

## Some like it hot, some don't

*One of our St. Catharines members had an adventure with the cooling system of his LBC that started at our July meeting. The following is a narrative of his adventure.*

The Series 1 E-types have a reputation for being hot. That's temperature not attitude. When driving in England back in the '70s one hardly ever encountered heavy traffic except in the big cities. In the country the roads were relatively congestion free so there was always plenty of cooling air flowing through the radiator while cruising. But, get into heavy traffic and the engine had a penchant for overheating. I don't think the designers of the engines in the 70s ever anticipated cooling to be a problem but in case it did they installed a token fan.

A fan motor was installed on the picture frame and what I suppose passed for a fan blade. Only one blade made from a strip of metal about 1" wide and 12" long. It had a slight twist which would untwist itself at anything approaching highway speed.

It seemed reasonable if not necessary when the car was being restored to install a proper fan given that stop and go traffic in this country is the rule not the exception. Aftermarket electric fans can be expensive. I found out that cooling fan assemblies can cost up to US\$1500. As it happens I had a used electric cooling fan from a 1995 Chevy Lumina APV. It easily fit inside the existing shroud and after making several mounting brackets it was all set to install. When connected it created quite a hurricane and it seemed like it would do the job.

Fast forward about 5 years after the car was on the road we were having our monthly Niagara car club meeting at our usual restaurant in St. Catharines. It happened to be the same night that a transport truck on the QEW collided with the centre concrete barrier. It was carrying Phosphine gas (not Phosgene which is a nerve gas and was used in WWI). Phosphine is toxic and flammable. Because the police didn't know if any of the canisters were broken and leaking gas they closed the highway in both directions and declared a 2km evacuation zone around the accident. The result was that all eastbound and westbound traffic was redirected onto the main street of St. Catharines. All the big rigs piled up nose to tail and nothing moved. 3' forward then wait 5 minutes until the next move. I watched the temperature gauge go up and up until it pegged. The next thing I noticed was a wisp of steam rising from the bonnet. Not good I thought so I pulled into the next driveway which happened to be the local Ford dealership. We left the car overnight to cool down and walked to our club meeting. Thanks to Ray and Lois Hobbs we had a ride home after the meeting.

Next morning we returned to the car to assess the damage. When examining under the bonnet I noticed that the overflow tube from the rad cap had fallen out of the overflow reservoir. Aha! that's the where the wisp of steam was coming from. Put the tube back in the reservoir, filled the header tank full and drove home without a problem. As a precaution against any unseen damage I added some stop leak to the coolant. Just in case.

Time to go to our monthly Jag meeting except this time there was no meeting but instead a garage visit to Brad Marshland's superb car collection in Waterloo. Great evening, great cars. Out to the parking lot to go home when I noticed a very large pool of coolant on the pavement under the radiator. I thought the overflow hose had come adrift again but not so. Brad very kindly gave me a gallon of antifreeze to top up the header tank and off I went home. I very nervously kept one eye on the temp.

gauge. Can that be considered distracted driving? Everything went well and there was no overheating at all. But remember I was never stopped in traffic.

Next trip was to our monthly OJOA meeting at Kat's Deli in Toronto when again after parking the car there appeared a large pool of coolant on the ground. Because of the unanticipated cooling problems I always made sure I had a gallon of water in the boot (not literally in the boot but in a container). After the meeting I topped up the header tank and set off for home hoping I could make it without overheating problems. No problems appeared.

That weekend we had a party/garage tour for the NBCC club and I was determined to find the source of the leak. I offered free beer for anyone that could find the source. Now like Tom Sawyer I had lots of help. One bright spark (Bruce Bowman) noticed that there was corrosion on some of the tubes in the bottom corner of the core. His suggestion was to take out the rad and have it pressure tested. I had never removed the rad from the Jag so I was a bit apprehensive. Rather than take the car to a mechanic whose rates were much more than mine I rolled up my sleeves and brought out my toolbox. Eight hours later the rad was out and taken to the rad shop.

My friend had been right. Several of the tubes were leaking and the rad required a recore. So why did the tube start leaking?

I spent another 8 hours reinstalling the rad. Out on the road all was cool (literally). Except when we were in traffic when the temperature started to rise a bit. After the slowdown and back to highway speed the temp. came down. It seemed that everything was okay but I had a nagging feeling that something was still wrong. When we got home I lifted the bonnet with the engine running to see if there were any leaks. There were none but I noticed that the fan was not running and it should have been. Perhaps that was the problem.

More investigation was required. Was the fan defective or was it something else. The first test I performed was to connect the fan motor directly to the battery. Fan worked fine. Whew. I wasn't pleased about the prospect of buying a new fan. Okay so follow the wires from the fan back to the fan relay. A relay had been installed to handle the current for the fan rather than putting all that current (20+amps) through the normal wiring. I energized the fan terminal on the relay and the fan worked. The relay is energized by something called an Otter switch. Wonder if that is related to a Muskrat switch? The Otter switch was invented in England in 1940 to regulate the heat of pilot's flying suits in WW2. It is also used in kettles to cut the current so the kettle doesn't boil dry. The Jag has an Otter switch whose function is to turn on the electric cooling fan when the coolant temperature gets too high. Was the relay defective? I grounded the relay which is what happens when the temp. gets too high and the relay is supposed to close and allow current to the fan. I could hear the relay clicking but the fan did not operate. Fortunately I had a spare relay in the workshop so I swapped the old one out.

I tried grounding the relay again and prosto chango the fan came on.

After some ruminating over the sequence of events I concluded that the fan relay failed and the fan did not get energized. That was what caused the engine to overheat. The higher pressure caused by the overheating pushed out the stop leak. As long as the car was moving the flow of air through the radiator kept the engine cool but as soon as the car stopped in traffic there was no cooling air flowing through the rad and overheating was the result. And the final conclusion, never trust anything made in China. The only thing worse than English Lucas is Chinese Lucas and that was the source of the relay.

I am currently installing a light on the dash that will show me when the fan is running so if the relay fails again I will know it before I have to spend \$500 on a recore.

