Waterless coolant concerns

Chris Danner sought advice or information on replacing the standard antifreeze/water coolant in an MGBGTV8 with the waterless type? Here we have some useful information and views on waterless coolants in an MGV8.

Chris Danner said "since I keep my car inside for most of the winter months and especially out of the wet with only the occasional engine run or a drive out on the road if it's dry, I was considering relenting to the sales pitch from the various waterless coolant adverts - no corrosion and water pump damage!" He welcomed any insights or advice from fellow members.

Victor Smith responded saying "waterless coolants is a topic like Marmite - you either believe in it and the claimed benefits and accept the comparatively high price of waterless coolants or you are happy to stay with a less expensive and simpler water and glycol mix. I believe Evans is the sole supplier in the UK and their website sets out their case for its benefits and use.

As experienced qualified engineers Nic Houslip and Tony Lake are able to provide their views and outline any benefits. If you type in "waterless coolant" in the search box on the V8 Website homepage very few links are there but one note – V8NOTE549 - with Andrew Collins providing his view that a waterless coolant is not necessary from his experience of driving to Portugal in his MGBGTV8". Victor Smith adds that if you do decide to stay with a water and glycol mix then it will be worth reading a note linked to V8NOTE413.and note with concerns with antifreeze.

Tony Lake noted "it's not so much what a waterless coolant supplier might say as what is not said. The incontrovertible fact is that the coolant in any engine that changes to a waterless coolant will run hotter than compared with a 50/50 antifreeze/water mix and even hotter than with de-ionised water and a corrosion inhibitor. Raw water has the best heat transfer properties. The reasons are twofold; firstly, the specific heat of their mixture is about 0.58 Btu/lb/deg F vs 0.865 Btu/lb/deg F for a conventional mixture that contains water. Secondly their mixture is more viscous so there is some flow loss at the water pump as well. Those two factors combine to change the coolant operating temperatures across the engine. That only makes a V8 engine run hotter than it was originally designed to achieve.

On a like for like day the heat rejection from the engine to the waterless coolant will not change but the "coolant out" temperature will increase and all the hot components will just get a bit hotter until a new equilibrium is reached.

Typically a radiator will cool the coolant by 10 deg F, give or take, that doesn't change because a waterless coolant is used, a higher coolant inlet temperature will be the result as equilibrium is reached. There is some recognition of this in one of the waterless coolant supplier's older blurb where they say that engine designers when provided with their technical specification often come back to say that a larger radiator is now required to achieve the correct operating temperatures. They rebut that by saying that it is an incorrect assumption that water based coolants actually behave as a fluid all the time, they argue that water vapour is present around hot spots, spark plug, exhaust valve, which does not occur with their waterless coolant because of its high boiling point, therefore no risk of pinking or detonation. Not a bad argument but my MGBGTV8 engine will pink at will on 95 octane. When I use 97 octane it is very smooth, the coolant temperatures are the same so I'm not convinced that the all alloy V8 is at any risk from coolant boiling. I expect many high performance iron engines are at risk and that is probably where a waterless coolant might score".

Victor Smith looked into the cost of a change to waterless coolant using the information available on the Moss Europe website in November 2018. With a coolant capacity on an MGBGTV8 of 9.1 litres(16 pints) the **cost is around £170**. You will need sufficient special "Prep fluid" (7 litres as they say you must have a minimum of 75% of the coolant volume) at £50 to help flush out the water based coolant and then two 5 litre containers of waterless coolant at £120 to refill the system".

Nic Houslip commented "it's really helpful to have Tony's in depth explanation too. I'm always surprised that people think that the design of the MGBGTV8 cooling system was lacking, yet I am quite certain that the engineers at MG/BL would have made the calculations based on facts similar to Tony's and then tested their design under all the climatic conditions that the car might encounter in the markets it was to be sold into. On that basis I think we can say if it is overheating - for example boiling over - then something is wrong, which must be investigated before investing in shiny aluminium radiator upgrades or indeed a waterless coolant. An alloy radiator or EWC might mask the symptoms but the problem is still there.

It is important to understand that humans are not good at "measuring" temperature, we are able to tell something is hot, but to discriminate between a large lump of metal at 99 deg C or 120 deg is beyond our capabilities yet that is what we would need to be able to do to decide if a V8 was overheating. Because the V8 is rather a big lump in a small container, there will inevitably be heat dissipation problems. To be honest the original V8 electric fans are pretty puny compared to the larger fans available today that are also much more efficient. If you are less concerned with originality and more with practicality, this might be a very easy modification. Keeping the old fans in a box in the garage to hand to a new owner would also be a nice idea, especially if the new owner was an originality buff".

Other options to consider with cooling a V8

Victor Smith mentioned "there is another item worth checking, or even replacing on a preventative basis, and that is the **pressure cap on the expansion tank**. As that component ages it can begin to fail to maintain the correct pressure on the water based coolant which will also contribute to overheating. A replacement cap is around a fiver so is not a life threatening investment. There are a couple of V8NOTES on this - just type "pressure cap" into the search box on the V8 website homepage.

The other modification I have had for some years is a **manual override switch** which enables me to turn the twin cooling fans on before the thermostat clicks in. It's a very easy modification to do. Just type in V8NOTE389. The switch is useful if you want to anticipate a heat build up - for example coming off the M4 onto the elevated road leading to the Chiswick Roundabout in West London where often the traffic slows from 60mph to well below 40mph or lower if there is a queue".

Concerns with antifreeze

See our useful note on concerns with antifreeze for classic cars.
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