

**300 SK
400 SK
Log Skidders**
Service Manual

9-73832

CASE

CONTENTS OF SECTIONS

<u>Section or Subsection Title</u>	<u>Section No.</u>	<u>Section or Subsection Title</u>	<u>Section No.</u>
Specifications and Engine Maintenance, 300	I	Transfer Case, 300	V
Specifications and Engine Maintenance, 400	I	Drive Shafts and Universal Joints, 300 and 400	V
Hydraulic System	II	Transmission Removal, Filter, Controls, 400	V
Electrical System	III	Transmission, 400	Allison Service Manual TT 2220 and Supplement SA 1225.
Brake System	IV	Planetary Axles and Differentials	VI
Torque Converter, 300	V	Frames	VII
14-Inch Traction Clutch, 300	V	Winch, Gearmatic Model 19	VIII
Transmission, 300	V		

INDEX

<u>Section</u>	<u>Page</u>	<u>Subsection</u>	<u>Section</u>	<u>Page</u>	<u>Subsection</u>
A					
Adjustment, belt tension	I 10	300 Spec.	Brake system, exp. view, 400	IV 5	
	I 10	400 Spec.	C		
	III 26		Cable, winch	VIII 6	
Adjustment, brake relief valve	IV 13		Canopy and exhaust, 300	VII 16-17	
Adjustment, clutch free travel	V 19	Clutch	Canopy and exhaust, 400	VII 18-19	
Adjustment, clutch levers	V 5	Clutch	Capacities, fluid, 300	I 4	300 Spec.
Adjustment, differential bearings	VI 20		Capacities, fluid, 400	I 5	400 Spec.
Adjustment, differential pinion	VI 15		Charging circuit, trouble shooting	III 16	
Adjustment, differential pinion-ring gear backlash	VI 21		Clutch, description	V 3	Clutch
Adjustment, engine shutoff, 300	I 13	300 Spec.	Clutch, exp. view	V 4	Clutch
	III 38		Clutch lever setting	V 5	Clutch
Adjustment, engine shutoff, 400	I 14	400 Spec.	Clutch linkage	V 10	Clutch
	III 40		Clutch release	See Transmission, 300	
Adjustment, field relay	III 31		Clutch, servicing	V 3-11	Clutch
Adjustment, oscillation tube, 300	VII 10		Clutch, specifications	V 3	Clutch
Adjustment, oscillation tube, 400	VII 14		Controls, transmission, 400	V 4	400 Trans.
Adjustment, parking brake, 300	IV 16		Control valve	See Flow Control Valve	
Adjustment, parking brake, 400	IV 16		Control valve, dozer	II 40	
Adjustment, remote relief valve	II 42		Cooling system, 300	I 10	300 Spec.
Adjustment, transfer case bearings	V 15	T. Case	Cooling system, 400	I 10	400 Spec.
Adjustment, voltage regulator	III 17,20		Cooling system, flushing	I 10	300 Spec.
Adjustment, wheel bearing	VI 33		Coupling, pump-to-engine	II 22,26	
Adjustment, winch brake	VIII 15		Cylinders	II 35-39	
Adjustment, winch clutch bearing	VIII 19		Cylinders, trouble shooting	II 10	
Adjustment, winch drum shaft bearing	VIII 22		D		
Adjustment, winch pinion bearing	VIII 21		Differential, exp. view	VI 6	
Adjustment, winch ring gear and pinion	VIII 23		Differential, servicing	VI 6-24	
Air cleaner, 300	I 9	300 Spec.	Differential, trouble shooting	VI 4	
Air cleaner, 400	I 9	400 Spec.	Dozer control valve	See Control Valve, dozer	
Alternator output check	III 24-25		Dozer hydraulics, 300 exp. view	II 16	
Alternator, trouble shooting	III 11-17		Dozer hydraulics, 400 exp. view	II 21	
Axle installation	VI 34		Drive line, 300, rear	V 4-5	D. Shafts
axles	See Planetary Axles			VII 6-7	
B					
Batteries	III 18-23		Drive line, 400, rear	V 4-5	D. Shafts
Batteries, trouble shooting	III 11-17			VII 11-12	
Belt tension adjustment	III 26		Drive shafts, servicing	V 4-7	D. Shafts
Bleeding brakes	IV 15		Drive shafts, trouble shooting	V 3	D. Shafts
Bleeding, hydraulics	II 6		Dry clutch	See Clutch	
Bleeding, winch hydraulics	VIII 6		E		
Brake head	IV 10-12		Electrical system, exp. view, 300	III 6	
Brake lock	IV 8-9		Electrical system, exp. view, 400	III 10	
Brake system, 400	Also see Allison service manual supplied with this manual		Electrical trouble shooting	III 11-17	
Brake system diagram, 300	IV 3		Engine installation, 300	I 9	300 Spec.
Brake system, exp. view, 300	IV 4		Engine installation, 400	I 7	400 Spec.
			Engine removal, 300	I 8	300 Spec.
			Engine removal, 400	I 7	400 Spec.
			Engine shutoff controls, 300	I 13,15	300 Spec.
				III 35	

	<u>Section</u>	<u>Page</u>	<u>Subsection</u>
Engine shutoff controls, 400	I	12,14	400 Spec.
Exhaust system	III	40,42	
Exploded view, brake head	See		Canopy and Exhaust
Exploded view, brake lock	IV	10	
Exploded view, brake system	IV	7	
Exploded view, canopy and exhaust	VII	16,18	
Exploded view, clutch	V	4	Clutch
Exploded view, clutch linkage, 300	V	11	Clutch
Exploded view, control valve	II	46	
Exploded view, cooling system, 400	I	11	400 Spec.
Exploded view, cylinder	II	37	
Exploded view, differential	VI	6	
Exploded view, electrical, 300	III	6	
Exploded view, electrical, 400	III	10	
Exploded view, filter, return	II	43	
Exploded view, flow control valve	II	47	
Exploded view, fuel system, 300	I	14	300 Spec.
Exploded view, fuel system, 400	I	13	400 Spec.
Exploded view, fuel tank, 300	II	49	
Exploded view, hydraulics, 300	II	14-17	
Exploded view, hydraulics, 400	II	18-21	
Exploded view, hydraulics, transmission 400	V	3	400 Trans.
Exploded view, instrument panel, 300	III	36-37	
Exploded view, instrument panel, 400	III	41	
Exploded view, master cylinder	IV	7	
Exploded view, parking brake, 300	IV	17	
Exploded view, parking brake, 400	IV	20	
Exploded view, planetary wheel end	VI	26-27	
Exploded view, pump, gear type	II	27	
Exploded view, pump, manual steering	II	31	
Exploded view, pump-to-engine coupling	II	22,26	
Exploded view, pump, vane type	II	23	
Exploded view, radiator-hood, 300	I	12	300 Spec.
Exploded view, rear drive line, 300	VII	7	
Exploded view, rear drive line, 400	VII	12	
Exploded view, rear frame, 300	VII	8-9	
Exploded view, rear frame, 400	VII	13	
Exploded view, relief valve, brake	II	14	
Exploded view, remote relief valve	II	43	
Exploded view, reservoir, 300	II	49	
Exploded view, reservoir, 400	II	53	
Exploded view, throttle controls, 300	I	16	300 Spec.
Exploded view, throttle control, 400	I	15	400 Spec.
Exploded view, torque converter, 300	V	16	T. Conv.
Exploded view, transfer case	V	6-7	T. Case
Exploded view, transmission 300	V	7-10	
Exploded view, transmission controls, 400	V	35-38	300 Trans.
Exploded views, winch, Model 19	VIII	11-16, 27-28,31-32 35-36	

F

Fairlead bearings	VII	15	
Fan belt tension adjustment	See		Adjustment, belt tension
Filter condition indicator	II	45	
Filter, engine oil, 300	I	10	300 Spec.
Filter, engine oil, 400	I	16	400 Spec.
Filter, fuel, 300	I	13	300 Spec.
Filter, return line	II	44	
Filter, suction, hydraulic	See		Magnetic Separator
Filter, transmission pressure line	V	4	400 Trans.
Flow Control Valve	II	46	
Flowmeter	II	12	
Foot pedal	See		Throttle Control
Frame, rear, 300	VII	6,10	
Frame, rear, 300, exp. view	VII	8-9	
Frame, rear, 400	VII	11	
Frame, rear, 400, exp. view	VII	13	
Frames, separating front and rear	VII	3	
Fuel system, 300	I	13	300 Spec.

	<u>Section</u>	<u>Page</u>	<u>Subsection</u>
Fuel system, 400	I	12	400 Spec.
Fuel tank, 300	II	48	
Fuel tank removal, 400	I	14	400 Spec.

H

High traction differential	See		Differential
Hinge tube	See		Oscillation Tube
Hydraulic diagram, 300	II	4	
Hydraulic diagram, 400	II	5	
Hydraulic reservoir, oil level	II	6	
Hydraulics, transmission, 400, exp. view	V	3	400 Trans.
Hydraulic system, 300, exp. views	II	14-17	
Hydraulic system, 400, exp. views	II	18-21	
I			
Instrument panel, 300	III	35-39	
Instrument panel, 400	III	40-43	

L

Left hand, definition of	I	3	400 Spec.
Lights, 300	III	6	
Lights, 400	III	10	
Lubrication, differentials	VI	21	
Lubrication, drive shafts	V	6	D. Shafts
Lubrication, oscillation tube, 300	VII	19	
Lubrication, oscillation tube, 400	VII	14	
Lubrication, planetary axle shaft end	VI	34	
Lubrication, torque converter, 300	V	7	T. Conv.
Lubrication, transfer case	V	1	T. Case
Lubrication, transmission, 300	V	4	300 Trans.
Lubrication, winch, Model 19	VIII	4-5	

M

Magnetic separator	II	46	
Master cylinder	IV	6-7	
Misc twist lock, brake	IV	8-9	

N

No-spin differential	See		Differentials
----------------------	-----	--	---------------

O

Orbitrol pump	See		pump, Manual Steering
Oscillation tube, description	VII	4	

P

Parking brake	IV	16-20	
Parking brake, 400	Also see		Allison ser- vice manuals supplied with this manual
Planetary axes, description	VI	3	
Planetary axle shaft ends, exp. view	VI	26-27	
Planetary axle shaft ends, servicing	VI	26-31	
Planetary axle shaft ends, trouble shooting	VI	25	
Power train, parts identification, 300	V	6	300 Trans.
Pressure check, brake system	IV	13	
Pressure check, hydraulic system	II	41	
Pressure check, torque converter, 300	V	9	T. Conv.
Pump, gear type	II	26	
Pump hydraulics, 300, exp. view	II	14-15	
Pump hydraulics, 400, exp. view	II	18-19	
Pump, manual steering	II	30-35	
Pump, testing with flowmeter	II	12	
Pump, trouble shooting	II	7	
Pump, vane type	II	22	

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	Section	Page	Subsection
R			
Radiator removal, 300	I	11	300 Spec.
Radiator removal, 400	I	10	400 Spec.
Regulator, checks and adjustments	III	27-31	
Regulator, voltage, trouble shooting	III	11-17	
Relief valve, brake system	IV	13-14	
Relief valve, remote (hydraulic)	II	41	
Reservoir, hydraulic oil, 300	II	48	
Reservoir, hydraulic oil, 400	II	52	
Reservoir oil level	II	6	
Right hand, definition of	I	3	400 Spec.

	Section	Page	Subsection
S			
Shift lever, bending, 300	V	45	Trans.
Solenoid, starter	III	34	
Specifications, 300	I	4	300 Spec.
Specifications, 400	I	4	400 Spec.
Specifications, alternator	III	24	
Specifications, articulation, 300	I	4	300 Spec.
Specifications, articulation, 400	I	4	400 Spec.
Specifications, battery	III	18	
Specifications, clutch	V	3	Clutch
Specifications, cooling, 300	I	6	300 Spec.
Specifications, cooling, 400	I	6	400 Spec.
Specifications, electrical test	III	14	
Specifications, engine, 300	I	5	300 Spec.
Specifications, engine, 400	I	5	400 Spec.
Specifications, fast charging	III	21	
Specifications, fluid capacities, 300	I	4	300 Spec.
Specifications, fluid capacities, 400	I	5	400 Spec.
Specifications, general, 300	I	4	300 Spec.
Specifications, general, 400	I	4	400 Spec.
Specifications, hydraulic	II	3	
Specifications, regulator	III	27	
Specifications, specific gravity	III	21	
Specifications, starter	III	32	
Specifications, starter solenoid	III	34	
Specifications, steering, 300	I	4	300 Spec.
Specifications, steering, 400	I	4	400 Spec.
Specifications, steering-dozer hydraulics	II	3	
Specifications, tires, 300	I	5	300 Spec.
Specifications, tires, 400	I	5	400 Spec.
Specifications, torque converter, 300	V	3	T. Conv.
Specifications, transmission, 300	V	3	300 Trans.
Specifications, travel speeds, 400	I	4	400 Spec.
Specifications, weight, 400	I	5	400 Spec.
Specifications, winch	VIII	4	
Starter check	III	32-33	
Starter solenoid check	III	34	
Starting Circuit, Trouble shooting	III	14	
Steering cylinders			See Cylinders, hydraulic
Steering hydraulics, 300, exp. view	II	17	
Steering hydraulics, 400, exp. view	II	20	
Steering, trouble shooting	II	8	

	Section	Page	Subsection
T			
Throttle control linkage, 300	I	16	300 Spec.
	II	51	
Throttle control linkage, 400	I	15	400 Spec.
Torque converter, 300, exp. view	V	16	T. Conv.
Torque converter, 300, maintenance	V	7-8	T. Conv.

	Section	Page	Subsection
T			
Torque converter, 300, operation	V	5-6	T. Conv.
Torque converter, 300, servicing	V	11-22	T. Conv.
Torque converter, 300, specifications	V	3	T. Conv.
Torque converter, 300, trouble shooting	V	9-11	T. Conv.
Torque converter, 400			Also see Allison service manuals supplied with this manual.
Torques, bolt & nut, grade 5 & 8	I	7	300 Spec.
Torques, hydraulic fittings	II	6	
Torques, standard	I	7	300 Spec.
Torques, Torque converter, 300	V	4	T. Conv.
Torques, transfer case	V	4	T. Case
Torques, transmission, 300	V	3	300 Trans.
Torques, universal joints - drive shafts	V	6	D. Shafts
Traction clutch, 300			See clutch
Transfer case, description	V	4	T. Case
Transfer case, exp. view	V	6-7	T. Case
Transfer case, lubrication	V	4	T. Case
	V	16	T. Case
Transfer case, servicing	V	3-17	T. Case
Transmission, 300, specifications	V	3	Trans.
Transmission, 300, S/N 5133-5247, exp. view	V	35-38	Trans.
Transmission, 300, S/N 5133-5247, servicing	V	34-45	Trans.
Transmission, 300, S/N 5255 up, exp. view	V	7-10	Trans.
Transmission, 300, S/N 5255 up, servicing	V	5-53	Trans.
Transmission, 400	V	2-4	400 Trans.
Transmission, 400			Also see Allison service manuals supplied with this manual.
Trouble shooting, differentials	VI	4	
Trouble shooting, drive shafts & universal joints	V	3	D. Shafts
Trouble shooting, electrical	III	11-17	
Trouble shooting, hydraulic	II	7	
Trouble shooting, planetaries	VI	25	
Trouble shooting, steering	II	7	
Trouble shooting, torque converter, 300	V	9-11	T. Conv.
Trouble shooting, winch	VIII	7-9	
Twist lock, brake	IV	8-9	
U			
U-joint box	V	8	T. Case
Universal joints, servicing	V	4-6	D. Shafts
Universal joints, trouble shooting	V	3	D. Shafts
V			
Voltage Regulator			See Regulator, voltage

	Section	Page	Subsection
W			
Winch, Model 19, description	VIII	3	
Winch, Model 19, exp. views	VIII	11-16, 27-28, 31-32	
Winch, Model 19, servicing	VIII	10-30	
Winch, Model 19, specifications	VIII	4	
Winch, Model 19, trouble shooting	VIII	7-9	
Wiring diagram, 300	III	4-5	
Wiring diagram, 400	III	8-9	

**SPECIFICATIONS AND
ENGINE MAINTENANCE
ON
MODEL 300 SKID KING**

TABLE OF CONTENTS

INTRODUCTION	3
SPECIFICATIONS	4
STANDARD TORQUES	7
Grade 5 Capscrews, Nuts, Studs	7
Grade 8 Capscrews, Nuts, Studs	7
REMOVING ENGINE	8
INSTALLING ENGINE	9
AIR CLEANER	9
COOLING SYSTEM	10
ENGINE OIL FILTER	10
RADIATOR AND GRILLE	11
FUEL SYSTEM	13
Engine Shutoff Controls	13
Throttle Control Linkage, Exploded View	16

INTRODUCTION

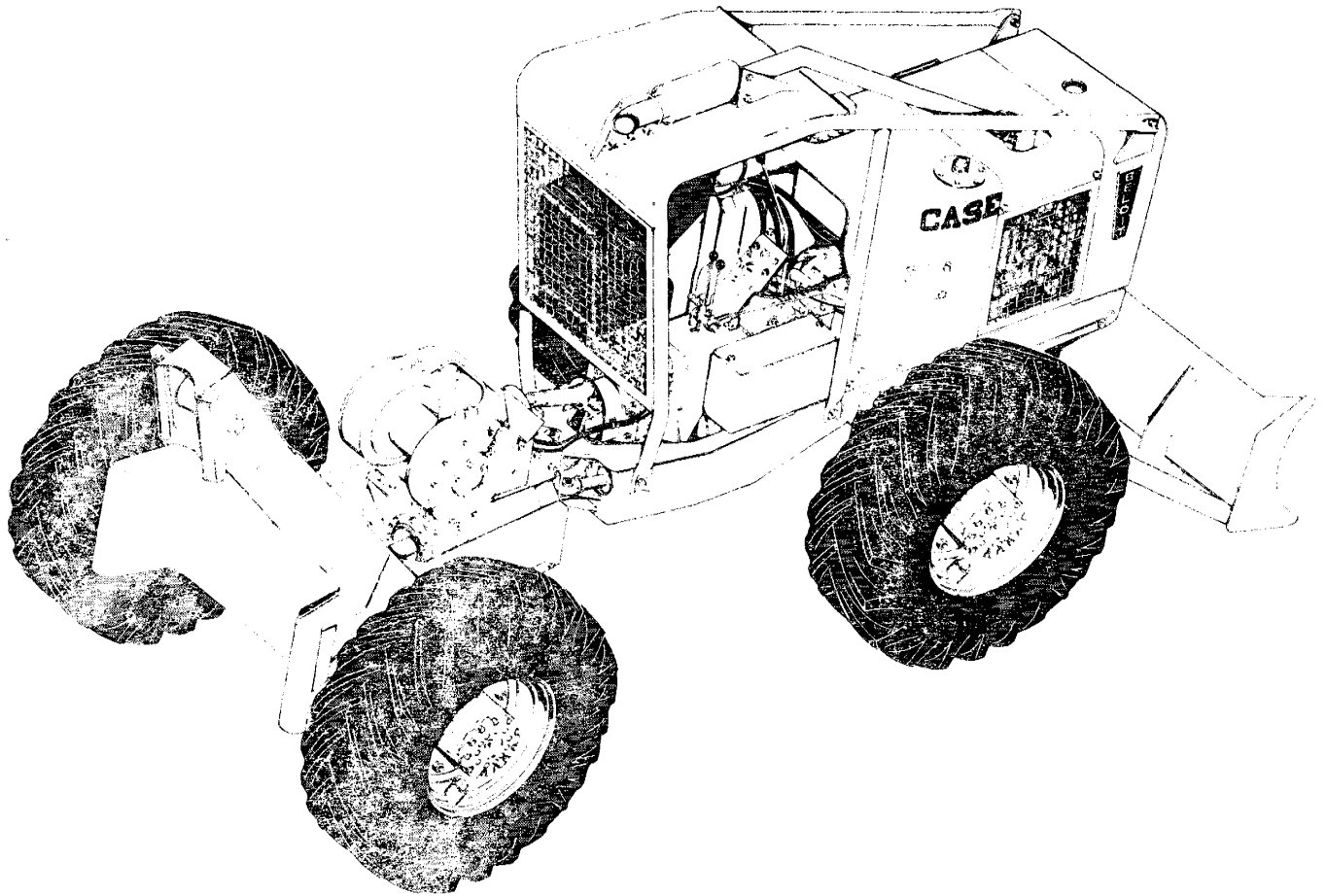


Figure 1

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

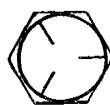
Torque values listed are to be used under normal conditions.

require tightening to a special torque for proper installation. These torques are shown in the servicing instructions and illustrations for each component.

Many capscrews, bolts, nuts etc. re-

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.



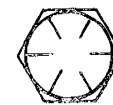
Coarse Thread (N.C.)

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 capplugs. 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.

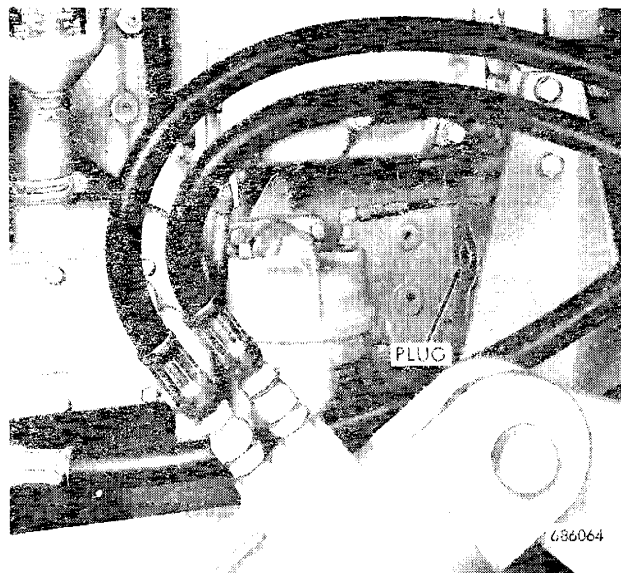


Figure 2

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.

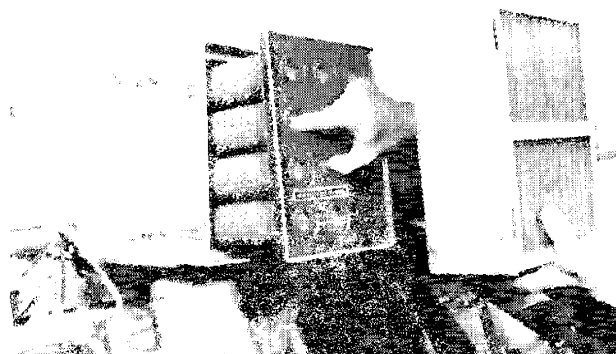


Figure 3

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.

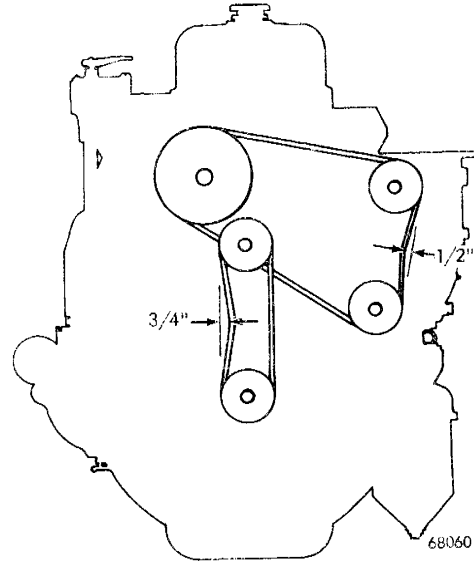


Figure 4

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.

RADIATOR AND GRILLE

REMOVAL

Refer to Figure 5. The radiator and grille should be removed as an assembly.

1. Remove the hood and side panels.
2. Drain the radiator and engine block. Open the drain plug at the bottom rear of the radiator, the drain cock on the bottom of the oil cooler on the left hand side of the engine, and the drain cock on the right hand side of the engine block.
3. Unbolt the canopy arms from the grille. To remove the canopy and exhaust, refer to "Canopy and Exhaust System", Section VII, Frames.
4. Remove the upper and lower radiator hoses.
5. Remove the six lower grille mounting bolts and lockwashers.
6. Attach a hoist to the grille assembly and take up the slack.
7. Remove the grille-to-front frame mounting bolts, lockwashers, and nuts (one each side).
8. Carry and guide the grille forward very carefully until it clears the fan blades. Lower to the ground and remove the radiator from the grille by removing attaching bolts, washers, and lockwashers.

INSTALLATION

1. Installation of the radiator and grille is the reverse of the removal instructions above.
2. Fill the cooling system with approximately six gallons of fresh coolant (50% permanent anti-freeze, 50% water).

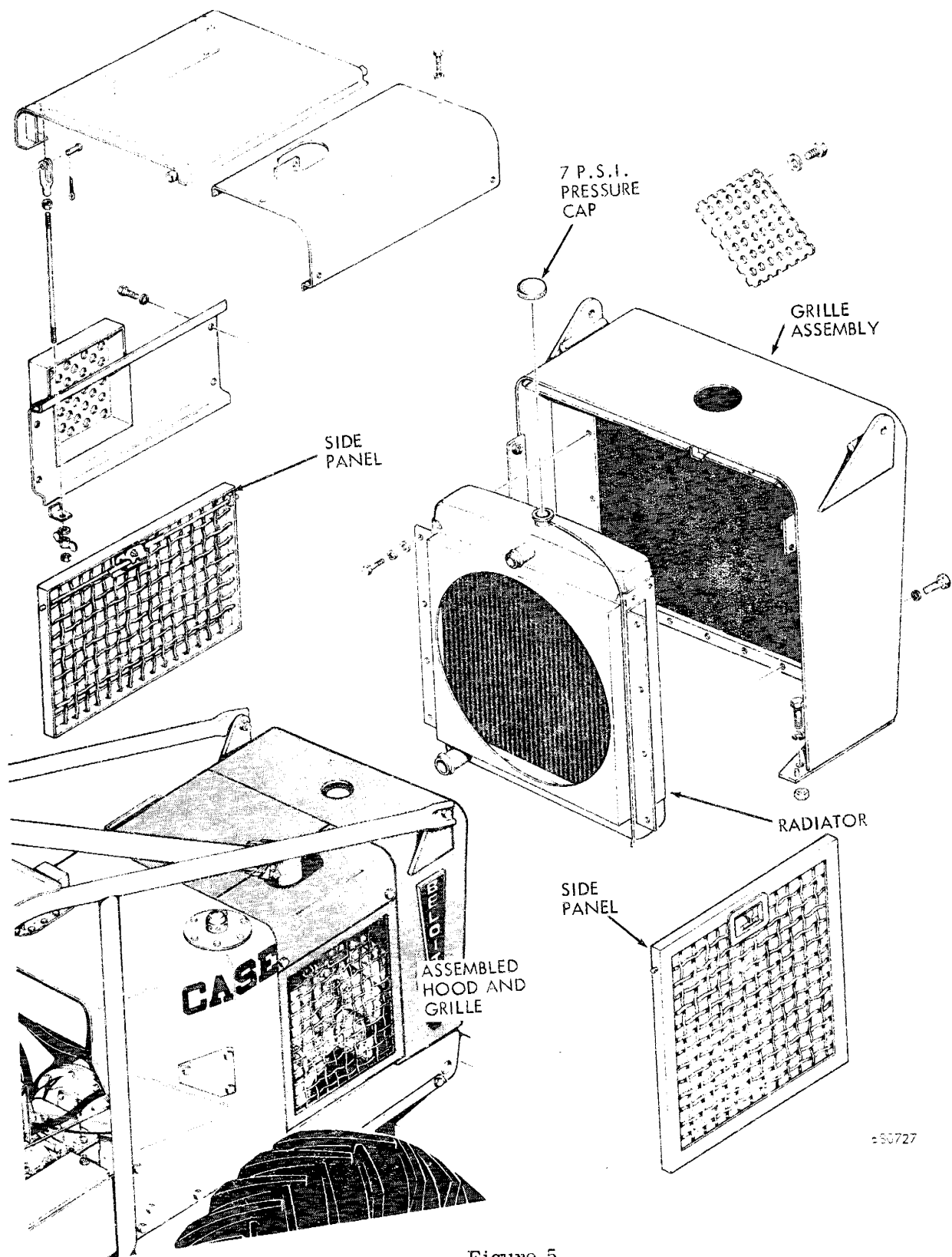


Figure 5

FUEL SYSTEM

PRIMING FUEL SYSTEM

Refer to Figure 7.

After running out of fuel or changing elements in the fuel strainer and fuel filter, it may be necessary to "prime" the fuel system as follows:

1. Fill the fuel tank and open the fuel shutoff valve.
2. Remove the small plug on top of the fuel strainer and fuel filter bodies and fill with fuel. Replace the plugs.
3. Start the engine and operate at a reduced speed until the fuel system is bled.

REMOVING FUEL TANK

Refer to "Hydraulic Oil and Diesel Fuel Tank", Section II, Hydraulic System.

REPLACING FILTER ELEMENTS

The fuel strainer and fuel filter elements should be changed every 80 hours of operation. The fuel strainer is located on the right side of the engine; the fuel filter on the left side.

Procedure for changing elements is the same for both strainer and filter. Refer to Figure 6.

1. With the engine stopped, place a drain pan under the strainer or filter and open the drain cock. Loosen the cover nut just enough to allow the fuel to drain out freely. Close drain cock.
2. When completely drained, unscrew the cover nut and remove the shell and element.
3. Discard the filter element. Wash the shell thoroughly with clean fuel and blow it dry with compressed air.
4. Remove the old cover shell gasket.
5. Install a new element in the shell. Fill shell about two-thirds full of clean

fuel.

6. Using a new gasket between shell and cover, assemble shell and element to cover and secure with the cover nut.

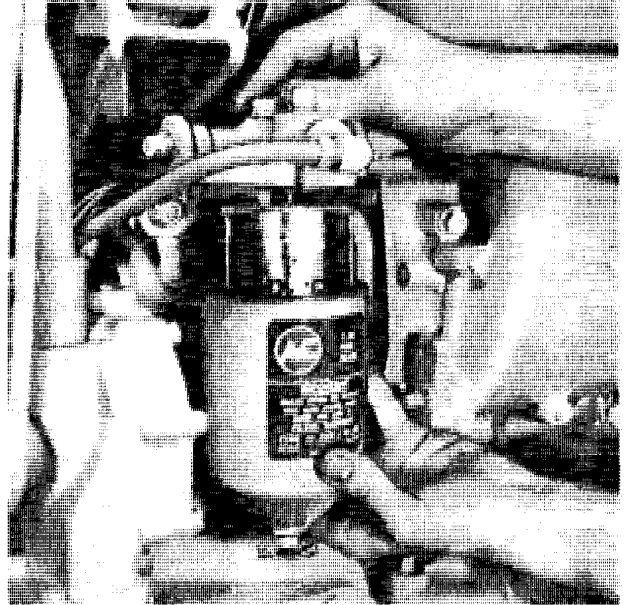


Figure 6

7. Prime the system as described under "Priming Fuel System" above.

Engine Shut Off Controls

REMOVING ENGINE SHUTOFF

Refer to Figure 8.

1. The engine shutoff control stops all fuel flow to the engine when pulled out completely. It should be replaced if kinked or damaged.
2. Remove the jam nut and lockwasher from the underside of the instrument panel.
3. Loosen the set screw on the cable anchor and remove cable clamp, Figure 8. Retract the entire cable and lever mechanism through the instrument panel.

ADJUSTING ENGINE SHUTOFF

1. Loosen the set screw on the cable anchor, Figure 8, allowing the wire

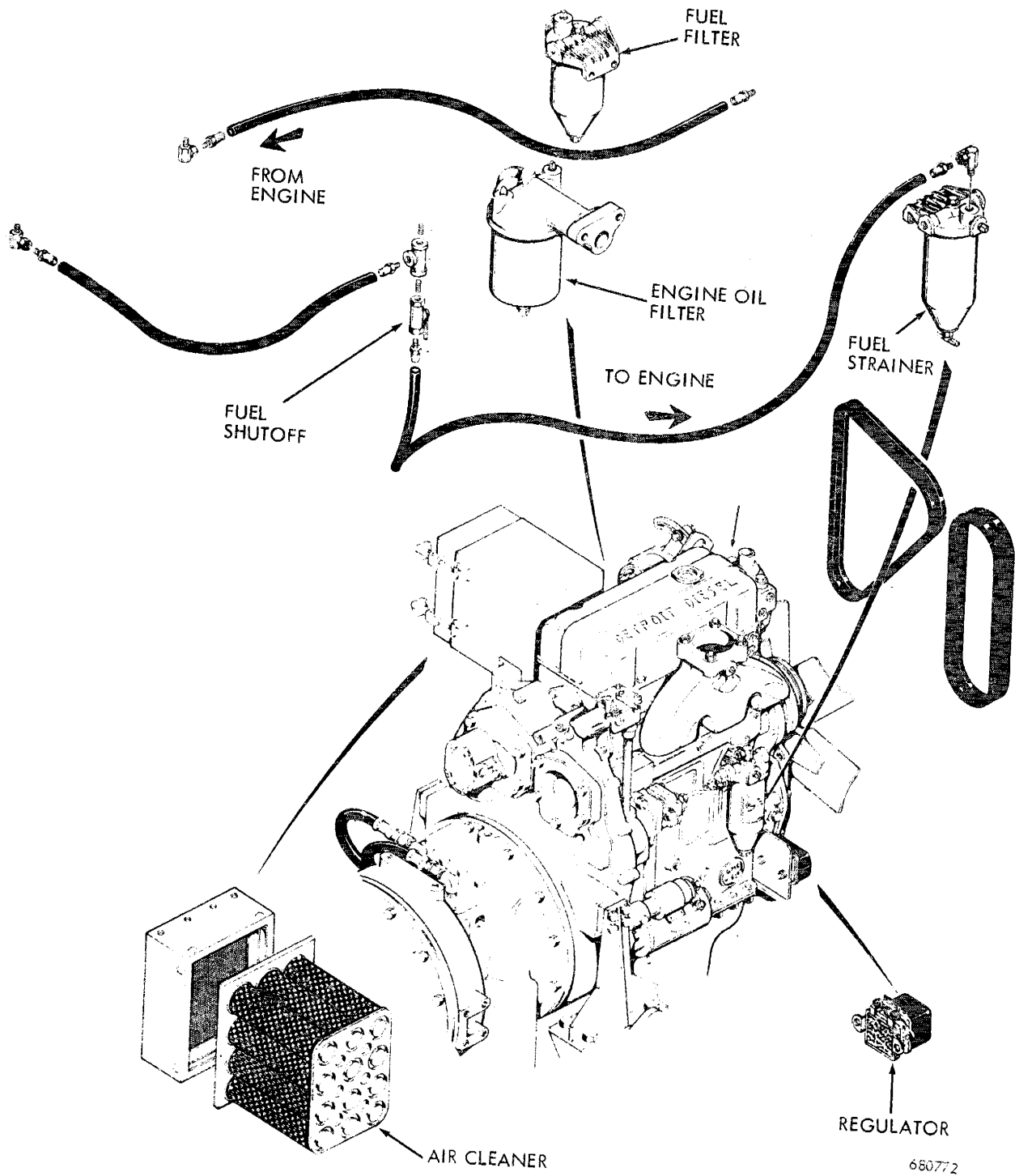


Figure 7

to slide freely within it.

2. Move the shutoff lever forward completely. Tighten the set screw.

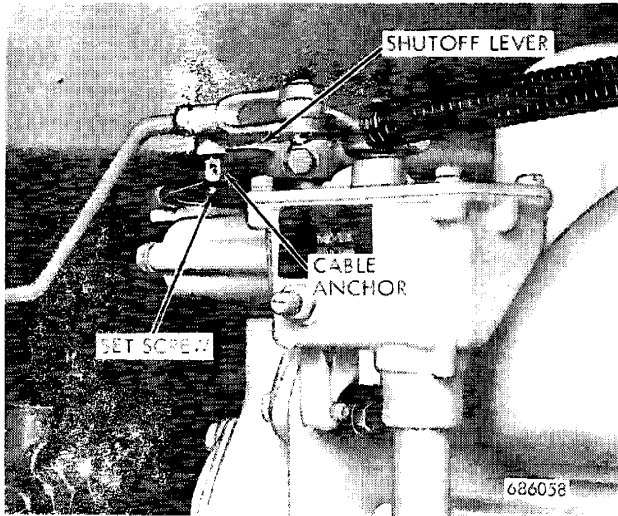


Figure 8

ADJUSTING EMERGENCY ENGINE SHUTOFF

1. Loosen the set screw on the cable anchor, Figure 9, allowing the wire to slide freely within it.
2. Push the emergency control lever completely forward. Have the linkage reset lever on the engine in the down position.
3. Tighten the set screw.

NOTE: For description and operation of the shutoff controls, refer to "Instrument Panel", Section III, Electrical System and Instruments.

REMOVAL

1. Follow same procedure as outlined under removing engine shutoff above.

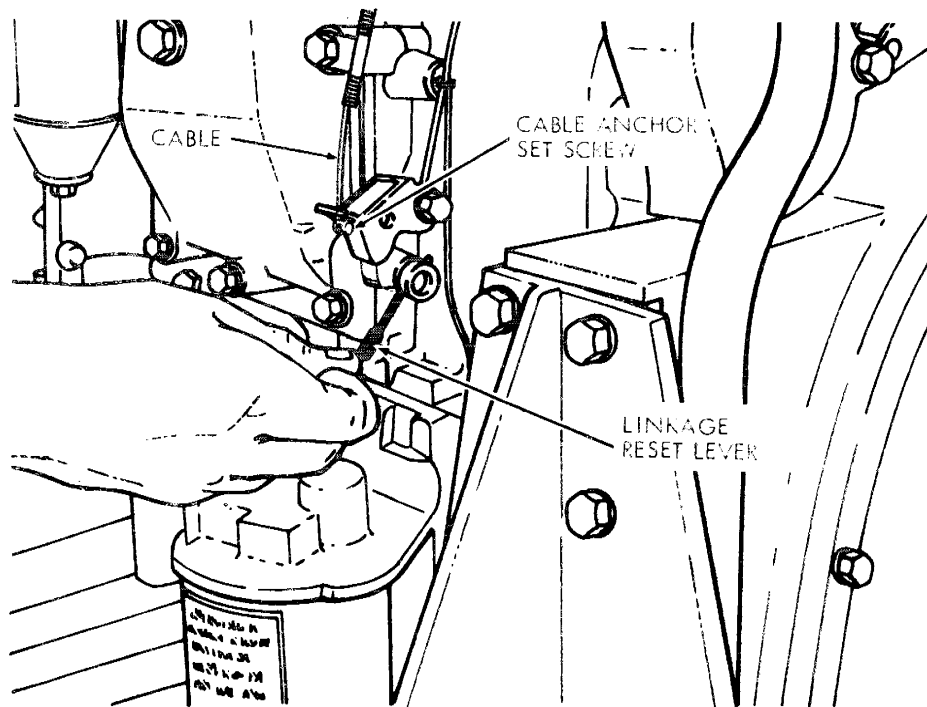


Figure 9