Erik

Joined: 10 May 2005
Posts: 410
Location: Moerdijk, The Netherlands
Posted: Mon Oct 01, 2007 10:06 am Post subject: Boiling Scott

---

Hey all,

During the last weeks I have done several trips on my two speeder. On track, in town and longer (100 miles +). On all occasions the water in my radiatior started to boil at some point.

So far I have cleaned the radiator through riding with water with soda in it. I have also taken off the waterdome and sealed it again. The rubber rings that were used to seal it seriously restricted water flow. Both rad as the cylinderblock look very clean. Ever since my first clean whenever I drain the water it is always almost crystal clear (picture was before that ;o)

I have replaced the bottom hose that had a serious dent in it. I have checked my ignition settings 4 times. It is set on 35 degrees max advance. The jets in my binks 2 jet are 2 and 9 (the right ones according to the Binks manual).

All this measures have helped quite a bit. Yesterday, during a 110 mile run, the water only boiled two times and I did not loose as much as earlier. Last week I had to top up 1,5 liter (total capacity is 3 liter!)

The bike runs absolutely fine otherwise.

Any idea what I could try next?

Back to top

efr215

Joined: 06 Nov 2004
Posts: 215
Location: Leigh-on-sea, Essex
Posted: Mon Oct 01, 2007 12:17 pm Post subject:

At anything like full chat the radiator has to dump something like 4Kw. of energy, it is none too large in area, it relies on the thermosyphon process for circulation and has no forced draught save forward motion so at best the heat balance is marginal.

Ensure that the down pipe in the head is as near the bottom of the water space in the block as possible without restricting flow. I have two old heads with steel tubes that are largely rusted away thus effectively reducing the height difference between hot and cold connections, might be worth a check.

Heat rises and the greater the temperature difference between pipe ends the better. Oddly enough the radiator, other than rejecting heat plays, no part here. Sounds odd? Not really, if the ends of the two pipes were of equal height there would be little or no circulation radiator or no. Scale and any repairs to the core will reduce flow so it is an off the bike job for a thorough clean and

back flush.

Not pretty maybe but if your bike has electrics how about fitting a couple of computer cooling fans to the radiator? It is probably at low speeds when there is little airflow that the heat builds up and it would be simple enough to make them easily removed for showing.

A word of warning, aluminium is resistant to most acids but is not good with alkalis so avoid the soda treatment just to be on the safe side.

Back to top

Erik

Joined: 10 May 2005
Posts: 410
Location: Moerdijk, The Netherlands
Posted: Mon Oct 01, 2007 12:33 pm Post subject:

I noticed the heat building up when riding slowly through a traffic jam for a long time, while standing to have a look at the map and while going flat out on track. But mostly when going slow.

The pipes are not rusted and compared to my other Scott the internals of the waterdome and cylinderblock are really clean.

I have used the computer fan on my Piatti scooter that also serious cooling problems. But that was out of sight completely. I am sure there must be a way to prevent the boiling on my Scott, my other Scott never boils.

Any ideas on where to flush the rad with? Worth a shot although it seems very clean....

Back to top

efr215

Joined: 06 Nov 2004
Posts: 215
Location: Leigh-on-sea, Essex
Posted: Mon Oct 01, 2007 2:22 pm Post subject:

There are propriety products on the market; Holts sell a radiator flush product in the UK for instance. Citric acid crystals can be bought from the chemists, (drug store), and should deal with limescale after a soak. A 10% Sulphuric acid mixture would be quicker but needs a lot more care in its use and disposal.

While the radiator internals may look clean, and lets face it you can't see much through the various 'sposed-to-be-there holes', it is still possible that there are fragments of rubbish trapped in the small tubes. The water in your picture looks fairly rusty coloured so there might be some larger flakes. Also vandalism is not just a 21st century thing and there has been plenty of time in the bikes life for enterprising imps to insert foreign objects for fun or malice.

From what you have written, engine clean, pipes OK, etc. it would suggest that the problem can only lie in the radiator core although short of a well trained

mouse with a miniature video camera its going to be hard to know for sure other than taking a tin opener to it! The only back yard test I can think of is to invert the radiator and feed a known quantity of water into the top hose fitting from the same height as the difference between the radiator and the engine and time how long it takes to stop flowing out of the bottom fitting. If it proves to be slow you will know you have a problem. The down side is that we have no benchmark and such a test is likely to be fairly insensitive. I will try it on my radiator and see what happens, (it is off the bike so its not a problem); at least then there will be something for a comparison.

Back to top

Erik

Joined: 10 May 2005
Posts: 410
Location: Moerdijk, The Netherlands
Posted: Mon Oct 01, 2007 2:49 pm Post subject:

My rad has been recored long ago by a Belfast firm. It is not honeycomb anymore but more of a waffle design. It holds a little over 3 liters (incl the engine block) and that is more than my larger Flying Squirrel honeycomb radiator! See picture:

I will try and flush it. The rusty water was before I cleaned it After that I have done some 400 km and the water now is very clear. But it is still worth a shot. Taking it out is no effort, I have done so several times the last weeks. So I will do the test with the water sometime soon.

To be sure I understand your idea: So take out the rad, hold it upside down (with the fillercap on it of course), pour in let's say a liter of water, turn it the righ way and see how long it takes to pour out again. Am curious... I did flush my rad vigurously using my garden hose and it was pratically going out one hole as fast as it was going in the other...

But I do like the old school style of this test ;o)

Back to top

efr215

Joined: 06 Nov 2004
Posts: 215
Location: Leigh-on-sea, Essex
Posted: Mon Oct 01, 2007 3:57 pm Post subject:

Not quite, hold it upside-down with the cap on, for convenience you can keep the hose on. The idea is to use the head thus provided to mimic the force generated by the thermosyphon effect. Use a bucket of water, most seem to be marked in litres so you have a known quantity. Pour it all in as fast as it will go and time how long it takes to stop flowing through. If a bucket proves too little to get a reliable time the flow is probably OK anyway but to be sure you could fill it with a hose for a known time and fill buckets with the outflow. Do a before and after and see if there is any difference.

Some garages/workshops have facilities for pressure flushing so it might be worth asking around. Do any neighbours, (if any are still on speaking terms with you yowling around the block that is!), have one of those pressure-washing wand things that are used for cleaning algae off concrete and paths? A good radiator should be able to stand several pounds of pressure, if not it's on the way out anyway so better to find a weakness at home than 50Km away, there is little risk. Failing that if you have a greasy spoon nearby you could always nick a radiator off a 16 wheeler while the driver is feeding his face. It'll be down to you how you see over it though!

Back to top

Roy Lapidge

Joined: 07 Feb 2006
Posts: 4

Posted: Mon Oct 01, 2007 8:30 pm Post subject:

Hello Erik,
I am no radiator expert but I believe that there are variations in the cooling surface area of the 'waffle' type radiator cores.

When your 2-speeder had it's rad. re-cored, perhaps the incorrect core was used and hence it had insufficient cooling from day one.

Regards.

Back to top

efr215

Joined: 06 Nov 2004
Posts: 215
Location: Leigh-on-sea, Essex

Posted: Mon Oct 01, 2007 11:29 pm Post subject:

Roy makes a very good point, something I'd not thought of. Can anybody state with any certainty how many core tubes these radiators originally carried and their size? Fin numbers, effectively surface area, would also have a significant bearing, anyone fancy counting 'em?. With that information it would be a fairly simple matter to work out the rate at which the core might be expected to reject heat or at the very least do a numbers comparison with the current core.

One small point, I've tinkered on the test bed and elsewhere with a lot of different engines over the years and I can't think of one that needed 35° of advance. I'm speaking of regular stuff now not racing machinery, that's not my field. I'd have thought 28° to 30° for full advance would be quite enough for a 2stroke, which has a much lower effective compression ratio than the bore/stroke/combustion chamber volume might suggest. Too much advance will result in the pressure in the combustion chamber rising too early which will tend to slow the piston, in turn that will require more throttle for a given demand resulting in the engine burning more fuel and producing more waste heat. Something to consider maybe?

Mark you, too retarded can be even more embarrassing as evidenced by the Scott rider I met in Canterbury many years ago. I'd pulled up at the traffic lights by

the cattle market; the Scott rider was going the other way. A smug grin crossed his face and while honour bound to wait for the green he was clearly anticipating thrashing my old Comet to the centre of the junction, which was the object of the exercise, and we both knew it. The lights changed, a big fistful of throttle and the confident grin changed in an instant to one of stark horror as he nipped smartly backwards and fell off! You've guessed it, he'd retarded the ignition to get maximum grunt and the Scott engine being at tickover had quite happily gone into reverses!

I even had the decency to stop as he picked himself out of the gutter and enquire if he was all right. His reply was unprintable even to this day . . .

Back to top

Erik

Joined: 10 May 2005
Posts: 410
Location: Moerdijk, The Netherlands
Posted: Tue Oct 02, 2007 6:54 am Post subject:

I guess Roy could have a point. I have send John Hodges an email on this as he makes new rads he might know something on this subject too.

I set the ignition on 35 degrees because that is the figure I read in several postings on this forum. I double checked with the figure of 7,5 mm before TDC that Ian Parsons gave me (he has used this setting for years and got it from Glyn Chambers). But while going through the search again I also read of settings more around 30 degrees...

When I bought the Scott the ignition setting was fixed as the bike missed a lever for it. Last week I put on a lever so I could vary the ignition. During my 110 mile trip last weekend I played with the ignition and hardly used it on full advance, mostly just a bit less while doing 50 mph. So in practice i think I have been riding around with about 30-32 degrees that run. The boiling was less but not gone.

_____

Back to top

PHIL

Joined: 02 May 2007
Posts: 10

Posted: Tue Oct 02, 2007 4:02 pm Post subject:

Erik
Not tried this but might be worth thinking about. Anyone else have any comments ?
Regards
Phil
http://www.redlineoil-europe.com/coolants/product.asp?product=SuperCool%5Fwith%5FWaterWetter%5F00089

Back to top

efr215

Joined: 06 Nov 2004
Posts: 215
Location: Leigh-on-sea, Essex
Posted: Tue Oct 02, 2007 5:52 pm Post subject:

That stuff is basically washing up liquid without the bubbles. As the biggest problem in transferring heat from the water to the outside is the boundary layer it should work although to what extent I would not want to guess. Many years ago I had a student that did some work on boundary layers, he calculated that if it were possible to entirely remove the boundary layer effect power station cooling towers could be reduced to the size of a three-bedroom house. He didn't say how big the bathroom was but it does serve to indicate the scale of the effect. As it also seems to claim it has corrosion inhibiting qualities can't see it doing any harm to anything other than your wallet.

I've been trawling through some old data regarding ignition settings on bikes and while most of it refers to 4strokes the angles for full advance ignition settings are frequently quoted as in excess of 30° so maybe 35° for the Scott makes sense after all. The trouble is that finding out exactly the setting that suits your engine with any certainty is a test bed job. (When I think of all the Heenan Froude brakes I've scrapped I want to cry!) However all is not lost if you can fit an accurate rev counter of some sort it is just possible, if a bit dangerous, to do some testing on the bike. The ignition is first set slightly early; the machine is run up to maximum revs in top gear and the ignition is then retarded a little. If the revolutions increase retard the ignition a little more until the revs start to drop back. It then only remains to reset full advance to the best setting.

If at the end of it you are not parboiled, broken the crank, run or out of road or all three at least you will know the ignition is not the problem!

Back to top

Stooriefit

Joined: 03 Oct 2007
Posts: 1
Location: Largs, Scotland
Posted: Wed Oct 10, 2007 7:20 am Post subject:

Hello! The Forum

This is my first post to this forum and I was immediately attracted to the heading 'Boiling Scott' and I felt I had to add something, having lived with the problem for several years, a bit of a story, though of relevance to the thread. Bear with me, please.

Once upon a time, in early 1960 whilst stationed at RAF Kinloss in Scotland I'd purchased and as I recall, paid 30 quid for it from a chap in Dallas, a village located in Morayshire, an old motorbike with sidecar, a Scott. I'd never seen a bike like it and neither had anyone else in my ken but I needed the sidecar, increasing family. The 'bike had lots of mechanical problems, including boiling every 15 miles or so. Tried everything to cure the boiling, mainly timing but to no avail so learned to live with it. The whole motorbike mechanically was a steep, steep learning curve for me.

Enough preamble, cut to the story:

I'd had the 'Boiling Scott' several years, and used it every day, then I had to drive from RAF Kinloss, near Inverness to RAF Compton Basset near Calne in Wiltshire in the days before motorways, and as I remember a 19 hour journey- must have been mad to contemplate it, on a 'Boiling Scott', by this time the only thing wrong with it.
Having to go through every town en route it was embarrassing the amount of steam at traffic lights when I had to stop, but by this time I was used to it, the charm of Scott ownership. The cure – temporary, as it so happened - I used to carry numerous old glass lemonade bottles – no handy plastic containers in those days Gunga Din- filled with water carried in the sidecar boot. Water? Nae bother! I live in Scotland remember, re-filling the bottles up at burns, ditches, troughs and the odd garage when I refuelled. When the radiator boiled I filled up with water from the sidecar – sure slowed journey times down and required much perseverance. I'm gey thrane but!

So to the permanent cure, whilst in the Deep South, near Chippenham, lo and behold! I saw another Scott – only the second one I'd ever seen - and on examination I started to kick myself, for there staring me in the face was the answer, it was obvious, from the radiator header tank was a copper overflow pipe coming from just below the radiator cap internally to well below the engine water level externally. The 'Boiling Scott' only had a hole at the bottom of the header tank where the pipe should be and from which water flowed on refill, I thought this normal, silly, or should I say thicky me – aqueous thermal-convection currents did not exist!

Anyway, nothing that a bit of copper pipe and a 250watt soldering iron could not cure. Hurray! Being canny, I quickly got my money back on the empty lemonade bottles, which lightened the load on the 'bike but curiously the return trip to Kinloss still took about 19 hours, it being uphill most of the way I suppose. The Scott never boiled again!

Erik, I see from your picture that you have an overflow down pipe, but have you got a sufficient length of pipe inside the radiator to give a head of water in the header tank or perhaps, is it leaking due to corrosion say low down inside the tank dispelling enough water on warm up to lower the level to the extent that you do not have the thermal convection circuit so to speak and thus generate only steam. Just a thought.

Regards,

Brian McDermott (Stooriefit)

Back to top

Erik

Joined: 10 May 2005
Posts: 410
Location: Moerdijk, The Netherlands
Posted: Wed Oct 10, 2007 7:34 am Post subject:

Nice story Brian and welcome to the Forum!

The pipe in my headertank is just below the fillerneck so long enough I guess. But I will double check for leaks.

Cheers,
Erik