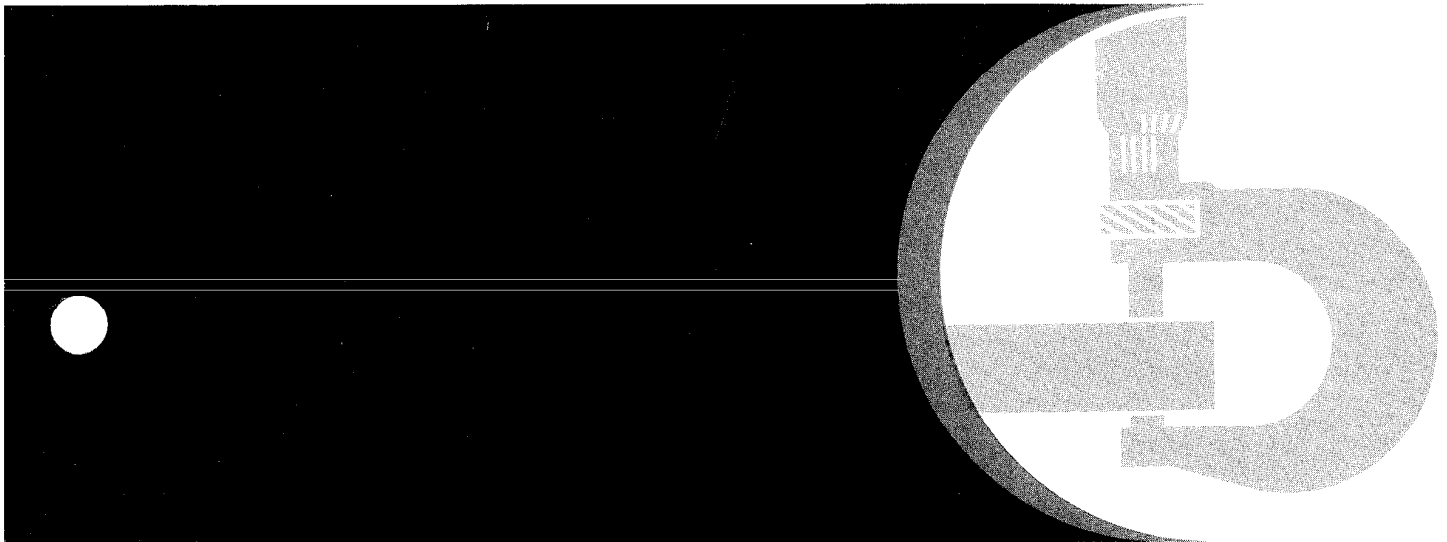


890A Excavator



TECHNICAL MANUAL

TM1263 (Jun-86)
LITHO IN U.S.A. (REVISED)

890A EXCAVATOR TECHNICAL MANUAL TM-1263 (JUN-86)

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All information, illustrations and specifications contained in this technical manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice. Whenever applicable, specifications and design information are in accordance with SAE and ICED standards.

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INTRODUCTION AND SAFETY INFORMATION

INTRODUCTION

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 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 service guides for specific machines. Technical manuals are on-the-job guides containing only the vital information needed by an experienced service technician.



30A-T85958, T26:1 110:1 130582

FEATURES OF THIS TECHNICAL MANUAL

- John Deere ILLUSTRATION format emphasizing detailed pictures and fewer words in easy-to-use modules.
- Removal and installation groups preceding some repair groups.
- A section of system diagnostic testing.
- Table of contents of all sections at the front of the manual and a listing of all groups and headings at the front of each section.
- Special tools and specifications listed at the front of each group they are used in.
- Special tools illustrated in numerical order at end of manual.
- Alphabetical listing of all major components, specifications, and special tools.
- Safety rules, general specifications, and lubrication specifications.

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 when you need to know 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.



30A-T85959 T26:1 111:5 130582

SAFETY AND YOU

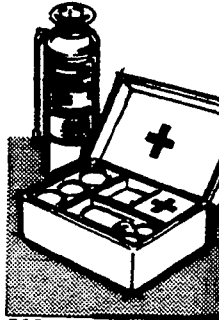


CAUTION: This safety symbol is used for important safety messages. When you see this symbol, follow the safety message to avoid personal injury.



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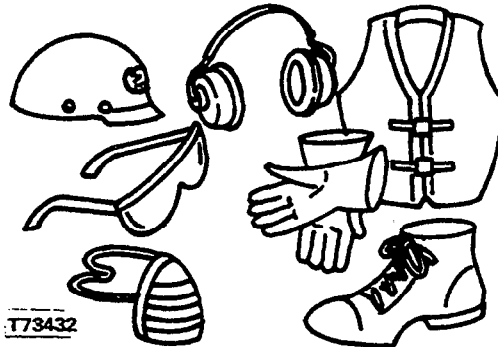
Be prepared for an accident or fire.
Know where the first aid kit and fire extinguisher are.
Know how to use them.
Know where to get help.



T27504N

30A/T27504 N T28:1 1103 280581

Wear safety equipment.



T73432

30A/T73432 T28:1 1104 260883

Wear fairly tight clothing.



T45672

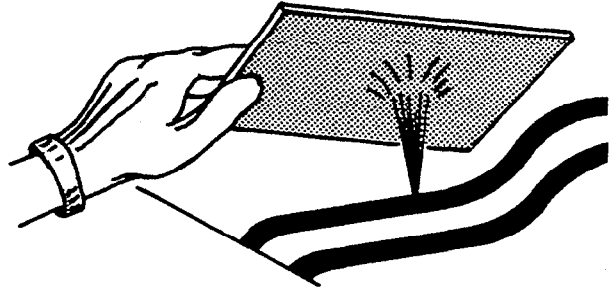
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Introduction and Safety Information



CAUTION: Escaping fluid under pressure can have sufficient force to penetrate the skin, causing serious injury. Before disconnecting lines, be sure connections are tight and lines, pipes and hoses are not damaged. Use a piece of cardboard or wood, rather than hands, to search for leaks.

If injured by escaping fluid, see a doctor at once. Serious infection or reaction can develop if proper medical treatment is not administered immediately.



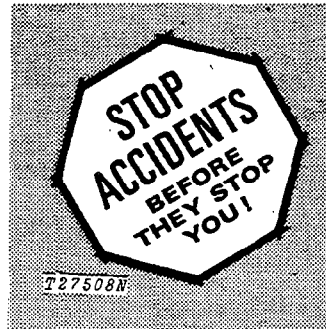
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KEEP SHOP AND STORAGE AREA CLEAN

Maintenance area should be well-ventilated.

Keep maintenance area clean and dry.

Store flammable materials in a cool and well-ventilated area out of reach of unauthorized personnel.



30A-T27508 N T28i 1107 260881

FOLLOW SAFE WORKING CONDITIONS

Do not work on the equipment unless you are approved to do so. Then be sure you know the correct procedure.

Do not work on equipment while it is being operated.

Keep hands away from moving parts.

When the engine is running, do not work on equipment unless the procedure is approved.

If you must work on the machine with the engine running, ALWAYS USE TWO service technicians. One must be at the controls. The other must be within sight of the operator.

Put a support under all raised equipment.

Park the machine across a slope, or use blocks to hold it in place.

Do not lift heavy parts by yourself. Use a hoist or jack.

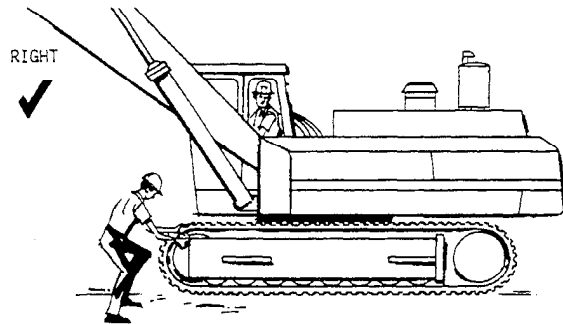
TAKE CARE! WATCH OUT FOR OTHER PEOPLE IN THE AREA.

When you drill, grind or hammer metal, wear safety glasses.

X WRONG



RIGHT



OBSERVE SERVICE PRECAUTIONS

Keep ALL equipment free of dirt and oil.

Clean oil, grease, mud, ice or snow from the operator's station, steps and hand rails.

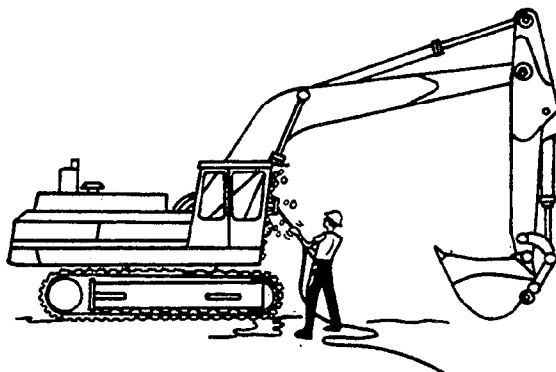
Do not remove the radiator cap unless the engine is cool. First, loosen the cap slowly to the stop. Then release all pressure in the cooling system before you remove the cap.

Check the exhaust system regularly for leaks.

Release hydraulic pressure before you work on the hydraulic system. See page I-II-06.

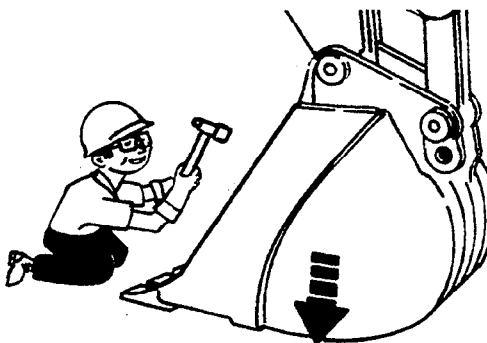
When you check hydraulic pressure, be sure to use the correct test gauge.

Before you work on the fuel system, close the fuel shutoff valve.



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Do not work under a raised bucket. Lower the bucket to the ground, or put blocks under the bucket.



30A-782343 T28:1 1110 260881

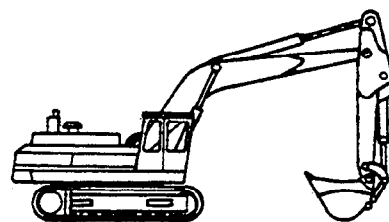
CHECK SAFETY EQUIPMENT ON MACHINE

All protective parts (shields, guards, ROPS, etc.) should be in good condition and fastened in place.

Check for leaks in all systems:

- Air intake system
- Engine oil system
- Hydraulic system
- Fuel system
- Cooling system

RIGHT



30A-782323 T28:1 1111 260881

AVOID EXPLOSIONS OR FIRE

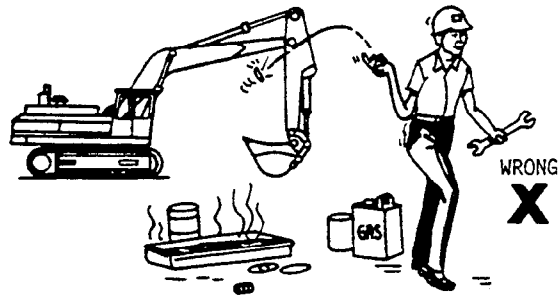
Do not smoke while you fill the fuel tank.

Do not smoke while you work with material that will start on fire easily.

Stop the engine before you fill the fuel tank.

Do not fill fuel tank if engine is hot.

Do not use gasoline or diesel fuel for cleaning parts. Use solvents that will not start on fire.



30A/T82411 T28/I 1112 260881

OBSERVE BATTERY PRECAUTIONS

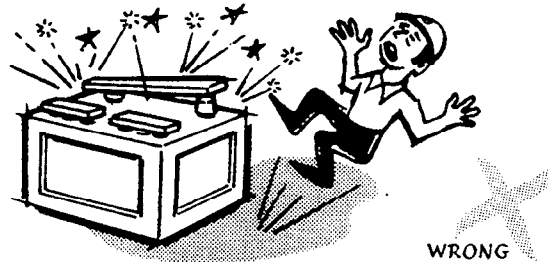
Do not put metal objects across terminals to check the battery charge.

When you charge a battery, be sure there is enough ventilation.

Keep sparks and flames away from batteries.

Do not smoke near battery.

Before you work on the electrical system, or make major repairs, turn off the battery disconnect switch.



30A/T27509 T28/I 1113 260893

BEFORE YOU WORK ON THE HYDRAULIC SYSTEM

Follow these steps before you work on any part of the hydraulic system:

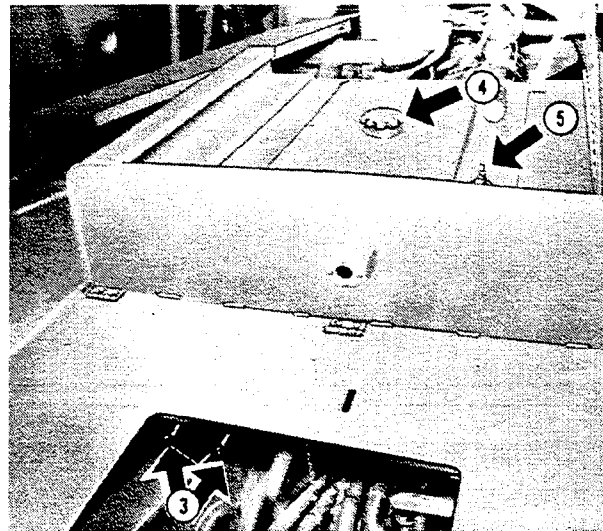
1. Park the excavator on level ground.
2. Lower hydraulic pressure:
 - Lower bucket to ground.
 - Stop engine.
 - Move control levers until boom and bucket do not move.
3. Push valve levers in all the way to stop oil flow.
4. Loosen the reservoir filler cap slowly to release pressure.
5. Open the diffuser vent. Turn it counterclockwise.

IMPORTANT: After you finish:

- Close diffuser vent.
- Pull levers out.



CAUTION: Do not walk or stand on sloping fenders or other sheet metal to service the excavator.



30A/T82348 T28/I 1114 260891

Group II

GENERAL SPECIFICATIONS

890A EXCAVATOR

(Specifications and design subject to change without notice. Wherever applicable, specifications are in accordance with PCSA and SAE Standards. Except where otherwise noted, these specifications are based on a unit equipped with 107-in. (2.72 m) dipperstick, 39-in. (991 mm) bucket, 30-in. (750 mm) track shoes, and standard equipment.)

Power (@2100 engine rpm):	SAE	DIN
Gross	225 hp(168 kW)	
Net	210 hp(157 kW)	213 PS

Net engine flywheel power is for an engine equipped with fan, air cleaner, water pump, lubricating oil pump, alternator, and muffler. Gross engine power is without fan. Power ratings are under SAE standard conditions of 500-ft. (150 m) altitude and 85°F (29.5°C) temperature, and DIN 6270 conditions (non-corrected). No derating is required up to 10,000 ft. (3000 m) altitude.

Engine: John Deere turbocharged 6-cylinder, valve-in-head, 4-stroke cycle.

Bore and stroke	5.12 x 5.00 in. (130 x 127 mm)
Piston displacement	619 cu. in. (10.145 L)
Compression ratio	15.2:1
Max. torque @ 1300 rpm	.810 lb-ft (1098 N-m) (112 kg-m)

Lubrication	Pressure system w/full-flow filter
Cooling	Pressurized w/thermostat and fixed bypass
Air cleaner w/restriction indicator	Dry
Electrical system	24 volts w/alternator
Batteries (2) 12-volt	Reserve capacity: 180 minutes each

Hydraulic System:

Three open-center pumps mounted in line are coupled directly to the flywheel. The total flow is 163 gpm (10.3 L/s) at rated engine rpm. System operating pressure is 2900 psi (20 000 kPa)(204 kg/cm²) for the propel circuit and 2900 psi (20 000 kPa) (204 kg/cm²) for the digging circuit.

Relief valves:

Boom (2) ...	3260 psi (22 483 kPa) (229.3 kg/cm ²)
Crowd (2) ..	3260 psi (22 483 kPa) (229.3 kg/cm ²)
Bucket (2) ..	3260 psi (22 483 kPa) (229.3 kg/cm ²)

Oil filtration:

- Two 149-micron suction screens
- Two 10-micron filters in return lines
- Three 25-micron high pressure filters

Cylinders:	Bore	Stroke
Boom (2)	7.0 in. (178 mm)	62.87 in. (1597 mm)
Crowd	7.0 in. (178 mm)	78.17 in. (1986 mm)
Bucket	7.0 in. (178 mm)	40.51 in. (1029 mm)
Boom cylinder rods	3.75 in. (95 mm dia.)	
Crowd and bucket cylinder rods	4.50 in. (114 mm dia.)	

All cylinders have phenolic wear rings. Boom, crowd and bucket cylinders have a built-in hydraulic cushion at each end of the stroke. Full-width hydraulic oil cooler matched with engine coolant radiator.

Operating Information:

Swing speed	6.1 rpm
Gradability	70 percent
Travel	0 to 2.2 mph (3.5 km/h)
Locked in low	0 to 0.95 mph (1.5 km/h)
Optional track shoes	36 in. (0.9 m)

Digging Information:

Bucket rating (SAE heaped)	1½ yd. ³ (1.2 m ³)
Lift capacity	24,200 lb. (108 kN ²) at 20 ft. (6 m)
Bucket penetrating force	38,160 lb. (170 kN)
Arm crowd force	30,310 lb. (135 kN)
Maximum reach at ground level ..	36.75 ft. (11.2 m)
Maximum dump height	19.75 ft. (6 m)
Digging depth	25 ft. (7.6 m)

General Specifications

Swing mechanism:

Swing 360-degree, internal drive, continuous
Turntable bearing Single row, ball
Case-hardened ring and pinion gears run in lubricant.

Undercarriage:

Propel motors (one for each track) High-torque, variable-speed, axial-piston hydraulic motors with planetary drive. Multiple-disk brakes automatically release while propelling, and apply when stationary. Independent drive to each track permits counterrotation.

Undercarriage, car body, and track frame Each track frame is a formed, reinforced U-channel. Track frames are joined by reinforced boxed car body with swing bearing mount.

Track Chain Sealed track chain

Track Adjustment Hydraulic

Buckets: High-strength steel, ribbed and plated bottom section.

Cab:

Steel, with urethane sound-proofing on ceiling and side walls, and cushioned neoprene floor mat. Safety glass on all sides and top. Front and rear windows open. Front window can be stored overhead.

Seat:

Fully adjustable heavy-duty cloth, foam-rubber cushioned seat.

Controls:

Pilot-operated two-lever for boom, crowd, bucket, and swing. Pilot-operated right and left pedals control forward and rearward movement of right and left tracks respectively.

Nominal Width	Bite Width	SAE	Capacity	Struck	Weight
39 in. (991 mm)	42 in. (1067 mm)	1½ cu. yd. (1.15 m³)		1¼ cu. yd. (0.96 m³)	2550 lb. (1157 kg)
45 in. (1143 mm)	47 in. (1194 mm)	1⅞ cu. yd. (1.43 m³)		1½ cu. yd. (1.15 m³)	2670 lb. (1211 kg)
51 in. (1295 mm)	54 in. (1372 mm)	2⅞ cu. yd. (1.62 m³)		1¾ cu. yd. (1.34 m³)	2820 lb. (1279 kg)
Heavy-duty					
33 in. (838 mm)	37 in. (940 mm)	1½ cu. yd. (1.15 m³)		1¼ cu. yd. (0.96 m³)	3050 lb. (1383 kg)
39 in. (991 mm)	44 in. (1118 mm)	1⅞ cu. yd. (1.43 m³)		1½ cu. yd. (1.15 m³)	3575 lb. (1622 kg)
45 in. (1143 mm)	50 in. (1270 mm)	2 cu. yd. (1.53 m³)		1½ cu. yd. (1.15 m³)	3660 lb. (1660 kg)
Track Shoes:					
Width	Shoes	Ground Contact		Ground Pressure	
30 in. (750 mm)	Triple-bar semigrouser	9723 sq. in. (62 731 cm²)		8.92 psi (61.5 kPa) (0.63 kg/cm²)	
36 in. (900 mm) (optional)	Triple-bar semigrouser	11,668 sq. in. (75 278 cm²)		7.74 psi (53.4 kPa) (0.54 kg/cm²)	

General Specifications

Boom and Arm

Internally reinforced tapered box construction with heat-treated steel bushings. Machined and bored after welding for accurate alignment. All pivot points are sealed to allow extended lubrication intervals.

Servicing and Vandal Protection:

Swingaway service doors expose built-in platforms for easy access to engine and hydraulic systems. Cab and access covers to fuel tank, radiator, and hydraulic reservoir lock with switch key.

Capacities:	U.S.	Imp.	Liters
Fuel tank	140 gal.	117 gal.	530
Cooling system	16 gal.	13.3 gal.	61
Engine lubrication, including filter	32 qt.	26.7 qt.	30.3
Hydraulic system	165 gal.	137 gal.	625
Planetary propel drive (each)	21 qt.	17.5 qt.	20.0
Swing drive (each)	8 qt.	6.7 qt.	7.5

Operating Weights (without bucket)

	lb.	(kg)
Total weight—with narrow track	85,059	(38 598)
—with wide track	88,650	(40 210)
Boom	7,450	(3 380)
Arm—108 in. (2.7 m)	5,080	(2 300)
—140 in. (3.6 m)	5,490	(2 490)
Main Counterweight	12,810	(5 810)
Auxiliary Counterweight	3,050	(1 380)

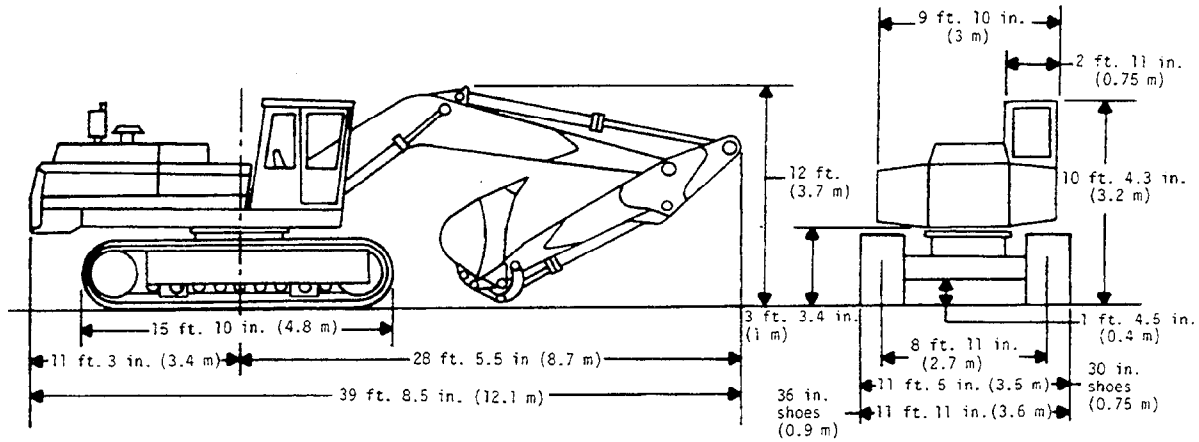
Additional Standard Equipment:

Electric hour meter
 Alternator charge indicator light
 Hydraulic oil filter pressure warning light
 Engine overheating warning light
 Gauges (internal illuminated):
 Engine coolant temperature
 Hydraulic oil temperature
 Engine oil pressure
 Fuel
 Key switch
 Cold weather starting aid
 Horn
 Positive-position hand throttle
 12,810 lb. (5 810 kg) counterweight
 Counterweight removal system
 Track guides
 Cab with heater
 Floor mat
 Lifting hook
 Tinted roof window

Special Equipment:

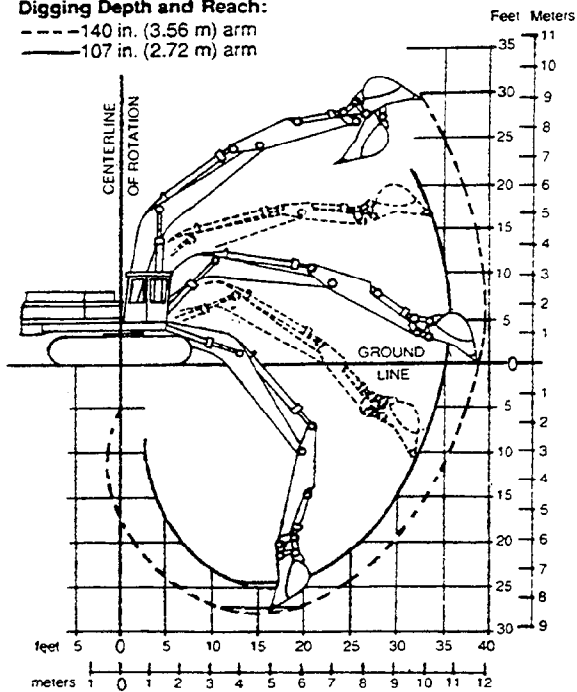
36-in. (900 mm) triple-bar semigrouser shoes
 Bucket side cutters
 Fire extinguisher
 Engine water heater
 Window protection group
 Air conditioner
 Auxiliary counterweight—3,050 lb. (1 380 kg)
 Two electric cab fans
 Vandal protection

General Specifications



Digging Depth and Reach:

- 140 in. (3.56 m) arm
- 107 in. (2.72 m) arm





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Group III CAP SCREW TORQUE VALUES

CUSTOMARY TORQUE SPECIFICATIONS

NOTE: Wrench torque tolerance is $\pm 10\%$.

Cap Screw in.	Plain Head* (lb.-ft.)	N-m	Three Dashes* (lb.-ft.)	N-m	Six Dashes* (lb.-ft.)	N-m
1/4	-----	-----	(10)	14	(14)	19
5/16	-----	-----	(20)	27	(30)	41
3/8	-----	-----	(35)	47	(50)	68
7/16	(35)	47	(55)	75	(80)	108
1/2	(55)	75	(85)	115	(120)	163
9/16	(75)	102	(130)	176	(175)	237
5/8	(105)	142	(170)	230	(240)	325
3/4	(185)	251	(300)	407	(425)	576
7/8	(160)	217	(445)	603	(685)	929
1	(250)	339	(670)	908	(1030)	1396
1-1/8	(330)	447	(910)	1234	(1460)	1979
1-1/4	(480)	651	(1250)	1695	(2060)	2793

All torques are dry torque unless noted.

*Dashes identify the grade of hardware.

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METRIC TORQUE SPECIFICATIONS

NOTE: Wrench torque tolerance is $\pm 10\%$.

Cap Screw Diameter	Property Class 8.8* (lb.-ft.)	N-m	Property Class 10.9* (lb.-ft.)	N-m
M5	(4.4)	6.0	(6.3)	8.5
M6	(7.4)	10.0	(10.7)	14.5
M8	(18.1)	24.5	(25.8)	35.0
M10	(36.1)	49.0	(51.6)	70.0
M12	(62.7)	85.0	(89.2)	121.0
M16	(154.9)	210.0	(221.2)	300.0
M20	(265.5)	360.0	(368.7)	500.0
M24	(457.2)	620.0	(634.2)	860.0
M30	(885.0)	1200.0	(1224.2)	1660.0
M36	(1541.3)	2090.0		

All torques are dry torque unless noted.

*Numbers identify the grade of hardware.

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