

Pure Energy - 1994 Toyota Supra

SP Engineering Unleashes A Four-Digit Freak

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The Internet has become an integral part of car culture. Parts can be compared and bought online and fellow enthusiasts can be tapped on the shoulder cyber style and asked about engine power, style, maintenance and other important issues facing today's performance-minded boost junkie. Amidst the details regarding everything from wheel backspacing to valvetrain geometry, not to mention the fellowship of sharing, there is a dark side. There can be a lot of smack talk, usually based on heresy, sometimes heresy that's three or four parties removed. The problem is ignorant people type away with no consideration of the significant damage that can be made in the real world. The Supra community is highly competitive and when these skirmishes surface they can move like wildfire. There is a group of enthusiasts with the clout to see through the hype and cut-throat tactics and set the record straight. **One such beacon of reason is Ken Henderson.**

When it comes to Supras, Ken has done them all. He started with a 5M, which he ceremoniously boosted with a Cartech turbo conversion kit. He jumped to the 7M-GTE, which gave him a factory turbo platform to tinker with, and in 1990 Ken became SP Engineering's first customer, working with owner Alex Shen, when Alex wrenched out of his home garage. Both had an eye for detail, lust for boost and a desire to push the limits. Ken bought his JZA80 new in 1994 and

continued as one of SP's loyal customers. Alex had yet to establish SP Engineering (the shop opened in 1996) and, in the early days he used Dynamic Autosports' Dynojet.

We first spied Ken's Toyota at the Supras Invade Las Vegas III event. Its glistening one-off aluminum intake set-up caught our eye. We lined up a feature. The 2JZ was fitted with GReddy TD05H-18G turbos and tuned with the traditional array of HKS piggyback computers. Initial dyno testing for the article netted 577 whp, well short of the 600-whp goal set forth by Ken and Alex. The boost was cranked up but the TD05s couldn't keep pace and both units simultaneously failed on the dyno.

Ken recalls, "Alex said, 'There was only one thing to do' and I said 'Get bigger turbos,' finishing the thought for him." And so began their high-anxiety thrash to special order new turbos from Japan, have them shipped to the United States, installed in time to post a 600-plus-whp run and meet Turbo's publishing timeframe-no easy feat when you consider all of Japan was on vacation (Golden Week) when the first plaintive faxes went out. They got lucky. A Trust/GReddy employee in the right department was working during part of his vacation and he arranged to air-ship two new turbos to SP Engineering in record time. The GReddy TD06L2 20G 8cm2 turbochargers were bolted on and with additional custom fabrication by Advance Design Fabrication of Whittier, Calif., the car was finished in time and laid down 666 whp and 551 lb-ft, just in time to make the December 2000 edition of Turbo.

Ken's Supra appeared again in Turbo, December 2001 when he was kind enough to bring his car and convince a friend, Nils Leufven, the founder of www.to4r.com, to bring his Supra to the BFGoodrich Ultimate Street Car Challenge, an event where Primedia titles brought street cars and put them through their paces at The Streets of Willow.

While other magazines brought ringers, or rather trailered-in ringers, Team Turbo had legitimate street cars; Nils drove from Las Vegas and placed very well. Ken's car would've done as well or better but a broken power steering pump sidelined his black beauty. At this point the TD06s had been fine-tuned to 690 whp.

The Supra's next chapter saw the addition of a Veilside intake manifold and an HKS Racing Titanium exhaust. A VeilSide fuel rail with 1000cc Denso fuel injectors and an HKS F-CON V Pro engine management system were also added. Ken wanted to retain his twin-turbo setup and experimented by performing the Extrude Hone process on the compressor housings of his GReddy hairdryers. All of these changes resulted in new power numbers-789 whp and 625 lb-ft with Unocal 100-octane unleaded, and 801 whp and 633 lb-ft using Sunoco 104-unleaded GT Plus. Finished yet? "I thought so," said Ken, "I really did." Events proved otherwise.

We knew Ken was installing a then brand-new Do-Luck Type II body kit at 20/20 Auto Body. If any of you are news buffs, you'll remember a debilitating longshoremen's strike going on up and down the West Coast at the time. Suffice it to say, after a very round-about trip from Japan, the container wound up in Mexico, where the body kit was unloaded and made its way to the state of New York before it was tracked down. The car was then delivered to 20/20 Auto Body Tech. Ken, Tommy Lin, the owner of 20/20, and David Huang, also of 20/20, plotted a strategy to meet Ken's fit-and-finish goals. "It wasn't easy," said Tommy Lin. " First off, the car was black and

Mr. Henderson had about the highest standards we had encountered." Added David Huang, 20/20 Production Manager, "Ken and I, plus the worker assigned to his car, had many, many discussions about how his goals could be met."

Ten long months later, the car rolled out of 20/20's facilities....and into Primedia's space at the 2003 SEMA showsporting the first Do-Luck kit in the U.S.

Finally, more than a year after first agreeing to do another article, all parties involved met up on March 31, 2004 to take the accompanying pictures. Ken's custom-offset, forged Work Meister S2Rs were spec'd by Harry Hayashi and Tim Chinn of HRS Enterprises specifically to fit within the confines of the Do-Luck kit's front blister fenders, rear overfenders and clear the Brembo four-piston calipers. With custom one-of-a-kind features, such as four-piston calipers and 14-inch rotors at each corner, custom intercooler cover and airbox tin work, a TEIN RA coil-over suspension system, with pillow mounts, TRD and Cusco front and rear tower bars, supplemented by a Do-Luck rear cross brace and Do-Luck floor support bars, the car is equipped to handle the power it produces and this is where we should ride off into the sunset. Wait, there's more!

About a week after the studio session, SP Engineering received the first HKS 3.4-liter stroker kit to land on American shores. Consisting of a new, forged, nickel-plated, HKS long-throw crankshaft (stroke is increased from 86mm to 94mm), stout H-beam connecting rods and forged, nickel-plated, HKS 87mm pistons, (one millimeter larger in diameter than stock) this kit increases displacement of the square OEM 86mm x 86mm motor from 2997 cubic centimeters to 3352 cubic centimeters (rounded up to 3.4L). The kit was originally slated for the infamous SP Engineering Supra-7, but ...

Ken and Alex had been conducting on-again off-again informal discussions about the GReddy turbos being tapped out at 801 whp and whether they should stand pat and enjoy their handiwork or launch another project. Both say the decision to stand pat was virtually made until the day the HKS stroker kit arrived. In addition to all the work involved, the bigger problem was the GReddy turbos were maxed at 801. The bigger displacement motor would only exacerbate the issue and these guys had enough experience blowing the earlier turbos to know they did not want a repeat performance.

After more discussion, the decision was made to go with new turbos; a never before used combination-twin HKS GT 3240s. These dual ball-bearing turbos have an .87 A/R and are rated by HKS as capable of producing 580 hp each. By this time SP Engineering Chief Technician Jason Reinholdt was busting knuckles putting the engine back together but like airliners in well-orchestrated flight patterns everything came together seamlessly.

After a detailed engine break-in regime it was time to tune. Again with deadlines looming the roller was put in motion. With boost set to 1.3 bar via the wastegate spring pressure, timing was adjusted and fuel added and the crew coaxed 774 whp from the 2JZ on C-16 race gas. When the HKS boost controller was brought online a hiccup developed as the rush of boost hit at about 1.5 Bar, boost pressure was wavering. SP elected to call it a night and the next day the problem was traced to how the vacuum lines were configured and plumbed into the wastegates.

Back on the dyno, Jason, Alex and technician Hiro Kondo made some "no-sampling" runs to ensure the boost was flowing smoothly. The climb for 1000 whp was in full swing, as Alex trimmed the timing and adjusted the fuel...1.58 bar = 818 whp, 1.85 bar netted 952 whp and at 2.0 bar the Supra spit out 1013 whp.

Alex had attained a life-long goal 1000-all-turbo whp from a street Supra. He could not say enough about the HKS F-CON V Pro. "'The Bomb' is not a term you want to use too much when pushing an engine this far, but the HKS F-CON V Pro is awesome engineering. It is user friendly and hyper accurate. If you know what you want from it, you can get there. If you know you need 2 degrees less timing at 5750 rpm you get 2 degrees less timing at 5750. It is precision on this minute of a scale that made it possible to maximize the potential of Ken's stroker motor."

Boost was raised to 2.18 bar, where the 2JZ generated 1031 whp and the SP crew found itself not short of boost, not short of nerve, but short of gas. The 1000cc injectors were done. This was on a Thursday. By Friday morning plans to add a pair of secondary 1000cc injectors were in the works and we were looking to push our Monday drop-dead deadline to the limit. Alex was again relying on the strength of the F-CON V Pro. "We are using the F-CON V Pro to drive all eight injectors in real time. That gives us 1333cc per cylinder. Updating the tuning for eight injectors is easy with the F-CON V Pro. Going the full-time route means we do not have to decide where to bring the secondaries online and it allows us to go easier, from a duty cycle standpoint, on the injectors."

After a weekend of thrashing, Ken's black beauty was once again poised in the dyno cell. After warm-up runs, the tranny wouldn't shift. We offered up Turbo's Project SCerious' gearbox but a \$2.50 flywheel bolt was the culprit. With the bolt replaced power quickly jumped to 1076.0 whp and torque climbed to 787.6 lb-ft. Then the engine was de-tuned to run on 104-octane street gas and Ken has a "measly" 849 whp to play with on the road.

We think Ken is D-O-N-E, done; but we thought the same thing when he was making 801 whp. This time around, however, there isn't anything more he can possibly do to the Supra, save splicing in an all-wheel-drive powertrain ... Ehhh, forget we said that, Ken.

Power Technik
Car
1994 Toyota Supra

Owner
Kenneth J. Henderson

Builder/Tuner
SP Engineering

Engine
3.0-L Toyota 2JZ-GTE

Displacement

3.4-L (HKS Stroker Kit)

Turbos

HKS GT 3240 Dual Ball-Bearing Turbo x 2 (.87 A/R)

Manifold

HKS GT Tubular Equal-Length (JetHot 2000 Ceramic Coated)

Wastegate

HKS 50mm GT Series x 2 (1.3 bar W/G springs)

Intercooler

GRReddy Four-Row Air-to-Air (25" x 12" x 6")

Plumbing

SP Engineering Custom Aluminum Intercooler Pipe Kit

Blow-Off Valves

Blitz Racing Dual-Drive x 2

Intake Manifold

VeilSide Surgetank W/ Fuel Rail and 100mm Throttle Body

Air Filtration

ADF Super Induction Custom Aluminum Air Intake Box W/ Blitz Racing SUS Air Filters x 2

Ignition

HKS Type DLI Ignition Amplifier

Valvetrain

JUN/Toyota Adjustable Cam Gears, Ferrea Stainless-Steel Valves (Stock Size), Ferrea Dual Valve Springs, Ferrea Titanium Retainers, HKS 272-degree Intake Cam, HKS 272-degree Exhaust Cam

Exhaust

HKS 102mm Titanium Exhaust

Fuel System

VeilSide High Performance Billet Fuel Rail, Denso 1000cc Fuel Injectors, SP Engineering Custom Fuel System, Toyota Racing Development Fuel Pressure Regulator, Toyota Supra Turbo Fuel Pump x 2,

Tuning Electronics

HKS F-CON V Pro Engine Management System, HKS A/F Knock Amplifier, HKS EVC-Pro Boost Controller

Cooling (Water)

Fluidyne Prototype High Performance Aluminum Radiator

Cooling (oil)

Trust 16-Row Thermostatically-Controlled Oil Cooler W/ Oil Filter Relocation Kit

Miscellaneous

Boost Logic Crank Damper, Earl's Accessories, Flame Guard, Fittings and Stainless-Steel Hose Clamps, SP Engineering/ADF Custom Aluminum Intercooler Cover, Earl's Dual-Layer Steel Braided Oil/Water Lines, GReddy Underdrive Pulley Kit, GReddy Extreme Timing Belt

Drivetrain

OS Giken Triple-Plate Clutch, ACPT 3.25-Inch, 11,000 RPM, Carbon Fiber Driveshaft, TRD Motor Mounts, TRD Heavy Duty Transmission Mount

Suspension/Brakes

TEIN RA 16-way Adjustable Coil-overs, TRD Strut Tower Brace (Fr) Cusco Carbon Fiber Strut Tower Brace (Rr), Do-Luck Rear Cross Bar, Do-Luck Aluminum Floor Assist Bars, TRD Anti-Roll Bars, Brembo 4-Piston Calipers Fr/Rr, Brembo 14x1.3-Inch Vented/Cross-Drilled 2-Piece Rotors Fr/Rr, Race Logic Adjustable Traction Control.