

John Deere JD350 Crawler Tractors and Crawler Loaders



Service Manual

John Deere Dubuque Works
SM-2063 (Jan-74)

LITHO IN U.S.A.



SERVICE MANUAL

JOHN DEERE JD 350 CRAWLER TRACTORS AND CRAWLER LOADERS

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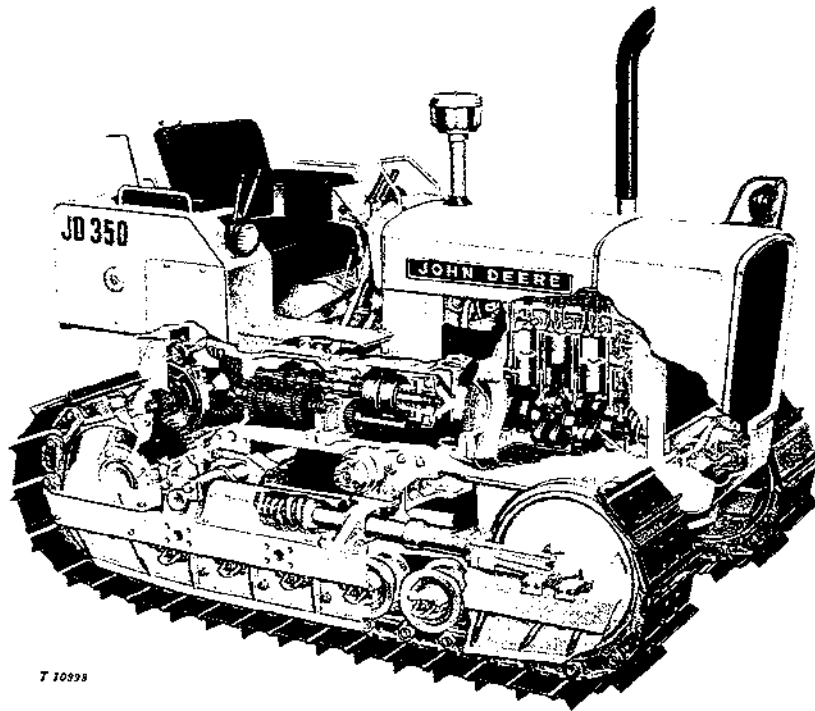
TO THE JOHN DEERE SERVICEMAN

This service manual contains maintenance instructions for John Deere JD350 Crawler Tractors and Loaders. Included are complete instructions for removal, disassembly, inspection, repair, assembly and installation of the major parts and assemblies of the tractor.

In addition, the manual contains brief descriptions of the more complicated systems of the tractor, and tells how they operate. Dimensions of many new wearing parts are given as an aid in determining when parts replacement is necessary. Tests and adjustments, required to keep the tractor operating efficiently, are explained in detail.

This manual was planned and written for the Service Department; its place is in the shop. Use the manual whenever in doubt about correct maintenance procedures. Use it as a text book for training new Service Department personnel who are unfamiliar with John Deere Tractors.

Daily use of the Service Manual as a guide for any and all service problems will reduce error and costly delay to a minimum and assure you the best in finished service work. In many instances your customer's confidence in your work will be improved when he sees you using the Service Manual. He knows you are following approved maintenance procedures and making proper adjustments. There is no guesswork when you use the manual.



T 10299

Right-Hand View of John Deere JD350 Crawler Tractor

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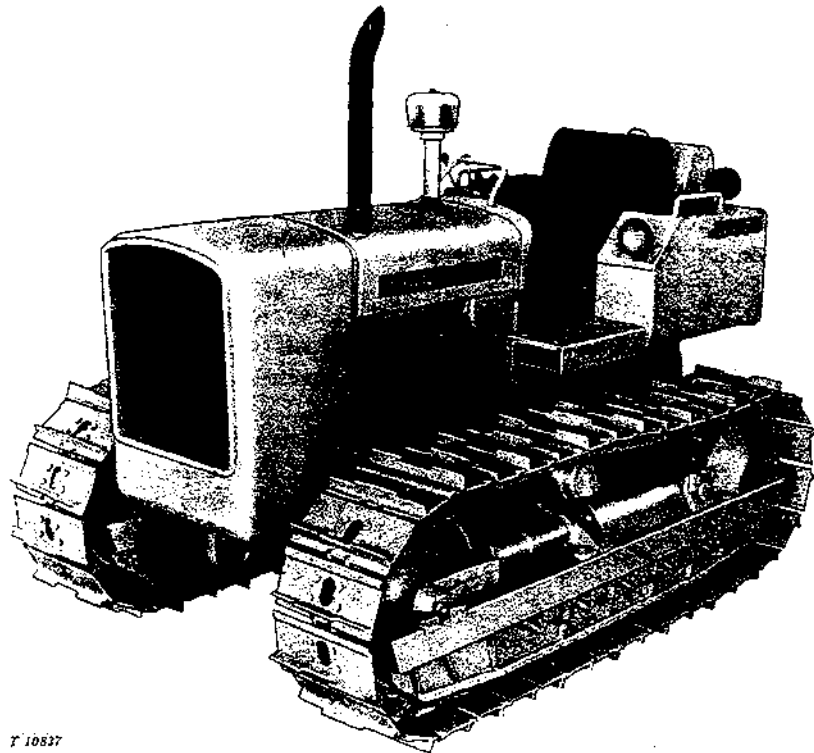
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Section 10

DESCRIPTION AND SPECIFICATIONS

Group 5 DESCRIPTION



T 10837

Fig. 10-5-1—Left-Hand View of JD350 Crawler Tractor

The John Deere JD350 is a heavy duty crawler tractor designed to operate with industrial equipment such as loaders and dozers and to perform various pulling and hauling jobs on construction and logging sites.

The JD350 Crawler Tractor is available with gasoline or diesel engine, and with a sliding gear transmission. A direction reverser option is also available.

The main features of the tractor are described in the paragraphs which follow. Full descriptions of major components are given in various sections throughout this manual.

SERIAL NUMBERS

The engine serial number is stamped on a plate at the lower right side of the engine cylinder block.

The tractor serial number is located on a plate on the front panel of the operator's seat. *NOTE: When ordering tractor parts, record ALL digits on the serial number plate.*

The location of the engine and tractor serial numbers is shown on the next page. A detailed explanation of each serial number is also given.

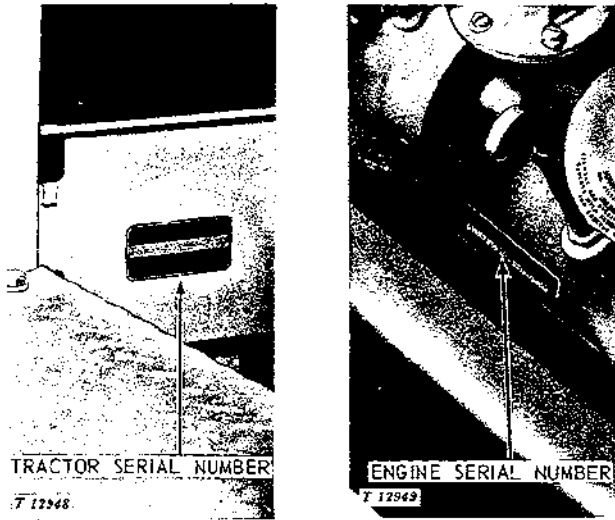


Fig. 10-5-2-Serial Number Locations

NOTE: Early model tractor and engine serial number plates have an "SN" prefix before the digits listed below.

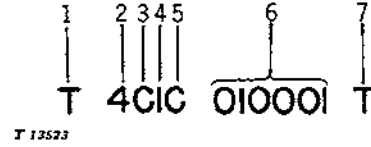
BASIC ENGINE SERIAL NUMBER EXPLANATION



T 12950

1. The first letter designates the application. M - Engine
2. This number designates the series. . . . 4 - 3-Cylinder
3. This number designates the fuel type of the engine. 1 - Gasoline
3 - Diesel
4. Using factory T - Dubuque
5. Application. C - Crawler
E - Crawler-Loader
F - Crawler-Dozer
6. Sequence serial number of six digits. . . . Differs for each engine
7. This letter designates the manufacturer. . . . T - John Deere
Dubuque Tractor Works

BASIC TRACTOR SERIAL NUMBER EXPLANATION



T 12953

1. The first letter designates the application. T - Tractor
2. This number designates the series 4 - JD350
3. This letter designates the tractor style C - Crawler
E - Crawler-Loader
F - Crawler-Dozer
4. This number designates the fuel type of engine. 1 - Gasoline
3 - Diesel
5. This letter designates the type of transmission C - Sliding Gear
D - Sliding Gear with reverser
6. Sequence serial number of six digits Differs for each tractor
7. This letter designates the manufacturer. . . . T - John Deere
Dubuque Tractor Works

LOADER SERIAL NUMBER

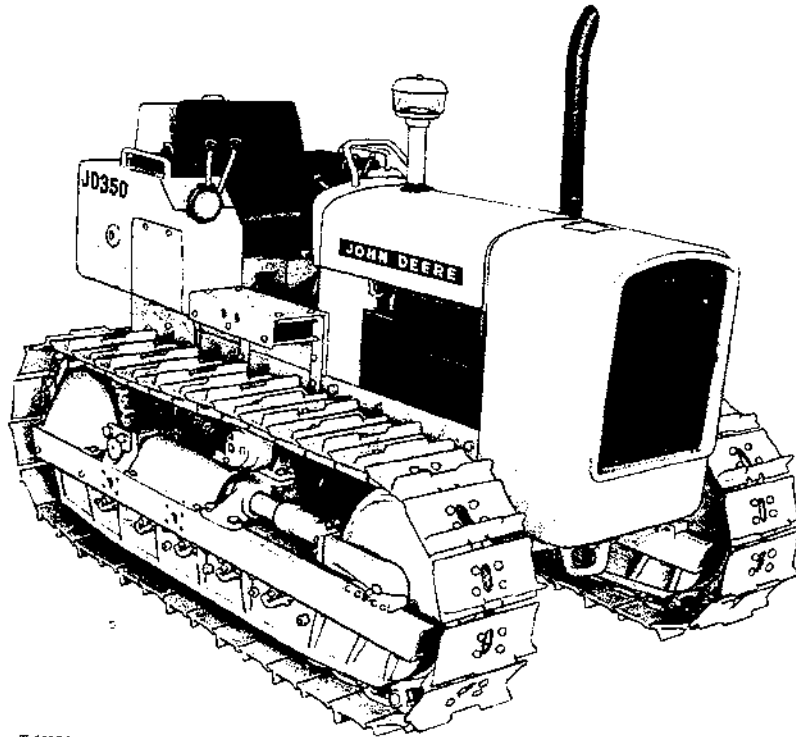
The serial number plate for the loader is located on the loader frame beside the tractor instrument panel.

WINCH SERIAL NUMBER (Early Models)

The serial number plate for the winch is located on the top left side of the winch housing.

MODEL NUMBERS

The distributor and the carburetor (gasoline), the fuel injection pump (diesel), the alternator, and the main hydraulic pump have identifying model numbers.



T 19024

Fig. 10-5-3—Right-Hand View of JD350 Crawler Tractor

ENGINES

The vertical, 3-cylinder, valve-in-head, four-stroke cycle engine is available in either gasoline or diesel models. The engines have three in-line cylinders which use individual wet-sleeve liners of the replaceable type.

LUBRICATION SYSTEM

The engine lubrication system is a force-feed and splash type. The system has a positive displacement, gear-type oil pump, with an externally adjustable pressure regulating valve, and a full-flow oil filter.

GOVERNOR SYSTEM

Gasoline engine speeds are controlled by a flyweight type governor, driven from the engine crankshaft. Diesel engine speeds are governed by flyweights in the fuel injection pump.

COOLING SYSTEM

All engines are liquid cooled and are equipped with pressure cooling systems having a centrifugal water pump and a bypass-type thermostat.

FUEL SYSTEMS

The large-capacity fuel tank on all tractors is located behind the operator's seat.

GASOLINE

Gasoline fuel systems are fed by a fuel transfer pump driven by the engine camshaft.

A replaceable fuel line filter cleans fuel before it enters the single-throat, updraft carburetor.

DIESEL

Diesel fuel systems are fed by a fuel transfer pump driven by the engine camshaft.

Diesel fuel is filtered by two stages of replaceable micronic filter elements. Fuel sediment bowls are located under each filter.

Fuel is delivered to 9.5 MM injector nozzles by means of a distributor type fuel injection pump.

ELECTRICAL SYSTEM

All units have a 12-volt negative grounded electrical system. Current is generated by an alternator-regulator circuit. A solenoid-shift starting motor is used to start the engine.

Gasoline units may be equipped with a single 56-ampere or 90-ampere battery. Diesel units may have a single 90-ampere or two 90-ampere batteries.

LIGHTING SYSTEM

All lighting equipment is optional and includes a dash lamp, rear light, and a choice of grille-mounted or rear box-mounted headlights.

TRANSMISSION

The sliding gear transmission consists basically of the shafts which carry the gears necessary to provide four forward speeds and one reverse speed. The various speeds are selected manually while clutching.

DIRECTION REVERSER

A direction reversing mechanism, which provides reverse speed equivalent to transmission forward speed, is available as optional equipment. The direction reverser replaces the engine clutch and is controlled hydraulically—no foot clutching is required.

ENGINE CLUTCH (Tractors Without Direction Reversers)

The engine clutch is a single, dry-disk type with friction facings riveted to either side of the driven disk. When engaged, these facings contact the rear surface of the engine flywheel and the pressure plate.

POWER TAKE-OFF

The power take-off is transmission driven from the rear of the tractor and is controlled by the engine clutch and PTO control lever. Shaft speed is 540 rpm at 1620 rpm engine speed. It fully meets all ASAE-SAE standards.

BRAKES

The two tractor brakes are of the contracting-band type operated in series with the steering clutch mechanism. Both brakes are operated by a single pedal located on the right-hand side of the tractor platform. A brake lock holds the brakes applied while the tractor is parked.

STEERING MECHANISM

The steering clutches are dry, multiple-disk types and each is controlled by a hand steering lever. Pulling back on a steering lever separates the drive facings and driven plates of the clutch on that side, interruption flow of power to that track sprocket. Any further rearward movement of the steering lever contracts a brake band around the drum on the clutch driven assembly, retarding or stopping motion of the sprocket and track.

Optional power steering is available. Hydraulic booster cylinders are actuated by steering lever movement to aid in easier steering.

The brake bands can also be operated by a pedal. Depressing the pedal applies both brakes; it does not disengage the steering clutches.

TRACKS AND TRACK CARRIERS

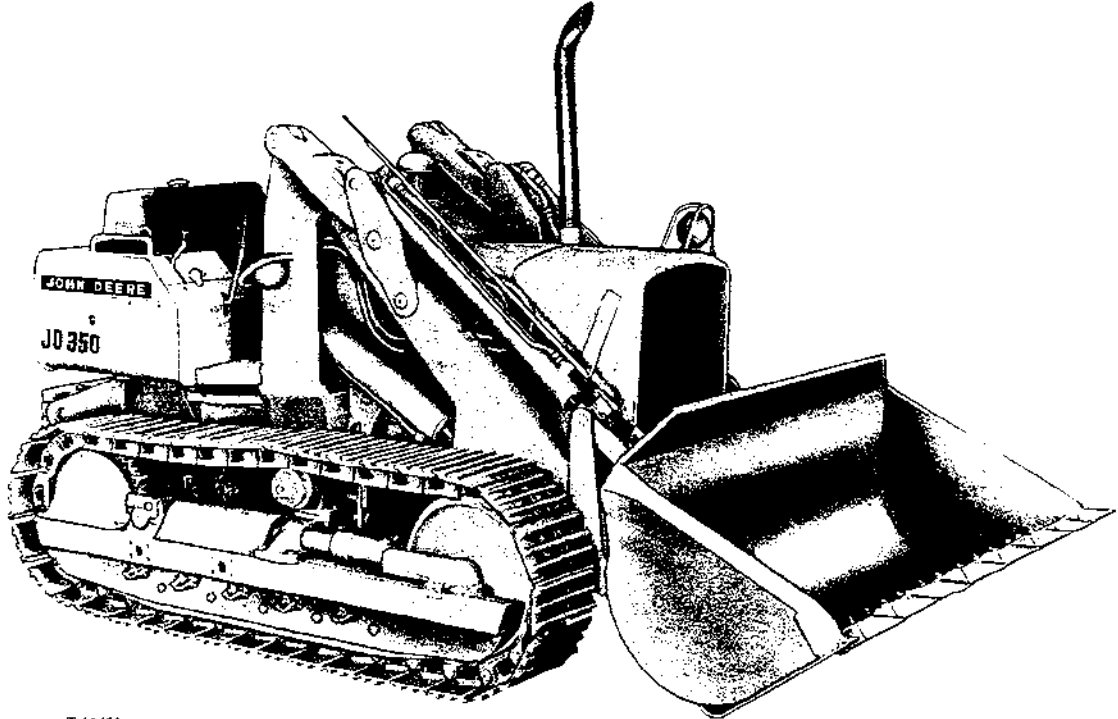
Four- or five-roller track frames are available. The track frames are fixed units of heavy unit-welded steel. Replaceable wear strips are provided on the front idler guides. Track alignment can be adjusted by shims. Track tension is adjusted by means of a hydraulic piston or mechanical screw-type mechanism. Track gauge is fixed at 48 inches.

Track shoes are bolted to hardened links which are joined by replaceable pressed-in pins and bushings. Track shoes are available in several types and sizes to meet any job condition.

WINCHES

The JD350 Crawler Tractor may be equipped with either a Manual Control winch or a Power Control winch. Both winches are gear driven from the rear of the tractor. Winch speed and pull requirements are directly related to the weight and power available in the tractor.

Group 10 SPECIFICATIONS



T 10466

Fig. 10-10-1-Right-Hand View of JD350 Crawler Loader

TRACTOR SPECIFICATIONS			ENGINE (Cont.)	Diesel	Gasoline
			Slow-idle (rpm) . . .	800	375
ENGINE	Diesel	Gasoline			(-15905)
Flywheel horse- power (observed) at 2500 rpm	42.0	42.0	Fast-idle (rpm) . . .	2650 (DB Pumps)	600 (15906-Up)
Torque in ft-lbs, max. at 1300 rpm (observed) (nom- inal)	110.0	110.0	Governed speed range (rpm)	2660 (C Pumps)	2770
Number of cylin- ders	3	3		800-2650 (DB Pump) (375-2770 -15905)
Bore and stroke, inches	3.86 x 4.33	3.86 x 3.86	Engine clutch	800-2660 (C Pump) (15906-	600-2770)
Displacement in cubic inches	152.0	135.0		11-inch, single dry disk, foot operated.	
Compression ratio	16.3 to 1	7.5 to 1*	DIRECTION REVERSER		
N.A.C.C. or A.M.A. Horsepower rat- ing for tax pur- poses	17.88	17.88	Type	Hydraulic wet clutches reversing "on the go" without clutching.	
Intake valve clear- ance	0.014-inch	0.014-inch	TRANSMISSION		
Exhaust valve clearance	0.018-inch	0.022-inch	Type	Manually selected, slid- ing gear type with direc- tional reverser. 4 forward speeds and one reverse speed.	

TRAVEL SPEEDS, MPH (No Slip)

Gear	1500 RPM	2100 RPM	2500 RPM
1st	.9	1.2	1.4
2nd	1.2	1.6	1.9
3rd	2.0	2.8	3.3
4th	3.9	5.5	6.5
Rev.	1.2	1.6	1.9

STEERING

System type. . . Manually or hydraulically operated clutch and brake type
Clutch type. Dry multiple disk
No. of friction surfaces (each clutch) 16
Brake type Contracting band
Turning clearance circle. 156 in. (tractor)
234 in. (loader)

CAPACITIES (U.S. Standard Measures)

Fuel tank 22 gals.
Cooling system 3-1/4 gals.
Engine crankcase (including filter) 9 qts.
Transmission case. 9 qts.
Hydraulic system. 4 gals. (min.)
12-1/2 gals. (loader)
Direction reverser case 3 gals.
Final drives, each 3 qts.
Rockshaft housing 1 pt.

DIMENSIONS

Maximum height (inches) (with exhaust stack) 76 inches
Height to top of hood. 52 inches
Over-all width (at bucket) 66 inches
Over-all length (5 roller) 99-1/8 inches
159-3/16 inches (loader)
(4 roller) 96-5/8 inches
Ground clearance at rear crossbar 13-1/4 inches
Drawbar height (above ground) 13-3/16 inches
Total weight (approx.) 7895 lbs. (diesel tractor)
11,570 lbs. (diesel loader)

TRACK EQUIPMENT

Track frame 4 or 5 roller (tractor)
5 roller only (loader)
Diameter of track roller 8-3/8 inches
Type of bushing. Bronze
Diameter of track carrier (5 roller) 5-7/8 inches
Type of bushing. Bronze

Track shoes (types and sizes)

open center notched grouser (snow shoe) 12 or 14-inch
all-purpose semi-grouser 12 or 14-inch*
open center grouser 12 or 14-inch
grouser 10, 12, or 14-inch
rubber 10-inch*

*Crawler loader track options.

Track gauge (center to center) 48 inches (fixed)
Number of track shoes (each side):
Four-roller type. 32
Five-roller type. 36
Total ground contact area (sq. in.):

	4-Roller	5-Roller
10-inch shoes	1226	1350
12-inch shoes	1357	1628
14-inch shoes	1588	1904
Ground pressure (lbs. per sq. in. with 12-inch shoes)	5.5	4.6*
Length of track on ground (inches)	57-3/4	69-1/4

*7.1 on loader units

FINAL DRIVES

Type . . . Induction hardened pinion and final drive spur gears.
Gear reduction ratio in first gear (engine to axle) 112 to 1
Gear reduction ratio in high gear (engine to axle) 24 to 1

WINCHES (Manual and Power Types)

Drum speed (at 2100 rpm engine speed) 57-1/2 rpm
Drum diameter 6 inches
Drum capacity (no allowance for looseness or uneven spooling)
(with 1/2-inch cable) 195 feet
(with 5/8-inch cable) 125 feet
Cable speed (at 2100 rpm engine speed)
(with full drum) 157 fpm*
(with bare drum) 98 fpm*
Cable pull (at 2100 rpm engine speed)
(with bare drum) 10,600 lbs.
(with full drum) 6,650 lbs.

*With 5/8-inch cable.

(Specifications and design subject to change without notice. Wherever applicable, specifications are in accordance with IEMC Standards.)

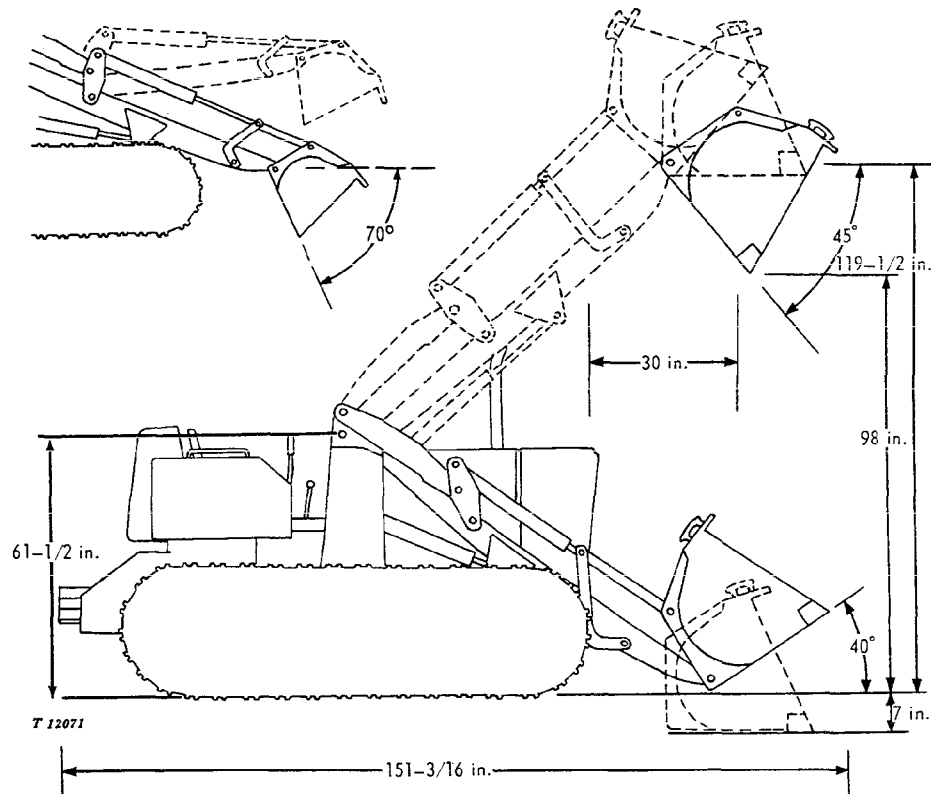


Fig. 10-10-2—Loader Dimensions

LOADER SPECIFICATIONS

LOADER DIMENSIONS

Dumping reach (full height)	30 in.
Dumping clearance (full height)	98 in.
Digging depth below ground (bucket level)	7 in.
Bucket width (3/4 cu. yd. size)	66 in.
Dump angle (full height)	45°
Bucket roll-back (ground level)	40°
Grading angle	70° from horizontal
Height to eccentric pin	61-1/2 in.
Height to bucket hinge pin at max. lift	119-1/2 in.

LOADER OPERATING INFORMATION

System pressure (at 2500 engine rpm)	2000 psi (-600) 2250 psi (601-Up)
Bucket capacities	3/4 or 1-1/4 cu. yd.
Breakout capacity	9000 lbs.
Lift (full height)	4000 lbs.
Raising time	6 sec.
Lowering time	4 sec.
Dumping time	1-1/2 sec.

(Specifications and design subject to change without notice. Wherever applicable, specifications are in accordance with IEMC Standards.)



Section 20

TRACTOR SEPARATION

Group 5

ENGINE REMOVAL AND INSTALLATION

ENGINE REMOVAL

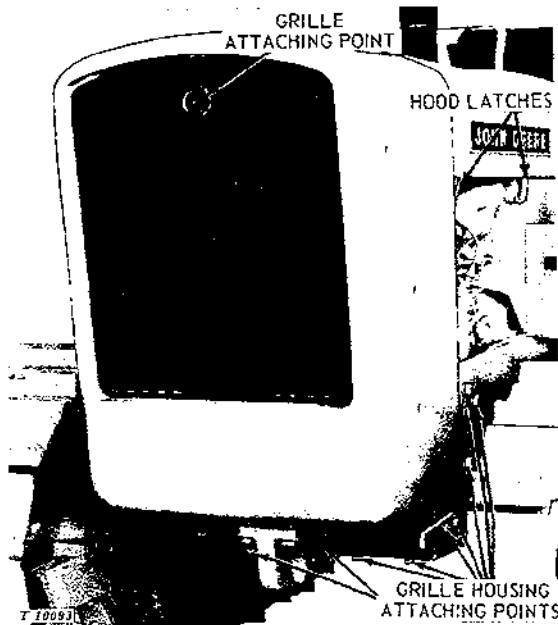


Fig. 20-5-1—Hood and Grille Housing Attaching Points

Disconnect battery ground straps for safety. On crawler-loaders, support loader boom (Group 30 of this Section).

Remove engine side shields if equipped.

1. On each side of hood, unhook latches attaching hood to radiator and cowl supports. Remove muffler stack and lift off hood.

2. Remove grille by unscrewing knob (Fig. 20-5-1). Attach chain hoist to grille housing (Fig. 20-5-2).

3. Disconnect front light leads from headlights.

4. Remove cap screws attaching grille housing to bottom plate and side frames (Fig. 20-5-1). With the aid of a chain hoist remove grille housing (Fig. 20-5-2).

5. Drain radiator and disconnect water inlet and outlet hoses (Fig. 20-5-3). On units with direction reverser, also disconnect oil cooler lines.

6. Remove cap screws which secure upper radiator support to radiator.

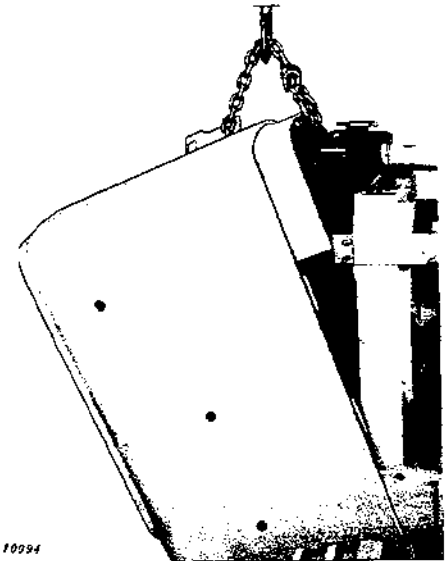


Fig. 20-5-2—Removing Grille Housing

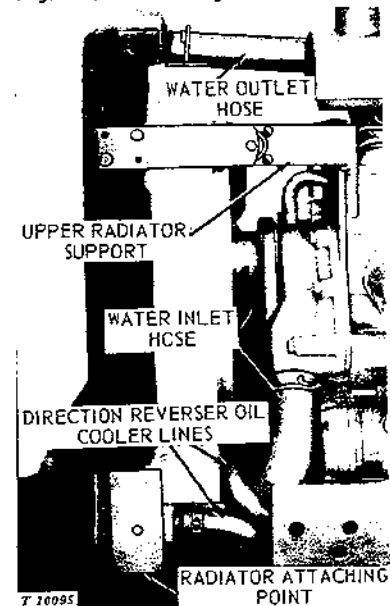


Fig. 20-5-3—Removing Radiator

7. Remove two hex. nuts which secure radiator to front end support mounts. Lift radiator from tractor. Remove front end support from engine if necessary.

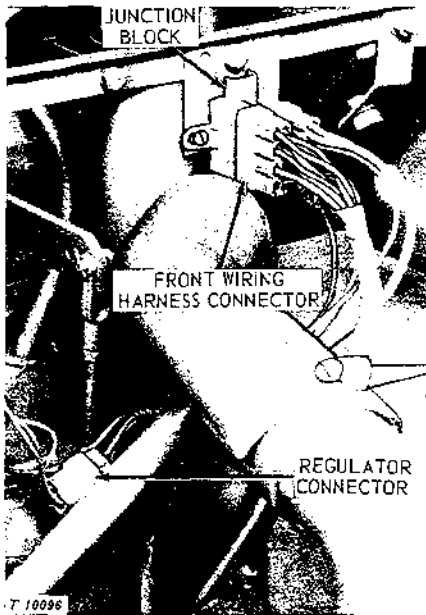


Fig. 20-5-4—Disconnecting Wiring

8. Disconnect battery cable at starter.
9. Disconnect front wiring harness connector at junction block (Fig. 20-5-4).
10. Disconnect wiring harness connector from voltage regulator connector.
11. Disconnect throttle rod from injection pump (diesel) or bellcrank (gasoline engines). Also disconnect choke cable (gasoline).
12. Disconnect air cleaner hose to air intake manifold (diesel) or to carburetor (gasoline).
13. On diesel engines, disconnect starting fluid line from manifold (if equipped).
14. Disconnect and remove tachometer cable from right rear of engine. Remove rubber gasket from tachometer cable (gasket may remain in clutch housing) and inspect for damage. Gasket should be replaced if any indication of damage is found.
15. Disconnect fuel inlet line from fuel transfer pump. Also free fuel return line from rear of nozzle leakoff assembly (diesel).

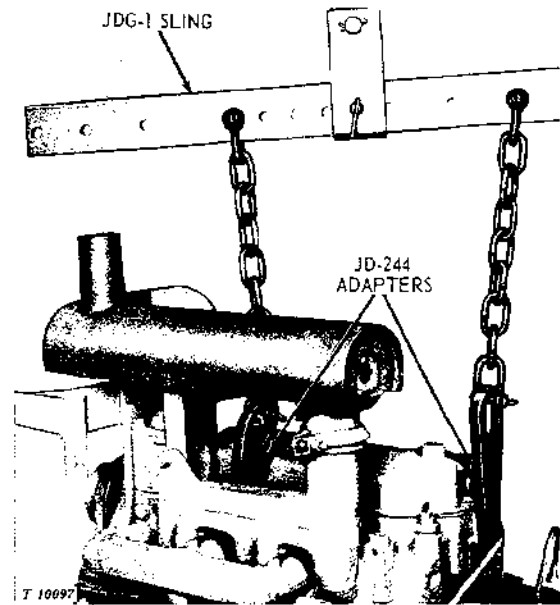


Fig. 20-5-5—Sling for Lifting Engine

16. Install two JD-244 adapter tools on engine cylinder head (Fig. 20-5-5).

17. Place JDG-1 sling on a hoist and attach sling to engine adapter tools as shown in Fig. 20-5-5.

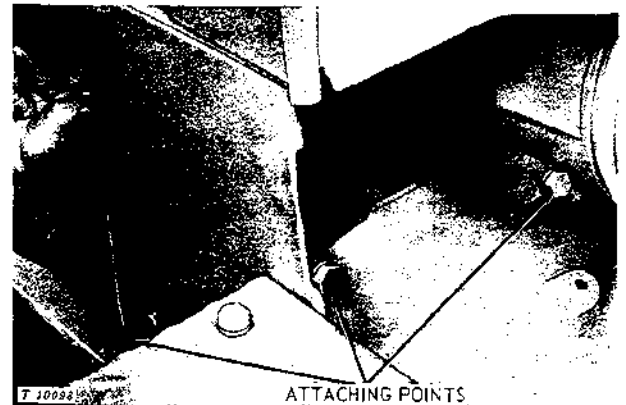


Fig. 20-5-6—Engine Attaching Points

18. Remove cap screws attaching floor plates to transmission top cover. Remove plates.

19. Remove two cap screws under cowl support attaching clutch housing to engine (Fig. 20-5-6).

20. Reach through from front of engine, parallel with side frames, and remove cap screws securing engine to clutch housing.

Using a hoist, pull engine forward off clutch housing mount. Lift engine from tractor.

ENGINE INSTALLATION

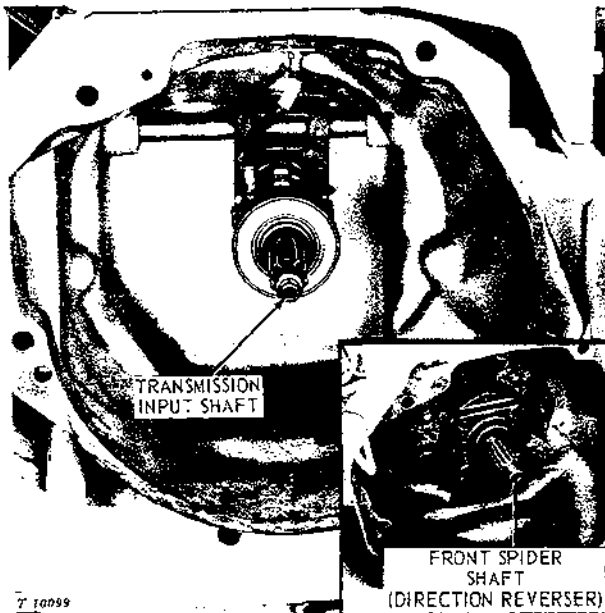


Fig. 20-5-7—Transmission Input Shaft Indexing Point

To install engine correctly, line up cap screw holes of engine with those of clutch housing. Bar engine over, holding it in a horizontal position and exert a steady pressure on the engine toward the clutch housing until the engine clutch indexes with transmission input shaft or front spider shaft (direction reverser). Refer to Fig. 20-5-7.

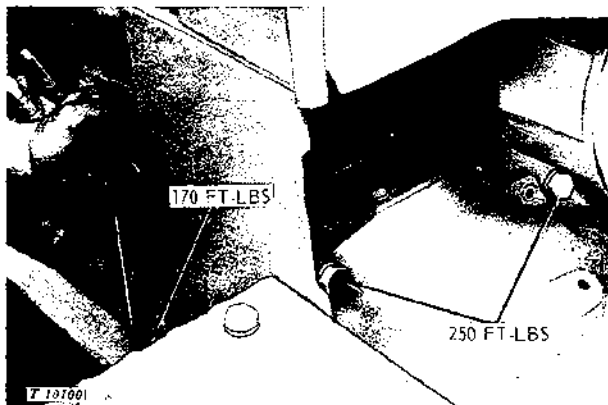


Fig. 20-5-8—Tightening Engine Attaching Cap Screws

Install clutch housing to engine cap screws (Fig. 20-5-8). Tighten the lower cap screws to 170 ft-lbs and the upper screws to 250 ft-lbs torque.

On diesel engines, connect starting line to manifold (if equipped).

Connect air cleaner hose to air intake manifold (diesel engines) or to carburetor (gasoline engines).

Attach throttle control rod to fuel injection pump (diesel engines) or to bellcrank (gasoline engines). Also attach choke cable to carburetor (gasoline engines).

Connect fuel inlet line to fuel transfer pump. On diesel engines, also connect fuel return line to injector pump.

Connect tachometer cable to tachometer drive at right rear of engine. Be sure sealing gasket is in place on cable. Index slot in cable to drive and tighten connector finger tight. Then tighten so that no oil leaks form around cable. Do not tighten too tight or gasket will be damaged and oil leaks will develop.

Connect front wiring harness to junction block. Connect battery cable to starter.

Connect wiring harness connector to voltage regulator connector.

Position front end support in line with mounting points on front of engine if removed.

Install radiator on front end support and secure with stop nuts. Secure radiator to top of radiator support with cap screws and hex. nuts.

Connect radiator inlet and outlet hoses to the radiator. On units with direction reversers, connect oil cooler lines to the radiator.

Fill cooling system with clean soft water. Add John Deere Summer Engine Coolant Conditioner or antifreeze solution as required (Section 80). Install radiator cap.

Fill engine crankcase with oil of proper weight and quality (Section 30).

Connect batteries (Section 100, Group 35). **CAUTION: Batteries are NEGATIVE ground only. Never attempt to polarize alternator-equipped tractors.**

Start engine and allow it to warm up. Check for oil and water leaks.

Install grille housing over front end support with all baffling in place. Secure front end support to bottom plate and side frames.

Connect light leads to headlights. Install grille screen in grille housing. Install hood and muffler stack.

Group 10

DIRECTION REVERSER CASE OR CLUTCH HOUSING REMOVAL AND INSTALLATION

REMOVAL

NOTE: On crawler-loader units, alternate method of removing clutch housing or reverser case is to leave loader and cowl support intact. Remove engine from tractor (Group 5), then remove clutch pedal from lever and roll lever back. Disconnect all wiring and control linkage from clutch housing or reverser case. Remove cap screws securing clutch housing or reverser case to cowl support, to side frames and to transmission. With the aid of a hoist, remove clutch housing or reverser case by sliding forward off transmission studs and out under loader and cowl support.

Remove engine (Group 5 of this Section).

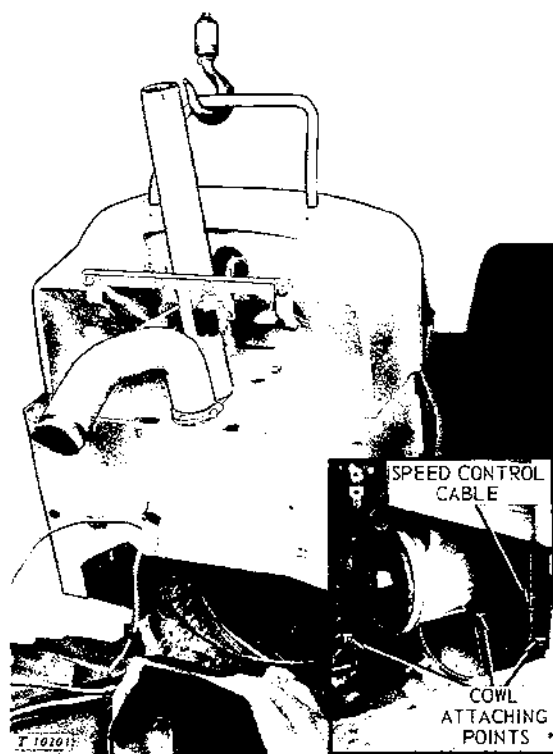


Fig. 20-10-1—Removing Cowl Support (Tractors without Loaders)

1. Disconnect rear wiring harness connector at junction block on front of cowl.

2. Disconnect all wiring and speed control linkage from cowl.

3. Disconnect reverser control cable from lever and from clamp on cowl support (tractors equipped with direction reverser).

4. Remove two cap screws under cowl attaching cowl support to clutch housing or reverser case (see inset in Fig. 20-10-1).

5. Remove two cap screws attaching right and left fenders to cowl support.

6. Pull brake lock lever from dowel on right side of cowl support.

7. With the aid of a chain hoist, lift cowl with support from tractor as shown in Fig. 20-10-1.

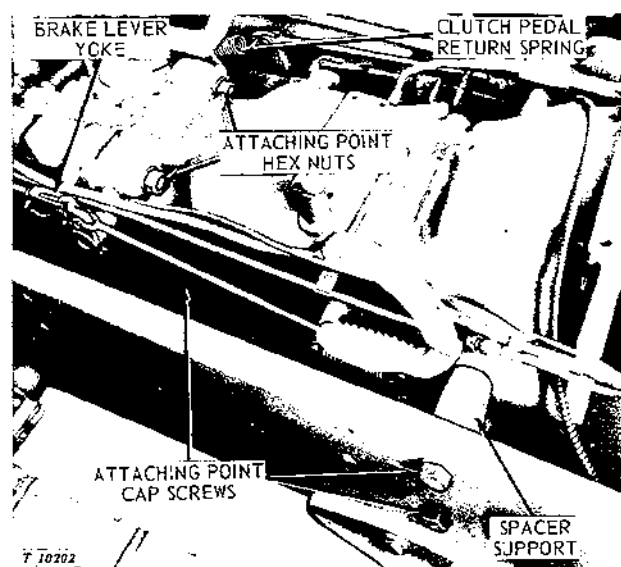


Fig. 20-10-2—Reverser Case or Clutch Housing Attaching Points

8. Disconnect clutch pedal return spring (Fig. 20-10-2).

9. Disconnect rear yokes from brake levers.

10. Install two JD-244 adapter tools on front and rear of clutch housing or reverser case (Fig. 20-10-4).

11. Support JDG-1 sling in a hoist and attach chains to adapter tools.

12. Remove two hex. nuts from clutch housing or reverser case-to-transmission top studs (Fig. 20-10-2).