



# ALFA ROMEO GTV/6 2.5

# & CALLAWAY TWIN TURBO



*A most  
unreluctant dragon*



PHOTOS BY JOHN LANDER



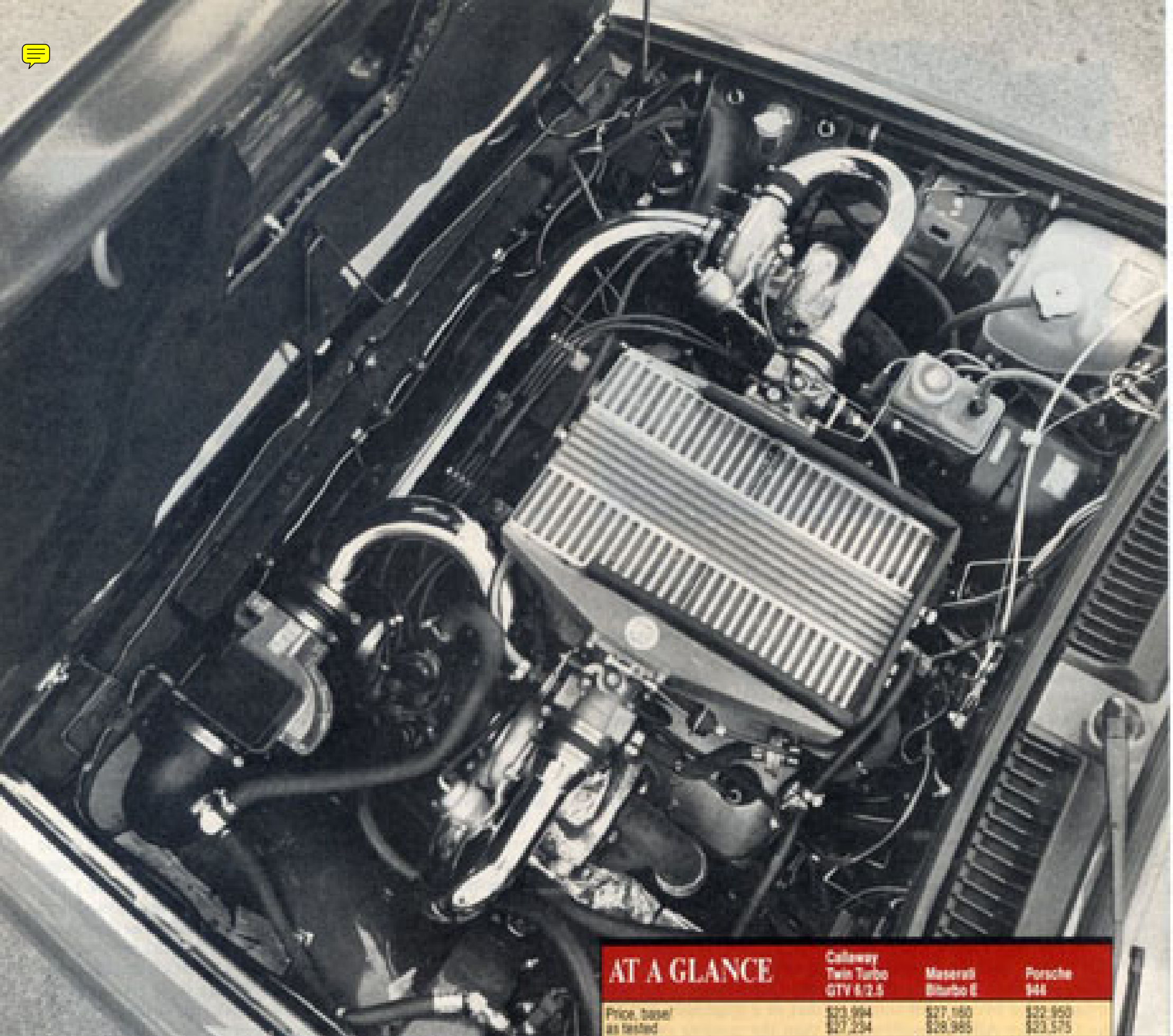
THE ALFA ROMEO GTV carries a lot of tradition within its familiar wedge-shape form. The current Giugiaro-designed 2+2 coupe, with its rear-mounted transaxle and De Dion suspension, has been around long enough that some of our younger readers may not remember it as the 4-cylinder, 2.0-liter Alfetta GT that made its debut in May 1974. In June 1975, when it was new to America, we chose the Alfetta coupe as the Best Sports-GT in the \$8000-\$12,000 category in our list of 10 Best Enthusiast Cars, and in June 1978, as the Sprint Veloce, it took the same honors. Three years later, with the insertion of the strong and willing 2.5-liter V-6 engine, the GTV convincingly outpointed the Datsun 280ZX and Porsche 924 Turbo in our Gran Turismo comparison test (July 1981). The GTV label itself (V for Veloce, of course) dates back to the old Bertone 1.6-liter Giulia (also Giugiaro-styled) of the Sixties, and *that* car was a development of the famous Giulietta Sprint of the Fifties.

The last four years have not been particularly kind to the GTV/6 2.5, or rather the competition hasn't. We've seen a new Nissan 300ZX, a Porsche 944, a Toyota Supra and the GSL-SE version of the Mazda RX-7, all cars of more recent conception

and greater refinement. In our most recent test of the GTV/6 2.5 (*Road & Track's Guide to Sports & GT Cars 1984*), we criticized its vague shifting, heavy steering and dated interior.

For 1985 Alfa Romeo has addressed some of these shortcomings, particularly the gear linkage, and has made the GTV/6 more competitive by removing some items of luxury equipment and trimming the base price to \$16,500 (down from \$19,000). The new shift linkage is a clear improvement, allowing confident and quick—though still slightly stiff—changes up or down. There's still a bit of synchro "wait-for-it" in 2nd, but the vagueness of the old linkage is gone and will only be missed by a few traditionalists who took pride in mastering it. The change has made a positive difference in the Alfa's usability and appeal.

Making leather an option because of the lower base price, Alfa has come up with nice fabric-covered seats that pleased most of the staff but still made problems for certain drivers despite the adjustable steering wheel. The main difficulty is with the legs; the seat cushions don't give enough thigh support and the driver's left knee may become sore from the leg being angled excessively toward the clutch pedal. The rest of the interior is still Dark Ages: an unattractive hodgepodge of controls in an



Callaway Twin Turbo adds complexity to engine compartment.

excessively angular black panel, wispy ventilation and several examples of poor quality control.

The V-6 engine has always been the car's main appeal; it still makes those great Italian ripping-rav-fabric sounds, has lots of torque and sends the car down the road smartly. In the standard 1985 GTV/6 we got substantially better acceleration times than in 1984, 0-60 mph in 8.5 seconds, for example, and 24.3 sec to 100. These are more than a half-second quicker to 60 and nearly 3 sec quicker to 100, and the improvement is welcome: a much better performance-per-dollar package.

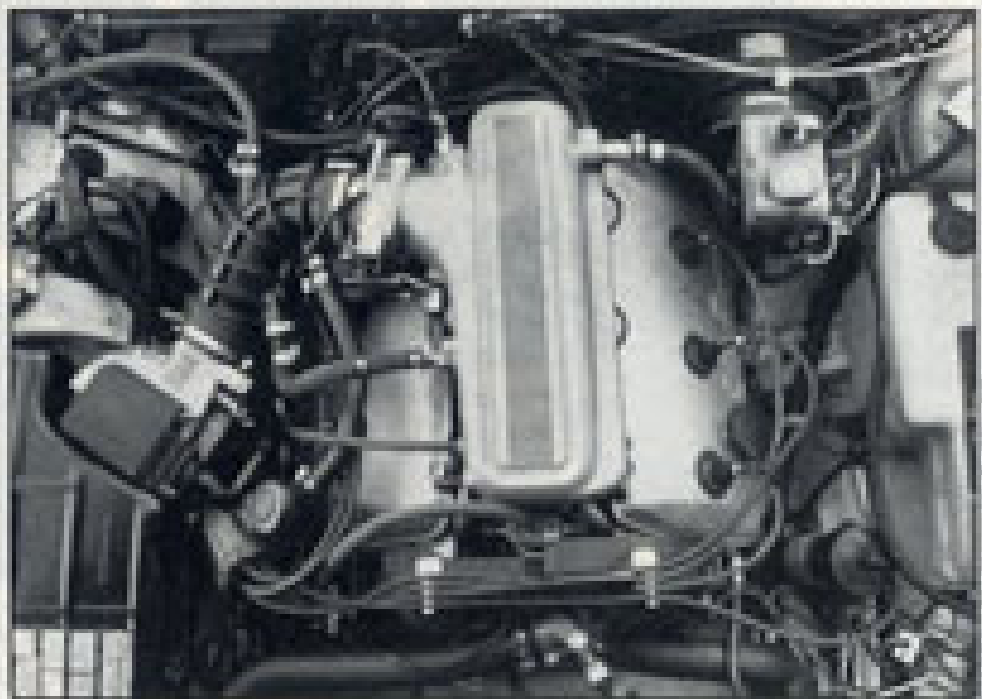
But forget all that. Here comes the Callaway Twin Turbo, a conversion that transforms the Alfa into a supercar worthy of the Nuvolari and Fangio tradition. How about *three* sec quicker to 60 mph and *twelve* sec quicker to 100? How about mean, ripping-rav-concrete power? Power that comes in at 3000 rpm, demands all of your attention at 4000, and swings the needle to redline so quickly that you'd better be watching the tach or have a really good ear. It's a blast—in a way that the much used word seldom really means. Full acceleration pushes you back into the seat and even makes the belt ratchet you tighter. Nothing incredible happens at less than 3000 rpm but if you slip the clutch to

## AT A GLANCE

	Callaway Twin Turbo GTV 6/2.5	Maserati Bifurbo E	Porsche 944
Price, base/ as tested	\$23,994 \$27,254	\$27,160 \$28,985	\$22,950 \$23,575
Curb weight, lb	2890	2775	2805
Engine/drive	V-6/red	V-6/red	inline-4/red
Transmission	5-sp M	5-sp M	5-sp M
0-60 mph, sec	6.2	6.3	9.0
Standing ¼ mi, sec @ mph	14.5 @ 97.5	15.0 @ 91.0	16.4 @ 82.5
Stopping distance from 60 mph, ft	157	150	141
Lateral acceleration, g	0.81	0.81	0.82
Slalom speed, mph	60.1	55.8	61.4
Fuel economy, mpg	18.5	18.0	21.5
	<b>Pro</b>	<b>Con</b>	
Twin Turbo GTV 6/2.5:	a very powerful turbo engine that's also tractable, good high-speed handling, improved shifter	less suitable for city driving, heavy controls, poor ventilation system, outdated dash	
Bifurbo E: tested 7-85	excellent power with west-coast available intercoolers, opulent interior, exclusivity	turbo lag, poor high-speed braking stability, uneven workmanship and materials, small trunk	
944: tested 8-83	exceptionally balanced handling and road feel, usable engine performance, high quality, good mileage	rear seats only for children, ride sometimes jiggly, steering wheel too low for some	



The stock GTV16 2.5 for 1985 is more than 0.5 sec quicker 0-60 than the 1984 model we tested. The alloy wheel design is new for 1985.



build up revs, you run the risk of burning it out. First gear is suddenly very short, and you won't stay in any gear very long.

Callaway Engineering of Old Lyme, Connecticut has installed two IHI RHB5 turbos that push the charge through twin air-to-air intercoolers mounted on top of the engine. They are fed by a Callaway-designed air scoop, a well integrated fiberglass piece that distinguishes the conversion (along with the rear spoiler, "Callaway Twin Turbo" window lettering, BBS 16 x 7 wheels and Goodyear Eagle 205/55VR-16 tires). Callaway has also incorporated a solid-state fuel injection control it calls the Microfueler, which senses engine speed and manifold pressure to monitor the Bosch L-Jetronic injectors. All the stock Alfa emission controls remain. But the result is 230 bhp at 5500 rpm, a 50-percent increase over the stock engine, and 245 lb-ft torque at 2500. Overall the engine is very flexible and you can drive it virtually in 5th gear most of the time; cruising at 55 mph in top you're using 2500 rpm, just a bit less than the point where the fun starts. Even then you won't have to shift down to surprise those who don't know which Alfa this is.

We heard a little detonation at sustained full throttle, and when you back off there is noticeable turbo surge. On some turbos we've likened this sound to that of a respirator, but on the Callaway Alfa it's nothing less than the panting of a fire-breathing dragon.

Despite the Alfa's entertainingly responsive handling, several of our staff expressed more than a little respect for the available power, something they wouldn't want to learn about suddenly on an 80-mph curve. The chassis gives the driver the security of direct response. It can produce a diagonal pitching during fast cornering, but the steering is wonderfully precise and an educated use of the wheel and the throttle is what's called for. Nevertheless, we couldn't match the slalom speed of our previous GTV16 test, the extra power being an excess in this case.

The ride is firm but acceptable; the Callaway's Goodyears give a good combination of ride and handling, although a true Big City pothole can give the whole structure a big bang.

To sum up the GTV16, the stock version is a moderately improved product at a much more attractive price, appealing to the driving enthusiast but overdue for replacement by something more refined. (Sorry, all you *ngisi* out there, but it's true.) The Callaway Twin Turbo version will keep even the most skilled driving-with-a-capital-D enthusiast entertained for as long as his license lasts. It's the first Alfa in a long time (perhaps since the 8C 2900B, that supercharged master road car of the late Thirties) with the power to take on almost any rival. As equipped, the Callaway test car cost \$27,234. That's half again as much as the standard GTV16 but you do get half again the power, as well as full membership in the Supercar club.

Callaway Twin Turbo has the optional leather interior and boost gauge added below speedometer.





### PRICE

	Callaway Twin Turbo	GTV 6/2.5
List price, all POE	\$23,994	\$16,500
Price as tested	\$27,234	\$17,395
Price as tested includes for the Callaway Twin Turbo, wheel and tire pkg (\$2095), leather interior (\$750), rear spoiler (\$395); for the Alfa GTV 6/2.5, sunroof (\$500), AM/FM stereo/cassette (\$395)		

### GENERAL

Curb weight, lb	2890	2840
Test weight	3030	2955
Weight dist (with driver), fr, %	51/49	50/50
Wheelbase, in	94.5	
Track, front/rear	54.0/53.2	
Length	167.7	
Width	65.5	
Height	52.4	
Trunk space, cu ft	9.7	
Fuel capacity, U.S. gal	17.6	

### ENGINE

Type	turbocharged sohc V-6	sohc V-6
Bore x stroke, mm	88.0 x 68.3	
Displacement, cc	2492	
Compression ratio	7.5:1	9.0:1
Bhp @ rpm, SAE net	230 @ 5500	154 @ 5500
Torque @ rpm, lb-ft	245 @ 2500	155 @ 3200
Fuel injection	Bosch L-Jetronic	
Fuel requirement	unleaded, 91.89 pump octane	

### DRIVETRAIN

Transmission	5-sp manual	
Gear ratios: 5th (0.78)	3.20:1	
4th (0.95)	3.00:1	
3rd (1.26)	5.17:1	
2nd (1.96)	8.04:1	
1st (3.56)	14.35:1	
Final drive ratio	4.10:1	

### CHASSIS & BODY

Layout	front engine/rear drive	
Body/frame	unit steel	
Brake system	10.4-in. (264-mm) discs	
	front 9.8-in. (249-mm) discs rear, vacuum assisted	
Wheels	cast alloy, 15 x 7	15 x 6J
Tires	Goodyear Eagle	Pirelli P6
	205/55VR-16	195/60HR-15
Steering type	rack & pinion	
Turns, lock-to-lock	3.5	
Suspension, front/rear	lower A-arms, upper lateral links with drag struts, torsion bars, tube shocks, anti-rol bar/De Dion axle on angled trailing links & Watt linkage, coil springs, tube shocks, anti-rol bar	

### CALCULATED DATA

Lb/bhp (test weight)	13.2	12.1
Bhp/liter	92.3	61.8
Mph/1000 rpm (5th gear)	21.8	
Engine revs/mi (60 mph)	2750	
R&T steering index	1.08	

## ROAD TEST RESULTS

### ACCELERATION

	Callaway Twin Turbo	GTV 6/ 2.5
Time to distance, sec:		
0-100 ft	3.0	3.4
0-500 ft	8.1	8.5
0-1320 ft (1/4 mi)	14.5	16.4
Speed at end of 1/4 mi, mph	97.5	85.0
Time to speed, sec:		
0-30 mph	2.1	2.8
0-50 mph	4.7	6.1
0-60 mph	6.2	8.5
0-70 mph	7.8	11.1
0-80 mph	9.7	14.0
0-100 mph	15.4	24.3

### SPEEDS IN GEARS

5th gear (6300/5960 rpm) est	137	130
4th (6300)	115	
3rd (6300)	85	
2nd (6300)	55	
1st (6300)	30	

### FUEL ECONOMY

Normal driving, mpg	18.5	25.0
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### BRAKES

Minimum stopping distances, ft:		
From 60 mph	157	153
From 80 mph	268	275
Control in panic stop	very good	
Pedal effort for 0.5g stop, lb	18	
Fade: percent increase in pedal effort to maintain 0.5g deceleration in 6 stops from 60 mph	22	
Overall brake rating	very good	

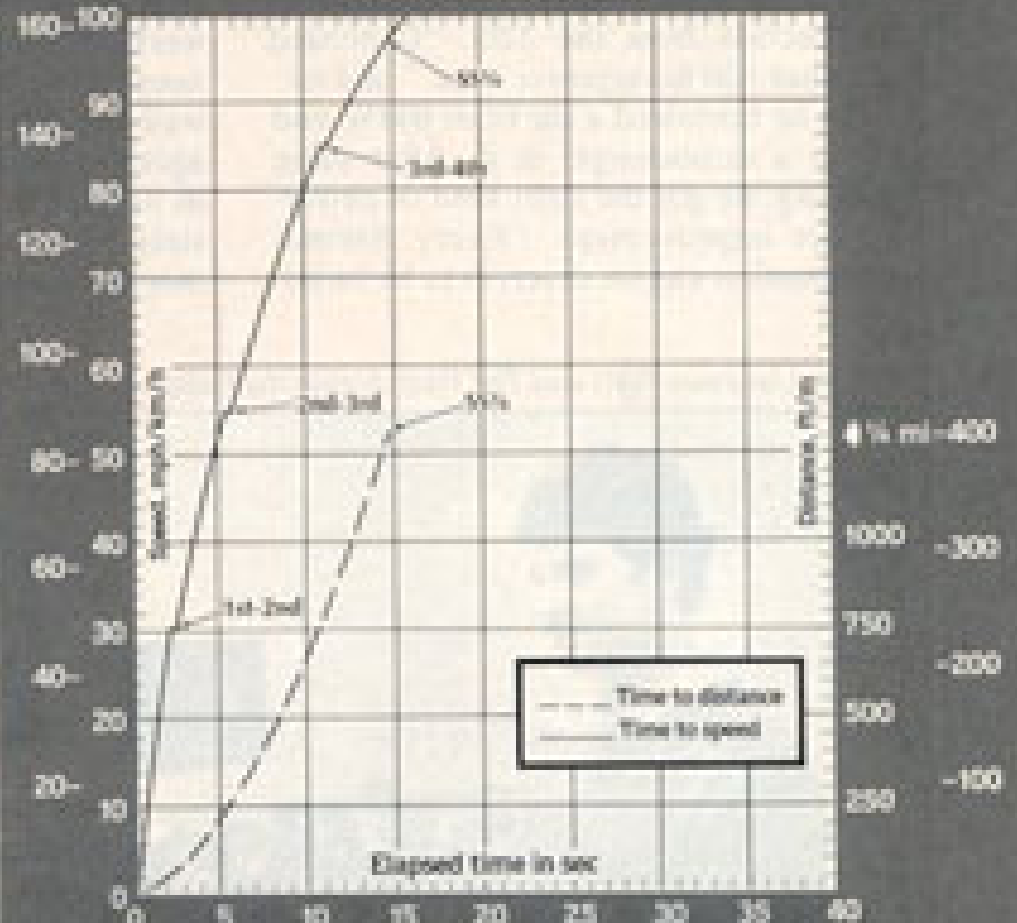
### HANDLING

Lateral accel, 100-ft radius, g	0.81	0.75
Speed thru 700-ft slalom, mph	60.1	58.3

### INTERIOR NOISE

Constant 30 mph, dBA	66	64
50 mph	69	68
70 mph	73	72

## ACCELERATION



## Ye Auld Newe Englande Hellhouse Manufactorie

**D**EEP IN THE land of lime-green trousers and politely dilapidated Topsiders, lost amidst the cherry-checked decentness that ever shall be New England, lies a manufactorie of indecently fast and decidedly impolite road machinery. Say what you like, the ever more-legendary concern called Callaway Engineering belongs in the quaint wee whaling and coupon-clipping enclave of Old Lyme, Connecticut like Jamie Lee Curtis' poster belongs in Westminster Abbey.

Yet there Callaway Engineering stands, housed in a handsome, gleaming new double-dip chrome building just off I-95, looking for all the world as if it intends to stay awhile. And the story of how this chromium casino got there seems distressingly simple, not to mention distressingly by-your-own-bootstraps Yankee.

It all began eight years ago with a dead-broke Formula Vee racer, a brand-new white BMW 320i and insufficient throttle response. In late 1976 Reeves Callaway, having come to the end of his wallet after several seasons of SCCA racing, took part in the promotional program for the new 320i to raise needed cash. By winter, however, BMW's ride-and-drive program had been completed, and Callaway was thoroughly annoyed that his right foot got no satisfaction from the 320i. "It needed another 100 horsepower or so," said he.

So he borrowed a car from BMW and threw a turbocharger at it. After some fiddling, he got the right kind of performance improvement. "Every internal combustion engine deserves to be turbo-

charged," he says flatly. "It's a thermodynamic fact of life." And this was followed by the right kind of publicity. Result, his turbocharging and general autobellionizing business has been expanding ever since.

In the early days the company was very much "Reeves Callaway and hirelings," 15 or so of them coming to his house every day to build turbo packages. But by 1982 every shelf and cupboard was jammed with hardware, necessitating the move to the chrome casino. The company concerned itself entirely with designing turbo "Bump-Up" kits for German cars "with sufficient engineering head room to allow substantial increases in power," and despite everything, Callaway found himself making a buck.

We say "despite everything" because by the early Eighties original equipment turbos were increasingly common and the aftermarket turbo business had dwindled—but not for Callaway. From both an image and warranty standpoint, it isn't prudent for OE manufacturers to offer radical turbo packages. "For Porsche to build a 400-bhp 928 might be considered irresponsible," Callaway says, "but for special drivers, it's just great." Yet from the beginning Callaway Engineering had a reputation as the premier purveyor of Prurient Performance, and this well defined niche has remained intact and profitable to this day. "There'll always be a high-end turbo market," Callaway explains, adding with a knowing twinkle, "boost is addictive."

Now, indeed, the company has expanded so greatly and become so professional that Callaway is at great pains to explain that it's no longer a one-guy deal. Rather, it's a well diversified design, engineering and production facility working on all manner of projects for all manner of contractees. Its reputation for well engineered high-quality turbo packages has attracted other clients, notably in aerospace; and with the purchase of state-of-the-art computerized Kitamura machine tools, the shop can now sculpt

billet stock to practically any configuration imaginable.

Perhaps predictably, as if to demonstrate this capability, Callaway's old love of racing reasserted itself three years ago in plans for an all-new 4-cam V-8 designed by Hans Herrmann for Indy. Despite dizzying expense, the Callaway V-8 will be in a chassis early this fall, and its power appears more than competitive. It also offers dimensional advantages, notably a narrower crankcase allowing 50 percent more under-chassis space for critical aero-tunnel volume. The engine weighs a feathery 277 lb, compared with an average Cosworth's approximately 340 lb, and is radically modular, with separate pieces for the oil pan, crankcase, cylinder block, head and cam carrier. The intention is to reduce repair expenses, but this approach also allows easy displacement changes from, say, a 1.5-liter F1 engine to a 3.8-liter street powerplant. Depend on it, you'll hear more about this innovative engine.

But, as we said, these days Callaway Engineering is far more than just retail Bump-Up kits and Indy engines. The array of projects in progress during our visit was impressive. There was the Alfa GTV 6 Turbo program, of course, just gaining momentum, as well as a 24-valve head for the BMW small-block six, good for 200 bhp in the 2.3 version, about 220 bhp in the 2.7 version. In the middle of the floor stood a turbocharged 460-cu-in. Ford V-8, meant to run at a constant 1800 rpm on natural gas as an auxiliary generator—it makes 100 kW of power, instead of the non-turbo unit's 60 kW. On a lift was the turbocharged BMW K100 motorcycle, which would need 170 hp to break the land speed record of 165 mph—for sidecars. Here was a Vanagon getting a full-boat 911SC engine; there was a Nissan 200SX Turbo being intercooled to get the other half of what is implied in the word "turbo." The place was the Devil's Playpen.

And, so you shouldn't think these guys are just a bunch of Berylcream hot-rodders, up the hill from the chrome casino is an entirely separate structure of equal dimensions—the "secure" building. Here, sealed away from prying eyes, Callaway builds highly profitable "sensitive" bits for the government, aerospace and anyone else who isn't answering the phone just now. Yes, the word is out—Callaway builds top-quality turbo kits for Porsches and Volkswagens and BMWs, but they'll build you a moonship, too . . . just bring your checkbook. No, your big one. And your fat pen. And if you own a white 1976 BMW 320i with a weak right pedal, leave it home. Reeves Callaway doesn't want to know about it. —Ted West

Reeves Callaway (left) and Ted West discuss the Callaway 4-cam V-8 designed for Indy.



PHOTO BY LARRY JACOBSON