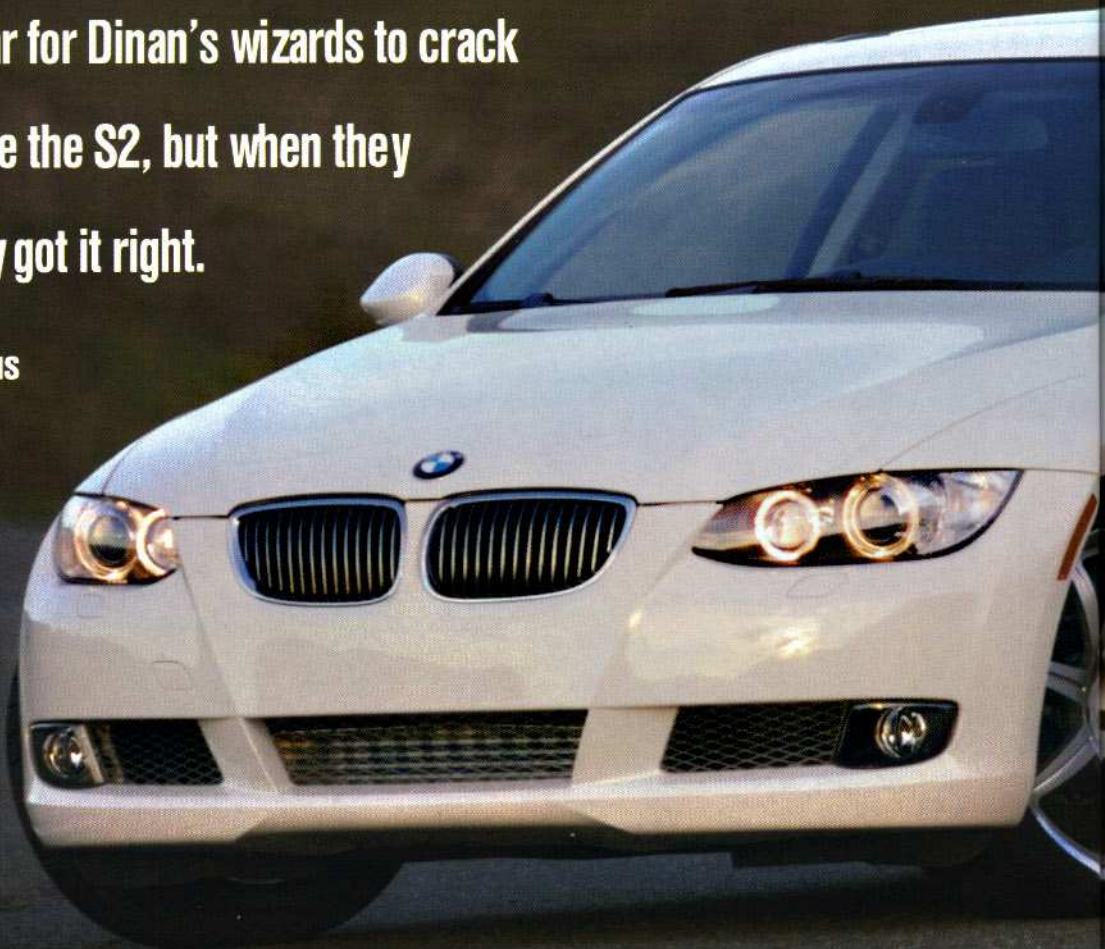


Dinan 335i S2

It took over a year for Dinan's wizards to crack the code to create the S2, but when they finally got it, they got it right.

STORY AND PHOTOGRAPHS
BY TERRY SHEA



As a journalist, I tend to doubt people. It's not that I am cynical, or that I look for the negative in people, it's just that it's my duty to filter out the BS for you, the faithful reader. That's my *job*, dammit. So when I got the assignment to test the new Dinan-modified 335i S2, which puts out 407 horsepower when running on 93 octane, I figured something was up. Something had to give. There had to be compromise somewhere, even if Dinan promises "Performance Without Compromise."

But when I arrived in San Jose, Steve Dinan met me at the airport, more or less tossed me the key, explained the best shift points, and then left me to the car. Just like that.

This will be easy, I figured. Without being coddled or cajoled by a California tuner, without being spoon-fed propaganda direct from the source, I'd wring out the Dinan 335i S2 for the next eight days or so

and come to my own skeptical conclusions. Dinan has a fantastic reputation in this business, but for me, that was just reputation—and we all know what that's worth.

Boy, was I ever wrong.

Throttle response was the first thing I noticed. Even though a stock 335i reacts quite well when the right foot goes down—especially for a turbo car—the Dinan S2 was playing in another league. But despite the healthy increase in throttle sensitivity, the car was not jerky or hesitant at any point in the rev range, or under any load conditions.

Once on the open road, throttle tip-in was just, well, the tip of the iceberg, for there is simply an abundant mountain of torque at nearly all rpm. BMW's already robust N54 torque curve has been banished in favor of something along the lines of BMW's latest six-cylinder bi-turbo diesels—only instead of running out of steam at 4,500 rpm,

it packs a massive punch until just over 6,000, at which point it begins to drop off. But even in the stock car, there ain't a whole lot of party between 6,250 and the optimistic 7,000-rpm redline.

The Dinan S2 squirts through traffic like no other vehicle on the road. Unlike an M car that requires you drop down a couple of gears to pass on the highway, you just press the accelerator on the S2, and 60 rapidly turns to 80—and 80 dissolves to 100 in even less time. And when you mash it, the car can still press you into the seat even after passing triple digits.

So how does Dinan do it? How does he transform BMW's "ultimate driving machine" into a vehicle that even Munich's best do not produce? He does it the old-fashioned way: with a roomful of engineers locked into their cubicles and logged onto their PCs for months on end. And once they



get all their calculations complete, the real-world testing begins. Prototype parts are made, installed, tested, and remade until they are just right. Engines are strapped to the dyno and final adjustments are made, until Dinan gets the maximum power while still maintaining reliability and drivability.

And last but not least, Steve Dinan himself does the final suspension tuning. With countless racing laps and even more hot street laps (he is quite popular with the CHP and the local constabulary), the man knows how to make a car stick properly to the pavement.

Dinan is, in a word, thorough. The S2 is not a simple turbo upgrade, but the complete package, a car that not only raises the threshold of performance, but also improves the ride and comfort of a stock 335i—yet still remains docile and completely reasonable on the street, something

not many tuners can claim for their cars.

In fact, let's consider the word *tuner* for a minute. Dinan should be considered a manufacturer, not a tuner; the Dinan guys don't just grab a bunch of parts off the shelf, stick them in a box, and call it a car. Dinan has more than a dozen engineers on staff, with five dedicated to software tuning, in his R&D department. His Morgan Hill facility receives around 10,000 parts from more than 700 suppliers around the world, and his dedicated team of assemblers creates no fewer than 966 different, unique Dinan parts, which are then distributed to his nationwide dealer network of BMW retailers and independent shops. No one else in the BMW world in the U.S. even comes close. Admittedly, Dinan is not the cheapest source to make your BMW go fast, but you certainly get what you pay for—in every way.

Beyond the BMW world—well beyond—there is no shortage of tuners in the U.S. with experience modifying turbocharged cars, be it the madcap creations of Bob Norwood in Texas (1,000-hp Ferrari, anyone?) or the endless variety of young guys with laptops turning Subaru STIs and Mitsubishi EVOs into eleven-second quarter-mile demons. Some of these tuners have now begun working their wizardry on the 335i, with its potential for creating far more power by a simple boost in boost. However, instead of locking a gaggle of engineers in a room for fourteen months, as Dinan did in carefully re-writing 2,000 bytes of code in the 335i's ECU, others usually create a "piggyback" ECU that fools the stock system into thinking it is not making as much boost at that rpm as it's supposed to. The ECU responds by upping the boost to make up for that deficiency.

Unfortunately, the BMW's ECU does more than just control boost; it is also in charge of fuel mapping, ignition timing, knock control, and a host of emissions controls and other engine-saving code. A piggyback ECU will never properly replace all of those functions in your car. Unless you use very-high-octane fuel, the BMW's ECU will retard the ignition timing and fuel mapping in the best interests of saving your engine. In other words, it only makes boost under ideal conditions—with racing fuel, more or less.

That's why it took Dinan so long to create the 335i S2: They did it right. With a team of sixteen engineers, including those

used by all the major automobile makers when designing their own engine maps.

So what exactly have they done to the 335i? There's that ECU reprogramming, to begin with—*reprogramming*, not “fooling.” The 335i's stock boost ranges from 7 psi at 2,000 rpm, rising to 8.8 pounds at 4,500 rpm and finally tapering off to just 6 pounds at 6,500. In the Dinan S2, boost is raised only 10% at 2,000 rpm, but more like 60% at 4,000 rpm and 75% at 6,000. The result is a time-and-space-compressing rush of power in the mid-range that leaves the stock car in the dust—and it's something that no high-revving naturally-aspirated M car can match. (Speaking of M cars,

335i S2 is most certainly faster than the E92 M3 in a straight line. While the S65 V8 packs more torque than the S54 six, it lags behind the stock N54—and is substantially in over its head compared to Dinan's S2. And with that massive midrange punch, the Dinan sled pulls like the proverbial bullet train well into the triple digits.)

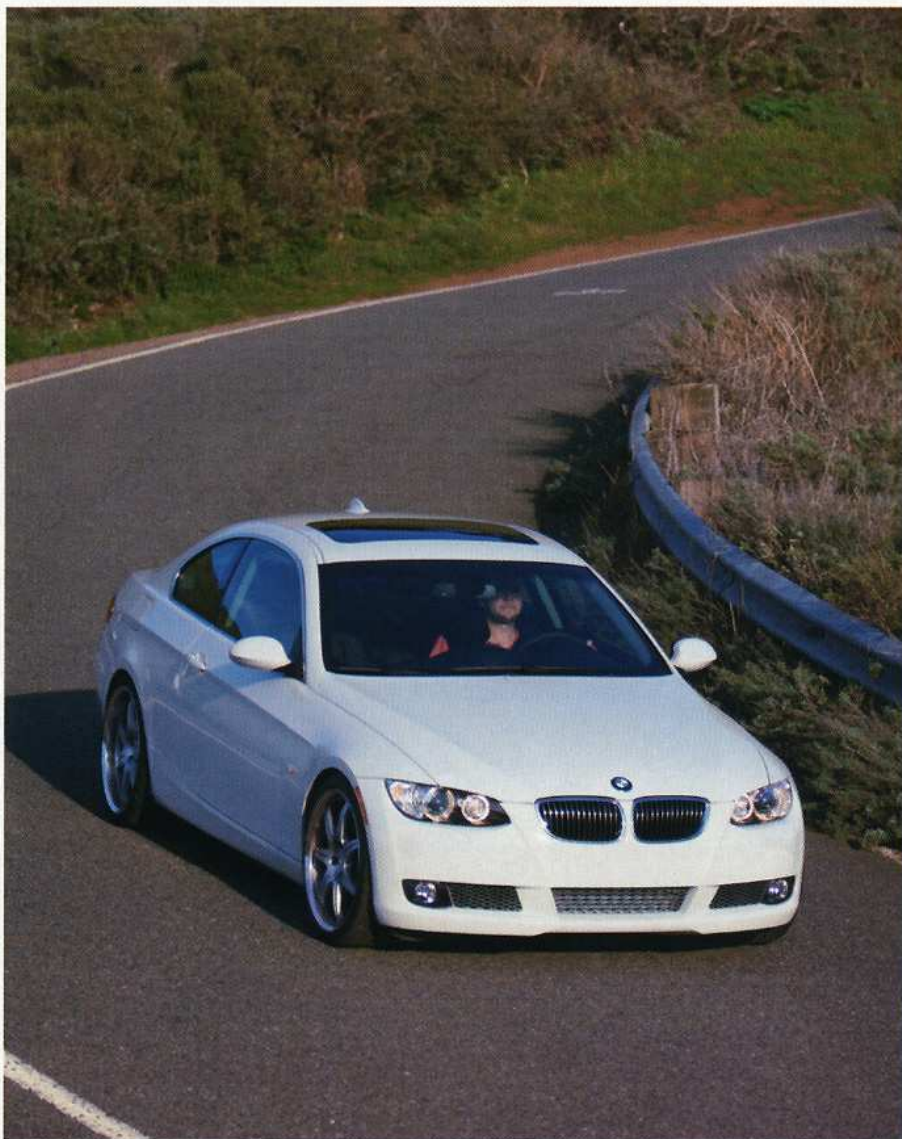
Although peak torque comes on a bit higher than the stock car, there is more torque *everywhere*; the peak of 429 foot-pounds comes at 3,700 rpm. To help maintain engine longevity, boost is tapered off at the highest rpm, as that level of boost and engine speed can overwhelm the inter-cooler's capacity to properly cool the intake charge. Without backing off the boost, engine durability could be compromised—absolutely unthinkable to Dinan, whose warranty matches BMW's.

Being thorough, Dinan also incorporates a spectacularly well-engineered oil cooler, as the 335i's oil temperature, even in a stock car, can get quite high in spirited driving; some cars have been known to get so hot after just a few laps on the track that the oil temp puts the car into “limp-home mode” to save itself—even in cars that have the stock sport-option oil cooler. (It's now supposed to come on all 335i's, but even the dealers can't tell which ones have it and which don't until they open the hood.)

To augment the 335's small oil cooler—or provide one for cars that didn't come with one from the factory—some in the aftermarket have come up with a simple oil cooler that mounts in front of the car's main radiator—which doesn't exactly help the heat escape. Dinan, predictably, went the extra mile with their unit. With double the surface area of the stock unit—again, not always included on a 335i—Dinan's high-capacity oil cooler sits in the stock location behind the front bumper on the right side. Moreover, a special shroud diverts about a third of the air normally being ducted to the right front brake and sends it through the cooler.

Another lesson in thorough: Because they intended to take some of the airflow from the brake-cooling duct, Dinan measured the flow characteristics of the duct and determined that it was already well oversized, so re-directing a third of its air would not affect brake cooling at all. They also calculated that there would be no offset in operating temperatures between the right and left brakes. To top it off, the oil cooler is louvered on the backside to properly divert the warm air instead of spilling it out directly into the wheel well, which might create unwanted lift at speed.

They really have thought of everything (would you believe lightweight Kevlar oil-



five software mavens, Dinan's group was very, very thorough. There's that word again.

Buried in the thousands of lines of code in the ECU are controls that take priority over making boost, such as those that prevent the catalyst from getting cooked by excessive heat. Layer upon layer of throttle matrix maps were reviewed and revised, tested, and revised again. Dinan uses the same advanced—and expensive—software

here's a word of advice for those who have been saving their lunch money and patiently waiting for the E92 M3 V8 to come to our shores: If you encounter a 335i with a Dinan badge on the trunk, don't throw down for pink slips. The car is so fast in a straight-line drag that you'll have to hitchhike home. Or at least that's my impression; having driven both cars on the same day, I can say that the seat of my pants tells me the Dinan



Students, what's wrong with this sequence?
Where is he looking through the turn?

cooler lines?). Of course, this sort of thoroughness takes time and money—lots of both—which not only explains the \$1,999 cost of the oil cooler, but also the fourteen months it took to get this car on the road, while others were releasing products within weeks of the 335i's debut in 2006.

After the oil-cooling problem was solved, a high-performance intercooler—one that increases the factory unit's performance by 93%—was the final piece in the puzzle. While the intercooler itself is good for a couple of horsepower in the stock engine, its increased capacity allowed the software engineers to find an additional 23 horsepower hidden in the code, although torque remains the same. Along with this increased capacity, Dinan's intercooler features larger tubing to improve airflow.

At the aft end of the car, Dinan's all-stainless-steel, custom exhaust system

improves flow as well, which is good for a small bump in power in conjunction with the other modifications. More importantly, despite the entire exhaust being muted by the turbos, the new Dinan exhaust makes spectacular sounds. In true testament to Dinan's preservation of BMW's refinement, the exhaust is audible inside the car, but somewhat subtle. This ain't no race car! But open the windows and the sound is raspy and burbling—and when the revs get turned up, wicked and howling, as a high-performance car should be.

The engine-performance mods can be broken down to \$1,999 for the software, \$1,999 for the oil cooler (which is worth it alone for anyone who wants to take his 335i on the track even in stock form!), \$1,699 for the exhaust, and \$1,599 for the intercooler. All told, for about \$7,300, you get 407 horsepower at 5,700 rpm on 93 octane

gas. For those stuck with only 91 octane—like the entire State of California, for instance—you lose about 25 horsepower.

Pile on the Dinan mods until your wallet cries for mercy, and you get a lot of performance. But what's the catch—what do you give up in exchange? Nothing: Drivability remains the same. I would even say that you gain the peace of mind that your oil temperature will remain far steadier than in a stock car. In spirited driving, the oil temp never once went above 250°, and in a 30-minute slog through bumper-to-bumper traffic at the Golden Gate Bridge, it never breached that mark, either. You can buy Dinan's software and boost upgrade separate from the oil cooler, but their famous match of BMW's warranty is not included if you don't have some kind of oil cooler in the package. That is perhaps the only compromise with the car.

Dinan's thoroughness does not stop with the motor mods. The S2 includes a full treatment to the suspension, wheels, and brakes as well. While the wheels are the only part of the package that modifies the look of the car, they also provide a very specific performance and ride advantage. Gone are the run-flat tires from the stock setup and the heavy cast BMW wheels; in their place is a set of ultra-lightweight Dinan-exclusive custom-forged, seven-spoke wheels wrapped in massive 19-inch Michelin Pilot Sport 2 rubber, 265/30 at the front and 275/30 at the rear. As the goal is more neutral handling, only 10 mm difference in width separates the front from the rear tires.

By ditching the stock wheels for the lightweight forged ones, you can save approximately ten pounds per wheel. By losing the run-flats for the sticky Michelins, you can save another six to seven pounds per corner. Add it all up, and the wheel and tire package results in a net savings of nearly 60 pounds of unsprung rotating mass. A side benefit is that the ride improves considerably. The ultra-stiff sidewalls of the stock run-flats transmit every bump, nook, cranny,

and imperfection on the road like a Braille speed-reader. The ultra-low-profile Michelins certainly have stiff sidewalls, and you can hear the noise from such imperfections, but much of the harshness does not reach the driver's body, only his ears. At \$5,096, the wheels and tires are not cheap, but you could easily spend more for less.

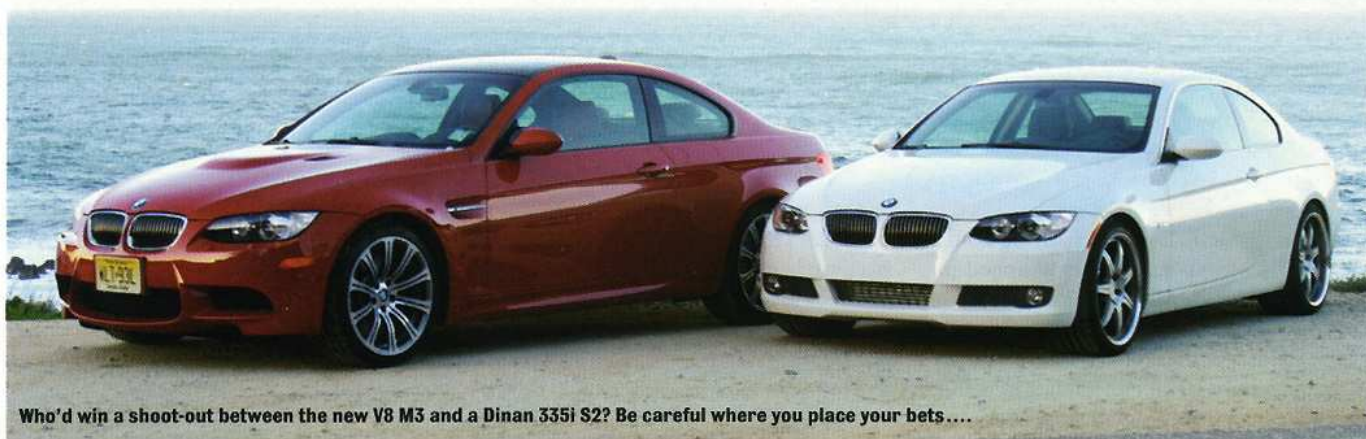
From a performance standpoint, the stickier tires are kept planted to the ground by Dinan's Stage 3 suspension system. After his team of engineers spent countless hours of R&D time calculating the ideal suspension setup, Steve Dinan did the final on-the-road, real-world testing before deciding on a setup for Stage 3. The system includes springs, Koni adjustable shocks and struts—pre-set by Dinan—a 28-mm front anti-roll bar, and a 15-mm rear bar, as well as front camber plates. The 3 Series has had adjustable camber plates from the factory for a while now, but the Dinan plates allow for an extra half degree of negative camber. But unlike some tuners, Dinan does not put adjustable coil-over setups on street cars. "Race car parts belong on a race car," he says. "Street car parts belong on a street car. And they are different parts."

An added benefit of the lighter-weight wheels and the proper lowering of the car while maintaining the correct geometry is a ride quality that is vastly improved over that of the stock 335i sport, which has a harshness as a side effect of its generally stiff setup. Other than some road noise from the low-profile Michelins, there is little, if any, compromise in the \$2,468 Stage 3 suspension. Dinan cars have long been known as having both improved handling and a very reasonable ride. Lowering for the sake of lowering the car and then stiffening it up has never been Dinan's MO. "Getting balance right is a tightrope act," he adds. "If you give the car more travel, not only does the ride improve, the car turns better."

Dinan's setup is so well dialed in, so good at keeping those four contact patches on the ground during the most spirited cornering, that it obviates the need for a limited-slip differential in most cases. It does not replace an LSD, but certainly works out the kinks that BMW's engineers and accountants were not able to overcome on their budget.

Inside those massive wheels lies a set of Dinan-by-Brembo brakes. As functional as they are beautiful, six-piston aluminum





Who'd win a shoot-out between the new V8 M3 and a Dinan 335i S2? Be careful where you place your bets....

calipers up front clamp down on 380-mm (15") rotors, and four-piston calipers out back put the squeeze on 345-mm (13.6") discs. At \$7,445, the brakes—available slotted or drilled, as was our test car—are not cheap. But like everything else Dinan does, they work supremely well and banish any sort of fading you can expect on a track day. Connected via Goodridge stainless-steel brake lines, the feel and power of the brakes are stunning. Barreling down a mountain road for nearly 50 miles, using the brakes more than recommended by the numerous signs on the road, they never once hinted at fade or reduced pedal feel. Likewise, they work with the ABS and other systems that use the brakes for car control.

Okay, then: With \$22,308 in modifications, how does the Dinan 335i S2 go?

Like a rabid, scalded dog, if you want it to—or like a docile pussycat if you just need to putter around town. For more spirited driving, there is that spectacular mountain of torque and incredible rush of power at all rpm. Passing opportunities increase exponentially, as the car's ability to find gaps on the road and get ahead of slower cars is second-to-none, compared to anything else with a blue-and-white roundel and a 3 on the trunk. Handling, likewise, takes a leap forward.

Turn-in via the Michelins, the suspension changes, and the camber plates is telegraphic between the contact patch and driver's brain. Ultimate grip with warm tires is also at a vastly higher level. But the suspension's unflappability in quick transitions from one turn to the next speaks to the higher level of engineering and vast experience found inside Dinan's headquarters.

No stranger to boosted BMWs, Steve Dinan has been at this game since the late 1970s. With all that experience behind him and BMW's already competent and fast 335i, Dinan turns a standard car into a powerful machine with exotic levels of performance; they not only maintain BMW's

Lurking behind lightweight Dinan wheels are huge brake discs and Dinan-by-Brembo six-pot calipers.



refinement, they improve on it. Still, at over \$22,000 for all of the mods listed above—many can be purchased separately—the Dinan S2 is not for everyone.

But for the committed enthusiast, Dinan truly does deliver on their promise of "Performance Without Sacrifice." They have done the seemingly impossible task of not

only improving the 335i's performance in all areas—acceleration, braking, and handling—but also improving the ride quality and refinement. Dinan didn't just up the boost; they created a car with a completely new character. Think *more, faster, better 335i*, and you'll get an inkling of what the Dinan 335i S2 is all about. ♦