

TRIUMPH TR6 EFI INSTALL

My car previously had bike carbs fitted on, at the time, bespoke built DANST manifolds (these are now available routinely from DANST Engineering). The car never ran well and was always a pig to start after a bit of a layoff, not a reflection of the setup, just a bit of 'nature of the beast'! This continuing frustration ultimately drove me to go for EFI.

The kit from Classic Fuel Injection was well packed and comprehensive, including sundries such as clips, tie-wraps etc.

The instruction write up supplied with the kit was clear and easy to understand and where there was any head scratching, then a call or an email soon answered the conundrum.

PREPARATION

As stated in the instructions before commencing anything else, I set the car up to 10° BTDC to set the timing datum (**important!!**). I then updated the ignition with the supplied components, modified the distributor and whilst temporarily using the Maxx ECU to govern the ignition, ran the car again to match the 10° BTDC datum.

INSTALLATION

The mechanical install can be broken down into two principal elements:

- Customer sourced items.
- Kit Contents.

CUSTOMER SOURCED ITEMS

I had previously sourced (from a well-known auction site), intake manifolds which were of the correct size for the supplied injectors.



These needed minor modification to allow the kit supplied fuel rail to sit correctly on top of the manifolds. This entailed removing the vacuum inlet on the left hand manifold and the hexagon headed blank on the middle manifold and replacing them with flush fitting blanks.

As mentioned, I opted for the fuel rail solution, which introduced the need to acquire double M8 threaded securing studs to screw into the pre threaded fuel rail and then locate into the two outer manifolds. The securing points are between the injector orifices. In the picture above, these securing points are occupied by grub screws, these screws are removed and the securing points left unoccupied with the securing studs passing through and secured by nuts. I also fabricated angled washers to account for the differing planes of the manifold as the studs pass through.

In addition, just visible on the left hand side of the left hand manifold is a AN-6 fitting, this would be used for brake servo vacuum, utilising an AN-6 90° Barb fitting for the hose.

Included in the purchase was a plenum which fortunately already had a throttle body fitted. Unfortunately, the interior of this item needed careful cleaning and painting.

The throttle body did have the correct fitting for the Inlet Air Temperature Sensor.



Refer to the image (left) to see Air Sensor in situ.



The plenum also needed modification to accommodate extra facilities required by the EFI. One of these being the Idle Control Valve. This item required the installation of the take off port (supplied in the kit). I installed this port just inside of the plenum which allowed easy access to fit the securing nut (purchased separately). This port was installed facing downwards.

I addressed the need for a vacuum feed to supply the MAP sensor (built into the ECU) by drilling a hole into the plenum and fitting a Rivnut of the appropriate size to accommodate the MAP Sensor take off (supplied in the kit).

Also of note is that the throttle body came with a throttle position sensor fitted. As a matter of course I replaced this item with the sensor supplied in the EFI kit.

In addition and in spite of having the upper securing bolts for the plenum, I fabricated a support bracket to fit the two fixing lugs on the lower face of the plenum which was then located on the engine mount bolt.

KIT CONTENTS – UNDER THE BONNET

WIDEBAND OXYGEN - O2 SENSOR

First item to be addressed was the O2 sensor. My own car has a tubular exhaust manifold, describing a 6 into two layout, presenting the conundrum: are two O2 sensors required?

A quick email to Classic Fuel Injection soon assured me that installing the sensor in one of the branches would be fine! The sensor was duly installed, after carefully following the Classic Fuel Injection instructions and noting routing considerations for the sensor connector and cabling.

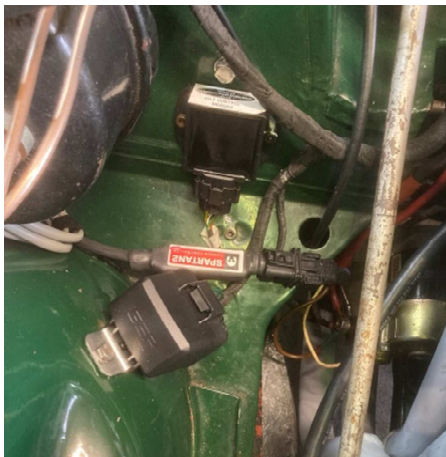


ECU AND IGNITION AMPLIFIER

After studying some of the install photos on the Classic Fuel Injection website, I decided to place the ECU on the engine shelf behind the brake servo (for RHD cars!). After offering up the main loom I also positioned the ignition amplifier in this area as well. I also took the precaution of adding heat transfer paste when mounting the ignition amplifier.

O2 SENSOR

In the image you can also see the (grey) cable and connector routed from the O2 sensor via its Lambda Controller.



Again, I found that the main loom presented easily to this routing to the O2 sensor connector. This sensor cable then routes as shown down and the surplus cable stowed under the brake servo.

IDLE CONTROL MODULE AND POWER MODULE

Once again, 'dry fitting' the main loom largely dictated where to locate these two modules in the well behind the front offside wheel arch under the brake servo. As can be seen in the picture above. Also visible in this image is the O2 connector and its Lambda Controller and the surplus cable stowed under the brake servo.

TEMPERATURE SENSOR

The Coolant Temperature Sender supplied with the kit is a standard item with an M12 thread but on my car, on the thermostat housing where I wanted to fit the sensor, a 5/8" UNF thread is used. This necessitated sourcing a 5/8" by M12 adaptor to allow fitment.

A simple solution!



IDLE CONTROL VALVE



After taking into account wiring loom and inlet hose routing and physical lengths, the Idle Control Valve could be mounted as illustrated in the image. In order to mount it as shown I fabricated a simple bracket and mounted the assembly on the offside inner wing.

Incidentally, also visible in this image is the support strut for the plenum bolted at the engine mount.

FUEL PRESSURE REGULATOR

I decided to mount the Fuel Pressure Regulator at a point that gave good access to the fuel rail and to the routing of the return fuel line.

Once again I fabricated a simple bracket to mount the Regulator so that the inlet and outlet presented to the fuel lines without complicated routings. In addition, the vacuum inlet port also offers easy connection to the vacuum line running to the ECU via the vacuum take-off on the plenum.

This bracket was then bolted to the radiator support strut.



MAIN LOOM

The main loom, with a bit of fiddling around pipes and wiring, largely found its own way around the engine bay – thanks to solid design for the TR6. The main positive and negative supply lines were connected as advised by Classic Fuel Injection to the starter motor (positive) with the negative connected to the engine/gearbox casing. The ignition element of the main loom is routed along the top of the firewall and then to the distributor and coil.

When it came to the fuel pump supply line, I didn't follow the Installation Guide - I'll explain. My car previously had an electric fuel pump mounted in the boot space which sourced its 12V supply from the engine bay. This supply was controlled by a relay which in its turn was controlled by an isolation switch under the dashboard used as a simple security measure. Therefore the fuel pump 12V line as supplied in the kit provisioned to reach to the boot space was shortened, terminated and connected to this control circuitry in the engine bay.

KIT CONTENTS – BEYOND THE BONNET AREA

FUEL LINES

The kit supplies a generous amount of fuel line, easily sufficient for the install on my car. I was a tad over the top with protecting the two fuel lines as they ran from the engine bay to the boot space. To this end I purchased trunking to cover the fuel lines as they were routed up and down the car.

The routing for the fuel lines ran down the left hand side of the car following the main chassis rail which offered general protection for the entire run. The only area of concern being as the two lines ran through what is called the T shirt panel on the TR6 where space was shared with the exhaust. For protection I installed a simple heat resisting block, cut to fit the space.



One other area where some work was required was one bracket support on the chassis rail where the orifice was opened out to accommodate the two lines.

Once in the engine bay, the two lines were routed up and along the front of the battery using clipping to maintain position.

FUEL PUMP AND FILTER

The fuel pump and filter mounting was straightforward, my only variation being adding a second locating clip for the fuel pump. Note location of pump and filter allowing spare wheel positioning.



START UP!

The ECU was loaded with the supplied file for my car and after double and triple checking as much as possible, finally took the plunge and went for it. It was with some trepidation that I turned the key - a bit of churning as everything found its way and then the car burst into life, then after a little bit of mild hunting settled to idle gently at about 1100rpm – PHEW! As the car settled further the idle came down to about 1000rpm – brilliant.

The car was then taken for a short drive of a few miles and following this the car seemed completely happy. The initial 'self-learning' aspect seemed to have done its thing fine.

In the future I will be studying techniques for personalising the specific tune for my installation but in the meantime the car runs absolutely fine.

One thing I would strongly advise, to get things going, only use the Classic Fuel Injection supplied ECU file which will have been prepared specifically for the Classic Fuel Injection installation prepared for your car. I made the mistake of experimenting with other TR6 files as supplied on the USB stick and my car did not like that!! Once proficient with all aspects of the tuning (or of course if you are already proficient!) I'm sure there will be no problems. By the way, reloading the original file cleared all the problems I had introduced.

In conclusion, considering the cost and the amount of modification I was nervous of the install but as long as the installation guide is followed carefully, even this idiot managed to successfully complete the install. The couple of queries I did have during the install were answered very quickly indeed by Kevin at Classic Fuel Injection.

Dave G

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