6.2 Radiator Repairs

THE HONEYCOMBE MAZE V11 12 Oct. 1980

D. J. D. Gwatkin

My 1938 Scott had lain in pieces for 20 years, and in 1977, I decided to put it together again. All went well till I came to the radiator, this had lain in a box after it had been chrome plated when I stripped down the bike. I fitted two corks to the top and bottom hose outlets, and filled it with water, it made a smashing gardening can, and leaked everywhere!!!

After I had come round from the fright I'd had, I looked in the *YOWL* and rang up Johnsons at Hull. I was told that they don't do the repairs any more as the only man who could do the work has retired. Next, it was Serk, they didn't want to know, neither did a local radiator repairer, but he suggested I try Marstons, and they quoted £325 ('77 price).

I then decided to try and do the job myself, and went in search of a metal stockist, haveing ascertained that the hole size in the radiator was $^{9}/_{32}$in. O.D. The tube on the radiator is "belled" out to a larger size one end. After many false trails, I was given the name of J. Smith & Sons, 50 St Johns Square EC1 (01-253-1277) and bought 10ft (0.3 Kilo) of $^{9}/_{32}$in. 24 S.W.G. tube for £3.00 odd. Today's price Aug '80 is £8.93 a Kilo which is 33ft, which makes 132 tubes approx.

I then cut up this tubing into lengths of 2$\frac{7}{8}$in, which is $^{11}/_{16}$in. shorter than the width of the radiator, chamfered the ends to 45°. Bought some Plastic Padding, the hard stuff (N°3 Hard).

To find out which tubes leaked, I hit on the method of filling the radiator with water, and pushing lengths of tie wrap into the holes (the wire embedded in paper for sealing plastic bags), then letting out the water and drying the radiator on the boiler! This left me with a set of marked tubes, I cleaned up the ends, so that the Padding would take, and pushed the new tubes in so that they were recessed each end. Using about 6 tubes at a time and making up the Padding in small quantities, because of its setting time, which is about 10 minutes. When all the marked holes had been filled, the process was again repeated with water and tie wraps. If you get Padding into the new tubes, don't panic, you can drill them clear later with a smaller drill $^{7}/_{32}$in. Sand down the rough parts around the tube ends, and again see what happens, I heated water in a metal bucket on a portable stove and filled the radiator with "Bars" leak repairer and kept filling the radiator from the bowl, till it stopped leaking!

So far I've done about 1000 miles, and the radiator hasn't leaked very much (crossed fingers). The total cost was around the £10 mark.

RADIATOR FINISH V8/12 July 1974

Having attended a few Rallies of late and seen a few very nice Scotts, marred with either brass or enamelled radiators, and remembering the expense, and problems involved in re-chroming them, I wonder, has anyone tried those aerosol cans of "stainless steel" on Scott radiators?

I recall that these first appeared two or three years ago at about 50p per can, and were said to be molecules of stainless steel suspended in polyutherane, the flakes drying to a smooth surface indistinguishable from the stainless steel.

If this is the case, it may well be an improvement upon removing the last vestiges of plating and polishing up the revealed brass-work.

Has anyone tried them—if so, let us hear about the results.

Concertaina hoses for Brum Scotts V13/6 Oct. 1983

Dear Sir,

I had previously found it difficult to acquire a concertina-style radiator hose for my 1957 Brummie Scott until a recent visit to the Isle of Man. While I was there, I got talking with the owner of a 1967 Brummie Scott who told me that he had acquired his hose from a garage. It appears that the garage owner had searched through a box of old hoses and discovered that the appropriate hose was that from an old Morris Minor Traveller.

So, on returning, I went to my local garage and ordered this type. To my delight, all I had to do was to cut about ½in from either end to attain a perfect fit.

I sincerely hope this information will help Scott owners who have had the same problem.

Eric Blyth

KEEPING THEIR COOL

(Reprinted with acknowledgements to Autocar, 25.3.78)

One of the most vulnerable mechanical components of any front-engined car tends to be the radiator, and especially its core. Anyone who has had even a minor front-end shunt will know only too well the telltale signs when the trickle of anti-freeze appears, indications that the core is no longer in one piece. Although there have been advances in the materials used for cores, they still tend to be relatively fragile. A new core for a modern car is an easy part to obtain, but where do you go for a new radiator for your Bullnose Morris, Rolls-Royce Phantom 1 or your Bugatti?

Many of the older types of cars had the cores as an integral part of the shell, so that corrosion can set in not only in the cooling areas, but in the top or bottom tanks. A dented, patched or badly repaired shell can ruin the appearance of an otherwise immaculate vehicle.

Marston Radiators have been in business for nearly as long as the motor car has been in existence, and the founder, John Marston, made the cores for Sunbeam originally, and later for Rolls-Royce, Wolseley, Vauxhall, Albion, Beardmore and Austin. The honeycomb system developed by Marston is still used by the vintage restoration unit at Coventry. The process starts with either circular or square section brass tube, 6, 7 or 8mm in diameter. These are cut to the appropriate length (between 50 and 140mm) and then their ends are expanded by about 1mm over their original diameter. The tubes are then stacked on their ends in a rectangular frame, although the profile can be varied to suit the various models. For instance, the Bullnose Morris has a curved front, while the Mercedes has a V-shaped appearance. With the tubes held firmly in the frame, they are then solder dipped to seal the gaps. This initial dip gives around a 90 per cent seal; the final job is done with a flame torch and a great deal of skill. Too much heat will cause the solder to run out in adjacent joints, and too little will not do a proper job.

The shells, such a distinctive part of any vintage car, are inspected for damage, either physical or chemical in the way of corrosion. If they can be repaired they are. Otherwise, it is a matter of making a brand new one, finishing if necessary with brand new enamelled badges, caps and hose stubs.

The rectangular core is then cut to shape against a template, with individual tubes being "picked" off with a flame gun and piece of wire until the right outline is achieved. Then the whole unit can be assembled. Marston do not confine themselves to car radiators. They have a fairly regular job in rebuilding Scott motor-cycle radiators, and the recent upsurge in interest in war planes has meant that they have become experts once more in rebuilding the under-wing radiators for the Spitfire and Hurricane fighters. One recent order was for a couple of the distinctive hexagonal radiators for the First World War Spad fighter, destined for the United States.

Costs vary greatly, but a complete radiator for a Rolls-Royce of the 1920s will cost in the region of £2,500, while even the simple radiator shell for a MG T-series, modified so that the centre bar will not fracture, costs £250. But without a radiator, a veteran car, like any water-cooled car, will simply not be able to keep its cool.

RADIATOR TOPICS

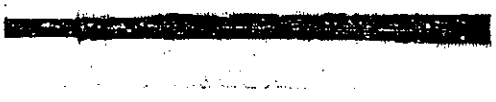
The last edition of *Yowl* was largely devoted to lubrication topics, and I had hoped that both of the "to be continued" articles would be concluded in this issue. Unfortunately, neither of the contributors has sent any material, and this results in a sudden change of content for this December issue. Whilst the oilpump and ignition system on a Scott undoubtedly make a vulnerable pair of "Achilles' heels," there is another component which can make life miserable for a novice with a well-worn model—the radiator. Nearly all pre-war Scotts had radiators built on the honeycomb core principle, and they were robust as well as reasonably efficient. If damage did occur, or a leak developed, it was easy to repair the faulty section—a good tinsmith could take out the bad tubes and put in new ones. Northern and Serck radiators used thin-wall brass tubes, slightly bell-mouthed at each end. (Gallay radiators, fitted on some models, were not of the honeycomb type). Soldering honeycomb cores should not be undertaken lightly by a novice, but any reasonably skilled handyman should be able to make a serviceable job. If in doubt . . . go to a *good* repair firm. Reg. Summers, who spent the best part of his working life with Sercks, should be able to recommend suppliers of suitable thin-wall tubing for the cores. (His address is in the membership list).

The Scott "radiator" is not really a radiator at all. Although some heat *is* lost by radiation, the majority is conducted away by the airstream as it flows through the honeycomb or finned core. Devices of this type are generally known as heat exchangers, and in recent years much development has taken place in their construction and efficiency. Of particular interest to Scott owners is a new material called "Hi-Temp Hi-Fin" Ferrotherm tubing, which has obvious possibilities as a new "radiator" fabric.

Ferrotherm's helically-wound fin tubing, with up to 40 fins an inch and with a continuous brazed metallurgical bond between fin and tubing, is said to have twice the heat transfer area and efficiency previously attainable. There is a choice of tube materials, fin materials, tube diameter (5/32 inch to 5/8 inch) fin height and fin spacing. The stress-free fin brazing process also is said to permit use of thinner wall tubing, with corresponding reductions in weight and cost of tube required.

The tubing is available with a 0.001 inch fusion-bonded nickel-chrome alloy coating which can be applied over fins of copper, brass, bronze and other materials. Similarly-clad materials, such as stainless steel tubing finned with stainless-clad copper fins, have withstood prolonged tests in compact, efficient prototype systems.

Details and prices may be obtained from the manufacturers:
The Ferrotherm Co., 4758, Warner Rd., Cleveland, Ohio, U.S.A.



Left: "Hi-Temp Hi-Fin" tubing. (Illustration and block by courtesy of "Research Techniques and Instrumentation.")

If readers are by now wondering how on earth Ferrotherm tubing can be utilised as a radiator core, they will see the obvious application in an ingenious type of heat-exchanger developed by Winn and Son, Ltd., Milton St., Maidstone, Kent. It was described in *The Autocar* over ten years ago, when a prototype was built for Stirling Moss's Cooper-Alta. There were three rows of vertical, finned tubes ; side plates were welded between header tank and bottom, forming

an oblong frame which relieved the cooling tubes of all structural duties. Here is how *The Autocar* described the construction :

"A new kind of radiator, which has removable and renewable tube elements set in rubber, is making its first appearance in the car world in the Cooper-Alta built for Stirling Moss. Besides its light weight—that one weighs only 10lb. and is made of aluminium alloy—the radiator has the advantage that a damaged tube can be removed quickly by hand and a new one fitted, even during a brief pit stop. Steel, copper and brass have been used for commercial transport and industrial cooling applications.

Each of the top and bottom plates, which receive the tubes, has a sheet of rubber bonded to one side. Holes are punched to receive the ends of the tubes ; owing to the momentary deformation of the rubber as this takes place, these holes take a slight taper, which makes entry of the tubes easy, while the rubber springs back a little to make a tight fit for the tubes. A special mix of rubber is used, synthetic enough to resist oil and ethylene glycol anti-freeze, and natural enough to retain its springiness. If the centre of a tube is taken in the hand and pulled, the tube curves and the ends come out of their holes ; a new tube is curved, and straightened into place, entering the ends in the rubber holes. The cooling fins on the tubes are a continuous spiral, like a screw thread, each fin being initially one long strip, but "frilly" Clayton-Dewandre wire fins have been used as an alternative in some radiators. Each rubber-covered plate has, laid over it, a plain metal plate with matching but larger holes, and the flanged edges of top and bottom tanks are rolled round the edges of the plates, holding them firmly together. A complete radiator has side members welded to the top and bottom tanks, so that all the structural strength is in the form of an oblong or square frame. Apart from the very light weight, this form of construction renders the radiator impervious to vibration and distortion ; it is quite possible to spring the frame and misalign the top and bottom tanks with no effect whatever on the tubes and their seals.

The impression was gained, during a visit to the makers, Winn and Son, Ltd., Milton Street, Maidstone, Kent, that such radiators are easy to produce and assemble, and would, therefore, in large-scale production compare favourably in cost with a normal radiator having a soldered element."

So far as I know, nothing has developed on a commercial scale yet. There may be disadvantages, although it is difficult to see why there should be. Perhaps one of our "special-building" members will look into the idea—or are they all finding modified LE radiators entirely satisfactory ?

A very useful kit for would-be honeycomb-menders is available at 7*s.* 6*d.*, and it makes soldering to chromium-plate (on header tank and side-plates) much easier than with conventional acid or resin fluxes.

With the new Wescolite solder kit it is possible to tackle almost any soldering job without difficulty—even chrome to stainless steel.

No pre-cleaning or after cleaning is necessary, and all common metals (except aluminium, magnesium and zinc diecast) can be soldered, both to themselves and to each other : stainless steel, chrome, monel, copper, brass, some types of cast iron, nickel-silver, steel, galvanised parts, gold, silver, bronze and coated steels.

The kit consists of a small dispenser bottle of Fluxall (a newly developed flux) and a coil of Wescol 220 soft silver solder. Fluxall will disperse oxides as tenacious as the chromium and nickel oxides found on stainless steel. The solder has high tensile strength with strong capillary action and excellent wetting action and is highly resistant to water corrosion. It is quick melting and setting.

V4/9 Dec. 1965

For 4 feet of one-sixteenth inch silver solder and a small plastic dispenser bottle of flux, both contained in a small plastic drum, the cost is 7*s*. 6*d*.

Let me finish by wishing all readers the very best for the festive Season. May you enjoy safe Scotting in 1966, and may you also send me something for *Yowl*.

Sincerely,
GEORGE.

V9/5 May 1975

REEVES ON 'RADS'

My 2-speed Super has now been running for several years and though mechanically sound, is by no means 'concours', especially the radiator, which has several dents and large quantities of solder applied by a previous owner. However, it didn't leak, so I carried on.

When I retired last year, I decided to rectify this under the mistaken impression that I would have lots of spare time.

I went all brave, heated up my biggest soldering iron and took out the end caps from the header tank and promptly wished I hadn't for under the mound of solder were lots of cracks both on the caps and the header tank.

Well, I had passed the point of no return, so I had to do something!

There were three possibilities, beating, pressing or spinning.

Well, I am not that good at beating, I haven't got a press set, so I had to settle for spinning.

As I had not done any metal spinning either, I spent an evening looking through some old copies of the "Model Engineer", finally coming up with an article by the late E. T. Westbury, giving all the details.

First I made a template then a hardwood former and finally after a practise run, I turned out a cap. A paper template was then made to suit the header tank in the flat and from this a thin sheet brass header tank top was cut, bent to shape, and soldered in place over the dents, then the caps and all feather-edged to hide the join.

Fired by this success, I tackled the core, taking out twenty-two tubes. For replacement tubes, I had some copper which was cut to length, pushed onto a mandrel and the centre reduced in diameter leaving a flange at each end for soldering together.

I had intended to have the radiator plated, but the time had gone on and the riding season was with us, so that will have to wait.

G. R. REEVES

THE GOOD SCOTTING GUIDE (Part five)

Brian Marshall

This article is concerned with radiator care, and as a new radiator can cost you anything up to £450, this component is well worth looking after carefully.

Leaky old radiators are a curse that most of us have had at some time or other, and once a radiator gets to a certain age it seems inevitable that they start to give trouble. Years of high frequency vibration, stresses and stains, plus the occasional knock, seems to fatigue the solder, and a repair in one spot only seems to cause another leak a couple of inches away from the repair.

There is also the question of aesthetics, because the radiator is very much part of the Scott's uniqueness, and nothing spoils a Scott's appearance more than a grotty battered old radiator, full of blobs of solder, dents, and peeling plating.

Internal care is simple. Don't just use tap water in the cooling system. Use 'soft' water such as rainwater, deionised water, or distilled water, to which has been added a glycol-type antifreeze containing a corrosion inhibitor. The majority of modern antifreezes are suitable, but check from the label that it is a 'universal' product ("suitable for both iron and aluminium engines") and methanol free. Use this mixture all year round and don't drain the system unless the bike is going to face very hard frosts. (With a large enough percentage of antifreeze in the coolant there is never any need to drain.) If you do drain the system, put a large reminder label in a prominent position on the bike, so that the first ride in the spring doesn't have dire consequences! (Have you got that, Arthur!?)

Do not use proprietary leak sealers in the system, even as a get-you-home measure, because they will clog the small gaps between the tubes and reduce the efficiency of the radiator. (A blob of chewing gum, soap, Araldite, or whatever, applied externally to the leak, should get you home without ruining the radiator.)

Every Scott that has come into my hands has had the radiator mounting bolts over-tightened, and several have been so grossly over-tightened that the rubber washers have been flattened and distorted. The correct technique is to slowly tighten the nuts whilst attempting to turn the rubber washers with the other hand. The nuts should only be tightened sufficiently to stop you turning the washers; just a slight 'nip'. As the washers settle, and become affected by heat, this will need checking annually, but renew the washers if they show signs of hardening, perishing, or splitting.

The rubber sleeves over the mounting bolts should also be renewed when they start to harden, and always choose as soft a grade of tubing as you can find for the sleeves, because this helps to absorb vibration.

If you are unlucky enough to have your Scott fall over, you will normally find that the radiator will escape major damage if you have 'standard', factory-fitted handlebars. Those with shortened handlebars should note that if their Scotts fall over, the radiator will take the impact instead of the bars! I suppose that if you are in the habit of going through narrow gateways or passages with your Scott it would be prudent to fit a 'badge bar' or something similar, across the front down tubes to protect the radiator.

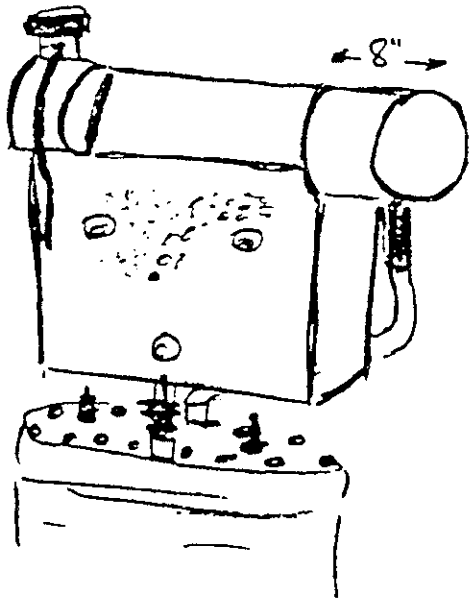
There is not much to say about the fitting of hoses to radiators. 'Concertina' type hoses certainly are easier to fit, and transmit less vibration from the engine to the radiator, but they look awful. One inch bore genuine Dunlop hose is still available (in one metre lengths) from most rubber suppliers, but if you have difficulties getting hoses, there are plenty of one inch bore car hoses that can be used. Some Scotts seem to have an awkward angle between the hose spigot on the radiator and the spigot on the cylinder head. this tends to make the hose crease and cause overheating, and a car hose with an appropriate moulded-in bend is a better bet than straight hose. (To avoid creasing of a straight hose, a useful tip is to insert a spring of stainless steel wire into the hose at the critical point.)

Right then, that's it, so the Rule No. 5 is:
LOOK AFTER YOUR RADIATOR.

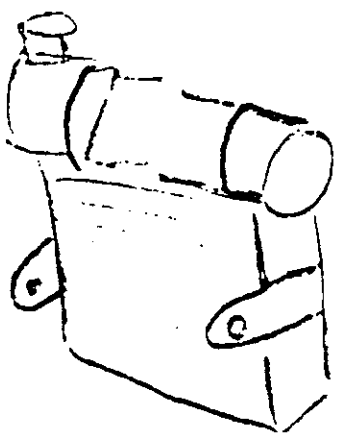
RADIATOR MODIFICATIONS

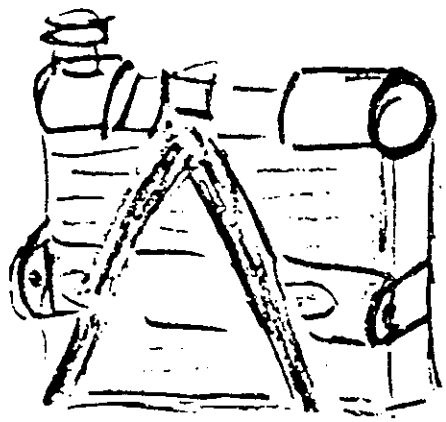
Brian Lilley

I have recently come across a couple of modifications to Scott radiators which may interest readers, even if there is a possibility that they were well known in the distant past. Both these mods seem to have been put into use, but I have no information as to whether they were a success or not.



The first is an attempt to improve the cooling on a Scott combination in the late 1940s, when the owner, a Mr. Jackson from Wales, who had experienced overheating whilst touring with four up, decided that increasing the capacity of the radiator header tank would help, so he extended the header by taking off the end cap on the near side, and soldered in a tube of a slightly larger diameter as the header, so that it now projected out about 8" towards the sidecar. The end cap was refitted, and the existing cylinder head to radiator top tube was blanked off. An inlet tube was taken from the new header extension to the cylinder head via a flexible hose. The pre-war machine to which this modified radiator was fitted, was eventually sold to make way for a 1947 model, and was sold without its increased capacity radiator.





The second modification is on a Scott bought by Bill Lymburn, and is an attempt to make a repair to the radiator core without facing the problem of having to put in the three, through-the-core mounting holes. The original honeycomb core has been removed and replaced with a complete section of modern filament block. A pair of side brackets was then fixed, one either side of the radiator, so as to mate up with a purpose-made bracket bolted to the usual mounting lugs. The whole radiator then seems to have been. It seems to be quite an economical way of rebuilding a radiator if you are not too bothered about originality.