

Product: EXCAVATOR

Model: 312D2 GC EXCAVATOR BRW

Configuration: 312D2 GC Excavator BRW00001-UP (MACHINE) POWERED BY 3054C Engine

## Disassembly and Assembly 3054C Engines for Caterpillar Built Machines

Media Number -SEN5069-18

Publication Date -01/05/2015

Date Updated -19/09/2018

i02293555

### Flywheel - Remove

SMCS - 1156-011

### Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	-	Guide Bolt (1/2 inch - 20 NF by 4 inch)	2
B	138-7575	Link Bracket	1

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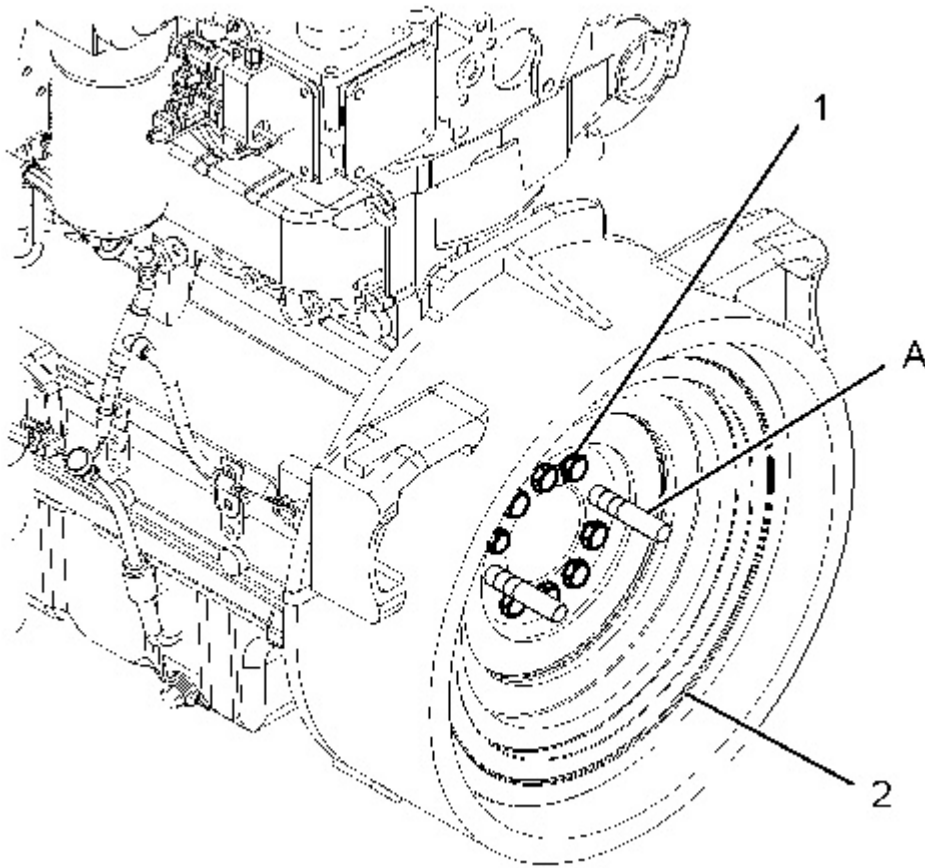
#### NOTICE

**Keep all parts clean from contaminants.**

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

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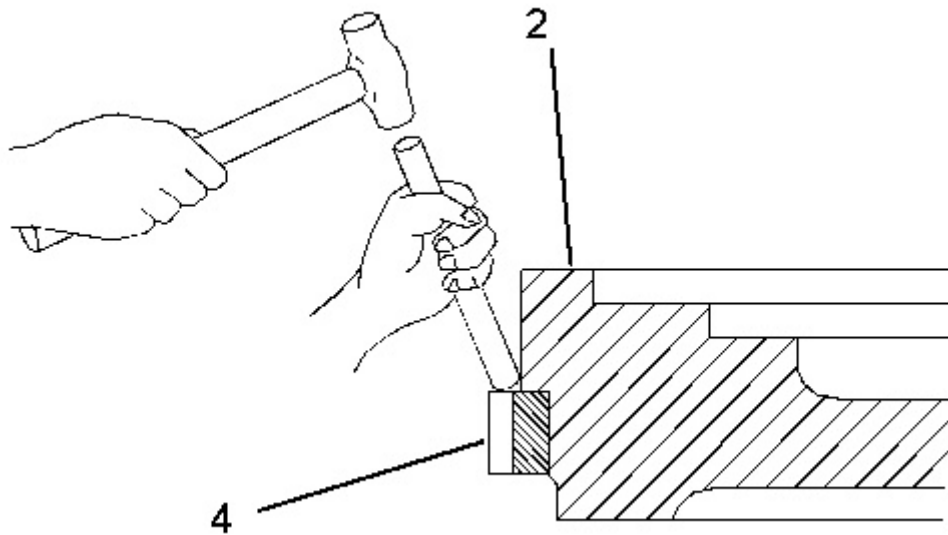
Illustration 1  
Typical example

g01148312

1. Remove the two setscrews and install the Tooling (A) as guides.

**Note:** The weight of the flywheel (2) is approximately 54 kg (119 lb). Install the Tooling (B) in order to support the flywheel (2) before the remainder of the setscrews (1) are removed.

2. Remove the remaining setscrews (1) that secure flywheel (2) to the crankshaft.
  3. Remove the flywheel (2) from the engine.
-



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Illustration 2

g01148313

4. Check the condition of the ring gear (4). Remove the ring gear (4) if the ring gear is worn or damaged.

**Note:** Identify the orientation of the ring gear (4) on the flywheel (2) and the position of the chamfer on the teeth for the correct positioning when the new ring gear is installed.

5. Place the flywheel (2) and the ring gear (4) on a suitable support. Use a hammer and a chisel in order to remove the ring gear (4) from the flywheel (2).
-

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i07030444

# Flywheel - Install

SMCS - 1156-012

## Installation Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	-	Guide Bolt (1/2 inch - 20 NF by 4 inch)	2
B	138-7575	Link Bracket	1

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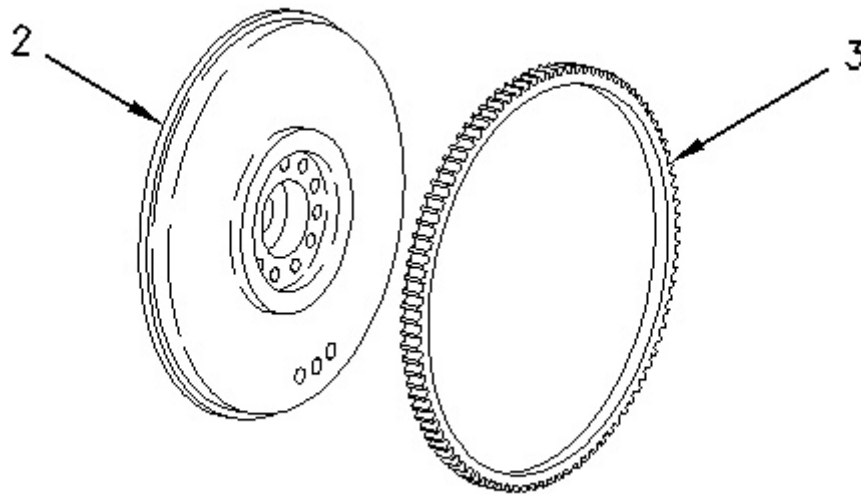
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1. Thoroughly clean the flywheel housing. Inspect the crankshaft rear seal for leaks. If there are any oil leaks, refer to this Disassembly and Assembly Manual, "Crankshaft Rear Seal - Remove" for the correct procedure.
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Illustration 1

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**Always wear protective gloves when handling parts that have been heated.**

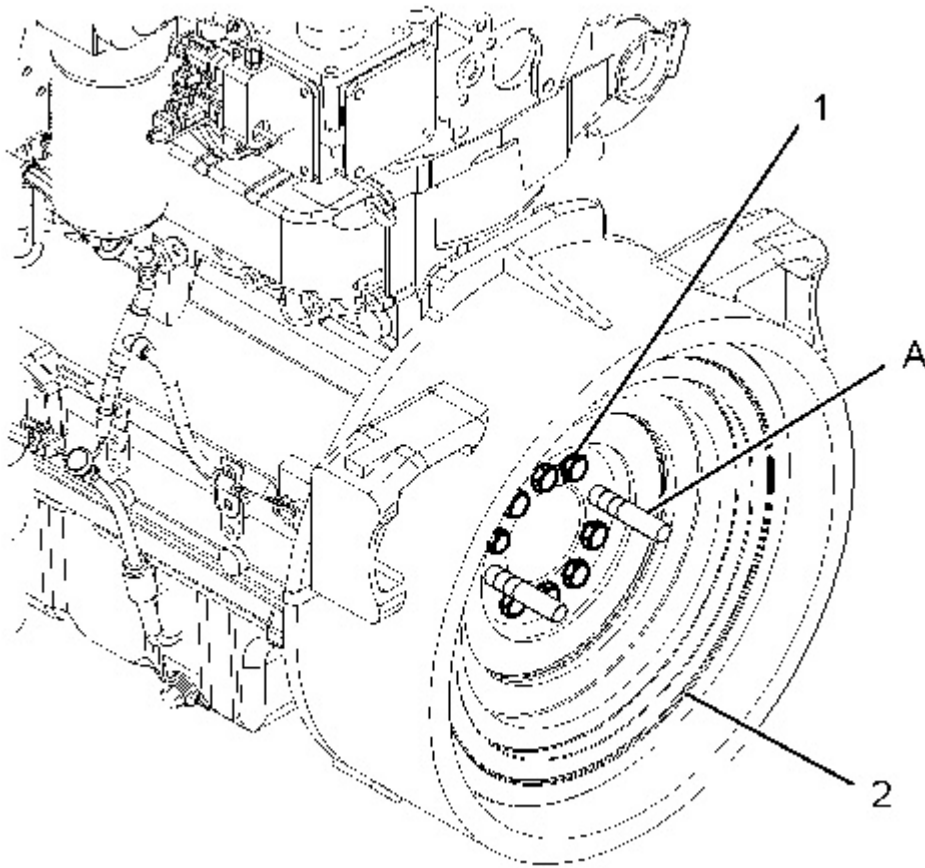
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**Note:** If ring gear (3) has been removed from flywheel (2). Identify the orientation of ring gear (3) on the flywheel for the correct positioning when the new ring gear is installed.

2. Heat the ring gear to 250 °C (480 °F) in an oven to install the ring gear onto the flywheel. Ensure that the orientation of the ring gear is correct and quickly install the ring gear onto the flywheel.

**Note:** Do not use a torch to heat the ring gear.

3. Clean flywheel (2) and ring gear (3) when the ring gear has cooled.
-



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Illustration 2

g01148312

4. Install the Tooling (A) on the crankshaft. Install the Tooling (B) and a suitable lifting device on flywheel (2) and position the flywheel in the flywheel housing. The weight of the flywheel is approximately 54 kg (119 lb).
  5. Install bolts (1) to flywheel (2).
  6. Remove Tooling (A). Install the remaining bolts (1) that secure flywheel (2) to the crankshaft. Tighten the bolts (1) to a torque of 140 N·m (103 lb ft).
  7. Check the alignment of flywheel (2) with the crankshaft. Refer to Testing and Adjusting, "Flywheel - Inspect" for the correct procedure.
-

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## **Disassembly and Assembly 3054C Engines for Caterpillar Built Machines**

Media Number -SEN5069-18

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i02293665

# **Crankshaft Rear Seal - Remove**

SMCS - 1161-011

## **Removal Procedure**

### **Start By:**

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

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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.**

**Refer to Special Publication, NENG2500, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat products.**

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

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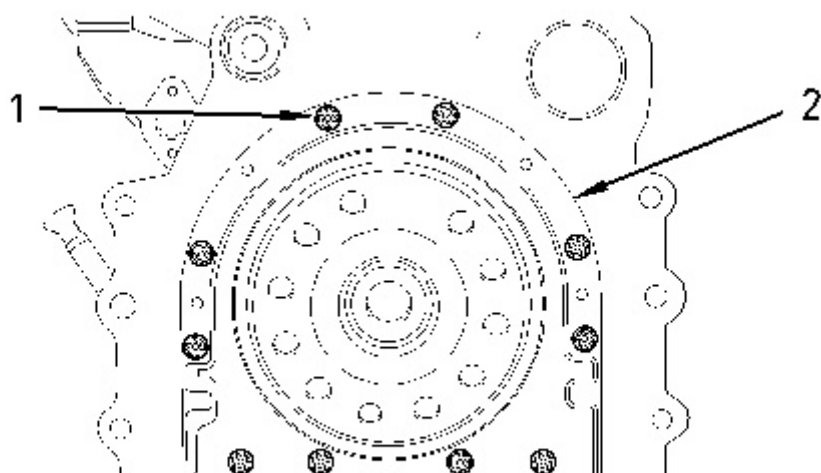


Illustration 1

g00991388

**Note:** The crankshaft rear seal is nonserviceable. If the crankshaft rear seal is removed, the complete housing assembly must be replaced.

1. Remove the setscrews (1) from the housing assembly (2).
  2. Remove the housing assembly (2) from the cylinder block. Discard the housing assembly (2).
-



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i02293676

# Crankshaft Rear Seal - Install

SMCS - 1161-012

## Installation Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	FT-2806	Alignment Tool	1

**Note:** The crankshaft rear seal and the housing for the crankshaft rear seal are manufactured as a one-piece assembly. The assembly of the crankshaft rear seal uses ten setscrews in order to fasten the assembly to the cylinder block.

**Note:** The following procedure assumes that the crankshaft rear seal is a replacement assembly.

**Note:** The crankshaft rear seal is lubricated. There is no need to lubricate the seal or the crankshaft flange before installation.

**Note:** An installation sleeve (2) is supplied with the new housing assembly. The installation sleeve must be in place when housing assembly is installed on the crankshaft flange in order to prevent damage to the crankshaft rear seal during assembly.

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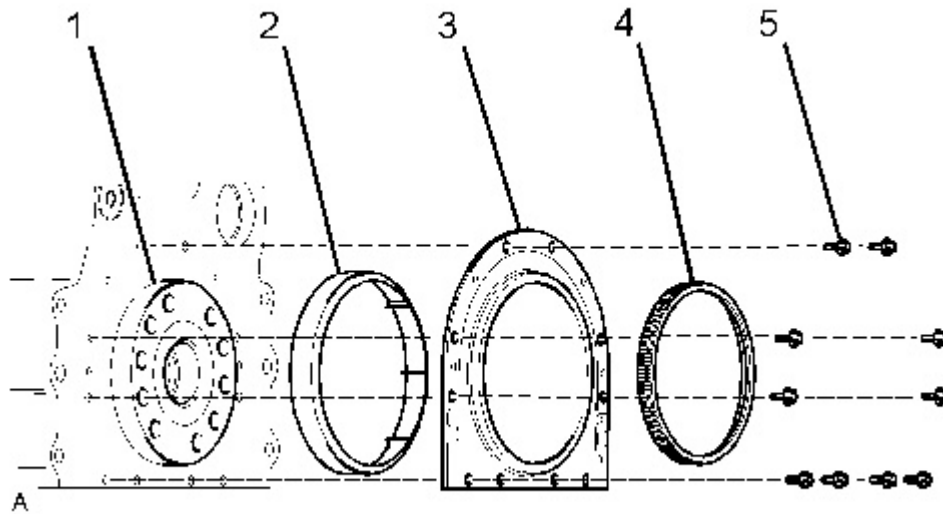
### NOTICE

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1. Ensure that the crankshaft flange (1) is clean, dry and free from rough metal edges. Ensure that the face of the cylinder block and the bridge in the crankcase are clean and dry.

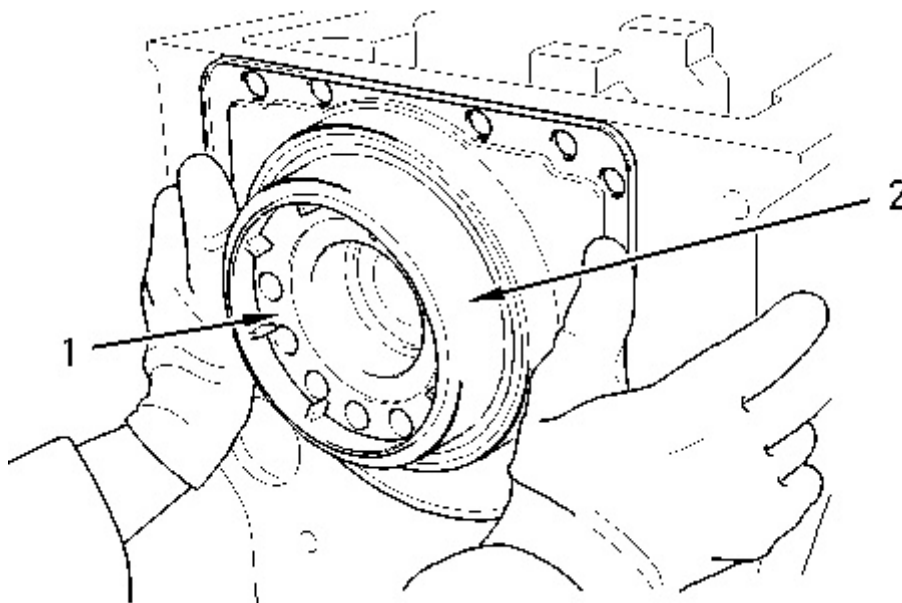


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Illustration 1

g01148393

2. Remove the packaging from the new assembly of the crankshaft rear seal (3). Ensure that the plastic sleeve (2) is squarely installed within the seal of the assembly of the crankshaft rear seal (3). The plastic sleeve (2) is included in order to protect the lip of the seal as the lip is pushed over the crankshaft flange (1).



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Illustration 2

g01004958

Typical example

3. Place the assembly of the crankshaft rear seal (3) over the crankshaft flange (1) and engage the plastic sleeve (2) onto the crankshaft flange.

4. Ensure that the plastic sleeve (2) is engaged onto the crankshaft flange (1). Push the assembly of the crankshaft rear seal (3) evenly and push the assembly smoothly onto the crankshaft flange (1) until the assembly is against the cylinder block. During this process, the plastic sleeve (2) will be forced out of the assembly of the crankshaft rear seal (3). Discard the plastic sleeve (2).
  5. Rotate the assembly of the crankshaft rear seal (3) in order to align the setscrew holes in the assembly with the setscrew holes in the rear face of the cylinder block.
  6. Install the setscrews (5) in order to position housing assembly (3) to the cylinder block. Do Not tighten the bolts.
  7. Place the Tooling (A) over housing assembly (2). This will center the housing assembly onto the crankshaft flange (3).
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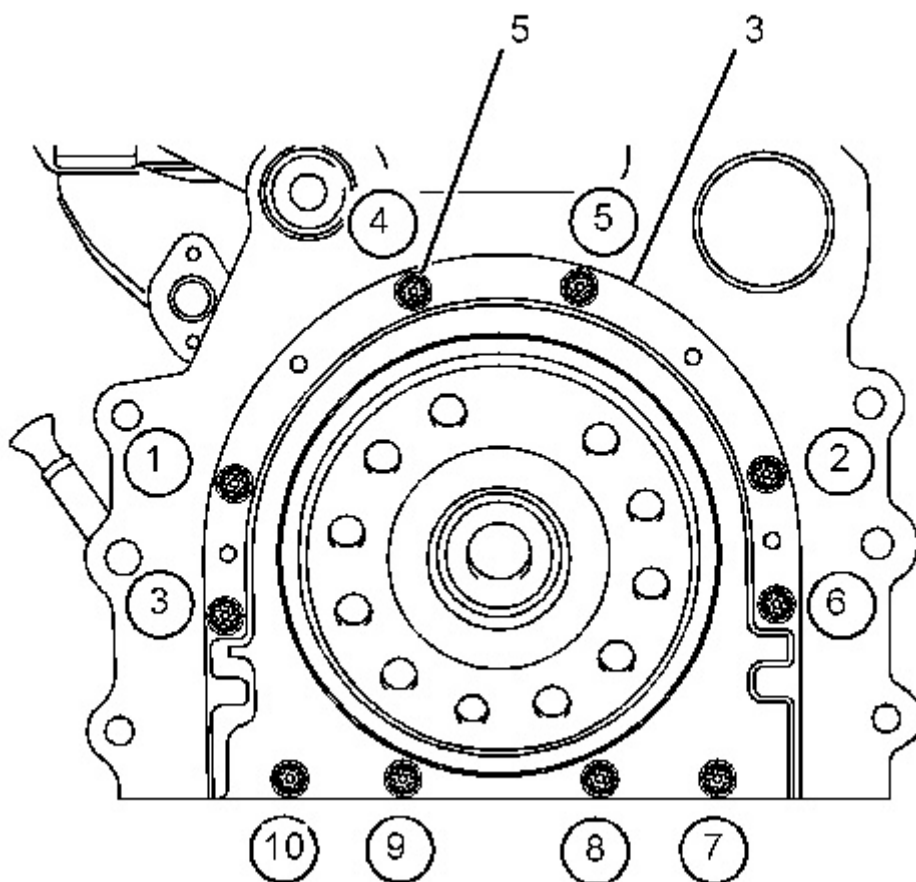


Illustration 3

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8. Tighten the setscrews (1) in numerical order to a torque of 22 N·m (16 lb ft). Do not tighten the setscrews (X) at this time.
9. Remove the Tooling (A). Tighten the setscrews (X) to a torque of 22 N·m (16 lb ft).

**End By:**

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

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Media Number -SEN5069-18

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i05322247

# Crankshaft Wear Sleeve (Rear) - Remove

SMCS - 1161-011-ZV

## Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	242-9955	Puller	1
	-	Spacer	1

### Start By:

- A. Remove the crankshaft rear seal. Refer to Disassembly and Assembly, "Crankshaft Rear Seal - Remove and Install" for the correct procedure.

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### NOTICE

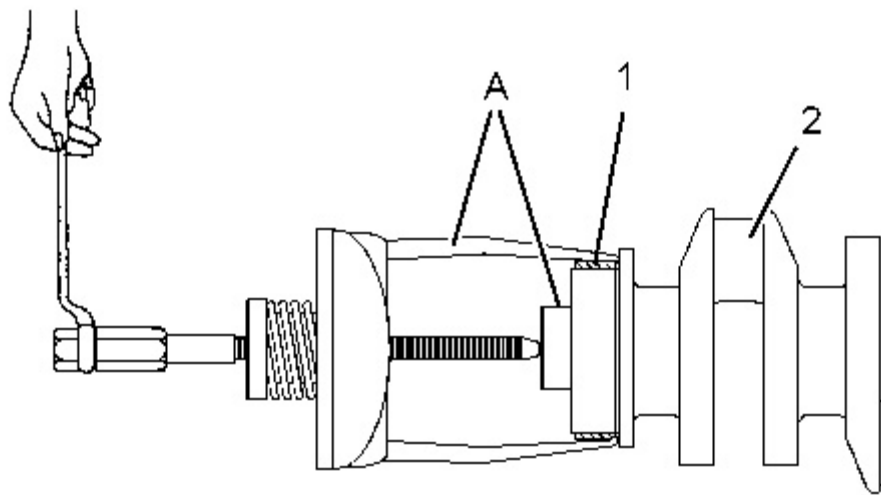
**Keep all parts clean from contaminants.**

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

---

**Note:** Wear sleeves are used to reclaim worn seal surfaces or damaged seal surfaces. Wear sleeves are not original equipment. The wear sleeve is supplied with a crankshaft rear seal that has a larger internal diameter than a standard crankshaft rear seal. A standard crankshaft rear seal cannot be used if a wear sleeve is installed.

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Illustration 1

g02815577

Typical example

1. Use Tooling (A) in order to remove crankshaft wear sleeve (1) from crankshaft (2) .
-

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i05764187

# Crankshaft Wear Sleeve (Rear) - Install

SMCS - 1161-012-ZV

## Installation Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	438-3244	Oil Seal Installer	1
	8T-0375	Bolt	1
	5P-8247	Hard Washer	1
B	438-3245	Oil Seal Locator	1
	9U-6172	Bolt	2

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### NOTICE

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---

**Note:** Wear sleeves are used to reclaim worn seal surfaces or damaged seal surfaces. Wear sleeves are not original equipment. The wear sleeve is supplied with a crankshaft rear seal that has a larger internal diameter than a standard crankshaft rear seal. A standard crankshaft rear seal cannot be used if a wear sleeve is installed.

1. Ensure that the crankshaft is thoroughly clean and dry. Remove any areas of raised damage.

2. Lubricate the inner surface of the crankshaft wear sleeve with clean engine oil.

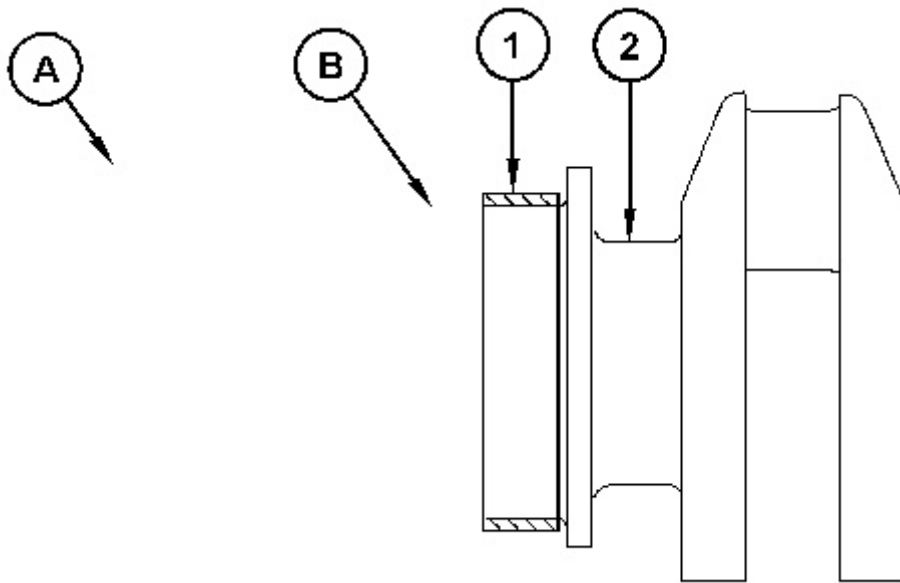


Illustration 1

g03657723

Sectional view of the crankshaft, the wear sleeve, and the installation tool

3. Use Tooling (A) and Tooling (B) to install the crankshaft wear sleeve, as follows:
- Align Tooling (B) with the dowels in crankshaft (2) and install Tooling (B) to the crankshaft. Ensure the correct orientation.
- Note:** Verify that Tooling (A) will slide freely over Tooling (B).
- Carefully slide crankshaft wear sleeve (1) over Tooling (B) until the crankshaft wear sleeve contacts the rear of crankshaft (2).
  - Assemble Tooling (A) to Tooling (B) and install the bolt and the washer. Ensure that the face of Tooling (A) with the deep counterbore is toward crankshaft wear sleeve (1).
  - Tighten the bolt until Tooling (A) bottoms out on Tooling (B) in order to pull crankshaft wear sleeve (1) onto crankshaft (2).
  - Remove Tooling (A) and Tooling (B).

**End By:**

- Install the new crankshaft rear seal that was supplied with the crankshaft wear sleeve.
-

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Date Updated -19/09/2018

i02294250

# Flywheel Housing - Remove and Install

SMCS - 1157-010

## Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	138-7575	Link Bracket	2

### Start By:

- a. Remove the electric starting motor. Refer to Disassembly and Assembly, "Electric Starting Motor - Remove and Install".
- b. Remove the flywheel. Refer to Disassembly and Assembly, "Flywheel - Remove".

---

### NOTICE

**Keep all parts clean from contaminants.**

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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**

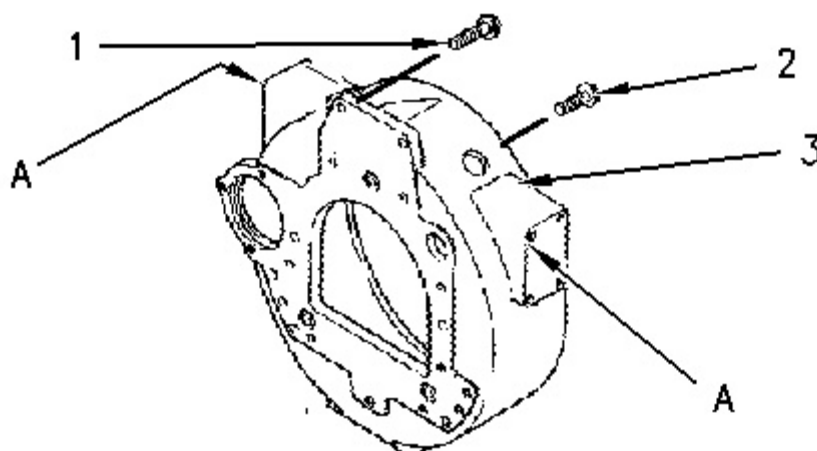


**before opening any compartment or disassembling any component containing fluids.**

**Refer to Special Publication, NENG2500, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat products.**

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

- 
1. The weight of the flywheel housing (3) is approximately 39 kg (85 lb). Use suitable lifting equipment to support the flywheel housing (3) while the setscrews (1) are being removed and while the flywheel housing is being removed.
- 



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Illustration 1

g00977367

2. Remove the setscrews (1) from the top of the flywheel housing (3).
3. Attach the Tooling (A) and a suitable lifting device to the flywheel housing (3).
4. Remove the setscrews (2) that attach the flywheel housing (3) to the cylinder block.
5. Remove the flywheel housing (3). If necessary, tap the flywheel housing with a soft faced hammer in order to separate the flywheel housing from the cylinder block.

## Installation Procedure

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
A	138-7575	Link Bracket	2

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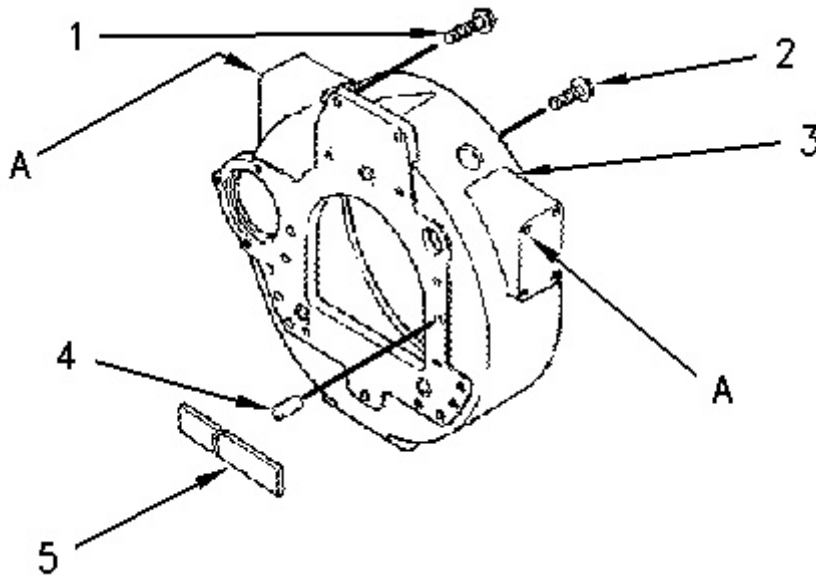
## NOTICE

**Keep all parts clean from contaminants.**

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1. Clean the rear face of the cylinder block and the mating surface of the flywheel housing (3).
- 



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Illustration 2

g00977388

2. If a felt seal (5) is installed, replace the felt seal. Inspect the dowels (4) in the cylinder block that align the flywheel housing (3). Replace the dowels, if necessary.
3. The weight of the flywheel housing (3) is approximately 39 kg (85 lb). Use the Tooling (A) and a suitable lifting device to position the flywheel housing (3) on the dowels (4) that are on the cylinder block.
4. Install the setscrews (1) that attach the flywheel housing (3) to the cylinder block.
5. Install the setscrews (2) that attach the flywheel housing (3) to the cylinder block.

Tighten the setscrews (1) and the setscrews (2) to the following torque:

M10 "8.8" ... 44 N·m (33 lb ft)

M10 "10.9" ... 63 N·m (46 lb ft)

M12 "8.8" ... 75 N·m (55 lb ft)

M12 "10.9" ... 115 N·m (85 lb ft)

6. Remove Tooling (A) and the lifting device from the flywheel housing.

7. Check the alignment of the flywheel housing with the cylinder block. Refer to Testing and Adjusting, "Flywheel Housing - Inspect".

**End By:**

- a. Install the flywheel. Refer to Disassembly and Assembly, "Flywheel - Install".
  - b. Install the electric starting motor. Refer to Disassembly and Assembly, "Electric Starting Motor - Remove and Install".
-

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## **Disassembly and Assembly 3054C Engines for Caterpillar Built Machines**

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i02294252

# **Crankshaft Pulley - Remove and Install**

SMCS - 1205-010

## **Removal Procedure**

### **Start By:**

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

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### **NOTICE**

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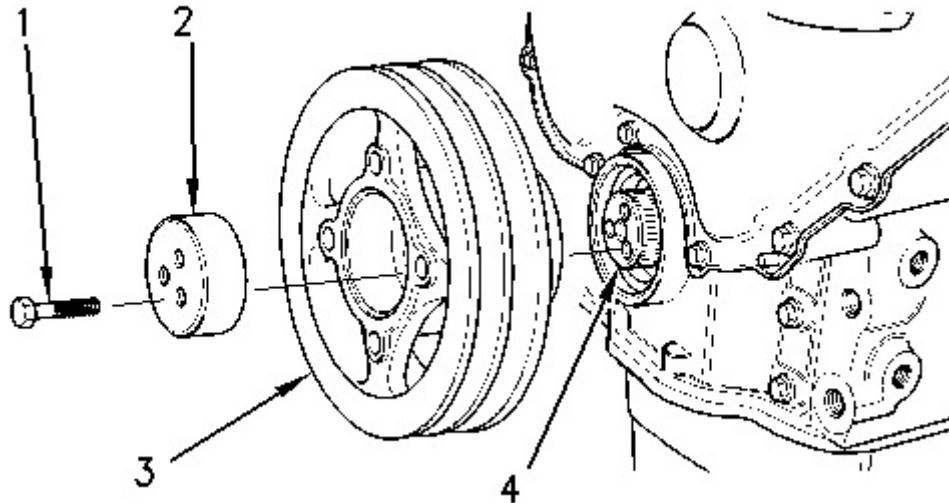


Illustration 1

g00952102

1. Remove the setscrews (1). Remove the thrust block (2).
2. Remove the pulley (3) from the crankshaft (4).

## Installation Procedure

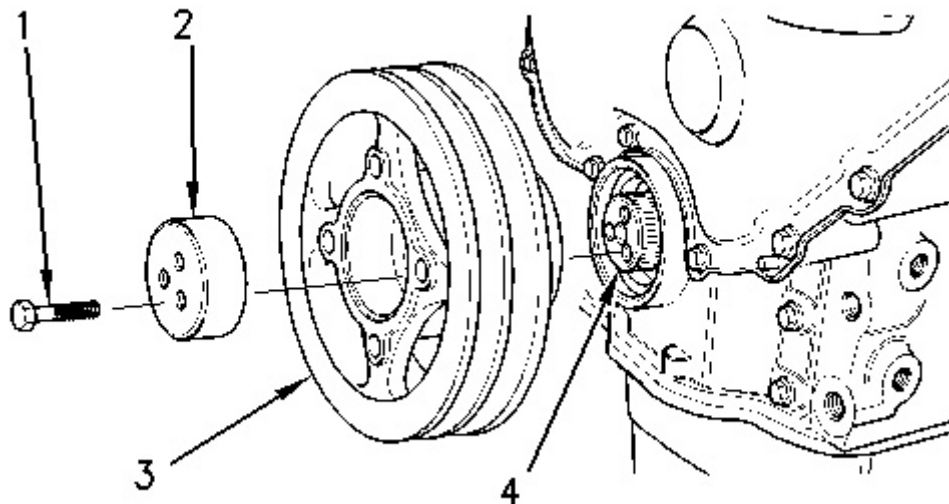


Illustration 2

g00952102

1. Clean the pulley (3) and clean the thrust block (2). Inspect the pulley (3) and the thrust block (2) for wear and for damage. If necessary, replace any damaged component. Inspect the area on the pulley (3) that is normally in contact with the crankshaft front seal. If there is excessive wear then a wear sleeve can be installed. Refer to this Disassembly and Assembly

Manual, "Crankshaft Wear Sleeve (Front) - Remove and Crankshaft Wear Sleeve (Rear) - Install" for further details.

2. Position the pulley (3) onto the crankshaft (4).
3. Lubricate the threads and the shoulder of the setscrews (1). Position the thrust block and install the setscrews (1). Tighten the setscrews evenly to a final torque of 115 N·m (85 lb ft).

**End By:**

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

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i02294258

# **Crankshaft Front Seal - Remove**

SMCS - 1160-011

## **Removal Procedure**

### **Start By:**

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

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### **NOTICE**

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

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**Note:** Do not remove the crankshaft front seal at this time if the housing (front) will also be removed. It is easier to remove the crankshaft front seal when the housing (front) has been removed from the engine. Refer to this Disassembly and Assembly Manual, "Housing (Front) - Remove".

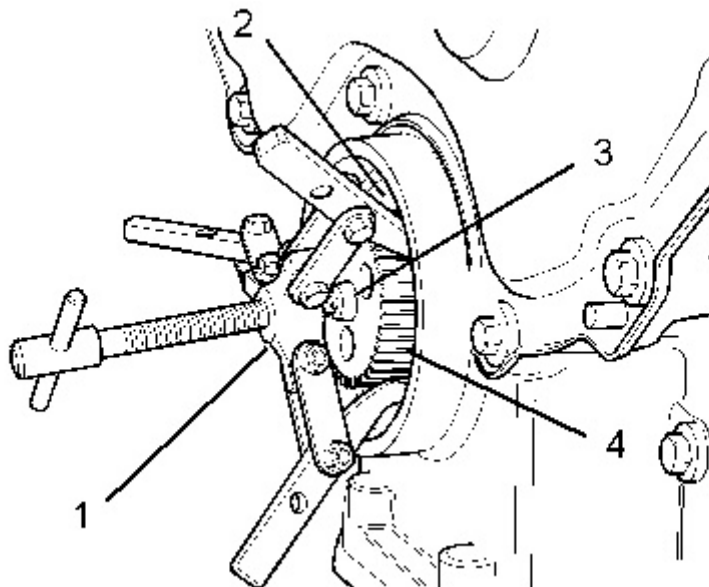


Illustration 1

g01020672

1. Use a suitable puller (1) with three legs and install the legs under the crankshaft front seal (2). Lock the legs into position.
2. Install a suitable adapter (3) between the crankshaft (4) and the puller (1).

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### NOTICE

**Ensure that the main lip is used in order to remove the crankshaft front seal. Do not damage the edge of the housing for the crankshaft front seal.**

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3. Use the puller (1) in order to remove the crankshaft front seal (2). Discard the crankshaft front seal (2).

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### NOTICE

**Ensure that the main lip is used in order to remove the crankshaft front seal. Do not damage the edge of the housing for the crankshaft front seal.**

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