

# DR. JEKYLL & MR. HEIDFELD

YOU WON'T SEE MOST OF WHAT MAKES THE DINAN S3 M5 SO  
MUCH MORE THAN A STOCK M5—UNTIL YOU DRIVE IT.

STORY AND PHOTOGRAPHS BY CHRIS WRIGHT

*I too am not a bit tamed, I too am untranslatable,*

*I sound my barbaric YAWP over the roofs of the world.*

*Walt Whitman*

When I die, I fear that I will probably be thinking about sex or cars. Either way, I imagine I'll be recalling the best I ever had. As for cars, will it be my Porsche GT3? That willowy race-prepared Lotus? The first Ferrari I ever drove? The surprisingly well-sorted Lingenfelter Corvette a student once had me wring out on track? The supercharged NSX?

Well, maybe. But as of today, it's going to be the E60-based Dinan S3 M5. Simply put, this is the best car I have ever driven.

If only the sex were so easy to rank.

Imagine, if you will, being at a deserted race track. It's quiet at first, but then you hear a distant howl: not deserted after all. Some racing team must be testing. You might cock your head, trying to place the sound and attach the right adjective. Exotic? Expensive? Yes. Then it gets louder, closer, more urgent. Erotic? Glory be: So *this* is aural sex! The source explodes off a corner and blasts past you, slowing the rotation of the earth with its thrust and filling the atmosphere with the maniacally mellifluous mechanical music of a choir of automotive angels: Mahle, Carrillo, BMW—

And Dinan.

While Mahle does indeed make those stunningly complex pistons, and Carrillo



does make those forged rods, and BMW does make the block that makes it all possible, the proper analysis of this disquietingly lust-worthy vehicle will start—*must* start—with the exhaust and its note, both manufactured by one Stephen J. Dinan and associates.

The symphony is best heard from outside the car. Driving it is a *diminuendo* passage; at first I simply didn't know it was there. In thirty miles of highway cruising, the sound is barely distinguishable from the tightly corked pipes of my own bone-stock version of the same car. The Dinan system provides no annoying aftermarket drone, no intrusion at all. It is only after we reach the Angeles Crest Highway, snaking through the mountains above Los Angeles, and my rib cage compresses as I dip into third gear in anger for the first time, that some Wagnerian soprano banshee goes ripping and howling around the canyon walls.

That's when I get a real taste of just how unique a car this is. Crazy fast and breath-takingly responsive, assuredly; but, oh! That *sound!* More Ferrari than BMW, more Italian than German, more Carla Bruni than Claudia Schiffer—and somehow, despite its visceral, atavistic intensity, more sophisticated than wild.

What is it with this unique—how to say it?—*character* of sound? Dinan answers matter-of-factly. "Uneven pulses," he observes. "You *do* understand that the natural angle for a V10 would be

72 degrees, yes?"

The deer in my eyes obviously freezes in the headlights of his gaze, so he kindly answers his own question: In a four-stroke engine, the crank will turn twice in each complete cycle. That's 720 degrees: ten cylinders equals a 72-degree V, if you want each piston to arrive at top dead center at equal intervals. Get it? The fog begins to lift. But when BMW designed the geometry of the Formula 1 V10—the architecture on which this engine is closely based—they wanted a wider V for many reasons, not the least of which was to lower the center of gravity and create room between the cylinder banks for other components. So they settled on a 90-degree angle, which trickled down to the (much larger) street engine; and the root of the yawp that is somehow simultaneously barbaric and beautiful is the asymmetric firing required to give all ten cylinders a fair shake. (Not so with a V8, where 720 divides rather nicely across the eight pistons for an even burble—and now you know why—on the ubiquitous 90-degree configuration.)

That brief and one-way exchange of engineering insight was a harbinger of how my time with Steve Dinan would be spent—that and an evanescent few hours spent swapping cars and chasing each other in the cool air of the first days of Fall over some of Southern California's better driving roads, much of that Angeles Crest Highway, but also the Malibu roads of local legend: Stunt, Piuma, Mulholland, the Rock Store, Encinal Canyon.

Dr. Jekyll and Mr. Hyde? Not really. Even when the claws come out, the S3 is energizing rather than evil, invigorating rather than intimidating.

Let's call him Mr. Heidfeld instead.

The seemingly impossible combination of cruising refinement and wide-open-throttle auditory irresponsibility provides a superb analogy for what has been achieved with every aspect of this staggeringly competent vehicle. Compared with my near-identical car, the Dinan S3 feels more compliant and offers better ride quality on the freeway. However, it turns in like a slot car, exhibits little body roll, and absorbs mid-corner undulations on high-speed sweepers with a composure that makes my car feel ragged and twitchy. Steering is a strength in the stock E60 M5, with the rack-and-pinion steering a very welcome improvement over the E39 M car's recirculating-ball arrangement. But this, too, somehow feels better yet in Dinan's car, and I start wondering how you modify steering feel, of all things, without re-engineering the entire car.

Again, the veil of my ignorance is pierced by an engineering answer: What I'm feeling is a little extra caster that adds some much-appreciated heft to the steering but also creates better on-center stability.

It is characteristic of Dinan—and refreshingly at odds with most of the aftermarket automotive industry—that despite vast and pricey re-engineering everywhere that counts, appearance changes only in the most tasteful and understated ways. No wings, dams, spoilers or stripes here—and certainly no dubs. But let's note what change items there *are*. Take a deep breath: Long-block V10 engine, bored and stroked to 5.7 liters (one); engine-control software package, permitting this demon to spin to 8,400 rpm (one); high-flow air-mass meters and intake assemblies (two); high-flow throttle bodies (ten); free-flow rear mufflers (two); high-flow racing middle exhaust (one); customer choices of volume in the resonators (three: racy, rorty, ridiculous); underdrive pulley

(one—but the damper is left undisturbed, for those worried souls who have read Dinan's white paper on crankshaft har-



monics); performance springs with matching bump stops and heavy-duty billet perches (four); front roll-control system (one—read on to see just what *that* is); camber/caster plates (two); monoball lower-control-arm bearings (two); rear sway bar (one); carbon-fiber strut braces with forged brackets (two); nineteen-inch lightweight forged wheels (four); 380-mm Brembo rotors

incapable of rational decision-making in this sphere. Mercifully, there are many other drunks out there to keep me company, and in my years instructing at West Coast CCA events, I have had the privilege of driving some epic conveyances. But I can report emphatically that no power plant I've ever uncorked before matches up to this one—not the turbocharged flat sixes from Zuff-

this world will ever get to experience the Bonneville torque flats and Alpine power peaks of a large, meticulously developed, naturally aspirated race motor of this caliber, and fewer still will drive one that works perfectly on the street, too.

But I did. And for a few precious hours—sometimes on my own, sometimes with Dinan in my mirrors driving my car—I got



**Note the matching carbon-fiber weave on air-box lids and strut brace. It accommodates an internal intake trumpet smoothing airflow within the air box.**

(four); six-piston monoblock aluminum Dinan/Brembo front calipers (two); four-piston aluminum Dinan/Brembo rear calipers (two); 3.91 limited-slip differential (one).

Utterly transformed sled that will get groceries, cruise five people in luxury all day long, and still run with a GT3 on a fast race track: one.

My relationship with cars matches that of alcoholics to booze; I am pathetically

fenhausen; not the naturally aspirated GT3 engines, magnificent as those are; not that honking V8 in the new ZO6; not even those Italian screamers from Maranello. Some might be tempted to look to the big-displacement motors from Mercedes' AMG division as close competitors, now that they're moving back to unforced breathing; in my humble submission, however, none come close. Tragically, very few people in

to breathe the rarified air at the top of the automotive food chain—and it was good. Being an apex predator has its up sides.

Those 5.7 liters come about with bore at 93 mm, stroke at 83 mm, keeping the compression ratio of 12.0 to 1. This represents a 14% rise in displacement; output, however, rises even more, to a colossal 628 horsepower—more than 23% above stock. Perhaps most important, with significantly more torque available at 3,000 rpm than the factory motor creates at its 6,100-rpm peak, and with twist peaking at 480 foot-pounds (some 25% more than the base motor), daily drivability is *enhanced*—despite all the exotica. So there's no bitchy, balky, compromised power delivery when tooling around the neighborhood. First and foremost, this car is a BMW when its development at Dinan begins, and it remains one when that development is complete.

A startling 21 additional horses—and fourteen twist-feet—come from improved intake airflow. Factory ram-air ducting is enhanced via larger air boxes, all the better to accommodate significantly bigger filter

elements. Characteristically, about the only bling in the car is the understated carbon-fiber finish on those air boxes; who, other than Dinan, puts the only cosmetics under the hood? And that suggestive little power bulge on those boxes? Well, even those oversized replacement air boxes weren't quite large enough to accommodate the intake trumpets (yes, *inside* the air boxes!) that

when the motor's at full chat (right around half the speed of sound), and centrifugal force would create a faster and hotter flow through those outer tubes, leading to more power—but also uneven temperatures at the inner and outer exhaust tips, resulting in uneven discoloration of those tips over time. Again, knowing the power was available, it simply wasn't in Dinan's DNA *not* to tap

In the medical profession, the Hippocratic Oath lays down a vital principle: *First, do no harm*. It is testament to Dinan's commitment to producing nothing short of excellence, then, that he knows when *not* to change things just for the sake of changing them. In the suspension packages Dinan offers for virtually all other models, front sway bars, as well as shocks and struts all



**The 3.5-inch pipes are a subtle indicator of the Dinan touch.**

were found late in the proceedings to squeeze a few extra equines out of the breathing arrangements. "Once we knew the power was there, we damn sure weren't going to leave it on the table," smiles Dinan over a Heineken at my kitchen counter when the day is done. Hence those achingly elegant domes in the carbon-fiber air-box lids... and the carbon-fiber weave matches the strut brace behind them. Cool.

At the other end of the breathing arrangements, the exhaust setup carves some 20 pounds of unnecessary weight out of the equation; and as if the audio weren't sufficient, the visual on those four 3.5" tips is just aggressive enough to change the character of the car's rear perspective, but subtle enough that it would take a keen eye to say why. Another somewhat unexpected few horses were found by permitting and encouraging, rather than strangling, the faster flow of exhaust gases in the outer of the two feeds on each side from the central exhaust to the mufflers. These gases are moving quickly



into it. Necessity being the mother of invention and all, their proprietary Cool Tip technology was developed, employing a vent at the base of the tip that allows the momentary drop in density that follows an exhaust pressure wave to draw in external air and keep the tips equally hot.

And this exhaust doesn't just make power and present an orchestral orgasm. It, ahem, *grows*. I kid you not: When hot, it's over an inch longer than when, er, unaroused. Cool.

around, are replaced. But when he saw the beautifully engineered front sway bar on the E60, Dinan realized immediately that it would not be cost-effective to build a better replacement; BMW had deployed their formidable development capabilities most excellently on this occasion. But Dinan did need to introduce *adjustability* into the equation; his time with ultra-modern shaker-rig analysis in the racing world has made Dinan a firm fan of stiff sway bars and slightly softer damping and springs. So he enhanced the

bar with the ingeniously simple three-way adjustable mounting plates that now bear the moniker of Roll Control System.

Some of suspension tuning is alchemy, and not even the apothecary always knows exactly what's going to be required. But in this case, most elements of the S3's magic potion can be clearly articulated. Dinan believes that BMW overdamps their M cars, such that the relationship between the springs and the shocks is not optimal—at least not for American roads and tracks, which tend to be less smooth than their European counterparts. Making that relationship right would typically involve either softening the damping or stiffening the springs, or both.

Both is exactly what happened in the Stage 3 suspension kit Dinan built for the E39 M5—but that was in the days before the alphabet soup contained EDC. Dinan was impressed with the factory's elec-

tronic shocks and struts on the new car, just as he had been with that front sway bar. Out of respect for engineering well done (oh, all right, and also out of cost considerations), the shocks and struts were

left in place, the springs mildly stiffened, and the recommendation made to run the car on the intermediate, rather than the full hard, electronic-damping-control setting. Expensive—but this part of Dinan's S3 M5 makeover bears the lowest cost of any complete suspension package the company offers, largely because of the stock shocks, struts, and front sway bar remaining in the car. And there's no arguing with the result of the work. The witches' brew of camber, caster, toe, ride height (7/8" lower than stock up front, 3/4" in back), sway bar stiffness, pitch resistance, wheel-and-tire dimensions slightly staggered—not to create understeer, but rather to ensure even tire wear over time—and all the other newt's eyes and frogs' spleens of professional race-team-level suspension tuning simply works—reassuringly, confidence-inspiringly, neutrally, superbly. It matches the

better deal in the aftermarket automotive universe. No better handling, either.

I notice this the first time I pull away from the curb with Dinan in the passenger seat. "You forgot to push the M button," he says quickly (the EDC setting is one of the parameters you can pre-select with the wheel-mounted M button). I hear this from him several times over the course of the day, uttered the way most people would say, "You forgot to put on your seat belt."

I smile. "I usually only use it in my car when I hit the twisties."

Dinan looks genuinely puzzled, and I can see him turning the idea over in that busy brain: *This guy actually sometimes drives his car with the M mode off. With only 400 horsepower. Imagine that. Oh, well—takes all sorts.*

But what about the M6, you ask, which shares so much hardware with the M5? So



**The Dinan car turns in more crisply, exhibiting substantially lower body roll, and its cornering attitude responds instantly and predictably to throttle adjustments, making it surprisingly easy to drive fast, even over unfamiliar and less-than-perfect roads.**

good of you to ask: In short, you can get just about the identical package. "The Six is a few car lengths faster to 180," says Dinan. "We do that often between some lights near the shop." The smaller frontal area and slightly lower weight of the E63 M6 chassis accounts for that edge. "But the Five handles a shade better," he continues. "Longer wheelbase."

That M6 drag-race superiority doesn't trouble Dinan's client base; for the most part, his M5 customers are apparently more concerned about at-the-limit handling than 0-to-180 trophies. I can't speak about the M6 from personal experience, but I can tell you that this M5 responds to the subtlest

tronic shocks and struts on the new car, just as he had been with that front sway bar. Out of respect for engineering well done (oh, all right, and also out of cost considerations), the shocks and struts were

engine for sheer shock-and-awe, better-than-your-best-expectations brilliance. Those whose budgets, like mine, can barely afford the stock car might have to live with just that suspension package; I know of no

of mid-corner throttle adjustments in much the way my Porsche GT3 did—but without the sensation that if you err even slightly, you're going to get bitten (and it's worth noting that the Porsche had no rubber anywhere in the suspension, strut mounts being metal-to-metal uniballs; the car weighed only a little over 3,000 pounds, and was a triumph of uselessness as a daily driver). The monoball bearings with which Dinan has replaced the stock lower-control-arm bushings have as their principal purpose the reduction of front steering-geometry deflection under load. But they also have the salutary effect of unbinding the suspension in fore-and-aft weight trans-

**The stock car works decently on track, but body roll is significant and track imperfections upset the car when running on the hard damping setting.**



fer; throttle adjustment in high-speed cornering is where you really feel that effect, and it gets better the faster you go, as the big sedan shrinks around you and magically takes on the feel of an LMP12 or a Dinan-powered Daytona prototype.

**W**hy doesn't BMW offer all of this *pur sang* development themselves? Dinan's gracious answer is that the factory has to build cars for a larger audience, an audience that might object to the tire wear that results from running significant negative camber, or from the fractionally higher noise levels associated with those monoball bearings. Engaging in some devil's advocacy, I would submit that the fine-tuning of such a stunning piece of work is simply not all that easy for a large corporation, and may actually be done better by a small, high-quality outfit run as a benign dictatorship by someone who lives and breathes performance. In multinationals,

good ideas get led down dark committees to be quietly strangled, doubtless with the best of intentions. Vast quantities of data get crunched by supercomputers—but are they really better than a superbly talented and experienced racer-cum-engineer who is willing on occasion to substitute black art and intuition based on decades of seat-of-the-pants race experience for what the computer thinks should be the right setting?

The first iteration of the Cadillac CTS-V was a surprisingly good car, not because of the number-crunching capacity of General Motors, but because of their uncharacteristic good sense in getting out of the legendary John Heinricy's way in setting up a truly performance-oriented vehicle. Would BMW give really give *any* single individual the discretion to tinker with shock valving and engine mapping and caster and gearing and the myriad tiny details that go into elevating a driver's car from the merely excellent to the truly unfor-

gettable? I fear the answer is no.

But at Dinan they would. Especially if that someone were, you know, Steve Dinan.

Performance without sacrifice? Well, yes—in engineering terms. There is, of course, the small matter of the \$75,000 cost of this package; some might call *that* a sacrifice, particularly when added to the \$100,000-odd out-the-door cost that most loaded M5s are approaching. Not for the faint of wallet—but then, show me the car that does all of this for less. Or, for that matter, for more—much more. Even the redheaded-stepchild SMG III transmission seems to fit better into this re-imagined car than it does into the one the factory produced. Why? I'm not sure I can say... and not sure that even Steve Dinan can, his encyclopedic engineering knowledge and articulate presentation skills notwithstanding. "Some of this," he allows, "is more art than science." Sometimes Deep Blue wins; sometimes Kasparov.

As for the performance, let there be no doubt that what Dinan hath wrought here is nothing short of unforgettable. Tough to describe the 507-horsepower stock M5 as underpowered, but that's precisely how it feels when you get back into it after driving the S3. Throttle response is fabulous in the stock car above 5,000 rpm, but just a hair disappointing below that. In the S3, the combination of vast, big-displacement-race-car-engine torque and the subtly lowered gearing make for a RIGHT NOW response in any gear—at any speed—that defies capture in words. On the freeway, the car pulls harder in seventh gear than the stock vehicle does in fourth. When I downshifted to third before tossing the car into one of the first sweepers on the Angeles Crest Highway, Dinan chuckled. "You're in the habit of shifting," he smiled, "but you don't have to." So for the next corner I leave it in fourth, and, expecting a lazy acceleration off the relatively tight apex, roll progressively but rapidly into a wide-open throttle as I unwind the steering. Dinan smiles again, and my eyes widen as that sophisticated demon under the hood bares its teeth from 3,500 rpm and launches 4,500 pounds of men and machinery down the blacktop with a ferocity usually known only to pro racers.

Same story with the steering, same story with the suspension. And the brakes, superbly powerful and progressive when deployed with serious intent, remain better (and lighter) than the stock units in regular driving, with none of the oddly overboosted feel and occasional light-braking grabbiness of the factory car. The package is simply honed to such sharp focus that the standard vehicle begins to feel blurry by comparison: much the same symphony, but being played off enhanced DVD rather than vinyl. It's that black magic again, where the whole is orders of magnitude greater than the sum of the parts: lighter wheels with lighter brakes, riding at more aggressive angles, compressing better calibrated suspension, and being powered by the Dark Side.

Maybe some other engine builders could do this with the motor (although some would probably cut costs with a welded crankshaft, rather than the obscenely costly bespoke billet unit built in Germany that spins at the soul of the Dinan S3). Maybe some handling guru could do this with the suspension. Maybe an experienced bushings tinkerer could figure out that the lowered resistance to fore-and-aft weight transfer afforded by the monoball lower control-arm bearings would assist both in putting power down and in getting the car to turn in (via smoother, quicker weight transfer than with standard rubber bushings).

But the whole? The achievement here, making this four-door Daytona Prototype

as involving on the twisties as the GT3, but simultaneously not just as comfortable on the freeway but *more* so than the base car, making it Ferrari fast but BMW practical, is one that I truly hope gets the kudos it deserves when the car goes next (yes, *Roundel* got the scoop) to *Road & Track* and *Car and Driver*.

Of course, one important question remains: why? Does anyone *need*, in contemporary America, a 628-hp, criminally thirsty street-legal race car, however understated its appearance and startling its daily

**Which one would you rather drive? Not as hard for Steve Dinan to answer as the picture might suggest.**



utility? Simply put, no—but there's more to it than that. "O, reason not the need! Our basest beggars are in the poorest thing superfluous," said King Lear. Necessary, no; excessive, perhaps; an artistic statement, of course. Politically correct, not by a long shot. But in these political times, regardless of our leanings, first and foremost some of us remain car enthusiasts, and car enthusiasts should be giddy that cars like this still get built, even if they do cause the measurable melting of polar ice with each glorious mission to the far side of 8,000 rpm.

Later that evening, chatting with Dinan, I observe that with the BMW Board having accepted both climate change and soaring gas prices as inescapable realities, the last ten years may come to be seen as a kind of Golden Age of the automotive industry when it comes to high performance. Dinan agrees: "This is probably the last big, naturally aspirated motor that

BMW will build," he says. Well-placed to work with the trend, Dinan has immersed himself in the technology of forced induction for years, and is an authority on the platinum-based technology of the exceptionally advanced catalytic converters so vital to BMW's push to lower environmental impact. BMW's decisions in the past on the Efficient Dynamics program, the Mini brand, and the commitment to forced induction on both diesel and gas engines are suddenly looking remarkable prescient. The prestigious pan-European lobbying group Transport & Environment recently ranked the company first in the industry for having achieved the greatest improvement in its fleet carbon emissions—over 7%—in 2007, and while much of America still seems not to care, Europe does, deeply—and if nothing else, BMW's actions are good for business.

So don't hold your breath for the next V10 or V12 beast to enthrall you with the

sheer unstoppable urge that can only come from lots of cubes and lots of cylinders. From BMW, at least, they may well be things of the past. Dinan the corporation will soon go public, and Dinan the man will segue into more of a business and less of an engineering role. Attention will probably turn to a broader market, enthusiasts clamoring for Dinan improvements on the 335i and 135i. So I am simply delighted that I got to play with what may well be the last and the best of the big engines that Steve Dinan himself has developed and tested—and tested—and developed—until it was as good as it could possibly be—and better than it had any right to be.

Mr. Dinan's opus? Quite possibly. And a magnum opus it is, too—probably because when you get right down to it, the primary reason for the development of the Dinan S3 M5 was simply that Steve Dinan *wanted* one, and nobody else made anything like it. ♦