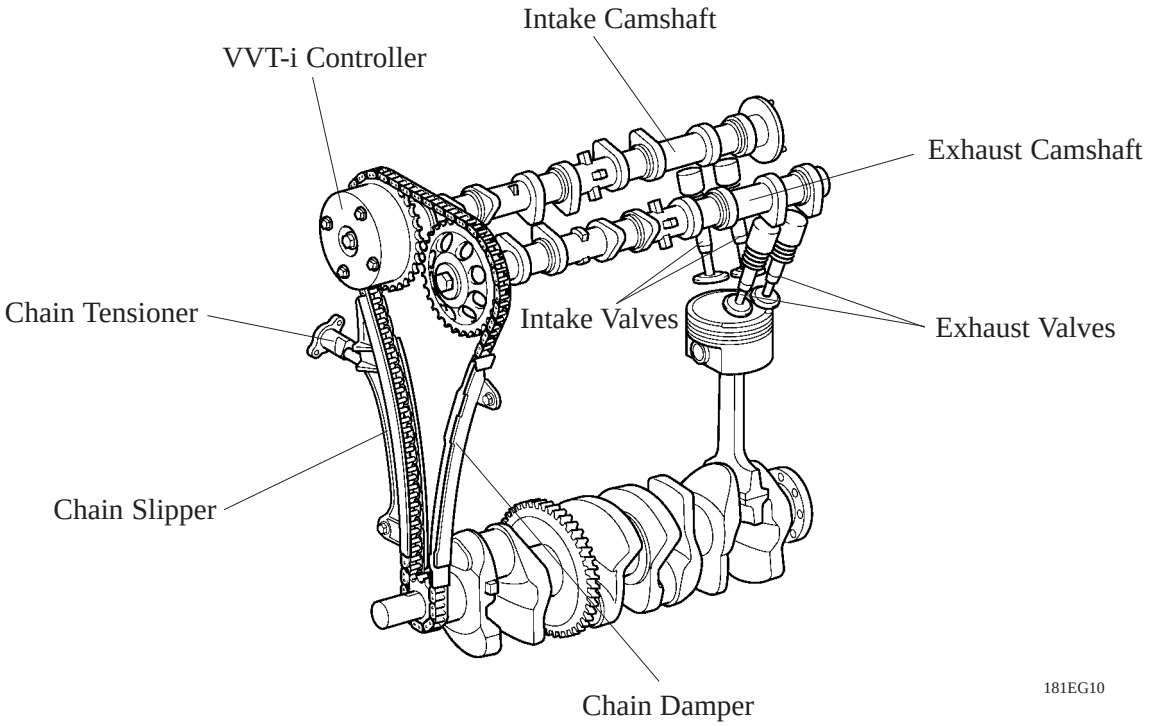
■VALVE MECHANISM

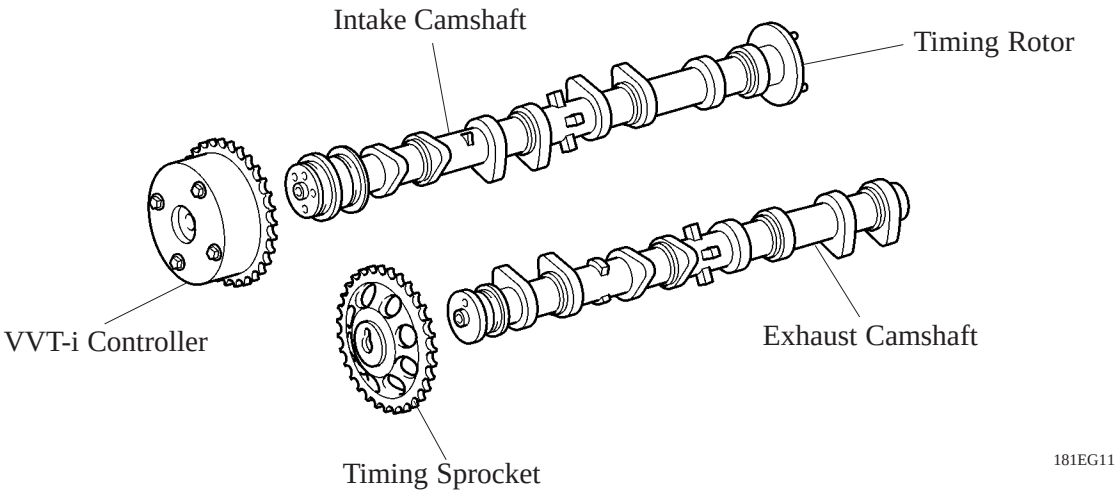
1. General

- Each cylinder is equipped with 2 intake valves and 2 exhaust valves. Intake and exhaust efficiency has been increased due to the larger total port areas.
- The valves are directly opened and closed by 2 camshafts.
- The intake and exhaust camshafts are driven by a chain. The VVT-i system used for the intake camshaft is used to realize highly fuel economy, engine performance and reduce exhaust emissions. For details, see page EG-43 in the VVT-i system section.
- The shimless type valve lifter is used.



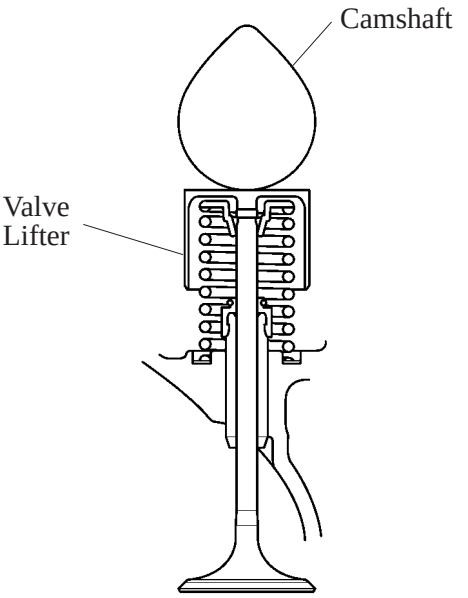
2. Camshaft

- The intake camshaft is provided with timing rotor to trigger the camshaft position sensor.
- In conjunction with the adoption of the VVT-i system, an oil passage is provided in the intake camshaft in order to supply engine oil pressure to the VVT-i system.
- A VVT-i controller has been installed on the front of the intake camshaft to vary the timing of the intake valves.



3. Intake and Exhaust Valves

- Intake and exhaust valves with large-diameter valve face have been adopted to improve the intake air and exhaust gas flow.
- Narrow valve stems have been adopted to reduce the intake and exhaust resistance and for weight reduction.



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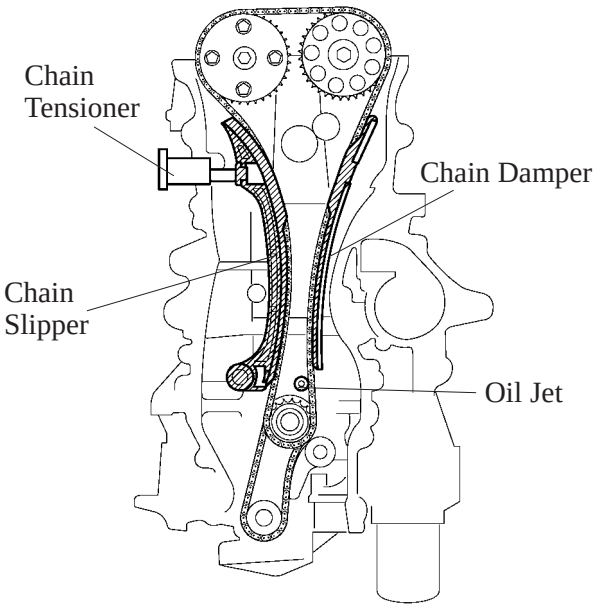
- Along with the increased amount of valve lift, shimless valve lifters that provide a large cam contact surface have been adopted.
  The adjustment of the valve clearance is accomplished by selecting and replacing the appropriate valve lifters.

Service Tip

The valve lifters are available in 35 size in increment of 0.020 mm (0.008 in.), from 5.060 (0.199 in.) to 5.740 (0.226 in.).
For details, refer to see the 1AZ-FE and 2AZ-FE Engine Repair Mnual (Pub. No. RM916E).

4. Timing Chain

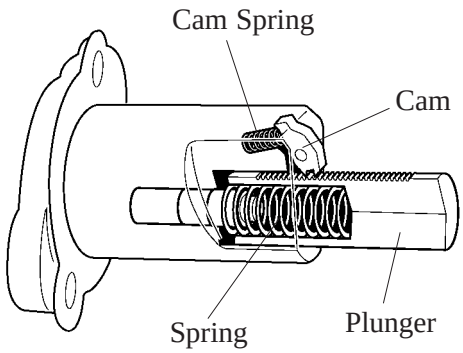
- A roller chain with an 8 mm pitch has been adopted.
- The timing chain is lubricated by an oil jet.



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5. Chain Tensioner

- 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 chain.
  A ratchet type non-return mechanism is also used.
- To improve serviceability, the chain tensioner is constructed so that it can be removed and installed from the outside of the timing chain cover.



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