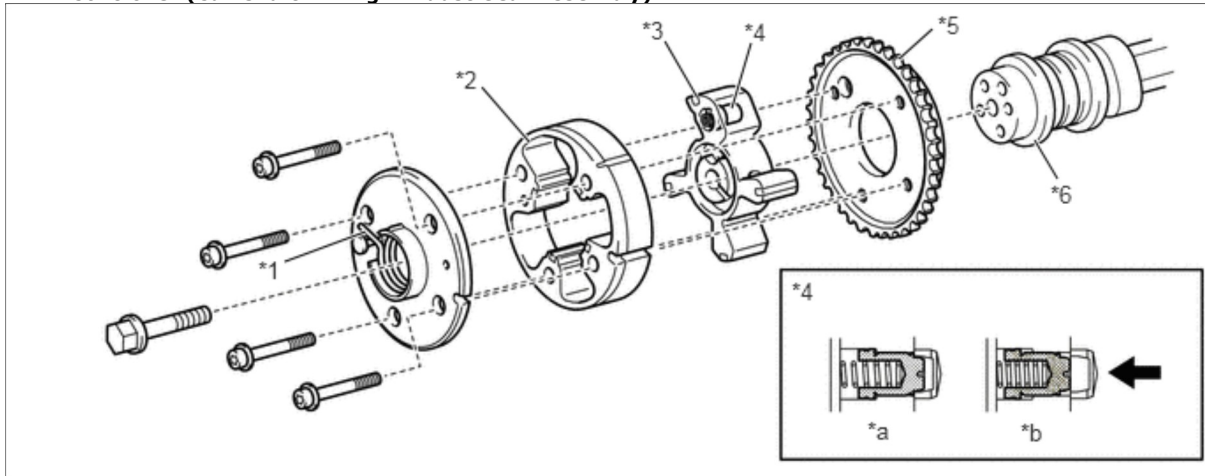



[Print](#)[Exit](#)**6AR-FSE ENGINE MECHANICAL ENGINE UNIT DETAILS VVT-i CONTROLLER****CONSTRUCTION**

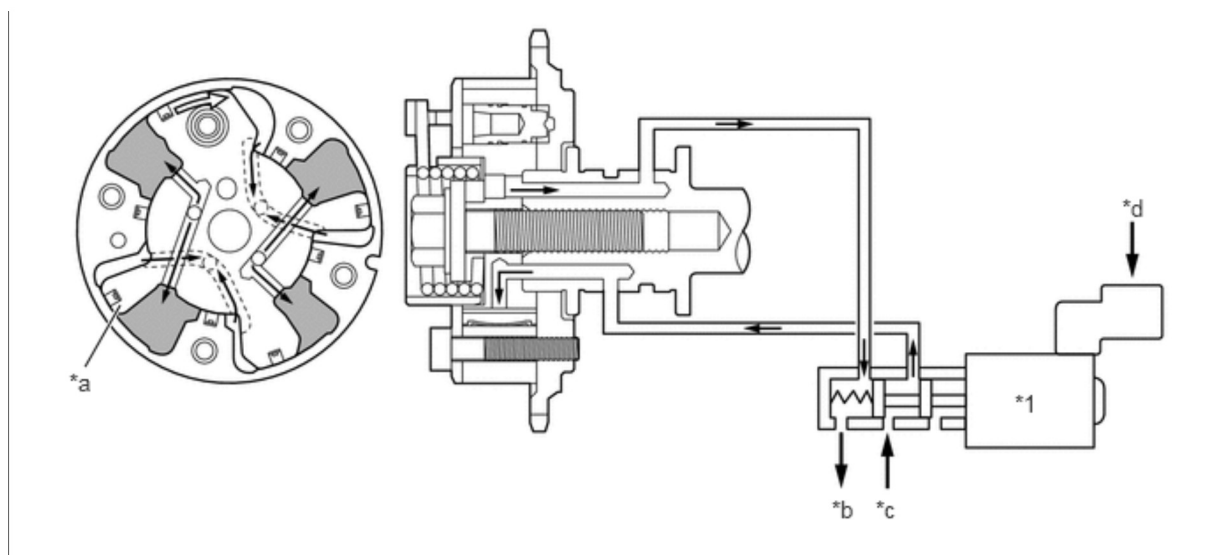
- a. A 4-blade vane type VVT-i controller (camshaft timing exhaust gear assembly) is used on the exhaust side.
- b. When the engine is stopped, a lock pin locks the exhaust camshaft at the most advanced position to ensure that the engine starts properly.
- c. An advance assist spring is provided in the VVT-i controller (camshaft timing exhaust gear assembly) to assist the necessary torque in the advanced direction to keep the lock pin securely connected when the engine is stopped.
- d. The ECM controls the amount of oil pressure applied to the advanced chamber and retarded chamber inside the VVT-i controller (camshaft timing exhaust gear assembly) based on signals from each sensor via the camshaft timing oil control valve assembly installed on the cylinder head cover sub-assembly and continuously changes the exhaust camshaft (No. 2 camshaft) phase.


VVT-i Controller (Camshaft Timing Exhaust Gear Assembly)

*1	Advance Assist Spring	*2	Housing
*3	Vane (Fixed on Exhaust Camshaft (No. 2 Camshaft))	*4	Lock Pin
*5	Sprocket	*6	Exhaust Camshaft (No. 2 Camshaft)
*a	At a Stop	*b	In Operation
	Oil Pressure	-	-

OPERATION

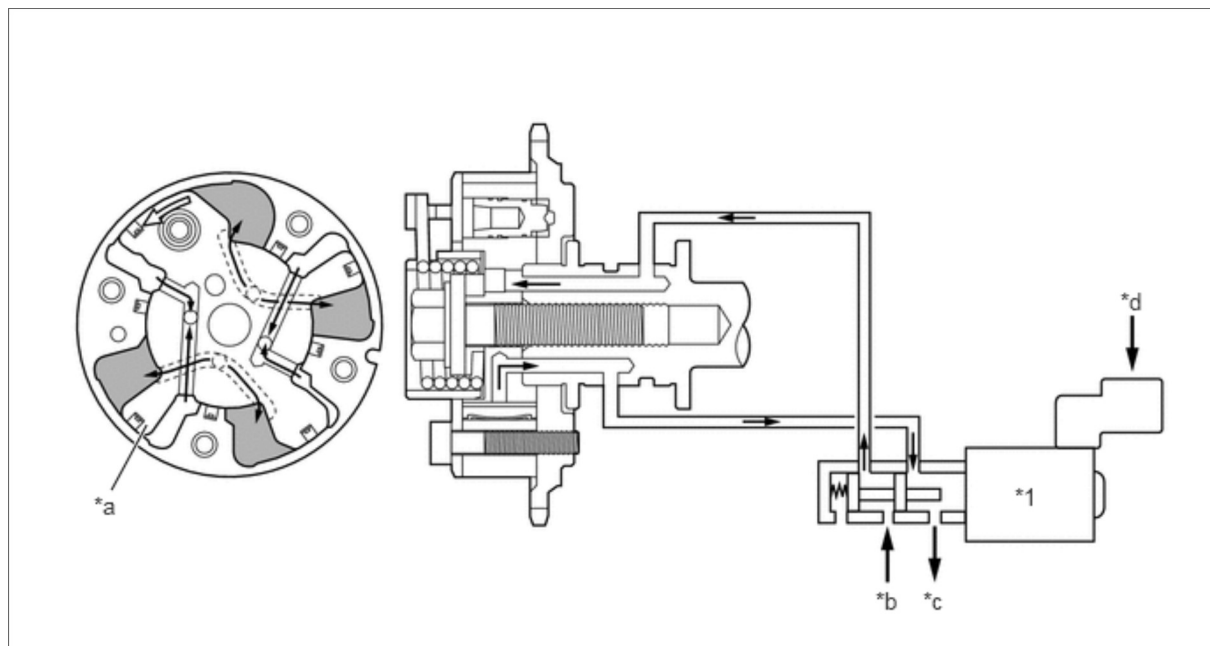
- a. Advance
 - i. When the camshaft timing oil control valve assembly is positioned as shown in the illustration below by the advance signals from the ECM, the resultant oil pressure is applied to the timing advance side vane chamber to rotate the exhaust camshaft (No. 2 camshaft) in the timing advance direction.

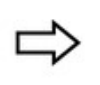


*1	Camshaft Timing Oil Control Valve Assembly	-	-
*a	Vane	*b	Drain
*c	Oil Pressure	*d	From ECM
	Rotation Direction	-	-

b. Retard

- i. When the camshaft timing oil control valve assembly is positioned as shown in the illustration below by the retard signals from the ECM, the resultant oil pressure is applied to the timing retard side vane chamber to rotate the exhaust camshaft (No. 2 camshaft) in the timing retard direction.



*1	Camshaft Timing Oil Control Valve Assembly	-	-
*a	Vane	*b	Oil Pressure
*c	Drain	*d	From ECM
	Rotation Direction	-	-

c. Hold

- i.** The ECM calculates the target advanced angle according to driving conditions and performs control. After setting the target timing, timings are maintained by the neutral camshaft timing oil control valve assembly as long as driving conditions do not change. As a result, unnecessary engine oil discharge is suppressed while valve timings are aligned to the desired target position.

© 2012 TOYOTA MOTOR CORPORATION. All Rights Reserved.