I Always Wanted a COOL Car

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Have you noticed that the most common phrase heard at an LBC (Little British Car) gathering is “If you think that’s bad, let me tell you what happened to me?” It seems that putting up with the many adversities presented by our LBCs is accepted as our “Red Badge of Courage”. Further, to overcome these difficulties and to help others to do so as well seems to be what we find most enjoyable about owning our LBCs.

Under the banner of marque purity, many of us put up with bad original design and feel the heat. Many LBCs, exemplified by my Austin Healey 3000, were notoriously designed with the driver’s legs encased in an airless enclosure that extends deep into the engine compartment within inches of the engine. To further the discomfort, the exhaust pipes were placed relatively close to this enclosure and run directly under the driver’s bottom. To add to the list of issues, many LBCs are prone to overheating in traffic while owners notice the temperature climb at speed when sufficient cooling air is wrongly assumed to be passing through the radiator.

To relieve this summer driving discomfort, many have added space-age insulation to the cabin and some often wear shorts and have even purchased sandals (I refer to as my Healey Shoes). The object of this article is to address some of the more common issues leading to hot driving and discuss some easily implemented and reversible changes to gain a little more driving enjoyment. However, commonly addressed maintenance and alterations such as engine cooling system flushing, coolant type and mixtures, aggressive fans, and radiator maintenance and recoring will not be addressed as others have covered these topics in great detail.

Misperceptions Leave me Boiling

Over the years I have been the recipient of many false perceptions. I expected when I replaced a part with a more modern unit, I was improving things. Well, that has proven false many times.

Back in the 70s when it was common to change coolant and thermostat on a regular basis, I purchased the latest replacement from one of the biggest US manufacturers. At the time, having had some experience with American cars and little with British, all seemed proper, but what a mistake. A good while after I installed the new thermostat I learned that the thermostat (Fig 1) that I had replaced was equipped with a cylindrical component or sleeve that would drop when the thermostat opened to block a

circulation bypass that is cast into the block. This bypass was common in LBCs, but not in American iron, and would allow fast warm-ups by directing coolant from the engine block to go directly to the pump without going through the radiator. The more modern American thermostats were, and still are, not designed with this feature and when used in an LBC would allow approximately 25% of the circulating coolant to bypass the radiator. When the LBCs marginal cooling system is placed under stress, as in traffic, the loss or this cooling capacity further extends the car's potential to overheat.

Figure 1

Although it is difficult to find a bellows/sleeved thermostat, they are available at a substantially higher price than their commonly available so-called replacements. A number of LBC specialty shops and parts housed do carry these components, however, be sure to specify the sleeve feature as they may be referenced with different terms.

A Full Tank (of Coolant) is Best

It has always been important to have a full measure of coolant in the radiator, however more often than not; at some point in a summertime drive a lake will form under a parked LBC. Back in the days when LBCs were born, coolant recovery systems were either nonexistent or minimal. As a result, during a drive, more and more coolant was lost and replaced with air. Since the purpose of coolant is to make contact with the engine block and carry off heat, less available coolant translates into lower heat transfer, higher operating temperatures, and a greater overheating potential.

In order to maintain the greatest volume of coolant within the cooling system, coolant must be retained without loss. To achieve this, cars since the 1970s have incorporated coolant recovery systems that capture the overflow and, upon cool down, allow the fluid to be reintroduced into the radiator.

It should be understood that this change only marginally increases overall cooling capacity when compared to an original installation with a full measure of fluid. The purpose of this alteration is to eliminate the deterioration of cooling capacity when passing through multiple heat-up/cool-down cycles. To incorporate a recovery cooling system in your LBC, you must first acquire a special recovery-capable radiator pressure cap (Fig 2), with a 1" drop, for your original radiator. Although this is a non-common item, they are available for both LBCs and older American classics through NAPA (Balkamp 703-1411) and a number of other suppliers.

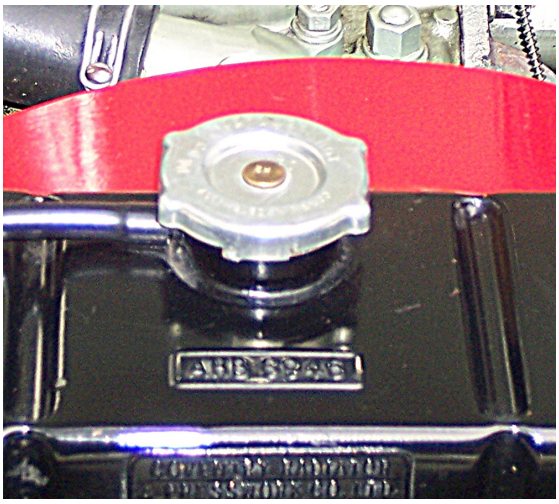

Figure 2

Figure 3

Additionally, as this is a non-pressurized recovery system, any 2-quart container with a cap (Fig 3) and capable of holding hot coolant can be selected and should be mounted as close to the radiator top tank as practical (Fig 4). The original overflow tube leading from the filler neck should be directed through a hole made in the cap of the recovery container and extended to approximately ½" above the bottom. In the uncommon case of excess fluid in the recovery tank, a small cap hole should also be made to provide for vessel air/fluid evacuation. The cold radiator should now be filled to the brim with the expansion tank half filled.

Figure 4

A Matter of Pressure

Have you ever driven at around 65 MPH and noticed your LBC's temperature gauge slowly rise. With all that air passing through the radiator, why is the engine temperature increasing?

One day, when Googling for cooling system ideas, I came across a Morgan site that addressed this very issue and described experiments and interesting conclusions made by a few engineers/Morgan-owners. It seems that the engineers, responsible for performance and reliability at a major truck builder, used a wind tunnel to investigate this

phenomenon and came up with some interesting conclusions and suggestions.

The Morgan engineers found that, as a result of air passing around and under the radiator at speed, a high pressure buildup in the engine compartment blocks air from freely passing through the radiator and results in insufficient cool air flow. Many have directly, or inadvertently, addressed this problem by installing front fender vents or bonnet louvers to improve cooling, however, what follows is a less drastic and reversible intervention

To begin with, a panel covering the front 1/3 of the engine compartment bottom should be installed to direct air moving under the car to well past the area behind the radiator. My installation consisted of a conveniently available piece of rigid sign plastic attached to the bottom of my Healey's frame rails and extending from the front cross member to within 6" before the engine pan (Fig 5). As this panel will not be under any significant stress, your choice of ridged panel materials is relatively broad.

Figure 5

With the engine compartment panel in place, my next step was to block the air gap between the lower radiator tank and the panel. This task proved more difficult as it required the fabrication of a simple frame, created from scrap adjustable shelf track (Fig 6), extending across the lower 3/4 of the bottom radiator tank with sides bent 90-degreese back and secured in place via the radiator mounting bolts.


Figure 6

To close this gap, I chose a suitably sized piece of flexible plastic carpet runner (Fig 7) that I attached to the frame and wrapped below the bottom radiator tank to connect to the cross member beneath the front edge of the installed panel (Fig 5). Finally, I cut a flap out of the runner to allow for access to the radiator drain.

Figure 7

Although the described modifications will provide the greatest effects for your efforts, it should be noted that additional benefit would be derived from stopping any air penetration coming through either side of the radiator.

Directed Air

The efficiency and affect of a fan on the flow and velocity of air is directly related to its blade angle and enclosure. It is not uncommon to find a relatively mild fan blade angle and no enclosure on an LBC. As a result, little cooling air is pulled through the radiator by the fan with most activated-air bleeding off the end of the blades. To address this condition, some have acquired or built fully encircling fan shrouds that improve fan performance dramatically. Although this approach is best, it has the drawback of substantially changing the appearance of the fan area and requires a great deal of fabrication.

As an alternative, the above-mentioned Morgan owners suggest a relatively easy contribution toward fan efficiency. This approach, designed to limit the amount of air-bleed at the end of the blades, consists of (2) 4”x radiator length flat ridged panels installed on each side of the radiator and attached via radiator installation bolts (Fig 8). These panels help to close the active area surrounding the fan and direct airflow back rather then allowing it to escape toward the side. As a result, an improvement in air movement during low or no speed is provided with an increase in cooling efficiency. Further, when under way, the effect of this addition, in combination with the previously described engine compartment de-pressurization modification, will significantly improve directed airflow resulting in cooler operation at all speeds.

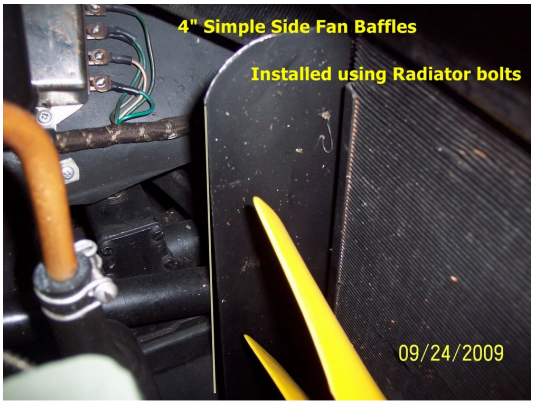

Figure 8

Cooler Car but Not Cool Enough

Following the installations, I found my LBC could handle traffic jams without melting into a puddle on the ground. Directing and ducting air more efficiently in and out of the engine compartment has gone far to make my Healey a more dependable and enjoyable ride. Though I still wear shorts and Healey sandals, when driving on a hot summer afternoon, this attire may soon be relegated to my fashion statement

with the installation of some addition cabin-cooling ideas and thoughts. However, that is still a future project and a subject for another time.