

Product: TRACK-TYPE TRACTOR

Model: D3K2 LGP TRACK-TYPE TRACTOR JPJ

Configuration: D3K2 XL & D3K2 LGP Small Track Type Tractor JPJ00001-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

i05820284

Crankshaft Front Seal - Remove and Install

SMCS - 1160-010

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	367-3534	Oil Seal Removal & installer Tool	1

Start By:

- Remove the crankshaft pulley. Refer to Disassembly and Assembly, "Crankshaft Front Pulley- Remove and Install" for the correct procedure.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

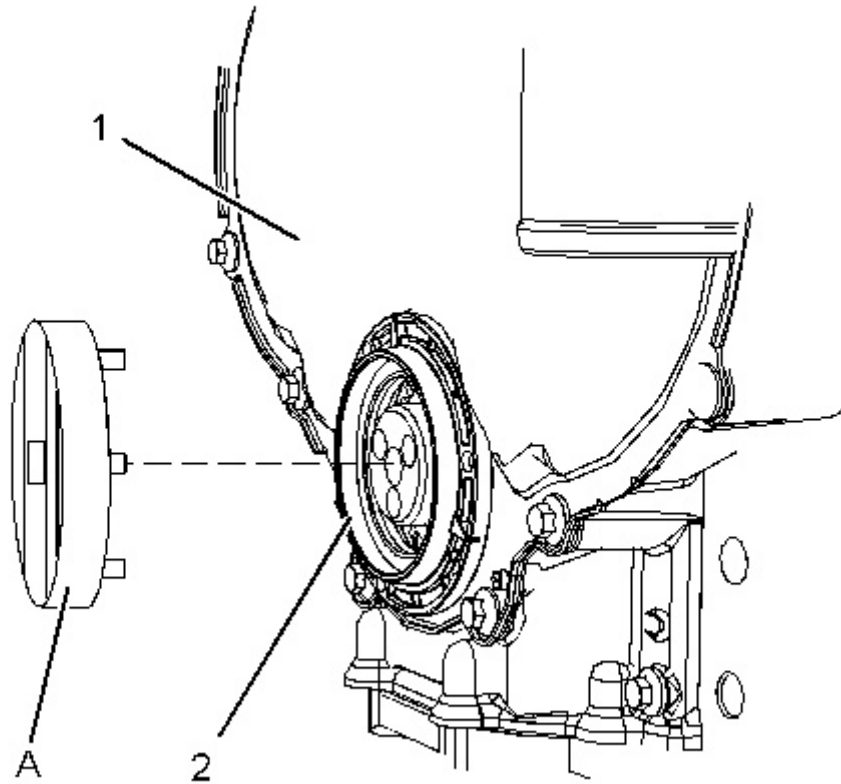


Illustration 1

g02445196

1. Align Tooling (A) onto crankshaft front seal (2).
2. Turn Tooling (A) in a counterclockwise direction and remove crankshaft front seal (2) from front cover (1).

Installation Procedure

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
A	367-3534	Oil Seal Removal & installer Tool	1
B	-	Loctite 5900	1

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Ensure that the front cover is clean and free from damage.

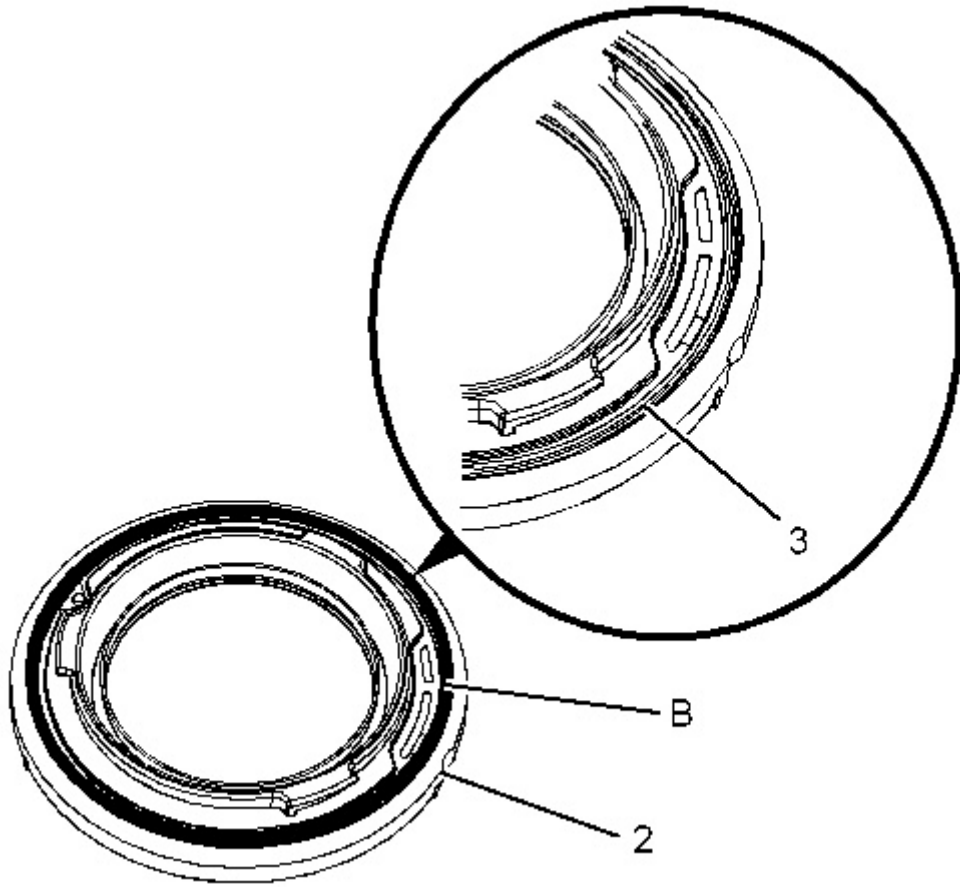


Illustration 2

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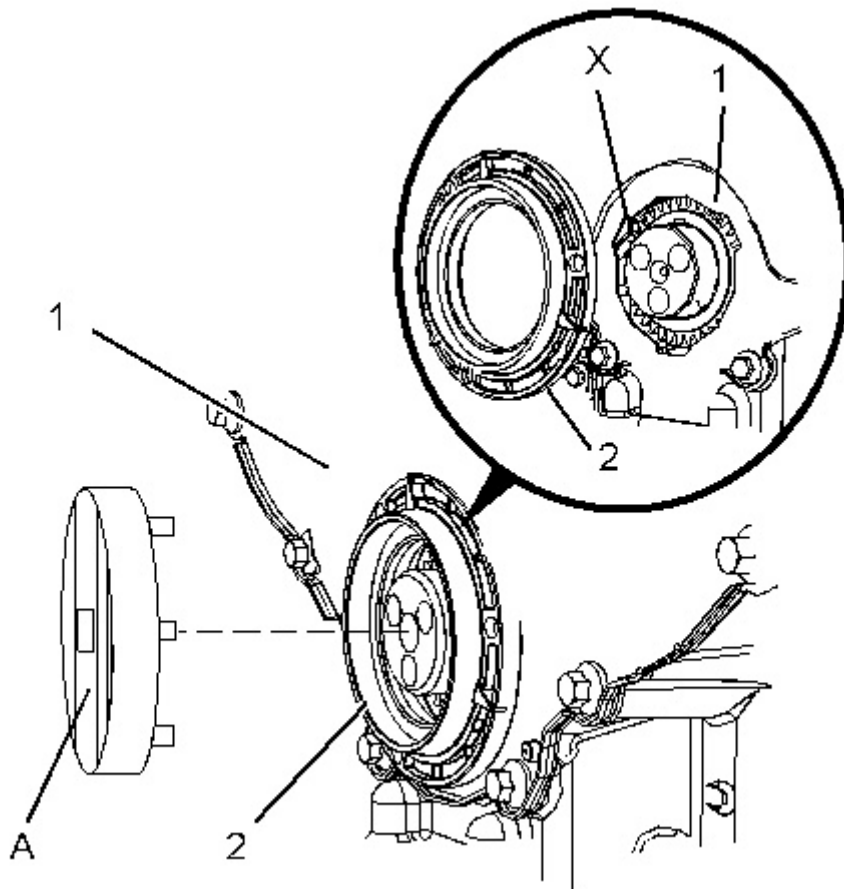


Illustration 3

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2. Apply a continuous bead of Tooling (B), approximately 3 mm (0.118 inch) in diameter, to the top of the static seal beads (3).
3. Correctly position a new crankshaft front seal (2) in Position (X) onto front cover (1).
4. Position Tooling (A) onto crankshaft front seal (2).
5. Use Tooling (A) in order to turn crankshaft front seal (2) in clockwise direction.
6. If it is necessary, to apply a torque greater than 50 N·m (37 lb ft) in order to install crankshaft front seal (2). Remove crankshaft front seal (2). Inspect the crankshaft front seal and the front cover for faults or damage.
7. If necessary repeat Step 2 through Step 6 in order to install crankshaft front seal (2).

End By:

- a. Install the crankshaft pulley. Refer to Disassembly and Assembly, "Crankshaft Front Pulley-Remove and Install" for the correct procedure.

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i05820285

Crankshaft Front Seal - Remove and Install - Crankshaft Front Seal for Heavy Duty Front Cover

SMCS - 1160-010

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	1P-2320	Combination Puller	1

Start By:

- Remove the crankshaft pulley. Refer to Disassembly and Assembly, "Crankshaft Front Pulley- Remove and Install" for the correct procedure.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

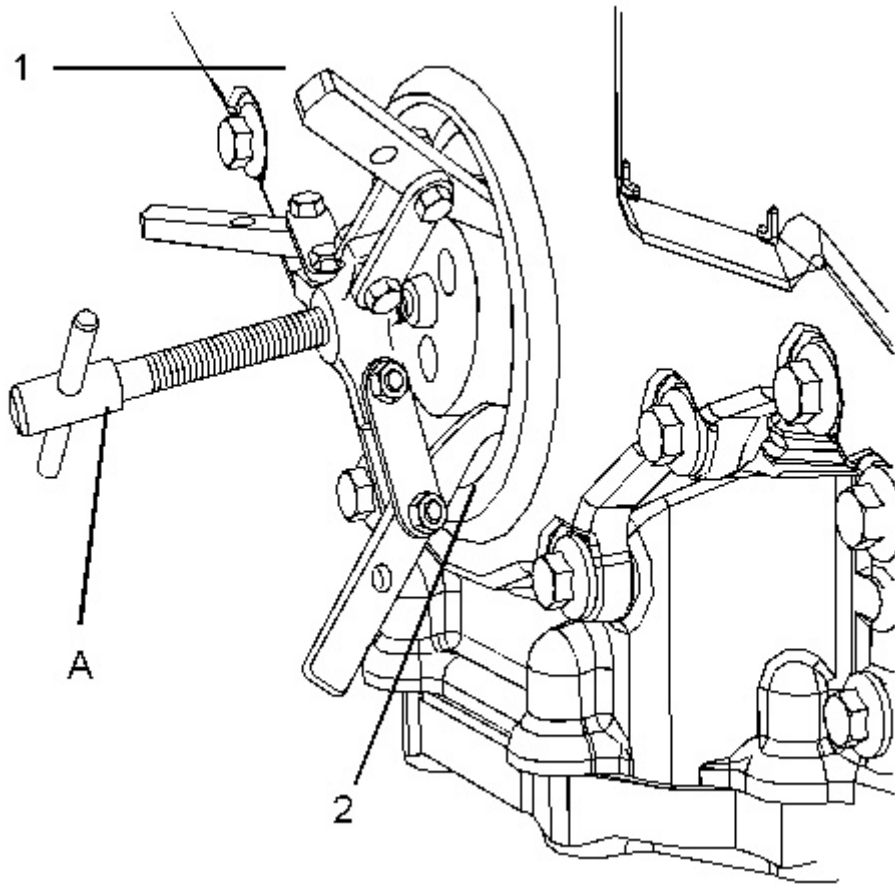


Illustration 1

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1. Install the legs of Tooling (A) behind crankshaft front seal (2). Install a suitable spacer between Tooling (A) and the crankshaft.
2. Use Tooling (A) in order to pull crankshaft front seal (2) out of front cover (1).

Note: Do not damage the edge of the front cover for the crankshaft front seal.

Installation Procedure

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
B	9U-6206	Front Seal Installer	1
	9U-6207	Plate	1
	9U-6208	Anchor Plate	1
	276-1209	Seal Installer Tool	1
	9U-6209	Sleeve	1

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Ensure that the bore for the crankshaft front oil seal in the front cover is clean and free from damage.
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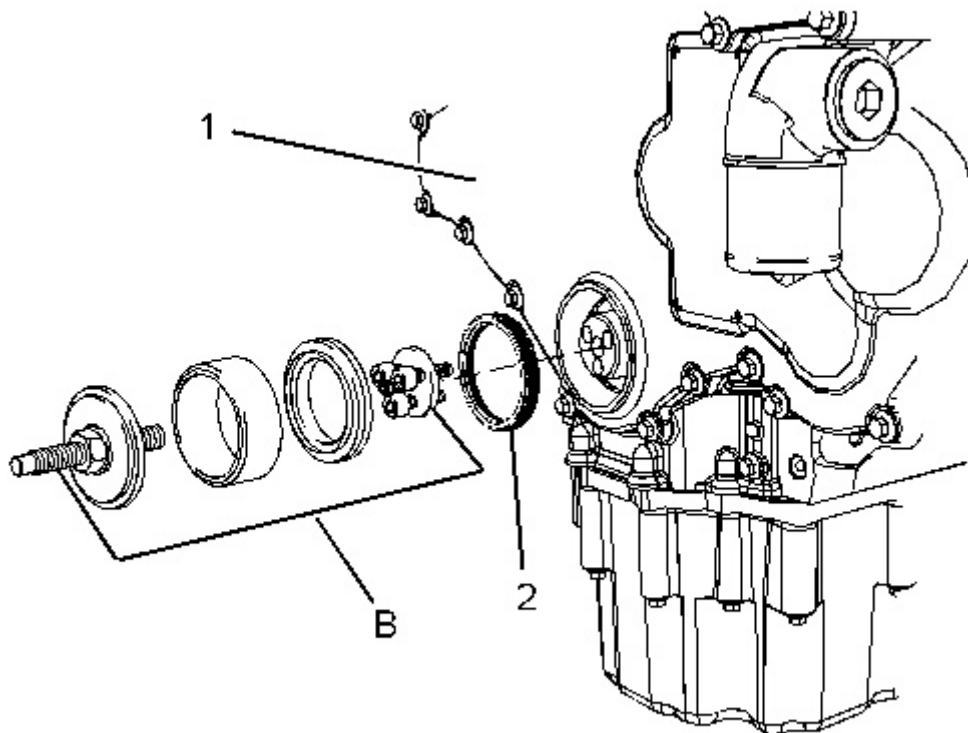


Illustration 2

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2. Assemble Tooling (B).
3. Correctly position a new crankshaft front seal (2) to front cover (1).

Note: If the crankshaft front seal is supplied with a sleeve, remove the sleeve from the crankshaft front seal before installation.

4. Use Tooling (B) to install crankshaft front seal (2) to front cover (1). Ensure that the front face of the crankshaft front seal is installed to a depth of 6.5 ± 0.2 mm (0.256 ± 0.008 inch).
5. Remove Tooling (B) from the crankshaft.

End By:

- a. Install the crankshaft pulley. Refer to Disassembly and Assembly, "Crankshaft Front Pulley-Remove and Install" for the correct procedure.
-

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Disassembly and Assembly

C4.4 Engines for Caterpillar Built Machines

Media Number -UENR4516-11

Publication Date -01/06/2015

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i05820286

Front Cover - Remove and Install

SMCS - 1166-010

Removal Procedure

Start By:

- a. Remove the crankshaft pulley. Refer to Disassembly and Assembly, "Crankshaft Pulley - Remove and Install" for the correct procedure.
 - b. If the engine has a fan, remove the fan. Refer to Disassembly and Assembly, "Fan - Remove and Install" for the correct procedure.
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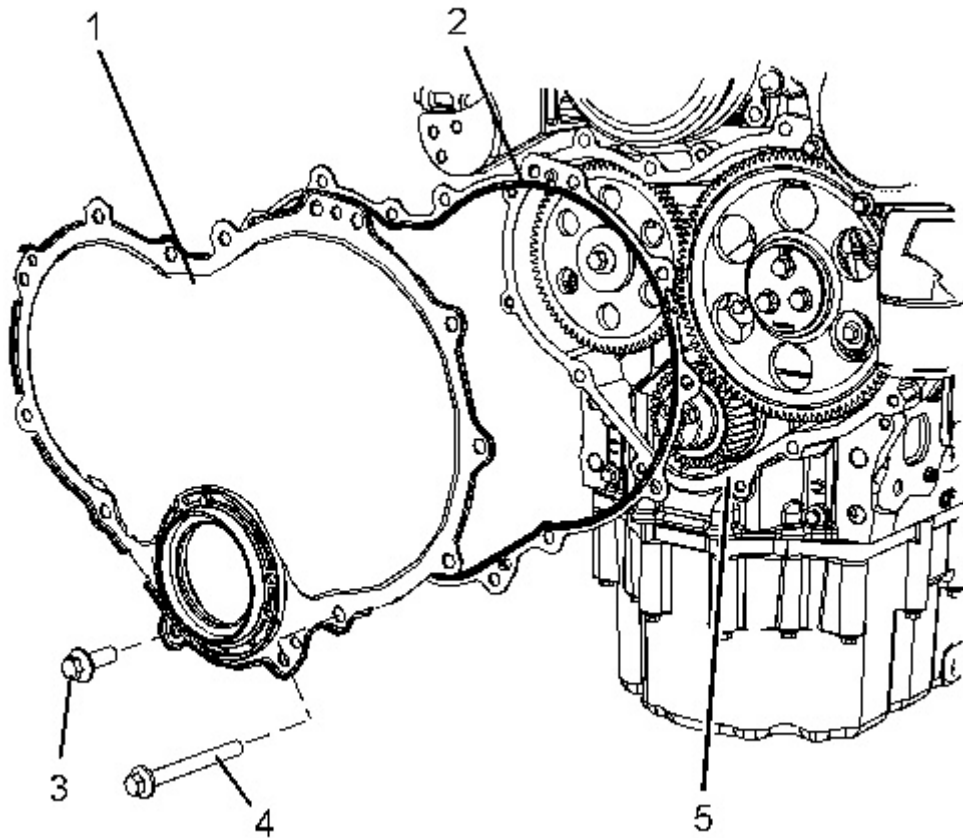


Illustration 1

g02481028

1. Remove the front seal from the front cover. Refer to Disassembly and Assembly, "Crankshaft Front Seal - Remove and Install" for the correct procedure.
2. Remove bolts (3) and bolts (4). Identify the positions of bolts of different length.
3. Remove front cover (1) from front housing (5).
4. Remove gasket (2).

Installation Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	-	Guide Studs M8 by 70 mm	2
B	342-9206	Front Cover Alignment Tool	1

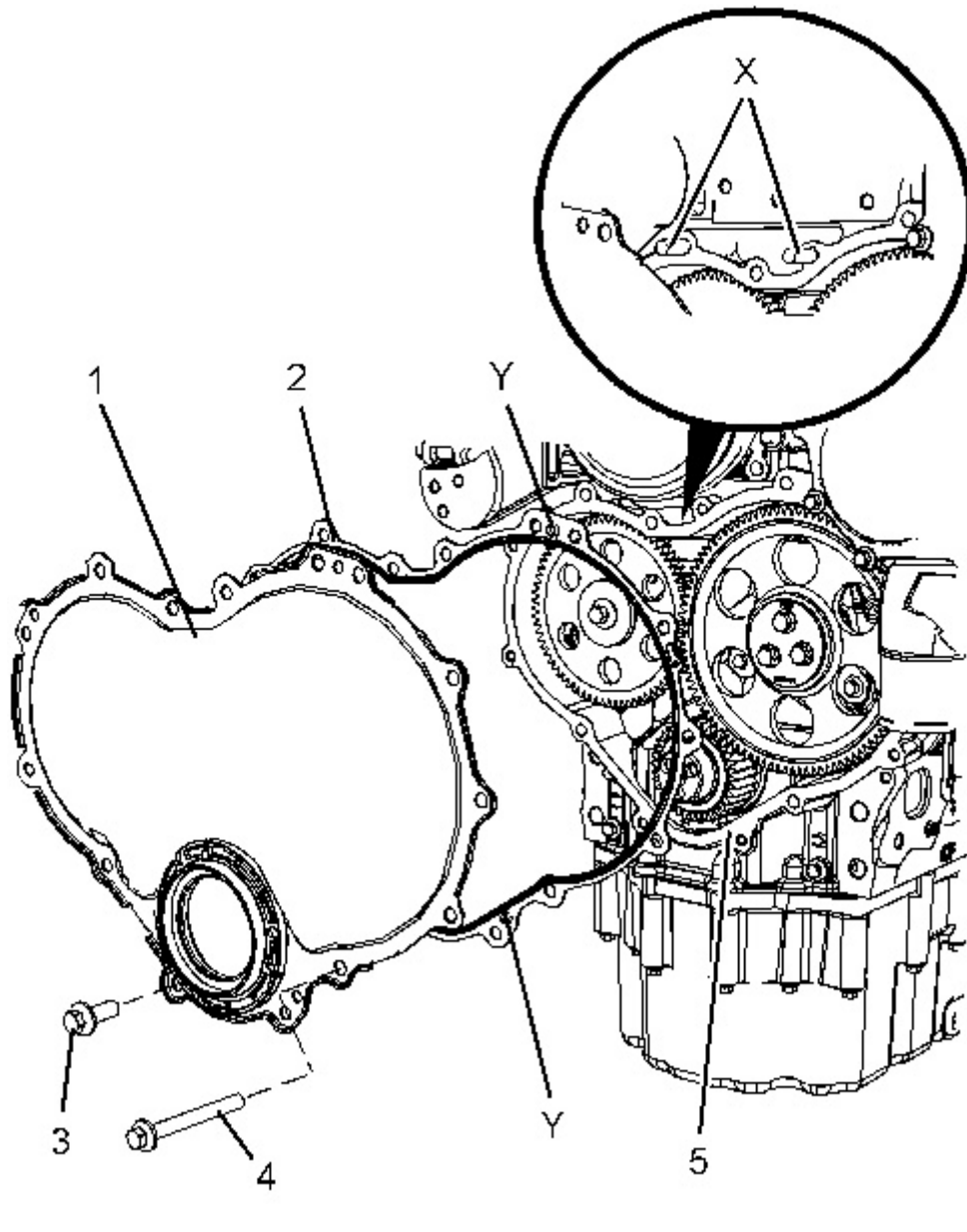


Illustration 2

g02481030

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

6. Install a new front seal to the front cover. Refer to Disassembly and Assembly, "Crankshaft Front Seal - Remove and Install" for the correct procedure.
7. Use Tooling (B) in order to align the front cover.
8. Remove Tooling (A) and install the remaining bolts.
9. Tighten bolts (3) and bolts (4) to a torque of 22 N·m (195 lb in).
10. Remove Tooling (B) from the front cover.

End By:

- a. Install the crankshaft pulley. Refer to Disassembly and Assembly, "Crankshaft Pulley - Remove and Install" for the correct procedure.
 - b. If the engine has a fan, install the fan. Refer to Disassembly and Assembly, "Fan - Remove and Install" for the correct procedure.
-

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Disassembly and Assembly

C4.4 Engines for Caterpillar Built Machines

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Publication Date -01/06/2015

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i05820287

Front Cover - Remove and Install - Heavy Duty Front Cover

SMCS - 1166-010

Removal Procedure

Start By:

- a. Remove the crankshaft pulley. Refer to Disassembly and Assembly, "Crankshaft Pulley - Remove and Install" for the correct procedure.
 - b. If the engine has a fan, remove the fan. Refer to Disassembly and Assembly, "Fan - Remove and Install" for the correct procedure.
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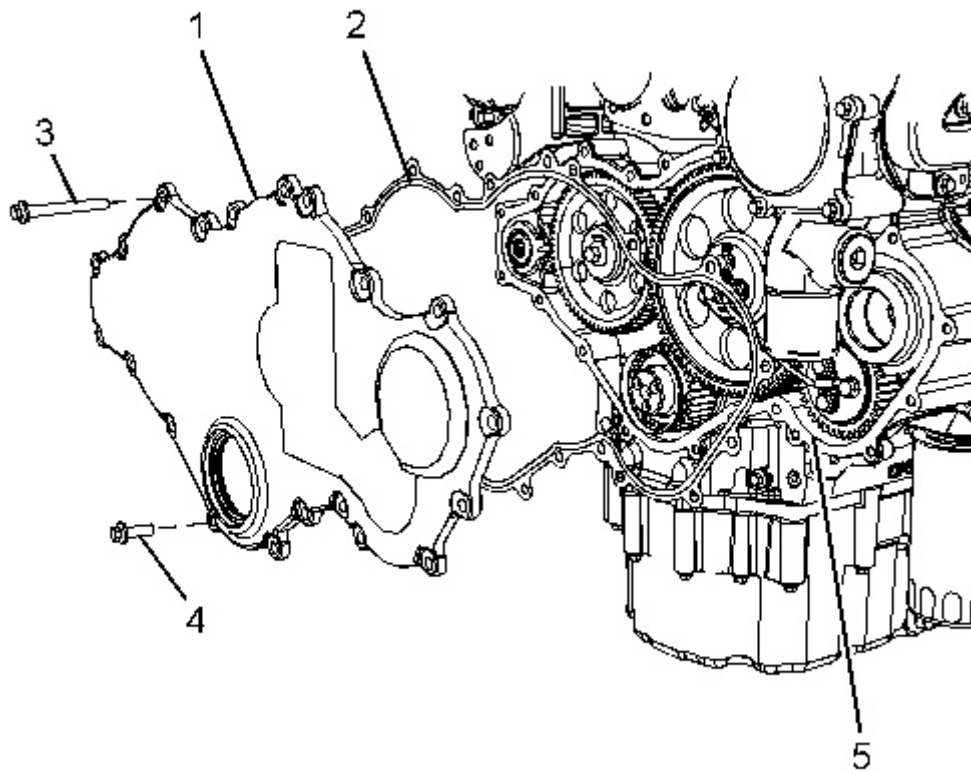


Illustration 1

g02480997

1. Remove the front seal from the front cover. Refer to Disassembly and Assembly, "Crankshaft Front Seal - Remove and Install" for the correct procedure.
2. Remove bolts (3) and bolts (4). Identify the positions of bolts of different length.
3. Remove front cover (1) from front housing (5).
4. Remove gasket (2).

Installation Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	-	Guide Studs M8 by 70 mm	2
B	364-7209	Front Cover Alignment Tool	1

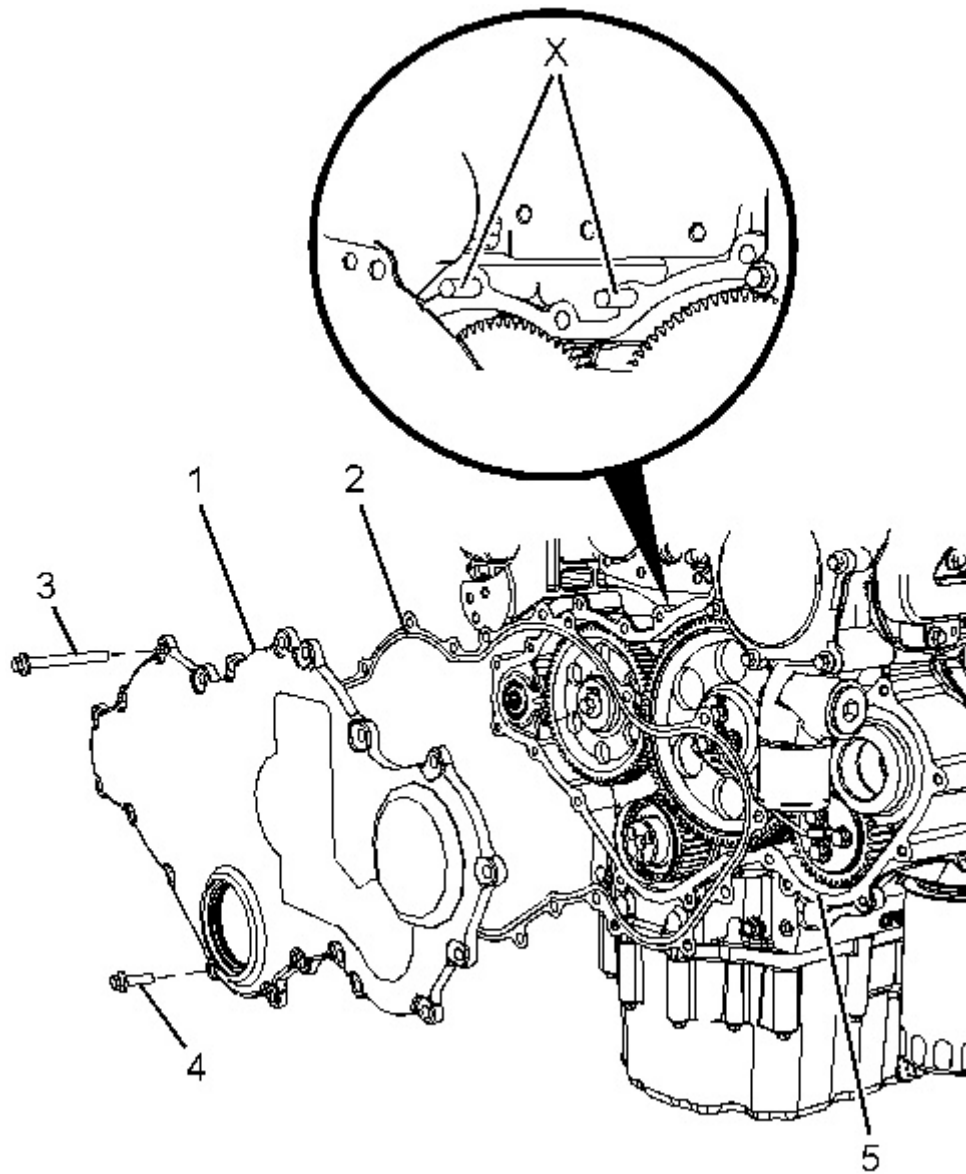


Illustration 2

g02480998

1. Ensure that all components are clean and free from damage. Replace any damaged components.
2. Thoroughly clean the gasket surface of front housing (5).
3. Thoroughly clean front cover (1).
4. Install Tooling (A) into Holes (X) in front housing (5).
5. Install a new gasket (2) onto Tooling (A).
6. Install front cover (1) onto Tooling (A).
7. Install bolts (3) and bolts (4) finger tight. Ensure that the bolts of different length are installed in the correct positions.
8. Use Tooling (B) to align the front cover assembly.

9. Remove Tooling (A) and install the remaining bolts.
10. Tighten bolts (3) and bolts (4) to a torque of 22 N·m (195 lb in).
11. Remove Tooling (B).
12. Install a new front seal to the front cover. Refer to Disassembly and Assembly, "Crankshaft Front Seal - Remove and Install" for the correct procedure.

End By:

- a. Install the crankshaft pulley. Refer to Disassembly and Assembly, "Crankshaft Pulley - Remove and Install" for the correct procedure.
 - b. If the engine has a fan, install the fan. Refer to Disassembly and Assembly, "Fan - Remove and Install" for the correct procedure.
-

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i05820288

Gear Group (Front) - Remove and Install

SMCS - 1206-010

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	9U-7336	Housing	1
	5P-7305	Engine Turning Tool	1
B	230-6284	Timing Pin (Camshaft)	1
C	364-9107	Timing Pin (Fuel Injection Pump)	1
D	136-4632	Timing Pin (Crankshaft)	1
	268-1966	Adapter	1
E	298-5564	T40 Torx Socket	1

Start By:

- a. Remove the front cover. Refer to Disassembly and Assembly, "Front Cover - Remove and Install" 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.

NOTICE

Keep all parts clean from contaminants.

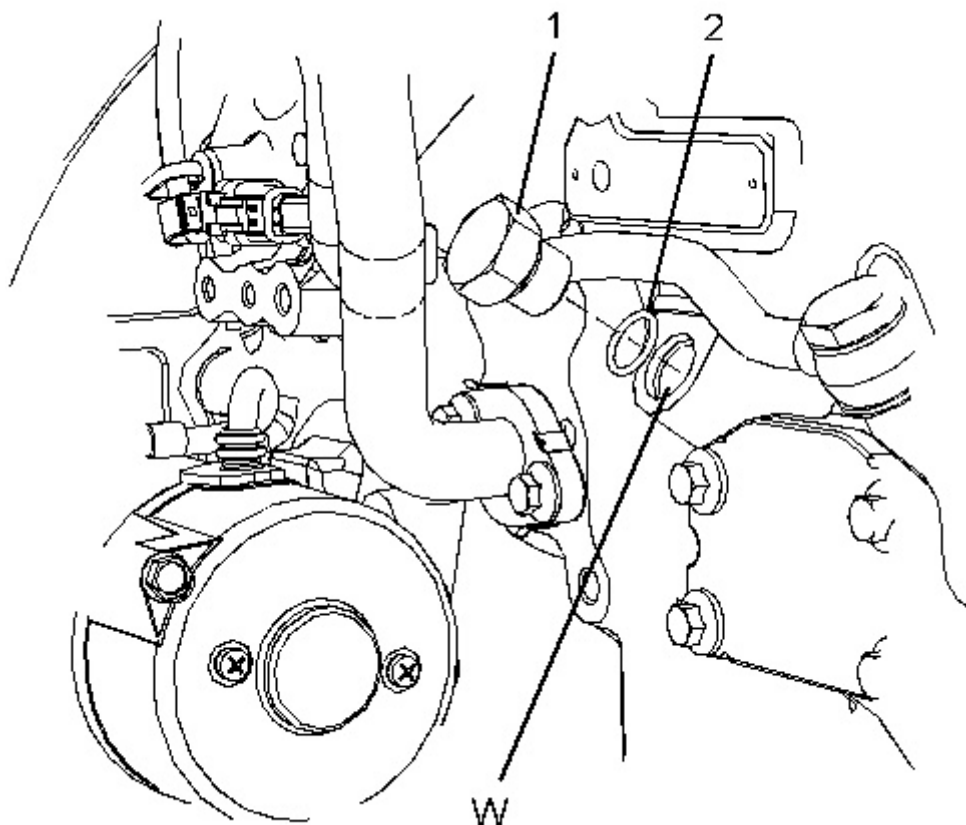
Contaminants may cause rapid wear and shortened component life.

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.

Note: 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. Remove plug (1) from the cylinder block. Remove O-ring seal (2) from the plug.
 2. 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" for the correct procedure. Install Tooling (D) through Hole (W) in order to lock the crankshaft so that number one piston is at top dead center on the compression stroke.
 3. Remove Tooling (D).
 4. 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.
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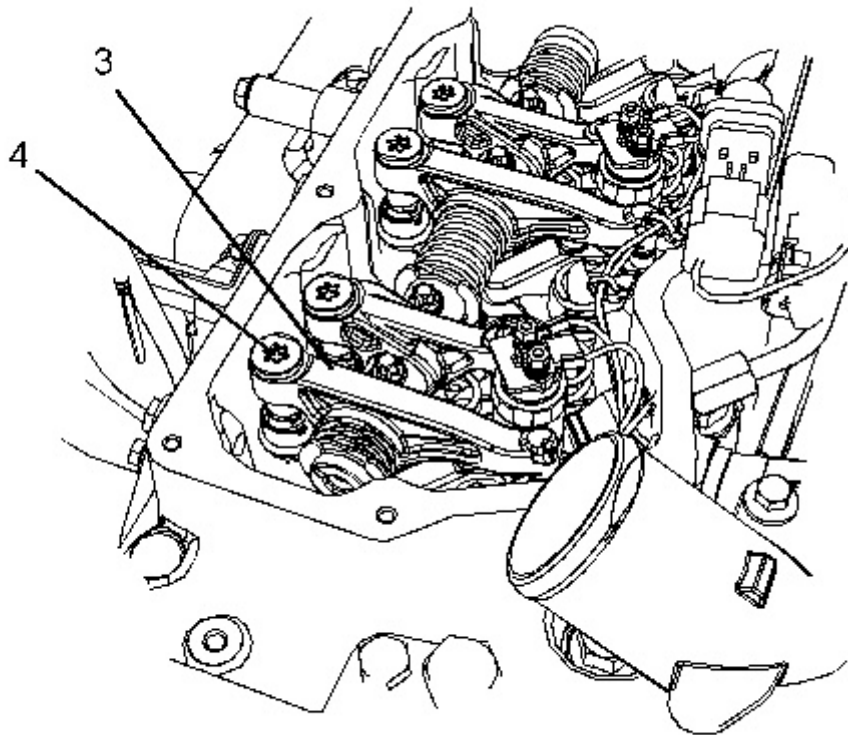


Illustration 2

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5. Use Tooling (E) in order to loosen threaded inserts (4) on all rocker arms (3). Unscrew threaded inserts (4) on all rocker arms (3) until all valves are fully closed.

Note: Ensure that ALL threaded inserts are fully unscrewed.

6. 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" for the correct procedure. Install Tooling (D) through Hole (W) in order to lock the crankshaft so that number one piston is at top dead center on the compression stroke. Refer to Illustration 1.
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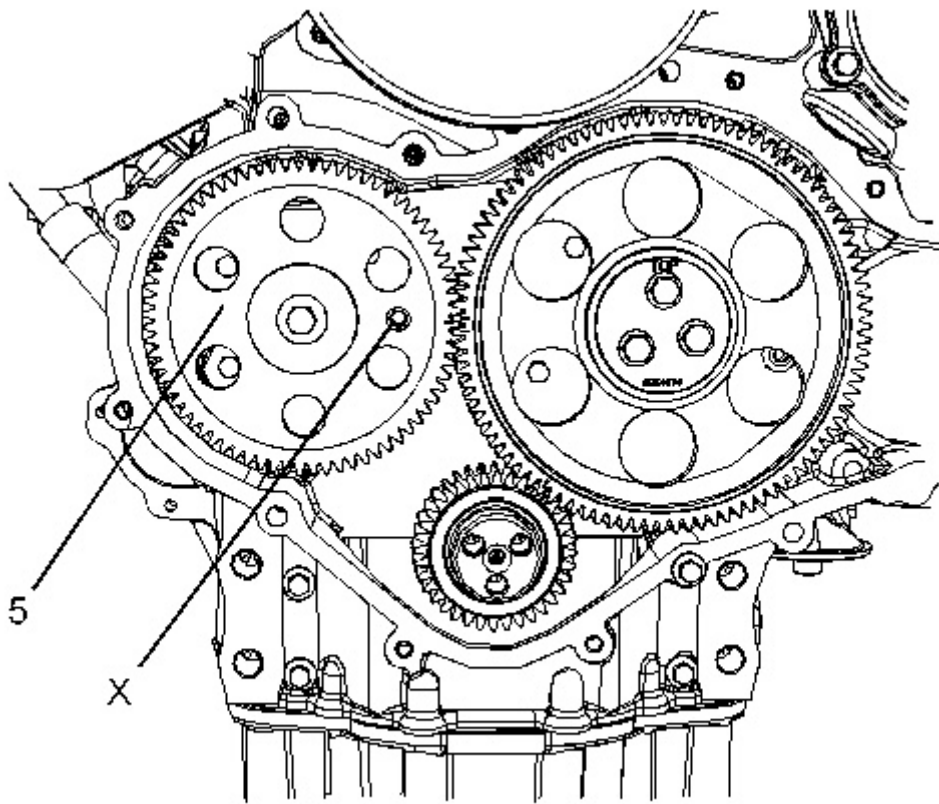


Illustration 3

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7. Install Tooling (B) through Hole (X) in camshaft gear (5) 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" for the correct procedure.
8. Install Tooling (D) into Hole (W) in the cylinder block. Use Tooling (D) 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" for the correct procedure.

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

9. Use Tooling (C) in order to lock the fuel injection pump gear in the correct position. Refer to Disassembly and Assembly, "Fuel Injection Pump - Remove" for the correct procedure.
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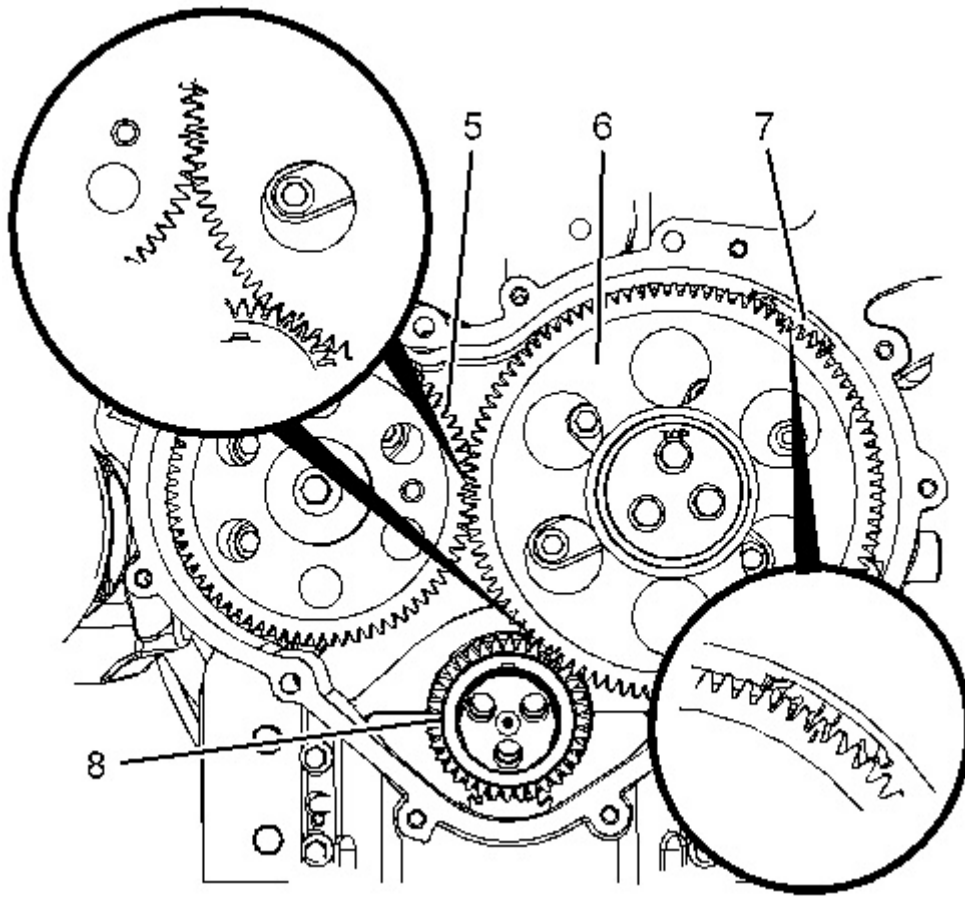


Illustration 4

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Alignment of timing marks

10. Mark gear (5), gear (6), gear (7) and gear (8) in order to show alignment. Refer to Illustration 4.

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

11. Remove camshaft gear (5). Refer to Disassembly and Assembly, "Camshaft Gear - Remove and Install" for the correct procedure.
12. Remove idler gear (6). Refer to Disassembly and Assembly, "Idler Gear - Remove and Install" for the correct procedure.

Installation Procedure

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
A	9U-7336	Housing	1
	5P-7305	Engine Turning Tool	1
B	230-6284	Timing Pin (Camshaft)	1

C	364-9107	Timing Pin (Fuel Injection Pump)	1
D	136-4632	Timing Pin (Crankshaft)	1
	268-1966	Adapter	1
E	298-5564	T40 Torx Socket	1
F	9U-7324	Indicator Bracket	1
	7H-1942	Dial Indicator	1
	3S-3268	Indicator Contact Point	1
	7H-1940	Universal Attachment	1

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

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 Position for No.1 Piston" for the correct procedure.
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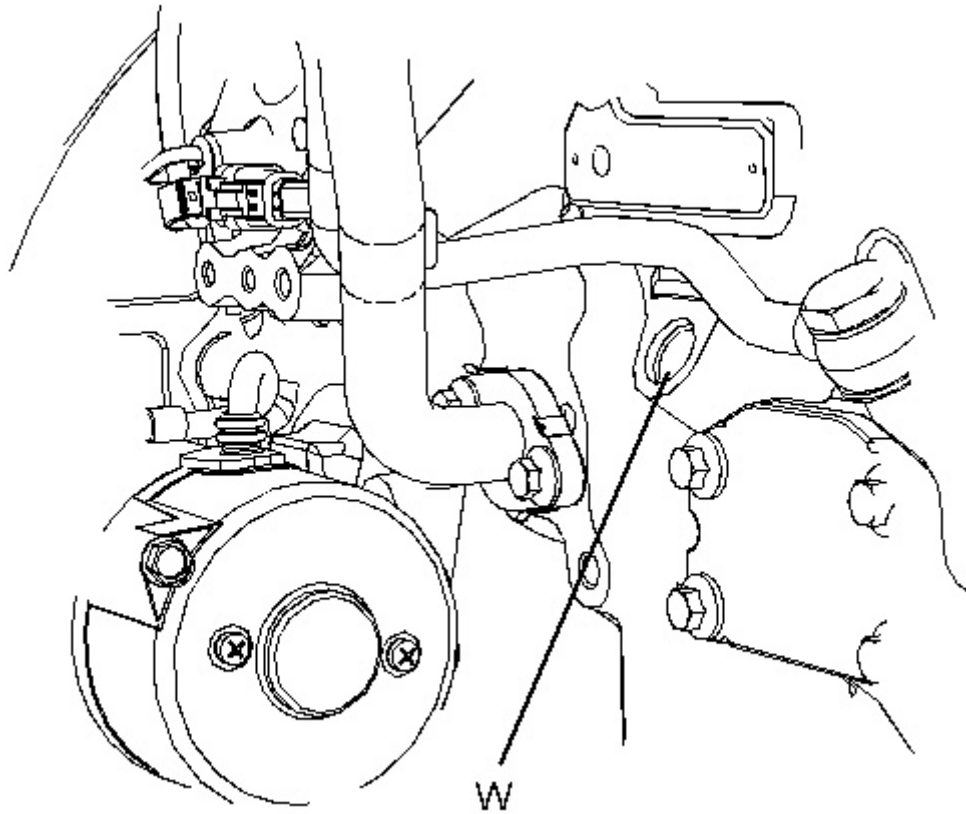


Illustration 5

g02485938

2. If necessary, install Tooling (D) into Hole (W) in the cylinder block. Use Tooling (D) 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" for the correct procedure.

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

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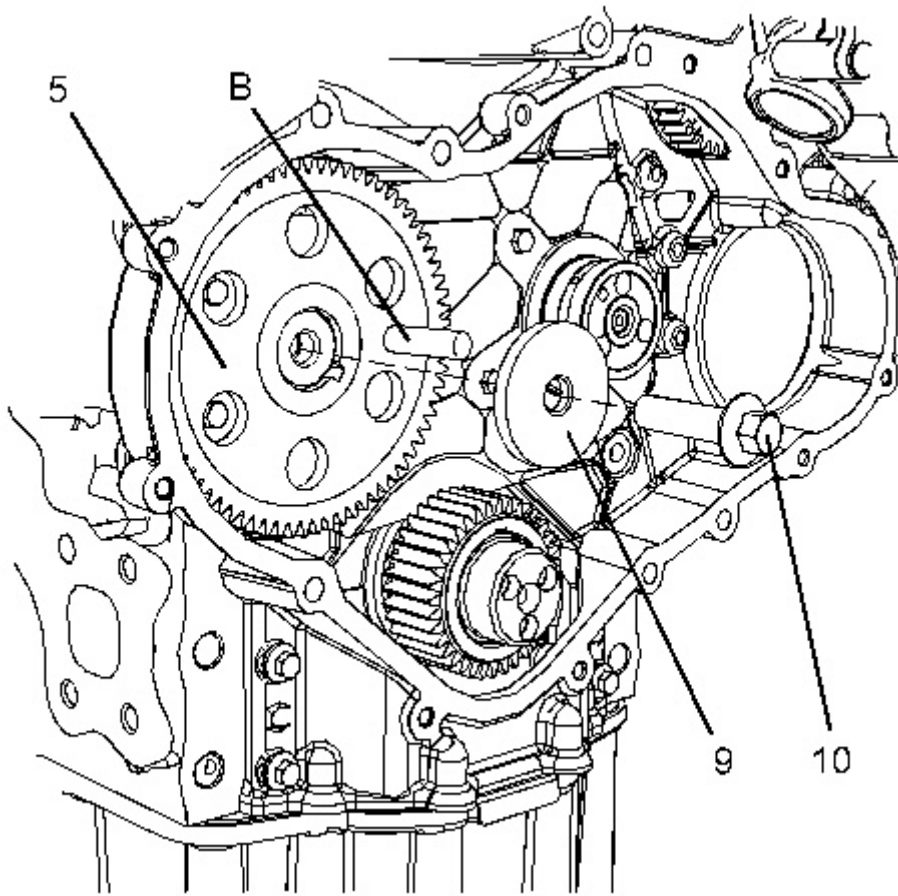


Illustration 6

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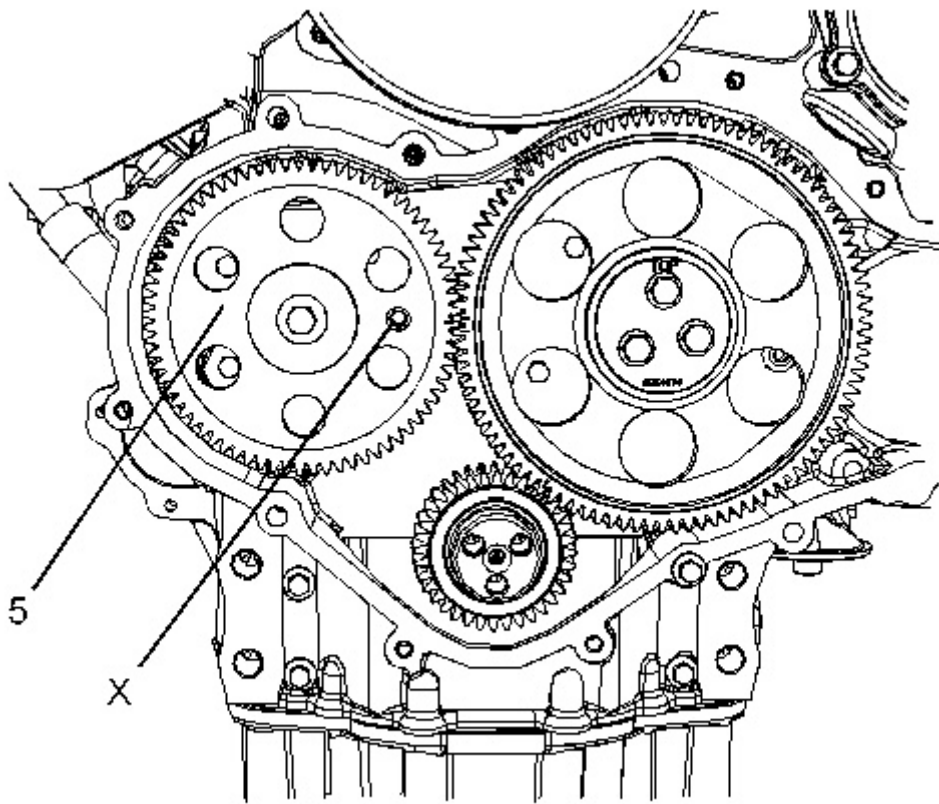


Illustration 7

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4. Install camshaft gear (5). Loosely install bolt (10) and washer (9) for the camshaft gear. Refer to Disassembly and Assembly, "Camshaft Gear - Remove and Install" for more information.
 5. Install Tooling (B) through Hole (X) in camshaft gear (5) into the front housing.
-

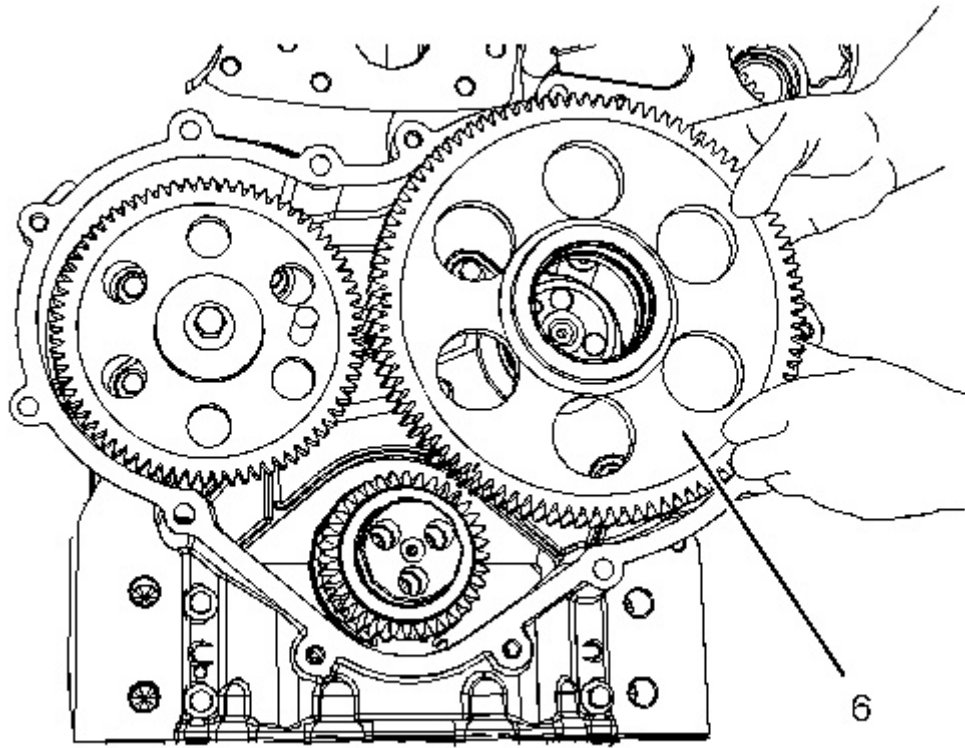


Illustration 8

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