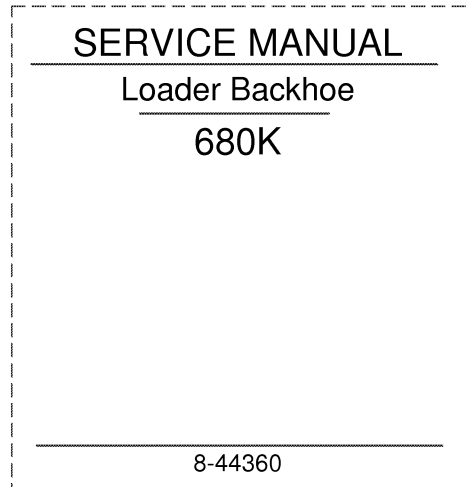


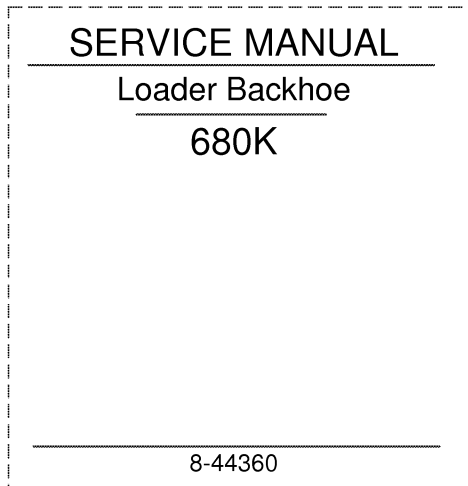
1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

TYPE 1-4



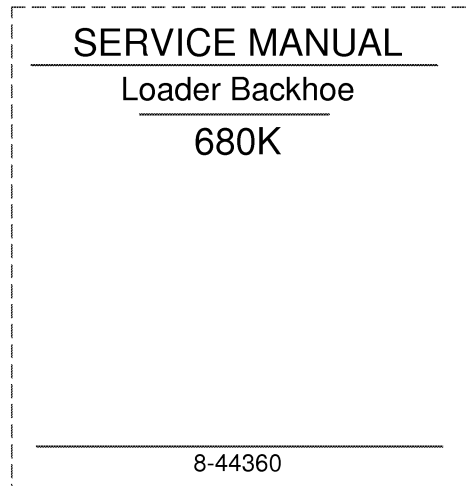
1. Trim along dashed line.
2. Slide into pocket on Binder Spine.

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

680K LOADER BACKHOE

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SAFETY RULES, SERVICE MANUAL INTRODUCTION, AND TORQUE SPECIFICATIONS

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Written In *Clear
And
Simple
English*

SAFETY RULES

 **This symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED.** The message that follows the symbol contains important information about safety. Carefully read the message. Make sure you fully understand the causes of possible injury or death. 1-1-C


NOTE: 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.

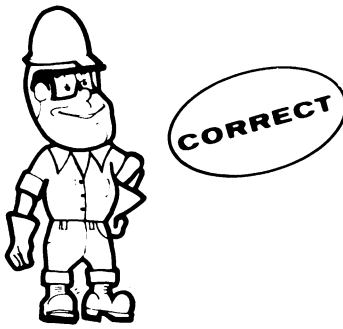



 **WARNING:** This is a one man machine, no riders allowed. 35-8


 **WARNING:** Before starting engine, study operator's manual safety messages. Read all safety signs on machine. Clear the area of other persons. Learn and practice safe use of controls before operating.


It is your responsibility to understand and follow manufacturer's instructions on machine operation, service, and to observe pertinent laws and regulations. Operator's and service manuals may be obtained from your J I Case dealer. 45-2

 **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



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



CAUTION: Lower all attachments to the ground or use stands to safely support the attachments before you do any maintenance or service. 49-11



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 or track off the floor. Always block machine in place with suitable safety stands. 40-7-A



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



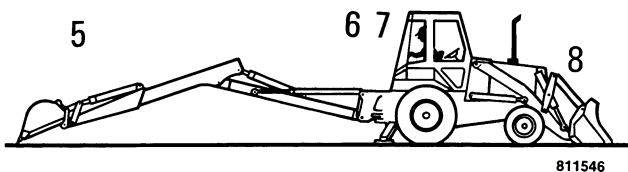
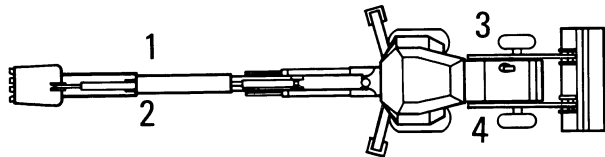
DANGER: Engine exhaust fumes can cause death. If it is necessary to start the engine in a closed place, remove the exhaust fumes from the area with an exhaust pipe extension. If you do not have an exhaust pipe extension, open the doors and get outside air into the area. 48-56

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. <i>Right Side-Backhoe</i> | 5. <i>Front-Backhoe</i> |
| 2. <i>Left Side-Backhoe</i> | 6. <i>Rear-Backhoe</i> |
| 3. <i>Left Side-Machine</i> | 7. <i>Rear-Machine</i> |
| 4. <i>Right Side-Machine</i> | 8. <i>Front-Machine</i> |

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 also have a Table of Contents.

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.

Clear and Simple English

This manual is written in C.A.S.E. (Clear and Simple English). C.A.S.E. is easier to read than "regular" English because C.A.S.E. uses a small number of common words and has special rules for writing.

All sections written in C.A.S.E. are indicated by the symbol below.

Written In *Clear
And
Simple
English*

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

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

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 moly-disulfide grease or oil is used.

Grade 8.8 Bolts, Nuts, and Studs			
			
Size	Pound-Feet	Newton metres	Kilogram metres
M4 0.15 in	2-3	3-4	0.3-0.4
M5 0.19 in	5-6	6.5-8	0.7-0.8
M6 0.23 in	8-9	10.5-12	1.1-1.2
M8 0.31 in	19-23	26-31	2.6-3.2
M10 0.39 in	38-45	52-61	5.3-6.2
M12 0.46 in	66-79	90-107	9.1-10.9
M14 0.55 in	106-127	144-172	14.7-17.6
M16 0.62 in	160-200	217-271	22.1-27.7
M20 0.78 in	320-380	434-515	44.2-52.5
M24 0.94 in	500-600	675-815	69.1-83.0
M30 1.17 in	920-1100	1250-1500	127-152
M36 1.40 in	1600-1950	2175-2600	221-270

Grade 10.9 Bolts, Nuts, and Studs			
			
Size	Pound-Feet	Newton metres	Kilogram metres
M4 0.15 in	3-4	4-5	0.4-0.5
M5 0.19 in	7-8	9.5-11	1.0-1.1
M6 0.23 in	11-13	15-17.5	1.5-1.8
M8 0.31 in	27-32	37-43	3.7-4.4
M10 0.39 in	54-64	73-87	7.5-8.8
M12 0.46 in	93-112	125-150	12.9-15.5
M14 0.55 in	149-179	200-245	20.6-24.7
M16 0.62 in	230-280	310-380	31.8-38.7
M20 0.78 in	450-540	610-730	62.2-74.7
M24 0.94 in	780-940	1050-1275	108-130
M30 1.17 in	1470-1770	2000-2400	203-245
M36 1.40 in	2580-3090	3500-4200	357-427

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.

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

1002

MAINTENANCE AND LUBRICATION

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Systemgard Testing Schedule	1002-3	Maintenance Schedule	1002-3
Run-In Period	1002-3		

Written In *Clear
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Simple
English*

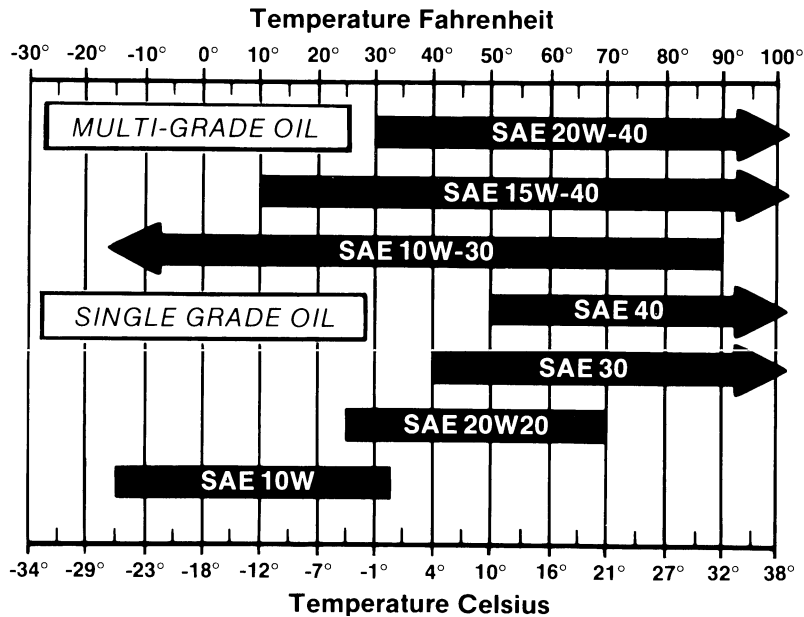
FLUIDS AND LUBRICANTS

Fuel Tank

Capacity38 U.S. gallons (144 litres)
 Specifications See the Operators Manual

Engine crankcase

Capacity - Without filter change 15 U.S. quarts (14.2 litres)
 With filter change 16 U.S. quarts (15 litres)
 Specifications Case HDM oil



Hydraulic system

Capacity - Reservoir 13.6 U.S. gallons (51.5 litres)
 Complete system 40.8 U.S. gallons (154 litres)
 Specifications Case TCH Fluid
 Alternate C3 hydraulic fluid

Transmission

Capacity 16 U.S. quarts (15.1 litres)
 Specifications Case TCH Fluid
 Alternate C3 hydraulic fluid

Rear axle

Capacity - Differential 8 U.S. quarts (7.6 litres)
 Planetary (each) 2 U.S. quarts (1.9 litres)
 Specifications Case FDL
 Alternate SAE 85/140 API GL-5

Engine cooling system

Capacity - With heater 27 U.S. quarts (25.6 litres)
 Without heater 25 U.S. quarts (23.7 litres)
 Specifications Mix ethylene glycol antifreeze and water. See the Operators Manual

Alcohol evaporator

Capacity one U.S. pint (0.47 litres)
 Specifications Clean methyl alcohol

Battery Drinking or distilled water

Grease fittings Multipurpose molydisulfide grease

Front wheel bearings Number 2 wheel bearing grease

SYSTEMGARD TESTING SCHEDULE

Get samples of lubricants for Systemgard analysis at the intervals shown below. Follow the instructions with the Systemgard kits.

NOTE: *Get your sample before you drain the lubricant.*

Engine	Every 250 hours of operation (every oil change)
Hydraulic Reservoir	Every 500 hours of operation or 3 times each year
Transmission	Every 500 hours of operation or 3 times each year
Rear Axle	Every 500 hours of operation or 3 times each year

RUN-IN PERIOD

During the first 20 hours of operation for a new machine, or a machine with a rebuilt engine, make sure you do the following:

1. Operate the machine with normal loads for the first 8 hours.
2. Keep the engine at normal operating temperatures.
3. Do not run the engine at idle speeds for long periods of times.
4. See the Run-In Maintenance Schedule on this page for additional information.

RUN-IN MAINTENANCE SCHEDULE

The following items are to be done during the Run-In Period and are in addition to the items in the Maintenance Schedule on the following page.

After The First 2 Hours Of Operation

Tighten the wheel nuts and bolts until the nuts and bolts remain tight	Section 6229
Tighten the rear axle mounting bolts	Section 6226
Tighten the swing cylinder mounting bolts (Trunnion mounting plates)	Section 9100
Check the upper nut of the swing pivot pin	Section 9100

After The First 20 Hours Of Operation

Have your Case dealer do the After Delivery Check	See Operators Manual
---	----------------------

After The First 50 And First 100 Hours Of Operation

Replace the transmission fluid filter	See Operators Manual
---	----------------------

After The First 100 Hours Of Operation

Tighten all hose clamps	-----
-------------------------------	-------

MAINTENANCE SCHEDULE

The items in this maintenance schedule are at maximum intervals. If you are operating the machine under severe conditions (high temperatures, mud, dust, water, etc.), shorten the intervals.

As Required

- Check the fan drive belt Replace as required
- Service the air cleaner if the air cleaner warning lamp illuminates See Section 2001
- Replace the hydraulic filter if the hydraulic filter warning lamp illuminates See Operators Manual
- Drain water and remove sediment from the fuel system See Operators Manual
- After a wheel has been removed and installed, check the wheel bolt torque every two hours of operation until the bolts remain tight See Section 6229
- Fill the alcohol evaporator (if equipped) See Operators Manual

Every 10 Hours Of Operation Or Each Day Whichever Occurs First

- Lubricate the loader pivot points (24 grease fittings) See Operators Manual
- Lubricate the backhoe pivot points (25 grease fittings) See Operators Manual
- Lubricate the 4-in-1 bucket pivot points (6 grease fittings) if equipped See Operators Manual
- Lubricate the Extendahoe dipper slide (12 holes) if equipped See Operators Manual
- Lubricate the front axle pivots (2 remote grease fittings) one each side See Operators Manual
- Check the engine oil level See Operators Manual
- Drain water from the air reservoir See Operators Manual
- Clean or replace all safety decals and instruction decals that cannot be read See Operators Manual

Every 50 Hours Of Operation

- Lubricate the anti-rollback pivot point (two grease fittings) See Operators Manual
- Lubricate the front axle kingpins (2 grease fittings) one each side See Operators Manual
- Lubricate the drive shaft universal joints and slip spline (3 grease fittings) See Operators Manual
- Lubricate the brake shaft and brake adjusters (4 grease fittings) See Operators Manual
- Check the hydraulic fluid level See Operators Manual
- Check the air cleaner dust valve and cover wing nut See Operators Manual
- Check the coolant reservoir fluid level See Operators Manual
- Check the transmission oil level See Operators Manual
- Check the fuel tank for water See Operators Manual

Every 100 Hours Of Operation

- Lubricate the boom release pivot pin (one grease fitting) See Operators Manual
- Clean the spark arresting muffler See Section 2001
- Check the tire pressure and tire condition See Section 6229

Every 250 Hours Of Operation

- Lubricate the seat post (one grease fitting) See Operators Manual
- Lubricate the backhoe and loader control lever pivots (9 standard backhoe, 10 extendahoe, and one optional loader control lever) See Operators Manual
- Change the engine oil and replace the engine oil filter See Operators Manual
- Check the rear axle oil level at the center bowl and at each planetary end. See Operators Manual
- Check the tension of the air conditioning and air compressor drive belt See Sections 7103 and 9003
- Check the radiator fluid level (with coolant cold) See Operators Manual
- Clean the batteries and check the battery fluid level See Section 4005
- Clean the alcohol evaporator screen (if equipped) See Operators Manual

Every 500 Hours Of Operation

- Replace the fuel filters See Operators Manual
- Replace the transmission filter See Operators Manual
- Lubricate the front wheel bearing See Operators Manual

Every 1000 Hours Of Operation

- Change the transmission oil See Operators Manual
- Clean the transmission suction screen See Operators Manual
- Replace the hydraulic fluid filter See Operators Manual
- Change the hydraulic reservoir fluid See Operators Manual
- Clean the hydraulic fluid suction screen See Operators Manual
- Change the rear axle oil See Operators Manual
- Check the engine valve adjustment See Section 2415
- Clean the cab air filter See Operators Manual
- Check the battery fluid level (maintenance free batteries) See Section 4005

Every 2000 Hours Of Operation Or Each Year

- Drain, flush, and refill the engine cooling system See Operators Manual
- Service the alcohol evaporator (if equipped) See Operators Manual

Section 1010

GENERAL ENGINE SPECIFICATIONS

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.*

ENGINE SPECIFICATIONS

General

Type	6 Cylinder, 4 Stroke Cycle, Valve-In-Head
Firing Order	1,5,3,6,2,4
Bore	102 mm
Stroke	120 mm
Piston Displacement	5.88 Litres
Compression Ratio	17.0 to 1
No Load Governed Speed	2345 to 2440 RPM
Rated Engine Speed	2305 to 2385 RPM
Engine Idle Speed	700 to 750 RPM
Valve Tappet Clearance (Exhaust)(Cold)	0.508 mm
(Intake)(Cold)	0.254 mm
Thermostat Operating Range	181°F to 203°F (83°C to 95°C)

Piston and Connecting Rods

Rings Per Piston	3
Number of Compression Rings	2
Number of Oil Rings (two piece)	1
Type of Pins	Full Float
Type Bearings	Steel Back Leaded Bronze

Main Bearings

Number of Bearings	7
Type of Bearings	Replaceable

Engine Lubricating System

Oil Pressure	42 to 54 PSI (290 to 372 kPa)(2.90 to 3.72 bar) with Engine Warm at Rated Engine Speed
Type of System	Pressure and Spray Lubrication
Oil Pump	Rotor Type
Oil Filter	Full Flow Turn-on Type
Oil Capacity (with filter)	16 Quarts (15 litres)
(without filter)	15 Quarts (14.3 litres)

Fuel System

Fuel Injection Pump	CAV
Pump Timing	Top Center
Fuel Injectors	Bosch 17 mm Opening Pressure (New) 3190 to 3310 PSI (21 994 to 22 822 kPa)(220 to 228 Bar)
Governor	Variable Speed, a Part of the Injection Pump
First Stage Fuel Filter	Turn on Type
Second Stage Fuel Filter	Turn on Type
Lift Pump	5 to 7 PSI (34 to 48 kPa)(0.34 to 0.48 Bar)

NOTE: The J I Case Company reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

Section 1024

SPECIFICATION DETAILS

Written In *Clear
And
Simple
English*

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Click on the image link below for the full version of the service manual

