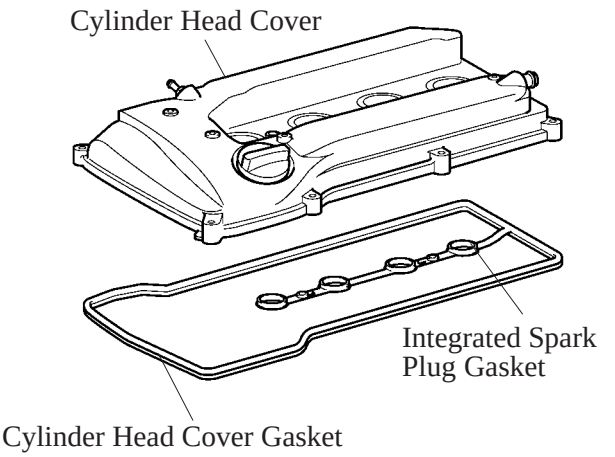
■ENGINE PROPER

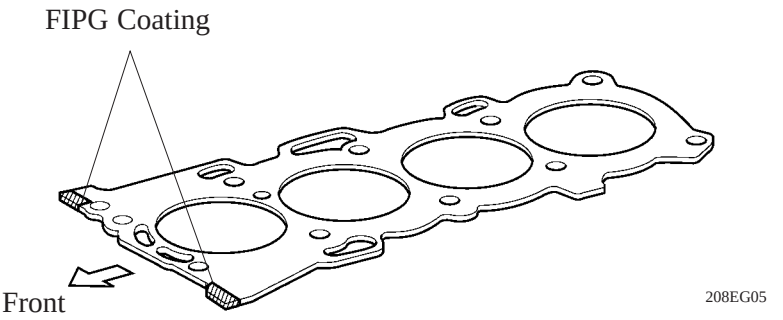
1. Cylinder Head Cover

- A lightweight magnesium alloy diecast cylinder head cover is used.
- The cylinder head cover gasket and the spark plug gasket have been integrated to reduce the number of parts.



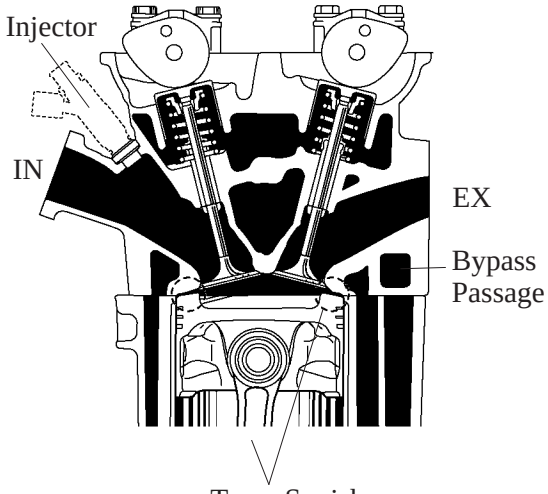
2. Cylinder Head Gasket

A steel-laminate type cylinder head gasket has been adopted.



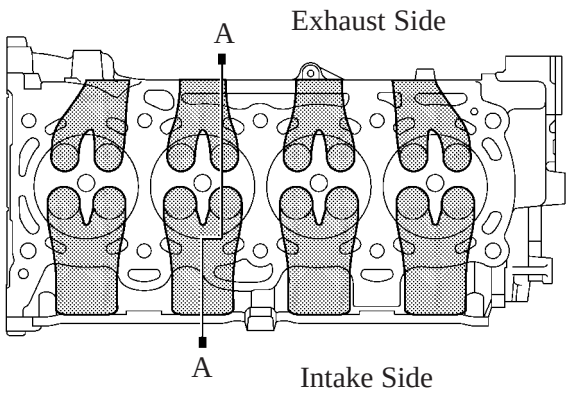
3. Cylinder Head

- The taper squish combustion chamber has been used to realize the highly engine's knocking and fuel efficiency.
- An upright intake port has been used to realize the highly intake efficiency.
- Installing the injectors in the cylinder head enables the injectors inject fuel as close as possible to the combustion chamber. This prevents the fuel from adhering to the intake port walls, which reduces HC exhaust emissions.
- The routing of the water bypass jacket in the cylinder head has been optimized to realize the highly cooling performance. In addition, a water bypass passage has been provided below the exhaust ports to reduce the number of parts and to achieve weight reduction.



208EG67

A – A Cross Section

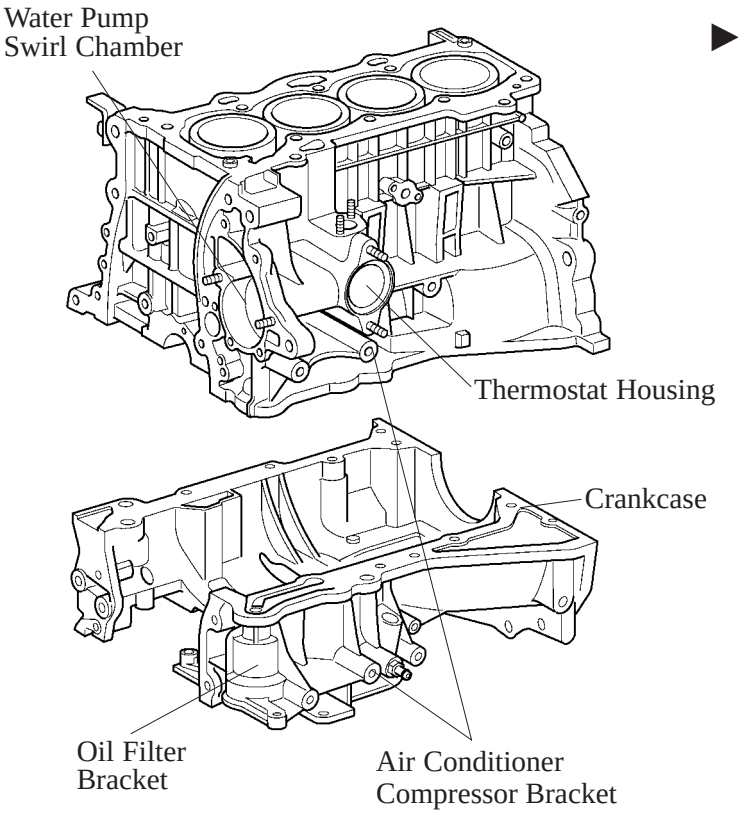


198EG29

View from the Back Side

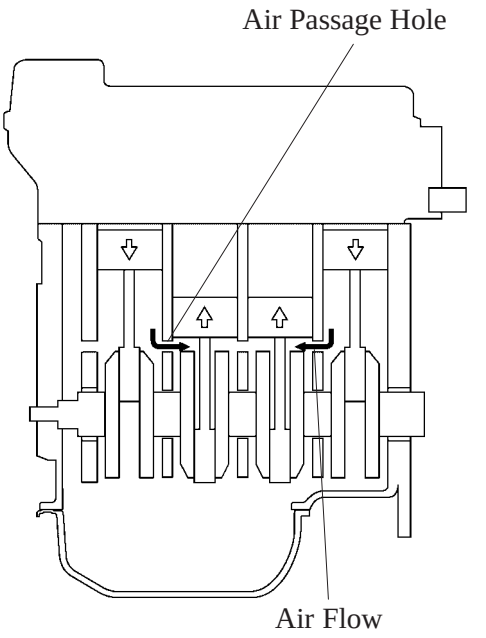
4. Cylinder Block

- Lightweight aluminum alloy is used for the cylinder block.
- By producing the thin cast-iron liners and aluminum alloy cylinder block as a unit to realize the compact design. The liner is thin, so that boring is not possible.
- Passage holes are provided in the bulkhead of the cylinder block. As a result, the air at the bottom of the cylinder flows smoother, and pumping loss (back pressure at the bottom of the piston generated by the piston's reciprocal movement) is reduced to improve the engine's output.
- The oil filter and the air conditioner compressor bracket are integrated the crankcase, also the water pump swirl chamber, the thermostat housing and the rear oil seal retainer integrated the cylinder block.



185EG42

▶ Air Flow During Engine Revolution ◀



179EG04

5. Piston

- The piston is made of aluminum alloy and skirt area is made compact and lightweight.
- The piston head portion has adopted a taper squish shape to improve the fuel efficiency.
- The piston skirt has been coated with resin to reduce the friction loss.
- Full floating type piston pins are used.
- By increasing the machining precision of the cylinder bore diameter, the outer diameter of the piston has been made into one type.

: Resin Coating

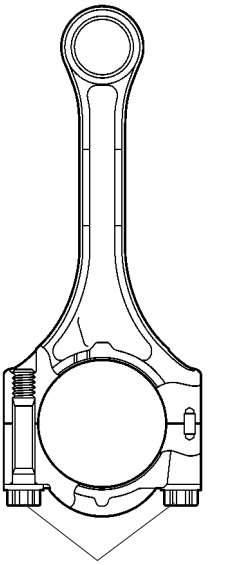


208EG06

View from the Top Side

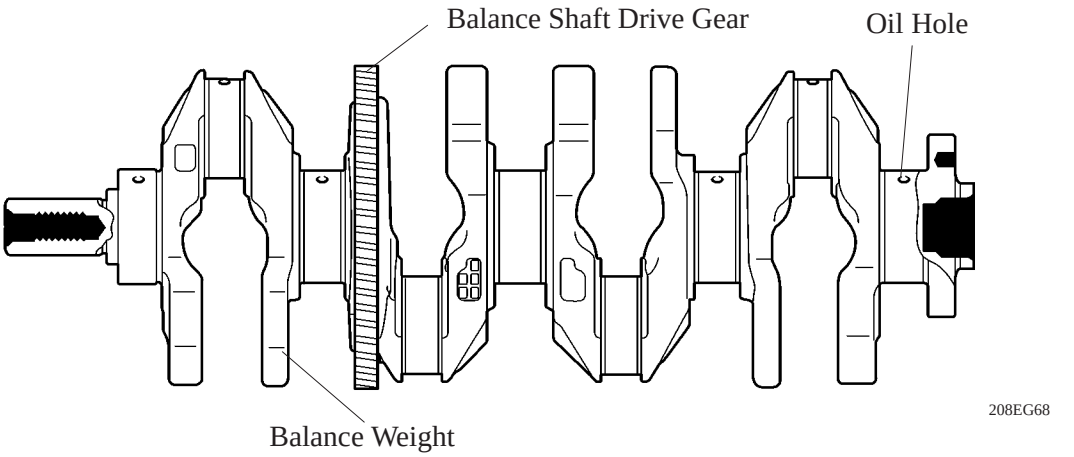
6. Connecting Rod

- The connecting rods and caps are made of high strength steel for weight reduction.
- Nutless-type plastic region tightening bolts of the connecting rod are adopted for a lighter design.



7. Crankshaft

- The crankshaft has 5 journals and 8 balance weights.
- The crankshaft bearings have been reduced in width to reduce friction.
- The precision and surface roughness of the pins and journals have been realized to reduce friction.
- The balance shaft drive gear has been installed onto the crankshaft.
- The crankshaft is made of forged steel.



8. Balance Shaft

- A balance shaft has been adopted to reduce vibrations.
- A direct-drive system has been adopted which makes use of a gear that is installed onto the counterweight of crankshaft.
- In addition, a resin gear has been adopted on the driven side to suppress noise and offer lightweight design.

