

Product: INDUSTRIAL ENGINE  
Model: C15 INDUSTRIAL ENGINE JRE  
Configuration: C15 Industrial Engine JRE00001-UP

## **Disassembly and Assembly C15 and C18 Industrial Engines**

Media Number -REN8630-07

Publication Date -01/11/2017

Date Updated -15/11/2017

i02115856

# **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 and Install".

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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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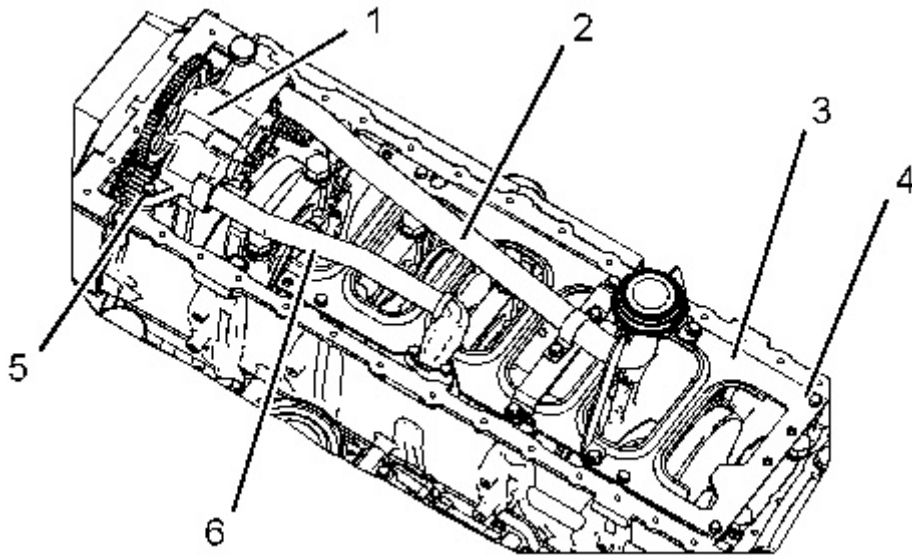
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### **NOTICE**

**Keep all parts clean from contaminants.**

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

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Illustration 1

g01077736

1. Remove tube assembly (6). Remove the O-ring seal from the tube assembly.
  2. Remove the suction bell assembly and tube assembly (2). Remove the O-ring seal from the tube assembly.
  3. Remove bolts (5) and remove engine oil pump (1) from the cylinder block.
  4. If necessary, remove bolts (4) and remove underframe assembly (3).
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## Disassembly and Assembly C15 and C18 Industrial Engines

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Publication Date -01/11/2017

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i07233176

## Engine Oil Pump - Disassemble

SMCS - 1304-015

### Disassembly Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	1P-2321	Combination Puller	1
B	1P-0510	Driver Group	1

#### Start By:

- a. Remove the engine oil pump.
-

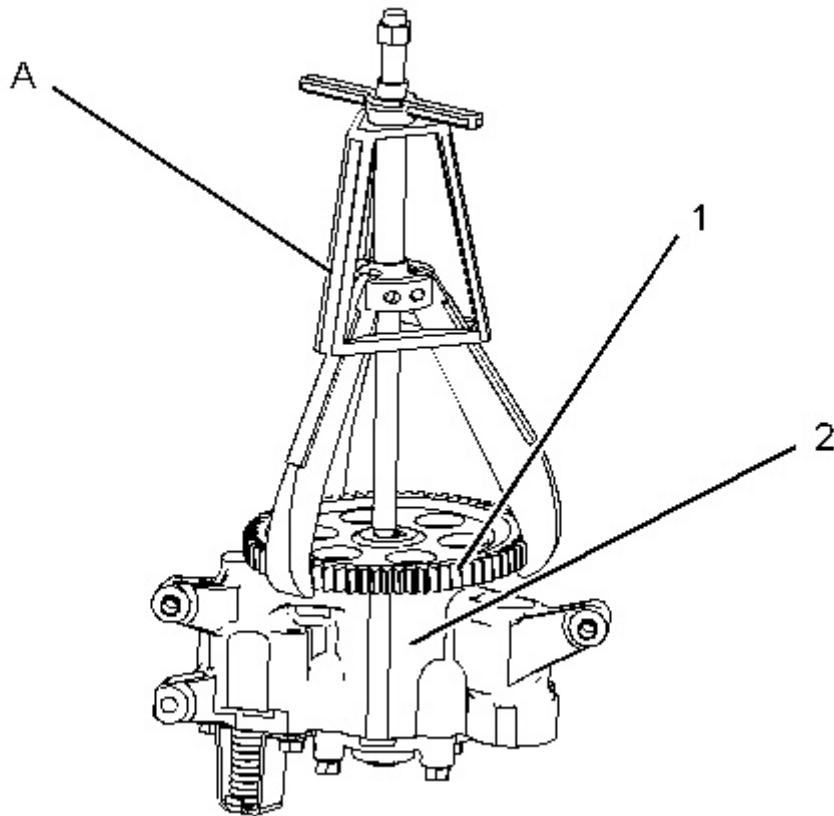


Illustration 1

g01001918

1. Remove the bolt that holds drive gear (1) to the shaft of engine oil pump (2).
2. Use Tooling (A) to remove drive gear (1).
3. Remove the woodruff key from the shaft.

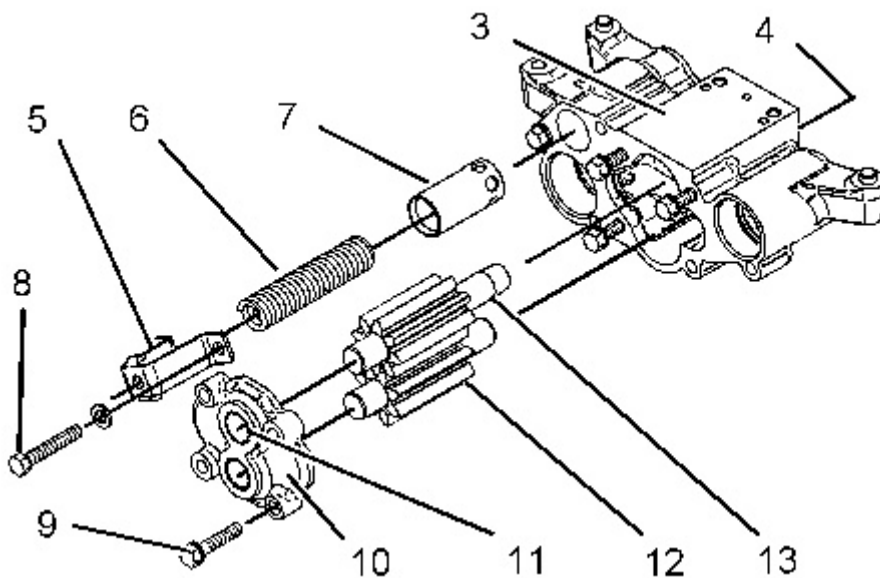


Illustration 2

g01101672

 **WARNING**

**Personal injury can result from parts and/or covers under spring pressure.**

**Spring force will be released when covers are removed.**

**Be prepared to hold spring loaded covers as the bolts are loosened.**

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4. Remove bolts (8).
  5. Remove retainer (5), spring (6), and relief plunger (7) from pump body (3).
  6. Remove bolts (9) and cover (10).
  7. Remove idler gear (12) and drive gear (13) from pump body (3).
  8. Use Tooling (B) to remove sleeve bearings (4) from pump body (3).
  9. Use Tooling (B) to remove sleeve bearings (11) from cover (10).
-

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i07233184

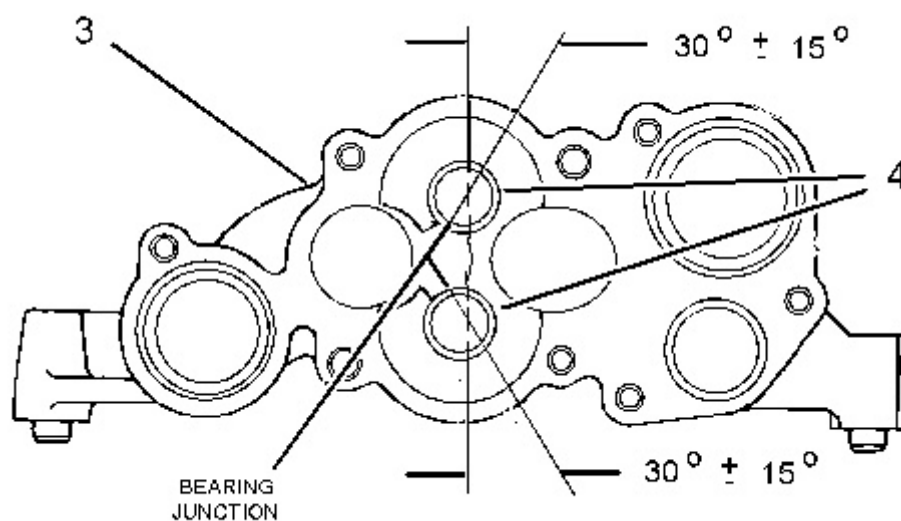
### Engine Oil Pump - Assemble

SMCS - 1304-016

### Assembly Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	1P-2321	Combination Puller	1
B	1P-0510	Driver Group	1



1. Use Tooling (B) to install sleeve bearings (4) in pump body (3). The bearing joint should be  $30 \pm 15$  degrees from the center line of the two bearing bores. Install the sleeve bearings so the sleeve bearings are even with the outside of the pump body.

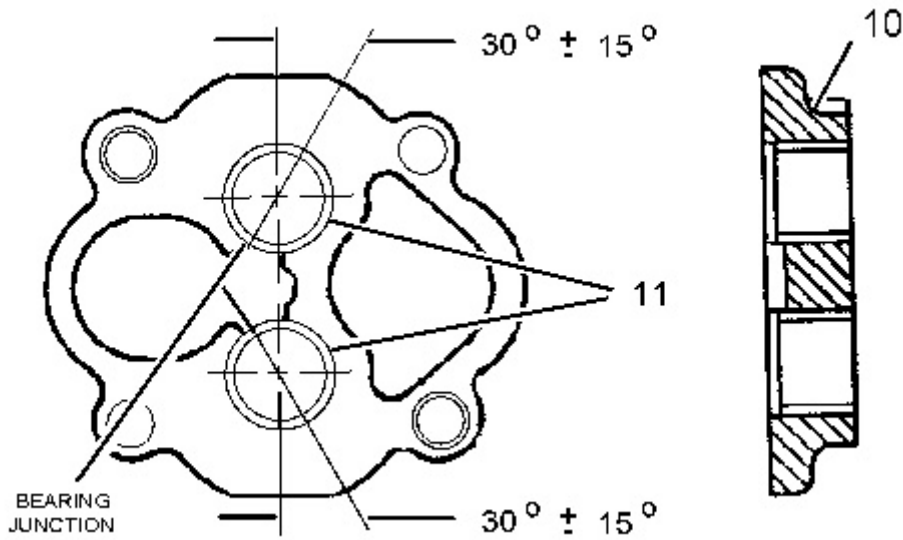


Illustration 2

g01101732

2. Use Tooling (B) to install sleeve bearings (11) in cover (10). The bearing joint should be  $30 \pm 15$  degrees from the center line of the two bearing bores. Install the sleeve bearings so the sleeve bearings are even with the outside of the cover.

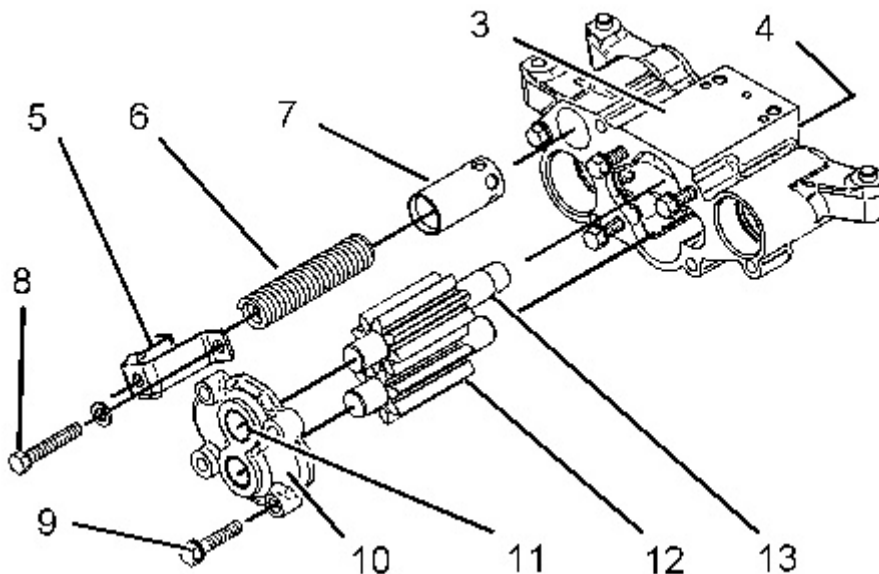


Illustration 3

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**! WARNING**

**Improper assembly of parts that are spring loaded can cause bodily injury.**

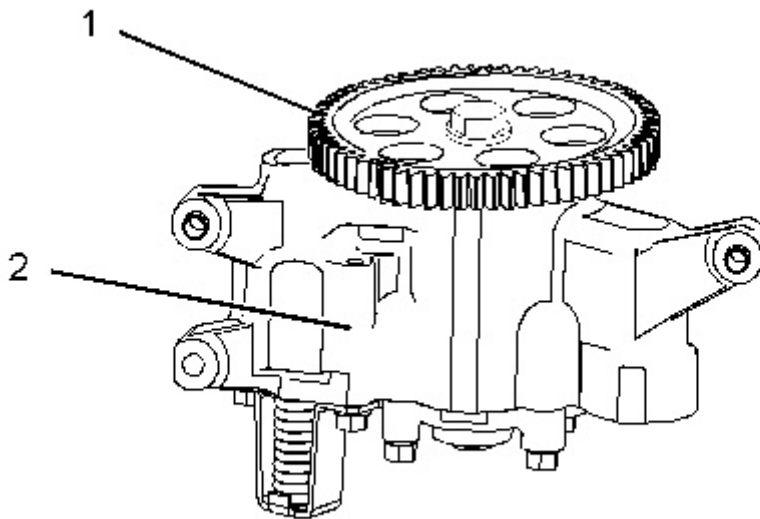
**To prevent possible injury, follow the established assembly procedure and wear protective equipment.**

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3. Lubricate idler gear (12) and drive gear (13) with clean engine oil. Lubricate sleeve bearings (4) with clean engine oil.
4. Install idler gear (12) and drive gear (13) in pump body (3).
5. Lubricate sleeve bearings (11) with clean engine oil.
6. Install cover (10) and bolts (9).

**Note:** The engine oil pump must turn freely after assembly. Turn the engine oil pump by hand. Reposition cover (10) if the engine oil pump does not turn freely.

7. Install relief plunger (7), spring (6), retainer (5), and bolts (8).
  8. Install the woodruff key on the shaft of the engine oil pump.
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Illustration 4

g06302676

9. Install drive gear (1) on the shaft of engine oil pump (2) and install the bolt. Tighten the bolt that holds drive gear (1) to engine oil pump (2) to a torque of  $55 \pm 10 \text{ N}\cdot\text{m}$  ( $41 \pm 7 \text{ lb ft}$ ).

**End By:**

- a. Install the engine oil pump.
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## Disassembly and Assembly C15 and C18 Industrial Engines

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Publication Date -01/11/2017

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i02183426

## Engine Oil Pump - Install

SMCS - 1304-012

## Installation Procedure

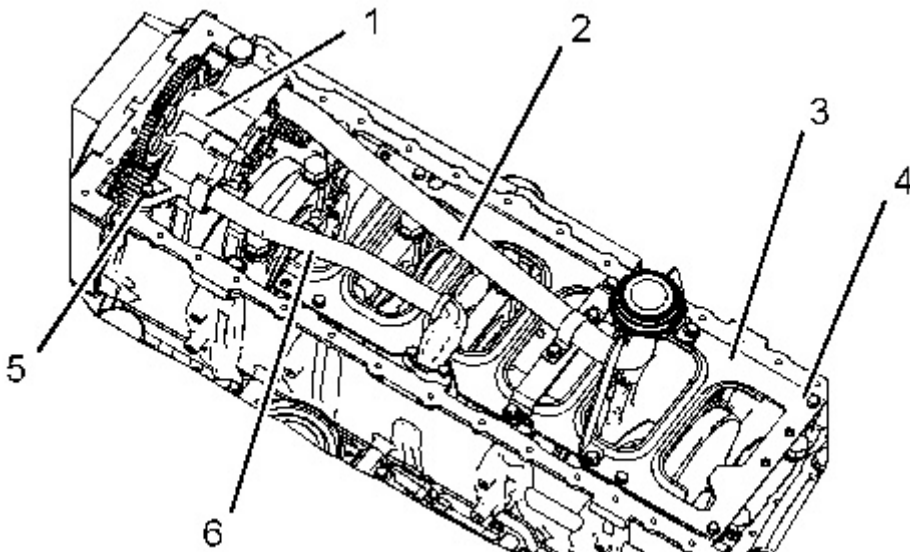
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### NOTICE

**Keep all parts clean from contaminants.**

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

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1. Position underframe assembly (3) and install bolts (4).
2. Position engine oil pump (1) on the dowels in the cylinder block. Install bolts (5).

**Note:** Ensure that the engine oil pump is seated on the dowels before the bolts are tightened.

3. Install the O-ring seal on tube assembly (6). Lubricate the bore in the engine oil pump with clean engine oil. Install tube assembly (6).
4. Install the O-ring seal on tube assembly (2). Lubricate the bore in the engine oil pump with clean engine oil. Install the suction bell assembly and tube assembly (2).

**End By:**

- a. Install the engine oil pan. Refer to Disassembly and Assembly, "Engine Oil Pan - Remove and Install".
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## **Disassembly and Assembly C15 and C18 Industrial Engines**

Media Number -REN8630-07

Publication Date -01/11/2017

Date Updated -15/11/2017

i02535294

# **Water Pump - Remove**

SMCS - 1361-011

## **Removal Procedure**

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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 Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Caterpillar products.**

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

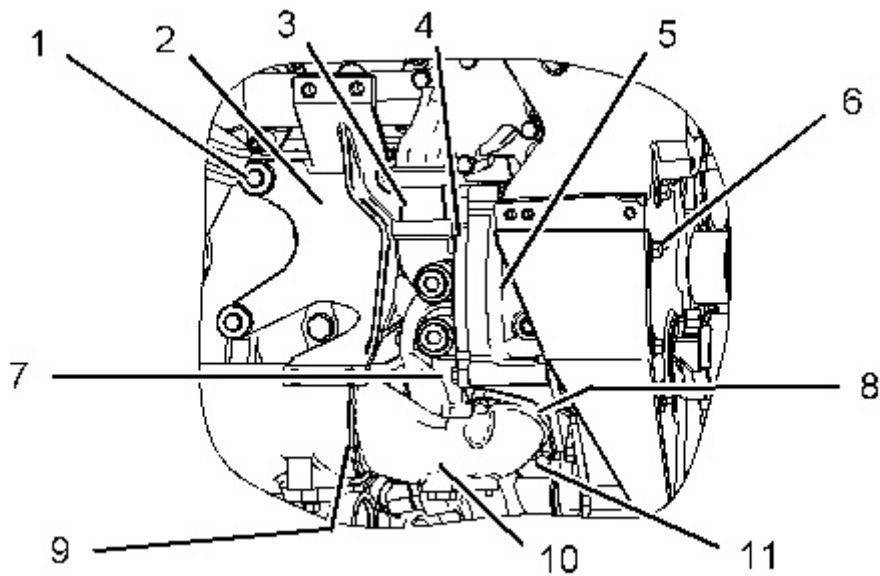
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### **NOTICE**

**Keep all parts clean from contaminants.**

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

g01092920

2. Remove bolts (1). Remove support (2).
  3. Remove bolts (11). Remove oil cooler bonnet (10) from the engine oil cooler. Remove integral seal (8) and O-ring seal (9) from the oil cooler bonnet.
  4. Remove bolts (7). Remove water pump cover (4) from water pump (5).
  5. Remove pipe (3) from the water temperature regulator housing. Remove the O-ring seals from the pipe.
  6. Remove bolts (6).
  7. Remove water pump (5) from the front housing.
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## Disassembly and Assembly C15 and C18 Industrial Engines

Media Number -REN8630-07

Publication Date -01/11/2017

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i05611929

## Water Pump - Disassemble

SMCS - 1361-015

## Disassembly Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	8S-2264	Puller Group	1
	4B-3903	Bolt	2
	1P-0456	Plate	1
	4B-4277	Washer	2
B	9S-9152	Bearing Puller Gp	1
C	1P-0510	Driver Gp	1

### Start By:

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

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### NOTICE

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

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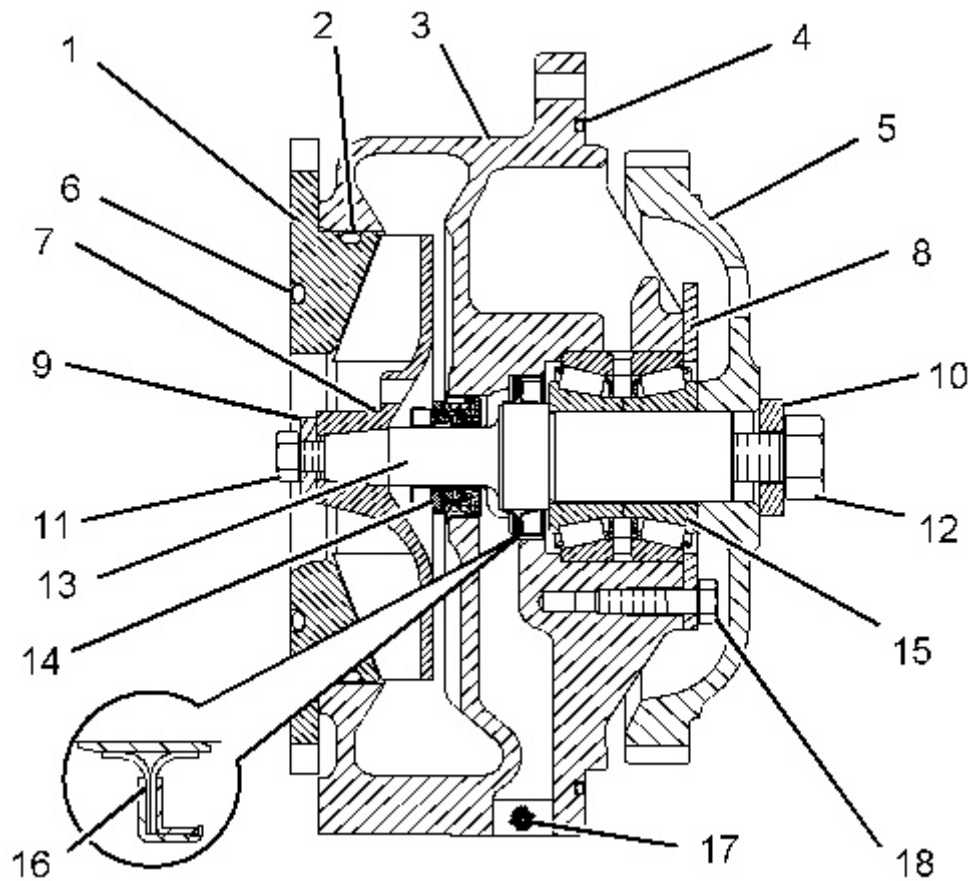


Illustration 1

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1. Remove O-ring seal (4) from water pump housing (3) .
2. Remove O-ring seal (6) from inlet adapter (1) .
3. Remove inlet adapter (1) from water pump housing (3) . Remove O-ring seal (2) .
4. Remove water pump filter (17) from water pump housing (3) .
5. Remove bolt (11) and washer (9) from water pump shaft (13) .
6. Use Tooling (A) to remove impeller (7) from water pump shaft (13) .
7. Remove bolt (12) and washer (10) from water pump shaft (13) .
8. Remove gear (5) from water pump shaft (13) .
9. Remove bolts (18) and retainer (8) from the water pump housing.
10. Remove water pump shaft (13) from the water pump housing.
11. Use a suitable press and Tooling (B) to remove bearing assembly (15) from water pump shaft (13) .
12. Use a suitable press and Tooling (C) to remove seal group (14) from water pump housing (3) .

13. Use a suitable press and Tooling (C) to remove lip seal (16) from water pump housing (3) .

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Publication Date -01/11/2017

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i07059535

## Water Pump - Assemble

SMCS - 1361-016

## Assembly Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	1P-0510	Driver Group	1
B	138-9299 <sup>(1)</sup>	Oil Seal Tool	1
	488-2672 <sup>(2)</sup>	Oil Seal Tool	1
D	139-0088 <sup>(1)</sup>	Seal Installer	1
	FT-3171 <sup>(2)</sup>	Seal Installer	1
F	169-5464	Quick Cure Primer	-

<sup>(1)</sup> Use with a 19.1 mm (0.75 inch) shaft

<sup>(2)</sup> Use with a 25.4 mm (1.00 inch) shaft

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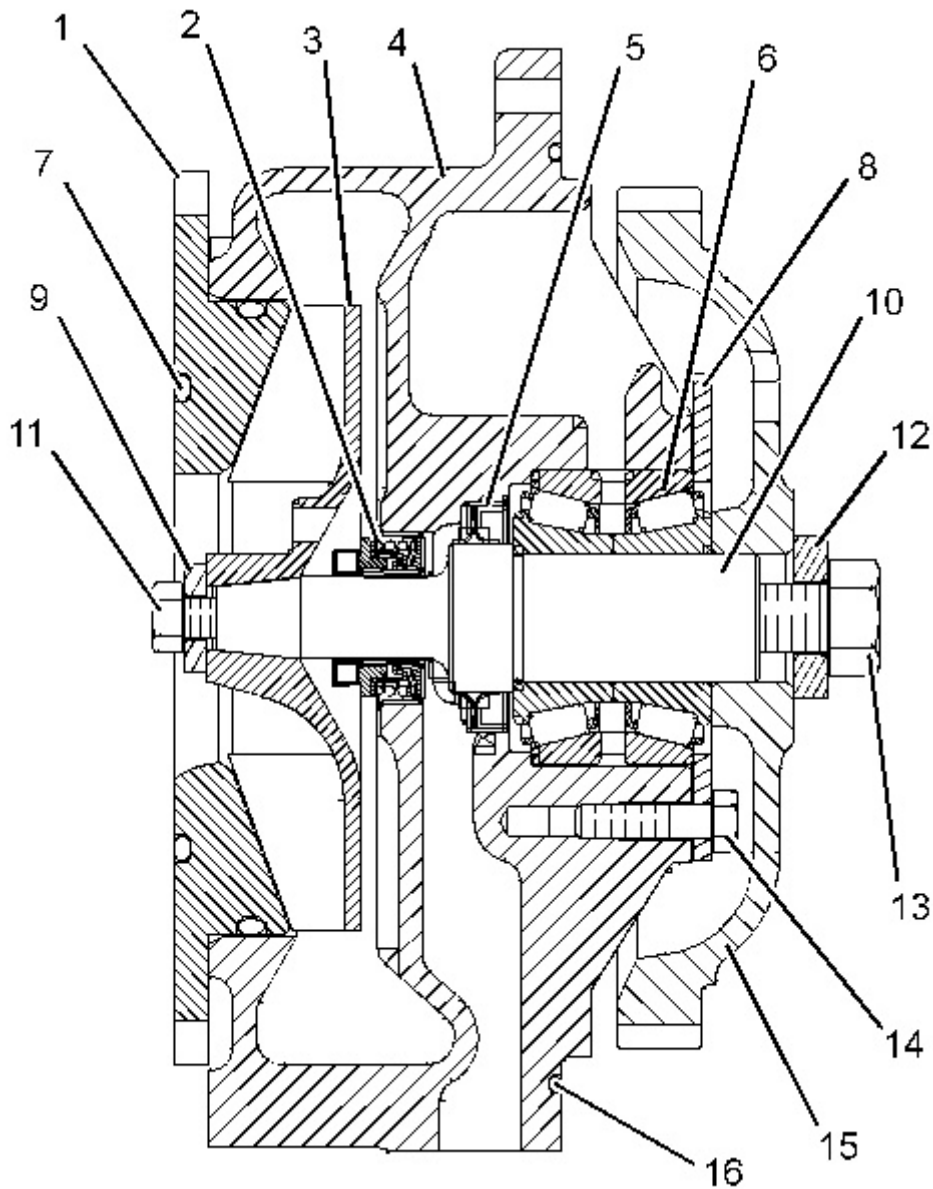


Illustration 1

g01163722

1. Use Tooling (F) to clean shaft (10) and the counterbore for oil seal (5) in housing (4).
2. Use Tooling (A) to install a new oil seal (5) in housing (4). Install the seal with the part number on the metal face of the seal toward the housing. Ensure that the oil seal is flush with the front edge of the counterbore of the housing. Do not lubricate the oil seal.
3. Install bearing cone (6) on shaft (10).
4. Position bearing retainer (8) with “this side out” markings toward the gear end of shaft (10). Install gear (15). Install washer (12) and bolt (13) on shaft (10). Tighten bolt (13) to a torque of  $215 \pm 40 \text{ N}\cdot\text{m}$  ( $159 \pm 30 \text{ lb ft}$ ).
5. Slide Tooling (B) over shaft (10). The tapered edge will be facing outward.
6. Install the gear and shaft assembly into housing (4). Use care not to damage the oil seal. Install bolts (14) that hold bearing retainer (8) to the housing.

7. Remove Tooling (B) from shaft (10).
8. Use Tooling (D) and a suitable press to install a new seal (2) over shaft (10) and into housing (4). Ensure that the outer shell of the seal is fully seated in the housing.
9. Position impeller (3) on shaft (10). Install washer (9) and bolt (11). Tighten the bolt to a torque of  $39 \pm 3$  N·m ( $29 \pm 2$  lb ft).
10. Install a new O-ring seal on the outside of adapter (1). Lightly lubricate the seal with clean engine oil.
11. Install a new O-ring seal (7) on adapter (1).
12. Position adapter (1) on housing (4).
13. Install a new O-ring seal (16) in housing (4).

**End By:**

- a. Install the water pump.
-

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## Disassembly and Assembly C15 and C18 Industrial Engines

Media Number -REN8630-07

Publication Date -01/11/2017

Date Updated -15/11/2017

i02155142

## Water Pump - Install

SMCS - 1361-012

## Installation Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	1U-6396	O-Ring Assembly Compound	-

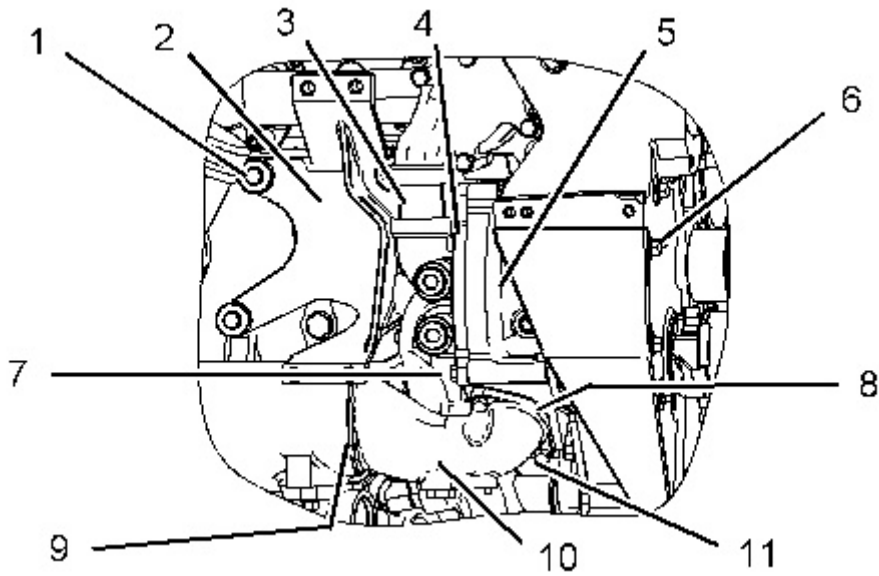
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### NOTICE

**Keep all parts clean from contaminants.**

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

---



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Illustration 1

g01092920

1. Install water pump (5). Install bolts (6).
  2. Install the O-ring seals on pipe (3). Apply Tooling (A) to the O-ring seals. Install the pipe in the water temperature regulator housing.
  3. Position water pump cover (4) on water pump (5) and install bolts (7).
  4. Install O-ring seal (9) on oil cooler bonnet (10). Apply Tooling (A) to the O-ring seal. Install the oil cooler bonnet in the engine oil cooler.
  5. Install integral seal (8) on oil cooler bonnet (10). Position the oil cooler bonnet on the water pump and install bolts (11).
  6. Position support (2) and install bolts (1).
  7. Fill the cooling system. Refer to Operation and Maintenance Manual, "Cooling System Coolant - Change".
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