




**► ENGINE BLOCK****Removal**

-  **Warning:** Drain lubricant oil.
-  **Warning:** Remove tank cap and loosen water hoses from radiator.
-  **Warning:** Remove drain plug and drain cooling system.

1. Loosen electric cables from starter motor, lubricant oil pressure and engine temperature gauges.

**Disassembly**

1. Disconnect inlet pipes and fuel return.
2. Remove engine from equipment.
3. Install support on the engine and install it in the engine stand.
4. Remove fan.
5. Remove crankshaft pulley.
6. Remove water pump.
7. Remove accessories.
8. Remove cylinder head.
9. Remove fuel lift pump.
10. Remove lubricant oil filter and cooler.
11. Remove distribution cover, pulleys and housing.
12. Remove fuel injection pump.
13. Remove camshaft.
14. Remove flywheel and flywheel housing.
15. Remove oil pan.
16. Remove timing housing.
17. Remove alternator with vacuum pump and power steering pump.

18. Remove accessories support.
19. Remove rear seal and crankshaft.
20. Remove pistons and connecting rods.

### Cleaning and inspection

1. Remove oil gallery rear plug.
2. Remove all water gallery plugs and lubricant oil filter support.
3. Flush block with water at 80°C (176 °F) under pressure and a chemical grease remover. Keep block in an immersion bathing with a solution of the same type for 12 hours and dry with compressed air.
4. Clean block galleries, flush again with hot water under pressure and dry with compressed air. Make sure that the passages of water and lubricant oil are unobstructed.
5. Check for cracks or other damages in the block. Measure cylinders bore, see CYLINDER.
6. Assembly water gallery plugs applying Loctite 601. Fix aluminum washer and oil lubricating rear plug applying Loctite 271.

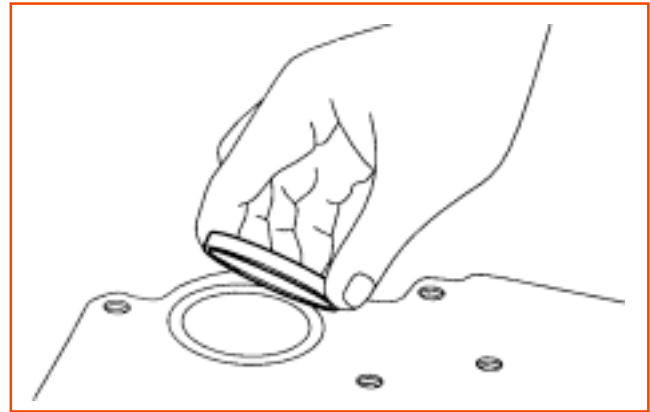
### CAMSHAFT BUSHING AND BEARING

#### Removal

1. Quit camshaft bearings bushing using tool nr. 8130635 and tool nr. 8130636.



2. Remove camshaft rear seal.



### Cleaning, inspection and assembly

1. Check camshaft bushing housing bores.



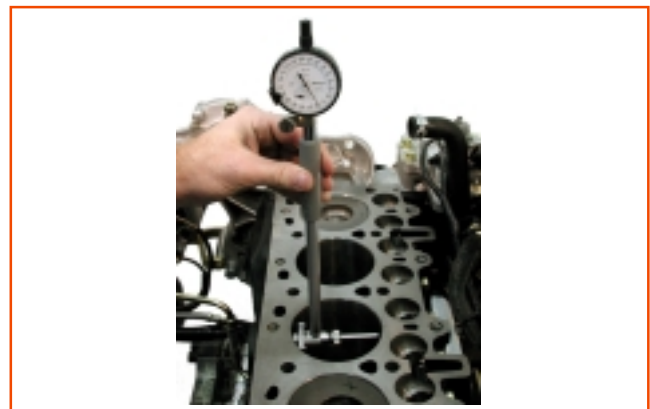
2. Position bushing in engine block.
3. Assemble bushing, making sure that lubrication hole is aligned with the hole in the block.
4. Assemble camshaft rear seal, applying Loctite 601.



### CYLINDER

#### Verification

1. Check cylinder inner diameter and out-of-roundness. If dimensions found are higher than specified, replace the engine block. Maximum bore allowed for service.



## CYLINDER FINISHING

### Mandrill and burnishing

1. Adjust the machine to operate at 293 rpm and advance of 0.15 to 0.30 mm / turn. The final bore must be gotten in only one pass of the broach.
2. First step must be made with burnishing batons of granulation 80 to 100 mash. In finishing for final bore, it has to be used batons of granulation 320 mash. In the two steps, the grain quality of all the batons must be CG (carbide of green silicon, hardness N).
3. During burnishing, use oil Honilo 407 (Castrol).
4. Finishing must be uniform on all cylinder extension. All mandrill marks must be removed. The cylinder surface must not be polished. The rugosity must be within the specified values.

### Cleaning and inspection

1. Remove incrustated particulate in the inner surface of cylinder after the burnishing.
2. Check cylinder bore and out-of-roundness.