

ACE Header Dyno Information

[ACE Header Forum Thread](#)

ACE dyno testing was done with a 2013 BRZ Automatic. It was "de-tuned" before testing. Horsepower and torque numbers change from dyno to dyno but the shape of the curves are fairly consistent. The following runs were conducted on an Italian Dimsport in May 2015 with ambient temps around 30°C-33°C (86°F-91°F).

Workshop/tuner: Dimtech s.r.l
Address: Via Torino 16Bis Gabiano (AI) Internet: www.dimsport.it
Phone: 01429552 Fax: 01429552 E-mail: paolo.castellano@dimtech.it

Client name:
Model: 86

Vehicle plate:
Type: STI

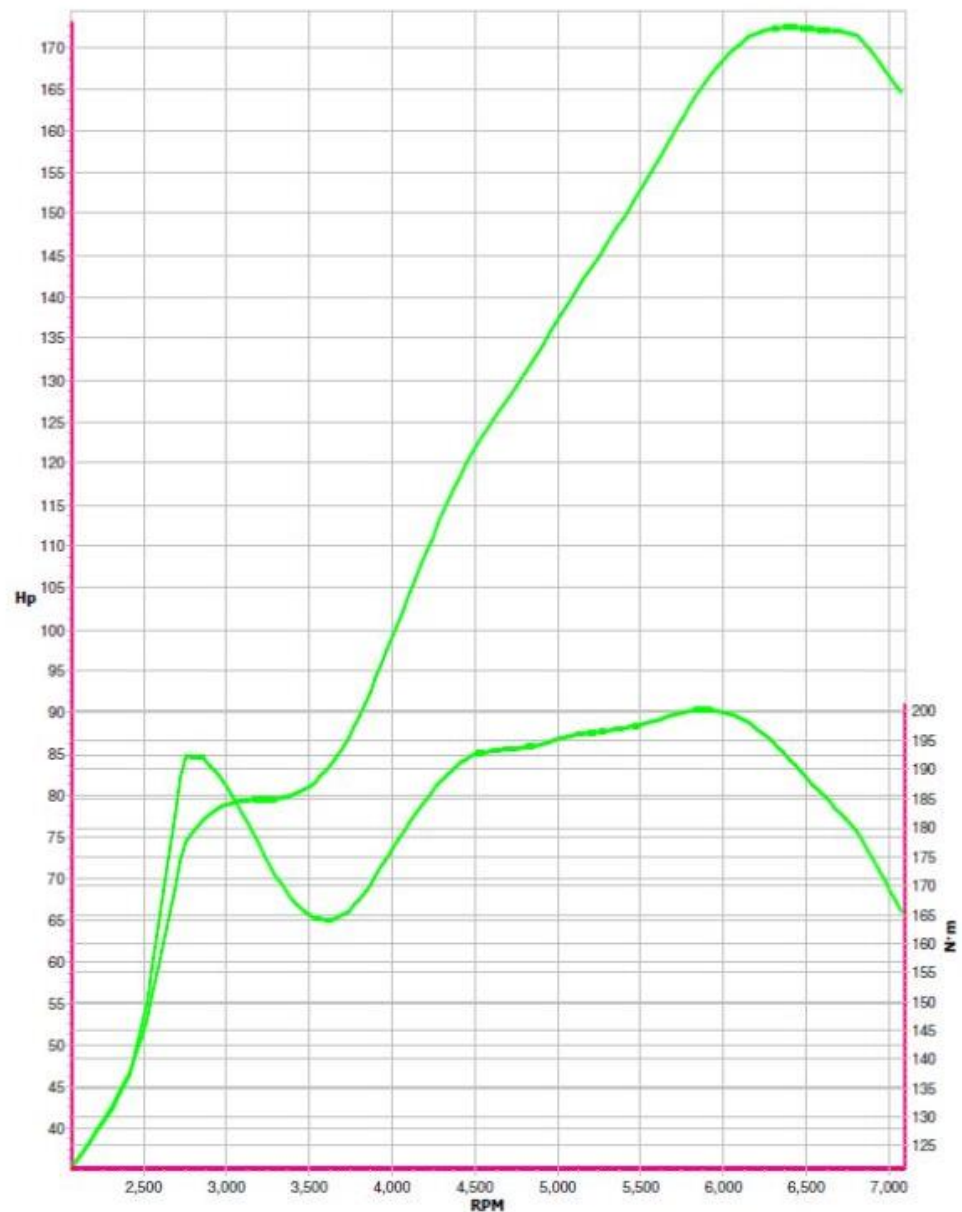
Manufacturer: TOYOTA

Motore - Motor

Full OEM Stock

OEM 01

Engine Power: 172.4 Hp @6402 rpm
Engine Torque: 200.3 N·m @5929 rpm



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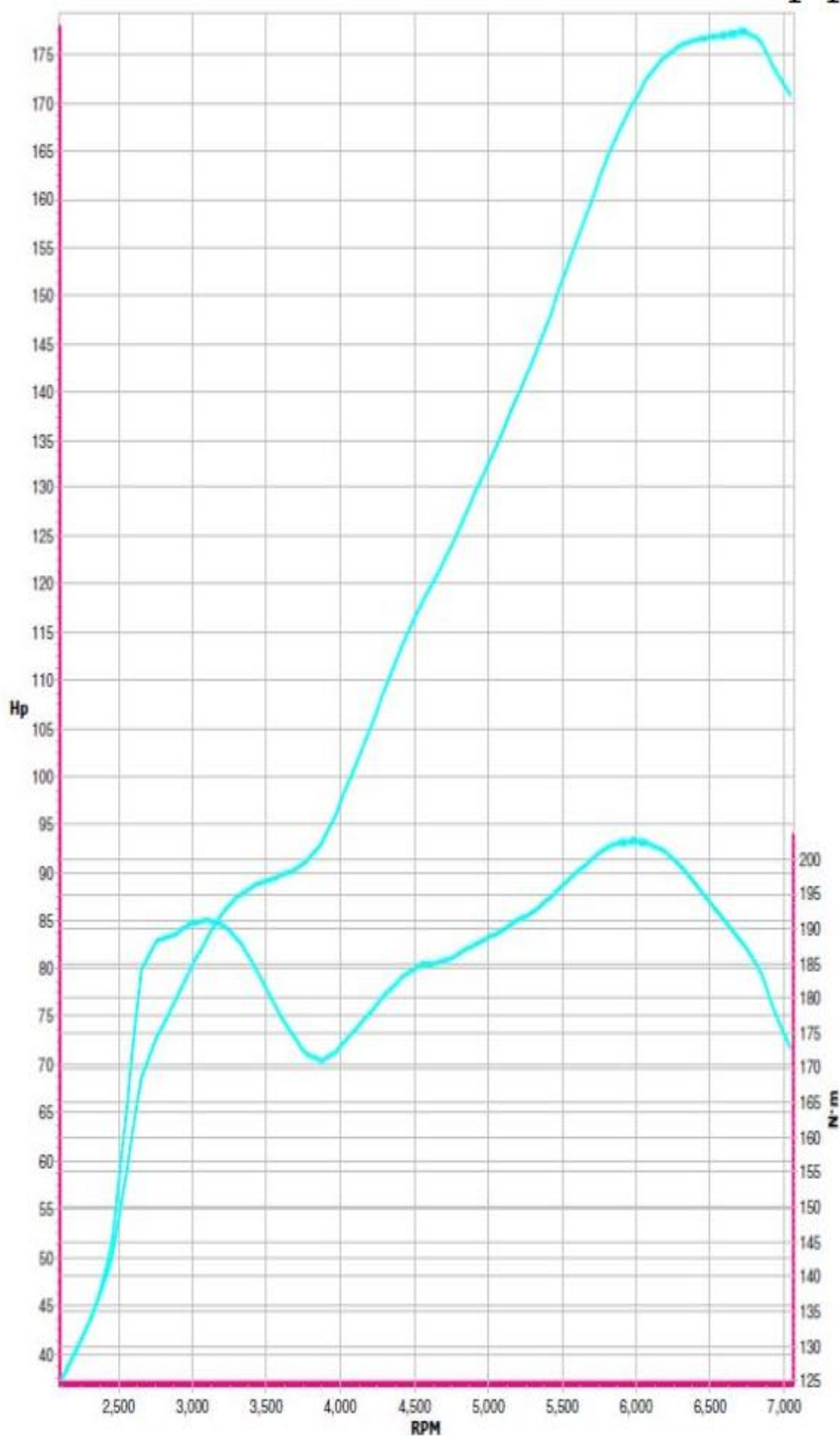
Motore - Motor

— ACE 4-1 with OE OP & Frontpipe

4-1 OEFP 01

Engine Power: 177.4 Hp @6705 rpm

Engine Torque: 202.5 N·m @5963 rpm



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Client name: AAY-5600
Model: 86

Vehicle plate:
Type: AAY-5600

Manufacturer: TOYOTA

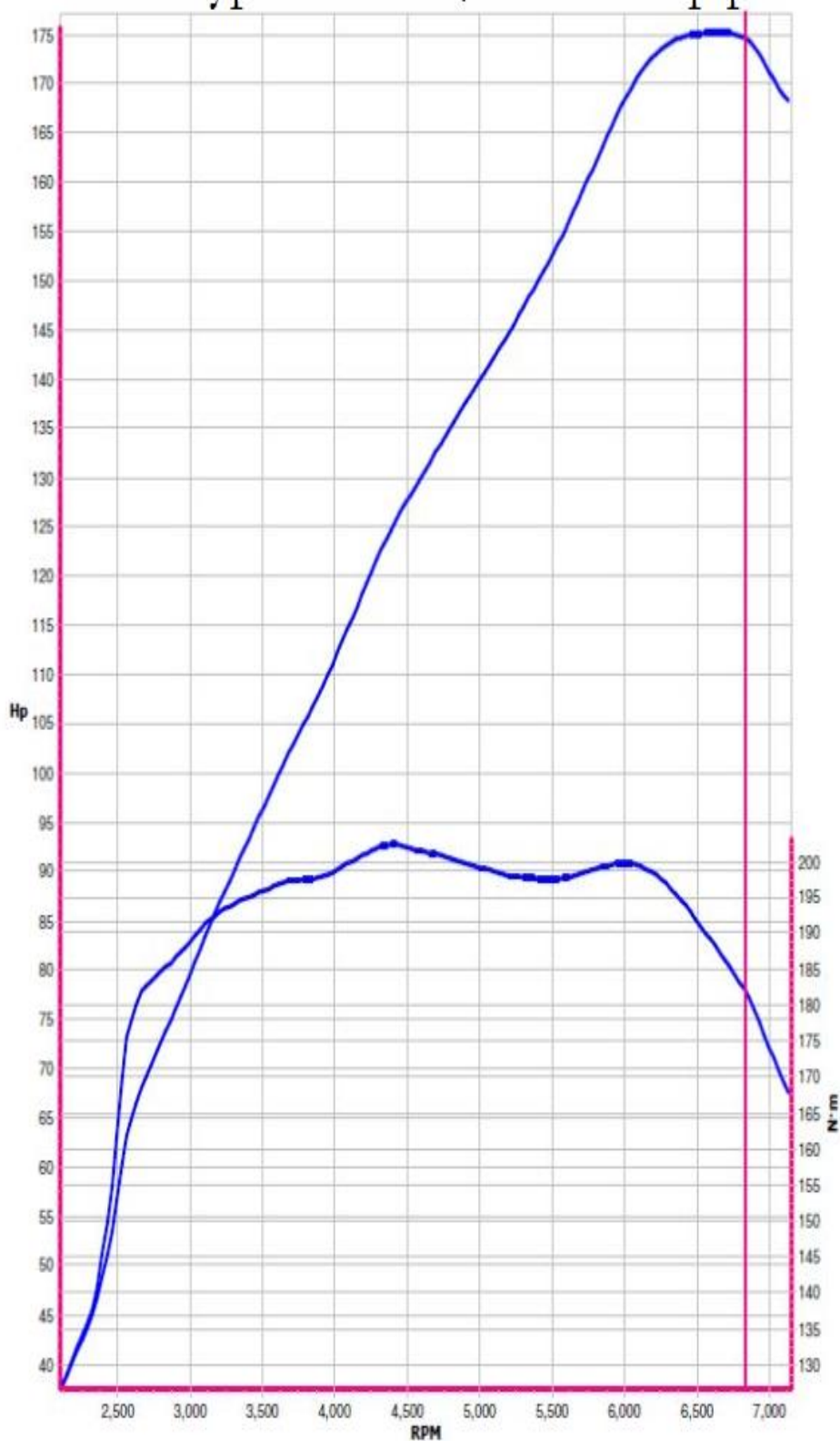
Motore - Motor

— Type A 350 w/OE Frontpipe

4-2-1 OEFP 02

Engine Power: 175.1 Hp @6625 rpm

Engine Torque: 202.4 N·m @4424 rpm



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Client name: AAY-5600
Model: 86

Vehicle plate:
Type: AAY-5600

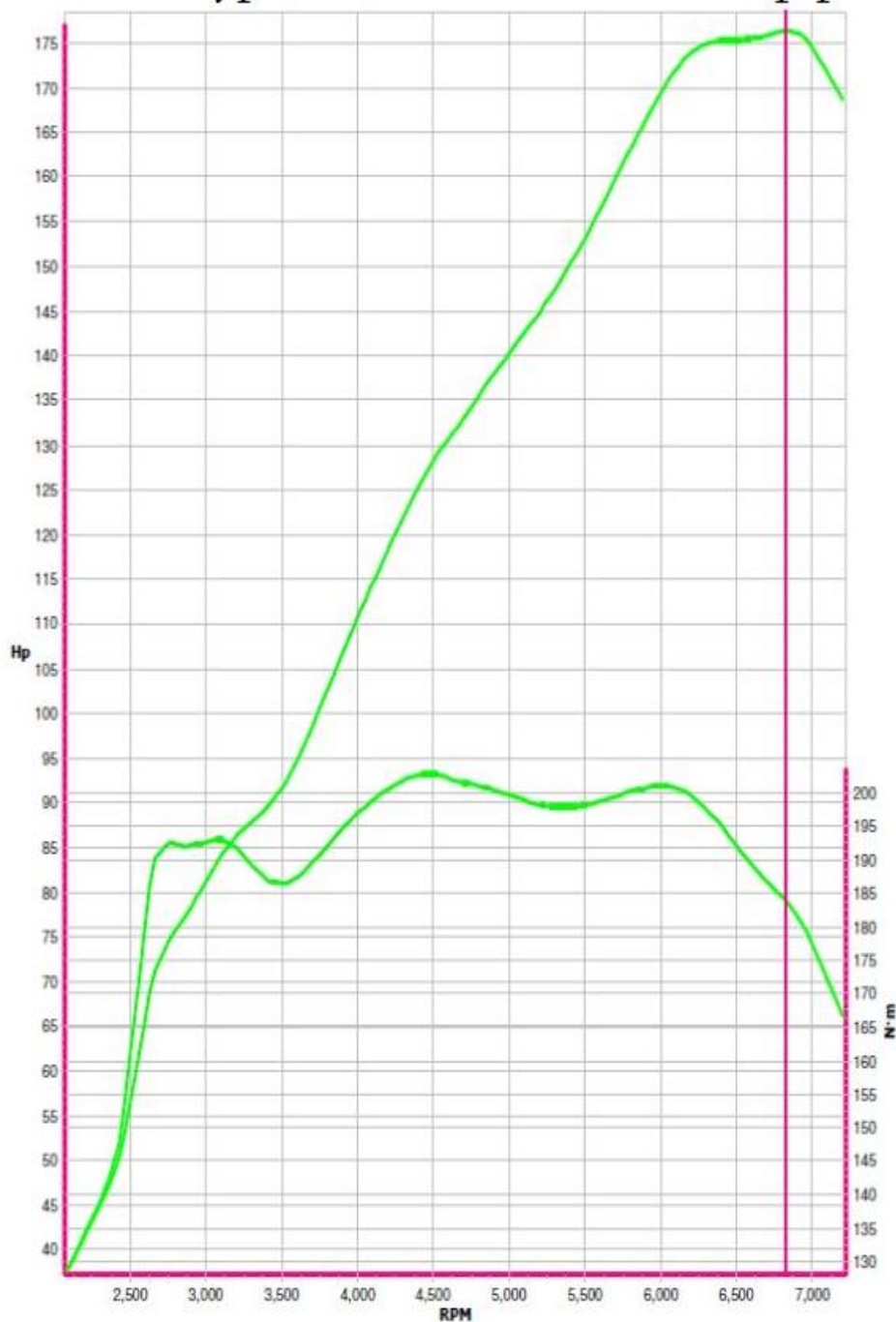
Manufacturer: TOYOTA

Motore - Motor

— Type A 350 with Ace Frontpipe

4-2-1 full 02

Engine Power: 176.4 Hp @6828 rpm
Engine Torque: 202.8 N·m @4492 rpm



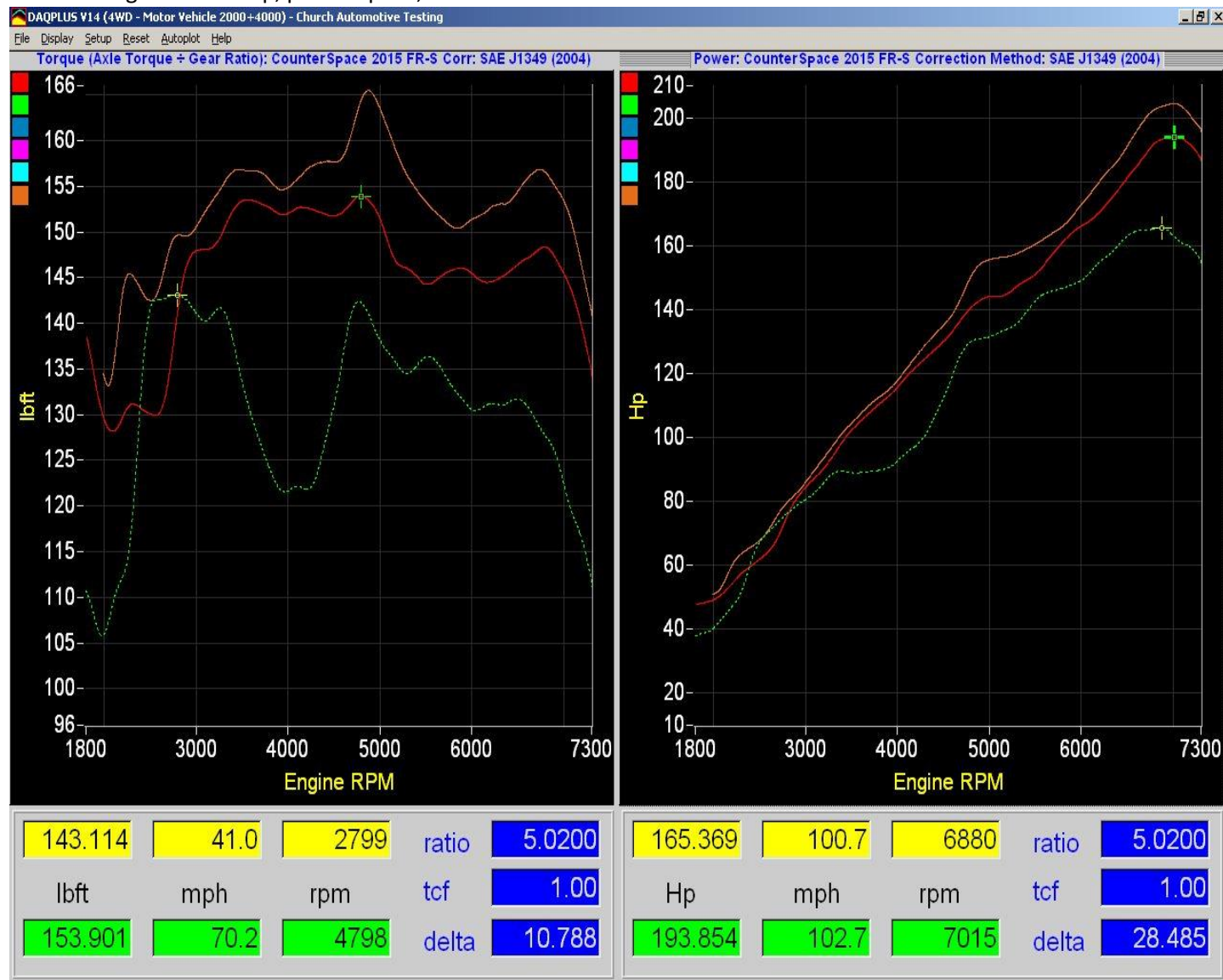
The following performance dyno runs were performed by Counter Space Garage (CSG)
CSG independent testing results FT86club.com

First, we compared ACE 4-2-1 Type A 350 vs Stock

- Orange – ACE 4-2-1 Type A 350 on E70
- Red – ACE 4-2-1 Type A 350 ACN 91
- Green - Stock

Test notes:

- There is a gain of 10.8 lb/ft wtq, peak vs peak, on ACN 91
- There is a gain of 28.5 whp, peak vs peak, on ACN 91
- There is a gain of 22 lb/ft wtq, peak vs peak, on E70 vs stock
- There is a gain of 39 whp, peak vs peak, on E70 vs stock



Folder Mike Kang 2014 BRZ
Run ID baseline
Date 21-Dec-2013 10:55:23



Second, here is the same graph of the ACE 4-2-1 Type A 350 vs Stock, but with the peak torque gain (maximum delta) highlighted

- Orange – ACE 4-2-1 Type A 350 vs Stock
- Red – ACE 4-2-1 type A 350 ACN 91
- Green - Stock

Test notes:

- There is a peak gain of 30.4 lb/tq, on ACN 91
- There is a peak gain of 22whp at that same RPM, on CAN 91
- E70 gains speak for themselves over stock



Third, here is a graph of a leading UEL header + OP combo, vs the ACE 4-2-1 Type A 350 Header + OP. Both setups have been dyno tuned per our methodology. Peak power for CAN 91 is highlighted.

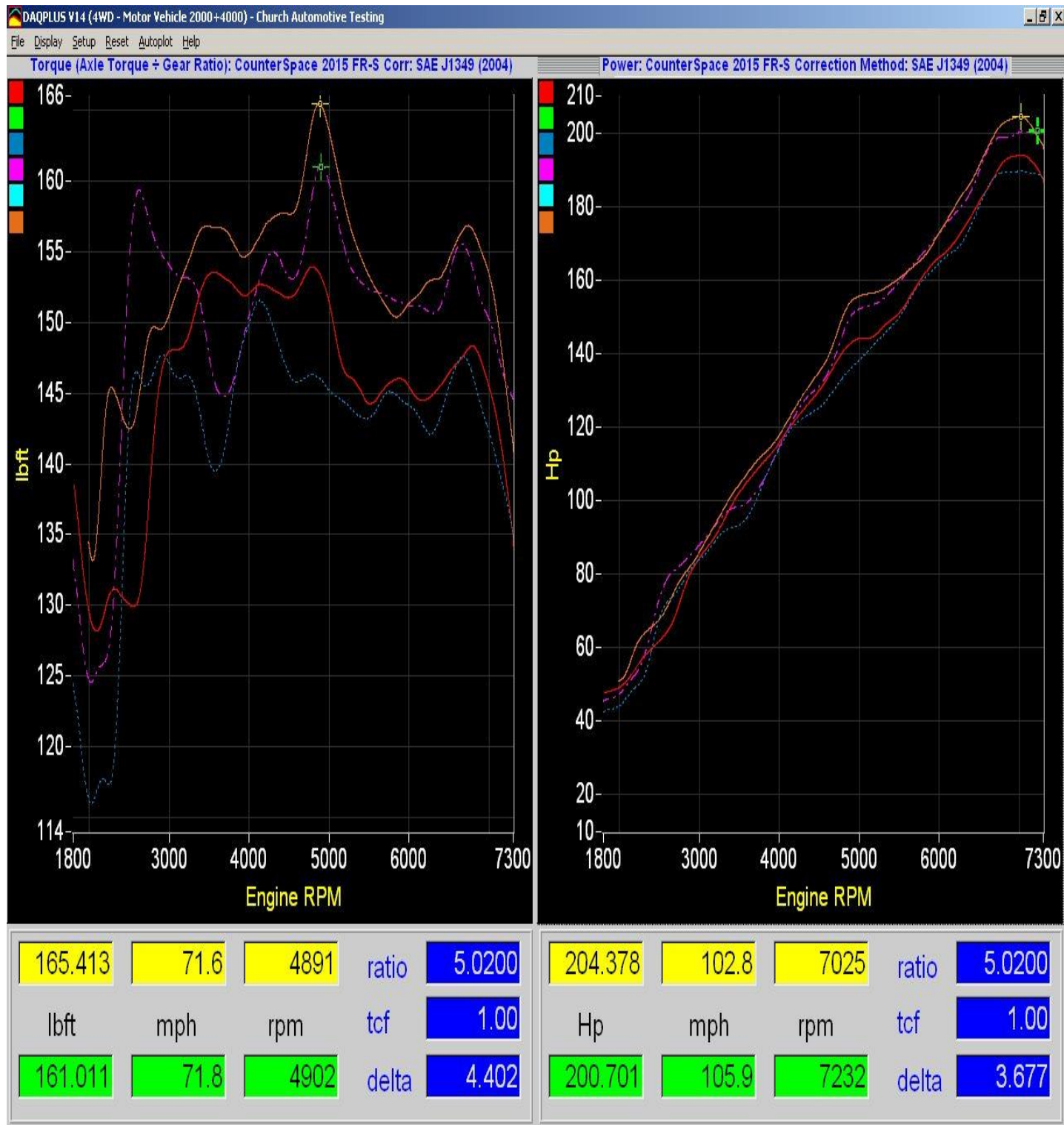
- Orange – ACE 4-2-1 Type A 350 E70
- Red – ACE 4-2-1 type A 350 ACN 91
- Purple – UEL + OP E70
- Blue – UEL + OP CAN 91

Test notes:

- The UEL makes more power from 2400-3150 on E70
- The UEL makes more power from 2450-2950 on CAN 91
- The ACE Header makes more power through the rest of the RPM range on both E70 and CAN 91



Forth, the same graph as above, but with E70 peaks highlighted.



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Run ID tune 2

Date 14-May-2015 16:04:21



Some followup thoughts from CSG

- ACN91 is notoriously known as “pisswater”, because it is, literally, the worst “premium” octane gasoline commonly available. Despite this, MUCH more timing could be added with the ACE 4-2-1 Type A 350. This indicates to us that the ACE 4-2-1 Type A 350 is evacuating the exhaust gas out of the cylinders faster and more completely than the OEM or UEL headers. Because we are able to add timing, the 91 octane gains are larger compared to the other options.
- However, for the very reason that 91 octane gains are larger, E70 gains are even smaller. Ethanol allows you to add more timing, because it is both more knock resistant, and has superior cooling properties, which are compounded by the finer atomization of Direct Injection. Because we can already run so much timing on CAN 91, Ethanol gains are lower.
- Due to time and budget constraints, we elected to test E70, rather than E85. While E85 would certainly yield higher numbers, purging the system completely enough to have E85 (instead of E84, or E82, ect.) would have been too time consuming. We compromised by testing E70, which we could verify via our Delicious Tuning Flex Fuel kit. Additionally, we believe these numbers to be reasonably close to E85 numbers as Ethanol has diminishing returns as the ethanol content goes up with Naturally Aspirated cars.
- All testing was performed with an otherwise OEM car. We believe an aftermarket front pipe will free up the exhaust flow even more, allowing for more gains. This leads us to more testing next week; the ACE Type A 350 header will be tested with multiple diameter front pipes to see if any of them produce better results.
- We are absolutely certain that even deleting the cat in the OEM front pipe will yield more power. We are also of the belief that a properly matched front pipe will probably flatten out the torque drop between 5000 and 6800 RPMs. This is heavily reinforced by many dyno's we've seen on other cars, including the fifth dyno above, that shows the 5000-6800 range being flattened out when there are no cats in the exhaust system. Any peak gains are just icing on the cake.

CSG follow-up dyno runs with Front Pipe variations:

First, ACE 4-2-1 type A 350 vs ACE 4-2-1 Type A 350 with Front Pipe

- Dotted Red – ACE 4-2-1 type A 350 + ACE Front Pipe on ACN 91
- Striped Red - ACE 4-2-1 type A 350 on ACN 91

Test notes:

- There is a gain of 13.8 lb/ft by adding the ACE front Pipe!
- Horsepower gains are only 5.5WHP. However, you can see a huge gain in the area under the curve; there's effectively a horsepower gain everywhere.
- The odd dip you see at 3700 RPM is not actually a dip. This is the AVCS being unable to keep up with the RPMs as the revs are climbing up the dyno. If we change the ramp rate, the dip will shift, based on how quickly you go through the RPM band. In actuality, the dip is not manifested under street driving conditions.
- 199.6WHP on CAN 91. This is a short 4th gear pull. As you know, CSG does not do "hero" dynos. Just to see what we could be, by altering *how* we performed the pull, we were able to make the dyno read 209whp with CAN 91, but this is not representative of real world performance. This 199.6WHP is repeatable all day, every day, under heat soaked conditions, at the track.



Second, here is the same test, but on E70

- Solid Purple – ACE 4-2-1 type A 350 + ACE Front Pipe on E70
- Striped Orange - ACE 4-2-1 type A 350 on E70

Test notes:

- There is a gain of 8.6lb/ft torque
- There is a 7.7WHP
- As previously mentioned, you'll notice that odd dip has shifted. It's not really there, as it's a cam angle artifact from not being able to keep up with the rate of RPM rise.



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Run ID decat 2

Date 27-May-2015 14:45:14



Third, we add stock to the graph, with ACN 91 results highlighted.

- Dotted Green is stock on ACN 91
- Striped Red is ACE 4-2-1 type A 350 + ACE Front Pipe on ACN 91
- Solid Purple is ACE 4-2-1 type A 350 + ACE Front Pipe on E70

Test notes:

- There is a peak gain of 45lb/ft torque at the wheels on ACN 91
- There is a peak gain of 33.8WHP at the wheels on ACN 91



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Run ID decat 2

Date 27-May-2015 14:45:14



Forth, we take the same graph and highlight E70 results.

- Dotted Green is stock on ACN 91
- Striped Red is ACE 4-2-1 type A 350 + ACE Front Pipe on ACN 91
- Solid Purple is ACE 4-2-1 type A 350 + ACE Front Pipe on E70

Test notes:

- There is a peak gain of 50lb/ft torque at the wheels on E70
- There is a peak gain of 46.4WHP on E70



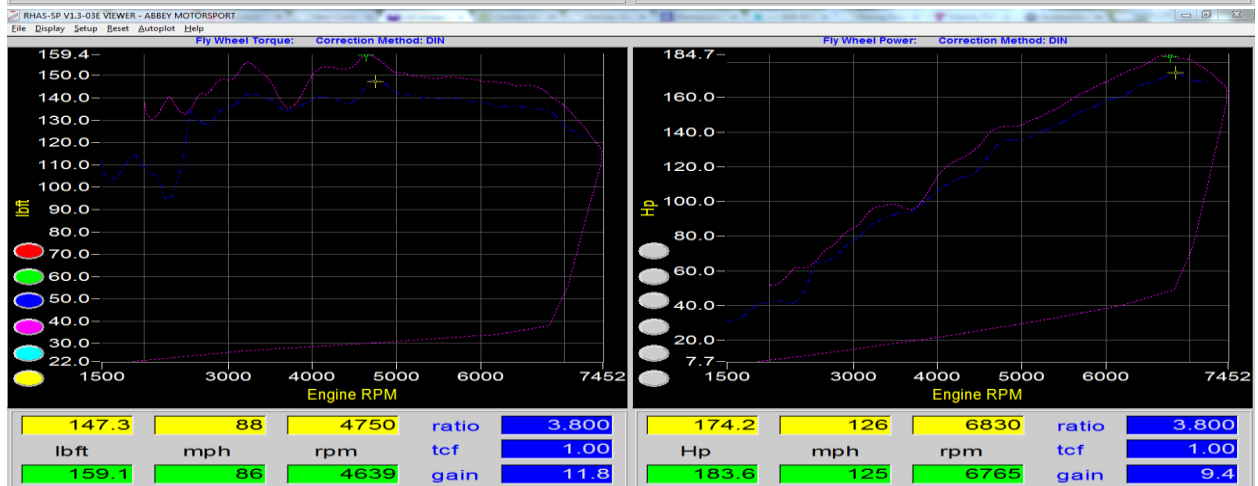
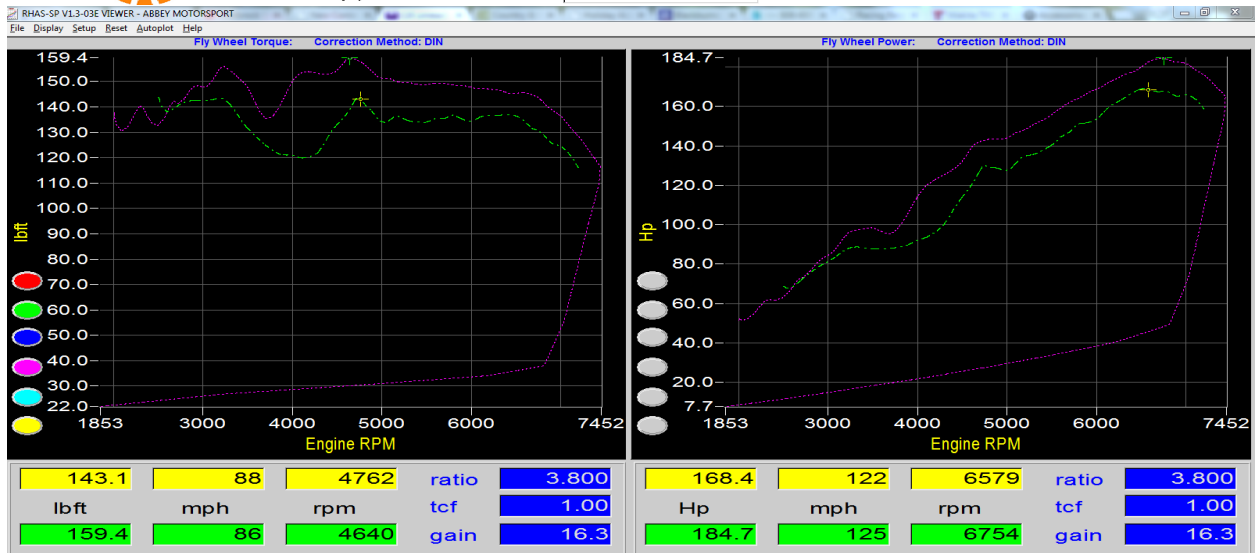
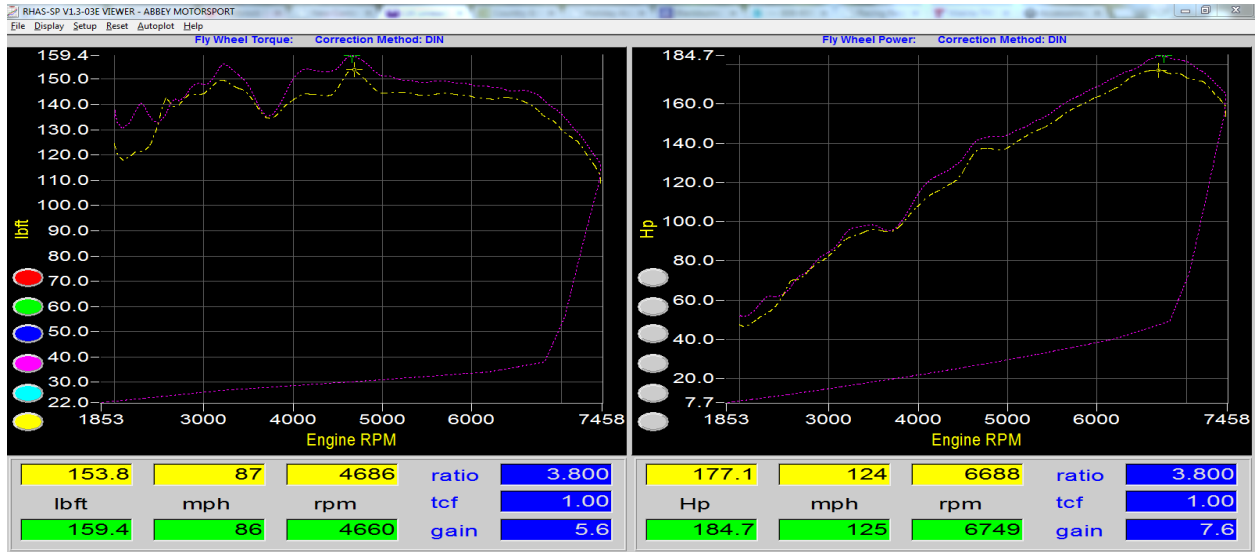
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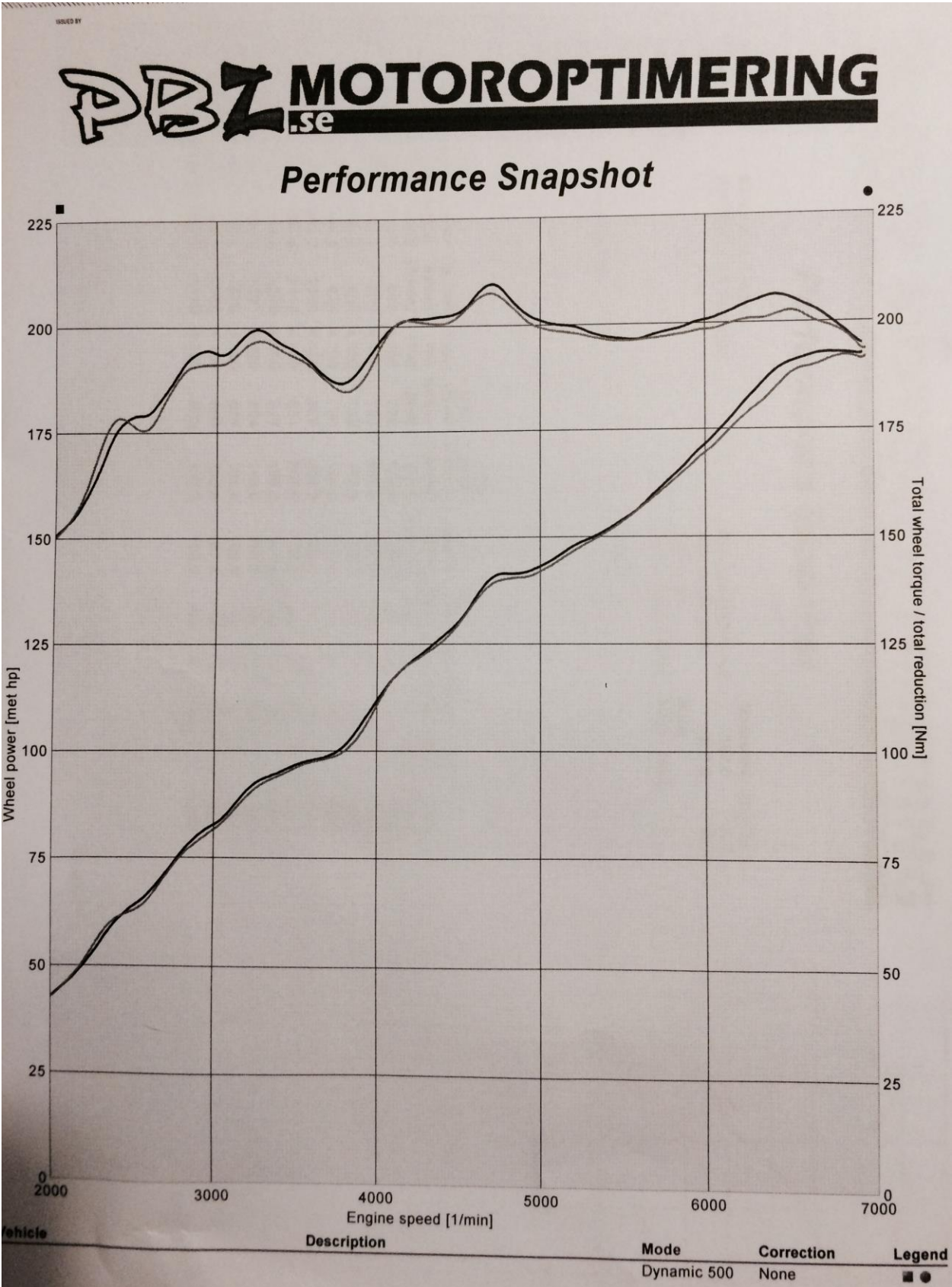
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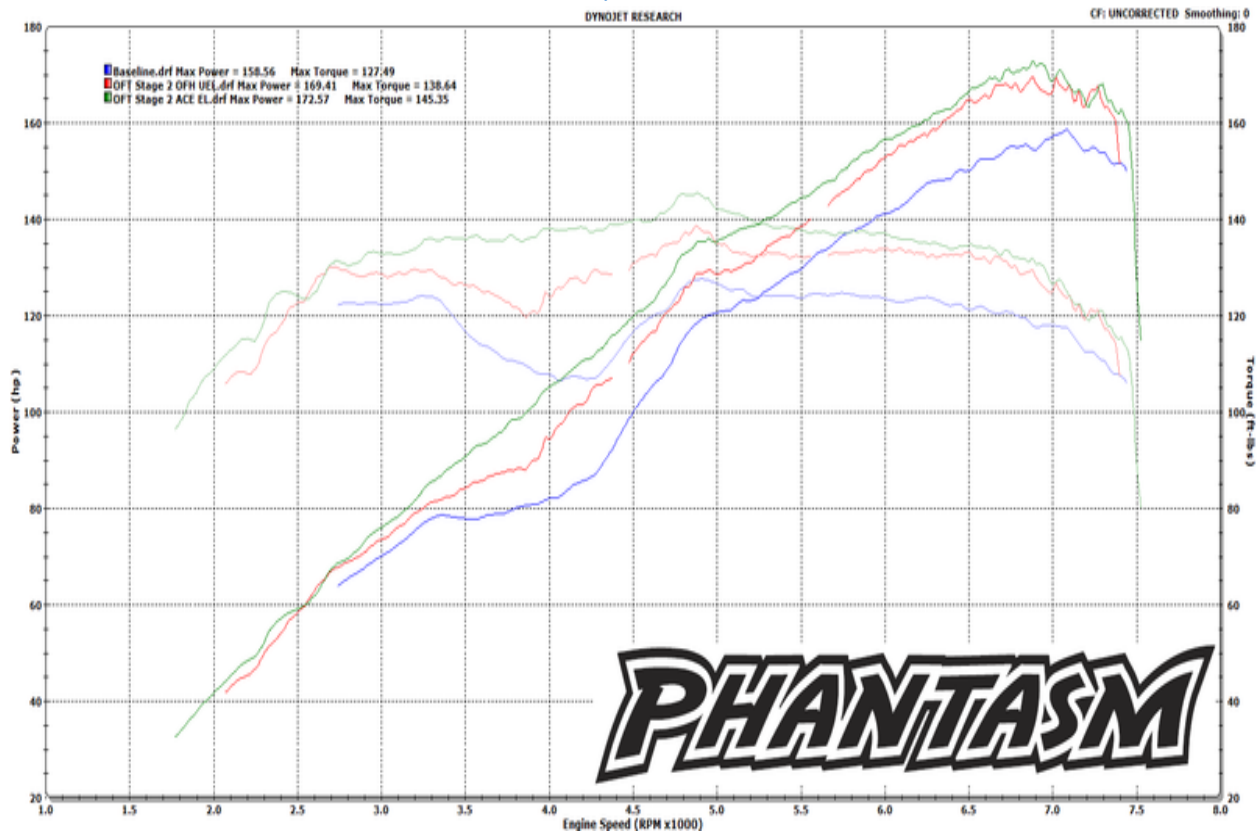
Dyno graphs from independent sources running an ACE Header:
Abbey Motorsports-United Kingdom: Type A 250





Jordan Best – USA: Type B 350

[Write-up and review](#)



Alex Jackson – USA: Type A 350 (with Jackson Racing Supercharger)

