Controlling engine operating temperature by eliminating 'hot spots'

Traditional engine coolants can cause many problems when used in high performance engines.

Many high performance car owners experience fluctuating operating temperatures depending on the environment. Not only does this make for an uneasy driving experience, it also puts your engine at risk.

Studying how an engine's cooling system works you very quickly see the traditional coolants such as pure water or a mix of ethylene glycol and water are much less than ideal. An engine with elevated power needs more than these liquids can handle. A performance engine, even with all the proper components such as a large aluminum radiator and high-speed electric fan must operate within the chemical and physical limitations of water.

Within a cooling system, heat is transferred from the cylinder bore and cylinder head walls to the liquid coolant. As the coolant reaches the hottest part of the cylinder head that is usually around the combustion chamber and exhaust valve, the coolant will actually start to boil. This phase change is identified as the nucleate boiling point and allows efficient transfer of heat. The coolant's chemical and thermal reaction is responsible for how efficient this process becomes.

When the coolant first comes in contact with the hot metal it will boil, changing phase and then due to the pressure in the cooling system the gas bubbles will be pushed from the localized boiling spot and carry with it the heat. It then re-condenses into a liquid.

This process has its limitations. When critical heat flux is reached (thermal limit of the fluid) thermal conductivity is dramatically reduced. This results in steam bubbles attaching themselves to the metal surface. Vapour is formed which insulates the metal surface and inhibits heat transfer from the hot surface to the coolant.

Evans Cooling Systems have developed a coolant called Evans High Performance Waterless Engine Coolant that uses no water; therefore the coolant remains in its liquid form ensuring no vapour is formed and maximum thermal conductivity is achieved at all temperatures.

In addition, it never freezes and does not boil until 190 degrees C. It also is a lifetime coolant so maintenance is completely eliminated once it is installed.

Evans High Performance Waterless Engine Coolant can be installed in any engine (stock or modified) with excellent results.

With Evans Coolant in your system and sufficient measures taken to increase flow of coolant to the radiator it is possible to control higher operating temperatures on and off the highway. More importantly, since the Evans Coolant is removing the heat from the engine it runs great at any temperature. The loading up and poor driveability at elevated coolant temperature is now gone.

The important thing to note is that the cylinder head metal surface temperature has dropped dramatically with Evans Coolant installed, though the liquid temperature on the gauge may not have changed much.