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## Hayabusa Cooling System with Electric Water Pump

Engine with electric water pump control either with MBE9A9/9A6 ECUs controlled directly or MBE9A4/9A8 ECUs with external amp unit or external water pump controller.

When using an electric water pump, the MBE ECU controls the flow and speed of the cooling system based on engine temperature, this simplifies the cooling system dramatically since the ECU will maintain the engine's temperature to a pre-determined target temperature and will change the water pump speed to obtain the temperature. So when the vehicle is in competition use, the ECU is continually changing the speed of the water pump to help maintain the optimum temperature. If in a rally car, race car or track vehicle when a radiator fan is also fitted, the radiator fan can also be controlled to help maintain an optimum temperature particularly when the vehicle is in a stationary position such as in the paddock, services or pit lane. The ECU can even run both the water pump and the radiator fan when the engine is turned off to help prevent heat soak to either a pre-determined temperature or length of time after the engine is turned off.

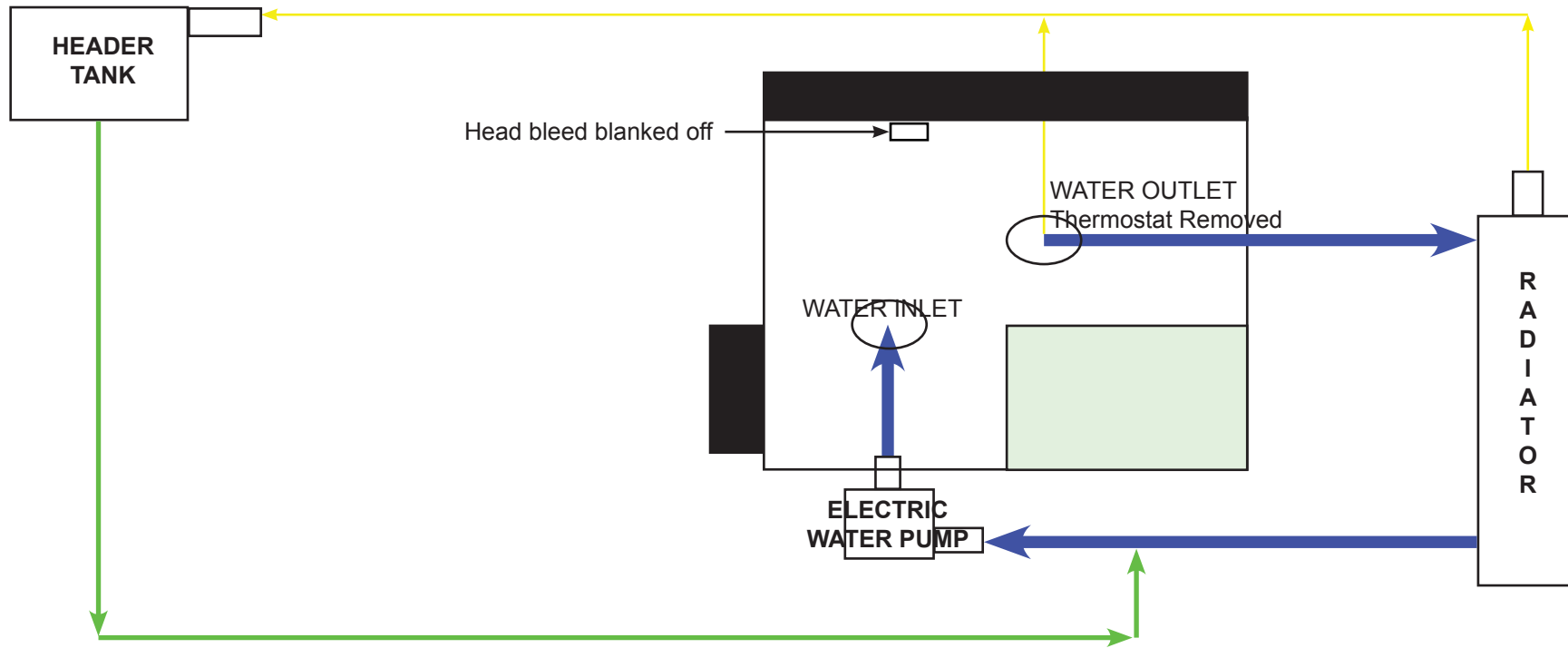
The small Bosch water pump has been used by us on our own 300+ BHP supercharged car and many race cars which are normally aspirated and turbo charged without any problems. It has come to our attention that some people have become worried that this pump is too small.

It must be remembered that a standard mechanical water pump has to work at RPM ranging from idle to over 11000 RPM in some cases. You should realise that if you have been driving your car or bike flat out and come to idle, the heat that has been generated is still in the engine, it does not instantly get removed by the cooling system. The mechanical water pump is now being turned at a very low speed in comparison with what it was doing when you were driving flat out, therefore the pump itself needs to be sufficiently large enough to pump this hot water away from the engine & into the radiator.

The electric pump does not have this problem, as it moves the water through the radiator fast enough to efficiently cool the engine. You must also understand that it is not a question of how fast it can move the water through the engine, it's a question of moving it at the right speed so the heat transfers correctly from the engine to the coolant, then from the coolant into the radiator. The small electric pump we have found is ideal for this, even if not used with a control system, the engine thermostat must always be removed to allow correct flow. Ideally the pump should be controlled by a control unit, if you are using our MBE ECUs these can control the water pump & vary its speed according to temperature. If however you are not using one of our ECUs, we can supply a standalone controller made by Davies Craig.

If you still feel you would like a bigger pump, the Davies Craig EP80 pump (SBD part number: WT-PM5-EWP-1) is more than sufficient for any engine, but this must be used with a controller otherwise the pump's flow rate unchecked is much too high.

View from side



Arrowhead direction shows direction of flow		
	Blue	Main cooling system flow
	Yellow	Engine automatic bleeding system flow
	Green	Header tank supply to cooling system

**Note 1:** The original water pump is removed, when fitting the SBD dry sump system and if remaining wet sump, simply remove the water pump and insert a plug where the pump was fitted.

**Note 2:** No thermostat must be used due to the fact that the ECU now controls water flow and speed through the system.

**Note 3:** The bleed from the underside of the cylinder head to the original water pump is removed completely and plug the bleed hole in the underside of the cylinder head.

**Note 4:** Do not attempt to use any other configuration than described and the electric water pump must be controlled for the system to function correctly.

We cannot comment on any other cooling system layout,

**Free technical support is available on our website. If you require personalised technical support training, this is available at a chargeable rate.**

Website: [www.sbdmotorsport.co.uk](http://www.sbdmotorsport.co.uk) Telephone: 020 8391 0121

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