

Product: VIBRATORY COMPACTOR

Model: CS78B VIBRATORY COMPACTOR M78

Configuration: CS78B, CS79B Vibratory Soil Compactor M7800001-UP (MACHINE) POWERED BY C7.1 Engine

## Disassembly and Assembly

### C7.1 Engines

Media Number -UENR0633-19

Publication Date -01/07/2015

Date Updated -29/10/2018

i05292128

## Cylinder Head - Remove

SMCS - 1100-011

### Removal Procedure

#### 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 fuel priming pump and the primary fuel filter. Refer to Disassembly and Assembly, "Fuel Priming Pump - 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 - Remove and Install" for the correct procedure.
- e. Remove the electronic control module and the mounting bracket. Refer to Disassembly and Assembly, "Electronic Control Module - Remove and Install" for the correct procedure.
- f. Remove the electronic unit injectors. Refer to Disassembly and Assembly, "Electronic Unit Injector - Remove" for the correct procedure.
- g. Remove the valve mechanism cover base. Refer to Disassembly and Assembly, "Valve Mechanism Cover Base - Remove" for the correct procedure.
- h. 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.**

---

---

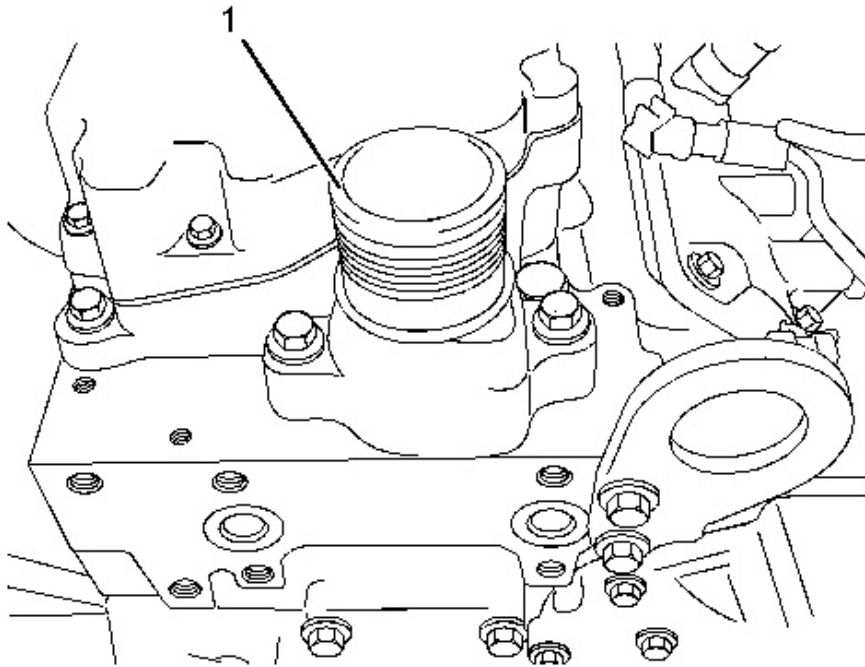
## NOTICE

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.
- 

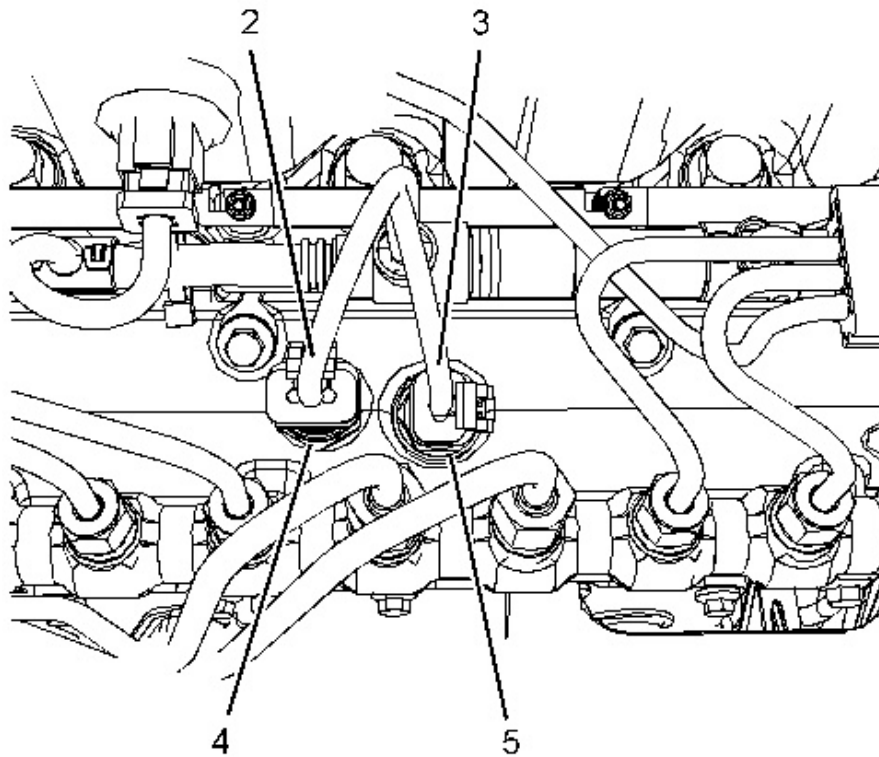


---

Illustration 1  
Typical example

g03369765

---



---

Illustration 2

g03369763

2. Disconnect the upper radiator hose from water temperature regulator housing (1).
3. Follow Step 3.a through Step 3.c in order to disconnect the harness assemblies from boost pressure sensor (6) and inlet air temperature sensor (5).
  - a. Slide the locking tab into the unlocked position.
  - b. Disconnect harness assembly (2) from boost pressure sensor (4).
  - c. Disconnect harness assembly (3) from inlet air temperature sensor (5).

**Note:** The harness assembly for the air temperature sensor (5) has no locking tab.

---

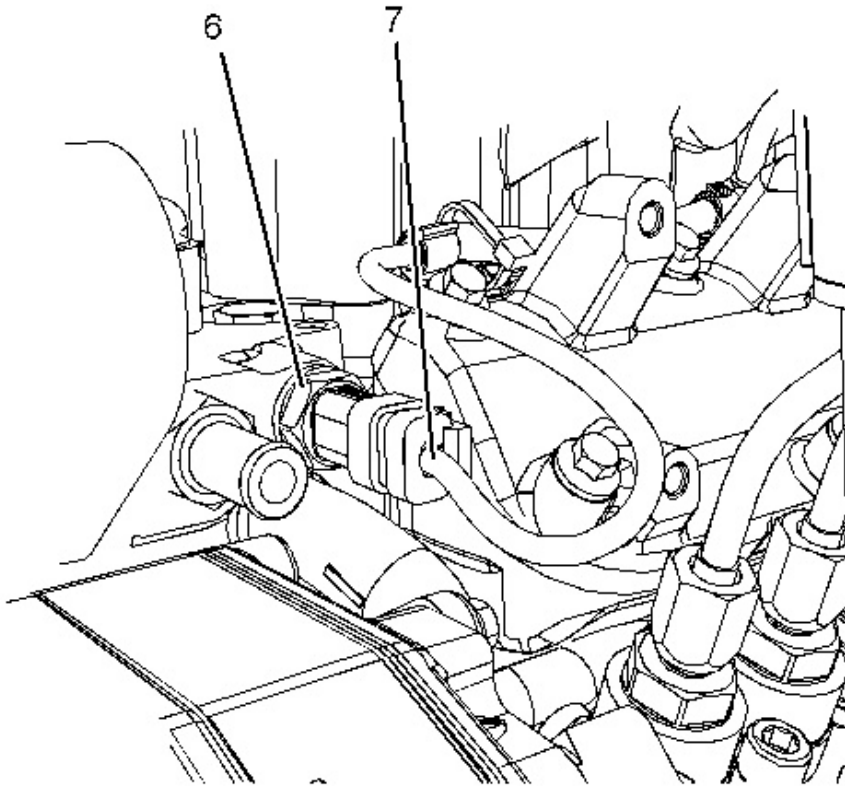


Illustration 3

g03369783

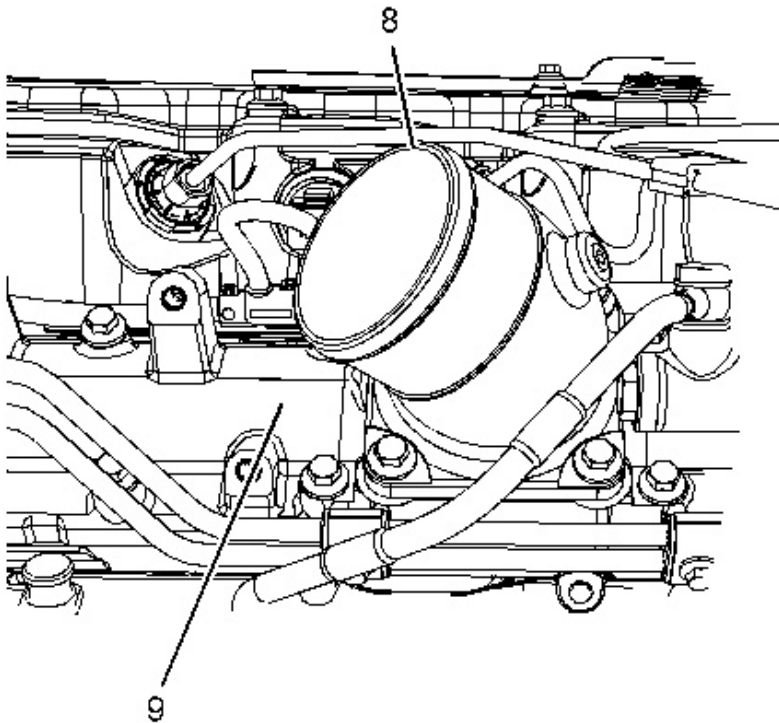


Illustration 4

g03369782

4. Disconnect harness assembly (7) from coolant temperature sensor (6).

5. Remove the air inlet hose from inlet connection (8) on inlet manifold (9).
6. Remove all cable straps that secure harness assembly (4) to the cylinder head or to the inlet manifold. The harness assembly should be positioned in order to avoid causing an obstruction during the removal of the cylinder head.

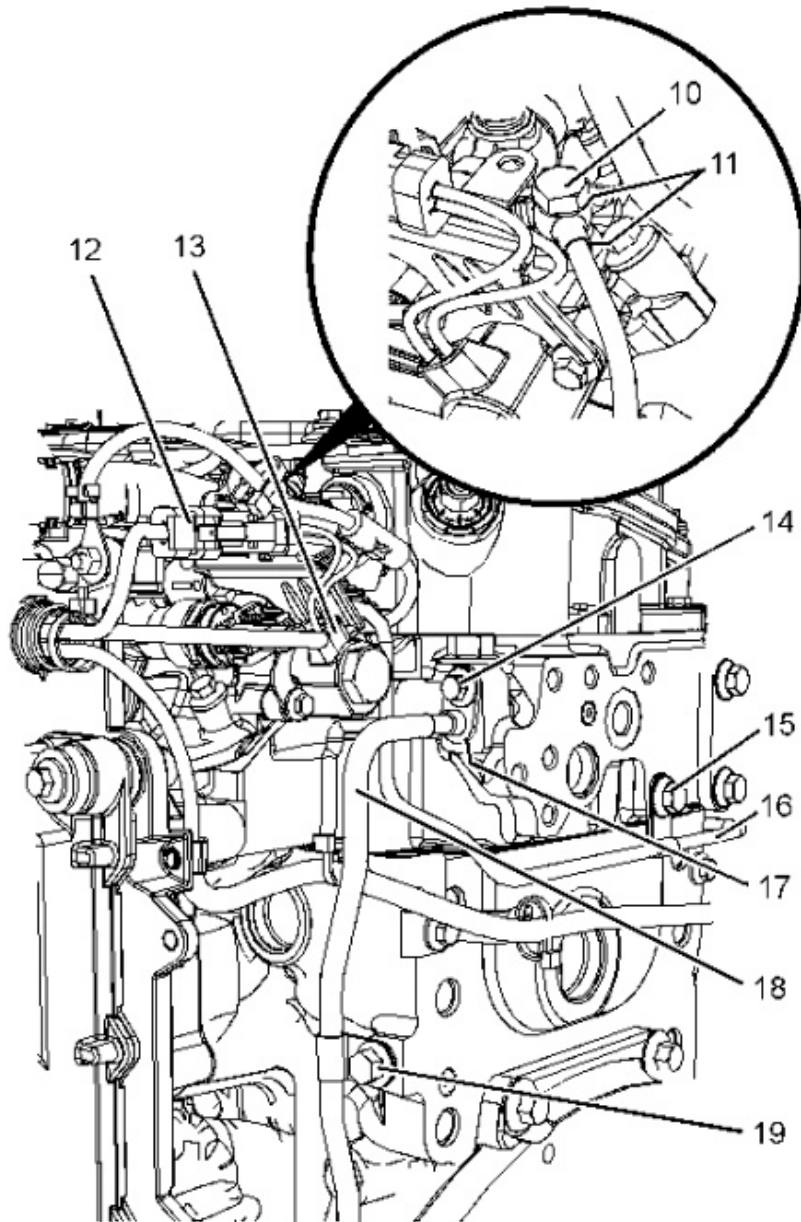
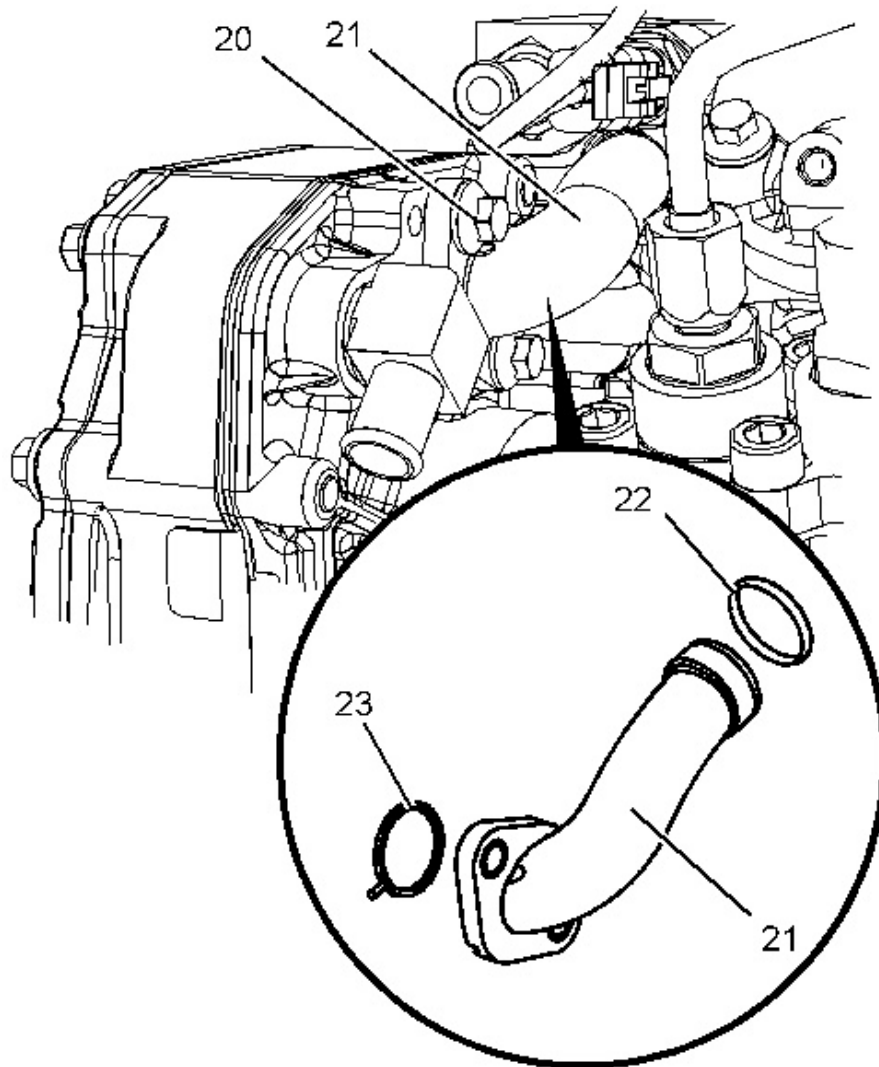


Illustration 5

g03369766

7. Disconnect harness assembly (12) from wastegate solenoid (13).
8. Remove bolt (14) and bolt (19) from tube assembly (18).
9. Disconnect tube assembly (18) from the cylinder head.
10. Remove O-ring seal (17) (not shown) from tube assembly (19).
11. Remove bolt (15) from tube assembly (16).
12. Follow Step 12.a through Step 12.b in order to disconnect tube assembly (16).

- a. Remove banjo bolt (10).
  - b. Remove sealing washers (11) (not shown).
- 



---

Illustration 6

g03369767

13. Remove bolts (20). Remove bypass tube (21) from the cylinder head. Remove O-ring seals (22) and O-ring seal (23) from bypass tube (21).
-

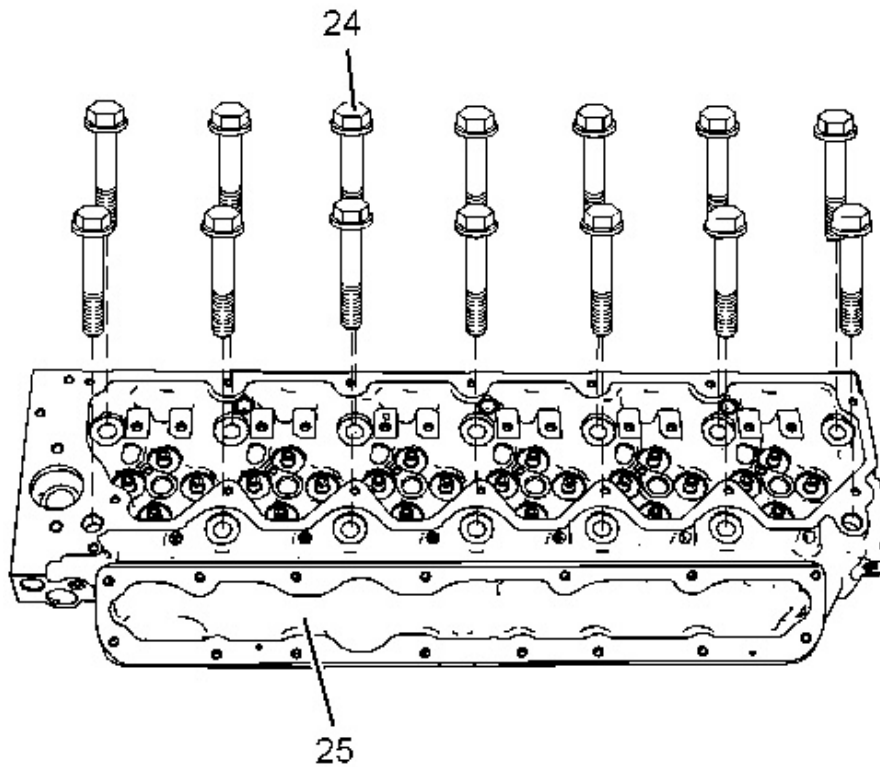


Illustration 7

g03369768

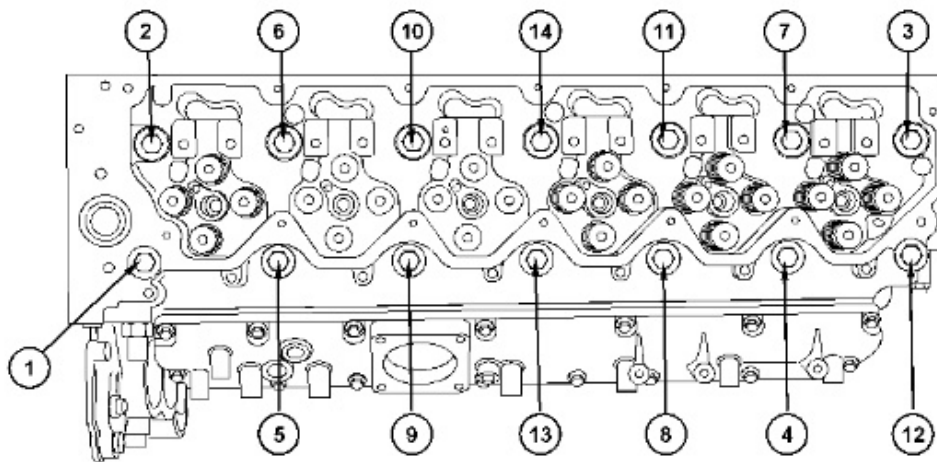


Illustration 8

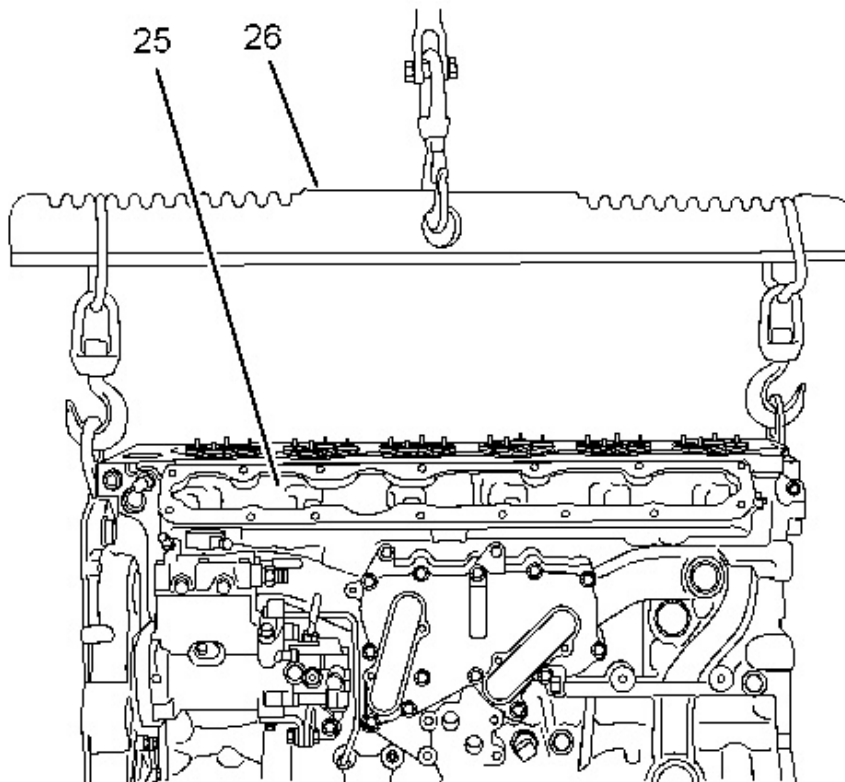
g03369769

14. Gradually loosen bolts (24) in the reverse numerical order to the tightening sequence. Refer to the illustration 8.

Sequence for tightening the bolts for the cylinder head

**Note:** Follow the correct sequence in order to help prevent distortion of the cylinder head.

15. Remove bolts (24) from cylinder head (25).



---

Illustration 9

g03369770

16. Attach a suitable lifting device (26) to cylinder head (25). Support the weight of the cylinder head. The weight of the cylinder head is approximately 66 kg (145.5 lb).

**Note:** A spreader bar must be used in order to distribute the weight of the cylinder head during the lifting operation.

17. Use the suitable lifting device (26) to lift cylinder head (25) carefully off the cylinder block.

**Note:** Do not use a lever to separate the cylinder head from the cylinder block. Take care not to damage the machined surfaces of the cylinder head during the removal procedure.

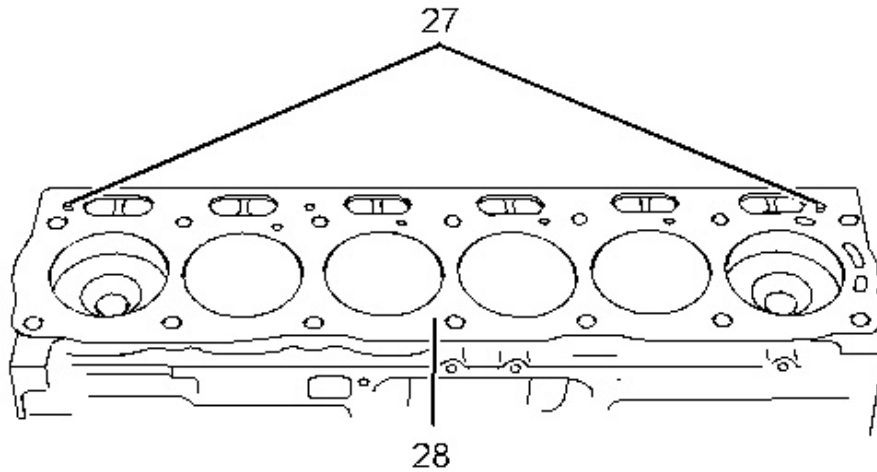
---

### NOTICE

**Place the cylinder head on a surface that will not scratch the face of the cylinder head.**

---





---

Illustration 10

g03369771

18. Remove cylinder head gasket (28).
  19. Note the position of dowels (27) in the cylinder block.
  20. If necessary, remove the water temperature regulator from the cylinder head. Refer to Disassembly and Assembly, "Water Temperature Regulator - Remove and Install" for the correct procedure.
  21. If necessary, remove the inlet manifold from the cylinder head. Refer to Disassembly and Assembly, "Inlet manifold - Remove and Install" for the correct procedure.
-

Product: VIBRATORY COMPACTOR

Model: CS78B VIBRATORY COMPACTOR M78

Configuration: CS78B, CS79B Vibratory Soil Compactor M7800001-UP (MACHINE) POWERED BY C7.1 Engine

## Disassembly and Assembly

### C7.1 Engines

Media Number -UENR0633-19

Publication Date -01/07/2015

Date Updated -29/10/2018

i07161948

## Cylinder Head - Install

SMCS - 1100-012

### Installation Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	-	Guide Studs (M16 by 115mm)	2
B	8T-3052	Angle gauge	1
C	1U-6396	O-Ring Assembly Compound	1

---

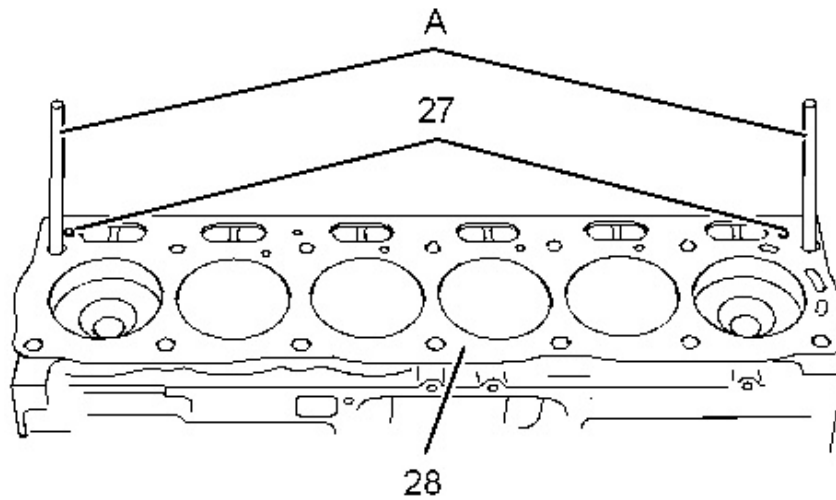
### NOTICE

**Keep all parts clean from contaminants.**

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

---

1. Thoroughly clean the gasket surfaces of the cylinder head and the cylinder block. Do not damage the gasket surfaces of the cylinder head of the cylinder block. Ensure that no debris enters the cylinder bores, the coolant passages, or the lubricant passages.
  2. Inspect the gasket surface of the cylinder head for distortion. Refer to Specifications, "Cylinder Head" for more information. If the gasket surface of the cylinder head is distorted beyond maximum permitted limits, replace the cylinder head.
  3. If necessary, install the inlet manifold to the cylinder head. Refer to Disassembly and Assembly, "Inlet manifold - Remove and Install" for the correct procedure.
-

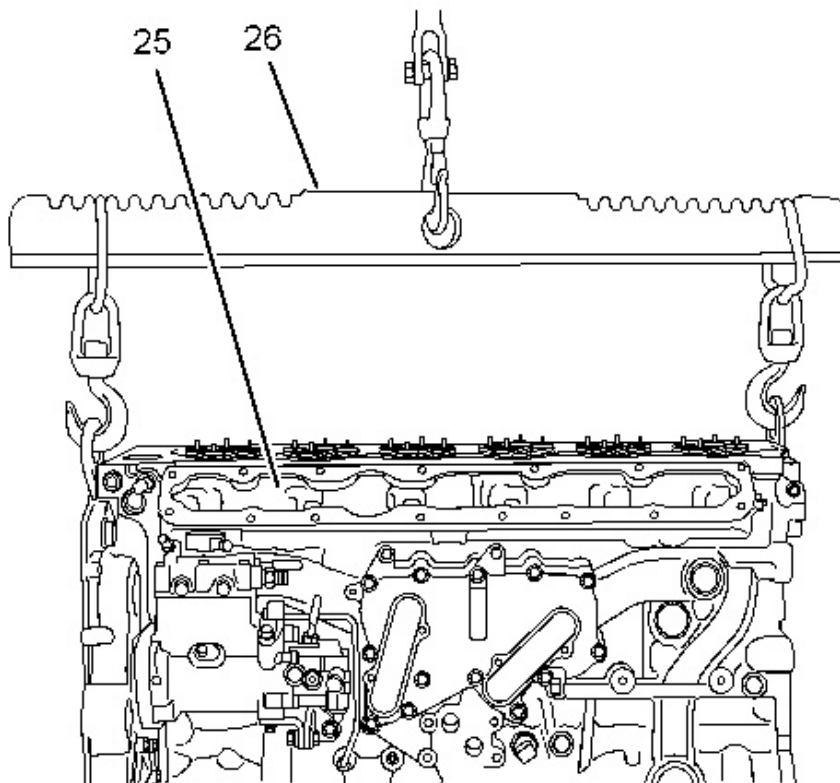


---

Illustration 1

g03370339

4. Inspect dowels (27) for damage. If necessary, replace the dowels in the cylinder block.
  5. Install Tooling (A) to the cylinder block.
  6. Align cylinder head gasket (28) with dowels (27). Install cylinder head gasket (28) onto the cylinder block.
- 



---

Illustration 2

g03369770

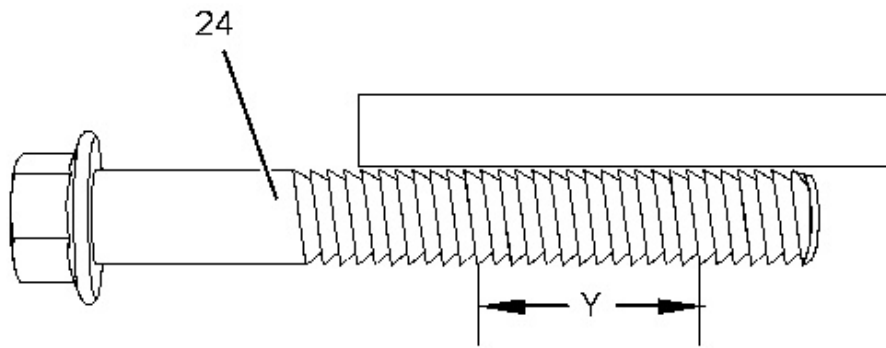
7. Use a suitable lifting device (26) to lift cylinder head (25). The weight of the cylinder head is approximately 66 kg (145.5 lb).

**Note:** A spreader bar must be used to distribute the weight of the cylinder head during the lifting operation.

8. Use Tooling (A) to align cylinder head (18) with the cylinder block. Install the cylinder head to the cylinder block.

**Note:** Ensure that the cylinder head is correctly positioned on dowels.

9. Remove Tooling (A).



---

Illustration 3

g03370340

10. Clean bolts (24). Follow Steps 10.a for the procedure to inspect the bolts.
  - a. Use a straight edge to check the threads of the bolts. Refer to Illustration 3. Replace any bolts that show visual reduction in the diameter of the thread over Length (Y).
11. Lubricate the threads and the shoulder of bolts (24) with clean engine oil.

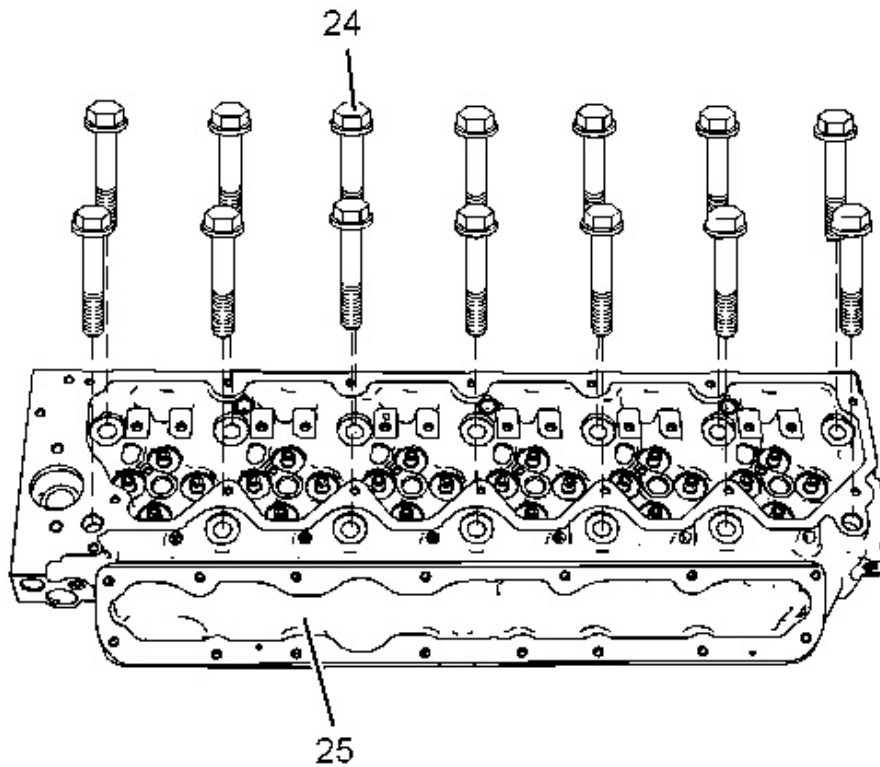


Illustration 4

g03369768

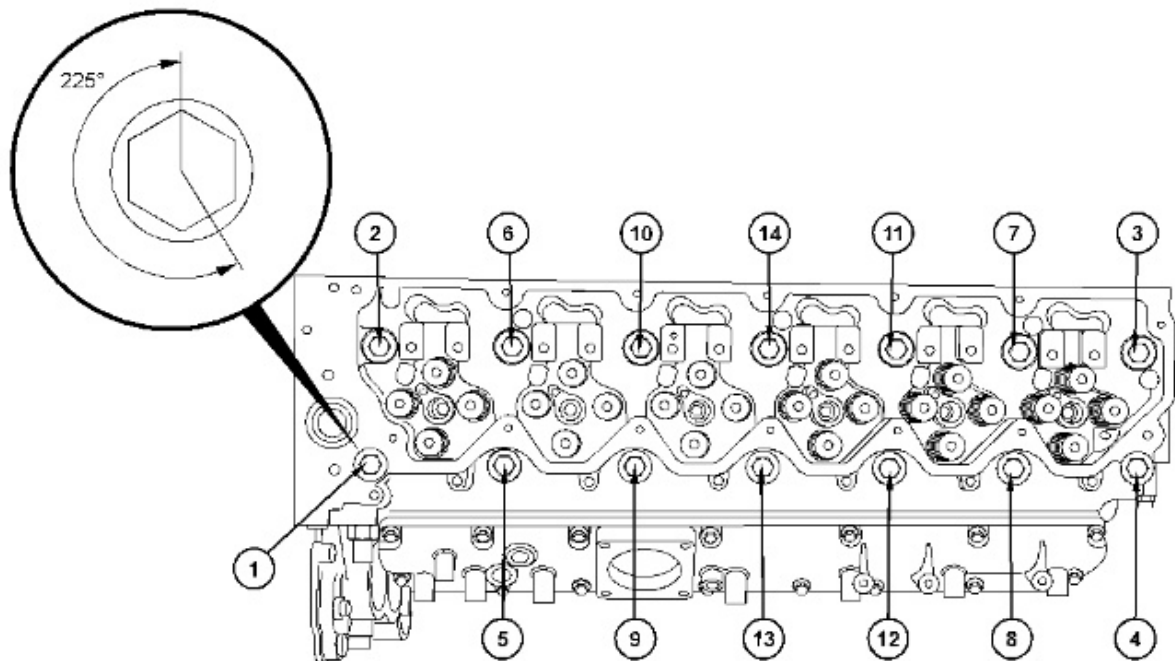
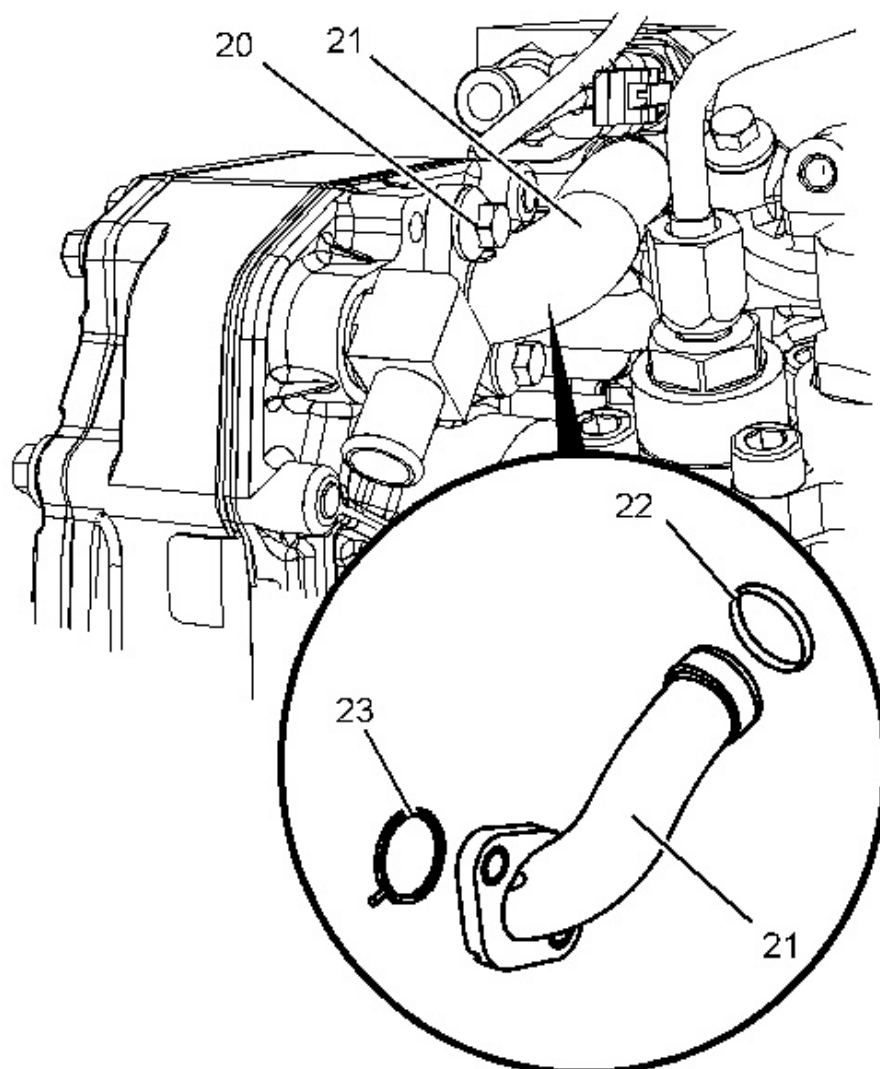


Illustration 5

g06239253

12. Install bolts (24) to cylinder head (25).
13. Tighten the bolts to a torque of 50 N·m (37 lb ft) in the numerical sequence. Refer to Illustration 5.
14. Tighten the bolts to a torque of 100 N·m (74 lb ft) in the numerical sequence. Refer to Illustration 5.

15. Turn the bolts through an extra 225 degrees in the numerical sequence. Refer to Illustration 5. Use Tooling (B) to achieve the correct final torque.
- 



---

Illustration 6

g03369767

16. Use Tooling (C) to lubricate the O-ring seals. Install new O-ring seal (23) and new O-ring seal (22) to bypass tube (21). Install the bypass tube in the cylinder head. Install bolts (20). Tighten the bolts to a torque of 22 N·m (16 lb ft).
-

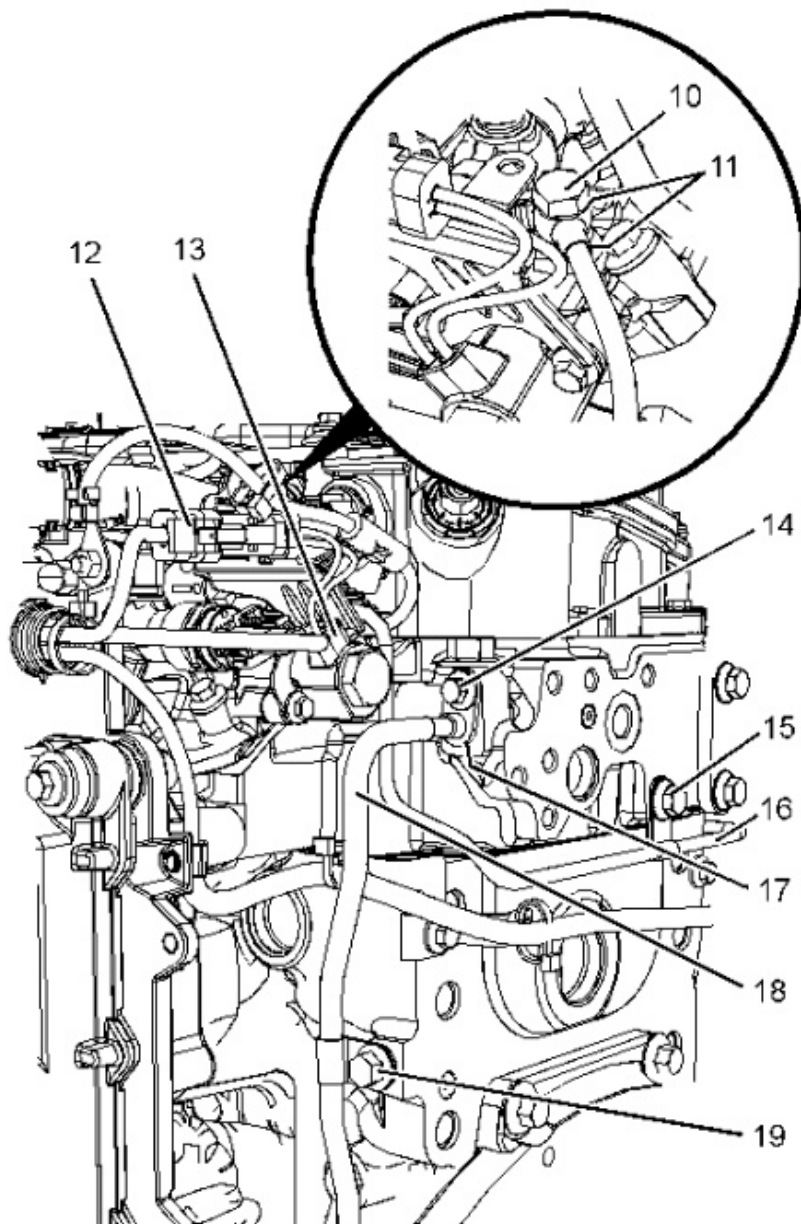


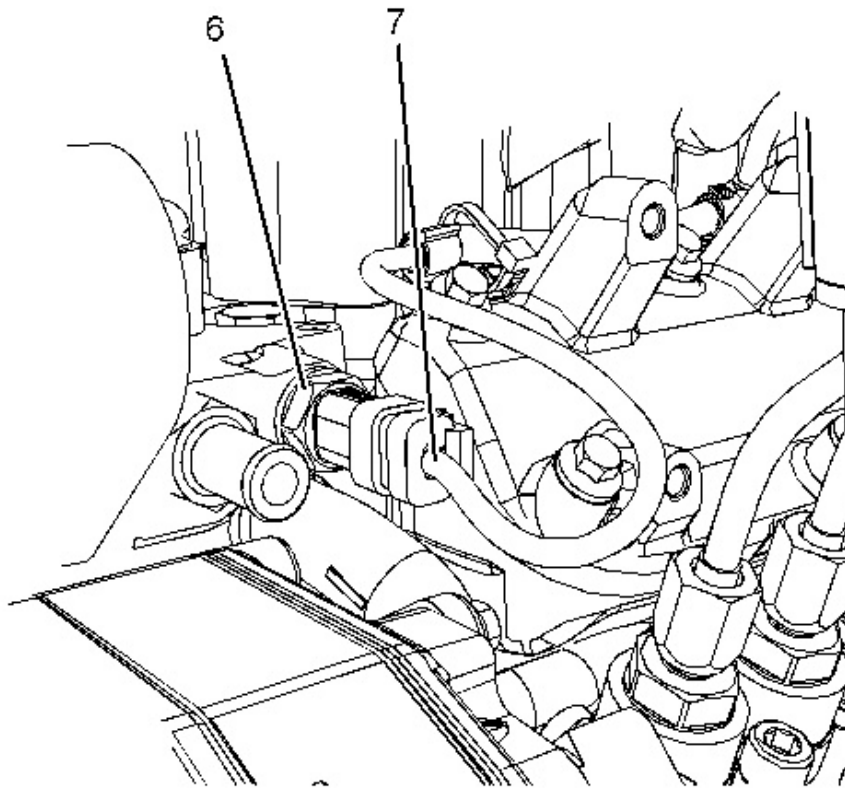
Illustration 7

g03369766

17. Install a new O-ring seal (17) (not shown) to tube assembly (19).
18. Connect tube assembly (18) to the cylinder head. Ensure that the tube assembly is correctly seated into the cylinder head.
19. Install bolt (14) and bolt (19) to tube assembly (18). Tighten the bolts to a torque of 22 N·m (195 lb in).
20. Follow Step 20.a through Step 20.c to connect tube assembly (16).
  - a. Install a new sealing washer (11) (not shown) to banjo bolt (10).
  - b. Install banjo bolt (10) to tube assembly (16).
  - c. Install the remaining new sealing washer (11) (not shown) to banjo bolt (10).

Tighten banjo bolt (10). Tighten the banjo bolt to a torque of 15 N·m (133 lb in).

21. Install bolt (15) to tube assembly (16). Tighten the bolt to a torque of 44 N·m (32 lb ft).
  22. Connect harness assembly (12) to wastegate solenoid (13).
- 

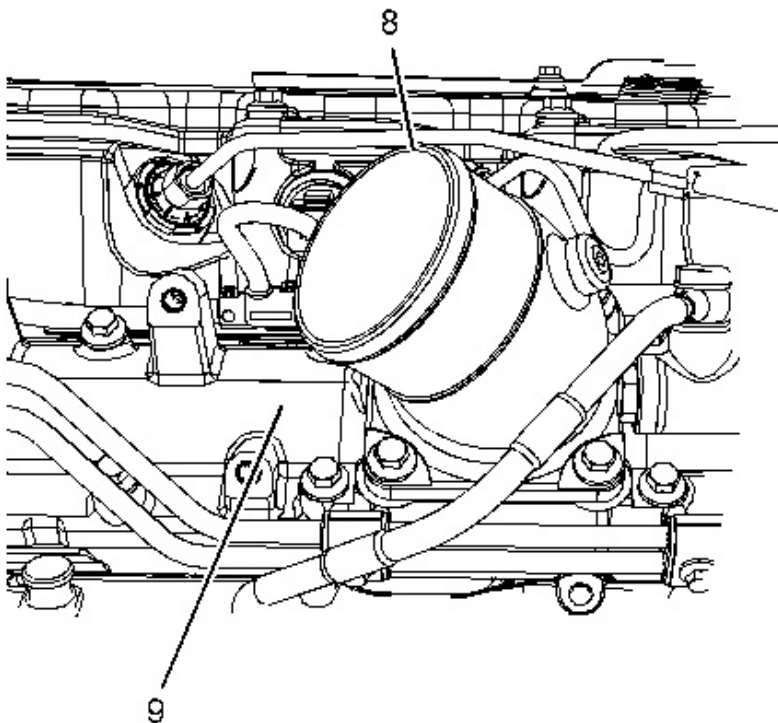


---

Illustration 8

g03369783

---





23. Connect harness assembly (7) to coolant temperature sensor (6).
24. Install the air inlet hose to inlet connection (8) on inlet manifold (9). Securely tighten the hose clamps.

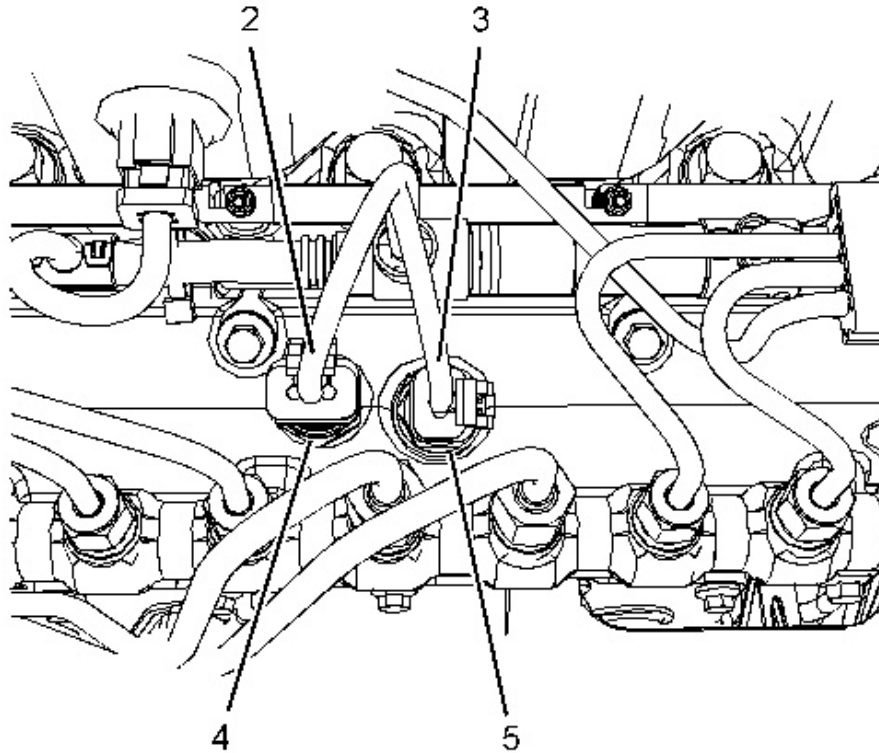


Illustration 10

g03369763

25. Follow Step 25.a through Step 25.c to disconnect the harness assemblies from boost pressure sensor (6) and inlet air temperature sensor (5).
  - a. Connect harness assembly (2) to boost pressure sensor (4).
  - b. Slide the locking tab into the locked position.
  - c. Connect harness assembly (3) to inlet air temperature sensor (5).

**Note:** The harness assembly for the air temperature sensor (5) has no locking tab.

26. Use new cable straps to secure the harness assembly to the cylinder head and to the inlet manifold. Ensure that the harness assembly is not strained.

**Note:** Ensure that the harness assembly is clear of other engine components.

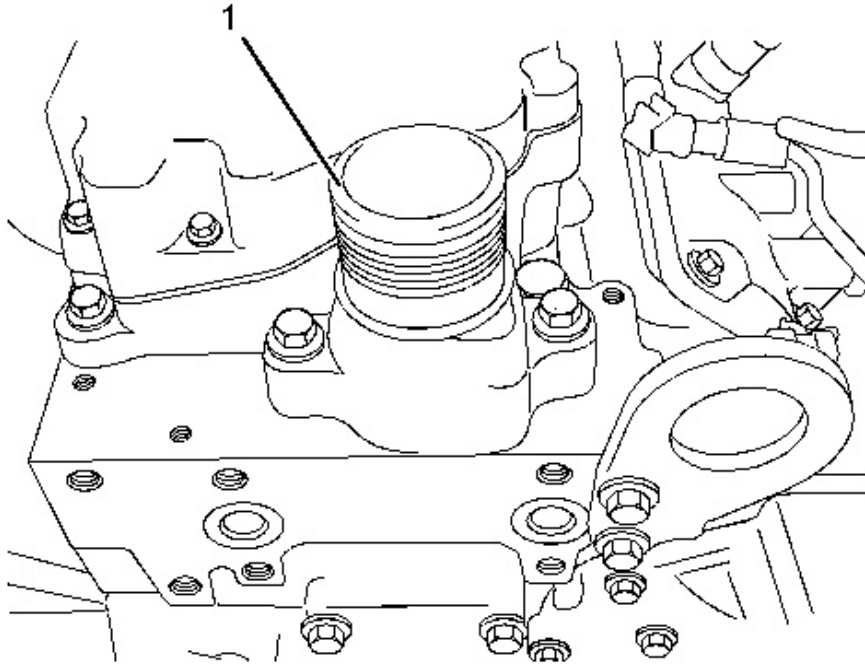


Illustration 11

g03369765

27. If necessary, install water temperature regulator housing (1) to the cylinder head. Refer to Disassembly and Assembly, "Water Temperature Regulator Housing - Remove and Install" for the correct procedure.
28. Connect the upper radiator hose to water temperature regulator housing (1) on the cylinder head. Securely tighten the hose clamps.
29. Fill the cooling system with coolant. Refer to Operation and Maintenance Manual, "Cooling System Coolant - Change" for the correct filling procedure.
30. If necessary, fill the engine oil pan to the correct level that is indicated on the engine oil level gauge. Refer to Operation and Maintenance Manual, "Engine Oil Level - Check" for the correct filling procedure.

**End By:**

- a. Install the electronic unit injectors. Refer to Disassembly and Assembly, "Electronic Unit Injector - Remove" for the correct procedure.
- b. Install the rocker shaft and pushrods. Refer to Disassembly and Assembly, "Rocker Shaft and Pushrods - Install" for the correct procedure.
- c. Install the valve mechanism cover base. Refer to Disassembly and Assembly, "Valve Mechanism Cover Base - Install" for the correct procedure.
- d. Install the glow plugs. Refer to Disassembly and Assembly, "Glow Plugs - Remove and Install" for the correct procedure.
- e. Install the fuel manifold. Refer to Disassembly and Assembly, "Fuel Manifold - Remove and Install" for the correct procedure.

- f. Install the electronic control module and the mounting bracket. Refer to Disassembly and Assembly, "Electronic Control Module - Remove and Install" for the correct procedure.
  - g. If necessary, install the fuel filter base and the secondary fuel filter. Refer to Disassembly and Assembly, "Fuel Filter Base - Remove and Install" for the correct procedure.
  - h. If necessary, install the fuel priming pump and the primary fuel filter. Refer to Disassembly and Assembly, "Fuel Priming Pump - Remove and Install" for the correct procedure.
  - i. Install the exhaust manifold. Refer to Disassembly and Assembly, "Exhaust Manifold - Remove and Install" for the correct procedure.
-

Product: VIBRATORY COMPACTOR

Model: CS78B VIBRATORY COMPACTOR M78

Configuration: CS78B, CS79B Vibratory Soil Compactor M7800001-UP (MACHINE) POWERED BY C7.1 Engine

## Disassembly and Assembly

### C7.1 Engines

Media Number -UENR0633-19

Publication Date -01/07/2015

Date Updated -29/10/2018

i05292355

## Lifter Group - Remove and Install

SMCS - 1209-010

### Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
<sup>(1)</sup> A	9U-6198	Crankshaft Turning Too	1
<sup>(2)</sup> A	9U-7336	Housing As	1
	5P-7305	Engine Turning Tool	1
B	1U-7262	Telescopic Magnet	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:

- a. Remove the engine oil pump. Refer to Disassembly and Assembly, "Engine Oil Pump - Remove" for the correct procedure.
- b. Remove the camshaft. Refer to Disassembly and Assembly, "Camshaft - 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. If the crankshaft is installed, use Tooling (A) to rotate the crankshaft in order to gain access to appropriate lifters (1).

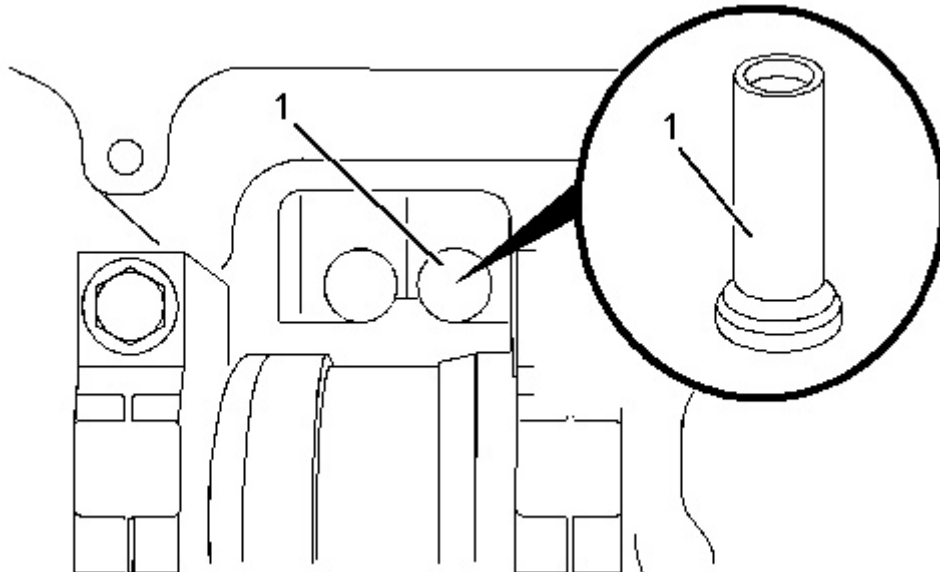


Illustration 1

g01340518

2. Use Tooling (B) in order to remove lifters (1).

**Note:** Place a temporary identification mark on each lifter in order to identify the correct location.

3. Repeat Step 1 and Step 2 in order to remove the remaining lifters.

## Installation Procedure

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
<sup>(1)</sup> A	9U-6198	Crankshaft Turning Too	1
<sup>(2)</sup> A	9U-7336	Housing As	1
	5P-7305	Engine Turning Tool	1
B	1U-7262	Telescopic Magnet	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.

**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.**

---

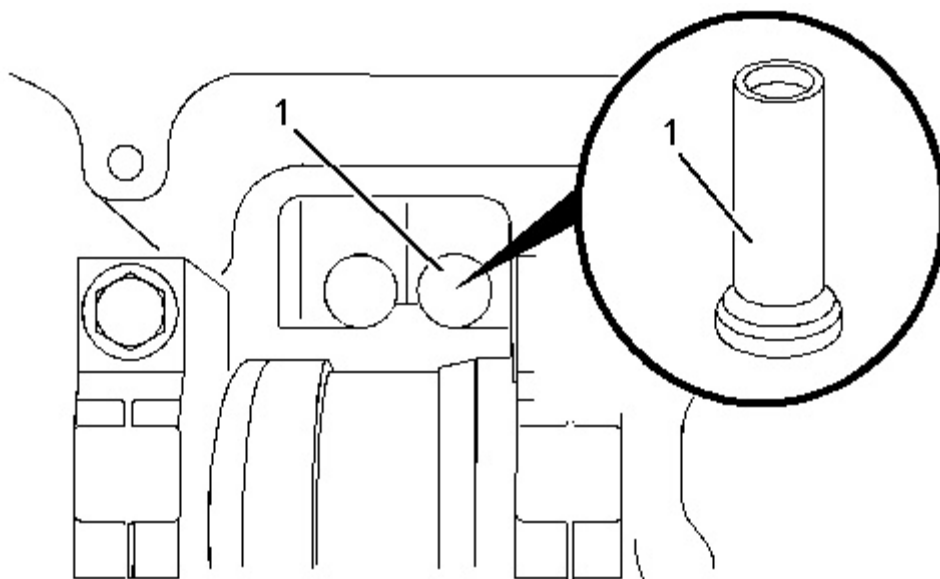
---

## NOTICE

**It is strongly recommended that all lifters should be replaced when a new camshaft is installed.**

---

1. Clean the lifters. Follow Step 1.a through Step 1.c in order to inspect the lifters. Replace any worn lifters or damaged lifters.
  - a. Inspect the seat of the pushrod in the lifter for visual wear or damage.
  - b. Inspect the shank of the lifter for wear or damage. Refer to Specifications, "Lifter Group" for more information.
  - c. Inspect the face of the lifter that runs on the camshaft for visual wear or damage.
2. If the crankshaft is installed, use Tooling (A) to rotate the crankshaft to access to the cylinder block in order to install appropriate lifters (1).
3. Lubricate lifters (1) with clean engine oil.



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)