

“HORSEPOWER FROM LUBRICANTS” BY CHRIS REAL CERTIFIED LUBRICATION SPECIALIST*Documented Horsepower & Torque
From Engine Lubrication*

The claims of additional horsepower and torque from lubricants are often made. Usually, these claims are boastful marketing claims made without documentation or independent, unbiased or scientific methods used to gather data to support the claims.

Torco International recently elected to evaluate several “performance” lubricants in high performance automobile engines. The goal was to evaluate how different lubricants effect engine power output.

To perform the testing, Torco International retained an independent certified consulting firm, Diversified Petrochemical Services Inc. to establish the procedure for performing the testing. With the recommendation of the consulting firm, as well as input from respected members of the high performance industry, **Jackson Racing** in Westminster, California was selected to be the site where the vehicle testing was to be done.

Jackson Racing is one of the most recognized & experienced performance authorities on Honda VTEC engines, and the Dynojet Model 248E Chassis dynamometer which is used at Jackson Racing is extremely accurate and produces repeatable data.

The primary testing in this report was performed utilizing the testing facilities of **Jackson Racing**, with **Oscar Jackson** personally operating the dynamometer, with the individuals from Diversified Petrochemical and Tovatt Engineering performing the data review, monitoring, samples collection and mechanical service between each of the performance measuring sessions.

The consulting firm secured the candidate samples for the testing and arranged for the test vehicle.

The car used for the test was a stock 1994 Honda Civic EX front wheel drive passenger car with 42,708 total general use miles.

The additional information in this report pertaining to the Ford F2000 engine testing results have been included to provide information on the performance results which may be obtained when oil is evaluated in a precision racing engine of similar displacement.

These results were gathered at the noted **Quicksilver Racing Engine** facility in Maryland. This test was performed using a 4-cylinder Ford racing (F2000) engine that was placed upon the **Quicksilver** engine dynamometer and run to evaluate performance changes exclusively related to the oil which was being used.

Mr. Sandy Shamlain of Quicksilver RacEngines independently performed and evaluated the testing procedure, with an engine from one of their racing teams and backed up the data by repeating the test several times for repeatability & accuracy.

The additional power, which was found in the racing engine laboratory testing, was then applied to actual racing conditions. The corresponding lap times additionally reflected the gain in the horsepower & torque.

WHY THE TESTING

“Why the extensive performance testing”, is one of the questions often asked, and should be answered first.

This testing has taken place to accurately document performance capabilities of the Torco products for high performance and competition automobiles.

Torco International is very involved in numerous forms of motorsports, and has always taken the position that accurate data is the best way to improve the products that are manufactured.

It is also very useful to know how the Torco Oil Products perform in real-world & severe conditions. The users of Torco Racing Oils are not the average passenger car oil users; Torco customers are typically the Motorsports participants where improved performance and durability are the most important considerations.

OUTLINE OF THE VEHICLE TESTING PROCEDURE

The vehicle testing that is outlined followed precise testing procedures. Initially the car was warmed up and one set of (3 pulls) was made on the chassis dynamometer. The car was then removed from the dyno & inspected for general serviceability; the tire pressures were matched, and the vehicle was given a complete engine tune-up including new spark plugs, a new OEM air, fuel and oil filter. The car was then placed on the dyno and run at normal performance speeds. All of the dyno functions were checked & inspected for proper calibration and operation. This set of calibration runs were recorded and used as the baseline for the performance testing.

Each set of recorded pulls consisted of a 5-mile warm-up & heating run. The dyno was then brought to a stop, and the reported pulls were then started. 4 consecutive pulls were made with each candidate lubricant, with the power output readings measured and recorded over the power delivery range of the vehicle.

The published data in this report are averages of the 2 most consistent of the recorded pulls, and consist of computer corrected results for the slight changes in ambient conditions.

All sets of pulls were performed consecutively on the same day for accuracy and repeatability of the test.

Prior to starting the next set of pulls the oil was changed, & new oil filter was installed.

The exact procedure was then repeated for each of the recorded sets, with an average of 25 minutes between each set to perform the oil and filter changes. No additional service was performed on the vehicle for the duration of the test.

EFFECTS OF VISCOSITY ON HORSEPOWER

It should be noted that viscosity has a significant effect upon measured power out-put of an engine.

Fluid drag in an engine can therefore account for significant changes in dyno readings. For this reason, the correct way to accurately compare lubricants is to only directly rate them in relationship to oils of similar physical and hydrocarbon properties.

Using the correct viscosity of product for the ambient temperatures, engine tolerances, oil flow & oil pressure rate for the engine is very important for maximum performance.

The chemical components in motor oils additionally have an effect upon the frictional characteristics of a lubricant.

These components may also have an effect upon the engines' performance for a period of time after the parent oil has been removed from the engine. The residual compounds may have a slight effect upon the engine and effect ring sealing, mechanical drag and negative horsepower.

To take these factors into consideration this test was run in a specific order to eliminate as many of the variables as possible.

Technical Documentation

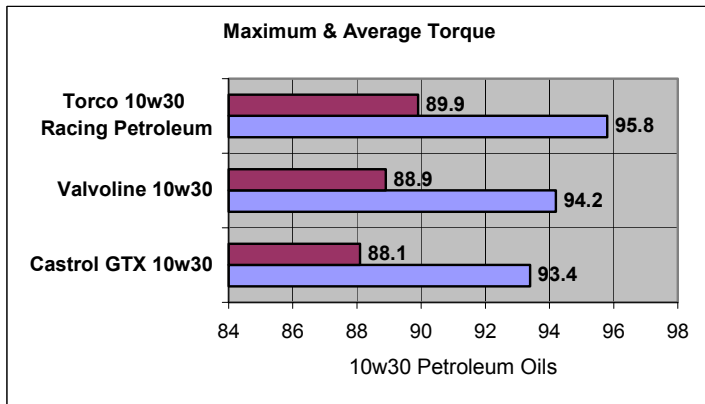
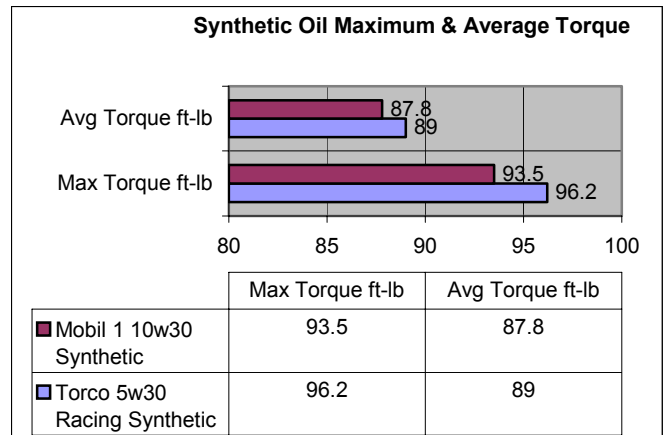
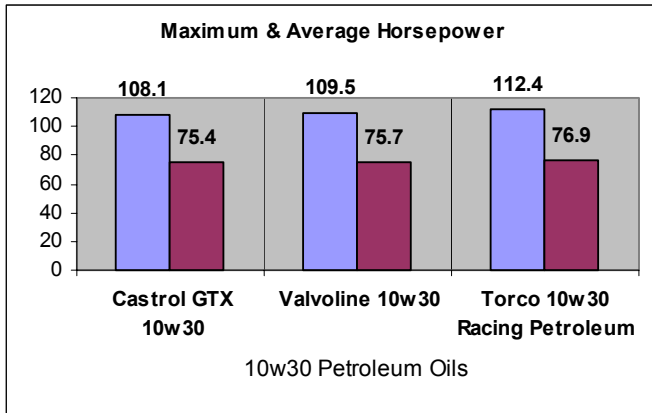
The first set of charts show the direct comparison of petroleum based oils of similar viscosity.

These test results indicate that Maximum and Average Horsepower and Torque, as well as the performance differences with the oil that is being used.

The reported numbers are not performance spikes, but data that has been averaged over a consistent data reporting range.

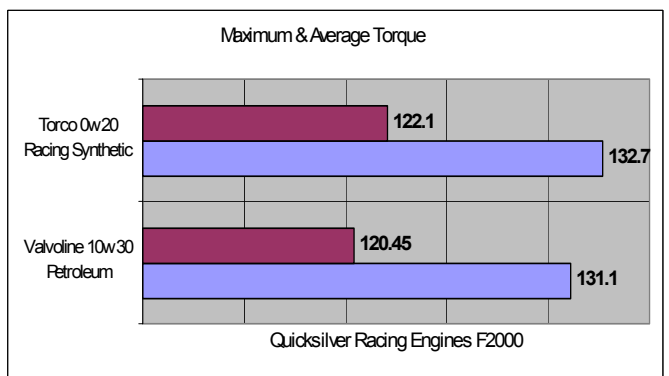
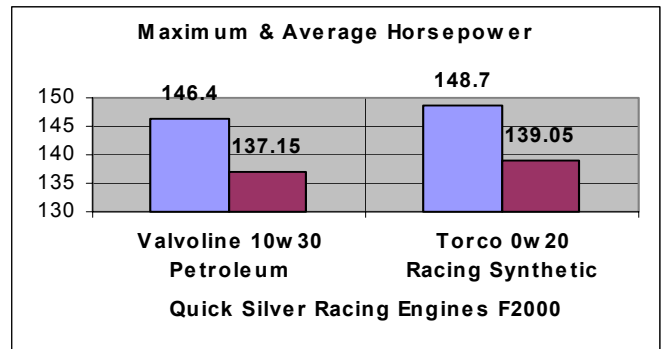
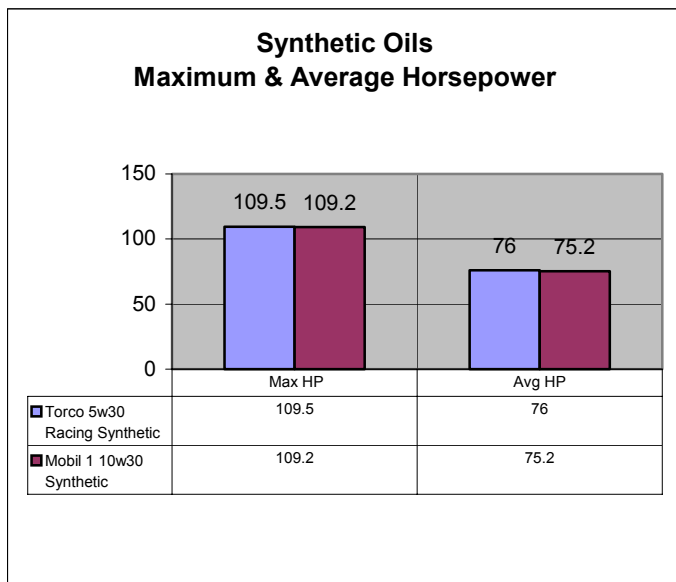


Honda Civic / VTEC Engine Test Results from Jackson Racing.



These charts show the comparison results from the evaluation of oils used in the 4-cylinder F2000 Ford racing engine.

Ford F2000 Racing engine Dynamometer testing from Quicksilver Racing.



Summary & Conclusions

- Engine horsepower & torque can be improved with the use of higher performance oils, this is true even when the oils are of similar hydrocarbon makeup.

(Petroleum based directly compared with other petroleum-based products of similar physical viscosity characteristics).

- The physical & chemical makeup of the products has an effect upon friction, resulting in less power consumed to operate the engine.

Friction reduction reduces wear and consequently improves efficiency, by a measurable amount.

Can the horsepower and torque that is documented on the dyno be translated to performance on the race track? Yes!

Racing Performance

The additional horsepower is not just visible by numbers on a dyno report, but in lap times and consistent race results.

A case in point is US F2000 Forsythe Racing driver, Aaron Justus, who in 2000, totally dominated the highly competitive US F2000 formula car racing series. Aaron set records for the most fastest race laps, set the most qualifying records, won the most road and oval races, and won the road racing and oval championships, and also won the most prize money.

Aaron's car for the season definitely had a performance advantage, with the driver, crew, engine builder, and the lubricants.

The lubricants that allowed Aaron to maximize the performance in this spec series were Torco synthetic lubricants, such as 0w20 & 5w30 synthetic racing oil, RTF synthetic racing transaxle fluid, and MPZ® friction reducer.



Jackson Racing

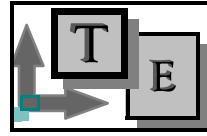
"This was the most comprehensive oil testing that I have ever been involved with. The results of the comparison testing were accurate. I personally performed each identical warm-up, each set of Dyno pulls, and witnessed the independent technicians do the oil and filter change procedure. No other changes took place".

"Since the time of the original test, I have run many oil comparison Dyno tests on a number of different high performance engines, and have found additional repeatable horsepower increases by using Torco oils".

"Extra horsepower is expensive, and Torco lubricants produce repeatable extra horsepower results".

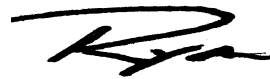
"I have every oil available to me, and I use Torco in my racecar".

Oscar Jackson
Jackson Racing
Westminister, California



Tovatt Engineering

"The vehicle testing that I took part in was accurate, and very interesting. I performed each of oil & filter changes for the test VTEC Honda, and am confident that each of the tests were performed identically".



Ryan Tovatt
Tovatt Engineering
Huntington Beach, CA



Quicksilver RacEngines

In our racing engine facility we build many engines each year. We also spend numerous hours on engine development.

The results that we found on simply switching to Torco lubricants made us take a closer look at the first set of dyno results. We re-ran the test several times and the results showed a consistent improvement in Torque and Horsepower.

"In F2000 the competition is fierce. When we found the extra horsepower with Torco oils it was a clear sign that everyone will have to use Torco oils, or face being an also-ran in this series".



Sandy Shamlain
Quicksilver RacEngines
Frederick, Maryland



Diversified Petrochemical Services Inc.

"The tests which we took part in were performed within sound engineering procedures."

"With over 25 years experience in the lubrication field, I feel that the results are an accurate and true representation of the evaluation of these lubricants".

C.F. Real
Certified Lubrication Specialist
Diversified Petrochemical Services Inc.
Rancho Cucamonga, CA

Torco Continues to Independently Document Performance claims. In another technical report, the issue of Synthetic Oils & power comparisons will be discussed. The next technical update will include documentation of additional independent testing results, which include data from The University of Central Florida using larger displacement engines.