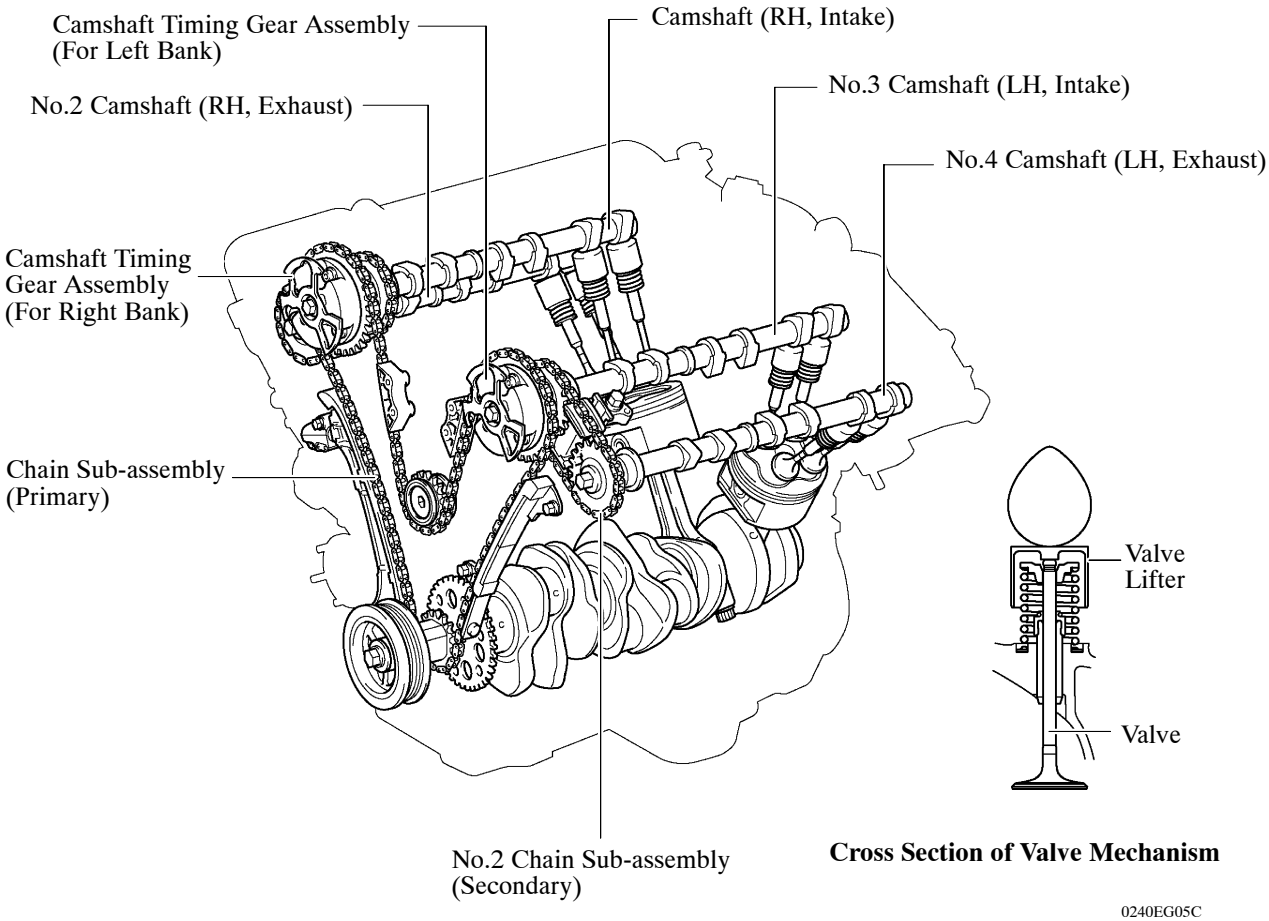
## ■VALVE MECHANISM

### 1. General

- The camshaft (RH, Intake) and No.3 camshaft (LH, Intake) are driven by the crankshaft via the chain sub-assembly (primary). The intake camshaft of the respective bank drives the exhaust camshafts via the No.2 chain sub-assembly (secondary).
- The valves are directly opened and closed by the 4 camshafts.
- The camshaft timing gear assembly is installed on the front of the camshaft (RH, Intake) and No.3 camshaft (LH, Intake) 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**

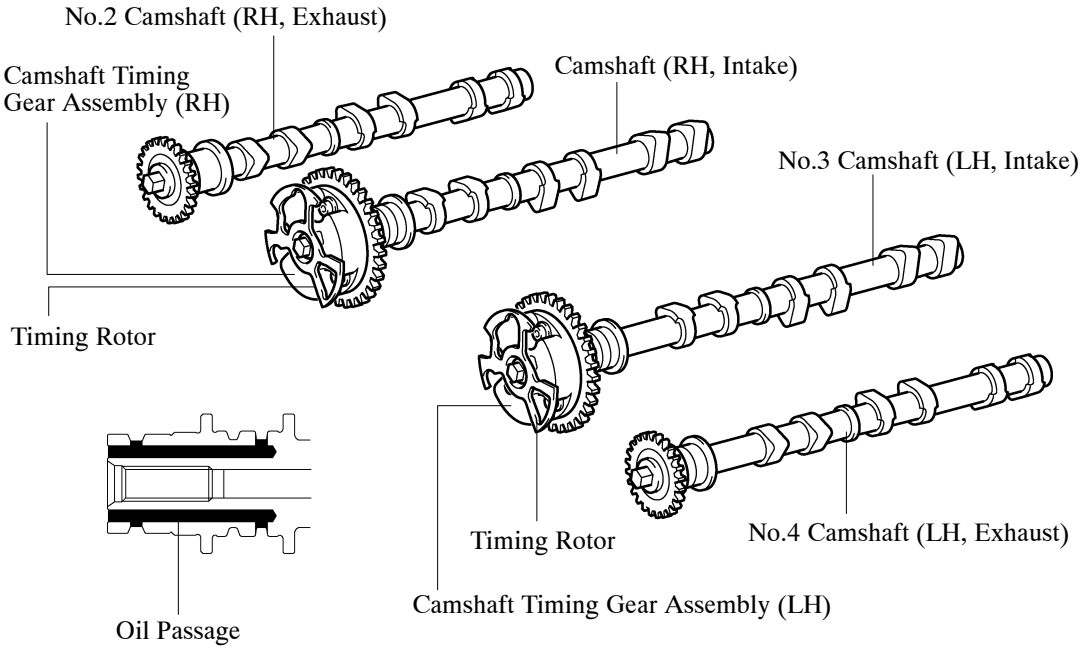
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**Service Tip**

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 (0.0008 in.) increments, from 5.060 mm (0.199 in.) to 5.740 mm (0.226 in.). For details, see the FJ CRUISER Repair Manual (Pub. No. RM07D1E).

## 2. Camshaft

- The camshafts are made of a cast iron alloy.
- Oil passages are provided in the camshaft (Intake) in order to supply engine oil to the VVT-i system.
- A timing rotor is provided in front of the camshaft timing gear assembly to detect the actual position of the camshaft (Intake).



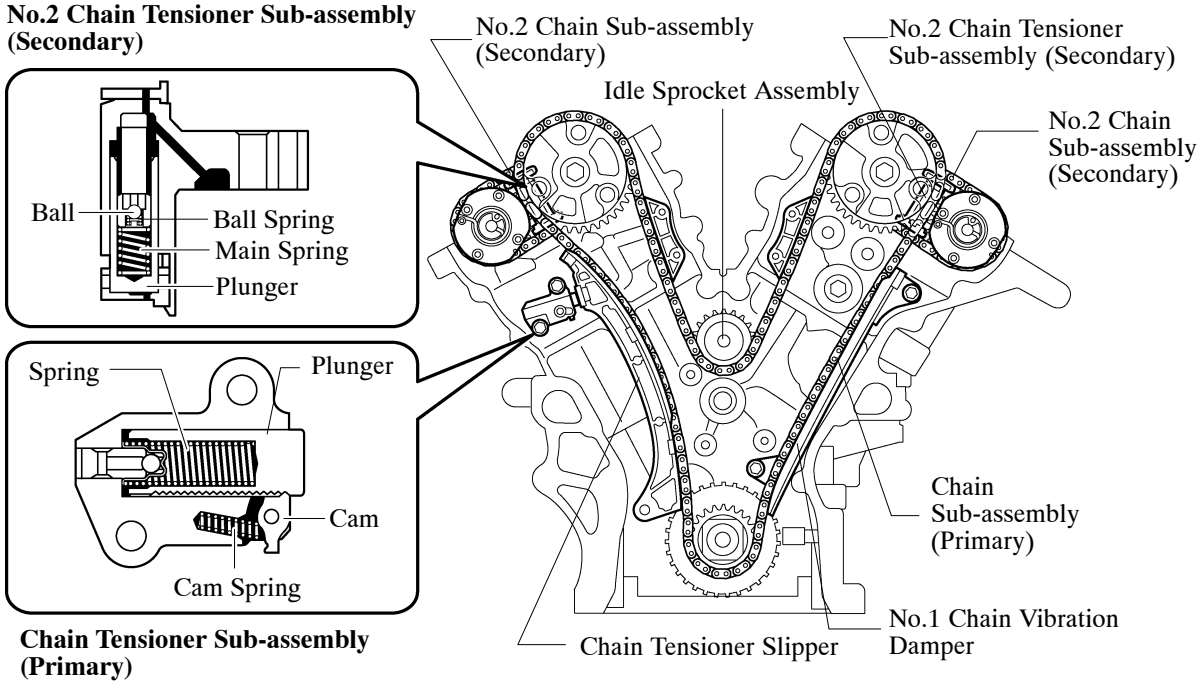

**Cross Section of the End of the Camshaft (Intake)**

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## 3. Chain Sub-assemblies and Chain Tensioner Sub-assemblies

- Each a chain sub-assembly (primary) and 2 No.2 chain sub-assemblies (secondary) use roller chains with a pitch of 9.525 mm (0.375 in.).
- All chain sub-assemblies are lubricated by an oil jet.
- The chain sub-assembly (primary) uses one chain tensioner sub-assembly (primary) and each of the No.2 chain sub-assemblies (secondary) for the right and left banks uses one No.2 chain tensioner sub-assembly (secondary).
- Both the chain tensioner sub-assembly (primary) and No.2 chain tensioner sub-assembly (secondary) use a spring and oil pressure to maintain proper chain tension at all times. They suppress noise generated by the chain sub-assemblies.
- The chain tensioner sub-assembly (primary) is a ratchet type with a non-return mechanism.

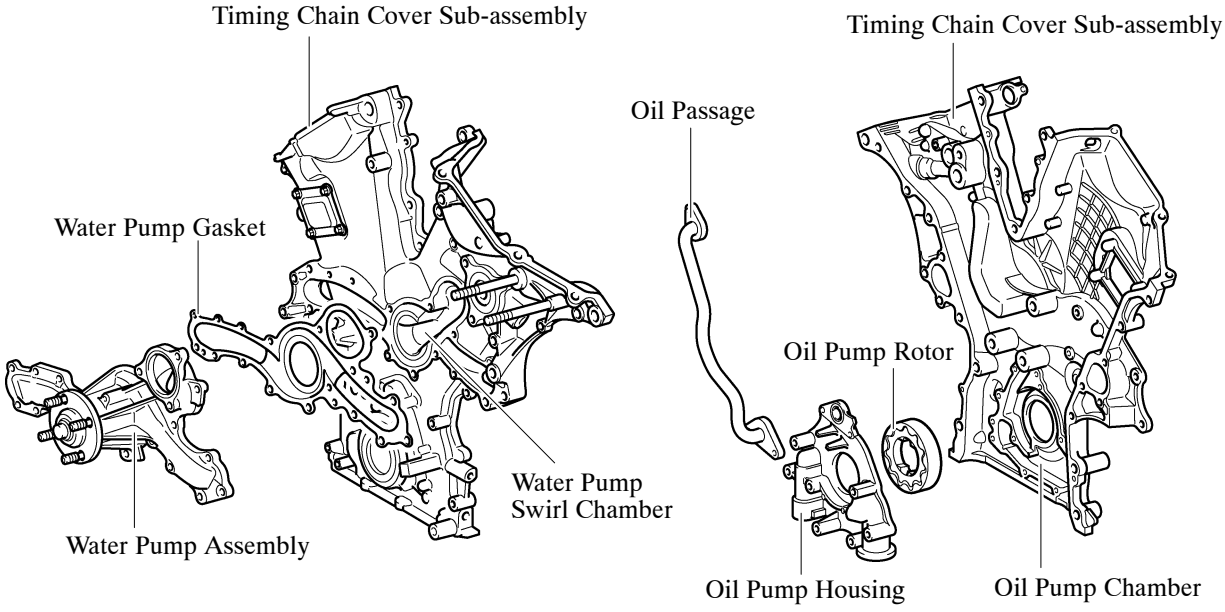





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## 4. Timing Chain Cover Sub-assembly

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




**View from Front Side** **View from Back Side**

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