MRT Performance Pty Ltd
ACN : 100 017 543 ABN 70 679 485 952
1 Averill Street
(Cnr Averill St & Concord Rd)
Rhodes NSW AUSTRALIA 2138

Phone +61 2 9767 4545
Facsimile +61 2 9767 4599
info@MRTRally.com.au
www.MRTrally.com.au

For Your Total Auto Care
& Suspension Specialists

There's Nothing Quite Like a V8

April 2005

V2

Modifications:

- Reflashed and retuned OEM ECU
- Standard exhaust !
- Standard Fuel pump.!

MRT's Ford XR8 ECU Re-Flash Software

MRT Performance has been in the business of small capacity Japanese import cars for over 12 years now, so it came as a bit of a novelty to have an Aussie Ford BA XR8 Falcon Ute through the doors of the workshop.
Legend has it that Ford altered the roof-line of the Ute so that owners could get in and out of the car without having to remove their Akubra hats!. Unfortunately apart from a lot of baseball caps, no Akubra's could be found among the staff at MRT so this point remained untested. Only Bluey the cattle dog and a couple of hay bales in the back of the Ute were missing from the complete picture.

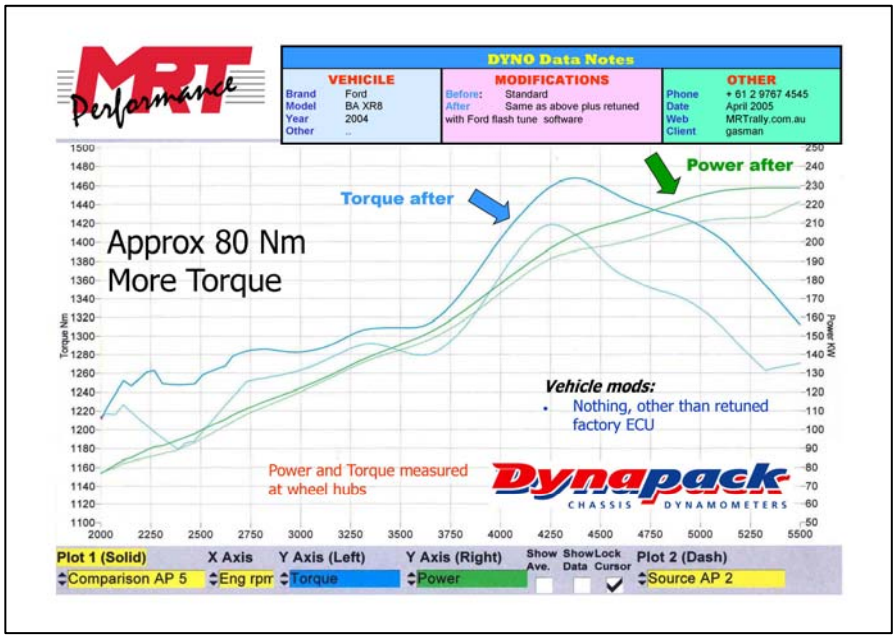
All jokes aside, the Ute's basic engine spec on paper is promising, featuring a High Tech (For Ford) 5.4Ltr Quad Cam 32 Valve engine claimed to make 260Kw at the flywheel and on regular unleaded, all with scarcely a pushrod in sight. With laptop in hand and one of MRT's new Ford ECU re-flash boxes the BA Ute was backed into MRT's purpose built performance test cell for some serious testing connected up to the Dynapak hub Dyno.

Completely stock with 65,000Km on the odometer the BA pulled an average of 225Kw at the rear wheels over a set of four separate Dyno power runs. Examination of logged data collected from the series of Dyno pulls showed that Fuelling was pretty conservative, getting a touch rich towards the top-end of the RPM range, as was the comparatively small amount of Ignition timing, tuned obviously to suit low octane unleaded.

Apparently due to tight production deadlines set for the Quad Cam V8 (Made up of a combination of parts unique to Australia Only) Ford Engineers ran out of time to adapt existing Knock control protocols to suit the home grown 32 Valve engine package. Knock control is a system whereby the Engine Computer uses an electronic microphone mounted on the engine block, listening for signs of Knocking or pinging, in order for the best possible ignition timing curve under all types of operating conditions. This helps not only to maximise power and torque, but also reduces exhaust emissions and boosts fuel economy. Releasing an engine without Knock control is highly unusual in this day and age, and the Boss V8 is probably the first one in over 5 years without it!

Without the benefit of Knock control, Fuel and Ignition mapping must be setup to suit the harshest possible operating conditions, with the engine tuned to with the lowest octane commercially available fuel, under high ambient temperatures and extreme load. Tuning for worst possible situation will ensure that the engine remains reliable under all conditions, but also means that outright power and torque is compromised.

Normally re-mapping an un-modified naturally aspirated engine achieves only a small increase in engine power as the factory maps are generally pretty well close to spot on. Spending countless hours on the Dyno adjusting tune maps may only result in an increase that is so small it may not be noticeable on the road! In the case of the Ford V8 given that it does not have Knock control, MRT's engine tuners were pretty confident that on a diet of 98 Octane unleaded quite a few more ponies could be extracted out of the Ute's engine.



Painstaking is the word to describe the re-mapping process. Optimising the Original Ford map is a time consuming procedure consisting of incremental changes to the base fuel and ignition maps, the results of which are then tested with a set of Dyno runs. Logged data from the completed Dyno Tests are examined for traces of damaging knock, along with Power, Torque and Air Fuel Ratio curves. Based on data log results another round of carefully chosen mapping changes are made followed by yet another set of Dyno tests.

Traditionally such a gruelling program on a conventional roller dyno would leave the vehicle's Tyres decidedly second hand. Modern high performance "sticky" tyres are particularly easy to overheat and grip characteristics can often be permanently affected even after only a short session on a roller dyno. MRT's Dynapak Dyno is unlike traditional chassis dyno's and bolting directly to the wheel hubs of the car, leaving your expensive road rubber carefully stacked up in the corner of the workshop, in exactly the same condition as before!

In addition to changes in Fuel and Ignition mapping, MRT's tuners also make some very specific changes to parameters such as idle speed to prevent stalling, a problem that Ford is yet to fix, modest increases in the RPM limit and removal of throttle based "soft" RPM limiting. Soft RPM limiting makes for a soggy feel around the edges of the RPM limit and effectively reduces total engine RPM operating range. Other significant changes include modifications to open and closed loop fuel scheduling, changing both the point and speed at which the factory computer switches from an ultra-lean economy map to a slightly richer more performance orientated map, improving mid-range power, torque and throttle response.

BA Falcon XR8 V8 Engine

The 5.4ltr Quad Cam engine only exists in the USA, fitted to the Lincoln Navigator, a bloated 3.5 tonne SUV favoured by gangsters, rappers and Pro Football players, but comes fitted with an intake manifold that looks like it was made from recycled spaghetti, and in traditional Ford style is so restrictive it tends to cancel out any benefits gained from 4 valves per cylinder. Otherwise, apart from the big Lincoln, only the Mustang Cobra gets a Quad cam V8, but in 4.6ltr engine size.

Oz Ford engineers were faced with a bit of a dilemma, as they needed to find a replacement for an ageing 5.0ltr Windsor V8 that could compete with Holden's heavy hitting 5.7ltr Chev sourced LS1 from within Ford's global empire. Quad Cams and four valves per cylinder had good marketing potential, but the 4.6ltr Mustang engine was too small and the Lincoln 5.4ltr engine could never be made to fit an Aussie Falcon due to its towering intake manifold.

Using some good old Aussie ingenuity, engineers put together an engine with a 5.4ltr Crank and rods, Mustang Cobra block and heads and a home grown cast alloy intake manifold. Camshafts are a combination of Mustang Cobra intake and Lincoln exhaust cams. Custom made exhaust headers complete the package. So impressed were Ford heavies at the result, there was some talk of this (new) engine being re-exported to the US for fitment to domestic Ford cars.

Final Dyno power and torque results justified the large amount of Dyno time invested and showed substantial gains in all areas of the engines operating range. Peak power increased by over 15Kw over standard at 5600Rpm, but more impressive was an almost 25kw gain between 4000 and 5300Rpm over stock. Peak Torque was up by 65Nm and is especially meaty between 3800 and 5000Rpm. On the road the car felt great, with a definite improvement to mid-range punch, making the car easier and far more enjoyable to drive.

Even with a full load of Round-up weed killer and sheep dip in the back of the Ute, MRT's Ford re-flash software package can put a whole heap more sparkle in you're your BA's XR8.

MORE INFORMATION:

- www.MRTrally.com.au
- Complete tuned suspension kits available.

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