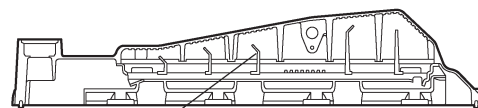
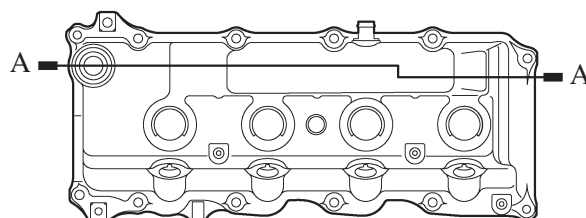


ENGINE PROPER

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.

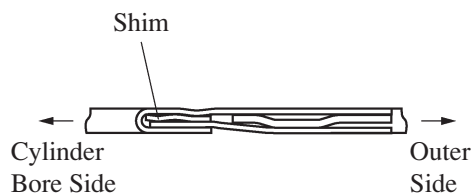
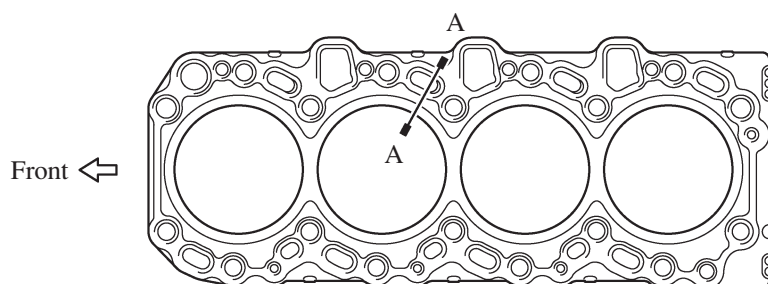


Baffle Plate
A – A Cross Section

271EG99

2. Cylinder Head Gasket

- A steel-laminate type cylinder head gasket has been adopted.
- A shim has been added around the cylinder bore to increase the sealing surface, thus realizing excellent sealing performance.

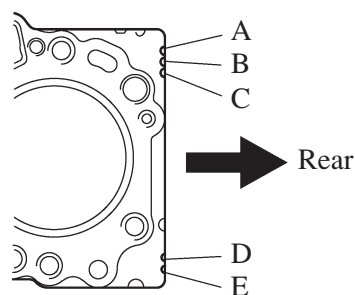


A – A Cross Section

271EG100

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 Hilux Repair Manual.

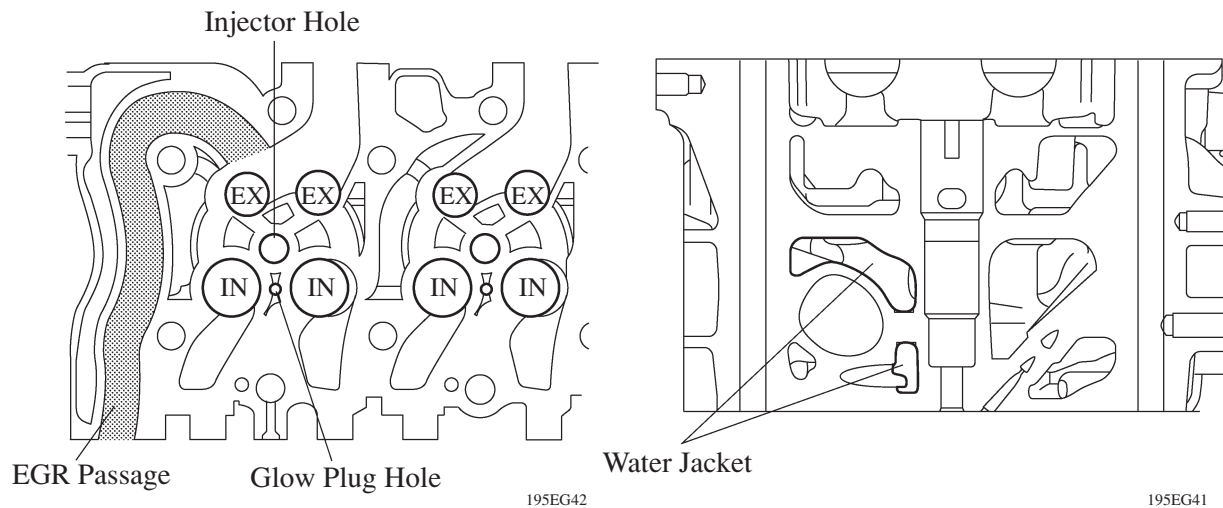


271EG101

3. Cylinder Head

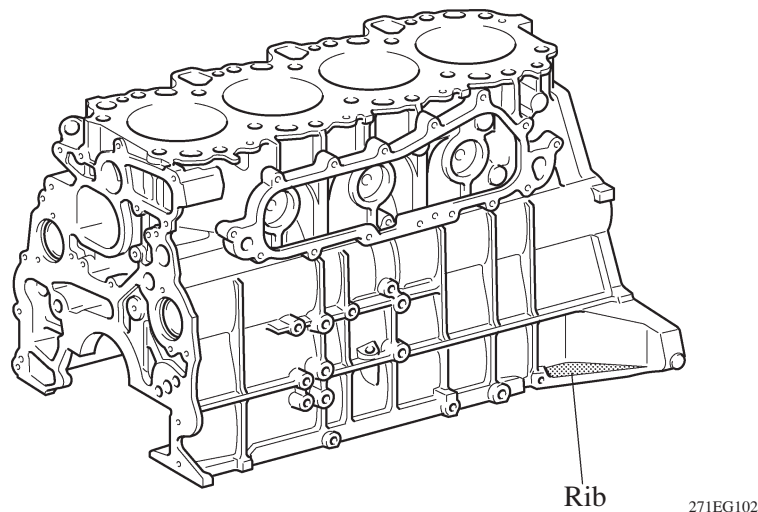
- The cylinder head is made of aluminum alloy. The injector has been located in the center of the combustion chamber in order to improve engine performance and clean emission.
- Two intake ports with different shapes have been combined to promote the mixture of fuel and air by optimizing the swirl in 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.
- The cylinder head bolt employs plastic region tightening bolts.

EG



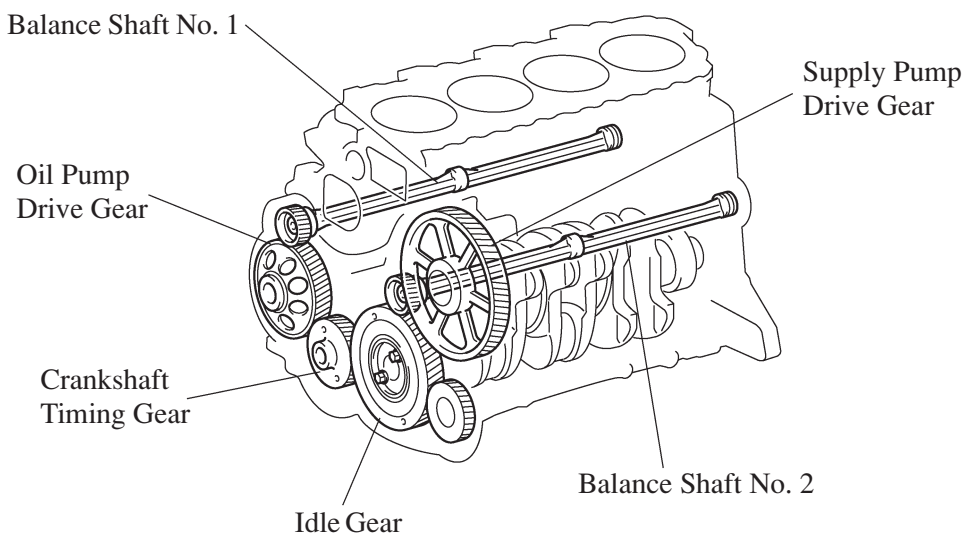
4. Cylinder Block

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



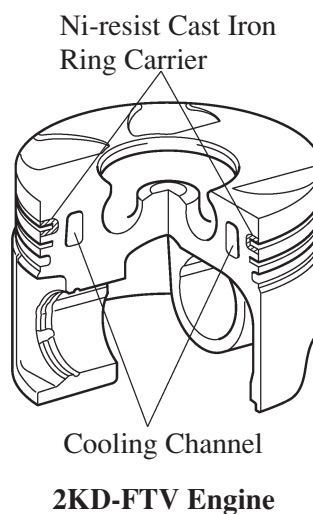
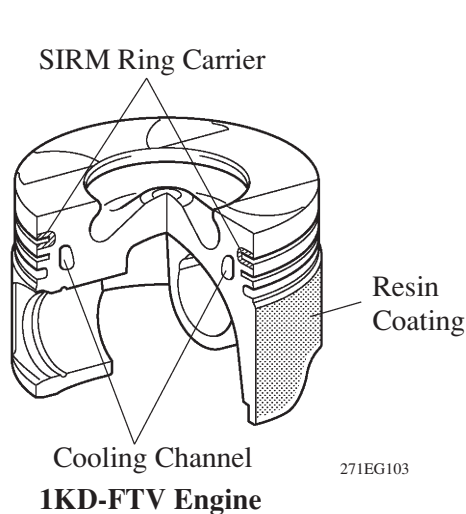
5. Balance Shaft (for 1KD-FTV Engine)

- For in-line 4 cylinder engines, the main cause of vibration is 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.



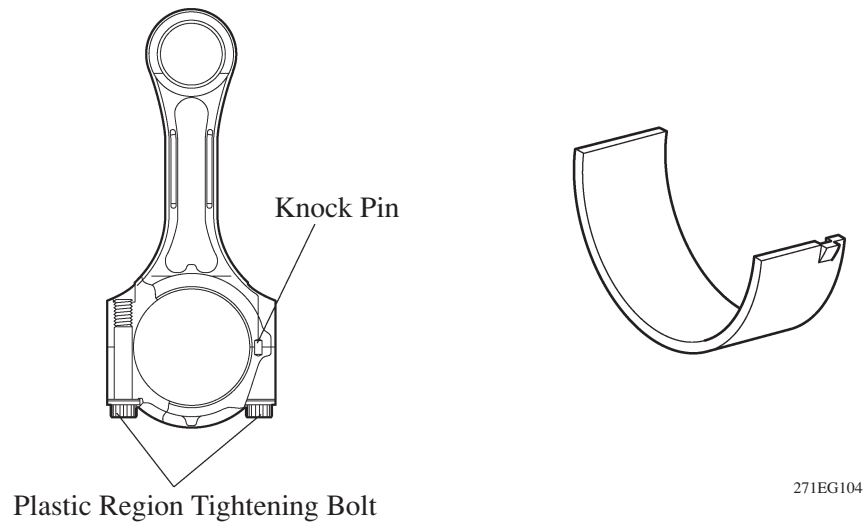
6. Piston

- 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, the 1KD-FTV engine has adopted an SIRM (Sintered Iron Reinforced Metal) ring carrier and the 2KD-FTV engine has adopted an Ni-resist cast iron ring carrier.
- On 1KD-FTV engine models and emission regulation non-compliance 2KD-FTV engine models, 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 of the 1KD-FTV engine has been coated with resin to reduce the friction loss.



7. Connecting Rod and Connecting Rod Bearing

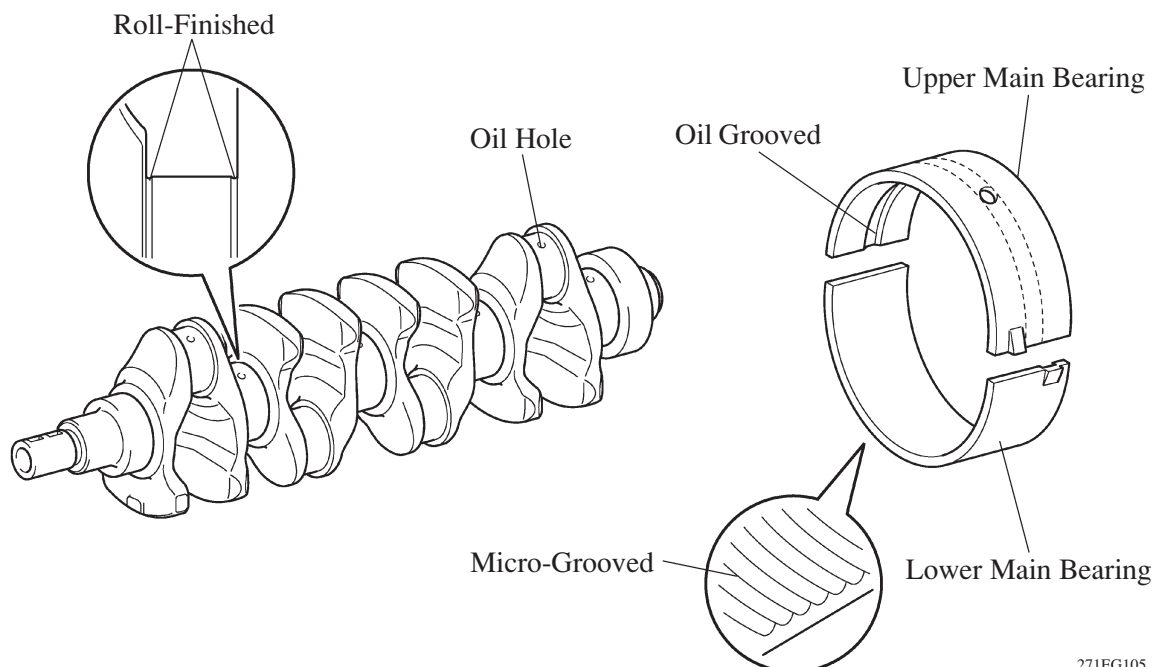
- The connecting rods are made of high-strength material to ensure the proper strength.
- Knock pins are used at the mating surfaces of the bearing caps of the connecting rod to minimize the shifting of the bearing caps during assembly.
- Plastic region tightening bolts are used.
- An aluminum bearing is used for the connecting rod bearings.



EG

8. Crankshaft and Crankshaft Bearing

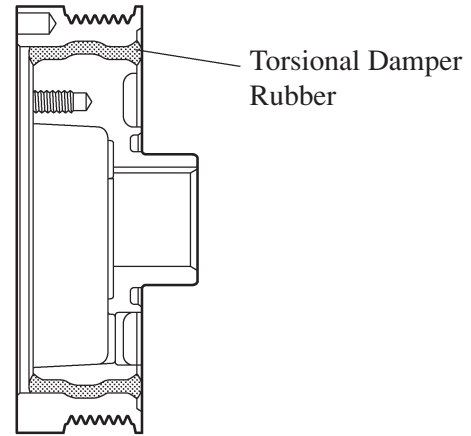
- The crankshaft has 5 journals and 8 balance weights.
- All pin and journal fillets are roll-finished to maintain adequate strength.
- The crankshaft bearing is made of aluminum alloy.
- The lining surface of the crankshaft bearing has been micro-grooved to realize an optimal amount of oil clearance. As a result, cold-engine cranking performance has been improved and engine vibrations have been reduced.
- The upper main bearing has an oil groove around its inside circumference.



271EG105

9. Crankshaft Pulley

The rigidity of the torsional damper rubber has been optimized to reduce noise.



271EG106