

# John Deere JD450 Crawler Tractors Crawler Loaders



JOHN DEERE

## SERVICE MANUAL

John Deere JD450 Crawler Tractors  
Crawler Loaders

SM2064 (01MAY87) English

(SERIAL NO. 3250 AND UP)

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LITHO IN U.S.A. (REVISED)  
ENGLISH







# JOHN DEERE

## JD450

### CRAWLER TRACTORS AND CRAWLER LOADERS

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

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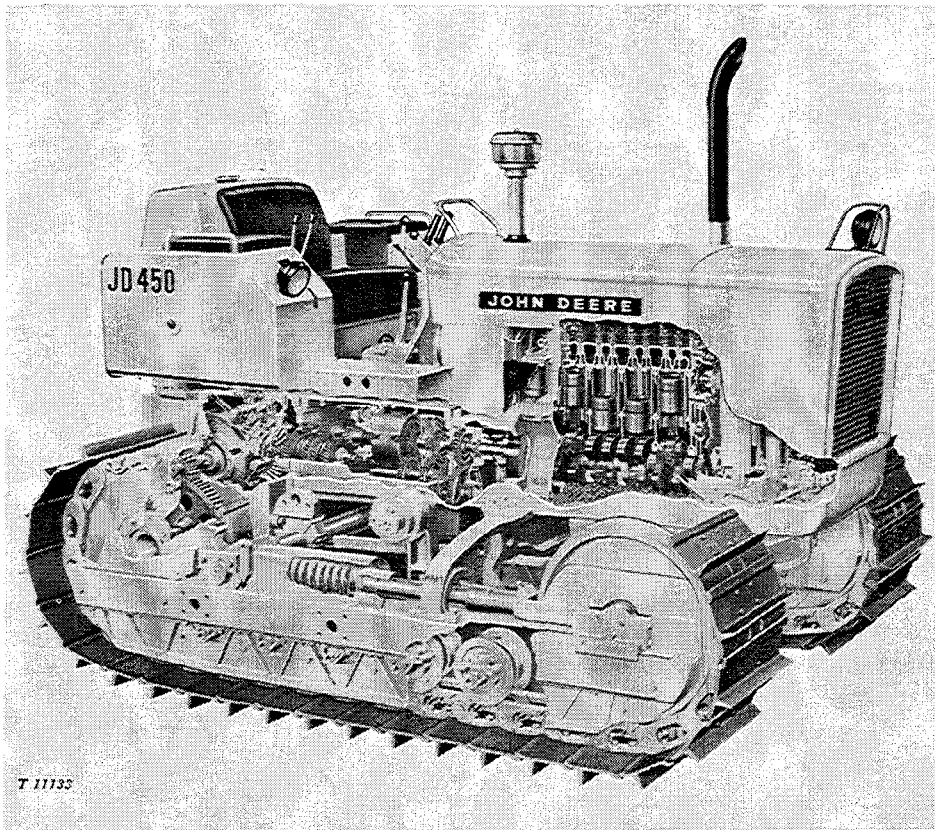
**TO THE JOHN DEERE SERVICEMAN**

This service manual contains maintenance instructions for John Deere JD450 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.



*Right-Hand Cutaway View of John Deere JD450 Crawler Tractor*

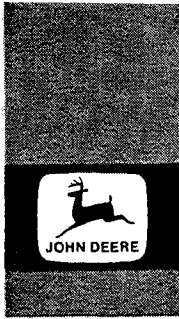
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## Section 10

10-5-1

# DESCRIPTION AND SPECIFICATIONS

## Group 5 DESCRIPTION

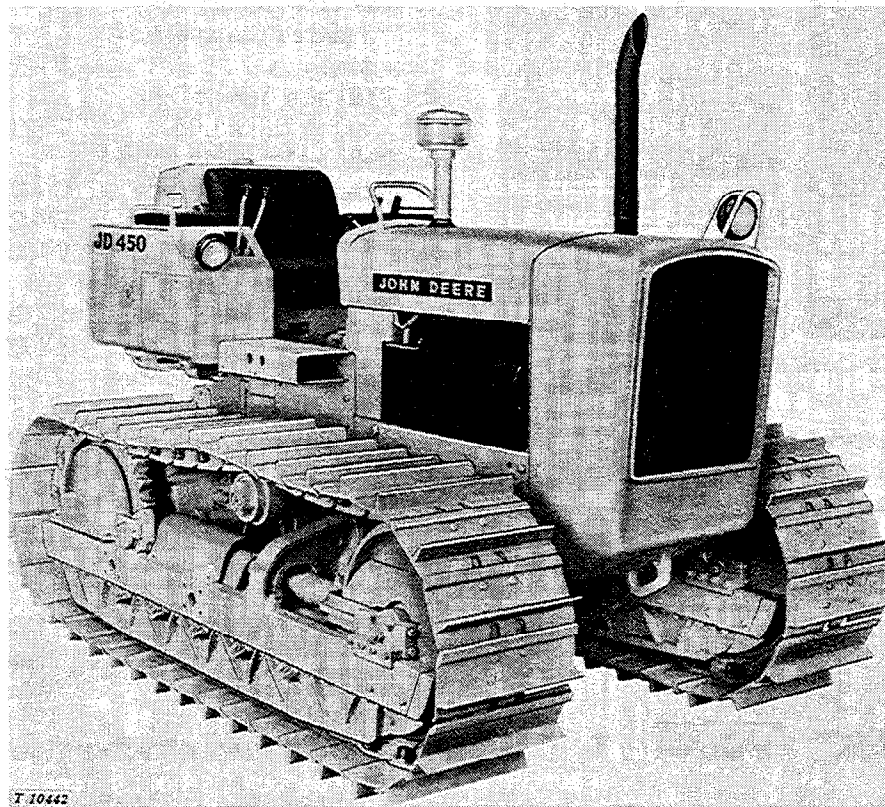


Fig. 10-5-1—Right-Hand View of JD450 Crawler Tractor

The John Deere JD450 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 JD450 Crawler Tractor is equipped with a diesel engine. Early model crawlers were also available with gasoline engines. A choice of H-L-R or Constant Mesh transmission is 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 and engine parts, record ALL digits on the tractor serial number plates.*

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.

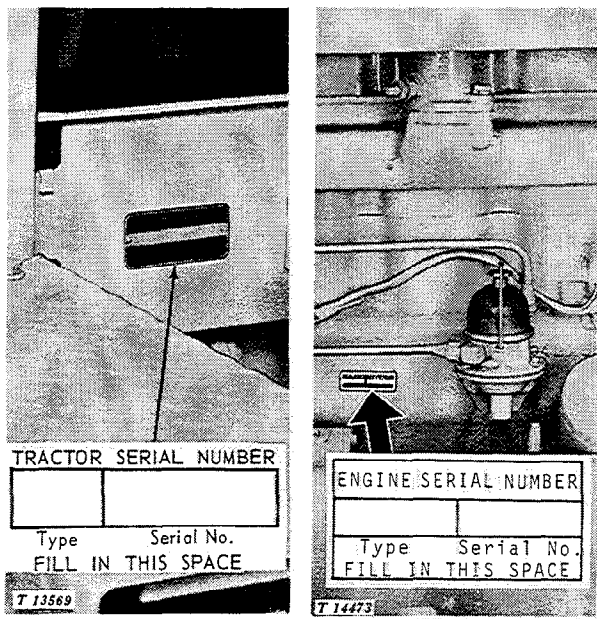
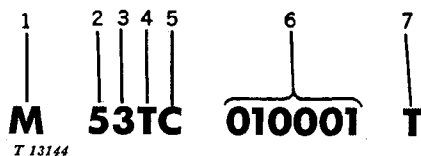


Fig. 10-5-2—Serial Number Locations

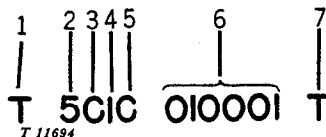
NOTE: Early model tractor and engine serial number plates have an "SN" prefix before the digits listed below.

**BASIC ENGINE SERIAL NUMBER EXPLANATION**



1. The first letter designates the application . . . . . M - Engine
2. This number designates the series . . . . . 5 - 4-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**



1. The first letter designates the application . . . . . T - Tractor
2. This number designates the series . . . . . 5 - JD450
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 - Collar Shift  
M - Hi-Low Reverse
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 (Early Models)**

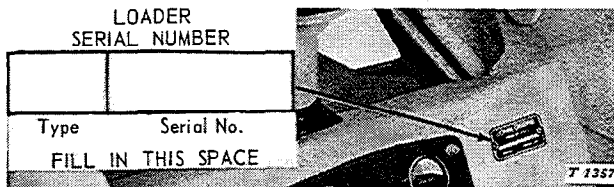


Fig. 10-5-3—Loader Serial Number Location (Early Models)

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

**WINCH SERIAL NUMBER**

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.



## ENGINES

The vertical, 4-cylinder, valve in head, four-stroke cycle engine is available in diesel models (early crawlers were also available with gasoline engines). The engines have four in-line cylinders using individual, replaceable wet-sleeve liners.

## 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.

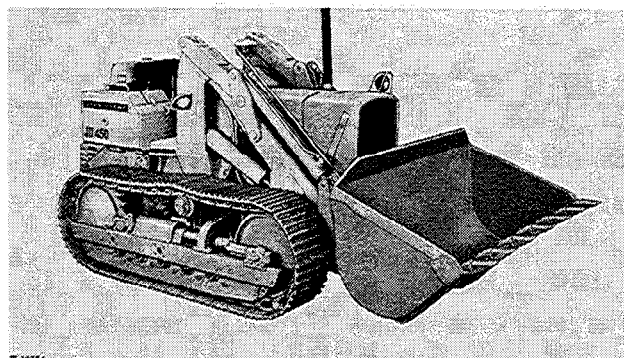


Fig. 10-5-3—Right-Hand View of JD450 Crawler Loader

## 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.

## TRANSMISSIONS

### H-L-R TRANSMISSION

The H-L-R transmission is basically a standard collar shift transmission plus an automatic reverser and underdrive unit. The gears in the speed change box are shifted manually, while the gears in the range change box are shifted hydraulically under load without clutching by means of "wet" clutches. The operator can use the reverser lever to select a high, low, or reverse range for any shift station. This gives a choice of eight forward gears and four reverse gears.

### CONSTANT MESH TRANSMISSION

The Constant Mesh transmission consists basically of the shafts which carry the necessary gears, pinions, collar gears, and shifters to provide eight forward speeds and four reverse speeds. It is selective sliding-collar type and is shifted manually while clutching.

## ENGINE CLUTCH

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.

The clutch is foot-operated. On units with H-L-R transmissions, the clutch pedal is used as a disconnect for cold weather starting and also as a PTO clutch.

## POWER TAKE-OFF

The power take-off is transmission driven from the rear of the tractor and is controlled by the engine clutch on tractors with Constant Mesh transmission. On tractors with H-L-R transmission, the power take-off shaft is continuous running. Shaft speed is 1000 rpm at 1900 rpm engine speed. It fully meets all ASAE-SAE standards.

## WINCHES

The JD450 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.

## 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 in applied position 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, interrupting the 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

Five-roller track frames are standard equipment. 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 mechanism. Track tread is fixed at 52 inches.

Trackshoes 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.

# Group 10 SPECIFICATIONS

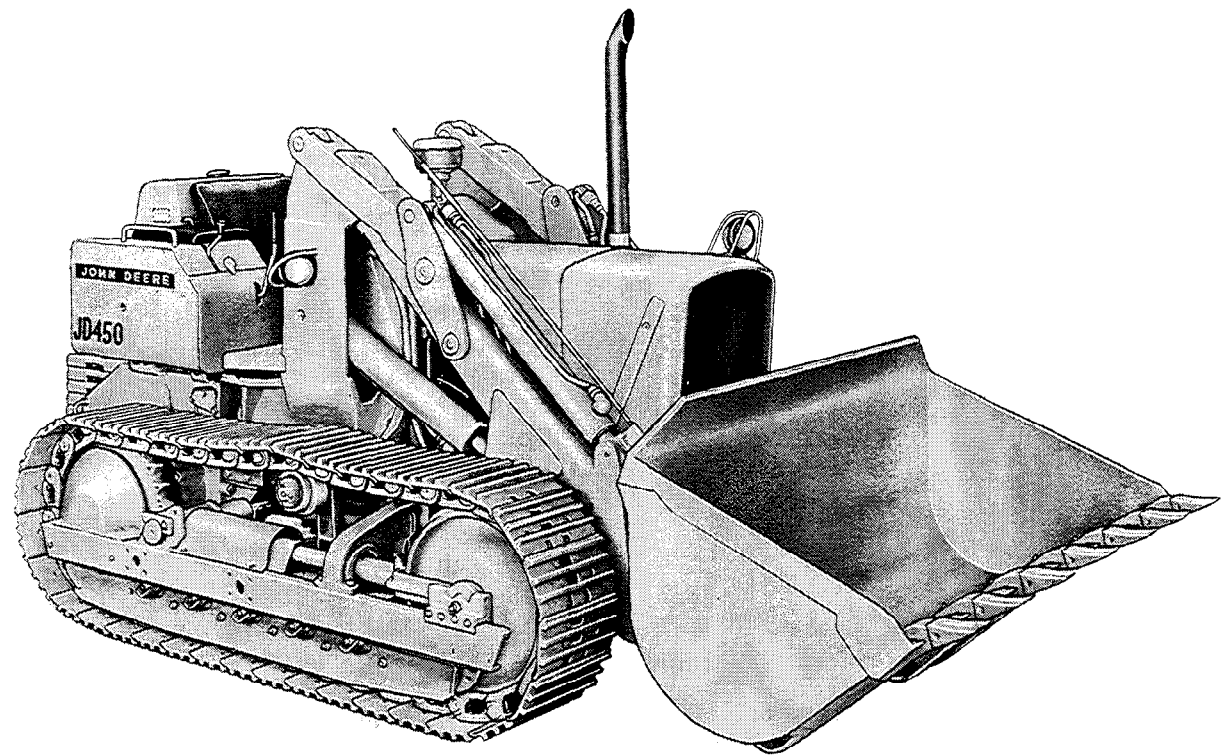


Fig. 10-10-1—Right-Hand View of JD450 Crawler Loader

### TRACTOR SPECIFICATIONS

ENGINE	Diesel	Gasoline**
Flywheel horsepower (observed) . . . . .	57.0	57.0
Torque in ft.-lbs at 1300 rpm (observed) (nominal) . . . . .	145.0	145.0
Number of cylinders . . . . .	4	4
Bore and stroke, inches . . . . .	3.86 x 4.33	3.86 x 3.86
Displacement in cubic inches . . . . .	202.0	180.0
Compression ratio	16.3 to 1	7.5 to 1*
N.A.C.C. or A.M.A. horsepower rating for tax purposes . . . . .	23.84	23.84
Slow-idle (rpm) . . . . .	800	375 (15905) 600 (15906-up)

\*8.6 to 1 with high altitude pistons.

ENGINE (Cont.)	Diesel	Gasoline**
Fast-idle (rpm) . . . . .	2650	2770
Governed speed range (rpm) . . . . .	800 to 2650	600 to 2770
Intake valve clearance . . . . .	0.014 in.	0.014 in.
Exhaust valve clearance . . . . .	0.018 in.	0.022 in.
Engine clutch . . . . .	with Constant Mesh: 12-in. dry disk, foot-operated; with H-L-R: 11-in., spring-loaded dry disk, foot-operated.	

### TRANSMISSIONS

*Constant Mesh:* High, low and reverse gears grouped to shift mechanically in series with 4 shift stations to give eight forward speeds and 4 reverse speeds.

*H-L-R:* High, low, and reverse gears grouped to shift (under full load with a hydraulic assist) in series with 4 shift stations to give 8 forward speeds and 4 reverse speeds.

\*\*Gasoline engine available on early models only.

Tractors and Loaders, Crawler, JD450-  
Description and Specifications

10-10-2

Specifications

TRAVEL SPEEDS, MPH (No Slip)

H-L-R Transmission		Constant Mesh Transmission	
Range	2500 rpm	Range	2500 rpm
<b>No. 1</b>			
Hi Gear	1.8	Hi Gear	1.8
Lo Gear	1.3	Lo Gear	1.5
Rev. Gear	1.7	Rev. Gear	1.7
<b>No. 2</b>			
Hi Gear	2.8	Hi Gear	2.8
Lo Gear	2.0	Lo Gear	2.3
Rev. Gear	2.7	Rev. Gear	2.7
<b>No. 3</b>			
Hi Gear	4.3	Hi Gear	4.3
Lo Gear	3.0	Lo Gear	3.5
Rev. Gear	4.1	Rev. Gear	4.1
<b>No. 4</b>			
Hi Gear	6.7	Hi Gear	6.7
Lo Gear	4.7	Lo Gear	5.5
Rev. Gear	6.4	Rev. Gear	6.4

CAPACITIES (U.S. Standard Measures)

Fuel tank	31 gals.
Cooling system	4 gals.
Engine lubrication (including filter)	9 qts.
Transmission case	8 gals.
Final drive cases (each)	7 qts.

DIMENSIONS

Height to top hood	57-1/16 in.
Over-all height (without stack)	76 in.
Over-all width, minimum, (with 12-in. shoes)	65-3/8 in. (tractor)
Over-all length	109-1/4 in. (tractor) 171 in. (loader)

Ground clearance (at rear crossbar)	14-1/4 in.
Total weight (approx.)	10,590 lbs. (diesel tractor) 15,630 lbs. (diesel loader)

STEERING — Manually or hydraulically operated clutch-brake system

Clutch	11-inch dry multiple disk type
No. of friction surfaces (each clutch)	16
Brakes	Contracting band-bonded lining
Turning clearance circle	180 in. (tractor) 253 in. (loader)

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

FINAL DRIVES

Gear reduction ratio in first gear (engine to axle)	144 to 1
Gear reduction ratio in eighth gear (engine to axle)	27.2 to 1

TRACK EQUIPMENT

Track frame	5-roller
Track shoes (types and sizes):	
Grouser	12, 14, 16, or 18 in.
Notched grouser (snow shoe)	12, 14, 16, or 18 in.
Triple semi-grouser	12, 13, 14, or 16 in.
Open center grouser	12, 14, 16, or 18 in.
Rubber	13 in.
Track gauge (center to center)	52 in. (fixed)
Number of track shoes (each side)	36
Total ground contact area (sq. in.):	
12-inch shoes	1711
13-inch shoes	1857
14-inch shoes	2032
16-inch shoes	2294
18-inch shoes	2585
Ground pressure (lbs. per sq. in.)	
with 12-inch shoes	5.7 (tractor) 8.8 (loader)
Length of track on ground (inches)	72-3/4

WINCHES (Manual and Power Types)

Drum speed (at 2200 rpm engine speed)	58-1/2 rpm
Drum diameter	6 inches
Drum capacities*	
(with 1/2-inch cable)	185 feet
(with 5/8-inch cable)	115 feet
(with 3/4-inch cable)	90 feet
Cable speed (at 2200 rpm engine speed)	
(with bare drum)	100 fpm**
(with full drum)	159 fpm**
Cable pull (at 2200 rpm engine speed)	
(with bare drum)	13,900 lbs. (manual) 15,000 lbs. (power)
(with full drum)	8,700 lbs. (manual) 9,600 lbs. (power)

\*Calculated capacities — allowance must be made for loose or uneven spooling.  
\*\* With 5/8-inch cable.

Tractors and Loaders, Crawler, JD450—  
Description and Specifications

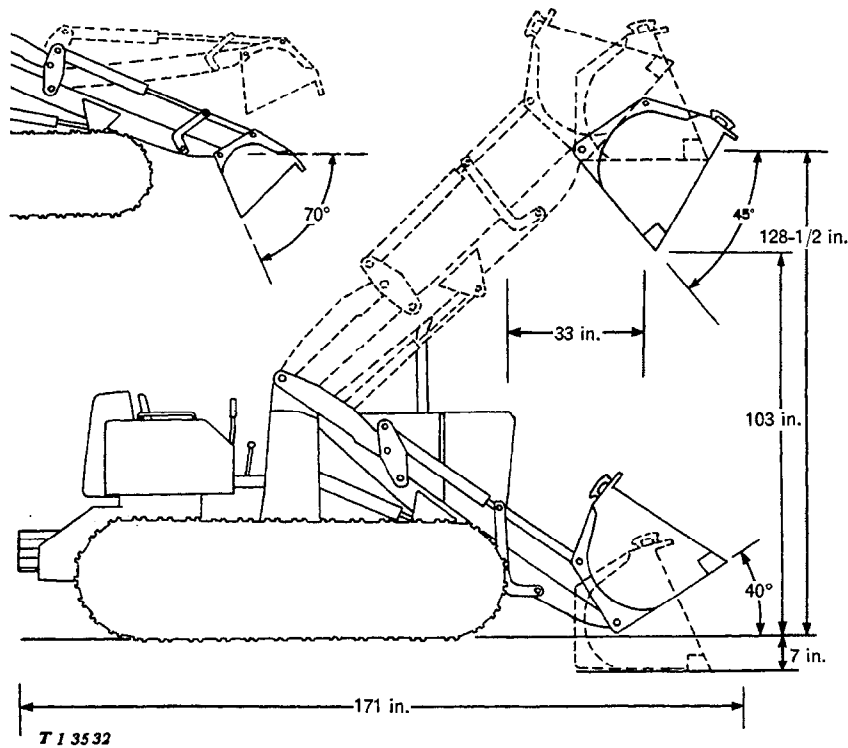


Fig. 10-10-2—Loader Dimensions

**LOADER SPECIFICATIONS**

**LOADER DIMENSIONS (Fig. 10-10-2)**

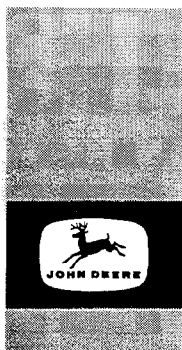
- Dumping reach (full height) . . . . . 33 in.
- Dumping clearance (full height) . . . . . 103 in.
- Maximum lift (bucket at full height). 128-1/2 in.
- Digging depth below ground (bucket level) . . . . . 7 in.
- Bucket width (1-1/8 yd. bucket) . . . . . 72 in.
- Dump angle
  - Full height. . . . . 45° from horizontal
  - Ground level . . . . . 70° from horizontal
- Bucket roll-back (ground level) . . . . . 40°
- Overall length. . . . . 171 in.
- Overall height (with exhaust stack). 81-3/8 in.
- Overall width (minimum)
  - (with 12-in. shoes). . . . . 65-3/8 in.
- Ground clearance (at rear crossbar) 14-1/4 in.
- Turning clearance circle (carry height, bucket rolled back) . . . . . 253 in.

**LOADER OPERATING INFORMATION**

- System pressure at 2500 engine rpm . . . . . 2000 psi ( -1300) 2250 psi (1301-up )
- Bucket capacities . . . . . 1-1/8 or 1-3/4 cu. yd.
- Breakout force . . . . . 12000 lbs.
- Hydraulic lift capacity (full height). 5500 lbs.
- Raising time . . . . . 6.6 sec.
- Lowering time . . . . . 4 sec.
- Dumping time . . . . . 1.7 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

Disconnect battery ground straps for safety. Remove engine side shields if equipped. On crawler-loaders, support loader boom (Group 30 of this Section).

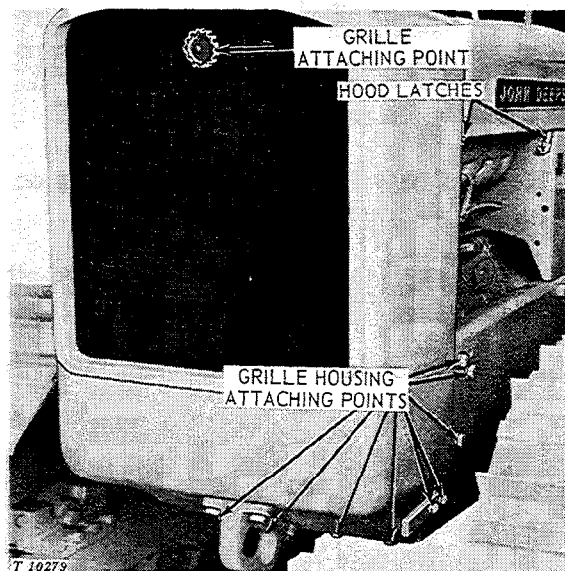


Fig. 20-5-1—Hood and Grille Housing Attaching Points

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. Detach H-L-R oil filter base (if equipped) from inside of grille housing. With the aid of chain hoist, remove grille housing.
5. Drain radiator and disconnect water inlet and outlet hoses. Also disconnect H-L-R transmission oil cooler lines (if equipped).

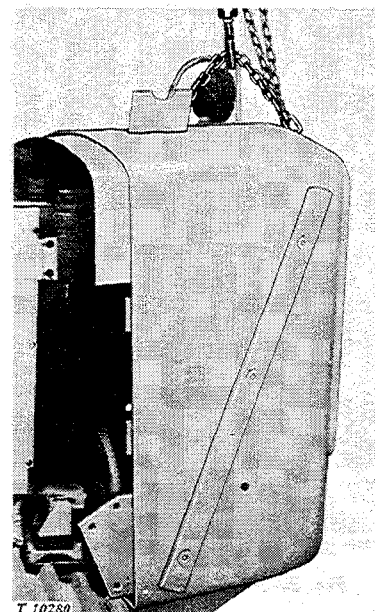


Fig. 20-5-2—Removing Grille Housing

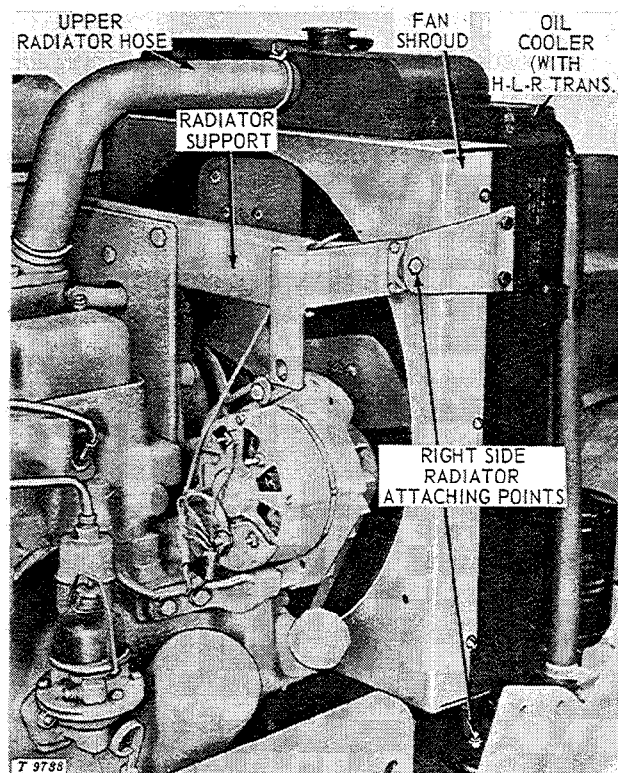


Fig. 20-5-3—Removing Radiator

6. Remove cap screws which secure upper radiator support mounts. Remove two hex. nuts which secure base of radiator to front end support mounts. Lift radiator from tractor. Remove front end support from engine if necessary.

7. Disconnect battery cable at starter.

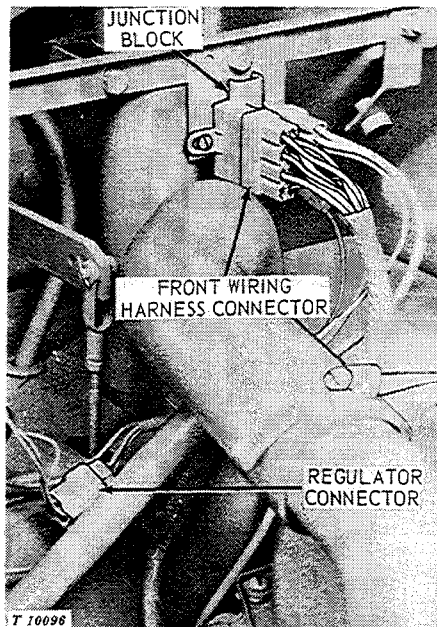


Fig. 20-5-4—Disconnecting Wiring

8. Disconnect front wiring harness connector at junction block (Fig. 20-5-4).

9. Disconnect wiring harness connector from voltage regulator connector.

10. Disconnect throttle rod from injection pump (diesel) or bellcrank (gasoline). Also disconnect choke cable (gasoline).

11. Disconnect air cleaner hose from air intake manifold (diesel) or from carburetor (gasoline).

12. On diesel engines, disconnect starting fluid line from manifold (if equipped).

13. 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.

14. Disconnect fuel inlet line to fuel transfer pump. Also free fuel return line from rear of nozzle leakoff assembly (diesel).

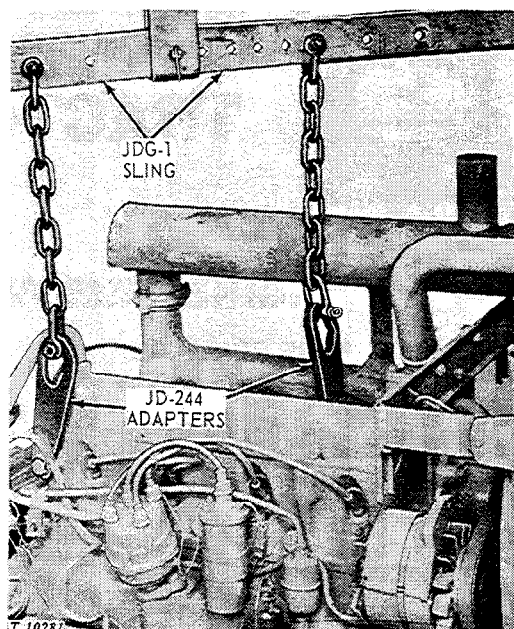


Fig. 20-5-5—Sling for Lifting Engine

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

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

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

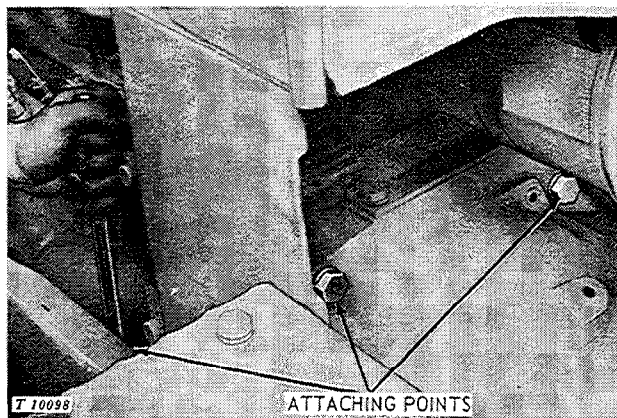


Fig. 20-5-6—Engine Attaching Points

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

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

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



### ENGINE INSTALLATION

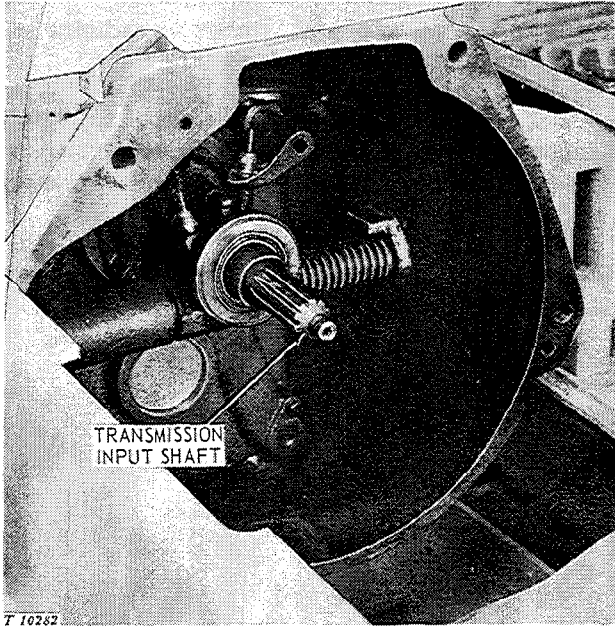


Fig. 20-5-7—Transmission Drive Shaft Indexing Point

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 exerting a steady pressure on the engine toward the clutch housing until the engine clutch indexes with transmission input shaft.

**CAUTION:** Make sure tachometer drive shaft packing is in place before installing engine.

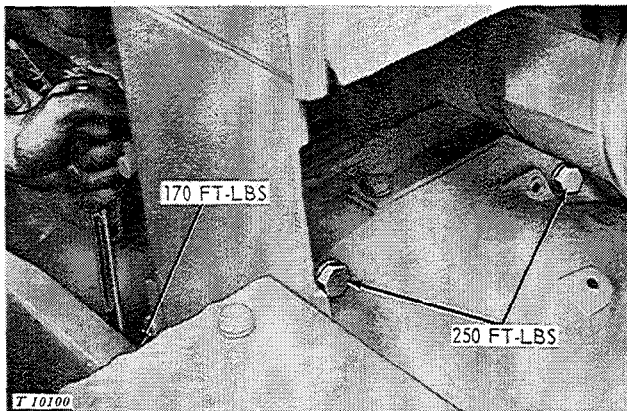


Fig. 20-5-8—Torquing Engine Attaching Cap Screws

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

Remove JDG-1 sling and JD-244 adapters from engine.

On diesel engines, connect starting fluid 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. Also connect fuel return line to injection pump (diesel).

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 from 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 support with cap screws and hex. nuts.

Connect radiator inlet and outlet hoses to the radiator. On units with H-L-R transmission, connect oil lines to the cooler.

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

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

Connect batteries (Section 100, Group 35).

**CAUTION:** Batteries are **NEGATIVE** ground only. Never attempt to polarize alternator.

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 with attaching cap screws and lock washers (Fig. 20-5-1).

Attach H-L-R oil filter base (if equipped) to inside of grille housing.

Connect light leads to headlights.

Install grille screen in grille housing.

Install hood and hook latches to radiator and cowl supports. Install muffler stack.

*NOTE: When replacing muffler extensions, position extension opening to the right or front on crawler loaders and to the left or front on crawler dozer models.*

# Group 10

## CLUTCH HOUSING REMOVAL AND INSTALLATION

### REMOVAL

*NOTE: On crawler-loader units, the alternate method of removing clutch housing is to leave loader and cowl support intact. Remove engine (Group 5), then drive clutch shaft to right side and remove clutch stop lever. Roll back clutch and brake pedals. Disconnect all wiring and control linkage from clutch housing. Remove cap screws securing clutch housing to cowl support, to side frames, and to transmission. With the aid of a hoist, remove clutch housing by sliding forward off transmission dowels and out under loader and cowl support.*

Remove engine (Group 5 of this Section).

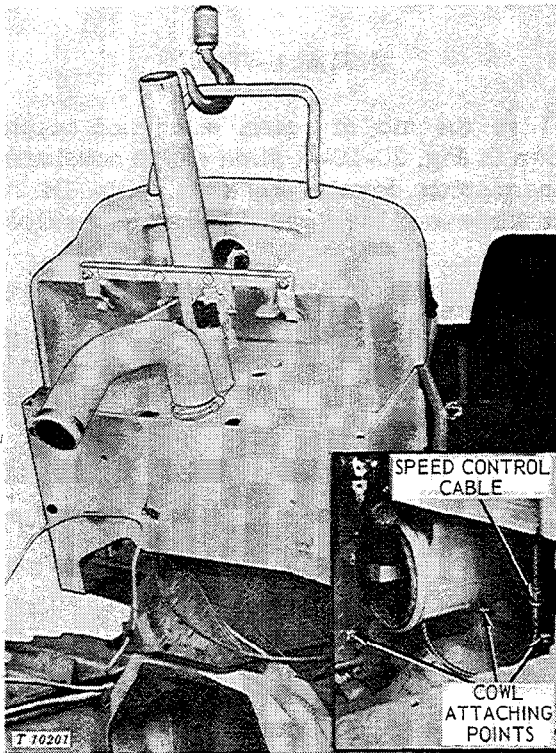


Fig. 20-10-1—Removing Cowl Support (Tractors Without Loader)

1. Disconnect rear wiring harness connector at junction block on front of cowl.
2. Disconnect all wiring and speed control linkage from cowl.

3. Remove two cap screws under cowl attaching cowl support to clutch housing (see inset in Fig. 20-10-1).
4. Remove two cap screws attaching right and left fenders to cowl support.
5. Pull brake lock lever off dowel on right side of cowl support.
6. With the aid of a chain hoist, lift cowl with support off tractor as shown in Fig. 20-10-1.

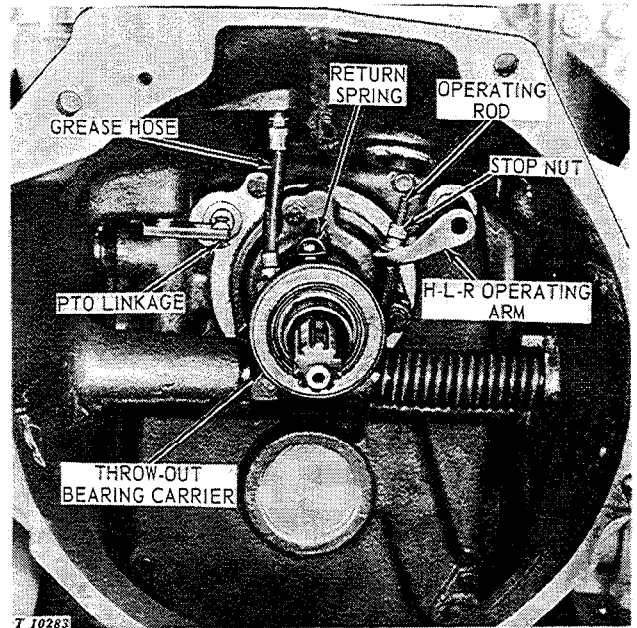


Fig. 20-10-2—Disconnecting Clutch Control Linkage

7. Disconnect PTO lever linkage at transmission front cover (if equipped).
8. Detach grease hose from throw-out bearing carrier.
9. Detach return spring from throw-out bearing carrier.
10. On tractors equipped with H-L-R transmission, remove stop nut securing operating rod to valve operating arm. Free rod from shifter arm. Unscrew oil cooler line and elbow from right side of clutch housing-to-transmission front cover.
11. Disconnect clutch pedal return spring.

12. Disconnect yokes from brake levers.

13. Install two JD-244 adapter tools in front and rear of clutch housing (Fig. 20-10-4).

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

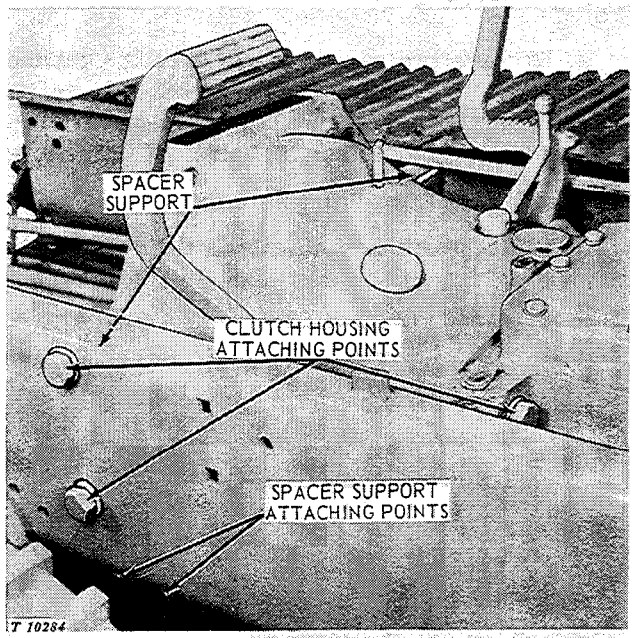


Fig. 20-10-3-Clutch Housing Attaching Points

15. Remove four cap screws from clutch housing to transmission case.

16. Remove four cap screws from bottom of right and left side frames to spacers.

17. Remove four cap screws from right and left side frames to clutch housing.

18. With the aid of a hoist, remove clutch housing by sliding forward off transmission dowels and input shaft (Fig. 20-10-3). Be careful not to allow clutch throw-out bearing and carrier to fall out.

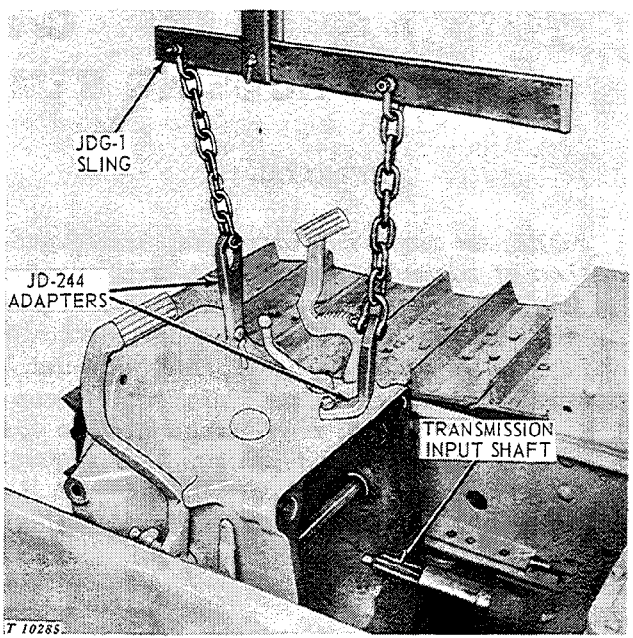


Fig. 20-10-4-Removing Clutch Housing

### INSTALLATION

With the aid of hoist, sling and adapters shown in Fig. 20-10-4, slide clutch housing onto transmission dowels and input shaft. Be sure that throw-out bearing is correctly positioned.

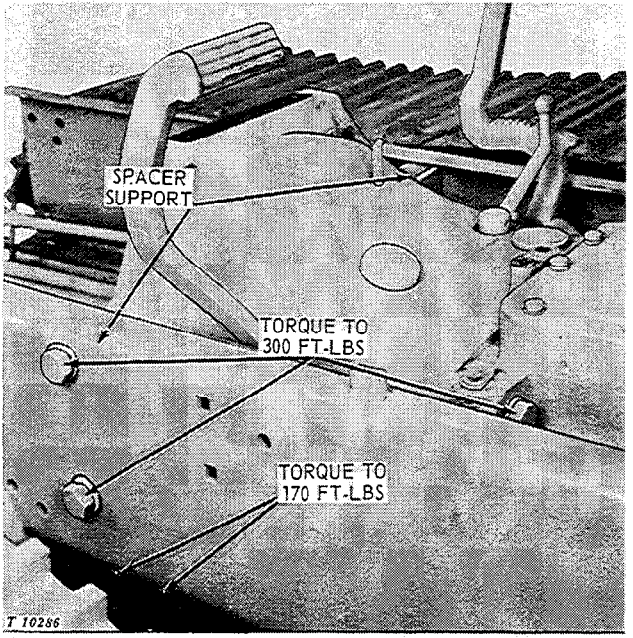


Fig. 20-10-5-Torquing Clutch Housing Attaching Cap Screws