CATERPILLAR®

RENR9705-08

# Disassembly and Assembly

## C13 On-Highway Engine

**S/N LEE1-UP**

*Use the bookmarks for navigation inside of the manual*

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**Disassembly and Assembly**
**C13 On-Highway Engine**
**Media Number -RENR9705-08** **Publication Date -01/10/2009** **Date Updated -26/10/2009**

i02730261

# Fuel Priming Pump - Remove and Install

**SMCS** - 1258-010

## Removal Procedure

**Note:** Put identification marks on all hoses, on all hose assemblies, on all wires, and on all tube assemblies for installation purposes. Plug all hose assemblies and all tube assemblies. This helps to prevent fluid loss, and this helps to keep contaminants from entering the system.

**Note:** Cleanliness is an important factor. Before you begin the removal procedure, the exterior of the components should be thoroughly cleaned. This will help to prevent dirt from entering the internal mechanism.

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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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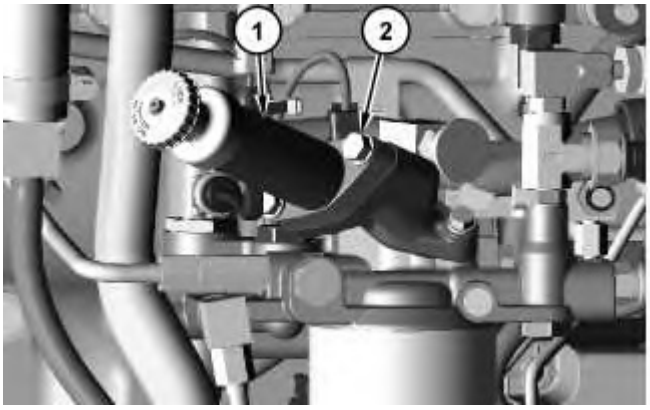


Illustration 1 g01369019

1. Remove bolts (2), fuel priming pump (1), and the gasket.

## 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.

**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.**

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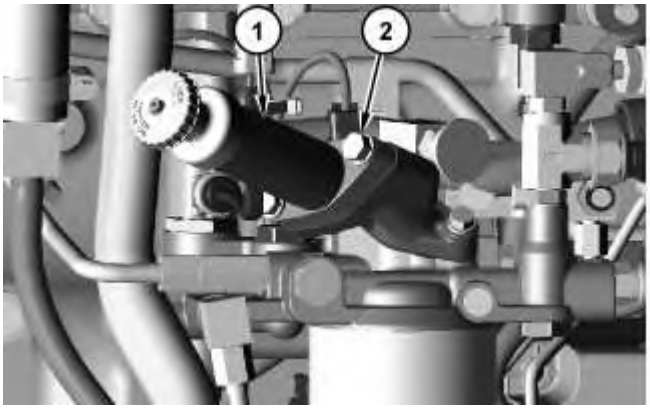


Illustration 2 g01369019

1. Position the gasket and fuel priming pump (1). Install bolts (2) .

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i01942452

# Flywheel - Remove

**SMCS** - 1156-011

# Removal Procedure

Table 1

| Required Tools | | | |
|---|---|---|---|
| **Tool** | **Part Number** | **Part Description** | **Qty** |
| A | 138-7573 | Link Bracket | 2 |
| B | FT2712 | Guide Stud | 2 |

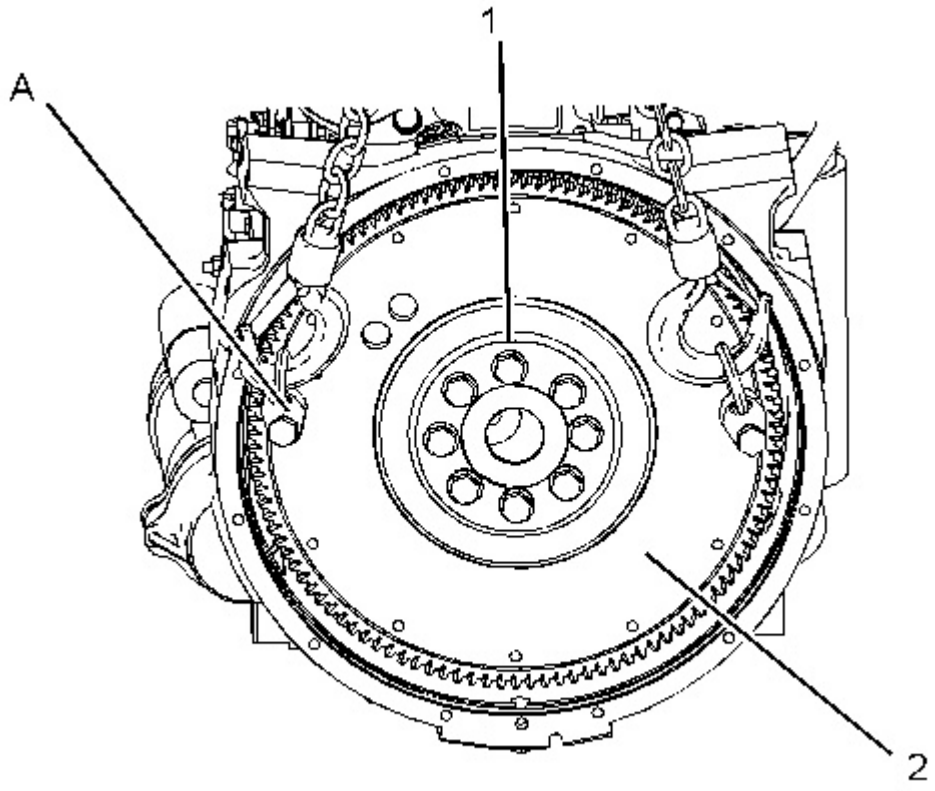


Illustration 1 g01010803

1. Install Tooling (A) on flywheel (2). Fasten a suitable lifting device to flywheel (2). The weight of the flywheel is approximately 41 kg (90 lb).
2. Remove two bolts (1) that are 180 degrees from the first bolt. Install Tooling (B) .
3. Remove the remaining six bolts (1) .
4. Remove flywheel (2) .
5. Inspect the flywheel ring gear. Replace the ring gear, if necessary. Place the flywheel on a wood block. Use a hammer and a punch in order to remove the ring gear.

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i02641059

# Pistons and Connecting Rods - Assemble

**SMCS** - 1225-016

## Assembly Procedure

Table 1

| **Required Tools** | | | |
|---|---|---|---|
| **Tool** | **Part Number** | **Part Description** | **Qty** |
| A | 4C-3601 | Piston Ring Expander | 1 |
| C | 4C-8165 (1) or 208-7630 (2) | Piston Ring Groove Gauge | 1 |

(1) Use with C11 Engines only
(2) Use with C13 Engines only

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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**

**Verify correct assembly of the pistons and the connecting rods. Ensure that the etched numbers on the rod and the rod cap are in the correct positions. The etched number on the rod and the rod cap correspond to the cylinder in which it should be installed.**

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**Note:** The word "FRONT" may be stamped on the pistons in some engines. Ensure that the word "FRONT" is toward the front of the engine when the piston is installed. The etched number on the connecting rod must be on the right side of the engine in the corresponding cylinder. Ensure that the

piston and the etched number are correctly positioned.

**Note:** Inspect condition of all piston ring grooves. Use Tooling (C) to verify diameter of top ring groove. Refer to Tool Operating Manual, NEHS0840 for additional information.

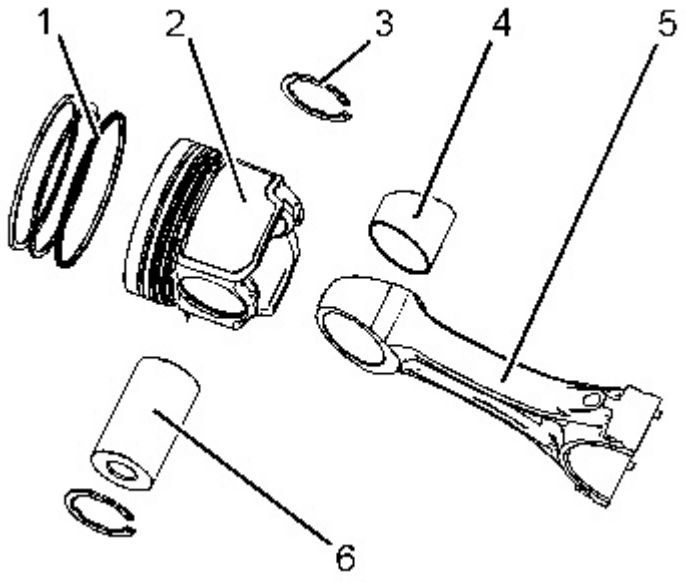


Illustration 1 g01319591

**Note:** Ensure that new bearing (4) is installed prior to assembly of the piston.

**Note:** Careful handling is required for fractured connecting rods. Fractured faces for the connecting rod and connecting rod cap should not be placed on any surface. The connecting rod and the connecting rod cap should be placed on the sides in order to prevent damage. When possible, the connecting rod and the connecting rod cap should be bolted together in order to prevent damage.

1. Place piston (2) on connecting rod (5) . Apply clean engine oil to piston pin (6) and install the piston pin.
2. Install retaining rings (3) .
3. Check the clearance between the ends of piston rings (1) . Refer to Specifications, "Piston and Rings".

   **Note:** The oil ring must be installed over the spring with the end gap 180 degrees from the oil ring spring joint.
4. Install the oil control piston ring. The ends of the spring should be rotated 180 degrees from the ring end gap.
5. Install the intermediate piston ring with the side marked "UP-2" toward the top of the piston. Use Tooling (A) in order to install the ring.
6. Install the top piston ring with the side marked "UP-1" toward the top of the piston. Use Tooling (A) in order to install the ring.
7. After installation, all three of the piston rings should be placed 120 degrees away from each other.

**End By:** Install the pistons and the connecting rods. Refer to Disassembly and Assembly, "Pistons and Connecting Rods - Install".

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i03252920

# Fan Drive Mounting Group - Remove and Install

**SMCS** - 1359-010

**S/N** - EMC1-UP

**S/N** - LEE1-UP

## Removal Procedure

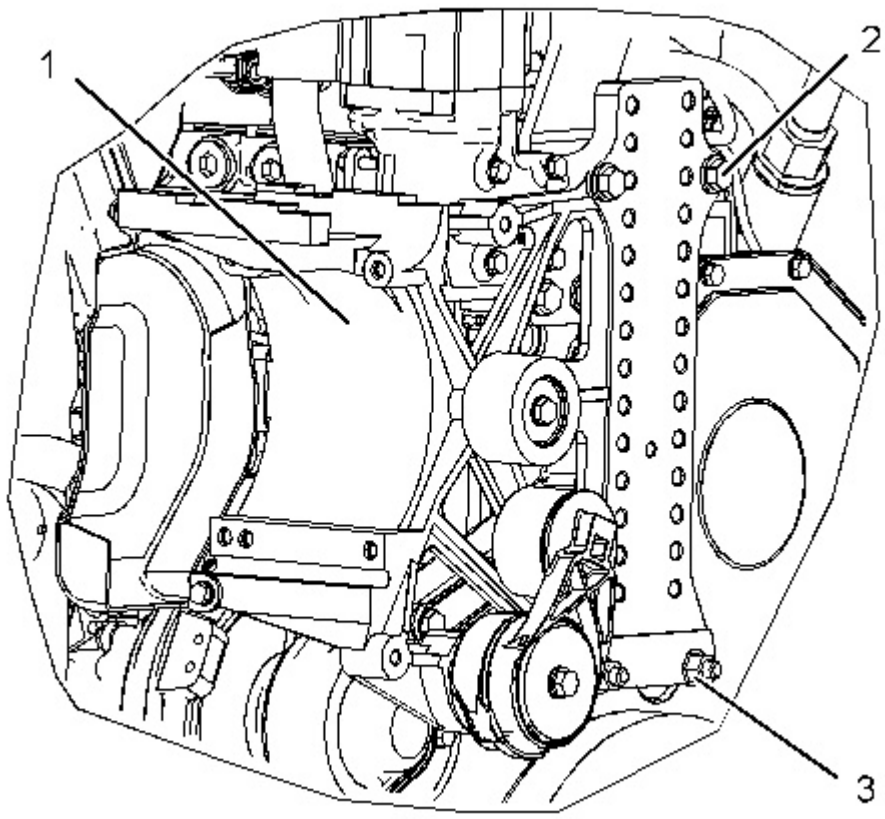


Illustration 1 g01653595

Diesel Engines

| | |
|---|---|
| ABS | Agco-Sisu |
| Akasaka | Baudouin |
| BMW | Bukh |
| Caterpillar | CHN 25/34 |
| Cummins | Daihatsu |
| Detroit | Deutz |
| Doosan-Daewoo | Fiat |
| Ford | GE |
| Grenaa | Guascor |
| Hanshin | Hatz |
| Hino | Honda |
| Hyundai | Isotta |
| Isuzu | Iveco |
| John-Deere | Kelvin |
| Kioti | Komatsu |
| Kubota | Liebherr |
| Lister | Lombardini |
| MAK | MAN B&W |
| Mercedes | Mercruiser |
| Mirrlees BS | Mitsubishi |
| MTU | MWM |
| Niigata | Paxman |
| Perkins | Pielstick |
| Rolls / Bergen | Ruggerini |
| Ruston | Scania |
| Shibaura | Sisu-Valmet |
| SKL | Smit-Bolnes |
| Sole | Stork |
| VM-Motori | Volvo |
| Volvo Penta | Westerbeke |
| Wichmann | Yanmar |

Machinery

| | |
|---|---|
| ABG | Airman |
| Akerman | Ammann |
| Astra | Atlas Copco |
| Atlas Weyha. | Atlet |
| Bell | Bendi |
| Bigjoe | Bobcat |
| Bomag | BT |
| Carelift | Case |
| Caterpillar | Cesab |
| Challenger | Champion |
| Claas | Clark |
| Combilift | Crown |
| Daewoo-Doosan | Demag |
| Deutz-Fahr | Dressta |

Machinery

| | |
|---|---|
| Drott | Dynapack |
| Extec | Faun |
| Fendt | Fiat |
| Fiatallis | Flexicoil |
| Furukawa | Gehl |
| Genie | Grove-gmk |
| Halla | Hamm |
| Hangcha | Hanix |
| Hanomag | Hartl |
| Haulpack | Hiab |
| Hidromek | Hino truck |
| Hitachi | Hyster |
| Hyundai | IHI |
| Ingersoll-rand | JCB |
| JLG | John-Deere |
| Jungheinrich | Kalmar |
| Kato | Kioti |
| Kleeman | Kobelco |
| Komatsu | Kramer |
| Kubota | Lamborghini |
| Landini | Liebherr |
| Linde | Link-belt |
| Manitou | Massey-Ferg. |
| Mccormick | MDI-Yutani |
| Mitsubishi | Moxy |
| Mustang | Neusson |
| New-Holland | Nichiyu |
| Nissan | OK |
| OM-Pimespo | others-tech |
| Pel-Job | PH-mining |
| Poclain | Powerscreen |
| Same | Samsung |
| Sandvik | Scania |
| Schaefer | Schramm |
| Sennebogen | Shangli |
| Shibaura | Steiger |
| Steinbock | Steyr |
| Still | Sumitomo |
| Super-pac | Tadano |
| Takeuchi | TCM |
| Terex | Toyota |
| Valpadana | Venieri |
| Versatile | Vogele |
| Volvo | Weidemann |
| Wirtgen | Yale |
| YAM | Yanmar |