

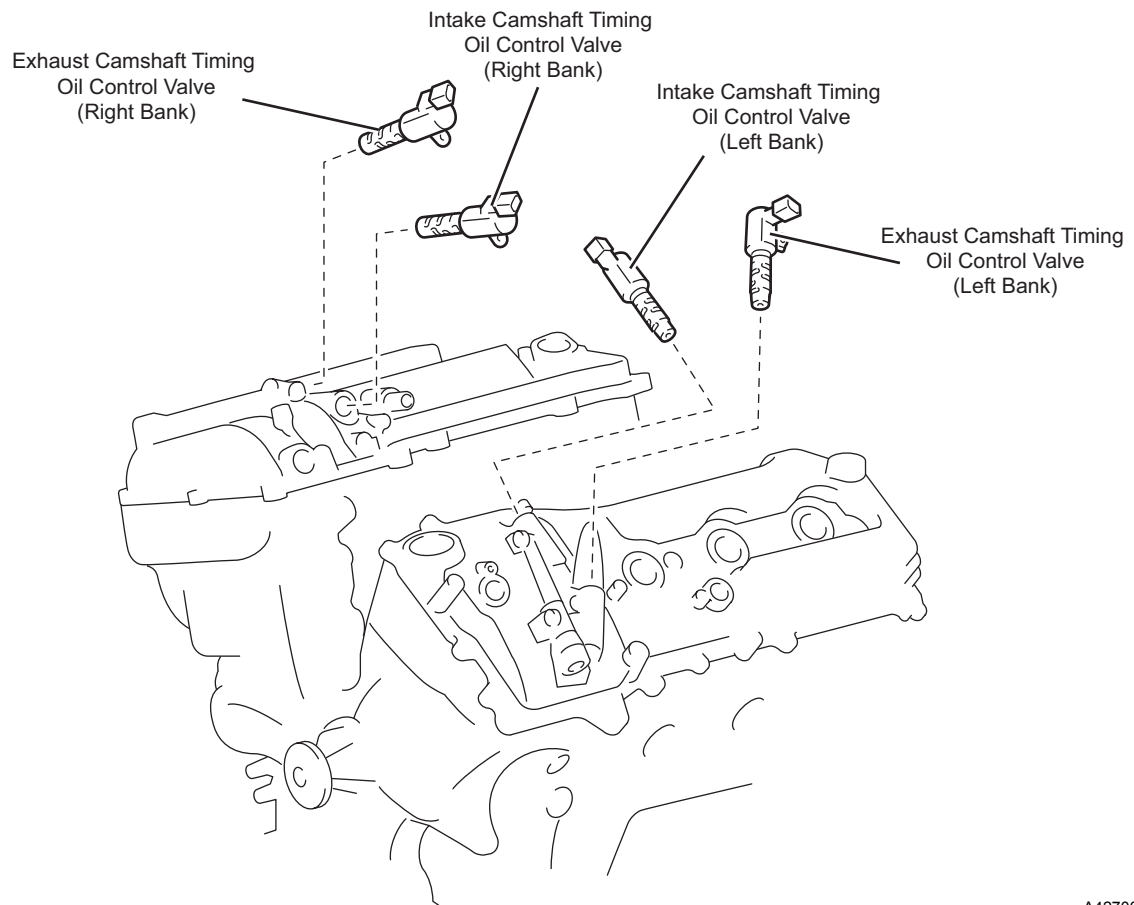
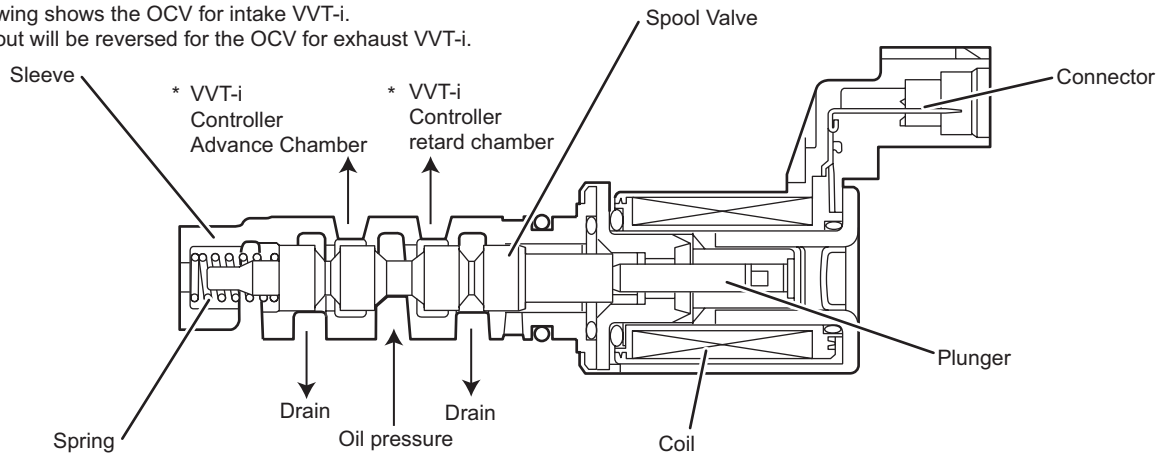
Camshaft Timing Oil Control Valve

- In accordance with the duty cycle signals received from the engine ECU, this OCV controls the position of the spool valve in order to constantly achieve optimal valve timing. When the engine is stopped, the force of a spring keeps the intake side of the spool valve in the most retarded state, and the exhaust side to the most advanced state, in order to ready the valves for the subsequent starting.

EG

*The drawing shows the OCV for intake VVT-i.

The layout will be reversed for the OCV for exhaust VVT-i.



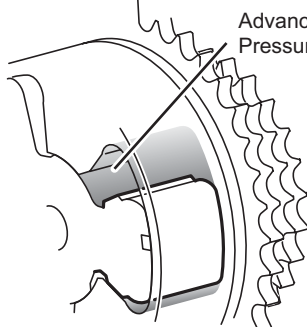
Dual VVT-i Operation

- The Dual VVT-i controls the advance, retard, and holding states as illustrated below, in accordance with the driving conditions.

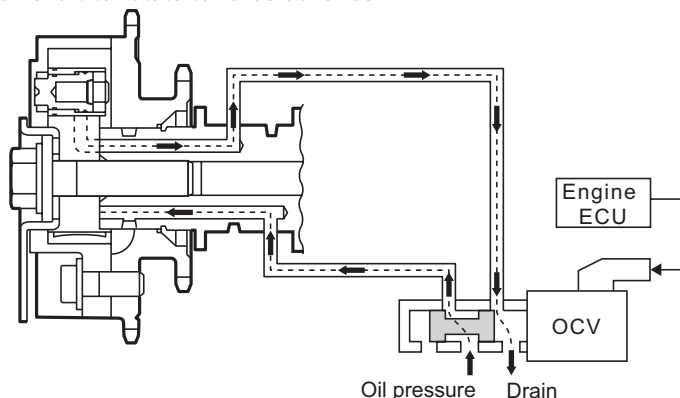
Outline of Intake VVT-i Operation

The spool valve of the OCV reaches the position shown in the drawing, as a result of receiving a signal from the engine ECU. Then, hydraulic pressure is applied to the hydraulic pressure chamber for advance, causing the intake camshaft to rotate towards advance.

Advance

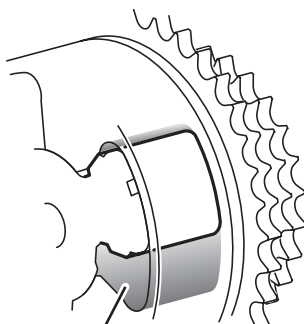


Advance Hydraulic Pressure Chamber

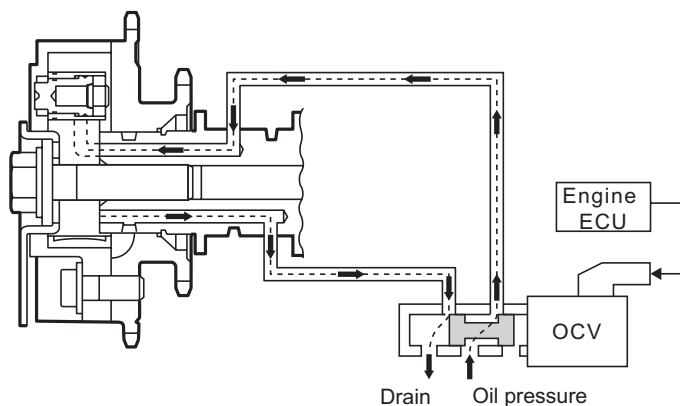


The spool valve of the OCV reaches the position shown in the drawing, as a result of receiving a signal from the engine ECU. Then, hydraulic pressure is applied to the hydraulic pressure chamber for retard, causing the intake camshaft to rotate towards retard.

Retard

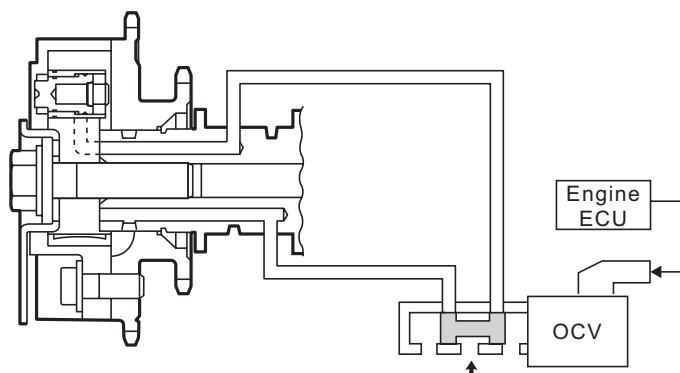
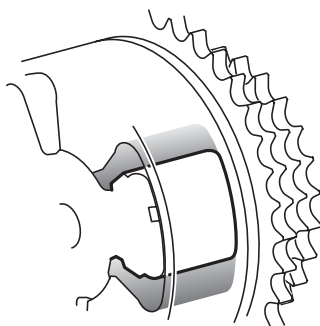


Retard Hydraulic Pressure Chamber



The engine ECU effects control by calculating the target degree of advance in accordance with the driving conditions. After reaching the target timing, the engine ECU maintains the timing by setting the OCV to neutral, provided that the driving conditions do not change. As a result, the valve timing can be set to any target position.

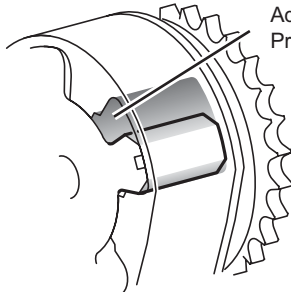
Hold



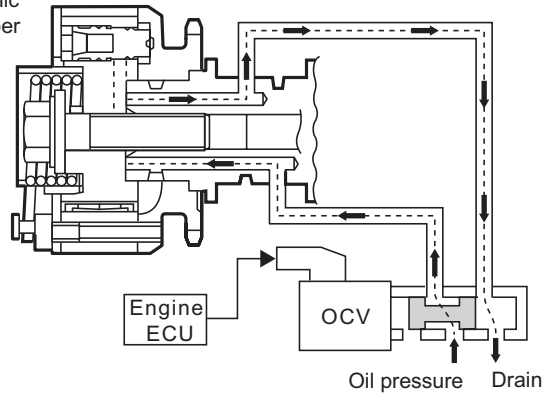
Outline of Exhaust VVT-i Operation

Advance

The spool valve of the OCV reaches the position shown in the drawing, as a result of receiving a signal from the engine ECU. Then, hydraulic pressure is applied to the hydraulic pressure chamber for advance, causing the exhaust camshaft to rotate towards advance.



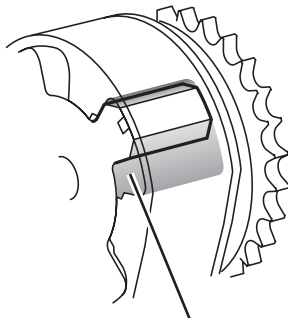
Advance Hydraulic Pressure Chamber



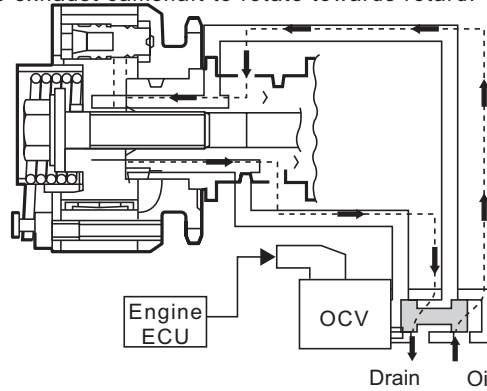
Oil pressure Drain

Retard

The spool valve of the OCV reaches the position shown in the drawing, as a result of receiving a signal from the engine ECU. Then, hydraulic pressure is applied to the hydraulic pressure chamber for retard, causing the exhaust camshaft to rotate towards retard.



Retard Hydraulic Pressure Chamber



Drain Oil pressure

The engine ECU effects control by calculating the target degree of advance in accordance with the driving conditions. After reaching the target timing, the engine ECU maintains the timing by setting the OCV to neutral, provided that the driving conditions do not change. As a result, the valve timing can be set to any target position.

At the same time, the engine oil is prevented from flowing out needlessly.

Hold

