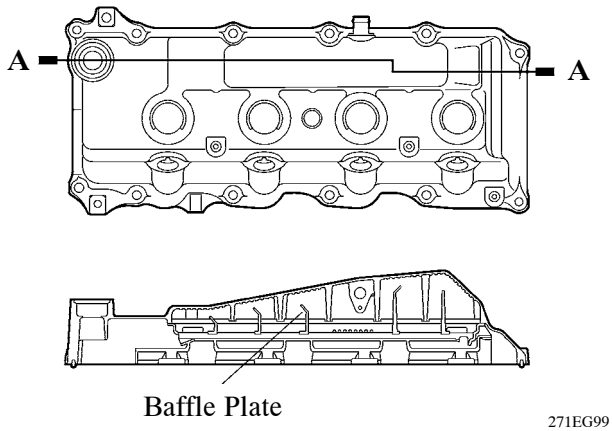
■ ENGINE PROPER

1. Cylinder Head Cover

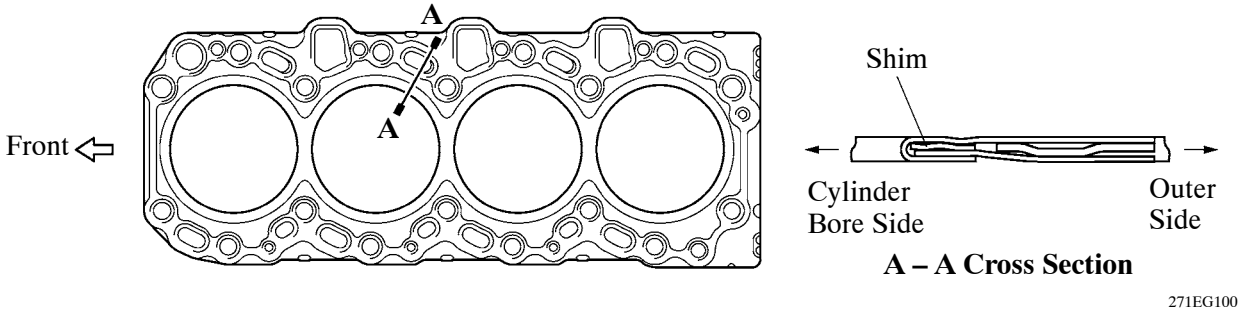
- The cylinder head cover is made of plastic to reduce weight and noise.
- A baffle plate is provided on the inside of the cylinder head cover to reduce the consumption of engine oil through blow-by gas.



A – A Cross Section

2. Cylinder Head Gasket

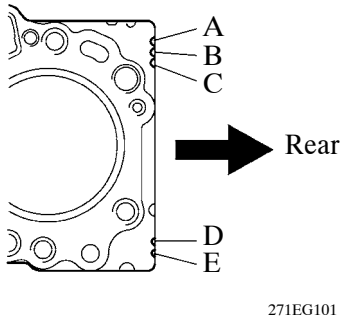
- A steel-laminate type cylinder head gasket is used.
- A shim has been provided around the cylinder bore to increase the sealing surface, thus achieving excellent sealing performance.



A – A Cross Section

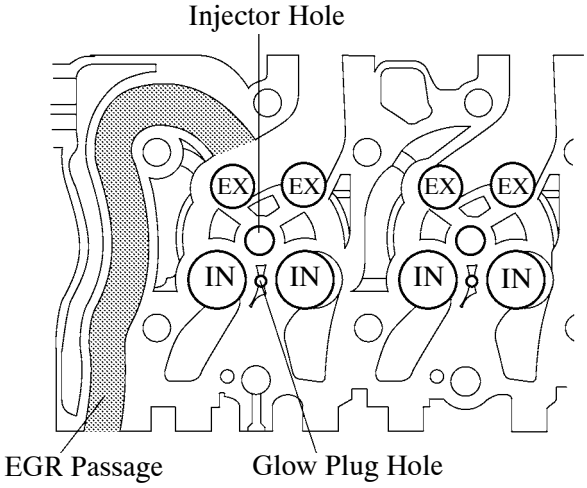
Service Tip

There are 5 sizes of new cylinder head gaskets, marked “A”, “B”, “C”, “D”, or “E” in accordance with piston protrusion. For details, refer to the Hilux Repair Manual.

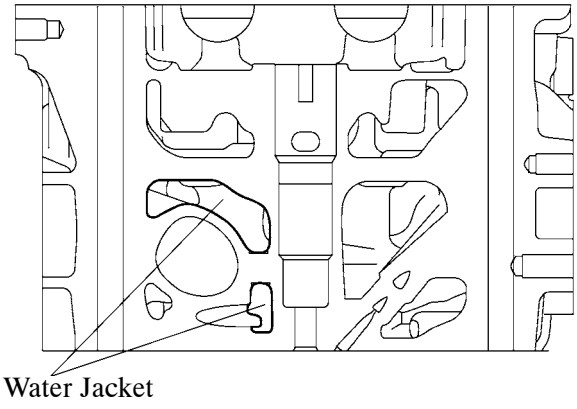


3. Cylinder Head

- 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 to achieve cleaner 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 2-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, it is possible to recirculate the great amount of exhaust gas.
- On the models without EGR control, an EGR hole cover plate which plugs the EGR passage is provided.
- The cylinder head bolt employs plastic region tightening bolts.



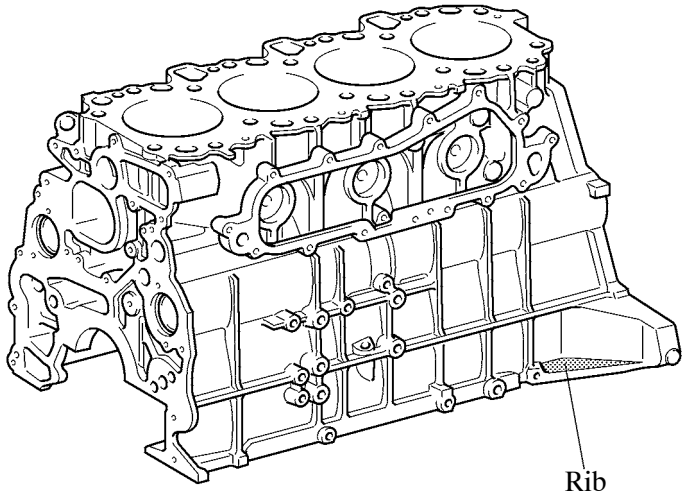
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4. Cylinder Block

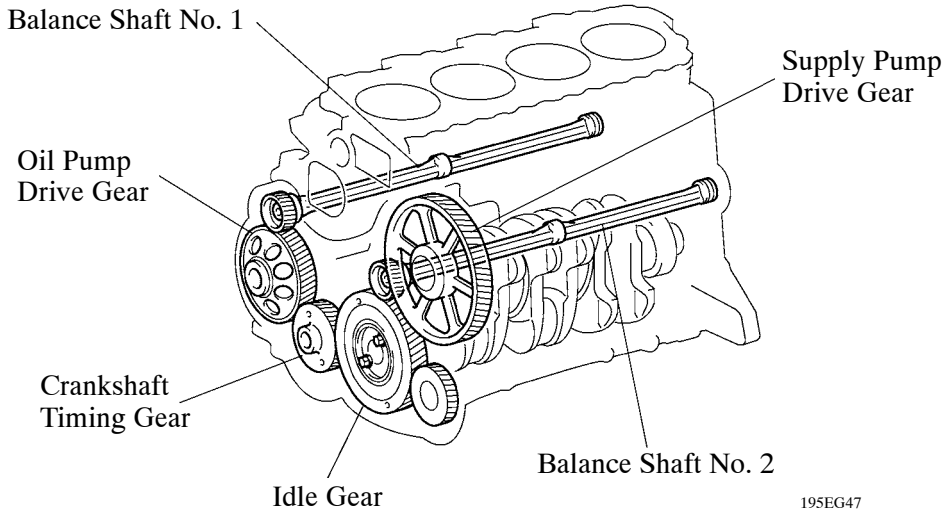
- The cylinder block is constructed of liner-less cast iron alloy.
- A rib has been provided to the cylinder block to reduce engine vibration.



271EG102

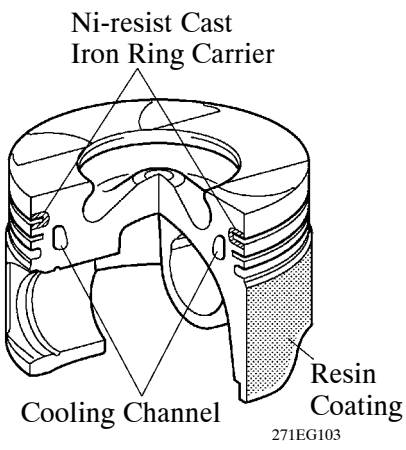
5. Balance Shaft (1KD-FTV Engine)

- For in-line 4-cylinder engines, the main cause of vibration is the imbalanced inertial force of reciprocating parts, such as the pistons and connecting rods. The 1KD-FTV engine vibration has been reduced by using 2 balance shafts to cancel the imbalanced inertial force, thereby reducing engine noise (booming noise).
- 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.

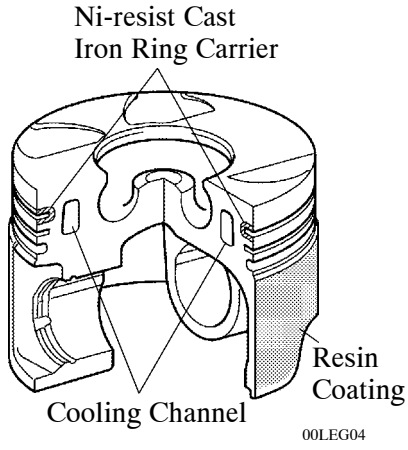


6. Piston

- A 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, and achieve high reliability.
- An Ni-resist cast iron ring carrier is used for the top ring groove to improve the wear resistance.
- On the models with 1KD-FTV engine, 2KD-FTV engine non-compliant with emission regulations, 2KD-FTV High Version engine non-compliant with emission regulations and 2KD-FTV High Version engine with intercooler, a PVD (Physical Vapor Deposition) coating has been applied to the surface of the No. 1 compression ring, to improve its wear resistance.
- The piston skirt portion has been coated with resin to reduce the friction loss.



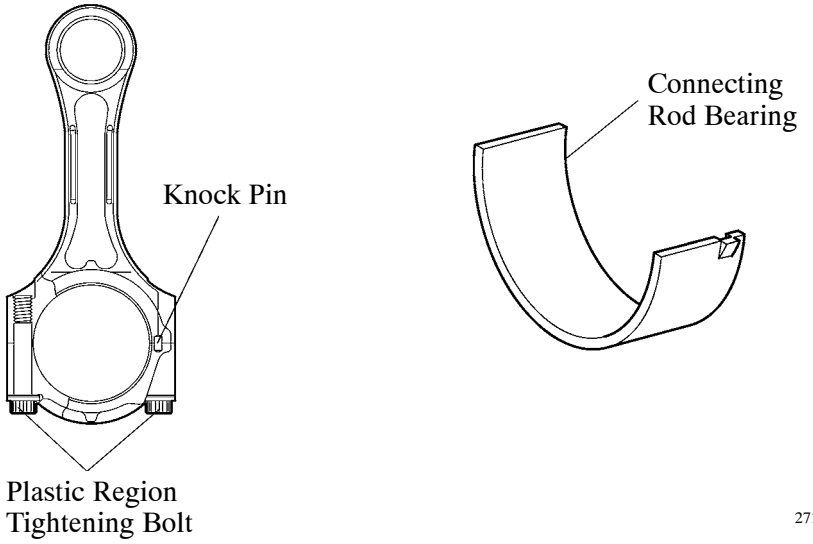
1KD-FTV Engine



2KD-FTV Engine

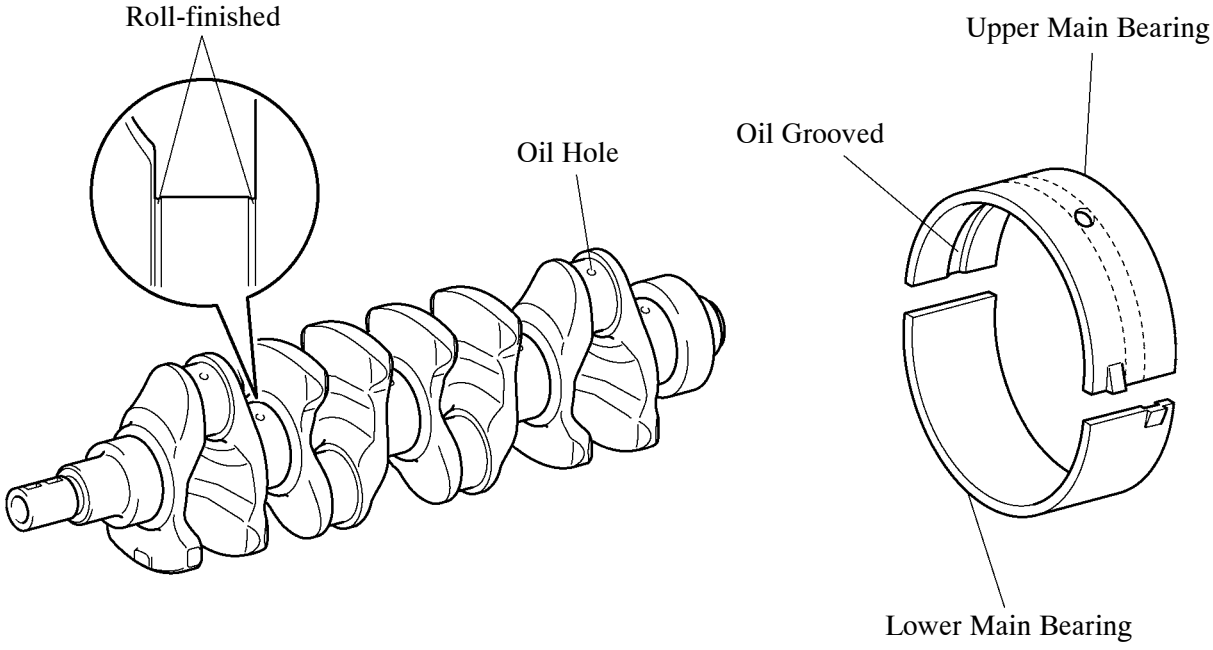
7. Connecting Rod and Connecting Rod Bearing

- The connecting rods 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.
- Plastic region tightening bolts are used.
- An aluminum bearing is used for the connecting rod bearings.



8. Crankshaft and Crankshaft Bearing

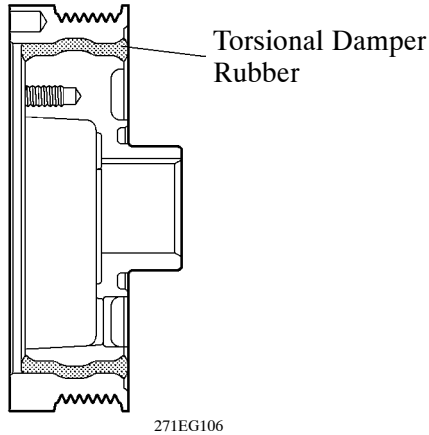
- The crankshaft has 5 journals and 8 balance weights.
- All pin and journal fillets are roll-finished to maintain adequate strength.
- The crankshaft bearing is made of aluminum alloy.
- The upper main bearing has an oil groove around its inside circumference.



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9. Crankshaft Pulley

The rigidity of the torsional damper rubber is used to reduce noise.



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