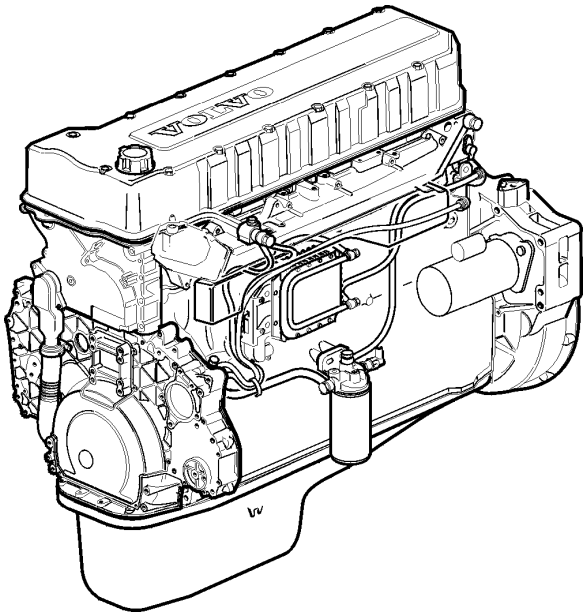
VOLVO
Volvo Trucks North America, Inc.
Greensboro, NC USA

TSI

This TSI Service Bulletin and others in Groups 21 and 33 replace TSI Service Manual 210–600, “Basic Engine, D12, D12A, D12B, D12C” (08.2000), publication no. PV776–TSP142853.

Piston to Connecting Rod



W2003244

Fig. 1: VOLVO D12C Engine

This information covers procedures for replacing the piston connecting rod of VOLVO D12 engines.

Contents

Tools

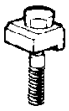
Special Tools

The following special tools are used to replace or repair components. The tools can be ordered from Volvo; please use the specified part number when ordering.

9991801

9992013

9996956
Flywheel turning tool



9996966
Clamping tool

Service Procedures

2132-03-05-01 Piston to Connecting Rod, Replacement

CAUTION

Observe the greatest possible cleanliness when working on the cylinder head. Dirt particles in the fuel and oil channels can cause the unit injectors to malfunction, and can cause the VEB (if equipped) to fail.

Special tools: 9991801, 9992013

Removal

1
Remove the snap rings from the old piston.

2

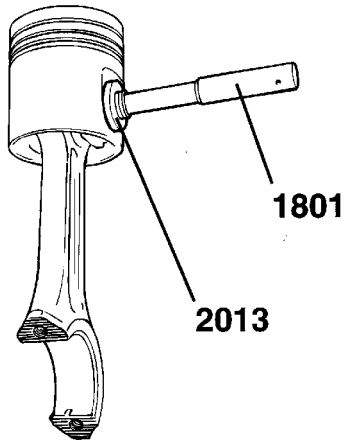


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Fig. 2: Removing piston from connecting rod

Remove the piston pin using drift 9992013 and handle 9991801.	9991801 9992013

3
Remove the connecting rod.

4

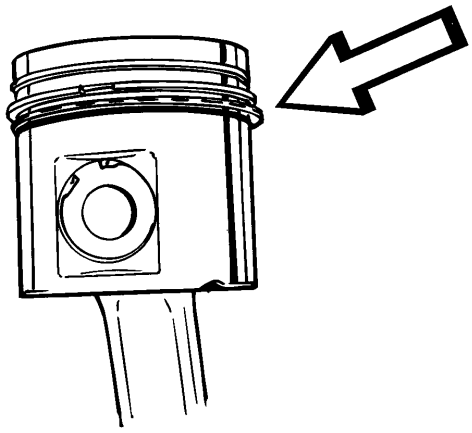

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Fig. 3: Piston rings

If the piston rings are to be removed and reinstalled, use piston ring pliers.

Installation

1
Install one snap ring into the piston sleeve.

2

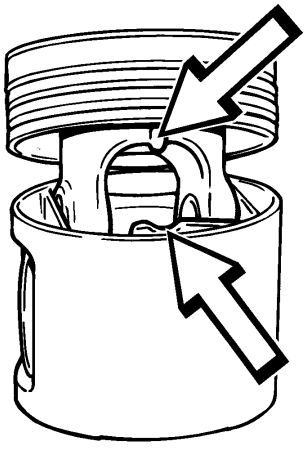

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Fig. 4: Assembling the piston and the piston skirt

Assemble the upper and lower sections of the piston so that the stud in the upper section of the piston mates with the recess in the bottom section.

Note: Heat the piston skirt to 100 °C (212 °F) if necessary for easier assembly.

3

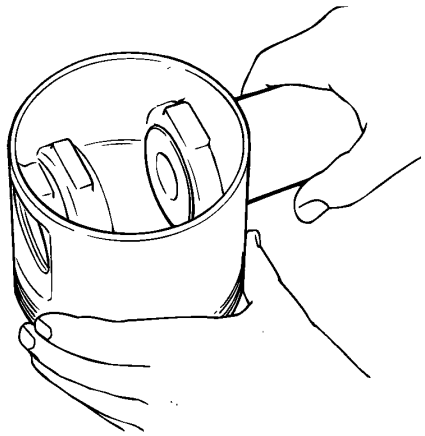

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Fig. 5: Installing the piston pin

Install the piston pin to hold the piston halves together.

4

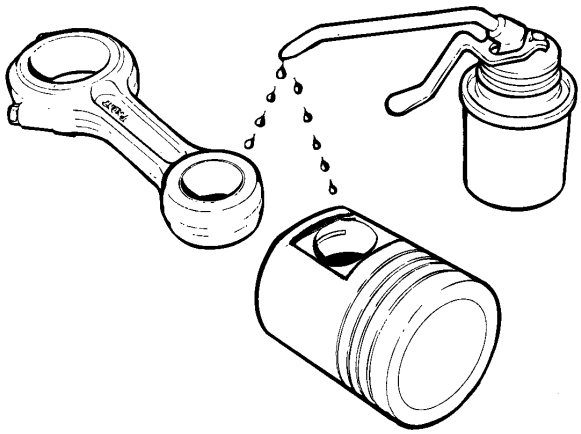

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Fig. 6: Piston and piston pin lubrication

Lubricate the piston pin, piston pin bushings, and connecting-rod bushing with engine oil.

5

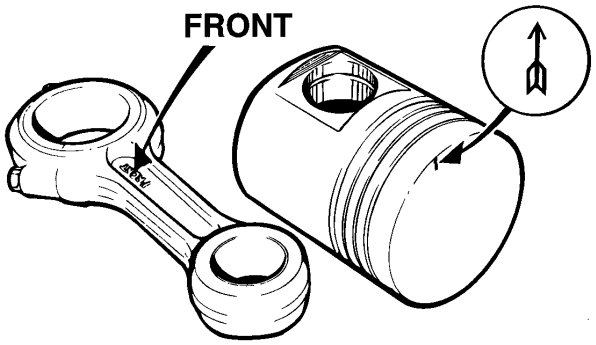

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Fig. 7: Piston and connecting rod

Align the connecting rod with piston so that the “Front” marking on the connecting rod and arrow on the piston are facing in the same direction.

6

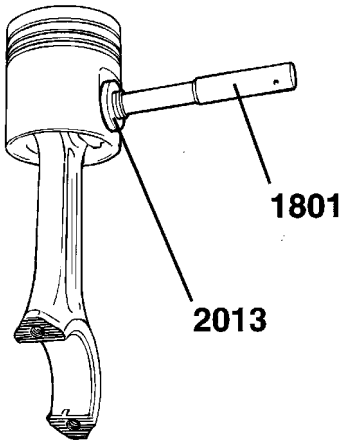

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Fig. 8: Installing piston pin

Press in the piston pin using drift 9992013 and handle 9991801.

9992013
9991801

Note: It should be possible to lightly press in the piston pin. Do not tap it in.

7

Install the other snap ring to hold the piston pin.

8

Make sure that the upper and lower sections of the piston can move easily relative to each other and that the piston pin moves freely in the connecting rod bushing.

9

Lubricate the piston and piston rings with engine oil.

10
Make sure that the piston ring gaps are evenly staggered around the piston.

11

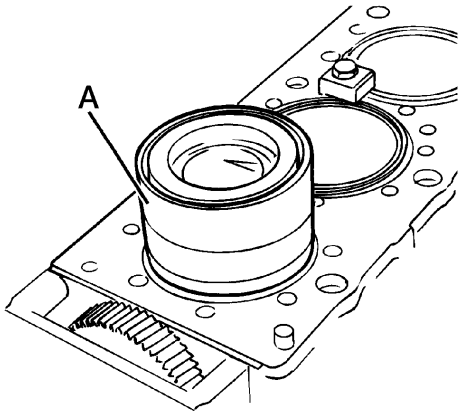

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Fig. 9: Installing piston and connecting rod

Install the piston and connecting rod with the arrow and front markings facing forward. Use tool (A) to guide the piston rings into the cylinder liner.	9996966

Note: Temporarily remove cylinder liner clamping tools 9996966 when using tool piston installation tool. When the piston is in position, reinstall clamping tools 9996966 onto the liner.

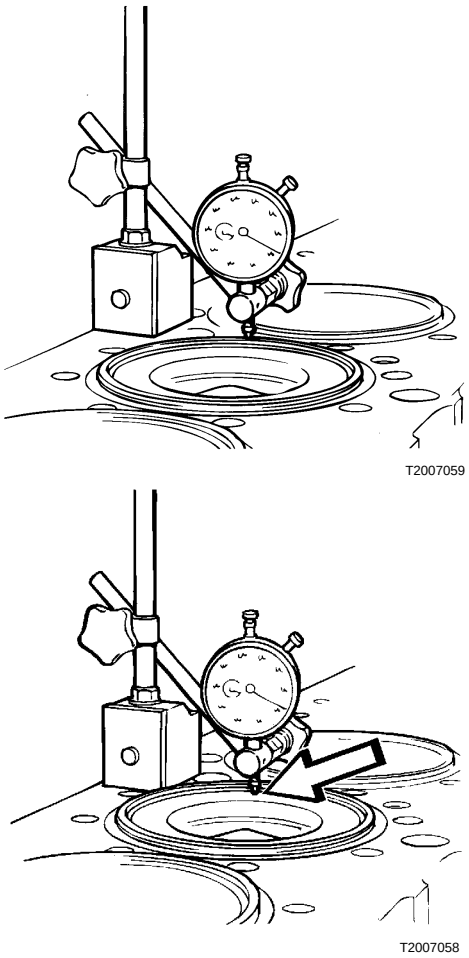
12
Lubricate the crankshaft bearing shells and crankshaft pin with engine oil. Install the bearing shells and make sure that they are mounted correctly in the connecting rod and bearing cap.

13
Install the bearing cap according to the marking and tighten the bolts by hand.

14

Make sure clamping tools 9996966 are in position and carefully rotate the flywheel with flywheel turning tool 9996956 until the piston reaches bottom dead center. Torque tighten the rod bearing cap bolts to 275 $^{+25}_{-0}$ Nm (205 $^{+11}_{-0}$ ft-lb).	275 $^{+25}_{-0}$ Nm (205 $^{+11}_{-0}$ ft-lb) 9996956 9996966

15



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T2007058

Fig. 10: Measuring the height of the piston

With piston at TDC, measure the height of the piston above the cylinder block face. The height should be 0.15 – 0.65 mm (0.006 – 0.026 in.).	0.15 – 0.65 mm (0.006 – 0.026 in.)

Note: It is not necessary to measure the piston height if the cylinder block has **not** been machined.

16

Remove flywheel turning tool 9996956.	9996956

17

Install and torque-tighten the piston cooling jet to 24 ± 4 Nm (18 ± 3 ft-lb).	24 ± 4 Nm (18 ± 3 ft-lb)

Note: Check that the piston cooling jet is not damaged. A damaged jet must be replaced. Also make sure that the jet is directed toward the recess on the piston.