

More about Roadster Cooling

by Paul Alting van Geusau

Introduction

It is a well-known fact that over the years the cooling capacity of a radiator deteriorates and that in hot weather the risk of overheating and boiling increases. Because I run my Roadster 2000 with a high capacity electric fan only I didn't have any problems in respect of overheating but I noticed that, even at speed, the electric fan always ran for longer periods in hot weather. Checking my radiator I found that, for its age, it appeared to be in a very good state and also the cooling liquid was clear but closer inspection revealed some accumulation in the form of a thin layer covering the internals of the radiator. Despite the remedies proposed in the February 2013 Review it proved impossible to get rid of this layer by flushing the radiator. Because my electric fan draws a lot of current - almost the full amount supplied by my generator - I considered that it was time for a radiator cooling capacity increase, i.e. a radiator recore.

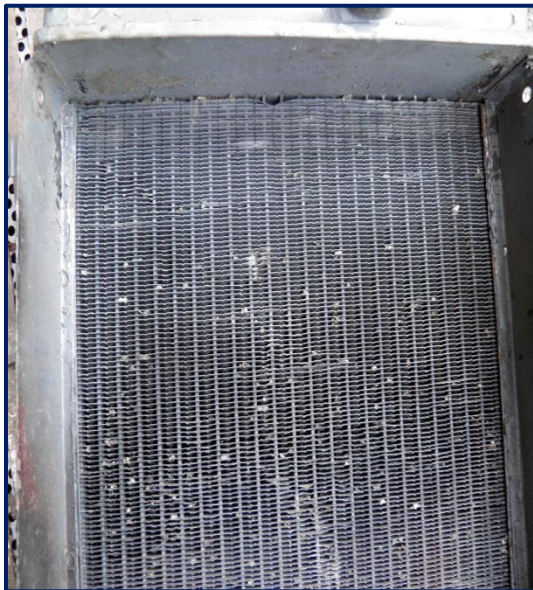
What recore?

I noticed that when counting my 2000 radiator vertical water tubes I came to 24 in a row whereas some 2000 radiators depicted in the Triumph Roadster Review articles showed a row of 36 tubes (see for example

<http://www.triumphroadster.org.uk/MembersArea/pdf/2000ChassisPics.pdf>)

Picture 1

24 vertical tubes



Picture 2

36 vertical tubes



When checking a Roadster 1800 radiator I also found 24 vertical tubes so in this respect the 1800 and 2000 radiators cores appear to be the same (assuming that also the number of tubes in the direction perpendicular to the radiator surface is the same) and those radiators with more tubes apparently are recored radiators because the companies that recore radiators tend to use upgraded cores for the repair.

Two types of upgraded cores are available.

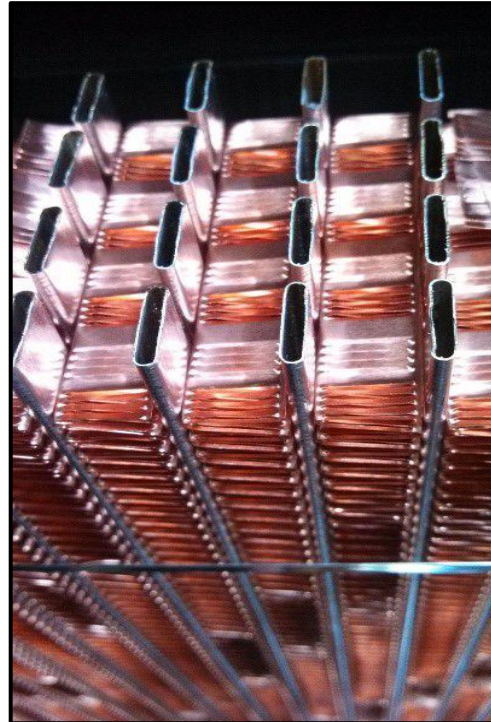
An "X-type Packed Construction" core (Pic. 3, 4) has more tubes and a higher fin pitch to increase the surface area the cool air flows over. The X-type is the most efficient core available in copper and brass and is available in many different numbers of rows (thickness.)

"Packed construction"

Picture 3



Picture 4



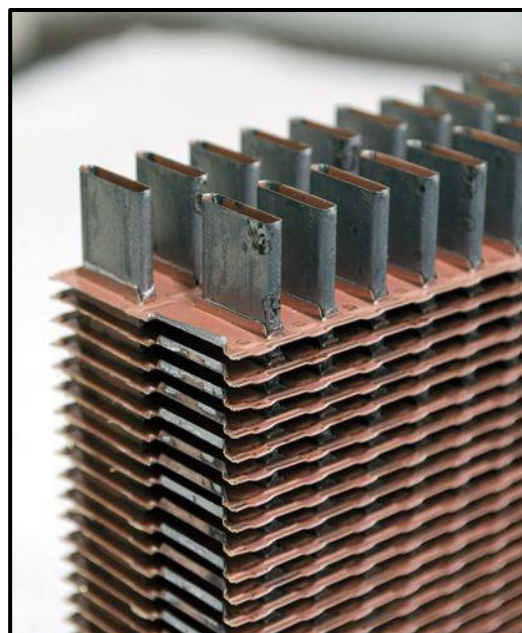
An upgraded "Tube & Fin" (Pics 5, 6) is also available which is more durable and resistant to vibration. This is the type originally fitted to the Roadster and it is advised to use the same type for the recore in view of the required robustness.

"Tube and Fin"

Picture 5



Picture 6



In fact Picture 5 shows my recored 2000 radiator (not fitted yet) and has now, if I count well, 46 vertical tubes, so almost double the amount when compared to the original core!

Costs

Of course a quality job has its price and prices may vary in accordance with the amount of work done. In the Netherlands a complete renovation of a radiator by a specialised company, including sandblasting of the frame, taking out any dents, a recore and painting costs about 675€.

For that price you have an “as new” radiator. Most companies will also carry out small modifications, for example a threaded brass plate for mounting a temperature switch. Usually these switches for actuating an electric fan are positioned in the bottom tank of the radiator but in view of the rather low Roadster running temperature of 75°C and difficulty of obtaining switches with a switching temperature below 80° I had mine fitted in the upper tank near the radiator water entry.

Coolant considerations

In the November 2010 Newsletter some advice was given about which type of coolant to use. This is perhaps a good occasion to remind the members of the club that distilled and de-ionised water is the most corrosive, while hard tap water develops limescale.

AAAClassic Coolant Pre-mix was advised but this coolant is not easily available on the continent. Based on the information given in this newsletter it is important to look for a propylene glycol based product with organic anti-corrosion additives and not the toxic ethylene glycol products or coolants having inorganic additives.

When confronted in the past with this problem I had a look at the French coolant products because Renault was the first manufacturer to use a premix coolant (in 1961 in their R4) with all year round service. The R4 engine has wet liners as in the Standard Vanguard 2000 engine, a copper and brass radiator and some aluminium (head in the R4, thermostat housing in the 2000). Therefore what is good for the Renault engine should also be fine for the 2000. In the Carrefour markets in France a universal -30°C coolant with Renault certification is available which coolant is based on deionised water, monopropylene glycol, contains organic anticorrosion additives and, if we believe the manufacturer, lasts 150.000km. As regards its composition this product appears to be quite similar to the AAA Classic Coolant Premix.

I have used this coolant since 2001 and observed that after 12 years of service the coolant, engine block and thermostat housing, where corrosion starts, were remarkably clean (see Pics 7, 8), in particular when comparing these pictures with the thermostat housing shown on page 14 of the December 2010/ January 2011 Roadster Review.

Anyway, better change the liquid every 5 years for optimum corrosion protection.

After 12 years of use...

Picture 7



Picture 8



In Germany coolant classification is a bit more complicated. The Volkswagen classification (G11, G12, G13, whereby G11 is for older and G12 and G13 for newer engines which usually having a lot more aluminium), is extensively used. However G11 often contains the toxic ethylene glycol so better go for G12.

(For the American market have a look here:

<http://www.aa1car.com/library/2004/us120426.htm>)

Coolant manufacturers give their different products specific colours but these colours are not conclusive about the composition. So always look for the coolant composition before ordering your product.

Electric fan

Electric fans come in two varieties: a pusher fan (mounted in front of the radiator) or a puller fan (mounted between the radiator and the motor).

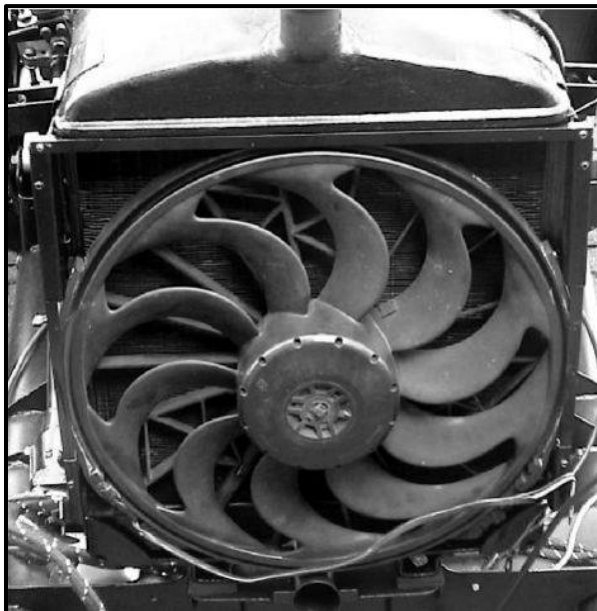
Puller fans are about 20% more efficient than pushers. A puller draws the air in at any angle and around obstacles, pulling the hot air from the radiator. With a pusher the air is pushed towards the radiator and this causes some bounce where it loses 20% of its flow.

Additionally, a pusher will impede air flow through the radiator while driving (Pic. 9).

However, with a mechanical fan in place normally there is not sufficient room for a puller fan and that is the reason why I initially mounted a pusher fan. Now that I omitted the mechanical fan entirely I will replace the pusher by the more economical puller fan when I install my recored radiator (see picture 10),

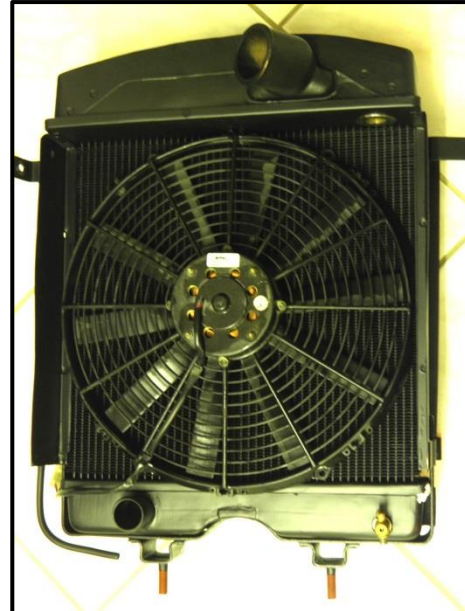
Picture 9

Pusher



Picture 10

Puller



The only negative point with electric fans is that they draw a lot of current, usually in excess of 20Amps. This may not be a problem if combined with a mechanical fan because in such combination the electric fan normally runs only for short periods to avoid overheating at low speeds. However, when having to rely on the electric fan only, definitely a dynamo upgrade is necessary because the original dynamo gives about 23 Amps Max. I opted for the Dynalite, an alternator in Lucas C40 housing.