SHOP MANUAL
FORD

Models 1100-1110-1200-1210-1300-1310
1500-1510-1700-1710-1900-1910-2110

The tractor model number, serial number and engine number are stamped on an identification tag located on left side of transmission housing.

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DUAL DIMENSIONS

This service manual provides specifications in both the Metric (SI) and U.S. Customary systems of measurement. The first specification is given in the measuring system used during manufacture, 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 the equipment was manufactured using the metric system of measurement and the U.S. equivalent of 0.28 mm is 0.011 inch.

CONDENSED SERVICE DATA

	1100	1110	1200	1210
GENERAL				
Engine Make	Shibura			
Engine Model	LEK752C2	LEK757C	LEK802D	S723
Number of Cylinders	2	2	2	3
Bore	75 mm (2.95 in.)	75 mm (2.95 in.)	80 mm (3.15 in.)	72 mm (2.83 in.)
Stroke	80 mm (3.15 in.)	80 mm (3.15 in.)	80 mm (3.15 in.)	72 mm (2.83 in.)
Displacement	706 cc (43.1 cu. in.)	706 cc (43.1 cu. in.)	804 cc (49.1 cu. in.)	879 cc (53.6 cu. in.)
Compression Ratio	23:1	23:1	23:1	24:1
TUNE-UP				
Firing Order	2-1	2-1	2-1	1-2-3
Valve Clearance – Cold				
Intake	0.30 mm (0.012 in.)	0.20 mm (0.008 in.)	0.30 mm (0.012 in.)	0.20 mm (0.008 in.)
Exhaust	0.30 mm (0.012 in.)	0.20 mm (0.008 in.)	0.30 mm (0.012 in.)	0.20 mm (0.008 in.)
Valve Face Angle	45°			
Valve Seat Angle	45°			
Injection Timing, Static-BTDC	23°-24°	20°-21°	23°-24°	24°
Injector Opening Pressure	11760 kPa (1705 psi)	11760 kPa (1705 psi)	11760 kPa (1705 psi)	11760 kPa (1705 psi)

CONDENSED SERVICE DATA (CONT.)

TUNE-UP (CONT.)	1100	1110	1200	1210
Governed Speeds – Engine Rpm				
Low Idle	750-850	750-850	750-850	750-850
High Idle (No Load)	2750-2800	2750-2800	2850-2900	2850-2900
Rated (Full Load)	2600	2600	2700	2700
Power Rating at Pto Shaft	8.2 kW (11 hp)	8.6 kW (11.5 hp)	10 kW (13.5 hp)	10 kW 13.5 hp)
Battery				
Volts	12			
Ground Polarity	Negative			
CAPACITIES				
Cooling System	3.0 L (3.2 U.S. qt.)	2.5 L (2.6 U.S. qt.)	4.0 L (4.2 U.S. qt.)	2.3 L (2.5 U.S. qt.)
Crankcase*	3.3 L (3.5 U.S. qt.)	3.3 L (3.5 U.S. qt.)	4.0 L (4.2 U.S. qt.)	3.3 L (3.5 U.S. qt.)
Fuel Tank	14 L (3.7 U.S. gal.)	18 L (4.8 U.S. gal.)	14 L (3.7 U.S. gal.)	18 L (4.8 U.S. gal)
Standard Transmission & Rear Axle	18.9 L (20 U.S. qt.)	17 L (18 U.S. qt.)	18.9 L (20 U.S. qt.)	17 L (18 U.S. qt.)
Hydrostatsic Transmission & Rear Axle	....	15.5 L (16.4 U.S. qt.)	....	15.5 L (16.4 U.S. qt.)
Front Axle Differential Case	1.5 L (1.6 U.S. qt.)	1.5 L (1.6 U.S. qt.)	1.5 L (1.6 U.S. qt.)	1.5 L (1.6 U.S. qt.)
Front Axle Reduction Case (Each)	0.2 L (0.21 U.S. qt.)	0.2 L (0.21 U.S. qt.)	0.2 L (0.21 U.S. qt.)	0.2 L (0.21 U.S. qt.)
*With filter change.				
SPECIAL TORQUES				
Connecting Rod Caps	24-27 N·m (18-20 ft.-lbs.)	24-27 N·m (18-20 ft.-lbs.)	24-27 N·m (18-20 ft.-lbs.)	29-34 N·m (22-25 ft.-lbs.)
Main Bearing Holders	....	....	71-81 N·m (52-60 ft.-lbs.)	25-29 N·m (18-25 ft.-lbs.)
Crankshaft Rear Plate	46-54 N·m (34-40 ft.-lbs.)	46-54 N·m (34-40 ft.-lbs.)	....	....
Flywheel	343-441 N·m (253-325 ft.-lbs.)	343-441 N·m (253-325 ft.-lbs.)	343-441 N·m (253-325 ft.-lbs.)	56-69 N·m (43-51 ft.-lbs.)
Cylinder Head	146-152 N·m (108-112 ft.-lbs.)	128 N·m (94 ft.-lbs.)	150-155 N·m (110-114 ft.-lbs.)	48 N·m (35 ft.-lbs.)

CONDENSED SERVICE DATA

	1300	1310	1500	1510
GENERAL				
Engine Make	Shibura			
Engine Model	LEK802D	S753	LET862C	K773
Number of Cylinders	2	3	2	3
Bore	80 mm (3.15 in.)	75 mm (2.95 in.)	85 mm (3.35 in.)	77 mm (3.03 in.)
Stroke	80 mm (3.15 in.)	72 mm (2.83 in.)	100 mm (3.94 in.)	80 mm (3.15 in.)
Displacement	804 cc (49.1 cu. in.)	954 cc (58.2 cu. in.)	1134 cc (69.2 cu. in.)	1117 cc (68.2 cu. in.)
Compression Ratio	23:1	23:1	21:1	23:1
TUNE-UP				
Firing Order	2-1	1-2-3	2-1	1-2-3
Valve Clearance-Cold				
Intake	0.30 mm (0.012 in.)	0.20 mm (0.008 in.)	0.30 mm (0.012 in.)	0.20 mm (0.008 in.)
Exhaust	0.30 mm (0.012 in.)	0.20 mm (0.008 in.)	0.30 mm (0.012 in.)	0.20 mm (0.008 in.)
Valve Face Angle	45°			
Valve Seat Angle	45°			
Injection Timing, Static-BTDC	23°-24°	20°-21°	23°-24°	22°
Injector Opening Pressure	11760 kPa (1705 psi)	11760 kPa (1705 psi)	11760 kPa (1705 psi)	11760 kPa (1705 psi)
Governed Speeds-Engine Rpm				
Low Idle	750-850	750-850	750-850	750-850
High Idle (No Load)	2900-2950	2950-3000	2650-2700	3000-3050
Rated (Full Load)	2700	2800	2500	2800
Power Rating at Pto Shaft	10 kW (13.5 hp)	12.3 kW (16.5 hp)	12.7 kW (17 hp)	14.7 kW (19.7 hp)
Battery				
Volts	12			
Ground Polarity	Negative			
CAPACITIES				
Cooling System	4.0 L (4.2 U.S. qt.)	2.7 L (2.8 U.S. qt.)	5.3 L (5.6 U.S. qt.)	3.0 L (3.2 U.S. qt.)
Crankcase*	4.3 L (4.5 U.S. qt.)	3.8 L (4.0 U.S. qt.)	4.3 L (4.5 U.S. qt.)	4.0 L (4.2 U.S. qt.)
Fuel Tank	22 L (5.8 U.S. gal.)	26.6 L (7 U.S. gal.)	22 L (5.8 U.S. gal.)	26.6 L (7 U.S. gal.)
Transmission, Rear Axle & Hydraulic System	20 L (21 U.S. qt.)	18 L (19 U.S. qt.)	20 L (21 U.S. qt.)	18 L (19 U.S. qt.)
Front Axle Differential Case	1.5 L (1.6 U.S. qt.)	2.4 L (2.5 U.S. qt.)	2.4 L (2.5 U.S. qt.)	2.4 L (2.5 U.S. qt.)
Front Axle Reduction Case (Each)	0.18 L (0.19 U.S. qt.)	0.22 L (0.23 U.S. qt.)	0.22 L (0.23 U.S. qt.)	0.22 L (0.23 U.S. qt.)
SPECIAL TORQUES				
Connecting Rod Caps	25-28 N·m (18-20 ft.-lbs.)	30-34 N·m (22-25 ft.-lbs.)	80-85 N·m (59-63 ft.-lbs.)	25-27 N·m (18-20 ft.-lbs.)
Main Bearing Holders	....	25-29 N·m (18-22 ft.-lbs.)	....	48-53 N·m (36-39 ft.-lbs.)
Crankshaft Rear Plate	46-54 N·m (34-40 ft.-lbs.)	27-33 N·m (20-24 ft.-lbs.)	46-54 N·m (34-40 ft.-lbs.)	46-54 N·m (34-40 ft.-lbs.)
Flywheel	343-441 N·m (253-325 ft.-lbs.)	59-69 N·m (44-50 ft.-lbs.)	343-441 N·m (253-325 ft.-lbs.)	59-69 N·m (44-50 ft.-lbs.)

*With filter change.

CONDENSED SERVICE DATA (CONT.)

	1300	1310	1500	1510
SPECIAL TORQUES (CONT.)				
Cylinder Head	150-155 N·m (110-114 ft.-lbs.)	48 N·m (35 ft.-lbs.)	150-155 N·m (110-114 ft.-lbs.)	†

†61 N·m (45 ft.-lbs.) with 10 mm bolts; 95 N·m (70 ft.-lbs.) with 12 mm bolts.

CONDENSED SERVICE DATA

	1700	1710	1900	1910	2110
GENERAL					
Engine Make	Shibura				
Engine Model	LE892	H843	LEM853	T853A	T854B
Number of Cylinders	2	3	3	3	4
Bore	90 mm (3.54 in.)	84 mm (3.31 in.)	85 mm (3.35 in.)	85 mm (3.35 in.)	85 mm (3.35 in.)
Stroke	100 mm (3.94 in.)	84 mm (3.31 in.)	84 mm (3.31 in.)	100mm (3.94 in.)	100mm (3.94 in.)
Displacement	1272 cc (77.7 cu. in.)	1396 cc (85.2 cu. in.)	1429 cc (87.2 cu. in.)	1702 cc (103.8 cu. in.)	2268 cc (138.4 cu. in.)
Compression Ratio	21:1	23:1	21:1	21:1	21:1
TUNE-UP					
Firing Order	2-1	1-2-3	1-2-3	1-2-3	1-3-4-2
Valve Clearance-Cold					
Intake	0.30 mm (0.012 in.)	0.20 mm (0.008 in.)	0.30 mm (0.012 in.)	0.30 mm (0.012 in.)	0.30 mm (0.012 in.)
Exhaust	0.30 mm (0.012 in.)	0.20 mm (0.008 in.)	0.30 mm (0.012 in.)	0.30 mm (0.012 in.)	0.30 mm (0.012 in.)
Valve Face Angle	45°				
Valve Seat Angle	45°				
Injection Timing, Static-BTDC	20°-22°	22½°-23½°	26°-27°	23½°-24½°	23½°-24½°
Injector Opening Pressure	11760 kPa (1705 psi)				
Governed Speeds-Engine Rpm					
Low Idle	750-850	750-850	750-850	750-850	750-850
High Idle (No Load)	2600-2650	2825-2875	2900-2950	2650-2700	2650-2700
Rated (Full Load)	2500	2700	2800	2500	2500
Power Rating at Pto Shaft	17.4 kW (23.3 hp)	17.8 kW (23.9 hp)	20 kW (26.9 hp)	21.3 kW (28.6 hp)	25.9 kW (34.8 hp)
Battery					
Volts	12				
Ground Polarity	Negative				
CAPACITIES					
Cooling System	5.3 L (5.6 U.S. qt.)	5.5 L (5.8 U.S. qt.)	6.8 L (7.2 U.S. qt.)	7.0 L (7.4 U.S. qt.)	8.5 L (9.1 U.S. qt.)
Crankcase*	5.0 L** (5.3 U.S. qt.)	5.3 L (5.6 U.S. qt.)	5.5 L (5.8 U.S. qt.)	6.5 L (6.9 U.S. qt.)	7.5 L (7.9 U.S. qt.)
Fuel Tank	22 L (5.8 U.S. gal.)	29 L (7.6 U.S. gal.)	29 L (7.6 U.S. gal.)	35 L (9.3 U.S. gal.)	40 L (10.6 U.S. gal.)

CONDENSED SERVICE DATA (CONT.)

CAPACITIES (CONT.)	1700	1710	1900	1910	2110
Transmission, Rear Axle & Hydraulic System	22 L (23.2 U.S. qt.)	18 L (19 U.S. qt.)	24 L (25.4 U.S. qt.)	28 L (29.6 U.S. qt.)	32.2 L (34 U.S. qt.)
Rear Axle Final Drive Case (Each)	....	2.4 L (2.5 U.S. qt.)	....	....	....
Front Axle Differential Case	2.4 L (2.5 U.S. qt.)	3.3 L (3.5 U.S. qt.)	2.4 L (2.5 U.S. qt.)	4.2 L (4.5 U.S. qt.)	5.2 L (5.5 U.S. qt.)
Front Axle Reduction Case (Each)	0.22 L (0.23 U.S. qt.)	0.22 L (0.23 U.S. qt.)	0.22 L (0.23 U.S. qt.)	0.22 L (0.23 U.S. qt.)	0.22 L 0.23 U.S. qt.)

* With filter change.
** Crankcase capacity is 0.5 L (0.53 U.S. quarts) less when equipped with front wheel drive.

SPECIAL TORQUES					
Connecting Rod Caps	80-85 N·m (59-63 ft.-lbs.)	45-50 N·m (32-36 ft.-lbs.)	45-50 N·m (32-36 ft.-lbs.)	78-83 N·m (58-62 ft.-lbs.)	78-83 N·m (58-62 ft.-lbs.)
Main Bearing Holders	....	48-53 N·m (36-39 ft.-lbs.)	71-81 N·m (52-60 ft.-lbs.)	71-81 N·m (52-60 ft.-lbs.)	71-81 N·m (52-60 ft.-lbs.)
Crankshaft Rear Plate	46-54 N·m 34-40 ft.-lbs.)	46-54 N·m (34-40 ft.-lbs.)	46-54 N·m (34-40 ft.-lbs.)	46-54 N·m (34-40 ft.-lbs.)	46-54 N·m (34-40 ft.-lbs.)
Crankshaft Pulley	49-59 N·m (36-43 ft.-lbs.)	49-59 N·m (36-43 ft.-lbs.)	49-59 N·m (36-43 ft.-lbs.)	49-59 N·m (36-43 ft.-lbs.)	49-59 N·m (36-43 ft.-lbs.)
Flywheel	343-441 N·m (253-325 ft.-lbs.)	343-441 N·m (253-325 ft.-lbs.)	343-441 N·m (253-325 ft.-lbs.)	343-441 N·m (253-325 ft.-lbs.)	343-441 N·m (253-325 ft.-lbs.)
Cylinder Head	150-155 N·m (110-114 ft.-lbs.)	Note 1	Note 2	95 N·m (70 ft.-lbs.)	95 N·m (70 ft.-lbs.)

Note 1: 61 N·m (45 ft.-lbs.) with 10 mm bolts; 129 N·m (95 ft.-lbs.) with 14 mm bolts.
Note 2: 150-155 N·m (110-114 ft.-lbs.) for 11 large nuts and 58-62 N·m (43-46 ft.-lbs.) for 6 small nuts.

FRONT AXLE AND STEERING SYSTEM

FRONT AXLE (TWO WHEEL DRIVE)

All Models So Equipped

1. The front axle may be fixed tread width type or adjustable type for 1100, 1110, 1200, 1210, 1300, 1310, 1500 and 1510 models as shown in Figs. 1, 2 and 3. The adjustable axle used on 1700, 1710, 1900 and 1910 models is shown in Fig. 4. Adjustable axle used on 1710 Offset tractor is shown in Fig. 5, and adjustable axle used on 2110 tractor is shown in Fig. 6.

Front wheel toe-in is set by adjusting the length of the tie rod. Toe-in should be 0-5 mm (0-3/16 inch) on all models.

Clearance between axle pivot shaft and bushings (26 – Figs. 1, 2, 3, 4, 5 and 6) should be 0.02-0.15 mm (0.001-0.006 inch). Bushings should be renewed if clearance exceeds 0.30 mm (0.012 inch).

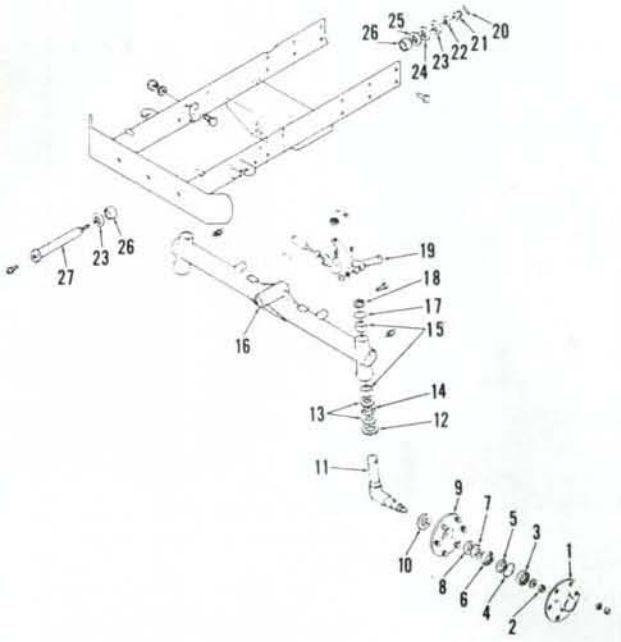

Fig. 1 – Exploded view of fixed tread front axle assembly used on two wheel drive 1100, 1110, 1200 and 1210 models.

1. Front wheel hub outer half
2. Nut
3. Outer bearing
4. "O" ring
5. Collar
6. Inner bearing
7. Seal
8. Seal
9. Wheel hub inner half
10. Spacer
11. Spindle
12. Oil seal
13. Bearing washers
14. Needle thrust bearing
15. Bushings
16. Axle
17. "O" ring
18. Washer
19. Steering arm
20. Cotter pin
21. Castelated nut
22. Washer
23. Washer
24. Shim
25. Shim
26. Bushing
27. Pivot shaft

Axle end play should not exceed 0.20 mm (0.008 inch). If end play is excessive, renew thrust washers (23) and/or add shims (24) as required.

When renewing spindle bushings (15), the top bushing should be pressed into bore until bushing is 4.7 mm (3/16 inch) below top surface of axle on models equipped with an "O" ring (17–Figs. 1 and 2) at top of spindle (11). On models equipped with a lip type seal (12–Figs. 3, 4, 5 and 6) at top of spindle, top bushing should be pressed into bore until top of bushing is 7 mm (9/32 inch) below top surface of axle. Install seal with lip facing upward.

Front wheel bearings should be removed, cleaned, inspected, renewed if damaged and packed with a good quality No. 2 EP lithium base grease after each 600 hours of operation. Tighten wheel bearing retaining nut (2) until slight drag is noticed while rotating wheel hub, then loosen nut to first castellation and install cotter pin.

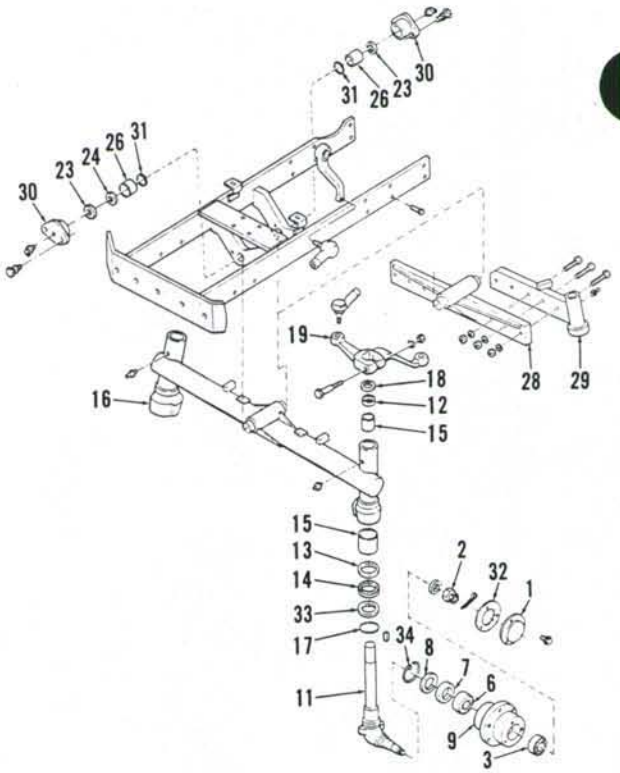

Fig. 3–Exploded view of fixed tread front axle (16) used on 1300 and 1500 models. Axle center member (28) and extensions (29) are used on 1300, 1310, 1500 and 1510 adjustable axle models.

1. Cover
2. Castelated nut
3. Outer bearing
6. Inner bearing
7. Seal
8. Spacer
9. Hub
11. Spindle
12. Seal
13. Bearing washer
14. Needle thrust bearing
15. Bushings
16. Fixed tread axle
17. "O" ring
18. Shims
19. Steering arm
23. Washers
24. Shim
26. Bushing
28. Axle center member
29. Axle extension
30. Pivot casting
31. "O" ring
32. Gasket
33. Washer
34. Snap ring

FRONT AXLE (FOUR WHEEL DRIVE)

2. The front axle of four wheel drive models includes the differential assembly, axle housings, drive shafts, universal joints and final drives. Refer to appropriate paragraphs 3 through 12 for service to components.

Tie rod length should be adjusted to provide front wheel toe-in of 0-5 mm (0-3/16 inch) on all models.

Models 1100-1200-1300-1500-1700 -1900 So Equipped

3. **REMOVE AND REINSTALL.** To remove the complete front drive axle assembly, first raise front of tractor and place a support behind the axle. Detach drag link from steering arm. Place front wheel drive control lever in "disengaged" position. Loosen clamps that attach drive shaft cover at the rear. Support axle to prevent tipping, then remove cap screws attaching axle pivot brackets to front support. Carefully lower axle until it can be moved forward out of drive shaft splines.

Inspect axle pivot bushings (13 and 36–Figs. 7, 8 and 9) for wear or damage. Renew bushings if clearance

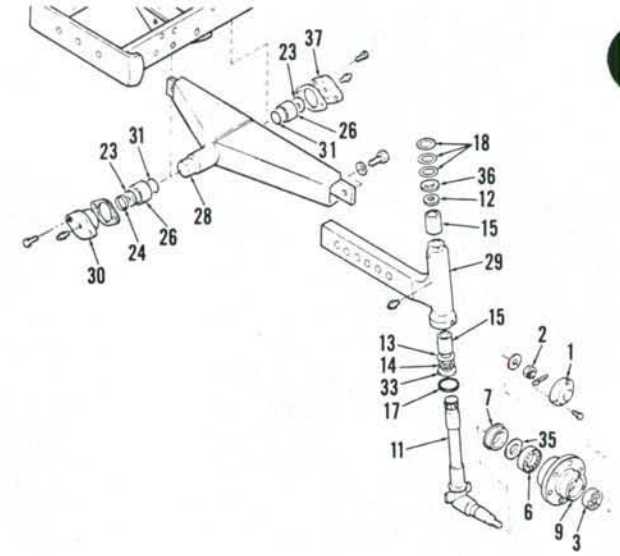

Fig. 4–Exploded view of adjustable front axle used on 1700, 1710, 1900 and 1910 models with two wheel drive. Refer to Fig. 3 for legend except for the following:

35. Spacer
36. Spacer
37. Retainer

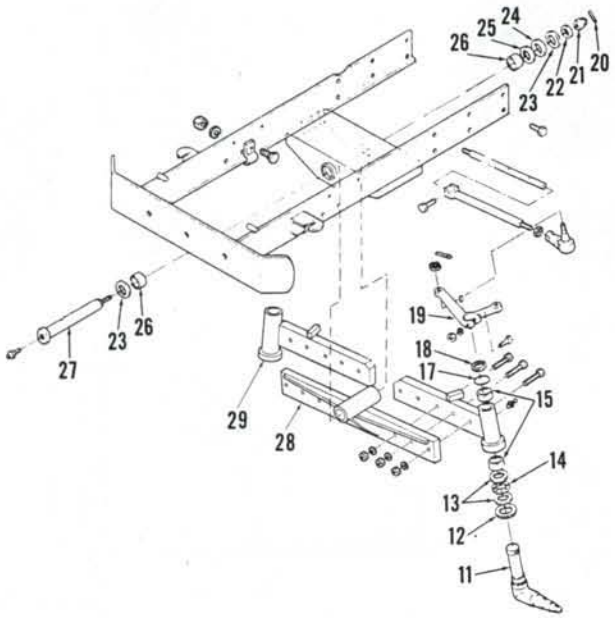

Fig. 2–Exploded view of adjustable tread width front axle available on 1100, 1110, 1200 and 1210 models. Refer to Fig. 1 for legend except for the following:

28. Axle center member
29. Axle extensions

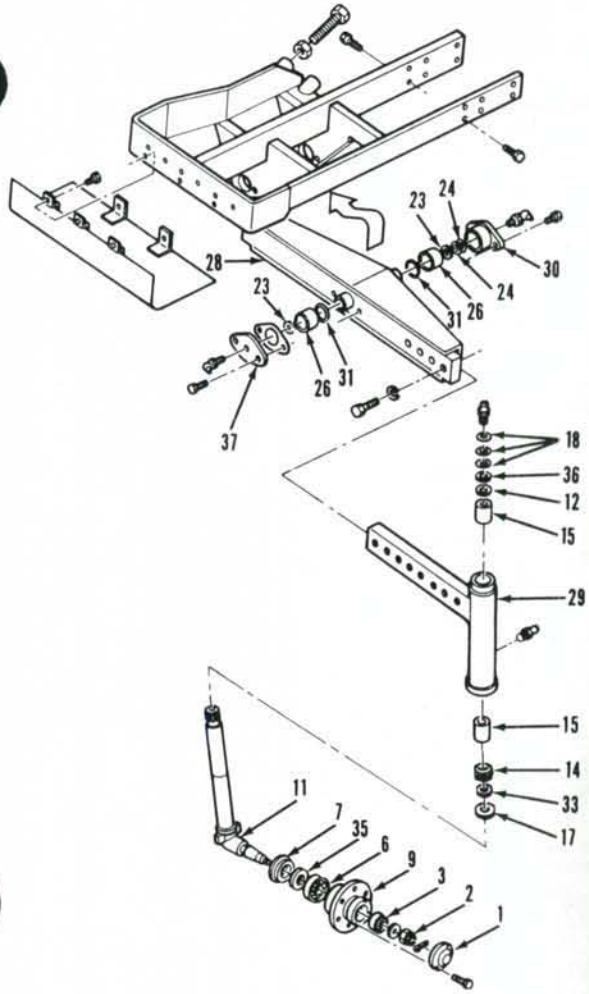

Fig. 5 – Exploded view of adjustable front axle assembly used on 1710 Offset tractors. Refer to Fig. 3 for legend except for the following:

35. Spacer
36. Spacer
37. Retainer

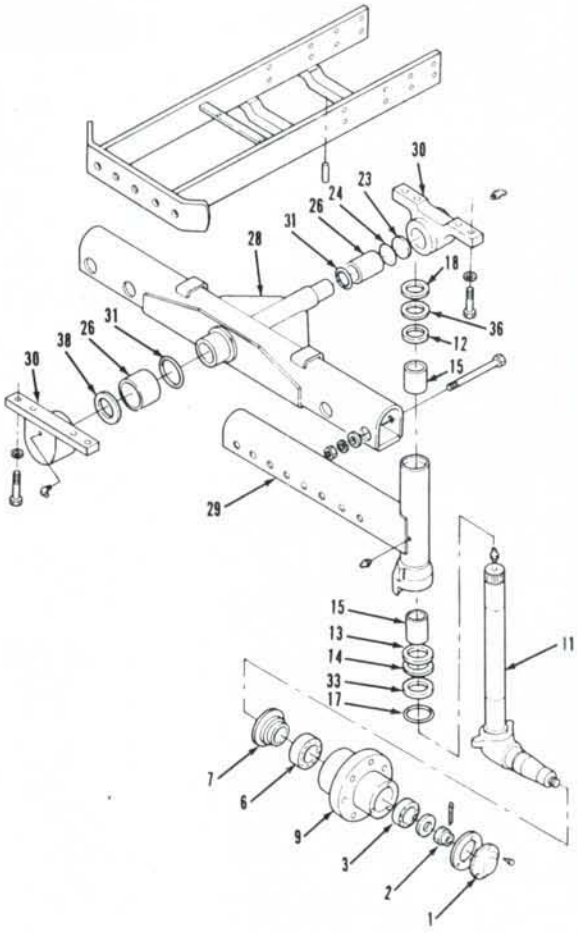

Fig. 6 – Exploded view of adjustable front axle used on Model 2110.

1. Cover
2. Nut
3. Outer bearing
6. Inner bearing
7. Seal
11. Spindle
12. Seal
13. Bearing washer
14. Needle thrust bearing
15. Bushings
17. "O" ring
18. Shim
23. Washers
24. Shim
26. Bushings
28. Axle center member
29. Axle extension
30. Pivot casting
31. "O" ring
33. Washer
36. Spacer
38. Thrust washer

between differential case trunnions and bushings exceeds 0.35 mm (0.014 inch). Use a suitable driver to install bushings and make certain bushings are recessed 4 mm (5/32 inch) in pivot carriers to allow for installation of "O" rings (14 and 35).

When reinstalling axle, observe the following: Move axle assembly carefully into position while sliding drive shaft splines and pinion shaft splines into coupling. Tighten screws attaching pivot brackets to front support, then check axle housing fore and aft end play. Desired end play is 0.30 mm (0.012 inch) or less. If end play exceeds 0.50 mm (0.020 inch), shims should be installed in front pivot bracket as required to obtain desired end play.

Stop bolts (49 – Figs. 7, 8 and 9) should be adjusted to provide correct turning radius and to prevent drag link interference. Stop bolt setting is measured from head of bolt to surface of mounting pad. Correct length is 24 mm (15/16 inch) for 1100 and 1200 models; 32 mm (1-¼ inches) for 1300 and 1500 models; 40 mm (1-9/16 inches) for 1700 and 1900 models.

4. **OUTER DRIVE ASSEMBLY.** To remove the outer drive, first remove wheel and tire. Detach drag link and tie rod from axle steering arm. Remove plates and seal parts (65 through 68 – Figs. 7, 8 and 9). Support the outer drive unit, then unbolt and remove king pins (47 and 50). Withdraw assembly from axle housing (43).

On early 1100 and 1200 models, universal joint (48 – Fig. 7) is integral with shaft for outer pinion gear (53). To remove universal joint first separate outer cover (63) from housing (57) and remove snap ring (55) from end of shaft. Tap universal joint and shaft out of bearings (52 and 54) and pinion gear. Remove wheel axle (64), gear (59), bearings and seals from outer cover and housing.

On late 1100 and 1200 models and all 1300, 1500, 1700 and 1900 models, pinion shaft is integral with the pinion gear (53 – Figs. 8 and 9) and universal joint (48) can be removed without disassembling outer drive unit. To disassemble outer drive, remove snap ring from inner end of pinion shaft (53). Unbolt and separate outer cover (63) from housing (57). Remove nut and washer (71), then tap wheel axle (64) out of bearings and gear. Remove pinion gear, bearings and seals from housing and cover.

On all models, backlash between pinion gear (53) and final drive gear (59) should be 0.20-0.40 mm (0.008-0.016 inch). If backlash exceeds 0.70 mm (0.028 inch), renew bearings or gears as required. Clearance between king pins (47 and 50) and bushings (45) should be 0.02-0.12 mm (0.001-0.005 inch). Maximum allowable clearance is 0.30 mm (0.012 inch).

To reassemble, reverse the disassembly procedure. Note that shims (70 – Fig. 8 and 9) are used on all except 1100 and 1200 models to adjust bearings (58 and 61) to zero end play.

1. "O" ring
2. Holder
3. Boot
4. Drive shaft housing
5. Snap rings
6. Universal joint
7. Drive shaft
8. "O" ring
9. Coupling
10. Pin (6 x 32 mm)
11. Seal
12. Rear carrier bracket
13. Bushing
14. "O" ring
15. Nut
16. Washer
17. Pinion bearing
18. Snap rings
19. Shims
20. Snap ring
21. Pinion gear
22. Ring gear
23. Differential carrier
24. Thrust washer
25. Spider gear
26. Spider shaft
27. Pin (5 x 40 mm)
28. Side gear
29. Thrust washer
30. Carrier cover
31. Carrier bearings
32. Shim
33. Shim
34. Center housing
35. "O" ring
36. Bushing
37. Carrier bracket
38. Plug
39. Gasket
40. Seal
41. Shaft
42. Pin
43. Housing
44. Thrust bearing assy.
45. King pin bearing
46. Bushing
47. Pin
48. Universal joint
49. Stop bolt
50. Pin & steering arm
51. Seal
52. Bearing
53. Outer pinion
54. Bearing
55. Snap ring
56. Fill plug
57. Housing
58. Bearing
59. Gear
60. Snap ring
61. Bearing
62. Seal
63. Outer cover
64. Wheel axle
65. Plate
66. Seal
67. Felt
68. Plate
69. Support assy.

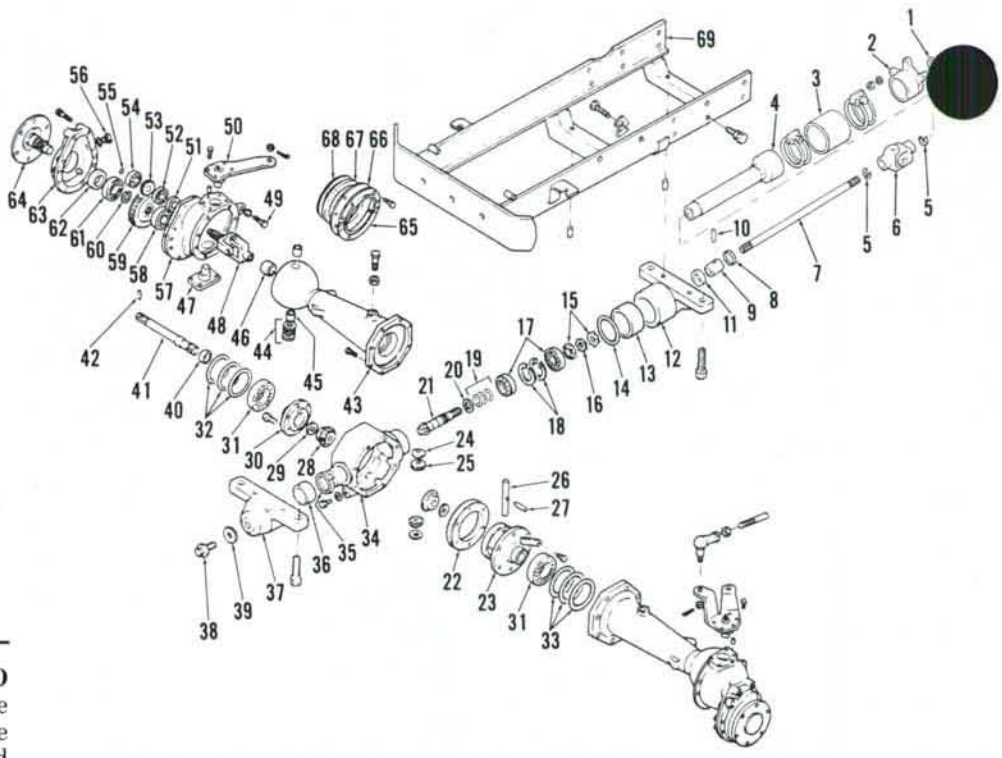

Fig. 7—Exploded view of front wheel drive axle used on 1100 and 1200 models.

5. **BEVEL DRIVE GEARS AND DIFFERENTIAL.** To disassemble front axle center section, first remove both outer drive assemblies as outlined in paragraph 4. Remove front axle assembly as outlined in paragraph 3. Drain oil from axle center housing.

The differential and ring gear (22 through 30—Figs. 7, 8 and 9) can be removed after unbolting and separating axle shaft housings from center housing (34). Bevel pinion (21) can be removed after removing nuts (15) from shaft.

Retain all shims for use in reassembly. Shims (19) are used to adjust mesh of bevel pinion and ring gear. Shims (32 and 33) are used to adjust differential carrier bearing preload and bevel gear backlash.

To disassemble differential unit, unbolt and remove cover (30) from carrier (23). Remove retaining pin (27), then slide pinion shaft (26) out of carrier. Remove pinion gears (25), side gears (28) and thrust washers (24 and 29).

Backlash between differential pinion gears (25) and side gears (28) should be 0.10-0.15 mm (0.004-0.006 inch) with a wear limit of 0.50 mm (0.020 inch) for 1100, 1200, 1300 and 1500 models. Backlash between pinion gears and side

1. "O" rings
2. Holder
4. Drive shaft housing
5. Snap ring
6. Coupling
7. Drive shaft
8. "O" ring
9. Coupling
11. Seal
12. Rear carrier bracket
13. Bushing
14. "O" ring
15. Nuts
16. Washer
17. Pinion bearings
18. Snap rings
19. Shims
20. Washer
21. Pinion gear
22. Ring gear
23. Differential carrier
24. Thrust washers
25. Spider gears
26. Spider shaft
27. Pin
28. Side gear
29. Thrust washer
30. Carrier cover
31. Carrier bearings
32. Shim
33. Shim
34. Center housing
35. "O" ring
36. Bushing
37. Carrier bracket
38. Plug
39. Gasket
40. Seal
41. Shaft
43. Housing
44. Thrust bearing
45. Bushings
46. Bearing (25 x 25 mm)
47. Pin
48. Universal joint
50. Pin & steering arm
51. Seal
52. Bearing
53. Outer pinion & shaft
54. Bearing
55. Snap rings
56. Fill plug
57. Housing
58. Bearing
59. Gear
61. Bearing
62. Seal
63. Outer cover
64. Wheel axle
65. Plate
66. Seal
67. Felt
68. Plate
69. Support assy.
70. Shims
71. Nut & washer
72. Adapter plates
73. Oil seal
74. Front wheel drive housing

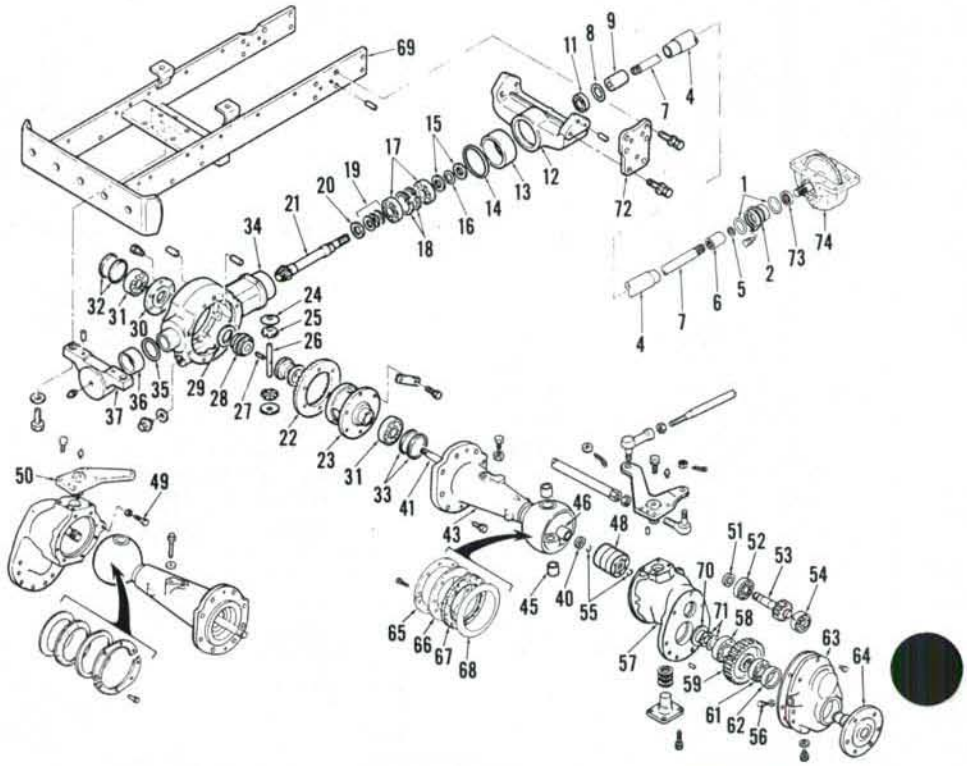

Fig. 8—Exploded view of front wheel drive axle assembly used on 1300 models.

gears for 1700 and 1900 models should be 0.05-0.10 mm (0.002-0.004 inch) with a wear limit of 0.45 mm (0.018 inch). Renew thrust washers (24 and 29) and/or gears if backlash is excessive. Diametral clearance between pinion gears (25) and shaft (26) should be 0.10-0.30 mm (0.004-0.012 inch).

Ring gear (22) and pinion (21) must be renewed as a matched set. Cap screws attaching ring gear to differential carrier (23) should be tightened to the following torque: 30-34 N·m (22-25 ft.-lbs.) on 1100 and 1200 models; 30-40 N·m (22-30 ft.-lbs.) on 1300 models; 60-70 N·m (44-51 ft.-lbs.) on 1500 models; 47-55 N·m (35-40 ft.-lbs.) on 1700 and 1900 models.

Install drive pinion (21) in center housing using shims (19) that were originally installed for initial assembly. To adjust pinion bearing preload, wrap a cord around pinion shaft as shown in Fig. 10. Use a spring scale to measure pull required to rotate the shaft. Tighten inner nut (15 – Fig. 7, 8 or 9) until spring scale reading is 5-6 kg (11-13 pounds) for 1100 and 1200 models; 5½-7 kg (12-13 pounds) for 1300 and 1500 models; 11-15 kg (24¼-33 pounds) for 1700 and 1900 models. Install washer (16) and tighten outer nut (15), then recheck rolling torque.

If differential carrier (23), cover (30), carrier bearings (31), ring gear and drive pinion, center housing (34) or axle shaft housings (43) were renewed, differential carrier bearing preload, ring gear to pinion backlash and gear mesh must be checked and adjusted as outlined in paragraphs 6 and 7. If none of these components are being renewed, reassemble differential and front axle installing original shims in their original locations.

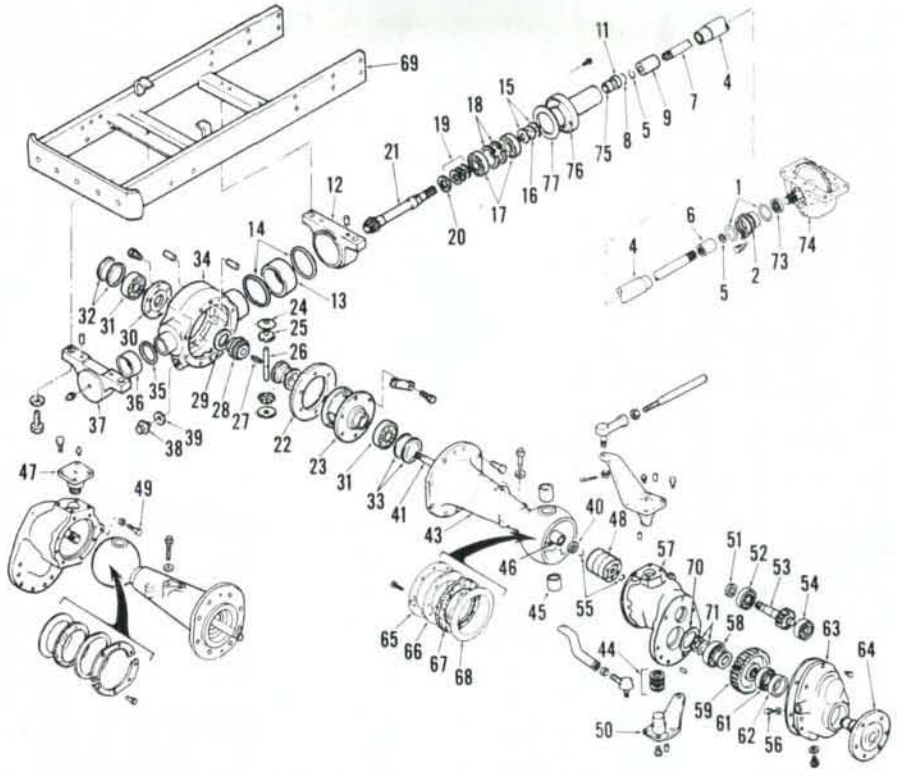

Fig. 9 – Exploded view of front wheel drive axle assembly typical of type used on 1500 and 1700 models. The front wheel drive axle used on 1900 models is similar.

1. "O" ring
2. Holder
4. Drive shaft housing
5. Snap ring
6. Coupling
7. Drive shaft
8. "O" ring
9. Coupling
11. Seal
12. Rear carrier bracket
13. Bushing
14. "O" rings
15. Nuts
16. Washer
17. Pinion bearings
18. Snap rings
19. Shims
20. Washer
21. Pinion gear
22. Ring gear
23. Differential carrier
24. Thrust washer
25. Spider gear
26. Spider shaft
27. Pin
28. Side gear
29. Thrust washer
30. Carrier cover
31. Carrier bearings
32. Shim
33. Shim
34. Center housing
35. "O" ring
36. Bushing
37. Carrier bracket
38. Plug
39. Gasket
40. Seal
41. Shaft
43. Housing
44. Thrust bearing
45. Bushings
46. Bushings
47. Pin
48. Universal joint
50. Pin & steering arm
51. Seal
52. Bearing
53. Outer pinion & shaft
54. Bearing
55. Snap rings
56. Fill plug
57. Housing
58. Bearing
59. Gear
61. Bearing
62. Seal
63. Outer cover
64. Wheel axle
65. Plate
66. Seal
67. Felt
68. Plate
69. Support assy.
70. Shims
71. Nut & washer
73. Oil seal
74. Front wheel drive housing
75. Bearing
76. Casting
77. Gasket

6. DIFFERENTAL CARRIER BEARING PRELOAD. To adjust carrier bearings, first attach right axle housing to center housing (34 – Fig. 7, 8 or 9). Place housing in vertical position with center housing up. Assemble sufficient thickness of shims (32) in housing bore to make sure that ring gear will not contact drive pinion, then install differential assembly in center housing. Be sure that carrier bearing is properly seated in axle housing bore.

Position left axle housing over differential assembly using more shims (33) than will be required to ensure that there is clearance between axle housing and center housing. Install four equally spaced bolts around axle housing and tighten finger tight. Use a feeler gage to measure gap between the two housings, then remove left axle housing and subtract shims from shim pack (33) equal to the measured gap.

This will provide correct preload for differential carrier bearings. Adjust ring gear to pinion backlash as outlined in paragraph 7.

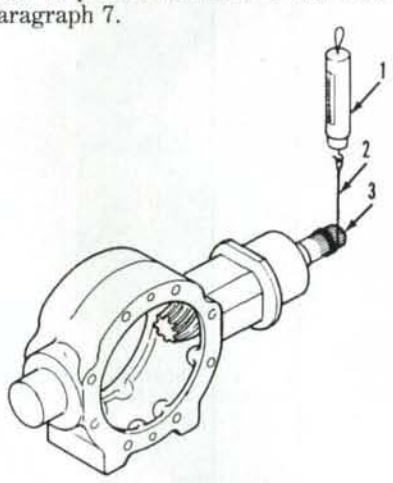

Fig. 10 – Wrap a cord (2) around pinion shaft (3) and use a spring scale (1) to check pinion rolling torque. Refer to text for adjustment.

7. RING GEAR TO PINION BACKLASH. The backlash between ring gear and pinion should be 0.10-0.15 mm (0.004-0.006 inch). With left axle housing removed, backlash can be checked using a dial indicator as shown in Fig. 11. To adjust backlash, move shims (32) from right axle housing to left axle housing.

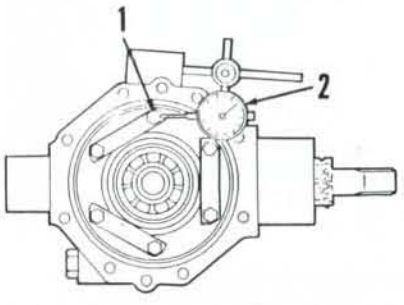

Fig. 11 – Use a dial indicator (2) to measure ring gear (1) backlash. Refer to text for adjustment.