M45 Cooling Improvments

Written by Colin M34 at Jul 23, 2011 3:31 pm

Barry asked about M45 cooling improvements and I hope others will post their comments as well.

Here is my contribution. The Meadows engine shares typical 1920's practice by having alloy castings which transfer water between block and head. Circulation is not particularly good, and the LG 45s had an additional water transfer casting at the back of the head. To add this feature to my M45 I made my own rear transfer connector out of 1/2 in pipe. I removed one of the screwed core plugs at the back of the block and used a Tee pipe adaptor so that I could also take another pipe into back of the aluminium water rail. This allows cold water to circulate directly round to the back of the block. I have seen a further improvement where the screwed core plug at the front of the block is similarly used to connect a pipe to the front of the water rail.

Any other comments folks?

Colin

Re: M45 Cooling Improvments

Written by bruffsup at Jul 24, 2011 2:27 am

Colin, That is exactly the type of priceless info that I am looking for. Thank you for sharing it. Barry

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Re: M45 Cooling Improvments

Written by Julian at Jul 25, 2011 11:41 am

Hi Collin,
Great point you are making here! And this refers to every single "classic car" engine I have ever seen. The cooling circulation / coolant distribution is poor to say the least! The mods you recommend are certainly worth doing to the rear of the block on the 4.5 Meadows, as it is almost always 5 and 6 cyls that seize first if they are going to do. This must point to poor circulation around this area at the very least. We have measured this and found it true. V12s suffer on the front right bank to a very severe extent, and when you take even a little look you can see exactly why!

People fitting modern thermostats should read this VERY carefully. In an ideal world we would like to run our engines as hot as possible in order to make as much use of the heat produced by our combustion, and get that heat to act on expanding gasses and making power and not heating water! Fantastic modern cooling systems can do this quite well and we find some engines running at a design temp of 100+ degrees. However, if you are running your old pre-war engine at a happy 70 degrees C, you may find that on very poor cooling systems in some blocks like the V12 Lagonda, that some of your cylinders have water surrounding them at 95+ degrees C ! ! ! ! ! you therefore are not far away from a problem if you hit any situation that causes your water temp to increase! Although you may not even realise it as you think your water is "only" at 75 or 80 degrees as your gauge is telling you.

In any Lagonda other than a V12 you will be running at about 50 to 60 degrees in normal conditions with a good pump and clean radiator with shutters open. My advice is to let it be, it is rare for such low mileage engines to be harmed by too little engine temperature, but VERY common for them to overheat cylinders for seemingly no apparent reason! (the reason is actually very apparent once you are aware of the poor coolant circulation in various engines)
The V12 is another fish all together and needs extreme care if damage is not to be encountered! We are thinking about making a "cooling kit" for the V12 to help the situation. Hope we find time soon!

One thing to be careful about though is making things worse and not better! unless you are sure where the "new" water is actually going and able to measure this accurately (we are regularly surprised when testing that "theories" often don't work quite as well as we or others thought they would) then best leave it alone and just rely on a good clean Lagonda radiator to keep things on your gauge at about 60 degrees as ALL Lagondas with water pumps can do with the exception of said V12s, unless your radiator is not working to it's full capacity.

Good luck and enjoy your sunny days!
Julian

Re: M45 Cooling Improvments

Written by bill at Jul 27, 2011 8:03 pm

Julian knows far more than me on the subject but I modified my M45 so that the cooling was exactly as on the 3 litre i.e. I blanked off the 2 holes on the side of the engine which took water from the pump then I extended the casting from the pump so that it blew straight into the back of the head. There was no transfer port from the block to the head at the back or the front. This is exactly what is done on the 3 litre.

I never had any problems with this system.

Any comments ?

Re: M45 Cooling Improvments

Written by Julian at Aug 02, 2011 7:59 am

Hi Bill,

Interesting!

Only comments I have is that in my experience neither the Three litre or the 4.5 Meadows show much cooling problems in "standard tune" setup and manage generally ok as long as the rads are clean. The 3 litre does suffer when power goes up though and you have to be rather aware that the temp gauge is not telling the whole story either when driving hard. Or stuck in traffic with either a standard or tuned engine as the block has very poor water flow and is actually "thermosyphon".

4.5s generally don't "show" cooling issues until it's too late, the temp gauge reads fine and all will be well "until" it picks up a piston for no apparent reason! this is usually down to stagnant flow around certain cylinders. Clean blocks and heads, clean radiators etc all help a great deal and in general and in standard form and normal driving conditions we have little problems with any setup.

We find problems occur most when people expect a little too much from a 70 year old design and drive as they would in their Audi. Or go racing! then we really need to know the truth about the complete engine temp, not just the rad header tank!

I think Bill, people like your self who have rather a good knowledge of the vehicles you drive have little problems with any of this because experience plays so much in driving these old cars and keeping your selves out of trouble areas. Monitoring gauges and listening to sounds, and above all "knowing what those sounds are from experience"

Julian.

Re: M45 Cooling Improvments

Written by bill at Aug 19, 2016 9:03 am

Just to resurrect this thread about cooling on the 4.5 engine. I had an interesting conversation at VSCC Prescott 2 weeks ago about the cooling on a Pre War 6 cylinder BMW/Bristol engine. The owner was an engineer who worked at the time for an Formula 1 team. He was not satisfied with the cooling on this engine and as he worked in F1 he had access to all the proper equipment to test flow, cooling etc properly. He told me that he ascertained that the cooling was inadequate and (just like the 6 cylinder Meadows 4.5) there was insufficient cooling to number 6 cylinder - even though this was not apparent on the normal dash mounted temperature gauge. His solution was to put all the cooling water from the water pump to the back of the head . Thus all the cooling flow went from the back of the head to the front and then into the radiator.

This does not of course mean that this is the ideal solution for all 4.5 litre cooling issues (although it worked for me - see earlier post) but it would be interesting if someone who has the knowledge, time and equipment checked whether this alternative type of cooling system is in fact a proper long term solution.

Those of you with spare socks can however rest assured as a sock (or filter) would, however, (for other reasons) still be required in the top of the radiator !

Food for thought !

Re: M45 Cooling Improvments

Written by bill at Jul 05, 2017 12:32 pm

Just resurrecting this thread again and with a particular point directed at Julian if he is able to find time to reply.

I see that Historic Competition Services (Julian) currently has a 1939 Delage D6-75 (3 litre straight 6) for sale which seems to have exactly the modification I referred to above. I.E. the water pump seems to blow cooling water in through the back of the head. Presumably the block cools by thermo syphon only.

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I just wondered who it was who decided to make this mod and whether it made a lot of difference to the cooling compared to the original system.
For those who dont know this type of Delage engine, originally the water pump blew cooling water through a cast iron water rail bolted front to back on the other side of the block.
Julian, if you read this, your thoughts would be interesting when possible!

Re: M45 Cooling Improvments

Written by Julian at Jul 12, 2017 8:47 am

Morning Bill,

Funny you mention this as we are just rebuilding that engine at the moment via Formhalls. (Which is part of HCS now)
I was over there yesterday discussing this very subject.

We are now converting it back to a more standard setting as the engine used to run at about 80 degrees on the gauge but the block was always reading much higher with the laser gun compared to the head, which is quite logical looking at the cooling flow.
The engine would also run very rough untill fully up to temperature and I think this was partially due to the head being over cooled compared to the block.
This will I am sure be sorted after / during this complete rebuild.
Interesting question and I will follow it up with our findings.

Very best regards,
Julian

Re: M45 Cooling Improvments

Written by eddie bourke at Jul 12, 2017 1:39 pm

A simple solution to the poor cooling at the back of a long block/engine is just to bore the say back two cylinders with a little extra clearance, that is what they did years ago on competition engines. Better if you can get cooling to flow evenly everywhere

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Re: M45 Cooling Improvments

Written by bill at Jul 12, 2017 5:36 pm

Thanks very much for the information Julian.
Your technical assessment is very interesting !
Look forward to future findings.
Thanks.
Bill
