■FEATURES OF 1RZ AND 1RZ-E ENGINES

Features of the 1RZ and 1RZ-E engines are as follows:

Features	Contents
High Performance and Fuel Economy	● A cross-flow intake and exhaust layout to improve intake and exhaust efficiency. ● A thermostat is installed in the intake manifold in order to restrain the rise in the intake air temperature, thus improving the intake charging efficiency.*1 ● Engine control system is used.*2
Low Noise and Vibration	● A highly rigid, fully balanced crankshaft is used. ● A highly rigid cylinder block is used. ● A two-layer steel sheet cylinder head cover is used.
Lightweight and Compact Design	An aluminum radiator core is used.
Good Serviceability and High Reliability	● Outer shim type valve lifters and adjusting shims. ● A single timing chain with superb wear resistance. ● Aluminum alloy bearings for the connecting rods and the crankshaft.

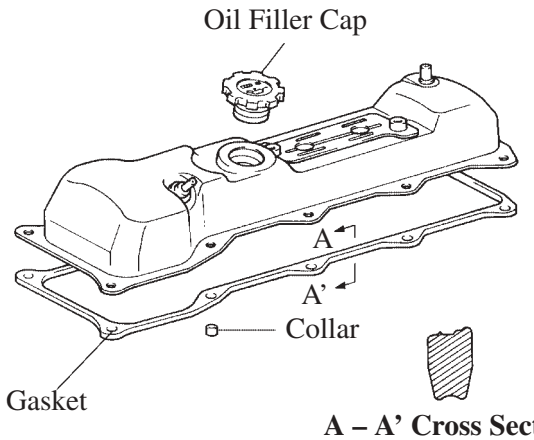
*1: Only for 1RZ Engine
*2: Only for 1RZ-E Engine

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■ENGINE PROPER

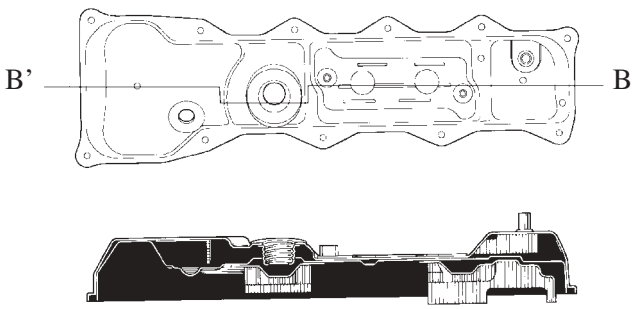
1. Cylinder Head Cover and Cover Gasket

- Two layers of thin steel sheet are used to make the cylinder head cover. This type of cover helps to reduce noise.
- An acryl rubber ring type cylinder head cover gasket with superb sealing properties is used and the cylinder head cover is made so that it is tightened with bolts around the outer circumference of the cylinder head.



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A – A' Cross Section

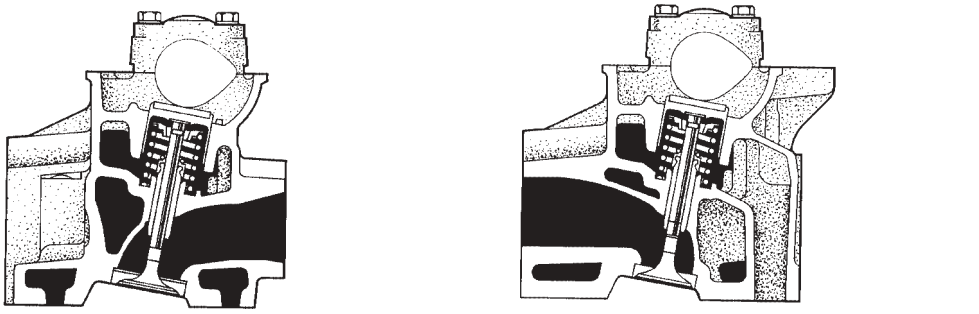


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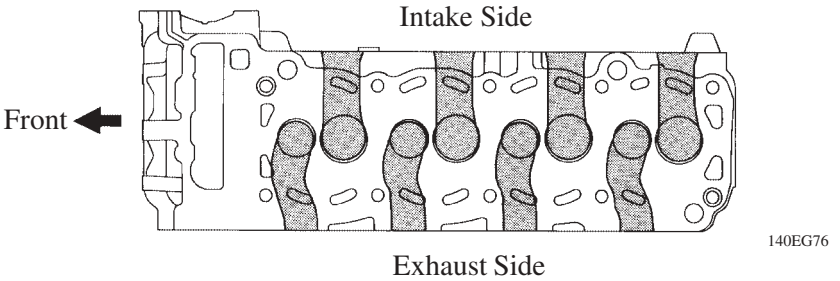
B – B' Cross Section

2. Cylinder Head

- The cylinder head is made of lightweight aluminum alloy having good thermal conductivity.
- Wedge type combustion chambers improve combustion efficiency and antiknocking properties.
- A cross-flow intake and exhaust layout is used to improve intake and exhaust efficiency.
- Plastic region tightening bolts are used for the cylinder head.



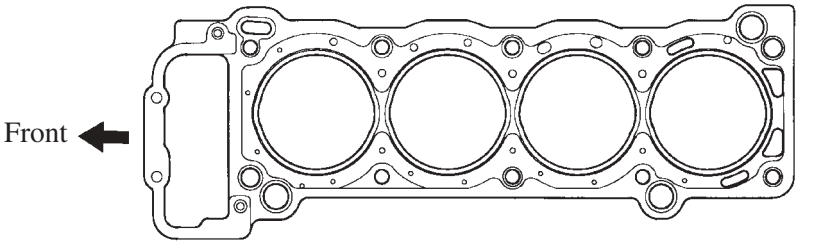
Intake Port **Exhaust Port** 140EG75



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3. Cylinder Head Gasket

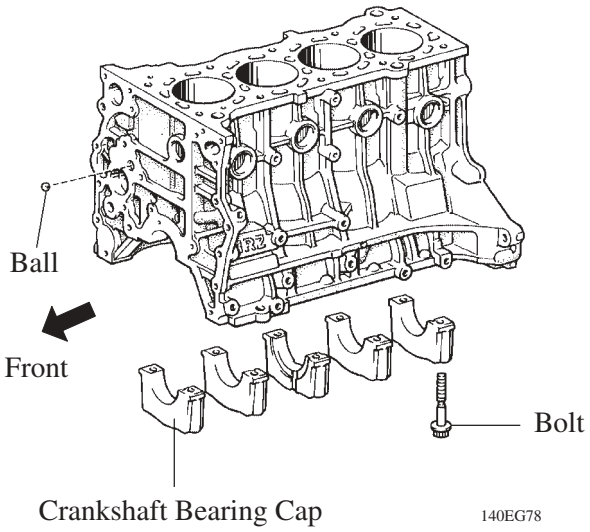
- A graphite gasket with stainless grommets, which provides excellent pressure resistance and sealability, is used for the cylinder head gasket.
- To improve anti-knocking properties, water holes have been optimized and cooling characteristics around the combustion chamber have been improved.



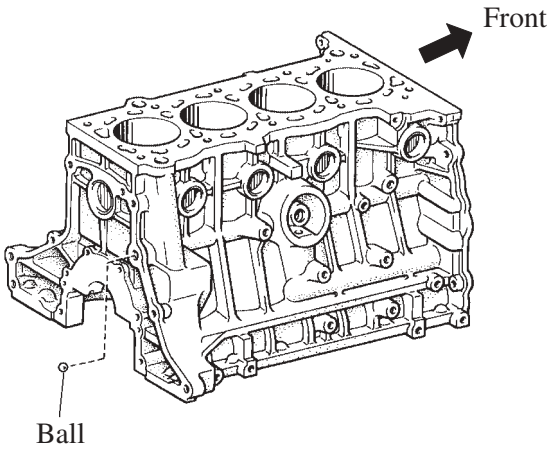
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4. Cylinder Block

- The cylinder block is made of cast iron, with the rib shape of each part optimized and with the skirt given a curved surface to increase rigidity while reducing vibration and noise.
- Balls have been pressure inserted in the plug holes of oil passages to assure that no oil leakage occurs.
- Plastic region tightening bolts are used for the crankshaft bearing cap bolts.



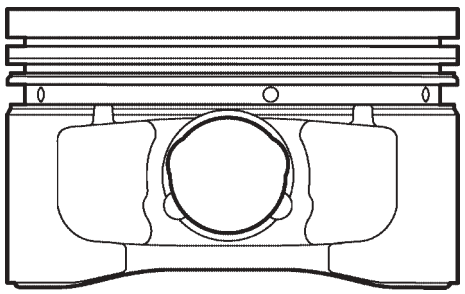
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5. Piston

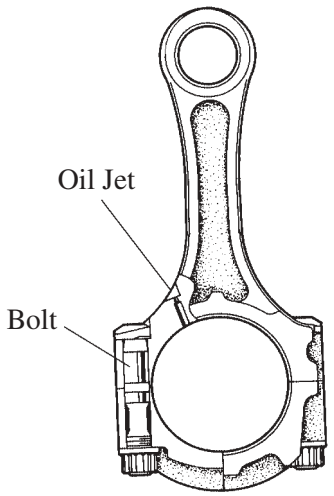
- The piston is made of aluminum alloy. The piston skirt portion is made more compact and rigid to reduce noise and friction.
- The piston pin is made of chrome steel and is full-floating type.



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6. Connecting Rod

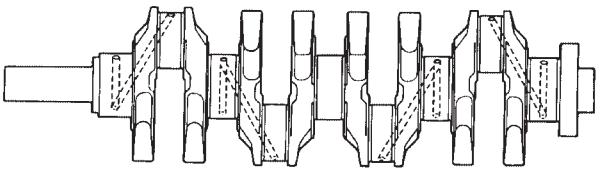
- The connecting rod is made of a lightweight carbon steel that withstand higher speed and high output operation.
- An oil jet is provided in the large end for cooling the piston.
- Plastic region tightening is used for the connecting rod bolts.



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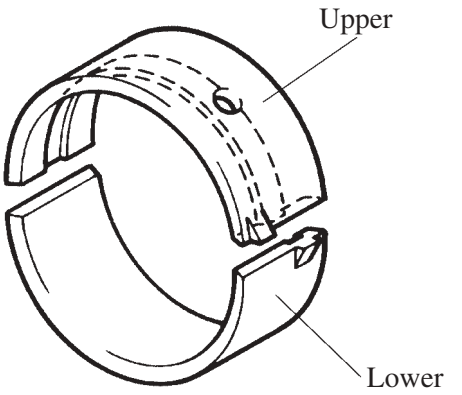
7. Crankshaft

- The crankshaft is made of cast iron, and has 5 journals and 8 counterweights.



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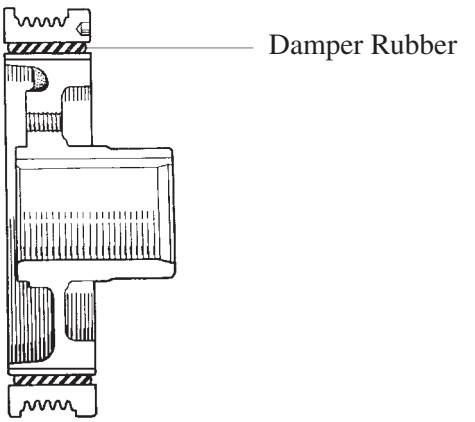
- The crankshaft bearing is made of aluminum alloy.



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8. Crankshaft Pulley

A torsional damper pulley is used and the use of damper rubber which is inserted under high pressure improves reliability.



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