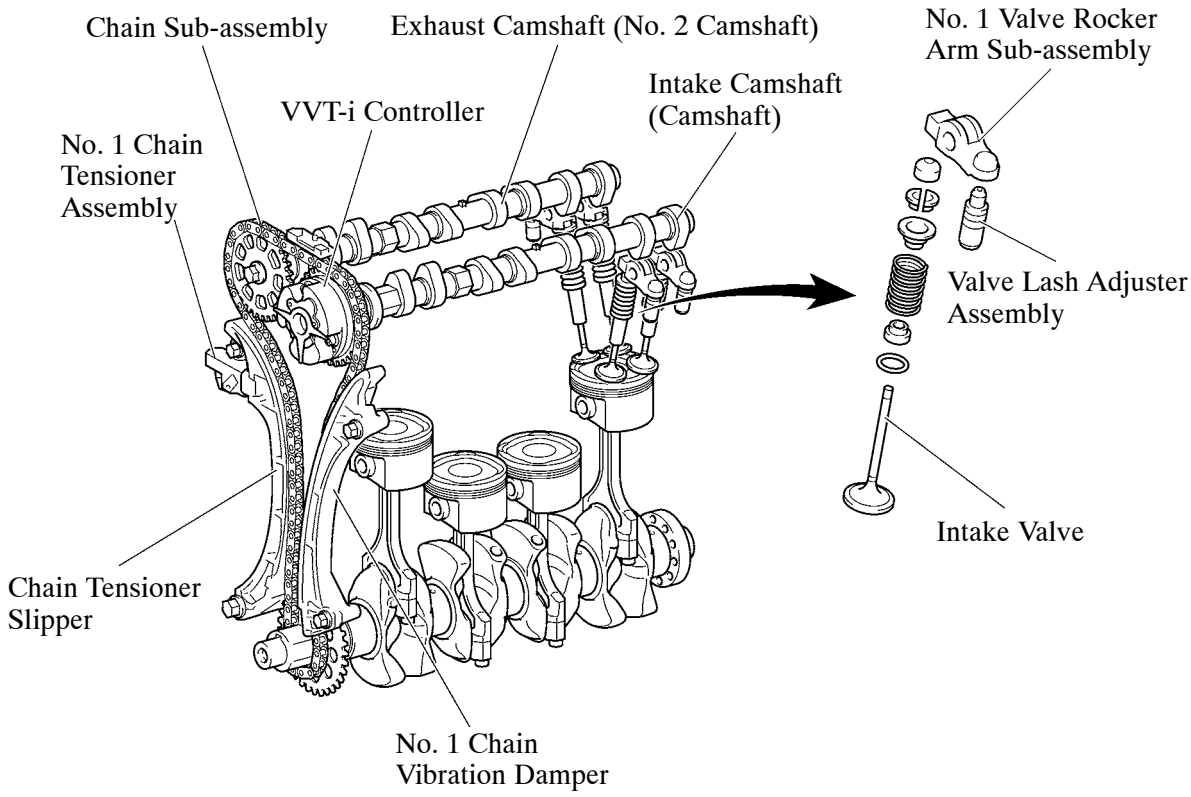
■VALVE MECHANISM

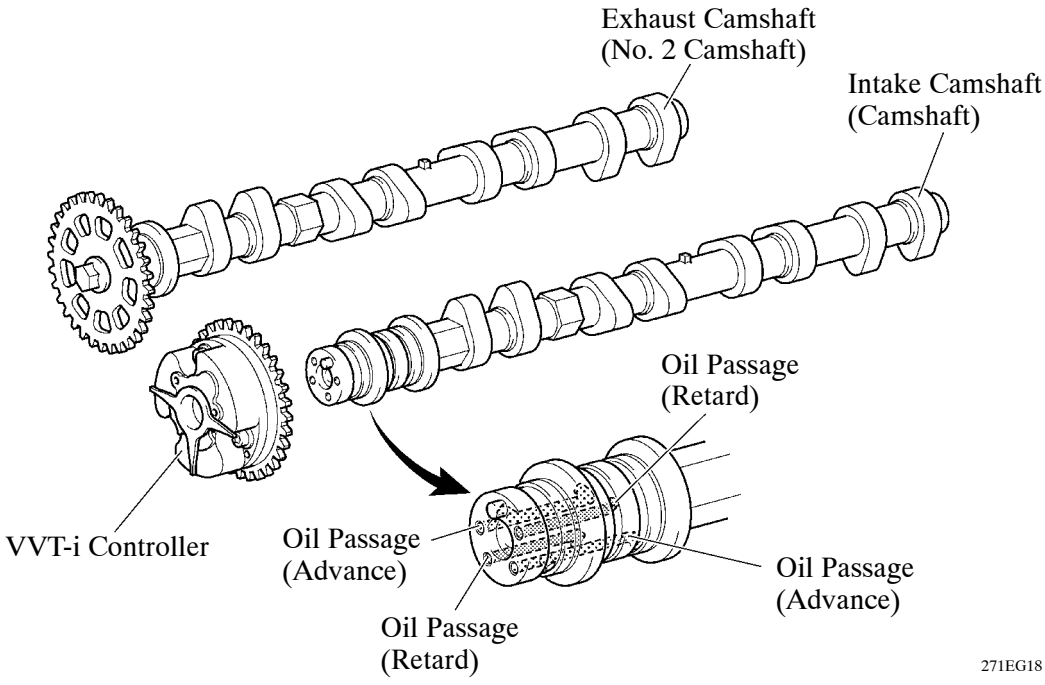
1. General

- The 1TR-FE engine uses a valve actuation mechanism that uses roller rocker arms with built-in needle bearings. This reduces the friction that occurs between the cams and the areas (roller rocker arms) that push the valves down, thus improving fuel economy.
- A valve lash adjuster assembly, which maintains a constant zero valve clearance through the use of oil pressure and spring force, is used.
- The VVT-i system is used to achieve low fuel consumption and higher engine performance to reduce exhaust emissions. For details of VVT-i control, see page 61.



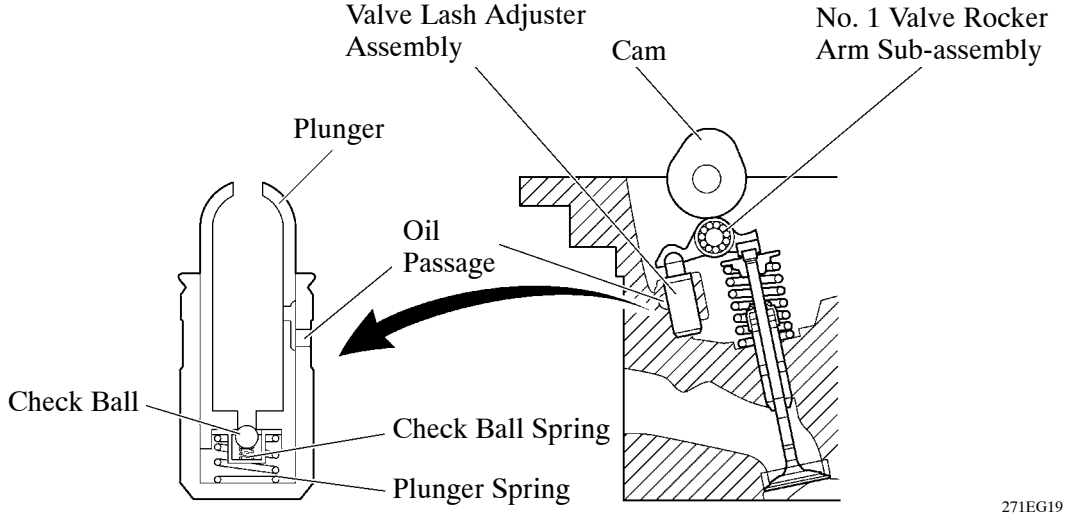
2. Camshaft

- An oil passage is provided in the intake camshaft (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 (camshaft) to vary the timing of the intake valves.



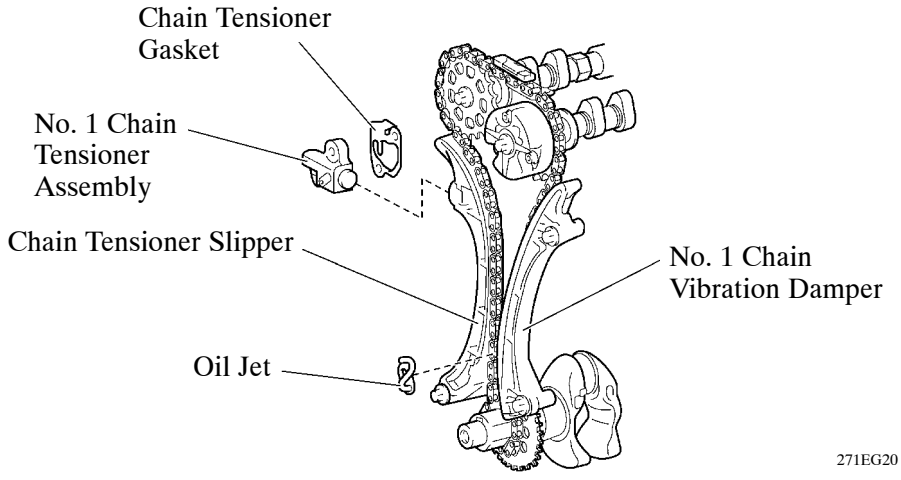
3. Hydraulic Lash Adjuster

- The valve lash adjuster assembly, which is located at the fulcrum of the No. 1 valve rocker arm sub-assembly, consists primarily of a plunger, plunger spring, check ball, and check ball spring.
- The engine oil that is supplied by the cylinder head sub-assembly and the built-in spring actuates the valve lash adjuster assembly. The oil pressure and the spring force that act on the plunger push the No. 1 valve rocker arm sub-assembly against the cam, in order to adjust the valve clearance that is created during the opening and closing of the valve. This results in both improving the quietness of the engine and making valve clearance adjustments unnecessary.



4. Timing Chain and Chain Tensioner

- A high-strength roller chain with a 9.525 mm (0.375 in.) pitch is used to make the engine more compact and to ensure the reliability of the chain sub-assembly.
- The chain sub-assembly is lubricated by oil jet.
- The No. 1 chain tensioner assembly uses a spring and oil pressure to maintain proper No. 1 chain tensioner assembly at all times. The No. 1 chain tensioner assembly suppresses noise generated by the chain sub-assembly.
- A ratchet type non-return mechanism is used in the No. 1 chain tensioner assembly.



5. Timing Chain Cover

The components listed below have been integrated in the chain or belt cover sub-assembly to reduce the number of parts (water pump swirl chamber, thermostat housing, oil pump housing, alternator bracket and power steering vane pump bracket).

