Group 00
SPECIFICATIONS AND SPECIAL TOOLS

SPECIFICATIONS

Serial Numbers

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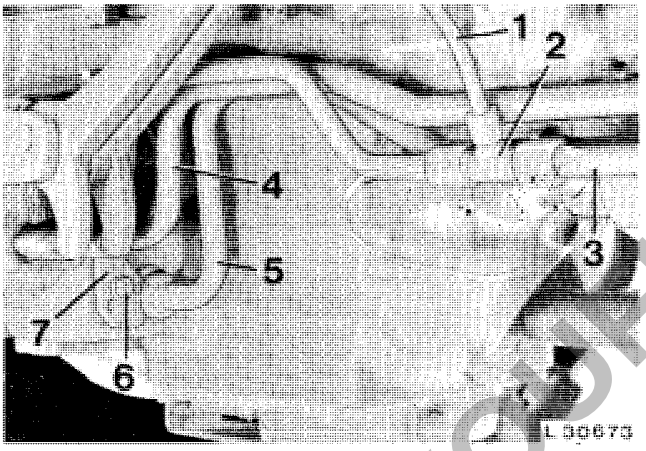
10. Drain coolant and disconnect upper and lower water hoses (2 and 3, Fig. 2) at radiator.

11. Disconnect fuel inlet line (5, Fig. 1) at fuel tank and at fuel transfer pump. Remove fuel inlet line.

12. Remove tool box and side frame (when equipped).

13. Remove both spacers (6, Fig. 1).

14. Drain transmission oil.



1—Power Steering Pressure Line
2—T-piece
3—Hydraulic Pump Pressure Line
4—Hydraulic Pump Inlet Line
5—Oil Cooler Return Line
6—Cap Screw
7—Clamp

Fig. 3 — Disconnecting Hydraulic Lines

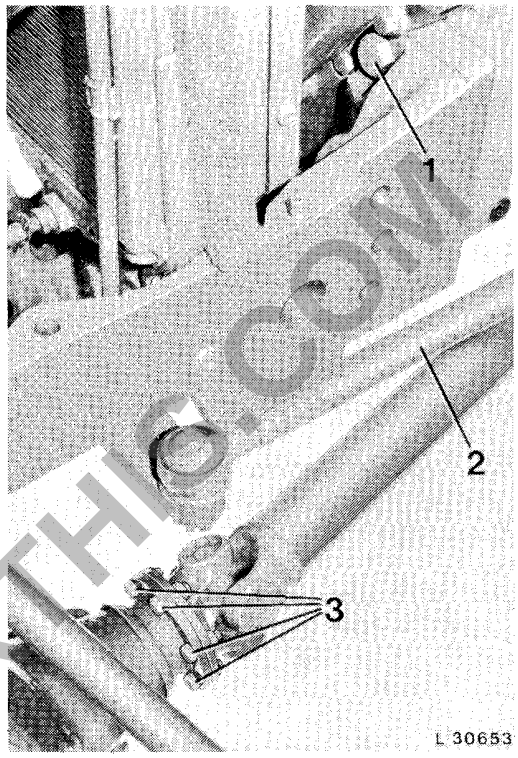
15. Remove cap screw (6, Fig. 3) and clamp (7), which supports hydraulic pump inlet line (4) and return line (5).

NOTE: On tractors not equipped with Hi-Lo shift unit, reverser transmission and independent PTO: Take care that the check valve installed in hydraulic pump inlet line is not lost when the inlet line is removed.

16. Disconnect pressure line (3, Fig. 3) at T-piece (2).

17. Disconnect drag line (2, Fig. 4) at bell crank.

IMPORTANT! Use plastic plugs to plug all hydraulic lines in order to prevent entry of dirt.



1—Cap Screw (4 used)
2—Drag Link
3—Cap Screws (6 used)

Fig. 4 — Attaching Points of Tractor Front End

18. *On tractors with MFWD,* remove cap screws (3, Fig. 4) and disconnect flange of jointed shaft at front axle drive hub.

19. Loosen clamping screws of hydraulic pump drive shaft.

20. Securely support rear of tractor under clutch housing.

21. Insert wooden blocks between front axle and front axle carrier to prevent the latter from tipping sideways.

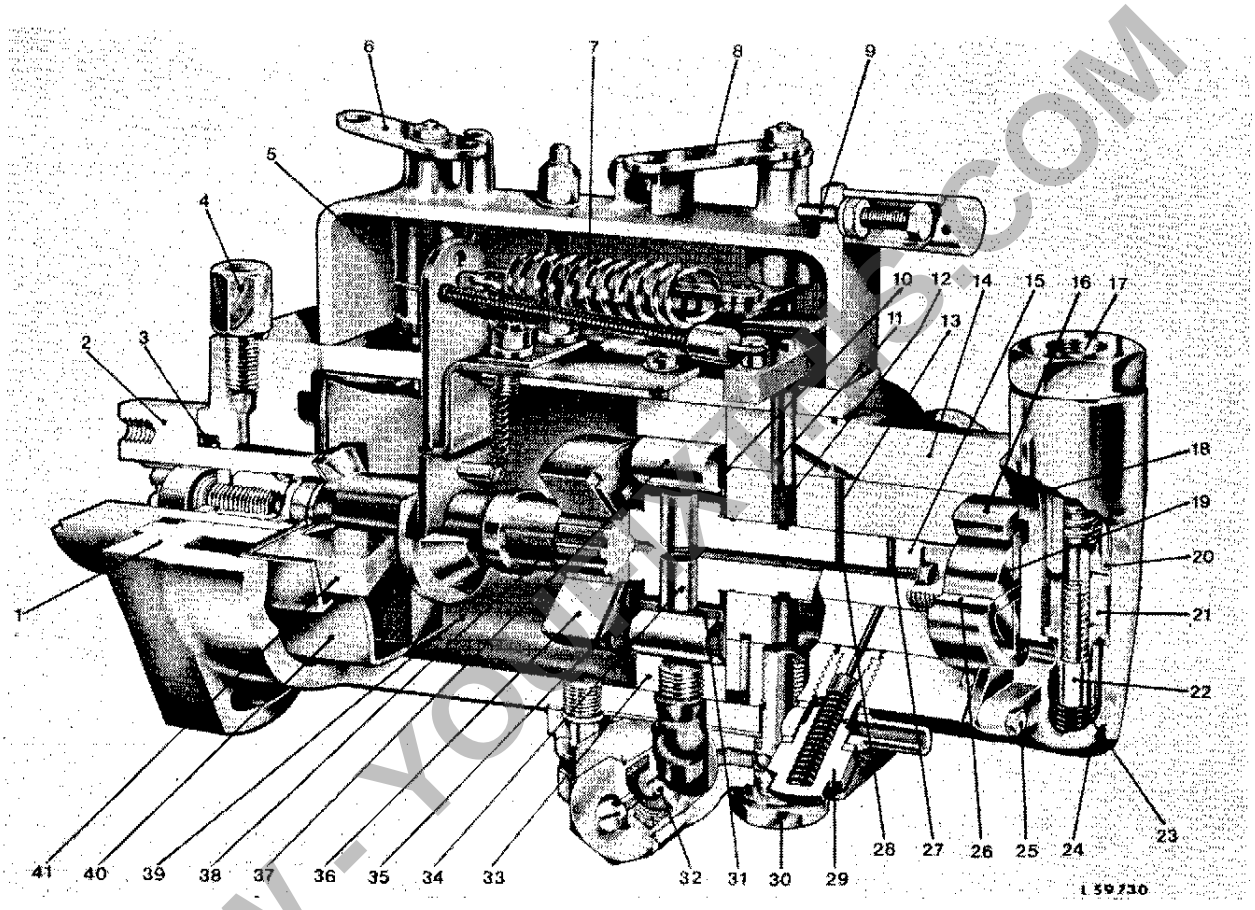
22. Attach front of tractor to a suitable hoist.

23. Remove the four cap screws (1, Fig. 4) and both cap screws located at rear of front axle carrier and separate front end from engine.

⚠ CAUTION! Take measures to prevent front of tractor from tipping to the front. If tank contains too much fuel, drain it or safely support front of tractor.

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Group 15
ROTO DIESEL FUEL INJECTION PUMP

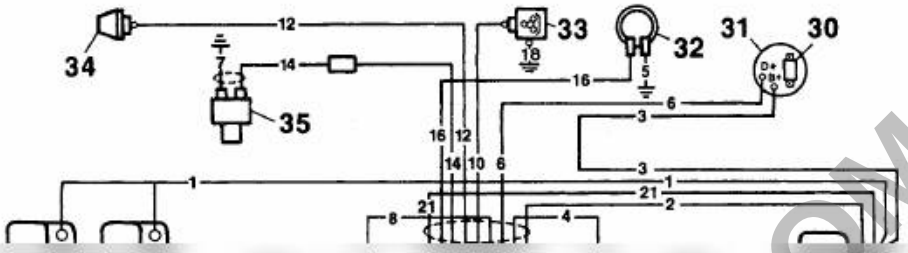


1—Pump Housing
2—Drive Hub
3—Seal Ring
4—Leak-off Adapter
5—Governor Housing
6—Shut-off Lever
7—Governor Spring
8—Speed Control Lever
9—Fast Idle Adjusting Screw
10—Real Adjusting Plate
11—Metering Valve
12—Metering Valve Chamber
13—Metering Channel
14—Pump Head
15—Pump and Distributor Rotor
16—Eccentric Sleeve of Transfer Pump
17—Fuel Inlet
18—Seal
19—Rotor of Transfer Pump
20—Filter
21—Pressure Regulating Valve Sleeve
22—Pressure Regulating Valve Piston
23—Bleed Spring
24—End Plate
25—Cap Screw
26—Rotor Blades of Transfer Pump
27—Distributor Channel
28—Radial Bore (one bore for each cylinder)
29—Pressurizing Valve (one for each cylinder)
30—Hollow Screw
31—Race
32—Automatic Hydraulic Speed Advance
33—Cam Ring
34—Plunger
35—Front Adjusting Plate
36—Drive Plate
37—Cam Roller
38—Pump Shaft
39—Internal Chamber of Pump Housing
40—Governor Cage
41—Flyweights

Fig. 1 — Roto Diesel Fuel Injection Pump, Sectional View

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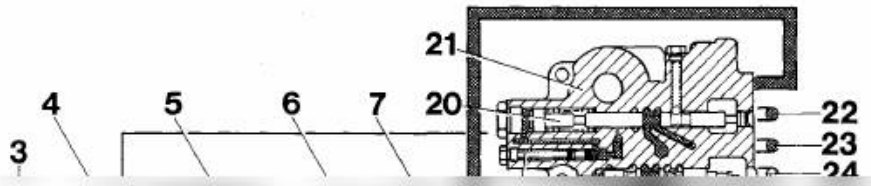
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STANDARD TORQUES

RECOMMENDED TORQUES IN N•m AND FT-LBS FOR UNC AND UNF CAP SCREWS		
Head marking (identifying strength)	 or 10.9*	 or 12.9**

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2040 and 2240 Tractors (Serial No. 350,000L-)

Technical Manual
TM-1221 (Nov-80)

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OOG

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GREASE

Lithium saponified multipurpose grease (JDM J13 C3) or its equivalent is recommended for all grease fittings. Grease must be free of dust and other contamination.

Grease the tractor only when the engine is not running!

STORING LUBRICANTS

The tractor can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture, and other contamination.

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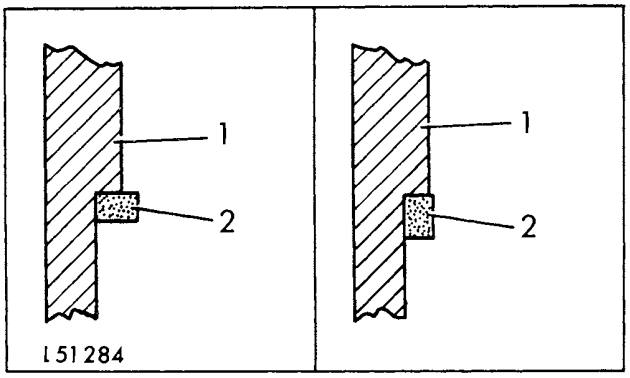
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NOTE: Do not soak packings and O-rings in oil before installing them as they would swell up and could get damaged when installing the cylinder liners.



Improper Installation *Proper Installation*

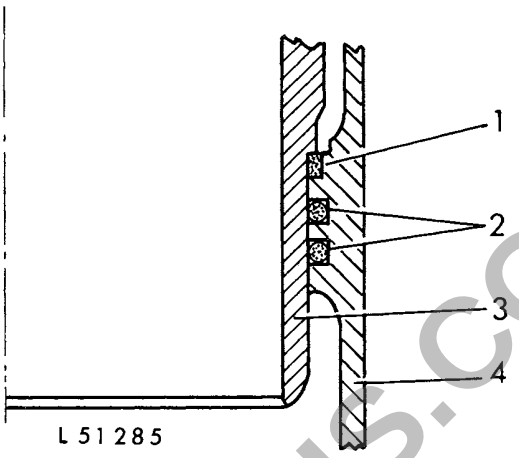
1—Cylinder Liner
2—Packing

Fig. 5 — Installing Rectangular-Section Packing

4. Apply AR54749 lubricating soap to new packing 1 (Fig. 6) and install over liner until it contacts liner shoulder. Be sure packing is not twisted or crimped. Also make sure inner flank of packing contacts liner face when packing is installed.

5. Apply AR54749 lubricating soap to two new O-rings 2 (Fig. 6) and install in grooves of cylinder block.

NOTE: See packing instructions for sequence of installing O-rings.



1—Rectangular Section Packing
2—O-Rings
3—Cylinder Liner
4—Cylinder Block

Fig. 6 — Lower Liner Sealing

NOTE: Before installing liner, make sure O-rings are properly seated in cylinder block grooves. If part of an O-ring projects into bore for liner, the O-ring could be pressed onto groove edge, thus getting damaged without the serviceman noticing it.

6. Slide liner together with shim into its bore in cylinder block. Observe the mark applied during disassembly to identify the liner and its corresponding bore in the block. Work the liner gently in by hand. Finally use a block of hardwood to drive the liner into its proper position by tapping lightly with a hammer.

IMPORTANT! Do not yet compress packing.

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	Specifications
Nozzle in service	20685 ± 345 kPa (207 ± 3.5 bar)(3000 ± 50 psi)
Maximum opening pressure (Difference between cylinders)	690 kPa (69 bar) (100 psi)
Spray angle — degrees	152

Torques

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REPAIR

Check air intake line for proper condition and tight connections, especially the rubber hoses between air cleaner and intake manifold.

INSTALLATION

When installing the air cleaner, reverse removal procedure.

IMPORTANT! Do not operate engine without filter element or dust unloading valve.

Inspecting the Air Intake System

1. Clean air cleaner.

2. Using a commercial vacuum gauge with a range of up to 100 mbar (40 in. water), check air intake system for restrictions.

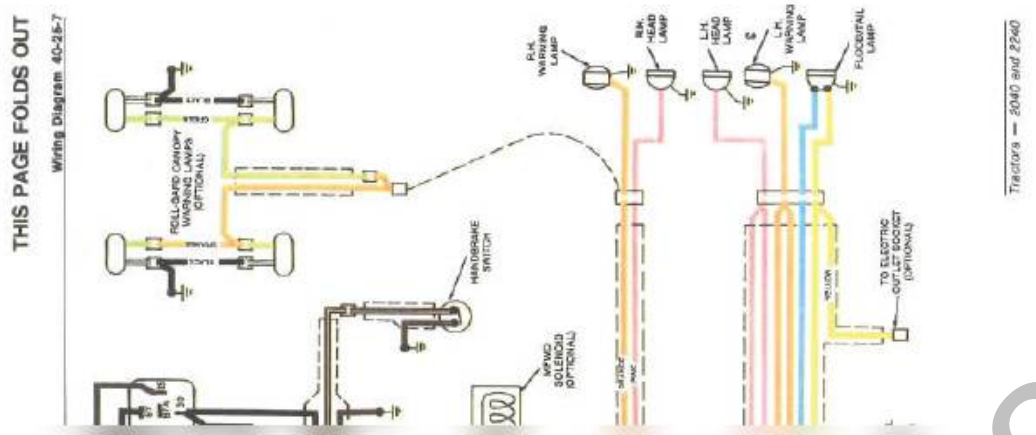
3. Remove restriction indicator switch and connect vacuum gauge.

4. Run engine at 2660 rpm.

5. If the air cleaner is not restricted, the gauge should show a vacuum of approx. 35 mbar (14 in.) water head. However, it should not exceed 60 mbar (25 in.). If this happens, the free flow of air is restricted. Find and remove the cause of restriction.

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Hi-Lo Shift Unit

Transmission Input Shaft

O.D. of shaft in hub of clutch drum	40.67 to 40.87 mm	(1.601 to 1.609 in.)

Drive Shaft

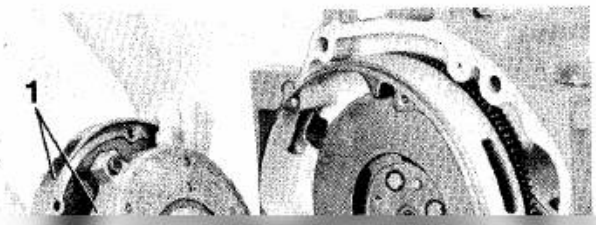
Dia. of shaft in planet pinion carrier bushing	31.98 to 31.99 mm	(1.259 to 1.260 in.)

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INSTALLATION



1. Install flywheel (if necessary), tighten attaching screws crosswise to 160 N•m (120 ft-lbs) torque.

2. Insert centering tool No. 19.58-90.486 (see 2, Fig. 10) in clutch assembly and slide clutch disk on tool with side marked "Flywheel Side" facing the flywheel (protruding hub end of torsion damper facing flywheel).

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TESTING

If the reverser unit is not functioning properly, use the following test procedures to locate the difficulty before attempting to remove and disassemble the reverser control valve assembly or clutch packs.

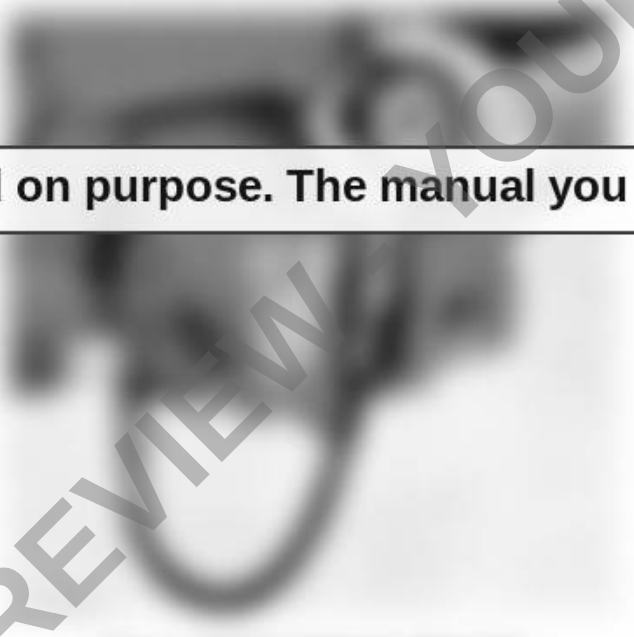
Oil Supply

If a reverser malfunction is observed or if tests are

Apply hand brake, start the tractor, and set the engine speed at 2100 rpm.



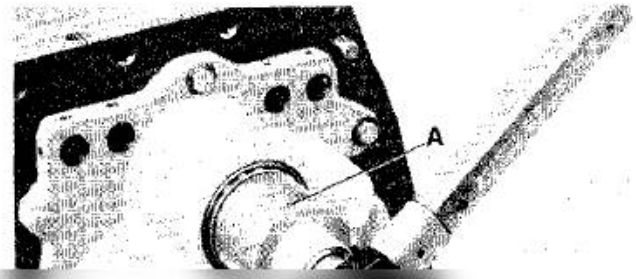


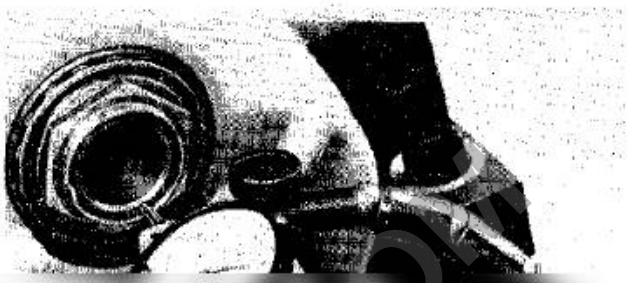


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REMOVAL

For removal of final drives, see Section 10, Group 20.

DISASSEMBLY

1. Remove lock plate (29, Fig. 2) and unscrew cap screw (28) from rear axle.

5. Check both bearing cones (9) and (23) for serviceability.

6. Replace cap screw (28) with a new one.

7. Check planet pinion shafts (32) with needle bearings (35) and thrust washers (33) for wear or damage and replace, if necessary. Always replace **all** pinion shaft needle bearings.



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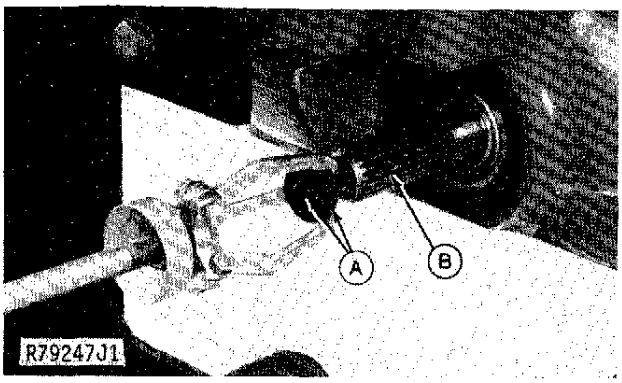
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REMOVAL

NOTE: The MFWD clutch can be removed without separating the tractor.

1. Drain transmission oil and remove universal jointed drive shaft.
2. Remove oil pan from under the clutch housing.
3. Remove three attaching cap screws (28, Fig. 13) from bearing quill (27) and lift off quill together with oil seal (26) and O-ring (25).
4. Remove shims (24).



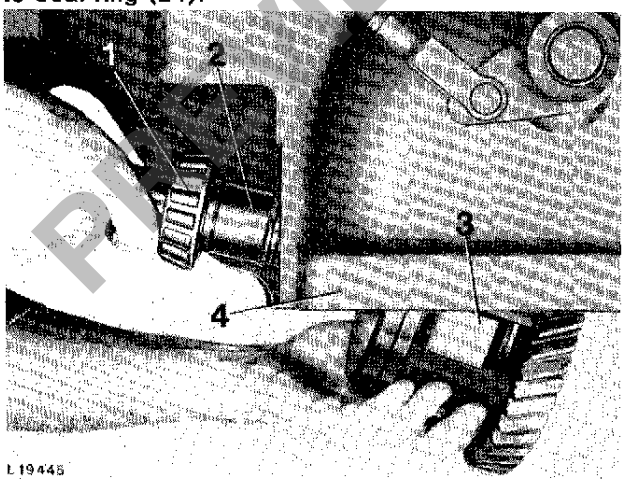
A—JDG-70-2 Puller Screw with Washer **B—Clutch Shaft**

Fig. 10 — Pulling Clutch Shaft

5. Install JDG-70-2 Puller Screw with washer (A, Fig. 10) in end of shaft (B).
6. Attach a slide hammer puller as shown in Fig. 10.

NOTE: When clutch shaft is removed, spacer (2, Fig. 13) and bearing cone (1) are free to drop out of clutch housing.

7. Pull shaft until bearing cup just comes from housing. Support clutch assembly to avoid damage to seal ring (21).



1—Tapered Roller Bearing Cone **3—Disk Clutch**
2—Clutch Shaft **4—Clutch Housing**

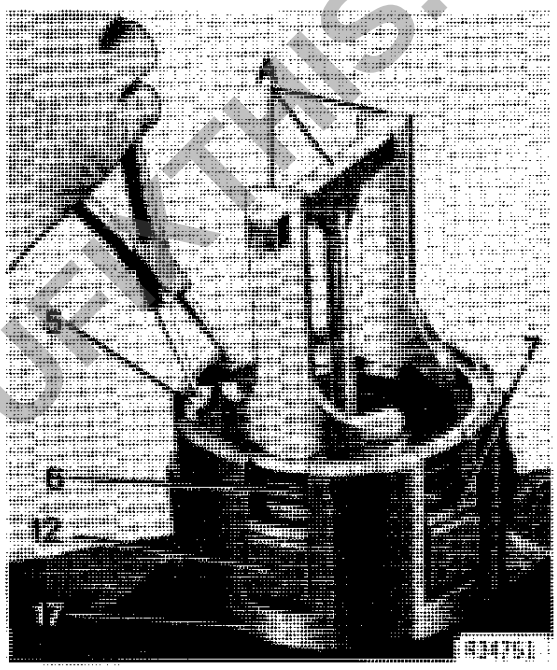
Fig. 11 — Removal of Disk Clutch

8. As shown in Fig. 11, lower clutch disk assembly (3) and holding in this position, pull out clutch shaft (2) together with tapered roller bearing cone (1) and spacer. Lower and remove the clutch assembly, and catch spacer and bearing cone.

DISASSEMBLY

1. Pull tapered roller bearing cone (23, Fig. 13) from clutch shaft (21).

2. Pull clutch hub (4) out of clutch drum (18) and remove thrust washer (16).



A—JDT-24A Spring Compressor **7—Release Plate**
5—Snap Ring **12—Release Jaws**
6—Belleville Springs **17—Clutch Drum**

Fig. 12 — Disassembly of MFWD Clutch, Using JDT-24A Spring Compressor

3. Use JDT-24A Spring Compressor (A, Fig. 12) to compress spring washers (6), and remove snap ring (5) from groove of clutch drum as shown in Fig. 12.

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SPECIAL TOOLS*

Power Steering

No.	Description	Use
JD 252	Driving tool	Driving in oil seal of steering shaft in clutch housing and bushings in steering shaft cover and clutch housing
JDH-41A	Steering valve service set	Repairing steering valve

**Order From: Service Tools, Box 314, Owatonna, Minnesota 55060*

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Selective Control Valves — Continued

Adjustments

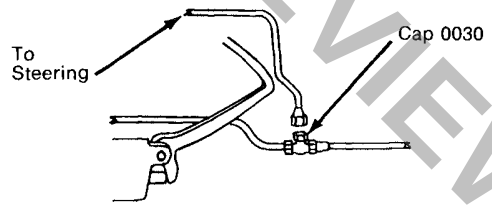
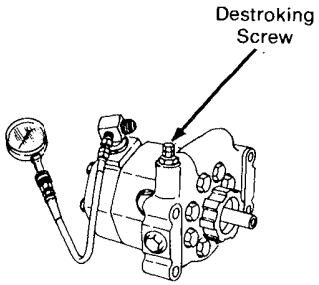
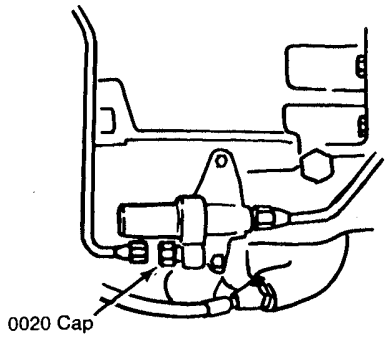
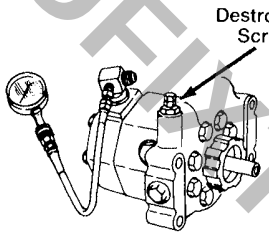
Metering Valve

Flow rate at 10300 kPa (103 bar; 1500 psi) and 2500 rpm engine speed	7 to 45 L/min.	(2 to 12 gpm)
Metering valve arm in center position	22 to 26 L/min.	(6 to 7 gpm)

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STEP	SEQUENCE	RESULT
4 **You have excessive leakage to sump. Remove oil line to steering valve. Cap tee.**  **Note: Reconnect oil line after testing or repair.**	**Observe inlet pressure gauge before and after destroking pump as in step 3.**  1.38 Cubic in.	**0-3 psi increase: Repair steering valve. Then . . .** → **GO TO STEP 3** **More than 3 psi increase:** → **GO TO STEP 5**
5 **If SCV return oil line is connected to the ported filter cover, go to step 10.** **Remove oil line between PCV and SCV inlet. Cap PCV.**  **Note: Reconnect oil line after testing or repair.**	**Observe inlet pressure gauge before and after destroking main pump as in step 3.**  1.38 Cubic in.	**0-3 psi increase: Repair SCV. Then . . .** → **GO TO STEP 3** **More than 3 psi increase:** → **GO TO STEP 10**

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Inspection

Pump Housing (Fig. 5)

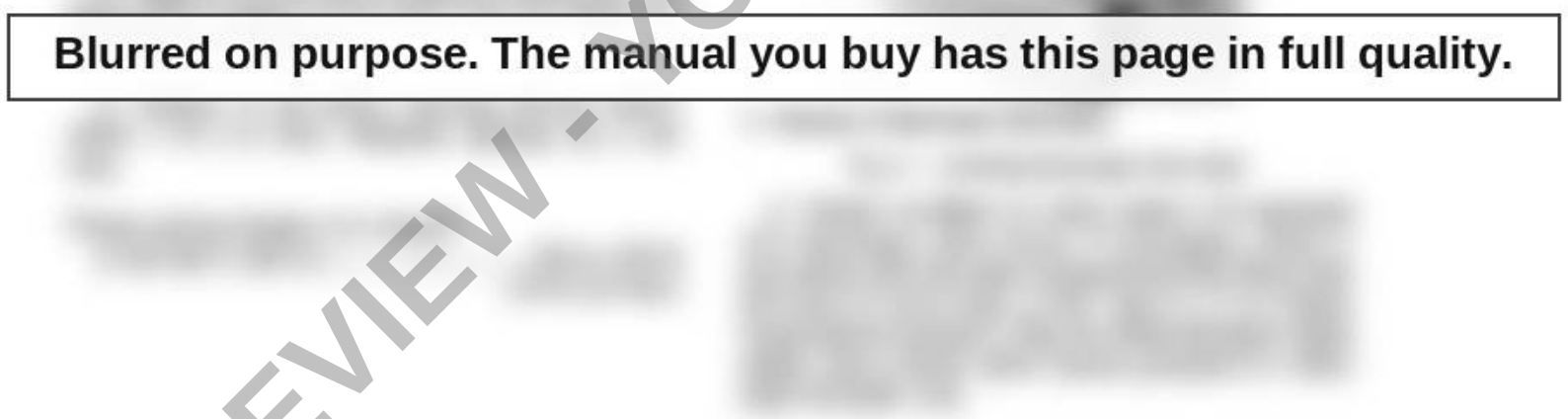
1. Check clearance between finished face of pump housing and shoulder of cam and race bore. Wear at this point will give pump shaft excessive end play.

2. Check needle sleeve in pump housing for wear

Valves (Fig. 5)

1. Inspect intake valves for damaged springs (11), valve guides (12), balls (10) and valve seats (8). Replace valve seat O-rings (9).

2. Check discharge valve disks (15) for wear or damage and check their diameter. Examine valve guides (17), springs (16) and valve bodies (18) for damage and replace if necessary. Replace plug



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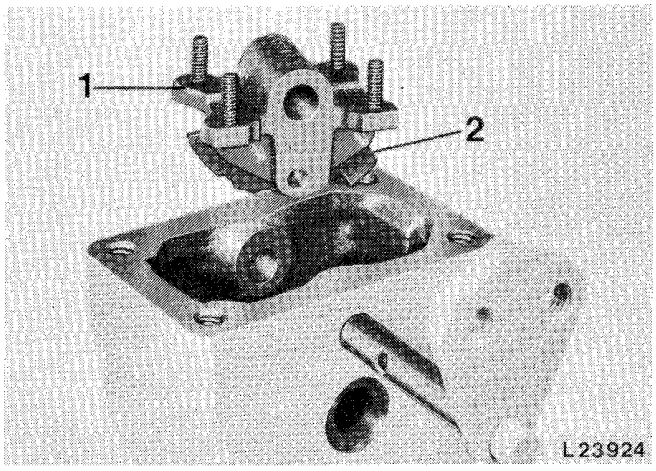
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Assembly

1. Assemble selective control valve by reversing sequence of steps explained under "Disassembly."

2. Use new O-rings and back-up rings. Dip all parts in clean transmission oil, ensuring that all parts remain thoroughly clean.



1—Rocker
2—Detent Cam

Fig. 8 — Installation of Detent Cam

3. Install cam plates (3 and 5, Fig. 7). The tapered end of cam plates must point toward front of valve housing assembly. Note that the "float" cam is shorter than the "regular" cam and is installed on the numbered side of the housing (on the left, as you look into the rocker cavity).

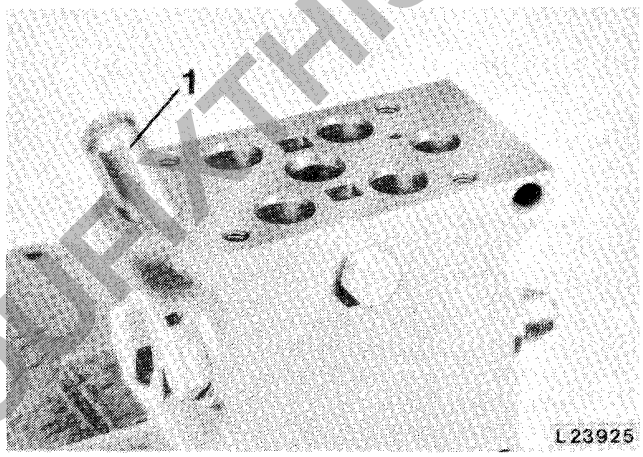
4. Insert detent follower in housing.

5. Attach cam to rocker. Install rocker assembly (Fig. 8), making sure follower is located on rocker.

6. Secure cam plates by means of special screws. Do not tighten special screws until cam plates have been adjusted. Install control lever arm and shaft in housing and rocker so that the arm faces top side of housing. Drive in spring pin securing shaft to rocker.

7. Install pressure valves and return valves. Make sure that valve rollers are properly seated on cam plates (see Fig. 1). Use the correct spring for each valve.

8. Install flow control valve spring and flow control valve.



1—Driver JDH-28

Fig. 9 — Installation of Inner Detent Piston Guide

9. Drive inner detent guide into detent bore with JDH-28 Driver (Fig. 9).

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