

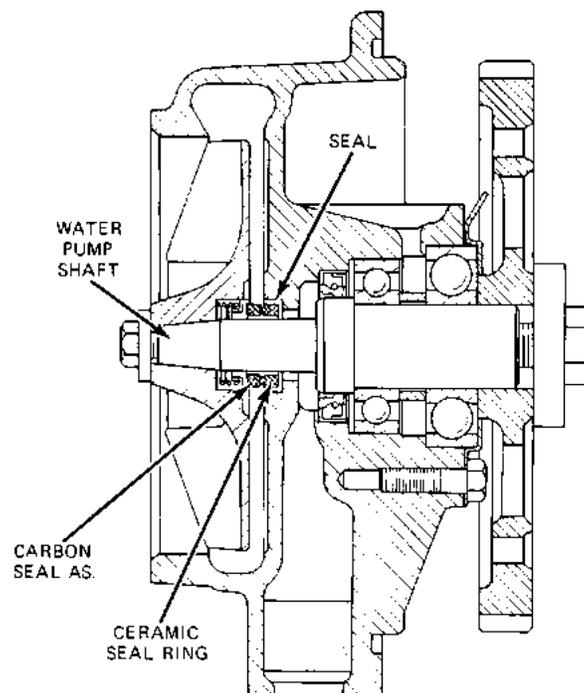
Inspection And Installation Procedures For Water Pump Shaft And Seals

All 3400 Series Engines

Reference: The article "New Oil Seal And Coolant Seal Group Improve Service Life Of Engine Water Pump", in this issue of Service Magazine, gives additional information on new water pump seal components used in the water pumps of 3406 Engines.

Correct inspection and installation procedures can help prevent unneeded replacement of engine water pump components.

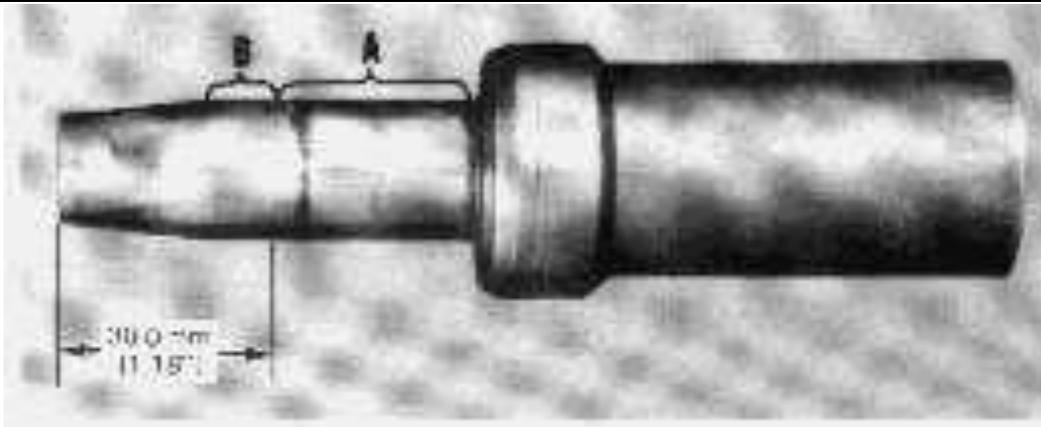
A "face-type" seal (see Illustration 1) is used in the engine water pump group on all 3400 Series Engines. With this "face-type" seal, a carbon seal assembly is installed on the water pump shaft, and presses against a ceramic ring and seal installed in the water pump housing.



A small amount of coolant leakage across the surface of the "face-type" seals is normal, and required, to provide lubrication for this type of seal. A hole is provided in

the water pump housing to allow this coolant/seal lubricant to drain from the pump housing. Intermittent leakage of small amounts of coolant from this hole is not an indication of water pump seal failure. Replace the water pump seals only if a large amount of leakage, or a constant flow of coolant, is observed draining from the water pump housing.

When an engine water pump is disassembled to replace the seal, make an inspection of the pump shaft (see Illustration 2). Remove the seals and use steel wool to remove deposits or corrosion from the pump shaft. Some corrosion and/or deposits on the pump shaft, where the carbon seal assembly and ceramic ring meet [Area (A)], is normal and does not require replacement of the shaft. Do not replace the pump shaft unless deep pitting or extensive corrosion has damaged the shaft. Also, inspect Area (B) on the shaft. Replace the shaft only if pitting, corrosion or scoring, in Area (B) can provide a path for coolant to leak between the seal and the pump shaft.



A polished area on the water pump shaft indicates a carbon seal assembly has been spinning on the shaft. Before installing a new seal assembly, use a fine grit sandpaper to clean the polished area.

NOTE: Do not use any sandpaper that will leave visible scratches on the pump shaft.

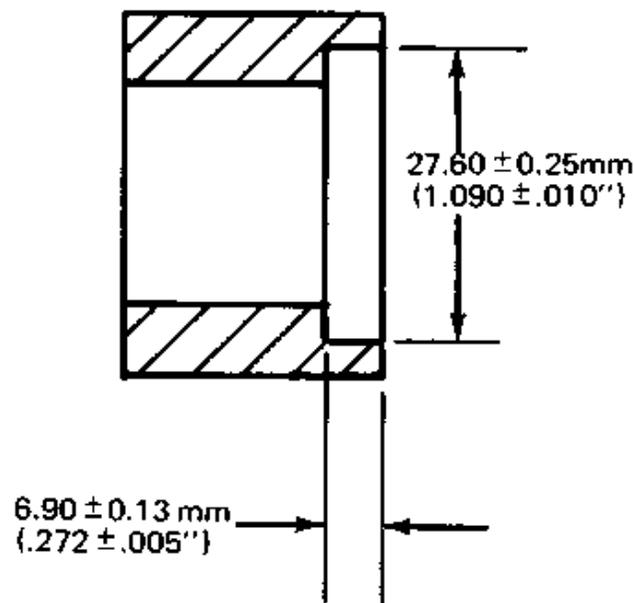
Use a micrometer to measure the pump shaft at Area (B). The shaft diameter must be $19.10 \pm .05$ mm ($.752 \pm .002$ ") for correct fit of the carbon seal assembly.

Correct installation of the carbon/ceramic seals is an important part of the sealing ability of the engine water pump. After cleaning and inspecting the pump shaft, use the following procedure to install the seals in the water pump.

Procedure To Install Seals In The Engine Water Pump

1. Use 6V1541 Quick Cure Primer to clean the 6N139 Water Pump Shaft and the ceramic ring seal counterbore in the pump housing.
2. Use a 7N7843 Installation Tool to install the ceramic ring and seal into the water pump housing.

NOTE: On 3406 and 3406B Engines use a 2W9102 Installation Tool (black in color) or modify an earlier tool as shown in Illustration 3.



Remove the spring and immerse the carbon seal assembly in clean water or coolant. Avoid contaminating the seal "faces" with ANY grease or oil. Also avoid stretching the rubber of the seal during installation. Stretching the seal will reduce the service life of the seal.

4. Use only the appropriate installation tool and hand pressure to press the seal assembly onto the shaft, until the seal "faces" make light contact.

NOTE: The carbon seal assembly must rotate WITH the water pump shaft. Do not use any lubricant, except clean water or coolant, that will reduce the friction between the seal and the shaft.

5. Install the carbon seal assembly spring and complete the assembly and installation of the water pump as shown in the Service Manual.