



NSW Impreza WRX Club

Eastern Creek race track

End of year Trade show and Driver training Xmas party 6th December 2003

This is a report on the vehicles that were run on the day by MRT performance and the outcome of those results.

For more photographs and high resolution dyno plots refer [ftp://ftp.mrtrally.com.au/news/2003-nsw-wrx-east-ck/](http://ftp.mrtrally.com.au/news/2003-nsw-wrx-east-ck/)

All images of cars, Dyno plots are recorded with model and owners first name.

Vehicle data and modifications are as supplied by the owners and MRT accepts no responsibility for errors.

Set up and Tuning Equipment

- Dyno System Dynapack Evolution 4000 4wd Hub dyno
 - 2 x 240 v air blowers.
 - Dynapack inputs:
 - Fuel mixture logging
 - Inlet manifold Pressure (boost)
 - Inlet air temperature.
 - Power KW
 - Torque Nm
 - EcuTeK "Delta Dash" diagnostic Software was used to separately log (where needed) power runs
 - EcuTeK "Delta ECU" tuning tools was used to re-flash software
 - All dyno runs were printed for general public reference on display, copies
- supplied to vehicle owners as well as saved on the Dyno PC
- A Laptop remote screen display was enabled with a separate PC screen for people to view the Lap top screen of the person tuning the car (Paul Fisher). this was used to show how the EcuTeK works and its features.
 - To reduce risk of doubt, all (non MRT demonstration) cars were installed on the dyno without any Logging PC's connected, so that no alterations could be made.

NOTES:

- Only Power related modifications are listed.
- As reference Standard Subaru's display the following power figures on the MRT Dynapack Dyno:
 - 2003 Impreza WRX 140 – 150 Kw at the hubs
 - 2003 Impreza WRX Sti 170 – 180 Kw at the hubs
 - 1997 Impreza WRX 130 – 140 Kw at the hubs
 - 2001 Impreza WRX 130 - 140 Kw at the hubs
- Torque and power on dyno plots are measured at the hubs. (To convert real torque back to Flywheel torque, simply divide the number by the final drive ratio.)
- Torque listed is "real" torque, not "tractive effort as in the case of some other chassis dyno machines
- Weather was overcast with average temperature approximately 20 – 25 deg
- A EcuTek ECU remap was donated to the NSW Impreza WRX club for raffle. This was won by Evan McNeill (congratulations Evan!!).
- All sales and dyno proceeds (including \$20 per Dyno run) have been donated to the NSW Westmead Children's Hospital. Approximately \$700 was raised in total.

Car 1

MRT Performance Tuned 2003 Subaru Impreza WRX Sti.

Owner: Steve

Modifications (other than standard)

- MRT Performance complete exhaust
 - Downpipe with splitter and cat converter. *Part number musse033t*
 - Centre assembly with muffler. *Part number suwe032s*
 - Rear Muffler (quiet option) with 4 inch tip. *Part number suwe031ts*
- 500 Hp in tank fuel pump. *Part number musse008h*
- Hybrid blow off valve *Part number musse127g6*
- EcuTek Custom tune with:
 - Map Switching.
 - Low boost setting 9psi High boost 18psi
 - Launch control.
 - User tune with following adjustable features enabled:
 - Camshaft timing
 - Knock Sensor sensitivity
 - Boost Target
 - Boost Duty
 - Fuel
 - Rpm Limit



Launch control:

Whilst the car was not driven on the road, it was able to be demonstrated how the car holds boost at a preset RPM to enable full boost launches from standstill. Total boost at 6500 RPM and zero road speed was noted at 0.8 Bar or approx. 12 PSI.

- Total logged (peak) boost Low map
 - 9 PSI
- Total logged (peak) boost High map
 - 18.5 PSI
- Dyno results low Map:
 - Power Kw 192 @ 6700 RPM
 - Torque Nm 1430 @ 6400 RPM
- Dyno results high Map:
 - Power Kw 240 @ 4300 RPM
 - Torque Nm 1965 @ 6796 RPM

NOTES:

This car was used to compare before and after dyno power runs utilising some of the features that an EcuTek ECU offers:

Map Switching:

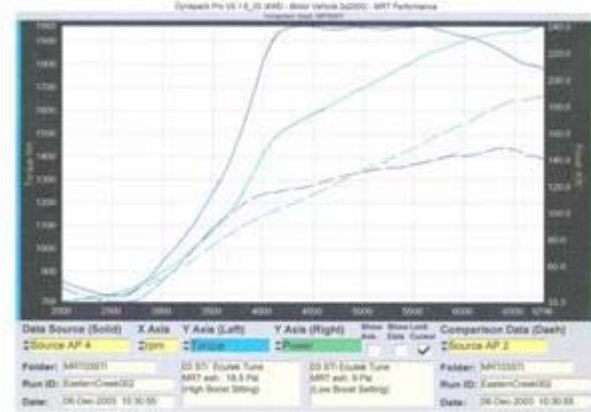
The car was run up with the existing tune and then a second time on the lower setting using “Map Switching” (See dyno plots) This shows the unique benefits of EcuTek’s ability to use separately tuned maps within the ECU, and how easy it is to swap between them “at the flick of a switch”

User Tune:

A demo was done on how the EcuTeK enhanced ECU can allow the car owner to access this feature and make changes to ECU settings see above.

DYNO GRAPH NOTES

The two plots were run with low and high boost (using map switching)



Car 2

Whiteline P Rex III 2003 Subaru Impreza WRX.

Owner: Bob

Modifications (other than standard)

- MRT Performance Power kit type XA (refer to separate document on this car)
 - EcuTek ECU tune.
 - Rear "Cannon muffler *Part number suwe031tea*.
 - Rear muffler adapter *Part number musse035a*.
 - Intake airfilter flat panel filter *Part number musse040*.
 - Intake resonatorectomy.

- Total logged (peak) boost (with XA kit settings)
 - 15.2 PSI
- Total logged (peak) boost on std ECU settings
 - 15 PSI

- Dyno results: (XA Kit)
 - Power Kw 171.3 @ 3800 RPM
 - Torque Nm 1398 @ 6200 RPM
- Dyno results: (Std Subaru ECU settings with mechanical mods as listed)
 - Power Kw 145 @ 600 RPM
 - Torque Nm 1200 @ 3750 RPM



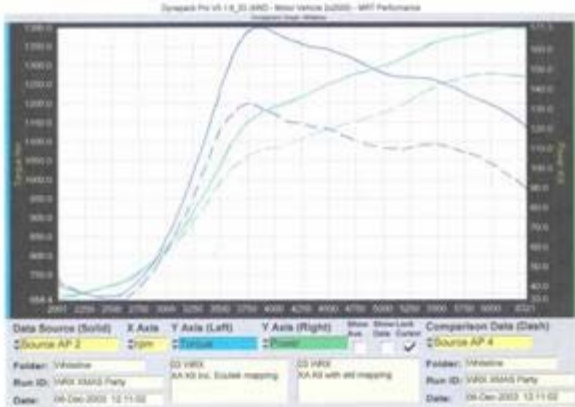
NOTES:

This car was used to compare before and after runs with the above mods with and without the MRT EcuTeK remapped Ecu. In other words meaning the car was dyno'd with mechanical modifications (muffler, airfilter, etc) using standard Subaru ECU settings, then compared to EcuTek retuned settings.

This showed how much the EcuTeK tune increases power and Torque.

For some reason on the day the low power run on this car was lower than expected.

DYNO GRAPH NOTES



The two plots show the MRT Performance XA kit with the low result being the same kit **WITHOUT** the enhanced ECU and only the standard Subaru Map loaded.

Run 1 The car was ran up on the Dyno with the MRT EcuTeK tuned ECU and mechanical mods (as listed).

Paul displayed via the remote PC screen and using his laptop, how he can re load the standard Subaru ECU settings.

Nothing else was changed other than the software settings in the ECU.

Run 2 The car was again ran up with no other changes than as mentioned and it displayed lower Power and Torque.

To ensure repeatability the car's ECU was again re mapped with the MRT XA kit ECU software settings into the cars Subaru ECU.

Run 3 Again the car was ran up on the dyno and similar results to Run 1 (as expected) were displayed on the dyno plot.

Car 3

APS enhanced 2001 Subaru Impreza WRX

Owner: Gary

Modifications (other than standard)

- APS Club spec kit
 - Unichip
 - APS Top mount intercooler
 - APS Water Spray
 - K / N Airfilter
 - Inner guard airfilter resonator modification
 - Complete exhaust
- Dyno results:
 - Power Kw 166 @ 4400 RPM
 - Torque Nm 1076.3 @ 6000 RPM
- Total logged (peak) boost
 - 13 PSI



NOTES:

Non MRT tuned cars were dyno'd "as is" IE no data logging or re tuning equipment was connected.

Run 1 This car was run up and immediately it was noted that something was wrong.

The car was turned off and on inspection a faulty (leaking) carbon canister purge control valve was diagnosed. This was repaired somewhat crudely, but effectively by blocking the leaking hose. This hose has



no effect on power when blocked, however it did effect the first Dyno run result as the hose that leaked was the one that connected to the AFM and this caused a bleed off of the signal and resulted in potentially risky fuel mixtures.

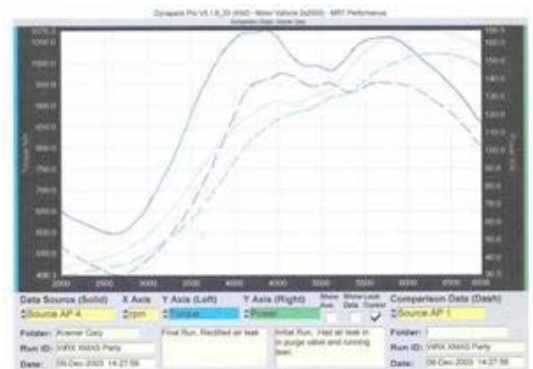
Run 2 The car responded better, but results were still mixed.

Run 3 This was done to ensure accuracy (this was the best run).

Run 4 To ensure complete accuracy runs were continued until a drop off was recorded due to heat. Ensuring the fairest result (This run was worse than the other three due to heat soak.)

DYNO GRAPH NOTES

The two plots were run 2 and 3



Car 4

2003 Subaru Impreza WRX Sti

Owner: Dan

Modifications absolutely none

- Dyno results:
 - Power Kw 182.3 @6300 rpm in 5th gear
 - Torque Nm 1623.6 @ 5000 rpm in 5th gear



NOTES:

Non MRT tuned cars were dyno'd "as is" IE no data logging or re tuning equipment was connected.

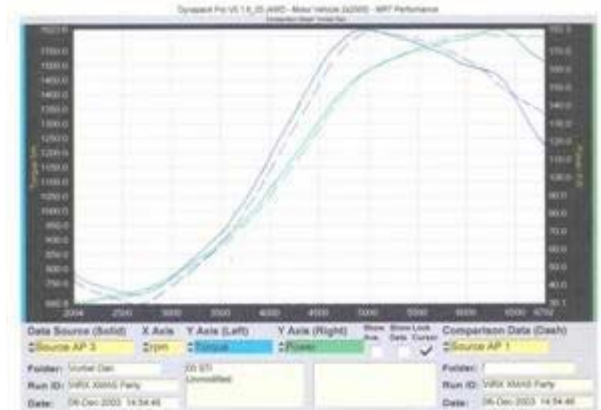
Run 1 A reasonable result was achieved

Run 2 Run again to ensure accuracy of first results. Slightly better than 1st run.

Run 3 Heat soak was beginning to effect results. 3rd run not as good as the second.

DYNO GRAPH NOTES

The two plots run were 1 and 2



Car 5

1999 BMW M3 3.2 Litre 6 Speed SMG

Owner: Halil

Modifications absolutely none

• Dyno results:

- Power Kw n/a @ n/a RPM
- Torque Nm n/a @ n/a RPM

NOTES

Runs on this car could not be completed as a result of the car outsmarting itself. The SMG transmission (Electronically controlled clutch manual gearbox) would not allow a gear higher than 2nd to be selected as the ECU diagnosed (incorrectly) that the car was wheel spinning.

With the car only able to be run in 2nd gear (almost the same as 1st gear on a WRX!), the torque of the engine in such a low gear resulted in the dyno seeing wildly varying results and set itself into protection mode!

The car was removed from the dyno to avoid possible damage to both the car or dyno should we have continued.

Results statistically not reliable.



Car 6

1997 Subaru Impreza WRX

Owner: Danny

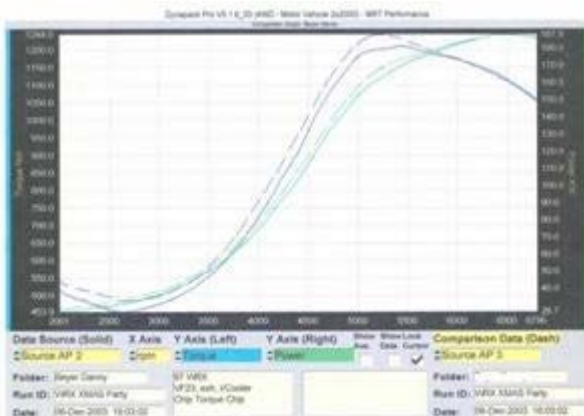
Modifications:

- VF23 Turbo
- MRT Top Mount Intercooler
- 3 inch exhaust (unbranded), with HKS Super Dragger Cannon muffler 5inc dump pipe
- Chip Torque ECU upgrade 18psi
- GFB Blow Off Valve
- Water Spray on intercooler
- Lightened Pulley Kit
- Top Gun Ignition 8mm leads
- K/N Air filter
- Cold air intake



Total logged (peak)boost

- 18 PSI
- Dyno results:
 - Power Kw 187.9 @ 6500 RPM
 - Torque Nm 1244 @ 5200 RPM



NOTES:

Non MRT tuned cars were dyno'd "as is" IE no data logging or re tuning equipment was connected.

Run 1 The car ran reasonably well

Run 2 Similar performance achieved.

Run 3 Heat soak was beginning to take its toll. A drop in performance was noted.

CONCLUSION

The day was a success with people gaining a better understanding of the Dynapack Chassis dyno and its ability to run cars of all types (with the exception of cars that were too smart for themselves! ☺). The features and benefits of EcuTek software in tuning MY99 onwards Subaru's were also shown in detail.

REFERENCE DATA

- www.ecutek.com.au Ecutek ECU tuning tools.
- <ftp://ftp.mrtrally.com.au/news/> MRT Power kits with EcuTeK upgraded ECU's
- www.dynapack.com Dyno manufacturer.
- www.MRTrally.com.au MRT Performance.
- http://www.mrtrally.com.au/forums/forum.asp?FORUM_ID=10 EcuTek Support forum.
- http://www.mrtrally.com.au/forums/topic.asp?TOPIC_ID=10682 MRT Performance **Power kits** story.
- <http://www.mrtrally.com.au/performance/magazine.htm> Magazine stories and independent reports on EcuTeK and how it works.

MRT PERFORMANCE. More than SUBARU.

EcuTeK / MoTeC / Haltech / Link and factory EFI Specialists

MRT Performance report
NSW Impreza WRX owners club Xmas party.