# 8000 Series
# Grain Drills

JOHN DEERE

## TECHNICAL MANUAL

8000 Series
Grain Drills

TM1131 (01AUG80) English

**TM1131 (01AUG80)**

LITHO IN U.S.A.
ENGLISH

# 8000 SERIES GRAIN DRILLS
# Technical Manual
# TM-1131 (Aug-80)

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*All information, illustrations and specifications contained in this technical 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.*

*Right and Left-hand Determination—"Right-hand" and "left-hand sides are determined by facing in the direction the grain drill will travel when in use.*




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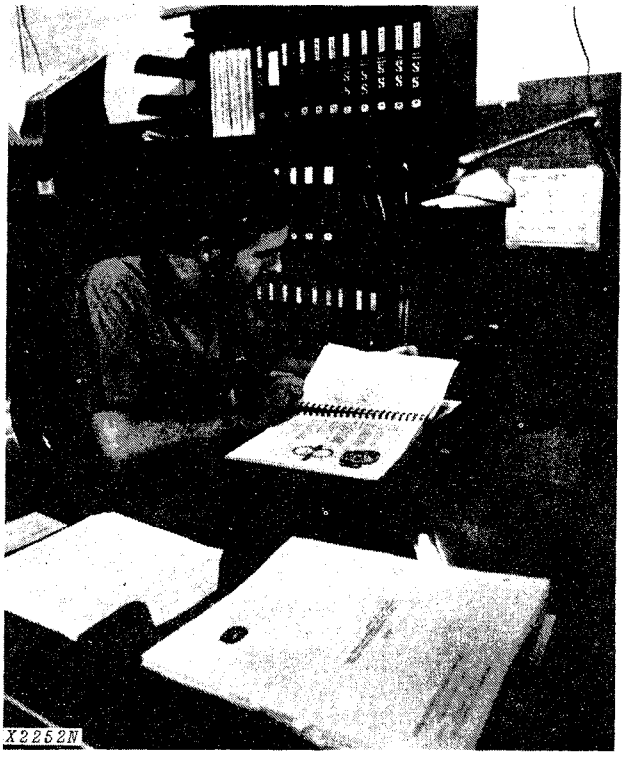
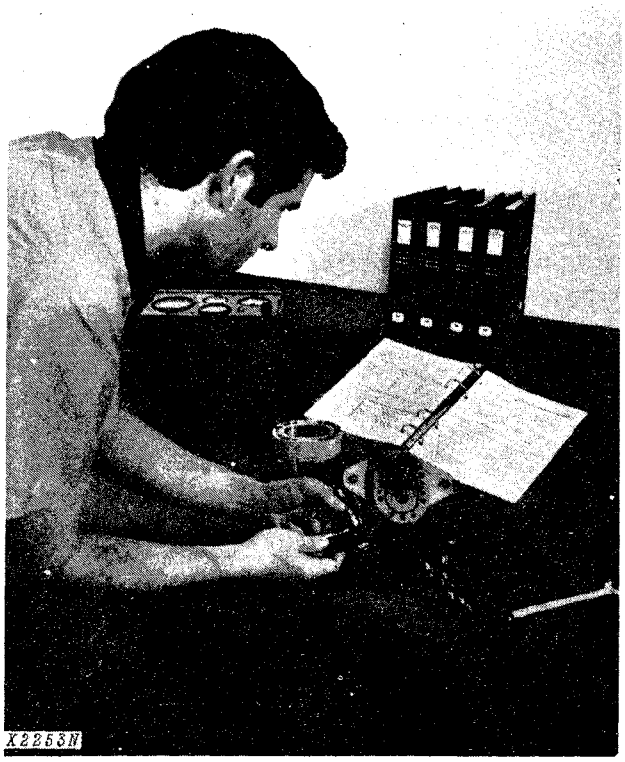
# INTRODUCTION




*Use FOS Manuals for Reference*




*Use Technical Manuals for Actual Service*

This technical manual is part of a twin concept of service:

- **FOS Manuals—for reference**
- **Technical Manuals—for actual service**

The two kinds of manuals work as a team to give you both the general background and technical details of shop service.

*Fundamentals of Service (FOS) Manuals* cover *basic* theory of operation *fundamentals* of trouble shooting, *general* maintenance, and *basic* types of failures and their causes. FOS Manuals are for training new people and for reference by experienced technicians.

*Technical Manuals are concise* service guides for a *specific* machine. Technical Manuals are on-the-job guides containing only the vital information needed by an experienced technician.

*NOTE: Whenever the service technican should refer to a FOS Manual for more information, a specific reference is provided.*

Some features of this technical manual:

- *Table of contents at front of manual*
- *Exploded views showing parts relationship*
- *Photos showing service techniques*
- *Specifications grouped for easy reference*

This technical manual was planned and written for you—an experienced technician. Keep it in a permanent binder in the shop where it is handy. Refer to it whenever in doubt about correct service procedures or specifications.

Using the technical manual as a guide will reduce error and costly delay. It will also assure you the best in finished service work.

This technical manual contains SI Metric equivalents which follow immediately after the U.S. customary units of measure.

## FOR YOUR CONVENIENCE

Vertical lines appear in the margins of many of the pages. These lines identify new material and revised information that affects specifications, procedures, and other important instructions.

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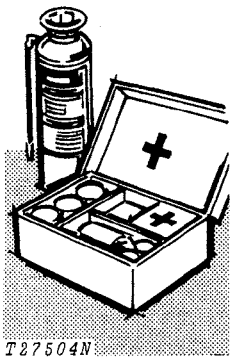
# SAFETY AND YOU

T27999

## INTRODUCTION

This safety alert symbol identifies important safety messages in this manual and on the drill. When you see this symbol, be alert to the possibility of personal injury and carefully read the message that follows.



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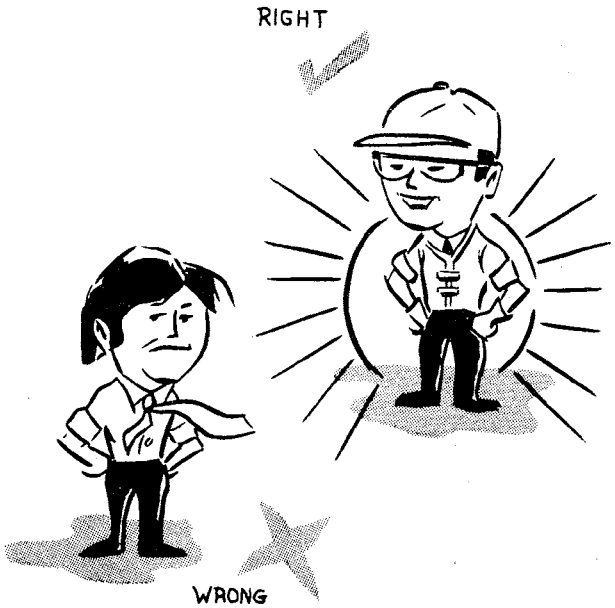
Be prepared if an accident or fire should occur. Know where the first aid kit and the fire extinguishers are located—know how to use them.

## PERSONAL SAFETY

If attached to tractor, shut off tractor engine and remove switch key before working on grain drill.

If it is necessary to make checks with the tractor engine running, ALWAYS USE TWO PEOPLE—one, the operator, at the controls, the other person checking so as to be visible to the operator on the tractor seat. KEEP HANDS AWAY FROM MOVING PARTS.

Don't attempt to check belt tension while the tractor engine is running.

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Always avoid loose clothing or any accessory—flopping cuffs, dangling neckties and scarves—that can catch in moving parts and put you out of work.

Always wear your safety glasses while on the job.

## FLUIDS UNDER PRESSURE

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 lines, pipes 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.

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# GENERAL INFORMATION

## DESCRIPTION

The 8000 Series Grain Drills include the following combinations of capacities and sizes.

There are 4 drill widths—8, 10, 12, and 13 ft. (2.4, 3.0, 3.7, and 4.0 m); and 4 opener spacings—6, 7, 8, and 10 inches (152, 178, 203, and 254 mm).

There are 18 grain box capacities.

There are 5 types of openers.

There are 4 sizes of tires.

Two different feed cups are available—fluted feed or double run.

The attachments available for the 8000 Series Drills include a grain agitator, grass seeder, gang press, 2 and 3 drill hitches, double-disk outside opener scrapers, Gage-O-Matic outside opener scrapers, inside opener scrapers for single disks, depth bands, markers, feed stops, and hydraulic lift for markers.

The serial number is located on the right-hand side of the front of the drill.

## LUBRICATION

| System | Capacity | Type of Lubricant |
|---|---|---|
| Drive Shaft Clutch | ..... | John Deere Multi-purpose Lubricant or an equivalent SAE multipurpose-type grease |
| Fertilizer Drive Tube | ..... | John Deere Multi-purpose Lubricant or an equivalent SAE multipurpose-type grease |
| Fertilizer Feed Shaft Bearings | ..... | John Deere Multi-purpose Lubricant or an equivalent SAE multipurpose-type grease |
| Gear Case(s) | 1 qt. (0.95 L) | John Deere SAE 90 Gear Lubricant or an equivalent SCL multipurpose gear oil |
| Gage-O-Matic Openers | ..... | John Deere Multi-purpose Lubricant or an equivalent SAE multipurpose-type grease |

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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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**Quantities Drilled Not Agreeing With Feed Chart—Continued**

Excessive overlapping or double planting.
Be aware of driving patterns (for various field conditions) that would make the feed chart appear incorrect.
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.

**Seed Distribution Stops**

Broken shear pin in axle assembly.
Replace pin and check feed shaft torque, pages 9 and 43.
Broken chain.
Replace, and check drive shaft for ease of rotation, page 11, 18, 31, or 38.
Feed shaft or hub rounded or worn.
Replace, page 15, 20, 36, or 41.
Clutch spring broken.
Replace, page 14, 18, 34, or 40.
Clutch jaws or halves have been assembled backwards.
Assemble correctly, page 14, 18, 34, or 40.

**Bunching and Skipping of Drilled Seed**

Drill improperly hitched.
Hitch drill properly, see operator's manual.
Improper adjustment of furrow openers.
Adjust openers properly, pages 45 to 49.
Openers not turning.
Loosen scrapers or if double disks, add spacers, page 47.

**Fertilizer Distribution Erratic or Incorrect**

Using wrong fertilizer drive.
Check for proper gear and sprocket combination, see operator's manual.
Check quantity drilled.
See operator's manual.
Fertilizer density other than 65 lbs. per cubic foot (1040 kg/m3).
Adjust rate for correct density, see operator's manual.
Calibrate density meter.
Baffle housing bent.
Straighten to match feed wheels or replace, page 28.
Baffle too far from end of box.
Shift baffle and wheels closer to end of box; baffle should be no more than 1/8-inch (3 mm) from the end of box.

**Fertilizer Distribution Stops**

Broken shear pin (cotter pin) on drive sprocket.
Free shaft and replace pin, page 21.
Broken shear pin (spring pin) in axle assembly.
Replace pin after checking torque, page 9,
Broken drive chains.
Inspect and replace chain; check all torques, page 50.
Crown gear in gear case not engaging pinion gears.
Add shim to adjusting shaft, page 27.
Sleeve on feed shaft worn or rounded; shaft also rounded.
Replace, page 21.

**Seed Tube Pulling Out of Openers**

Tube assembled improperly.
Make sure first convolution is entirely inside boot and expanded out. Turn tube to eliminate any folds in first convolution.
Check for correct installation by pulling up on tube; then connect to feed cup.

**Acremeter Tallying Incorrectly**

Improper tire inflation or size.
Inflate tires correctly, page 7. Do not mix tire sizes, see operator's manual.
Acremeter out of adjustment.
Adjust correctly, see operator's manual.
Land area is not accurately known.
Remeasure land.
Feed cups 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.
Excessive overlapping or double planting.
Avoid driving patterns (for various field conditions) which make the acremeter read higher.

**Clutch Slips or Will not Engage**

Worn spring.
Replace, pages 14 and 34.
Teeth worn on clutch.
Replace, pages 14 and 34.
Throw-out rod or stationary bracket in wrong hole.
Correct, pages 14 and 34.
Broken or bent throw-out rod.
Replace rod and check correct installation, pages 14 and 34.

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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

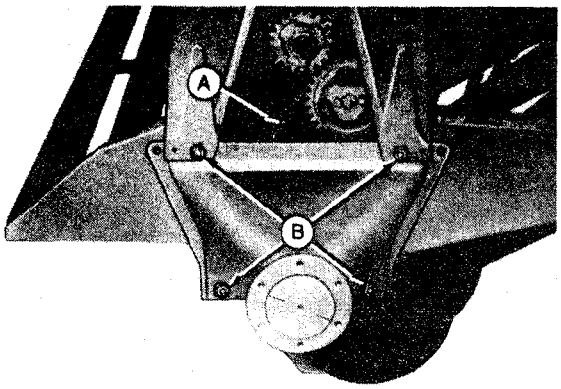
1. Raise the end of the drill with a jack under the axle plate, or the tractor hitch.

**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.

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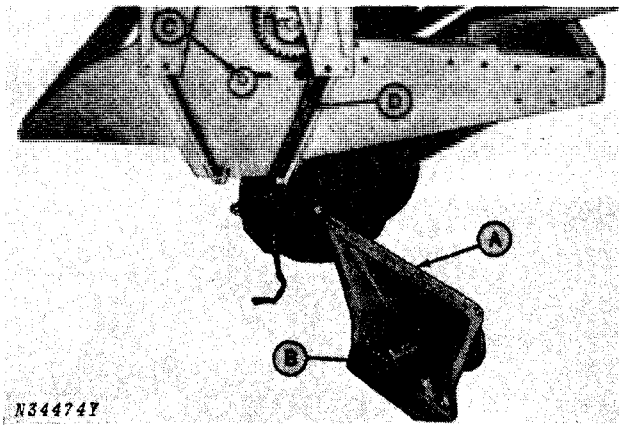
*A—Chain Partially Apart* *B—Axle Plate Nuts*

*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.

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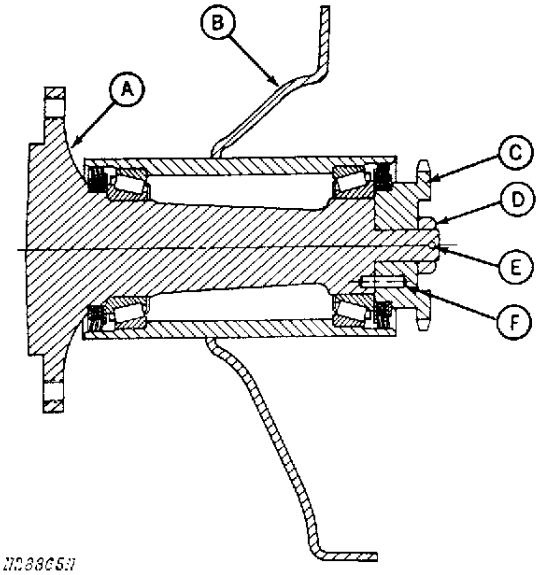
*A—Axle Plate* *C—Idler*
*B—Drive Sprocket* *D—Chain*

*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.

## AXLE AND AXLE PLATE DISASSEMBLY—Continued

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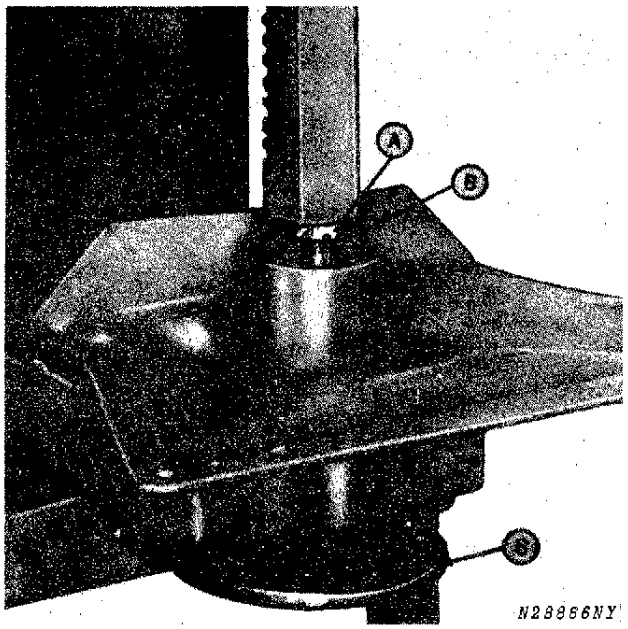
A—Axle
B—End Plate
C—Drive Sprocket
D—Slotted Nut
E—Cotter Pin
F—Spring Shear Pin

*Fig. 3-Axle Cross Section*

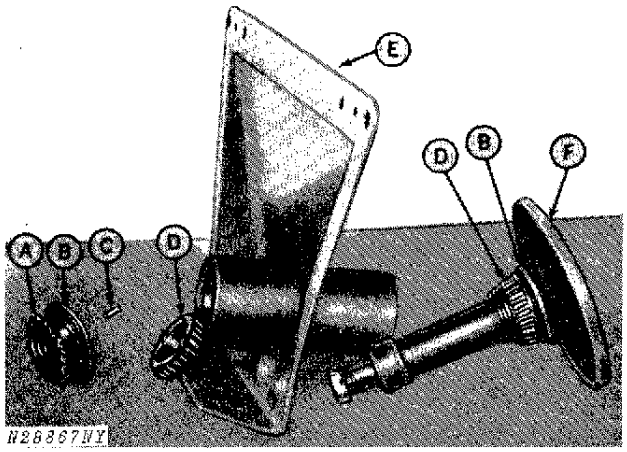
9. When removing the sprocket and seal assembly, do not lose the spring pin (F, Fig. 3); when reassembling the axle, make sure the spring pin is installed.




A—Protective Nut
B—Axle

*Fig. 4-Pressing Out Axle*

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

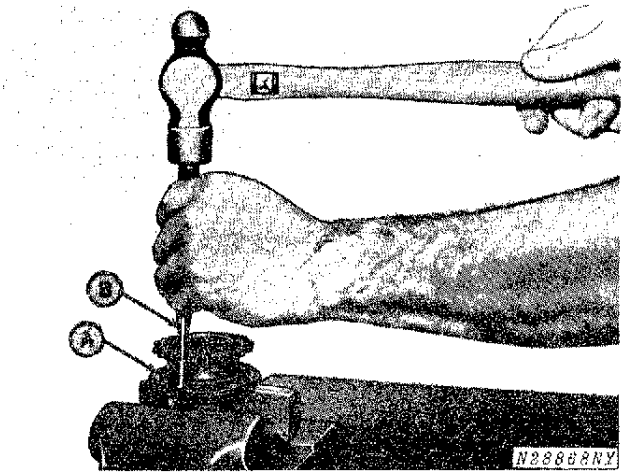



A—Sprocket
B—Seal
C—Spring Pin
D—Bearing
E—Plate
F—Axle

*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.*

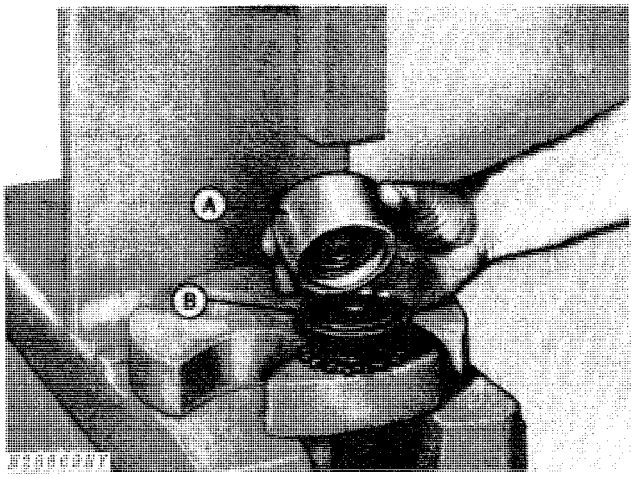



A—Small Diameter Metal Flange
B—Punch

*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.

## ASSEMBLY



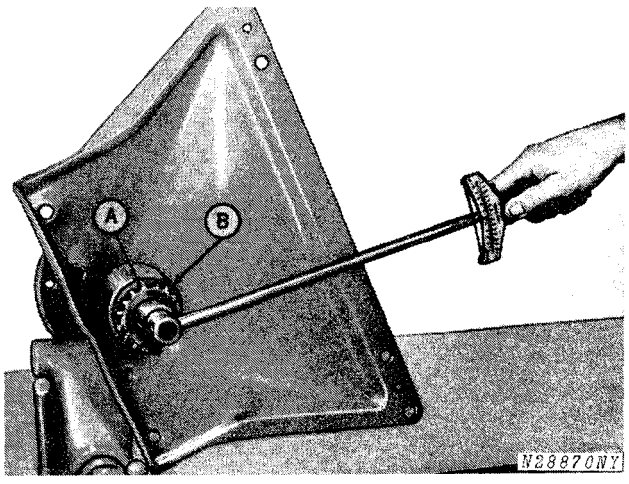

A—Driver B—Large Metal Flange

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

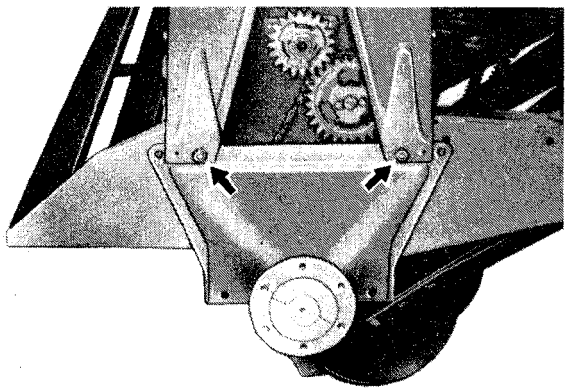



Fig. 9-Installing Axle Plate

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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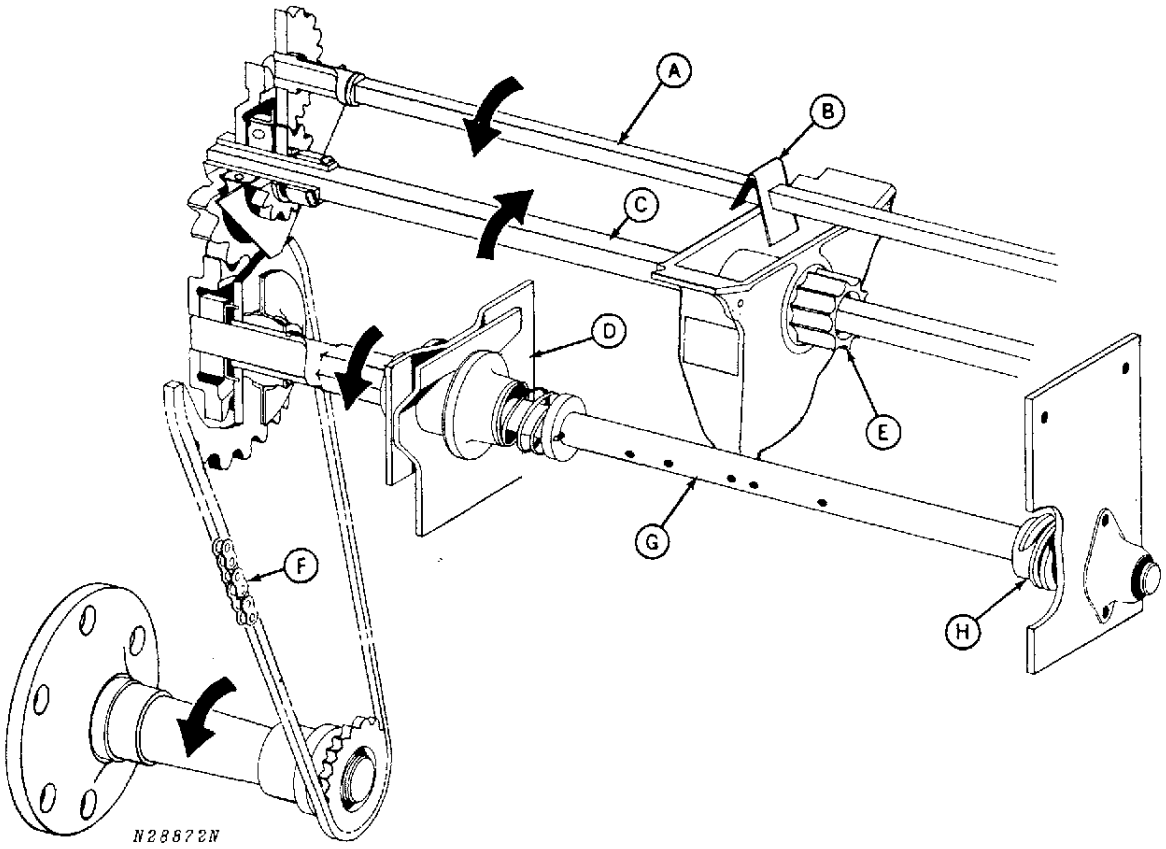
# PLAIN GRAIN FLUTED-FEED DRIVE

## GENERAL INFORMATION

The plain grain fluted-feed drill drive mechanism is the least complicated of the four possible drive trains.

Seed delivery is controlled by the amount of fluted-feed roll within the feed cup and the gate setting. The speed of the feed shaft is controlled by the ground speed and wheel slippage, tire size and type (and air pressure), and the gear combination (two possible) in the end panel.

The clutch incorporated in the drive shaft disengages the feed shaft when the furrow openers are raised.




*A—Agitator Shaft*
*B—Agitator Clip*
*C—Feed Shaft*
*D—Clutch*
*E—Fluted-Feed Roll*
*F—Drive Chain*
*G—Drive Shaft*
*H—Acremeter Screw*

*Fig. 10-Drive Train Diagram*

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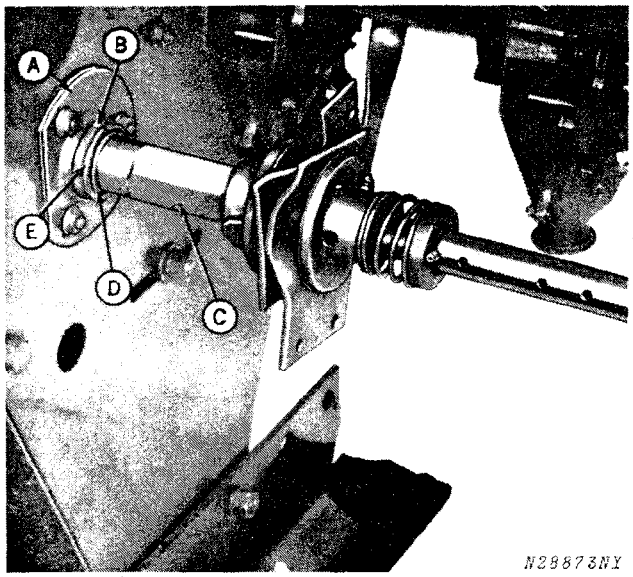
## DRIVE SHAFT BEARINGS

### Replacing Outer Bearing




*A—Bearing Retainer*
*B—Bearing*
*C—Drive Tube*
*D—Retaining Ring*
*E—Washer*

*Fig. 11-Outer Bearing Assembly*

1. Take off the semi-circular retaining ring (D, Fig. 11).

2. Remove the three nuts securing the bearing retainer (A) to the end panel.

*NOTE: Do not let the three bolts fall out or you will have to loosen the drive shaft and remove the drive gear in the end panel to replace them. Turn nuts on bolts loosely to retain them.*

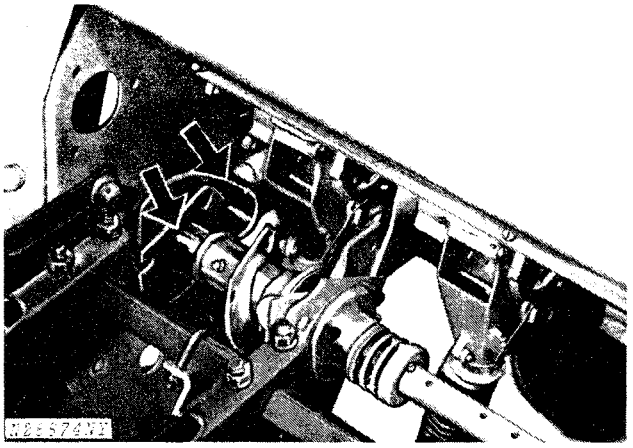
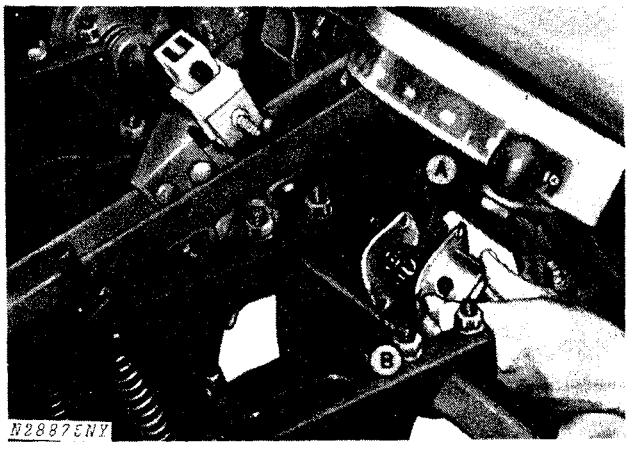


*Fig. 12-Bearing Removed*

3. Push the bearing retainer and washer along tube toward the center of the drill. This will free the split bearing (Fig. 12) and allow easy replacement.

4. When installing new bearing halves, first lubricate the outside of the drive tube where the bearing rides; then install halves.

### Replacing Inner Bearing




*A—Plastic Bearing*
*B—Bearing Retainer*

*Fig. 13-Inner Bearing Exposed*

Remove the two bolts securing the bearing retainer (B, Fig. 13) to the bracket.

Slide the retainer and bearing (A) off the end of the shaft and replace parts as needed.

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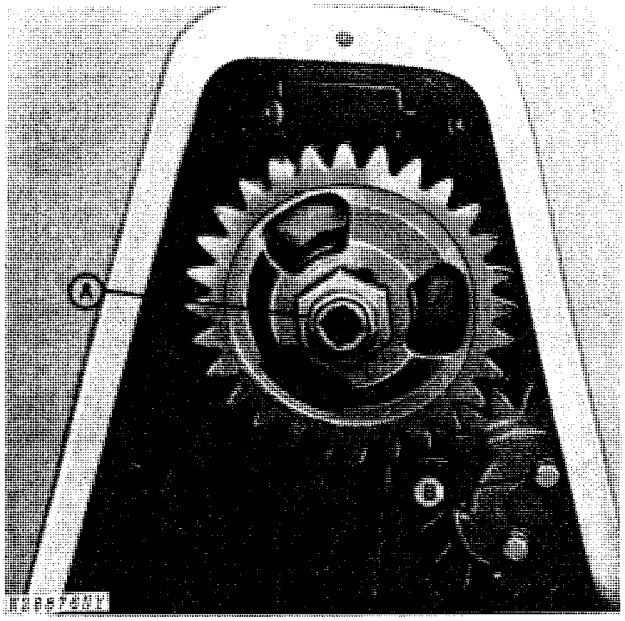
## REPLACING DRIVE TUBE AND SPROCKET ASSEMBLY

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

**IMPORTANT: Do not support drill by jacking or blocking under the footboard supports.**

2. Remove the wheel and inspection plate.

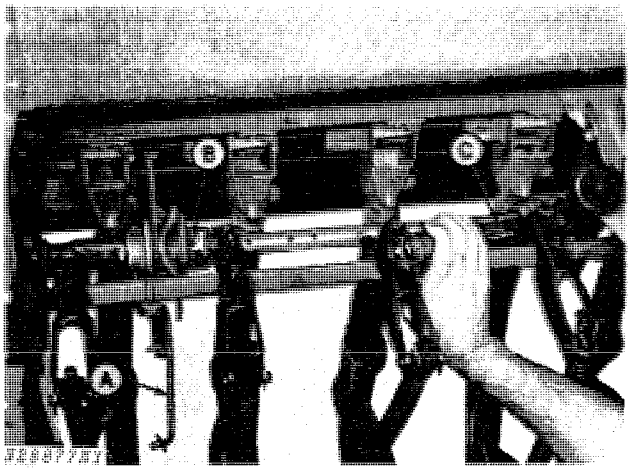



*A—Feed Shaft Lock Nut* *B—Drive Shaft Gear Screws*

*Fig. 14-Removing Gears*

3. Remove the lock nut (A, Fig. 14) securing the gear on the feed shaft with a 1-11/16-inch wrench. Hold the shaft with a wrench (A, Fig. 22) while turning off the nut.

4. Remove the outer bearing from the drive shaft, see page 11. Now the drive tube (Fig. 18) is free on the shaft.

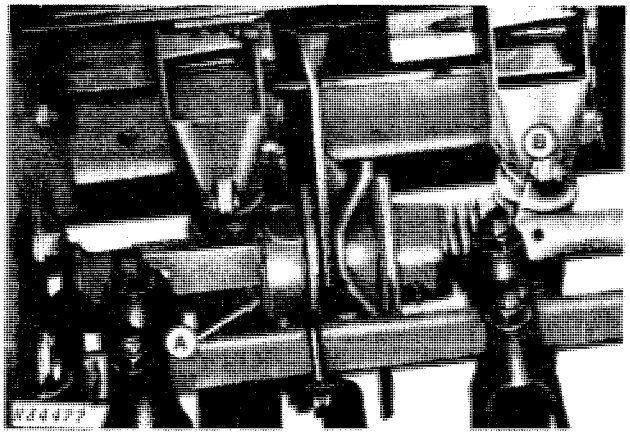



*A—Throw-out Rod* *C—Prying Wrench*
*B—Drive Pin*

*Fig. 15-Clutch Pin (Early Model Shown)*

5. Remove the throw-out rod (A, Fig. 15) from the clutch by removing a cotter pin.

*NOTE: The inner clutch half on early models was equipped with two holes, allowing access to the drive pin (B). These holes are not present on late models.*

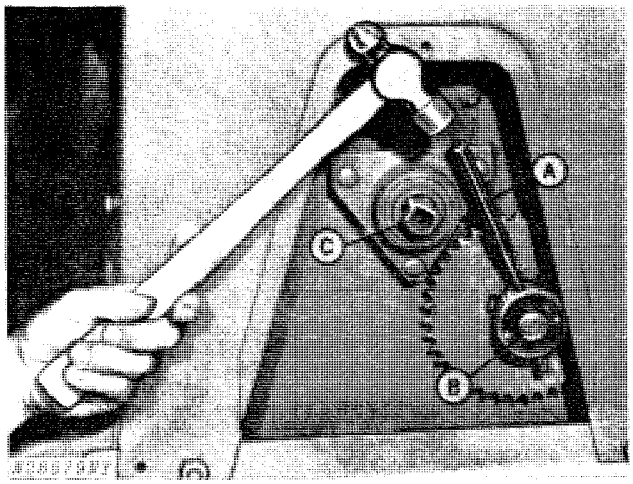



*A—Snap Ring* *B—Spring Pin*

*Fig. 16-Removing Clutch Tension*

6. If desired, remove snap ring (A, Fig. 16) or spring pin (B) to remove tension from clutch spring, allowing repairs to drive shaft to be made more easily.

*Litho in U.S.A.*




A—Punch
B—Drive Shaft
C—Feed Shaft

Fig. 17-Removing Collar From Drive Shaft

7. Use a punch (A, Fig. 17) to remove the spring pin securing the collar to the drive shaft (B). Take off the collar and wear washer.

*NOTE: Measure the washer thickness and replace if less than 0.044 inches (1.12 mm).*

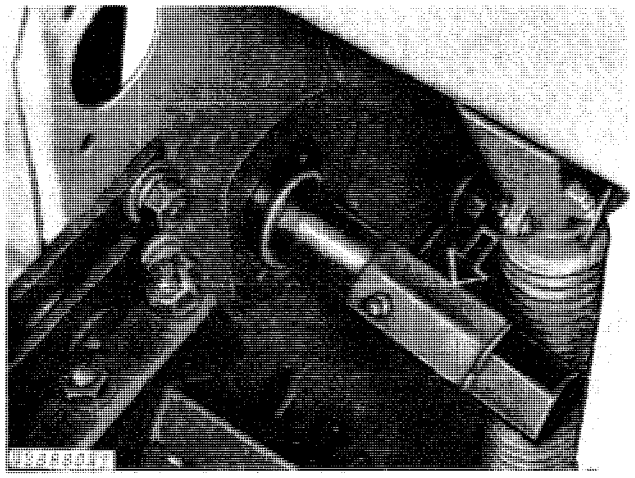
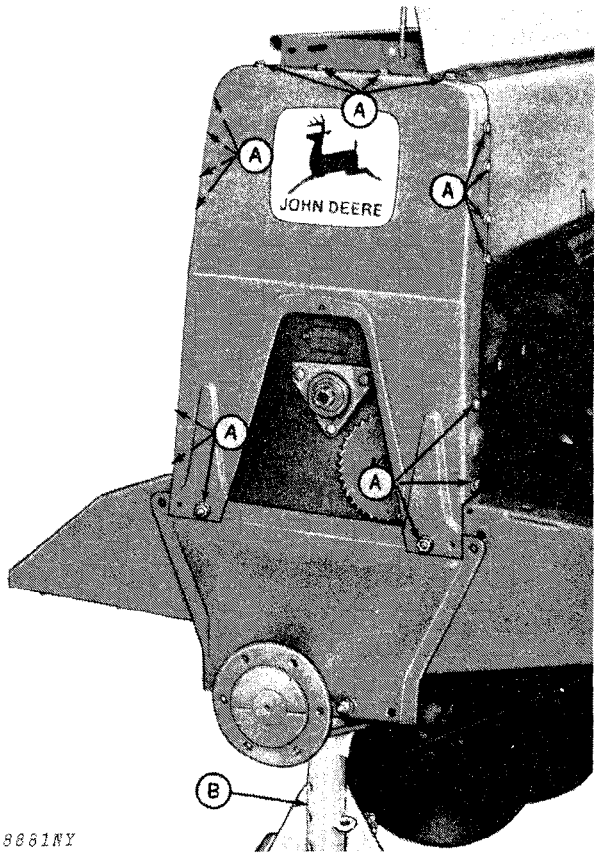


Fig. 18-Outer Bearing Removed

8. Remove the outer bearing from the drive shaft (Fig. 12). Now the drive tube (Fig. 18) can be removed.




A—End Cover Bolts
B—Jack Stand

Fig. 19-Removing End Cover

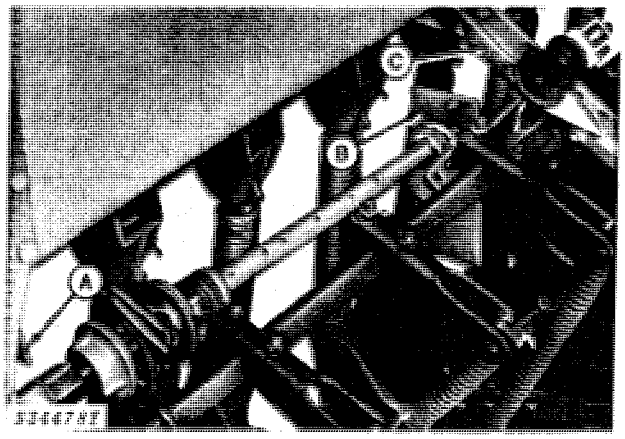
9. Take off the end cover to allow the drive tube to be removed from the drill. The 8100 series drills have 18 bolts (A, Fig. 19) securing the end cover; the 8200 series drills have 25 bolts; and the 8300 series drills have 26 bolts.

**IMPORTANT: To prevent the drill box from being sprung when the end cover is removed, lower the drill onto a stand (B) placed under the center of the axle plate.**

10. Pull the drive tube out and replace (Fig. 18). Lubricate the shaft before installation, and again after installation (through the grease fitting) (See page 4).

## REMOVING CLUTCH

1. To remove the clutch, follow the instructions for Replacing Drive Tube and Sprocket Assembly on pages 12 and 13, Figs. 14, 15, 16, and 17. Do not remove the outer bearing nor the end cover to replace the clutch or drive shaft.




*A—Stationary Bracket*
*B—Inner Bearing Bracket*
*C—Bearing Channel*

*Fig. 20-Removing Clutch (Early Model Shown)*

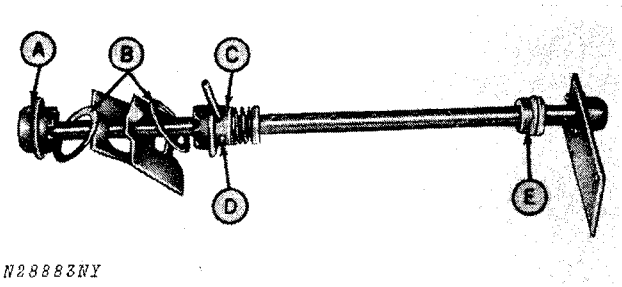
2. Remove the rear stationary bracket (A, Fig. 20) from the clutch.

3. Separate the acremeter from the inner bearing bracket (B) by removing one bolt (Early Models), or two bolts (Fig. 33B, page 20, Late Models).

4. Remove the two bolts securing the inner bearing bracket to the bearing channel (C).

5. Break the grass seed chain (optional attachment).

6. Pull the entire assembly out of the drive tube.




N28883NY

*A—Right-hand Clutch Half*
*B—Wear Washers*
*C—Right-hand Clutch Half*
*D—Grease Fitting*
*E—Acremeter Screw*

*Fig. 21-Clutch and Drive Shaft*

*NOTE: The right-hand drive clutch half (A, Fig. 21) cannot be interchanged with the right-hand driven clutch half (C); drills with two clutches (or four clutch halves) have four different parts.*

On all drills, the clutch half with the grease fitting (D) is always toward the inside of the drill.

## INSTALLING CLUTCH

1. Replace the wear washers (B) if less than 0.048 inches (1.22 mm) thick.

2. Slide the outer end of the drive shaft and clutch assembly (Fig. 21) through the drive tube (Fig. 18).

3. Install the wear washer and collar (Fig. 17). Drive the spring pin through the collar.

4. Bolt the inner bearing bracket (B, Fig. 20) to the bearing channel (C).

5. Bolt the acremeter bracket to the inner bearing bracket; connect the grass seed chain.

6. Connect the throw-out arm and the stationary bracket to the clutch (Figs. 20 and 15).

7. Install snap ring or spring pin to secure clutch (Fig. 16). Lubricate the clutch and drive tube fittings (See page 4).

8. Install the two drive gears (Fig. 14). Tighten the lock nut on the feed shaft to 100-125 ft-lbs (136-160 Nm) torque (Fig. 26).

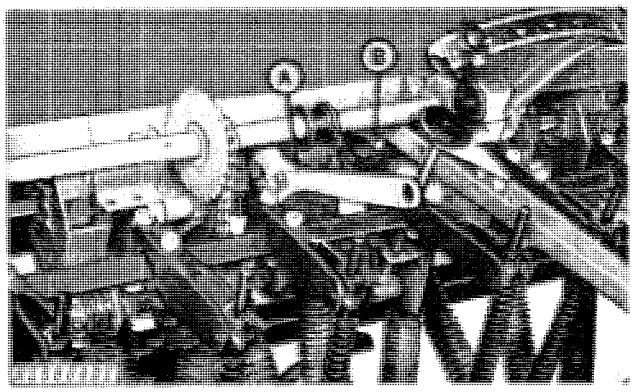
9. Replace the inspection plate and wheel.

## FEED SHAFT BEARING REMOVAL

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.**

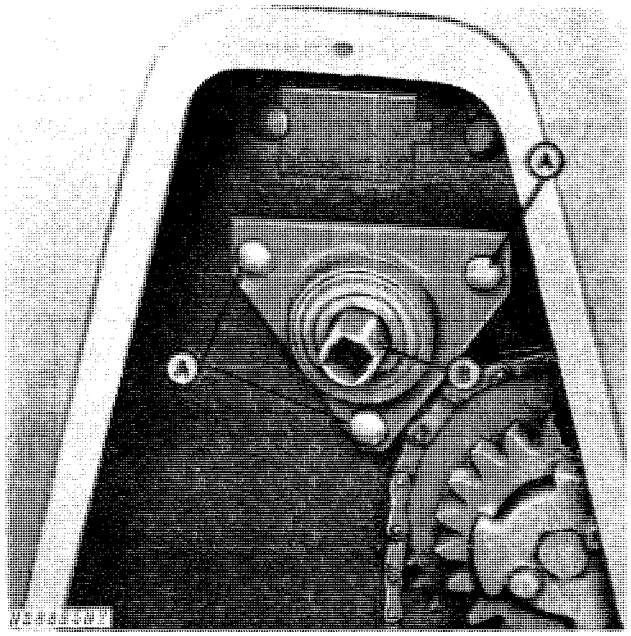
2. Remove the wheel (20-inch wheel only) and inspection plate.




*A—Wrench* *B—Feed Shaft*

*Fig. 22-Holding Feed Shaft*

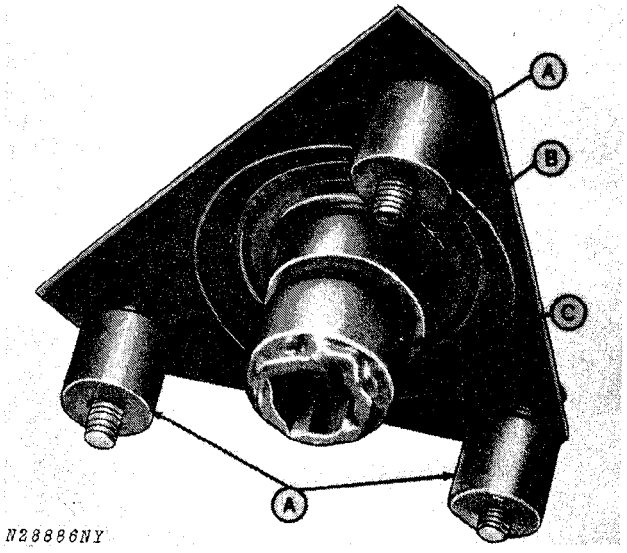
3. Remove the lock nut (A, Fig. 14) securing the gear on the feed shaft with a 1-11/16-inch wrench. Use a wrench (A, Fig. 22) to hold the feed shaft (B) while removing the lock nut.




*A—Bearing Retainer Bolts* *B—Threaded Feed Shaft Drive Hub*

*Fig. 23-Removing Bearing Assembly*

4. Remove nuts from bolts (A, Fig. 23) holding the triangular bearing assembly to the drill. Note how the assembly mounts on the drill—with the straight side on top.




*A—Spacers* *C—Hub*
*B—Large Spacer*

*Fig. 24-Hub and Bearing Assembly*

5. Remove the assembly from the drill, making sure not to lose the spacers (A, Fig. 24). If agitator option is installed, a small spacer and gear will be present instead of the large spacer (B).

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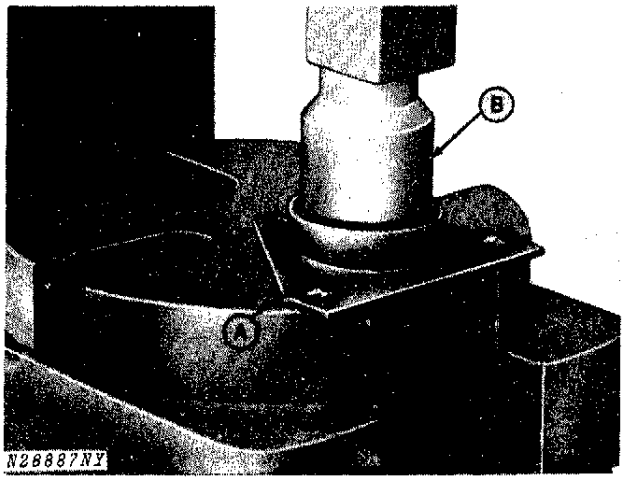
## FEED SHAFT BEARING REMOVAL—Continued

6. Remove the hub (C, Fig. 24) and spacer (B) from the bearing assembly. The bearing and retainer can be replaced as a unit, or separated as follows.




*A—Bearing Retainer* *B—Driver*

*Fig. 25-Pressing Out Bearing*

7. Press the bearing out of the bearing retainer (A, Fig. 25). Use a driver (B) with a maximum O.D. of 2-7/16-inches (62 mm).

## FEED SHAFT BEARING INSTALLATION

1. Press bearing into retainer from FLANGED side of retainer (opposite from side shown in Fig. 25), until flat surface of bearing case is 0.18 in. (4.6 mm) below outer surface of retainer flange.

2. Install bearing assembly on drill (Fig. 23).

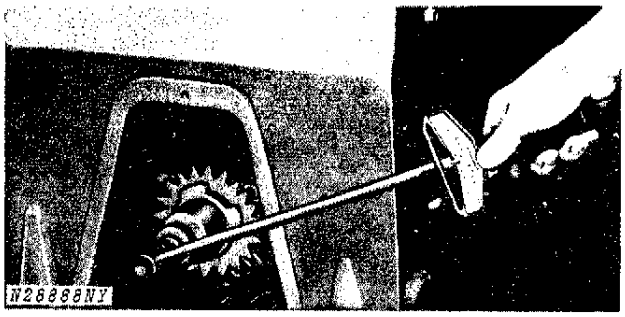



*Fig. 26-Tightening Bearing Nut*

3. Determine desired feed shaft speed. Assemble smaller gear on feed shaft (Fig. 26) for higher speed or larger gear on feed shaft (Fig. 14) for lower speed.

4. Install lock nut and tighten to 100-125 ft-lbs (136-169 Nm [14-17 kgm]) torque. Hold feed shaft with wrench (Fig. 22) while tightening nut.

5. Remove gear from drive shaft and check rolling torque of feed shaft with torque wrench (Fig. 26). If rolling torque is greater than 17 ft-lbs (23 Nm [2.3 kgm]), it may be necessary to adjust depth of bearing in flangette to prevent interference between gear and flangette. If feed cups were serviced, it may be necessary to readjust them (See page 43).

6. After obtaining correct rolling torque, install drive gear, inspection plate, and wheel.

## REMOVING FLUTED-FEED SHIFTER

Remove and replace the entire shifter lever assembly if the lever is not staying engaged in the desired notch.

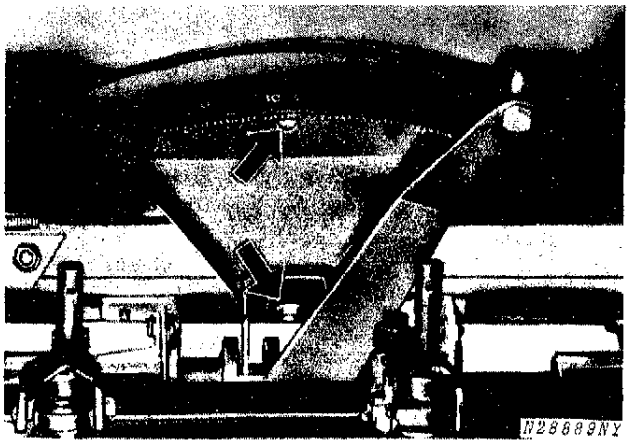



*Fig. 27-Removing Shifter*

Remove the two shifter bolts (Fig. 27) securing the shifter and take it off the box. Do not try to remove the shifter when the box is full of grain because the bolt heads are inside the box.

*NOTE: If the shifter lever does not coincide with the zero mark when all the cups are closed, move the shifter index to the right or left to achieve a correct reading, then tighten bolts. If lever binds, lower the feed gates (B, Fig. 89) to eliminate possible interference.*

*Litho in U.S.A.*