



# Service Repair Manual

## **Model**

432F BACKHOE LOADER

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Product: BACKHOE LOADER

Model: 432F BACKHOE LOADER SEJ

Configuration: 432F Backhoe Loader SEJ00001-UP (MACHINE) POWERED BY C4.4 Engine

## Disassembly and Assembly

### C4.4 (Mech) Engines for Caterpillar Built Machines

Media Number -KENR9210-10

Publication Date -01/12/2014

Date Updated -08/08/2018

i02763412

## Inlet and Exhaust Valve Springs - Remove and Install

SMCS - 1108-010

### Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A <sup>(1)</sup>	9U-6198	Crankshaft Turning Tool	1
A <sup>(2)</sup>	9U-7336	Housing	1
	5P-7305	Engine Turning Tool	1
B	9U-6195	Valve Spring Compressor	1
	268-1969	Adapter	1
	276-1221	Head	1

<sup>(1)</sup> The Crankshaft Turning Tool is used on the front pulley.

<sup>(2)</sup> This Tool is used in the aperture for the electric starting motor.

#### Start By:

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

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

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### NOTICE

**Keep all parts clean from contaminants.**

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

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**Note:** The following procedure should be adopted in order 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 the top center position before the valve spring is removed. Failure to ensure that the piston is at the top center position may allow the valve to drop into the cylinder bore.

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### **NOTICE**

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

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### **WARNING**

**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.**

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### **NOTICE**

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

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1. Follow Steps 1.a through 1.d in order to position the appropriate piston at top center.
  - a. Install Tooling (B) in position on the cylinder head in order to compress a valve spring for the appropriate piston.
  - b. Use Tooling (B) in order to compress valve spring (3) and open the valve slightly.

**Note:** Do not compress the spring so that valve spring retainer (2) touches the valve stem seal.

- c. Use Tooling (A) in order 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 (B) until the piston is at the top center position. The valve is now held in a position that allows the valve spring to be safely removed.

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## NOTICE

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

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**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 of the valve springs are installed before changing from one pair of cylinders to another pair of cylinders.

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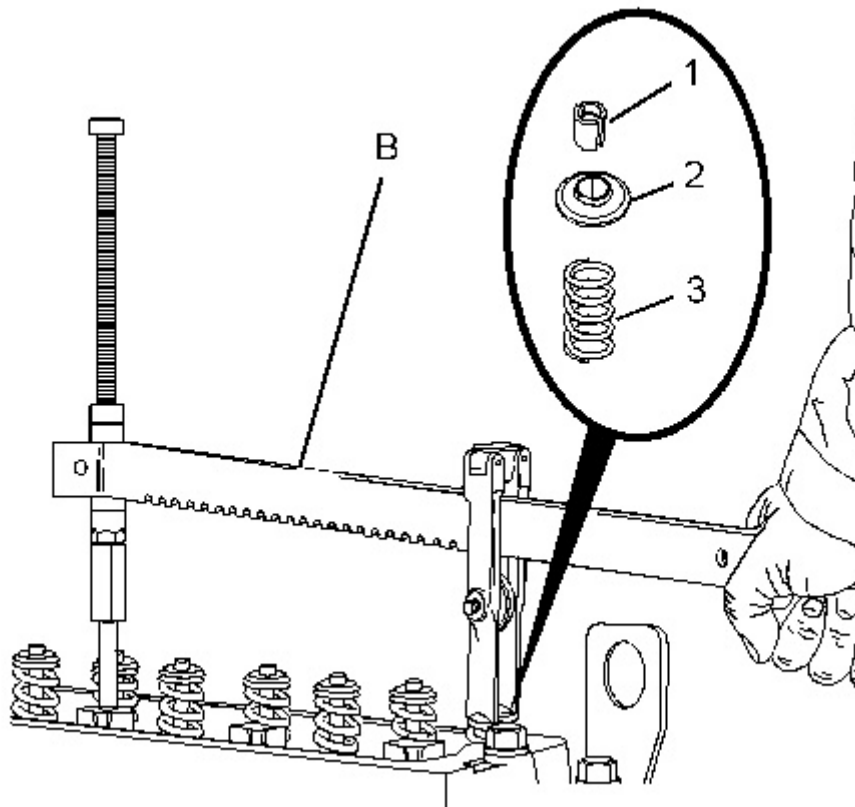


Illustration 1  
Typical example

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2. Apply sufficient pressure to Tooling (B) in order to allow removal of valve keepers (1). Remove valve keepers (1).

**Note:** Do not compress the spring so that valve spring retainer (2) touches the valve stem seal.

3. Slowly release the pressure on Tooling (B).
4. Remove valve spring retainer (2) and remove valve spring (3).
5. If necessary, remove the valve stem seals.
6. Repeat Steps 2 through 5 in order to remove the remaining valve spring from the appropriate cylinder.
7. Remove Tooling (B).

## Installation Procedure

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
A <sup>(1)</sup>	9U-6198	Crankshaft Turning Tool	1
A <sup>(2)</sup>	9U-7336	Housing	1
	5P-7305	Engine Turning Tool	1
B	9U-6195	Valve Spring Compressor	1
	268-1969	Adapter	1
	276-1221	Head	1

<sup>(1)</sup> The Crankshaft Turning Tool is used on the front pulley.

<sup>(2)</sup> This Tool is used in the aperture for the electric starting motor.

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

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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

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