

## MGB Electric Fans

In last September's *Can-Am Connection*, we reprinted the first part of Roger Parker's article, originally published in the British magazine *Enjoying MG*, concerning mechanical cooling fans. Below is the second part dealing with electric fans. As overheating seems to plague post 1977 MGBs more than the mechanical fan cooled models, we hope that the advice Roger gives helps keep some of members a little cooler under the bonnet.

It was the V8 that introduced electric fans to the MGB because the radiator had to be moved forward and two electric fans then fitted in the space in front of the it. One drawback with the fan and motor being mounted in this position is that it is exposed to all the weather that comes in through the grille, which often reduces the fan motor service life.

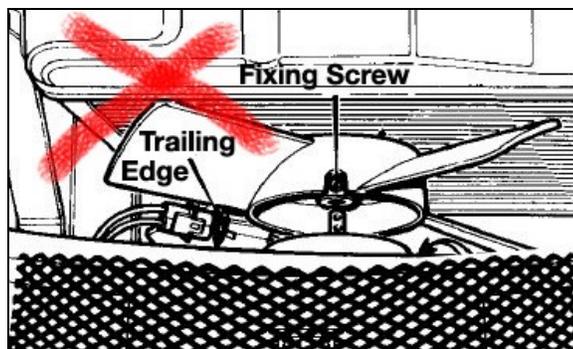
Over time, and more so on infrequently used cars, the motors start to suffer and the rotational speed drops, and with it comes a noticeable loss of air flow. When this happens the presence of twin fans allows you to see, and to a lesser extent hear, the difference in speed, so you know there is a problem, although what usually draws you to take a closer look is that the fans tend to operate for longer and the expected rate of temperature reduction isn't achieved.

I wonder how many 1977 and later model year MGBs suffer from inefficiencies in cooling because a fan motor is no longer turning as fast as it should. My own experience with twin fans on my V8, was that when one slowed slightly, the car delivered noticeably poorer performance.

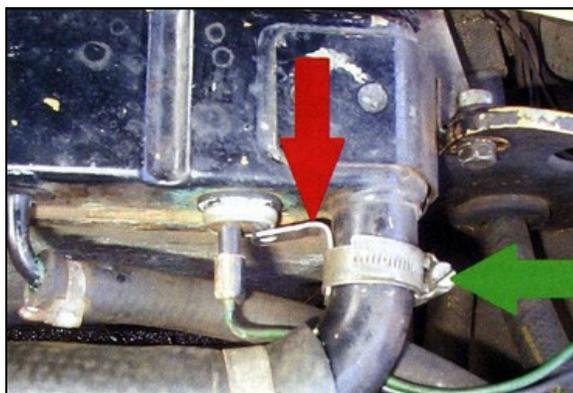
In a previous article I mentioned some installation issues with respect to mechanical fans, so I must also here note those with electric fans, the biggest of which is that many are fitted the wrong way round. I have looked at a number of official MG documents, including parts books and workshop manuals, and I have yet to find one that shows the fan fitted correctly. Very simply, the cut out in the fan molding that allows access to insert a screwdriver to secure the head-less fixing screw, is shown pointing towards the motor, but because the motor is mounted in front of the radiator and the fan needs to push air away from the motor and towards the radiator, this is the wrong way round. **THE SLOT NEEDS TO POINT AWAY FROM THE MOTOR AND TOWARDS THE RADIATOR.** The importance of the fan blade position is the same as for the mechanical fans in that the blades have a leading and trailing edge with a curvature to the blade to maximize airflow efficiency only on one direction.

Another issue that affects the 1977 model year is the security of the thermostatic switch that sits in the top rear face of the radiator next to the top hose connection pipe. It is not unknown for these to pop out when under pressure and hot coolant to cause a spectacular steam show, and give owners heart failure. This often occurs soon after disturbance or replacement of the switch or the rubber ring, which is not the most impressive of seals! Over the years, there have been a number of clips made to provide better security for the switch, but a simple home-made route is shown in the picture to the right using a hose clip and length of metal bent into an L shape. The effect of this is to just apply slight pressure on the switch that discourages movement. Usually after a few weeks in position a partial bonding occurs between the seal and radiator, as well as the switch, which will last years, if not decades, unless it is disturbed.

There is what I see as a weakness with the post 1977 MGB fan wiring, especially on those cars which have twin fans (export MGBs). All the electrical load for the fan motors is switched through the radiator thermostatic switch, whereas it would be better to have the switch operate a relay that then handles the heavy electrical load, just like the



The top illustration, from the factory workshop manual, is WRONG. From the front of the car, the fan turns counter-clockwise, and like the aircraft wing or helicopter blade it closely resembles, the leading or blunter edge of the fan blade should cut the air. The lower illustration shows the correct fan orientation.



The original 1977 to 1980 MGB thermostatic switch can blow out of its fitted position, especially when a new seal or switch is fitted. This simple angled additional bracket (red arrow), secured by the additional hose clip (green arrow) prevents this from occurring.

V8s had. The problem is that without a relay, the thermostat terminals tend to degrade with heavier loads and the resultant voltage drop slows the fan speed and with it its efficiency. [Thermostat contact failure is also common when no relay is fitted – ed.] Obviously this also gives better reliability over a longer period.

Fan mounting position can also be quite variable and often the fans can be too distant from the radiator so less of the air the fan moves will pass through the radiator core. The shape of MGB radiators prevents the fan(s) being mounted for maximum efficiency — really close to the core — even though there is no engine movement to consider as there is with belt driven fans.

Often, greater flow through the radiator core can be achieved by mounting the fan(s) as close to the core as possible, which is how many of the modern aftermarket fan conversions achieve greater efficiency.

Not only do the modern aftermarket electric fans benefit from being mounted right onto the radiator core, ensuring that most of the air moved is actually forced through the radiator, but addition, the design of the blades has benefitted from forty years of development so as to provide more flow from smaller fans, which are also less noisy.

One aspect affecting all electric fans is their switch-on and switch-off temperatures. V8s use a thermostatic switch known as the Otter® switch, which has a switch-on temperature of 90°C [194°F] with an off temperature of approximately 85°C [185°F], although in recent years some replacements have had a slightly lower switch-on and off temperatures, which if matched to the normal 82°C [180°F] thermostat can lead to the fans switching on, yet being reluctant to switch off as the thermostat's operating temperatures are too close to the thermostatic switch's shut-off temperature and so the coolant temperature may not dip low enough for the fans to be switched off, until the engine is turned off and allowed to cool.

For reference, the original 1977 model year on MGB thermostatic switch has a switch-on temperature of 92°C [198°F] and a switch-off temperature of 87°C [189°F], which is distant enough to work well with the 82°C [180°F] 'stat. Non-original alternative thermostatic switches are available, but their switch-on and off temperatures are not so clear, but some seem to have slightly lower thresholds, mimicking the V8 switching issues. Of course there is also the option of using one of the aftermarket thermostatic switches that are found with the aftermarket fans with original electric fans, which will bring some adjustability to the fan operating range.

With the continuing growth of poor running issues that can so often be caused by modern fuel with engine bay heat being a major contributor, the option of running MGBs and V8s with a 74°C [165°F] thermostat rather than 82°C [180°F], for the UK climate at least, becomes a quite attractive as it will overcome any fan switching issues, and also help reduce some of the engine bay heat.

Finally, going back to the original single and twin fans on V8s and the post 1977 cars there is some merit in considering converting the safety fan guard that stops you putting fingers into the rotating fans from a grille to a closed cover which will provide a cowl above the fans and help to divert the air you can always feel coming through the guard when the fan(s) are operating and instead push it through the radiator.

The basic cooling system should work well but that doesn't mean there is still no room for more improvement. Others may have developed additional small changes to improve on the standard cooling system and we would always welcome hearing from them with their experiences.



Modern cooling fans offer improved airflow with less power consumption and quieter operation. Here, shown mounted in an MGA, they can be installed on either side of the radiator as space allows, and replace both mechanical and electrical fans. Being so close to the cooling matrix, almost all the air passes through it.



There is very likely to be an increase in airflow through the radiator if the standard open finger guard grille on V8 and 1977 on models is covered so it no longer allows air to pass through it, forcing some of this blocked air to pass through the radiator and reduce 'lost airflow'