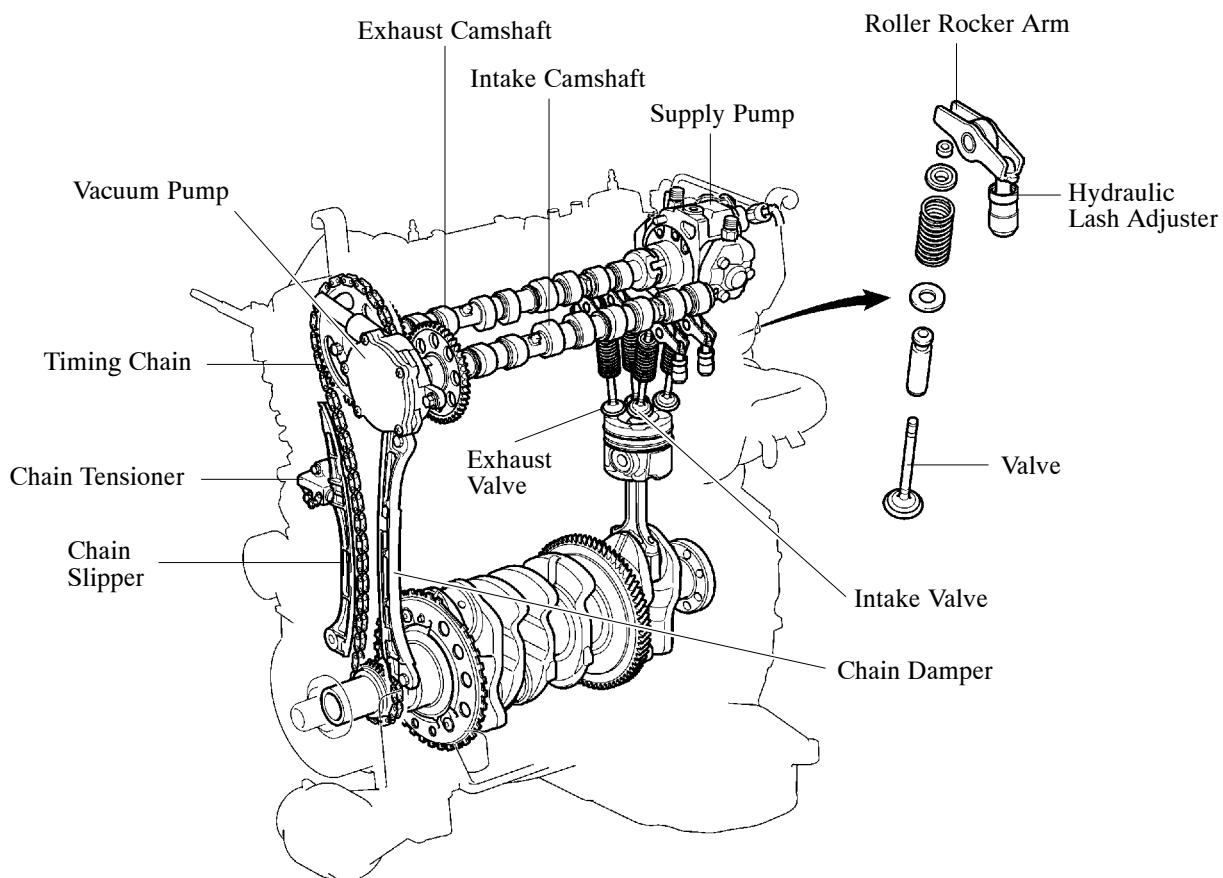


■ VALVE MECHANISM

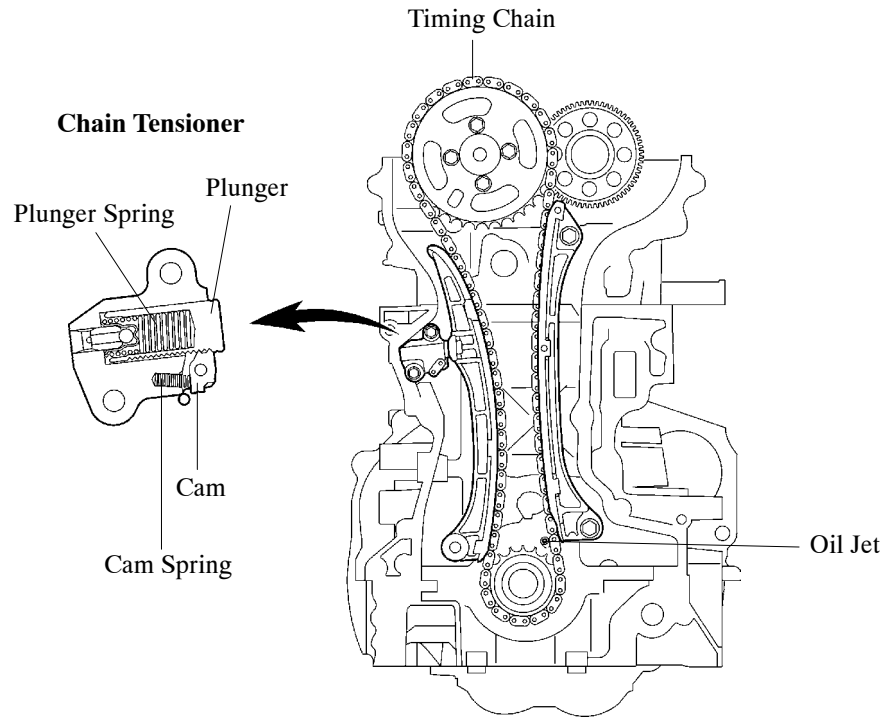
1. General

- Each cylinder of this engine has 2 intake valves and 2 exhaust valves. Intake and exhaust efficiency is increased due to the larger total port areas.
- This engine uses roller rocker arms with built-in needle bearings. This reduces the friction that occurs between the cams and the rocker arms that push the valves down, thus improving fuel economy.
- A hydraulic lash adjuster, which maintains a constant zero valve clearance through the use of oil pressure and spring force, is used.
- The exhaust camshaft is driven by a timing chain, while the intake camshaft is driven by a gear on the exhaust camshaft.
- The fuel supply pump is driven by the exhaust camshaft to realize a lightweight and compact design.
- The vacuum pump is driven by the intake camshaft to realize a lightweight and compact design.



2. Timing Chain and Chain Tensioner

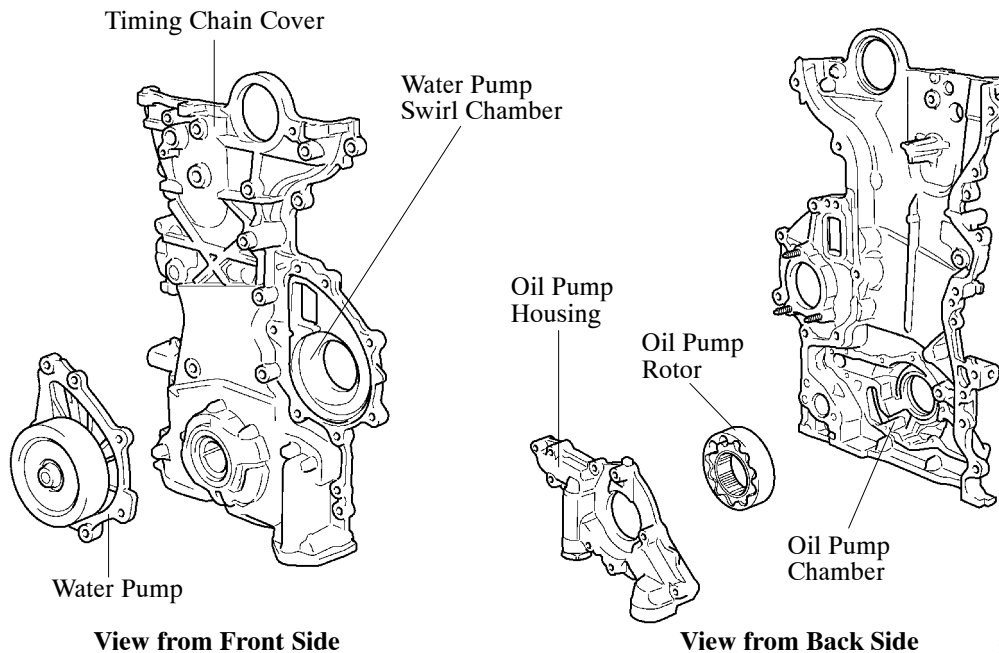
- A bushed chain with a 9.525 mm (0.375 in.) pitch is used to make the engine more compact and realize maintenance-free operation.
- An oil jet lubricates the timing chain.
- The chain tensioner uses a spring and oil pressure to maintain proper chain tension at all times.
- The chain tensioner suppresses noise generated by the chain.
- A ratchet type chain tensioner with a backlash prevention mechanism is used.



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3. Timing Chain Cover

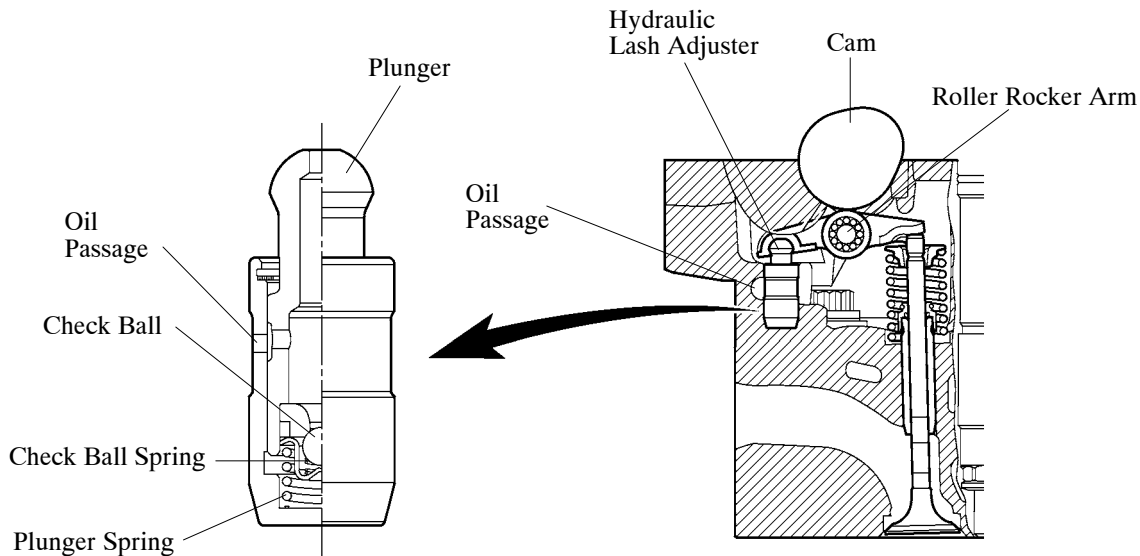
- A single piece, aluminum diecast timing chain cover that entirely seals the front portion of the cylinder block and the cylinder head is used.
- The components listed below are integrated in the timing chain cover to reduce number of parts. (water pump swirl chamber, oil pump chamber, alternator bracket and chain tensioner service hole).



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4. Hydraulic Lash Adjuster

- The hydraulic lash adjusters, each of which are located at the fulcrum of the roller rocker arms, consist primarily of a plunger, plunger spring, check ball, and check ball spring.
- The engine oil that is supplied by the cylinder head and the built-in spring actuate the hydraulic lash adjusters. The oil pressure and the spring force that act on the plunger push the roller rocker arm against the cam, in order to adjust the clearance between the valve stem and rocker arm. This prevents the generation of noise during the opening and closing of the valves. As a result, engine noise is reduced.



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Service Tip

- Valve clearance adjustment is not necessary because hydraulic lash adjusters are used.
 - When the hydraulic lash adjuster is removed, bleed the air before installation.
- For details, refer to the LEXUS IS250/220d Repair Manual (Pub. No. RM0151E).