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” (8.2000), publication no. PV776–TSP142853.

Rocker Arm Shaft

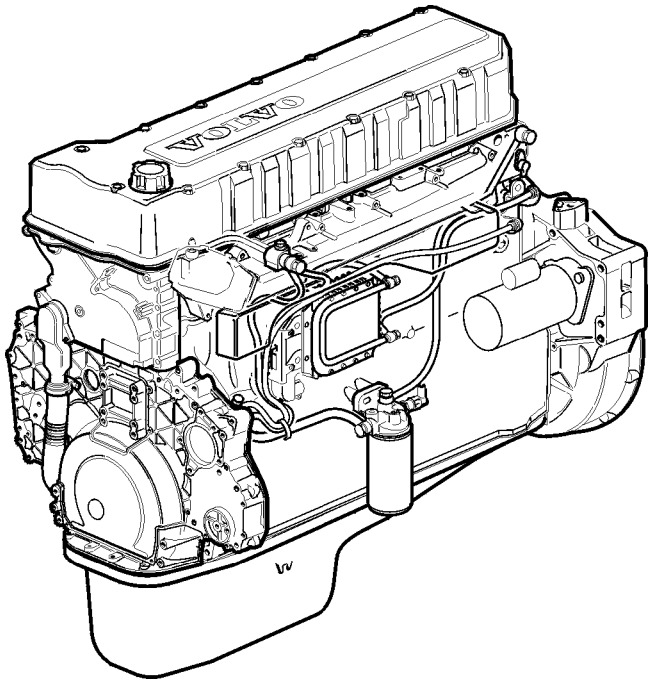


Fig. 1: Volvo D12C engine

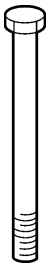
This information covers procedures for checking oil pressure of the rocker arm shaft on VOLVO D12, D12A, D12B, and D12C engines.

Contents

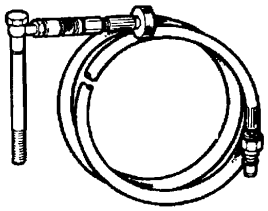
Tools

Special Tools

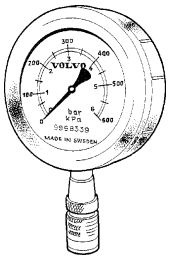
The following special tools are used to replace or repair components. The tools can be ordered from Volvo; please refer to the specified part number when ordering.



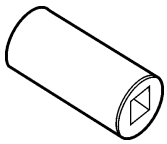
9808001
Bolt



9998338
Connector



9998339
Pressure Gauge



W0002053
J-41203
Socket

Service Procedures

2146-06-02-01 Rocker Arm Shaft Oil Pressure, Checking

DANGER

Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

WARNING

Always wear appropriate eye protection to prevent the risk of eye injury due to contact with engine debris or fluids.

WARNING

HOT ENGINE! Keep yourself and your test equipment clear of all moving parts or hot engine parts and/or fluids. A hot engine and/or fluids can cause burns or can permanently damage test equipment.

WARNING

Fuel spilled or leaked onto hot surfaces or electrical components can cause a fire, with potential for serious personal injury from burns.

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.

Note: Extreme cleanliness must be observed when performing this procedure. Clean the engine before servicing.

Special tools: 9808001, 9998338, 9998339, J–41203

Installing Test Components

1

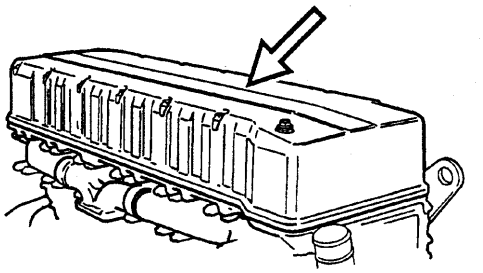


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Fig. 2: Valve cover removal

Unscrew oil fill cap and remove the valve cover.

Note: Avoid damage to the valve cover by making sure the mounting studs do not unscrew from the cylinder head during removal. **Do not** use impact tools to remove the nuts securing the valve cover.

2

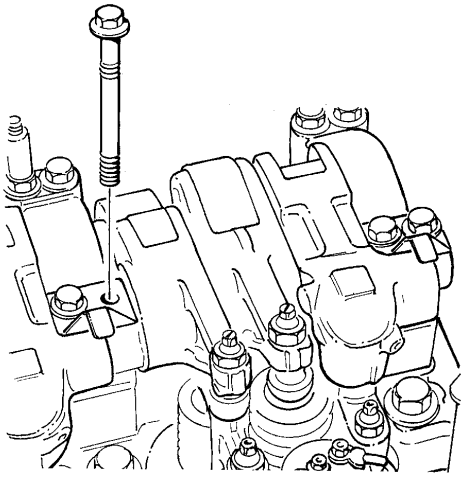

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Fig. 3: Rocker arm bridge bolt removal

Remove the bolts retaining the rocker arm bridge between cylinders 4 and 5. Remove the spring washer.

3

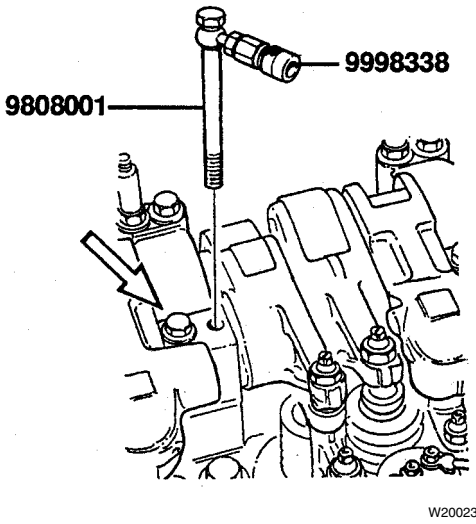

Fig. 4: Installing Connector (9998338)

Install one of the bolts **without** the spring washer. Install bolt (9808001) with connector (9998338) and tighten the two bolts.

Note: Bolt (9808001) must be used. It is shorter than the previous version and has no sleeve.

4

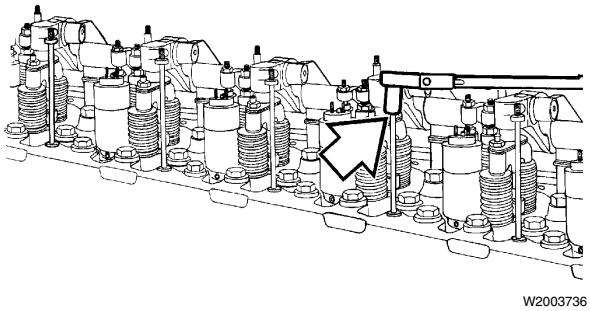

Fig. 5: Valve cover stud bolt removal

Use Kent-Moore socket J–41203 to remove the valve cover stud located beside the VEB control valve. J–41203

5

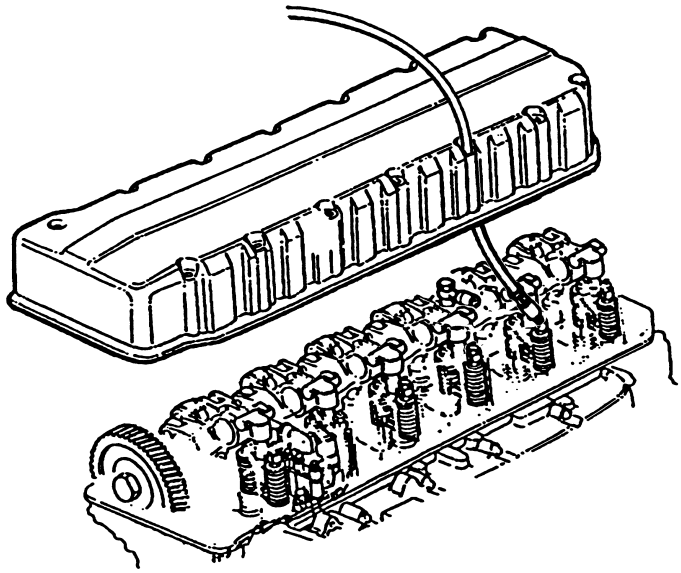

Fig. 6: Oil pressure hose routing

Route the oil pressure hose through the hole in the valve cover. Connect the oil pressure hose to connector (9998338).

Note: Check that connector (9998338) and the oil pressure hose do not obstruct the rocker arms.

6

Install the valve cover. Make sure the oil pressure hose is routed correctly and does not interfere with the rocker arms or any part of the valve mechanism.

7

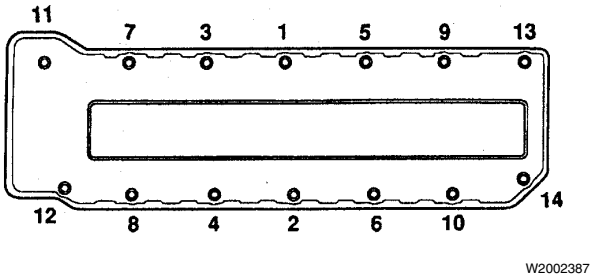

Fig. 7: Tightening sequence for valve cover

Use a 14 mm socket to torque the valve cover nuts to 30 ± 3 Nm (22 ± 2 ft-lb). Follow the tightening sequence shown. 30 ± 3 Nm (22 ± 2 ft-lb)

8

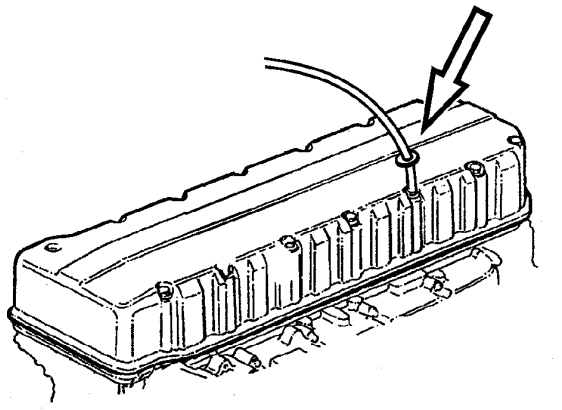

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Fig. 8: Installing the oil hose seal

Install the seal for the oil pressure hose as shown. Make sure the seal fits into the stud hole in the valve cover.

9

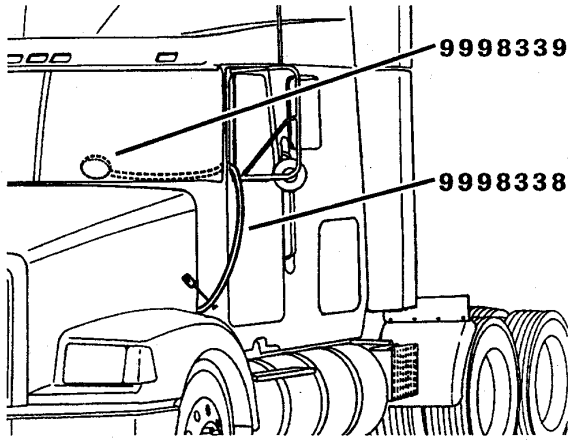

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Fig. 9: Oil pressure hose routing

Route the oil pressure hose into the cab as shown. Install pressure gauge (9998339).

Note: Secure the oil hose with cable-ties so it will not kink and restrict flow.

Testing

1

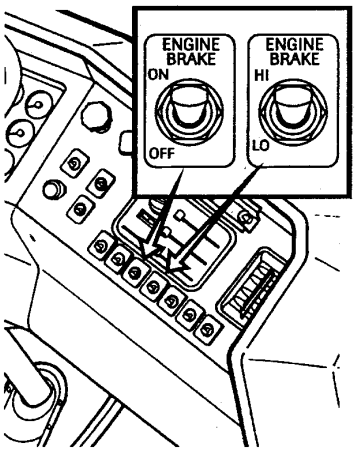

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Fig. 10: Engine and exhaust brake dashboard controls, AC/WG models

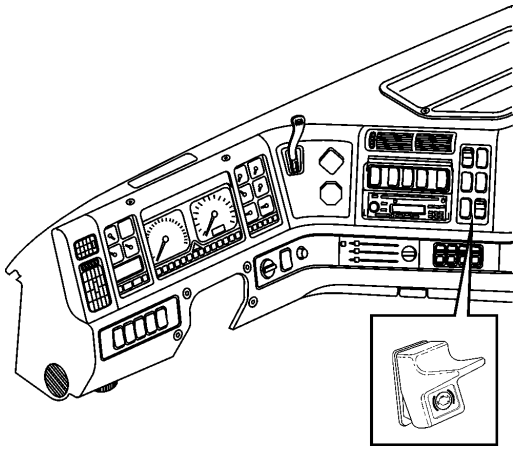

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Fig. 11: Engine and exhaust brake dashboard controls, VN/VHD models

Test run the engine and allow it to reach operating temperature. Activate the engine brake by making sure the engine brake controls on the instrument panel are in the **ON/HI** positions.

Note: The accelerator and clutch pedals must not be depressed.

2
Let the pressure stabilize with the engine running. The gauge should indicate at least 200 kPa (29 psi). Repeat the test several times to confirm the reading and with set switches OFF (VEB disabled). The pressure should be approximately 1 bar (14.5 psi).

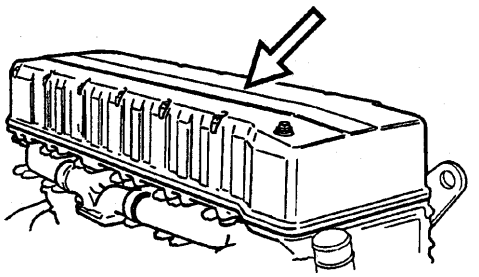
200 kPa (29 psi)

Note: Check the rocker arm bushing for excessive wear; refer to Service Information, Group 21.

Removal of Test Components

1
Stop the engine and set the parking brake. Remove the pressure gauge (9998339) and oil hose from the cab. Cut the oil hose free from the cable-ties and remove the pressure gauge.

2



W2002391

Fig. 12: Valve cover removal

Unscrew oil fill cap and remove the valve cover.

Note: Avoid damage to the valve cover by making sure the mounting studs do not unscrew from the cylinder head during removal. **Do not** use impact tools to remove the nuts securing the valve cover.

3
Remove the oil pressure hose from connector (9998338). Pull the oil pressure hose through the valve cover and remove the oil hose seal.

4

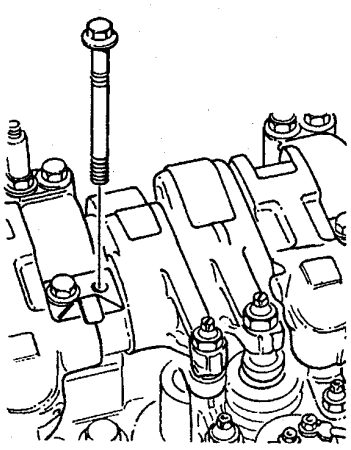


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Fig. 13: Rocker arm bridge bolt installation

Remove connector (9998338) and bolt (9808001) from the rocker arm shaft. Install the spring washer and the two rocker arm bridge bolts.

5
Torque-tighten both bolts using the following steps:

15 Nm (11 ft-lb), 90°

Step 1 Torque to 15 Nm (11 ft-lb).

Step 2 Angle torque both bolts 90°.

6

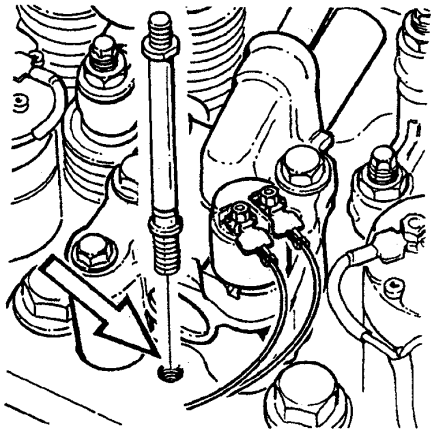

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Fig. 14: Valve cover stud bolt installation

Clean the threaded hole in the cylinder head located beside the VEB control valve. Clean the valve cover stud bolt and apply locking fluid. Use Kent-Moore socket J41203 and torque the stud to 48 ± 8 Nm (35 ± 6 ft-lb).	48 ± 8 Nm (35 ± 6 ft-lb)

Note: Carefully remove any excess locking fluid after the valve cover stud bolt is tightened.

7
Press the electronic cable clamp onto the valve cover stud bolt.

Note: The electronic cable must be positioned on the outside of the valve cover studs.

8

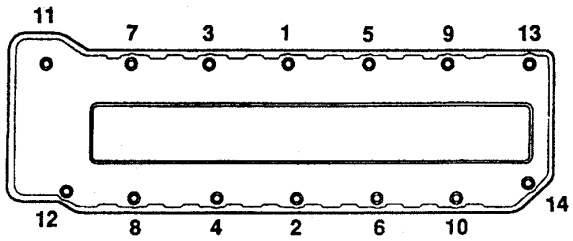

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Fig. 15: Tightening sequence for valve cover

Install the valve cover. Follow the tightening sequence shown and torque the valve cover nuts to 30 ± 3 Nm (22 ± 2 ft-lb).	30 ± 3 Nm (22 ± 2 ft-lb)

9
Test run engine and check for oil leaks.