Testing and Adjusting
C15 On-highway Engine

Engine Valve Lash - Inspect/Adjust

SMCS - 1102-025

**WARNING**

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.

**WARNING**

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. Check the valve lash while the engine is stopped. The range is specified in Table 1.

<table>
<thead>
<tr>
<th>Valves</th>
<th>Acceptable Range for Valve Lash</th>
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</thead>
<tbody>
<tr>
<td>Inlet</td>
<td>0.38 ± 0.08 mm (0.015 ± 0.003 inch)</td>
</tr>
<tr>
<td>Exhaust</td>
<td>0.76 ± 0.08 mm (0.030 ± 0.003 inch)</td>
</tr>
</tbody>
</table>

If the measurement is not within this range adjustment is necessary. Refer to Testing And Adjusting, "Valve Lash Adjustment".

Valve Lash Adjustment

Illustration 1

(A) Inlet valves
(B) Exhaust valves
(C) Left side of the engine
(D) Cylinder number
Adjust the valve lash while the engine is stopped. Use the following procedure in order to adjust the valves:

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>Valve Lash</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Valves</strong></td>
<td><strong>Lash Setting</strong></td>
</tr>
<tr>
<td>Inlet</td>
<td>0.38 mm (0.015 inch)</td>
</tr>
<tr>
<td>Exhaust</td>
<td>0.76 mm (0.030 inch)</td>
</tr>
</tbody>
</table>

(E) Front of the engine
(F) Flywheel end of the engine
(G) Right side of the engine
1. Determine the style of variable valve actuator that is installed on the engine.
   a. For the BXS engines, remove the variable valve actuators.
   b. For the MXS engines, it is not necessary to remove the variable valve actuators.

2. Put the No. 1 piston at the top center position. See Testing and Adjusting, "Finding Top Center Position for No. 1 Piston" for further details.

   **Note:** If the engine is equipped with an engine compression brake, loosen the adjustment screw for the lash on the slave piston for the compression brake prior to adjusting the engine valve lash. Refer to the Testing and Adjusting, "Slave Piston Lash - Adjust" topic in order to adjust the slave piston lash.

3. With No. 1 piston at the top center position of the compression stroke, an adjustment can be made to the valves.

   Before any adjustments are made, lightly tap each rocker arm at the top of the adjustment screw. Use a soft mallet to ensure that the lifter roller seats against the camshaft's base circle.

4. Make an adjustment to the valve lash on the inlet valves for cylinders 1, 2, and 4.
   a. Loosen valve adjustment locknut (3).
   b. Place the appropriate feeler gauge (5) between the inlet rocker arm and the inlet valve bridge. Turn inlet adjustment screw (4) while valve adjustment locknut (3) is being held from turning. Adjust the valve lash until the correct specification is achieved. Refer to Table 2.
   c. After each adjustment, tighten valve adjustment locknut (3) while valve adjustment screw (4) is being held from turning. Tighten to a torque of 30 ± 7 N·m (22 ± 5 lb ft). Recheck each adjustment.

5. Make an adjustment to the valve lash on the exhaust valves for cylinders 1, 3, and 5.
   a. Loosen valve adjustment locknut (1).
   b. Place the appropriate feeler gauge (5) between the exhaust rocker arm and the exhaust valve bridge. Turn exhaust adjustment screw (2) while valve adjustment locknut (1) is being held from turning. Adjust the valve lash until the correct specification is achieved. Refer to Table 2.
   c. After each adjustment, tighten valve adjustment locknut (1) while valve adjustment screw (2) is being held from turning. Tighten to a torque of 30 ± 7 N·m (22 ± 5 lb ft). Recheck each adjustment.

6. Remove the timing bolt, and turn the flywheel by 360 degrees in the direction of engine rotation. This will position the No. 6 piston at the top center on the compression stroke. Install the timing bolt in the flywheel.

7. Make an adjustment to the valve lash on the inlet valves 3, 5, and 6.
   a. Loosen valve adjustment locknut (3).
b. Place the appropriate feeler gauge (5) between the inlet rocker arm and the inlet valve bridge. Turn inlet adjustment screw (4) while valve adjustment locknut (3) is being held from turning. Adjust the valve lash until the correct specification is achieved. Refer to Table 2.

c. After each adjustment, tighten valve adjustment locknut (3) while valve adjustment screw (4) is being held from turning. Tighten to a torque of 30 ± 7 N·m (22 ± 5 lb ft). Recheck each adjustment.

8. Make an adjustment to the valve lash on the exhaust valves 2, 4, and 6.

   a. Loosen valve adjustment locknut (1).

   b. Place the appropriate feeler gauge (5) between the exhaust rocker arm and the exhaust valve bridge. Turn exhaust adjustment screw (2) while valve adjustment locknut (1) is being held from turning. Adjust the valve lash until the correct specification is achieved. Refer to Table 2.

   c. After each adjustment, tighten valve adjustment locknut (1) while valve adjustment screw (2) is being held from turning. Tighten to a torque of 30 ± 7 N·m (22 ± 5 lb ft). Recheck each adjustment.

9. Remove the timing bolt from the flywheel after all valve lash adjustments have been made.

   Refer to the Testing and Adjusting, "Slave Piston Lash - Adjust" topic for information on adjusting the slave piston lash.

**Note:** The engine valve lash must be adjusted before you adjust the compression brake.

The lash must also be adjusted on the electronic unit injector. Refer to Testing and Adjusting, "Electronic Unit Injector - Adjust" for more information.