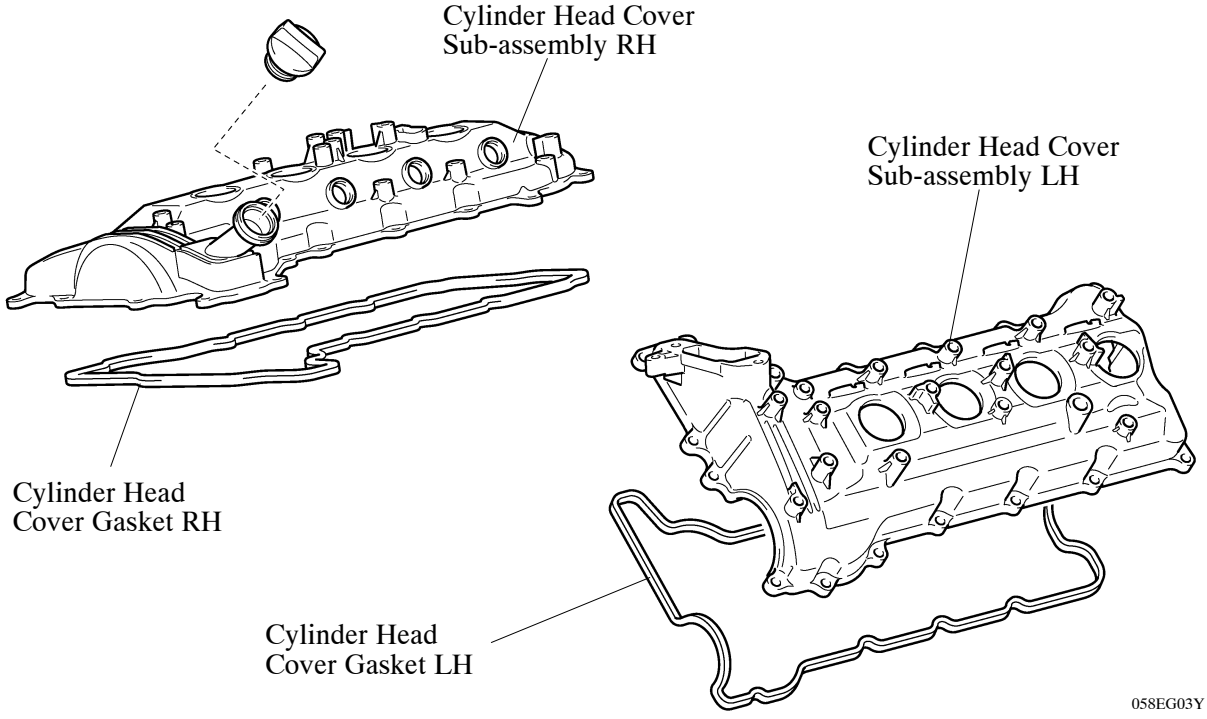
■ENGINE PROPER

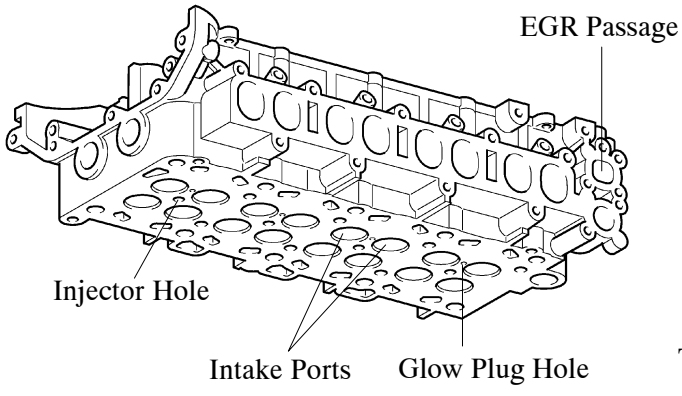
1. Cylinder Head Cover

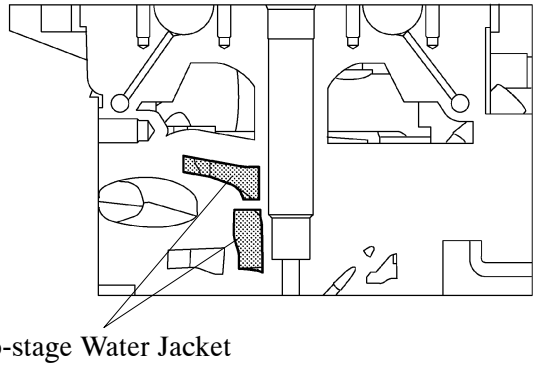
- The cylinder head cover sub-assemblies are made of plastic to reduce weight and noise.
- Acrylic rubber, which excels in heat resistance and reliability, is used for the cylinder head cover gaskets.



2. Cylinder Head

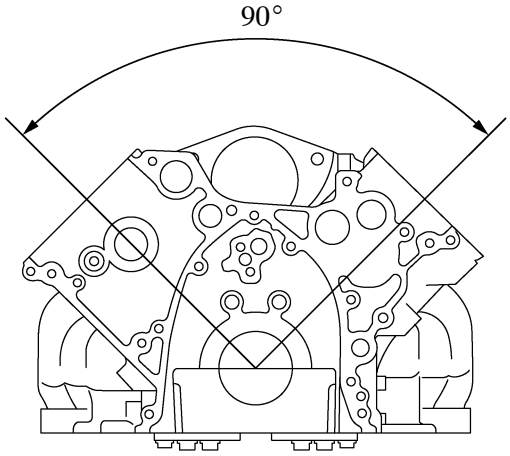
- The cylinder head is made of aluminum alloy.
- The fuel injector has been located in the center of the combustion chamber in order to improve engine performance and clean emission.
- The passage for the EGR is provided in the cylinder head. By cooling the exhaust gas, the great amount of exhaust gas can recirculate.
- 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.

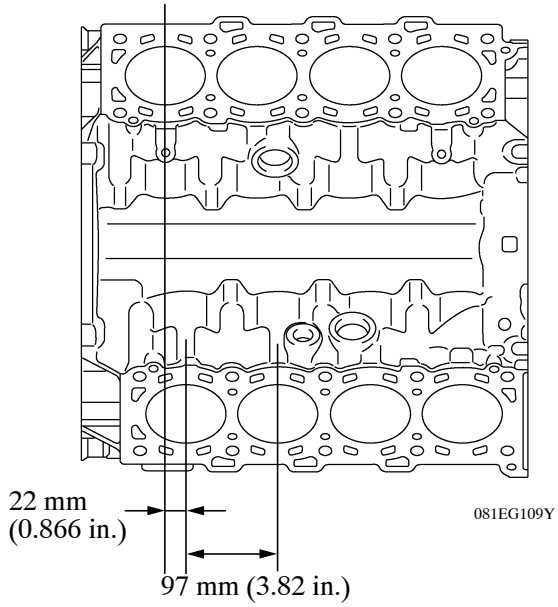




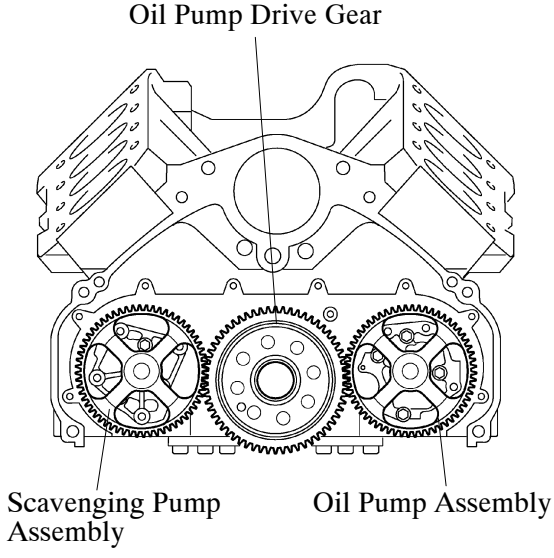
3. Cylinder Block

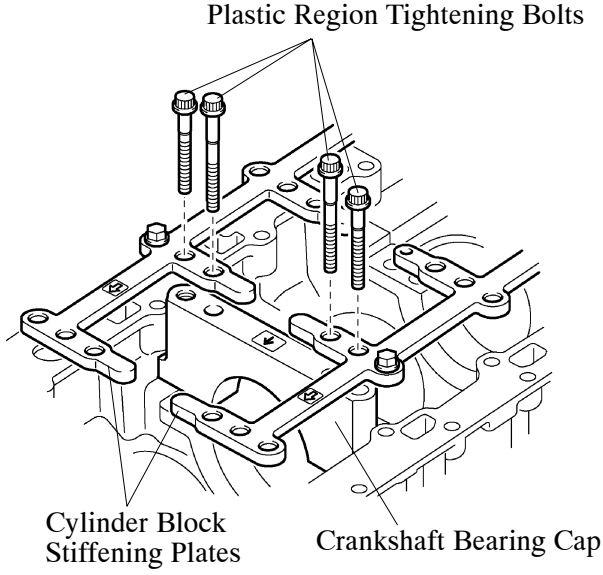
- Lightweight compact graphite iron is used for the cylinder block.
- The cylinder block has a bank angle of 90°, a bank offset of 22 mm (0.866 in.) and a bore pitch of 97 mm (3.82 in.), resulting in a compact block in its length and width even for its displacement.





- The oil pump drive gear at the rear end of the cylinder block drives the oil pump and the scavenging pump in order to achieve a compact engine. For details of the scavenging pump, see page EG-150.
- Four plastic region tightening bolts are used to tighten the crankshaft bearing caps together with the cylinder block stiffening plates in order to reduce vibrations.

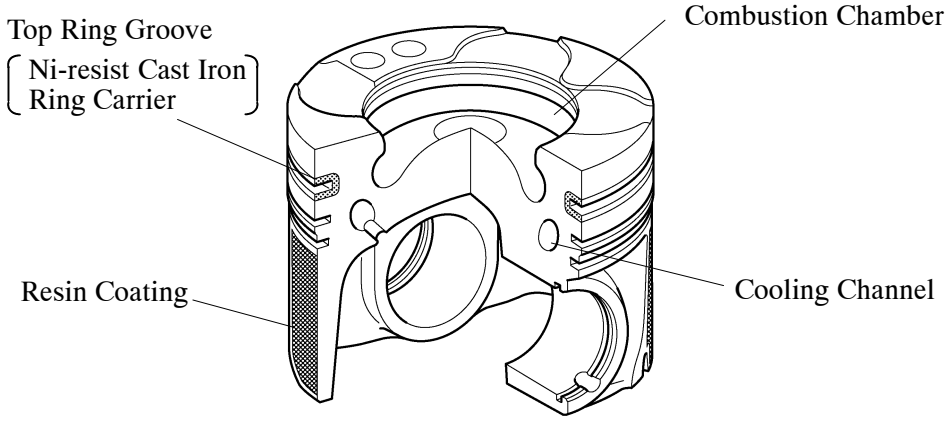




4. Piston

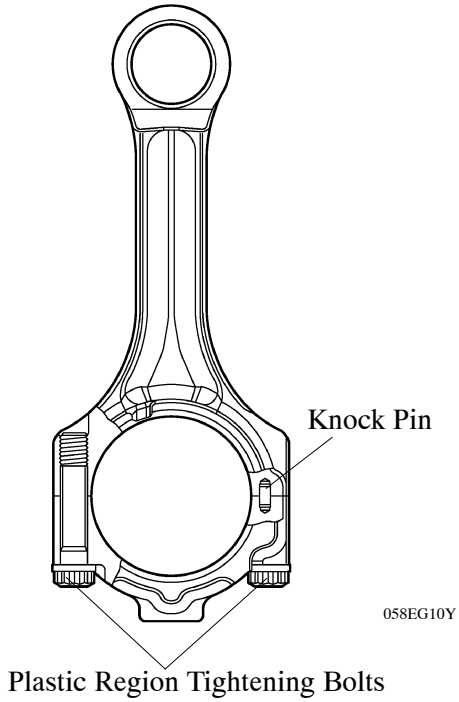
- The piston is made of aluminum alloy.
- In conjunction with the adoption of direct injection, the piston provided with combustion chamber is used.
- A cooling channel is provided to realize excellent piston performance.
- The top ring groove uses a Ni-resist cast iron ring carrier to improve wear resistance.
- The piston skirt is coated with resin to reduce friction loss and improve initial seizure resistance.
- On G.C.C. countries models, general countries models and some European models*, a PVD (Physical Vapor Deposition) coating has been applied to the surface of the No.1 compression ring, to improve its wear resistance.

*: Russian package models



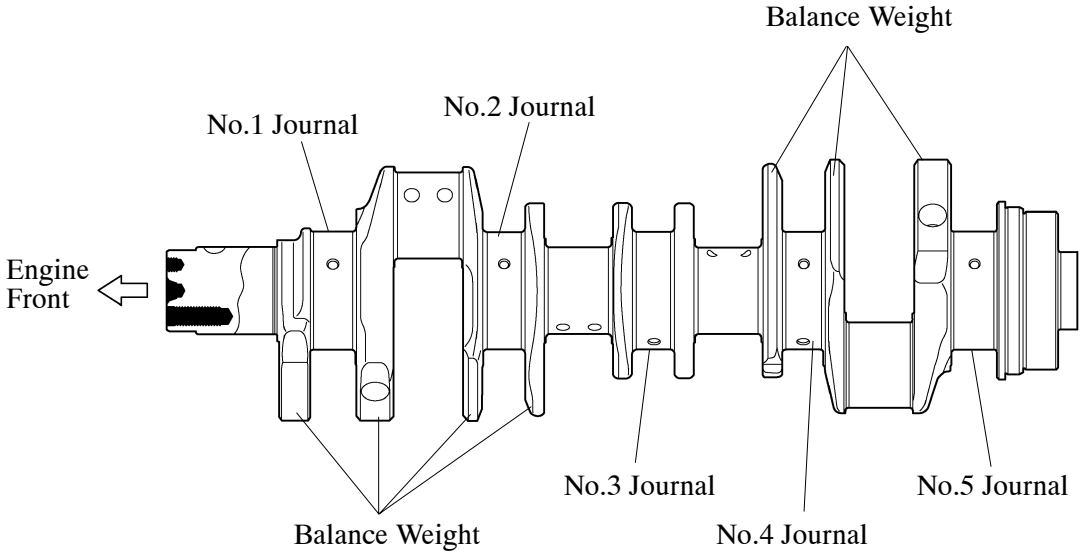
5. Connecting Rod

- The connecting rods and caps are made of high-strength material to ensure the proper strength.
- Knock pins are used at the mating surfaces of the bearing caps of the connecting rod to minimize the shifting of the bearing caps during assembly.
- Nutless type plastic region tightening bolts are used.
- The connecting rod bearings are reduced in width to reduce friction.



6. Crankshaft

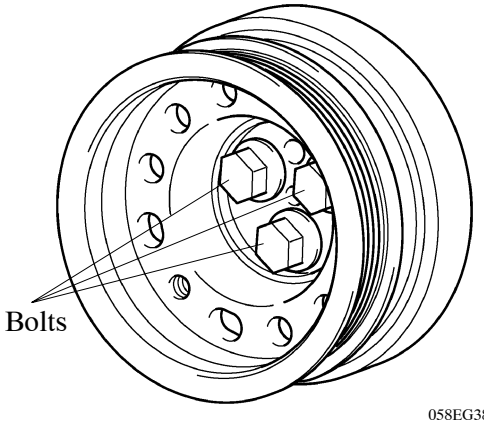
- A crankshaft made of forged steel, which excels in rigidity and wear resistance, is used.
- The crankshaft has 5 journals and 7 balance weights.
- All pins and journal fillets are IH (Induction Hardening)-finished to maintain adequate strength.
- An aluminum bearing is used for the crankshaft bearings.



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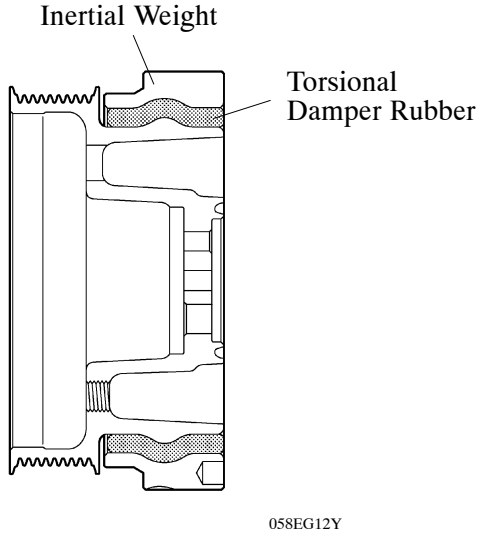
7. Crankshaft Pulley

- Three bolts tighten the crankshaft pulley onto the crankshaft to reduce the tightening torque and improve serviceability.
- An inertial weight is installed via a torsional damper rubber to reduce vibrations.



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Models without Viscous Heater

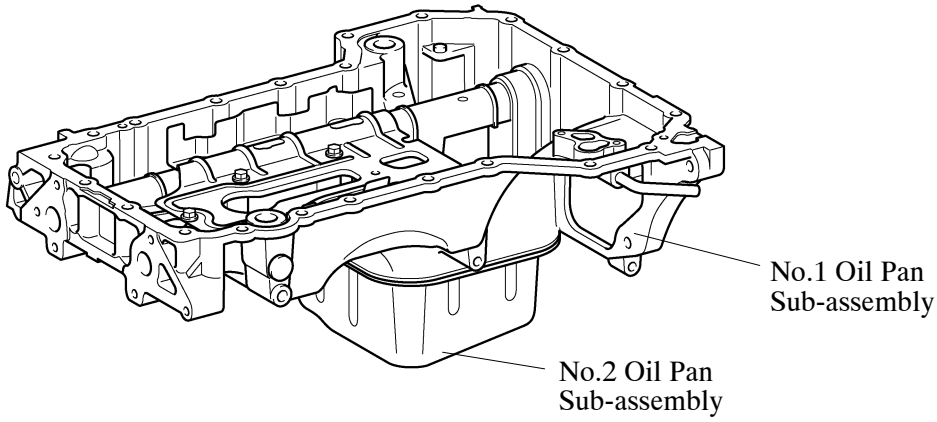


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Cross Section

8. Oil Pan

- The No.1 oil pan sub-assembly is made of aluminum alloy.
- The No.2 oil pan sub-assembly is made of steel.
- The No.1 oil pan sub-assembly is secured to the cylinder block and the transmission housing to increase rigidity.



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