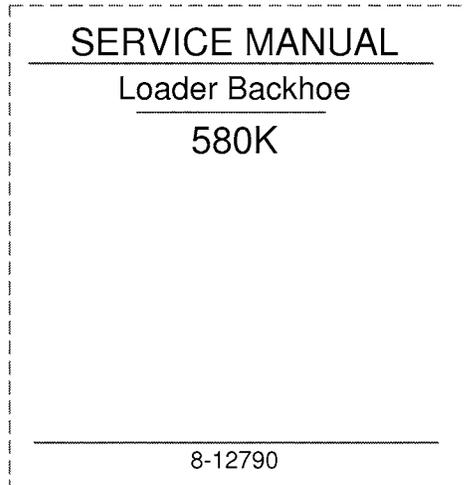


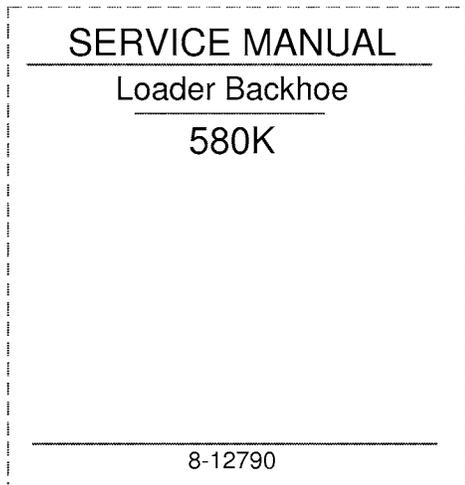
1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4



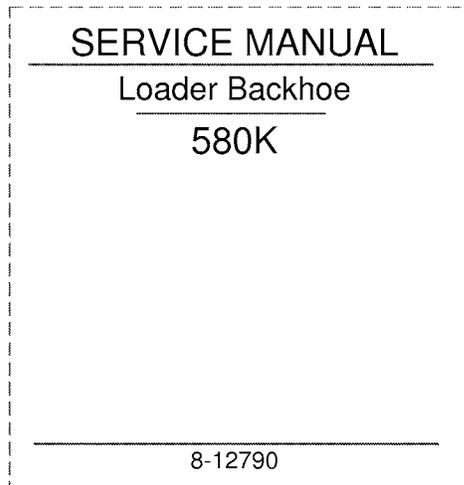
1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4



1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4



1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4

# 580K Loader Backhoe

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# 1001

## STANDARD TORQUE SPECIFICATIONS

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## TORQUE SPECIFICATIONS - DECIMAL 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, molydisulfide greases, or other extreme pressure lubricants are used.

Grade 5 Bolts, Nuts, and Studs		
		
Size	Pound-Feet	Newton metres
1/4 in	9-11	12-15
5/16 in	17-21	23-28
3/8 in	35-42	48-57
7/16 in	54-64	73-87
1/2 in	80-96	109-130
9/16 in	110-132	149-179
5/8 in	150-180	203-244
3/4 in	270-324	366-439
7/8 in	400-480	542-651
1.0 in	580-696	787-944
1-1/8 in	800-880	1085-1193
1-1/4 in	1120-1240	1519-1681
1-3/8 in	1460-1680	1980-2278
1-1/2 in	1940-2200	2631-2983

Grade 8 Bolts, Nuts, and Studs		
		
Size	Pound-Feet	Newton metres
1/4 in	12-15	16-20
5/16 in	24-29	33-39
3/8 in	45-54	61-73
7/16 in	70-84	95-114
1/2 in	110-132	149-179
9/16 in	160-192	217-260
5/8 in	220-264	298-358
3/4 in	380-456	515-618
7/8 in	600-720	814-976
1.0 in	900-1080	1220-1465
1-1/8 in	1280-1440	1736-1953
1-1/4 in	1820-2000	2468-2712
1-3/8 in	2380-2720	3227-3688
1-1/2 in	3160-3560	4285-4827

**NOTE:** Use thick nuts with Grade 8 bolts.

## TORQUE SPECIFICATIONS - METRIC HARDWARE

Use the following torques when special torques are not given.

These values apply to fasteners with coarse threads as received from supplier, plated or unplated, or when lubricated with engine oil. These values do not apply if graphite or molydisulfide grease or oil is used.

<b>Grade 8.8 Bolts, Nuts, and Studs</b>		
		
Size	Pound-Feet	Newton metres
<b>M4</b>	2-3	3-4
<b>M5</b>	5-6	6.5-8
<b>M6</b>	8-9	10.5-12
<b>M8</b>	19-23	26-31
<b>M10</b>	38-45	52-61
<b>M12</b>	66-79	90-107
<b>M14</b>	106-127	144-172
<b>M16</b>	160-200	217-271
<b>M20</b>	320-380	434-515
<b>M24</b>	500-600	675-815
<b>M30</b>	920-1100	1250-1500
<b>M36</b>	1600-1950	2175-2600

<b>Grade 10.9 Bolts, Nuts, and Studs</b>		
		
Size	Pound-Feet	Newton metres
<b>M4</b>	3-4	4-5
<b>M5</b>	7-8	9.5-11
<b>M6</b>	11-13	15-17.5
<b>M8</b>	27-32	37-43
<b>M10</b>	54-64	73-87
<b>M12</b>	93-112	125-15
<b>M14</b>	149-179	200-245
<b>M16</b>	230-280	310-380
<b>M20</b>	450-540	610-730
<b>M24</b>	780-940	1050-1275
<b>M30</b>	1470-1770	2000-2400
<b>M36</b>	2580-3090	3500-4200

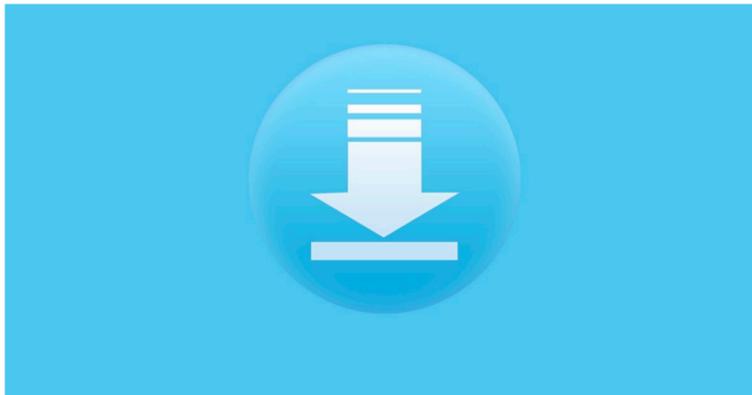
### Grade 12.9 Bolts, Nuts, and Studs



Usually the torque values specified for grade 10.9 fasteners can be used satisfactorily on grade 12.9 fasteners.

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## TORQUE SPECIFICATIONS - O-RING FACE SEAL FITTING

Nom. SAE Dash Size	Tube OD	Thread Size	Pound-Feet	Newton Metres	Thread Size	Pound-Feet	Newton Metres
<b>O-ring Face Seal End</b>					<b>O-ring Boss End Fitting or Locknut</b>		
-4	<b>1/4 in</b> 6.4 mm	9/16-18	10-12	14-16	7/16-20	17-20	23-27
-6	<b>3/8 in</b> 9.5 mm	11/16-16	18-20	24-27	9/16-18	25-30	33-40
-8	<b>1/2 in</b> 12.7 mm	13/16-16	32-40	43-54	3/4-16	45-50	61-68
-10	<b>5/8 in</b> 15.9 mm	1-14	46-56	60-75	7/8-14	60-65	81-88
-12	<b>3/4 in</b> 19.0 mm	1-3/16-12	65-80	90-110	1-1/16-12	85-90	115-122
-14	<b>7/8 in</b> 22.2 mm	1-3/16-12	65-80	90-110	1-3/16-12	95-100	129-136
-16	<b>1.0 in</b> 25.4 mm	1-7/16-12	92-105	125-140	1-5/16-12	115-125	156-169
-20	<b>1-1/4 in</b> 31.8 mm	1-11/16-12	125-140	170-190	1-5/8-12	150-160	203-217
-24	<b>1-1/2 in</b> 38.1 mm	2-12	150-180	200-254	1-7/8-12	190-200	258-271

# Section 1002

FLUIDS AND LUBRICANTS

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### CAPACITIES AND LUBRICANTS

Engine Oil	
Capacity with Filter Change .....	11.6 U.S. quarts (11 litres)
Type of oil.....	See Engine Oil Recommendations on page 1002-3
Engine Cooling System	
Capacity without heater.....	17.2 U.S. quarts (16.3 litres)
Capacity with heater.....	17.9 U.S. quarts (16.9 litres)
Type of coolant.....	Ethylene glycol and water mixed for lowest ambient temperature At least 50/50 mix
Fuel Tank	
Capacity.....	25 U.S. gallons (94.6 litres)
Type of fuel.....	See Diesel fuel specifications on page 1002-4
Hydraulic System	
Hydraulic reservoir refill capacity .....	21.5 U.S. gallons (81.4 litres)
Type of oil.....	Case TCH Fluid
Transmission	
Capacity.....	47.6 U.S. quarts (45 litres)
Total System Capacity .....	57.1 U.S. quarts (54 litres)
Type of oil.....	Case Hy-Trans Plus (MS 1207)
Front Axle - Four Wheel Drive	
Capacity of center bowl .....	7.4 quarts (7 litres)
Capacity of planetary (each).....	1.1 U.S. quarts (1 litre)
Type of oil.....	CaseIH 135-H EP gear lube
Brake Reservoir	
Type of fluid.....	Case TCH Fluid





# Section

# 1024

## SPECIFICATION DETAILS

Written In *Clear  
And  
Simple  
English*

**IMPORTANT:** *This engine was made using the metric measurement system. All measurements and checks must be made with metric tools to make sure of an accurate reading when inspecting parts.*

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## RUN-IN INSTRUCTIONS

### Engine Lubrication

Fill the engine crankcase with CC or CD service classification oil that has the correct viscosity rating for the ambient air temperature. Install new oil filters, after the engine has been rebuilt.

### Run-In Procedure For Rebuilt Engine

- Step 1 Disconnect the wire to the electric shut-off on the injection pump so that the engine will not start. Crank the engine for 30 seconds until there is oil pressure, then reconnect the wire.
- Step 2 Remove the air from the cooling system at the temperature sending unit.
- Step 3 Run the engine at 1000 RPM minimum load for 5 minutes and check for oil leaks.
- Step 4 During the Run-In, continue to check the oil pressure, coolant level, and coolant temperature.

### Run-In Procedure For Rebuilt Engines (With A Dynamometer)

The following procedure must be followed when using a PTO dynamometer to Run-In the engine. The dynamometer will control the engine load at each speed and will remove stress on new parts during Run-In.

During the Run-In, continue to check the oil pressure, coolant level and coolant temperature.

STEP	TIME	ENGINE SPEED	DYNAMOMETER SCALE LOAD
1	5 Minutes	1000 RPM	50
2	5 Minutes	1100 RPM	1/2
3	5 Minutes	2200 RPM	Full

### Run-In Procedure for Rebuilt Engines (Without A Dynamometer)

STEP	TIME	ENGINE SPEED	LOAD
1	5 Minutes	1000 RPM	No Load
2	5 Minutes	1100 RPM	Light Load
3	5 Minutes	2200 RPM	Light Load

### Run-In Procedure (Agriculture Tractors)

For the first 8 hours of field operation stay one gear lower than normal. For the next 12 hours DO NOT "lug" the engine. Prevent "lugging" by moving the lever to a lower gear. The engine must not be "lugged" below the rated engine RPM during early hours of life.

### Run-In Procedure (Construction Equipment)

For the first 8 hours, operate the engine at full throttle maintaining a normal load. DO NOT "baby" the engine, but avoid converter or hydraulic stall. The engine must not be "lugged" below the Rated Engine RPM (Do not stall the engine more than 10 seconds).

## ENGINE SPECIFICATION DETAILS

### Cylinder Block

	Metric Value
Type .....	Non-Sleeved
Material .....	Cast Iron
ID of Cylinder .....	102.00 to 102.04 mm
Maximum Service Limit .....	102.116 mm
Cylinder Out of Round (Maximum) .....	0.038 mm
Cylinder Taper (Maximum) .....	0.076 mm
0.5 mm Oversize Piston	
Machine Cylinder Bore to .....	102.50 to 102.54 mm
1.00 mm Oversize Piston	
Machine Cylinder Bore to .....	103.00 to 103.04 mm

### Service Cylinder Sleeve

Type .....	Dry, Can Be Replaced
Material .....	Cast Iron
Machine Cylinder Block Bore to .....	104.500 to 104.515 mm
Installation .....	Press Fit
Machine Sleeve Bore to:	
Standard Size Piston .....	102.00 to 102.04 mm
0.5 mm Oversize Piston .....	102.50 to 102.54 mm
1.0 mm Oversize Piston .....	103.00 to 103.04 mm

### Piston

Type .....	Cam Ground
Material .....	Aluminum alloy
OD at 12 mm From the Bottom, 90 Degrees Piston Pin	
Standard Size Piston .....	101.873 to 101.887 mm
Minimum Service Limit .....	101.823 mm
0.5 mm Oversize Piston .....	102.373 to 102.387 mm
Minimum Service Limit .....	101.323 mm
1.0 mm Oversize Piston .....	102.873 to 102.887 mm
Minimum Service Limit .....	102.823 mm
ID of Piston Pin Bore .....	40.006 to 40.012 mm
Maximum Service Limit .....	40.025 mm
Width of 1st Ring Groove (Top) .....	2.465 to 2.485 mm
Width of 2nd Ring Groove (Intermediate) .....	2.425 to 2.445 mm
Width of 3rd Ring Groove (Oil Ring) .....	4.040 to 4.060 mm
Protrusion Above Cylinder Block (Maximum) .....	0.660 mm

### Piston Pin

Type .....	Full Float
OD of Pin .....	39.997 to 40.003 mm
Minimum Service Limit .....	39.990 mm

## Piston Rings

No. 1 Compression 4T-390 Engine	Key Stone Type (Barrel Face)
End Gap in 102.02 ID	0.4 to 0.70 mm
No. 1 Compression 4-390 Engine	Rectangular Type (Barrel Face)
End Gap in 102.02 ID	0.25 to 0.55 mm
Maximum Service Limit	0.806 mm
Side Clearance	0.075 to 0.120 mm
Maximum Service Limit	0.15 mm
No. 2 Compression	Rectangular Type (Tapper Face)
End Gap in 102.02 ID	0.25 to 0.55 mm
Maximum Service Limit	0.806 mm
Side Clearance	0.075 to 0.120 mm
Maximum Service Limit	0.15 mm
No. 3 Oil Control Rings	Two Piece
End Gap in 102.02 ID	0.25 to 0.55 mm
Maximum Service Limit	0.806 mm
Side Clearance	0.130 mm

## Cylinder Head

Warpage (Maximum)	0.20 mm
-------------------	---------

## Lifters

Material	Hardened Iron
OD of Lifter	15.961 to 15.977 mm
Minimum Service Limit	15.960 mm
Bore Diameter in Block	16.000 to 16.030 mm
Maximum Service Limit	16.055 mm

## Connecting Rod

Bushing	Steel Backed Leaded Bronze
Bushing ID Installed (Ream to Size)	40.053 to 40.067 mm
Maximum Service Limit	40.092 mm
Bearing Liners	Replaceable
Journal ID Without Bearing Liners	72.987 to 73.013 mm
Bearing Oil Clearance	0.038 to 0.116 mm
Maximum Service Limit	0.129 mm
Side Clearance	0.100 to 0.300 mm
Maximum Service Limit	0.330 mm
Connecting Rod Bend (Maximum)	
Without Bushing	0.200 mm
With Bushing	0.150 mm
Connecting Rod Twist (Maximum)	
Without Bushing	0.500 mm
With Bushing	0.300 mm

**Crankshaft**

Type .....	Hardened Steel, Balanced
Main Bearing Liners .....	Replaceable
End Clearance, Center Main Bearing Cap .....	0.041 to 0.119 mm
Center Main Bearing Thrust Surface Thickness .....	2.50 mm
Connecting Rod Journal	
OD, Standard .....	68.987 to 69.013 mm
Minimum Service Limit .....	68.962 mm
0.25 mm OD Undersize, Grind to .....	68.737 to 68.763 mm
Minimum Service Limit .....	68.712 mm
0.50 mm OD Undersize, Grind to .....	68.487 to 68.513 mm
Minimum Service Limit .....	68.462 mm
0.75 mm OD Undersize, Grind to .....	68.237 to 68.263 mm
Minimum Service Limit .....	68.212 mm
1.00 mm OD Undersize, Grind to .....	67.987 to 68.013 mm
Minimum Service Limit .....	67.962 mm
Connecting Rod Journal Maximum Taper .....	0.013 mm
Journals Out of Round Maximum .....	0.050 mm
Undersize Main Bearing Liners For Service .....	0.25, 0.50, 0.75 and 1.00 mm
Main Bearing Oil Clearance .....	0.041 to 0.119 mm
Maximum Service Limit .....	0.140 mm
Main Bearing Journal	
OD, Standard .....	82.987 to 83.013 mm
Minimum Service Limit .....	82.962 mm
0.25 mm OD Undersize, Grind to .....	82.737 to 82.763 mm
Minimum Service Limit .....	82.712 mm
0.50 mm OD Undersize, Grind to .....	82.487 to 82.513 mm
Minimum Service Limit .....	82.462 mm
0.75 mm OD Undersize, Grind to .....	82.237 to 82.263 mm
Minimum Service Limit .....	82.212 mm
1.00 mm OD Undersize, Grind to .....	81.987 to 82.013 mm
Minimum Service Limit .....	81.962 mm
Main Bearing Journal Bore ID No Liners .....	87.982 to 88.018 mm
Maximum Service Limit .....	88.031 mm
Main Journal Width:	
1st, 2nd, 3rd, 5th .....	37.424 to 37.576 mm
4th .....	37.475 to 37.525 mm
Connect Rod Journals Width .....	38.950 to 39.050 mm