

Product: VIBRATORY COMPACTOR

Model: CS-64 VIBRATORY COMPACTOR C7F

Configuration: CS64 CP64 Vibratory Compactor C7F00001-UP (MACHINE) POWERED BY C6.6 Engine

## **Disassembly and Assembly C6.6 Engines for Caterpillar Built Machines**

Media Number -KENR6081-15

Publication Date -01/03/2014

Date Updated -04/03/2014

i02786783

# **Front Cover - Remove and Install**

SMCS - 1166-010

## **Removal Procedure**

### **Start By:**

- a. If the engine has a fan, remove the fan. Refer to Disassembly and Assembly, "Fan - Remove and Install".
- b. Remove the water pump. Refer to Disassembly and Assembly, "Water Pump - Remove".

**Note:** In order to remove the front cover, it is not necessary to remove the crankshaft pulley or the alternator.

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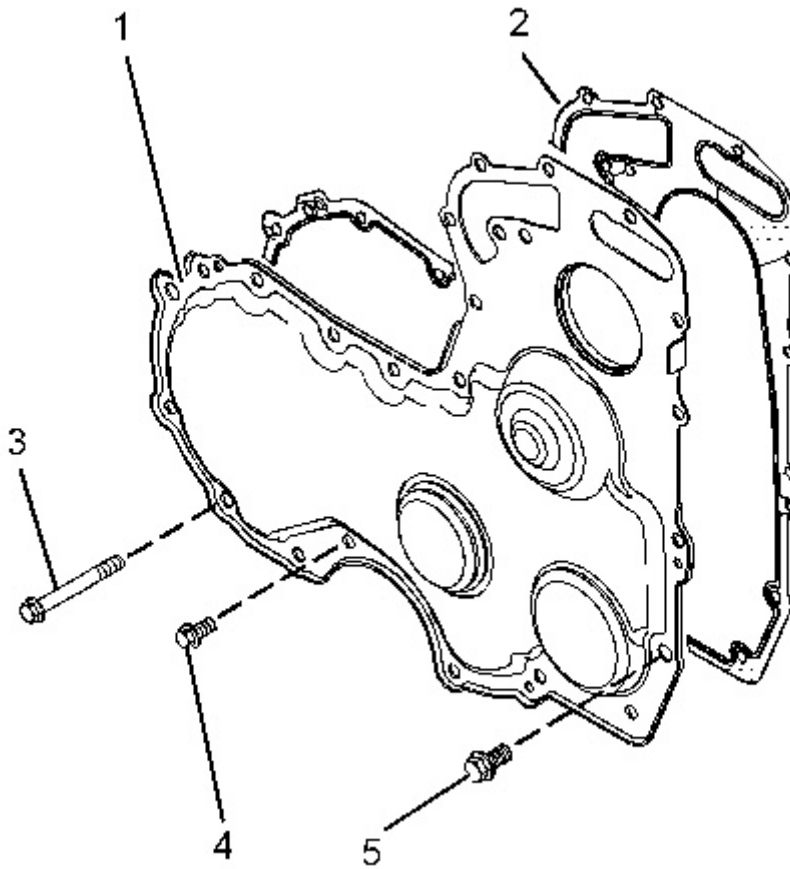


Illustration 1  
Typical example

g01337873

1. Remove bolts (3) and (4). Remove bolt (5). Identify the positions of the different bolts .

**Note:** The bolt (5) may not be installed to some engines.

2. Remove front cover (1) from the front housing.
3. Remove joint (2) from front cover (1).

## Installation Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	-	Guide Stud (M8 by 70 mm)	2

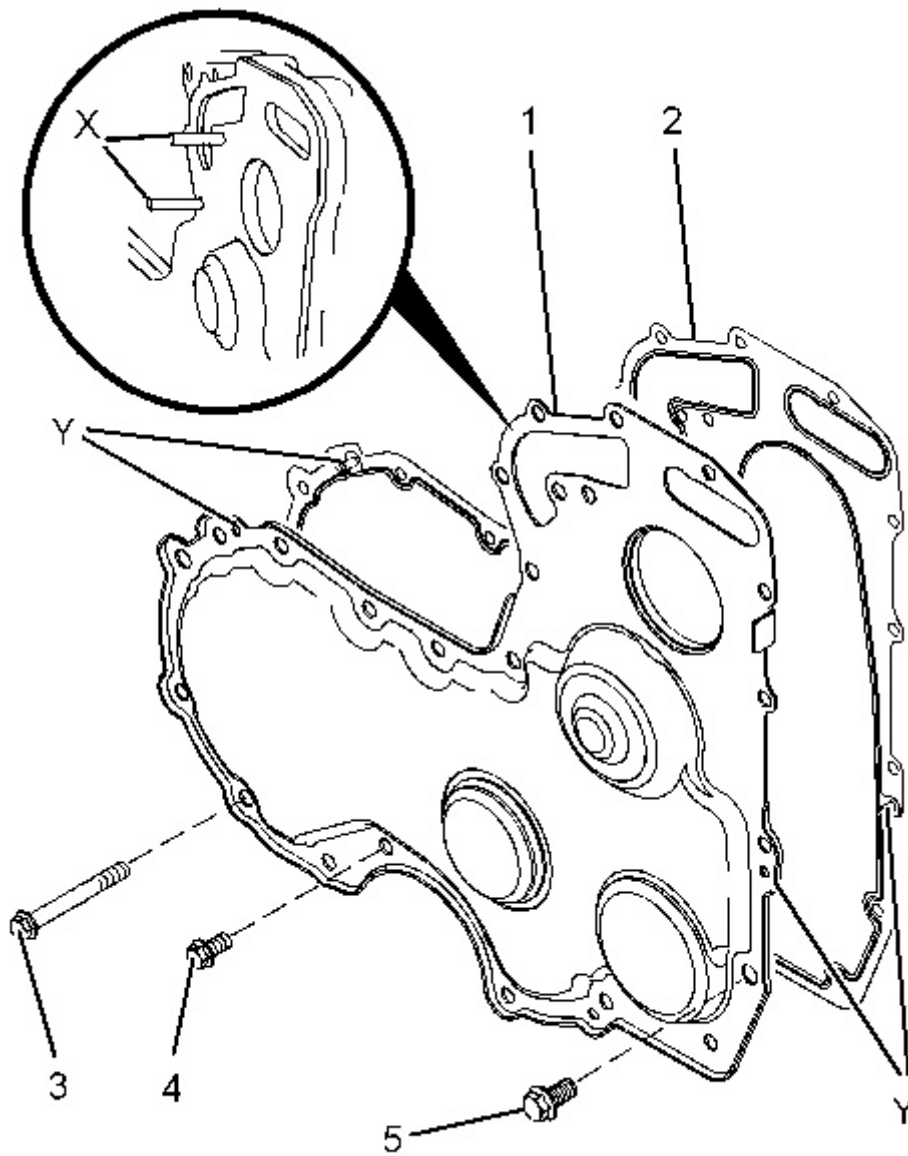


Illustration 2

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Typical example

1. Thoroughly clean the mating surface of the front housing.
2. If the original front cover is installed, follow Steps 2.a through 2.b.
  - a. Thoroughly clean front cover (1).
  - b. Install a new joint (2) to front cover (1). Engage three locators (Y) into the holes in the front cover.
3. Install Tooling (A) into holes (X) in the front housing.
4. Use Tooling (A) in order to position the front cover assembly onto the front housing.
5. Install bolts (3) and (4). Install bolt (5) finger tight. Ensure that the different bolts are installed in the correct positions.

**Note:** The bolt (5) may not be installed to some engines.

6. Loosely install the water pump assembly and remove Tooling (A). Refer to Disassembly and Assembly, "Water Pump - Install" for the correct procedure.
7. Tighten bolts (3), (4) and (5) to a torque of 22 N·m (16 lb ft).
8. Tighten the bolts for the water pump to a torque of 22 N·m (16 lb ft).

**End By:**

- a. If the engine has a fan, install the fan. Refer to Disassembly and Assembly, "Fan - Remove and Install".
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## Disassembly and Assembly C6.6 Engines for Caterpillar Built Machines

Media Number -KENR6081-15

Publication Date -01/03/2014

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i06192499

# Gear Group (Front) - Remove and Install

SMCS - 1206-010

## 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>	9U-7336	Housing	1
	5P-7305	Engine Turning Tool	1
B	230-6284	Timing Pin (Camshaft)	1
C	136-4632	Timing Pin (Crankshaft)	1
	268-1966	Adapter	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 front cover. Refer to Disassembly and Assembly, "Front Cover - Remove and Install".
- B. Remove the valve mechanism cover. Refer to Disassembly and Assembly, "Valve Mechanism Cover - Remove and Install".

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### NOTICE

**Keep all parts clean from contaminants.**

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

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## **NOTICE**

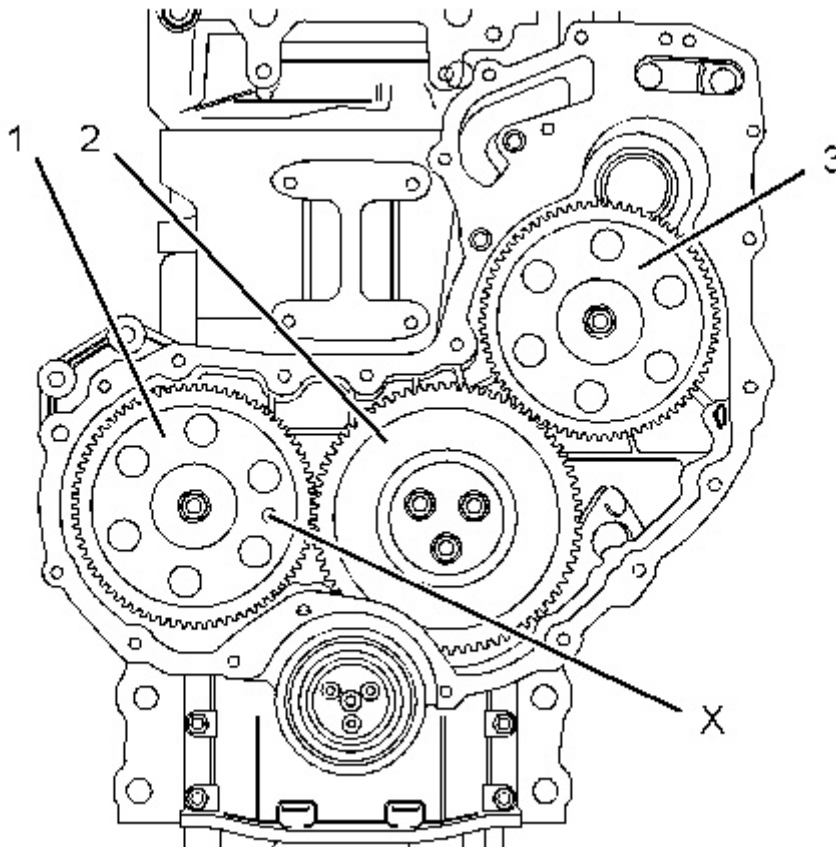
**Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.**

**Dispose of all fluids according to local regulations and mandates.**

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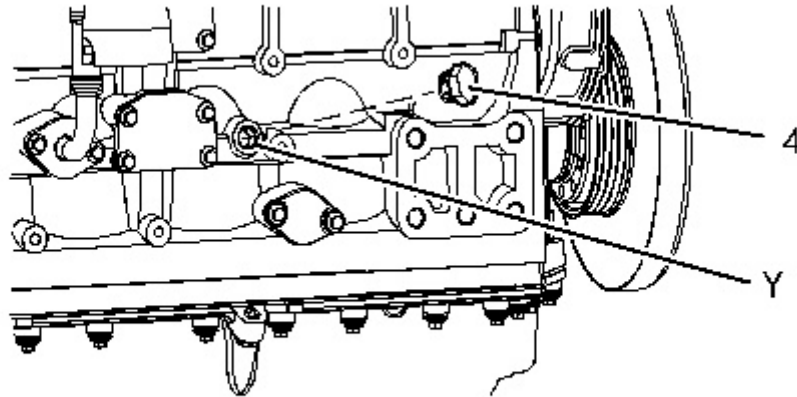
**Note:** Either Tooling (A) can be used. Use the Tooling that is most suitable. Care must be taken in order to ensure that the fuel injection pump timing is not lost during the removal of the front gear group. Carefully follow the procedure in order to remove the gear group.

1. Use Tooling (A) in order to rotate the crankshaft so that number one piston is at top dead center on the compression stroke. Refer to System Operation, Testing and Adjusting, "Finding Top Center Position for No.1 Piston".



Typical example

2. Install Tooling (B) through hole (X) in camshaft gear (1) into the front housing. Use Tooling (B) in order to lock the camshaft in the correct position. Refer to System Operation, Testing and Adjusting, "Finding Top Center Position for No.1 Piston".



3. Remove plug (4) from the cylinder block. Install Tooling (C) into hole (Y) in the cylinder block. Use Tooling (C) in order to lock the crankshaft in the correct position. Refer to System Operation, Testing and Adjusting, "Finding Top Center Position for No.1 Piston".

**Note:** Do not use excessive force to install Tooling (C) . Do not use Tooling (C) to hold the crankshaft during repairs.

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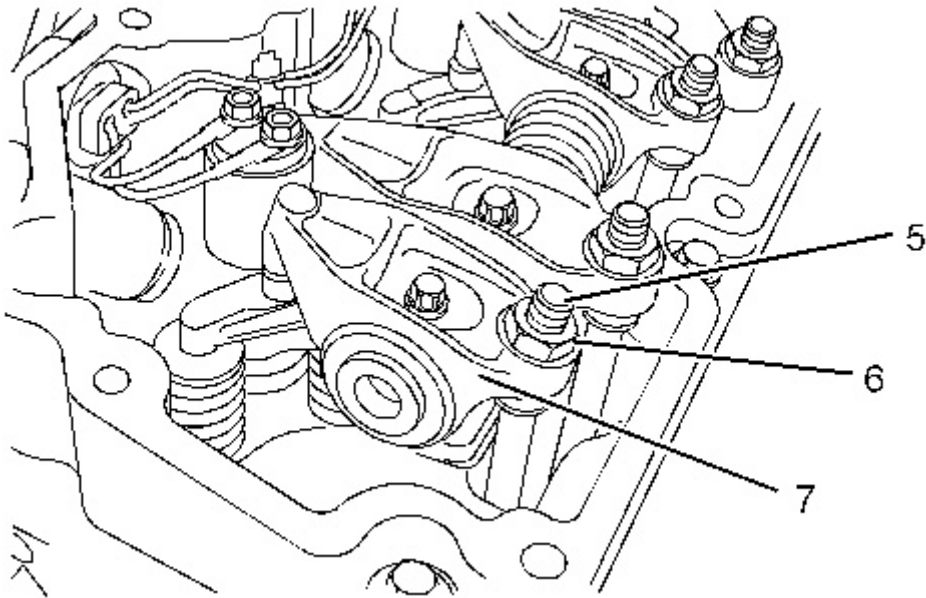


Illustration 3

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4. Loosen nuts (6) on all rocker arms (7) . Unscrew adjusters (5) on all rocker arms (7) until all valves are fully closed.

**Note:** Failure to ensure that ALL adjusters are fully unscrewed can result in contact between the valves and pistons.

5. Apply sufficient pressure to fuel injection pump gear (3) in a counterclockwise direction in order to remove the backlash. Lock the fuel injection pump in this position. Refer to Disassembly and Assembly, "Fuel Pump Gear - Remove" for the correct procedure.

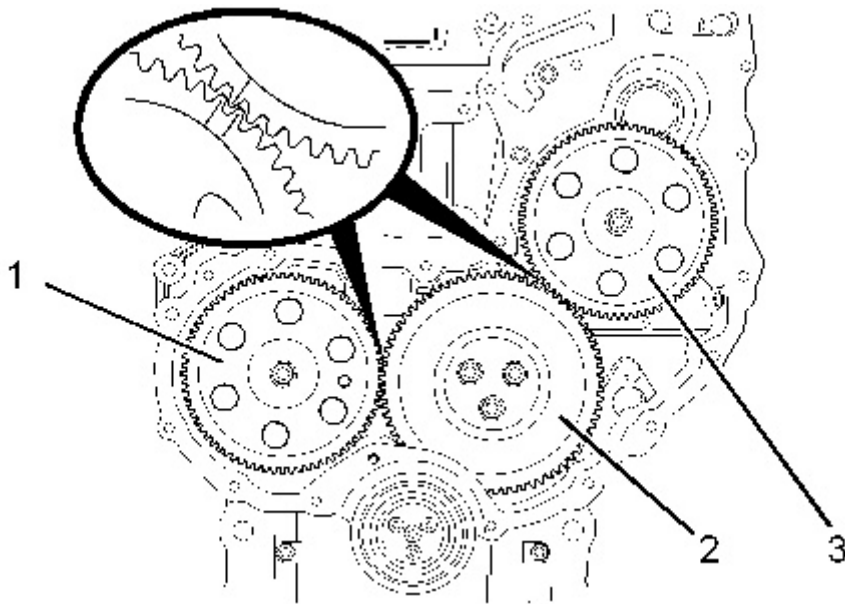


Illustration 4

g01335384

Typical example



6. Mark gears (1) , (2) and (3) in order to show alignment. Refer to Illustration 4.

**Note:** Identification will ensure that the gears can be installed in the original alignment.

7. Remove fuel pump gear (3) . Refer to Disassembly and Assembly, "Fuel Pump Gear - Remove and Install" for the correct procedure.

8. Remove camshaft gear (1) . Refer to Disassembly and Assembly, "Camshaft Gear - Remove and Install".

9. Remove idler gear (2) . Refer to Disassembly and Assembly, "Idler Gear - Remove and Install".

## Installation Procedure

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
B	230-6284	Timing Pin (Camshaft)	1
C	136-4632	Timing Pin (Crankshaft)	1
	268-1966	Adapter	1

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### NOTICE

**Keep all parts clean from contaminants.**

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

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**Note:** The fuel injection pump must remain locked until the procedure instructs you to unlock the fuel injection pump.

1. Ensure that number one piston is at top dead center on the compression stroke. Refer to System Operation, Testing and Adjusting, "Finding Top Center for No. 1 Piston".

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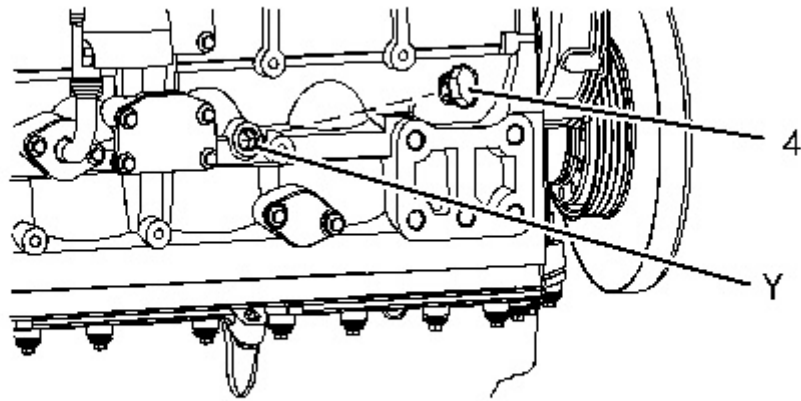


Illustration 5

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2. If necessary, install Tooling (C) into hole (Y) in the cylinder block. Use Tooling (C) in order to lock the crankshaft in the correct position. Refer to System Operation, Testing and Adjusting, "Finding Top Center Position for No.1 Piston".

**Note:** Do not use excessive force to install Tooling (C) . Do not use Tooling (C) to hold the crankshaft during repairs.

3. Ensure that all of the components of the front gear group are clean and free from wear of damage. If necessary, replace any components that are worn or damaged.

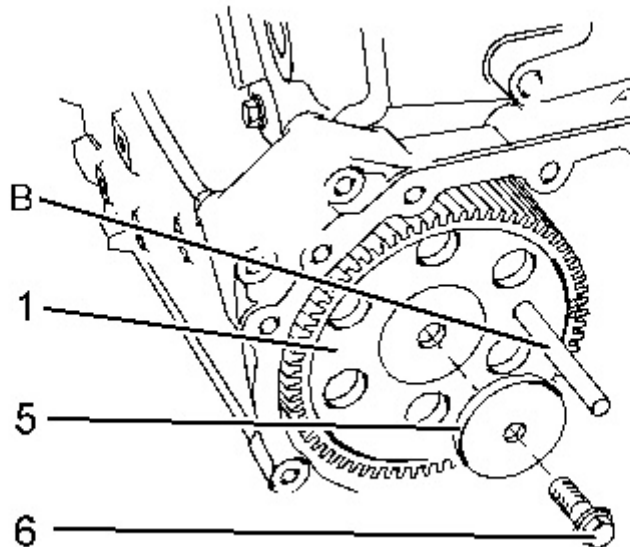
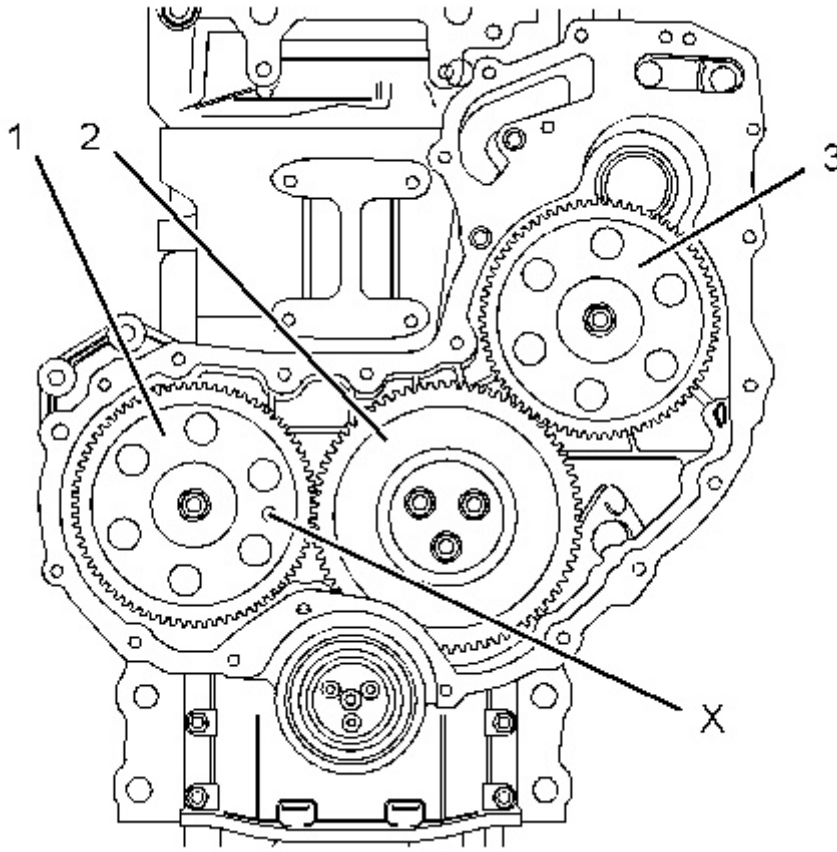


Illustration 6

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4. Install camshaft gear (1) . Loosely install bolt (6) and washer (5) for the camshaft gear. Refer to Disassembly and Assembly, "Camshaft Gear - Remove and Install" for more information.



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Illustration 7

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Typical example

5. Install Tooling (B) through hole (X) in camshaft gear (1) into the front housing.
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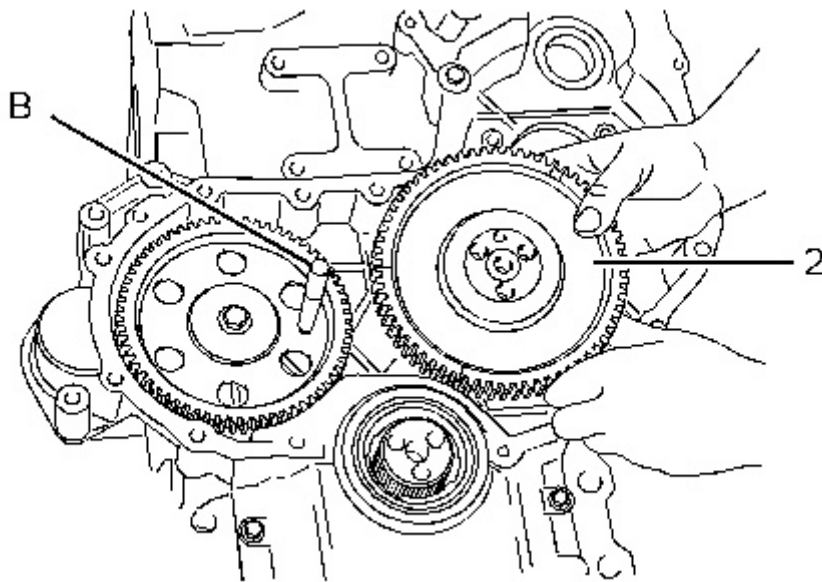


Illustration 8

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Typical example

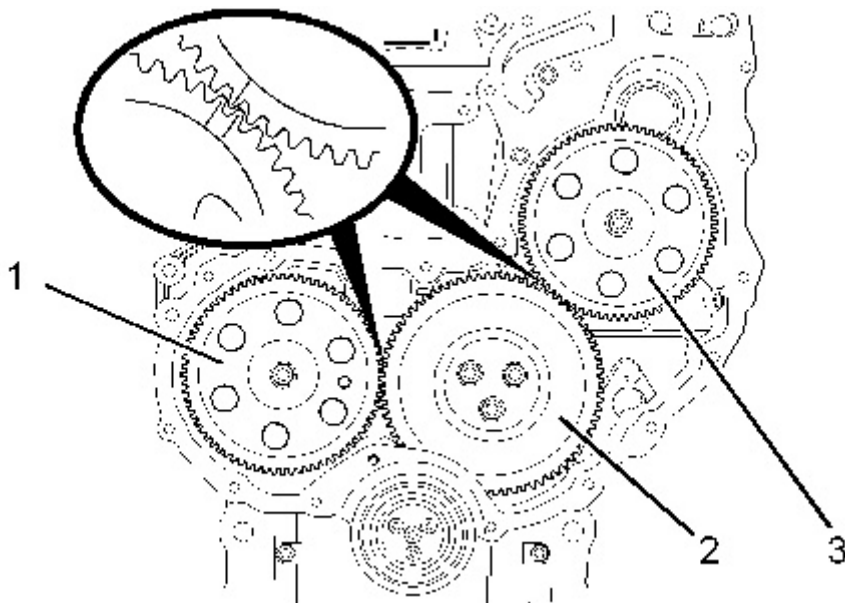


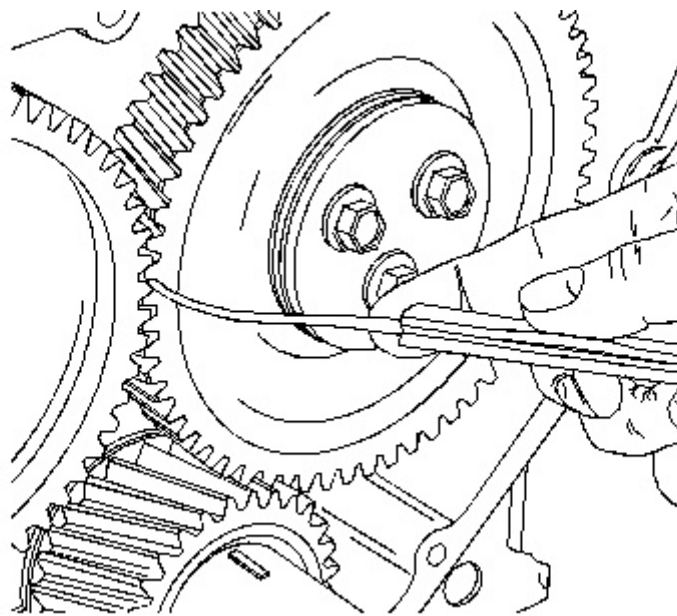
Illustration 9

g01335384

Alignment of timing marks

6. Install idler gear (2) . Ensure that the timing marks on gear (1) and gear (2) are in alignment and that the mesh of the gears is correct. Refer to Disassembly and Assembly, "Idler Gear - Remove and Install". Check the end play of the idler gear. Refer to Specifications, "Gear Group (Front)" and refer to Disassembly and Assembly, "Idler Gear - Remove and Install" for further information.

7. Tighten bolt (6) for the camshaft gear to a torque of 95 N·m (70 lb ft). Check the end play of the camshaft gear. Refer to Specifications, "Camshaft" for more information.
8. Ensure that the fuel injection pump is locked in the correct position. Refer to Disassembly and Assembly, "Fuel Injection Pump - Install".
9. Install fuel injection pump gear (3) . Ensure that the timing marks on gear (2) and gear (3) are in alignment. See Illustration 9. Ensure that the mesh of the gears is correct. Refer to Disassembly and Assembly, "Fuel Injection Pump Gear - Install" for more information.
10. Remove Tooling (B) and (C) . Install plug (4) into hole (Y) in the cylinder block. Refer to Illustration 5.



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Illustration 10

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Checking backlash

11. Ensure that the backlash for gears (1) , (2) and (3) is within specified values. Refer to Specifications, "Gear Group (Front)" for further information.
12. Lubricate each gear with clean engine oil.
13. Adjust the engine valve lash. Refer to System Operation, 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".
  - b. Install the front cover. Refer to Disassembly and Assembly, "Front Cover - Remove and Install".
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## Disassembly and Assembly C6.6 Engines for Caterpillar Built Machines

Media Number -KENR6081-15

Publication Date -01/03/2014

Date Updated -04/03/2014

i05735237

### Idler Gear - Remove

SMCS - 1206-011

### Removal Procedure (Standard Idler Gear)

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	230-6284	Timing Pin (Camshaft)	1
B	136-4632	Timing Pin (Crankshaft)	1
	268-1966	Adapter	1

#### Start By:

- a. Remove the fuel injection pump gear. Refer to Disassembly and Assembly, "Fuel Pump Gear - Remove" for the correct procedure.
- b. Remove the valve mechanism cover. Refer to Disassembly and Assembly, "Valve Mechanism Cover - Remove and Install" for the correct procedure.

**Note:** Care must be taken in order to ensure that the fuel injection pump timing is not lost during the removal of the fuel pump gear. Carefully follow the procedure in order to remove the fuel pump gear.

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#### NOTICE

**Keep all parts clean from contaminants.**

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

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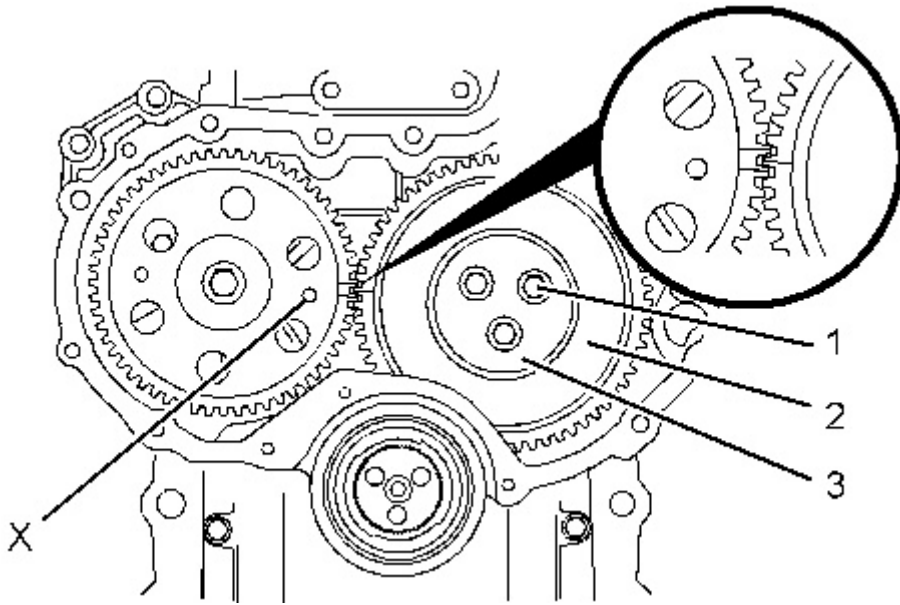


Illustration 1

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Alignment of timing marks

1. Ensure that Tooling (A) is installed into Hole (X) in the camshaft gear. Use Tooling (A) in order to lock the camshaft in the correct position.

**Note:** Ensure that the gears are marked in order to show alignment. Refer to Illustration 1.

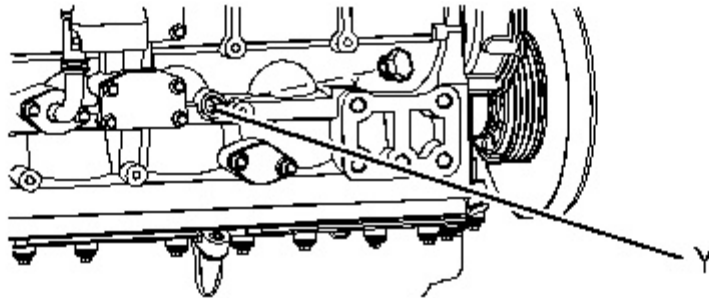


Illustration 2

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2. Ensure that Tooling (B) is installed in Hole (Y) in the cylinder block. Use Tooling (B) in order to lock the crankshaft in the correct position.
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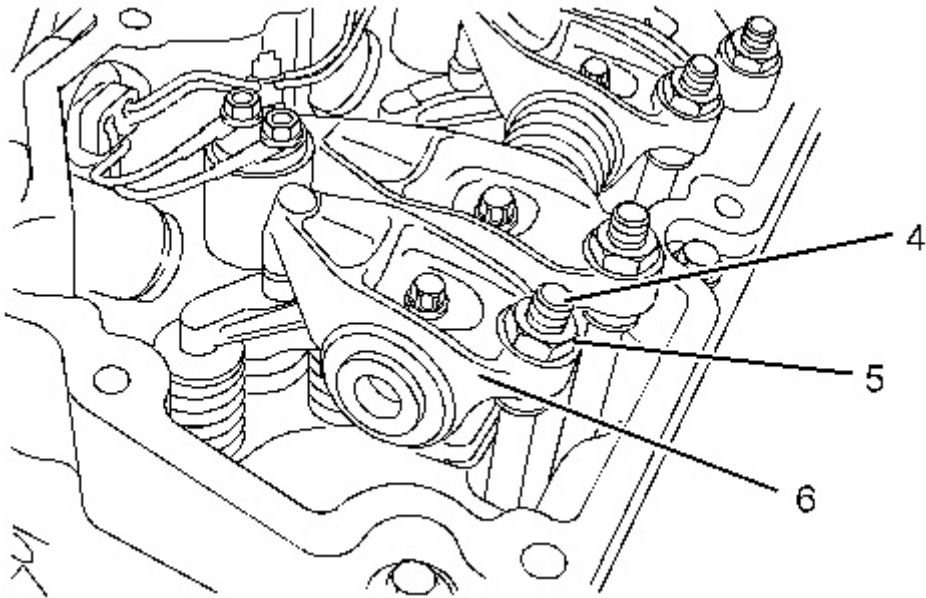


Illustration 3

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3. Loosen nuts (5) on all rocker arms (6). Unscrew adjusters (4) on all rocker arms (6) until all valves are fully closed.

**Note:** Failure to ensure that ALL adjusters are fully unscrewed can result in contact between the valves and pistons.

4. Mark plate (3) in order to show orientation.

**Note:** Identification will ensure that the plate can be installed in the original orientation.

5. Remove bolts (1).

6. Remove plate (3).

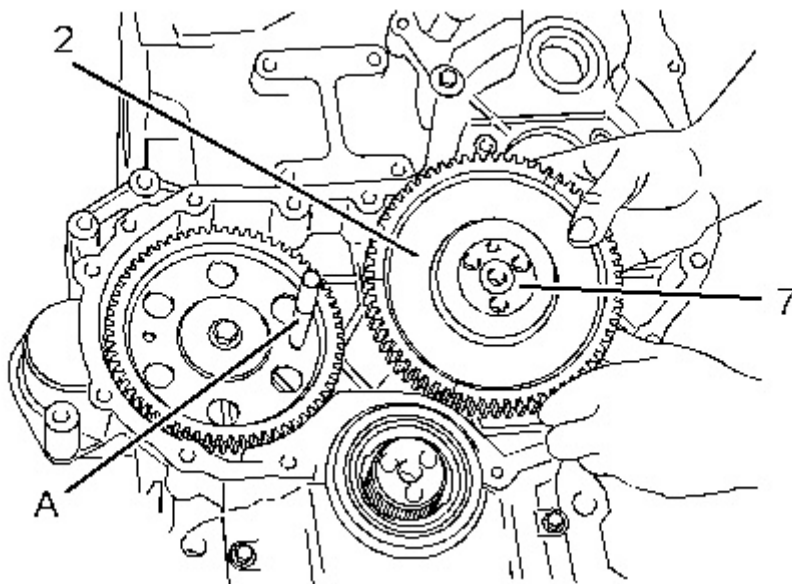


Illustration 4

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7. Remove the assembly of idler gear (2) and hub (7) from the recess in the front housing.

**Note:** The idler gear must be tilted during removal.

8. Remove hub (7) from idler gear (2).

## Removal Procedure (Early Heavy-Duty Idler Gear)

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
A	230-6284	Timing Pin (Camshaft)	1
B	136-4632	Timing Pin (Crankshaft)	1
	268-1966	Adapter	1

### Start By:

- a. Remove the fuel injection pump gear. Refer to Disassembly and Assembly, "Fuel Pump Gear - Remove" for the correct procedure.
- b. Remove the valve mechanism cover. Refer to Disassembly and Assembly, "Valve Mechanism Cover - Remove and Install" for the correct procedure.

**Note:** Care must be taken in order to ensure that the fuel injection pump timing is not lost during the removal of the fuel pump gear. Carefully follow the procedure in order to remove the fuel pump gear.

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### NOTICE

**Keep all parts clean from contaminants.**

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

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**Note:** The assembly of heavy-duty idler gear is not serviceable. Do not disassemble the heavy-duty idler gear.

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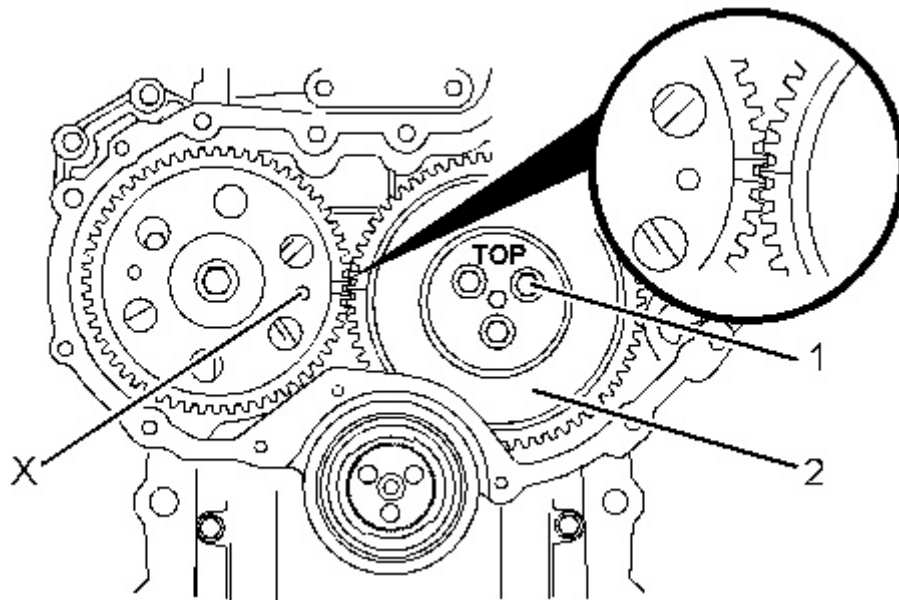


Illustration 5

g01337924

Alignment of timing marks

1. Ensure that Tooling (A) is installed into hole (X) in the camshaft gear. Use Tooling (A) in order to lock the camshaft in the correct position.

**Note:** Ensure that the gears are marked in order to show alignment. Refer to Illustration 5.

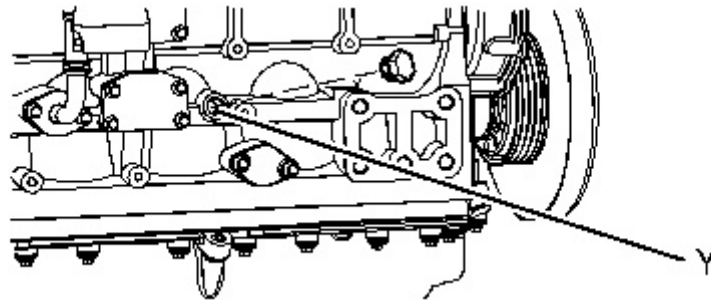


Illustration 6

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2. Ensure that Tooling (B) is installed in hole (Y) in the cylinder block. Use Tooling (B) in order to lock the crankshaft in the correct position.

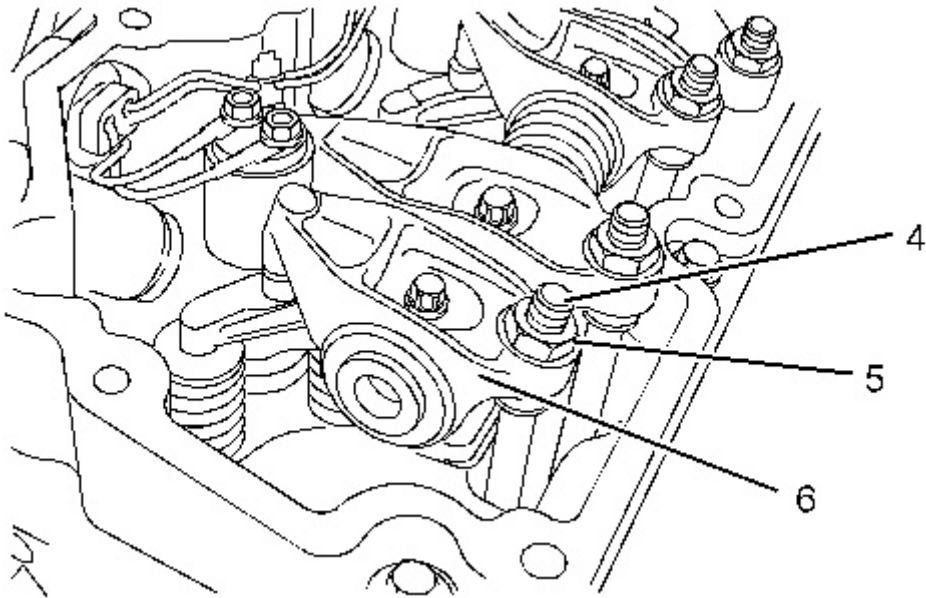


Illustration 7

g01337921

3. Loosen nuts (4) on all rocker arms (5). Unscrew adjusters (3) on all rocker arms (5) until all valves are fully closed.

**Note:** Failure to ensure that ALL adjusters are fully unscrewed can result in contact between the valves and pistons.

4. Remove bolts (1) from the assembly of heavy-duty idler gear (2).

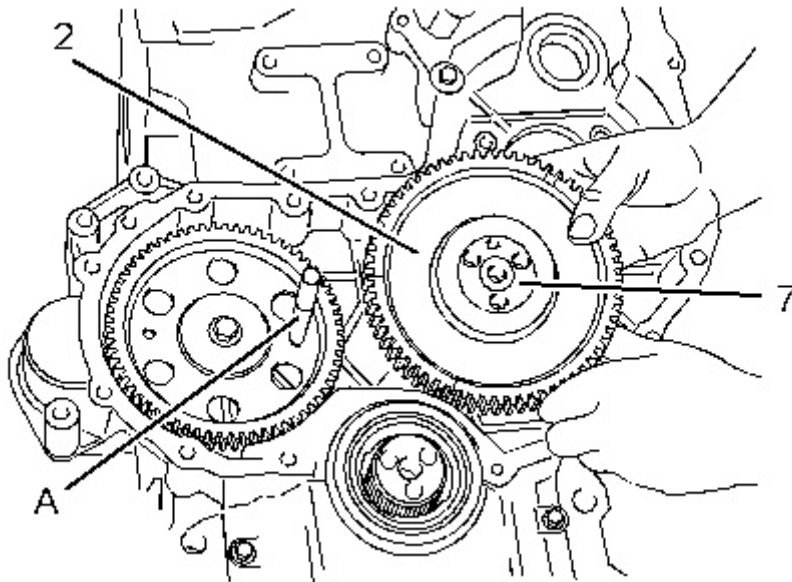


Illustration 8

g01337922

5. Remove the assembly of idler gear (2) from the recess in the front housing.

**Note:** The idler gear must be tilted during removal.

# Removal Procedure (Latest Heavy-Duty Idler Gear)

Table 3

Required Tools			
Tool	Part Number	Part Description	Qty
A	230-6284	Timing Pin (Camshaft)	1
B	136-4632	Timing Pin (Crankshaft)	1
	268-1966	Adapter	1
C	-	Bolt (M8 x 80mm)	1

## Start By:

- a. If the engine is equipped with an air compressor, remove the air compressor. Refer to Disassembly and Assembly, "Air Compressor - Remove and Install" for the correct procedure.
- b. If the engine is equipped with an accessory drive, remove the accessory drive. Refer to Disassembly and Assembly, "Accessory Drive - Remove and Install" for the correct procedure.
- c. Remove the fuel injection pump gear. Refer to Disassembly and Assembly, "Fuel Pump Gear - Remove" for the correct procedure.
- d. Remove the valve mechanism cover. Refer to Disassembly and Assembly, "Valve Mechanism Cover - Remove and Install" for the correct procedure.

**Note:** Care must be taken in order to ensure that the fuel injection pump timing is not lost during the removal of the fuel pump gear. Carefully follow the procedure in order to remove the fuel pump gear.

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## NOTICE

**Keep all parts clean from contaminants.**

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

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**Note:** The assembly of heavy-duty idler gear is not serviceable. Do not disassemble the heavy-duty idler gear.

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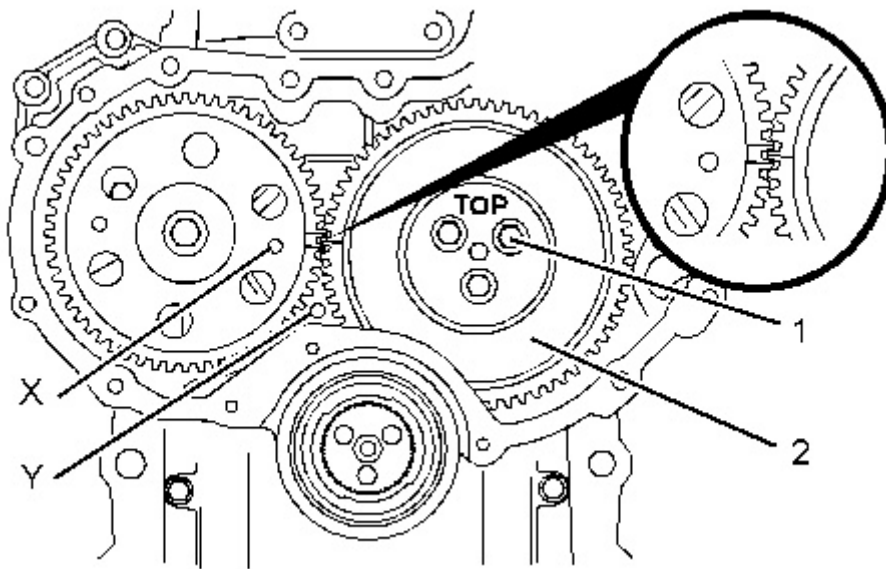


Illustration 9

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Alignment of timing marks

1. Ensure that Tooling (A) is installed into Hole (X) in the camshaft gear. Use Tooling (A) in order to lock the camshaft in the correct position.

**Note:** Ensure that the gears are marked in order to show alignment. Refer to Illustration 9.

2. Ensure that Tooling (B) is installed in Hole (Y) in the front housing. Use Tooling (B) in order to lock the crankshaft in the correct position.

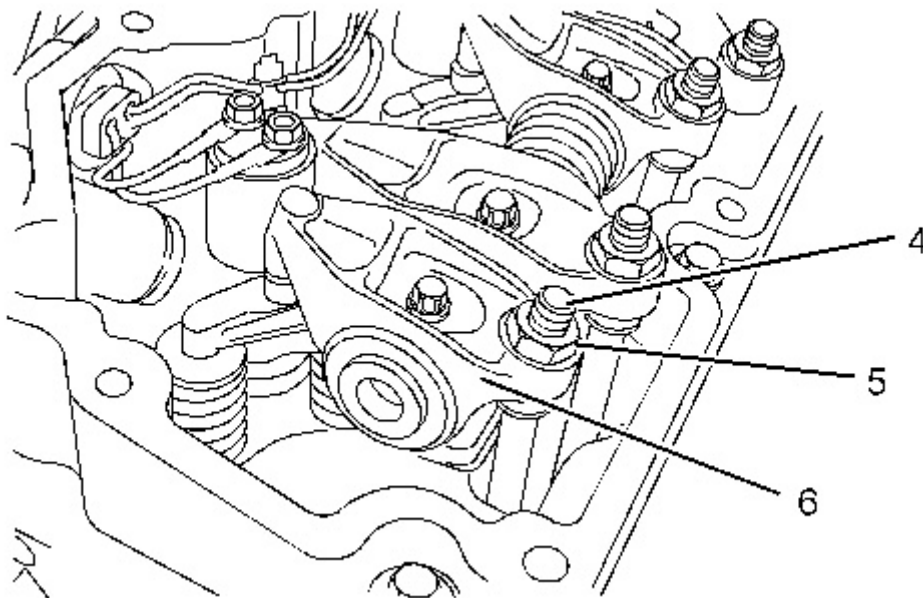


Illustration 10

g01337921

Typical example

3. Loosen nuts (5) on all rocker arms (6). Unscrew adjusters (4) on all rocker arms (5) until all valves are fully closed.

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