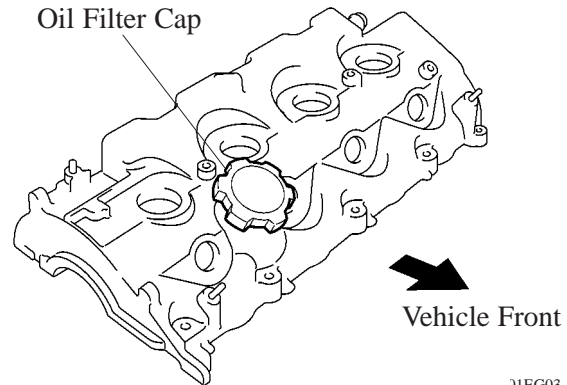


ENGINE PROPER

1. Cylinder Head Cover

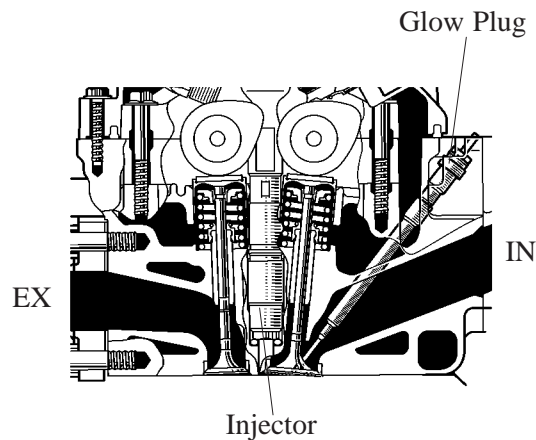
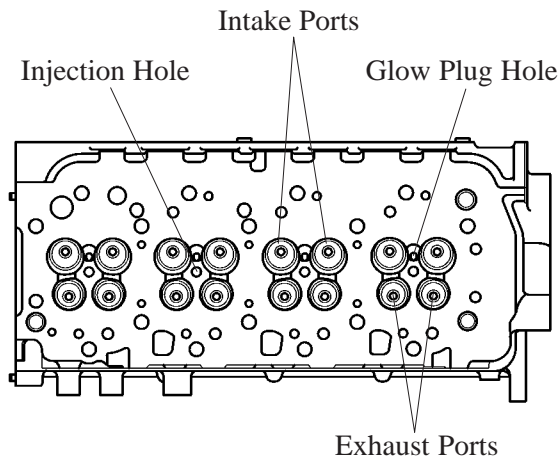
In conjunction with the application of this engine on the Avensis Verso/Picnic, the oil filler cap has been relocated to the front of the vehicle in consideration of serviceability.



01EG03

2. Cylinder Head

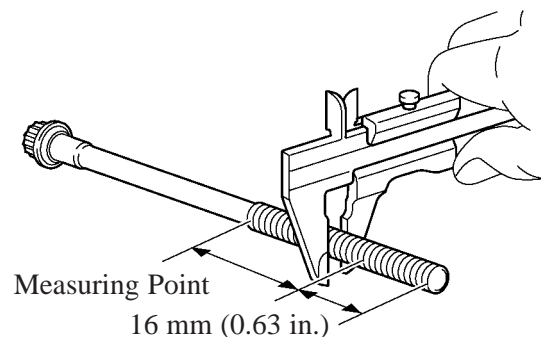
- The cylinder head is made of aluminum alloy.
- The injector has been located in the center of the combustion chamber in order to improve engine performance and clean emission.
- A glow plug is placed between the intake ports of each cylinder to ensure startability.



201EG04

Service Tip

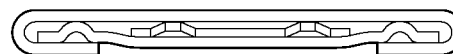
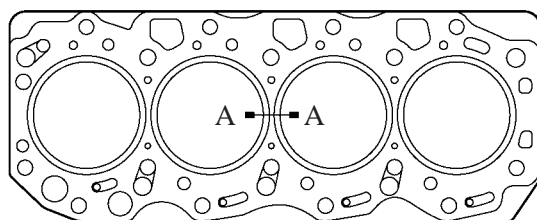
When reusing the cylinder head bolt, if the thread outside diameter at the measuring portion is less than 10.40 mm (0.4094 in.), it is necessary to replace them with new ones.



201EG05

3. Cylinder Head

This gasket has adopted a 3-layer steel laminate construction.

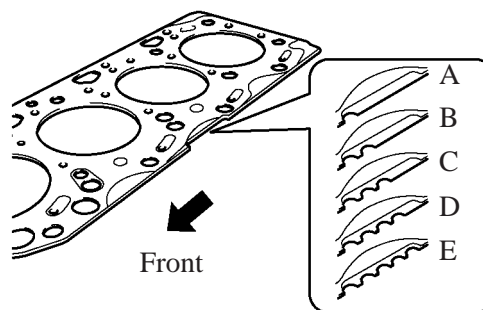


A – A Cross Section

201EG06

Service Tip

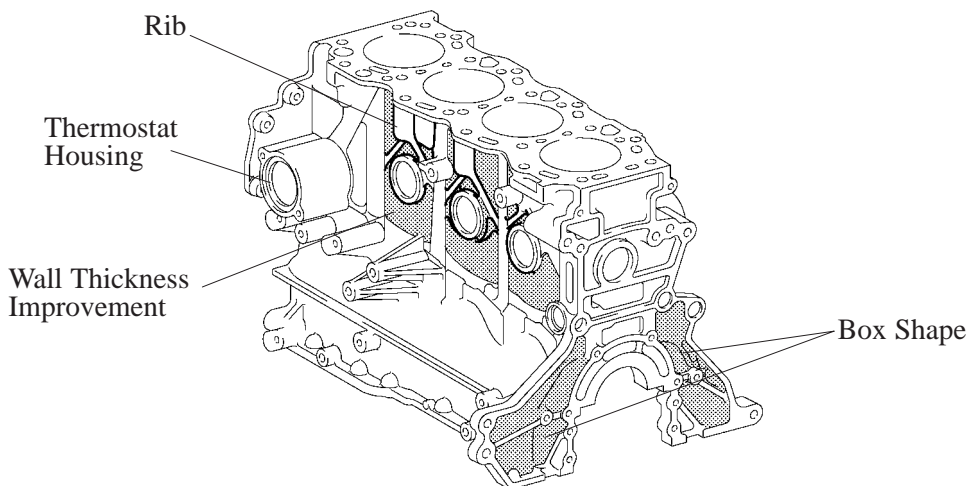
There are 5 sizes of new cylinder head gaskets, Marked “A”, “B”, “C”, “D”, or “E”, according to Piston protrusion, For details, refer to see the 1CD-FTV Engine Repair Manual (Pub. No. RM866E).



201EG07

4. Cylinder Block

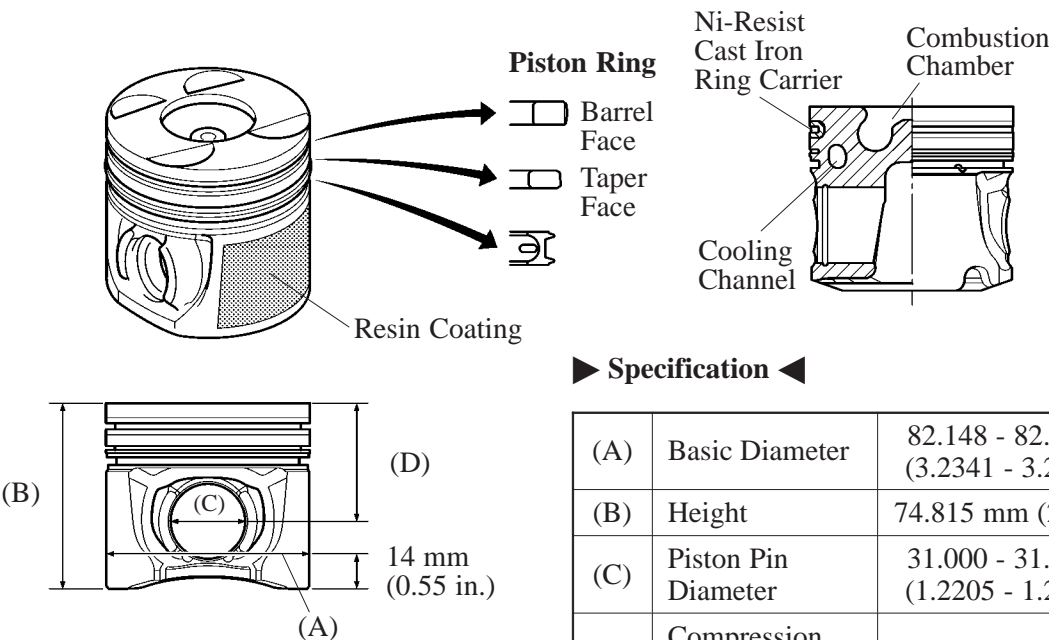
- This cylinder block is constructed of linerless cast iron alloy.
- By making the rear surface of the cylinder block in a box shape, thus aimed to improved low vibration high rigidity and light weight.
- By adoption of the rib and implementation of the wall thickness improvement for the cylinder block, optimal strength is secured.
- By expanding the thermostat housing and reducing the water flow resistance, thus improved the cooling performance.



195EG73

5. Piston, Piston Pin and Piston Ring

- In conjunction with the adoption of direct injection, piston provided with combustion chamber has been adopted.
- A cooling channel has been provided to reduce the piston temperature.
- To improve the wear resistance of the top ring groove, a Ni-resist cast iron ring carrier has been adopted.
- Along with the improved engine performance, the piston skirt has been applied with resin coating to reduce friction loss.
- Full floating type piston pins are used.



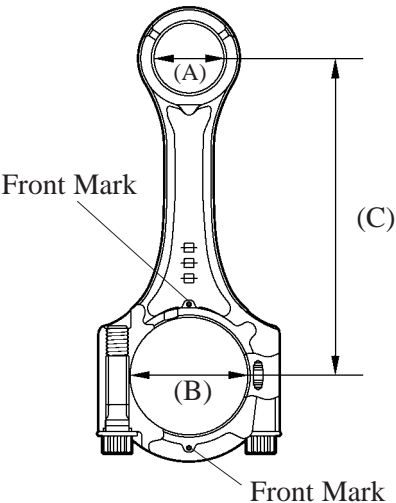
201EG09

► Specification ◀

(A)	Basic Diameter	82.148 - 82.182 mm (3.2341 - 3.2355 in.)
(B)	Height	74.815 mm (2.945 in.)
(C)	Piston Pin Diameter	31.000 - 31.012 mm (1.2205 - 1.2209 in.)
(D)	Compression Height	47.815 mm (1.882 in.)
Material		Aluminum Alloy

6. Connecting Rod

To accommodate the high combustion pressure generated by the direct injection, this connecting rod is constructed of a special type of carbon steel that ensures the proper strength.



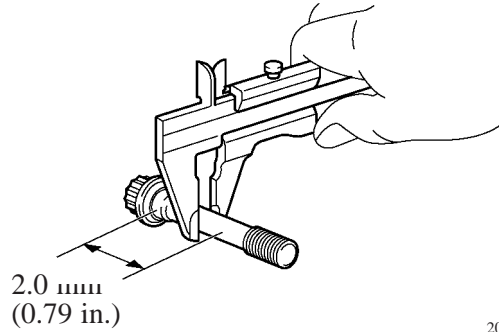
201EG10

► Specification ◀

(A)	Small End Inside Diameter	31.015 - 31.027 mm (1.2211 - 1.2215 in.)
(B)	Big End Inside Diameter	53.5 - 53.518 mm (2.106 - 2.107 in.)
(C)	Center Distance Between Big and Small Ends	146 mm (5.75 in.)

Service Tip

- When reusing the connecting rod cap bolts, if the diameter at the measuring portion is less than 8.0 mm (0.315 in.), it is necessary to reduce them with new ones.



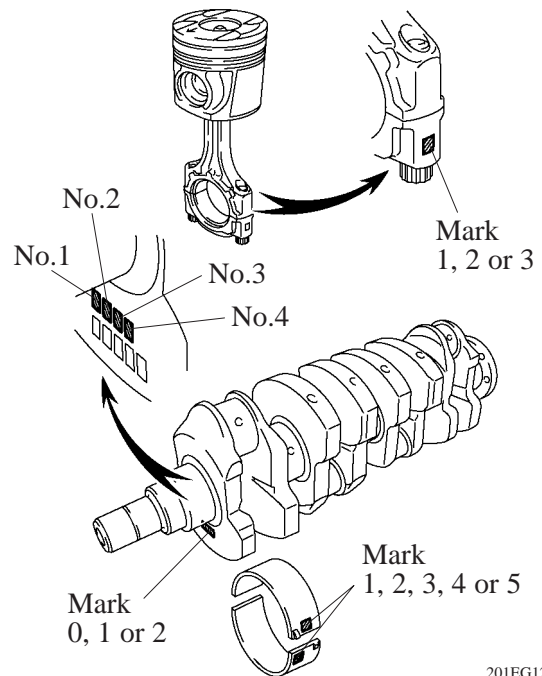
201EG11

- If using a standard bearing, replace it with one having the same number. If the number of the bearing cannot be determined, select the correct bearing by adding together the numbers imprinted on the crankshaft and connecting rod cap, then selecting the bearing with the same number as the total. There are 5 sizes of standard bearings, marked “1”, “2”, “3”, “4” and “5” accordingly.

	Number marked									
Connecting rod cap	1			2			3			
Crankshaft	0	1	2	0	1	2	0	1	2	
Use bearing	1	2	3	2	3	4	3	4	5	

EXAMPLE: Connecting rod cap “2” + Crankshaft “1”
= Total number 3 (Use bearing “3”)

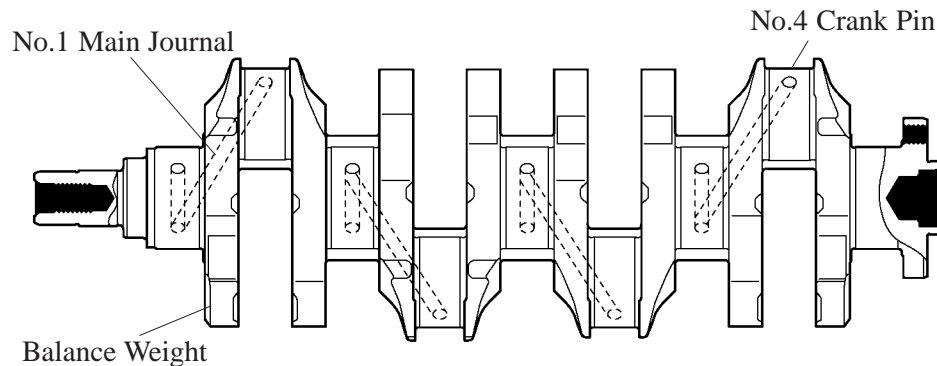
For details, refer to the 1CD-FTV Engine Repair Manual (Pub. No. RM866E).



201EG12

7. Crankshaft

- A forged crankshaft with 5 main journals, 4 connecting rod pins and 8 balance weights is used.
- The crankshaft pins and main journals have been induction-hardened to ensure their reliability.



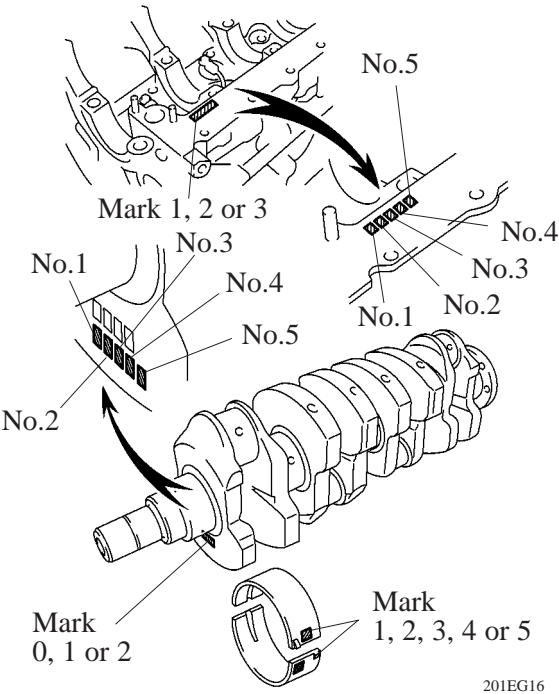
206EG27

Service Tip

If using a standard bearing, replace it with one having the same number. If the number of the bearing cannot be determined, select the correct bearing by adding together the numbers imprinted on the cylinder block and crankshaft, then selecting the bearing with the same number as the total. There are 5 sizes of standard bearings, marked “1”, “2”, “3”, “4” and “5” accordingly.

	Number marked									
Cylinder block	1			2			3			
Crankshaft	0	1	2	0	1	2	0	1	2	
Use bearing	1	2	3	2	3	4	3	4	5	

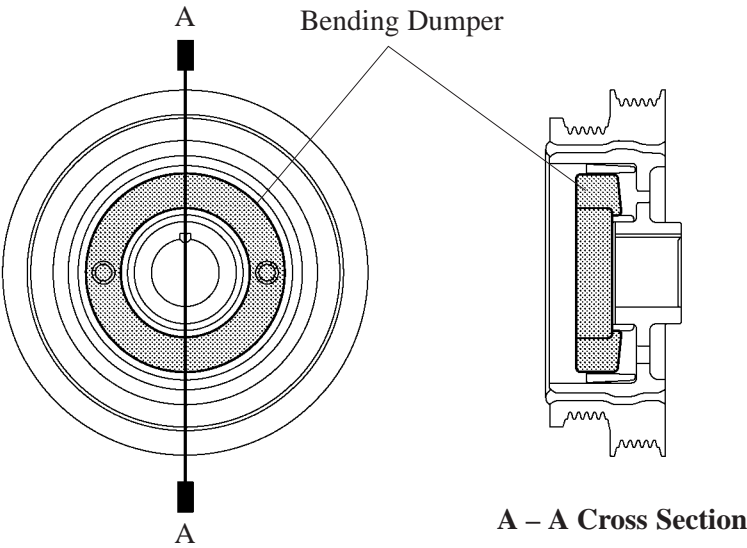
EXAMPLE: Cylinder block “2” + Crankshaft “1”
= Total number 3 (Use bearing “3”)
For details, refer to the 1CD-FTV Engine Repair Manual (Pub. No. RM866E).



201EG16

8. Crankshaft Pulley

- The crankshaft pulley with bending dumper has been adopted to reduce noise and vibration.



206EG43