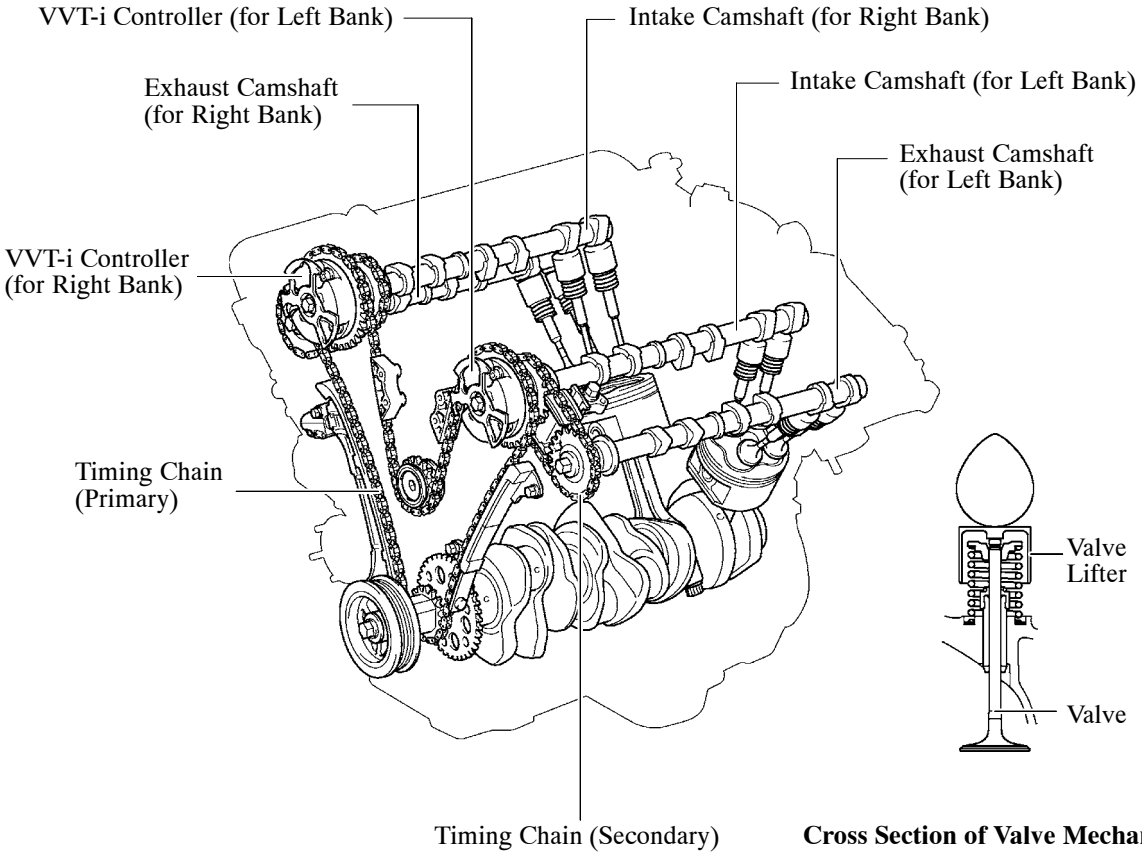
■VALVE MECHANISM

1. General

- The intake camshafts are driven by the crankshaft via the primary timing chain. The intake camshaft of the respective bank drives the exhaust camshafts via the secondary timing chain.
- The valves are directly opened and closed by 4 camshafts.
- The VVT-i controller is installed on the front of the intake camshaft to vary the timing of the intake valves.
- Along with increase in the amount of valve lift, a shimless type valve lifter is used. This valve lifter raises the cam contact surface.



Cross Section of Valve Mechanism

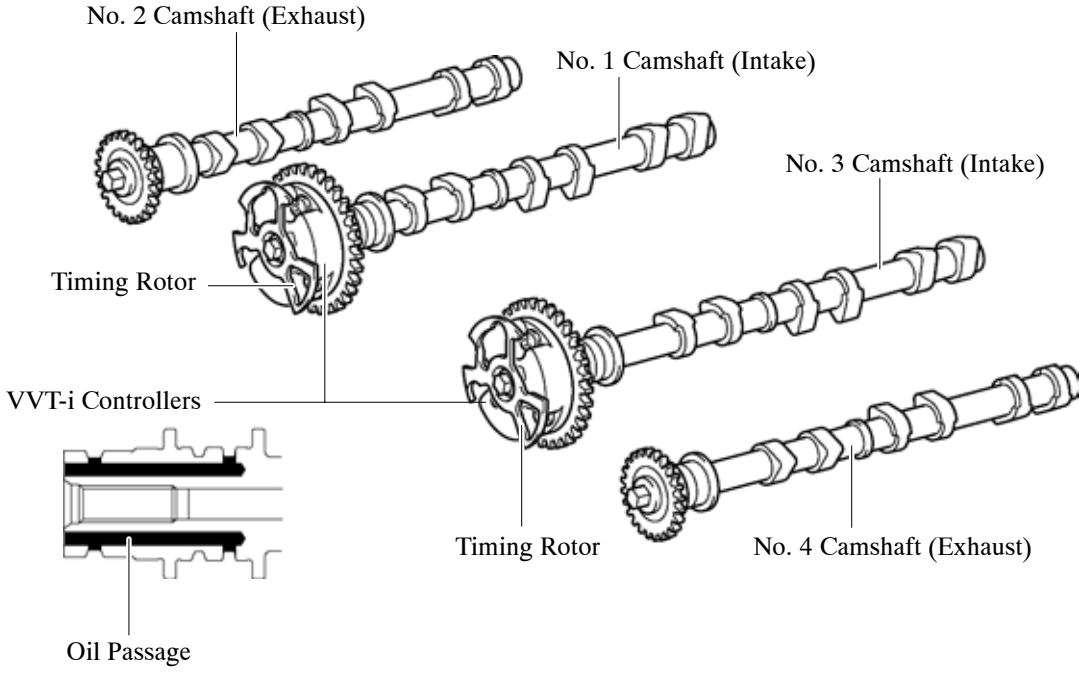
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Service Tip

The adjustment of the valve clearance is accomplished by selecting and replacing the appropriate valve lifters.
A total of 35 valve lifters are available in 0.020 mm (0.008 in.) increments, from 5.060 mm (0.199 in.) to 5.740 mm (0.226 in.). For details, refer to the 2007 FJ Cruiser Repair Manual (Pub. No. RM0240U).

2. Camshaft

- The camshafts are made of a cast iron alloy.
- An oil passage is provided in the intake camshaft in order to supply engine oil to the VVT-i system.
- A timing rotor is provided in front of the VVT-i controller to detect the actual position of the intake camshaft.

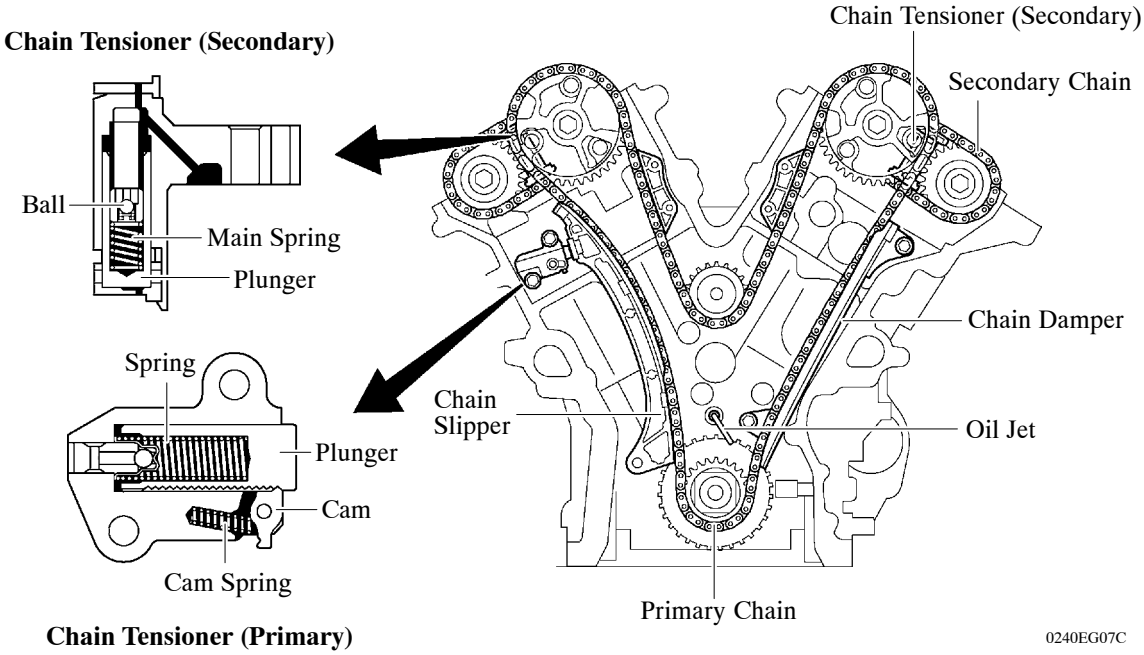


Cross Section of the End of the Intake Camshaft

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3. Timing Chain and Chain Tensioner

- Both the primary and secondary timing chains use roller chains with a pitch of 9.525mm (0.375 in.).
- The timing chain is lubricated by an oil jet.
- The primary chain uses one timing chain tensioner and each of the secondary chains for the right and left banks uses one timing chain tensioner.
- Both the primary and secondary chain tensioners use a spring and oil pressure to maintain proper chain tension at all times. They suppress noise generated by the timing chains.
- The chain tensioner for the primary chain is the ratchet type with a non-return mechanism.



4. Timing Chain Cover

The timing chain cover has an integrated construction consisting of the cooling system (water pump and water passage) and the lubrication system (oil pump and oil passage). Thus, the number of parts is reduced to reduce weight.

