SPECIFICATIONS

Axle Nut (Wheel Bearings)	60 ft-lbs (81 N·m) torque
Wear Washer, Drive Shaft Collar	0.060 inches (1.5 mm) new; replace when 0.044 inches (1.1 mm)
Wear Washer, Clutch	0.060 inches (1.52 mm) new; replace when 0.048 inches (1.2 mm)
Gear Case Shims	0.030 or 0.048 inches (0.8 or 1.2 mm)
Single-Disk Opener, Two Piece Boot, Blade to Drawbar	105 ft-lbs (142 N·m) torque
Single-Disk Opener, One-Piece Boot, Blade-to-Boot	55 ft-lbs (75 N·m) torque
Double-Disk Opener, Blade to Boot	50 ft-lbs (68 N·m) torque
Feed Shaft Lock Nut	100-125 ft-lbs (136-169 N·m) torque
Feed Shaft	17 ft-lbs (23 N·m) rolling torque
Feed Shaft, total drill (plain grain)	35 ft-lbs (48 N·m) rolling torque
Feed Shaft, total drill (fertilizer)	40 ft-lbs (54 N·m) rolling torque
Grass Seed Shaft, without chain	3 ft-lbs (4 N·m) rolling torque
Double Run Feed Cup Gate Maximum Opening	1/32 in. (0.8 mm)
TRU-VEE Opener Support Slotted Nut	60-80 in-lbs (7-9 N·m)
TRU-VEE Opener Wheel Bolt Nut	170 ft-lbs (230 N·m)

STANDARD TORQUE VALUE CHART

Recommended Torque Value in Foot-Pounds (N·m)
Coarse and Fine Threads

Bolt Diameter	Three Radial Dashes	Six Radial Dashes
1/4	10 (14)	14 (19)
5/16	20 (27)	30 (41)
3/8	35 (47)	50 (68)
7/16	55 (75)	80 (101)
1/2	85 (115)	130 (163)
9/16	130 (176)	185 (237)
5/8	170 (230)	250 (325)
3/4	300 (407)	420 (576)
7/8	445 (603)	670 (928)
1	670 (908)	1000 (1396)

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Clutch Slips or Will Not Engage—Continued

Make sure the arm on the pressure shaft (that the rod is connected to) is installed so the flange is pointing toward the end of the drill.

Clutch Will Not Disengage

Broken throw-out rod.
Replace, pages 14 and 34.
Broken stationary bracket.
Replace, pages 14 and 34.
Throw-out rod or stationary bracket in wrong hole.
Correct, Fig. 69.

END WHEELS

GENERAL INFORMATION

The end wheels provide the power that is necessary to operate the grain drill. The input shaft—tube and sprocket assembly—is connected directly to the axle sprocket with a roller chain.

The following tires are available for drills as noted:

8-foot (2.4 m) drills (Models 8100, 8200, and 8250), 7.60-15, 4 or 6 PR tires only
10-foot (3.0 m) drills (Models 8200 and 8250), 7.60-15, 4 or 6 PR; 7.50-20, 4 PR tires.
10-foot (3.0 m) drills (Models 8300 and 8350), 7.50-20, 4 PR tires only
12 and 13-foot (3.7 and 4.0 m) drills (Models 8200, 8300, and 8350), 7.50-20, 4 PR tires only

The 4-ply tires require 28 psi (1.9 bar [2.0 kg/cm²]) and the 6-ply tires require 32 psi 2.0 bar or kg/cm²)

IMPORTANT: Correct tire pressure is critical for the correct interpretation of seed charts.

AXLE AND AXLE PLATE DISASSEMBLY

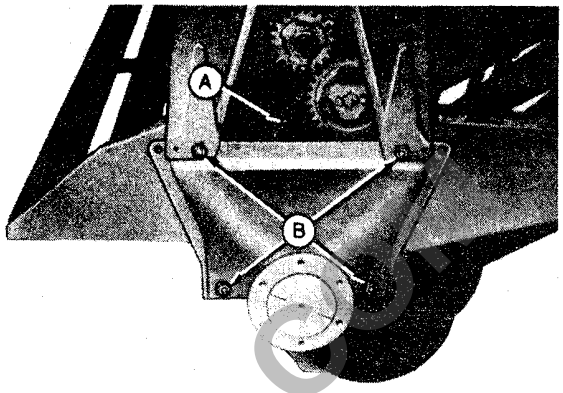
1. Raise the end of the drill with a jack under the axle plate, or the tractor hitch.

IMPORTANT: Do not support drill by jacking or blocking under the foot board supports.

2. Take out the six wheel bolts and remove the wheel and tire; also remove the inspection plate.

3. Loosen the drive chain tightener (C, Fig. 2) and push it toward the rear of the drill.

4. Break the drive chain (A, Fig. 1) and let it drop down.



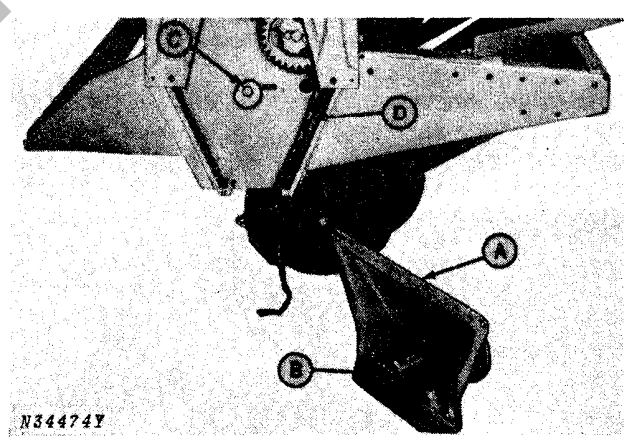
N344475Y

A—Chain Partially Apart *B—Axle Plate Nuts*

Fig. 1-Removing Axle

5. Remove the four or five nuts (B) from the axle plate. Larger drills will have six or seven bolts in the plate.

6. Drive the bolts back through the end cover and plate.



N344474Y

A—Axle Plate *C—Idler*
B—Drive Sprocket *D—Chain*

Fig. 2-Axle Plate Removed

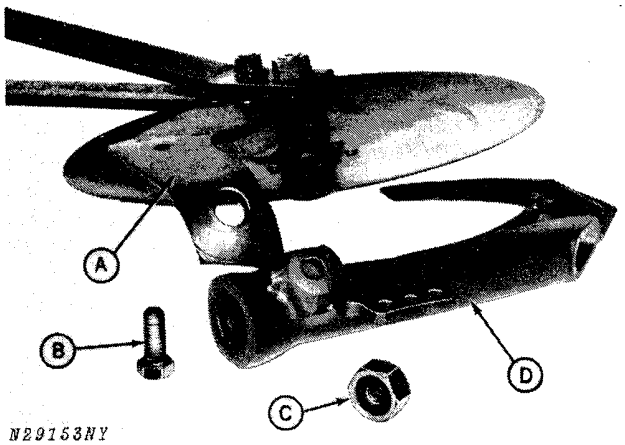
7. Slide the axle plate (A, Fig. 2) down; then remove it from the drill.

8. Clamp the axle (A, Fig. 3)—not the plate—in a vise and remove the cotter pin and slotted nut. This will free the sprocket and seal, and the bearing.

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Replacing Boot—Continued



N29153NY

A—R.H. Boot Support *C—Cone Nut*
B—Bolt *D—R.H. Boot*

Fig. 99-Boot Removed

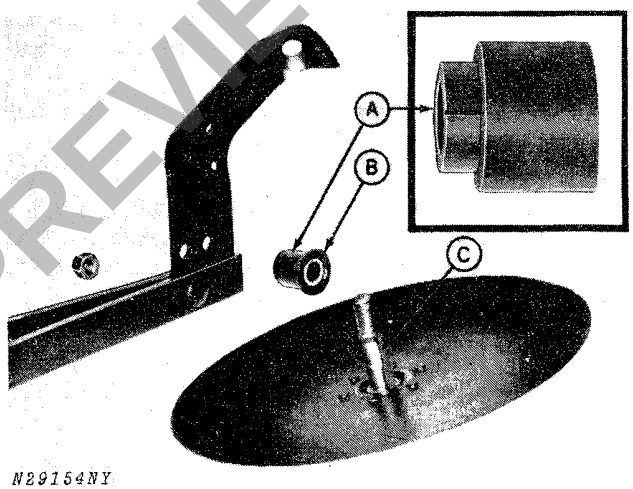
NOTE: The bolt (B, Fig. 99) goes through the boot (D) from the inside out, then through the boot support (A); then the cone nut (C).

2. When reassembling, make sure the edge of the boot support (B, Fig. 98) makes contact with the top of the 3-hole flange of the boot.

3. Make sure the tip of the toe scraper (E, Fig. 98) touches the blade but does not prevent free turning of the blade. The heel of the toe scraper should be 0.08 inches (2.0 mm) away from the blade.

4. To simulate soil pressure, press with the palm of your hand on the blade opposite the scraper; then check the toe scraper. Loosen the nut (C, Fig. 99) and turn the boot to adjust the scraper. Hold the heel (D, Fig. 98) of the boot with locking pliers.

Replacing Disk or Bearing



N29154NY

A—Spacer *B—Seal* *C—Curved Bolt*

Fig. 100-Disk Removed

1. Remove the nut from the curved bolt (C, Fig. 100); then slide the disk and spacer out of the drawbar.

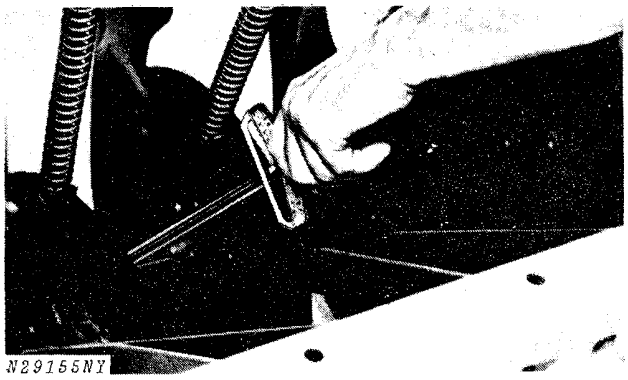
2. If disk is still serviceable, but bolt or bearing are badly worn or damaged, grind off rivet heads to remove parts. Replace as needed and rivet case to disk, using 1/4 x 3/8-in. pointed, round-head rivets (Obtain from parts).

NOTE: Observe flat surfaces in drawbar, spacer, and bolt; also bevel on end of spacer that makes contact with drawbar.

3. Because of the flat surfaces, a disk must be installed correctly. Install it with the wide part of the spacer (B, Fig. 100) down (or the flat inner surface on top). The bolt will curve up, and the long, flat side of it will be inside the curve.

NOTE: This arrangement of flat surfaces and the curved bolt sets the angle of the disk (the angle that it enters the ground). If the drawbar and opener components are not bent, and are installed properly, the disk will enter the ground properly.

4. When assembling, fill the seal (B) with rubber seal lubricant.



N29155NY

Fig. 101-Tightening Disk

5. Pull top of disk toward boot support (B, Fig. 98), or push bottom of disk toward toe scraper (E), until all slack is removed from bolt holes. Install disk, spacer, and seal. Tighten disk bolt nut to 105 ft-lbs (142 Nm [14 kgm]) torque (Fig. 101). Tighten drawbar clamp bolt to 85 ft-lbs (115 Nm [12 kgm]) torque.

NOTE: When mounting drawbars on frame, refer to Operator's Manual for adjustments which may be needed to obtain desired penetration and seed placement.

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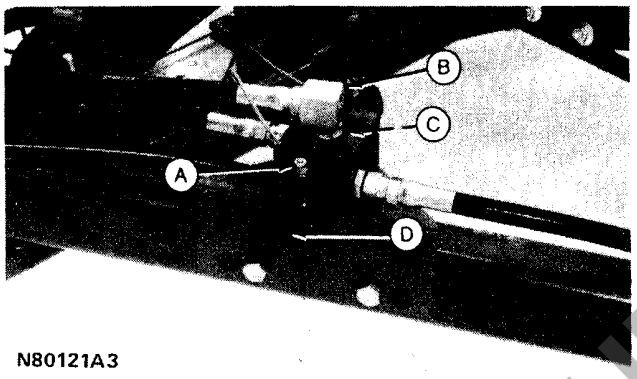
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REAR MOUNTED ROW MARKER ATTACHMENT SELECTOR VALVE

GENERAL INFORMATION

The hydraulic selector valve (Fig. 113) is electrically operated from a switch (Fig. 118) at the tractor operator's station, to provide independent raising or lowering of a left-hand marker, or selective raising and lowering of a dual (right and left-hand) marker system.

SOLENOID AND VALVE REPAIR



N80121A3

A—Front Solenoid
B—Rear Solenoid
C—Ground
D—Valve Stud

Fig. 113-Solenoid Valve

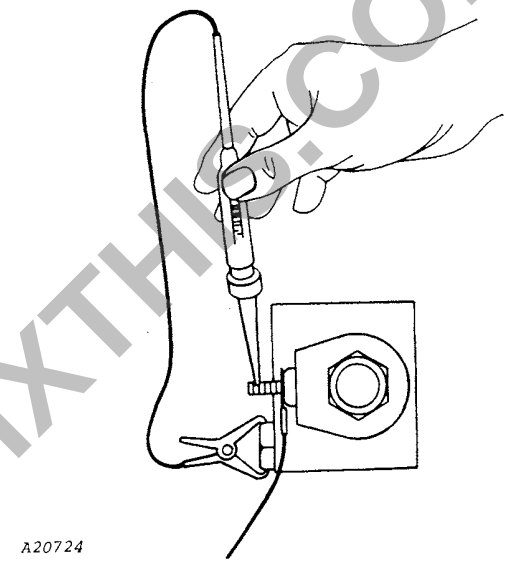
CAUTION: Escaping fluid under pressure can have sufficient force to penetrate the skin, causing serious personal injury. Before disconnecting lines, be sure to relieve all pressure. Before applying pressure to the system, be sure all connections are tight and that all lines and hoses are not damaged.

Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands, to search for suspected leaks.

If injured by escaping fluid, see a doctor at once. Serious infection or reaction can develop if proper medical treatment is not administered immediately.

1. Make a preliminary check of the system oil supply, oil lines, hydraulic and electrical connections, and associated components. Correct any problems discovered by this check before continuing.

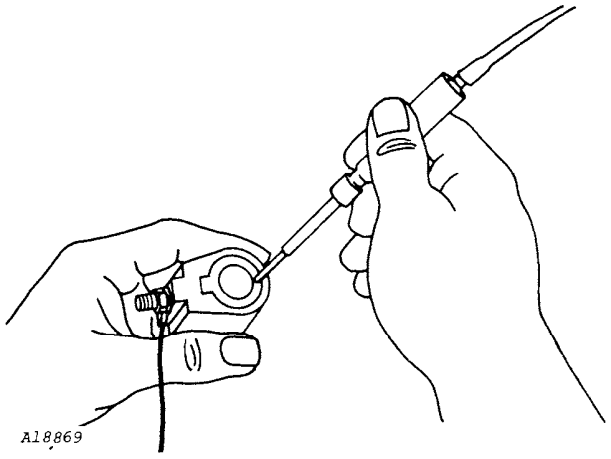
2. Check operation of a solenoid by placing a steel screwdriver blade on the valve stud (D). Turn on tractor key switch and the switch for that solenoid. If no pull is felt on the screwdriver, the solenoid is not receiving electrical current.



A20724

Fig. 114-Voltage Check

3. Check for voltage at the solenoid, using a low voltage test probe as shown (Fig. 114), or a voltmeter (See Fig. 122). If no voltage is indicated, check wiring and replace or repair as necessary. If voltage is present, solenoid may be defective.



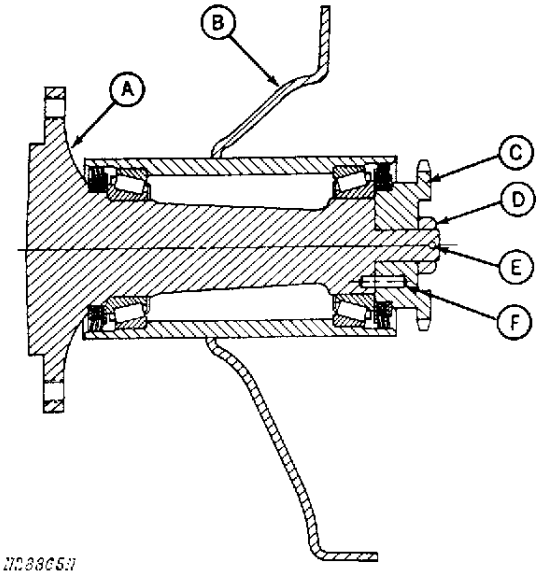
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Fig. 115-Checking Solenoid

4. Remove nut from valve stud (D, Fig. 113) and lift solenoid off. Remove cover and check for voltage as shown with probe tip on metal ring on solenoid and clip end of probe grounded (or use voltmeter in a similar manner).

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AXLE AND AXLE PLATE DISASSEMBLY—Continued

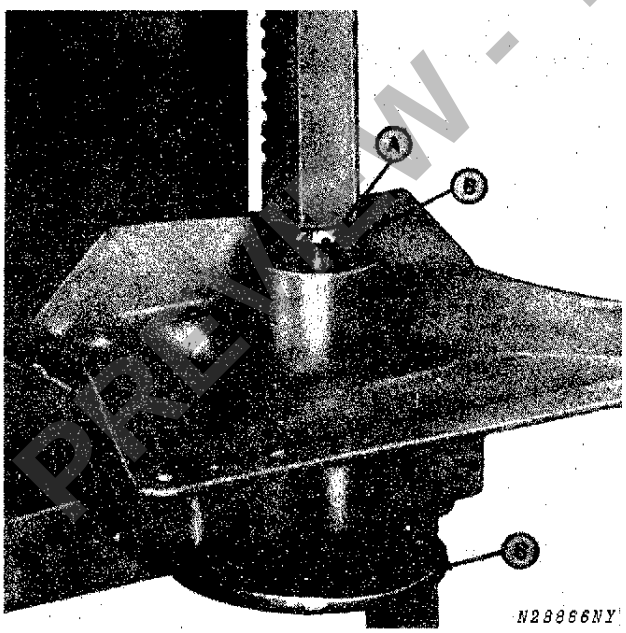


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A—Axle
B—End Plate
C—Drive Sprocket
D—Slotted Nut
E—Cotter Pin
F—Spring Shear Pin

Fig. 3-Axle Cross Section

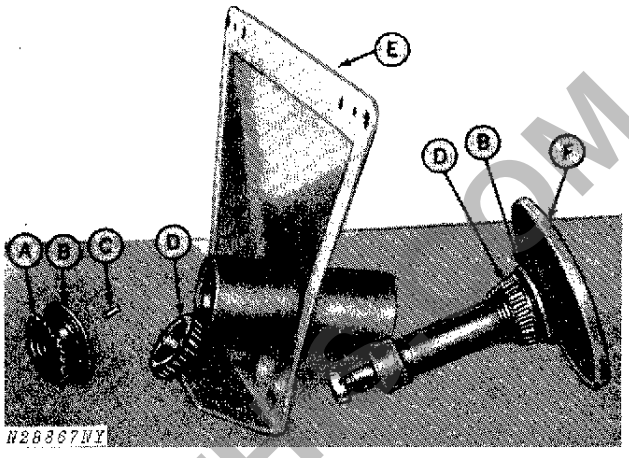
9. When removing the sprocket and seal assembly, do not lose the spring pin (F, Fig. 3); when reassembling the axle, make sure the spring pin is installed.



A—Protective Nut
B—Axle

Fig. 4-Pressing Out Axle

Press the axle out of the axle plate (Fig. 4).

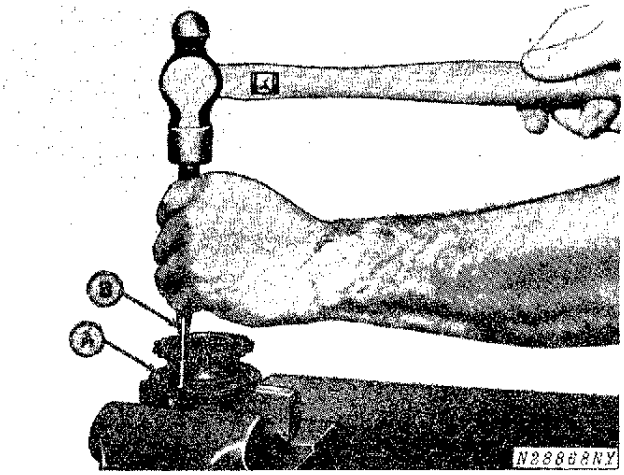


A—Sprocket
B—Seal
C—Spring Pin
D—Bearing
E—Plate
F—Axle

Fig. 5-Axle Out of Plate

10. Inspect the bearings (D, Fig. 5) and the bearing cups (in plate, E) for wear. Replace if defects are found.

NOTE: Remove cups using an internal puller or a punch.



A—Small Diameter Metal Flange
B—Punch

Fig. 6-Removing Seal

11. If the seal on the sprocket side is worn, remove it with a punch (B, Fig. 6). The seal and bearing on the inside of the axle must be removed with a puller.

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DIAGNOSING MALFUNCTIONS AND TESTING

ORGANIZING THE DIAGNOSIS

1. Know the Unit

Study this manual to know how the individual components work and their function in the over-all system.

Keep up with the latest service information. Read it and store it in a handy reference file.

2. Consult the Operator

Ask the operator how the unit was performing when the problem occurred. Find out if any corrective measures were already taken. Ask if the unit was serviced regularly as prescribed in the operator's manual.

3. Operate the Unit

If the unit can be safely operated, see for yourself how it malfunctions—don't completely rely on the operator's diagnosis.

4. Inspect the Unit

Visually check the unit. Look at the components for any cracked welds, loose hardware, damaged linkages, worn or broken lines, or anything that looks out of the ordinary.

5. List the Probable Causes

Write down the information you have learned by steps 1 through 4. What are the signs you found while inspecting the unit and what are the most probable causes as outlined under "Diagnosing"?

6. Reach Some Conclusions

Look over the possible causes and decide which ones are most likely. Reach your decision on the most probable cause and plan to check it first.

7. Test Your Conclusions

Before disassembling any components, test your conclusions to see which are correct. Tests narrow the possibilities and soon the actual cause will be pinpointed.

DIAGNOSING

Opener Disks Not Revolving

Drill hitched too high so pressure is on boot instead of disk.
Hitch drill properly, see Operator's Manual.
Scrapers adjusted too tightly.
Loosen, pages 47, 48.
Pressure rod not adjusted properly.
Make sure pressure rod collar is 1-1/2 inches (3.75 cm) above pressure arm swivel.
Disk bearing frozen.
Replace disk or bearing, pages 46, 47.
Double disk assembled wrong.
Add washer between bearing and boot, pages 47, 48.

Fluted-Feed Shifter Lever Difficult to Shift

Feed gate(s) positioned too high.
Lower feed gate(s), position shifter lever in place; then position feed gate(s), page 16.

Fluted-Feed Shifter Does Not Stay In Position

Bent or damaged shifter lever.
Replace entire assembly, page 16.

Varying Quantities Drilled by Individual Feeds

Feed gates not all set the same.
Set all gates identically, page 43.
Feed cup out of adjustment with the fluted-feed roll.
Set the shifter on zero and move any cups that are not completely closed, pages 16 and 43.

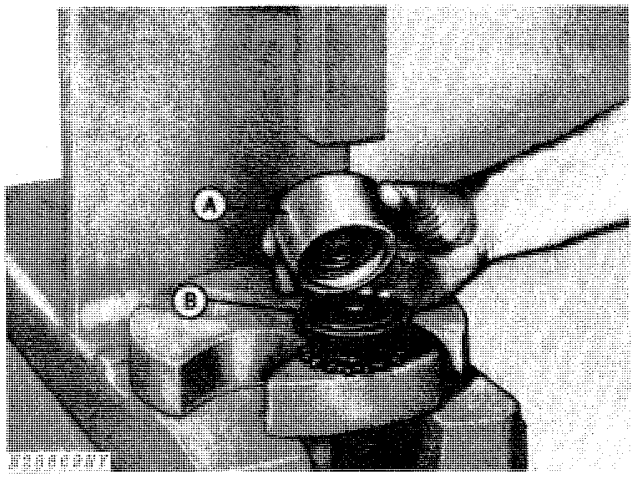
Quantities Drilled Not Agreeing With Feed Chart

Feed gates adjusted improperly.
Adjust gates, see Operator's Manual.
Heavier or lighter-than-average weight seed.
Check quantity drilled, see Operator's Manual.
Improper tire inflation.
Inflate tires correctly, page 7.
Improper tire size.
Do not mix tires; use recommended size for drill, see operator's manual.
Improper sprocket or gear combinations.
Check both sides of drill (if large drill) for identical settings and desired settings.

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ASSEMBLY



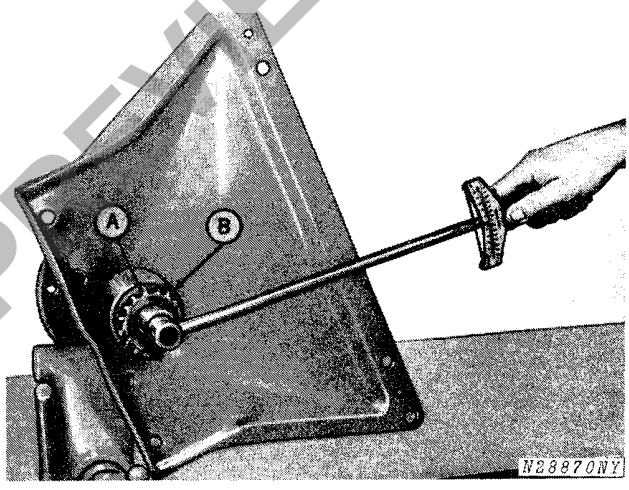
A—Driver B—Large Metal Flange

Fig. 7-Installing Seal

IMPORTANT: Install new seals (B, Fig. 5) whenever the axle housing is disassembled. Make sure large metal flange (B, Fig. 7) of inner seal is away from sprocket (facing the bearing). The large flange of the outer seal must also face the bearing (away from wheel flange). (See Fig. 3).

1. Press inner seal onto sprocket, using a driver (A, Fig. 7) having a 2-1/4-inch (57 mm) inside diameter (15-inch wheels) or 2-9/16-inch (67 mm) inside diameter (20-inch wheels).

2. Press outer seal and bearing onto the axle. Pack axle housing and both bearings with John Deere Multi-Purpose Lubricant or equivalent.



A—Sprocket B—Seal

Fig. 8-Tightening Axle Nut

3. Insert axle assembly into housing and install inner bearing, spring (shear) pin, and sprocket and seal assembly (A, B, Fig. 8).

4. Install the slotted nut and tighten to a minimum of 60 ft-lbs (81 Nm [8 kgm]) torque (Fig. 8).

NOTE: Maximum rolling torque is 7 ft-lbs (10 Nm [1 kgm]).

5. Install cotter pin.

INSTALLATION

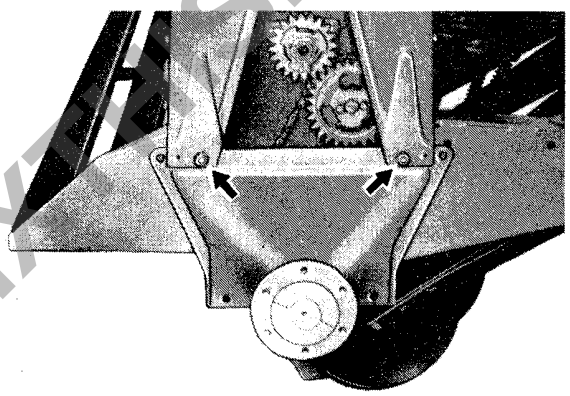


Fig. 9-Installing Axle Plate

1. Slide the axle plate up between the frame and the box end and loosely install the top bolts and nuts (Fig. 9). This will allow the plate to hinge slightly and provide enough clearance to thread the chain up through the bottom and around the sprocket.

2. Connect the chain, making sure it goes in front of the idler.

3. Install the bottom bolts and tighten all.

4. Adjust the chain tension by sliding the idler forward until the chain is just tight; then tighten the idler.

5. Install the inspection plate and the wheel.

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If voltage is not present, the solenoid may be checked further, by using an AC-DC Converter (John Deere BB33816 or equivalent) with a voltmeter.

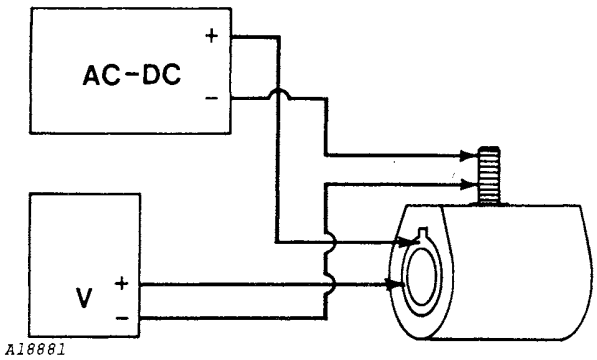


Fig. 116-Testing Solenoid Diode

5. Connect both positive (+) leads to the solenoid ground ring and both negative (–) leads to the solenoid stud (Fig. 116). The AC-DC Converter circuit breaker must shut off. If it does not, replace the solenoid.

NOTE: If the leads are reversed (positive to solenoid stud) the test results of the solenoid will not show a defective diode.

If the solenoid is functional, the valve may be sticking open or closed due to foreign material in the valve.

6. Remove the valve from the manifold by turning the hexagon nut on the valve stud (D, Fig. 113) with the solenoid removed.

7. Clean valve in a safe solvent. Move poppet assembly (B) to check for proper freedom by pushing a rod up into body (A). Also be sure the washer (C) is in place and can move.

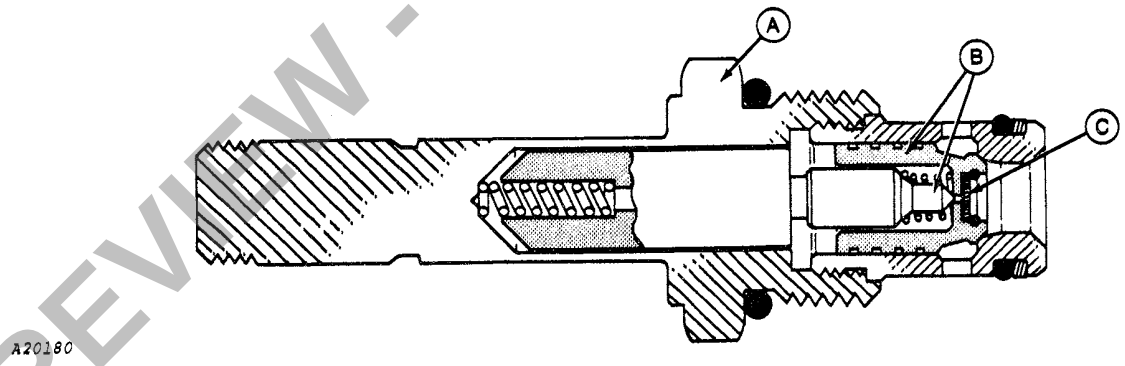
Inspect the threads on both ends of the valve for rust or oxidation. Use a wire brush to clean the threads.

Install the valve in the valve block, replace special washer, solenoid, cover, and nut. If the problem still persists, replace the valve.

To prevent leakage, install new O-rings whenever valve is disassembled from manifold. If leakage cannot be stopped with new O-rings, install new manifold assembly.

If valve is functional, but operation is erratic, check continuity of switch (Fig. 118).

NOTE: If wires are disconnected from the solenoids, connect as shown in Fig. 113.



A—Body *B—Poppet* *C—Washer*

Fig. 117-Valve Sectional View

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