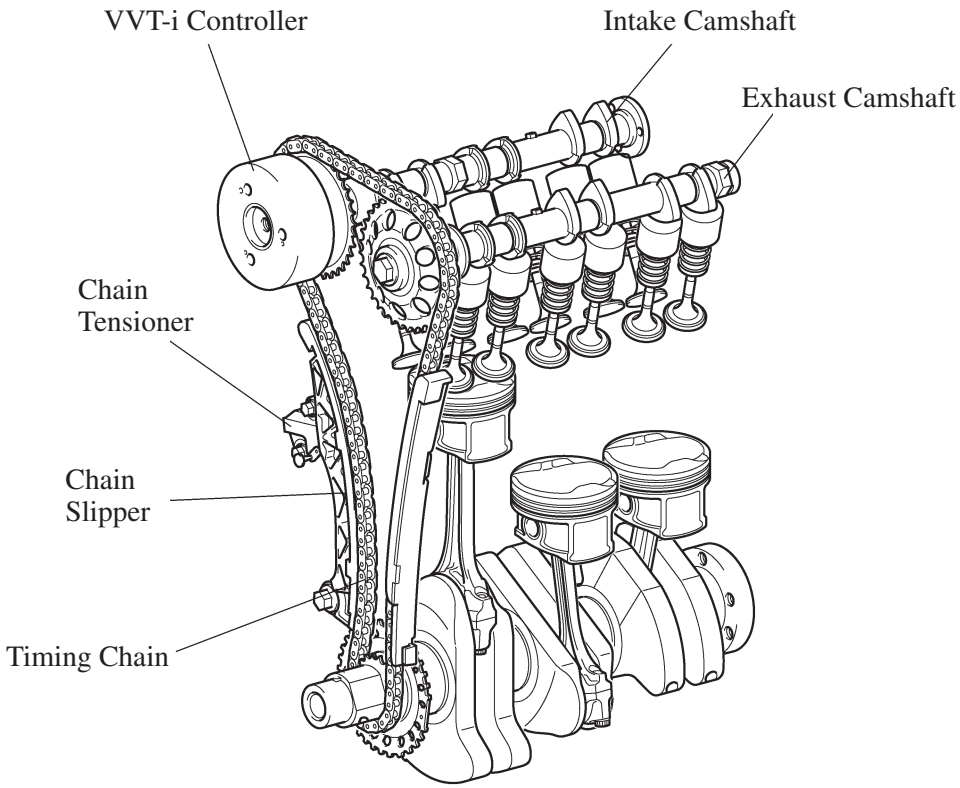
■VALVE MECHANISM

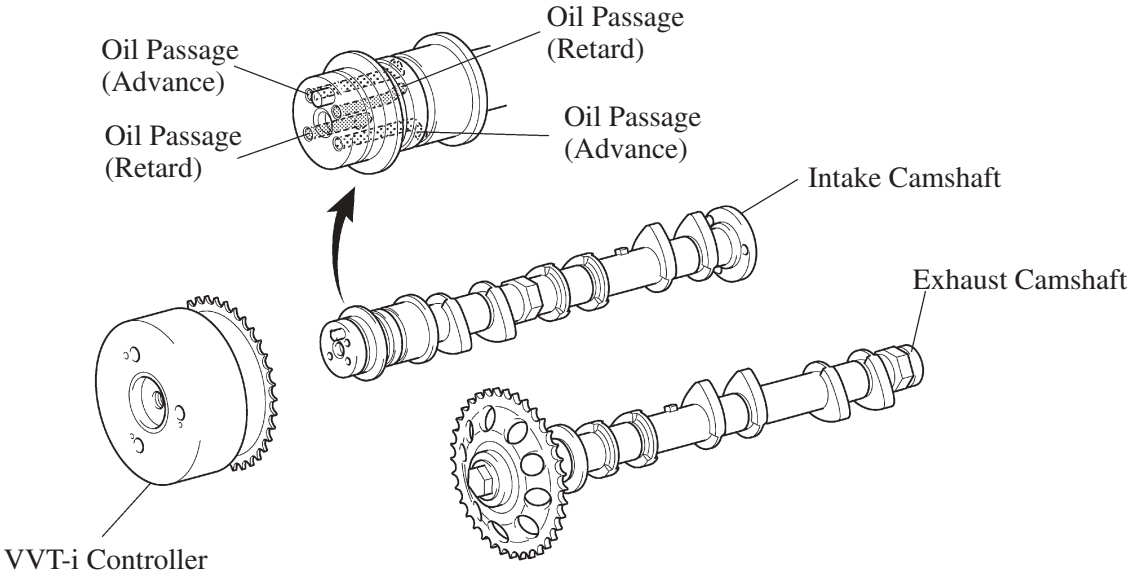
1. General

- Each cylinder has 2 intake valves and 2 exhaust valves. Intake and exhaust efficiency is increased by means of the large total port areas.
- The valves are directly opened and closed by 2 camshafts.
- The VVT-i system is used to achieve low fuel consumption and high engine performance, and to reduce exhaust emissions. For details of VVT-i system, see page EG-50.



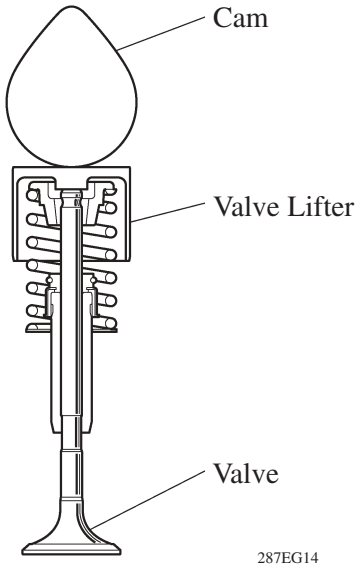
2. Camshaft

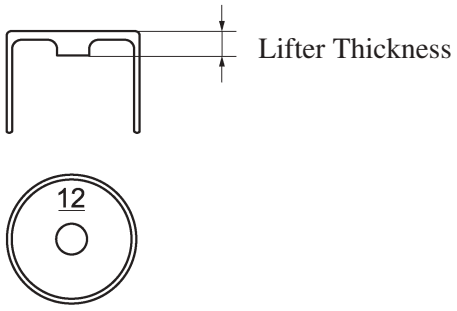
- Oil passages are provided in the intake camshaft in order to supply engine oil pressure to the VVT-i system.
- A VVT-i controller is installed on the front of the intake camshaft to vary the timing of the intake valves.



3. Intake and Exhaust Valve and Valve Lifter

- Narrower valve stems are used to reduce the intake and exhaust resistance and to reduce weight.
- The same valve springs are used for both the intake and exhaust valves. They are variable pitch springs that offer good valve following performance.
- Valve lifters with shimless valve adjustment is used for weight reduction.





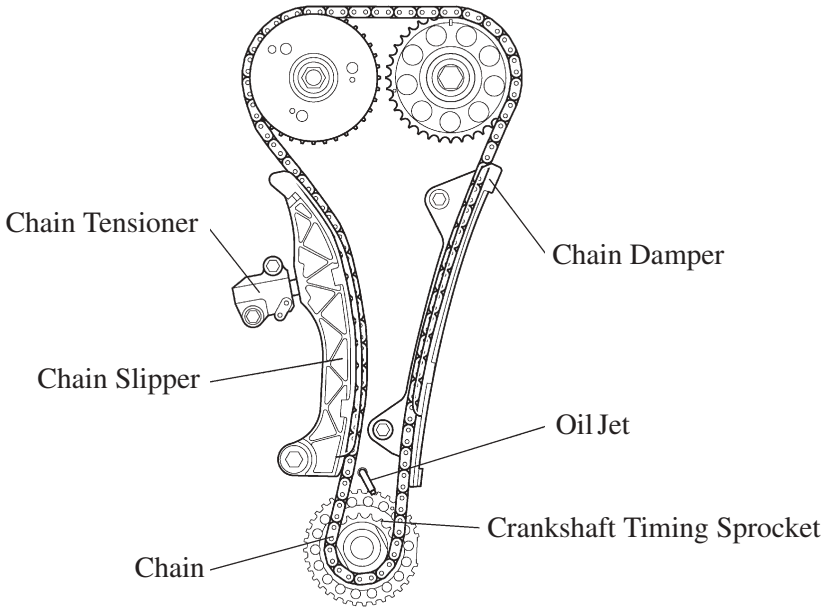
Service Tip

The adjustment of the valve clearance is accomplished by selecting and replacing the appropriate valve lifters. Adjusting valve lifters are available in 29 increments of 0.02 mm (0.0008 in.), from 5.12 mm (0.201 in.) to 5.68 mm (0.223 in.). For details, refer to the Yaris Repair Manual (Pub. No. RM00S1E).

EG

4. Timing Chain and Chain Tensioner

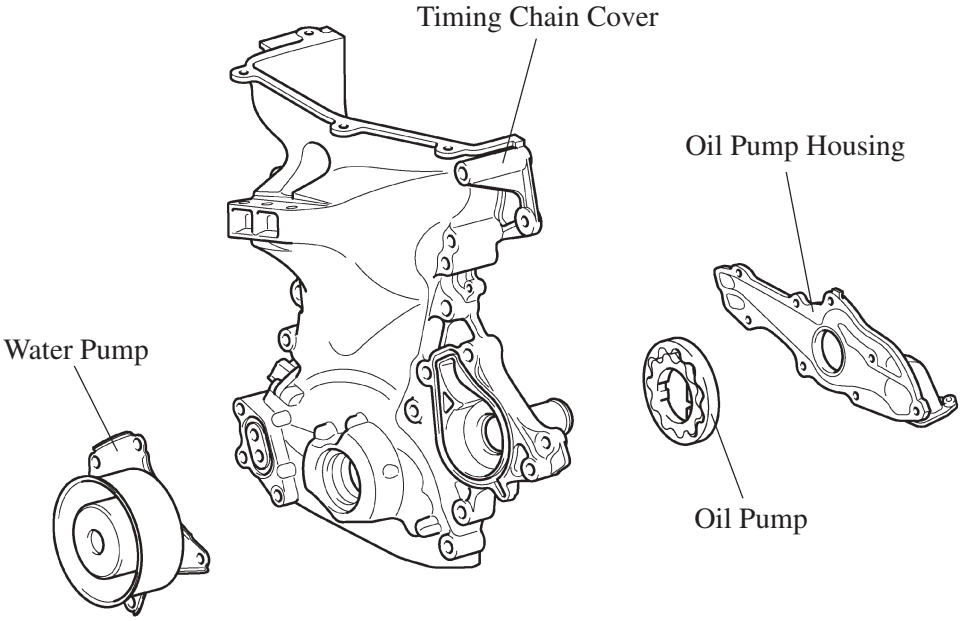
- A high-strength roller chain with an 8.0 mm (0.31 in.) pitch is used to make the engine more compact and to ensure the reliability of the timing chain.
- The chain tensioner uses a spring and oil pressure to maintain proper chain tension at all times. The chain tensioner suppresses noise generated by the timing chain.
- An oil jet is provided to lubricate the crankshaft timing sprocket and chain.



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5. Timing Chain Cover

The oil pump housing is enclosed in a timing chain cover made of aluminum, to which a water pump is mounted.



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