

Product: TRACK-TYPE TRACTOR

Model: D6R STD TRACK-TYPE TRACTOR EMM

Configuration: D6R TRACK-TYPE TRACTOR STD, XL EMM00001-UP (MACHINE) POWERED BY C9 Engine

Disassembly and Assembly C9 Engines for Caterpillar Built Machines

Media Number -REN9579-20

Publication Date -01/02/2015

Date Updated -15/08/2018

i02580032

Valve Mechanism Cover - Remove and Install

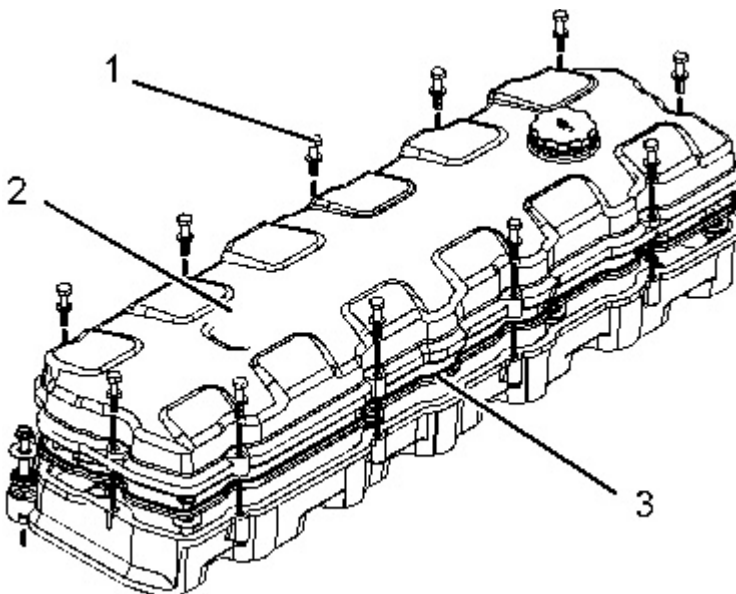
SMCS - 1107-010

Removal Procedure

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.



1. Remove bolts (1) .
2. Remove valve mechanism cover (2) and seal (3) .

Installation Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	4C-9612	Silicone Sealant	1

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

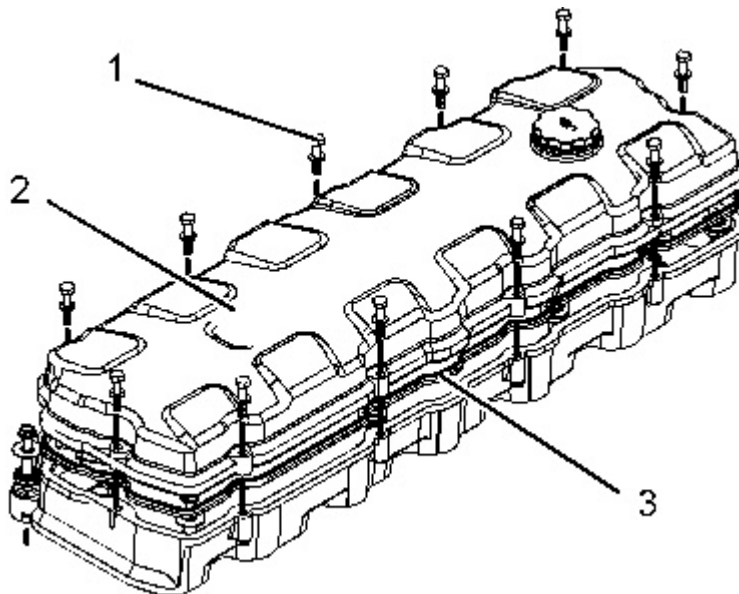


Illustration 2

g01152102

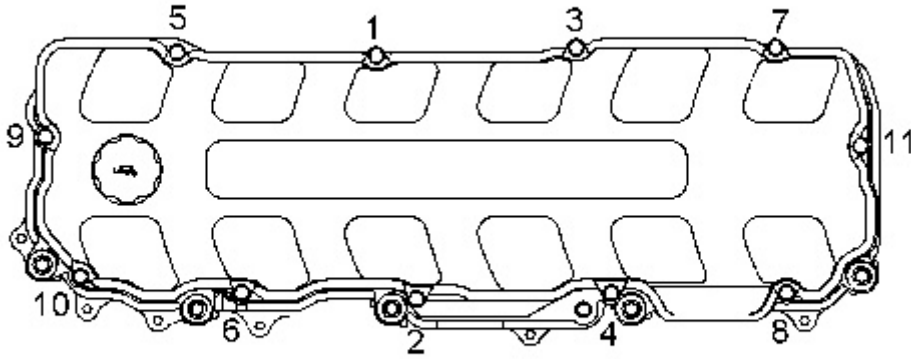


Illustration 3

g01138382

1. Position seal (3) in valve mechanism cover (2) . Apply Tooling (A) to both sides of the seal joint. Position valve mechanism cover (2) and seal (3) on the valve cover base.
 2. Install bolts (1) . Tighten bolts (1) in a numerical sequence to a torque of 20 ± 3 N·m (15 ± 2 lb ft).
-

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i02409213

Valve Mechanism Cover Base - Remove and Install

SMCS - 1120-010

Removal Procedure

Start By:

- a. Remove the valve mechanism cover. Refer to Disassembly and Assembly, "Valve Mechanism Cover - Remove and Install".

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

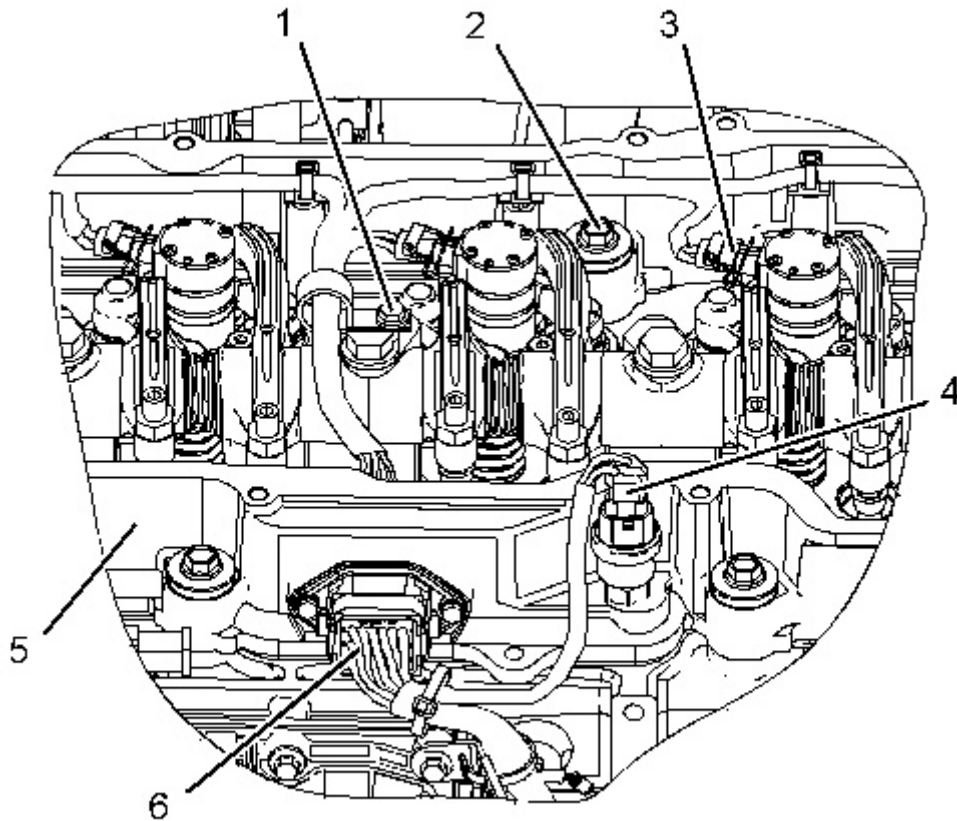


Illustration 1

g01140735

1. Disconnect sensor (4) and harness assembly (6) from valve cover base (5).
2. Remove bolt (1) and the clip that holds the harness assembly.
3. Disconnect harness assemblies (3).
4. Remove bolts (2), the washers, and the springs.
5. Remove valve cover base (5) and the seal.

Installation Procedure

NOTICE

Keep all parts clean from contaminants.

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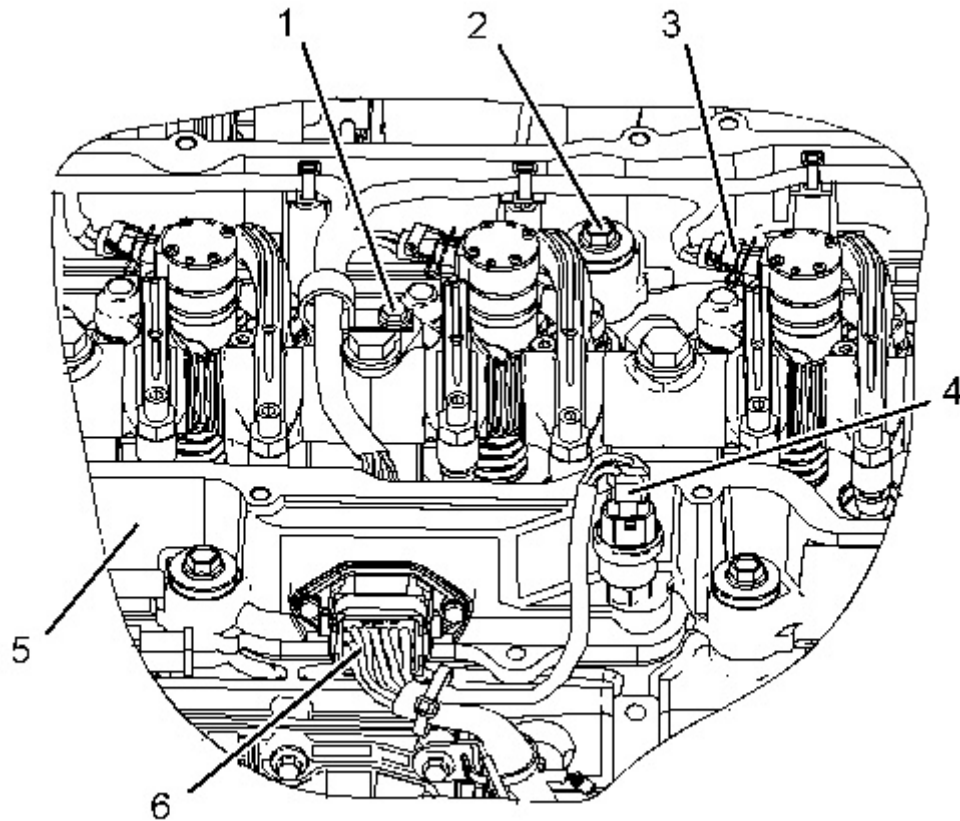


Illustration 2

g01140735

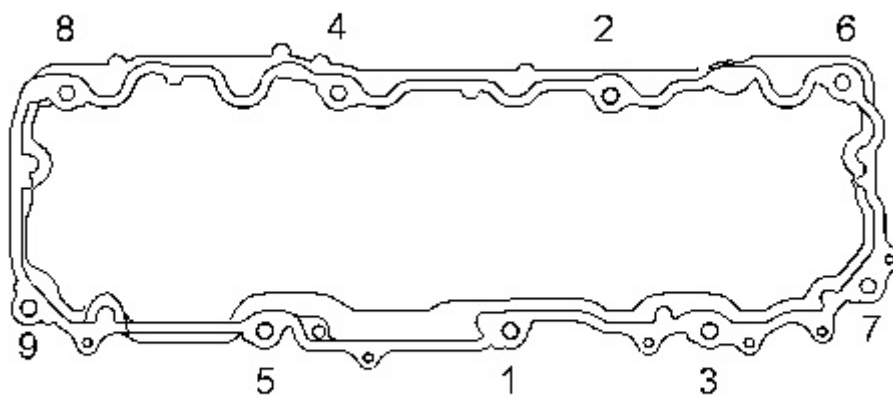


Illustration 3

g01061297

1. Position the seal and valve cover base (5) on the cylinder head.
2. Install the springs, the washers, and bolts (2). Tighten bolts (2) in a numerical sequence.

3. Connect harness assemblies (3).
4. Install the clip and bolt (1) that holds the harness assembly.
5. Connect harness assembly (6) to valve cover base (5). Tighten the bolts to a torque of $6 \pm 1 \text{ N}\cdot\text{m}$ ($53 \pm 9 \text{ lb in}$).
6. Connect sensor (4) to valve cover base (5).

End By:

- a. Install the valve mechanism cover. Refer to Disassembly and Assembly, "Valve Mechanism Cover - Remove and Install".
-

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i02884496

Rocker Arm and Shaft - Remove

SMCS - 1102-011

Removal Procedure

Start By:

- a. Remove the valve mechanism cover. Refer to Disassembly and Assembly, "Valve Mechanism Cover - Remove and Install".

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Place identification marks on each of the rocker arms in order to identify the proper location for installation.
-

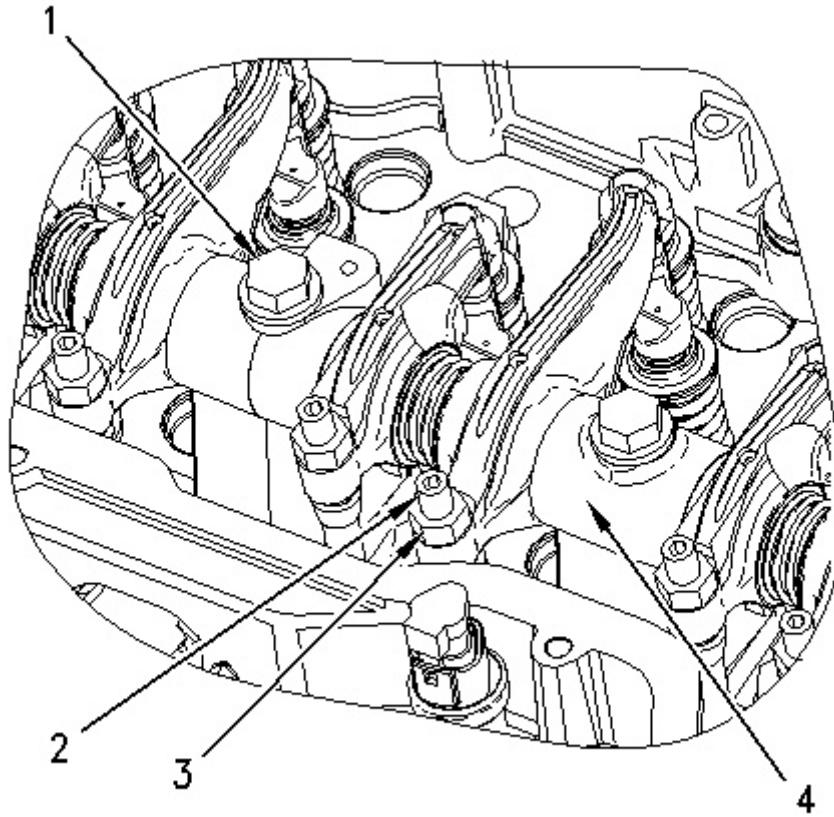


Illustration 1

g00953116

2. Loosen nuts (3) and rocker arm adjustment screws (2).
 3. Remove bolts (1) and rocker shaft (4).
 4. Remove the pushrods and the valve bridges.
-

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i02544763

Rocker Arm - Disassemble

SMCS - 1123-015

Disassembly Procedure

Start By:

- a. Remove the rocker arm and shaft. Refer to Disassembly and Assembly, "Rocker Arm and Shaft - Remove".

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

Note: Place an identification mark on each of the components of the rocker shaft for installation purposes.

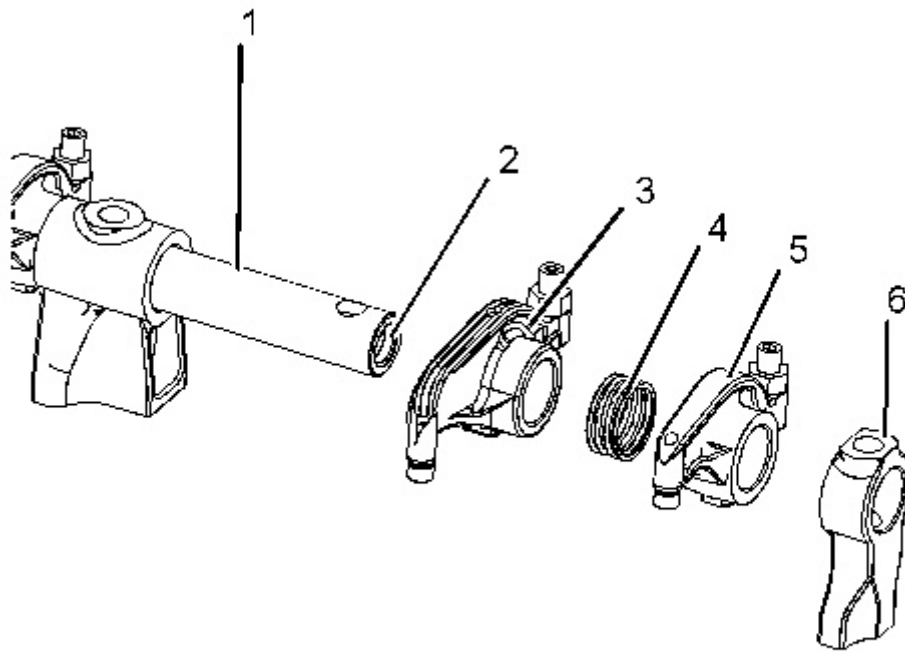


Illustration 1

g01160012

 **WARNING**

Personal injury can result from being struck by parts propelled by a released spring force.

Make sure to wear all necessary protective equipment.

Follow the recommended procedure and use all recommended tooling to release the spring force.

-
1. Remove plug (2) from rocker shaft (1).
 2. Remove stand (6), inlet rocker arm (5), spring (4), and exhaust rocker arm (3) from rocker shaft (1).
-

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i02544772

Rocker Arm - Assemble

SMCS - 1123-016

Assembly Procedure

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Lubricate all components of the rocker arm shaft with clean engine oil.
-

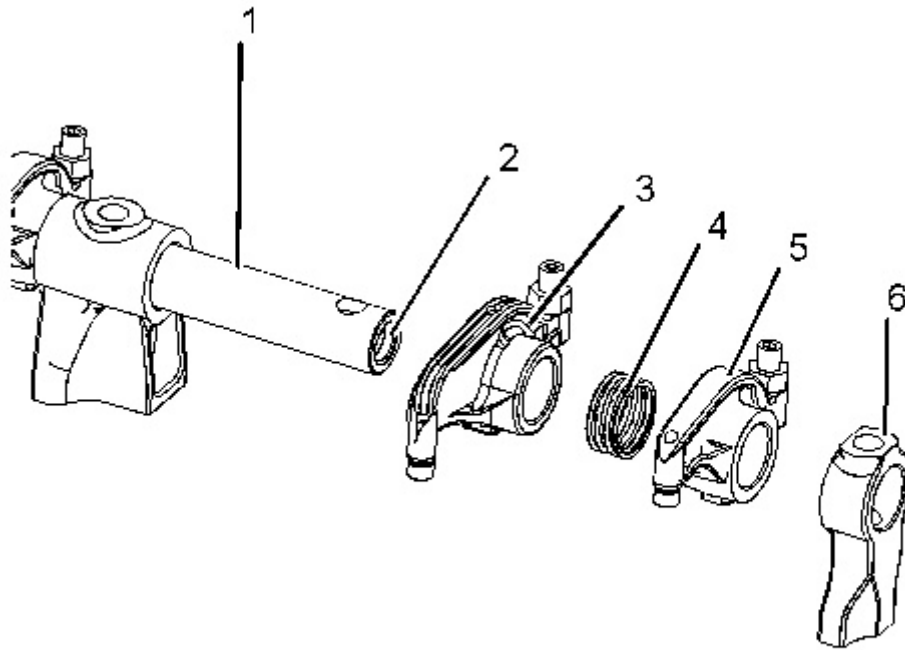


Illustration 1

g01160012

 **WARNING**

Improper assembly of parts that are spring loaded can cause bodily injury.

To prevent possible injury, follow the established assembly procedure and wear protective equipment.

2. Install exhaust rocker arm (3), spring (4), inlet rocker arm (5), and stand (6) on rocker shaft (1).
3. Install plug (2) into rocker shaft (1).

End By:

- a. Install the rocker arm and shaft. Refer to Disassembly and Assembly, "Rocker Arm and Shaft - Install".
-

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i04506590

Rocker Arm and Shaft - Install

SMCS - 1102-012

Installation Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	8T-2998	Lubricant	-

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Apply Tooling (A) to both ends of the pushrods.
 2. Lubricate the pushrods with clean engine oil. Install the pushrods and the valve bridges.
-

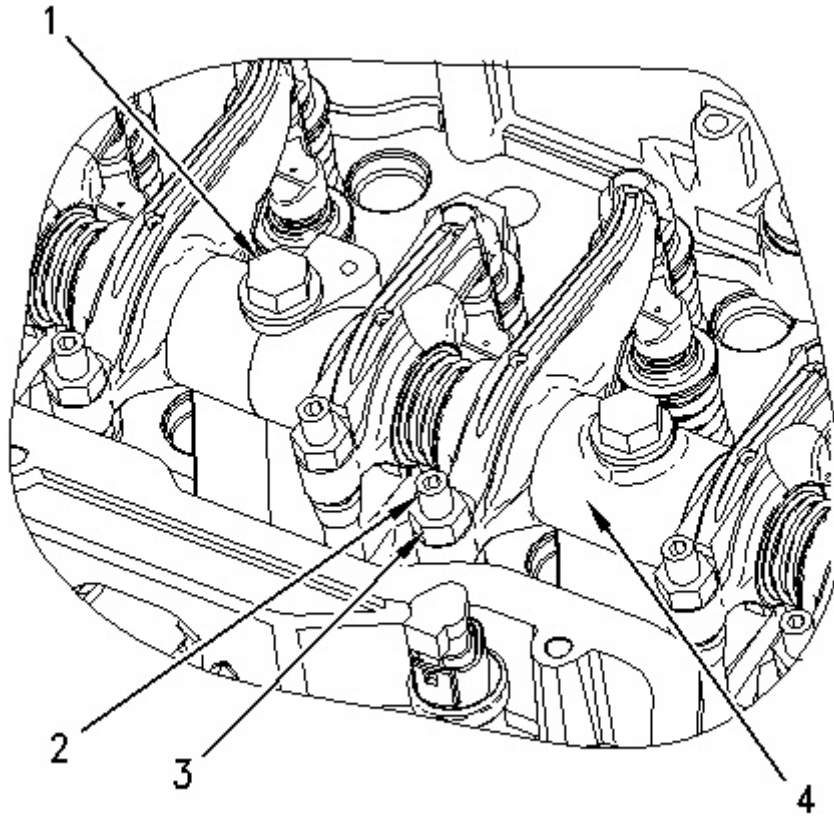


Illustration 1

g00953116

3. Position rocker shaft (4) on the cylinder head. Install bolts (1).

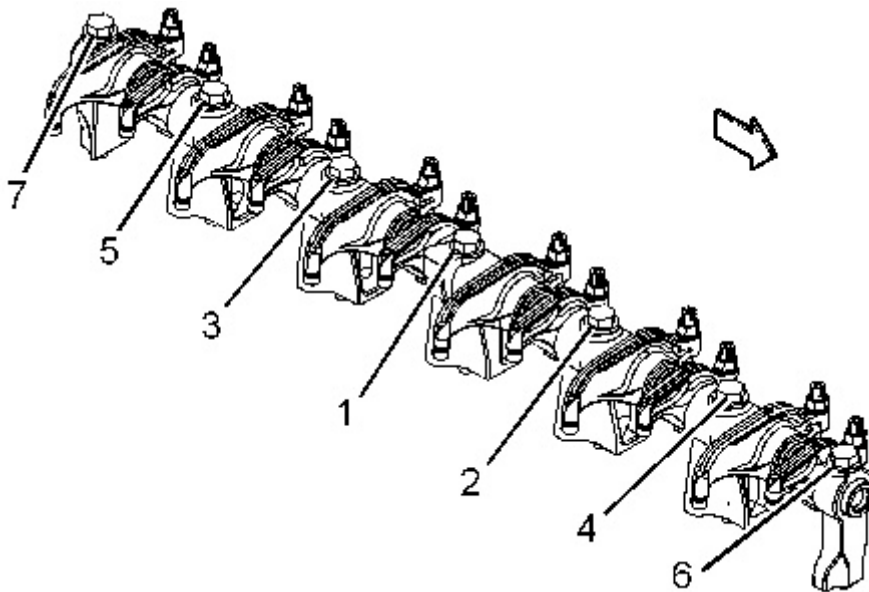


Illustration 2

g02685496

Rocker shaft hold down bolts tightening sequence

4. Tighten bolts (1) in the sequence shown. Tighten bolts (1) to standard torque.

5. Apply Tooling (A) to each of the bottom faces of the rocker arms.
6. Position rocker arm adjustment screws (2) and tighten nuts (3). Adjust the valve lash of the rocker arms. Refer to Testing and Adjusting, "Engine Valve Lash - Inspect/Adjust".

End By:

- a. Install the valve mechanism cover. Refer to Disassembly and Assembly, "Valve Mechanism Cover - Remove and Install".
-

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i02308888

Cylinder Head - Remove

SMCS - 1100-011

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	138-7575	Link Bracket	1

Start By:

- Remove the rocker arm and shaft. Refer to Disassembly and Assembly, "Rocker Arm and Shaft - Remove".
- Remove the valve mechanism cover base. Refer to Disassembly and Assembly, "Valve Mechanism Cover Base - Remove and Install".
- Remove the fan drive. Refer to Disassembly and Assembly, "Fan Drive - Remove".

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting, and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat® products.

Dispose of all fluids according to local regulations and mandates.

1. Drain the coolant from the cooling system into a suitable container for storage or for disposal. Refer to Operation and Maintenance Manual, "Cooling System Coolant (ELC) - Change".
-

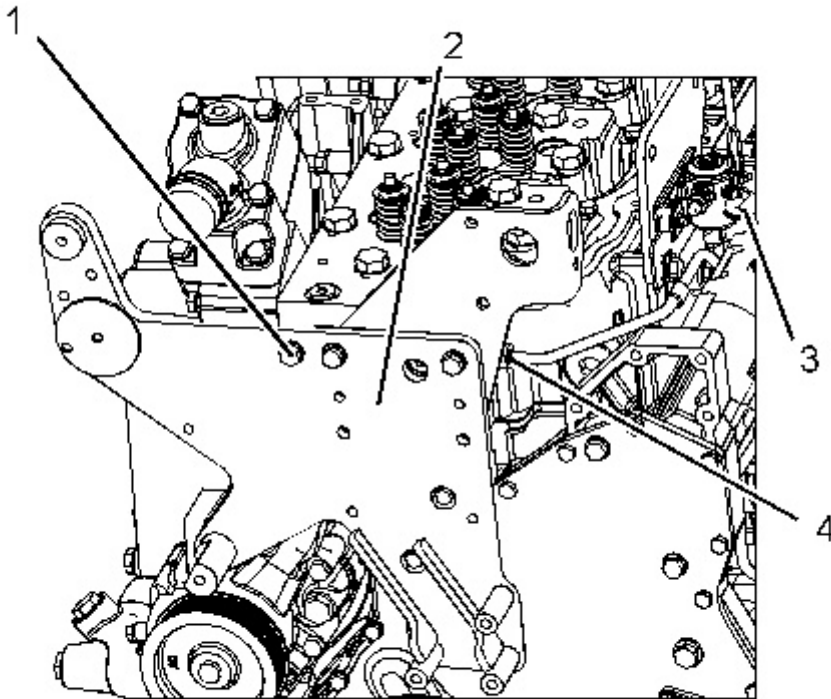


Illustration 1

g01156402

2. Remove bolts (1) and remove support assembly (2). Disconnect cable assembly (3). Disconnect tube assembly (4).
-

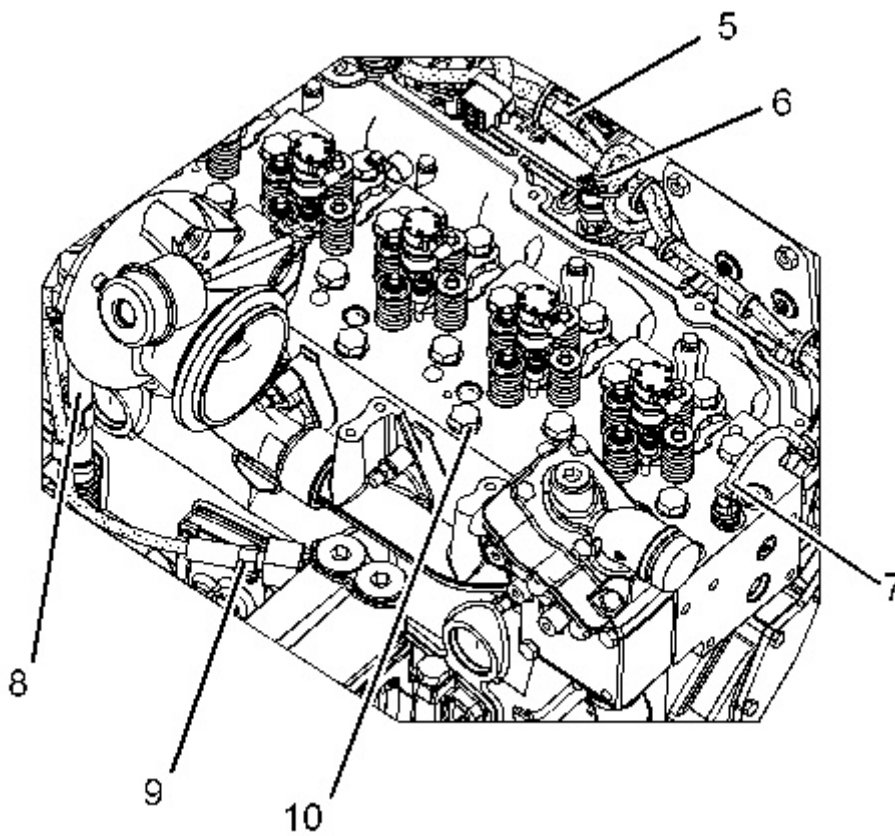


Illustration 2

g01156406

3. Disconnect harness assemblies (5), (6), and (7).
 4. Disconnect tube assembly (8) from the turbocharger.
 5. Disconnect hose assembly (9).
 6. Remove bolts (10).
-

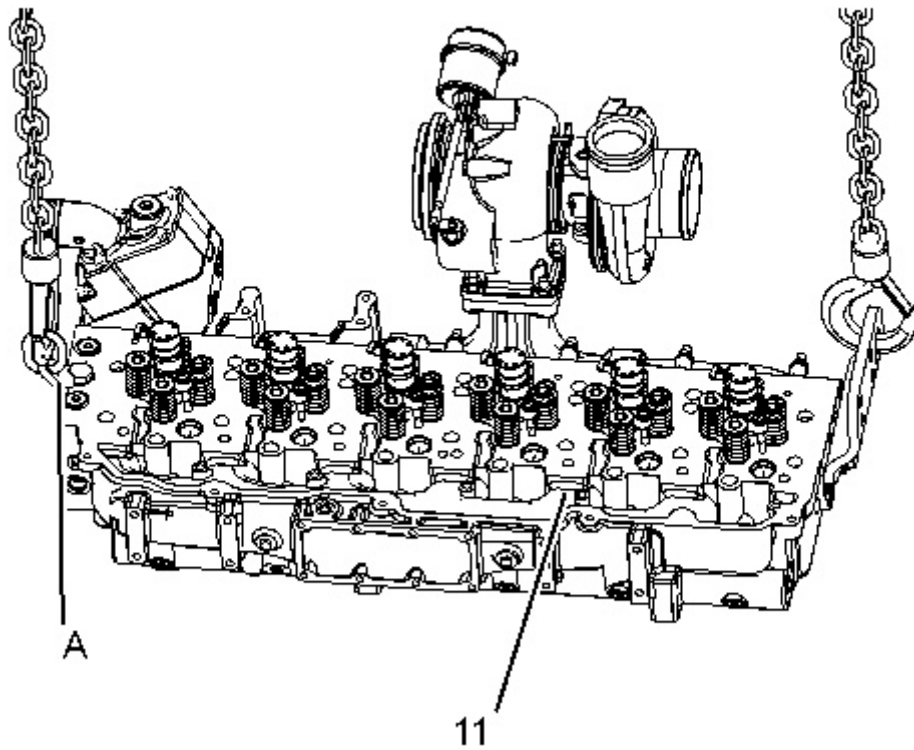


Illustration 3

g01156425

Note: Use caution in order not to damage the tips of the injectors.

7. Attach Tooling (A) and a suitable lifting device onto cylinder head (11). The weight of cylinder head (11) is approximately 181 kg (400 lb). Remove cylinder head (11) and the gasket.
-

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i05351278

Cylinder Head - Install

SMCS - 1100-012

Installation Procedure

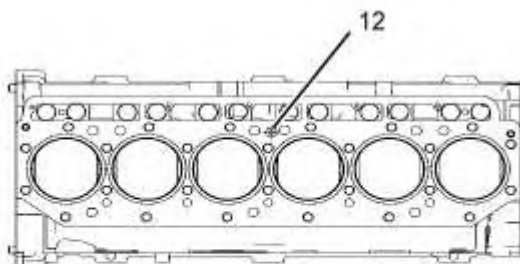
Table 1

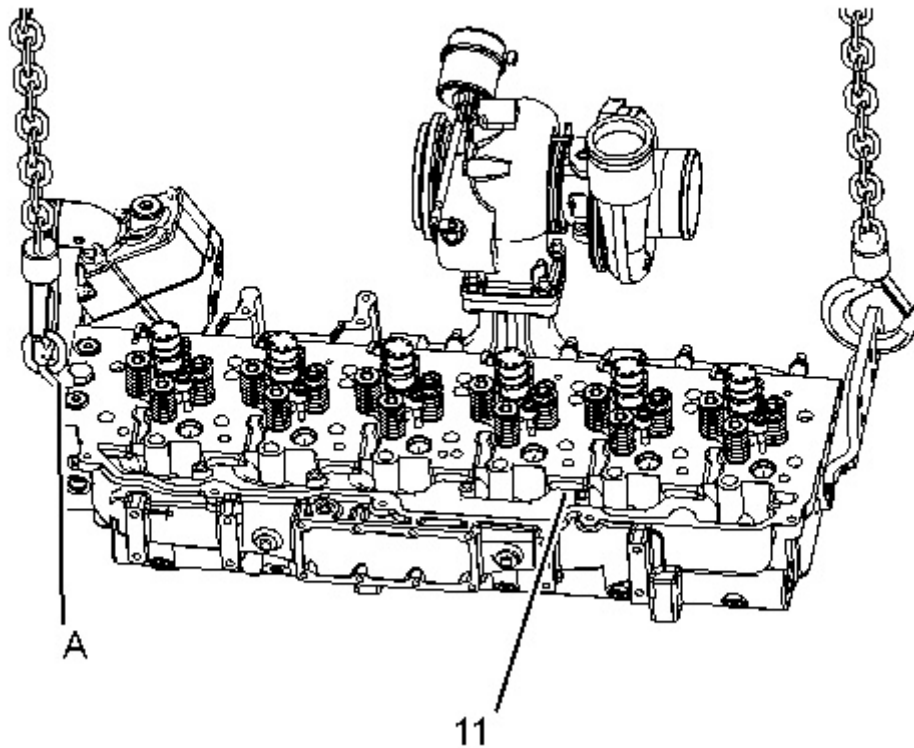
Required Tools			
Tool	Part Number	Part Description	Qty
A	138-7575	Link Bracket	1

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.





1. Place O-ring seal on engine block before installing the gasket. Position the gasket on the engine block. Attach Tooling (A) and a suitable lifting device onto cylinder head (11). The weight of cylinder head (11) is approximately 181 kg (400 lb). Position cylinder head (11) on the engine.
 - 2.
-

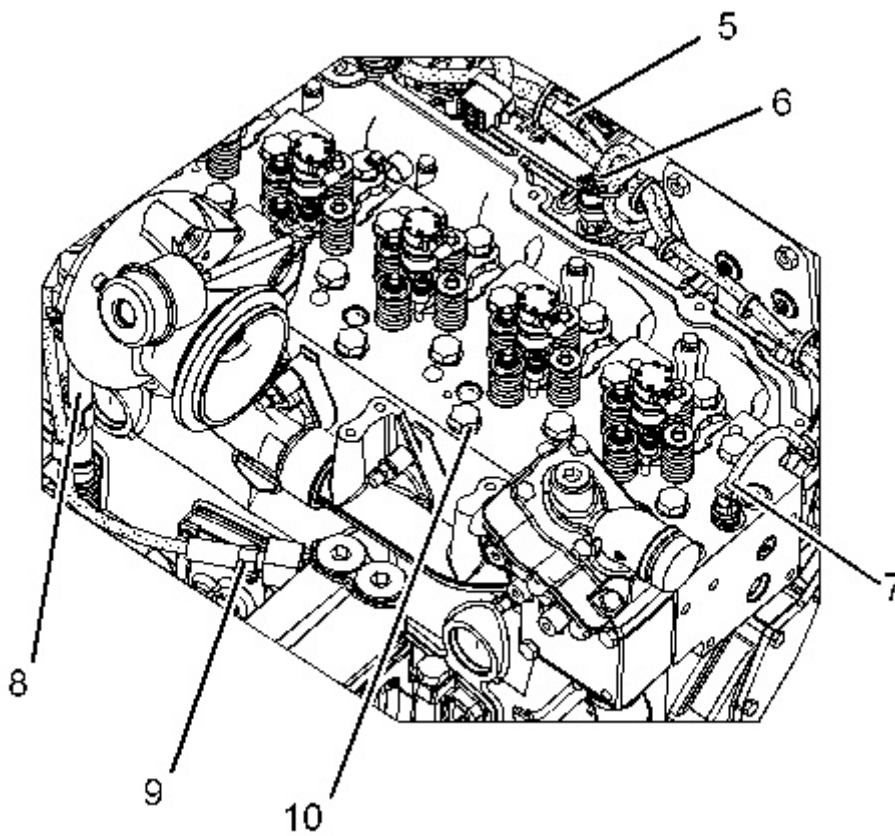


Illustration 3

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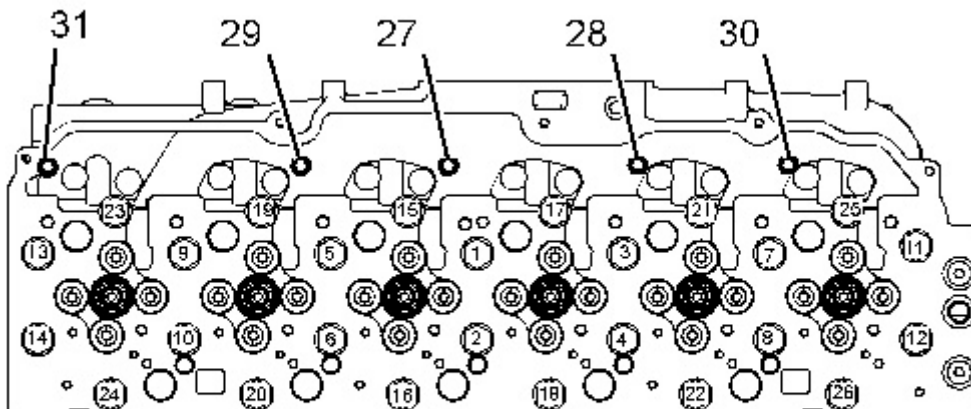


Illustration 4

g02963318

3. Apply clean engine oil to the threads of bolts (10) and under the bolt heads. Install bolts (10).

4. Torque the bolt (1) through bolt (26) in a numerical sequence to $130 \pm 15 \text{ N}\cdot\text{m}$ ($95 \pm 11 \text{ lb ft}$).
 5. Again torque the bolt (1) through bolt (26) in a numerical sequence to $130 \pm 15 \text{ N}\cdot\text{m}$ ($95 \pm 11 \text{ lb ft}$).
 6. Place a mark on bolt (1) through bolt (26). Rotate the bolt (1) through bolt (26) in the clockwise direction in a numerical sequence to 90 degrees ($1/4$ turn).
 7. Loosen the bolt (1) through bolt (26) in a numerical sequence to $0 \text{ N}\cdot\text{m}$ (0 lb ft).
 8. Repeat Step 3 through Step 6.
 9. Torque the bolt (27) through bolt (31) in a numerical sequence to $28 \pm 7 \text{ N}\cdot\text{m}$ ($21 \pm 5 \text{ lb ft}$).
 10. Connect hose assembly (9).
 11. Connect tube assembly (8) onto the turbocharger.
 12. Connect harness assemblies (5), (6), and (7).
-

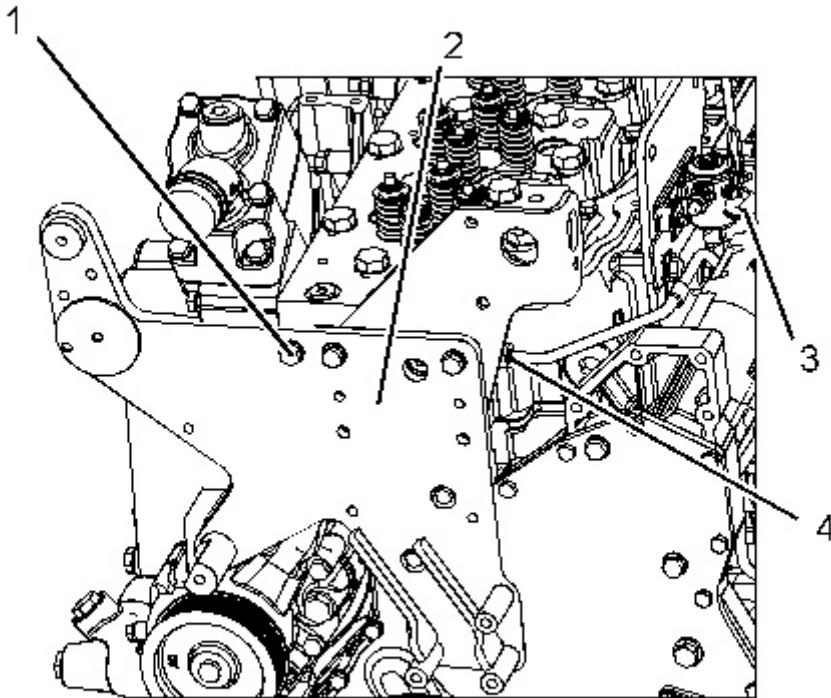


Illustration 5

g01156402

13. Connect tube assembly (4). Connect cable assembly (3). Position support assembly (2) and install bolts (1).

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