

HYDRAULIC LASH ADJUSTER, ROCKER ARM [SKYACTIV-D 2.2]

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Purpose, Function

HLA

- The HLA maintains the valve clearance at a constant 0 mm and maintenance-free valve clearance is realized.

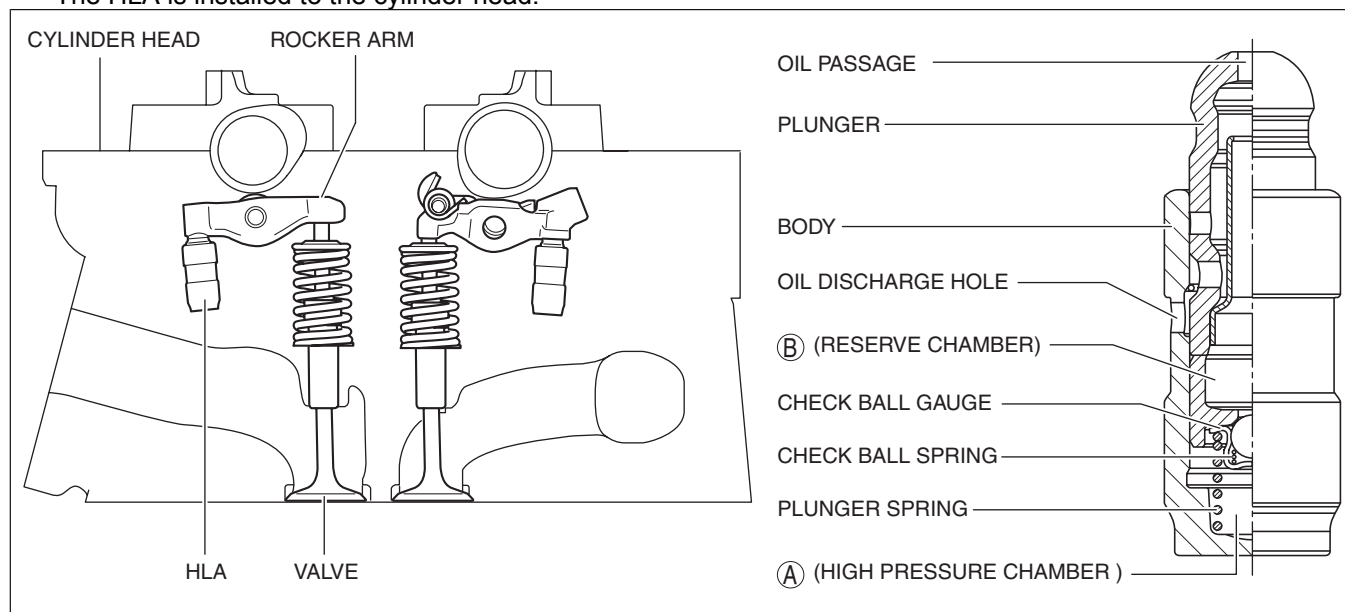
Rocker arm

- With the adoption of the rocker arm built into the needle roller bearing, the contact to the cam employs rolling contact to reduce sliding resistance.
- The rocker arm (No.2) is a constituent part of the exhaust valve lift mechanism. Opens the exhaust valve of the cylinder on the intake stroke to re-circulate a part of the exhaust gas into the cylinder.

Construction

HLA

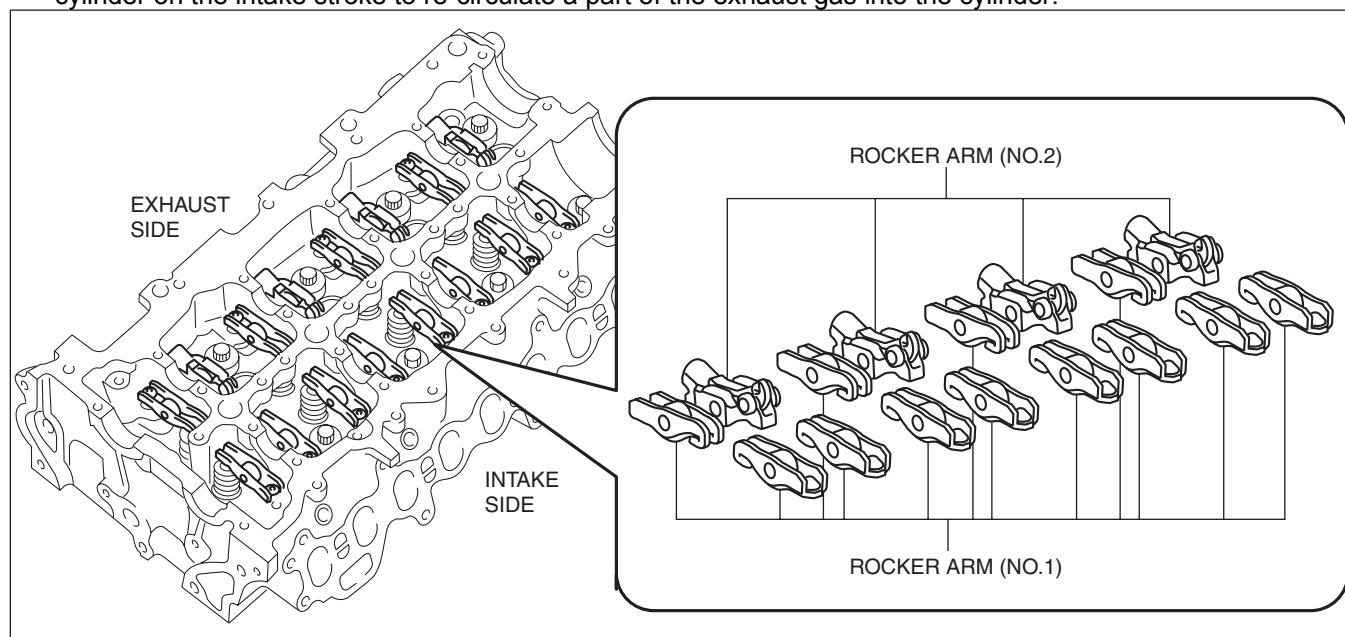
- The HLA is installed to the cylinder head.



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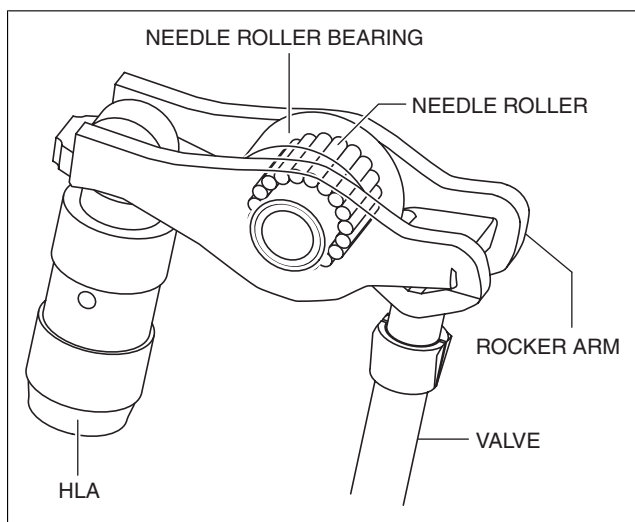
Rocker arm

- The rocker arm is installed to the HLA and upper area of the valve.
- The rocker arm (No.2) is a constituent part of the exhaust valve lift mechanism. Opens the exhaust valve of the cylinder on the intake stroke to re-circulate a part of the exhaust gas into the cylinder.



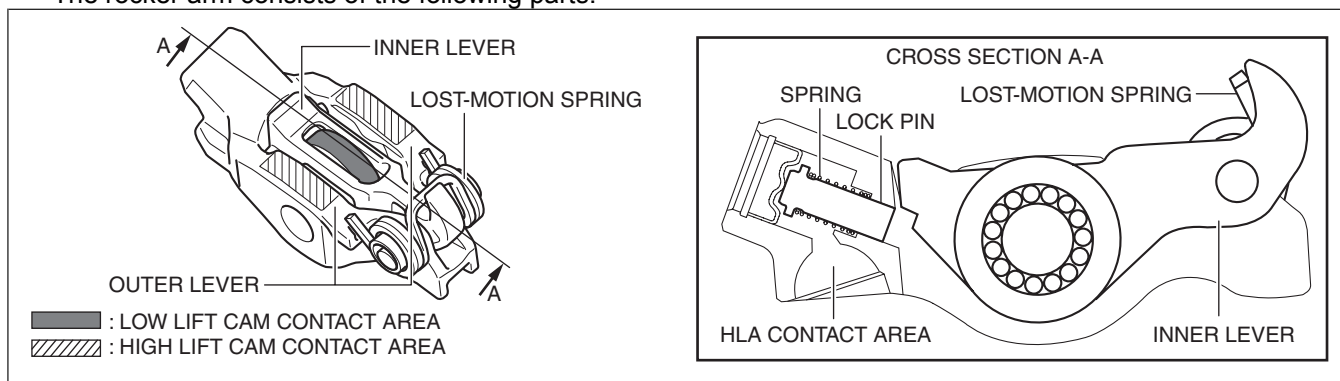
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- The needle roller bearing is built into the rocker arm.



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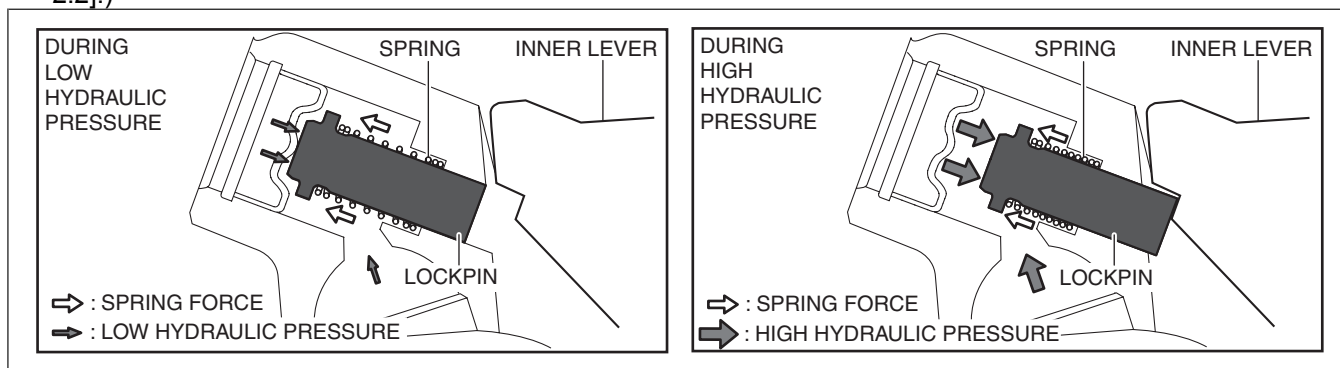
- The rocker arm consists of the following parts:



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Part name	Function
Outer lever	The outer lever is pressed to the down position by contact with the high lift cam of the exhaust camshaft.
Inner lever	The inner lever is pressed to the down position by contact with the low lift cam of the exhaust camshaft. By fixing the inner lever with the lock pin, power is transmitted to the outer lever.
Lock pin	Fixes the inner lever to the outer lever.
Spring	Presses the lock pin back.
Lost-motion spring	Lifts up the inner lever by spring force when the inner lever is pressed down while not being fixed.

- The rocker arm (No.2) operates by hydraulic pressure. This hydraulic pressure is switched in two steps (low hydraulic pressure, high hydraulic pressure) by the OCV. (See OIL CONTROL VALVE (OCV) [SKYACTIV-D 2.2].)



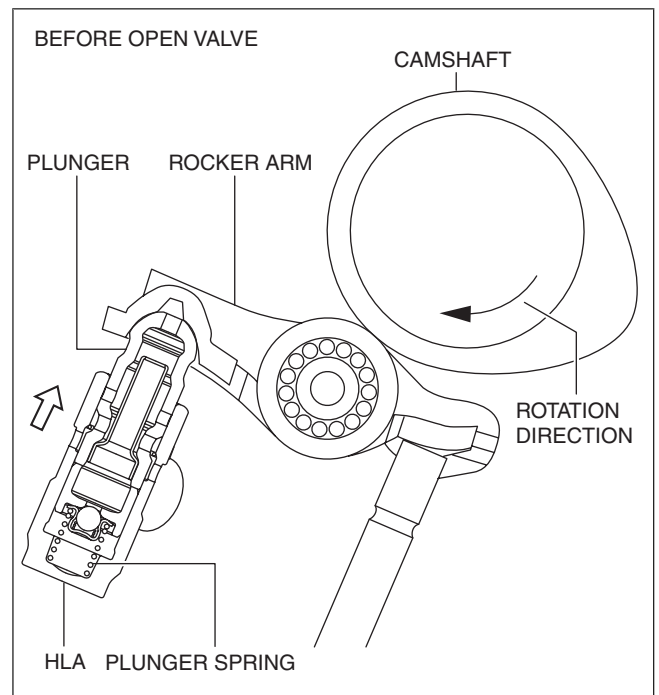
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During low hydraulic pressure	The lock pin does not move because the spring force is greater than the hydraulic pressure.
During high hydraulic pressure	Because the hydraulic pressure is greater than the spring force, the lock pin is pressed out.

Operation

Before valve opening

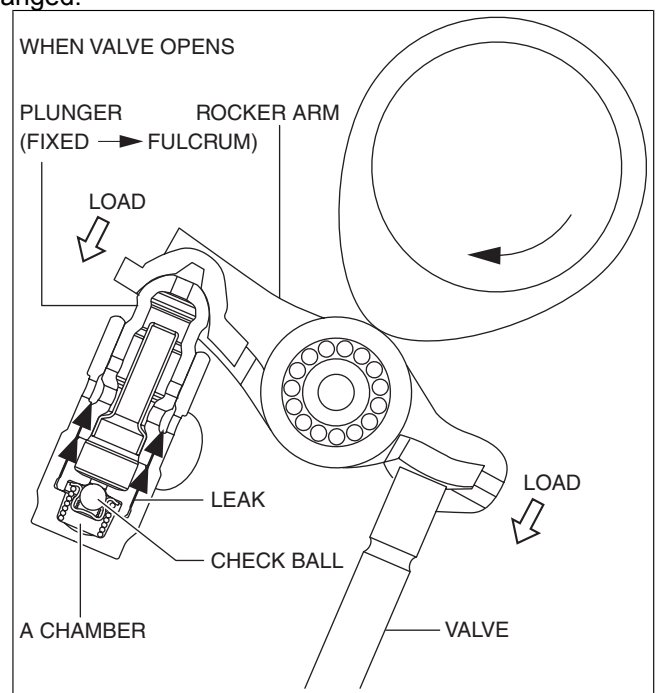
1. The plunger presses up the rocker arm by the spring force of the plunger spring to maintain the valve clearance at 0 mm.



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During valve opening

1. If the cam presses down the rocker arm, load is applied to the plunger and valve.
2. If load is applied to the plunger, the hydraulic pressure in the high pressure chamber (A chamber) increases and the check ball closes the hydraulic passage.
3. If the hydraulic passage is closed, the plunger is fixed becoming the rocker arm pivot point because the volume of the engine oil in the high pressure chamber is not changed.
4. The rocker arm presses down the valve.

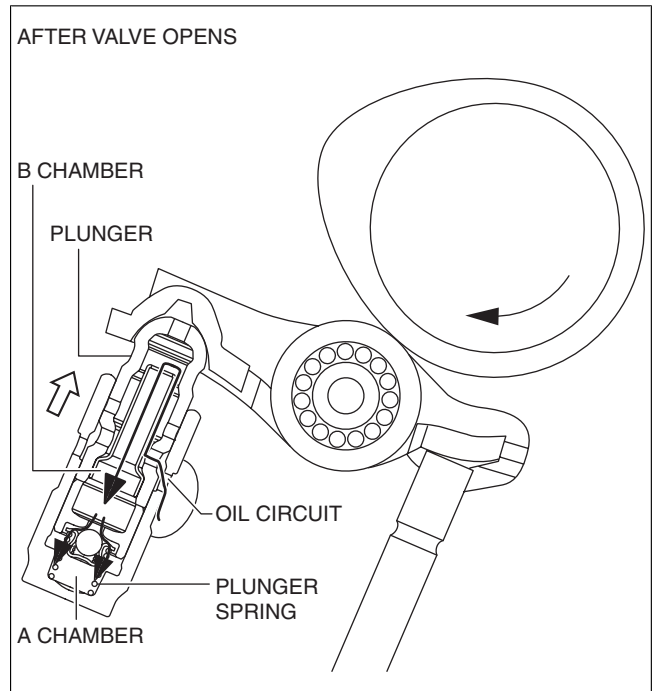


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After valve opening

1. If load is not applied to the plunger, the plunger spring presses up the plunger (maintains valve clearance at 0 mm).
2. Because the capacity of the high pressure chamber (A chamber) increases in Step 1, the check ball is opened and engine oil flows from the reserve chamber (B chamber) to the high pressure chamber (A chamber) to prepare for the next step.

3. The oil in the reserve chamber (B chamber) which is decreased by supplying it to the high pressure chamber (A chamber), is supplied from the oil passage of the cylinder head.

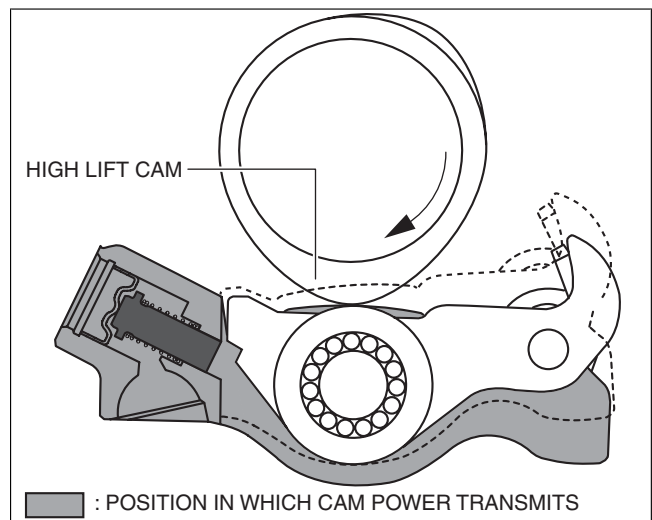


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Rocker arm (No.2)

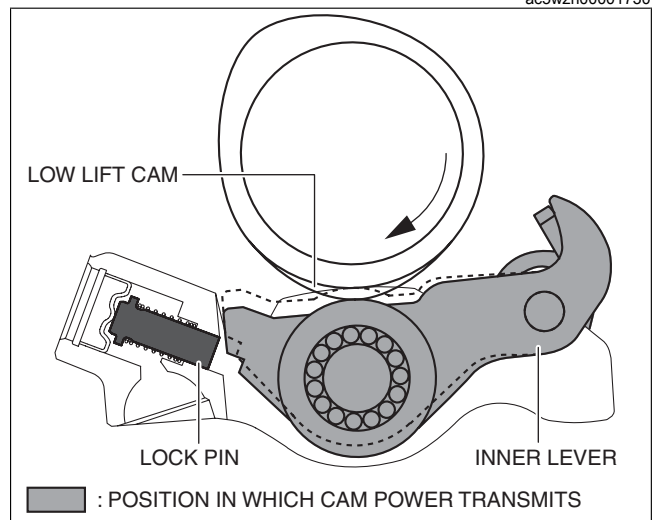
OCV OFF

1. The high lift cam of the exhaust camshaft presses down the outer lever.



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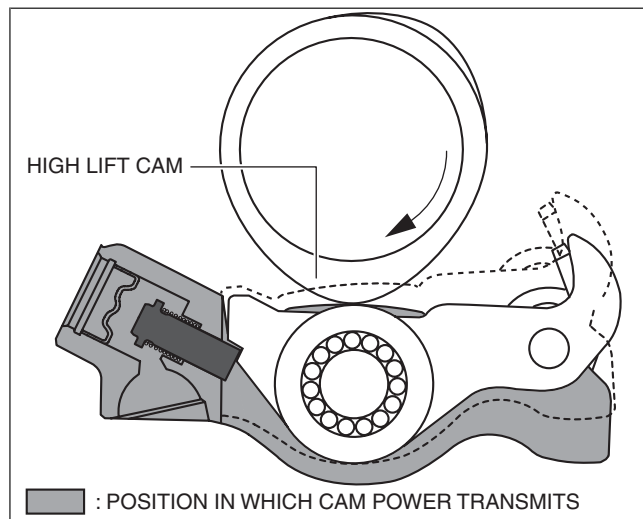
2. When the OCV is not operating, the inner lever is not fixed. For this reason, the low lift cam of the exhaust camshaft only presses down the inner lever.



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OCV ON

1. The high lift cam of the exhaust camshaft presses down the outer lever.



2. When the OCV is operating, the inner lever is fixed to the outer lever. For this reason, the entire rocker arm (No.2) is pressed down when the low lift cam of the exhaust camshaft presses the inner lever.

