TM

Technical Manual

John Deere JD401-C Loader and Backhoe Loader

TM1092

Litho in U.S.A.

JD401-C LOADER AND BACKHOE LOADER

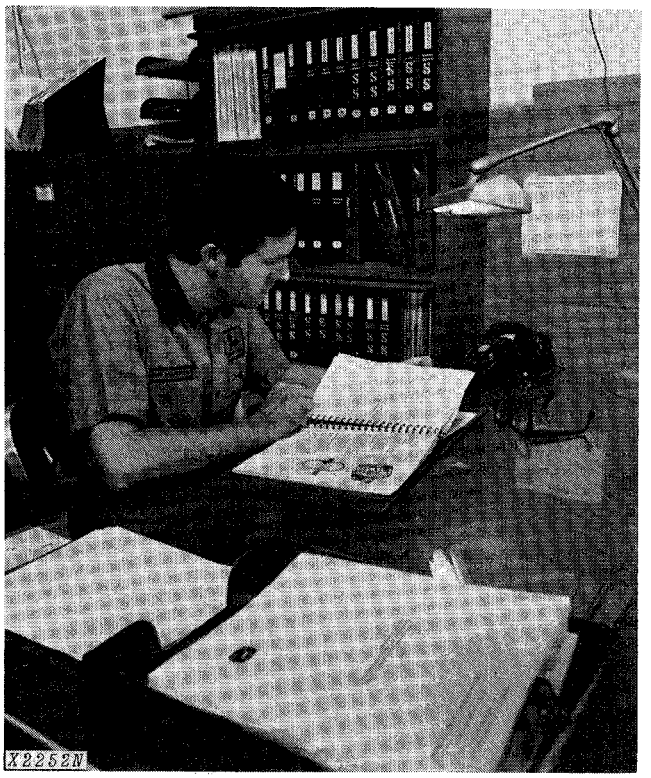
Technical Manual
TM-1092 (Jan-79)

CONTENTS

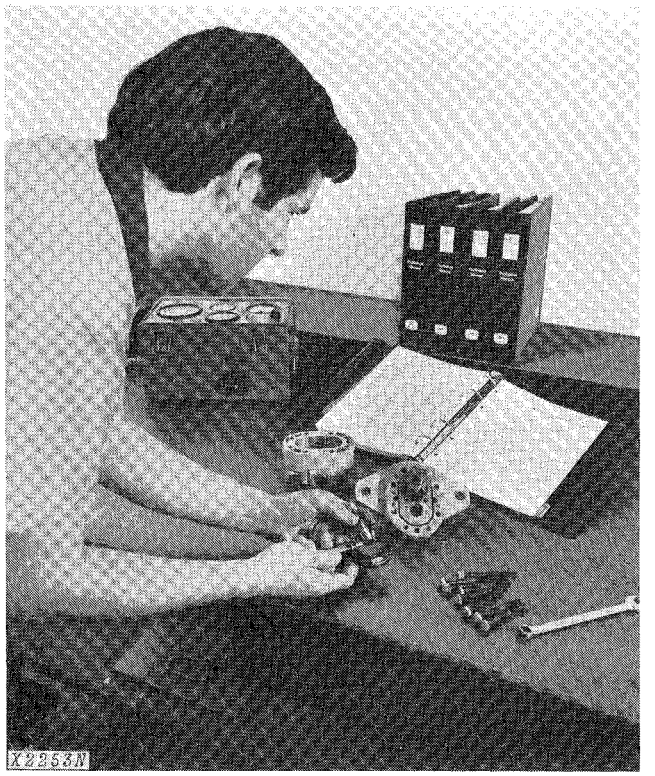
The specifications and design information contained in this manual were correct at the time this machine was manufactured. It is John Deere's policy to continually improve and update our machines. Therefore, the specifications and design information are subject to change without notice. Wherever applicable,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

Litho in U.S.A.

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 failure and their causes. FOS Manuals are for training new personnel and for reference by experienced service 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.

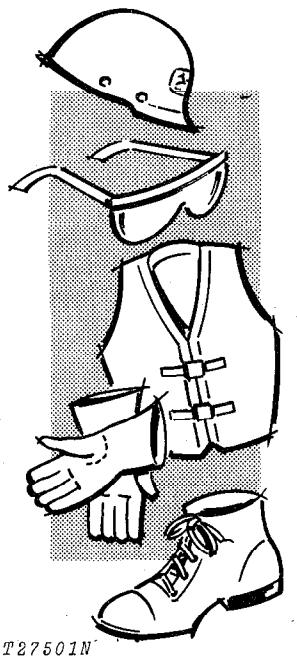
Litho in U.S.A.

MAINTENANCE WITHOUT ACCIDENT
WORK SAFELY

T27999

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

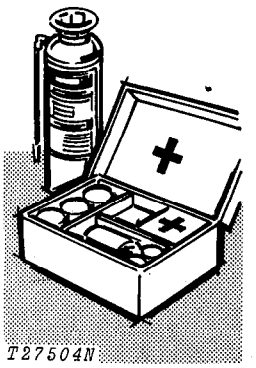
Consult your shop foreman for specific instructions on a job, and the safety equipment required.

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.

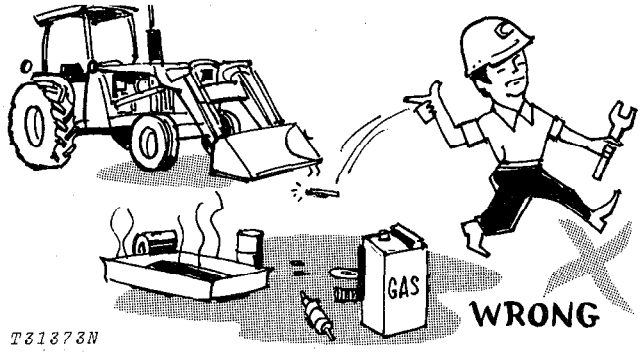
Store starting aids in a cool and well-ventilated place, out of the reach of unauthorized personnel.

Litho in U.S.A.

MAINTENANCE WITHOUT ACCIDENT

AVOID FIRE HAZARDS—

Fuel Is Dangerous!



T31373N

Don't smoke while refueling.

Don't smoke while handling highly flammable material.

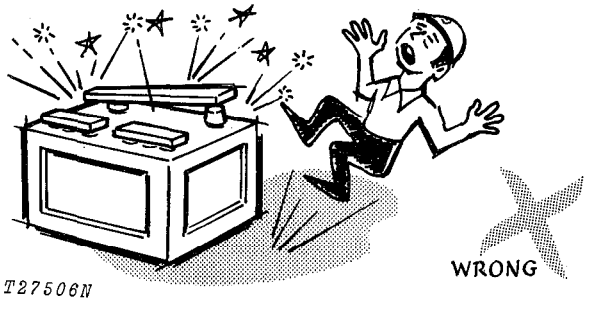
Engine should be shut off when refueling.

Use care in refueling if the engine is hot.

Don't use open pans of gasoline or diesel fuel for cleaning parts. Good commercial, nonflammable solvents are preferred.

Battery Gas Is Highly Flammable!

Provide adequate ventilation when charging batteries.



T27506N

Don't check battery charge by placing metal objects across the posts.

Don't allow sparks or open flame near batteries.

Don't smoke near battery.

Flame Is Not a Flashlight!

NEVER USE OPEN FLAME AROUND THE MACHINE.

KNOW WHERE FIRE EXTINGUISHERS ARE KEPT!

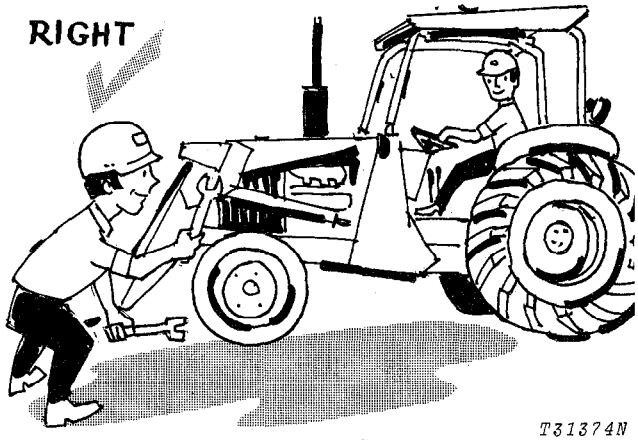
UNDER ALL MAINTENANCE CONDITIONS—

Do not perform any work on the equipment unless authorized to do so. Then be sure you know the safe and proper procedure.

Follow recommended procedures.

Never service the equipment while it is being operated.

Avoid working on equipment with the engine running.



T31374N

If it is necessary to make checks with the engine running, **ALWAYS USE TWO** service technicians—one, the operator, at the controls, the other checking within sight of the operator.

KEEP HANDS AWAY FROM MOVING PARTS

Support all raised equipment.

Never work under raised bucket or backhoe.

Lower bucket and backhoe to ground.

If the machine is on an incline, block it securely.

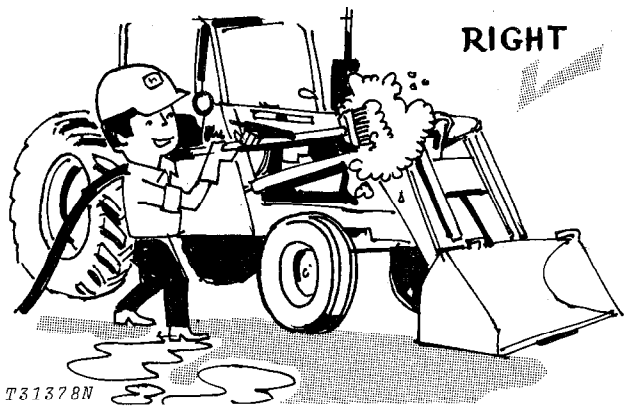
Use hoisting equipment for lifting heavy parts.

TAKE CARE! WATCH OUT FOR OTHER PEOPLE IN THE VICINITY

Wear safety glasses when drilling, grinding, or hammering metal.

Litho in U.S.A.

SERVICING PRECAUTIONS



Keep ALL equipment free of dirt and oil.

Be sure to clean any oil, grease, mud, ice, or snow from floor of operator's compartment and stepping points.

When preparing the engine for storage, remember that inhibitor is volatile and therefore dangerous. Seal and tape openings after adding the inhibitor. Keep container tightly closed when not in use.

Don't remove the radiator cap until coolant temperature is below the boiling point. Then loosen cap slowly to the stop to relieve pressure before removing.

Periodically check exhaust system for excessive leakage.

Relieve hydraulic pressure before working on hydraulic system: shut off engine, lower bucket and backhoe to ground, and move control levers and steering wheel until no response is felt.

When checking hydraulic pressure, be sure to use the correct test gauge.

PRECAUTIONS DURING REPAIR

Before working on hydraulic system relieve hydraulic pressure.

Before repairing the electrical system, or performing a major overhaul, disconnect batteries.

KNOW EQUIPMENT IS READY!

Check guards, canopies, safety guards — all protective devices installed on the unit. Every one should be in place and secure.

CHECK IT OUT!

- ☐ GUARDS
- ☐ CANOPIES
- ☐ SHIELDS
- ☐ PROTECTIVE DEVICES
- ☐ ROLL-OVER PROTECTIVE STRUCTURES
- ☐ SEAT BELTS, ETC.

Carefully inspect equipment for visual defects—leaks in fuel, lubrication, and hydraulic systems. Do not search for pressurized fluid leaks with your hands. Use cardboard or wood to search for leaks.

Litho in U.S.A.

Litho in U.S.A.

COMPLETE PAGE LISTING WITH LATEST DATE LINES

1,2	(Jan-79)	20-25-13,14	(Jan-79)	40-5-9,10	(Jan-79)
3,4	(Jan-79)	20-30-1,2	(Jan-79)	40-5-11,12	(Oct-79)
5,6	(Jan-79)	20-35-1,2	(Oct-79)	40-5-13,14	(Jan-79)
7,8	(Oct-79)	20-40-1,2	(Oct-79)	40-10-1,2	(Jan-79)
		20-40-3,4	(Oct-79)	40-10-3,4	(Jan-79)
10-5-1,2	(Oct-79)	20-40-5,6	(Oct-79)	40-10-5,6	(Jan-79)
10-5-3,4	(Oct-79)	20-40-7,8	(Oct-79)	40-10-7,8	(Jan-79)
10-10-1,2	(Oct-79)	20-40-9,10	(Oct-79)	40-10-9,10	(Jan-79)
10-10-3,4	(Oct-79)	20-40-11,12	(Oct-79)	40-15-1,2	(Jan-79)
10-10-5,6	(Oct-79)	20-40-13,14	(Oct-79)	40-15-3,4	(Jan-79)
10-10-7,8	(Oct-79)	20-40-15,16	(Oct-79)	40-15-5,6	(Jan-79)
10-10-9,10	(Oct-79)	20-40-17,18	(Oct-79)	40-20-1,2	(Jan-79)
10-10-11,12	(Oct-79)	20-40-19,20	(Oct-79)	40-20-3,4	(Jan-79)
10-10-13,14	(Oct-79)	20-40-21,22	(Jan-79)	40-25-1,2	(Jan-79)
10-10-15,16	(Oct-79)	20-40-23,24	(Jan-79)	40-25-3,4	(Jan-79)
10-10-17,18	(Oct-79)	20-40-25,26	(Jan-79)	40-25-5,6	(Jan-79)
10-10-19,20	(Oct-79)	20-40-27,28	(Jan-79)	40-30-1,2	(Jan-79)
10-10-21,22	(Oct-79)			40-30-3,4	(Jan-79)
10-10-23,24	(Oct-79)	30-5-1,2	(Jan-79)	40-30-5,6	(Jan-79)
10-10-25,26	(Oct-79)	30-5-3,4	(Jan-79)	40-35-1,2	(Oct-79)
10-10-27,28	(Oct-79)	30-5-5,6	(Jan-79)	40-35-3,4	(Jan-79)
10-10-29,30	(Oct-79)	30-10-1,2	(Jan-79)	40-35-5,6	(Jan-79)
10-10-31,32	(Oct-79)	30-10-3,4	(Jan-79)	40-35-7,8	(Jan-79)
10-10-33,34*	(Jan-79)	30-10-5,6	(Jan-79)		
10-10-35,36*	(Jan-79)	30-10-7,8	(Jan-79)	50-5-1,2	(Jan-79)
10-15-1,2	(Jan-79)	30-10-9,10	(Jan-79)	50-5-3,4	(Jan-79)
		30-10-11,12	(Jan-79)	50-10-1,2	(Jan-79)
20-5-1,2	(Jan-79)	30-15-1,2	(Jan-79)	50-10-3,4	(Oct-79)
20-5-3,4	(Oct-79)	30-15-3,4	(Jan-79)	50-10-5,6	(Oct-79)
20-10-1,2	(Oct-79)	30-15-5,6	(Jan-79)	50-15-1,2	(Oct-79)
20-10-3,4	(Jan-79)	30-15-7,8	(Jan-79)	50-15-3,4	(Jan-79)
20-10-5,6	(Oct-79)	30-15-9,10	(Jan-79)	50-15-5,6	(Jan-79)
20-10-7,8	(Jan-79)	30-20-1,2	(Jan-79)	50-20-1,2	(Oct-79)
20-10-9,10	(Oct-79)	30-20-3,4	(Jan-79)	50-25-1,2	(Oct-79)
20-10-11,12	(Oct-79)	30-20-5,6	(Jan-79)	50-25-3,4	(Oct-79)
20-10-13,14	(Jan-79)	30-20-7,8	(Jan-79)	50-25-5,6	(Jan-79)
20-10-15,16	(Jan-79)	30-25-1,2	(Jan-79)	50-25-7,8	(Jan-79)
20-10-17,18	(Oct-79)	30-25-3,4	(Jan-79)	50-30-1,2	(Oct-79)
20-10-19,20	(Jan-79)	30-30-1,2	(Jan-79)	50-30-3,4	(Oct-79)
20-10-21,22	(Jan-79)	30-30-3,4	(Jan-79)	50-35-1,2	(Jan-79)
20-15-1,2	(Oct-79)	30-30-5,6	(Jan-79)	50-35-3,4	(Jan-79)
20-15-3,4	(Jan-79)	30-30-7,8	(Jan-79)	50-35-5,6	(Jan-79)
20-20-1,2	(Jan-79)	30-30-9,10	(Jan-79)	50-35-7,8	(Jan-79)
20-20-3,4	(Jan-79)	30-30-11,12	(Jan-79)	50-35-9,10	(Jan-79)
20-25-1,2	(Jan-79)	30-30-13,14	(Jan-79)	50-35-11,12	(Jan-79)
20-25-3,4	(Jan-79)			50-35-13,14	(Jan-79)
20-25-5,6	(Jan-79)	40-5-1,2	(Jan-79)	50-40-1,2	(Jan-79)
20-25-7,8	(Jan-79)	40-5-3,4	(Jan-79)	50-40-3,4	(Jan-79)
20-25-9,10	(Jan-79)	40-5-5,6	(Jan-79)	50-40-5,6	(Jan-79)
20-25-11,12	(Jan-79)	40-5-7,8	(Jan-79)	50-41-1,2	(Jan-79)
				50-41-3,4	(Jan-79)

Vertical lines indicate pages included in this revision.
*Remove these pages from the manual.

Litho in U.S.A.

PAGE LISTING—Continued

Vertical lines indicate pages included in this revision.
*Remove these pages from the manual.

Litho in U.S.A.

Section 10
GENERAL

CONTENTS OF THIS SECTION

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 16.9-24, 6 ply rating, R4 rear tires; 11L-15, 8 ply rating, F-3 front tires; 3/4 cu. yd. (0.57 m³) bucket, and standard equipment.)

Power

(@ 2500 engine rpm):	SAE	DIN
Gross	66 hp (49.2 kW*)	
Net	62 hp (46.2 kW)	65.9 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 4-cylinder diesel, valve-in-head, 4-stroke cycle

Bore and stroke ..... 4.02x4.33 in. (102x110 mm)
Piston displacement ..... 219 cu. in. (3 588 cm³)
Compression ratio ..... 16.2 to 1
Maximum torque @ 1300 rpm ..... 160 lb-ft (217 Nm) (17.8 kg-m)
NACC or AMA (U.S. Tax) horsepower 25.65
Main bearings 5
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

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

Gear:	Travel Speeds mph		km/h	
	Fwd.	Rev.	Fwd.	Rev.
1	1.4	1.6	2.3	2.6
2	2.0	2.3	3.2	3.7
3	3.0	3.5	4.8	5.6
4	4.2	4.8	6.8	7.7
5	5.5	6.3	8.9	10.1
6	7.9	9.0	12.7	14.5
7	11.7	13.5	18.8	21.7
8	16.4	18.7	26.4	30.1

Final Drives ..... Inboard, planetary

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

Litho in U.S.A.

Hydraulic Cylinders:

	Bore	Stroke
Boom	2.75 in. (70 mm)	28.25 in. (718 mm)
Bucket	2.5 in. (64 mm)	15.125 in. (384 mm)
Cylinder rods	Ground, heat-treated, chrome-plated, polished	
Boom cylinder rods	1.75-in. (44 mm) dia.	
Bucket cylinder rods	1.25-in. (32 mm) dia.	

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

Steering.....Power
Turning radius (brake applied).....11 ft. 1 in. (3.35 m)
Loader clearance (brake applied).....33 ft. (10.06 m)
Number of turns, far left to far right 3.3

Tires: Front	Rear
11L-15, 8 ply rating, F3	16.9-24, 6 ply rating, R1
7.50/8.00-16, 10 ply rating, F3	16.9-24, 8 ply rating, R4
	19.5L-24, 8 ply rating, R4

Wheel Treads:
Front.....56 in. (1.42 m)
Rear.....62 in. (1.57 m)

Dimensions:
Height to top of hood.....4 ft. 7.3 in. (1.40 m)
Overall height to top of canopy..7 ft. 8 in. (2.34 m)
Overall width without bucket.....6 ft. 7 in. (2.01 m)
Overall length with 3-point hitch.....14 ft. 9.25 in. (4.50 m)
Ground clearance (under front axle).....1 ft. 6 in. (457 mm)
Ground clearance, min. .....1 ft. 1.25 in. (337 mm)

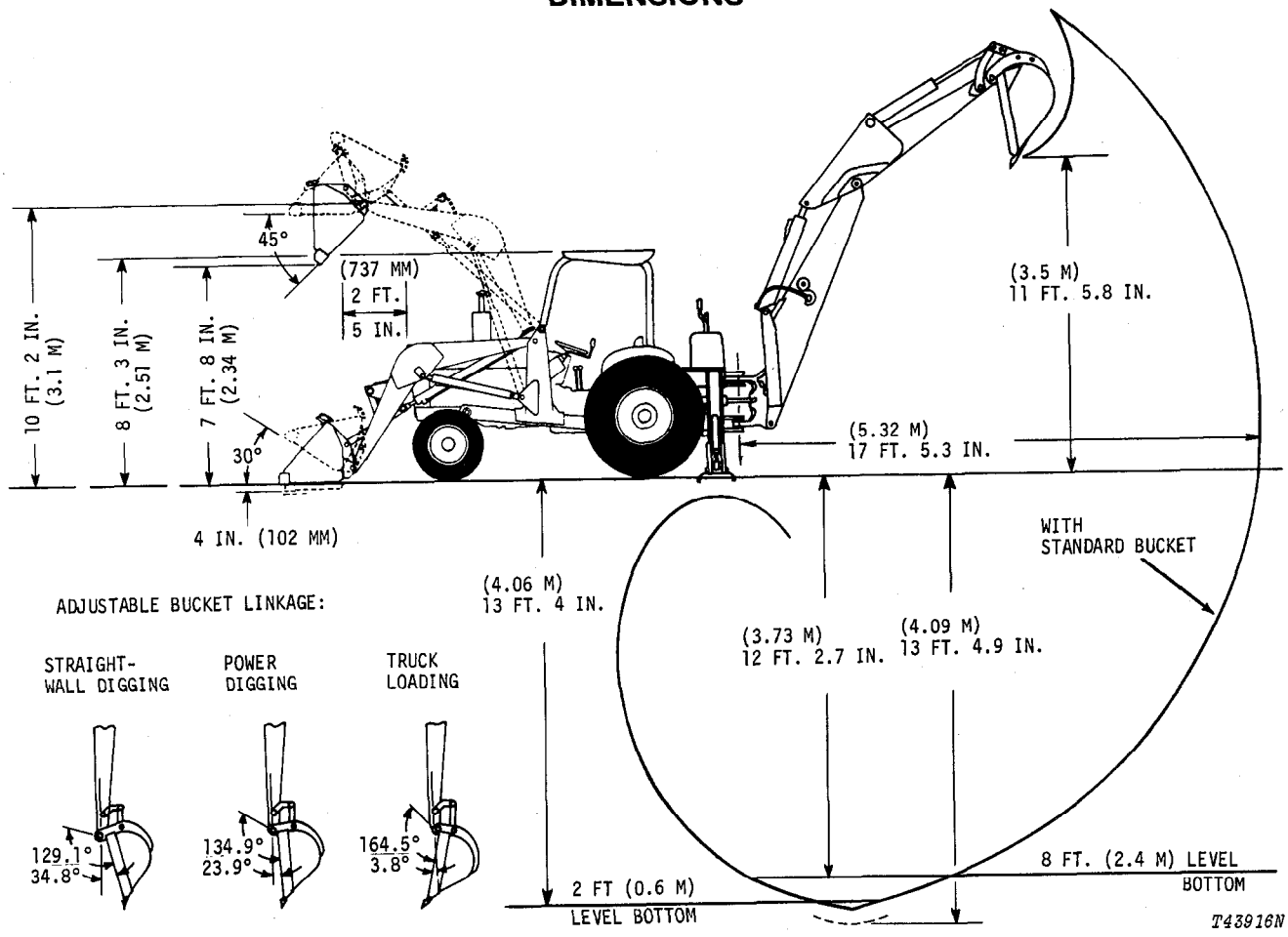
Capacities	U.S.	Liters
Cooling system	3 gal.	11.4
Fuel tank	19.5 gal.	73.8
Engine lubrication, including filter	9 qt.	8.5
Transmission and hydraulic system	10 gal.	37.9
Loader hydraulic system	3 gal.	11.4

Additional Standard Equipment:
Transistorized voltage regulator
Oil pressure indicator light
Alternator charge indicator light
Coolant temperature gauge
Key switch safety start
Cushioned seat
Vertical muffler w/rain cap
Fenders
Antifreeze
Bucket-level indicator
Lights
Differential lock
Foot throttle
Fuel gauge
Air cleaner restriction indicator
Cigar lighter
Cold weather starting aid
Speed-hour meter
Horn

SAE Operating Weight.....7840 lb. (3 556 kg)

Litho in U.S.A.

DIMENSIONS



Special Equipment

Backhoe
Counterweights with bracket (without 3-point hitch or remote cylinder)
Deluxe seat
Front axle counterweights
Front grille guard
Parking brake
Rear PTO (continuous "live" 540 rpm)
Rear wheel weights
Remote hydraulic cylinder
ROPS with canopy and seat belt
Single remote hydraulic cylinder control with quick-disconnect couplers
Swinging drawbar
3 inch seat belt
3-point hitch (Category 1 or 2 with sway blocks and regular or short links)

Buckets:	**Nominal Heaped Capacity**	**Width**
	3/4 cu. yd. (0.57 m³)	81.125 in. (2.06 m)
	1 cu. yd. (0.76 m³)	81.125 in. (2.06 m)

Operating Information:

Breakout force	5500 lb. (24.65 kN) (2 495 kg)
Digging depth below ground level	4 in. (102 mm)
Lifting capacity, full height	3500 lb. (1 590 kg)
Maximum dumping angle	50 deg.
Raising time to full height	3.5 sec.
Bucket dumping time	1.3 sec.
Lowering time (power)	2.3 sec.
Float-down time	3.8 sec.
Minimum effective rear wheel counterweight required, except when used with backhoe	2700 lb. (1 225 kg)

9250-A WHEEL BACKHOE SPECIFICATIONS (24 in. [610 mm] STANDARD BUCKET)

Operating Information:
Digging depth (ICED):
Maximum . . . . . 13 ft. 5 in. (4.09 m)
2 ft. (610 mm) flat bottom . . . . 13 ft. 4 in. (4.07 m)
8 ft. (2.44 m) flat bottom . . . . . 12 ft. 3 in. (3.73 m)
Swing arc . . . . . 180 deg.
Digging force (bucket cylinder in power-dig position), ICED . . . . 7409 lb. (33.21 kN) (3 361 kg)
Digging force, crowd cylinder . . . . . 4198 lb. (18.82 kN) (1 904 kg)
Reach from center of swing mast, ICED . . . . . 17 ft. 5 in. (5.31 m)
Reach from center of rear axle: . . . . . 20 ft. 5.25 in. (6.23 m)
Loading height, ICED . . . . . 11 ft. 6 in. (3.51 m)
Transport height . . . . . 11 ft. 2 in. (3.40 m)

Hydraulic System: Closed-center
Max. Pressure . . . . . 2350 psi (16 203 kPa) (165.2 kg/cm²)
Pump . . . . . 28 gpm (106 L/min) @ 2500 engine rpm

Hydraulic Cylinders:	Bore	Stroke	Rod Diameter
Boom	4 in. (102 mm)	32.38 in. (822 mm)	2 in. (51 mm)
Crowd	3.5 in. (89 mm)	31.25 in. (794 mm)	1.75 in. (44 mm)
Bucket	3 in. (76 mm)	26.5 in. (673 mm)	1.75 in. (44 mm)
Swing	3.5 in. (89 mm)	8.88 in. (226 mm)	1.75 in. (44 mm)
Stabilizer	3.5 in. (89 mm)	15.5 in. (394 mm)	1.75 in. (44 mm)

Cylinder rods . . Ground, heat-treated, chrome-plated, polished

Stabilizer Width:
Transport position . . . . . 6 ft. 8 in. (2.03 m)
Operating position (overall) . . . . . 9 ft. 8 in. (2.95 m)
Operating position (ICED) . . . . . 8 ft. 6 in. (2.59 m)

Buckets:

	Width		Struck Capacity	
	in.	mm	cu. ft.	m³
Standard	12	305	1.6	0.045
	16	406	2.6	0.074
	18	457	3.6	0.102
	24	610	4.8	0.136
	30	762	6.0	0.170
	36	914	7.2	0.204
Heavy-duty	18	457	3.6	0.102
	24	610	4.8	0.136
Ejector	24	610	4.2	0.119
Cemetery Special	36	914	7.2	0.204

Attachments:
Ripper tooth replaces backhoe bucket. Cast steel; 225 lb. (102 kg) tooth has hardened replaceable tip. Bolt-on rubber street pads for stabilizer pads.

Shipping Weight:
W/mounting parts, without bucket . . . . . 2,550 lb. (1 157 kg)

Litho in U.S.A.

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 JD401-C 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.

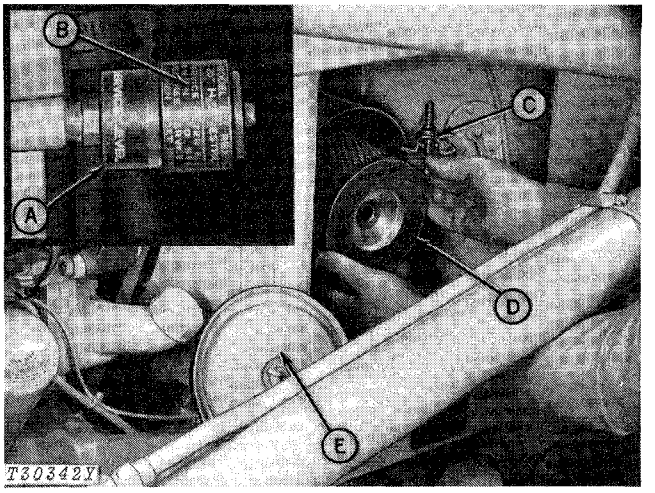
6. Reduce shipping pressure of all tires to the inflation pressure listed on page 10-10-2.

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.

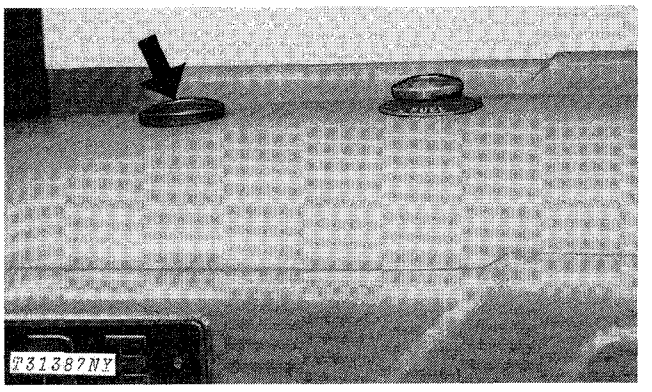


Fig. 2-Radiator Filler Cap

Maintain coolant level midway between the radiator core and the filler neck. If needed add clean soft water for warm weather or a solution of 50% clean water and 50% ethylene glycol (permanent type antifreeze with approved rust inhibitor) for cold weather. Tighten the filler cap.

Check cooling system for loose connections and leaks.

Coolant level checked *Yes* *No*

3. Batteries

Check battery electrolyte level. If distilled water is not available, use clean soft water. Avoid use of hard water. Remove foreign material from top of battery and coat terminals with petroleum jelly. Check vent holes in battery caps.

IMPORTANT: Never add water to battery in freezing weather unless engine will be run 2 or 3 hours.

Punch date code on battery.

Batteries checked *Yes* *No*

4. Tires

Check tire pressure with an accurate gauge having 1 psi (0.07 bar) graduation.

Inflate tires according to the chart below.

FRONT TIRES

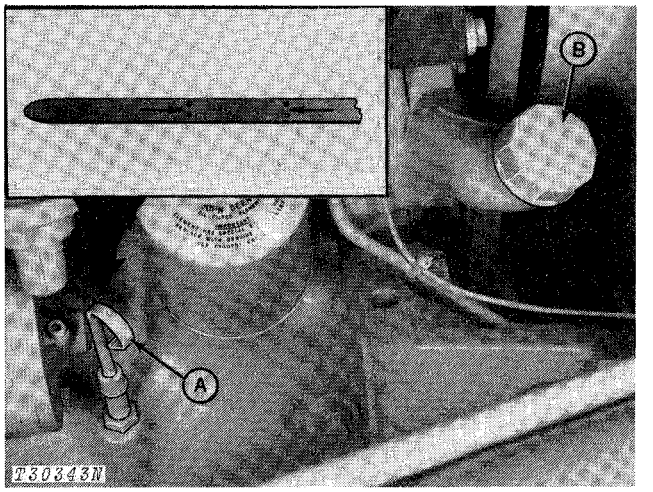
Tire Size	Type	Ply Rating	Inflation Pressure psi (bar)
11L-15	I-1A	8	40 (2.8)
7.50/8.00-16	F-3	10	56 (4)

REAR TIRES

Tire Size	Type	Ply Rating	Inflation Pressure psi (bar)
16.9-24	R1	6	16 (1.1)
16.9-24	R4	8	22 (1.5)
19.5L-24	R4	6	20 (1.4)

Tire pressure checked *Yes* *No*

5. Crankcase Oil Level



A—Dipstick **B—Oil Filler Cap**

Fig. 3-Crankcase Oil Level

Check crankcase oil level with machine on level ground. (Allow a minimum of 10 minutes for the oil to drain down before checking. If oil level is at or below bottom mark on dipstick, add oil specified on page 10-15-1 to bring oil level to between marks on dipstick. Do not operate engine with oil level below the bottom mark.

Crankcase oil level checked *Yes* *No*
Oil added *qts (L)*

6. Transmission-Hydraulic Oil Level

Check transmission-hydraulic oil level.

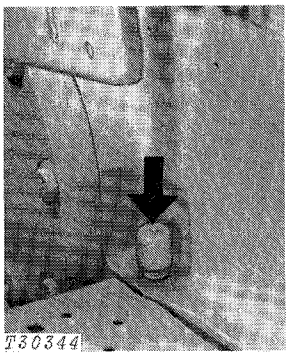


Fig. 4-Transmission-Hydraulic System Dipstick Resting On Top Threads

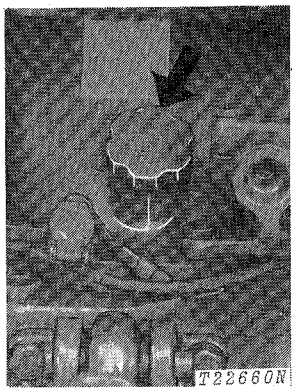


Fig. 5-Transmission-Hydraulic System Filler Cap

Run engine two to three minutes to fill oil circuits. Check oil level with machine on level ground, engine running at slow idle, rockshaft and any equipment lowered, reverser lever locked in neutral, parking brake engaged (if equipped), range shift lever in park, and clutch engaged. Remove dipstick and wipe oil off. Insert dipstick with cap resting on threads of tube (not screwed in place). If oil level is down to bottom mark on dipstick, add oil. Remove filler cap on rockshaft housing and add oil specified on page 10-15-1 to bring oil level to top mark on dipstick.

Oil level checked *Yes* *No*
Oil added *qts. (L)*

7. Fuel Tank

Fill fuel tank with correct fuel. Check action of fuel gauge.

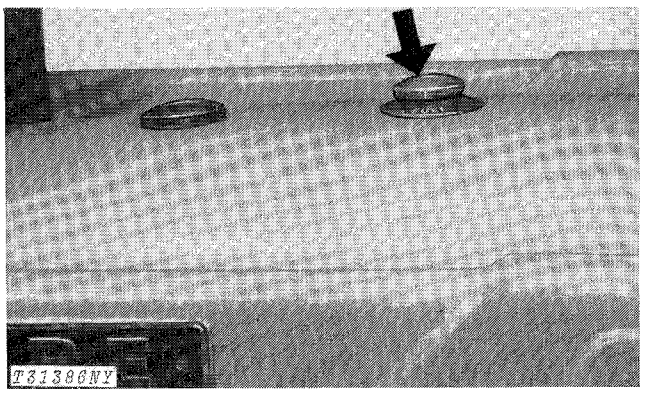
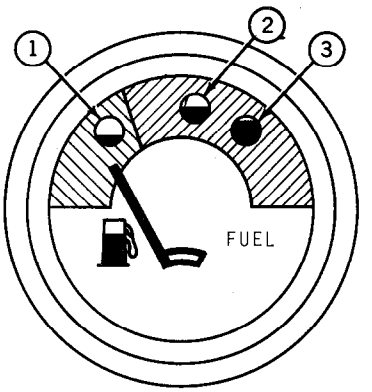


Fig. 6-Fuel Tank Filler Cap



1—Empty Tank **2—Half Full Tank**
3—Full Tank

Fig. 7-Fuel Gauge

Fuel tank filled *Yes* *No*
Fuel gauge checked *Yes* *No*

8. Grease Fittings

All grease fittings were lubricated and checked before the unit left the factory. However, to insure customer satisfaction, check each fitting shown on the following pages. Lubricate, if necessary, with John Deere Multi-Purpose Grease or an equivalent.

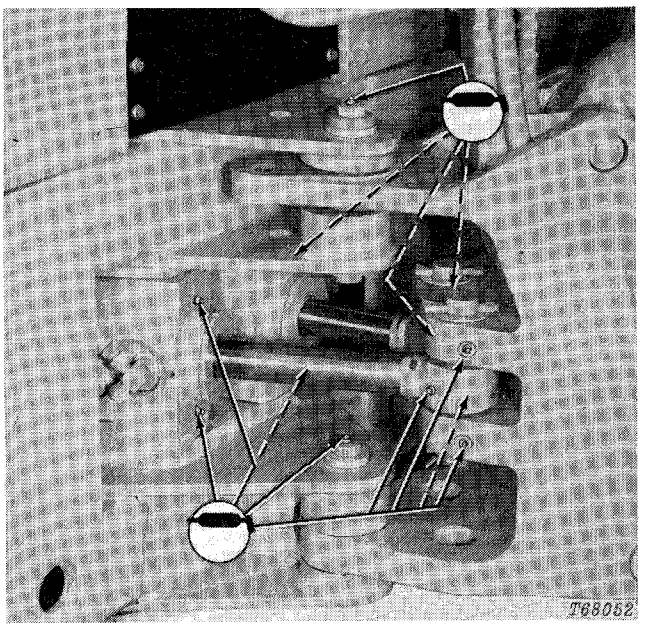


Fig. 8-Backhoe Pivot Points (12 points)

Lubrication required *Yes* *No*

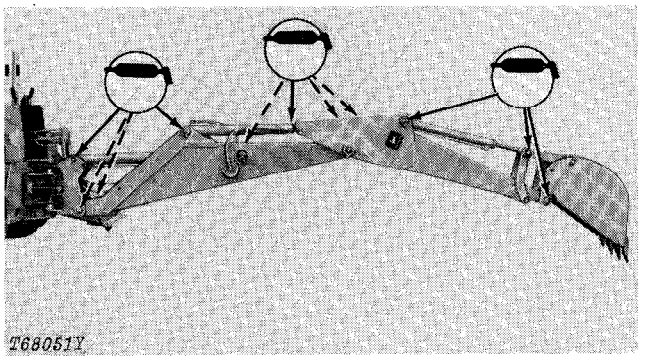


Fig. 9-Backhoe Boom Pivots (11 points)

Lubrication required Yes No

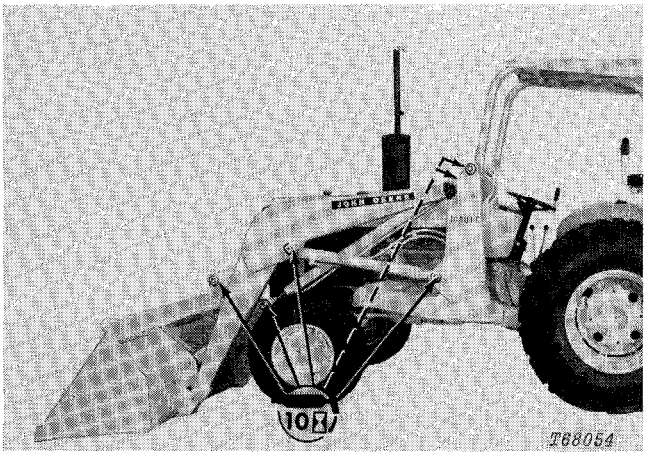


Fig. 10-Loader Pivot Points (12 points)

Lubrication required Yes No

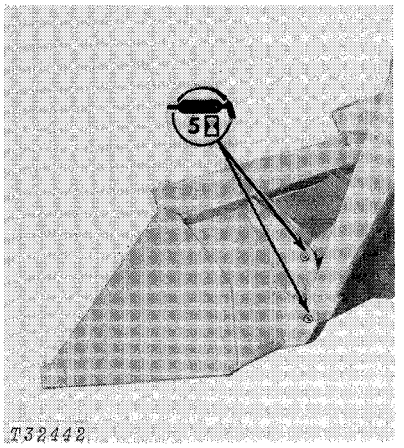


Fig. 11-Bucket Pivots (4 points)

Lubrication required Yes No

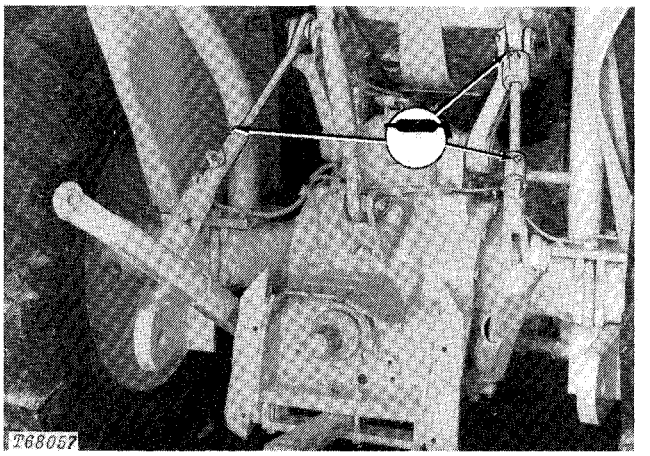


Fig. 12-3-Point Hitch (3 points)

Lubrication required Yes No

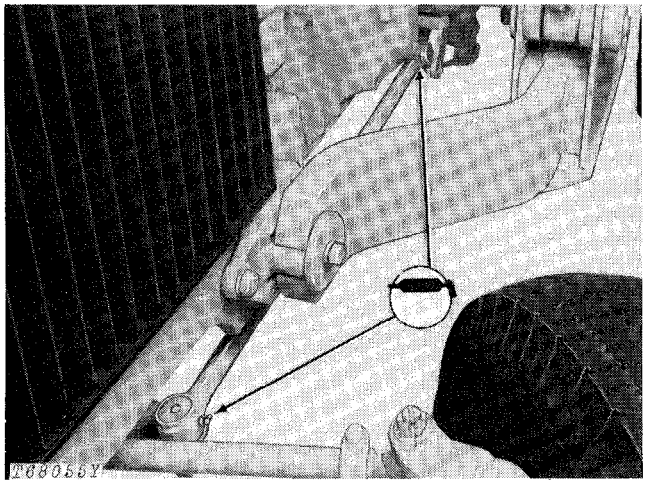


Fig. 13-Drag Links (2 points)

Lubrication required Yes No

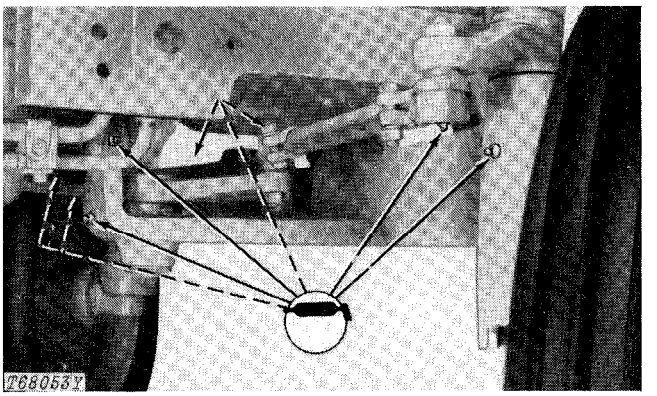


Fig. 14-Front Axle Pivot Points (8 points)

Lubrication required Yes No

9. Air Intake Hoses

Check clamps on hoses connecting air cleaner and engine. Tighten hose clamps where necessary. Inspect hoses for cracks.

Intake hoses checked *Yes* *No*

10. Alternator-Fan Belt Tension

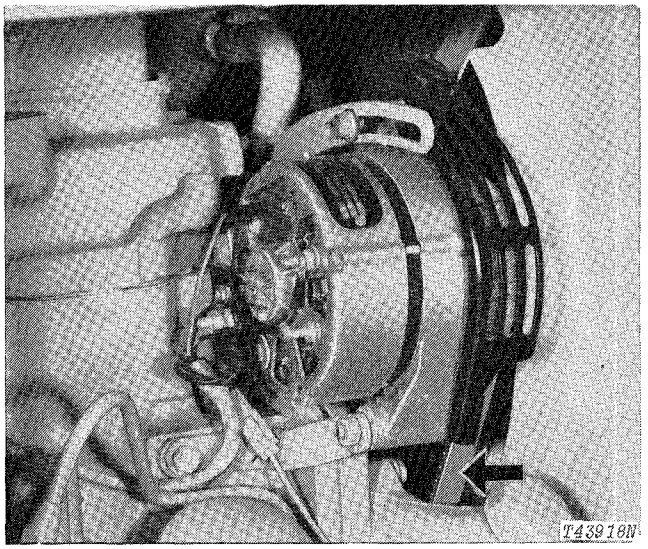


Fig. 15-Alternator-Fan Belt Tension

Check alternator belt tension. Loosen the alternator bracket and adjusting cap screws. Apply outward force to the FRONT alternator frame until 20 lb (9 kg) force on the belt midway between the pulleys will deflect the belt 3/4 inch (19 mm). If a strand tension gauge is used, strand tension must be 90 lb (41 kg).

IMPORTANT: Do not pry on the rear half of the alternator housing.

Belt tension checked *Yes* *No*

11. Engine Speeds

Check engine speeds.

Slow idle - 825 rpm
Fast idle - 2650 rpm hand throttle
2800 rpm foot throttle

If adjustment is needed, see page 10-10-20.

Engine speeds checked *Yes* *No*

12. Fuel Filter

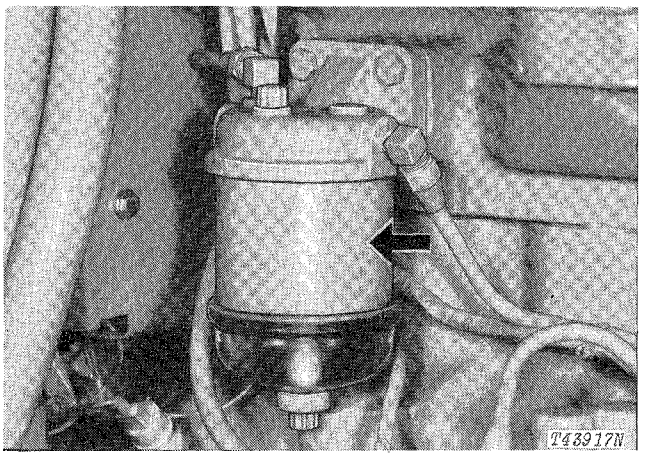


Fig. 16-Fuel Filter

Check fuel filter for sediment and drain if necessary.

Fuel filter checked *Yes* *No*

13. Indicator Lights and Gauges

Check operation of indicator lights.

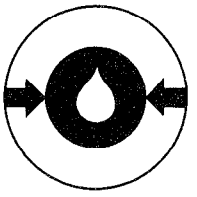


Fig. 17-Engine Oil Pressure Indicator Light

If light glows red when engine is running, stop engine immediately and determine cause.

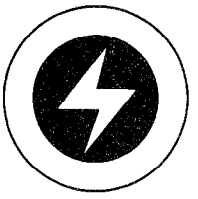
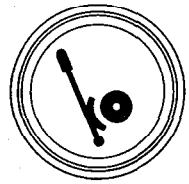


Fig. 18-Alternator Indicator Light

Light glows red when alternator is not charging. When light goes on with engine running, stop engine and determine cause.

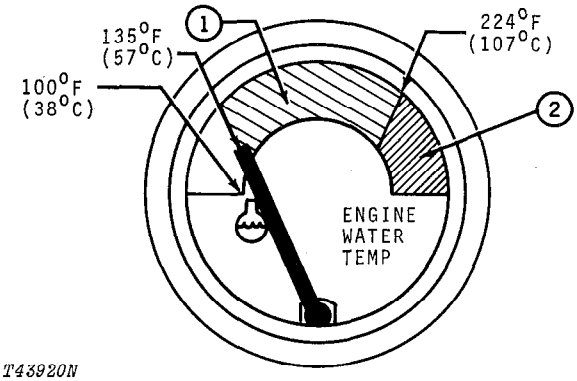


T62798N

Fig. 19-Parking Brake Indicator

Indicator light will glow when key switch is on and parking brake is engaged.

Check operation of the engine coolant temperature gauge.



T43920N

1—Operating Range **2—Overheat Range**

Fig. 20-Water Temperature Gauge

NOTE: Fuel gauge is on page 10-10-3.

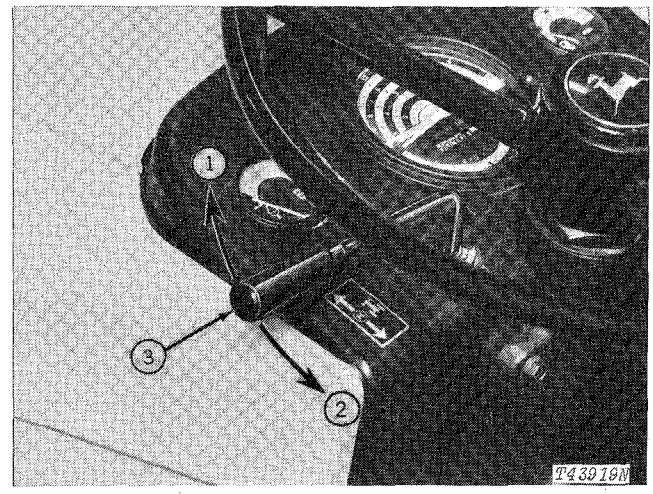
Indicator lights and gauges checked *Yes* *No*

14. Reverser

The reverser unit allows the operator to change the direction of travel "on the go" without declutching or shifting gears.

Note and correct any reverser malfunctions.

See page 10-10-22 for reverser speed of shift adjustment.



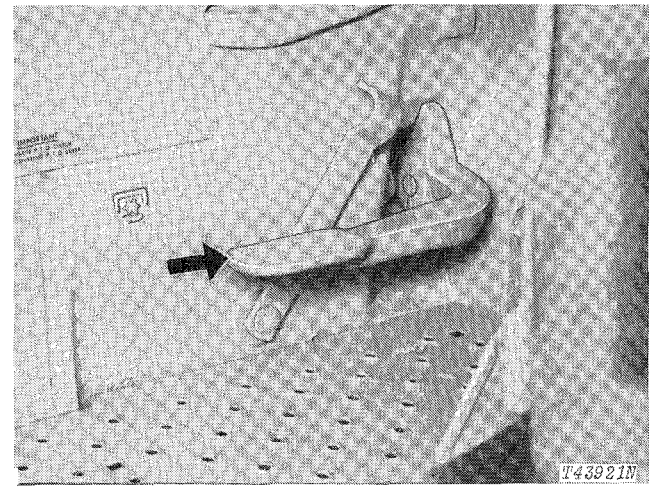
T43919N

1—Forward **2—Reverse**
3—Neutral

Fig. 21-Reverser Lever

Reverser checked *Yes* *No*

15. Differential Lock



T43921N

Fig. 22-Differential Lock Pedal

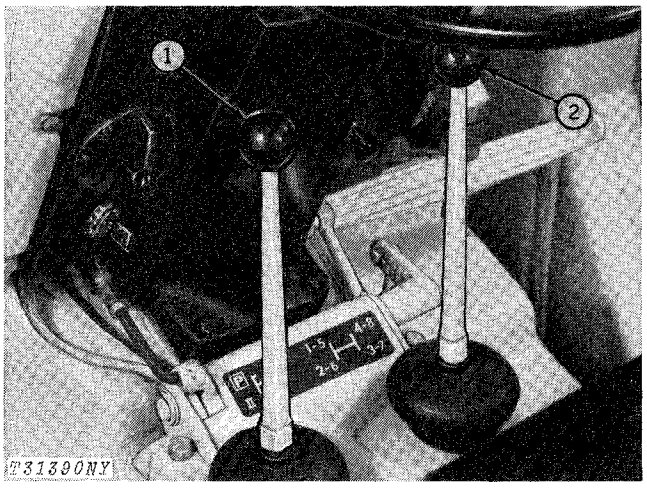
Check the differential lock operation.

While driving straight ahead push down the differential lock pedal. Hold the pedal down. Turn the steering wheel slightly. The operator will feel steering resistance if differential lock is working correctly.

The differential lock will automatically disengage when the pedal is released if traction for both rear wheels is equal. Unequal traction will keep the lock engaged.

Differential lock checked *Yes* *No*

16. Transmission Shifting



1—Range Shift Lever **2—Gear Shift Lever**

Fig. 23-Transmission

Check the operation of the unit in all ranges and gears.

Correct any malfunctions.

Transmission shifting checked *Yes* *No*

17. Brakes

Check operation of brakes.

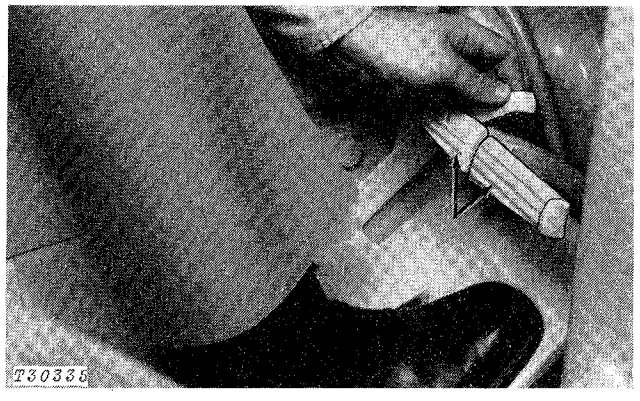


Fig. 24-Hydraulic Brakes

To stop the machine, push down both brake pedals. The machine must not pull to one side when stopping.

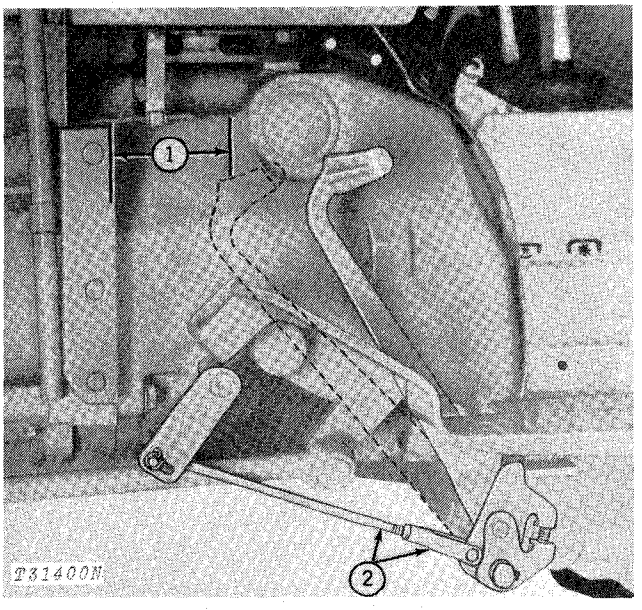
Turn to the left (L.H.). Push down the left (L.H.) brake pedal as you turn. Turn to the right (R.H.). Push down the right (R.H.) pedal as you turn.

The operator must feel the braking action pulling the machine to the left (L.H.) or right (R.H.). Brake action must be the same for both brakes.

Hydraulic brakes checked *Yes* *No*

18. Clutch Pedal Free Travel

Check the free travel of the clutch pedal.



1—5-1/4 inches (133 mm) to 5-3/4 (146 mm)
2—Pedal Adjusting Rod and Yoke

Fig. 25-Clutch Pedal Free Travel

Push the pedal down to the bottom of the first stage detent. In this position the throwout bearing will be against the clutch fingers. The top right (R.H.) edge of the rear of the pad of the clutch pedal must be 5-1/4 in. (133 mm) to 5-3/4 in. (146 mm) (1, Fig. 25) from the front of the bolting flange of the clutch housing.

If free travel is more than 5-3/4 in. (146 mm), see page 10-10-25 for adjustment.

Free travel checked *Yes* *No*

19. Accumulator

Check the accumulator action.

Run the engine five to ten minutes. Stop the engine. The steering wheel must turn easily until all hydraulic pressure is released.

If the steering wheel cannot be turned immediately after stopping the engine, the accumulator needs repair.

Accumulator checked *Yes* *No*

20. Engine Crankcase Vent Tube

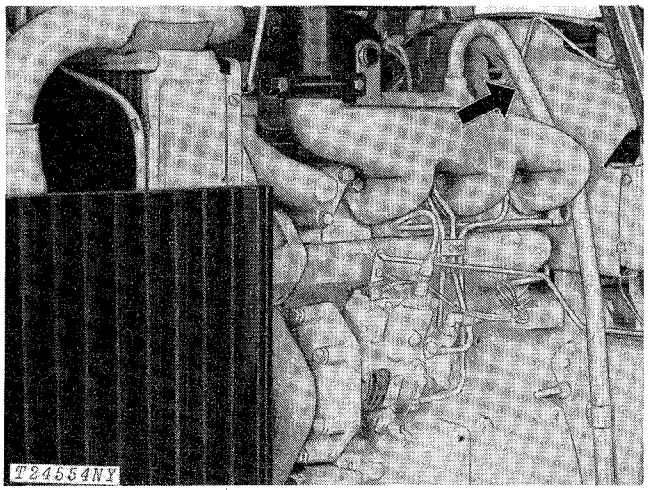


Fig. 26-Crankcase Vent Tube

Remove the vent tube. Clean it with diesel fuel. Install the vent tube. Be sure the packing is seated correctly in the tappet cover.

Vent tube cleaned *Yes* *No*

21. Seat

Check the operation of the seat.

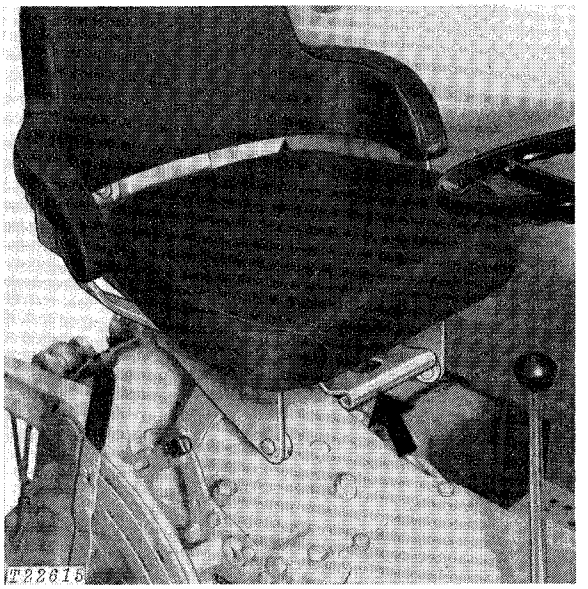
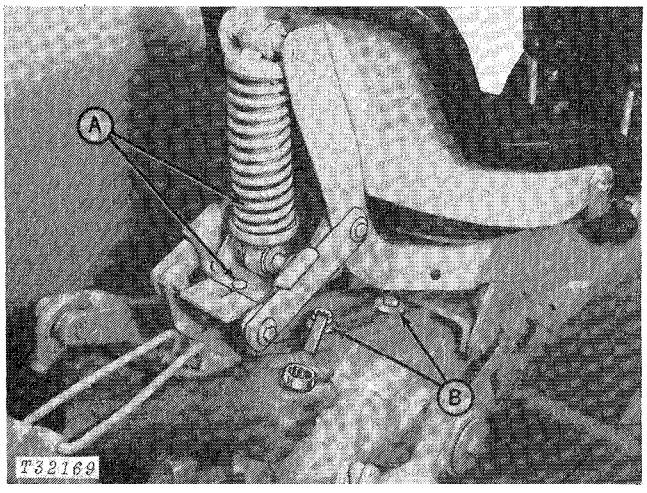


Fig. 27-Seat Release Latch (Deluxe Seat)

To move the seat to the upper rear position for standing, lift the release latch (Fig. 27). Stand. Lift the seat to the upper rear position.

To move the seat back to normal position, pull the seat forward. The seat will automatically go back to normal position when you sit.

Litho in U.S.A.



A—Weight Adjustment **B—Height Adjustment**

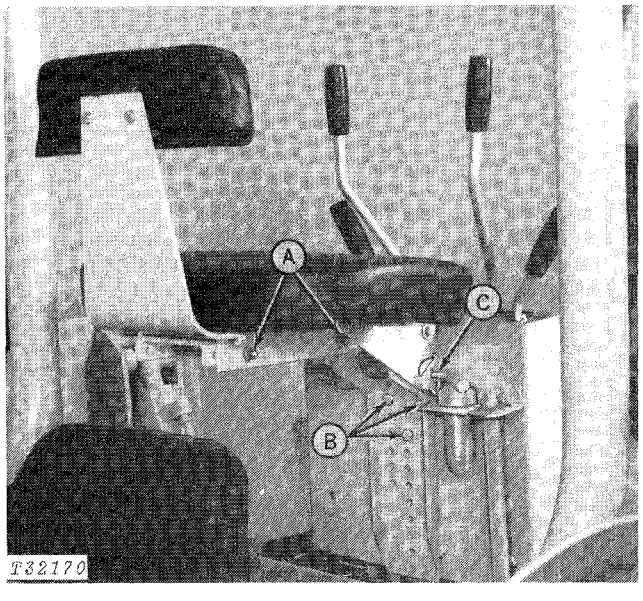
Fig. 28-Seat Adjustments

To change the adjustment for the height of the seat, loosen the cap screws (B, Fig. 28). Slide the seat to the desired position. Tighten the cap screws thoroughly.

To change the adjustment for the weight of the operator, move the seat to the upper rear position. Loosen the wing nuts under the support for the shock absorber. Slide the support to the desired position. Tighten the wing nuts.

Backhoe Seat

To change the horizontal adjustment of the seat, remove four cap screws (A, Fig. 29). Slide the seat to the desired position. Install the cap screws.

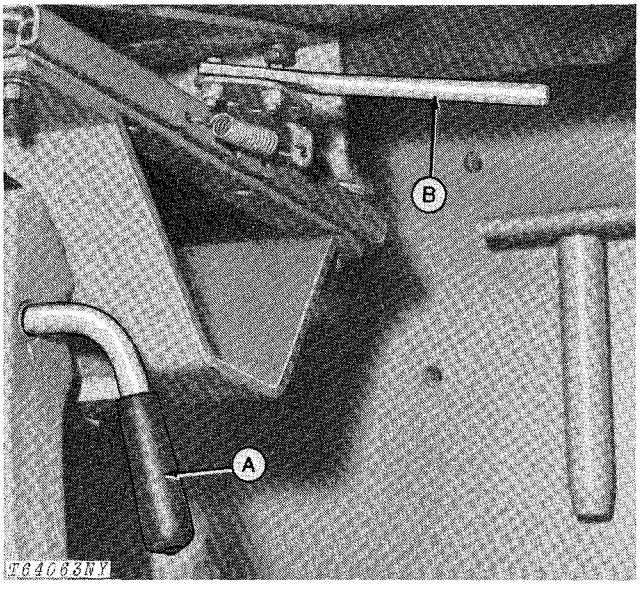


A—Horizontal Adjustment **C—Seat Latch**
B—Vertical Adjustment

Fig. 29-Seat Adjustment

To change the vertical adjustment, remove three cap screws (B, Fig. 29). Move the seat to the desired height. Install the cap screws.

Swivel Seat Adjustment



A—Release Lever **B—Horizontal Adjustment Lever**

Fig. 30-Seat Controls

To change the seat from tractor position to backhoe position, move the release lever (A, Fig. 30) to the rear. Turn the seat. Release the lever. The seat will automatically lock in the backhoe position.

To move the seat horizontally, move the horizontal adjustment lever (B, Fig. 30) to the right (R.H.). Slide the seat forward or backward to the desired position. Release the lever. Move the seat forward or backward a little to lock the seat.

Seat operation checked *Yes* *No*

Litho in U.S.A.

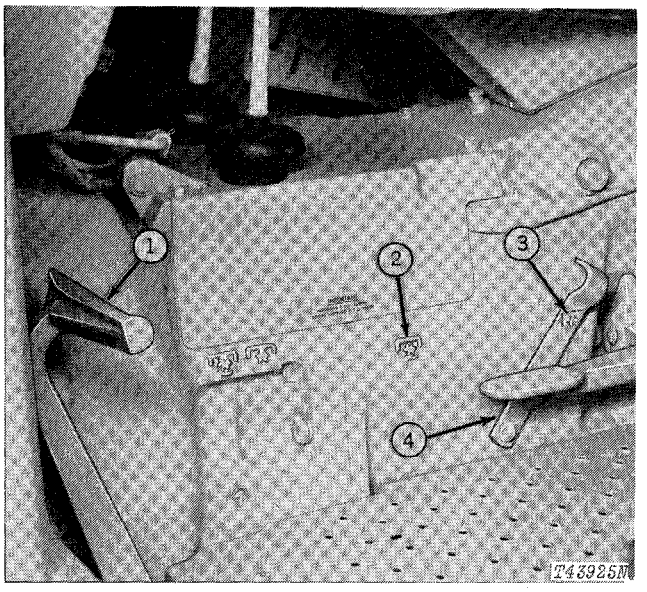
22. Power Steering

Check the power steering. The steering wheel must turn freely in both directions without seizure or too much play.

Power steering checked *Yes* *No*

23. Power Take-Off

Check power take-off operation.



1—PTO Clutch
2—On
3—Off
4—PTO Lever

Fig. 31-PTO Operation

Continuous-Running PTO

To engage the PTO, completely depress the clutch pedal (momentarily waiting for machine motion to stop) and move the PTO selector lever to the "ON" position. Slowly engage the clutch pedal.

IMPORTANT: Disengage PTO clutch at pedal before shifting PTO selector lever. PTO lever must be in fully engaged or "ON" position to avoid excessive spline wear.

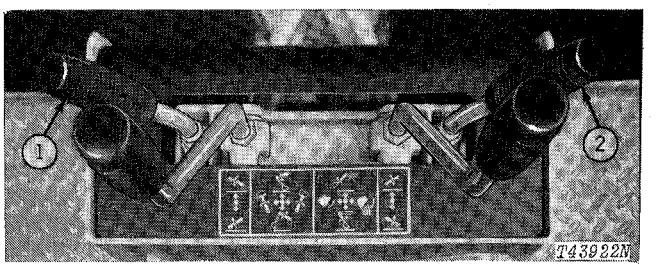
To disengage the PTO, completely depress the clutch pedal and shift the selector lever to the "OFF" position.

IMPORTANT: Always disconnect rear PTO stub shafts when not in use.

PTO operation checked. *Yes* *No*

24. Backhoe Control Levers

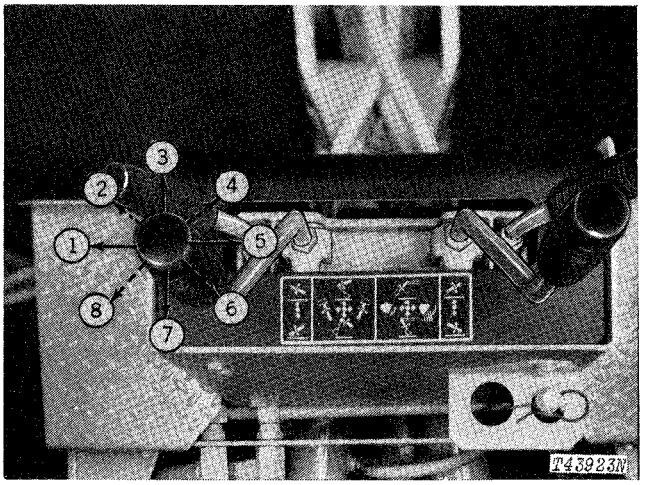
Check the operation of backhoe control levers.



1—Left Stabilizer Control
2—Right Stabilizer Control

Fig. 32-Stabilizer Control Levers

To lower the stabilizers, move the control levers forward; to raise them, pull the levers rearward.

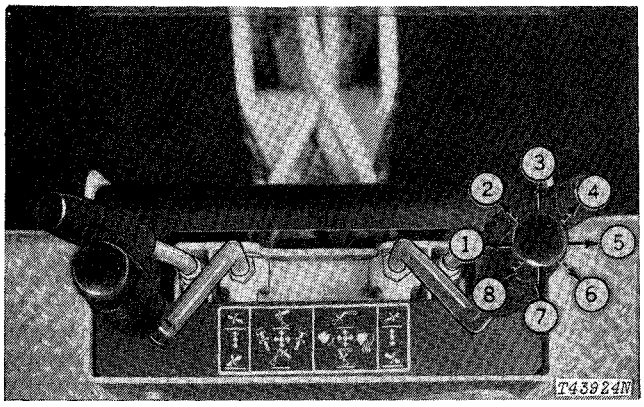


1—Left
2—Left and Down
3—Down
4—Right and Down
5—Right
6—Right and Up
7—Up
8—Left and Up

Fig. 33-Boom Control Lever

Move the lever to one of the intermediate positions to swing the boom left or right at the same time it is being raised or lowered.

A swing brake, built into the swing cylinder, automatically slows the boom when it travels to the far right or left.



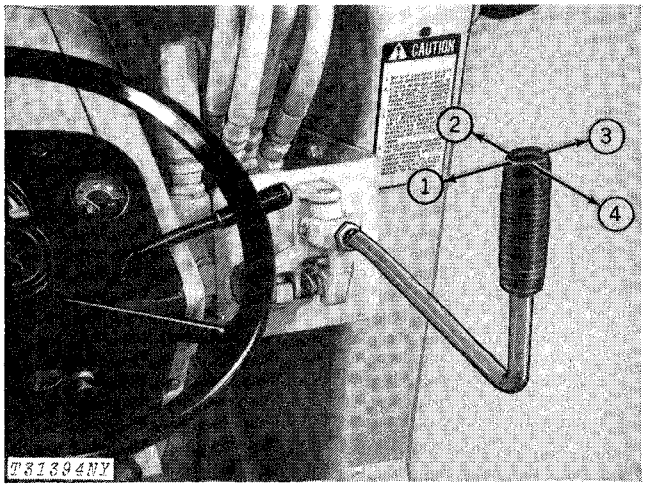
1—Load
2—Out and Load
3—Bucket Out
4—Out and Dump
5—Dump
6—In and Dump
7—Bucket In
8—In and Load

Fig. 34-Bucket and Dipperstick Control Lever

Move the lever to one of the intermediate positions to extend or retract the dipperstick at the same time the bucket is being loaded or dumped.

Backhoe control levers checked *Yes* *No*

25. Loader Control Lever



1—Retract Bucket
2—Lower Boom
3—Dump Bucket
4—Raise Boom

Fig. 35-Loader Control Lever

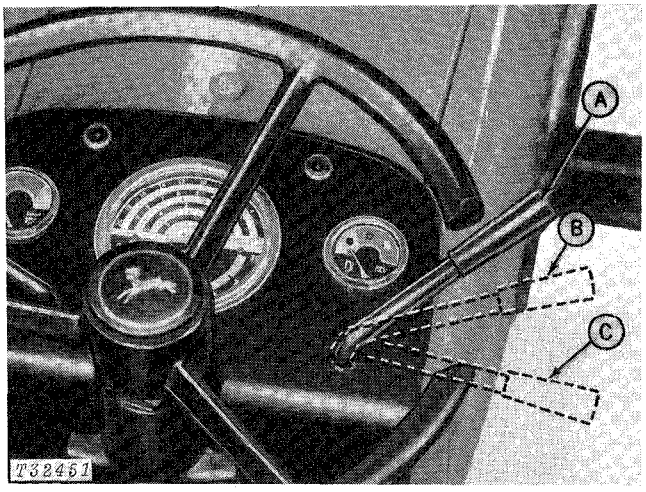
Check loader operation.

If the lever is released at any time during normal loader operation, it will return to neutral and the boom or bucket will be held in the position reached at that time.

Loader control checked *Yes* *No*

26. Hand Throttle

Check operation of hand throttle.



A—Slow Idle
B—PTO Speed
C—Fast Idle

Fig. 36-Hand Throttle

Hand throttle operation checked *Yes* *No*

27. Lights

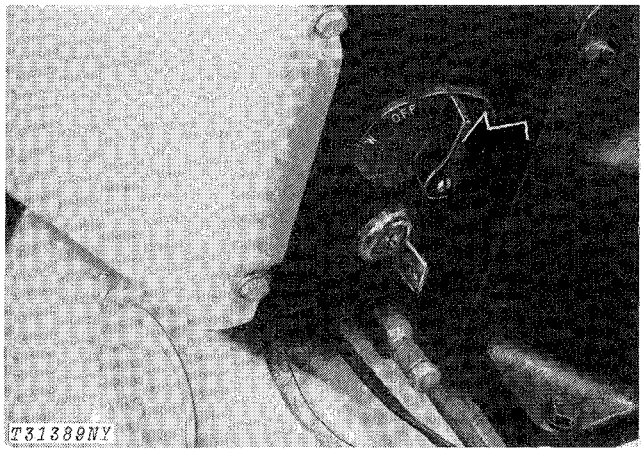


Fig. 37-Light Switch

Position	Headlights	Warning Lamps	Rear Combination Light
OFF	Off	Off	Off
W		On	
F	Dim		White
H	Bright	On	Red
H2	Dim	On	Red

NOTE: If customer desires, wire the lights to turn on when the key switch is off. Remove the purple wire from the "BAT" terminal. Install the unused red wire coming off the circuit breaker. Tape the end of the purple wire.

All lights checked *Yes* *No*

28. Parking Brake

Check the operation of the parking brake.

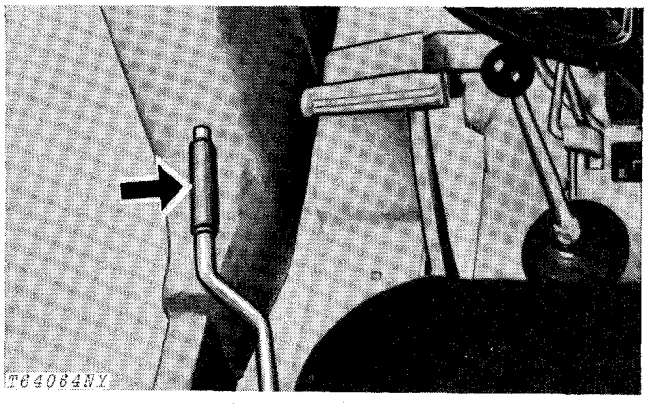
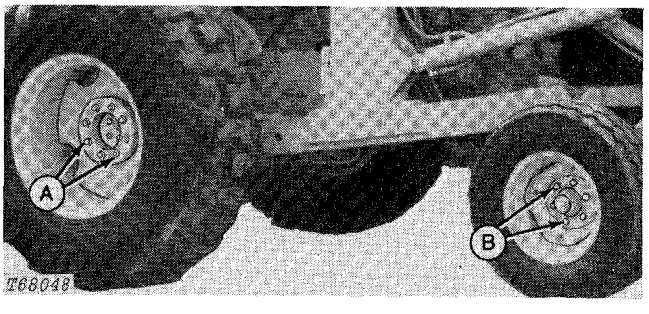


Fig. 38-Parking Brake

1. To engage, pull up.
2. To disengage, press button and push lever down.

If adjustment is needed, see page 10-10-28.

29. Wheel Retainers



A—Rear Wheel Retainer **B—Front Wheel Retainer**

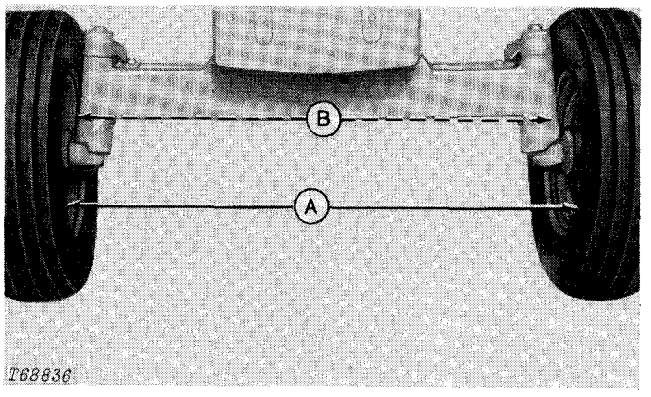
Fig. 39-Wheel Retainers

Check wheel retainer torque. Tighten to 100 lb-ft (14 kg/m).

Wheel retainers checked *Yes* *No*

30. Toe-In

Check front wheel toe-in.



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

Fig. 40-Checking Front Wheel 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 adjustment is needed, see page 10-10-31.

Toe-in checked *Yes* *No*

31. Backhoe Tapered Pins

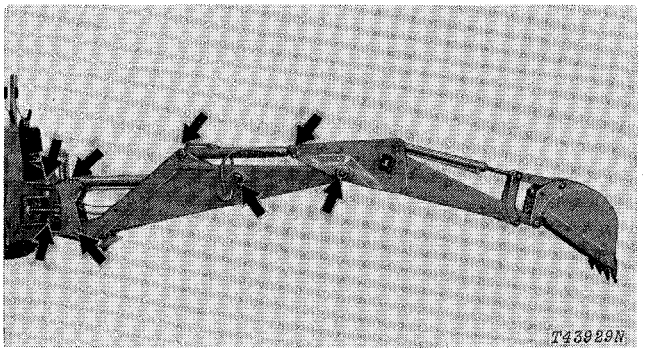
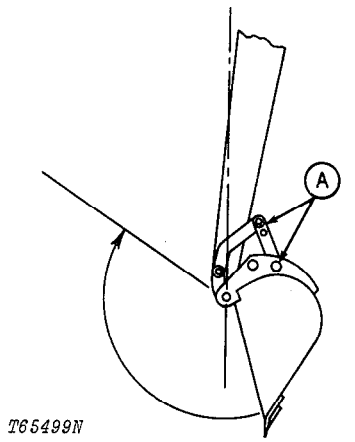


Fig. 41-Backhoe Tapered Pins

Check the torque on the backhoe tapered pins using the torque chart on page 10-10-32. If torquing is required, see procedure on page 10-10-30.

Be sure the backhoe bucket is in the power dig position.



A—Install Pins

Fig. 41A-Power Dig Position

Tapered pins checked *Yes* *No*
Bucket position checked *Yes* *No*

32. Accessible Hardware Torque Values

Check all accessible bolts and nuts for correct tightness. If hardware is loose, tighten it to the correct torque. See torque chart on page 10-10-32.

Accessible hardware checked *Yes* *No*

33. Final Check

The final predelivery procedure is the overall clean-up on the unit. Make the unit LOOK like a new machine with the proper touch-up of chipped paint and a good wash job. Deliver to the customer a machine anyone would be proud to own.

DELIVERY SERVICE

A thorough discussion of the operation and service of this loader backhoe at the time of delivery helps to assure complete customer satisfaction. Proper delivery should be an important phase of a dealer's program. A portion of the John Deere Delivery Receipt emphasizes the importance of proper delivery service.

Many complaints arise because the owner was not shown how to operate and service the new loader backhoe properly. Devote enough time, at the customer's convenience, to introduce the owner to the new loader backhoe and explain how to operate and service it.

The following procedure is recommended before the service technician and owner complete the delivery acknowledgments portion of the Delivery Receipt.

Use the operator's manual as a guide to be sure that the owner understands these points thoroughly:

1. The importance of safety.
2. The importance of lubrication and periodic services.
3. The importance of the break-in period.
4. Controls and instruments.
5. How to start and stop the engine.
6. All functions of the hydraulic system.

After explaining and demonstrating the above features, have the owner sign the Delivery Receipt and give the owner the operator's manual.

AFTER-SALE INSPECTION

The purchaser of a new John Deere loader backhoe is entitled to a free inspection at some mutually agreeable time within the warranty period after the equipment has been "run-in," usually after 50 to 100 hours of loader backhoe operation. The terms of this after-sale inspection are outlined on the customer's John Deere Delivery Receipt.

The purpose of this inspection is to make sure that the customer is receiving satisfactory performance from the loader backhoe. At the same time, the inspection should reveal whether or not the loader backhoe is being operated, lubricated, and serviced properly.

If the recommended after-sale service inspection is followed, the dealer can eliminate a needless volume of service work by preventing minor irregularities from developing into serious problems later on. This will promote strong dealer-customer relations and present the dealer an opportunity to answer questions that may have arisen during the first few days of operation.

During the inspection service, the dealer has the further opportunity of promoting the possible sale of other new equipment.

Check operation of all controls and instruments for freedom of movement and correct operation.

Litho in U.S.A.

1. Engine Crankcase Oil and Filter

NOTE: Check with the customer if oil has been changed and filter replaced before performing this service.

Normal sequence of service is as follows:
Oil and Filter Change - after first 100 hours
Oil Change - every 200 hours thereafter
Filter Change - every 200 hours thereafter
If changed, record information below:
Approximate hours at change _____
If not, change as follows:

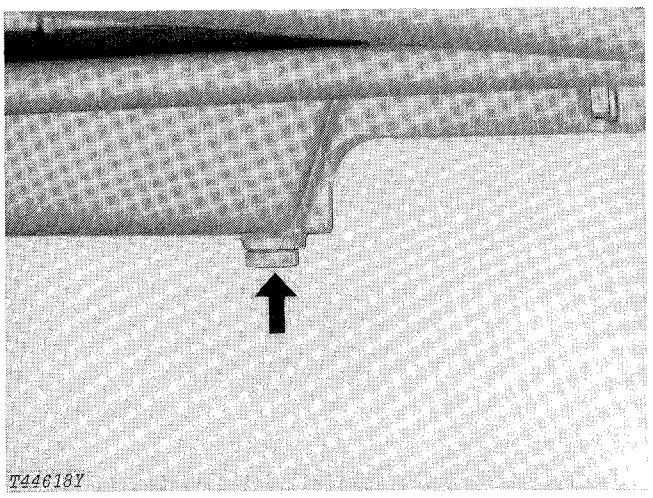
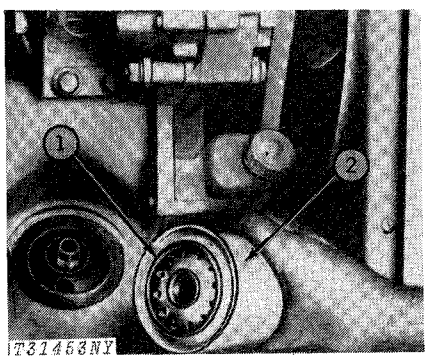


Fig. 42-Crankcase Drain Plug

When engine is warm, remove crankcase drain plug. Drain oil from crankcase.

While crankcase is draining, remove crankcase filter.

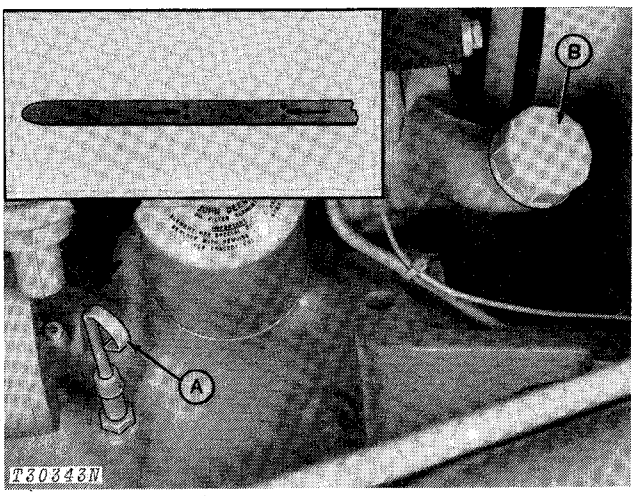


1—Sealing Ring **2—Filter**

Fig. 43-Crankcase Oil Filter

Turn filter counterclockwise and discard it. Thoroughly clean filter mounting surface and install new filter. Apply a thin film of oil to the sealing ring. Turn the filter clockwise by hand until sealing ring just touches mounting pad. Then turn down an additional 1/2 to 3/4 turn. Do not overtighten.

Install drain plug.



A—Dipstick **B—Oil Filler Cap**

Fig. 44-Crankcase Oil Level

Remove filler cap (B). Add 9 quarts (8.5 L) of oil specified on page 10-15-1.

Start the engine. Check for leaks around drain plug and filter. Retighten only enough to stop leaks. Do not overtighten.

Stop the engine. Check the oil level.

Engine oil changed	*Yes*	*No*
Oil filter changed	*Yes*	*No*

2. Transmission-Hydraulic System Oil Level and Oil Filter Element

NOTE: Before checking oil level find out if customer has changed filter element (first 50 hours service).

If changed at an earlier date, record information below:

Approximate hours at change _____

If not, change as follows:

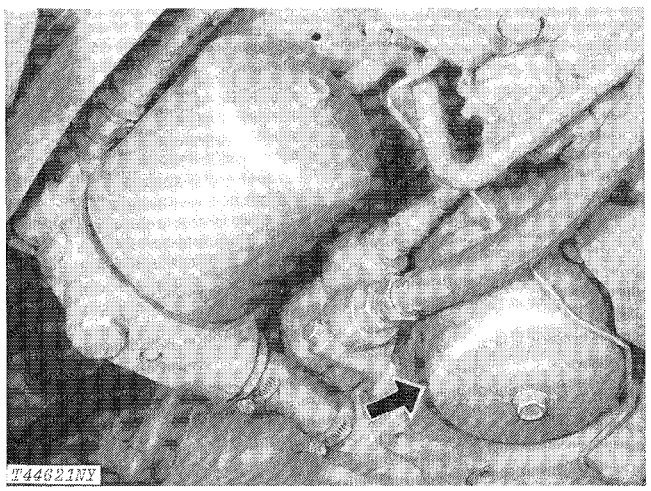


Fig. 45-Transmission-Hydraulic System Filter

Remove the transmission-hydraulic system oil filter cover and pull out rubber packing and filter element. Install new packing in groove in transmission case. Be sure packing is fully seated. Install new filter element and the filter cover. Tighten the filter cover cap screw to 55 lb-ft (7.6 kg/m). Do not overtighten.

After changing the filter element for the loader backhoe (item 3), check the transmission-hydraulic oil level.

Transmission-hydraulic element changed. *Yes* *No*

3. Loader Backhoe Return Oil Filter Element

NOTE: Before changing filter element find out if customer has changed element (first 50 hours service).

If changed at an earlier date, record information below:

Approximate hours at change _____

If not, change as follows:

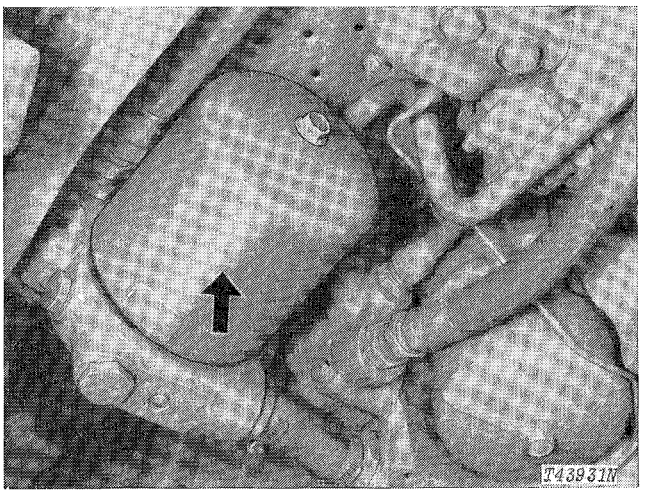


Fig. 46-Loader Backhoe Return Oil Filter

Remove the hydraulic return filter cover and pull out rubber packing and filter element. Install new packing in groove in transmission case. Be sure packing is fully seated. Install new filter element and the cover. Tighten the filter cover cap screw to 55 lb-ft (7.6 kg/m). Do not overtighten.

Check transmission-hydraulic oil level.

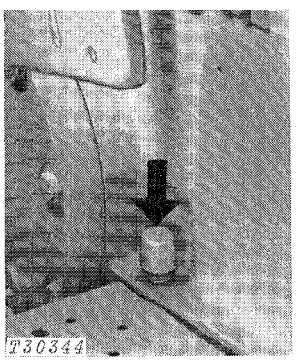


Fig. 47-Transmission-Hydraulic System Dipstick Resting On Top Threads

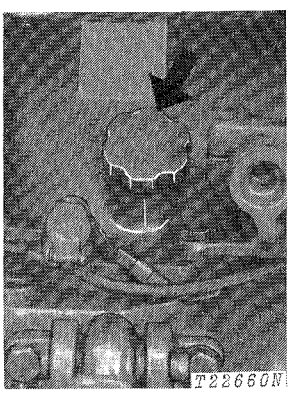


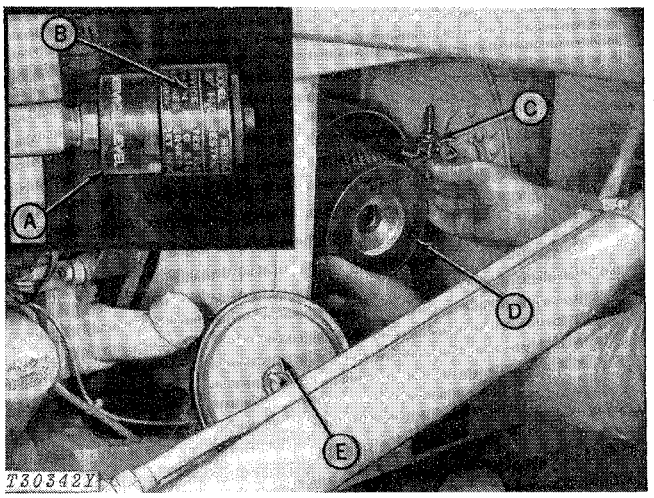
Fig. 48-Transmission-Hydraulic System Filler Cap

Litho in U.S.A.

Run engine two to three minutes to fill oil circuits. Check oil level with machine on level ground, engine running at slow idle, rockshaft and any equipment lowered, reverser lever locked in neutral, parking brake engaged (if equipped), range shift lever in park, and clutch engaged. Remove dipstick and wipe oil off. Insert dipstick with cap resting on threads of tube (not screwed in place). If oil level is down to bottom mark on dipstick, add oil. Remove filler cap on rockshaft housing and add oil specified on page 10-15-1 to bring oil level to top mark on dipstick.

Filter element changed *Yes* *No*
Oil level checked *Yes* *No*
Oil added _ *qts. (L)*

4. Air Cleaner



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

Fig. 49-Air Cleaner

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

Element OK *Yes* *No*

5. 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.

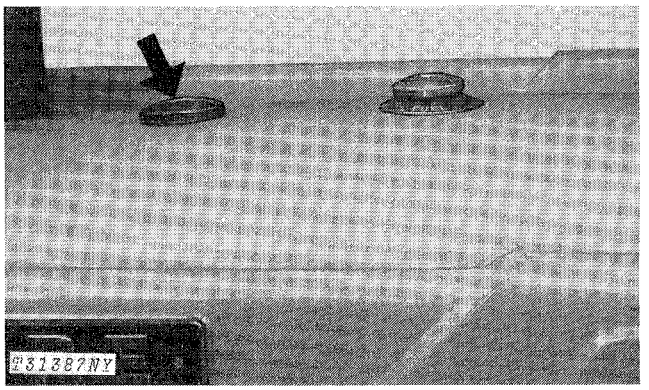


Fig. 50-Radiator Filler Cap

Maintain coolant level midway between the radiator core and the filler neck. If needed add clean soft water for warm weather or a solution of 50% clean water and 50% ethylene glycol (permanent type antifreeze with approved rust inhibitor) for cold weather. Tighten the filler cap.

Check cooling system for loose connections and leaks.

Coolant level checked *Yes* *No*

6. Batteries

Check battery electrolyte level. If distilled water is not available, use clean soft water. Avoid use of hard water. Remove foreign material from top of battery and coat terminals with petroleum jelly. Check vent holes in battery caps.

IMPORTANT: Never add water to battery in freezing weather unless engine will be run 2 or 3 hours.

Batteries checked *Yes* *No*

Litho in U.S.A.

7. Tires

Check tire pressure with an accurate gauge having 1 psi (0.07 bar) graduations.

Inflate tires according to the chart below.

FRONT TIRES

Tire Size	Type	Ply Rating	Inflation Pressure psi (bar)
11L-15	I-1A	8	40 (2.8)
7.50/8.00-16	F-3	10	56 (4.2)

REAR TIRES

16.9-24	R1	6	16 (1.1)
16.9-24	R4	8	22 (1.5)
19.5L-24	R4	6	20 (1.4)

Tire pressure checked *Yes* *No*

8. Fuel Filter

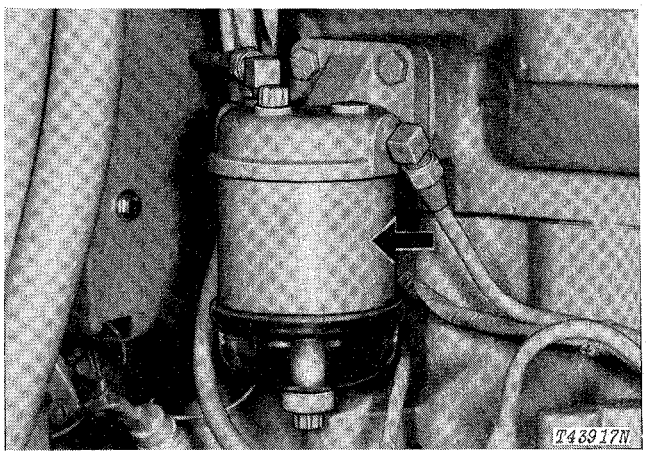


Fig. 51-Fuel Filter

Check fuel filter for sediment. Drain if necessary.

Bleed the fuel system.

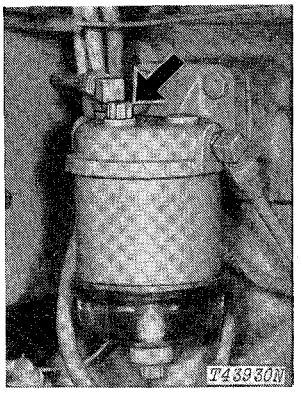


Fig. 52-Bleed Plug

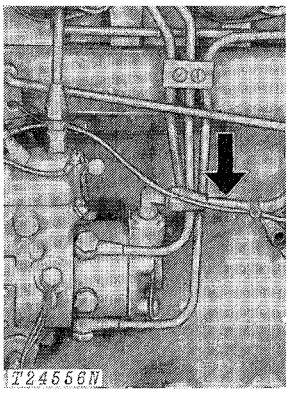


Fig. 53-Inlet Line

1. Loosen bleed plug on top of fuel filter. Pump primer lever until a solid stream of fuel free of air bubbles flows from the opening. Tighten plug.

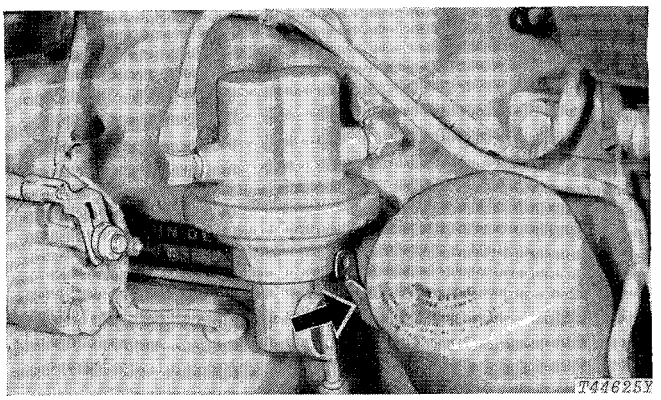


Fig. 54-Primer Lever

2. Loosen pump inlet line. Pump primer lever until a solid stream of fuel free of air bubbles flows from line. Retighten line.

3. Be sure to leave primer lever at lowest point of stroke.

Fuel filter drained *Yes* *No*
Fuel system bled *Yes* *No*

9. Fuel Tank Filter

Clean the fuel tank filter.

Open the needle valve (on bottom of fuel tank) to remove fuel from tank. Remove the fuel line from the needle valve. Remove the needle valve and filter. Clean the filter with diesel fuel. Install all parts. Add fuel to tank. Bleed the fuel system. See item 8.

Filter cleaned *Yes* *No*

Litho in U.S.A.

10. Grease Fittings

Check each fitting shown on the following pages. Lubricate, if necessary, with John Deere Multi-Purpose Grease or an equivalent.

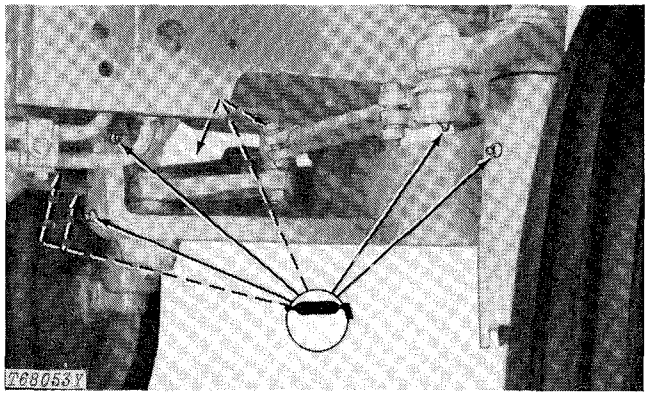


Fig. 55-Front Axle Pivot Points (8 points)

Lubrication required *Yes* *No*

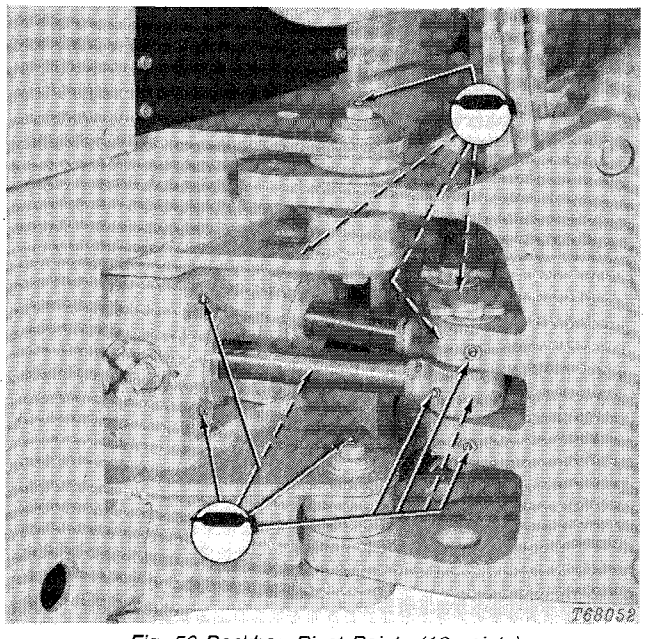


Fig. 56-Backhoe Pivot Points (12 points)

Lubrication required *Yes* *No*

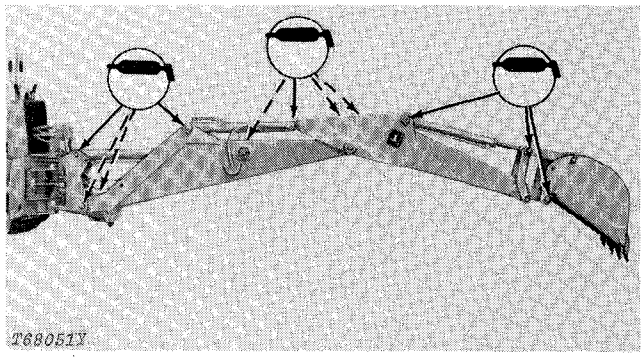


Fig. 57-Backhoe Boom Pivots (11 points)

Lubrication required *Yes* *No*

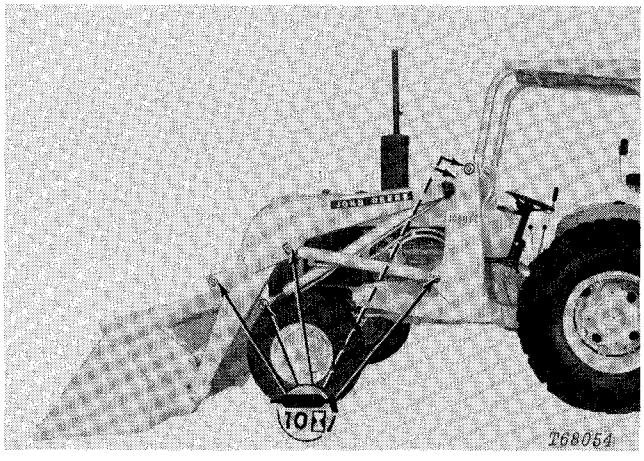


Fig. 58-Loader Pivot Points (12 points)

Lubrication required *Yes* *No*

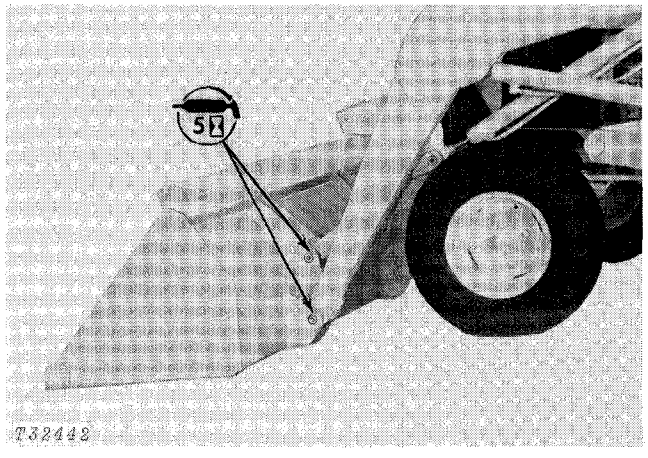


Fig. 59-Bucket Pivots (4 points)

Lubrication required *Yes* *No*

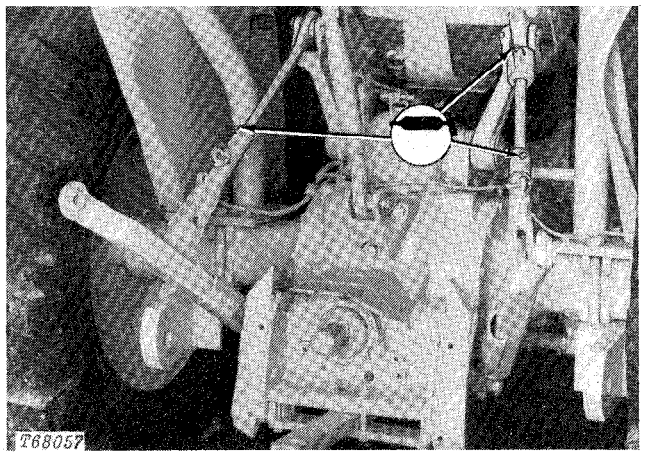


Fig. 60-3-Point Hitch (3 points)

Lubrication required *Yes* *No*

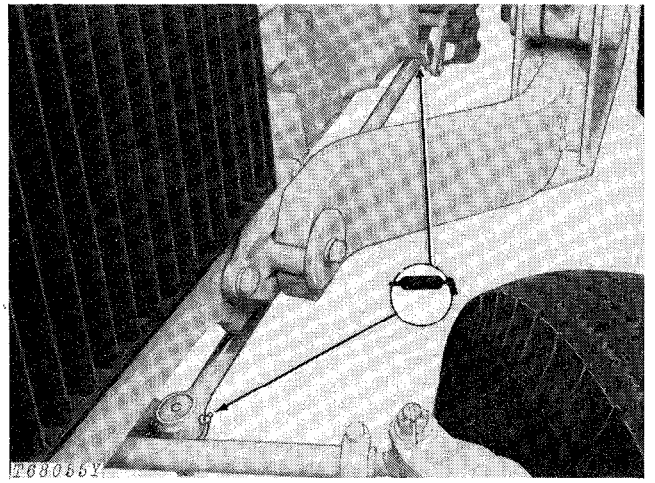


Fig. 61-Drag Links (2 points)

Lubrication required *Yes* *No*

11. Air Intake Hoses

Check clamps on hoses connecting air cleaner and engine. Tighten hose clamps where necessary. Inspect hoses for cracks.

Intake hoses checked *Yes* *No*

12. Alternator-Fan Belt Tension

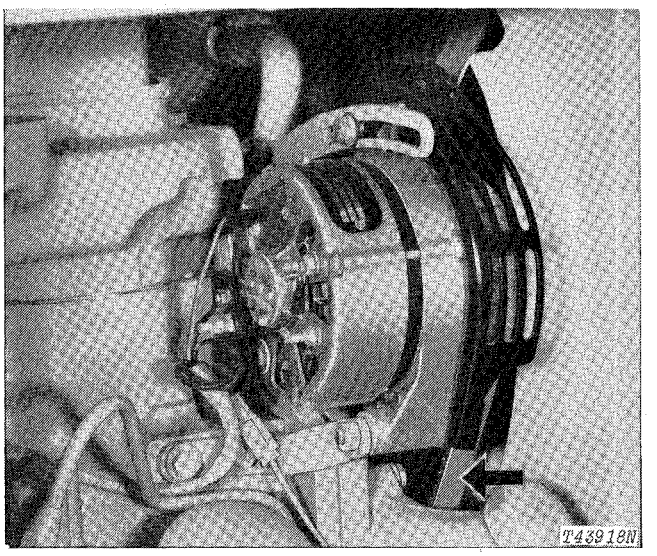


Fig. 62-Alternator-Fan Belt Tension

Check alternator belt tension. Loosen the alternator bracket and adjusting cap screws. Apply outward force to the FRONT alternator frame until 20-pound (9 kg) force on the belt midway between the pulleys will deflect the belt 3/4 inch (19 mm). If a tension gauge is used, strand tension must be 90 lb (41 kg).

IMPORTANT: Do not pry on the rear half of the alternator housing.

Belt tension checked *Yes* *No*

13. Engine Speeds

Check engine speeds.

Slow idle - 825 rpm
Fast idle - 2650 rpm hand throttle
2800 rpm foot throttle

If adjustment is needed, follow the procedure below.

NOTE: Make all speed control adjustments in the exact order given. Be sure engine is warmed up before making speed adjustments. Attach a master tachometer to check engine speeds.

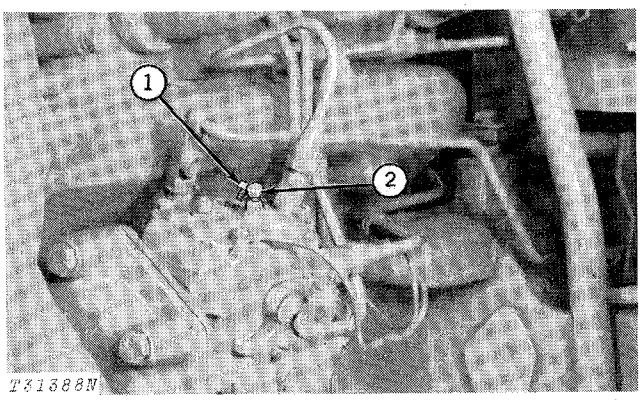
Litho in U.S.A.

1. Disconnect speed control rod from injection pump lever. Adjust pump fast and slow idle as follows:

2. Disconnect speed control rod from injection pump arm.

3. Run engine. Turn pump throttle arm until fast idle stop screw (1, Fig. 63) contacts its stop. Engine speed must be 2650 rpm fast idle. If not, adjust fast idle stop screw to correct fast idle. Lock screw with sealing wire.

4. Turn pump throttle arm to slow idle position. Engine speed must be 800 rpm slow idle. If not, adjust slow idle stop screw (2, Fig. 63) to correct slow idle.



1—Fast Idle Stop Screw **2—Slow Idle Stop Screw**

Fig. 63-Speed Control Adjustments

5. Connect speed control rod to injection pump arm. Move hand throttle counterclockwise until pump arm is preloaded to 1/4 inch (6 mm) against its stop. Move slow idle stop screw head (2) against dash. Lock with jam nut.

6. Move hand-throttle clockwise until fast idle is reached. Move fast idle stop screw head against dash. Fasten with lock nut.

7. Adjust foot throttle rod so that pump lever is preloaded 1/4 inch (6 mm) when engine is running at 2800 rpm.

Engine speeds checked *Yes* *No*

14. Indicator Lights and Gauges

Check operation of indicator lights.

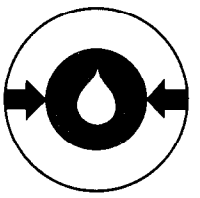


Fig. 64-Engine Oil Pressure Indicator Light

If light glows red when engine is running, stop engine immediately and determine cause.

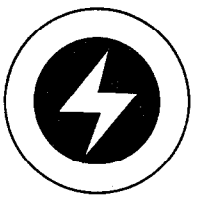


Fig. 65-Alternator Indicator Light

Light glows red when alternator is not charging. When light goes on with engine running, stop engine and determine cause.

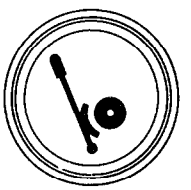
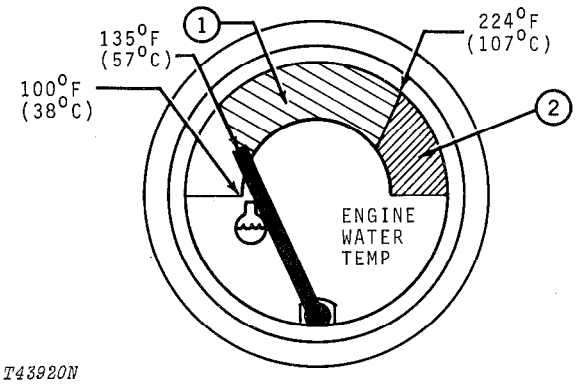


Fig. 66-Parking Brake Indicator

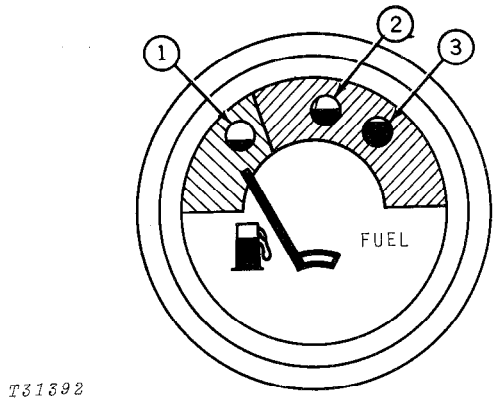
Indicator light will glow when key switch is on and parking brake is engaged.

Check operation of gauges.



1—Operating Range **2—Overheat Range**

Fig. 67-Water Temperature Gauge



1—Empty Tank **2—Half Full Tank**
3—Full Tank

Fig. 68-Fuel Gauge

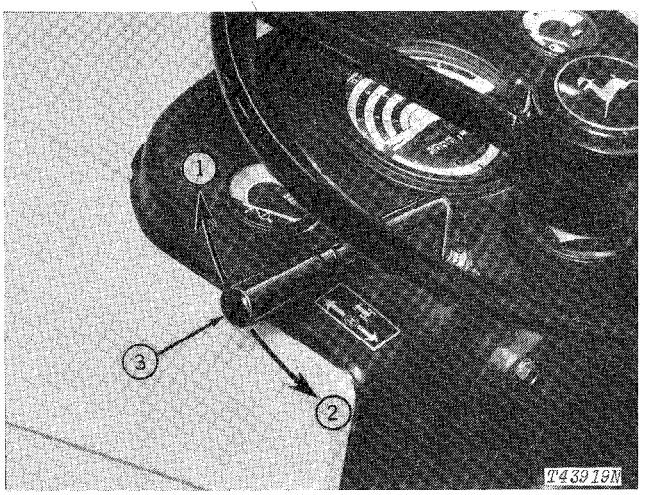
Add a small amount of fuel to the fuel tank. Check the action of the fuel gauge.

Indicator lights and gauges checked *Yes* *No*

15. Reverser

The reverser allows the operator to change the direction of travel "on the go" without declutching or shifting gears.

Note and correct any reverser malfunctions.



1—Forward **2—Reverse**
3—Neutral

Fig. 69-Reverser Lever

Check the reverser speed-of-shift time. Total time must be 3/4 to 1-1/4 seconds. Make the speed-of-shift as smooth as possible.

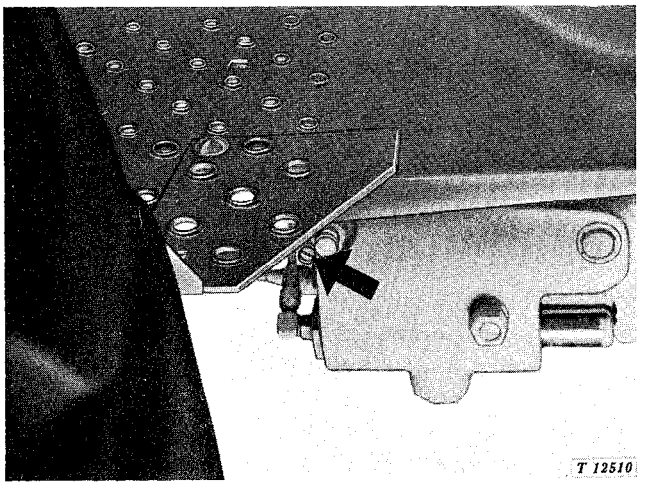


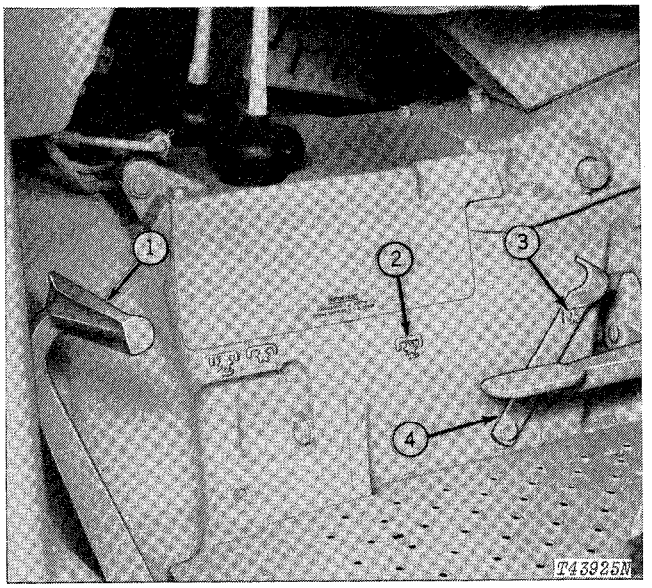
Fig. 70-Reverser Speed-Of-Shift Adjusting Screw

Turn the adjusting screw clockwise to slow down the shift. Turn the screw counterclockwise to speed up the shift. Turn the screw one-fourth turn at a time until the desired speed-of-shift is obtained.

Reverser operation checked *Yes* *No*

16. Power Take-Off

Check power take-off operation.



1—PTO Clutch
2—On
3—Off
4—PTO Lever

Fig. 71-PTO Operation

IMPORTANT: Disengage PTO clutch at pedal before shifting PTO lever.

Continuous-Running PTO

To engage the PTO, completely depress the clutch pedal (momentarily waiting for machine motion to stop) and move the PTO selector lever to the "ON" position. Slowly engage the clutch pedal.

IMPORTANT: Disengage PTO clutch at pedal before shifting PTO selector lever. PTO lever must be in fully engaged or "ON" position to avoid excessive spline wear.

To disengage the PTO, completely depress the clutch pedal and shift the selector lever to the "OFF" position.

IMPORTANT: Always disconnect rear PTO stub shafts when not in use.

PTO operation checked. *Yes* *No*

17. Differential Lock

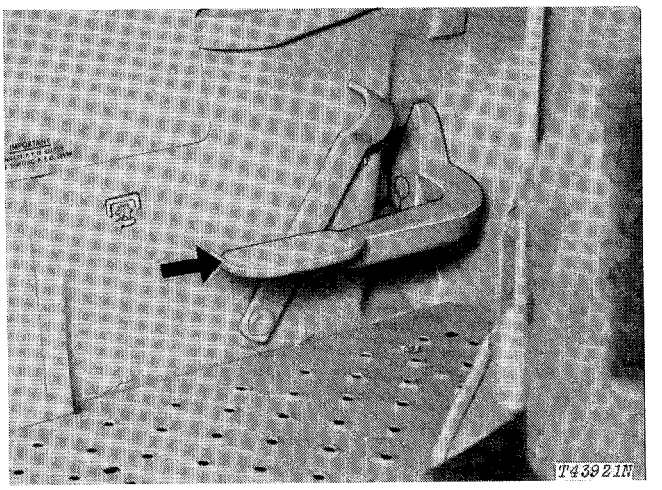


Fig. 72-Differential Lock Pedal

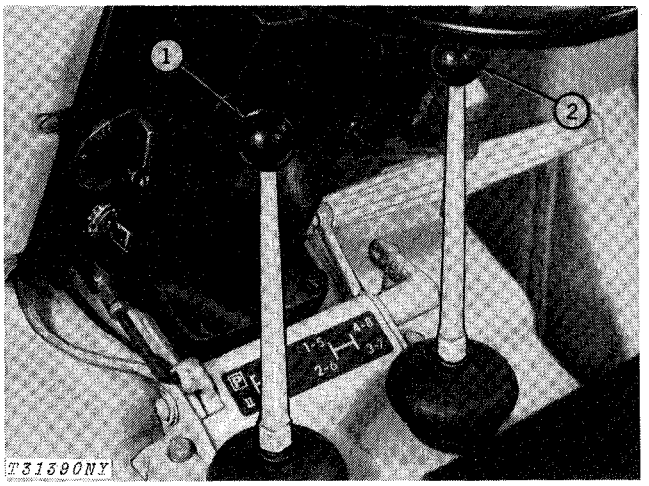
Check the differential lock operation.

While driving straight ahead push down the differential lock pedal. Hold the pedal down. Turn the steering wheel slightly. The operator will feel steering resistance if differential lock is working correctly.

The differential lock will automatically disengage when the pedal is released if traction for both rear wheels is equal. Unequal traction will keep the lock engaged.

Differential lock checked *Yes* *No*

18. Transmission Shifting



1—Range Shift Lever **2—Gear Shift Lever**

Fig. 73-Transmission

Check the operation of the unit in all ranges and gears.

Correct any malfunctions.

Transmission shifting checked *Yes* *No*

19. Brakes

Check operation of brakes.

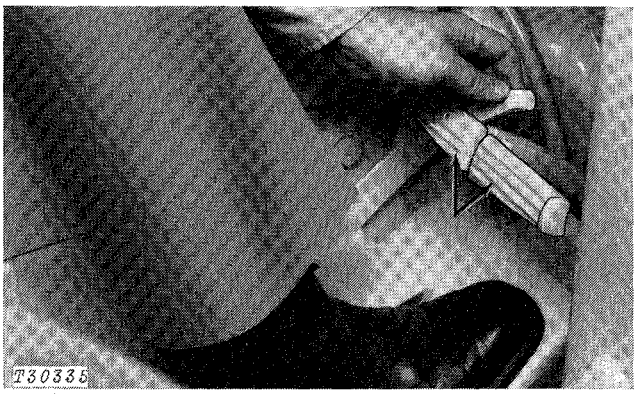


Fig. 74-Hydraulic Brakes

When stopping, push down both brake pedals. The machine must not pull to one side when stopping.

Turn to the left (L.H.). Push down the left (L.H.) brake pedal as you turn. Turn to the right (R.H.). Push down the right (R.H.) pedal as you turn.

The operator must feel the braking action pulling the machine to the left (L.H.) or right (R.H.). Brake action must be the same for both brakes.

Bleeding Brakes

Whenever braking action is poor or erratic, or pedal action feels spongy, bleed the hydraulic brakes.

To bleed the brakes, run the engine at 2000 rpm with clutch engaged for at least two minutes. This will permit the brake valve reservoir to fill with oil.

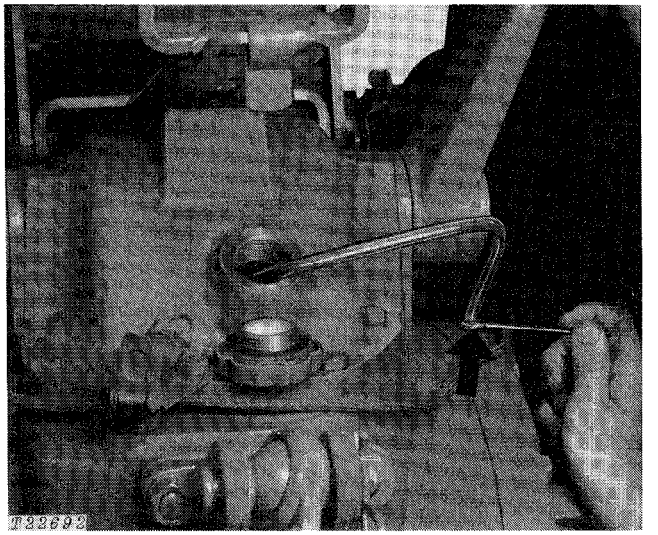


Fig. 75-Bleeding Brakes

Attach a transparent bleeder tube to the brake bleed screw located on top of the rear axle housing and allow the tube to hang submerged in transmission oil through the filler hole as shown.

Unscrew bleed screw 3/4 turn, slowly depress brake pedal on brake being bled, and allow it to return slowly. Continue operating pedal until oil in tube is free of air bubbles.

With brake pedal depressed, close bleed screw securely.

Remove bleeder tube. Repeat operation on other brake.

Brakes checked *Yes* *No*
Brakes bled *Yes* *No*

20. Accumulator

Check the accumulator action.

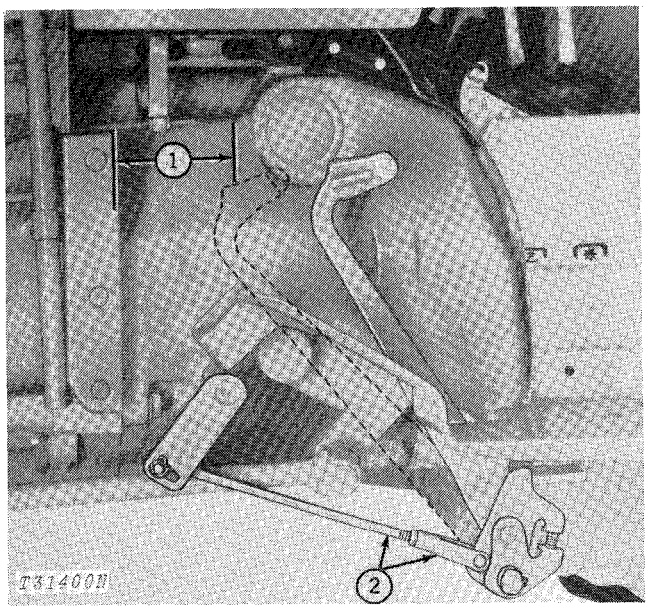
Run the engine five to ten minutes. Stop the engine. The steering wheel must turn easily until all hydraulic pressure is released.

If the steering wheel cannot be turned immediately after stopping the engine, the accumulator needs repair.

Accumulator checked *Yes* *No*

21. Clutch Pedal Free Travel

Check the free travel of the clutch pedal.



1—5-1/4 Inches (133 mm) to 5-3/4 (146 mm)
2—Fork Shaft Rod and Yoke

Fig. 76-Clutch Pedal Free Travel

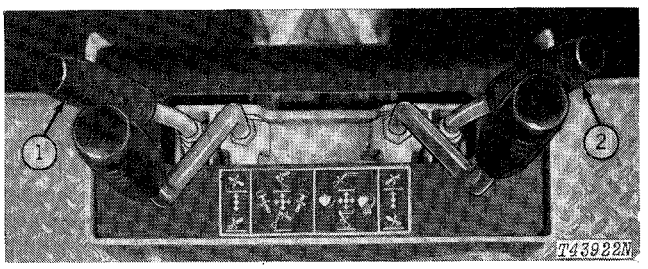
Push the pedal down to the bottom of the first stage. In this position the throwout bearing will be against the clutch fingers. The top right (R.H.) edge of the rear of the pad of the clutch pedal must be 5-1/4 in. (133 mm) to 5-3/4 in. (146 mm) from the front of the bolting flange of the clutch housing (1, Fig. 76).

If adjustment is needed, remove the yoke (2, Fig. 76) from the pedal arm. Loosen the jam nut. Turn the yoke on the rod of the fork shaft until the adjustment (1) is about 5-1/2 in. (140 mm). Tighten the jam nut.

Clutch pedal checked *Yes* *No*

22. Backhoe Control Levers

Check the operation of backhoe control levers.

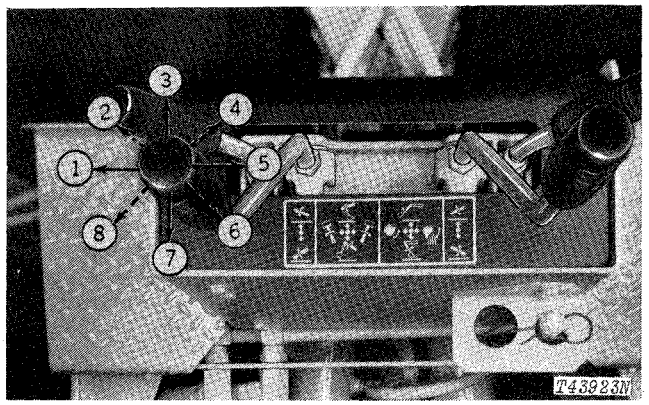


1—Left Stabilizer Control
2—Right Stabilizer Control

Fig. 77-Stabilizer Control Levers

The right and left stabilizer legs on each side of the main frame are individually controlled by the two levers shown above. The stabilizers may be raised or lowered individually, or simultaneously.

To lower the stabilizers for backhoe operation, move the control levers forward; to raise them, pull the levers rearward.

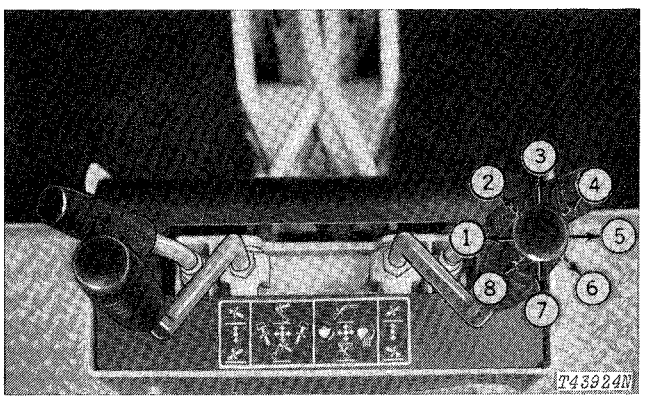


1—Left
2—Left and Down
3—Down
4—Right and Down
5—Right
6—Right and Up
7—Up
8—Left and Up

Fig. 78-Boom Control Lever

Move the lever to one of the intermediate positions to swing the boom left or right at the same time it is being raised or lowered.

A swing brake, built into the swing cylinder, automatically slows the boom when it travels to the far right or left.



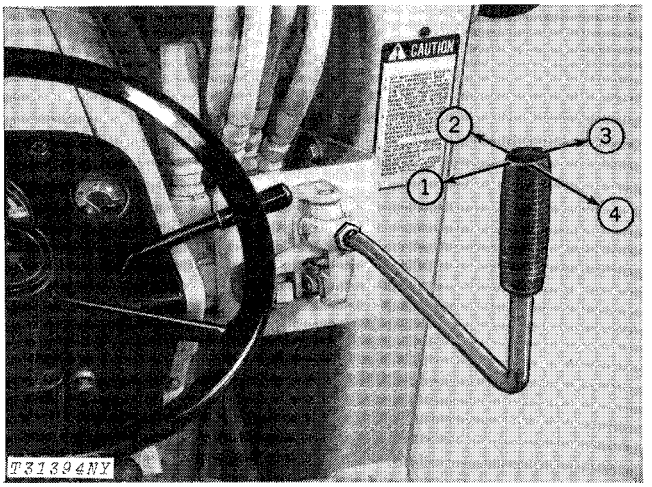
1—Load
2—Out and Load
3—Bucket Out
4—Out and Dump
5—Dump
6—In and Dump
7—Bucket In
8—In and Load

Fig. 79-Bucket and Dipperstick Control Lever

Move the lever to one of the intermediate positions to extend or retract the dipperstick at the same time the bucket is being loaded or dumped.

Backhoe control lever checked *Yes* *No*

23. Loader Control Lever



1—Retract Bucket
2—Lower Boom
3—Dump Bucket
4—Raise Boom

Fig. 80-Loader Control Lever

Check loader operation.

If the lever is released at any time during normal loader operation, it will return to neutral and the boom or bucket will be held in the position reached at that time.

Loader control checked *Yes* *No*