



Media Information for Immediate Release
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After 7 months of intensive testing Thorney Motorsport (TMS) can now categorically confirm what the entire car tuning World already knew – the quality of fuel you use in your car has a direct effect on the level of power your car provides.

TMS specialize in honest, no bullsh*t tuning of BMW's and Vauxhalls. Our knowledge, skill and attention to detail have given us a reputation of testing without compromise and product development without compare so when we develop any new product we know it's the best that can be achieved.

We spend countless hours seeking new ways to eek out extra power from road and race cars and always knew that the quality of fuel used in the car does make a huge difference in power level and delivery but we surprised to find out that no-one had actually conducted any reported data on the actual effects fuel quality made on cars, both tuned and standard.

Our move to our new £750,000 custom workshop in Milton Keynes, Bucks gave us the opportunity to try the (then) new 99 Octane fuel available from Tesco's (there are three local stores, all of which supply the 99 fuel) so we conducted some early testing and were amazed at the results the fuel gave – the cars drove faster, power delivery picked up quicker and they held the power for longer.

However, anecdotal evidence based on 'feel' is not enough for us to rely on so we set about conducting the most in depth fuel test ever done in the UK.

The Equipment

To accurately measure a car's performance you need an accurate vehicle dynamometer. A chassis dynamometer (also called a rolling road) is a sophisticated piece of equipment that allows you to drive a car as you would on the open road (the wheels turning on rollers) whilst it is strapped down in a fixed position. The vehicle's static position allows us to connect up an extensive list of measuring equipment to monitor and measure what the car is doing, including power and torque. Think of it like a patient hooked up to a heart monitor.



At TMS we're fortunate to own one of the World's most advanced chassis dynometers – the Dyno Dynamics Low Boy 450 Chassis Dyno. Dyno Dynamics are world renowned for creating one of the most accurate dynos available and are used accross the globe from everyone from car tuners to fuel suppliers. Their accuracy has earned them the nickname the “Ego Buster” for the equipment’s ability to measure data and not manipulate it.

The Dyno Dynamics dyno has a feature called “Shootout Mode” where the operators ability to manipulate or amend readings is locked down, and all the measuring features are locked off so all the system can do is measure. Such is their faith in the accuracy of their product all the Dyno Dynamics dynos are linked globally and their measurements monitored to ensure accuracy. Failure to comply with their stringent methods of operation gets you removed from their global list of recognised operators. In short, it's accurate and has a unique system to ensure that that accuracy is maintained.



The Thorney Motorsport dyno cell, showing the Dyno Dynamics chassis dyno.

To give an accurate reading of what the car is doing on a dyno you need to generate a large airflow to replicate as near as possible the conditions on the open road. To this end we have installed the highest airflow dyno cell in the UK. Four one metre radial fans generate a combined airflow of over 120,000cfm (cubic feet per minute).



Two fans are situated behind the vehicle to suck out the hot air generated by the vehicle engine and exhaust and two further fans blow air over the vehicle. With all four fans in operation we exchange the entire air contents of the cell every 5 seconds. Basically it's a wind tunnel with a dyno in it.



The Thorney Motorsport dyno cell, showing the 1m radial fans.

We mount the dyno on the surface of the floor to allow airflow to run under the vehicle, this allows us to run low race cars but also to allow proper airflow to rear engine cars which need under floor airflow to keep cool. It also allows direct chassis strapping of the vehicle to ensure they are secure and give consistent measurements.

The Vehicles Tested

Thorney Motorsport specializes in tuning and enhancing BMW's and Vauxhall cars. Our specialist cars are the BMW M3, the Vauxhall VX220 and the Vauxhall VXR range. We are accredited with full Vauxhall Motors warranty approval for servicing and repairs, the only UK tuning firm to have such recognition from any manufacturer.



As a consequence of our area of expertise it made sense to test cars we knew well so we chose a 2003 BMW E46 M3 CSL, and as a control car a standard Toyota MR2. We are also testing with a 2006 Vauxhall Astra VXR and will release this data when it is finalized.

BMW E46 M3 CSL

The BMW was chosen primarily due to our view that it represents the finest engineered 6 cylinder engine ever developed. The S54 engine in CSL form generates 350-360bhp at the flywheel which in itself is an enhancement over the standard M3's 340bhp. We have modified this further with our 'Stage 2' tuning package where we add a Milltek Sport performance exhaust and race catalytic converter and remap the car's ECU with advanced engine code to give a flywheel power figure of 380bhp.

Toyota MR2

The Toyota was chosen specifically because the car represents an older vehicle but with a recognized advanced design of engine. Run in purely standard form the vehicle should generate 175 bhp at the flywheel.

The Testing Process

Thorney Motorsport specializes in accurate data collection and vehicle enhancement. Honesty, integrity and transparency are all bywords of our company ethos. We planned the testing (which we imagined could potentially generate politically upsetting results) meticulously so that our data would stand up to scrutiny and expert breakdown.

Each car was initially run for 3 full fuel tanks on Total 95 Octane fuel, different fuel stations were chosen and the cars filled at different times of the day. After three full tanks were consumed by the vehicle we tested the car on the dyno and recorded the data. Specific data as to weather, barometric reading, humidity, air temperature and engine intake temperature were all recorded.

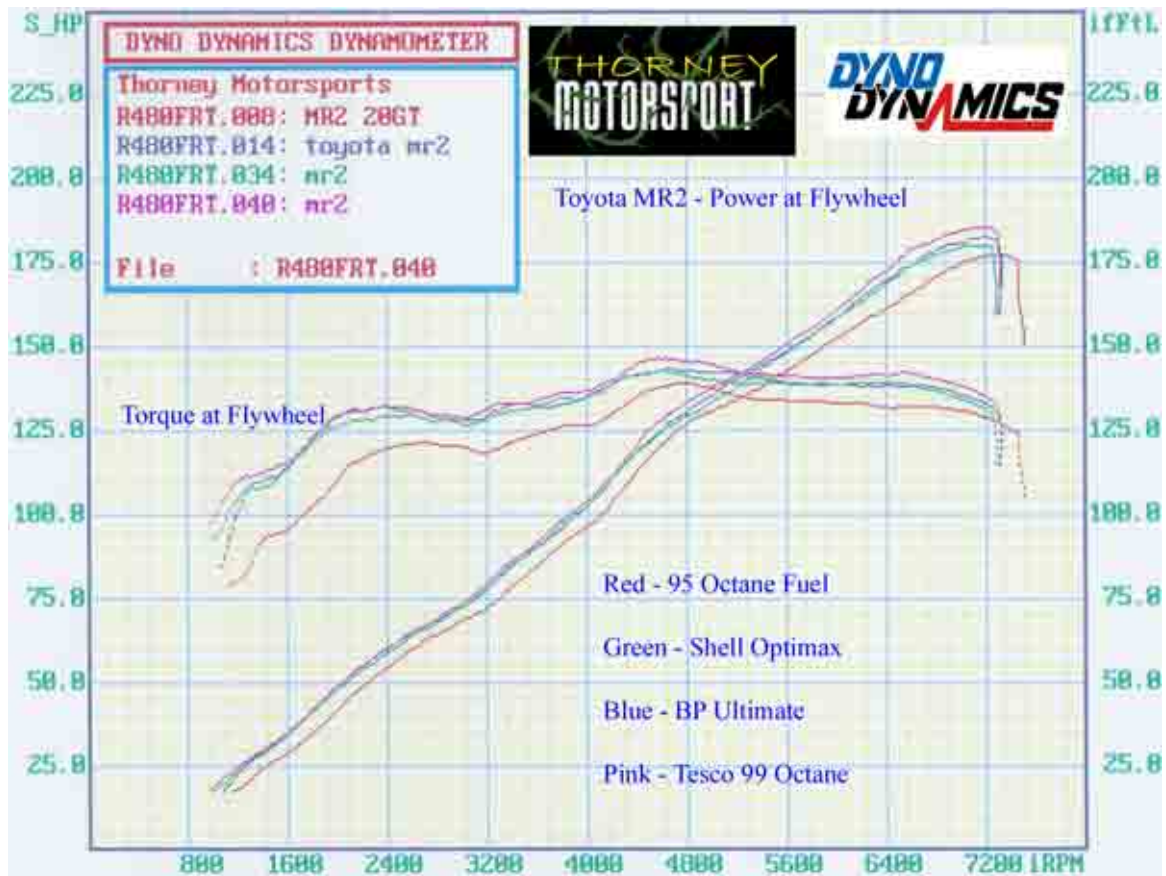
Next, each car was then run for three full tanks of BP Ultimate 97 Octane fuel and the process repeated. Again all external readings were taken and logged. We then repeated the process again with Shell Optimax and finally Tesco 99 Octane fuel, again we used three full tanks of each fuel between testing and logged all the external and vehicle data on each test.



We repeated this process for approximately 8 months. In total the cars were measured between 18-34 times in weathers as varied as 6 to 35 degrees ambient temperature. The Dyno dynamics dyno has an inbuilt compensator to address variance in ambient temperatures but we still ensured that each car was measured in comparable weather conditions (one of the reasons it all took 8 months)

The Results

The different colour lines represent the different fuels used in the car.

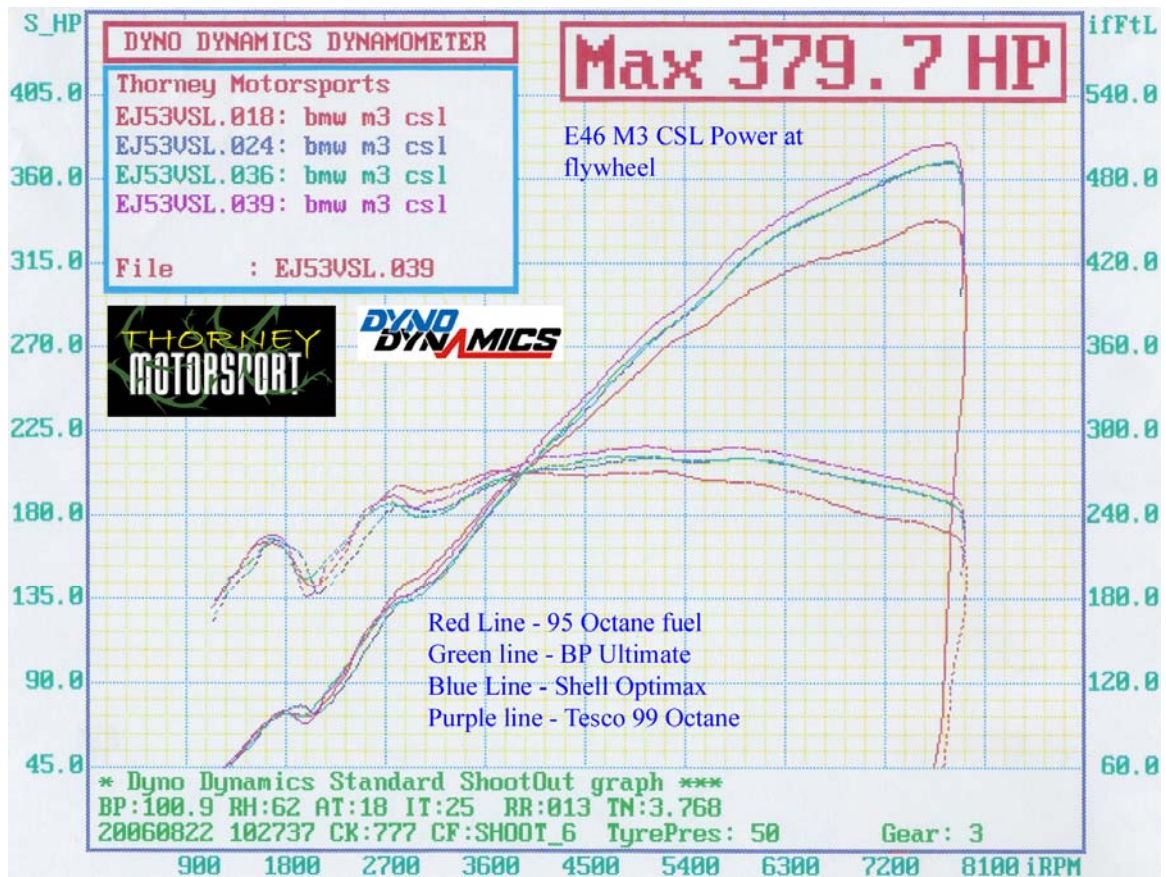


The red line at the bottom shows the car running on 95 octane fuel, the jump in power and torque when changing to either Shell Optimax or BP Ultimate is quite significant. However what we also found was there was another jump when changing to the Tesco 99 Octane fuel (the pink line).



So switching from 95 octane fuel to Tesco 99 Octane gave an extra 8.1bhp (almost 5%). As well as these peak gains the charts show a clear improvement throughout the rev range.

For the E46 M3 CSL the difference was even more pronounced:

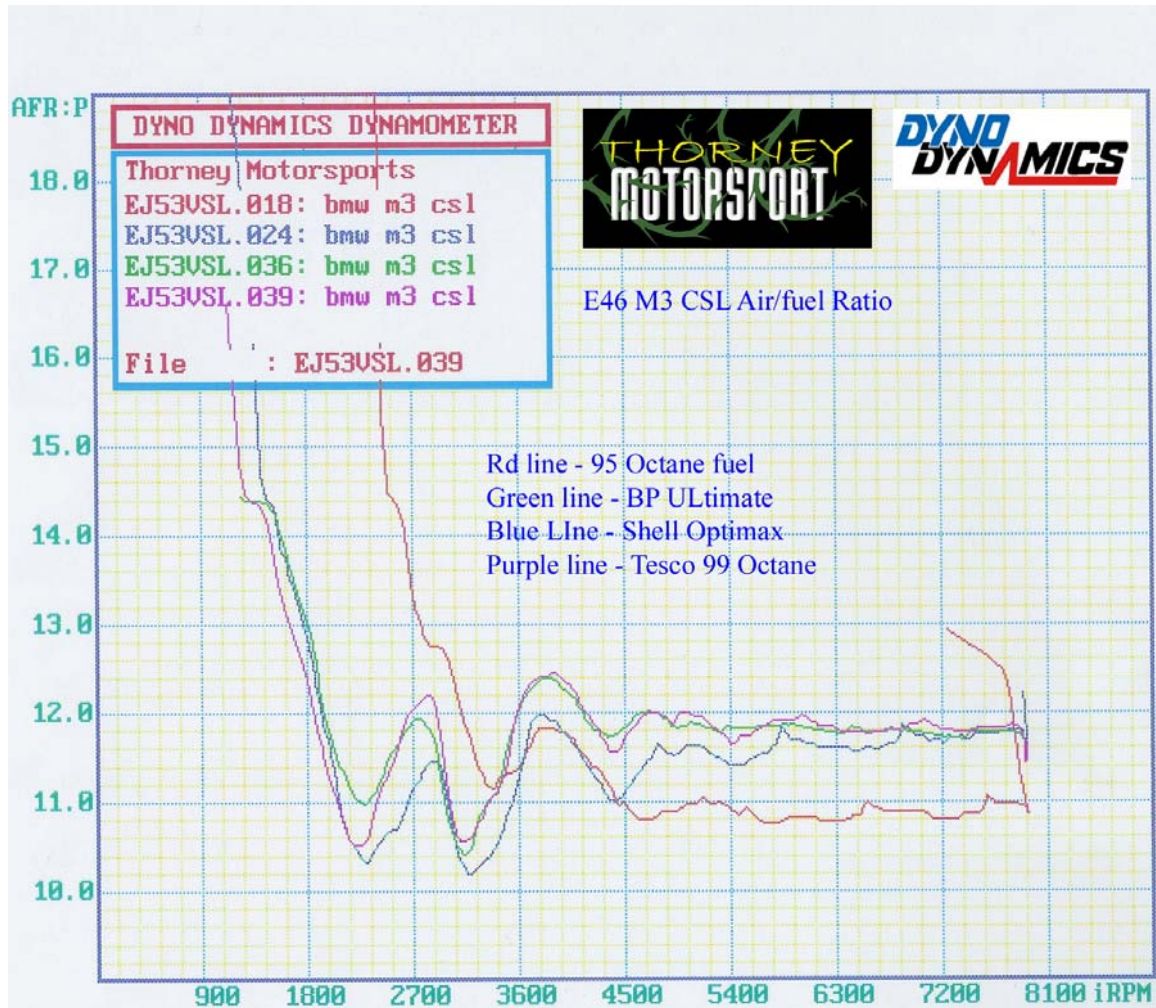


The difference between running 95 Octane fuel and a higher octane fuel from BP or Shell was very noticeable on the open road and the dyno confirmed this, the car did indeed very sluggish on the lower octane fuel. Interestingly the BP Ultimate and Shell Optimax performed almost identically, a fact quite evident on the chart; the lines are difficult to separate.

But what was nice was the extra gains that Tesco 99 Octane fuel gave over and above the BP and Shell fuels. There was a clear improvement in both torque and power that was both evident on the road and the dyno.



This apparent gain in power is due to the ECU of the car's ability to advance the ignition timing to take advantage of the extra power the higher octane offers. Looking at the air/fuel ratio on the charts does show that the higher octane fuel allows a more efficient burn creating more power.



The chart shows the car's ECU when running on 95 Octane fuel enriches the fuel mixture (adds fuel) to compensate for the less efficient burn and to avoid early detonation. This extra fuel robs power as the air/fuel mix is less efficient. By changing this fuel to a higher octane the car is able to advance the ignition (essentially using less fuel at higher rpm's) to create more power.



The Conclusion

Our role in the motor trade is to enhance motor vehicles beyond the process of compromise that manufacturers have to follow. We use our skills to adapt and extend the operating levels of cars by enhancing their power, their handling and their braking by fulfilling a need from our customers who demand more from their cars. For us and we expect for all the tuning industry any method which facilitates this process of vehicle enhancement (ie it makes it easier for us to do our jobs) should be seen positively.

It is clear from the testing that whilst older engines show a clear benefit of running higher octane fuel, more modern, sophisticated engines have the ability to advance their fuel timing to take full advantage of this enhancement to a far greater degree. For the BMW M3 CSL the difference between running 95 octane fuel and Tesco 99 Octane fuel was over 40bhp, that's over 10%.

It is our fundamental belief and now our clear recommendation to our customers that if they want to maximize the power of their cars, before they even consider using our services to enhance the power of their car further, they should use the best fuel they can buy. The simple fact borne out of our extensive test is that using Tesco 99 Octane fuel will make your car more powerful. It will feel faster, accelerate faster and perform better. If you're going to tune your car at least give it the best fuel it can run on and in our opinion, based on extensive testing that fuel is Tesco 99 Octane.

As a postscript to the testing we also measured the relative fuel consumption of the cars during the testing with the conclusion that the higher quality fuel did offer a greater mpg than 95 octane fuel. However fuel consumption testing is conducted under different conditions which we (even with our facilities) would be unable to recreate to an extent we could stand by.

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