JD301-A TRACTOR AND LOADER

TECHNICAL MANUAL

TM-1088 (Dec-78)
LITHO IN U.S.A.

JD301-A TRACTOR AND LOADER

Technical Manual
TM-1088 (Dec-78)

CONTENTS

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

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 failures and their causes. FOS Manuals are for training new personnel and for reference by experienced technicians.

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

•Technical Manuals—for actual service

Technical Manuals are concise service guides for a *specific* machine. Technical manuals are on-the-job guides containing only the vital information needed by an experienced service technician.

This technical manual was planned and written for you—an experienced service technician. Keep it in a permanent binder in the shop where it is handy. Refer to it whenever in doubt about correct service procedures or specifications.

Some features of this manual:

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

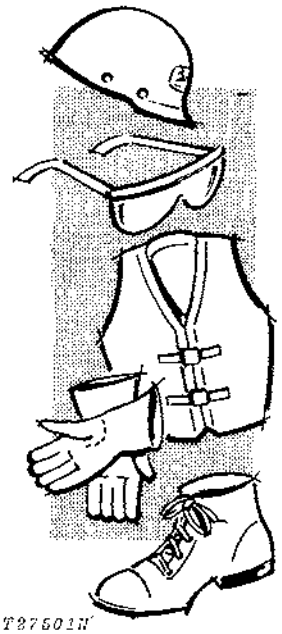
Litho in U.S.A.

MAINTENANCE WITHOUT ACCIDENT
WORK SAFELY


T27999N

This safety alert symbol identifies important safety messages in this manual and on the tractor. 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

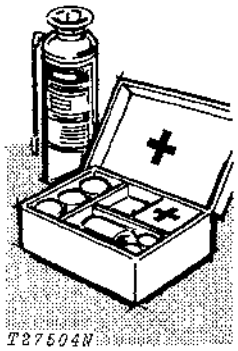
Consult your shop foreman for specific instructions on a job, and the safety equipment required.

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.

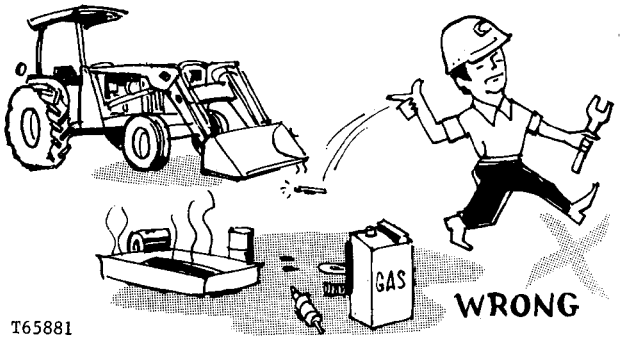
Store starting aids in a cool and well-ventilated place, out of the reach of unauthorized personnel.

Litho in U.S.A.

MAINTENANCE WITHOUT ACCIDENT

AVOID FIRE HAZARDS—

Fuel Is Dangerous!



T65881

Don't smoke while refueling.

Don't smoke while handling highly flammable material.

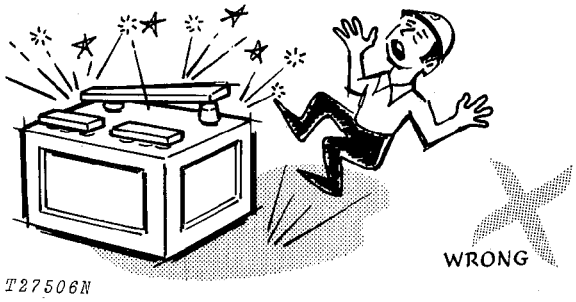
Engine should be shut off when refueling.

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!

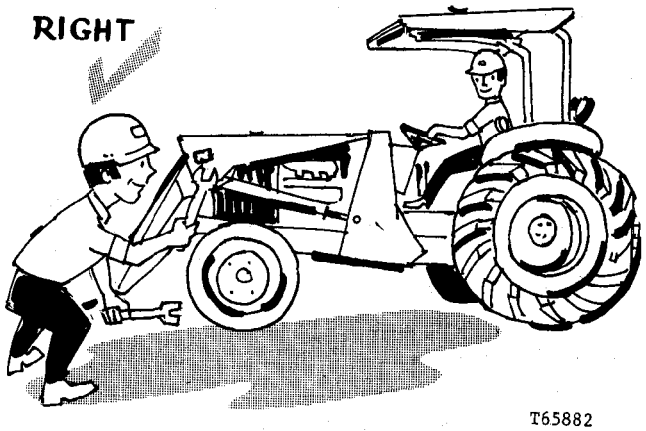
UNDER ALL MAINTENANCE CONDITIONS—

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.



T65882

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.

Lower bucket to ground.

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

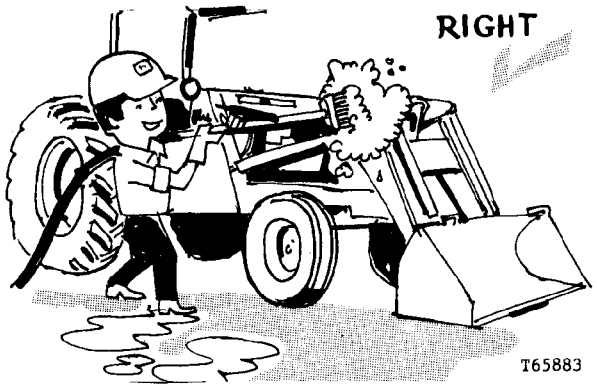
Use hoisting equipment for lifting heavy parts.

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 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.

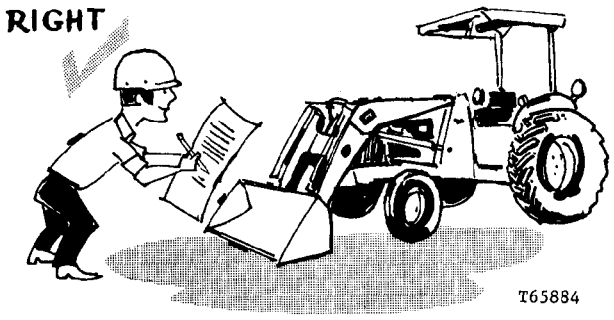
Before repairing the electrical system, or performing a major overhaul, disconnect batteries.

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.

COMPLETE PAGE LISTING WITH LATEST DATE LINES

Vertical lines indicate pages included in this revision.

Litho in U.S.A.

PAGE LISTING—Continued

Vertical lines indicate pages included in this revision.
**Remove pages from 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 14.9-24, 6 ply rating rear tires, 6.00-16, 6 ply rating front tires; 3/4 cu. yd. (0.57 m³) bucket; and standard equipment.)

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

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

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

Bore and stroke	3.86x4.33 in. (98x110 mm)
Piston displacement	152 cu. in. (2491 cm³)
Compression ratio	16.2 to 1
Maximum torque @ 1,300 rpm	110 lb-ft (149 Nm) (15.2 kg-m)
NACC or AMA (U.S. Tax) horsepower	17.88
Main bearings	4
Lubrication	Pressure system w/full flow filter
Cooling	Pressurized w/thermostat and fixed bypass
Fan	Suction
Air cleaner	Dry
Electrical system	12 volt w/alternator
Battery (12 volt) reserve capacity	60 minutes 110 minutes

Engine Clutch...Foot-operated: single 10 in. (254 mm) plate w/reverser; single 11 in. (280 mm) plate w/o reverser

Transmission....Constant mesh, 8 forward speeds, 4 reverse with helical gears and sliding collars; mechanical shuttle. Optional hydraulic direction reverser provides 8 speeds forward and 8 reverse: hydraulic wet clutches, no clutching required.

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

Final Drives	Inboard, planetary
Brakes...Hydraulically actuated, fully enclosed, wet-disk. Self-equalizing. Foot-operated individually or simultaneously.	
Steering	Manual
Turning radius (brake applied)	10 ft. 2 in. (3.10 m)
Loader clearance circle, dia. (brake applied)	32 ft. (9.75 m)
Number of turns, far left to far right	3.3

Hydraulic System: Closed-center

Max. pressure	2350 psi (16 203 kPa) (165.2 kg/cm²)
Loader control	2-lever
Pump	Piston, constant pressure, variable-displacement, 13 gpm (49 L/min) @ 2500 engine rpm

Litho in U.S.A.

Hydraulic Cylinders:

	Bore	Stroke
Boom	2.25 in. (57 mm)	33.28 in. (845 mm)
Bucket	2.25 in. (57 mm)	24.56 in. (624 mm)

Cylinder rods . . . . Ground, heat-treated, chrome-plate, polished
Boom cylinder rods . . . . . 1.5-in. (38 mm) dia.
Bucket cylinder rods . . . . . 1.25-in. (32 mm) dia.

Tires:	Front	Rear
Turf	27-9.50-15, 6 ply rating, I1 Terra-tires 27-9.50-15, 10 ply rating, I1 Terra-tires	18.4-16A, 6 ply rating, R3
Utility	6.50-16, 6 ply rating, I1	13.6-28, 4 ply rating, R1
	11L-15, 8 ply rating, F3	14.9-24, 6 ply rating, R4
	7.50/8.00-16, 6 ply rating F3	14.9-24, 6 ply rating, R3
		14.9-24, 6 ply rating, R1
		16.9-24, 6 ply rating, R3
		17.5L-24, 8 ply rating, R4

Wheel Treads (dependent on tires and front axle):
Front . . . . . 49 to 74 in. (1.25 to 1.88 m)
Rear . . . . . 48 to 76 in. (1.22 to 1.93 m)

Capacities:	U.S.	Liters
Cooling system	3 gal.	11.4
Fuel tank	19.5 gal.	73.8
Engine lubrication, including filter	6 qt.	5.7
Transmission and hydraulic system	10 gal.	37.9

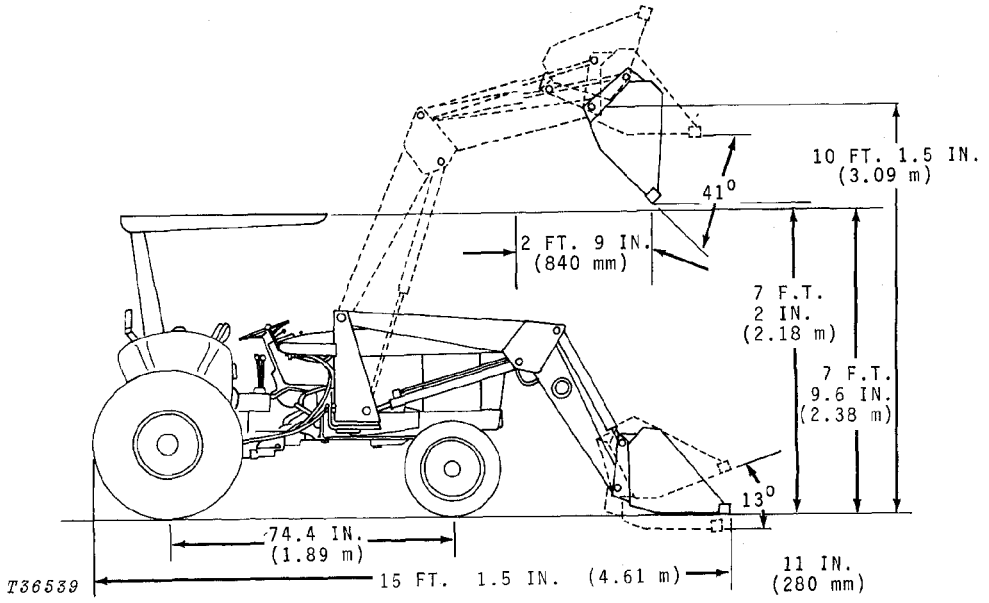
Dimensions:
Height to top of hood . . . . . 4 ft. 7 in. (1.40 m)
Overall height to top of muffler . . . 6 ft. 5 in. (1.90 m)
Overall height to top of canopy . . 7 ft. 2 in. (2.18 m)
Overall width w/60 in. tread width . . . . . 6 ft. 3 in. (1.90 m)
Overall length . . . . . 15 ft. 1.5 in. (4.61 m)
Overall length w/3-point hitch . . . . . 16 ft. 2.5 in. (4.94 m)
Wheelbase . . . . . 74.4 in. (1.89 m)
Ground clearance (under front axle) . . . . . 1 ft. 5 in. (430 mm)
Ground clearance, min. . . . . 11 in. (280 mm)

Additional Standard Equipment:
Oil pressure indicator light
Alternator charge indicator light
Coolant temperature gauge
Fuel gauge
Speed-hour meter
Horn
Key switch safety start
Cushioned seat
Vertical muffler w/rain cap
Transistorized voltage regulator
Fenders
Antifreeze
Two-position disk rear wheels
3/4 cu. yd. (0.57 m^3) loader bucket
Air cleaner restriction indicator
Cigar lighter
Cold weather starting aid

SAE Operating Weight . . . . . 6120 lb. (2 776 kg)

Litho in U.S.A.

DIMENSIONS



Special Equipment:

Batteries (2); reserve capacity 220 minutes
Deluxe seat
Differential lock
Fixed front axle
Foot throttle
Front grille guard
Hydraulic direction reverser
Lights
Mid PTO (1000 rpm "live," w/rear PTO)
Muffler extension (vertical muffler)
Parking brake
Power steering
Rear muffler
Rear PTO (continuous "live" or independent 540 rpm)
Remote hydraulic cylinder
ROPS and seat belt, w/ or w/o canopy
Single or dual remote-cylinder control w/quick-connect couplers
Swinging drawbar
3-inch seat belt
3-point hitch (Category 1 or 2 w/sway blocks and regular or short links)
Toolbox

LOADER SPECIFICATIONS

Buckets:	Nominal Heaped Capacity	Width
	3/4 cu. yd. (0.57 m³)	73.8 in. (1.88 m)

Operating Information:

Breakout force...4000 lb. (17.92 kN) (1814 kg)
Lifting capacity, full height...2500 lb. (1134 kg)
Raising time to full height ..... 5.1 sec.
Bucket dump time ..... 2.9 sec.
Lowering time (power) ..... 3.0 sec.
Rollback time ..... 2.6 sec.
Float-down time ..... 6.1 sec.
Recommended rear ballast ..... 2000 lb. (910 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 JD301-A 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 operating control levers and steering wheel until system fails to respond.

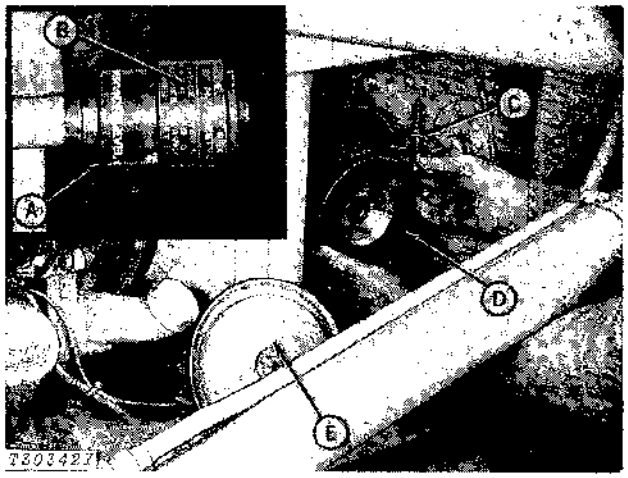
6. Reduce shipping pressure of all tires to the inflation pressure listed on page 10-10-2.

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 relieve pressure before removing the cap.

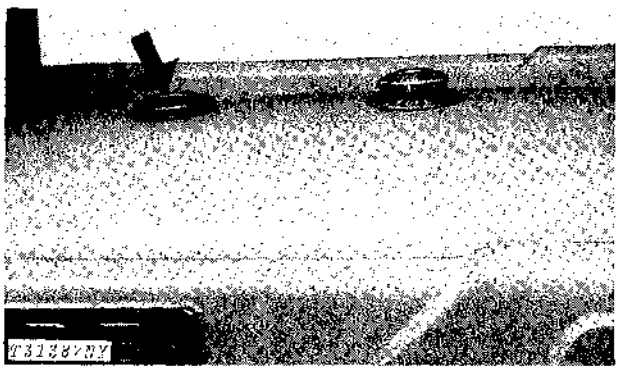


Fig. 2-Radiator Filler Cap

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.

Check cooling system for loose connections and leaks.

Coolant level checked *Yes* *No*

3. Battery

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.

4. Tire Pressure

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

Inflate tires according to the chart below.

Battery checked *Yes* *No*

FRONT TIRE INFLATION

Tire Size	Type	PR	Inflation Pressure: With Towed or Rear-Mounted Equipment	Inflation Pressure: With Light Front-Mounted Equipment	Inflation Pressure: With Heavy Front-Mounted Equipment
6.50-16	I-1	6	36 psi (2.5 bar)	40 psi (2.8 bar)	48 psi (3.3 bar)
7.50/8.00-16	F-3	6	28 psi (1.9 bar)	32 psi (2.2 bar)	36 psi (2.5 bar)
27x9.50-15	I-1	6	35 psi (2.4 bar)	40 psi (2.8 bar)	Do not use
27x9.50-15	I-1	10	55 psi (3.8 bar)	60 psi (4.1 bar)	65 psi (4.5 bar)
11L-15	F-3	8	40 psi (2.8 bar)	40 psi (2.8 bar)	40 psi (2.8 bar)

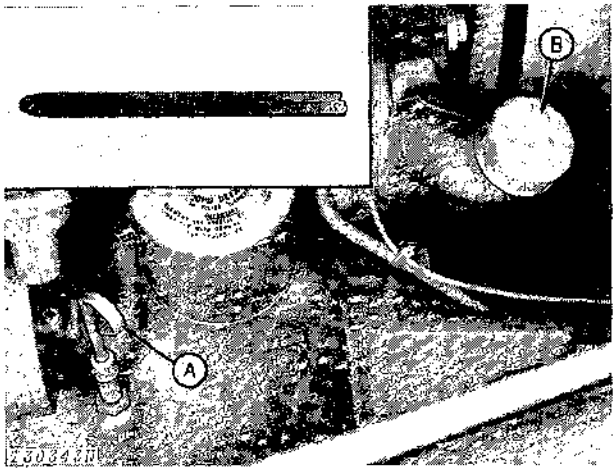
REAR TIRE INFLATION

Tire Size	PR	Inflation Pressure: With Little Ballast or No Rear-Mounted Equipment	Inflation Pressure: With Moderate Ballast or Light Rear-Mounted Equipment	Inflation Pressure: With Maximum Ballast or Heavy Rear-Mounted Equipment
13.6-28	4	14 psi (1.0 bar)	14 psi (1.0 bar)	Do not use
14.9-24	6	14 psi (1.0 bar)	16 psi (1.1 bar)	18 psi (1.2 bar)
16.9-24	6	18 psi (1.2 bar)	20 psi (1.4 bar)	22 psi (1.5 bar)
17.5L-24	8	24 psi (1.7 bar)	24 psi (1.7 bar)	24 psi (1.7 bar)
18.4-16A	6	14 psi (1.0 bar)	14 psi (1.0 bar)	Do not use

Tire pressure checked *Yes* *No*

Litho in U.S.A.

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 Oil Level

Check transmission-hydraulic oil level.

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

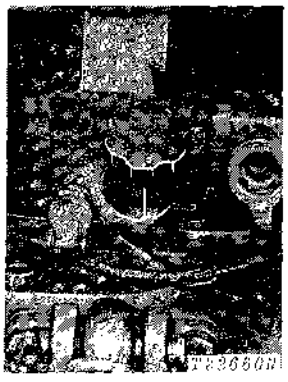


Fig. 5-Transmission-Hydraulic System Filler Cap

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 (if equipped) locked in neutral, parking brake engaged (if equipped), range shift lever in park, and clutch engaged. Remove dipstick and wipe off oil. 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.

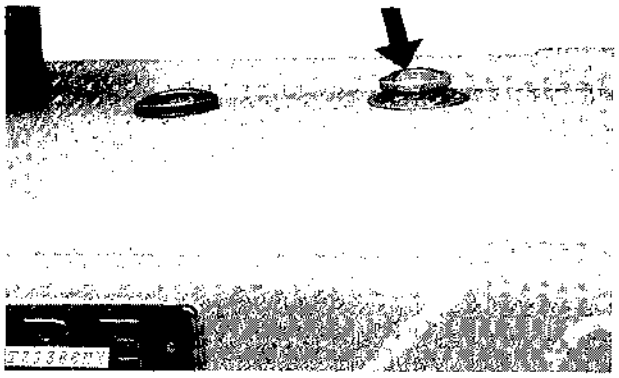
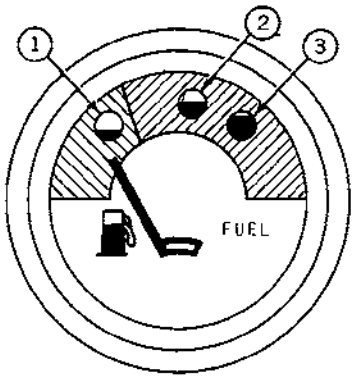


Fig. 6-Fuel Tank Filler Cap



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. Lubricate, if necessary, with John Deere Multi-Purpose Grease or an equivalent.

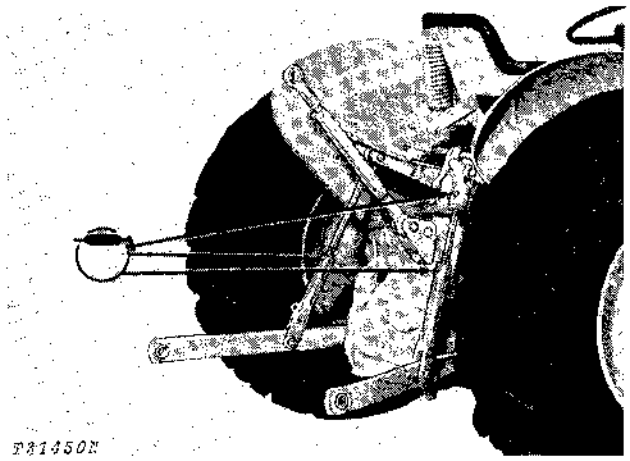


Fig. 8-3-Point Hitch (3 points)

Lubrication required *Yes* *No*

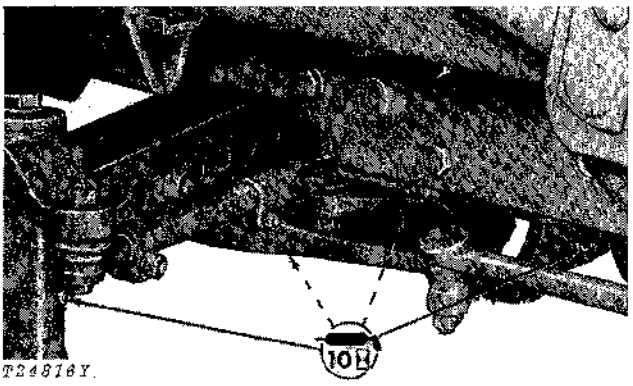


Fig. 9-Front Axle Pivot Points (4 points)

Lubrication required *Yes* *No*

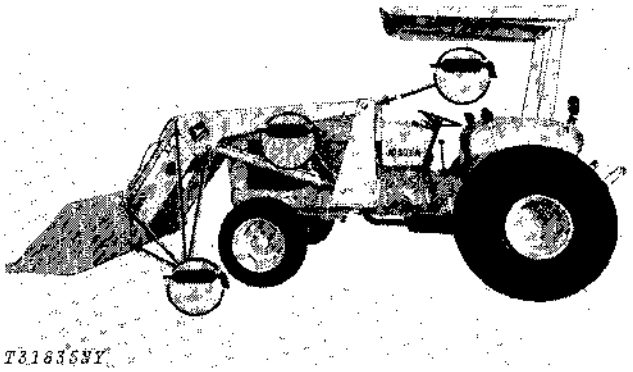


Fig. 10-Loader Pivot Points (12 points)

Lubrication required *Yes* *No*

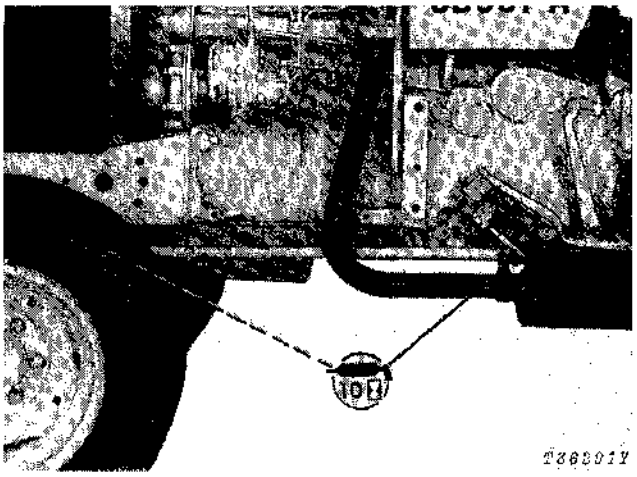


Fig. 11-Drag Links (2 points)

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

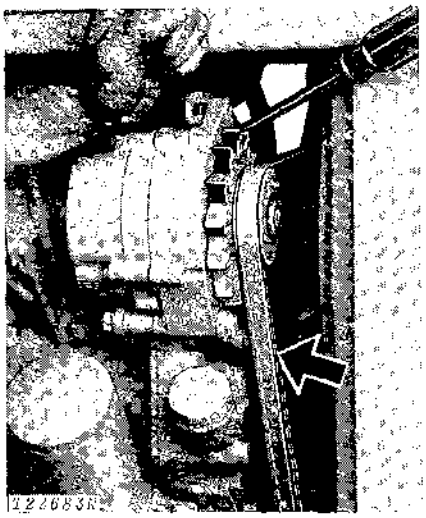


Fig. 12-Alternator - Fan Belt Tension

Check alternator-fan 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 tension gauge is used, strand tension must be 90 lb (41 kg).

IMPORTANT: Do not pry on the rear 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 10-10-18.

Engine speeds checked *Yes* *No*

12. Fuel Filter

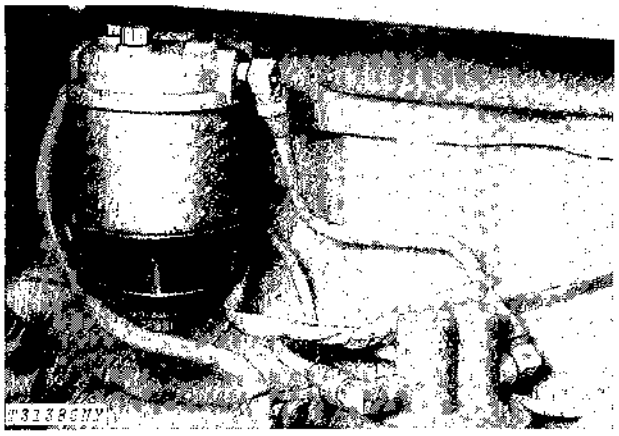


Fig. 13-Fuel Filter

Check fuel filter for sediment. Drain if necessary.

Fuel filter checked *Yes* *No*

Litho in U.S.A.