SHOP MANUAL

KUBOTA

Models

L185-L235-L245-L275-L285-L295-L305-L345-L355

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DUAL DIMENSIONS

This service manual provides specifications in both the U.S. Customary and Metric (SI) systems of measurement. The first specification is given in the measuring system perceived by us to be the preferred system when servicing a particular component, while the second specification (given in parenthesis) is the converted measurement. For instance, a specification of "0.28 mm (0.011 inch)" would indicate that we feel the preferred measurement, in this instance, is the metric system of measurement and the U.S. system equivalent of 0.28 mm is 0.011 inch.

CONDENSED SERVICE DATA

	L185	L235	L245	L275	L285
GENERAL					
Engine Make	Own				
Engine Model	Z751A	D1102A	D1101A	D1302A	V1501A
Number of Cylinders	2	3	3	3	4
Bore	76 mm (3 in.)	76 mm (3 in.)	76 mm (3 in.)	82 mm (3.23 in.)	76 mm (3 in.)
Stroke	82 mm (3.23 in.)				
Displacement	743 cc (45.3 cu.in.)	1115 cc (68.3 cu.in.)	1115 cc (68.3 cu.in.)	1299 cc (79.3 cu.in.)	1487 cc (90.7 cu.in.)
Cylinder Sleeves	Dry				
Battery-Volts	12				
Ground Polarity	Negative				
Forward Speeds	8				
TUNE-UP					
Compression Pressure	3235 kPa (470 psi)				
Firing Order	1-2	1-2-3	1-2-3	1-2-3	1-3-4-2
Valve Clearance – Intake and Exhaust	0.18-0.22 mm (0.007-0.009 in.)				
Injection Timing (BTDC)	25°				
Timing Mark Location	Flywheel				
Injection Pressure	13720-14700 kPa (1990-2135 psi)				
Low Idle Speed (rpm)	800-850				
High Idle Speed (rpm)	2950	2750	2950	2750	2550
Rated Speed (rpm)	2800	2600	2800	2600	2400
Rated Power at Pto Shaft	11.5 kW (15.45 HP)	14.6 kW (19.59 HP)	16.4 kW (22 HP)	17.5 kW (23.42 HP)	19.8 kW (26.45 HP)
SIZES-CLEARANCES					
Crankshaft Main Journal – Diameter	51.921-51.940 mm (2.0441-2.0449 in.)				
Bearing Clearance – Front Bearing	0.040-0.118 mm (0.0016-0.0046 in.)				
All Other Bearings	0.040-0.104 mm (0.0016-0.0041 in.)				
Crankshaft Crankpin Journal – Diameter	43.959-43.975 mm (1.7307-1.7313 in.)				
Bearing Clearance	0.035-0.093 mm (0.0014-0.0037 in.)				
Crankshaft End Play	0.15-0.31 mm (0.006-0.012 in.)				
Camshaft Journal – Diameter	39.934-39.950 mm (1.5722-1.5728 in.)				
Bearing Clearance	0.050-0.091 mm (0.0020-0.0036 in.)				

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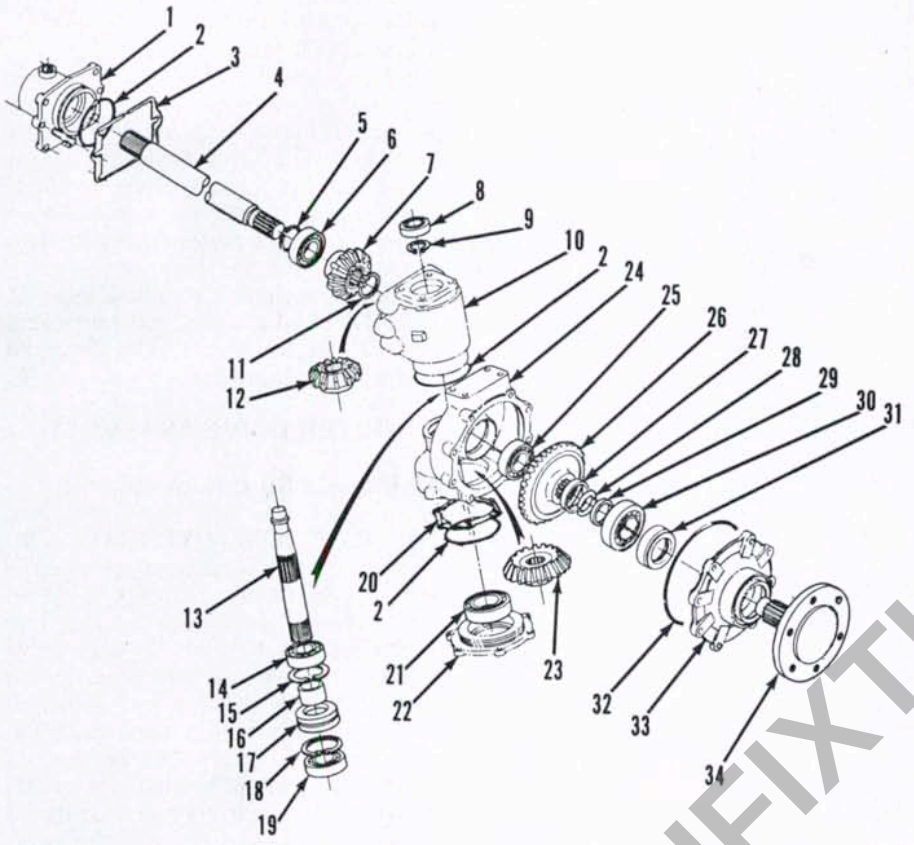


Fig. 10—Exploded view of outer drive assembly used on tractors equipped with front-wheel drive. Some models have a spacer between bearing (6) and bevel gear (7) and retain gear with a cap screw and washer instead of snap rings (5 and 11).

1. Axle housing
2. "O" ring
3. Shim
4. Differential yoke shaft
5. Snap ring
6. Bearing
7. Bevel gear
8. Bearing
9. Split ring
10. Bevel gear housing
11. Snap ring
12. Bevel gear
13. Bevel gear shaft
14. Bearing
15. Snap ring
16. Sleeve
17. Oil seal
18. Snap ring
19. Bearing
20. Shim
21. Bearing
22. Bearing cap
23. Bevel gear
24. Axle case
25. Bearing
26. Bevel gear
27. Retainer
28. Retaining ring
29. Thrust washer
30. Bearing
31. Oil seal
32. "O" ring
33. Flange
34. Axle shaft

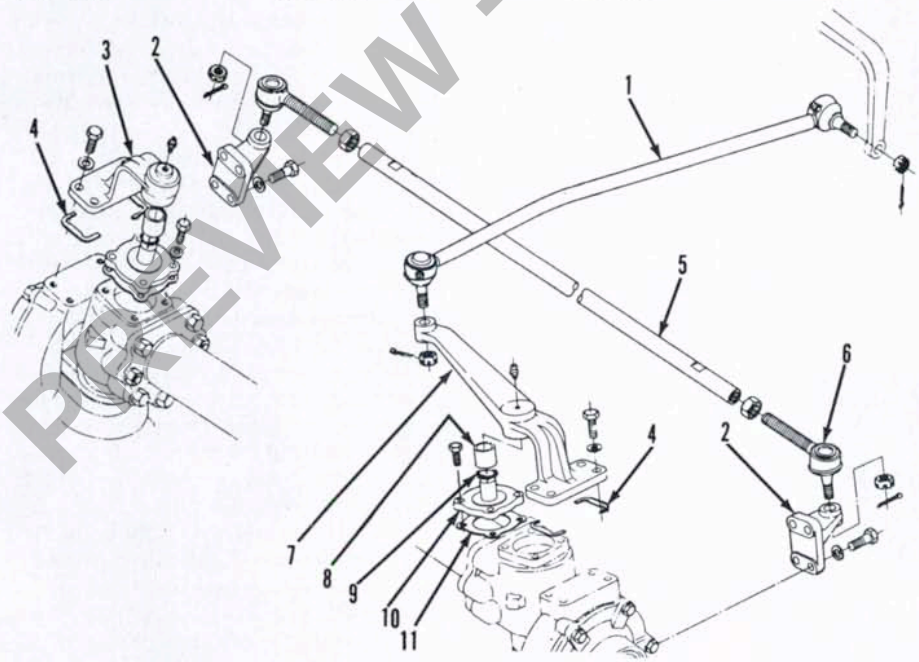


Fig. 11—View of front-wheel drive steering linkage and knuckle pins.

1. Drag link
2. Arms
3. Knuckle support R.H.
4. Shim
5. Tie rod
6. Tie rod end
7. Steering arm
8. Bushing
9. "O" ring
10. Knuckle pin
11. Gasket

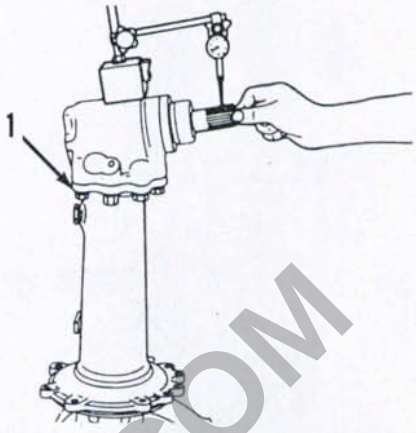


Fig. 12—Use a dial indicator to check backlash between upper bevel gear and yoke shaft bevel gear. Add or remove shims (1) between housings to obtain desired backlash.

(12—Fig. 10) and differential yoke shaft gear (7) should be 0.15-0.30 mm (0.006-0.012 inch). Use a dial indicator to check backlash as shown in Fig. 12, then add or remove shims (1) between bevel gear housing and axle housing to obtain desired backlash. Recommended backlash between lower bevel gear (23—Fig. 10) and axle shaft bevel gear (26) is 0.15-0.30 mm (0.006-0.012 inch). Use a dial indicator to check backlash as shown in Fig. 13, then add or remove shims (2) at lower bearing cap to obtain desired backlash. Tighten axle flange mounting cap screws to a torque of 20-34 N·m (15-25 ft.-lbs.). Tighten bevel gear case to axle housing mounting cap screws to a torque of 98-132 N·m (75-95 ft.-lbs.). Tighten knuckle support or steering arm mounting nuts to a torque of 80-90 N·m (60-65 ft.-lbs.), then measure clearance between support and pivot pin bracket with a feeler gage as shown in Fig. 14. Adjust shim pack under knuckle support as needed to obtain desired clearance of 0.1-0.2 mm (0.004-0.008 inch). Check end play of ax-

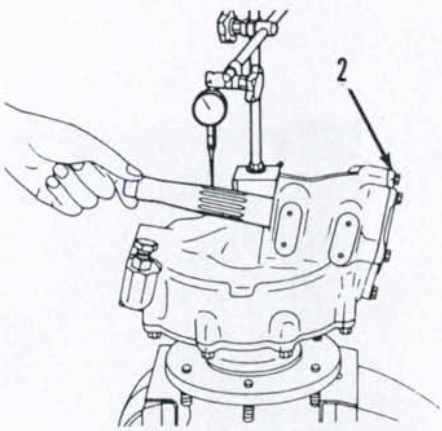


Fig. 13—Check backlash between lower bevel gear and axle bevel gear and adjust as necessary with shims (2) at lower bearing cap.

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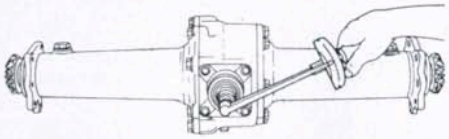


Fig. 19—Rolling torque of bevel pinion shaft with differential assembly installed should be within range of 1.96-2.94 N·m (17-26 in.-lbs.). Refer to text.

Side gear thrust washers (20–Fig. 16) are available in three different thicknesses to adjust backlash to desired value. Tighten ring gear mounting cap screws to a torque of 61-68 N·m (45-50 ft.-lbs.).

Assemble bevel pinion shaft using new bearings and oil seal. Tighten adjusting nut finger tight, then reinstall pinion shaft and case into differential housing. Use a torque wrench to measure torque required to turn pinion shaft as shown in Fig. 18. Tighten adjusting nut (1–Fig. 16) to obtain recommended rolling torque of 1.27-1.67 N·m (11-15 in.-lbs.). Stake adjusting nut after bearing adjustment is completed.

Install differential assembly and ring gear into differential case and reinstall axle housing.Measure torque required to rotate bevel pinion shaft and differential as shown in Fig. 19. Rolling torque should be within the range of 1.96-2.94 N·m (17-26 in.-lbs.). Adjust as needed by changing shim thickness (15 and 8–Fig. 16) in differential case and bevel pinion case.

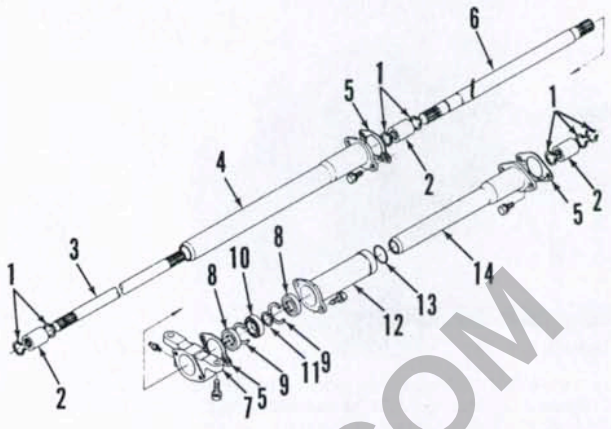


Fig. 22—Exploded view of two- piece drive shaft assembly with center carrier bearing used on some models.

1. Snap ring
2. Coupling
3. Front drive shaft
4. Front tube
5. Gasket
6. Rear drive shaft
7. Bearing case
8. Oil seals
9. Retaining rings
10. Bearing
11. Snap ring
12. Center tube
13. "O" ring
14. Rear tube

Check and adjust ring gear to bevel pinion backlash as follows: Secure ring gear by inserting a screwdriver through oil drain hole in housing. Set dial indicator on bevel pinion shaft spline as shown in Fig. 20, then move pinion shaft and measure backlash. Recommended

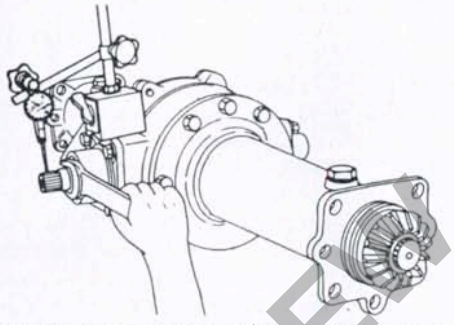


Fig. 20—Use a dial indicator to check backlash between ring gear and pinion. Recommended backlash is 0.15 mm (0.006-0.010 inch).

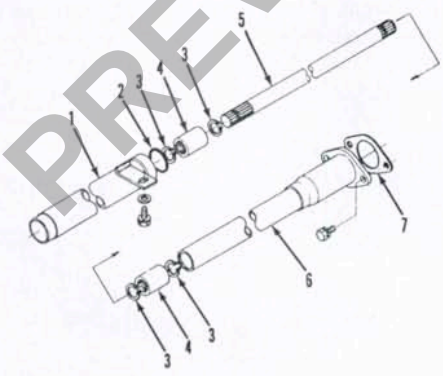


Fig. 21—Exploded view of one-piece drive shaft assembly used on some models.

1. Front tube
2. "O" ring
3. Snap ring
4. Coupling
5. Drive shaft
6. Rear cover
7. Gasket

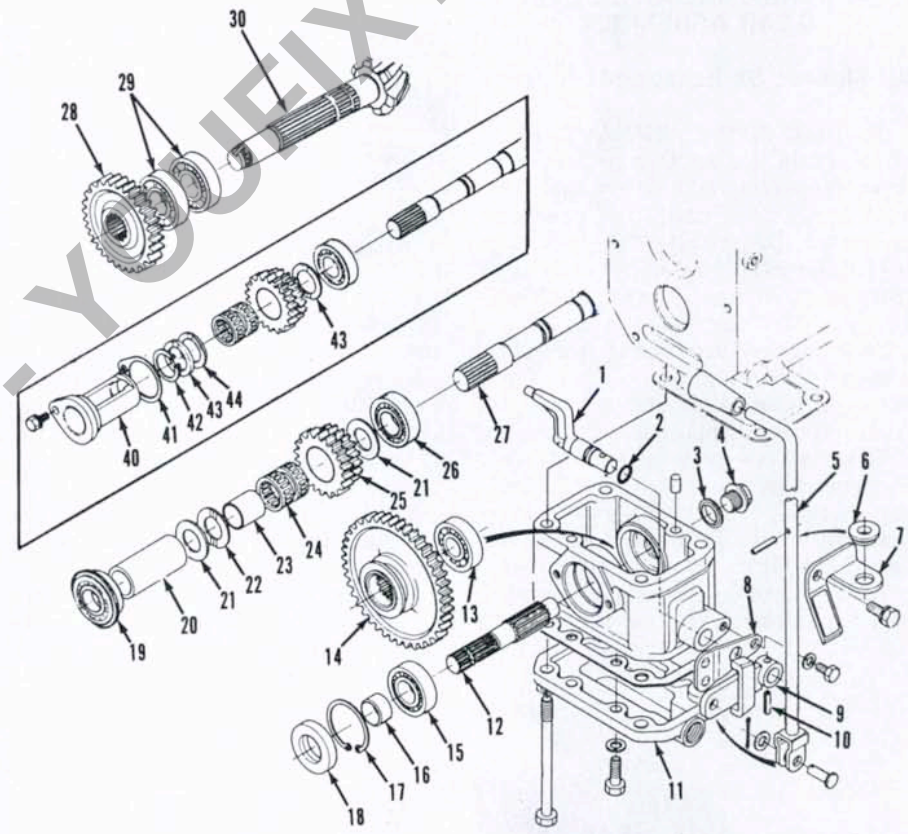


Fig. 23—Transfer case is mounted to bottom of range transmission housing and is lubricated with transmission oil. Idler gear assembly shown in inset (40 through 44) is used on Models L305, L345 and L355.

1. Shift lever
2. "O" ring
3. Seal washer
4. Plug
5. Shift lever
6. Rubber guide
7. Support
8. Guide
9. Shift arm
10. Spring pin
11. Cover
12. Shaft
13. Bearing
14. Driven gear
15. Bearing
16. Sleeve
17. Snap ring
18. Oil seal
19. Bearing
20. Spacer
21. Washers
22. Thrust washer
23. Inner race
24. Bearings
25. Idler gear
26. Bearing
27. Pto shaft
28. Drive gear
29. Bearings
30. Bevel pinion shaft
40. Spacer
41. Shim
42. Snap ring
43. Thrust washers
44. Washer

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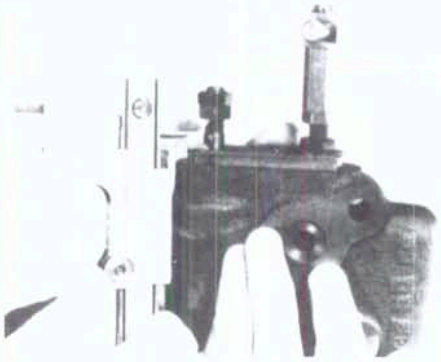


Fig. 167—Measure distance from plate to poppet locknut before disassembling valve. Record measurement for use in reassembly.

bore is worn or damaged, complete valve assembly must be renewed.

POSITION CONTROL VALVE

All Models

123. The position control valve (Fig. 166) controls up and down movement of hydraulic hitch. Valve spool (1) is moved to direct oil to lift cylinder. A poppet valve (6) is opened to return oil to reservoir when hitch is lowered. An unloading valve (3) allows oil from pump to return to reservoir when control valve is in neutral. A drop check valve (4) maintains oil pressure in hydraulic cylinder until pump pressure is sufficient to raise load on hitch.

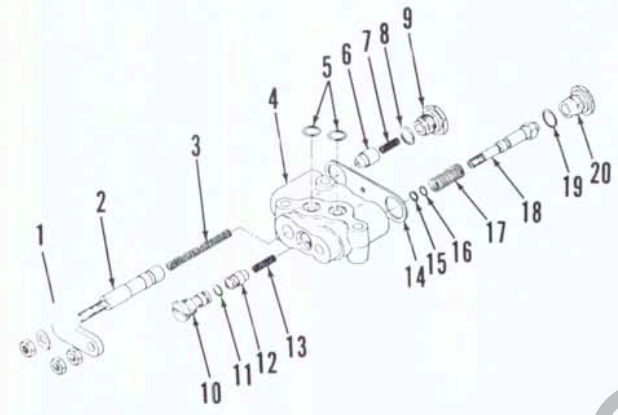


Fig. 168—Exploded view of position control valve assembly.

1. Plate
2. Valve spool
3. Spring
4. Valve body
5. "O" rings
6. Unloading valve
7. Spring
8. "O" ring
9. Plug
10. Seat plug
11. "O" ring
12. Check valve
13. Spring
14. Plate
15. Back-up ring
16. "O" ring
17. Spring
18. Poppet valve
19. "O" ring
20. Seat plug

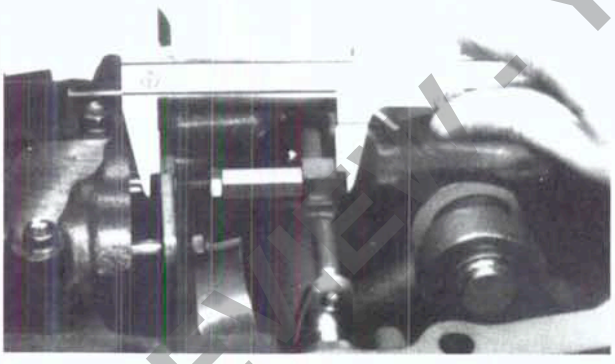


Fig. 169—Measure distance between plate and position control valve spool joint end as shown. Adjust by turning turnbuckle. Refer to text.

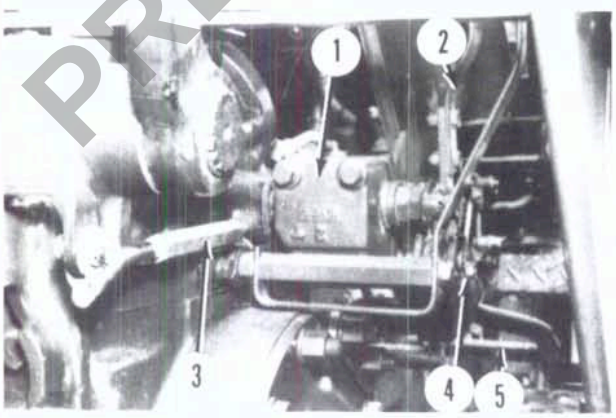


Fig. 170—Draft control valve (models so equipped) is mounted on right side of rockshaft housing.

1. Draft control valve
2. Control lever
3. Feedback rod
4. Bracket
5. Differential lock pedal

124. **R&R AND OVERHAUL.** Position control valve (14–Fig. 164) is mounted on bottom of rockshaft housing. To remove valve, first remove rockshaft housing as outlined in paragraph 127. Remove valve mounting cap screws and lift off valve housing. Do not disturb valve spool adjustment unless necessary.

Before disassembling valve, move plate (Fig. 167) against valve body and measure and record distance between plate and poppet valve locknut. When reassembling valve, install locknut to same dimension. Remove nuts from poppet valve (18–Fig. 168). Withdraw valve spool (2) and plate (1). Remove plugs (9 and 20), plate (14) and unloading valve (6). Pull poppet valve (18) and spring (17) from valve body. Unscrew check valve seat (10) and remove check valve (12) and spring (13).

Inspect all parts for excessive wear or other damage and renew as necessary. Renew all "O" rings. Be sure to coat all parts with clean hydraulic oil during reassembly.

When reassembling valve, tighten check valve seat (10) to a torque of 49-59 N·m (36-43 ft.-lbs.). Be sure "O" ring (16) and back-up ring (15) are correctly positioned on poppet valve. Tighten plugs (9 and 20) to a torque of 69-88 N·m (50-65 ft.-lbs.). Install poppet valve locknuts to same dimension as measured prior to disassembly (Fig. 167). To adjust poppet valve locknuts, apply compressed air at pump port and move control valve (2–Fig. 168) and plate (1) up and down until neutral position is obtained. Tighten poppet valve lower nut until it contacts plate, then loosen nut ½-turn and lock in place with jam nut.

Reinstall valve assembly onto rockshaft housing. Tighten valve mounting cap screws to a torque of 18-23 N·m (13-17 ft.-lbs.). Adjust control valve spool as follows: Measure distance between plate (Fig. 169) and control valve spool joint end. If distance is not within 69.0-69.5 mm (2.717-2.736 inches) on Models L235 and L275 or 59.5-60.5 mm (2.342-2.382 inches) on all other models, loosen locknut and adjust turnbuckle to obtain recommended dimension.

DRAFT CONTROL VALVE

Models So Equipped

125. The draft control valve is mounted on right side of rockshaft housing. Hitch load sensing is transmitted through a torsion bar and linkage to draft control valve. The valve automatically raises or lowers hitch to maintain a constant load on hitch.

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first drain oil from transmission housings and rear axle housings. Disconnect brake rods, electrical wiring and hydraulic pipes as necessary. Remove steps and on Models L235 and L275 disconnect shift lockout cable from range shift lever. On models equipped with front wheel drive, disconnect drive shaft. Support front transmission housing with a suitable stand and wedge front axle to prevent tipping. Support rear transmission housing with a suitable splitting stand or hoist, then remove rear axle housings as outlined in paragraph 100. Remove housing mounting stud nuts, then separate rear housing from tractor.

To reinstall transmission housing, reverse the disassembly procedure. Tighten stud nuts to a torque of 103-118 N·m (76-86 ft.-lbs.).

Models L235-L275-L355

86. OVERHAUL. To disassemble rear transmission housing, proceed as follows: Remove differential lock shaft and shift fork. Remove bearing retainer from front of countershaft (2–Fig. 118 or 119) and snap ring (6) from rear of shaft. Tap shaft forward out of housing and lift out gear (3). Wedge a brass rod in ring gear teeth to lock bevel pinion shaft (18), then remove nut (8) from front of shaft. Remove differential bearing cases and lift differential assembly from rear housing. Be sure to retain shims with each bearing case for use in reassembly. Loosen shift rail set screw

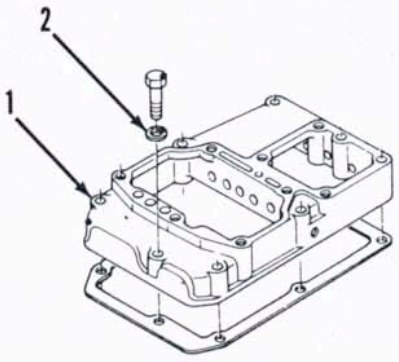


Fig. 117—A seal washer is used on shifter housing front mounting cap screw.

1. Shifter housing
2. Seal washer

and remove retainer pin, then pull shift rail forward and withdraw shift fork. Disengage snap ring (15) from its groove, then tap pinion shaft (18) rearward and remove gears. Unbolt and remove front bearing (10) and bearing case (11). Retain shims (12) for use in reassembly. On Models L235 and L275, remove cap screws securing pto shaft bearing case (35–Fig. 118), then pull pto output shaft (33) and bearing case rearward as a unit from housing. Remove snap ring from rear of pto drive shaft (21) and bearing retainer (13) from front of shaft, then tap shaft foward out of housing. On Model L355, remove snap ring from front of pto output shaft (33–Fig. 119) and remove front bearing (21) with a suitable puller. Remove retainer (22), thrust washers (23 and 24), bearings (25) and gear (26). Remove bearing case mounting screws, then pull shaft and bearing case (35) rearward from housing. On all models, remove nut (28–Fig. 118 or 119) and snap ring (29), then press bearing case and bearing off shaft. Drive oil seal (32) out of case.

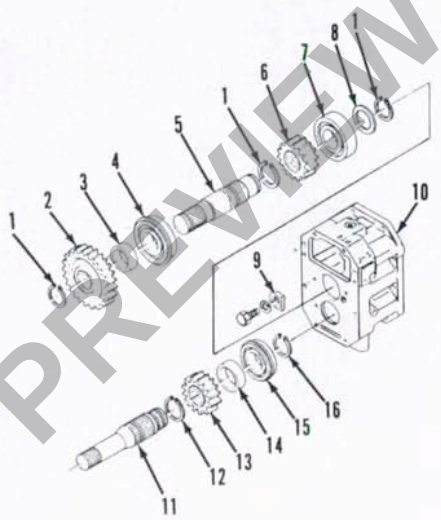


Fig. 116—Exploded view of gears and shafts located in center case on Model L355.

1. Snap ring
2. Gear (23T)
3. Spacer
4. Bearing
5. Pto gear shaft
6. Gear (14T)
7. Bearing
8. Thrust washer
9. Bearing retainer
10. Center case
11. Pto countershaft
12. Snap ring
13. Gear (14T)
14. Spacer
15. Bearing
16. Snap ring

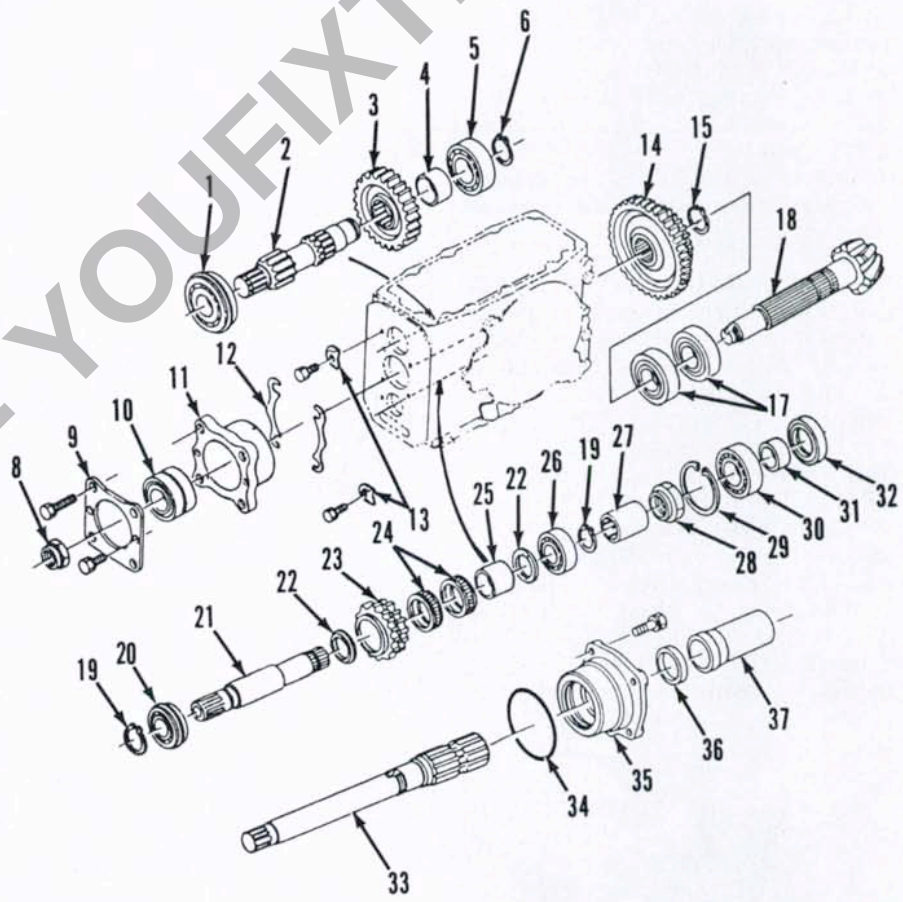


Fig. 118—Exploded view of gears and shafts located in rear transmission housing on Models L235 and L275.

1. Bearing
2. Range countershaft
3. Gear (27T)
4. Spacer
5. Bearing
6. Snap ring
8. Nut
9. Cover
10. Bearing
11. Bearing case
12. Shim
13. Bearing retainers
14. Gear (23-46T)
15. Snap ring
17. Bearings
18. Bevel pinion shaft
19. Snap ring
20. Bearing
21. Pto drive shaft
22. Thrust washer
23. Gear
24. Needle bearings
25. Spacer
26. Bearing
27. Coupling
28. Nut
29. Snap ring
30. Bearing
31. Sleeve
32. Oil seal
33. Pto output shaft
34. "O" ring
35. Bearing case
36. Slinger
37. Cap

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CONDENSED SERVICE DATA (CONT.)

SIZES-CLEARANCES (CONT.)	L185	L235	L245	L275	L285
Cam Height – Intake and Exhaust	33.36 mm (1.3134 in.)				
Piston Pin – Diameter	23.002-23.011 mm (0.9056-0.9059 in.)				
Clearance in Rod	0.014-0.038 mm (0.0006-0.0015 in.)				
Valve Seat Angle – Intake and Exhaust	45°				
CAPACITIES					
Crankcase Oil	3.8 L (4.0 qts.)	6.1 L (6.4 qts.)	6.1 L (6.4 qts.)	6.1 L (6.4 qts.)	8.9 L (9.4 qts.)
Cooling System	5.3 L (5.6 qts.)	6.6 L (7.0 qts.)	6.6 L (7.0 qts.)	6.6 L (7.0 qts.)	7.0 L (7.4 qts.)
Transmission – 2WD	22 L (23 qts.)	24 L (25 qts.)	22 L (23 qts.)	24 L (25 qts.)	27 L (29 qts.)
4WD	23 L (24 qts.)	24 L (25 qts.)	23 L (24 qts.)	24 L (25 qts.)	...
Fluid Type	Kubota UDT Transmission Fluid				...
Front Axle Differential Case (4WD)	1.1 L (1.2 qts.)	2.3 L (2.4 qts.)	1.1 L (1.2 qts.)	2.6 L (2.7 qts.)	...
Fluid Type	SAE 80 or 90 Gear Oil				...
Front Axle Outer Drive Case (4WD) – Each	0.8 L (0.8 qts.)	0.3 L (0.3 qts.)	0.8 L (0.8 qts.)	0.3 L (0.3 qts.)	...
Fluid Type	SAE 80 or 90 Gear Oil				...
Steering Gear Box (Manual)	0.3 L (0.3 qts.)				
Fluid Type	SAE 80 or 90 Gear Oil				

CONDENSED SERVICE DATA

GENERAL	L295	L305	L345	L355
Engine Make	Own			
Engine Model	D1301A	D1301A	V1501A	V1702A
Number of Cylinders	3	3	4	4
Bore	82 mm (3.23 in.)	82 mm (3.23 in.)	76 mm (3 in.)	82 mm (3.23 in.)
Stroke	82 mm (3.23 in.)			
Displacement	1299 cc (79.3 cu.in.)	1299 cc (79.3 cu.in.)	1487 cc (90.7 cu.in.)	1732 cc (105.6 cu.in.)
Cylinder Sleeves	Dry			
Battery Volts	12			
Ground Polarity	Negative			
Forward Speeds	8			
TUNE-UP				
Compression Pressure	3235 kPa (470 psi)			
Firing Order	1-2-3	1-2-3	1-3-4-2	1-3-4-2
Valve Clearance – Intake and Exhaust	0.18-0.22 mm (0.007-0.009 in.)			
Injection Timing (BTDC)	25°			
Timing Mark Location	Flywheel			
Injection Pressure	13720-14700 kPa (1990-2135 psi)			

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pto and use two pto shift forks (26). Model L285 is equipped with two speed pto and uses a single pto shift fork.

To disassemble main transimission shift mechanism, first unbolt and remove lever housing (9) and remove shift rail detent springs (12) and balls (13). Main shift lever (2) and pto shift lever (1) are withdrawn from below after removing lever knob, snap ring (3), washers and spring (5). Positioning pins (10) can be punched out and renewed if worn or damaged.

With shift housing removed, drive spring pins (20) down out of shift forks. Bump shift rails rearward out of housing. Note that interlock balls (14) occupy a cross drilling between rails. When one rail is moved from neutral, balls enter grooves in adjoining rails, thus locking rails and preventing shift forks from moving into two gears at one time. A suggested method of disassembly is to remove center rail first, then dump both interlock balls out through hole where center rail was removed. Make certain interlock balls are reinstalled when shift housing is reassembled.

To remove range shift fork (39) and rail (40), tractor must be split between front and rear transmission housings and hydraulic lift housing must be removed. Remove retaining set screw (41) and snap pin, then push pin rail rearward catching detent ball and spring as rail is removed. Drive out spring pin and remove plate (34) to disassemble shift lever (33) and arm (36).

To reinstall shift mechanism, remove lever housing (9) if not already done. Position all shift forks and sliding gears to neutral position. Hold main shift forks together to hold neutral stops (18) in position, then carefully install shift cover making sure each fork correctly meshes with its respective slot in sliding gears and pto levers (30) engage pins (29) in pto shift forks. Tighten shift housing retaining screws, then move all shift forks to be sure they operate properly. Install lever cover guiding ends of

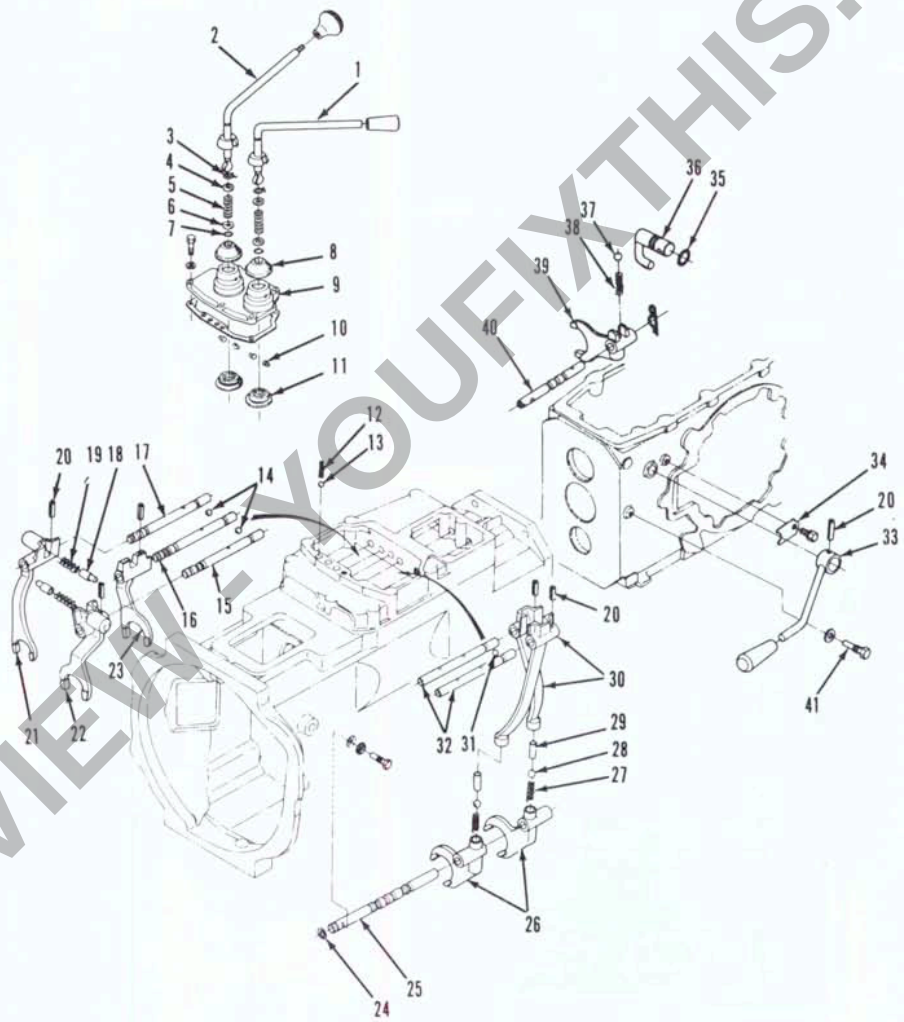


Fig. 97—Exploded view of transmission shift rails and forks used on Models L185, L245 and L295. Models L285, L305 and L345 are similar except a single pto shift fork is used.

1. Pto shift lever
2. Main shift lever
3. Snap ring
4. Washer
5. Spring
6. Washer
7. "O" ring
8. Shield
9. Housing
10. Pins
11. Oil shield
12. Spring
13. Detent ball
14. Interlock balls
15. Shift rail
16. Shift rail
17. Shift rail
18. Neutral stop
19. Spring
20. Spring pin
21. Shift fork
22. Shift fork
23. Shift fork
24. "O" ring
25. Fork shaft
26. Shift forks (pto)
27. Spring
28. Ball
29. Pin
30. Shift levers (pto)
31. Interlock ball
32. Shift rails (pto)
33. Range shift lever
34. Stop plate
35. "O" ring
36. Shift arm
37. Ball
38. Spring
39. Shift fork
40. Shift rail
41. Set screw

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