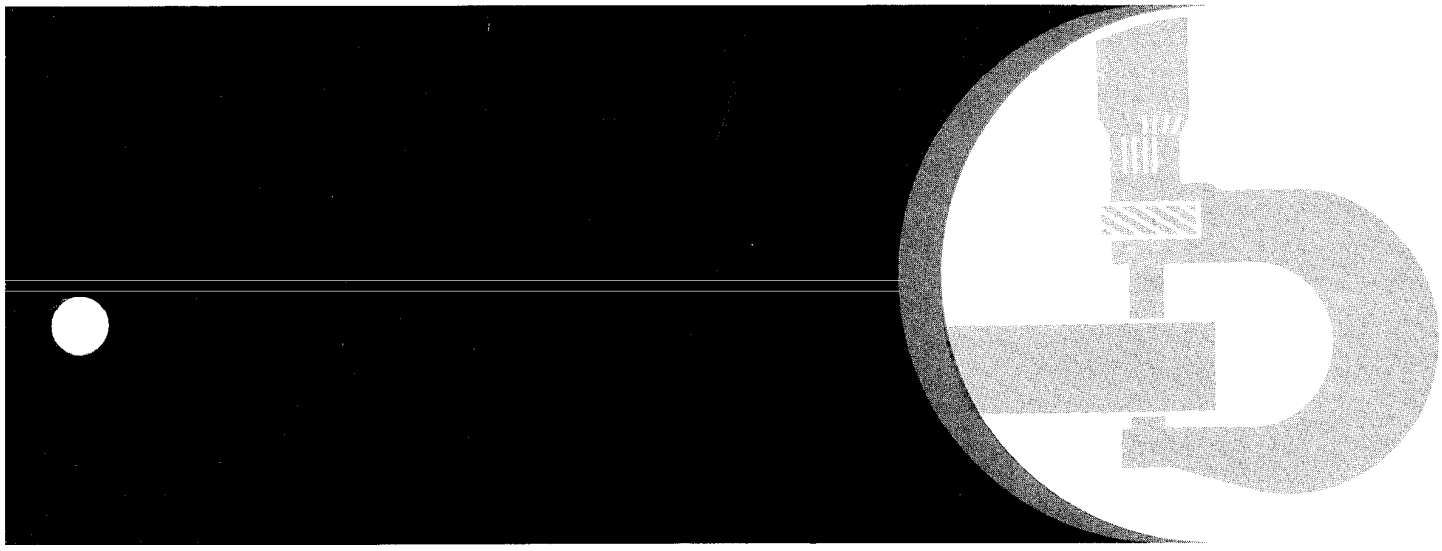
890A
Excavator



TECHNICAL MANUAL

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

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

SECTION AND GROUP CONTENTS

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.

T28;1263 09 130686

SECTION AND GROUP CONTENTS—CONTINUED

T28;1263 02 160686

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.

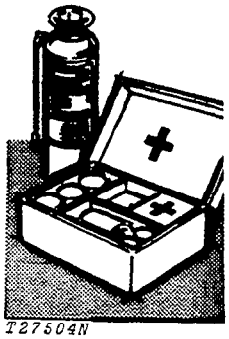
30A;T81389 T28:I 1102 280881

Be prepared for an accident or fire.

Know where the first aid kit and fire extinguisher are.

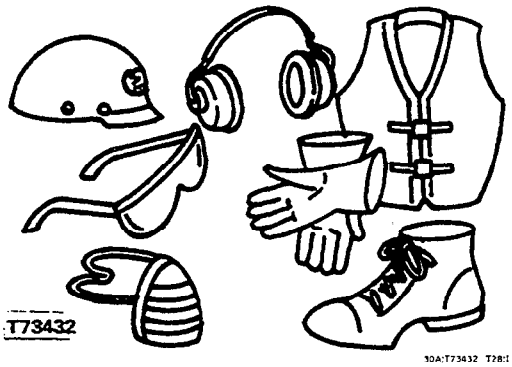
Know how to use them.

Know where to get help.



30A;T27504 N T28:I 1103 280581

Wear safety equipment.



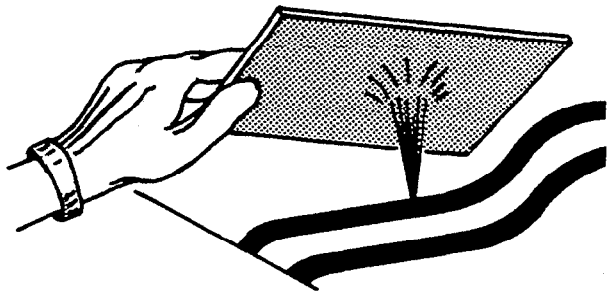
30A;T73432 T28:I 1104 280881

Wear fairly tight clothing.

30A;T45672 T28:I 1105 280581

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.



30A;T80991 T28;I H06 260881

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 T28;I H07 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.

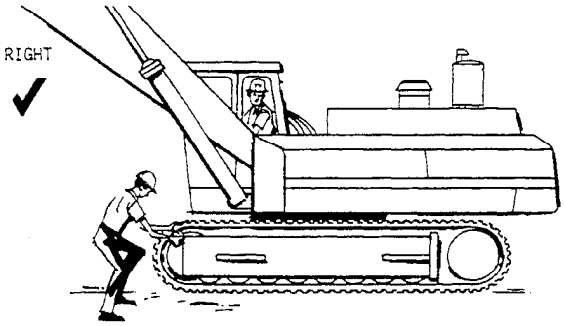
Put a support under all raised equipment.

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.



30A,T32709 N, 82412 T28:: 1108 260881

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.

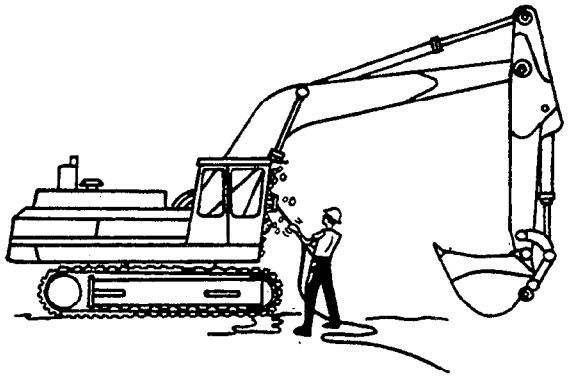
Do not remove the radiator cap unless the engine is cool. First, loosen the cap slowly to the stop. Then release all pressure in the cooling system before you remove the cap.

Check the exhaust system regularly for leaks.

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

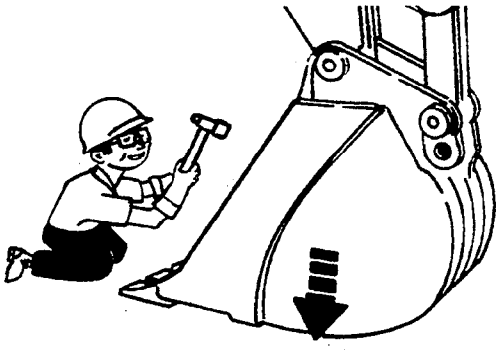
When you check hydraulic pressure, be sure to use the correct test gauge.

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



30A;T82345 T30;I 1109 091281

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

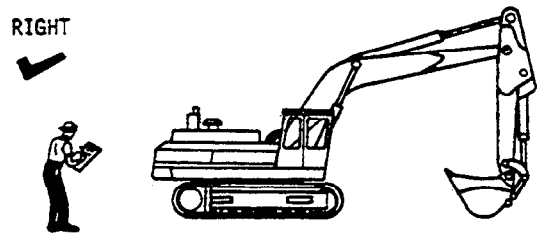


30A;T82343 T28;I 1110 260881

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



30A;T82323 T28;I 1111 260881

AVOID EXPLOSIONS OR FIRE

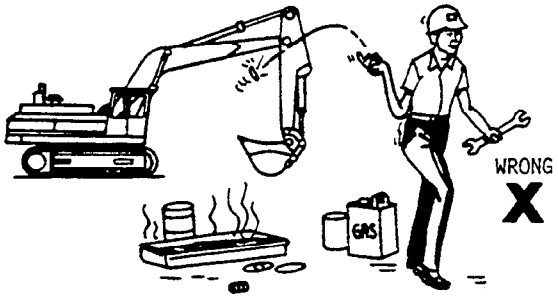
Do not smoke while you fill the fuel tank.

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

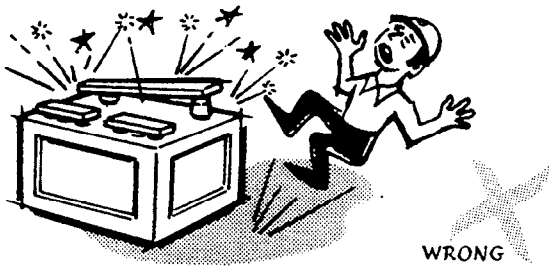
Do not put metal objects across terminals to check the battery charge.

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;T27506 T28;I 1113 260881

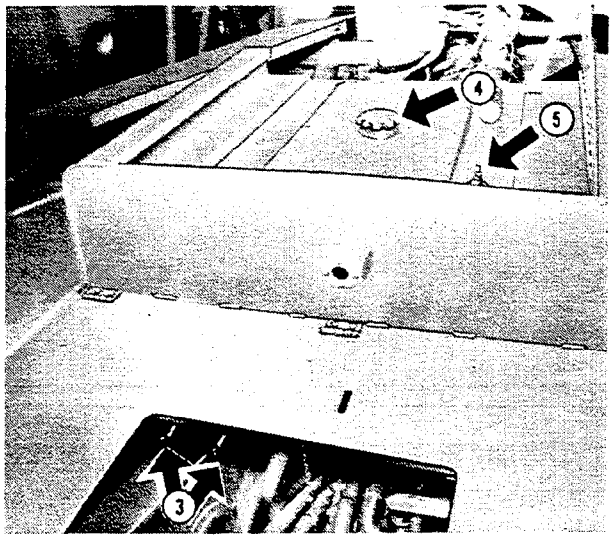
BEFORE YOU WORK ON THE HYDRAULIC SYSTEM

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 260881

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/cm²)
Crowd (2)	3260 psi (22 483 kPa) (229.3 kg/cm²)
Bucket (2)	3260 psi (22 483 kPa) (229.3 kg/cm²)

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 m³)
Lift capacity	24,200 lb. (108 kN²) 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)

T28:1 11105 260382

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

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.

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

		Capacity		
Nominal Width	Bite Width	SAE	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)	2⅛ 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 semigrousers	9723 sq. in. (62 731 cm²)	8.92 psi (61.5 kPa) (0.63 kg/cm²)
36 in. (900 mm) (optional)	Triple-bar semigrousers	11,668 sq. in. (75 278 cm²)	7.74 psi (53.4 kPa) (0.54 kg/cm²)

T28:I 11106 260382

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)

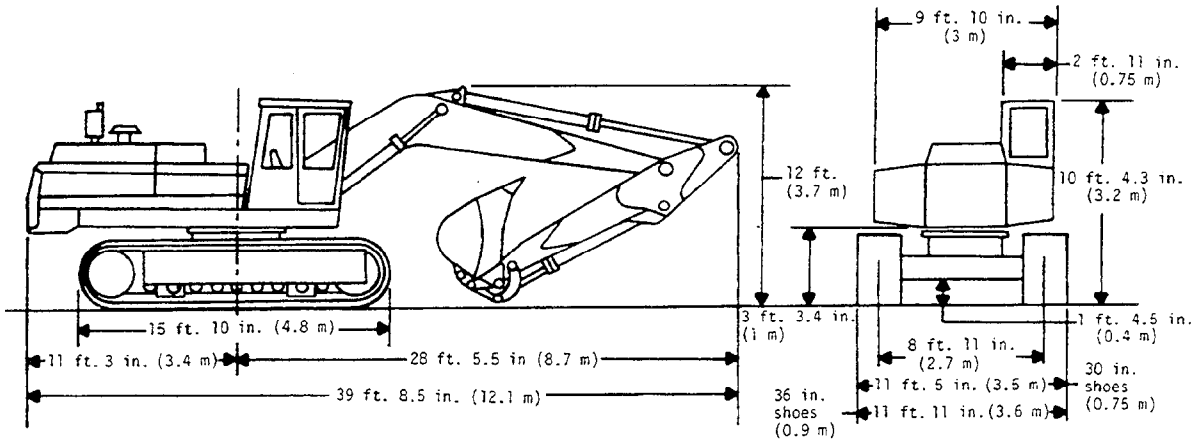
	lb.	(kg)
Total weight—with narrow track	85,059	(38 598)
—with wide track	88,650	(40 210)
Boom	7,450	(3 380)
Arm—108 in. (2.7 m)	5,080	(2 300)
—140 in. (3.6 m)	5,490	(2 490)
Main Counterweight	12,810	(5 810)
Auxiliary Counterweight	3,050	(1 380)

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

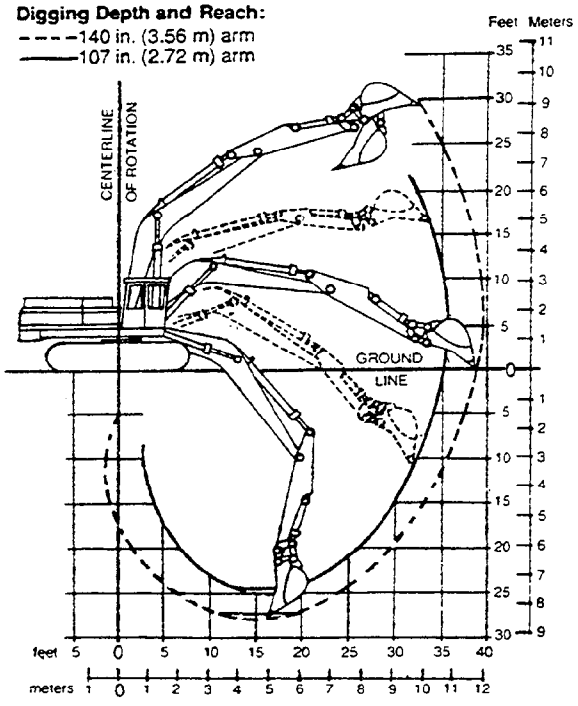
Key switch
Cold weather starting aid
Horn
Positive-position hand throttle
12,810 lb. (5 810 kg) counterweight
Counterweight removal system
Track guides
Cab with heater
Floor mat
Lifting hook
Tinted roof window

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

T28;I III07 260382



Digging Depth and Reach:
- - - - 140 in. (3.56 m) arm
——— 107 in. (2.72 m) arm



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CAP SCREW TORQUE VALUES

CUSTOMARY TORQUE SPECIFICATIONS

NOTE: Wrench torque tolerance is ± 10%.

Cap Screw	Plain Head*		Three Dashes*		Six Dashes*	
in.	(lb-ft.)	N·m	(lb-ft.)	N·m	(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.

T28:I IIIO9 170582

METRIC TORQUE SPECIFICATIONS

NOTE: Wrench torque tolerance is ±10%.

Cap Screw	Property Class 8.8*		Property Class 10.9*	
Diameter	(lb-ft)	N·m	(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.

T28:I IIIIO 190582