300 SK
400 SK
Log Skidders

Service Manual

9-73832

CASE

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SPECIFICATIONS AND ENGINE MAINTENANCE ON MODEL 300 SKID KING

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INTRODUCTION

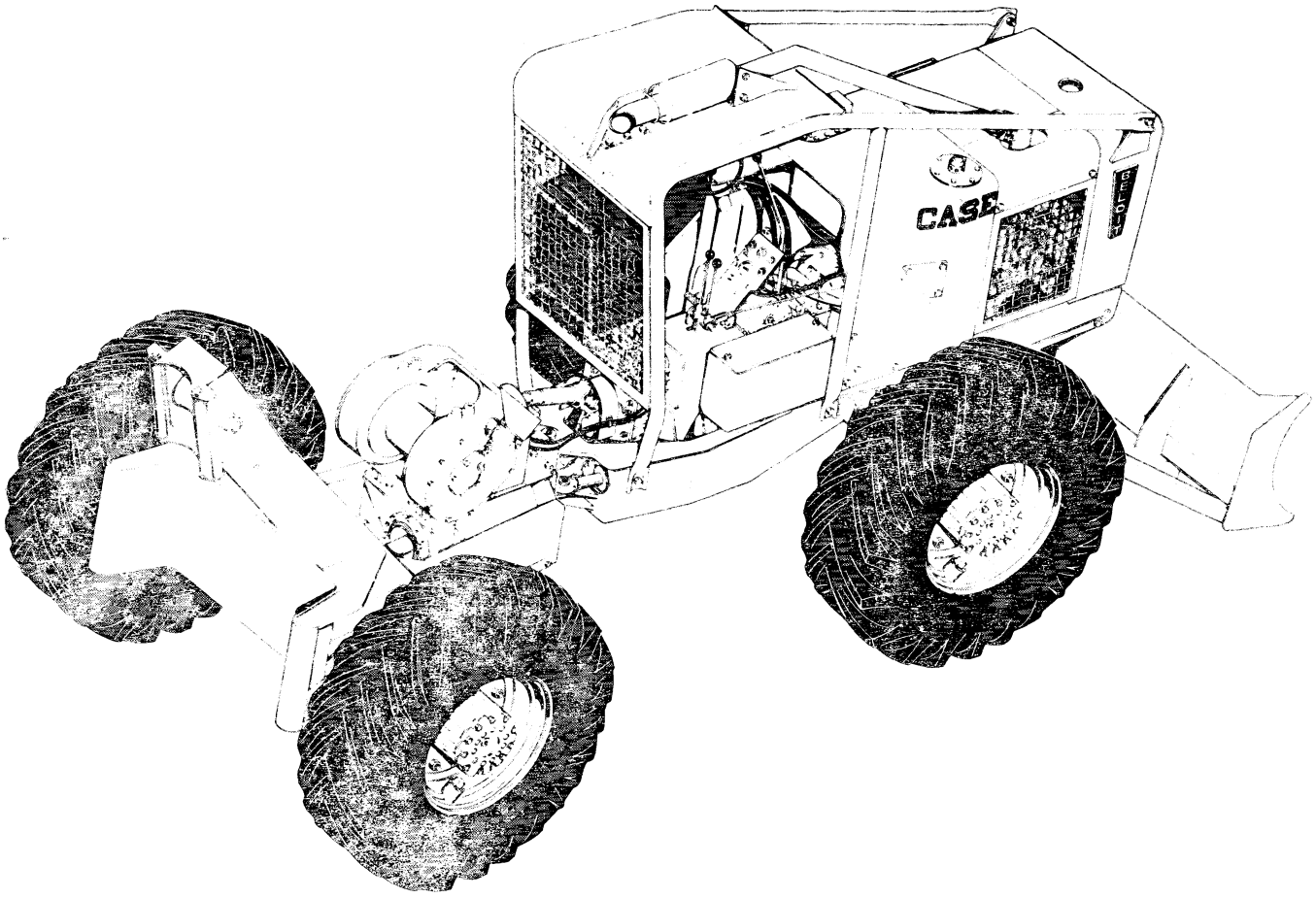


Figure 1

The illustrations, photos, and informative text in this manual will enable the mechanic to disassemble, service, and adjust the hydraulic and electric systems, power train, and frames.

IMPORTANT: This manual does not cover the Detroit Diesel engine, excepting routine maintenance items. Service problems relating to the engine should be referred to a Detroit Diesel service center.

The J. I. Case Company continually strives to improve the performance and dependability of its machines through better engineering and manufacturing methods. Therefore, the right is reserved to change specifications given in this manual without notice or without incurring any obligation relating to such changes.

DEFINITION OF "RIGHT HAND" AND "LEFT HAND"

The terms "right hand" and "left hand" are determined by standing at the rear of the unit and facing the direction of forward travel.

SPECIFICATIONS

DIMENSIONS (WITH STANDARD EQUIPMENT)

*Overall length with dozer blade	228"
without dozer blade	202-3/4"
*Overall width at tires	96"
*Overall height to top of canopy	98-1/2"
to top of muffler	105-1/2"
Height from center of fairlead to ground	72"
Vertical distance from center of fairlead to center of axle	45"
Horizontal distance from centerline of fairlead roller to centerline of axle	25-1/2"
*Ground clearance, at pivot joint	21"
at axle banjo	18"
*Turning clearance radius (to corner of blade)	219"
*Tread width	76-3/8"
*Wheel base	111"

BLADE DIMENSIONS AND SPECIFICATIONS

*Blade dimensions	84" x 23-1/2"
*Digging depth below ground	12-1/2"
*Lift height above ground	55"
Lifting force	7500 lbs.

STEERING AND ARTICULATION

Steering	Full hydraulic, wheel control
Steering angle, each direction from center	40°
*Turning clearance radius (to corner of blade)	219"
Frame oscillation, up or down	16°

TRAVEL SPEEDS (M.P.H.)

	LOW RANGE	HIGH RANGE
First	0 - 1.6	0 - 3.1
Second	0 - 2.9	0 - 5.7
Third	0 - 5.3	0 - 10.4
Fourth	0 - 9.2	0 - 18.1
Reverse	0 - 1.6	0 - 3.1

NOTE: Speeds established with 18.4 x 26 tires.

DOZER-STEERING HYDRAULIC SPECIFICATIONS

Refer to Section II, Steering-Dozer Hydraulic System.

APPROXIMATE CAPACITIES

Engine oil	12-1/2 quarts
Transmission	22 pints
Hydraulic reservoir	
Refill capacity	14 U.S. gallons
System capacity	18 U.S. gallons
Cooling system	6 U.S. gallons

Fuel tank	23 U.S. gallons
Winch	
Holt	12 quarts
Gearmatic	7-1/4 quarts
Torque converter	10 quarts
Wheel planetaries	7 pints each
Differentials	6-1/2 quarts each
Transfer case	7 pints

NOTE: For specific lubricants and fluids, refer to sections in this manual for each component.

TIRES

Standard	18.4 x 26, 10 ply-rating, "Loggers Special"
Optional	18.4 x 34, 10 ply-rating, "Loggers Special"
Description	Nylon carcass, shredded wire undertread and sidewalls, bead to bead
Recommended pressure	20 P.S.I.

WEIGHT DISTRIBUTION

Front axle	10,240 lbs.
Rear axle	4,120 lbs.
Total shipping weight	14,260 lbs.

WINCH SPECIFICATIONS

Refer to Section VIII, Winches.

ELECTRICAL SPECIFICATIONS

Refer to Section III, Electrical System.

ENGINE SPECIFICATIONS

NOTE: For detailed specifications, refer to Detroit Diesel service manual or operator's manual.

Make and model	Detroit Diesel 3-53
Maximum rated horsepower	
Gross (see note 1 below)	97 H.P. @ 2800 R.P.M.
S.A.E. net (see note 2 below)	81 H.P. @ 2500 R.P.M.
Fuel	No. 2 diesel fuel
Cylinders, number, valve-in-head	3
Bore and stroke	3-7/8" x 4-1/2"
Displacement	159 cu. inches
Starting	12-volt, neg. ground
Fuel induction	Injectors (3)
Fuel supply	Low pressure transfer pump
Ignition	Diesel cycle
Air cleaner	Dry type
Governor	Limiting speed with throttle control
Oil filter type	Renewable cartridge
Lubrication	Positive pressure

NOTE 1: Manufacturer's rating of maximum engine horsepower at flywheel without accessories. Fuel set at maximum quantity for this application. Corrected to sea level - 29.92" Hg. and 60° F. dry air.

NOTE 2: S.A.E. net flywheel horsepower of engine as applied to this vehicle when equipped with all accessories. Corrected to 500' altitude with .38" Hg. vapor pressure (29.38" Hg. observed barometer) and 85° F. air (per S.A.E. J816a).

COOLING SYSTEM

Type	HD tropical radiator, pressurized at 7 P.S.I.
Thermostat	Bypass type, 170° to 190°
Pump	Impeller type, lubricated bearing

NOTE: Specifications preceded by an asterisk (*) conform to I.E.M.C. definition. I.E.M.C. definitions are not established for specifications without an asterisk.

IMPORTANT: J. I. Case Company reserves the right to change these specifications without notice and without incurring any obligation relating to such changes.

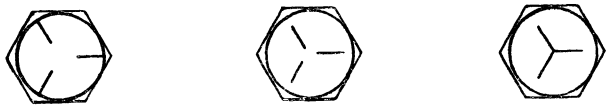
STANDARD TORQUES

Torque values listed are to be used under normal conditions.

Many capscrews, bolts, nuts etc. require tightening to a special torque for proper installation. These torques are shown in the servicing instructions and illustrations for each component.

Grade 5 Capscrews, Nuts, Studs

S.A.E. Grade 5 Bolts (A.S.T.M. A325 and A.S.T.M. A449) are made from quenched and tempered medium carbon steel - Grade 5 bolts are identified by three (3) equally spaced radial lines embossed on the head of the bolt.



Coarse Thread (N.C.) Fine Thread (N.F.)

	Torque (ft. lbs.)		Torque (ft. lbs.)
1/4" - 20 N.C.	5-10	9/16" - 12 N.C.	100-120
1/4" - 28 N.F.	10-15	9/16" - 18 N.F.	110-130
5/16" - 18 N.C.	15-20	5/8" - 11 N.C.	135-165
5/16" - 24 N.F.	15-20	5/8" - 18 N.F.	160-200
3/8" - 16 N.C.	25-35	3/4" - 10 N.C.	235-285
3/8" - 24 N.F.	30-40	3/4" - 16 N.F.	270-330
7/16" - 14 N.C.	45-55	7/8" - 9 N.C.	360-440
7/16" - 20 N.F.	50-60	7/8" - 14 N.F.	395-490
1/2" - 13 N.C.	65-85	1" - 8 N.C.	520-640
1/2" - 20 N.F.	80-100	1" - 12 N.F.	575-705

Grade 8 Capscrews, Nuts, Studs

S.A.E. Grade 8 Bolts (A.S.T.M. A354, Grade BD), are made from quenched and tempered medium carbon alloy steel. Grade 8 Bolts are identified by six (6) equally spaced radial lines embossed on the head of the bolt.

Coarse Thread (N.C.) Fine Thread (N.F.)

	Torque (ft. lbs.)		Torque (ft. lbs.)
1/4" - 20 N.C.	10-15	9/16" - 12 N.C.	135-165
1/4" - 28 N.F.	15-20	9/16" - 18 N.F.	155-190
5/16" - 18 N.C.	20-30	5/8" - 11 N.C.	200-240
5/16" - 24 N.F.	25-30	5/8" - 18 N.F.	215-265
3/8" - 16 N.C.	40-50	3/4" - 10 N.C.	340-420
3/8" - 24 N.F.	45-55	3/4" - 16 N.F.	380-460
7/16" - 14 N.C.	60-80	7/8" - 9 N.C.	540-660
7/16" - 20 N.F.	70-90	7/8" - 14 N.F.	595-725
1/2" - 13 N.C.	100-120	1" - 8 N.C.	810-990
1/2" - 20 N.F.	110-130	1" - 12 N.F.	900-1100

REMOVING ENGINE

1. Remove the engine hood and side panels. Drain the engine oil.

2. Remove the canopy and exhaust tubing. Refer to "Canopy and Exhaust System", Section VII, Frames.

3. Remove the three front frame underpan attaching bolts, lockwashers, and nuts, allowing the front portion of the underpan to drop.

4. Drain the engine coolant and remove the radiator housing and grille as an assembly. Refer to "Removing Radiator" in this section.

5. Drain the hydraulic tank and remove the dozer-steering pump from the rear of the engine. Refer to "Steering-Dozer Hydraulic Pump", Section II, Hydraulic System.

6. Close fuel shut off valve. Disconnect fuel lines. Remove or disconnect all other items from engine such as torque converter cooler hoses, electric wires, etc. Close all hydraulic and fuel line openings with clean caplugs. Tag wires, lines, and hoses to aid in reassembly.

7. Provide suitable support under the torque converter or transmission (dry clutch models) to prevent stresses against the power train when the engine is separated from the torque converter or transmission.

8. On torque converter models, remove eight flywheel-to-flex plate bolts:

   a. Remove plug shown in Figure 2.

   b. Turn the flywheel with a 1-1/8" wrench applied to the crankshaft pulley bolt at the front of the engine until the bolts come in view through the plug hole. Turn flywheel and remove bolts until all eight have been removed.

NOTE: For additional working room, if desired, the engine oil filter near the plug may be removed.

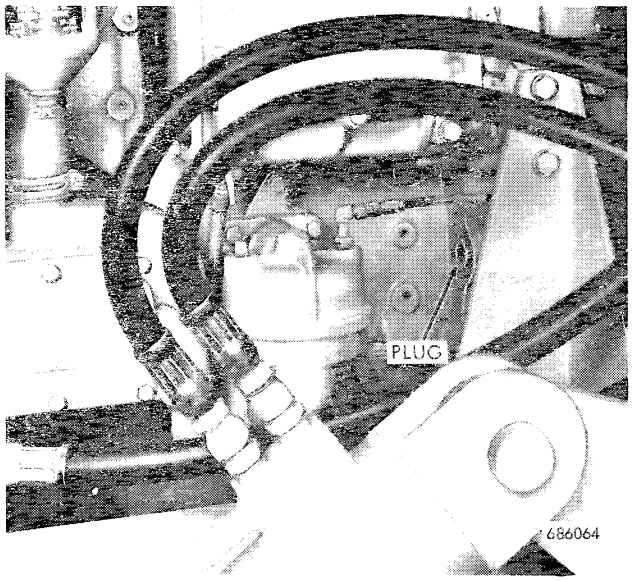


Figure 2

9. On dry clutch models, remove the access plate on top of the transmission. Through this access, remove the bolts and lockwashers which attach the clutch assembly to the flywheel.

10. Remove the twelve engine flywheel housing to torque converter or transmission mounting bolts and lockwashers.

11. Remove the two front engine mounting bolts, lockwashers, and nuts.

12. Remove the eight (four each side) side engine mounting bolts and lockwashers. Remove the engine mount bracket from each side.

13. Attach a suitable hoist to the two engine lifting lugs provided on the engine.

14. Make certain everything is disconnected, then carefully raise the engine from the tractor.

IMPORTANT: Engine overhaul and repairs other than routine maintenance (oil changes, filter service, etc.) should be done at an authorized Detroit Diesel service center.

INSTALLING ENGINE

1. The engine should be installed in the reverse order of the instructions under "Removing Engine" above.

2. In addition, the following illustrations will be helpful during the installation:

Electrical wiring . . Figure 1, Section III
Pump installation Figures 12 & 14, Section II
Fuel lines installation . Figure 7, Section I
Radiator installation . . Figure 4, Section I
Canopy and exhaust Figure 4 or 5, Section VII

NOTE: On torque converter models, torque the eight flywheel-to-flex plate mounting bolts to 41-49 foot pounds.

3. Install oil, fuel, and engine coolant as follows:

   a. Replace engine oil filter. Add 12-1/2 quarts of oil.
   b. Fill fuel tank with 23 gallons No. 2 diesel fuel.
   c. Fill radiator with 6 gallons of coolant—1/2 water, 1/2 anti-freeze.
   d. Fill hydraulic reservoir with 14 U.S. gallons Case Hi-Lo TCH oil.

AIR CLEANER

DESCRIPTION

The heavy duty, dry type air cleaner consists of a removable wire screen cover attached to the air cleaner body which contains a replaceable filter cartridge. The cartridge incorporates an individual tube design which presents a large filtration area to the incoming air.

Air entering the air cleaner is given a precleaning while passing through the multiple wire screen cover. The air then passes through the tubes of the paper filter cartridge into the engine.

The cartridge should be replaced and their air cleaner serviced at least every two months; more often in dusty conditions.

SERVICING

1. Loosen the four wing nuts and remove the wire cover assembly.

2. Pull the paper cartridge from the filter housing and discard it.

3. Thoroughly clean the filter housing and wire mesh cover.

NOTE: Take care to prevent dirt from falling into blower intake.

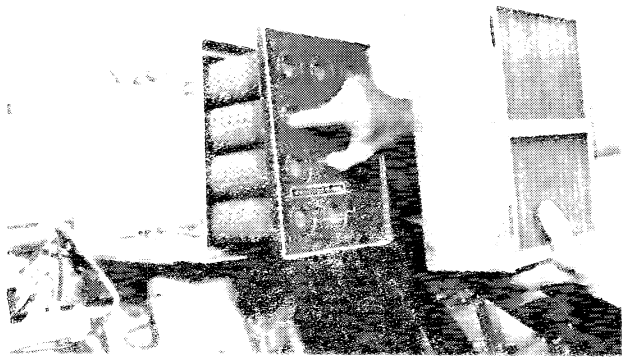


Figure 3

4. Reassemble the air cleaner with a new filter cartridge. NEVER attempt to wash or clean a plugged filter cartridge. Do not reuse a filter cartridge.

COOLING SYSTEM

CAPACITY

The capacity of the basic engine cooling system (cylinder block, head, thermostat housing, and oil cooler is 8 quarts.

The complete cooling system capacity including the engine and radiator is 6 U.S. gallons.

DRAIN COCKS

Drain cocks are located on the right hand side of the engine block and the lower rear of the radiator. There is an additional drain cock located on the bottom of the oil cooler housing.

FLUSHING

The cooling system should be flushed each Spring and Fall.

1. Drain the engine and radiator.
2. Refill the cooling system with soft, clean water. If the engine is hot, fill SLOWLY.
3. Start the engine and run for 15 minutes.
4. Drain the system.
5. Refill the system with approximately 6 U.S. gallons of coolant—1/2 water, 1/2 permanent type anti-freeze.

FAN BELT TENSION

Proper fan and alternator belt tension is illustrated in Figure 4.

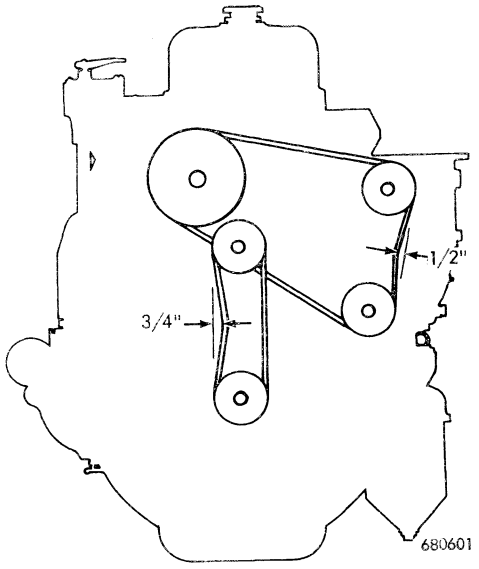


Figure 4

ENGINE OIL FILTER

REPLACING ELEMENT

The oil filter element should be changed every time the oil is changed.

1. The filter shell, element, and stud may be detached as an assembly after removing the center stud unscrewing it from the bottom of the shell. Discard the gasket.
2. Discard the used element. Clean the filter shell and all parts. Install a new element.
3. Place a new gasket in the filter base, position the shell and element assembly on the gasket and tighten the center stud carefully to prevent damaging the gasket or center stud.
4. Start the engine, and check for leaks.

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