

C6 T1 prepared Corvette IsoTorque vs. production plate differential test and race at NJMP, 10-30-2009

The test was managed and report was prepared by John Heinrichy, Heinrocket™ Inc with cooperation and assistance from Phoenix Performance Inc and Corner Speed Analysis™ LLC. Report date, 11-11-2009

Test Objective

To obtain objective and subjective data from race track evaluation of the IsoTorque differential positraction unit installed in a C6 Corvette race prepared and maintained by Phoenix Performance Inc, to SCCA T1 specifications. Extended run durability during racing conditions was also obtained on the C6 Corvette with IsoTorque differential installed, by participation in the NASA race at NJMP Thunderbolt track on 10-31-2009, driven by Andrew Aquilante, Phoenix Performance Inc.

Test Facility

New Jersey Motorsports Park was used for this test. The track configuration used was the Thunderbolt track without the chicane. This configuration provides a good variety of high speed and low speed turns with increasing and decreasing radius turns as well as camber and elevation variety.

Test Procedure

The complete test was accomplished in one day with a swap from the production to the IsoTorque completed mid day after the production differential evaluation was complete.

John Heinrichy was the test driver for all sessions. Weather and track conditions were cool and dry and consistent for the entire day.

Four short sessions for a total of 19 laps were run on the production differential. The first two sessions were used to sort the car out to make sure valuable consistent information could be obtained. The third session was used to get the driver and car up to speed. The fourth session then was used for data collection and subjective evaluation near racing speeds.

The IsoTorque equipped differential was installed in the C6 Corvette at noon. Two sessions were run with the IsoTorque. The first session of 8 laps was run at moderate speeds and loads to “break in” the gear sets and to give the driver a feel for the difference in performance between the two systems. The last session of 7 laps was run near racing speeds for data collection and subjective evaluation.

The production differential had a separate oil cooler installed during testing. Because of the short time required for the parts swap, the cooler was not used for the IsoTorque. It should be noted that the test car does have a transmission cooler and because the configuration is a transaxle, the transmission cooler does provide some cooling to the differential.

The fuel load was kept between half tank and full to minimize weigh effects and the same scrubbed Hoosier A6 tires in good condition were used for all tests.

Summary of Results – Subjective Driver Comments

-Corner turn in

The Corvette was slightly more responsive on turn in to a corner while maintaining good stability.

-Turn in to APEX

From turn in to APEX, the Corvette maintained good stability while developing less understeer giving a feeling of having more lateral grip.

-APEX

At APEX the Corvette with the production differential typically exhibits more understeer than desired. With the IsoTorque installed the Corvette felt “freed up” with less understeer and more lateral grip. This gives a feeling of carrying more speed into the APEX while making it easier to get to the APEX.

-Turn Exit

From APEX to turn exit the driver was able to achieve full throttle acceleration earlier, thus achieving more acceleration while experiencing less understeer. The drive off the turn had a feeling of more stability which improved driver confidence. High speed turn exits had noticeable improved stability also.

Summary of Results-Objective Data

-Lap times

Fastest lap for the Corvette with the IsoTorque installed was **1.13 seconds faster** than the Corvette with the production differential. The driver’s subjective impression was that some of this improvement was due to improved braking as well as the IsoTorque improvements.

-Data Analysis

DL1 data for the test was analyzed by Corner Speed Analysis™ LLC. A separate PDF attachment is included. **Analysis concludes that lap time improvement due to the IsoTorque differential is approximately 0.9 seconds due to approximately 2.4% improvement in combined acceleration capability.**

Extended Run NASA Race Results – 10-31-2009

The T1 race prepared C6 Corvette was entered in the NASA race at New Jersey Motorsports Park, run on the Thunderbolt track without chicane on Saturday 10-31-2009, driven by Andrew Aquilante. The event consisted of 9 laps of practice with best lap time of 1 min. 41.3 sec (wet track), 10 laps of qualifying with best lap time of 1 min 25.6 sec, and 12 laps of racing (5 laps of caution) with best lap time of 1 min 24.43 sec (fastest overall lap time of the race). Andrew reported very similar positive subjective comments to those of John Heinricy from the previous day's testing. He reported consistent performance for the entire event. Andrew won the race overall in a group of approximately 50 cars with considerably faster cars participating.

Additional Comments

A temperature readout for the differential fluid was not installed for this test, but throughout the testing and racing, there was no indication of high temperature of the fluid, no smoke or fluid expulsion, etc. The differential with IsoTorque hardware will be torn down in the near future and will be inspected for wear, heat, etc.