WATER PUMP TROUBLE SHOOTING

BROKEN WATER PUMP BEARINGS OR SHAFTS ARE CAUSED BY ONE OR MORE OF THE FOLLOWING CONDITIONS

EXCESSIVE ENGINE ACCELERATION: Rapid engine acceleration, particularly in low gear during quick get-aways, place heavy overloads in the bearing. Any minor imbalance can be amplified during rapid acceleration and high speeds, which can result in severe whipping action and sudden fractures.

DEFECTIVE FAN: Relatively minor fan defects can impose substantial strain on the water pump shaft at 3000 to 5000 RPM. A small piece of fan blade missing can result in tremendous adverse centrifugal force. Fatigue cracks near the rivits can cause blade shift or vibration. Bent fan blades can also cause serious load problems.

FAN NOT SQUARE WITH SHAFT: It is extremely important that the fan is mounted square to the center line of the shaft. If it is not square, the fan will wobble, causing vibrations to develop. This is particularly important where shaft spacers are used to move the fan closer to the radiator. The mounting bolts, if not properly torqued, will cause the fan to be tilted and may result in permanent deformation of the spacer.

BENT OR CRACKED PULLEYS: Damaging vibration can result from bent or cracked pulleys. This usually happens when a pulley is improperly handeled or installed.

FAN BELT TOO TIGHT: An overtightened fan belt can overload the bearing, resulting in shorter than ordinary fatigue life. It also causes bending of the shaft. Sudden acceleration cause large unbalanced loads, excessive shaft bending and early shaft failure.

SHAFT FAILURE CAUSED BY IMBALANCE

Examination of a failed water pump shaft will reveal the probable cause of falure. Discoloration around the fracture indicates unusually high temperatures caused by centrifugal forces due to imbalance. A small amount of imbalance can result in tremendous pressure on the shaft at operating RPM. The overload is concentrated at one point of the shaft and eventually the shaft snaps.

Lack in discoloration at the break indicates no heat build up occurred before a sudden vibratory overload of the shaft caused a clean, instantaneous fracture. Rapid acceleration of the engine coupled with imbalance in the shaft is the cause. Small vibrations can be amplified during rapid acceleration and when combined with other engine vibrations can result in an instantaneous shaft fracture.

PREVENT WATER PUMP FAILURE WITH THESE COMMON SENSE RULES

ALWAYS TIGHTEN FAN BELTS PROPERLY. Drive belt tension should be 1/2 or 3/4 inch deflection with light pressure applied midway between pulleys

NEVER HAMMER BEARING SHAFT. Often it is neccessary to tap the pump to get it properly aligned during installation. It is very important not to tap on the shaft, as this results in ball race and ball damage. This can cause anything from a noisy pump to an early failure and even a fracture of the shaft.

BE SURE FAN IS SEATED SQUARE WITH THE PUMP SHAFT AND FAN CLUTCH IS NOT DEFECTIVE: Fan wobble during rotation will cause the shaft to vibrate, contributing to bearing and shaft failure.

ALWAYS REPLACE DAMAGED FANS: Never straighten bent blades; replace the complete fan. Stress cracks and loose rivets in the blades can go undetected and cause a catastrophic failure. If a fan breaks, it can cause serious personal injuries and vehicle damage.