



Service Repair Manual

Models

**303E CR Mini
Hydraulic Excavator**

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Product: MINI HYD EXCAVATOR

Model: 303E CR MINI HYD EXCAVATOR SMG

Configuration: 303E CR Mini Hydraulic Excavator SMG00001-UP (MACHINE) POWERED BY C1.3 Engine

Disassembly and Assembly

C1.3 Engine for Caterpillar Built Machines

Media Number -UENR3292-03

Publication Date -01/05/2014

Date Updated -02/02/2017

i05317149

Governor - Remove

SMCS - 1264-011

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	1P-1859	Retaining Ring Pliers	1

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.



1. Before removing the governor assembly, align the timing marks on all gears on the front of the engine.

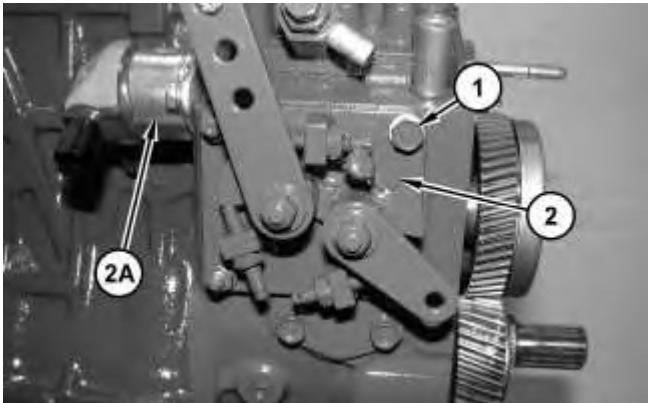


Illustration 2

1. Remove bolts (1) and speed control plate (2). Remove stop solenoid (2A).

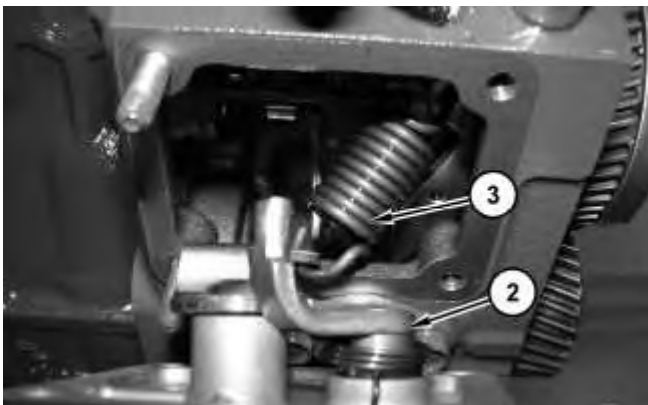
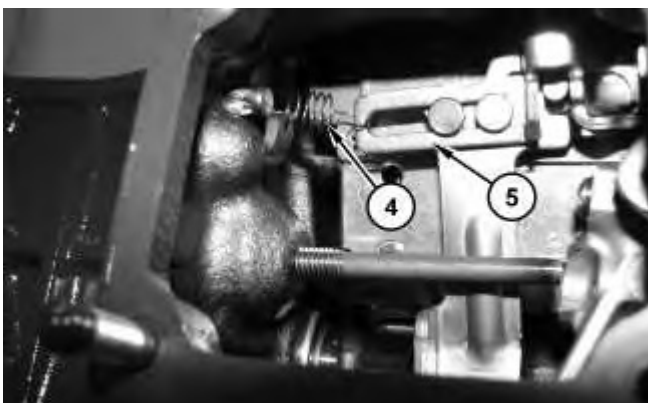


Illustration 3

2. Disconnect governor spring (3) from speed control plate (2). Remove governor spring (3).



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3. Remove start spring (4) from thrust lever (5).



Illustration 5

g03370075

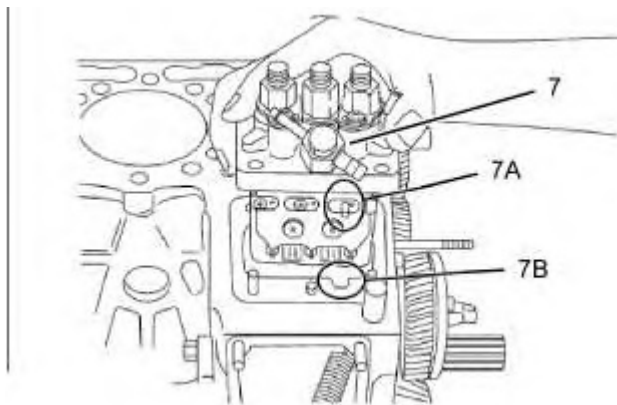


Illustration 6

g03381361

4. Remove bolts (6) and injector pump (7). Align the control rack pin (7A) with the notch in the crankcase (7B).



Illustration 7

g03370082

5. Remove plug (8).



Illustration 8

g03370176

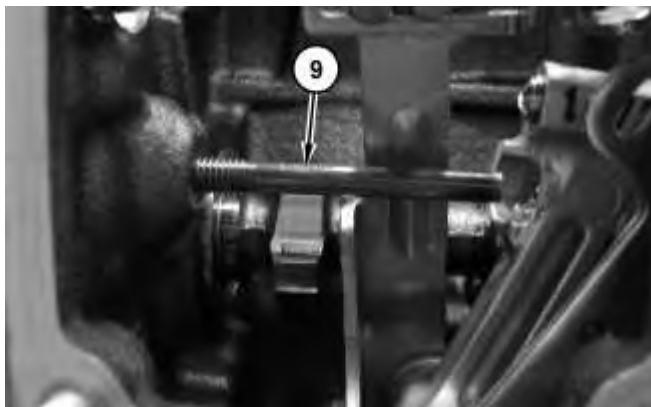


Illustration 9

g03370186

6. Measure the height of max torque limiter (8) from block and record for installation purposes. Remove max torque limiter (8).

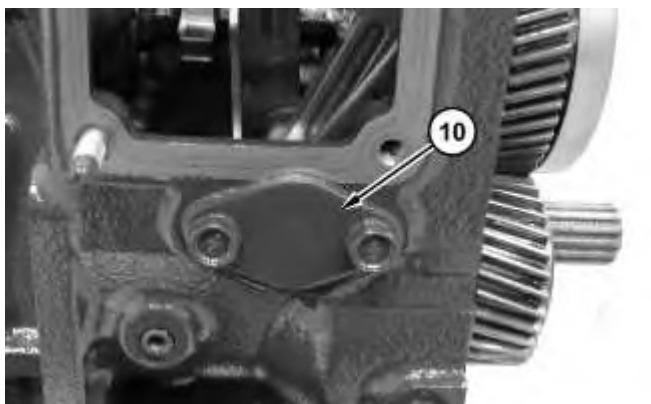


Illustration 10

g03370189

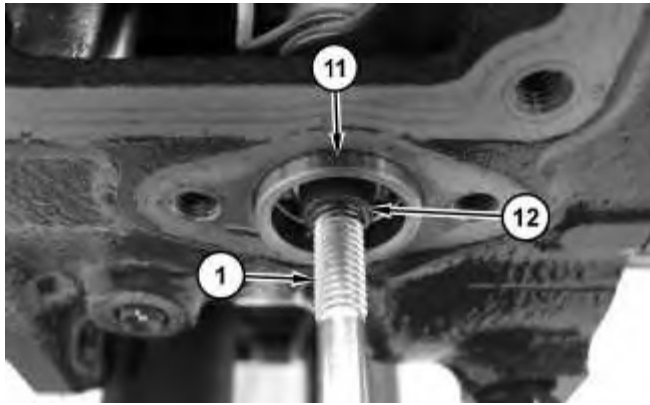


Illustration 11

g03370193

7. Remove plate (10). Use bolt (1) in order to pull shaft (12) and bearing collar (11) from the governor housing.



Illustration 12

g03370379

8. Remove fork lever assembly (13) from the governor housing.

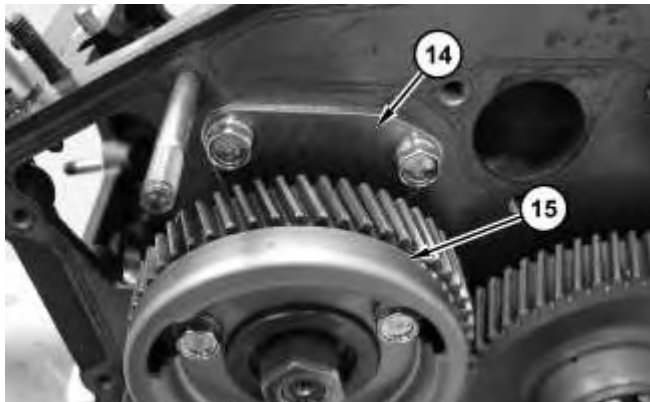


Illustration 13

g03370397

9. Remove fuel camshaft stopper (14) and fuel camshaft gear assembly (15).



Illustration 14

g03370400

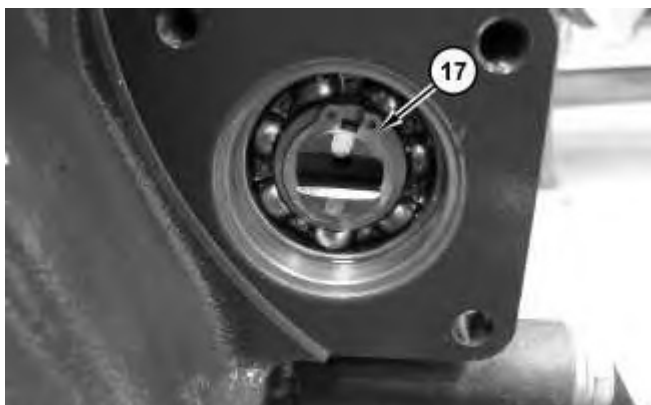


Illustration 15

g03370402

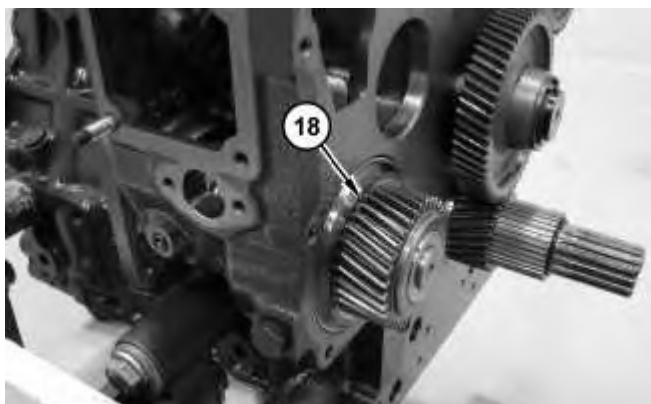


Illustration 16

g03370401

-
10. Remove plug (16). Using Tooling (A) remove retaining ring (17). Remove governor shaft and gear assembly (18).
-

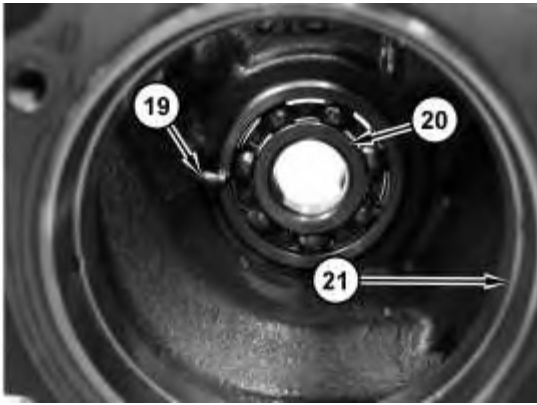


Illustration 17

g03370504

11. Remove setscrew (19) and bearing (20). Remove bearing (21).

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Product: MINI HYD EXCAVATOR

Model: 303E CR MINI HYD EXCAVATOR SMG

Configuration: 303E CR Mini Hydraulic Excavator SMG00001-UP (MACHINE) POWERED BY C1.3 Engine

Disassembly and Assembly

C1.3 Engine for Caterpillar Built Machines

Media Number -UENR3292-03

Publication Date -01/05/2014

Date Updated -02/02/2017

i05318443

Governor - Install

SMCS - 1264-012

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	1P-1859	Retaining Ring Pliers	1
B	442-0744	Bushing Tool	1
C	-	Loctite 593 Silicone Sealer	

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

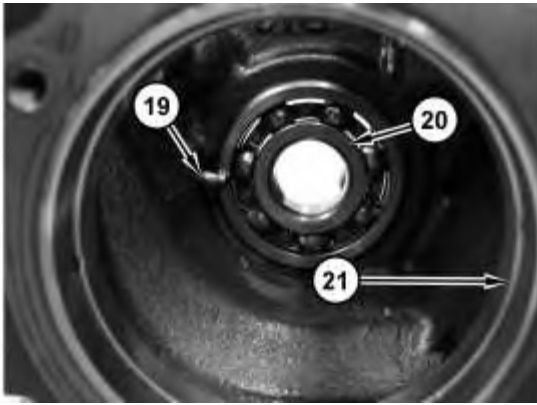


Illustration 1

g03370555

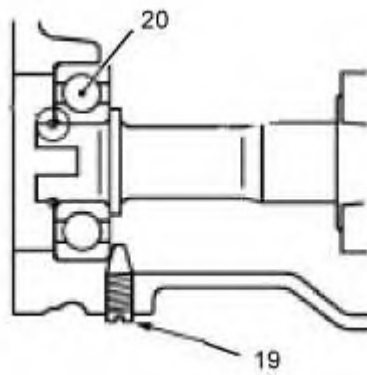


Illustration 2

g03381410

1. Install bearing (20). Apply Tooling (C) to set screw (19). Install set screw (19) until the tapered part contacts the bearing (20) as shown. Using Tooling (B), install bearing (21).

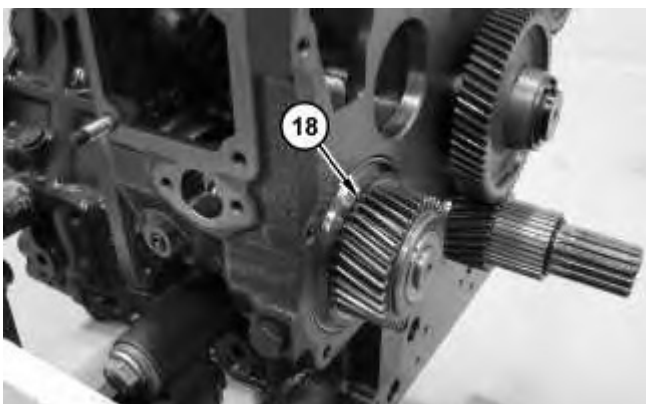


Illustration 3

g03370558

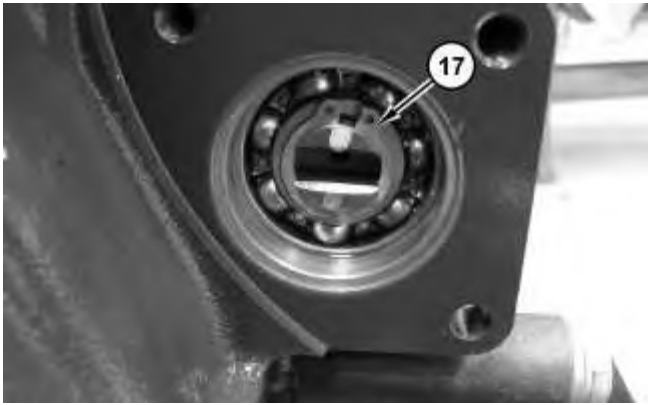


Illustration 4

g03370578



Illustration 5

g03370582

2. Install governor shaft and gear assembly (18). Install retaining ring (17) on shaft. Install plug (16).



Illustration 6

g03370616

3. Install fuel camshaft gear assembly (15). Make sure to line up timing marks on gears upon installation. Install fuel camshaft stopper (14).



Illustration 7

g03370617

4. Install fork lever assembly (13) into the governor housing.

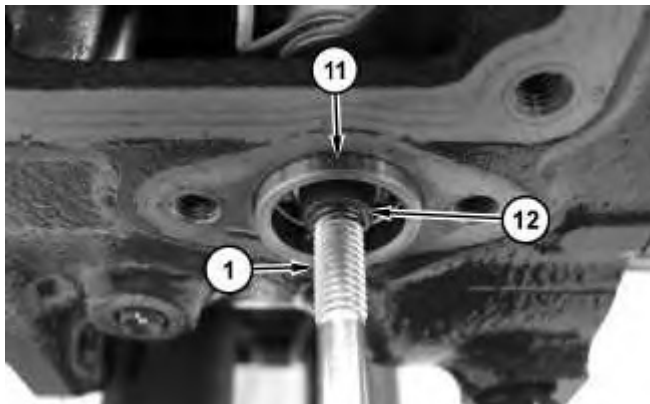


Illustration 8

g03370618

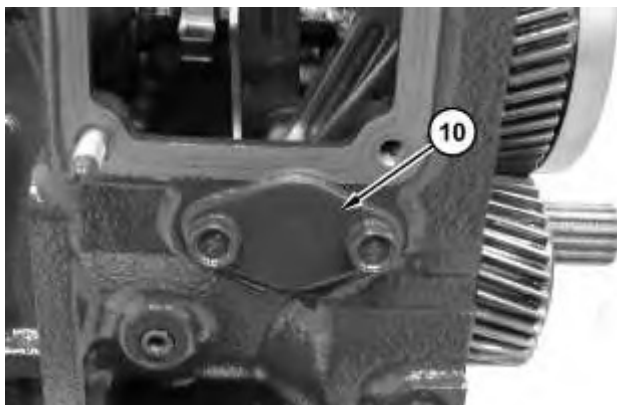


Illustration 9

g03370620

5. Use bolt (1) in order to install shaft (12) into the governor housing and fork lever assembly (13). Install bearing collar (11). Install plate (10).
-

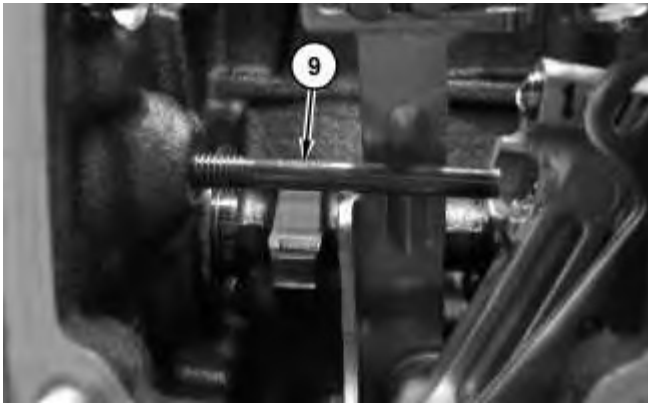


Illustration 10

g03370636



Illustration 11

g03370637

6. Install max torque limiter (9) to the Pre measured height recorded from disassembly.



Illustration 12

g03370639

7. Apply Tooling (C) on plug (8). Install plug (8).
-

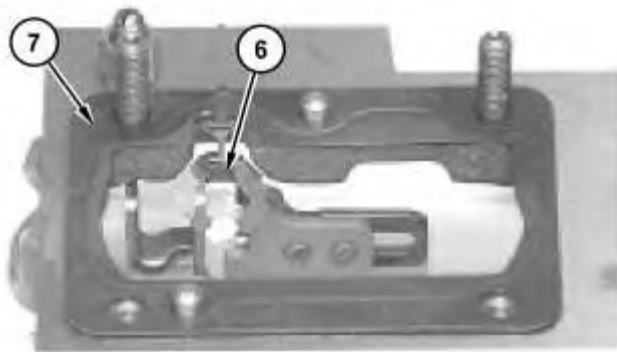


Illustration 13

g03381440



Illustration 14

g03370640

Note: Addition or reduction of shims 0.05 mm (0.002 inch) delays or advances the injection timing by approximately 0.0087 rad (0.5). In disassembling and replacing, be sure to use the same thickness of new shims that are being replaced.

8. Place new shims (7) to the amount of thickness recorded from the removal procedure. When installing injection pump (6) insert the rack pin into the groove (6) of the thrust lever on the fork. Install injector pump (5). Install the bolts.



Illustration 15

g03370658

9. Install start spring (4) onto the thrust lever.

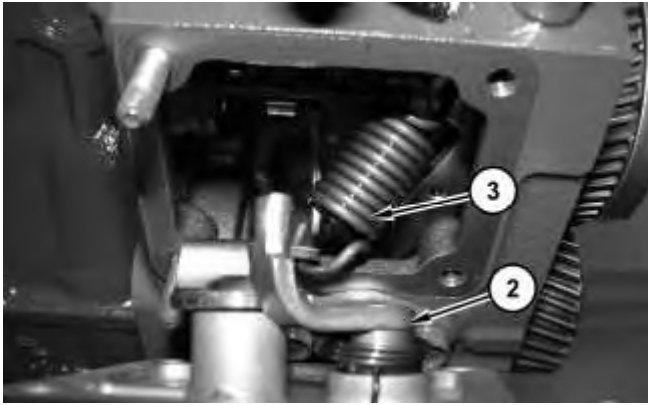


Illustration 16

g03370659

10. Install governor spring (3). Connect governor spring (3) to speed control plate (2).

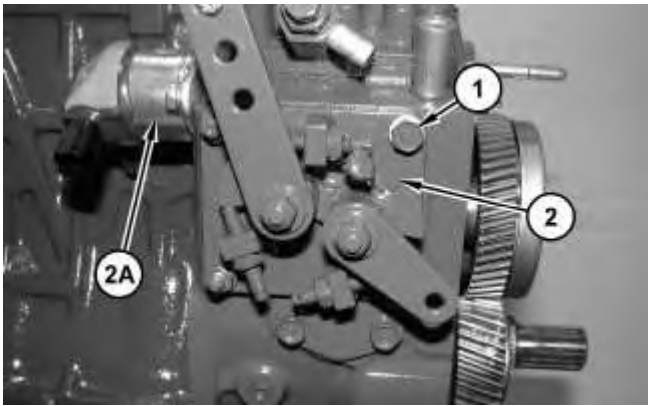


Illustration 17

g03370660

11. Place Tooling (C) onto the mounting surface of speed control plate (2). Install speed control plate (2). Install bolts (1). Place Tooling (C) on stop solenoid (2A). Install stop solenoid (2A).

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Configuration: 303E CR Mini Hydraulic Excavator SMG00001-UP (MACHINE) POWERED BY C1.3 Engine

Disassembly and Assembly C1.3 Engine for Caterpillar Built Machines

Media Number -UENR3292-03

Publication Date -01/05/2014

Date Updated -02/02/2017

i05319637

Fuel Injection Pump - Remove and Install

SMCS - 1251-010

Removal Procedure

Start By:

- a. Remove fuel injection lines.

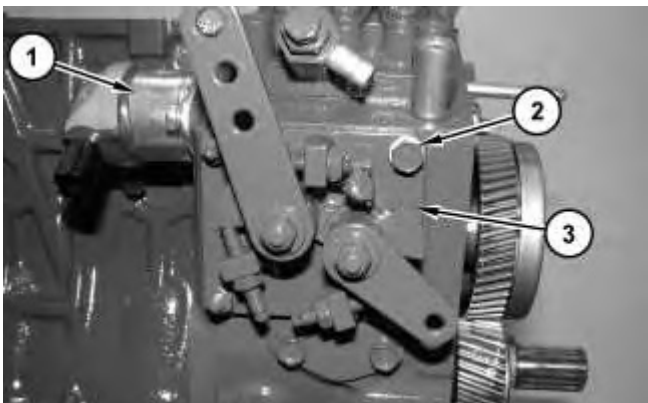


Illustration 1

g03371180

1. Remove solenoid (1). Remove bolts (2) and speed control plate (3).

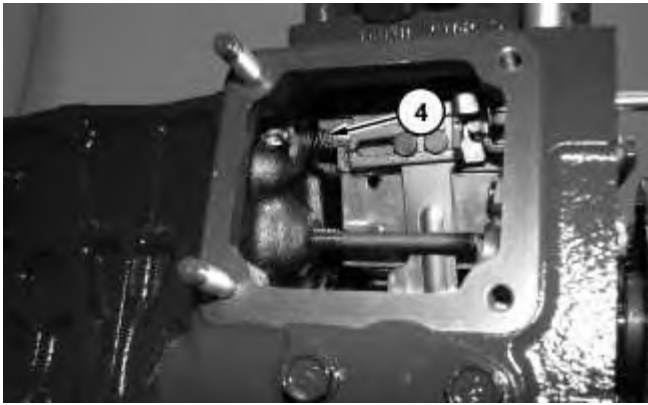


Illustration 2

g03371184

2. Remove start spring (4).

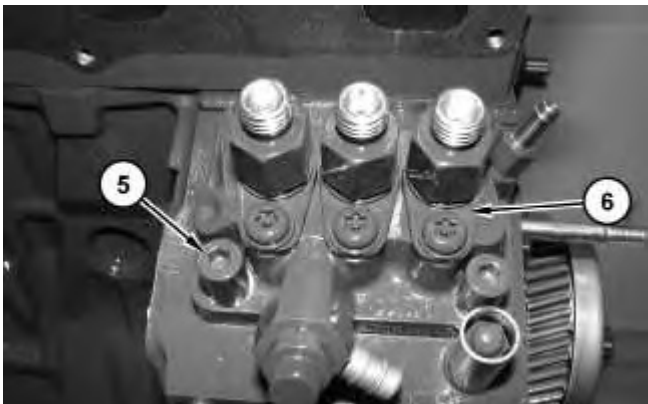


Illustration 3

g03371170



Illustration 4

g03371249

3. Remove bolts (5) and fuel injection pump (6).
4. When removing the injection pump, align the control rack pin with the notch.
5. Remove shims (7) from under fuel injection pump (6). Record the number and thickness of shims (7) for installation purposes.

Installation Procedure

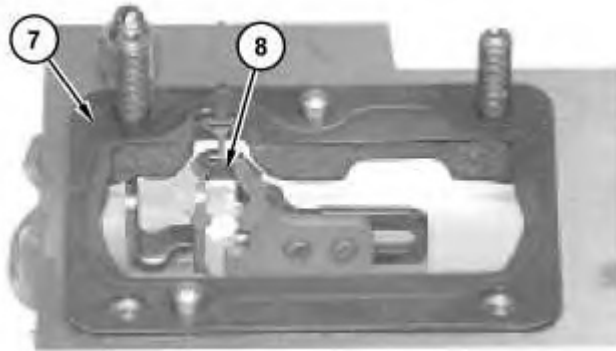


Illustration 5

g03371238

1. Place new shims (7) to the amount of thickness recorded from the removal procedure. When installing injection pump (6) align the control rack pin with the notch. Insert the rack pin into groove (8) of the thrust lever on the fork.

Note: Addition or reduction of shims 0.05 mm (0.002 inch) delays or advances the injection timing by approximately 0.0087 rad (0.5). In disassembling and replacing, be sure to use the same thickness of new shims that are being replaced.

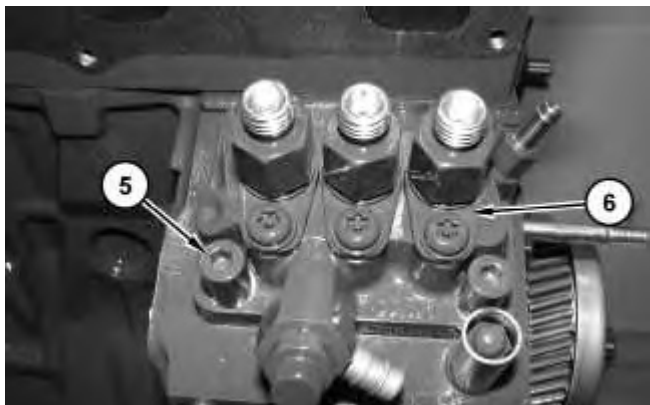


Illustration 6

g03371259

2. Install fuel injection pump (6). Install bolts (5).
-

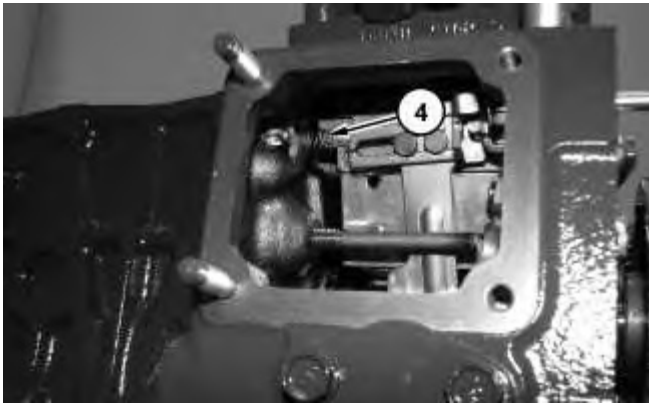


Illustration 7

g03371269

3. Install start spring (4).

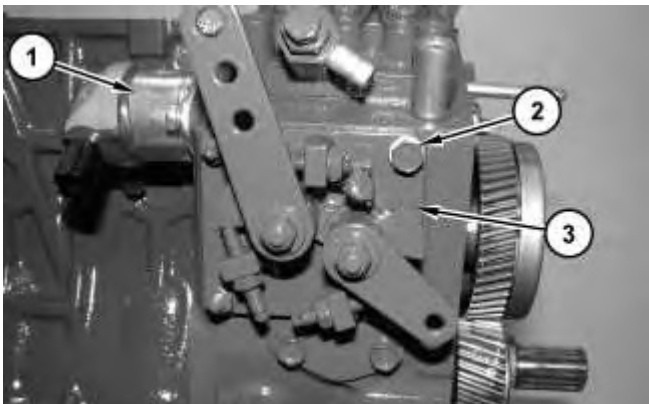


Illustration 8

g03371286

4. Install speed control plate (3) and bolts (2). Install solenoid (1).

End By:

- a. Install the fuel injection lines.

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Product: MINI HYD EXCAVATOR

Model: 303E CR MINI HYD EXCAVATOR SMG

Configuration: 303E CR Mini Hydraulic Excavator SMG00001-UP (MACHINE) POWERED BY C1.3 Engine

Disassembly and Assembly

C1.3 Engine for Caterpillar Built Machines

Media Number -UENR3292-03

Publication Date -01/05/2014

Date Updated -02/02/2017

i05350824

Fuel Injector - Remove and Install

SMCS - 1290-010

Removal Procedure

Start By:

- a. Remove the fuel injection lines

Note: Use caution in removing the line fittings on the fuel injection pump. Hold the fuel injector line fitting stationary to avoid turning and causing leaks from the fuel injector pump.

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.

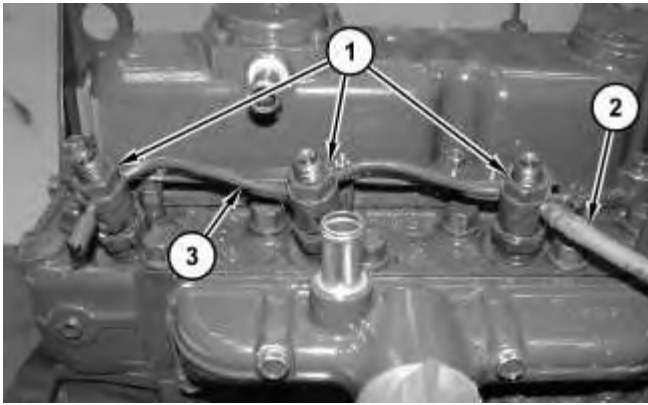


Illustration 1

g03389378

1. Remove hose (2). Remove nuts (1) that holds overflow pipe (3). Remove overflow pipe (3).

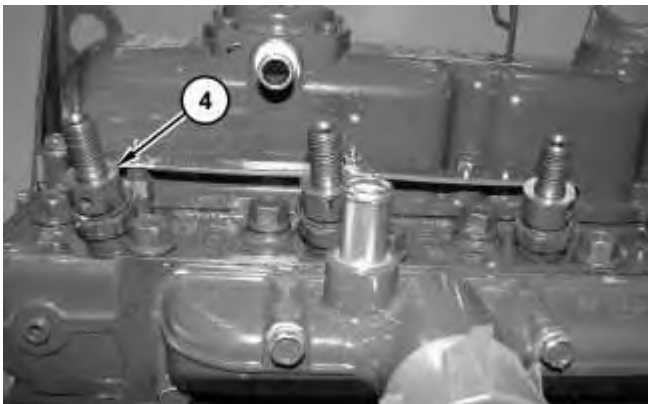


Illustration 2

g03389404

2. Remove copper washers (4).

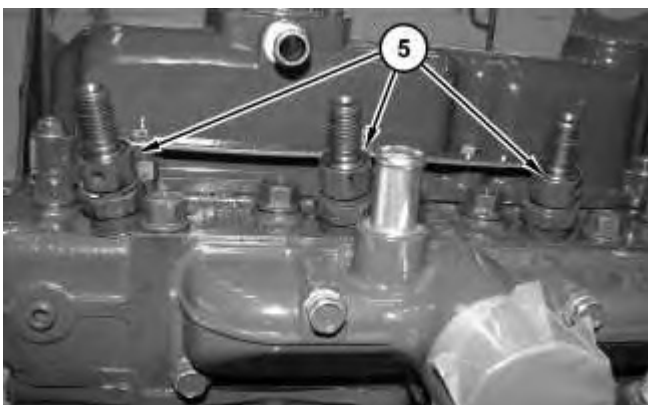


Illustration 3

g03389412

3. Remove fuel injectors (5).



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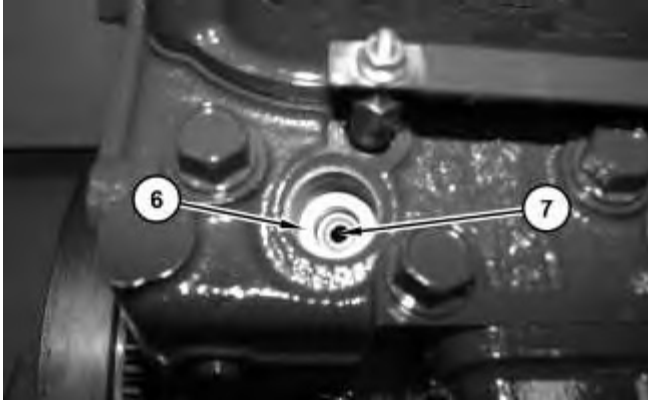


Illustration 4

g03389436

4. Remove copper gasket (6) and heat seal (7).

Installation Procedure

Note: Replace copper gasket (6) and heat seal (7) with new upon installation.

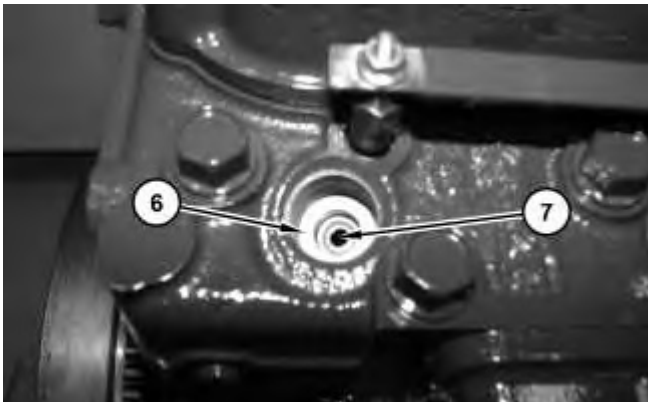


Illustration 5

g03389445

1. Place heat seal (7) and copper gasket (6) in the cylinder head.

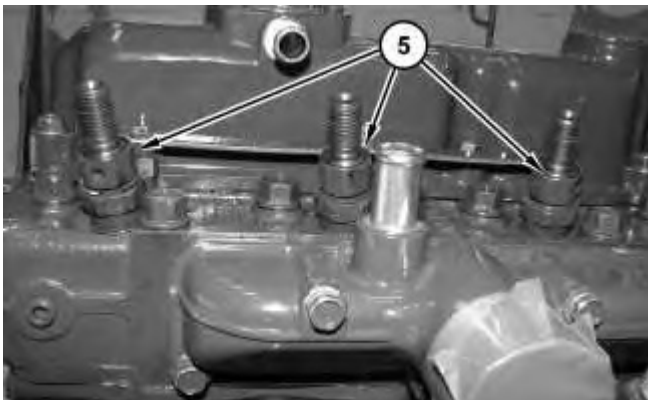


Illustration 6

g03389452

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