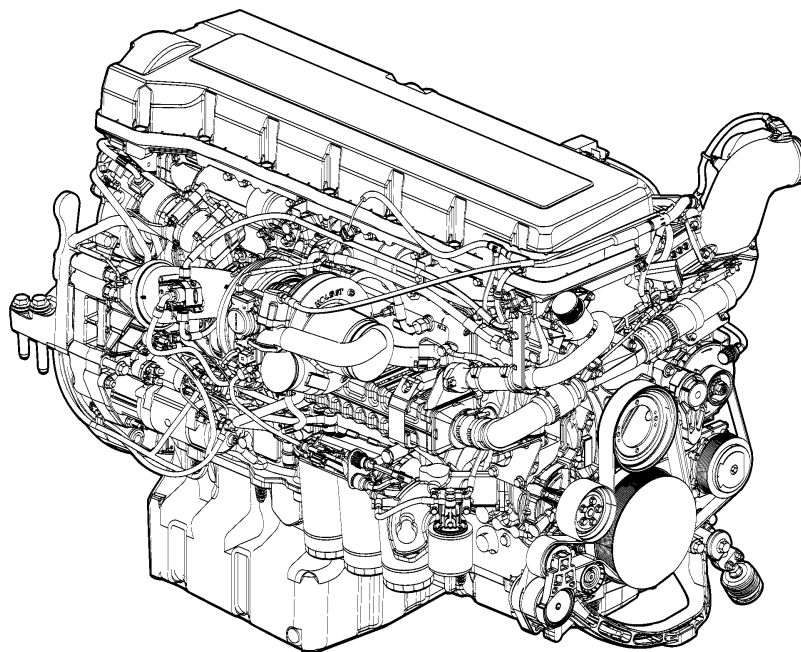


Date	Group	No.	Page
3.2007	<b>214</b>	<b>60</b>	1(4)

## Valve Stem Seals, Replace D16F

### Valve Stem Seals, Replace



W2005772

### Contents

- "Valve Stem Seals, Replacement" page 2

**Note:** Information is subject to change without notice. Illustrations are used for reference only and may differ slightly from the actual vehicle being serviced. However, key components addressed in this information are represented as accurately as possible.

## 2149-03-02-01 Valve Stem Seals, Replacement

You must read and understand the precautions and guidelines in Service Information, group 20, "General Safety Practices, Engine" before performing this procedure. If you are not properly trained and certified in this procedure, ask your supervisor for training before you perform it.

*Special tools: 9990210, 88800014, 88800151*

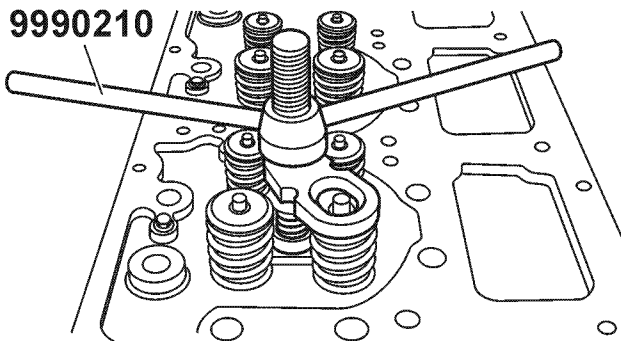
1

### **WARNING**

Remove all cables from ground (negative) battery terminals to prevent personal injury from electrical shock.

Remove the unit injectors (See "Unit Injectors, Replacement" Group 23).  
Insert and screw tight tool 9990210 in the unit injector location.

9990210

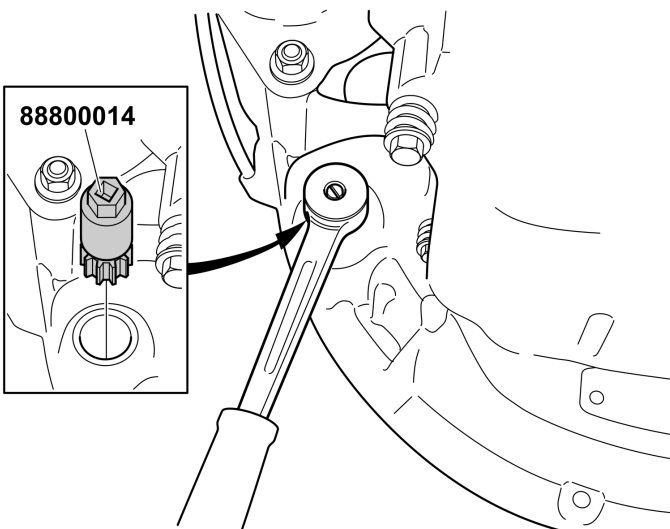


2

Turn the engine crankshaft to top dead center (TDC) for the appropriate pair of cylinders.

**Note:** Pistons must be at TDC when the valves are released. This is so that the valves do not drop into the cylinder.

88800014



3

 **WARNING**

Use protective goggles or eye injury could occur.

Press down the valve springs for the appropriate cylinder.  
Use tool 9990210.

9990210

4

Remove the valve retainers and the valve springs.

5

Remove the old valve stem seals.

6

Using a clean cloth, thoroughly clean all engine oil off the  
valve stem and valve guide.

7

Position the new valve stem seal onto the valve stem.

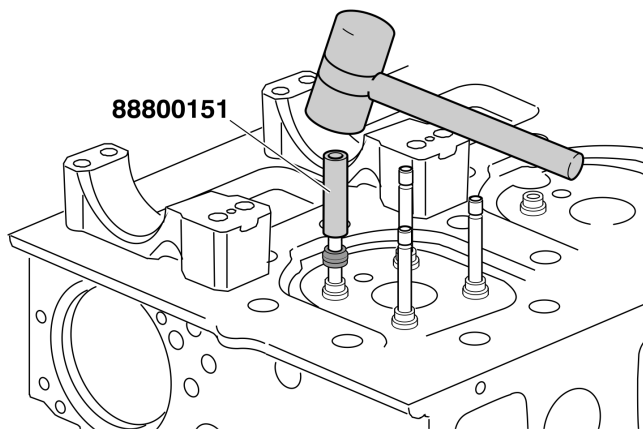
**Note:** The valve stem seal must be dry when installed.

8

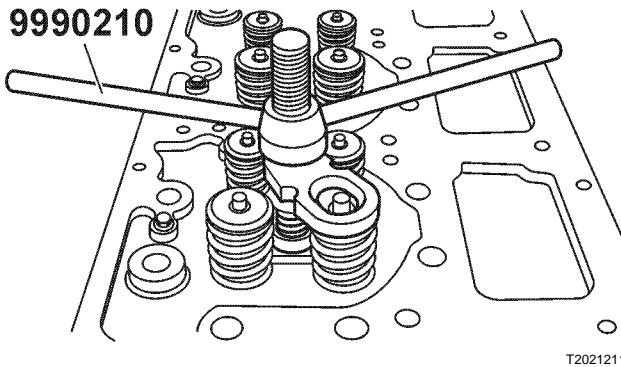
Use tool 888800151 to install the valve stem seal into  
the valve guide.

**Note:** Ensure that the valve stem seal is pushed all the  
way down, so that the bottom of the seal is in contact  
with the surrounding valve guide.

888800151



T2023966



9

 **WARNING**

Use protective goggles or eye injury could occur.

Install the valve spring and valve keepers. Using a plastic or rubber hammer, carefully tap in the valve keepers to their correct positions.

9990210

10

 **WARNING**

Fingers can be trapped in the camshaft gear and cause personal injury.

Move the valve spring compressor to the next cylinder for the appropriate cylinder pair and repeat the above procedure. Turn the engine so that the next cylinder pair is at TDC. Repeat the procedure. Continue with the final cylinder pair.

**Note:** Each piston must be at TDC when the valves are released. This is to prevent the valves from falling into the cylinder.

11

Install the unit injectors (See "Unit Injectors, Replacement" Group 23).

12

Install all previously removed cables to the ground (negative) battery terminals.  
Switch on the main switch.

13

Perform a functional check and check for leakage.