



Service Repair Manual

Models

320D LRR Excavator

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Product: EXCAVATOR

Model: 320D LRR EXCAVATOR DHE

Configuration: 320D LRR Excavator DHE00001-UP (MACHINE) POWERED BY C6.4 Engine

**Disassembly and Assembly
C6.4 Engine for Caterpillar Built Machines**

Media Number -KENR8106-09

Publication Date -01/10/2017

Date Updated -18/10/2017

i02741773

Engine Oil Pump - Remove

SMCS - 1304-011

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	1P-2320	Combination Puller	1
B	1P-0510	Driver Group	1

Start By:

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

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.

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.

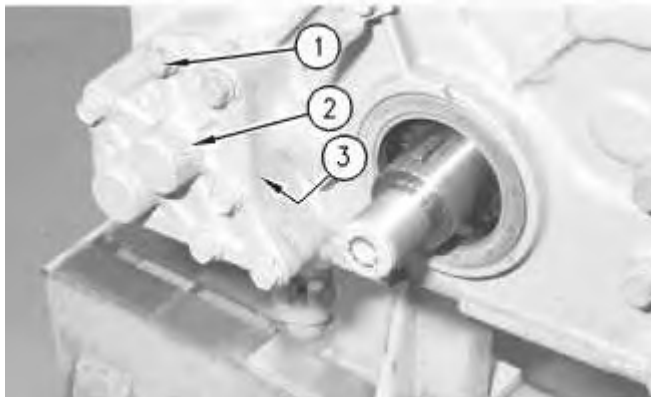


Illustration 1

g00607826

Note: Illustration 1 does not show that the front housing is removed from the cylinder block.

1. Remove bolts (1) from the cover (2).
2. Remove cover (2) for the engine oil pump from the front housing. Remove gasket (3) (not shown).

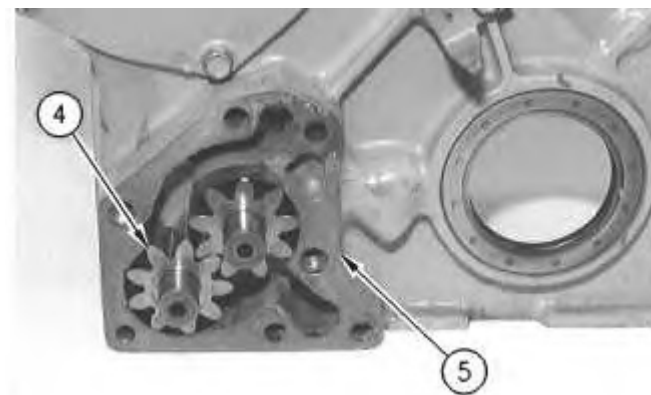


Illustration 2

g00607770

3. Remove driven gear (4) for the oil pump. Pull the gear straight out of the front housing (5) (slip fit).
-

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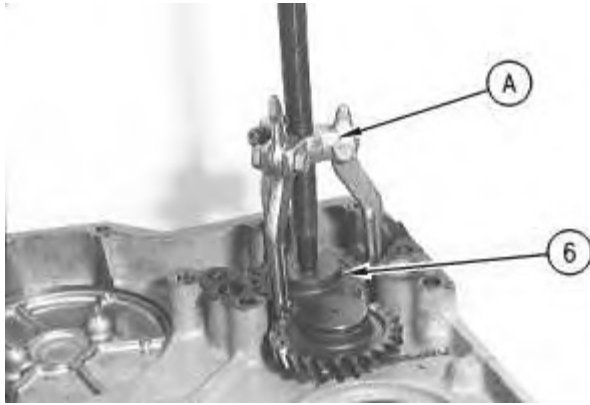


Illustration 3

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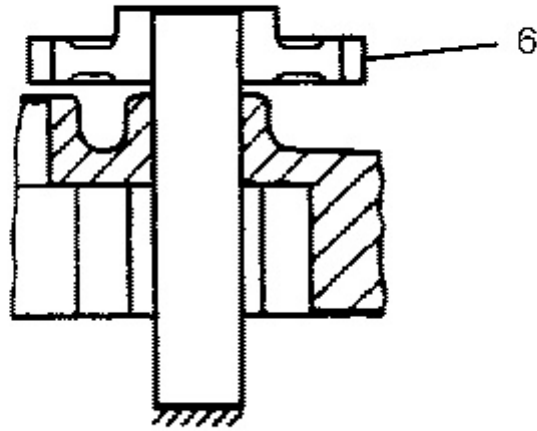


Illustration 4

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4. Use Tooling (A) in order to remove oil pump gear (6) from the front housing.

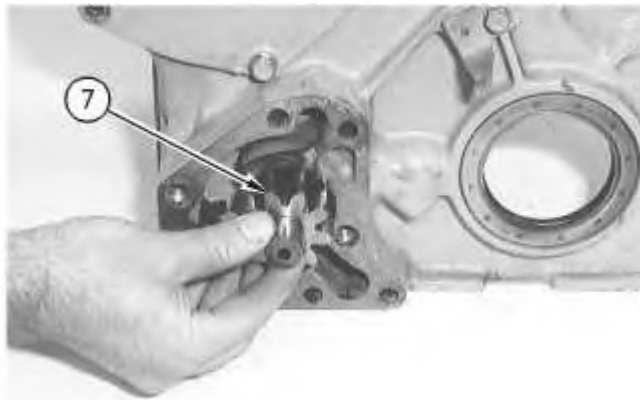


Illustration 5

g00607885

5. Remove drive gear (7) from the front housing.

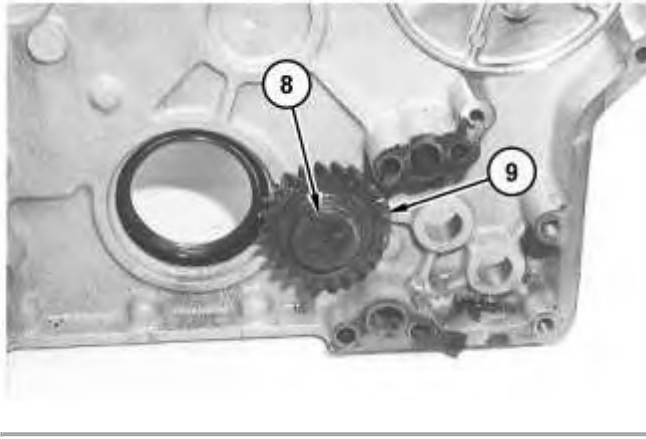


Illustration 6

g01374076

6. Remove spindle (8) and idler gear (9) as an assembly.

Note: Use care not to damage the pump idler gear and the crankshaft gear.

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Disassembly and Assembly C6.4 Engine for Caterpillar Built Machines

Media Number -KENR8106-09

Publication Date -01/10/2017

Date Updated -18/10/2017

i02741820

Engine Oil Pump - Install

SMCS - 1304-012

Installation Procedure

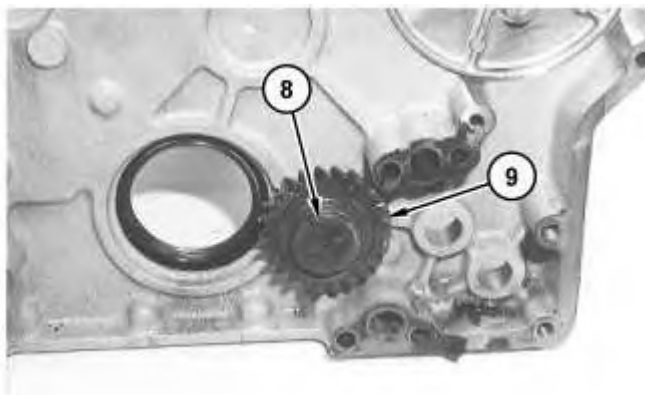
Table 1

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

NOTICE

Keep all parts clean from contaminants.

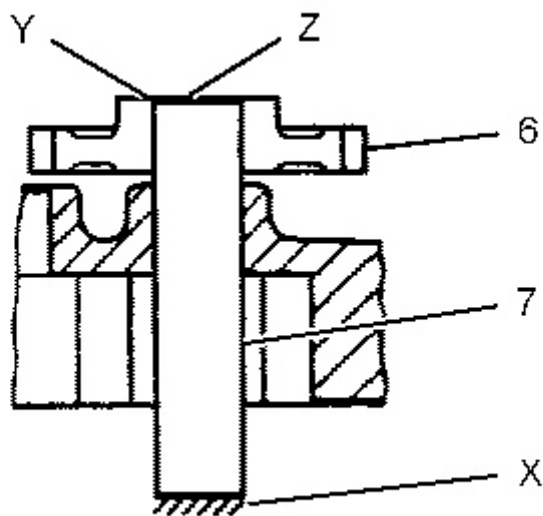
Contaminants may cause rapid wear and shortened component life.



1. Lower the temperature of the spindle (8). Install spindle (8) and idler gear (9) as an assembly in the front housing.



2. Lower the temperature of the drive gear assembly. Install drive gear (7) in the front housing.



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

3. Raise the temperature of oil pump gear (6). Support End (X) of the shaft of drive gear (7). Use Tooling (B) in order to install oil pump gear (6) onto the shaft. The end of the Gear (Z) should be flush with the end of the Shaft (Y).

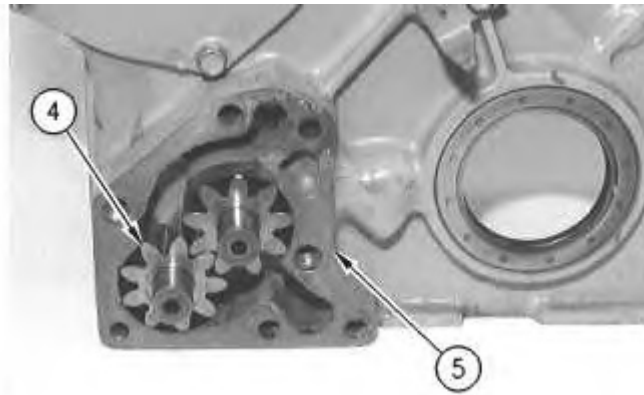


Illustration 4

g00607770

4. Install driven gear (4) into the front housing.

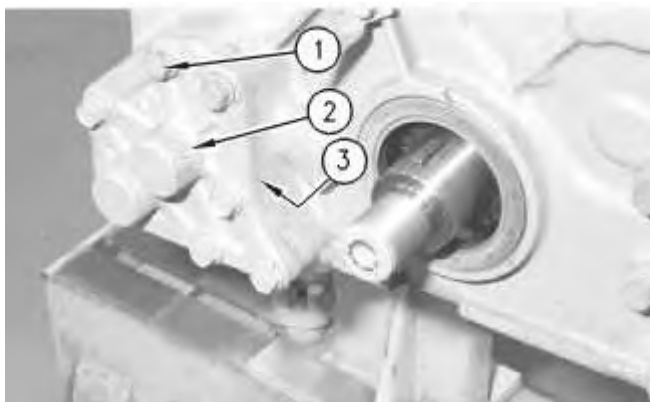


Illustration 5

g00607826

5. Position gasket (3) (not shown) and cover (2) onto the front housing.

Note: Ensure that the old gasket material is removed from the mating surfaces.

6. Install the washers and bolts (1) that secure cover (2) to the front housing. Tighten bolts (1) to a torque of $34 \pm 5 \text{ N}\cdot\text{m}$ ($25 \pm 4 \text{ lb ft}$).

Refer to the Specifications Module, "Engine Oil Pump" for more information on the engine oil pump.

End By:

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

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Product: EXCAVATOR

Model: 320D LRR EXCAVATOR DHE

Configuration: 320D LRR Excavator DHE00001-UP (MACHINE) POWERED BY C6.4 Engine

Disassembly and Assembly C6.4 Engine for Caterpillar Built Machines

Media Number -KENR8106-09

Publication Date -01/10/2017

Date Updated -18/10/2017

i02741485

Water Pump - Remove

SMCS - 1361-011

Removal Procedure



At operating temperature, the engine coolant is hot and under pressure.

Steam can cause personal injury.

Check the coolant level only after the engine has been stopped and the filler cap is cool enough to touch with the bare hand.

Remove the filler cap slowly to relieve pressure.

Cooling system conditioner contains alkali. Avoid contact with skin and eyes to prevent personal injury.

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.

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. Remove the belt. Refer to Operation and Maintenance Manual, "Belts - Inspect/Adjust/Replace".



Illustration 1

g01373990

2. Remove bolts (1) and remove water pump pulley (2).



Illustration 2

g01373996

3. Remove bolts (3), water pump (4), and the O-ring seal.
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**Disassembly and Assembly
C6.4 Engine for Caterpillar Built Machines**

Media Number -KENR8106-09

Publication Date -01/10/2017

Date Updated -18/10/2017

i02741528

Water Pump - Disassemble

SMCS - 1361-015

Disassembly Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	1P-2321	Combination Puller	1
B	1P-1861	Retaining Ring Pliers	1
C	1P-0510	Driver Group	1

Start By:

- a. Remove the water pump. Refer to Disassembly and Assembly, "Water Pump - Remove".

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.



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

Note: If the water pump is heated up to 80 °C (176 °F), the components can be easily removed.

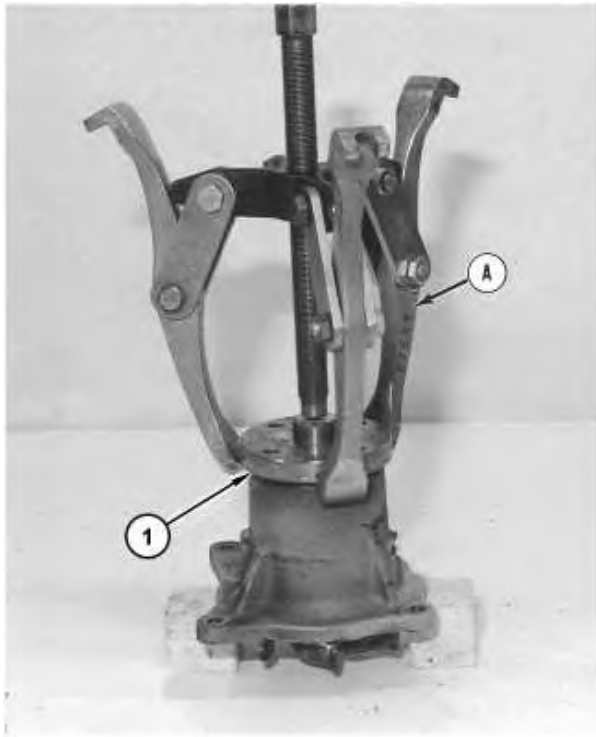


Illustration 1

g01374016

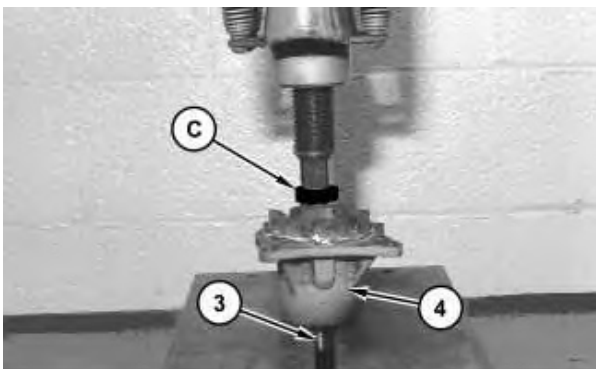
1. Use Tooling (A) in order to remove flange (1) from the water pump.



Illustration 2

g01374022

2. Use Tooling (B) in order to remove retaining ring (2) from the water pump.



3. Use a suitable press and Tooling (C) in order to remove shaft assembly (3) from water pump housing (4).

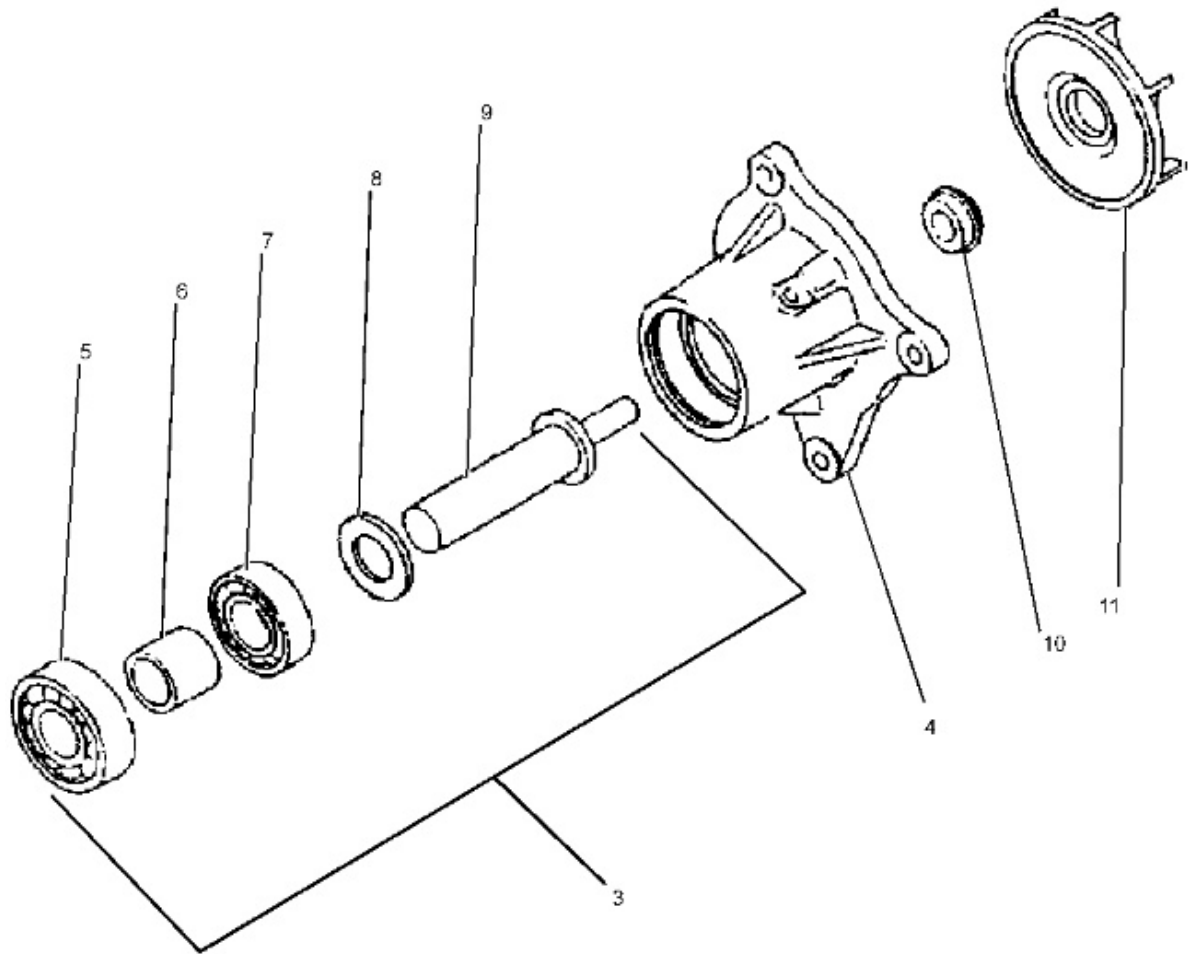


Illustration 4

g01374030

4. Remove impeller (11) from shaft assembly (3).

Note: Check the impeller for wear, corrosion, and metal to metal contact. Replace the impeller, if necessary.

5. Remove bearing (5), spacer (6), bearing (7), and washer (8) from shaft (9).
6. Check seal (10) for wear and damage. Use Tooling (C) in order to remove seal (10) from the water pump housing (4), if necessary.

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Disassembly and Assembly C6.4 Engine for Caterpillar Built Machines

Media Number -KENR8106-09

Publication Date -01/10/2017

Date Updated -18/10/2017

i02741533

Water Pump - Assemble

SMCS - 1361-016

Assembly Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
B	1P-1861	Retaining Ring Pliers	1
C	1P-0510	Driver Gp	1
D	1P-0765	Seal Guide	1

Note: Refer to Specifications, "Water Pump" for specifications that are required during assembly.

Note: Check the O-ring seals, the gaskets, and the seals for wear or for damage. Replace the components, if necessary.

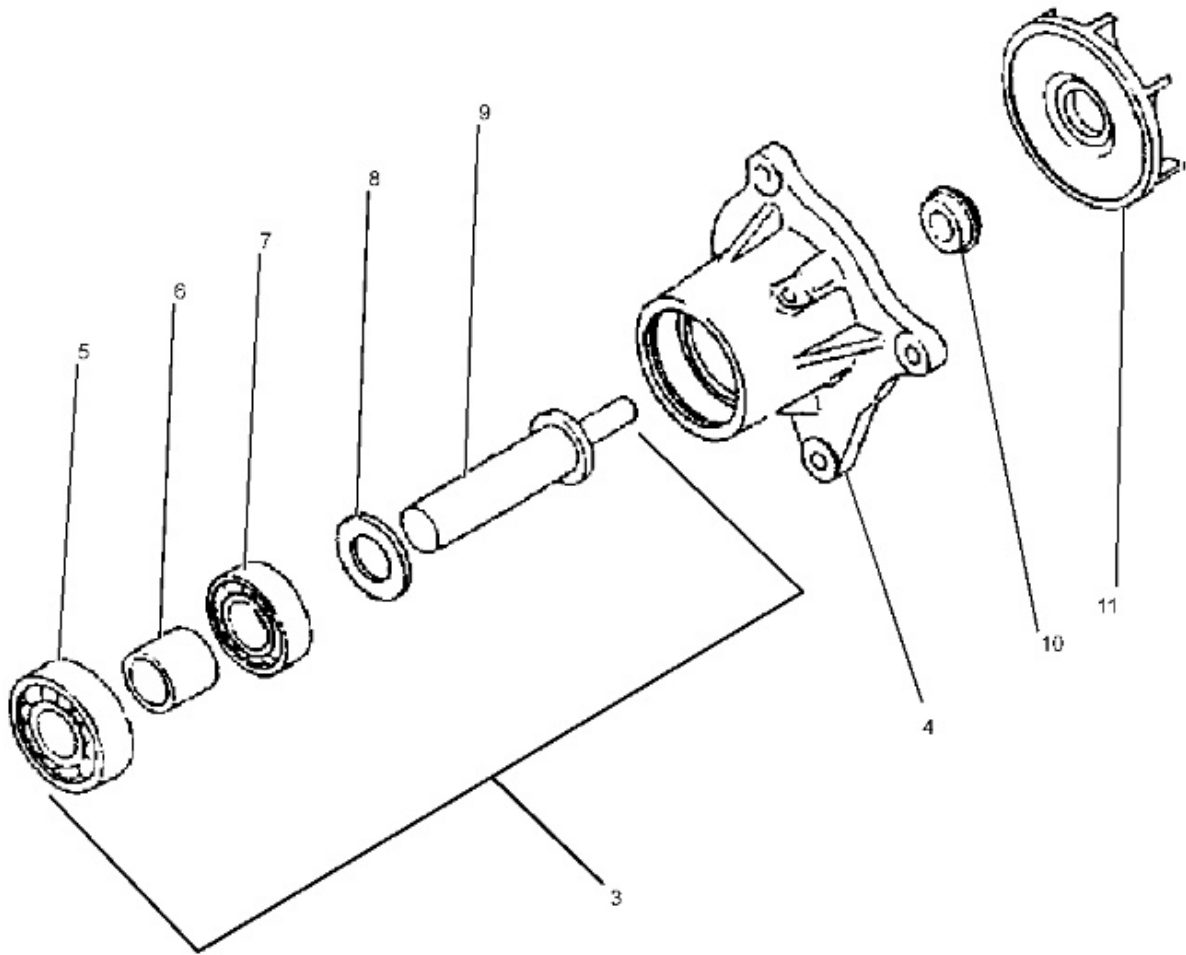


Illustration 1

g01374030

1. Install seal (10).
2. Install washer (8), bearing (7), spacer (6), and bearing (5) onto shaft (9).
3. Lower the temperature of shaft assembly (3). Install shaft assembly (3) into water pump housing (4).

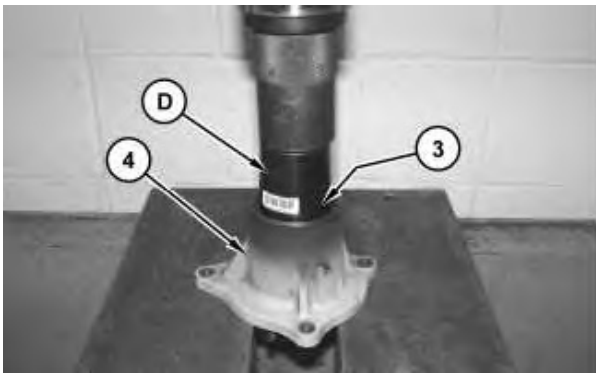


Illustration 2

g01374069

4. Position water pump housing (4) onto a suitable press. Lower the temperature of shaft assembly (3) (not shown). Use Tooling (D) and the suitable press in order to install shaft assembly (3) into water pump housing (4).



Illustration 3

g01374022

5. Use Tooling (B) in order to install retaining ring (2).

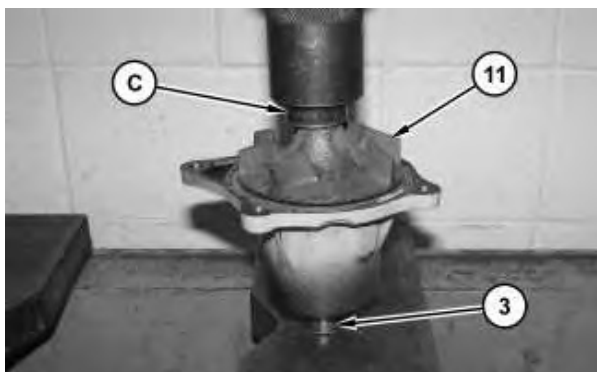


Illustration 4

g01374073

6. Use Tooling (C) and a suitable press in order to install impeller (11) onto shaft assembly (3).

Note: Shaft assembly (3) and impeller (11) should be flush with each other.

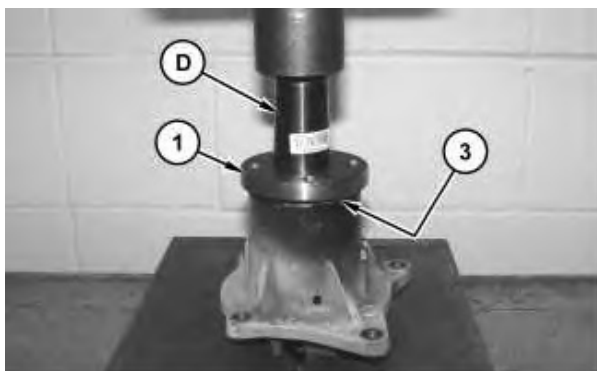


Illustration 5

g01374074

7. Reposition the water pump assembly on the suitable press. Use Tooling (D) and the suitable press in order to install flange (1) onto shaft assembly (3) (not shown).

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Configuration: 320D LRR Excavator DHE00001-UP (MACHINE) POWERED BY C6.4 Engine

Disassembly and Assembly C6.4 Engine for Caterpillar Built Machines

Media Number -KENR8106-09

Publication Date -01/10/2017

Date Updated -18/10/2017

i02741490

Water Pump - Install

SMCS - 1361-012

Installation Procedure

Note: Cleanliness is an important factor. Before assembly, thoroughly clean all parts in cleaning fluid. Allow the parts to air dry. Do not use wiping cloths or rags to dry parts. Lint may be deposited on the parts which may cause trouble. Inspect all parts. If any parts are worn or damaged, use new parts for replacement. Dirt and other contaminants can damage the precision component. Perform assembly procedures on a clean work surface. Keep components covered and protected at all times.

Note: Check the O-ring seals, the gaskets, and the seals for wear or for damage. Replace the components, if necessary.



Illustration 1

g01373996

1. Position the O-ring seal and water pump (4). Install bolts (3).



Illustration 2

g01373990

2. Position water pump pulley (2) and install bolts (1).
3. Install the belt. Refer to Operation and Maintenance Manual, "Belts - Inspect/Adjust/Replace".

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Disassembly and Assembly C6.4 Engine for Caterpillar Built Machines

Media Number -KENR8106-09

Publication Date -01/10/2017

Date Updated -18/10/2017

i02879381

Water Temperature Regulator - Remove and Install

SMCS - 1355-010

Removal Procedure

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

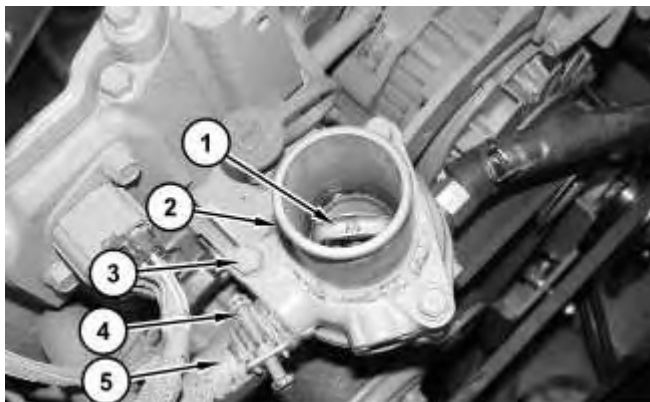


Illustration 1

g01375549

1. Loosen clamp (4) and disconnect hose (6) . Remove bolts (3) . Remove housing (2) and the gasket. Remove water temperature regulator (1) .

Installation Procedure

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

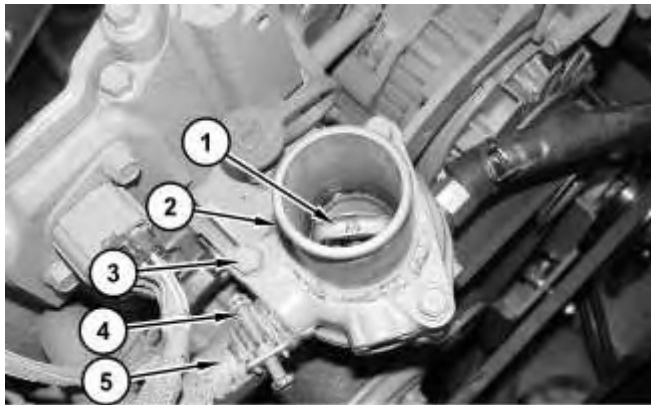


Illustration 2

g01375549

1. Install water temperature regulator (1) . Install housing (2) and a new gasket. Install bolts (3) . Connect hose (5) and tighten clamp (4) .

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Disassembly and Assembly C6.4 Engine for Caterpillar Built Machines

Media Number -KENR8106-09

Publication Date -01/10/2017

Date Updated -18/10/2017

i02743771

Flywheel - Remove

SMCS - 1156-011

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	138-7575	Link Bracket	1
B		Forcing bolts M16 - 2 by 120 mm	2

Start By:

- a. Remove the crankshaft position sensor. Refer to Disassembly and Assembly, "Crankshaft Position Sensor - Remove and Install".
- b. Remove the muffler. Refer to Disassembly and Assembly, "Muffler - Remove and Install".

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

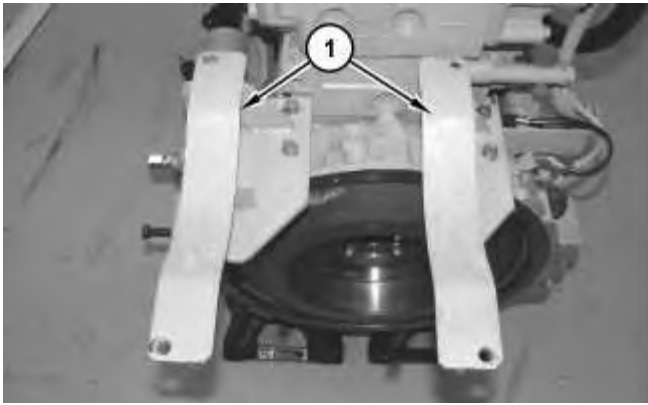


Illustration 1

g01374966

1. Remove muffer brackets (1).

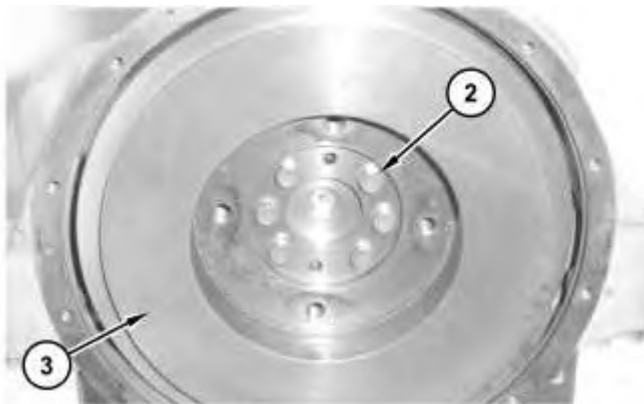


Illustration 2

g01374968

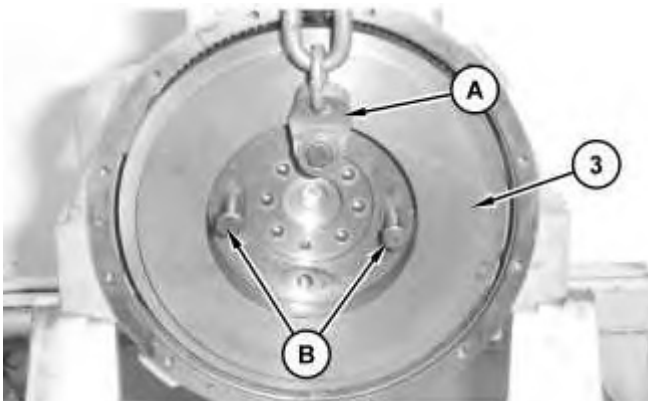


Illustration 3

g01374970

2. Remove bolts (2).
3. Install Tooling (A) and a suitable lifting device onto flywheel (3).
4. Use Tooling (B) in order to remove flywheel (3) out of the housing. The weight of flywheel (3) is approximately 50 kg (110 lb).

5. Perform the following procedure in order to remove the flywheel ring gear.

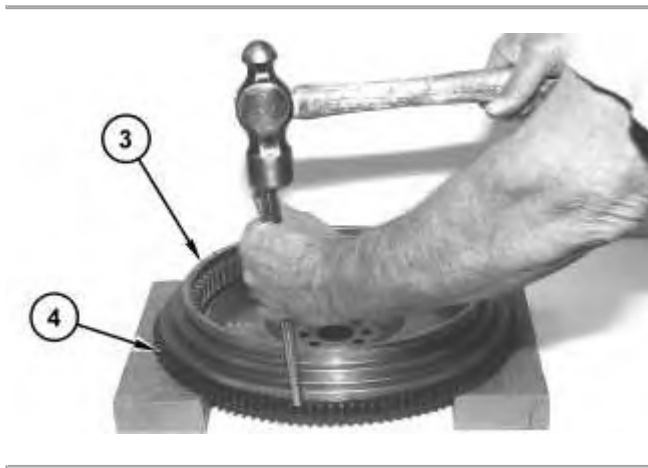


Illustration 4

g01374977

Typical Example

- a. Place flywheel (3) and ring gear (4) on suitable cribbing.

Note: Mark the orientation of ring gear (4) on flywheel (3) for assembly purposes.



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

- b. Raise the temperature of ring gear (4) uniformly.
- c. Remove the ring gear (4) by tapping ring gear (4) all the way around flywheel (3).
- d. Reposition flywheel (3) in order to remove ring gear (4).

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Publication Date -01/10/2017

Date Updated -18/10/2017

i02744399

Flywheel - Install

SMCS - 1156-012

Installation Procedure

Table 1

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

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.



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

1. Perform the following procedure, if the ring gear was removed from the flywheel:
 - a. Raise the temperature of the ring gear 149 °C (300 °F).



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- b. Use a suitable press in order to install the ring gear onto the flywheel.

Note: Prior to the installation of the flywheel, refer to Specifications, "Flywheel" for information on checking the flywheel assembly for flatness.



Illustration 1

g01374993

2. Install Tooling (A) and a suitable lifting device onto flywheel (3).
3. Install flywheel (3). The weight of flywheel (3) is approximately 50 kg (110 lb).

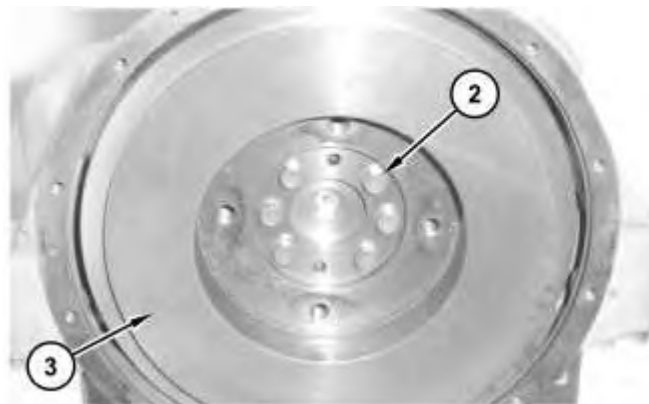


Illustration 2

g01374968

4. Install bolts (2) in order to secure flywheel (3) onto the crankshaft. Tighten bolts (2) to a torque of 83 ± 5 N·m (61 ± 4 lb ft).
 5. Remove Tooling (A) from flywheel (3).
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