



Service Repair Manual

Models

955L TRACK LOADER

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Product: TRACK LOADER

Model: 955L TRACK LOADER 13X

Configuration: 955L TRACK LOADER / POWER SHIFT / 13X00001-UP (MACHINE) POWERED BY 3304 ENGINE

Disassembly and Assembly 3304 VEHICULAR ENGINE FOR 955L TRACK-TYPE LOADER

Media Number -SEN7675-00

Publication Date -01/08/1978

Date Updated -12/10/2001

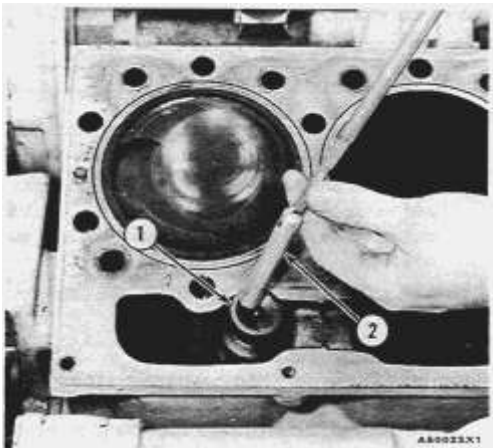
Valve Lifters, Pistons

SMCS - 1209-11; 1209-12; 1214-11

Remove Valve Lifters

start by:

a) remove cylinder head



1. Remove valve lifters (1) with magnet (2).
2. Put identification on each lifter for use at installation of the valve lifters.

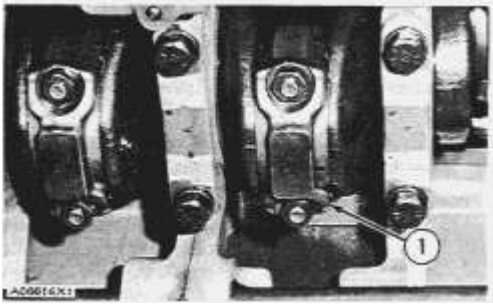
Install Valve Lifters

1. Put clean engine oil on the valve lifters and camshaft lobes. Install the valve lifters in their original positions in the cylinder block.

end by:

a) install cylinder head

Remove Pistons



start by:

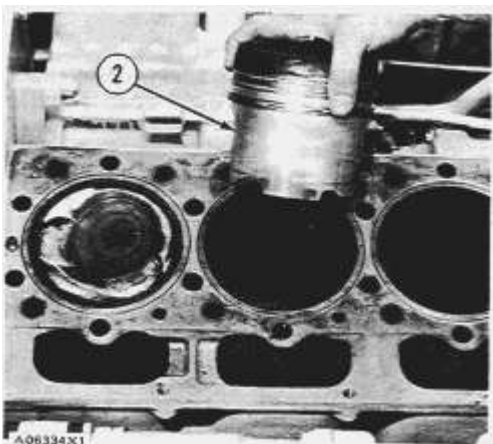
a) remove cylinder head

b) remove oil pan plate

1. Remove the ring of carbon from the top inner surface of the cylinder liners.
2. Turn the crankshaft until two pistons are at bottom center. Remove connecting rod caps (1) from the two connecting rods.
3. Put tape or pieces of rubber hose over the threads of the connecting rod bolts. This will prevent damage to the crankshaft during removal of the pistons.

NOTICE

Do not let the connecting rods hit the bottom edge of the cylinder liners or the crankshaft during removal and installation of the pistons.



TYPICAL EXAMPLE

4. Push the piston and connecting rod away from the crankshaft until the piston rings are above the cylinder liner. Remove the two pistons (2) and the connecting rods from the engine.
5. Keep each connecting rod cap with its respective connecting rod and piston. Put identification on each connecting rod as to its location in the engine for use at assembly of the engine.

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6. Do Steps 2 through 5 for the remainder of the pistons.

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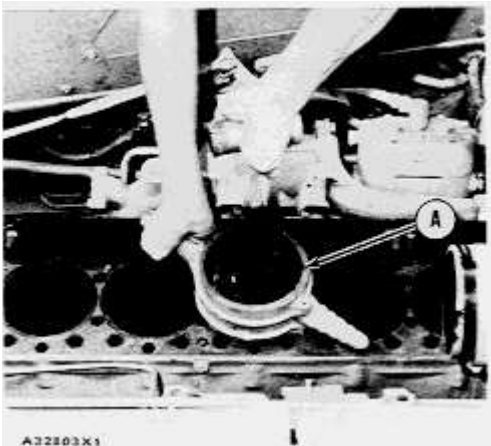
Date Updated -12/10/2001

Pistons

SMCS - 1214-15; 1214-16; 1214-12

Install Pistons

	Tools Needed	A
5P3525	Ring Compressor	1

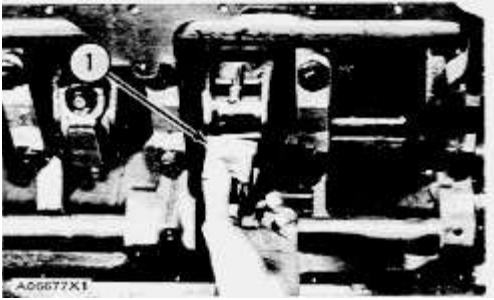


TYPICAL EXAMPLE

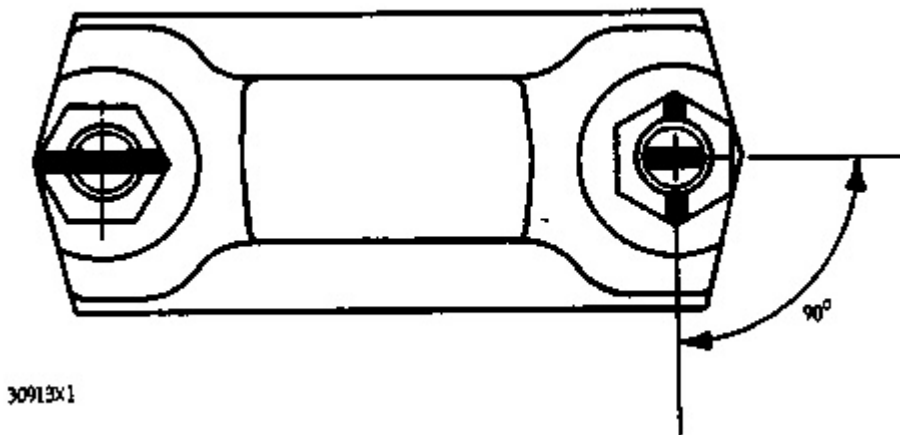
1. Turn the crankshaft until the bearing journals for the pistons to be installed are at bottom center.
2. Put clean engine oil on the crankshaft journals and on the inside of the cylinder liners. Put clean engine oil on the piston rings and connecting rod bearings.
3. Move the rings on the piston until the ring openings are approximately 90° apart.

NOTICE

Never install the ring compressor on the piston unless the cylinder liner is used as a guide. Damage to the piston rings can be the result.



- Put ring compressor (A) in position on the cylinder liner. Put the connecting rod and piston in position in the same cylinder liner from which it was removed and into the ring compressor. Make sure the "V" mark on the piston is in alignment with the "V" mark on the cylinder block.
- Push the piston into place as the connecting rod is put into position on the crankshaft.



- Put clean engine oil on bearings, bolt threads and surfaces of the nuts that make contact with the connecting rod caps. Put caps (1) in position on the connecting rods and install the nuts. Tighten the nuts to a torque of 30 ± 3 lb.ft. (40 ± 4 N·m). Put a mark on each nut and the end of each bolt. Tighten the nuts 90° more.

NOTICE

When connecting rod caps are installed, make sure the number on the side of the cap is next to and respective with the number on the side of the connecting rod.

- Follow the same above procedure for installation of the remainder of the pistons.

end by:

- install oil pan plate
- install cylinder head

Disassemble Pistons

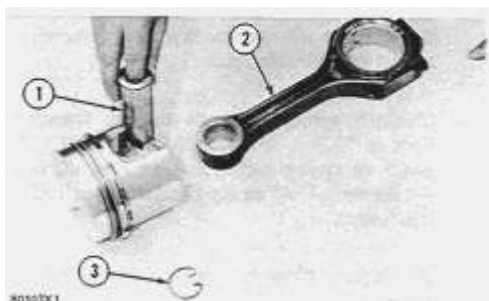
Tools Needed		A
7S9470	Ring Expander	1

start by:

a) remove pistons



1. Remove rings from piston with tool (A).

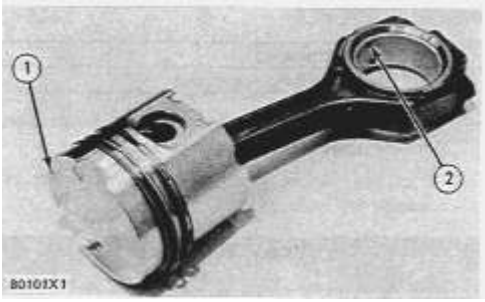


2. Remove snap ring (3), piston pin (1) and connecting rod (2) from piston.

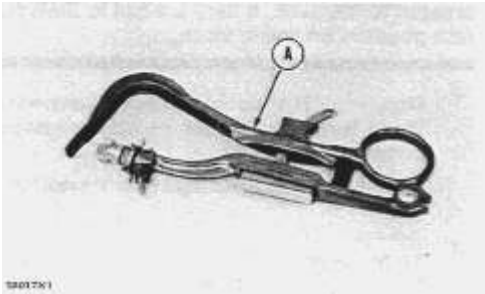
Assemble Pistons

Tools Needed		A	B
8S2304	Piston Ring Groove Cleaner	1	
7S9470	Ring Expander		1

NOTE: If a replacement of the rod pin is made, use a pin boring machine to make the bearing the correct size.



1. Install rod on piston with bearing tab groove (2) and number identification on the same side as the "V" mark (1) on top of piston.
2. Install piston pin and snap rings.



3. When the old pistons are used, clean the piston grooves with tool (A) before new piston rings are installed.
4. Install rings on piston with tool (B). The ring openings must be 90° apart.

end by:

a) install pistons

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Disassembly and Assembly

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Media Number -SEN7675-00

Publication Date -01/08/1978

Date Updated -12/10/2001

Valves

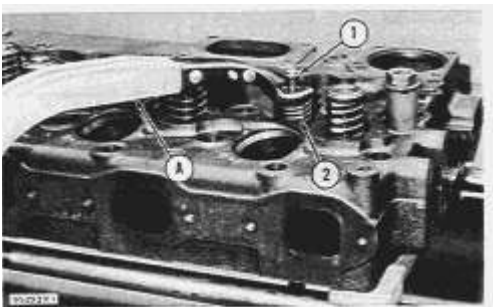
SMCS - 1105-12; 1105-11

Remove Valves

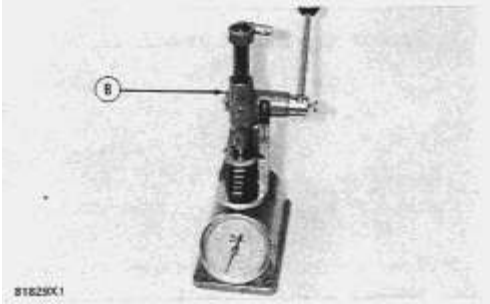
Tools Needed		A	B
5S1330	Valve Spring Compressor	1	
8S2263	Valve Spring Tester		1

start by:

- a) remove cylinder head
- b) remove precombustion chambers



1. Put compression on valve spring (2) with tool (A) and remove locks (1).
2. Remove tool (A), rotocoil, spring and valve. Put identification on valves with respect to their location in the cylinder head.

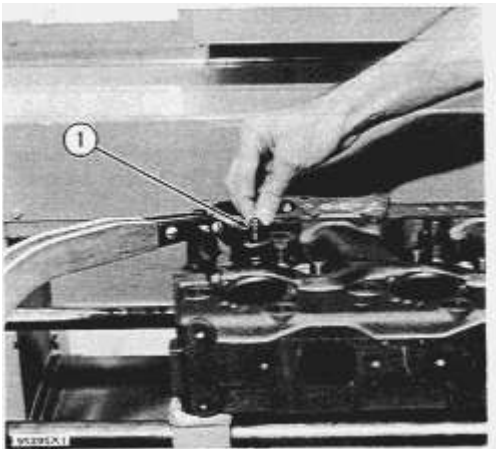


3. Check the spring force with tool (B). The spring force is 57.7 ± 4.5 lb. (256.7 ± 20 N). The length of spring under test force is 1.766 in. (44.86 mm). The free length after test is 2.05 in. (52.1 mm).

4. Do Steps 1 through 3 again for remainder of valves.

Install Valves

Tools Needed		A
5S1330	Valve Spring Compressor	1



1. Put clean engine oil on valve stems. Install valve, spring and rotocoil in the cylinder head.

2. Put tool (A) in position on valve spring and install the locks (1).



Locks can be thrown from valve when compressor is released, if they are not in their correct position on valve stem.

3. Remove tool (A) and hit the top of valve with a plastic hammer to be sure the locks are in their correct position on valve.

4. Do Steps 1 through 3 again for remainder of valves.

end by:

a) install precombustion chambers

b) install cylinder head

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Valve Seat Inserts, Water Directors

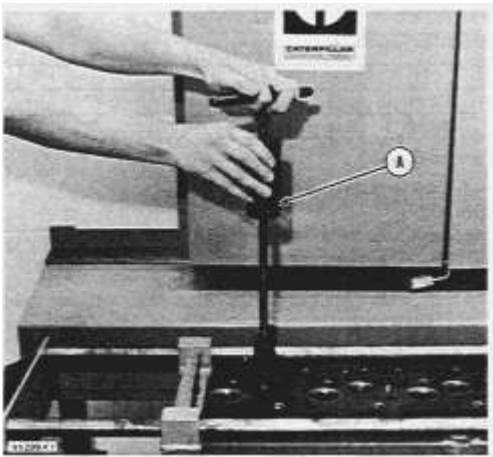
SMCS - 1103-10; 1115-10

Remove And Install Valve Seat Inserts

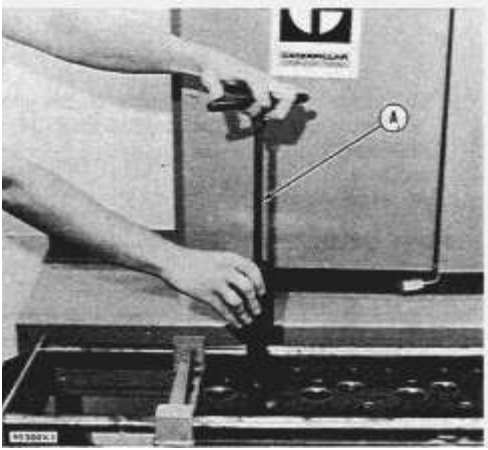
Tools Needed		A
9S3080	Valve Seat Insert Group	1

start by:

a) remove valves



1. Remove valve seat insert with tool group (A).
2. Clean and remove burrs from the valve seat bore.



3. Install the new valve seat insert with tool group (A). Do not increase diameter of extractor in valve seat insert when the insert is installed in the head.

4. Grind valve seat insert according to specifications given in SPECIFICATIONS SECTION.

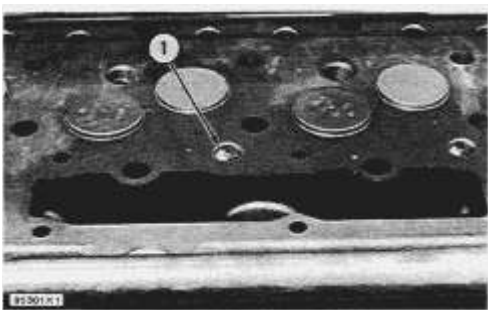
end by:

a) install valves

Remove And Install Water Directors

start by:

a) remove cylinder heads



1. Remove old water directors (1) from the cylinder head.

2. Clean the cylinder head.

3. Install new water directors in the cylinder head. Install the directors so the hole in the directors is in alignment with the "V" mark on cylinder head.

NOTE: For reconditioning of cylinder head see STMG FORM JEG02327.

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Valve Guides, Cylinder Liners

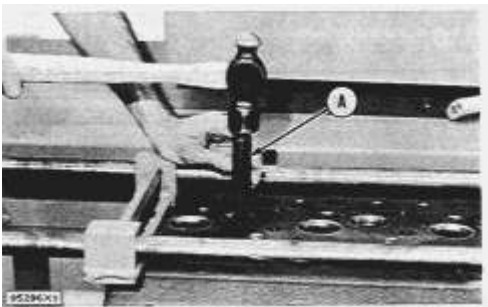
SMCS - 1104-10; 1216-11

Remove And Install Valve Guides

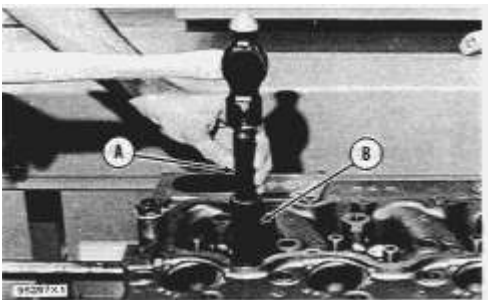
Tools Needed		A	B
7S8859	Guide Driver	1	
7S8858	Bushing		1

start by:

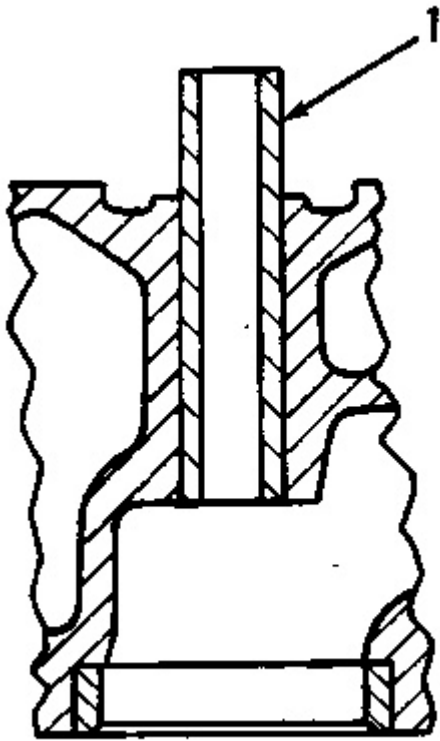
a) remove valves



1. Remove valve guides from the cylinder head with tool (A).



2. Put clean engine oil on the outside diameter of the valve guide. Install valve guide (1) with tools (A) and (B).



A08021 X1

3. The inside diameter of the valve guides after installation must be $.3734 \pm .0010$ in. ($9.48 \pm .025$ mm).

end by:

a) install valves

Remove Cylinder Liners

Tools Needed		A
5P8665	Cylinder Liner Puller	1
1P2394	Plate	1

start by:

a) remove pistons

1. Check to be sure that all coolant has been removed from the cylinder block.
2. Cover the crankshaft bearing journals before the cylinder liners are removed.



TYPICAL EXAMPLE

3. Remove the cylinder liner with tooling (A).

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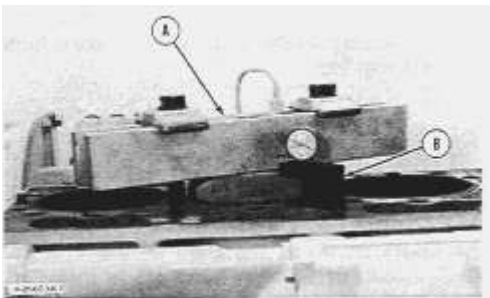
Cylinder Liners

SMCS - 1216-12

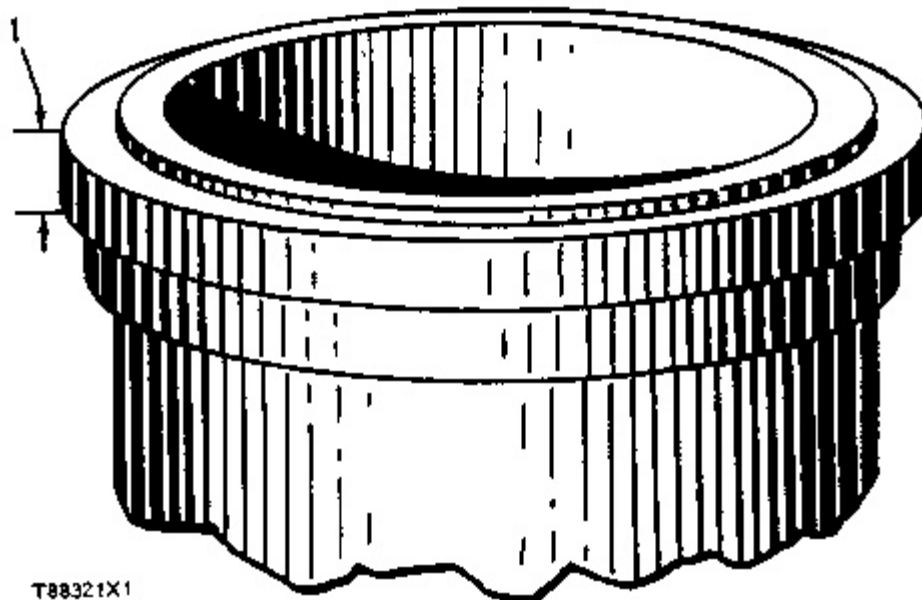
Install Cylinder Liners

Tools Needed		A	B	C
8B7548	Puller Assembly (Crossbar only)	1		
3H465	Plate	2		
1P2394	Plate	1		
1P5510	Liner Projection Tool Group		1	
2P8260	Liner Installer Group			1

1. Clean the cylinder liners and block.
2. Install the liners in the block without the O-ring seals.



3. Install tooling (A) and two 5/8"-11 NC bolts 4 1/2 in. long. Tighten the bolts evenly to 50 lb.ft. (70 N·m).

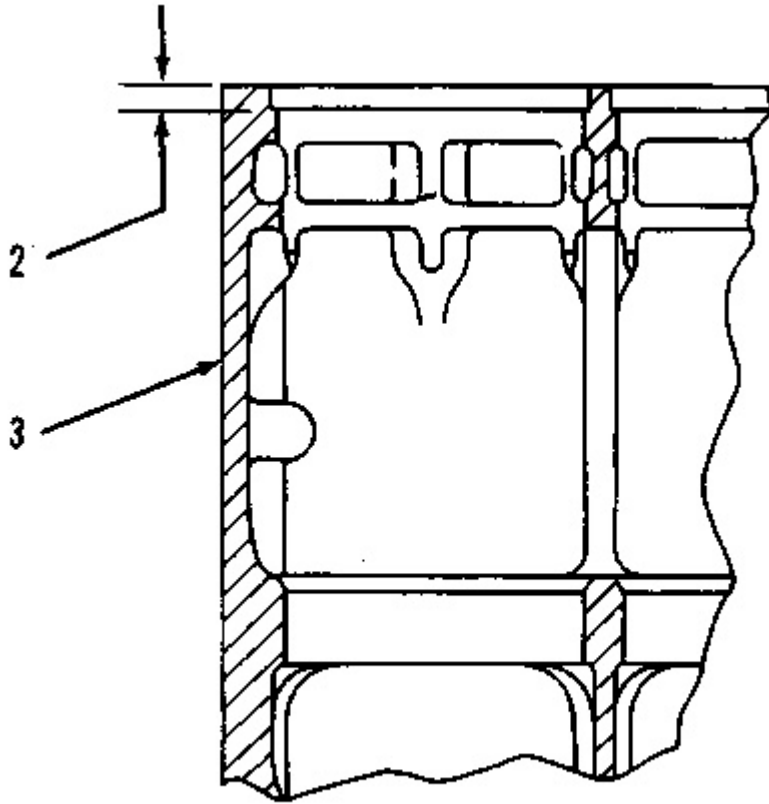


T88321X1

4. Check the liner (projection) height with tool group (B) at four locations around the line to find the average measurement. The difference between the four measurements must not be more than .001 in. (0.03 mm).

5. The average measurement of liner (projection) height must be .0020 to .0056 in. (0.051 to 0.142 mm). The measurement between liners next to each other, must not be more than .001 in. (0.03 mm) difference.

NOTE: If the liner is turned in the bore, it can make a difference in the liner (projection) height.

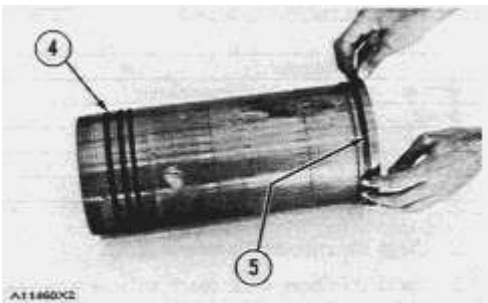


A26493X1

6. If the liner (projection) height is not .0020 to .0056 in. (0.051 to .0142 mm), check the thickness of the liner flange (1) and depth of the liner bore (2) in the block (3). The thickness of the liner flange must be $.4048 \pm .0008$ in. (10.282 ± 0.020 mm). The depth of the liner bore in block must be $.401 \pm .001$ in. (10.19 ± 0.03 mm).

NOTE: If the liner bore in the block is worn and the measurement is not correct, the liner bore can be corrected with a cylinder block counterboring tool. See SPECIAL INSTRUCTIONS, Form FM055228.

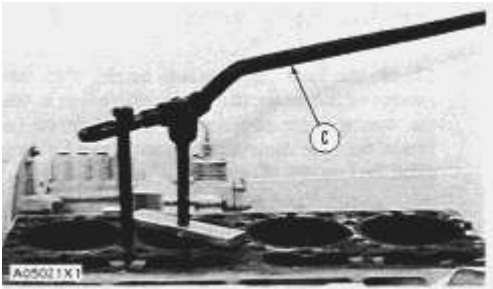
7. Put a mark on the liner and block so the liner can be installed in the same position from which it was removed.



8. Install new seals (4) on the cylinder liners. Put liquid soap on the seals and in the bores in the cylinder block.

NOTICE

The liners must be installed in the cylinder block immediately after band (5) is installed. Make sure the marks on the liners and the cylinder block are in alignment when the cylinder liners are installed.



9. Put clean SAE 30 oil on band (5) and install it on the liner as shown. Put clean SAE 30 oil on the liner and install it immediately in the cylinder block with tool group (C).

end by:

a) install pistons

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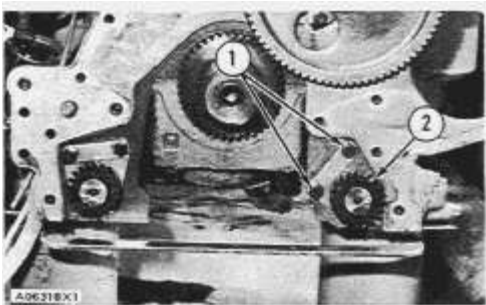
Balancer Shafts

SMCS - 1220-11; 1220-12

Remove Balancer Shafts

start by:

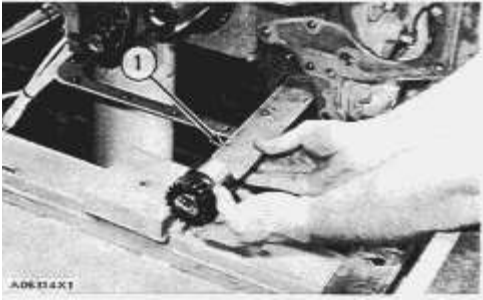
- a) remove timing gear cover
- b) remove oil pump



TYPICAL EXAMPLE

1. Remove bolts (1), lock, and plate that hold the balancer shaft in the cylinder block.
2. Remove balancer shaft (2).
3. Remove the other balancer shaft with the same above procedure.

Install Balancer Shafts



TYPICAL EXAMPLE

1. Put clean engine oil on the balancer shaft. Put balancer shaft (1) in position in the cylinder block. Install the plate, lock, and bolts that hold the balancer shaft in place.

NOTE: Make sure the balancer shaft timing is correct. See INSTALL OIL PUMP.

end by:

a) install oil pump

b) install timing gear cover

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3304 VEHICULAR ENGINE FOR 955L TRACK-TYPE LOADER

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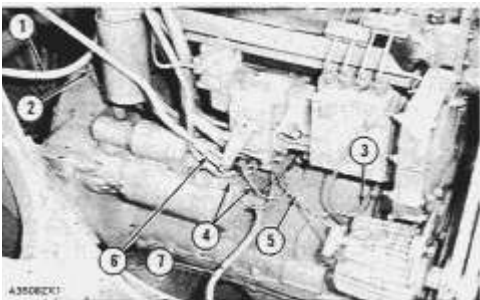
Publication Date -01/08/1978

Date Updated -12/10/2001

Engine

SMCS - 1000-11; 1000-12

Remove Engine



start by:

a) remove radiator and guard

1. Remove the oil from the engine. Disconnect cables from the battery.

2. Disconnect fuel line (1) from the fuel filter base.

3. Disconnect governor control linkage (6) from the lever on the governor. Let the linkage be along the engine.

4. Disconnect power cable (2) and ground cable (7) from the starting motor.

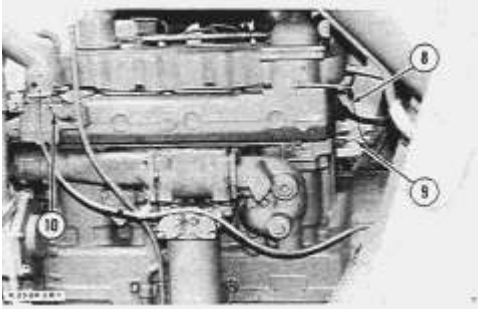
NOTE: Put a mark on all wires before they are removed for installation purposes.

5. Disconnect the wiring harness by:

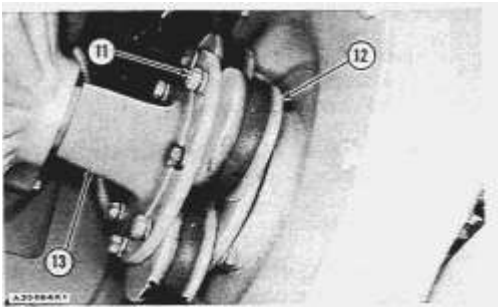
a) Disconnect two wires (4) from the solenoid.

b) Disconnect double wire (5) from the alternator.

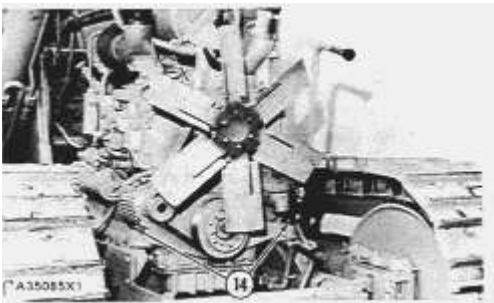
c) Disconnect wire (3) from the pressure switch.



6. Disconnect wires (8) and (9) from connectors in the rear of the engine.
7. Disconnect the two brackets that hold water temperature sensor (10) to the engine and disconnect the water temperature sensor.

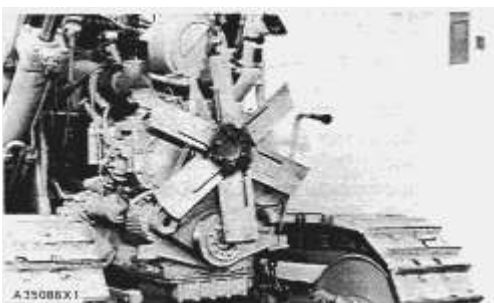


8. Remove eight bolts (11) and disconnect torque converter flange (13) from flexible joints (12).



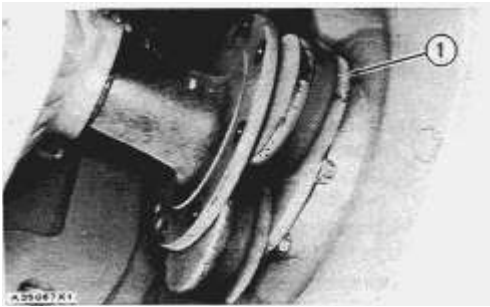
9. Fasten a hoist to the engine. Remove two bolts (14) and washers from the front support. Remove the bolts and washers that hold the engine in position in the rear.
10. Remove the engine from the chassis. Weight of the engine is 1850 lb. (839 kg).

Install Engine



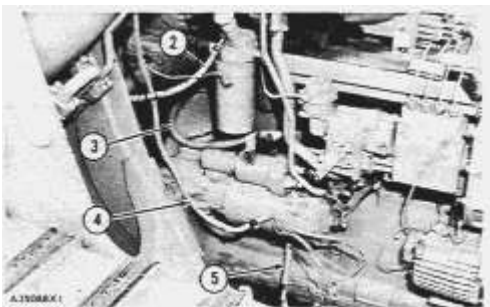
1. Fasten a hoist and a chain to the front and rear lifting eyes.

2. Put the engine in position in the chassis. Make an alignment with the engine and transmission. See FLEXIBLE DRIVE COUPLING in TESTING AND ADJUSTING. This information is in the POWER TRAIN SECTION.



3. When the alignment is correct install flexible joints (1) to the torque converter flange and the engine output flange. Tighten the retaining bolts to a torque of 80 ± 5 lb.ft. (110 ± 7 N·m).

4. When the engine to transmission alignment is correct tighten the engine mounting bolts as follows:



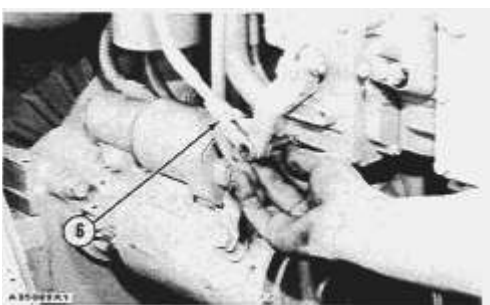
a) Front mounting bolts: 460 ± 50 lb.ft. (624 ± 70 N·m).

b) Rear mounting bolts: 225 ± 30 lb.ft. (300 ± 40 N·m).

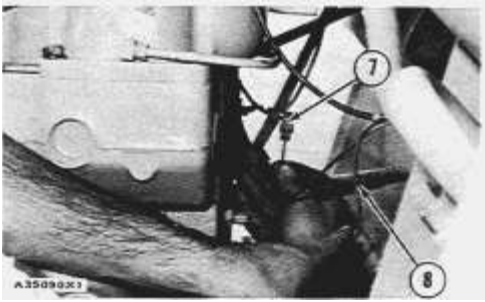
5. Connect power cable (3) and ground cable (5) to the starting motor.

6. Connect fuel line (2) to the fuel filter base.

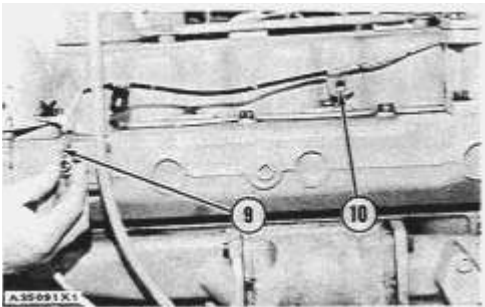
7. Connect harness (4) by connection of wires to the correct terminals where marks of identification were made.



8. Connect governor control linkage (6) to the lever as shown with a pin and cotter pin.



9. Connect wires (7) and (8) to connectors at the rear of the engine.



10. Put water temperature sensor (9) in position on the engine and install it. Connect two clips (10) to the engine to hold the water temperature sensor in place.

11. Connect the battery cables to the battery. Fill the engine with oil to the correct level. See LUBRICATION AND MAINTENANCE GUIDE.

end by:

a) install radiator and guard

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Date Updated -12/10/2001

Flywheel

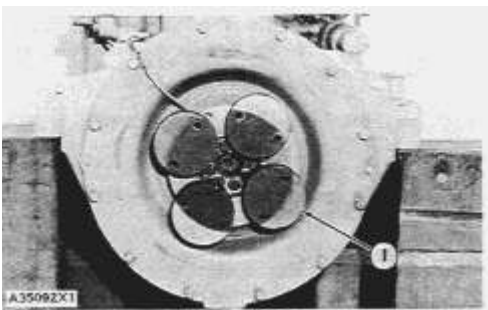
SMCS - 1156-11; 1156-12

Remove Flywheel

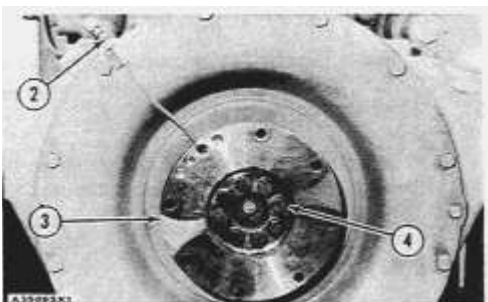
Tools Needed		A
FT120	Lifting Bracket	1

start by:

a) remove engine

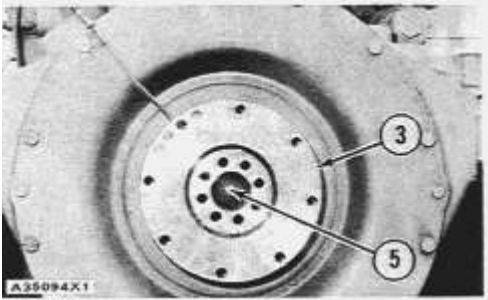
NOTE: Engine is removed from machine for better illustration for removal of flywheel.

1. Remove four flexible drive joints (1).

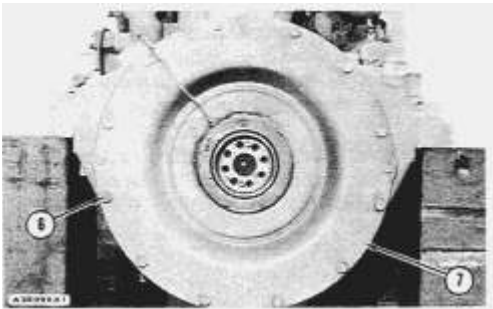


2. Disconnect lubrication tube (2) at the joint.

3. Remove eight bolts (4) from flexible drive flange (3). Remove the plug from the center of the flange.

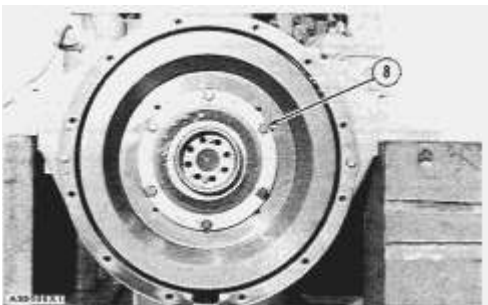


4. Install forcing screw (5) in center of flange (3) and remove the flange.

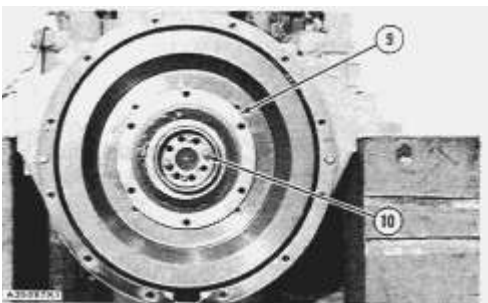


5. Remove the remainder of the lubrication tube and remove twelve bolts (6). Remove cover (7).

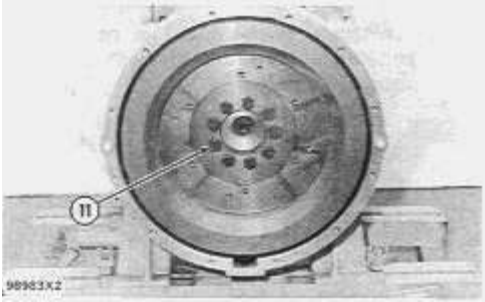
6. Remove two seals from the flywheel cover.



7. Remove five bolts (8) and locks from the flange assembly.



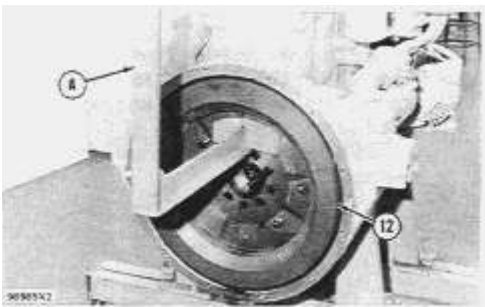
8. Install two forcing screws (10) in flange assembly (9) and remove the flange assembly.



9. Loosen nine bolts (11). Remove two of the bolts and install two 5/8"-18 NF guide bolts.

10. Put a mark on the flywheel and crankshaft for the correct alignment at installation.

11. Install two forcing screws in the flywheel and move the flywheel away from the flange of the crankshaft.

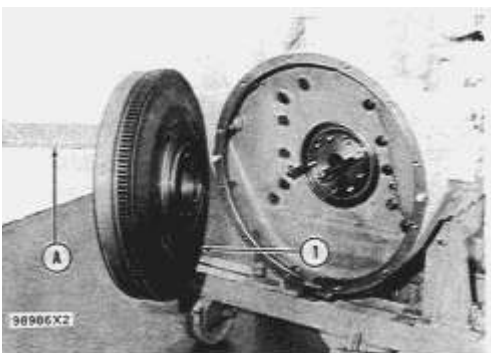


12. Install tool (A). Remove the flywheel (12). Weight of the flywheel is 65 lb. (29 kg).

Install Flywheel

Tools Needed		A	B
FT120	Lifting Bracket	1	
1P531	Handle		1
1P524	Drive Plate		1
1P527	Drive Plate		1

1. Install two 5/8"-18 NF guide bolts in the flange of the crankshaft.





Suggest:

If the above button click is invalid.

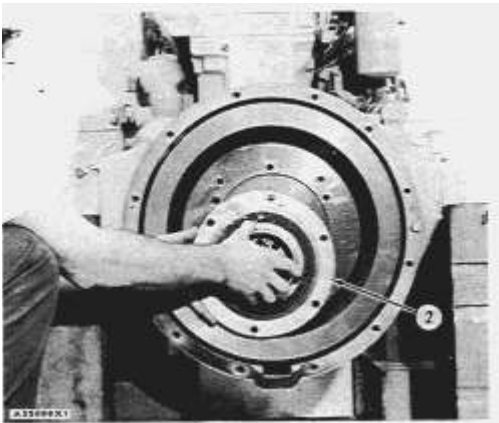
Please download this document

first, and then click the above link

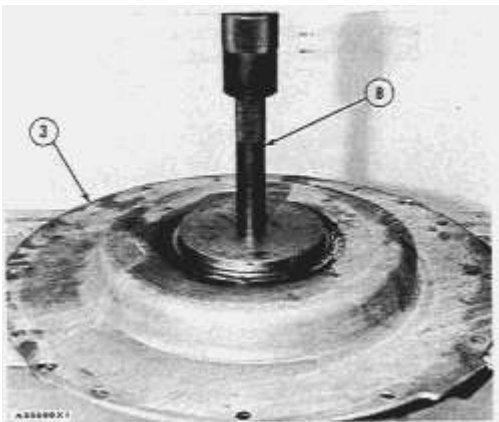
to download the complete manual.

Thank you so much for reading

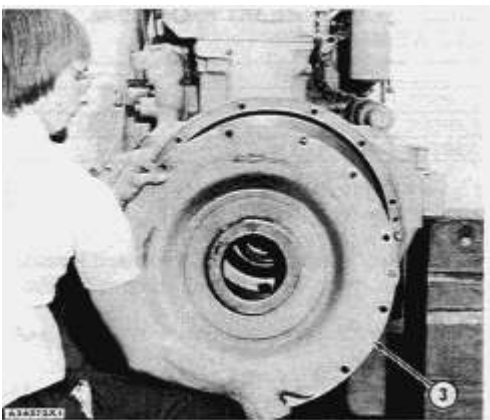
2. Fasten a hoist to tool (A) on flywheel (1). Put the flywheel in position on the crankshaft. Make sure the mark on the flywheel is in alignment with the mark on the crankshaft. Remove tool (A).
3. Install seven of the bolts that hold the flywheel in position. Remove the two guide bolts. Install the other two bolts.



4. Put flange assembly (2) in position and install five bolts and locks to hold it in place.



5. Install the two seals in flywheel cover (3) with tooling (B). The first seal is pushed to the bottom of the seat. The second seal is installed even with the top of the seat. Put 1P808 General Purpose Grease between the two seals.



6. Install a new gasket on the flywheel housing if one is needed. Put flywheel cover (3) in position and install the twelve bolts that hold the cover in place. Install section of the lubrication tube on the cover.

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