

Product: TRACK-TYPE TRACTOR

Model: D4K2 XL TRACK-TYPE TRACTOR KM2

Configuration: D4K2 XL & D4K2 LGP Small Track Type Tractor KM200001-UP (MACHINE) POWERED BY C4.4 Engine

## **Disassembly and Assembly**

### **C4.4 Engines for Caterpillar Built Machines**

Media Number -UENR4516-11

Publication Date -01/06/2015

Date Updated -29/10/2018

i05820300

## **Valve Mechanism Cover - Remove and Install**

SMCS - 1107-010

### **Removal Procedure**

#### **Start By:**

- a. If the Clean Emission Module (CEM) is mounted on the valve mechanism cover. Removal of the CEM will be necessary in order to access the valve mechanism cover. Refer to Disassembly and Assembly, "Support and Mounting (CEM) - Remove and Install" for the correct procedure.

---

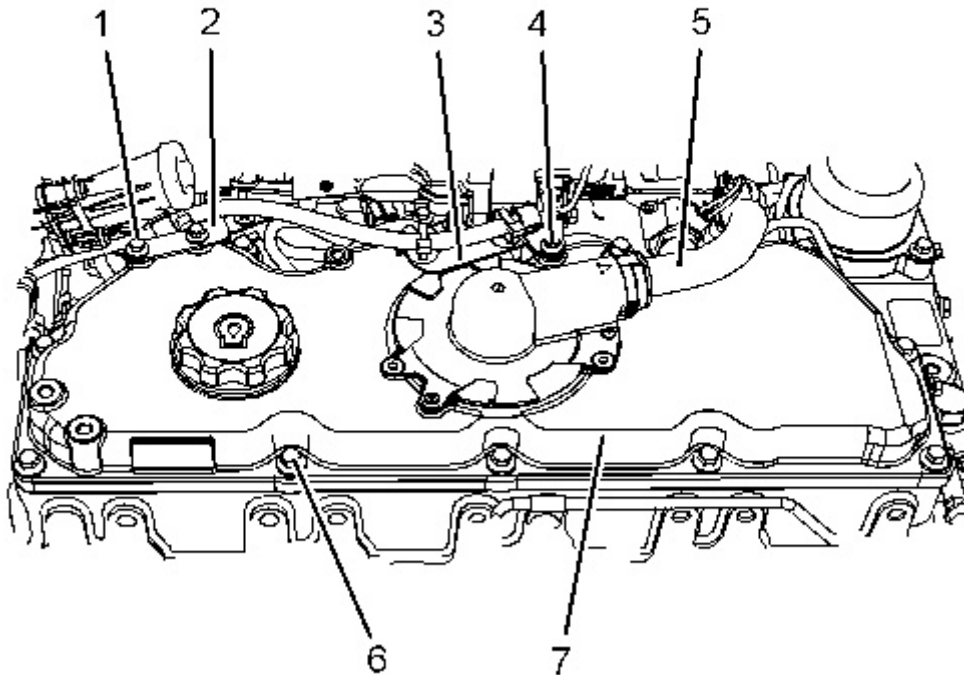
#### **NOTICE**

**Keep all parts clean from contaminants.**

**Contaminants may cause rapid wear and shortened component life.**

---

---



---

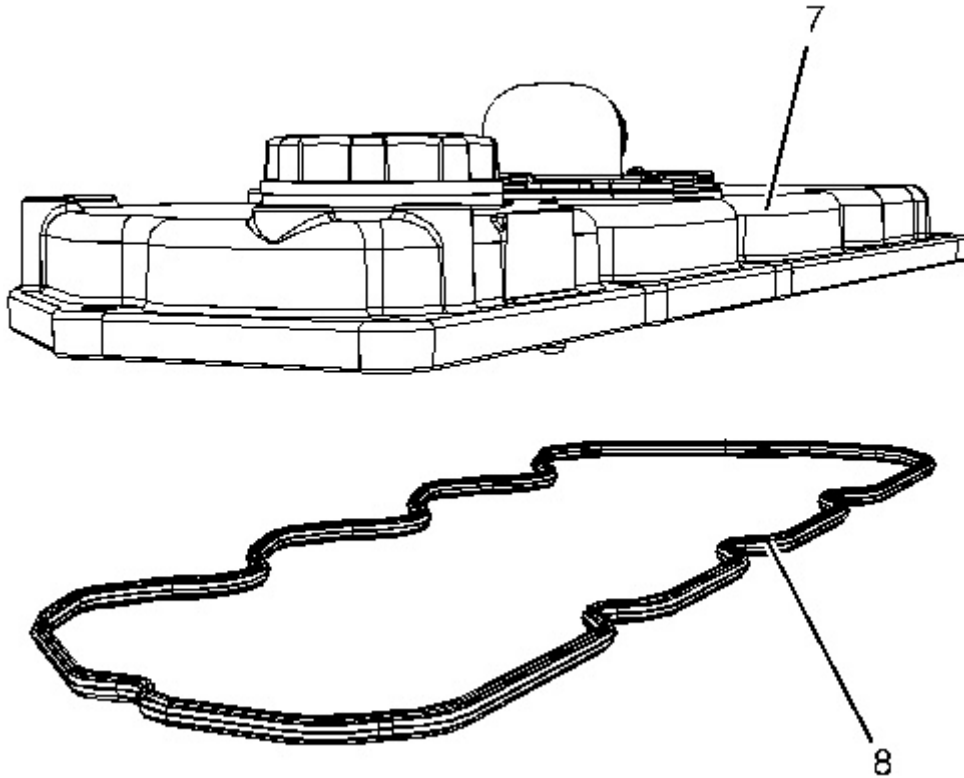
Illustration 1

g02522396

1. Remove bolts (1) and bolts (4) from bracket (2) and bracket (3). Position brackets and harness assembly away from valve mechanism cover (7).
2. Disconnect the plastic tube assembly (5) from the valve mechanism cover for the crankcase breather. Refer to Disassembly and Assembly, "Crankcase Breather - Remove" for the correct procedure.
3. Remove bolts (6) from valve mechanism cover (7).
4. Remove valve mechanism cover (7) from the cylinder head.

**Note:** Remove the valve mechanism cover vertically in order to avoid damage to the electronic unit injectors.

---



---

Illustration 2

g02522397

5. Remove gasket (8) from valve mechanism cover (7).

## Installation Procedure

---

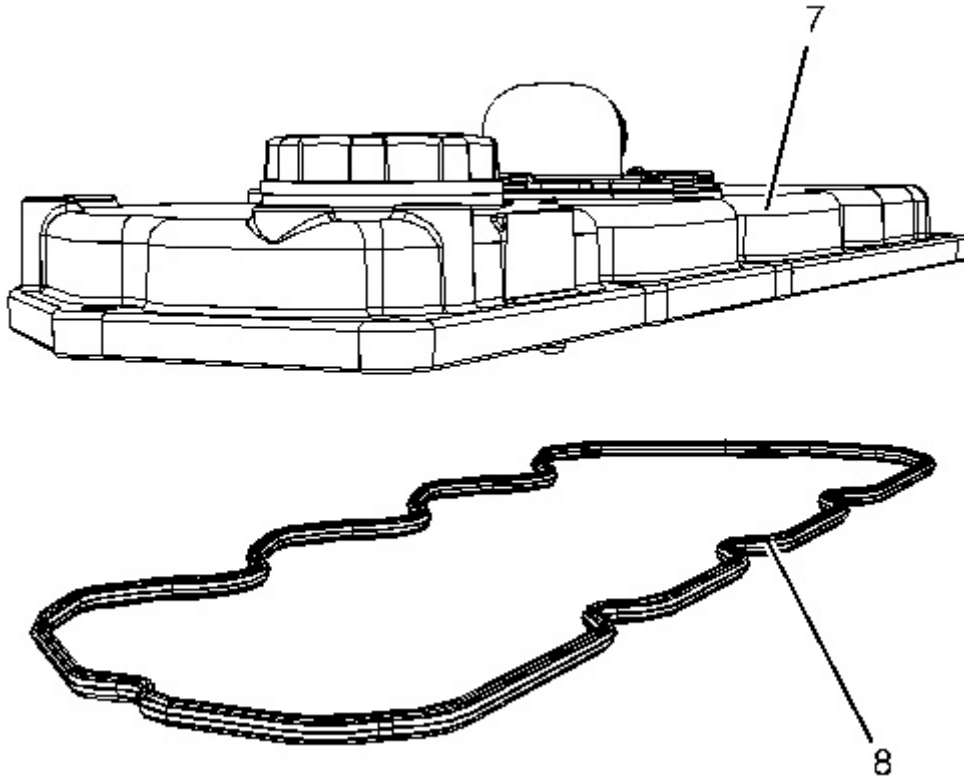
### NOTICE

**Keep all parts clean from contaminants.**

**Contaminants may cause rapid wear and shortened component life.**

---

---



---

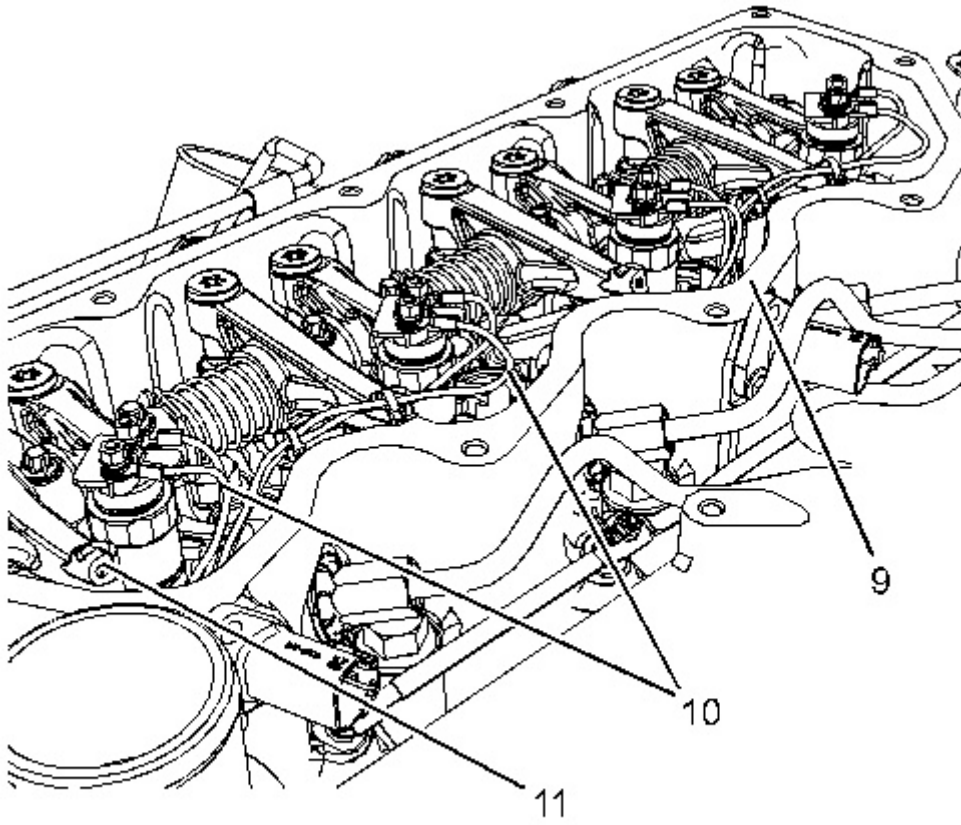
Illustration 3

g02522397

1. Thoroughly clean all gasket surfaces of valve mechanism cover (7). Clean the gasket surfaces of the cylinder head.
2. Inspect gasket (8) for damage. If necessary, install a new gasket (8) to valve mechanism cover (7).

**Note:** Ensure that the gasket is fully seated into the groove of the valve mechanism cover.

---

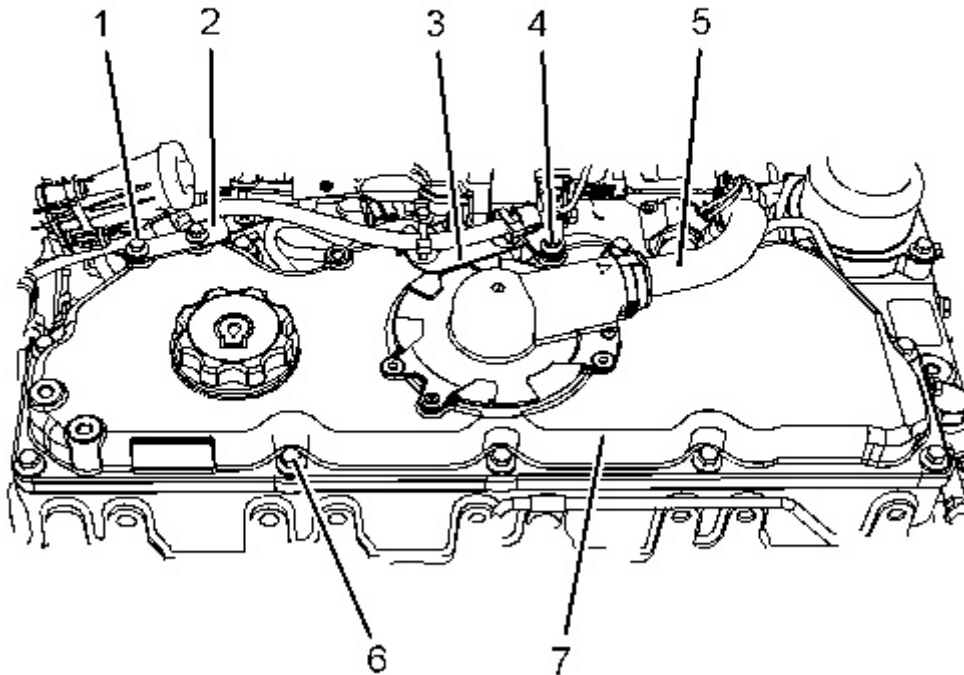


---

Illustration 4

g02522398

---



---

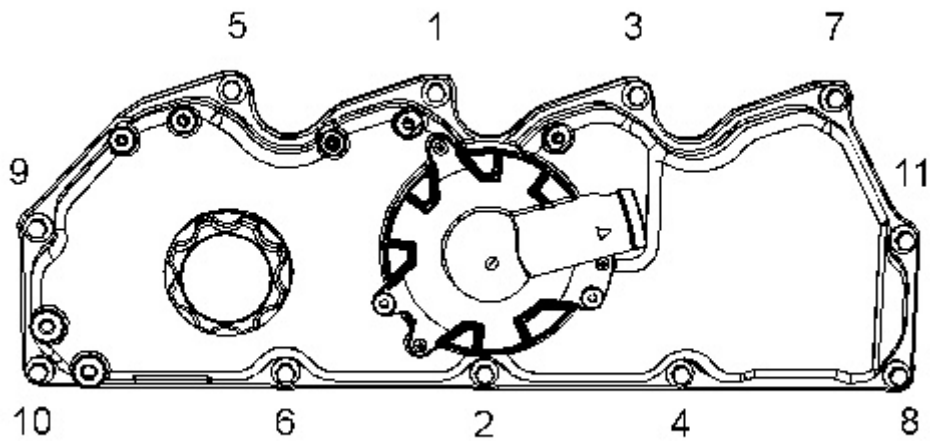
Illustration 5

g02522396

3. Ensure that harness assemblies (10) are not in contact with rocker arms (11) or cylinder head (9).

**Note:** Install the valve mechanism cover vertically in order to avoid damage to the electronic unit injectors.

4. Position valve mechanism cover (7) onto cylinder head (9). Ensure that harness assemblies (10) are not trapped during the assembly procedure.
  5. Install bolts (6).
-



---

Illustration 6

g02522516

6. Tighten the bolts in the numerical sequence that is shown in Illustration 6. Tighten the bolts to a torque of 22 N·m (195 lb in).

Repeat Step 6 in order to ensure correct torque.

7. Position brackets and harness assembly onto the valve mechanism cover. Install bolts (1) and bolts (4) to bracket (2) and bracket (3).
8. Tighten bolts (1) and bolts (4) 9 N·m (79 lb in).
9. Connect the plastic tube assembly to the valve mechanism cover for the crankcase breather. Refer to Disassembly and Assembly, "Crankcase Breather - Install" for the correct procedure.

**End By:**

- a. If necessary, mount the CEM on the valve mechanism cover. Refer to Disassembly and Assembly, "Support and Mounting (CEM) - Remove and Install" for the correct procedure.
-

Product: TRACK-TYPE TRACTOR

Model: D4K2 XL TRACK-TYPE TRACTOR KM2

Configuration: D4K2 XL & D4K2 LGP Small Track Type Tractor KM200001-UP (MACHINE) POWERED BY C4.4 Engine

## Disassembly and Assembly

### C4.4 Engines for Caterpillar Built Machines

Media Number -UENR4516-11

Publication Date -01/06/2015

Date Updated -29/10/2018

i05820301

## Rocker Shaft and Pushrod - Remove

SMCS - 1102-011; 1208-011

### Removal Procedure

Table 1

| Required Tools   |             |                         |     |
|------------------|-------------|-------------------------|-----|
| Tool             | Part Number | Part Description        | Qty |
| A <sup>(1)</sup> | 9U-6198     | Crankshaft Turning Tool | 1   |
| A <sup>(2)</sup> | 5P-7306     | Housing                 | 1   |
|                  | 5P-7305     | Engine Turning Tool     | 1   |
| B                | 298-5564    | T40 Torx Socket         | 1   |
| C                | 227-4389    | E10 Torx Socket         | 1   |

<sup>(1)</sup> The Crankshaft Turning Tool is used on the front pulley.

<sup>(2)</sup> This Tool is used in the aperture for the electric starting motor.

#### Start By:

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

**Note:** Either Tooling (A) can be used. Use the Tooling that is most suitable.

---

### NOTICE

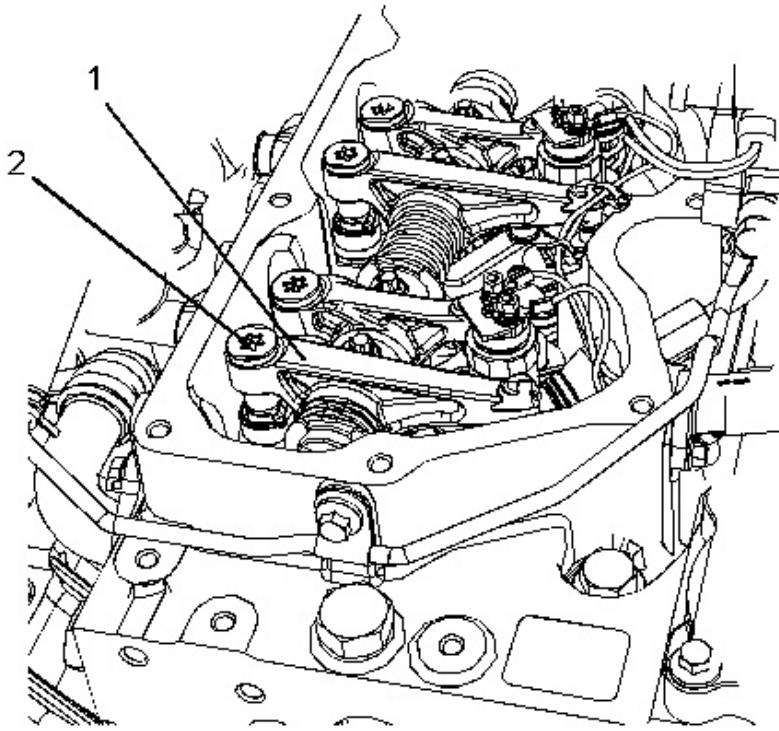
**Keep all parts clean from contaminants.**

**Contaminants may cause rapid wear and shortened component life.**

---



1. Use Tooling (A) in order to rotate the crankshaft in a clockwise direction and position the crankshaft the safe position. Refer to System Operation, Testing and Adjusting, "Position the Valve Mechanism Before Maintenance Procedures" for the correct procedure.
- 



---

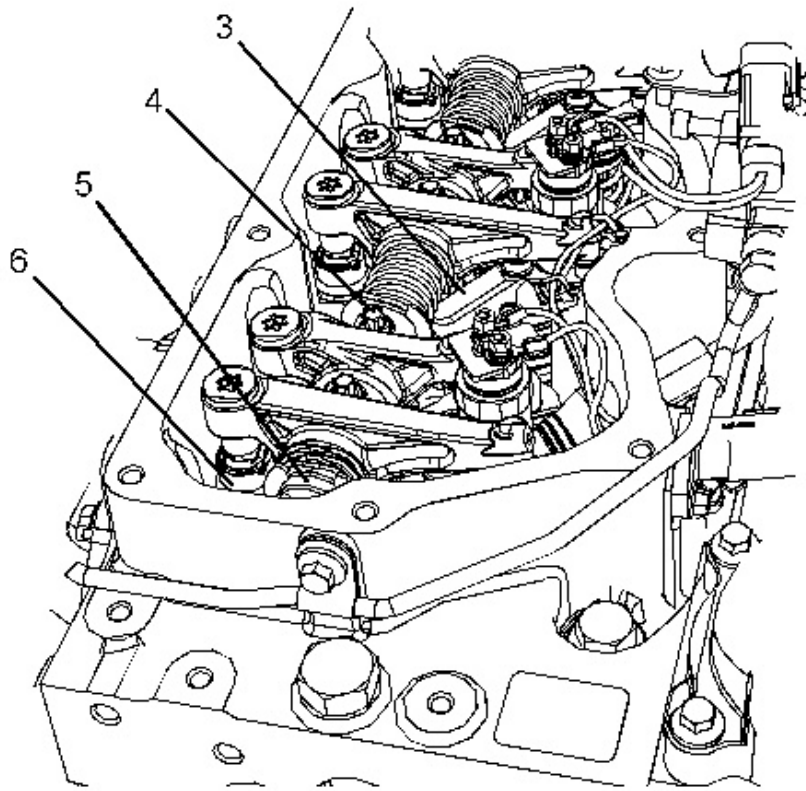
Illustration 1

g03703568

2. Use Tooling (B) in order to loosen threaded inserts (2) on all rocker arms (1). Unscrew threaded inserts (2) on all rocker arms (1) until all valves are fully closed.

**Note:** Ensure that ALL threaded inserts are fully unscrewed.

---

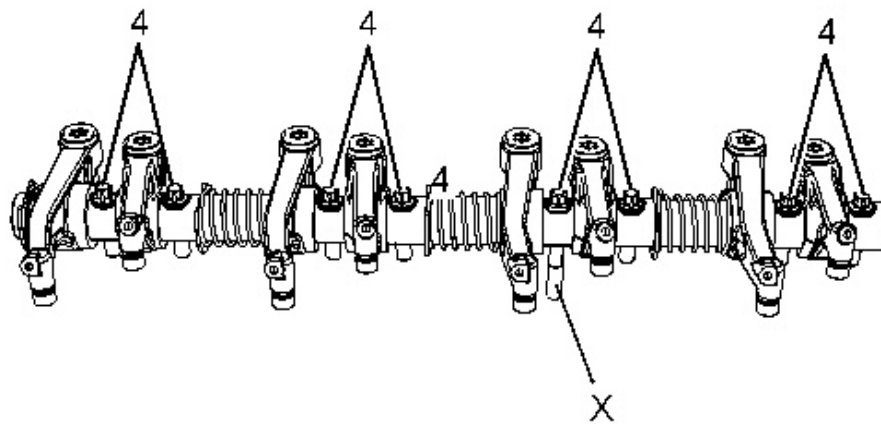


---

Illustration 2

g03703569

---



---

Illustration 3

g03703570

---

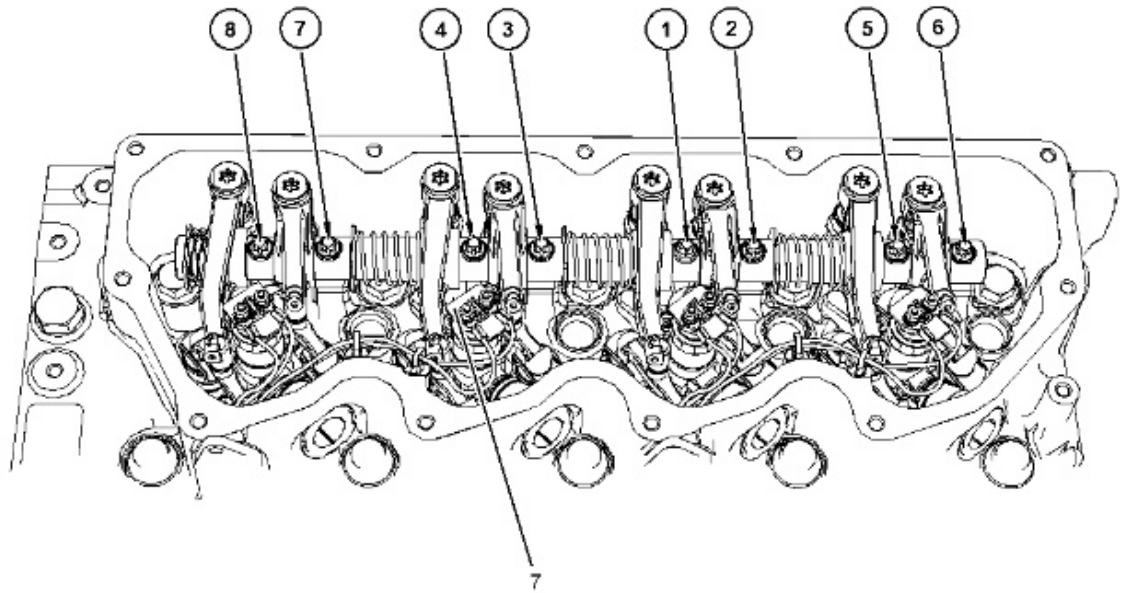


Illustration 4

g03703575

Sequence for tightening the bolts for the rocker shaft assembly

3. Use Tooling (C) to loosen Torx screws (5) in the reverse numerical order to the tightening sequence. Refer to the Illustration 4.

4. Loosen Torx screws (4) from sufficiently in order to allow removal of rocker shaft assembly (6).

**Note:** Note Position (X) of different length Torx screws (4).

5. Remove rocker shaft assembly (5) from the cylinder head. Ensure that rocker shaft assembly (5) does not come into contact with the electronic unit injector identification tag (7).

6. Place an identification mark on pushrods (6) in order to show the location. Remove the pushrods from the cylinder head.

**Note:** Identification will ensure that the pushrods can be reinstalled in the original positions. Do not interchange the positions of used pushrods.

7. Make a temporary mark on valve bridges (3) in order to show the location and the orientation. Remove the valve bridges from the cylinder head.

**Note:** Identification will ensure that the valve bridges can be reinstalled in the original location and the original orientation. Do not interchange the location or the orientation of used valve bridges.

Product: TRACK-TYPE TRACTOR

Model: D4K2 XL TRACK-TYPE TRACTOR KM2

Configuration: D4K2 XL & D4K2 LGP Small Track Type Tractor KM200001-UP (MACHINE) POWERED BY C4.4 Engine

## Disassembly and Assembly

### C4.4 Engines for Caterpillar Built Machines

Media Number -UENR4516-11

Publication Date -01/06/2015

Date Updated -29/10/2018

i05820302

## Rocker Shaft - Disassemble

SMCS - 1102-015

### Disassembly Procedure

#### Start By:

- a. Remove the rocker shaft assembly. Refer to Disassembly and Assembly, "Rocker Shaft and Pushrod - Remove" for the correct procedure.

---

#### NOTICE

**Keep all parts clean from contaminants.**

**Contaminants may cause rapid wear and shortened component life.**

---



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

**Make sure to wear all necessary protective equipment.**

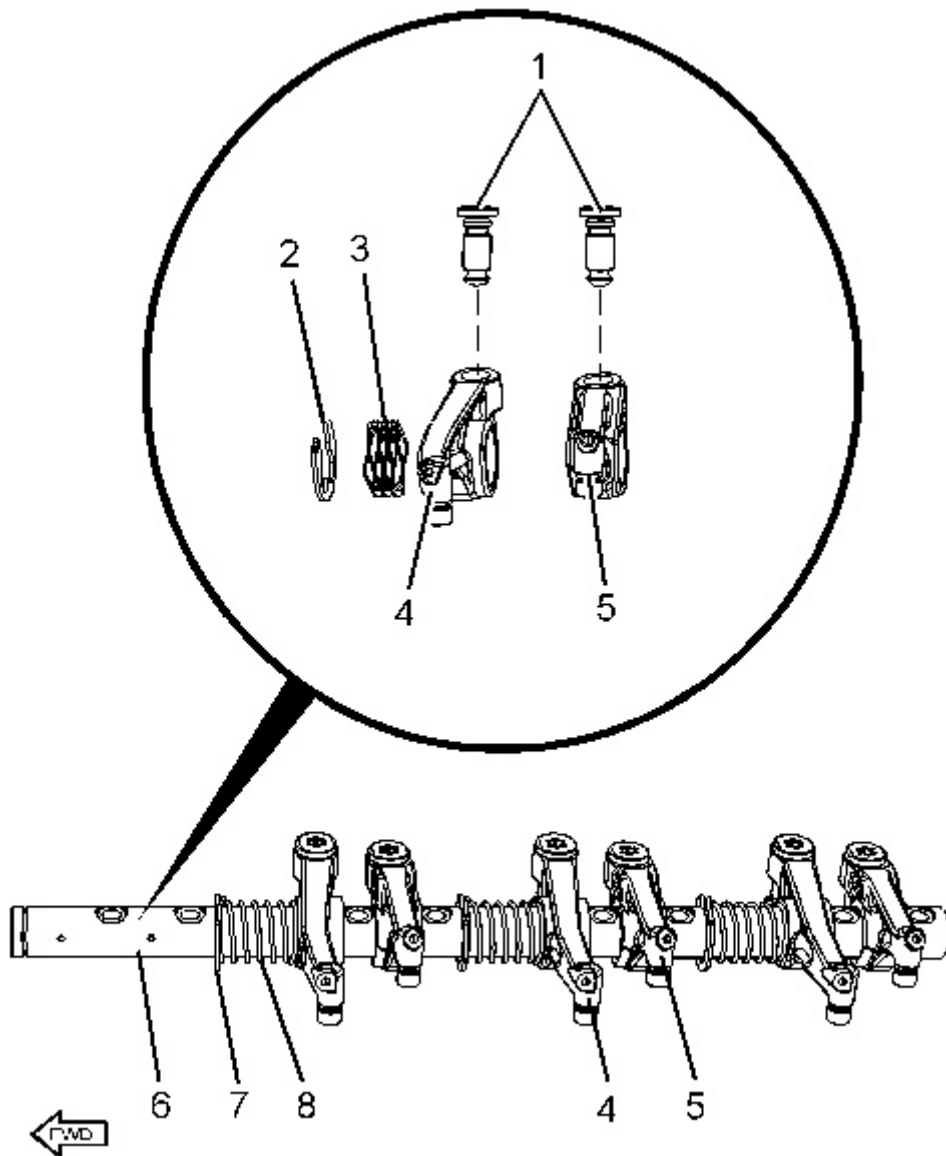
**Follow the recommended procedure and use all recommended tooling to release the spring force.**

---

1. Make an identification mark on each rocker arm assembly in order to show the location.

**Note:** The components must be reinstalled in the original location. Do not interchange components.

---



---

Illustration 1

g03706861

2. Remove the Torx screws from the rocker shaft assembly. Note position of different length Torx screws for assembly purposes.
3. Remove retaining clip (2) from rocker shaft (6). Remove spring (3) from the rocker shaft.
4. Remove rocker arm assembly (4) for the inlet valve from rocker shaft (6). Remove rocker arm assembly (5) for the exhaust valve from rocker shaft (6).

**Note:** The rocker arm assembly for the inlet valve is longer than the rocker arm assembly for the exhaust valve.

5. Remove retaining clip (7) from rocker shaft (6). Remove spring (8) from the rocker shaft.

6. Remove rocker arm assembly (4) for the exhaust valve from rocker shaft (6). Remove rocker arm assembly (5) for the inlet valve from rocker shaft (6).
7. Repeat Step 5 through Step 6 in order to remove the remaining rocker arms from rocker shaft (6).
8. If necessary, follow Step 8.a through Step 8.b in order to remove threaded inserts (1) from the rocker arms.

- a. Make a temporary identification mark on each threaded inserts (1) in order to show the location.

**Note:** The components must be reinstalled in the original location. Do not interchange components.

- b. Remove threaded inserts (1) from the rocker arms.
-

Product: TRACK-TYPE TRACTOR

Model: D4K2 XL TRACK-TYPE TRACTOR KM2

Configuration: D4K2 XL & D4K2 LGP Small Track Type Tractor KM200001-UP (MACHINE) POWERED BY C4.4 Engine

## **Disassembly and Assembly**

### **C4.4 Engines for Caterpillar Built Machines**

Media Number -UENR4516-11

Publication Date -01/06/2015

Date Updated -29/10/2018

i05820303

## **Rocker Shaft - Assemble**

SMCS - 1102-016

### **Assembly Procedure**

---

#### **NOTICE**

**Keep all parts clean from contaminants.**

**Contaminants may cause rapid wear and shortened component life.**

---

1. Ensure that all components are clean and free from wear and damage. Refer to Specifications, "Rocker Shaft" for more information. If necessary, replace any components that are worn or damaged.
-

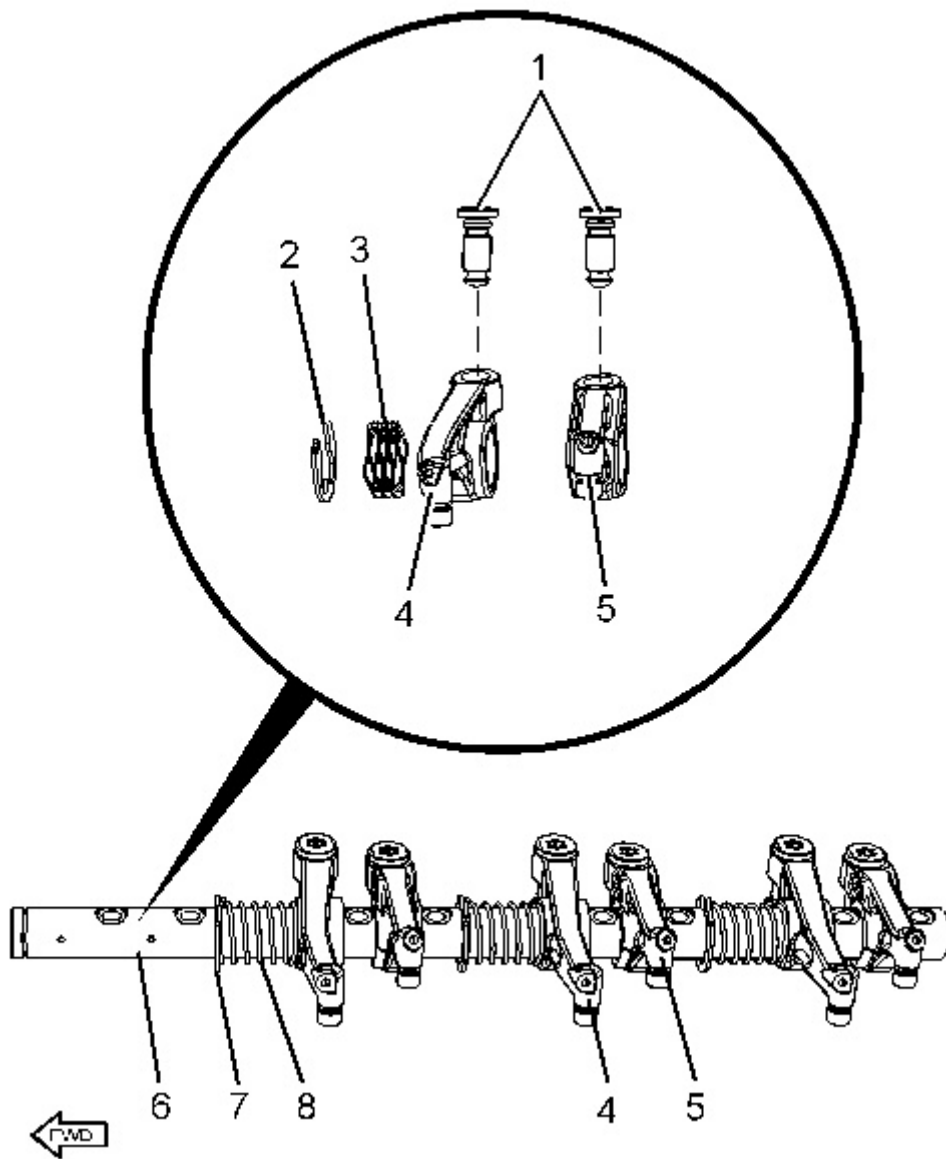


Illustration 1

g03706861

2. If necessary, loosely install threaded inserts (1) to rocker arm assembly (4) and rocker arm assembly (5).

**Note:** The components must be reinstalled in the original location. Do not interchange components.

3. Lubricate the bores of rocker arm assembly (4) for the inlet valve and rocker arm assembly (5) for the exhaust valve and rocker shaft (6) with clean engine oil.
4. Install retaining clip (2) and spring (3) to the front end of rocker shaft (6).
5. Install rocker arm assembly (4) for number one inlet valve to the rocker shaft. Install rocker arm assembly (5) for number one exhaust valve to rocker shaft (6).

**Note:** The rocker arm assembly for the inlet valve is longer than the rocker arm assembly for the exhaust valve. Used components should be installed in the original location.



 **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.**

---

6. Install retaining clip (7) to rocker shaft (6).
7. Install spring (8) to rocker shaft (6).
8. Install rocker arm assembly (4) for number two inlet valve to the rocker shaft. Install rocker arm assembly (5) for number two exhaust valve to rocker shaft (6).  
  
**Note:** The rocker arm assembly for the inlet valve is longer than the rocker arm assembly for the exhaust valve. Used components should be installed in the original location.
9. Repeat Step 6 through Step 8 in order to assemble the remaining components to rocker shaft (6).
10. Install the Torx screws to the rocker shaft assembly. Ensure that the different length Torx screws is installed into the correct position.

**End By:**

- a. Install the rocker shaft assembly. Refer to Disassembly and Assembly, "Rocker Shaft and Pushrod - Install" for the correct procedure.
-

Product: TRACK-TYPE TRACTOR

Model: D4K2 XL TRACK-TYPE TRACTOR KM2

Configuration: D4K2 XL & D4K2 LGP Small Track Type Tractor KM200001-UP (MACHINE) POWERED BY C4.4 Engine

## Disassembly and Assembly

### C4.4 Engines for Caterpillar Built Machines

Media Number -UENR4516-11

Publication Date -01/06/2015

Date Updated -29/10/2018

i05820304

## Rocker Shaft and Pushrod - Install

SMCS - 1102-012; 1208-012

### Installation Procedure

Table 1

| Required Tools   |             |                         |     |
|------------------|-------------|-------------------------|-----|
| Tool             | Part Number | Part Description        | Qty |
| A <sup>(1)</sup> | 9U-6198     | Crankshaft Turning Tool | 1   |
| A <sup>(2)</sup> | 5P-7306     | Housing                 | 1   |
|                  | 5P-7305     | Engine Turning Tool     | 1   |
| B                | 298-5564    | T40 Torx Socket         | 1   |
| C                | 227-4389    | E10 Torx Socket         | 1   |
| D                | 370-4657    | Rocker Arm Spacer       | 4   |

<sup>(1)</sup> The Crankshaft Turning Tool is used on the front pulley.

<sup>(2)</sup> This Tool is used in the aperture for the electric starting motor.

**Note:** Either Tooling (A) can be used. Use the Tooling that is most suitable.

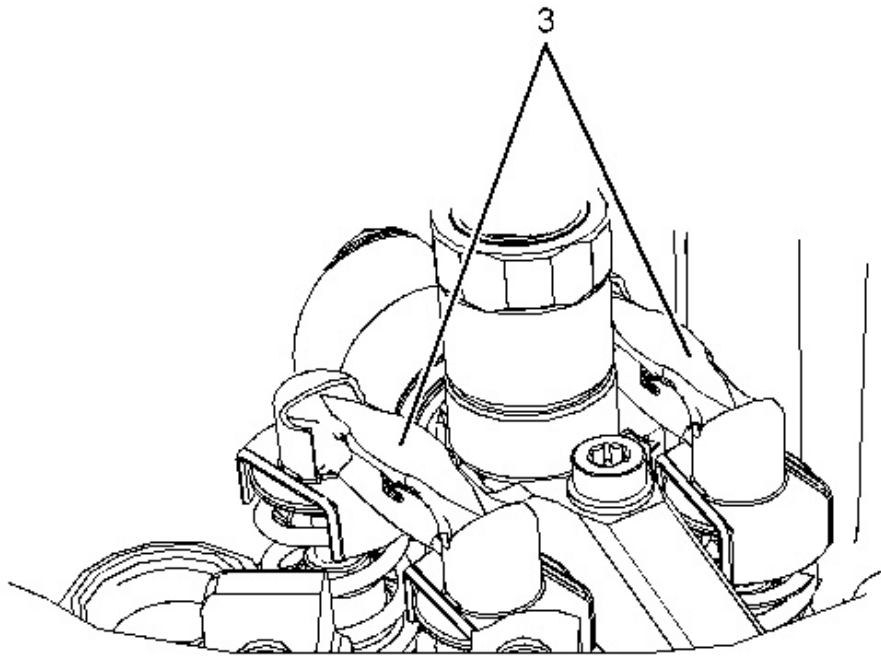
---

### NOTICE

**Keep all parts clean from contaminants.**

**Contaminants may cause rapid wear and shortened component life.**

---



---

Illustration 1

g03706856

The correct location of valve bridges on valve stems is shown.

1. Clean valve bridges (3). Inspect the valve bridges for wear and damage. Replace any valve bridges that are worn or damaged.
2. Lubricate valve bridges (3) with clean engine oil.

---

### NOTICE

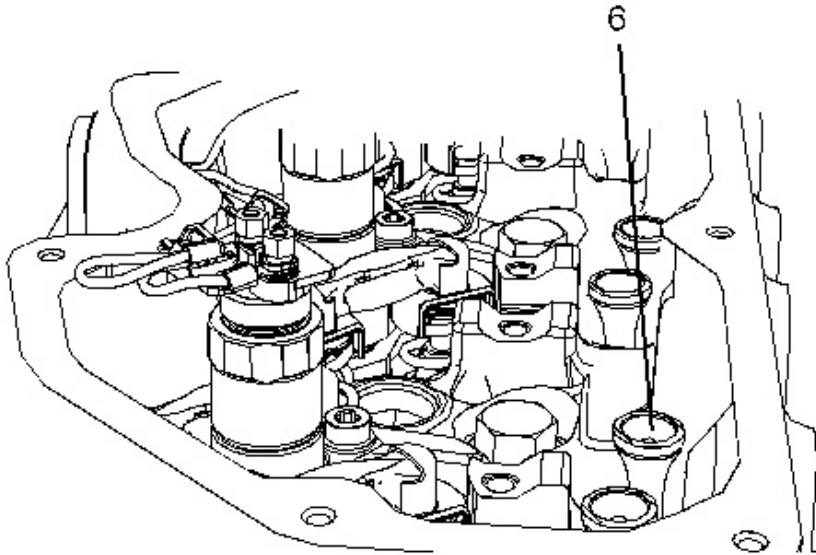
**Failure to ensure that ALL valve bridges are correctly seated onto the valve stems will cause interference between the pistons and the valves, resulting in damage to the engine.**

---

3. Install valve bridges (3) to the valve stems.

**Note:** Install used valve bridges in the original location and in the original orientation. Ensure that the valve bridges are correctly seated on the valves. New valve bridges may be installed in either orientation.

---



---

Illustration 2

g03706857

4. Clean pushrods (6). Inspect the pushrods for wear and damage. Replace any pushrods that are worn or damaged.
5. Apply clean engine oil to both ends of pushrods (6). Install the pushrods to the engine with the cup upward.

**Note:** Ensure that the pushrods are installed in the original location and that the ball end of each pushrod is correctly seated in the valve lifters.

---

### NOTICE

**Failure to ensure that the crankshaft is set in the safe position will result in interference between the pistons and the valves. Interference between the pistons and the valves will result in damage to the engine.**

---

6. Use Tooling (A) in order to rotate the crankshaft in a clockwise direction and position the crankshaft at the safe position. Refer to System Operation, Testing and Adjusting, "Position the Valve Mechanism Before Maintenance Procedures" for the correct procedure.
-

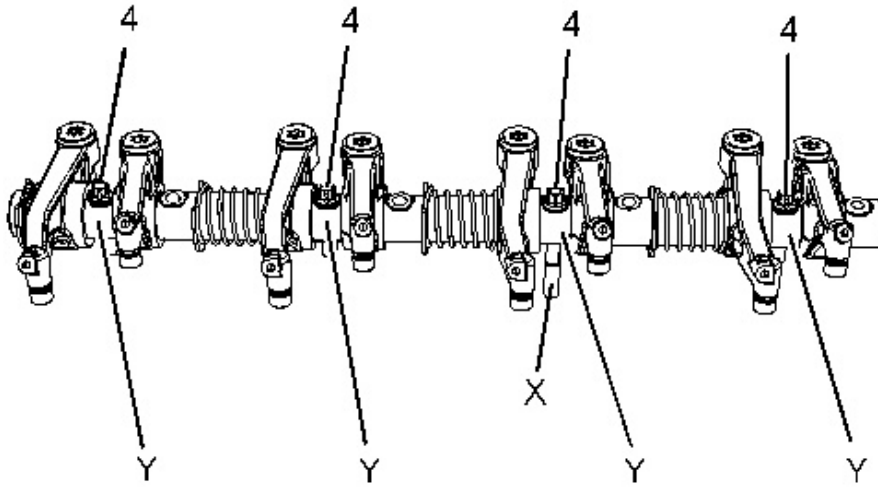


Illustration 3

g03706858

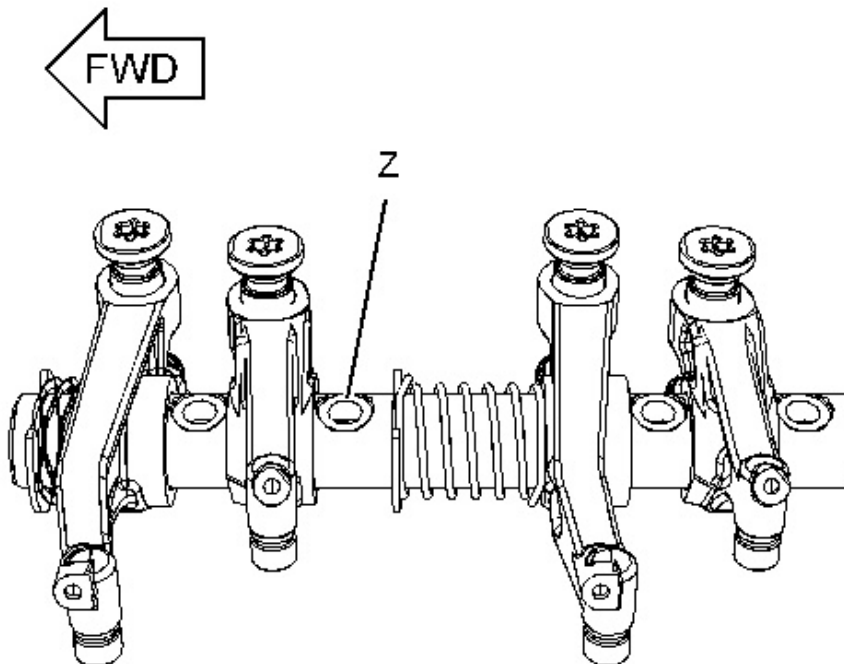
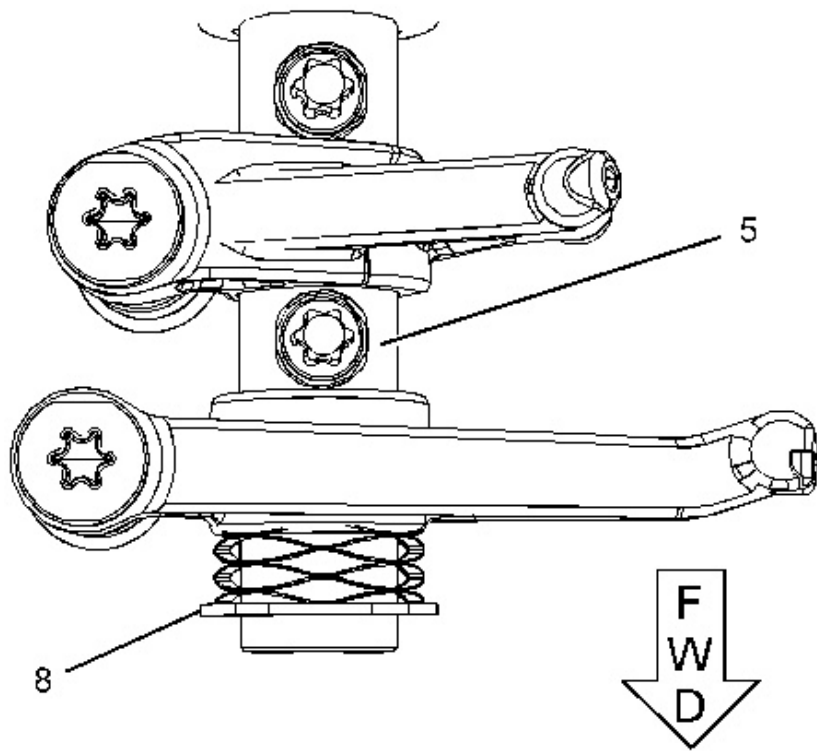


Illustration 4

g02623177

7. Ensure that the rocker shaft assembly is clean and free from wear and damage.
8. Position the rocker shaft assembly with Spotfaces (Z) for Torx screws (4) in the up ward position.
9. Install Tooling (D) to rocker shaft assembly.
10. Install Torx screws (4) in the rocker shaft in Positions (Y).

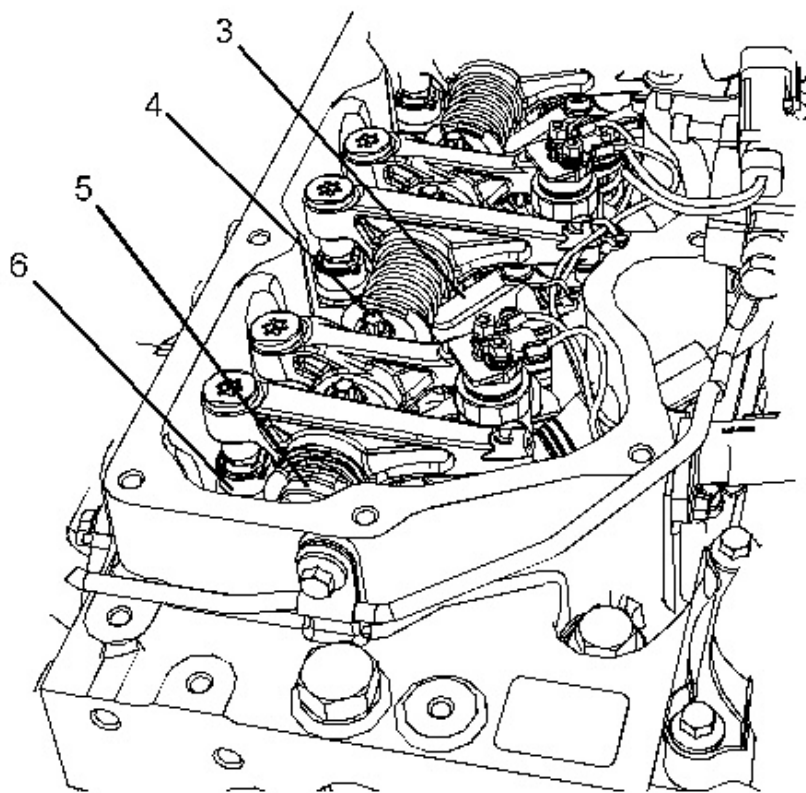
**Note:** Ensure that the correct Torx screw (4) is installed to Position (X).



---

Illustration 5

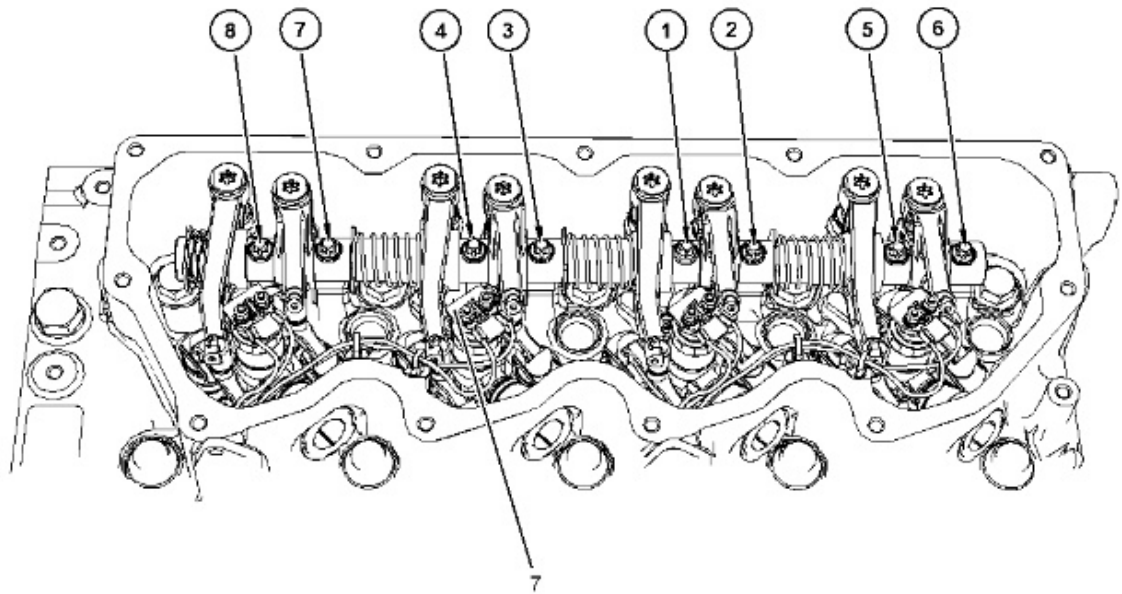
g03706859



---

Illustration 6

g03703569



---

Illustration 7

g03703575

Sequence for tightening the bolts for the rocker shaft assembly

11. Ensure that ALL threaded inserts are fully unscrewed.

---

### NOTICE

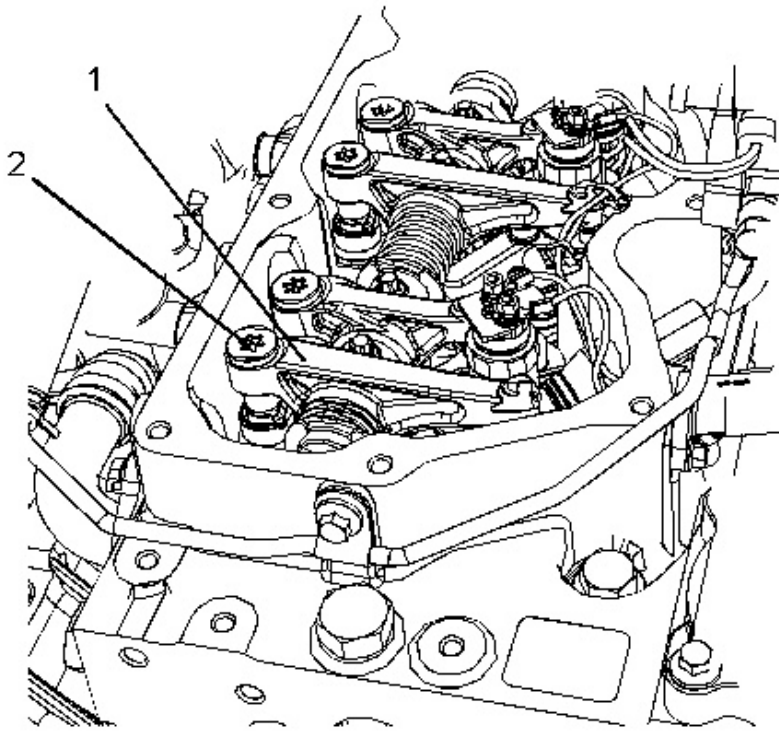
**Damage to the engine will occur if all threaded inserts are not fully unscrewed.**

---

12. Position rocker shaft assembly (5) onto the cylinder head. The retaining clip (8) should face the front of the engine. Ensure that the rocker shaft assembly (5) does not come into contact with the electronic unit injector identification tag (7).

**Note:** Ensure that the threaded inserts are correctly seated in ends of the pushrods.

13. Use Tooling (C) in order to tighten Torx screws (4).
  14. Remove Tooling (D) from rocker shaft assembly. Install remaining Torx screws (4). Use Tooling (C) in order to tighten the remaining Torx screws (4).
  15. Tighten Torx screws (4) to a torque of 35 N·m (26 lb ft) in the numerical sequence. Refer to Illustration 7.
  16. Ensure that valve bridges (4) are still located correctly on the valve stems.
-



---

Illustration 8

g03703568

17. Use Tooling (B) in order to tighten threaded inserts (2) on all the rocker arms. Tighten the threaded inserts to a torque of 30 N·m (265 lb in).

**Note:** When the threaded insert is tightened, the threaded insert must be seated correctly in the cup for the pushrod.

18. The engine should not be operated for a period 45 minutes after the threaded inserts on all the rocker arms have been tightened. This period will allow the force of the valve springs to purge off excessive engine oil from the hydraulic lifters.

**End By:**

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



Product: TRACK-TYPE TRACTOR

Model: D4K2 XL TRACK-TYPE TRACTOR KM2

Configuration: D4K2 XL & D4K2 LGP Small Track Type Tractor KM200001-UP (MACHINE) POWERED BY C4.4 Engine

## Disassembly and Assembly

### C4.4 Engines for Caterpillar Built Machines

Media Number -UENR4516-11

Publication Date -01/06/2015

Date Updated -29/10/2018

i05820305

## Cylinder Head - Remove

SMCS - 1100-011

### Removal Procedure

Table 1

| Required Tools |             |                   |     |
|----------------|-------------|-------------------|-----|
| Tool           | Part Number | Parts Description | Qty |
| A              | 370-8376    | Capping Kit       | 1   |

#### Start By:

- a. If necessary, remove the secondary fuel filter and the fuel filter base. Refer to Disassembly and Assembly, "Fuel Filter Base - Remove and Install" for the correct procedure.
- b. If necessary, remove the water separator and fuel filter (Primary). Refer to Disassembly and Assembly, "Fuel Water Separator and Fuel Filter (Primary) - Remove and Install" for the correct procedure.
- c. Remove the exhaust manifold. Refer to Disassembly and Assembly, "Exhaust Manifold - Remove and Install" for the correct procedure.
- d. Remove the fuel manifold. Refer to Disassembly and Assembly, "Fuel Manifold (Rail) - Remove and Install" for the correct procedure.
- e. Remove the electronic unit injectors. Refer to Disassembly and Assembly, "Electronic Unit Injector - Remove" for the correct procedure.
- f. Remove the glow plugs. Refer to Disassembly and Assembly, "Glow Plugs - Remove and Install" for the correct procedure.

---

**NOTICE**

**Keep all parts clean from contaminants.**

**Contaminants may cause rapid wear and shortened component life.**

---

---

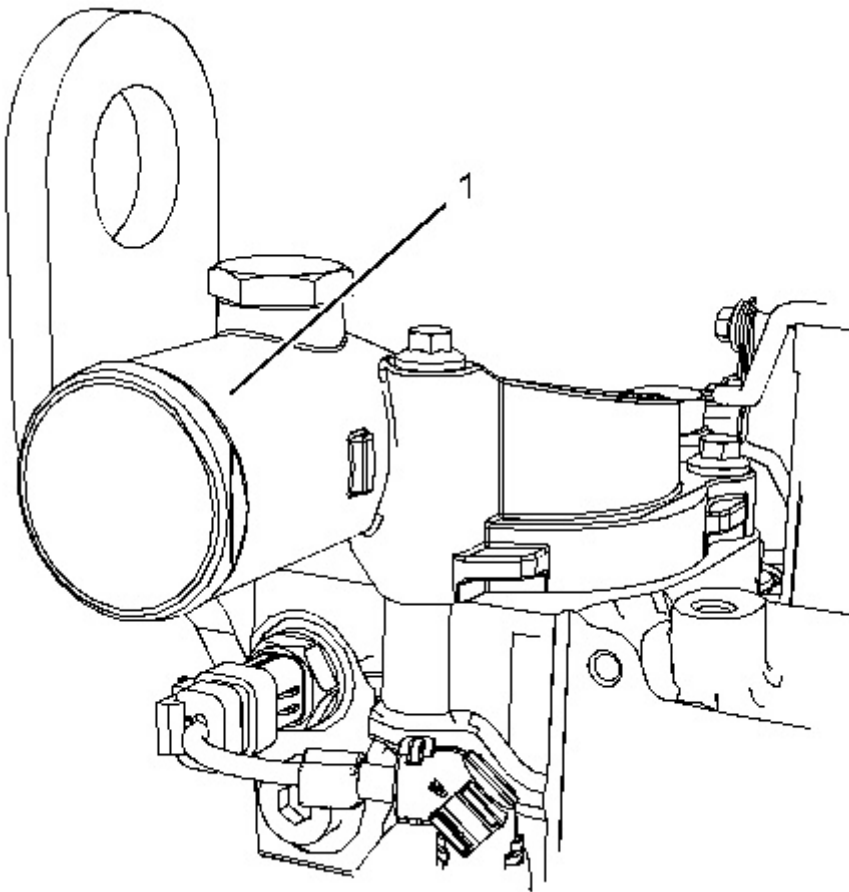
### **NOTICE**

**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.**

**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 - Change" for the correct draining procedure.
- 



2. Disconnect the upper radiator hose from water temperature regulator housing (1) on the cylinder head.
- 

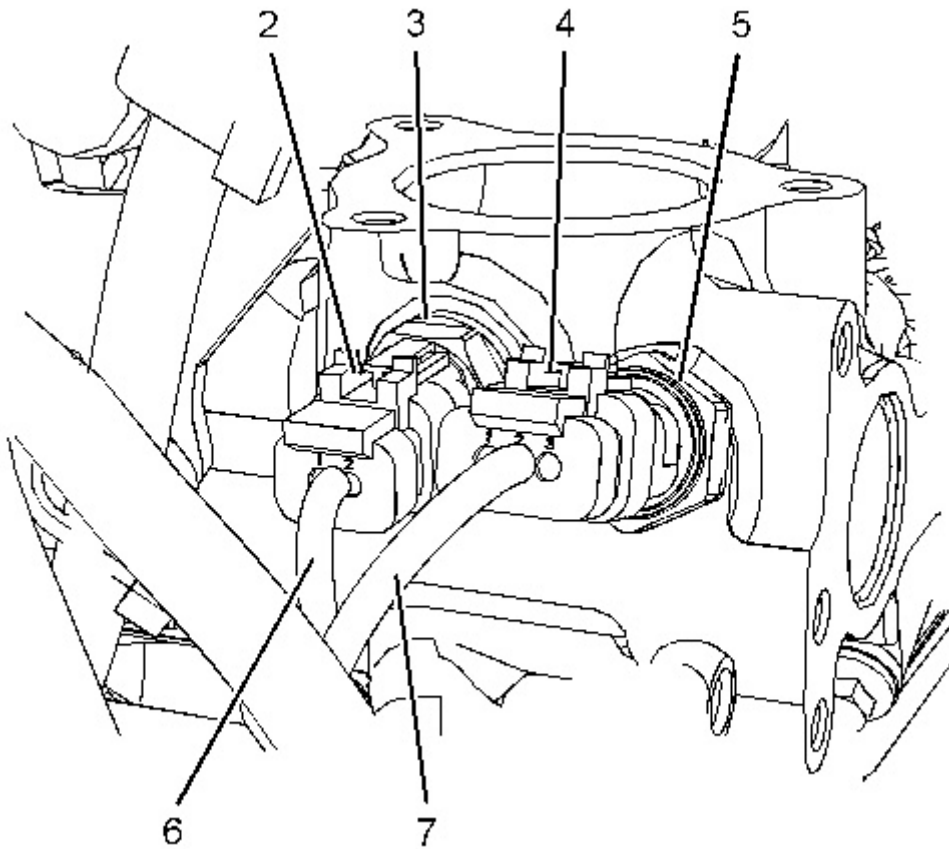
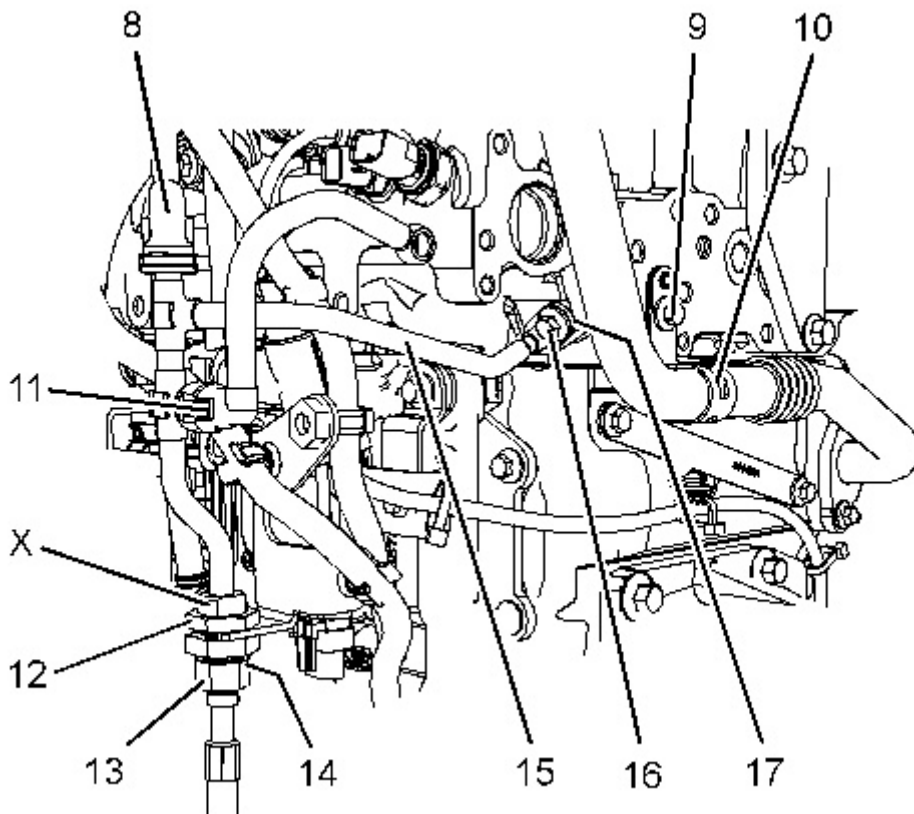


Illustration 2

g02452915

3. Follow Step 3.a through Step 3.b in order to disconnect harness assembly (7) from boost pressure sensor (5).
    - a. Slide the locking tab into unlocked position (4).
    - b. Disconnect harness assembly (7) from boost pressure sensor (5).
  4. Follow Step 4.a through Step 4.b in order to disconnect harness assembly (6) from inlet air temperature sensor (3).
    - a. Slide the locking tab into unlocked position (2).
    - b. Disconnect harness assembly (6) from inlet air temperature sensor (3).
  5. Remove all cable straps that secure harness assembly to the cylinder head. The harness assembly should be positioned away from the cylinder head in order to avoid causing an obstruction during the removal of the cylinder head.
-



---

Illustration 3

g02452919

6. Disconnect plastic tube assembly (8) and plastic tube assembly (11) from tube assembly (15). Use Tooling (A) in order to plug the plastic tube assemblies and to cap the tube assembly.
  7. Disconnect hose assembly (13) from connection on tube assembly (15). Remove O-ring seal (14) (not shown). Use Tooling (A) in order to plug the hose assembly and to cap the tube assembly.
  8. Use a suitable tool in Position (X) in order to hold tube assembly (15) as nut (12) is loosened. Remove bolt (16) from tube assembly (15).
  9. Remove tube assembly (15) from the bracket and the cylinder head. Use Tooling (A) in order to plug the cylinder head and to cap the tube assembly.
  10. Remove O-ring seal (15) from tube assembly (17).
-

Thank you so much for reading.  
Please click the “Buy Now!”  
button below to download the  
complete manual.



After you pay.

You can download the most  
perfect and complete manual in  
the world immediately.

Our support email:

[ebooklibonline@outlook.com](mailto:ebooklibonline@outlook.com)