

Product: WHEEL LOADER

Model: 906M WHEEL LOADER Z66

Configuration: 906M Compact Wheel Loader Z6600001-UP (MACHINE) POWERED BY C3.3B Engine

Disassembly and Assembly

C3.3B Tier 4 Final and EU Stage 3B Engines for Caterpillar Built Machines

Media Number -UENR3278-07

Publication Date -01/09/2014

Date Updated -11/07/2016

i05223576

Bridge Dowels - Remove and Install

SMCS - 1100-010

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	5P-0944	Dowel Puller Gp	1

Start By:

- a. Remove valve springs.

Note: Refer to Specification UENR3421 "Engine Design" for non-specified engine Torque Values.

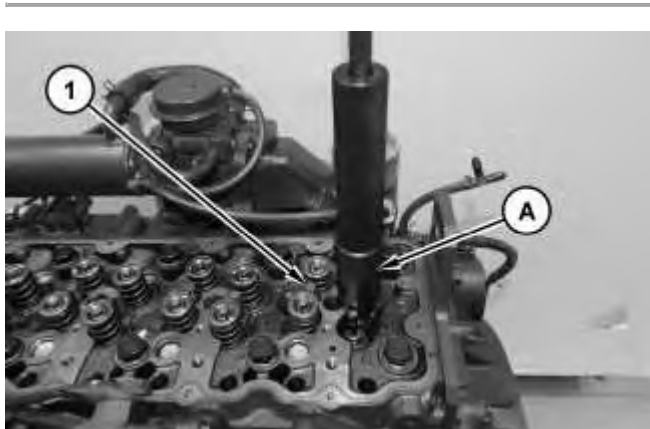


Illustration 1

g02882621

1. Install Tooling (A) and remove bridge dowel (1).

Installation Procedure

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
B	390-1142	Spacer	1

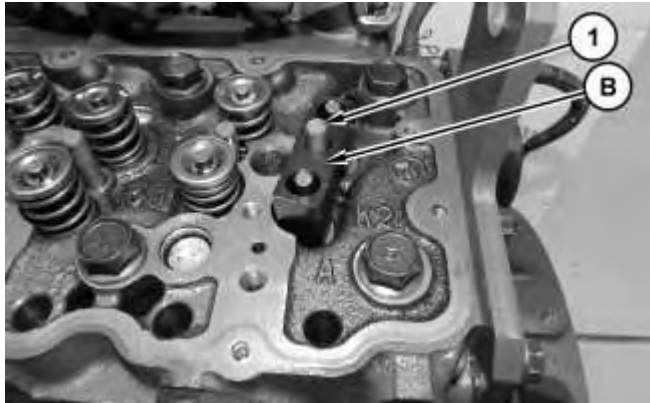


Illustration 2

g02882716



Illustration 3

g02882838

1. Use a press or hammer to drive bridge dowel (1) to a height that is flush with Tooling (B).

End By:

- a. Install valve springs.
-

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Media Number -UENR3278-07

Publication Date -01/09/2014

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i05221855

Rocker Shaft and Push Rod - Remove and Install

SMCS - 1102-010; 1208-010

Removal Procedure

Start By:

- a. Remove valve mechanism cover.

Note: Refer to Specification UENR03421 "Engine Design" for non-specified engine Torque Values.

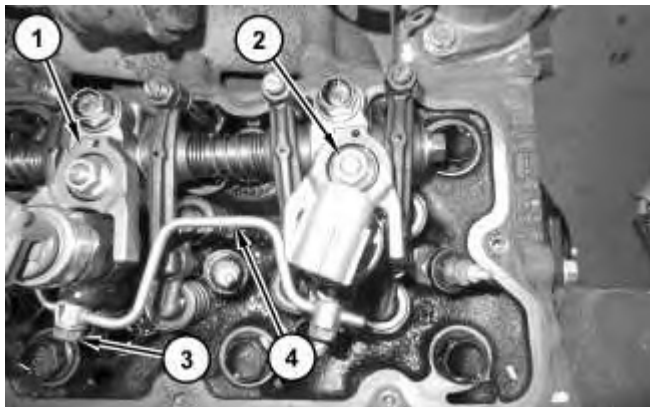


Illustration 1

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1. Remove bolts (3) and tube assembly (4).
2. Remove nuts (2) and brackets (1).

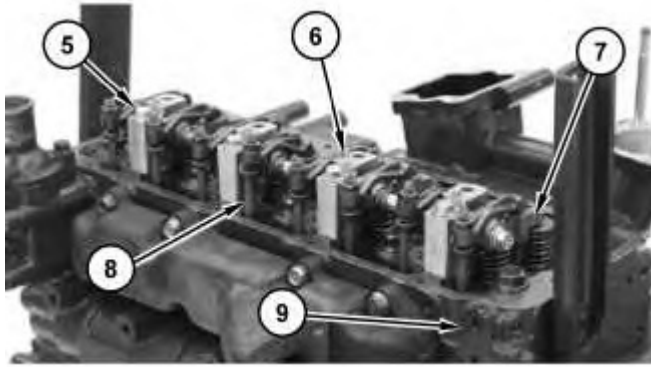


Illustration 2

g03338669

3. Remove bolts (5) from rocker shaft assembly (6).
4. Remove rocker shaft assembly (6) from cylinder head (9).
5. Place an identification mark on pushrods (8) in order to show the location. Remove pushrods (8) from cylinder head (9).

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

6. Remove valve bridge arms (7).

Installation Procedure

1. Install rocker shaft assembly (6) and pushrods (8) in the reverse order of removal.
 - a. Install bolts (5) and tighten to a torque of 49 to 55 N·m (37 to 41 lb ft).
 - b. Position brackets (1) and install nuts (2). Tighten nuts (2) to a torque of 24 to 27 N·m (18 to 20 lb ft).
 2. Position tube assembly (4) and install bolts (3). Tighten bolts (3) to a torque of 9.8 to 11.2 N·m (87 to 100 lb in).
 3. Adjust the inlet valve lash and the exhaust valve lash to 0.13 to 0.17 mm (0.005 to 0.007 inch). Refer to Testing and Adjusting, "Engine Valve Lash - Inspect/Adjust".
-

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i05307420

Rocker Shaft - Disassemble

SMCS - 1102-015

Disassembly Procedure

Start By:

- a. Remove the rocker shaft and pushrods.

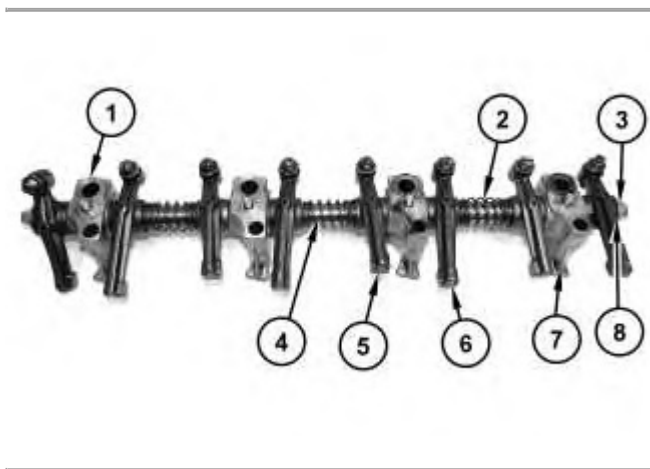


Illustration 1

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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.

Note: Make an identification mark on each rocker arm assembly in order to show the location. The components must be reinstalled in the original location. Do not interchange components.

1. Remove two bolts (3) and washers (8) from ends of rocker shaft (4).
 2. Remove inlet valve rocker arm assemblies (5), supports (1), exhaust valve rocker arm assemblies (6) and springs (2) from rocker shaft (4).
-

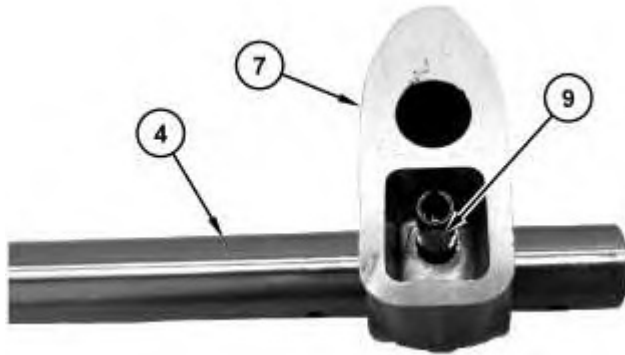


Illustration 2

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3. Remove pin (9) and support (7) from rocker arm shaft (4).
-

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i05307609

Rocker Shaft - Assemble

SMCS - 1102-016

Assembly Procedure

Note: Refer to Specifications, "Engine Design" for non-specified engine torque values.

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

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

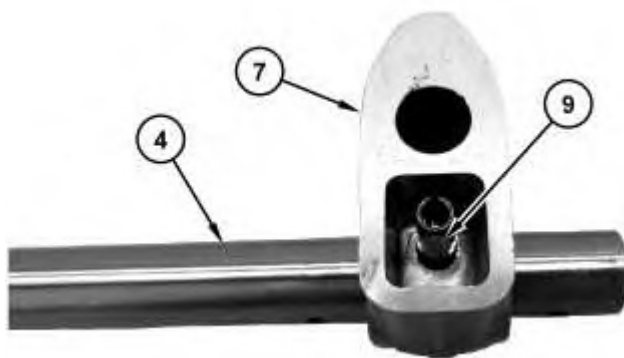


Illustration 1

g03367346

2. Position support (7) on rocker arm shaft (4) and install pin (9).
-

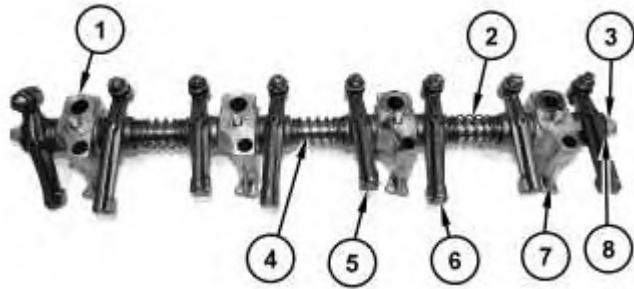


Illustration 2

g03367345

 **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.

3. Lubricate the bore of inlet valve rocker arm assemblies (5) and exhaust valve rocker arm assemblies (6) with clean engine oil. Lubricate rocker shaft (4) with clean engine oil.
4. Install springs (2), exhaust valve rocker arm assemblies (6), supports (1) and inlet valve rocker arm assemblies (5) on rocker arm shaft (4).
5. Install washers (8) and two bolts (3) on the ends of rocker arm shaft (4).

End By:

- a. Install the rocker shaft and pushrods.
-

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Publication Date -01/09/2014

Date Updated -11/07/2016

i05331010

Cylinder Head - Remove and Install

SMCS - 1100-010

Removal Procedure

Start By:

- a. Remove the exhaust manifold.
- b. Remove the inlet manifold.
- c. Remove the rocker arm shaft and pushrods.
- d. Remove the electronic fuel injector.

Note: Refer to Specification UENR3421 "Engine Design" for non-specified engine Torque Values.

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" for the correct draining and filling procedures.

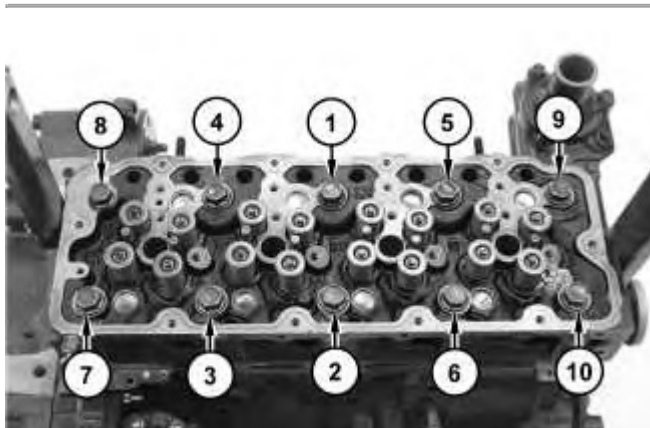


Illustration 1

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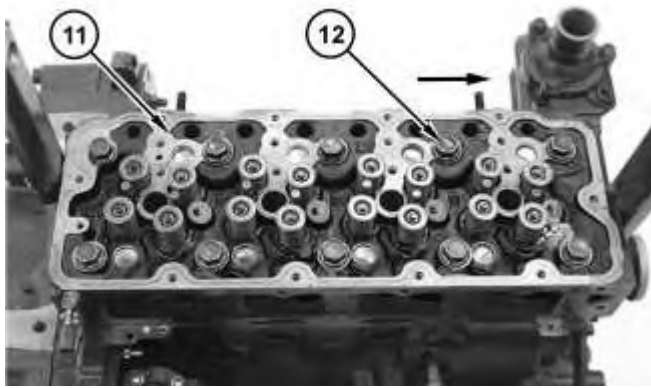


Illustration 2

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2. Gradually loosen cylinder head bolts (12) in reverse numerical order from (10) through (1) from cylinder head (11). Remove cylinder head bolts (12) from cylinder head (11).
3. Attach a suitable lifting device to cylinder head (11). The weight of cylinder head (11) is approximately 46 kg (100 lb).
4. Use the suitable lifting device to lift cylinder head (11) off the cylinder block.

NOTICE

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

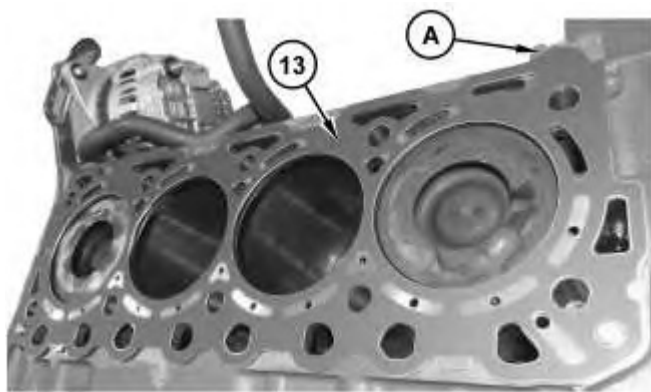


Illustration 3

g03339590

5. Remove cylinder head gasket (13) from the cylinder block.
6. Notice the location of the cylinder head gasket notches in area (A). Refer to illustration 3 and illustrations 4.
7. Note the position of the dowels in the cylinder block.

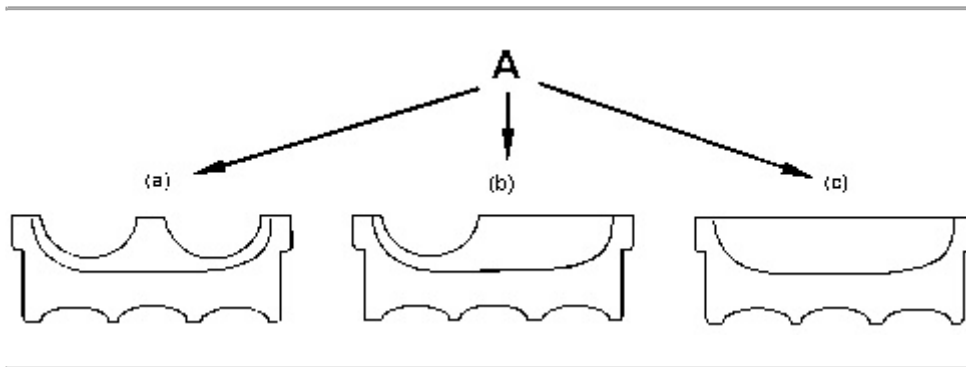


Illustration 4

g02796320

8. Notice the number of notches in area (A).

Table 1

Head Gasket Notch	Head Gasket Thickness		Piston head protrusion or recessing from crankcase cylinder face
	Before Tighten	After Tighten	
(a)-two notches	0.900 mm (0.0354 inch)	0.800 mm (0.0315 inch)	0.0775 to 0.150 mm (0.00306 to 0.00590 in.)
(b)-one notch	1.00 mm (0.039 inch)	0.900 mm (0.0354 inch)	0.150 to 0.250 mm (0.0059 to 0.0098 in.)
(c)-without notch	1.10 mm (0.043 inch)	1.00 mm (0.039 inch)	0.250 to 0.343 mm (0.0098 to 0.0135 in.)

Installation Procedure

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
A	4C-5592	Thread Lubricant	1

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

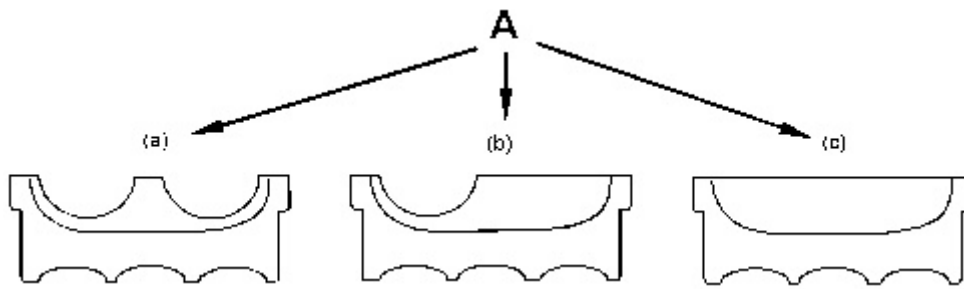


Illustration 5

g02796320

1. Notice the number of notches in area (A). Refer to illustrations 5 and 6.
2. Thoroughly clean the gasket surfaces of the cylinder head and the cylinder block. Do not damage the gasket surfaces of the cylinder head or the cylinder block. Ensure that no debris enters the cylinder bores, the coolant passages, or the lubricant passages.
3. Inspect the dowels for damage. If necessary, replace the dowels in the cylinder block.

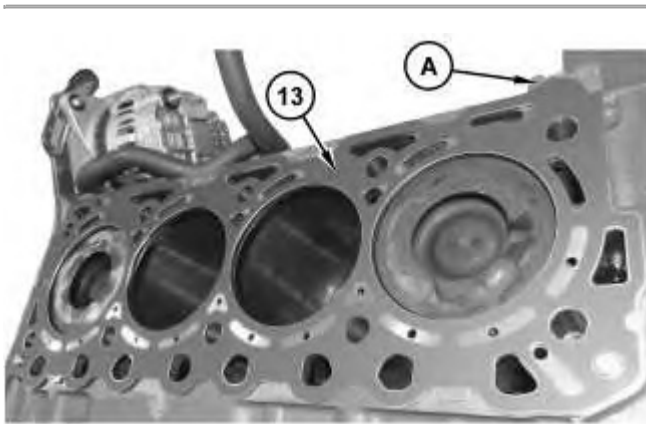
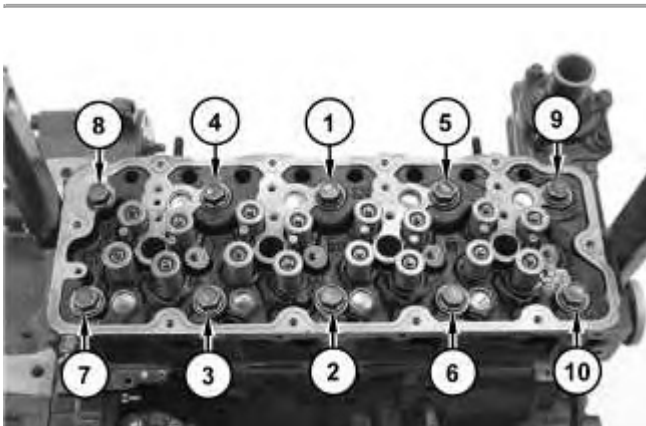


Illustration 6

g03339590

4. 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.
5. Notice the location of the cylinder head gasket notches in area (A) and refer to table 2. Align new cylinder head gasket (13) with the dowels.



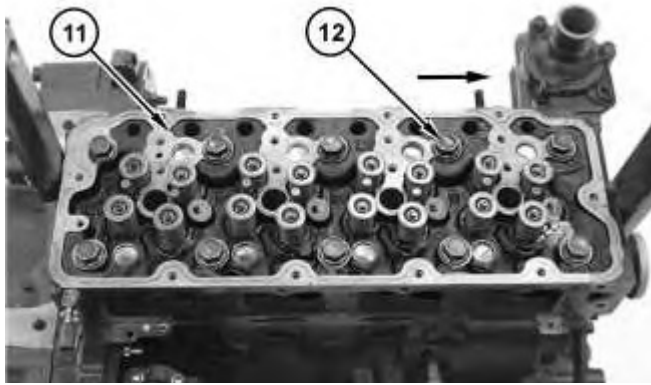


Illustration 8

g03339573

6. Use a suitable lifting device to lift cylinder head (11). The weight of cylinder head (11) is approximately 46 kg (100 lb).
7. Align cylinder head (11) with the cylinder block. Install cylinder head (11) to the cylinder block.

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

8. Clean and inspect cylinder head bolts (12).
9. Lubricate the threads and the shoulder of cylinder head bolts (12) with engine oil.
10. Install cylinder head bolts (12) in numerical order from (1) through (10) to cylinder head (11).
11. Tighten the cylinder head bolts according to the following procedure.
 - Tighten bolts (1) through (10) to a torque of 35 N·m (26 lb ft)
 - Tighten bolts (1) through (10) to a torque of 108 N·m (80 lb ft)
 - Tighten bolts (1) through (10) to a torque of 187 to 196 N·m (138 to 144 lb ft)
12. Fill the cooling system with coolant. Refer to Operation and Maintenance Manual, "Cooling System Coolant - Change" for the correct filling procedure.

End By:

- a. Install the electronic fuel injector.
- b. Install the rocker arm shaft and pushrods.
- c. Install the inlet manifold.
- d. Install the exhaust manifold.

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i05307111

Camshaft and Valve Lifters - Remove and Install

SMCS - 1209-010; 1210-010

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	-	Magnets	8
B	390-1149	Driver	1

Start By:

- a. Remove the rocker shaft and pushrods.
- b. Remove the flywheel housing.
- c. Remove the oil pan. (Only necessary if valve lifters will be removed.)

Note: Refer to Specifications, "Engine Design" for non-specified engine torque values.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Find top dead center for number 4 piston. Refer to Testing and Adjusting, "Finding Top Center for No. 4 Piston".

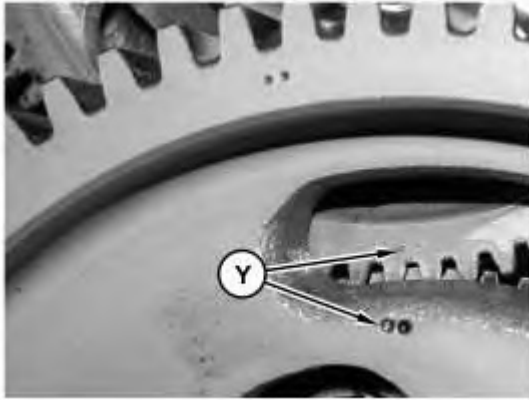


Illustration 1

g02795978

2. Ensure that Timing Marks (Y) on the idler gear and the camshaft gear are aligned. Refer to illustration 1.



Illustration 2

g02798975

3. Use Tooling (A) to hold up the valve lifters (1) in order to remove the camshaft.



Illustration 3

g02796757

NOTICE

Do not damage the lobes or the bearings when the camshaft is removed or installed.

4. Remove bolts (3).
 5. Carefully remove camshaft (2) from the cylinder block.
 6. Remove Tooling (A). Use a suitable container to catch the valve lifters (1) as the valve lifters (1) slide out the bottom of the cylinder block.
-

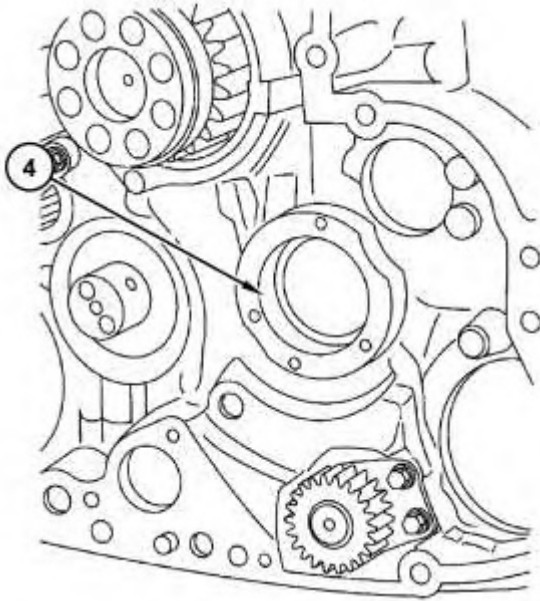


Illustration 4

g02880896

7. Remove camshaft cover (4).

Installation Procedure

1. Install camshaft (2) in the reverse order of removal.
-

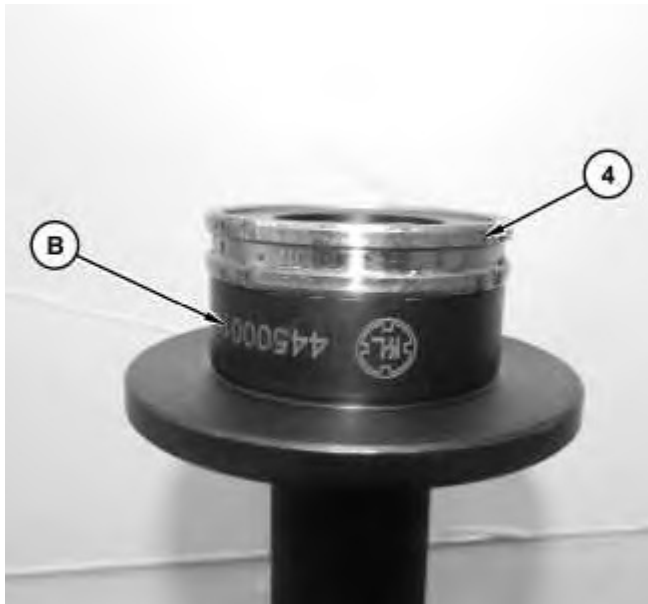


Illustration 5

g02881018

- a. Place camshaft cover (4) on Tooling (B).



Illustration 6

g02881076

- b. Use Tooling (B) to install the camshaft cover (4).
c. Tighten bolts (3) to a torque of 24 to 27 N·m (212 to 239 lb in).
-

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Disassembly and Assembly

C3.3B Tier 4 Final and EU Stage 3B Engines for Caterpillar Built Machines

Media Number -UENR3278-07

Publication Date -01/09/2014

Date Updated -11/07/2016

i05221819

Camshaft Gear - Remove and Install

SMCS - 1210-010-GE

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	1P-0510	Driver Group	1
B	8B-7551	Puller Assembly	1
C	8H-0663	Bearing Puller	1

Start By:

- a. Remove the camshaft.

Note: Refer to Specification UENR3421 "Engine Design" for non-specified engine Torque Values.

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.

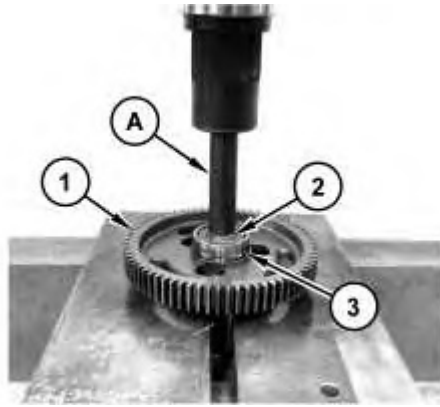


Illustration 1

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1. Use Tooling (A) in order to remove camshaft gear (1) from camshaft (2).
2. If necessary, apply heat to raise the temperature of the race (3) of the roller bearing to remove.

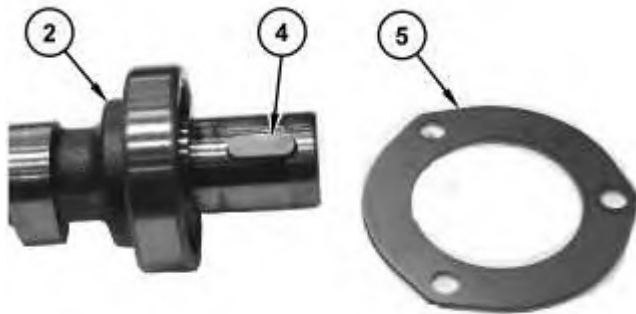


Illustration 2

g02796779

3. Remove plate (5) from camshaft (2).
4. If necessary, remove key (4) from the nose of camshaft (2).

Installation Procedure

1. Install camshaft gear (1) in the reverse order of removal.
-

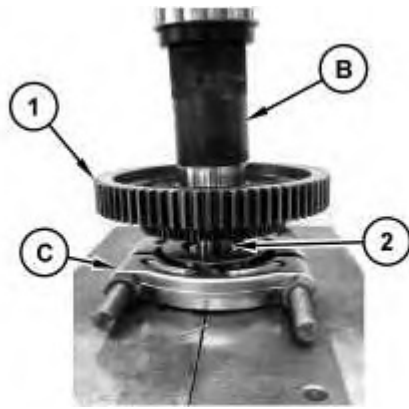


Illustration 3

g02807848

- a. Use Tooling (B) and Tooling (C) in order to install camshaft gear (1) onto camshaft (2).
 - b. Ensure that the camshaft gear and the key are clean and free from wear and damage.
-

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