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◀ Product: INDUSTRIAL ENGINE  
Model: C13 INDUSTRIAL ENGINE RRA04344  
Configuration: C13 Industrial Engine RRA00001-UP

## Testing and Adjusting C11 and C13 Industrial Engines

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# Engine Valve Lash - Inspect/Adjust

SMCS - 1102-025



To prevent possible injury, do not use the starter to turn the flywheel.

Hot engine components can cause burns. Allow additional time for the engine to cool before measuring valve clearance.



This engine uses high voltage to control the fuel injectors.

Disconnect electronic fuel injector enable circuit connector to prevent personal injury.

Do not come in contact with the fuel injector terminals while the engine is running.

**Note:** Valve lash is measured between the rocker arm and the valve bridge. All measurements and adjustments must be made with the engine stopped and the valves fully closed.

## Valve Lash Check

An adjustment is not necessary if the measurement of the valve lash is in the acceptable range in Table 1.

- Put the No. 1 piston at the top center position on the compression stroke. Refer to Testing and Adjusting, "Finding Top Center Position for No. 1 Piston".

Table 1

	Inlet Valves	Exhaust Valves
Valve Lash (Stopped Engine)	0.38 ± 0.08 mm (0.015 ± 0.003 inch)	0.76 ± 0.08 mm (0.030 ± 0.003 inch)
TC Compression Stroke	1-2-4	1-3-5
TC Exhaust Stroke <sup>(1)</sup>	3-5-6	2-4-6
Firing Order	1-5-3-6-2-4 <sup>(2)</sup>	

<sup>(1)</sup> 360° from TC compression stroke

<sup>(2)</sup> The No. 1 cylinder is at the front of the engine.

If the measurement is not within this range, an adjustment is necessary. Refer to "Valve Lash Adjustment" for the proper procedure.

## Valve Lash Adjustment

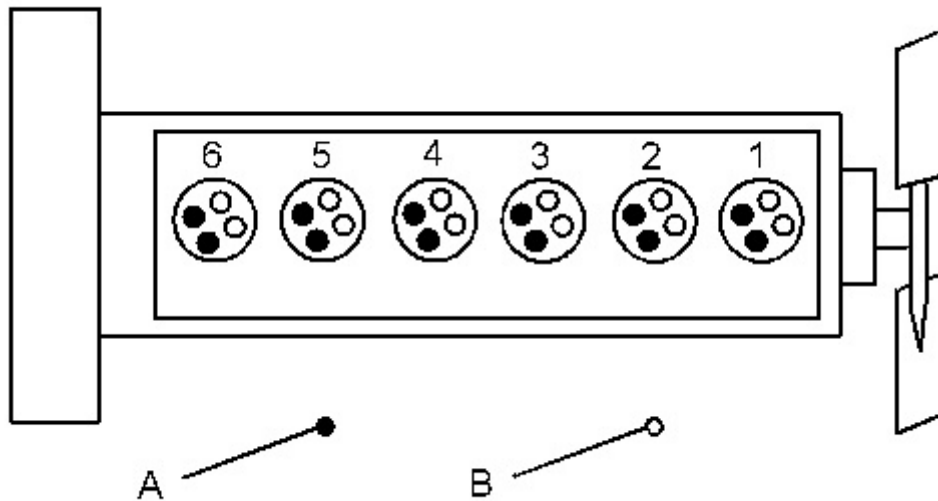


Illustration 1

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Cylinder and valve location

(A) Exhaust valves

(B) Inlet valves

Use the following procedure to adjust the valve lash:

1. Ensure that the No. 1 piston is at the top center position on the compression stroke.

Table 2

<b>TC Compression Stroke</b>	<b>Inlet Valves</b>	<b>Exhaust Valves</b>
Valve Lash	0.38 ± 0.08 mm (0.015 ± 0.003 inch)	0.76 ± 0.08 mm (0.030 ± 0.003 inch)
Cylinders	1-2-4	1-3-5

2. Adjust the valve lash according to Table 2.
  - a. Lightly tap the rocker arm with a soft mallet. This tapping will ensure that the lifter roller seats against the camshafts base circle.
  - b. Loosen the adjustment locknut.
  - c. Place the appropriate feeler gauge between rocker arm and the valve bridge. Then, turn the adjustment screw in a clockwise direction. Slide the feeler gauge between the rocker arm and the valve bridge. Continue turning the adjustment screw until a slight drag is felt on the feeler gauge. Remove the feeler gauge.
  - d. Tighten the adjustment locknut to a torque of 30 ± 7 N·m (22 ± 5 lb ft). Do not allow the adjustment screw to turn while you are tightening the adjustment locknut. Recheck the valve lash after tightening the adjustment locknut.
3. Remove the timing bolt and turn the flywheel by 360 degrees in the direction of engine rotation. This additional rotation will put the No. 6 piston at the top center position on the compression stroke. Install the timing bolt in the flywheel.

Table 3

<b>TC Exhaust Stroke</b>	<b>Inlet Valves</b>	<b>Exhaust Valves</b>
Valve Lash	0.38 ± 0.08 mm (0.015 ± 0.003 inch)	0.76 ± 0.08 mm (0.030 ± 0.003 inch)
Cylinders	3-5-6	2-4-6

4. Adjust the valve lash according to Table 3.
  - a. Lightly tap the rocker arm with a soft mallet. This tapping will ensure that the lifter roller seats against the camshafts base circle.
  - b. Loosen the adjustment locknut.
  - c. Place the appropriate feeler gauge between rocker arm and the valve bridge. Then, turn the adjustment screw in a clockwise direction. Slide the feeler gauge between the rocker arm and the valve bridge. Continue turning the adjustment screw until a slight drag is felt on the feeler gauge. Remove the feeler gauge.

- d. Tighten the adjustment locknut to a torque of  $30 \pm 7$  N·m ( $22 \pm 5$  lb ft). Do not allow the adjustment screw to turn while you are tightening the adjustment locknut. Recheck the valve lash after tightening the adjustment locknut.
5. Remove the timing bolt from the flywheel after all adjustments to the valve lash have been made. Reinstall the timing cover.

**Note:** The valve lash must be adjusted before adjusting the compression brake and variable valve actuators, if equipped.

If variable valve actuators are equipped, refer to Testing and Adjusting, "Variable Valve Actuators - Inspect/Adjust".

Refer to Testing and Adjusting, "Electronic Unit Injector - Adjust".