

1993 ALLANTÉ

CRITICS' CHOICE



Motor Trend
Car and Driver
AutoWeek
Automobile Magazine
Popular Science
Road & Track



The 1993 Allanté has captured the attention of the country's leading automotive journalists, and their opinions are unanimous: Cadillac's luxury two-seater is dramatically different from the model it replaces and is now a significant entry in the ultra-luxury roadster market. We invite you to read the reviews on the pages that follow and discover for yourself why the 1993 Allanté truly is the critics' choice.

1993 ALLANTÉ CRITICS' CHOICE

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Cadillac Allanté
One instance where power doesn't corrupt

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Cadillac Allanté Northstar
Or, why you should steer Grandpa
toward a Sedan de Ville or a Brougham

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A Star, Indeed
The new Northstar V8 helps point the Allanté in the right direction,
but other changes also go a long way in moving it toward its goal

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1993 Cadillac Allanté
The brilliant 290-bhp Northstar V8 brings us within a hair's
breadth of buying the idea of a \$67,000 Cadillac

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Allanté's New V8

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1993 Allanté with Northstar V8:
Subtle Change, Big Improvement



block is die-cast around iron cylinder-bore liners. A one-piece girdle combines all five of the four-bolt main-bearing caps into one rigid assembly. Forged-steel connecting rods are heat-treated and shot-peened for strength. The forged-aluminum pistons carry full-floating wrist pins. Camshafts are driven by three fine-pitched roller chains in a two-stage arrangement. A distributorless ignition system energizes four coils to light the fires.

Northstar's blueprint is advanced without departing far afield from what GM engineer Dale Phillips calls proven technology. Variable valve timing and a multipath intake tract were two items deemed more trouble than they were worth. This engine's most interesting feature is what GM calls a Fluid Induction System, which combines all air and fuel metering functions in one sealed box. Two magnesium castings—essentially the box and its lid—contain eight fuel injectors, eight thermoplastic ram tubes, temperature and pressure sensors, and a nylon fuel rail. Air enters the box through a throttle-body assembly and leaves (with atomized fuel) through a pair of composite distribution plates that isolate the FIS

from the heat and vibration below. This modular assembly is attached to the cylinder heads by only four bolts.

Northstar delivers an impressive 290 horsepower at 5600 rpm and revs willingly to a 7000-rpm redline. Torque curve rises gradually to a 290-pound-foot peak at 4400 rpm. To back up this powerhouse, the Allanté has a new four-speed automatic with plenty of capacity to handle the full brunt of the engine's output. The Hydramatic 4T80-E represents the third generation of electronically controlled transmissions at GM.

Two hundred horsepower was once considered the absolute outer limit for front-wheel drive. That rule of thumb falls by the wayside with the '93 Allanté, which behaves admirably with 290 horsepower, thanks to equal-length driveshafts, fast-acting traction control, and road-speed-sensitive power steering. Cadillac presented the new Allanté on mountain roads in Nevada, Utah, and Arizona, and kindly supplied the rest of the premium two-seat roadster class—Mercedes-Benz 300 and 500SLs and a Jaguar XJ-S—for comparison. To close the loop, we conducted full instrumented testing at GM's desert proving grounds.

The Allanté's Northstar V-8 introduces itself with a forceful wallop when the accelerator pedal is floored for the first time. With a 0-60 time of 6.7 seconds, the Allanté vaults into contention for king of the class status (the 322-horsepower 500SL runs neck and neck through the quarter mile, then leaves the Allanté behind beyond 100 mph). Cadillac rates top speed at 145 mph. But what's more impressive is that the new engine delivers world-class performance without a ruckus. It's smooth from idle to redline and a commendably quiet power producer at all times. In fact, within a few miles, the 32-valve prime mover fades from mind like a good engine should.

A competent chassis is absolutely essential with this much power on tap. Up front, the Allanté's MacPherson struts are little changed, but the rear suspension is completely overhauled. Out go struts, in goes a multilink design (two control arms plus a toe-control link to locate each wheel) with reduced friction, superior geometry, and better road isolation. Conventional coil springs replace the transverse plastic monoleaf used before. One thing the new suspension does particularly well is eliminate

CADILLAC ALLANTÉ

ROAD TEST

Cadillac's Italian-American Allanté has struggled for five years in search of an audience. To woo a few more chief executives and power

brokers to the fold, Cadillac has upped the ante with practically a whole new car for 1993. About the only thing that hasn't changed is exterior design. This is, after all, the age of substance over style, so the Allanté's new lease on life is all beneath the skin.

It's a laundry list that would give any chief engineer gooseflesh: a 32-valve V-8 engine, new four-speed electronically controlled automatic transmission, the rear suspension, "road-sensing" shock absorbers, speed-sensitive steering, larger brakes, revised wheels and tires, and redesigned bucket seats. So the exterior designers don't feel slighted, there are a few visual clues to distinguish this year's roadster from those gone before: restyled wheels, a more prominent horizontal lip for the front spoiler, relocated outside mirrors,

ONE INSTANCE WHERE POWER DOESN'T CORRUPT

by Don Sherman

PHOTOGRAPHY BY JIM FRENAK

and a quartet of exhaust tips.

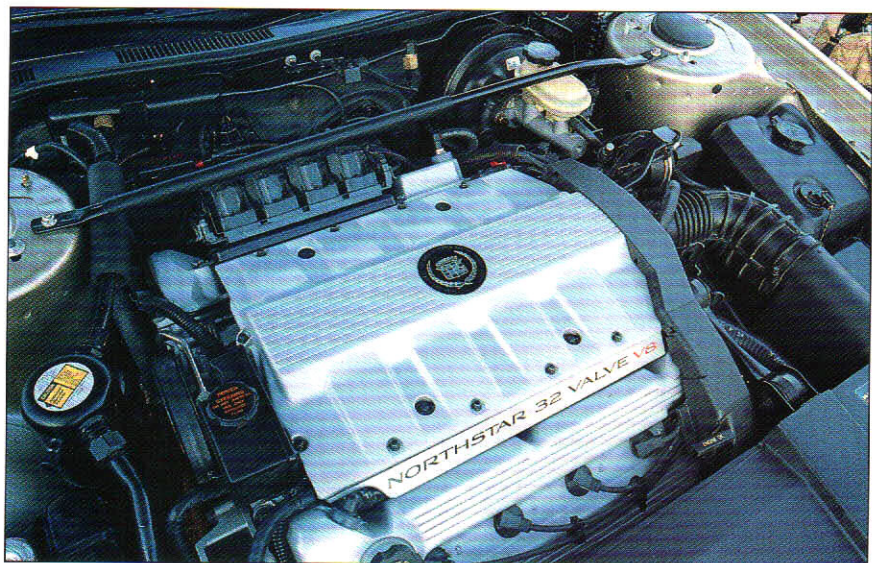
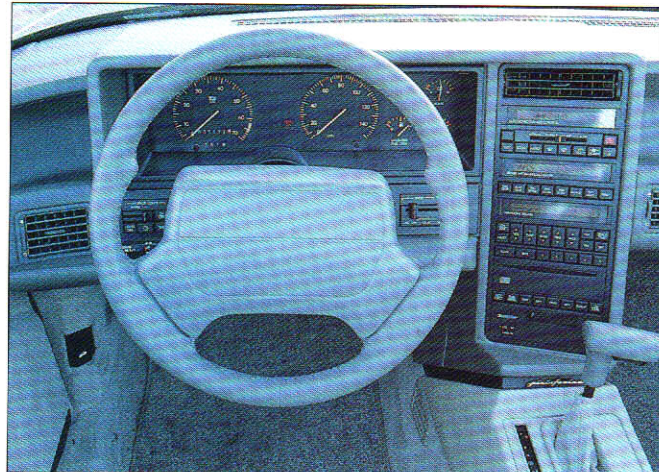
The result is a dramatic personality change. Previous editions of the Allanté were pleasant but passive. The rejuvenated model, which goes on sale this spring, is hungry for highway and eager to demonstrate its newfound fitness.

It's like Dirty Harry bursting forth from an Inspector Clouseau disguise. The most significant upgrade is under the hood: the Allanté has been tapped to introduce GM's Northstar DOHC 4.6-liter V-8, an all-new engine that spent five full years in the development labs.

The Northstar's major components are aluminum to save weight. The

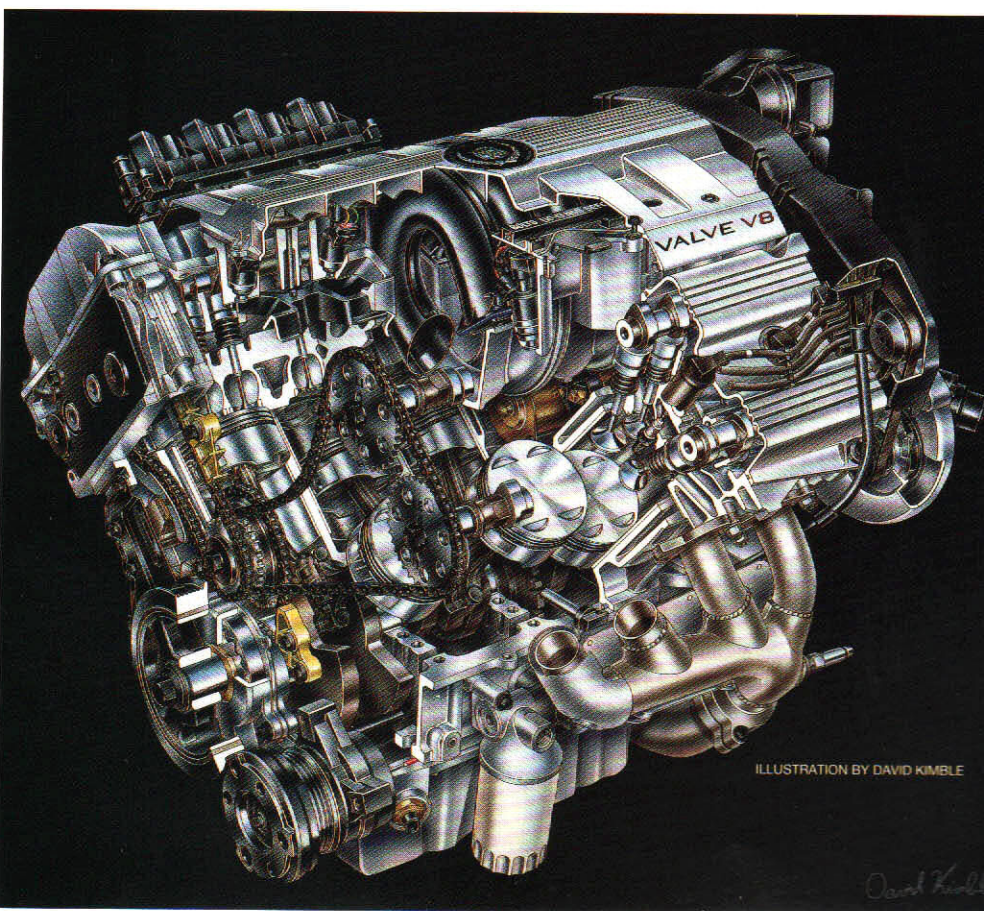


Rear seats have been replaced by new American-made buckets that adjust three ways from Sunday; the driver's side has a memory module with a new exit mode. A reconfigured console has a combination coin and cupholder, two storage compartments, and a shift knob twisted toward the driver.



the steep brake dive that plagued the first-generation Allanté.

In concert with the new rear suspension, Cadillac has blessed the Allanté with another engineering breakthrough: adjustable shock absorbers that deliver practically all the benefits of a fully active suspension with none of the usual drawbacks. This is the logical extension of the speed-dependent damping intro-



Conceived as a guiding light for GM engines of the future, the Northstar V-8 is compact, lightweight (approximately 450 pounds), and powerful. Soon, it will power most Cadillacs and eventually filter into the GM luxury models with a piston displacement range of 3.5 to 5.0 liters. Front- or rear-drive layouts are feasible, and a SOHC variation also exists. A Fluid Induction System, including sequential fuel injection, is contained within a die-cast magnesium box that attaches to the engine with only four bolts. The four overhead camshafts are driven by three fine-pitched roller chains.

ILLUSTRATION BY DAVID KIMBLE

duced on this car line in 1989. (That system reacted to brake, throttle, and road-speed inputs by selecting one of three shock settings simultaneously at all four wheel positions.) The new arrangement, called road-sensing suspension by Cadillac, measures body acceleration (vertical plane only) and wheel position at all four corners of the car. A control computer studies the information and instructs each shock absorber independently to choose between a soft or firm damping position. At 60 mph, the Allanté's suspension takes a reading every inch of road distance traveled and reacts with a revised damper setting (if needed) every 10 inches.

Cadillac's flagship rides pleasantly in the soft mode most of the time, but rapidly tenses its muscles when necessary. Yank the steering wheel smartly toward an apex, and the shock absorbers firm up to resist body roll. Crest a sharp rise in the road, and the wheels cycle up and down fluidly without bottoming. At felonious cruising speeds, the Allanté feels gyro-stabilized. Over the same roads, the Mercedes sportsters demonstrated a busy ride and an annoying amount of road harshness transmitted to the interior through the rear suspension. The Jag felt old, arthritic, and out of its league. In other words, the '93 Allanté is vastly improved and a fit alternative to the high-priced bluebloods from across the Atlantic. However, Cadillac's two-seater is not yet knocking on perfection's door.

Most of the Allanté's shortcomings have to do with its interior design. First of all, cowl shake is no longer a venial sin when the window sticker crosses the \$60,000 barrier (prices have not yet been announced). And raising or lowering the convertible top requires manual labor and learned manipulation of three buttons versus the one-button power-operated design presented by Mercedes-Benz. The Allanté's steering wheel is decidedly lacking in verve, and its multifunction turn-signal stalk smacks of off-the-shelf déclassé. The central stack of climate control and sound-system equipment presents the driver with a blithering array of 44 buttons, each confusingly similar in size and shape.

These are relatively minor flaws in what must now be considered an absolute jewel of a sports roadster. The Northstar beams brightly in this setting. With power and performance in spades, Cadillac's Allanté at last deserves to be discovered by the affluent elite.

MT

TECH DATA



CADILLAC ALLANTE

GENERAL

Make and model	Cadillac Allanté
Manufacturer	Cadillac Motor Car div., Detroit, Mich.
Body style	2-door, 2-passenger
Drivetrain layout	Front engine, front drive
Base price	\$67,000 (est.)
Typical market competition	Porsche 928S 4, Mercedes-Benz 500SL, Chevrolet Corvette ZR-1, Jaguar XJ-S

DIMENSIONS

Wheelbase, in./mm	99.4/2525
Track, f/r, in./mm	60.4/60.4/1533/1533
Length, in./mm	178.7/4538
Width, in./mm	73.4/1865
Height, in./mm	51.6/1308
Ground clearance, in./mm	5.7/144
Manufacturer's curb weight, lb	3766
Weight distribution, f/r, %	63/37
Cargo capacity, cu ft	16.3
Fuel capacity, gal	23.0
Weight/power ratio, lb/hp	13.0

ENGINE

Type	V-8, liquid cooled, cast aluminum block and heads
Bore x stroke, in./mm	3.66 x 3.31/93.0 x 84.0
Displacement, ci/cc	279/4565
Compression ratio	10.3:1
Valve gear	DOHC, 4 valves/cylinder
Fuel/induction system	Multipoint EFI
Horsepower	hp @ rpm, SAE net 290 @ 5600
Torque	lb-ft @ rpm, SAE net 290 @ 4400
Horsepower/liter	63.5
Redline, rpm	7000
Recommended fuel	Unleaded premium

DRIVELINE

Transmission type	4-speed auto.
Gear ratios	
(1st)	2.96:1
(2nd)	1.63:1
(3rd)	1.00:1
(4th)	0.68:1
Axle ratio	3.71:1
Final-drive ratio	2.52:1
Engine rpm, 60 mph in top gear	2000

CHASSIS

Suspension	
Front	MacPherson struts, lower control arms, coil springs, anti-roll bar
Rear	Upper and lower control arms, coil springs, anti-roll bar
Steering	
Type	Rack and pinion, power assist
Ratio	15.6:1
Turns, lock to lock	2.7
Turning circle	40.2
Brakes	
Front, type/dia., in.	Vented discs/10.9
Rear, type/dia., in.	Discs/11.1
Anti-lock	Standard
Wheels and tires	
Wheel size, in.	16 x 7.0
Wheel type/material	Cast aluminum
Tire size	225/60ZR16
Tire mfr. and model	Goodyear Eagle GA

INSTRUMENTATION

Instruments	150-mph speedo; 7000-rpm tach; volts; fuel level; coolant temp; oil pressure
Warning lamps	Service engine soon; theft system; airbag; seatbelts; oil pressure; check info center; temperature; traction control; cruise control

PERFORMANCE AND TEST DATA

Acceleration, sec	
0-30 mph	2.8
0-40 mph	3.9
0-50 mph	5.1
0-60 mph	6.7
0-70 mph	8.4
0-80 mph	10.7
Standing quarter mile	
sec @ mph	14.9 @ 93.5
Braking, ft	
30-0 mph	41
60-0 mph	145
Handling	
Lateral acceleration, g	0.78
Speed through 600-ft slalom, mph	59.3
Speedometer error, mph	
Indicated	Actual
30	30
40	42
50	52
60	60
Interior noise, dBA	
Idling in neutral	50
Steady 60 mph in top gear	67

FUEL ECONOMY

EPA, city/hwy, mpg	Not available
Est. range, city/hwy, miles	Not available

Cadillac Allanté Northstar

Or, why you should steer Grandpa toward a Sedan de Ville or a Brougham.

BY DON SCHROEDER

Most of the changes to the Cadillac Allanté for 1993 are subtle indeed. The little stop lamp on the deck lid loses its Cadillac crest. The nose gets a larger chin spoiler. And the side windows are one piece instead of two. In fact, the truly dramatic changes to this car lie hidden under the hood. And the first clue to their existence is in the tachometer, where the redline becomes 6700 rpm, 1500 rpm more than that of today's car.

The '93 Allanté is the first Cadillac to get the long-awaited Northstar engine, a 32-valve all-aluminum V-8 intended to put

Cadillac power on equal footing with the high-zoot engines from the likes of Mercedes, Infiniti, and Lexus. Its 4565cc displacement, 10.3:1 compression ratio, and bore and stroke figures may all be within spitting distance of competitors' small-blocks. But this is no copy. The Northstar's combination of cast-in-iron cylinder liners, a one-piece crankshaft cradle, hydraulic lifters, a crank-fired ignition system, and a two-stage compact roller-chain camshaft drive makes its technical résumé unique.

The new Allanté engine doesn't offer

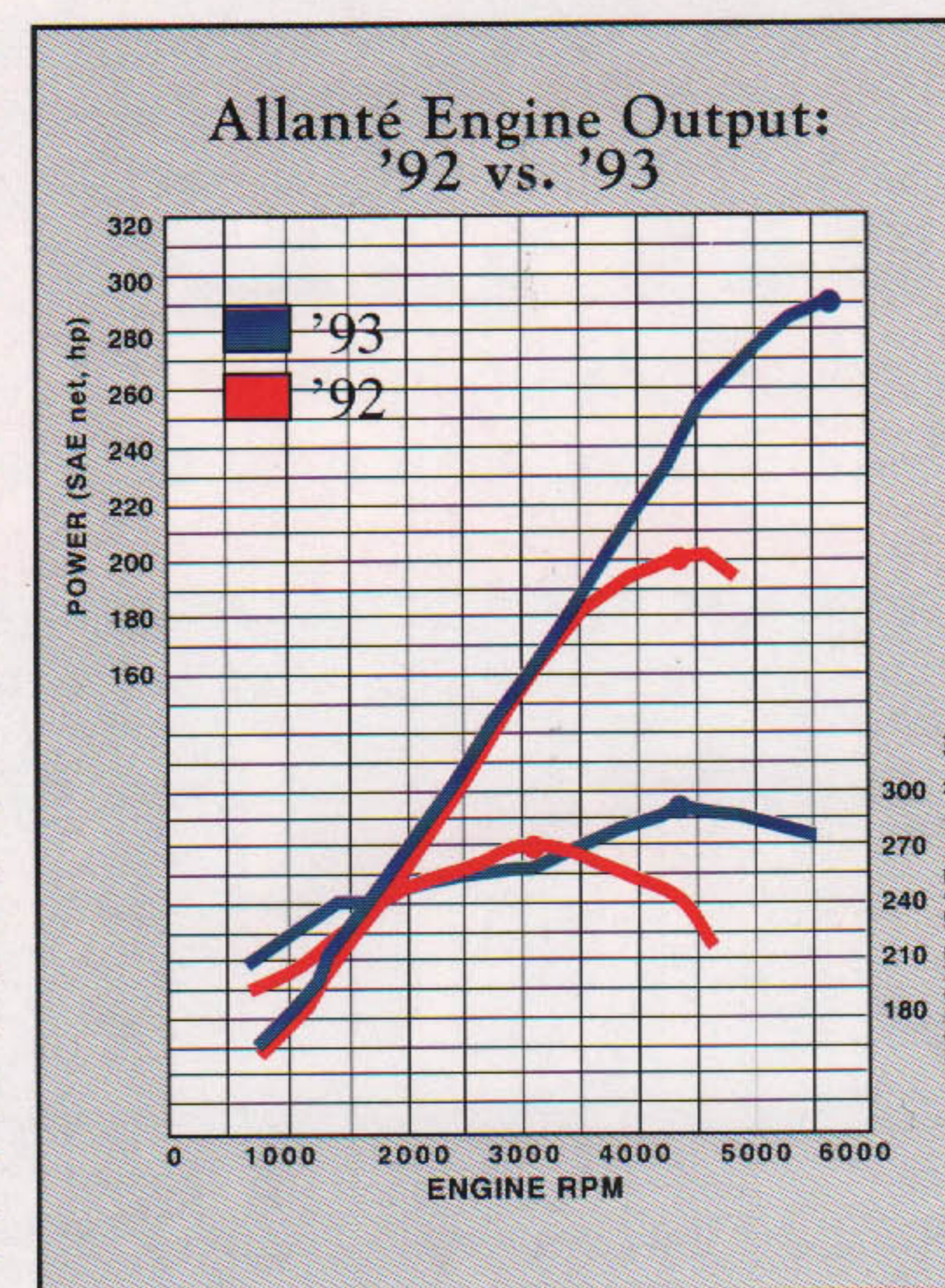
variable valve timing, though. Dale Phillips, Cadillac's powertrain engineering manager, says the marginal advantages (primarily in fuel economy) offered by variable valve timing on the Northstar would not have justified its cost and complexity. Too bad, because it looks like this engine will be a guzzler in Allanté tune—same as the current engine. What gas the Allanté Northstar does use, however, it converts into prodigious horsepower: 290 at 5600 rpm to be precise, with a torque peak of 290 pound-feet at 4400 rpm.

This caliber of power would make

metal purée out of the current transmission's innards, which is why there's a new four-speed Hydra-matic under the hood, the 4T80. This electronically controlled design would be unremarkable if not for a unique binary fluid pump, which has a separate heavy-duty mode for leadfoot motoring. The system results in less engine drag and spin losses during normal driving.

The first impression from our encounter with a '93 pilot car was that Cadillac has, once again, brewed its own taste with this motor. Don't expect a soft Lexus hum from underhood. Turn the key and the Northstar starts with a bark not unlike that of the current Allanté's 4.5-liter V-8. At low rpm, the '93 leaps around a lot like the current car; both engines have similar low-end torque curves. Hold down the throttle and the similarity ends, though, as the Northstar storms past the current car's redline. Bass exhaust growling turns to baritone, then soprano, where the transmission then clips off a crisp shift, at 6400 rpm.

Continue in this fashion and the speedometer makes haste. The needle sweeps past 60 mph in 6.4 seconds and shows triple digits faster than you can say, "That's impossible, officer, no Allanté is that fast, no sireee . . ." Start practicing that



mantra now, because on a level, empty road, our pilot car charged to 140 mph. Vehicle chief engineer Dave Hill expects that, in a lower altitude than where we tested, production cars will beat that figure soundly.

What that top end doesn't communi-

cate is how confidently the '93 handles at speed. Thank a whole package of improvements, including new variable-assist power steering, more advanced road-sensing electronically adjusting shock absorbers, brakes from the Eldorado/Seville, and an entirely different unequal-length-control-arm rear suspension. At top speed, the package is rock-steady (aided, says Hill, by the new chin spoiler). At a saner pace, steering feel and body motions are progressive and controlled. Braking distances are a bit longer than before, but the '93 Allanté stops with much less wallowing and better pedal feel.

Even with the new underpinnings, the '93 doesn't abandon its heritage completely; when we hit the go-pedal, the pilot car nosed up and torque-steered to the left about as much as the current car (which is to say, just a little). But keep in mind that the new car is nearly 50 percent more powerful. And very fast. In fact, this is probably the first Cadillac package—engine, drive-

train, and suspension—that feels better the faster you go. It's enough to call to mind that vaunted overseas competitor, that dreaded hyphenated M-word.

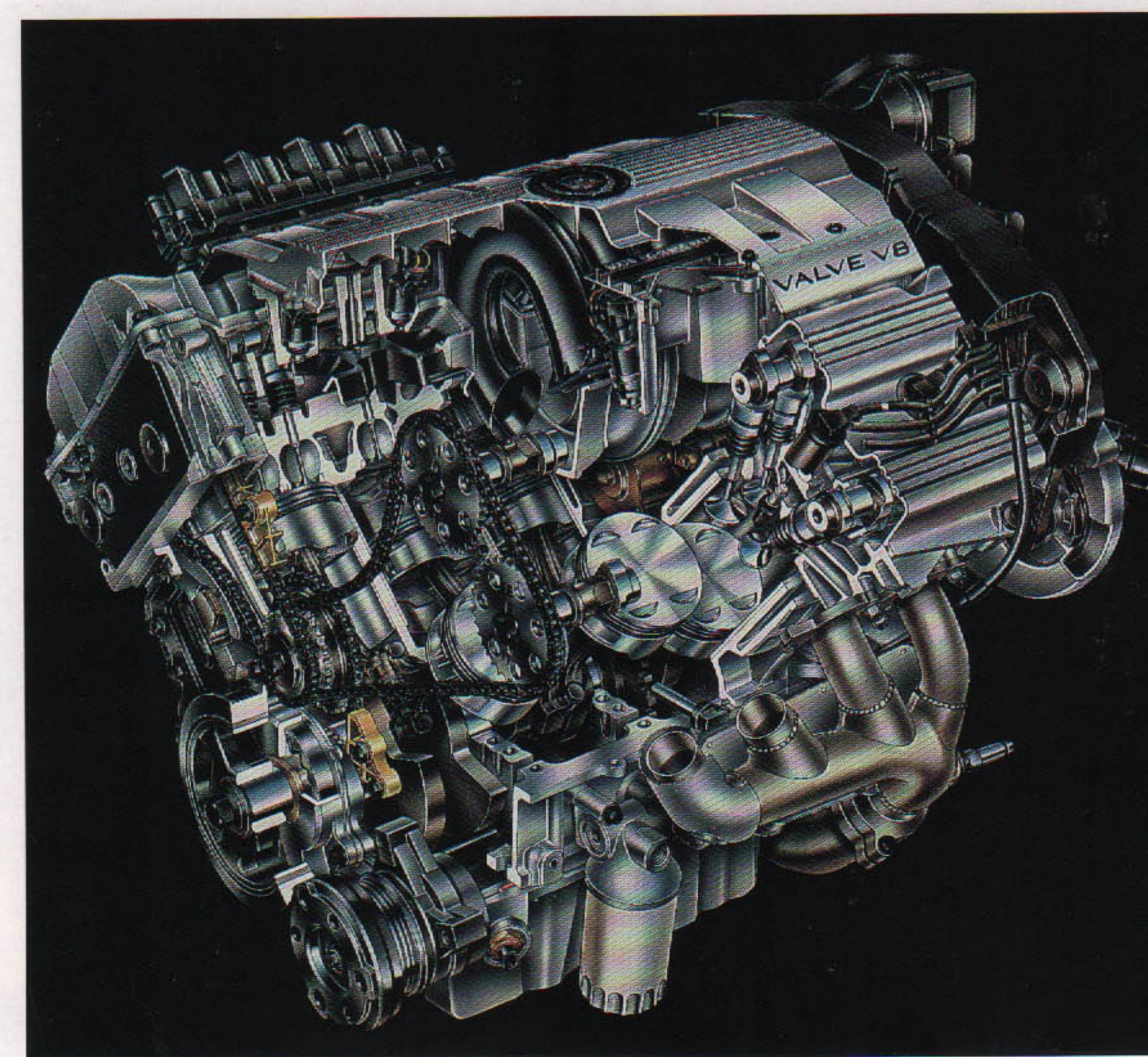
The Cadillac engineers brought along a pair of Mercedes-Benz SL roadsters for comparison. Gluttons for punishment? Not really. The 500SL has a better and far more convenient top design and more safety items (passenger air bag, roll bar). It is also slightly quicker. But the '93 Allanté will trounce it in road-noise isolation, ride, steering accuracy, interior room, and the biggie—price. Cadillac expects the '93 to arrive at a few grand more than the current car, perhaps \$70,000 with the hardtop. What a (gulp) bargain compared to the (gulp . . . blink) \$107,000 500SL.

Wouldn't it be nice if all Cadillacs came out this good the first time around? ●

Vehicle type: front-engine, front-wheel-drive, 2-passenger, 2-door convertible

Estimated base price: \$63,000
 Engine type: DOHC 32-valve V-8, aluminum block and heads, GM engine-control system with port fuel injection
 Displacement: 279 cu in, 4565cc
 Power (SAE net): 290 bhp @ 5600 rpm
 Transmission: 4-speed automatic with lockup torque converter
 Wheelbase: 99.4 in
 Length: 178.7 in
 Width: 73.4 in
 Height: 51.5 in
 Curb weight: 3700 lb

Car and Driver test results:	1993	1992
Zero to 60 mph	6.4 sec	7.9 sec
Zero to 100 mph	17.7 sec	26.3 sec
Standing 1/4-mile	15.0 sec	16.3 sec
@ 93 mph		83 mph
Top speed	140 mph	122 mph
Braking, 70-0 mph	189 feet	183 feet
EPA fuel economy, city driving	N.A.	15 mpg



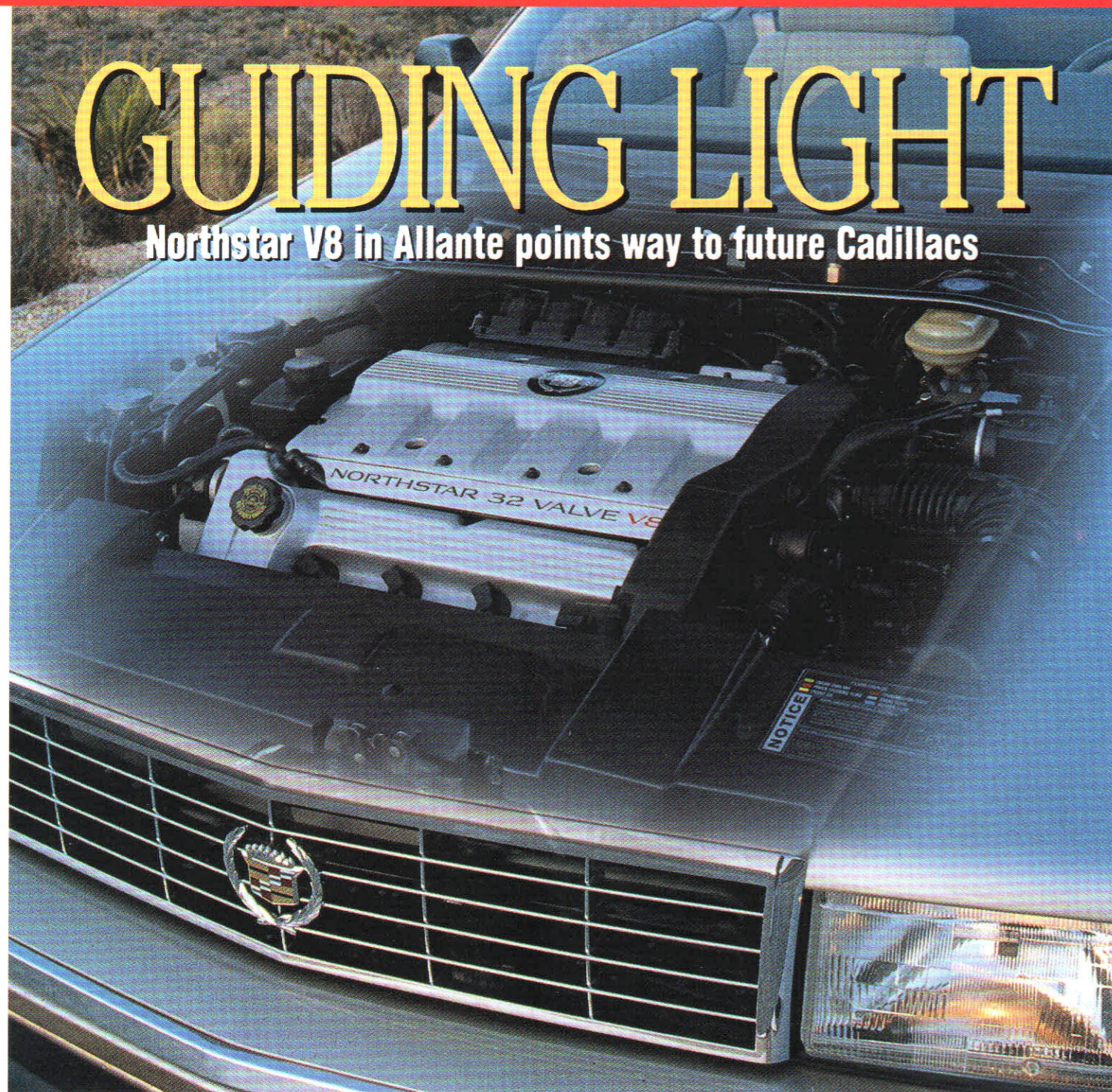
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GUIDING LIGHT

Northstar V8 in Allante points way to future Cadillacs



COVER

STORY



A STAR, INDEED

The new Northstar V8 helps point the Allante in the right direction, but other changes also go a long way in moving it toward its goal

By James D. Sawyer



Lip spoiler, new wheels, fresh side glass treatment are part of the package on 1993 Allante

All right, now how about doing something with the top?

You're probably thinking we've missed the point entirely. Cadillac comes out with a brand new engine—a *grand* new engine—for the Allante and we're back to harping about its Neolithic convertible top.

That, however, is the point. Or at least the only logical conclusion that can be reached about the 1993 Allante, designated pace car of the 1992 Indianapolis 500 and technology leader of GM's lead division. In other words, what fits under the top deserves a better crowning touch than what it's got.

There is more—much more—to the 1993 Allante than just a new engine. Granted the long-awaited Northstar is quite a power-plant. This V8 gets 290 hp and 290 lb ft of

torque out of its 4.6 liters, 32 valves and four cams. But Cadillac has turned up the wick on technology in other areas, too.

There's a new four-speed automatic, the 4T80-E, that makes GM's not-so-old 4T60-E seem like something out of the Bronze Age. And we've raved about the 4T60-E since it was introduced in 1990.

Plus there's a new short/long arm (SLA) rear suspension that contributes mightily to the car's handling balance. Of course, it doesn't hurt that the Allante also gets a new computerized control system for the shocks that reacts much faster and better to road conditions than the electronic setup used previously. The steering's been improved as well and the traction control system's new and more capable, too. It all adds up to a rather impressive package.

So like we said, isn't it time to drag the top into, say, the 1960s and make it go up and down under its own power?

Sure, it is. But it's not gonna happen anytime soon. Let's put that subject behind us for now and look more closely at how all these new goodies work on the '93 Allante:

Very well, thank you.

Our impressions were formed along some comparatively short stretches of freeway and far longer reaches of two-lane in the sparsely populated territory between Las Vegas and Cedar City, Utah. Cadillac had a '92 Allante as well as a Jaguar XJS convertible and a Mercedes-Benz 500SL and 300SL on hand for comparison purposes. It soon became apparent that because of their superior power levels this was a shoot-out between the '93 with Northstar and the 322 hp 500SL. Forget

the rest. They weren't even in the running when the big boys started sprinting.

Now we've been on these things before where the host manufacturer puts its new pride and joy up against the competition which turns out to be some poor old sway-back that's had the bejabbers beaten out of it by the engineering department and company test drivers. Not the case this time. All the cars were brand new for this exercise, and in fact the 500SL had fewer miles on it than the '93 Allante. Now, we don't know if Cadillac threw us a ringer with this car because there are no production '93 Allantes to compare it with. But if the car we drove is what hits the showrooms come April, look out.

Compared to the 500SL, which had the optional (\$3,935) Automatic Damping System, the '93 Allante felt more under control on the two-lane blacktop of southwestern Utah. Here the roads twist and turn as they cling to the rolling terrain like dark, gray ribbons draped on wrinkled khaki velvet, and the Allante clung to the roads just as well as the roads hugged the land. The Mercedes acquitted itself quite respectably, but the 500SL's great weight put it at a disadvantage. The captain of this vessel could ring down to the computer room for the crew to pour on any number of electrons to manage the damping rates, but the fact remains that the Benz was toting nearly 400 pounds more than the Allante. And that meant the Allante was easier to drive fast and well.

There's no doubt better *ultimate* times could be wrung from the 500SL at any track or on any road, particularly at the hands of an expert. If nothing else, the Mercedes' rear-drive would see to that. But in the hands of a driver concentrating more on getting there than the process of getting there or more absorbed by and with the fun of the experience than with the finesse of the exercise, the front-drive Cadillac is less demanding and more satisfying.

Under such conditions and mindsets the 1993 Allante imparts a superior feeling of control *vis-a-vis* the 500SL. The Cadillac exhibits more connectedness between, across and among the corners of the suspension and offers less abrupt snubbing of jounce and rebound. In fact, the suspension was *so* controlled that we became highly aware of body motion. Under certain circumstances it seemed as if the Allante's body were a raft that was bobbing on a river as it was carried along by the current that was the suspension.

While the mental image of such movement might start to induce some small stirrings of seasickness, let's note here that the body motion was not excessive, and reached the peaks it did only because it was exaggerated by the contour of the road surface

and speeds that were, um, high.

Comparing the steering feel of the German and American cars also found the Allante exhibiting a greater feeling of finesse on-center, *i.e.*, there was a smaller "dead" area with the wheels aiming straight and as the wheel was turned from that point the feel was more progressive.

Those keeping count know we've gone half-a-dozen paragraphs without even alluding to the Northstar, the reason we've been so eager to see the '93 Allante. One part of the reason is that the other changes Cadillac has made to the Allante's hardware are so extensive, so successful and—frankly—so unexpected that they demanded attention right off the bat (for even more details see sidebar below). The other part of the reason is we've saved the best, the drivetrain, for last.

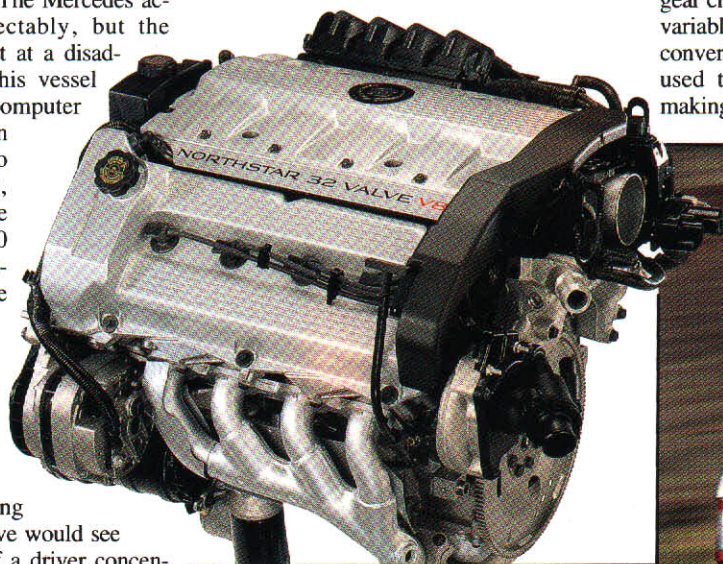
The 4.6-liter Northstar V8 is powerful, quiet, smooth. No, make that *smoooooth*.

About the power there can be no doubt because figures don't lie. The Northstar has a startling 90 hp more than the 4.5-liter

pushrod V8 it's replacing and a quite respectable 25 lb ft more torque.

As for quiet, well, the Northstar has an interlock so that the starter motor can't be ground in case someone turns the key while the engine's running. "We don't really expect that our owners are so inattentive they'll go around trying to crank the starter with the engine running," said a Cadillac staffer who shall go nameless. "But it does make a good marketing tool to say the engine's so quiet it needs the interlock." The reason for the Cadillac guy's anonymity: Mere hours after this pronouncement he proved the need for the interlock by trying to start an engine that was already running.

Northstar's smoothness is related to its quietness, but a good deal of help comes from the new transmission. Gone are the vacuum modulator and governor thanks to the trans being electronically controlled and coupled to the engine. Part of that coupling is a computerized torque management system that retards timing during shifts, thus easing gear changes. Part of these controls work on a variable solenoid inside a new, larger torque converter. The solenoid regulates the pressure used to control the converter clutch, thus making clutch operation smoother.



Northstar's the star, but other advances shine, too

Suspension, traction control, steering given tech upgrades

You can tell the '93 Allante by subtle cues on the outside: a lip spoiler, one-piece door glass with no vestigial frame stub at the front, redesigned side mirrors, new wheels and new tail pipes. And on the inside: new seats, console and audio system. But this stuff is all frosting. The hardware is what's really important.

By now you know about Northstar. What comes as a surprise are the other technological advances.

Take the short/long arm rear suspension. It replaces the old strut setup with

upper and lower control arms, shocks and an additional lateral link. Coupled with what Cadillac calls the Road Sensing Suspension (RSS) it helps give the '93 Allante its balanced, highly controlled handling.

RSS "reads" the road surface in real time by measuring the wheel position and body motion and responds by adjusting the suspension damping. At 60 mph it can read the road in one-inch increments. According to Cadillac, it's less expensive, less complex and doesn't drain engine power the way a full active system does, but Cadillac

The 4T80-E also interacts with the engine in ways other than electronic. The Northstar drives the transaxle's lubrication and pressure system. This system includes a binary pump, the larger of which works during hard acceleration. During cruising the large pump shuts down and the smaller takes over. The binary pump system draws less power than a single pump would and thus adds to fuel efficiency.

Northstar will push Allante to quicker 0-

60s and a higher top speed than the 4.5-liter ever could. Despite being nearly 300 pounds heavier than the '90 Allante we analyzed (AW, June 11, '90) the '93 model should knock at least 1.5 seconds off that car's 0-60 mph time of 8.5 seconds in our estimation, thanks to the Northstar's greater output and the '93's higher final drive (3.71:1 vs. 3.21:1). And in spite of that higher ratio, the new Allante should be able to make far better use of its tires' speed rating (Z, capable of

155 mph). The '90 wore V-rated tires (with a max of 149 mph).

Deep breathing is the reason for the Northstar's superiority. Four overhead camshafts—each with its own profile—fit two to a head (which are themselves distinct) and operate 32 valves. The new V8 produces peak torque at the point—4400 rpm—where the 4.5-liter made peak horsepower and produces peak horsepower at a point—5600 rpm—where the old engine would find prolonged existence uncomfortable, if not untenable.

The cams are chain-driven and chain tension is maintained via hydraulics and designed so that it never needs maintenance. In fact, says Cadillac spokesman Kyle Johnson, Northstar is meant to be an extremely low-maintenance engine. "The whole intent," he says, "was to be able to change only fluids and filters for the first 100,000 miles." Toward that end, platinum spark plugs are used as is a direct ignition system with no moving parts.

All of which is nice, but power is what it's really all about. And Northstar's horsepower curve isn't really a curve but a fairly straight line that runs from about 30 hp at idle to 290 hp at 5600 rpm. While most of the muscle is made in the upper reaches of the rev range, as is usually the case with four-valve-per-cylinder engines, the torque curve is relatively flat. Northstar produces 210 lb ft of torque as soon as the key is turned, and once the tach passes 1500 rpm it never produces less than 240 lb ft.

Such power is achieved by using some race-bred techniques such as a two-piece cast aluminum block (with cast-iron bore liners) as well as aluminum heads. Valve seats for the intake ports are triple angled, another bit of racing legerdemain. Finally, the water pump is a reverse-flow unit, the same technology that helps Chevrolet get 300 hp out of the new LT1 Corvette engine.

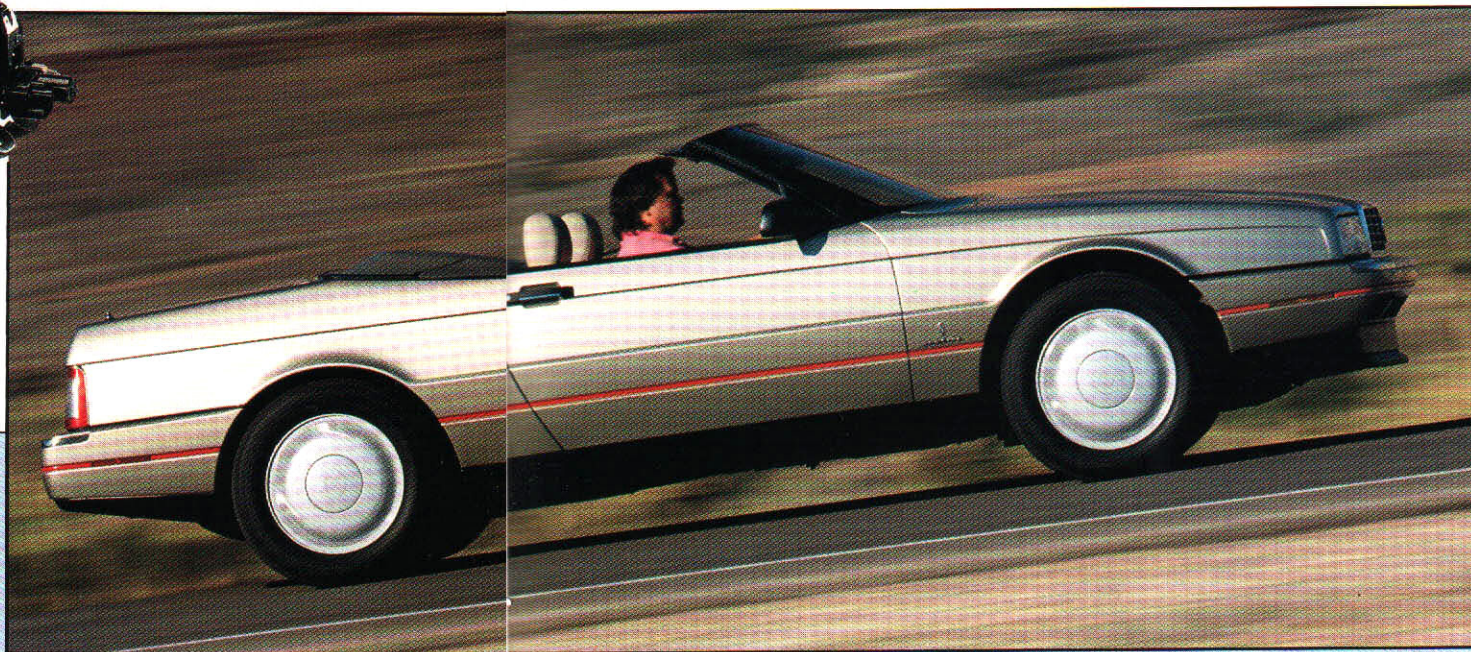
Cadillac has applied another trick to the cooling system. If the pump quits or the fluid leaks out, the engine management computer senses the problem and sends the Northstar into limp-home mode. Essentially this means shutting off fuel and spark to one cylinder at a time so the shut-down cylinder becomes a pump to air cool the engine. Timing to the other cylinders is retarded so top speed is limited to about 40 mph in order to hold the pieces together until a safe haven is reached.

And yes, there are some changes to the top: a new latch and new fabrics. But nothing that matches the technology—or the effectiveness—of the other new hardware. We'll probably have to await a reskin or full redo to see a top that's worthy of the rest of the car.

It won't take as long to see the '93 Allante's technology trickle down to other Cadillacs, though. The division makes only 13 roadsters a day, but has the capacity for 1000 Northstars. Expect to see the quad-cam V8 in Eldos and Seviles this fall—along with the new transaxle, SLA rear suspension and computerized damping system. ■



New seats (left) offer power lumbar support. Other comfort and convenience changes include a cup holder in console, easier access to interior cargo space. Dash has been changed so tach and speedometer readings keep pace with capacity of new engine



admits it's not quite as effective as Infiniti's active system. However, the division notes RSS has growth potential.

Traction control, which Allante helped pioneer, has had more of its potential developed on the '93 model. The second-generation system, like the first, will apply the brakes and simultaneously cut off cylinders sequentially to control wheel slip. However, if intense wheel slip is sensed the system will cut off six cylinders all at once, something the old system couldn't do.

Besides hooking up to the new traction

control, the brakes have received some attention of their own: larger rotors and calipers for more balanced braking and control.

The last major piece of tech is speed-sensitive steering. Up to 20 mph it gives full assist. From 20 to 128 mph it varies the amount of effort until it goes to maximum effort. The steering system is controlled by the same computer that handles the RSS.

While the Northstar V8 has piqued the most interest, these other upgrades go a long way toward making the '93 Allante the most balanced Cadillac yet. ■

1993 CADILLAC ALLANTÉ

Remember the first time we met?" asked Fred Wood as we shot down the evil two-lane that bounds east across the Mojave Desert from Interstate 15 toward the Valley of Fire. Wood is a senior engineer in vehicle development at Cadillac. This deserted Nevada road—vicious, terrible pavement, whoops and leaps and twists—was not the kind of road you would associate with a Cadillac test drive. And we were in an Allanté, for Pete's sake.

"It was three years ago, and you asked me if we were really serious about this car. We're serious about this car, Jean," said Wood.

I had just done this nasty twenty-mile leg in a Mercedes-Benz 500SL and had bottomed its suspension in the very dip that now faced me and the 1993 Allanté. I clenched my teeth, hit that hole at 80 mph, and waited for the sickening crash-through. Wood was smiling serenely over in the passenger's seat because he was in charge of the Allanté's new rear suspension. We dipped. We squidged. We rebounded. No crash-through.

I thought I had flown out to Las Vegas to form a close personal relationship with the long-awaited North Star V-8, the engine that will eventually power the Seville and the Eldorado. I had come to meet Cadillac's first new engine in a decade, a lovely DOHC 32-valve, fuel-in-

*The brilliant
290-hp North Star
V-8 brings us
within a hair's
breadth of buying
the idea of a
\$67,000 Cadillac.*

jected, all-aluminum 4.6-liter V-8 that promised nearly 50 percent more power than the 200 horses of the 4.5-liter V-8 it was replacing.

Stop the presses here a second. It wasn't too long ago that engineers were excitedly talking about breaking the 200-hp mark for a front-wheel-drive car. And what are we looking at? 290? And from what? A Cadillac!

Cadillac has been developing the North Star for five years. For the record, its sophisticated two-piece aluminum block is a design you find most often on dedicated racing engines, not production-car powerplants. It is composed of an upper cylinder block with cast-in iron liners, a lower ladder-frame assembly supporting the crankshaft, and an additional oil manifold plate that seals a groove in the lower crankcase to form the oil gallery.

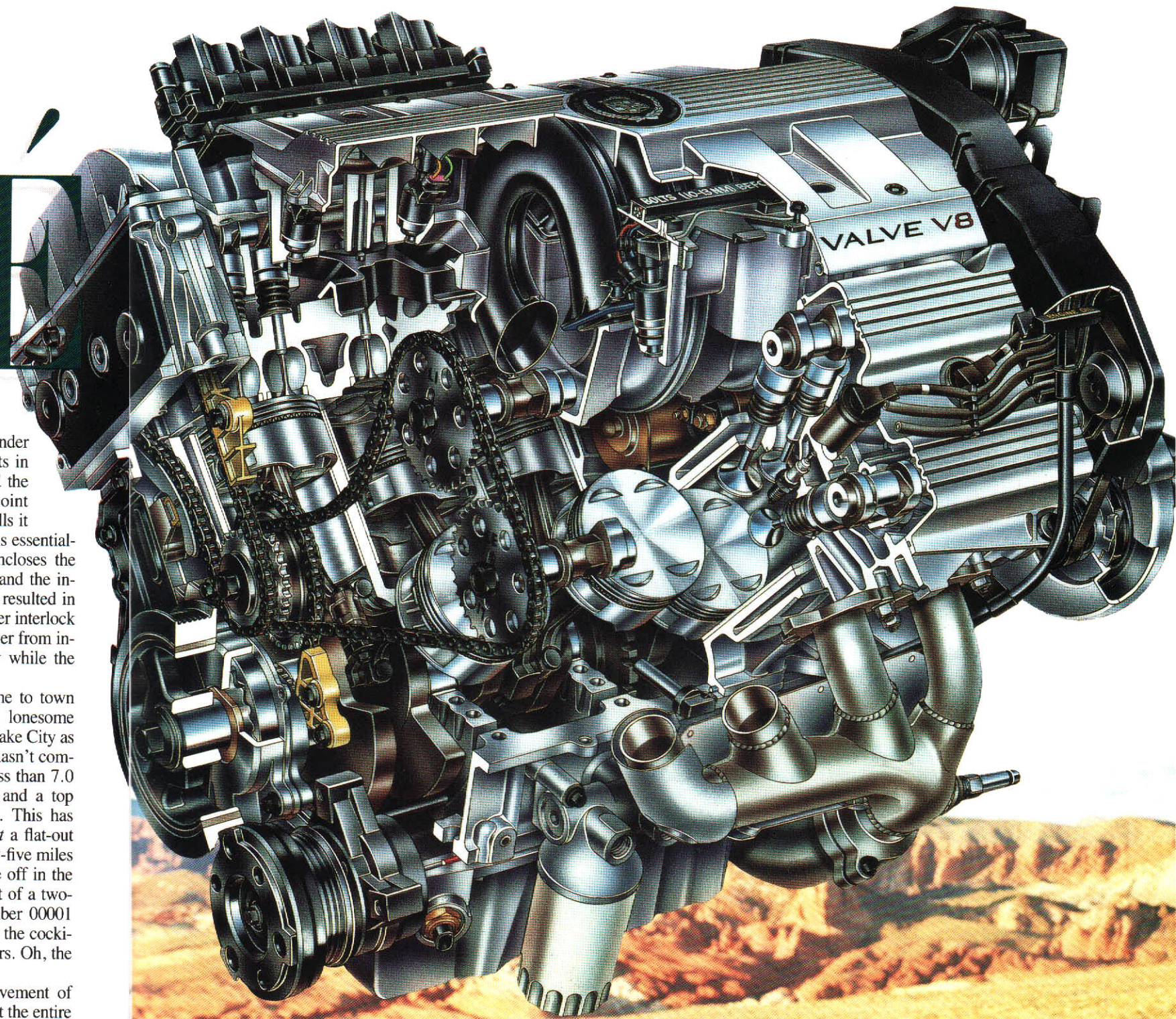
Extensive work was done to suppress noise. A roller chain drives the four

overhead cams (two per cylinder bank), the starter housing sits in the crook of the engine, and the computer-controlled multipoint injection system (Cadillac calls it the Fluid Induction System) is essentially a magnesium box that encloses the tuned runners, the fuel rail, and the injectors. This and other work resulted in an engine so quiet that a starter interlock was added to prevent the driver from inadvertently cranking the key while the engine is running.

So this is what I had come to town for: 290 horsepower and a lonesome desert highway blast to Salt Lake City as fast as I can fly it. (Cadillac hasn't completed testing but has seen less than 7.0 seconds from 0 to 60 mph and a top speed of 150 mph.) But no. This has turned out to be anything *but* a flat-out engine test. We weren't thirty-five miles north of Vegas, and we were off in the badlands, beating the hell out of a two-seat luxury convertible, number 00001 off the Allanté pilot line. Oh, the cockiness of these Cadillac engineers. Oh, the competence of their work.

As it turns out, the achievement of North Star dictated that almost the entire Allanté be overhauled: new transmission, new suspension, new brakes, new steering, new tires.

The 4T80-E transmission takes electronic shift control one step further. It can monitor the length and time of shifts and correct itself in the case of temperature change and wear on the compo-

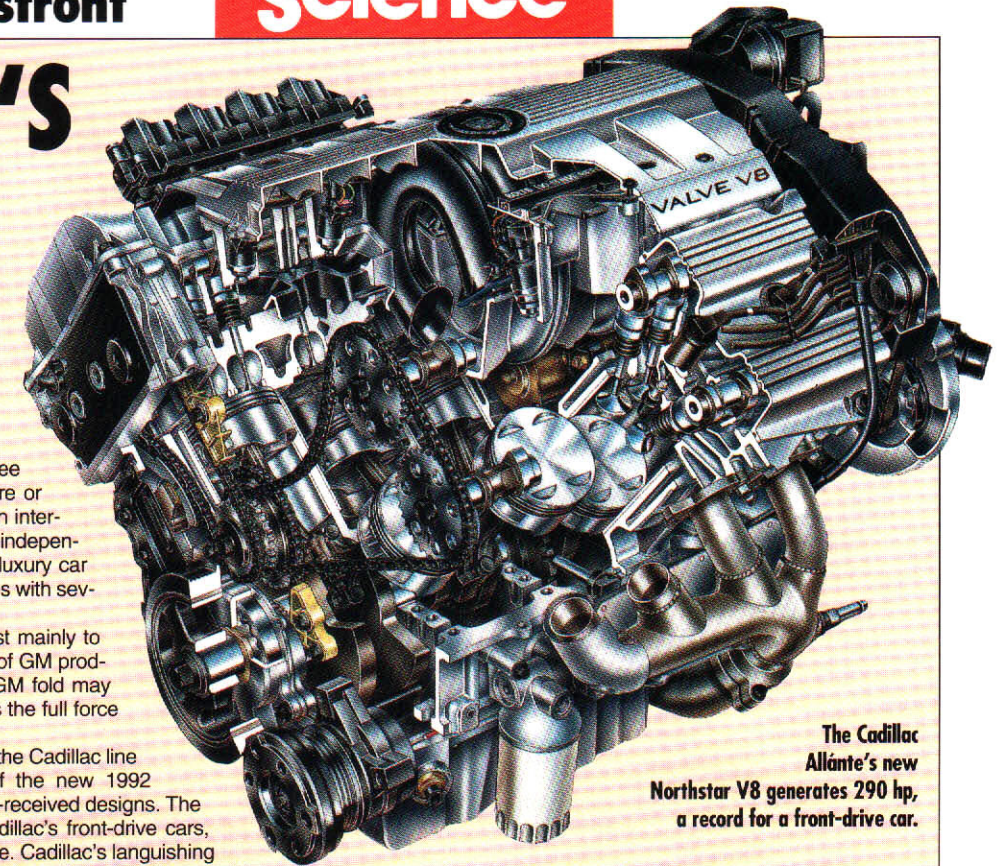


BY JEAN LINDAMOOD

ILLUSTRATION BY DAVID KIMBLE

ALLANTE'S NEW V8

By DAN McCOSH



The Cadillac Allanté's new Northstar V8 generates 290 hp, a record for a front-drive car.

Cadillac split with General Motors three years ago, an event that went more or less unrecognized. It mainly was an internal reorganization that set up an independent engineering group to develop GM's luxury car line, rather than sharing technical resources with several other GM divisions.

The changes at Cadillac were of interest mainly to those tracking the technical development of GM products, but Cadillac's breakaway from the GM fold may yet turn out to be the watershed that frees the full force of GM's huge technical resources.

The first hint at the profound changes in the Cadillac line came last year, with the introduction of the new 1992 Seville and Eldorado, two striking and well-received designs. The major mechanical changes slated for Cadillac's front-drive cars, however, will arrive first on the 1993 Allanté. Cadillac's languishing two-seat convertible will emerge later this year with a brand-new multi-valve V8 engine and a sophisticated new suspension system that will become the new chassis for the 1993 Seville and Eldorado as well.

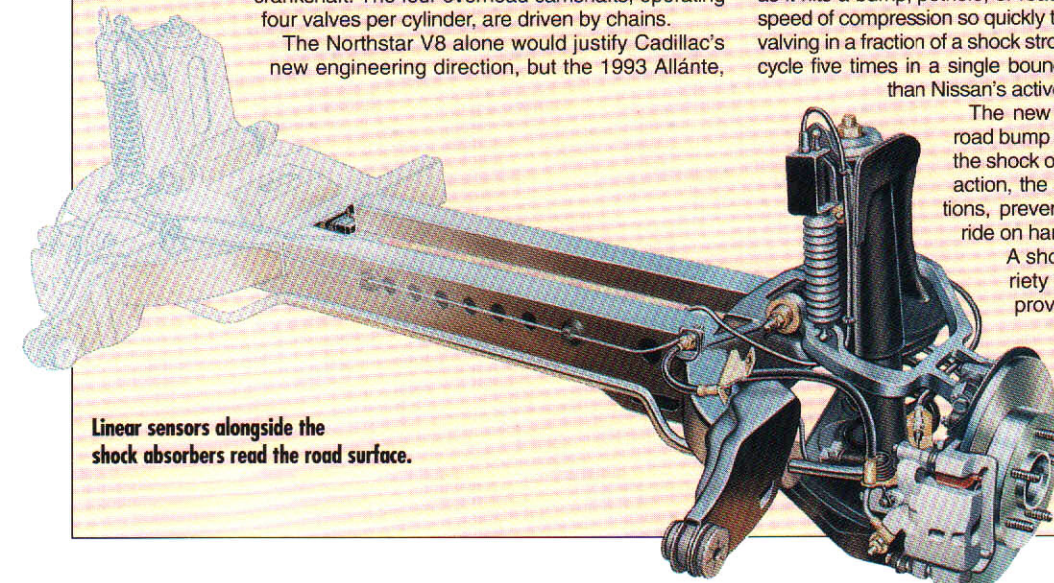
The new engine alone is a major piece of work. The Northstar V8 is Cadillac's first ground-up V8 design in more than a decade. At 290 horsepower from 4.6 liters, it turns out more than enough horsepower per liter to compete with today's world standards. It's also a radical break from the cast-iron push-rod technology in GM engines today.

The Northstar design is an unusual construction, splitting the die-cast aluminum block in a line across the main bearings. This sandwich supports the bearings that take the primary crankshaft loads, rather than using separate bolted-on bearing caps. It's also the first GM V8 to adopt cast-in-place iron liners for such a large engine.

The block is die cast, rather than manufactured by GM's often-promoted lost-foam casting process. Though die casting is more costly, it allows for a finer exterior finish to keep with the luxury car image. The intake manifold is made of high-temperature plastic, which helps cool intake air by conducting heat less rapidly than aluminum.

A four-coil ignition system uses small booster coils to fire pairs of spark plugs, actuated by a timing ring cast in the center of the crankshaft. The four overhead camshafts, operating four valves per cylinder, are driven by chains.

The Northstar V8 alone would justify Cadillac's new engineering direction, but the 1993 Allanté,



Linear sensors alongside the shock absorbers read the road surface.

the first car to get the new engine, also incorporates innovative suspension features that will be added to the 1993 Seville and Eldorado as well.

The Allanté's rear axle assembly has been redesigned to include anti-dive geometry, a welcome change that eliminates the pitching common to the Allanté and the cars that share the platform. More significant, however, is a new approach to electronic suspension control, which combines several features of so-called "active" suspension in a system that uses less energy and can be produced less expensively.

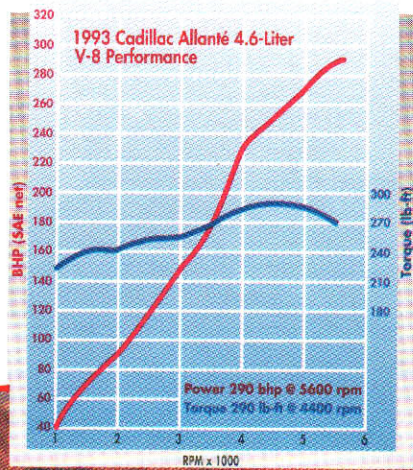
Extremely high-speed computer networking and fast-acting hydraulic valve technology combine in the road sensing-suspension, the name for Cadillac's new real-time shock absorber system.

This is the first production application of a new approach to electronically controlling ride and handling—vastly different from the numerous electronically controlled variable-damping shock systems currently on the market, which rose input from the throttle position sensor and brakes to adjust damping ratios.

The new Cadillac setup uses a position sensor tied to the shock itself. The sensor monitors precisely how fast the suspension is compressing as it hits a bump, pothole, or road undulation, detecting changes in the speed of compression so quickly that it is capable of adjusting the shock valving in a fraction of a shock stroke. The sensor and valve can actually cycle five times in a single bounce-rebound cycle—significantly faster than Nissan's active suspension.

The new system detects the abruptness of a road bump almost quickly enough to react before the shock of the impact reaches the car spring. In action, the system swallows high-speed undulations, prevents bottoming, and retains a smooth ride on harsh surfaces.

A short drive with the new Allanté in a variety of winding, twisting mountain roads proved the merits of the new chassis. Although high altitudes diminished the performance of the new Northstar V8, the overall package demonstrated that Cadillac has gained back most of the territory it had ceded in the past to high-line European and Japanese imports.



1993 CADILLAC ALLANTÉ

GENERAL:
Front-engine, front-wheel-drive convertible
2-passenger, 2-door steel and aluminum body
Base price (estimated) \$67,000 (+ luxury tax of 10% over \$30,000)

ENGINE:
32-valve DOHC V-8, aluminum block and heads
Bore x stroke 3.66 x 3.31 in (93.0 x 84.0 mm)
Displacement 279 cu in (4565 cc)
Compression ratio 10.3:1
Fuel system sequential multipoint injection
Power SAE net 290 bhp @ 5600 rpm
Torque SAE net 290 lb-ft @ 4400 rpm
Redline 6500 rpm

DRIVETRAIN:
4-speed automatic transmission
Gear ratios (I) 2.96 (II) 1.63 (III) 1.00 (IV) 0.68
Final-drive ratio 3.71:1
Traction control system

MEASUREMENTS:
Wheelbase 99.4 in
Track front/rear 60.4/60.4 in
Length x width x height 178.7 x 73.4 x 51.5 in
Curb weight 3766 lb
Weight distribution front/rear 63/37%
Ground clearance 5.7 in
Coefficient of drag 0.35
Fuel capacity 23.0 gal
Cargo capacity 16.3 cu ft

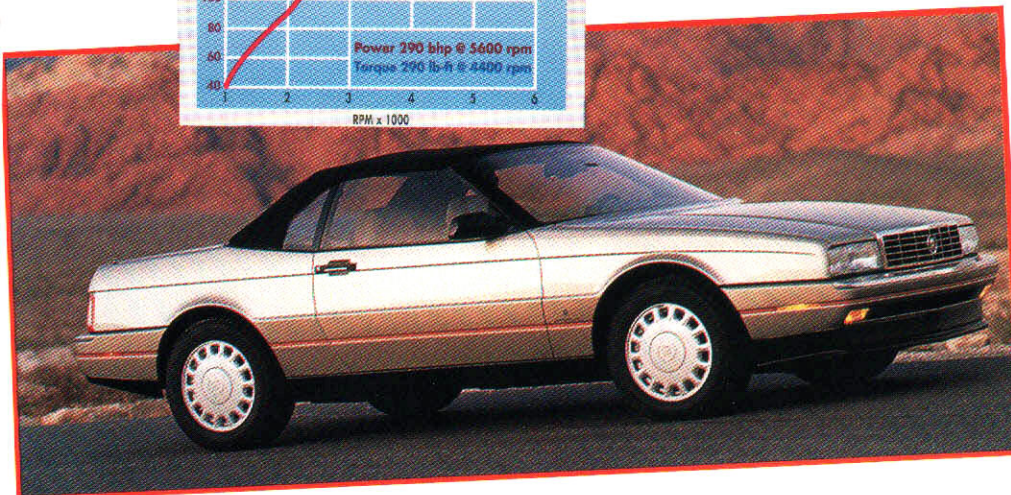
SUSPENSION:
Independent front, with electronically variable damper struts, coil springs, lower control arms, anti-roll bar
Independent rear, with electronically variable damper struts, coil springs, upper and lower control arms, anti-roll bar

STEERING:
Rack-and-pinion, variable-power-assisted
Turns lock to lock 2.7
Turning circle 40.2 ft

BRAKES:
Vented discs front and rear
Anti-lock system

WHEELS AND TIRES:
16 x 7.0-in cast aluminum wheels
225/60ZR-16 Goodyear Eagle GA tires

PERFORMANCE (manufacturer's data):
0-60 mph in 7.0 sec
Standing 1/4-mile in 15.1 sec
Top speed 150 mph
Pounds per bhp 13.0



1993 CADILLAC ALLANTÉ

nents. The electronic torque converter is bigger, and the new aluminum transmission case has been reshaped to accommodate a larger final drive and differential. Equal-length driveshafts go a long way toward controlling torque steer, a crucial element in a front-wheel-drive car that is seeing 290 pounds-feet at its 4400-rpm torque peak.

The new rear suspension pieces—a short upper arm and a longer lower arm locating each wheel hub, together with an additional lateral link—are mounted on a subframe. The geometry of this multi-link system helps control oversteer tendencies and rear lift during braking and helps keep maximum tire patch on the ground during cornering and braking. Cadillac has also developed what it calls the Road Sensing Suspension, an electronic system that monitors vertical wheel velocity and body acceleration and can adjust shock absorber damping rates independently at each wheel in real time. At 60 miles per hour, the road is being read one inch at a time.

So the guys wanted to show off all this good stuff, in addition to humongous new brakes, a speed-sensitive steering system (controlled by the same computer that's running the high-tech

suspension system), and new Z-rated 225/60ZR-16 Goodyear Eagle GA tires.

One thing led to another. The faster I charged toward the Valley of Fire, the harder I leaned on the suspension, and the better it worked. The harder I stood on the brakes—which were dynamite—the later I'd dive into the corners, reveling in the crisp steering, and the faster I'd go.

We returned to Interstate 15 eventually for that high-speed tear to Utah, and it was a gas. Power out of the hole, power at 50 mph, power at 80 mph, power at 9000 feet of elevation.

I found two flaws: At such a high altitude, the four-to-two downshift was a little harsh. (Karl Janovits, GM's engineering director of front-wheel-drive transmissions and one of the masterminds on the wonderful 4T60-E, called it "a hole in the calibration" and said it would be dealt with.) And I could fool the suspension if I hit a pothole with a sharp-edged drop. Ouch. That will also be scrutinized.


But here are two shining truths: The North Star engine is as smooth as a Lexus engine, with the performance excitement of an Infiniti's. And Cadillac is rare among the GM divisions in that it can build a high-performance car with a

suspension that doesn't sink to its knees when you push it past 90 mph. The Allanté still doesn't have the structural rigidity of the 500SL, but Mercedes-Benz might want to look at the Allanté's suspension. And its price tag.

In fact, if I hadn't been staring at the cheesy-looking instrument panel and wall of control buttons that have plagued the Allanté's interior since its debut, I would have given the nod to its rumored-to-be-\$67,000 price. (Some haggling is expected over this figure before the Allanté hits showrooms in the spring.)

Sure, there are other noteworthy improvements: The side-view mirrors are repositioned forward, a lower front spoiler was added to improve high-speed stability, and the window glass is now one piece that is 60 percent thicker for quieter and smoother operation. There are new seats (from the Eldorado), a redesigned top (no, not power, but new fabric), new wheels, and redesigned Mercedes-style seat controls.

But Cadillac's roadster is getting long in the tooth. One more round—in the design studio—and Cadillac will have it right. That will happen for the cockpit in 1994; a new skin is scheduled for 1996.

Cadillac is serious about this car. 

1993 Allanté With Northstar V-8: Subtle Change, Big Improvement

Over the past half-decade, the Lotus-developed Corvette LT5 has been the sole American response to five new multi-valve V-8s from Europe and Japan. But now the time has come for America to leave the technological sidelines, and it's only fitting that Cadillac, developer of the first high-compression V-8, should be first off the bench. Its new powerplant is named

"Northstar," for its leading role within GM, and next spring it will offer front-drive Cadillacs, starting with the Allanté, a substantial improvement in performance and refinement.

The alluring Allanté has always been Cadillac's technical testbed, and with Northstar that means, among other improvements, a 4.6-liter alloy block fitted with iron liners, free-floating forged aluminum pistons, chain-driven cams with hydraulic tappets, a

tuned thermoplastic intake manifold, computer-controlled port fuel injection and distributorless direct ignition. The result is 290 bhp at 5600 rpm, a whopping 90-bhp gain over the 4.5-liter ohv design. Torque benefits as well, though by a narrower margin: 290 lb-ft at 4400 rpm versus 270 at 3200. That makes the Allanté the most powerful fwd car in the U.S., a challenge it tames with a new transmission that blends electronic engine dialog and mechanical improvements to smooth shifts and reduce internal friction.

While Northstar helps the Allanté gain ground on the 322-bhp 500SL (Cadillac claims a 0-60 of 7.0 sec, vs.

6.4 for the 500SL in our testing), a new adjustable damping system swaps the previous all-wheels-at-once design for one that adjusts each wheel independently. Improving handling is a new independent rear suspension that mates coil springs and unequal-length upper and lower arms with a lateral link to control toe angle during suspension movement, reducing roll-induced oversteer. The new setup also minimizes brake dive on high-g stops. Finally, a new speed-sensitive steering system more smoothly proportions boost based on data from the same microprocessor that controls damping.

Given that the Allanté, from a dynamic perspective, is virtually a new car, Cadillac limited its interior and exterior changes, reasoning that the marketplace says it likes both as is, and the cost of the change couldn't be justified. "We don't run the Allanté like a charity," says Dave Hill, chief engineer for Allanté and Fleetwood. "People still point at the car, they like the way it looks. We don't need to beat them over the head with a new model."

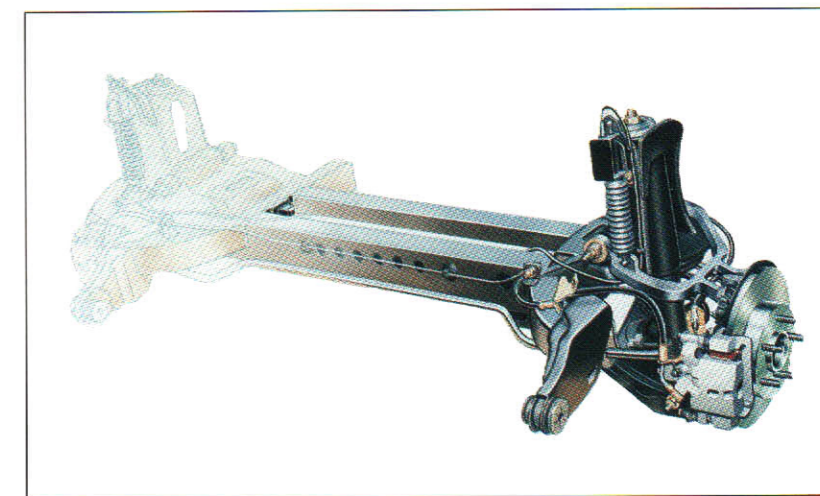
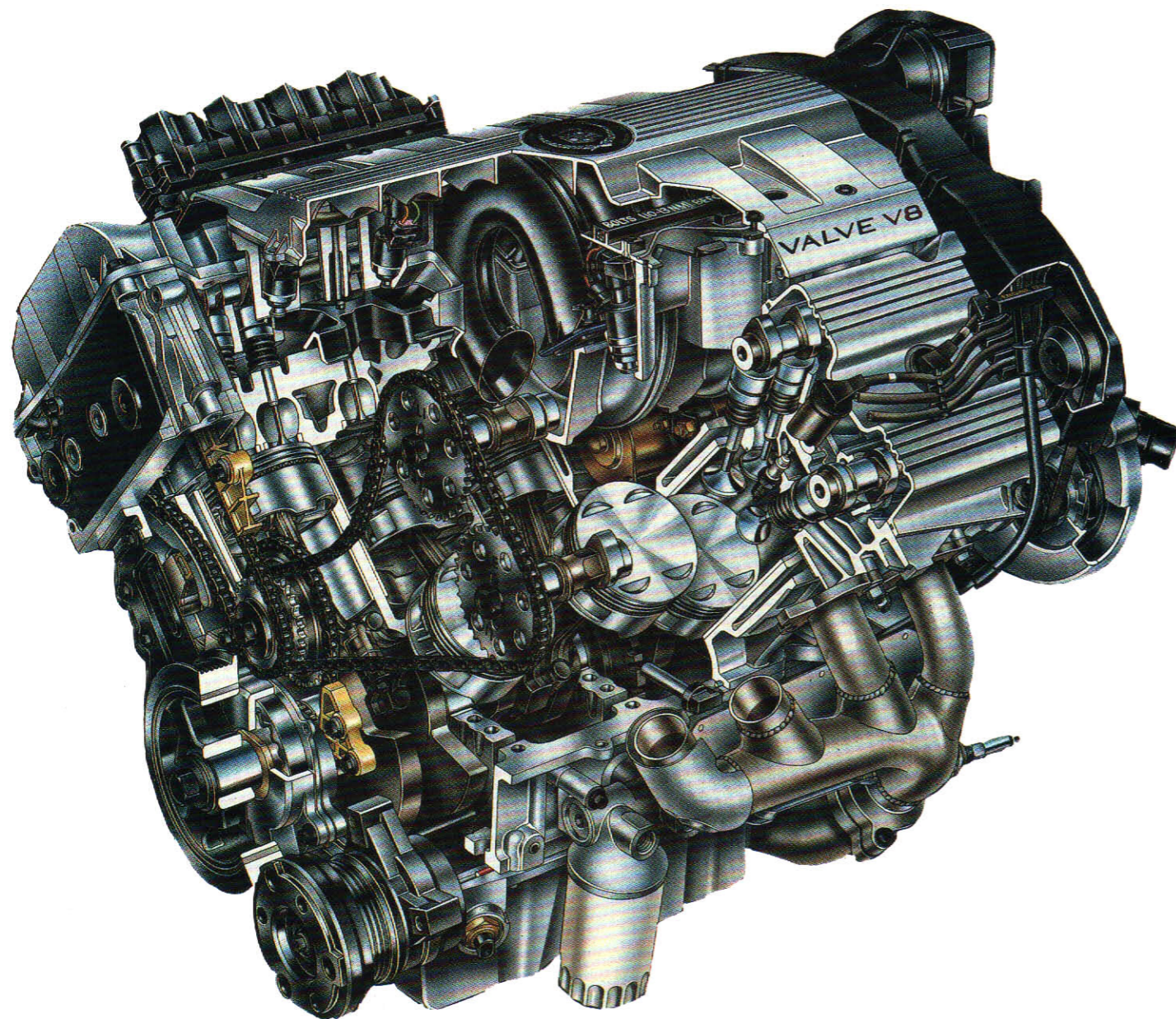
That said, a myriad of detail changes have made the car more livable, such as the deletion of the vent panes in the door glass, allowing the mirror to be moved forward to a more natural position. Equally functional but less aesthetically pleasing is a new chin spoiler

that reduces high-speed lift. Opening the doors is now easier, and inside redesigned seats receive a lumbar support that's adjustable both vertically and horizontally. There's even a pair of the now-ubiquitous cupholders, should you wish to take your Perrier along.

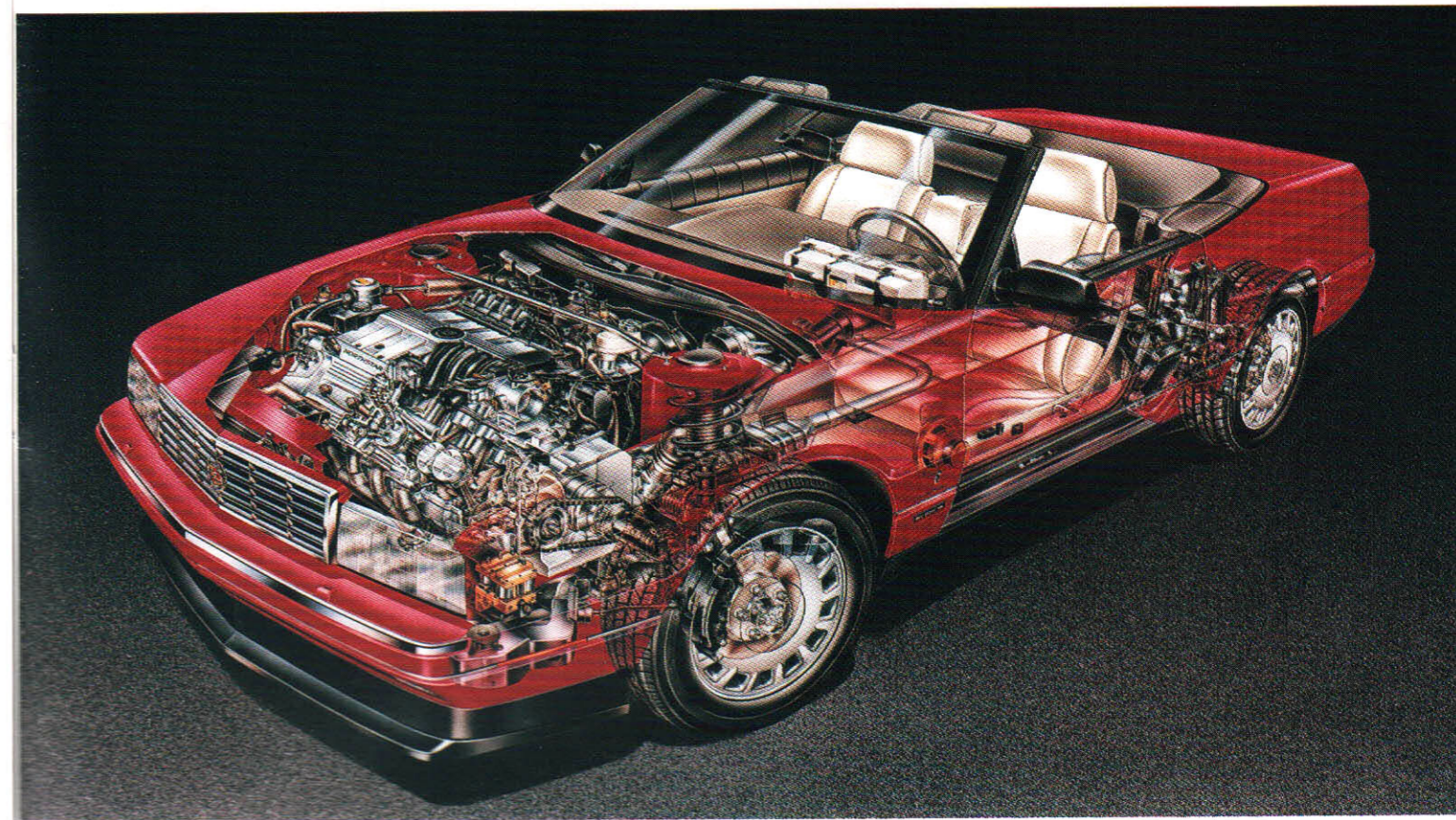
So does the whole exceed the sum of its parts? During a brief comparative stint with the 500SL I'd have to say yes. Apart from the silky thrust generated by its new engine, the most apparent improvement is the car's "rolling feel." Whereas the previous car had a comparatively firm ride and numb steering response, its replacement is more sup-

ple overall, offering greater road isolation, vastly improved ride quality, better directional stability and more responsive steering. The billet-like SL still excels in chassis stiffness, however, an advantage gained at a 400-lb premium over the Allanté.

Given that it will sell for, say, \$25,000 less than the \$90,000 SL, the 1993 Allanté is definitely more competitive than before. But will consumers look past its unchanged exterior and savor the technology below? That's a marketing hurdle something more substantial than Cadillac Style will have to surmount.—L.P.



DRAWINGS BY DAVID KIMBLE





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