

# ELECTRIC COOLING FANS

By WAYNE MCGILL  
& FRED MCEACHERN  
Joint TR6 Marque Coordinators

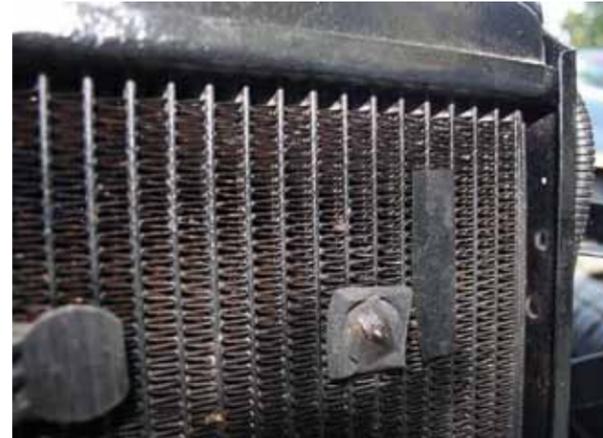
Ever stop to think and forget to start again? I was thinking some time ago about the cooling systems in most of our Triumphs, that is to say the models up to and including the TR-6. All of these cars came with fan belt powered cooling fans and most were bolted directly to the water pump pulley. This is a simple and mostly effective way of cooling the water as it passes through the radiator the majority of the time. Cars going back to the turn of the last century used this system, so why would we want to change?

Well, ...there are a number of compromises that make this system less than optimal most of the time. The fan turns at a speed dictated by the diameter size of the pulley and the speed of the engine. As the pulley size is usually fixed, that is to say there is no optionally larger or smaller pulley available, we are stuck with what the engineers decided was best. Compromise number one put to bed. The speed of the fan is controlled therefore solely by the speed of the engine. This means that at idle, the fan is turning relatively slowly and on the highway at 100kph, the fan is turning much faster. This is exactly the reverse of what the ideal situation would be. In slow and stop and go traffic, heat builds up in the engine compartment as relatively little air passes through the radiator both because the vehicle is not moving through the air and the fan is turning slowly. That is a major reason why our cars begin to over-heat in town on a hot summer day.

Any other issues such as too hot a thermostat, silt in the radiator, poorly tuned engine, modified engine, missing radiator shrouds, etc. all just add to the problem. At highway speed we have lots of air flowing the radiator as the car moves down the road. In addition, the fan is now turning at a high speed, giving further cooling which



Pre-set fan switch and thermostat control



Fan is attached to front of radiator with plastic clamps



Pusher fan mounted on Triumph Herald



Control switch and thermostat

may not be needed at all. This isn't a huge issue for our cars which usually don't get driven in the winter, but would lead to slow warm up, reduced heater efficiency, and greater fuel consumption. In our case, the fan is being turned and using engine horsepower, read using more fuel and giving less power to the rear wheels, when we really don't need it. Compromise number two and a big one! In the 1960's and 1970's engineers tried a couple of things to improve this situation.

First came the so called flex fan blade. These were usually very thin steel with a fairly pronounced curve to the blade, sometimes called a course pitch. This gave increased air flow at low speed. As the engine speed increased, centrifugal force made the fan blades reduce their curve, or go into a fine pitch. This reduced the amount of air being forced through the radiator and therefore reduced the horsepower required to turn the fan and increased fuel consumption. All good things as far as it could go, but still not optimal.

Another solution was the clutch fan. Later Spitfires and the Stag used this technology. Attached to the pulley and the fan blades this device acted as a clutch

and engaged and dis-engaged the fan to the fan pulley. At low speed, the clutch would automatically engage and turn the fan blades, giving us the cooling that was needed. At high speed the clutch automatically dis-engaged and allowed the fan blades to wind mill, giving less cooling and therefore using less horsepower and less fuel. Better than a fixed system and better than a flexible fan blade, but still not exactly what we want. In the 1970's we began to see the introduction of electric fans that are controlled by a thermostatic switch. Finally we had something that more closely matches the engines need for cooling. It is not dependent upon engine speed, which is its first major advantage. The fan can run at top speed while the car is idling in heavy traffic, exactly when we need it most. At highway speed it can shut itself down, just letting the fan blades free wheel and using no horsepower which increases both power and fuel economy. When the car engine is cold, the fan does not run at all. This hastens initial warm up of the engine, giving better fuel economy due to shorter time needed for the choke to be used.

We now have the most optimal system currently available even for our old

Triumphs. So how do we go about installing this system and what exactly is available. The average owner with moderate mechanical skills can install most of the systems available in an afternoon or evening, with very little difficulty. It is best to start with a properly tuned engine and a good basic cooling system. Proper radiator shrouds, a correct heat range thermostat and a silt and damage free radiator are all necessary if this exercise is going to be successful. Fans are available in both pusher and puller configurations.

A pusher fan sits in front of the radiator

and blows or pushes air through the radiator. A puller fan sits behind the radiator and draws air through the radiator that way. The direction of the fan rotation is critical. A fan that blows, will not work if placed behind the radiator and one which pulls will not work if installed in front of the radiator. Some fans are reversible and can be used in either position. A great deal of engineering has gone into fan blade design, making some fans more or less efficient as either pusher or puller types. The manufacturer can help you decide what is best for your application.

The original fan blades need to be re-

moved and the new electric fan installed. Some are attached with traditional nut and bolt hardware and some attached with nylon straps that mount right to the radiator cooling core fins. Again the manufacturer can help you decide what is best. Now we want some system to turn the fan on and off. You could wire it directly to the ignition switch of the car. Turn the ignition on and the fan starts. Shut the engine off and the fan stops. Works, but not very efficient! You could put a mechanical switch on the dash to turn the fan on and off. Got to keep your eye on the temperature gauge all the time.



Cowl/shroud over the fan



Double electric pusher fans

Hayden preset temperature switch



to have the system work only when the ignition is on, or whenever the coolant temperature demands. If wired to work with the ignition off, remember to make sure that adequate fan blade guards are in place and that you add a warning label that the fan may start at any time.

Forget to turn it on and the cloud of steam coming from the front of the car will certainly remind you. Forget to turn it off and it becomes inefficient.

Much better to add a thermostatic switch which will automatically start and stop the fan as needed. Perhaps the simplest is the snap switch. These are wired in series with the fan and turn on at a preset temperature such as 185 degrees F. and then turn off at 165 degrees F. These are available from companies such as Hayden for less than \$40 and come as a kit with a fuse and a relay. The kit number 3652 includes a snap switch which fits between the radiator fins and needs no tools to install. Very simple. The wiring even allows for the addition of an auxiliary manual override switch if desired. You can choose

The second type of switch is adjustable. This installation is a little more complex as both the rheostat and a temperature probe need to be attached to the car. Ideally the probe should be in the water, which means getting it in the upper radiator hose where it connects to the inlet to the radiator. There is a possibility of a leak where the capillary tube exits the hose if the hose clamp is not tight enough and damage to the capillary tube if the clamp is too tight. It will work if placed in close proximity to the radiator, but will be less accurate. Most units have



Adjustable thermostat control switch and probe

an adjustment range of 32 degrees F to 248 degrees F. which is way too broad a range for our needs and once set, there really isn't a need to reset it in the future. The third alternative is to do it like the big boys do it. This involves adding a welded in bung in the radiator and a proper temperature switch. This is the ultimate method for our cars, but will necessitate some outside help installing the required radiator bung as most of us do not have the skill or equipment available. **RAGTOP**

MERCEDES TRIUMPH AUSTIN-HEALEY JAGUAR ASTON MARTIN  
 BENTLEY ROLLS-ROYCE LOTUS/ACCORD TVR  
 BENTLEY ROLLS-ROYCE LOTUS/ACCORD TVR  
 BRISTOL PORSCHE ALLARD MORGAN  
 LAND ROVER ALLARD MORGAN  
 AUDI ARMSTRONG-SIDDELEY MANCHESTER STRAKER-SQUIRE



905-953-0052 www.lnerautomotive.ca



## London Trading Post

Fine English Countrywear  
[www.londontradingpost.ca](http://www.londontradingpost.ca)

Spencefield House  
 189 County Rd 49  
 Bobcaygeon, ON K0M 1A0  
 Tel/Fax: (705) 738-1956  
 Open most weekends  
 Sat. 10am-3pm Sun. 11am-3pm or by appointment



Pino (Joe) Policelli  
 DIRECT JOBBER

### High Performance Synthetic Lubricants

Dealer Cell: (905) 510-9437  
 pinopolicelli@gmail.com  
[www.lubedealer.com/oils](http://www.lubedealer.com/oils)

**We can print your Imagination in full color.**  
**RUSH SERVICE AVAILABLE**

FLYERS / POSTERS  
 POSTCARDS  
 CATALOGUES  
 CALENDARS  
 BROCHURES  
 POCKET FOLDERS  
 BUSINESS CARDS  
 STATIONERY



22A STRATHEARN AVE, UNIT 6A - 7A BRAMPTON, ON L6T 4S9

**905.791.5558**

email: [info@printwelloffset.com](mailto:info@printwelloffset.com)  
[www.printwelloffset.com](http://www.printwelloffset.com)



## TECHNO STRIP LTD The Metal Cleaners

Chemical Dipping to Remove Paint & Rust

Shells      Frames & Misc Parts  
 Fenders & Doors      Hoods & Lids

1 Blair Drive, Brampton, Ontario L6T 2H4  
 Tel (905) 459-6196 Fax (905) 459-6196  
 On-line Quote Request: [www.technostrip.com](http://www.technostrip.com)

## European Classic Car Specialists

- Maintenance and Service
- Complete Mechanical Repairs
- Complete Electrical Repairs
- Parts New and Used
- Parts Fabrication
- Restoration of Body and Interior

