

Galvanic Effect



An important concept regarding the endurance and performance of the water pump is electrolytic metal erosion or EME. This is also referred to as the galvanic effect. With the ever-increasing use of dissimilar metals in engine components, plus the higher reliance of electronics, the problem of EME is brought to the forefront.

This electrical activity is not a voltage leak from the electronics in the vehicle. If you disconnect the battery, the same voltage is present. The problem is actually from the cooling system acting like a storage battery. The system cannot store electrical energy while cooling the system - and it cannot transfer the energy to operating the electrical system. Therefore erosion of components occurs.

To measure the EME activity in any cooling system, simply use a multimeter. Open the cooling system at the radiator cap, stick the positive probe of the meter into the cooling system and ground the negative probe to the engine block. With the meter set at the lowest setting for voltage, you'll find electrical activity in just about every vehicle tested.

Be aware of the common EME or galvanic effect within an engine. It is commonly mistaken for corrosion caused by oxidation in the cooling system or erosion from fluid that flows through and around the insides of the engine. Also, it is sometimes simply assumed to be caused by a defective casting.

To minimize the galvanic effect in an engine, make it common practice to regularly change the coolant. When installing a new water pump, always clean the cooling system with a chemical cleaner and reverse-flush all sediment, rust, and scale before removing the old pump.