Jaguar XJ6 Series 3 Haltech ECU conversion

Chapter 1 – Introduction

Your most likely here because you are having problems with the aging L-Jetronic injection system fitted to your XJ6 and are looking to making your car reliable again. In my case, my ECU finally packed up after misbehaving for some time. I had already gone down the path of checking all the sensors, including replacing many of them, repositioning the wiper to run on a different part of the carbon track in the AFM and validating as much as I could. I am an electronics technician by trade with over 40 years' experience having done an apprenticeship with the UK Ministry of Defence. This put me in good stead to troubleshooting the problem and, ultimately, defining a solution.

At some point we have to be pragmatic when it comes to maintaining these beautiful cars. Ensuring they are reliable enough to enjoy them without changing the fundamentals, is something all true Jaguar enthusiasts want to ensure. The purists may argue that the L-Jetronic system is fine, well, it was 40 years ago. We are now dealing with aging electronics, including electrolytic capacitors that have dried out and integrated circuit chips that are no longer available to replace. Granted, the ECU can be repaired if one has the time, money and expertise to do so, but unless you are adamant about having a concours car it really isn't worth the bother. Especially when there are excellent aftermarket options available.

There are a number of paths one can take depending on skill level, how much you want to spend and how original you want to keep your engine bay looking. I've listed three below, but you could create a unique combination that suits your needs.

Option 1, replace the factory ECU with a Haltech Elite 750 or similar and keep the existing fuel and Ignition systems. This is by far the simplest option and may well be the best one if you want to keep the under-bonnet look as original as possible. One could even put the new ECU in the boot, in the position vacated by the existing ECU, use the existing loom with new connectors, or install a new loom. At a bare minimum you will need an O2 sensor, a crank position toothed-wheel and sensor, a throttle position sensor, a water temperature sensor and an air temperature sensor. One could even modify the AFM to keep the under-

bonnet look. Don't forget to remove the air flap from the AFM if you do. It may be possible to use the inbuilt temp sensor, but you would need to calibrate it to the ECU so it can determine the temperature from the resistance value. It may be easier to simply incorporate a new temp sensor that has a calibration file. If you want to have the ECU control the idle then you'll also need to add an idle control valve. Otherwise, you can drive idle using the factory air-block. Trust me when I say the idle air valve is well worth the effort. This solution won't give you full sequential control, as you won't be driving the ignition or have a cam position sensor.

Option 2, replace the factory ECU with a Haltech Elite or similar and keep the factory fuel injection system but replace the ignition system. This will give you full sequential control as you can modify the distributor to be a cam sensor. Put simply, for full sequential control, the ECU needs to know whereabouts you are in the 720° engine cycle. As the distributor rotates at half crank speed – the same as the camshafts – it makes an ideal cam sensor. This negates the need to mount an actual cam sensor to the engine which would likely require the drilling of holes etc. This also means you can use the ignition coil mount to install an idle control valve as I did. The Bosch idle valve I used is close to the same diameter as the ignition coil so I even used the existing bracket. One then has to decide on the ignition system to use. One could use a coil pack option and have HT leads run to each spark plug. You would need to find a place to mount the coil packs though. The other option, that I chose, is to have an ignitor block and run coil on plug ignition. This takes up less space and looks neater in my opinion. It does require making some brackets and drilling some tricky holes in the support bolts though. As in option 1 you can use the modified AFM, or do as I did, and make up a new air-pipe with a sensor bung in the top. This joins to the existing bellows and can use the same mounts. It does look rather neat I must say. Thanks to my wife for the offcut of stainless pipe and the welding which was done at her place of work.

Option 3, replace the factory ECU with a Haltech Elite or similar. Replace the ignition system as in option 2 and replace the fuel rail to allow the use of modern injectors. I took this option as my injectors were so worn that no amount of ultrasonic cleaning would bring them back to new. It is possible to get reproduction injectors, but I liked the idea of using a modern 4-hole injector and do away with those pesky little hoses. I had a fuel rail machined by a Melbourne based injection

specialist. It uses a standard fuel rail extrusion, that is cut, drilled and tapped to suit and was not that expensive either. I then made some brackets to mount it such that the injectors sit tight between the rail and the existing plenum injector receptor holes. I made a wooden fuel rail first to check my measurements and ensure I had no vacuum leaks before getting the rail made. I also took the opportunity to up the rail pressure to 3 bar which made the ECU calibration easier; more on that later. The stock fuel pump is well up to the task for 3 Bar running. I used an adjustable fuel pressure regulator to give me the 3 Bar pressure.

While I took the Haltech Elite 750 option and bought most of the sensors from them, you could get many of the sensors and valves from other suppliers. I did this for convenience as much as anything. The support from Haltech, both pre and post-sale, was nothing short of superb. They were patient and answered all my questions and were a pleasure to deal with.

The rest of this article will deal with Option 3 – the one I chose. In chapter 2 I will discuss what parts you need to get.