CHEMICAL

MINIMUM OCTANE RATING
120

VP Import Color: Clear | Motor Octane: 120+ | Specific Gravity: 0.744 at 60° F

Maximum power and torque in small displacement, high RPM, all motor, turbocharged or nitrous sport-compact applications. Makes up to five percent more power than C16 and similar non-oxygenated fuels.

MINIMUM OCTANE RATING
118

NEW! Q16 Color: Yellow | Oxygenated: Yes | Motor Octane: 116 | Research Octane: 120+ | Specific Gravity: .716 at 60° F

Q16 will work well in any drag racing or circle track application — naturally aspirated, nitrous or blowers. Q16 is highly oxygenated, requiring a 4-6% increase in fuel flow, which will make 3-5% more power than competitive 116 octane fuels. This added fuel flow also effectively increases its octane by 6-8 numbers above its standard ASTM octane rating. Q16's oxygenation will significantly expand the range of air/fuel ratio acceptability, so performance will be more consistent and won't vary as dramatically with altitude or density changes.

ROMANCE: PART 1

ADD 100+ HORSEPOWER FOR LESS THAN A $100

Text by Michael Ferrara Photos by Richard Fong

WHAT YOU FEED your engine determines its ultimate performance. The nutritional performance needs of an engine are influenced by a number of factors. Some of these most important factors include an engine's compression ratio, RPM potential and the boost pressure of the forced-induction system. Engines that run higher compression ratios (above 10.0:1), operate at higher speeds (generally over 6,500 RPM) or use some form of forced induction are usually the applications where improving the quality of the fuel results in a significant increase in performance.

This month, we decided to see how three different race-gas blends (VP Racing Import, C16 and Q16) would affect the performance and tuning on our Project S15. On a diet of 91-octane pump gas, the SR20DET engine consistently produces over 320 horsepower to the wheels. With the entrée switched out to some of VP Racing's top racing gas blends, the same engine made over to 90 more peak horsepower at the wheels. Understanding the science of race fuels will help you to pick the best blend for your vehicle. Choosing the right fuel and tuning to optimize this fuel will allow your engine to develop more power at a higher degree of reliability than ever before.

The Candidates: VP Import, Q16, C16

When it comes to the import-performance market, VP Racing's C16 has been the tried-and-true benchmark racing fuel. C16's high-performance characteristics, superior availability and affordability have made it a fuel of choice for many import performance enthusiasts and tuners. On the competition end of the spectrum, VP Racings Import blend has been the fuel of choice for the majority of all import drag racing teams. The VP Import blend featured higher-octane with an oxygenated-formulation that allowed some race teams to realize up to five percent more power. On a thousand horsepower engine, five-percent translates into 50 horsepower over C16. Unfortunately, the higher price point of VP Import kept it out of the hands of the street-enthusiasts that rely upon C16. Recently, VP Racing fuels decided to formulate a new blend that would offer nearly all of the performance advantages of VP Import at the price of C16. This was the impetus behind the launch of VP Racing's Q16 racing fuel.

C16 Color: Blue | Motor Octane: 117 | Specific gravity: 0.735 at 60° F

The import-performance market's reference race fuel. Recommended for use in forced-induction and nitrous applications, as well as all-motor applications with compression ratios up to 17.0:1.

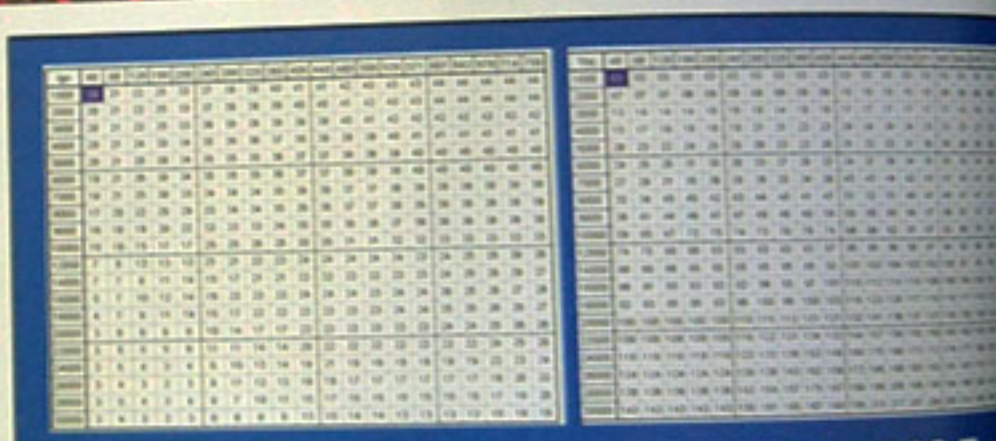
Our custom fuel system...do not attempt this at home.

"All three blends were then tuned for maximum performance at the 1.6 Bar boost level."

The Test

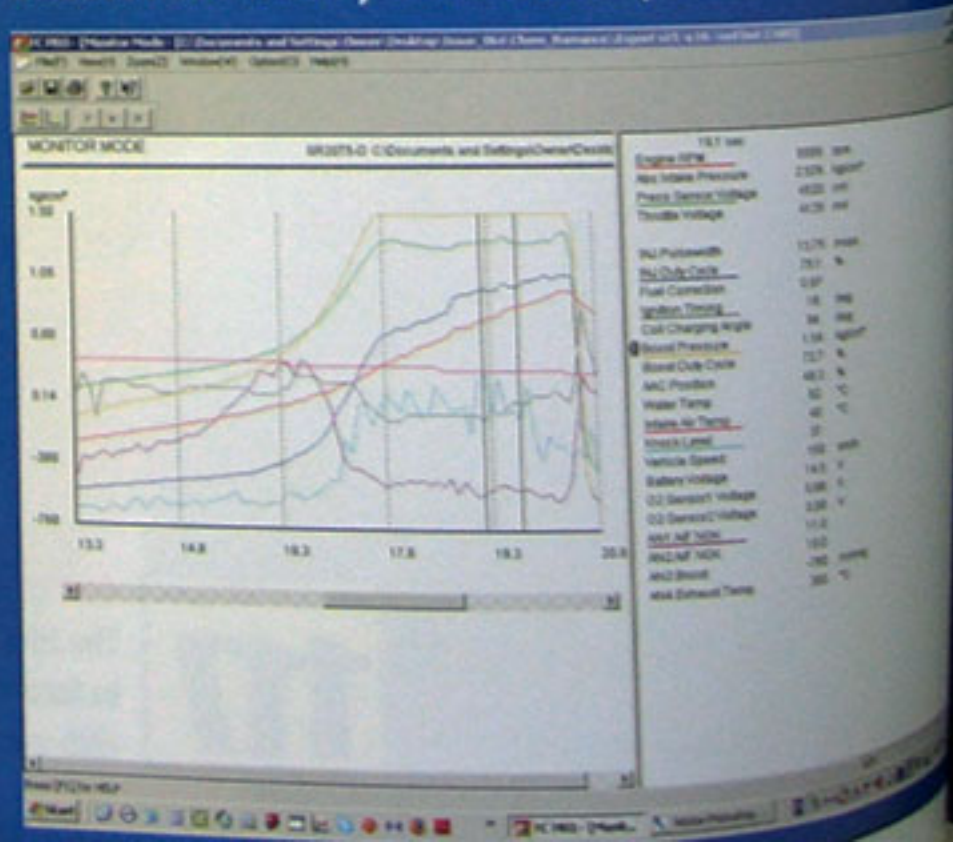
We had professional tuner Koji Arai of XS Engineering meet us on a Saturday at the DynoJet 224 of Power Pros in Santa Ana, California to conduct the testing. A special independent fuel system was engineered to allow the vehicle to draw its fuel directly from the five-gallon fuel container. This method eliminated the possibility of fuel dilution that would have occurred with the factory fuel tank.

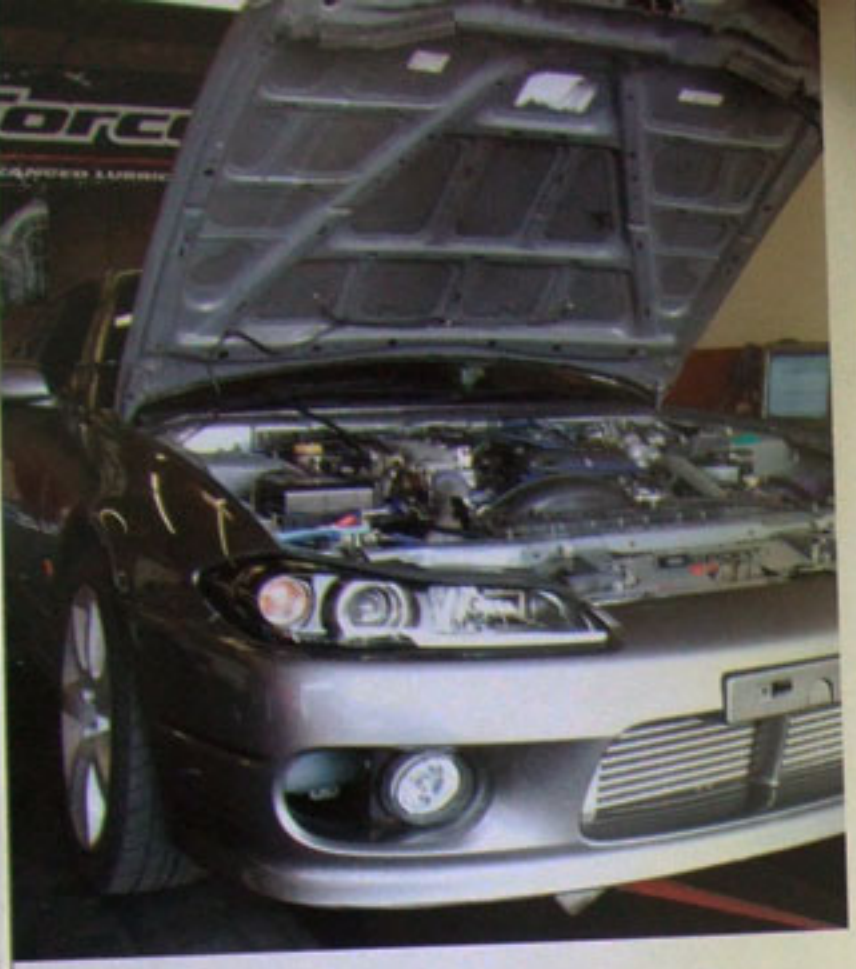
Baseline runs were established on 91-octane pump gas. The pump gas limited the boost pressure to 1.1 Bar (15.6psi) for the tune. We then swapped over to the VP Import blend. The A'PEXi Power FC was first tuned by Koji to maximize power at the original 1.1 Bar boost level before additional dyno pulls were completed at higher boost levels. Eventually, it was determined that the igniton system was incapable of avoiding misfires above boost pressures of 1.6 Bar (22.7psi). With this limitation in place, all three blends were then tuned for maximum performance at the 1.6 Bar boost level.

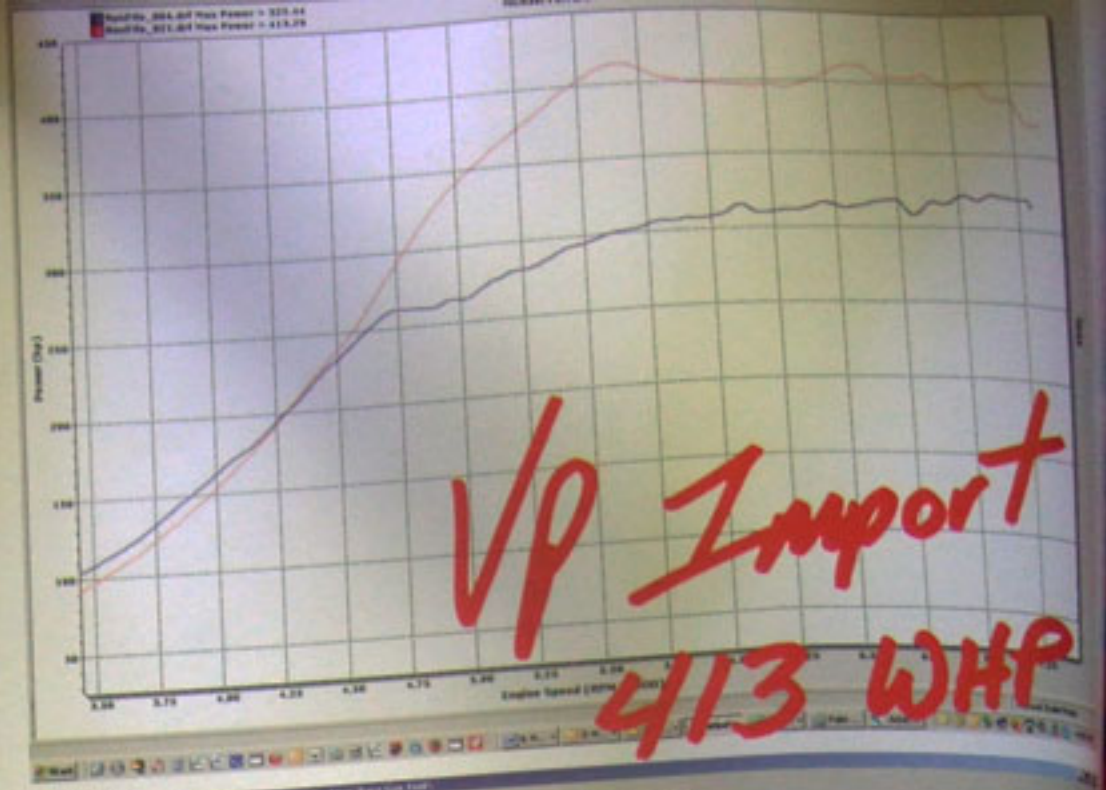


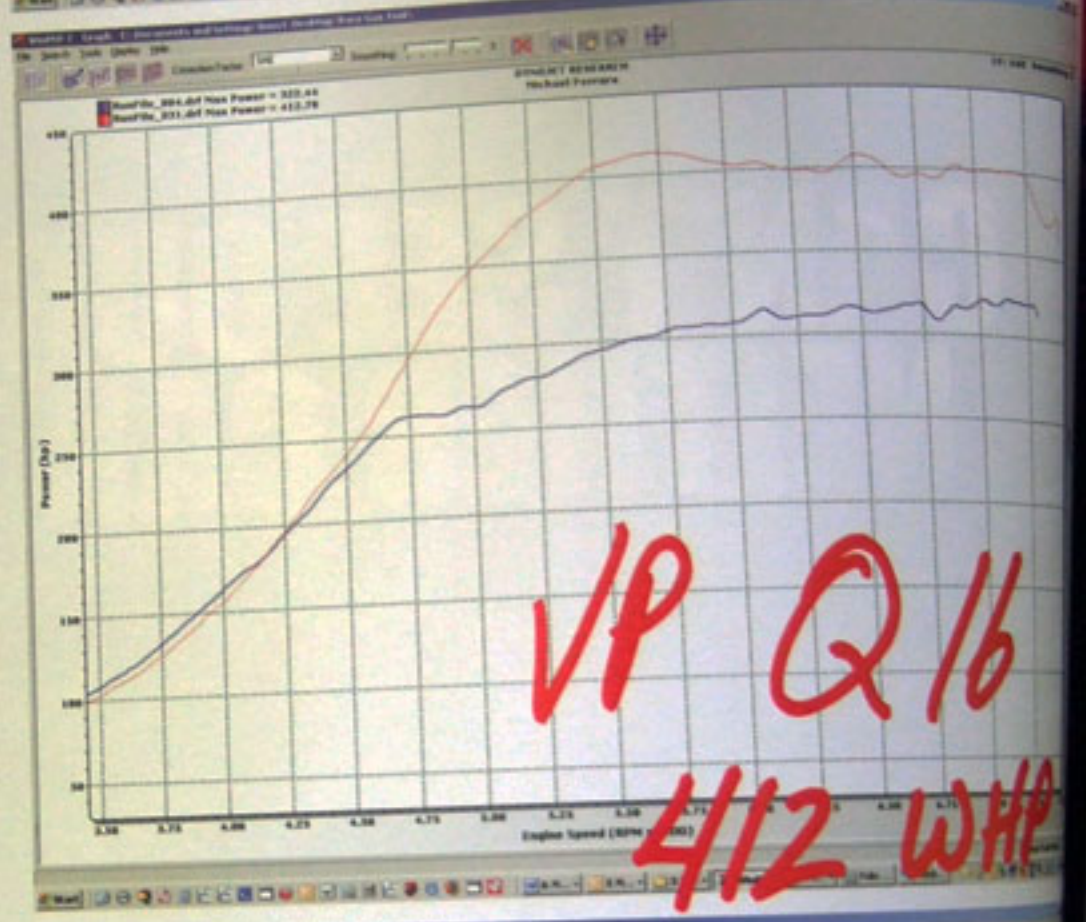
VP "NEW" Q16: SR20DET 1.6 Bar (22.7p

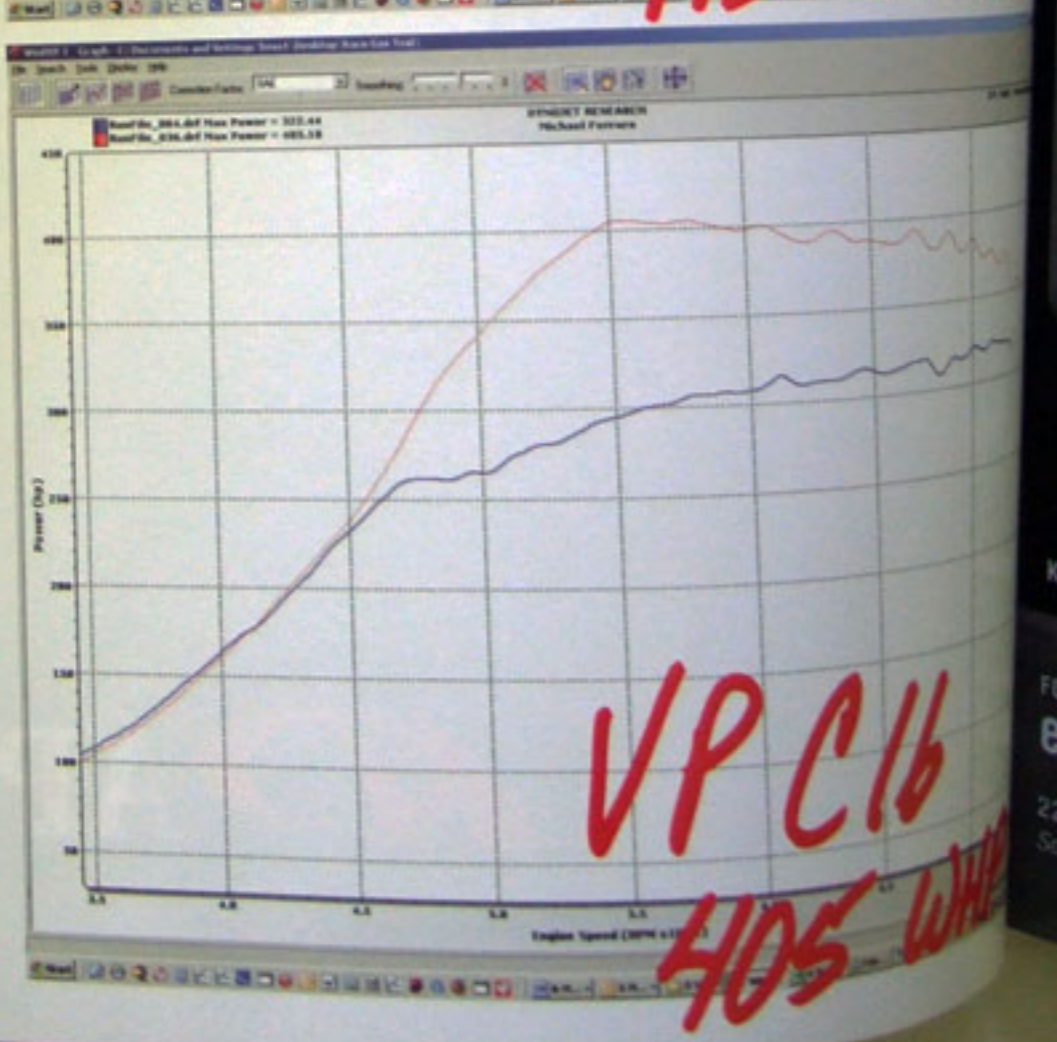
IGNITION MAP, FUEL MAP, DATALOGS











The Dyno Says...

The dyno showed a peak horsepower output of 322 horsepower with 91-octane pump gas and the boost set to 1.1 Bar. With the engine running on VP Import, Koji was able to adjust the fuel and ignition tables to realize a significant power increase at the same boost level. The peak power output jumped to 370 horsepower, a gain of 48 horsepower. Significant gains in the power output started at 4,500 RPM and continued to redline. After 13 full-throttle passes on the dyno, the tuning was optimized for the VP Import gas at the higher 1.6 Bar boost level. Now, peak power checked in at 413 horsepower; a gain of 91 horsepower at the wheels, or roughly 107 horsepower at the flywheel. At 5,700 RPM, the maximum gain of over 112 horsepower at the wheels was realized (132 hp at the flywheel).

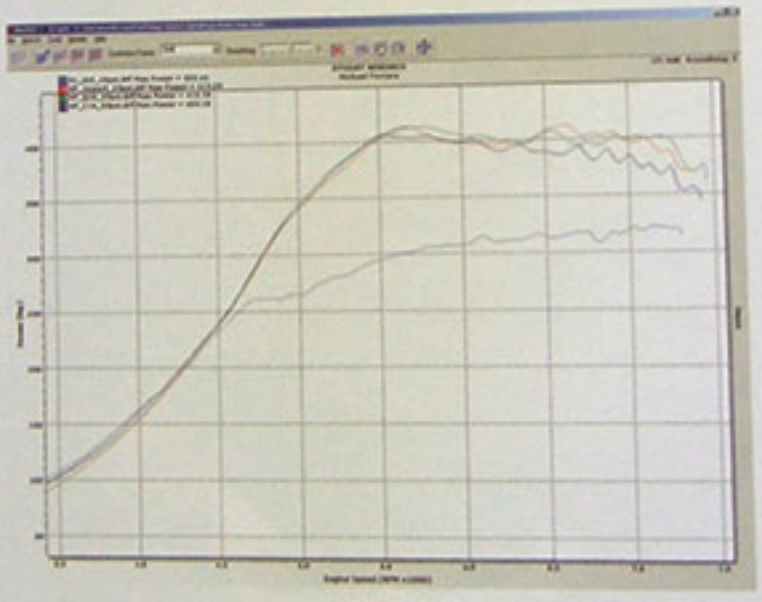
Next up, it was time to test VP Racing's new Q16 blend. As we mentioned before Q16 was formulated to offer performance very close to VP Import at nearly half the price. After eight full-throttle passes to get the A/F ratios matched and the power output maximized, the results were in. Q16 resulted in an output of 412 peak horsepower with a power curve that mimicked the curve for VP Import. For VP Racing Fuels, Q16 seems to have hits its mark.

"At 5,700 RPM, a gain of over 112 horsepower at the wheels was realized"

The last race fuel to test was the venerable C16. With the C16, peak power hit a maximum of just 405 horsepower (7 to 8 peak horsepower less than VP Import and Q16). While that may not seem like a significant difference, peak power differences do not tell the whole story. Past 6,500 RPM, the power output from C16 was considerably less than Q16 or Pro Import due to C16's slower burn rate. At 7,000 RPM to redline, the difference in output was 20 to 30 horsepower less than VP Import or Q16. Thus, if your engine spends time above 6,500 RPM, Q16 or VP Import is going to give your engine significant power gains. In fact, we can't wait to test these blends on our Project GT-R. Pushing from 1,030 horsepower into the 1,100s may be as simple as changing to Q16 and retuning.

+100hp from race gas?!? You better believe it...

"With an identical price point to C16, but the power potential of higher-priced blends, it's only a matter of time before Q16 is the standard race gas for the import enthusiast."



The Tuner Says...

According to Koji, the tuning for each fuel was significantly different. The standard used was to keep the A/F ratio between 11.3- and 11.5-to-1. The timing was optimized to provide the minimum ignition advance needed to realize the optimum torque. With the VP Import blend, Koji noted that additional ignition advance beyond the minimum needed for best torque was possible. Hence, you could advance the timing more with the VP Import blend without encountering knock (which would occur at those same ignition timing settings with C16 and Q16). However, this was more of a safety or reliability advantage as the addition timing advance allowed by VP Import didn't translate into the engine making measurably more power over the Q16 blend.

A few test passes were also conducted at a leaner target air-fuel ratio of 12.0-to-1 with the VP Import blend. The result was an increase on the order of two to five horsepower.

The Bottom Line

The days of C16 being the standard race gas for the import performance community may be coming to an end. In our testing, we found that VP Racing's new Q16 blend offers additional power, especially in applications above 6,500 RPM. With an identical price point to C16, but the power potential of higher-priced blends, it's only a matter of time before Q16 is the standard race gas for the import enthusiast. Of course, those needing the highest degree of safety and performance will likely continue to pay the premium for the VP Import blend. For DSport, our plan is phase in Q16 as our primary race gas for testing.

Coming Attractions

In this initial installment of Chemical Romance, we witnessed the tremendous power increase available through the use of race gas instead of low-octane pump gas. With the proper tuning, we realized an increase in peak horsepower of 28 percent. Considering that a five gallon drum will generally run you under $80, race gas may be one of the best bang for the buck propositions for your vehicle. In part two of our Chemical Romance series, we'll see how water-methanol injection compares to the favorable results obtained with race gas. Stay tuned.

HOOK UPS Support DSport, tell them we sent you.

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