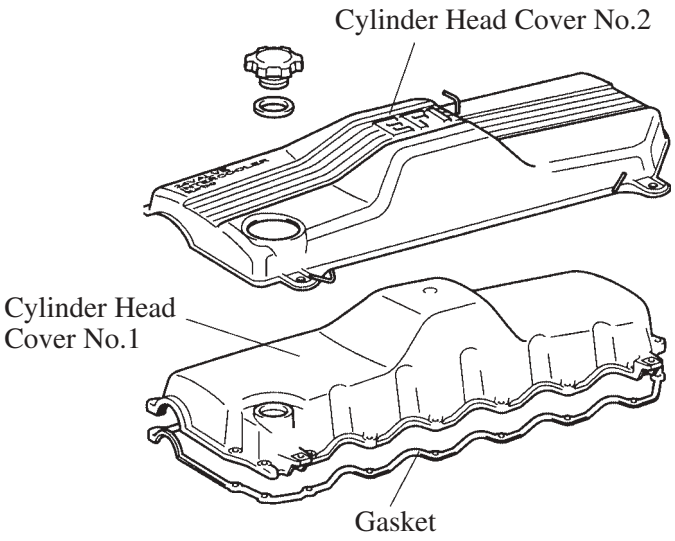
■ENGINE PROPER

1. Cylinder Head Cover

- The No.1 cylinder head cover is made of resin, adopts a curved shape, and has optimally allocated ribs for weight reduction and reduced noise.
- Spaced bolts are used for fastening the cylinder head covers. In addition, vibration isolating washers containing laminated layers of rubber and aluminum sheets have been adopted to achieve a floating retaining construction that reduces noise and improves reliability.
- The blowby gas passage in the cylinder head cover has adopted a maze-like configuration to minimize the consumption of engine oil through blowby gas.
- A No.2 cylinder head cover has been adopted. The No.2 cylinder head cover, which is made of iron sheet, is completely covered with foam rubber on the inside. A vibration isolating rubber gasket is used to achieve a floating retaining construction to improve sound insulation.



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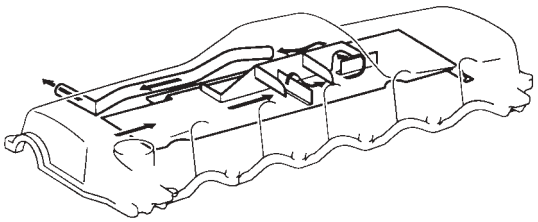

Blowby Gas Flow

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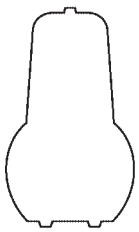

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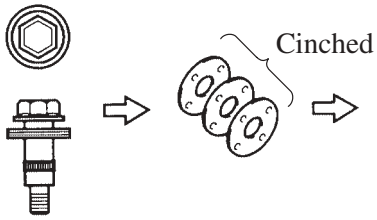
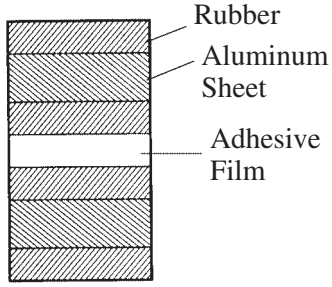
Gasket Cross Section



Spaced Bolt



Vibration Isolating Washer

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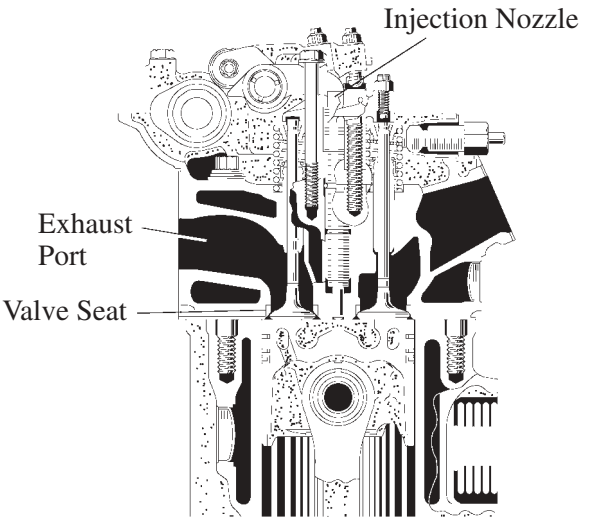
2. Cylinder Head

- Similar to the previous 1HD-FT engine, the adoption of the 4-valve mechanism has made it possible to position the injection nozzle perpendicularly over the center of the cylinder bore. Together with the adoption of 2 intake ports of different shapes, this enables the generation of an optimal swirl and the introduction of an ample volume of intake air. As a result, the mixing of fuel and air has been accelerated to achieve an appropriate combustion.
- The cooling performance has been improved by enlarging the water jacket around the exhaust valves and the injection nozzles, thus improving the reliability of the engine.
- The exhaust valve seats have been changed to a type made of sintered alloy that excels in wear resistance.



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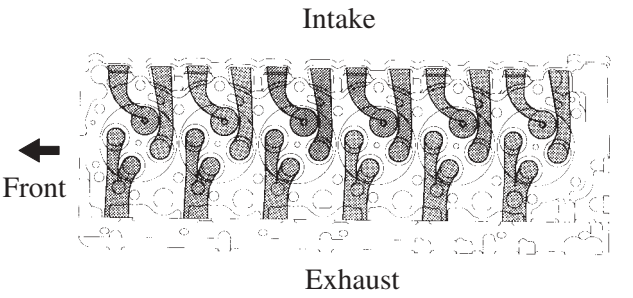

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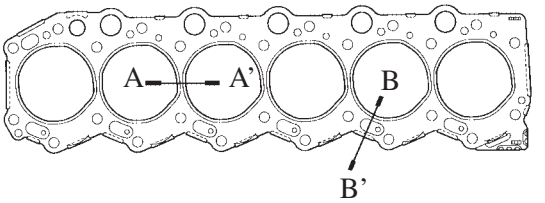
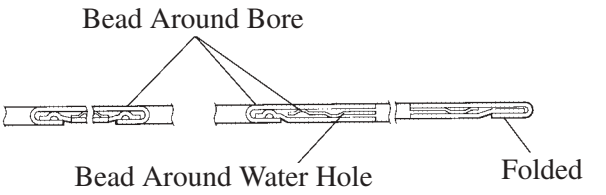
3. Cylinder Head Gasket

- A 3-layer steel laminate type cylinder head gasket has been adopted.
- The gasket has adopted a bead construction at its cylinder bores, water holes, and oil holes. The periphery of the gasket has been folded to accept bearing stress. This prevents unnecessary bearing stress from being applied to the sealing portions such as at the bores, thus restraining the deformation of the bores over the cylinder block.



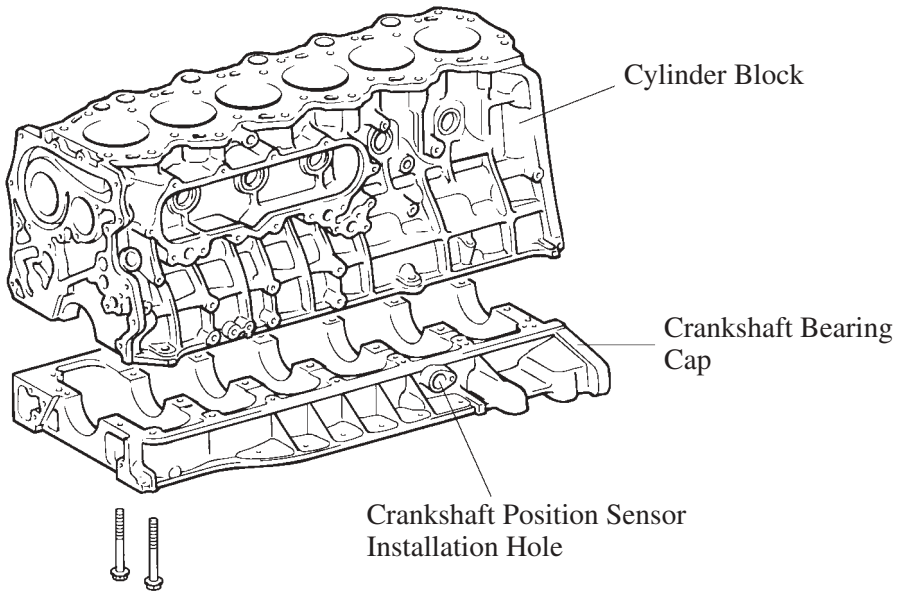


A – A' Cross Section **B – B' Cross Section**

147EG50

4. Cylinder Block

- Crankshaft bearing caps with a ladder frame construction have been adopted as in the previous model. To accommodate the high performance engine, the ladder frame has been optimally designed to improve its rigidity while restraining the increase of its weight, thus reducing noise and vibration.
- Along with the adoption of the engine control system, the hole for installing the crankshaft position sensor is provided in the crankshaft bearing cap.



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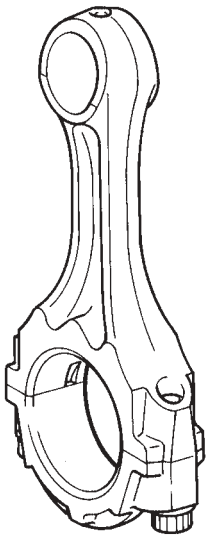
5. Connecting Rod

- The connecting rod is made of a lightweight carbon steel that withstand higher speed and high output operation.
- The small end of the connecting rods has been given a tapered shape to reduce weight.



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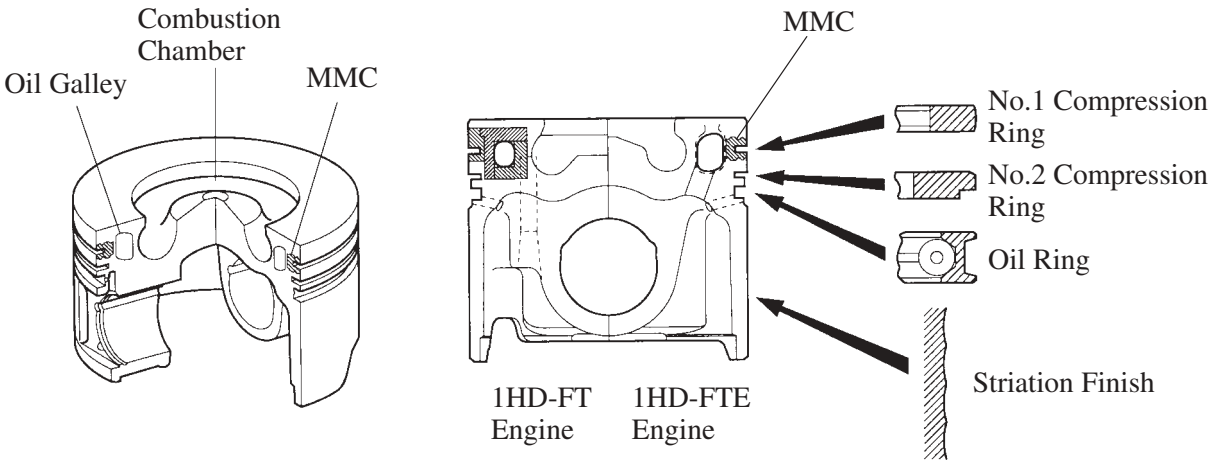
6. Piston

- The piston is made of aluminum alloy that offers high temperature strength. The top ring groove has been treated with MMC (Metal Matrix Composites) to improve its wear resistance.
- The combustion chamber has been designed with an optimal shape to improve the engine performance while reducing exhaust emissions.
- The piston skirt has been designed with an optimal shape to reduce noise and vibration.
- The cross sectional area of the oil galley in the piston has been enlarged to improve the piston's cooling performance and reduce its temperature during high power output.
- A gas nitriding process has been applied to the piston ring surface to improve its durability and reduce the piston ring tension, thus reducing the friction loss.



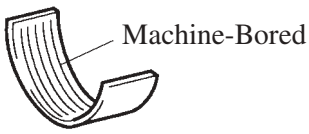
– REFERENCE –

MMC (Metal Matrix Composites)

It is a type of composite material that is made of a metal matrix for the purpose of obtaining characteristics such as high strength, high elasticity, and low thermal expansion. Because of its excellent heat transmission performance, this material helps to dissipate the piston's heat through the piston ring to the cylinder block.

7. Crankshaft

- As in the previous engine, a crankshaft with 7 forged journals and 12 balance weights has been adopted. Along with the high performance of the engine, the rigidity of its arms and the balance rate of its weights have been improved.
- Along with the adoption of the engine control system, a protrusion is provided for the crankshaft position sensor.
- The inner surface of the crankshaft bearing has been machine-bored to provide minute crests and valleys in the circumferential direction. This process helps to improve the bearing's break-in and engine oil retention, thus improving the reliability of the engine.



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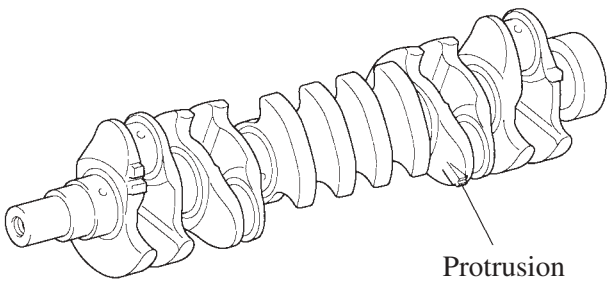
Crankshaft Bearing



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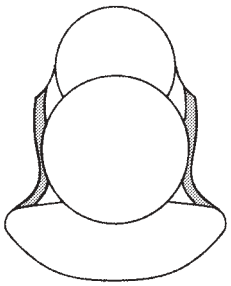
: Reinforced Area



Cross Section

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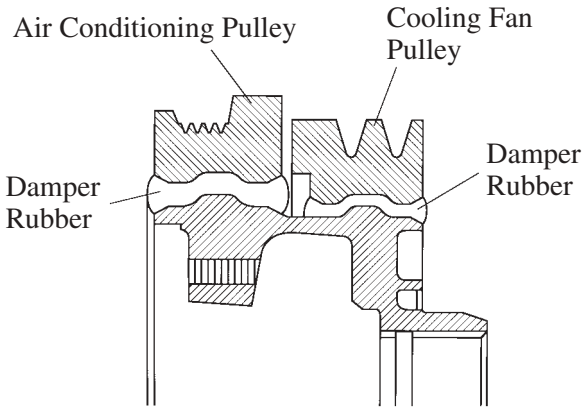
8. Crankshaft Pulley

A torsional damper pulley has been adopted to reduce noise and vibration.
The pulley for air conditioning, which had previously been retrofitted, has now been integrated with the pulley for the cooling fan. At the same time, the pulley's inertial moment has been improved and a high-damping rubber damper has been adopted to further reduce noise and vibration.



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