

Overheating Problems

It is during the summer months, when our cars tend to make extended trips in warm weather, that members report problems with overheating. Either the car runs hot all the time, or the temperature gauge fluctuates erratically between normal and hot. Our cars were originally designed with adequate cooling (when new!), and to prove this many are still used today for long and arduous journeys in very hot climates. There have been discussions on this topic recently on the RREC web site message board, and there are many interesting articles in the five RREC Technical Manuals.

We will assume that the engine timing (valve and ignition) are correctly set up, that the carburettor is correctly adjusted, and that the air tubes through the radiator are not blocked (these can all be checked fairly easily). If all the above pass inspection, overheating is caused by poor circulation of coolant. This could be a worn water pump, partially blocked radiator, or blocked waterways in the block and/or head, see photograph. There is no alternative but to check these out systematically and remedy the cause of the problem. In cases where the block and/or the head are choked full of rust and scale, this can be a long, long job and possibly require a new head, but the results will be worth it. A good job for the winter, if you intend to intend to enjoy journeys of more than 10-20 miles next year!

An official modification designed to improve water circulation around the rear of the head and block was to blank off the front six water holes on the off side of the cylinder head, see photograph reproduced from Haynes & Grigsby. Most cars should have received this treatment already, but check when you next have the head off.

Once the system is clear, the engine can be maintained in pristine condition by running with the correct coolant at all times. The correct formulation is a 40%-50% mixture of concentrate (glycol containing corrosion and scale inhibitors), with clean deionised or distilled water*. Suitable inhibitors were not available when our cars were first put on the road, and indeed were not regarded as necessary right up to the 1960s. Even in the 1970s, many people continued the custom of replacing their "antifreeze" with plain water for the summer months. Rapid corrosion always results when dirty water courses through a mixed-metal labyrinth made of iron, copper, brass and aluminium components. The system behaves more like a short-circuited battery than an internal combustion engine. Therefore all cars which have not had a comprehensive engine re-build, regardless of mileage, are certain to have their water passages partially blocked by rust and scale.

It is also important to renew the coolant every two years, to preserve the effectiveness of the inhibitors.

Stephe Boddice, on the RREC message board, warns that the latest coolants designed for the most modern cars use organic inhibitors which attack the types of gaskets and sealants used on our old cars. This can cause serious leakage of coolant. To summarise Stephe's long story, manufacturers have now started to declare what type of inhibitor is used in their concentrated coolant: avoid coolants with OAT (organic acid technology) or HOAT (hybrid organic acid technology).

We are lucky that modern technology enables our cars to be both used and preserved; however you must only use coolants with IAT (inorganic additive technology). In the UK, if the coolant is coloured blue, then it is OK. Check the label and the colour.

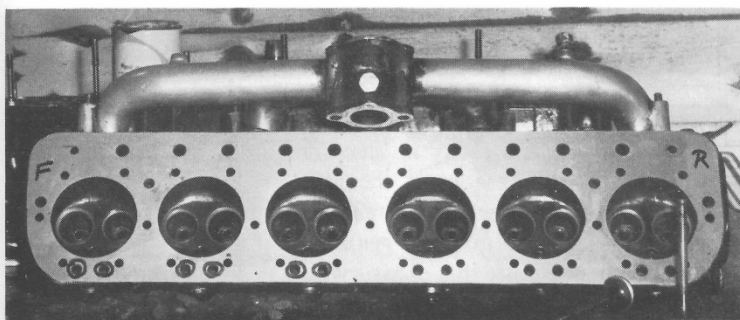
One correspondent phoned to say he used the modern OAT coolant in his 20hp after it had been fitted with a new head gasket. The engine had an aluminium head and a recently-skimmed block. Within a few miles coolant was pouring from the head gasket, and from other locations. So he added Radweld to temporarily cure the problem, but this had another potentially disastrous effect: Radweld blocked a water strainer which was located in his radiator feed pipe, and this caused rapid overheating. So be careful when using a leak repair material, especially if you have a water strainer!

K-Seal is a good leak repair additive as it is composed of microscopic fibres plus ultra-fine particles of copper which combine to clog up leaks without clogging the fine gaps between the tubes in the radiator.

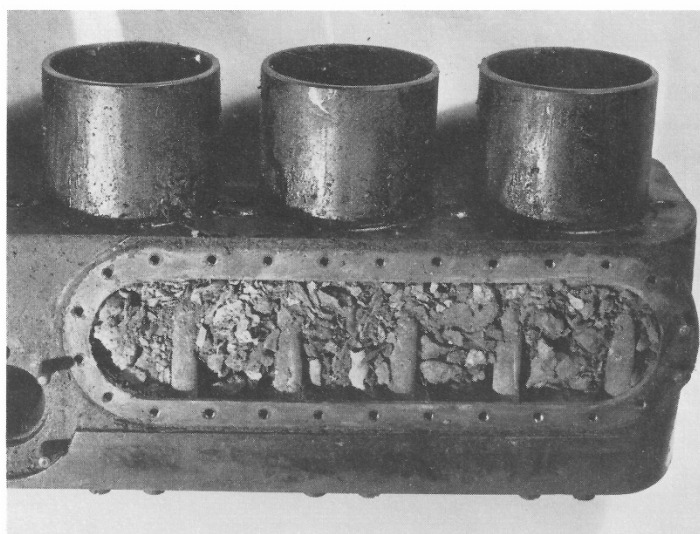
* If you use deionised water it should be specified for use in car batteries and purchased from a reputable source such as an auto factor. It is quite expensive to buy in bottles but if you or a friend work in a laboratory, deionised water is available on tap at negligible cost.

Do not use softened water, as that merely has the calcium and magnesium ions replaced by sodium, so is even more corrosive than hard water!

It is difficult to buy distilled water these days, so you can collect your own from a dehumidifier. Clean rain water is by definition distilled, and can also be used. Any slight acidity in the rainwater is negligible, and anyway is completely neutralised by the inhibitors; just check that the rain it is not contaminated by Sahara dust!



20/25 cylinder head, showing the front six water holes on the off-side of the engine to be blanked-off to improve water circulation around the rear of the head and block.



Early 20 h.p. cylinder block showing an accumulation of scale inside the water jacket. The large apertures revealed when the side-plates are removed constitute a structural weakness, and cast-iron 'struts' were fitted to many early blocks, the later ones having them cast-in.