

Product: INDUSTRIAL ENGINE  
Model: C1.6 INDUSTRIAL ENGINE C1M  
Configuration: C1.6 Industrial Engine C1M00001-UP

## Disassembly and Assembly C0.5, C0.7, C1.1/3011C, C1.5/3013C, C1.6 and C2.2/3024C/3024CT Industrial Engines and Engines for Caterpillar Built Machines

Media Number -REN2424-09

Publication Date -01/04/2007

Date Updated -14/07/2017

i02234874

# Flywheel Housing - Remove and Install

SMCS - 1157-010

## Removal Procedure (Engines with Flywheel Housing and Back plate)

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	138-7573	Link Bracket	1

### Start By:

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

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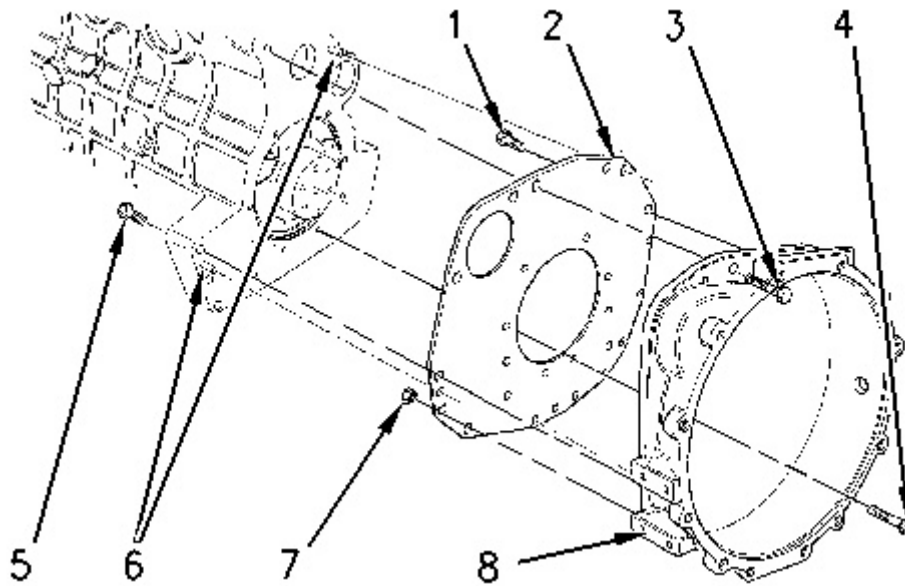
### NOTICE

**Keep all parts clean from contaminants.**

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

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1. Support the engine with a suitable lifting device or support the engine on blocks that are positioned on a flat level surface.
  2. Install tool (A) and a suitable lifting device to the flywheel housing. Support the weight of the housing (8).
-



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Illustration 1  
Typical example

g00827061

3. Remove the setscrews (3) that fasten the flywheel housing (8) to the cylinder block.
  4. Remove the setscrews (5) on each side of the cylinder block. These setscrews fasten the flywheel housing (8) to the cylinder block.
  5. Remove the setscrews (1) that fasten the back plate (2) to the flywheel housing (8).
  6. Remove the nuts (7) and the bolts (not shown) that fasten the back plate (2) to the flywheel housing (8).
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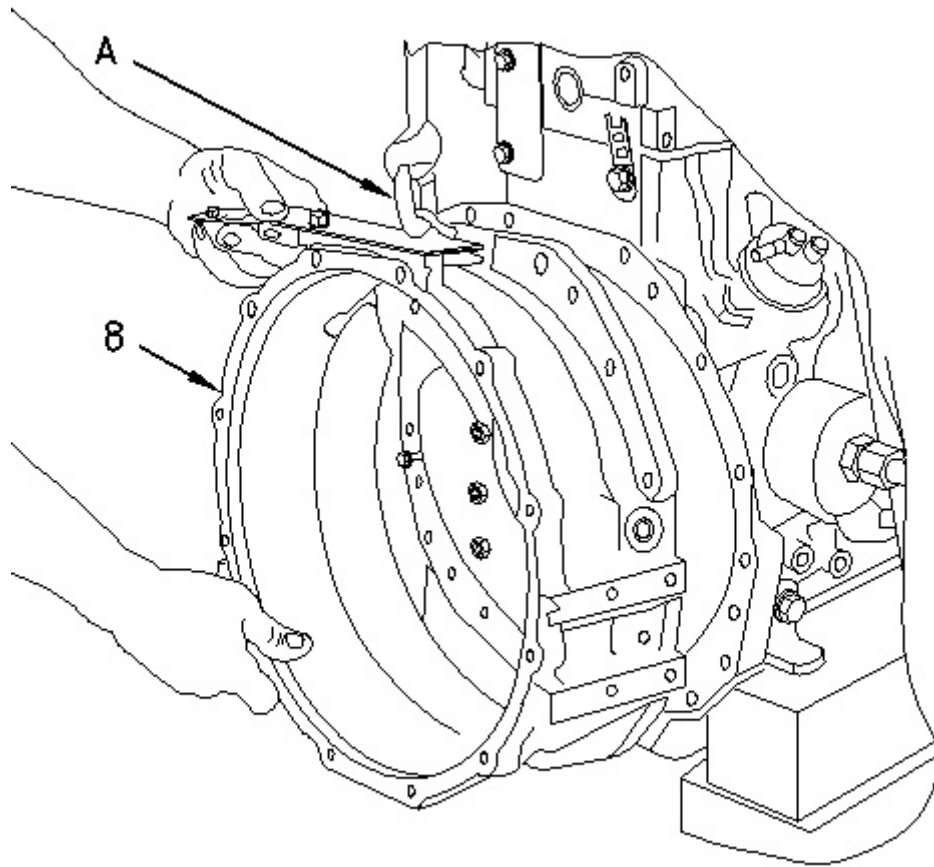


Illustration 2  
Typical example

g00826988

7. Use tool (A) and the lifting device to remove the flywheel housing (8) from the back plate.

## Removal Procedure (Engines with Flywheel Housing)

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
A	138-7573	Link Bracket	1

### Start By:

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

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**Note:** The two cylinder, the three cylinder and the four cylinder engines have different flywheel housings. The removal procedure is similar for all models.

1. Support the engine with a suitable lifting device or support the engine on blocks that are positioned on a flat level surface.
2. Install tool (A) and a suitable lifting device to the flywheel housing. Support the weight of the housing (2).

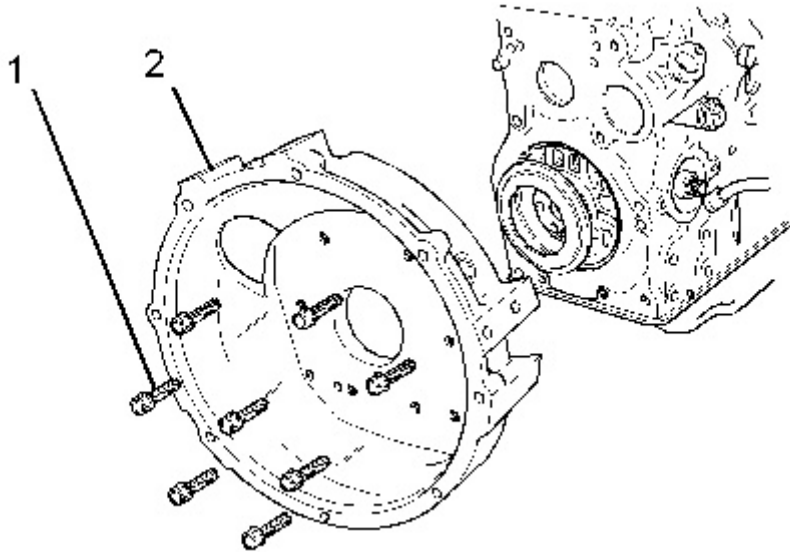


Illustration 3

g01123577

Typical example

3. Remove the setscrews (1) that fasten the flywheel housing (2) to the cylinder block.
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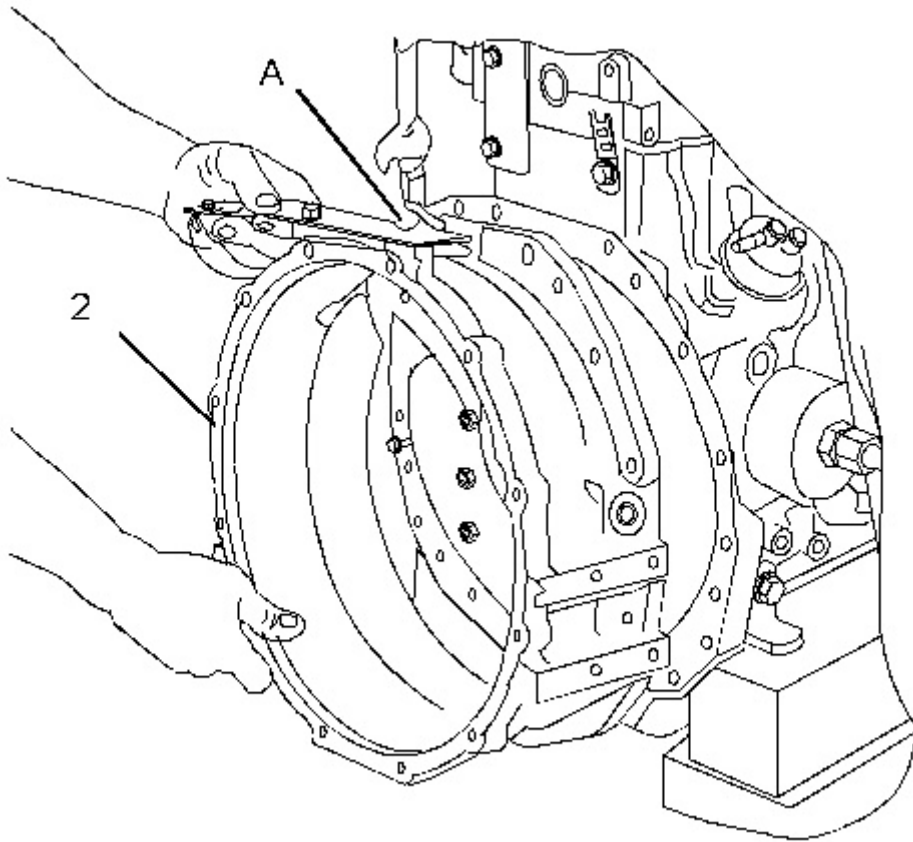


Illustration 4

g01126979

4. Use the tool (A) and the lifting device to remove the flywheel housing (2) from the engine.

## Installation Procedure (Engines with Flywheel Housing and Back plate)

Table 3

Required Tools			
Tool	Part Number	Part Description	Qty
A	138-7573	Link Bracket	1

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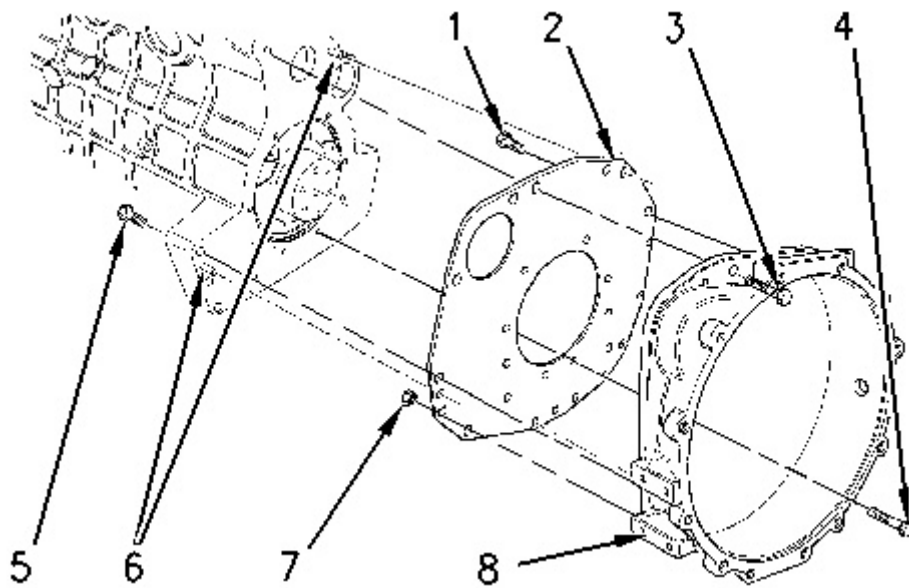
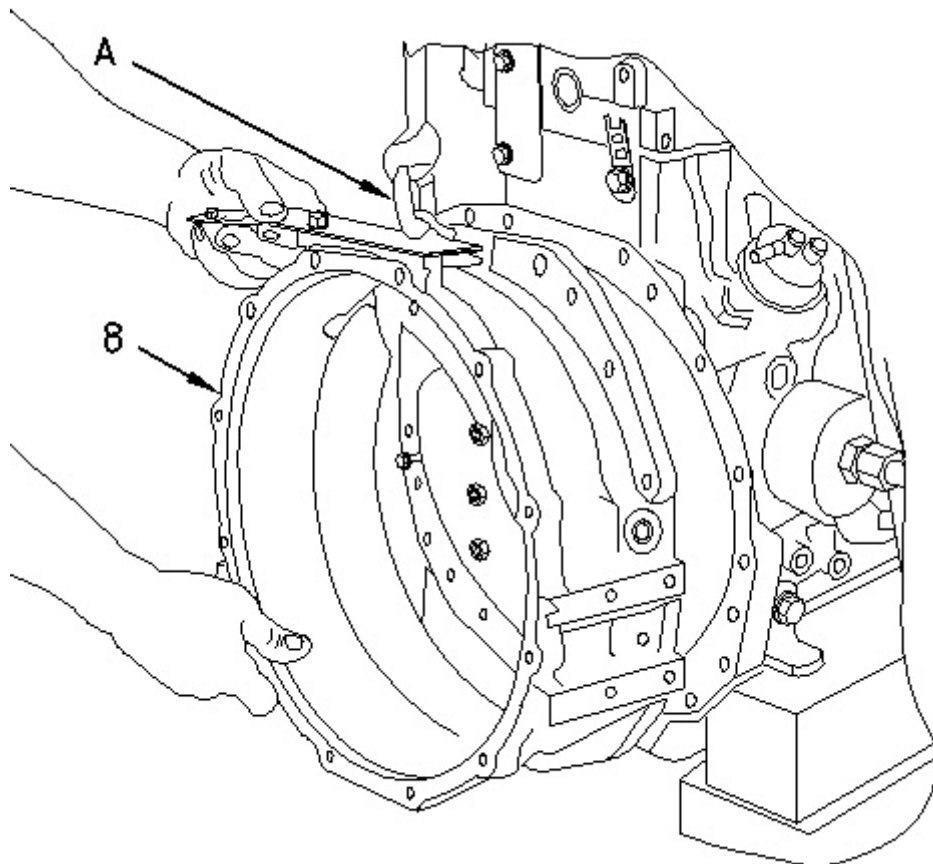


Illustration 5  
Typical example

g00827061

1. Clean the rear face of the back plate (2) and the faces of the flywheel housing (8). Inspect the crankshaft rear seal (not shown) for leaks. Inspect the dowels (6) for damage. If the crankshaft rear seal or the dowels are damaged, use new parts for replacement. Refer to Disassembly and Assembly, "Crankshaft Rear Seal - Remove" and Disassembly and Assembly, "Crankshaft Rear Seal - Install".



2. Use tool (A) and the lifting device to align the flywheel housing (8) to the dowels (6). Install the flywheel housing to the back plate.
3. Install the nuts (7) and the bolts (not shown) that fasten the back plate (2) to the flywheel housing (8).
4. Install the setscrews (1) that fasten the back plate (2) to the flywheel housing (8).
5. Install the setscrews (5) on each side of the cylinder block. These setscrews fasten the flywheel housing (8) to the cylinder block.
6. Remove the tool (A) and the lifting device from the flywheel housing.
7. Install the setscrews (3) that fasten the flywheel housing (8) to the cylinder block.
8. For C1.5/3013C, C2.2/3024C and C2.2/3024CT engines, tighten the fasteners to a torque of 25 N·m (19 lb ft).

**End By:**

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

## Installation Procedure (Engines with Flywheel Housing)

Table 4

<b>Required Tools</b>			
<b>Tool</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Qty</b>
<b>A</b>	138-7573	Link Bracket	1

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**NOTICE**

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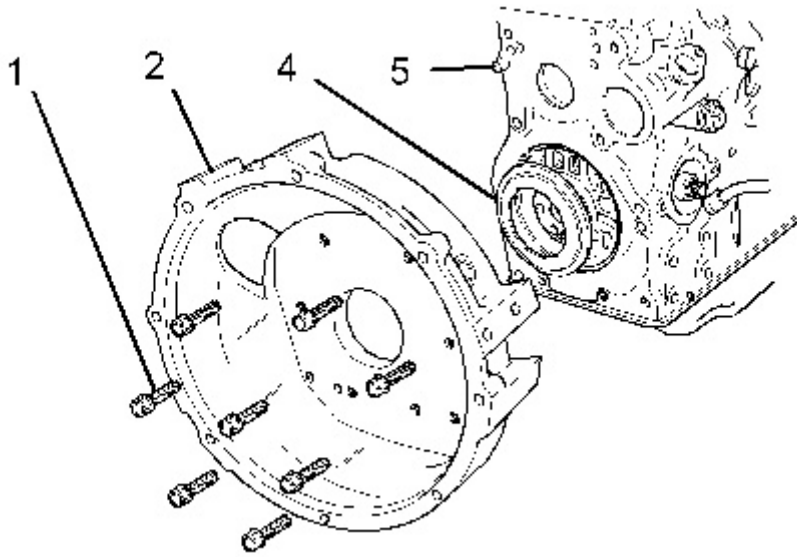
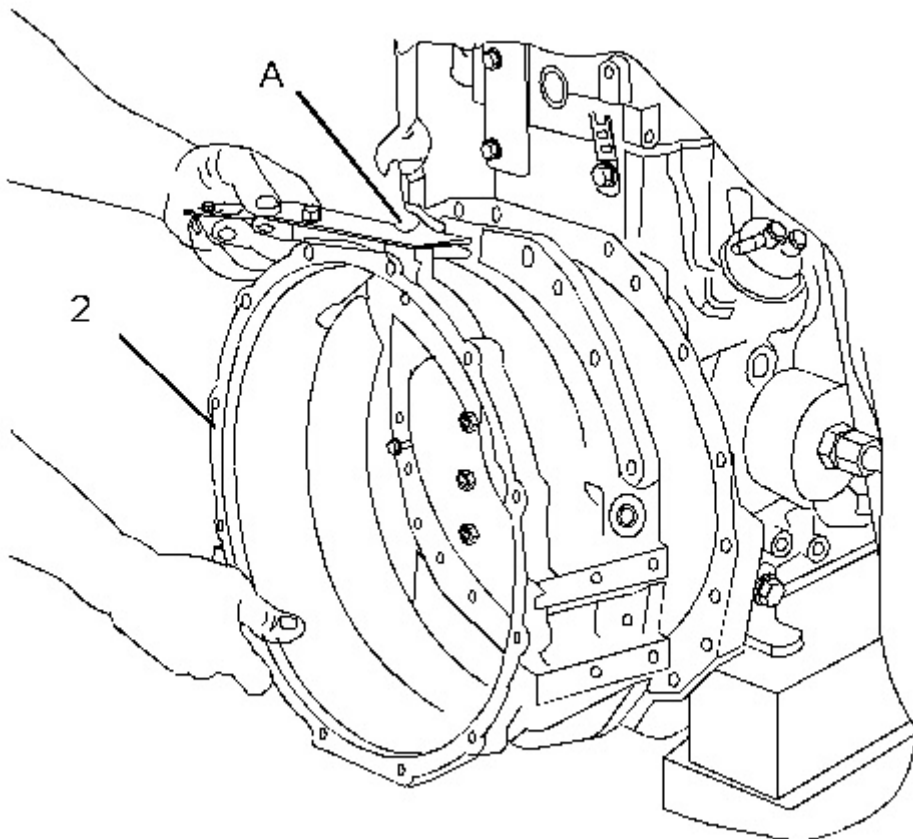


Illustration 7  
Typical example

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1. Clean the mating face of the flywheel housing (2). Inspect the crankshaft rear seal (4) for leaks. Inspect the dowels (5) for damage. If the crankshaft rear seal or the dowels are damaged, use new parts for replacement. Refer to Disassembly and Assembly, "Crankshaft Rear Seal - Remove" and Disassembly and Assembly, "Crankshaft Rear Seal - Install".





## Typical example

2. Use tool (A) and the lifting device to align the flywheel housing (2) to the dowels (5). Install the flywheel housing to the engine.
3. Install the setscrews (1) that fasten the flywheel housing to the cylinder block.  
  
For C0.5 and C0.7 engines, tighten the setscrews to a torque of 15 N·m (11 lb ft).  
  
For C1.1/3011C and C1.6 engines, tighten the setscrews to a torque of 50 N·m (37 lb ft).  
  
For C1.5/3013C engines, tighten the setscrews to a torque of 25 N·m (19 lb ft).
4. Remove tool (A) and the lifting device from the flywheel housing.

**End By:**

- a. Install the flywheel. Refer to Disassembly and Assembly, "Flywheel - Install".
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Product: INDUSTRIAL ENGINE  
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## Disassembly and Assembly C0.5, C0.7, C1.1/3011C, C1.5/3013C, C1.6 and C2.2/3024C/3024CT Industrial Engines and Engines for Caterpillar Built Machines

Media Number -REN2424-09

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i02235578

# Crankshaft Pulley - Remove and Install

SMCS - 1205-010

## Removal Procedure

### Start By:

- a. Remove the fan drive belt. Refer to Disassembly and Assembly, "V Belts Remove and Install" for more information.

Table 1

Required Tools			
Tool	Part Number	Description	Qty
A	8S-2264	Puller Group	1
	6V-3668	Bolt	3

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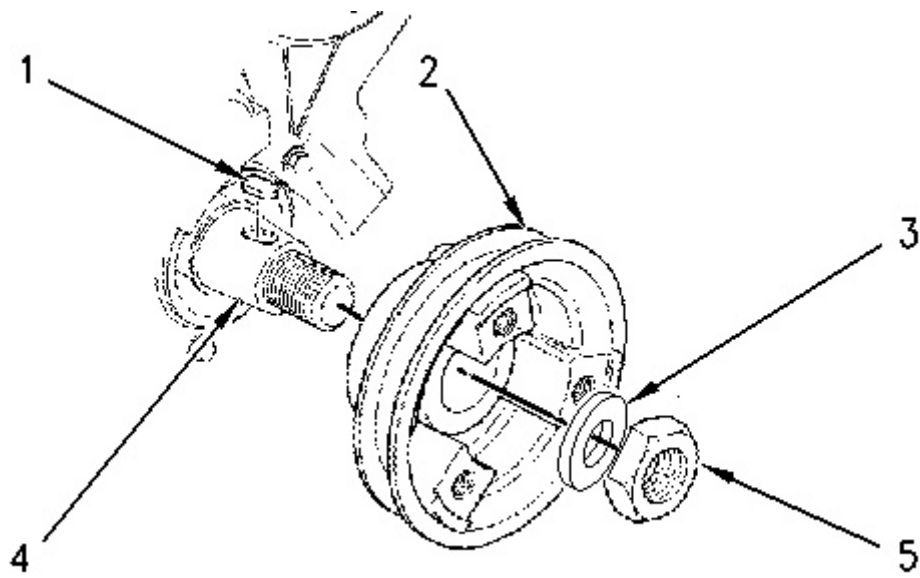


Illustration 1

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1. Remove the nut (5) and the washer (3) from the crankshaft pulley (2).

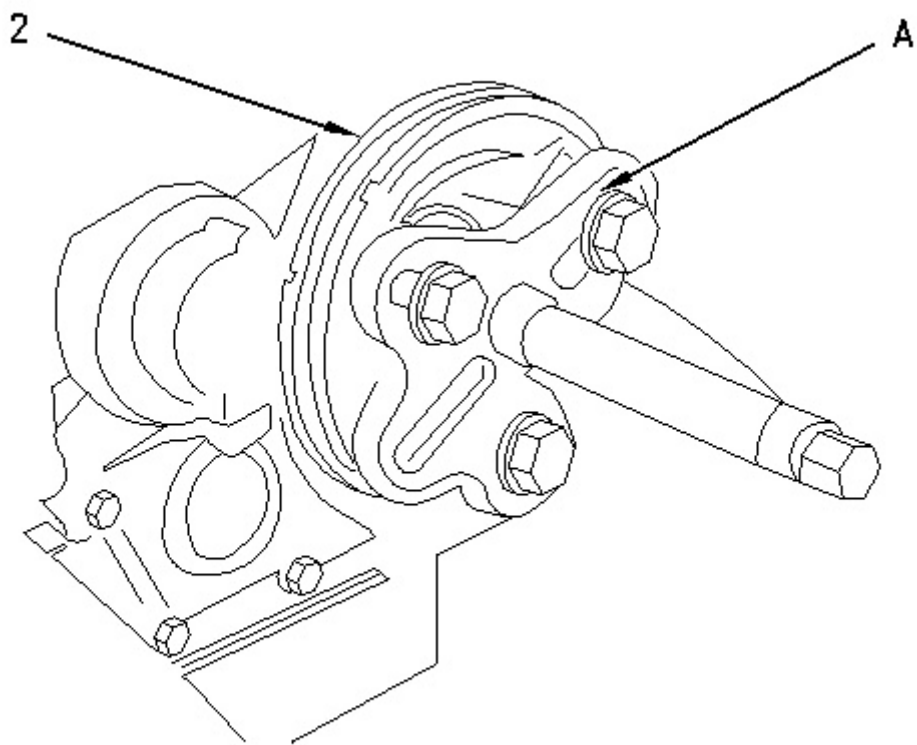


Illustration 2

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2. Install tool (A). Use tool (A) in order to remove the crankshaft pulley (2) from the crankshaft (4).

3. Remove the woodruff key (1) from the crankshaft (4).

## Installation Procedure

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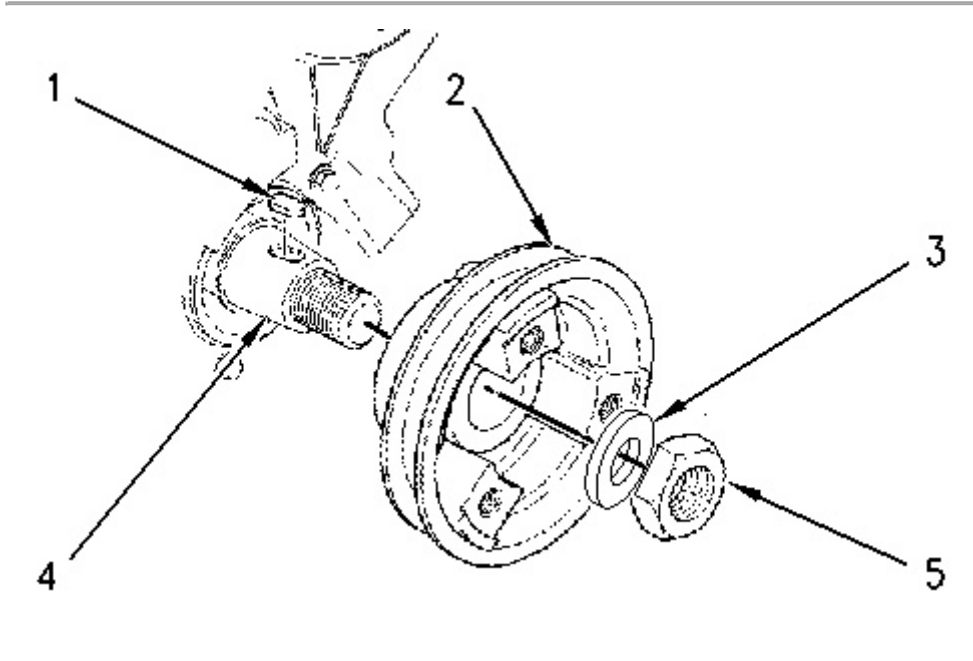


Illustration 3

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**Note:** Inspect the following components for damage: the taper of the crankshaft, the woodruff key and the bore of the crankshaft pulley. Replace any components that are damaged. Ensure that the taper of the crankshaft and the bore of the crankshaft pulley are clean and dry before assembly.

1. Install the woodruff key (1) to the crankshaft (4).
2. Install the crankshaft pulley (2) to the crankshaft (4).
3. Install the washer (3) to the crankshaft (4).
4. Lubricate the nut (5) with clean engine oil and install the nut.

For C0.5 and C0.7 engines, tighten the nut (5) to a torque of 93 N·m (69 lb ft).

For C1.1/3011C and C1.6 engines, tighten the nut (5) to a torque of 123 N·m (91 lb ft).

For C1.5/3013C, C2.2/3024C and C2.2/3024CT engines, tighten the nut (5) to a torque of 304 N·m (224 lb ft).

### End By:

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

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Media Number -REN2424-09

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i02237294

### **Crankshaft Front Seal - Remove**

SMCS - 1160-011

### **Removal Procedure for the Front Oil Seal that is Installed in the Engine**

Table 1

<b>Required Tools</b>			
<b>Tool</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Qty</b>
A	1U-8145	Drill Bit	1
B	1U-7600	Slide Hammer Puller Gp	1

#### **Start By:**

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

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#### **NOTICE**

**Keep all parts clean from contaminants.**

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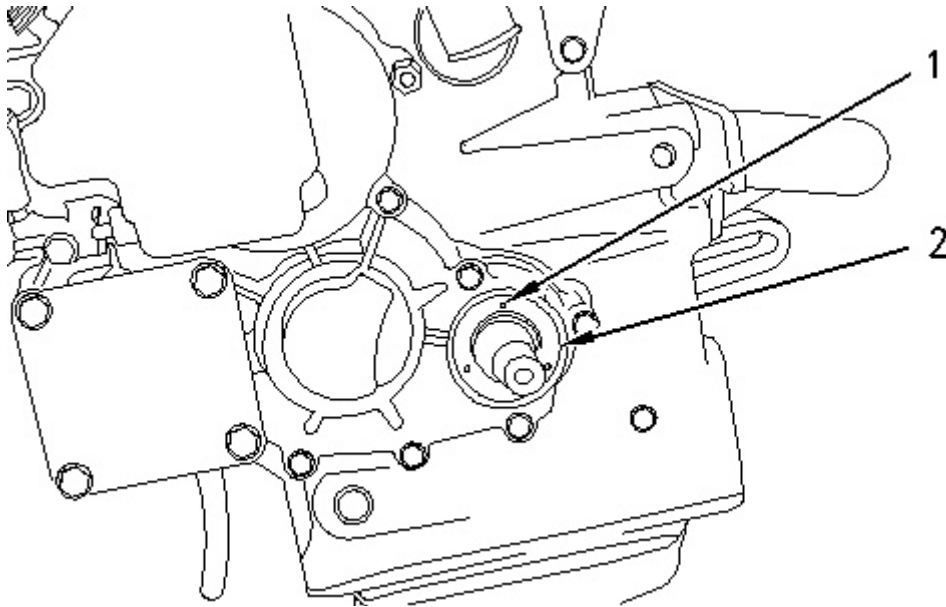
#### **NOTICE**

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.

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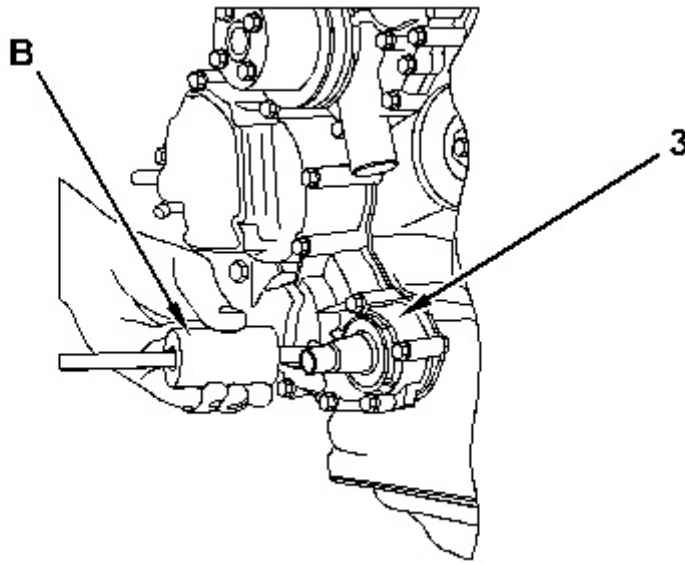


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Illustration 1  
typical example

g00827263

1. Use Tooling (A) and carefully drill three evenly spaced holes (1) in crankshaft front seal (2).
-



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Illustration 2  
Typical example

g01037807

2. Carefully remove the crankshaft front seal by alternating the position of Tooling (B) from one hole to another hole. This will allow you to evenly remove the crankshaft front seal from housing (3).

**Note:** Do not damage the flange of the crankshaft during the removal process of the crankshaft front seal.

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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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## Removal Procedure for the Front Oil Seal from a Disassembled Front Cover

### Start By:

- a. Remove the crankshaft pulley. Refer to Disassembly and Assembly, "Crankshaft Pulley - Remove and Install".
- b. Remove the housing (Front). Refer to Disassembly and Assembly, "Housing (Front) - Remove".

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### NOTICE

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1. If the front cover has been removed from the engine, use a suitable hydraulic press in order to remove the oil seal from the front cover. Ensure that the front cover is supported correctly in order to prevent damage to the cover while the oil seal is being removed.
- 

### **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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## **Disassembly and Assembly C0.5, C0.7, C1.1/3011C, C1.5/3013C, C1.6 and C2.2/3024C/3024CT Industrial Engines and Engines for Caterpillar Built Machines**

Media Number -REN2424-09

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Date Updated -14/07/2017

i02237296

## **Crankshaft Front Seal - Install**

SMCS - 1160-012

### **Installation Procedure**

Table 1

<b>Required Tools</b>			
<b>Tool</b>	<b>Part Number</b>	<b>Part Description</b>	<b>Qty</b>
A	5P-3537	Seal Guide	1

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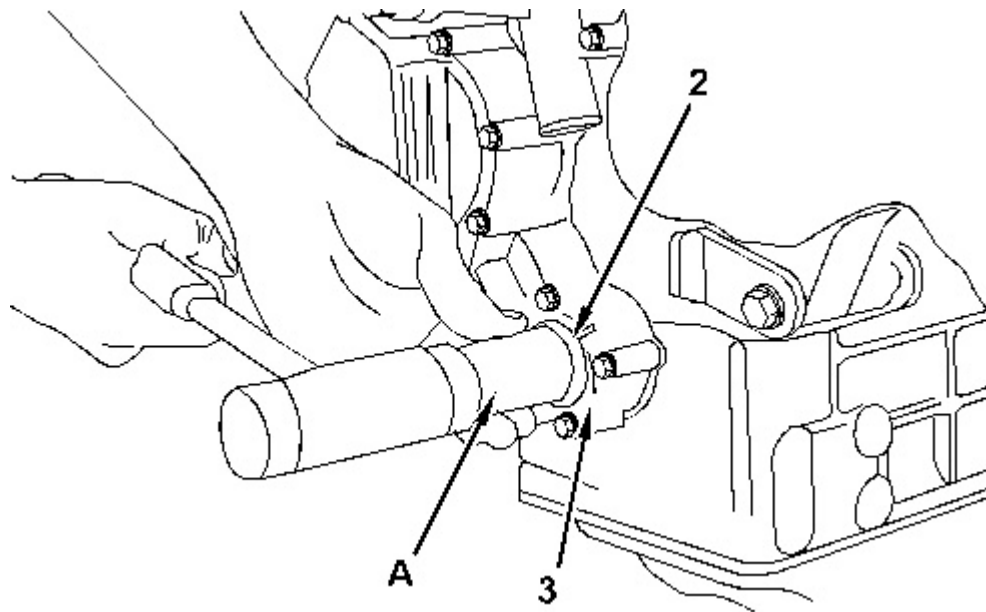
### **NOTICE**

**Keep all parts clean from contaminants.**

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Illustration 1  
typical example

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1. Clean housing (3) for crankshaft front seal (2) and inspect the housing for any damage.
2. Lubricate the lip of crankshaft front seal (2) with clean engine oil.
3. Position crankshaft front seal (2) in housing (3) for the crankshaft front seal.

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### NOTICE

**Ensure that the lip of the crankshaft front seal that is spring loaded is facing toward the inside of the front housing and that it is square with the bore of the housing for the crankshaft front seal.**

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4. Use Tooling (A) to install new crankshaft front seal (2).
5. Apply clean engine oil on the area of the crankshaft pulley that will be in contact with crankshaft front seal (2).

### End By:

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

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## **Disassembly and Assembly C0.5, C0.7, C1.1/3011C, C1.5/3013C, C1.6 and C2.2/3024C/3024CT Industrial Engines and Engines for Caterpillar Built Machines**

Media Number -REN2424-09

Publication Date -01/04/2007

Date Updated -14/07/2017

i03631161

### **Housing (Front) - Remove**

SMCS - 1151-011

### **Removal Procedure**

#### **Start By:**

- A. Remove the fuel injection pump. Refer to Disassembly and Assembly, "Fuel Injection Pump - Remove".
- B. Remove the crankshaft pulley. Refer to Disassembly and Assembly, "Crankshaft Pulley - Remove and Install".

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#### **NOTICE**

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#### **NOTICE**

**If the front housing is not installed, do not turn the crankshaft.  
Damage to the engine may occur.**

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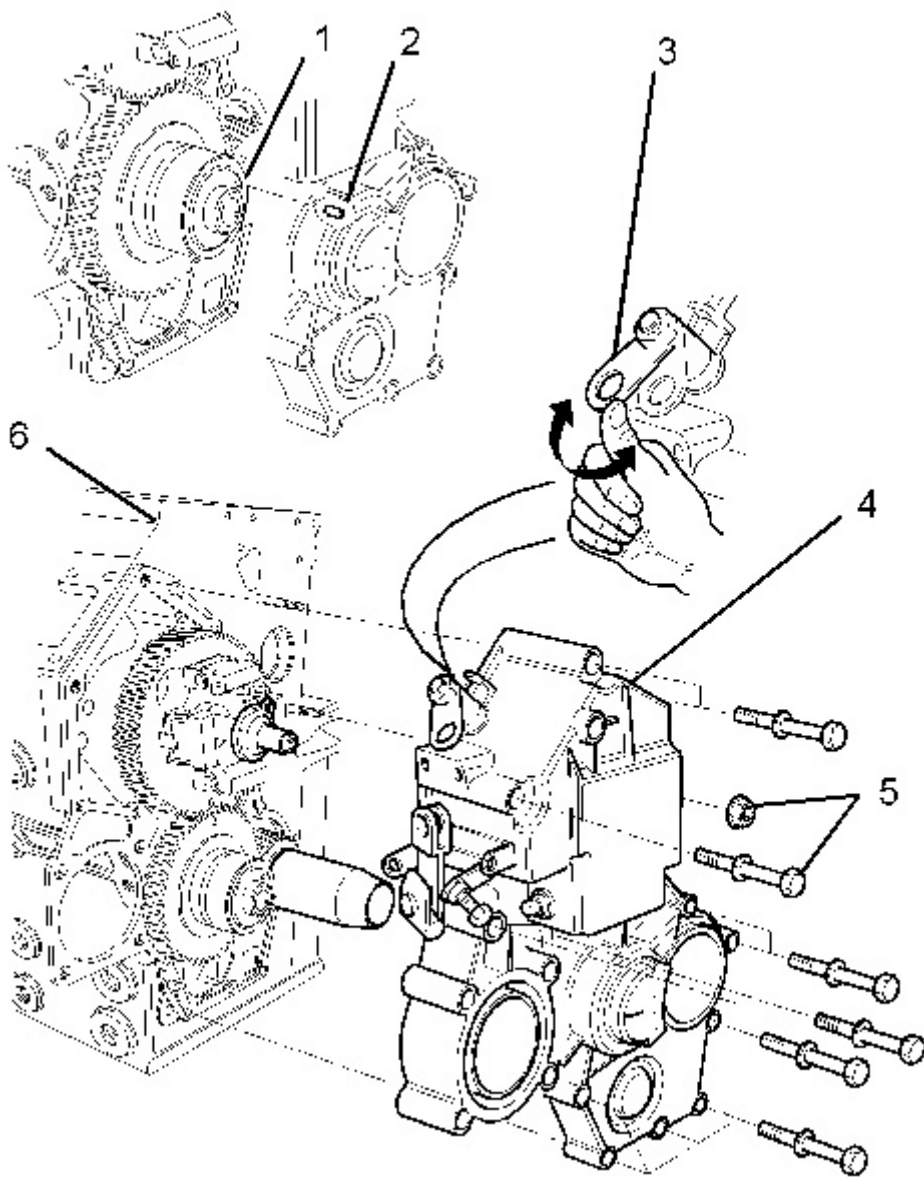
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Dispose of all fluids according to local regulations and mandates.



Typical example

1. Remove the setscrews and the nuts (5) from the front housing (4) .
2. Turn the mechanical stop lever (3) to the full clockwise position so that the spring is held under tension.
3. Remove the front housing (4) from the front of cylinder block (6) .

**Note:** Identify the position of the locating pin (2) and the locating hole (1) for installation.

4. Remove the joint for the front housing (not shown). Discard the joint.
  5. Inspect the front housing assembly (4) for wear or damage. If the front housing assembly is damaged, use new parts for replacement.
-

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## **Disassembly and Assembly C0.5, C0.7, C1.1/3011C, C1.5/3013C, C1.6 and C2.2/3024C/3024CT Industrial Engines and Engines for Caterpillar Built Machines**

Media Number -REN2424-09

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i02233016

## **Housing (Front) - Disassemble**

SMCS - 1151-015

### **Disassembly Procedure**

#### **Start By:**

- a. Remove the engine front housing. Refer to Disassembly and Assembly, "Housing (Front) - Remove".

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#### **NOTICE**

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

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**! WARNING**

**Personal injury can result from being struck by parts propelled by a released spring force.**

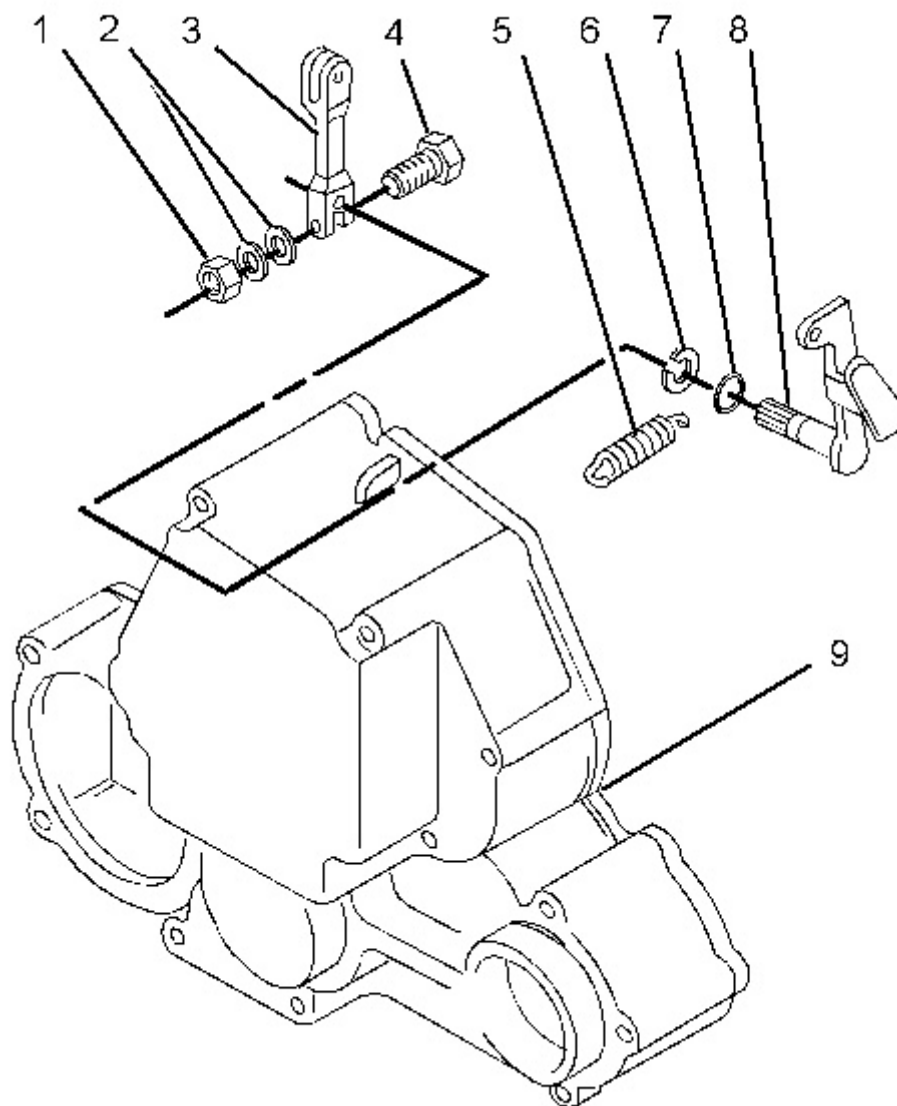
**Make sure to wear all necessary protective equipment.**

**Follow the recommended procedure and use all recommended tooling to release the spring force.**

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### Removal of the Throttle Control

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