

**John Deere
540D Skidder
548D Grapple Skidder
Repair**



TECHNICAL MANUAL

TM-1438 (Apr-88)

LITHO IN U.S.A.

Introduction

FOREWORD

This manual is written for an experienced technician. Essential tools required in performing certain service work are identified in this manual and are recommended for use.

Live with safety: Read the safety messages in the introduction of this manual and the cautions presented throughout the text of the manual.



This is the safety-alert symbol. When you see this symbol on the machine or in this manual, be alert to the potential for personal injury.

Technical manuals are divided in two parts: repair and diagnostics. Repair sections tell how to repair the components. Diagnostic sections help you identify the majority of routine failures quickly.

Information is organized in groups for the various components requiring service instruction. At the beginning of each group are summary listings of all applicable essential tools, service equipment and tools, other materials needed to do the job, service parts kits, specifications, wear tolerances, and torque values.

Binders, binder labels, and tab sets can be ordered by John Deere dealers direct from the John Deere Distribution Service Center.

This manual is part of a total product support program.

FOS Manuals-reference

Technical Manuals-machine service

Component Manuals-component service

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

Technical Manuals are concise guides for specific machines. Technical manuals are on-the-job guides containing only the vital information needed for diagnosis, analysis, testing, and repair.

Component Technical Manuals are concise service guides for specific components. Component technicals manuals are written as stand-alone manuals covering multiple machine applications.

**540D SKIDDER
548D GRAPPLE SKIDDER
TECHNICAL MANUAL
TM-1438 (APR-88)**

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HANDLE FLUIDS SAFELY—AVOID FIRES

When you work around fuel, do not smoke or work near heaters or other fire hazards.

Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

Make sure machine is clean of trash, grease, and debris.

Do not store oily rags; they can ignite and burn spontaneously.



AB6;TS227 053;FLAME 050188

PREVENT BATTERY EXPLOSIONS

Keep sparks, lighted matches, and open flame away from the top of battery. Battery gas can explode.

Never check battery charge by placing a metal object across the posts. Use a volt-meter or hydrometer.

Do not charge a frozen battery; it may explode. Warm battery to 16°C (60°F).



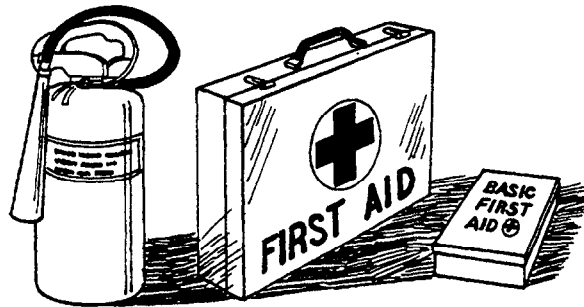
ABT;TS204 053;SPARKS 050188

PREPARE FOR EMERGENCIES

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.



AB6;TS186 053;FIRE2 080785

PREVENT ACID BURNS

Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

Avoid the hazard by:

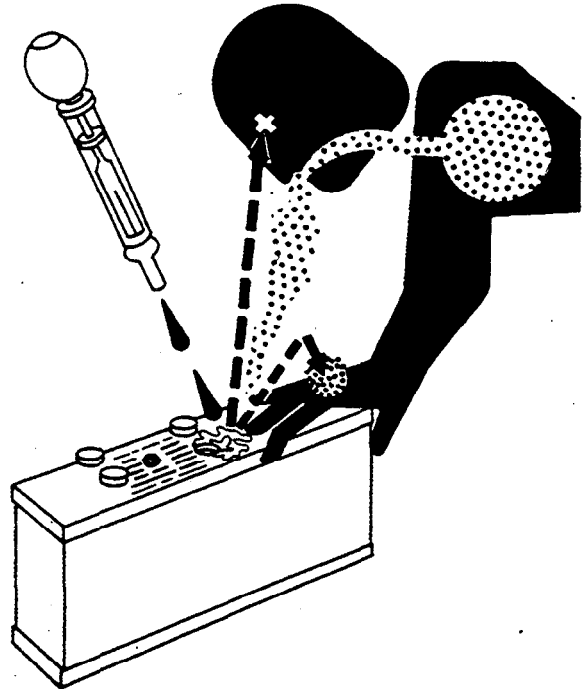
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

If you spill acid on yourself:

1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for 10-15 minutes. Get medical attention immediately.

If acid is swallowed:

1. Drink large amounts of water or milk.
2. Then drink milk of magnesia, beaten eggs, or vegetable oil.
3. Get medical attention immediately.

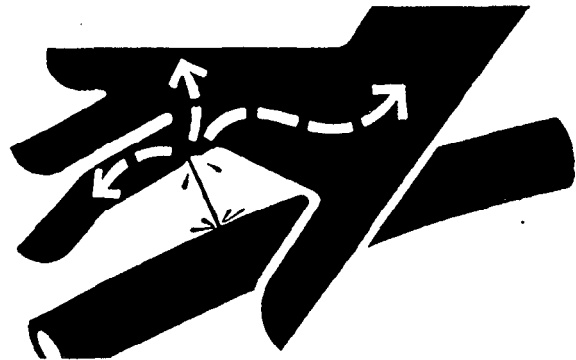


AB6;TS203 053;POISON 211287

AVOID HIGH-PRESSURE FLUIDS

Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before unhooking hydraulic or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Use a piece of cardboard to search for leaks.

If ANY fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type injury or gangrene may result.

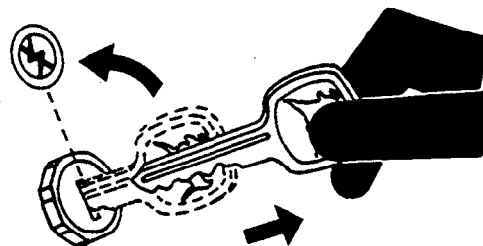


AB6;X9811 053;FLUID 180987

PARK MACHINE SAFELY

Before working on the machine:

- Lower all equipment to the ground.
- Stop the engine and remove the key.
- Disconnect the battery ground strap.
- Hang a "DO NOT OPERATE" tag in operator station.

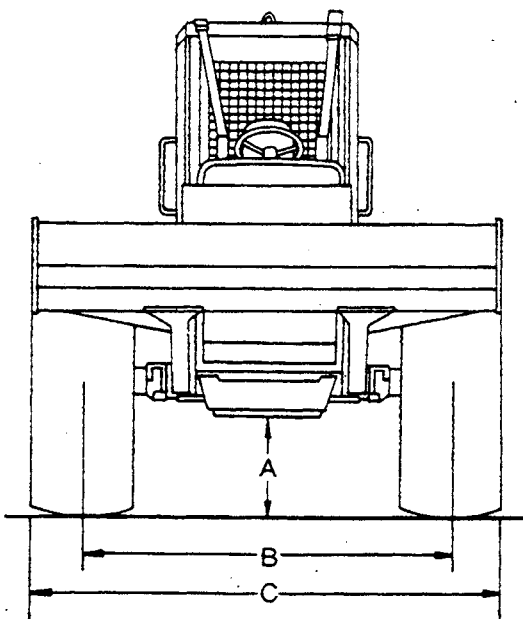
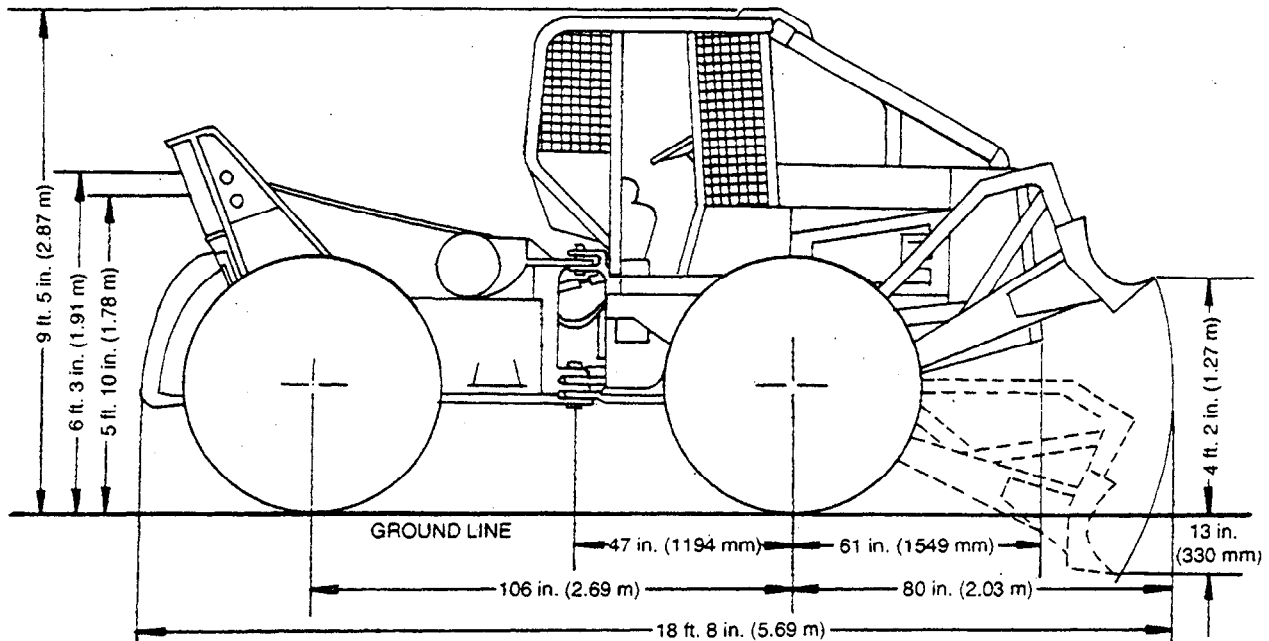


AB6;TS230 053;PARK 050188

Group II General Specifications

540D SKIDDER

NOTE: Machine equipped with 18.4 x 26 tires and adjustable arch.



TIRE SIZE	A GROUND CLEARANCE	B WHEEL TREAD	C OVERALL WIDTH
18.4-26	1 ft. 6.5 in. (470 mm)	76 in. (1.93 m)	7 ft. 11 in. (2.41 m)
18.4-34	1 ft. 10 in. (559 mm)	76.6 in. (1.95 m)	7 ft. 11 in. (2.41 m)
23.1-26	1 ft. 9 in. (533 mm)	82.1 in. (2.09 m)	8 ft. 10 in. (2.69 m)
28L-26	1 ft. 9.5 in. (546 mm)	85.4 in. (2.17 m)	9 ft. 6 in. (2.90 m)

87A;T6793AE 05T;115 K61 120488

General Specifications

540D SKIDDER—CONTINUED

Specifications and design subject to change without notice. Wherever applicable, specifications are in accordance with SAE Standards. Except where otherwise noted, these specifications are based on a unit with 18.4-26, 10 PR tires, full fuel tank, 175-lb. (80 kg) operator and standard equipment.

Rated Power @ 2200 rpm:	SAE	DIN 70 020
Net	100 hp (75 kW)	75 kW
Gross	105 hp (78 kW)	

Net engine power is with standard equipment including air cleaner, exhaust system, alternator, and cooling fan, at standard conditions per SAE J1349 and DIN 70 020, using No.2-O fuel @ 35 API gravity. No derating is required up to 10,000 feet (3050 m) altitude. Gross power is without cooling fan.

Engine: John Deere 4-276T	
Type	4-stroke cycle, turbocharged diesel
Bore and stroke	4.19 x 5.00 in. (106.5 x 127 mm)
No. of cylinders	4
Displacement	276 cu. in. (4.524 L)
Maximum net torque @ 1300 rpm	290 lb-ft (393 Nm) (40 kg-m)
Cooling fan	Blower
Compression ratio	16.8 to 1
Lubrication	Pressure system w/full-flow filter
Electrical system	12-volt w/42 amp alternator
Battery	Reserve capacity: 180 minutes

Differentials:
Front and rear Full differentials w/hydraulic lock

Engine Clutch Disconnect:
Hand-operated, spring-loaded, dry disk. Single plate, 12 in. (305 mm).

Transmission:
Power Shift with planetary gears, hydraulically actuated wet-disk clutches and brakes; provides 8 speeds forward—4 reverse. Controlled by single lever on console.

Travel Speeds (2200 engine rpm, no tire slip):	mph	km/h
Forward	1.6-17.4	2.6-28.0
Reverse	2.1-5.8	3.4-9.3

Drive Axles:
Four-wheel drive with inboard planetary gears on all axles. Front axle oscillates 15 degrees above and below horizontal. Travel at tire center line 20 in. (508 mm).

Steering: Power
Articulated frame hydraulically actuated by two double-acting cylinders with cushioned stops. Steering system has hydraulic pressure priority.
Outside clearance circle w/o blade 34 ft. 4 in. (10.46 m)
Outside clearance circle w/blade 35 ft. 0 in. (10.67 m)

Brakes:
Service Hydraulic, power-actuated, pedal-controlled wet disk brakes located in axle.
Parking, winching and emergency stop Hand-operated mechanical wet-disk brake located on driveline for braking front and rear axles. Hydraulic release.

Hydraulic System:
Closed center, constant pressure. Variable-displacement pump driven from crankshaft 25 gpm (95 L/min), 2000 psi (13 790 kPa) (140.6 kg/cm²) @ 2200 engine rpm. Full-flow filtration. Oil-to-air cooler.

Hydraulic Cylinders:	Rod Dia.	Bore	Stroke
Blade lift cylinders (2)	1.50 in.	3.50 in.	14.25 in.
	(38.1 mm)	(89 mm)	(362 mm)
Steering cylinders (2)	1.75 in.	2.75 in.	14.37 in.
	(44.5 mm)	(70 mm)	(365 mm)

Cylinder rods are ground, heat-treated, chrome-plated and polished.

Blade: Hydraulic control	
Width	6 ft. 11 in. (2.11 m)
Max. lift above ground level	4 ft. 2 in. (1.27 m)
Max. drop below ground level	15 in. (330 mm)
Height (ends)	1 ft. 9 in. (533 mm)
Height (center)	2 ft. 3 in. (686 mm)

Cable Arch:	
Horizontal roller	6 in. (152 mm) dia.
Vertical rollers (through-hardened steel)	4.5 in. (114 mm) dia.
Working height settings (top of horizontal roller to ground):	
Lower	5 ft. 10 in. (1.78 m)
Upper	6 ft. 3 in. (1.91 m)

Winch:
Live mechanical drive; hydraulically actuated clutch and brakes, single lever control.
Winch capacities*
1/2-in. (12.7 mm) cable 223 ft. (68 m)
5/8-in. (15.8 mm) cable 146 ft. (45 m)
3/4-in. (19.1 mm) cable 103 ft. (31.4 m)
*Calculated—no allowance made for loose or uneven spooling.

Linepull:**
Bare drum 26,700 lb. (119 kN) (12 100 kg)
Full drum 18,100 lb. (81 kN) (8200 kg)
**Based on winch clutch capacity and .75 in. (19 mm) cable.

Line speed (2200 rpm) and .75 in. (19 mm) cable:
Bare drum 126 fpm (38.3 m/min)
Full drum 176 fpm (53.6 m/min)

Tires:
18.4-26, 10 PR, steel-ply, LS2
18.4-34, 10 PR, steel-ply, LS2
23.1-26, 10 PR, steel-ply, LS2
28L-26, 10 PR, steel-ply, LS2
28L-26, 10 PR, steel-ply, LS3

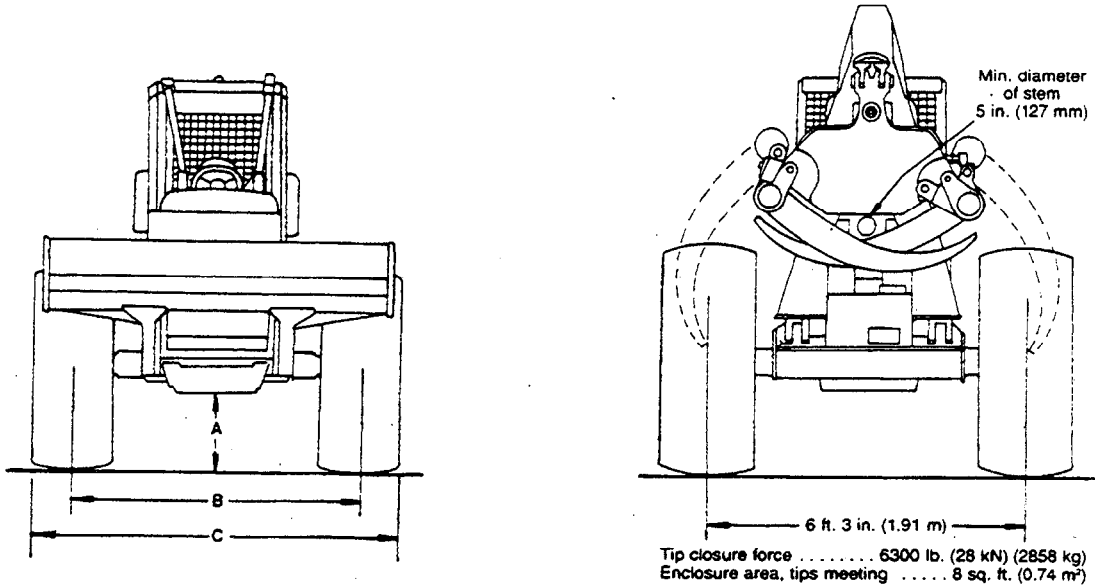
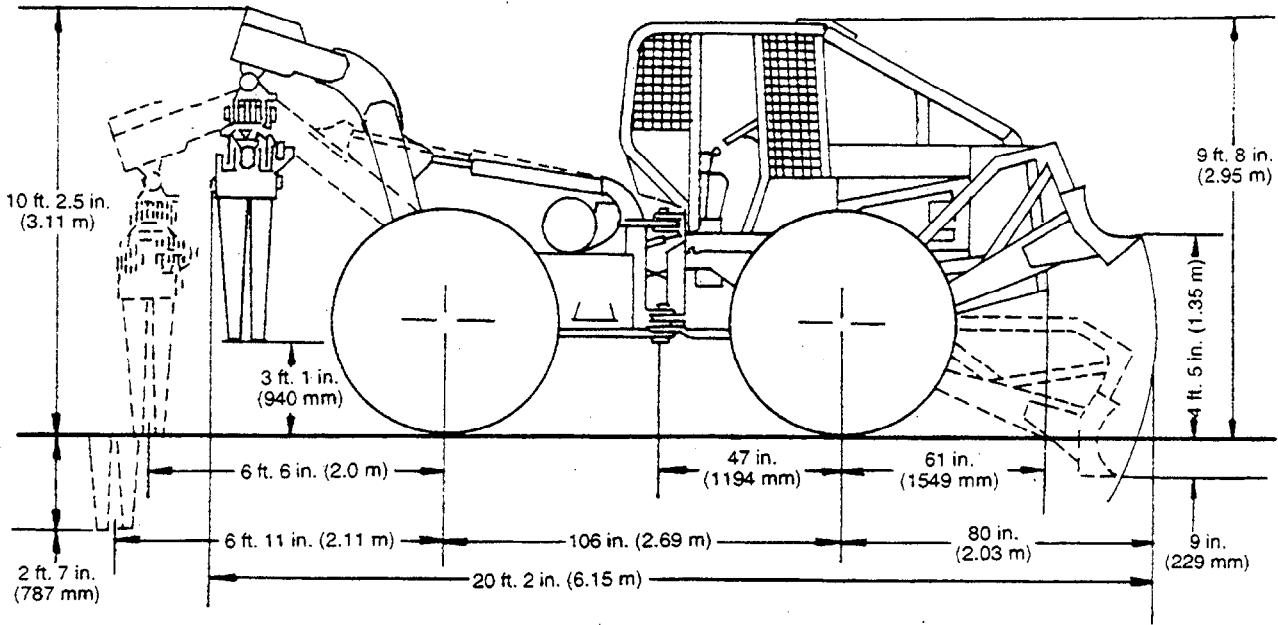
Capacities:	U.S.	Liters
Fuel tank	41 gal.	155.2
Cooling system	7.7 gal.	29.2
Engine lubrication, including filter	15 qt.	14.2
Transmission and hydraulic system	9 gal.	34.1
Front differential	4.5 gal.	17
Rear differential	4.5 gal.	17
Winch	1.8 gal.	6.8

SAE Operating Weight w/Blade 16,200 lb. (7348 kg)
SAE Operating Weight w/o Blade 14,970 lb. (6790 kg)

87A:T6793AF 05T:115 K62 120488

General Specifications

548D/7411 GRAPPLE SKIDDER



TIRE SIZE	A GROUND CLEARANCE	S3 SERIES AXLES		S4 SERIES AXLES	
		B WHEEL TREAD	C OVERALL WIDTH	B WHEEL TREAD	C OVERALL WIDTH
18.4-34	1 ft. 10 in. (559 mm)	76.6 in. (1.95 m)	7 ft. 11 in. (2.41 m)	N/A*	N/A
23.1-26	1 ft. 9 in. (533 mm)	80.8 in. (2.05 m)	8 ft. 9 in. (2.67 m)	80.2 in. (2.04 m)	8 ft. 8 in. (2.64 m)
28L-26	1 ft. 9.5 in. (546 mm)	N/A	N/A	87.5 in. (2.22 m)	9 ft. 8 in. (2.95 m)

* N/A= not available

NOTE: Machine equipped with 18.4 x 34 tires, grapple positioned with cylinders fully retracted and tongs tip to tip.

87A;T6793AD 05T;115 K63 220488

General Specifications

548D/7411 GRAPPLE SKIDDER—CONTINUED

Specifications and design are subject to change without notice. Wherever applicable, specifications are in accordance with SAE Standards. Except where otherwise noted, these specifications are based on a unit with 18.4-34, 10 PR tires, full fuel tank, 175-lb. (80 kg) operator and standard equipment.

Rated Power @ 2200 rpm:	SAE	DIN 70 020
Net	100 hp (75 kW)	75 kW
Gross	105 hp (78 kW)	

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Engine: John Deere 4-276T

Type	4-stroke cycle, turbocharged diesel
Bore and stroke	4.19 x 5.00 in. (106.5 x 127 mm)
No. of cylinders	4
Displacement	276 cu. in. (4.524 L)
Maximum net torque @ 1300 rpm	290 lb-ft (393 Nm) (40 kg-m)
Cooling fan	Blower
Compression ratio	16.8 to 1
Lubrication	Pressure system w/full-flow filter
Electrical system	12-volt w/42-amp alternator
Battery	Reserve capacity: 180 minutes

Differentials:

Front and rear Full differentials w/hydraulic lock

Engine Clutch Disconnect:

Hand-operated, spring-loaded, dry disk. Single plate, 12 in. (305 mm).

Transmission:

Power Shift with planetary gears, hydraulically actuated wet-disk clutches and brakes; provides 8 speeds forward—4 reverse. Controlled by single lever on console.

Travel Speeds (2200 engine rpm, no tire slip):

	mph	km/h
Forward	1.8-19.8	2.9-31.9
Reverse	2.3-6.6	3.7-10.6

Drive Axles:

Four-wheel drive with inboard planetary gears on all axles. Front axle oscillates 15 degrees above and below horizontal. Travel at tire center line 20 in. (508 mm).

Steering: Power

Articulated frame hydraulically actuated by two double-acting cylinders with cushioned stops. Steering system has hydraulic pressure priority.

Outside clearance circle w/o blade	34 ft. 4 in. (10.46 m)
Outside clearance circle w/blade	35 ft. 0 in. (10.67 m)

Brakes:

Service Hydraulic, power-actuated, pedal-controlled wet-disk brakes located in axle.

Parking, winching and emergency stop Hand-operated mechanical wet-disk brake located on driveline for braking front and rear axles. Hydraulic release.

Hydraulic System:

Closed center, constant pressure. Variable-displacement pump driven from crankshaft 25 gpm (95 L/min), 2000 psi (13 790 kPa) (140.6 kg/cm²) @ 2200 engine rpm. Full-flow filtration. Oil-to-air cooler.

Capacities:	U.S.	Liters
Fuel tank	41 gal.	155
Cooling system	7.7 gal.	29.2
Engine lubrication, including filter	15 qt.	14.2
Transmission and hydraulic system	16 gal.	60.6
Front differential	4.5 gal.	17
Rear differential	4.5 gal.	17
Winch	1.8 gal.	6.8

Blade: Hydraulic control

Width	6 ft. 11 in. (2.11 m)
Max. lift above ground level	4 ft. 5 in. (1.35 m)
Max. drop below ground level	9 in. (229 mm)
Height (ends)	1 ft. 9 in. (533 mm)
Height (center)	2 ft. 3 in. (686 mm)

Winch:

Live mechanical drive; hydraulically actuated clutch and brakes, single-lever control.

Winch capacities*

1/2-in. (12.7 mm) cable	223 ft. (68 m)
5/8-in. (15.8 mm) cable	146 ft. (45 m)
3/4-in. (19.1 mm) cable	103 ft. (31.4 m)

*Calculated—no allowance made for loose or uneven spooling.

Linepull:**

Bare drum	26,700 lb. (119 kN) (12 100 kg)
Full drum	18,100 lb. (81 kN) (8200 kg)

**Based on winch clutch capacity and .75 in. (19 mm) cable.

Line speed (2200 rpm) and .75 in. (19 mm) cable:

Bare drum	126 fpm (38.3 m/min)
Full drum	176 fpm (53.6 m/min)

Hydraulic Cylinders:	Rod Dia.	Bore	Stroke
Blade lift cylinders (2)	1.50 in. (38.1 mm)	3.50 in. (89 mm)	14.25 in. (362 mm)
Steering cylinders (2)	1.75 in. (44.5 mm)	2.75 in. (70 mm)	14.37 in. (365 mm)
Grapple boom cylinders (2)	2.00 in. (51 mm)	4.00 in. (102 mm)	29.8 in. (757 mm)
Grapple tong cylinder (1)	2.25 in. (57 mm)	5.25 in. (133 mm)	16.8 in. (427 mm)

Cylinder rods are ground, heat-treated, chrome-plated and polished.

Tires:

- 18.4-34, 10 PR, steel-ply, LS2
- 23.1-26, 10 PR, steel-ply, LS2
- 28L-26, 10 PR, steel-ply, LS2
- 28L-26, 10 PR, steel-ply, LS3

SAE Operating Weight w/Blade	18,040 lb. (8183 kg)
SAE Operating Weight w/o Blade	16,815 lb. (7627 kg)

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