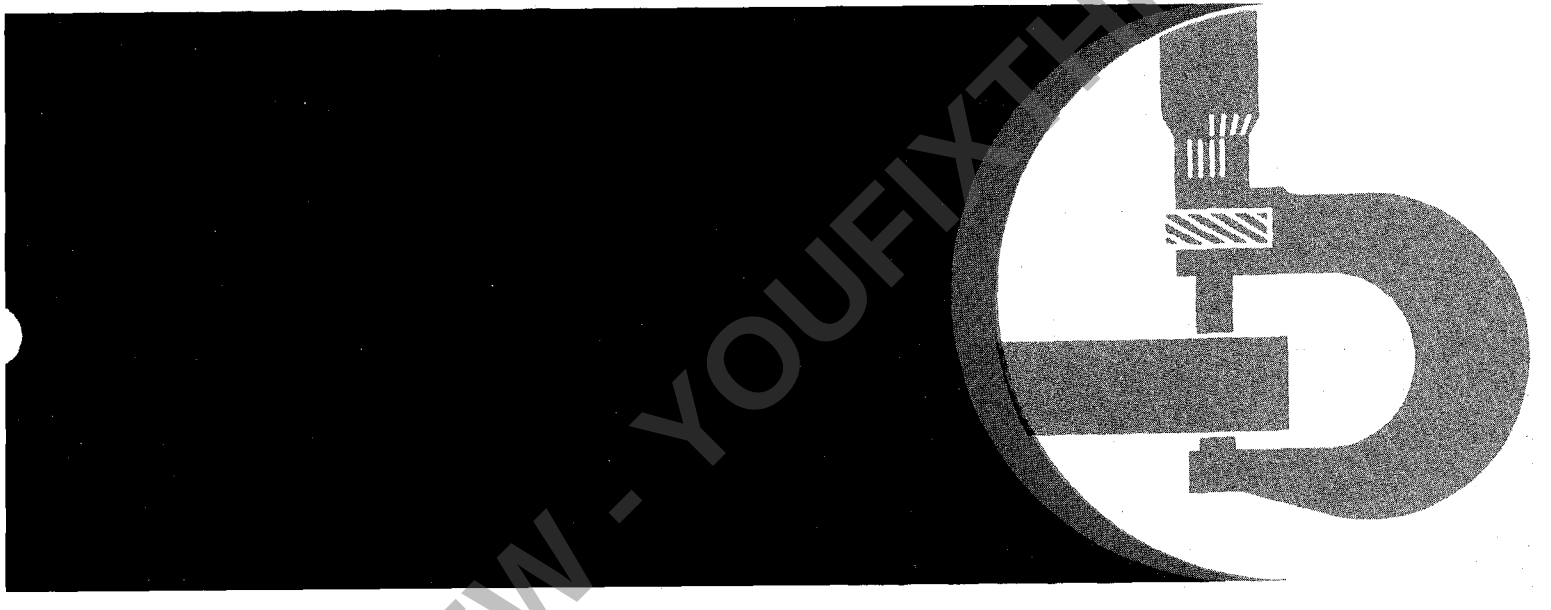
John Deere JD300-B Loader and Backhoe Loader



TECHNICAL MANUAL

TM-1087
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JD300-B LOADER AND BACKHOE LOADER

Technical Manual
TM-1087 (Dec-78)

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The specifications and design information contained in this manual were correct at the time it was printed. It is John Deere's policy to continually improve and update our machines. Therefore, the specifications and design information are subject to change without notice. Wherever applicable, specifications and design information are in accordance with SAE and ICED standards.

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MAINTENANCE WITHOUT ACCIDENT
WORK SAFELY



T27999N

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

EVERY EMPLOYER HAS A SAFETY PROGRAM. KNOW WHAT IT IS!



T27501N

Consult your shop foreman for specific instructions on a job, and the safety equipment required.

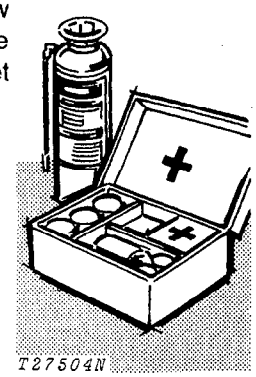
For instance, you may need: Hard hat, safety shoes, safety goggles, heavy gloves, reflector vests, ear protectors, respirators.



T27502N

BE ALERT!

Plan ahead—work safely—know how to use a first-aid kit and a fire extinguisher—and where to get aid and assistance.



T27504N

Maintenance Area

Make sure the maintenance area is adequately vented.

Keep maintenance area CLEAN AND DRY. Oily and wet floors are slippery; greasy rags are a fire hazard; wet spots are dangerous when working with electrical equipment.

Store starting aids in a cool and well-ventilated place, out of the reach of unauthorized personnel.

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Section 10
GENERAL

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Group 5
GENERAL MACHINE SPECIFICATIONS

(Specifications and design subject to change without notice. Wherever applicable specifications are in accordance with ICED and SAE Standards. Except where otherwise noted, these specifications are based on a unit equipped with 14.9-24, 6 ply rating, R4 rear tires; 11L-15, 8 ply rating, F-3 front tires; 3/4 cu. yd. (0.57 m³) utility bucket, and standard equipment.)

Power

@ 2500 engine rpm):	SAE	DIN
Gross	46 hp (34.3 kW*)	
Net	43 hp (32.1 kW)	45.7 PS

Net engine flywheel power is for an engine equipped with fan, air cleaner, water pump, lubricating oil pump, fuel pump, alternator, and muffler. Gross engine power is without fan. Flywheel power ratings are under SAE standard conditions of 500 ft. altitude and 85°F temperature and DIN 70 020 standard conditions of 760 mm Hg barometer (sea level) and 20°C temperature.

*In the International System of Units (SI), power is expressed in kilowatts (kW).

Engine: John Deere 3-cylinder diesel, valve-in-head, 4-stroke cycle

Bore and stroke ..... 3.86 x 4.33 in. (98x110 mm)
Piston displacement ..... 152 cu. in. (2491 cm³)
Compression ratio ..... 16.2 to 1
Maximum torque@ 1,300 rpm ..... 110 lb-ft (149 Nm) (15.2 kg-m)
NACC or AMA (U.S. Tax) horsepower 17.88
Main bearings 4
Lubrication ..... Pressure system with full flow filter
Cooling ..... Pressurized with thermostat and fixed bypass
Fan ..... Suction
Air cleaner ..... Dry
Electrical system ..... 12 volt with alternator
Batteries (two 12 volt) ..... Reserve capacity: 220 minutes

Engine Clutch ..... Foot-operated, single 10 in. (254 mm) plate with reverser; single 11 in. (280 mm) without reverser

Transmission:
Constant mesh, 8 speeds forward, 8 reverse. Optional hydraulic direction reverser permits no-clutch reversing in all gears.

Gear:	Travel Speeds mph		km/h	
	Fwd.	Rev.	Fwd.	Rev.
1	1.3	1.6	2.1	2.6
2	1.9	2.2	3.1	3.5
3	2.9	3.3	4.7	5.3
4	4.0	4.7	6.4	7.6
5	5.3	6.2	8.5	10.0
6	7.6	8.8	12.2	14.2
7	11.2	13.0	18.0	20.9
8	15.7	18.3	25.3	29.4

Final Drives ..... Inboard, planetary

Brakes ..... Hydraulically actuated, fully enclosed wet-disk. Self-equalizing. Foot-operated individually or simultaneously

Hydraulic System: Closed-center
Max. pressure ..... 2350 psi (16 203 kPa (165.2 kg/cm²
Loader control ..... Single-leve
Pump ..... Piston, constant pressure, variable-displacement 28 gpm (106 L/min) at 2500 engine rpm
Filter ..... 25 micron steel-enclosed paper cartridge in retur

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Group 10
PREDELIVERY, DELIVERY, AND AFTER-SALE SERVICES

TEMPORARY UNIT STORAGE

After receiving your unit from the factory and before putting the machine into temporary storage, perform the following checks and services.

For long term storage (over 30 days) information, consult your JD300-B operator's manual.

1. Check battery electrolyte level and charge the battery, if necessary.

2. Check engine coolant level. Maintain midway between the radiator core and filler neck.

3. Fill the fuel tank.

4. Check crankcase oil level. Oil must be between marks on dipstick after machine has been shut down for 10 minutes.

5. Relieve hydraulic pressure by stopping engine, lowering bucket and backhoe and operating control levers and steering wheel until system fails to respond.

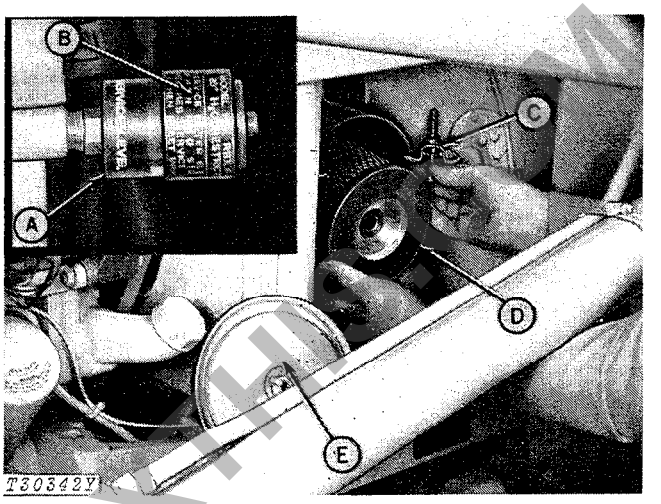
6. Reduce shipping pressure of all tires to the inflation pressure listed on page 10-10-2.

PREDELIVERY SERVICE

Because of the shipping factors involved, plus extra finishing touches that are necessary to promote customer satisfaction, proper predelivery service is of prime importance to the dealer and the customer.

Use the following list when preparing a unit for delivery to the customer.

1. Air Cleaner



A—Restriction Indicator
B—Red Signal
C—Wing Nut
D—Element
E—Cover

Fig. 1-Air Cleaner

Check air filter restriction indicator (A). If red signal can be fully seen, remove element (D) and clean. Install a new element if necessary.

Element checked	*Yes*	*No*

2. Radiator

Check engine coolant level.

CAUTION: Do not remove radiator filler cap unless the engine is cool. Then loosen the cap slowly to the stop to release pressure before removing the cap.

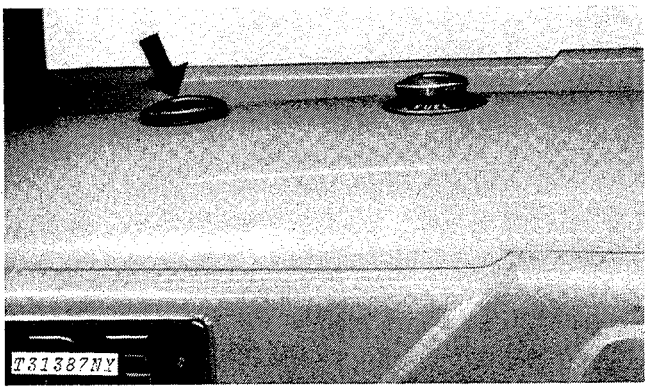


Fig. 2-Radiator Filler Cap

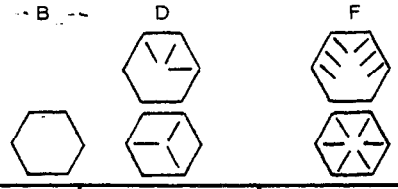
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35. Accessible Hardware Torque Values

Check all accessible bolts and nuts for proper tightness. If hardware seems loose, tighten it to the proper torque. The table below gives correct torque values for various bolts and cap screws. Most hardware used is high-strength (note dashes on hex. heads).

RECOMMENDED TORQUE IN LB-FT [kg/m]
COARSE AND FINE THREADS



Bolt Diameter	Plain Head	Three Dashes	Six Dashes
1/4	Not used	10[1.4]	14[1.9]
5/16	Not used	20[2.8]	30[4.1]
3/8	Not used	35[4.8]	50[6.9]
7/16	35[4.8]	55[7.6]	80[11.1]
1/2	55[7.6]	85[11.8]	120[16.6]
9/16	75[10.4]	130[18.0]	175[24.2]
5/8	105[14.5]	170[23.5]	240[33.2]
3/4	185[25.6]	300[41.5]	425[58.8]
7/8	160[22.1]	445[61.5]	685[94.7]
1	250[34.6]	670[92.5]	1030[142.4]
1-1/8	330[45.6]	910[125.8]	1460[201.9]
1-1/4	480[66.4]	1250[172.8]	2060[284.8]

T30882

Fig. 96-Torque Chart

The types of bolts and cap screws are identified by head markings as follows:

Plain Head: regular machine bolts and cap screws.

3-Dash Head: tempered steel high-strength bolts and cap screws.

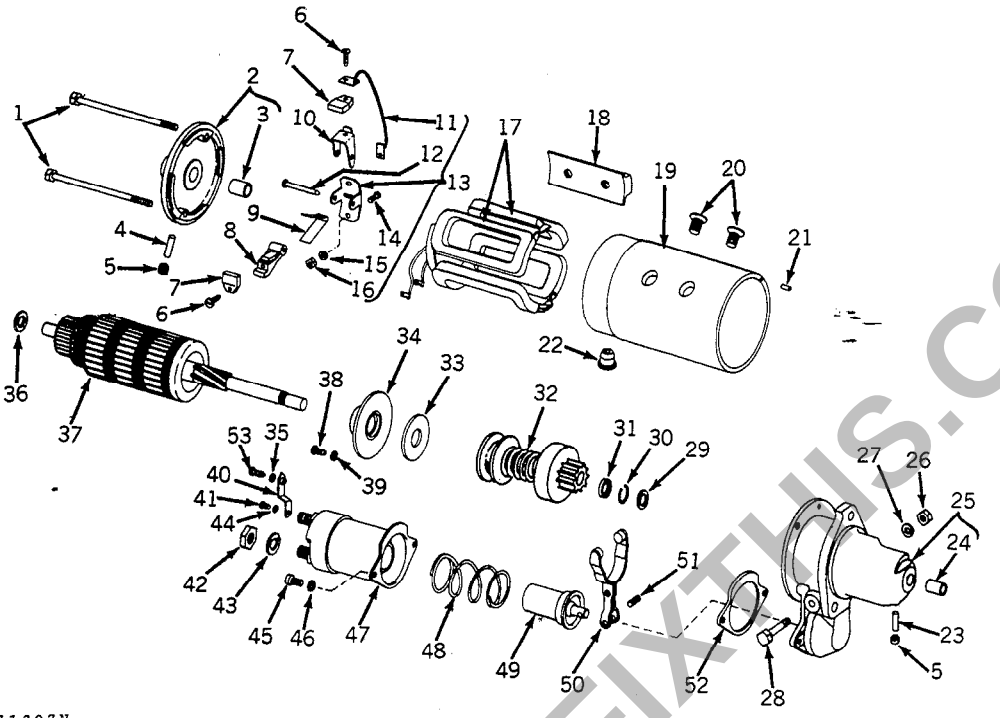
6-Dash Head: tempered steel extra high-strength bolts and cap screws.

Machine bolts and cap screws 7/8 inch [22 mm] and larger are sometimes formed hot rather than cold, which accounts for the lower torque.

All accessible hardware torqued *Yes* *No*

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1—Through Bolt (2 used)
2—Commutator End Frame
3—Commutator Bushing
4—Commutator End Wick
5—Pipe Plug (2 used)
6—Drive Screw (4 used)
7—Brush (4 used)
8—Insulated Brush Holder (2 used)
9—Brush Spring (4 used)
10—Ground Brush Holder (2 used)
11—Lead Assembly (2 used)
12—Brush Pin (2 used)
13—Brush Support Package
14—Machine Screw (4 used)
15—Lock Washer (4 used)
16—Nut (4 used)
17—Field Coil Assembly
18—Pole Shoe (4 used)
19—Frame
20—Pole Shoe Screw (8 used)
21—Dowel Pin
22—Grommet
23—Drive End Wick
24—Drive End Bushing
25—Drive Housing
26—Jam Nut
27—Lock Washer
28—Shift Lever Screw
29—Drive End Thrust Collar
30—Retaining Ring
31—Piston Stop
32—Motor Drive
33—Brake Washer
34—Center Bearing Plate
35—Lock Washer
36—Commutator End Spacer Washer
37—Armature
38—Center Bearing Screw
39—Lock Washer
40—Connector
41—Machine Screw
42—Nut
43—Lock Washer
44—Internal Tooth Lock Washer
45—Machine Screw (2 used)
46—Lock Washer (2 used)
47—Solenoid Switch Assembly
48—Plunger Return Spring
49—Solenoid Switch Plunger
50—Shift Lever
51—Spring Pin
52—Solenoid Gasket
53—Machine Screw

Fig. 7-Starting Motor

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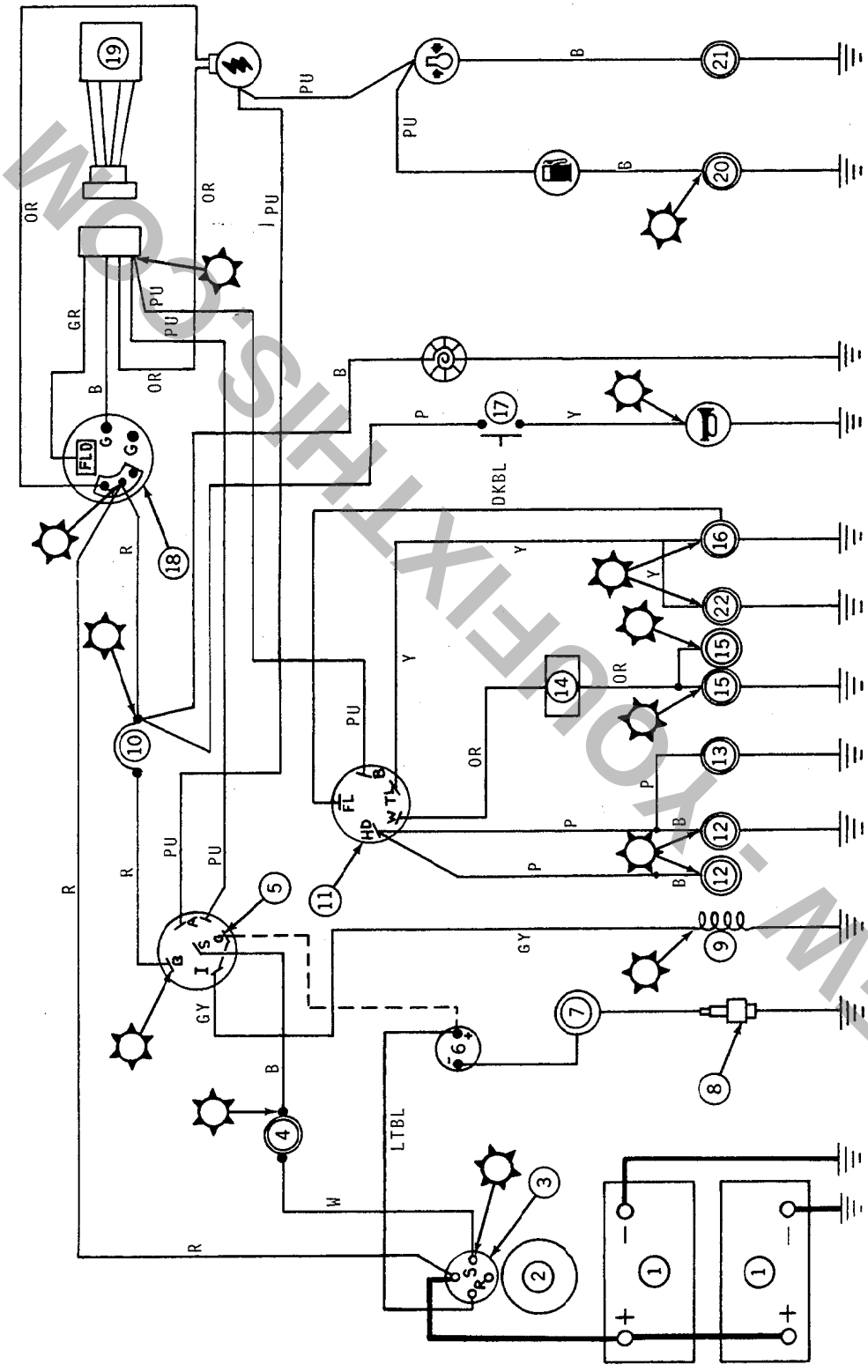


Fig. 7-Electrical Schematic

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DIAGNOSING MALFUNCTIONS

Engine Will Not Start or Starting Hard

- Fuel System Malfunction
  - Fuel tank empty
  - Improper type of fuel
  - Foreign material in fuel
  - Fuel lines clogged or restricted
  - Air leak on suction side of fuel system
  - Fuel transfer pump malfunction
  - Fuel filter restricted
  - Restricted air intake system
  - Faulty injection pump (diesel)
  - Faulty injection nozzles (diesel)
  - Water, dirt, or air in fuel system
  - Carburetor malfunction (gasoline)
- Electrical System Malfunction
  - Corroded or loose battery cables
  - Weak or dead battery
  - Cranking speed too slow

Uneven Running or Frequent Stalling

- Basic Engine Malfunction
  - Improper valve clearance
  - Cylinder head gasket leaking
  - Valves sticking or burned
  - Worn or broken compression rings
  - Low compression
  - Incorrect timing
  - Dirty air intake system
  - Exhaust system restricted
  - Engine overheating
- Fuel System Malfunction
  - Improper type of fuel
  - Air leak on suction side of fuel system
  - Fuel line clogged or restricted
  - Fuel transfer pump malfunction
  - Fuel filter restricted (diesel)
  - Faulty injection pump (diesel)
  - Faulty injection nozzles (diesel)
  - Water, dirt, or air in fuel system
  - Injection nozzle leak-off lines clogged (diesel)
  - Injection pump or distributor out of time
  - Exhaust system restricted
  - Improper carburetor setting (gasoline)

Engine Misses

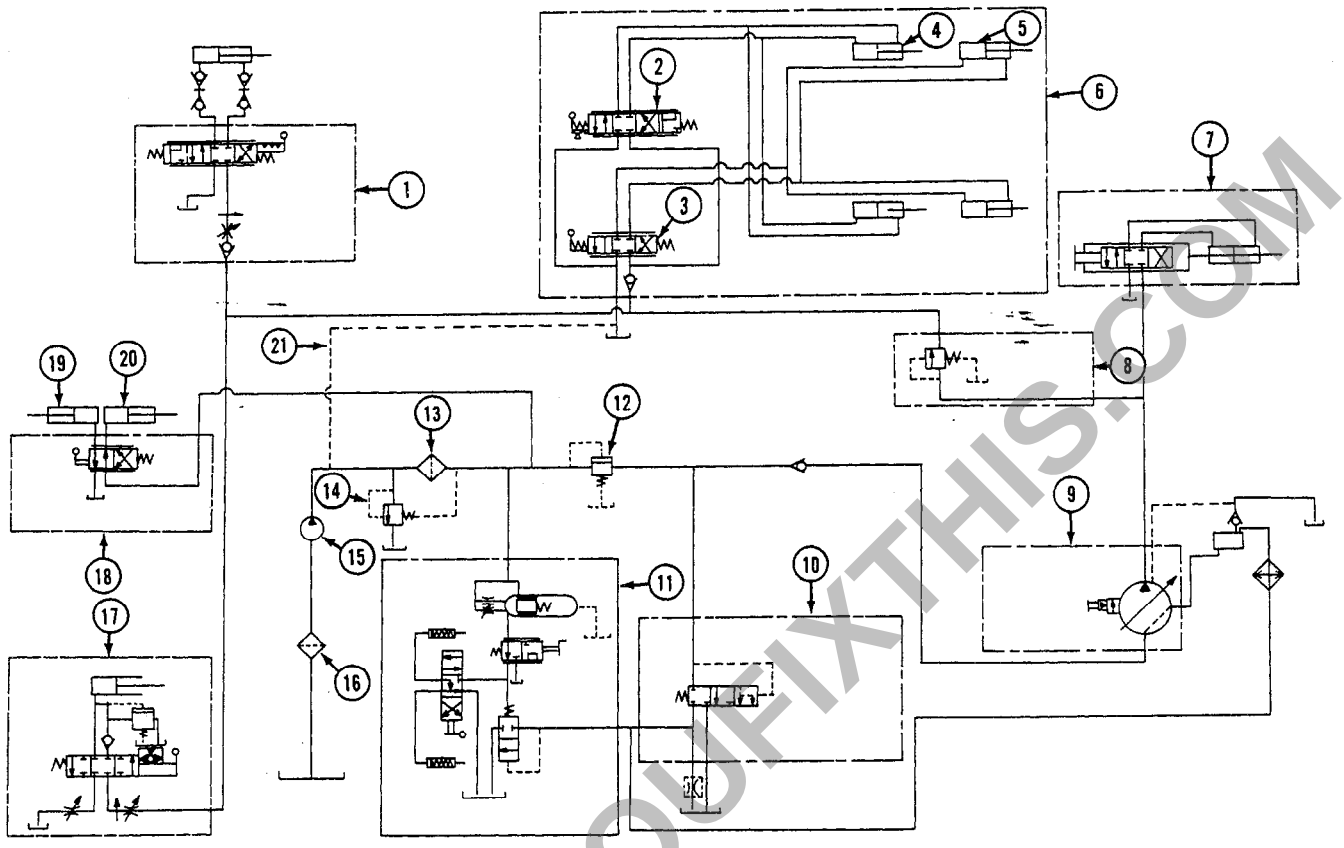
- Basic Engine Malfunction
  - Weak valve springs
  - Incorrect valve clearance
  - Burned, warped, pitted or sticking valves
  - Low compression
  - Worn camshaft lobes
  - Engine overheating
- Fuel System Malfunction
  - Water, air or dirt in fuel
  - Faulty injection nozzles (diesel)
  - Faulty injection pump (diesel)
  - Faulty transfer pump
  - Detonation
  - Mixture of gasoline and diesel fuels
  - Carburetor out of adjustment (gasoline)

Lack of Power

- Basic Engine Malfunction
  - Blown cylinder head gasket
  - Worn camshaft lobes
  - Incorrect valve clearance
  - Incorrect valve timing
  - Burned, warped, pitted, or sticking valves
  - Weak valve springs
  - Low compression
  - Dirty air intake system
  - Incorrect timing
  - Engine overheating
- Fuel System Malfunction
  - Improper type of fuel
  - Air leak on suction side of fuel system
  - Fuel line clogged or restricted
  - Fuel transfer pump malfunction
  - Speed control linkage not adjusted properly
  - Fuel filter restricted (diesel)
  - Fuel injection pump malfunction (diesel)
  - Fuel injection nozzle faulty (diesel)
  - Water, dirt or air in fuel system
  - Injection nozzle leak-off line clogged (diesel)
  - Injection pump or distributor out of time
  - Clogged manifold system
  - Carburetor adjusted too lean (gasoline)

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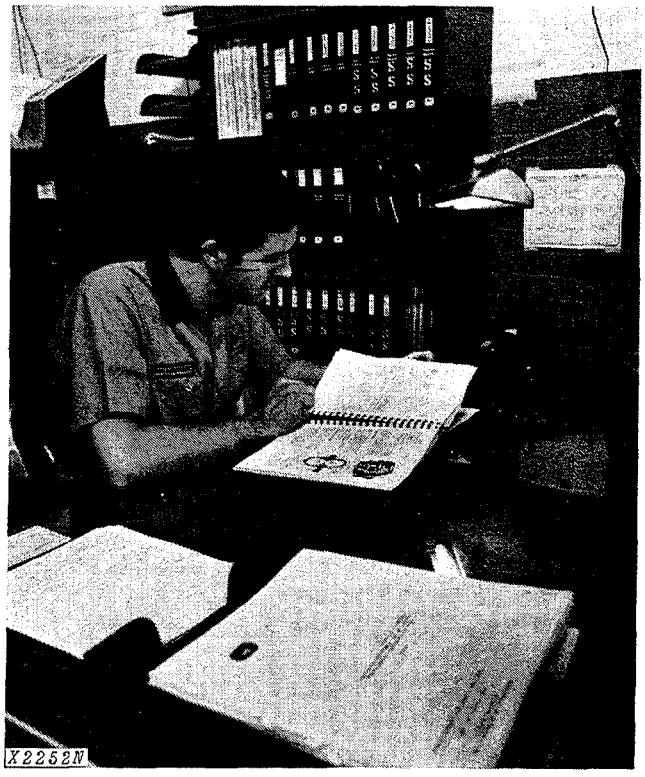
1—Selective Control Valve
2—Boom Section
3—Bucket Section
4—Boom Cylinders
5—Bucket Cylinders
6—Loader Circuit
7—Power Steering
8—Pressure Control Valve
9—Main Hydraulic Pump
10—Oil Cooler Bypass and Charge Relief Valve
11—Reverser Control Circuit
12—Pressure Regulating Valve
13—Transmission Filter
14—Oil Filter Relief Valve
15—Transmission Oil Pump
16—Intake Screen
17—Rockshaft
18—Independent PTO Control Valve
19—Clutch Cylinder
20—Brake Cylinder
21—Optional Return

Fig. 2-Hydraulic Schematic

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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:

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

•FOS Manuals—for reference

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 personnel and for reference by experienced technicians.

When a service technician should refer to a FOS Manual for more information, a FOS symbol like the one at the left is used in the TM to identify the reference.

•Technical Manuals—for actual service

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 service technician.

This technical manual was planned and written for you—an experienced service 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.

Some features of this manual:

- Inside front cover - "Table of Contents" and "Maintenance Without Accident".
- Section 10 - General specifications and services.
- Sections 20 through 60 - Removal, repair, testing (components removed), installation, and adjustment.
- Section 70 - Detailed explanation of system operation, diagnosis, visual inspection, testing, and adjustments.
- Specifications grouped and illustrated at the end of each section.

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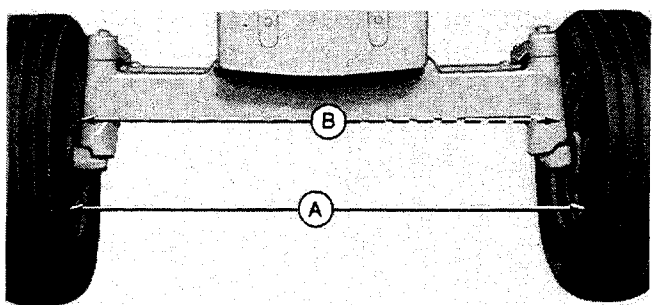
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C. Tighten bolt(s) to full torque per torque chart.
D. Repeat Step B.
E. Check torque.
F. Repeat Steps C and B alternately until shock loading the assembly does not reduce the torque reading on the bolts.
G. Recheck for centered position.

Tapered pins checked *Yes* *No*

33. Toe-In

Check front wheel toe-in.



A—Distance Between Front of Rims **B—Distance Between Rear of Rims**

Fig. 94-Checking Toe-In

1. Use down pressure of loader bucket to raise front wheels. Turn wheels so each valve stem is at bottom of tire.
2. Lower wheels to ground.
3. Measure from ground to hub.
4. Mark this distance on inside of each rim at the bead of tire front (A) and rear (B).
5. Measure distance between rims at front and rear marks.
6. Distance between front of rims must be 1/8 to 3/8 in. (3 to 9.5 mm) less than distance between rear of rims.

If distance in step 6 is not correct, change toe-in as follows:

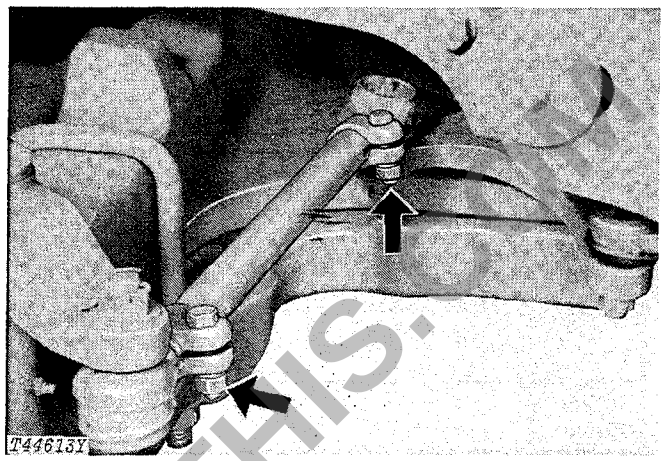


Fig. 95-Adjusting Front Wheel Toe-In

1. Loosen clamps (above) on tie rods (four clamps total).
2. Turn each tie rod the same number of turns until toe-in distance is correct.
3. Be sure tie rod ends are equal in length.
4. The tie rod slot must be turned to the rear.
5. Tighten cap screws on all four clamps to 40 lb-ft (54 Nm).

Toe-in checked *Yes* *No*

34. Fluid Leakage

Check the following systems for leakage due to poor or faulty connections and broken hoses or lines.

A. Cooling system checked *Yes* *No*
B. Hydraulic system checked *Yes* *No*
C. Transmission system checked *Yes* *No*
D. Fuel system checked *Yes* *No*

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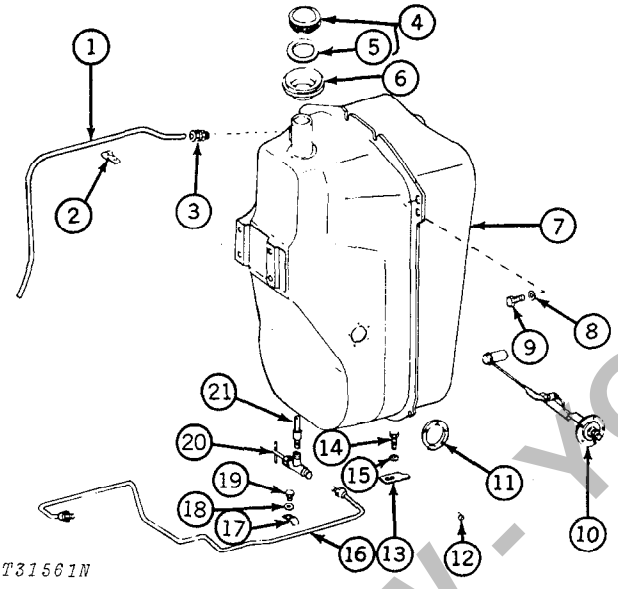
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Repair

⚠ CAUTION: Repairing a fuel tank is very dangerous. Never permit live sparks, smoking, or fire of any nature in vicinity of fuel tank repair work.

Refer to Fig. 2 during disassembly and assembly of the fuel tank.

Refer to FOS Manual - ENGINES for repair of fuel tank.



1—Leak-off Tube (diesel)
2—Clamp (diesel)
3—Connector (diesel)
4—Fuel Cap
5—Gasket
6—Grommet
7—Fuel Tank
8—Washer (4 used)
9—Cap Screw (4 used)
10—Fuel Gauge Sender
11—Gasket
12—Screw (5 used)
13—Stop (5 used)
14—Cap Screw (2 used)
15—Washer (2 used)
16—Fuel Line
17—Clip
18—Lock Washer
19—Cap Screw
20—Shut-off Valve
21—Fuel Tank Screen

Fig. 2-Fuel Tank Assembly

IMPORTANT: Install front support end of side grille retaining spring with open end of hook facing front of tractor.

Follow the removal procedure in the reverse order.

⚠ CAUTION: The fuel tank filler cap is vented for safety. Always replace it with a vented cap.

Fill tank with proper fuel.

On diesel fuel systems, bleed fuel system before operating engine.

FUEL TANK SCREEN

Removal

Drain fuel from tank.

NOTE: If fuel is to be reused, drain into clean container and keep covered.

Remove fuel shut-off valve (20, Fig. 2) and fuel line (16) to transfer pump. Remove screen (21).

Repair

The screen seldom needs cleaning because the sloshing of the fuel tends to wash dirt particles from it.

If the screen does need cleaning, wash out in clean fuel.

Replace the screen if it will not wash clean or has large holes.

Installation

Follow removal procedure in reverse order.

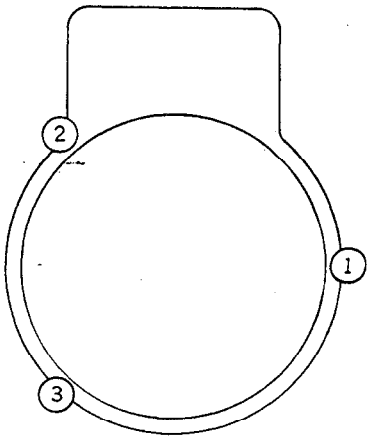
Fill tank with proper fuel.

On diesel fuel systems, bleed fuel system before operating engine.

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FUEL SYSTEM

SPECIFICATIONS AND TORQUE VALUES—Continued (JDB331MD2797-AR49899)



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Fig. 40-Injection Line Connection

IMPORTANT: In order to obtain proper test results, do the following:

Use 0.25 in. (6.4 mm) O.D. by 0.093 in. (2.36 mm) I.D. by 20 in. (508 mm) long test lines.

Use 12SD12 Robert Bosch Calibrating Nozzles, 2500 psi (172 bar) (176 kg/cm²) opening pressure. Use JDF-2 Test Oil, or a test oil equivalent to SAE J967A with a 34 to 36 SUS rating with oil at 100°F (38°C).

Test oil should be 110° to 115°F (43° to 46°C).

Operate pump clockwise (viewed from drive end) at 500 rpm wide open throttle (WOT) for 10 minutes prior to test.

Electric shut-off connected to 12-volt D.C. negative (—) ground power source.

NOTE: 1 to 3 psi (0.07 to 0.21 bar) (0.07 to 0.21 kg/cm²) supply pressure required at pump inlet.

Transfer pump vacuum (200 rpm)
(minimum) ..... 18 in. Hg.
(609.5 mbar)

Transfer pump pressure (1250 rpm) .... 85 to 95 psi
(5.9 to 6.5 bar) (6.0 to 6.7 kg/cm²)

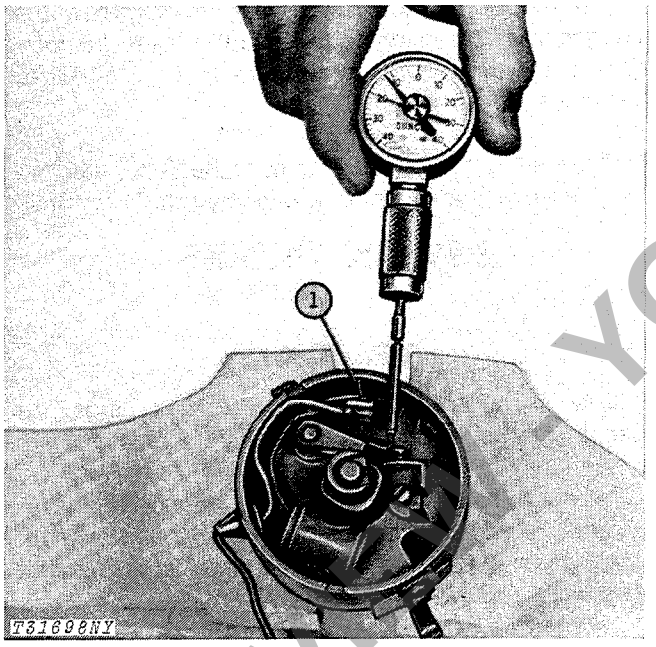
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Assembly

Install cam spacer on shaft and weight plate assembly. Fill upper housing bearing lubrication hole and lubricate bearing bore of cam and the advance weights with a cam lubricant or other suitable high-temperature grease. Install advance springs, weights, cam and cam retaining ring.

Lubricate the drive shaft with SAE 20W oil and place the outer and inner thrust washers on drive shaft. Install drive shaft in distributor housing. Place inner and outer thrust washers, spacer, and drive gear on distributor shaft. Install spring pin with one end of spring pin exposed (0.060 inch [1.52 mm] max.) to indicate position of rotor. Distributor shaft end play is 0.002 to 0.010 inch [0.05 to 0.25 mm].



1—Spring Attaching Screw

Fig. 7-Checking Breaker Spring Tension

Install breaker plate, distributor wire, condenser, and point assembly. Check point alignment. Bend only the stationary contact to align contacts. Set the contact gap to 0.020 inch [0.51 mm]. Check breaker spring tension with a scale and pull on a line perpendicular to the contact face. The tension should be 17 to 22 ounces [481.95 to 623.70 g] at the center of contact or 19 to 24 ounces [538.65 to 680.40 g] when measured beside the contact (Fig. 7). Spring may be adjusted by sliding spring pin in or out on the attaching screw or by bending the spring.

The contacts should be cleaned with a few drops of lighter fluid on a strip of lint-free cloth. Then pull a dry strip through points to remove residue. Observe caution when using lighter fluid. If present, oxide on the points can be removed with a cloth soaked in water.

Apply a trace of cam lubricant to the cam. DO NOT OVERLUBRICATE.

TEST AFTER ASSEMBLY

Mount distributor in syncrograph, using flexible drive connection. Connect lead to distributor terminal. Turn switch to "CAM ANGLE." With contact points closed, adjust "SET" knob until pointer is at "SET" on meter dial.

Operate distributor at 950 rpm. Cam angle should be 96 to 102 degrees. Do not set contact gap outside of limits of 0.018 to 0.022 inch [0.46 to 0.56 mm] to obtain specified cam dwell. Replace cam if difficulty is encountered.

Correct point opening can be set with a feeler gauge only when points are new or in good condition, because of the irregularity of worn points.

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Inspect interlocking pin in transmission case for damage. If pin is to be replaced, drive spring pin through front wall of transmission case and push interlock pin out right side of transmission case (Fig. 6).

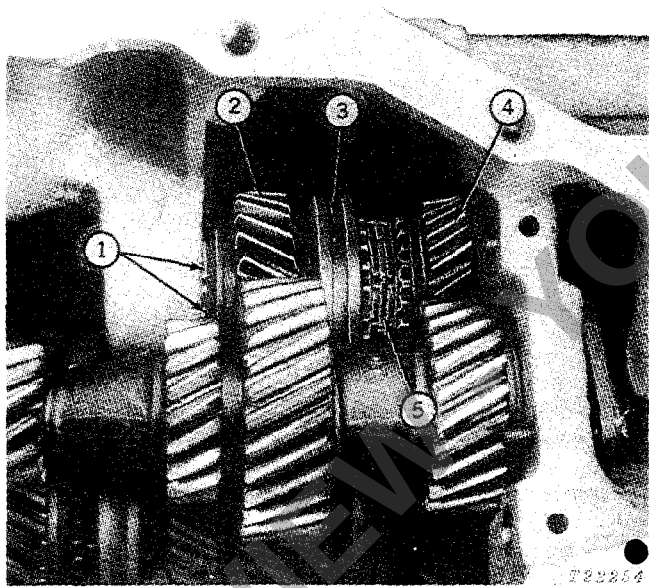
Insert new pin in from right side of transmission case and replace plug and spring pin.

Remove PTO drive gears from front of transmission.

Remove transmission lubricating oil cup with oil lines.

Countershaft

Remove cap screws securing bearing support to front of transmission.



1—Snap Ring
2—Low Range Pinion
3—Collar
4—Reverse Range Pinion
5—Locking Washer

Fig. 7-Removing Countershaft

Remove snap ring from groove at rear of countershaft (Fig. 7).

Rotate the locking washer (Fig. 7) until the splines on the washer index with the countershaft splines.

Pry the bearing support off the dowels on the front of the transmission case. As the bearing support, countershaft, and transmission drive gear are pulled forward, the gears and shifter collar will slide off the rear of the countershaft. Keep these parts in order to aid in assembly.

Transmission Drive Shaft

Remove transmission drive shaft front bearing quill, shims, and front lubricating oil line.

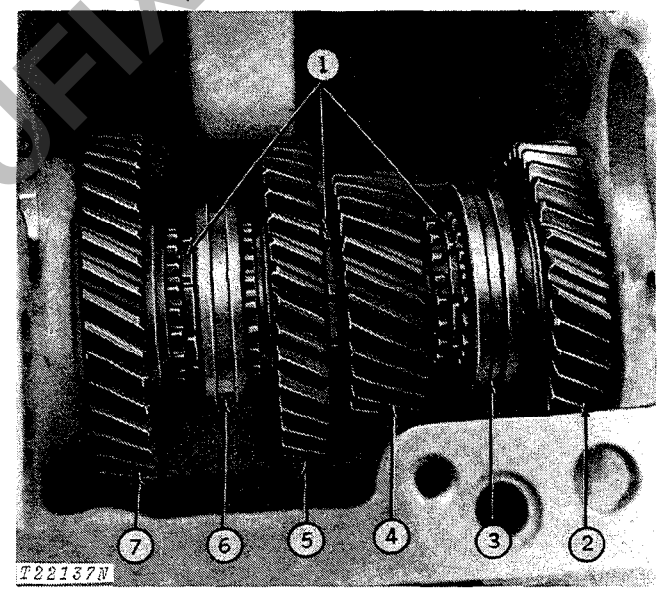
Tap transmission drive shaft forward to free front bearing cup from case and rear bearing cone from cup.

Move transmission drive shaft forward and work rear end of shaft up through top of transmission case.

Differential Drive Shaft

To service differential drive shaft, block up transmission case and remove final drive housing from tractor.

Remove differential assembly as instructed in Section 40, Group 25.



1—Locking Thrust Washers
2—3rd and 7th Speed Gear
3—Collar
4—4th and 8th Speed Gear
5—2nd and 6th Speed Gear
6—Collar
7—1st and 5th Speed Gear

Fig. 8-Removing Differential Drive Shaft

Remove hex. nut, washer, bearing, shim pack, and spacer from the front of the differential drive shaft.

Locate the three locking thrust washers on the drive shaft (Fig. 8). Rotate the thrust washers in their grooves until the splines on the shaft and washers index.

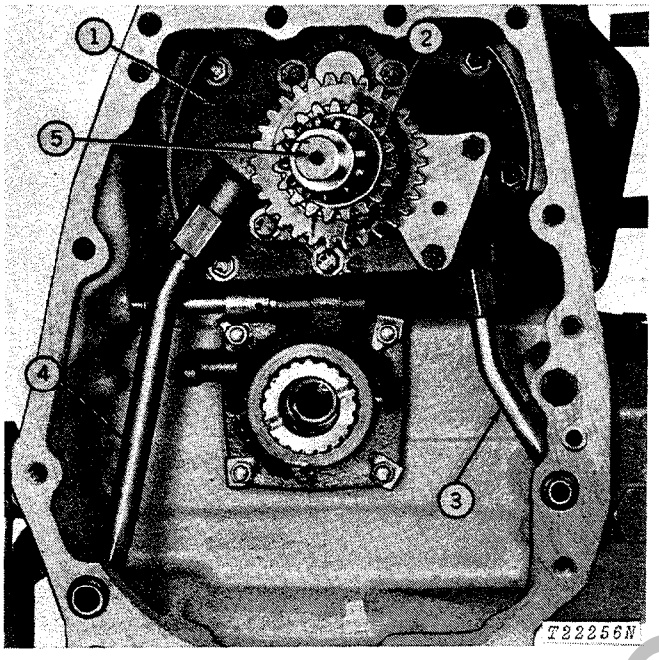
Pull drive shaft to the rear until it can be lifted from the differential compartment. Keep these parts in order to aid in assembly.

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Group 5
TRANSMISSION PUMP

GENERAL INFORMATION



1—Transmission Oil Pump
2—Powershaft
3—Outlet Line
4—Inlet Line
5—Clutch Shaft

Fig. 1-Transmission Oil Pump

The transmission oil pump (Fig. 1) is a constant displacement, gear-type pump, located on the rear wall of the clutch housing and driven at engine speed by the powershaft (clutch shaft on transmission-driven PTO systems).

FOS

For additional gear-type pump information, refer to "Hydraulic Pumps" in FOS Manual - HYDRAULICS.

REMOVAL

Separate transmission from clutch housing (Section 40, Group 5).

Remove pump inlet and outlet tubes.

Pull clutch shaft and powershaft from pump drive gear (clutch shaft only on transmission-driven PTO system).

Remove pump from rear of clutch housing.

REPAIR

Refer to Fig. 2 during disassembly and assembly of the pump.

Separate pump body (8) from pump adapter (11) and remove pump gears (10).

Check pump body for damage. Burrs can be removed with a file. Replace housing if cracked or badly scored.

Examine roller bearing (14) in pump drive shaft bore for wear or damage. Install new bearing to bottom of bearing bore.

Inspect pump adapter for damage or wear.

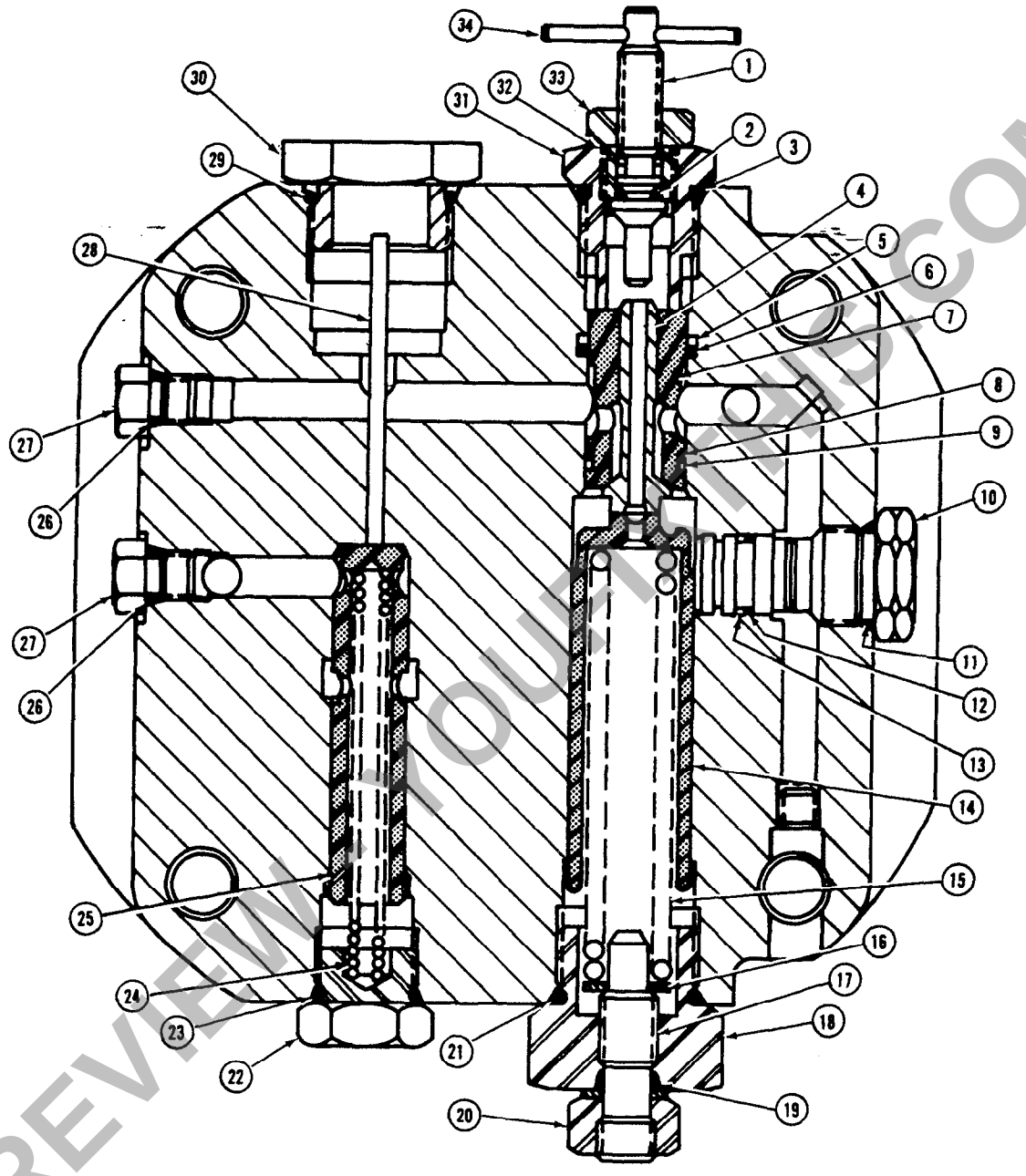
Inspect pump gears for damage. Examine idler gear bushing for wear. Replace gears if unfit for service. Both gears must be replaced as a matched set.

Assemble pump body with gears and bearing to pump adapter. Coat gears with John Deere Special-Purpose Oil or an equivalent before installation.

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Assemble Stroke Control Valve Assembly



1—Screw
2—O-Ring
3—O-Ring
4—Stroke Control Valve
5—Backup Ring
6—O-Ring
7—Sleeve
8—O-Ring
9—Backup Ring
10—Special Plug
11—O-Ring
12—O-Ring
13—Backup Ring
14—Spring Guide
15—Spring
16—Special Washer
17—Screw with Washer
18—Fitting
19—O-Ring
20—Nut
21—O-Ring
22—Plug
23—O-Ring
24—Spring
25—Crankcase Outlet Valve
26—O-Ring (2 used)
27—Plug (2 used)
28—Pin
29—O-Ring
30—Special Plug
31—Special Plug
32—O-Ring
33—Fitting
34—Spring Pin

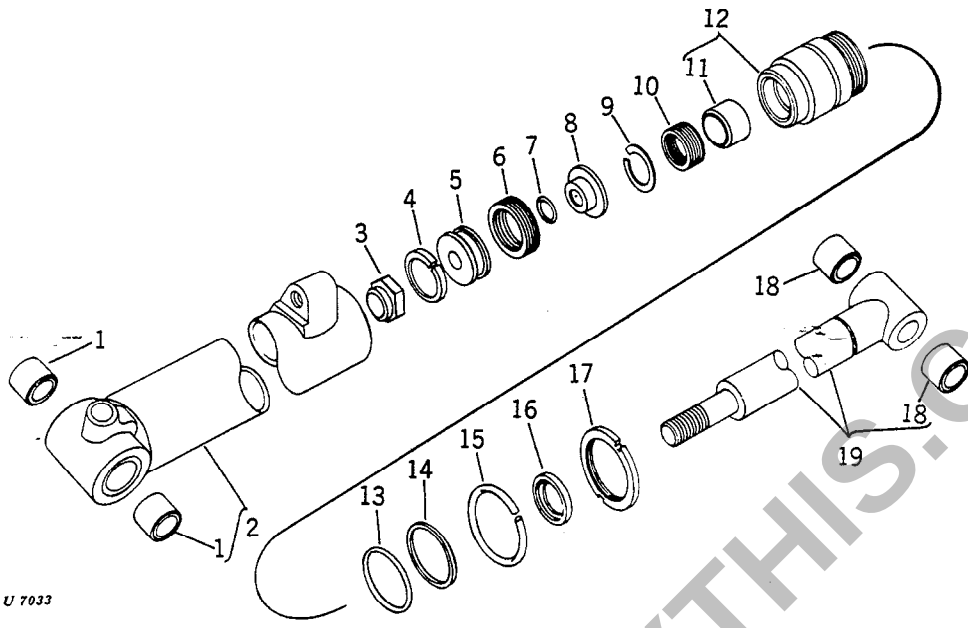
Fig. 119-Cross Section of Stroke Control Valve Assembly

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1—Bushing (2 used)
2—Barrel
3—Stop Nut
4—Wear Ring
5—Retainer
6—V-Packing
7—O-Ring
8—Piston
9—Snap Ring
10—V-Packing
11—Wear Ring
12—Rod Guide
13—O-Ring
14—Backup Washer
15—Snap Ring
16—Wiper Seal
17—Spanner Nut
18—Bushing (2 used)
19—Piston Rod

Fig. 10-Backhoe Stabilizer Cylinder Assembly

REMOTE CYLINDER

General Information

The remote cylinders are double-acting cylinders and are provided with a hydraulic adjustable stop to vary the working stroke from 0 to 8 inches [0 to 203.2 mm].

Removal

Remove remote cylinder from equipment.

Repair

Refer to Fig. 11 for reference to disassemble and assemble the remote cylinder.

Remove cylinder end cap (16). Stop and bleed valves (13) may be removed by pushing stop rod assembly into cylinder to its limit. Pull stop valve from bleed valve. After removing ball from recess, bleed valve may be removed from the stop rod.

Remove piston (22), and piston rod (36).

Push stop rod (9) all the way into cylinder to prevent distortion of stop rod while driving groove pin (25) from stop rod arm (26). Push V-packing assembly (2) from housing.

1. Press in a new piston rod oil seal (30) with sealing lip toward outer end of bore.

2. Install stop rod V-packing assembly (2) with sealing lip toward outer end of bore.

3. Install piston rod guide (24) and gasket (23) but do not tighten attaching hardware.

Install stop rod assembly. Use stop and bleed valve assembly to push stop rod (9) through stop rod V-packing. Tighten piston rod guide hardware to 35 lb-ft. [4.84 kg-m].

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MISCELLANEOUS HYDRAULIC COMPONENTS

SPECIFICATIONS AND TORQUE VALUES—Continued

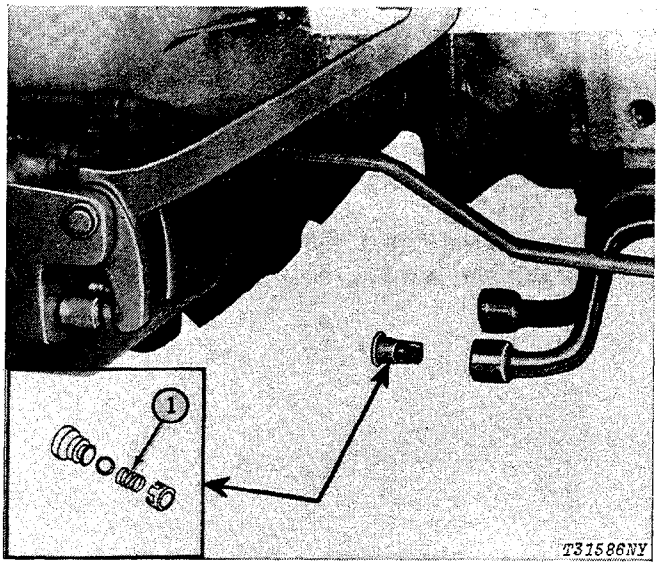


Fig. 49-Inlet Line Check Valve

1 - Inlet line check valve spring free length..... 0.5 in. [12.7 mm]
Inlet line check valve spring test length.....0.31 in. [7.9 mm] with 5 to 6 oz. [141.7 to 170.1 g]

SPECIAL TOOLS

Tool	Tool Number	Use
	D-15010 NU	Oil pumped nitrogen charging kit
	D-15011 NU	Water or oxygen pumped nitrogen charging kit
	D-15012 NU	Nitrogen charging kit for both oil and water
	D-15019 NU	Supplemental adapter kit

NOTE: Prior to ordering, contact your area distributor of nitrogen and establish whether oil pumped or oxygen pumped nitrogen can be furnished, then order the proper kit above. If this information is unobtainable, order the D-15012 NU kit and both left and right-hand fittings will be furnished.

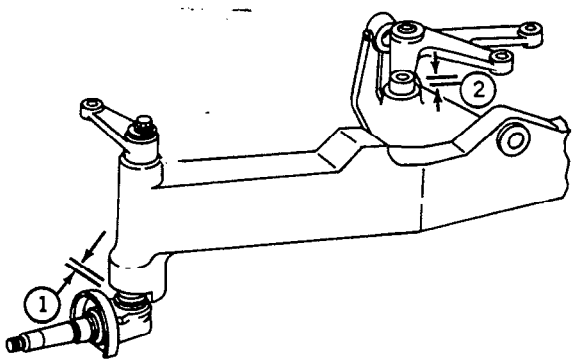
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Group 25
SPECIFICATIONS AND SPECIAL TOOLS

FRONT END ASSEMBLY

SPECIFICATIONS AND TORQUE VALUES

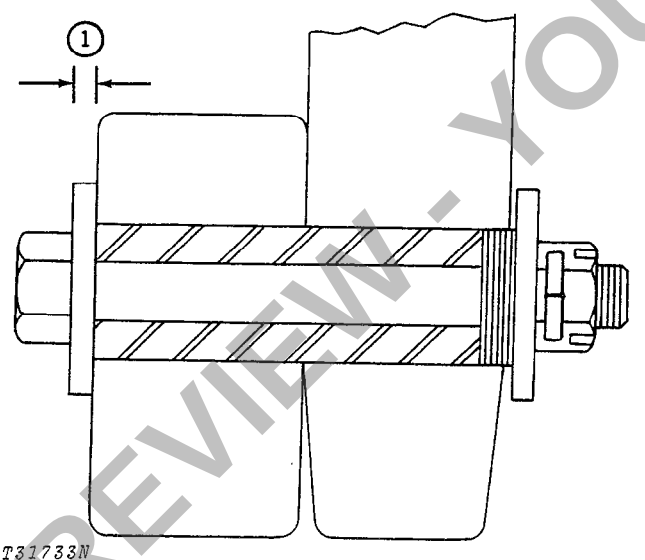


T64659N

Fig. 1-Front Axle Assembly End Play

1 - Vertical spindle end play .....0.030 in. max. (0.76 mm)

2 - Bell crank end play .....0.010 in. max. (0.254 mm)



T31733N

Fig. 2-Front Axle End Play

1 - Axle pivot end play ..... 0.000 to 0.015 in. (0.00 to 0.38 mm)

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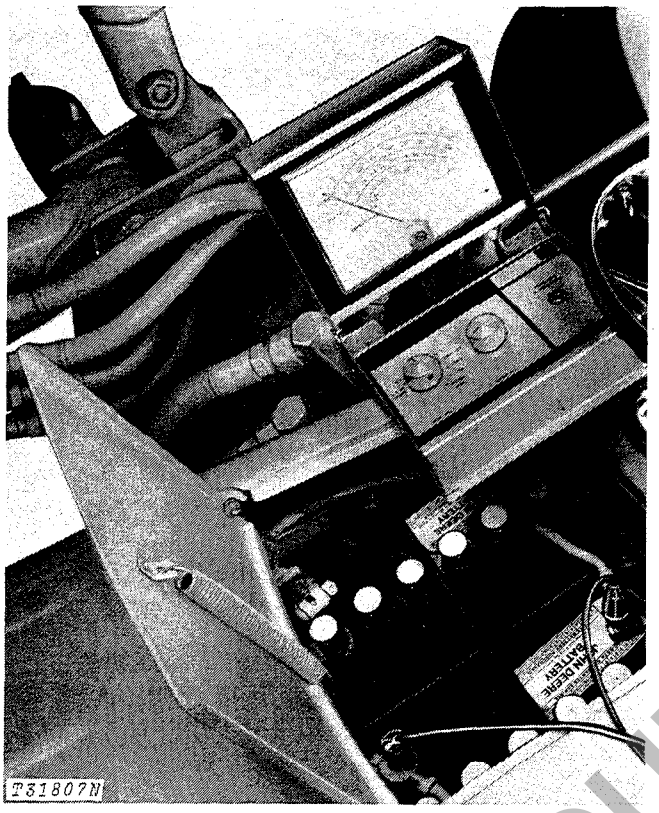


Fig. 11-Checking Battery Voltage

3. Voltmeter should read at least 9 volts. If above the minimum, continue testing. If below minimum, replace or recharge battery.

When the key switch is turned to the start position, you can expect one of five things to occur if the starting circuit is defective:

1. Nothing happens - there is no "click" indicating that the solenoid contacts did not close.

2. An audible "click" in the solenoid is heard, but the starting motor does not operate.

3. The starting motor is running, but the engine does not turn over.

4. The starting motor turns over the engine slowly or erratically.

5. The engine starts but the starting motor drive does not disengage from the flywheel.

You can check out these five problems as follows.

1 - Nothing happens

Test No. 1

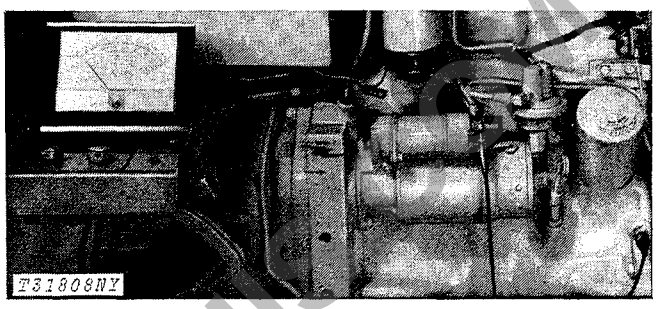


Fig. 12-Voltmeter Connected to Solenoid "S" Terminal

Connect voltmeter to solenoid "S" terminal and to ground (Fig. 12). With shift lever in neutral position, turn key switch to start position. Voltmeter should read 9 to 12 volts.

If there is a voltage reading of 9 to 12 volts, the problem is in the solenoid. See Section 30, Group 15 for "Solenoid Tests".

If there is no voltage reading connect voltmeter to solenoid battery terminal. Voltmeter should read 9 to 12 volts.

If there is a reading of 9 to 12 volts proceed to Test No. 2.

If there is no voltage reading check for a defective battery cable or poor and corroded connections.

Test No. 2

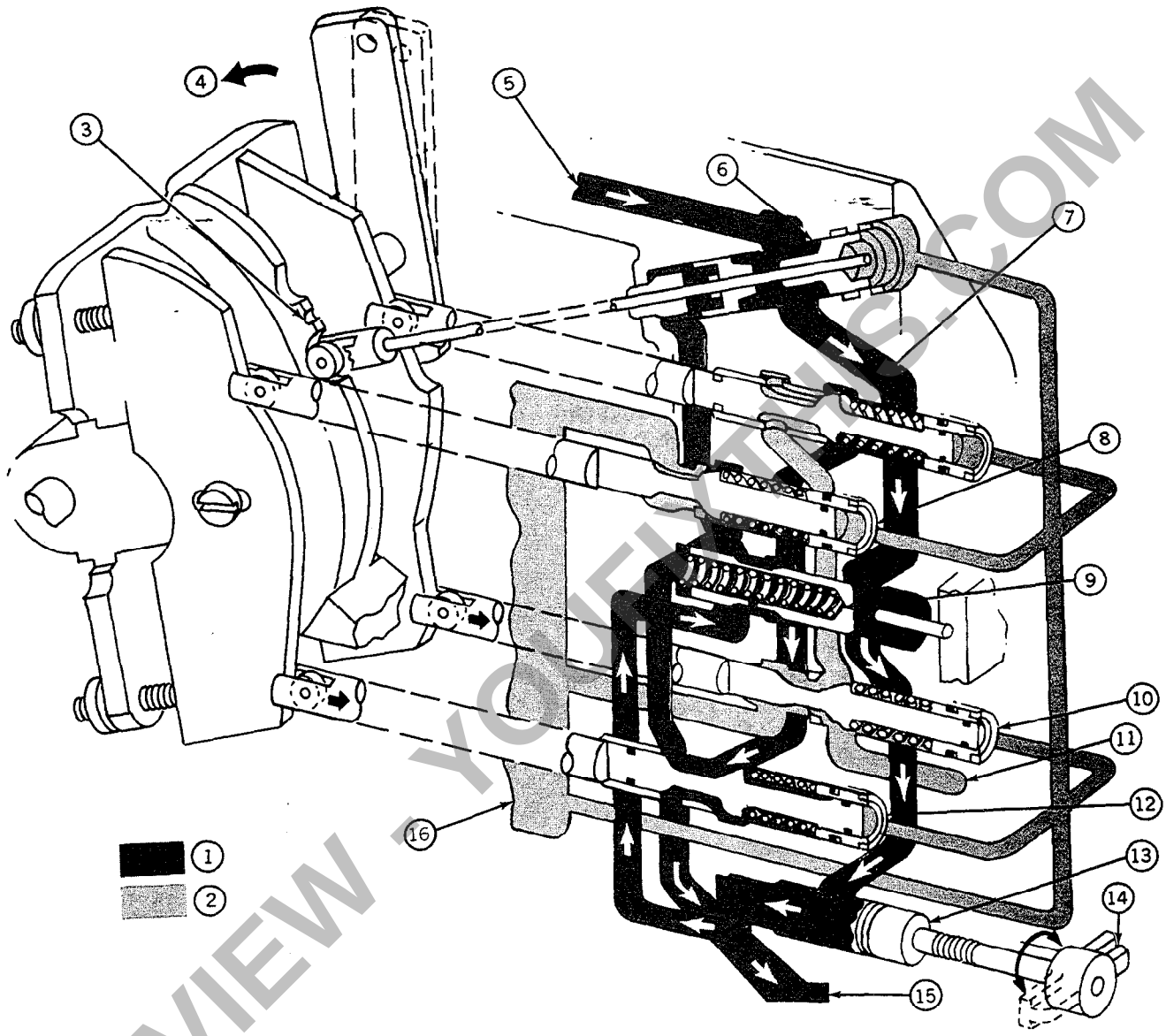
Remove left hand cowl panel.

Insert a straightened paper clip into the key switch connector at the red lead. Connect voltmeter to paper clip (Fig. 13). Voltmeter should read 9 to 12 volts.

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SELECTIVE CONTROL VALVE



T31823

1—Pressure Oil
2—Return Oil
3—Neutral Detent
4—Extend
5—From Pump
6—Detent Piston
7—Pressure Valve
8—Return Valve
9—Flow Control Valve
10—Return Valve
11—From Coupler
12—Pressure Valve
13—Metering Valve
14—Full Flow
15—To Coupler
16—Sump

Fig. 9-Selective Control Valve (Fast Extend Illustrated)

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Transmission Pump Test

Connect the Tachometer/Temperature Reader as shown in System Test, page 70-26-8.

Install a manual destroke valve into the stroke control valve housing if unit is not equipped. Do not turn valve in at this time.

Remove the footrest from the right (R.H.) side of unit. This will give you easier access to the transmission filter relief valve.

With orifice flow, heat the hydraulic oil to 100 to 110°F (38 to 43°C). See System Test for procedure.

NOTE: If orifice is not installed, operate the loader or backhoe functions to heat the hydraulic oil.

CAUTION: To prevent an injury to you by hot oil carefully remove transmission oil filter cover and element.

When the hydraulic oil is hot (100 to 110°F [38 to 43°C]), stop the engine. Immediately remove the transmission oil filter cover and element. Install the tool kit, fittings, orifice (Part No. 203663) and hose assemblies as shown in Figs. 14 and 15.

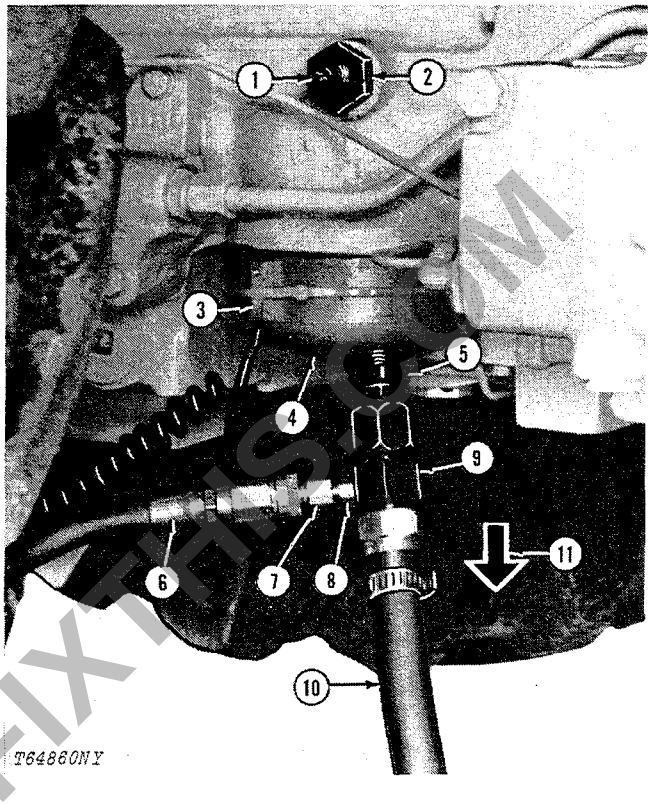
Put the end of return hose (10, Fig. 14) into the filler tube (Fig. 16).

Connect hose assembly (6, Fig. 14) to No. 3 coupling adapter on Hydraulic Analyzer.

With a plastic strap, fasten temperature sensor (3) to cover assembly (4).

NOTE: For good contact, put a layer of grease between temperature sensor and cover.

Remove the transmission filter relief valve. Install the spool assembly (1) and special adapter (2). This will prevent the loss of oil from circuit during test.



1—JD-293-4 Spool Assembly
2—202807 Special Adapter
3—Temperature Sensor
4—JD-293-1 Filter Housing Cover Assembly
5—17502 Special Fitting
6—36952 Hose Assembly 144 in. (3 658 mm)
7—202850 Coupling Adapter
8—202853 Straight Fitting
9—203663 Orifice 0.156 in. (3.96 mm)
10—203658 Return Hose
11—Direction of Flow

Fig. 14-Installation for Transmission Pump Test (Loader Removed to Show Installation)

Turn the manual destroke valve in to destroke the main pump. Keep test short because no charge oil goes to the main pump during test.

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