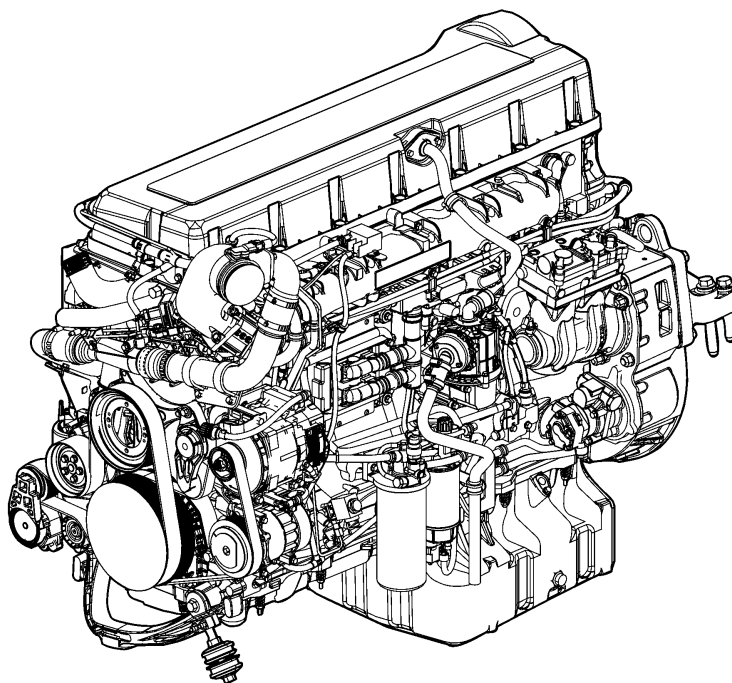


Date	Group	No.	Page
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Piston to Connecting Rod Replacement D16F

Piston to Connecting Rod, Replacement



W2005773

This information covers procedures for replacing the piston and connecting rod on the Volvo D16F engine.

Contents

- "Special Tools" page 2
- "Piston to Connecting Rod, Replacement" page 3

Note: Information is subject to change without notice. Illustrations are used for reference only and can differ slightly from the actual vehicle being serviced. However, key components addressed in this information are represented as accurately as possible.

Tools

Special Tools

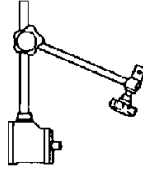
For special tools ordering instructions, refer to Tool Information, group 08.



998 9876

T0008543

9989876
Dial Indicator



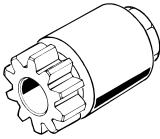
W0001790

9999696
Magnetic Stand



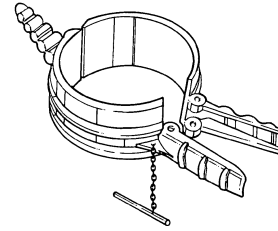
W0001775

85109123
Cylinder Liner Clamp Tool



T0012612

88800014
Flywheel Turning Tool



W0002016

J48062
Piston Ring Compressor

Service Procedures

2132-03-05-01

Piston to Connecting Rod, Replacement

You must read and understand the precautions and guidelines in Service Information, group 20, "General Safety Practices, Engine" before performing this procedure. If you are not properly trained and certified in this procedure, ask your supervisor for training before you perform it.

Special tools: 9989876, 9999696, 85109123, 88800014, J48062

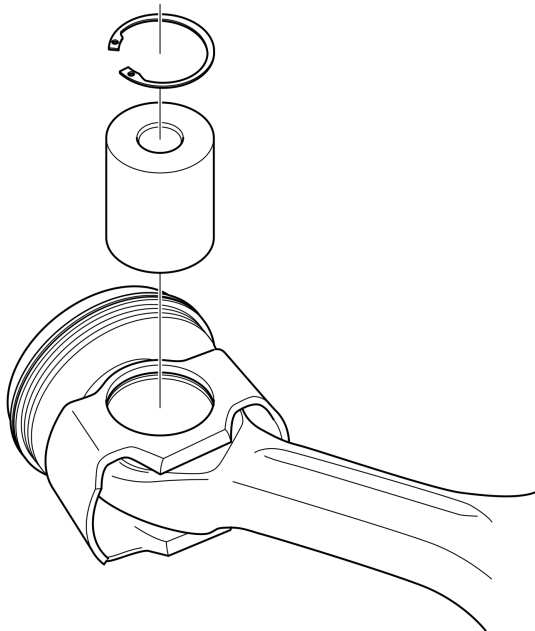
Removal

1

Remove components as necessary to gain access to the piston and connecting rod. Remove the piston and connecting rod from the cylinder block. Also, remove the piston cooling nozzle from the same cylinder. Refer to Service Information, Group 21.

2

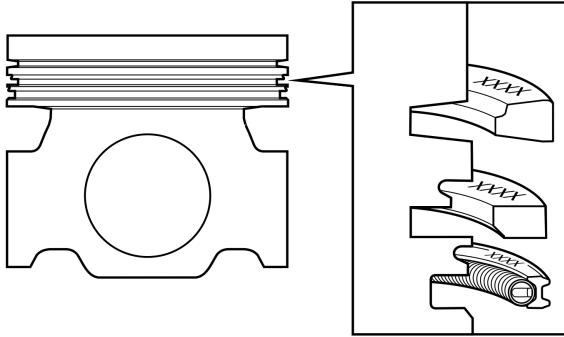
Remove the snap ring from the piston and push out the wrist pin.



T2022501

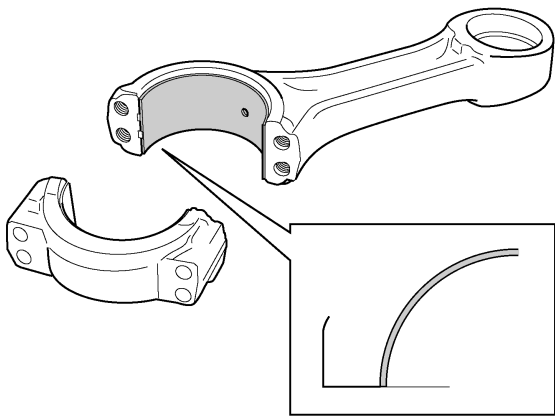
3

Separate the connecting rod from the piston.



T2022726

- 4**
If the piston rings are to be removed and reinstalled, use piston ring pliers to remove the rings.

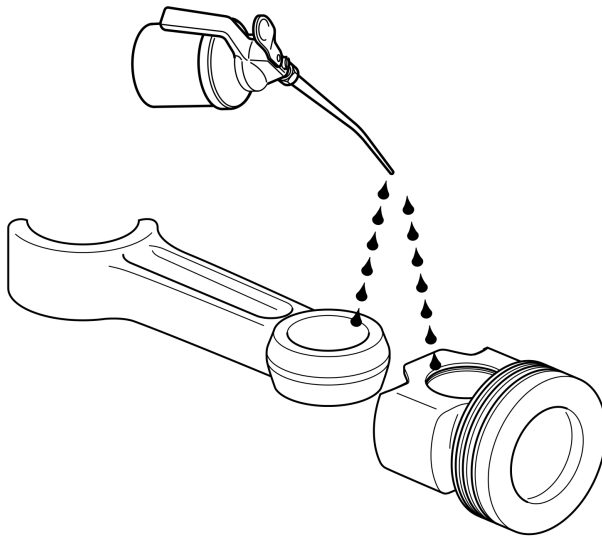


W2006371

- 5**
Remove the bearings from the big end of the connecting rod and the connecting rod cap.

Installation

- 1**
Install a snap ring into the snap ring groove of the piston wrist pin bore.

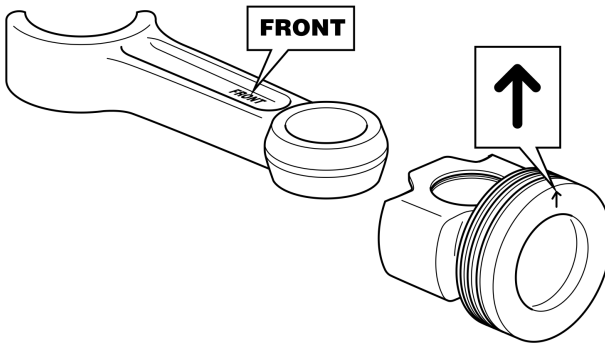


T2022502

2

Lubricate the wrist pin, connecting rod and piston with engine oil.

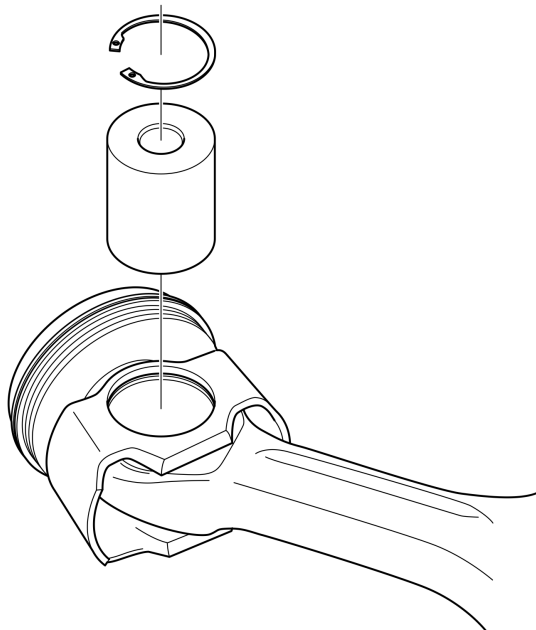
Note: Check the condition of the wrist pin bushing in the connecting rod before assembly. Replace if necessary.



T2022504

3

Align the connecting rod with the piston so that the "FRONT" marking on the connecting rod and arrow on the piston are facing in the same direction. Install the connecting rod into the piston.



T2022501

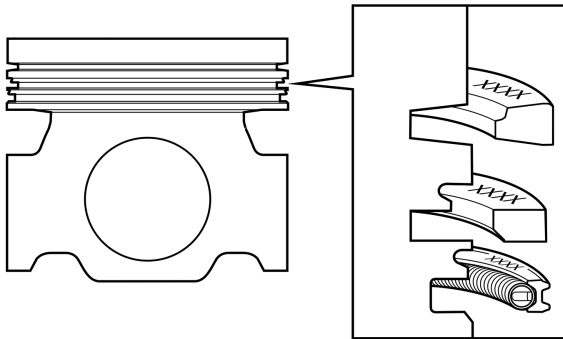
4

Install the wrist pin in the piston through the connecting rod. Install the snap ring to hold the wrist pin.

Note: The wrist pin should install with light pressure. Do not tap it in.

5
Make sure that the wrist pin moves freely in the connecting rod bushing.

6
If removed, install the piston rings using piston ring pliers.



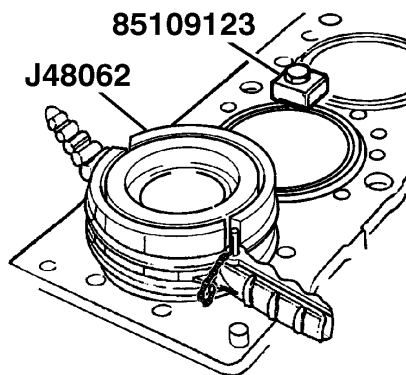
T2022726

7
Lubricate the piston and piston rings with engine oil.

8
Make sure that the piston ring gaps are evenly staggered around the piston.

9
Using the piston ring compressor, install the piston assembly. Install the piston assembly with the arrow and front markings facing the front of the engine.

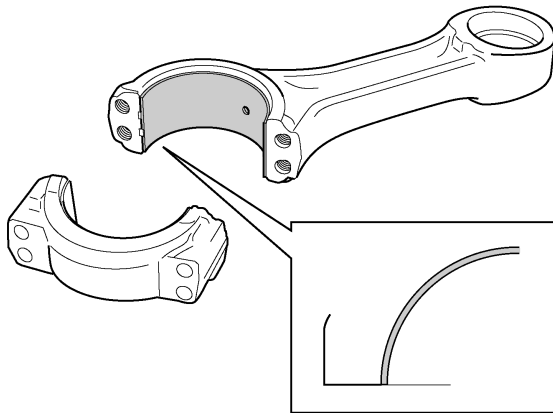
Note: Temporarily remove any cylinder liner clamp tools when using the piston ring compressor. When the piston is in position, reinstall the cylinder liner clamp tools.



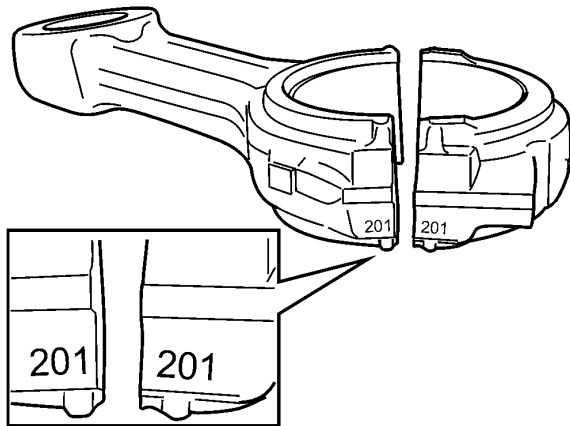
J48062, 85109123

W2006375

10
Use compressed air to carefully clean the mating and bearing surfaces of the connecting rod and bearing caps. Inspect the connecting rods and bearing caps for damage. Replace the assemblies as needed.



W2006371



T2019085

11

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

12

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

13

Make sure the cylinder liner clamp tools are in position and carefully rotate the flywheel with the flywheel turning tool until the piston reaches Bottom Dead Center (BDC). Tighten the connecting rod bearing cap bolts to 20 ± 3 Nm (15 ± 2 ft-lb), then 60 ± 3 Nm (44 ± 2 ft-lb), plus 90 ± 5 degrees angle of tightening. Tighten rod bearing cap bolts in a cross pattern.

20 ± 3 Nm (15 ± 2 ft-lb)
Then 60 ± 3 Nm (44 ± 2 ft-lb)
Plus 90 ± 5 degrees rotation
88800014, 85109123

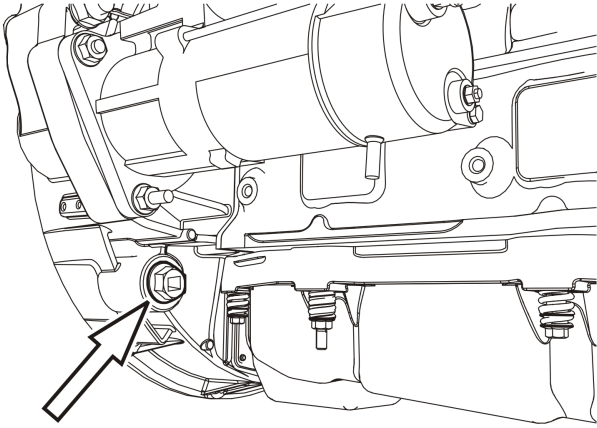
14

After the bolts have been tightened, check the axial clearance between connecting rod and crankshaft. Maximum axial clearance is 0.10 mm (0.0039 inch).

15

Using the flywheel turning tool, rotate the flywheel until the piston reaches Top Dead Center (TDC).

88800014

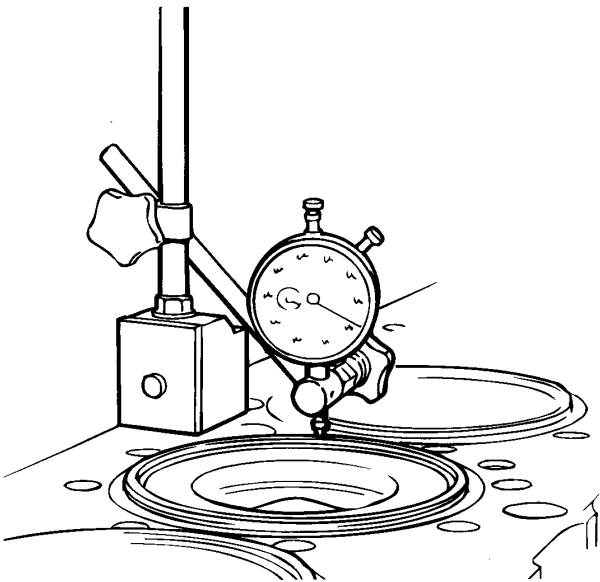


W0002368

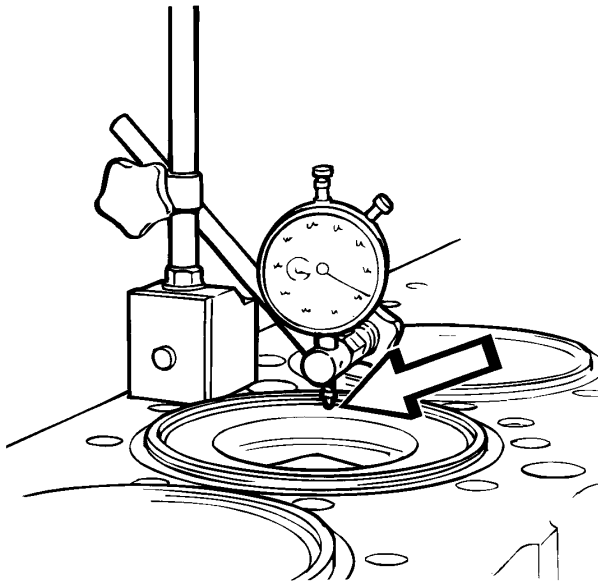
16

Install magnetic dial indicator stand and dial indicator. Zero the dial indicator on the cylinder block face.

9989876, 9999696



T2007059



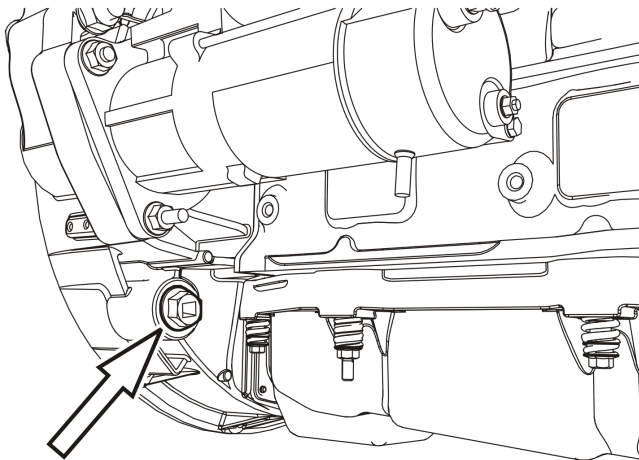
T2007058

17

With piston at TDC, use the dial indicator to measure the height of the piston above the cylinder block face. The height should be $0.35 +0.1$ to -0.3 mm ($0.0137 +0.0039$ to -0.0118 inch).

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

9989876, 9999696

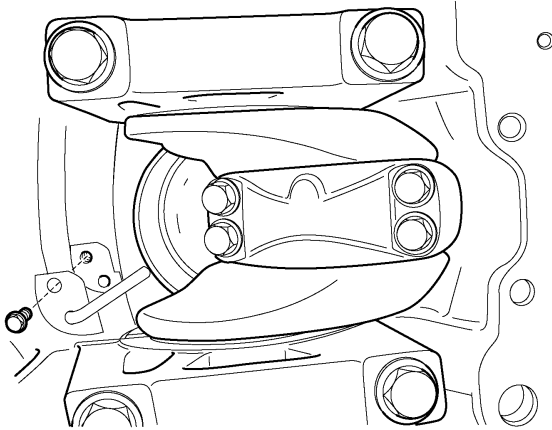


W0002368

18

Remove the flywheel turning tool and install the dust plug.

88800014



19

Position the piston cooling nozzle on the block and install a new fastener. Torque-tighten fastener to 24 ± 3 Nm (18 ± 2 ft-lb).

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

24 ± 3 Nm
(18 ± 2 ft-lb)

W2006372

20

Install the components removed to gain access to the piston and connecting rod. Refer to Service Information, Group 21.