

Product: EXCAVATOR

Model: 323D LN EXCAVATOR RAC

Configuration: 323D LN & 323D S Excavators RAC00001-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

i04625003

# Inlet and Exhaust Valve Guides - Remove and Install

SMCS - 1104-010

## Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	384-8861	Valve Guide Remover	1
B	138-7573	Link Bracket	4
C	1U-9200	Lever Puller Hoist	1
D	8S-6691	Cylinder Head Repair Stand	1

### Start By:

- A. Remove the inlet and exhaust valves. Refer to Disassembly and Assembly, "Inlet and Exhaust Valves - Remove and Install".
- B. Remove the electronic unit injectors. Refer to Disassembly and Assembly, "Electronic Unit Injector - 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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## NOTICE

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Dispose of all fluids according to local regulations and mandates.

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**Note:** Refer to Special Instructions, SMHS7953-00, "Use of Valve Seat Insert Puller Group" to aid with the removal of the inlet and exhaust valve seats.

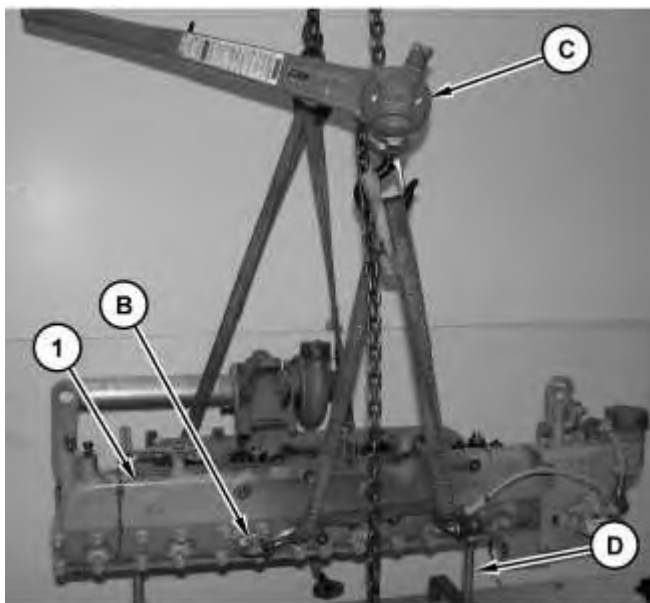


Illustration 1

g01377064

1. Attach Tooling (B) , Tooling (C) , and a suitable lifting device to cylinder head (1) . Use Tooling (B) , Tooling (C) , and the suitable lifting device in order to turn over cylinder head (1) by 180° onto Tooling (D) .
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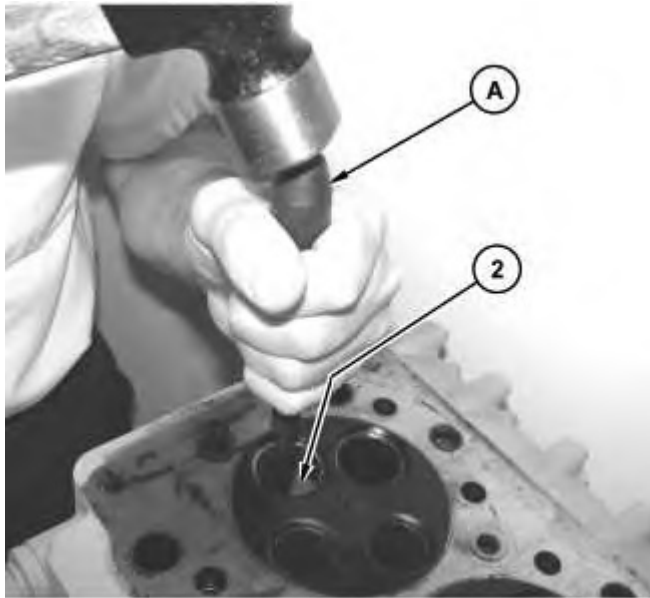


Illustration 2

g01377121

2. Use Tooling (A) in order to remove valve guides (2) (not shown).

## Installation Procedure

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
E	384-8862	Valve Guide Installer	1

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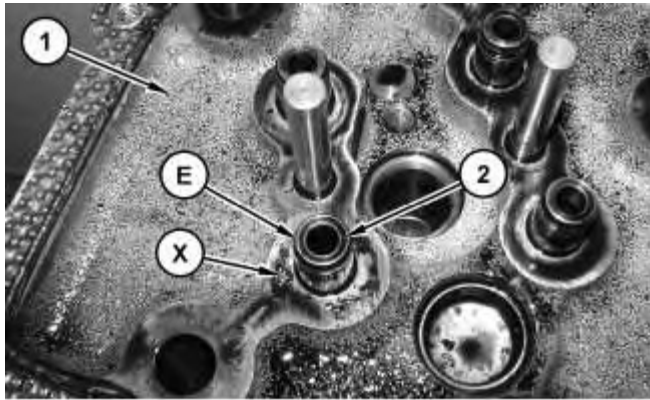
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Illustration 3

g01377130

1. Lubricate the outside of valve guides (2) (not shown) with clean engine oil.
2. Use Tooling (E) in order to install new valve guides (2) . Install valve guide (2) so that valve guide (2) protrudes 16.000 mm (0.6299 inch) above Surface (X) of cylinder head (1) .

**End By:**

- a. Install the electronic unit injectors. Refer to Disassembly and Assembly, "Electronic Unit Injector - Install".
  - b. Install the inlet and exhaust valves. Refer to Disassembly and Assembly, "Inlet and Exhaust Valves - Remove and Install".
-

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i04625001

# Inlet and Exhaust Valve Seat Inserts - Remove and Install

SMCS - 1103-010

## Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	166-7441	Valve Seat Extractor Tool	1
	6V-4194	Valve Seat Extractor <sup>(1)</sup>	1
	6V-4196	Valve Seat Extractor <sup>(1)</sup>	1
B	138-7573	Link Bracket	4
C	1U-9200	Lever Puller Hoist	1
D	8S-6691	Cylinder Head Repair Stand	1

<sup>(1)</sup> Component of the Valve Seat Extractor Tool Group.

### Start By:

- A. Remove the inlet and exhaust valves. Refer to Disassembly and Assembly, "Inlet and Exhaust Valves - Remove and Install".
- B. Remove the electronic unit injectors. Refer to Disassembly and Assembly, "Electronic Unit Injectors - Remove".

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**Note:** Refer to Special Instructions, SMHS7953-00, "Use of Valve Seat Insert Puller Group" to aid with the removal of the inlet and exhaust valve seats.

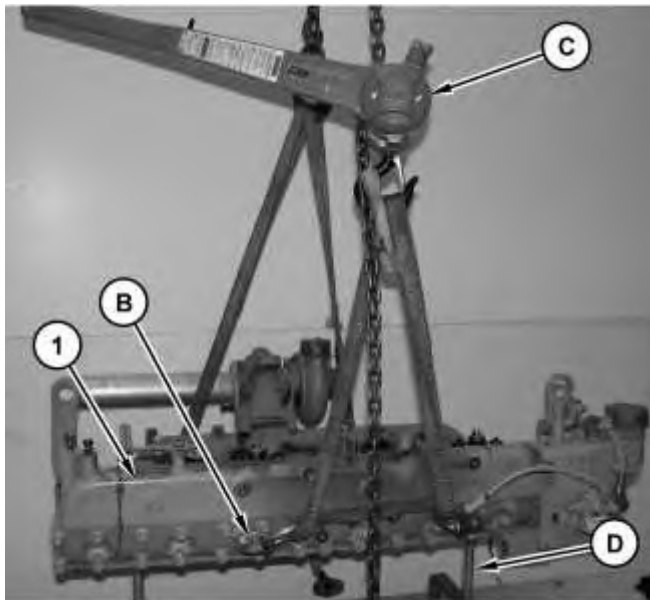
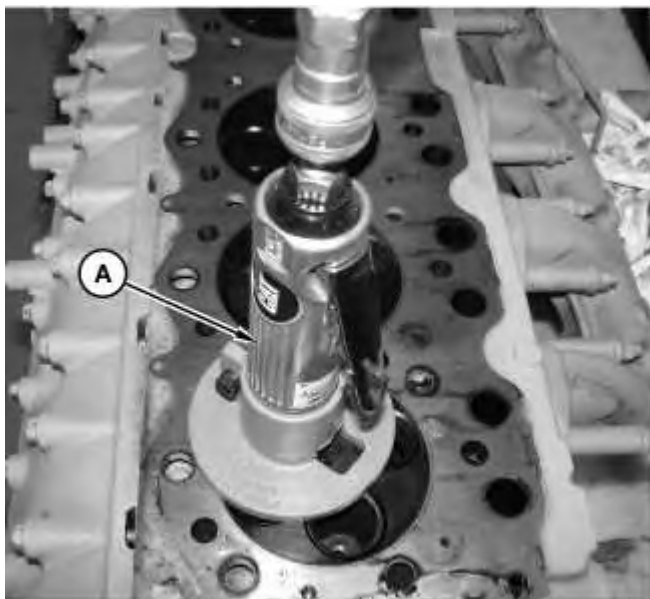


Illustration 1

g01377064

1. Attach Tooling (B) , Tooling (C) , and a suitable lifting device to cylinder head (1) . Use Tooling (B) , Tooling (C) , and the suitable lifting device in order to turn over cylinder head (1) by 180° onto Tooling (D) .



2. Use the valve seat grinder of Tooling (A) in order to notch the valve seat.

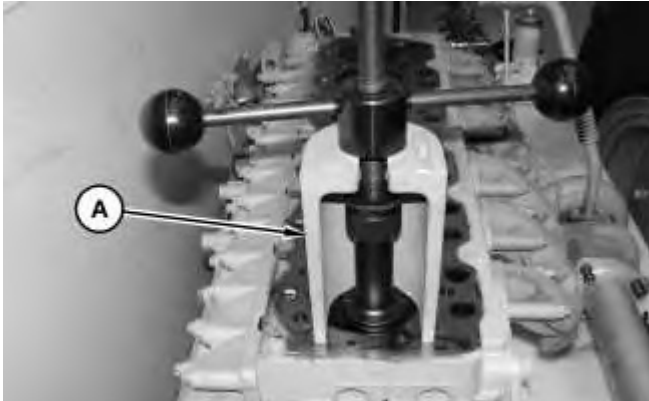


Illustration 3

3. Use the valve seat extractor of Tooling (A) to remove the inlet and exhaust valve seats.
4. Clean the valve seat in the cylinder head. Remove any rough areas from the valve seat in the cylinder head.
5. Repeat Steps 2 through 4 for the remaining inlet valve seat inserts and exhaust valve seat inserts.

## Installation Procedure

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
E	384-8859	Valve Seat Installer	1
F	384-8860	Valve Seat Installer	1

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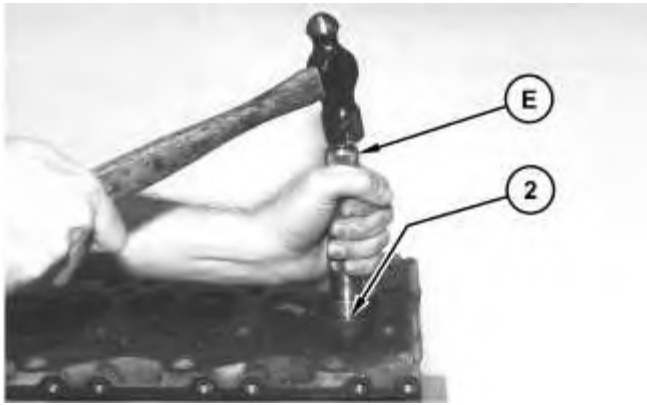


Illustration 4

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Typical Example

1. Lower the temperature of the new inlet valve seat inserts (2) . Use Tooling (E) in order to install a new inlet valve seat insert (2) (not shown) in the cylinder head.

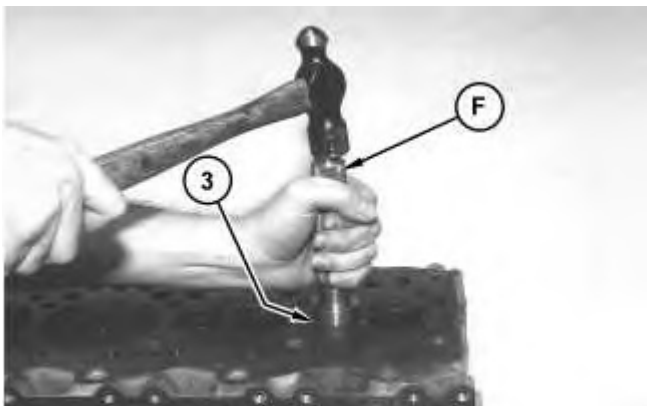


Illustration 5

g01376588

Typical Example

2. Lower the temperature of new exhaust valve seat inserts (3) . Use Tooling (E) and Tooling (F) in order to install the new exhaust valve seat insert (3) (not shown) in the cylinder head.

**Note:** The temperature of exhaust valve seat insert (3) is lowered in order to ease the installation of exhaust valve seat insert (3) .

3. Repeat Step 1 and 2 for the remaining inlet valve seat inserts and exhaust valve seat inserts.

**End By:**

- a. Install the inlet and exhaust valves. Refer to Disassembly and Assembly, "Inlet and Exhaust Valves - Remove and Install".
- b. Install the electronic unit injectors. Refer to Disassembly and Assembly, "Electronic Unit Injectors - Install".



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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

i02746253

# **Engine Oil Cooler - Remove**

SMCS - 1378-011

## **Removal Procedure**

### **Start By:**

- a. Remove the fuel injection pump. Refer to Disassembly and Assembly, "Fuel Injection Pump - Remove".

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

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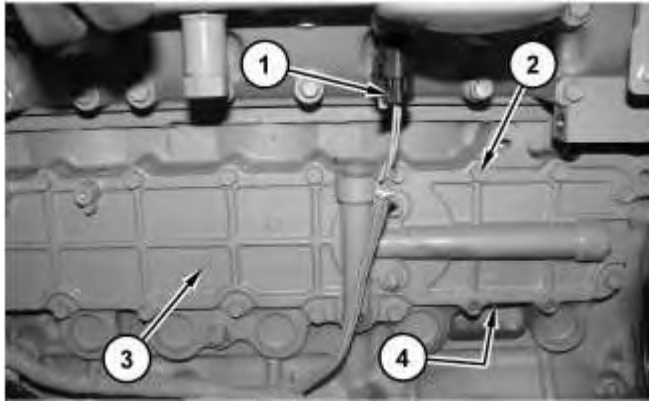


Illustration 1

g01375410

1. Disconnect harness assembly (1).
  2. Remove bolts (2) and remove engine oil cooler (3). Remove gasket (4) (not shown) from the engine cylinder block.
-

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i02746254

## Engine Oil Cooler - Disassemble

SMCS - 1378-015

### Disassembly Procedure

#### Start By:

- a. Remove the engine oil cooler. Refer to Disassembly and Assembly, "Engine Oil Cooler - Remove".

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#### NOTICE

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#### NOTICE

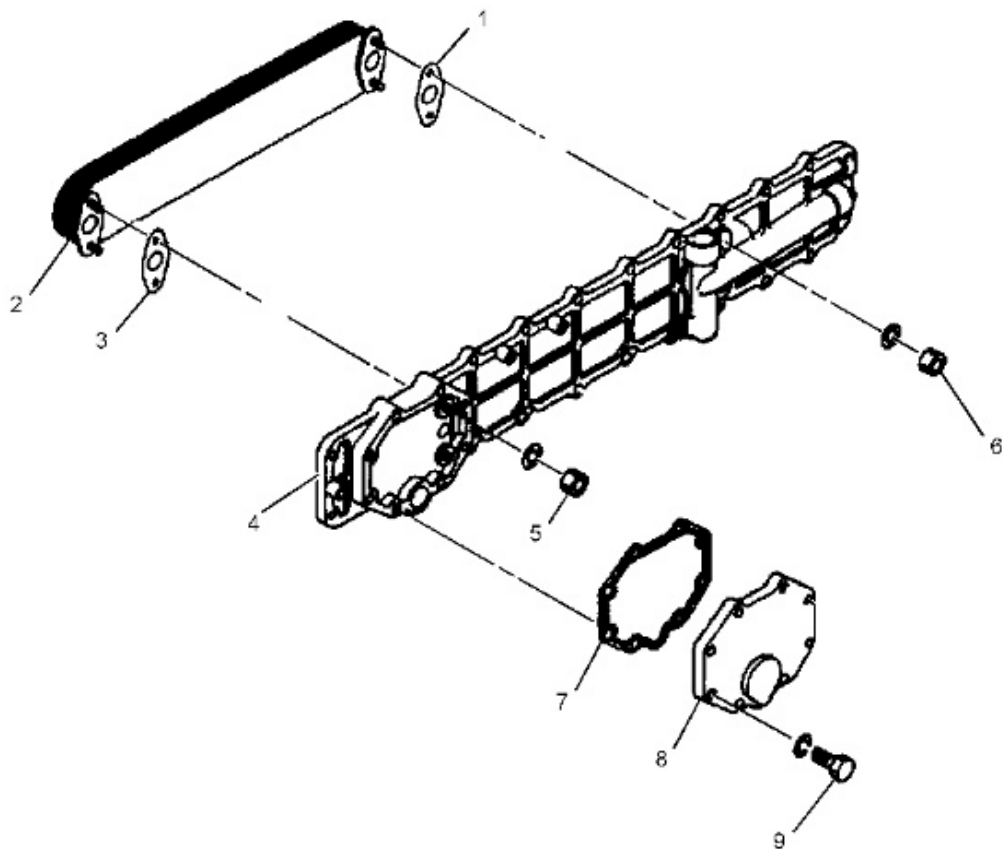
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**Dispose of all fluids according to local regulations and mandates.**

---

**Note:** Cleanliness is an important factor. Before you begin the disassembly procedure, the exterior of the components should be thoroughly cleaned. This will help to prevent dirt from entering the internal mechanism. Precision components can be damaged by contaminants or by dirt. Perform disassembly procedures on a clean work surface. Keep components covered and protected at all times.



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Illustration 1

g01375411

1. Remove bolts (9) and the washers. Remove cover (8) and gasket (7).
  2. Remove nuts (5) and the washers from engine oil cooler cover (4). Remove nuts (6) and the washers from engine oil cooler cover (4).
  3. Remove engine oil cooler core (2) from engine oil cooler cover (4). Remove gaskets (1) and (3).
-

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i02746255

## **Engine Oil Cooler - Assemble**

SMCS - 1378-016

### **Assembly Procedure**

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#### **NOTICE**

**Keep all parts clean from contaminants.**

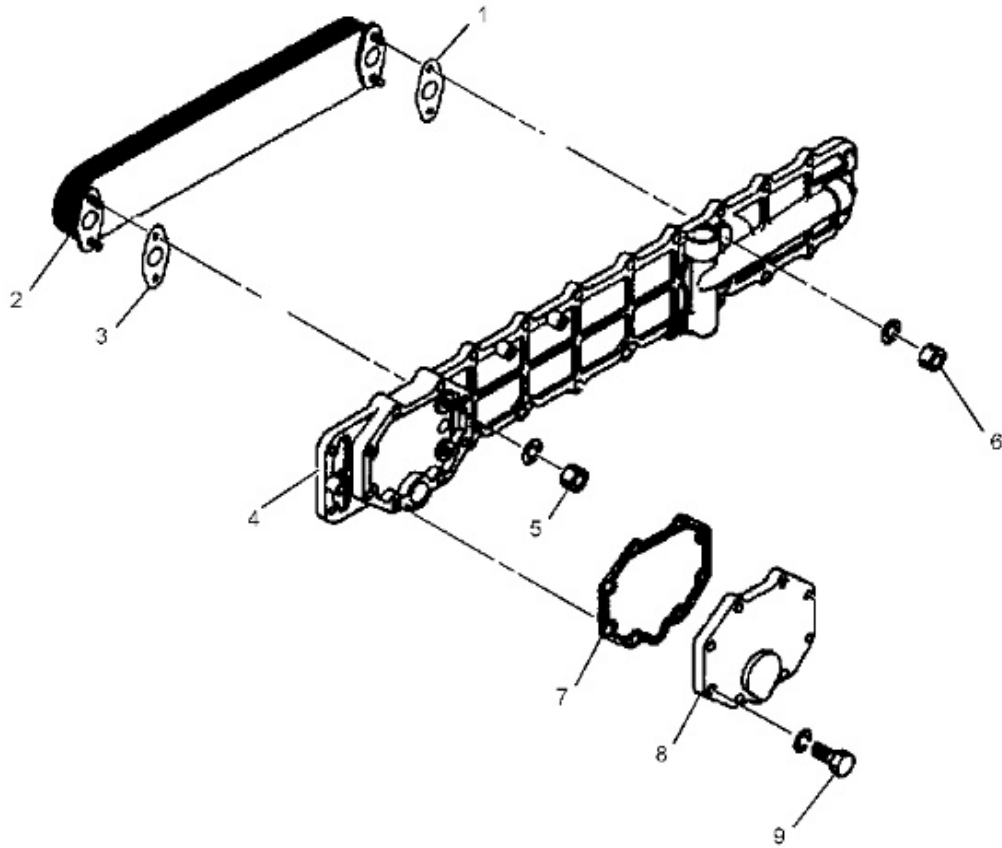
**Contaminants may cause rapid wear and shortened component life.**

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**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 gaskets for damage. Replace the components, if necessary.

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Illustration 1

g01375411

1. Install gaskets (3) and (1) to engine oil cooler core (2). Position engine oil cooler core (2) to engine oil cooler cover (4).
2. Install the washers and nuts (6). Install the washers and nuts (5).
3. Install gasket (7) and position cover (8). Install the washers and bolts (9).

**End By:**

- a. Install the engine oil cooler. Refer to Disassembly and Assembly, "Engine Oil Cooler - Install".
-

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

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Date Updated -18/10/2017

i02746256

# Engine Oil Cooler - Install

SMCS - 1378-012

## 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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**Note:** Check the gaskets for wear or for damage. Replace the components, if necessary.

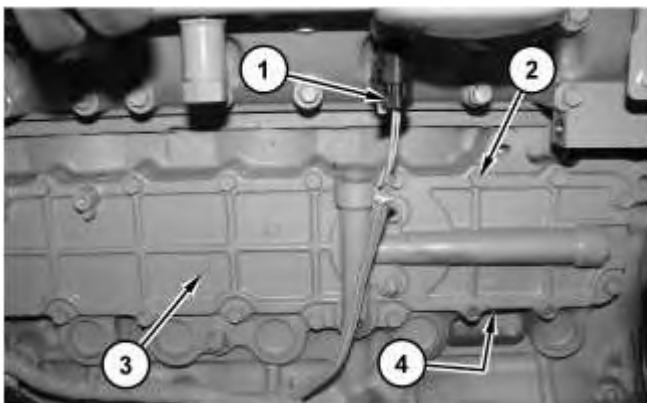


Illustration 1

g01375410

1. Install gasket (4) (not shown). Position engine oil cooler (3) to the engine block. Install bolts (2).

2. Connect harness assembly (1).

**End By:**

- a. Install the fuel injection pump. Refer to Disassembly and Assembly, "Fuel Injection Pump - Install".
-



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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

i02751808

# Engine Oil Relief Valve - Remove and Install

SMCS - 1315-010

## Removal Procedure

### Start By:

- a. Remove the electronic control module. Refer to Disassembly and Assembly, "Electronic Control Module - Remove and Install".

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### NOTICE

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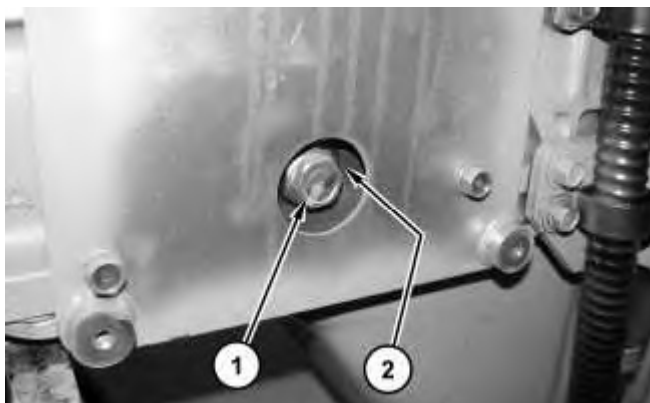


Illustration 1

g01377673

1. Remove engine oil relief valve (1).
2. Remove gasket (2) (not shown). Discard gasket (2).

## Installation Procedure

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### NOTICE

**Keep all parts clean from contaminants.**

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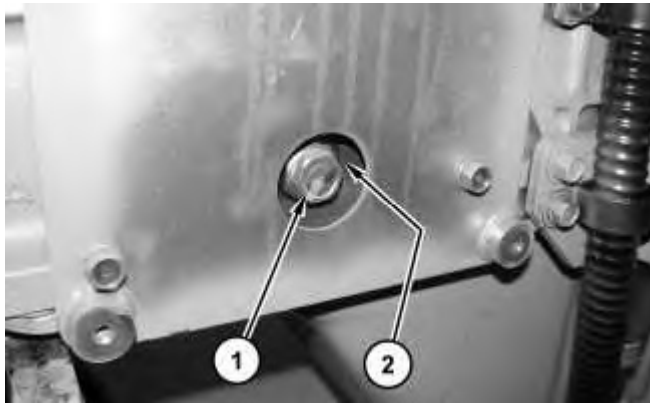


Illustration 2

g01377673

1. Install a new gasket (2) (not shown).
2. Install engine oil relief valve (1). Tighten engine oil relief valve (1) to a torque of  $49 \pm 5 \text{ N}\cdot\text{m}$  ( $36 \pm 4 \text{ lb ft}$ ).

### End By:

- a. Install the electronic control module. Refer to Disassembly and Assembly, "Electronic Control Module - Remove and Install".
-

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i02751881

# Engine Oil Bypass Valve - Remove and Install

SMCS - 1306-010-BV

## Removal Procedure

### Start By:

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

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### NOTICE

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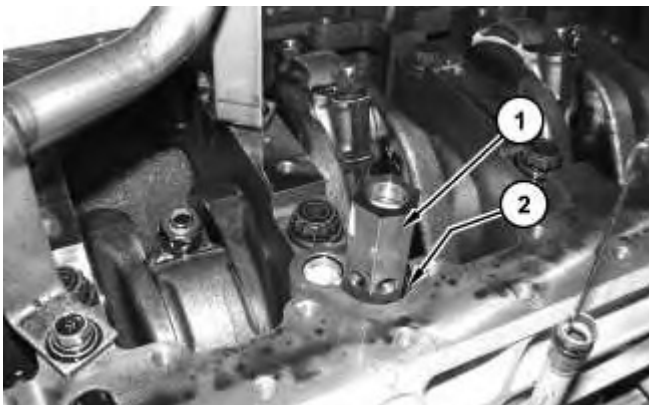


Illustration 1

g01377713

1. Remove engine oil bypass valve (1). Remove gasket (2) (not shown). Discard gasket (2).

# Installation Procedure

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## NOTICE

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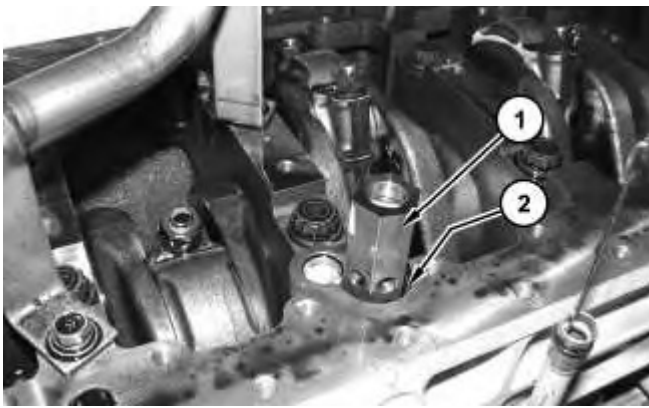


Illustration 2

g01377713

1. Install a new gasket (2) (not shown). Install engine oil bypass valve (1). Tighten engine oil bypass valve (1) to a torque of  $69 \pm 5$  N·m ( $51 \pm 4$  lb ft).

### End By:

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

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i02751822

# Engine Oil Pump Relief Valve - Remove and Install

SMCS - 1304-010

## Removal Procedure

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### NOTICE

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Illustration 1

g01377698

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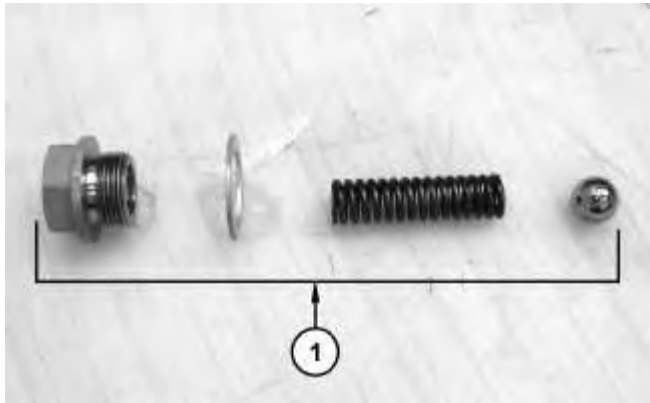


Illustration 2

g01377701

## **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.**

1. Remove engine oil pump relief valve (1).

## **Installation Procedure**

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### **NOTICE**

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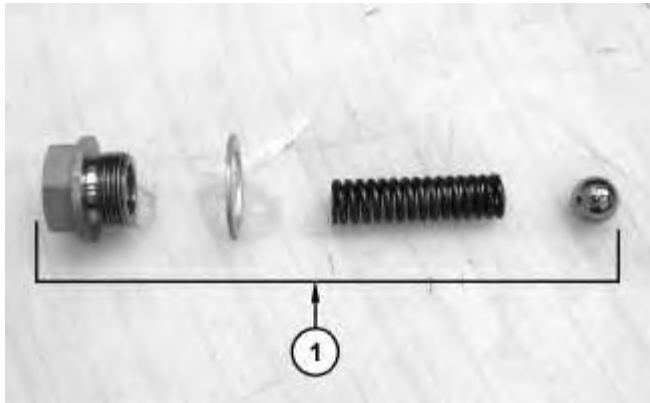


Illustration 3

g01377701



Illustration 4

g01377698

 **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.**

1. Install engine oil pump relief valve (1). Tighten engine oil pump relief valve (1) to a torque of  $59 \pm 10 \text{ N}\cdot\text{m}$  ( $44 \pm 7 \text{ lb ft}$ ).

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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:

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

---

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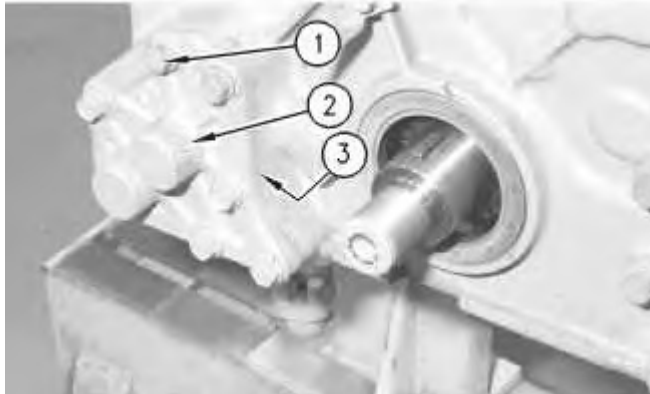


Illustration 1

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).

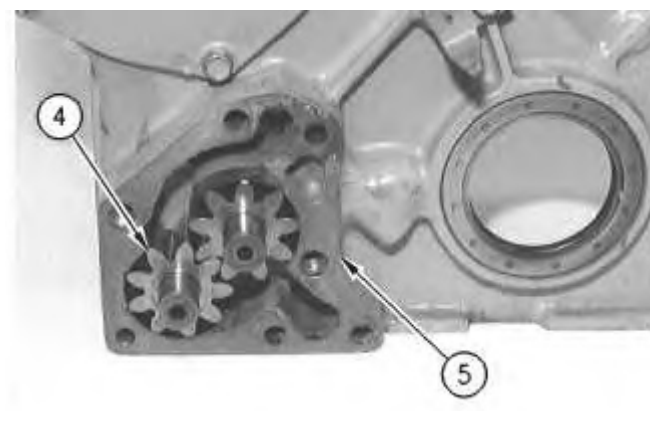


Illustration 2

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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