CATERPILLAR®

Service Repair Manual

Models

314E CR, 314E SR and 314E LCR Excavator

Product: EXCAVATOR
Model: 314E LCR EXCAVATOR YCW
Configuration: 314E CR/SR & 314E LCR Excavators YCW00001-UP (MACHINE) POWERED BY C4.4 Engine

Disassembly and Assembly
C4.4 Engines for Caterpillar Built Machines
Media Number -UENR0602-11 **Publication Date -01/08/2013** **Date Updated -25/10/2017**

i04048651

Inlet and Exhaust Valves - Remove and Install

SMCS - 1105-010

Removal Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	9U-6195	Valve Spring Compressor	1
	268-1969	Adapter	1
	276-1221	Head	1

Start By:

a. Remove the cylinder head. Refer to Disassembly and Assembly, "Cylinder Head - Remove" for the correct procedure.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

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1. Clean the bottom mating surface of the cylinder head. Check the depth of the valves below the face of the cylinder head before the valve springs are removed. Refer to Specifications, "Cylinder Head Valves" for the correct dimensions.

2. Place a temporary identification mark on the heads of the valves in order to identify the correct position.

   Note: Inlet valves have a recess in the center of the head.

3. Use a suitable lifting device to position the cylinder head with the valve springs upward. The weight of the cylinder head is approximately 65 kg (143 lb).

   Note: Ensure that the cylinder head is kept on a clean, soft surface in order to prevent damage to the machined face.

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.

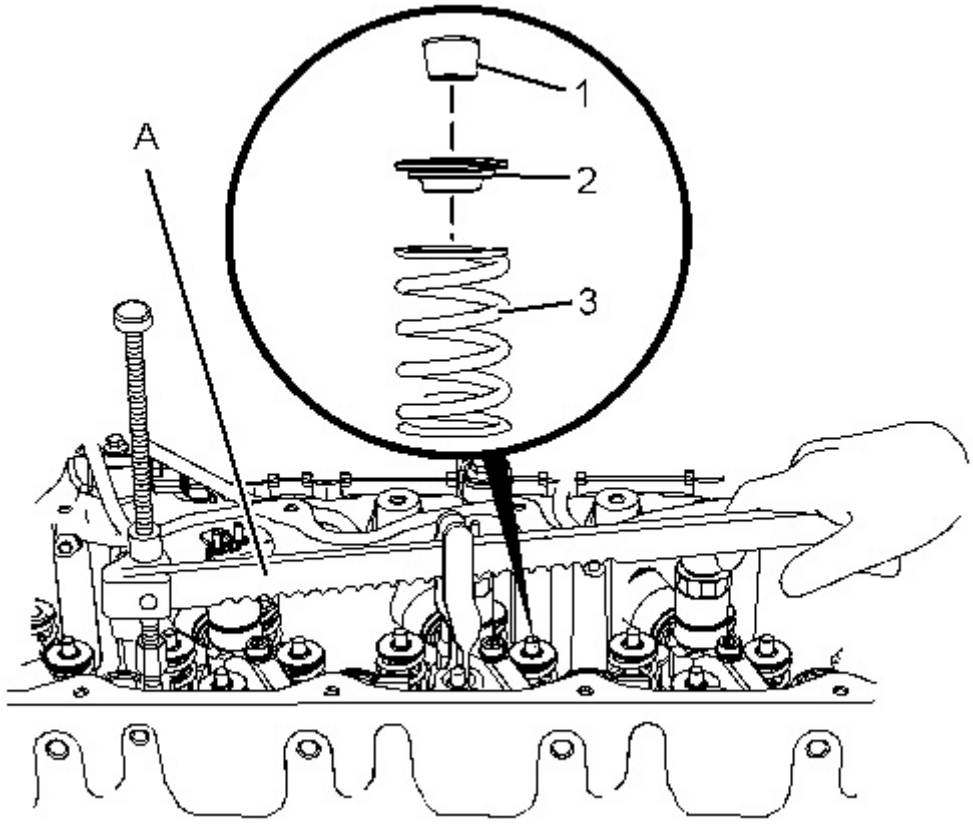

Illustration 1 g02511756

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4. Install Tooling (A) in position on the cylinder head in order to compress appropriate valve spring (3).

NOTICE

Ensure that the valve spring is compressed squarely or damage to the valve stem may occur.

5. Apply sufficient pressure to Tooling (A) in order to remove valve keepers (1).

   Note: Do not compress the spring so that valve spring retainer (2) touches valve stem seal (4).

6. Slowly release pressure on Tooling (A).

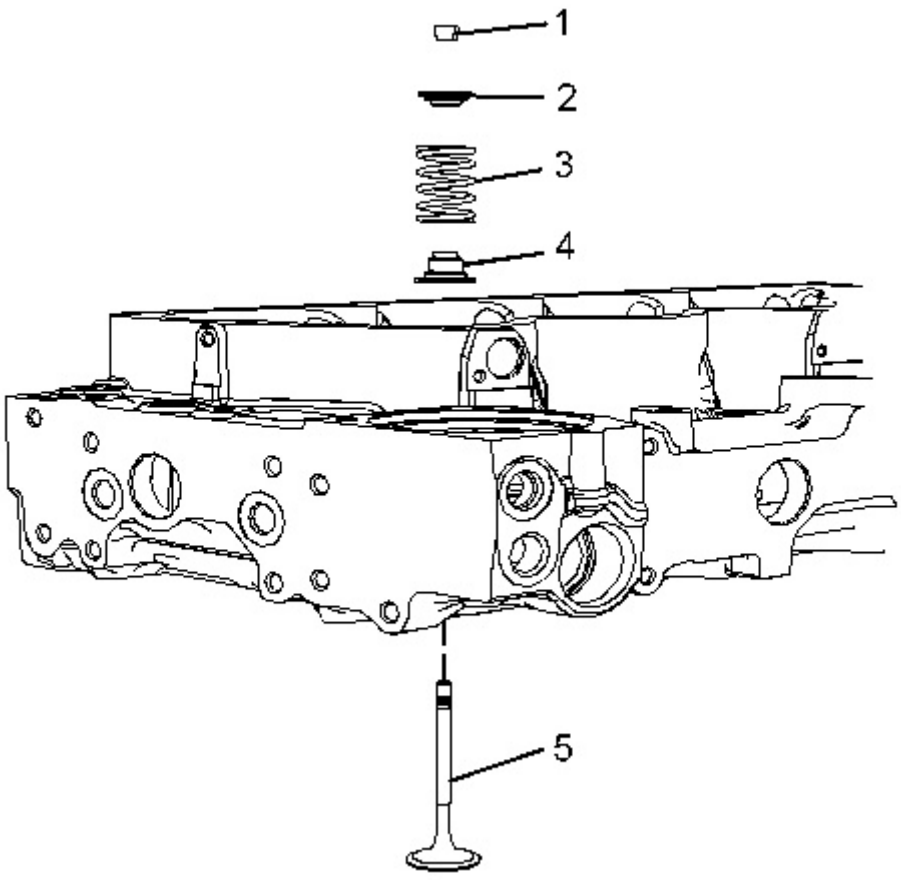

Illustration 2 g02511676

7. Place a temporary identification mark on valve spring (3) in order to identify the correct position.

8. Remove valve spring retainer (2). Remove valve spring (3).

9. Repeat Step 4 through Step 8 for the remaining valves.

10. Remove Tooling (A).
11. Remove valve stem seals (4).
12. Use a suitable lifting device in order to carefully turn over the cylinder head.
13. Remove valves (5).

Installation Procedure

Table 2

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	9U-6195	Valve Spring Compressor	1
	268-1969	Adapter	1
	276-1221	Head	1

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

Note: The valves have a hard surface finish. Grinding compound must not be used on the valves. Grinding compound will damage the hard surface finish of the valves.

1. Clean all components of the cylinder head assembly. Ensure that all ports, all coolant passages, and all lubrication passages in the cylinder head are free from debris. Follow Step 1.a through Step 1.d in order to inspect the components of the cylinder head assembly. Replace any components that are worn or damaged.

    a. Inspect the cylinder head for wear and for damage. Refer to System Operation, Testing and Adjusting, "Cylinder Head Inspect" for the correct procedure.

    b. Inspect the valve seats for wear and for damage. Refer to Specifications, "Cylinder Head Valves" for further information.

    c. Inspect the valve guides for wear and for damage. Refer to Specifications, "Cylinder Head Valves" and System Operation, Testing and Adjusting, "Valve Guide - Inspect" for further information.

    d. Inspect the valves for wear and for damage. Refer to Specifications, "Cylinder Head Valves" for further information.

    e. Inspect valve springs (3) for damage and for the correct length. Refer to Specifications, "Cylinder Head Valves " for further information.

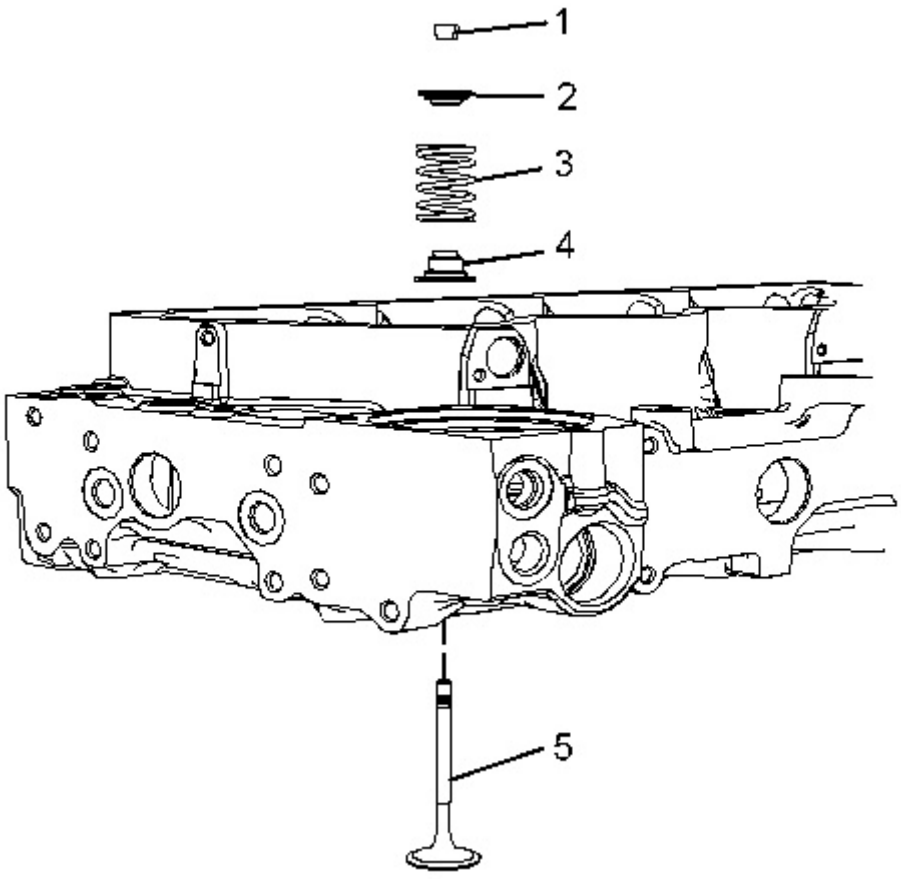

Illustration 3 g02511676

2. Lubricate the stems of valves (5) with clean engine oil. Install valves (5) in the appropriate positions in the cylinder head. Check the depth of the valves below the face of the cylinder head. Refer to System Operation, Testing and Adjusting, "Valve Depth - Inspect" for more information.

3. Use a suitable lifting device in order to carefully turn over the cylinder head. The weight of the cylinder head is approximately 65 kg (143 lb).

   Note: Ensure that all of the valves remain in place.

4. Install new valve stem seals (4) onto each of the valve guides.

   Note: The outer face of the valve guides must be clean and dry before installing valve stem seals (4).

5. Install valve spring (3) onto the cylinder head. Position valve spring retainer (2) on valve spring (3).

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.

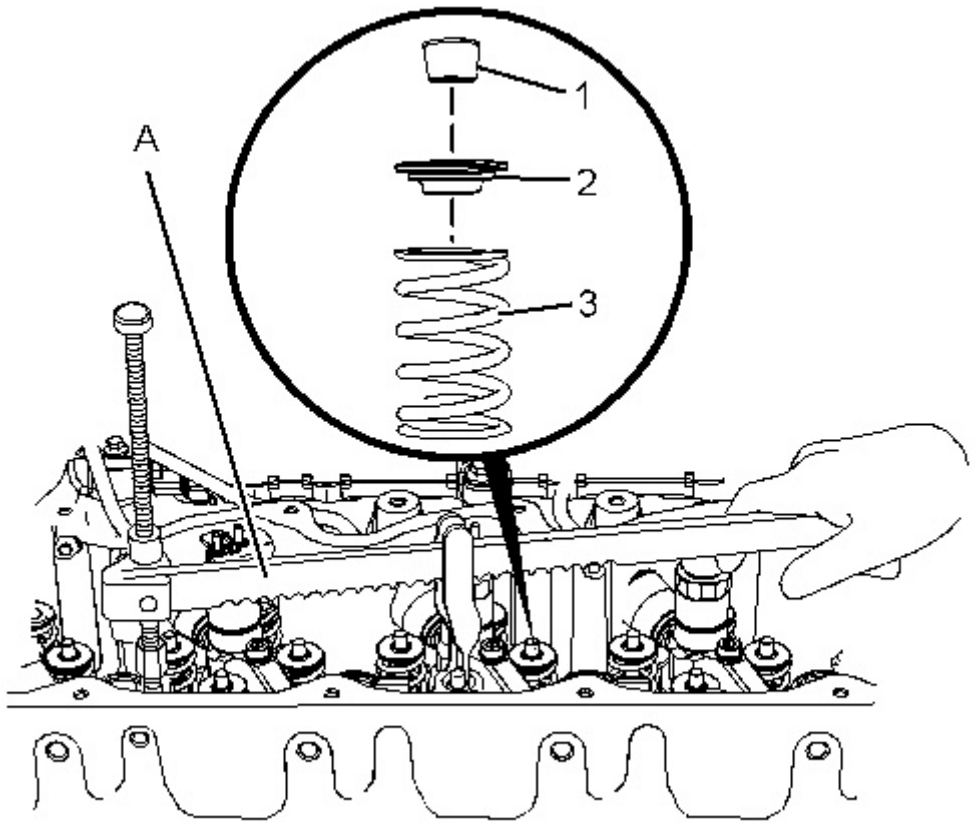

Illustration 4 g02511756

6. Install Tooling (A) in the appropriate position on the cylinder head in order to compress valve spring (3).

NOTICE

Ensure that the valve spring is compressed squarely or damage to the valve stem may occur.

7. Apply sufficient pressure to Tooling (A) in order to install valve keepers (1).

   Note: Do not compress the spring so that valve spring retainer (2) touches valve stem seal (4).

The valve spring keepers can be thrown from the valve when the valve spring compressor is released. Ensure that the valve spring keepers are properly installed on the valve stem. To help prevent personal injury, keep away from the front of the valve spring keepers and valve springs during the installation of the valves.

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8. Carefully release the pressure on Tooling (A).
9. Repeat Step 5 through Step 8 for the remaining valves.
10. Remove Tooling (A) from the cylinder head.

End By:

a. Install the cylinder head. Refer to Disassembly and Assembly, "Cylinder Head - Install" for the correct procedure.

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Model: 314E LCR EXCAVATOR YCW
Configuration: 314E CR/SR & 314E LCR Excavators YCW00001-UP (MACHINE) POWERED BY C4.4 Engine

Disassembly and Assembly
C4.4 Engines for Caterpillar Built Machines
Media Number -UENR0602-11 **Publication Date -01/08/2013** **Date Updated -25/10/2017**

i04047794

Engine Oil Filter Base - Remove and Install

SMCS - 1306-010

Removal Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	-	Strap Wrench	1

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.

Dispose of all fluids according to local regulations and mandates.

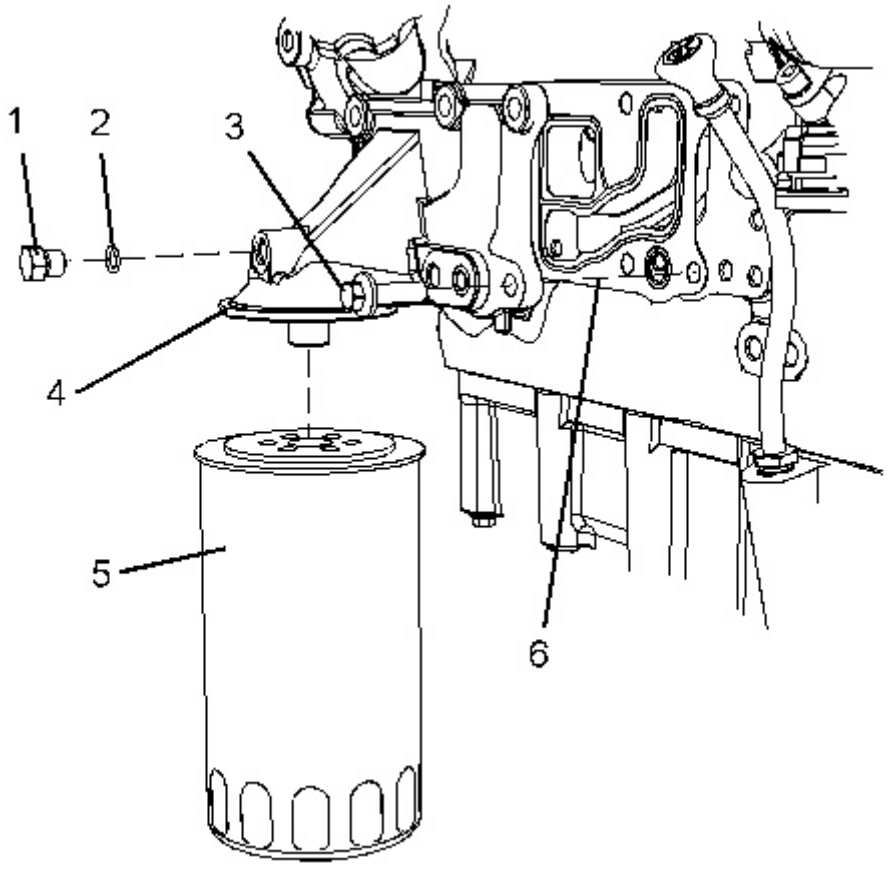

Illustration 1 g02475535

1. Place a suitable container below engine oil filter base (5) in order to catch any oil that might be spilled.
2. Use Tooling (A) to remove engine oil filter (5). Refer to Operation and Maintenance Manual, "Engine Oil and Filter - Change" for the correct procedure.
3. Remove bolts (3).
4. Remove engine oil filter base (4).
5. Remove gasket (6).
6. If necessary, remove plug (1) from engine oil filter base (4). Remove O-ring seal (2) from plug (1).

Installation Procedure

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

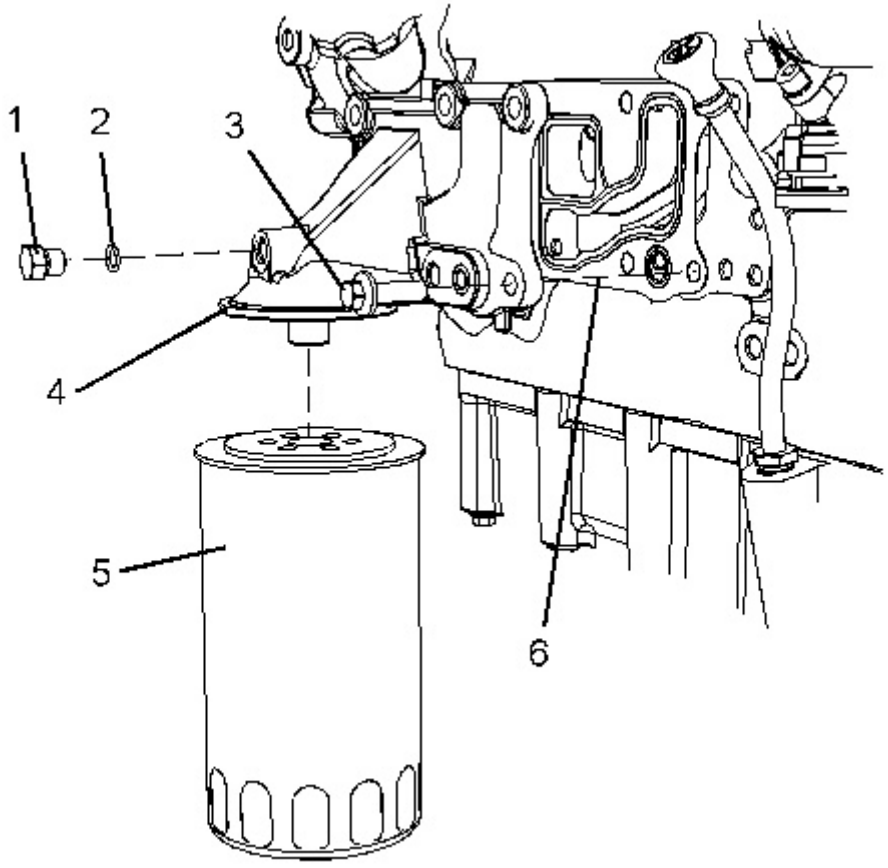

Illustration 2 g02475535

1. Clean engine oil filter base (4). Clean the gasket surfaces of the cylinder block.
2. If necessary, install new O-ring seals (2) to plugs (1). Install plugs (1) to engine oil filter base (4). Tighten the plugs to a torque of 12 N·m (106 lb in).
3. Install bolts (3) to engine oil filter base (4).
4. Install a gasket (6) onto bolts (3). Install the assembly of the engine oil filter base to the cylinder block.
5. Tighten bolts (3) to a torque of 22 N·m (195 lb in).
6. Install a new engine oil filter (5) and check the level of the engine lubricating oil. Refer to Operation and Maintenance Manual, "Engine Oil Level - Check" for the correct procedure.

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Product: EXCAVATOR
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Configuration: 314E CR/SR & 314E LCR Excavators YCW00001-UP (MACHINE) POWERED BY C4.4 Engine

Disassembly and Assembly
C4.4 Engines for Caterpillar Built Machines
Media Number -UENR0602-11 **Publication Date -01/08/2013** **Date Updated -25/10/2017**

i04047792

Engine Oil Cooler - Remove

SMCS - 1378-011

Removal Procedure

Start By:

a. Remove the Electronic Control Module (ECM). Refer to Disassembly and Assembly, "Electronic Control Module - Remove" for the correct procedure.

NOTICE

Ensure that all adjustments and repairs that are carried out to the fuel system are performed by authorized personnel that have the correct training.

Before beginning ANY work on the fuel system, refer to Operation and Maintenance Manual, "General Hazard Information and High Pressure Fuel Lines" for safety information.

Refer to System Operation, Testing and Adjusting, "Cleanliness of Fuel System Components" for detailed information on the standards of cleanliness that must be observed during ALL work on the fuel system.

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.

Dispose of all fluids according to local regulations and mandates.

1. Drain the coolant from the cooling system into a suitable container. Refer to Operation and Maintenance Manual, "Cooling System Coolant - Drain" for the correct procedure.

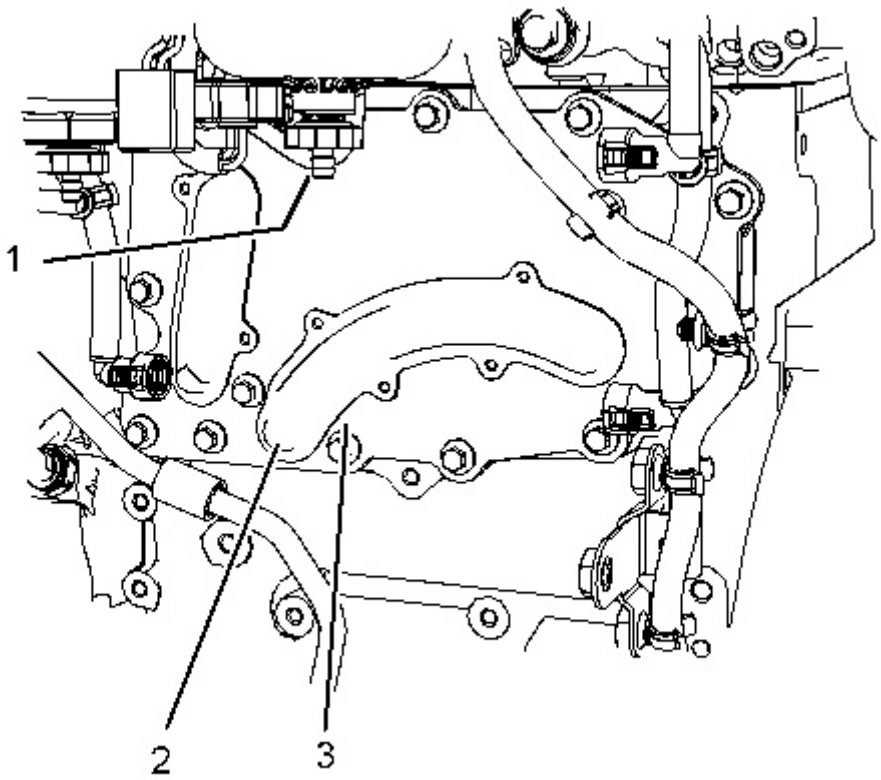

Illustration 1 g02475489

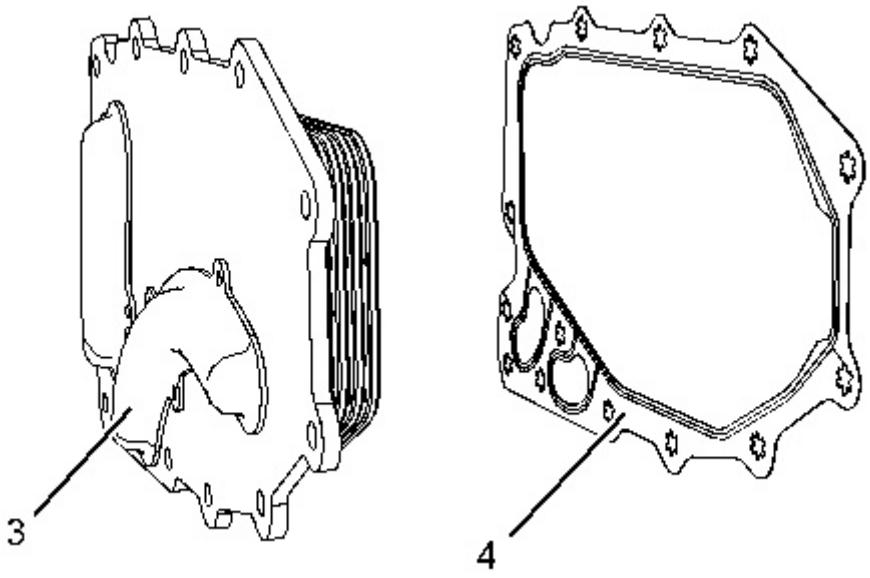

Illustration 2 g02475493

2. Remove spacer (1) (not shown) from the cylinder block.
3. Remove bolt (2) from the assembly of engine oil cooler (3).

   Note: Support the engine oil cooler as the bolts are removed.
4. Remove the assembly of engine oil cooler (3) from the cylinder block.
5. Remove gasket (4) from engine oil cooler (3).

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Configuration: 314E CR/SR & 314E LCR Excavators YCW00001-UP (MACHINE) POWERED BY C4.4 Engine

Disassembly and Assembly
C4.4 Engines for Caterpillar Built Machines
Media Number -UENR0602-11 **Publication Date -01/08/2013** **Date Updated -25/10/2017**

i06148094

Engine Oil Cooler - Install

SMCS - 1378-012

Installation Procedure

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

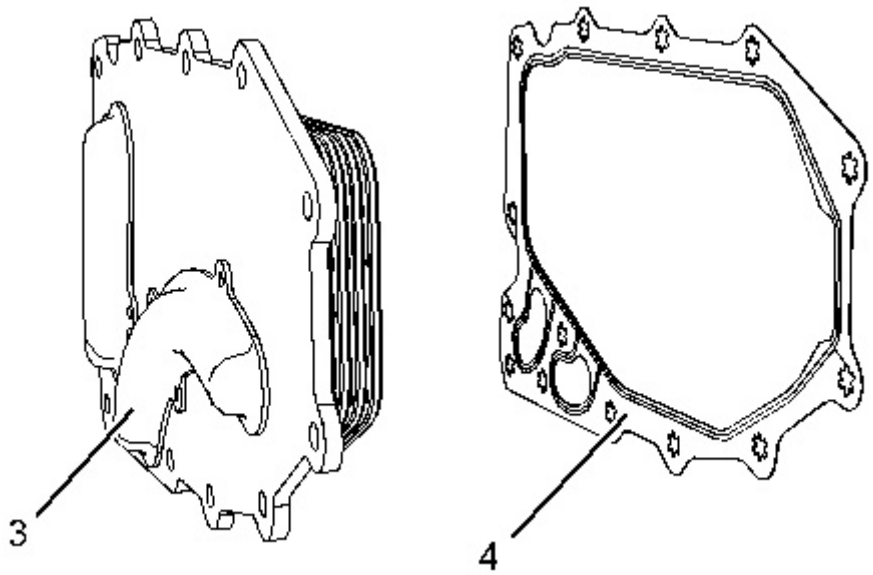

Illustration 1 g02475493

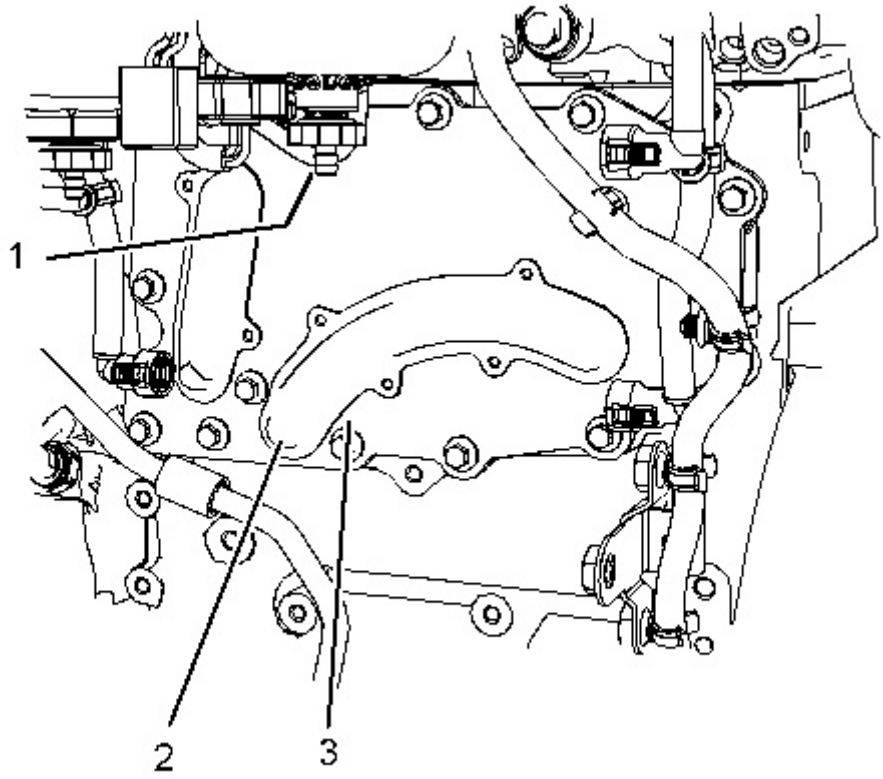

Illustration 2 g02475489

1. Ensure that engine cooler (3) is clean and free from damage. Ensure that the engine oil cooler is free from restriction.
2. Position a new gasket (4) onto engine oil cooler (3) .
3. Push bolts (1) through the holes in the gasket.

   Note: The holes in the gasket have serrations that hold the bolts captive.
4. Clean the gasket surfaces of the cylinder block.
5. Position engine oil cooler (3) onto the cylinder block. Install all bolts (2) hand tight.
6. Tighten bolts (2) to an initial torque of 10 N·m (88 lb in) in sequence shown in illustration 3.

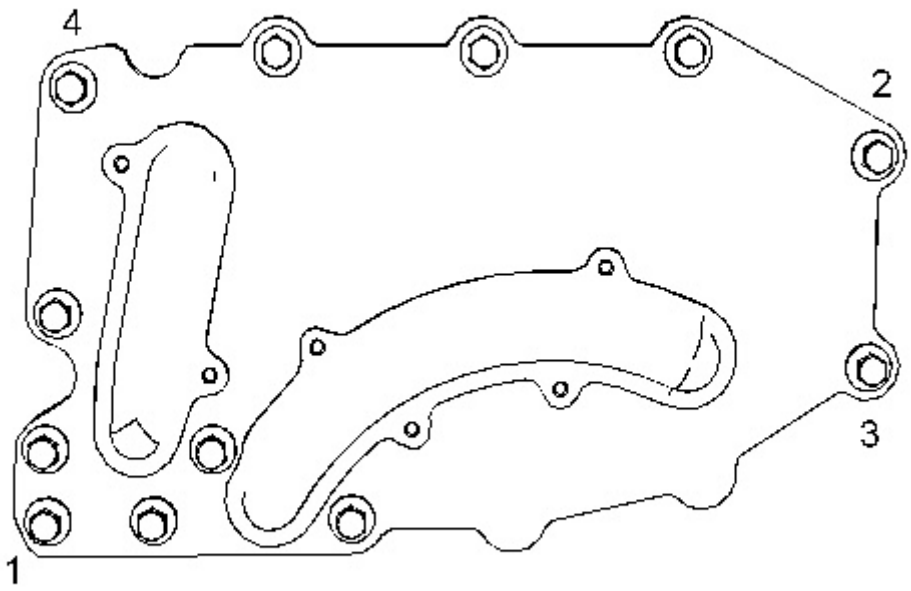

Illustration 3 g03828324

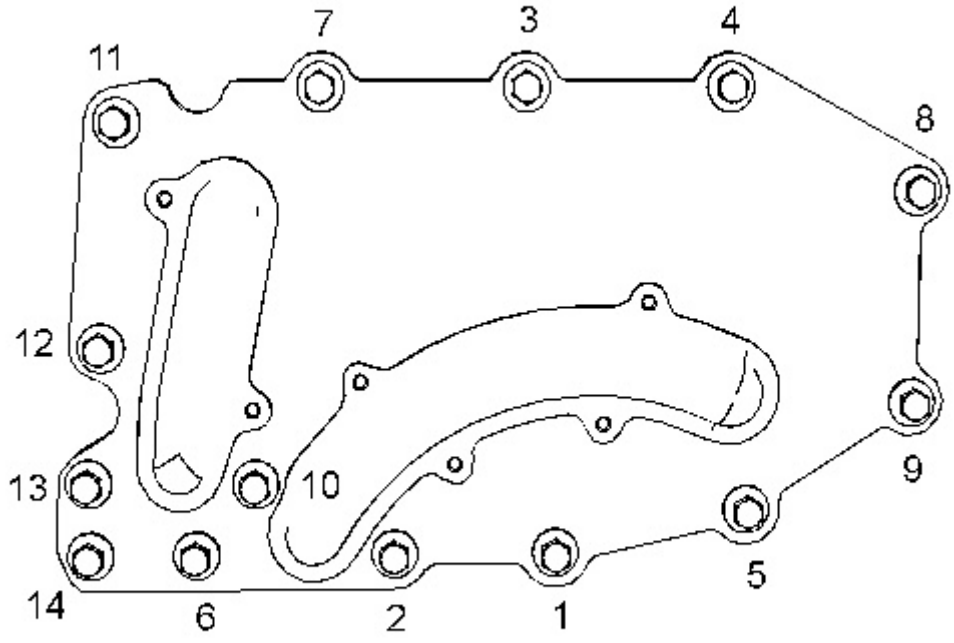

Illustration 4 g03828328

Tightening sequence for an engine oil cooler

7. Tighten the bolts (2) to a final torque of 26 N·m (230 lb in) in the sequence that is shown in Illustration 4.

8. Install spacer (1) (not shown). Tighten the bolts to a torque of 44 N·m (32 lb ft). Refer to Illustration 2

End By: Install the Electronic Control Module (ECM). Refer to Disassembly and Assembly, "Electronic Control Module - Install" for the correct procedure.

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Configuration: 314E CR/SR & 314E LCR Excavators YCW00001-UP (MACHINE) POWERED BY C4.4 Engine

Disassembly and Assembly
C4.4 Engines for Caterpillar Built Machines
Media Number -UENR0602-11 **Publication Date -01/08/2013** **Date Updated -25/10/2017**

i04047799

Engine Oil Pump - Remove

SMCS - 1304-011

Removal Procedure

Start By:

a. Remove the engine oil pan. Refer to Disassembly and Assembly, "Engine Oil Pan - Remove" for the correct procedure.

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.

Dispose of all fluids according to local regulations and mandates.

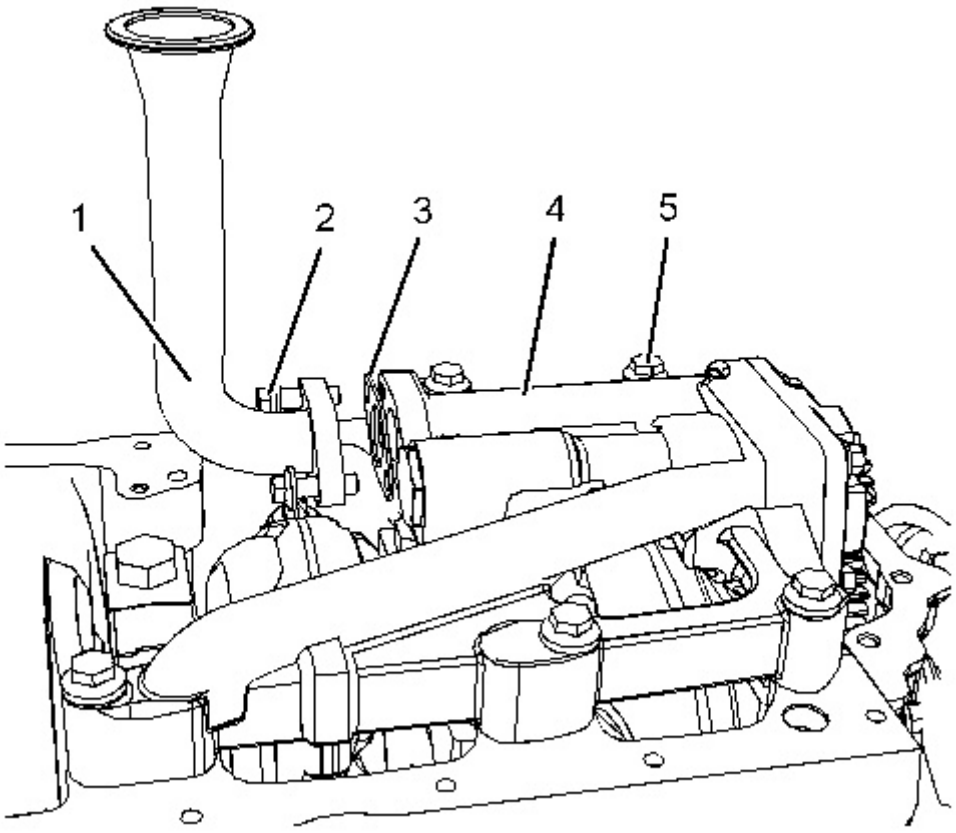

Illustration 1 g02476517

1. Remove bolts (2). Remove suction pipe (1) from engine oil pump (4).
2. Remove gasket (3).
3. Remove bolts (5) and remove the assembly of engine oil pump (4) from the cylinder block.

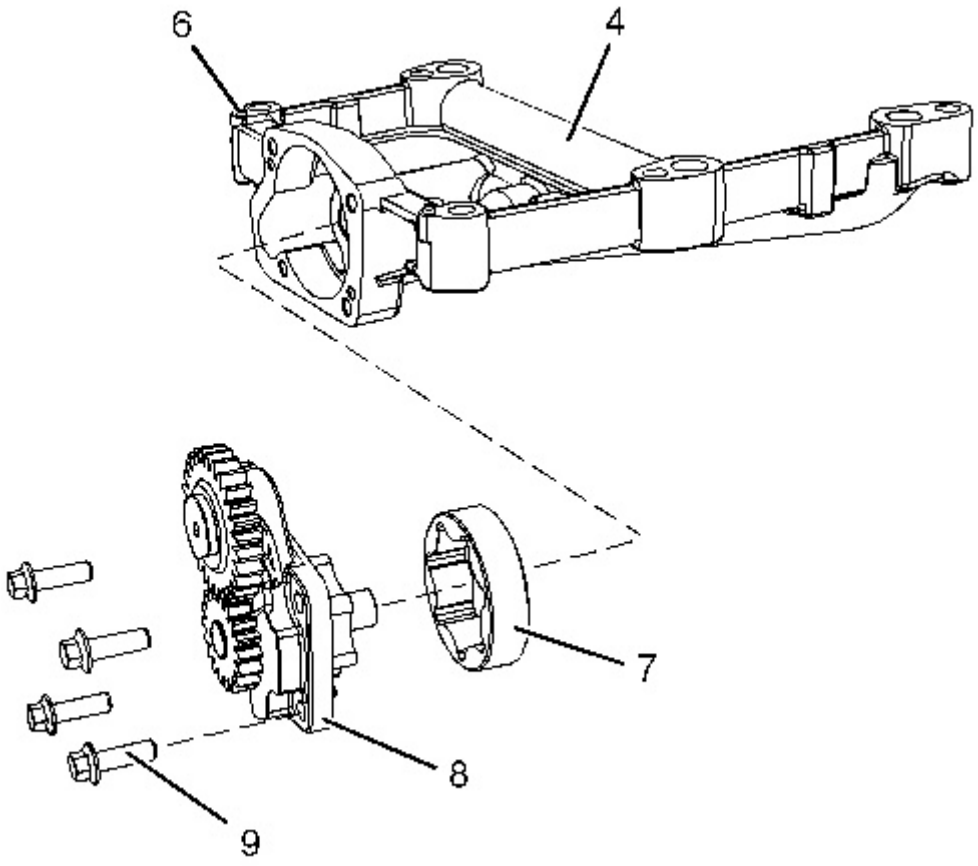

Illustration 2 g02476518

4. If necessary, follow Step 4.a through Step 4.d in order to disassembly engine oil pump (4).
    a. Remove bolts (9) from front cover assembly (8).
    b. Remove front cover assembly (8) from the housing of the engine oil pump (4).
    c. Remove outer rotor (7) from the housing of engine oil pump (4).
    d. Do not remove dowel (6) from the housing of engine oil pump (4) unless the dowels are damaged.

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Product: EXCAVATOR
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Configuration: 314E CR/SR & 314E LCR Excavators YCW00001-UP (MACHINE) POWERED BY C4.4 Engine

Disassembly and Assembly
C4.4 Engines for Caterpillar Built Machines
Media Number -UENR0602-11 **Publication Date -01/08/2013** **Date Updated -25/10/2017**

i04047798

Engine Oil Pump - Install

SMCS - 1304-012

Installation Procedure

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

NOTICE

If any part of the engine oil pump is worn or damaged, the complete assembly of the engine oil pump must be replaced.

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1. Ensure that all components of the engine oil pump are clean and free from wear and damage. Refer to System Operation, Testing and Adjusting, "Engine Oil Pump - Inspect" for more information. Replace the complete assembly of the engine oil pump if any of the components are worn or damaged.

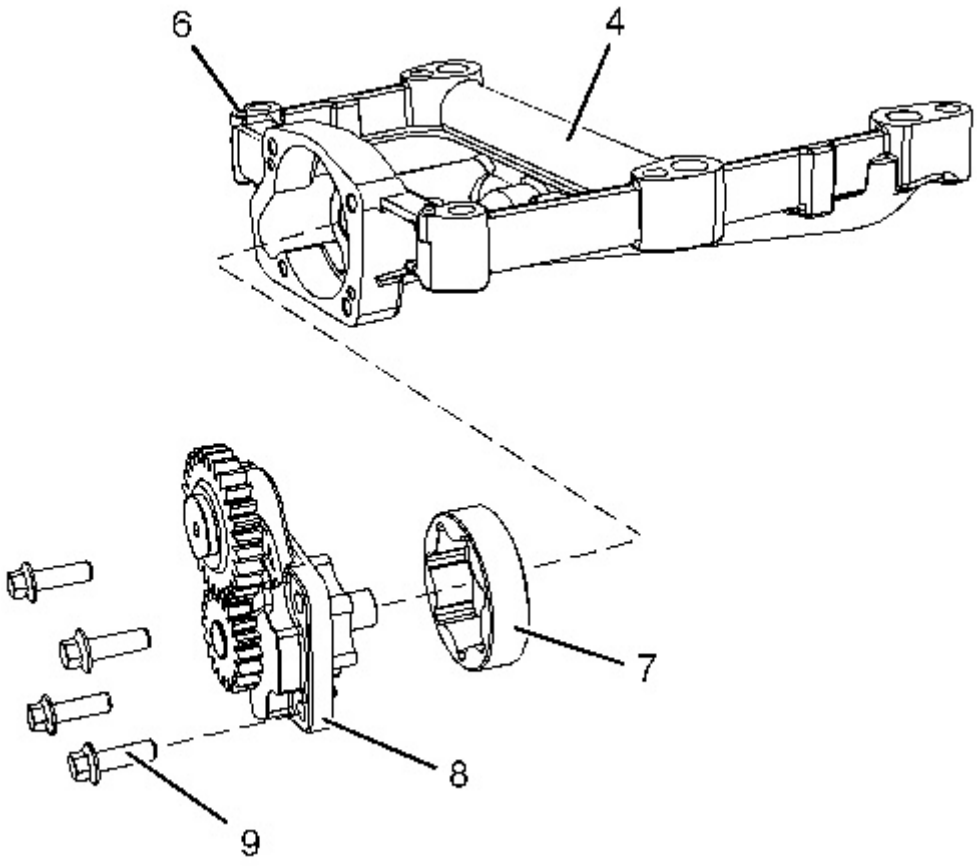

Illustration 1 g02476518

2. If necessary, follow Step 2.a through Step 2.f in order to assembly engine oil pump (4).
   a. Lubricate the internal components for the assembly of engine oil pump (4) with clean engine oil.
   b. Install outer rotor (7) to the housing of engine oil pump (4).
   c. Install front cover assembly (8) to the housing of the engine oil pump (4).
   d. Install bolts (9) to front cover assembly (8). Tighten the bolts finger tight.
   e. Tighten bolts (8) to a torque of 24 N·m (212 lb in).
   f. Ensure that dowels (6) are correctly located in the housing of engine oil pump (4).

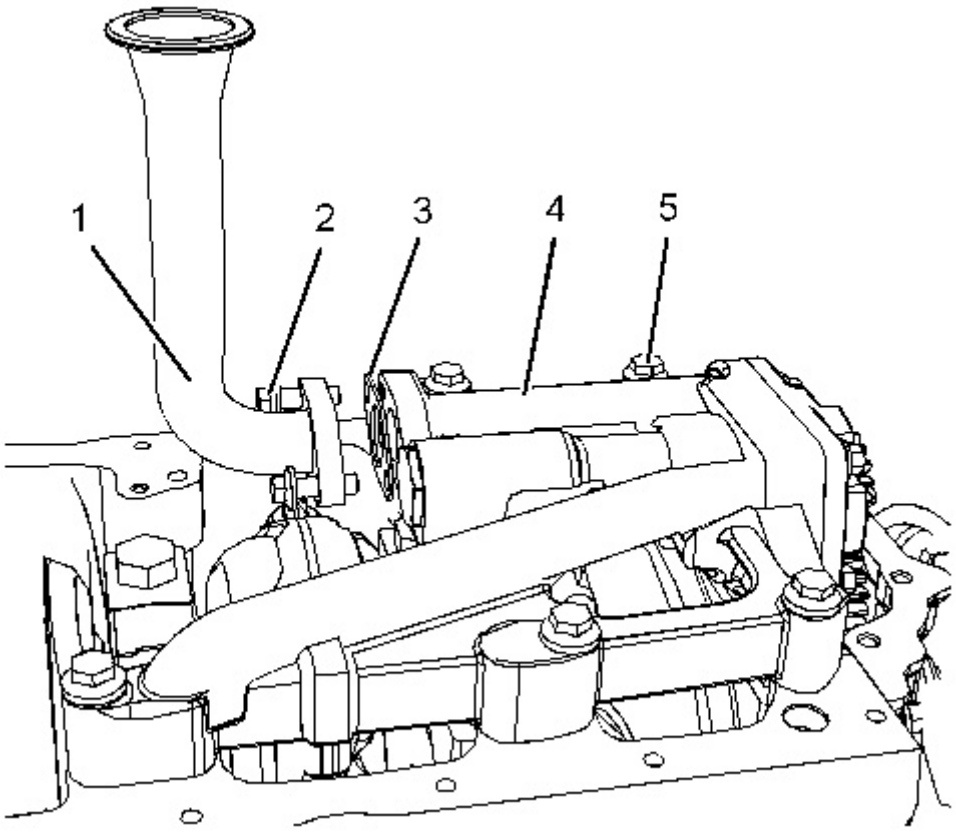

Illustration 2 g02476517

3. Position the assembly of engine oil pump (4) onto the cylinder block.

   Note: Ensure that the dowels in the housing of the engine oil pump are aligned with the holes in the cylinder block.

4. Install bolts (5). Tighten the bolts to a torque of 44 N·m (32 lb ft).

5. Check the backlash between idler gear and the crankshaft gear. Refer to Specifications, "Gear Group (Front)" for further information.

6. Position a new gasket (3) onto suction pipe (1). Install the assembly of suction pipe (1) onto the assembly of engine oil pump (4).

7. Install bolts (2) finger tight. Tighten the bolts to a torque to 22 N·m (195 lb in).

End By:

a. Install the engine oil pan. Refer to Disassembly and Assembly, "Engine Oil Pan - Install" for the correct procedure.

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Disassembly and Assembly
C4.4 Engines for Caterpillar Built Machines
Media Number -UENR0602-11 **Publication Date -01/08/2013** **Date Updated -25/10/2017**

i04048844

Water Pump - Remove

SMCS - 1361-011

Removal Procedure

Start By:

a. Remove the fan and the fan pulley. Refer to Disassembly and Assembly, "Fan - Remove and Install" for the correct procedure.

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.

Dispose of all fluids according to local regulations and mandates.

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1. Drain the coolant from the cooling system into a suitable container for storage or disposal. Refer to Operation and Maintenance Manual, "Cooling System Coolant - Change" for the correct procedure.

2. Loosen the hose clamps and remove the hose from the water pump inlet.

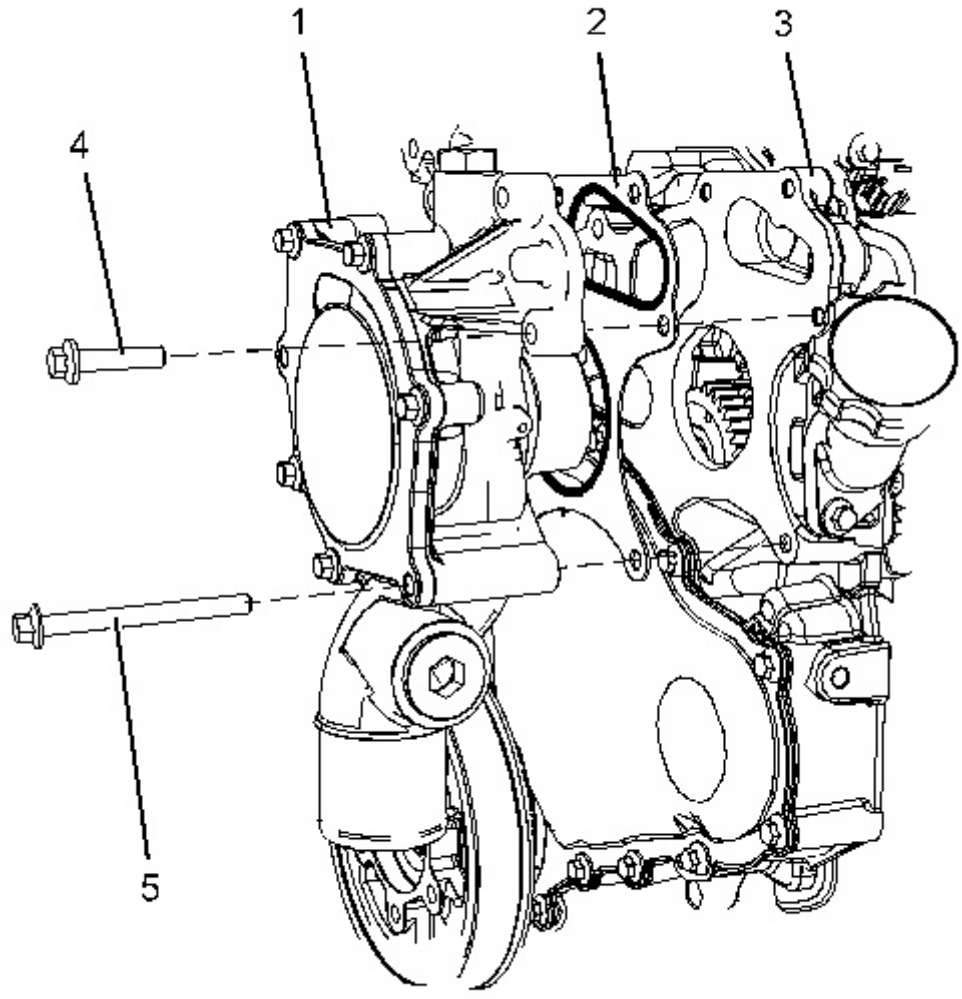

Illustration 1 g02524476

3. Remove bolts (4) and bolts (5).

4. Remove water pump (1) from housing (3).

   Note: If necessary, tap the water pump with a soft faced hammer in order to loosen the water pump.

5. Remove gasket (2).

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