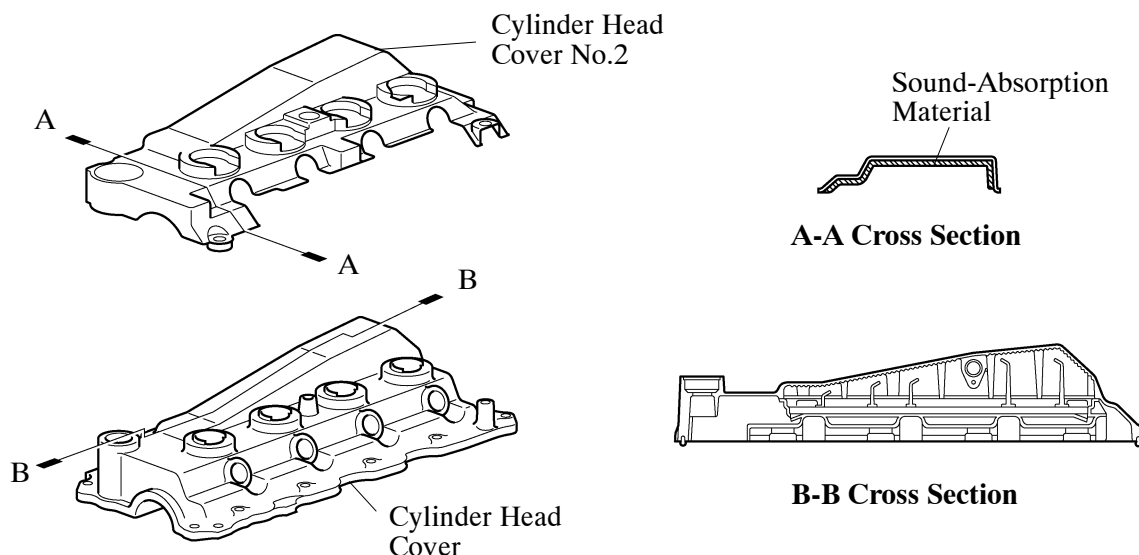


ENGINE PROPER

1. Cylinder Head Cover

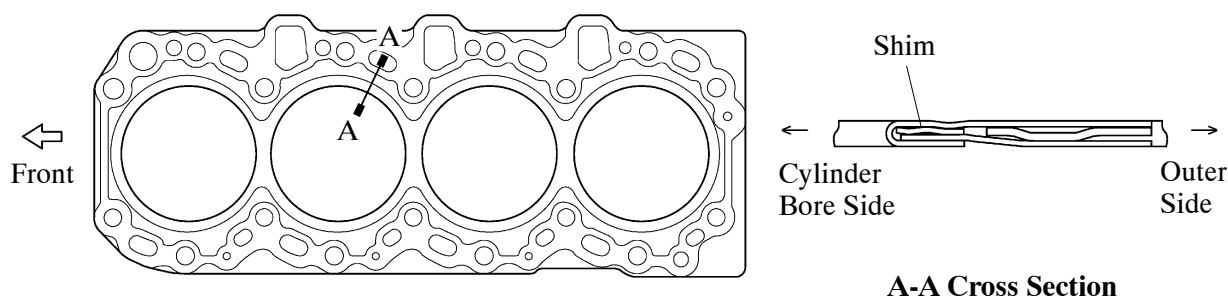
- A new, No. 2 cylinder head cover that helps reduce noise has been provided. A sound-absorption material is affixed on the inside of this cover, which is made of plastic.
- The cylinder head cover is made of resin to reduce weight and noise.
- A baffle plate is provided on the cylinder head cover to reduce the consumption of engine oil through blow-by gas.



233EG04

2. Cylinder Head Gasket

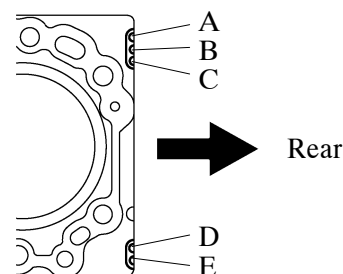
A steel-laminate type cylinder head gasket is used. A shim is used around the cylinder bore to increase the sealing surface, thus improving the sealing performance and durability.



195EG43

Service Tip

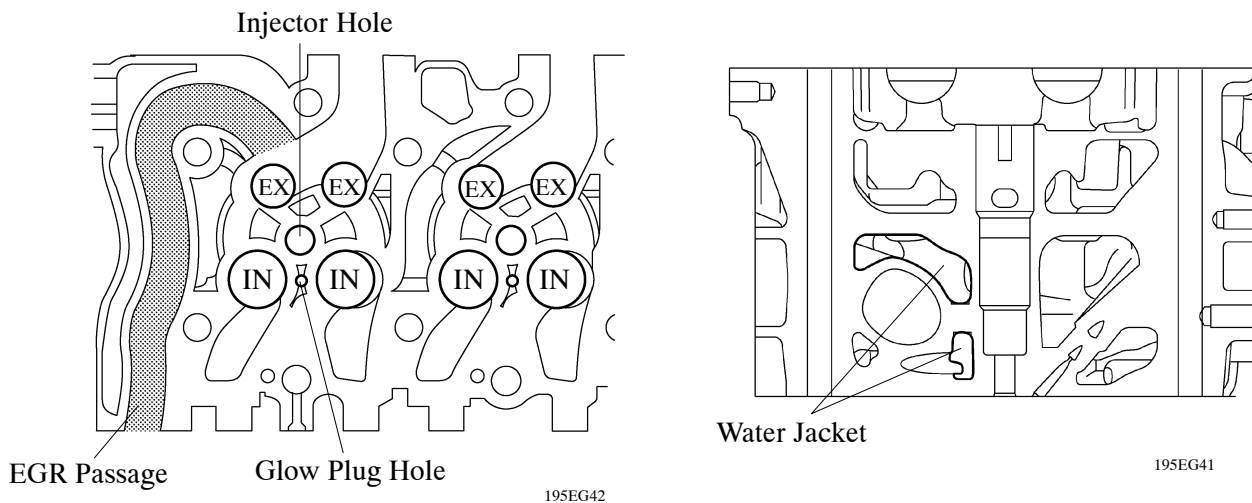
There are 5 sizes of new cylinder head gaskets, marked "A", "B", "C", "D", or "E" according to piston protrusion. For details, refer to see the 1KD-FTV Engine Repair Manual (Pub. No. RM992E).



224EG05

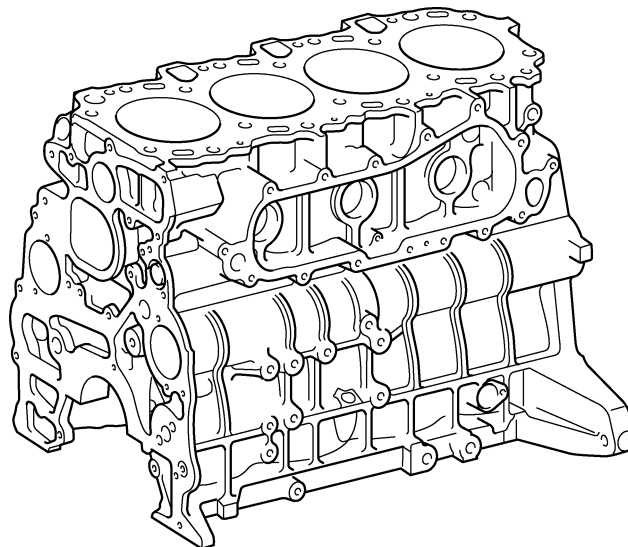
3. Cylinder Head

- The cylinder head is made of aluminum alloy.
The injector has been located in the center of the combustion chamber in order to improve engine performance and clean emission.
- Two intake ports with different shapes have been combined to promote the mixture of fuel and air by optimizing the swirl in the cylinder.
- A vertical two-stage construction is used for the water jacket to improve cooling performance.
- A glow plug is placed between the intake ports of each cylinder to ensure startability.
- The passage for the EGR is provided in the cylinder head. By cooling the exhaust gas, this makes it possible to re-circulate the great amount of exhaust gas.



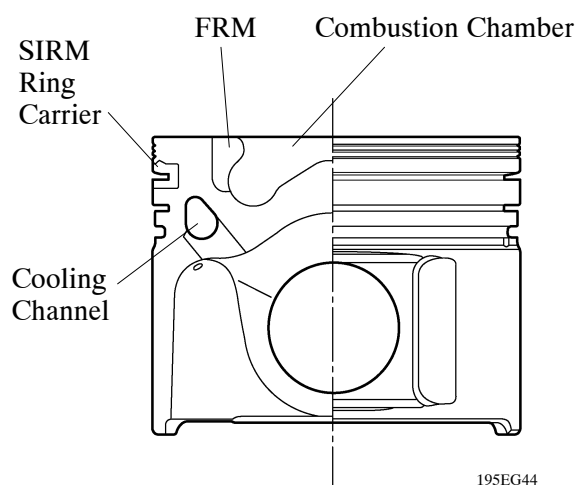
4. Cylinder Block

The cylinder block is constructed of liner-less cast iron alloy.



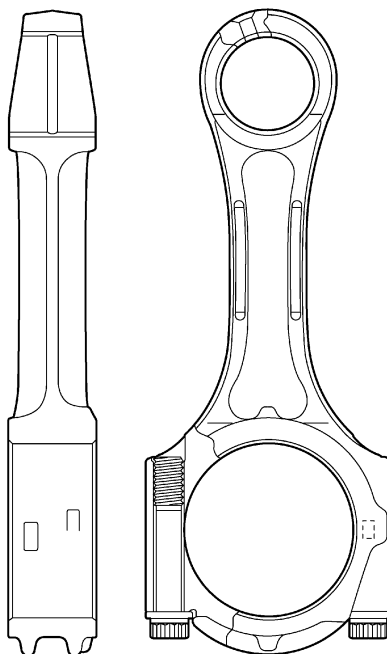
5. Piston

- In conjunction with the adoption of direct injection, piston provided with combustion chamber is used.
- The piston is made of aluminum alloy.
- A cooling channel has been provided to reduce the piston temperature.
- To improve the wear resistance of the top ring groove, a SIRM (Sintered Iron Reinforced Metal) ring carrier is used.
- Along with the improved engine performance, FRM (Fiber Reinforced Metal) has been cast into the area surrounding the combustion chamber to ensure the proper strength.

**EG**

6. Connecting Rod

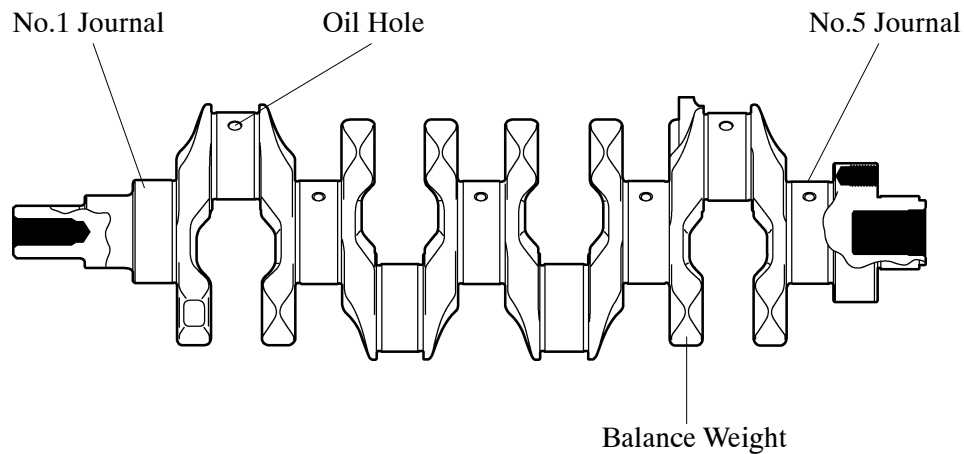
The connecting rods are made of high-strength material to ensure the proper strength.



195EG45

7. Crankshaft

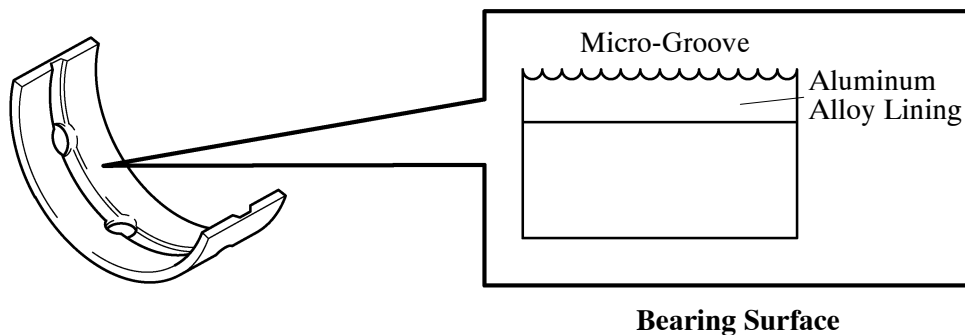
- The crankshaft has 5 journals and 8 balance weights.
- A newly developed crankshaft is made of a highly-strengthened material without lead.



233EG20

8. Connecting Rod Bearing & Crankshaft Bearing

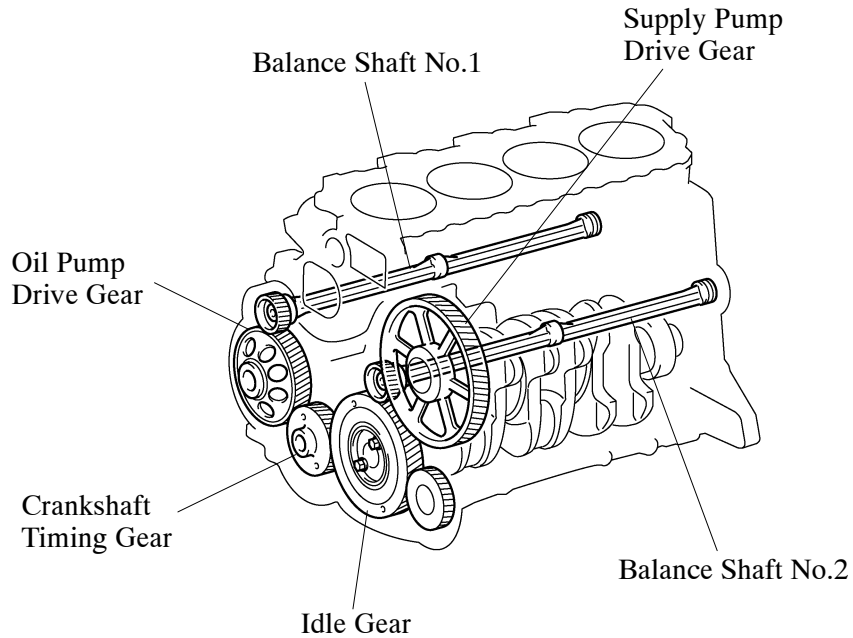
To improve the conformance with the shaft and the retention of engine oil, micro-groove bearings that have fine grooves on the bearing surface are used.



224EG07

9. Balance Shaft

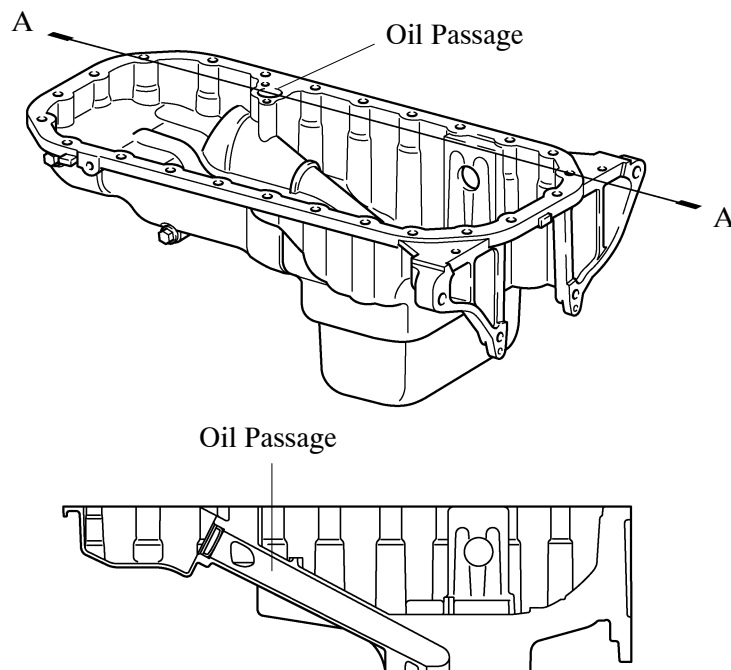
- The two balance shafts are used to reduce engine vibration.
- These balance shafts are built into the cylinder block. Driven by the timing gear, the balance shafts rotate at twice the speed of the crankshaft and in the opposite direction of each other.



195EG47

10. Oil Pan

- The oil pan material is made of aluminum alloy.
- The oil passage has been integrated in the oil pan to simplify the construction of the oil strainer.



A-A Cross Section

233EG23