Section 10
GENERAL

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Group 5
GENERAL MACHINE SPECIFICATIONS

Engine

	Gasoline	Diesel
Flywheel Horsepower (net) (observed at 2500 rpm)	50	50
Number of Cylinders	3	3
Bore and Stroke	4.02 x 4.33	4.02 x 4.33
Displacement	164	164
Compression Ratio	7.5 to 1*	16.2 to 1
Firing Order	1-2-3	1-2-3
Engine Speeds		
Slow Idle	600 rpm	800 rpm
Fast Idle	2650 rpm	2650 rpm
Governed Speed Range (rpm)	600-2650 rpm	800-2650 rpm
Valve Clearance		
Intake	0.014 in.	0.014 in.
Exhaust	0.022 in.	0.018 in.

Electrical System

Voltage	12
Battery Ground	Negative
Battery Specific Gravity	1.260

** 8.6:1 High-Altitude Pistons*

Capacities

Fuel Tank	19-1/2 gals.
Cooling System	12 qts.
Engine Crankcase	
(with filter) (early units)	7 qts.
(with filter) (later units)	9 qts.
Transmission-Hydraulic Reservoir	20-1/2 gals.

Clutch

Single-stage, spring-loaded, dry-disk, foot-operated.

Transmission

Collar-shift with hydraulic reverser containing hydraulic wet clutches provide 8 speeds forward and 4 rearward.

Differentials and Final Drives

Planetary-reduction final drives with spiral bevel gear drive differential.

Differential lock: foot-operated mechanical lock, spring-loaded out of engagement.

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Group 25
SEPARATION

GENERAL INFORMATION

Follow all precautions concerning safety, cleanliness, and general mechanical procedures.

Have several metal support stands and adequate supply of blocking available for supporting the heavy components of this machine.

To speed up separation, first take time to remove grease, dirt, or debris from the machine.

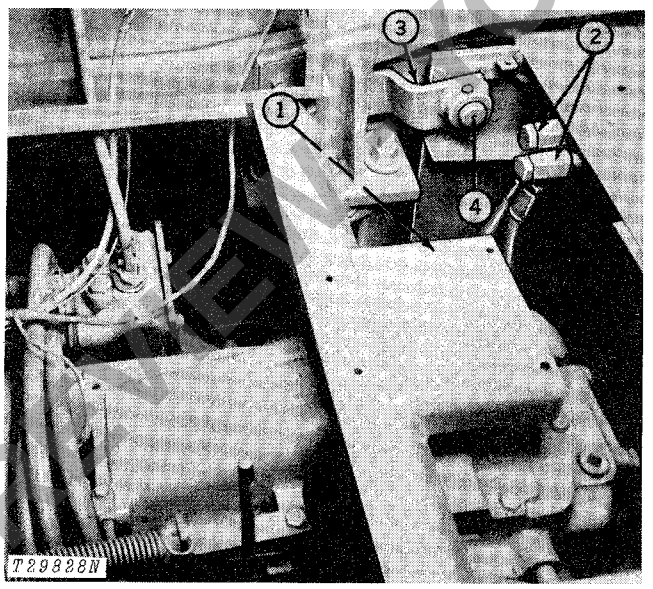
REMOVING AND INSTALLING 9405 BACKHOE

Removal

1. Remove cab if equipped.

2. Drive machine to an area where the backhoe can be safely supported and blocked.

3. Extend dipperstick and boom to maximum extended position with bucket resting on floor.



1—Lower Mounting Pins
2—Hydraulic Hoses
3—Tie Bar
4—Tie Bar Mounting Pins

Fig. 1-Backhoe Mounting
(Seat and platform removed to illustrate mounting points)

4. Lower stabilizers to the floor and apply just enough hydraulic pressure to take the weight off the mounting pins for easy removal.

5. Place heavy blocking under backhoe main frame to support unit.

6. Remove the two lower rear pins on each side connecting the backhoe frame to loader frame (Fig. 1). To facilitate removal of the pins, align the cutout of the rear wheels with the pins.

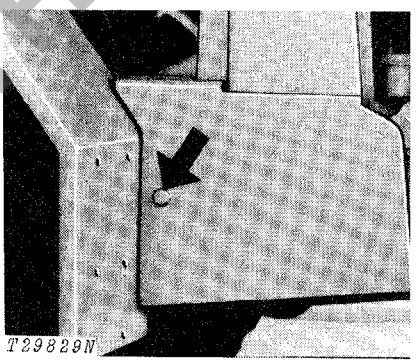


Fig. 2-Tie Bar Pins

7. Remove the two tie bar pins from the loader frame Fig. 2.

NOTE: Tie bars will come off with backhoe.

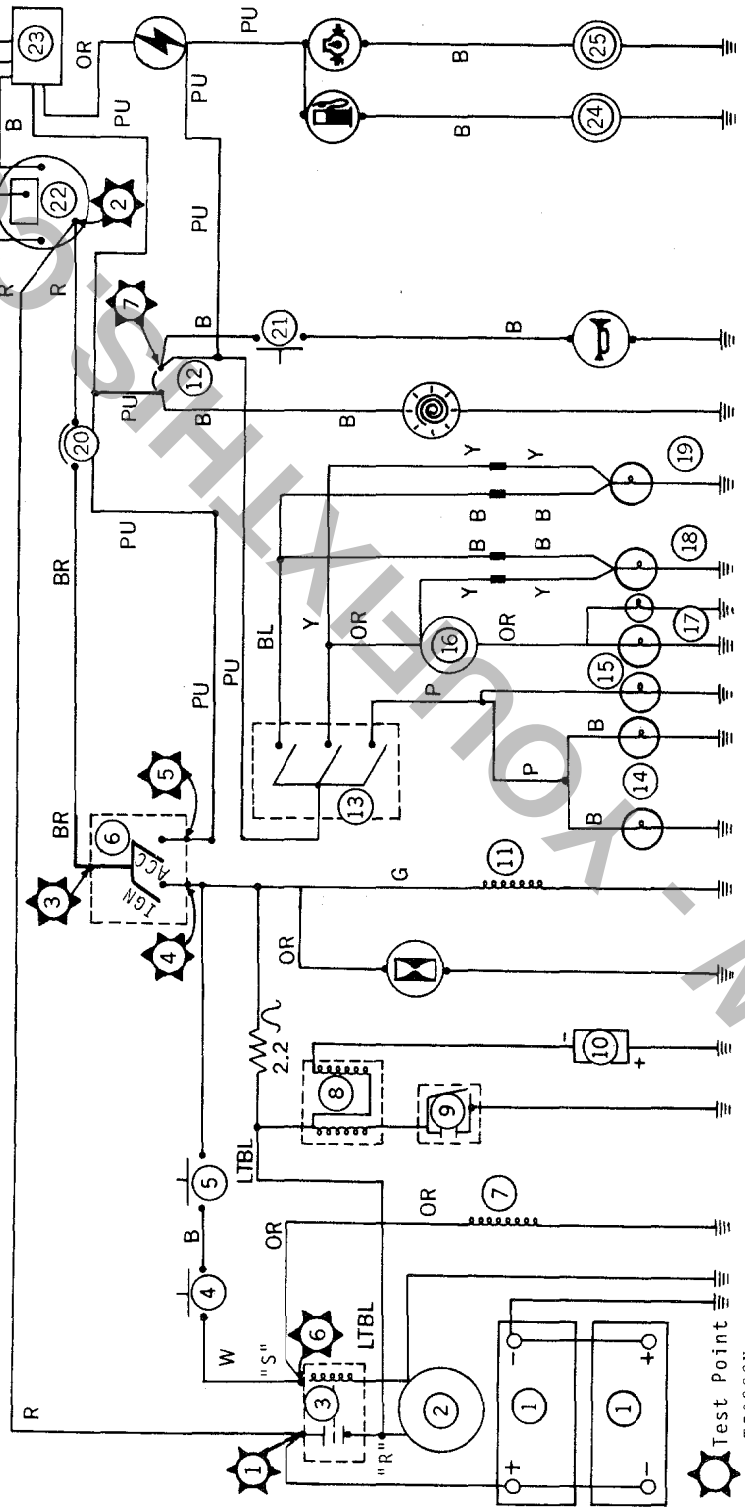
8. Carefully move the tractor away from the backhoe unit (with hoses attached) unitl the backhoe is clear of the loader frame. Do not separate far enough to stretch the hoses.

9. Operate stabilizer controls to permit backhoe to rest solidly on the blocking.

CAUTION: Be sure to discharge hydraulic function accumulator before disconnecting hoses. This can be done by operating stabilizer control until control response ceases.

10. Disconnect backhoe pressure and return lines at junction shown in Fig. 1.

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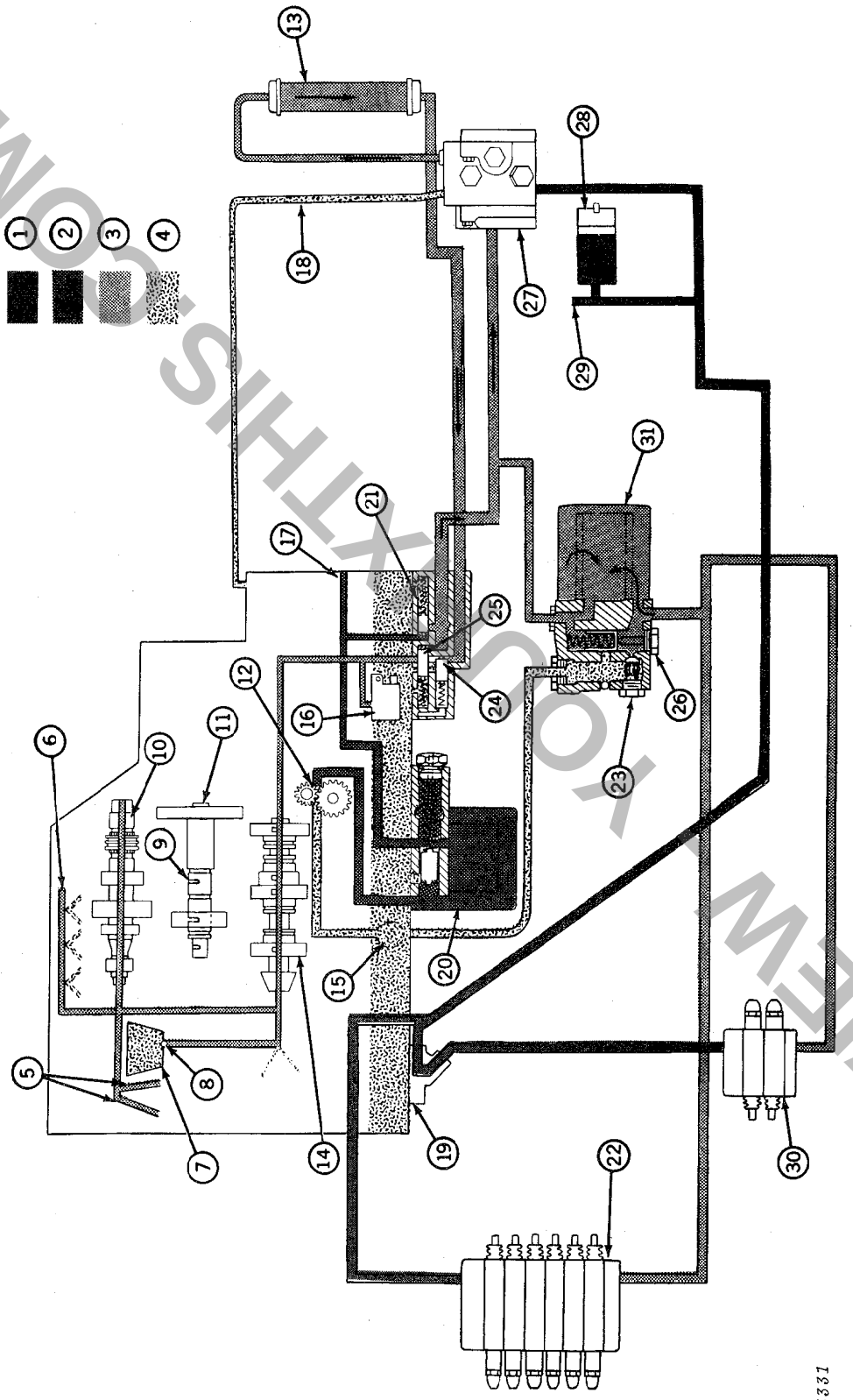
1—Battery (6-volt)
2—Starter
3—Solenoid
4—Start Safety Switch
5—Start Switch
6—Key Switch
7—Hyd. Pump Solenoid
8—Coil*
9—Distributor*
10—Spark Plug*
11—Fuel Shut-Off Solenoid
12—Circuit Breaker
13—Light Switch
14—Front Lamps (2)
15—Dash Lamp
16—Flasher
17—Warning Lamps (2)
18—Combination Lamp
19—Combination Lamp
20—Circuit Breaker
21—Horn Switch
22—Alternator
23—Regulator
24—Sending Unit
25—Pressure Switch
* —Gas Only

B—Black
BL—Blue
BR—Brown
GR—Green
LTBL—Light Blue
OR—Orange
P—Pink
PU—Purple
R—Red
W—White
Y—Yellow

Fig. 3-Electrical Schematic

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1—Pressure Oil
2—Intermediate Pressure Oil
3—Low Pressure Oil
4—Return Oil
5—Lube to Axle
6—Transmission Spray
7—Transmission Oil Cup
8—Check Valve
9—Countershaft Pin (-188122)
10—Transmission Drive Shaft
11—Countershaft
12—Transmission Oil Pump
13—Oil Cooler
14—Differential Drive Shaft
15—Transmission Intake Screen
16—Brake Valve
17—To Reverser Control Valve
18—Pump Bleed Line
19—Pressure Control Valve
20—Transmission Filter
21—Pressure Regulating Valve
22—Backhoe Control Valve
23—Surge Relief Valve
24—Lube Reduction Valve
25—Cooler By-Pass Relief Valve
26—Filter Relief Valve
27—Main Hydraulic Pump
28—Accumulator
29—To Power Steering Valve
30—Loader Control Valve
31—Function Return Filter

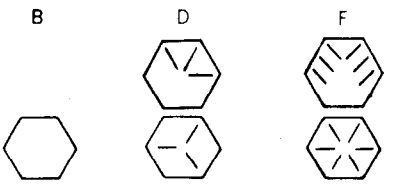
Fig. 1-Hydraulic System with 9405 Backhoe (-188122)

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SPECIFICATIONS

Standard Torque Chart

RECOMMENDED TORQUE IN FT-LBS
COARSE AND FINE THREADS



Bolt Diameter	Plain Head	Three Dashes	Six Dashes
1/4	Not used	10	14
5/16	Not used	20	30
3/8	Not used	35	50
7/16	35	55	80
1/2	55	85	120
9/16	75	130	175
5/8	105	170	240
3/4	185	300	425
7/8	160	445	685
1	250	670	1030
1-1/8	330	910	1460
1-1/4	480	1250	2060

T25227

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

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

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

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

Torque Values (Ft-Lbs, except where noted)

Wheels
- Rear Wheel to Axle 175
- Rear Rim to Cast Disk 275
- Front Wheel Rim to Axle Hub 130

Front End Support-to-Engine Block
- (5/8-inch) 170
- (9/16-inch) 130

Engine-to-Clutch Housing 250
Reverser Housing-to-Transmission 130
Axle Assemblies-to-Transmission 85
Front Support-to-Oil Pan 300
Clutch Housing-to-Transmission Case 130
Clutch Housing-to-Flywheel Housing 250

Loader Frame
- Loader Frame Rear Axle Bolts 445
- Loader Support Casting-to-Front Support 250
- Loader Side Frame-to-Loader Support Casting 250

Canopy
- Canopy Brackets-to-Flywheel Housing (5/8-inch) 170
- Canopy Frame-to-Brackets 200
- Canopy Frame-to-Rear Cross Member 300

Tachometer
- Cable to Tachometer . . . . . 50 in-lbs.
- Cable to Reverser Housing . . . . . 30 in-lbs.

SPECIAL TOOLS

Convenience Tools

No.	Name	Use
* JD-244	Lifting Eyes	Remove Engine
* JDG-1	Sling	Remove Engine

* *Order from: Service Tools Inc.*
1901 Indiana Avenue
Chicago, Illinois 60616

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Group 5
DIAGNOSIS

DIAGNOSING ENGINE MALFUNCTIONS

The following is a quick guide for diagnosing engine malfunctions. Each malfunction is elaborated further in the section or group in this manual pertaining specifically to the component or system.

Engine Hard To Start, Will Not Start

Check fuel system (Section 30).
Check electrical system (Section 40).
Check ignition system (Section 40).
Check air system (Section 30).
Low compression (Group 10).

Engine Starts, Won't Continue To Run

Check fuel system (Section 30).
Check ignition system (Section 40).
Check air system (Section 30).

Engine Loses Power

Check fuel system (Section 30).
Check ignition system (Section 40).
Check air system (Section 30).
Low compression (Group 10).

Engine Emits Black or Gray Exhaust Smoke

Check air intake system (Section 30).
Check fuel system (Section 30).
Low compression (Group 10).

Engine Has Low Oil Pressure

Check lubrication system (Group 15).

Engine Speed is Erratic

Check fuel injection pump (Section 30).
Check governor (Group 20).
Check speed control linkage (Group 20).

Engine Makes Abnormal Noise

Check timing (Section 40; Section 30).
Improper fuel (Section 30).
Worn or improperly adjusted engine parts (Group 10).
Plugged injection nozzles (Section 30).

Engine Operates At Abnormal Temperature

Check cooling system (Group 25).
Check ignition timing (Section 40).
Check fuel injection timing (Section 30).

Engine Consumes Excessive Fuel

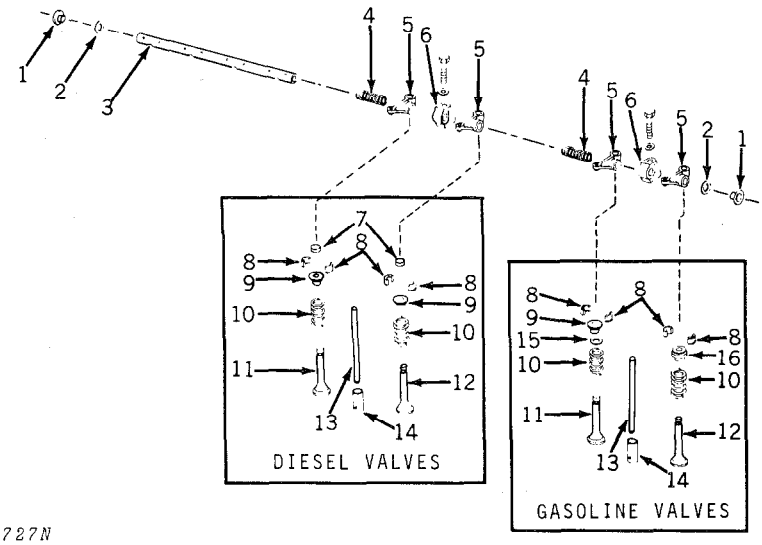
Check fuel system (Section 30).
Check ignition system (Section 40).
Check air intake (Section 30).
Low compression (Group 10).

Engine Misses

Low compression (Group 10).
Check fuel system (Section 30).
Check ignition system (Section 40).

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1—Plug (2 used)
2—Washer (2 used)
3—Rocker Arm Shaft
4—Spring (2 used)
5—Rocker Arm with Adjusting Screw (6 used)
6—Bracket (3 used)
7—Valve Stem Caps (Diesel) (6 used)
8—Keepers (12 used)
9—Valve Spring Cap (6 used Diesel) (3 used Gasoline)
10—Spring (6 used)
11—Intake Valve (3 used)
12—Exhaust Valve (3 used)
13—Push Rod (6 used)
14—Cam Follower (6 used)
15—Intake Valve O-Ring (Gasoline) (3 used)
16—Exhaust Valve Spring Cap Rotator (Gasoline) (3 used)

Fig. 1-Rocker Arm Assembly

Check to determine if cylinder head is flat and smooth. If it is necessary to resurface the bottom deck of the head, remove no more material than absolutely necessary (not to exceed 0.030 inch).

On diesel engines check distance from the bottom deck of the cylinder head to the valves when seated. The distance for intake valves must be 0.023 to 0.047 inch, the distance for exhaust valves must be 0.038 to 0.072 inch.

Refacing Valves

If end of valve stem on gasoline engine is excessively pitted or worn by rocker arm, grind down end of valve until squared. On diesel engines, replace valve stem caps if worn or damaged.

Inspecting Valve Springs

Check compression strength of springs.

Inspecting Rocker Arm Assembly

Make sure that rocker arm oil holes are not plugged.

If ends of arms are worn, replace or resurface them.

Thoroughly clean holes in rocker arm mounting brackets. This is especially important for the rear bracket, because oil is fed to the rocker arm shaft through this hole.

On gasoline engines, replace the intake valve stem O-ring.

If a failed valve has been replaced, also replace the rocker arm and push rod for that valve.

Valve Rotators (Gasoline)

On gasoline engines, inspect valve rotators. If rotator will not turn freely in one direction, replace with a new part.

ASSEMBLY

Rocker Arm Assembly

Assemble parts to rocker arm shaft in sequence that they were removed (Fig. 1).

Oil hole in rocker arm shaft-to-shaft support must face downward when assembly is installed on cylinder.

Apply John Deere Valve Stem Lubricant AR44402 to valve stems and install valves in valve guides, working them back and forth to make sure they slip through the guides easily and seat properly.

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JD310 LOADER BACKHOE

Technical Manual TM-1036 (Feb-77)

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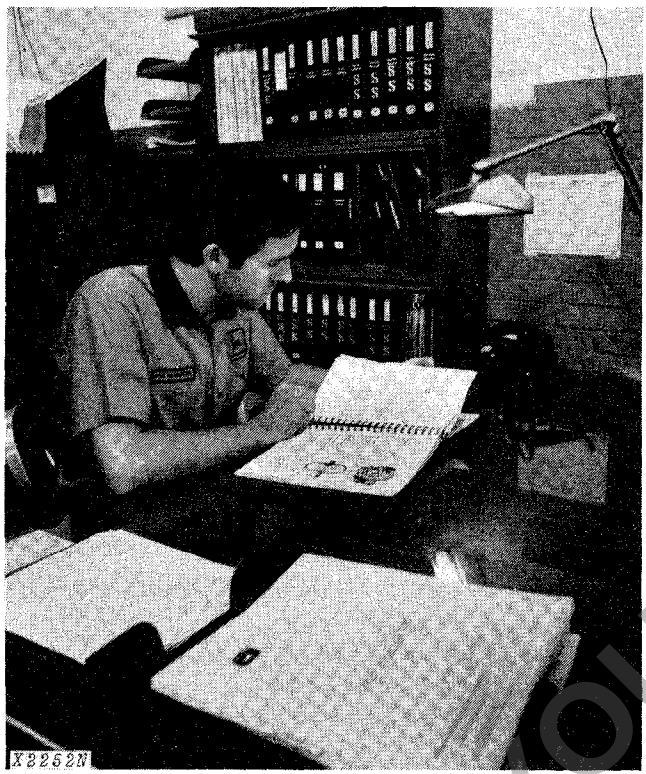
The specifications and design information contained in this manual were correct at the time it was printed. It is John Deere's policy to continually improve and update our machines. Therefore, the specifications and design information are subject to change without notice. Wherever applicable, specifications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

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INTRODUCTION



Use FOS Manuals for Reference

This technical manual is part of a twin concept of service:

- **FOS Manuals—for reference**
- **Technical Manuals—for actual service**

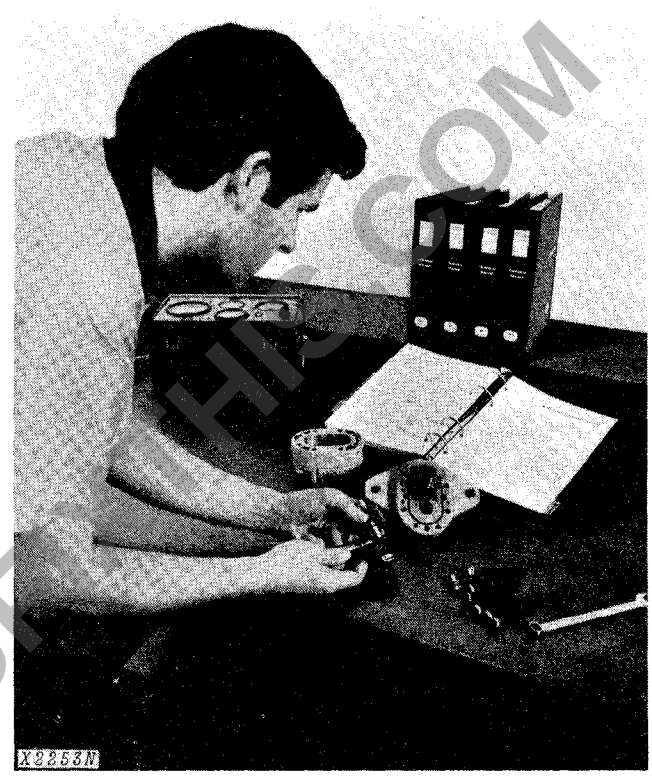
The two kinds of manuals work as a team to give you both the general background and technical details of shop service.

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 personnel.

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 mechanic.



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.



Use Technical Manuals for Actual Service

Some features of this technical manual:

- *Table of contents at front of manual*
- *Exploded views showing parts relationship*
- *Photos showing service techniques*
- *Specifications grouped for easy reference*

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

Using the technical manual as a guide will reduce error and costly delay. It will also assure you the best in finished service work.

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

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Group 10

BASIC ENGINE

DIAGNOSING MALFUNCTIONS

Engine Noise (Valve Train)

Improperly adjusted valve clearance.
Valve rotators inoperative (gasoline).
Worn shaft or rocker arm bore.
Bent push rods.
Worn camshaft or cam followers.

Engine Noise (Piston and Pins)

Scored piston and liner.
Worn piston.
Worn piston pin or bushings.
Broken piston.

Engine Noise (Bearings)

Worn connecting rod bearings.
Excessive crankshaft end play.
Excessive main bearing clearance.

Engine Noise (Timing Gear Train)

Worn gears.

Engine Uses Excessive Amount of Oil

Worn valve guides.
Valve deflectors worn or missing (gasoline).
Stuck piston rings or worn rings.
Excessive connecting rod bearing clearance.
Excessive oil pressure.
Crankcase oil diluted with fuel.
Engine overloaded.
Clogged breather pipe.

Low Compression

Worn rings.
Burned valves.
Damaged pistons.
Failed head gasket.

Engine Misses

Improperly adjusted valves.
Burned valves.
Weak valve springs.
Low compression on one or more cylinders.
(Also see Ignition, Section 40; Fuel System, Section 30).

Lack of Engine Power

Low compression on some or all cylinders.
Improperly adjusted valves.
Burned valves (check compression).
Valves sticking.
(Also see Ignition, Section 40; Fuel System, Section 30).

Coolant in Crankcase

Failure of head gasket.
Cracked head or block.
Leakage at cylinder liner seal.

CYLINDER HEAD, VALVES AND ROCKER ARMS

REMOVAL

The engine need not be removed to service cylinder head, valves, and related parts.

Plug all open injection lines. Remove injection nozzles from head. (Nozzle tips extend below face of cylinder head and may be accidentally damaged.)

REPAIR

Do not rotate crankshaft with cylinder head removed unless all cylinder liners are bolted down.

Inspecting Cylinder Head

Measure inside diameter of valve guides. Valves are available with standard size or oversize stems.

Valve guides must be precision reamed to match oversized valves. Make sure valves fit freely in guides.

Badly worn valve guides should be sized by knurling. Use knurling tool (1002) exactly as recommended by the manufacturer.

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Basic Engine

TUNE-UP DATA

ENGINE	DIESEL	GASOLINE
Minimum Compression Readings	300 psi	120 psi

The most important factor in compression readings is the difference between cylinders. This difference should be no more than 30 psi on gasoline engines; 50 psi on diesel engines.

Spark Plug Gap	----	0.025 inch
Vacuum Tests		
At Manifold	----	15 to 20 inches hg.
At Air Cleaner	14 to 25 inches water	14 to 25 inches water
Valve Clearance		
Exhaust Valves	0.018 inch	0.022 inch
Intake Valves	0.014 inch	0.014 inch

	New Part	Wear Tolerance	New Part	Wear Tolerance
Valve Lift (Clearance Adjusted)				
Exhaust Valve	0.456 to 0.482 in.	0.4260 in.	0.452 to 0.482 in.	0.4220 in.
Intake Valve	0.460 to 0.490 in.	0.4300 in.	0.460 to 0.490 in.	0.4300 in.

SPECIAL TOOLS

Tool No.	Name	Use
Essential Tools		
813 and 815*	Mandrels	To be used with bushing and seal drivers.
JDE-45*	Piston Ring Expander	To install piston rings.
JD271*	Piston Ring Compressor	Sleeve type compressor for installing pistons.
JD246*	Governor Bushing Driver	To install governor drive shaft bushing in timing gear cover.
JD248*	Oil Pressure Relief Valve Bushing Driver	To install relief valve bushing in cylinder block.
JD250*	Oil Seal Driver	To install crankshaft front oil seal.
JD251*	Driver	To install crankshaft rear oil seal wear ring (used with JD251-3 pilot ring).
JD251-3*	Pilot Ring	To install crankshaft rear oil seal wear ring.
JD251-4*	Seal Protector	To protect crankshaft rear oil seal during installation over crankshaft.
JD252*	Driver	To install idler gear bushings.
JD254*	Gear Timing Tool	To time engine front gear train.
970-JD*	Puller	To pull cylinder liners from cylinder block.
970-8*	Adapter Plate	To adapt 970-JD puller to cylinder liner.
JDE62*	Ring Groove Gauge	Check keystone ring groove wear.
1002* *	Knurling Tool	To resize valve guides.

** Order from Service Tools Inc., 1901 Indiana Avenue, Chicago, Illinois 60616.*

** * Available from United Tool Processes Corporation, Box 914, New Canaan, Connecticut 06840.*

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Check brushes for continuity between points "A" to "C" and "B" to "D" (Fig. 12). Check insulated brush for grounds. When checking, wiggle the brush and lead to locate poor connections or intermittent ground.

Replace brush assembly if brush exposed length is 1/4 inch or less.

Diodes

A humming or growling sound with considerably low output (6 to 10 amps.) is caused by a shorted diode. If maximum output is slightly low (30 amps.) a diode may be open-circuited.

If available, use a diode tester and follow the manufacturer's instructions. Do not use 110-volt test lamp to check diodes.

If using a 12-volt test lamp, the lamp should light only when the diode is connected in a forward bias.

With a 1-1/2-volt ohmmeter, a good diode will give a high and a low reading. If the high and low readings are identical, all diodes are good. A slightly different reading indicates that the diode is probably defective. Disconnect defective diode and recheck diodes.

Refer to Chapter 4 of FOS, ELECTRICAL SYSTEMS for additional diode test information.

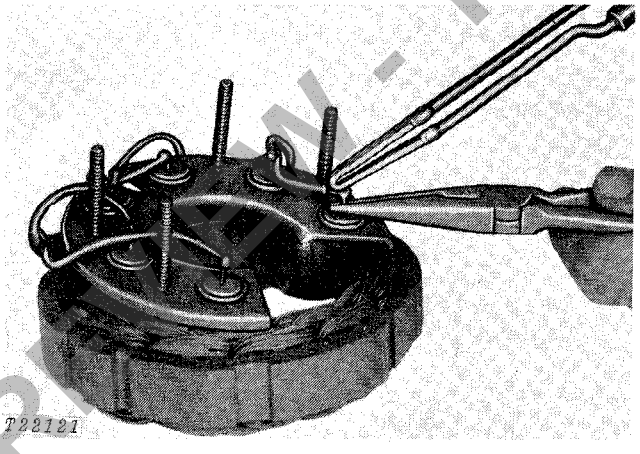


Fig. 13-Pliers Used as a Heat Sink

When soldering a diode lead, use a pair of pliers as a heat sink (Fig. 13). Use solder with melting point of 360°F. or higher. Never use an acid-core solder.

If a diode is defective, replace the diode assembly. Note the insulator locations on the positive diode assembly to aid in correct assembly. The diode connections and polarity must be correct. A positive diode has red printing and a negative diode has black printing.

Stator

Examine stator for insulation failure or defects. Shorted stator windings are usually discolored and smell. Replace stator only after other electrical components have been proven to be satisfactory.

Disconnect "Wye" connected stator leads (Fig. 14). An armature tester or test lamp may be used. After testing, connect leads. Make sure that the three common leads (A,B,C) are soldered together.

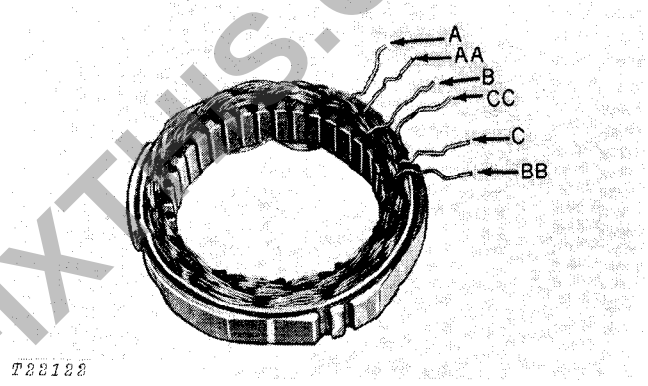


Fig. 14-Stator Leads

Open Circuit Tests.

The test lamp should light when connected to points: A to AA, B to BB, and C to CC.

Grounded Winding Test.

The test lamp should not light when one lead is connected to the metal frame and the other lead to point A, then to point B, then to point C.

Short-Circuited Test.

The test lamp should not light when connected to points: A to B, B to C, and A to C.

Assembly

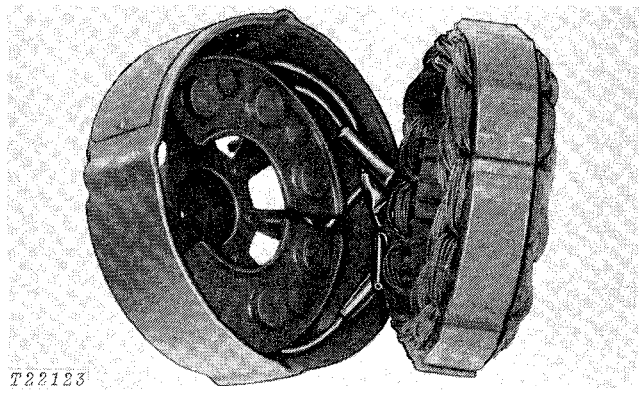


Fig. 15-Stator and Slip Ring End Frame

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SHAFTS AND GEARS

REMOVAL

Separate tractor between clutch housing and transmission as instructed in Section 10, Group 25.

Remove top cover from top of transmission.

Remove shifter mechanism from front of transmission.

Remove transmission lubricating oil cup with oil lines.

Countershaft

Remove cap screws securing bearing support to front of transmission.

Remove snap ring from groove at rear of countershaft.

Rotate the locking washer 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.

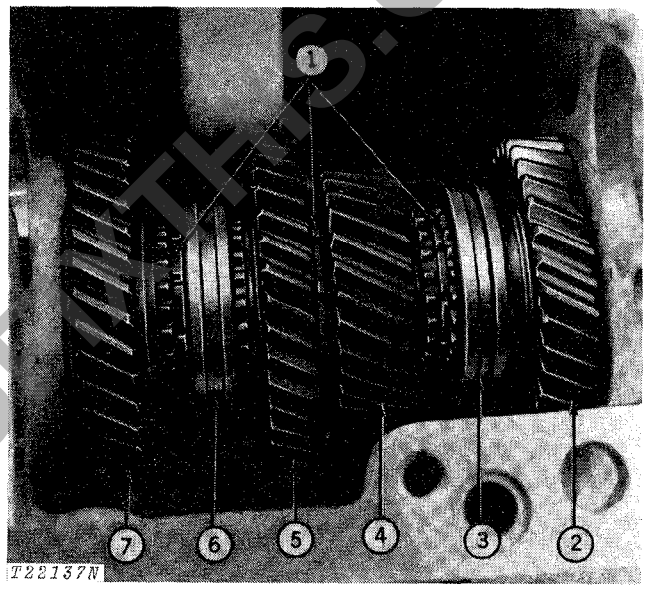
Tap transmission drive shaft forward to free front bearing cup from case and rear bearing cone from cup.

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 housings from unit.

Remove differential assembly as instructed on page 50-25-2.



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

Fig. 7-Removing Differential Drive Shaft

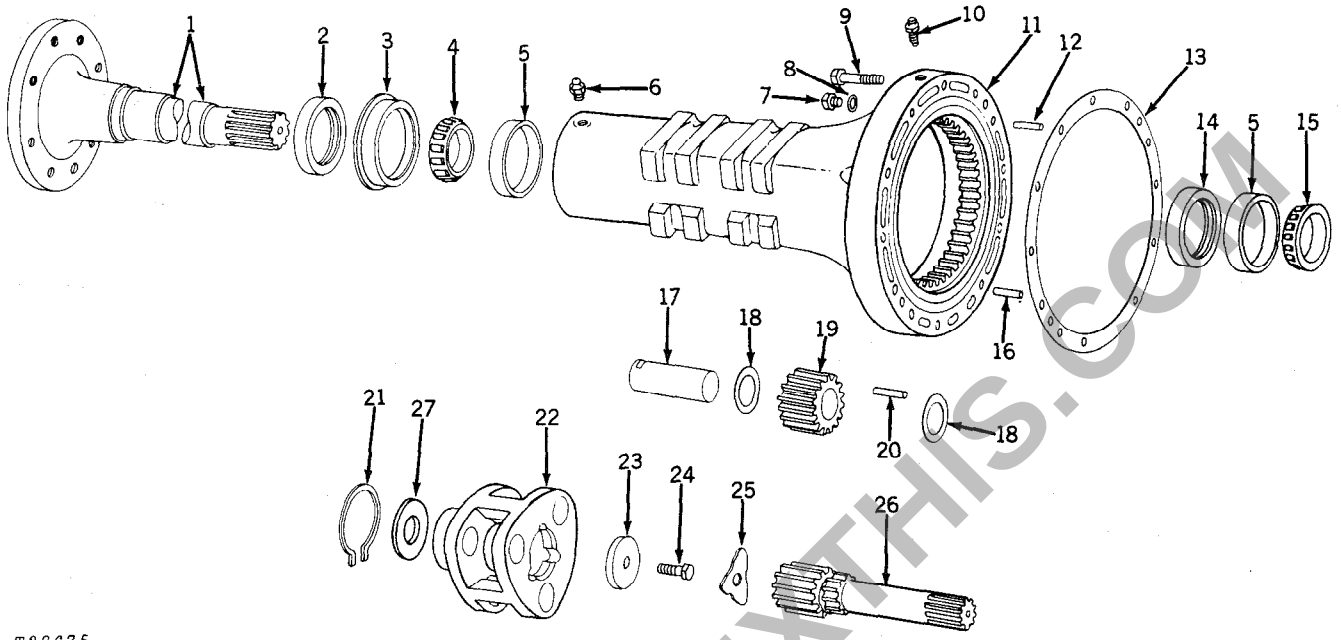
Remove hex. nut, washer, bearing, shim pack, and spacer from the front of the differential drive shaft.

Locate the three locking thrust washers on the drive shaft (Fig. 7). 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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1—Flanged Axle Shaft
2—Outer Oil Seal
3—Oil Seal Cup
4—Outer Bearing Cone
5—Outer Bearing Cup (2 used)
6—Grease Fitting
7—Brake Oil Lead Plug
8—O-ring
9—Cap Screw (12 used)
10—Special Screw
11—Rear Axle Housing
12—Dowel Pin (3 used)
13—Gasket
14—Inner Oil Seal
15—Bearing Cone
16—Dowel Pin (3 used)
17—Planet Pinion Shaft (3 used)
18—Thrust Washer (6 used)
19—Planet Pinion (3 used)
20—Bearing Roller (69 used)
21—Snap Ring
22—Planet Pinion Carrier
23—Special Washer
24—Special Screw
25—Lock Plate
26—Final Drive Shaft
27—Thrust Washer

Fig. 2-Axle Assembly

Planet Pinion Carrier

Check bearing rollers for excessive wear and replace entire set if any are found defective. Coat bearing rollers with light oil after assembling rollers in pinion bores.

Inspect snap ring and thrust washers for damage or undue distortion.

Rear Axle

Check oil seal for damage or evidence of excessive leakage.

Inspect bearing cone for damage or excessive wear. If found defective, drive it from shaft. Heat new cone not to exceed 200°F. Assemble rear axle shaft and drive inner bearing cone into position while hot.

ASSEMBLY

Coat bores of planet pinions with SAE multipurpose-type grease; position bearing rollers in planet pinions and secure assembly in carrier.

Coat final drive housing inner oil seal bore with SAE multipurpose-type grease, and install axle in housing.

Tape splined end of axle shaft with thin plastic tape to prevent damage to inner oil seal.

Place planet pinion carrier assembly on shaft and pull bearing cone into position by tightening the special hex. bolt.

ADJUSTING AXLE BEARINGS

Measure drag torque with end play in rear axle bearings. This value should not exceed 4 ft-lbs. Then tighten special hex. bolt to provide total specified drag torque.

Install lock plate and install assembled axle assembly on unit as instructed in Section 10, Group 25.

Fill axle assembly with grease as recommended in Section 10, Group 20.

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SPECIFICATIONS

Item	Specification
Steering leakage test (with oil at 150°F, cylinders against stops, and 60 in-lbs applied to steering shaft)	4 seconds per revolution maximum (40 turns)

TORQUE VALUES

Item	Specification
Steering wheel shaft nut	50 ft-lbs.
Steering valve end cap screws	250 in-lbs.

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LIST OF PARTS FOR TESTS

System Test

1.	202836	0.125 in. (3.18 mm) orifice
2.	202853	Straight connector (3 used)
3.	202850	Quick coupler adapter (3 used)
4.	202852	45° Swivel elbow
5.	36940	Special sleeve
6.	202854	Straight connector
7.	202851	90° Swivel elbow
8.	36952	144 in. (3 658 mm) hose assembly
9.	36953	144 in. (3 658 mm) hose assembly
10.	Magnetic pickup	
11.	Electrical mount	
12.	D-01080AA Master hydraulic system analyzer	
13.	D-01084AA Tachometer temperature reader.	

Backhoe and Loader Function Circuit Test

1.	202853	Straight connector (2 used)
2.	202850	Quick coupler adapter (2 used)
3.	202853	45° Swivel elbow
4.	202836	0.125 in. (3.18 mm) orifice
5.	36952	144 in. (3 658 mm) hose assembly
6.	36953	144 in. (3 658 mm) hose assembly with needle valve
7.	Magnetic pickup	
8.	Electrical mount	
9.	D-01080AA Master hydraulic system analyzer	
10.	D-01084AA Tachometer temperature reader	

Transmission Pump Test

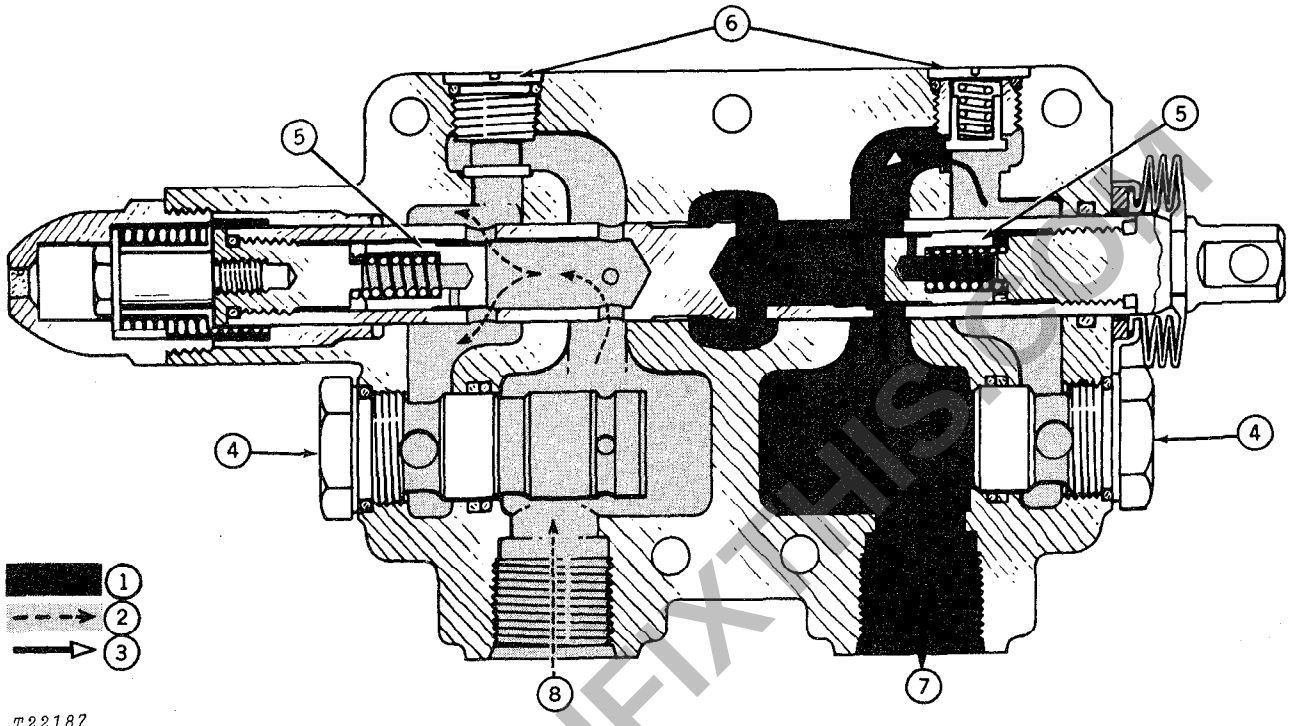
1.	JD-293	Dummy filter kit
2.	17502	Connector
3.	202850	Quick coupler adapter
4.	202853	Straight connector
5.	203665	0.187 in. (4.75 mm) orifice
6.	202807	Fitting
7.	203658	Plastic hose assembly
8.	36952	144 in. (3 658 mm) hose assembly
9.	Magnetic pickup	
10.	Electrical mount	
11.	Manual destroke valve and lever	
12.	D-01080AA Master hydraulic system analyzer	
13.	D-01084AA Tachometer temperature reader	

Pressure Control Valve Test

1.	202853	Straight connector
2.	202850	Quick coupler adapter
3.	36953	144 in. (3 658 mm) hose assembly with needle valve
4.	D-01080AA Master hydraulic system analyzer	
5.	D-01084AA Tachometer temperature reader	

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1—Pressure Oil
2—Return Oil
3—Anti-Cavitation Oil
4—Relief Valve
5—Lift Check
6—Anti-Cavitation Check Valve
7—To Cylinder
8—From Cylinder

Fig. 3-Swing Section (Left Swing Circuit Shown)

REPAIR

Operate backhoe control valve levers until all hydraulic pressure is relieved.

Discharge the accumulator by turning the machine steering wheel back and forth until it no longer operates freely.

Label control valve ports and lines to aid assembly.

If control valve stack is to be removed for servicing and it is believed that fragments of failed valve parts may have entered the hydraulic system, completely drain the system and replace the hydraulic filters.

Service individual valves separately. Be sure valve bodies and their spools are kept together because these parts are matched assemblies.

Remove tie bolts and separate valve sections.

Remove end caps and remove spools from valve housings.

Clean and dry all parts thoroughly and inspect for wear or damage.

Discard old O-rings and use new O-rings and seal kits when assembling.

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MISCELLANEOUS

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Group 5
FRONT AXLE AND FRONT SUPPORT

FRONT AXLE

GENERAL INFORMATION

The heavy-duty swept-back front axle mounts on the front end support. Swept-back axles give a shorter turning radius for sharper turns in close quarters.

REPAIR

Removal

Place transmission in park position and attach hoist to tractor front end support.

Remove drag link from steering bell crank and steering shaft arm.

On units with hydrostatic steering, disconnect cap and mark hoses from steering cylinder.

CAUTION: Place a floor jack under the axle assembly during removal.

Remove cotter pin, slotted hex. nut, washers, shim pack, and special cap screw from axle assembly. Slide axle assembly toward the rear until clear of support pivot pins.

Disassembly and Assembly

Refer to Figs. 1 and 2 during disassembly and assembly of the front axle.

Inspect all parts for wear or damage and repair or replace as necessary.

Refer to "Assembly Notes" (see "Specifications") when installing front axle pivot pin and all axle bushings. Install rear pivot pin bushing with grease holes lined up.

Install thrust bearing (23, Fig. 1) onto spindle shaft with numbered side of bearing away from knuckle.

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