AWE TUNING'S

THE QUICKEST MK6 IN THE WORLD

TEXT / Peter Wu
PHOTOGRAPHY / Henry Z. DeKayper
INTERVIEW:
TODD SAGER,
THE BIG MAN AT AWE

EC: What’s the trick to making this system work?
TS: Like all AWE Tuning turbocharger kits, the success is due to a combination of heavily researched and tested hardware (most of which bears the AWE Tuning name), solid software engineering in conjunction with GIAC and 20 years of performance engineering experience to make it all come together.

Interestingly, there seems to still be an incorrect assumption in the marketplace that the Borg Warner 2.0T K04 turbo (which is what we start with for the AWE Tuning Quarter Mile Kit) is just “slightly” bigger than stock, and thus is being stretched beyond its limit to produce such record-setting power. Not true. In fact, the contemporary K04 is similar in size to the Garrett GT28RS turbo, which has been traditionally used in many tuners’ “big turbo” kits over the years.

The 2.0T K04 is a big turbo, and besides the machining and modification we do to physically fit it to the TSI engine, the task of safely making big power fell to creating proper supporting hardware and software. We worked hard to craft a fuel injection system powerful enough to get to the 11s, yet safe enough for mass-market consumption, and daily drivability. We left some torque on the table simply because more would be overstressing the rods with potential for catastrophic failure. Our goal was to create a daily driver MK6 GTI with bolt-on upgrades that does an 11, and returns to commuting after the track. Excessive torque request can also run the fueling system dry, leading to dangerous lean conditions and the chance of piston meltdown. Cranking boost to unsafe levels is not how we would achieve our goal.

Another “wrong” way we have seen in tuning of these engines is overly aggressive ignition advance, which leaves the engine vulnerable to fluctuations in octane, or too dependent on finite supplies of water/meth injection. Any tuning strategy that relies on a consumable that can run out during the heat of battle (excluding the actual gasoline in the tank) is too volatile when you’re looking for reliability as well, in our opinion. It’s not the way we make reliable power.

EC: Describe “wrong” ways of getting more power from these engines.
TS: Love this question — and wish more people asked it. The “wrong” way to get more power from these engines is to crank up the boost without regard to compressor efficiency, weak points in the mechanics of the motor or daily drivability. We left some torque on the table simply because more would be overstressing the rods with potential for catastrophic failure. Our goal was to create a daily driver MK6 GTI with bolt-on upgrades that does an 11, and returns to commuting after the track. Excessive torque request can also run the fueling system dry, leading to dangerous lean conditions and the chance of piston meltdown. Cranking boost to unsafe levels is not how we would achieve our goal.

Another “wrong” way we have seen in tuning of these engines is overly aggressive ignition advance, which leaves the engine vulnerable to fluctuations in octane, or too dependent on finite supplies of water/meth injection. Any tuning strategy that relies on a consumable that can run out during the heat of battle (excluding the actual gasoline in the tank) is too volatile when you’re looking for reliability as well, in our opinion. It’s not the way we make reliable power.

EC: How far can you take the Quarter Mile Package? Is there another stage in the works?
ON APRIL 9, 2011, AWE TUNING’S MK6 GTI POSTED AN 11.87-SECOND QUARTER MILE TIME AT CECIL COUNTY DRAGWAY IN RISING SUN, MARYLAND. And on another run that same day, the car posted a 120.3-mph trap speed. Both the c.r. and trap speed figures set a world record for a car powered by a K04-equipped 2.0 TSI engine. And while there are quicker and faster VWs out there, none of those are either street legal or the kind of car you’d want to drive on a daily basis.

According to the driver of the GTI, an AWE Tuning engineer who chose to remain anonymous, you don’t have to be a drag racer to set a good time.

“The funny thing about the record-setting vehicle is that essentially anyone could have done the record-setting run with the AWE Tuning Quarter Mile Package. I got in, did a nice burnout to get the tires warm, staged the car with launch control, and when the light went green, I just let go of the brake, held the throttle to the floor and shifted at 6800 rpm. The car did all the work, and pulled it off beautifully and easily.”

What makes AWE’s MK6 GTI stand out is that the car actually was a daily driver for some of AWE’s crew members during its development and the fact that the Quarter Mile Package in their MK6 is essentially a bolt-on kit.

**TS:** AWE Tuning is about bolt-on performance upgrades, which helps empower our global network of dealers by providing straightforward, cleanly designed upgrades, while at the same time minimizing installation variables.

Within these parameters, there is no low-hanging fruit left on the tree. Going to a larger turbocharger with a higher power potential requires increasing the fuel output, creating a bespoke exhaust manifold and extensively uprating the engine internals.

To push the AWE Tuning Quarter Mile Package would essentially turn it into a new class of product, as far as reliability and price, which would alienate the very market for which this 150-hp upgrade was intended.

**ec:** The fast runs were done on Hoosier DOT drag radial, not slicks. A client who replicates this record-setting run can still remain 100 percent street legal, even down to the tires.

**TS:** The fastest runs were done on Hoosier DOT drag radial, not slicks. A client who replicates this record-setting run can still remain 100 percent street legal, even down to the tires.

When it comes to street tires, we’re fans of Michelin, but honestly, tire technology has advanced so much in the past decade that the performance gaps are rather narrow. It used to be that the performance spread between the best tires and the OK tires was pretty wide, and the worst tires were absolutely awful. The spectrum for street tires is now as broad as it used to be. And, since we’re celebrating our 20-year anniversary this year, we remember when a 50-series P7 Cinturato was the pinnacle of tire tech!

**ec:** What’s the trick to getting a powerful FWD car to hook up? Are you running a limited-slip diff?

**TS:** Even with drag radial it can be difficult to get full traction off the line. For the first few runs we did, tire pressure up front was at 20 psi, and a constant 50 psi in the rear. This gave us our best trap speed, but there was still some tire spin and the 60-foot times weren’t great (11.9 seconds). Pushing forward, we lowered front tire pressure to 18 psi, which helped with grip and 60-foot times, but hurt top speed a little.

A good burnout is also important. Even at 18 psi, the tires will still spin without a good burnout. The 11.87 run was the only one without any spin. Burnout advice: Try launch control with the e-brake on. We used the factory launch control (which is at 3000 rpm) and we were able to get a full 3000-rpm launch with the drag radial. Just make sure your tires are nice and sticky by doing the burnout. We shifted at 6800 rpm and were in manual mode. Also, don’t go WOT right off the bat. During a run on street tires, we feathered the throttle for the beginning of the run to avoid spinning. Once the tires hook properly, go WOT.

As far as suspension, for our record-setting runs, the AWE Tuning GTI used Bilstein PS910 coilovers, which are adjustable for compression and rebound. We set the front shocks to their softest setting and put the rears to full stiff. We did this to minimize weight transfer to the rear of the car under hard acceleration. This improves traction to the front wheels allowing for lower e.t.’s and better 60-foot times.

The transmission was 100 percent stock factory DSG unit.
that doesn’t require internal engine mods. The record-setting car, however, ran on VP 109 race gas and was fitted with Hoosier drag racing slicks. It also was stripped of its front passenger and rear seats, spare tire and floor mats to bring the weight down to 2,625 pounds. Its Bilstein PSS10 coilovers were set to full soft in front and full stiff in back to control weight transfer. On previous runs using regular tires instead of racing slicks, AWE’s GTI ran 12.26 in the quarter-mile, a figure more likely what buyers of the Quarter Mile Package can expect.

To put those numbers into perspective, both an M3 and a Carrera S run 12.4 in the quarter-mile. So for an additional 5K, any Mk6 GTI can run with some pretty heavy hitters and easily shame any other hot hatch or car in its class.

AWE’s Quarter Mile Package consists of their Mk6 TSI K04 Turbo Kit, their cat-back exhaust system, a downpipe with a metal catalytic converter, a turbo outlet pipe, their S3 front-mount intercooler, boost hose and vent-mounted boost gauge kit. GIAC coding controls the ECU and their Cold Cone Box intake system inhales air. Their Cold Cone Box intake system is a fully enclosed system that draws air from outside of the engine bay and also does away with the restrictive stock MAS sensor.

According to AWE, the kit is good for 360 hp at 5950 rpm and 370 lb-ft of torque at 4600 rpm to the crank with 93-octane gas. With race gas, the numbers are 388 hp at 5800 rpm and 380 lb-ft at 4600 rpm. Max boost pressure is 22 psi.

AWE felt that 370 lb-ft and 22 psi were well within the reliability window for the EA888 TSI engine. Going beyond that would probably require some internal engine modifications, which would be contrary to their goal of a bolt-on package that provided both increased performance and daily drivability. The engine in the record-setting car hasn’t been taken apart to check for signs of wear but the company says it has seen no signs of wear or performance degradation.

Unfortunately, the car is now at AWE’s Japanese distributor in Osaka, so we didn’t get a chance to drive it. But the numbers say enough, and for such a straightforward, relatively easy system, getting below 12 seconds is definitely a high-water mark for a daily driven VW.