VOLVO
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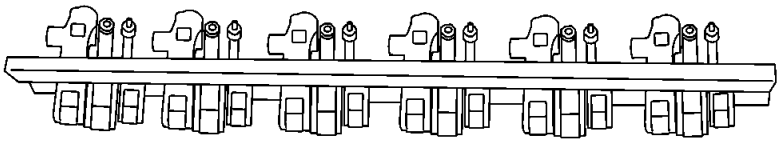
Greensboro, NC USA

TSI

This TSI Service Bulletin replaces TSI Service Bulletin 214–010, “Rocker Arm Shaft, D12, D12A, D12B, D12C” (11.2001), publication no. PV776–TSP160591.

Rocker Arm Shaft with VEB



W2004495

Fig. 1: Volvo D12C Rocker Arm Shaft Assembly

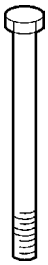
This information covers procedures for checking oil pressure of the rocker arm shaft on VOLVO D12, D12A, D12B, and D12C engines with VEB.

Contents

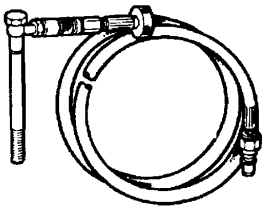
Tools

Special Tools

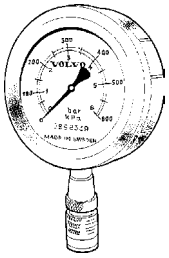
The following special tools are used to replace or repair components. The tools can be ordered from Volvo; please refer to the specified part number when ordering.



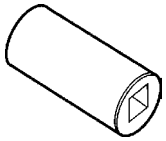
9808001
Bolt



9998338
Connector



9998339
Pressure Gauge



W0002053
J-41203
Socket

Service Procedures

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

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.

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
Remove the valve cover.

Note: On older D12 engines, 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.

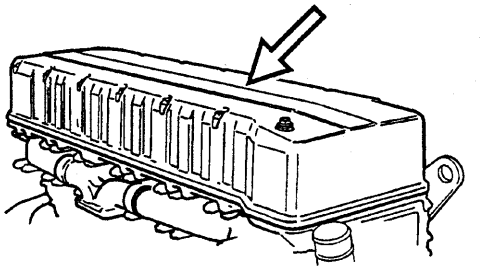


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Fig. 2: Valve cover removal

2
Remove the bolts retaining the rocker arm bridge between cylinders 4 and 5. Remove the spring washer.

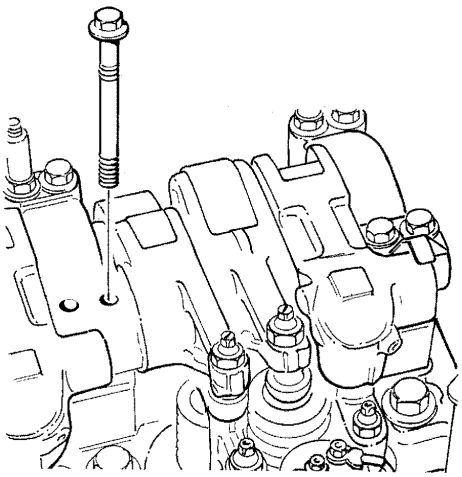

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Fig. 3: Rocker arm bridge bolt removal

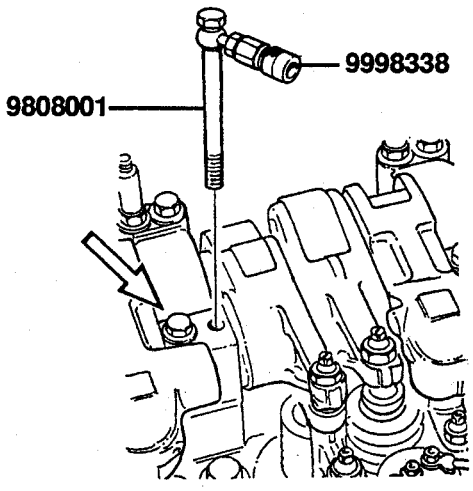

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Fig. 4: Installing Connector (9998338)

3

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.

9808001, 9998338

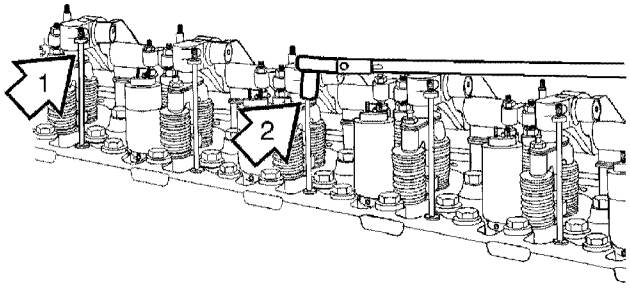

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Fig. 5: Valve cover stud bolt removal

4

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

Note: Some older D12 engines used a larger valve cover stud and require a standard deep well socket for removal.

Note: The VEB control valve is located between cylinders 1 and 2 for D12, D12A, and D12B engines. It is located between cylinders 3 and 4 in D12C engines.

J–41203

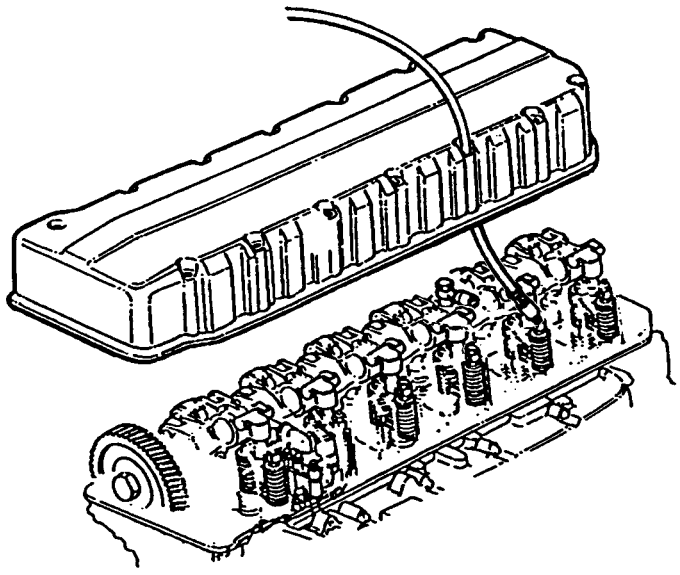

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Fig. 6: Oil pressure hose routing

5

Route the oil pressure hose through the hole in the valve cover. Where the stud was removed, 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

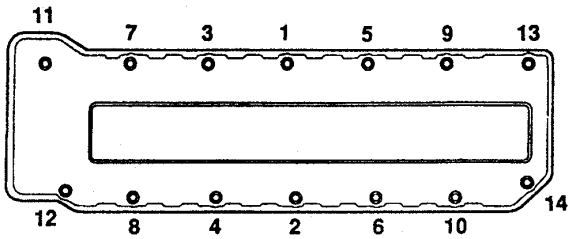

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Fig. 7: D12, D12A, D12B Valve cover tightening sequence

For D12, D12A, and D12B engines, follow the tightening sequence shown and torque the valve cover nuts to 30 ± 3 Nm (22 ± 2 ft-lb). For D12C engines, follow the tightening sequence shown and torque the valve cover nuts to 20 ± 2 Nm (15 ± 1 ft-lb).

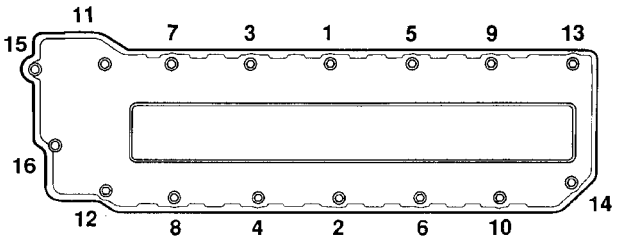

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Fig. 8: D12C Valve cover tightening sequence

30 ± 3 Nm (22 ± 2 ft-lb),
20 ± 2 Nm (15 ± 1 ft-lb)

8
Install the seal for the oil pressure hose as shown. Make sure the seal fits into the stud hole in the valve cover.

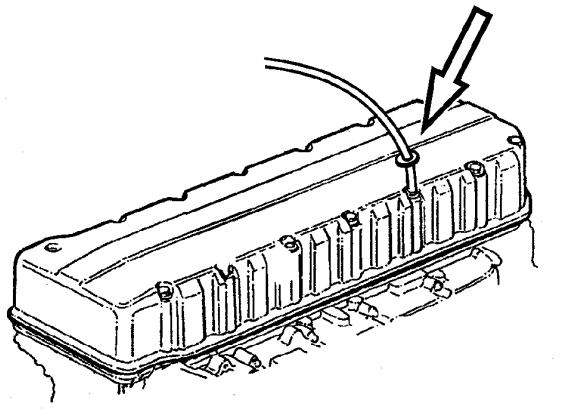

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Fig. 9: Installing the oil hose seal

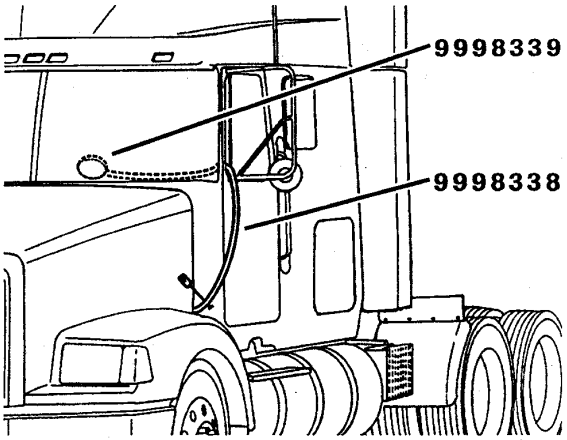

Fig. 10: Oil pressure hose routing

9
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.

9998339

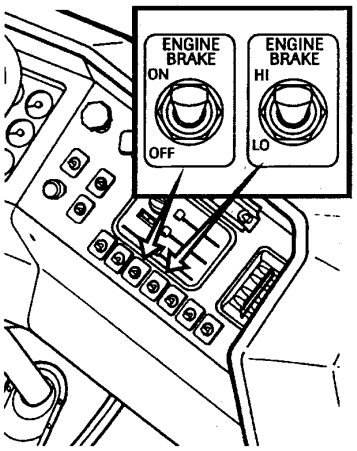

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Fig. 11: Engine and exhaust brake dashboard controls, AC/WG models

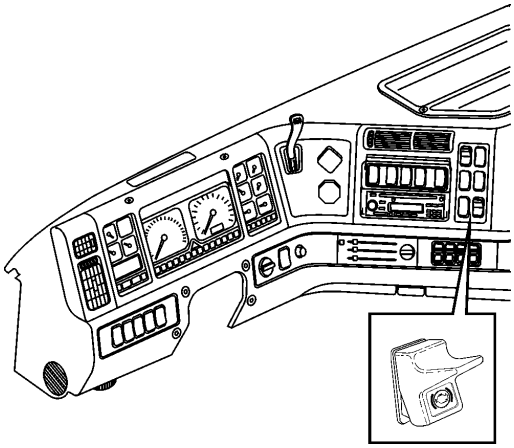

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Fig. 12: Engine and exhaust brake dashboard controls, VN/VHD models

Testing

1

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

Note: When measuring the VEB operation, 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).

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

Activated VEB	Minimum 200 kPa (29.0 psi)
Non-Activated VEB	100 kPa (14.5 psi)

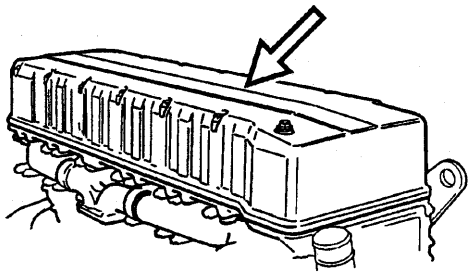
200 kPa (29.0 psi)
100 kPa (14.5 psi)

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
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.



W2002391
Fig. 13: Valve cover removal

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

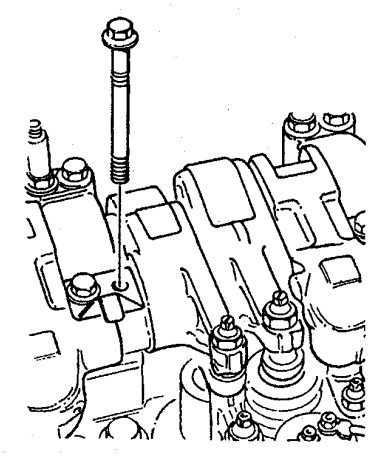


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Fig. 14: Rocker arm bridge bolt installation

5
For D12, D12A, and D12B engines. torque-tighten both bolts using the following steps:

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

Step 2 Angle torque both bolts 90°.

For D12C engines, torque-tighten both bolts to 15 Nm + 120° (11 ft-lb + 120)

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15 Nm (11 ft-lb), 90°,
15 Nm ± 120° (11 ft-lb + 120°)

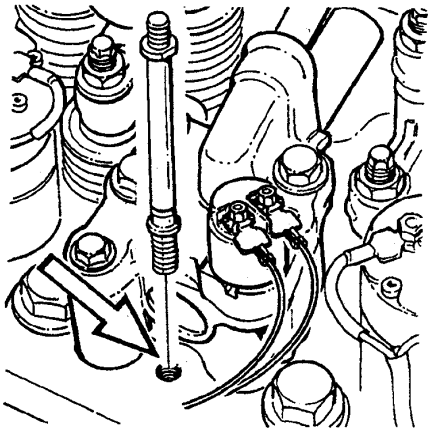

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Fig. 15: Valve cover stud bolt installation

6

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).

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

48 ± 8 Nm (35 ± 6 ft-lb)

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

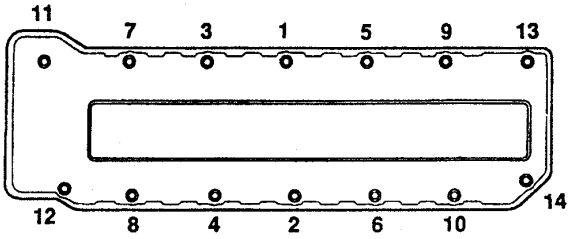

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Fig. 16: D12, D12A, D12B Valve cover tightening sequence

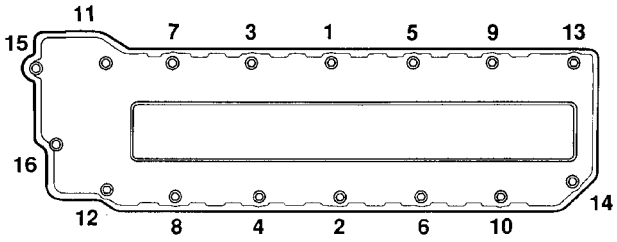

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Fig. 17: D12C Valve cover tightening sequence

Install the valve cover. For D12, D12A, and D12B engines, follow the tightening sequence shown and torque the valve cover nuts to 30 ± 3 Nm (22 ± 2 ft-lb). For D12C engines, follow the tightening sequence shown and torque the valve cover nuts to 20 ± 2 Nm (15 ± 1 ft-lb).

30 ± 3 Nm (22 ± 2 ft-lb),
20 ± 2 Nm (15 ± 1 ft-lb)

9

Test run engine and check for oil leaks.