

# ***Banderlog***

## ***Water Injection Valve***

**Why come up with a “Black box” for water injected headers? What should *The Water Injection Valve* do for you?**

The water used to cool injected headers, must not be introduced at too low of an RPM. Spraying water into the headers, at too low of an RPM, can allow the water to be pulled into the combustion chambers of the engine. This can cause all sorts of troubles for the engine. Water in the oil or even hydro locking the poor thing and breaking or bending something, like a rod. Spraying the water in too late, can allow the headers to overheat and burn off the chrome. Assuming, of course, that they are chrome.

How is the introduction of the cooling water controlled? Traditionally, the pressure of the engine’s cooling water is regulated by inlet and outlet valves. As the engine RPM increases, the pressure in the block increases. In the traditional system, there would be a *T-Valve* between the engine and the headers. The *T-Valve* acts as a pressure relief valve. When the cooling water pressure inside the engine block gets high enough, the *T-Valve* vents, allowing water to pass through to cool the headers.

The problem with the traditional system is, that it is complicated. The inlet and outlet valves must be adjusted such that the water pressure will begin venting at the correct RPM. At the same time, they must be adjusted to keep the engine at some reasonable running temperature. Not to mention the worry of over pressuring the block and blowing the cooling water through the gaskets into the oil pan.

*The Banderlog Water Injection Valve* does away with all of this complication. With this setup, actual engine RPM is used to control when the header cooling water is on or off. Because of this, the header cooling water can now be tapped off *before* the reducing valve. This slight change in plumbing breaks the cooling method down from one complex system to two simple and independent systems.

Simpler systems, easier to use and maintain.

**What are all these bits I have here in the box?**

**Item -1 )** This manual..

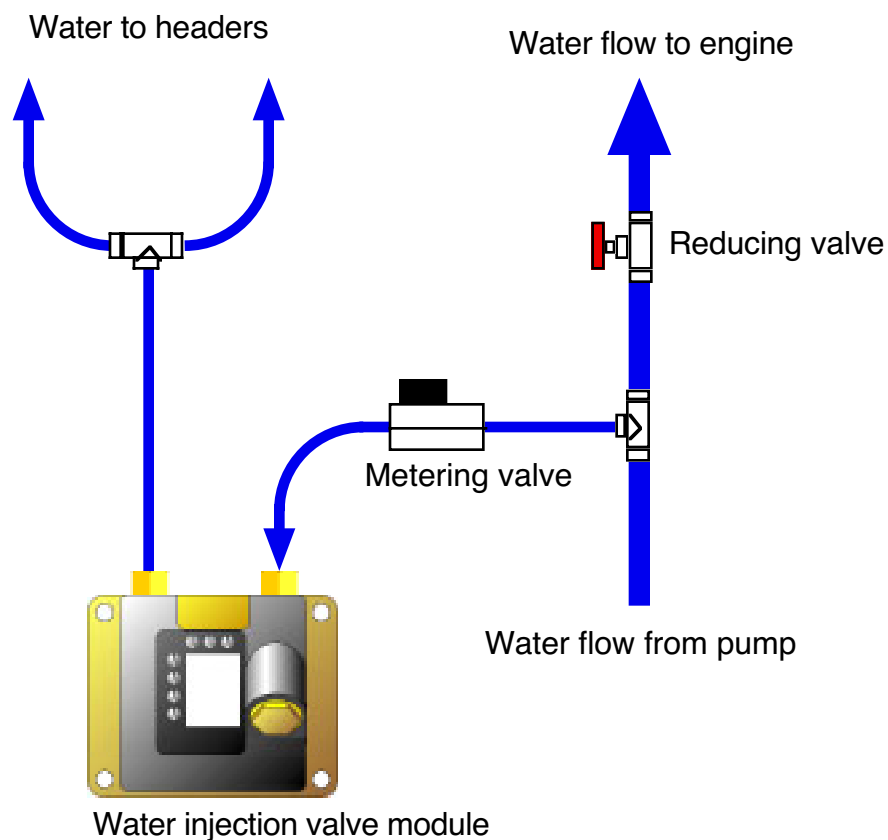
**Item -2 )** A drilling template. This drilling template has been printed full scale and can be used to locate the mounting holes for mounting the *The Water Injection Valve Module*.

**Item -3 )** *The Water Injection Valve Module*.

**Item -2 )** The small parts package. This package contains the metering valve, to be plumbed between the water pressure source and *The Water Injection Valve Module*. An assortment of wire lugs and bits of heat shrink tubing for finishing off the wiring installation. Five 1/4" washers for use when mounting the module.

**Installation?**

Lets start out with a plumbing diagram..



Think about how *The Water Injection Valve* is to be plumbed. First, the cooling water for the injection valve should be brought straight from the source. You will need fittings to tap into the cooling water line at this point, before the reducing valve. A typical size for running header cooling water is 3/8" ID hose. Are you planning on using steel braided line? Rubber hose? Stainless steel tubing? This must be decided now, so all the necessary plumbing fittings can be gathered.

Next, the header cooling water will pass through the metering valve. There will be times when this valve needs to be adjusted while the boat is on the water. Therefore, the metering valve should be mounted in a place that is easily accessible. The metering valve has 1/4" Pipe thread fittings. One male and one female. This valve can be plumbed in either direction. You will need fittings to attach your cooling line from your pump to this valve. And, you will also need fittings to attach a cooling line from this valve, to *The Water Injection Module* inlet port.

*The Water Injection Module* has two 1/4" Pipe thread fittings, both female. On the module there is also a large hex bolt. This is actually the filter screen. The fitting above this filter is the inlet for the module. The module must be mounted such that this bolt is pointing down. The reason for this is because when the screen is removed, there will be much less chance of contaminating the internals of the module in this orientation. You will need fittings to attach the inlet cooling hose from the metering valve to the module. As well as fittings to attach the exit port of the module to the exhaust pipes.

The water Injection module has been designed to be mounted with 1/4" bolts. The module should be located in a dry location, right side up and the filter screen must be accessible. You **MUST** use the rubber grommets when mounting the module. Why? Because, although the epoxy that the module is encased in makes it impervious to just about everything on the planet.. The one thing it can not take, is flexing. Forcing the base plate to flex or twist will kill the module faster than anything. The rubber grommets supplied on the base plate solve this problem by giving the mounting bolts some room to move about. Locate a suitable location for mounting *The Water Injection Module* and the metering valve.



An example of the module and metering valve mounted to the back of a rear seat base. Notice that the filter screen is pointing down and both the filter and the metering valve are easily accessible.

The method used for the mounting and plumbing is pretty much up to you. Now is the time to mount *The Water injection Valve Module* and the metering valve. Once they are mounted, run the plumbing from the pump through the system to the headers.

Once the plumbing is complete, you can run the wires out to their respective areas. **Power** needs to be hooked to a switched ignition power terminal. **Ground** can be hooked to any convenient ground source. The engine block is typically fine for this. **Tach. signal** is hooked to wherever your system receives its tach. signal. For example: On standard points systems, the hookup point is on the primary coil lug connected to the distributor. For MSD or HEI systems there will be a tach. output that you must hook up to.

If you would like to run the optional racing cutoff, you will need to install a wide open throttle switch. This switch must be wired such that the circuit between the two screws labeled *Racing cutoff* is closed when the throttle is wide open. Otherwise the circuit is open. **Warning! The racing cutoff can blue your headers. If having shiny chrome headers is important to you, do not use this option.**

*The Water Injection Valve* is set to cut off water flow to the headers at 1,500RPM or less. If you are running a lot of cam overlap. This would typically be something like a racing cam. You might need a higher cutoff point. This can be achieved by connecting a jumper wire between the two screws on the module labeled *High RPM jumper*. Doing this will raise the cutoff point to 2,000 RPM.

### **Adjustments & Maintenance:**

Initially, set the metering valve to about 1/2 to 3/4 flow. This should run enough water through the headers to keep them cool. Once the boat is running in the water, adjust the metering valve to allow steam, but very little dripping out of the exhaust pipes. This adjustment should be made at cruise speed.

Keep an eye on the amount of cooling water flowing through the system. If the amount begins to drop off, unscrew the filter screen and clean out the debris that can collect there. Be very careful not to let any debris fall into the module when the filter screen is removed.

### **Pitfalls:**

Do **NOT** torque fittings into the *The Water injection Valve Module* without using a backing wrench. Failure to use a backing wrench can break the epoxy case and ruin the unit.

Do **NOT** attempt to run hot water through *The Water injection Valve Module*. Hot, as in it went through and cooled the engine or oil first. The module is designed to use the water from the pump to keep its electronics cool. Preheated water from the engine will cook its little brain.

## **Questions? Comments?**

The best way to get in touch is by e-mail: [support@banderlog.com](mailto:support@banderlog.com)

If you are really stuck and need a speedier response,  
The phone is also an option: (408) 776-3966 ..ask for Jim

**Enjoy!**