1590 Grain Drill

(Serial No. 795101 -)

JOHN DEERE

OPERATOR'S MANUAL

1590 Grain Drill

OMKK82218 ISSUE D1 (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.

Additional Proposition 65 Warnings can be found in this manual.

John Deere Des Moines Works

North American Edition

PRINTED IN U.S.A.

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 or statement which you should have received from your dealer

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

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

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

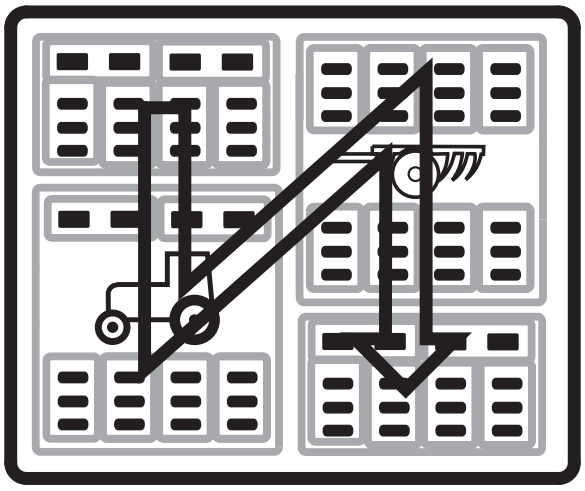
DX,IFC2-19-03APR09

A Message to Our Customers

We appreciate the confidence placed in us by the purchase of this machine. To ensure that the machine performs at the highest level, countless hours were spent designing and testing, before this machine was produced. To achieve the maximum performance, it is imperative that this machine is operated in accordance with the procedures outlined in this manual.

Information in this manual is divided into sections. The section names are identified in the table of contents and at the top of each page. Each section has a unique number and page count. Specific information within each section is organized into topics identified with bold headings.

The topic headings are listed in the table of contents with the section number and page number where the topic begins. Topics and information related to each topic are also referenced in the index along with the section and page number.



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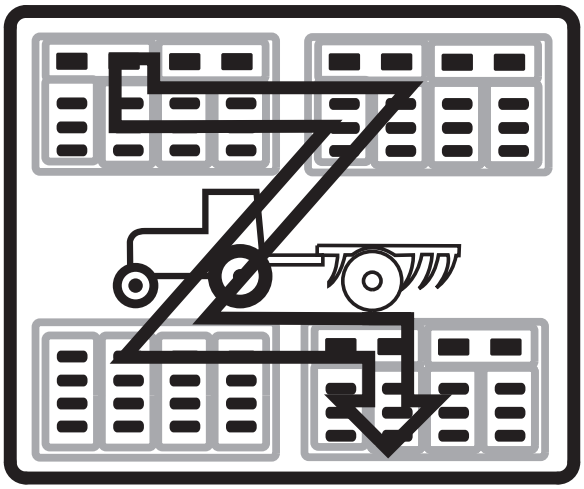


A100768—UN—07JUN18

The flow can divide both before and after the images and tables that span the width of a page.

Review this manual often to learn where to look for information.

Thanks again for purchasing this machine.

OUO6074,000106B-19-07JUN18

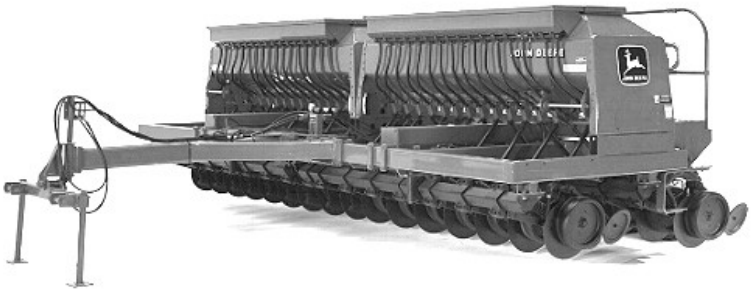
3 m (10 ft) Single Box Drill

N47881—UN—04NOV97
AG,OUO1074,401-19-03JAN17

4.6 m (15 ft) Single Box Drill

N47993—UN—05MAY98
AG,OUO1074,402-19-03JAN17

6.1 m (20 ft) Single Box Drill



N47882—UN—04NOV97
AG,OUO1074,404-19-03JAN17

Contents

Continued on next page

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

Recognize Safety Information

T81389—UN—28JUN13

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

Follow recommended precautions and safe operating practices.

DX,ALERT-19-29SEP98

Understand Signal Words

TS187—19—30SEP88

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

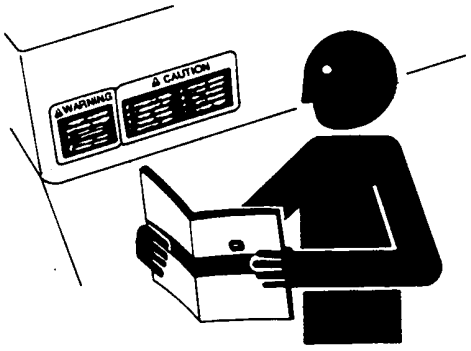
WARNING; The signal word WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

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

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

DX,SIGNAL-19-05OCT16

Follow Safety Instructions



TS201—UN—15APR13

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

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

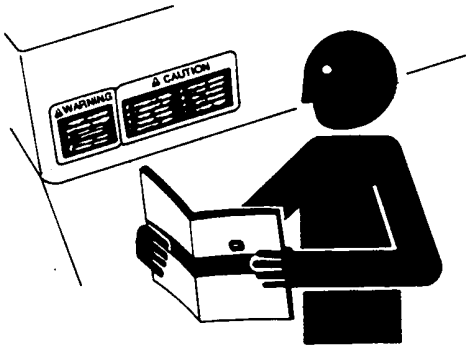
Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

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

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

DX,READ-19-16JUN09

Replace Safety Signs



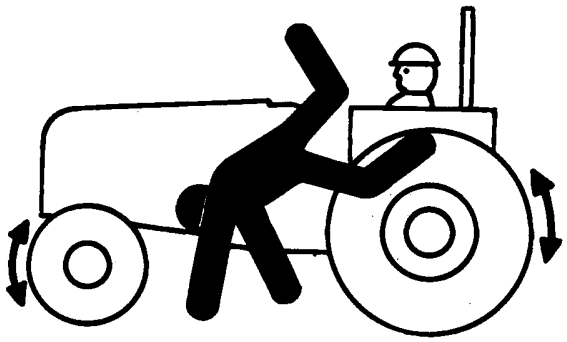
TS201—UN—15APR13

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

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

DX,SIGNS-19-18AUG09

Keep Riders Off Machine



TS290—UN—23AUG88

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

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

DX,RIDER-19-03MAR93

Hydraulic Hose Replacement

Inspect hydraulic hoses between the lift cylinders and hydraulic lock-up valves frequently for leakage, kinking, cuts, cracks, abrasion, blisters, corrosion, exposed wire braid, or any other signs of wear or damage. Replace worn or damaged hose assemblies immediately. See yourJohn Deere™ dealer for replacement hoses.

⚠ CAUTION: Avoid serious injury or death while working under a raised implement. Replacement hoses must be properly rated.

Ensure that fabricated hoses are rated at no less than 20 680 kPa (207 bar) (3 000 psi.) according to SAE standard J517, 100R17 hose specification.

Decrease the chance of hose wear or damage. To ensure proper hose length and routing, use old hose as a guide.

To avoid mating surface damage and leaks, use steel fittings approved for use with hose manufacturer. Ensure that replacement hose fittings use the same size and thread type as replaced hose.

OUO6030,0000354CONV1-19-11SEP14

Practice Safe Maintenance

TS218—UN—23AUG88

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

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

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

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

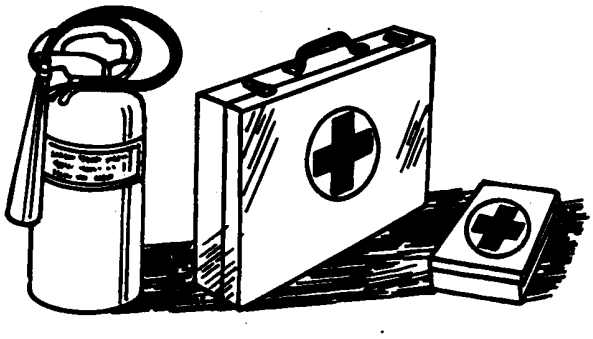
On self-propelled equipment, disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

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

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

DX,SERV-19-28FEB17

Prepare for Emergencies



TS291—UN—15APR13

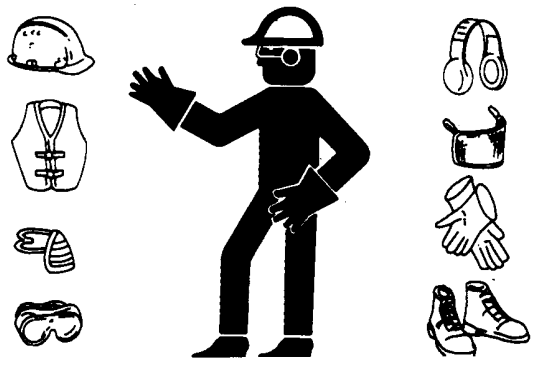
Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

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

DX,FIRE2-19-03MAR93

Wear Protective Clothing



TS206—UN—15APR13

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

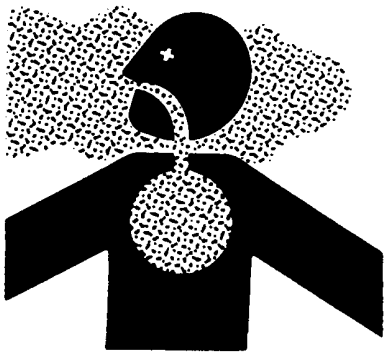
Prolonged exposure to loud noise can cause impairment or loss of hearing.

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

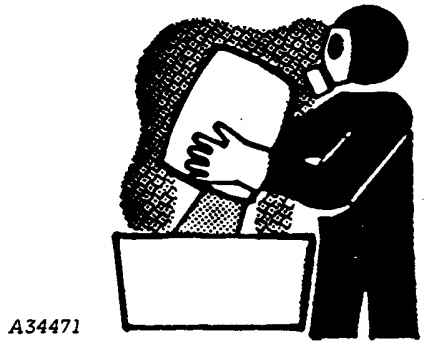
Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine.

DX,WEAR-19-10SEP90

Handle Agricultural Chemicals Safely



TS220—UN—15APR13



A34471—UN—11OCT88

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

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

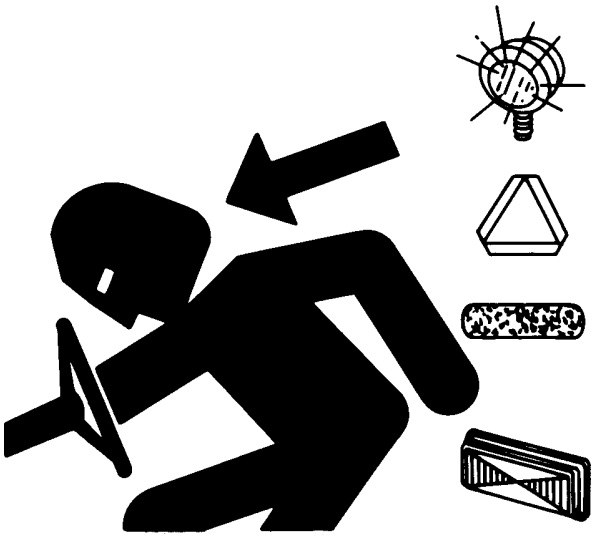
Reduce risk of exposure and injury:

- Wear appropriate personal protective equipment as recommended by the manufacturer. In the absence of manufacturer's instructions, follow these general guidelines:
  - Chemicals labeled **'Danger'**: Most toxic. Generally require use of goggles, respirator, gloves, and skin protection.
  - Chemicals labeled **'Warning'**: Less toxic. Generally require use of goggles, gloves, and skin protections.
  - Chemicals labeled **'Caution'**: Least toxic. Generally require use of gloves and skin protection.
- Avoid inhaling 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.

DX,WW,CHEM01-19-29JUN04

Use Safety Lights and Devices



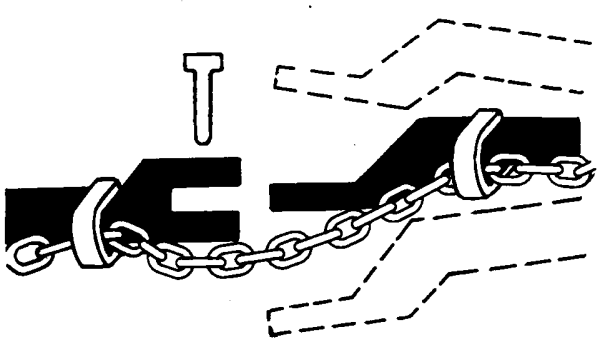
TS951—UN—12APR90

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

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

DX,FLASH-19-07JUL99

Use a Safety Chain



TS217—UN—23AUG88

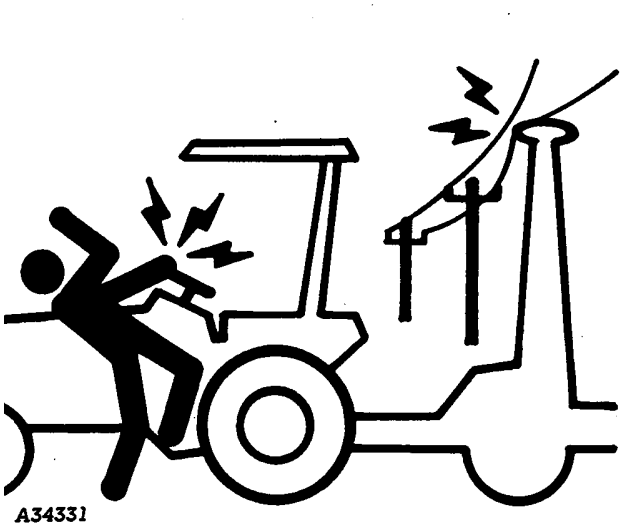
A safety chain will help control drawn equipment should it accidentally separate from the drawbar.

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

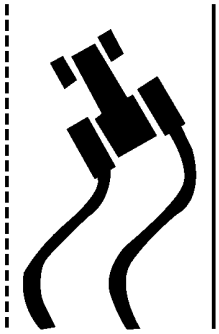
See your John Deere dealer for a chain with a strength rating equal to or greater than the gross weight of the towed machine. Do not use safety chain for towing.

DX,CHAIN-19-03MAR93

Transport Safely



A34331—UN—13OCT88



A41981—UN—02SEP97

Always raise parking stand before transporting.

Tractor brakes must be latched together.

Shift tractor into a lower gear when transporting down steep slopes or hills.

Always travel at a reasonable and safe speed.

Always use flashing warning lights, day, and night when transporting on a public roadway. Keep reflective material and slow moving vehicle (SMV) emblem clean and visible.

Prevent collisions between motorists and slow moving equipment on public roads. Frequently check for traffic from the rear, especially in turns, and use turn signal lights.

Everyone must be clear of machine.

For stability and operator safety, tractor must be properly ballasted.

If the tractor has Roll-Gard™ Safety Canopy, keep seat belt fastened when transporting.

Know transport height and width of machine.

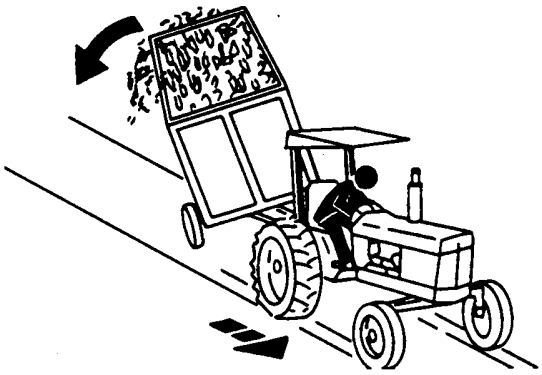
Keep marker arms away from overhead power lines. Serious injury or death may result. Proceed cautiously under overhead power lines and around utility poles.

Never tow this implement with a motor vehicle. Tow only with a properly ballasted tractor.

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

AG,OUO6074,1424-19-21MAR17

Tow Loads Safely



TS216—UN—23AUG88

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:

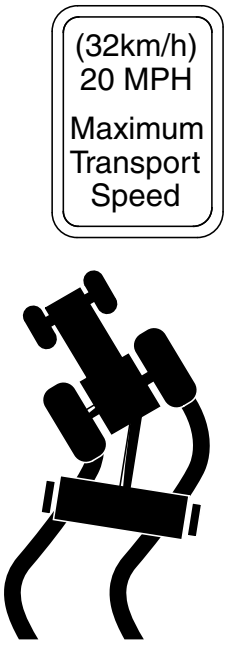
- If towed equipment does not have brakes, do not travel more than 32 km/h (20 mph) and do not tow loads more than 1.5 times the tractor weight.
- If towed equipment has brakes, do not travel more than 40 km/h (25 mph) and do not tow loads more than 4.5 times the tractor weight.

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.

DX,TOW-19-02OCT95

Roll-Gard is a trademark of Deere & Company

Observe Maximum Transport Speed



A46805—19—16JUL10

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

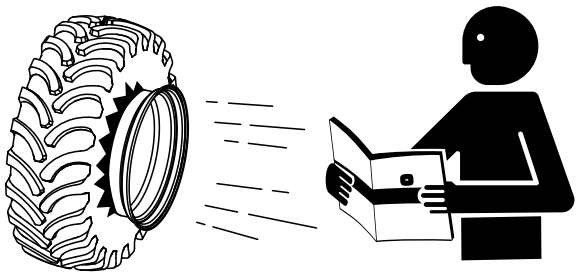
Use additional caution and reduce speed when towing under adverse surface conditions, when turning, and when on inclines.

Do not attempt transport if the fully loaded implement weighs more than 1.5 t (3 300 lb) and more than 1.5 times the weight of the tractor.

Never tow this implement with a motor vehicle. Tow only with a properly ballasted tractor.

DX,TOW2-19-11APR07

Follow Tire Recommendations



H111235—UN—13MAY14

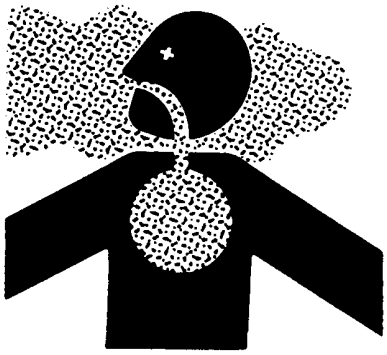
Keep your machine in proper working order.

Use only prescribed tire sizes with correct ratings and inflate to the pressure specified in this manual.

Use of other than prescribed tires may decrease stability, affect steering, result in premature tire failure, or cause other durability or safety issues.

DX,TIRE,INFO-19-19MAY14

Remove Paint Before Welding or Heating



TS220—UN—15APR13

Avoid potentially toxic fumes and dust.

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

Remove paint before heating:

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

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

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

Dispose of paint and solvent properly.

DX,PAINT-19-24JUL02

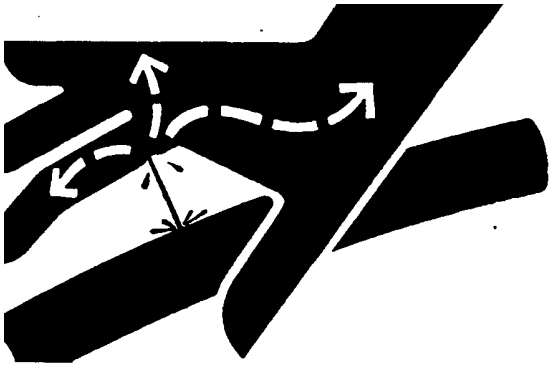
Avoid Heating Near Pressurized Fluid Lines

TS953—UN—15MAY90

Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can accidentally burst when heat goes beyond the immediate flame area.

DX,TORCH-19-10DEC04

Avoid High-Pressure Fluids



X9811—UN—23AUG88

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

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

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

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

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

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

DX,FLUID-19-12OCT11

Store Attachments Safely

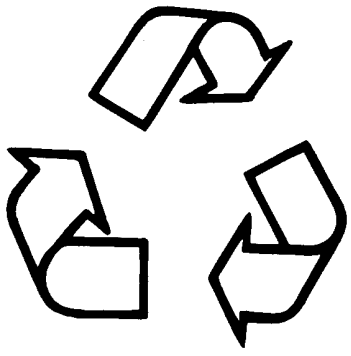
TS219—UN—23AUG88

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

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

DX,STORE-19-03MAR93

Decommissioning — Proper Recycling and Disposal of Fluids and Components



TS1133—UN—15APR13

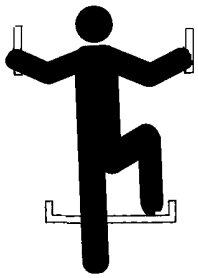
Safety and environmental stewardship measures must be taken into account when decommissioning a

machine and/or component. These measures include the following:

- Use appropriate tools and personal protective equipment such as clothing, gloves, face shields or glasses, during the removal or handling of objects and materials.
- Follow instructions for specialized components.
- Release stored energy by lowering suspended machine elements, relaxing springs, disconnecting the battery or other electrical power, and releasing pressure in hydraulic components, accumulators, and other similar systems.
- Minimize exposure to components which may have residue from agricultural chemicals, such as fertilizers and pesticides. Handle and dispose of these components appropriately.
- Carefully drain engines, fuel tanks, radiators, hydraulic cylinders, reservoirs, and lines before recycling components. Use leak-proof containers when draining fluids. Do not use food or beverage containers.
- Do not pour waste fluids onto the ground, down a drain, or into any water source.
- Observe all national, state, and local laws, regulations, or ordinances governing the handling or disposal of waste fluids (example: oil, fuel, coolant, brake fluid); filters; batteries; and, other substances or parts. Burning of flammable fluids or components in other than specially designed incinerators may be prohibited by law and could result in exposure to harmful fumes or ashes.
- Service and dispose of air conditioning systems appropriately. Government regulations may require a certified service center to recover and recycle air conditioning refrigerants which could damage the atmosphere if allowed to escape.
- Evaluate recycling options for tires, metal, plastic, glass, rubber, and electronic components which may be recyclable, in part or completely.
- Contact your local environmental or recycling center, or your John Deere dealer for information on the proper way to recycle or dispose of waste.

DX,DRAIN-19-01JUN15

Use Steps and Handholds Correctly



T133468—UN—15APR13

Prevent falls by facing the machine when getting on and off. Maintain 3-point contact with steps, handholds, and handrails.

Use extra care when mud, snow, or moisture present slippery conditions. Keep steps clean and free of grease or oil. Never jump when exiting machine. Never mount or dismount a moving machine.

DX,WW,MOUNT-19-12OCT11

Charge Row Marker Hydraulic System

N39213—UN—22SEP88

Falling row markers can cause personal injury. Verify that the cylinders and attaching hoses are fully charged with oil before operating. Failure to do so allows the markers to fall rapidly.

ALWAYS stay clear of the markers when raising or lowering.

NX,515,C9-19-17MAY16

Avoid Tip-overs

N39084—UN—30MAR89

Use a seat belt when present in the machine.

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

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

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

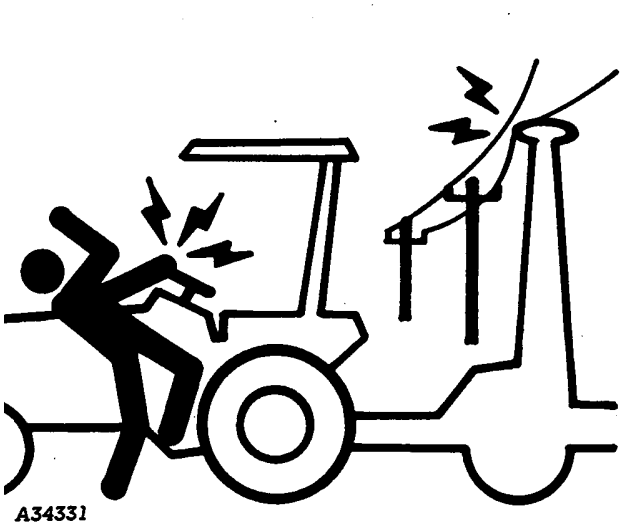
OM63945A,05B-19-16APR18

Operator Ability

- Machine owners must make sure that operators are responsible, trained, have read the operating instructions and warnings, and know how to operate the machine properly and safely.
- Age, physical ability, and mental capacity can be factors in machine-related injuries. Operators must be mentally and physically capable of accessing the operator station and/or controls, and operating the machine properly and safely.
- Never allow a child or an untrained person to operate the machine. Instruct all operators not to give children a ride on the machine or an attachment.
- Never operate machine when distracted, fatigued, or impaired. Proper machine operation requires the operator's full attention and awareness.

DX,ABILITY-19-07DEC18

Operate the Machine Safely



A34331—UN—13OCT88

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.

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 wings are being folded or unfolded. Mechanical or hydraulic failure can allow wings to move rapidly.

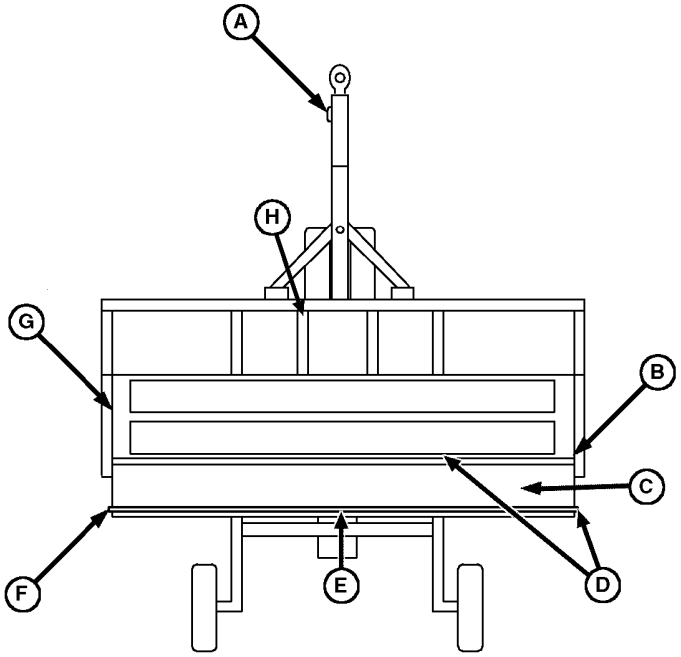
Be sure cylinder and attaching hoses are fully charged with oil before operating system.

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.

AG,OUO6074,1162-19-04AUG00

Safety Features—1590 Grain Drill



N55644—UN—07DEC00

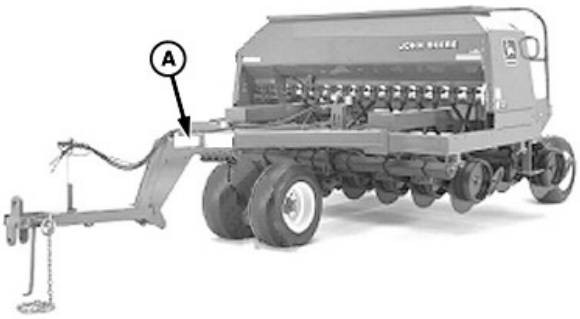
A—Safety Chain
B—Handle and Steps
C—Slip Resistant Footboard
D—Warning Lights
E—Slow Moving Vehicle Emblem (SMV)
F—Handrail
G—Safety Signs
H—Safety Sign

In addition to the safety features shown here, safety messages and instructions in the operator's manual contribute to the safe operation of the 1590 Grain Drill when combined with the care and concern of a capable operator.

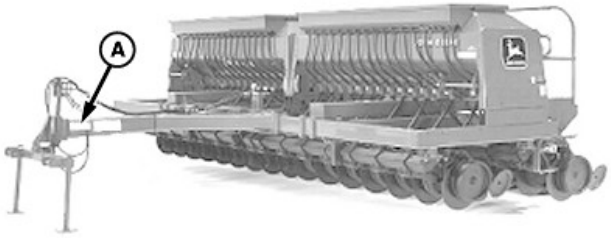
The construction of this implement may not meet all local or national requirements for operation on a public roadway. In regions or countries that have national certification requirements for roadway operation, it may be impossible for this implement to be approved for such roadway operation. The customer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

OUO6074,0000152-19-30NOV17

Transport Guidelines



N142218—UN—14JAN19



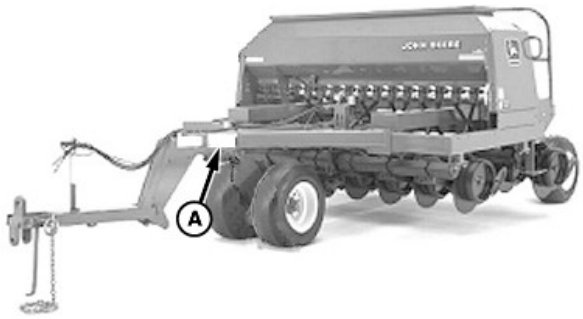
N142220—UN—14JAN19

SSH177618—19—18MAR05

(A)—Warning

SH27916,0000169-19-19MAR19

Hydraulic Injection



N142219—UN—14JAN19

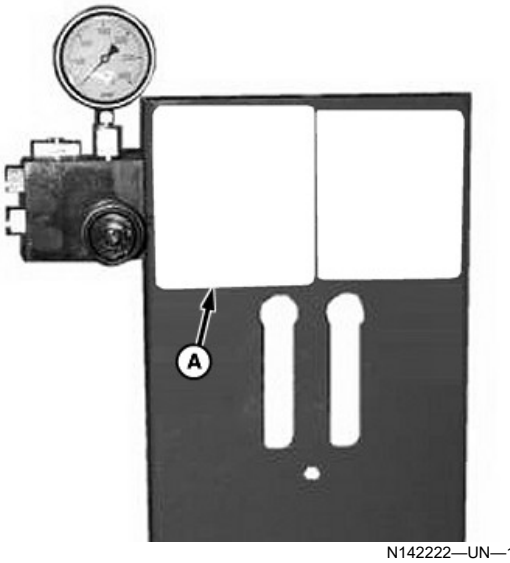
N142221—UN—14JAN19

SSA80683—19—08MAR05

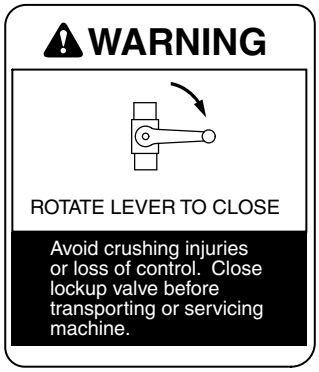
(A)—Warning

SH27916,000016A-19-19MAR19

Sudden Crushing Movement



N142222—UN—14JAN19

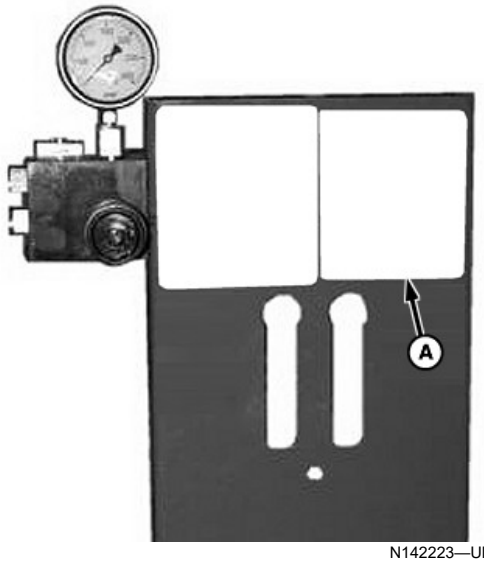


SSN282805—19—03JUN10

(A)—Warning

SH27916,000016B-19-19MAR19

Avoid Runover



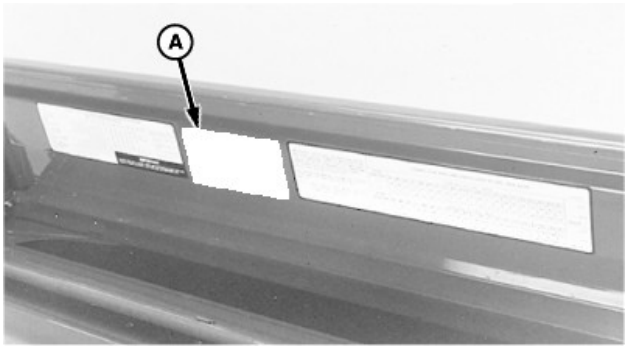
N142223—UN—14JAN19

SSA72515—19—03JUN10

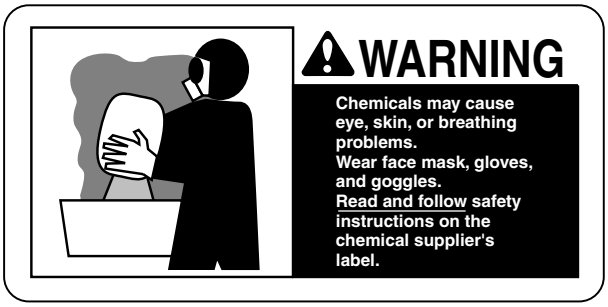
(A)—Danger

SH27916,000016C-19-19MAR19

Chemical Contact



N71631—UN—28MAR06

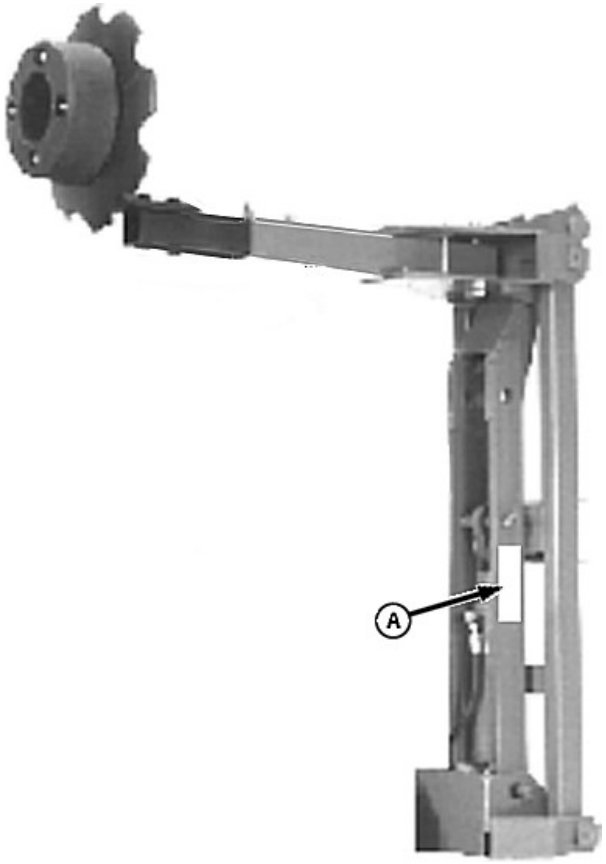


SSN280995—19—20APR06

(A)—Warning

SH27916,000016D-19-19MAR19

Falling Marker



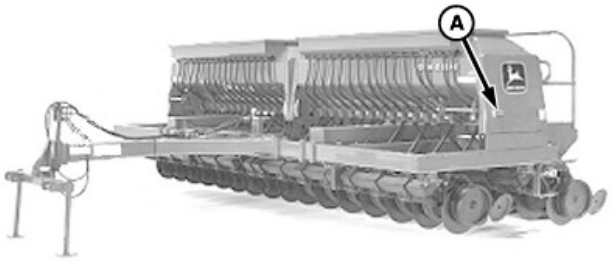
N69569—UN—07APR05

SSN280991—19—14JAN20

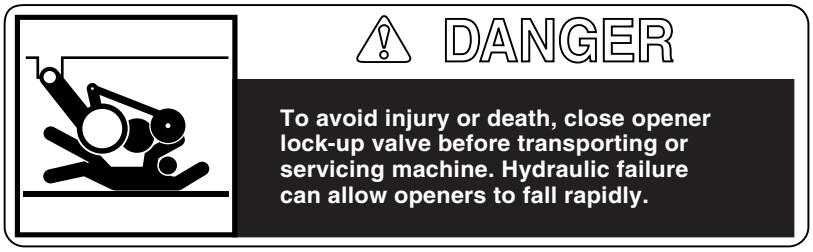
(A)—Warning

SH27916,000016E-19-19MAR19

Sudden Crushing Movement



N142224—UN—14JAN19

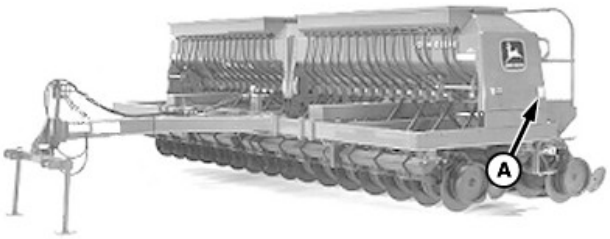


SSN280987—19—08MAR05

(A)—Danger

SH27916,000016F-19-19MAR19

Falling from Height



N142225—UN—14JAN19

SSN272929—19—09AUG05

(A)—Warning

SH27916,0000170-19-10JAN20

Use The Tractor Operator's Manual

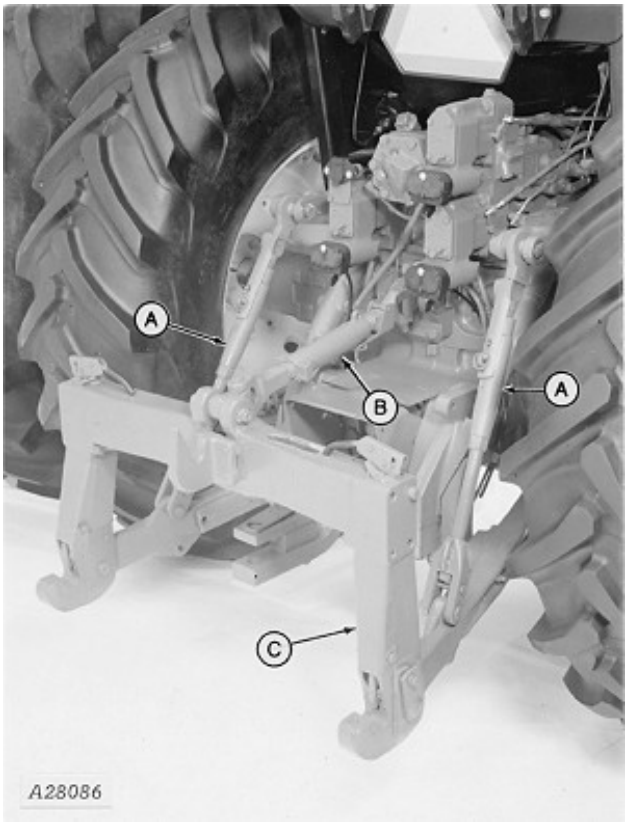
TS190—UN—17JAN89

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

The following tractor related information uses John Deere tractors to illustrate preparation, attachment and operational procedures needed for the 1590 Grain Drill. Use the tractor operator's manual for detailed information, as procedures will vary by equipment.

OUO6074,0000154-19-05DEC00

Link Lengths



A28086—UN—13OCT88

A—Lift Links
B—Center Link
C—Quick-Hitch

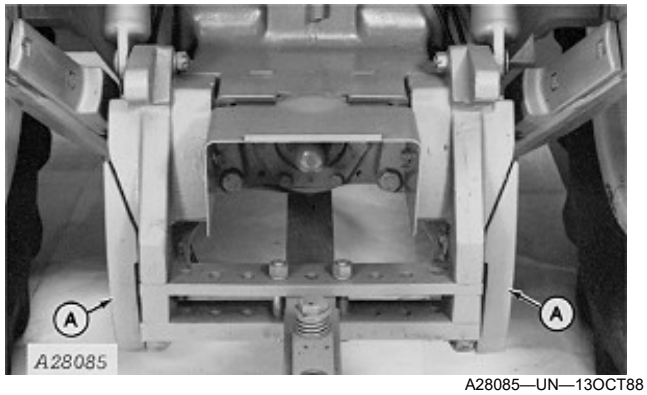
Set the lift links (A) as short as possible to provide maximum transport clearance.

IMPORTANT: For convenience, use a quick-hitch to make attaching and detaching a one-man operation.

Adjust the center link (B) until the quick-hitch (C) is vertical when in the seeding position.

AG,OUO1074,428-19-23JAN18

Position Sway Blocks



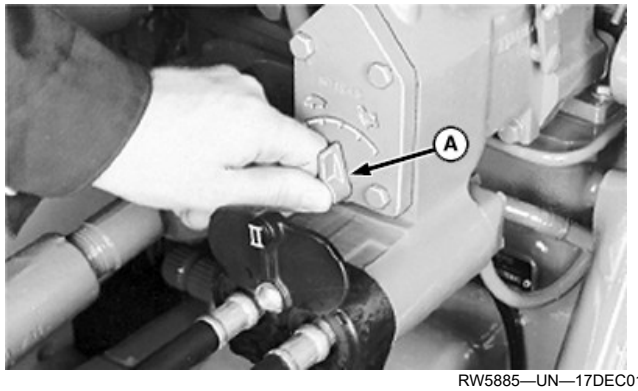
A28085—UN—13OCT88

A—Sway Blocks

To limit side-to-side movement, position the sway blocks (A) in the lower position.

OUO6074,0000156-19-30NOV17

Adjust Metering Valves—Tractors with Mechanical SCV (Selective Control Valve)



RW5885—UN—17DEC01

With Mechanical SCV Controls

RW21395—UN—18JUN92

With Mechanical SCV Controls

A—Metering Valves

Turn the metering valves (A) to the fast position.

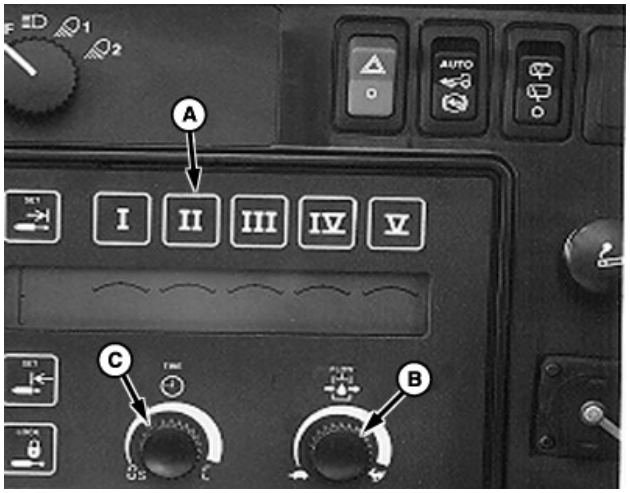
OUO6074,0000157-19-29NOV17

Adjust Metering Valves—Tractors with Electro/Hydraulic SCV Controls

N143749—UN—25MAR19

A—SCV I Selector Button
B—Flow Control Knob
C—Time Detent Knob

1. Press the selective control valve (SCV) I selector button (A) and turn the flow control knob (B) to the fast/rabbit position.
2. Turn the time detent knob (C) until the display reads “C” (continuous). The time can be decreased for actual time required to lift and lower the opener rockshaft.



N143748—UN—25MAR19

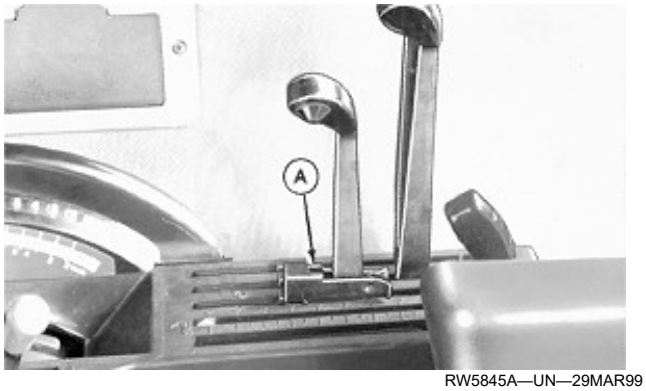
A—SCV II Selector Button
B—Flow Control Knob
C—Time Detent Knob

3. If equipped with markers, press the SCV II selector button (A) and turn the flow control knob (B) to the fast/rabbit position.
4. Turn the time detent knob (C) until the display reads “5” seconds. The time can be increased or decreased depending on actual time required to lower and raise the markers.

AG,OUO1074,432-19-26MAR19

Lever Lock Clip—Tractors with Mechanical SCV Controls

NOTE: The lever lock clip holds the lever in the continuous flow position for the downforce system.



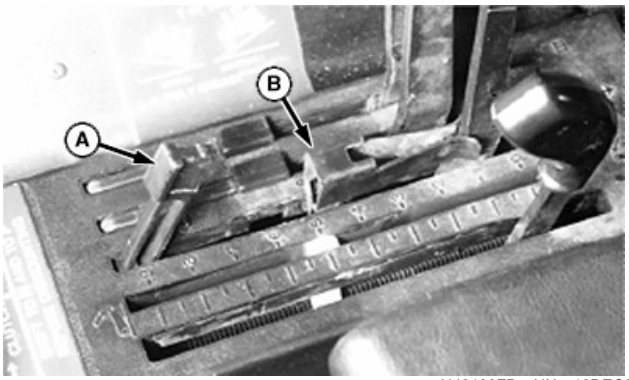
RW5845A—UN—29MAR99

A—Lock Clip

The lever lock clip (A) must be used to hold the selective control valve (SCV) lever in the downforce position. (See Install Lever Lock Clip in this section.)

OUO6076,0000061-19-04APR17

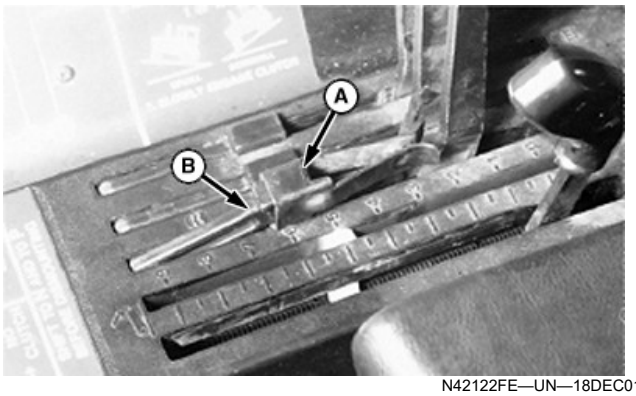
Install Lever Lock Clip—Tractors with Mechanical SCV Controls



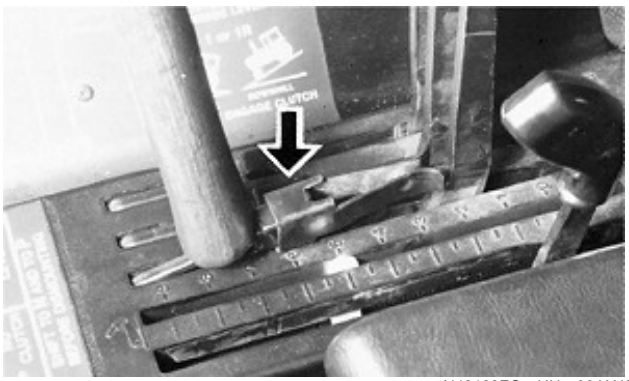
N42122FD—UN—18DEC01

A—Lockout
B—Lock Clip

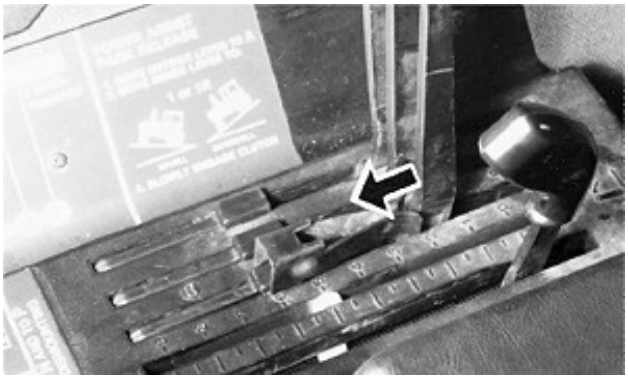
1. Lift the float lockout (A).
2. Squeeze the sides of the lock clip (B) and partially insert the clip into the groove as shown.



N42122FE—UN—18DEC01



N42122FG—UN—06JAN92



N42122FH—UN—06JAN92

A—Lock Clip
B—Lockout

3. Slide the lock clip (A) over lockout (B).
4. Push the lockout and lock clip down.
5. To test the function, push the selective control valve (SCV) lever forward into the clip.

OUO6076,0000062-19-22AUG18

Set Flow Rate and Detent Time—6000, 6010, 7000 and 7010 Series Tractors

RW21395—UN—18JUN92

RW21754—UN—21AUG92

RW21758—UN—21AUG92

A—Valve Knob
B—Lock Position
C—No Detent Position
D—Continuous Detent Position

1. Adjust the rate of operation by turning the metering

valve knob (A). Turn the knob counterclockwise to increase the flow rate and clockwise to decrease the flow rate.

NOTE: If equipped with row markers, drill operations require the use of continuous position (D) on SCV I and no detent position (C) on SCV II. Lock position (B) is not used for drill operations.

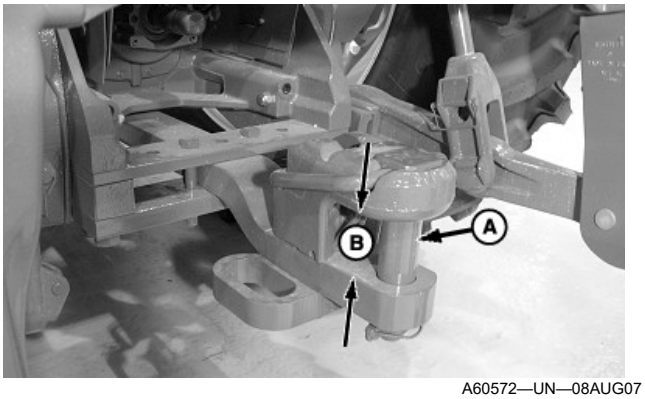
2. Turn SCV I to the motor position (D) (continuous detent).
3. If the drill has row markers, turn SCV II to the no detent position (C).

AG,OUO1074,435-19-29NOV17

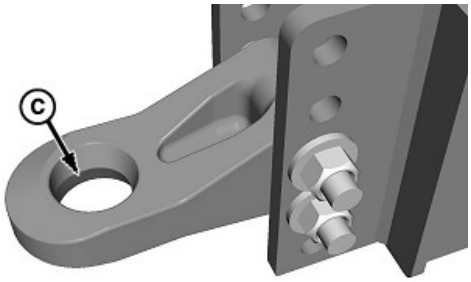
Before Use

1. Check tire pressure and inflate as necessary. (See Check Tire Pressure in the Servicing section.)
2. Check wheel bolts and bearings as necessary. (See Check Wheel Bolts and Check Wheel Bearings in the Servicing section.)
3. Inspect for loose, damaged, or missing parts. Repair or replace parts before entering the field.
4. Check the torque of all bolts, U-bolts, and cap screws after the first 10 to 15 hours of operation. Check the torque again at the end of the first week (50 hours) of operation. Torque hardware to the specifications in the Servicing section unless otherwise noted.
5. Perform required lubrication. (See Lubrication and Maintenance section.)
6. Make sure that hydraulic hoses do not interfere with moving parts. Relocate hoses and retain with tie bands.

AG,OUO1074,438-19-09APR18



A60572—UN—08AUG07



A60573—UN—08AUG07

A—Drawbar Pin
B—Drawbar Opening
C—Slot

Determine Tractor Drawbar and Implement Hitch Compatibility

IMPORTANT: Avoid machine damage. Match the tractor drawbar and implement hitch. Refer to the operators manual for specific drawbar information.

Do not exceed the static vertical load capacity of the tractor drawbar. See Specifications section for the vertical load limit. See operators manual for the drawbar limits and heavy duty supports.

Match the tractor drawbar and implement hitch. The only exception is a category IV hitch used with a category III drawbar that has a 90 mm (3.54 in) opening. Never exceed the vertical load limits.

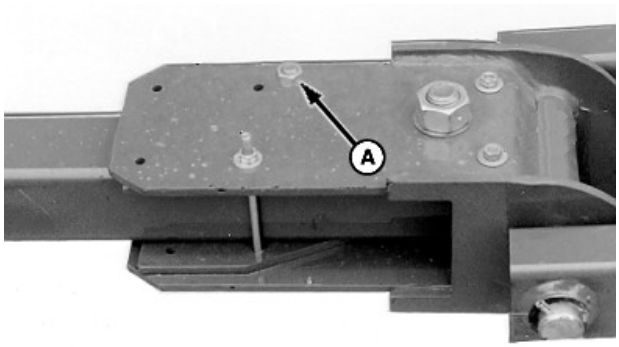
Drawbar and Hitch Compatibility					
	Tractor Drawbar		Implement Hitch		
Drawbar and Hitch Category	Drawbar Pin (A) Diameter	Drawbar Opening (B)	Slot (C) Length	Slot (C) Width (Minimum)	Hitch Link Thickness
III	38 mm (1.50 in)	70—90 mm (2.75—3.54 in)	41—66 mm (1.61—2.60 in)	41 mm (1.61 in)	48 mm (1.89 in)
IV	51 mm (2.00 in)	90 mm (3.54 in)	55—70 mm (2.17—2.75 in)	55 mm (2.17 in)	50 mm (1.97 in)
V	70 mm (2.75 in)	100 mm (3.94 in)	73—85 mm (2.87—3.35 in)	73 mm (2.87 in)	60 mm (2.36 in)

OUO6074,000102C-19-25JUN18

Marker Safety Bolt

CAUTION: Do not operate without safety bolt (A) installed.

IMPORTANT: Safety bolt MUST be on front side of marker arm (side facing tractor).



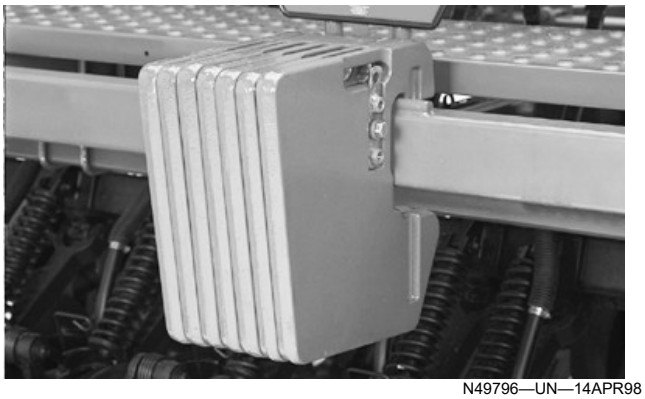
A48645—UN—05FEB02

A—Safety Bolt

Marker safety bolt (A) must be installed to ensure marker does not swing forward after shear bolt breaks.

OUO6074,00004F0-19-05APR07

Install Suitcase Weights for Ballast



N49796—UN—14APR98

4.6 m (15 ft) Drill

N49797—UN—14APR98

6.1 m (20 ft) Drill

CAUTION: Avoid injury. Use proper lifting equipment when installing the suitcase weights. Each suitcase weight weighs 45.4 kg (100 lb).

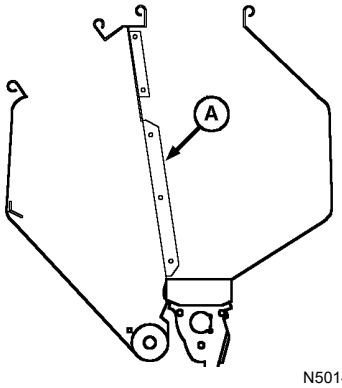
IMPORTANT: Avoid limited or excessive opener penetration. Add or remove weight based on soil conditions.

To increase the downforce, attach the suitcase weights to the rear support tube. 3 m (10 ft) and 4.6 m (15 ft) grain drills hold a maximum of 10 weights. 6.1 m (20 ft) grain drills hold a maximum of 20 weights (10 per side).

OUO6074,0000159-19-19MAR19

Understand Combination Grain/Fertilizer Box Configurations

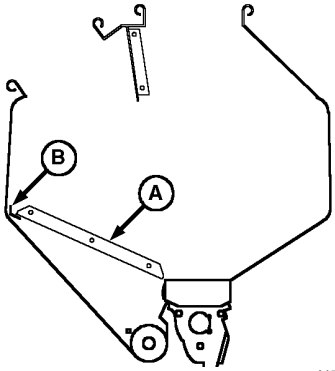
IMPORTANT: To avoid metal corrosion and feed shaft "binding" or "freezing", clean out all fertilizer and/or treated seed in box before switching configuration or storing drill. (See Clean Fertilizer Box in the Storing section.)



N50149—UN—30MAR99

A—Partition

Drills are shipped with partition (A) in 60 percent grain/ 40 percent fertilizer configuration.



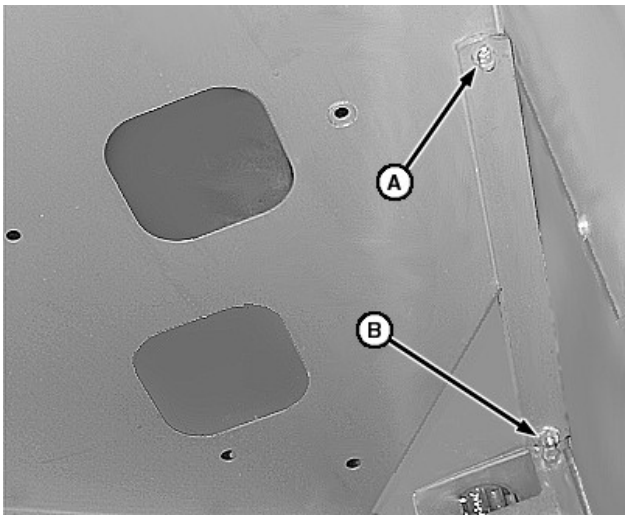
N50150—UN—30MAR99

A—Panel
B—Support Angle

Divider panel (A) pivots down to support angle (B) on the rear sheet for 100 percent grain configuration.

AG,OUO1074,444-19-15MAR17

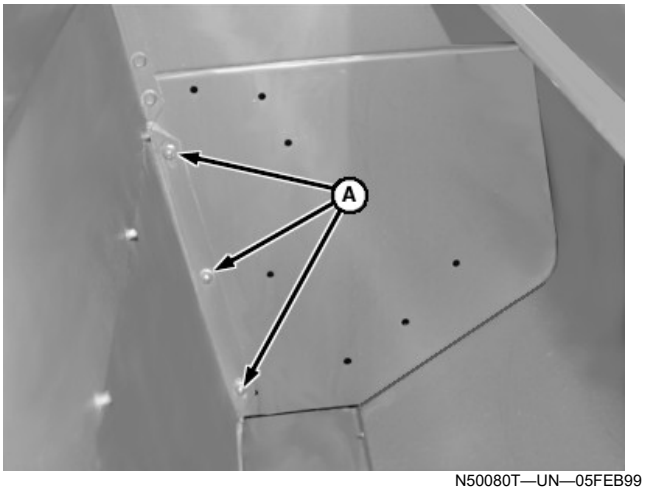
Change Combination Box Partition to Grain Only Position



N50080S—UN—05FEB99

A—Cap Screw
B—Cap Screw

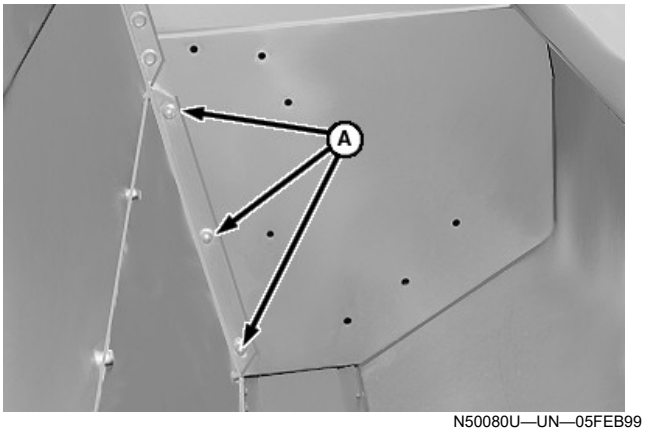
1. Remove the cap screw (A) and nut from the connecting strap and bulkhead in the front box compartment. Loosen the cap screw (B) and nut on bottom of the strap. Let the strap drop.



N50080T—UN—05FEB99

A—Cap Screws

2. Remove the cap screws (A) and nuts from the center bulkhead and angles.

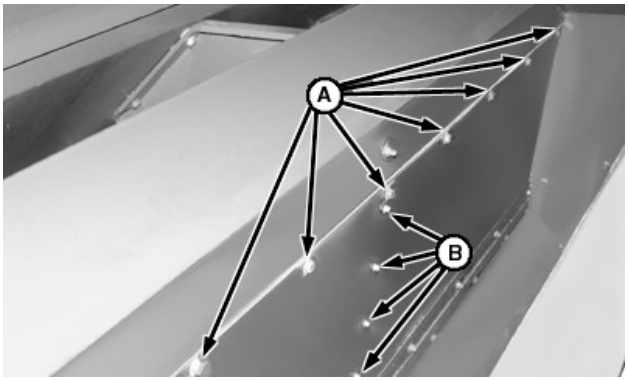


N50080U—UN—05FEB99

Front Box

A—Cap Screws

3. Remove the cap screws (A) from the angle and end panel on each end of the box.

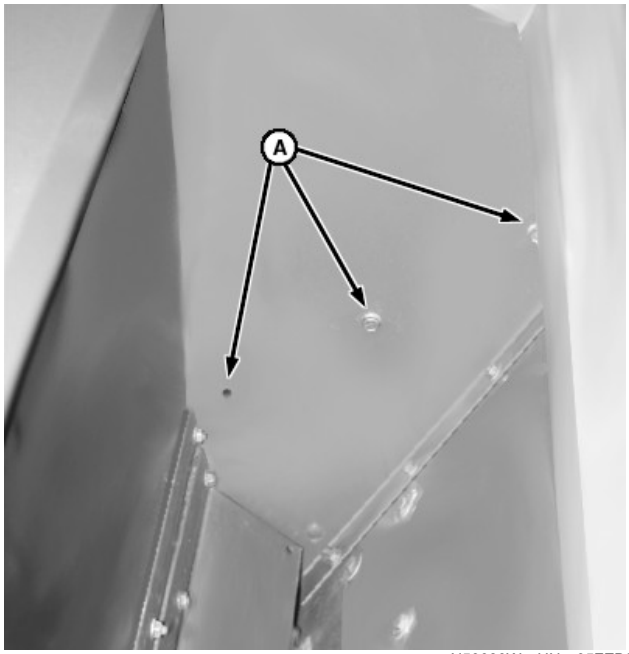


N50080V—UN—05FEB99

Rear Box

A—Deflector Panel
B—Divider Panel

4. Remove the cap screws from the top deflector panel (A) and divider panel (B).

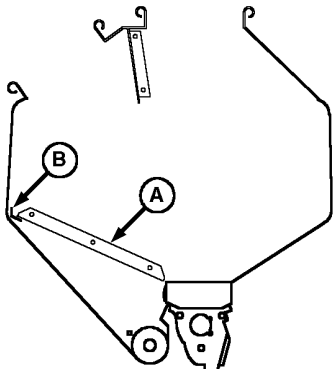


N50080W—UN—05FEB99

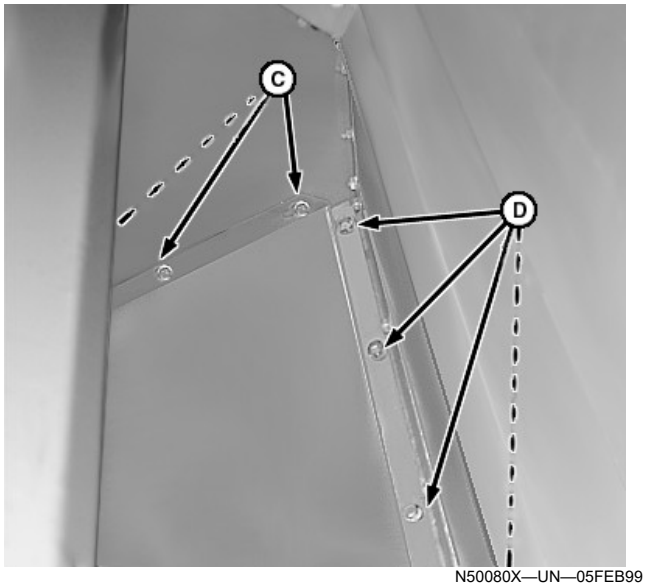
Rear Box

A—Cap Screw (3 used)

5. Remove the cap screws (A) from each end panel.



N50150—UN—30MAR99



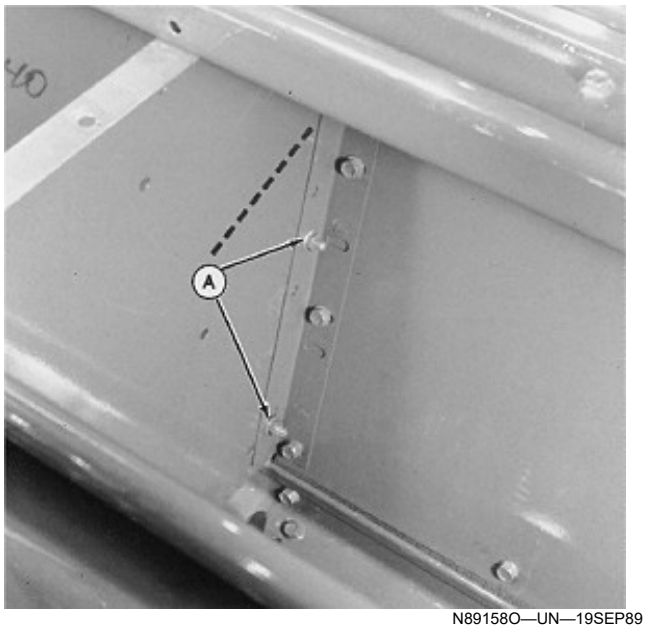
N50080X—UN—05FEB99

A—Divider Panel
B—Support Angle
C—Center Bulkhead
D—Divider Panel

6. Position the divider panel (A) to the rear and down until it rests on the rear support angle (B).

NOTE: Be sure that additional three cap screws are installed in each end panel.

7. Install all the hardware into the end panels, center bulkhead (C), and divider panel (D).



N89158O—UN—19SEP89

A—Hole

8. Raise the center brace and attach with existing hardware in hole (A), then tighten cap screw on lower end.
9. Tighten all hardware. Perform steps 1—8 in reverse

order to reset partition to 60 percent grain and 40 percent fertilizer position.

AG,OUO1074,445-19-29NOV17

How to Change Between Narrow and Wide Row Spacing

How to Change Between Narrow and Wide Row Spacing			
Narrow to Wide Row Spacing		**Wide to Narrow Row Spacing**	
Adjust markers for reduced machine width.	(See Set Marker Length in Operating the Grain Drill section.)	Adjust markers for increased machine width.	(See Set Marker Length in Operating the Grain Drill section.)
Lock-up front rank of openers.	(See Front Rank Lock-Up Valve in this section.)	Release front rank of openers.	(See Front Rank Lock-Up Valve in this section.)
Install grain feed stops on locked up rows.	(See Feed Stop information in this section.)	Remove grain feed stops.	(See Feed Stop information in this section.)
Set feed cup rate at twice the weight in rate charts, not at twice the seed index setting in the charts.	(See Set Grain Shifter and Rate Charts in this section.)	Set feed cup rate to match rate charts. Adjust index lever to value given in chart.	(See Set Grain Shifter and Rate Charts in this section.)
Set feed cups that supply rear rank the same.	(See Set Feed Cups in this section.)	Verify that all feed cups are set the same.	(See Set Feed Cups in this section.)
Adjust hydraulic downforce.	(See downforce procedures in Operating the Grain Drill section.)	Adjust hydraulic downforce.	(See downforce procedures in Operating the Grain Drill section.)
Adjust ComputerTrak™ Monitor settings. (See ComputerTrak™ Operator's Manual and enter the following information.)			

ComputerTrak is a trademark of Deere & Company

3 m (10 ft) Drill					
Planting on 19 cm (7.5 in) Rows			**Planting on 38 cm (15 in) Rows**		
Row Spacing	Number of Rows	Split Row Feature	Row Spacing	Number of Rows	Split Row Feature
19 cm (7.5 in)	16	Off or Deactivated	19 cm (7.5 in)	15	On and Activated

4.6 m (15 ft) Drill					
Planting on 19 cm (7.5 in) Rows			**Planting on 38 cm (15 in) Rows**		
Row Spacing	Number of Rows	Split Row Feature	Row Spacing	Number of Rows	Split Row Feature
19 cm (7.5 in)	24	Off or Deactivated	19 cm (7.5 in)	23	On and Activated

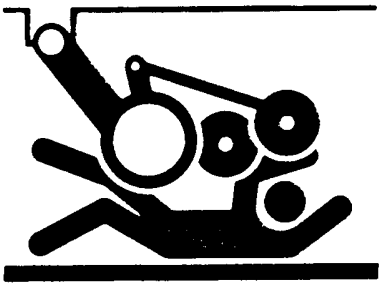
4.6 m (15 ft) Drill					
Planting on 25 cm (10 in) Rows			**Planting on 50 cm (20 in) Rows**		
Row Spacing	Number of Rows	Split Row Feature	Row Spacing	Number of Rows	Split Row Feature
25 cm (10 in)	18	Off or Deactivated	25 cm (10 in)	18	On and Activated

6 m (20 ft) Drill					
Planting on 19 cm (7.5 in) Rows			**Planting on 38 cm (15 in) Rows**		
Row Spacing	Number of Rows	Split Row Feature	Row Spacing	Number of Rows	Split Row Feature
19 cm (7.5 in)	32	Off or Deactivated	19 cm (7.5 in)	31	On and Activated

6 m (20 ft) Drill					
Planting on 25 cm (10 in) Rows			**Planting on 50 cm (20 in) Rows**		
Row Spacing	Number of Rows	Split Row Feature	Row Spacing	Number of Rows	Split Row Feature
25 cm (10 in)	24	Off or Deactivated	25 cm (10 in)	24	On and Activated

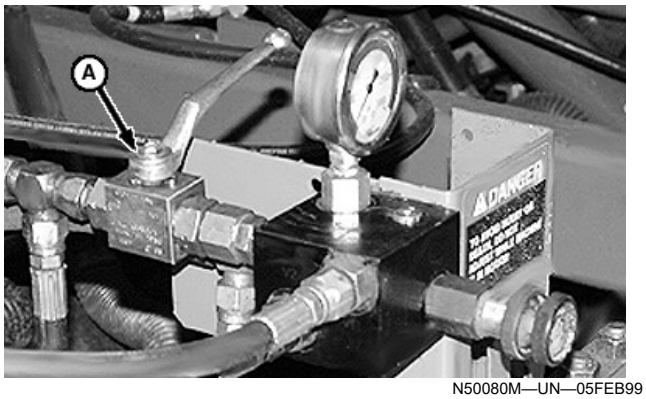
OUO6074,0000ABF-19-26FEB19

Lock-Up Rockshafts and Openers



N39645—UN—06OCT88

CAUTION: Hydraulic failure can allow openers to fall rapidly, causing injury or death. To avoid hazard, always lock openers in raised position before adjusting, lubricating or servicing machine.



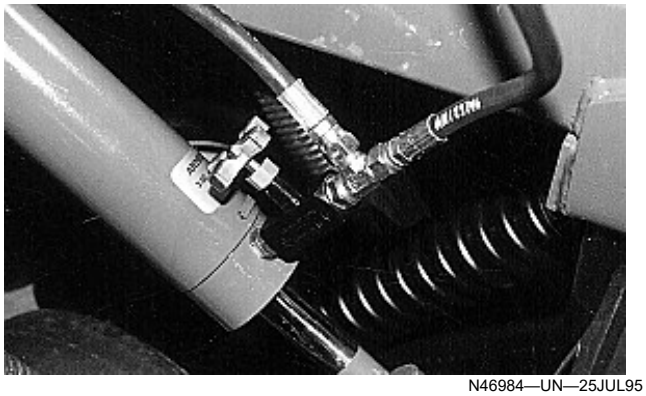
N50080M—UN—05FEB99

A—Lock-Up Valve

Fully retract rockshaft/opener cylinders and close lock-up valve (A).

AG,OUO1074,475-19-22FEB00

Front Rank Lock-Up Valve

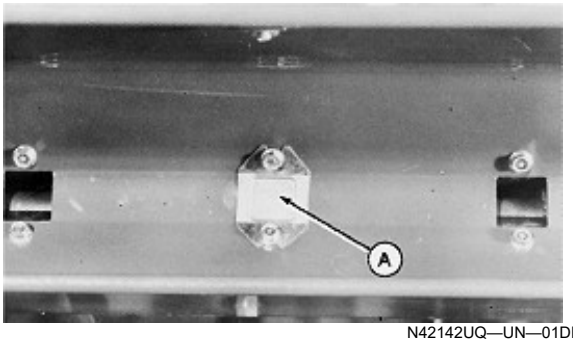


N46984—UN—25JUL95

Front rank lock-up valve is available for all machines.

AG,OUO1074,519-19-22FEB00

Grass Seed Feed Stop



N42142UQ—UN—01DEC93

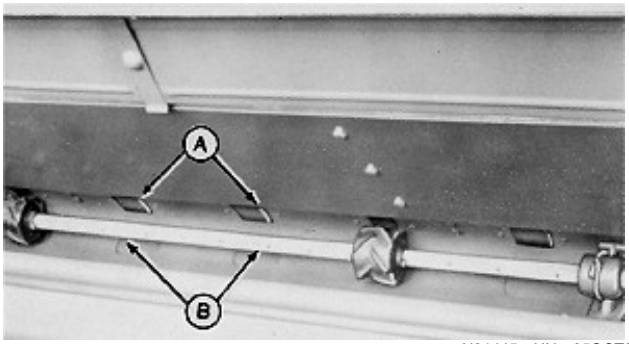
A—Feed Stop

Cover feeds not being used with feed stop (A).

AG,OUO1074,471-19-22FEB00

Fertilizer Feed Stop

IMPORTANT: Be sure that feed wheels are correctly assembled on the feed shaft. (See Replacing Fertilizer Feed Wheels in Servicing section.)



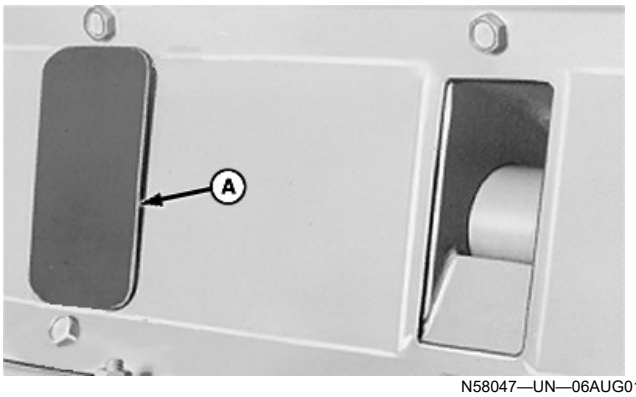
N31445—UN—05OCT88

A—Feed Stops
B—Feed Wheels

Remove feed wheels (B) to install feed stops (A).

AG,OUO1074,472-19-08MAR17

Grain Feed Stop—Fluted-Feeds



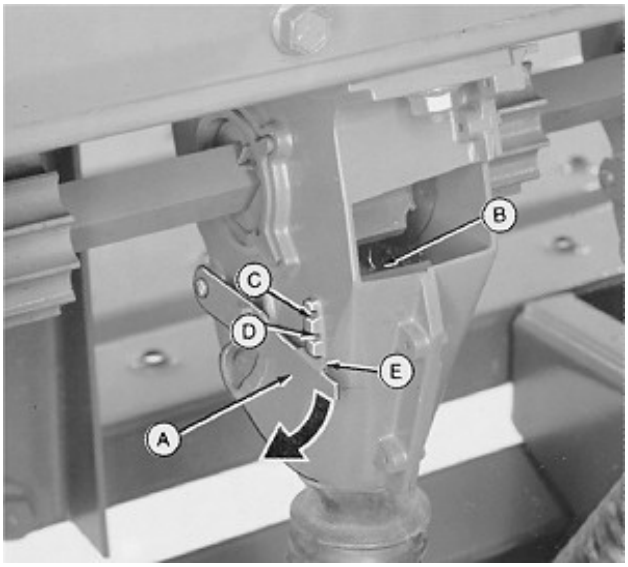
N58047—UN—06AUG01

A—Feed Stop

Position feed stop (A) in place with tabs under floor of box with feed stop flat against floor.

AG,OUO1074,473-19-22FEB00

Set Feed Cups



N81187I1—UN—05OCT88

A—Latch
B—Feed Gate
C—Position
D—Position
E—Position

IMPORTANT: Set all feed cups identically to prevent uneven drilling, wrong quantities drilled and/or damage to seed.

Moving latch (A) downward opens the feed gate (B) wider to allow for larger seed. Position the feed gate latch to match the type of seed being used.

Position (C): Wheat, oats, barley, rye, flax, rice, and similar seed.

Position (D): Small peas, common beans, and small soybeans (above 5500 seeds per kg [2500 seeds per pound]).

Position (E): Large peas, large soybeans (below 5500 seeds per kg [2500 seeds per pound]), kidney beans, and lima beans.

OUO6074,000015A-19-29NOV17

Reset Feed Cups

Reset cups whenever:

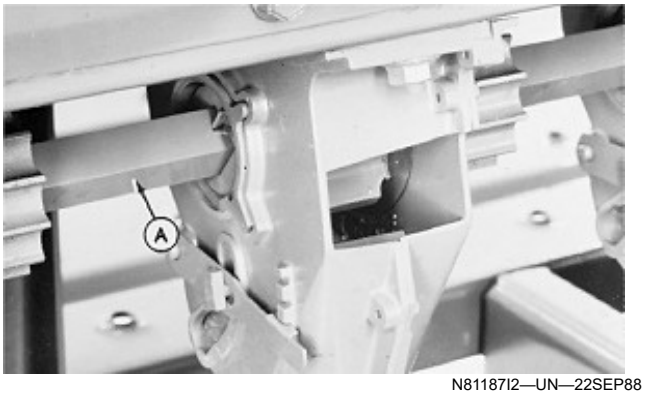
- Cup has been removed from the drill.
- Cup has been knocked out of position.
- Quantity of seed sown varies from cup to cup.
- Quantity of seed sown does not agree with the chart.

To reset, see Reset Fluted Feed Cups in the Servicing section.

AG,OUO1074,447-19-29NOV17

Check Grain Feed Shaft

IMPORTANT: Avoid deterioration of rubber convoluted tubes by preventing contact with petroleum products.



N81187I2—UN—22SEP88

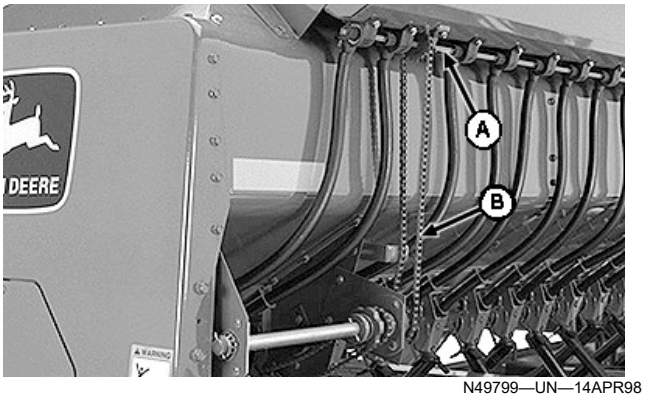
A—Feed Shaft

1. Before adding seed, raise the openers to disengage the clutch.
2. Turn the feed shaft (A) in the direction feeds normally turn.
3. If the shaft turns hard, loosen the moving parts with a safe solvent.

AG,OUO1074,448-19-29NOV17

Check Grass Seed Feed Shaft

IMPORTANT: Avoid deterioration of rubber tubes by preventing contact with petroleum products.



N49799—UN—14APR98

Plain Grain Box Shown

A—Feed Shaft
B—Chain

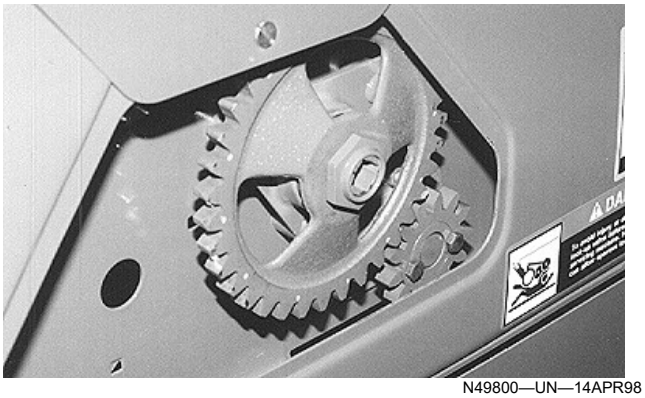
1. Before adding seed, raise the openers to disengage the clutch.
2. Turn the feed shaft (A) in the direction of normal travel.
3. If the shaft turns hard, loosen the moving parts with a safe solvent. Remove chain (B) as necessary.

AG,OUO1074,449-19-29NOV17

Use Half-Speed Drive Attachment (If Equipped)

IMPORTANT: The 35-tooth gear must be installed on the feed shaft as shown. (See Attach Half-Speed Drive in the Attachments section.)

IMPORTANT: Doubling the seed index setting does not double the seeding rate.



N49800—UN—14APR98

A 35-tooth gear and 13-tooth gear is available to replace 28-tooth and 20-tooth gears in the end panel. The 35-tooth and 13-tooth gears produce feed rates one-half the values on the fluted feed charts in this section. Double the desired seeding rate before selecting seed index setting from chart.

Example: To meter 67 kg/ha (60 lb/acre) with the half-speed drive, select the seed index setting for 54 kg (120 lb). (See the Seed Index Setting charts in this section.)

AG,OUO1074,450-19-21MAR17

Understand the Rate Charts

IMPORTANT: Rates shown in the charts are only to be used as a guide. (See Rate Check—Method 1 or Rate Check—Method 2 in this section for an accurate rate test.

Rate charts are based on drills with a standard drive. If using a half-speed drive, the drill sows at one-half the rates shown on charts.

If feed stops are installed, as shown in this section, feed rates in charts should be adjusted proportionally to the number of feeds blocked.

The following factors also affect product delivery as shown in the rate charts:

NOTE: Perform a rate check to ensure that product delivery rate is as expected.

1. Physical Characteristics—Two bags of seed that weigh the same may hold different quantities of seed because of moisture content, residue, unfilled kernels, or simple seed size.
2. Drive Wheel Circumference—Tire size, air pressure, field condition, and ground speed all effect seeding rate.
3. Operator Judgment—Land contains more or less area than assumed. Overlapping rows or leaving too wide a space between rows.
4. Acremeter—Worn out counter, chipped teeth, or loose worm gear.

OUO6074,000015B-19-30NOV17

Seed Index Setting for Kilograms of Seed Per Hectare on 19 cm Row Spacing—All Drills

IMPORTANT: For 38 cm (15 in.) row spacing, set the meter at twice the suggested weight in the chart NOT at twice the seed index setting in the chart.

Rates are approximate. Perform a rate check before planting.

	Notches on Seed Index		4		8		12		16		20		24	28	32	36	40	44	48	52	56	60
Seed		**Kilograms Per Hectare for Drills with 19 cm (7.5 in.) Row Spacing**																				
Wheat			20	29	38	47	58	68	80	91	1-03	11-5	12-8	1-54	1-80	20-7	2-35	2-63	2-90	31-8		
Barley				19	27	34	41	48	57	64	72	80	89	1-04	1-21	13-8	1-56	1-74	1-92	21-1	2-30	
Oats or Safflower					21	27	33	38	45	50	56	63	68	82	94	10-8	1-20	1-33	1-47	16-1	1-75	18-8

	Notches on Seed Index		4		8		12		16		20		24	28	32	36	40	44	48	52	56	60
Seed		**Kilograms Per Hectare for Drills with 19 cm (7.5 in.) Row Spacing**																				
Rye				26	34	43	52	61	69	78	87	96	10-5	1-24	1-43	16-3	1-82	2-01	2-21	24-1		
Rice-Short Kernel									47	56	65	72	78	90	1-02	11-8	1-35	1-55	1-76			
Rice-Long Kernel									41	48	55	61	66	78	90	10-2	11-8	1-33	1-52			
Peas							63	78	94	11-0	1-27	1-43	16-0	1-96	2-33	27-1	3-12	3-53	3-97	44-2	4-86	
Soybeans or Navy Beans					25	41	55	68	83	98	11-3	1-30	14-7	1-82	2-15	25-2	2-88	3-23	3-58	39-1	4-23	45-2
Buckwheat					27	34	40	48	57	66	74	83	93	11-2	1-31	15-0	1-73					
Sorghum or Vetch			17	25	34	43	52	61	71	81	92	1-02	11-3	1-37								
Crested Wheat Grass					10	11	15	17	20	22	25	28	30	37								
Alfalfa or Rape		9	16	21	29	36	43	50	58													
Millet		10	17	24	30	38	45	53	62													
Flax or Sudan Grass			13	20	28	35	43	49	56	64	72											

AG,OUO1074,452-19-17JUN11

Seed Index Setting for Pounds of Seed Per Acre on 7.5 in. Row Spacing—All Drills

Rates are approximate. Perform a rate check before planting.

IMPORTANT: For 38 cm (15 in.) row spacing, set the meter at twice the suggested weight in the chart NOT at twice the seed index setting in the chart.

	Notches on Seed Index		4		8		12		16		20		24	28	32	36	40	44	48	52	56	60
Seed		**Pounds Per Acre for Drills with 19 cm (7.5 in.) Row Spacing**																				
Wheat			18	26	34	42	52	61	71	81	92	1-03	11-4	1-37	1-61	18-5	2-10	2-35	2-59	28-4		
Barley				17	24	30	37	43	51	57	64	71	79	93	1-08	12-3	1-39	1-55	1-71	18-8	2-05	
Oats or Safflower					19	24	29	34	40	45	50	56	61	73	84	96	1-07	11-9	1-31	14-4	1-56	16-8
Rye				23	30	38	46	54	62	70	78	86	94	11-1	1-28	14-5	1-62	1-79	1-97	21-5		
Rice-Short Kernel									42	50	58	64	70	80	91	10-5	1-20	1-38	1-57			
Rice-Long Kernel									37	43	49	54	59	70	80	91	1-05	11-9	1-36			
Peas							56	70	84	98	11-3	1-28	14-3	1-75	2-08	24-2	2-78	3-15	3-54	39-4	4-34	
Soybeans or Navy Beans					22	37	49	61	74	87	1-01	11-6	13-1	1-62	1-92	22-5	2-57	2-88	3-19	34-9	3-77	40-3
Buckwheat					24	30	36	43	51	59	66	74	83	1-00	11-7	13-4	1-54					
Sorghum or Vetch			15	22	30	38	46	54	63	72	82	91	10-1	1-22								
Crested Wheat Grass					90	10	13	15	18	20	22	25	27	33								
Alfalfa or Rape		8	14	19	26	32	38	45	52													

	Notches on Seed Index		4		8		12		16		20		24	28	32	36	40	44	48	52	56	60
Seed		**Pounds Per Acre for Drills with 19 cm (7.5 in.) Row Spacing**																				
Millet		9	15	21	27	34	40	47	55													
Flax or Sudan Grass			12	18	25	31	38	44	50	57	64											

OUO6074,0000172-19-17JUN11

Seed Index Setting for Kilograms of Seed Per Hectare on 25 cm Row Spacing 4.6 m Drills

IMPORTANT: For 50 cm (20 in.) row spacing, set the meter at twice the suggested weight in the chart NOT at twice the seed index setting in the chart.

Rates are approximate. Perform a rate check before planting.

	Notches on Seed Index		4		8		12		16		20		24	28	32	36	40	44	48	52	56	60
Seed		**Kilograms Per Hectare for Drills with 25 cm (10 in.) Row Spacing**																				
Wheat			15	21	28	35	43	50	59	67	76	85	92	11-4	1-35	15-5	1-75	1-96	2-18	23-8		
Barley				15	20	26	31	37	43	48	54	59	65	77	90	10-3	11-7	1-29	1-42	15-7	1-72	
Oats or Safflower					16	22	25	29	34	38	43	47	52	61	70	80	90	1-00	11-0	12-0	1-30	14-0
Rye				19	26	33	39	45	52	58	65	72	78	93	1-08	12-1	1-36	1-50	1-66	18-0	1-96	
Rice-Short Kernel									38	43	48	53	57	67	77	88	1-01	11-4	1-30			
Rice-Long Kernel									31	36	40	48	49	58	67	77	87	1-01	11-4			
Peas							47	58	71	83	95	1-08	12-0	1-47	1-75	20-4	2-33	2-65	2-97	33-1	3-67	
Soybeans or Navy Beans					22	31	41	52	62	73	85	98	11-0	1-36	1-61	18-8	2-15	2-42	2-68	29-4	3-17	34-0
Buckwheat					20	25	30	36	43	49	56	63	71	85	97	11-3	1-30					
Sorghum or Vetch			13	19	25	31	38	45	53	61	68	76	85	1-02								
Crested Wheat Grass					7	9	11	12	15	17	19	21	24	28								
Alfalfa or Rape		7	11	15	21	27	33	38	44													
Millet		8	12	18	22	28	34	39	46													
Flax or Sudan Grass			10	16	20	26	31	37	43	48	54											

AG,OUO1074,453-19-17JUN11

Seed Index Setting for Pounds of Seed Per Acre on 10 in. Row Spacing (15 ft.) Drills

IMPORTANT: For 50 cm (20 in.) row spacing, set the meter at twice the suggested weight in the chart NOT at twice the seed index setting in the chart.

Rates are approximate. Perform a rate check before planting.

	Notches on Seed Index		4		8		12		16		20		24	28	32	36	40	44	48	52	56	60
Seed		**Pounds Per Acre for Drills with 25 cm (10 in.) Row Spacing**																				
Wheat			13	19	25	31	38	45	53	60	68	76	85	1-02	1-20	13-8	1-56	1-75	1-94	21-2		
Barley				13	18	23	28	33	38	43	48	53	58	69	80	92	1-04	11-5	1-27	14-0	1-53	
Oats or Safflower					14	18	22	26	30	34	38	42	46	54	62	71	80	89	98	10-7	11-6	12-5
Rye				17	23	29	35	40	46	52	58	64	70	83	96	10-8	1-21	1-34	1-48	16-1	1-75	
Rice-Short Kernel									34	38	43	47	51	60	69	79	90	1-02	11-6			
Rice-Long Kernel									28	32	36	40	44	52	60	69	79	90	1-02			
Peas							42	52	63	74	85	96	10-7	1-31	1-56	18-2	2-08	2-36	2-65	29-5	3-27	
Soybeans or Navy Beans					20	28	37	46	55	65	76	87	98	1-21	1-44	16-8	1-92	2-16	2-39	26-2	2-83	30-4
Buckwheat					18	22	27	32	38	44	50	56	63	76	88	10-1	11-6					
Sorghum or Vetch			12	17	22	28	34	40	47	54	61	68	76	91								
Crested Wheat Grass					6	8	10	11	13	15	17	19	21	25								
Alfalfa or Rape		6	10	14	19	24	29	34	39													
Millet		7	11	16	20	25	30	35	41													
Flax or Sudan Grass			9	14	18	23	28	33	38	43	48											

OUO6074,0000173-19-17JUN11

Rate Chart—19 cm (7.5 in.) Spaced Grass Seed Attachment—All Drills

	Notches on Seed Index	1	2	3	4	6	8	10	12	14	16
Seed		**Kilograms Per Hectare for Drills with 19 cm (7.5 in.) Row Spacing**									
Alfalfa, Red Alsike and Ladino Clovers		2.2	3.9	6.7	9.6	14.6	20.8	25.9	31.5	38.2	45
Serecia and Lespedeza Hulled, Crimson Clover, Birdsfoot Trefoil		1.7	4.5	7.3	10.7	17.4	24.7	32.6	41	50	59.6
Lespedeza Unhulled		0.6	1.1	2.2	3.4	6.2	9	11.8	14.6	18	21.9
Timothy, Red Top, Sand and Love Grass		1.7	3.4	5.6	7.3	11.8	15.7	20.2	25.3	30.9	37.1
Kentucky Blue Grass, Reed Canary Grass		0.6	1.7	2.8	4.5	6.2	8.4	10.6	12.9	16.3	20.2
Millet		1.7	3.9	6.2	9	14.1	20.8	27	34.3	41.6	50
Broom Corn, Hog Millet		1.1	3.4	6.2	9.6	16.9	23.6	33.2	43.3	54.6	65.8
Bermuda, Canary Grass		1.1	2.8	3.9	5.6	8.4	11.2	14.6	18	22.5	27
Sudan Grass				2.8	6.2	11.8	17.4	23.6	32.6	42.2	52.9
Crested Wheat, Orchard Grass					2.2	3.9	6.2	7.9	9	10.7	12.9
Rye Grass, Alta Fescue				0.6	1.7	3.4	5.1	6.7	8.4	10.1	12.3

AG,OUO1074,454-19-22FEB00

Rate Chart—19 cm (7.5 in.) Spaced Grass Seed Attachment—All Drills

	Notches on Seed Index	1	2	3	4	6	8	10	12	14	16
Seed		**Pounds Per Acre for Drills with 19 cm (7.5 in.) Row Spacing**									
Alfalfa, Red Alsike and Ladino Clovers		2	3.5	6	8.5	13	18.5	23	28	34	40
Serecia and Lespedeza Hulled, Crimson Clover, Birdsfoot Trefoil		1.5	4	6.5	9.5	15.5	22	29	36.5	44.5	53
Lespedeza Unhulled		0.5	1	2	3	5.5	8	10.5	13	16	19.5
Timothy, Red Top, Sand and Love Grass		1.5	3	5	6.5	10.5	14	18	22.5	27.5	33
Kentucky Blue Grass, Reed Canary Grass		0.5	1.5	2.5	4	5.5	7.5	8.5	11.5	14.5	18
Millet		1.5	3.5	5.5	8	12.5	18.5	24	30.5	37	44.5
Broom Corn, Hog Millet		1	3	5.5	8.5	15	21	29.5	38.5	48.5	58.5
Bermuda, Canary Grass		1	2.5	3.5	5	7.5	10	13	16	20	24
Sudan Grass				2.5	5.5	10.5	15.5	21	29	37.5	47
Crested Wheat, Orchard Grass					2	3.5	5.5	7	8	9.5	11.5
Rye Grass, Alta Fescue				0.5	1.5	3	4.5	6	7.5	9	11

OUO6074,0000171-19-07DEC00

Rate Chart—24.5 cm (10 in.) Spaced Grass Seed Attachment 4.6 m (15 ft) Drills

	Notches on Seed Index	1	2	3	4	6	8	10	12	14	16
Seed		**Kilograms Per Hectare for Drills with 25 cm (10 in.) Row Spacing**									
Alfalfa, Red Alsike and Ladino Clovers		1.7	2.8	4.5	7.3	11.2	14.6	19	24	28	34
Serecia and Lespedeza Hulled, Crimson Clover, Birdsfoot Trefoil		1.1	2.8	5.0	7.8	12.3	17.9	25	31	39	47
Lespedeza Unhulled		0.6	1.1	1.7	2.5	4.5	6.7	9	11.2	13.5	15.7
Timothy, Red Top, Sand and Love Grass		1.1	2.2	3.9	5.6	8.4	11.2	14.6	17.9	22.4	27
Kentucky Blue Grass, Reed Canary Grass		0.6	1.1	2.2	3.4	4.5	5.6	7.3	9.5	12.3	15.7
Millet		1.1	2.8	4.5	6.7	11.2	15.7	20.2	26	31	36
Broom Corn, Hog Millet		1.1	2.2	4.5	7.3	12.3	17.9	25	33	40	49
Bermuda, Canary Grass		1.1	1.7	2.8	3.9	5.7	9	12.3	15.7	20.2	25
Sudan Grass				1.7	4.5	8.4	12.3	16.8	25	33	41
Crested Wheat, Orchard Grass					1.7	2.8	4.5	6.2	7.8	10.1	12.3
Rye Grass, Alta Fescue				0.6	1.1	2.2	3.4	4.5	6.2	7.8	10.1

AG,OUO1074,455-19-22FEB00

Rate Chart—24.5 cm (10 in.) Spaced Grass Seed Attachment 4.6 m (15 ft) Drills

	Notches on Seed Index	1	2	3	4	6	8	10	12	14	16
Seed		**Pounds Per Acre for Drills with 25 cm (10 in.) Row Spacing**									
Alfalfa, Red Alsike and Ladino Clovers		1.5	2.5	4	6.5	10	13	17	21	25	30
Serecia and Lespedeza Hulled, Crimson Clover, Birdsfoot Trefoil		1	2.5	4.5	7	11	16	22	28	35	42
Lespedeza Unhulled		0.5	1	1.5	2.25	4	6	8	10	12	14
Timothy, Red Top, Sand and Love Grass		1	2	3.5	5	7.5	10	13	16	20	24
Kentucky Blue Grass, Reed Canary Grass		0.5	1	2	3	4	5	6.5	8.5	11	14
Millet		1	2.5	4	6	10	14	18	23	28	32

	Notches on Seed Index	1	2	3	4	6	8	10	12	14	16
Seed		Pounds Per Acre for Drills with 25 cm (10 in.) Row Spacing									
Broom Corn, Hog Millet		1	2	4	6.5	11	16	22	29	36	44
Bermuda, Canary Grass		1	1.5	2.5	3.5	5.13	8	11	14	18	22
Sudan Grass				1.5	4	7.5	11	15	22	29	37
Crested Wheat, Orchard Grass					1.5	2.5	4	5.5	7	9	11
Rye Grass, Alta Fescue				0.5	1	2	3	4	5.5	7	9

OUO6074,0000174-19-07DEC00

Determine Rate Setting—Grains and Grasses

IMPORTANT: Rates shown in charts are only to be used as a guide. See RATE CHECK—METHOD 1 or RATE CHECK—METHOD 2 in this section for accurate rate test.

Rates per acre are determined by adjusting seed shifter lever to proper notch on index.

Rate charts are based on standard densities of materials being used. See Standard Densities chart in this section for a listing.

1. Find actual density of product used. See USING DENSITY METER in this section.
2. Locate standard density on Standard Density Chart and divide by actual density to get the conversion factor.

   FORMULA:

   Standard Density (Rate Chart) ÷ Actual Density (Density Meter) = Conversion Factor
3. Multiply desired metering rate by the conversion factor. Locate that value on rate chart, match it with seed index value and adjust seed shifter to value. See SETTING GRAIN SHIFTER in this section.

EXAMPLE:

- Product: Wheat
- Standard Density: 774 kg/m^3 (48.2 lb/ft^3)
- Actual Density: 721 kg/m^3 (45 lb/ft^3)
- Desired Rate: 83 kg/ha (73 lb/acre)
- Drill: 19 cm (7-1/2 in.) row spacing

1. Find conversion factor:

   774 kg/m^3 (48.2 lb/ft^3) ÷ 721 kg/m^3 (45 lb/ft^3) = 1.07 Conversion Factor
2. Multiply desired rate by conversion factor.

   82 kg/ha x 1.07 = 87.74 kg/ha

   (73 lb/acre x 1.07 = 78.11 lb/acre)
3. Find value, 87.74 kg/ha (78.11 lb/acre) on rate chart and move seed shifter to “18”, which is the closest setting for determined value.

OUO6074,000015C-19-05DEC00

Standard Densities—Grains and Grasses

Grain	lb/bu	lb/ft^3	kg/m^3
Wheat, Soybeans, Navy Beans, Peas	60	48.2	774
Rye, Flax	56	45	722
Buckwheat	52	41.6	671
Sorghum	50	40	645
Barley	48	38.6	619
Oats	32	25.7	413
Crested Wheat Grass	21	16.8	271

Grass	lb/bu	lb/ft^3	kg/m^3
Alfalfa, Red Alsike, Ledino Clovers	60	48.2	774
Broom Corn, Hog Millet, Rye Grass, Alta Fescue	56	45	722
Millet, Bermuda, Canary, Sudan	50	40	645
Timothy, Red Top, Sand, Love	45	36	581
Lespedeza (Unhulled)	25	20	323

Grass	lb/bu	lb/ft^3	kg/m^3
Serecia, Lespedeza (Hulled), Crimson Cover, Birdsfoot Trefoil	22	17.6	284
Crested Wheat Grass	21	16.8	271
Kentucky Blue Grass, Reed Canary, Orchard	14	11.2	181

AG,OUO1074,457-19-22FEB00

Using Kilograms of Seed Per Hectare Chart

NOTE: If a specific population of seed is desired, use the Kilograms of Seed Per Hectare Chart and Rate Chart to determine the approximate seed shifter setting. Fluted meters are VOLUME meters not population meters. The number of seeds per hectare will vary according to the size of seed.

1. Determine from seed bag how many seeds equal one kilogram. Locate value on left-hand column of chart.
2. Locate under “desired population” the number of seeds desired per hectare in thousands.
3. Where the value in side column and the value in upper column meet is number of kilograms of seed to apply for each hectare.

   EXAMPLE: If there are 4510 seeds per kilogram, and desired population is 469 000 seeds per hectare apply 104 kilograms of seed per hectare.

	DESIRED POPULATION (seeds per hectare in thousands)																
	395	**408**	**420**	**432**	**445**	**457**	**469**	**482**	**494**	**506**	**519**	**531**	**543**	**556**	**568**	**605**	**618**
Seeds Per Kg	**Kilograms Of Seed Per Hectare**																
2640	150	155	159	164	169	173	178	183	187	192	197	201	206	211	215	229	234
2750	144	148	153	157	162	166	171	175	180	184	189	193	197	202	207	220	225
2860	138	143	147	151	156	160	164	169	173	177	181	186	190	194	199	212	216
2970	133	137	141	145	150	154	158	162	166	170	175	179	183	187	191	204	208
3080	128	132	136	140	144	148	152	156	160	164	169	172	176	181	184	196	201
3190	124	128	132	135	139	143	147	151	155	159	163	166	170	174	178	190	194
3300	120	124	127	131	135	138	142	146	150	153	157	161	165	168	172	183	187
3410	116	120	123	127	130	134	138	141	145	148	152	156	159	163	167	177	181
3520	112	116	119	123	126	130	133	137	140	144	147	151	154	158	161	172	176
3630	109	112	116	119	123	126	129	133	136	139	143	146	150	153	156	167	170
3740	106	109	112	116	119	122	125	129	132	135	139	142	145	149	152	162	165
3850	103	106	109	112	116	119	122	125	128	131	135	138	141	144	148	157	161
3960	100	103	106	109	112	115	118	122	125	128	131	134	137	140	143	153	156
4070	97	100	103	106	109	112	115	118	121	124	128	130	133	137	140	149	152
4180	94	98	100	103	106	109	112	115	118	121	124	127	130	133	136	145	148
4290	92	95	98	101	104	107	109	112	115	118	121	124	127	130	132	141	144
4400	90	93	95	98	101	104	107	110	112	115	118	121	123	126	129	138	140
4510	88	90	93	96	99	101	104	107	110	112	115	118	120	123	126	134	137
4620	85	88	91	94	96	99	102	104	107	110	112	115	118	120	123	131	134
4730	84	86	89	91	94	97	99	102	104	107	110	112	115	118	120	128	131
4840	82	84	87	89	92	94	97	100	102	105	107	110	112	115	117	125	128
4950	80	82	85	87	90	92	95	97	100	102	105	107	110	112	115	122	125
5060	78	81	83	85	88	90	93	95	98	100	103	105	107	110	112	120	122
5170	76	79	81	84	86	88	91	93	96	98	100	103	105	108	110	117	120
5280	75	77	80	82	84	87	89	91	94	96	98	101	103	105	108	115	117
5390	73	76	78	80	83	85	87	89	92	94	96	99	101	103	105	112	115
5500	72	74	76	79	81	83	85	88	90	92	94	97	99	101	103	110	112
5610	70	73	75	77	79	81	84	86	88	90	93	95	97	99	101	108	110
5720	69	71	73	76	78	80	82	84	86	88	91	93	95	97	99	106	108
5830	68	70	72	74	76	78	80	83	85	87	89	91	93	95	97	104	106

	DESIRED POPULATION (seeds per hectare in thousands)																
	395	**408**	**420**	**432**	**445**	**457**	**469**	**482**	**494**	**506**	**519**	**531**	**543**	**556**	**568**	**605**	**618**
Seeds Per Kg	**Kilograms Of Seed Per Hectare**																
5940	66	69	71	73	75	77	79	81	83	85	87	89	91	94	96	102	104
6050	65	67	69	71	74	76	78	80	82	84	86	88	90	92	94	100	102
6160	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	98	100
6270	63	65	67	69	71	73	75	77	79	81	83	85	87	89	91	96	99
6380	62	64	66	68	70	72	74	76	77	79	81	83	85	87	89	95	97
6490	61	63	65	67	69	70	72	74	76	78	80	82	84	86	88	93	95
6600	60	62	64	65	67	69	71	73	75	77	79	80	82	84	86	92	94
6820	58	60	62	63	65	67	69	71	72	74	76	78	80	82	83	89	91
7040	56	58	60	61	63	65	67	68	70	72	74	75	77	79	81	86	88
7260	54	56	58	60	61	63	65	66	68	70	71	73	75	77	78	83	85
7480	53	55	56	58	59	61	63	64	66	68	69	71	73	74	76	81	83
7700	51	53	55	56	58	59	61	63	64	66	67	69	71	72	74	79	80
7920	50	52	53	55	56	58	59	61	62	64	66	67	69	70	72	76	78
8140	49	50	52	53	55	56	58	59	61	62	64	65	67	68	70	74	76
8360	47	49	50	52	53	55	56	58	59	61	62	64	65	67	68	72	74
8580	46	48	49	50	52	53	55	56	58	59	60	62	63	65	66	71	72
8800	45	46	48	49	51	52	53	55	56	58	59	60	62	63	65	69	70
9020	44	45	47	48	49	51	52	53	55	56	58	59	60	62	63	67	69
9240	43	44	45	47	48	49	51	52	53	55	56	57	59	60	61	65	67
9460	42	43	44	46	47	48	50	51	52	53	55	56	57	59	60	64	65
9680	41	42	43	45	46	47	48	50	51	52	54	55	56	57	59	63	64
9900	40	41	42	44	45	46	47	49	50	51	52	54	55	56	57	61	62
10120	39	40	42	43	44	45	46	48	49	50	51	52	54	55	56	60	61
10340	38	39	41	42	43	44	45	47	48	49	50	51	53	54	55	59	60
10560	37	39	40	41	42	43	44	46	47	48	49	50	51	53	54	57	59

OUO6074,0000478-19-05APR05

Using Pounds of Seed Per Acre Chart

NOTE: If a specific population of seed is desired, use the Pounds of Seed Per Acre Chart and Rate Chart to determine the approximate seed shifter setting. Fluted meters are VOLUME meters not population meters. The number of seeds per acre will vary according to the size of seed.

1. Determine from seed bag how many seeds equal one pound. Locate value on left-hand column of chart.
2. Locate under “desired population” the number of seeds desired per acre in thousands.
3. Where the value in side column and the value in upper column meet is number of pounds of seed to apply for each acre.

   EXAMPLE: If there are 2050 seeds per pound, and desired population is 190 000 seeds per acre apply 93 pounds of seed per acre.

	DESIRED POPULATION (seeds per acre in thousands)																		
	160	**165**	**170**	**175**	**180**	**185**	**190**	**195**	**200**	**205**	**210**	**215**	**220**	**225**	**230**	**235**	**240**	**245**	**250**
SEEDS PER LB	**POUNDS OF SEED PER ACRE**																		
1200	133	138	142	146	150	154	158	163	167	171	175	179	183	188	192	196	200	204	208
1250	128	132	136	140	144	148	152	156	160	164	168	172	176	180	184	188	192	196	200
1300	123	127	131	135	138	142	146	150	154	158	162	165	169	173	177	181	185	188	192
1350	119	122	126	130	133	137	141	144	148	152	156	159	163	167	170	174	178	181	185
1400	114	118	121	125	129	132	136	139	143	146	150	154	157	161	164	168	171	175	179

	DESIRED POPULATION (seeds per acre in thousands)																		
	160	**165**	**170**	**175**	**180**	**185**	**190**	**195**	**200**	**205**	**210**	**215**	**220**	**225**	**230**	**235**	**240**	**245**	**250**
SEEDS PER LB	**POUNDS OF SEED PER ACRE**																		
1450	110	114	117	121	124	128	131	134	138	141	145	148	152	155	159	162	166	169	172
1500	107	110	113	117	120	123	127	130	133	137	140	143	147	150	153	157	160	163	167
1550	103	106	110	113	116	119	123	126	129	132	135	139	142	145	148	152	155	158	161
1600	100	103	106	109	113	116	119	122	125	128	131	134	138	141	144	147	150	153	156
1650	97	100	103	106	109	112	115	118	121	124	127	130	133	136	139	142	145	148	152
1700	94	97	100	103	106	109	112	115	118	121	124	126	129	132	135	138	141	144	147
1750	91	94	97	100	103	106	109	111	114	117	120	123	126	129	131	134	137	140	143
1800	89	92	95	97	100	103	106	108	111	114	117	120	122	125	128	131	133	136	139
1850	86	89	92	95	97	100	103	105	108	111	114	116	120	122	124	127	130	132	135
1900	84	87	89	92	95	97	100	103	105	108	111	113	116	118	121	124	126	129	132
1950	82	85	87	90	92	95	97	100	103	105	108	110	113	115	118	121	123	126	128
2000	80	83	85	88	90	93	95	98	100	103	105	108	110	113	115	118	120	123	125
2050	78	80	83	85	88	90	93	95	98	100	103	105	107	110	112	115	117	120	122
2100	76	79	81	83	86	88	90	93	95	98	100	102	105	104	106	112	114	117	119
2150	74	77	79	81	84	86	89	91	93	95	98	100	102	105	107	109	112	114	116
2200	73	75	77	80	82	84	86	89	91	93	95	98	100	102	105	107	109	112	114
2250	71	73	76	78	80	82	84	87	89	91	93	95	98	100	102	105	107	109	111
2300	70	72	74	76	78	80	83	85	87	89	91	93	96	98	101	102	104	107	109
2350	68	70	72	74	77	79	81	83	85	87	89	91	94	96	98	100	102	104	106
2400	67	69	71	73	75	77	79	81	83	85	88	90	92	94	96	98	100	102	104
2450	65	67	69	71	73	76	78	80	82	84	86	88	90	92	94	96	98	100	102
2500	64	66	68	70	72	71	76	78	80	82	84	86	88	90	92	94	96	98	100
2550	62	65	67	69	71	73	75	76	78	80	82	84	86	88	90	92	94	96	98
2600	62	63	65	67	69	71	73	75	77	79	81	83	85	87	88	90	92	94	96
2650	60	62	64	66	68	70	72	74	75	77	79	81	83	85	87	89	91	92	94
2700	59	61	63	65	67	69	70	72	74	76	78	80	81	83	85	87	89	91	93
2750	58	60	62	64	65	67	69	71	73	75	76	78	80	82	84	85	87	89	91
2800	57	59	61	63	64	66	68	70	71	73	75	77	79	80	82	84	86	88	89
2850	56	58	60	61	63	65	67	68	70	72	74	75	77	79	81	82	84	86	88
2900	55	57	59	60	62	64	66	67	69	71	72	74	76	78	79	81	83	84	86
2950	54	56	58	59	61	63	64	66	68	69	71	73	75	76	78	80	81	83	85
3000	53	55	57	58	60	62	63	65	67	68	70	72	73	75	77	78	80	82	83
3100	52	53	55	56	58	60	61	63	65	66	67	69	71	73	74	76	77	79	80
3200	50	51	53	55	56	58	59	61	63	64	66	67	69	70	72	73	75	77	78
3300	48	50	52	53	54	56	58	59	62	62	65	65	68	68	71	72	74	75	77
3400	47	49	50	51	52	54	56	57	59	60	62	63	65	66	68	69	71	72	74
3500	46	47	49	50	51	53	54	56	57	59	60	61	63	64	66	67	69	70	71
3600	44	46	47	49	50	51	53	54	56	57	58	60	61	63	64	65	67	68	69
3700	43	45	46	47	49	50	51	53	54	55	57	58	59	61	62	64	65	66	68
3800	42	43	45	46	47	49	50	51	53	54	55	57	58	59	61	62	63	64	66
3900	41	42	44	45	46	47	49	50	51	53	54	55	56	58	59	60	62	63	64
4000	40	41	43	44	45	46	48	49	50	51	53	54	55	56	58	59	60	61	63
4100	39	40	41	43	44	45	46	48	49	50	51	52	54	55	56	57	59	60	61
4200	38	39	40	42	43	44	45	46	48	49	50	51	52	54	55	56	57	58	60
4300	37	38	40	41	42	43	44	45	47	48	49	50	51	52	53	55	56	57	58
4400	36	38	39	40	41	42	43	44	45	47	48	49	50	51	52	53	55	56	57
4500	36	37	38	39	40	41	42	43	44	46	47	48	49	50	51	52	53	54	56
4600	35	36	37	38	39	40	41	42	43	45	46	47	48	49	50	51	52	53	54
4700	34	35	36	37	38	39	40	41	43	44	45	46	47	48	49	50	51	52	53
4800	33	34	35	36	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52

OUO6074,000015D-19-05APR05

Use Mixtures—Grains and Grasses

NOTE: If a particular seed is not shown on rate charts in this section, select a seed of comparable weight and size when selecting a shifter setting.

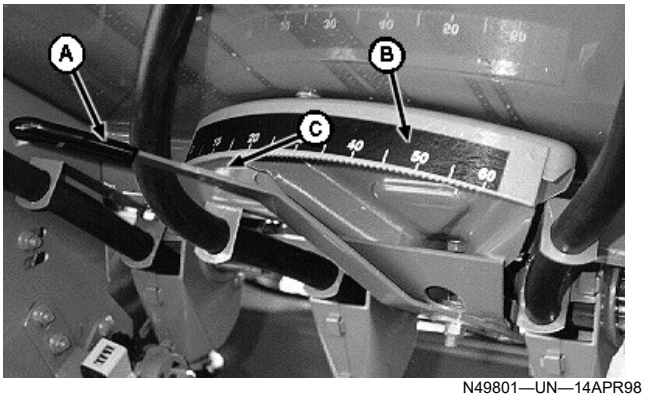
1. Locate shifter settings from the proper rate chart which gives desired quantity for each kind of seed.
2. Add shifter setting together and set the shifter in a notch which represents the total of all settings. See Setting Grain Shifter or Setting Grass Seed Shifter in this section.
3. Perform a rate check (see rate checks in this section) and adjust shifters as necessary.

OUO6074,000015E-19-15MAR17

Set Manual Grain Shifter

IMPORTANT: Prevent moving parts from seizing. Proper lubrication before and after the planting season is essential for smooth and accurate response from the rate adjuster. (See Lubrication and Maintenance section.)

IMPORTANT: The seed rate charts are only approximate kilograms per hectare (pounds per acre). Set the shifter higher or lower after referring to Use Density Meter and Rate Check in this section.



N49801—UN—14APR98

A—Shifter Lever
B—Seed Index Setting
C—Indicator Lip

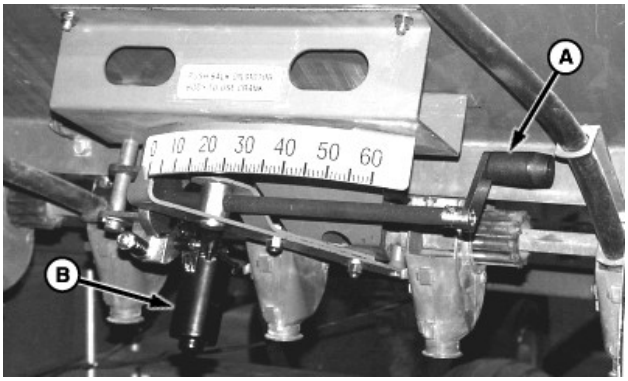
1. Select the desired population and corresponding index number from the rate charts for the selected crop.
2. Move the shifter lever (A) so indicator lip (C) is five or more notches (if possible) above the desired seed index setting (B).
3. Move the lever back slowly to one notch below the desired setting.
4. Place the lever in the desired setting.

OUO6074,000015F-19-10JUN20

Set Electronic Grain Shifter

IMPORTANT: Prevent moving parts from seizing. Proper lubrication before and after the planting season is essential for smooth and accurate response from the rate adjuster. (See Lubrication and Maintenance section.)

IMPORTANT: The seed rate charts are only approximate kilograms per hectare (pounds per acre). Set the shifter higher or lower after referring to Use Density Meter and Rate Check in this section.



N54977—UN—23AUG00

N54978—UN—23AUG00

A—Hand Crank
B—Motor
C—Electronic Hand Controller

1. Move the rate indicator all the way to the left. If the indicator is not on the zero mark, see Reset Fluted Feed Cups in the Servicing section.
2. Select the desired population and corresponding

index number from the rate charts for the selected crop.

NOTE: Motor (B) must be pushed back before turning hand crank (A) manually.

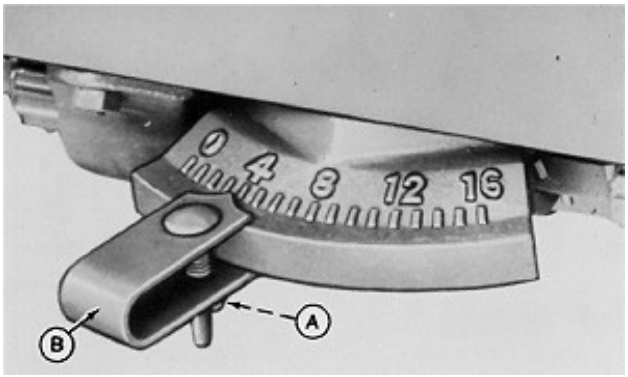
3. Move the rate indicator five or more numbers (if possible) above the desired seed index setting using either the electronic hand controller (C) or the hand crank (A).
4. Move the rate indicator back slowly to one number below the desired setting.
5. Move the rate indicator to the desired setting.

OUO6074,0000753-19-10JUN20

Set Grass Seed Shifter

IMPORTANT: The seed rate charts are only approximate kilograms per hectare (pounds per acre). Set the shifter higher or lower after referring to Use Density Meter and Rate Checks in this section.

NOTE: If the box is full and the shifter is on zero, turn the feed shaft with a wrench while positioning the lever.



N36438—UN—04OCT88

A—Wing Nut
B—Shifter Lever

Loosen the wing nut (A) and move the shifter lever (B) one notch higher than the desired setting. Position the lever into the correct setting and tighten the wing nut.

OUO6074,0000160-19-29NOV17

Fertilizer Rate Charts

IMPORTANT: For 38 cm (15 in.) and 50 cm (20 in.) row spacing, set the meter at twice the suggested weight in the chart NOT at twice the seed index setting in the chart.

Rates are approximate. Perform a rate check before planting.

Gear Case Setting	A1	B1	A2	C1	B2	A3	D1	C2	B3	A4	C3*	B5	C4	D3	E2	C5	D4	E3	D5	E4	E5
Row Spacing	**Kilograms Per Hectare with Feed Shaft in Drive One**																				
19 cm	20	23	25	26	28	29	32	33	34	35	39	45	46	47	50	53	56	60	63	70	79
25 cm	15	17	19	20	21	23	24	25	26	26	30	34	35	36	37	39	42	45	47	52	60
	C3* setting is identical to A5, B4, D2 and E1 (not shown in chart)																				

Gear Case Setting	A1	B1	A2	C1	B2	A3	D1	C2	B3	A4	C3*	B5	C4	D3	E2	C5	D4	E3	D5	E4	E5
Row Spacing	**Kilograms Per Hectare with Feed Shaft in Drive Two**																				
19 cm	64	73	80	86	92	97	102	106	110	111	128	146	150	153	161	170	179	191	205	224	255
25 cm	48	55	60	64	69	72	77	80	82	84	96	110	113	115	120	128	134	144	153	168	191
	C3* setting is identical to A5, B4, D2 and E1 (not shown in chart)																				

Gear Case Setting	A1	B1	A2	C1	B2	A3	D1	C2	B3	A4	C3*	B5	C4	D3	E2	C5	D4	E3	D5	E4	E5
Row Spacing	**Pounds Per Acre with Feed Shaft in Drive One**																				
7.5 inch	18	20	22	23	25	26	28	29	30	31	35	40	41	42	44	47	50	53	56	62	70
10 inch	13	15	17	18	19	20	21	22	23	23	27	30	31	32	33	35	37	40	42	46	53
	C3* setting is identical to A5, B4, D2 and E1 (not shown in chart)																				

Gear Case Setting	A1	B1	A2	C1	B2	A3	D1	C2	B3	A4	C3*	B5	C4	D3	E2	C5	D4	E3	D5	E4	E5
Row Spacing	**Pounds Per Acre with Feed Shaft in Drive Two**																				
7.5 inch	57	65	71	76	82	86	91	94	98	99	114	130	133	136	14-2	151	159	170	182	199	227
10 inch	43	49	53	57	51	64	68	71	73	75	85	98	100	102	10-7	114	119	128	136	149	170
	C3* setting is identical to A5, B4, D2 and E1 (not shown in chart)																				

AG,OUO1074,462-19-17JUN11

Determine Rate Setting—Fertilizer

IMPORTANT: Rates shown in the charts are only to be used as a guide. See Rate Check—Method 1 or Rate Check—Method 2 in this section for an accurate rate test.

Rates per acre are determined by adjusting the speed selector levers on the gear case or switching the drive sprocket configuration.

NOTE: Nitrogen fertilizers generally weigh less than high potash or phosphorus.

Rate charts are based on fertilizer having a standard density of 1041.2 kg/m^3 (65 lb/ft^3).

1. Find the actual density of fertilizer used. (See Use Density Meter in this section.)
2. Locate the actual density on the Fertilizer Density Chart and find the conversion factor.
3. Multiply desired metering rate by the conversion factor. Locate that value on rate chart, match it with seed index value and adjust speed selector levers to value. (See Fertilizer Drive Settings in this section.)

EXAMPLE:

- Product: Fertilizer
- Desired Rate: 112 kg/ha (100 lb/acre)
- Actual Density: 800.9 kg/m^3 (50 lb/ft^3)
- Drill: Row Spacing (7-1/2 in)
- Drive: Drive 2

1. Locate conversion factor from the Fertilizer Density Chart.

   800.9 kg/m^3 (50 lb/ft^3)

2. Multiply the desired rate by the conversion factor.

   112 kg/ha x 1.30 = 146 kg/ha

   (100 lb/acre x 1.30 = 130 lb/acre)

3. Find value, 146 kg/ha (130 lb/acre) on rate chart and move speed selector levers to position “B5”.

OUO6074,0000161-19-30NOV17

Fertilizer Density Chart

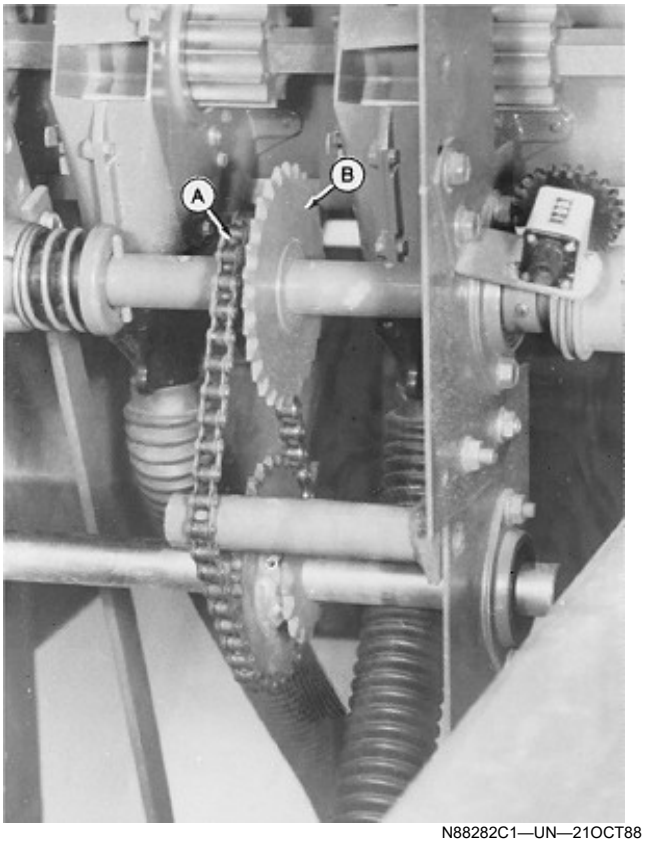
Density kg/m^3 (lb/ft^3)	Conversion Factor
720.81 (45)	1.45
800.9 (50)	1.30
881.0 (55)	1.20
961.1 (60)	1.10
1041.2 (65)	1.00
1121.3 (70)	0.93

Density kg/m^3 (lb/ft^3)	Conversion Factor
1201.4 (75)	0.87
1281.44 (80)	0.81

AG,OUO1074,464-19-22FEB00

Set Fertilizer Feed Shaft Speed

Speed is determined by the drive sprocket combinations and the gear case. There are two different speeds available with the sprockets and 21 speeds per drive for each row spacing available with the gear case.



N88282C1—UN—21OCT88

A—Small-Top Sprocket
B—Large-Top Sprocket

SLOW-SPEED (Drive 1 on fertilizer rate charts) and FAST-SPEED (Drive 2 on fertilizer rate charts) are determined by 15 and 27-tooth sprocket assemblies. Drive 1 uses the small-top (A) and large-bottom sprockets; Drive 2 uses the large-top (B) and small-bottom sprockets.

Use the SLOW-SPEED drive whenever possible for maximum efficiency and to minimize wear. Use the FAST-SPEED drive for drilling larger quantities.

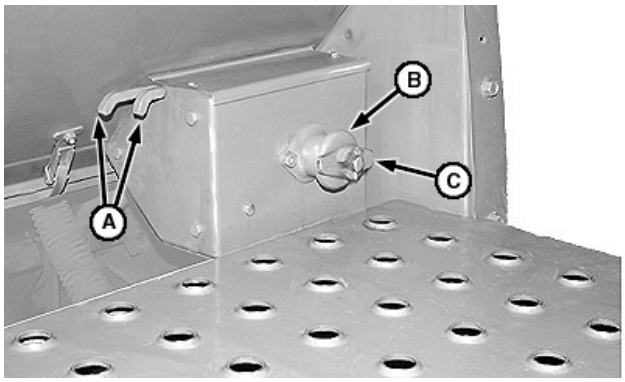
AG,OUO1074,465-19-29NOV17

Fertilizer Drive Settings

IMPORTANT: To attain proper fertilizer drive speeds, set speed selectors (A) so desired digits are just outside the gear case and NOT the rubber seal. Line up mark with edge of cover.

NOTE: If unsure of setting, remove cover to check gear position.

NOTE: Disengage gears when not distributing fertilizer.



N50080L—UN—05FEB99

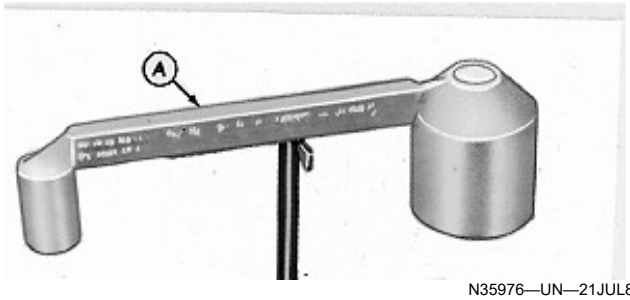
A—Speed Selector
B—Knob
C—Lock

A graduated increase in speed (from slow to fast) is made with the gear case speed selector (A). Turn lock (C) vertical, then pull out knob (B) to disengage gears. Move speed selectors to the “Gear Box Setting” as shown on the Fertilizer Rate Charts in this section for your desired kilograms per hectare (pounds per acre).

Push knob in and turn lock horizontal to engage gears.

AG,OUO1074,466-19-22FEB00

Use Density Meter



N35976—UN—21JUL89

A—Density Meter

NOTE: Density meter (A) is available from your dealer to determine density of seeds and fertilizers.

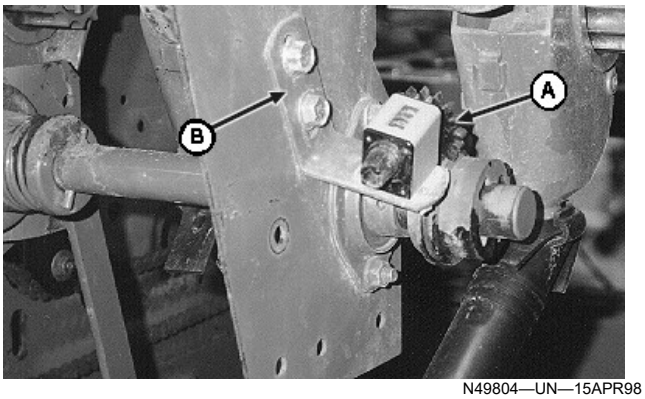
Fill the meter bucket with product, tap lightly, level material with top of the bucket, balance on the knife edge and take reading.

AG,OUO1074,467-19-29NOV17

Perform Accurate Rate Checks

It is important to conduct accurate rate checks as the following variables affect seed and fertilizer rates. (See Rate Check—Method 1 or Rate Check—Method 2 in this section for accurate ways of checking seed or fertilizer rates.)

1. Quality of Seeds—Two bags of seed that weigh the same may have different quantities of seed because of moisture content, density, residue, unfilled kernels, or simple seed size.
2. Type of Fertilizer—Nitrogen fertilizers generally weigh less than high potash or phosphorus fertilizers.
3. Tires—Size, type, and air pressure affect seeding rates. Use the recommended tire size and proper air pressure listed in the Preparing the Grain Drill section.
4. Operator Judgment—Land contains more or less area than assumed. Overlapping rows or leaving too wide a space between rows. Turning at row ends without lifting furrow openers.



N49804—UN—15APR98

A—Gear Teeth
B—Bracket

NOTE: Gear teeth (A) should mesh with drive worm gear, but not "bottom out" on drive worm. Bracket (B) can be adjusted to provide proper gear mesh.

5. Acremeter—Worn out counter or chipped teeth. Worm gear loose on shaft. If acremeter accuracy is suspect, refer to Check Acremeter Accuracy in the Servicing section.

AG,OUO1074,468-19-26FEB19

Rate Check—Method 1

1. Make all adjustments as shown on rate chart for seed or fertilizer to be checked.
2. Fill box level-full in field, then pull drill a short distance to settle seed or fertilizer. Refill box exactly level-full.
3. Mark drive wheel and drill specified number of wheel revolutions (see chart below) to obtain one hectare (acre).
4. Carefully weigh seed or fertilizer required to refill box level-full.
5. Compare weight of seed or fertilizer required to fill box with predetermined rate.
6. Adjust seed shifter index setting (or fertilizer gear case) to compensate for any variation between weight desired and amount actually drilled. Adjust feed rates accordingly.

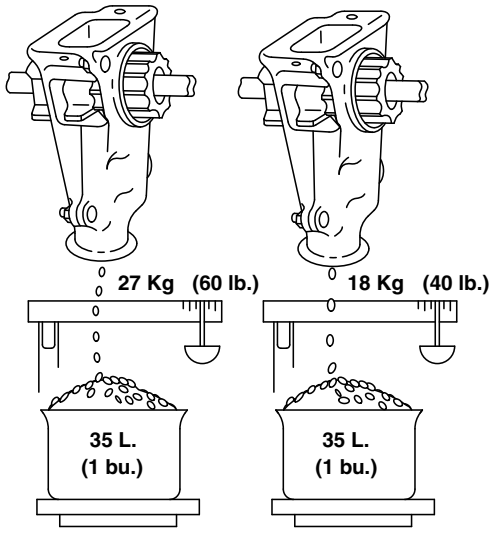
3.1 m (10 ft) Drill		
Drive Tire Size	**Revolutions/Hectare**	**Revolutions/Acre**
11L x 15	1344	544
31-13.5 x 15	1344	544

4.6 m (15 ft) Drill		
Drive Tire Size	**Revolutions/Hectare**	**Revolutions/Acre**
11L x 15	897	363
12.5L x 15	848	343
31-13.5 x 15	897	363

6.1 m (20 ft) Drill		
Drive Tire Size	**Revolutions/Hectare**	**Revolutions/Acre**
5.90-15	751	304

AG,OUO1074,469-19-22FEB00

Rate Check—Method 2



N92121—UN—01JUN11

1. Put seed or fertilizer in box and a container under each feed.
2. Set the seed index lever or fertilizer gear case for desired quantity per hectare (acre) as shown on rate chart or calculated with density meter.
3. Mark drive wheel and drill specified number of wheel revolutions (see the following chart) to obtain one hectare (acre).
4. Carefully weigh seed or fertilizer in all containers and compare weight to value shown on rate charts.
5. Adjust seed index lever or fertilizer gear case to compensate for any variation. Adjust feed rates accordingly. Repeat test until desired quantity is obtained.

NOTE: Feed cups meter VOLUME, not weight.

3.1 m (10 ft.) Drill		
Drive Tire Size	**Revolutions per Hectare**	**Revolutions per Acre**
11L x 15	1344	544
31-13.5 x 15	1344	544

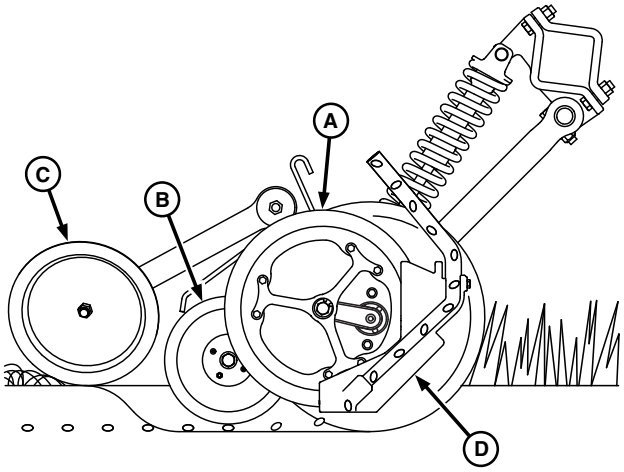
4.6 m (15 ft.) Drill		
Drive Tire Size	**Revolutions per Hectare**	**Revolutions per Acre**
11L x 15	897	363
12.5L x 15	848	343
31-13.5 x 15	897	363

6.1 m (20 ft.) Drill		
Drive Tire Size	**Revolutions per Hectare**	**Revolutions per Acre**
5.90-15	751	304

OUO6074,0000162-19-23MAR11

Seed Opener Components and Adjustments

Opener adjustments are necessary for optimized seed placement based on soil and field conditions. Adjust all components for the best seed placement.



A109345—UN—08MAR21

A—Depth Gauge Wheel
B—Press Wheel
C—Closing Wheel
D—Seed Boot

Depth Gauge Wheel (A)—Firms the furrow wall and controls the furrow (seed) depth between 12.5 mm (0.5 in) and 89 mm (3.5 in). There are 13 depth settings. The depth gauge wheel also acts as a scraper to reduce soil buildup on the disk. The depth gauge wheel is available in both 7 cm (3 in) and 11 cm (4.5 in) widths and in both closed and spoked wheel configurations. The spoked wheel configuration improves operation in muddy conditions.

Press Wheel (B)—Pushes seed into the bottom of the furrow for improved germination. There are three downforce settings.

Closing Wheel (C)—Places soil over the seed. There are four downforce settings.

Refer to detailed adjustment procedures for further information.

In addition to wheel adjustments, the following items can be repositioned to improve opener performance.

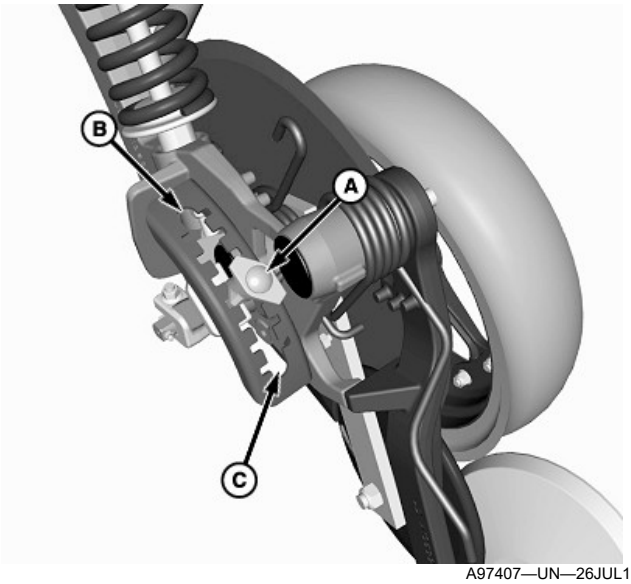
Closing Wheel—Reposition the wheel, closer or further from the furrow, based on soil conditions for optimum furrow closure.

Seed Boot (D)—Reposition the seed boots up-or-down to suit the implement, field, and seeding conditions.

Refer to positioning procedures for further information.

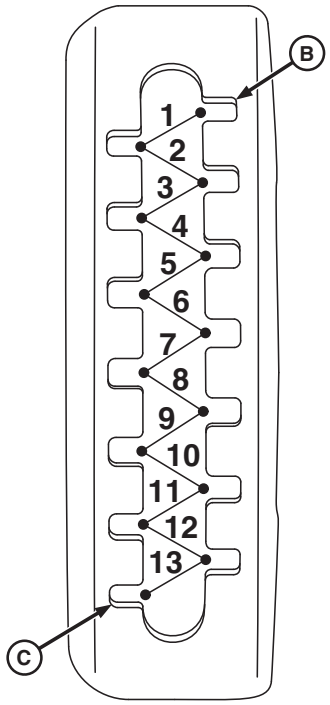
BB83525,0000518-19-08MAR21

Adjust Depth Gauge Wheel and Seeding Depth



A97407—UN—26JUL17

11 cm (4.5 in) Spoked Depth Gauge Wheel



A97646—UN—16AUG17

A—Handle
B—Deep (Depth Position 1)
C—Shallow (Depth Position 13)

Raise the depth gauge wheel to seed deeper. Lower the depth gauge wheel to seed shallower.

NOTE: If heavy field residue or a worn disk prevents normal soil penetration, use a deeper position.

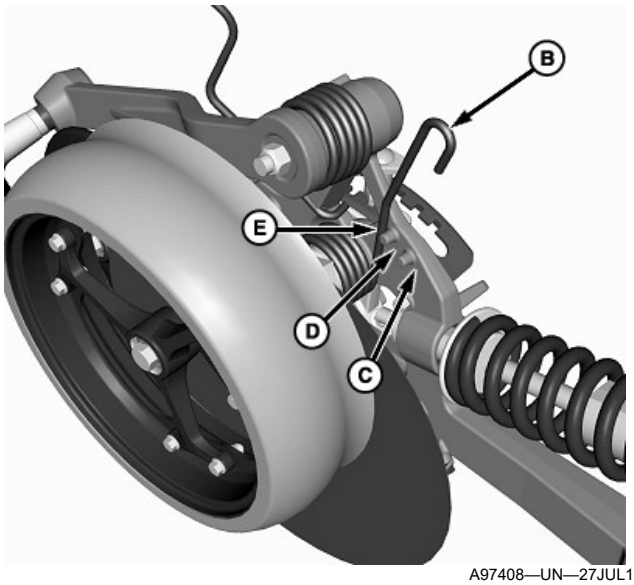
Handle (A) controls seed depth 13—90 mm (0.5—3.5 in). Generally, position 3 (25 mm [1 in] seed depth) is used as a starting point. Each position changes seed depth 6.35 mm (0.25 in).

To Adjust:

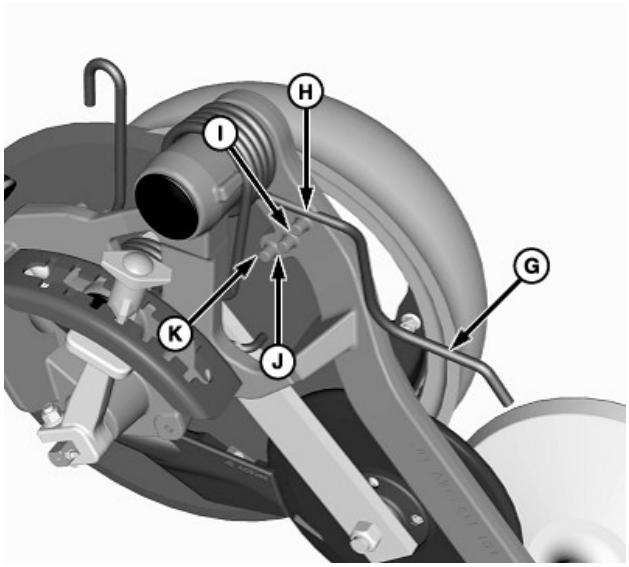
Pull handle (A) up, move the handle to a new position, and latch the handle into the slots.

BB83525,0000504-19-26SEP18

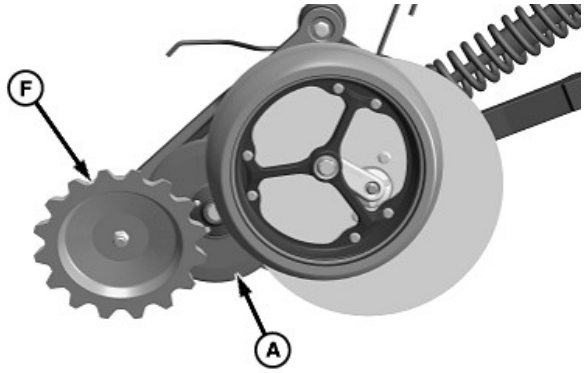
Adjust Press and Closing Wheel Downforce



A97408—UN—27JUL17



A97663—UN—22AUG17



A109347—UN—04MAR21

A—Press Wheel
B—Adjustment Spring
C—Minimum Downforce, Press Wheel
D—Medium Downforce, Press Wheel
E—Maximum Downforce, Press Wheel
F—Closing Wheel
G—Adjustment Spring
H—Heaviest Downforce, Closing Wheel
I—Heavy Downforce, Closing Wheel
J—Medium Downforce, Closing Wheel
K—Light Downforce, Closing Wheel

PRESS WHEEL

To promote germination and optimum emergence, maintain a uniform downforce on all press wheels. Set the press wheel (A) downforce to one of the following positions (C—E) to achieve the best seed-to-soil contact using adjustment spring (B).

- Minimum downforce (C) is used for deep seeding depth due to the opener arm angle.
- Medium downforce (D) is used for moderate seeding depth.
- Maximum downforce (E) is used for shallow seeding depth due to the opener arm angle.

CLOSING WHEEL

Do not use excessive downforce on the closing wheel (F). Use enough force to crumble the furrow wall and cover the seed with soil without compacting the seed zone.

Place the adjustment spring (G) in one of the following positions (H—K). The following positions are recommended starting points. Perform field checks to verify the setting.

- Heaviest downforce (H) is used for the heaviest soil conditions.
- Heavy downforce (I) is used for heavy, moist soil.
- Medium downforce (J) is used for most common soil types.
- Light downforce (K) is used for light, loose, or sandy soil.

BB83525,0000505-19-08MAR21

Position Seed Closing Wheel

A97434—UN—27JUL17

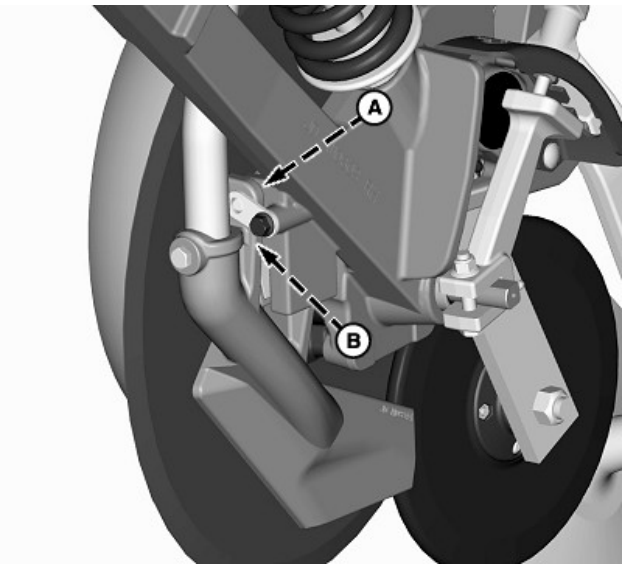
A—Washers (as required)

Washers (A) are used to position closing wheels to the side of furrow, depending on soil conditions.

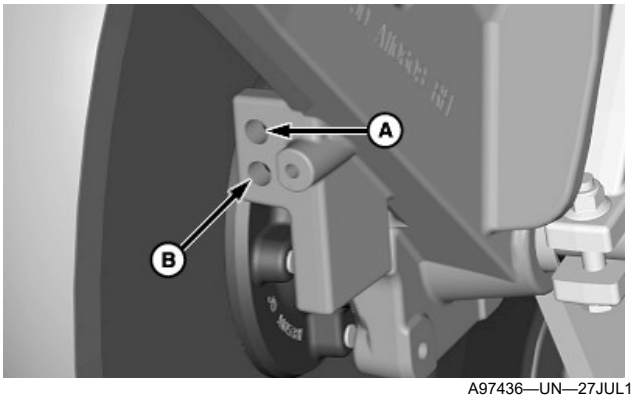
When seeding in heavier soils, position the closing wheel farther to the outside of the furrow.

BB83525,0000506-19-07AUG17

Adjust Seed Boots

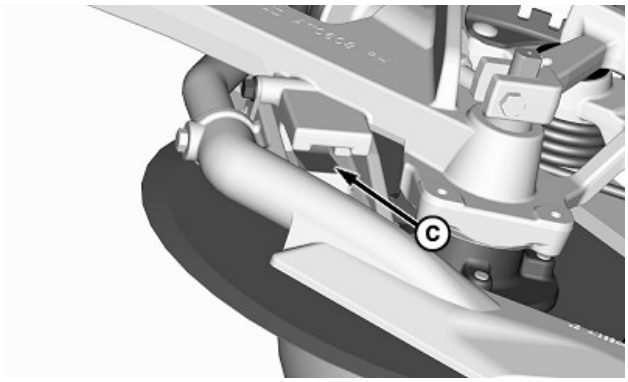


A97435—UN—27JUL17



A97436—UN—27JUL17

Components Removed for Clarity



A97437—UN—27JUL17

A—Top Hole
B—Bottom Hole
C—Leaf Spring

Seed boots are attached at hole (A) (as shown) for most planting conditions.

Attach boot at the bottom hole (B) when:

- Shallow seeding at 25 mm (1 in) or less.
- Planting in heavy-residue conditions.
- Worn boot is used with a new disk.
- Higher speed planting causes inconsistent seed depth.

Leaf spring (C) keeps the seed boot against the inside of the disk for accurate seed placement.

BB83525,0000507-19-11SEP18

Check Opener Adjustments

After making adjustments to opener components, a short test planting is recommended to ensure that changes have the desired effect.

IMPORTANT: Using a combination of adjustments, opener components work together to open the furrow, place the seed, and close the furrow. Adjusting one of these actions can affect the other two, so additional adjustments may be needed to achieve desired seed placement.

Check seed placement periodically and whenever planting conditions change. Depending on soil/field conditions, revise adjustment settings as needed to achieve proper seed placement.

AG,OUO1074,480-19-26FEB16

Use The Tractor Operator's Manual

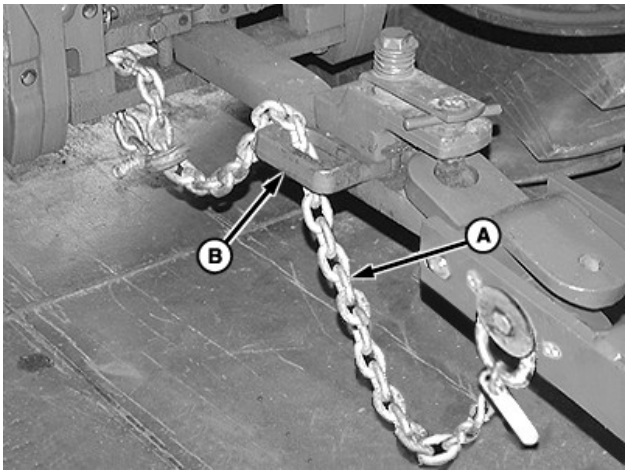
TS190—UN—17JAN89

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

The following tractor related information uses John Deere tractors to illustrate preparation, attachment and operational procedures needed for the 1590 Grain Drill. Use the tractor operator's manual for detailed information, as procedures will vary by equipment.

OUO6074,0000166-19-05DEC00

Attach Grain Drill to Tractor



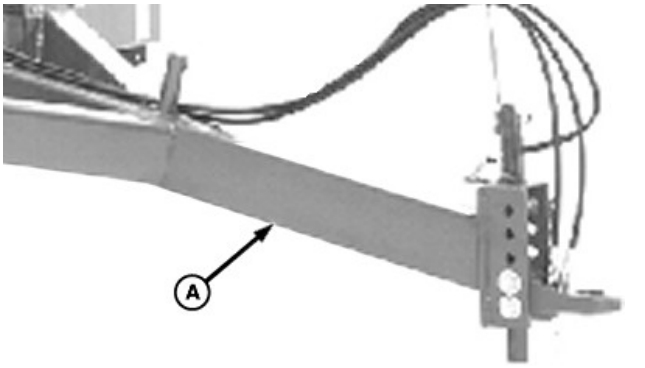
N52738—UN—14MAR00

A—Safety Chain
B—Safety Chain Support

Use of a safety chain (A) is recommended to secure the hitch to the tractor. All tractors must be equipped with an intermediate chain support (B) ahead of the hitch pin. If the tractor is not equipped, see your John Deere dealer or qualified service provider.

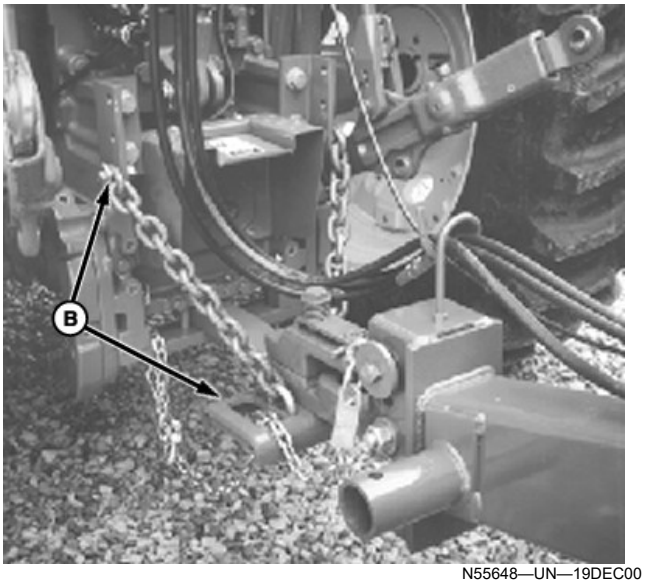
Attach the drill to the tractor with a pin and route the safety chain (A) through the intermediate safety chain support (B).

NOTE: Drawbar support is only required with regular hitches.



N55647—UN—19DEC00

Regular Hitch

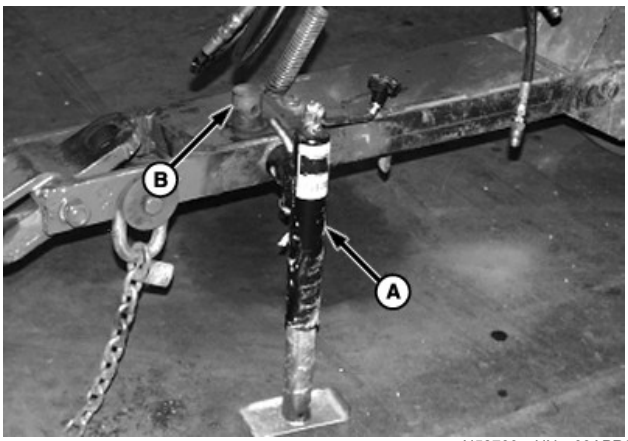


N55648—UN—19DEC00

A—Regular Hitch
B—Drawbar Support

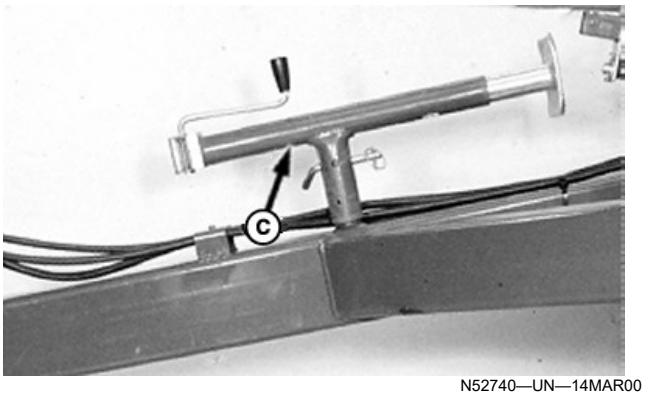
Regular hitches (A) on 3 m (10 ft) drills attached to tractors with less than 112 kW (150 hp) require a drawbar support (B) installed on the tractor. All 4.57 m (15 ft) drills require a drawbar support (B) installed on the tractor. (See your John Deere dealer or qualified service provider.)

Move Storage Stand to Transport Position



N52739—UN—03APR00

Caster Wheel Hitch



N52740—UN—14MAR00

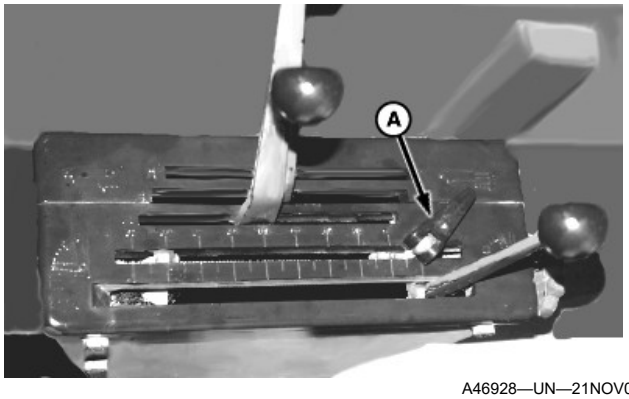
Simple Hitch

A—Stand
B—Transport Position
C—Jackstand

Once the drill is attached to the tractor, move the storage stand (A) to the transport position (B) on the caster wheel hitch. Relocate the jackstand (C) as shown when the drill is equipped with a simple hitch.

Rockshaft Operating Lever Height Stop (30—60 Series Tractors)

IMPORTANT: If the tractor rockshaft is accidentally lowered with a quick-coupler hitch on the tractor, damage can occur to the machine hitch when turning the tractor.



A46928—UN—21NOV00

A—Lever Stop

To prevent accidental lowering of the rockshaft while operating the machine, place the rockshaft control lever in the raised position and engage the lever stop (A).

Rockshaft Operating Lever Height Stop—7000 Series Tractors

IMPORTANT: If the tractor rockshaft is accidentally lowered with a quick-coupler hitch on the tractor, damage can occur to the machine hitch when turning the tractor.

RW21858—UN—21AUG92

A—Transport Lock Position

To prevent accidental lowering of the rockshaft while operating the machine, place the rockshaft control lever in the transport lock position (A).

Rockshaft Operating Lever Height Stop—8000 Series Tractors

IMPORTANT: If the tractor rockshaft is accidentally lowered with a quick-coupler hitch on the tractor, damage can occur to the machine hitch when turning the tractor.

A41056—UN—01APR97

A—Control Lever

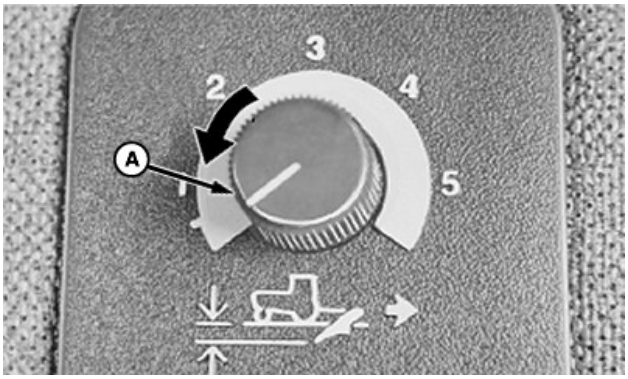
To prevent accidental lowering of the rockshaft while operating the machine, place the rockshaft control lever (A) in the transport lock position.

AG,OUO1074,482-19-29NOV17

Attach Two-Point Hitch to Tractor with Quick-Hitch

IMPORTANT: Set the tractor rockshaft load/depth control (A) in the position setting. If the tractor rockshaft control is set to load sensing, the drill tongue raises and lowers with an increase or decrease of drill draft load. This results in uneven seed depth as drill is operated across the field.

NOTE: Refer to the tractor Operator's Manual for specific tractor adjustments.



A46758—UN—09OCT00

55—60 Series

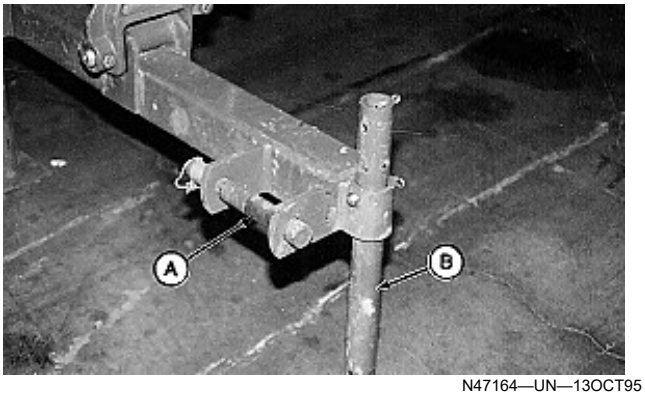
A44931—UN—13MAY98

8000 Series

A—Load/Depth Control

Set the rockshaft hitch/load depth control (A) for position sensing to prevent unexpected hitch movement.

NOTE: Before attaching machine to the tractor, be sure that the hitch pins and spacers are assembled to match the hitch configuration of your tractor.



N47164—UN—13OCT95

A—Hitch Pins
B—Parking Stands

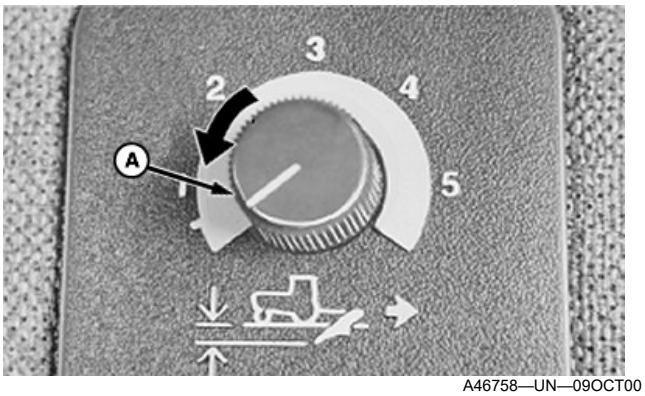
1. Lower the quick-hitch to allow the hooks to pass under the machine hitch pins (A).
2. Back the tractor into position. Raise the quick-hitch to seat the hooks.
3. Lock the latch levers on the tractor. The spring loaded latches in the lower hooks must be extended above the hitch pins.
4. Raise the parking stands (B) and pin into the transport position.

AG,OUO1074,483-19-05APR18

Attach Two-Point Hitch to Tractor without Quick-Hitch

IMPORTANT: Set the tractor rockshaft load/depth control (A) in the position setting. If tractor rockshaft control is set to load sensing, the drill tongue raises and lowers with an increase or decrease of drill draft load. This results in uneven seed depth as the drill is operated across the field.

NOTE: Refer to the tractor Operator's Manual for specific tractor adjustments.



A46758—UN—09OCT00

55—60 Series

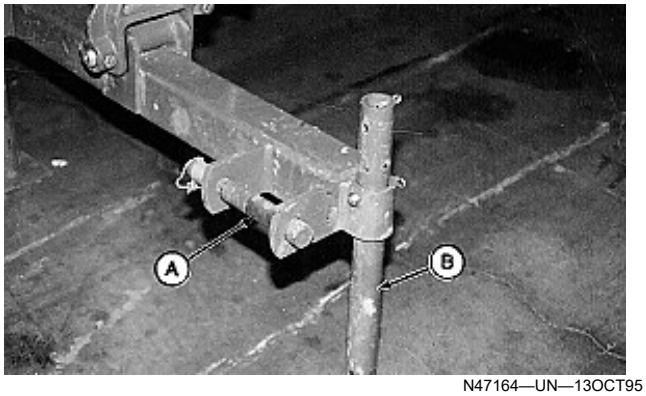
A44931—UN—13MAY98

8000 Series

A—Load/Depth Control

Set the rockshaft hitch/load depth control (A) for position sensing to prevent unexpected hitch movement.

NOTE: Before the attaching machine to the tractor, be sure that hitch pins and spacers are assembled to match the hitch configuration of your tractor.



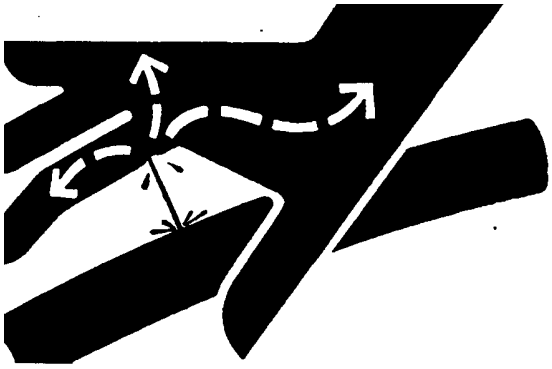
N47164—UN—13OCT95

A—Hitch Pins
B—Parking Stands

1. Back the tractor and align the draft links with hitch pins (A).
2. Stop the engine and set the brakes.
3. Extend the draft links and adjust the length of the lift links to allow installation of the hitch pins.
4. Install the pins through the draft links and retain with quick-lock pins.
5. Raise the parking stands (B) and pin into the transport position.

AG,OUO1074,484-19-05APR18

Attach Hydraulic Hoses

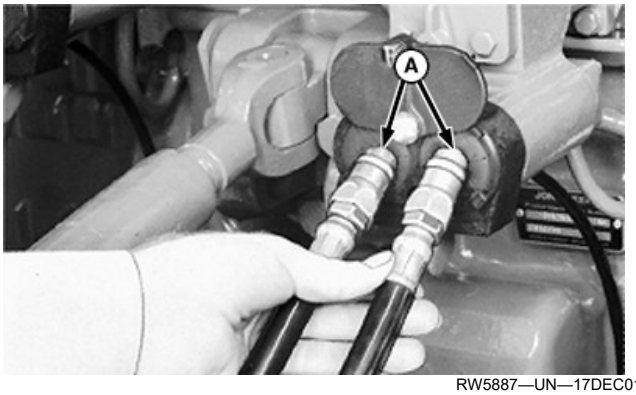


X9811—UN—23AUG88

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.

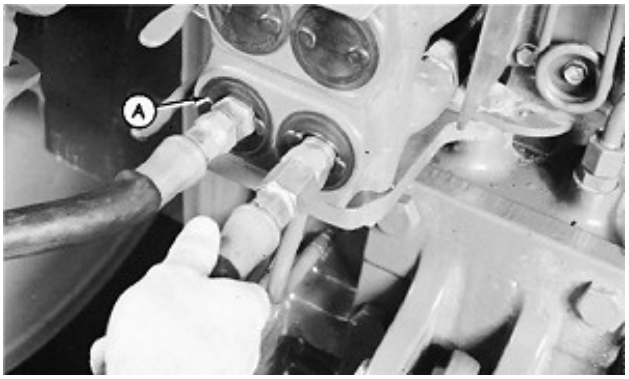
If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene can result.

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



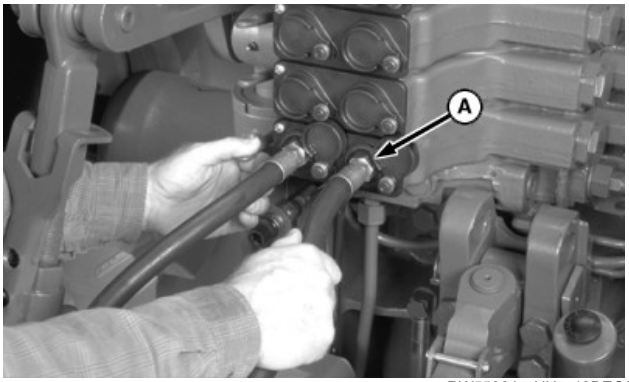
RW5887—UN—17DEC01

With Mechanical SCV Controls



RW21240—UN—18JUN92

With Mechanical SCV Controls



RW55304—UN—18DEC01

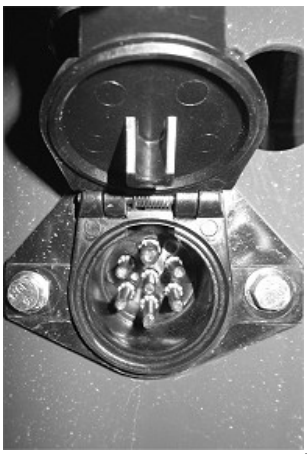
With Electro/Hyd. SCV Controls

A—SCV I

1. Connect downforce hoses to the selective control valve (SCV) I (A).
2. Connect row marker hoses, if equipped, to SCV II.

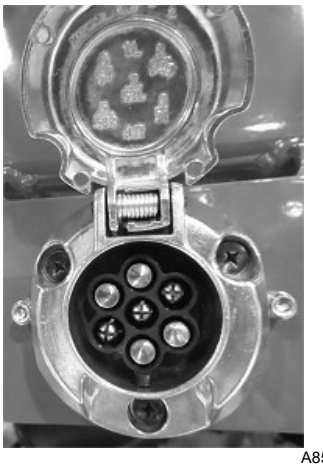
OUO6074,0000167-19-04APR17

Attach the Warning Light Harness



A85921—UN—25MAR15

Style A



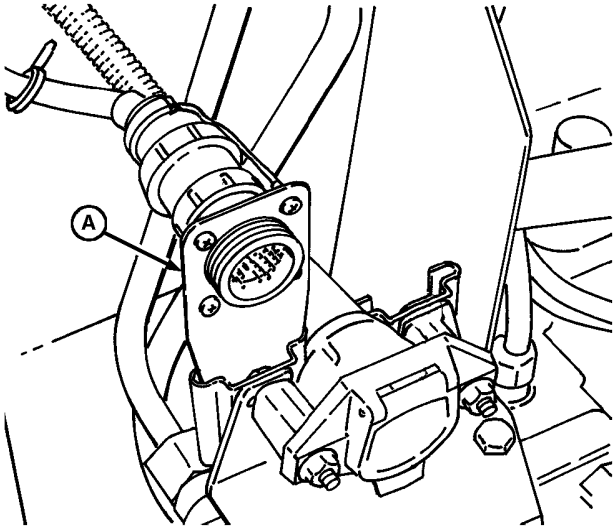
A85922—UN—25MAR15

Style B

Attach the warning light harness to the 7-pin connector.

OUO1074,0000042-19-26JUN18

Connect ComputerTrak™ Monitor



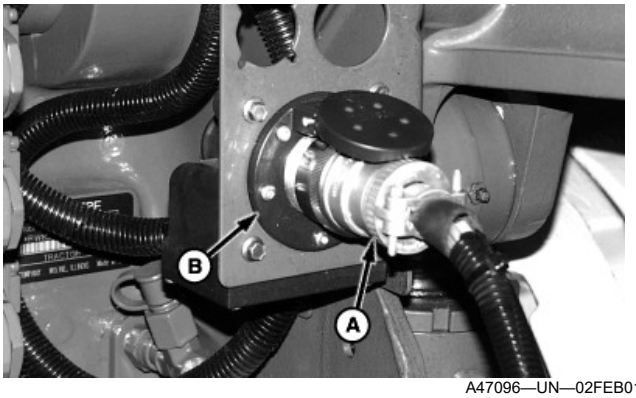
A46764—UN—13OCT00

A—Monitor Connector

Connect ComputerTrak™ monitor harness to connector (A).

OUO6074,0000754-19-06APR15

Connect SeedStar™ Monitor Harness



A47096—UN—02FEB01

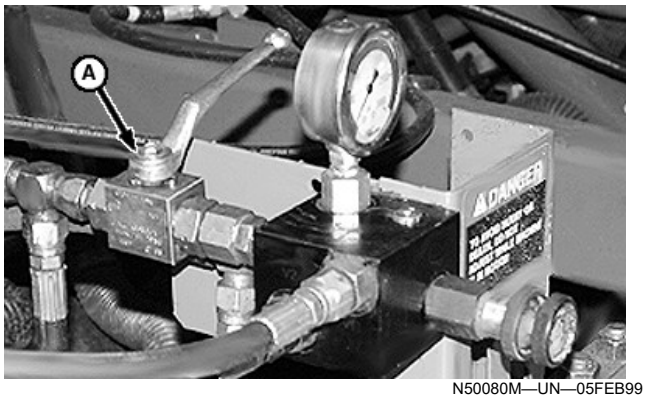
A—Monitor Harness
B—Connector

Connect the SeedStar™ monitor harness (A) to connector (B).

OUO6074,0000170-19-30NOV17

ComputerTrak is a trademark of Deere & Company
SeedStar is a trademark of Deere & Company

Open and Close Opener Lock-Up Valve



N50080M—UN—05FEB99

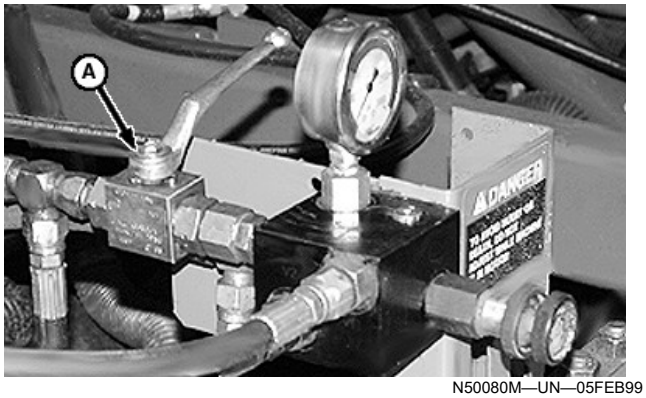
A—Lock-Up Valve

After making hydraulic hose connections to the tractor, open the lock-up valve (A) and check the rockshaft control operation.

Before transporting, raise the openers fully using rockshaft cylinders and close the lock-up valve.

AG,OUO1074,488-19-29NOV17

Check Rockshaft/Opener Control Operation



N50080M—UN—05FEB99

A—Lock-Up Valve

1. Open the lock-up valve (A).

A98730—UN—12DEC17

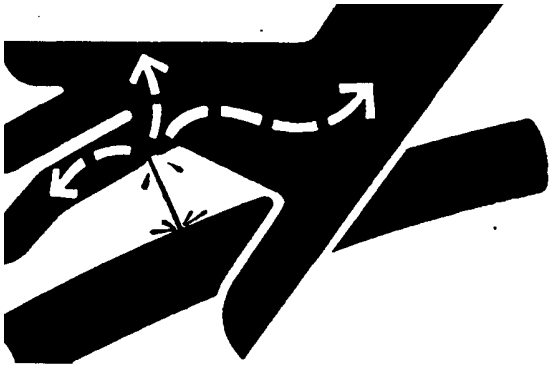
CommandARM

A—SCV I Lever

2. Place the tractor transmission in park and/or set the brakes.
3. Start the engine and pull back on SCV I lever (A) until the rockshaft cylinders are fully retracted
4. Move SCV I control lever back and forth several times while observing the operation of the openers. The openers should raise when the lever is pulled back, and lower when the lever is pushed forward. If action is reversed, reverse hose connections in SCV I hydraulic coupler.
5. After attaching and cycling cylinders, check the tractor hydraulic oil reservoir. Add oil if necessary.

AG,OUO1074,489-19-05MAR18

Detach Drill from Tractor



X9811—UN—23AUG88

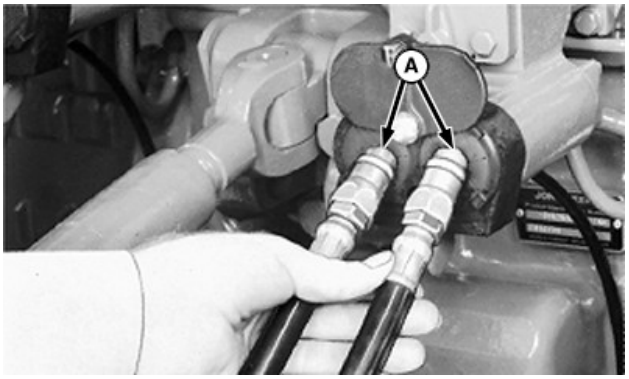
CAUTION: Serious personal injury can result if you attempt to disconnect hydraulic hoses under pressure.

Tractors with Mechanical SCV Controls: Shut off tractor engine and work levers back and forth before disconnecting hoses to prevent a sudden accident that could cause severe injury to yourself.

Tractors with Electro/Hydraulic SCV Controls: Place SCV controls in the float position before disconnecting hoses to prevent a sudden accident that could cause severe injury to yourself.

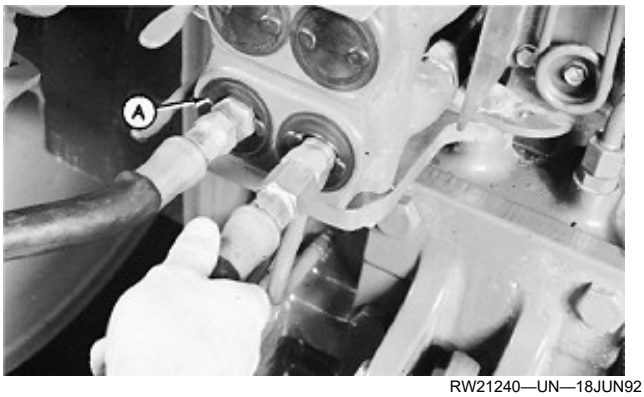
1. Lower the openers to the ground.
2. Tractors with Mechanical SCV Controls: Shut off the tractor engine and work the levers back and forth.

   Tractors with Electro/Hydraulic SCV Controls: Place SCV controls in the float position before disconnecting the hoses.



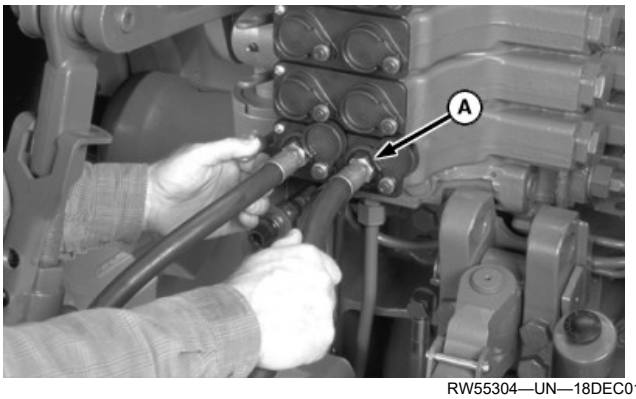
RW5887—UN—17DEC01

With Mechanical SCV Controls



RW21240—UN—18JUN92

With Mechanical SCV Controls



RW55304—UN—18DEC01

With Electro/Hyd. SCV Controls

A—Hydraulic Hoses

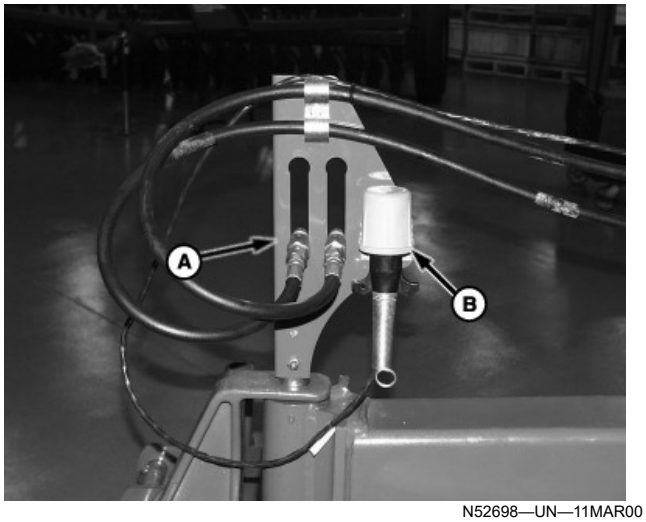
3. Disconnect the hydraulic hoses (A) from the tractor.
4. Lower the storage stands or jack to the ground.
5. Detach the warning light plug from the tractor.

CAUTION: To help prevent personal injury caused by unexpected movement of machine:

- **Park machine on a flat, level surface.**
- **Block the drill tires.**
- **Be sure that no upward force exists at hitch connection before removing the hitch pin.**

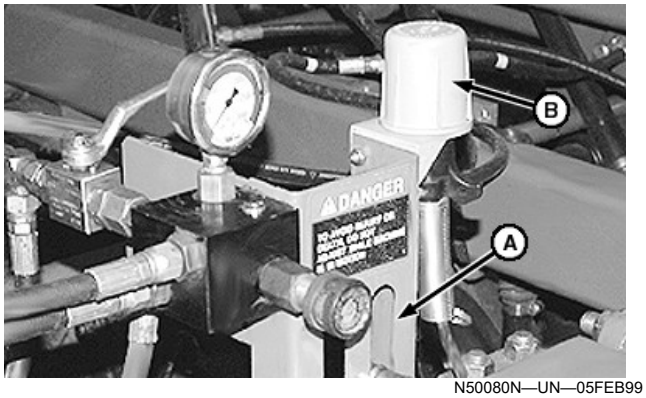
6. Caster and Simple Hitch: Remove the hitch pin and safety chain to separate the tractor from the drill.

   Two-Point Hitch: Lower the parking stands to the ground and detach the drill from the tractor.



N52698—UN—11MAR00

Two-Point Hitch



N50080N—UN—05FEB99

Caster and Simple Hitch

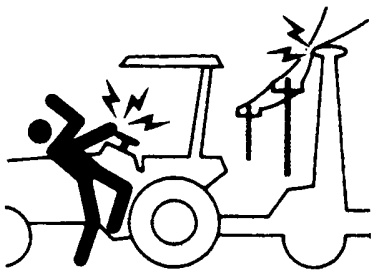
A—Bracket
B—Receptacle

7. Store the hydraulic hoses in bracket (A) and warning light plug in receptacle (B).

AG,OUO1074,490-19-29NOV17

Transporting the Machine

N39084—UN—30MAR89



N39394—UN—06OCT88

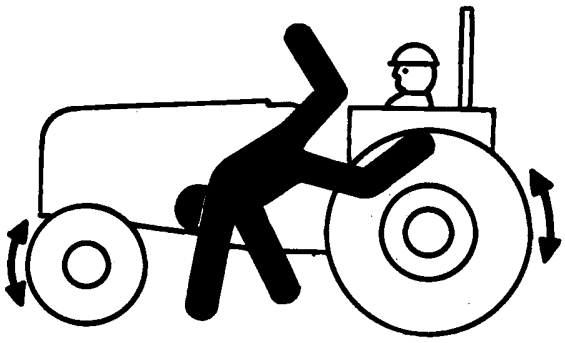
CAUTION: Travel at a reasonable and safe speed. Do not exceed weight and speed guidelines shown in the Safety section. Reduce speed considerably when traveling over rough ground.

Reduce speed when turning. Do not uncouple tractor brake pedals and apply the tractor brakes individually in an attempt to make a shorter turn.

Serious injury or death can result from contact with electric lines. Use care when moving or operating this machine near electrical lines to avoid contact. Know the transport height of your machine.

AG,OUO1074,498-19-22FEB00

Keep Riders Off Machine



TS290—UN—23AUG88

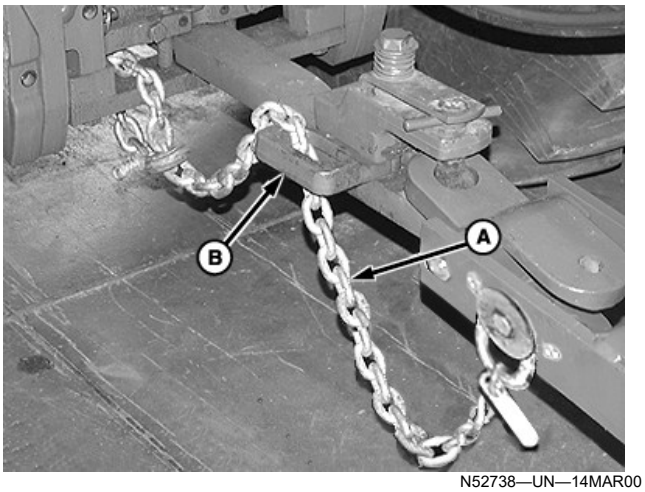
Only allow the operator on the machine. Keep riders off.

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

DX,RIDER-19-03MAR93

Attach Safety Chains

CAUTION: Safety chains help control drawn equipment should it accidentally separate from the drawbar while transporting. A runaway machine could cause severe injury or death to someone. Using appropriate adapter parts, attach chain to the tractor drawbar support. 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.



N52738—UN—14MAR00

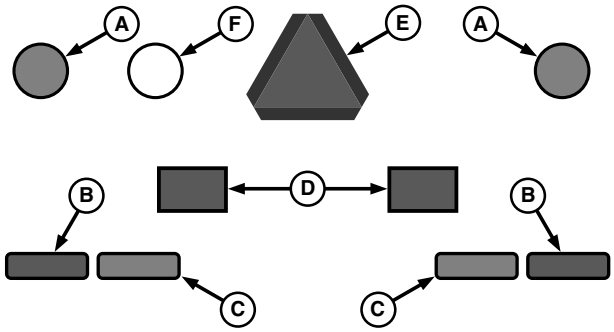
A—Safety Chain
B—Chain Support

Be sure the safety chain (A) is attached to the hitch and

tractor and passes through the intermediate safety chain support (B) as shown.

AG,OUO1074,491-19-29NOV17

Lighting and Marking (Configuration A)



N149051—UN—31JAN20

Rear View

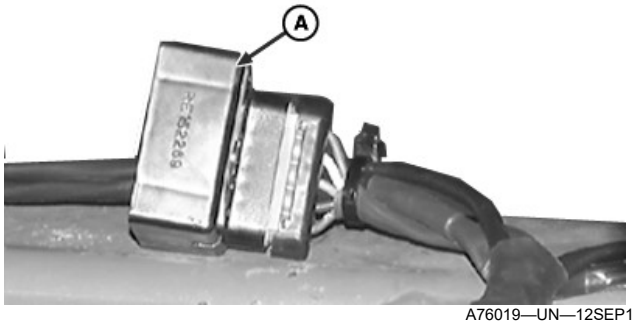
A—Amber Clearance Light
B—Red Reflector
C—Orange Reflector
D—Red Tail Light
E—SMV Emblem
F—Speed Identification Sign

Viewed from the rear of the machine, the lights and reflectors are oriented as shown.

- Amber clearance light (A)
- Red reflector (B)
- Orange reflector (C)
- Red tail light (D)
- Slow-moving vehicle (SMV) emblem (E)
- Speed identification sign (F)

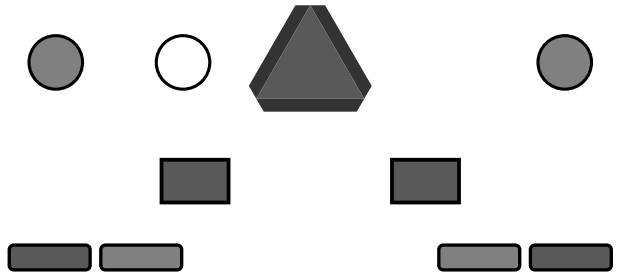
OUO6074,0000E8F-19-23MAR20

Light Enhancement Module



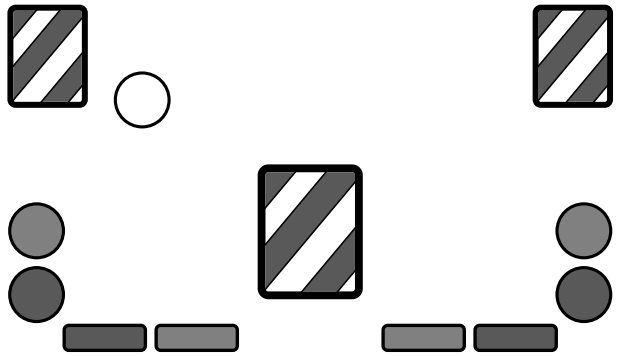
A76019—UN—12SEP12

Light Enhancement Module



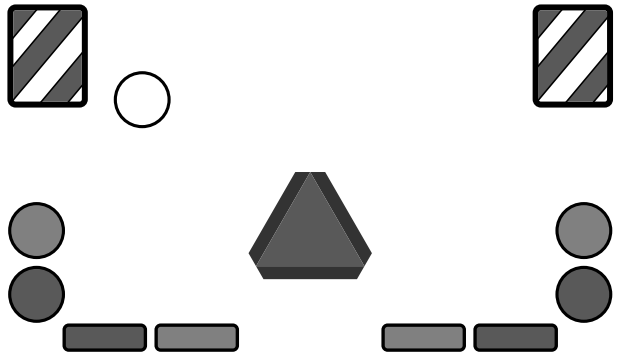
N149052—UN—31JAN20

Lighting and Marking (configuration A)



N149053—UN—31JAN20

Lighting and Marking (configuration B)



N149253—UN—31JAN20

Lighting and Marking (configuration C)

A—Light Enhancement Module

CAUTION: Use safety lights and devices when transporting on roadways. (See Use Safety Lights and Devices in the Safety section.)

IMPORTANT: The construction of this drill 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 drill 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.

NOTE: Keep lighting and marking visible, clean, and in good working order.

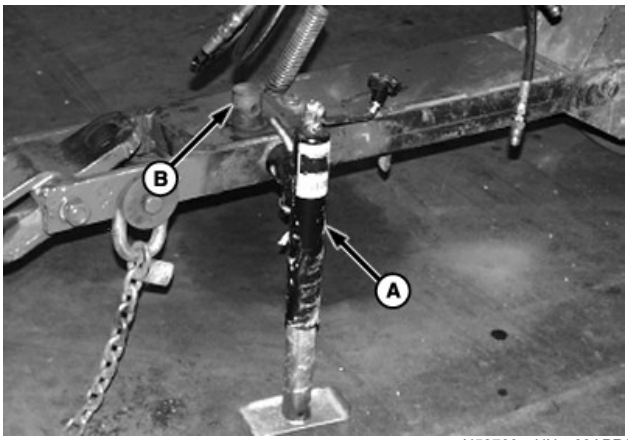
Drills are equipped with the light configuration typically used in the destination country. The customer is responsible for checking local government regulations. See your John Deere dealer or qualified service provider for devices that meet local roadway compliance.

A light enhancement module (A) is included in the lighting and marking (configuration A) to control certain light functions. Lighting and marking (configurations B and C) do not contain a light enhancement module.

For operation in Australia, remove the light enhancement module. The specific functions of the enhancement module are not used in Australia.

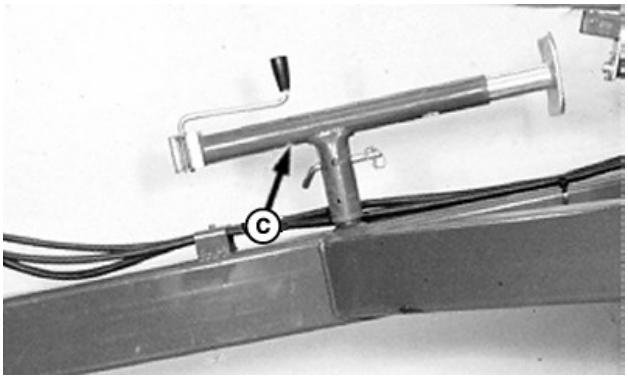
OUO6074,0000E8E-19-23MAR20

Move Storage Stand to Transport Position



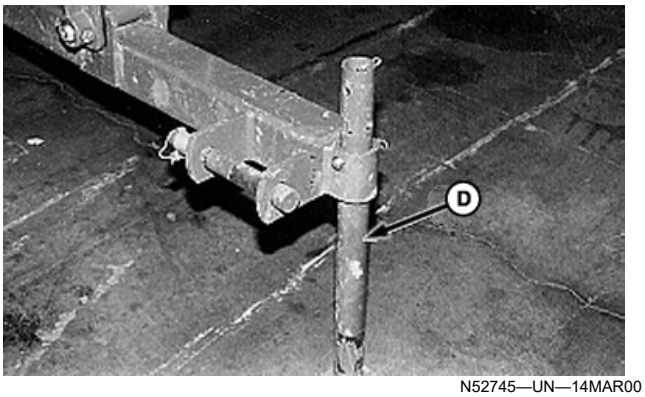
N52739—UN—03APR00

Caster Wheel Hitch



N52740—UN—14MAR00

Simple Hitch



N52745—UN—14MAR00

Two-Point Hitch

A—Stand
B—Transport Position
C—Jackstand
D—Stand

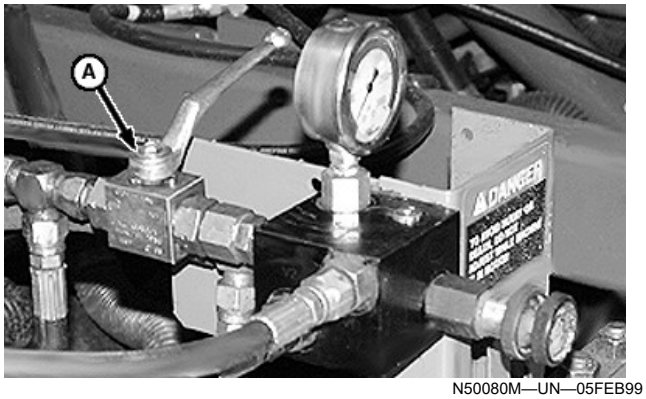
Once drill is attached to the tractor, move the storage stand (A) to the transport position (B) on the caster wheel hitch. Relocate jackstand (C) as shown on a drill with a simple hitch. On a two-point hitch, raise stand (D) to the transport position.

AG,OUO1074,493-19-29NOV17

Lock-Up the Openers

IMPORTANT: Transport grain drill with depth control cylinders fully retracted and lock-up valve closed.

Hydraulic hoses between the lift cylinders and hydraulic lock-up valves should be inspected frequently for leakage, kinking, cuts, cracks, abrasion, blisters, corrosion, exposed wire braid, or any other signs of wear or damage before working under a raised implement. Worn or damaged hose assemblies can fail during use and should be replaced immediately. Failure to do so may result in serious injury or death



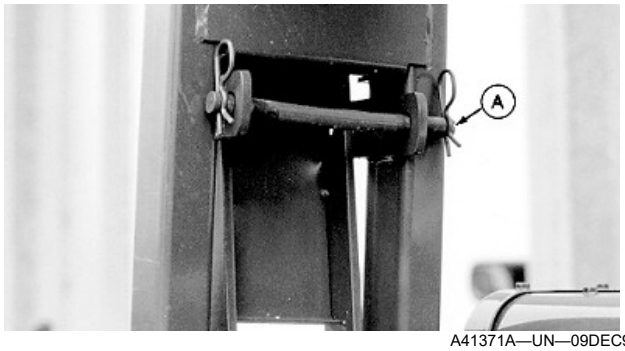
N50080M—UN—05FEB99

A—Lock-Up Valve Handle

1. Raise the openers.
2. Rotate transport lock-up valve handle (A) clockwise to lock up the openers.

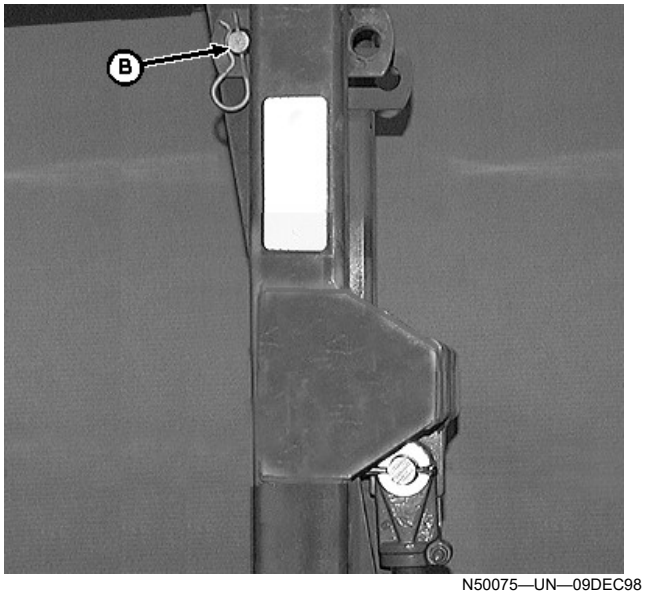
AG,OUO1074,494-19-29NOV17

Lock-Up the Markers



A41371A—UN—09DEC98

Storage Position



N50075—UN—09DEC98

Lock Position

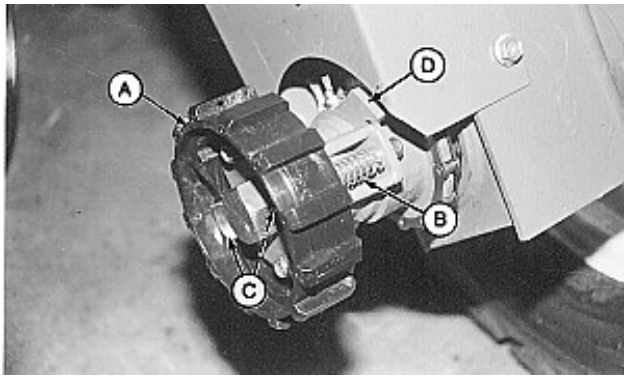
A—Storage Position

B—Lock Position

1. Raise the markers to the upright position.
2. Remove the transport pin from the storage position (A). Install in the lock position (B).

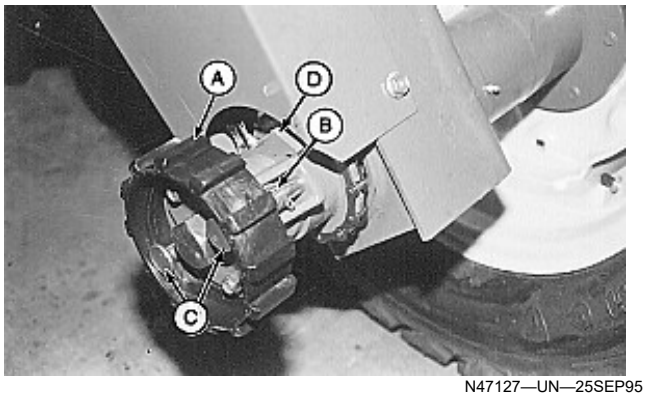
AG,OUO1074,495-19-29NOV17

Disengage Drive—3 m (10 ft) and 4.6 m (15 ft)



N47128—UN—25SEP95

Drive Engaged



N47127—UN—25SEP95

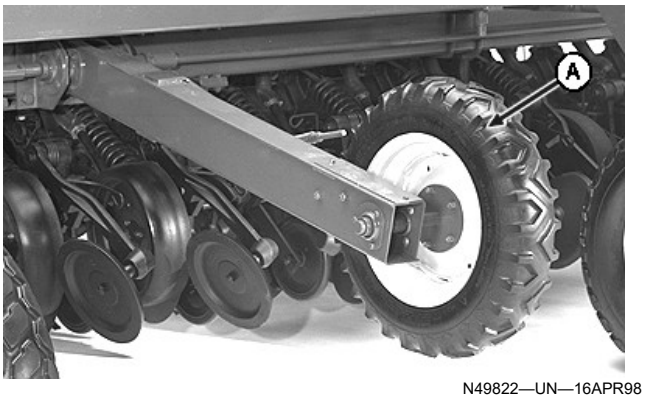
Drive Disengaged

A—Cam
B—Springs
C—Pins
D—Sprocket “ears”

Before transporting drill, be sure drive is disengaged. To move from engaged to disengaged position, turn outside cam (A) until springs (B) are compressed and pins (C) slide toward outside edge of cam. Drive is disengaged when pins move outward so inner ends no longer make contact with sprocket “ears” (D).

AG,OUO1074,496-19-22FEB00

Disengage Drive—6.1 m (20 ft)



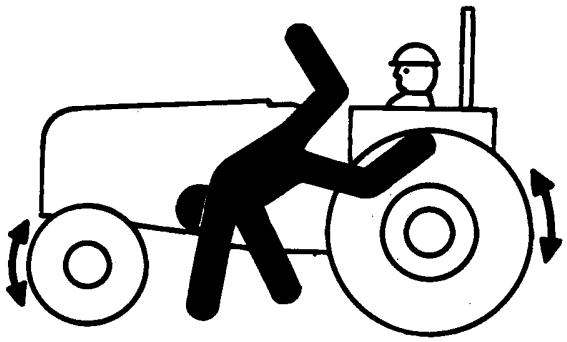
N49822—UN—16APR98

A—Drive Wheel

Drive wheel (A) is attached to rockshaft. When openers are raised, drive wheel is raised off ground and disengaged.

AG,OUO1074,497-19-22FEB00

Keep Riders Off Machine



TS290—UN—23AUG88

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

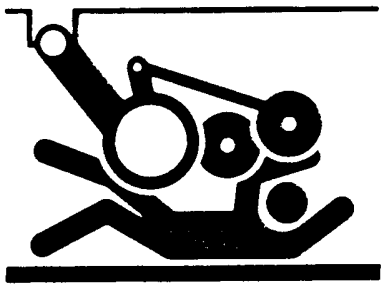
Riders on machine are subject to injury such as being struck by foreign objects and being thrown off of the machine. Riders also obstruct the operator's view resulting in the machine being operated in an unsafe manner.

DX,RIDER-19-03MAR93

Follow Safe Operating Procedures

N39213—UN—22SEP88

N39627—UN—22SEP88



N39645—UN—06OCT88

CAUTION: To help prevent severe injury or death to you or someone else:

Keep all persons away from machine when raising and lowering markers.

Follow all recommended operating procedures:

Operate drill from the tractor seat only.

Do not operate close to a ditch or creek.

Slow down when turning or traveling over rough ground.

Shut off tractor and shift to "Park" or set brakes when leaving tractor. Remove key when leaving tractor unattended.

Keep hands away from opener disks during opener adjustment.

Lock up opener lift cylinders before performing any maintenance or adjustments under machine.

AG,OUO1074,501-19-22FEB00

Use The Tractor Operator's Manual

TS190—UN—17JAN89

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

Following tractor related information uses John Deere tractors to illustrate preparation, attachment and operational procedures needed for the 1590 Grain Drill.

Use the tractor operator's manual for detailed information, as procedures will vary by equipment.

OUO6074,0000168-19-05DEC00

Guidelines for Use

CAUTION: Handle and apply fertilizers and chemically treated seeds according to manufacturers recommendations to keep from being severely injured.

IMPORTANT: To avoid metal corrosion and feed shaft binding or “freezing”, clean out all treated seed in box before storing drill (even over night).

1. Use recommended size tractor. (See Specifications section.)
2. Operate at a ground speed of 6 km/h (4 mph) to 10 km/h (6 mph).
3. Raise the openers out of the ground before backing up or making sharp turns in the field.
4. Start moving forward before lowering openers.
5. Adjust the openers individually to equalize the seeding depth.
6. Turn the feed shaft by hand before adding seed if the drill has been standing for a long period. If treated seed is used, turn shaft whenever drill has been standing for an hour or longer.
7. Check the tire pressure before seeding.
8. Check the seed rates.
9. To achieve proper seed placement, perform the necessary adjustments. (See Preparing the Grain Drill section.)

OUO6074,0000169-19-26FEB19

Level the Drill—Simple Hitch

IMPORTANT: Tighten the cap screws according to specifications in the torque chart.

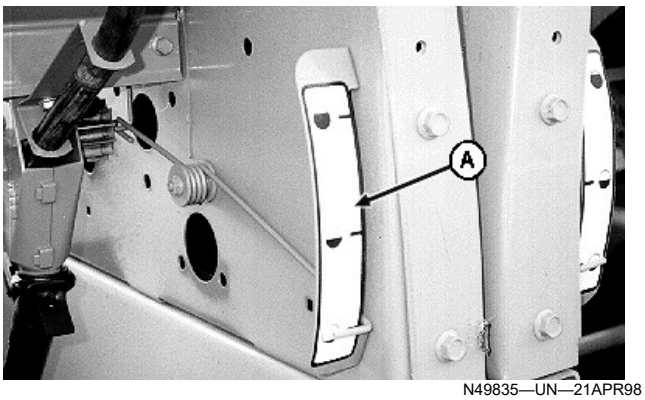
N47617—UN—24SEP96

Level operation requires that the simple hitch link be positioned flat and level to the tractor drawbar.

A variety of hitch link positions are available. Hitch position holes are in increments of 57 mm (2-1/4 in). If repositioning the hitch link to a different set of holes raises or lowers the front of the frame too far beyond level, hitch link can be turned over and returned to its original set of holes for a half-adjustment. Due to its offset shape, turning the link over changes hitch height by 28.5 mm (1-1/8 in).

OUO6074,0000752-19-29NOV17

Check Product Level



N49835—UN—21APR98

6 m (20 ft) Drill Shown

A—Gauge

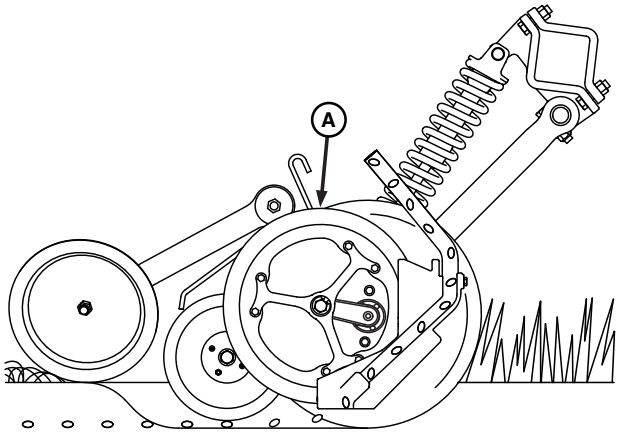
To determine how much product is in the box, use gauge (A).

AG,OUO1074,504-19-29NOV17

Principles of the Active Downforce System

NOTE: The active hydraulic downforce system requires a tractor equipped with closed center (pressure and flow compensated) hydraulics.

If the tractor has open center hydraulics, see your John Deere dealer for installation of an Open Center Hydraulic Kit with Change Valve.



A109469—UN—26MAR21

A—Depth Gauge Wheel

Active hydraulic downforce keeps the depth gauge wheel (A) in contact with the soil surface on uneven terrain. The depth gauge wheel adjustments determine seed depth, not downforce.

Soil composition, moisture, and residue cover determine the amount of downforce required to maintain soil contact and penetration.

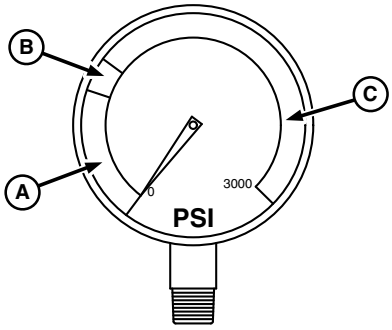
Do not use more downforce than necessary for the openers to penetrate the soil and for the depth gauge wheels to maintain firm contact with the soil.

The amount of downforce applied changes the operating angle of all the opener components. Too much or too little downforce causes the opener to operate at an inefficient angle. An inefficient operating angle results in inaccurate and uneven seed placement.

If rear transport wheels lift off the ground, downforce is adjusted too high or there is insufficient ballast.

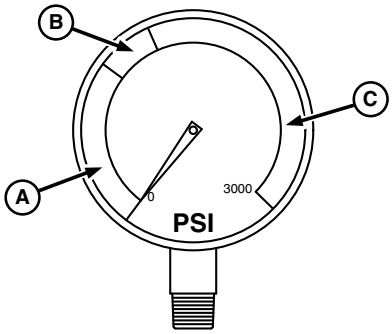
IMPORTANT: Avoid uneven opener penetration and variations in seeding depth. Reduce hydraulic downforce if the rear of the drill raises off the ground.

IMPORTANT: Excessive downforce increases wear on components. Use only as much downforce as necessary to achieve consistent operating depth.



N92119—UN—01JUN11

Gauge for 3 (10 ft) and 6 m (20 ft) Zones



N92120—UN—01JUN11

Gauge for 4.6 m (15 ft) Zones

A—Green Zone
B—Orange Zone
C—Red Zone

GREEN ZONE: Operate in this pressure zone when seeding into conventionally tilled fields with loosened soil. If openers appear to plow through the loose soil, operate with zero or low downforce. Do not operate above the upper limit of the green zone without ballast on the drill.

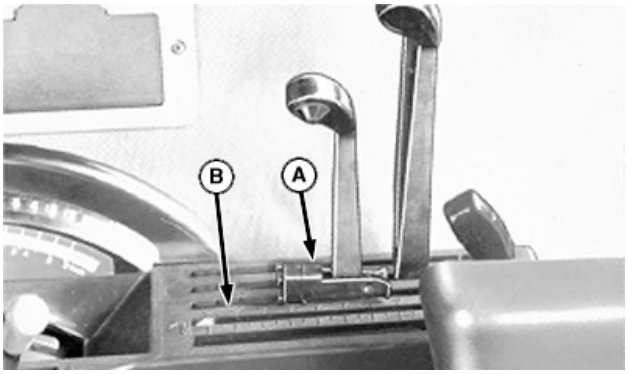
ORANGE ZONE: Operate in this pressure zone when seeding into soils with minimum or no tillage. To keep the depth gauge wheels in contact with the soil surface, additional ballast is needed. Avoid inaccurate seed placement. Do not operate the drill in this pressure range without additional ballast.

RED ZONE: Do not operate in this zone.

OUO6074,000016A-19-26MAR21

Lock SCV Lever for Active Downforce Operation

NOTE: The lever lock clip holds the lever in the continuous flow position for the downforce system.



RW5845—UN—17DEC01

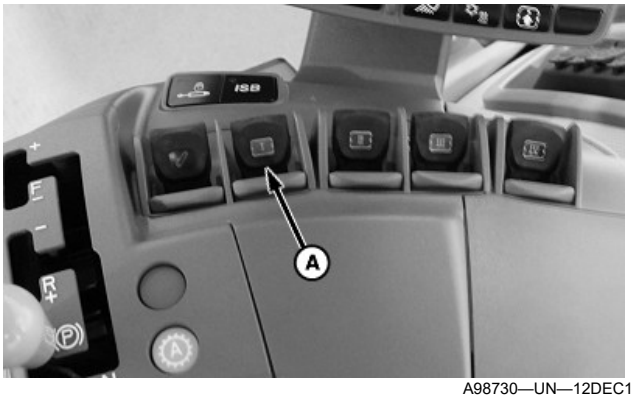
A—Lever Lock Clip
B—Downforce Position

55—60 Series Tractors: Lever lock clip (A) must be used to hold opener control lever in the downforce position (B). To install lever lock clip, see Install Lever Lock Clip—Tractors with Mechanical SCV Controls in Preparing the Tractor section.

A36437—UN—03MAR94

A—Detent Selector
B—Flow Rate Valve

6000, 6010, 7000 and 7010 Series Tractors: Rotate valve detent selector (A) to continuous detent to lock lever in forward position. Adjust flow rate valve (B) to rabbit position.



A98730—UN—12DEC17

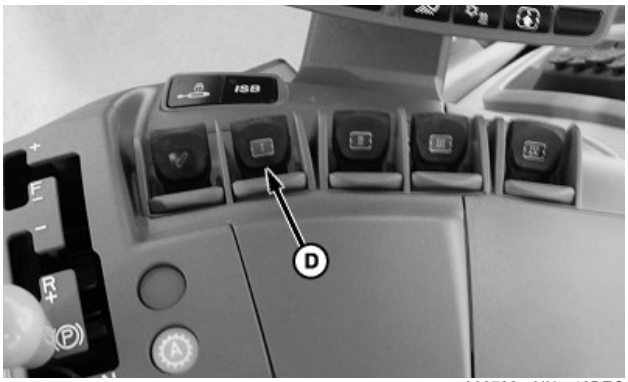
CommandARM

A—SCV I Lever

Electro/Hydraulic selective control valve (SCV) Controlled Tractors: Push SCV I lever (A) forward until detent click is heard. With SCV I time knob set to “continuous”, constant oil pressure goes to the downforce valve, as required, to maintain the chosen pressure setting.

OUO6074,000016B-19-13DEC17

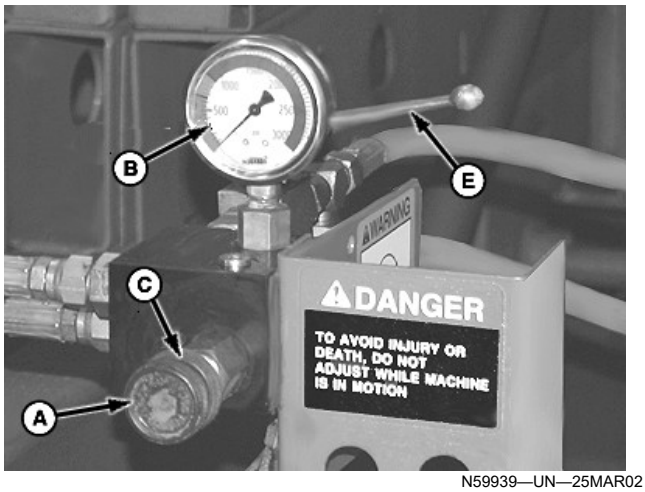
Adjust Opener Downforce—Tractors with Electro/Hydraulic SCV (Closed Center Systems)



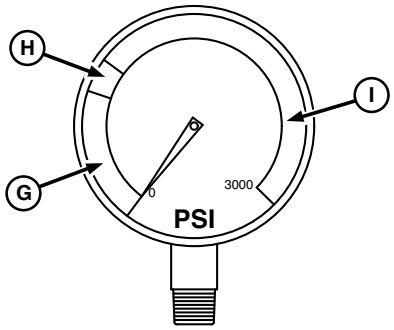
A98732—UN—12DEC17

CommandARM

N63071—UN—17JUN03



N59939—UN—25MAR02



N92118—UN—01JUN11

A—Dial, Adjustment
B—Pressure Gauge
C—Dial, Lock
D—SCV I Lever
E—Lock-Up Valve
F—Open Center Change Valve
G—Green Zone
H—Orange Zone
I—Red Zone

IMPORTANT: Lock-up valve (E) must be open to operate and closed to service the machine.

IMPORTANT: Avoid machine damage. Do not use excessive downforce. Use only enough hydraulic downforce to maintain firm contact between depth gauge wheels and soil.

NOTE: Active hydraulic system requires a tractor with closed-center (pressure and flow compensated) hydraulics.

NOTE: If machine is equipped with an open center change valve (F), valve must remain in the open position.

1. To determine an initial pressure setting, refer to Principals of the Active Hydraulic Opener Downforce System in this section.
2. Open valve (E).

NOTE: Time detent must be set to "continuous."

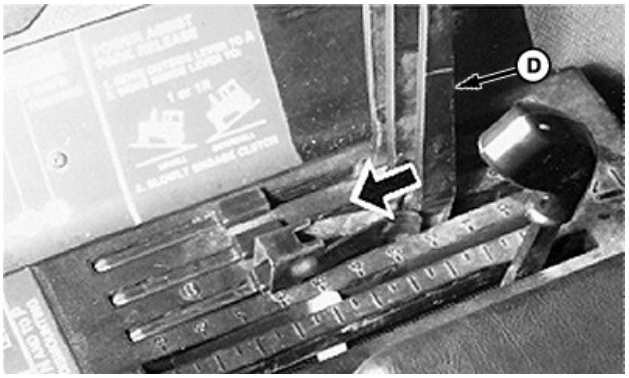
3. Activate opener lever (D) in the forward detent. (See the tractor Operator's Manual for details.)
4. Watch pressure gauge (B) and adjust downforce to the intended setting with dial (A). Once set, lock the dial-in position with dial (C). If gauge needle does not move, see Troubleshooting section in this manual.

NOTE: Performance varies based on quantity of the product in tanks.

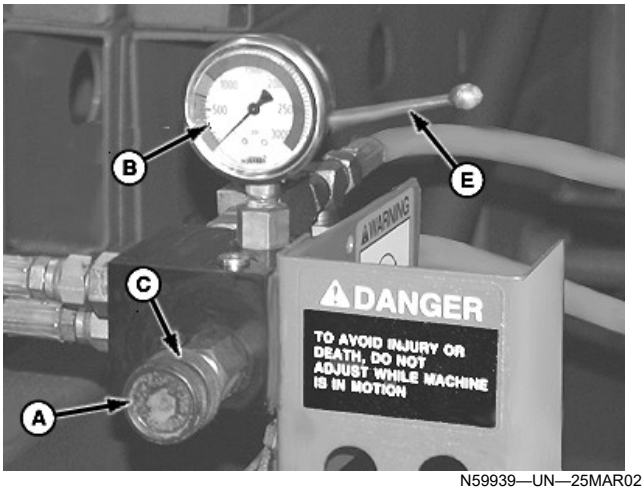
5. Make a trial pass in the field.
6. If opener penetration is not satisfactory, adjust hydraulic pressure for more downforce. If depth gauge wheel contact is adequate but depth of penetration is not, see Adjust Gauge Wheel and Seed Depth in Preparing the Grain Drill section. Also see Seed Opener Components and Adjustments in Preparing the Grain Drill section for more information.

OUO6074,0000758-19-26FEB19

Adjust Opener Downforce—Tractors with Mechanical SCV Levers (Closed Center Systems)

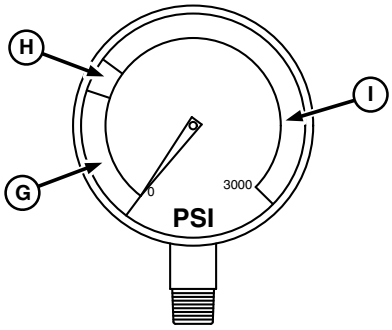


N92122—UN—24MAR11



N59939—UN—25MAR02

N63071—UN—17JUN03



N92118—UN—01JUN11

A—Dial, Adjustment
B—Presure Gauge
C—Dial, Lock
D—Lever
E—Lock-Up Valve
F—Open Center Change Valve
G—Green Zone
H—Orange Zone
I—Red Zone

IMPORTANT: Lock-up valve (E) must be open to operate and closed to service the machine.

IMPORTANT: Avoid machine damage. Do not use excessive downforce. Use only enough hydraulic downforce to maintain firm contact between depth gauge wheels and soil.

NOTE: Active hydraulic system requires a tractor with closed-center (pressure and flow compensated) hydraulics.

NOTE: If machine is equipped with an open center change valve (F), valve must remain in the open position.

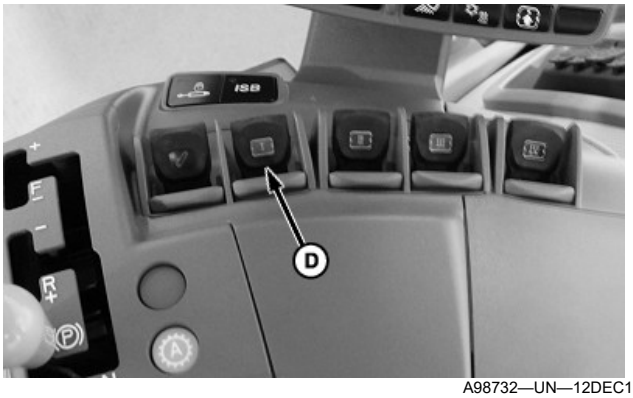
1. To determine an initial pressure setting, refer to Principals of the Active Hydraulic Opener Downforce System in this section.
2. Open valve (E).
3. To provide constant pressure and flow to rockshaft cylinders, push lever (D) forward into the lock-clip.
4. Watch pressure gauge (B) and adjust downforce to the intended setting with dial (A). Once set, lock the dial-in position with dial (C). If gauge needle does not move, see Troubleshooting section in this manual.

NOTE: Performance varies based on quantity of the product in the tanks.

5. Make a trial pass in the field.
6. If opener penetration is not satisfactory, adjust hydraulic pressure for more downforce. If depth gauge wheel contact is adequate but depth of penetration is not, see Adjust Gauge Wheel and Seed Depth in Preparing the Grain Drill section. Also see Seed Opener Components and Adjustments in Preparing the Grain Drill section for more information.

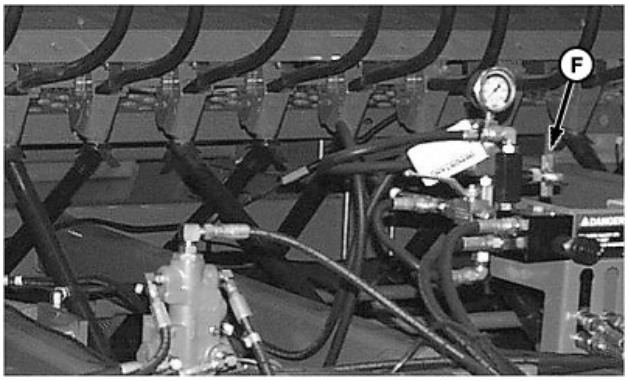
OUO6074,0000757-19-26FEB19

Adjust Opener Downforce—Tractors with Open Center Hydraulic Systems



A98732—UN—12DEC17

CommandARM



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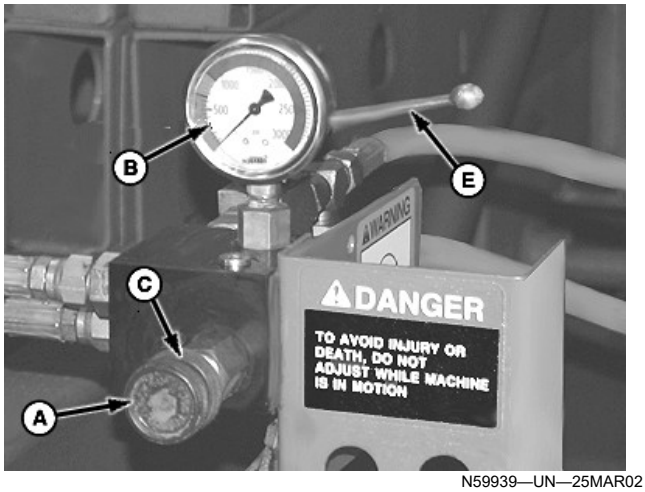
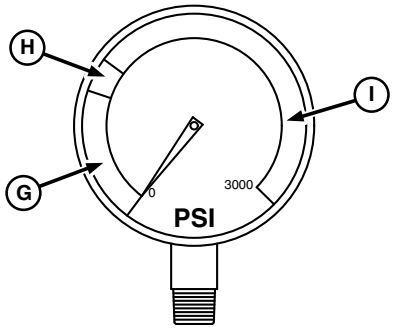


N59939—UN—25MAR02



N92118—UN—01JUN11

A—Dial, Adjustment
B—Pressure Gauge
C—Dial, Lock
D—SCV I Lever
E—Lock-Up Valve
F—Change Valve
G—Green Zone
H—Orange Zone
I—Red Zone

IMPORTANT: Lock-up valve (E) must be open to operate and closed to service the machine. Change valve (F) must be in closed position when operating.

IMPORTANT: If the tractor has an open center hydraulic system, drill must be equipped with Open Center Hydraulic Kit with Change Valve (F). (See your John Deere dealer for installation.)

1. To determine an initial pressure setting, refer to Principals of the Active Hydraulic Opener Downforce System in this section.
2. Place tractor transmission in park position and keep engine running.
3. Lower openers to the ground and continue to hold the SCV I lever (D) forward for a few seconds to pressurize the opener downforce system.
4. To determine if pressure requires adjustment, check gauge (B).

NOTE: One full turn equals approximately 1724 kPa (17.24 bar) (250 psi). Once set, lock dial (A) in position with dial (C).

NOTE: Gauge needle does not move as dial (A) is turned.

   a. To decrease the downforce setting, open change valve (F), turn dial (A) counterclockwise, and close valve (F).
   b. To increase the downforce, turn dial (A) clockwise.

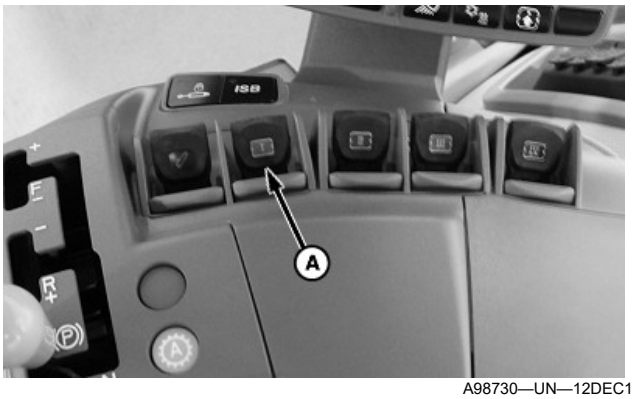
5. Raise and lower openers to the ground and continue to hold the SCV lever forward for a few seconds to pressurize the opener downforce system.
6. To determine if pressure requires adjustment, check gauge (B). If gauge needle is not at new setting, see Opener Downforce System—Tractor with Open-Center Hydraulics in the Troubleshooting section.
7. Close change valve (F).

NOTE: Performance varies based on quantity of the product in the tanks.

8. Make a trial pass in the field.
9. If opener penetration is not satisfactory or pressure drops during operation, activate SCV to repressurize system. If depth gauge wheel contact is adequate but depth of penetration is not, see Adjust Gauge Wheel and Seed Depth in Preparing the Grain Drill section. Also see Seed Opener Components and Adjustments in Preparing the Grain Drill section for more information.

OUO6074,0000755-19-26FEB19

Prepare to Operate Drill in Field



A98730—UN—12DEC17

A—SCV I Lever

1. Make sure that tractor and drill are properly prepared. (See Preparing the Tractor and Preparing the Grain Drill sections.) Check that proper connections have been made. (See Attaching And

Detaching section.) Engage drive wheel disconnect on 3 m (10 ft) and 4.6 m (15 ft) machines. (See Engaging Drive in this section.)

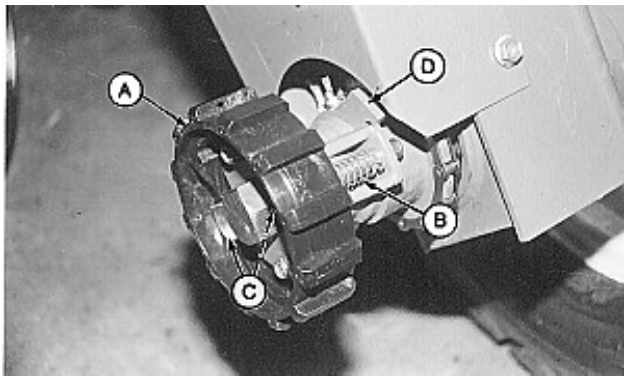
2. Place the tractor transmission in park and/or set the brakes and start the engine.
3. While moving forward, lower openers into the ground by pushing selective control valve (SCV) I lever (A) forward into the detent lock.
4. Operate the grain drill normally over a test distance.
5. Stop the grain drill and check seed placement.

   If seed placement is not as desired, make opener adjustments and/or reset active hydraulic downforce.

   If seed placement is as desired, return to tractor seat and continue with normal operations.

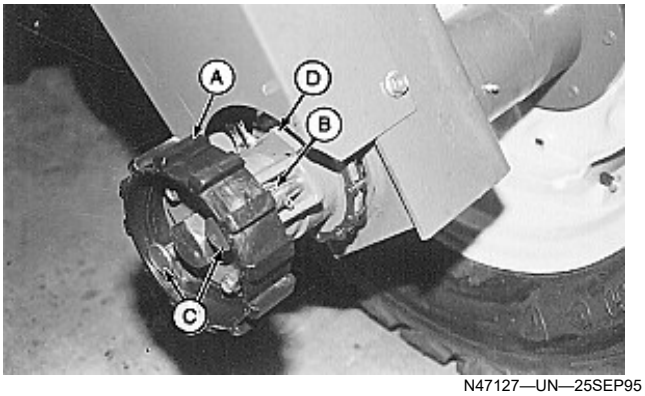
AG,OUO1074,510-19-19MAR19

Engage the Drive—3 m (10 ft) and 4.6 m (15 ft)



N47128—UN—25SEP95

Drive Engaged



N47127—UN—25SEP95

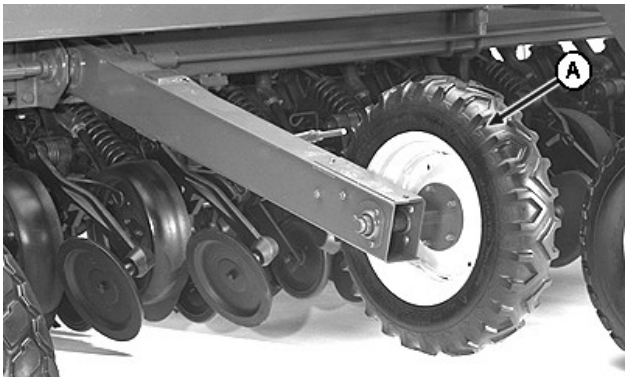
Drive Disengaged

A—Cam
B—Springs
C—Pins
D—Sprocket Tabs

Before operating 3 m (10 ft) and 4.6 m (15 ft) drills, be sure that drive wheel is engaged. To move from disengaged to engaged position, turn the outside cam (A) until springs (B) are released and pins (C) slide toward inside of the cam. Drive system is engaged when inner ends of pins make contact with sprocket tabs (D).

AG,OUO1074,511-19-29NOV17

Engage the Drive—6.1 m (20 ft)



N49822—UN—16APR98

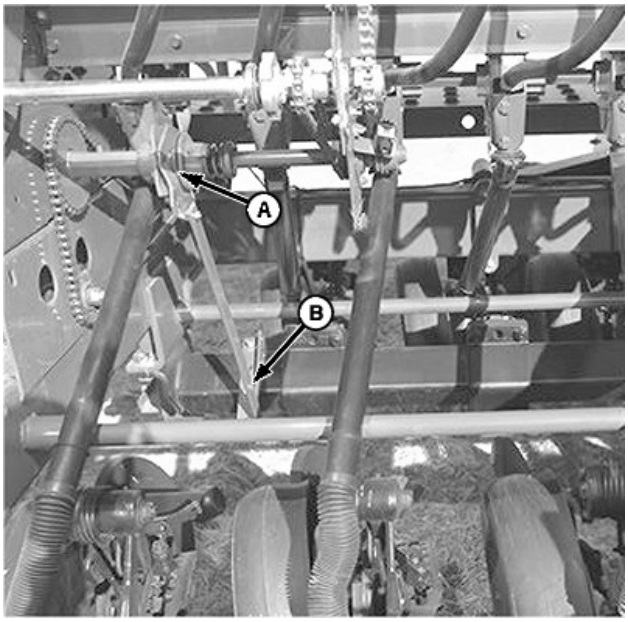
A—Drive Wheel

Drive wheel (A) is attached to the rockshaft. When the openers are lowered, the drive wheel is lowered to the ground and engaged.

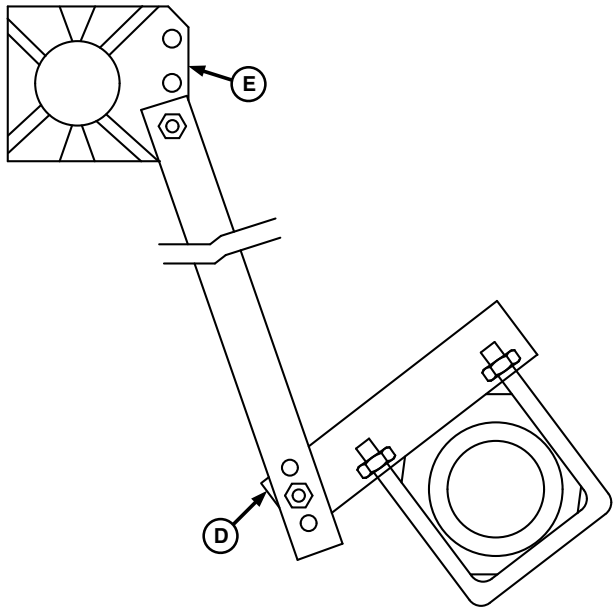
AG,OUO1074,512-19-29NOV17

Adjust Seed Clutch Engagement

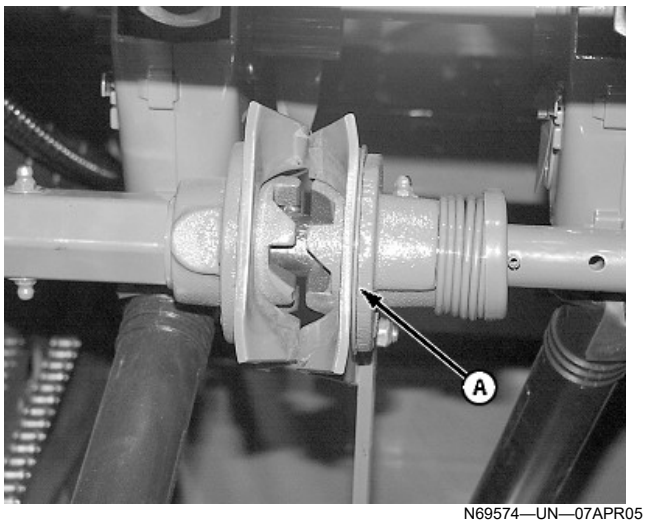
IMPORTANT: Always use the lower set of holes (D) when adjusting the clutch strap. Do not adjust using the upper set of holes (E) in the clutch.



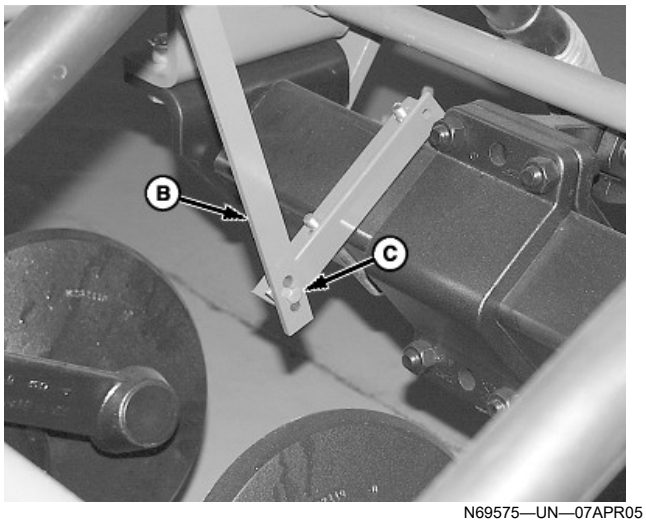
N69573—UN—03OCT06



N73997—UN—04OCT06



N69574—UN—07APR05



N69575—UN—07APR05

Adjustments At Lower End Of Strap

A—Clutch
B—Strap, Lower End
C—Cap Screw
D—Strap Holes
E—Clutch Holes

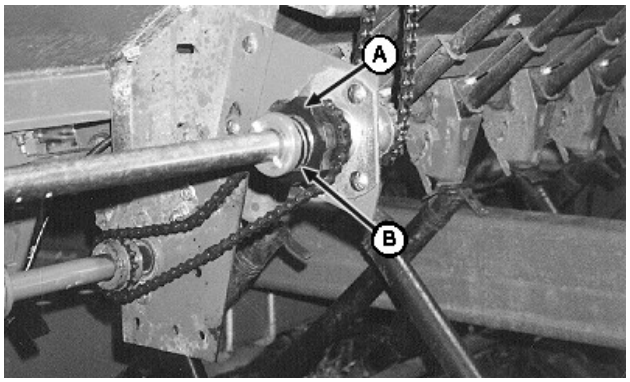
Seed clutch (A) is shipped with the lower end of strap (B) attached to rockshaft bracket with the cap screw (C) in the middle hole.

Seed clutch engages sooner when attached through the upper hole.

Seed clutch engages later when attached through the lower hole.

OUO6074,0000DDD-19-29NOV17

Engage/Disengage Grass Seed Drive



N49834—UN—21APR98

A—Coupling
B—Spring

To engage grass seed drive, turn disconnect coupling (A) so spring (B) slides coupling slot over roll pin.

To disengage grass seed drive, pull disconnect coupling (A) to outside, turn so slot is out of alignment with roll pin and allow coupling to rest against roll pin.

AG,OUO1074,513-19-22FEB00

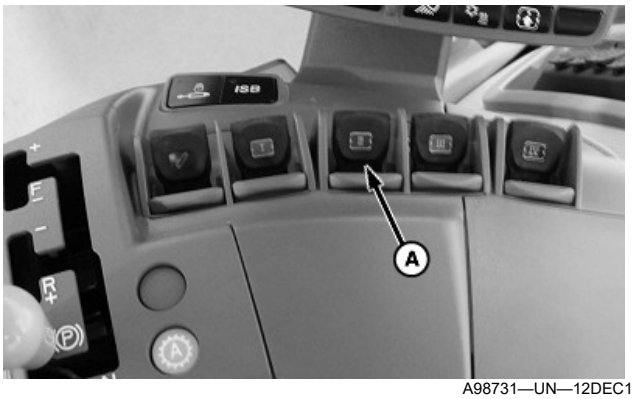
Operation in Wet Conditions

When operating in wet conditions, a solid “ribbon” of soil can cover the furrow, creating a seed tunnel which causes slow and/or erratic emergence.

No opener adjustment prevents soil “ribbon” from forming in wet soil. The only way to correct this problem is to delay seeding until the field is dry.

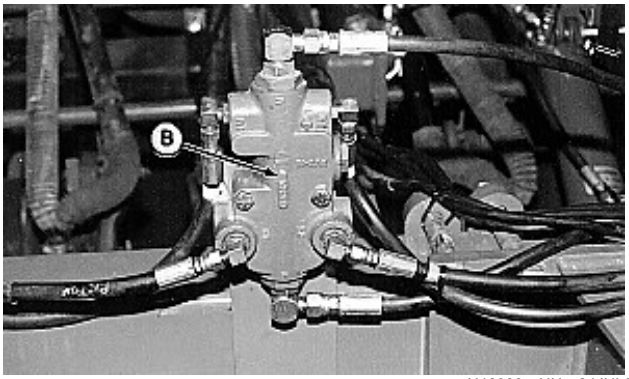
OUO6023,000016A-19-02MAR16

Operate Row Markers (If Equipped)



A98731—UN—12DEC17

CommandARM



N46983—UN—24JUL95

Alternating Valve

A—SCV II Lever
B—Alternating Valve

To raise and lower one marker at a time, move the selective control valve (SCV) II lever (A) forward and rearward.

An alternating valve (B) shifts oil flow each time the SCV lever returns to the neutral position.

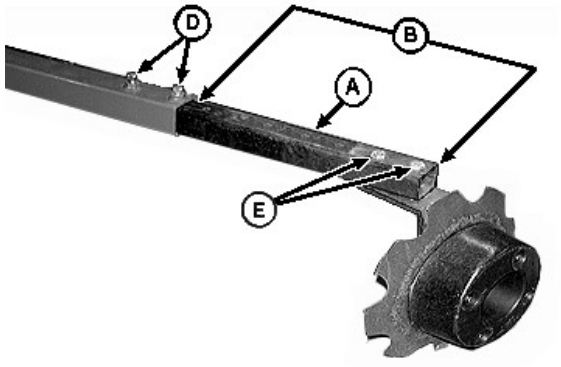
To lower both the markers at the same time, perform the following procedure:

1. Lower one marker.
2. Briefly move lever (A) rearward (to shift alternating valve).
3. Lower the other marker.

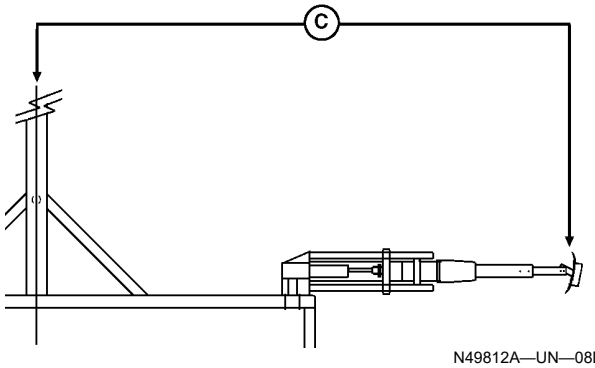
AG,OUO1074,515-19-05MAR18

Set Marker Length

NOTE: If the marker arms do not hold the position, drill indentations in the solid tube for the set screws to engage.



N50074—UN—08DEC98



N49812A—UN—08DEC98

4.6 m (15 ft) Machine Shown

A—Telescoping Arms
B—Dimension
C—Dimension
D—Set Screw (2 used)
E—Cap Screw and Nut (2 used)

1. Loosen nuts and set screws (D). Adjust telescoping arms (A) until approximately 482 mm (19 in) (B) of the arm is exposed. This position is the initial setting.
2. Adjust dimension (C) according to the following table.
3. Tighten set screws (D) and nuts.
4. Cap screw and nut (E) are used to set the disk angle and change the furrow. (See Adjust Marker Disk in this section.)

Marker Lengths for Narrow and Wide Row Spacing	
NARROW ROW SPACING	WIDE ROW SPACING

3 m (10 ft) Drill			
Planting on 19 cm (7.5 in) Rows		**Planting on 38 cm (15 in) Rows**	
Left-Hand Marker	Right-Hand Marker	Left-Hand Marker	Right-Hand Marker
Dimension (C) 305 cm (120 in)	Dimension (C) 305 cm (120 in)	Dimension (C) 305 cm (120 in)	Dimension (C) 286 cm (112.5 in)

4.6 m (15 ft) Drill			
Planting on 19 cm (7.5 in) Rows		**Planting on 38 cm (15 in) Rows**	
Left-Hand Marker	Right-Hand Marker	Left-Hand Marker	Right-Hand Marker
Dimension (C) 457 cm (180 in)	Dimension (C) 457 cm (180 in)	Dimension (C) 457 cm (180 in)	Dimension (C) 438 cm (172.5 in)

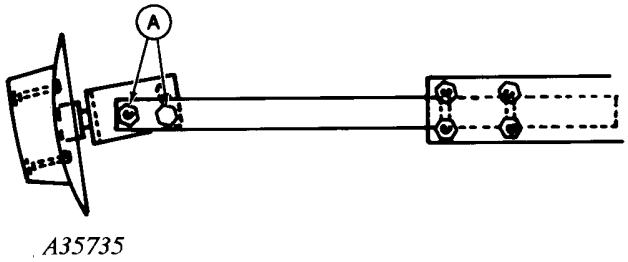
4.6 m (15 ft) Drill			
Planting on 25 cm (10 in) Rows		**Planting on 50 cm (20 in) Rows**	
Left-Hand Marker	Right-Hand Marker	Left-Hand Marker	Right-Hand Marker
Dimension (C) 457 cm (180 in)	Dimension (C) 457 cm (180 in)	Dimension (C) 432 cm (170 in)	Dimension (C) 457 cm (180 in)

6 m (20 ft) Drill			
Planting on 19 cm (7.5 in) Rows		**Planting on 38 cm (15 in) Rows**	
Left-Hand Marker	Right-Hand Marker	Left-Hand Marker	Right-Hand Marker
Dimension (C) 610 cm (240 in)	Dimension (C) 610 cm (240 in)	Dimension (C) 610 cm (240 in)	Dimension (C) 590 cm (232.5 in)

6 m (20 ft) Drill			
Planting on 25 cm (10 in) Rows		**Planting on 50 cm (20 in) Rows**	
Left-Hand Marker	Right-Hand Marker	Left-Hand Marker	Right-Hand Marker
Dimension (C) 610 cm (240 in)	Dimension (C) 610 cm (240 in)	Dimension (C) 584 cm (230 in)	Dimension (C) 610 cm (240 in)

AG,OUO1074,516-19-08MAR17

Adjust Marker Disk



A35735—UN—06SEP94

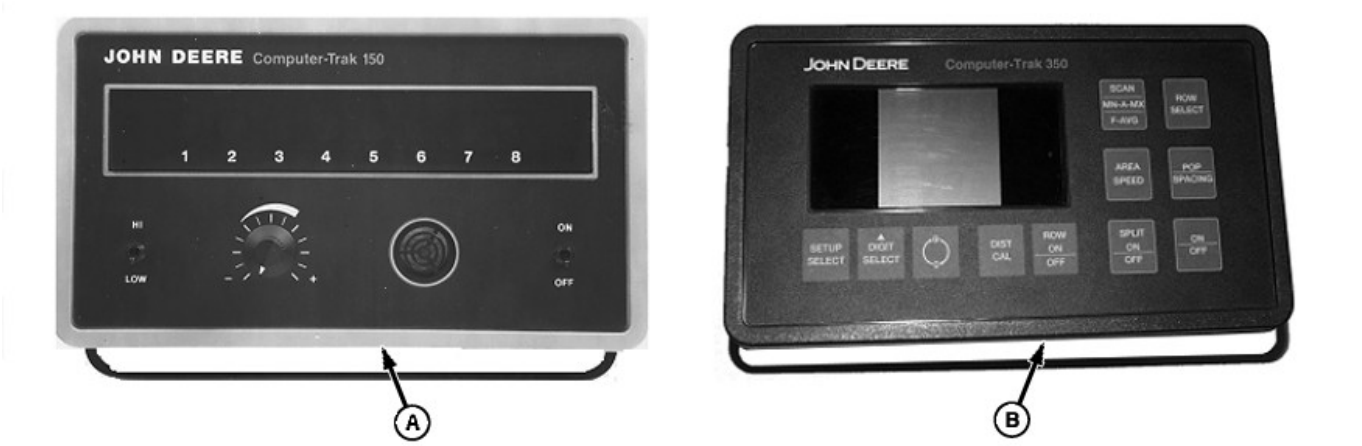
Left-Hand Marker Shown

A—Nuts

The marker disk creates a furrow in the soil. This adjustment changes the size of furrow. Increase the angle of disk, in relation to direction of travel, for a larger furrow.

OUO6074,0000AC4-19-23MAR11

Seed Monitor



A51973—UN—07MAR03

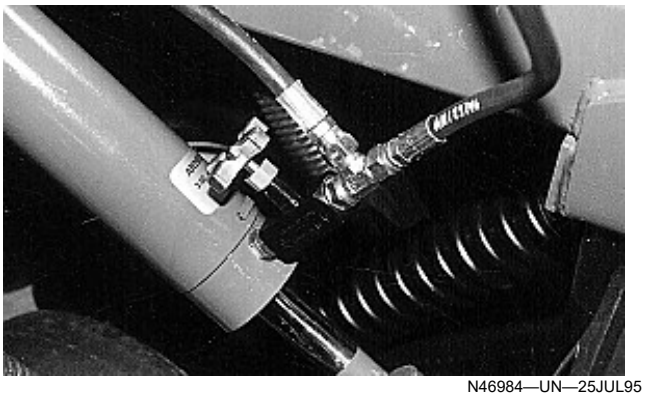
A—150 Monitor

If machine is equipped with ComputerTrak™ monitor, see operator's manual for operating instructions.

OUO6074,0000756-19-30JUL08

B—350 Monitor

Front Rank Lock-Up Valve



N46984—UN—25JUL95

Front rank lock-up valve is available for all machines.

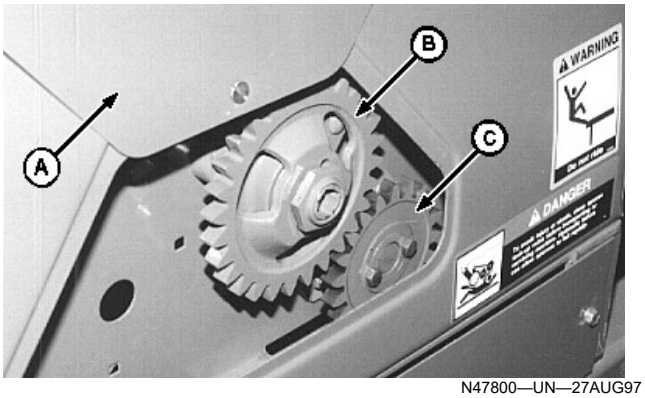
AG,OUO1074,519-19-22FEB00

Half-Speed Drive

Half-speed drive system is available for all sizes of machines. (See Attach Half-Speed Drive in this section for the installation procedure.)

AG,OUO1074,520-19-29NOV17

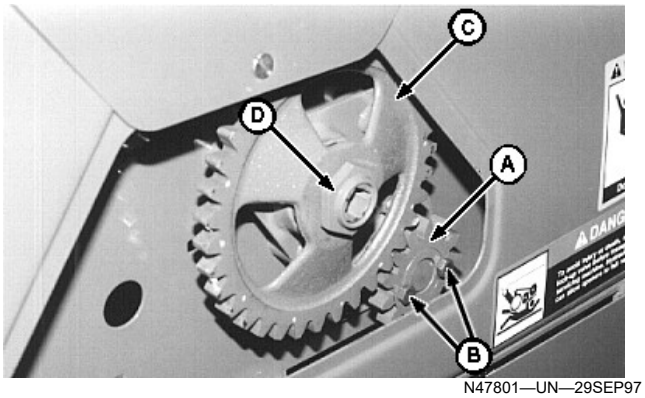
Attach Half-Speed Drive



N47800—UN—27AUG97

A—Cover
B—Gear (28-tooth)
C—Gear (20-tooth)

1. Open the side panel cover (A).
2. Remove the 28-tooth gear (B) and 20-tooth gear (C). Retain the gear mounting hardware.



N47801—UN—29SEP97

A—Gear (13-tooth)
B—Cap Screws (2 used)
C—Gear (35-tooth)
D—Nut

ComputerTrak is a trademark of Deere & Company

3. Install the 13-tooth gear (A) using the previously removed cap screws (B).
4. Install the 35-tooth gear (C) with the previously removed nut (D). Tighten the nut to specification and close the box cover.

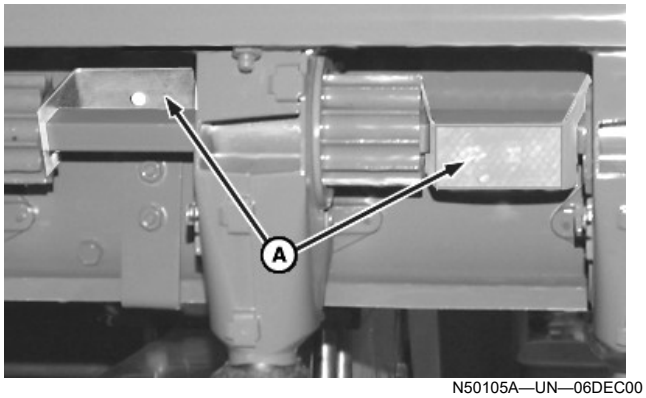
Specification

Nut—Torque (dry). . . . . 135 N·m (100 lb·ft)

5. **For 6.1 m (20 ft) Drills Only:** Repeat the procedure on the opposite side of the box.
6. Apply the half-speed drive label to the inside of the lid next to the seeding chart.

AG,OUO1074,521-19-11FEB19

Drillshaft Turn Indicator



N50105A—UN—06DEC00

A—Drillshaft Turn Indicator

The drillshaft turn indicator (A) can be installed to help confirm rotation of drillshaft.

See your John Deere dealer or qualified service provider to order.

OUO6074,000016C-19-11FEB19

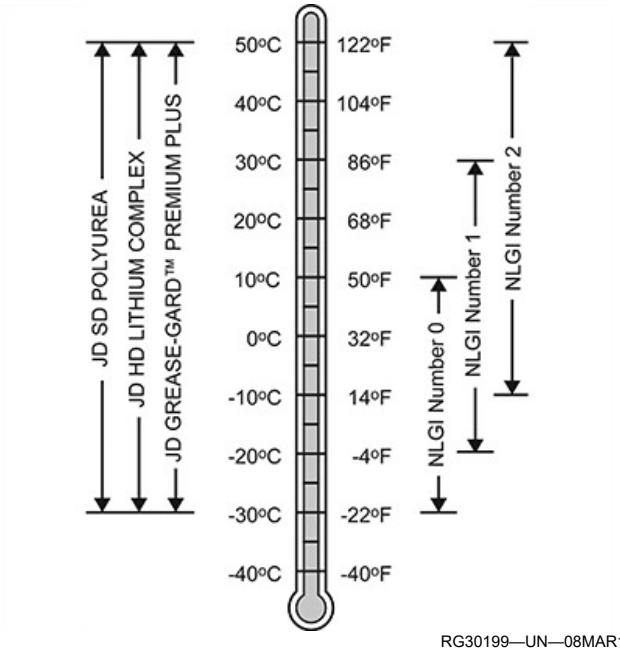
Lubricating and Maintaining Machine Safely

CAUTION: To help prevent personal injury caused by unexpected movement, be sure to service machine on a level surface. 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 safety stands to prevent movement.

AG,OUO1074,522-19-22FEB00

Multipurpose Extreme Pressure (EP) Grease

IMPORTANT: For automated lubrication systems different ambient air temperatures need to be considered.



RG30199—UN—08MAR18

Greases for Air Temperature Ranges

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 Grease-Gard™ Premium Plus

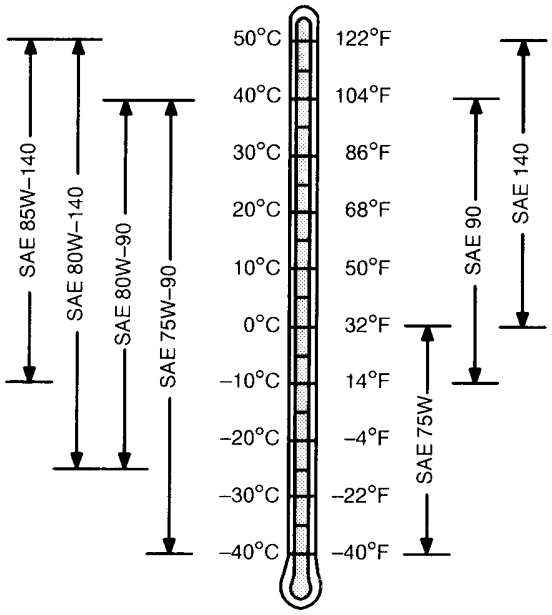
Other greases may be used if they meet the following:

- NLGI Performance Classification GC-LB
- ISO-L-X-BDHB 2 or DIN KP 2 N-10 Lithium Complex, Non-Synthetic Base Oil (100 to 220 mm2/s @ 40°C)

IMPORTANT: Some types of thickeners, base oils, and additives used in greases are not compatible with others. Mixing greases should be avoided. Consult your grease supplier before mixing different types of grease.

DX,GREA1-19-13JAN18

Gear Oil



TS1653—UN—14MAR96

Oil Viscosities for Air Temperature Ranges

Use oil viscosity based on the expected air temperature range during the period between oil changes.

The following oils are preferred:

- John Deere GL-5 Gear Lubricant
- John Deere EXTREME-GARD™

Other oils may be used if they meet the following:

- API Service Category GL-5

DX,GEOIL-19-14APR11

Grease-Gard is a trademark of Deere & Company

EXTREME-GARD is a trademark of Deere & Company

Alternative and Synthetic Lubricants

Conditions in certain geographical areas may require lubricant recommendations different from those printed in this manual.

Some John Deere brand coolants and lubricants may not be available in your location.

Consult your John Deere dealer to obtain information and recommendations.

Synthetic lubricants may be used if they meet the performance requirements as shown in this manual.

The temperature limits and service intervals shown in this manual apply to John Deere branded fluids or fluids that have been tested and/or approved for use in John Deere equipment.

Re-refined base stock products may be used if the finished lubricant meets the performance requirements.

DX,ALTER-19-13JAN18

Lubricant Storage

Your equipment can operate at top efficiency only when clean lubricants are used.

Use clean containers to handle all lubricants.

Store lubricants and containers in an area protected from dust, moisture, and other contamination. Store containers on their side to avoid water and dirt accumulation.

Make certain that all containers are properly marked to identify their contents.

Properly dispose of all old containers and any residual lubricant they may contain.

DX,LUBST-19-11APR11

Beginning and End of Season

Perform each lubrication and service illustrated in this section.

AG,OUO1074,527-19-22FEB00

Lubrication Symbols

A54361—UN—24MAY04

Lubricate with TY6350 John Deere Multi-Purpose Spray Lubricant as required.

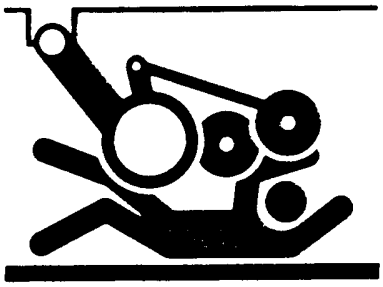
Lubricate with John Deere grease at an hourly interval indicated on symbol. If other greases are used, grease should contain 3—5% molybdenum disulfide.

Pack wheel bearings with axle bearing grease at hourly interval indicated on symbol.

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

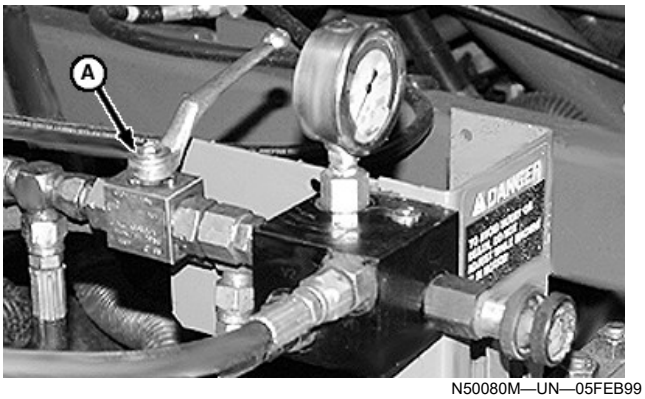
OUO6074,0000CB6-19-04DEC19

Lock-Up Rockshafts and Openers



N39645—UN—06OCT88

CAUTION: Hydraulic failure can allow openers to fall rapidly, causing injury or death. To avoid hazard, always lock openers in raised position before adjusting, lubricating or servicing machine.



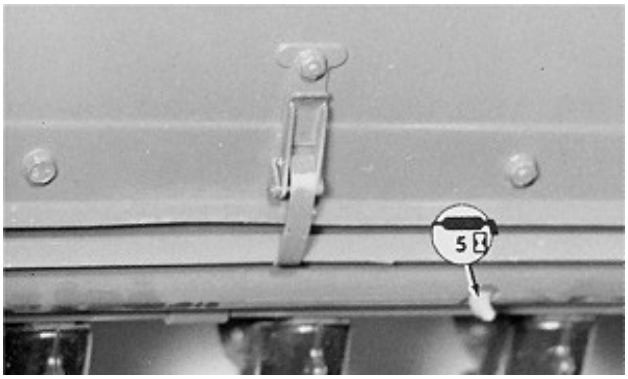
N50080M—UN—05FEB99

A—Lock-Up Valve

Fully retract rockshaft/opener cylinders and close lock-up valve (A).

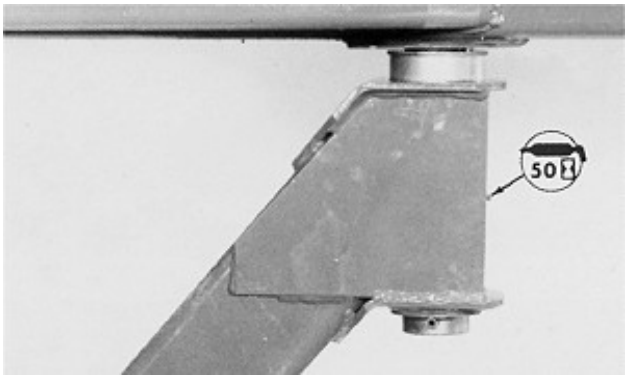
AG,OUO1074,529-19-22FEB00

Lubricate Fertilizer Feed Shaft Bearings



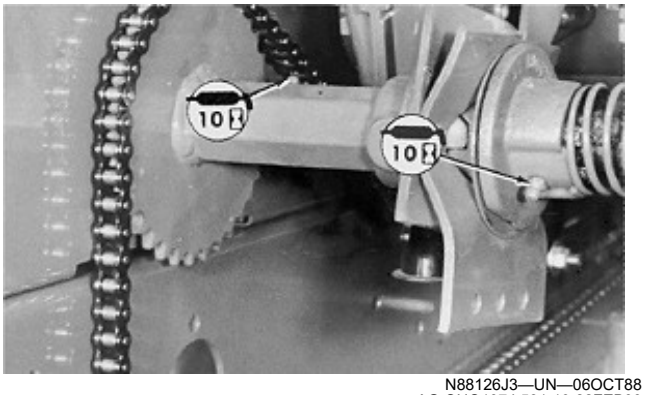
N88126M1—UN—06OCT88
AG,OUO1074,530-19-22FEB00

Lubricate Caster Wheel Pivot



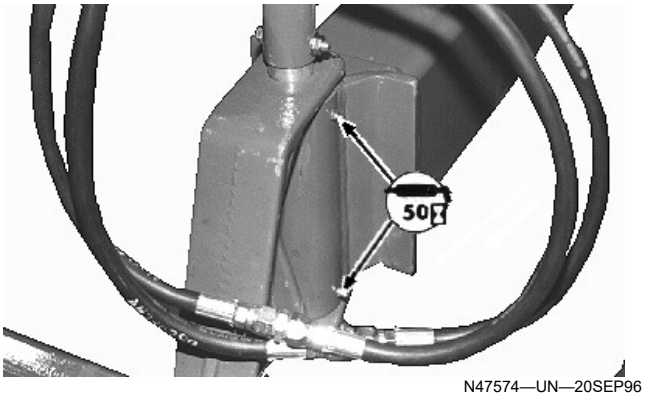
N88200C2—UN—27SEP88
AG,OUO1074,533-19-22FEB00

Lubricate Drive Clutch

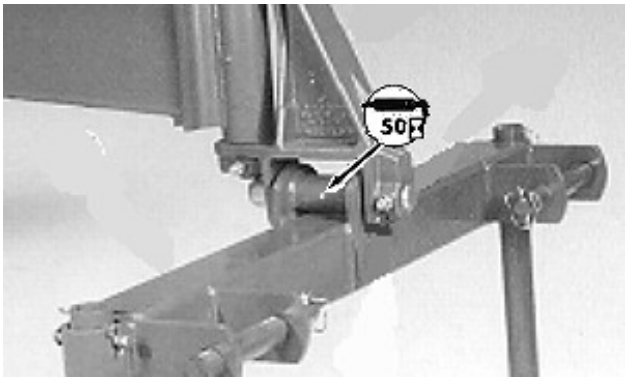


N88126J3—UN—06OCT88
AG,OUO1074,531-19-22FEB00

Lubricate Two-Point Hitch

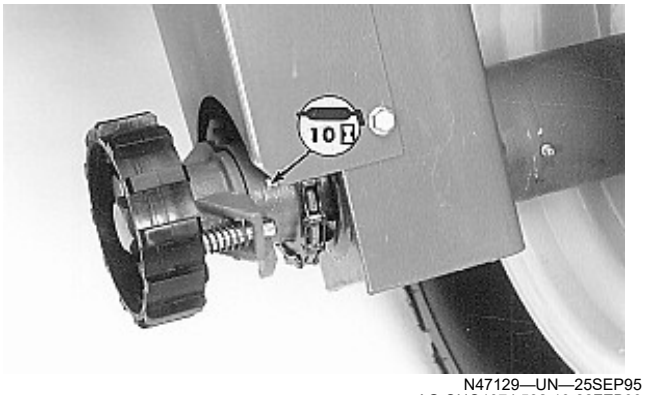


N47574—UN—20SEP96



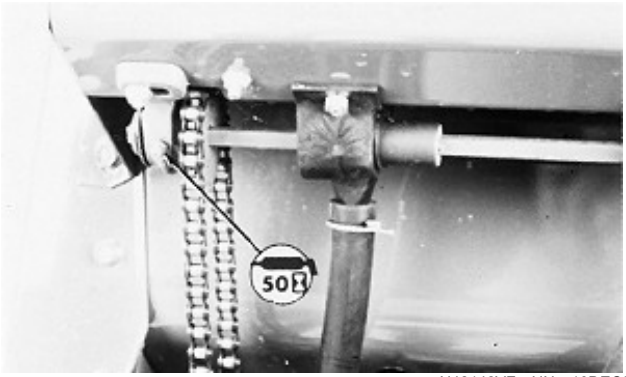
N47573—UN—24SEP96
AG,OUO1074,534-19-22FEB00

Lubricate Drive Wheel Disconnect



N47129—UN—25SEP95
AG,OUO1074,532-19-22FEB00

Lubricate Grass Seed Drive Shaft (If Equipped)

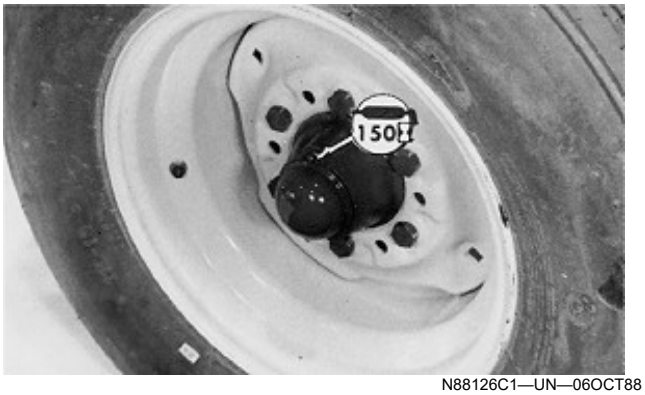


N42142VF—UN—10DEC93

Lubricate on each end of machine.

AG,OUO1074,535-19-22FEB00

Lubricate Wheel Bearings



N88126C1—UN—06OCT88

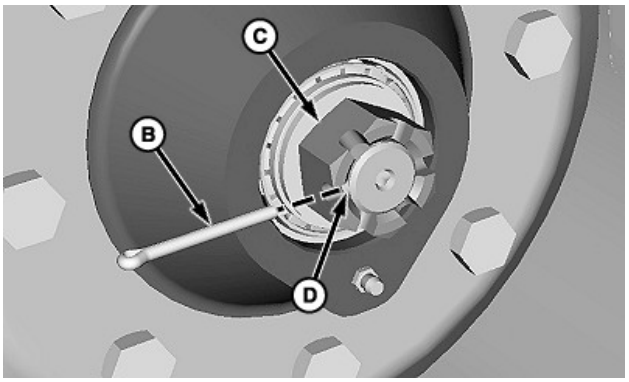
After the first 50 hours, remove hub caps and lubricate until grease flows through bearing. Replace hub cap and continue to lubricate until grease flows through seal on inside of hub.

Every 150 hours thereafter, lubricate until grease flows through seal on inside of hub.

AG,OUO1074,536-19-22FEB00

Check Wheel Bearings—500 Hours

A85373—UN—04MAR15



A85376—UN—04MAR15

A—Hub Cap
B—Cotter Pin
C—Castle Nut
D—Hole

To adjust the wheel bearing, proceed as follows:

1. Remove the center hub cap (A) and cotter pin (B).
2. Tighten castle nut (C) until there is a slight drag on the bearings while turning the wheel.
3. Tighten the castle nut to specification.

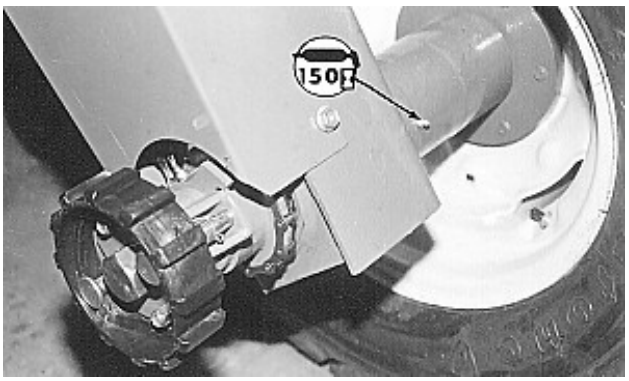
Specification

Castle Nut (C)—Torque (dry). . . . . 16 N·m (142 lb·in)

4. Back off the castle nut until the cotter pin can be installed in hole (D).
5. Install the previously removed hub cap.

BB83525,00005BD-19-11MAR19

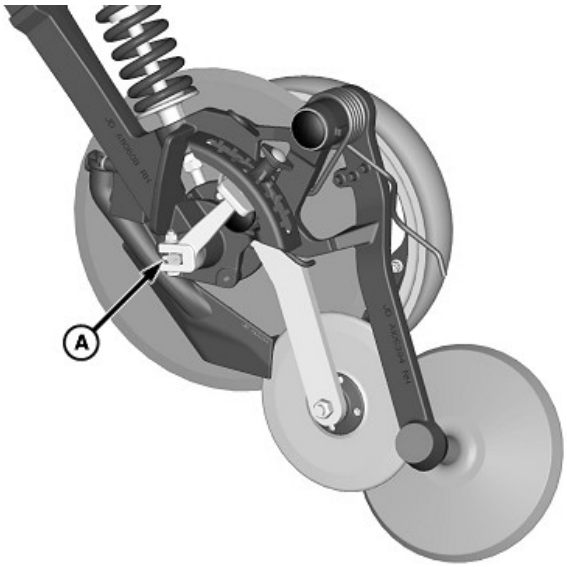
Lubricate Drive Wheel Hub



N47018—UN—07AUG95
AG,OUO1074,537-19-22FEB00

Lubricate Seed Opener

IMPORTANT: Do not use a clay based grease. Use TY6341 grease.



A99112—UN—22JAN18

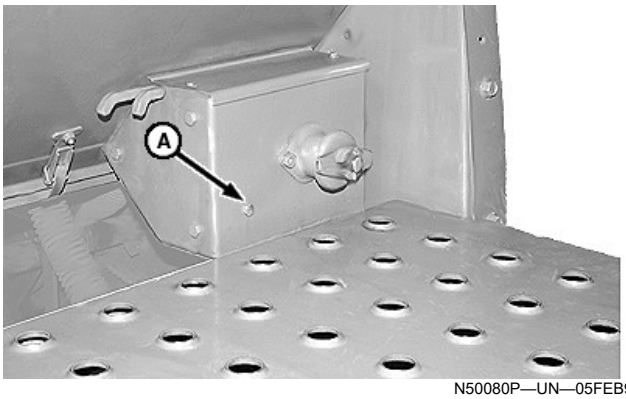
A—Depth Gauge Arm

Apply ten pumps of grease to each depth gauge arm (A) at the end of each season or once a year.

Cycle the depth gauge arm fully in each direction.

SH27916,00001C2-19-12FEB19

Check Fertilizer Gear Case Oil Annually



N50080P—UN—05FEB99

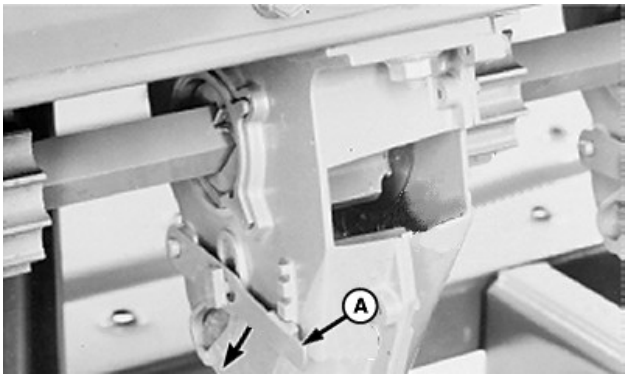
A—Gear Case Screw

Remove the gear case screw (A) annually to check the oil level. If no oil runs out, add oil through the hole or by removing the top cover. Change oil only if dirty by removing the pipe plug in the bottom of the gear case.

AG,OUO1074,538-19-30NOV17

Meter Components

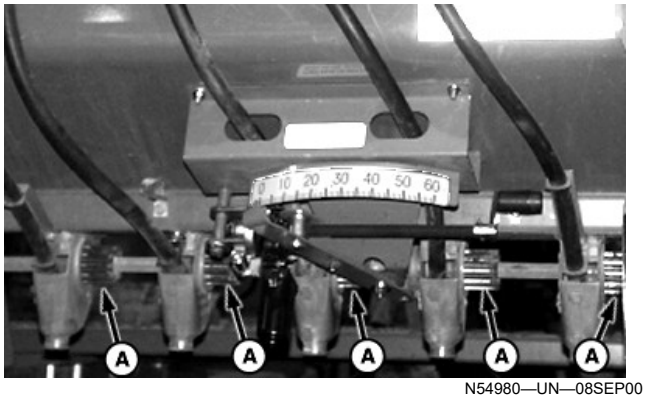
IMPORTANT: Clean and lubricate all meter components at end of planting season.



N55096—UN—11SEP00

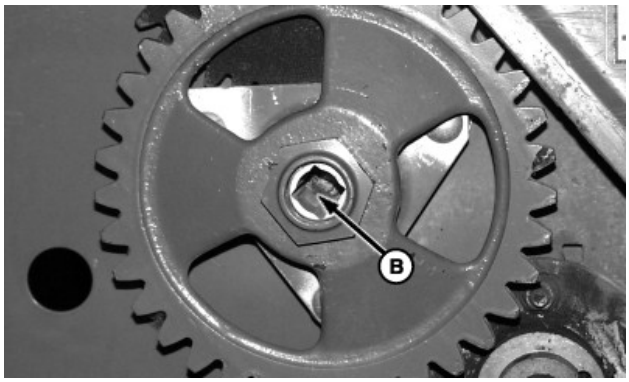
A—Latch

1. Move latch (A) on each feed cup downward off retaining teeth to open feed gate and empty feed cup.



N54980—UN—08SEP00

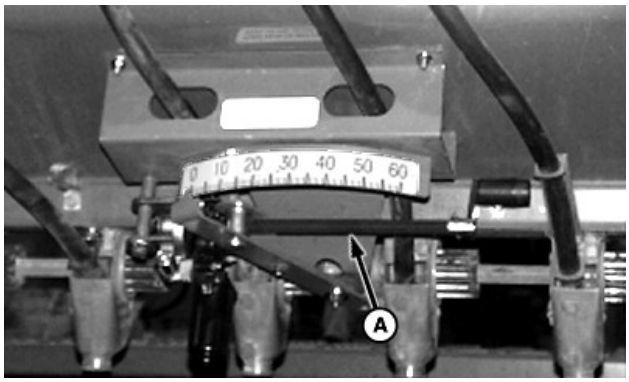
Electronic Rate Adjuster Shown



N55065—UN—08SEP00

A—Meter Rolls
B—Shaft

2. Clean and lubricate all fluted meter rolls (A) with light spray lubricant. Lubricate meter shaft (B) where it passes through hole in drive gear, located behind end panel access door, with light spray lubricant.



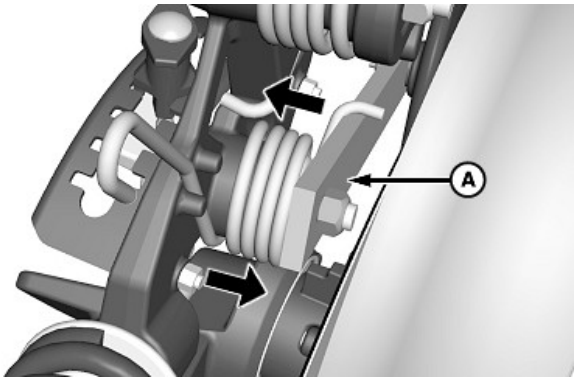
N55064—UN—07SEP00

A—Shaft

3. If equipped, lightly lubricate threaded shaft (A) on electronic rate adjuster.
4. Cycle rate adjuster full range to distribute lubricant.

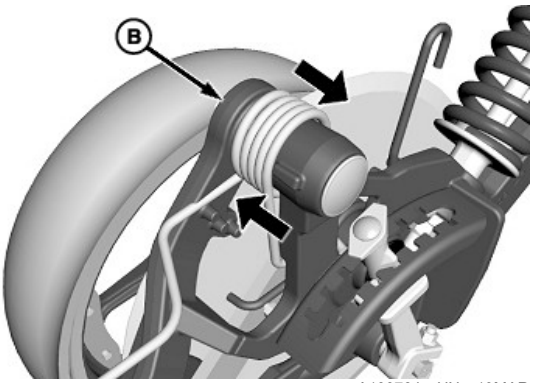
OUO6074,000047A-19-02NOV01

Check Opener Pivot Points—ProSeries™ Openers



A103783—UN—19MAR19

Press Wheel Arm



A103784—UN—19MAR19

Closing Wheel Arm

A—Pivot Point, Press Wheel Arm
B—Pivot Point, Closing Wheel Arm

Check the opener pivot points (A and B) for side-to-side movement at the beginning of the season.

If there is excessive side-to-side movement, replace the bushings. (See Repair Closing Wheel Assembly or Repair Press Wheel Assembly in the Servicing section.)

BB83525,00006CB-19-19MAR19

Troubleshooting

Openers

Symptom	Problem	Solution
Grain tubes and furrow openers plug.	High residue seed or lumpy fertilizer.	Use clean seed and dry, free-flowing fertilizer.
	Bottom of boot fills with dirt.	Raise furrow openers before stopping drill. If it is necessary to stop without raising furrow openers, do not allow drill to roll backward.
	Seed left in openers. Seeds swell over time.	Lower openers to clean out seed before parking overnight.
Mud builds up on press wheels and wheels stop turning.	Field too wet.	Allow field to dry.
Poor opener penetration.	Hard ground conditions.	Add suitcase weights. (See Install Suitcase Weights for Ballast in Preparing the Grain Drill section.)
		Increase the downforce.
	Excessive downforce.	Decrease the downforce if the left-hand rear wheel is lifting off ground during operation.
	Residue laying in bunches.	Spread residue evenly across field.
	Excessive field residue.	Adjust depth gauge wheel for deeper operation. (Add suitcase weights as required.)
		Increase the downforce.
	Dull disk openers.	Sharpen or replace disks.
	Disk opener worn too small.	Replace the disks.
Furrow not closing.	Closing wheel not adjusted properly.	Adjust closing wheel laterally. (See Position Seed Closing Wheel in Preparing the Grain Drill section.)
	Field is wet.	Allow field to dry.
Furrows covered with a solid ribbon of soil.	Field is wet.	Allow field to dry. A solid ribbon of soil (instead of loose soil) over the seed causes erratic or poor emergence.
Poor seed placement when drilling soybeans after corn while following old corn rows.	Opener depth gauge wheels ride directly on the row (over the corn root balls) and cause opener to bounce.	Use alternate opener pattern. (See Using an Alternate Opener Pattern in the Servicing section.)
Residue blowing after drilling.	Opener depth gauge wheels ride directly on the old row, loosening the residue.	Use alternate opener pattern.

Symptom	Problem	Solution
Furrow covered too deep with loose soil.	Rear openers throwing loose soil.	Decrease the opener downforce. (See Adjust Opener Downforce in Operating the Grain Drill section.)
		Operate slower.
		Raise boot on front rank.
Residue buildup in the front of openers.	Residue wedged between seed boot and disk opener.	Decrease the opener downforce. (See Adjust Opener Downforce in Operating the Grain Drill section.)
Uneven seed depth.	Residue laying in bunches.	Spread residue evenly across field. (Depth gauge wheel gauges from top of the residue encountered.)
	Inadequate downforce.	Increase the downforce to keep the depth gauge wheel in contact with the ground and/or install suitcase weights.
	Excessive downforce.	Decrease the downforce if the left-hand rear wheel is lifting off the ground during operation or install suitcase weights.
	Seed boots worn.	Install seed boot in the lower mounting hole for additional life or replace seed boot.

AG,OUO1074,539-19-26MAR19

Delivery System

Symptom	Problem	Solution
Bunching and skipping.	Stopping drill in field.	Stop at row ends.
	Convoluted seed hoses sag when drilling at shallow depths.	Slide convoluted hose lower on the steel seed tube to tighten hose.
Varying quantities drilled by individual feeds.	Seed bridging in box due to unclean seed, inoculation, treatment, or dampness.	Use agitators. (Available from your John Deere dealer or qualified service provider).
	Feed gates not all set the same.	Adjust gates. (See Set Feed Cups in Preparing the Grain Drill section.)
	Feed cup out of adjustment with the fluted feed roll.	Adjust feed. (See Reset Feed Cups in Preparing the Grain Drill section.)
Sensor reading low.	Sensor eye dirty.	Remove seed tube and clean sensor eye with bottle brush or cloth.
	Feed cup not calibrated.	Calibrate feed cup. (See Reset Fluted Feed Cups in the Servicing section.)

Symptom	Problem	Solution
Sensor reading high.	Feed cup not calibrated.	Calibrate feed cup. (See Reset Fluted Feed Cups in the Servicing section.)
Rate adjuster ratcheting instead of moving the index pointer when activated by hand held control unit.	Meter shaft and/or meters dirty, rusty, or corroded.	Lightly spray metallic meter shaft components, including hole in drive gear behind the end panel of the grain box, then manually crank index pointer full range of motion. (See the Lubrication and Maintenance section).
Rate adjuster not moving when activated by hand held control unit.	Faulty fuse.	Replace fuse.
	Harness damaged.	Repair or replace harness.
	Harness connections loose.	Fasten all connections tightly.
	Meter shaft and/or meters dirty, rusty, or corroded.	Lightly spray metallic meter shaft components, including hole in drive gear behind the end panel of the grain box, then manually crank index pointer full range of motion. (See the Lubrication and Maintenance section).
Seeds cracking.	Improper feed gate latch position.	Adjust feed cups properly. (See Set Feed Cups in Preparing the Grain Drill section.)
Quantities drilled not agreeing with the seed chart.	Feed gates improperly adjusted.	Adjust feed cup gates. (See Set Feed Cups in Preparing the Grain Drill section.)
	Heavier or lighter than average seed weight or varied seed size.	(See Perform Accurate Rate Checks, Use Density Meter, and/or Rate Charts in Preparing the Grain Drill section.)
	Feed cups not properly adjusted.	(See Set Feed Cups in Preparing the Grain Drill section.)
	Improper shift lever setting.	Correct setting. (See Set Manual or Electronic Grain Shifter in Preparing the Grain Drill section.)
Quantities drilled not agreeing with the fertilizer chart.	Using wrong fertilizer drive.	Check drive for proper gear and sprocket assembly. Be sure of the gear case setting. (See Set Fertilizer Feed Shaft Speed in Preparing the Grain Drill section.)
	Quantity drilled has not been checked.	(See Perform Accurate Rate Checks in Preparing the Grain Drill section.)

Symptom	Problem	Solution
	Fertilizer density other than 1041 kg/m^3 (65 lb per ft^3).	Set fertilizer rate for correct density. (See Use Density Meter and Fertilizer Rate Charts in Preparing the Grain Drill section.)
	Feed wheel installed incorrectly.	Install correctly. (See Replace Fertilizer Feed Wheels in the Servicing section.)
Flow of fertilizer stops.	Broken shear pin.	Install new shear pin.
Fertilizer spills out of feeds.	Baffles installed incorrectly.	Install baffles correctly. (See Clean Fertilizer Box in the Storing section.)
Acre meter tallying incorrectly.	Double tracking, or leaving too wide a space between rows on each trip across field.	Drive carefully; leave same space between the seeded strip as the furrow opener spacing on the drill.
	Plot of land contains more or less land than assumed.	Measure land.

AG,OUO1074,540-19-19MAR19

Opener Downforce System

Symptom	Problem	Solution
Pressure gauge near zero when openers are lowered and SCV lever is held forward for a few seconds.	Hose routing between the pressure control valve and opener cylinders incorrect.	Route hoses per Hydraulic Diagram—Opener Cylinders. (See Downforce Hose Routing in the Servicing section.)
Pressure gauge shows pressure as openers are raised.	Hose routing between the pressure control valve and opener cylinders incorrect.	Route hoses per Hydraulic Diagram—Opener Cylinders. (See Downforce Hose Routing in the Servicing section.)
Openers rise when SCV is held forward and lower when SCV is held rearward.	Hydraulic hoses are connected to tractor incorrectly.	Interchange hoses in SCV coupler.
Pressure gauge shows zero when openers are down.	Valve is in the float or neutral position.	Install R52667 SCV clip in proper position on 55-60 Series Tractors to hold SCV lever forward, valve open. Rotate valve detent selector to continuous detent to lock lever in forward position on 6000, 6000 Ten, 7000, and 7000 Ten Series Tractors. Push SCV control forward until detent click is heard. Set time detent to “continuous” on electrohydraulic SCV controlled tractors.

Symptom	Problem	Solution
Openers do not "float" over undulating ground.	SCV lever is not in the forward position.	Install R52667 SCV clip in proper position on 55-60 Series Tractors. Rotate valve detent selector to continuous detent to lock lever in forward position on 6000, 6000 Ten, 7000, and 7000 Ten Series Tractors. Push SCV control forward until detent click is heard. Set time detent to "continuous" on electrohydraulic SCV controlled tractors.
No reading on gauge.	Using an open center tractor.	Install open center hydraulic kit with a change valve from your John Deere dealer.
Openers drift down after being raised.	There may be contamination in the V1 ball check assembly or the piston seal in the hydraulic cylinder may be leaking.	Close transport valve and disconnect hydraulic hoses to the tractor SCV. If openers still continue to drop, see your John Deere dealer or qualified service provider.

AG,OUO1074,541-19-04APR17

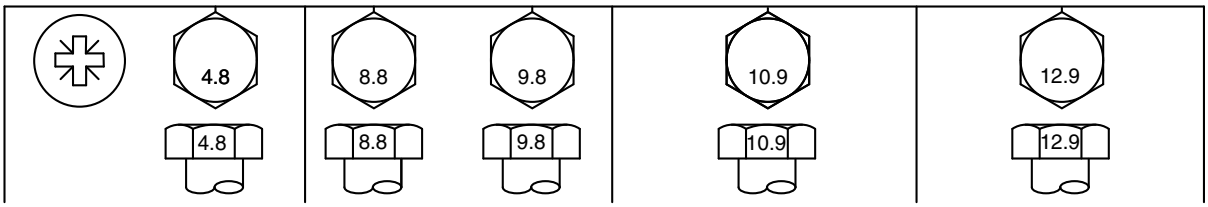
Opener Downforce System—Tractor with Open Center Hydraulics

Symptom	Problem	Solution
Downforce does not function.	Lock-up valve closed.	Open lock-up valve.
Pressure gauge shows zero when openers are down.	SCV lever in float position.	Put SCV lever in neutral position.
	SCV lever not held forward long enough to charge downforce system.	When lowering openers, hold SCV lever forward long enough for the downforce system to reach preset pressure as shown on pressure gauge.
Openers do not maintain proper ground contact.	SCV lever not held forward long enough to charge downforce system.	When lowering openers, hold SCV lever forward long enough for the downforce system to reach preset pressure as shown on pressure gauge.
	Slow internal hydraulic leakage. (Normal with all hydraulic systems.)	Hold SCV lever forward long enough for the downforce system to reach preset pressure as shown on pressure gauge.
	More hydraulic pressure required.	Increase preset hydraulic pressure.
Preset pressure does not lower when turning valve dial counterclockwise.	Open center attachment traps oil in system until openers are raised.	Raise and lower openers to reset to lower pressure.
	Pressure valve sticks.	Disassemble valve and clean.

Symptom	Problem	Solution
Preset pressure does not rise when turning valve dial clockwise.	No pressure to the adjusting valve.	Hold SCV #1 in forward position for a few seconds.
	Hose couplers not connected properly to tractor.	Ensure that hose couplers are connected to proper SCV and locked.
Openers drift down after being raised.	There may be contamination in the V1 ball check assembly or the piston seal in the hydraulic cylinder may be leaking.	Close transport valve and disconnect hydraulic hoses to the tractor SCV. If openers still continue to drop, see your John Deere dealer.

AG,OUO1074,542-19-06APR17

Metric Bolt and Screw Torque Values



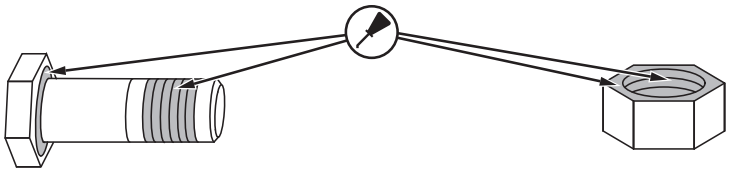
TS1742—UN—31MAY18

Bolt or Screw Size	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Hex Head[a]		Flange Head[b]		Hex Head[a]		Flange Head[b]		Hex Head[a]		Flange Head[b]		Hex Head[a]		Flange Head[b]	
	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	3.6	31.9	3.9	34.5	6.7	59.3	7.3	64.6	9.8	86.7	10.8	95.6	11.5	102	12.6	112
									N·m	lb·ft	N·m	lb·ft	N·m	lb·ft	N·m	lb·ft
M8	8.6	76.1	9.4	83.2	16.2	143	17.6	156	23.8	17.6	25.9	19.1	27.8	20.5	30.3	22.3
			N·m	lb·ft	N·m	lb·ft	N·m	lb·ft								
M10	16.9	150	18.4	13.6	31.9	23.5	34.7	25.6	46.8	34.5	51	37.6	55	40.6	60	44.3
	N·m	lb·ft														
M12	—	—	—	—	55	40.6	61	45	81	59.7	89	65.6	95	70.1	105	77.4
M14	—	—	—	—	87	64.2	96	70.8	128	94.4	141	104	150	111	165	122
M16	—	—	—	—	135	99.6	149	110	198	146	219	162	232	171	257	190
M18	—	—	—	—	193	142	214	158	275	203	304	224	322	245	356	263
M20	—	—	—	—	272	201	301	222	387	285	428	316	453	334	501	370
M22	—	—	—	—	365	263	405	299	520	384	576	425	608	448	674	497
M24	—	—	—	—	468	345	518	382	666	491	738	544	780	575	864	637
M27	—	—	—	—	683	504	758	559	973	718	1080	797	1139	840	1263	932
M30	—	—	—	—	932	687	1029	759	1327	979	1466	1081	1553	1145	1715	1265
M33	—	—	—	—	1258	928	1398	1031	1788	1319	1986	1465	2092	1543	2324	1714
M36	—	—	—	—	1617	1193	1789	1319	2303	1699	2548	1879	2695	1988	2982	2199

The nominal torque values listed are for general use only with the assumed wrenching accuracy of 20%, such as a manual torque wrench.
DO NOT use these values if a different torque value or tightening procedure is given for a specific application.
For lock nuts, for stainless steel fasteners, or for nuts on U-bolts, see the tightening instructions for the specific application.

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 that fastener threads are clean.
- Apply a thin coat of Hy-Gard™ or equivalent oil under the head and on the threads of the fastener, as shown in the following image.
- Be conservative with the amount of oil to reduce the potential for hydraulic lockup in blind holes due to excessive oil.
- Properly start thread engagement.

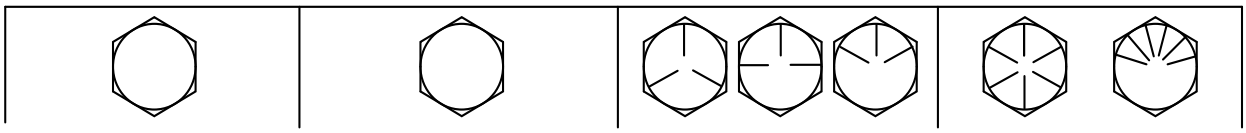


TS1741—UN—22MAY18

[a] *Hex head column values are valid for ISO 4014 and ISO 4017 hex head, ISO 4162 hex socket head, and ISO 4032 hex nuts.*
[b] *Hex flange column values are valid for ASME B18.2.3.9M, ISO 4161, or EN 1665 hex flange products.*

DX,TORQ2-19-30MAY18

Unified Inch Bolt and Screw Torque Values



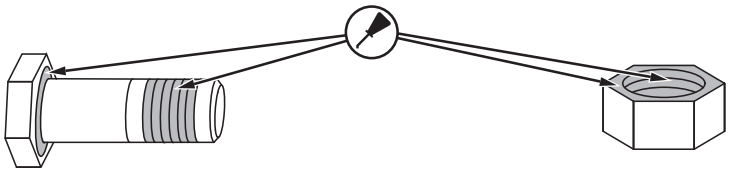
TS1671—UN—01MAY03

Bolt or Screw Size	SAE Grade 1[a]				SAE Grade 2[b]				SAE Grade 5, 5.1 or 5.2				SAE Grade 8 or 8.2			
	Hex Head[c]		Flange Head[d]		Hex Head[c]		Flange Head[d]		Hex Head[c]		Flange Head[d]		Hex Head[c]		Flange Head[d]	
	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	3.1	27.3	3.2	28.4	5.1	45.5	5.3	47.3	7.9	70.2	8.3	73.1	11.2	99.2	11.6	103
													N·m	lb·ft	N·m	lb·ft
5/16	6.1	54.1	6.5	57.7	10.2	90.2	10.9	96.2	15.7	139	16.8	149	22.2	16.4	23.7	17.5
									N·m	lb·ft	N·m	lb·ft				
3/8	10.5	93.6	11.5	102	17.6	156	19.2	170	27.3	20.1	29.7	21.9	38.5	28.4	41.9	30.9
					N·m	lb·ft	N·m	lb·ft								
7/16	16.7	148	18.4	163	27.8	20.5	30.6	22.6	43	31.7	47.3	34.9	60.6	44.7	66.8	49.3
	N·m	lb·ft	N·m	lb·ft												
1/2	25.9	19.1	28.2	20.8	43.1	31.8	47	34.7	66.6	49.1	72.8	53.7	94	69.3	103	75.8
9/16	36.7	27.1	40.5	29.9	61.1	45.1	67.5	49.8	94.6	69.8	104	77	134	98.5	148	109
5/8	51	37.6	55.9	41.2	85	62.7	93.1	68.7	131	96.9	144	106	186	137	203	150
3/4	89.5	66	98	72.3	149	110	164	121	230	170	252	186	325	240	357	263
7/8	144	106	157	116	144	106	157	116	370	273	405	299	522	385	572	422
1	216	159	236	174	216	159	236	174	556	410	609	449	785	579	860	634
1-1/8	305	225	335	247	305	225	335	247	685	505	751	554	1110	819	1218	898
1-1/4	427	315	469	346	427	315	469	346	957	706	1051	775	1552	1145	1703	1256
1-3/8	564	416	618	456	564	416	618	456	1264	932	1386	1022	2050	1512	2248	1658
1-1/2	743	548	815	601	743	548	815	601	1665	1228	1826	1347	2699	1991	2962	2185

The nominal torque values listed are for general use only with the assumed wrenching accuracy of 20%, such as a manual torque wrench.
DO NOT use these values if a different torque value or tightening procedure is given for a specific application.
For lock nuts, for stainless steel fasteners, or for nuts on U-bolts, see the tightening instructions for the specific application.

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 that fastener threads are clean.
- Apply a thin coat of Hy-Gard™ or equivalent oil under the head and on the threads of the fastener, as shown in the following image.
- Be conservative with the amount of oil to reduce the potential for hydraulic lockup in blind holes due to excessive oil.
- Properly start thread engagement.

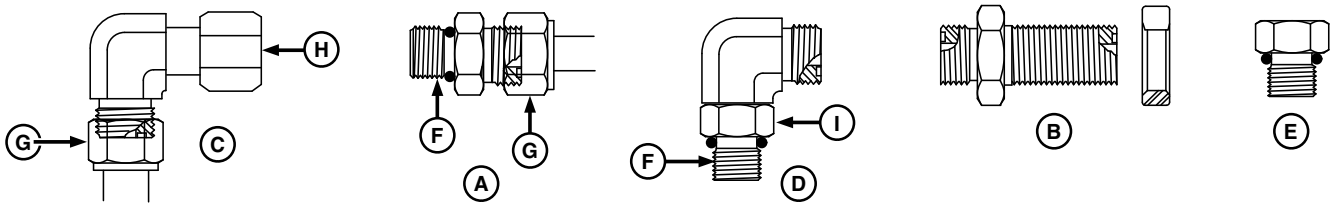


TS1741—UN—22MAY18

[a]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]Grade 2 applies for hex cap screws (not hex bolts) up to 6 in (152 mm) long.
[c]Hex head column values are valid for ISO 4014 and ISO 4017 hex head, ISO 4162 hex socket head, and ISO 4032 hex nuts.
[d]Hex flange column values are valid for ASME B18.2.3.9M, ISO 4161, or EN 1665 hex flange products.

DX,TORQ1-19-30MAY18

Metric Face Seal and O-Ring Stud End Fitting Torque Chart—Standard Applications



N79757—UN—13FEB08

A—Stud Straight and Tube Nut
B—Bulkhead Union and Bulkhead Lock Nut
C—90° Swivel Elbow and Tube Nut
D—90° Adjustable Stud Elbow
E—Port Plug
F—Stud End
G—Tube Nut
H—Swivel Nut
I—Lock Nut

Metric Face Seal and O-Ring Stud End Fitting Torque Chart—Standard Pressure-Below 27.6 MPa (4000 psi)																	
Nominal Tube OD Hose ID				O-Ring Face Seal/ Tube Swivel Nut				Bulkhead Jam Nut Torque[A]			O-Ring Straight, Adjustable, and External Port Plug Stud Ends[A]						
Metric Tube OD	Inch Tube OD			Thread Size	Swivel Nut Hex Size	Tube Nut and Swivel Nut Torque		Jam Nut Hex Size	Jam Nut Torque		Thread Size	Straight Hex Size[B]	Adj Lock Nut Hex Size	Steel or Gray Iron Torque		Aluminum or Brass Torque[C]	
mm	Dash Size	in	mm	in	mm	N·m	lb·ft	mm	N·m	lb·ft	mm	mm	mm	N·m	lb·ft	N·m	lb·ft
4	-2	Note: Use the heavy-duty torque chart on these sizes.															
5	-3																
6	-4																
8	-5																
10	-6																
12	-8																
16	-10																
20	-12	0.7-50	19.0-5	1-3/16-12	36	102	75	41	175	129	M27 x 2	32	32	100	74	67	49
22	-14	0.8-75	22.2-3	1-3/16-12	36	102	75	41	175	129	M30 x 2	36	36	130	96	87	64
25	-16	1.0-00	25.4-0	1-7/16-12	41	142	105	46	247	182	M33 x 2	41	41	160	118	107	79
28	—	—	—	—	—	—	—	—	—	—	M38 x 2	46	46	176	130	117	87
32	-20	1.2-50	31.7-5	1-11/16-12	50	190	140	50	328	242	M42 x 2	50	50	210	155	140	103
38	-24	1.5-00	38.1-0	2-12	60	217	160	60	374	276	M48 x 2	55	55	260	192	173	128
50	-32	2.0-00	50.8-0	—	—	—	—	—	—	—	M60 x 2	65	65	315	232	210	155

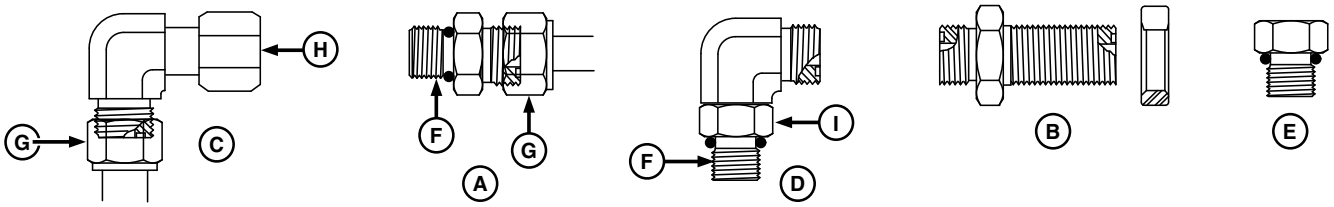
[A] Tolerance is plus 15%, minus 20% of mean tightening torque unless otherwise specified.

[B] The straight hex key wrench sizes listed apply to connectors only and may not be the same as the corresponding plug of the same thread size.

[C] These torques were established using steel-plated connectors in aluminum and brass.

BB83525,00007ED-19-06DEC19

Metric Face Seal and O-Ring Stud End Fitting Torque Chart—Heavy-Duty Applications



N79757—UN—13FEB08

A—Stud Straight and Tube Nut
B—Bulkhead Union and Bulkhead Lock Nut
C—90° Swivel Elbow and Tube Nut
D—90° Adjustable Stud Elbow
E—Port Plug
F—Stud End
G—Tube Nut
H—Swivel Nut
I—Lock Nut

Metric Face Seal and O-Ring Stud End Fitting Torque Chart

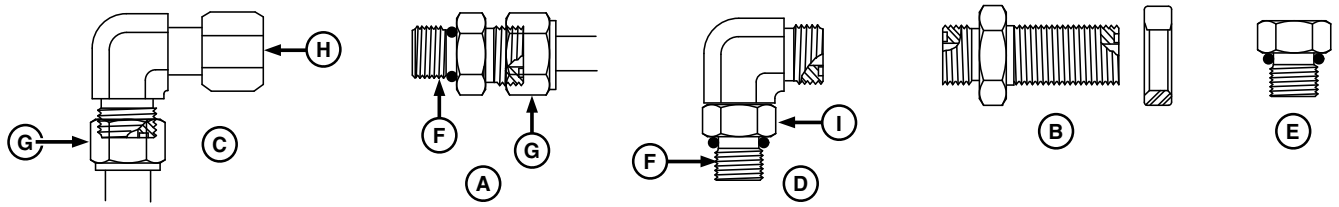
Nominal Tube OD Hose ID				O-Ring Face Seal/ Tube Swivel Nut				Bulkhead Jam Nut Torque[A]			O-Ring Straight, Adjustable, and External Port Plug Stud Ends[A]				
Metric Tube OD	Inch Tube OD			Thread Size	Swivel Nut Hex Size	Tube Nut/ Swivel Nut Torque		Jam Nut Hex Size	Jam Nut Torque		Thread Size	Straight Hex Size[B]	Adj Lock Nut Hex Size	Steel or Gray Iron Torque	
mm	Dash Size	in	mm	in	mm	N·m	lb·ft	mm	N·m	lb·ft	mm	mm	mm	N·m	lb·ft
4	-2	0.125	3.18	—	—	—	—	—	—	—	M8 x 1	12	12	8	6
5	-3	0.188	4.76	—	—	—	—	—	—	—	M10 x 1	14	14	15	11
6	-4	0.250	6.35	9/16-18	17	24	18	22	32	24	M12 x 1.5	17	17	35	26
8	-5	0.312	7.92	—	—	—	—	—	—	—	M14 x 1.5	19	19	45	33
10	-6	0.375	9.53	11/16-16	22	37	27	27	42	31	M16 x 1.5	22	22	55	41
12	-8	0.500	12.70	13/16-16	24	63	46	30	93	69	M18 x 1.5	24	24	70	52
16	-10	0.625	15.88	1-14	30	103	76	36	118	87	M22 x 1.5	27	27	100	74
20	-12	0.750	19.05	1-3/16-12	36	152	112	41	175	129	M27 x 2	32	32	170	125
22	-14	0.875	22.23	1-3/16-12	36	152	112	41	175	129	M30 x 2	36	36	215	159
25	-16	1.000	25.40	1-7/16-12	41	214	158	46	247	182	M33 x 2	41	41	260	192
28	—	—	—	—	—	—	—	—	—	—	M38 x 2	46	46	320	236
32	-20	1.250	31.75	1-11/16-12	—	286	211	50	328	242	M42 x 2	50	50	360	266
38	-24	1.500	38.10	2-12	—	326	240	60	374	276	M48 x 2	55	55	420	310

[A] Tolerance is plus 15%, minus 20% of mean tightening torque unless otherwise specified.

[B] The straight hex key wrench sizes listed apply to connectors only and may not be the same as the corresponding plug of the same thread size.

BB83525,00007EF-19-03DEC19

SAE Face Seal and O-Ring Stud End Fitting Torque Chart—Standard Applications



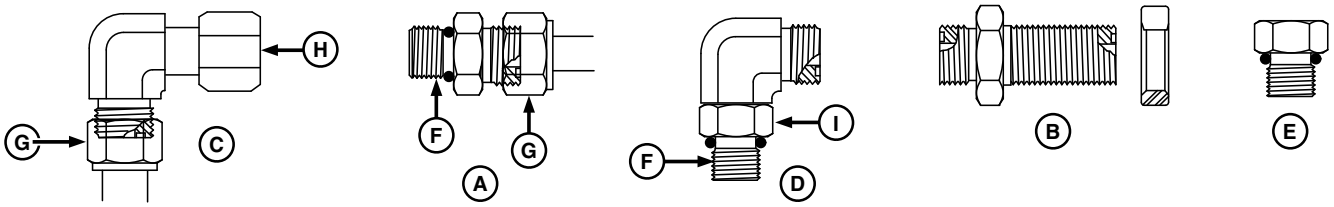
N79757—UN—13FEB08

A—Stud Straight and Tube Nut
B—Bulkhead Union and Bulkhead Lock Nut
C—90° Swivel Elbow and Tube Nut
D—90° Adjustable Stud Elbow
E—Port Plug
F—Stud End
G—Tube Nut
H—Swivel Nut
I—Lock Nut

SAE Face Seal and O-Ring Stud End Fitting Torque Chart—Standard Pressure-Below 27.6 MPa (4000 psi)																	
Nominal Tube OD Hose ID				**O-Ring Face Seal/ Tube Swivel Nut**				**Bulkhead Jam Nut Torque[A]**			**O-Ring Straight, Adjustable, and External Port Plug Stud Ends[A]**						
Metric Tube OD	Inch Tube OD			Thread Size	Swivel Nut Hex Size	Tube Nut and Swivel Nut Torque		Jam Nut Hex Size	Jam Nut Torque		Thread Size	Straight Hex Size[B]	Adj Lock Nut Hex Size	Steel or Gray Iron Torque		Aluminum or Brass Torque[C]	
mm	Dash Size	in	mm	in	in	N·m	lb·ft		N·m	lb·ft	in	in	in	N·m	lb·ft	N·m	lb·ft
5	-3	**Note: Use the heavy-duty torque chart on these sizes.**															
6	-4																
8	-5																
10	-6																
12	-8																
16	-10																
20	-12	0.750	19.05	1-3/16-12	1-3/8	10-2	75	1-1/2	17-5	1-29	1-1/16-12	1-1/4	1-3/8	102	75	68	50
22	-14	0.875	22.23	1-3/16-12	—	10-2	75	—	17-5	1-29	1-3/16-12	1-3/8	1-1/2	122	90	81	60
25	-16	1.000	25.40	1-7/16-12	1-5/8	14-2	10-5	1-3/4	24-7	1-82	1-5/16-12	1-1/2	1-5/8	142	105	95	70
32	-20	1.25	31.75	1-11/16-12	1-7/8	19-0	14-0	2	32-8	2-42	1-5/8-12	1-3/4	1-7/8	190	140	127	93
38	-24	1.50	38.10	2-12	2-1/4	21-7	16-0	2-3/8	37-4	2-76	1-7/8-12	2-1/8	2-1/8	217	160	145	107
50.8	-32	2.000	50.80	—	—	—	—	—	—	—	2-1/2-12	2-3/4	2-3/4	311	229	207	153
[A] Tolerance is plus 15%, minus 20% of mean tightening torque unless otherwise specified.																	
[B] The straight hex key wrench sizes listed apply to connectors only and may not be the same as the corresponding plug of the same thread size.																	
[C] These torques were established using steel-plated connectors in aluminum and brass.																	

BB83525,00007EE-19-03DEC19

SAE Face Seal and O-Ring Stud End Fitting Torque Chart—Heavy-Duty Applications



N79757—UN—13FEB08

A—Stud Straight and Tube Nut
B—Bulkhead Union and Bulkhead Lock Nut
C—90° Swivel Elbow and Tube Nut
D—90° Adjustable Stud Elbow
E—Port Plug
F—Stud End
G—Tube Nut
H—Swivel Nut
I—Lock Nut

SAE Face Seal and O-Ring Stud End Fitting Torque Chart

Nominal Tube OD Hose ID				O-Ring Face Seal/ Tube Swivel Nut				Bulkhead Jam Nut Torque[A]			O-Ring Straight, Adjustable, and External Port Plug Stud Ends[A]				
Metric Tube OD	Inch Tube OD			Thread Size	Swivel Nut Hex Size	Tube Nut/ Swivel Nut Torque		Jam Nut Hex Size	Jam Nut Torque		Thread Size	Straight Hex Size[B]	Adj Lock Nut Hex Size	Steel or Gray Iron Torque	
mm	Dash Size	in	mm	in	in	N·m	lb·ft		N·m	lb·ft	in	in	in	N·m	lb·ft
5	-3	0.188	4.78	—	—	—	—	—	—	—	3/8-24	5/8	9/16	18	13
6	-4	0.250	6.35	9/16-18	11/16	24	18	13/16	32	24	7/16-20	5/8	5/8	24	18
8	-5	0.312	7.92	—	—	—	—	—	—	—	1/2-20	3/4	11/16	30	22
10	-6	0.375	9.53	11/16-16	13/16	37	27	1	42	31	9/16-18	3/4	3/4	37	27
12	-8	0.500	12.70	13/16-16	15/16	63	46	1-1/8	93	69	3/4-16	7/8	15/16	75	55
16	-10	0.625	15.88	1-14	1-1/8	103	76	1-5/16	118	87	7/8-14	1-1/16	1-1/16	103	76
20	-12	0.750	19.05	1-3/16-12	1-3/8	152	112	1-1/2	175	129	1-1/16-12	1-1/4	1-3/8	177	131
22	-14	0.875	22.23	1-3/16-12	—	152	112	—	175	129	1-3/16-12	1-3/8	1-1/2	231	170
25	-16	1.000	25.40	1-7/16-12	1-5/8	214	158	1-3/4	247	182	1-5/16-12	1-1/2	1-5/8	270	199
32	-20	1.25	31.75	1-11/16-12	1-7/8	286	211	2	328	242	1-5/8-12	1-3/4	1-7/8	286	211
38	-24	1.50	38.10	2-12	2-1/4	326	240	2-3/8	374	276	1-7/8-12	2-1/8	2-1/8	326	240

[A] Tolerance is plus 15%, minus 20% of mean tightening torque unless otherwise specified.

[B] The straight hex key wrench sizes listed apply to connectors only and may not be the same as the corresponding plug of the same thread size.

BB83525,00007F0-19-03DEC19

Face-Seal-Fitting Assembly and Installation —All Pressure Applications

Face-Seal O-Ring to Stud End Installation

1. Inspect the fitting surfaces. They must be free of dirt and/or defects.
2. Inspect the O-ring. It must be free of damage and/or defects.
3. Lubricate O-rings using system oil, and install into groove.
4. Push O-ring into groove so O-ring is not displaced during assembly.
5. Index angle fittings and tighten by hand pressing joint together to insure O-ring remains in place.
6. Tighten fitting or nut to torque value shown on the chart per dash size stamped on the fitting. DO NOT allow hoses to twist when tightening fittings.

Face-Seal Adjustable Stud End O-Ring Installation

1. Back off the lock nut and washer to full exposed turned down section of the fitting.
2. Install a thimble over the fitting threads to protect the O-ring from nicks.
3. Slide the O-ring over the thimble into the turned down section of the fitting.
4. Remove thimble.

Face-Seal Straight Stud End O-Ring Installation

1. Install a thimble over the fitting threads to protect the O-ring from nicks.
2. Slide the O-ring over the thimble into the turned down section of the fitting.
3. Remove thimble.

Fitting Installation

1. Install fitting by hand until snug.
2. Position adjustable fittings by unscrewing the fitting no more than one turn.
3. Apply assembly torque per table.

Assembly Torque

1. Use one wrench to hold the connector body and one wrench to tighten nut.
2. For a hydraulic hose, it may be necessary to use three wrenches to prevent twist; one on the connector body, one on the nut, and one on the body of the hose fitting.

BB83525,00007F6-19-04DEC19

Practice Safe Maintenance

TS218—UN—23AUG88

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

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

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

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

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

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

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

DX,SERV-19-28FEB17

Welding Near Electronic Control Units

TS953—UN—15MAY90

IMPORTANT: Do not jump-start engines with arc welding equipment. Currents and voltages are too high and may cause permanent damage.

1. Disconnect the negative (-) battery cable(s).
2. Disconnect the positive (+) battery cable(s).
3. Connect the positive and negative cables together. Do not attach to vehicle frame.
4. Clear or move any wiring harness sections away from welding area.
5. Connect welder ground close to welding point and away from control units.
6. After welding, reverse Steps 1—5.

DX,WW,ECU02-19-14AUG09

Keep Electronic Control Unit Connectors Clean

IMPORTANT: Do not open control unit and do not clean with a high-pressure spray. Moisture, dirt, and other contaminants may cause permanent damage.

1. Keep terminals clean and free of foreign debris. Moisture, dirt, and other contaminants may cause the terminals to erode over time and not make a good electrical connection.
2. If a connector is not in use, put on the proper dust cap or an appropriate seal to protect it from foreign debris and moisture.
3. Control units are not repairable.
4. Since control units are the components LEAST likely to fail, isolate failure before replacing by completing a diagnostic procedure. (See your John Deere dealer.)
5. The wiring harness terminals and connectors for electronic control units are repairable.

DX,WW,ECU04-19-11JUN09

Prevent Machine Runaway

TS177—UN—11JAN89

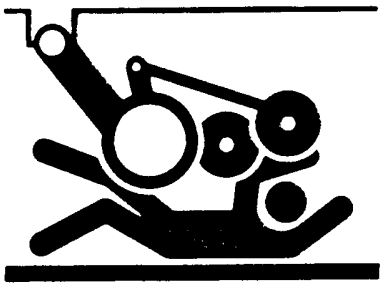
Avoid possible injury or death from machinery runaway.

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

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

DX,BYPAS1-19-29SEP98

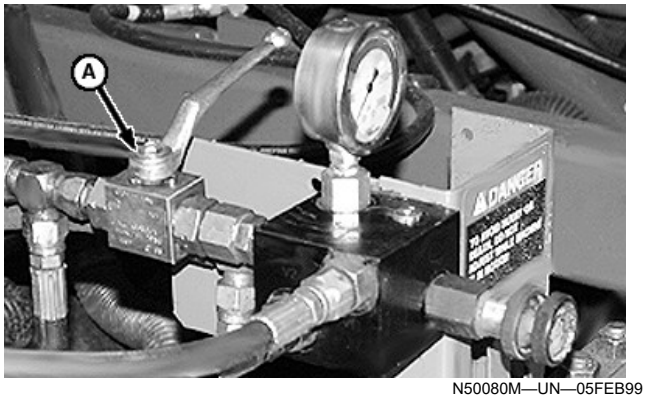
Lock-Up Rockshafts and Openers



N39645—UN—06OCT88

CAUTION: Hydraulic failure can allow openers to fall rapidly, causing injury or death. To avoid hazard, always lock openers in raised position before adjusting, lubricating or servicing machine.

IMPORTANT: Hydraulic hoses between the lift cylinders and hydraulic lock-up valves should be inspected frequently for leakage, kinking, cuts, cracks, abrasion, blisters, corrosion, exposed wire braid or any other signs of wear or damage prior to working under a raised implement. Worn or damaged hose assemblies can fail during use and should be replaced immediately. Failure to do so may result in serious injury or death



N50080M—UN—05FEB99

A—Lock-Up Valve

Fully retract rockshaft/opener cylinders and close lock-up valve (A).

AG,OUO1074,544-19-20MAR06

Replacing Ground Engaging Tools

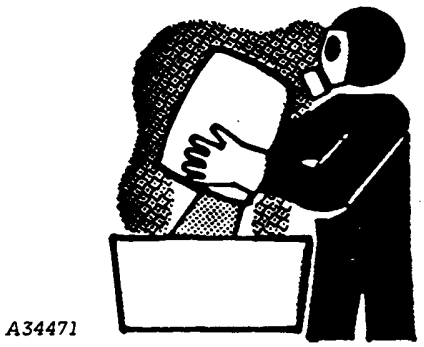
N39087—UN—30MAR89

CAUTION: Prevent injury or death. Always support the frame with jack stands or completely lower the openers and close lock-up valve before working around or under the machine or it may fall on you.

AG,OUO1074,545-19-22FEB00

Handle Agricultural Chemicals Safely

TS220—UN—15APR13



A34471—UN—11OCT88

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

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

Reduce risk of exposure and injury:

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

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

DX,WW,CHEM01-19-24AUG10

Keep Service Area Clean

TS218—UN—23AUG88

CAUTION: To help prevent personal injury, keep the service area clean and dry. Wet or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment.

Be sure all electrical outlets and tools are properly grounded.

Use adequate light for the job at hand.

Never lubricate or service machine while it is moving. Keep hands, feet and clothing from power-driven parts. Disengage all power and operate controls to relieve pressure.

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

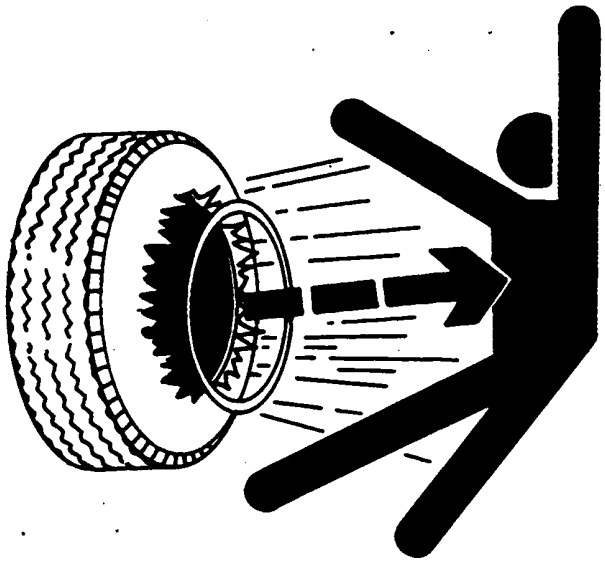
Understand service procedure before doing work.

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.

Disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

AG,OUO1074,546-19-22FEB00

Service Tires Safely



TS211—UN—15APR13

CAUTION: Explosive separation of a tire and rim parts can cause serious injury or death.

Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job.

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

Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure resulting in a tire explosion. Welding can structurally weaken or deform the wheel.

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

Check wheels for low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.

DX,RIM1-19-27OCT08

Check Tire Pressure

NOTE: Incorrect air pressure affects seeding rates.

Inflate the tires to the following air pressures.

Tire Size	kPa	bar	psi
11L-15/10PR	331	3.31	48
11L-15/12PR	359	3.59	52
12.5L-15/12PR	359	3.59	52
31-13.5 x 15/ 8PR	331	3.31	48
7.6 x 15	248	2.48	36

AG,OUO1074,439-19-08JAN20

Check Wheel Bolts

A85020—UN—19FEB15

A—Wheel Bolts (8 used)

Check all wheel bolts (A) during the first week of operation and periodically during the season.

Tighten the wheel bolts to specification.

Specification

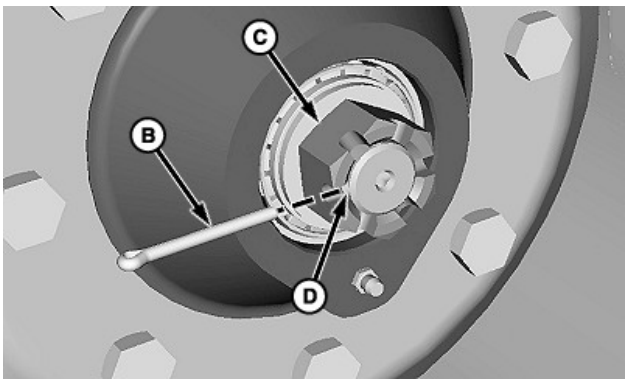
Wheel Bolt—Torque (dry). . . . . 155 N·m (115 lb·ft)

BB83525,00005BE-19-11FEB19

Check Wheel Bearings

IMPORTANT: Avoid implement damage. Check the wheel bearings every 500 hours of operation.

A85373—UN—04MAR15



A85376—UN—04MAR15

A—Hub Cap
B—Cotter Pin
C—Castle Nut
D—Hole

To adjust the wheel bearing proceed as follows:

1. Remove the center hub cap (A) and cotter pin (B).
2. Tighten nut (C) until there is a slight drag on the bearings while turning the wheel.
3. Tighten the nut to specification.

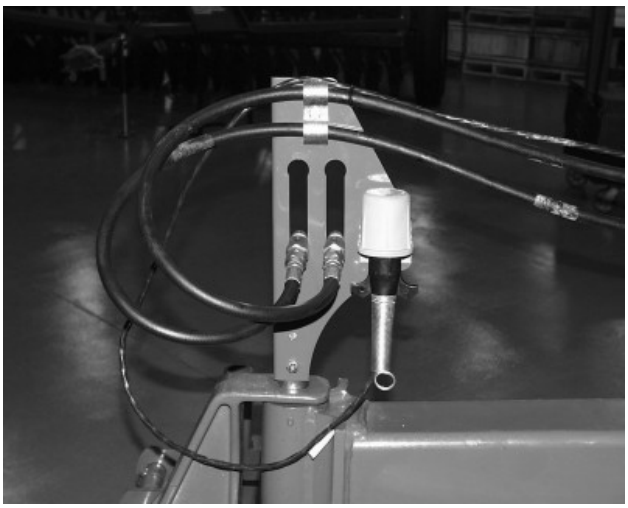
Specification

Nut (C)—Torque (dry). . . . . 16 N·m (142 lb·in)

4. Back off the nut until the cotter pin can be installed in hole (D)
5. Install the previously removed hub cap.

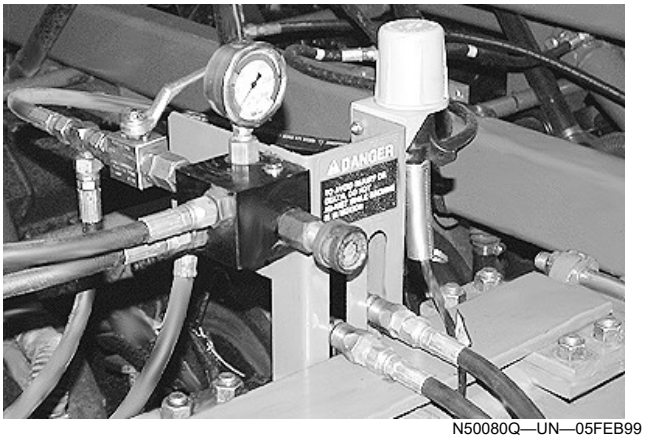
SH27916,00001C5-19-19MAR19

Prevent Hydraulic System Contamination



N52700—UN—11MAR00

Two-Point Hitch Storage Position



N50080Q—UN—05FEB99

Caster and Simple Hitch Storage Position

IMPORTANT: Cleanliness is very important when working on the hydraulic system. Prevent contamination by assembling the cylinders, hoses, couplers, and valves in a clean area of the shop.

Leave protective caps on the fluid openings until ready to make the connection. When charging the system, use a tractor or other source that contains clean oil, free of abrasive materials. Keep couplers clean. Abrasive particles, like sand or metal fragments, can damage seals, barrels and pistons, causing internal leakage.

NOTE: In order to help keep couplers clean, always place in storage position as shown when not attached to tractor.

AG,OUO1074,552-19-22FEB00

Hydraulic Hose Replacement

Inspect hydraulic hoses between the lift cylinders and hydraulic lock-up valves frequently for leakage, kinking, cuts, cracks, abrasion, blisters, corrosion, exposed wire braid, or any other signs of wear or damage. Replace worn or damaged hose assemblies immediately. See yourJohn Deere™ dealer for replacement hoses.

CAUTION: Avoid serious injury or death while working under a raised implement. Replacement hoses must be properly rated.

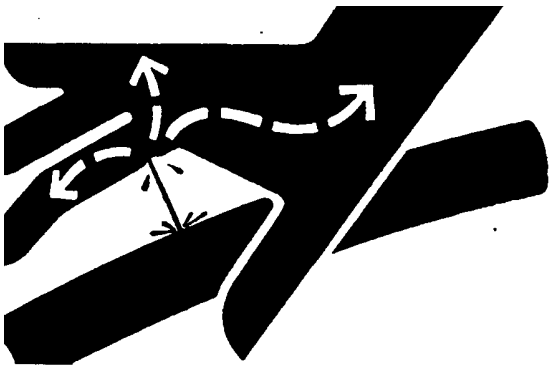
Ensure that fabricated hoses are rated at no less than 20 680 kPa (207 bar) (3 000 psi.) according to SAE standard J517, 100R17 hose specification.

Decrease the chance of hose wear or damage. To ensure proper hose length and routing, use old hose as a guide.

To avoid mating surface damage and leaks, use steel fittings approved for use with hose manufacturer. Ensure that replacement hose fittings use the same size and thread type as replaced hose.

OUO6030,0000354CONV1-19-11SEP14

Remove Hydraulic Cylinders



X9811—UN—23AUG88

CAUTION: 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 can result.

1. Fully lower the rockshaft and/or markers.
2. Shut off the tractor engine and move the hydraulic levers back and forth to relieve pressure.

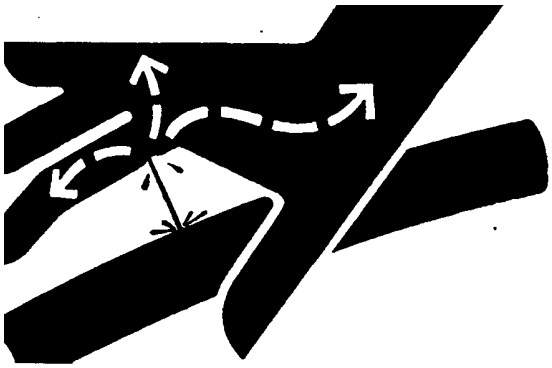
3. Disconnect the hoses at the tractor and from the cylinder ports. Cover the tractor outlets, cylinder ports, and hose ends.

CAUTION: If the row marker cylinders must be removed with markers in the folded position, be sure to lock-up markers to prevent accidental falling on you or others. Before reinstalling, the cylinder must be fully charged with oil. (See Bleed and Attach Hydraulic Cylinders in this section.

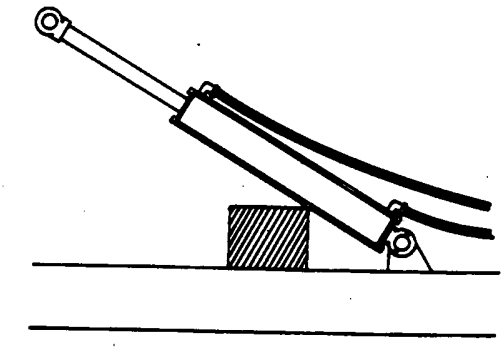
4. Unpin the cylinder. Check and repair if necessary. See your John Deere dealer or qualified service provider.

AG,OUO1074,553-19-30NOV17

Bleed and Attach Hydraulic Cylinders



X9811—UN—23AUG88



N37063—UN—06OCT88

CAUTION: 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 can result.

1. Attach the cylinder base end to the linkage, but leave the rod end detached.
2. Attach all the hoses in the hydraulic circuit.
3. Support the cylinder on wooden blocks, so the rod can extend and retract without interference.

CAUTION: If the cylinders are not bled as described previously, markers and\or the rockshaft could drop unexpectedly, causing injury or death to you or others.

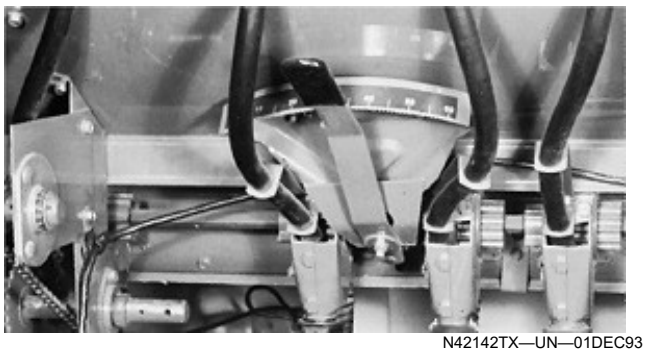
4. Connect hoses to the tractor. Fully extend and retract all cylinders at least two times, maintaining hydraulic pressure at full extension for at least 30 seconds. Then extend cylinders one more time, maintaining pressure at full extension for one minute. This allows all air to escape from cylinders.

CAUTION: To avoid injury or death, stand clear of machine when hydraulic cylinders are being extended or retracted. Mechanical or hydraulic failure can allow openers or markers to fall rapidly and injure or kill you or others.

5. Attach the rod end of the cylinder to the machine.

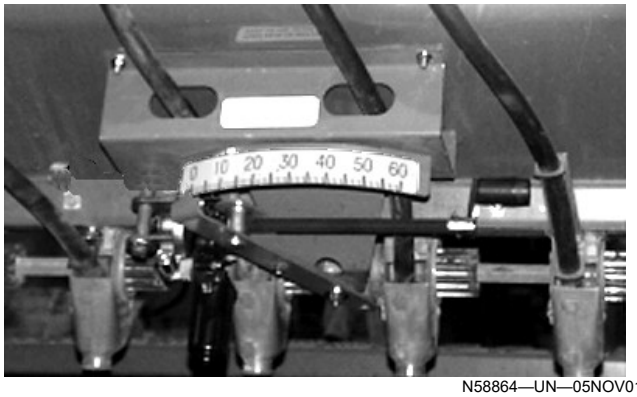
AG,OUO1074,554-19-30NOV17

Reset Fluted Feed Cups



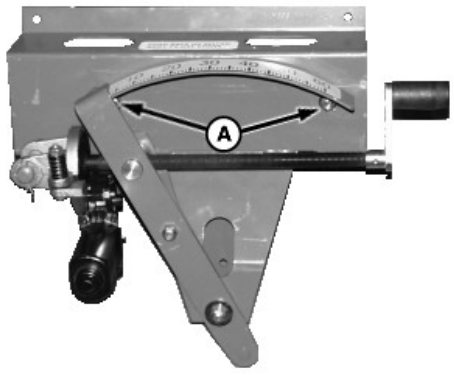
N42142TX—UN—01DEC93

Manual Shifter



N58864—UN—05NOV01

Electronic Shifter



N63049—UN—16JUN03

A—Cap Screws

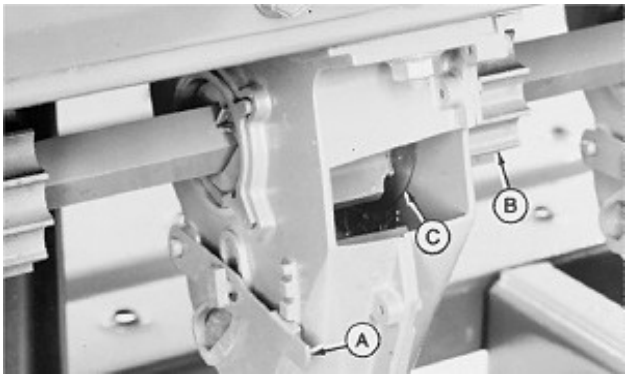
Reset cups whenever:

- Cup has been removed from the drill.
- Cup has been knocked out of position.
- Quantity of the seed sown varies from cup to cup.
- Quantity of the seed sown does not agree with the chart.

Reset as follows:

1. Set the feed shifter to the “0” notch. Adjust the shifter lever as far left as possible and return it to the “0” notch to equalize spring pressure.

   If the shifter does not line up with the “0”, loosen the cap screws (A) and adjust the face plate.



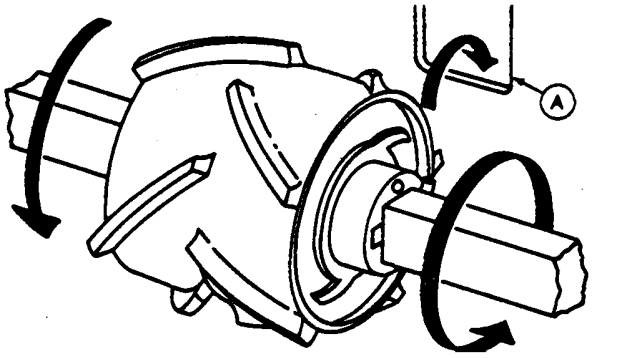
N81187I3—UN—06OCT88

A—Latch
B—Feed Roll
C—Seed Retainer Ring

2. Move latch (A) downward off its retaining teeth.
3. Start at the master feed cup (first feed cup on each side of the shifter lever) and loosen the cap screws holding the feed cup to the box bottom.
4. Move the feed cup until the end of the feed roll (B) is flush with the inside surface of the seed retainer ring (C) on the lower radius of the seed reservoir. Reset all the feed cups in same manner, beginning with the master feeds and working in both directions. Tighten the cap screws on each feed cup as soon as resetting is complete.
5. Recheck the adjustment by moving the feed shaft shifter through the full index setting range; then move the lever past notch “0” and return to “0”. Recheck to make sure that all feed rolls are flush at the lower radius of the feed cup.
6. Close seed gates to desired setting, making sure that all gates are in identical position.

OUO6074,000075A-19-30NOV17

Replace Fertilizer Feed Wheels



N37908—UN—05OCT88

A—Discharge Hole

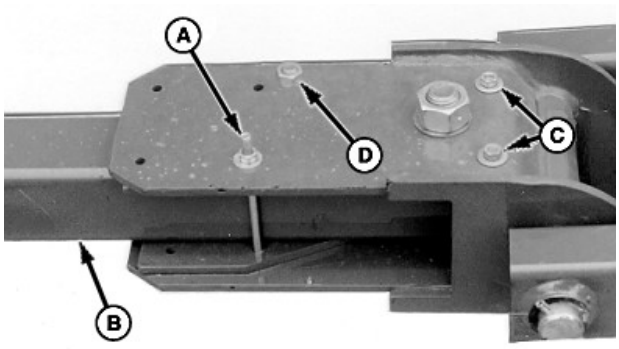
1. Remove the feed shaft from the drill.
2. Slide the wheel off the shaft.
3. Install the new feed wheel.
4. Align wheels with the discharge hole (A) and install the shaft.

AG,OUO1074,556-19-30NOV17

Replace Marker Breakaway Bolt

CAUTION: Prevent injury and machine damage. Do not operate if the safety bolt (D) is missing. Make sure to identify that the safety bolt (D) is in place and tightened down.

NOTE: Safety bolt must be on the front side of the marker arm (side facing the tractor).



A48644—UN—05FEB02

A—Breakaway Bolt, 5/16 x 5-1/4 in
B—Arm
C—Breakaway Bolt (2 used)
D—Safety Bolt

The marker breakaway bolt (A) provides breakaway protection when the marker hits an obstacle.

To replace the breakaway bolt, proceed as follows:

Return arm (B) to the operating position and insert breakaway bolt (A) through the marker mounting plates and secure in place with washers and nut. Tighten nut to specification.

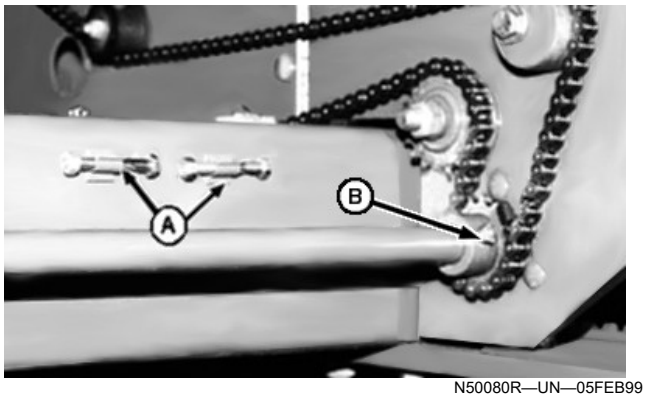
Specification	
Nut—Torque (dry)	34 N·m (25 lb·ft)

Extra breakaway bolts (C) are stored in the mounting plates.

BB83525,0000578-19-26FEB19

Replace Drive System Shear Bolt

IMPORTANT: Do not use any other hardware to replace the factory specified shear bolt (19H1947) or the transmission could be damaged. (See your John Deere dealer or qualified service provider for the correct repair parts.)



N50080R—UN—05FEB99

A—Clamps
B—Shear Bolt

Replace the drive shear bolt (B) with #8 machine screw.

Spare shear bolts and lock nuts are provided with the machine and are stored in clamps (A) above the shaft.

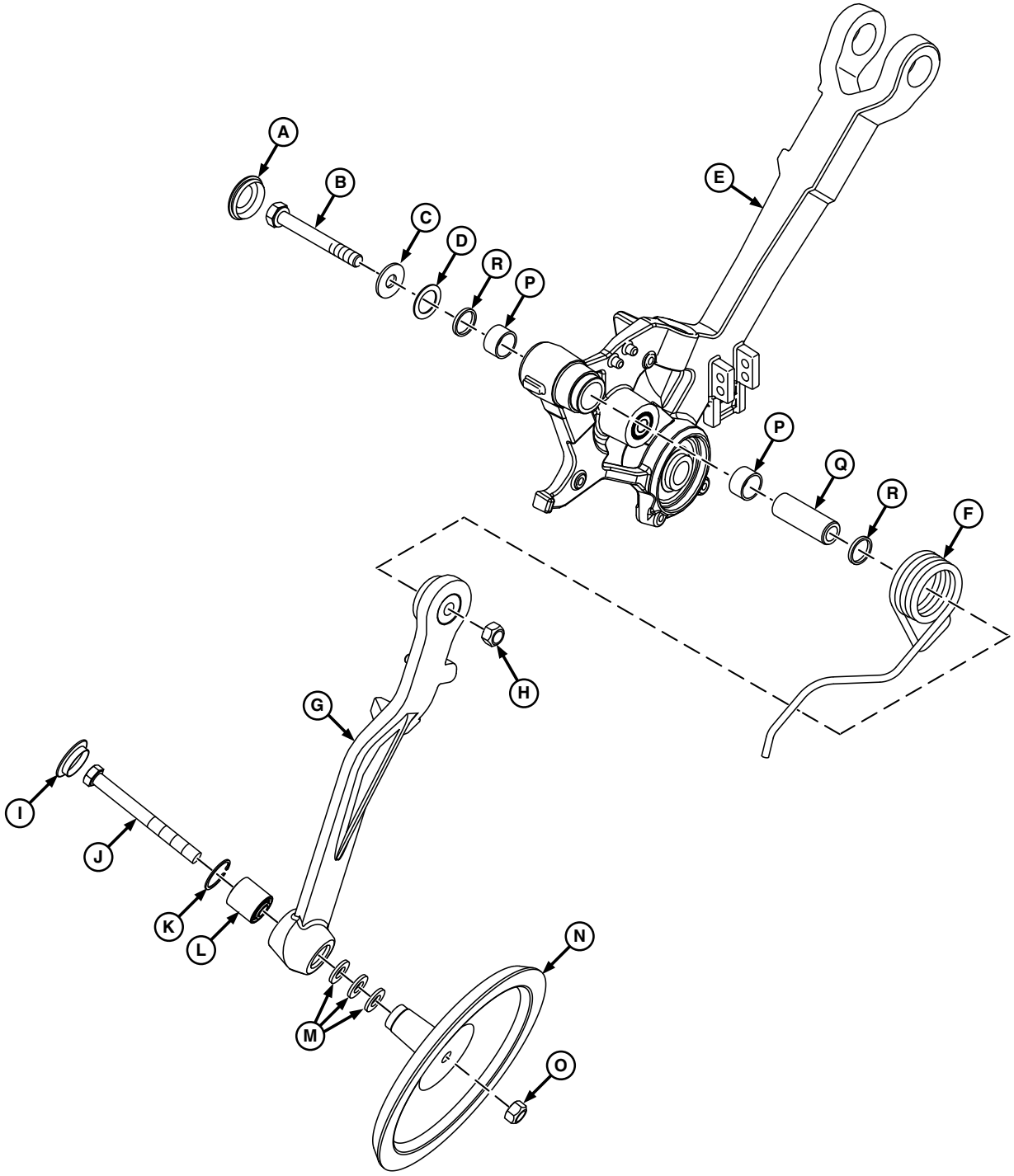
Shear bolt is used to protect the drive transmission from damage when overloaded. To prevent shearing the bolt, avoid transmission overload.

AG,OUO1074,557-19-30NOV17

Repair Closing Wheel Assembly

NOTE: Follow steps 1—6 for closing wheel repair.

NOTE: Clean dirt from the parts before removal.



A97576—UN—10AUG17

A—Bearing Cap
B—Cap Screw, M16 x 130
C—Washer, 17 mm (43/64 in) ID
D—Washer, 30 mm (1-3/16 in) ID
E—Opener Arm
F—Spring
G—Closing Wheel Arm
H—Lock Nut, M16
I—Bearing Cap
J—Cap Screw, M16 x 160
K—Snap Ring
L—Bearing
M—Washer, 16 mm (41/64 in) ID (as required)
N—Closing Wheel
O—Lock Nut, M16
P—Bushing (2 used)

Q—Bushing

R—Seal (2 used)

1. Remove the bearing cap (I), cap screw (J), lock nut (O), and snap ring (K) when removing wheel assembly and bearing (L) from closing wheel arm (G).

NOTE: Shim washers (M) are used for lateral repositioning of closing wheel. (See Position Seed Closing Wheel in the Preparing the Grain Drill section for further information.)

2. Remove bearing (L) from the arm.
3. Inspect all parts for wear or damage and replace as necessary.
4. Press the new bearing into the arm bore. Install the previously removed snap ring.
5. Install the wheel and shim washers (as required) to the cap screw and retain with a lock nut. Tighten the hardware to specification.

Specification

Closing Wheel
Hardware—Torque (dry). . . . . 217 N·m (160 lb·ft)

6. Install the bearing cap.

NOTE: Follow steps 7—13 for arm bushing replacement.

7. Remove the bearing cap (A), cap screw (B), washers (C and D), lock nut (H), and the arm parts.
8. Remove the bushings (P and Q) and seals (R) from the bore.
9. Press the new bushings (P) into bore 5.0—5.5 mm (3/16—7/32 in) below the outside surface.
10. Press one seal (R) onto one side flush with the outside surface. Lubricate seal (R) with soapy water, then insert bushing (Q) into joint from the side opposite of seal (R).
11. Slide bushing (Q) far enough so the second seal (R) can be installed. Press the second seal flush with the outside surface.
12. Lubricate the second seal (R) with soapy water. Slide bushing (Q) towards the second seal until both ends of bushing (Q) are clear of the seals.
13. Install the previously removed arm and attaching parts. Tighten the pivot hardware to specification.

Specification

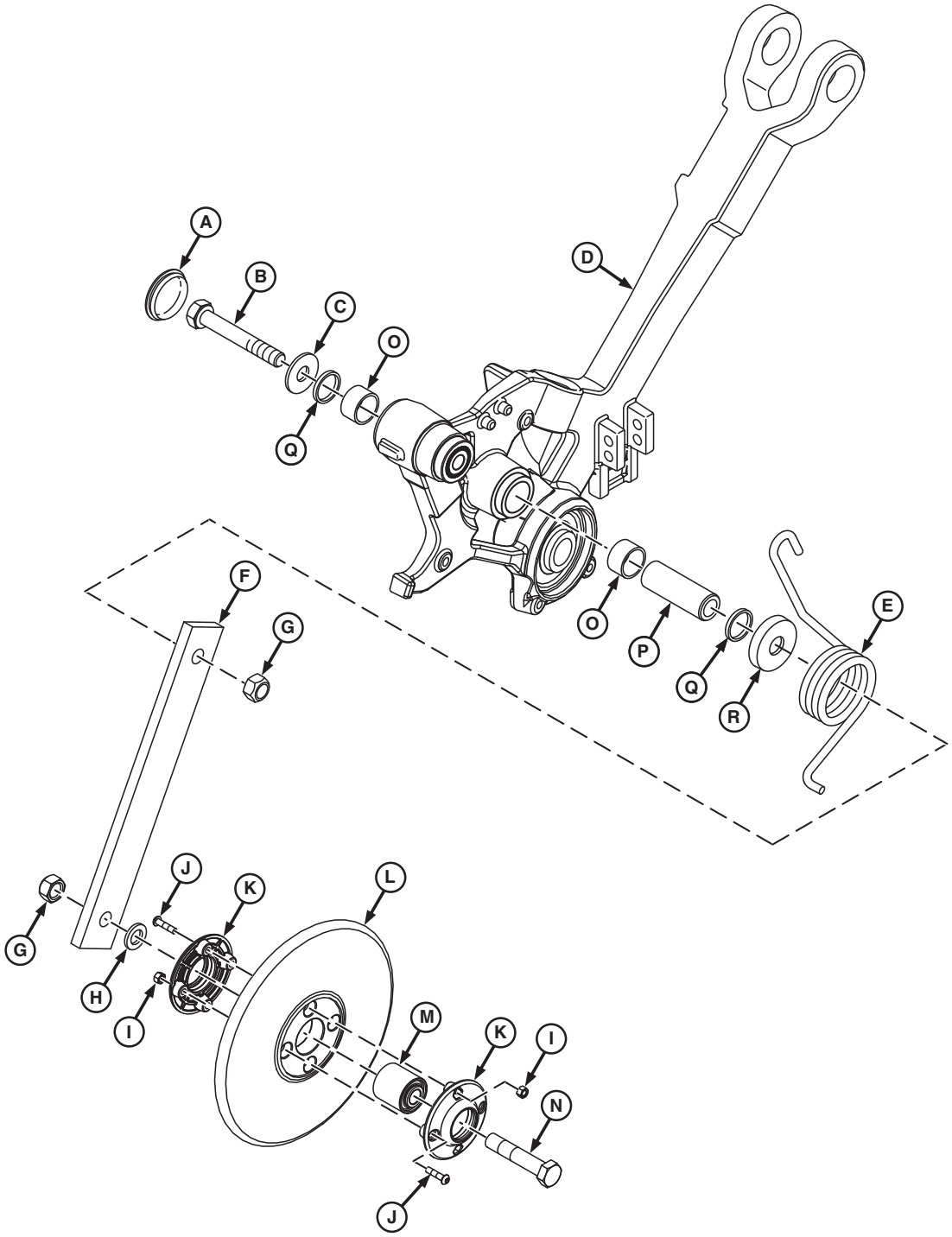
Pivot Hardware—Torque (dry). . . . . 237 N·m (175 lb·ft)

SH27916,00001C3-19-26FEB19

Repair Press Wheel Assembly

NOTE: Follow steps 1—5 for press wheel repair.

NOTE: Clean dirt from parts before removal.



A97784—UN—22AUG17

A—Bearing Cap
B—Cap Screw, M16 x 100
C—Washer, 17 mm (43/64 in) ID
D—Opener Arm
E—Spring
F—Press Wheel Arm
G—Lock Nut, M16
H—Washer, 16 mm (41/64 in) ID
I—Lock Nut, M6 (4 used)
J—Screw, M6 x 25 (4 used)
K—Hub (2 used)
L—Press Wheel
M—Bearing
N—Cap Screw, M16 x 80
O—Bushing (2 used)
P—Bushing

Q—Seal (2 used)

R—Dust Cap

1. Remove cap screw (N), washers (H), and nut (G) to remove wheel assembly from arm (F).
2. Remove cap screws (J) and lock nuts (I) to disassemble wheel (L).
3. Inspect parts for wear or damage and replace as necessary.
4. Install bearing (M) and assemble wheel parts with cap screws (J) and lock nuts (I).
5. Attach wheel to arm using previously removed hardware. Tighten hardware to specification.

Specification

Press Wheel Hardware—Torque (dry). . . . . 217 N·m (160 lb·ft)

NOTE: Follow steps 6—12 for arm bushing replacement.

6. Remove parts (A—C), parts (E—G), and dust cap (R).
7. Remove bushings and seals (O, P, and Q).
8. Press new bushings (O) into bore 5—5.5 mm (3-16—7/32 in) below the outside surface.
9. Press one seal (Q) onto one side flush with the outside surface. Lubricate seal (Q) with soapy water, then insert bushing (P) into joint from the side opposite of seal (Q).
10. Slide bushing (P) far enough so the second seal (Q) can be installed. Press the second seal flush with the outside surface.
11. Lubricate the second seal (Q) with soapy water. Slide bushing (P) towards the second seal until both ends of bushing (P) are clear of the seals.
12. Install previously removed arm (F) and attaching parts. Tighten to specification.

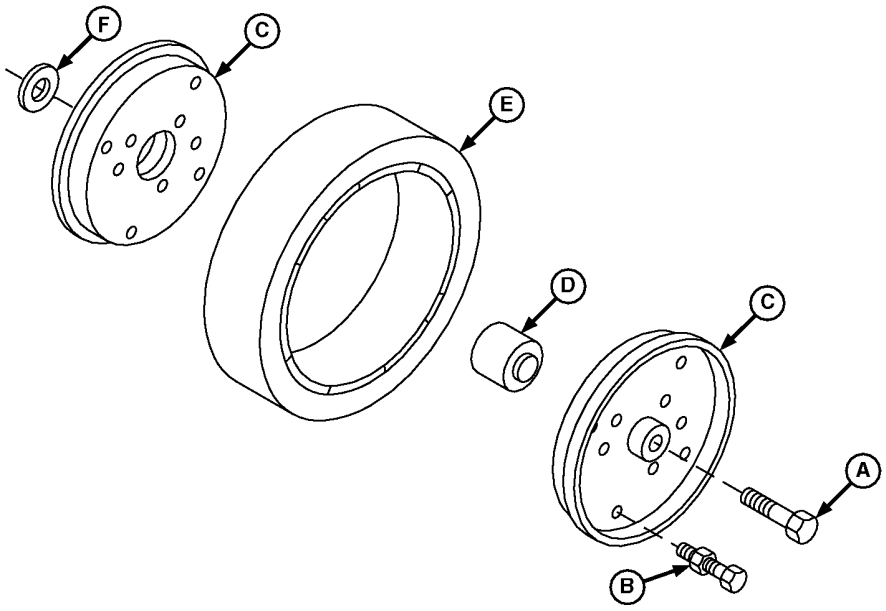
Specification

Wheel Arm Pivot Hardware—Torque (dry). . . . . 237 N·m (175 lb·ft)

SH27916,00001C6-19-12FEB19

Repair Steel Depth Gauge Wheel Assembly

NOTE: Clean dirt from parts before removing wheel.



N49843—UN—23APR98

A—Cap Screw, M16 x 70
B—Cap Screw and Lock Nut, M8 x 16
C—Wheel Half
D—Bearing
E—Rubber Tire
F—Shim Washers (As Required)

1. Remove the cap screw (A) and wheel assembly from the arm.
2. Remove hardware (B) and disassemble wheel.
3. Inspect the parts for wear or damage and replace as necessary.
4. Reassemble the wheel with hardware (B). Tighten the four outer cap screws first; then the three inner cap screws.
5. Attach the wheel to the arm with shim washers (F) and cap screw (A). Tighten cap screw to specification.

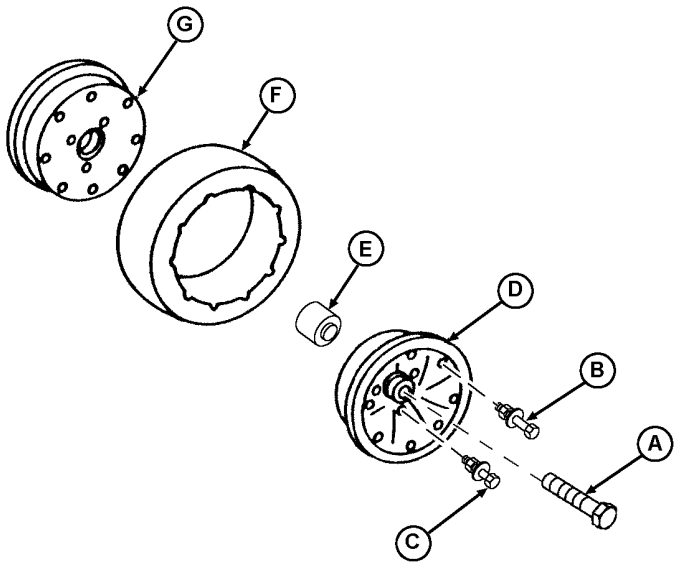
Specification

Cap Screw (A)—Torque (dry). . . . . 217 N·m (160 lb·ft)

BB83525,000056E-19-11SEP18

Repair Smooth-Sided Depth Gauge Wheel Assembly

NOTE: Clean dirt from parts before removing wheel.



N49836—UN—21APR98

A—Cap Screw, M16 x 70
B—Cap Screw and Lock Nut, M8 x 45
C—Cap Screw and Lock Nut, M8 x 25
D—Outer Wheel
E—Bearing
F—Tire
G—Inner Wheel

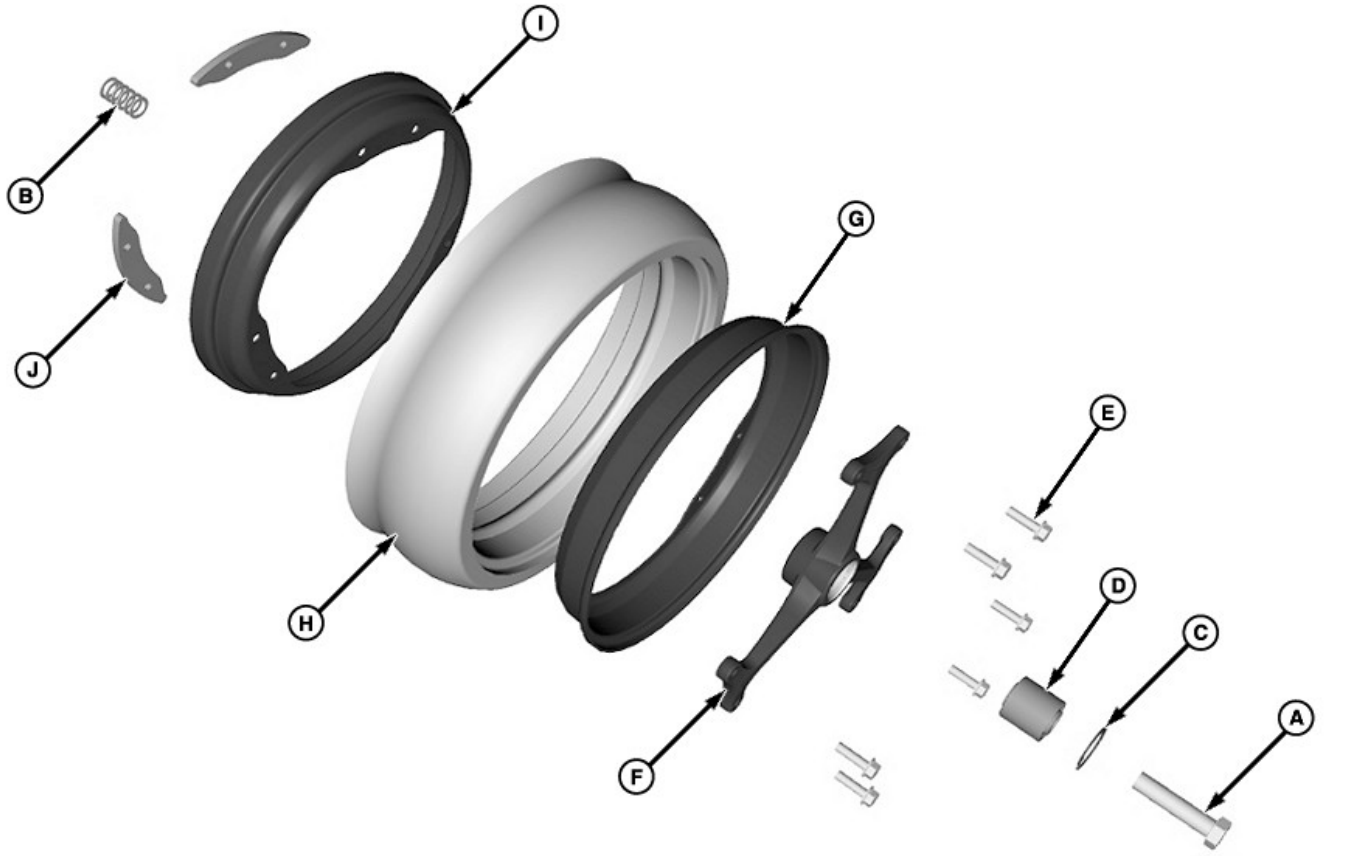
1. Remove the center cap screw (A) and wheel assembly.
2. To disassemble the wheel, remove hardware (B and C).
3. Inspect parts for wear or damage and replace as necessary.
4. Assemble bearing (E) and wheel parts with the previously removed hardware.
5. Attach the wheel to the arm using the previously removed hardware. Tighten the cap screw (A) to specification.

Specification

Cap Screw (A)—Torque (dry). . . . . 217 N·m (160 lb·ft)

BB83525,000056F-19-01OCT18

Repair Spoked Depth Gauge Wheel Assembly



A105143—UN—24JUL19

114 mm (4-1/2 in) Wheel Shown

A—Cap Screw, M16 x 70
B—Shim Washers (as required)
C—Snap Ring
D—Bearing
E—Flange Cap Screw, M8 x 30 (6 used)
F—Hub
G—Outer Wheel Half
H—Rubber Tire
I—Inner Wheel Half
J—Plate (3 used)

NOTE: Clean dirt from parts before removing wheel.

1. Remove the cap screw (A), washers (B), and the wheel assembly from the arm.
2. Remove the snap ring (C) and bearing (D).
3. Remove flange cap screws (E) and disassemble the wheel.
4. Inspect the parts for wear or damage and replace as necessary.
5. Reassemble the wheel using flange cap screws (E). Tighten to specification.

Specification

Flange Cap Screw (E)—Torque (dry). . . . . 22 N·m (195 lb·in)

6. Install the previously removed bearing and snap ring.

NOTE: Verify the depth gauge wheel-to-disk clearance. (See Check Depth Gauge Wheel Clearance in this section.)

7. Attach the wheel to the arm using the shim washers (B) and cap screw (A). Tighten the cap screw to specification.

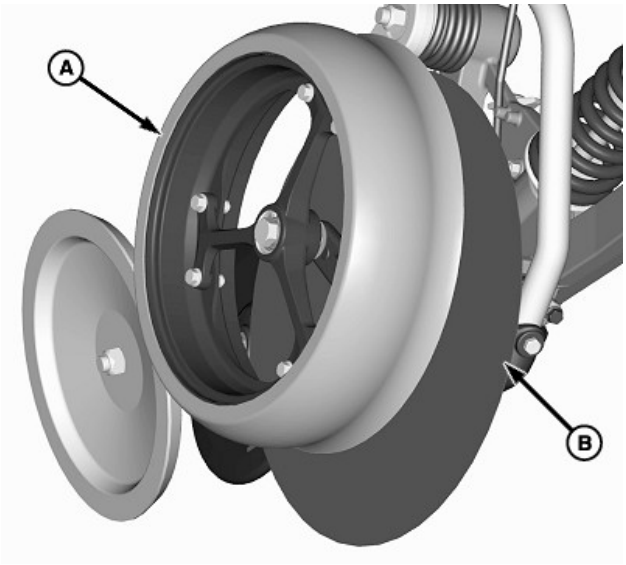
Specification

Cap Screw (A)—Torque (dry). . . . . 217 N·m (160 lb·ft)

BB83525,0000233-19-24JUL19

Check Depth Gauge Wheel Clearance—All Depth Gauge Wheels

NOTE: Clearance must be checked at the seed boot outlet.



A97567—UN—04AUG17

112.5 mm (4-7/16 in) Spoked Depth Gauge Wheel Shown

A—Depth Gauge Wheel
B—Disk

Measure the clearance between the depth gauge wheel (A) and disk (B).

NOTE: Verify that the clearance is 1.0 to 5.6 mm (3/64 to 7/32 in).

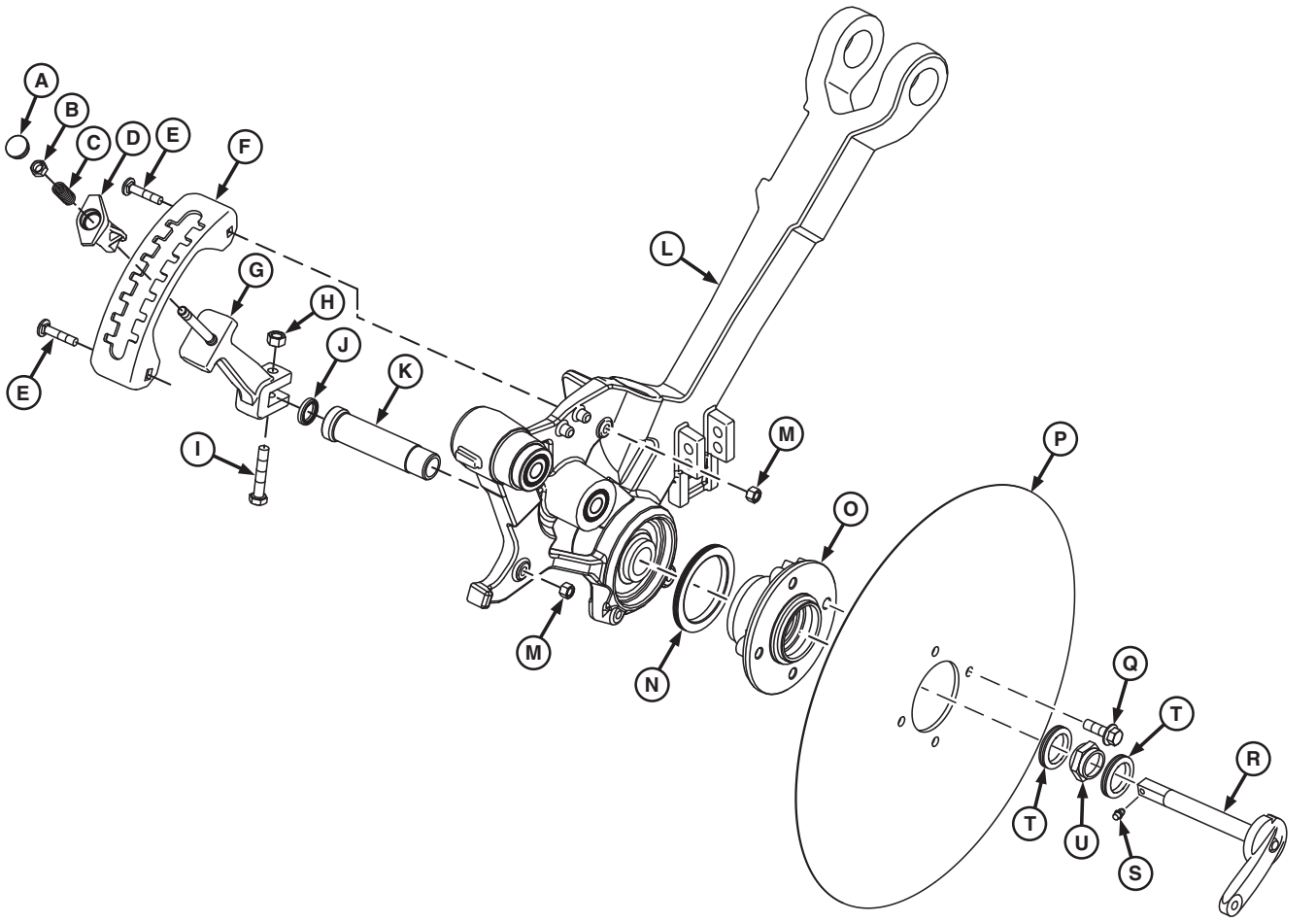
Add or remove the shim washers at the wheel mounting, as necessary, to obtain the preferred opener setting.

Specification	
Depth Gauge Wheel to Disk—Clearance	1.0—5.6 mm (3/64—7/32 in)

BB83525,000052F-19-19MAR19

Replace Disk and Hub Assembly

⚠ CAUTION: Disks are sharp. Use caution and wear protective clothing to avoid cutting hands.



A108730—UN—04DEC20

A—Cap, Depth Handle
B—Nut, 9.5 mm (3/8 in)
C—Compression Spring
D—Handle
E—Carriage Bolt, M8 x 40 (2 used)
F—Adjuster
G—Depth Handle Arm
H—Flange Lock Nut, M10
I—Cap Screw, M10 x 55
J—Seal
K—Spindle
L—Opener Arm
M—Lock Nut, M8 (2 used)
N—Seal
O—Hub Assembly
P—Disk
Q—Flange Cap Screw, M10 x 30 (4 used)
R—Depth Adjustment Arm
S—Grease Fitting
T—Triple Lip Seal (2 used)
U—Nut, 29 mm (1-1/8 in)

Disk Replacement

NOTE: Diameter of a new disk (P) is 459 mm (18 in). Replace the disk when the diameter is less than 406 mm (16 in) or if uneven seeding depth occurs.

NOTE: Clean dirt from the parts before removal.

1. Remove the depth gauge wheel (not shown) from the depth adjustment arm (R). (Depending on the type of depth gauge wheel used, see Repair Depth Gauge Wheel Assembly in this section for information.)
2. Place handle (D) in the highest possible slot (maximum depth position).

⚠ CAUTION: Disks are sharp. Use caution and wear protective clothing to avoid cutting hands.

3. Remove the flange cap screws (Q).
4. Remove disk (P) over the depth adjustment arm (R).

5. Install the new disk with the beveled side towards the hub using flange cap screws (Q). Tighten to specification.

Specification

Flange Cap Screws
(Q)—Torque (dry). . . . . 73 N·m (54 lb·ft)

IMPORTANT: Tire damage can occur if the disk and depth gauge wheel are not correctly spaced.

6. Install the previously removed depth gauge wheel. (See Check Depth Gauge Wheel Clearance—All Depth Gauge Wheels in this section when installing the depth gauge wheel.)

Depth Adjustment Arm, Spindle, and Hub Assembly Replacement

1. Remove the depth gauge wheel (not shown) from depth adjustment arm (R). (Depending on the type of depth gauge wheel used, see Repair Depth Gauge Wheel Assembly in this section for information.)
2. Remove parts (A—D), hardware (E and M), and adjuster (F).
3. Remove the depth handle arm (G), hardware (H and I), and grease fitting (S).
4. Remove the depth adjustment arm (R).
5. Remove the flange cap screws (Q) and disk (P).
6. Remove the triple lip seals (T) and nut (U).
7. Remove the hub assembly (O) and spindle (K).
8. Replace seals (J and N) as necessary.
9. Install the new spindle and hub assembly using nut (U). Tighten to specification.

Specification

Nut (U)—Torque (dry). . . . . 258 N·m (190 lb·ft)

10. Install the previously removed disk and flange cap screws. Tighten to specification.

Specification

Flange Cap Screws
(Q)—Torque (dry). . . . . 73 N·m (54 lb·ft)

11. Install the new depth adjustment arm using depth handle arm (G) and hardware (H and I). Tighten to specification.

Specification

Flange Nut (H)—Torque (dry). . . . . 50 N·m (36 lb·ft)

12. Install the previously removed grease fitting (S).
13. Position the previously removed adjuster (F) over the stud on depth handle arm (G).
14. Install previously removed handle (D) using spring (C) and nut (B). Tighten to specification.

Specification

Nut (B)—Torque (dry). . . . . 25 N·m (19 lb·ft)

15. Install cap (A).
16. Attach adjuster (F) to the opener arm using hardware (E and M). Tighten to specification.

Specification

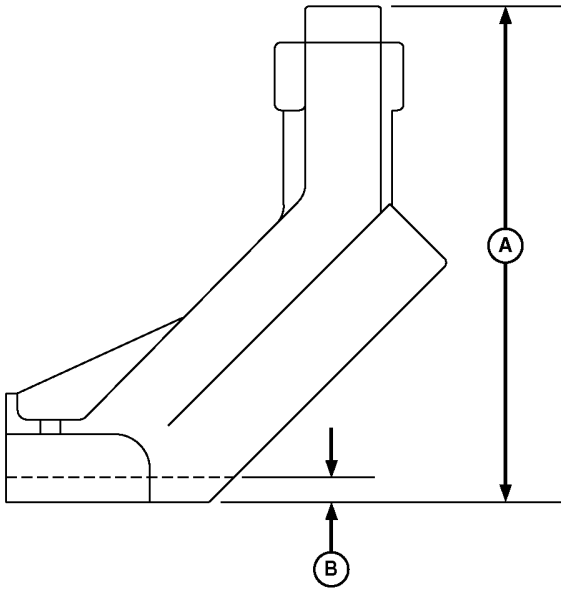
Nut (M)—Torque (dry). . . . . 25 N·m (19 lb·ft)

IMPORTANT: Avoid implement damage. Tire damage can occur if the disk and depth gauge wheel are not correctly spaced.

17. Install the previously removed depth gauge wheel. (See Check Depth Gauge Wheel Clearance—All Depth Gauge Wheels in this section when installing the depth gauge wheel.)

BB83525,0000530-19-08DEC20

Inspect Boots and Disks



N47469—UN—12APR96

A—Overall Height
B—Bottom Edge

Poor opener penetration may be a result of worn disks. Uneven seed depth may be a result of worn boots.

Measure the boot and replace if the bottom edge (B) is worn 12.7 mm (1/2 in) or more or if overall height (A) is 287 mm (11-5/16 in) or less.

Repositioning the seed boot may extend the service life. (Refer to Adjust Seed Boots in Preparing the Grain Drill section.)

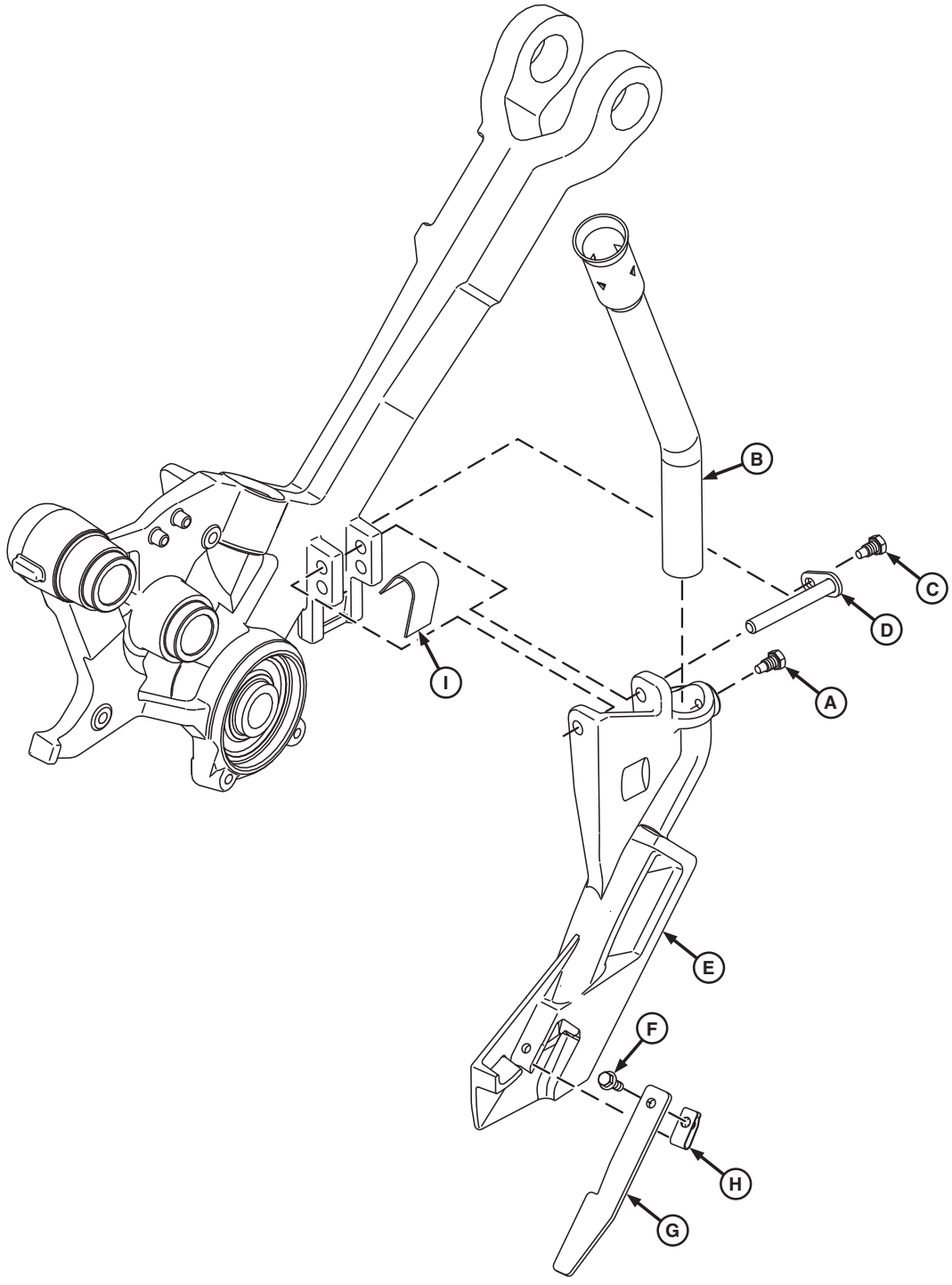
Diameter of the new disk is 457 mm (18 in). Replace the disk when uneven seeding depth due to poor penetration occurs or if the disk diameter is less than specification.

Specification	
Disk—Diameter	406 mm (16 in)

See Replace Disk and Hub Assembly in this section for disk replacement.

BB83525,00006D0-19-20MAR19

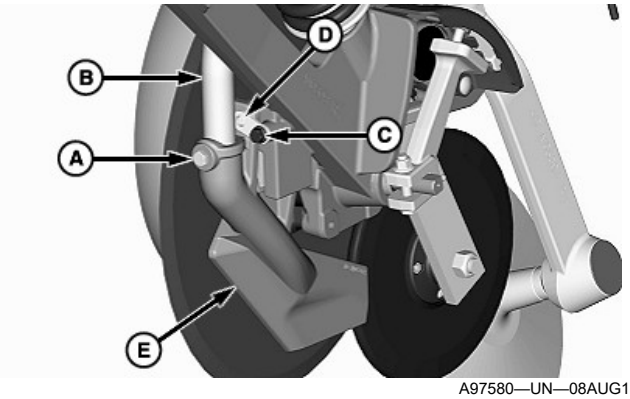
Replace Seed Boots and Deflectors



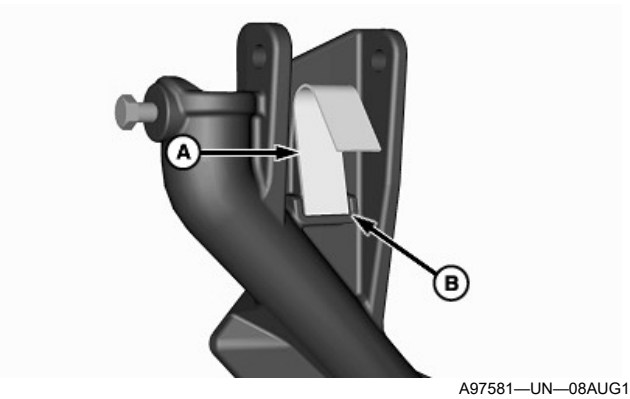
A97578—UN—10AUG17

A—Cap Screw, 3/8 x 11/16 in
B—Seed Tube
C—Cap Screw, M8 x 20
D—Pin
E—Seed Boot
F—Cap Screw, 1/4 x 3/4 in
G—Seed Deflector
H—Nut
I—Leaf Spring

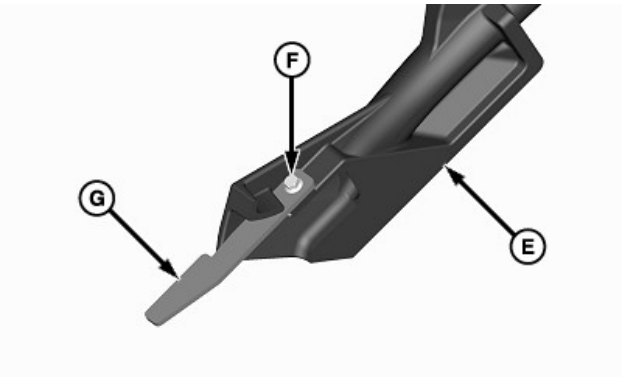
NOTE: Clean dirt from the parts before removal.



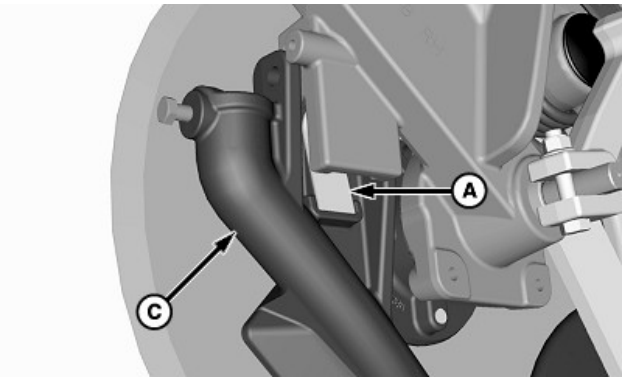
A97580—UN—08AUG17



A97581—UN—08AUG17



A97579—UN—08AUG17



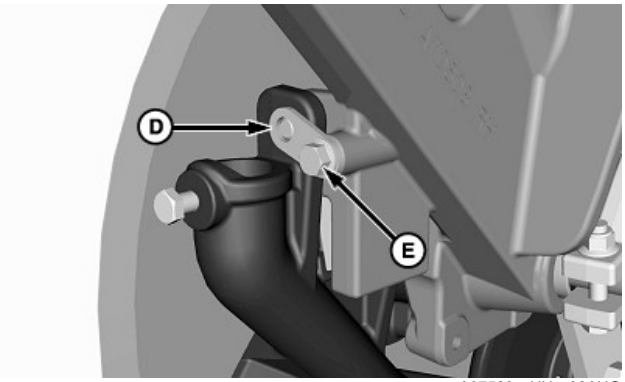
A97582—UN—08AUG17

A—Cap Screw, 3/8 x 11/16 in
B—Seed Tube
C—Cap Screw, M8 x 20
D—Pin
E—Seed Boot
F—Cap Screw, 1/4 x 3/4 in
G—Seed Deflector

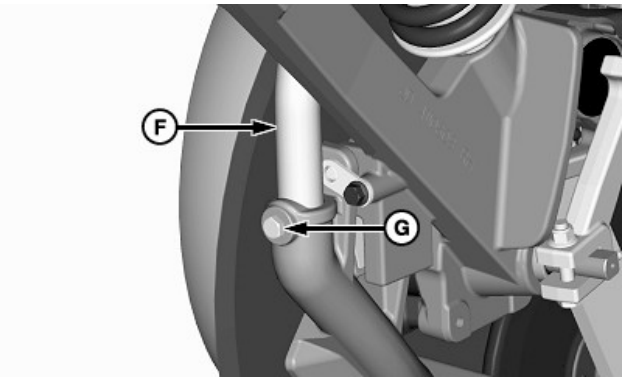
1. Loosen the cap screw (A) and remove the seed tube (B).
2. To remove the seed boot (E), remove the cap screw (C) and pin (D).
3. To replace the seed deflector (G), remove the cap screw (F).

IMPORTANT: Leaf spring (A) must be installed to keep the seed boot against inside of the disk for accurate seed placement.

NOTE: The seed boot can be installed using one-of-two mounting positions. (See Adjust Seed Boots in Preparing the Grain Drill section for further information.)



A97583—UN—08AUG17



A97584—UN—08AUG17

A—Leaf Spring
B—Recessed Area
C—Seed Boot
D—Pin
E—Cap Screw, M8 x 20
F—Seed Tube
G—Cap Screw, 3/8 x 11/16 in

4. Squarely position the leaf spring (A) in the recessed area (B) on the seed boot.
5. While holding the leaf spring with a finger, slide the seed boot (C) into position.

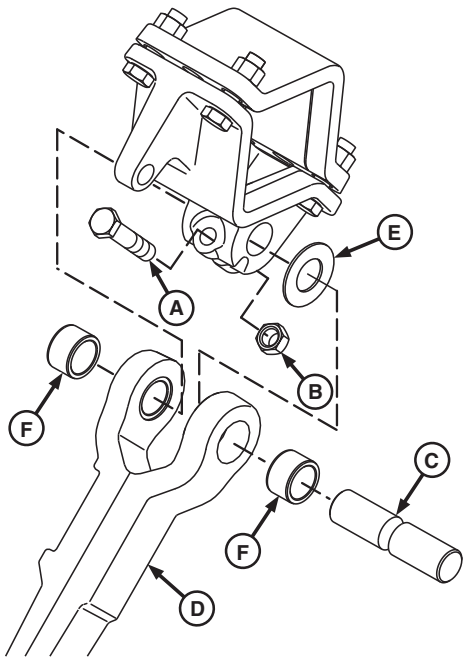
NOTE: The leaf spring must be seated in the recessed area before pin (D) and cap screw (E) are installed.

6. Position the seed boot in a desired level, compress the spring until the holes are aligned, and install pin (D) and cap screw (E).
7. Install the previously removed seed tube (F) using cap screw (G).

SH27916,00001CB-19-26FEB19

Replace Opener Arm Pivot Bushings

NOTE: Clean dirt from parts before removal.



A97585—UN—10AUG17

A—Cap Screw, M16 x 75
B—Lock Nut, M16
C—Pivot Pin
D—Opener Arm
E—Thrust Washer
F—Arm Pivot Bushings

1. Remove hardware (A and B) and pivot pin (C) from arm (D). Retain thrust washer (E).
2. Drive old bushings (F) from arm.

IMPORTANT: Be careful not to damage outer edges of new bushings when installing.

3. Press new bushings into the arm bores, flush to 0.76 mm (0.03 in) below outside surface.

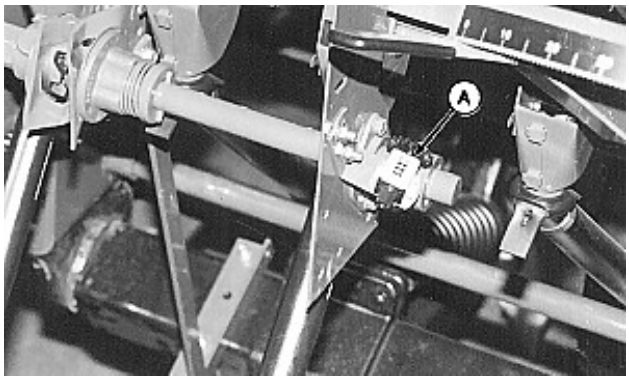
IMPORTANT: Thrust washer must be installed between arm and anchor castings, on the same side of the arm as disk.

4. Position thrust washer on the disk side of arm (between arm and anchor) and attach arm with pivot pin. Be careful not to damage bushings when installing pin.
5. Install pin retaining hardware and tighten to specification.

Specification	
Pin Retaining Hardware—Torque (dry)	190 N·m (140 lb·ft)

SH27916,00001C4-19-12FEB19

Check Acremeter Accuracy



N47136—UN—28SEP95

A—Acremeter Reading

Acremeter reading (A) is an approximate measurement and may be affected by a worn out counter, chipped gear teeth, or a loose worm gear. To test accuracy of the acremeter, perform the following procedure.

1. Divide 43 560 by the width of the drill to find a calibration distance equal to 1 acre.
2. Operate the machine over the calibration distance (1 acre).
3. Disengage the clutch and review the acremeter reading to ensure 1 acre has been covered.

EXAMPLE: 20 ft drill

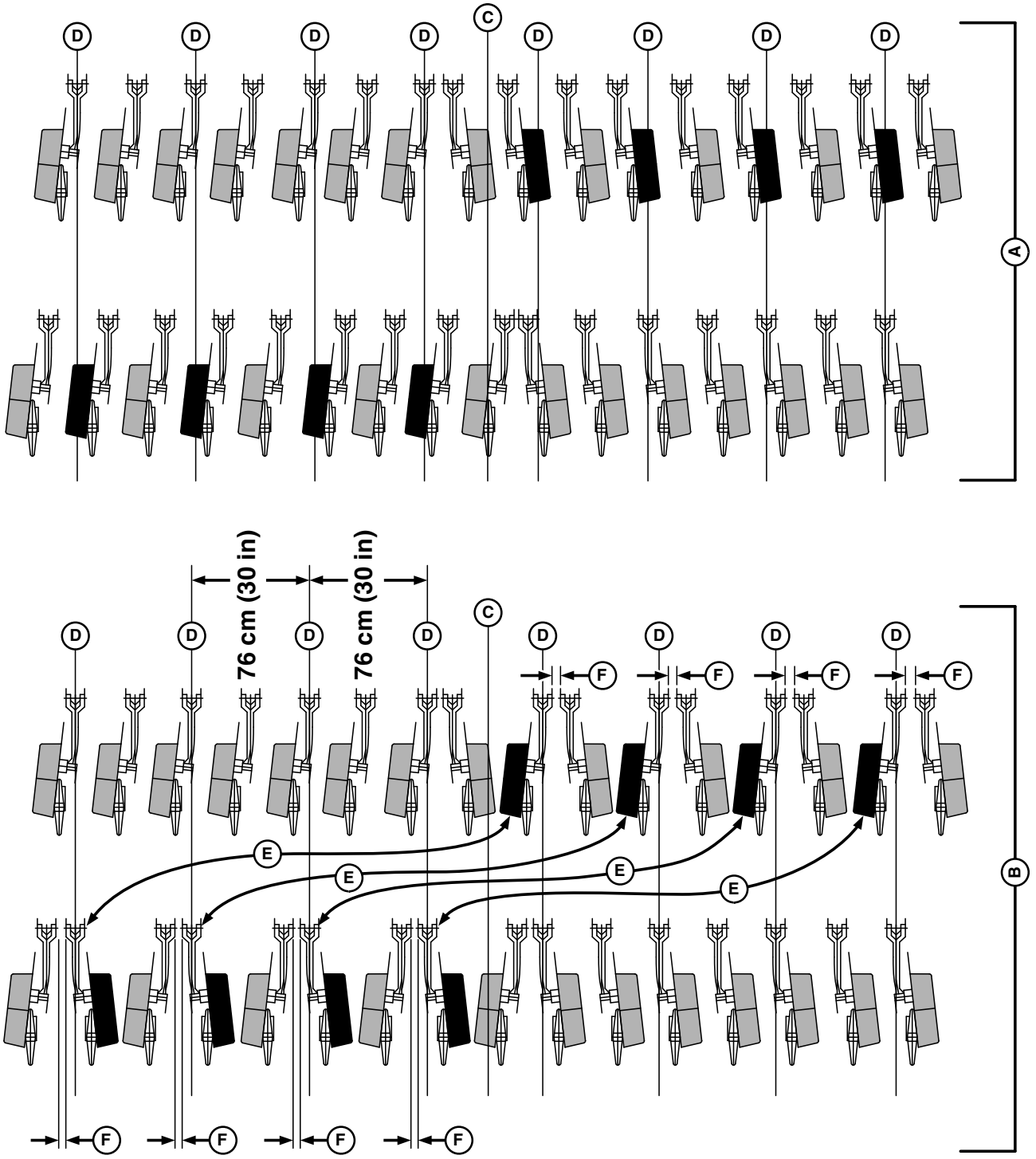
1. 43 560 ÷ 20 ft = 2178 ft
2. Operate drill for 2178 ft
3. Check the acremeter reading. Acremeter reading should increase by 1 acre.

AG,OUO1074,567-19-30NOV17

Use an Alternate Opener Pattern

NOTE: Kit number AN281162 is required to change to an alternate opener pattern and can be purchased from your John Deere Dealer.

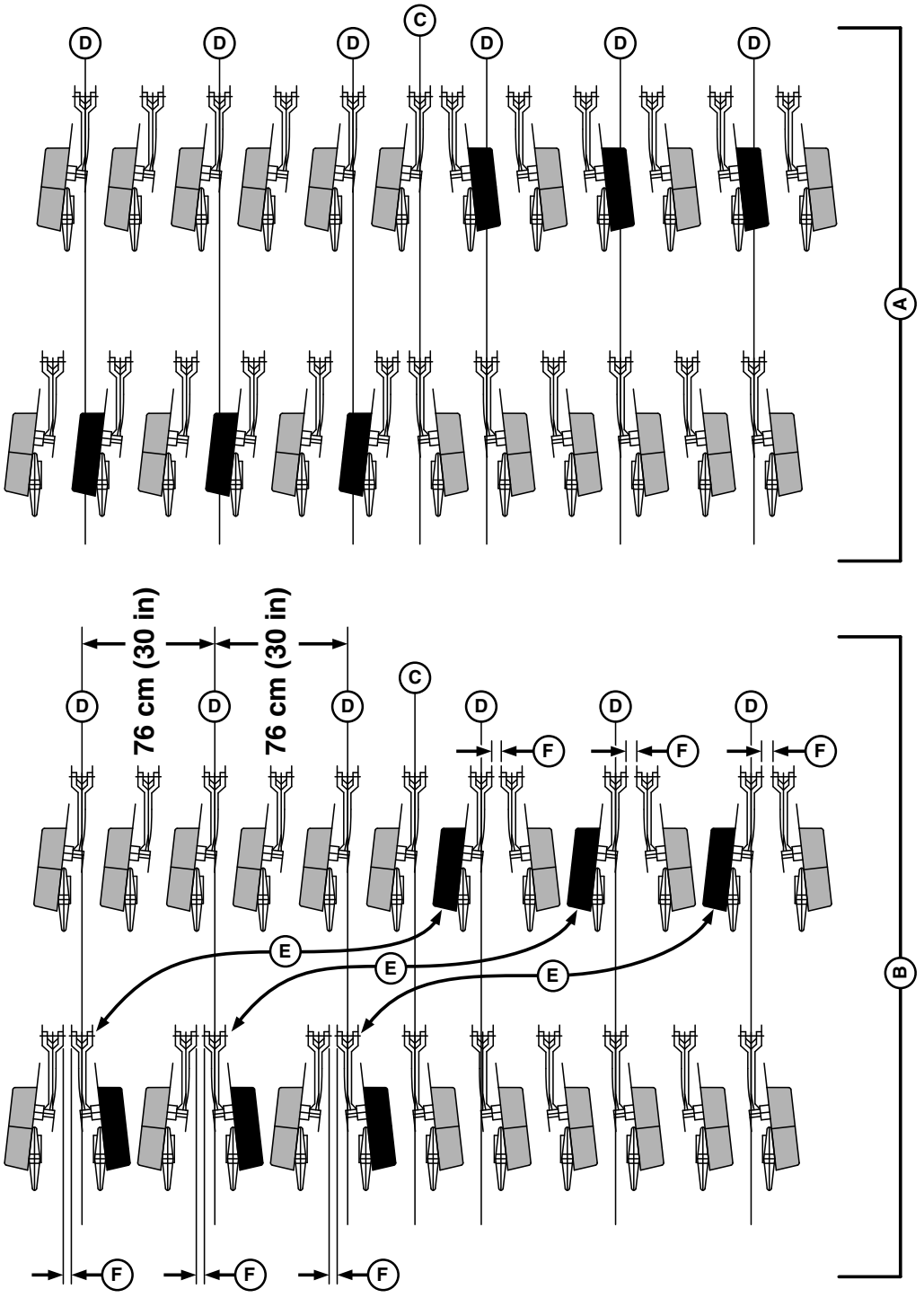
Poor seed placement can occur when following crop rows from prior year. Some of the disk openers can ride on top of the corn or other crop stalks remaining from prior year. The following examples show the most common alternate opener pattern when drilling into a prior corn crop that was planted on 76 cm (30 in) rows. To avoid openers riding on top of the stalks from prior year, reposition the disk openers. The following examples show the factory pattern (A) and the alternate pattern (B). Reposition the openers (E) to achieve the alternate pattern. Place the opener brackets 47 mm (1-7/8 in) (F) from the existing opener brackets. Close the opener lock-up valve before working on the machine and use safe lifting procedures when moving the openers.



N133486—UN—30NOV17

6 m (20 ft) Drill—Alternate Opener Pattern 19 cm (7.5 in) Soybeans Into 76 cm (30 in) Corn Residue

A—Factory Pattern
B—Alternate Pattern
C—Machine Centerline
D—Existing Corn Row Residue
E—Openers to Reposition
F—47 mm (1-7/8 in) Between Brackets



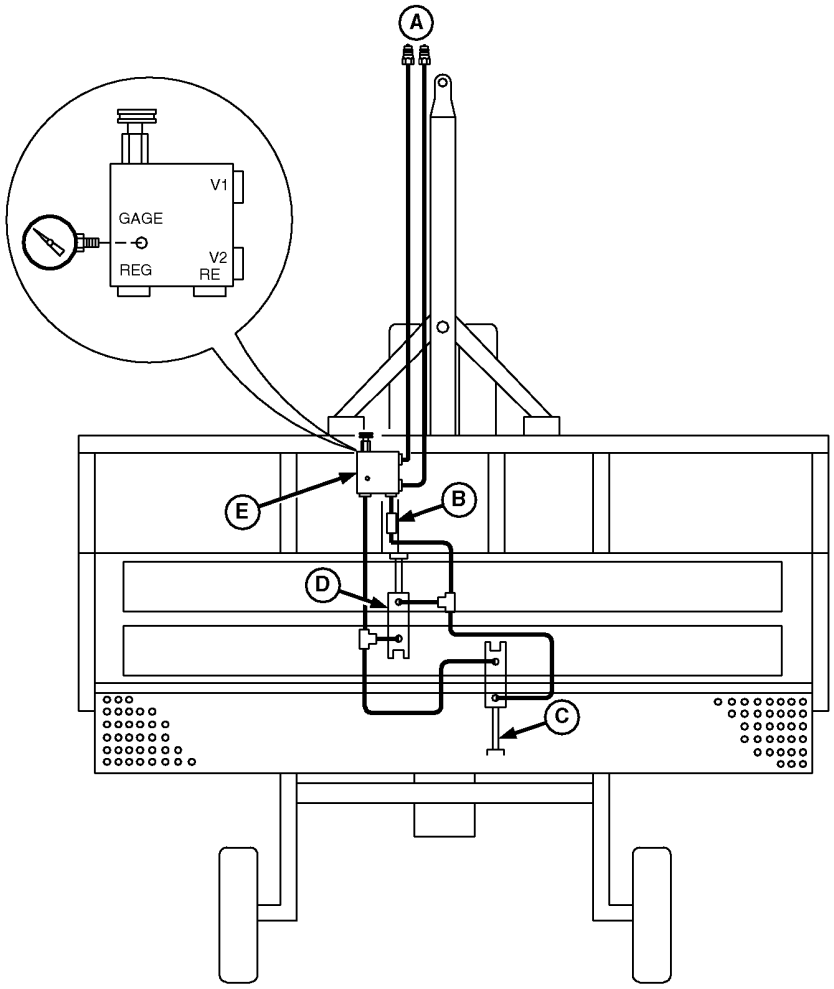
N133487—UN—30NOV17

4.6 m (15 ft) Drill—Alternate Opener Pattern 19 cm (7.5 in) Soybeans Into 76 cm (30 in) Corn Residue

A—Factory Pattern
B—Alternate Pattern
C—Machine Centerline
D—Existing Corn Row Residue
E—Openers to Reposition

AG,OUO1074,568-19-30NOV17

Downforce Hose Routing

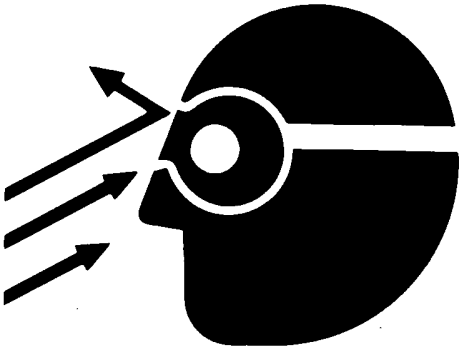


N47228—UN—23JAN96

A—To Tractor SCV
B—Hydraulic Lock-Up Valve
C—Rear Rank Opener Downforce Cylinder
D—Front Rank Opener Downforce Cylinder
E—Active Downforce Control Valve

OUO6074,000017A-19-04APR17

Prepare for Storage



TS266—UN—23AUG88

CAUTION: Reduce compressed air to less than 210 kPa (2 bar) (30 psi) when using for cleaning purposes. Clear area of bystanders, guard against flying debris, and wear personal protection equipment, including eye protection.

IMPORTANT: Compressed air (dry) cleaning method is recommended to prevent gum-like deposits (left by water wash) from forming on the seed box components and/or blocking product passages.

1. Empty the drill boxes and clean caked deposits from boxes. (See Clean Grain Box and Clean Fertilizer Box in this section.)

   Compressed Air (Dry) Cleaning:

   CAUTION: The chemicals that are used in the machine are harmful to your health or the environment. Do not allow residue from the box washing to contaminate well or ground water.

   NOTE: If compressed air is not available for cleaning, water wash method is used. Thoroughly dry seed boxes after cleaning. Drying takes time since moisture trapped in bearing areas is slow to drain or evaporate.

   Thoroughly clean the inside of the boxes using compressed air. A good dry cleaning is preferable to poor washing and drying.

   Water Wash (Wet) Cleaning:

   Wash the grain drill thoroughly inside and out. Wipe the surfaces and components dry.

2. Remove the chain from the drive system. Clean the chain with spray lubricant, coat with oil, and hang in a dry place.
3. Paint all bare metal and rust spots.
4. Replace any missing or damaged parts including hoses, hardware, and decals. Tighten all hardware.
5. Apply grease to the exposed area of the hydraulic cylinder rods.
6. Place the hose ends and warning light plug in the storage positions on the hitch.
7. Lubricate the grain drill. (See the Lubrication and Maintenance section.)

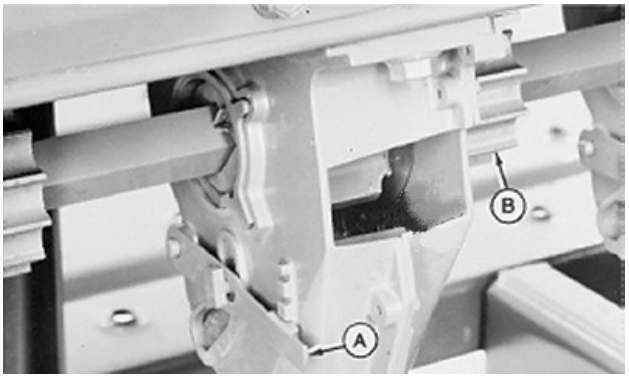
BB83525,00006AF-19-19MAR19

Remove from Storage

1. Check the tire pressure. (See Check Tire Pressure in the Servicing section.)
2. Clean the grain drill thoroughly.
3. Make sure that the seed tubes and openers are free of obstruction.
4. Perform the required lubrication and maintenance. (See the Lubrication and Maintenance section.)
5. Check all hardware and torque as needed.
6. Review the Operator's Manual, giving special attention to safety precautions.

BB83525,00006B0-19-19MAR19

Clean Grain Box



N53015—UN—29MAR00

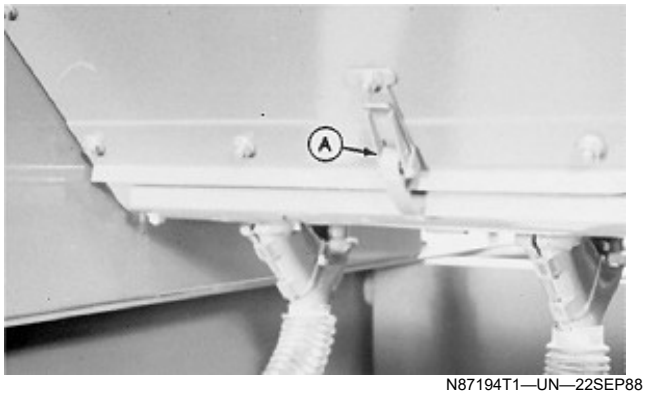
A—Latch
B—Feed Gate

1. Move latch (A) downward off retaining teeth to open feed gate (B).
2. Empty product from box and thoroughly clean inside of box. (See Prepare for Storage in this section.)
3. Lightly coat inside of the box with spray lube.

AG,OUO1074,574-19-06MAR17

Clean Fertilizer Box

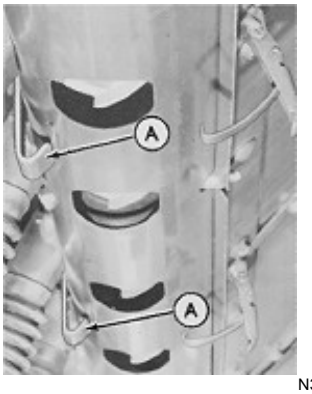
IMPORTANT: To avoid metal corrosion and feed shaft binding or "freezing", clean out all fertilizer in box before storing drill (even overnight).



N87194T1—UN—22SEP88

A—Spring Clips

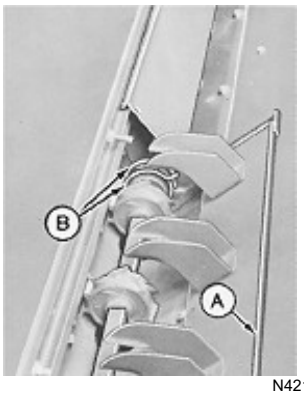
1. Release all spring clips (A) to drop bottom covers.



N37821—UN—04OCT88

A—Hangers

2. Remove covers as necessary by rotating them off hangers (A).

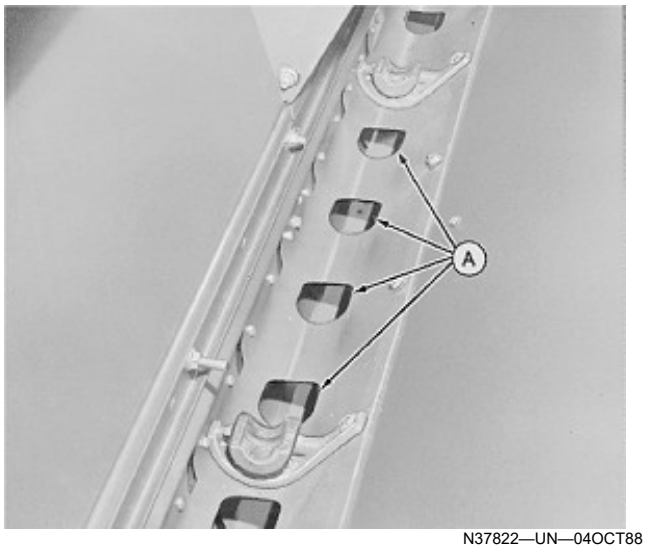


N42142MG—UN—07OCT93

A—Baffle
B—Bearing Clamps

3. Remove baffle hold-down knobs. Tip left-hand baffle (A) to rear and lift out. Tip and lift out right-hand baffle.
4. Remove bearing clamps (B) and bearing caps and lift feed shaft out of box.

IMPORTANT: To avoid deterioration, do not allow the spray lube to come in contact with rubber tubes.



N37822—UN—04OCT88

A—Holes

5. Clean remaining fertilizer through cleanout holes (A) in the bottom of the box. If drill is to be stored for longer than 24 hours, coat metal parts and inside of the box with spray lube.

NOTE: When installing baffles, the right-hand baffle is installed first.

Install baffles over feed wheels so outer ends of the baffles are flush with the end panels of the fertilizer box.

6. Install feed shafts, clamps, and baffles. The baffle "ears" locate the feed wheels, and if bent, may cause erratic delivery of the product.

IMPORTANT: The outer end of either bottom cover must not contact the end panel hardware of the box or leakage results.

7. Replace bottom covers.

AG,OUO1074,575-19-15MAR17

Use Machine Covers

Vinyl covers are available for all 1590 Grain Drill boxes without grass seed attachment. See your John Deere dealer for information.

AG,OUO1074,576-19-06MAR17

Specifications

Tractor Recommendations

Model	Minimum Horsepower kW (hp) At PTO
3.1 m (10 ft) with 19 cm (7.5 in.) spacing	63 kW (85 hp)
4.6 m (15 ft) with 19 cm (7.5 in.) spacing	75 kW (100 hp)
4.6 m (15 ft) with 25 cm (10 in.) spacing	69 kW (93 hp)
6.1 m (20 ft) with 19 cm (7.5 in.) spacing	104 kW (140 hp)

AG,OUO1074,577-19-22FEB00

Transport Weights and Drawbar Hitch Load

N75886—UN—24APR07

Simple Hitch

CAUTION: The drill is heavy. Chart shows weights for one drill. Use adequate towing vehicle to avoid injury. A runaway machine can cause injury or death to you or others.

The maximum static vertical load on tractor drawbar is achieved with the tanks full of product.

Machine Size m (ft.)	Maximum Machine Weight Empty	Maximum Machine Weight Full	Maximum Simple Hitch Static Load[a]
Combination Box	**kg (lb.)**	**kg (lb.)**	**kg (lb.)**
3.1 (10)	3130 (6900)	4082 (9000)	1497 (3300)
4.6 (15)	4581 (10 100)[b]	5942 (13 100)[b]	2087 (4600)
6.1 (20)	6682 (14 730)[c]	8936 (19 860)[c]	2903 (6400)

[a]Weights are with typical optional equipment. Weights with other optional equipment vary.
[b]If 4.6 m (15 ft.) drills are equipped with row markers, add 259 kg (570 lb.).
[c]If 6.1 m (20 ft.) drills are equipped with row markers, add 259 kg (570 lb.).

AG,OUO1074,579-19-17MAR11

Machine Dimensions

Model		3.1 m (10 ft.)	4.6 m (15 ft.)	6.1 m (20 ft.)
Overall Length Single Placement Caster Wheels	m	6.4	6.4	6.4
	(ft.)	21	21	21
Overall Length With Two-Point Hitch	m	5.38	5.38	5.38
	(ft.)	17.7	17.7	17.7
Overall Height	mm	2085	2085	2085
	(in.)	82	82	82
Overall Height With Marker Arm Length Set for Machine	mm	n/a[a]	2502	2502
	(in.)		98.5	98.5
Overall Width	m	3.2	4.7	6.4
	(ft.)	10.5	15.5	20.6
Overall Transport Width (With Marker Arm Attachment)	m	3.2	4.7	6.4

Model		3.1 m (10 ft.)	4.6 m (15 ft.)	6.1 m (20 ft.)
	(ft.)	10.5	15.5	20.6
Overall Field Width (With Marker Arm Length Set For Machine)	m	n/a[a]	9.1	12.2
	(ft.)		30	40
Under Frame Clearance Vertical	cm	60	60	60
	(in.)	24	24	24
Specifications and design subject to change without notice.				

[a](n/a = not available for this size)

AG,OUO1074,581-19-24MAR11

Opener Specifications

Disk Blade Size/Angle	
New	457 mm (18 in) Diameter at 7 degrees
Replace at	406 mm (16 in) Diameter
Gauge Wheels	114 mm (4.5 in) x 406 mm (16 in) Rubber
	76 mm (3 in) x 406 mm (16 in) Rubber
Seed Depth Adjustment Range	13 mm (0.5 in) to 89 mm (3.5 in) with 6 mm (1/4 in) increments
Press Wheels	18 mm (23/32 in) x 254 mm (10 in) Rubber
Downforce Adjustment Range	2.3 kg (5 lb) to 20.4 kg (45 lb)
Closing Wheels	25 mm (1 in) x 305 mm (12 in) Cast
Downforce Adjustment Range	12 kg (26 lb) to 19.5 kg (43 lb)
Openers Per Machine	
3.1 m (10 ft)	16 at 19 cm (7.5 in)/25 cm (10 in) n/a[a]
4.6 m (15 ft)	24 at 19 cm (7.5 in)/18 at 25 cm (10 in)
6.1 m (20 ft)	32 at 19 cm (7.5 in)/25 cm (10 in) n/a[a]
Downforce per Opener	73 kg (160 lb) to 204 kg (450 lb)

[a](n/a = not available for this size.)

AG,OUO1074,583-19-30NOV17

1590 Machine Capacities and Specifications

Configuration	Plain Grain 100 Percent Grain	Combination Box 60 Percent Grain 40 Percent Fertilizer
Grain Box	404.7 L/m	250.9 L/m
	3.5 bu/ft	2.17 bu/ft
Fertilizer Box	0 kg/m	197.4 kg/m
	0 lb·ft	132.8 lb·ft

		Plain Grain Box	Combination Box
Total Box 3.1 m (10 ft)	liter	1233.4 L	1318.0 L
	bu	35 bu	37.4 bu
Total Box 4.6 m (15 ft)	liter	1850.1 L	2026.3 L
	bu	52.5 bu	57.5 bu
Total Box 6.1 m (20 ft)	liter	2466.8 L	2636.0 L
	bu	70 bu	74.8 bu

		3.1 m (10 ft) Drill	4.6 m (15 ft) Drill	6.1 m (20 ft) Drill
Grass seed Box with Plain Grain Box	liter	105.7 L	169.1 L	211.4 L
	bu	3.0 bu	4.8 bu	6.0 bu
Grass Seed Box with Combination Box	liter	52.9 L	84.6 L	105.7 L
	bu	1.5 bu	2.4 bu	3.0 bu

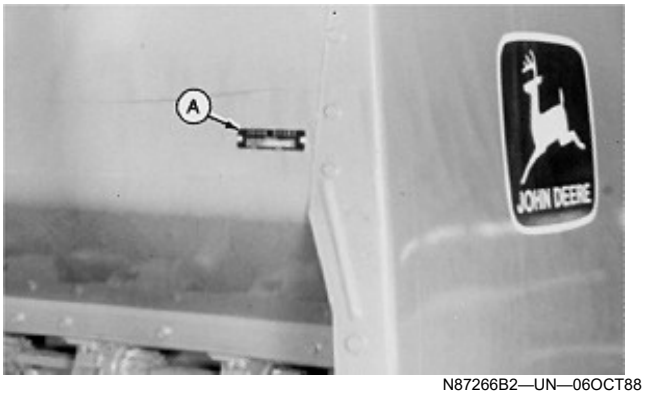
Seed weight is measured at 770 kg/m^3 (60 lb/bu).

Fertilizer weight is measured at 80 lb/bu^3 or 1041 kg/m^3 (65 lb/ft^3).

Hydraulic System Pressures	
Working pressure	20 684 kPa (207 bar) (3000 psi)
Burst pressure	82 737 kPa (827 bar) (12 000 psi)

AG,OUO1074,584-19-21MAR17

Serial Number



N87266B2—UN—06OCT88

A—Serial Number

Record serial number (A), located on left end of each grain box.

AG,OUO1074,586-19-22FEB00

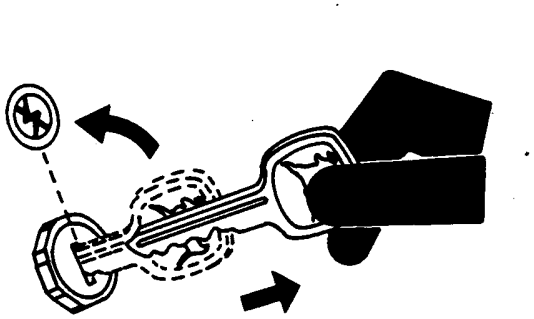
Keep Proof of Ownership

TS1680—UN—09DEC03

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

DX,SECURE1-19-18NOV03

Keep Machines Secure



TS230—UN—24MAY89

1. Install vandal-proof devices.
2. When machine is in storage:
   - Lower equipment to the ground
   - Set wheels to widest position to make loading more difficult
   - Remove any keys and batteries
3. When parking indoors, put large equipment in 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.

DX,SECURE2-19-18NOV03

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John Deere Service Literature Available

Technical Information

Technical information can be purchased from John Deere. Publications are available in print or CD-ROM format.

Orders can be made using one of the following:

- John Deere Technical Information Store: **www.JohnDeere.com/TechInfoStore**
- Call 1-800-522-7448
- Contact your John Deere dealer

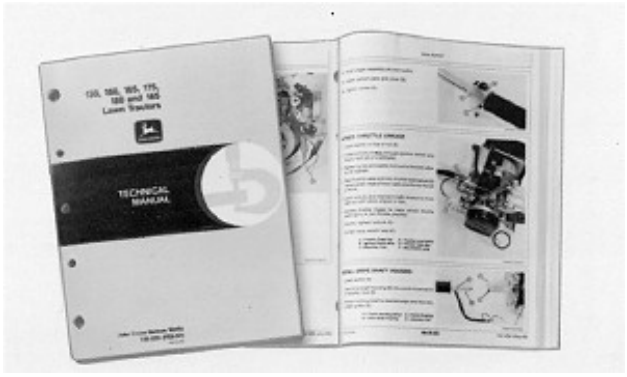
Available information includes:

TS189—UN—17JAN89

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.

TS191—UN—02DEC88

OPERATOR'S MANUALS providing safety, operating, maintenance, and service information.



TS224—UN—17JAN89

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 a separate component technical manual.

TS1663—UN—10OCT97

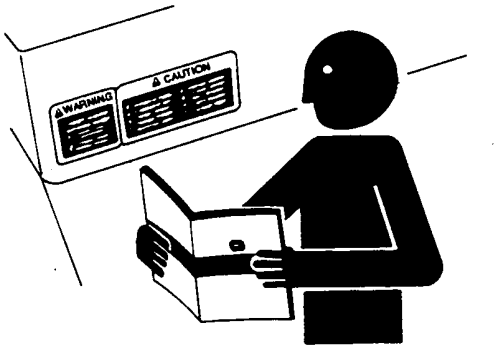
EDUCATIONAL CURRICULUM including five comprehensive series of books detailing basic information regardless of manufacturer:

- Agricultural Primer series covers technology in farming and ranching.
- 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.
- Fundamentals of Machine Operation manuals explain machine capacities and adjustments, how to improve machine performance, and how to eliminate unnecessary field operations.
- Fundamentals of Compact Equipment manuals provide instruction in servicing and maintaining equipment up to 40 PTO horsepower.

DX,SERVLIT-19-07DEC16

John Deere Service Keeps You On The Job

John Deere Is At Your Service



TS201—UN—15APR13

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/.

DX,IBC,2-19-02APR02