Range Rover water pump


Heater By-Pass

Fitting a Davies Craig EWP

In a V8BB post **Mike Howlett** said “my MGBGT with a Range Rover 3.9 engine gets extremely hot when standing still idling. In hot weather I have seen the temperature needle move into the oil pressure zone on the dual gauge. So I am thinking of fitting a Davies Craig electric water pump (EWP). I reckon if I move the oil filter mounting I think I can get it in below the alternator. However, I worry about the return pipe from the heater which is connected to the back of the water pump - see photo above. I have a home made heater by-pass connection which allows the flow of coolant when the heater water valve is shut - see photo above right. Obviously when the EWP is operating it will push coolant back up the heater return. Will this be a problem? If so, what could I do about it?”

Mike Howlett added “more research on Merlin Motorsports site shows that there are adapters to allow the heater return pipe to be plumbed in close to the bottom radiator connection. The hole on the back of the original pump would need to be sealed off, and ideally the impeller of the mechanical pump should be removed. `If the mechanical pump is disabled I suppose the EWP needs to run continuously? Is that right? I would be buying the computer controlled pack that goes with the EWP and adjusts the coolant flow rate according to user programmed-in temperature ranges.

I read a post from a Westfield owner with a Rover V8 up front, and he said the EWP cured his car completely of getting too hot. Apparently that car has a very limited radiator size, as does the MGBGT. I'm just trying to find out as much as I can before I open my wallet.”

Davies, Craig – “why select an electric water pump?” On their website Davies, Craig respond to that question saying “the Mechanical Water Pump is one of the last

mechanical components of the modern engine which has long been considered an inefficient device designed as an accessory on the earliest engines. A **mechanical belt driven water pump** runs at the same speed as the engine regardless of how hot the engine is. For example when travelling at high speeds down the freeway, the engine require less cooling as ram air is naturally cooling the engine, however the engine speed is high as is the mechanical water pump thus providing excessive cooling whilst draining the engine of power. In heavy traffic with high ambient temperatures, the engine is idling or slow running and so is the belt driven mechanical pump even though in this condition, extra coolant flow is required to cool the engine. So it works very efficiently when it's not required and very inefficiently when it is required. The EWP® corrects this inherent flaw by delivery maximum cooling when it's needed."

Davies, Craig's range of patented Electric Water Pumps are available in flow rates from 90L/min (23.8 gal/min) up to 162L/min (42.8 gal/min) at 12v & 24volt and in Nylon66 / Alloy housings. Their EWP's are designed for universal fitment to compliment or replace a vehicle's existing mechanical belt-driven water pump with simple, DIY installation. Davies Craig website

Fellow members' responses

Chris Armitage responsed "this is of great interest to me, I'll be keenly watching your progress! My Factory rubber bumper MGBGTV8 (daily driver) has always been marginal for cooling for past 39 years of my ownership. I have tried every single suggestion I have read here and elsewhere to remedy this (with the exception of cutting louvres in the bonnet or exiting the manifolds through the inner wings). I have an expensive aluminium radiator which made no difference. It's 3.9 litres now, and no better or worse cooling-wise since I enlarged the capacity (same engine) in 2022.

I've looked into fitting a Craig, Davis electric water pump (EWP) but couldn't quite fathom how to fit it in. Hadn't considered moving the oil filter, so will see how you go with that. I even made a full size wood and cardboard EWP model, using the dimensions available online, to try to accommodate it somehow! I would also use the **Craig, Davies electronic control module** as you're planning. The pump would only switch on when the temperature sensor triggers it, so it would be off some of the time, whether you keep or remove the original pump/impeller.

Could you just leave the original water pump intact, augmented by the EWP, hence solving the heater flow question? Surely there's enough clearance around the standard pump impeller for the electrically boosted water flow to get past? Otherwise the original pump would struggle to turn when the thermostat is closed?

It would be fantastic to cure this issue once and for all because at present my V8 is a much better winter car than a summer one. I'm always slightly on edge in summer, one eye on the temperature gauge, when approaching traffic queues!"

Mike Howlett was pleased to hear from Chris and responded saying he related to his comments that at present his V8 isa much better winter car than a summer one and is always slightly on edge in summer, one eye on the temp gauge, when approaching traffic queues!" Mike agreed saying "how I relate to that! Once the ambient temperature is above say 15C my fans are permanently on round town until I can get above 40 mph. I too have a very deep aluminium radiator, twin modern fans, and exhausts exiting through the inner wings with quite large holes through which they pass to encourage the exit of hot air".

Mike added "I was looking tonight at ways of setting it up and wondered if the cheaper option of simply using their electronic thermoswitch would be enough. The switch would trigger the EWP and the fans at the same time, leaving the mechanical fan to cope when driving at speed. I still think I would move the heater outlet to the bottom radiator connection. Otherwise the EWP will pressurise the heater circuit in the wrong direction.

All this is in my head at the moment. I also have a cardboard model of the pump and will have to see what could be possible, once I can clear necessary jobs in the house and get some time in the garage!"

Peter Varley responded "I have had some experience with a Davis, Craig water pump and digital controller which was installed on a Sunbeam Alpine. The water pump must go in the bottom radiator hose. The digital controller works by "by varying the speed of the pump in response to the coolant temperature". If you want to run the pump without the controller you must make sure that your thermostat has a small hole in it to allow some coolant to pass through it when the thermostat is closed to prevent the pump from over pressurizing itself.

You can run the pump with the mechanical pump's impeller in situ. My set up had the impeller removed and the water pump pulley removed and blanked off with a 'freeze plug' pushed in. However I found that the alternator could not be tightened sufficiently due to the angle of the belt to the harmonic balancer pulley. I had to then install a belt tension-er pulley to rectify this situation. I installed a manual override switch which allowed me to activate the thematic fan and EWP with the engine turned off. This was ideal when parked to help with cooling down the engine when needed.

The interesting thing about this set up is unlike most systems, the slower you go the cooler it gets because you are not using horsepower to turn a mechanical fan or water pump. To add to this conversation a club member who races an RV8 has installed an EWP in the bottom radiator hose but it hangs down a lot and is susceptible to damage and releasing all the coolant."

Update

A month later Mike Howlett provided an update saying “I had some time today to have a serious look in the engine bay. First you need to know that my car is neither a Factory V8 nor an RV8. It is a conversion that I built myself using a 1991 Range Rover 3.9 engine, very similar to the RV8 engine.

I have tried all ways to get enough space on the righthand side of the bay without success. I made a cardboard simulation of the Davies, Craig EWP115 pump which seems the model best suited this engine. Even attempting to shift the oil filter back a bit doesn't give anywhere enough space. The alternator and oil hoses all get in the way.

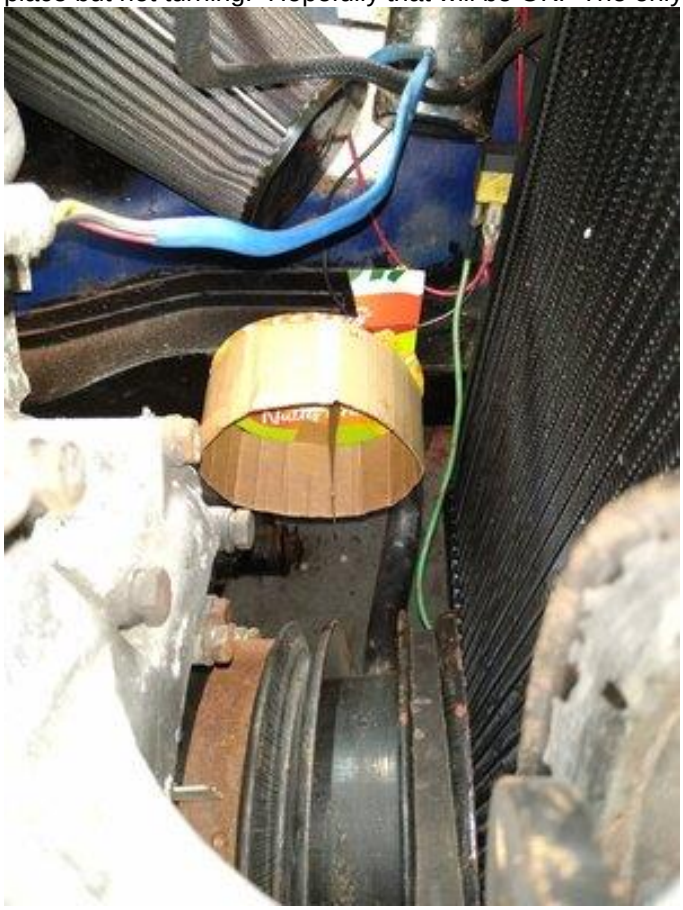
New belt run to the alternator

However it could be mounted on the lefthand side chassis rail. In one of my pictures you can see my fake pump in that position. The EWP inlet hose could be routed like this - leaving the bottom of the radiator, a 90 degree hose could take it horizontally across the car under the crank pulley, and then two more 90 degree bends could see it entering the pump inlet. The heater return hose would have to be plumbed into this hose.

With the EWP outlet facing upwards, a 90 bend could take that hose across the front of the engine above the crank pulley below the old water pump, and then a couple more bends would see it joining the downward facing original water pump inlet. I would remove the pulley from the front of the original water pump and run a shorter belt from the crankshaft to the alternator. If I extended the alternator adjustment bracket by an inch or so (pushing the alt a little further to the right) the short belt would run under the nose of the original water pump. In the picture showing the proposed belt run I have unbolted the water pump pulley and raised it with a socket. I need to ease the radiator forward a little to get it off the shaft.

I would have to block off the heater return connection on the back of the original water pump. I would definitely get the Davies, Craig controller - not sure where that would go inside the car. Does anyone know how big it is?

This proposed scheme leaves the old water pump in place but not turning. Hopefully that will be OK. The only question now is am I brave enough to commit the cash to buying the EWP kit?”



Cardboard EWP115 located