

John Deere™ Liquid Fertilizer - Block Manifold Delivery System

(Serial No. 755101 -)



OPERATOR'S MANUAL

John Deere™ Liquid Fertilizer - Block Manifold Delivery System

OMA96545 ISSUE D8 (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 Seeding Group
North American Edition
PRINTED IN U.S.A.



Introduction

Foreword

READ THIS MANUAL carefully to avoid personal injury or equipment damage. Learn how to operate and service the machine correctly. If desired, see your John Deere dealer to determine if this manual and safety signs on the machine are available in other languages.

CONSIDER THIS MANUAL a permanent part of the machine and include the manuals with the machine when sold.

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 require a specific metric or inch wrench.

RIGHT-HAND AND LEFT-HAND sides are determined by facing the direction the implement travels when moving forward.

WRITE PRODUCT IDENTIFICATION NUMBERS (P.I.N.) in the Specification section. Accurately record all the numbers to help trace the machine if stolen. Your dealer also needs these numbers to order parts. File the identification numbers in a secure place away from machine.

OJ06074,0001041 -19-03OCT07-1/1

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

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Safety

Recognize Safety Information

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

Follow recommended precautions and safe operating practices.



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

TS1389 —UN—28JUN13

Understand Signal Words

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.

▲ DANGER

▲ WARNING

▲ CAUTION

DX,SIGNAL -19-05OCT16-1/1

TS187 —19—30SEP88

Follow Safety Instructions

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

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 -19-16JUN09-1/1

TS201 —UN—15APR13

Operate the Machine Safely

Be careful when operating machine to avoid injury.

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

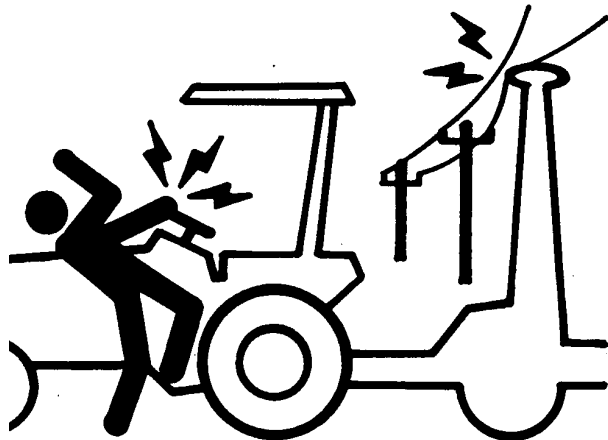
Serious injury or death can result from contact with electric lines. Use care when moving or operating this machine near electric lines to avoid contact.

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

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

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

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



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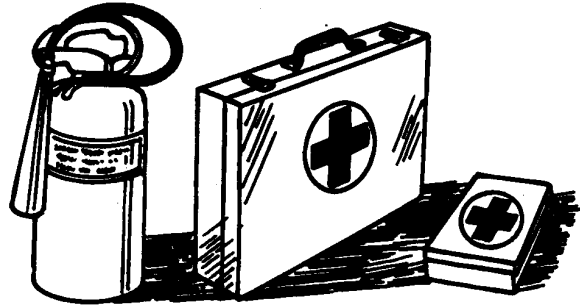
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Prepare for Emergencies

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

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



TS291 —UN—15APR13

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

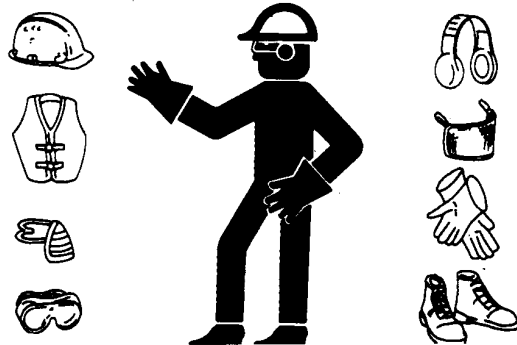
Wear Protective Clothing

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

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

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

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



TS206 —UN—15APR13

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

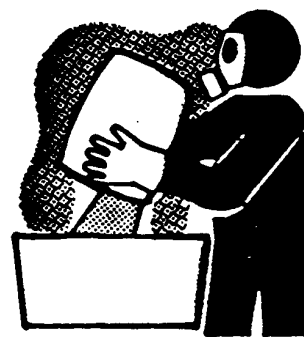
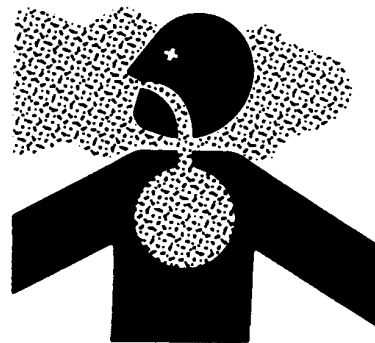
Handle Agricultural Chemicals Safely

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

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

Reduce risk of exposure and injury:

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



A34471

- 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.

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TS220 —UN—15APR13

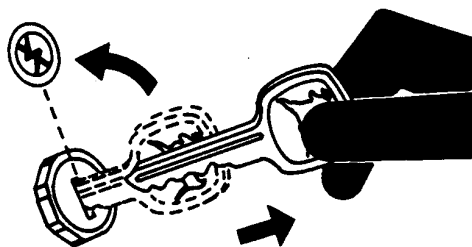
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Service Machine Safely

To help prevent personal injury caused by unexpected movement, be sure to service machine on 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.



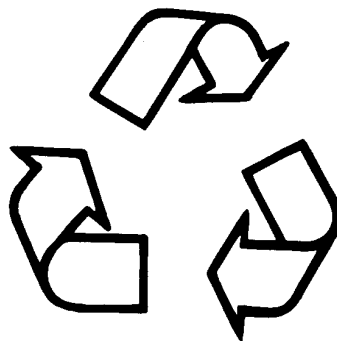
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TS230 —UN—24MAY89

Decommissioning — Proper Recycling and Disposal of Fluids and Components

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 -19-01JUN15-1/1

TS1133 —JUN—15APR13

Practice Safe Maintenance

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

Never lubricate, service, or adjust machine while it is moving. Keep hands, feet, and clothing 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.



TS218 —UN—23AUG88

DX,SERV -19-28FEB17-1/1

Replace Safety Signs

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.



TS201 —UN—15APR13

DX,SIGNS -19-18AUG09-1/1

System Overview

Fertilizer Distribution

NOTE: Inserting a non-chamfered hose into the distribution manifold distorts the O-ring which causes fertilizer leaks.

The John Deere Liquid Fertilizer system uses distribution manifolds and in-line orifices of varying sizes to distribute the product at various application rates. Distribution manifolds are mounted on the frame. This distribution system is compatible with all John Deere fertilizer openers.

The fertilizer system uses in-line orifices at each row to maintain system pressure. The lower end of the pressure range, 103 kPa (1.0 bar) (15 psi), must be maintained to ensure even fertilizer distribution. Do not exceed the upper end of the range, 689 kPa (6.9 bar) (100 psi). The pump setting and the orifices are adjusted when changing the rates. To set the application rate, refer to the rate chart, then adjust the pump to a target setting and install the recommended orifices. Next, verify that the system pressure is within 103—621 kPa (1.0—6.2 bar) (15—90 psi) when traveling at the target planting speed.

NOTE: As the ground speed is increased, the fertilizer pressure increases.

The delivery hose is equipped with a check valve near each opener. A minimum pressure of 14 kPa (0.1 bar) (2 psi) must be present before the fertilizer is delivered to the opener.

Priming the fertilizer system is critical for obtaining the best performance, especially at low flow rates (See Prime

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and Start the Pump). Eliminate any kinks, pinches, or sharp bends in the fertilizer hoses. Any restriction in the hoses reduces the fertilizer flow to the openers.

IMPORTANT: Monitor the system pressure by equipping all liquid fertilizer systems with a pressure sensor. SeedStar™ equipped planters show the fertilizer pressure on-screen (See your SeedStar™ Application Help or Operator's Manual for information about the fertilizer pressure).

Avoid pump damage. Remove the drive chain from the piston pump when the fertilizer system is not in use.

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Prime and Start the Pump

It is normal for a small amount of oil to leak from the weep hole (A). The weep hole must remain open. Perform an inspection at the beginning of each season. Too much grease at the lubrication fitting (B) increases the chance of plugging the weep hole or leaking grease.

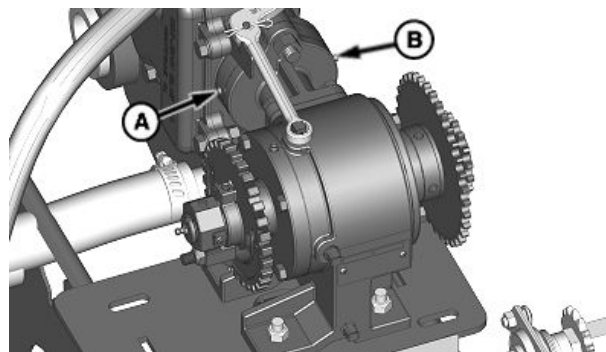
Before priming, inspect the fertilizer distribution system. Verify that the filter screen is clean and that there are no leaks in the pump suction line. Verify that there are no pinched, kinked, or otherwise restricted hoses. Verify that there are no extreme high or low variations in the path of hose. Inspect all orifices for debris and blockages. Verify that all 14 kPa (0.1 bar) (2 psi) check valves are free of debris and blockage.

1. Open the shutoff valve at the tank and strainer.
2. Fill the tank with a minimum of 75 L (20 gal) and check the system for leaks

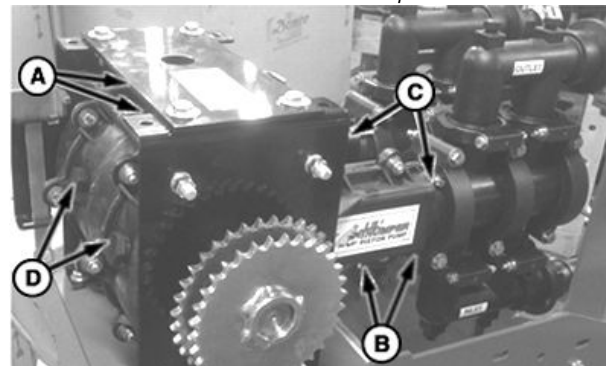
IMPORTANT: Avoid excessive system pressure.
Do not exceed the maximum recommended rate for the orifice or nozzle size.

3. Refer to the rate chart and set the pump to the maximum rate for the in-line orifice or nozzle that is installed.
4. Lower the machine to the planting position and drive 90 meters (100 yards) at planting speed 9.7 km/h (6 mph).
5. Raise the machine and turn the drive wheel on the fertilizer pump by hand.
6. Check all rows for liquid exiting the opener tubes in a steady stream. Repeat the initial steps until a steady flow of liquid is apparent at all openers and all air is flushed from the distribution hoses.
7. Select a target fertilizer rate from the rate chart. Set the pump range and install in-line orifices or nozzles for the selected fertilizer rate.

NOTE: As travel speed increases, the fertilizer system pressure also increases.



John Blue Pump



Demco Pump

A—Weep Hole
B—Lubrication Fitting

C—Lubrication Fitting
D—Oil Check and Fill Plug

8. Verify that the system pressure is within 103—621 kPa (1.0—6.2 bar) (15—90 psi) when traveling at the desired planting speed.
9. If the machine is stationary for a long period, air bubbles can develop and become trapped in the distribution hoses. Prime the system as necessary.

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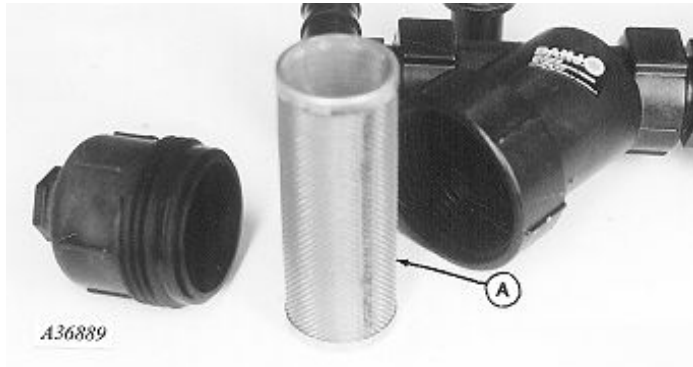
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A89993—UN—30MAR16

Strainer Recommendations

IMPORTANT: Prevent damage to piston pump.
See Storage section for recommended
storage procedures.

IMPORTANT: Equip all nurse tanks with strainers
to prevent contamination.



A—Strainer

A strainer (A) prevents obstructions in manifolds, nozzles, and orifices. It also prevents damage to piston pump, manifold, and check valves. An 80 mesh main strainer is recommended. Inspect and clean strainer after initial start up, daily, and as required thereafter.

An increased pressure reading on the pressure gauge is an indication of an obstruction. Obstructions cause inconsistent delivery to openers.

If fertilizer with a high solid content is plugging the 80 mesh strainer frequently, a less restrictive 50 mesh strainer is available, but this may result in more frequent obstructions with in-line orifices. See your John Deere dealer.

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Set John Blue™ Fixed Pump Drive Range

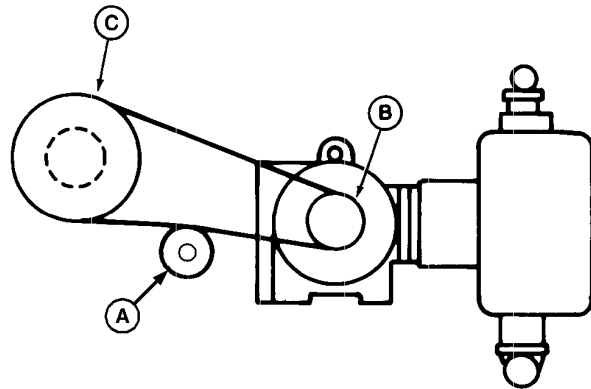
IMPORTANT: Avoid pump damage. Remove the
drive chain from the piston pump when the
fertilizer system is not in use.

High Drive Range:

Release the tension on the chain by pulling back on the tensioner (A). Install the chain on the 16-tooth pump sprocket (B) and on the 35-tooth drive sprocket (C) then release the tensioner.

A—Tensioner
B—16-Tooth Sprocket

C—35-Tooth Sprocket



High Drive Range

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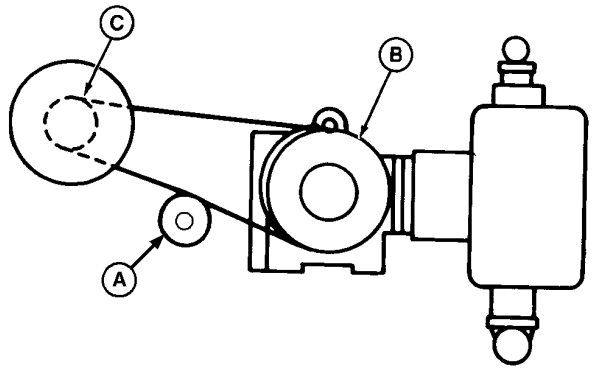
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Low Drive Range:

Release the tension on the chain by pulling back on the tensioner (A). Install the chain on the 35-tooth pump sprocket (B) and on the 16-tooth drive sprocket (C) then release the tensioner.

A—Tensioner
B—35-Tooth Sprocket

C—16-Tooth Sprocket



Low Drive Range

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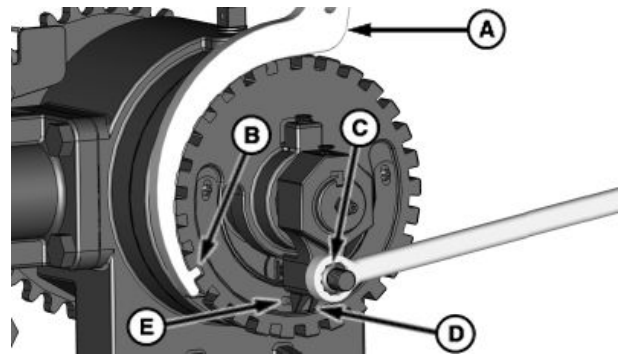
Adjust the John Blue™ (Fixed Rate) Pump Setting Number

1. Use the rate chart to determine a pump setting number for the application rate.
2. Install the wrench (A) on the scale ring (B) as shown.
3. Loosen the nut (C) and rotate the scale ring until the pointer (D) is aligned with the pump setting number on the gauge (E).
- 4.

Specification

Nut—Torque.....25 N·m
(18 lb·ft)

Tighten the nut (C) to specification.



A—Wrench
B—Scale Ring
C—Nut

D—Pointer
E—Gauge

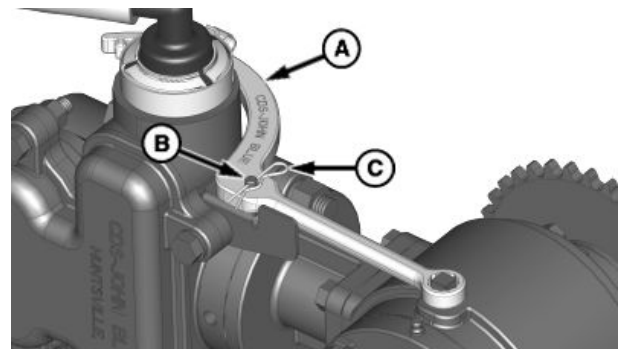
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5. Store the wrench (A) on pin (B) on the pump mounting bracket. Attach the tool with the clip (C).

A—Wrench
B—Pin

C—Clip



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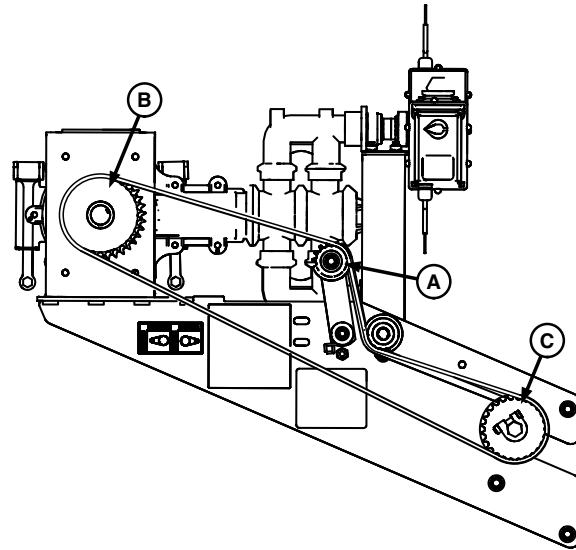
Set Demco™ Fixed Rate Pump Drive Range

IMPORTANT: Avoid pump damage. Remove drive chain from piston pump when fertilizer system is not in use.

HIGH DRIVE RANGE:

Release tension on chain by pulling back on tensioner (A). Install chain on 32-tooth pump sprocket (B) and on 26-tooth drive sprocket (C) and release tensioner.

A—Idler
B—32-Tooth Sprocket
C—26-Tooth Sprocket



High Drive Range

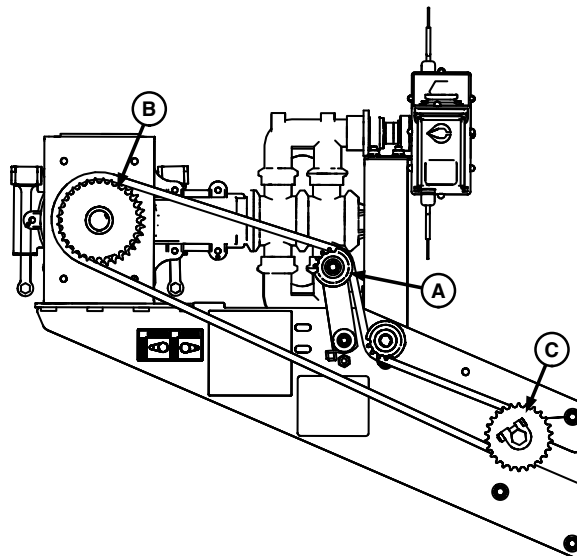
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LOW DRIVE RANGE:

Release tension on chain by pulling back on tensioner (A). Install chain on 35-tooth pump sprocket (B) and on 18-tooth drive sprocket (C) and release tensioner.

A—Idler
B—35-Tooth Sprocket
C—18-Tooth Sprocket



Low Drive Range

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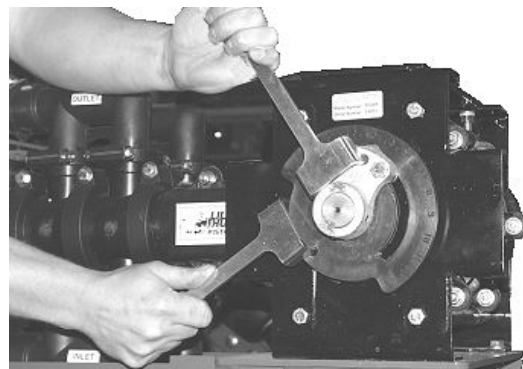
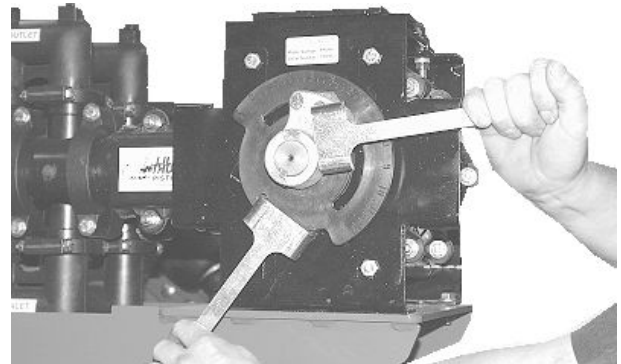
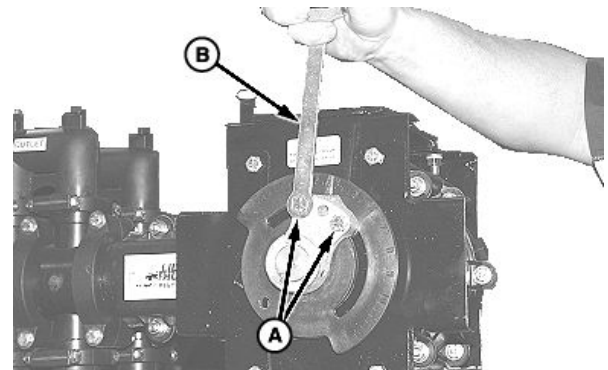
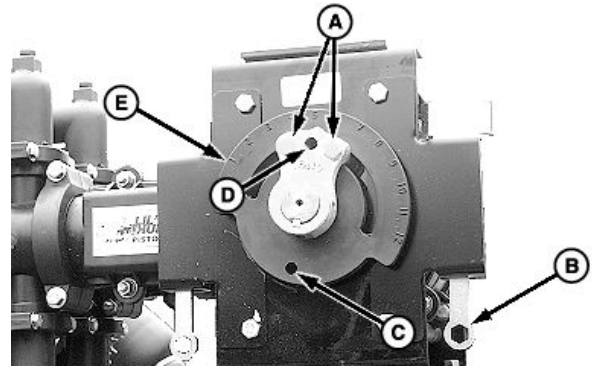
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Adjust Demco™ Fixed Rate Pump Setting Number

1. Loosen bolts (A), using wrench (B).
2. Insert one tab on wrench (B) into hole (C).
3. Insert one tab of second wrench into hole (D).
4. Turn adjustment disk (E) clockwise to desired setting, using second wrench.
5. Tighten bolts (A).

A—Bolts (2 used)
B—Wrench
C—Hole

D—Hole
E—Adjustment Disk



A53333 —UN—17NOV03

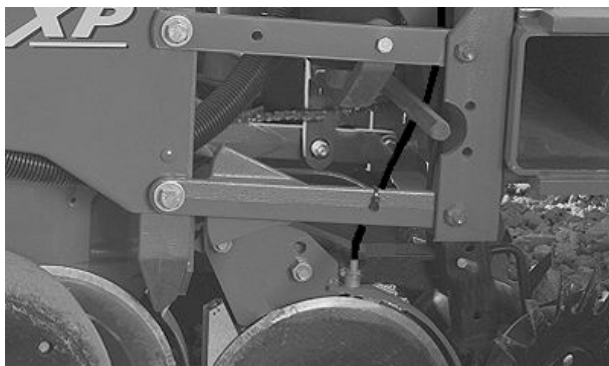
A53134 —UN—17OCT03

A53135 —UN—17OCT03

A53136 —UN—17OCT03

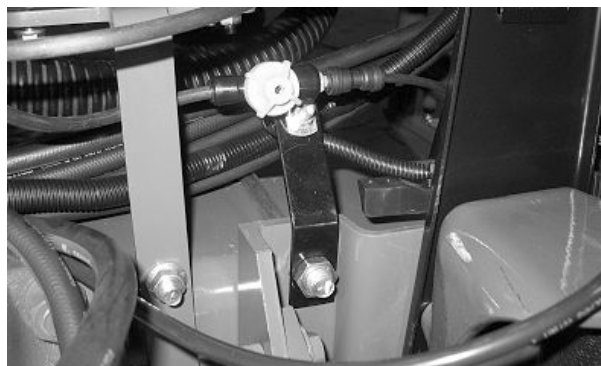
OOU6074,0000E77 -19-22MAY09-1/1

Liquid Fertilizer Without Openers



A74992 — UN—30MAR12

Graphic Used For Clarity and Example

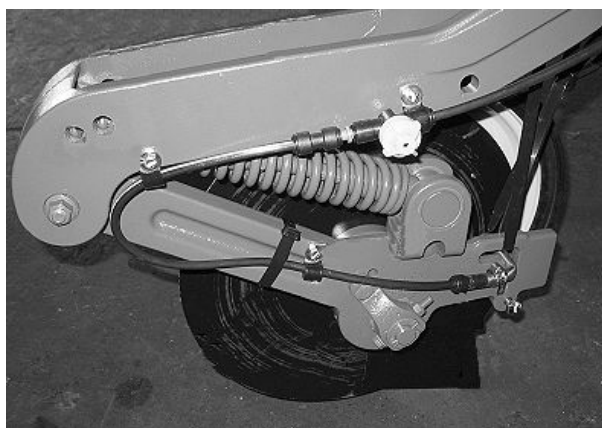


A74994 — UN—30MAR12

Graphic Used For Clarity and Example

NOTE: Planters installed with liquid fertilizer without openers should route shutoff valves as close to your openers as possible. Use graphics of fertilizer distribution set-up and connection on openers as example.

(See your John Deere™ dealer for more information.)



A75012 — UN—04APR12

Graphic Used For Clarity and Example

WP29706,000031A -19-10APR12-1/1

Liquid Fertilizer Rate Charts for Non-Injection Openers

How to Use Liquid Fertilizer Rate Charts

IMPORTANT: A field check must be done to verify the application rate. (See **CHECK FERTILIZER RATES** in this section.)

This system is NOT recommended for use with suspension fertilizers.

NOTE: 1.2 mm yellow orifices and 1.7 mm black orifices are included with this system from the factory. For customers wanting to apply higher or lower application rates, two additional orifice sizes (0.7 mm green and 2.5 mm gray) are available through Service Parts.

1. Refer to rate chart for the fertilizer opener installed on machine and select approximate application rate desired for row width being planted.
2. Pump range is given at top of Liquid Fertilizer Application Rate chart.
3. Set range of pump drive.
4. Next to approximate application rate selected, note pump setting, and travel speed.
5. Adjust pump to pump setting number.
6. Install recommended in-line orifice (shown next to the rate on the rate chart).

OUC6074,0000CB4 -19-06JAN16-1/1

Liquid Fertilizer Rate Charts for Non-Injection Openers (Frame Mounted, Unit Mounted, and In-Furrow)

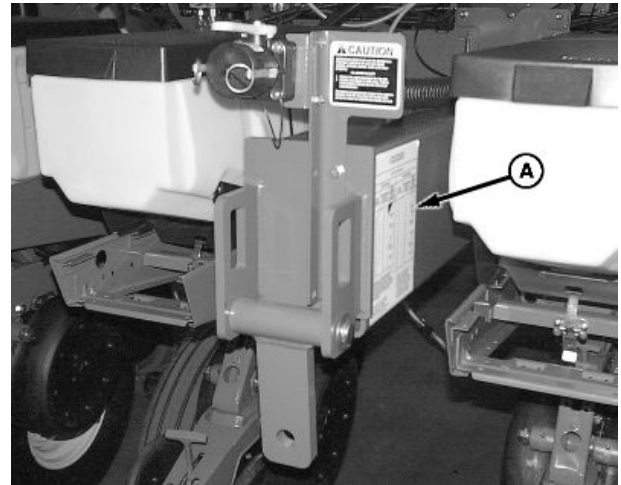
Many factors affect the orifice size chart (A) including ambient temperature, travel speed, wheel slippage, and type of fertilizer. The objective is to keep the system pressure between 103—621 kPa (1.0—6.2 bar) (15—90 psi). **DO NOT EXCEED 689 kPa (6.9 bar) (100 psi).**

The charts are optimized for ground speeds of 8—11 km/h (5—7 mph) and not recommended for speeds over 11 km/h (7 mph).

NOTE: To change the application rate L/ha (gal/acre), change the pump setting.

To change system pressure, change the in-line orifice size or the travel speed.

A—Chart



A47814—UN—02AUG01

MH69740,00006BD -19-19APR18-1/1

**76 cm (30 in) Rows, Models 1700 to 16-Row
1770NT and 1705 to 16-Row 1775NT**

LIQUID FERTILIZER APPLICATION RATE					
76 cm (30 in) ROW SPACING					
LOW RANGE			HIGH RANGE		
Pump Setting	Approximate Rate	In-Line Orifice	Pump Setting	Approximate Rate	In-Line Orifice
Value	L/ha (gal/acre)	Size and Color	Value	L/ha (gal/acre)	Size and Color
3.0	22.4 (2.4)	0.70 Green	2.0	73.9 (7.9)	1.2 Yellow
3.5	26.2 (2.8)		2.5	90.7 (9.7)	
4.0	29.9 (3.2)		3.0	108.5 (11.6)	1.7 Black
4.5	33.7 (3.6)		3.5	125.3 (13.4)	
5.0	37.4 (4.0)		4.0	143.1 (15.3)	
5.5	41.2 (4.4)	1.2 Yellow	4.5	160.0 (17.1)	
6.0	44.0 (4.7)		5.0	177.7 (19.0)	2.5 Gray
6.5	47.7 (5.1)		5.5	195.5 (20.9)	
7.0	51.4 (5.5)		6.0	212.3 (22.7)	
7.5	55.2 (5.9)		6.5	230.1 (24.6)	
8.0	58.9 (6.3)		7.0	246.9 (26.4)	
8.5	62.7 (6.7)		7.5	264.7 (28.3)	
9.0	66.4 (7.1)		8.0	282.5 (30.2)	
9.5	70.2 (7.5)		8.5	299.3 (32.0)	
10.0	73.9 (7.9)		9.0	317.1 (33.9)	
			9.5	333.9 (35.7)	
			10.0	351.7 (37.6)	

Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)
The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).
To verify the rate, perform a field check. (See Check the Fertilizer Rates.)

MH69740,00006AD -19-12APR18-1/1

91 cm (36 in) Rows, Models 1700 to 16-Row 1770NT and 1705 to 16-Row 1775NT

LIQUID FERTILIZER APPLICATION RATE					
91 cm (36 in) ROW SPACING					
LOW RANGE			HIGH RANGE		
Pump Setting	Approximate Rate	In-Line Orifice	Pump Setting	Approximate Rate	In-Line Orifice
Value	L/ha (gal/acre)	Size and Color	Value	L/ha (gal/acre)	Size and Color
3.0	18.7 (2.0)	0.70 Green	2.0	60.8 (6.5)	1.2 Yellow
3.5	21.5 (2.3)		2.5	75.8 (8.1)	
4.0	25.3 (2.7)		3.0	89.8 (9.6)	
4.5	28.1 (3.0)		3.5	104.8 (11.2)	1.7 Black
5.0	30.9 (3.3)		4.0	118.8 (12.7)	
5.5	33.7 (3.6)		4.5	133.8 (14.3)	
6.0	37.4 (4.0)		5.0	147.8 (15.8)	
6.5	40.2 (4.3)	1.2 Yellow	5.5	162.8 (17.4)	
7.0	43.0 (4.6)		6.0	176.8 (18.9)	2.5 Grey
7.5	45.8 (4.9)		6.5	191.8 (20.5)	
8.0	49.6 (5.3)		7.0	205.8 (22.0)	
8.5	52.4 (5.6)		7.5	220.8 (23.6)	
9.0	55.2 (5.9)		8.0	234.8 (25.1)	
9.5	58.0 (6.2)		8.5	249.7 (26.7)	
10.0	60.8 (6.5)		9.0	263.8 (28.2)	
			9.5	278.7 (29.8)	
			10.0	292.8 (31.3)	

Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)
 The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).
 To verify the rate, perform a field check. (See Check the Fertilizer Rates.)

MH69740,00006B3 -19-12APR18-1/1

**97 cm (38 in) Rows, Models 1700 to 16-Row
1770NT and 1705 to 16-Row 1775NT**

LIQUID FERTILIZER APPLICATION RATE					
97 cm (38 in) ROW SPACING					
LOW RANGE			HIGH RANGE		
Pump Setting	Approximate Rate	In-Line Orifice	Pump Setting	Approximate Rate	In-Line Orifice
Value	L/ha (gal/acre)	Size and Color	Value	L/ha (gal/acre)	Size and Color
3.0	17.8 (1.9)	0.70 Green	2.0	58.0 (6.2)	1.2 Yellow
3.5	20.6 (2.2)		2.5	72.0 (7.7)	
4.0	23.4 (2.5)		3.0	85.1 (9.1)	
4.5	26.2 (2.8)		3.5	99.2 (10.6)	1.7 Black
5.0	29.0 (3.1)		4.0	113.2 (12.1)	
5.5	31.8 (3.4)		4.5	126.3 (13.5)	
6.0	34.6 (3.7)		5.0	140.3 (15.0)	
6.5	38.4 (4.1)	1.2 Yellow	5.5	154.3 (16.5)	2.5 Grey
7.0	41.2 (4.4)		6.0	167.4 (17.9)	
7.5	44.0 (4.7)		6.5	181.5 (19.4)	
8.0	46.8 (5.0)		7.0	195.5 (20.9)	
8.5	49.6 (5.3)		7.5	208.6 (22.3)	
9.0	52.4 (5.6)		8.0	222.6 (23.8)	
9.5	55.2 (5.9)		8.5	236.7 (25.3)	
10.0	58.0 (6.2)		9.0	249.7 (26.7)	
			9.5	263.8 (28.2)	
			10.0	277.8 (29.7)	

Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)

The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).

To verify the rate, perform a field check. (See Check the Fertilizer Rates.)

MH69740,00006B4 -19-12APR18-1/1

**102 cm (40 in) Rows, Models 1700 to 16-Row
1770NT and 1705 to 16-Row 1775NT**

LIQUID FERTILIZER APPLICATION RATE					
102 cm (40 in) ROW SPACING					
LOW RANGE			HIGH RANGE		
Pump Setting	Approximate Rate	In-Line Orifice	Pump Setting	Approximate Rate	In-Line Orifice
Value	L/ha (gal/acre)	Size and Color	Value	L/ha (gal/acre)	Size and Color
3.0	16.8 (1.8)	0.70 Green	2.0	55.2 (5.9)	1.2 Yellow
3.5	19.6 (2.1)		2.5	68.3 (7.3)	
4.0	22.4 (2.4)		3.0	81.4 (8.7)	
4.5	25.3 (2.7)		3.5	94.5 (10.1)	1.7 Black
5.0	28.1 (3.0)		4.0	107.6 (11.5)	
5.5	30.9 (3.3)		4.5	120.7 (12.9)	
6.0	33.7 (3.6)		5.0	133.8 (14.3)	
6.5	36.5 (3.9)		5.5	146.9 (15.7)	
7.0	38.4 (4.1)	1.2 Yellow	6.0	159.0 (17.0)	2.5 Grey
7.5	41.2 (4.4)		6.5	172.1 (18.4)	
8.0	44.0 (4.7)		7.0	185.2 (19.8)	
8.5	46.8 (5.0)		7.5	198.3 (21.2)	
9.0	49.6 (5.3)		8.0	211.4 (22.6)	
9.5	52.4 (5.6)		8.5	224.5 (24.0)	
10.0	55.2 (5.9)		9.0	237.6 (25.4)	
			9.5	250.7 (26.8)	
			10.0	263.8 (28.2)	

Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)
The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).
To verify the rate, perform a field check. (See Check the Fertilizer Rates.)

MH69740,00006B5 -19-12APR18-1/1

**76 cm (30 in) Rows, Models 1770NT 24 Row
and 1775NT 24 Row**

LIQUID FERTILIZER APPLICATION RATE						
76 cm (30 in) ROW SPACING						
LOW RANGE			HIGH RANGE			
Pump Setting	Approximate Rate	In-Line Orifice	Pump Setting	Approximate Rate	In-Line Orifice	
Value	L/ha (gal/acre)	Size and Color	Value	L/ha (gal/acre)	Size and Color	
2.0	29.9 (3.2)	0.70 Green	2.0	48.6 (5.2)	1.2 Yellow	
2.5	37.4 (4.0)		2.5	59.9 (6.4)		
3.0	45.8 (4.9)		3.0	72.0 (7.7)		
3.5	53.3 (5.7)	1.2 Yellow	3.5	84.2 (9.0)		
4.0	60.8 (6.5)		4.0	96.3 (10.3)		
4.5	68.3 (7.3)		4.5	108.5 (11.6)		
5.0	75.8 (8.1)		5.0	120.7 (12.9)		
5.5	83.2 (8.9)		5.5	132.8 (14.2)		
6.0	90.7 (9.7)		6.0	145.0 (15.5)		
6.5	98.2 (10.5)		6.5	157.1 (16.8)		
7.0	105.7 (11.3)		7.0	169.3 (18.1)		
7.5	113.2 (12.1)		1.7 Black	7.5	180.5 (19.3)	
8.0	120.7 (12.9)	8.0		192.7 (20.6)		
8.5	128.1 (13.7)	8.5		204.9 (21.9)		
9.0	136.6 (14.6)	9.0		217.0 (23.2)		
9.5	144.1 (15.4)	9.5		229.2 (24.5)		
10.0	151.5 (16.2)	10.0		241.3 (25.8)		
10.5	159.0 (17.0)	10.5		253.5 (27.1)		
11.0	166.5 (17.8)	11.0		265.7 (28.4)		
11.5	174.0 (18.6)	11.5		277.8 (29.7)		
12.0	181.5 (19.4)	12.0		290.0 (31.0)		
Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)						
The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).						
To verify the rate, perform a field check. (See Check the Fertilizer Rates.)						

MH69740,00006AE -19-12APR18-1/1

76 cm (30 in) Rows, Models 1780 and 1785

LIQUID FERTILIZER APPLICATION RATE					
76 cm (30 in) ROW SPACING					
LOW RANGE			HIGH RANGE		
Pump Setting	Approximate Rate	In-Line Orifice	Pump Setting	Approximate Rate	In-Line Orifice
Value	L/ha (gal/acre)	Size and Color	Value	L/ha (gal/acre)	Size and Color
3.0	24.3 (2.6)	0.70 Green	2.0	78.6 (8.4)	1.2 Yellow
3.5	29.0 (3.1)		2.5	98.2 (10.5)	
4.0	32.7 (3.5)		3.0	116.9 (12.5)	
4.5	37.4 (4.0)		3.5	136.6 (14.6)	1.7 Black
5.0	41.2 (4.4)		4.0	156.2 (16.7)	
5.5	45.8 (4.9)	1.2 Yellow	4.5	175.9 (18.8)	
6.0	49.6 (5.3)		5.0	195.5 (20.9)	2.5 Grey
6.5	53.3 (5.7)		5.5	215.1 (23.0)	
7.0	58.0 (6.2)		6.0	234.8 (25.1)	
7.5	61.7 (6.6)		6.5	254.4 (27.2)	
8.0	66.4 (7.1)		7.0	274.1 (29.3)	
8.5	70.2 (7.5)		7.5	293.7 (31.4)	
9.0	73.9 (7.9)		8.0	312.4 (33.4)	
9.5	78.6 (8.4)		8.5	332.1 (35.5)	
10.0	82.3 (8.8)		9.0	351.7 (37.6)	
			9.5	371.4 (39.7)	
			10.0	391.0 (41.8)	

Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)
 The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).
 To verify the rate, perform a field check. (See Check the Fertilizer Rates.)

MH69740,00006B2 -19-12APR18-1/1

51 cm (20 in) Rows, Models 1790 and 1795

LIQUID FERTILIZER APPLICATION RATE					
51 cm (20 in) ROW SPACING					
LOW RANGE			HIGH RANGE		
Pump Setting	Approximate Rate	In-Line Orifice	Pump Setting	Approximate Rate	In-Line Orifice
Value	L/ha (gal/acre)	Size and Color	Value	L/ha (gal/acre)	Size and Color
3.0	30.9 (3.3)	0.70 Green	2.0	55.2 (5.9)	1.2 Yellow
3.5	35.5 (3.8)		2.5	68.3 (7.3)	
4.0	40.2 (4.3)		3.0	81.4 (8.7)	
4.5	44.9 (4.8)		3.5	94.5 (10.1)	
5.0	50.5 (5.4)		4.0	107.6 (11.5)	
5.5	55.2 (5.9)		4.5	121.6 (13.0)	
6.0	59.9 (6.4)		5.0	134.7 (14.4)	
6.5	64.5 (6.9)		5.5	147.8 (15.8)	
7.0	70.2 (7.5)	1.2 Yellow	6.0	160.9 (17.2)	1.7 Black
7.5	74.8 (8.0)		6.5	174.0 (18.6)	
8.0	79.5 (8.5)		7.0	187.1 (20.0)	
8.5	84.2 (9.0)		7.5	200.2 (21.4)	
9.0	89.8 (9.6)		8.0	213.3 (22.8)	
9.5	94.5 (10.1)		8.5	226.4 (24.2)	
10.0	99.2 (10.6)		9.0	239.5 (25.6)	
			9.5	252.6 (27.0)	
			10.0	265.7 (28.4)	

Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)
 The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).
 To verify the rate, perform a field check. (See Check the Fertilizer Rates.)

MH69740,00006AF -19-12APR18-1/1

76 cm (30 in) Rows, Models 1790 and 1795

LIQUID FERTILIZER APPLICATION RATE					
76 cm (30 in) ROW SPACING					
LOW RANGE			HIGH RANGE		
Pump Setting	Approximate Rate	In-Line Orifice	Pump Setting	Approximate Rate	In-Line Orifice
Value	L/ha (gal/acre)	Size and Color	Value	L/ha (gal/acre)	Size and Color
3.0	30.9 (3.3)	0.70 Green	2.0	55.2 (5.9)	1.2 Yellow
3.5	35.5 (3.8)		2.5	68.3 (7.3)	
4.0	40.2 (4.3)		3.0	81.4 (8.7)	
4.5	44.9 (4.8)		3.5	94.5 (10.1)	
5.0	50.5 (5.4)	1.2 Yellow	4.0	107.6 (11.5)	1.7 Black
5.5	55.2 (5.9)		4.5	121.6 (13.0)	
6.0	59.9 (6.4)		5.0	134.7 (14.4)	
6.5	64.5 (6.9)		5.5	147.8 (15.8)	
7.0	70.2 (7.5)		6.0	160.9 (17.2)	
7.5	74.8 (8.0)		6.5	174.0 (18.6)	
8.0	79.5 (8.5)		7.0	187.1 (20.0)	2.5 Grey
8.5	84.2 (9.0)		7.5	200.2 (21.4)	
9.0	89.9 (9.6)		8.0	213.3 (22.8)	
9.5	94.5 (10.1)		8.5	226.4 (24.2)	
10.0	99.2 (10.6)		9.0	239.5 (25.6)	
			9.5	252.6 (27.0)	
			10.0	265.7 (28.4)	

Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)
The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).
To verify the rate, perform a field check. (See Check the Fertilizer Rates.)

MH69740,00006B0 -19-12APR18-1/1

DB44 24-Row 56 cm (22 in) Rate Chart

LIQUID FERTILIZER APPLICATION RATE DB44 24 ROW MACHINES John Blue Pump					
56 cm (22 in) ROW SPACING					
8 km/h (5 mph)			11.3 km/h (7 mph)		
Pump Setting	Approximate Rate	In-Line Orifice	Pump Setting	Approximate Rate	In-Line Orifice
Value	L/ha (gal/acre)	Size and Color	Value	L/ha (gal/acre)	Size and Color
3.13	37.4 (4.0)	0.70 Green	2.35	28.1 (3.0)	0.70 Green
3.92	46.8 (5.0)		3.13	37.4 (4.0)	
4.7	56.1 (6.0)		3.92	46.8 (5.0)	
5.48	65.5 (7.0)		4.7	56.1 (6.0)	
6.27	74.8 (8.0)	1.2 Yellow	5.48	65.5 (7.0)	1.2 Yellow
7.84	93.5 (10.0)		6.27	74.8 (8.0)	
6.27	112.2 (12.0)		7.84	93.5 (10.0)	
7.31	131.0 (14.0)		6.27	112.2 (12.0)	
7.16	149.7 (16.0)		7.31	131.0 (14.0)	1.7 Black
8.06	168.4 (18.0)		7.16	149.7 (16.0)	
8.95	187.1 (20.0)		8.06	168.4 (18.0)	
			8.95	187.1 (20.0)	

Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)
The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).
To verify the rate, perform a field check. (See Check the Fertilizer Rates.)

OUO6064,00006C2 -19-12APR18-1/1

DB55 24-Row 70 cm (27.6 in) Rate Chart

LIQUID FERTILIZER APPLICATION RATE DB55 24R70 Planter John Blue Pump					
70 cm (27.6 in) ROW SPACING					
8 km/h (5 mph)			11.3 km/h (7 mph)		
Pump Setting	Approximate Rate	In-Line Orifice	Pump Setting	Approximate Rate	In-Line Orifice
Value	L/ha (gal/acre)	Size and Color	Value	L/ha (gal/acre)	Size and Color
3.21	30.6 (3.3)	0.70 Green	3.21	42.8 (4.6)	0.70 Green
4.27	40.8 (4.4)		4.27	57.1 (6.1)	
5.34	51 (5.5)		5.34	71.4 (7.6)	
6.41	61.2 (6.5)	1.2 Yellow	6.41	85.7 (9.2)	1.2 Yellow
7.48	71.4 (7.6)		7.48	100 (10.7)	
5.7	81.6 (8.7)		5.7	114.2 (12.2)	
7.12	102 (10.9)		7.12	142.8 (15.3)	
7.33	122.4 (13.1)		7.33	171.4 (18.3)	1.7 Black
7.48	142.8 (15.3)		7.48	199.9 (21.4)	

Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)
The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).
To verify the rate, perform a field check. (See Check the Fertilizer Rates.)

WP29706,0000B15 -19-12APR18-1/1

DB58 32-Row 56 cm (22 in) Rate Chart

LIQUID FERTILIZER APPLICATION RATE DB58 32 ROW MACHINES					
56 cm (22 in) ROW SPACING					
8 km/h (5 mph)			11.3 km/h (7 mph)		
Pump Setting	Approximate Rate	In-Line Orifice	Pump Setting	Approximate Rate	In-Line Orifice
Value	L/ha (gal/acre)	Size and Color	Value	L/ha (gal/acre)	Size and Color
4.18	15.1 (4.0)	0.70 Green	3.13	11.4 (3.0)	0.70 Green
5.22	18.9 (5.0)		4.18	15.1 (4.0)	
6.27	22.7 (6.0)		5.22	18.9 (5.0)	
7.31	26.5 (7.0)		6.27	22.7 (6.0)	
5.57	30.3 (8.0)	1.2 Yellow	7.31	26.5 (7.0)	1.2 Yellow
6.96	37.9 (10.0)		5.57	30.3 (8.0)	
8.36	45.4 (12.0)		6.96	37.9 (10.0)	
7.31	53.0 (14.0)		8.36	45.4 (12.0)	
			7.31	53.0 (14.0)	

Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)
The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).
To verify the rate, perform a field check. (See Check the Fertilizer Rates.)

OUO6064,00006C4 -19-12APR18-1/1

DB60 24-Row 76cm (30 in) Rate Chart

LIQUID FERTILIZER APPLICATION RATE DB60 24 ROW MACHINES John Blue Pump					
76 cm (30 in) ROW SPACING					
8 km/h (5 mph)			11.3 km/h (7 mph)		
Pump Setting	Approximate Rate	In-Line Orifice	Pump Setting	Approximate Rate	In-Line Orifice
Value	L/ha (gal/acre)	Size and Color	Value	L/ha (gal/acre)	Size and Color
3.21	28.1 (3.0)	0.70 Green	3.21	28.1 (3.0)	0.70 Green
4.27	37.4 (4.0)		4.27	37.4 (4.0)	
5.34	46.8 (5.0)		5.34	46.8 (5.0)	
6.41	56.1 (6.0)	1.2 Yellow	6.41	56.1 (6.0)	1.2 Yellow
7.48	65.5 (7.0)		7.48	65.5 (7.0)	
5.7	74.8 (8.0)		5.7	74.8 (8.0)	
7.12	93.5 (10.0)		7.12	93.5 (10.0)	
7.33	112.2 (12.0)		7.33	112.2 (12.0)	1.7 Black
7.48	131.0 (14.0)		7.48	131.0 (14.0)	

Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)
The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).
To verify the rate, perform a field check. (See Check the Fertilizer Rates.)

OUO6064,00006C3 -19-12APR18-1/1

DB60 36-Row 51 cm (20 in) Rate Chart

LIQUID FERTILIZER APPLICATION RATE DB60 36 ROW MACHINES John Blue Pump					
51 cm (20 in) ROW SPACING					
8 km/h (5 mph)			11.3 km/h (7 mph)		
Pump Setting	Approximate Rate	In-Line Orifice	Pump Setting	Approximate Rate	In-Line Orifice
Value	L/ha (gal/acre)	Size and Color	Value	L/ha (gal/acre)	Size and Color
4.27	37.4 (4.0)	0.70 Green	3.21	28.1 (3.0)	0.70 Green
5.34	46.8 (5.0)		4.27	37.4 (4.0)	
6.41	56.1 (6.0)		5.34	46.8 (5.0)	
7.48	65.5 (7.0)		6.41	56.1 (6.0)	
5.7	74.8 (8.0)		7.48	65.5 (7.0)	
7.12	93.5 (10.0)	1.2 Yellow	5.7	74.8 (8.0)	1.2 Yellow
7.33	112.2 (12.0)		7.12	93.5 (10.0)	
7.48	131.0 (14.0)		7.33	112.2 (12.0)	
			7.48	131.0 (14.0)	

Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)

The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).

To verify the rate, perform a field check. (See Check the Fertilizer Rates.)

OUO6064,00006C6 -19-12APR18-1/1

DB60 47-Row 38 cm (15 in) Rate Chart

LIQUID FERTILIZER APPLICATION RATE DB60 47 ROW MACHINES					
38 cm (15 in) ROW SPACING					
8 km/h (5 mph)			11.3 km/h (7 mph)		
Pump Setting	Approximate Rate	In-Line Orifice	Pump Setting	Approximate Rate	In-Line Orifice
Value	L/ha (gal/acre)	Size and Color	Value	L/ha (gal/acre)	Size and Color
5.23	46.8 (5.0)	0.70 Green	4.18	37.4 (4.0)	0.70 Green
6.28	56.1 (6.0)		5.23	46.8 (5.0)	
7.32	65.5 (7.0)		6.28	56.1 (6.0)	
5.58	74.8 (8.0)		7.32	65.5 (7.0)	
6.97	93.5 (10.0)		5.58	74.8 (8.0)	
8.37	112.2 (12.0)	1.2 Yellow	6.97	93.5 (10.0)	1.2 Yellow
7.32	131.0 (14.0)		8.37	112.2 (12.0)	
			7.32	131.0 (14.0)	

Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)

The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).

To verify the rate, perform a field check. (See Check the Fertilizer Rates.)

OUO6064,00006C5 -19-12APR18-1/1

DB66 36-Row 56 cm (22 in) Rate Chart

LIQUID FERTILIZER APPLICATION RATE DB66 36 ROW MACHINES John Blue Pump					
56 cm (22 in) ROW SPACING					
8 km/h (5 mph)			11.3 km/h (7 mph)		
Pump Setting	Approximate Rate	In-Line Orifice	Pump Setting	Approximate Rate	In-Line Orifice
Value	L/ha (gal/acre)	Size and Color	Value	L/ha (gal/acre)	Size and Color
4.7	37.4 (4.0)	0.70 Green	3.53	28.1 (3.0)	0.70 Green
5.88	46.8 (5.0)		4.7	37.4 (4.0)	
7.05	56.1 (6.0)		5.88	46.8 (5.0)	
8.23	65.5 (7.0)		7.05	56.1 (6.0)	
6.27	74.8 (8.0)	1.2 Yellow	8.23	65.5 (7.0)	1.2 Yellow
7.84	93.5 (10.0)		6.27	74.8 (8.0)	
7.05	112.2 (12.0)		7.84	93.5 (10.0)	
			7.05	112.2 (12.0)	

Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)
The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).
To verify the rate, perform a field check. (See Check the Fertilizer Rates.)

OOU6064,00006C8 -19-12APR18-1/1

DB74 32-Row 70 cm (27.6 in) Rate Chart

LIQUID FERTILIZER APPLICATION RATE DB74 32R70 Planter John Blue Pump					
70 cm (27.6 in) ROW SPACING					
8 km/h (5 mph)			11.3 km/h (7 mph)		
Pump Setting	Approximate Rate	In-Line Orifice	Pump Setting	Approximate Rate	In-Line Orifice
Value	L/ha (gal/acre)	Size and Color	Value	L/ha (gal/acre)	Size and Color
4.27	40.4 (4.3)	0.70 Green	4.27	56.6 (6.1)	0.70 Green
5.7	54.5 (5.8)		5.7	76.2 (8.2)	
7.12	68 (7.3)		7.12	95.2 (10.2)	
7.38	70.5 (7.5)		7.38	98.7 (10.6)	
6.2	88 (9.4)	1.2 Yellow	6.2	123.1 (13.2)	1.2 Yellow
7.01	99.4 (10.6)		7.01	139.2 (14.9)	

Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)
The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).
To verify the rate, perform a field check. (See Check the Fertilizer Rates.)

WP29706,0000B16 -19-12APR18-1/1

DB80 32-Row 76 cm (30 in) Rate Chart

LIQUID FERTILIZER APPLICATION RATE DB80 32 ROW MACHINES John Blue Pump					
76 cm (30 in) ROW SPACING					
8 km/h (5 mph)			11.3 km/h (7 mph)		
Pump Setting	Approximate Rate	In-Line Orifice	Pump Setting	Approximate Rate	In-Line Orifice
Value	L/ha (gal/acre)	Size and Color	Value	L/ha (gal/acre)	Size and Color
4.27	11.4 (3.0)	0.70 Green	4.27	11.4 (3.0)	0.70 Green
5.7	15.1 (4.0)		5.7	15.1 (4.0)	
7.12	18.9 (5.0)		7.12	18.9 (5.0)	
5.38	22.7 (6.0)		5.38	22.7 (6.0)	
6.2	26.5 (7.0)	1.2 Yellow	6.2	26.5 (7.0)	1.2 Yellow
7.01	30.3 (8.0)		7.01	30.3 (8.0)	
Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)					
The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).					
To verify the rate, perform a field check. (See Check the Fertilizer Rates.)					

OUO6064,00006CB -19-12APR18-1/1

DB80 48-Row 51 cm (20 in) Rate Chart

LIQUID FERTILIZER APPLICATION RATE DB80 48 ROW MACHINES John Blue Pump					
51 cm (20 in) ROW SPACING					
8 km/h (5 mph)			11.3 km/h (7 mph)		
Pump Setting	Approximate Rate	In-Line Orifice	Pump Setting	Approximate Rate	In-Line Orifice
Value	L/ha (gal/acre)	Size and Color	Value	L/ha (gal/acre)	Size and Color
5.7	37.4 (4.0)	0.70 Green	4.27	28.1 (3.0)	0.70 Green
7.12	46.8 (5.0)		5.7	37.4 (4.0)	
5.7	56.1 (6.0)		7.12	46.8 (5.0)	
6.65	65.5 (7.0)		5.7	56.1 (6.0)	
7.6	74.8 (8.0)	1.2 Yellow	6.65	65.5 (7.0)	1.2 Yellow
7.12	93.5 (10.0)		7.6	74.8 (8.0)	
			7.12	93.5 (10.0)	
Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.) The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).					
To verify the rate, perform a field check. (See Check the Fertilizer Rates.)					

OUO6064,00006C7 -19-12APR18-1/1

DB88 48-Row 56 cm (22 in) Rate Chart

LIQUID FERTILIZER APPLICATION RATE DB88 48 ROW MACHINES John Blue Pump					
56 cm (22 in) ROW SPACING					
8 km/h (5 mph)			11.3 km/h (7 mph)		
Pump Setting	Approximate Rate	In-Line Orifice	Pump Setting	Approximate Rate	In-Line Orifice
Value	L/ha (gal/acre)	Size and Color	Value	L/ha (gal/acre)	Size and Color
4.18	37.4 (4.0)	0.70 Green	3.13	28.1 (3.0)	0.70 Green
5.22	46.8 (5.0)		4.18	37.4 (4.0)	
6.27	56.1 (6.0)		5.22	46.8 (5.0)	
7.31	65.5 (7.0)		6.27	56.1 (6.0)	
7.16	74.8 (8.0)	1.2 Yellow	7.31	65.5 (7.0)	1.2 Yellow
7.84	93.5 (10.0)		7.16	74.8 (8.0)	
			7.84	93.5 (10.0)	

Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)
The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).
To verify the rate, perform a field check. (See Check the Fertilizer Rates.)

OUO6064,00006C9 -19-12APR18-1/1

DB90 36-Row 76 cm (30 in) Rate Chart

LIQUID FERTILIZER APPLICATION RATE DB90 36 ROW MACHINES					
76 cm (30 in) ROW SPACING					
8 km/h (5 mph)			11.3 km/h (7 mph)		
Pump Setting	Approximate Rate	In-Line Orifice	Pump Setting	Approximate Rate	In-Line Orifice
Value	L/ha (gal/acre)	Size and Color	Value	L/ha (gal/acre)	Size and Color
3.21	28.1 (3.0)	0.70 Green	3.21	28.1 (3.0)	0.70 Green
4.27	37.4 (4.0)		4.27	37.4 (4.0)	
5.34	46.8 (5.0)		5.34	46.8 (5.0)	
5.49	56.1 (6.0)		5.49	56.1 (6.0)	
6.41	65.5 (7.0)	1.2 Yellow	6.41	65.5 (7.0)	1.2 Yellow
7.33	74.8 (8.0)		7.33	74.8 (8.0)	

Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)
The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).
To verify the rate, perform a field check. (See Check the Fertilizer Rates.)

OUO6064,00006CA -19-12APR18-1/1

DB120 48-Row 76 cm (30 in) Rate Chart

LIQUID FERTILIZER APPLICATION RATE DB120 48 ROW MACHINES John Blue Pump					
76 cm (30 in) ROW SPACING					
8 km/h (5 mph)			11.3 km/h (7 mph)		
Pump Setting	Approximate Rate	In-Line Orifice	Pump Setting	Approximate Rate	In-Line Orifice
Value	L/ha (gal/acre)	Size and Color	Value	L/ha (gal/acre)	Size and Color
4.27	28.1 (3.0)	0.70 Green	4.27	28.1 (3.0)	0.70 Green
5.7	37.4 (4.0)		5.7	37.4 (4.0)	1.2 Yellow
7.12	46.8 (5.0)		7.12	46.8 (5.0)	
7.33	56.1 (6.0)	1.2 Yellow	7.33	56.1 (6.0)	
7.48	65.5 (7.0)		7.48	65.5 (7.0)	

Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)
The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).
To verify the rate, perform a field check. (See Check the Fertilizer Rates.)

OUO6064,00006CD -19-12APR18-1/1

Check Fertilizer Rates

IMPORTANT: Ensure that the liquid fertilizer system is working as designed. Perform a rate check on all rows of the planter simultaneously. Checking only one row is not a good indication of fertilizer system performance.

Liters Per Hectare Conversion Chart	
Row Spacing	Conversion Factor
51 cm	0.081
56 cm	0.074
76 cm	0.054
91 cm	0.045
97 cm	0.043
102 cm	0.041

Gallons Per Acre Conversion Chart	
Row Spacing	Conversion Factor
20 in	0.255
22 in	0.232
30 in	0.170
36 in	0.142
38 in	0.134
40 in	0.128

- Calculate size of collection container required.
Size of container required = L/ha (gpa) expected ÷ conversion factor.
METRIC example, 45 L/ha is expected application rate. Conversion factor for 76 cm row spacing is 0.054.

$$45 \div 0.054 = 833 \text{ mL}$$

Use a container capable of easily collecting at least 833 mL.

STANDARD example, 18 gpa is expected application rate. Conversion factor for 30 in row spacing is 0.170.

$$18 \div 0.170 = 106 \text{ oz}$$

Use a container capable of easily collecting at least 106 oz.

- Tie a container to machine frame next to every fertilizer opener. Remove delivery hoses from openers and insert hoses into containers.
- Drive forward 244 m (800 ft) at planting speed.
- Measure number of mL (oz) in each container.
- Calculate actual application rate for each opener.

$$\text{Measured mL (oz)} \times \text{conversion factor} = \text{actual rate}$$

METRIC example, 789 mL were captured in container. Conversion factor for 76 cm row spacing is 0.054.

$$789 \times 0.054 = 42.69 \text{ L/hectare (Actual Application Rate)}$$

STANDARD example, 118 oz were captured in container. Conversion factor for 30 in row spacing is 0.170.

$$118 \times 0.170 = 20 \text{ gpa (Actual Application Rate)}$$

OUO6074,0000823 -19-06JAN16-1/1

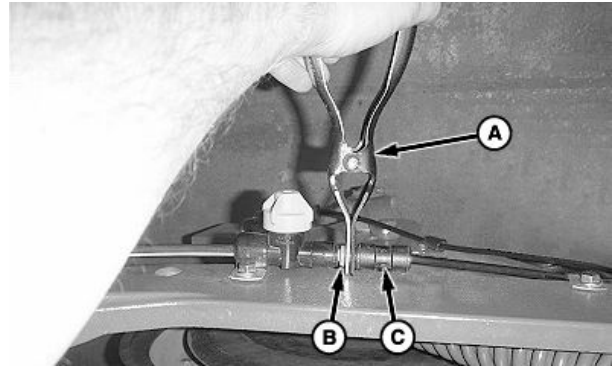
Change Fertilizer In-Line Orifices

Remove In-Line Orifice

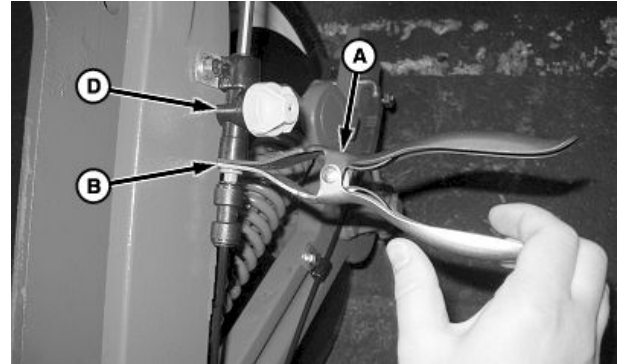
1. To remove orifice insert special pliers (A) as far as possible between in-line orifice (B) and coupler (C). Squeeze pliers to disengage coupler from in-line orifice.
2. Insert special pliers (A) as far as possible between in-line orifice (B) and check valve (D). Squeeze pliers to disengage in-line orifice from check valve.
3. Remove and retain in-line orifice (B) for future use.
4. Repeat on all fertilizer openers.

A—Special Pliers
B—In-Line Orifice

C—Coupler
D—Check Valve



A72734 —UN—22SEP11



A72735 —UN—22SEP11

OUO6064,0000583 -19-23FEB16-1/2

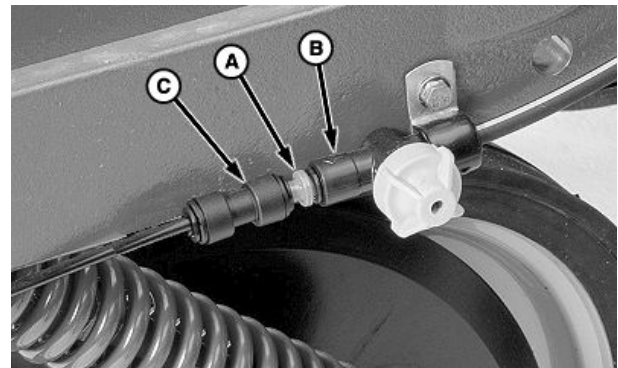
Install In-Line Orifice

NOTE: Consult your fertilizer rate charts to determine correct in-line orifice size for desired application rate.

1. Push in-line orifice (A) into check valve (B). Pull on in-line orifice to ensure that it is locked into check valve.
2. Push coupler (C) onto in-line orifice (A). Pull on coupler to ensure that it is locked onto the in-line orifice.
3. Repeat on all fertilizer openers.

A—In-Line Orifice
B—Check Valve

C—Coupler



A72736 —UN—22SEP11

OUO6064,0000583 -19-23FEB16-2/2

Liquid Fertilizer Rate Charts For Single Disk Injection Openers

How to Use Liquid Fertilizer Rate Charts

IMPORTANT: A field check must be done to verify the application rate. (See CHECK FERTILIZER RATES in this section.)

This system is NOT recommended for use with suspension fertilizers.

NOTE: The unit-mounted single disk opener comes equipped with number 2.5 nozzles installed. Number 5 nozzles are also provided. Other sizes must be purchased through service parts. See your John Deere dealer.

1. Refer to rate chart for the fertilizer opener installed on machine and select approximate application rate desired for row width being planted.
2. Pump range is given at top of Liquid Fertilizer Application Rate chart.
3. Set range of pump drive.
4. Next to approximate application rate selected, note pump setting, and travel speed.
5. Adjust pump setting number.
6. Install recommended nozzle (shown next to the rate on the rate chart).

OUC6074,0000CB5 -19-07JAN16-1/1

Liquid Fertilizer Rate Charts For Single Disk Injection Openers

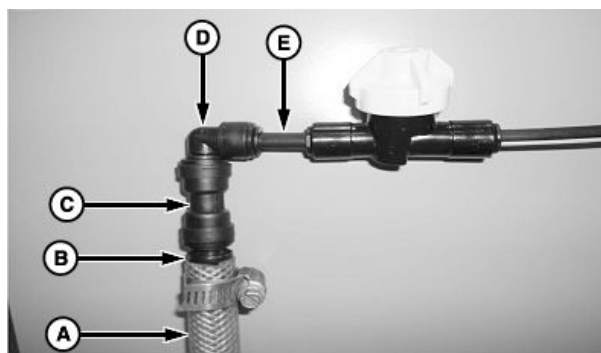
See following table to match nozzle number on rate chart to number stamped on nozzle. For additional nozzles, see your John Deere dealer.

NOTE: Nozzle number can be found on side of nozzle.

The unit-mounted single disk opener comes equipped with number 2.5 nozzles installed. Number 5 nozzles are also provided. Other sizes must be purchased through service parts. See your John Deere dealer.

Single Disk Injection Nozzle Reference Chart	
Nozzle Number	Rate Chart Number
00015	1.5
00025	2.5
0005	5
0008	8
0012	12

Remove the in-line orifice when utilizing a single-disk injection opener. The tubing going to the opener is then



A73214—UN—28OCT11

A—1/2 in Reinforced Hose
B—1/2 in Barb to 3/8 in Stem Reducer
C—3/8— 5/16 in Reducing Coupler

D—5/16 in Stem to 5/16 in Tube, 90 Degree Fitting
E—2 in Long Piece of 5/16 in (8 mm) Tube

inserted into the check valve using fittings described in picture. Reference the below rate chart for the correct nozzle number to be used for the desired application rate.

OUC6064,00006D9 -19-07JAN16-1/1

76 cm (30 in) Spacing 12 Row and 16 Row

Liquid Fertilizer Application Rate									
76 cm (30 in) Row Spacing									
Low Range					High Range				
Pump Setting	Approximate L/ha (gal/acre)	Travel Speed in km/h (mph)			Pump Setting	Approximate L/ha (gal/acre)	Travel Speed in km/h (mph)		
		8.0 (5)	9.6 (6)	11.2 (7)			8.0 (5)	9.6 (6)	11.2 (7)
		Nozzle Number					Nozzle Number		
3	22.45 (2.4)			1.5	2	73.90 (7.9)	2.5	2.5	2.5
3.5	26.19 (2.8)		1.5	1.5	2.5	90.73 (9.7)	2.5	2.5	5
4	29.93 (3.2)	1.5	1.5	1.5	3	108.51 (11.6)	2.5	5	5
4.5	33.67 (3.6)	1.5	1.5	1.5	3.5	125.34 (13.4)	5	5	5
5	37.42 (4.0)	1.5	1.5	1.5	4	143.12 (15.3)	5	5	5
5.5	41.16 (4.4)	1.5	1.5	1.5	4.5	159.95 (17.1)	5	5	8
6	43.96 (4.7)	1.5	1.5	2.5	5	177.73 (19.0)	5	8	8
6.5	47.71 (5.1)	1.5	1.5	2.5	5.5	195.50 (20.9)	8	8	8
7	51.45 (5.5)	1.5	2.5	2.5	6	212.33 (22.7)	8	8	8
7.5	55.19 (5.9)	1.5	2.5	2.5	6.5	230.11 (24.6)	8	8	8
8	58.93 (6.3)	2.5	2.5	2.5	7	246.94 (26.4)	8	8	8
8.5	62.67 (6.7)	2.5	2.5	2.5	7.5	264.72 (28.3)	8	8	12
9	66.41 (7.1)	2.5	2.5	2.5	8	282.49 (30.2)	8	12	12
9.5	70.15 (7.5)	2.5	2.5	2.5	8.5	299.33 (32.0)	12	12	12
10	73.90 (7.9)	2.5	2.5	2.5	9	317.10 (33.9)	12	12	12
					9.5	333.94 (35.7)	12	12	12
					10	351.71 (37.6)	12	12	12
Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)									
The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).									
To verify the rate, perform a field check. (See Check the Fertilizer Rates.)									

OUO6064,00007D0 -19-25APR18-1/1

**91 cm (36 in) Rows, Models 1700 to 16-Row
1770NT and 1705 to 16-Row 1775NT**

LIQUID FERTILIZER APPLICATION RATE									
91 cm (36 in) ROW SPACING									
LOW RANGE					HIGH RANGE				
Pump Setting	Approximate L/ha (gal/acre)	Travel Speed in km/h (mph)			Pump Setting	Approximate L/ha (gal/acre)	Travel Speed in km/h (mph)		
		8.0 (5)	9.6 (6)	11.2 (7)			8.0 (5)	9.6 (6)	11.2 (7)
		Nozzle Number					Nozzle Number		
3	18.71 (2.0)			1.5	2	60.80 (6.5)	2.5	2.5	2.5
3.5	21.51 (2.3)		1.5	1.5	2.5	75.77 (8.1)	2.5	2.5	5
4	25.26 (2.7)	1.5	1.5	1.5	3	89.80 (9.6)	2.5	5	5
4.5	28.06 (3.0)	1.5	1.5	1.5	3.5	104.76 (11.2)	5	5	5
5	30.87 (3.3)	1.5	1.5	1.5	4	118.80 (12.7)	5	5	5
5.5	33.67 (3.6)	1.5	1.5	1.5	4.5	133.76 (14.3)	5	5	8
6	37.42 (4.0)	1.5	1.5	2.5	5	147.79 (15.8)	5	8	8
6.5	40.22 (4.3)	1.5	1.5	2.5	5.5	162.76 (17.4)	8	8	8
7	43.03 (4.6)	1.5	2.5	2.5	6	176.79 (18.9)	8	8	8
7.5	45.83 (4.9)	1.5	2.5	2.5	6.5	191.76 (20.5)	8	8	8
8	49.58 (5.3)	2.5	2.5	2.5	7	205.79 (22.0)	8	8	8
8.5	52.38 (5.6)	2.5	2.5	2.5	7.5	220.75 (23.6)	8	8	12
9	55.19 (5.9)	2.5	2.5	2.5	8	234.78 (25.1)	8	12	12
9.5	57.99 (6.2)	2.5	2.5	2.5	8.5	249.75 (26.7)	12	12	12
10	60.80 (6.5)	2.5	2.5	2.5	9	263.78 (28.2)	12	12	12
					9.5	278.75 (29.8)	12	12	12
					10	292.78 (31.3)	12	12	12
Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)									
The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).									
To verify the rate, perform a field check. (See Check the Fertilizer Rates.)									

WP29706,0000345 -19-12APR18-1/1

**97 cm (38 in) Rows, Models 1700 to 16-Row
1770NT and 1705 to 16-Row 1775NT**

LIQUID FERTILIZER APPLICATION RATE									
97 cm (38 in) ROW SPACING									
LOW RANGE					HIGH RANGE				
Pump Setting	Approximate L/ha (gal/acre)	Travel Speed in km/h (mph)			Pump Setting	Approximate L/ha (gal/acre)	Travel Speed in km/h (mph)		
		8.0 (5)	9.6 (6)	11.2 (7)			8.0 (5)	9.6 (6)	11.2 (7)
		Nozzle Number					Nozzle Number		
3	17.77 (1.9)			1.5	2	57.99 (6.2)	2.5	2.5	2.5
3.5	20.58 (2.2)		1.5	1.5	2.5	72.03 (7.7)	2.5	2.5	5
4	23.38 (2.5)	1.5	1.5	1.5	3	85.12 (9.1)	2.5	5	5
4.5	26.19 (2.8)	1.5	1.5	1.5	3.5	99.15 (10.6)	5	5	5
5	29.00 (3.1)	1.5	1.5	1.5	4	113.18 (12.1)	5	5	5
5.5	31.80 (3.4)	1.5	1.5	1.5	4.5	126.28 (13.5)	5	5	8
6	34.61 (3.7)	1.5	1.5	2.5	5	140.31 (15.0)	5	8	8
6.5	38.35 (4.1)	1.5	1.5	2.5	5.5	154.34 (16.5)	8	8	8
7	41.16 (4.4)	1.5	2.5	2.5	6	167.44 (17.9)	8	8	8
7.5	43.96 (4.7)	1.5	2.5	2.5	6.5	181.4 (19.4)	8	8	8
8	46.77 (5.0)	2.5	2.5	2.5	7	195.50 (20.9)	8	8	8
8.5	49.58 (5.3)	2.5	2.5	2.5	7.5	208.59 (22.3)	8	8	12
9	52.38 (5.6)	2.5	2.5	2.5	8	222.62 (23.8)	8	12	12
9.5	55.19 (5.9)	2.5	2.5	2.5	8.5	236.66 (25.3)	12	12	12
10	57.99 (6.2)	2.5	2.5	2.5	9	249.75 (26.7)	12	12	12
					9.5	263.78 (28.2)	12	12	12
					10	277.81 (29.7)	12	12	12
Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.) The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph). To verify the rate, perform a field check. (See Check the Fertilizer Rates.)									

WP29706,0000346 -19-12APR18-1/1

**102 cm (40 in) Rows, Models 1700 to 16-Row
1770NT and 1705 to 16-Row 1775NT**

LIQUID FERTILIZER APPLICATION RATE									
102 cm (40 in) ROW SPACING									
LOW RANGE					HIGH RANGE				
Pump Setting	Approximate L/ha (gal/acre)	Travel Speed in km/h (mph)			Pump Setting	Approximate L/ha (gal/acre)	Travel Speed in km/h (mph)		
		8.0 (5)	9.6 (6)	11.2 (7)			8.0 (5)	9.6 (6)	11.2 (7)
		Nozzle Number					Nozzle Number		
3	16.84 (1.8)			1.5	2	55.19 (5.9)	2.5	2.5	2.5
3.5	19.64 (2.1)		1.5	1.5	2.5	68.28 (7.3)	2.5	2.5	5
4	22.45 (2.4)	1.5	1.5	1.5	3	81.38 (8.7)	2.5	5	5
4.5	25.26 (2.7)	1.5	1.5	1.5	3.5	94.47 (10.1)	5	5	5
5	28.06 (3.0)	1.5	1.5	1.5	4	107.57 (11.5)	5	5	5
5.5	30.87 (3.3)	1.5	1.5	1.5	4.5	120.67 (12.9)	5	5	8
6	33.67 (3.6)	1.5	1.5	2.5	5	133.76 (14.3)	5	8	8
6.5	36.48 (3.9)	1.5	1.5	2.5	5.5	146.86 (15.7)	8	8	8
7	38.35 (4.1)	1.5	2.5	2.5	6	159.02 (17.0)	8	8	8
7.5	41.16 (4.4)	1.5	2.5	2.5	6.5	172.11	8	8	8
8	43.96 (4.7)	2.5	2.5	2.5	7	185.21 (19.8)	8	8	8
8.5	46.77 (5.0)	2.5	2.5	2.5	7.5	198.30 (21.2)	8	8	12
9	49.58 (5.3)	2.5	2.5	2.5	8	211.40 (22.6)	8	12	12
9.5	52.38 (5.6)	2.5	2.5	2.5	8.5	224.49 (24.0)	12	12	12
10	55.19 (5.9)	2.5	2.5	2.5	9	237.59 (25.4)	12	12	12
					9.5	250.69 (26.8)	12	12	12
					10	263.78 (28.2)	12	12	12
Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)									
The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).									
To verify the rate, perform a field check. (See Check the Fertilizer Rates.)									

OUO6064,00007D3 -19-12APR18-1/1

51 cm (20 in) Rows, Models 1790 and 1795

LIQUID FERTILIZER APPLICATION RATE									
51 cm (20 in) ROW SPACING									
LOW RANGE					HIGH RANGE				
Pump Setting	Approximate L/ha (gal/acre)	Travel Speed in km/h (mph)			Pump Setting	Approximate L/ha (gal/acre)	Travel Speed in km/h (mph)		
		8.0 (5)	9.6 (6)	11.2 (7)			8.0 (5)	9.6 (6)	11.2 (7)
		Nozzle Number					Nozzle Number		
3	30.9 (3.3)			1.5	2	55.2 (5.9)	1.5	1.5	2.5
3.5	35.5 (3.8)		1.5	1.5	2.5	68.3 (7.3)	1.5	2.5	5
4	40.2 (4.3)	1.5	1.5	1.5	3	81.4 (8.7)	2.5	2.5	2.5
4.5	44.9 (4.8)	1.5	1.5	1.5	3.5	94.5 (10.1)	2.5	2.5	2.5
5	50.5 (5.4)	1.5	1.5	1.5	4	107.6 (11.5)	2.5	2.5	2.5
5.5	55.2 (5.9)	1.5	1.5	1.5	4.5	121.6 (13.0)	2.5	2.5	2.5
6	59.9 (6.4)	1.5	1.5	2.5	5	134.7 (14.4)	2.5	2.5	2.5
6.5	64.5 (6.9)	1.5	1.5	2.5	5.5	147.8 (15.8)	2.5	2.5	2.5
7	70.2 (7.5)	1.5	2.5	2.5	6	160.9 (17.2)	2.5	2.5	2.5
7.5	74.8 (8.0)	1.5	2.5	2.5	6.5	174.0 (18.6)	2.5	2.5	2.5
8	79.5 (8.5)	2.5	2.5	2.5	7	187.1 (20.0)	2.5	2.5	8
8.5	84.2 (9.0)	2.5	2.5	2.5	7.5	200.2 (21.4)	2.5	2.5	8
9	89.8 (9.6)	2.5	2.5	2.5	8	213.3 (22.8)	2.5	8	8
9.5	94.5 (10.1)	2.5	2.5	2.5	8.5	226.4 (24.2)	2.5	8	8
10	99.2 (10.6)	2.5	2.5	2.5	9	239.5 (25.6)	8	8	8
					9.5	252.6 (27.0)	8	8	8
					10	265.7 (28.4)	8	8	8
Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)									
The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).									
To verify the rate, perform a field check. (See Check the Fertilizer Rates.)									

OUC6064,00007B6 -19-12APR18-1/1

Liquid Fertilizer Rate Charts For Single Disk Injection Openers

76 cm (30 in) Rows, Models 1790 and 1795

LIQUID FERTILIZER APPLICATION RATE									
76 cm (30 in) ROW SPACING									
LOW RANGE					HIGH RANGE				
Pump Setting	Approximate L/ha (gal/acre)	Travel Speed in km/h (mph)			Pump Setting	Approximate L/ha (gal/acre)	Travel Speed in km/h (mph)		
		8.0 (5)	9.6 (6)	11.2 (7)			8.0 (5)	9.6 (6)	11.2 (7)
		Nozzle Number					Nozzle Number		
3	30.9 (3.3)	1.5	1.5	1.5	2	55.2 (5.9)	2.5	2.5	2.5
3.5	35.5 (3.8)	1.5	1.5	1.5	2.5	68.3 (7.3)	2.5	2.5	5
4	40.2 (4.3)	1.5	1.5	2.5	3	81.4 (8.7)	2.5	5	5
4.5	44.9 (4.8)	1.5	2.5	2.5	3.5	94.5 (10.1)	5	5	5
5	50.5 (5.4)	2.5	2.5	2.5	4	107.6 (11.5)	5	5	5
5.5	55.2 (5.9)	2.5	2.5	2.5	4.5	121.6 (13.0)	5	5	5
6	59.9 (6.4)	2.5	2.5	2.5	5	134.7 (14.4)	5	5	8
6.5	64.5 (6.9)	2.5	2.5	2.5	5.5	147.8 (15.8)	5	5	8
7	70.2 (7.5)	2.5	2.5	2.5	6	160.9 (17.2)	5	8	8
7.5	74.8 (8.0)	2.5	2.5	5	6.5	174.0 (18.6)	5	8	8
8	79.5 (8.5)	2.5	2.5	5	7	187.1 (20.0)	8	8	8
8.5	84.2 (9.0)	2.5	5	5	7.5	200.2 (21.4)	8	8	8 or 12
9	89.8 (9.6)	2.5	5	5	8	213.3 (22.8)	8	8	8 or 12
9.5	94.5 (10.1)	5	5	5	8.5	226.4 (24.2)	8	8 or 12	8 or 12
10	99.2 (10.6)	5	5	5	9	239.5 (25.6)	8	8 or 12	8 or 12
					9.5	252.6 (27.0)	8 or 12	8 or 12	12
					10	265.7 (28.4)	8 or 12	12	12
Many factors affect the orifice size chart including ambient temperature, travel speed, wheel slippage, and type of fertilizer. Use this chart as a guide. (See How to Use Liquid Fertilizer Rate Charts.)									
The charts are optimized for ground speeds of 8-11 km/h (5-7 mph) and not recommended for speeds over 11 km/h (7 mph).									
To verify the rate, perform a field check. (See Check the Fertilizer Rates.)									

OUO6064,00007B7 -19-12APR18-1/1

Check Fertilizer Rates

IMPORTANT: Ensure that the liquid fertilizer system is working as designed. Perform a rate check on all rows of the planter simultaneously. Checking only one row is not a good indication of fertilizer system performance.

Liters Per Hectare Conversion Chart	
Row Spacing	Conversion Factor
51 cm	0.081
56 cm	0.074
76 cm	0.054
91 cm	0.045
97 cm	0.043
102 cm	0.041

Gallons Per Acre Conversion Chart	
Row Spacing	Conversion Factor
20 in	0.255
22 in	0.232
30 in	0.170
36 in	0.142
38 in	0.134
40 in	0.128

1. Calculate size of collection container required.

Size of container required = L/ha (gpa) expected ÷ conversion factor.

METRIC example, 45 L/ha is expected application rate. Conversion factor for 76 cm row spacing is 0.054.

$$45 \div 0.054 = 833 \text{ mL}$$

Use a container capable of easily collecting at least 833 mL.

STANDARD example, 18 gpa is expected application rate. Conversion factor for 30 in row spacing is 0.170.

$$18 \div 0.170 = 106 \text{ oz}$$

Use a container capable of easily collecting at least 106 oz

2. Tie a container to machine frame next to every fertilizer opener. Remove delivery hoses from openers and insert hoses into containers.
3. Drive forward 244 m (800 ft) at planting speed.
4. Measure number of mL (oz) in each container.
5. Calculate actual application rate for each opener.

Measured mL (oz) x conversion factor = actual rate

METRIC example, 789 mL were captured in container. Conversion factor for 76 cm row spacing is 0.054.

$$789 \times 0.054 = 42.69 \text{ L/hectare (Actual Application Rate)}$$

STANDARD example, 118 oz were captured in container. Conversion factor for 30 in row spacing is 0.170.

$$118 \times 0.170 = 20 \text{ gpa (Actual Application Rate)}$$

Unit Mounted Double Disk Openers

Liquid Fertilizer For Unit Mounted Double Disk Openers

Utilize the in-line orifice for unit mounted double-disk openers. The orifice is inserted into the check valve then into the fittings described in picture. Use liquid fertilizer rate charts for non-injection openers for the desired application rate. (See RATE CHARTS in the Liquid Fertilizer Rate Charts For Non-Injection Openers section.)

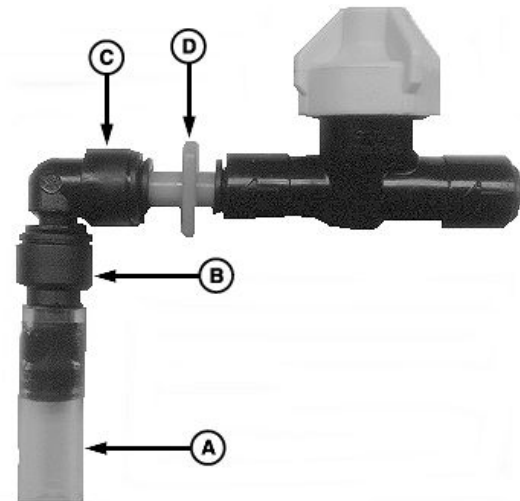
Unit Mounted Double Disk Orifice Reference Chart

Orifice	Orifice Size
Green	0.70
Yellow	1.2
Black	1.7
Grey	2.5

A—3/8 in. Hose

B—10 mm Stem to 8 mm Tube
Fitting

C—5/16 in. Stem To 5/16 in.
Tube, 90 Degree Fitting
D—Orifice



A74057—UN—19JAN12

OU06064,00006F5 -19-19JAN12-1/1

Service and Adjustments

Detailed Service Information

Refer to the appropriate technical (repair) manual for detailed service information or see your John Deere dealer.



TS224 —UN—17JAN89

OUO6064,000063B -19-24OCT11-1/1

Use Safe Service Procedures

CAUTION: To help prevent serious injury or death to you or others caused by unexpected movement, service the machine on a level surface. Lower the machine to the ground or sufficiently lock or block the raised machine before servicing. If the machine is connected to a tractor, engage the park brake and place the transmission in park, shut off the engine and remove the key. If the machine is detached from the tractor, block the wheels and use shop stands to prevent movement.



N40000 —UN—28SEP88

AG,OUO6074,1362 -19-29MAR18-1/1

Practice Safe Maintenance

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

Never lubricate, service, or adjust machine while it is moving. Keep hands, feet, and clothing 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.



TS218 —UN—23AUG88

DX,SERV -19-28FEB17-1/1

Welding Near Electronic Control Units

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.

TS953 —UN—15MAY90

DX,WW,ECU02 -19-14AUG09-1/1

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 -19-11JUN09-1/1

Fertilizer Distribution Tube

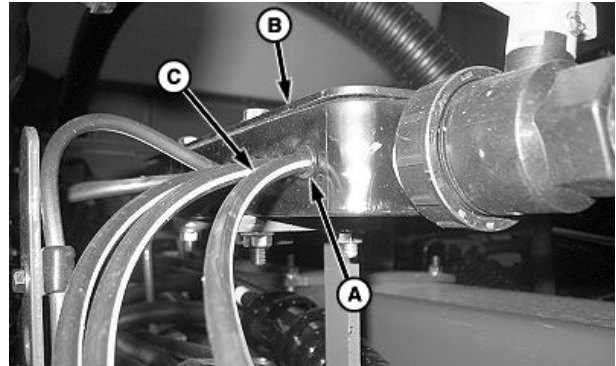
Replacing Worn or Damaged Distribution Tube

To replace worn or damaged distribution tubes complete the following procedures:

1. Push in fitting ring (A) at manifold (B) and remove tube (C).

A—Fitting Ring
B—Manifold

C—Tube



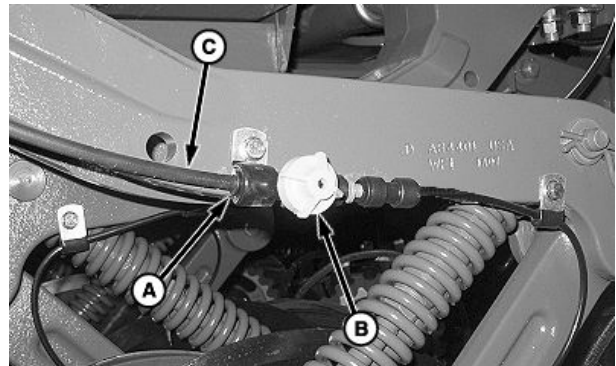
A72199 —UN—03AUG11

OUO6064,0000593 -19-28OCT11-1/11

2. Push in fitting ring (A) at check valve (B) and remove tube (C).

A—Fitting Ring
B—Check Valve

C—Tube



A72737 —UN—22SEP11

Continued on next page

OUO6064,0000593 -19-28OCT11-2/11

3. Loosen nuts (A) on all hose clamps (B) at all locations for tube (C) being replaced.

4. Remove tube (C) from hose clamps (B).

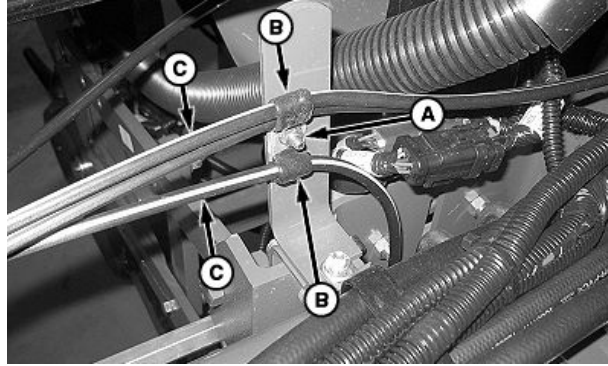
5. Measure tube length before discarding.

NOTE: Add 25.4 mm (1 in.) to overall tube length for trimming and chamfering.

6. Cut new tube to length.

A—Nut
B—Hose Clamp

C—Tube



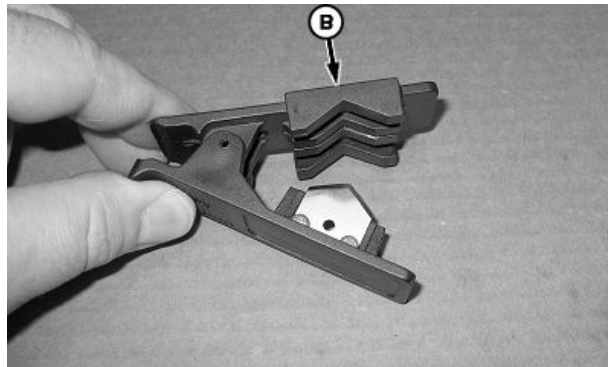
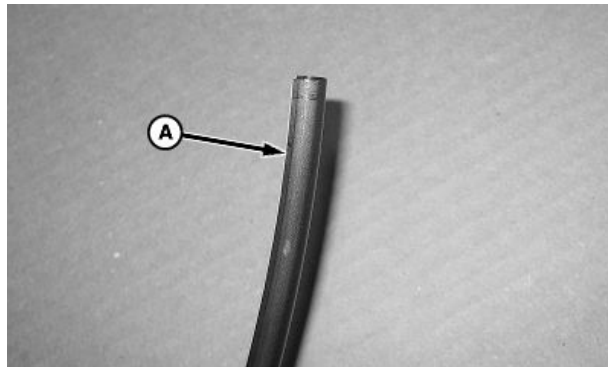
A72201—UN—03AUG11

OUO6064,0000593 -19-28OCT11-3/11

7. Trim each end of tube (A) square with tube cutter (B) or similar device. Ensure end of tubing is not crushed.

A—Tube

B—Tube Cutter



A72202—UN—03AUG11

A72204—UN—03AUG11

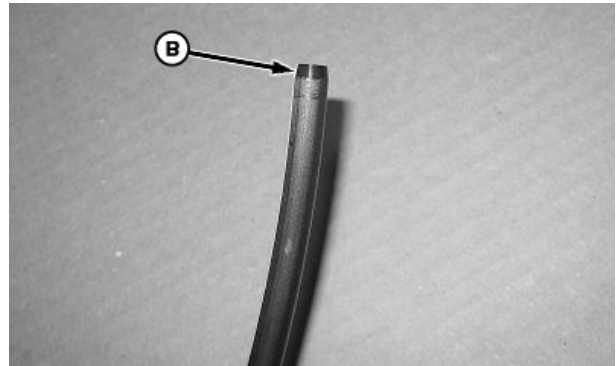
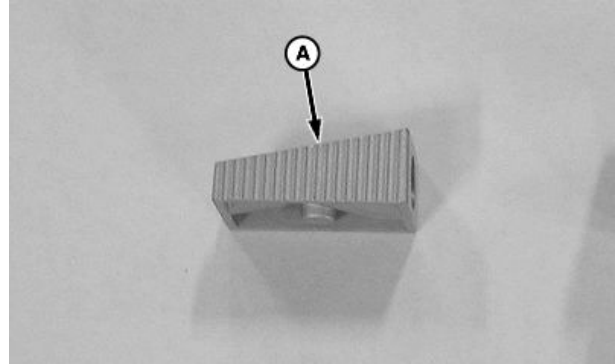
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OUO6064,0000593 -19-28OCT11-4/11

8. Using a chamfer tool (A) (a pencil sharpener works well), chamfer each end of tube (B).
9. Route tube from manifold to opener inserting tube in appropriate hose clamps.

A—Chamfer Tool

B—Tube



A72205 —UN—03AUG11

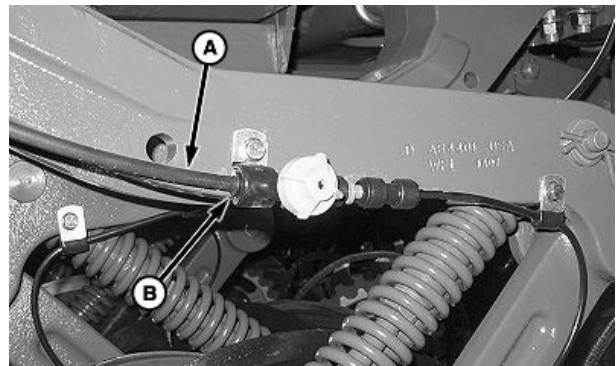
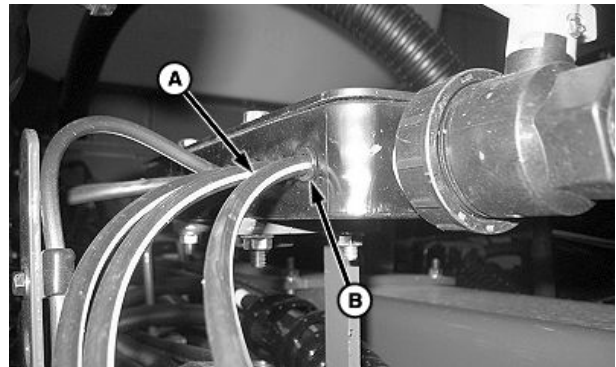
A72203 —UN—03AUG11

OOU6064,0000593 -19-28OCT11-5/11

10. Push each end of tube (A) fully into fittings (B). Pull tube to ensure that it is locked into fitting.

A—Tube

B—Fitting



A72206 —UN—03AUG11

A72738 —UN—22SEP11

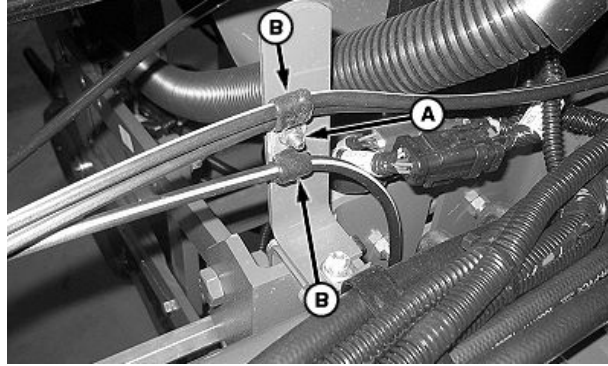
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OOU6064,0000593 -19-28OCT11-6/11

11. Tighten nut (A) on hose clamps (B).
12. Prime system and check for leaks. (See PRIMING AND INITIAL START UP OF PUMP in System Overview section.)

A—Nut

B—Hose Clamp



A72208—UN—03AUG11

OUO6064,0000593 -19-28OCT11-7/11

Fix Distribution Tube Connection Leak

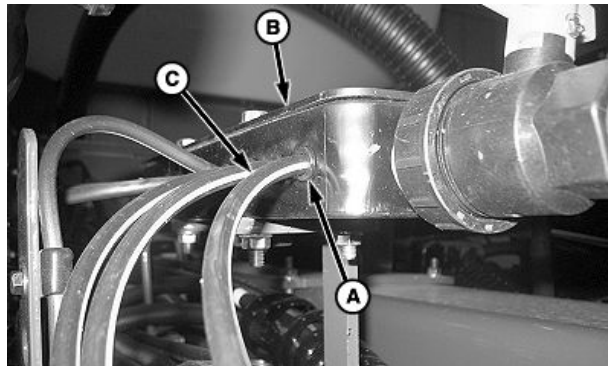
To fix a distribution tube connection leak complete the following procedures:

1. Push in fitting ring (A) at connection points (B), and pull out tube (C).

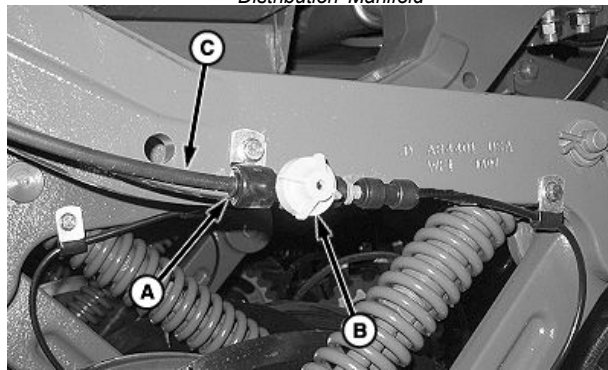
A—Fitting Ring

B—Connection Points

C—Tube



Distribution Manifold



A72199—UN—03AUG11

A72737—UN—22SEP11

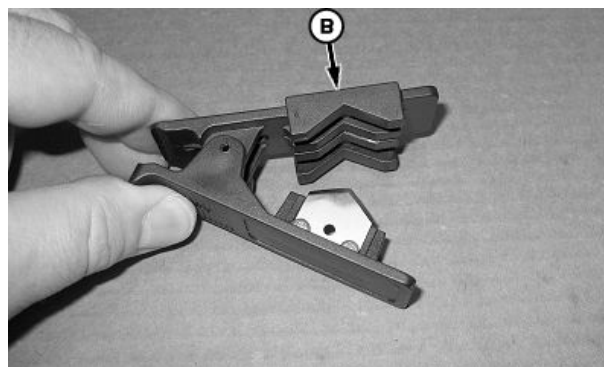
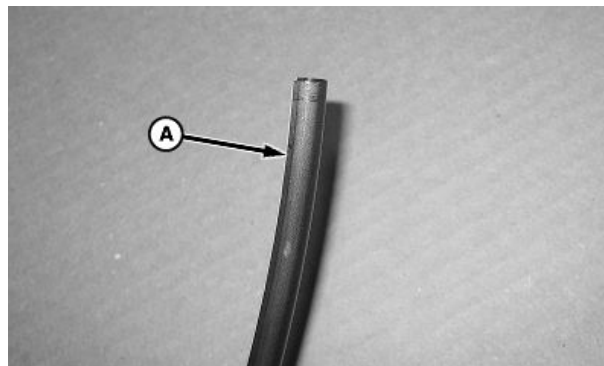
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OUO6064,0000593 -19-28OCT11-8/11

2. Trim end of tube (A) square with tube cutter (B) or similar device. Ensure end of tubing is not crushed.

A—Tube

B—Tube Cutter



A72202 —UN—03AUG11

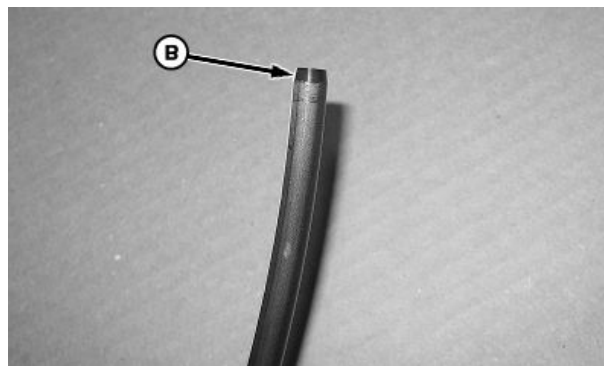
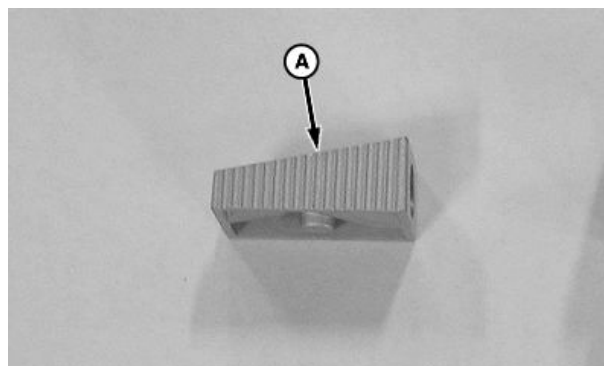
A72204 —UN—03AUG11

OOU6064,0000593 -19-28OCT11-9/11

3. Using a chamfer tool (A) (a pencil sharpener works well), chamfer end of tube (B).

A—Chamfer Tool

B—Tube



A72205 —UN—03AUG11

A72203 —UN—03AUG11

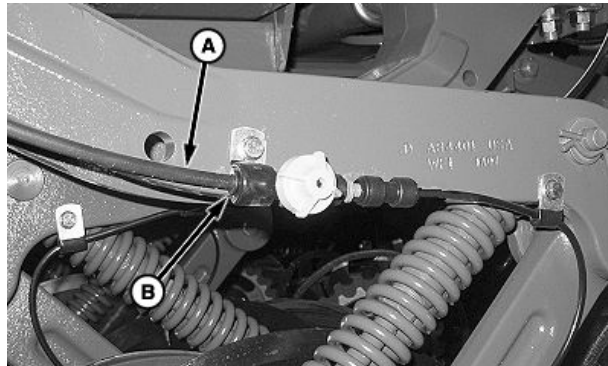
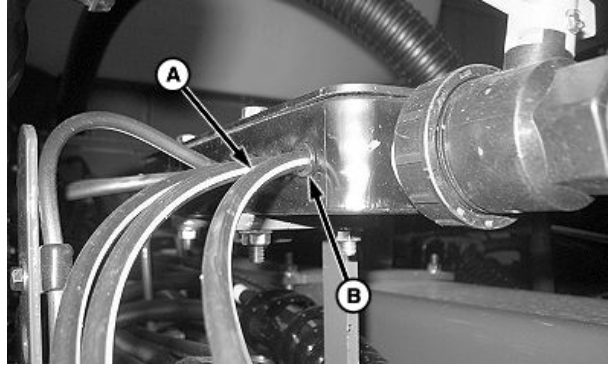
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OOU6064,0000593 -19-28OCT11-10/11

4. Push end of tube (A) fully into fittings (B). Pull tube to ensure that it is locked into fitting.
5. Prime system and check for leak. (See PRIMING AND INITIAL START UP OF PUMP in System Overview section.)

A—Tube

B—Fitting



A72206—UN—03AUG11

A72738—UN—22SEP11

OUO6064,0000593 -19-28OCT11-11/11

Lubricate and Maintain the Machine Safely

CAUTION: To help prevent serious injury or death to you or others caused by unexpected movement, service the machine on a level surface. Lower the machine to the ground or sufficiently lock or block the raised machine before servicing. If the machine is connected to a tractor, engage the park brakes and place the transmission in “Park”, shut off the engine and remove the key. If the machine is detached from the tractor, block the wheels and use shop stands to prevent movement.



N40000—UN—28SEP88

AG,OUO6074,1354 -19-29MAR18-1/1

Lubrication and Maintenance Procedures

CAUTION: Do not clean, lubricate, or adjust machine while in motion.

IMPORTANT: The recommended service intervals are based on normal conditions; severe or unusual conditions may require more frequent lubrication.

Perform each lubrication and service procedure illustrated in this section at the beginning and end of each season.

Clean grease fittings before using grease gun. Replace any lost or broken fittings immediately. If a new fitting fails to take grease, remove and check for failure of adjoining parts.

AG,OUO6074,1355 -19-04AUG00-1/1

Multipurpose Extreme Pressure (EP) Grease

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

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:

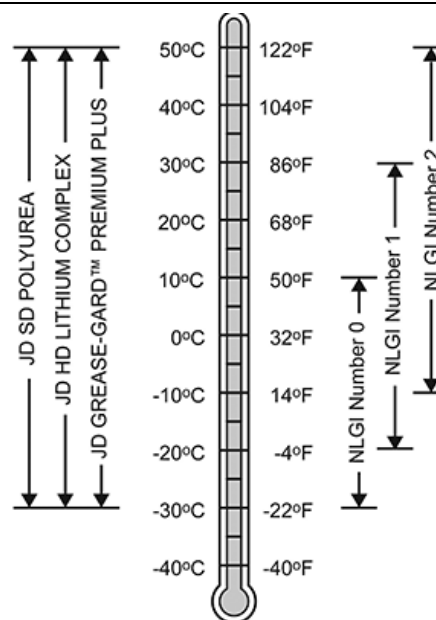
- John Deere HD Lithium Complex Grease
- John Deere Grease-Gard™ Premium Plus

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.

Grease-Gard is a trademark of Deere & Company



Greases for Air Temperature Ranges

RG30199 —UN—08MAR18

DX,GRE1 -19-13JAN18-1/1

Lubrication Symbols

A54361 —UN—24MAY04



Lubricate with John Deere TY6350 Multipurpose spray lube as required.



Lubricate with John Deere grease at hourly interval indicated on symbol. If other greases are used, grease should contain three to five percent 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 -19-25MAY04-1/1

Alternative Lubricants

Conditions in certain geographical areas require special lubricants and lubrication practices which do not appear

in this operator's manual. To obtain the latest information and recommendations, consult your John Deere dealer or qualified service provider.

AG,OUO6074,1357 -19-31JAN18-1/1

Lubrication—Roller Chains

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

The most effective roller chain lubrication routine varies, depending on environmental conditions and/or condition of chain. The goal is to maintain complete freedom at every chain link joint.

Lubricate all machine roller chains with John Deere Multipurpose Spray Lube, TY6350 (or equivalent) at intervals sufficient to maintain free chain movement.

When roller chains remain unused for several days, moisture in the air will accumulate on chain, causing

chain to rust. This can and will become serious enough in time to cause chain joints to become stiff, restricting their normal free movement. While very difficult to detect, this stiffness can disturb smooth rotation of seed meter components and cause a deterioration in performance.

If machine is not to be used for several days, thoroughly lubricate chains with John Deere Multipurpose Spray Lube, TY6350, at the beginning of idle period. If roller chains have become rusty or stiff during idle period, lubricate prior to continued usage and operate or "work" chains sufficiently to ensure all chain joints move freely before normal machine operation is resumed.

AG,OUO6074,1358 -19-04AUG00-1/1

Lubrication Intervals

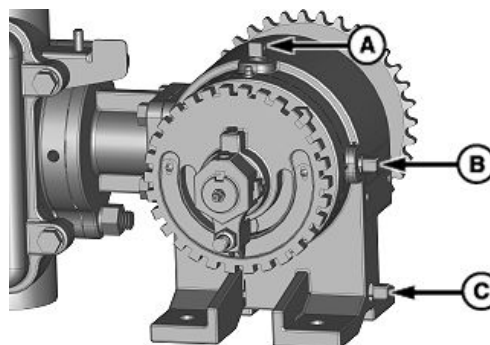
Item	Lubrication Intervals							
	Start of Season	As Required	10 Hours or Daily	25 Hours	50 Hours	100 Hours	200 Hours	End of Season
Fertilizer Drive Chain	•	•						•
Piston Pump Shafts			•					
Piston Pump Crankcase			•					

John Blue Pump System

1. Lower the planter into the plant position before checking the oil level.
2. Remove the fill plugs (A) and the check plugs (B) from both the pump crankcases.
3. Fill each crankcase with the TY6296 SAE 80W90 GL-5 gear lube or equivalent through the fill port until the lube is level with the check port.
4. Install the plugs.
5. Repeat on the second pump.

A—Fill Plug
B—Check Plug

C—Drain Plug



John Blue Pump

A89989—UN—29MAR16

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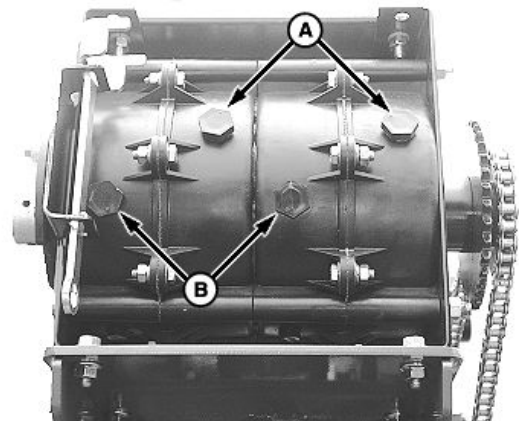
OUO6064,00006D8 -19-12APR18-1/3

Demco Pump System

1. Lower the planter into the plant position before checking the oil level.
2. Remove the fill plugs (A) and the check plugs (B) from both the pump crankcases.
3. Fill each crankcase with the SAE 30 TY22070 Torq-Gard™ Supreme engine oil or equivalent at the fill ports until the oil is level with the check ports.
4. Install the plugs.

A—Fill Plugs

B—Check Plugs

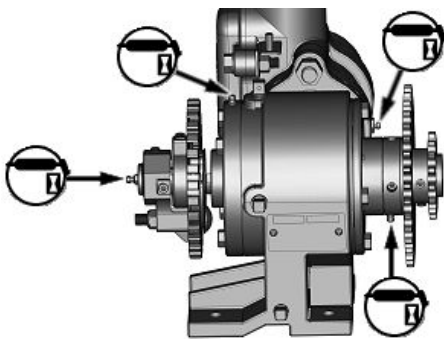


24 Row Fixed Rate Pump

Torq-Gard is a trademark of Deere & Company

OUO6064,00006D8 -19-12APR18-2/3

A53059—UN—10OCT03

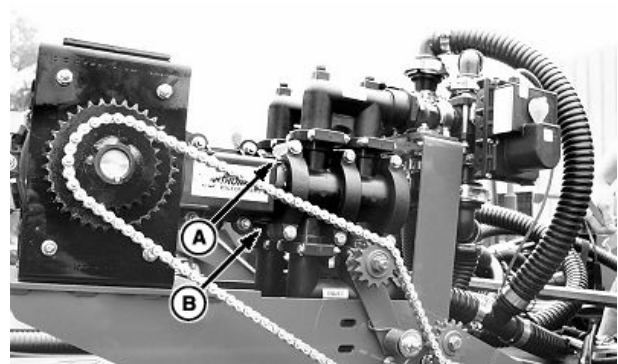


12 and 16 Row Piston Pump Shafts

A—Grease Fitting

B—Weep Hole

Cover the weep hole (B) tightly with your finger. Pump the grease into the fitting (A) until the pressure pushes the grease past your finger. Repeat on the other pump.



24 Row Fixed Rate Pump Shafts

OUO6064,00006D8 -19-12APR18-3/3

A53468—UN—10DEC03

A89988—UN—29MAR16

Troubleshooting

Liquid Fertilizer System

Symptom	Problem	Solution
Fertilizer flow rate slow or stopped.	Plugged in-line orifice or nozzle.	Clean in-line orifices or nozzles or increase in-line orifice size or nozzle size per rate chart.
	Excessive drive tire slippage	Reduce row unit down force. Check drive for misalignment or binding.
	Plugged strainer.	Clean strainer.
	Kinked delivery hose at wings or at row.	Fix or replace pinched hose.
	Drive tire or contact tire pressure low.	Inflate to proper pressure.
Fertilizer rate uneven row to row.	14 kPa (0.1 bar) (2 psi) check valves dirty or stuck.	Inspect check valves. Clean or replace as necessary.
	System pressure is too low.	Verify system in between 103—621 kPa (1.0—6.2 bar) (15—90 psi). If low, then install smaller in-line orifices or increase travel speed.
	Incorrect hose routing.	Verify there are no large hills or valleys in fertilizer distribution hose routing.
	System not primed correctly.	Prime system and make sure that all air is purged from distribution hoses.
	Some fertilizer hoses are pinched.	Fix or replace pinched hoses.
	Different size in-line orifices or nozzles installed at each row.	Verify all in-line orifices or nozzles are the same size.
Fertilizer opener does not penetrate sufficiently.	Improper adjustment of pressure.	Increase the amount of down force on the opener. Lower the depth setting of the opener.
		Install heavy spring.
Fertilizer opener penetrates too deeply.	Improper adjustment of pressure.	Reduce the amount of down force on the opener. Raise the depth setting of the opener.
		Install light spring.
One fertilizer opener not distributing fertilizer.	Check valve bad or installed in wrong direction.	Replace or reassemble check valve.
	Fertilizer tube opener spout plugged.	Inspect, clean, and remove obstruction.

Continued on next page

OUC6064,000057A -19-31OCT11-1/2

Troubleshooting

Symptom	Problem	Solution
Fertilizer system leaks.	Manifold pressure too low.	Use smaller in-line orifices or nozzles to increase pressure to between 103—621 kPa (1.0—6.2 bar) (15—90 psi) Add gauge to monitor pressure.
	Drive tire or contact tire pressure low.	Inflate to proper pressure.
	Distribution hose pinched, preventing flow to opener.	Reroute hose.
	High system pressure.	Verify system pressure is between 103—621 kPa (1.0—6.2 bar) (15—90 psi). If high, then reduce ground speed or increase in-line orifice size.
	Tubing in not fully pushed in.	Push tubing into coupler so it is fully inserted.
	Tubing is not squarely cut or is not chamfered.	Remove tubing, squarely cut and chamfer before re-inserting into coupler.
	In-line orifice outer surface is scored.	Replace in-line orifice.
	O-ring is damaged or missing in coupler.	Replace coupler.

OUO6064.000057A -19-31OCT11-2/2

Liquid Fertilizer—Piston Pump System

Symptom	Problem	Solution
The pump is hard to prime.	The suction hoses have a leak.	Check the plumbing for leaks. Tighten and seal the areas where needed.
	Open the special fitting check valve.	See Prime and Start the Pump in the Liquid Fertilizer System section.
The pump will not prime.	The strainer is plugged.	Clean the strainer.
	The pump rate is set too low.	Set the pump according to the rate chart.
	The pump valve is fouled.	See your John Deere dealer.
	The packings are worn.	See your John Deere dealer.
The pump is metering low.	The suction hoses have a leak.	Check the plumbing for leaks. Tighten and seal the areas where needed.
	Open the special fitting check valve.	See your John Deere dealer.
	The strainer is plugged.	Clean the strainer.
	The pump rate is set too low.	Set the pump according to the rate chart.
	The pump valve is fouled.	See your John Deere dealer.
	The pump drive range is set incorrectly.	Set the drive according to the rate chart.
	The valve spring is broken.	See your John Deere dealer.
The pump is metering high.	The pump rate is set too high.	Select the pump setting number according to the rate chart. Adjust the pump setting upward due to the low drive wheel slippage.
	The pump drive range is set incorrectly.	Set the drive according to the rate chart.
	The pump valve is stuck open.	See your John Deere dealer.
	The valve spring is broken.	See your John Deere dealer.
The fertilizer leaks past the pump when the pump is stopped.	There are contaminants under the valve.	See your John Deere dealer.
	The pump valve is stuck open.	See your John Deere dealer.
	The valve spring is broken.	See your John Deere dealer.

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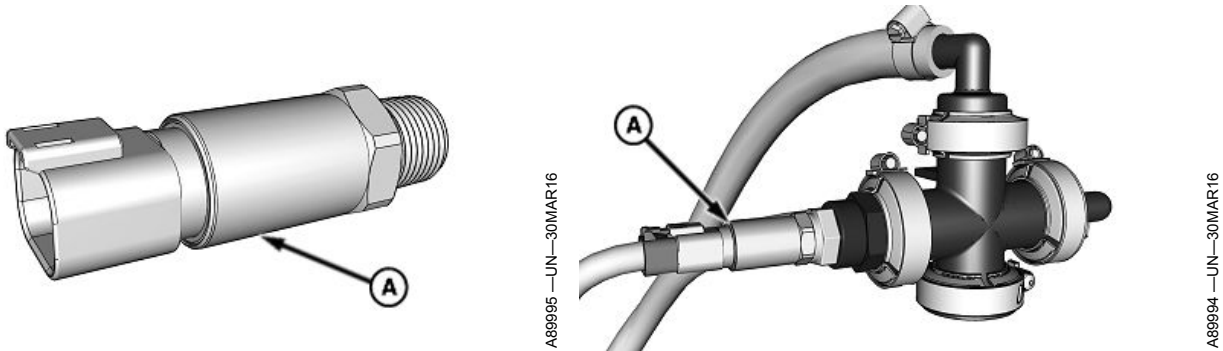
OU06064,000057B -19-04MAY17-1/2

Symptom	Problem	Solution
There are leaks between the pump and the crankcase.	The rod packing is worn.	See your John Deere dealer.
The pump is using excessive oil.	The oil seals are worn.	See your John Deere dealer.
	The O-rings are leaking.	See your John Deere dealer.
The pump is noisy during operation.	The pump components are worn.	See your John Deere dealer.
The fertilizer leaks at the opener when the planter is stopped.	The check valve is malfunctioning.	Repair or replace the check valve.
The main strainer screen is plugged frequently.	The main strainer mesh is too fine.	Use a courser mesh screen (See Strainer Recommendations in the Liquid Fertilizer System section).
	The fertilizer is dirty or crystallized.	Install the finer mesh strainer on the nurse tank.
The liquid fertilizer tank does not fill.	The drip line or fitting is plugged.	⚠ CAUTION: Avoid personal injury. Do not service if the system is under pressure. Relieve the pressure through the spring loaded vent of the tank cap. Do not remove the cap if the system is under pressure. Clean the fitting and the drip line (See Clean Liquid Fertilizer Tank Lid Fittings and Drip Line Hoses in the Service and Adjustments section).
The fertilizer manifold pulsates or shakes.	The incorrect in-line orifice or nozzle is used.	Install the correct in-line orifice or nozzle. Install the gauge to the monitor system pressure then verify that the pressure is between 103—621 kPa (1.0—6.2 bar) (15—90 psi). If high, then use a larger in-line orifice or decrease the travel speed.
	The main row strainer is plugged.	Clean the strainer. Install the strainer on the nurse tank.
The fertilizer leaks at the opener when the planter is stopped.	The check valve is stuck open or leaking.	Clean or replace the check valve.

OUC6064,000057B -19-04MAY17-2/2

Storage

Liquid Fertilizer Sensor (If Equipped)



A—Liquid Fertilizer Sensor

Remove the sensor (A) and flush it with clean water.

Do not insert any object or tool into the fluid port.

OUO6064,000057C -19-30MAR16-1/1

Liquid Fertilizer System Storage Procedures with John Blue™ and Demco Pumps

IMPORTANT: To prevent damage to piston pump:

Keep air out of pump. Entrance of air into the pump causes rapid and severe corrosion to the interior pump components, even for short periods of storage.

Keep pump from freezing.

Remove drive chain when not in use.

Suspension fertilizer must be flushed from the pump for any storage period.		
Clear Liquid Fertilizer		
Overnight	Cooling Temperatures	Solution is likely to settle out. Draw fresh water into pump and leave filled. DO NOT admit air.
Overnight	Steady or Rising Temperatures	Leave pump and hoses filled with solution.
One to Two Weeks	Acceptable	Draw fresh water into pump to dilute and flush fertilizer solution. DO NOT DRAIN. Keep pump sealed to exclude air.
One to Two Weeks	Preferred	Use approximately 19—38 L (5—10 gal.) of fresh water and operate pump to flush system thoroughly. Install 19 L (5 gal.) of SPRAY MASTER™ Winterizer Fluid or RV antifreeze ^a to the tank . Operate pump to circulate winterizer into system until the solution starts to come out the openers.
Winter	Preferred	Drain any excess fertilizer from the tank and manifolds. Operate pump to clear fertilizer from distribution hoses and check valves. Use approximately 19—38 L (5—10 gal.) of fresh water and operate pump to flush system thoroughly. Install 19 L (5 gal.) of SPRAY MASTER™ Winterizer Fluid or RV antifreeze ^a to the tank . Operate pump to circulate winterizer into system until the solution starts to come out the openers.

^aMix winterizer fluids to the correct ratio for system protection down to the lowest expected temperature

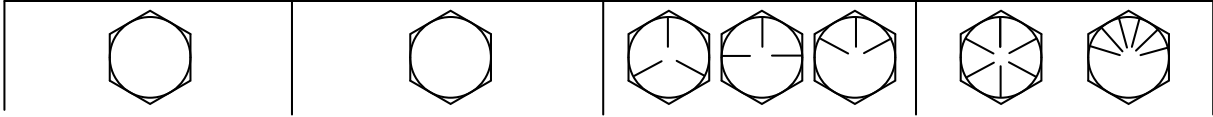
SPRAY MASTER is a trademark of Deere & Company

WP29706,000031C -19-10APR12-1/1

Specifications

Unified Inch Bolt and Screw Torque Values

TS1671 —UN—01MAY03



Bolt or Screw Size	SAE Grade 1				SAE Grade 2 ^a				SAE Grade 5, 5.1 or 5.2				SAE Grade 8 or 8.2			
	Lubricated ^b		Dry ^c		Lubricated ^b		Dry ^c		Lubricated ^b		Dry ^c		Lubricated ^b		Dry ^c	
	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.
1/4	3.7	33	4.7	42	6	53	7.5	66	9.5	84	12	106	13.5	120	17	150
													N·m	lb.-ft.	N·m	lb.-ft.
5/16	7.7	68	9.8	86	12	106	15.5	137	19.5	172	25	221	28	20.5	35	26
									N·m	lb.-ft.	N·m	lb.-ft.				
3/8	13.5	120	17.5	155	22	194	27	240	35	26	44	32.5	49	36	63	46
			N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.								
7/16	22	194	28	20.5	35	26	44	32.5	56	41	70	52	80	59	100	74
	N·m	lb.-ft.														
1/2	34	25	42	31	53	39	67	49	85	63	110	80	120	88	155	115
9/16	48	35.5	60	45	76	56	95	70	125	92	155	115	175	130	220	165
5/8	67	49	85	63	105	77	135	100	170	125	215	160	240	175	305	225
3/4	120	88	150	110	190	140	240	175	300	220	380	280	425	315	540	400
7/8	190	140	240	175	190	140	240	175	490	360	615	455	690	510	870	640
1	285	210	360	265	285	210	360	265	730	540	920	680	1030	760	1300	960
1-1/8	400	300	510	375	400	300	510	375	910	670	1150	850	1450	1075	1850	1350
1-1/4	570	420	725	535	570	420	725	535	1280	945	1630	1200	2050	1500	2600	1920
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2140	1580	2700	2000	3400	2500
1-1/2	990	730	1250	930	990	730	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For plastic insert or crimped steel type lock nuts, for stainless steel fasteners, or for nuts on U-bolts, see the tightening instructions for the specific application. Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Replace fasteners with the same or higher grade. If higher grade fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.

^aGrade 2 applies for hex cap screws (not hex bolts) up to 6 in. (152 mm) long. Grade 1 applies for hex cap screws over 6 in. (152 mm) long, and for all other types of bolts and screws of any length.

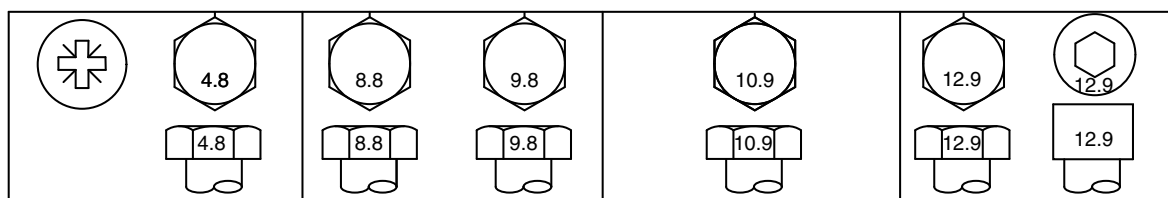
^b"Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or 7/8 in. and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.

^c"Dry" means plain or zinc plated without any lubrication, or 1/4 to 3/4 in. fasteners with JDM F13B, F13E or F13H zinc flake coating.

DX,TORQ1 -19-12JAN11-1/1

Metric Bolt and Screw Torque Values

TS1670 —UN—01MAY03



Bolt or Screw Size	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated ^a		Dry ^b		Lubricated ^a		Dry ^b		Lubricated ^a		Dry ^b		Lubricated ^a		Dry ^b	
	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.
M6	4.7	42	6	53	8.9	79	11.3	100	13	115	16.5	146	15.5	137	19.5	172
									N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.
M8	11.5	102	14.5	128	22	194	27.5	243	32	23.5	40	29.5	37	27.5	47	35
			N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.								
M10	23	204	29	21	43	32	55	40	63	46	80	59	75	55	95	70
	N·m	lb.-ft.														
M12	40	29.5	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	46	80	59	120	88	150	110	175	130	220	165	205	150	260	190
M16	100	74	125	92	190	140	240	175	275	200	350	255	320	235	400	300
M18	135	100	170	125	265	195	330	245	375	275	475	350	440	325	560	410
M20	190	140	245	180	375	275	475	350	530	390	675	500	625	460	790	580
M22	265	195	330	245	510	375	650	480	725	535	920	680	850	625	1080	800
M24	330	245	425	315	650	480	820	600	920	680	1150	850	1080	800	1350	1000
M27	490	360	625	460	950	700	1200	885	1350	1000	1700	1250	1580	1160	2000	1475
M30	660	490	850	625	1290	950	1630	1200	1850	1350	2300	1700	2140	1580	2700	2000
M33	900	665	1150	850	1750	1300	2200	1625	2500	1850	3150	2325	2900	2150	3700	2730
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2770	4750	3500

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For stainless steel fasteners or for nuts on U-bolts, see the tightening instructions for the specific application. Tighten plastic insert or crimped steel type lock nuts by turning the nut to the dry torque shown in the chart, unless different instructions are given for the specific application.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class. Replace fasteners with the same or higher property class. If higher property class fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.

^a“Lubricated” means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or M20 and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.

^b“Dry” means plain or zinc plated without any lubrication, or M6 to M18 fasteners with JDM F13B, F13E or F13H zinc flake coating.

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Specifications

Specifications for Central Insecticide System	
Operating Specifications	
Nozzles (Single-Disk Injection Opener Only)	00015 (1.5) 00025 (2.5) 0005 (5) 0008 (8) 0012 (12)
In-Line Orifices (Non-Injection Style Openers i.e. Frame Mounted Fertilizer Opener)	Green (0.70) Yellow (1.2) Black (1.7) Grey (2.5)
Operating Speed	8.5 km/h (4 mph) to 13 km/h (8 mph)
Operating System Pressure	103—621 kPa (1.0—6.2 bar) (15—90 psi)
Fertilizer Tank Fill Opening	QUIK-FILL™
Fertilizer Tank Strainer	80 Mesh

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