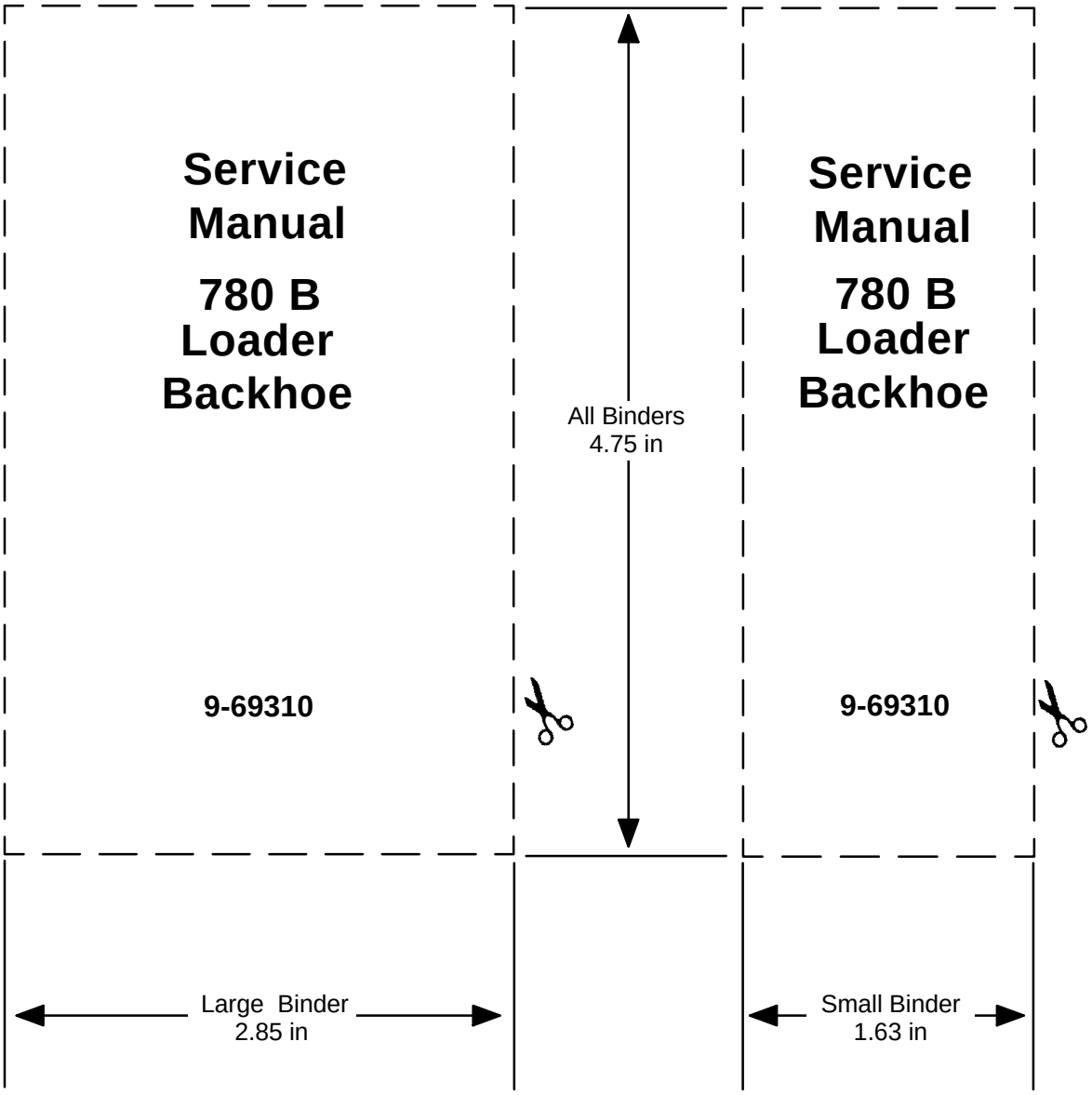

Service
Manual
780 B
Loader
Backhoe
9-69310
All Binders
4.75 in
Service
Manual
780 B
Loader
Backhoe
9-69310
Large Binder
2.85 in
Small Binder
1.63 in

780B Loader Backhoe
Table of Contents

Section
1001

SAFETY RULES
SERVICE MANUAL INTRODUCTION
AND
TORQUE SPECIFICATIONS

Written In *Clear*
And
Simple
English

CASE CORPORATION

9-69310

Printed in U.S.A.
Issued October 1982

SAFETY RULES

This Symbol Shows Important Information About Safety In This Manual. When You See This Symbol, Carefully Read The Information That Follows and Understand The Possible Causes of Injury Or Death. 1-1-A

IMPORTANT: *To prevent injury on job, follow the Warning, Caution, and Danger notes in this section and other sections throughout this manual. Follow the instructions carefully.*

The procedures recommended and shown in this manual are good, effective service methods. However, all possible procedures and service hazards may not be covered. Therefore, if you use a tool or procedure not recommended, you must make sure that the method you select is a safe method.

Put the warning tag shown below on the key for the key switch when you are servicing or repairing this machine. One warning tag is on every new machine. You can buy additional warning tags, part number 331-4614, from Service Parts Supply.

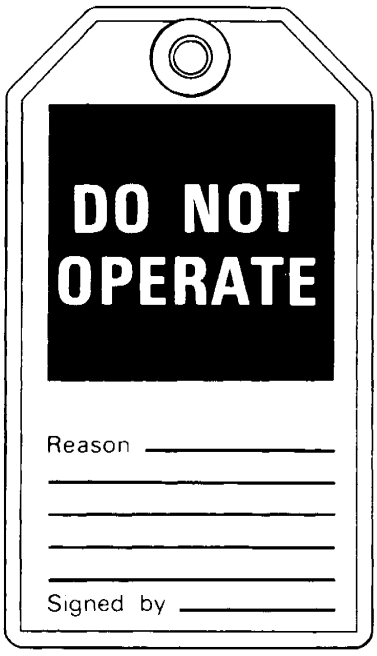


Figure 1

DANGER: *Before you move the backhoe boom to either side, make sure that all persons are out of the way. A swinging boom can crush.* 48-54

WARNING: *Read operator's manual to familiarize yourself with control lever functions.* 46-27

WARNING: *Operate tractor and equipment controls from the seat position only. Any other method could result in serious injury.* 48-55

WARNING: *This is a one man machine, no riders allowed.* 35-8

WARNING: *If you wear clothing that is too loose or do not use the correct safety equipment for your job, you can be injured. Always wear clothing that will not catch on objects. Extra safety equipment that can be required includes hard hat, safety shoes, ear protection, eye or face protection, heavy gloves and reflector clothing.* 45-3-A

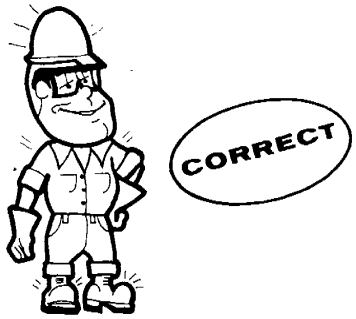
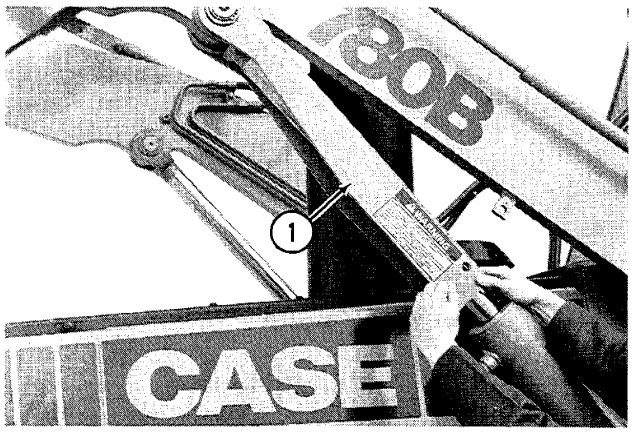


Figure 2

WARNING: *When working in the area of the fan belt with the engine running, avoid loose clothing if possible, and use extreme caution.* 35-4

WARNING: *Operate controls from the operator's seat only.* 35-7

WARNING: *Whenever the bucket must be raised to aid in servicing, block the loader arms in place with lift cylinder safety strut or a suitable safety stand.* *23-7-A*



1. *Lift Cylinder Safety Strut* Figure 3

WARNING: *When doing checks and tests on the equipment hydraulics, follow the procedures as they are written. DO NOT change the procedure.* *47-44*

WARNING: *When putting the hydraulic cylinders on this machine through the necessary cycles to check operation or to remove air from a circuit, make sure all people are out of the way.* *47-45*

WARNING: *Locate the machine on level ground and block the wheels securely before working under the machine. Failure to follow the above procedure can result in personal injury.* *46-77*

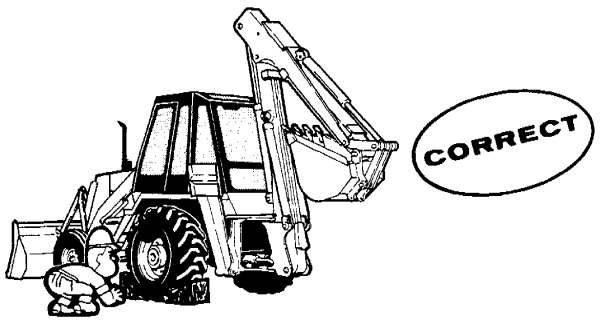


Figure 4

WARNING: *Use insulated gloves or mittens when working with hot parts.* *47-41A*

CAUTION: *Pin sized and smaller streams of hydraulic oil under pressure can penetrate the skin and result in serious infection. If hydraulic oil under pressure does penetrate the skin, seek medical treatment immediately. Maintain all hoses and tubes in good condition. Make sure all connections are tight. Make a replacement of any tube or hose that is damaged or thought to be damaged. DO NOT use your hand to check for leaks; use a piece of cardboard or wood.* *40-6-A*

CAUTION: *When removing hardened pins such as a pivot pin, or a hardened shaft, use a soft head (brass or bronze) hammer or use a driver made from brass or bronze and a steel head hammer.* *46-17*

CAUTION: *When using a hammer to remove and install pivot pins or separate parts, using compressed air or using a grinder, wear eye protection that completely encloses the eyes (approved goggles or other approved eye protectors).* *46-13*

CAUTION: *When servicing or repairing the machine, keep the shop floor and operator's compartment and steps free of oil, water, grease, tools, etc. Use an oil absorbing material and/or shop cloths as required. Use safe practices at all times.* *40-8*

CAUTION: *Use suitable floor (service) jacks or chain hoists to raise wheels off the floor. Always block machine in place with suitable safety stands.* *40-7*

CAUTION: *Some components of this machine are very heavy. Use suitable lifting equipment or additional help as instructed in this service manual.* *40-10*

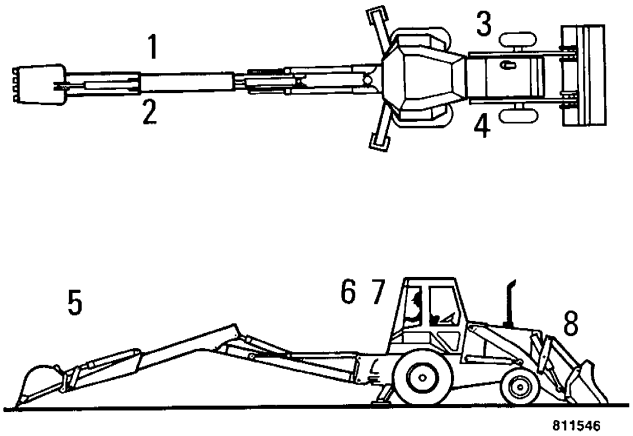
DANGER: *Engine exhaust fumes can cause death. If it is necessary to start the engine in a closed place, remove the exhaust fumes from the area with an exhaust pipe extension. If you do not have an exhaust pipe extension, open the doors and get outside air into the area.* *48-56*

SERVICE MANUAL INTRODUCTION

This service manual has been prepared with the latest service information available. Troubleshooting, removal, disassembly, inspection and installation procedures, and complete specifications and tightening references can be found in most sections. Some sections have drawings but no written procedure because the job is so easily done. This service manual is one of the most important tools available to the service technician.

Right, Left, Front, and Rear

The terms right-hand and left-hand and front and rear as used in this manual indicate the right and left sides, and front and rear of the machine as seen from the operator's seat for correct operation of the machine or attachment.



1. *Right Side-Backhoe*
2. *Left Side-Backhoe*
3. *Left Side-Machine*
4. *Right Side-Machine*
5. *Front-Backhoe*
6. *Rear-Backhoe*
7. *Rear-Machine*
8. *Front-Machine*

Figure 5

Text

If the service manual is for more than one machine or different models of components (planetary axles, gear boxes, control valves, etc.) the procedures have the steps necessary to service each model.

Table of Contents

A Table of Contents is in the front of this manual. The Table of Contents shows the main divisions and the sections that are in each division. The individual sections, where necessary, have a Table of Contents on the second page of that section.

Page Numbers

All page numbers are made of two numbers separated by a dash, such as 4002-9. The number before the dash is the section number. The number following the dash is the page number in that section. Page numbers will be found at the upper right or left of each page.

Illustrations

Illustrations are put as near as possible to the text and are to be used as part of the text.

Classification of Lubricants

The SAE number is the viscosity of engine oils; for example, SAE 30, a single viscosity oil. SAE 10W30 is a variable viscosity oil.

The API classification (SD, CD, etc.) is the oil performance in terms of engine usage. Only oil specified in Section 1002 can be used. These oils have the needed chemical additives to give maximum engine protection. Both the SAE grade and API classification must be found on the container.

Gear Lubricant and Grease

Gear lubricant and grease for each application is specified in Section 1002.

Special Tools

Special tools are needed to remove and install, disassemble and assemble, check and adjust some component parts of this machine. Some special tools can be easily made locally and the necessary information to make the tool is in this service manual. Other special tools are more difficult to make locally and are available from Service Tools in the U.S. and from Jobborn Manufacturing in Canada. Use these tools according to the instructions in this service manual for your personal safety and to do the job correctly.

Order special tools from either of the following companies:

Service Tools
P.O. Box 314
Owatonna, Minnesota 55060

Jobborn Manufacturing Co.
97 Frid Street
Hamilton, Ontario L8P 4M3
Canada

Product Identification Number (PIN) and Serial Numbers

NOTE: *A serial number plate is also on many components such as the starter, alternator, pumps, etc.*

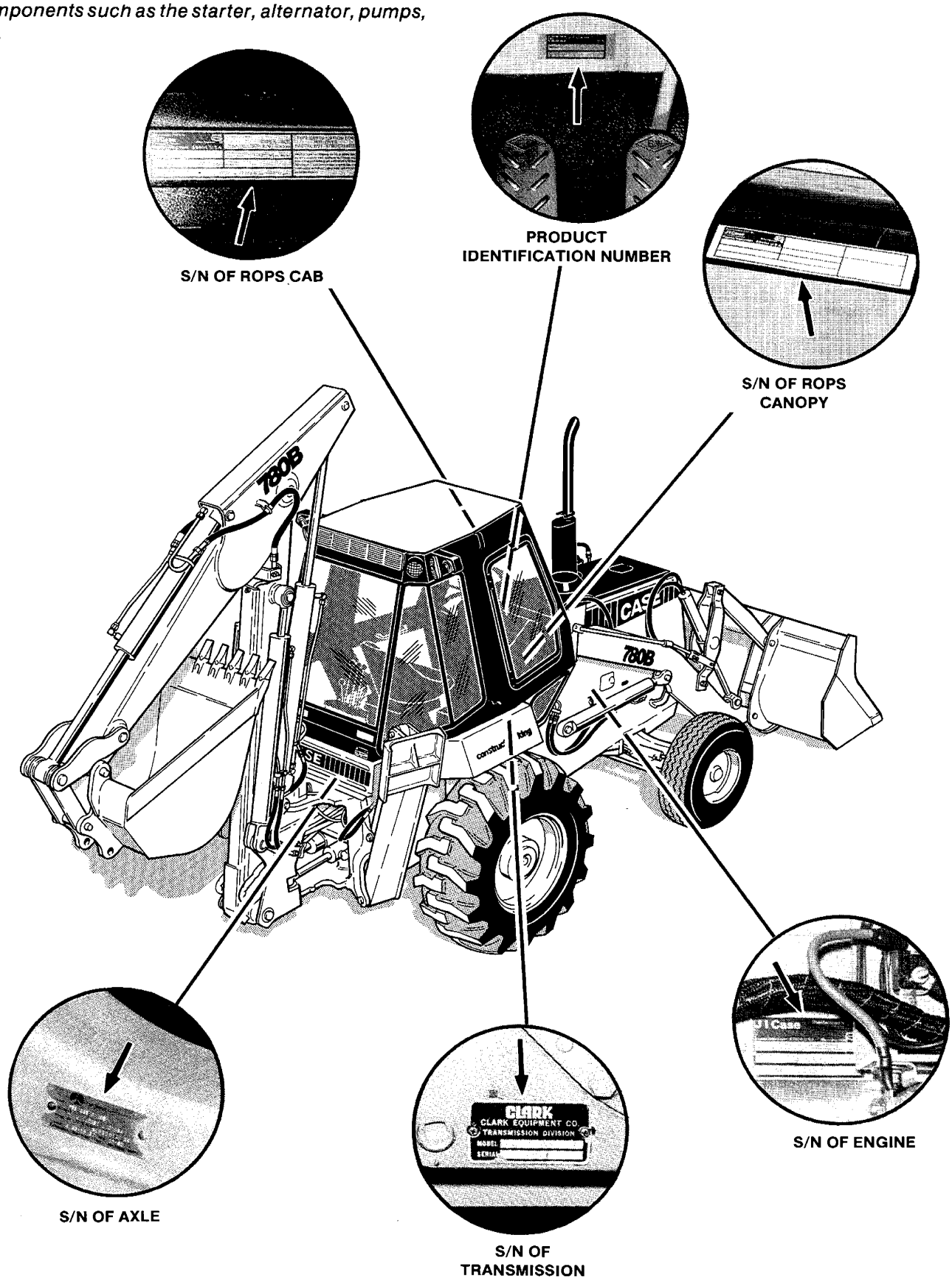


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Figure 6

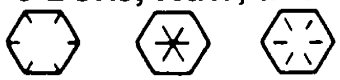
TORQUE SPECIFICATIONS - U.S. HARDWARE

Use the torques in this chart when special torques are not given. These torques apply to fasteners with both UNC and UNF threads as received from suppliers, dry, or when lubricated with engine oil. Not applicable if special graphites, moly-disulfide greases, or other extreme pressure lubricants are used.

Grade 5 Bolts, Nuts, and Studs

Size	Pound-Feet	Newton metres	Kilogram metres
1/4 in 6.4 mm	9-11	12-15	1.2-1.5
5/16 in 7.9 mm	17-21	23-28	2.4-2.9
3/8 in 9.5 mm	35-42	48-57	4.8-5.8
7/16 in 11.1 mm	54-64	73-87	7.5-8.8
1/2 in 12.7 mm	80-96	109-130	11.1-13.3
9/16 in 14.3 mm	110-132	149-179	15.2-18.2
5/8 in 15.9 mm	150-180	203-244	20.8-24.9
3/4 in 19.0 mm	270-324	366-439	37.3-44.8
7/8 in 22.2 mm	400-480	542-651	55.3-66.4
1.0 in 25.4 mm	580-696	787-944	80.2-96.2
1-1/8 in 28.6 mm	800-880	1085-1193	111-122
1-1/4 in 31.8 mm	1120-1240	1519-1681	155-171
1-3/8 in 34.9 mm	1460-1680	1980-2278	202-232
1-1/2 in 38.1 mm	1940-2200	2631-2983	268-304

Grade 8 Bolts, Nuts, and Studs



Size	Pound-Feet	Newton metres	Kilogram metres
1/4 in 6.4 mm	12-15	16-20	1.7-2.1
5/16 in 7.9 mm	24-29	33-39	3.3-4.0
3/8 in 9.5 mm	45-54	61-73	6.2-7.5
7/16 in 11.1 mm	70-84	95-114	9.7-11.6
1/2 in 12.7 mm	110-132	149-179	15.2-18.2
9/16 in 14.3 mm	160-192	217-260	22.1-26.5
5/8 in 15.9 mm	220-264	298-358	30.4-36.5
3/4 in 19.0 mm	380-456	515-618	52.5-63.0
7/8 in 22.2 mm	600-720	814-976	83.0-99.5
1.0 in 25.4 mm	900-1080	1220-1465	124-149
1-1/8 in 28.6 mm	1280-1440	1736-1953	177-199
1-1/4 in 31.8 mm	1820-2000	2468-2712	252-277
1-3/8 in 34.9 mm	2380-2720	3227-3688	329-376
1-1/2 in 38.1 mm	3160-3560	4285-4827	437-492

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TORQUE SPECIFICATIONS - STEEL HYDRAULIC FITTINGS

Tube OD Hose ID	Thread Size	Pound-Feet	Newton metres	Kilogram metres
37 Degree Flare Fittings				
1/4 in 6.4 mm	7/16-20	6-12	8-16	0.8-1.7
5/16 in 7.9 mm	1/2-20	8-16	11-21	1.1-2.2
3/8 in 9.5 mm	9/16-18	10-25	14-33	1.4-3.5
1/2 in 12.7 mm	3/4-16	15-42	20-56	2.1-5.8
5/8 in 15.9 mm	7/8-14	25-58	34-78	3.5-8.0
3/4 in 19.0 mm	1-1/16-12	40-80	54-108	5.5-11.1
7/8 in 22.2 mm	1-3/16-12	60-100	81-135	8.3-13.9
1.0 in 25.4 mm	1-5/16-12	75-117	102-158	10.4-16.2
1-1/4 in 31.8 mm	1-5/8-12	125-165	169-223	17.3-22.8
1-1/2 in 38.1 mm	1-7/8-12	210-250	285-338	29.0-34.6

Tube OD Hose ID	Thread Size	Pound-Feet	Newton metres	Kilogram metres
Straight Threads with O-ring				
1/4 in 6.4 mm	7/16-20	12-19	16-25	1.7-2.6
5/16 in 7.9 mm	1/2-20	16-25	22-33	2.2-3.5
3/8 in 9.5 mm	9/16-18	25-40	34-54	3.5-5.5
1/2 in 12.7 mm	3/4-16	42-67	57-90	5.8-9.3
5/8 in 15.9 mm	7/8-14	58-92	79-124	8.0-12.7
3/4 in 19.0 mm	1-1/16-12	80-128	108-174	11.1-17.8
7/8 in 22.2 mm	1-3/16-12	100-160	136-216	13.8-22.1
1.0 in 25.4 mm	1-5/16-12	117-187	159-253	16.2-25.9
1-1/4 in 31.8 mm	1-5/8-12	165-264	224-357	22.8-36.5
1-1/2 in 38.1 mm	1-7/8-12	250-400	339-542	34.6-55.3

Split Flange Mounting Bolts			
Size	Pound-Feet	Newton metres	Kilogram metres
5/16-18	15-20	20-27	2.1-2.8
3/8-16	20-25	26-33	2.8-3.5
7/16-14	35-45	47-61	4.7-6.2
1/2-13	55-65	74-88	7.6-9.0
5/8-11	140-150	190-203	19.4-20.7

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Section 1002

MAINTENANCE AND LUBRICATION

Written In *Clear And Simple English*

CASE CORPORATION

9-69310

Printed in U.S.A.
Issued October 1982

FLUIDS AND LUBRICANTS

COMPONENT	CAPACITY		SPECIFICATIONS
	U.S.	Metric	
Fuel tank	33 gallons	125 litres	Diesel Fuel, See Operators Manual
Engine crankcase Without filter change With filter change	 *16 quarts *17 quarts	 *15.1 litres *16.1 litres	Case HDM Oil Alternate engine oil: CD-Commercial class D Above 32°F (0°C) .....SAE 30 -10 - 50°F (-12 - 10°C) .....SAE 20 Below 32°F (0°C) .....SAE 10W
Hydraulic reservoir Total system Refill capacity With filter change Without filter change	 48 gallons 19.5 gallons 18.9 gallons	 181.7 litres 73.6 litres 71.5 litres	Case TCH Fluid Alternate oils: Automatic transmission fluid (ATF) such as Dexron II
Transmission oil	16 quarts	15.1 litres	Case TCH Fluid
Axle Center Bowl Planetary (each)	 8 quarts 2 quarts	 7.5 litres 1.9 litres	Case FDL multipurpose gear lubricant (API-GL-4) Above 40°F (4°C) .....SAE 140 -15 to 70°F (-26 to 21°C) .....SAE 80W -40 to 35°F (-40 to 2°C) .....SAE 75W
Engine cooling system With heater Without heater	 37 quarts 36 quarts	 35 litres 34 litres	A mixture of half ethylene glycol (antifreeze) and half water must be used at all times. If the coldest outside temperature will be colder than -34°F (-36°) add antifreeze.
Batteries	As needed		Add drinking water or distilled water
Alcohol evaporator	1 pint	0.5 litres	Clean methyl alcohol
Grease fittings	As needed		Number 2 molydisulfide grease
Wheel bearings	As needed		Number 2 wheel bearing grease

*Add 2 quarts (1.9 litres) if engine oil cooler is serviced.

MAINTENANCE CHART

This chart shows maximum service intervals for the correct maintenance of the machine. Some operating conditions will make it necessary to increase the service intervals.

INTERVAL	SERVICE	INSTRUCTIONS
After the first 2 hours of operation, new machine only	Tighten the wheel nuts and bolts.	See Section 6229.
	Tighten the mounting bolts for the rear axle.	See Section 6226.
	Tighten the mounting bolts for the swing cylinders.	See Section 9100.
	Tighten the nut on the upper pivot pin for the swing tower.	See Section 9100.
After the first 20 hours of operation, new machine only	Do the After Delivery Check.	See the Operators Manual.
Every 10 hours of operation or each day, whichever occurs first	Lubricate the loader and backhoe pivot points.	
	Lubricate the dipper extension, if equipped.	
	Lubricate the front axle pivot points.	
	Check the level of the engine oil.	
	Check the brakes for correct operation.	
	Check the level of the coolant in the radiator.	
	Check the level of the hydraulic oil.	See Section 8002.
	Clean the dust cup for the air cleaner, if equipped.	
	Clean or replace all safety and instruction decals that cannot be read.	See Section 9201.
	Remove water from the air reservoir.	
	Check the sediment bowl of the fuel transfer pump. If you see water or sediment, clean the sediment bowl.	
After every 50 hours of operation or each week, whichever occurs first	Lubricate the front axle king pins.	
	Lubricate the three grease fittings of the driveshaft	See Section 6222.
	Lubricate the four grease fittings of the brake shafts and brake adjusters	See Section 7123.
	Check the transmission oil level	
	Lubricate the anti-rollback pivots	

INTERVAL	SERVICE	INSTRUCTIONS
Every 100 hours of operation	Lubricate the seat post	
	Operate the air conditioner to lubricate the compressor seals.	
	Change the engine oil	
	Clean the spark arrestor muffler, if equipped.	See Section 2005.
	Lubricate the boom release pivot.	
Every 200 hours of operation	Replace the engine oil filter	
After every 250 hours of operation or each month, whichever occurs first	Lubricate the auxiliary loader control lever pivot	
	Lubricate the backhoe control pivots	
	Check the oil level in the rear axle planetaries	See Section 6226.
	Check the oil level in the rear axle center bowl	See Section 6226.
	Clean the screen in the alcohol evaporator	See Section 7111.
Every 500 hours of operation	Lubricate the drive coupling for the hydraulic pump	See Section 8005.
	Replace the fuel filters	See Section 3010.
	Lubricate the front wheel bearings	See Section 5021.
	Inspect the ROPS cab or ROPS canopy	See Section 9021.
	Replace the hydraulic filter	See Section 8002.
	Check the engine valve adjustment	See Section 2015.
	Check the drive belt(s) tension	See Section 4007.
	Change the transmission oil	See Section 6202.
	Clean the electric fuel pump filter, if equipped	See Section 3053.
After every 1000 hours of operation or two times a year, whichever comes first	Change the hydraulic oil	See Section 8002.
	Clean the hydraulic oil suction screen.	See Section 8002.
	Clean the transmission screen.	See Section 6202.
	Change the oil for the rear axle.	See Section 6226.
	Change the oil for the transmission.	See Section 6202.
	Check the battery fluid level.	See Section 4005.
	Clean the cab air filter (if equipped).	See Section 9061.

INTERVAL	SERVICE	INSTRUCTIONS
After every 2000 hours of operation or each year, whichever occurs first	Change the coolant in the radiator. Clean the cooling system.	See Fluids and Lubricants Chart.
	Drain water and sediment from fuel tank.	See Section 3052.
	Disassemble, clean, and replace gaskets in the alcohol evaporator	See Section 7111.
As necessary	Service the air cleaner filters when the air filter warning lamp is illuminated	See Section 2005.
	Replace the hydraulic filter when the warning lamp for the hydraulic filter is illuminated during operation	See Section 8002.
	When a wheel is removed and installed, tighten the bolts for the wheel every two hours until the torque does not change.	See Section 6229.
	Replace the ether can for the ether injection system.	
	Fill the alcohol evaporator, if equipped	
	Refill or replace fire extinguisher after using, if equipped	
	Replace the transmission oil filter after the first 50 and 100 hours of operation if a new or rebuilt transmission has been installed, or if the transmission has been repaired.	See Section 6202.

Section

1010

GENERAL ENGINE SPECIFICATIONS

780CK Series B Loader

Written In *Clear And Simple English*

CASE CORPORATION

Rac 8-23230

Printed in U.S.A.

April, 1981

DIESEL ENGINES

General

Type	4 Cylinder, 4 Stroke Cycle, Turbocharged, Valve In Cylinder Head
Firing Order	1-3-4-2
Bore	4-5/8 Inches (117.5mm)
Stroke	5 Inches (127mm)
Piston Displacement	336 Cubic Inches (8 259cm^3)
Compression Ratio	15.8 to 1
No Load Governed Speed	2300 to 2400 RPM
Rated Engine Speed	2200 RPM
Engine Idle Speed	725 to 775 RPM
Valve Tappet Clearance (Exhaust)	(Cold) .025 Inch (0.635mm)
(Intake)	(Cold) .015 Inch (0.381mm)
Thermostat Operating Range	175°F to 202°F (79°C to 94°C)

Piston and Connecting Rods

Rings per Piston	3
Number of Compression Rings	2
Number of Oil Rings	1
Type Pins	Full Float Type
Type Bearing	Steel Back With Aluminum or Copper and Lead Liners. Replacement Bearings Available.

Main Bearings

Number of Bearings	5
Type Bearings	Steel Back With Aluminum or Copper and Lead Liners. Replacement Bearings Available.

Engine Lubricating System

Oil Pressure	45 to 60 PSI (310 to 414 kPa) With Engine Warm and Operating at Rated Engine Speed
Type System	Pressure and Spray
Oil Pump	Gear Type
Oil Filter	Full Flow Turn on Type
Oil Capacity With Filter	17 U.S. Quarts (16.1 litre)
Without Filter	16 U.S. Quarts (15.1 litre)

Fuel System

Fuel Injection Pump	Robert Bosch, Type PES Multiple Plunger
Pump Timing	25 Degrees Before Top Center (Port Closing)
Fuel Injectors	17 mm, Opening Pressure 3950 to 4100 PSI (27 234 to 28 268 kPa)
Fuel Transfer Pump	Plunger Type, Part of Injection Pump
Governor	Variable Speed, Part of fuel Injection Pump
First Stage Fuel Filter	Full Flow Turn on Type
Second Stage Fuel Filter	Full Flow Turn on Type
Hand Primer Pump	Location is on Top of Fuel Transfer Pump
Primary Fuel Filter	Location is at Bottom of Fuel Transfer Pump

Section

1023

SPECIFICATION DETAILS

336BD AND 336BDT ENGINE

Written In *Clear And Simple English*

CASE CORPORATION

Rac 9-78647

Printed in U.S.A.
March, 1981

FRACTION to DECIMAL to MILLIMETER CONVERSION TABLE

Fraction	Decimal	MM	Fraction	Decimal	MM	Fraction	Decimal	MM
1/64	.0156	0.397	23/64	.3593	9.128	45/64	.7031	17.859
1/32	.0312	0.794	3/8	.3750	9.525	23/32	.7187	18.256
3/64	.0468	1.191	25/64	.3906	9.922	47/64	.7343	18.653
1/16	.0625	1.587	13/32	.4062	10.319	3/4	.7500	19.050
5/64	.0781	1.984	27/64	.4218	10.716	49/64	.7656	19.447
3/32	.0937	2.381	7/16	.4375	11.113	25/32	.7812	19.844
7/64	.1093	2.778	29/64	.4531	11.509	51/64	.7968	20.240
1/8	.1250	3.175	15/32	.4687	11.906	13/16	.8125	20.637
9/64	.1406	3.572	31/64	.4843	12.303	53/64	.8281	21.034
5/32	.1562	3.969	1/2	.5000	12.700	27/32	.8437	21.431
11/64	.1718	4.366	33/64	.5156	13.097	55/64	.8593	21.828
3/16	.1875	4.762	17/32	.5312	13.494	7/8	.8750	22.225
13/64	.2031	5.159	35/64	.5468	13.890	57/64	.8906	22.622
7/32	.2187	5.556	9/16	.5625	14.287	29/32	.9062	23.019
15/64	.2343	5.953	37/64	.5781	14.684	59/64	.9218	23.415
1/4	.2500	6.350	19/32	.5937	15.081	15/16	.9375	23.812
17/64	.2656	6.747	39/64	.6093	15.478	61/64	.9531	24.209
9/32	.2812	7.144	5/8	.6250	15.875	31/32	.9687	24.606
19/64	.2968	7.541	41/64	.6406	16.272	63/64	.9843	25.003
5/16	.3125	7.937	21/32	.6562	16.669	1	1.0000	25.400
21/64	.3281	8.334	43/64	.6718	17.065			
11/32	.3437	8.731	11/16	.6875	17.462			

INCH to MILLIMETER CONVERSION TABLE

Inch	MM	Inch	MM	Inch	MM	Inch	MM
1	25.400	6	152.000	10	254.000	60	1,524.000
2	50.800	7	177.800	20	508.000	70	1,778.000
3	76.200	8	203.200	30	762.000	80	2,032.000
4	101.600	9	228.600	40	1,016.000	90	2,286.000
5	127.000	10	254.000	50	1,270.000	100	2,540.000