Technical Tips, Modifications & Questions

GLYCOL AND ITS ALTERNATIVES

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All vehicle manufacturers advocate the use of glycol antifreeze solutions in their cars They do this as a blanket statement to cover every eventuality for the broad range of conditions that vehicles are expected to operate under, from the Sahara Desert to the snows of Scandinavia.

Much has been made by promoters of safe non toxic personal care toiletries and cosmetics of the potential dangers of known "safe toxic" chemicals such as Propylene Glycol and Ethylene Glycol, a related chemical. Although exposure to high levels of Propylene Glycol is known to cause serious and potentially irreversible health conditions, the chemical industry tell us that "small" quantities or low level exposure of Propylene Glycol is "safe" to use on the skin and in food.

According to the safety data sheets of industrial chemical manufacturers, chemicals such as Ethylene Glycol and Propylene Glycol will cause serious health conditions, including liver and heart damage and damage to the central nervous system if sufficient is absorbed by the body.

Ethylene glycol and propylene glycol are clear liquids used in antifreeze and de-icing solutions. Exposure to excess amounts of ethylene glycol can damage the kidneys, heart, and nervous system. Eating or drinking very large amounts of ethylene glycol can result in death, while large amounts can result in nausea, convulsions, slurred speech, disorientation, and heart and kidney problems.

Antifreeze over time becomes acidic, causing corrosion to metal parts of the cooling system, and in fact can turn the whole system into a battery whose anodes (typically the aluminium parts) are consumed. This is why antifreeze solutions must be flushed regularly and replaced, usually every 2 years.

Luckily here we live in an area where the ambient temperature doesn't fall low enough to warrant an antifreeze solution, so there is no need to add glycol to our cooling water systems in our cars, and we don't need to drink it to protect ourselves.

Running plain water is not a solution; our engines require an anticorrosive agent to stop corrosion and electrolysis, while the water pump and seals require lubrication to prevent cavitation, for efficiency and prolonged operating life.

An engine block also has many cavities where water can trap and cause localised hot spots. On the V12 engine, there are odd configurations to the cooling passages at the back of the cylinder heads, there is a complex cavity at the rear of the heads which drains oil into the block that cause air pockets to be trapped (and hot spots to develop). On the TWR race cars they ran braided hose from the back of the heads through a bleed valve back into the cooling system.

On my V12, I have modified the return water relocating the water outlet from the front of the engine to the rear, to increase the volume of water to the rear of the block and heads, to help overcome this problem.

In place of antifreeze, for 10 years I used Tannin tablets that provided the corrosion inhibiting required, and for the last 3 years I have used Millers Rad Hib Extracool, a water wetter additive.

Water wetter is one of few things that does actually help - the science behind it is quite sound. It won't necessarily reduce the temperature readings, but it will improve the engine's ability to survive running on the edge of overheating. It does this by preventing hot-spots.

What happens is that in every engine, due to the nature of the coolant passages, hot-spots develop. If the coolant in those places starts to boil, the problem gets exponentially bigger because steam is a good insulator, which makes the hot-spots get even hotter. Water wetter breaks down the surface tension of the coolant, which makes the boiling bubbles much smaller, thus reducing the insulation effect of boiling over, and thus improving the engine's chances of surviving overheating.

Technical Details

WaterWetter® is a unique wetting agent for cooling systems which reduces coolant temperatures by as much as 15ºC. This liquid product can be used to provide rust and corrosion protection in plain water for racing engines, which provides much better heat transfer properties than glycol-based antifreeze. Or it can be added to new or used antifreeze to improve the heat transfer of ethylene and propylene glycol systems. Designed for modern aluminium, cast iron, copper, brass and bronze systems.

- · Doubles the wetting ability of water
- · Improves heat transfer
- · Reduces cylinder head temperatures
- · May allow more spark advance for increased torque
- · Reduces rust, corrosion and electrolysis of all metals
- · Provides long term corrosion protection
- · Cleans and lubricates water pump seals
- · Prevents foaming
- · Reduces cavitation corrosion
- · Complexes with hard water to reduce scale

Products

Millers Rad Hib Extracool

Redline Water Wetter