

ESCORT COSWORTH/MIKE RAINBIRD

EVERYTHING FLOWS



Never one to do things by halves, this month

Mike's sourced a Mountune intake and Pectel ECU for the Escort!

LAST month I told

you about the improvements I had made on the exhaust side of the car. Now, obviously the logical step is to improve the intake side.

The standard plenums are extremely restrictive for big power and are only rated to the following approximate figures before they really need replacing:

2wd inlet manifold	430 bhp
4x4	450 bhp
YBP (EECIV)	480 bhp
RS500	580 bhp

Contrary to popular belief, the restriction is actually created by the elbow and not the throttle body or plenum volume, so fitting different throttle bodies or plenum spacers without addressing the restriction in the elbow, will not achieve anything. All you have to do is compare the inlets together and you will see the differences

and the improvements that Ford made to increase the airflow with each model update. Obviously the RS500 item was designed to have the required airflow to max out the T4 for homologation purposes, so the restrictions were realised way back in the mid '80s!

Originally being an EECIV car, mine was already equipped with the most efficient of the four-injector inlet plenums, and for

really big power there is the Swedish plenum that we supply, which is capable of flowing over 700 bhp!

The problem with this though is that the increased volume does create throttle response issues and my whole mantra for the last four years has been to maintain this at all costs. In view of this, I am not chasing big power figures and am



Moutune plenum: looks like a radar dome off an F16 fighter...



Roller-barrel ITBs inside the plenum give excellent throttle response

sticking with ye olde faithful T4! However, I want to improve throttle response even further.

To achieve this, I took a leaf out of the rally boys' book and purchased a Moutune roller-barrel intake from the Puma Cosworth that was built a few years ago. This has individual throttle bodies for each cylinder, which creates an extremely short intake tract, so throttle response is almost instant. Obviously, being designed for a 300 bhp rally car, the intake was originally built as

a 24 mm item, requiring it to be machined out to the 27.5 mm of my new head (all of which was carried out by Tim Ayliff of SCS). This is also one of the original four injector ones and came with full ALS control as well (to go with my Maram 247-shafted T4).

In keeping with my stealth engine bay (basically because I'm too lazy to polish shiny stuff!), the intake will be powdercoated black — originally I tried anodizing it, but due to the magnesium content it came out grey!



Mike's Escort should be back on track very soon



Custom Raychem loom is built to military standards...



Mike's intake originally came off the works Puma Cosworth rally car

If you ask nicely, it will even wake you up in the morning with a full English and a cup of tea

Unfortunately, this can't just be bolted on and controlled with the standard ECU, as it needs one capable of running multi-maps to support it. This is because the airflow changes so dramatically for each 10 degrees of throttle opening of the roller barrels, that it needs the engine mapping fully at each 10 degree stage. The Weber ECU, even upgraded to Super P8-spec is incapable of this and it requires something very special.

The decision was effectively made for me, as nothing else comes close and it is the ECU of choice by the works teams — the Pectel T6-2000 (or T-sex as it should be known!). This has the required built-in throttle multi-map multipliers, which allows you to have the main fuel map and then the ability to run up to six multi-map multipliers every 10 degrees of throttle position. It also has capability of holding two completely different sets of maps so can have a race fuel map and a road fuel map (changing fuel, ignition and boost at the flick of a switch).

It has four ignition and 12 injector outputs (software-selectable between high and low-impedance modes), with 11 external analogue sensor inputs including thermocouple and two NTK Lambda sensors (wide-band NTK Lambda sensors can be connected directly to the T6-2000 for in-car tuning/engine logging

and real-time bank-independent closed-loop Lambda control — no external interface box is required). Wheel and turbo speed sensors can be directly connected for monitoring or closed-loop strategies. Switch inputs are provided for control of ALS, dual calibrations, lap beacons, start-line strategies etc.

PWM outputs are provided for control of anything from fuel pumps and fans to turbocharger wastegates, water injection, nitrous injection, alternator control, and so on, and it has the ability for up to 2 MB of built-in engine logging memory to be fitted, with 40 simultaneously logged channels user-selectable from over 200, at frequencies of up to 1000 Hz (that is 1000 times per second!). If you ask it nicely, it will even wake

you up in the morning with a full English and a hot cup of tea!

This will be all linked to the engine by a state of the art Raychem loom (military spec — fire proof, waterproof and nuclear bombproof), which being screened as well, should minimise the chance of any electrical interference-related misfires.

Next month we'll look at what is required transmission-wise, which every 4x4 owner with over 400 bhp will be interested in!

T6-2000 MOTORSPORT ECU

TECH SPEC

Processor:

Motorola 32 bit 21Mhz

RAM: 512 KB-2MB

Flash: 256 KB

A/D Accuracy: 10 bit

Voltage Range: 6-18 volts

Temperature Range:

-40Å°C-85Å°C

Injector Drives:

12 Low/High Impedance

Ignition Drives:

4 Internal Clamp

PWM/Relay Outputs: 8

Crank Sensor Type:

Hall Effect/Inductive

Cam Sensor Type:

Hall Effect/Inductive

Analogue Inputs:

8, 1 K-type thermocouple,

2 UEGO Lambda

Internal Sensors: ECU

temperature, battery voltage

Communication:

RS232, Can 2.0B

Dimensions:

Length 167 mm, width 145 mm,

height 40 mm

Weight: 680 g

Case: CNC-machined HE30

Connector: 55-way amp

Datalogging: 40 channels

Data Throughput:

1000 Samples/Second

Engine Configuration:

1-12 cylinders, 2 or 4-stroke,

natural/forced induction,

16,000 rpm maximum

Application Software:

DescproW and Pi Toolbox

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T6-2000 ECU required as it can run multi-maps