



# Service Repair Manual

## **Models**

**336D2 and 336D2 L Excavator**

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Product: EXCAVATOR

Model: 336D2 EXCAVATOR DGR

Configuration: 336D2 L Excavator DGR00001-UP (MACHINE) POWERED BY C9 Engine

## Disassembly and Assembly C9 Engines for Caterpillar Built Machines

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## Unit Injector - Install

SMCS - 1290-012

## Installation Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	367-3070	Fuel Injector Installer and Removal Tooling	2
E	149-2955	Seal Protector	1
F	149-2956	Seal Installer	1
G	1U-5718	Vacuum Pump	1
	169-7372	Bottle Assembly	1
	4C-4057	Clear Plastic Tubing 7.92 mm (0.312 inch) OD	1
	4C-4055	Clear Plastic Tubing 6.35 mm (0.250 inch) OD	1
H	417-4368	Reamer	1
J	4C-6161	Tube Brush	1
K	9U-6862	Tapered Brush	1
L	4C-6774	Vacuum Gun Kit	1
M	4C-5026	Tap Wrench	1

## NOTICE

**Keep all parts clean from contaminants.**

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

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1. Evacuate as much fuel and oil as possible from the cylinder head before installing the unit injector. Several evacuations may be necessary. Use Tooling (G) to remove the fuel and oil from the cylinder head.

**Note:** Tooling (L) is available to clean loose material from the sleeve bore and the cylinder.

2. Inspect the unit injector sleeve for damage and carbon deposits.
3. Clean the carbon from the sleeve, the sleeve bore, and the end of the unit injector, if the unit injector is being reused. Clean the carbon from the seat area that is inside of the cylinder head. A fine grade of Scotch Brite material is preferred. Use Tooling (H) to clean the bore of the unit injector tip. Use the Surface Reconditioning Pad in order to clean the carbon in the cylinder head. Use Tooling (J) in order to remove the carbon from the surface of the sleeve.

**Note:** Using power tools in order to rotate the material should not be necessary. The carbon in the sleeve is more removable than the carbon at locations that are exposed to higher temperatures.

The following procedure is the preferred method of cleaning the sleeve bore.

Place a 38 mm (1.5 inch) square piece of Scotch Brite material on the end of Tooling (K) . Twist Tooling (K) with Tooling (M) against the lower surface of the sleeve bore.

The surface should be cleaned until the surface is smooth and shiny. The entire sleeve bore should be cleaned in order to remove any loose carbon particles.

**Note:** Tooling (J) is available to clean loose material from the sleeve bore and the cylinder.

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## NOTICE

**The correct procedures and tooling specifications must always be used. Failure to follow any of the procedures may result in damage, malfunction, or possible engine failure.**

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**Note:** New seals should be installed after each removal of the unit injector from the engine. To order O-ring seals for the unit injector, refer to the Parts Manual.

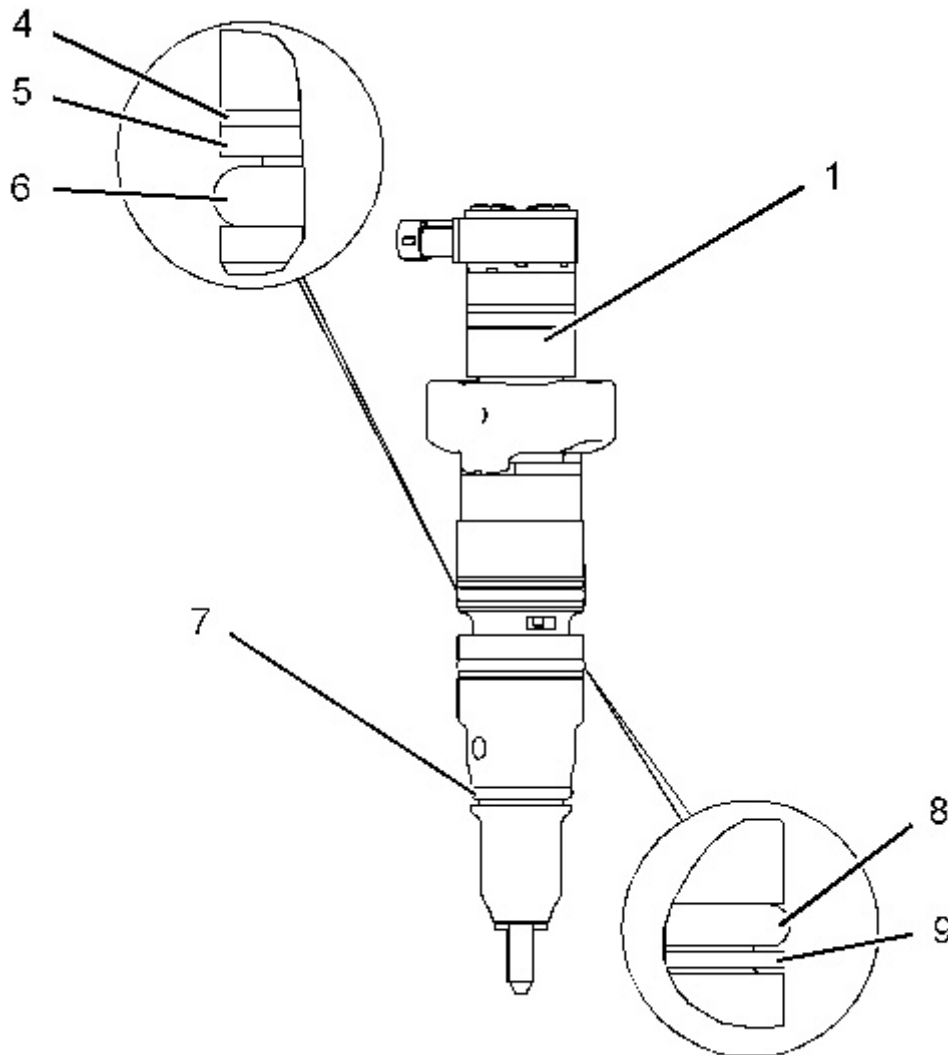
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## NOTICE

The O-ring seals and the backup rings must be installed in the correct orientation. Damaged seals will result in excessive oil consumption or excessive leakage under the valve cover. Use care to prevent nicks or damage to the seals.

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Illustration 1

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4. Lubricate O-ring seals (6) , (7) , and (8) and the sleeve bore of the unit injector sparingly with clean engine oil.
5. Use Tooling (E) and Tooling (F) to install the backup rings (4) and (5) first. Install O-ring seal (6) .
6. Use Tooling (E) and Tooling (F) to install backup ring (9) . Install O-ring seal (8) .

7. Install O-ring seal (7) .
8. Lubricate the O-ring seals and the backup rings on unit injector (1) with clean engine oil before installation.

**Note:** Proper installation of the unit injector is important. Damage to the upper high-pressure seals can cause excessive oil leakage under the valve cover. This may cause the engine not to start due to a low actuation pressure. Damage to the lower high-pressure seals may allow high-pressure oil to leak into the fuel supply passage. This will result in excessive oil consumption.

**Note:** Do not hit or strike the unit injector during installation. Do not use a wire brush to clean the tip of the unit injector. Damage to the unit injector will occur.

9. When you install a new unit injector the E-Trim value must be programmed into the Electronic Control Module. The E-Trim value is a six digit alphanumeric code that is supplied with the data sheet that comes with the new unit injectors. Use the following menu to program the E-Trim value.
  - ECM Summary Screen
  - Service Menu
  - Calibration
  - Injector Code Calibration



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Illustration 2

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10. Use Tooling (A) to install unit injector (1) in the cylinder head.
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