

Product: BACKHOE LOADER

Model: 428F BACKHOE LOADER SJW

Configuration: 428F Backhoe Loader SJW00001-UP (MACHINE) POWERED BY C4.4 Engine

Disassembly and Assembly C4.4 (Mech) Engines for Caterpillar Built Machines

Media Number -KENR9210-10

Publication Date -01/12/2014

Date Updated -08/08/2018

i02763428

Crankshaft Rear Seal - Install

SMCS - 1161-012

Installation Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	227-4390	E12 Torx Socket	1
B	FT-2806	Alignment Tool	1

Note: The crankshaft rear seal and the housing are manufactured as a one-piece assembly.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

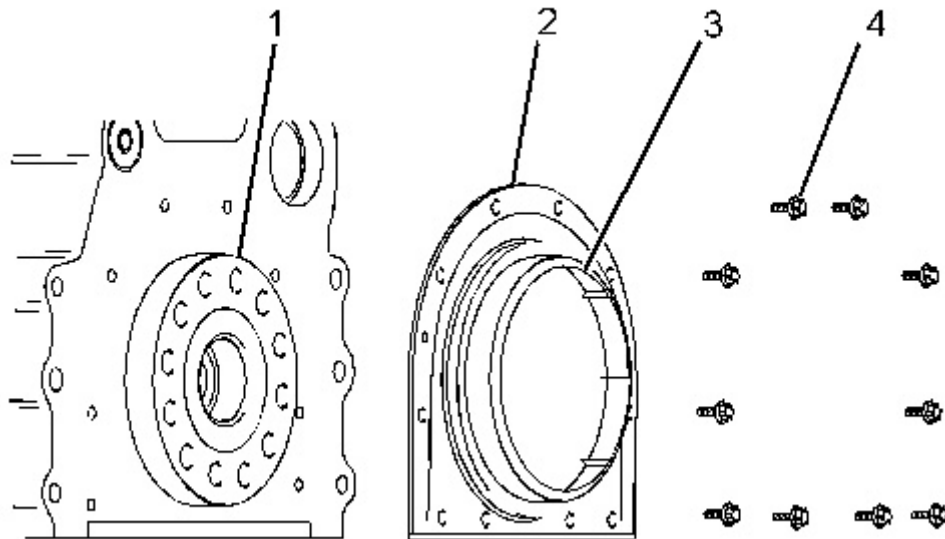


Illustration 1

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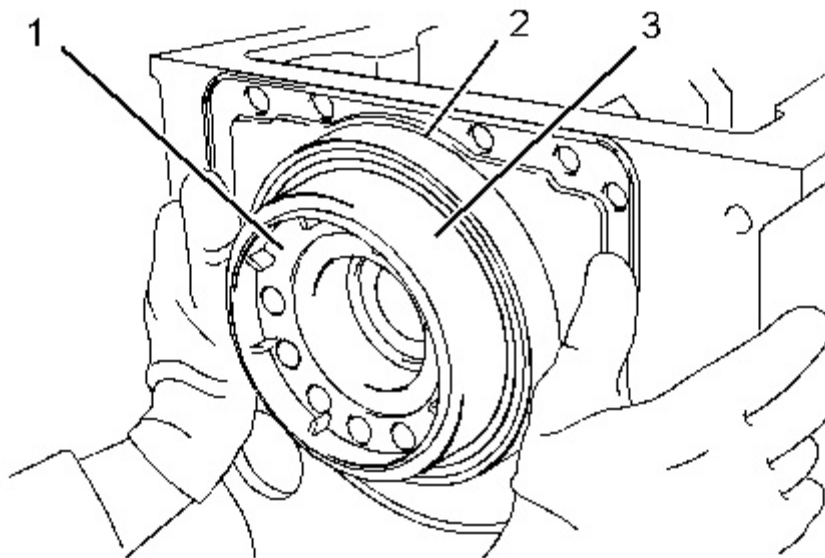


Illustration 2

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Typical example

1. Ensure that crankshaft flange (1) is clean, dry and free from damage.
2. Ensure that the face of the cylinder block and the bridge piece are clean and dry.
3. A new crankshaft rear seal is supplied with a plastic sleeve (3). Ensure that the plastic sleeve is squarely installed within crankshaft rear seal (2).

Note: The plastic sleeve is included in order to protect the lip of the seal as the seal is pushed over the crankshaft flange.

Note: Do not lubricate the crankshaft rear seal or the crankshaft flange. The crankshaft rear seal must be installed dry.

- Align plastic sleeve (3) with crankshaft flange (1). Ensure that the plastic sleeve is engaged onto the crankshaft flange. Push new crankshaft rear seal (2) squarely onto the crankshaft flange.

During this process, the plastic sleeve will be forced out of the crankshaft rear seal. Discard the plastic sleeve.

- Align the two molded locators on crankshaft rear seal (2) with the holes in the cylinder block. Ensure that the crankshaft rear seal is seated against the cylinder block.

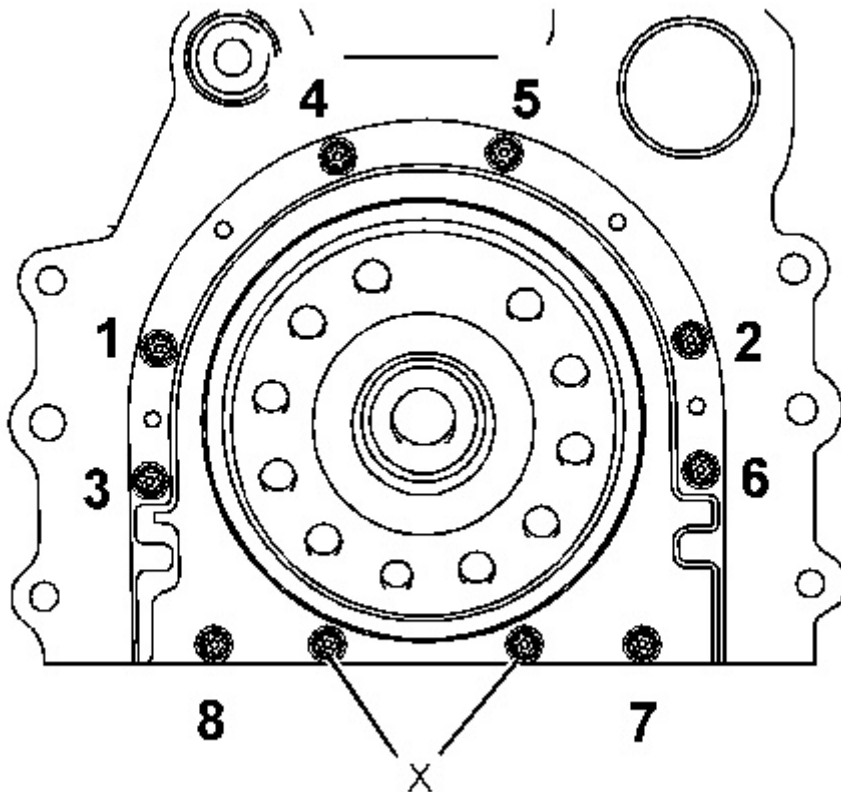


Illustration 3

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Tightening sequence for the crankshaft rear seal

- Install torx screws (4) finger tight.
Note: Do not install torx screws to positions (X) at this stage.
- Install Tooling (B) to crankshaft rear seal (2) and to crankshaft flange (1).
- Use Tooling (A) in order to tighten torx screws (4) to a torque of 22 N·m (16 lb ft). Tighten torx screws (4) in the sequence that is shown in Illustration 3.
- Remove Tooling (B).
- Install remaining torx screws (4) to positions (X). Use Tooling (A) in order to tighten the torx screws to a torque of 22 N·m (16 lb ft). Refer to Illustration 3.

End By:

- a. Install the flywheel. Refer to Disassembly and Assembly, "Flywheel - Install".
-

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Flywheel Housing - Remove and Install

SMCS - 1157-010

Removal Procedure

Start By:

- a. Remove the flywheel. Refer to Disassembly and Assembly, "Flywheel - Remove".

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Install a suitable lifting device to the flywheel housing in order to support the flywheel housing. The flywheel housing weighs approximately 30 kg (66 lb).
-

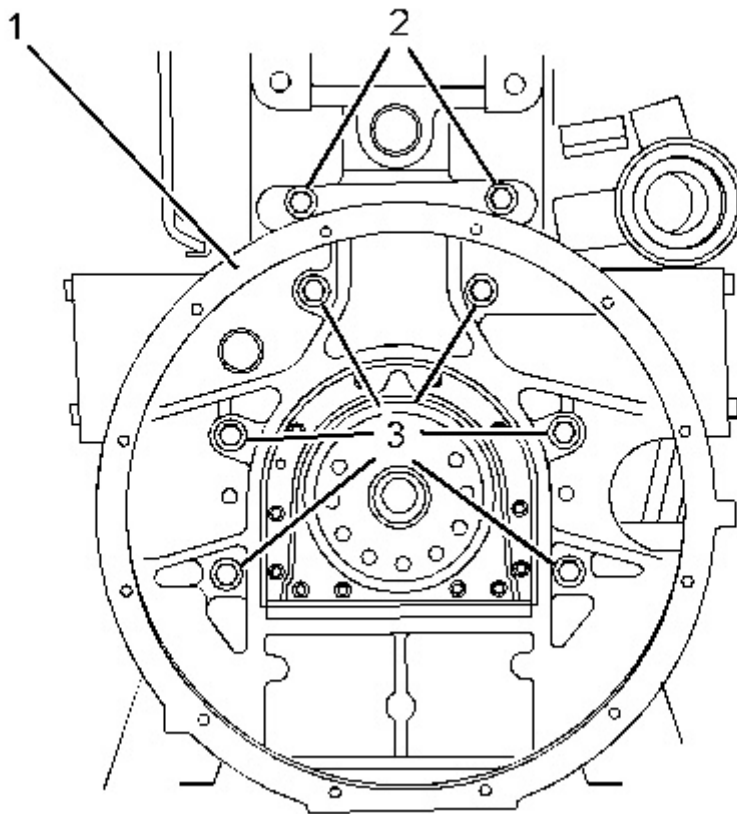


Illustration 1
Typical example

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2. Remove bolts (2) and bolts (3) from flywheel housing (1).
3. Use the lifting device in order to remove flywheel housing (1) from the cylinder block.

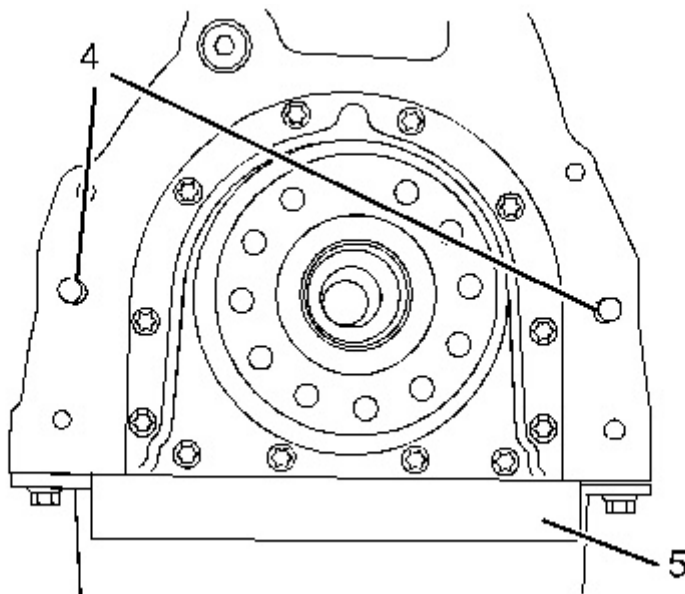


Illustration 2

g01244051

Typical example

4. If the engine has an aluminum oil pan, remove dust seal (5).
5. If necessary, remove dowels (4) from the cylinder block.

Installation Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	-	Guide Stud (M10 by 100 mm)	2
B	8T-5096	Dial Indicator Gp	1

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Ensure that the flywheel housing is clean and free from damage. If necessary, replace the flywheel housing.

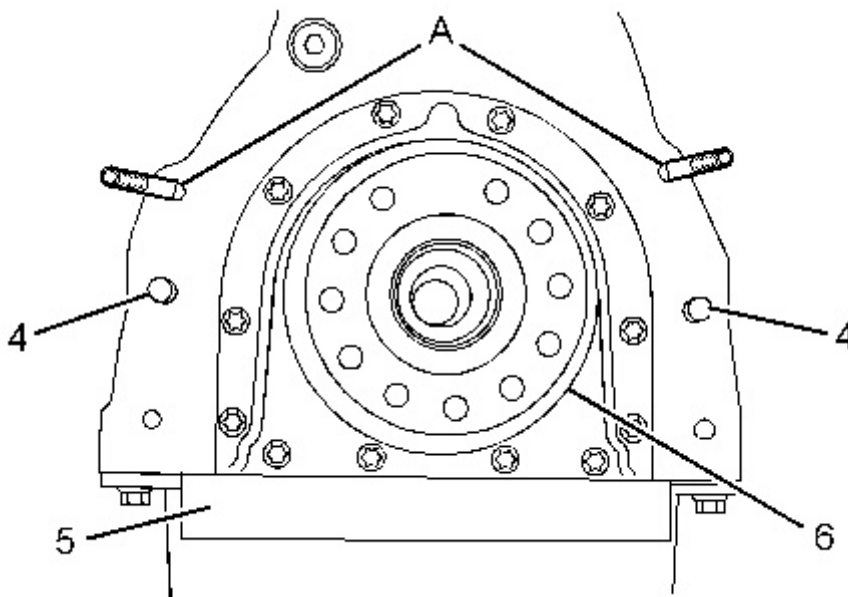


Illustration 3

Typical example

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2. Inspect crankshaft rear seal (6) for leaks. If there are any oil leaks, replace the crankshaft rear seal. Refer to Disassembly and Assembly, "Crankshaft Rear Seal - Remove" and refer to Disassembly and Assembly, "Crankshaft Rear Seal - Install".
 3. Clean the rear face of the cylinder block. If necessary, install dowels (4) to the cylinder block.
 4. Install Tooling (A) to the cylinder block.
 5. Install dust seal (5).
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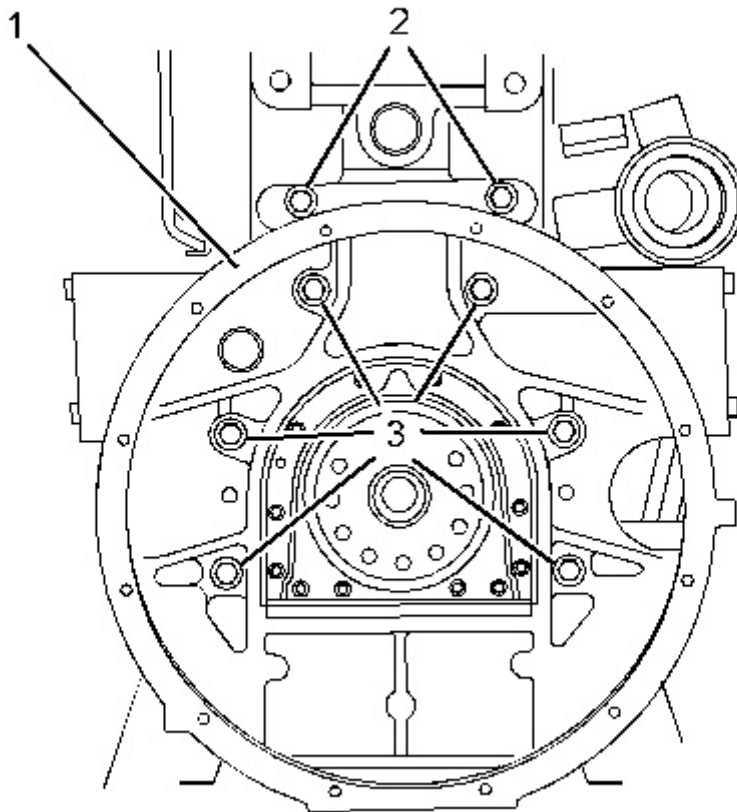


Illustration 4
Typical example

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6. Install a suitable lifting device to the flywheel housing. The flywheel housing weighs approximately 30 kg (66 lb).
7. Use the lifting device to align flywheel housing (1) with Tooling (A). Install the flywheel housing to the cylinder block.
8. Install bolts (2) and bolts (3) finger tight.
9. Remove Tooling (A). Install remaining bolts (3).
10. Tighten bolts (3) to a torque of 63 N·m (46 lb ft).
11. Tighten bolts (2) to a torque of 75 N·m (55 lb ft).

12. Use Tooling (B) to check the alignment of the flywheel housing with the crankshaft. Refer to Systems Operation, Testing and Adjusting, "Flywheel Housing - Inspect".

End By:

a. Install the flywheel. Refer to Disassembly and Assembly, "Flywheel - Install".

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i02763430

Crankshaft Pulley - Remove and Install - Engines Without an Automatic Belt Tensioner

SMCS - 1205-010

Removal Procedure

Start By:

- a. Remove the V-Belts. Refer to Disassembly and Assembly, "V-Belts - Remove and Install".

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

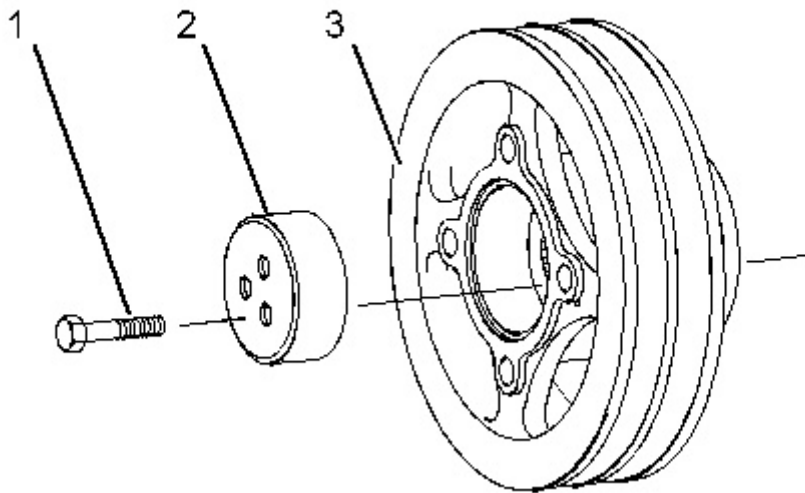


Illustration 1

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1. Use a suitable tool in order to prevent the crankshaft from rotating. Remove bolts (1).
2. Remove thrust block (2).
3. Carefully remove crankshaft pulley (3) from the crankshaft.

Installation Procedure

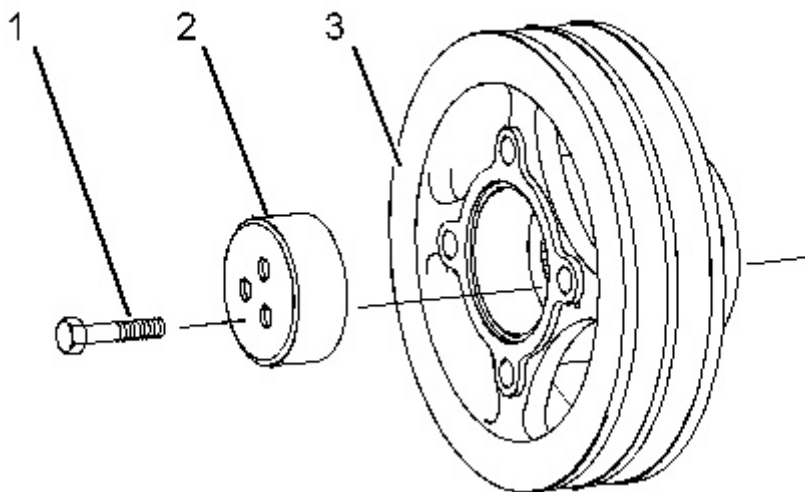


Illustration 2

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1. Ensure that the crankshaft pulley and the thrust block are clean and free from damage. Replace any components that are damaged. It is possible to reclaim a crankshaft pulley with

a worn seal surface by installing a wear sleeve. Refer to Disassembly and Assembly, "Crankshaft Wear Sleeve (Front) - Remove and Install".

2. Ensure that the front of the crankshaft is clean and free from damage. Install crankshaft pulley (3) to the crankshaft.

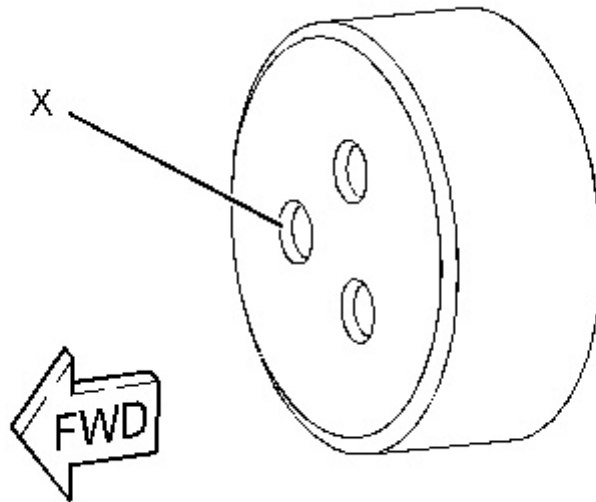


Illustration 3

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3. Align the holes in thrust block (2) with the holes in the crankshaft.

Note: Ensure chamfered holes (X) in thrust block (2). Face toward the front of the engine.

4. Install thrust block (2) to the assembly of the crankshaft pulley.
5. Install bolts (1) to thrust block (2).
6. Use a suitable tool in order to prevent the crankshaft from rotating. Tighten the bolts evenly to a torque of 115 N·m (85 lb ft).
7. Repeat Step 6 one more times in order to ensure correct torque.

End By:

- a. Install the V-Belts. Refer to Disassembly and Assembly, "V-Belts - Remove and Install".
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i02763431

Crankshaft Pulley - Remove and Install - Engines With an Automatic Belt Tensioner

SMCS - 1205-010

Removal Procedure

Start By:

- a. Remove the Alternator belt. Refer to Disassembly and Assembly, "Alternator Belt - Remove and Install".

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

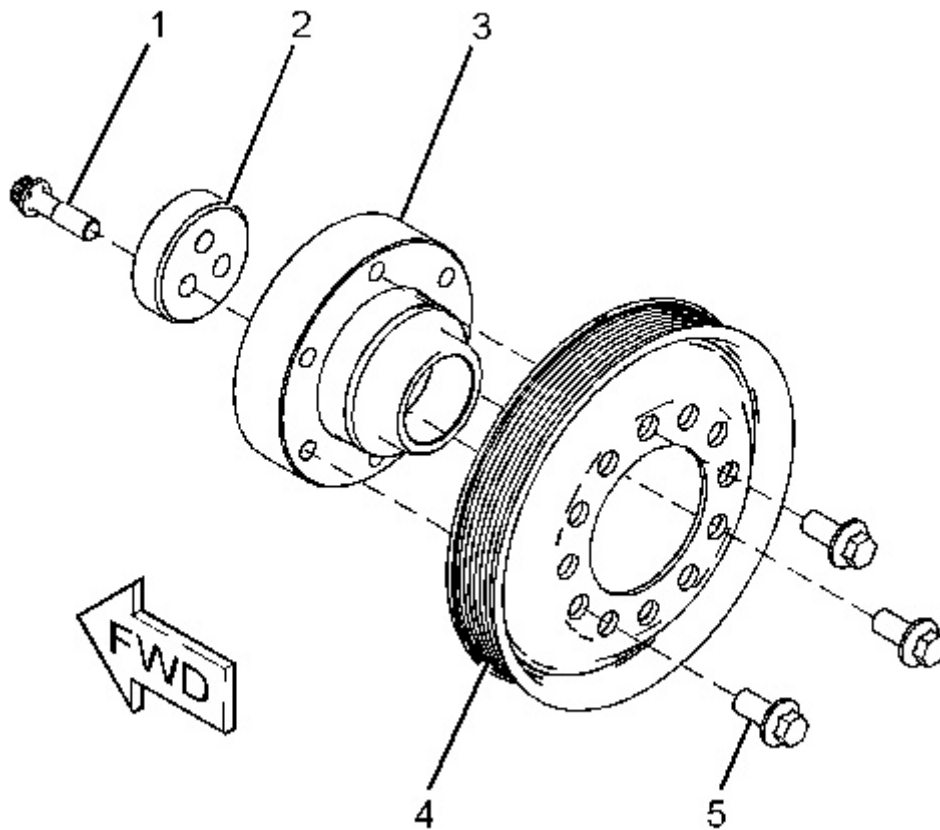


Illustration 1

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1. Use a suitable tool in order to prevent the crankshaft from rotating. Remove bolts (1).
2. Remove thrust block (2).
3. Carefully remove the assembly of the crankshaft pulley from the crankshaft.
4. Follow Steps 4.a through 4.b in order to disassemble the crankshaft pulley.
 - a. Remove bolts (5).
 - b. Remove crankshaft pulley (4) from crankshaft adapter (3).

Installation Procedure

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Ensure that the crankshaft adapter, the pulley and the thrust block are clean and free from damage. Replace any components that are damaged. It is possible to reclaim a crankshaft adapter with a worn seal surface by installing a wear sleeve. Refer to Disassembly and Assembly, "Crankshaft Wear Sleeve (Front) - Remove and Install".
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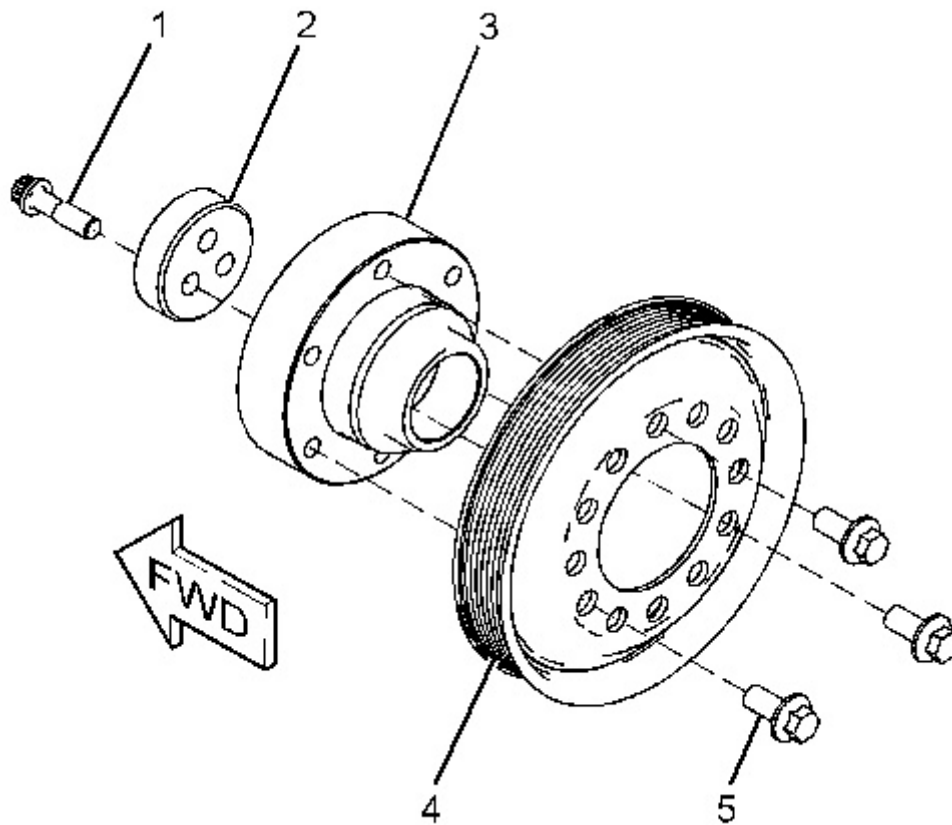


Illustration 2

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2. If necessary, follow Steps 2.a through 2.b in order to assemble the crankshaft pulley.
 - a. Install crankshaft pulley (4) to crankshaft adapter (3).
 - b. Install bolts (5) to the assembly of the crankshaft pulley, and the crankshaft adapter. The bolts should be evenly spaced.
 - c. Tighten the bolts to a torque of 78 N·m (58 lb ft).
 3. Ensure that the front of the crankshaft is clean and free from damage. Install the assembly of the crankshaft pulley to the crankshaft.
-

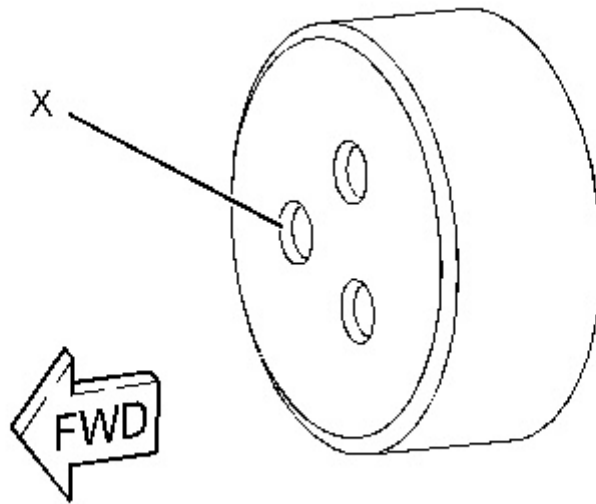


Illustration 3

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4. Align the holes in thrust block (2) with the holes in the crankshaft.

Note: Ensure chamfered holes (X) in thrust block (2). Face toward the front of the engine.

5. Install thrust block (2) to the assembly of the crankshaft pulley.
6. Install bolts (1) to thrust block (2).
7. Use a suitable tool in order to prevent the crankshaft from rotating. Tighten the bolts evenly to a torque of 115 N·m (85 lb ft).
8. Repeat Step 7 one more times in order to ensure correct torque.

End By:

- a. Install the alternator belt. Refer to Disassembly and Assembly, "Alternator Belt - Remove and Install".
-

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Crankshaft Front Seal - Remove and Install

SMCS - 1160-010

Removal Procedure

Table 1

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

Start By:

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

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

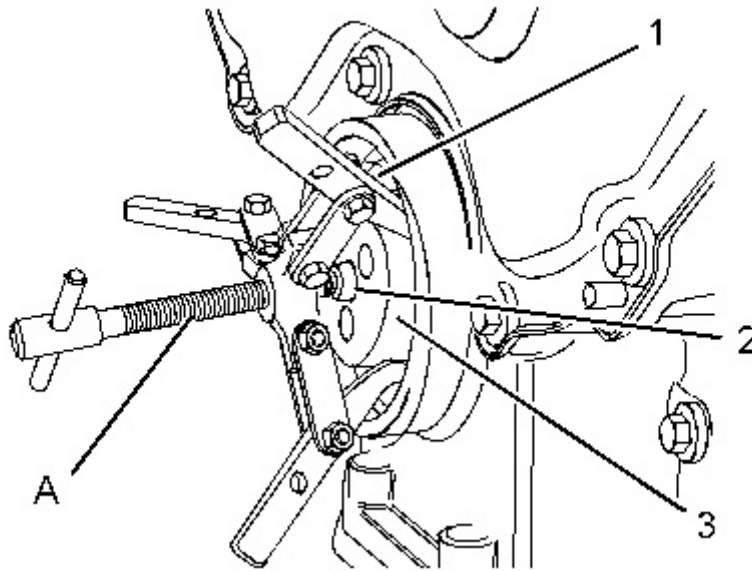


Illustration 1

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1. Install the legs of Tooling (A) behind crankshaft front seal (1). Install a suitable spacer (2) between Tooling (A) and crankshaft (3). Use Tooling (A) in order to pull the crankshaft front seal out of the front housing.

Note: Do not damage the bore for the crankshaft front seal in the front housing.

Installation Procedure

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
B	9U-6210	Front Seal Installer	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 seal in the front housing is clean and free from damage.



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