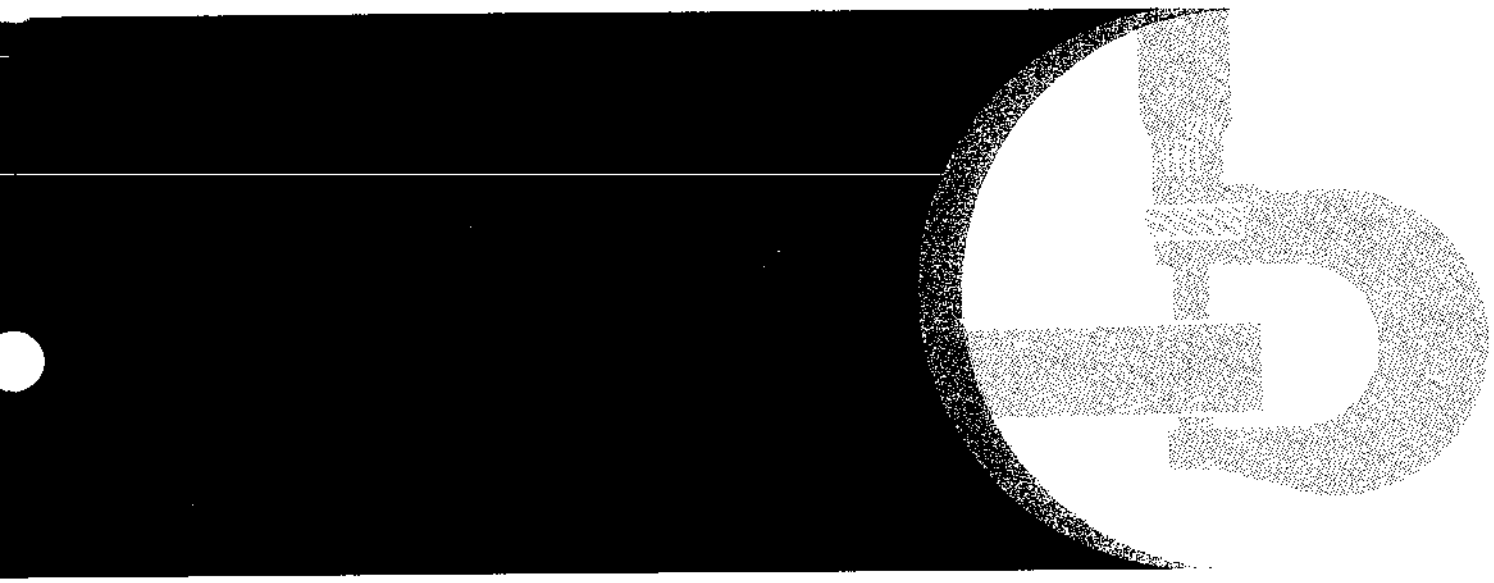
John Deere 440, 440 Series-A and 440-B Skidders



TECHNICAL MANUAL

John Deere Davenport Works
TM-1009

Litho in U.S.A.

JD440, JD440 SERIES-A, and JD440-B SKIDDERS

TECHNICAL MANUAL

TM-1009 (Mar-80)

CONTENTS

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

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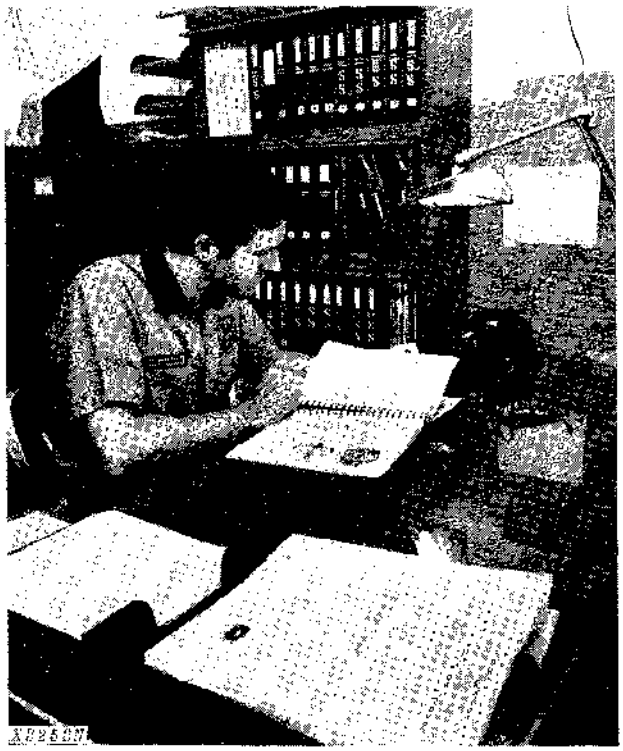
INTRODUCTION



Use FOS Manuals for Reference

This technical manual is part of a twin concept of service:

- **FOS Manuals—for reference**
- **Technical Manuals—for actual service**

The two kinds of manuals work as a team to give you both the general background and technical details of shop service.

Fundamentals of Service (FOS) Manuals cover *basic* theory of operation, *fundamentals* of trouble shooting, *general* maintenance, and *basic* types of failures and their causes. FOS Manuals are for training new personnel and for reference by experienced service technicians.

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

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

Use Technical Manuals for Actual Service

Some features of this technical manual:

- *Table of contents at front of manual*
- *Exploded views showing parts relationship*
- *Photos showing service techniques*
- *Specifications grouped for easy reference*

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

Using the technical manual as a guide will reduce error and costly delay. It will also assure you the best in finished service work.

This safety alert symbol identifies important safety messages in this manual. When you see this symbol, be alert to the possibility of personal injury and carefully read the message that follows.

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COMPLETE PAGE LISTING WITH LATEST DATE LINES

Vertical lines indicate pages included with this revision.

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T

V

W

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Section 10
GENERAL

CONTENTS OF THIS SECTION

Group 5
SPECIFICATIONS

	JD440	JD440 Series-A and JD440-B	
	Diesel	Gasoline	Diesel
ENGINE			
Flywheel horsepower (observed) at 2500 rpm	59.0	59.0	70
Torque (ft-lbs) (observed) (nominal)	145.0@1300 rpm	145.0@1300 rpm	173@1500 rpm
Number of cylinders	4	4	4
Bore and stroke, inches	3.86 x 4.33	3.86 x 3.86	4.02 x 4.33
Displacement in cubic inches	202.0	180.0	219.0
Compression ratio	16.3 to 1	7.5 to 1	16.7 to 1
N.A.C.C. or A.M.A. horsepower rating for tax purposes	23.84	23.84	23.84
Firing order	1, 3, 4, 2	1, 3, 4, 2	1, 3, 4, 2
Slow idle (rpm)	800	800	800
Fast idle (rpm)	2650	2700	2650
Working speed range (rpm)	1500 to 2500	1500 to 2500	1500 to 2500
Governed speed range (rpm)	800 to 2650	800 to 2700	800 to 2500

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ELECTRICAL SYSTEM

Battery voltage nominal ..... 12 volts
Battery specific gravity (corrected to 80°F.) (full charge) 1.260
Battery terminal grounded ..... Negative
Alternator regulation ..... Voltage regulator

SYNCRO-RANGE TRANSMISSION (Direct-Drive)

Type - Constant mesh with 8 forward and 4 reverse speeds (3 reverse speeds on JD440 Skidders). Four shift stations. Synchronized shifting within stations except reverse.

Clutch - 11 or 12-inch, dry-type, ceramic-faced, foot operated (early models). Ceramic button disc (later models).

POWER SHIFT TRANSMISSION (440-A and 440-B)

Type - Planetary, hydraulically actuated wet disk clutches and brakes. 8 forward and 4 reverse speeds hydraulically shifted and controlled by a single lever.

Disconnect Clutch - 12-inch, dry-type clutch operated by a hand lever (as a starting aid).

TRAVEL SPEEDS (MPH)
(with 18.4-26 Tires - no slippage)

	1500 rpm		2500 rpm	
Gear	Syncro-Range	Power Shift	Syncro-Range	Power Shift
1	1.2	0.9	2.0	1.5
2	1.8	1.3	3.1	2.2
3	2.4	2.0	4.0	3.4
4	3.1	2.6	5.2	4.4
5	3.8	3.4	6.4	5.6
6	5.1	4.4	8.5	7.3
7	6.4	5.8	10.6	9.7
8	10.2	9.7	16.9	16.1
1st Reverse	1.2	1.0	2.0	1.7
2nd Reverse	1.8	1.5	3.1	2.4
3rd Reverse	3.1	2.3	5.2	3.8
4th Reverse	5.1	2.9	8.5	4.9

DRIVE AXLES

Four wheel drive with inboard mounted planetary gears on all axles.

Oscillating front axle, fixed rear axle.

DIFFERENTIALS

Front - full differential with hydraulic lock.
Rear - solid axle with no differential action
- full differential without hydraulic lock

HYDRAULIC SYSTEM

Type - Closed center, constant pressure system. Includes power steering, power brakes, differential lock, front blade, and remote functions.

STEERING

Full power steering controlled by steering wheel.
Frame steered by two hydraulic cylinders.
Turning clearance circle (with blade)
Skidders with Syncro-Range (Direct Drive) (16.9 x 30 tires) ..... 35 ft. 6 in.
Skidders with Power Shift and Short Frame (16.9 x 30 tires) ..... 35 ft. 6 in.
Skidders with Power Shift and Long Frame (18.4 x 34 tires) ..... 38 ft. 8 in.
Turning radius
Skidders with Syncro-Range (16.9 x 30 tires) (Direct Drive) ..... 16 ft. 8 in.
Skidders with Power Shift and Short Frame (16.9 x 30 tires) ..... 16 ft. 8 in.
Skidders with Power Shift and Long Frame (18.4 x 34 tires) ..... 19 ft. 2 in.

BRAKES

Syncro-Range (Direct-Drive) - Hydraulically operated disk type on output shaft with single pedal control. Mechanical brake for parking and winching.

Power Shift - Axle-mounted single disk brakes, hydraulically operated with single pedal control. Mechanical brake for parking and winching.

TIRE OPTIONS

14.9 x 28 (early models)	8 ply (short frame only)
16.9 x 30	8 ply
18.4 x 26	10 ply
18.4 x 34 (early models)	10 ply (long frame only)
23.1 x 26 (early models)	10 ply (long frame only)

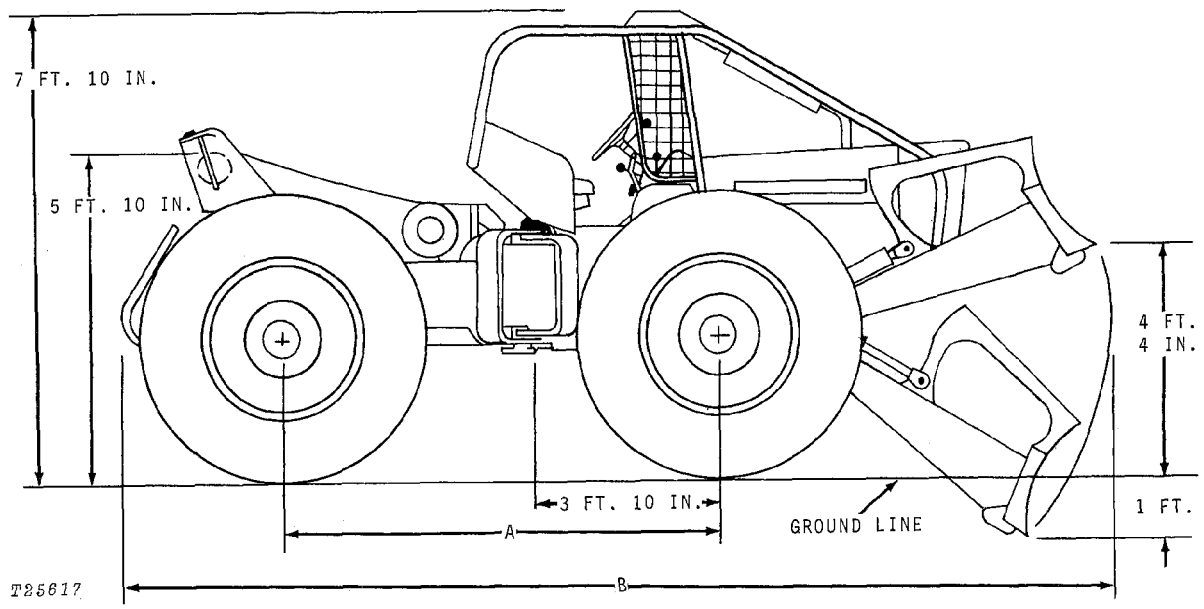
CAPACITIES (U.S. Standard Measures)

Fuel Tank	24 gals.
(Power Shift with long frame)	42 gals.
Cooling System (JD440)	3 gals.
Cooling System (JD440-A and JD440-B)	4 gals.
Engine Lubrication (including filter)	9 qts.
Transmission case (includes hydraulic system)	Syncro-Range 8 gals. Power Shift 9 gals.
Front Differential	9 gals.
Rear Differential	4-1/2 gals.
Oil Bath Air Cleaner (early units)	1-1/2 qts.
Winch Housing (with filter)	9 qts.

WINCH

Model	No. 3305
Drum speed (at 2200 rpm engine speed)	58-1/2 rpm
Drum diameter	6 in.
Drum capacities*	
(with 1/2-inch cable)	195 ft.
(with 5/8-inch cable)	125 ft.
(with 3/4-inch cable)	100 ft.
Cable speed (at 2200 rpm speed using 5/8-inch cable)	
(with bare drum)	100 fpm
(with full drum)	159 fpm
Cable pull (at 2200 rpm engine speed) (calculated)	
(with bare drum)	14,500 lbs (JD440) 17,300 lbs (JD440 Series-A and JD440-B)
(with full drum)	9,150 lbs (JD440) 10,800 lbs (JD440 Series-A and JD440-B)

* *Calculated Capacities - allowance must be made for loose or uneven spooling.*



	Syncro-Range (Direct Drive)	Power Shift
DIMENSIONS		
(Skidder with 18.4-26 tires)		
A. Wheel base	7 ft. 5 in.	8 ft. 8 in.
B. Over-all length (front blade extended, to log bumper)	17 ft. 4 in.	19 ft. 4 in.
Over-all height (to top of canopy)	7 ft. 10 in.	7 ft. 10 in.
Ground clearance	1 ft. 6 in.	1 ft. 6 in.
Over-all width	7 ft. 8 in.	7 ft. 10 in.
Stability weight	12,400	13,800

(Specifications and design subject to change without notice. Wherever applicable, specifications are in accordance with I.E.M.C. and S.A.E. standards.)

Group 10
PREDELIVERY, DELIVERY, AND AFTER-SALES SERVICES

PREDELIVERY SERVICE

Every new John Deere skidder leaves the factory so it can be delivered to the customer after a minimum of servicing.

Shipping factors, in addition to extra finishing touches needed for customer satisfaction, necessitate proper predelivery service on the part of the dealer.

A tag pointing out the factory-recommended procedure for predelivery service is attached to every new skidder before it leaves the factory.

After completing the factory-recommended checks and services listed on the predelivery tag, remove and file the tag with the job shop order. The tag and the customer's John Deere Delivery Receipt certify proper predelivery service when that section of his receipt is completed.

TEMPORARY MACHINE STORAGE

Service	Specifications	Reference
Check radiator for coolant loss and antifreeze protection.	Midway between radiator cover and filler neck.	FOS Manual 30—ENGINES
Fill fuel tank.	.....	Operator's Manual
Check crankcase oil level.	.....	Operator's Manual
Relieve hydraulic pressure.	Stop engine, lower skidder blade and operate cylinders to relieve pressure.	.....
Cover exhaust inlet pipe.	.....	.....
Reduce shipping pressure of tires.	.....	Operator's Manual
Check torque on wheel nuts.	.....	Section 10, Group 25

PREDELIVERY INSPECTION

ELECTRICAL SYSTEM		
Check battery terminals to be sure they are tight.	.....	Operator's Manual
COOLING SYSTEM		
Inspect radiator for coolant loss.	Midway between radiator core and filler neck.	.....
Check antifreeze protection.	.....	FOS Manual 30—ENGINES

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PREDELIVERY INSPECTION—Continued

Service	Specifications	Reference
TIRES AND WHEELS		
Adjust pressure of tires.	.....	Operator's Manual
Check torque on wheel nuts.	.....	Section 10, Group 25
LUBRICATION		
Check crankcase oil level.	To upper marks on dipstick.	Operator's Manual
Check transmission-hydraulic system oil level.	Between marks on dipstick. Type 303 Special-Purpose Oil.	Operator's Manual
Check winch housing oil level.	Level with oil level hole.	Operator's Manual
Check rear differential housing oil level.	Level with oil level hole.	Operator's Manual
Lubricate grease fittings.	.....	Operator's Manual
ENGINE		
Drain fuel tank sump and fuel filters.	.....	Operator's Manual
Check air cleaner.	.....	Operator's Manual
Fill fuel tank and start engine.	.....	Operator's Manual
Check operation of lights, gauges, and indicator lamps.	.....	Operator's Manual
Check speed control linkage for free operation.	.....	Section 20, Group 20
Check engine idle speeds.	.....	Section 20, Group 20
OPERATION		
Check engine clutch operation	.....	Section 50, Group 10
Shift transmission through all speeds.	.....	Operator's Manual
Check fire extinguisher.	.....	Operator's Manual
Check winching brake.	.....	Operator's Manual
Check steering, brakes, and hydraulic operations.	.....	Operator's Manual
Check seat operation.	.....	Operator's Manual

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Predelivery Inspection—Continued

GENERAL

Remove fire extinguisher cold shut.	.....	.....
Tighten accessible nuts and cap screws.	Refer to torque chart.	Section 10, Group 25
Clean skidder and touch up paint.	.....	.....

DELIVERY SERVICE

A thorough discussion of the operation and service of a new machine at the time of delivery helps to assure complete customer satisfaction. Proper delivery should be an important phase of a dealer's program. One section of the John Deere Delivery Receipt emphasizes the importance of proper delivery service.

Complaints may arise if the owner is not shown how to operate and service his new machine correctly. Devote enough time, at your customer's convenience, to introduce him to his new machine. Explain fully how to operate and service it.

The following procedure is recommended before the serviceman and owner complete the delivery acknowledgments section of the Delivery Receipt.

Using the operator's manual as a guide, make sure the owner thoroughly understands the following points:

1. Operation and use of controls and instruments.
2. Operation of the engine.
3. Importance of the break-in period.
4. Use of cast-iron ballast.
5. Operation and functions of the hydraulic system.
6. Importance of safety.
7. Importance of lubrication and periodic services.

After explaining and demonstrating the above points, have the owner sign the Delivery Receipt and give him his operator's manual.

AFTER-SALES INSPECTION

The purchaser of a new John Deere machine is entitled to a free inspection at some mutually agreeable time within the warranty period after the equipment has been "run in." The terms of this after-sales inspection are outlined on the customer's John Deere Delivery Receipt.

The purpose of this inspection is to insure that the customer is receiving satisfactory performance from his machine. At the same time, the inspection should reveal whether or not the machine is being operated, lubricated, and serviced properly.

If recommended after-sales service inspection is followed, the dealer can eliminate minor irregularities which can develop into major service problems at a later date. This will promote strong dealer-customer relations and give the dealer an opportunity to answer questions that may have arisen during the initial operation.

During the inspection service, the dealer has the opportunity to promote the sale of additional new equipment and accessories.

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AFTER-SALES INSPECTION

Service	Specifications	Reference
Check radiator coolant level.	Midway between radiator cover and filler neck.	Operator's Manual
Clean external surface of radiator core.	.....	.....
Check hoses and connections for leaks.	.....	.....
FUEL SYSTEM		
Drain fuel tank sump and clean strainer.	.....	Operator's Manual
Remove water and foreign matter from transfer pump (AC only) and filter sediment bowls.	.....	Operator's Manual
Bleed fuel system.	.....	Operator's Manual
Tighten loose connections and check entire system for leaks. Correct if necessary.	.....	.....
Check air cleaner element and clean, if necessary.	.....	Operator's Manual
ELECTRICAL SYSTEM		
Check specific gravity and electrolyte level of batteries.	Full charge - 1.260 at 80°F.	FOS Manual 20 - ELECTRICAL SYSTEMS
Check belt tension.	3/4-inch belt deflection with 20 lb. force.	Operator's Manual
Start engine and check action of starter, lights, and indicator lamps.	.....	Operator's Manual
LUBRICATION		
Check engine crankcase oil level.	To upper marks on dipstick.	Operator's Manual
Check transmission-hydraulic system oil level.	Between marks on dipstick. Use John Deere Type 303 Special-Purpose Oil.	.....
Check differential housing oil level.	Level with oil level hole.	Operator's Manual
Check winch housing oil level.	Level with oil level hole.	Operator's Manual

AFTER-SALES INSPECTION—Continued

Service	Specifications	Reference
ENGINE		
Check valve clearance.	. . . . .	Section 10, Group 15
Check engine speed under load, fuel consumption, and horsepower.	. . . . .	FOS Manual 30 - ENGINES
GENERAL		
Check clutch pedal free travel (Syncro-Range).	. . . . .	Operator's Manual
Check winching brake free travel.	. . . . .	Operator's Manual
Check transmission linkage adjustment.	. . . . .	Section 50
Check power steering, brakes, and other hydraulic functions.	. . . . .	Section 70
Check winch operation.	. . . . .	Section 80, Group 5
Tighten accessible nuts and cap screws.	Refer to "Torque Chart"	Section 10, Group 25
Check fire extinguisher operation	. . . . .	Operator's Manual

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Group 15
TUNE-UP AND ADJUSTMENT

GENERAL INFORMATION

Before tuning up an engine, determine if it is in condition so that performance can be restored by tune-up. Perform the following tests.

PRELIMINARY ENGINE TESTING

Operation	Specification	Reference
Vacuum test at air cleaner		
JD440 (Diesel)	14 to 25 inches of water at fast idle	.....
JD440 Series-A, JD440-B (Diesel)	11 to 25 inches of water at fast idle	.....
Manifold vacuum test (Gasoline)	15 to 20 inches of mercury at fast idle	.....
Intake manifold pressure (engines with altitude compensating turbochargers)	6.38 to 9.32 psi at 2500 rpm (full load)	Section 30, Group 15
Check radiator for air bubbles and indication of oil.	.....	Section 20, Group 25
Cylinder compression*		
JD440 Gasoline	120 psi	Section 20, Group 10
JD440 Diesel	300 psi	Section 20, Group 10
JD440 Series-A, JD440-B	350 psi	Section 20, Group 10

** The most important factor in compression readings is the difference between cylinders. This difference should be no more than 30 psi on gasoline engines or 50 psi on diesel engines.*

ENGINE TUNE-UP

AIR INTAKE SYSTEM		
Air cleaner (Dry Type) - clean filter element and dust cup.	.....	Section 30, Group 15
Air cleaner (Oil Bath Type) - clean oil cup	.....	Section 30, Group 15
Check breather pipe for restrictions	.....	.....
Tighten cylinder head cap screws	110 ft-lbs	Section 20, Group 10
Check valve clearance	Gasoline - 0.022 in. - Exhaust 0.014 in. - Intake Diesel - 0.018 in. - Exhaust 0.014 in. - Intake	Section 20, Group 10
Check for tight hose connections	.....	Operator's Manual
IGNITION SYSTEM		
Clean, adjust, test, or replace spark plugs.	0.025 in.	Section 40, Group 15
Check distributor cap, rotor, and wiring.	.....	Section 40, Group 15
Clean, adjust, or replace points	0.020 in. gap 66° to 72° dwell	Section 40, Group 15
Lubricate distributor cam	Cam lubricant	.....
Time distributor	"S" mark on front pulley at 2500 rpm	Section 40, Group 15

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ENGINE TUNE-UP—Continued

Operation	Specification	Reference
BATTERY		
Check electrolyte level	.....	Operator's Manual
Clean cables, terminals and box	.....	Operator's Manual
Tighten cable clamps	.....	.....
ALTERNATOR		
Check belt tension	20 pounds at 3/4 in. deflection	Section 40, Group 10
GASOLINE FUEL SYSTEM (early models)		
Check fuel tank and lines for leaks or restrictions	.....	.....
Clean fuel transfer pump bowl and strainer	.....	Section 30, Group 10
Check carburetor choke disk operation	.....	Section 30, Group 20
Clean carburetor fuel inlet screen	.....	Section 30, Group 20
Adjust speed control linkage and carburetor	.....	Section 20, Group 20
DIESEL FUEL SYSTEM		
Check fuel tank and lines for leaks or restrictions	.....	.....
Clean fuel transfer pump and strainer (early units)	.....	.....
Replace first stage fuel filter element	.....	Operator's Manual
Time injection pump	.....	Section 30, Group 25
Check injection pump advance	.....	Section 30, Group 25
Bleed fuel system	.....	Operator's Manual
Adjust speed control linkage and check engine speeds	.....	Section 20, Group 20
Check in line filter for obstructions (late models)	.....	Operator's Manual
Back flush fuel tank strainer (late models)	.....	Operator's Manual
Drain fuel tank sump	.....	Operator's Manual
ENGINE LUBRICATION SYSTEM		
Check engine oil pressure		
(-21883)	30 to 40 psi at 2500 rpm (180° to 220°F.)	Section 20, Group 15
(21884-Up)	45 to 65 psi at 2500 rpm (180° to 220°F.)	Section 20, Group 15
COOLING SYSTEM		
Clean and flush system	.....	.....
Inspect hoses	.....	.....
Clean trash from radiator	.....	.....

FINAL ENGINE TESTING

Use a dynamometer in final testing to determine if engine is performing at rated horsepower. See "Specifications."

Compare output of engine with horsepower delivered prior to tune-up.

Use a dynamometer and exhaust gas analyzer for accurate and efficient carburetor adjustment.

SKIDDER ADJUSTMENT

Operation	Specification	Reference
ENGINE CLUTCH		
Check pedal free travel (Direct-Drive)	.....	Section 50, Group 10
Lubricate clutch throw-out bearing (Direct Drive)	.....	Operator's Manual
BRAKES		
Bleed brakes	.....	Section 70, Group 25
Check action of brake accumulator	.....	Section 70, Group 15
Check mechanical winching brake	.....	Section 70, Group 25
POWER STEERING		
Bleed steering system	.....	Section 70, Group 20
Adjust steering stop pins	.....	Operator's Manual
Check time cycle (lock to lock)	3.0 seconds at 1000 rpm	Section 70, Group 5
SELECTIVE CONTROL VALVE		
Fully extend blade cylinder	2.5 to 3.0 seconds at 2500 rpm	.....
Fully extend remote cylinder	2.0 to 2.5 seconds at 2500 rpm	.....
POWER WINCH		
Check control lever adjustment	.....	Section 80, Group 5
Check brake adjustment	.....	Section 80, Group 5
TIGHTEN ACCESSIBLE BOLTS AND CAP SCREWS	See torque chart.	Section 10, Group 25