GEAR CASE REMOVAL (1550)

1. Remove the powershaft (Fig. 3).

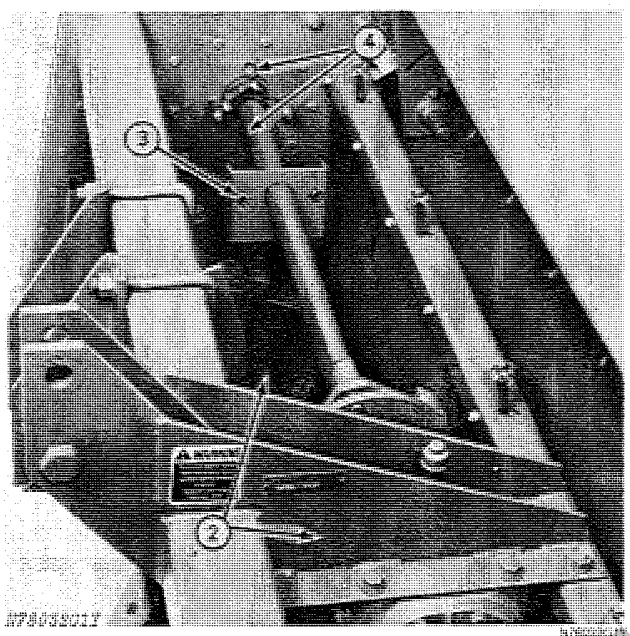


Fig. 13-Clutch Shields Removed

2. Remove both slip clutch shields by taking out the three cap screws and lifting off the shields.
3. Remove nuts holding one output shaft shield and slide shield inward on shaft.
4. Remove nuts from bearing flangette bolts.

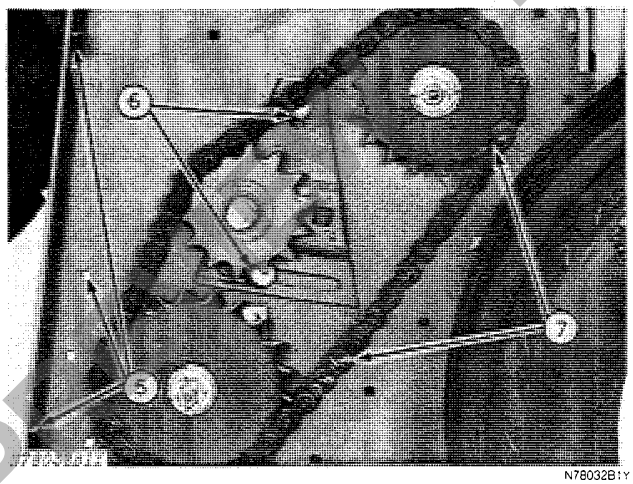


Fig. 14-Disconnecting Units Drive Chain

5. Remove end shield (same end of machine as steps 3 and 4), and drive chain cover.
6. Loosen bolts on tightener sprocket bracket to remove chain tension.

7. Remove chain from output shaft sprocket. If necessary, remove chain connecting link (Early Models), or lower sprocket (Late Models).

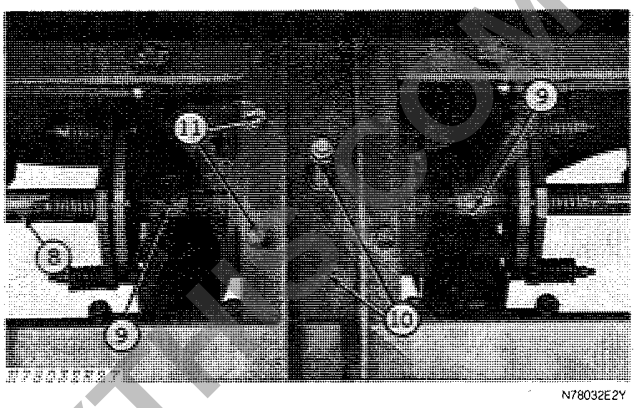


Fig. 15-Removing Gear Case

8. Slide shaft (on prepared side of seeder) away from gear case. Support other shaft inner end to prevent it from dropping down when case is removed.

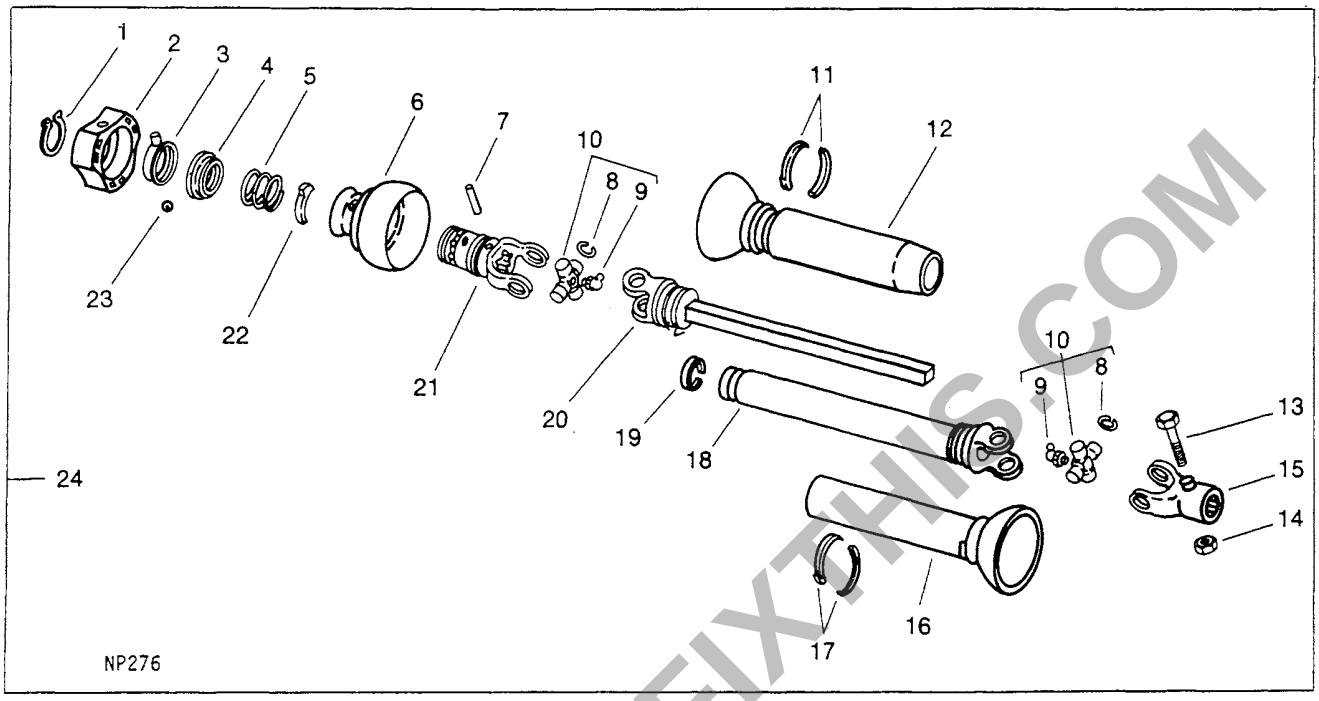
9. Remove spring pins and wires from both hubs. Remove clutch assembly on prepared side.

10. Remove breather pipe. Drain oil from gear case and replace drain plug.

⚠ CAUTION: Be careful when removing gear case. Use lifting equipment with at least (45 kg) 100 lbs capacity.

11. Slide a board between the gear case and the cutter wheel units, from the side of the seeder toward which the case will be removed. Support the gear case, remove the four cap screws, slide gear case sideward, and lift it out of the seeder.

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1—Ring	**7—Pin**	**13—Screw**	**19—Bearing**
2—Collar	**8—Ring (8)**	**14—Nut**	**20—Shaft**
3—Latch	**9—Fitting (2)**	**15—Yoke**	**21—Yoke**
4—Retainer	**10—Bearing (2)**	**16—Shield**	**22—Bearing (3)**
5—Spring	**11—Bearing (4)**	**17—Bearing (2)**	**23—Ball (3)**
6—Shield	**12—Shield**	**18—Tube**	**24—Joint**

Fig. 10-Powershaft Components (251)

INSPECTION AND REPAIR

Check the cross and bearings (10, Fig. 10) for wear. Replace if necessary.

Check the tube and shaft (18 and 20) for straightness. Replace if necessary.

Check the yoke compression spring (5) to see if it is broken or badly rusted. Replace if necessary.

Check the locking bearings (11, 17, 22) for wear. Replace if necessary.

Check lock pin in yoke (1550, not shown) and replace worn or rusted parts.

ASSEMBLY

1. Press the cross and bearing assemblies into the yokes, using reverse of disassembly procedure (Fig. 5).

2. Install cross and bearing retaining rings (Fig. 9).

3. Install lock pin and spring (1550, not shown) and secure with washer.

4. Liberally apply molydisulfide grease to all grooves that have nylon bearings. If the nylon bearings are stiff, soak them in boiling water for several minutes to soften them.

5. Install shields (6, 12, 16) and lock in place with locking bearings (22, 11, 17).

6. Grease shaft (see page 6) and slide two sections of powershaft together. Lubricate powershaft U-joints (see page 6).

IMPORTANT: Make sure tab and groove on tube and shaft (18 and 12) are aligned to assure proper phasing and balancing of powershaft sections.

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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 rely completely 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

Power train damage
- Incorrect PTO speed - page 4
- Slip clutch incorrectly assembled - page 23 or 24

Slip clutch overheating
- Incorrectly assembled - page 23 or 24
- Clutch facings worn - page 23 or 24

Slip clutch does not slip
- Incorrectly assembled - page 23 or 24

Powershaft damage
- Poor lubrication - page 6
- Improper tractor hookup - See Operator's Manual

Machine vibrates
- Powershaft sections not properly phased - page 11
- Unit drive shafts bent - page 25

Twisted powershaft
- Overload on powershaft - reduce load
- Slip clutch does not slip - page 23 or 24

Powershaft not telescoping properly
- Worn bearings - page 11
- Rotating shields rusted - page 11
- Poor lubrication - page 6
- Shaft packed with dirt - clean and lubricate

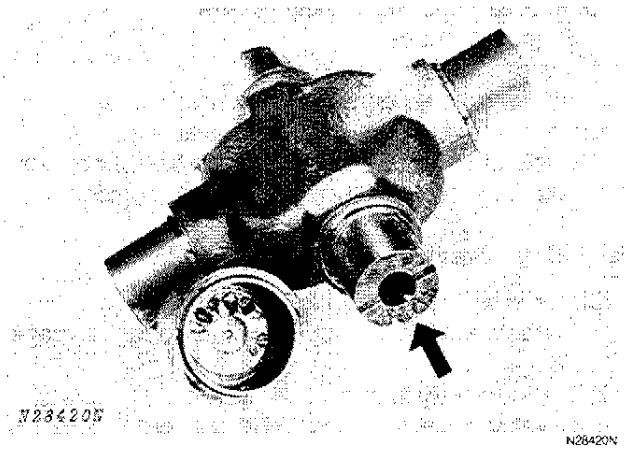


Fig. 2A-U-joint Damage

Galling or brinelling of U-Joint journal (Fig. 2A)
- Drive shaft rpm too high - page 4
- Incorrect powershaft phasing - page 11

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SPECIFICATIONS

Item	Measurement	
Gear Case		
Backlash (at Input Shaft)	(0.08-0.15 mm) 0.003-0.006 in. at shaft spline	
Input or Output Shaft Rolling Torque	(1-2 N·m) 5-15 in-lbs	
Slip Clutch		
Disk Diameter	(165.1 mm) 6-1/2 in.	
Disk Thickness	(8 mm) 5/16 in. approximately	
Spring Free Length	(64 mm) 2-1/2 in.	
Cutter Wheels		
Diameter	(305 mm) 12 in.	
*Shaft Nut Torque (Installation)	(108-163 N·m) 80-120 ft-lbs	
Speed	635 rpm	
*Refer to page 27 for disassembly torque requirements		
Press Wheels (Diameter)	(254 mm) 10 in.	
Tires and Wheels	1550	251
Size	6.70 x 15 in., 4 PR rib implement	7.60 x 15 in., 6 PR rib implement
Pressure	(193 kPa) 28 psi	(276 kPa) 40 psi
Axle Nut (wheel bearings)	(81 N·m) 60 ft-lbs torque	
Rolling Torque (wheels)	(10 N·m) 7 ft-lbs	
Grain Feed Shaft Rolling Torque	(23 N·m) 17 ft-lbs maximum	
Grass Feed Shaft Rolling Torque	(4 N·m) 36 in-lbs	
Grain Box Capacity	(0.35 m^3) 10 bu.	(0.57 m^3) 16.25 bu.
Grass Box Capacity	(0.09 m^3) 2-1/2 bu.	(0.07 m^3) 2 bu. (each)
Overall Width	(3 048 mm) 10 ft.	(4 674 mm) 15 ft. 4 in.
Working Width	(2 438 mm) 8 ft.	(4 064 mm) 13 ft. 4 in.
Length	(1 334 mm) 4 ft. 4-1/2 in.	(2 972 mm) 9 ft. 9 in.
Height (Lowered)	(1 270 mm) 4 ft. 2 in.	(1 283 mm) 4 ft. 2 in.
Weight (empty)		
Base Machine	(876 kg) 1930 lbs	(1 634 kg) 3600 lbs
With Grass Seed Attachment	(919 kg) 2025 lbs	(1 700 kg) 3745 lbs
Press Wheels (additional)	(24 kg) 52 lbs	(32 kg) 70 lbs
Grain Agitator (additional)	(4.1 kg) 9 lbs	(6.4 kg) 14 lbs

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GEAR CASE INSTALLATION

1. Install gear case using reverse of removal procedure. Leave cap screws loose. Install shims, if equipped, to original location between gear case and frame.

NOTE: Do not install lower sprockets or drive chains at this time.

2. Apply sealant compound (PT94 or equivalent) between bearing flangettes along inner edges of holes and around edge of flangette hole on outer surface of end panel, before bolting flangettes in place.

3. Tighten screws in output shaft bearing flangettes. Leave them loose, allowing enough room to permit some bearing movement inside the flangettes.

4. With gear case in position and output shafts installed in R.H. and L.H. clutch assemblies, align gear case with scribe marks on frame and snug gear case mounting screws. Leave screws loose enough to permit fore-and-aft movement during positioning operation in Step 5.

5. Using your hands, rotate the slip clutch assembly several revolutions and observe the (4) screws and washers which mount the gear case to the frame.

6. Tighten the gear case mounting screws in the position midway between extreme movements noted in Step 5. Torque screws to (115 N·m) 85 ft-lbs.

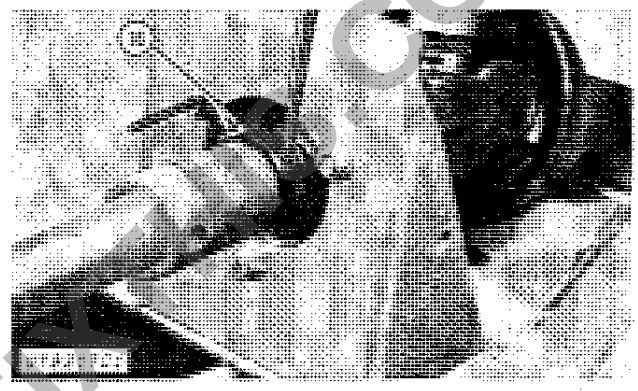
7. Torque output shaft bearing flangette screws to (115 N·m) 85 ft-lbs.

8. Install outer drive sprockets and drive chain.

9. Adjust drive chain tension (Fig. 20) to obtain (13 mm) 1/2-inch defleciton midway between sprockets (opposite tightener).

10. Install new gasket. Bolt drive chain cover in place. Tighten flange screws to (11-16 N·m) 8-12 ft-lbs.

11. Install new lubricant in gear case and drive housings (see page 6).



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Fig. 19-Locking Collar

12. (251 Only) If bearing on input shaft is replaced, tighten locking collar (16, Fig. 19) and set screw. After set screw is tightened, spacer and yoke must not touch collar or bearing. *NOTE: Allow a maximum of (0.8 mm) 1/32-inch between front of bearing and yoke.*

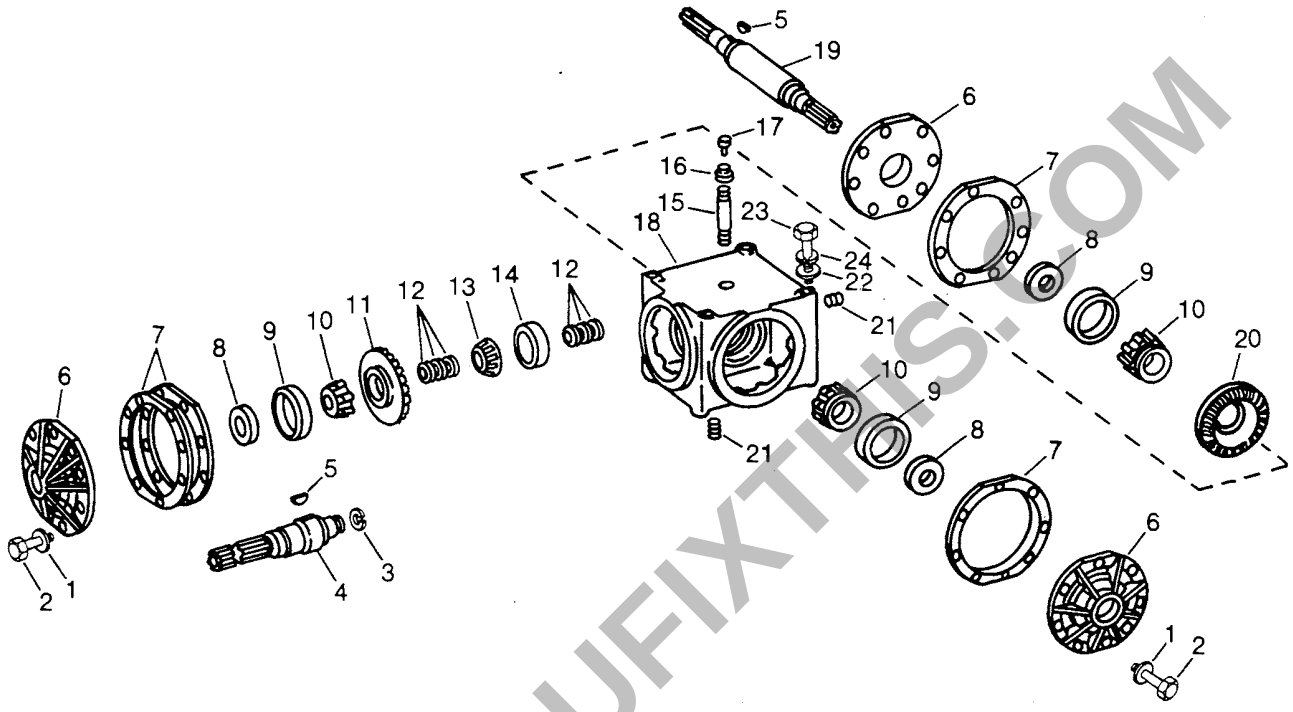
13. Operate the seeder for a few minutes and listen for any unusual noises. If necessary, stop the seeder and adjust as necessary to correct the problem.

14. Check and adjust drive chains and cutter wheel unit chains as needed. (See page 30).

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GEAR CASE INSPECTION



1—Washer	5—Key (2)	9—Cup (3)	13—Cone	17—Breather	21—Plug (2)
2—Cap Screw (24)	6—Cap (3)	10—Cone (3)	14—Cup	18—Case	22—Washer
3—Snap Ring	7—Gasket (As Req'd)	11—Gear, 20T*	15—Nipple	19—Shaft	23—Cap Screw (4)
4—Shaft	8—Seal (3)	12—Shim (As Req'd)	16—Cap	20—Gear, 27T*	24—Washer

***As indicated for 1000 rpm PTO. Reverse location of gears for 540 rpm PTO (1550 Only). Powershaft must also be changed to match tractor PTO shaft. (See page 9.)**

Fig. 30-Gear Case Components

Bearing Cups and Cones

Inspect bearing cups and cones (9, 10, 13, 14, Fig. 30) for nicks, scoring or excessive wear. Replace if necessary.

NOTE: It is desirable to replace cups and cones in pairs if either shows extensive wear or damage.

Gear Case and Caps

Examine gear case (18) and caps (6) closely for cracks or distortion. Replace if defective.

Input Shaft and Gear Assembly

Inspect input shaft (4) and gear (11) for pitting, scoring, or excessive wear, particularly the bearing seats of the shaft. If defects are noted, replace the shaft and/or gear.

Cross Shaft and Gear

Inspect cross shaft (19) and gear (20) for pitting, scoring, or excessive wear. Replace if defects are noted.

Seals

When overhauling gear case, replace all seals (8). An apparently good seal may fail quickly when the gear case is placed into service.

Shims

Inspect shims (12) to be sure they are not torn or nicked. If any shims are replaced, use the same quantity and thickness as originally used.

Breather

Examine breather (17) and clean or replace as necessary to assure adequate gear case ventilation.

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Journal cross end and cup chipping

Improper tractor hookup - See Operator's Manual

Abrasive corrosion on PTO shaft

Extreme low angle operation - See Operator's Manual

Noisy gears in gear case

Low on lubricant - page 6
Backlash incorrect - page 22
Rolling torque incorrect - page 22

Cutter wheels coming loose

Cutter wheel axle installed backwards - page 28

Excessive Vibration of Units

Drive shafts bent - page 29

Cutter wheels not turning

Hex shaft drive chain broken - page 26
Individual unit chain broken - page 26
Shaft or gear broken in gear case - page 19
Clutch drive splines worn - page 23 or 24
Slip clutch too loose - page 23 or 24

Acremeter tallying incorrectly

Improper tire inflation or size.
Inflate tires - page 45
Land area is not accurately known.
Remeasure land.
Acremeter out of adjustment.
Adjust acremeter, see Operator's Manual.
Excessive overlapping or double planting.
Avoid driving patterns (for various field conditions) which cause the acremeter to read higher.

Feed Cups Breaking (Early Models)

Cutter wheel units striking feed cups
Install longer, stiffer down-pressure springs - page 30.
Tilling extremely rough, rocky ground.
Level and clear ground, drive slower.

Fluted-Feed shifter lever difficult to shift

Feed gate position too high.
Lower feed gate, position grain shifter lever in place; then place feed gate in desired position - pages 40 and 41.

Fluted-Feed shifter does not stay in position

Bent or damaged shifter lever.
Replace entire assembly, page 40.

Varying quantities by individual feeds

Feed gates not all set the same.
Set all gates identically. (See Operator's Manual.)
Feed cup out of adjustment with the fluted-feed roll.
Set the shifter on zero and move any cups that are not completely closed. (See Operator's Manual.)

Quantities planted 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 - page 45
Excessive overlapping or double planting.
Avoid driving patterns (for various field conditions) which cause the feed chart information to seem incorrect.
Axle gear not engaging (251).
Lower seeder completely.

Seed distribution stops

Broken shear pin in axle assembly.
Replace pin and check torque, page 30 or 34.
Broken chain.
Replace chain and check drive shaft for ease of rotation, page 39.
Feed shaft or hub rounded or worn.
Replace parts, page 39.

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TORQUE VALUES FOR HARDWARE

Item	Torque Values, (N·m) ft-lbs
Powershaft Retaining Bolt	(115) 85
Gear Case Attaching Screws	(115) 85
End Drive Chain Cover Attaching Screws	(11-16 N·m) 8-12
Gear Case Output-Cap Screws	(47) 35
Outer Unit Drive Shaft Clamp Bolts	(136-163) 100-120
Unit Clamp Bolt or L-Bolt Nuts	(41-68) 30-50
Feed Shaft Lock Nut	(136-169) 100-125
Output Shaft Clamp Bolts (Early 1550)	(136-163) 100-120
Unit Bearing Flangette Bolts (1550, SN 899 and below)	41 (30)
Unit Bearing Flangette Bolts (251, 1550, SN 900 and above)	(61) 45
Cutter Wheel Shaft Nuts	(108-163) 80-120
Hitch Bracket U-Bolt Nuts (1550)	(203) 150 min.
Hitch Bolts (251)	
5/8-in.	(230) 170
3/4-in.	(271) 200
Slip Clutch Spring Nuts	(47) 35
Upper Output Shaft Slotted Nuts	(136) 100 min.
Lower Unit Shaft Slotted Nuts (1550)	(68) 50 min.
Lower Unit Shaft Slotted Nuts (251)	(257) 190 min.
Rockshaft Bearing Bolts (251)	(230) 170
Wheel Bolts	(102) 75

NOTE: For general tightening specifications on unit hardware not listed above, refer to chart following step 7, page 28.

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