1835 UNI-LOADER TABLE OF CONTENTS AND SERVICE MANUAL INTRODUCTION

Table of Contents

SERIES/SECTION	SECTION NO.	FORM NO.
10 SERIES - GENERAL		
General Engine Specifications - 188D Diesel	1010	8-22720
Decals and Painting	1012	9-68700
Detailed Engine Specifications - 188D Diesel	1027	9-78675
Maintenance and Lubrication	1050	9-68700
Torque Charts	1051	9-68700
Noise Control	1052	9-68700
General Engine Specifications - 148G Spark Ignition	1110	8-22790
Detailed Engine Specifications - 148G Spark Ignition	1129	9-79086
20 SERIES - ENGINE		
Engine Diagnosis	2001	9-78875
Engine Tune-Up - 188D Diesel	2002	9-78825
Cylinder Head, Valve Train and Camshaft - 188D Diesel	2015	9-78836
Cylinder Block, Sleeves, Pistons and Rods - 188D Diesel	2025	9-78855
Crankshaft, Bearings, Flywheel and Oil Seals - 188D Diesel	2035	9-78866
Oil Pump - 188D Diesel	2045	9-78885
General Engine Information	2050	9-68700
Air Cleaner and Muffler	2051	9-68700
Ether Injection	2053	9-68700
Cooling System - 188D Diesel	2055	9-78816
Engine Tune-Up - 148G Spark Ignition	2102	8-22800
Cylinder Head, Valve Train and Camshaft - 148G Spark Ignition	2115	8-22810
Cylinder Block, Sleeves, Pistons and Rods - 148G Spark Ignition	2125	8-22820
Crankshaft, Bearings, Flywheel and Oil Seals - 148G Spark Ignition	2135	8-22830
Oil Pump - 148G Spark Ignition	2145	8-22840
Cooling System - 148G Spark Ignition	2155	8-22850
Engine Lubrication - 188D Diesel	2555	9-78985
30 SERIES - FUEL SYSTEM		
Fuel Filters - 188D Diesel	3010	8-22770
Fuel Injection Pump	3012	9-78795
Fuel Injectors	3013	9-78806
Engine Controls, Fuel Lines, and Fuel Tank	3052	9-68700
Carburetor	3112	8-22870
40 SERIES - ELECTRICAL SYSTEM		
Electrical System Specifications and Troubleshooting	4002	9-68700
Wiring Diagram	4003	9-68700
Gauges	4004	9-68700
Battery	4005	9-68700
Starter and Solenoid	4006	9-68700
Alternator	4007	9-68700
Spark Ignition System	4008	9-68700
Electrical Accessories	4015	9-68700

CASE CORPORATION

CE Div. 9-68700
June 1980

PRINTED IN U S.A

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

SPECIAL TORQUES

Engine

	U.S. Value	Metric Value
Camshaft nut	80 to 90 ft. lbs.	109 to 122 Nm
Camshaft thrust plate mounting bolt	17 to 20 ft. lbs.	23 to 27 Nm
Connecting rod nuts	45 to 50 ft. lbs.	61 to 68 Nm
Crankshaft nut	125 to 135 ft. lbs.	169 to 183 Nm
Crankshaft pulley bolt	54 to 64 ft. lbs.	73 to 87 Nm
Cylinder head studs w/flange nuts (1/2")	90 to 100 ft .lbs.	122 to 136 Nm
Cylinder head cover stud nuts (3/8")	4 to 6 ft. lbs.	5 to 8 Nm
Cylinder head bolts (Gr. 8, 12 pt. hd.)	105 to 115 ft. lbs.	142 to 156 Nm
Cylinder head stud nuts (1/2")	95 to 105 ft. lbs.	129 to 142 Nm
Engine oil filter	Install until gasket contacts filter head, then hand tighten 1/2 turn. Loosen filter approximately 1 full turn and retighten until gasket contact is made, then hand tighten an additional 1/2 to 3/4 turn.	
Fan mounting bolts	35 to 42 ft. lbs.	48 to 57 Nm
Fuel pump drive gear nut	40 to 50 ft. lbs.	54 to 68 Nm
Flywheel to crankshaft bolt	65 to 70 ft. lbs.	88 to 95 Nm
Idler gear journal mounting bolts	35 to 42 ft. lbs.	48 to 57 Nm
Intake manifold (Aluminum) stud nuts	30 to 35 ft. lbs.	41 to 48 Nm
Intake and Exhaust Manifold stud nuts	25 to 30 ft. lbs.	34 to 41 Nm
Main bearing cap bolts	90 to 100 ft. lbs.	122 to 136 Nm
Oil pan capscrews (stamped steel)	10 to 12 ft. lbs.	14 to 16 Nm
Oil pan capscrews (cast iron)	24 to 28 ft. lbs.	33 to 38 Nm
Oil pan to seal retainer	15 to 20 ft. lbs.	20 to 27 Nm
Oil pan drain plug	29 to 31 ft. lbs.	39 to 42 Nm
Oil pump cover capscrews	6 to 8 ft. lbs.	8 to 11 Nm
Oil seal retainer bolts (Grade 8)	12 to 15 ft. lbs.	16 to 20 Nm
Oil pump suction tube nut	95 to 105 ft. lbs.	129 to 142 Nm
Rocker arm bracket bolts	25 to 30 ft. lbs.	34 to 41 Nm
Timing gear housing bolts	25 to 30 ft. lbs.	34 to 41 Nm
Water pump mounting bolts	25 to 30 ft. lbs.	34 to 41 Nm
Water pump body-to-cyl. mounting bolts	35 to 42 ft. lbs.	48 to 57 Nm

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

LOW ENGINE OIL PRESSURE

Internal Problems

1. Engine Low On Oil

An engine low on oil could lose lubrication to internal parts and start scoring pistons, sleeves and damage engine bearings. Proper oil level is required to help dissipate some of the engine heat. Check engine oil level every eight hours of operation. Low engine oil can also give low oil pressure readings.

2. Oil Pump Relief Malfunction

Low engine oil pressure readings can be caused by a malfunctioning oil pump relief valve. A broken spring, a piece of metal under valve seat or abrasives could cause relief valve to score and hang up. Remove engine oil pan and oil pump assembly. Inspect pump relief valve and repair as necessary.

3. Engine Oil Too Light

Using engine oil that is too light will aggravate all oil consumption areas because of additional oil flow and leakage of the lighter oil. Light engine oil will give lower than normal oil pressure readings. Check for proper weight oil and change oil if required.

4. Oil Pump Suction Assembly Off Pump

It is possible for the oil pump suction assembly to come off the engine oil pump from improper installation, defective threads or jam nuts or worn cotter pin holding on the suction screen. With the pick up screen off, the pump would have little or no oil pressure. Remove oil pan and inspect oil pump suction assembly.

5. Engine Oil Pump Worn

The engine oil pump can be worn from long service, contaminates in the oil, improper installation or no backlash in pump drive gear. Remove engine oil pan and inspect oil pump.

6. Engine Main Bearings Worn

A worn main bearing will have a thudding sound and increased engine vibration. Both symptoms will increase as engine speed increases. By grounding out (cracking injector line) the problem cylinder, the thudding sound will stop or decrease but the vibration will remain. Remove engine oil pan and check main bearing clearance with plasti-gauge. Also, low oil pressure can be the result of worn main bearings and excessive oil clearance.

7. Connecting Rod Bearings Worn

Worn rod bearings cause more than normal throw off of lubricating oil to cylinder pistons and liners. This excess oil is sometimes more than worn piston oil rings can control. The oil then passes the rings and on into the combustion chamber. Remove the engine oil pan and check rod bearings for wear using plasti-gauge. A worn rod bearing can cause the engine to knock and low oil pressure.

8. Rocker Arm Shafts Indexed Wrong

Incorrect rocker arms or rocker arm shafts indexed wrong can lead to excessive oil in the rocker arm compartment. This oil aggravates oil consumption especially past valve guides. Remove valve cover and check oil flow from rocker arm assemblies.

9. Rocker Arm Assembly Worn

Worn rocker arm assemblies allow larger than normal amounts of lubricating oil into the valve compartment. The extra quanitity of oil increases oil consumption past the valve guides. Run the engine with valve cover removed and check for excessive oil or oil flow from the rocker arms.

10. Oil Pump Suction Screen Plugged

The oil pump suction screen can become plugged with sludge, metal filings and other contaminants in the oil. Many times the oil pressure will be normal when engine is first started. The longer the unit runs, the more contaminants are collected on the pick-up screen shutting off the supply of suction oil. Remove engine oil pan and inspect oil pump screen.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Section
1027

DETAILED SPECIFICATIONS

188 Diesel Engines

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

Rac. 9-78675

PRINTED IN U S A

CASE CORPORATION

PREVIEW. YOUFIXTHIS.COM

Download full manual at youfixthis.com

RUN-IN-INSTRUCTIONS

Engine Lubrication

When the engine rebuild is complete, fill the engine crankcase with Case HDM oil and install new engine oil filter. **NOTE:** If Case HDM oil is not used, use only a Series 3 DS or CD Service Classification oil that has the proper viscosity rating for prevailing air temperature. Refer to vehicle Operators Manual.

After the first 20 hours of operation, change the engine oil while the engine is hot and replace the the engine oil filter. DO NOT DRAIN OIL UNTIL THE ENGINE HAS BEEN OPERATED 20 HOURS.

Change the engine oil and filter at the recommended intervals thereafter as outlined in the Operator's Manual.

Break-In Procedure for Rebuilt Engines (With a Dynamometer)

The following procedure must be implemented when using a PTO dynamometer to break-in the engine. The dynamometer will insure control of the engine load at each speed and will eliminate over stressing new parts during break-in.

During the break-in, continually check the oil pressure, coolant level, and coolant temperature.

STEP	TIME	ENGINE SPEED	DYNAMOMETER SCALE LOAD*
1	**10 Minutes	1000 RPM	None
2	**10 Minutes	1800 RPM	None
3	20 Minutes	1800 RPM	1/3
4	20 Minutes	1800 RPM	1/2
5	***30 Minutes	100 RPM below rated speed	3/4
6	Retorque the cylinder head bolts using the procedure described in Section 2015 of this service manual.		

*Based upon normal dynamometer scale load at rated speed for the particular vehicle model. Reduce this scale load as indicated.

**The most ideal break-in procedure would be to constantly vary the throttle between 750 to 1000 RPM for the first 10 minutes and from 1000 RPM to 1800 RPM for the next 10 minutes. The purpose of this changing RPM is to vary the lubrication and coolant flow.

***30 minutes at 3/4 load is a minimum amount of time the engine should be run. It is recommended that whenever possible the engine (especially turbocharged diesels) should be run for four (4) hours or more at the above speed and load before checking the full engine horsepower or before using the engine for heavy field work.

Break-In Procedure for Rebuilt Engines (Without a Dynamometer)

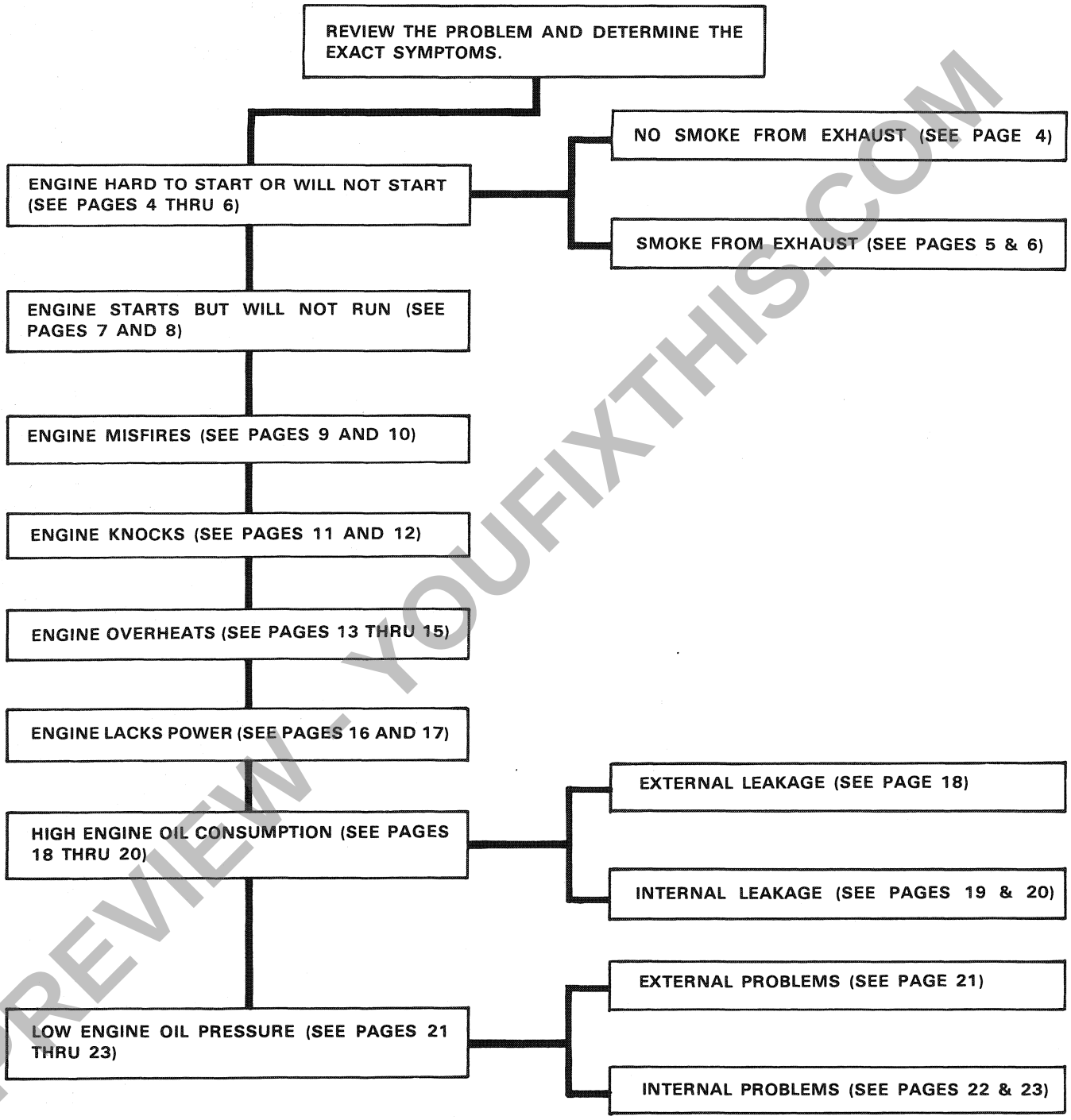
STEP	TIME	ENGINE SPEED	LOAD
1	*10 Minutes	1000 RPM	None
2	*10 Minutes	1800 RPM	None
3	30 Minutes	2/3 Rated RPM	Light Load
4	1 Hour	Full RPM (not over 2000 RPM)	80 to 90%
5	Retorque the cylinder head bolts using the procedure described in Section 2015 of this service manual.		

*If engine must then run at or near full load to operate the machine - for first hour remove load and run at high idle for a few minutes at 15 minute intervals.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

ENGINE DIAGNOSIS CHART



PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

188 DIESEL ENGINES

General

Type	Case Open Chamber, 4 Cylinder, 4 Stroke Cycle, Valve-in-Head
Firing Order	1-3-4-2
Bore	3-13/16 Inches (96.8 mm)
Stroke	4-1/8 Inches (104.8 mm)
Piston Displacement	188 Cubic Inches (3 081 cm^3)
Compression Ratio	17 to 1
No Load Governed Speed	2250 RPM
Rated Engine Speed	2100 RPM
Engine Idling Speed	800 to 850 RPM
Valve Tappet Clearance (Exhaust)	(Cold) 0.014 Inch (0.356 mm)
(Intake)	(Cold) 0.012 Inch (0.305 mm)

Piston and Connecting Rods

Rings per Piston	3
Number of Compression Rings	2
Number of Oil Rings	1
Type Pins	Full Floating Type
Type Bearing	Replaceable Precision, Steel Back, Copper-Lead Alloy Liners

Main Bearings

Number of Bearings	5
Type Bearings	Replaceable Precision, Steel Back, Copper-Lead Alloy Liners

Engine Lubricating System

Crankcase Capacity	6 Quarts (5.7 litres)
With Filter Change	7 Quarts (6.7 litres)
Oil Pressure	50 to 70 PSI (345 to 483 kPa)(3.45 to 4.83 bar) with Engine Warm and Operating at Rated Engine Speed
Type System	Pressure and Spray Circulation
Oil Pump	Gear Type
Oil Filter	Full Flow Spin on Type

Fuel System

Fuel Injection Pump	Roosa-Master
Pump Timing	4 Degrees Before Top Center
Fuel Injectors	Pencil Type Opening Pressure 3200 PSI (22 063 kPa)
Fuel Transfer Pump	Vane Type, Integral Part of Injection Pump
Governor	Variable Speed, Fly-Weight Centrifugal Type, Integral Part of Injection Pump
1st Stage Fuel Filter	Spin on Type
2nd Stage Fuel Filter	Spin on Type

NOTE: The CASE CORPORATION 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.

PREVIEW - YOUFIXTHIS.COM
Download full manual at youfixthis.com

MAINTENANCE CHART

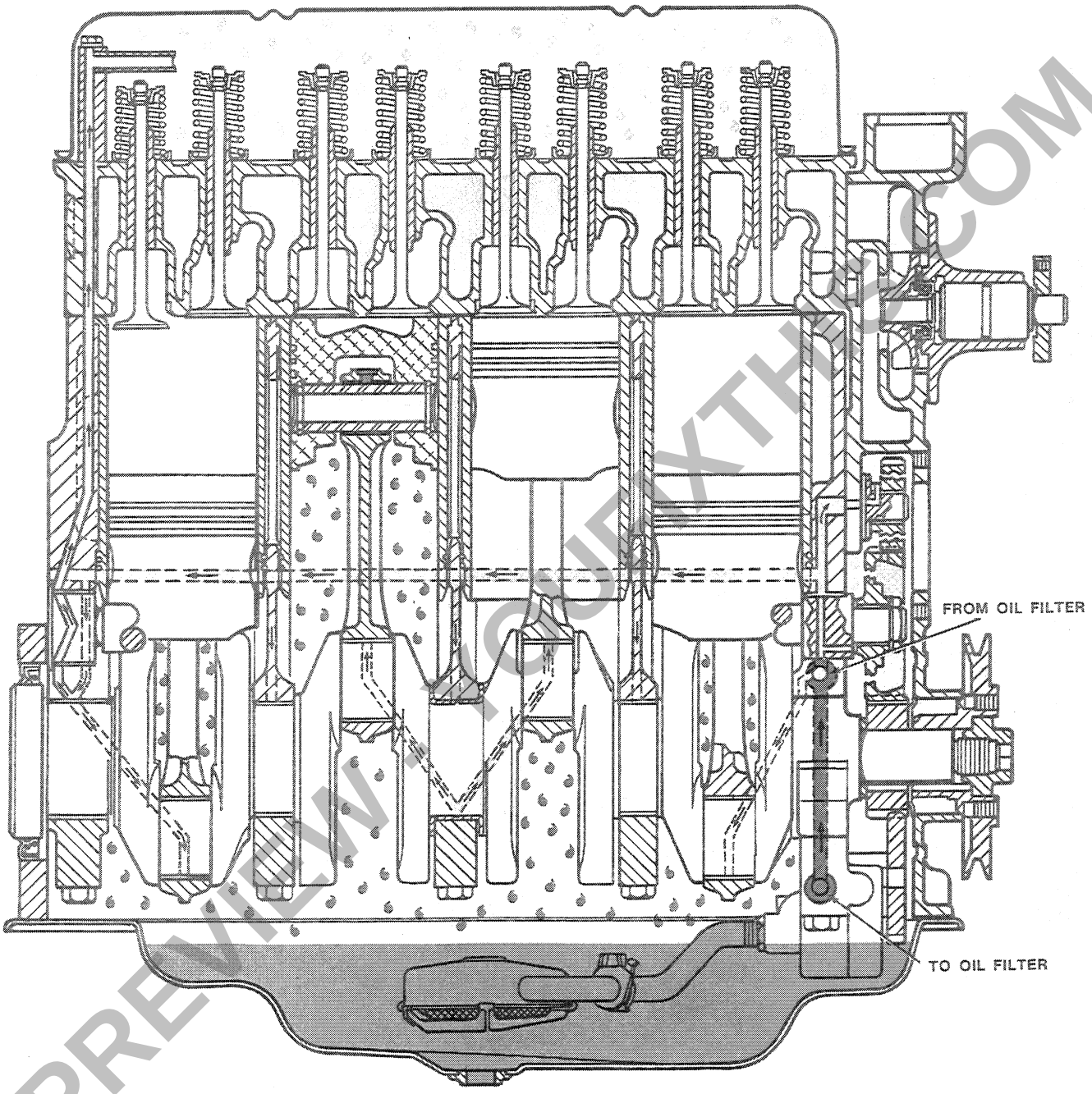
This chart shows maximum service intervals for the correct maintenance of the machine. Some working conditions will make it necessary to increase the service intervals.

INTERVAL	SERVICE	INSTRUCTIONS
After the first 2 hours of operation, new machine only	Check the fan belt tension.	See Section 4007.
	Tighten wheel nuts every 2 hours until the nuts stay tight.	See Section 6529.
After the first 20 hours of operation, new machine only	Do the After Delivery Check.	See the Operators Manual.
After the first 100 hours of operation, new machine only	Check the tension of the chain.	See Section 6515.
Every 10 hours of operation or each day, whichever occurs first	Check the level of the oil in the engine.	
	Check the level of the oil in the hydraulic reservoir.	See Section 8002.
	Check the level of the coolant in the radiator.	
	Check the hydraulic filter condition indicator.	See Section 8002.
	Lubricate the pivot points on the loader and grapple.	
	Check all warning lamps.	See Section 4004.
	Check the air cleaner restriction indicator.	See Section 2051.
	Clean the dust cup in the air cleaner.	See Section 2051.
	Clean or replace all safety and instruction decals that cannot be read.	See Section 1012.
	Check the tires for deep cuts and other damage.	
	Visually check the machine for loose, broken or missing parts. Check for oil leaks.	
Every 50 hours of operation or each week, whichever occurs first	Check the level of the electrolyte in the battery.	See Section 4005.
	Check the pressure in the tires.	See Section 6529.
	Lubricate the control lever linkage.	

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

ENGINE LUBRICATING OIL AND COOLANT SYSTEM



UNFILTERED OIL
FILTERED OIL
SUMP OIL
COOLANT

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

HIGH ENGINE OIL CONSUMPTION

External Leakage

1. Engine External Oil Leakage

Check for engine external oil leaks at the following locations:

A. Covers
B. Accessories
C. Valve cover gasket
D. Restricted breather
E. Oil pan gasket
F. Timing gear cover gasket
G. External oil lines
H. Camshaft welch plug
I. Engine oil filter
J. Engine oil cooler
K. Oil drain plug gasket
L. Front and rear crankshaft seal

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

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

General Information

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 will have drawings without a written procedure because the job is easily done. This service manual is one of the most important tools available to the service technician.

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.

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 will have steps that are for a specific component.

Table of Contents

The first two pages of this section are a Table of Contents which show the series number and title, and the sections that are in each series. The individual sections, where necessary, will have a Table of Contents on the second page of that section.

Page Numbers

All page numbers are made of two sets of numbers separated by a dash, such as 4002-9. The numbers before the dash are the section numbers. The numbers following the dash are the page numbers 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.

Torque References

Most of the time two grades of fasteners (bolts, nuts and screws) are used on Case machines. The grades of the fasteners are grade 5 and grade 8. See Section 1051 for torque specifications and identification marks.

The specifications in Section 1051 are standard torque values and are to be used on all fasteners during assembly and installation unless special torque values are shown in a section.

Serial and Model Numbers

When replacement parts are needed, it can be necessary to give the parts department one or all of the numbers. The model number is normally found on the Product Identification Number plate or Serial Number plate.

The Product Identification Number and Serial Numbers will be found in the following locations.

Machine - Product Identification Number plate fastened to the instrument panel.

Engine - serial number plate on the right-hand side of the engine above the starter.

Other Component parts - Serial Number plate or a stamped serial number is on the part.

NOTE: A part number plate will be found on some parts.

Classification of Lubricants

The Society of Automotive Engineers (SAE), the American Petroleum Institute (API), and the National Lubricating Grease Institute (NLGI) put oil and grease in classifications and grades according to temperature and use.

Engine Oil

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 1050 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 1050.

Special Tools

There are some special tools that are needed to remove and install, disassemble and assemble, check and adjust the component parts of this ma-

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

ENGINE KNOCKS

Low and High RPM (Cont'd)

8. Bent Connecting Rod

A bent connecting rod will cause piston slap from scoring due to misalignment. The engine will run rough because of incomplete combustion and emit white exhaust smoke from the bad cylinder. Remove engine oil pan and inspect connecting rods for alignment. A comparison of piston heights at Top Dead Center with cylinder heads removed may quickly indicate a bent rod condition. A difference of .020 inch in connecting rod can cause a noticeable miss at low RPM and cold engine conditions.

9. Valve Spring Weak

Weak valve springs will allow the valves to float at high speed. Broken valve springs will not close valve completely and valve could hit the piston doing internal engine damage. Always check and test valve springs when doing a valve job. Damping coils on spring should be assembled against the cylinder head.

10. Piston Pin or Bushing Worn

Piston pin or bushing knock will increase with speed. When grounding out the cylinder (cracking injector line) the knock will be twice as bad. Due to combustion, every other revolution will keep the piston pin and bushing tight giving no knock. Remove and inspect piston assembly producing the knock.

11. Camshaft Bearing Worn

A camshaft bearing knock is not a very sharp sounding knock. The knock will be only at one-half of crankshaft speed and will not become worse at different engine speeds. Low oil pressure could result from worn bearings and excessive oil clearance from lack of replacing cam bearing at engine overhaul.

12. Crankshaft End Play Excessive

Excessive crankshaft end play will be indicated by one thudding sound when increasing RPM and one thud when decreasing RPM. Due to the angle of the teeth on crank gear and cam gear, as speed changes it pushes the crankshaft back and forth. Check crankshaft end play with a dial indicator.

13. Foreign Material In Cylinders

Foreign material such as pieces of broken valve, bolts, nuts, washers, or pieces of castings, in the cylinder will cause a noise everytime the piston comes to Top Dead Center. The noise will not change by shorting out the cylinder. Due to the metal-to-metal contact, the vibration can be felt on the side of the engine. Remove cylinder heads and inspect.

14. Cylinder Ridge Not Removed

When performing an engine overhaul and installing new rings, the cylinder ridge must be removed. If the ridge was not removed, it would cause the engine to knock on all cylinders as the top piston ring hits the ridge on every stroke. If the top ring continued to hit the ridge, it would cause ring land breakage between top and second ring, causing piston and sleeve scuffing and scoring. Remove heads and check for cylinder ridge.

15. Improper Use of Ether (Low RPM)

Spraying either into the engine air intake without cranking the engine, will cause one or more cylinders to receive a large amount of ether due to open valves. Then, when the engine is cranked, volatile, uncontrolled explosions will occur in these cylinders breaking ring lands and damaging the piston. Be sure engine is cranking before using ether. Remove cylinder heads and inspect pistons for damage.

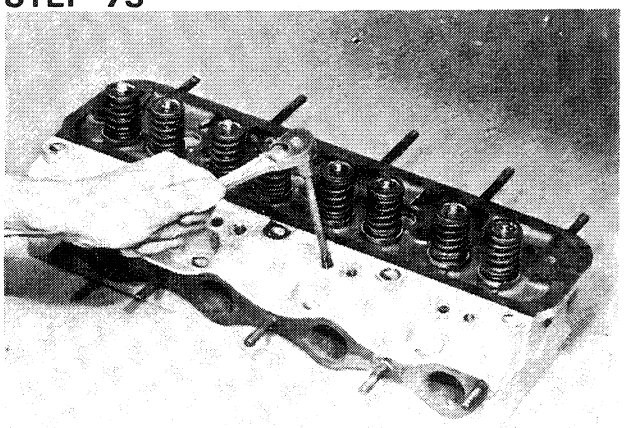
16. Camshaft End Play Excessive

Excessive camshaft end play will be indicated by one thudding sound when increasing engine speed and one thud when decreasing speed, but will not be as pronounced as crankshaft end play. Due to the angle of the teeth on crank gear and cam gear, as engine speed changes, it pushes and pulls the camshaft back and forth. Excessive camshaft end play can be caused by worn thrust washer, loose cam gear, or broken or missing camshaft thrust spring. Remove front timing cover and check camshaft end play with a dial indicator.

PREVIEW - YOUFIXTHIS.COM

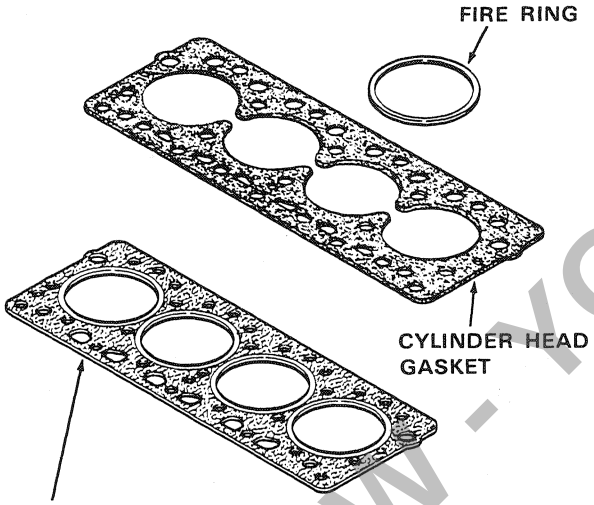
Download full manual at youfixthis.com

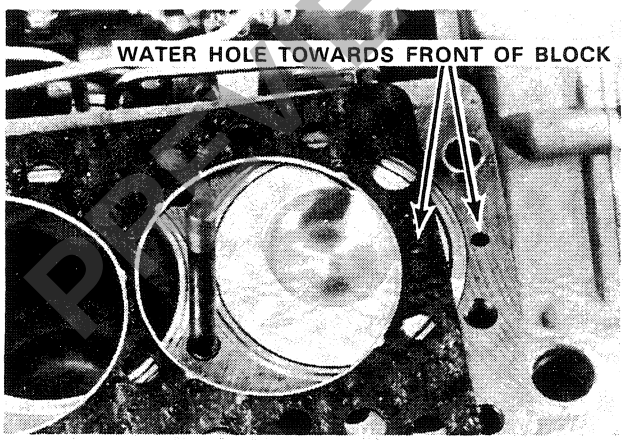
STEP 73



Before installing cylinder head on block, clean the injector bores using A43277 reamer.

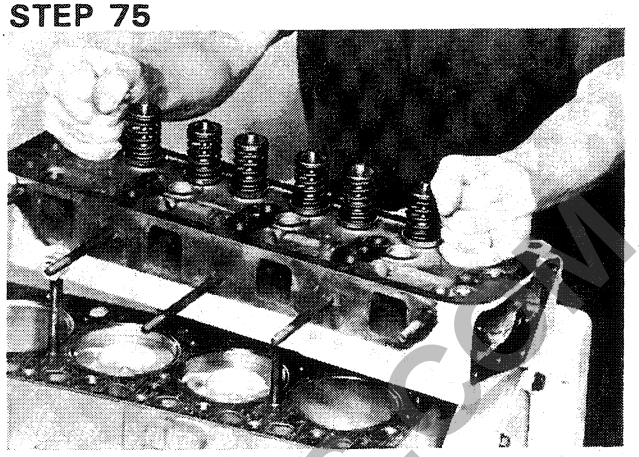
STEP 74





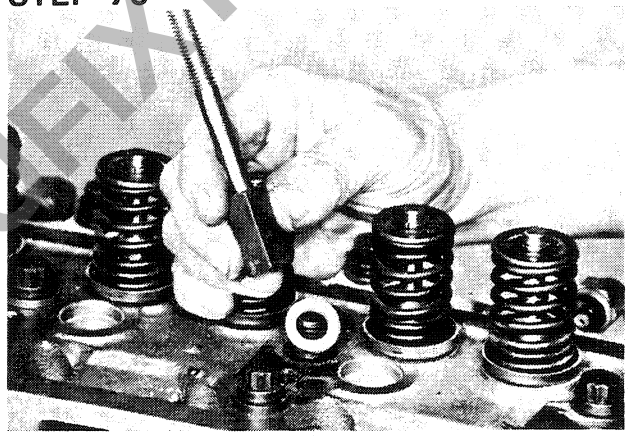
Install a new cylinder head gasket and check to see that all gasket holes align with block holes and especially that the 1/4" water hole of gasket is towards the front of the block. *NOTE:* Refer to Sections 2025 or 2125, sleeve protrusion, if you are experiencing head gasket leakage problems.

STEP 75



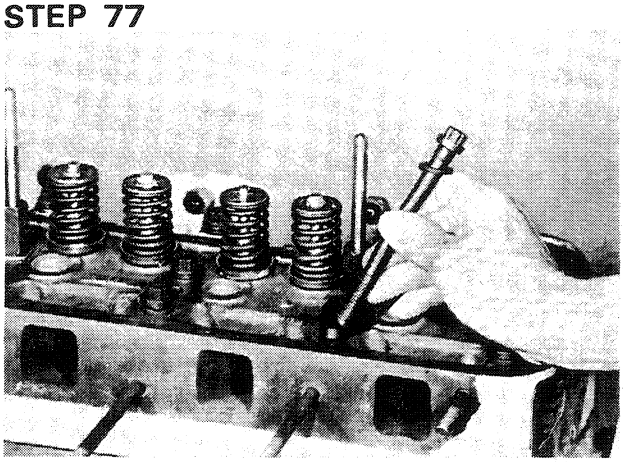
Carefully slide the cylinder head over the cylinder block and valve cover studs, down on the aligning dowels until resting on the block.

STEP 76



Install washers and valve cover mounting nut and stud assembly over the valve cover studs.

STEP 77

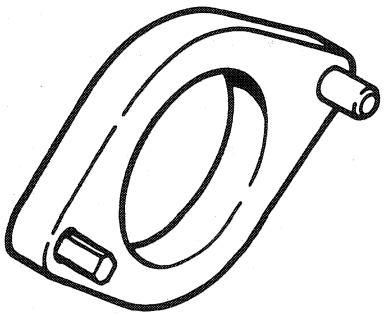


Install cylinder head bolts and washers or nuts.

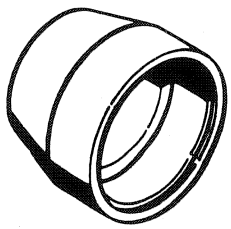
PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

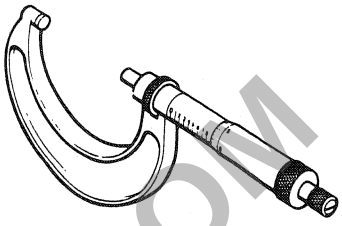
SPECIAL TOOLS



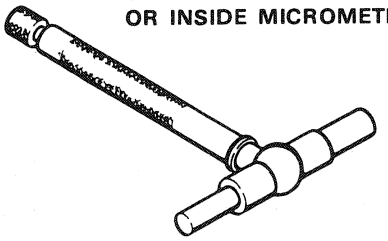
G13506 REAR SEAL
ALIGNING TOOL



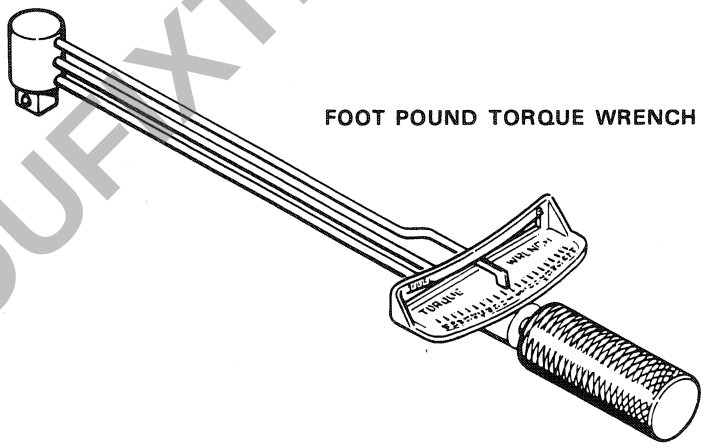
G15028 SLEEVE
REAR SEAL INSTALLATION



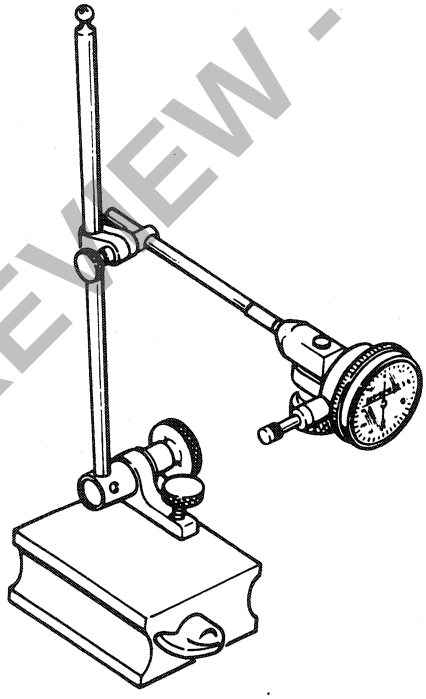
0" TO 5" MICROMETERS



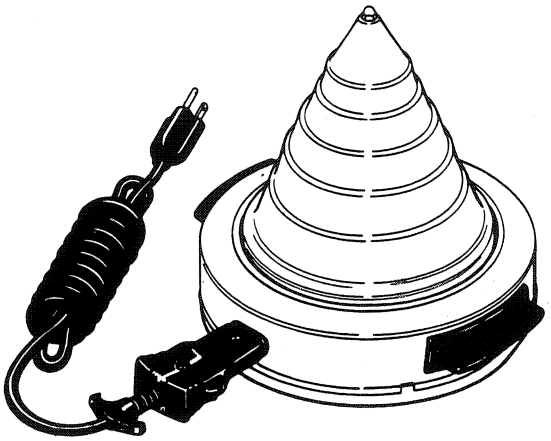
0" TO 5" BORE GAUGES
OR INSIDE MICROMETERS



FOOT POUND TORQUE WRENCH



DIAL INDICATOR



THERMO MOUNTER- MODEL "C"
ELECTRONIC DESIGNS, INC.
5164 N. 62ND STREET
MILWAUKEE, WIS. 53218

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Section 2051

AIR CLEANER AND MUFFLER

Written In *Clear And Simple English*

PREVIEW - YOUFIXTHIS.COM

ASE CORPORATION

CE Div. 9-68700
June 1980

PRINTED IN U.S.A.

Download full manual at youfixthis.com

TABLE OF CONTENTS

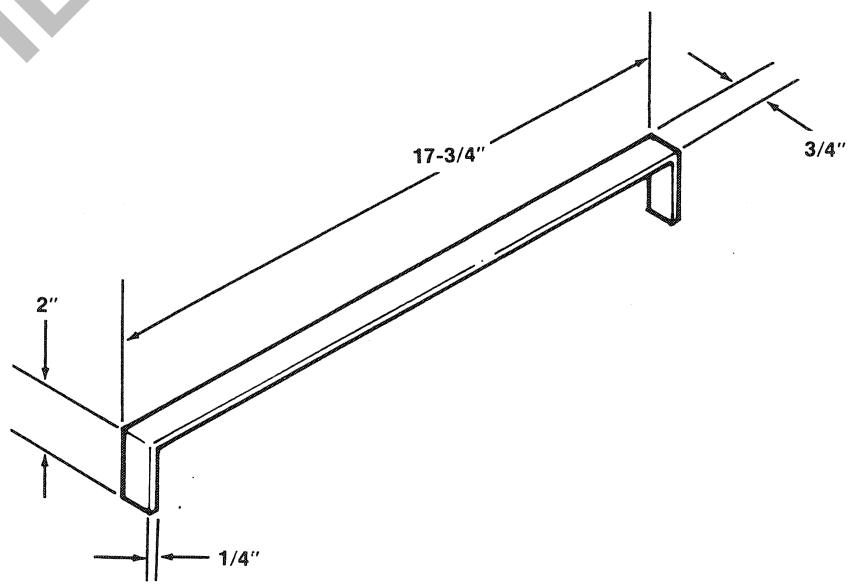
SPECIAL TOOLS 2,3
CYLINDER HEAD RECONDITIONING 4-49
Removal 4-11
Cylinder Head Inspection 11,12
Valve Guide Replacement 13,14
Replacement Of Push Rod Tubes 14,15
Inspection Of The Valves 16,17
Valve Seat Replacement 18
Refacing Intake and Exhaust Valves and Valve Seats 18-24
Cylinder Head Assembly and Installation 25-27
Rocker Arm Disassembly, Inspection and Assembly 28-33
Manifold Disassembly and Assembly 34-39
Locating Top Dead Center 39
Adjusting The Rocker Arm To Valve Clearance 40,41

CAMSHAFT, VALVE TRAIN AND BACKLASH 42-60
Camshaft Bushing Removal and Installation 42-49
Valve Lifter Inspection and Replacement 50
Camshaft Inspection, Assembly and Installation 51-60

PREVIEW - YOUFIXTHIS.COM

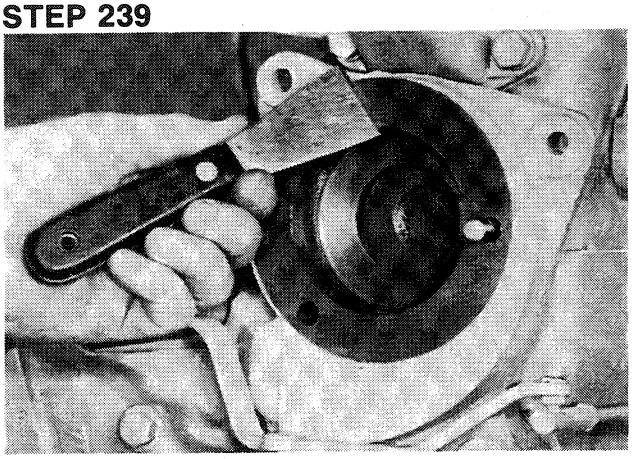
SPECIFICATIONS FOR TOOL WHICH MUST BE MADE

Rocker Arm Assembly Holding Tool



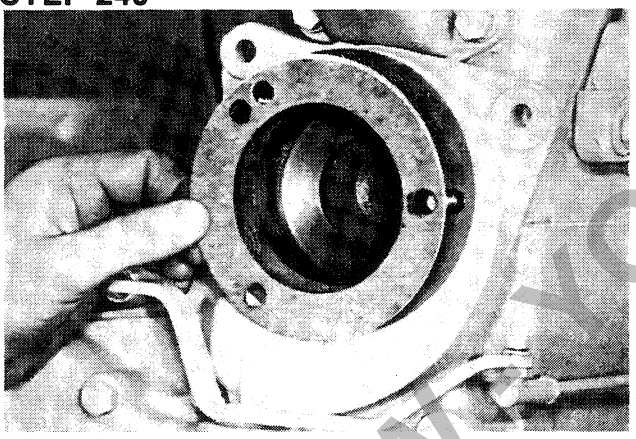
Download full manual at youfixthis.com
Issued 5-80 Printed in U.S.A.

STEP 239



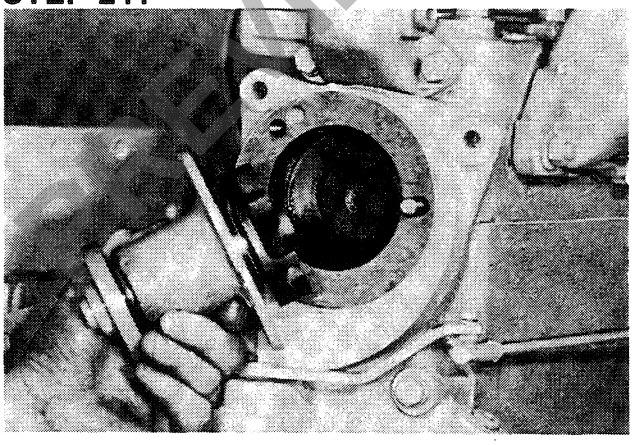
Remove any foreign material from the water pump mounting surface on the timing gear cover and the water pump.

STEP 240



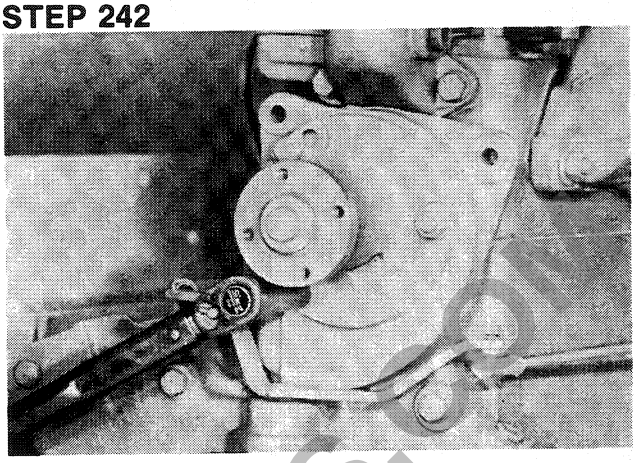
Install a new water pump gasket.

STEP 241



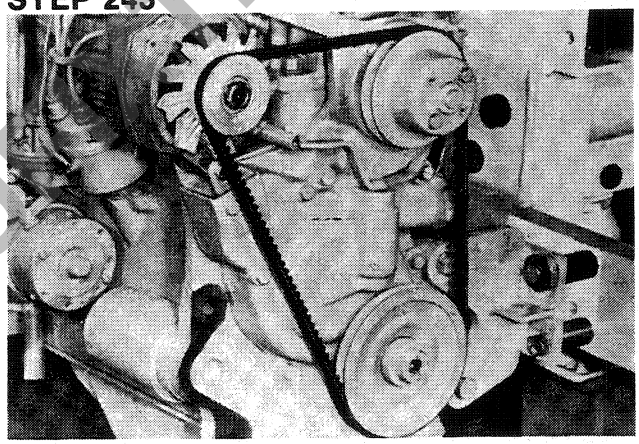
Install the water pump.

STEP 242



Install the retaining washers, nut and bolts and tighten.

STEP 243



Install the fan pulley, fan and belt on the engine.

REVIEW YOUFIXTHIS.COM

Download full manual at youfixthis.com

Issued 5-80 Printed in U.S.A.

Section

2145

LUBRICATION SYSTEM

OIL PAN, OIL PUMP AND OIL FILTER

148 Spark Ignition Engine

Written In *Clear And Simple English*

PREVIEW - YOUFIXTHIS.COM

ASE CORPORATION

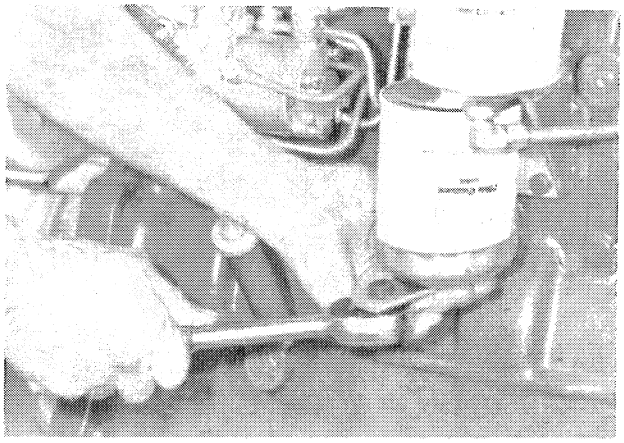
Rac 8-22840

Printed in U.S.A.
May, 1980

Download full manual at youfixthis.com

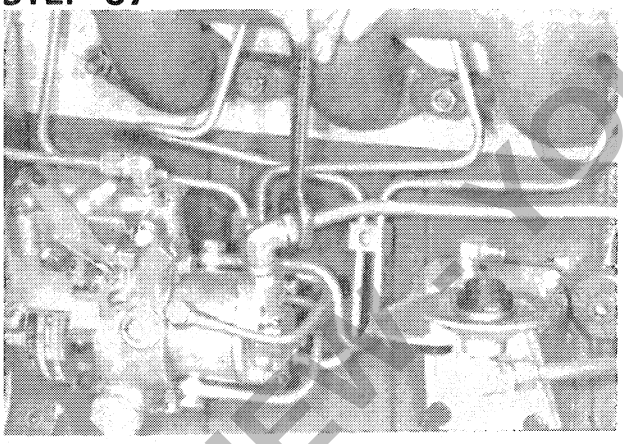
Replacing Pump Inlet Filter

STEP 86



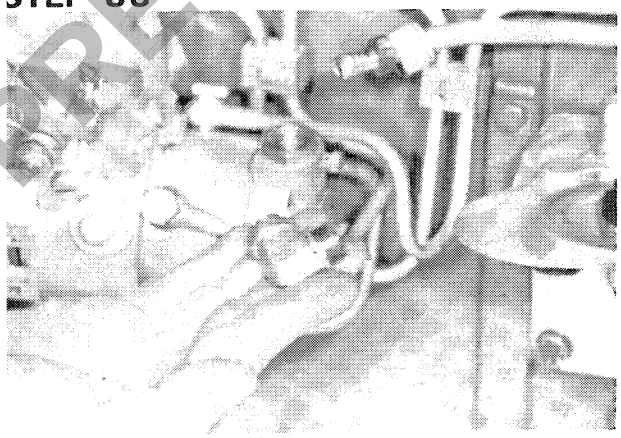
When servicing the fuel pump inlet filter, it is good practive to also change the primary and final fuel filters. Remove primary and final fuel filters from filter head.

STEP 87



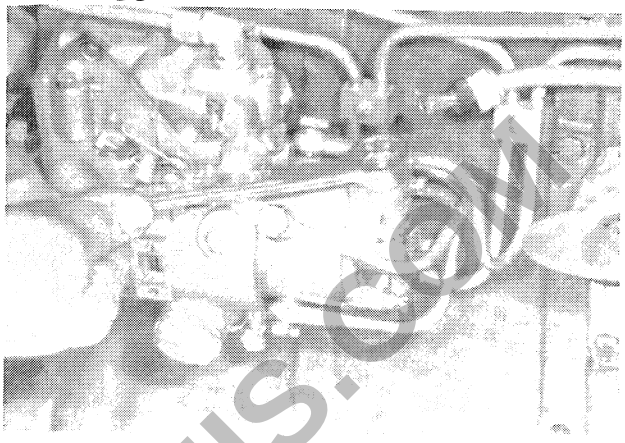
Disconnect fuel inlet line from fuel pump.

STEP 88



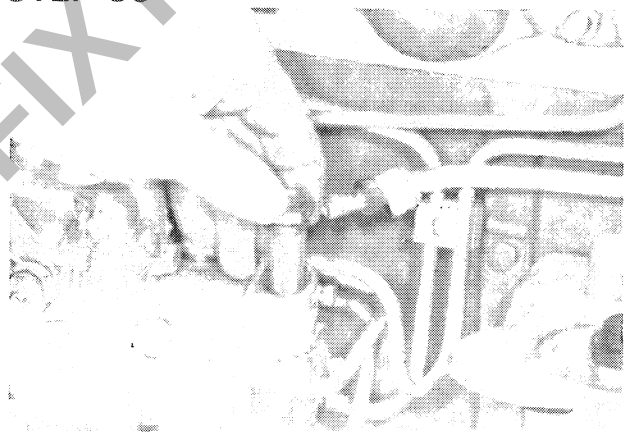
Remove elbow from fuel pump inlet.

STEP 89



Unscrew inlet filter from fuel pump.

STEP 90



Pull inlet filter assembly from fuel pump.

PREVIEW YOUFIXTHIS.COM

Download full manual at youfixthis.com

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

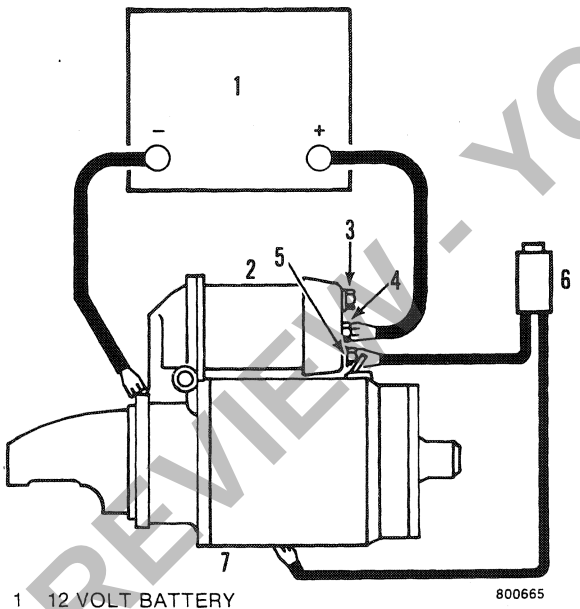
Pinion Clearance - Machines with Diesel Engine

The pinion clearance for the starter on machines with diesel engine cannot be adjusted. If there is too much clearance before disassembly, the wear of the internal parts is probably the cause. If the clearance is not correct after assembly, some of the parts are probably not installed correctly.

Use the following procedure to check pinion clearance:

1. Disconnect the field coil connector from the motor terminal on the starter solenoid. Use insulation as necessary to make sure that the field coil connector does not make contact with the motor terminal.

2. See Figure 80. Connect a 12 volt battery to the starter. Connect the positive battery cable to the switch terminal on the starter solenoid. Connect the negative battery cable to the housing of the starter.



1. 12 VOLT BATTERY
2. STARTER SOLENOID
3. BATTERY TERMINAL
4. SWITCH TERMINAL
5. MOTOR TERMINAL
6. REMOTE STARTER SWITCH
7. STARTER

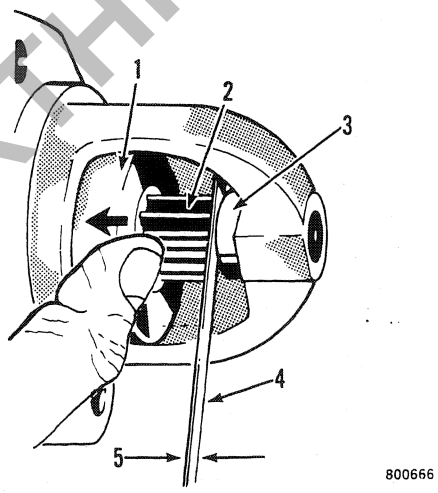
Figure 80 - Circuit for Checking Pinion Clearance

3. Make sure that the remote starter switch is in the Off position. Connect the remote starter switch between the motor terminal of the starter solenoid and the housing of the starter.

   NOTE: Steps 4, 5, and 6 must be done rapidly to prevent damage to the solenoid coils.

4. Actuate the remote starter switch. The starter drive will move to the starting position and stay in the starting position until the remote starter switch is released.

5. See Figure 81. Push the starter drive as far as possible toward the commutator end of the starter.



1. PUSH STARTER DRIVE TOWARD COMMUTATOR END AS FAR AS POSSIBLE
2. PINION
3. DRIVE RETAINER
4. FEELER GAUGE
5. PINION CLEARANCE MUST BE 010 - .140 INCH (0.25 - 3 56 mm)

Figure 81 - Measuring Pinion Clearance

6. See Figure 81. Use a feeler gauge to measure the clearance between the pinion and the drive retainer. Release the remote starter switch.

7. The pinion clearance in step 6 must be .010 - .140 inch (0.25 - 3.56 mm).

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

ıssembly

. Install the thrust washer on the shaft assembly.

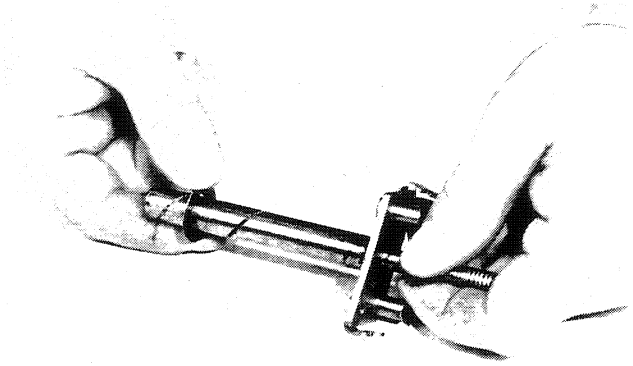
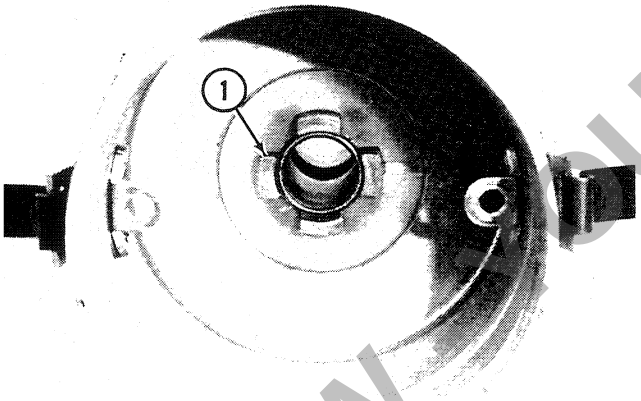


Figure 31

. Install the plastic washer in the housing.



1. Plastic Washer

Figure 32

ı. Install the shaft assembly in the housing.

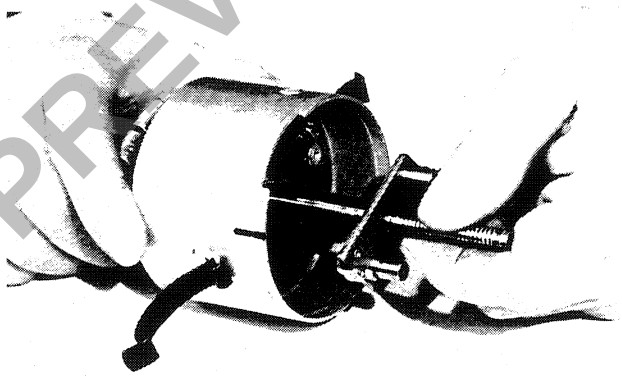


Figure 33

4. Install the washer on the shaft assembly.



Figure 34

5. Put a metal block that is approximately 1/4 inch (6.3 mm) thick on the press.

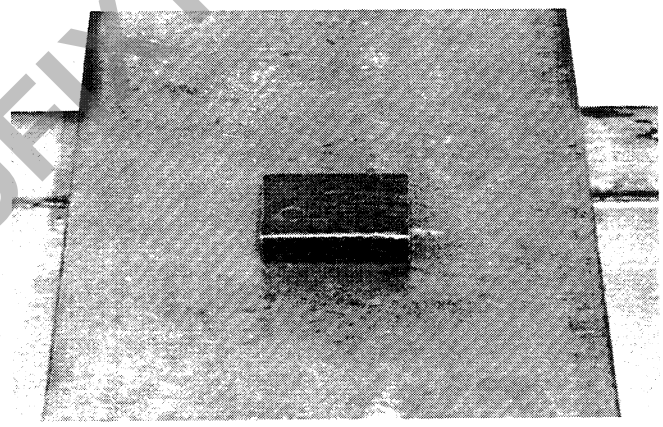


Figure 35

6. Put the housing and shaft assembly on the block so that the housing is not in contact with the press.

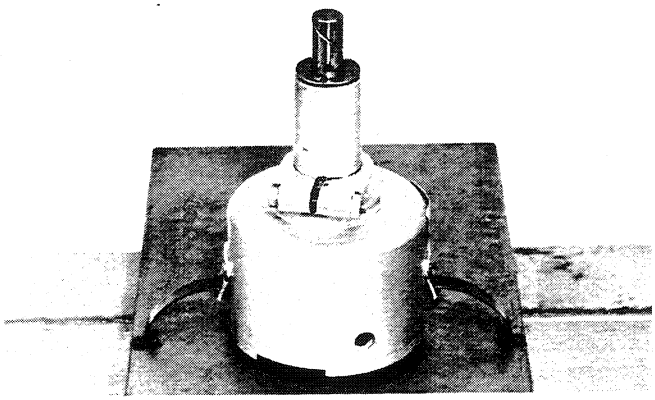
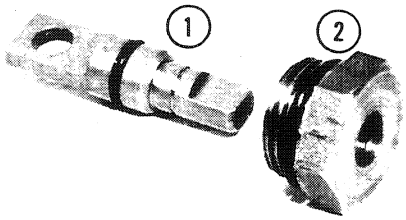


Figure 36

PREVIEW YOUFIXTHIS.COM

Download full manual at youfixthis.com

2. Use clean oil to lubricate the O-ring on the valve stem. Install the valve stem in the fitting.



1. Valve Stem
2. Fitting

Figure 78

3. Install the snap ring on the pressure release valve.

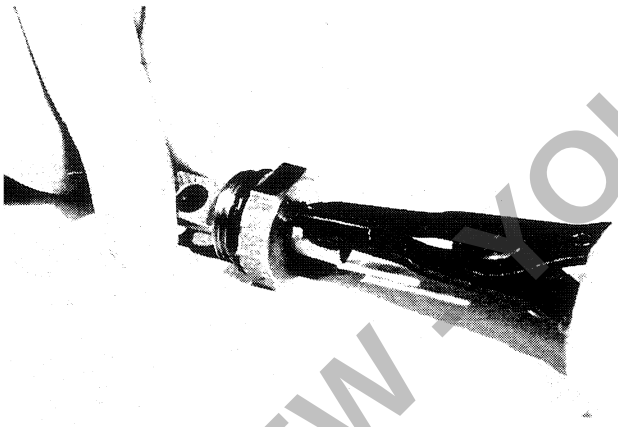
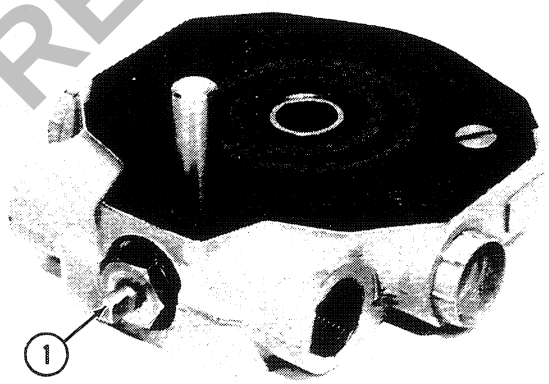


Figure 79

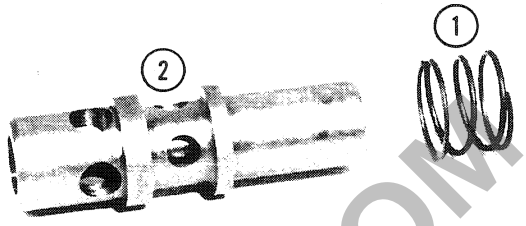
4. Install the pressure release valve in the bore in the top of the valve plate.



1. Pressure Release Valve

Figure 80

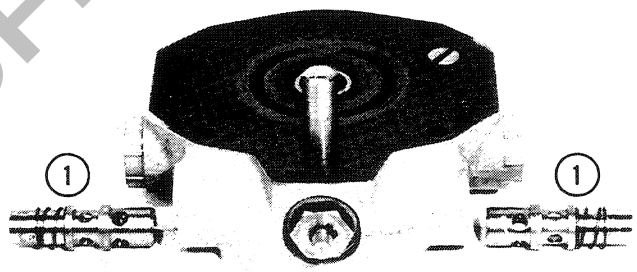
15. Install the springs on the relief valves.



1. Spring
2. Relief Valve

Figure 81

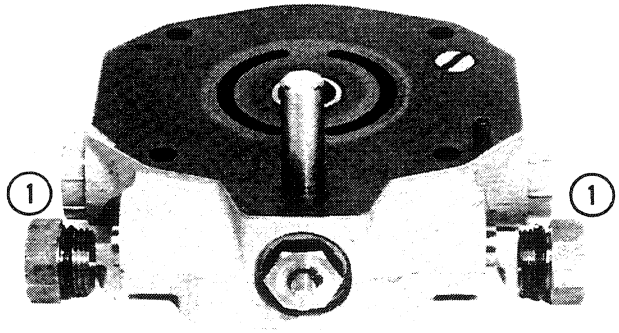
16. Install the relief valves and springs into the bores in the valve body.



1. Relief Valve

Figure 82

17. Install a new O-ring on each of the plugs for the relief valves. Use clean oil to lubricate the O-rings. Install the plugs in the bores for the relief valves. Tighten the plugs to a torque of 55 - 60 pound-feet (75 - 81 N m).



1. Plug

Figure 83

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

TABLE OF CONTENTS

Specifications 8007-3
General Information 8007-3
Operation 8007-4
All Spools in Neutral 8007-4
Main Relief Valve 8007-5
Lift Spool Actuated 8007-6
Lift Spool and Bucket Spool Actuated 8007-7
Lift Spool in Float 8007-8
Removal 8007-9
Installation 8007-10
Disassembly 8007-11
Assembly 8007-17
Inspection 8007-2

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PREVIEW ONLY

You're viewing 25 of 884 pages

The full manual includes:

- All 884 pages, complete
- Searchable PDF (find any keyword)
- No watermarks
- Instant download
- Print-ready quality

GET FULL MANUAL NOW

Case 1835 UNI-LOADER, 188 Diesel Engine, 148G Spark Ignition, G188D Service Manual

Scan or click anywhere
youfixthis.com

Click anywhere on this page to get the full manual