



Dinan BMW 5-SERIES

Performance
without sacrifice

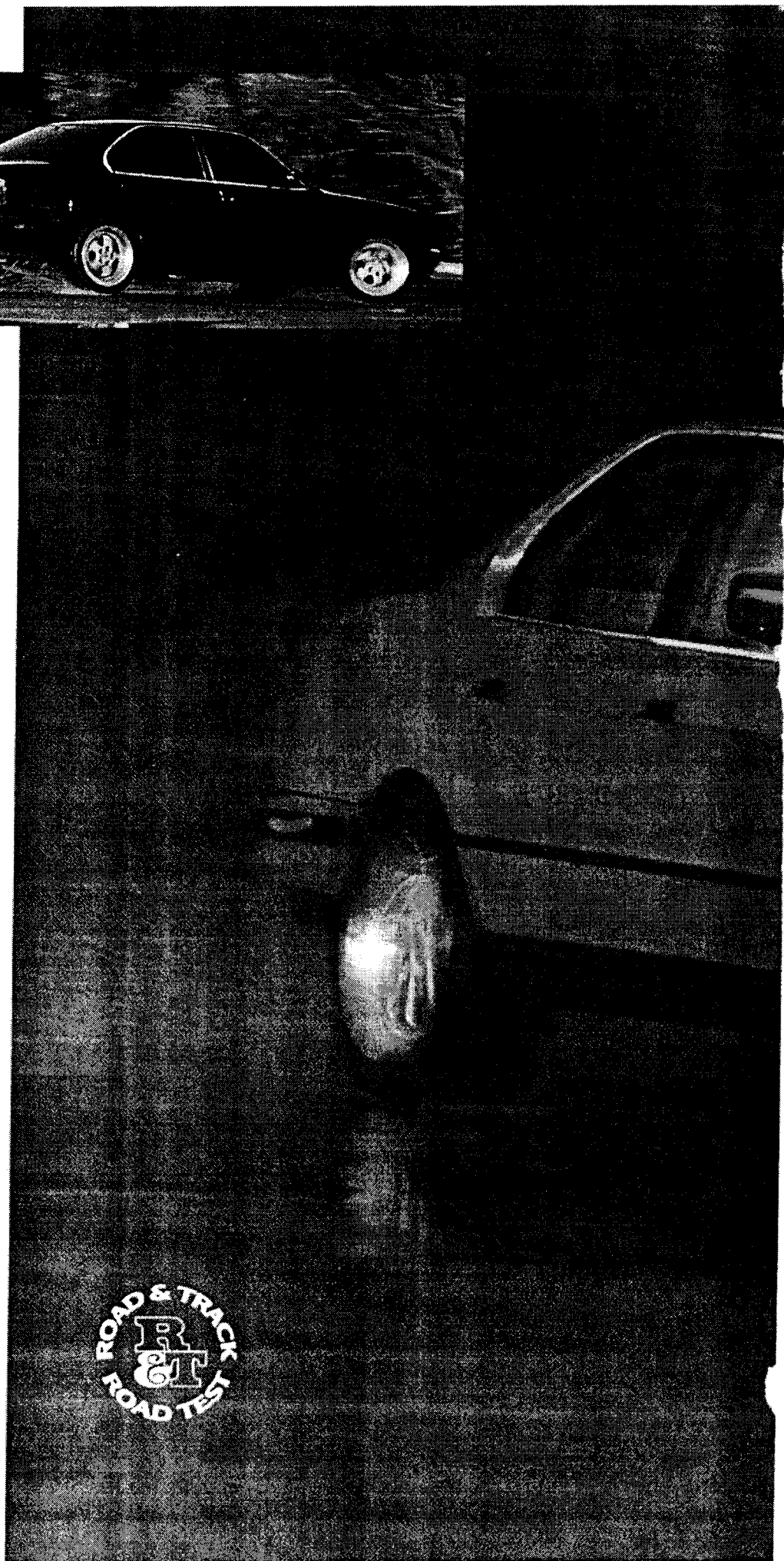
BY JOE RUSZ

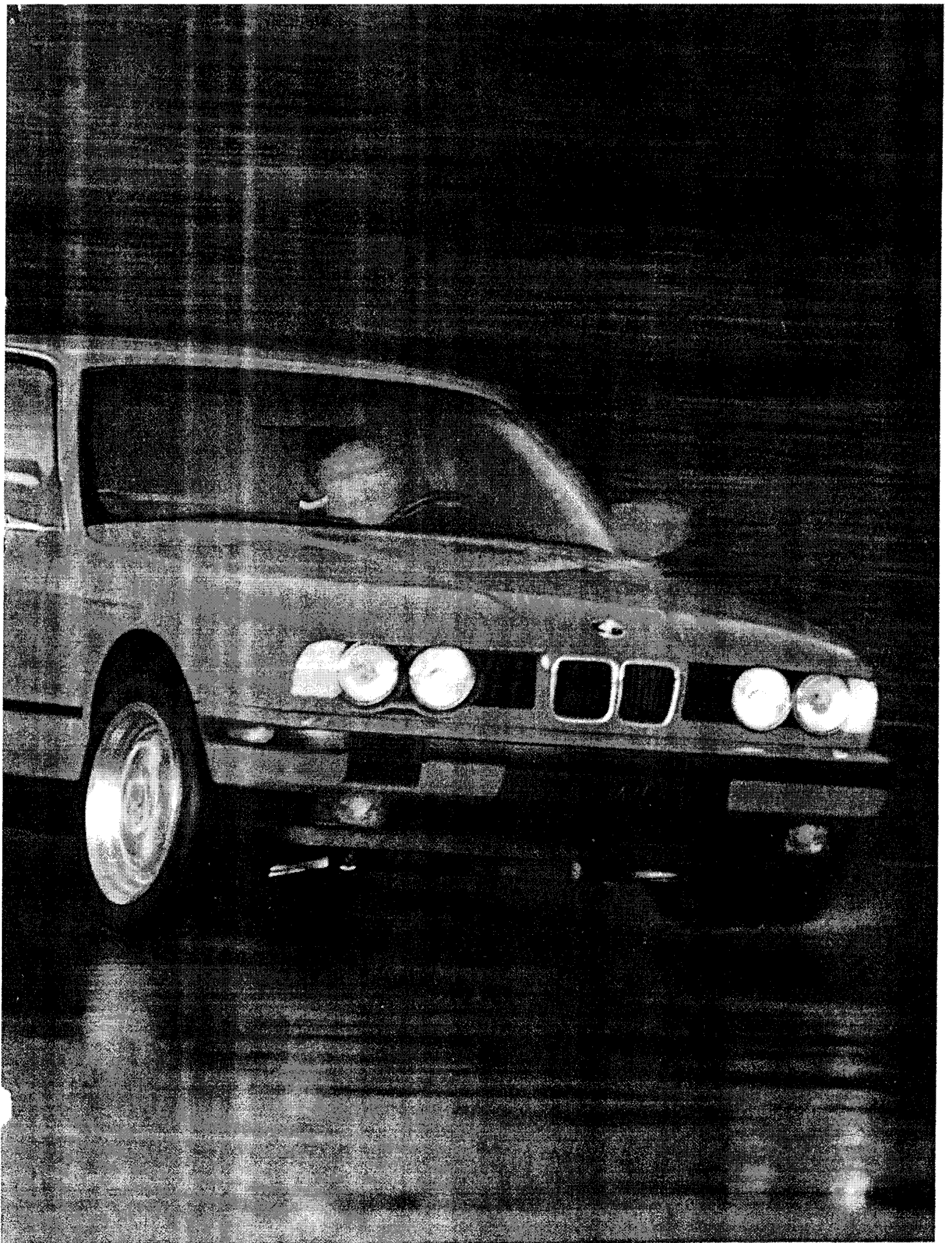
PHOTOS BY DEAN SIRACUSA

IN THE GOOD old days, or at least in the Sixties, the road to high performance was a simple two-lane. You'd bolt on a bigger carburetor, stick in a hotter camshaft and perhaps some high-compression pistons and *voilà*: instant horsepower. Crisp handling—for those who also wanted their car to negotiate turns smartly—was achieved in similarly simple fashion: namely, by adding beefy springs, stiff shocks and fat tires.

Times have changed and nowadays the road to high performance is more like a freeway. Most engines are fuel-injected, electronically controlled and factory-sealed, so unless you have a degree from MIT, about the only component you're likely to recognize under the hood is the dipstick. And, knowledgeable or not, you are strongly discouraged from enhancing output (by swapping microchips, for example) by the authorities.

Fortunately, modifying suspension is not illegal (although, given some of the cars we've driven, perhaps it should be), and most time-honored methods still apply. However, in the sophisticat-





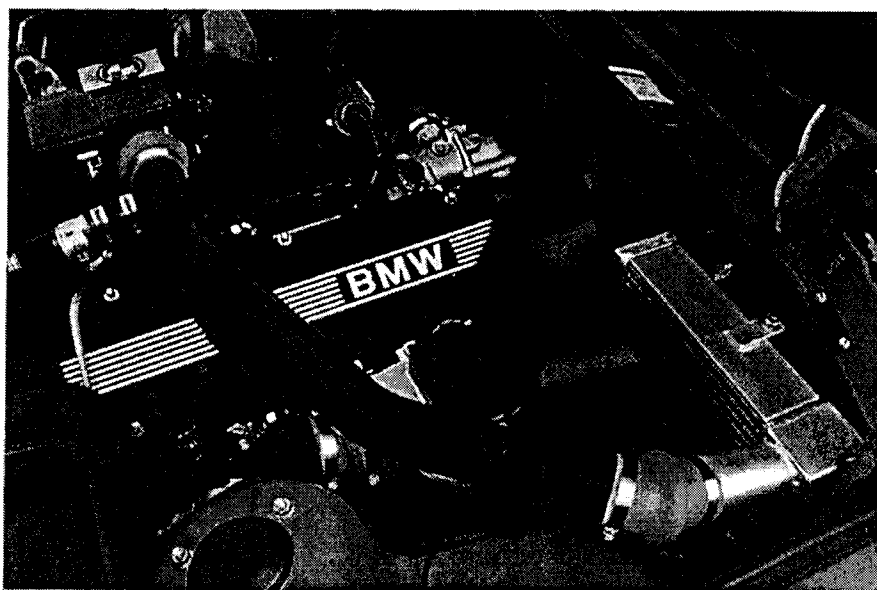


ed Nineties, any high-performance suspension worth its lateral g-forces must deliver a tolerably smooth ride—not unlike that of a Dinan BMW, which also has a legally modified engine and is exactly what the modern-day specialty sedan should be.

To understand how the Dinan came to be, you should know something about the man behind the machine, Steve Dinan. As a teenage musclecar enthusiast with an electrical engineer for a father, the St. Louis native grew up with a thorough understanding of both hot-rodding techniques and electronics. Although his dad and the United States Air Force believed he had an aptitude for the latter, Steve preferred automobiles, and after his tour of duty as a radar technician was over, he got a job as a foreign-car mechanic.

Gravitating toward BMWs because he "liked the way they were put together," Dinan opened his own BMW tuning facility, Bavarian Performance, in 1979. Among other things, he resuscitated baby Bimmers by installing a turbocharging system he had developed for the 320i back in 1977. Unfortunately, aftermarket turbo installations fell out of favor among enthusiasts, and, in 1985, Dinan decided to manufacture and sell BMW suspension kits—while preparing a variety of racing cars for numerous Northern California drivers.

When BMW began building sedans with large-displacement, 4-valve engines, Dinan turned his attention back to tuning and developed kits for both the sohc and twincam sixes. For a variety of reasons (basic engine design, cost, reliability), Steve used different means to enhance the BMW's 2- and 4-valve powerplants: turbocharging for the 535i; increased displacement and a higher compression ratio for the normally aspirated M5. He also went



about modifying each car's suspension differently, as we shall see.

But wait a minute! If BMW is "The ultimate driving machine," why would anyone need a Dinan? To be different. But more important, to go faster and more sure-footedly than the rest of the crowd. Compare the numbers of the Dinan M5 and 535i Turbo with those of the stock Bimmer 4-doors, and you'll find that the modified M5 and Turbo are about 1 and 2 seconds quicker, respectively. In fact, with nearly identical 0-to-60-mph times of 5.6 and 5.7 sec., the Dinans are in league with fast company that includes the Acura NSX, Corvette LT1 and ZR-1, and Porsche 968.

And yet, despite their similar acceleration times, the Dinan 535i Turbo and M5 are two different animals. The 535i is very much a family sedan, with subdued engine and moderately firm ride. The M5, although still a family 4-door, is the sporty Bimmer with a lively engine and taut suspension that gives away a tiny bit of ride quality for a whole lot of handling.

The Dinan 535i Turbo, which begins life as the more sedate Bimmer, gets the lion's share of attention. Dinan technicians take apart the engine, replace the stock 9:1 pistons with 8:1

■ BMW engine bays have always been orderly, but Dinan's craftsmanship makes them shine—note 535i Turbo's neatly fabricated and polished intercooler and lots of expertly applied wrinkle-finish paint.

slugs and reassemble the powerplant to stock specs. Then they install high-flow injectors, a recalibrated airflow meter, special exhaust headers, heavy-duty clutch and reengineered Bosch Motronic while adding an air-to-air intercooler with an air intake in the front bumper.

Turning their attention to the chassis and body, Dinan technicians fit the 535i with larger-diameter front brakes, 17 x 9-in. wheels shod with Yokohama AVS tires and install the Stage 4 suspension package comprising stiffer springs, shocks and (adjustable) front and rear anti-roll bars. Camber plates up front dial in negative camber, while a special Dinan crossmember at the rear gives the back wheels some positive camber—to offset the negative rear camber that occurs as a result of lowering the car. All of these components, plus a \$700 gauge option, tack about \$29,000 onto the price of a 535i, which costs \$44,350 new.

Dinan's Turbo costs about \$3500 less than its M5 because a stock 535i, having less content than the stock M5, is less expensive. Truth is, most of the money spent on the Turbo is in the engine, which costs \$19,500 versus \$9995 for the aspro powerplant. But 20 grand buys you 405 bhp, plus an axle-wrenching 438 lb.-ft. of torque, that gets the Turbo off the mark and on its way in rapid fashion—to 60 mph in 5.7 sec., to the quarter mile in 13.9.

Dinan's normally aspirated M5 is

the enthusiast's Bimmer. Its bored and stroked 3600-cc (214/240-cu-in) engine is blueprinted and balanced, and sports a billet crankshaft, higher-compression forged pistons and a reprogrammed Bosch Motronic. It loves to be toyed with, and like most 4-valves, it thrives on high revs. Although it develops "only" 382 bhp and 345 lb.-ft. of torque, it's actually quicker than the Turbo from 0 to 60 mph, this despite the M5's 290-lb. greater weight.

Except for the 535i's Dinan camber-adjusting rear subframe, which it doesn't have or need, the Dinan M5 uses the same suspension components as the Turbo. And because its stock brakes are more than adequate, the M5 does without the Turbo's 13-inchers although it does use the same wheels and tires.

Special exhaust plumbing and reduced-restriction mufflers (with stock converters) are fitted to the Turbo. (Dinan says this is a more effective method of boosting horsepower than larger catalytic converters.) Common to 535i and M5 is the modified speed-control circuitry that allows the Dinans to reach their true top speed (160 mph for both), rather than the artificial 155-mph limit agreed upon by German sedan builders.

Although both Dinans expand the 5-Series' performance envelope, each car has its own personality. The Turbo feels as if it accelerates quicker because there's more torque. And that imitable boot in the butt that occurs when the compressor spools up only reinforces this perception. In fact, with 405 bhp, there's no need for a lot of shift work. Simply step on the gas and motor away in silent, effortless style.

Like the powerplant, the Turbo's handling and ride are also more subdued. The Dinan 535i suspension feels more compliant, and the car rolls more and tends to understeer, especially on the skidpad where even throttle lift-off fails to induce oversteer. Nevertheless, the Turbo gets around the skidpad quicker than the stiffer M5, aided in part by its camber-compensating rear subframe that keeps the back wheels planted flatly against the surface. Unfortunately, compliance and positive camber inducement have their downsides, and in the abrupt, side-to-side motion of the slalom, the Turbo exhibits a rubbery feel that unsettles both the car's and the driver's composure. That said, I should point out that at 61.5 mph, the Dinan Turbo is 3.5 mph quicker through the pylons than a stock 535i.

Compared with the Turbo, the M5

feels more lively. The twin-cam engine makes better mechanical sounds and has that deep-breathed induction roar that's missing in the Turbo. And, although it's flexible and torquey enough to pull strongly at low revs, the Dinan 4-valve really comes alive above 4500 rpm as it quickly (and willingly) spins to its 7300-rpm redline.

The stock M5 gearbox works nicely with the increased-displacement Dinan engine whose performance char-

acteristics (as tracked by its power and torque curves) parallel those of the factory M5 powerplant. However, shift, clutch and steering effort seem greater, and even if the M5 wasn't almost 300 lb. heavier than the 535i, you'd think so because of the feel of these controls.

And yet the Dinan M5 is light on its feet, despite its meaty 255/40-series tires that measure a healthy 10 in. across. Unlike the Turbo, M5's handling is nearly neutral with mild un-

Dinan BMW 535i Turbo

PRICE

Base price	\$44,350
Price as tested	\$73,490
Price as tested includes BMW std. equip. (air cond., AM/FM stereo/cassette, ABS, cruise control, central locking, elect. window lifts, door locks, mirrors), plus Dinan high-performance engine with turbocharger system (\$19,500), Stage 4 suspension (\$2800), 3-piece alloy wheels and hubs (\$3100), Yokohama AYS tires (\$1000), brakes (\$2040), gauges (\$700).	

ENGINE

Type	turbo solid inline-6
Displacement	209 cu in./3430 cc
Bore x stroke	3.62 x 3.39 in./92.0 x 86.0 mm
Compression ratio	8.0:1
Horsepower (SAE)	405 bhp @ 5500 rpm
Torque	438 lb-ft @ 4500 rpm
Maximum engine speed	6400 rpm
Fuel injection	elect. sequential port
Fuel	prem unleaded, 92 pump octane

CHASSIS & BODY

Layout	front engine/rear drive
Body/frame	unit steel
Brakes	
Front	13.0-in. vented discs
Rear	11.8-in. discs
Assist. type	vacuum ABS
Wheels	cast alloy, 17 x 9J
Tires	Yokohama AYS, 255/40ZR-17
Steering	recirc. ball, variable power assist
Overall ratio	16.2
Turns lock to lock	3.5
Turning circle	37.7 ft.
Suspension	
Front	MacPherson struts, lower lateral links, compliance struts, coil springs, tube shocks, anti-roll bar
Rear	semi-trailing arms, coil springs, tube shocks, anti-roll bar

GENERAL DATA

Curb weight	3660 lb.
Test weight	3815 lb.
Weight dist. (with driver), l/r, %	50/50
Wheelbase	108.7 in.
Track, l/r	58.2 in./59.0 in.
Length	185.8 in.
Width	68.9 in.
Height	54.7 in.

ACCELERATION

	Seconds
Time to speed	
0-30 mph	2.2
0-40 mph	2.3
0-50 mph	4.2
0-60 mph	5.7
0-70 mph	7.1
0-80 mph	8.6
0-90 mph	10.4
0-100 mph	12.9
Time to distance	
0-100 ft.	3.1
0-500 ft.	7.7
0-1320 ft. (1/4 mi.)	13.3 @ 104.0 mph

FUEL ECONOMY

Normal driving	15.0 mpg
Fuel capacity	21.1 gal.

BRAKING

Minimum stopping distance	
From 60 mph	119 ft.
From 80 mph	221 ft.
Control	excellent
Brake feel	excellent
Overall brake rating	excellent

HANDLING

Lateral accel. (200-ft skidpad)	0.89g
Balance	mild understeer
Speed thru 700-ft slalom	61.5 mph
Balance	mild understeer

DRIVETRAIN

Transmission			5sp manual
Gear	Ratio	Overall ratio	5pm) Mph
1st	3.83:1	13.21:1	(6400) 34
2nd	2.20:1	7.59:1	(6400) 59
3rd	1.40:1	4.83:1	(6400) 93
4th	1.00:1	3.45:1	(6400) 130
5th	0.81:1	2.79:1	est (6400) 160
Final drive ratio			3.45:1
Engine rpm @ 60 mph in 5th			2400

Subjective ratings consist of excellent, very good, good, average, poor.

dersteer that can be controlled through throttle application. In fact, because of the chassis' balance and the engine's responsiveness, it's possible to position the car by this means, as our road tester did in the slalom where the M5 schussed its way through the cones at an impressive 63.1 mph, nearly 2 mph faster than the stock M5 we tested in the August 1990 issue. The skidpad told a subtly different story, with the Dinan M5's lateral acceleration of



■ M5 has the more aggressive suspension tuning; Turbo's detonation-warning LEDs are neatly done.

Dinan BMW M5

PRICE

Base price	\$60,700
Price as tested	\$77,045
Price as tested includes BMW std equip. (air cond, AM/FM stereo/cassette, ABS, cruise control, central locking, elect. window lifts, door-locks, mirrors), plus Dinan high-performance 3.8-liter engine (\$9995), Stage 3 suspension (\$2250), 3-piece alloy wheels and hubs (\$3100), Yokohama AVS tires (\$1000).	

ENGINE

Type	4-valve/cyl. dohc inline-6
Displacement	232 cu in./3800 cc
Bore x stroke	3.69 x 3.62 in./93.8 x 92.0 mm
Compression ratio	10.2:1
Horsepower (SAE)	382 bhp @ 6500 rpm
Torque	343 lb-ft @ 5500 rpm
Maximum engine speed	7300 rpm
Fuel injection	Bosch Motronic elect. sequential port
Fuel	prem unleaded, 92 pump octane

CHASSIS & BODY

Layout	front engine/rear drive
Body/frame	unit steel
Brakes	
Front	12.4-in. vented discs
Rear	11.8-in. discs
Assist type	vacuum, ABS
Wheels	cast alloy, 17 x 9J
Tires	Yokohama AVS, 255/40ZR-17
Steering	recirc ball, variable power assist
Overall ratio	15.6
Turns, lock to lock	3.5
Turning circle	38.6 ft
Suspension	
Front	MacPherson struts, lower lateral links, compliance struts, coil springs, tube shocks, anti-roll bar
Rear	semi-trailing arms, coil springs, tube shocks, anti-roll bar

GENERAL DATA

Curb weight	3950 lb
Test weight	4100 lb
Weight dist. (with driver), l/r, %	50/50
Wheelbase	108.7 in.
Track, l/r	58.2 in./59.0 in.
Length	185.8 in.
Width	68.9 in.
Height	54.7 in.

ACCELERATION

Time to speed	Seconds
0-30 mph	2.2
0-40 mph	3.4
0-50 mph	4.5
0-60 mph	5.6
0-70 mph	7.5
0-80 mph	9.3
0-90 mph	11.0
0-100 mph	13.7
Time to distance	
0-100 ft	3.1
0-500 ft	7.9
0-1320 ft (1/4 mi)	14.1 @ 102.5 mph

FUEL ECONOMY

Normal driving	14.0 mpg
Fuel capacity	21.1 gal.

BRAKING

Minimum stopping distance	
From 60 mph	122 ft
From 80 mph	216 ft
Control	excellent
Brake feel	excellent
Overall brake rating	excellent

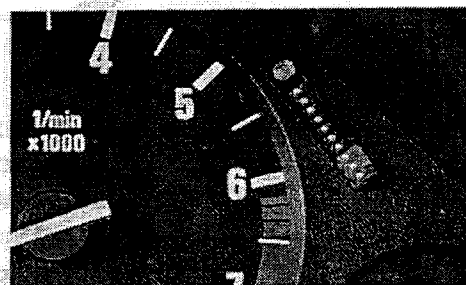
HANDLING

Lateral accel. (200-ft skidpad)	0.87g
Balance	mild understeer
Speed thru 700-ft slalom	63.1 mph
Balance	mild understeer

DRIVETRAIN

Transmission			5-sp manual
Gear	Ratio	Overall ratio	(Rpm) Mph
1st	3.51:1	13.72:1	(7300) 37
2nd	2.08:1	8.13:1	(7300) 63
3rd	1.35:1	5.28:1	(7300) 96
4th	1.00:1	3.91:1	(7300) 130
5th	0.81:1	3.17:1	est (7300) 160
Final drive ratio			3.91:1
Engine rpm @ 60 mph in 5th			2740

Subjective ratings consist of excellent, very good, good, average, poor.



0.87g being slightly less than the Turbo's 0.89g, we suspect because the Turbo's powerband allowed its rear tires to be worked slightly harder.

Of course, if you're the sort of person who gets off strictly on numbers, you're missing the point made by cars such as the Dinan BMWs, which offer a blend of performance, ride and comfort. "If we cross the line where the car is peaky or nasty, we back it off a notch," says Steve Dinan, whose philosophy is that his cars should be spirited, run 125,000 miles and retain the civility of a BMW. To ensure that they do, Dinan follows factory maintenance intervals and validates his work with his own 3-year/36,000-mile warranty. But the most heartening news is that turbocharged and normally aspirated Dinan powerplants are approved for highway use in all 50 states.

Although Dinan Engineering can build you a complete car and has begun supplying selected BMW dealerships with 5-Series sedans equipped with modified suspensions and other bolt-ons, the company's mainstay is sales of components. These can be fitted to existing BMWs by dealers or by the Dinan service department whose 12 employees also work on Acura, Infiniti, Lexus and Mercedes-Benz automobiles. And Dinan's BMW line is not restricted to the 5-Series. In fact, the company has a line of high-performance products for all late-model Bimmers, including an emissions-legal, twin-turbo V-12 for the 750i and 850i.

For BMW owners with a penchant for performance, that's good news. ☺