3	19.7
47	44.4	29.6	22.2	37.0	24.7	18.5	35.1	23.4	17.5	40.8	27.2	20.4
48	45.9	30.6	23.0	38.3	25.5	19.1	36.2	24.2	18.1	42.1	28.1	21.1
49	47.3	31.5	23.7	39.4	26.3	19.7	37.3	24.9	18.7	43.4	29.0	21.7
50	48.9	32.6	24.5	40.8	27.2	20.4	38.6	25.7	19.3	44.9	29.9	22.5

A47083 -19-31JAN01

Herbicide Rate Chart—Clay Granules—56 cm Rows

U.S. UNITS OF MEASURE - METER SETTING
 HERBICIDE APPLICATION RATES (Clay Granules)
 Approximate Rate in kg/hectare

METER SETTING	56 cm Rows		
	6.4	9.6	12.8
10	3.3	2.1	1.7
11	3.8	2.4	1.9
12	4.5	2.9	2.8
13	3.4	3.5	2.6
14	6.1	4.0	3.0
15	7.5	4.7	3.5
16	8.5	5.4	4.0
17	9.5	6.2	4.5
18	10.2	6.8	4.8
19	11.1	7.1	5.2
20	12.1	7.8	5.4
21	12.8	8.3	6.1
22	13.7	8.8	6.6
23	14.6	9.4	6.9
24	15.4	9.9	7.1
25	16.3	10.4	7.6
26	17.0	10.9	8.0
27	18.0	11.4	8.3
28	18.7	11.8	8.7
29	19.6	12.3	8.8
30	20.3	12.8	9.4
31	20.6	13.2	9.5
32	21.5	13.7	10.0
33	22.3	14.0	10.2
34	23.2	14.7	10.6
35	24.1	15.2	10.9
36	24.8	15.6	11.3
37	25.5	16.1	11.9
38	26.5	16.1	12.0
39	27.0	17.0	12.3
40	27.5	17.5	12.6
41	28.2	17.7	12.8
42	29.1	18.2	13.3
43	30.3	19.1	13.7
44	31.2	19.6	14.2
45	32.9	20.6	14.8
46	34.3	21.7	15.8
47	36.6	23.2	16.8
48	38.5	24.6	17.8
49	40.5	26.2	18.9
50	43.1	28.1	20.6
51	45.6	30.0	22.0
52	48.2	31.9	23.6
53	50.6	33.8	25.3
54	53.5	35.9	27.0
55	56.5	38.1	29.1
56	58.2	39.7	30.8
57	61.3	41.9	32.9
58	63.9	44.0	34.5
59	65.8	45.6	36.0
60	68.2	47.5	37.9

A41098

A41098 -19-22APR97

OUO1074.0001475 -19-26MAR03-1/1

Herbicide Rate Chart—Clay Granules—22 in. Rows

**U.S. UNITS OF MEASURE - METER SETTING
HERBICIDE APPLICATION RATES (Clay Granules)**

Approximate Rate in Lbs/Acre

METER SETTING	22 INCH ROWS		
	MPH		
	4	6	8
10	2.9	1.9	1.5
11	3.4	2.2	1.6
12	4.1	2.6	1.9
13	4.8	3.1	2.3
14	5.5	3.6	2.7
15	6.6	4.2	3.2
16	7.5	4.9	3.7
17	8.5	5.5	4.0
18	9.2	6.0	4.4
19	9.9	6.4	4.7
20	10.8	7.0	5.1
21	11.5	7.4	5.5
22	12.3	7.9	5.8
23	13.0	8.3	6.2
24	13.8	8.9	6.4
25	14.5	9.2	6.7
26	15.2	9.7	7.1
27	16.0	10.1	7.4
28	16.7	10.6	7.6
29	17.5	11.1	7.9
30	18.1	11.5	8.4
31	18.5	11.8	8.6
32	19.3	12.2	8.9
33	20.0	12.6	9.2
34	20.7	13.2	9.5
35	21.5	13.6	9.7
36	22.2	13.9	10.1
37	22.7	14.4	10.5
38	23.7	14.9	10.8
39	24.1	15.2	11.0
40	24.7	15.6	11.2
41	25.2	15.8	11.5
42	26.0	16.3	11.9
43	27.1	17.0	12.3
44	27.8	17.5	12.7
45	29.5	18.5	13.3
46	30.7	19.5	14.1
47	32.7	20.8	15.1
48	34.4	21.9	16.0
49	36.3	23.3	16.9
50	38.5	25.1	18.4
51	40.7	26.7	19.7
52	43.0	28.5	21.1
53	45.2	30.1	22.6
54	47.8	32.1	24.1
55	50.4	34.0	26.0
56	52.1	35.5	27.7
57	54.8	37.5	29.5
58	57.1	39.3	31.8
59	58.9	40.7	32.2
60	61.1	42.5	33.8

Herbicide Rate Chart—Clay Granules—76 cm to 97 cm Rows

METRIC UNITS OF MEASURE - METER SETTING
HERBICIDE APPLICATION RATES (Clay Granules)

Approximate Rate in kg/ha

METER SETTING	76 cm ROWS km/h			91 cm ROWS km/h			97 cm ROWS km/h		
	4	6	8	4	6	8	4	6	8
10	2.4	1.6	1.2	1.9	1.3	1.0	1.9	1.2	1.0
11	2.8	1.8	1.3	2.4	1.6	1.1	2.2	1.5	1.1
12	3.4	2.1	1.6	2.8	1.8	1.3	2.6	1.7	1.2
13	3.9	2.6	1.9	3.3	2.1	1.6	3.1	2.0	1.5
14	4.5	2.9	2.2	3.7	2.5	1.8	3.6	2.4	1.7
15	5.4	3.5	2.6	4.5	2.9	2.1	4.3	2.7	2.0
16	6.2	4.0	2.9	5.2	3.4	2.5	4.9	3.1	2.4
17	6.9	4.5	3.3	5.7	3.7	2.7	5.5	3.6	2.6
18	7.5	4.9	3.6	6.3	4.0	3.0	5.9	3.8	2.8
19	8.1	5.3	3.8	6.7	4.4	3.1	6.4	4.1	3.0
20	8.9	5.7	4.1	7.4	4.7	3.5	6.9	4.5	3.3
21	9.4	6.1	4.5	7.8	5.0	3.7	7.4	4.8	3.5
22	10.1	6.5	4.7	8.4	5.4	3.9	8.0	5.2	3.8
23	10.6	6.8	5.0	8.9	5.7	4.1	8.4	5.4	3.9
24	11.3	7.3	5.3	9.4	6.1	4.4	9.0	5.7	4.1
25	11.9	7.5	5.5	9.9	6.3	4.6	9.4	5.9	4.4
26	12.4	8.0	5.8	10.3	6.6	4.8	9.8	6.3	4.6
27	13.1	8.3	6.1	11.0	6.9	5.0	10.3	6.6	4.8
28	13.8	8.7	6.3	11.5	7.3	5.2	10.8	6.9	4.9
29	14.3	9.1	6.5	12.0	7.5	5.4	11.3	7.2	5.2
30	14.8	9.4	6.8	12.3	7.8	5.7	11.7	7.4	5.4
31	15.1	9.6	7.1	12.7	8.1	5.8	12.0	7.6	5.5
32	15.8	10.0	7.3	13.1	8.4	6.1	12.4	8.0	5.7
33	16.3	10.3	7.5	13.6	8.6	6.3	12.9	8.2	5.9
34	16.9	10.8	7.7	14.1	9.0	6.5	13.3	8.5	6.2
35	17.6	11.1	8.0	14.7	9.3	6.7	13.9	8.7	6.3
36	18.2	11.4	8.3	15.1	9.5	6.9	14.3	9.1	6.5
37	18.6	11.8	8.6	15.6	9.8	7.2	14.7	9.3	6.7
38	19.4	12.2	8.9	16.1	10.1	7.3	15.4	9.6	6.9
39	19.7	12.4	9.0	16.5	10.3	7.5	15.6	9.8	7.1
40	20.2	12.8	9.2	16.8	10.6	7.7	15.9	10.1	7.3
41	20.6	12.9	9.4	17.3	10.8	7.8	16.3	10.2	7.4
42	21.3	13.3	9.8	17.7	11.1	8.1	16.8	10.5	7.6
43	22.2	13.9	10.1	18.5	11.7	8.4	17.5	11.0	8.0
44	22.8	14.3	10.4	18.9	11.9	8.6	17.9	11.3	8.2
45	24.1	15.1	10.9	20.1	12.6	9.1	18.9	12.0	8.6
46	25.1	15.9	11.5	21.0	13.2	9.6	19.8	12.6	9.2
47	26.8	17.0	12.3	22.3	14.2	10.3	21.2	13.5	9.8
48	28.1	17.9	13.1	23.4	14.9	10.9	22.2	14.1	10.3
49	29.7	19.1	13.7	24.8	15.9	11.5	23.4	15.1	10.9
50	31.5	20.5	15.0	26.3	17.1	12.6	24.9	16.1	11.9
51	33.3	21.5	16.1	27.7	18.3	13.5	26.2	17.3	12.7
52	35.2	23.3	17.3	29.4	19.4	14.5	27.8	18.4	13.7
53	37.0	24.7	18.5	30.8	20.6	15.3	29.1	19.5	14.6
54	39.1	26.2	19.7	32.6	21.5	16.5	30.9	20.7	15.6
55	41.2	27.8	21.3	34.4	23.2	17.8	32.6	22.0	16.8
56	42.6	29.0	22.6	35.5	24.2	18.8	33.6	23.0	17.8
57	44.8	30.7	24.1	37.4	25.6	20.1	35.4	24.2	19.1
58	46.7	32.2	25.2	38.9	27.0	21.0	36.9	25.4	19.8
59	48.2	33.3	26.3	40.1	27.8	22.0	38.0	26.2	20.8
60	50.0	34.7	27.7	41.6	29.0	23.1	39.5	27.5	21.9

A47091 -19-05MAY05

Herbicide Rate Chart—Clay Granules—30 in. to 38 in. Rows

U.S. UNITS OF MEASURE - METER SETTING
HERBICIDE APPLICATION RATES (Clay Granules)

Approximate Rate in Lbs/Acre

METER SETTING	30 INCH ROWS MPH			36 INCH ROWS MPH			38 INCH ROWS MPH		
	4	6	8	4	6	8	4	6	8
10	2.1	1.4	1.1	1.7	1.2	0.9	1.7	1.1	0.9
11	2.5	1.6	1.2	2.1	1.4	1.0	2.0	1.3	1.0
12	3.0	1.9	1.4	2.5	1.6	1.2	2.3	1.5	1.1
13	3.5	2.3	1.7	2.9	1.9	1.4	2.8	1.8	1.3
14	4.0	2.6	2.0	3.3	2.2	1.6	3.2	2.1	1.5
15	4.8	3.1	2.3	4.0	2.6	1.9	3.8	2.4	1.8
16	5.5	3.6	2.6	4.6	3.0	2.2	4.4	2.8	2.1
17	6.2	4.0	2.9	5.1	3.3	2.4	4.9	3.2	2.3
18	6.7	4.4	3.2	5.6	3.6	2.7	5.3	3.4	2.5
19	7.2	4.7	3.4	6.0	3.9	2.8	5.7	3.7	2.7
20	7.9	5.1	3.7	6.6	4.2	3.1	6.2	4.0	2.9
21	8.4	5.4	4.0	7.0	4.5	3.3	6.6	4.3	3.1
22	9.0	5.8	4.2	7.5	4.8	3.5	7.1	4.6	3.4
23	9.5	6.1	4.5	7.9	5.1	3.7	7.5	4.8	3.5
24	10.1	6.5	4.7	8.4	5.4	3.9	8.0	5.1	3.7
25	10.6	6.7	4.9	8.8	5.6	4.1	8.4	5.3	3.9
26	11.1	7.1	5.2	9.2	5.9	4.3	8.7	5.6	4.1
27	11.7	7.4	5.4	9.8	6.2	4.5	9.2	5.9	4.3
28	12.3	7.8	5.6	10.3	6.5	4.6	9.6	6.2	4.4
29	12.8	8.1	5.8	10.7	6.7	4.8	10.1	6.4	4.6
30	13.2	8.4	6.1	11.0	7.0	5.1	10.4	6.6	4.8
31	13.5	8.6	6.3	11.3	7.2	5.2	10.7	6.8	4.9
32	14.1	8.9	6.5	11.7	7.5	5.4	11.1	7.1	5.1
33	14.6	9.2	6.7	12.1	7.7	5.6	11.5	7.3	5.3
34	15.1	9.6	6.9	12.6	8.0	5.8	11.9	7.6	5.5
35	15.7	9.9	7.1	13.1	8.3	6.0	12.4	7.8	5.6
36	16.2	10.2	7.4	13.5	8.5	6.2	12.8	8.1	5.8
37	16.6	10.5	7.7	13.9	8.7	6.4	13.1	8.3	6.0
38	17.3	10.9	7.9	14.4	9.0	6.5	13.7	8.6	6.2
39	17.6	11.1	8.0	14.7	9.2	6.7	13.9	8.7	6.3
40	18.0	11.4	8.2	15.0	9.5	6.9	14.2	9.0	6.5
41	18.4	11.5	8.4	15.4	9.6	7.0	14.5	9.1	6.6
42	19.0	11.9	8.7	15.8	9.9	7.2	15.0	9.4	6.8
43	19.8	12.4	9.0	16.5	10.4	7.5	15.6	9.8	7.1
44	20.3	12.8	9.3	16.9	10.6	7.7	16.0	10.1	7.3
45	21.5	13.5	9.7	17.9	11.2	8.1	16.9	10.7	7.7
46	22.4	14.2	10.3	18.7	11.8	8.6	17.7	11.2	8.2
47	23.9	15.2	11.0	19.9	12.7	9.2	18.9	12.0	8.7
48	25.1	16.0	11.7	20.9	13.3	9.7	19.8	12.6	9.2
49	26.5	17.0	12.3	22.1	14.2	10.3	20.9	13.5	9.7
50	28.1	18.3	13.4	23.5	15.3	11.2	22.2	14.4	10.6
51	29.7	19.5	14.4	24.7	16.3	12.0	23.4	15.4	11.3
52	31.4	20.8	15.4	26.2	17.3	12.9	24.8	16.4	12.2
53	33.0	22.0	16.5	27.5	18.4	13.7	26.0	17.4	13.0
54	34.9	23.4	17.6	29.1	19.5	14.7	27.6	18.5	13.9
55	36.8	24.8	19.0	30.7	20.7	15.9	29.1	19.6	15.0
56	38.0	25.9	20.2	31.7	21.6	16.8	30.0	20.5	15.9
57	40.0	27.4	21.5	33.4	22.8	17.9	31.6	21.6	17.0
58	41.7	28.7	22.5	34.7	24.0	18.7	32.9	22.7	17.7
59	43.0	29.7	23.5	35.8	24.8	19.6	33.9	23.4	18.6
60	44.6	31.0	24.7	37.1	25.9	20.6	35.2	24.5	19.5

Herbicide Rate Chart—Clay Granules—70 cm Rows

Metric Units of Measure - Meter Setting			
Herbicide Application Rates (Clay Granules)			
Approximate Rate in Kilograms/Hectare			
	70 CM ROWS		
	KM/HOUR		
Meter Settings	6.4	9.7	12.9
10	2.6	1.7	1.3
11	3.1	2.0	1.5
12	3.7	2.3	1.7
13	4.3	2.8	2.1
14	4.9	3.2	2.4
15	5.9	3.8	2.8
16	6.7	4.4	3.2
17	7.6	4.9	3.5
18	8.2	5.4	3.9
19	8.8	5.7	4.1
20	9.6	6.2	4.5
21	10.2	6.6	4.9
22	11.0	7.1	5.1
23	11.6	7.4	5.5
24	12.3	7.9	5.7
25	12.9	8.2	6.0
26	13.5	8.7	6.3
27	14.3	9.0	6.6
28	14.9	9.5	6.8
29	15.6	9.9	7.1
30	16.1	10.2	7.4
31	16.5	10.5	7.7
32	17.2	10.9	7.9
33	17.8	11.2	8.2
34	18.4	11.7	8.4
35	19.2	12.1	8.7
36	19.8	12.4	9.0
37	20.3	12.8	9.4
38	21.1	13.3	9.6
39	21.5	13.5	9.8
40	22.0	13.9	10.0
41	22.4	14.0	10.2
42	23.2	14.5	10.6

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OUO1074,0000090 -19-29JAN01-1/2

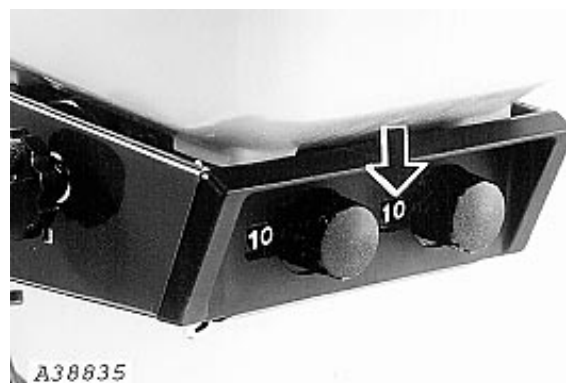
Metric Units of Measure - Meter Setting			
Herbicide Application Rates (Clay Granules)			
Approximate Rate in Kilograms/Hectare			
	70 CM ROWS		
	KM/HOUR		
Meter Settings	6.4	9.7	12.9
43	24.2	15.1	11.0
44	24.8	15.6	11.3
45	26.2	16.5	11.8
46	27.3	17.3	12.6
47	29.2	18.5	13.4
48	30.6	19.5	14.3
49	32.3	20.7	15.0
50	34.3	22.3	16.3
51	36.2	23.8	17.6
52	38.3	25.4	18.8
53	40.3	26.8	20.1
54	42.6	28.6	21.5
55	44.9	30.3	23.2
56	46.4	31.6	24.6
57	48.8	33.4	26.2
58	50.9	35.0	27.5
59	52.5	36.2	28.7
60	54.4	37.8	30.1

OUO1074,0000090 -19-29JAN01-2/2

Calibrating Insecticide/Herbicide Meter

If it should ever become necessary to recalibrate the granular meter on insecticide/herbicide hopper, proceed as follows:

1. Turn knob on rear of hopper to a setting of "10".
2. Remove hopper and turn it upside down on a flat surface.



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AG,OUO6074,1305 -19-29JUN05-1/5

A38835 -UN-19DEC95

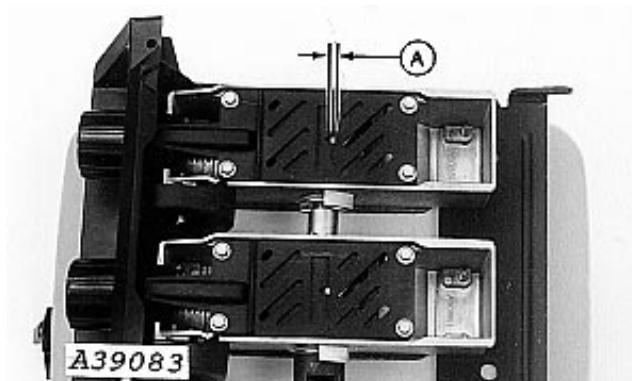
3. Measure the V-notch opening (A) on the meter gate.
The opening should be set to a specified width.

Specification

V-Notch Opening—Width4 mm
(0.160 in.)

If measurement is to specification, the meter is calibrated correctly. If measurement is not to specification, the meter must be recalibrated.

A—V-Notch Opening

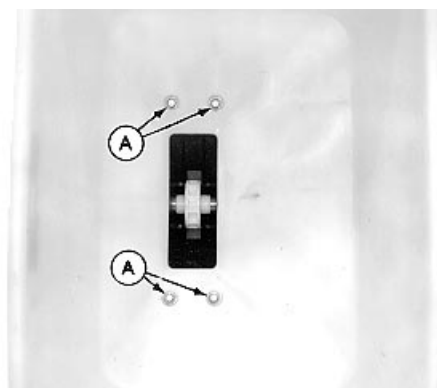


A39083 -UN-17JAN96

AG,OUO6074,1305 -19-29JUN05-2/5

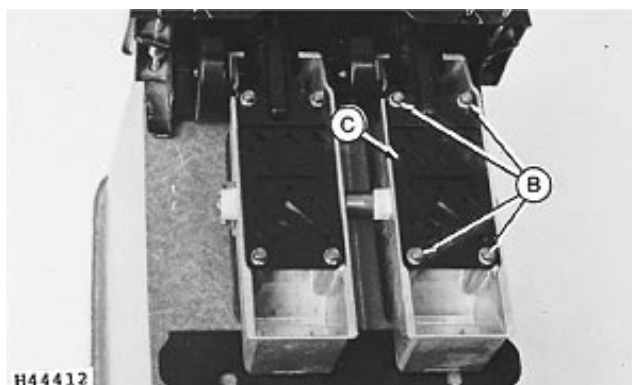
4. Remove four M6 x 20 cap screws (A) securing meter to hopper. Remove meter from bottom of hopper.
5. Remove four M6 x 16 cap screws (B). Remove gate cover (C).

A—Cap Screws, M6 x 20
B—Cap Screws, M6 x 16
C—Cover



A41132 -UN-21APR97

Single Meter



H44412 -UN-20MAY92

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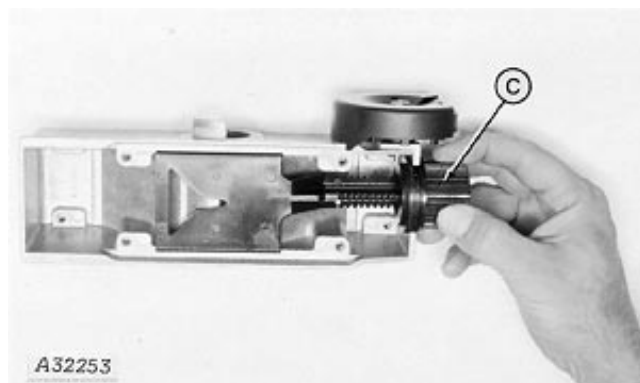
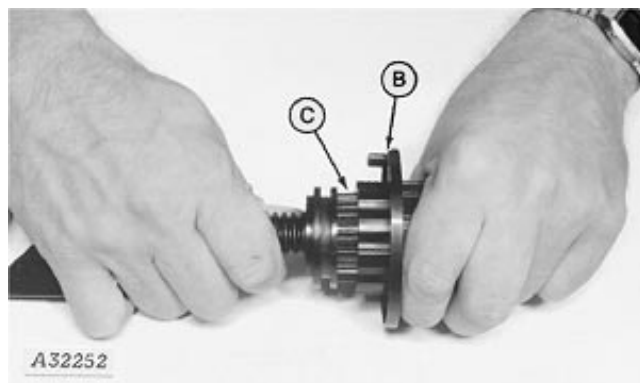
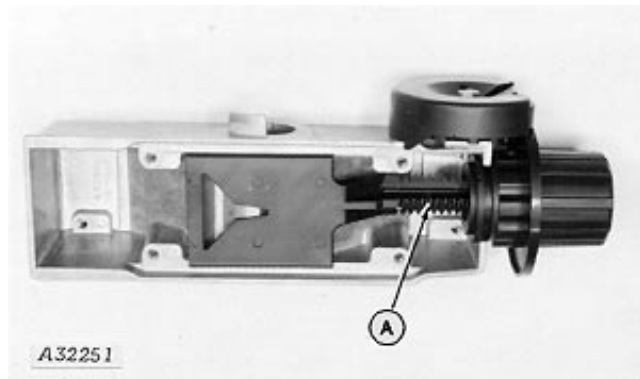
AG,OUO6074,1305 -19-29JUN05-3/5

6. Remove entire plastic gate assembly (A) from aluminum housing.
7. Work knob (B) back and forth while pulling apart to remove knob from splined nut (C).
8. Turn nut (C) until V-notch opening is to specification.

Specification

V-Notch Opening—Width4 mm
(0.160 in.)

A—Plastic Gate Assembly
B—Knob
C—Nut



Continued on next page

AG,OUO6074,1305 -19-29JUN05-4/5

9. Replace the knob on nut so the number "0" lines up with the number "1" on cam follower. The meter should have a setting of "10".
10. Seat knob to flange on nut.
11. Install gate cover with cap screws previously removed.
12. Install meter on bottom of hopper and attach with cap screws previously removed.



AG,OUO6074,1305 -19-29JUN05-5/5

Lid Fill Closed Handling System

An optional lid fill closed handling system is available for a machine ordered with insecticide only granular chemical application system.



OUO6074,00009DC -19-08MAR04-1/1

Idler Options

Slide-type idlers are standard equipment.

Sprocket-type are available as optional equipment through Service Parts.

The Slide Type idler is recommended for use with unit-mounted coulters, row cleaners or in fields that have high levels of residue. They can also be used in conventional or mulch-till.

Sprocket-Type idler is recommended for conventional tilled fields where residue levels are low.

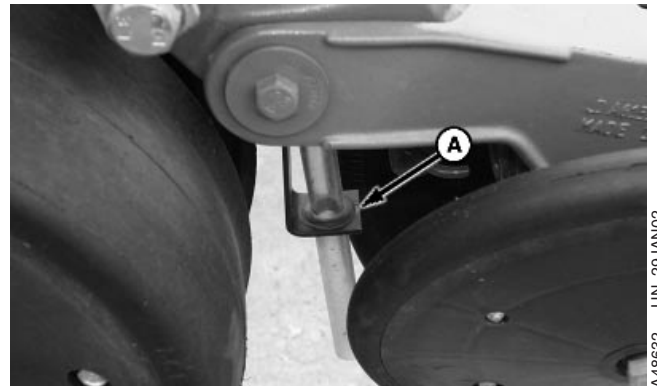
AG,OUO6074,1307 –19-04AUG00-1/1

Insecticide Seed-Furrow Placement Bracket

IMPORTANT: Some insecticides are toxic if it comes into direct contact with the seed.
Consult the chemical supplier for the proper location to apply the chemical.

Placement bracket (A) holds granular insecticide tube for placement of material in seed-furrow.

A—Bracket



A48632 –UN-29JAN02

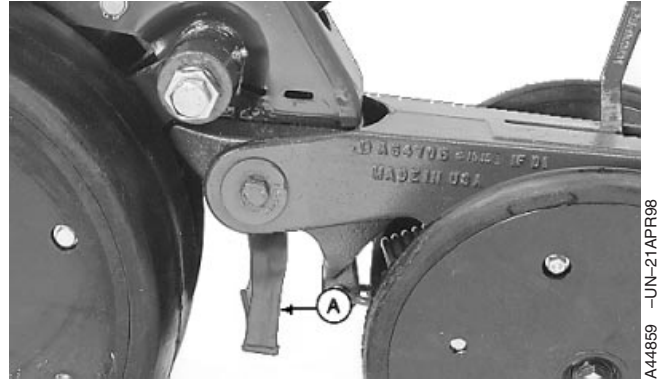
AG,OUO6074,1308 –19-04AUG00-1/1

Insecticide Band Spreader (Front Mounted)

IMPORTANT: Some insecticides are toxic if it comes into direct contact with the seed.
Consult the chemical supplier for the proper location to apply the chemical.

The insecticide band spreader (A) is designed to apply a band of granular insecticide approximately 18 cm (7 in.) wide on top of ground when planting.

A—Insecticide Band Spreader

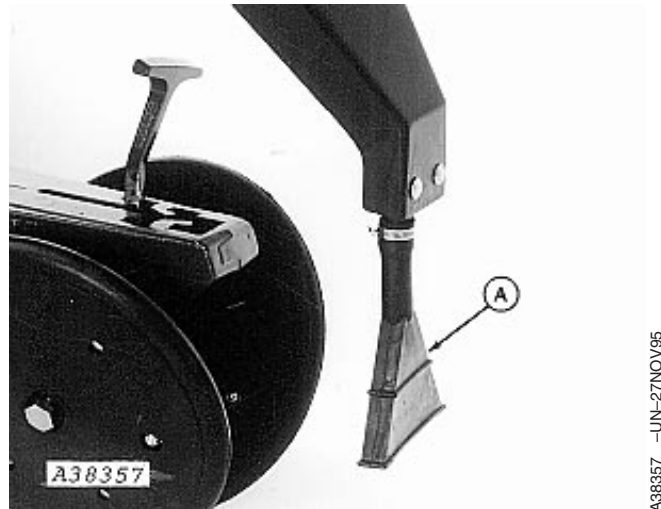


AG,OUO6074,1309 -19-04AUG00-1/1

Insecticide Band Spreader (Rear Mounted)

The rear mount insecticide band spreader (A) is designed to apply a band of granular insecticide approximately 18 cm (7 in.) wide behind closing wheels.

A—Insecticide Band Spreader

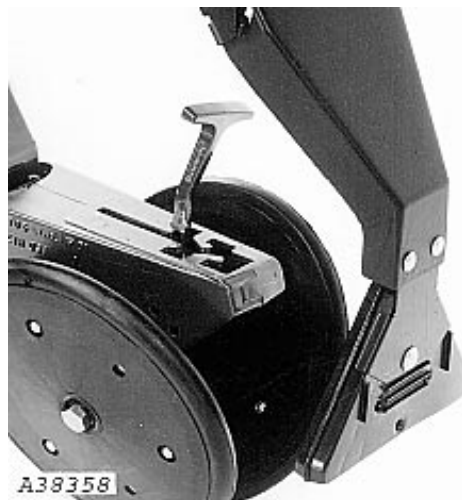


AG,OUO6074,1310 -19-04AUG00-1/1

Herbicide Diffuser

NOTE: We recommend measuring the actual band width applied and using this width in application rate calculations.

The herbicide diffuser is designed to, under normal conditions, apply a band of granular herbicide approximately 36 cm (14 in.) wide behind closing wheels.



A38358 -UN-27NOV95

AG,OUO6074,1311 -19-04AUG00-1/1

Windshield

The windshield (A) helps maintain distribution pattern of herbicide diffuser and/or rear mount insecticide spreader in windy conditions.

A—Windshield



A38359 -UN-27NOV95

AG,OUO6074,1312 -19-04AUG00-1/1

Tine-Tooth Incorporator

The tine-tooth incorporator attachment provides an efficient means of mixing insecticide and/or herbicide into the soil and leaves a smooth ground surface behind planting unit.

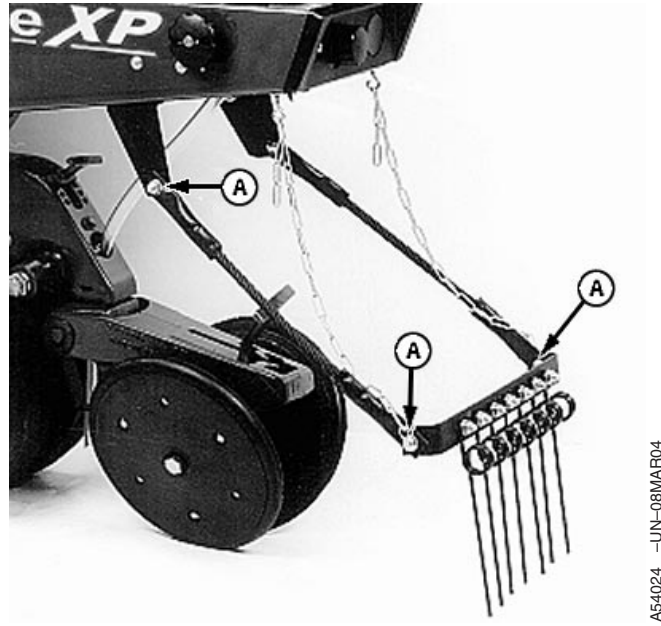
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OUO6074,00009DD -19-08MAR04-1/2

NOTE: Adjust support chains to allow tines to both contact soil and raise with machine without sagging.

Loosen nuts (A) to raise or lower cable supports and adjust spring angle and down pressure. Tighten nuts.

A—Nuts



OUO6074,00009DD -19-08MAR04-2/2

A54024 -UN-08MAR04

Lubrication

Lubricating and Maintaining Machine Safely



CAUTION: To help prevent serious injury or death to you or others caused by unexpected movement, service machine on a level surface. Lower machine to ground or sufficiently lock or block raised machine before servicing. If machine is connected to tractor, engage parking brake and place transmission in "PARK", shut off engine and remove key. If machine is detached from tractor, block wheels and use shop stands to prevent movement.



N40000 -UN-28SEP88

AG,OUO6074,1354 -19-04AUG00-1/1

Perform Lubrication and Maintenance Procedures



CAUTION: Do not clean, lubricate, or adjust machine while in motion.

IMPORTANT: The recommended service intervals are based on normal conditions; severe or unusual conditions may require more frequent lubrication.

Perform each lubrication and service procedure illustrated in this section

at the beginning and end of each season.

Clean grease fittings before using grease gun. Replace any lost or broken fittings immediately. If a new fitting fails to take grease, remove and check for failure of adjoining parts.

AG,OUO6074,1355 -19-04AUG00-1/1

Grease

Use grease based on NLGI consistency numbers and the expected air temperature range during the service interval.

John Deere SD POLYUREA GREASE is preferred.

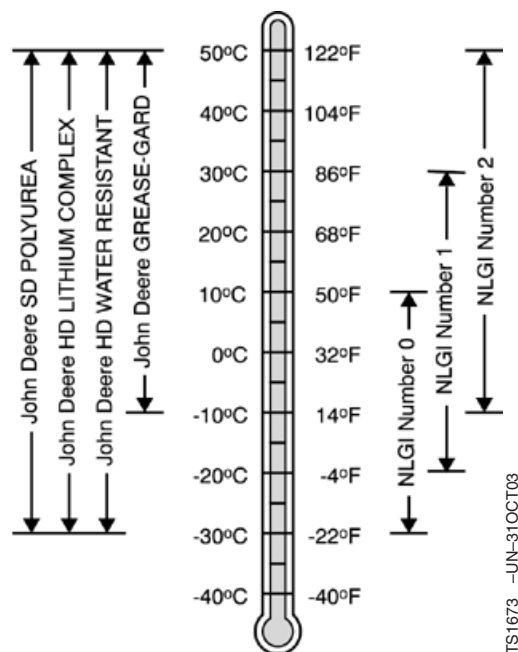
The following greases are also recommended

- John Deere HD LITHIUM COMPLEX GREASE
- John Deere HD WATER RESISTANT GREASE
- John Deere GREASE-GARD

Other greases may be used if they meet the following:

NLGI Performance Classification GC-LB

IMPORTANT: Some types of grease thickeners are not compatible with others. Consult your grease supplier before mixing different types of grease



GREASE-GARD is a trademark of Deere & Company

DX,GREAI -19-07NOV03-1/1

Lubrication Symbols

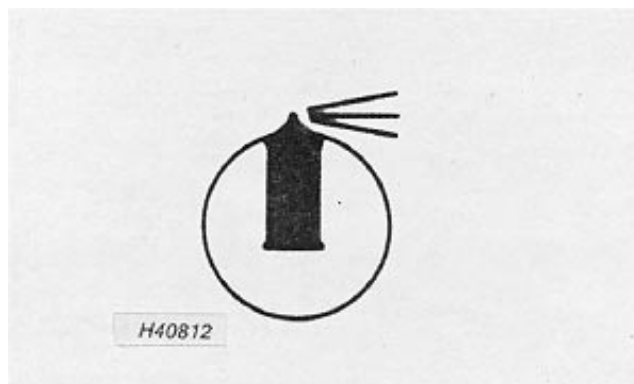
 Lubricate with grease at hourly interval indicated on symbol.

 Pack wheel bearings with axle bearing grease at hourly interval indicated on symbol.

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

AG,OUO6074,1356 -19-04AUG00-1/2

Lubricate with John Deere TY6350 Multipurpose spray lube as required.



AG,OUO6074,1356 -19-04AUG00-2/2

Alternative Lubricants

Conditions in certain geographical areas may require special lubricants and lubrication practices which do not appear in this operator's manual. If there are any questions, consult your John Deere dealer to obtain latest information and recommendation.

AG,OUO6074,1357 -19-04AUG00-1/1

Lubrication—Pro-Series *XP* Vacuum Seed Meters



CAUTION: Follow chemical manufacturers precautions when handling parts coated with seed treatments. Use proper skin, eye and respiratory protection.

IMPORTANT: Apply seed treatment to seed **BEFORE** applying talc lubricant to insure that treatment adheres to seed properly while minimizing buildup on meter components. If buildup of treatment still occurs, contact the chemical manufacturer for assistance.

IMPORTANT: Some insecticide-treated seed is coated with commercially applied talc.

For best performance, use of seed treatments is not recommended. If they must be used, apply any seed treatment to seed and allow to fully dry before placing in tanks. Adding talc is required to maintain metering performance. To add talc, perform the following.

If planting commercially-treated seed and no farmer-applied treatments are being used:

IMPORTANT: To ensure proper seeding, seed and treatment mixes must be free of clumps.

NOTE: Talc should be mixed with seed prior to being placed in tanks.

NOTE: Talc can be mixed proportionately and thoroughly while seed is being placed in tanks.

A34471



A34471 -JUN-11OCT88

Talc Application Rate

Unit Size	Amount of Talc
1762 L (50 bu) Bulk Tank	3.8 L (16 cups)
Per 80,000 kernel seed corn unit	74 mL (5 Tbls.) (2.5 oz)

Adjust these rates as necessary so all seeds become coated with talc, while avoiding an accumulation of talc in bottom of tank.

Double talc application for small seed sizes, very large seed, seeds with heavy treatment, or for humid planting conditions.

IMPORTANT: Cleanout any buildup of treatments or talc between fills.

NOTE: Using sticky seed treatments which leave a wet coating on seed is not recommended.

If talc builds up in bottom of hopper and vacuum manifolds require frequent cleanout, reduce accordingly. If a coating of seed treatment is found on seed disks, increase the amount of talc.

IMPORTANT: If farmer-applied treatments are used, follow chemical manufacturers recommendations carefully. HIGH-OIL-CONTENT TREATMENTS ARE NOT RECOMMENDED.

Chemical reaction between farmer-applied seed treatments and treatments commercially applied to seed can cause seed treatments to become sticky. Certain temperature and humidity levels can further complicate material compatibility.

Check with the chemical and seed supplier for treatment compatibility.

NOTE: When using seed treatments, meters should be cleaned as needed.

OOU6074,0000BC2 -19-26MAR04-2/2

Lubrication—MaxEmerge XP Vacuum Seed Meters

CAUTION: Follow chemical manufacturers precautions when handling parts coated with seed treatments. Use proper skin, eye and respiratory protection.

IMPORTANT: Apply seed treatment to seed **BEFORE** applying talc lubricant to insure that treatment adheres to seed properly while minimizing buildup on meter components. If buildup of treatment still occurs, contact the chemical manufacturer for assistance.

IMPORTANT: Some insecticide-treated seed is coated with commercially applied talc.

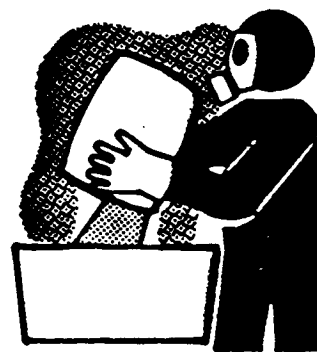
For best performance, use of seed treatments is not recommended. If they must be used, apply any seed treatment to seed and allow to fully dry before placing in tanks. Adding talc is required to maintain metering performance. To add talc, perform the following.

If planting commercially-treated seed and no farmer-applied treatments are being used:

IMPORTANT: To ensure proper seeding, seed and treatment mixes must be free of clumps.

NOTE: Talc should be sprinkled over top of seeds in hoppers.

A34471



A34471 -JUN-11OCT88

Talc Application Rate

Hopper Size	Amount of Talc
58 L (1.6 bu)	120 ml (1/2 cup)
106 L (3 bu)	240 ml (1 cup)

Adjust these rates as necessary so all seeds become coated with talc, while avoiding an accumulation of talc in bottom of tank.

Double talc application for small seed sizes, very large seed, seeds with heavy treatment, or for humid planting conditions.

IMPORTANT: Cleanout any buildup of treatments or talc between fills.

NOTE: Using sticky seed treatments which leave a wet coating on seed is not recommended.

If talc builds up in bottom of hopper and vacuum manifolds require frequent cleanout, reduce accordingly. If a coating of seed treatment is found on seed disks, increase the amount of talc.

IMPORTANT: If farmer-applied treatments are used, follow chemical manufacturers recommendations carefully. HIGH-OIL-CONTENT TREATMENTS ARE NOT RECOMMENDED.

Chemical reaction between farmer-applied seed treatments and treatments commercially applied to seed can cause seed treatments to become sticky. Certain temperature and humidity levels can further complicate material compatibility.

Check with the chemical and seed supplier for treatment compatibility.

NOTE: When using seed treatments, meters should be cleaned as needed.

OOU6074,0000BBF -19-26MAR04-2/2

Lubrication—MaxEmerge XP Radial Bean Meter

IMPORTANT: Some insecticide-treated seed is coated with commercially applied graphite. It is important that the recommended amount of graphite be added in addition to graphite already on the seed.

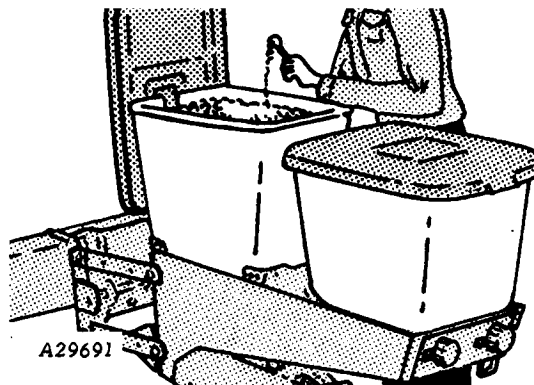
IMPORTANT: Regular use of 15 mL (1 Tbls.) of powdered graphite (Part No. B33379) added into hopper per each bushel of soybeans reduces wear of metering components and prolongs life of meter. Graphite will filter down into radial bean meter and insure proper lubrication. John Deere Graphite provides a dry lubrication. Some types have an oil base and will form a gummy residue on parts. Graphite does not eliminate need for proper and regular lubrication indicated in lubrication charts.

NOTE: Any additives other than John Deere powdered graphite in radial bean meters may leave residue on parts that could affect planting rates.

NOTE: If graphite is building up in bottom of hopper, reduce amount accordingly.

Add 15 mL (1 Tbls.) of powdered graphite (part No. B33379) into each 58 L (1.6 bu) hopper at each refill. Double the amount if using 106 L (3 bu) hoppers.

With rough-textured soybeans or treated soybeans, extra graphite added regularly with seed will improve seed flow into meter.



A29691 -UN-13OCT88

OUO6074,0000BC0 -19-26MAR04-1/1

Lubrication—MaxEmerge *XP* Finger Pick-Up

IMPORTANT: Some insecticide-treated seed may be coated with commercially applied graphite. It is important that the recommended amount of graphite be added in addition to graphite already on the seed.

IMPORTANT: Graphite will filter down into finger pick-up mechanism and insure proper lubrication. John Deere Graphite provides a dry lubrication. Some types have an oil base and will form a gummy residue on parts. Graphite does not eliminate need for proper and regular lubrication indicated in lubrication charts.

NOTE: If graphite is building up in bottom of hopper, reduce amount accordingly.

NOTE: During humid conditions, talc may be added to improve seed flow.

Regular Seed: Add 15 mL (1 Tbls.) of powdered graphite (part No. B33379) into each 58 L (1.6 bu) hopper at each refill. Double the amount if using 106 L (3 bu) hoppers.

Insecticide Treated Seed: Add 15 mL (1 Tbls.) of powdered graphite for each bushel of seed added into hopper. Every seed should be visibly grey when coated properly.

OUO6074,0000BC1 -19-27JUL04-1/1

Roller Chain and Pesticide Sprocket Lubrication

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

The most effective roller chain lubrication routine varies, depending on environmental conditions and/or condition of chain. The goal is to maintain complete freedom at every chain link joint.

Lubricate all machine roller chains with John Deere Multipurpose Spray Lube, TY6350 (or equivalent) at intervals sufficient to maintain free chain movement.

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

If machine is not to be used for several days, thoroughly lubricate chains with John Deere Multipurpose Spray Lube, TY6350, at the beginning of idle period. If roller chains have become rusty or stiff during idle period, lubricate prior to continued usage and operate or "work" chains sufficiently to ensure all chain joints move freely before normal machine operation is resumed.

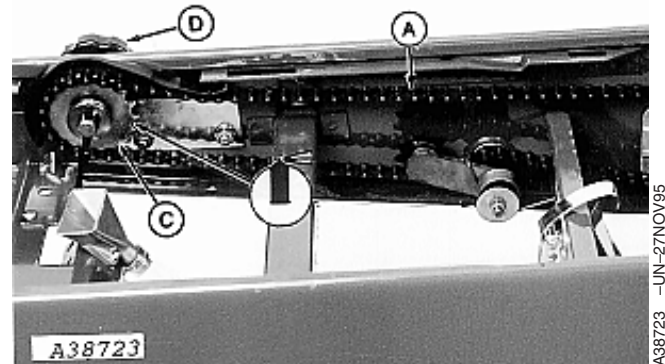
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AG,OUO6074,1358 -19-04AUG00-1/2

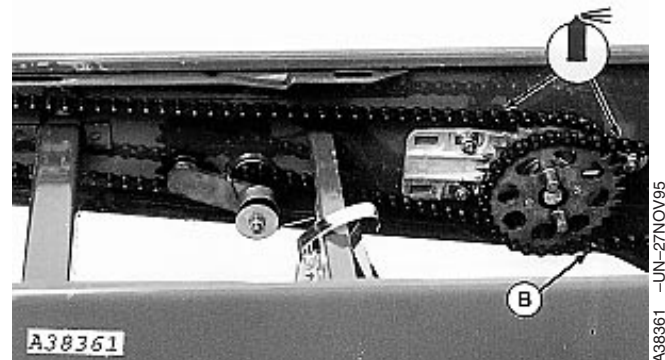
Lubricate pesticide drive chain (A) and seed meter drive chain (B) with John Deere Multipurpose Spray Lube, TY6350.

Lubricate pesticide drive sprocket (C) with John Deere Multipurpose Spray Lube, TY6350. Move drive disconnect knob (D) back and forth while spraying. This will loosen any paint or dirt buildup and help allow sprocket to turn freely. In adverse conditions it may be necessary to lubricate these sprockets daily.

- A—Pesticide Drive Chain
- B—Seed Meter Drive Chain
- C—Pesticide Drive Sprocket
- D—Drive Disconnect Knob



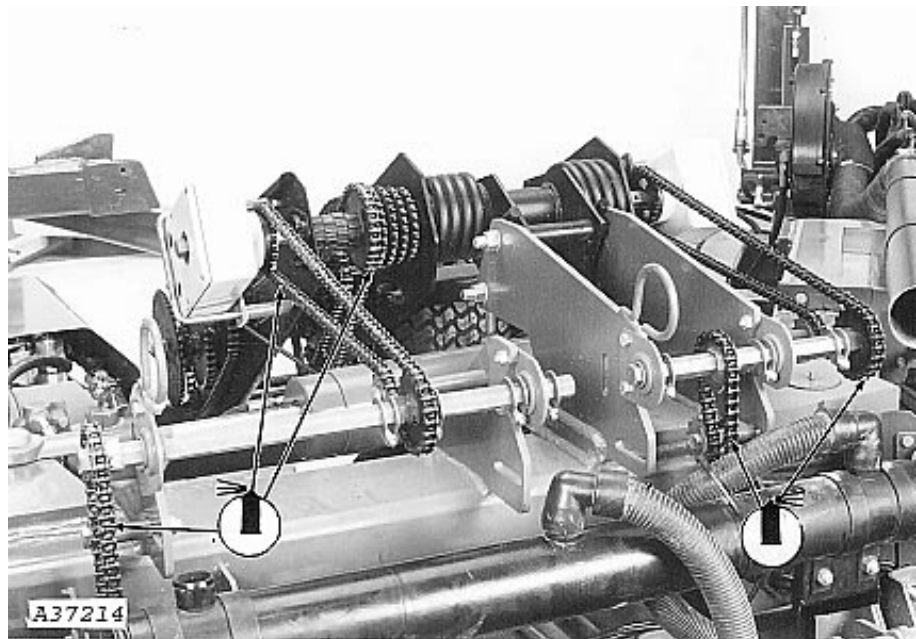
A38723 -UN-27NOV95



A38361 -UN-27NOV95

AG,OUO6074,1358 -19-04AUG00-2/2

Lubrication—As Required



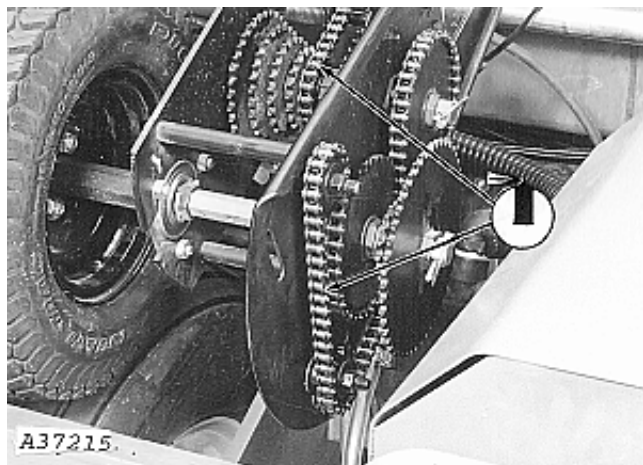
A37214 -UN-10AUG95

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 teeth.

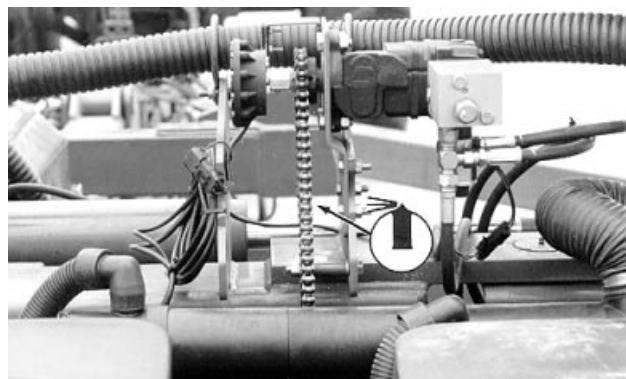
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OUO1074,0000148 -19-24JUN05-1/2



A37215 -UN-10AUG95

Seed Transmission Drive



A44250 -UN-06NOV97

Variable Rate Drive Chain (If Equipped)

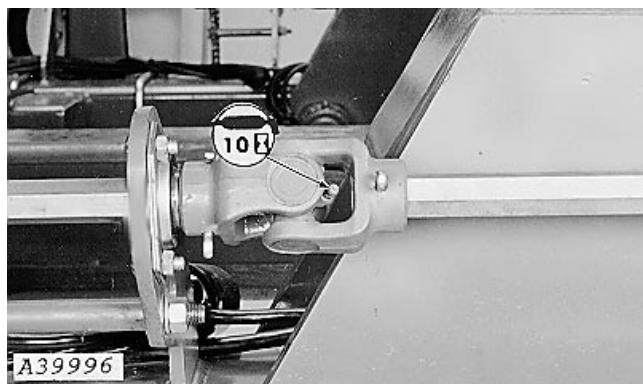


A40467 -UN-22NOV96

Drive Chains

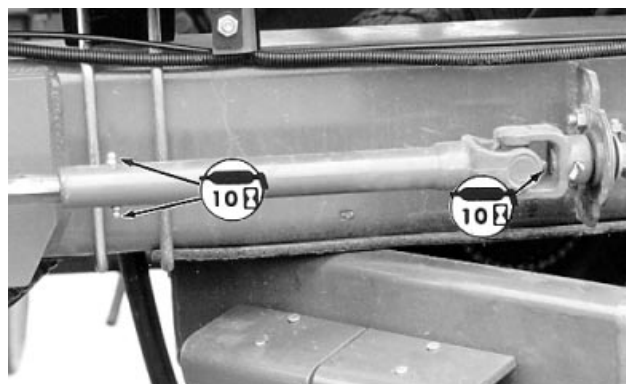
OUC1074,0000148 -19-24JUN05-2/2

Lubrication—Every 10 Hours or Daily



A39996 -UN-28AUG96

Jackshaft

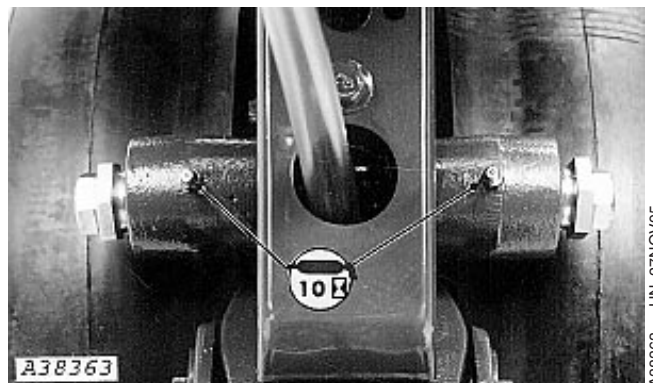


A44253 -UN-07NOV97

Jack Shafts

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OUC1074,000014A -19-15MAR01-1/2

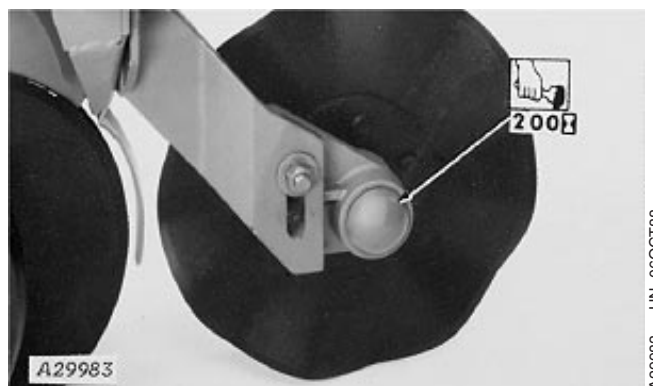


Gauge Wheels

OUO1074,000014A -19-15MAR01-2/2

Lubrication—Every 200 Hours

Lubricate coultter bearing with John Deere Multipurpose Lubricant or an equivalent. See COULTER MAINTENANCE—EVERY 200 HOURS in Service—Every 200 Hours section.



Unit Mounted Coulter

OUO1074,000014D -19-27MAY05-1/1

Lubrication—Frame

See your Bauer Built MFG. Operator's Manual.

OUO1074,0001497 -19-01MAY03-1/1

Troubleshooting

Drives

Symptom	Problem	Solution
Row units on right-hand side of machine not planting.	Right-hand drive shaft cotter pin(s) sheared.	Repair cause of pin shearing and replace cotter pin.
	Half-Width Drive Disconnect is engaged.	Move switch to middle position.
Row units on left-hand side of machine not planting.	Left-hand drive shaft cotter pin(s) sheared.	Repair cause of pin shearing and replace cotter pin.
	Half-Width Drive Disconnect is engaged.	Move switch to middle position.

OUO1074,00000EA -19-12MAR01-1/1

Row Units

Symptom	Problem	Solution
Row units on right-hand side of machine not planting.	Right-hand drive shaft cotter pin sheared.	Repair cause of pin shearing and replace cotter pin.
	Half-Width Drive Disconnect is engaged.	Move switch to middle position.
	Right-hand vacuum blower off.	Restart vacuum blower.
Row units on left-hand side of machine not planting.	Left-hand drive shaft cotter pin(s) sheared.	Repair cause of pin shearing and replace cotter pin.
	Half-Width Drive Disconnect is engaged.	Move switch to middle position.
	Left-hand vacuum blower off.	Restart vacuum blower.
Seed tubes plugging.	Machine rolling backward when lowering.	Lower machine while moving forward.
	Turning tractor steering wheel when machine is down and stationary. (Four Wheel Drive Tractors only.)	Avoid turning tractor when machine is down and stationary.
Inconsistent seed depth.	Planting in rough seed bed.	Use down force spring attachment on planting units.
	Seed tubes partially plugged or improperly installed.	Inspect seed tubes. Ensure seed tubes are hooked properly in unit shank.
Closing wheels leave severe imprint in soil.	Too much spring force.	Adjust closing wheel spring.
Closing wheels not firming soil around seed.	Insufficient spring force.	Adjust closing wheel spring.
Closing wheel running on top of seed furrow.	Improper centering.	Align.
Closing wheels not applying equal force.	Closing wheel frame not level.	Re-level.

Continued on next page

OUO6074,0000BC5 -19-24JUN05-1/2

Troubleshooting

Symptom	Problem	Solution
Drive chain consistently falls off.	Chain may be too long.	Remove offset link.
	Chain links stiff.	Oil or replace chain.
	Sprockets misaligned.	Align sprockets.
Monitor will not count seeds.	Dirt or debris has collected in seed tube or on sensor.	Clean seed tube and sensor with cleaning brush.

OUO6074,0000BC5 -19-24JUN05-2/2

Mechanical Seed Drives

NOTE: For issues related to Variable Rate Drive, see the *SEEDSTAR Variable Rate Drive Operator's Manual*.

Symptom	Problem	Solution
Meters stop driving on one-half or the entire machine.	Binding in a section of the drives system can cause a shear pin to fail, thus, protecting the rest of the drive components.	Note: When turning the drive system by hand to check for binding, be sure to rotate all drill shafts in their normal direction of rotation. Also, it is often useful to compare the torque values required to drive given sections of the machine against similar sections on the opposite side of the machine. Shear pins may also become deformed after extended use. In this condition, it is possible for the shear pin to eventually fail without a machine malfunction. For this reason, all shear pins should be replaced annually. Look for source of binding, and make sure that drives can be turned by hand before replacing pin and resuming planting. Common causes for binding include, but are not limited to, improper care and/or lubrication of drive components and meters. For shear pin locations on this machine see REPLACING SHEAR PROTECTION PINS in Service—As Required section.
	Half width disconnect failure due to overload.	Inspect half width clutch and repair as needed.

Symptom	Problem	Solution
Meters stop driving on the entire machine or drive erratically.	Failed or worn sprockets, chains, or chain idlers within the transmission.	Examine chains, sprockets and idlers within the transmission and fix, align or replace as necessary.
	Poor maintenance of row unit drives and meters.	Perform maintenance on seed meters and the components that drive them.
	Improper contact drive tire adjustment.	Adjust contact drive tire to proper specification. See ADJUSTING SEED/FERTILIZER TRANSMISSION WHEEL ENGAGEMENT POINT in Operating Machine section.
	Build-up of trash, mud and residue around transmission engagement tire.	Remove obstructions from around contact drive tire and proceed. If the machine is not equipped with mud scrapers on the chassis tire which drives the transmission tire, consider seeing your John Deere dealer about obtaining one.
	Excessive downforce setting on row units.	Decrease row unit downforce.
Meters stop driving on a section of the machine or drive erratically.	Failed or worn sprockets, chains, chain idlers, or misaligned drive couplers.	Note: When drive couplers become excessively worn, the left-hand and right-hand couplers can be swapped to provide new wear surfaces. Examine chains, sprockets, and idlers associated with failing section of the machine and fix, align, or replace as necessary. For proper drive coupler alignment, see ADJUSTING DRILLSHAFT COUPLERS AND FLEX SHAFTS in Operating the Machine section.
	Failed or disconnected Pro-shaft.	Reconnect, or replace Pro-shaft as necessary.

MaxEmerge XP Vacuum Meter

Symptom	Problem	Solution
False monitor reading.	Dirty seed tube sensors.	Clean sensors. See CLEANING SEED SENSOR in Service As Required section.
No seed being planted.	Hoppers empty.	Fill hoppers.
	No vacuum.	See Low Vacuum under VACUUM METER in Troubleshooting section.
	Seed tubes plugged or damaged.	Inspect seed tubes.

Continued on next page

OUO6074,0000BC6 -19-26JUN06-1/7

Troubleshooting

Symptom	Problem	Solution
Poor seed spacing.	Seed disk vacuum holes plugged.	Clean seed disks.
	Farmer-applied seed treatment causes buildup, seeds stick.	Follow recommended usage and application procedure.
	Worn meter brushes.	Replace brushes.
	Low vacuum.	See Low Vacuum under VACUUM METER in Troubleshooting section.
	Rusty planting unit or seed drive chains.	Lubricate chains.
	Dirt build-up on herbicide/insecticide drive.	Clean drive.
	Worn meter seals.	Replace seals.
	Seed disk hubs misadjusted.	Readjust hubs.
	Incorrect vacuum.	Adjust vacuum level to recommended setting.
	Faulty vacuum gauge.	Check air line to gauge. Clean if plugged. Replace if cut.
	Worn seed disks.	Replace disks.
	Seed tubes improperly installed or worn.	Reinstall or replace seed tubes. Ensure seed tube hook is properly positioned in unit shank.
	Worn seed tube guard.	Replace guard.
	Treated seed sticking in cell.	Increase application rate of John Deere Talc Lubricant.
	Seed disks have not been sprayed with Graphite Lubricant.	Spray seed disks with Spray on Graphite Lubricant TY25797.
Continued on next page		OUO6074.0000BC6 -19-26JUN06-2/7

Symptom	Problem	Solution
Low seed population.	If low population displays on monitor and field counts are accurate, sensors may be dirty.	Clean seed tubes and sensors.
	Seed disk vacuum holes plugged.	Clean seed disks. Flat/Type Disk: Install seed knockout assembly or replace worn seed knockout assembly.
	“Dirty” seed plugging vacuum holes.	Use clean seed. Flat/Type Disk: Install seed knockout assembly or replace worn seed knockout assembly.
	Seed disk wiper missing.	Replace wiper.
	“Treated” seed sticking in cells.	Add John Deere Talc Lubricant to seed hoppers.
	Farmer-applied seed treatment causes buildup, seeds stick.	Follow recommended usage and application procedure.
	Rusty planting unit chains.	Lubricate chains.
	Low vacuum.	See Low Vacuum under VACUUM METER in Troubleshooting section.
	Dirt build-up on herbicide/insecticide drives.	Clean drives.
	Worn meter seals.	Replace seals.
	Worn seed disks.	Replace seed disks.
	Seed “bridging” in hopper.	Add John Deere Talc Lubricant to seed hoppers. Clean vacuum meter and hopper.

Continued on next page

OUO6074.0000BC6 -19-26JUN06-3/7

Troubleshooting

Symptom	Problem	Solution
	Seed "bridging" in meter.	Open meter baffle. Add John Deere Talc Lubricant to seed hoppers. Clean vacuum meter and hopper.
	Seed size not compatible with seed disks.	Use correct seed disks.
	Excessive drive slippage.	Reduce unit down force. Check drives for binding or misalignment. Readjust seed transmission.
	Vacuum level too low.	Increase vacuum level.
	Planting too fast for rough field conditions.	Plant at speed recommended in planting rate chart. Increase unit down force.
	Meter brush improperly installed or worn.	Install brush properly or replace.
	Using incorrect transmission sprocket combination.	Use sprocket combination recommended in planting rate chart or adjust upward due to excess drive slippage.
	Using incorrect double eliminator setting.	Reduce double eliminator coverage of vacuum hole.
	Incorrect drive tire or contact tire pressure.	Inflate to proper pressure. See CHECKING TIRE INFLATION in Preparing Machine section.

Continued on next page

OUO6074.0000BC6 -19-26JUN06-4/7

Symptom	Problem	Solution
High seed population.	High vacuum.	Adjust vacuum level.
	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.
	Using incorrect transmission sprocket combination.	Use sprocket combination recommended in planting rate charts or adjust downward due to low drive wheel slippage.
	Using incorrect double eliminator setting.	Increase double eliminator coverage of vacuum hole.
	Incorrect drive tire or contact tire pressure.	Inflate to proper pressure. See CHECKING TIRE INFLATION in Preparing Machine section.
Seed tubes plugging.	Machine rolling backward when lowering.	Lower machine while moving forward.
	Turning tractor steering wheel when machine is down and stationary. (Four Wheel Drive tractors only.)	Avoid turning tractor when machine is down and stationary.
Inconsistent seed depth.	Planting in rough seed bed.	Use down force spring attachment on planting units.
	Seed tubes partially plugged or improperly installed.	Inspect seed tubes. Ensure seed tubes are hooked properly in unit shank.
Too many skips.	Planting too fast.	Reduce planting speed.

Continued on next page

OUO6074,0000BC6 -19-26JUN06-5/7

Troubleshooting

Symptom	Problem	Solution
Premature blower motor seal failure.	Incorrect hydraulic connections.	Reconnect hydraulic hoses.
	High case drain pressure.	Check for 25 psi or less back pressure at motor.
	Shutting off to neutral.	Shut off to "float".
	SCV lever stop not installed (30—60 series tractors).	Install SCV lever stop in tractor console.
Low vacuum.	Incorrect hydraulic connections.	Reconnect hoses.
	Planting unit vacuum hoses not connected to meter.	Connect vacuum hoses to meter.
	SCV lever stop not installed (30—60 series tractors).	Install lever stop in tractor console.
	Control valve misadjusted.	Adjust control valve knob.
	Air manifold system clogged with dust.	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.	Attach 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 (30—60 series tractors).	Recut lever stop.

Continued on next page

OUO6074.0000BC6 -19-26JUN06-6/7

Troubleshooting

Symptom	Problem	Solution
Erratic vacuum.	SCV lever stop not installed (30—60 series tractors).	Install lever stop.
	SCV lever stop cut to wrong length (30—60 series tractors).	Recut SCV lever stop.
	Tractor SCV linkage is mistimed (30—60 series tractors).	Tractor SCV linkage must be readjusted.
	Air manifold system clogged with dust.	Clean air manifold system.
	“Flow checking” at SCV prevents return oil flow.	Install Auxiliary Return Line Coupler Kit (BA25379).
	Control valve failed.	Replace control valve.
	Tractor oil level low.	Add oil.
Vacuum gauge does not zero.	Tractor not stabilizing flow (when controlled with tractor SCV).	Add motor adapter to vacuum motor.
	Not adjusted.	Zero adjustment. See ZEROING VACUUM GAUGE in Operating Vacuum Meter section.

OUO6074,0000BC6 -19-26JUN06-7/7

MaxEmerge XP Plateless Meter

Symptom	Problem	Solution
False monitor reading.	Dirty seed tube sensors.	Clean sensors. See CLEANING SEED SENSOR in Service As Required section.
No seed being planted.	Seed hopper empty.	Fill seed hopper.
	Seed tubes plugged or damaged.	Inspect seed tubes.
Irregular or incorrect seed spacing.	Driving too fast.	Check chart for correct speed.
	Wrong tire pressure.	Inflate tires to correct air pressure.
	Drive wheels slipping.	Reduce down force on unit down force spring.
	Wrong sprockets.	Check charts for correct sprocket combinations.
Seed spacing not as indicated in charts.	Wrong tire pressure.	Inflate tires to correct air pressure.
	Drive wheels slipping.	Reduce down force on unit down force spring.
	Inconsistent seed size.	Use seed of uniform size.
	Wrong sprockets.	Check chart for correct sprocket combination.
	Charts are approximate.	Use closest value shown.
Scattering of seeds.	Planting too fast.	Reduce planting speed.
	Seed tube improperly installed.	Check seed tube.
Seed tubes or openers plugging.	Allowing machine to roll backward when lowering.	Lower machine only when tractor is moving forward.
	Turning tractor steering wheel (four wheel drive tractors only) when machine is down and stationary.	Avoid turning tractor steering wheel when machine is lowered and stationary.

Troubleshooting

Symptom	Problem	Solution
Inconsistent seed depth.	Rough seed bed.	Use down pressure springs on planting units.
	Planting too fast	Reduce planting speed.
	Partially plugged seed tube.	Inspect and clean.
	Seed tube improperly installed.	Install properly. Fasten seed tube hook in shank.
One row not planting seed.	Obstruction or foreign material in seed hopper.	Empty seed hopper and check metering unit for obstruction.
	Seed hopper empty.	Fill seed hopper.
	Planting unit drive chain off of sprocket or broken.	Check drive chain.
	Cotter pin sheared on meter drive.	Replace cotter pin.
	Drive not functioning.	Inspect all drives.
Too many skips.	Obstruction or foreign material in seed metering unit.	Empty hopper and check metering unit for obstruction.
	Tight finger holder.	Adjust tension of finger pick-up.
	Broken finger.	Replace finger.
	Planting too slowly.	See charts for correct speed.
Too many doubles.	Planting too fast.	See charts for correct speed.
	Loose finger holder.	Adjust tension of finger pick-up.
	Worn brush in finger pick-up.	Replace brush.

OUO6074,0000BC7 -19-26APR05-2/2

MaxEmerge XP Radial Bean Meter

Symptom	Problem	Solution
False monitor reading.	Dirty seed tube sensors.	Clean sensors. See CLEANING SEED SENSOR in Service As Required section.
No seed being planted.	Seed hopper empty.	Fill seed hopper.
Irregular or incorrect seed spacing.	Driving too fast.	Check chart for correct speed.
	Wrong tire pressure.	Inflate tires to correct air pressure.
	Drive wheels slipping.	Reduce down force on unit down force spring.
	Seed treatment or surface texture of soybean affecting meter accuracy.	Add graphite to seed hopper. See Operating Radial Bean Meter section.
	Wrong sprockets.	Check charts for correct sprocket combinations.
	Seed of various sizes being used.	Use seed of uniform size.
	Excessive meter torque.	Clean out radial meter.
	Bowl height set incorrectly.	Adjust bowl height.
Seed spacing not as indicated in charts.	Wrong tire pressure.	Inflate tires to correct air pressure.
	Drive wheels slipping.	Reduce down force on unit down force spring.
	Inconsistent seed size.	Use seed of uniform size.
	Wrong sprockets.	Check chart for correct sprocket combination.
	Incorrect radial meter setting.	Adjust meter setting.
Scattering of seeds.	Charts are approximate.	Use closest value shown.
	Planting too fast.	Reduce planting speed.
	Seed tube improperly installed.	Check seed tube.

Troubleshooting

Symptom	Problem	Solution
Seed tubes or openers plugging.	Allowing machine to roll backward when lowering.	Lower machine only when tractor is moving forward.
	Turn tractor steering wheel (Four Wheel Drive tractors only) when machine is down and stationary.	Avoid turning tractor steering wheel when machine is lowered and stationary.
Inconsistent seed depth.	Rough seed bed.	Use down pressure springs on planting units.
	Planting too fast.	Reduce planting speed.
	Partially plugged seed tube.	Inspect and clean.
	Seed tube improperly installed.	Install properly. Fasten seed tube hook in shank.
One row not planting seed.	Foreign material in seed hopper.	Check seed hopper.
	Seed hopper empty.	Fill seed hopper.
	Planting unit drive chain off of sprocket or broken.	Check drive chain.
	Loose or worn components in meter.	Inspect meter.
	Drive not functioning.	Inspect all drives.
Too many skips.	Obstruction or foreign material in seed metering unit.	Empty hopper and check metering unit for obstruction.
	Planting too slow.	See charts for correct speed.
	Plugged cells on radial meter.	Inspect/clean cells in bowl.
	Swelled seeds.	Inspect/clean cells in bowl.
	Meter bowl adjusted too low.	Adjust per operator's manual.
Too many doubles.	Planting too fast.	See charts for correct speed.
	Worn brush in radial meter.	Replace brush.
	Meter bowl adjusted too high.	Adjust per operator's manual.

CCS Fan Assembly

Symptom	Problem	Solution
CCS fan motor leaks.	Case drain line crimped, not connected to low pressure port, or connected to wrong port with high back-pressure.	Repair fan motor. To avoid future failures, be sure to connect drain line to low-pressure (sump) return on tractor or place hose in storage position. Case drain must have less than 172 kPa (1.72 bar) (25 psi).
	CCS fan motor seal leaking.	Replace seal. See your John Deere dealer.
	Case drain line pulled out of coupler on tractor.	Check hose routing of hydraulic hoses across hitch. Ensure case drain is properly attached to tractor. Repair fan motor.

Continued on next page

AG,OUO6023,1197 -19-24JUN05-1/4

Troubleshooting

Symptom	Problem	Solution
CCS fan not turning.	Check valve installed backwards.	Switch check valve orientation.
	SCV not in continuous detent position.	Place SCV in retract detent position.
	Low hydraulic oil level.	Check and fill reservoir.
	Tractor control valve return line not open.	Cycle control lever in opposite direction momentarily.
	CCS fan motor seal leaking.	Replace seal. See your John Deere dealer.
	Faulty CCS fan motor.	Repair or replace motor. See your John Deere dealer.
	Faulty CCS flow control valve.	Repair or replace valve. See your John Deere dealer.
	Row unit switch is depressed.	Lower machine to ground and adjust switch as needed.
	Row unit switch faulty.	Replace switch.
	Flow control valve incorrectly set.	Increase flow control setting.
	Return hose not fully engaged in SCV outlet.	Check connections. Reverse hoses if necessary to prevent pull out.
CCS fan vibrates.	Dirty fan blades.	Clean fan.
	Broken fan blades; fan out of balance.	Replace fan assembly.
CCS fan surges.	Flow control valve incorrectly set.	Adjust flow control valve or replace.
Premature CCS fan motor seal failure.	CCS case drain not connected to sump.	Connect case drain hose to sump. Case drain must have less than 172 kPa (1.72 bar) (25 psi).

Continued on next page

AG,OUO6023,1197 -19-24JUN05-2/4

Troubleshooting

Symptom	Problem	Solution
Tank pressure too low.	CCS pressure gauge was not zeroed.	Zero CCS pressure gauge.
	CCS pressure gauge hose not connected or damaged.	Reconnect or replace hose.
	Tractor flow control set too low.	Increase valve setting.
	Faulty CCS control valve.	Repair or replace valve. See your John Deere dealer.
	Machine flow control valve set incorrect.	Increase valve setting.
	Tractor pressure too low.	Check and repair tractor hydraulic system. See your John Deere dealer.
	CCS fan motor seal leaking.	Replace seal. See your John Deere dealer.
	Faulty CCS fan motor.	Repair or replace motor. See your John Deere dealer.
	CCS fan turning backward.	Check valve removed from return line. Check and correct hose connections to tractor.
	Excessive air leakage from tank.	Install lids.
	Pressure gauge broken.	Repair or replace gauge.
Pressure gauge does not zero.	Gauge not adjusted.	Zero gauge. See ZEROING CCS FAN PRESSURE GAUGE in Pro-Series XP Central Commodity System section.
	Gauge damaged.	Replace gauge.
	Moisture in gauge.	Dry out gauge.
	Suction hose plugged.	Clean or replace hose as needed.

Continued on next page

AG,OUO6023,1197 -19-24JUN05-3/4

Symptom	Problem	Solution
CCS fan turning on and off while going through the field.	Frame height too high causing the row unit switch to open and close.	Adjust frame height. See ADJUST FRAME HEIGHT in your Operator Manual.
	Row unit fan switch misadjusted.	Adjust switch. See SETTING CCS ROW UNIT FAN SWITCH in Service—As Required section.

AG,OUO6023,1197 -19-24JUN05-4/4

CCS Product Delivery

Symptom	Problem	Solution
Plugged delivery hoses.	Foreign material in seed.	Clean seed or use lid screen.
	Tank lids were opened with CCS fan running.	Wait until CCS fan stops before opening lids.
	Excessive CCS fan pressure.	Reduce pressure.
	Tank lid open or leaking excessively.	Close lid, empty hose line.
	Hose pinched or crushed.	Replace or repair hose.
	Air volume too low.	Increase CCS fan speed. See SETTING CCS TANK PRESSURE in Central Commodity System section.
	Foreign material blocking air system.	Remove hose by pulling straight off (do not twist) from nozzle to remove material causing plug.
	Hoses routed flat or uphill or have large droops.	Reroute hoses correctly.
	High humidity.	Use more talc and mix thoroughly or wait for drier conditions.
	CCS fan running while not planting for excessive period of time.	Turn off fan if not planting for more than a few minutes.

Continued on next page

AG,OUO6023,1198 -19-30JUN05-1/6

Symptom	Problem	Solution
Uneven product distribution between row units.	Product level too low for accurate delivery.	CCS nozzle must be covered to deliver seed.
	Hopper screen plugged.	Remove screen and tap until clear.
	Discharge elbow plugged.	Remove elbow and clean.
		If required for seed used, make sure grey discharge elbows are installed properly on 36 row and larger machines. See OPERATING CCS SYSTEM WHEN PLANTING STANDARD SEED SIZES in Pro Series XP Central Commodity System.
	Air volume too low.	Increase CCS tank pressure. See SETTING CCS TANK PRESSURE in Central Commodity System section.
	Blockage in air hose.	Clear air hose.
	Blockage in nozzle.	Shut off CCS fan. Remove delivery hose by pulling straight off (do not twist) nozzle and remove material.
	Seed compacted in tank nozzles.	Shut off tractor, engage park brake and remove outlet delivery hose from CCS tank (pull straight off—do not twist). Loosen/remove seed stuck in nozzle. Whenever planter is lowered and stationary for more than a few minutes with seed in CCS tank, shut off tractor and turn key off. Agitators run anytime planter is lowered and key is on. This may cause seed to pack into nozzles.
	Nozzle inserts installed on nozzles for planting sorghum.	Remove nozzle inserts when not planting sorghum.
	Agitator not running.	Check fuse, power connector and ground lead.

Troubleshooting

Symptom	Problem	Solution
No seed in meter.	Air volume too low.	Verify tank pressure is set to recommended pressure.
	Blockage in air hose.	Cleanout meter using tray. Reinstall seed disc and close vacuum dome. Start CCS fan and shake hose vigorously near meter. Continue shaking hose closer and closer to tank. Increase tank pressure, if necessary to blow seed out easier. If meter fills with seed, repeat process until no more seed is in hose. Check that both tank lids are securely closed.
	Nozzle blockage inside tank.	With parking brake engaged, transmission in park and tractor off, remove outlet air hose from tank. Check for obstruction and remove if found.
	Seed compacted in tank nozzles.	Shut off tractor, engage park brake and remove outlet delivery hose from CCS tank (pull straight off—do not twist). Loosen/remove seed stuck in nozzle. Whenever planter is lowered and stationary for more than a few minutes with seed in CCS tank, shut off tractor and turn key off. Agitators run anytime planter is lowered and key is on. This may cause seed to pack into nozzles.
	High humidity.	Use more talc and mix thoroughly or wait for drier conditions.
	CCS tank lid open.	Close lid.
	Cleanout doors on bottom of tank are open or leaking air.	Close doors.
	Discharge elbow plugged in mini hopper.	Clear plug and decrease CCS tank pressure.

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AG.OUO6023,1198 -19-30JUN05-3/6

Symptom	Problem	Solution
		If required for seed used, make sure grey discharge elbows are installed properly on 36 row and larger machines. See OPERATING CCS SYSTEM WHEN PLANTING STANDARD SEED SIZES in Pro Series XP Central Commodity System.
	Seed bridging in CCS tank.	Check if agitator is running. Check fuse, power connector and ground lead. Increase CCS tank pressure. Add and thoroughly mix John Deere talc lubricant with seed.
	CCS tanks empty.	Fill CCS tanks.
	Nozzle inserts installed when not needed.	Remove nozzle inserts when planting other crops.
Seed damage.	Air volume too high.	Reduce CCS tank pressure. Add talc.
	Old, dry seeds.	Use fresh seeds.
Individual rows overpopulating.	CCS tanks running empty.	Fill or redistribute seed in CCS tanks.
	Meter vacuum level too high.	Decrease vacuum level.
	Vacuum hopper vent plugged.	Clean vent.
	Discharge elbow vent plugged.	Clean vent holes in elbow.

Continued on next page

AG,OUO6023,1198 -19-30JUN05-4/6

Symptom	Problem	Solution
Uneven/Inaccurate metering or product delivery.	Product level in seed meter too low for accurate delivery.	Increase CCS tank pressure.
	Foreign material blocking product passages.	Remove blockage. Use screens when filling tanks. With parking brake engaged, transmission in park and tractor off, remove outlet air hose from tank. Check for obstruction and remove if found.
	Hopper screen plugged.	Remove screen and tap until clear.
	Lumps in seed.	Use clean seed. Use screens when filling tanks.
	Seed bridging in tank.	Check agitator is running. Check fuse, power connector and ground lead. Increase CCS tank pressure. Add and thoroughly mix John Deere talc lubricant with seed.
No seed flow.	Rubber flap on meter not covering the seed tube opening in the shank.	Realign rubber flap to sit flat on row unit when meter is installed.
	Plugged seed delivery hose.	Do not raise and lower machine continuously without planting seed. Excessive fan stopping and starting without planting will lead to plugs. Do not operate machine with nearly all meters out of seed as the seed hoses to rows with seed will plug. Stop and fill machine once the first row runs out of seed. Adjust CCS fan pressure to recommended level.
	Cold hydraulic oil.	Allow tractor to warm before setting tank pressure.

Continued on next page

AG.OUO6023,1198 -19-30JUN05-5/6

Troubleshooting

Symptom	Problem	Solution
CCS fan surges.	Faulty flow control valve.	Replace valve.
CCS fan turns on and off while going through the field.	Frame height is too high causing fan switch on row unit between left-hand main frame wheels to open and close.	Adjust frame height.
		Adjust row unit fan switch.
Machine raises slowly.	CCS fan is running during raise cycle.	Row unit fan switch not functioning.
CCS seed delivery flow is low.	Seed hose is pinched.	Straighten or repair hose. Keep hoses as horizontal as possible.
	Foreign material may be lodged in hose or manifold.	Locate and remove foreign material blockage.
	Improper tank pressure.	Install lids.
		Readjust SCV.
CCS tank low warning light not functioning.		Increase CCS tank pressure by 2 in. of H ₂ O.
	Tank level sensor dirty.	Clean sensor LEDs with a brush.
	Tank low warning light burned out.	To test, unplug all tank level sensor harness connectors. If light does not come on, replace light inside frame control box.

AG,OUO6023,1198 -19-30JUN05-6/6

Pro-Series *XP* Vacuum Meter

Symptom	Problem	Solution
False monitor reading.	Dirty seed tube sensors.	Clean sensors. See CLEANING SEED SENSOR in Service As Required section.
No seed being planted.	Row unit hoppers empty.	See CCS PRODUCT DELIVERY in this section.
	No vacuum.	See Low Vacuum under VACUUM METER in Troubleshooting section.
	Seed tubes plugged or damaged.	Inspect seed tubes. Ensure seed tubes are hooked properly in unit shank. Replace if damaged.
		Clean off mud with cleaning brush.
	Drive not engaged.	Engage flex-drive.

Continued on next page

OUO6074,0000BC9 -19-30JUN05-1/9

Troubleshooting

Symptom	Problem	Solution
Poor seed spacing.	Seed disk vacuum holes plugged.	Clean seed disks.
	Farmer-applied seed treatment causes buildup, seeds stick.	Follow recommended talc usage and application procedure. Clean meter and disks.
	Worn meter brushes.	Replace brushes.
	Low vacuum.	See Low Vacuum under VACUUM METER in Troubleshooting section.
	Worn meter seals.	Replace seals.
	Seed disk hubs misadjusted.	Readjust hubs.
	Incorrect vacuum for the seed being planted.	Adjust vacuum level to recommended setting.
	Faulty vacuum gauge.	Check air line to gauge. Clean if plugged. Replace if cut.
	Worn seed disks.	Replace disks.
	Seed tubes improperly installed or worn.	Reinstall or replace seed tubes. Ensure seed tube hook is properly positioned in unit shank.
	Mud inside seed tubes.	Clean off mud with cleaning brush.
	Worn seed tube guard.	Replace guard.
	Treated seed sticking in cell.	Clean disks. Increase application rate of John Deere Talc Lubricant.

Continued on next page

OUO6074.0000BC9 -19-30JUN05-2/9

Symptom	Problem	Solution
Low seed population.	Dirty seed tube sensors, if low population is on monitor and field counts are different.	Clean seed tubes and sensors.
	Seed disk vacuum holes plugged.	Clean seed disks. Flat/Type Disk: Install seed knockout assembly or replace worn seed knockout assembly.
	“Dirty” seed plugging vacuum holes.	Use clean seed. Flat/Type Disk: Install seed knockout assembly or replace worn seed knockout assembly.
	Seed disk wiper missing.	Replace wiper.
	Low seed level in CCS tank.	Add seed.
	Low seed level in meter.	See NO SEED IN METER in CCS Product Delivery Troubleshooting section.
	“Treated” seed sticking in cells.	Run CCS fan 10 minutes prior to planting (to warm air). Inspect planting unit seed meter disks; clean if buildup is present. Add John Deere Talc Lubricant to CCS tanks.
	Farmer-applied seed treatment causes buildup, seeds stick.	Discontinue use of treatments or increase use of talc.
	Low vacuum.	Increase vacuum level. See Low Vacuum under VACUUM METER in Troubleshooting section.
	Foreign material (chaff) built up in vacuum dome.	Inspect dome and clean if necessary.
	Worn meter seals.	Replace seals.
	Worn seed disks.	Replace seed disks.

Troubleshooting

Symptom	Problem	Solution
	Seed “bridging” in hopper.	Increase rate of talc used. Clean vacuum meter and hopper.
	Seed “bridging” in meter.	Increase rate of talc used. Clean vacuum meter and hopper.
	Inadequate seed delivery.	Increase CCS tank pressure.
	Plugged inlet or discharge elbows.	Clean elbows. If required for seed used, make sure grey discharge elbows are installed properly on 36 row and larger machines. See OPERATING CCS SYSTEM WHEN PLANTING STANDARD SEED SIZES in Pro Series XP Central Commodity System.
	Seed size not compatible with seed disks.	Use correct seed disks.
	Excessive drive slippage.	Reduce unit downforce. Check mechanical seed transmission air bag pressure. Check drives for binding or misalignment. Readjust seed transmission.
	Planting too fast for rough field conditions.	Plant at speed recommended in planting rate chart. Increase vacuum. Increase unit downforce.
	Meter brush improperly installed or worn.	Install brush properly or replace.

Continued on next page

OUO6074,0000BC9 -19-30JUN05-4/9

Troubleshooting

Symptom	Problem	Solution
	Using incorrect transmission sprocket combination.	Use sprocket combination recommended in planting rate chart or adjust upward due to excess drive slippage.
	Incorrect drive tire or contact tire pressure.	Inflate to proper pressure. See CHECKING TIRE INFLATION in Preparing Machine section.
	Double eliminator set incorrectly.	See USING DOUBLE ELIMINATOR in Preparing Vacuum Meter section.

Continued on next page

OUC6074,0000BC9 -19-30JUN05-5/9

Symptom	Problem	Solution
High seed population.	High vacuum.	Adjust vacuum level.
	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.
	Using incorrect transmission sprocket combination.	Use sprocket combination recommended in planting rate charts or adjust downward due to low drive wheel slippage.
	Mini hopper screens plugged, meter overfilled.	Clean mini hopper screens.
	Discharge elbow holes plugged.	Clean elbows.
	Incorrect drive tire or contact tire pressure.	Inflate to proper pressure. See CHECKING TIRE INFLATION in Preparing Machine section.
	CCS tanks running empty.	Fill or redistribute seed in CCS tanks.
	Double eliminator set incorrectly.	See USING DOUBLE ELIMINATOR in Preparing Vacuum Meter section.
Seed sensor tubes plugging.	Machine rolling backward when lowering.	Lower machine while moving forward.
	Mud inside seed tubes.	Clean off mud with cleaning brush.
	Turning tractor steering wheel when machine is down and stationary. (Four Wheel Drive or Track tractors only.)	Avoid turning tractor when machine is down and stationary.

Troubleshooting

Symptom	Problem	Solution
Inconsistent seed depth.	Planting in rough seed bed.	Use downforce spring attachment on planting units.
	Seed tubes partially plugged or improperly installed.	Inspect seed tubes. Ensure seed tubes are hooked properly in unit shank.
		Clean off mud with cleaning brush.
Too many skips.	Low vacuum setting.	Increase vacuum.
	Planting too fast.	Reduce planting speed.
	Low seed level in hopper.	Increase CCS tank pressure.
Premature blower motor seal failure.	Incorrect hydraulic connections.	Reconnect hydraulic hoses.
	High case drain pressure.	Check for 25 psi or less back pressure at motor. Ensure case drain line is connected and hose not kinked.
	SCV lever stop not installed (30—60 series tractors).	Install SCV lever stop in tractor console.

Continued on next page

OUO6074,0000BC9 -19-30JUN05-7/9

Troubleshooting

Symptom	Problem	Solution
Low vacuum.	Incorrect hydraulic connections.	Reconnect hoses.
	Planting unit vacuum hoses not connected to meter.	Connect vacuum hoses to meter.
	SCV lever stop not installed (30—60 series tractors).	Install lever stop in tractor console.
	Flow control valve misadjusted.	Adjust control valve knob.
	Air manifold system clogged with dust.	Clean air manifold system.
	Manifold hoses kinked or pinched.	Reposition hoses.
	Blower guard clogged with dust or seed treatments.	Clean blower guard.
	Meter housing rubber strap not engaged.	Attach housing rubber strap 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 (30—60 series tractors).	Recut lever stop.
	Vacuum dome not closed properly.	Make sure vacuum dome closes properly.
	Foreign material (chaff) built up in vacuum dome.	Inspect dome and clean if necessary.
Continued on next page		OUO6074,0000BC9 -19-30JUN05-8/9

Troubleshooting

Symptom	Problem	Solution
Erratic vacuum.	SCV lever stop not installed (30—60 series tractors).	Install lever stop.
	SCV lever stop cut to wrong length (30—60 series tractors).	Recut SCV lever stop.
	Tractor SCV linkage is mistimed (30—60 series tractors).	Tractor SCV linkage must be readjusted.
	Air manifold system clogged with dust.	Clean air manifold system.
	Control valve failed.	Replace control valve.
	Tractor oil level low.	Add oil.
Vacuum gauge does not zero.	Not adjusted.	Zero adjustment. See ZEROING VACUUM GAUGE in Operating Vacuum Meter section.

OUO6074,0000BC9 -19-30JUN05-9/9

Service

Using Safe Service Procedures



CAUTION: To help prevent serious injury or death to you or others caused by unexpected movement, service machine on a level surface. Lower machine to ground or sufficiently lock or block raised machine before servicing. If machine is connected to tractor, engage parking brake and/or place transmission in "PARK", shut off engine and remove key. If machine is detached from tractor, block wheels and use shop stands to prevent movement.



N40000 -UN-28SEP88

AG,OUO6074,1362 -19-04AUG00-1/1

Practice Safe Maintenance

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 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.



TS218 -UN-23AUG88

DX,SERV -19-17FEB99-1/1

Service and Operate Chemical Sprayers Safely

Chemicals used in agricultural sprayers can be harmful to your health or the environment if not used carefully.

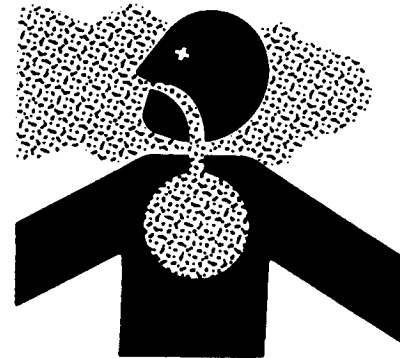
Always follow all label directions for effective, safe, and legal use of agricultural chemicals.

Reduce risk of exposure and injury:

- Wear appropriate personal protective equipment as recommended by the manufacturer. (See 'Handle agricultural chemicals safely' found in the Safety Section.)
- Fill, flush, calibrate, and decontaminate sprayer in an area where runoff will not reach ponds, lakes or streams, livestock areas, or gardens, or near other people.
- Keep children away from the chemicals, chemical solutions, and rinsates
- If spray or chemical concentrate contacts skin, hands, or face, wash immediately with soap and water. If spray or chemical concentrate gets into eyes, flush immediately with water
- If nozzle clogs or system malfunctions, stop engine and relieve spray pressure from system.
- Do not place nozzle tips or other components to the mouth to clear obstructions. Keep spare tips on hand for replacement.
- Minimize risk of spray drift.
 - Use large nozzle tips operated at lower pressures
 - Do not operate solution delivery system at pressures exceeding 345kPa (3.5 bar) (50 psi).
 - Do not spray when winds exceed 16 km/h (10 mph).
 - Do not spray when wind is blowing towards a nearby sensitive crop, garden, or populated area.
- Properly dispose of unused chemicals, flushing solution, and empty chemical containers.
- Decontaminate equipment used in mixing, transferring, and applying chemicals after use.



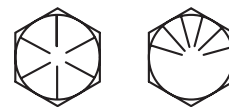
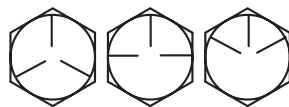
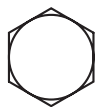
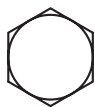
TS272 -UN-23AUG88



TS220 -UN-23AUG88

Unified Inch Bolt and Screw Torque Values

TS1671 -UN-01MAY03



Bolt or Screw	SAE Grade 1				SAE Grade 2 ^a				SAE Grade 5, 5.1 or 5.2				SAE Grade 8 or 8.2			
	Lubricated ^b		Dry ^c		Lubricated ^b		Dry ^c		Lubricated ^b		Dry ^c		Lubricated ^b		Dry ^c	
Size	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in
1/4	3.7	33	4.7	42	6	53	7.5	66	9.5	84	12	106	13.5	120	17	150
													N•m	lb-ft	N•m	lb-ft
5/16	7.7	68	9.8	86	12	106	15.5	137	19.5	172	25	221	28	20.5	35	26
									N•m	lb-ft	N•m	lb-ft				
3/8	13.5	120	17.5	155	22	194	27	240	35	26	44	32.5	49	36	63	46
			N•m	lb-ft	N•m	lb-ft	N•m	lb-ft								
7/16	22	194	28	20.5	35	26	44	32.5	56	41	70	52	80	59	100	74
	N•m	lb-ft														
1/2	34	25	42	31	53	39	67	49	85	63	110	80	120	88	155	115
9/16	48	35.5	60	45	76	56	95	70	125	92	155	115	175	130	220	165
5/8	67	49	85	63	105	77	135	100	170	125	215	160	240	175	305	225
3/4	120	88	150	110	190	140	240	175	300	220	380	280	425	315	540	400
7/8	190	140	240	175	190	140	240	175	490	360	615	455	690	510	870	640
1	285	210	360	265	285	210	360	265	730	540	920	680	1030	760	1300	960
1-1/8	400	300	510	375	400	300	510	375	910	670	1150	850	1450	1075	1850	1350
1-1/4	570	420	725	535	570	420	725	535	1280	945	1630	1200	2050	1500	2600	1920
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2140	1580	2700	2000	3400	2500
1-1/2	990	730	1250	930	990	730	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For plastic insert or crimped steel type lock nuts, for stainless steel fasteners, or for nuts on U-bolts, see the tightening instructions for the specific application. Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

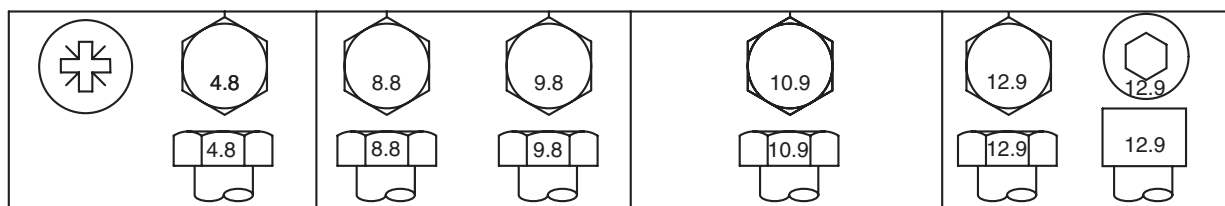
Replace fasteners with the same or higher grade. If higher grade fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.

^aGrade 2 applies for hex cap screws (not hex bolts) up to 6. in (152 mm) long. Grade 1 applies for hex cap screws over 6 in. (152 mm) long, and for all other types of bolts and screws of any length.

^b"Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or 7/8 in. and larger fasteners with JDM F13C zinc flake coating.

^c"Dry" means plain or zinc plated without any lubrication, or 1/4 to 3/4 in. fasteners with JDM F13B zinc flake coating.

Metric Bolt and Screw Torque Values



Bolt or Screw	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated ^a		Dry ^b		Lubricated ^a		Dry ^b		Lubricated ^a		Dry ^b		Lubricated ^a		Dry ^b	
Size	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in	N•m	lb-in
M6	4.7	42	6	53	8.9	79	11.3	100	13	115	16.5	146	15.5	137	19.5	172
									N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft
M8	11.5	102	14.5	128	22	194	27.5	243	32	23.5	40	29.5	37	27.5	47	35
			N•m	lb-ft	N•m	lb-ft	N•m	lb-ft								
M10	23	204	29	21	43	32	55	40	63	46	80	59	75	55	95	70
	N•m	lb-ft														
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

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For stainless steel fasteners or for nuts on U-bolts, see the tightening instructions for the specific application. Tighten plastic insert or crimped steel type lock nuts by turning the nut to the dry torque shown in the chart, unless different instructions are given for the specific application.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class. Replace fasteners with the same or higher property class. If higher property class fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.

^a"Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or M20 and larger fasteners with JDM F13C zinc flake coating.

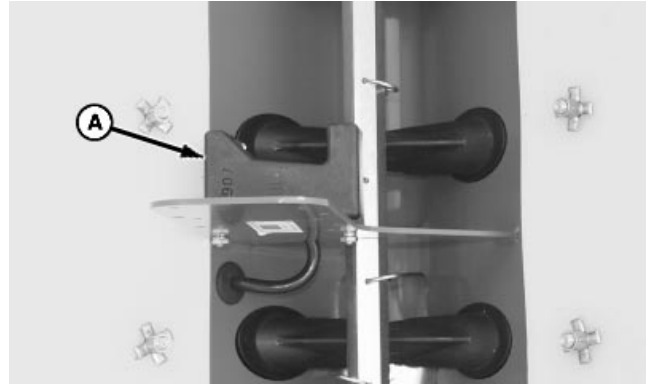
^b"Dry" means plain or zinc plated without any lubrication, or M6 to M18 fasteners with JDM F13B zinc flake coating.

Service—As Required

Cleaning CCS Tank Level Sensors

Clean tank level sensors (A) prior to filling CCS tanks. Use stiff bristled 1372 mm (4.5 ft) handle 203 mm (8 in.) wide broom to clean sensors.

A—Tank Level Sensor

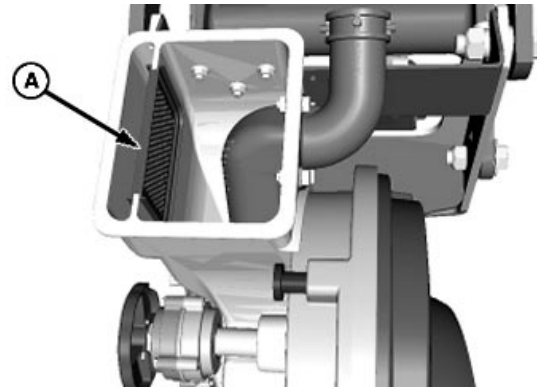


A49868 —UN-12AUG02

OUO6074,0000BCD —19-26MAR04-1/1

Cleaning Pro-Series XP Row Unit Hopper Screen

Remove hopper screen (A), tap until clear and replace.



A52516 —UN-18MAR04

OUO6074,0000BCC —19-26MAR04-1/1

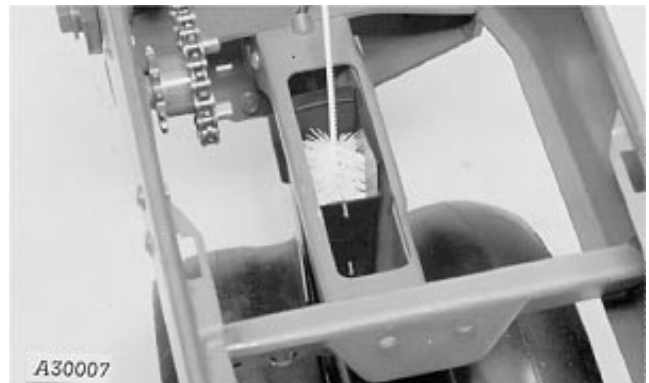
Cleaning Seed Sensor

In extremely dusty operating conditions, dust can build up on the seed sensor. Even in normal operating conditions, seed treatments can build up on the sensor. Eventually this buildup may become sufficient to disturb the sensor signal light, causing low population counts or low warnings to be indicated.

Periodically clean the seed sensor with the brush (dry) provided.

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

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



A30007 —UN-06OCT88

AG,OUO1074,849 —19-01MAR00-1/1

Cleaning Vacuum Manifold System

Dirt or seed inoculant/treatment may build up in vacuum manifold system and cause low vacuum at planting units. This could result in loss of seed metering accuracy.



CAUTION: Follow chemical manufacturer's precautions when handling parts coated with seed treatments. Use proper skin, eye and respiratory protection.

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

Clean as follows:

1. Turn on vacuum blower(s) and set hydraulic flow to 75 percent.
2. One at a time, remove vacuum hoses from meters. Inspect and clean all straw and/or foreign material from both attaching hose ends. Shake hose for a few seconds and replace it on meter.
3. Remove end caps from manifold tubes one at a time, then reinstall.

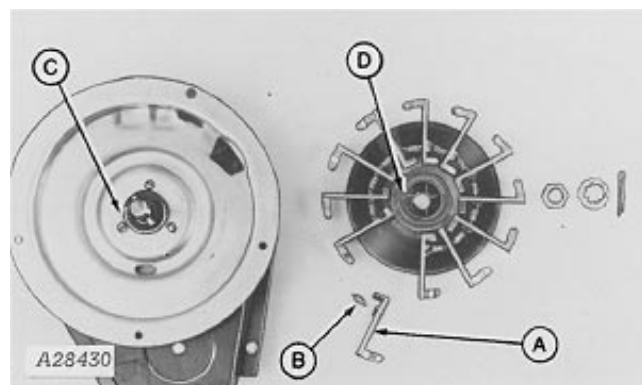
OUO6435,0001AEC -19-04MAR04-1/1

Replacing Fingers—Finger Pick-Up Meter

NOTE: Finger should seat in holder so holder is flush with carrier plate when assembled. Be certain to align notch in bearing (C) with projection on cam (D).

To replace fingers (A) or springs (B), remove springs from finger and remove finger from carrier. When replacing fingers, be certain to install springs with open end of spring loop toward inside of finger holder.

Fingers and springs are also sold through John Deere Service Parts as a complete finger assembly.



- A—Pick-Up Finger
- B—Spring
- C—Notch in Bearing
- D—Projection on Cam

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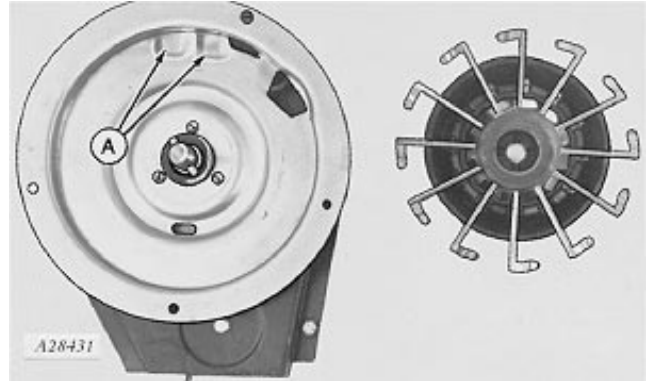
AG,OUO6074,1703 -19-07AUG00-1/4

Before installing finger pick-up assembly on carrier, check dimples (A) on carrier plate for wear.

Carrier plate is made of case-hardened steel with a hard chrome plated wear surface. Excessive wear of carrier plate at dimples will result in over population, especially with small seed corn sizes.

Inspect carrier plates yearly. Replace carrier plates when hard chrome surface has worn away and case-hardened steel begins to wear. This will be identifiable by a change in shape of dimples.

A—Dimple



AG,OUO6074,1703 -19-07AUG00-2/4

IMPORTANT: Never turn finger pick-up mechanism backward. Damage to brush will result.

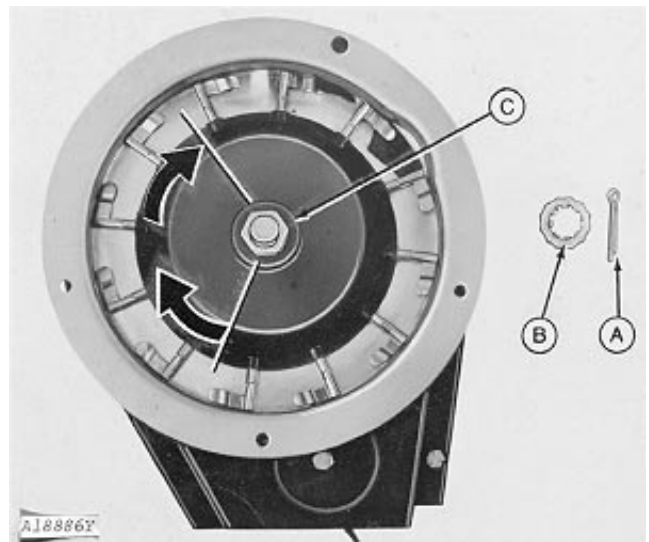
NOTE: Adjusting nut tension for various seed sizes and shapes will affect meter performance. See your John Deere dealer for fine tuning of nut tension on a seed meter test stand for your specific seed size and shape. Your dealer is your best source for service information on seed meter adjustment.

Install finger pick-up assembly and adjusting nut (C) on shaft. With finger holder firmly seated against carrier plate, turn nut clockwise by hand until it contacts finger holder and a slight resistance is felt.

Continue to turn nut two flats clockwise (one third turn) until finger holder is properly positioned against carrier.

Turn finger holder by hand to be certain mechanism is not over tightened. Finger holder must be adjusted firmly against carrier but still turn by hand with moderate force.

Secure adjustment with nut lock (B) and cotter pin (A).



A—Cotter Pin
B—Nut Lock
C—Nut

Continued on next page

AG,OUO6074,1703 -19-07AUG00-3/4

IMPORTANT: Check tightness of adjusting nut periodically. Failure to maintain proper finger assembly adjustment will result in a loose finger assembly which will tend to over populate, especially with small seed-corn sizes.

As a check on the above adjustment, there should be less than 0.15 mm (0.006 in.) gap between finger holder and carrier with light tension on a finger tab adjacent to area being measured. Raise finger tab until contact is felt, then use a feeler-gauge to check gap between finger holder and carrier.



A22060 -UN-13OCT88

AG,OUO6074,1703 -19-07AUG00-4/4

Inspecting Seed Belt—Finger Pick-Up Meter

IMPORTANT: When installing belt, ensure that it is centered in the meter. The pitch of the lower roller can be adjusted by loosening the hardware on belt housing and moving cover up and down by placing a flat screwdriver in the gap between cover and belt driver.

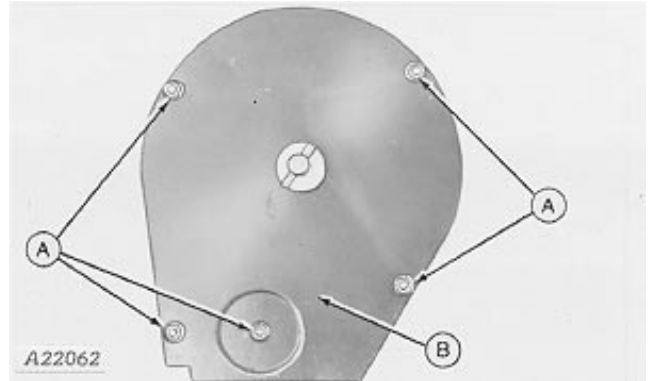
Seed delivery belt and driver should be replaced when wear is observed. If belt is worn (holes are elongated) or stiff it can affect placement of seed to the seed tube. The belt driver wheel should be replaced when driver tabs show sharp edges. Sharp edges on the driver tab can “hook” the belt causing a vibration in the belt area of the meter which could affect seed spacing.

Continued on next page

AG,OUO6074,1371 -19-04AUG00-1/3

Remove cap screws (A) and belt housing cover (B).

- A—Cap Screw
- B—Cover



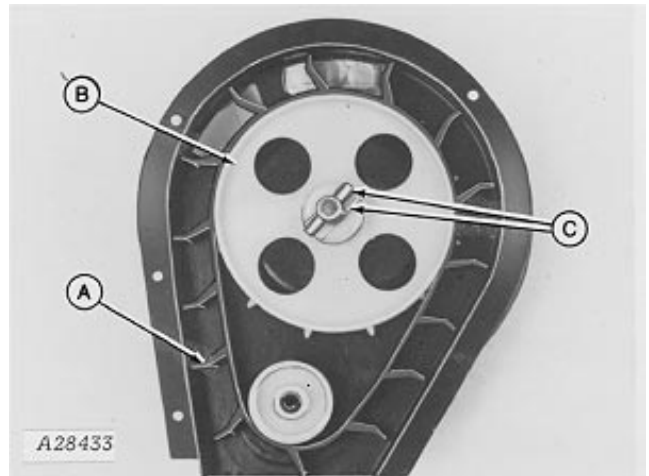
A22062 -UN-13OCT88

AG,OUO6074,1371 -19-04AUG00-2/3

IMPORTANT: If belt is replaced, paddles (A) must be oriented as shown.

To remove belt driver wheel (B), remove spring pins (C).

- A—Paddles
- B—Drive Wheel
- C—Spring Pins



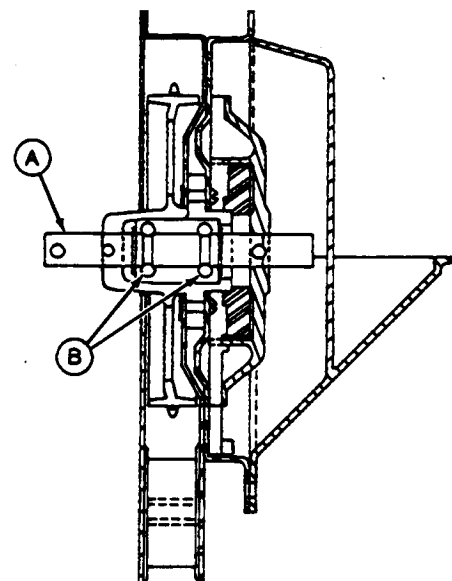
A28433 -UN-07JUN89

AG,OUO6074,1371 -19-04AUG00-3/3

Drive Shaft Bearing—Finger Pick-Up Meter

The finger pick-up drive shaft (A) has a sealed double-row ball bearing (B) designed to give years of dependable service. To remove drive shaft and bearing from belt housing, remove driver wheel and three face plate screws.

- A—Drive Shaft
- B—Ball Bearing



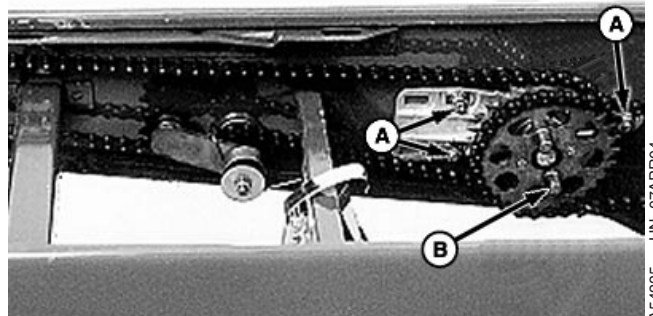
A28434 -UN-13OCT88

AG,OUO6074,1372 -19-04AUG00-1/1

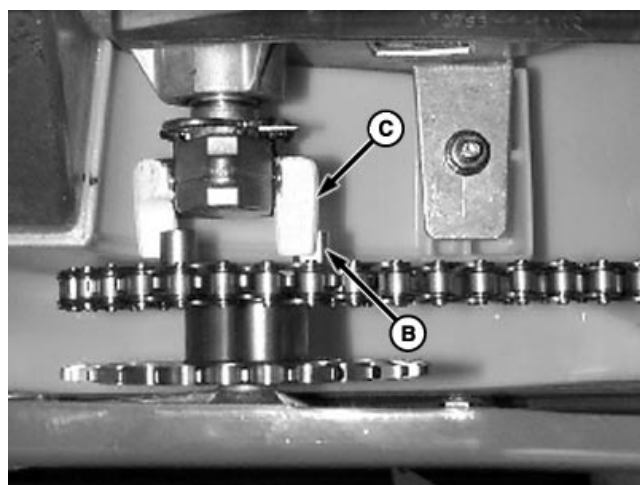
Adjusting MaxEmerge XP Seed Chain Drive Mechanism

1. It may be necessary to align sprockets with drive mechanism on meter.
2. Loosen nuts (A) and adjust sprocket assembly so drive lugs (B) align with meter tabs (C).
3. Install hoppers and use a small mirror to check alignment of drives.
4. When meter drive is misaligned, drive lugs (B) can be seen outside meter tabs (C) as shown.
5. When meter drive is properly aligned, drive lugs (B) and meter tabs (C) are in line as shown.

A—Nuts
B—Drive Lugs
C—Meter Tabs

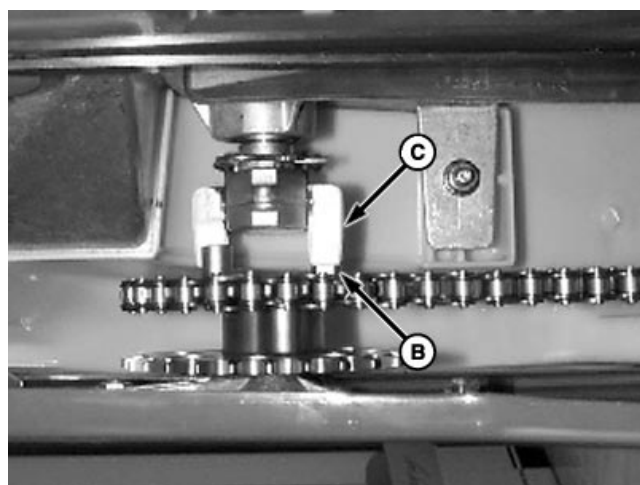


A54235 -UN-07APR04



A54236 -UN-07APR04

Drives Out Of Alignment



A54237 -UN-07APR04

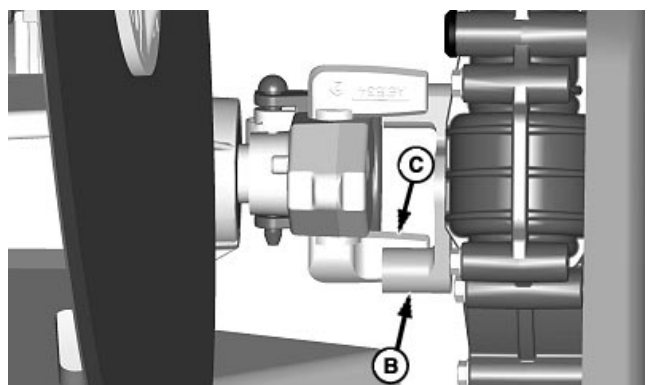
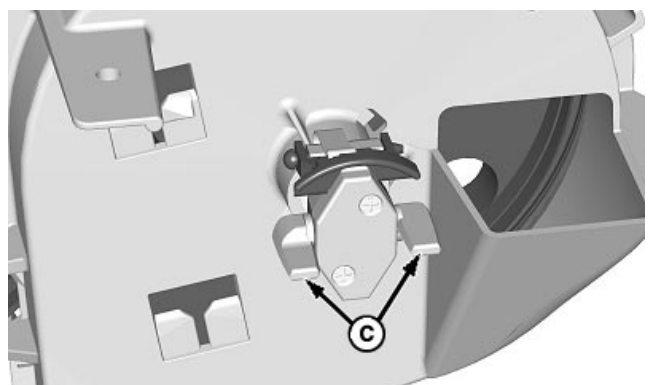
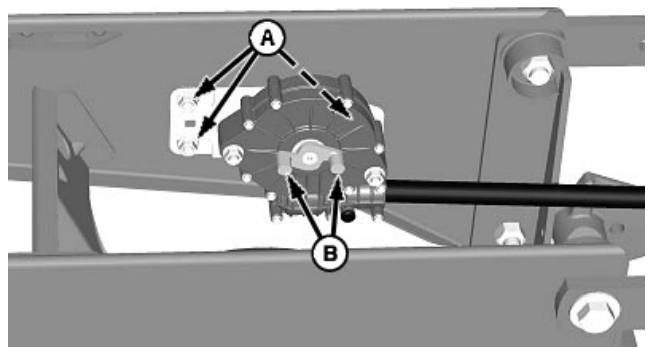
Drives In Alignment

OUC6074.0000C16 -19-07APR04-1/1

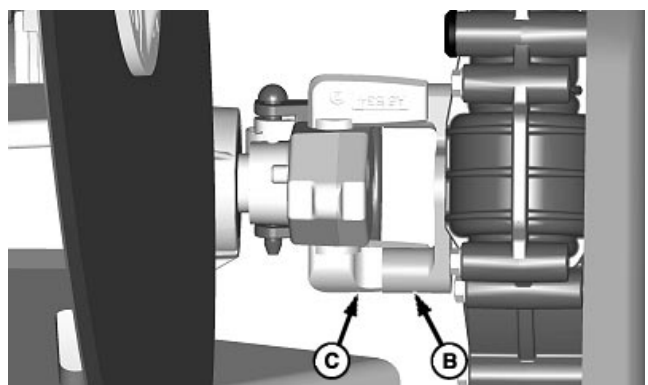
Adjusting MaxEmerge XP Seed Cable Drive Mechanism

1. It may be necessary to align sprockets with drive mechanism on meter.
2. Loosen nuts (A) and adjust sprocket assembly so drive lugs (B) align with meter tabs (C).
3. Install hoppers and use a small mirror to check alignment of drives.
4. When meter drive is misaligned, drive lugs (B) can be seen outside meter tabs (C) as shown.
5. When meter drive is properly aligned, drive lugs (B) and meter tabs (C) are in line as shown.

A—Nuts
B—Drive Lugs
C—Meter Tabs



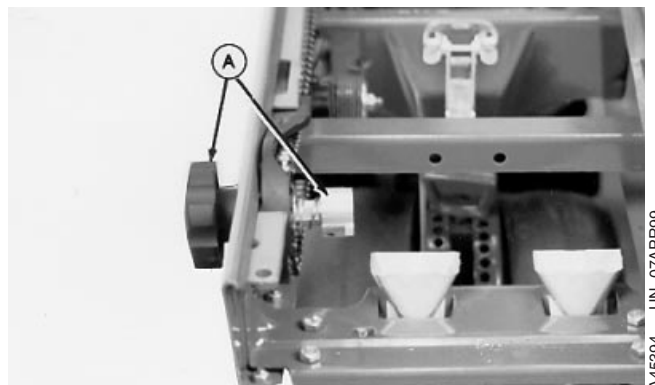
Drives Out Of Alignment



Drives In Alignment

Aligning MaxEmerge XP Chemical Meter Drive

1. Check and adjust alignment of drive assembly (A) and side panel hole. Assembly should be aligned with center of hole and tightened down. Loosening meter from bottom of hopper and aligning meter and meter drive sprocket side-to-side and fore-to-aft may also be necessary. Mounting holes are large enough to allow for slight side-to-side and fore-to-aft adjustment.
2. On machines with dual granular-chemical meters, inspect alignment of shafts. Drive should operate freely and smoothly when rotating coupler with hopper removed. To check and align a dual-meter system, chemical hoppers should be removed from row unit. Hopper should be turned upside down and meters should be checked for parallel side-to-side and fore-to-aft alignment on bottom of hopper using a straight edge.



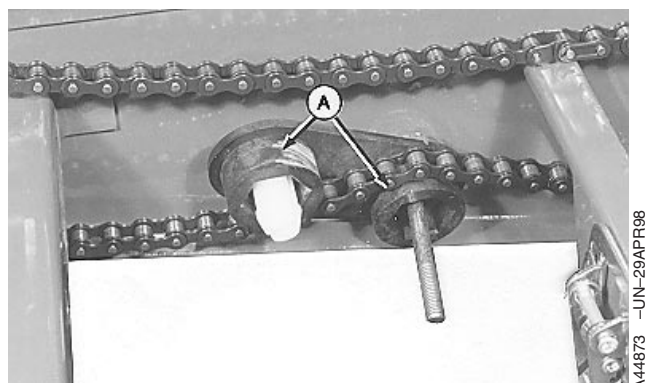
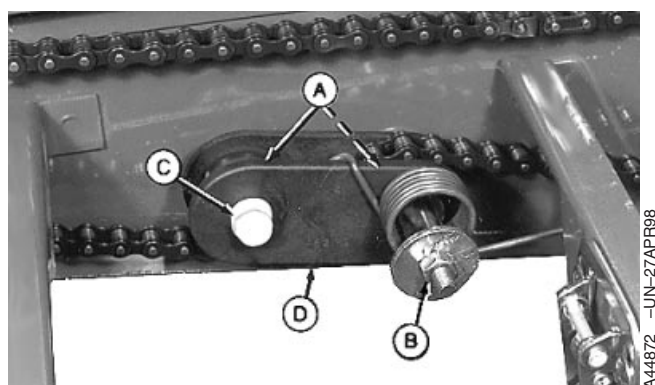
A—Drive Assembly

OUO6074,0000BCF -19-26MAR04-1/1

MaxEmerge XP High-Residue Chain Idler

1. Check where chain rides on inserts (A) for wear. Measure center of inserts, if worn down 3 mm (1/8 in.), remove nut (B), washers and spring.
2. Squeeze retaining pin (C) and remove outer plate (D).
3. Remove inserts, rotate one third turn and install on inner plate. Install outer plate, washers, spring and nut. If inserts have been previously turned two times, install new inserts available through service parts. See your John Deere dealer.

A—Inserts
B—Nut
C—Retaining Pin
D—Plate



OUO6074,0000BD0 -19-26MAR04-1/1

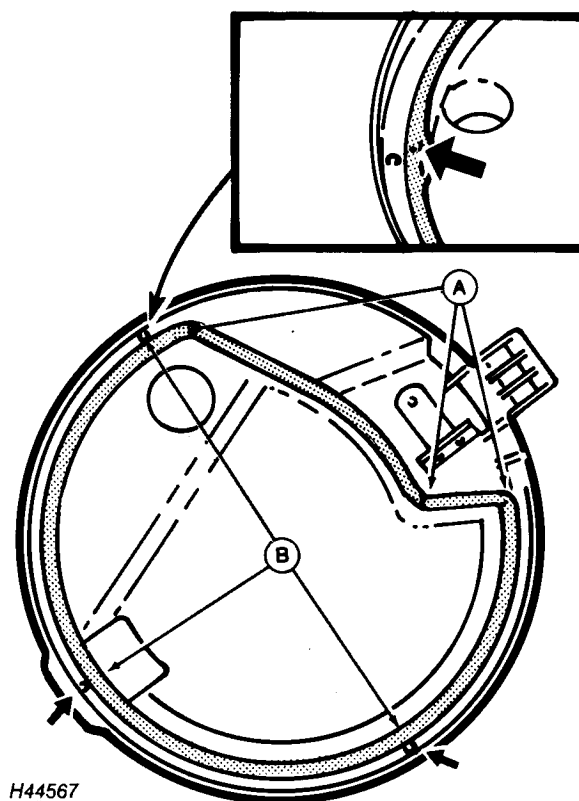
Installing New Vacuum Seal

1. Remove seed hopper from planting unit and place it on its side. It is not required to empty seed out of hopper.
2. Unlatch handle and swing open vacuum chamber.
3. Remove and discard old vacuum seal.

NOTE: This procedure prevents excessive slack in seal.

4. Install new seal. Insert corners of seal (A) then insert seal at three locations (B) with dimples on seal aligned with dimples on housing. Finally, insert remaining portions of seal.
5. If seed disk has been used, apply Spray on Graphite Lubricant TY25797 on vacuum seal side.
6. Close vacuum chamber and latch handle. Install seed hopper on planting unit.

A—Corners
B—Dimple Location



H44567

H44567 -UN-27MAY92

AG,QUO6074,1367 -19-26JUN06-1/1

Inspect and Adjust Seed Opener Blades



CAUTION: Disk blades are sharp. Wear protective gloves and handle disks carefully to avoid being injured.

1. Inspect blade edge contact point (D) as follows:
 - a. Insert two small business cards between blade opening and gently slide together until blade contact point is reached.
 - b. Measure distance between business cards and compare to specification.

Specification

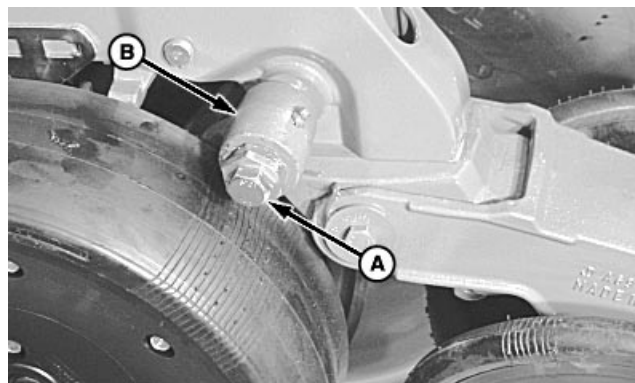
Blade Edge Contact—Blade Edge
Contact Length 38—63.5 mm
(1.5—2.5 in.)

- c. If distance does not fall within specifications, proceed as follows:
2. Remove cap screw (A), pivot shaft (B), and gauge wheel from row unit.
3. Inspect scrapers (C) for excessive wear and replace as necessary.
4. Inspect blades for wear or damage.

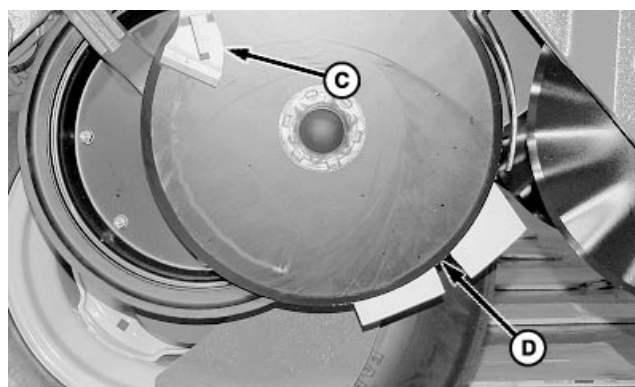
Measure blade diameter and compare to specification. Replace blades, if diameter is below specification, if beveled edge is worn off or if significant damage is apparent. See REPLACE SEED OPENER BLADES AND SEED TUBE GUARDS in this section.

Specification

Opener Blades—Minimum
Diameter 356 mm
(14 in.)



A53246 -UN-29OCT03



A53250 -UN-29OCT03

A—Cap Screw
B—Pivot Shaft
C—Scraper
D—Contact Point

Continued on next page

OUO6074,0000E6A -19-25JAN06-1/2

CAUTION: Disk blades are sharp. Wear protective gloves and handle disks carefully to avoid being injured.

IMPORTANT: Nut on left-hand blade has left-hand threads.

5. Only one blade needs to be removed to adjust contact point, as long as some shims still remain behind blade for relocation.

Remove hub cap, nut, flat washer (A) and hardened shims.

6. Remove blade (B).

NOTE: Do not discard shims. They will be needed at time of blade replacement.

7. Relocate enough shims from one side of blade to the other to increase or decrease contact point when assembled.

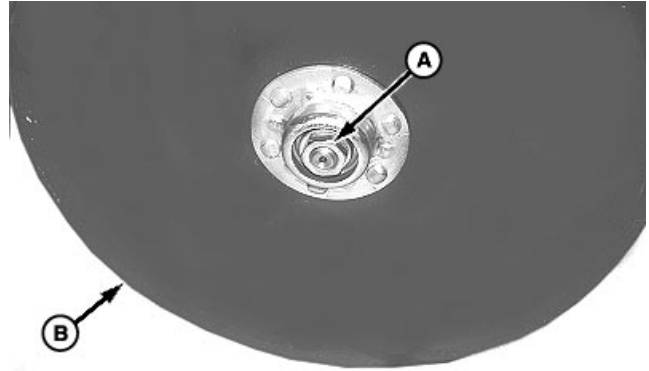
Blade may have to be installed and removed more than once before proper contact point is achieved.

8. While blade is off, inspect seed tube guard and replace, if excessively worn. See REPLACE SEED OPENER BLADES AND SEED TUBE GUARDS in this section.

9. During final reassembly, tighten blade nut and gauge wheel arm cap screw to specification.

Specification

Blade Nut—Torque.....	122 N•m (90 lb-ft)
Gauge Wheel Arm Cap Screw— Torque	271 N•m (200 lb-ft)



A—Nut and Washer
B—Disk

A51112 -JUN-20NOV02

OUO6074,0000E6A -19-25JAN06-2/2

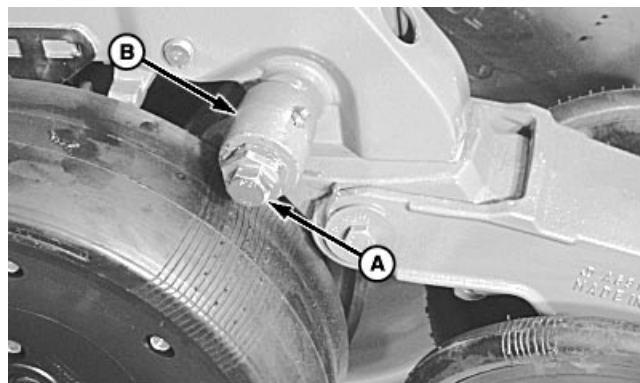
Replace Seed Opener Blades and Seed Tube Guard

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-hand blade does not need to be removed.

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

A—Cap Screw
B—Pivot Shaft



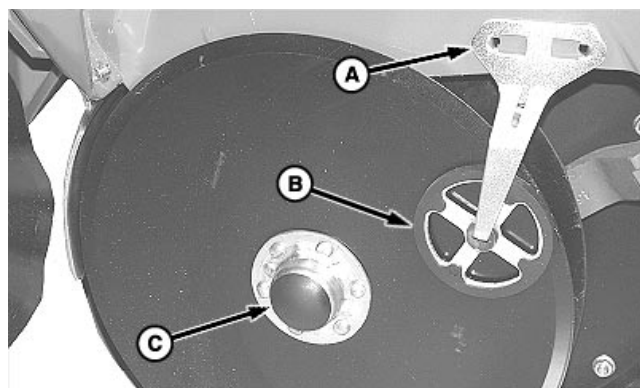
A53246 -UN-29OCT03

OUO6435,0001A4E -19-25JAN06-1/4

2. Planting unit equipped with rotary or rigid scraper—Pull front engagement pin (A) outward, disengage scraper assembly (B) from shank panels.

3. Remove hub cap (C).

A—Engagement Pin
B—Scraper
C—Hub Cap



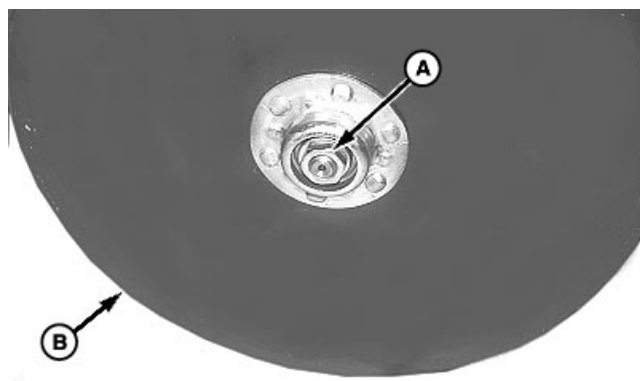
A51073 -UN-11NOV02

OUO6435,0001A4E -19-25JAN06-2/4

CAUTION: Disk blades are sharp. Wear protective gloves and handle disks carefully to avoid being injured.

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 blade on opposite side of row unit. If replacing seed tube guard only, right-hand blade does not need to be removed.



A—Nut and Washer
B—Disk

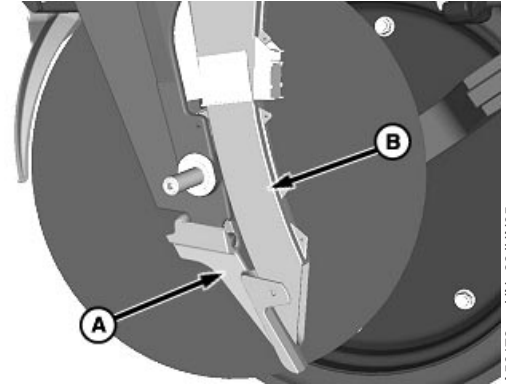
A51112 -UN-20NOV02

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OUO6435,0001A4E -19-25JAN06-3/4

NOTE: Replace seed tube guard, if excessively worn.

8. Remove seed-tube guard (A) by rotating clockwise and sliding forward.
9. Adjust blade contact point during reassembly. See INSPECT AND ADJUST SEED OPENER BLADES in this section.
10. During reassembly, tighten opener blade nut and gauge wheel arm cap screw to specification.



A—Seed Tube Guard
B—Seed Tube

Specification

Opener Blade Nut—Torque	122 N•m (90 lb-ft)
Gauge Wheel Arm Cap Screw— Torque	271 N•m (200 lb-ft)

11. Adjust gauge wheels. See ADJUST GAUGE WHEELS in this section.

OUO6435,0001A4E -19-25JAN06-4/4

Adjusting Gauge Wheels

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.

Adjust gauge wheels to prevent a buildup of dirt or residue between gauge wheels and opener blades.

Gauge wheels should just touch blades or be no more than maximum specification away from blades at their closest point when rotated.

Specification

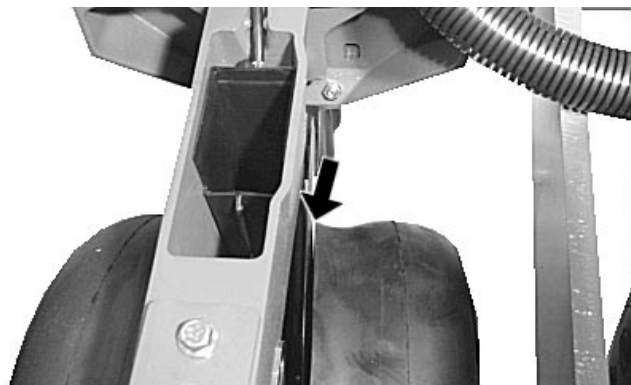
Wheel to Blade Maximum—	
Distance.....	1.5 mm (1/16 in.)

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

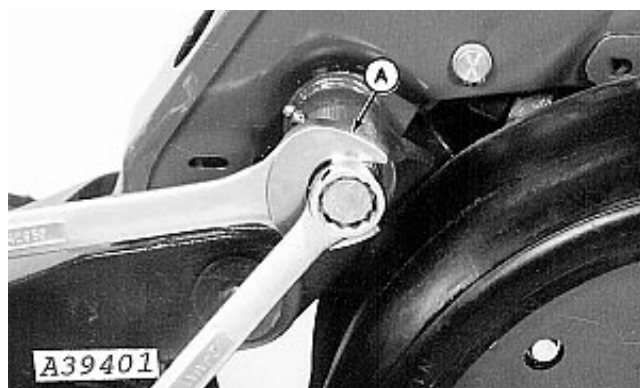
Tighten wheel arm cap screw to specification.

Specification

Wheel Arm Cap Screw—Torque.....	271 N•m (200 lb-ft)
---------------------------------	------------------------



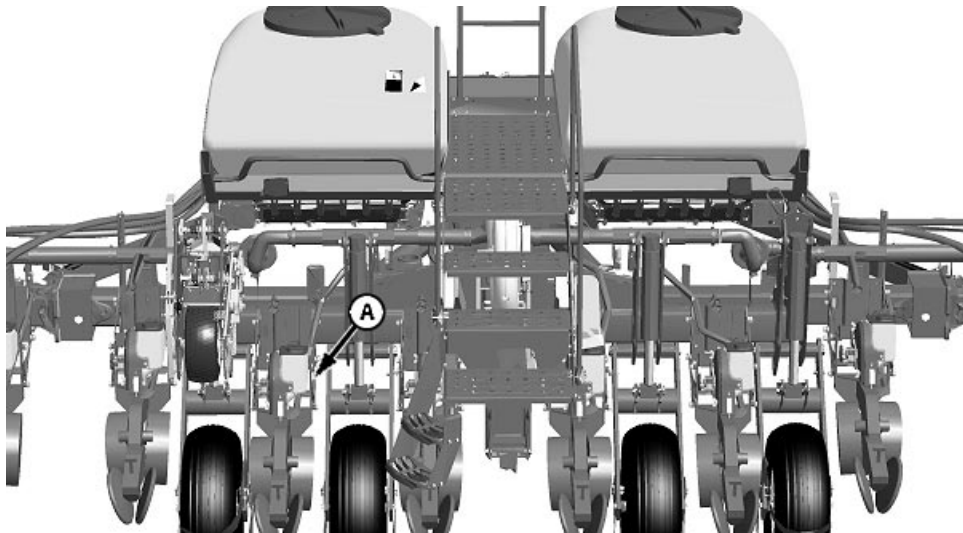
A53247 -UN-29OCT03



A39401 -UN-15MAR96

A—Adjusting Wrench

Setting CCS Row Unit Fan Switch



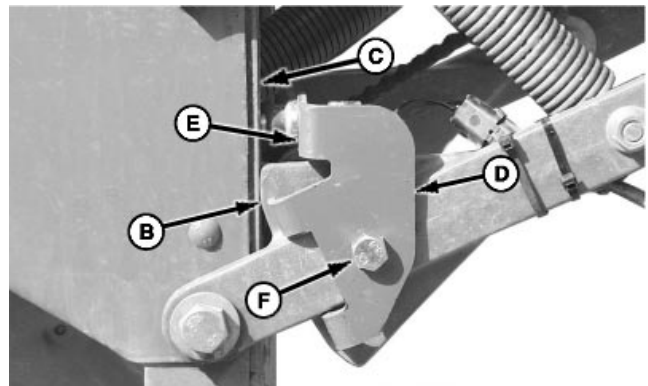
A53434 -UN-08JAN04

The CCS row unit switch (A) turns the CCS fan and agitator on and off as machine is raised and lowered.

1. Completely raise machine. Lower parallel arm stop (B) should be touching planting unit frame (C).
2. Rotate sensor bracket (D) until flat surface (E) is 20 mm (3/4 in.) from planting unit frame.
3. Tighten cap screw (F).

IMPORTANT: Avoid machine damage. Agitator will continue to run as long as tractor power is provided, if switch is not adjusted to deactivate when frame is raised.

NOTE: Tractor electrical power must be supplied when adjusting.



A53433 -UN-02DEC03

- A—Row Unit Switch
- B—Stop
- C—Frame
- D—Bracket
- E—Flat Surface
- F—Cap Screw

4. Observe agitator on CCS tank and adjust switch so agitator will shut off when frame obtains this fully raised position. This adjustment also ensures the CCS fan and agitator will engage the moment this row unit contacts the ground when lowered.

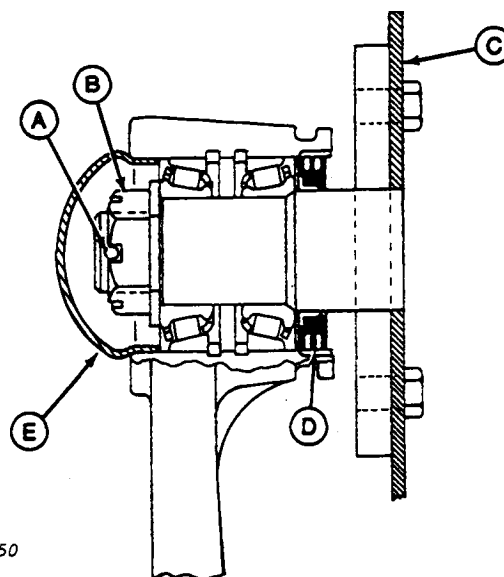
Coulter Maintenance

Anti-friction bearing has a face-type seal (D). Contact of seal against a machined surface retains grease and excludes dirt. Unless bearing is in proper adjustment, seal is ineffective. If there is any play in bearing, clamp coulter blade (C) in vise, disassemble, clean and repack with John Deere Multi-Purpose Lubricant or an equivalent SAE multipurpose-type grease. Tighten nut (B) until there is drag on bearing.

NOTE: Apply 1.3 N•m to 2.8 N•m (10 lb-in. to 25 lb-in.) of drag on bearing. This drag assures positive sealing. Replace cotter pin (A) into slotted nut to lock in position.

These anti-friction bearings are packed with grease at the factory. Every 100 hours, inspect bearing and adjust it if necessary. Every 200 hours, or before each planting season, whichever comes first, disassemble bearing, clean, and repack it as outlined above. Do not use chassis lubricant in anti-friction bearings.

A22350



- A—Cotter Pin
- B—Slotted Nut
- C—Coulter Blade
- D—Face Seal
- E—Hub Cap

A22350 -UN-13OCT88

AG,OUO6074,1381 -19-04AUG00-1/1

Service—Beginning of Season

Cleaning MaxEmerge XP Meter Drive

Drive (A) can stick in dusty conditions. Lubricate with John Deere Multipurpose Spray Lube TY6350.

Prior to season, disassemble drive, clean and repack with TY6333 grease.

Apply PM37477 LOCTITE to screw threads and assemble drive (A).

A—Drive



Vacuum Meter Drive Shown

A44734 -UN-24MAR98

LOCTITE is a trademark of Loctite Corp.

OUO6074,0000BD2 -19-26MAR04-1/1

Coulter Maintenance

Before each planting season, disassemble, inspect, clean and repack bearing. See COULTER MAINTENANCE in Service—As Required section.

OUO6074,000007D -19-03OCT00-1/1

MaxEmerge XP Chemical Meter Maintenance

The chemical meter fluted roller wears during operation. To maintain meter accuracy, the fluted roller should be replaced every 250 hours of use or beginning of planting season. To replace the roller, see CLEANING INSECTICIDE AND/OR HERBICIDE HOPPERS in Service—Every 10 Hours or Daily section.

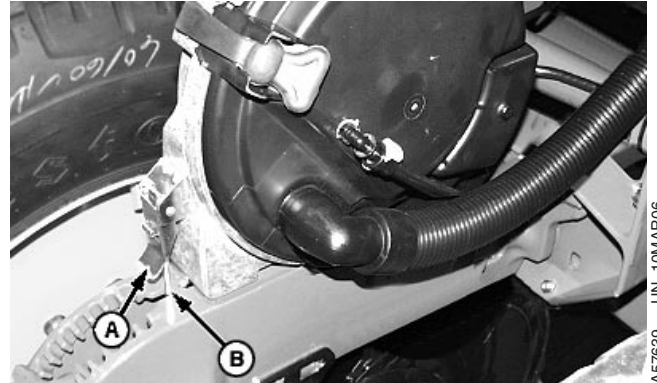
OUO6074,0000BD3 -19-26MAR04-1/1

Tightening Pro-Series XP Meter Latch

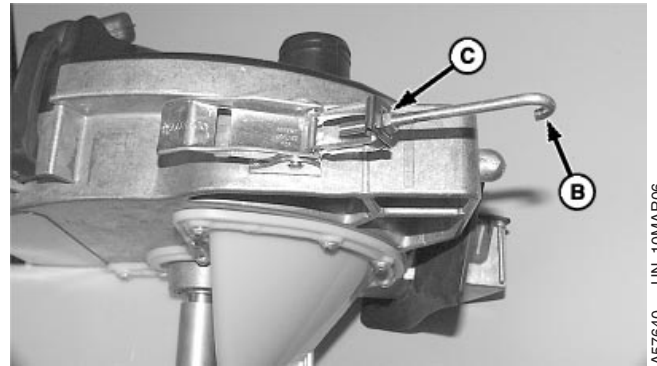
Meter latch (A) should close firmly into locked position when latch hook (B) is seated through notch and hole in row unit. Meter should fit securely on row unit. If latch or meter is out of adjustment, proceed as follows;

1. Release latch and hook.
2. Loosen nut (C).
3. Rotate hook one full revolution and tighten nut. Hook should face meter alignment pin when tight.
4. Install meter and check for proper adjustment. Repeat as necessary.

A—Latch
B—Latch Hook
C—Nut



A57639 -UN-10MAR06



A57640 -UN-10MAR06

OUO6074,0000EB5 -19-10MAR06-1/1

Service—Every 10 Hours or Daily

Cleaning MaxEmerge *XP* Insecticide and/or Herbicide Hoppers

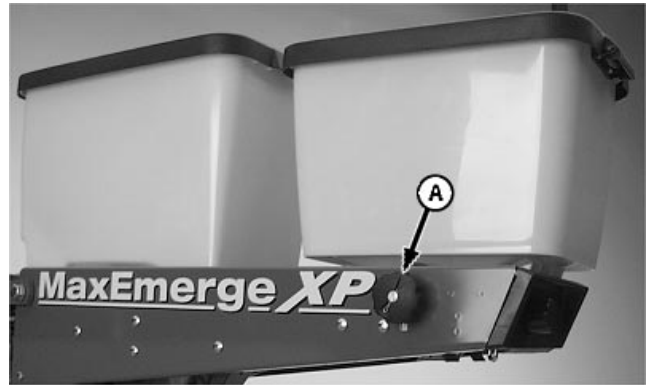


CAUTION: Agricultural chemicals can be dangerous. Follow instructions of chemical manufacturer when cleaning hoppers and handling insecticides or herbicides.

IMPORTANT: Under certain humidity or moisture conditions, material may tend to cake. When this happens, thoroughly clean hoppers at end of each days use.

1. Pull out and turn drive disconnect knob (A) to disconnect drive.
2. Pull down and rotate inner end of pin toward rear of planting unit.

A—Knob



A54022 -UN-08MAR04



A54028 -UN-08MAR04

3. Pull straight back and up until front hopper support hits back of slot in support rail. Then, lift up to disengage hopper from panels.



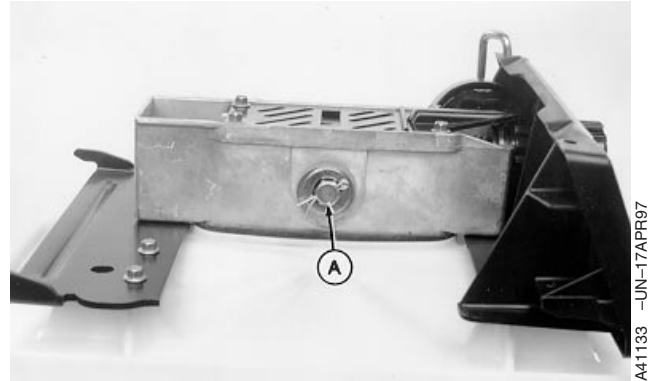
A54027 -UN-08MAR04

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OUO6074,0000BD4 -19-29JUN05-2/5

4. Remove cotter pin and shaft (A). Remove fluted roller and/or high-rate roller. Remove meter from hopper. Thoroughly clean hopper outlet opening and roller. Lubricate meter drive assembly between coupler, washers and outer bearing with John Deere Multipurpose Spray Lubricant.

A—Shaft



Single Meter

A41133 -UN-17APR97

OUO6074,0000BD4 -19-29JUN05-3/5

5. Slide hopper forward on rail until front support hooks drop into slots and rear support is firmly seated.



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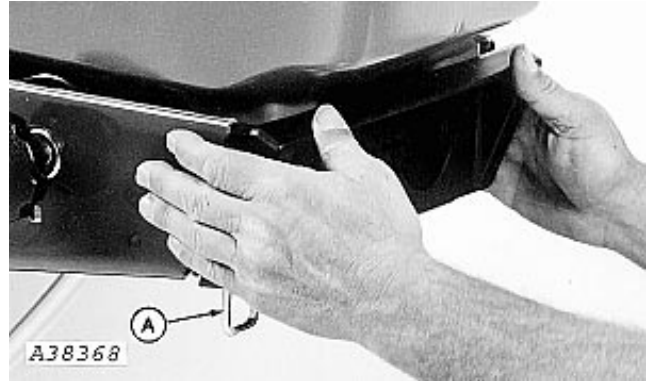
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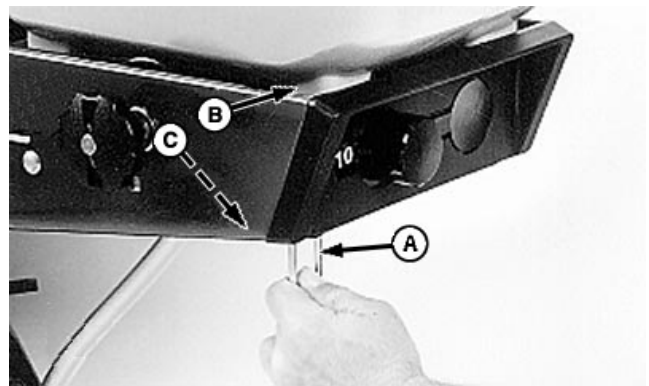
6. Push hopper forward until it stops. Rotate spring pins (A) inward slightly until pin “snaps” into place and locks hopper to unit at (B).

Do NOT attempt to install pin in support panel hole (C).

A—Spring Pin
B—Locked Location
C—Hole



A38368 -UN-27NOV95



A54029 -UN-08MAR04

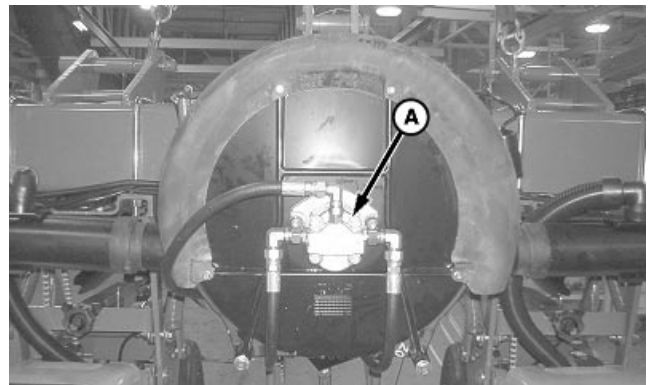
OUO6074,0000BD4 -19-29JUN05-5/5

Inspecting Vacuum Motor

Check vacuum motor for oil leaks.

A small amount of oil leakage is acceptable. If leakage occurs on motor housing, check for loose hardware on motor or loose fittings. If oil leakage is excessive or if vacuum levels can not be maintained, the vacuum motor should be replaced.

A—Motor



A57645 -UN-13MAR06

OUO6435,0001FE2 -19-13MAR06-1/1

Service—Every 50 Hours

Cleaning Vacuum Manifold System

Dirt or seed inoculant/treatment may build up in vacuum manifold system and cause low vacuum at planting units. This could result in loss of seed metering accuracy.



CAUTION: Follow chemical manufacturer's precautions when handling parts coated with seed treatments. Use proper skin, eye and respiratory protection.

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

Clean as follows:

1. Turn on vacuum blower(s) and set hydraulic flow to 75 percent.
2. One at a time, remove vacuum hoses from meters. Inspect and clean all straw and/or foreign material from both attaching hose ends. Shake hose for a few seconds and replace it on meter.
3. Remove end caps from manifold tubes one at a time, then reinstall.

OUO6435,0001AEC -19-04MAR04-1/1

Finger Pick-Up Meter

IMPORTANT: Never turn finger pick-up meter backward. Damage to brush will result.

Empty finger pick-up of all corn, chaff, and foreign material every 50 hours of use. Remove seed hopper from row unit and dump all material. Baffle covering fingers must also be emptied. Rotate finger pick-up several revolutions by hand to free any corn or foreign material from beneath fingers and empty this material before replacing seed hopper on planting unit.

To thoroughly inspect finger pick-up mechanism, see FINGER PICK-UP MECHANISM in Service—Every 100 Hours section.

AG,OUO6074,1380 -19-04AUG00-1/1

Service—Every 100 Hours

Coulter Maintenance

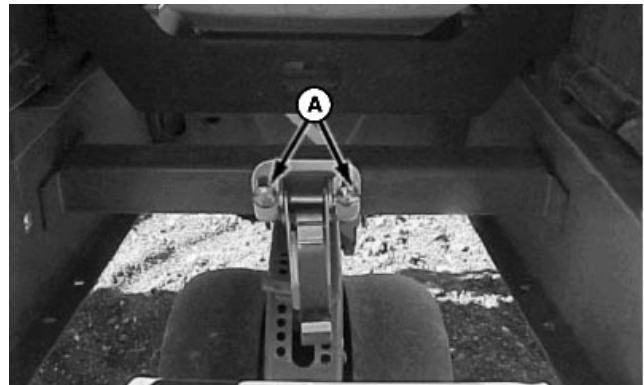
Every 100 hours, inspect bearing and adjust if necessary. See COULTER MAINTENANCE in Service—As Required section.

OUO6074,000007D -19-03OCT00-1/1

MaxEmerge XP 106 L (3.0 Bu) Hopper Latch

Every 100 hours, check latches on 106 L (3.0 bu) hoppers to make sure they latch tight. If latches are loose, loosen latch cap screws (A) and adjust latch.

A—Cap Screws



106 L (3.0 bu) Hopper Latch

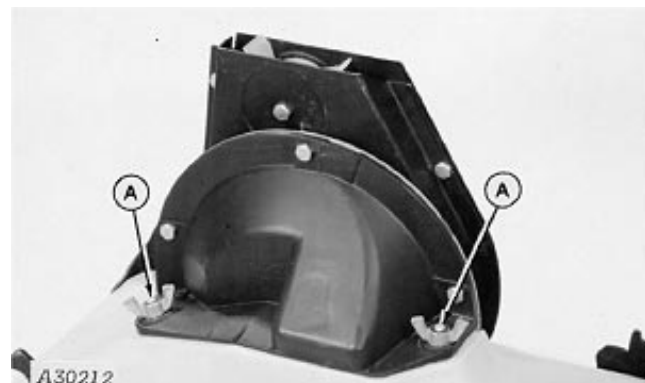
OUO6074,0000C52 -19-30APR04-1/1

Finger Pick-Up Mechanism

NOTE: This should be done every 100 hours or every season, whichever comes first.

1. Remove seed hopper from machine.
2. With seed hopper upside down, remove wing nuts (A) that connect finger pick-up mechanism to bottom of seed hopper and pull mechanism straight up to remove it from two mounting studs and retainer ring.

A—Wing Nut



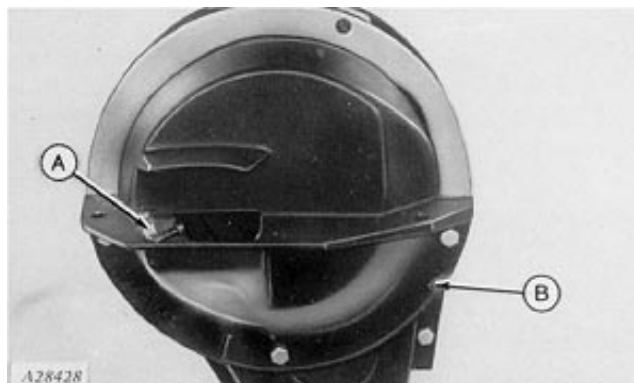
MaxEmerge XP Meter

Continued on next page

OUO6074,0000C53 -19-30APR04-1/9

3. Remove three screws and baffle (B) from front of finger pick-up assembly (A) to provide access to fingers.

A—Assembly
B—Baffle



A28428 -UN-13OCT88

OUO6074,0000C53 -19-30APR04-2/9

IMPORTANT: Never turn finger pick-up mechanism backward. Damage to brush will result.

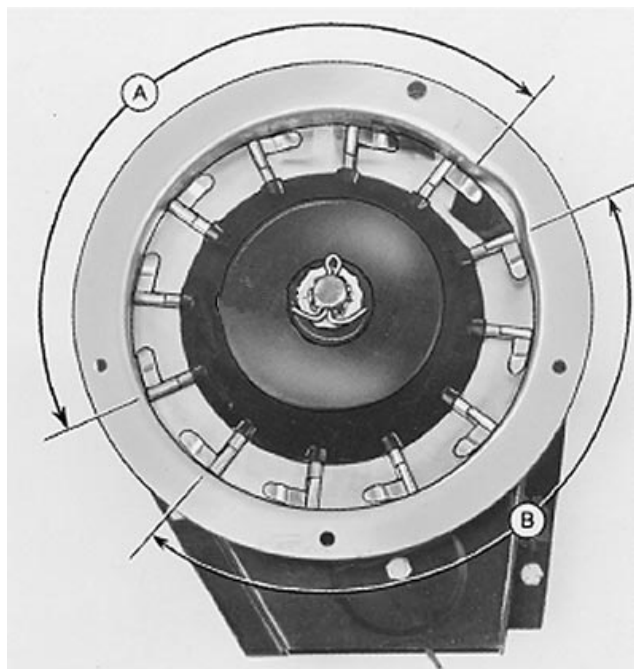
IMPORTANT: Check tightness of adjusting nut periodically. Failure to maintain proper finger assembly adjustment will result in a loose finger assembly which will tend to overpopulate, especially with small seed-corn sizes.

4. Turn finger pick-up by hand to see if springs are holding tabs of fingers in contact with carrier plate in appropriate area (A) and if cam is raising fingers properly in remaining area (B).

There should be less than 0.15 mm (0.006 in.) gap between finger holder and carrier with light tension on a finger tab adjacent to area being measured. Raise finger tab until contact is felt, then use a feeler-gauge to check gap between finger holder and carrier.

5. If there is an excessive build up of seed treatment material or chaff beneath finger holder, the gap between finger holder and carrier is too large or fingers need replaced, disassemble and clean or repair mechanism as follows:

A—Area
B—Area



A46468 -UN-03AUG00



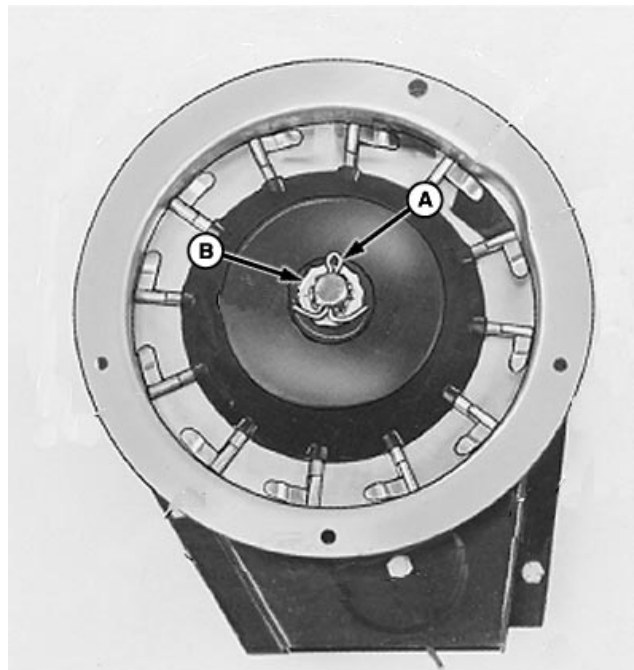
A22060 -UN-13OCT88

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OUO6074,0000C53 -19-30APR04-3/9

6. Remove cotter pin (A), nut lock (B) and adjusting nut from shaft.
7. Carefully lift finger pick-up assembly off shaft and clean.

A—Cotter Pin
B—Nut Lock

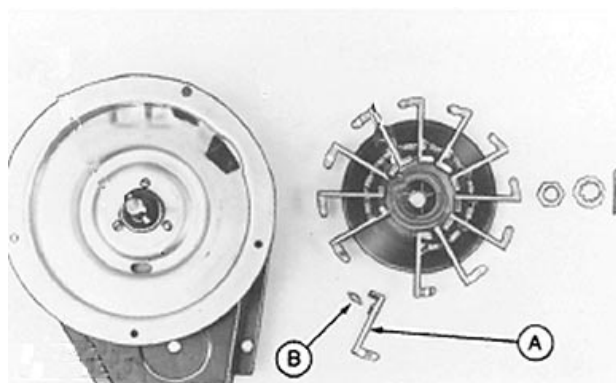


A46469 -UN-03AUG00

OUO6074,0000C53 -19-30APR04-4/9

8. To replace fingers (A) or springs (B), remove springs from finger and remove finger from carrier. When replacing fingers, install springs with open end of spring loop toward inside of finger holder.

A—Pick-Up Finger
B—Spring



A46470 -UN-03AUG00

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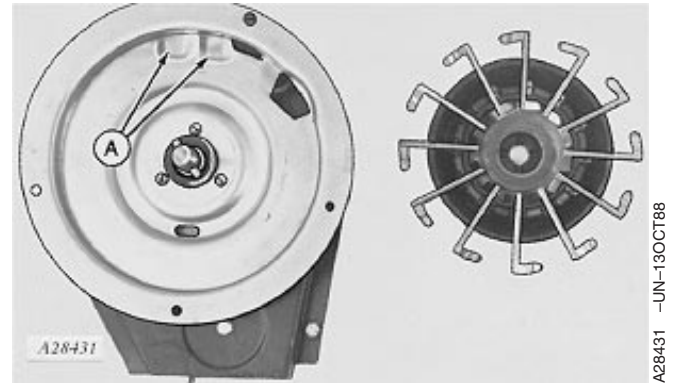
OUO6074,0000C53 -19-30APR04-5/9

9. Before installing finger pick-up assembly on carrier, check dimples (A) on carrier plate for wear.

Carrier plate is made of case-hardened steel with a hard chrome plated wear surface. Excessive wear of carrier plate at dimples will result in over population, especially with small seed corn sizes.

Inspect carrier plates yearly. Replace carrier plates when hard chrome surface has worn away and case-hardened steel begins to wear. This will be identifiable by a change in shape of dimples (A).

A—Dimples



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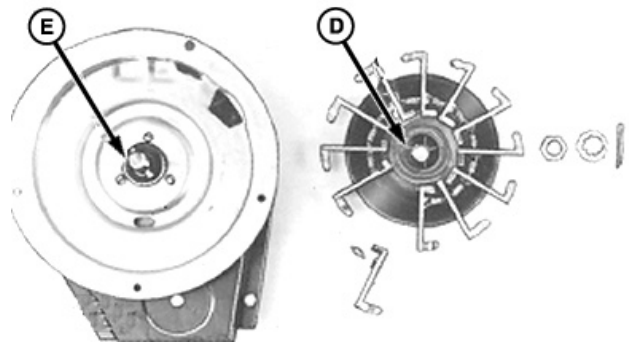
OUC6074,0000C53 -19-30APR04-6/9

IMPORTANT: Never turn finger pick-up mechanism backward. Damage to brush will result.

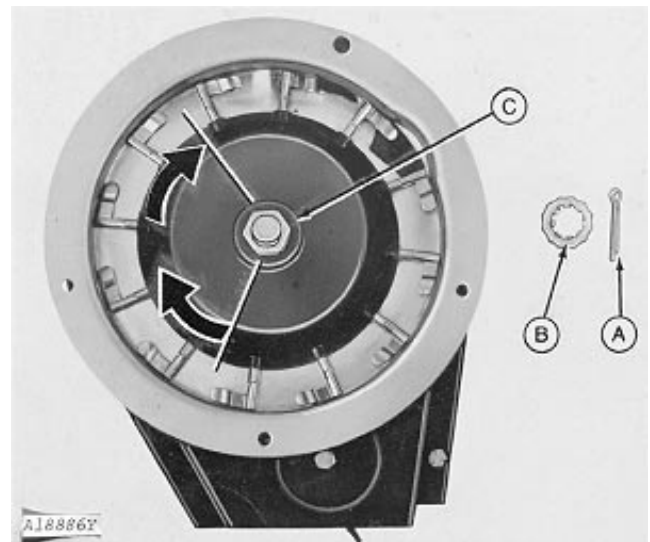
NOTE: Finger should seat in holder so holder is flush with carrier plate when assembled. Align notch in bearing (E) with projection on cam (D).

NOTE: Finger pickup finger tension can be adjusted for specific seed sizes and shapes. Seed size and shape in addition to meter rpm can affect meter performance. Your John Deere dealer can set your meter for your seed and meter speed. See your John Deere dealer for more information.

10. Install finger pick-up assembly and adjusting nut (C) on shaft.
11. With finger holder firmly seated against carrier plate, turn nut clockwise by hand until it contacts finger holder and a slight resistance is felt.
12. Continue to turn nut two flats clockwise (one third turn) until finger holder is properly positioned against carrier.
13. Turn finger holder by hand to ensure mechanism is not over tightened. Finger holder must be adjusted firmly against carrier but still turn by hand with moderate force.
14. Maintain adjustment with nut lock (B) and cotter pin (A).



A46471 -UN-03AUG00



A18886 -UN-13OCT88

- A—Cotter Pin
- B—Nut Lock
- C—Nut
- D—Projection on Cam
- E—Notch in Bearing

Continued on next page

OUC6074,0000C53 -19-30APR04-7/9

IMPORTANT: Check tightness of adjusting nut periodically. Failure to maintain proper finger assembly adjustment will result in a loose finger assembly which will tend to over populate, especially with small seed-corn sizes.

15. As a check on the above adjustment, there should be less than 0.15 mm (0.006 in.) gap between finger holder and carrier with light tension on a finger tab adjacent to area being measured. Raise finger tab until contact is felt, then use a feeler-gauge to check gap between finger holder and carrier.



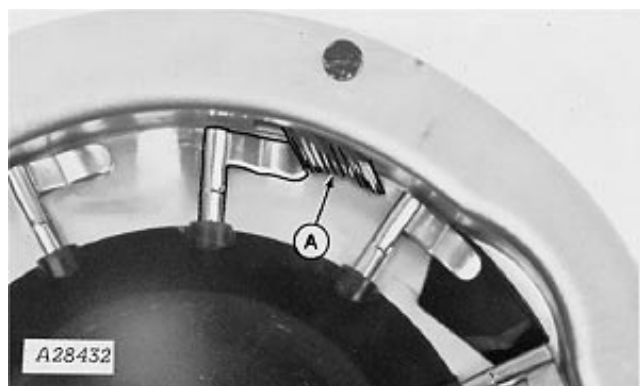
A22060 -UN-13OCT88

OUO6074,0000C53 -19-30APR04-8/9

16. The meter brush (A) helps dislodge multiple seeds held under individual fingers. If brush wear becomes excessive, individual fingers can meter multiple seeds resulting in over population.

Brush length should cover at least one-half the tab on pick-up finger. Since brush is being constantly used during operation, replacement is recommended every 100 hours.

A—Brush



A28432 -UN-07JUN89

OUO6074,0000C53 -19-30APR04-9/9

Service—Every 200 Hours

Coulter Maintenance

Every 200 hours or before each planting season, whichever comes first, disassemble bearing, clean and repack with grease. See COULTER MAINTENANCE in Service—As Required section.

OUO6074,000007F -19-03OCT00-1/1

Service—End of Season

Cleaning MaxEmerge XP Insecticide and/or Herbicide Hoppers

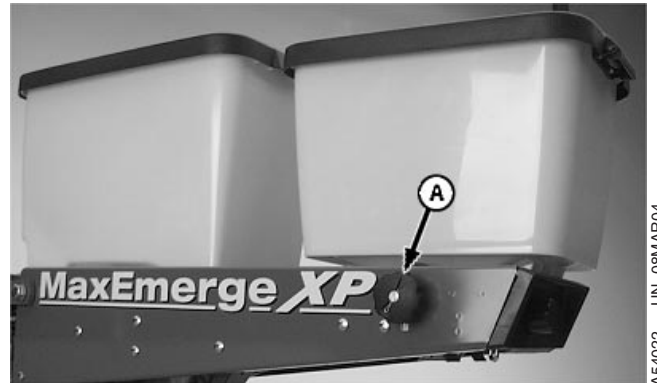


CAUTION: Agricultural chemicals can be dangerous. Follow instructions of chemical manufacturer when cleaning hoppers and handling insecticides or herbicides.

IMPORTANT: Under certain humidity or moisture conditions, material may tend to cake. When this happens, thoroughly clean hoppers at end of each days use.

1. Pull out and turn drive disconnect knob (A) to disconnect drive.
2. Pull down and rotate inner end of pin toward rear of planting unit.

A—Knob



A54022 -UN-08MAR04



A54028 -UN-08MAR04

OUO6074.0000BD4 -19-29JUN05-1/5

3. Pull straight back and up until front hopper support hits back of slot in support rail. Then, lift up to disengage hopper from panels.



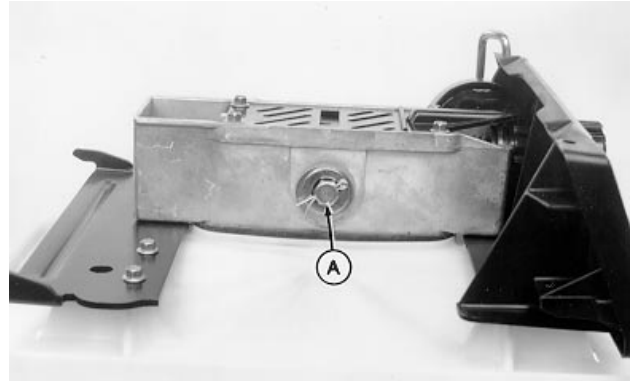
A54027 -UN-08MAR04

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OUO6074.0000BD4 -19-29JUN05-2/5

4. Remove cotter pin and shaft (A). Remove fluted roller and/or high-rate roller. Remove meter from hopper. Thoroughly clean hopper outlet opening and roller. Lubricate meter drive assembly between coupler, washers and outer bearing with John Deere Multipurpose Spray Lubricant.

A—Shaft



Single Meter

A41133 -UN-17APR97

OUC6074,0000BD4 -19-29JUN05-3/5

5. Slide hopper forward on rail until front support hooks drop into slots and rear support is firmly seated.



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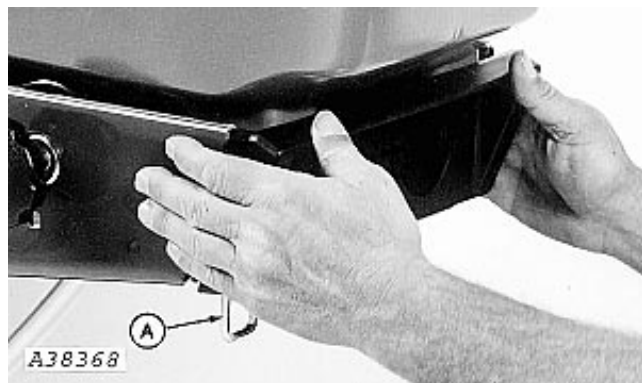
OUC6074,0000BD4 -19-29JUN05-4/5

A54027 -UN-08MAR04

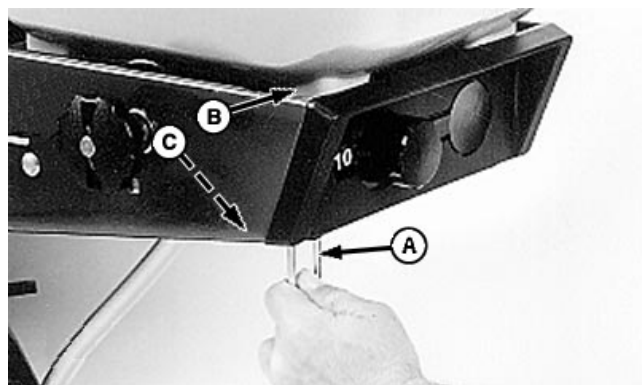
6. Push hopper forward until it stops. Rotate spring pins (A) inward slightly until pin “snaps” into place and locks hopper to unit at (B).

Do NOT attempt to install pin in support panel hole (C).

A—Spring Pin
B—Locked Location
C—Hole



A38368 -UN-27NOV95



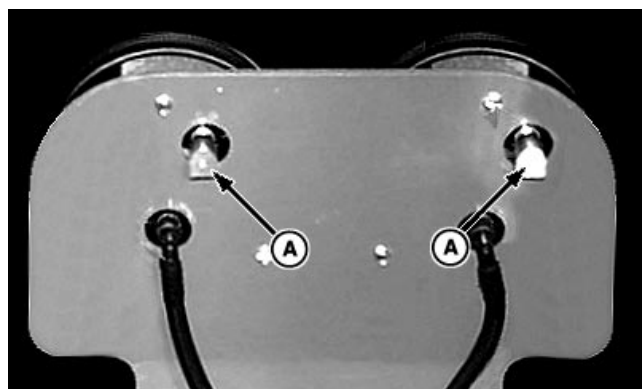
A54029 -UN-08MAR04

OUO6074,0000BD4 -19-29JUN05-5/5

Vacuum-Gauge Filter

Vacuum-gauge filter (A) may become clogged with dust. Annually inspect vacuum gauge and replace filter if needed.

A—Filter



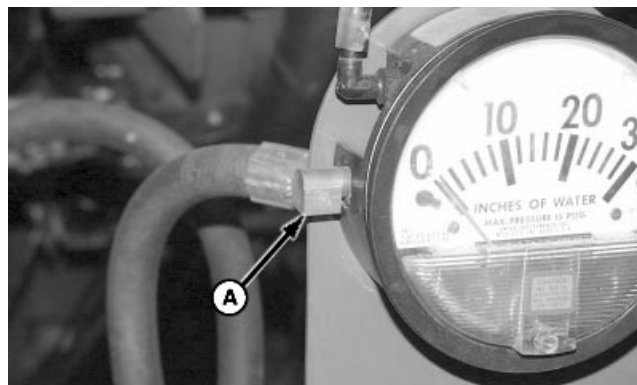
A53417 -UN-02DEC03

AG,OUO6074,1385 -19-02DEC03-1/1

CCS Fan Gauge Filter

CCS fan gauge filter (A) may become clogged with dust. Annually inspect CCS fan gauge filter and replace if needed.

A—Filter



CCS Fan Filter

A51173 -JUN-19NOV02

OUO6074,0000BD7 -19-26MAR04-1/1

MaxEmerge XP Vacuum Meter Inspection and Service

Annually inspect seed meter for wear and chemical/seed treatment build-up.

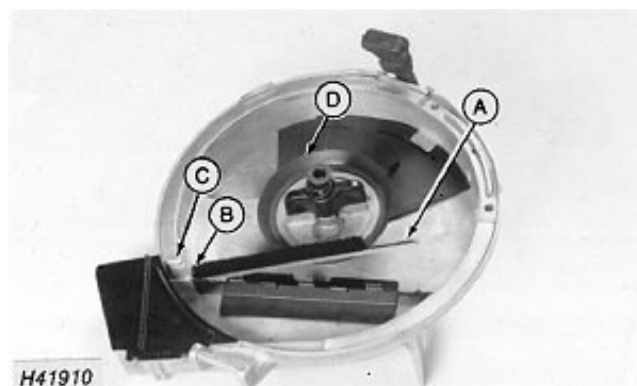
1. Check brush (A) for gaps. If gaps are big enough to allow seed to pass through, replace brush.

NOTE: When replacing brush:

Insert narrow end (B) into slot first.

Snap brush into slot until it contacts side of meter housing (C).

2. Replace hub seal (D) if cracked or weathered.

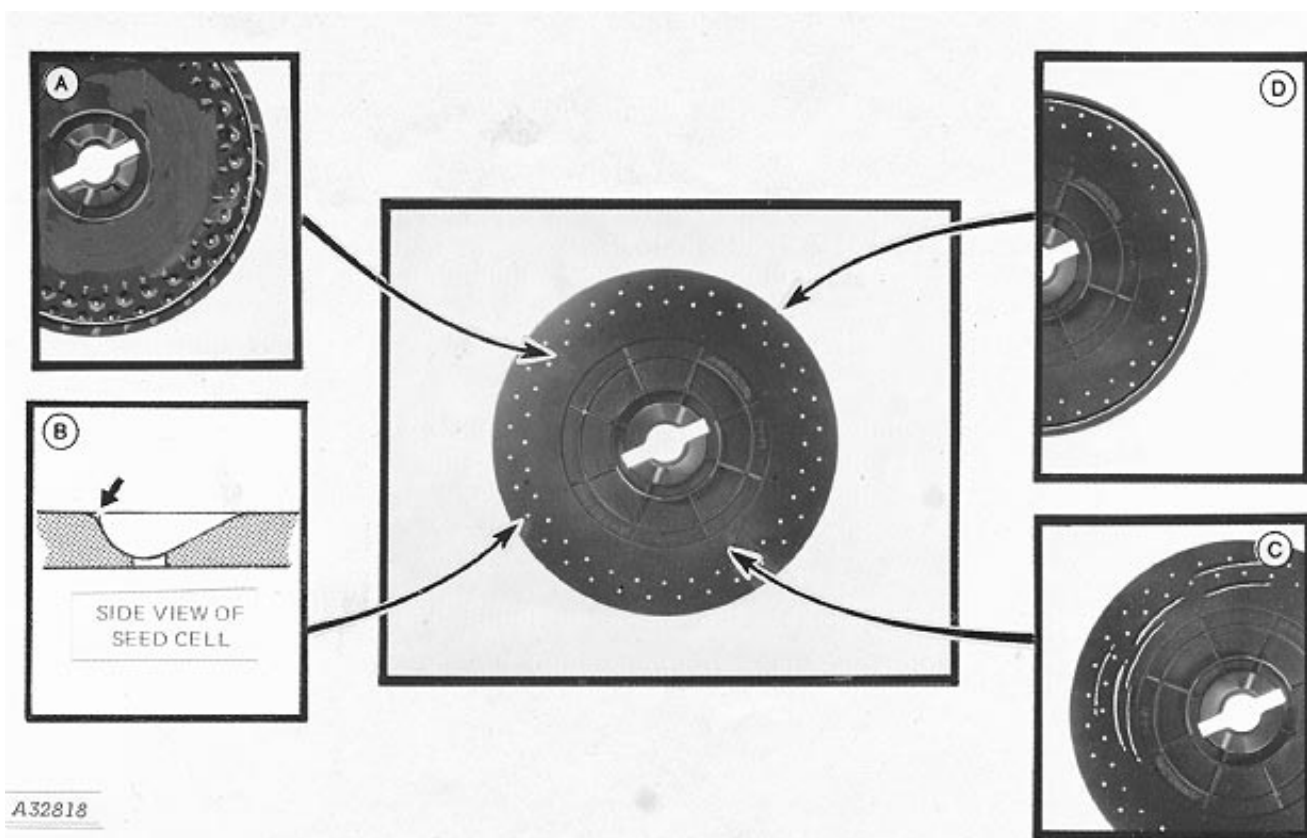


A—Brush
B—Narrow End
C—Housing
D—Seal

H41910 -JUN-08MAY90

Continued on next page

OUO6435,0001FE1 -19-26JUN06-1/5



A32818 -19-31JAN89

A—Wear Example

B—Corners

C—Wear Example

D—Wear Example

NOTE: Before replacing seed disks, perform a field check to determine if disk is metering seeds accurately. See *Checking Seed Population* section.

It is not necessary to replace seed disk if its metering performance is satisfactory.

3. Check seed disks for wear in following areas and replace as needed.

A small amount of wear around perimeter of disk (A) is acceptable. If wear occurs, check to see if seed can leak through gap between disk and housing.

Seed leakage may be eliminated by adjusting meter hub. See **ADJUSTING METER HUB** in *Preparing Vacuum Meter* section.

Inspect individual seed cells. Abrasion of seed may cause wear of sharp corners (B), which increases cell size. (This could result in overpopulation when planting small seed or under-population when planting large seed). Replace seed disk if size of cell is significantly increased and field checks determine a reduction in accuracy.

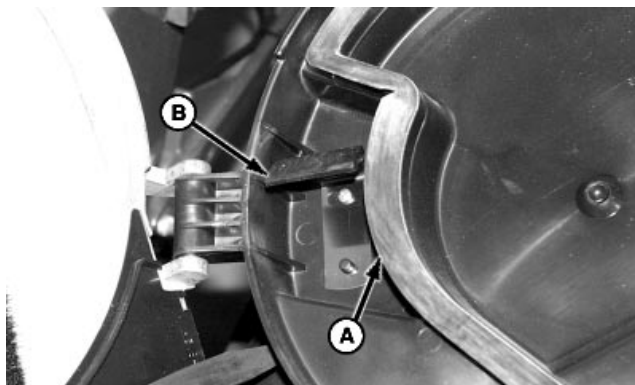
Small grooves or scratches are acceptable on vacuum side of seed disk (C).

Wear around perimeter of disk (D) is acceptable up to an approximate depth of 1.0 mm (3/64 in.).

NOTE: If vacuum seals are replaced, apply Spray on Graphite Lubricant TY25797 on vacuum side of used seed disks. See Lubrication—As Required section. New seed disks are factory lubricated.

4. Replace vacuum seals (A) if seed disks are replaced or when large cracks or wear areas are visible.
5. Replace seed-disk wiper (B) if edge of wiper is grooved or excessively worn.

A—Seals
B—Wiper



A51188 —UN-19NOV02

OUO6435,0001FE1 —19-26JUN06-3/5

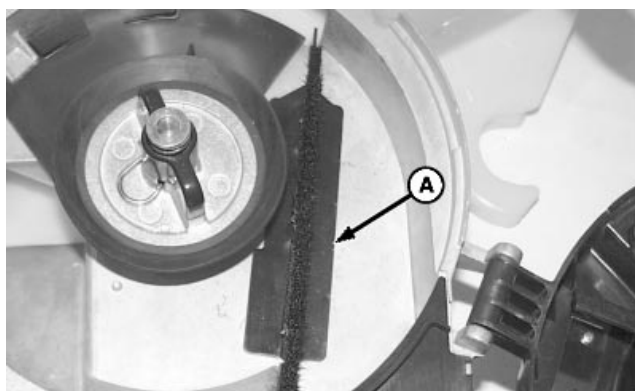


CAUTION: Follow chemical manufacturer's precautions when handling parts coated with seed treatments. Use proper skin, eye and respiratory protection.

NOTE: Thoroughly clean seed disk cell area and remove any excessive treatment buildup behind plastic (A) in vacuum meter housing.

6. Annual cleaning of vacuum meters and seed disks is recommended. Use mild detergent and a soft brush.

A—Plastic



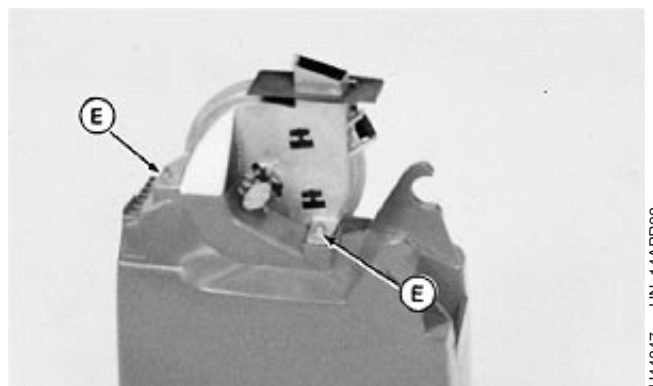
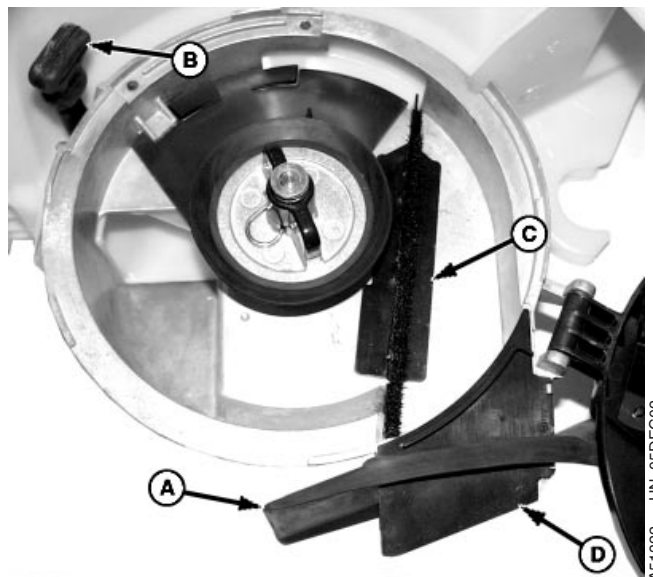
A51321 —UN-02DEC02

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OUO6435,0001FE1 —19-26JUN06-4/5

7. Replace vacuum meter dust cover (A) if it does not fit properly, is cracked or weathered.
8. Inspect rubber handle (B) and replace if cracked or broken.
9. Inspect plastic insert (C) and chute cover (D). Replace if worn.
10. Inspect flex-drive assembly to verify drive coupler pivots freely. Disassemble, clean and lubricate with molybdenum disulfide grease if flex drive does not pivot freely.
11. Place vacuum meter assembly on hopper and attach with nuts (E).

A—Dust Cover
B—Handle
C—Plastic Insert
D—Chute Cover
E—Nuts



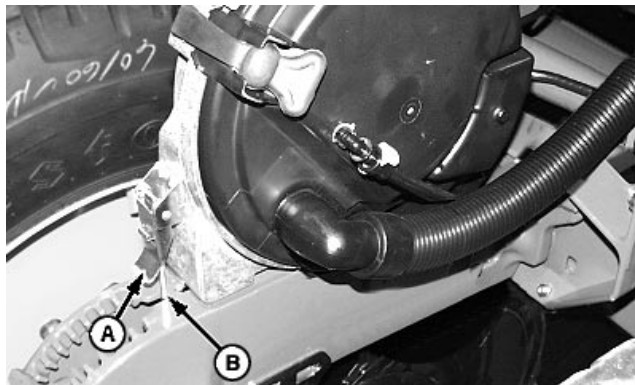
OOU6435,0001FE1 -19-26JUN06-5/5

Tightening Pro-Series XP Meter Latch

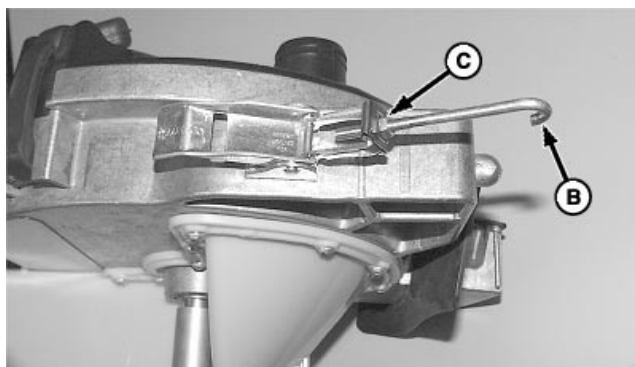
Meter latch (A) should close firmly into locked position when latch hook (B) is seated through notch and hole in row unit. Meter should fit securely on row unit. If latch or meter is out of adjustment, proceed as follows;

1. Release latch and hook.
2. Loosen nut (C).
3. Rotate hook one full revolution and tighten nut. Hook should face meter alignment pin when tight.
4. Install meter and check for proper adjustment. Repeat as necessary.

A—Latch
B—Latch Hook
C—Nut



A57639 —UN-10MAR06



A57640 —UN-10MAR06

OUO6074,0000EB5 —19-10MAR06-1/1

Pro-Series XP Vacuum Meter Inspection and Service

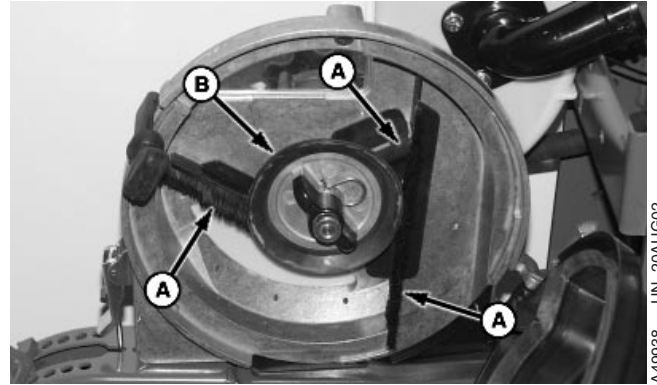
Annually inspect seed meter for wear and chemical/seed treatment build-up.

Continued on next page

OUO6435,0001FE0 —19-26JUN06-1/6

1. Check brushes (A) for gaps. If gaps are big enough to allow seed to pass through, replace brush.
2. Replace hub seal (B) if cracked or weathered.

A—Brushes
B—Hub Seal

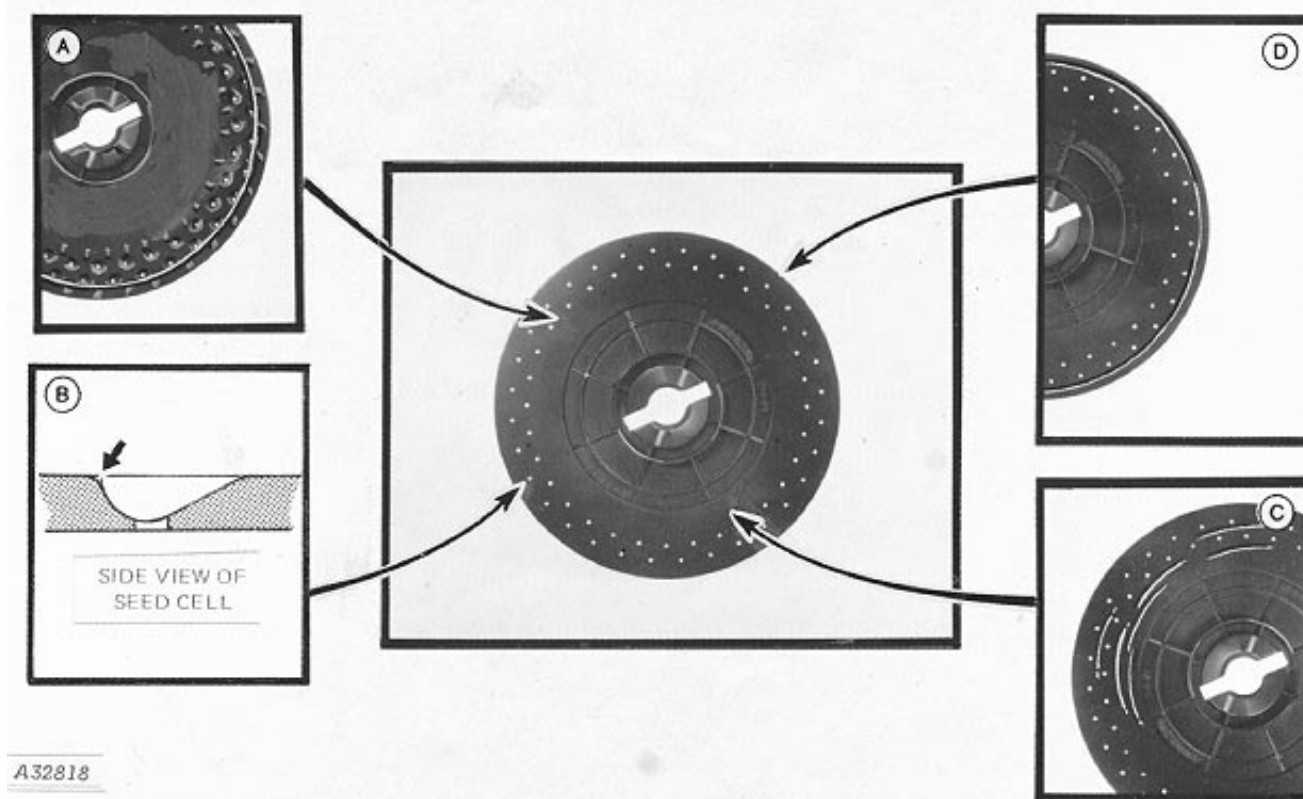


Vacuum Meter Shown

A49938 -UN-20AUG02

Continued on next page

OUO6435,0001FE0 -19-26JUN06-2/6



A32818 -19-31JAN89

A—Wear Example**B—Corners****C—Wear Example****D—Wear Example**

NOTE: Before replacing seed disks, perform a field check to determine if disk is metering seeds accurately. See *Checking Seed Population* section.

It is not necessary to replace seed disk if its metering performance is satisfactory.

3. Check seed disks for wear in following areas and replace as needed.

A small amount of wear around perimeter of disk (A) is acceptable. If wear occurs, check to see if seed can leak through gap between disk and housing.

Seed leakage may be eliminated by adjusting meter hub. See **ADJUSTING METER HUB** in *Preparing Vacuum Meter* section.

Inspect individual seed cells. Abrasion of seed may cause wear of sharp corners (B), which increases cell size. (This could result in overpopulation when planting small seed or under-population when planting large seed). Replace seed disk if size of cell is significantly increased and field checks determine a reduction in accuracy.

Small grooves or scratches are acceptable on vacuum side of seed disk (C).

Wear around perimeter of disk (D) is acceptable up to an approximate depth of 1.0 mm (3/64 in.).

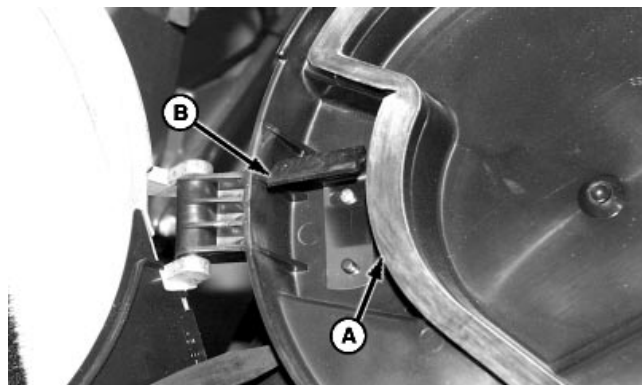
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OUO6435,0001FE0 -19-26JUN06-3/6

NOTE: If vacuum seals are replaced, apply *Spray on Graphite Lubricant TY25797* on vacuum side of used seed disks. See *Lubrication—As Required* section. New seed disks are factory lubricated.

4. Replace vacuum seals (A) if seed disks are replaced or when large cracks or wear areas are visible.
5. Replace seed-disk wiper (B) if edge of wiper is grooved or excessively worn.

A—Seals
B—Wiper



A51188 -UN-19NOV02

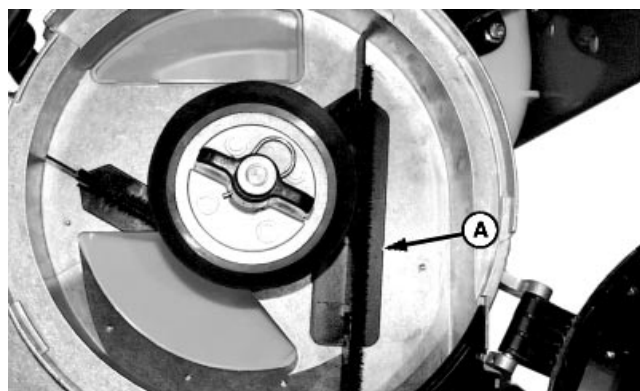
OUO6435,0001FE0 -19-26JUN06-4/6

CAUTION: Follow chemical manufacturer's precautions when handling parts coated with seed treatments. Use proper skin, eye and respiratory protection.

NOTE: Thoroughly clean seed disk cell area and remove any excessive treatment buildup behind plastic (A) in vacuum meter housing.

6. Annual cleaning of vacuum meters and seed disks is recommended. Use mild detergent and a soft brush.

A—Plastic



A51323 -UN-03DEC02

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OUO6435,0001FE0 -19-26JUN06-5/6

7. Replace vacuum meter dust cover (A) if it does not fit properly, is cracked or weathered.
8. Inspect rubber handle (B) and replace if cracked or broken.
9. Inspect plastic insert (C) and chute cover (D). Replace if worn.

A—Dust Cover
B—Rubber Handle
C—Plastic Insert
D—Chute Cover



Vacuum Meter Shown

OUO6435,0001FE0 -19-26JUN06-6/6

A49940 -UN-20AUG02

Radial Bean Meter Inspection and Service

Annually inspect seed meter for wear and chemical/seed treatment buildup.

1. Remove seed bowl.
2. Remove seed retainer from meter and clean debris from meter.

To remove seed retainer:

- a. Remove screw (A).
- b. Unsnap four hooks holding retainer to housing.
- c. Gently pull retainer from housing.

A—Screw

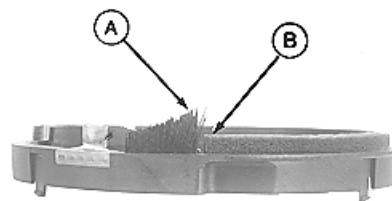


A49941 -UN-21AUG02

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OUO6074,0000953 -19-12JAN04-1/4

3. Check singling brush for wear. If brush thickness is less than 3 mm (1/8 in.) or if upper tip of brush (A) is below top of green retaining brush (B) when assembled in meter, replace singling brush. Rate of brush wear varies with field conditions and is accelerated under sandy soil conditions.



A40463 -UN-06NOV96

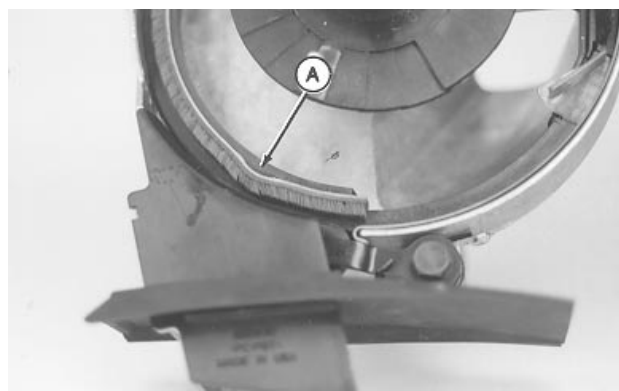
4. Inspect green retaining brush for wear. Development of a groove in brush fibers above singling brush is an indication that singling brush needs to be replaced more frequently.

A—Brush
B—Retaining Brush

OUO6074,0000953 -19-12JAN04-2/4

Wear of green retaining brush at cleanout “bump” (A) is normal and expected. Meter will operate properly with these fibers worn off.

A—Bump



A40464 -UN-06NOV96

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OUO6074,0000953 -19-12JAN04-3/4

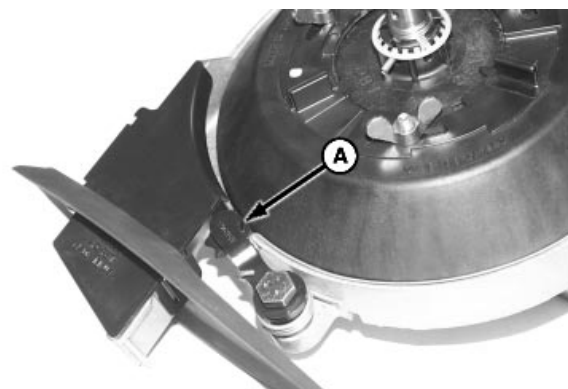


CAUTION: Follow chemical manufacturer's precautions when handling parts coated with seed treatments. Use proper skin, eye, and respiratory protection.

NOTE: Thoroughly clean seed-bowl cell area and remove any excessive treatment buildup in radial meter housing.

When installing seed bowl, knockout wheel (A) must not be pinched by seed bowl.

5. Inspect knockout wheel (A) for excessive wear. Replace if wheel fails to contact seed bowl.
6. Annual cleaning of radial bean meter is recommended. Use mild detergent and a soft brush.



A—Knockout Wheel

A49942 -JUN-21AUG02

OUO6074,0000953 -19-12JAN04-4/4

Storage

Removing From Storage

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.

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

Thoroughly inspect machine for loose parts and adjust as necessary.

OUO6074,0000AD0 -19-24MAR04-1/4

IMPORTANT: High pressure washers can damage electrical components, bearings, hoses and/or hoppers if direct contact is applied. Use caution, if power washing machine.

Clean any dirt or grease that may have accumulated on moving parts, gears and chains before operating machine. This will prevent abrasive action that could cause excessive wear.

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

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



A54030 -UN-08MAR04

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OUO6074,0000AD0 -19-24MAR04-2/4

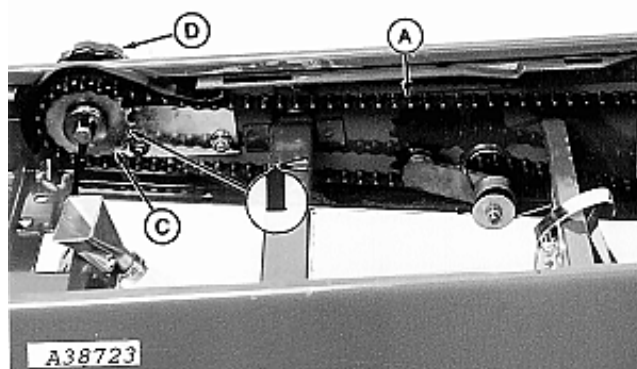
The pesticide drive chain (A), seed meter drive chain (B), pesticide drive sprocket (C) and gears must have adequate lubrication.

When lubricating pesticide drive gears, move drive disconnect knob (D) back and forth while spraying to help loosen any paint or dirt buildup and allow gears to turn freely.

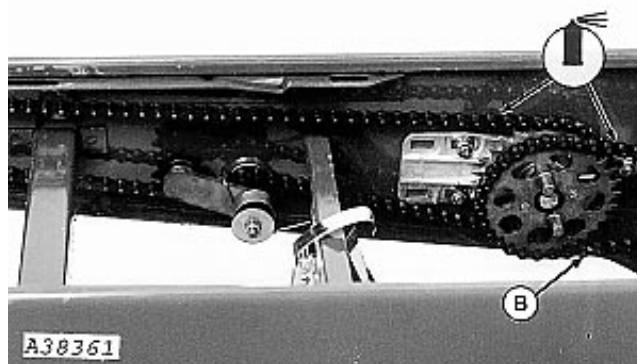
The meter drive shaft and seed meter should turn freely by hand. Rotate drive shaft forward only, as assemblies are not designed to rotate in reverse.

Adjust machine for planting conditions to be encountered.

- A—Pesticide Drive Chain
- B—Seed Meter Drive Chain
- C—Pesticide Drive Sprocket
- D—Drive Disconnect Knob



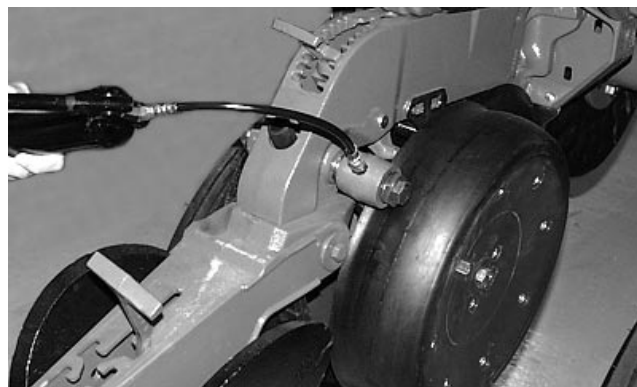
A38723 -UN-27NOV95



A38361 -UN-27NOV95

OOU6074,0000AD0 -19-24MAR04-3/4

Lubricate planting units as outlined in the Lubrication section.



A53141 -UN-04NOV03

OOU6074,0000AD0 -19-24MAR04-4/4

Storing Machine

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

Store machine in a RAISED position with service locks installed.

Paint all parts which are chipped or worn as required.

IMPORTANT: High pressure washers can damage electrical components, bearings, hoses and/or hoppers if direct contact is applied. Use caution, if power washing machine.

Clean machine thoroughly to remove dirt and residue which would hold moisture and cause rusting.

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

Thoroughly lubricate chains with John Deere Multipurpose Spray Lube, TY6350, at beginning of the idle period.

Empty and clean seed hoppers.

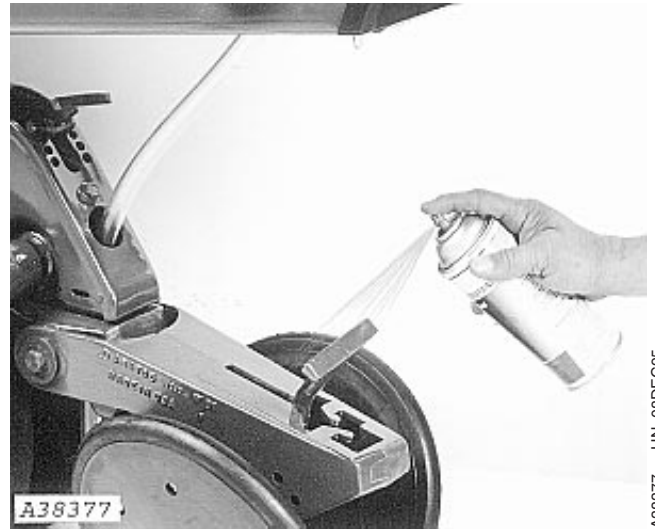
Clean insecticide and/or herbicide hopper thoroughly as various chemicals may deteriorate system components.

Clean liquid and dry fertilizer components thoroughly as various fertilizers may deteriorate system components (if equipped).

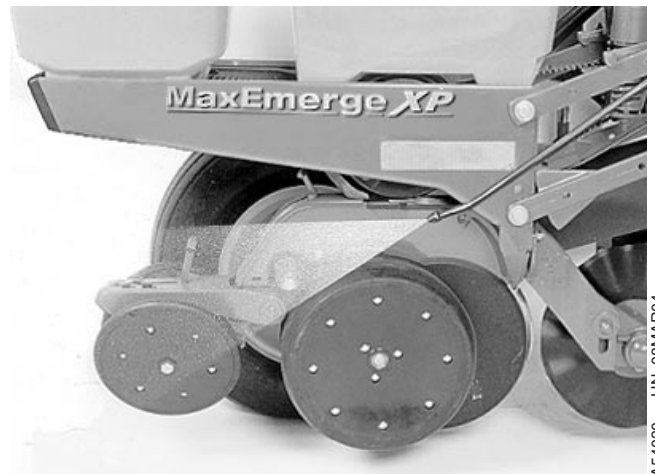
Inspect machine for worn or broken parts. See your John Deere dealer during the off season so that parts or service can be acquired when the machine is not needed in the field.

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

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



A38377 -UN-08DEC95



A54030 -UN-08MAR04

Thoroughly flush liquid herbicide system with clean water. Disconnect from tractor and completely drain all lines and components to prevent damage from freezing (if equipped).

Remove seed disks from meter. See VACUUM METER INSPECTION AND SERVICE in Service—End Of Season section.



CAUTION: Follow chemical manufacturer's precautions when handling parts coated with seed treatments. Use proper skin, eye and respiratory protection.

Clean meter housing, meter chamber and seed disk with mild detergent and soft brush.

OUC6074,0000A5C -19-16MAR06-2/3

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

Store disks (A) in shipping box or hang on wall.

Clean vacuum manifold system. (See CLEANING VACUUM MANIFOLD SYSTEM in Service—Every 50 Hours section.)

Check and replace necessary vacuum meter seals.

Check for hydraulic leaks.

A—Disks



A44241 -UN-19NOV97

OUC6074,0000A5C -19-16MAR06-3/3

Pneumatic Down Force Storage Procedures

When storing machine:

IMPORTANT: Do not remove air from system, air springs should be pressurized and may be allowed to leak down slowly to 0 psi.

- Park machine with 55 kPa (0.5 bar) (8 psi) of air pressure in the system.

Continued on next page

AG,OUO6074,1395 -19-04AUG00-1/2

When removing from storage:



CAUTION: Avoid serious injury from exploding parts due to overpressurization or operating the system without all components in place.

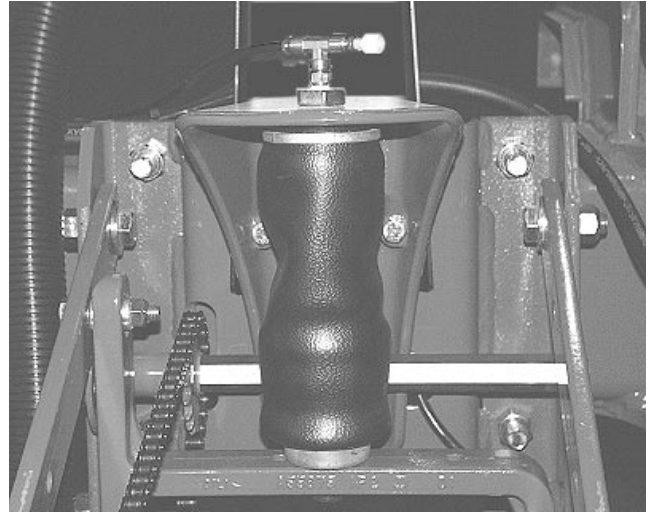
Do not inflate system above 827 kPa (8.2 bar) (120 psi).

Do not remove pressure relief valve.

Do not pressurize system unless all row unit components are in place.

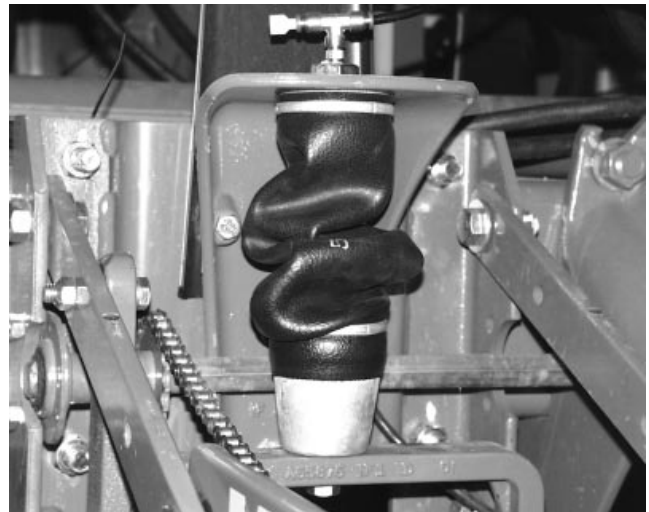
IMPORTANT: Do not operate a pinched or unrolled air spring . Should this occur, lower system pressure until springs can be rolled by hand. Roll spring back over lower piston. Incremental lowering of machine may be required to get rubber started rolling over the lower piston.

- Pressurize system to a minimum of 83 kPa (0.8 bar) (12 psi) before raising or lowering machine.
- Minimum system pressure during operation is 83 kPa (0.8 bar) (12 psi). Failure to hold 83 kPa (0.8 bar) (12 psi) during operation will result in damage to air springs.



Properly Rolled Spring

A48706 -UN-15FEB02



Improperly Rolled Air Spring

A48850 -UN-01MAR02

AG,OUO6074,1395 -19-04AUG00-2/2

Keep Proof of Ownership

1. Maintain in a 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

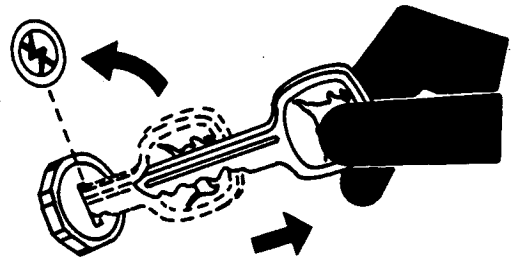


TS1680 -UN-09DEC03

DX, SECURE1 -19-18NOV03-1/1

Keep Machines Secure

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 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.



TS230 -UN-24MAY89

DX, SECURE2 -19-18NOV03-1/1

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John Deere Service Literature

Technical Information

Technical information can be purchased from John Deere. Some of this information is available in electronic media, such as CD-ROM disks, and in printed form. There are many ways to order. Contact your John Deere dealer. Call **1-800-522-7448** to order using a credit card. Search online from <http://www.JohnDeere.com>. Please have available the model number, serial number, and name of the product.

Available information includes:

- **PARTS CATALOGS** list service parts available for your machine with exploded view illustrations to help you identify the correct parts. It is also useful in assembling and disassembling.
- **OPERATOR'S MANUALS** providing safety, operating, maintenance, and service information. These manuals and safety signs on your machine may also be available in other languages.
- **OPERATOR'S VIDEO TAPES** showing highlights of safety, operating, maintenance, and service information. These tapes may be available in multiple languages and formats.
- **TECHNICAL MANUALS** outlining service information for your machine. Included are specifications, illustrated assembly and disassembly procedures, hydraulic oil flow diagrams, and wiring diagrams. Some products have separate manuals for repair and diagnostic information. Some components, such as engines, are available in separate component technical manuals
- **FUNDAMENTAL MANUALS** detailing basic information regardless of manufacturer:
 - Agricultural Primer series covers technology in farming and ranching, featuring subjects like computers, the Internet, and precision farming.
 - Farm Business Management series examines "real-world" problems and offers practical solutions in the areas of marketing, financing, equipment selection, and compliance.
 - Fundamentals of Services manuals show you how to repair and maintain off-road equipment.



TS189 -UN-17JAN89



TS191 -UN-02DEC88



TS224 -UN-17JAN89



TS1663 -UN-10OCT97

- Fundamentals of Machine Operation manuals explain machine capacities and adjustments, how to improve machine performance, and how to eliminate unnecessary field operations.

DX,SERVLIT –19–31JUL03–2/2

John Deere Service Keeps You on the Job

John Deere Is At Your Service

CUSTOMER SATISFACTION is important to John Deere.

Our dealers strive to provide you with prompt, efficient parts and service:

- Maintenance and service parts to support your equipment.
- Trained service technicians and the necessary diagnostic and repair tools to service your equipment.

CUSTOMER SATISFACTION PROBLEM RESOLUTION PROCESS

Your John Deere dealer is dedicated to supporting your equipment and resolving any problem you may experience.

1. When contacting your dealer, be prepared with the following information:

- Machine model and product identification number
- Date of purchase
- Nature of problem

2. Discuss problem with dealer service manager.

3. If unable to resolve, explain problem to dealership manager and request assistance.

4. If you have a persistent problem your dealership is unable to resolve, ask your dealer to contact John Deere for assistance. Or contact the Ag Customer Assistance Center at 1-866-99DEERE (866-993-3373) or e-mail us at www.deere.com/en_US/ag/contactus/.



TS201 –UN–23AUG88

DX,IBC,2 –19–01MAR06–1/1

