



Service Repair Manual

Model

320C U and 320C LU 320CLU Excavator

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Product: EXCAVATOR

Model: 320C EXCAVATOR PAC

Configuration: 320C U & 320C LU Excavators PAC00001-UP (MACHINE) POWERED BY 3066 Engine

**Disassembly and Assembly
3064 and 3066 Engines for Caterpillar Built Machines**

Media Number -SEN5553-10

Publication Date -01/05/2012

Date Updated -15/05/2012

i05421135

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	1
B	1P-0510	Driver Group	1

Start By:

- A. Remove the electric starting motor.
- B. Remove the flywheel and ring gear.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

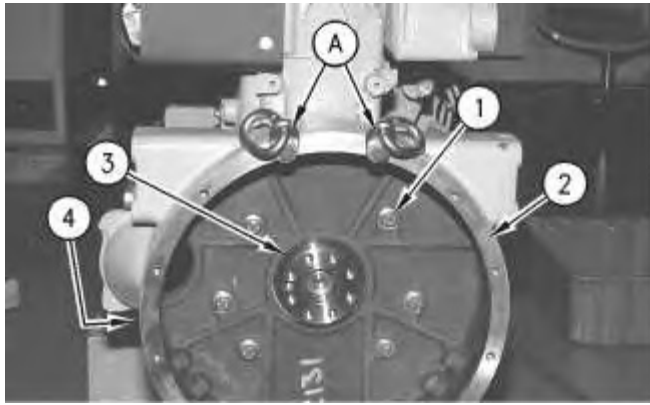


Illustration 1

g00605593

1. Install Tooling (A) , a strap, and a suitable lifting device onto flywheel housing (2) .
2. Remove bolts (1) and the washers that secure flywheel housing (2) to the cylinder block.
Note: Identify the four shorter bolts for later installation into the flywheel housing.
3. Remove flywheel housing (2) . The weight of the flywheel is approximately .29 kg (65 lb).
4. Check oil seal (3) for serviceability. If necessary, replace the oil seal and crankshaft wear sleeve.

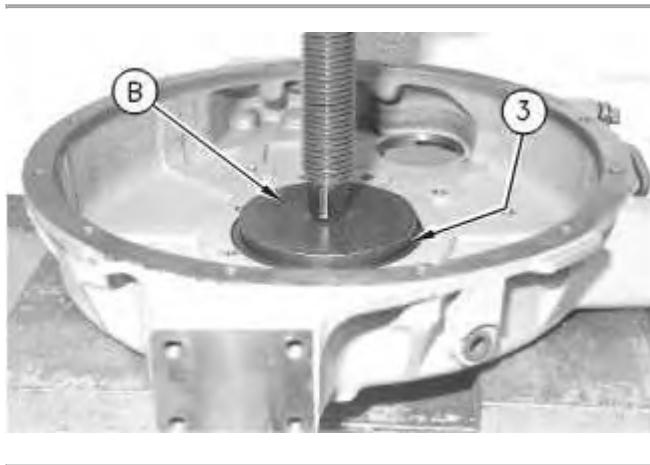


Illustration 2

g00605601

5. Use Tooling (B) in order to remove the oil seal (3) (not shown).

Installation Procedure

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
A	138-7575	Link Bracket	1

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NOTICE

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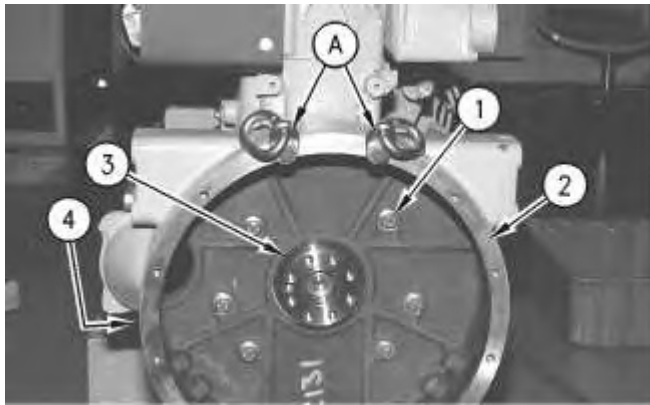


Illustration 3

g00605593

1. Clean old gasket material (4) from the mating surfaces of the cylinder block and the flywheel housing. Install a new gasket on the cylinder block.
2. Place flywheel housing (2) in position on the cylinder block.
3. Install the washers and bolts (1) in order to secure flywheel housing (2) to the cylinder block.
4. Use Tooling (B) in order to install the oil seal (3) , and the crankshaft wear sleeve (not shown).

End By:

- a. Install the flywheel.
- b. Install the electric starting motor.

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Publication Date -01/05/2012

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i01578488

Crankshaft Pulley - Remove and Install

SMCS - 1205-010

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	1P-2321	Combination Puller	1
B	6V-9120	Socket ⁽¹⁾	1

⁽¹⁾ Tool (B) is a 46 mm socket.

Start By:

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

NOTICE

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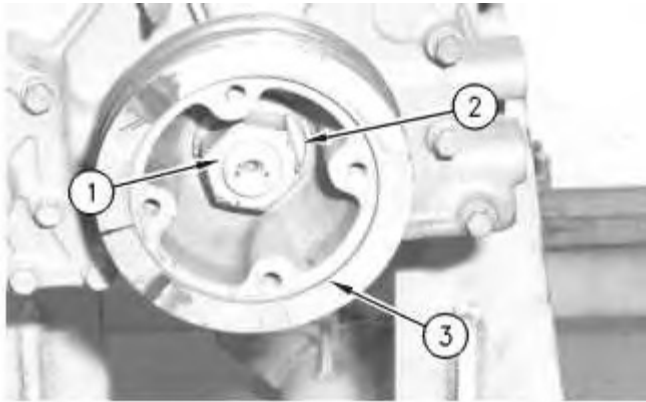


Illustration 1

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1. Use Tool (B) to remove nut (1) and washer (2) from the threaded end of the crankshaft.

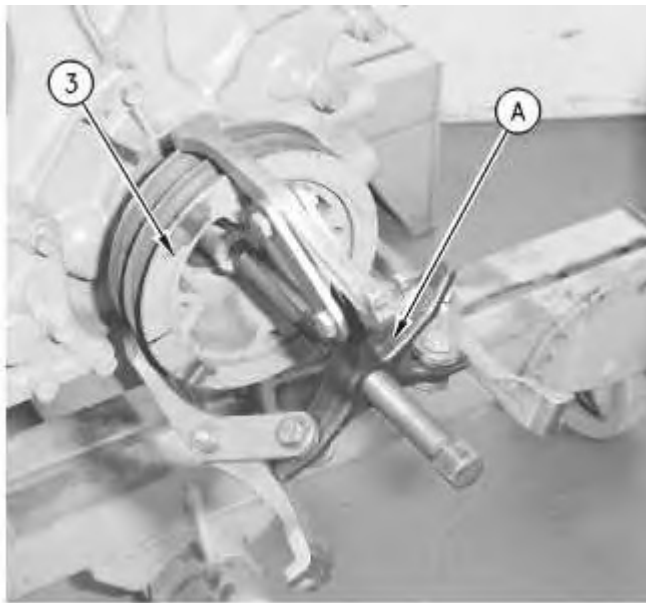


Illustration 2

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2. Use Tool (A) to remove crankshaft pulley (3) from the engine.
-

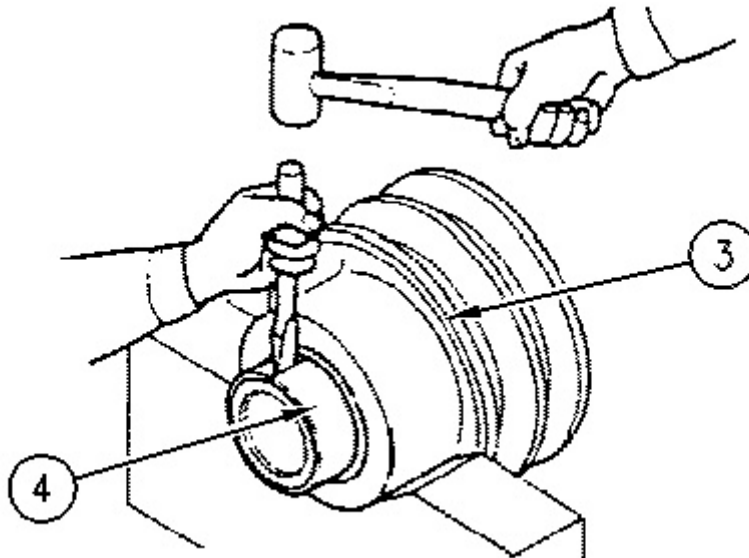


Illustration 3

g00604792

3. If it is necessary to remove the wear sleeve (4) from the crankshaft pulley (3), use a hammer and a chisel. Hold the chisel at right angles to the surface of the wear sleeve. Tap the wear sleeve in three places. You can remove the wear sleeve once the tension is released.

Installation Procedure

NOTICE

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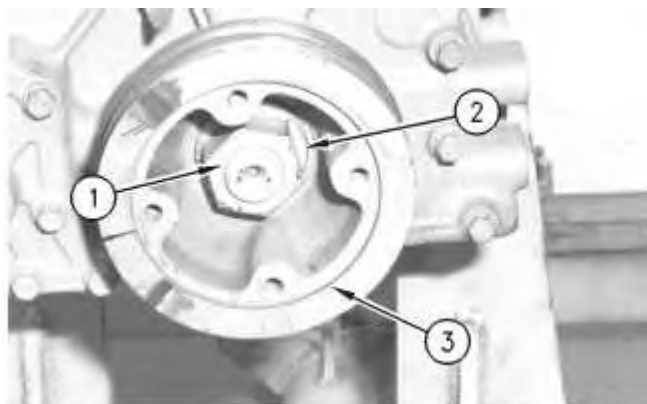


Illustration 4

g00604778

1. Put crankshaft pulley (3) in position on the engine.
2. Install washer (2) and nut (1). Use Tool (B) to tighten nut (1) to a torque of $490 \pm 10 \text{ N}\cdot\text{m}$ ($361 \pm 7 \text{ lb ft}$).

End By: Install the V-belts. Refer to Disassembly and Assembly, "V-Belts - Remove and Install".

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Media Number -SEN5553-10

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i01131366

Crankshaft Front Seal - Remove

SMCS - 1160-011

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	1U-7600	Slide Hammer Puller	1

Start By:

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

NOTICE

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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, "Caterpillar Tools and Shop Products Guide" for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

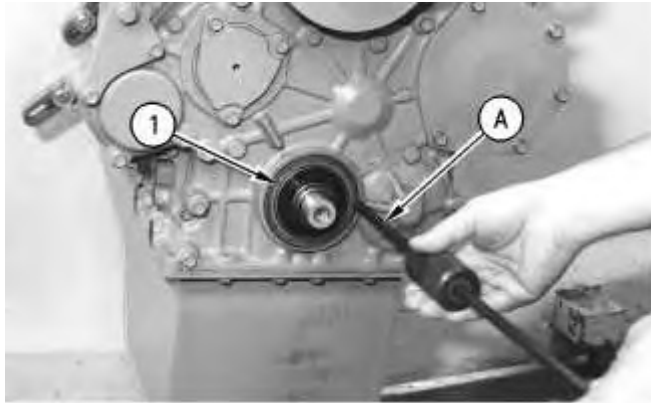


Illustration 1

g00529162

1. Drill three evenly spaced 3 mm (0.12 inch) holes in crankshaft front seal (1) .
2. Use Tool (A) and remove crankshaft front seal (1). Remove the seal evenly by alternating the position of Tool (A) from hole to hole.

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

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i02080454

Crankshaft Front Seal - Install

SMCS - 1160-012

Installation Procedure

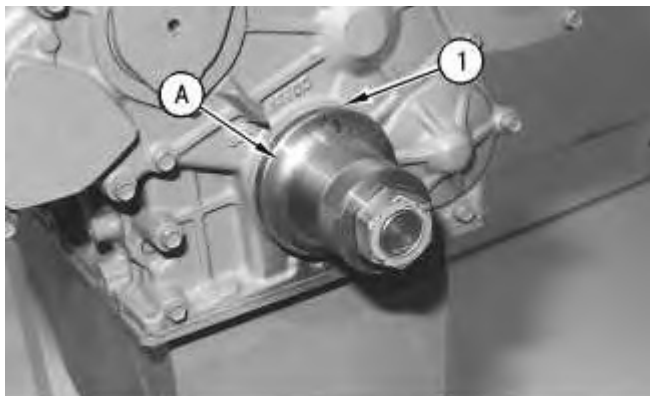
Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	9U-6180	Front Seal Installer	1

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.



1. Clean the faces of all the mating parts. Apply a thin coat of clean engine oil to a new crankshaft front seal.
2. Install new crankshaft front seal (1) in the front housing with Tool (A) .
3. Remove Tooling (A) and check crankshaft front seal (1) for correct installation.
4. Apply clean engine oil to the face of the crankshaft pulley that will be in contact with the new crankshaft front seal.

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

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**Disassembly and Assembly
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i01615339

Gear Group (Front) - Remove - Idler Gear Only

SMCS - 1206-011

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	9U-6148	Idler Shaft Puller	1
B	1P-0510	Driver Group	1

Start By:

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

NOTICE

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NOTICE

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Dispose of all fluids according to local regulations and mandates.

Note: Before removal, ensure that the marks on the timing gears are in alignment. Align the fuel injection drive gear with the "33" mark with the "3" mark on the idler gear. Make an alignment of the "2" mark on the camshaft gear with the "22" mark on the idler gear. Align the "1" mark on the crankshaft gear with the "11" mark on the idler gear. The No. 1 cylinder is at the top center position when these marks are in alignment.

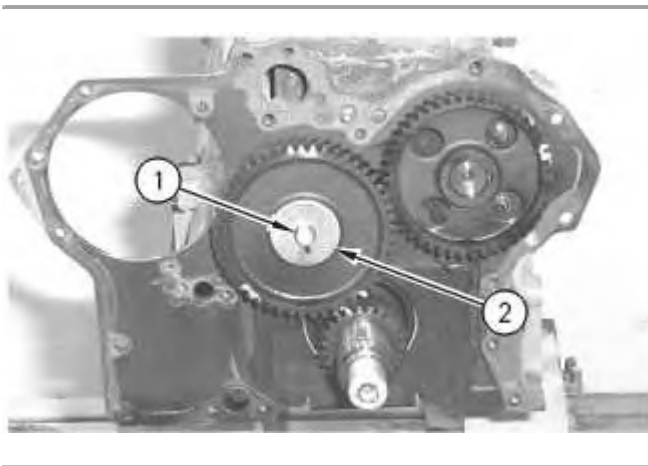


Illustration 1

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1. Remove idler gear bolt (1) and the washer from the idler gear shaft .
2. Remove thrust plate (2) from the idler gear shaft.



3. Remove idler gear (3) from the idler gear shaft.

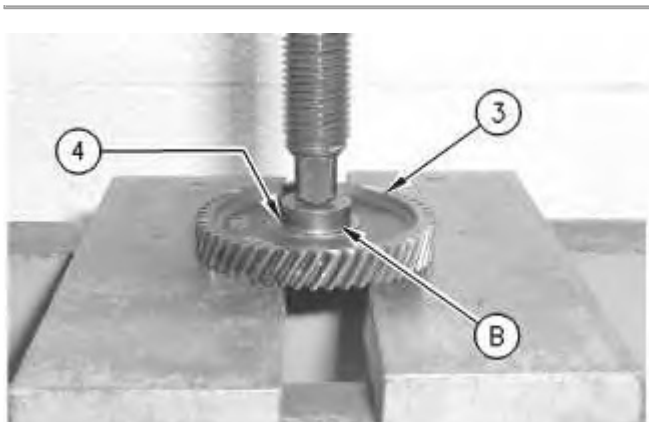


Illustration 3

4. If necessary, use Tool (A) to remove bushing (4) (not shown) from idler gear (3) .

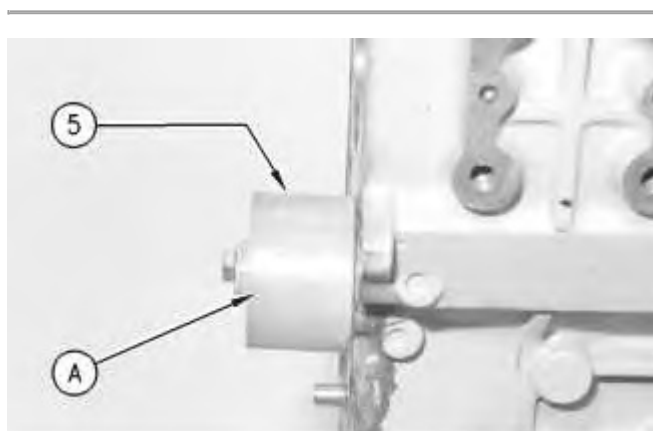


Illustration 4

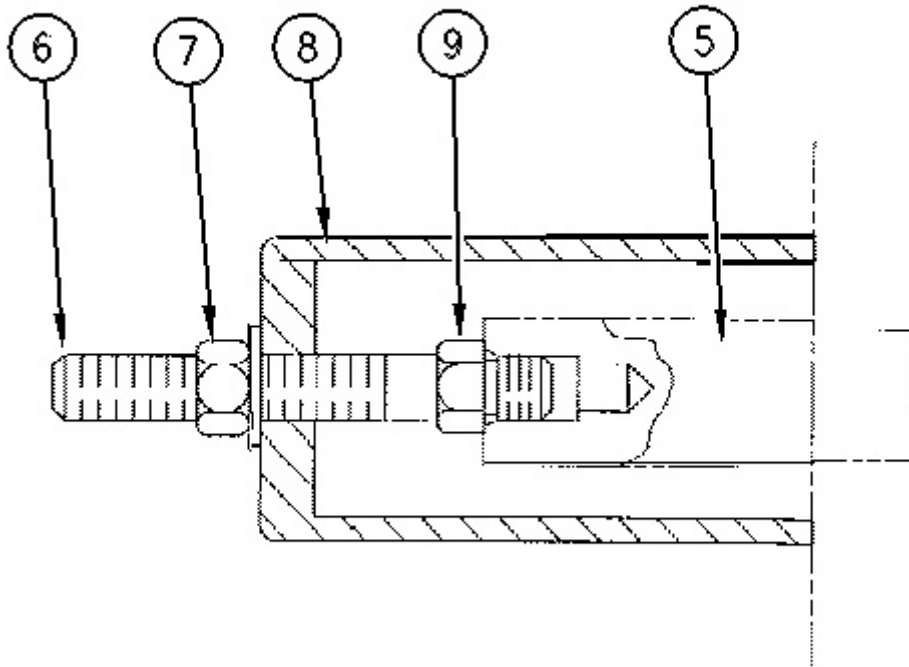


Illustration 5

g00611573

5. The following items are components of Tool (A) .
 - **9U-6147** Stud (6)
 - **6V-8231** Nut (7)
 - **9U-6146** Sleeve Assembly (8)
 - **8T-4244** Nut (9)
6. Use Tool (A) and remove idler shaft (5) from the cylinder block. Check the idler shaft for wear and damage. Replace the shaft, if necessary.

Note: See the following list for the removal of the other gears in the front gear group.

- In order to remove the camshaft gear, refer to Disassembly and Assembly, "Camshaft - Remove".
- In order to remove the fuel injection pump gear, refer to Disassembly and Assembly, "Fuel Injection Pump - Remove".
- In order to remove the gear from the engine oil pump, refer to Disassembly and Assembly, "Engine Oil Pump - Remove".
- In order to remove the crankshaft gear, refer to Disassembly and Assembly, "Crankshaft Gear - Remove and Install".

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i01615420

Gear Group (Front) - Install - Idler Gear Only

SMCS - 1206-012

Installation Procedure

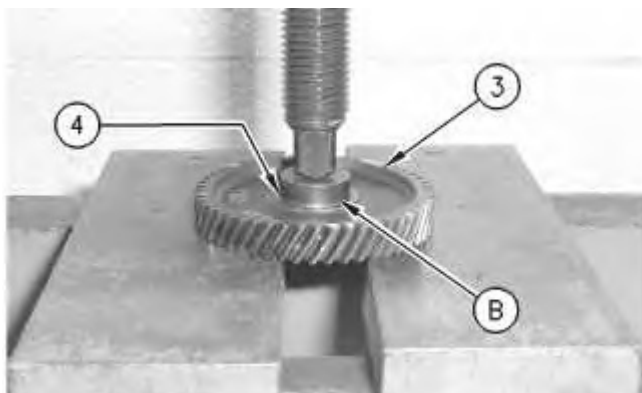
Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	1P-0510	Driver Group	1

NOTICE

Keep all parts clean from contaminants.

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1. Use Tool (A) to install a new bushing (4) (not shown), if the bushing was removed.

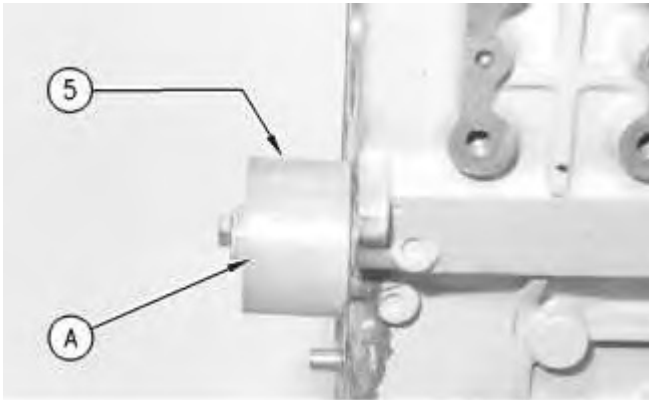


Illustration 2

2. Install idler shaft (5) onto the cylinder block.

Note: When the idler shaft is installed, ensure that the oil hole of the shaft is up. If necessary, cool the idler shaft to 0 °C (32 °F) before installation. The temperature of the idler shaft is lowered in order to ease the installation of the idler shaft.



Illustration 3

Note: Ensure that the marks on the timing gears are in alignment. Align the fuel injection drive gear with the "33" mark with the "3" mark on idler gear. Make an alignment of the "2" mark on the camshaft gear with the "22" mark on the idler gear. Align the "1" mark on the crankshaft gear with the "11" mark on the idler gear. The No. 1 cylinder is at the top center position when these marks are in alignment.

3. Install idler gear (3) onto the idler shaft.

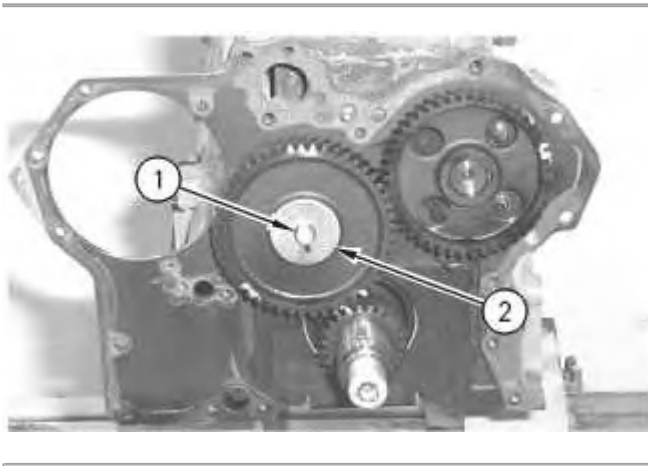


Illustration 4

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4. Install thrust plate (2) onto the idler shaft.
5. Install the washer and idler gear bolt (1) onto thrust plate (2). Tighten idler gear bolt (1) to a torque of $34 \pm 5 \text{ N}\cdot\text{m}$ ($25 \pm 4 \text{ lb ft}$).

Note: For more information, refer to Specifications, "Gear Group (Front)".

Note: See the following list for the installation of the other gears in the front gear group.

- In order to install the camshaft gear, refer to Disassembly and Assembly, "Camshaft - Install".
- In order to install the fuel injection pump gear, refer to Disassembly and Assembly, "Fuel Injection Pump - Install".
- In order to install the gear from the engine oil pump, refer to Disassembly and Assembly, "Engine Oil Pump - Install".
- In order to install the crankshaft front gear, refer to Disassembly and Assembly, "Crankshaft Gear - Remove and Install".

End By: Install the front housing. Refer to Disassembly and Assembly, "Housing (Front) - Install".

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i01615434

Housing (Front) - Remove

SMCS - 1151-011

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	1P-0510	Driver Group	1

Start By:

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

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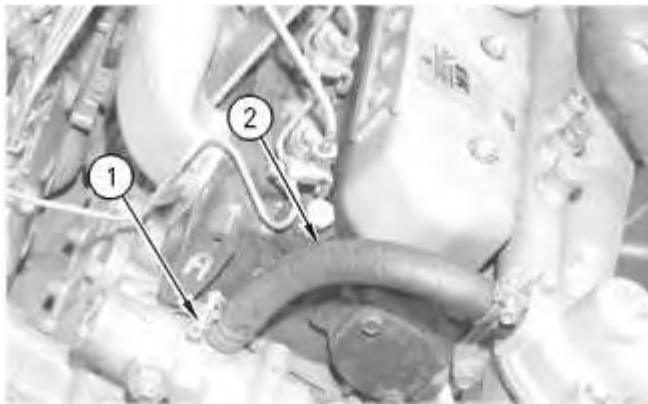


Illustration 1

g00605981

1. Loosen hose clamp (1) that secures hose (2) to the front housing.
2. Disconnect hose (2) from the front housing.

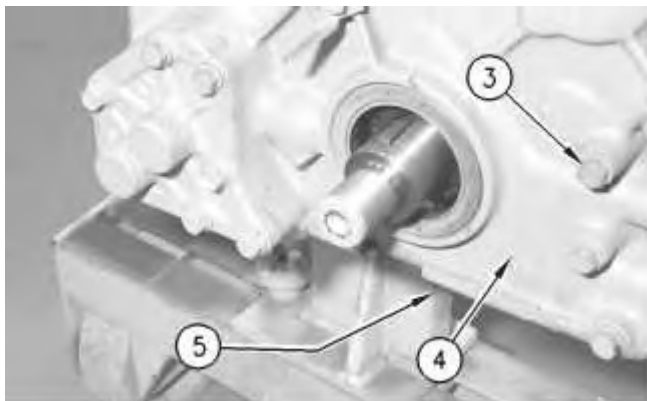


Illustration 2

g00605985

3. Remove bolts (3) and the washers that hold front housing (4) to the plate and the cylinder block.
4. Remove six bolts (5) (not shown) and the washers that mount the front housing (4) to the oil pan.

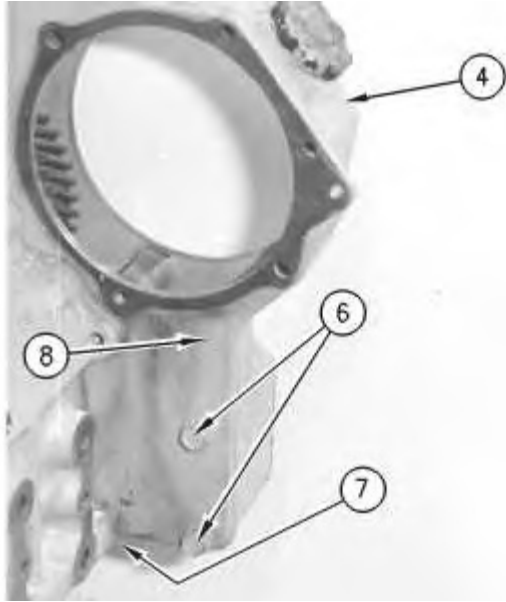
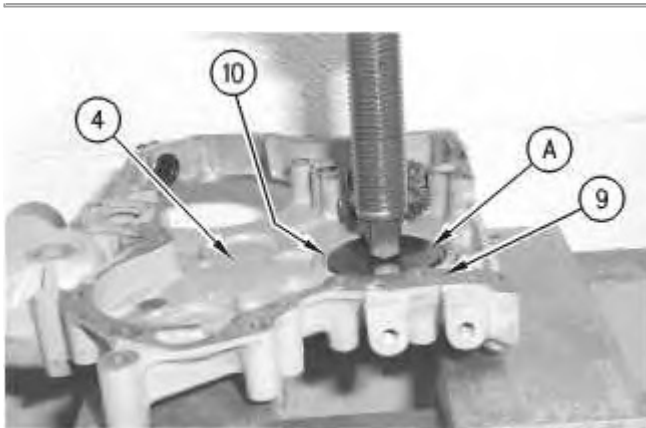


Illustration 3

g00606002

5. Remove two bolts (6) and the washers that mount the front housing (4) to the front plate (8) and the cylinder block.
6. Use two technicians to remove the front housing from the cylinder block and the front plate. The weight of the front housing is 20 kg (45 lb).

Note: Check the condition of the gasket (7) (not shown) for the engine oil pan. If the gasket is damaged, it may be necessary to replace the gasket. Refer to Disassembly and Assembly, "Engine Oil Pan - Remove and Install" for replacement of the gasket for the engine oil pan.





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7. Remove old gasket material (9) from the mating surface of front housing (4) and the timing gear plate.

Note: Check the condition of crankshaft front seal (10) (not shown). If the crankshaft front seal is worn or damaged, use a new part for replacement.

8. Use Tool (A) to remove the crankshaft front seal (10) (not shown) from the front housing (4), if necessary.
9. Check the teeth of the timing gears for the following items: wear, nicks, chips and uneven contact. Check the keyway for wear or damage.

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