

Product: BACKHOE LOADER

Model: 434F BACKHOE LOADER MTR

Configuration: 434F Backhoe Loader MTR00001-UP (MACHINE) POWERED BY C4.4 Engine

Disassembly and Assembly C4.4 Engines for Caterpillar Built Machines

Media Number -UENR0602-11

Publication Date -01/08/2013

Date Updated -25/10/2017

i06954631

Inlet and Exhaust Valve Springs - Remove and Install

SMCS - 1108-010

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	9U-6193	Valve Spring Compressor	1
	416-0288	Adapter	1
	416-0292	Head	1
B ⁽¹⁾	9U-6198	Crankshaft Turning Tool	1
B ⁽²⁾	5P-7306	Housing	1
	5P-7305	Engine Turning Tool	1

⁽¹⁾ The Crankshaft Turning Tool is used on the front pulley.

⁽²⁾ This Tool is used in the aperture for the electric starting motor.

Start By:

- a. Remove the rocker shaft assembly. Refer to Disassembly and Assembly, "Rocker Shaft and Pushrod - Remove" for the correct procedure.

Note: Either Tooling (B) can be used. Use the Tooling that is most suitable.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

Note: The following procedure should be adopted to remove the valve springs when the cylinder head is installed to the engine. Refer to Disassembly and Assembly, "Inlet and Exhaust Valves - Remove and Install" for the procedure to remove the valve springs from a cylinder head that has been removed from the engine.

Note: Ensure that the appropriate piston is at top dead center before the valve spring is removed. Failure to ensure that the piston is at top dead center may allow the valve to drop into the cylinder bore.



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.

NOTICE

Plug the apertures for the push rods in the cylinder head to prevent the entry of loose parts into the engine.

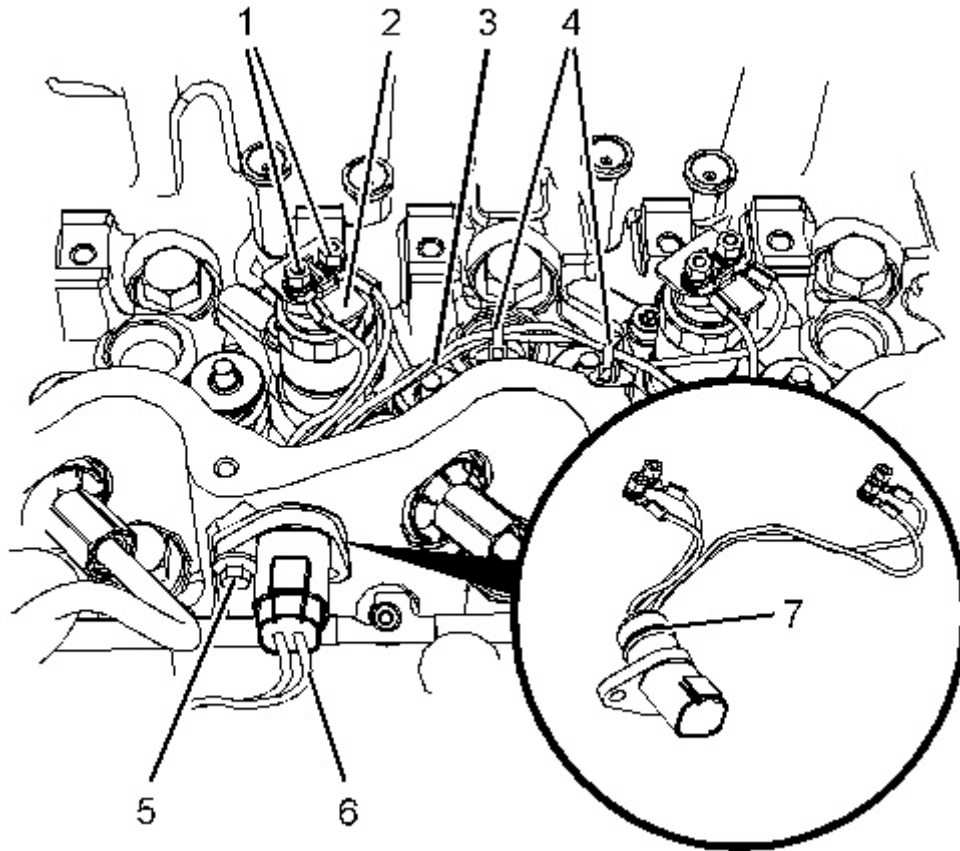


Illustration 1

g01978813

1. Follow Step 1.a through Step 1.h to remove the harness assemblies for the electronic unit injectors.
 - a. Place a temporary identification mark on connections (1) for harness assembly (3) for electronic unit injectors (2).
 - b. Use a deep socket to remove connections (1) from electronic unit injectors (2).
 - c. Cut cable straps (4) and remove the remaining sections of the cable straps from the cylinder head.
 - d. Disconnect plug (6) from harness assembly (3).
 - e. Remove bolt (5) from harness assembly (3).
 - f. Withdraw harness assembly (3) from the cylinder head.
 - g. Remove O-ring seal (7) from harness assembly (3).
 - h. Repeat Step 1.a through Step 1.g to remove the remaining harness assemblies.
-

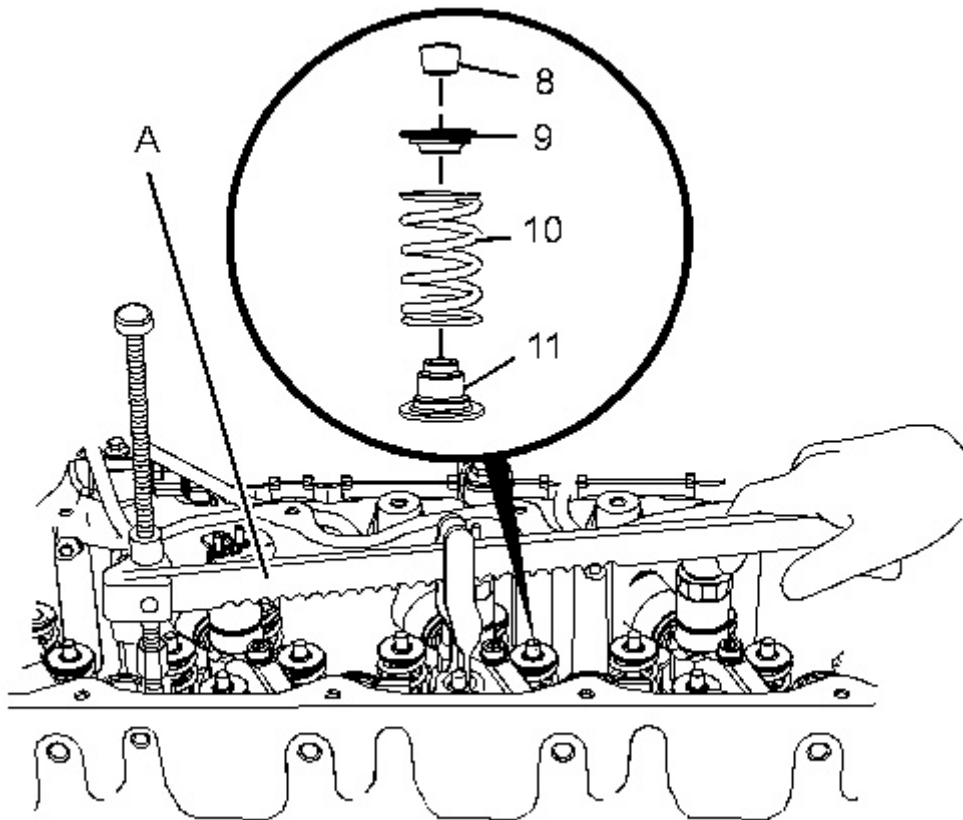


Illustration 2

g02501157

NOTICE

Ensure that the valve spring is compressed squarely or damage to the valve stem may occur.

2. Follow Step 2.a through Step 2.d to position the appropriate piston at top dead center.

a. Install Tooling (A) in position on the cylinder head to compress a valve spring (10) for the appropriate piston.

b. Use Tooling (A) to compress valve spring (10) and open the valve slightly.

Note: Do not compress the spring so that valve spring retainer (9) touches valve stem seal (11).

c. Use Tooling (B) to rotate the crankshaft carefully, until the piston touches the valve.

Note: Do not use excessive force to turn the crankshaft. The use of force can result in bent valve stems.

- d. **Continue to rotate the crankshaft and gradually release the pressure on Tooling (A) until the piston is at the top dead center position. The valve is now held in a position that allows the valve spring to be safely removed.**

Note: Valve springs must be replaced in pairs for the inlet valve or the exhaust valve of each cylinder. If all valve springs require replacement, the procedure can be carried out on two cylinders at the same time. The procedure can be carried out on the following pairs of cylinders. 1 with 4 and 2 with 3. Ensure that all the valve springs are installed before changing from one pair of cylinders to another pair of cylinders.

NOTICE

Do not turn the crankshaft while the valve springs are removed.

3. Apply sufficient pressure to Tooling (A) to allow removal of valve keepers (8).

Note: Do not compress the spring so that valve spring retainer (9) touches valve stem seal (11).

Remove valve keepers (9).

4. Slowly release pressure on Tooling (A).
5. Remove valve spring retainer (9) and remove valve spring (10).
6. If necessary, remove valve stem seals (11).
7. Repeat Step 3 through Step 6 to remove the remaining valve springs from the appropriate cylinder.
8. Remove Tooling (A).

Installation Procedure

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
	9U-6193	Valve Spring Compressor	1
A	416-0288	Adapter	1
	416-0292	Head	1
B ⁽¹⁾	9U-6198	Crankshaft Turning Tool	1
	5P-7306	Housing	1
B ⁽²⁾	5P-7305	Engine Turning Tool	1

C	247-5377	Torque Wrench	1
---	----------	---------------	---

⁽¹⁾ The Crankshaft Turning Tool is used on the front pulley.

⁽²⁾ This Tool is used in the aperture for the electric starting motor.

Note: Either Tooling (B) can be used. Use the Tooling that is most suitable.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

NOTICE

Do not turn the crankshaft while the valve springs are removed.

NOTICE

Plug the apertures for the push rods in the cylinder head to prevent the entry of loose parts into the engine

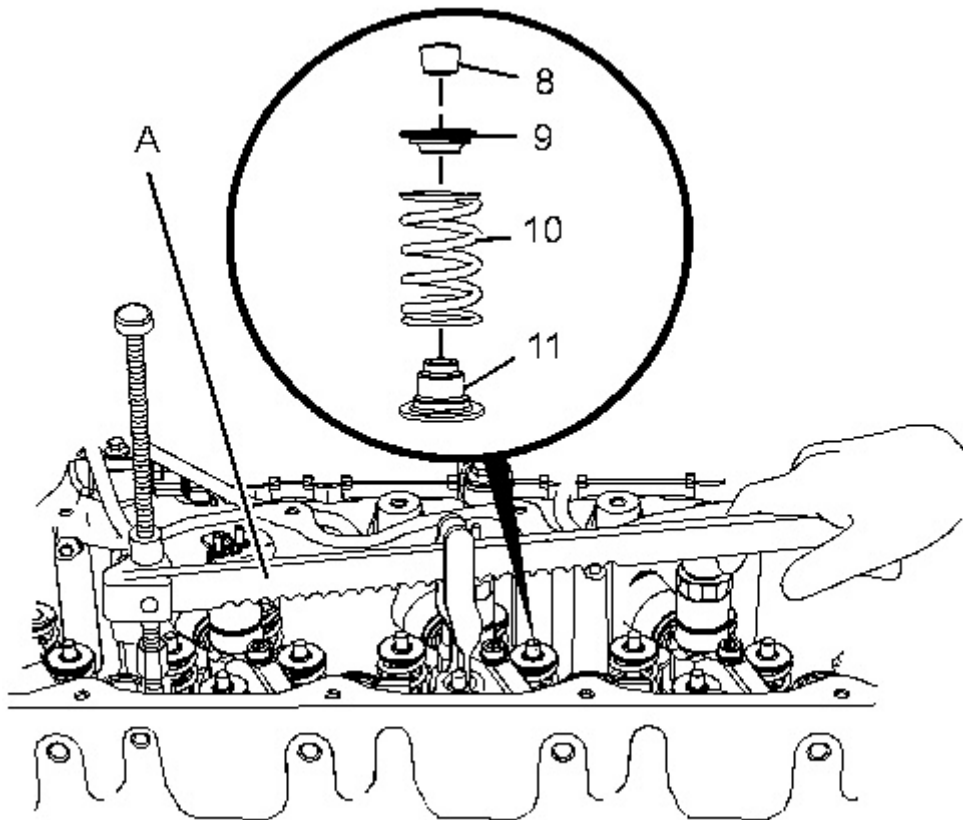


Illustration 3

g02501157

1. Inspect valve springs (10) for damage and for the correct length. Refer to Specifications, "Cylinder Head Valves" for further information.
2. If necessary, install a new valve stem seal (11) onto the valve guide.

Note: The outer face of the valve guide must be clean and dry before installing the valve stem seal.

3. Install valve spring (10) onto the cylinder head. Position valve spring retainer (9) on valve spring (10).

 **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.

NOTICE

**Thank you very much
for your reading.**

**Please click here to buy
After you pay.**

**Then, you can
download the complete
manual instantly.
No waiting.**