MRT FQ08 vs WL P28 Grudge Match II
13th June 2008

WHITELINE Flat out

DATA ANALYSIS OF P28

MRT "FQ08" SPEC (*information supplied by MRT - 1500kms)

MRT Sports brake pads front	MUSSBR020AECC
MRT Sports brake pads rear	MUSSBR021ADCC
AP-Racing 600 brake fluid	CP3600
EcuTeK factory ECU retune	EcuTeK My08 Sti
Custom Dyno tuning	dyno custom tune
Complete exhaust	
Engine pipe	MUSSE034TJSM
Centre pipe	SUWE034SJM
Rear twin outlet muffler	SUWE034TAM

40kw increase in power @5400 rpm
21% increase in torque @ 3600 rpm
(output would have varied with low ambient air temp 10-15 %?)
(Tests to be completed in next 2 weeks against P28 on same dyno to compare base power and Torque figures)

FQ08 Wheel alignment settings
"Factory standard",as delivered by local Subaru dealer.
(will be checked in 2 weeks for comparison purposes)

Fuel
98 RON as delivered out of bowser at Shell Sutton Forest

*Above information supplied by MRT

WHITELINE P28 SPEC (7000kms)

Front adjustable sway bar 22mm hard setting	BSF39Z
Rear adjustable sway bar 20mm middle(?) setting.	BSR49Z
Spherical swaybar links	FR KLC39/ RR KLC066
Anti lift kit/adjustable caster offset bush.	KCA334
Front lower control arm front bush	W0506
Rear cradle inserts	W0598
Adjustable rear upper control arm bushes	KTA126
Diff bush inserts	TBA
Brace-lower control arm, alloy 4 point	KSB723
Strut tower brace	KSB568
Control lowered springs	FR 73265
Control lowered springs	RR 73266
Heavy duty gearbox mounts	W0597
Additional front camber adj bolt kit	KCA414
Roll centre adj kit	KCA313

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Alignment specs (refer later sections also):

Front	Camber	Toe (?)
R	-2.30deg	0
L	-2.30deg	0

Rear	Camber	Toe
R	-2.00	0
L	-2.00	0

LAP TIMES- From the data logger.
(Note lap times are comparative only and should not be used for absolute comparisons with other sessions.)

Session 1 Best time and in order of run (Wet track, sun starting to dry surface)

MRT FQ08	1:13.17
WL P28	1:11.32

Session 2 Best time and in order of run (Dry to damp track, 45 minutes later)

WL P28	1:10.63
MRT FQ08	1:09.88

LATERAL G AND PERFORMANCE DATA
From data logger refer WL_Grudge_G-circle-freq.pdf and WL_Grudge_brake-corner.pdf for data.

- WL P28 max lateral G reading onto main straight achieved 1.21 Lat G, MRT FQ08 max lateral G reading onto main straight 1.04 Lat G
- Difference is magnified in more technical sections such as internal fish-hook sector where WL P28 shows significantly higher lateral G and grip with -1.125G mean vs MRT FQ08 with -1.05G.
- WL P28 consistently carried an average corner speed of 7.9 kph faster through the final turn onto the main straight than the MRT vehicle. MRT 66.62kph vs WL P28 74.59kph
- Fitment of upgraded brake pads and brake fluid to MRT would net approx 11.7m +/- 1% variation in increased braking performance provided there was no lateral loading on the tyre.
- Data (refer graphs) show MRT FQ08 car braking significantly later compared to WL P2 with stock pads and fluid however WL P28 carries higher corner speed under brakes as shown in graph and G-circle plot.

- Max speed on straight was function of higher corner exit speed with WL P28 at 180.09kph vs MRT FQ08 at 177.85 kph. (refer previous Power Vs Control test 2003)

It was also noted that the WL vehicle in some instances with data calculated by speed, Lat acceleration and longitudinal deceleration was able to achieve better braking efficiency during lateral acceleration than the MRT FQ08 vehicle due to the improved corner grip.

One area of concern where the W/L vehicle suffered heavily was through the top and bottom fishhook section of the track with a lot of time and speed loss due to front end plough and inability to transition weight smoothly, this was also backed up post lap with camera footage and Wayne Boatwright's driver impressions.

Rear swaybar setting was changed (tighter, harder) between sessions however did not lead to significant change to log data or driver impressions. As this was first track test of MY08 STi, we concluded that rear bar size needs to be increased due to DCCD and difference in drive-train config. More testing required.

It was also noted that there was unusual overheating of the front left tyre outer edge and poor heat cycling of the rear tyres combined with constant ploughing of the W/L vehicle that led to the conclusion that something was not quite right, this was also backed up by using logged information extrapolated from a G circle analysis of this part of the track.

From the information from the tyre temps provided one could draw the conclusion that a negative 2 1/2 deg Camber setting on the front and 2 deg on the rear would be more than sufficient for an S spec tyre and setup of this vehicle to handle the grip level and turn in asked of it.

The alignment was double checked for accuracy and found to be exhibiting a chronic toe-in issue on the front which is consistent with driver impression and logger feedback, it is uncertain at this stage as to how the alignment had been knocked out between head-office setup and Wakefield, causing poor turn in response. Subsequent workshop check found front left actual reading of <-2.0 camber and 10mm TOE-IN across front. This explained chronic corner entry understeer.

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CONCLUSION

Overall increase in average tyre temperatures show changing track conditions throughout and between sessions improved grip and favoured later runs as track dried out and grip improved.

Having knowledge of this I conclude that with the front alignment and rear swaybar size issues corrected, there is sufficient room for improvement with increase in Lateral G and lower overall consistent lap times.

We also concluded that equalizing braking performance with same pad material and brake fluid would deliver a closer outcome as P28's higher corner exit speed would partially negate power related acceleration advantage.

I would recommend further testing and comparison.