

WHAT PRICE PERFECTION?

Dinan's S3 package for the M5 and M6 may seem expensive, but it's a small price to pay for an M-car that's close to perfection.

By Jackie Jouret Photography by Helmut Werb





Forget, for a moment, this M6's 628-horsepower V10 engine, because that's more or less irrelevant here. On this road, even the standard 507 horsepower would be more than enough, because power is less important here than agility and grip.

There are 365 corners in less than seven miles on this narrow old road, which snakes up Mt. Hamilton from San Jose. It was originally created so that horse-drawn carts could bring the 36-inch telescope to the Lick Observatory back in 1876, and it doesn't seem to have gotten much wider since. Since the M6 we're driving and the M5 up ahead fill the width of the road in some spots, we're lucky we don't meet any oncoming traffic on the way to the summit.

As much as the absence of traffic anywhere in California tends to surprise us, we're even more astonished to find these stately M cars climbing to the top with such alacrity. For that, we can thank the people at Dinan Engineering, who've turned these luxury limos into the serious sports cars most enthusiasts expected from the start.

Though we've always enjoyed these big M-cars, especially when someone else was paying for the gas, we always felt like we'd enjoy them a lot more with less weight and

nimbler handling. At 4,012 lbs. for the M5 and 3,909 lbs. for the M6, these heavy vehicles have always seemed more at home reaching for 200 mph on the *autobahn* than clipping the apexes on a tight and twisty road like this one.

These Dinan cars, however, are about as good as any we've ever experienced on the climb up Mt. Hamilton. Though we'd prefer an M Coupe above all else, these big BMWs are surprisingly adept at a task that wouldn't really seem to suit them, which leads us to wonder whether weight was really the problem.

Total transformation under the skin

After all, Dinan hasn't exactly created a pair of strippies in turning this M6 and its companion M5 into S3s. All of the luxury appointments are still intact, and the total weight lost through the substitution of Dinan components for stock is only 52 lbs. Crucially, however, 32 of those pounds have been shed where it really matters.

No matter how many times we drive a Dinan BMW, we're always amazed by how much better the cars handle than their stock counterparts. Though there's a lot of careful suspension tuning behind that improvement, much of the credit is due to Dinan's ultra-light-

weight forged aluminum wheels. At 20 lbs. each, they reduce weight by 8 lbs. at each corner even as they add half an inch of width front and rear. (Diameter remains 19 inches.)

Since a car's wheels count as unsprung weight, each one acts like a pendulum as it moves along its travel, and a heavier wheel will force the suspension to work harder to control its mass. Since a rotating wheel also acts as a gyroscope, a heavier wheel also exerts a stronger effect on the vehicle's directional stability, impairing its ability to stop and turn.

Fitting lighter wheels is an easy way to make a car handle better, and one could reasonably stop there and enjoy a considerable improvement. To really get the most out of a car's potential, Dinan carries chassis development several steps further, replacing several key suspension components in pursuit of neutral handling.

Before we get into what Dinan does, it's important to note that although the M5 and M6 are based on a similar platform—the E63 6 Series being a close relative of the E60 5 Series—there are a few crucial differences in the specs which serve to make the cars feel a bit different on the road.

First, the M6's 109.5-inch wheelbase is 4.2 inches shorter than the M5's even as its over-



all length is 0.3 inches longer. The shorter wheelbase should enhance its agility at the (probably negligible) expense of high-speed stability and ride comfort.

Second, the M6's track dimensions are 61.7 inches front/62.4 inches rear where the M5's are 62.2 inches front and 61.7 inches rear. That would bias the M6 towards understeer while giving the M5 more neutral handling, but the effect is countered somewhat by BMW's decision to fit a smaller 26.5mm front anti-roll bar to the M5 than it does the M6, which gets a 28mm bar.

Dinan leaves both cars' front bars unchanged, relying instead on its own Roll Control System to effectively increase the bars' wheel rate (i.e. the force pushing the wheel down onto the pavement) by around 35%. Also on both cars, the 18mm rear anti-roll bar fitted as stock is replaced at Dinan by a 21mm bar to reduce understeer.

The Stage 3 setup also pairs Dinan's heavier-rate proprietary springs and matching bump stops to BMW's standard Electronic Damper Control shocks and struts. Retaining EDC allows ride stiffness to be adjusted from within the cockpit as per normal, with the M5/M6's usual settings of Comfort, Normal and Sport remaining available. (We drove both cars in Normal without complaint.)

Dinan further replaces the front and rear upper shock mounts and rear spring perches, lowering the cars by a full inch even as suspension travel actually increases—a great formula for improving cornering and ride quality simultaneously.

Dinan's front camber/caster plates increase negative camber for improved grip while cornering as well as better steering feel. Also crucial are Dinan's mono ball lower control arm bearings, which replace the stock rubber bushings and eliminate the dynamic suspension changes that allow the car to squirm when pushed hard around corners.

Though this nets the same effect as fitting a set of Delrin bushings, the Dinan mono balls are much more sophisticated and precise, and their Teflon coating allows them to improve ride quality as well as cornering and straight-line tracking. Though we didn't get a chance

Big power meets big handling improvements in the Dinan S3-M5 and M6 thanks to those lovely lightweight wheels and big Brembo brakes. Dinan aluminum pedals brighten the footwell.

to try this for ourselves, Dinan tells us that those who've driven a car with mono ball bearings back-to-back with a car on stock rubber bushings can feel a tremendous improvement in both handling and ride.

We can sense that in both cars, though each of these Dinan S3s retains a slightly different character. Driving the M6 first, we're immediately impressed by its willingness to go around corners. The stock M6 can feel a bit ponderous, but the Dinan car is almost as nimble as an M3 even though it weighs another 268 lbs. in stock form.

What's even more amazing than its willingness to change direction is the amount of grip available from the front. Where it's necessary to go into corners relatively slowly to avoid understeer in a stock M6, the Dinan car is willing to go in harder on the brakes—

wonderfully feelsome Brembos—and to carry more speed up to the apex. That allows our pace on this road to be much faster than it would be in the stock vehicle, and our confidence to be higher, as well.

Interestingly, getting into the Dinan M5 reveals a car that feels even lighter on its feet than the M6, while also having steering that seems a bit meatier. The latter is due to the slightly different underpinnings plus the M5's slightly lower steering rack ratio (the mean of which is 12.4:1 compared to the 13.0:1 mean in the M6) and slightly lower profile front tires (which have an aspect ratio of 30 instead of the 35s used on the M6).

Despite the differences, we're impressed by the handling of both cars whether we're on the ultra-twisty west side of Mt. Hamilton or the much faster east side. And beyond the improvement in agility, both cars surprise us—as do all Dinan vehicles—with the improvement in ride quality that Dinan has effected.

In addition to its 365 turns, the road to the Lick Observatory seems to have at least 365



potholes or other pavement irregularities, yet the Dinan cars manage to float over most of them with ease. We did scrape something when we bottomed out over one weird dip-pity-do, but other than that we were able to carry surprising speed through some really rough sections without fearing for the undercarriage or anything else on the vehicle, and without sending any sharp shocks to driver or passenger.

628 horses speak for themselves

As impressive as Dinan's suspension tuning is, the real story here has to be the motor. That 628 hp figure is big, of course, but the true magic of Dinan's motor work lies in infusing the S85 V10 with wonderfully abundant torque. Producing 480 lb-ft where the stock engine makes just 383 lb-ft, the V10 engine now pulls hard out of corners even when it isn't being revved to the moon.

Peak torque still arrives at a fairly high 6,000 rpm, 100 rpm lower than stock, but 403 lb-ft are now available from just 3,000 rpm, effectively just off idle for an engine that redlines at 8,000 rpm. (For comparison, the stock engine makes 332 lb-ft when it's turning at 3,500 rpm.)

The improvement in torque was most noticeable in the M5, which had just gotten new pistons and was still being broken in during our test. With revs limited to 5,500, we had to short-shift the transmission as we chased the M6 through the hills, but the engine compensated with enough pulling power to make up for the lack of time-in-gear.

Plenty of people have complained about the stock S85's lack of torque, a situation Dinan has corrected the old-fashioned way: through an increase in displacement. In addition to Dinan's usual high-flow throttle bodies, high-flow intakes and software recalibration, plus a 13% underdrive pulley, the engine gets its biggest boost from internal modifications that increase displacement from 5.0 to 5.7 liters. (With respect to those pulleys, Dinan says that they're fine so long as you don't eliminate the harmonic balancer, though the effectiveness of the air conditioning might be adversely affected on really hot days in heavy traffic. Dinan also says that the pulleys free up only about 5 hp, not the 30 hp claimed by some tuners.)

Though Dinan's powerful forced induction engines are well known, the enlarged V10 represents a return to familiar territory for those aware of the inline sixes the firm built before the forced induction era. In building the S85, Dinan also drew on the expertise gained in building S62 V8s for use in Daytona Prototype race cars.

Though the S85 didn't need the weight reduction program given the S62—which



loses 88 lbs. in the transition from E39 M5 motor to DP status—it did benefit from what Dinan learned about making motors fast and reliable, and from the added experience of its machinists.

Since all engine work is done in-house at Dinan HQ in Morgan Hill, those machinists are now charged with increasing the S85's bore and stroke from the original 92.0 x 75.2 to 93.0 x 83mm. As the entire engine block is cast in aluminum-silicon alloy (Alusil), there's no need to replat the cylinders before Dinan fits a billet crank, Carrillo rods and forged Mahle pistons. The cylinder head is left stock, and the shape of the piston crowns maintains the stock 12.0:1 compression ratio.

Regardless of any similarities to Dinan's DP motors, the Dinan-built S85 retains its

total streetability. Power delivery is smooth and glitch-free regardless of how quickly or slowly the throttles are opened, and the car runs equally well in steady-state operation. In other words, it feels like a stock BMW V10, only with a lot more torque and a lot more power—121 more hp, to be precise.

And a much better sound, too: As well as the V10 sings with its stock exhaust, it sounds even better with Dinan's free-flow system. More audible on the M6 than the M5, the Dinan exhaust—a high-flow middle section combined with a pair of high-flow mufflers—is louder without being obnoxious and never seems to hit a wrong note.

It looks cool, too, with four outlets whose larger-than-stock 3.5-inch diameter gives the cars a high-performance look. Manufactured





They're as stealthy as stock from the front, but there's no mistaking these Dinan specials from the rear thanks to those big quad pipes and Dinan badges. Dinan V10 engines make 628 hp.

from 100% 304-grade stainless steel, it weighs 20 lbs. less than the stock exhaust and reduces temperatures to keep the pipes and nearby bodywork from discoloring. The trick is Dinan's "Cool Tip" design, which uses an inner and outer pipe to create a vacuum that draws cool air toward the exhaust tips just after the positive pressure wave leaves the pipe.

The net effect of the increased power and improved sound is to make getting on the gas even more exciting than it is in a stock M5 or M6. As we mentioned earlier, the M5 was rev-limited during break-in, but the M6 could be run as hard as we liked, and we delighted in taking the engine to redline at every opportunity. The M6 lets you hear the engine and the exhaust a bit more than its sedan counterpart, which itself proves inspiring.

A better Bimmer all around

Needless to say, a car with 628 hp and 480 lb-ft is going to be seriously fast, and that's true of both Dinan cars. They're also perfectly tractable and easy to drive, exhibiting no untoward behavior that would indicate any post-factory fettling. If we'd never driven a stock M5 or M6, we'd assume they felt this way straight out of Garching.

Neither of these M-cars do, though, and it's a great testament to Dinan's meticulous preparation that the cars retain their essential BMW character even as every aspect of their performance has been improved. And as true as that is of engine power and handling, it's even more true of braking. The Dinan-by-Brembo conversion swaps the stock 374mm front rotors for 380s and the

stock 370mm rears for 380s, then mates them with six-piston calipers up front and four-piston calipers at the rear in place of the stock single-piston calipers at both ends.

We don't know whether the changes result in an increase in swept area or any other advantage in braking physics, though presumably they do, but we can say for sure that the Dinan-Brembo brakes look far cooler and inspire a lot more confidence than the stock brakes.

With their superior feel at the pedal and apparent ability to convert more energy into heat, big Brembos inspire us to drive any car harder. In the M5 and M6, they assuage any sense we might have that these two-ton vehicles are underbraked from the factory, which they are any time the pace heats up for more than a couple of miles.

We love these brakes, and they'd be the first investment we made if we owned a current M car. (Needless to say, if BMW would offer these brakes as an option, we'd spend that money with BMW...) They're not cheap at \$7,645, but they're worth every penny when it comes to making these cars look and feel like true high-performance vehicles.

The rest of the Dinan S3 parts are comparably priced, with the motor work commanding \$39,995 and the other power-related ancillaries fetching upwards of \$8,000. When the stock car already has 500 horsepower, investing that much money to net another 121 hp would probably be last on our list of priorities, but those who want the extra power won't be disappointed with the result. (Dinan tells us that 15 or 16 customers have already ponied up for a 5.7-liter engine and are happy they did.)

For us, the real priority beyond improving the cars' braking would be improving their handling. Whether we had an M5 or M6, we'd gladly spend the modest \$2,200 asked by Dinan for its Stage 3 suspension. We'd also gladly kick down the \$5,100 for those Dinan wheels and \$1,800 for the tires they ride on. For a total of significantly less than \$10,000, that seems a reasonable investment in making these cars handle ...well, like M-cars should.

And that's really what the Dinan S3-M5 and S3-M6 are all about: making these cars everything they can be without sacrificing their BMW-ness or M-essence. Given that the cars are a bargain in their class at \$83,900 for the M5 and \$100,300 for the M6, another \$17,000 or so seems a small price to pay to bring them closer to perfection. 🚗

