

Porsche 928S

Faster is better.

• "The old man would spin in his grave if he saw what they're passing off as a Porsche these days," raved the gas-station attendant. "They've lost the original concept. Where's the rear engine? Where's the air cooling?" Our rebuttal, emphasizing the performance virtues of the 1985-model 928S, failed to sway the man's thinking one iota. To the pump jockey and to many enthusiasts, the only real Porsches are those

that perpetuate the design themes of the original 356 model, a car born nearly 40 years ago.

That's a shame, because the good doctor would doubtless be proud of this new 928S. Ferdinand Porsche believed that a sports car must offer transportation superior to a regular sedan's, and this doctrine is a cornerstone of the firm that bears his name today. Sports cars necessarily have

smaller payloads than sedans, but for this reason they can be more fuel-efficient and be designed for higher speeds. And, unlike our federal government, Porsche has always understood that, in transportation, faster is better. Jet aircraft have replaced ocean liners and trains for long-distance travel; people drive cars instead of riding bicycles; and even bicycles are faster than they used to be. Faster transportation, simply put, is better transportation.

By the speediness criterion, the 1985 Porsche 928S is a substantial improvement over its predecessor. Top speed is up 10 mph, to 154. Our five-speed test car rocketed from a standing start to 60 mph in 5.7 seconds and hit 100 mph less than eight seconds later; the old car required 6.2 and 17.8 seconds, respectively. And the new model burned through the standing quarter-mile in 14.0 seconds at 102 mph, compared with 14.7 seconds at 94 mph for last year's 928. We also tested the automatic version, and its performance is similarly improved. The automatic's 0-to-60 and quarter-mile times now match those of last year's five-speed, and its top speed is up 10 mph, to 152.

These are amazing figures for a car with extremely tall, fuel-economy-oriented gearing and more than enough power to break the tires loose at low speeds. Credit for the improvements belongs to the new 5.0-liter V-8 engine. With 288 bhp, it's a hefty 54 bhp stouter than the previous 928's 4.7-liter engine, which wasn't what you'd call a weakling. To put this brawn into proper perspective, the new motor makes one-third more power than Chevrolet's fuel-injected V-8 of the same displacement and 104 bhp more than Mercedes' American-specification 5.0-liter V-8.

Even more remarkable than this lofty power output is the Porsche V-8's broadband torque. Although the 302-pound-foot peak occurs at a relatively low 2700 rpm, more than 250 pounds-feet is on hand from 1300 to over 6000 rpm. Most 5.0-liter V-8s do well to exceed that level at any engine speed.

This engine magic is the direct result of the new four-valve-per-cylinder, twin-cam heads (*C/D*, February). The four-valve layout provides good high-rpm breathing, ensuring plenty of power. This in turn allowed Porsche's powertrain engineers to tune the engine's manifold and valve timing for efficient low- and medium-rpm breathing, providing good torque. The four-valve design also has a pent-roof combustion chamber with a centrally located spark plug, a design that resists detonation and promotes thermodynamically efficient combustion. Consequently, a high compression ratio (10.0:1) could be employed, enhancing both fuel economy and power output at all rpm.

EPA fuel-economy figures have improved slightly from last year's, so the 928S will stay off the dreaded gas-guzzler rolls.



Still, with its 18-mpg over-the-road mileage, this car won't be of much interest to fuel misers. The 928S's efficiency improvements are significant, though, because they are true to the Porsche philosophy that cars are transportation tools. As the company credo goes, fuel efficiency is important to the transportation function and should never be sacrificed, not even for higher performance.

It's good that the firm feels strongly about this, because once a 928S is in the hands of a customer, a touch of the accelerator will wipe out any interest in fuel economy. Not only can the driver effortlessly dial up just about any speed he desires, but the tall gearing and the broad output offer several alternatives to how he goes about his business. To effect nearly instantaneous speed changes, one uses the lower gears, even at very high speeds. Or one can remain exclusively in fifth from about 30 mph and still outpace most traffic. (Since the 928's shift linkage is still not a strong point, this approach is quite attractive.) Or one can specify the four-speed automatic, which always seems ready to transform the engine's plentiful power into blinding speed, requiring only an effortless touch on the accelerator.

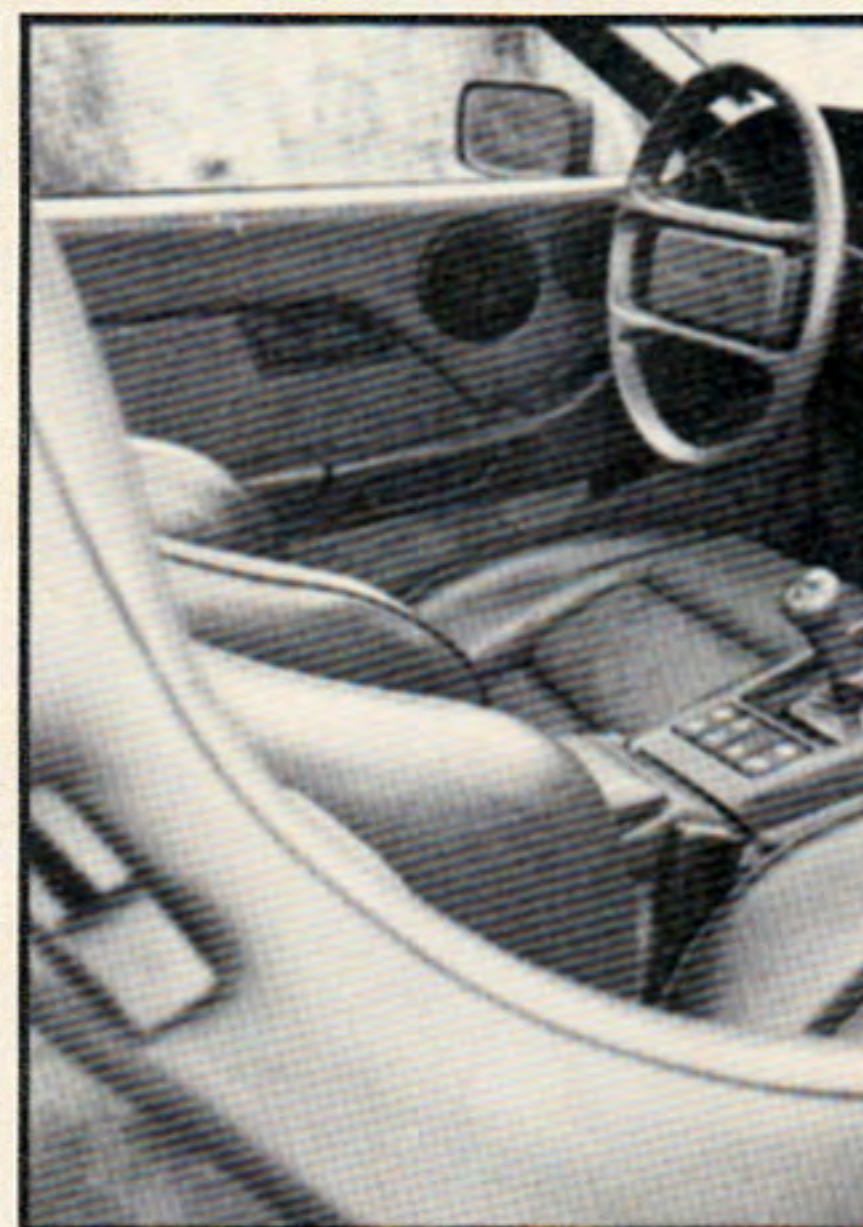
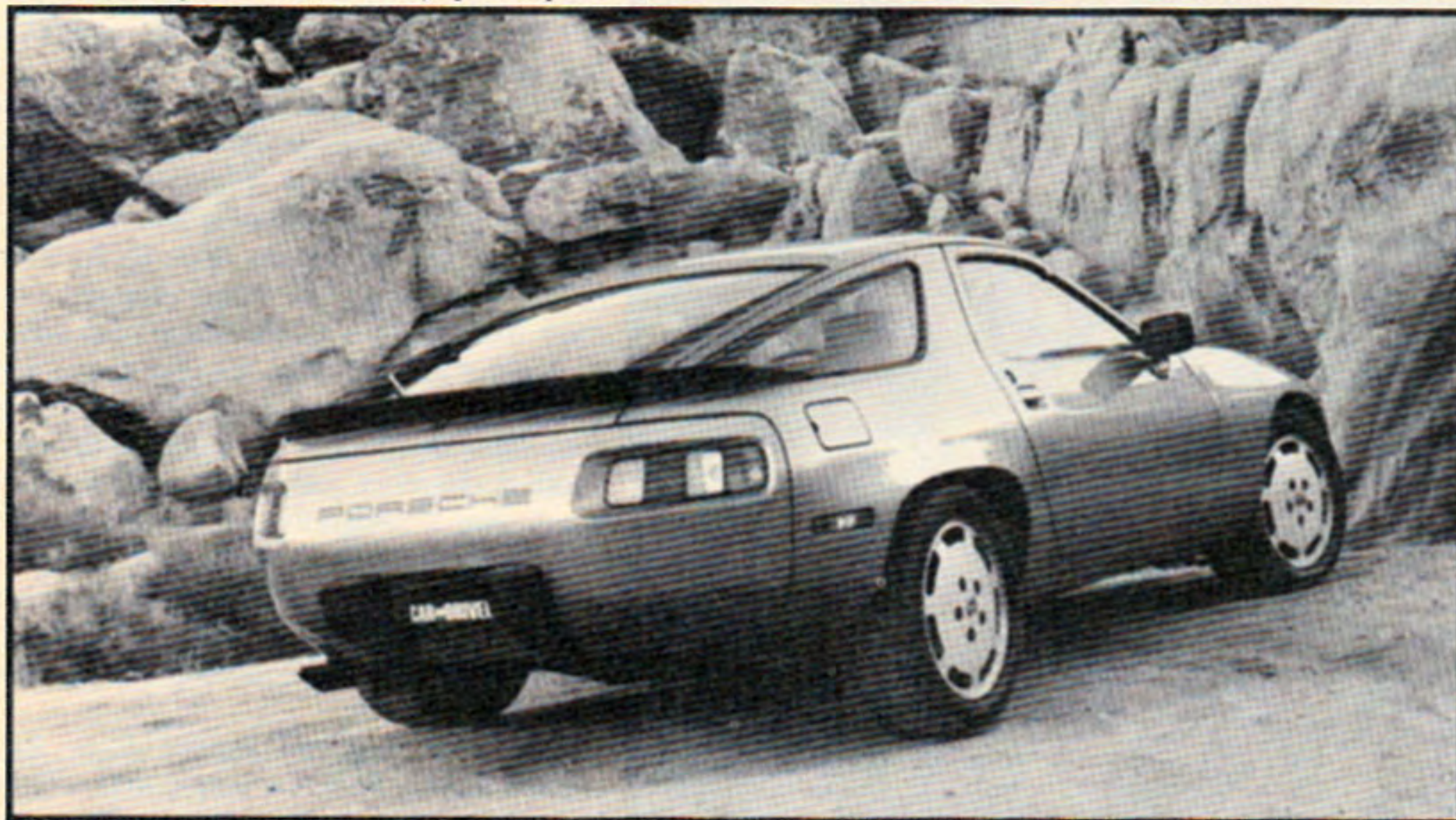
Despite the additional camshafts, valves, and output, the new 928S engine is no more obtrusive than its predecessor. This doesn't mean that it's totally isolated from the occupants, for, like most German cars, the 928S doesn't try to deny the fact that it is machinery. The whine of the cam drives, the tap of the hydraulic tappets, the rush of the gases flowing through the intake and exhaust systems, the hum of the various shafts and gears—all blend together to sing the muted song of a happy mechanism.

One would expect this song to be louder when one sees how stuffed with hardware the 928S is. Every nook and cranny under the hood is filled with engine, leading us to speculate that the assembly must somehow be cast in place. The bulky powerplant

forces the front suspension to be positioned so low that it occasionally drags the ground. In back, the spare-tire well, the battery, the transaxle, and a huge muffler occupy every inch of available space. The 928S's spinal column contains a torque tube and big-bore exhaust plumbing.

With so much of its volume full of machinery, it's no wonder that the 928S has little room for its occupants. The front-seat passengers have sufficient space, but anyone banished to the rear seats will want to have some means of forcing the front occupants into close proximity with the dashboard. Luggage space is also in critically short supply.

The two primary occupants are well coddled, however. The all-enveloping, cocoonlike interior is still as attractive in 1985 as it was at the car's introduction in 1978. This year, the major addition is a new set of power seats as standard equipment. Each front bucket has two four-way

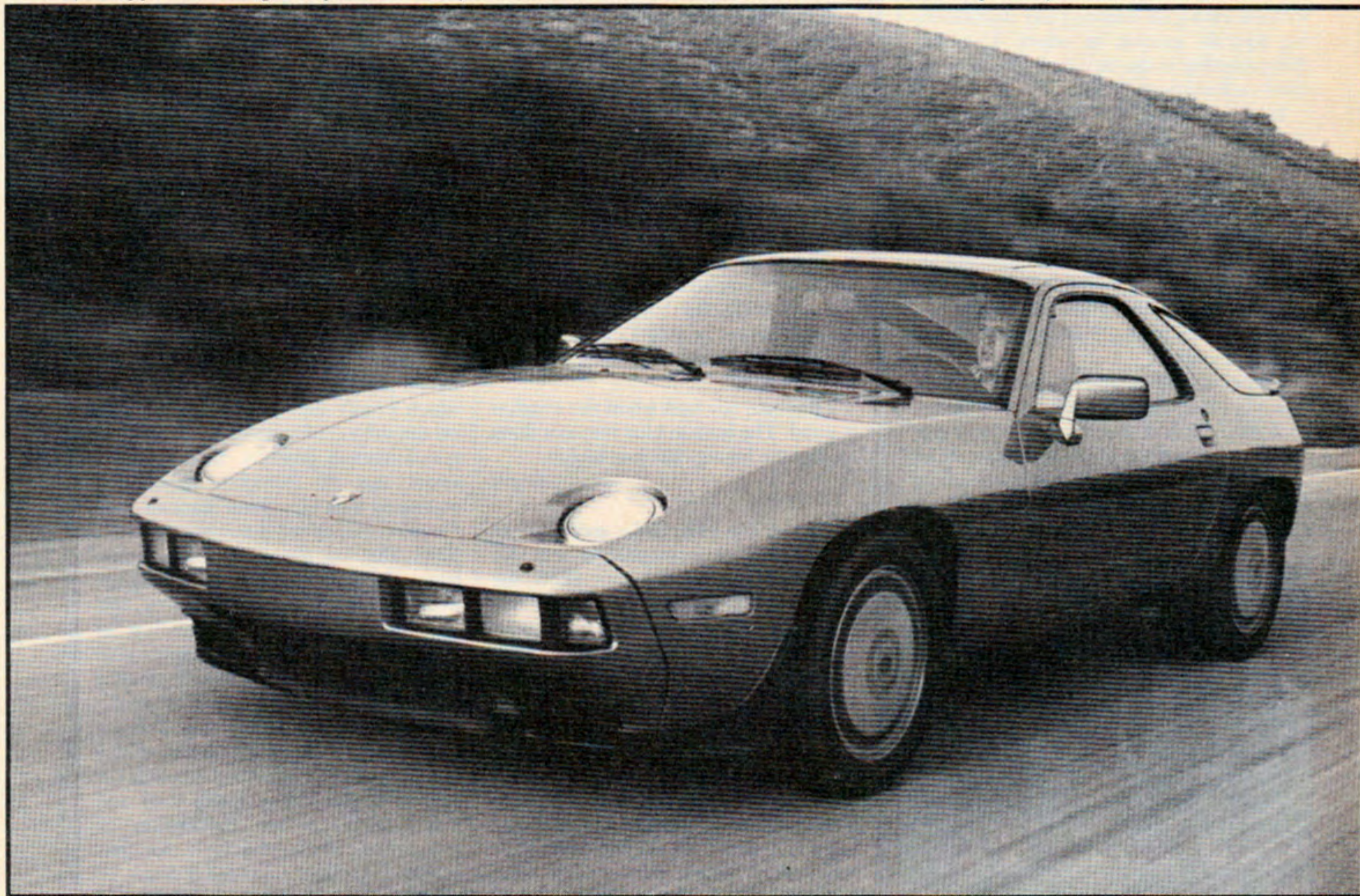


switches on its outside flank to control front and rear height, fore-and-aft position, and backrest angle. The bottom cushions are a half-inch lower than before, providing more headroom, and the side bolsters are significantly larger. There is additional lateral support, and it is indeed appreciated, partly because it comes with no loss in comfort. These seats are cushy enough to provide a soft initial sit-down, yet supportive enough for pleasant all-day

runs. In short, the 928S's seating is exactly what one expects in a serious transportation tool.

One also expects superior handling and roadholding, and the 928 does not disappoint. No suspension changes were made to accommodate the increased power, because none were necessary: European 928s have been operating at similar power levels for several years, and chassis tuning has been the same here and there for some

time. Thus the new 928S has the same uncanny combination of straight-line stability and instant responsiveness that we've come to relish over the years. In everyday driving, its suspension does a nice job of communicating pertinent tire-to-road information while blocking the transmittal of most pavement imperfections. When the road gets seriously twisty, the 928S seems to become smaller and lighter on its feet. It's supremely controllable with either the



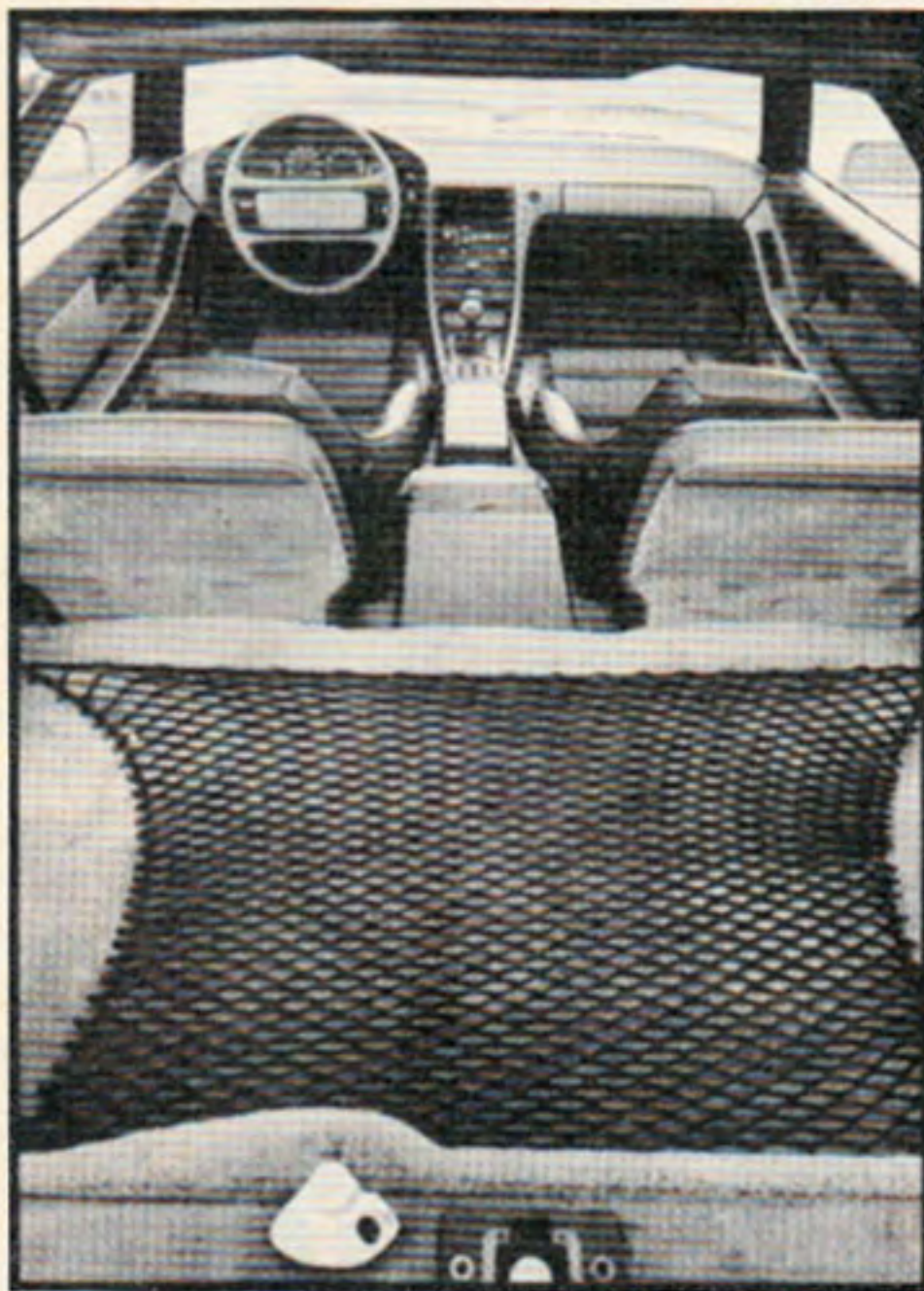
steering or the throttle in hard corners, and any decent driver can use its impressive 0.83-g grip with confidence and safety.

The braking system is also reassuring, thanks to linear performance, well-proportioned front-to-rear balance, and excellent modulation. These characteristics contribute to the 928S's ability to stop from 70 mph in just 175 feet. Perhaps even more impressive is the brake system's ability to absorb the energy of triple-digit speeds without fading or emitting any disconcerting squeals, groans, or odors. The only thing missing is the anti-lock system standard on European 928Ss.

In the design of a versatile, high-speed transportation device, no aspect of performance can be overlooked. Without its strong brakes, for example, the 928's strong engine could not be fully exploited to provide faster and better transportation. Dr. Porsche espoused this attitude, and we think he would be well satisfied with the way the 928S follows his philosophies—even if it does have a water-cooled, front-mounted engine.

Unfortunately, 40 years of progress does cost a lot: the new 928S will set you back a cool \$50,000. But if your taste in very fast cars runs toward the functional rather than the spectacular, you'll be hard pressed to find a better deal than the one available at your neighborhood Porsche store.

—Csaba Csere



COUNTERPOINT

• I can tell you what this car is like in the snow. It's *hilarious!*

I had no chance to run our 928 in dry weather. Now the weather is all white, and I'm going out of town, and the meanies at Porsche are hand wringing about getting their four-valve 928S toy back pronto. So it was me and the four-valve against snow white. The four-valve and I won in a sideways breeze.

See, we've got the automatic here, and that takes all the slack out of it. The engine behaves so beautifully at idle that you simply release the brakes and you get rolling pretty as you please. The revs rise so controllably that you make delicate adjustments without distraction, so your attention goes farther up the road. So well distributed is the weight of the 928 that it even accelerates with a rush in the snow. And when it yaws, the softest of dabs with the wheel sets you straight—amazing for a car with wide, flat VR-rated tires and enough power to put Con Ed on the skids. Only the mighty brakes need extra-special care.

I want my toy back when the weather is good. The boys in blue may not think so, but the hilarity has just begun.

—Larry Griffin

Since I'm the only bloke around here who's been lucky enough to drive both a five-speed and an automatic 928S, the difficult job of picking between the two falls on my shoulders. This used to be easy for me because the manual gearbox had so many flaws. The automatic was made for the job because it minimized the interruptions of power flow from the lovely V-8 engine.

Porsche apparently knew that its five-speed wasn't perfect: even though only a thousand or so manual 928s are sold in the U.S. each year, the engineers have redesigned certain parts of the shift

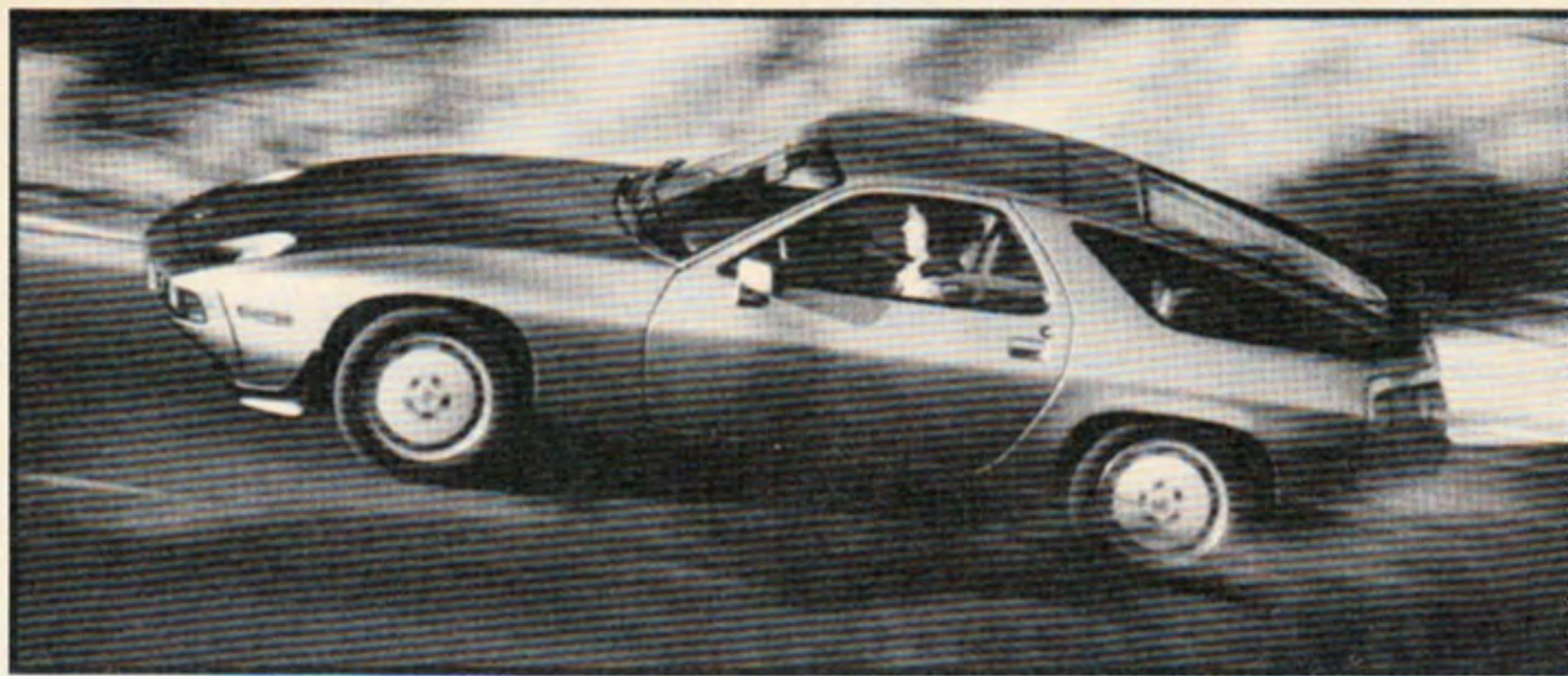
linkage in order both to shorten the throws and to reduce the effort. (Fans of the "racing" five-speed shift pattern will be happy to hear that first gear is still down and to the left, off the H.)

So far I've seen two 1985 928S five-speeds that shifted beautifully (those at the initial preview) and one that was cantankerous (our test car). In the last case, second gear was vague and hard to find, the clutch engagement felt nonlinear, and the shifter's spring loading to the right of the H was annoyingly high. Until I have the chance to conduct a more comprehensive survey, my recommendation stays with the automatic.

—Don Sherman

I'm still thrilled at the sight of a 928, S or otherwise, coming up in my rear-view mirror. There is no current-production Ferrari or Lamborghini that could give me greater pleasure than a 32-valve 928S, and there is no car I would rather own. It is unfortunate that the 928S of my dreams would cost me about what I would pay for a farm in the Irish Hills, which I can't afford either. I'd be torn on the subject of automatic versus five-speed manual gearbox. In my heart I know that all Porsches should be equipped with five-speed manuals, and I love the five-speed that comes with the 928S. But, on the other hand, I also know that the Porsche 928S engine, with its eight cylinders, 32 valves, 288 horsepower, and 302 pounds-feet of torque, needs a manual transmission about as much as Susan Sarandon needs a third nostril. Maybe I'd get the automatic and try to drive it so that on-lookers would think it had the manual. I dunno. I *do* know, however, that this car embodies everything, inside and out, that I regard as the embodiment of automotive virtue. There is, for me, simply none nicer. —David E. Davis, Jr.





Vehicle type: front-engine, rear-wheel-drive, 2+2-passenger, 3-door coupe

Price as tested: \$50,000

Options on test car: none

Sound system: Blaupunkt Köln AM/FM-stereo radio/cassette, 8 speakers, 9 watts per channel

ENGINE

Type V-8, aluminum block and heads
 Bore x stroke 3.94 x 3.11 in, 100.0 x 78.9mm
 Displacement 303 cu in, 4957cc
 Compression ratio 10.0:1
 Fuel system Bosch LH-Jetronic fuel injection
 Emissions controls 3-way catalytic converter, feedback fuel-air-ratio control, auxiliary air pump
 Valve gear .. belt- and chain-driven double overhead cams, 4 valves per cylinder, hydraulic lifters
 Power (SAE net) 288 bhp @ 5750 rpm
 Torque (SAE net) 302 lb-ft @ 2700 rpm
 Redline 6100 rpm

DRIVETRAIN (5-speed)

| Gear | Ratio | Mph/1000 rpm | Max. test speed |
|------|-------|--------------|--------------------|
| I | 4.07 | 8.1 | 49 mph (6100 rpm) |
| II | 2.72 | 12.1 | 74 mph (6100 rpm) |
| III | 1.93 | 17.0 | 104 mph (6100 rpm) |
| IV | 1.46 | 22.5 | 137 mph (6100 rpm) |
| V | 1.00 | 32.8 | 154 mph (4700 rpm) |

DRIVETRAIN (automatic)

| Gear | Ratio | Mph/1000 rpm | Max. test speed |
|------|-------|--------------|--------------------|
| I | 3.68 | 8.9 | 54 mph (6100 rpm) |
| II | 2.41 | 13.6 | 83 mph (6100 rpm) |
| III | 1.44 | 22.8 | 139 mph (6100 rpm) |
| IV | 1.00 | 32.8 | 152 mph (4650 rpm) |

DIMENSIONS AND CAPACITIES

Wheelbase 98.4 in
 Track, F/R 60.4/59.9 in
 Length 175.7 in

Width 72.3 in
 Height 50.5 in
 Frontal area 21.0 sq ft
 Ground clearance 4.7 in
 Curb weight (5-speed) 3450 lb
 Weight distribution, F/R (5-speed) 51.0/49.0%
 Fuel capacity 22.7 gal
 Oil capacity 7.9 qt
 Water capacity 16.0 qt

CHASSIS/BODY

Type unit construction
 Body material welded steel and aluminum stampings

INTERIOR

SAE volume, front seat 53 cu ft
 rear seat 21 cu ft
 trunk space 8 cu ft
 Front seats bucket with 8-way power assist
 Recliner type infinitely adjustable
 General comfort poor fair good excellent
 Fore-and-aft support poor fair good excellent
 Lateral support poor fair good excellent

SUSPENSION

F: ind, unequal-length control arms, coil springs, anti-sway bar
 R: ind, unequal-length control arms, coil springs, anti-sway bar

STEERING

Type rack-and-pinion, power-assisted
 Turns lock-to-lock 3.0
 Turning circle curb-to-curb 37.7 ft

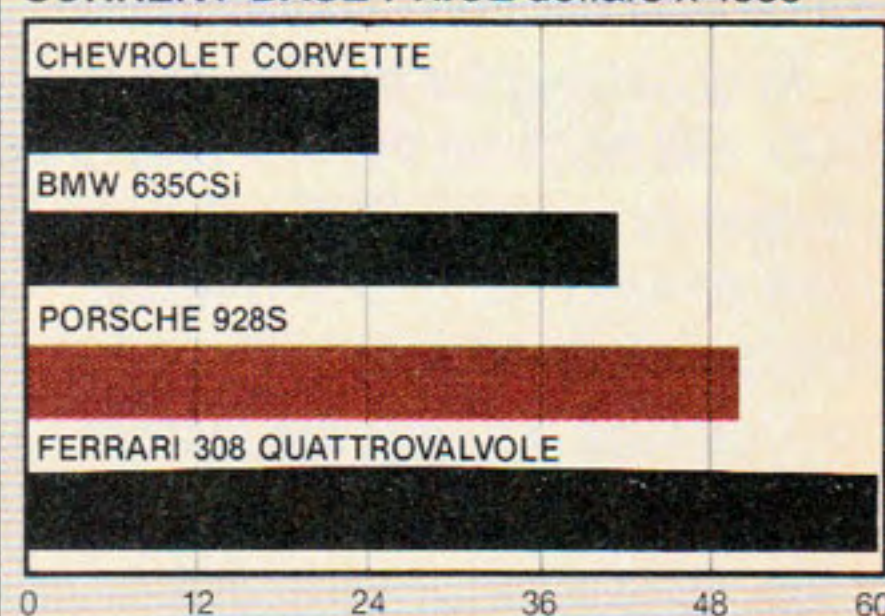
BRAKES

F: 11.1 x 1.3-in vented disc
 R: 11.4 x 0.8-in vented disc
 Power assist vacuum

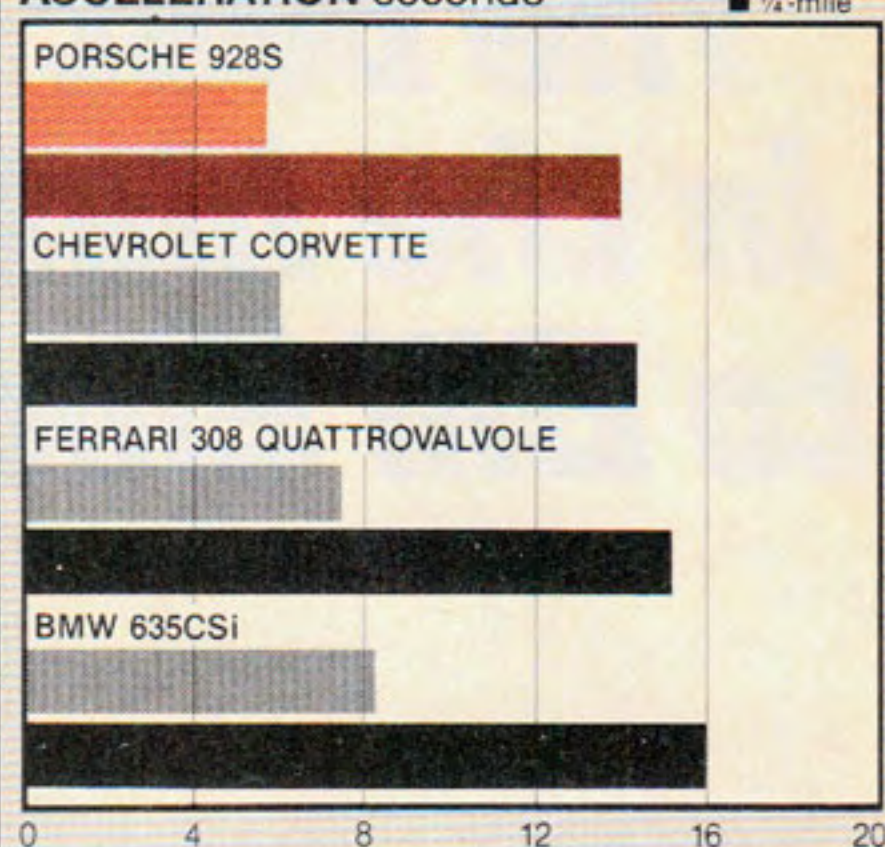
WHEELS AND TIRES

Wheel size 7.0 x 16 in
 Wheel type forged aluminum
 Tires Dunlop SP Sport Super D4, 225/50VR-16
 Test inflation pressures, F/R 36/42 psi

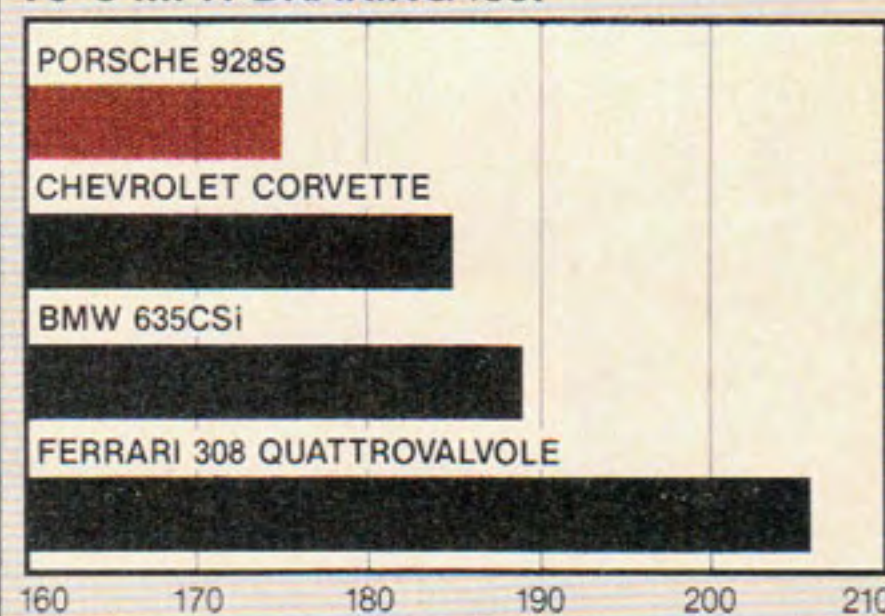
CURRENT BASE PRICE dollars x 1000



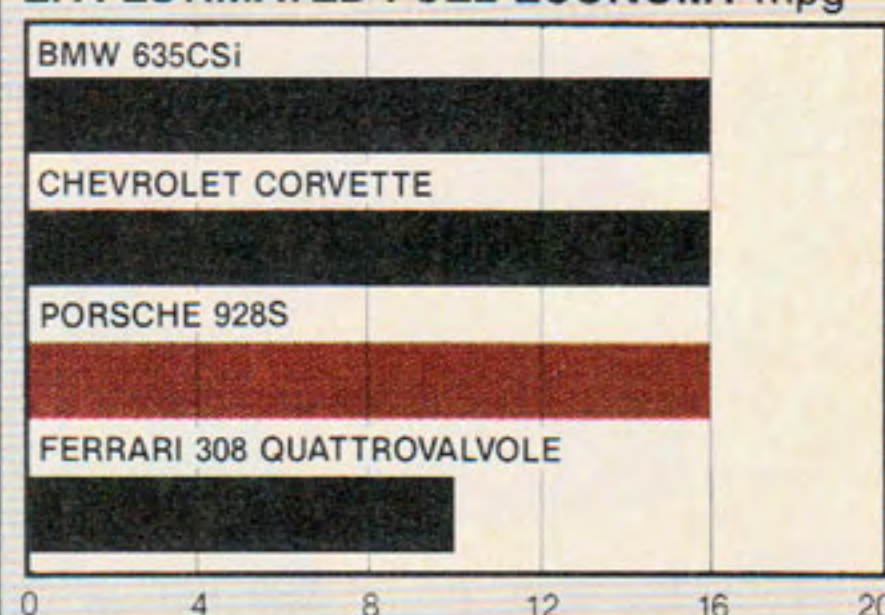
ACCELERATION seconds



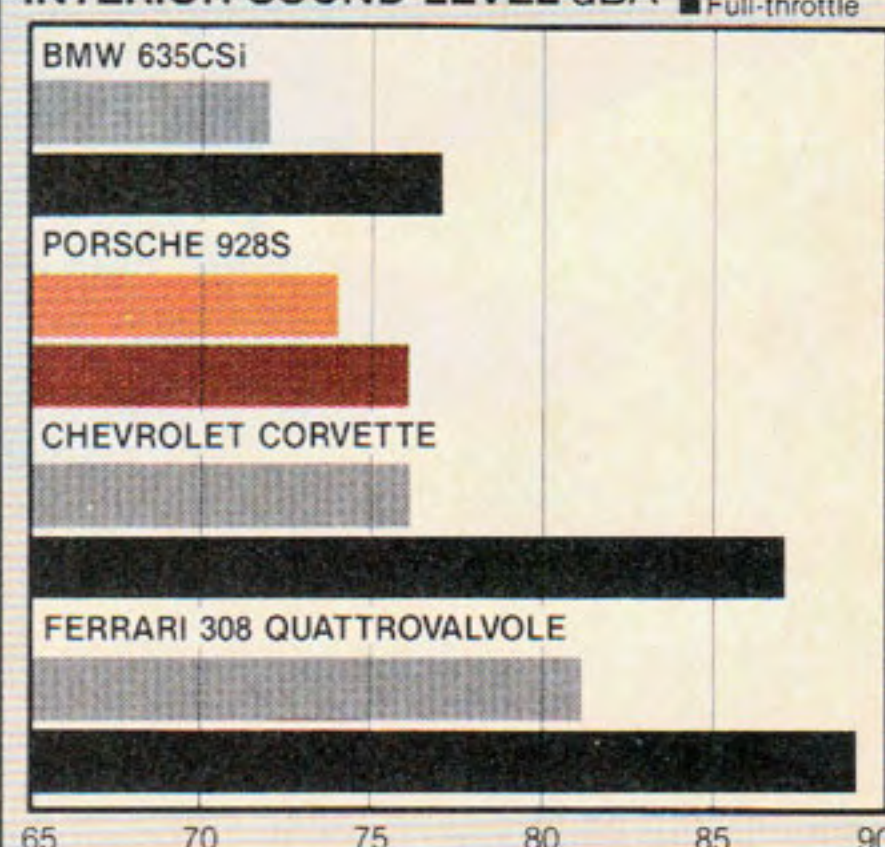
70-0 MPH BRAKING feet



EPA ESTIMATED FUEL ECONOMY mpg



INTERIOR SOUND LEVEL dBA



CAR AND DRIVER TEST RESULTS

ACCELERATION (5-speed)

| Speed | Seconds |
|----------------------------------|--------------------|
| Zero to 30 mph | 2.3 |
| 40 mph | 3.1 |
| 50 mph | 4.4 |
| 60 mph | 5.7 |
| 70 mph | 7.2 |
| 80 mph | 9.2 |
| 90 mph | 11.3 |
| 100 mph | 13.5 |
| Top-gear passing time, 30-50 mph | 8.9 |
| 50-70 mph | 9.7 |
| Standing 1/4-mile | 14.0 sec @ 102 mph |
| Top speed | 154 mph |

ACCELERATION (automatic)

| Speed | Seconds |
|----------------------------------|-------------------|
| Zero to 30 mph | 2.5 |
| 40 mph | 3.5 |
| 50 mph | 4.6 |
| 60 mph | 6.2 |
| 70 mph | 7.9 |
| 80 mph | 9.8 |
| 90 mph | 12.9 |
| 100 mph | 17.1 |
| Top-gear passing time, 30-50 mph | 3.5 |
| 50-70 mph | 3.5 |
| Standing 1/4-mile | 14.7 sec @ 94 mph |
| Top speed | 152 mph |

BRAKING

70-0 mph @ impending lockup 175 ft
 Modulation poor fair good excellent
 Fade none moderate heavy
 Front-rear balance poor fair good

HANDLING

Roadholding, 300-ft-dia skidpad 0.83 g
 Understeer minimal moderate excessive

COAST-DOWN MEASUREMENTS

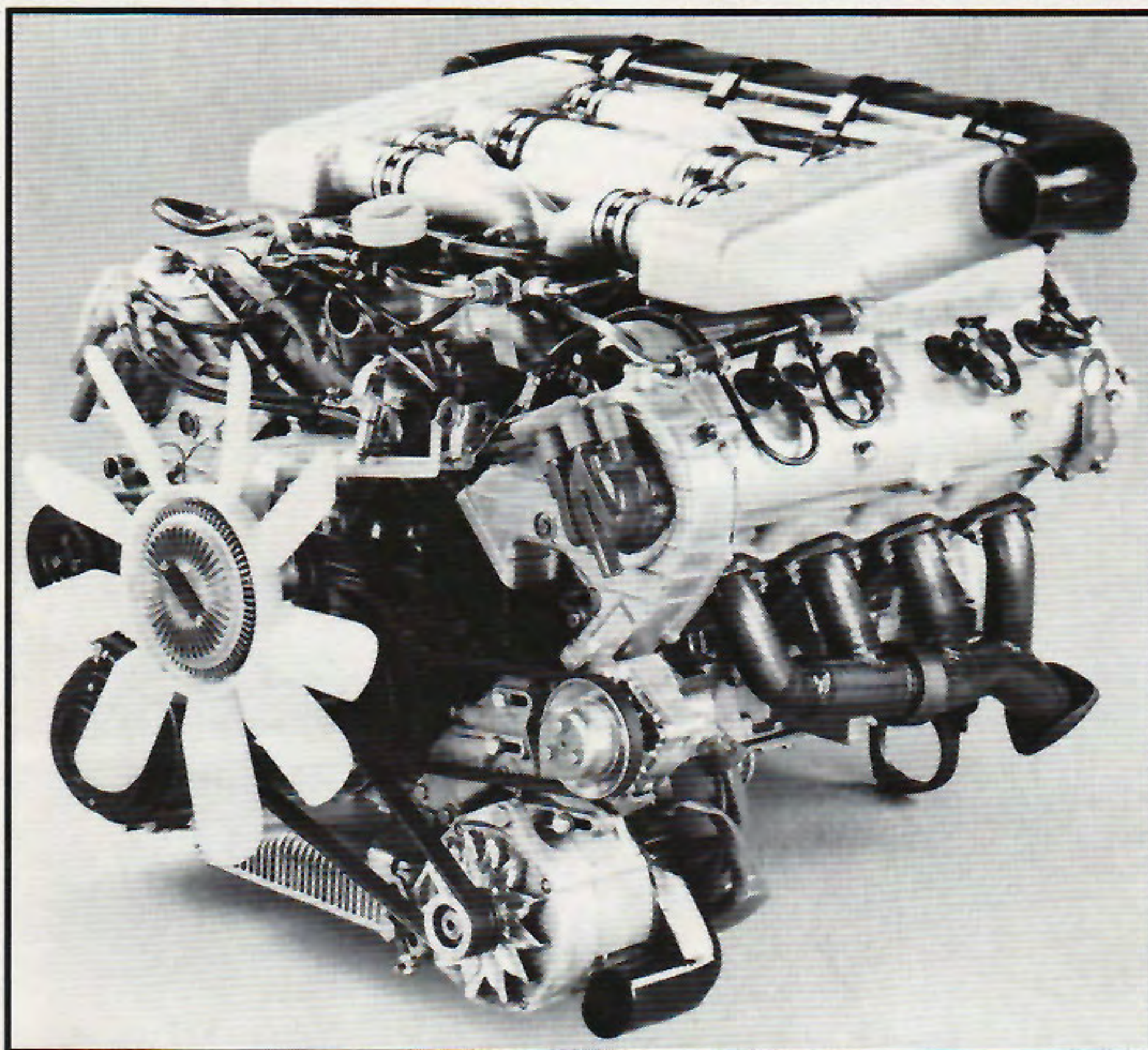
Road horsepower @ 50 mph 15.5 hp
 Friction and tire losses @ 50 mph 6.5 hp
 Aerodynamic drag @ 50 mph 9.0 hp

FUEL ECONOMY

EPA city driving, 5-speed 16 mpg
 automatic 17 mpg
 EPA highway driving, 5-speed 25 mpg
 automatic 23 mpg
 C/D observed, 5-speed 18 mpg

INTERIOR SOUND LEVEL (5-speed)

Idle 55 dBA
 Full-throttle acceleration 76 dBA
 70-mph cruising 74 dBA
 70-mph coasting 74 dBA



Porsche Potency

Belts! Chains! Four cams! 32 valves! 288 horsepower!

BY DON SHERMAN

• The tide has turned. Never before in recorded history has a European car manufacturer tooled up such an elaborate package of technical advances and aimed it first and foremost at America. For the next two years or so, Porsche will be shipping 928 models to the U.S. with sophisticated twin-cam, four-valve cylinder heads *that will not be available in its home market.*

This radical move is a creative way to pump a bit more life into Porsche's flagship and simultaneously to throw the gray market a surprise curve ball. Thanks to the new under-hood technology, the 928's horsepower, torque, fuel economy, acceleration, and top speed are all significantly improved. Naturally, the price will take a fat hike as well: the final figures haven't yet been released, but John Cook, president of Porsche Cars North America, advises that the window stickers for the 1985 models will be pushing \$50,000, an increase of roughly \$5000.

In joining the rapidly growing four-valve-per-cylinder club (Ferrari, Lotus, Saab, and Toyota have four-valve engines on the U.S. market, and Jaguar, Mercedes, Oldsmobile, and others will join them in the near future), Porsche has added a few

of its own technical twists to the 79-year-old idea. Though the 928's pent-roof combustion chambers, centralized spark-plug location, notched pistons, and free-flowing ports are standard practice with four-valve designs, the visionaries of Weissach have come up with what we believe is a unique system of driving the quartet of camshafts.

The new cam-drive system was crucial to Porsche's goal of preserving as much of the existing all-alloy V-8 as possible. Obviously, new cylinder-head castings were a must, but Porsche engineers, led by Paul Hensler, the firm's director of powertrain design and development, did manage to salvage nearly every last detail of the original engine's toothed-rubber-belt drive mechanism. This accomplishment was significant because a new layout in this area would have scrambled all the accessory drives and demanded a new design for the front half of the engine.

Several fresh features have been added to the layout, however. The drive belt has stronger reinforcement fibers, and its tension is now automatically maintained by a hydraulically damped bimetallic-strip device. (Similar materials are used in home thermostats; in the Porsche's case, heat causes the tensioner to shift position and take up any slack in the cam belt.) The new

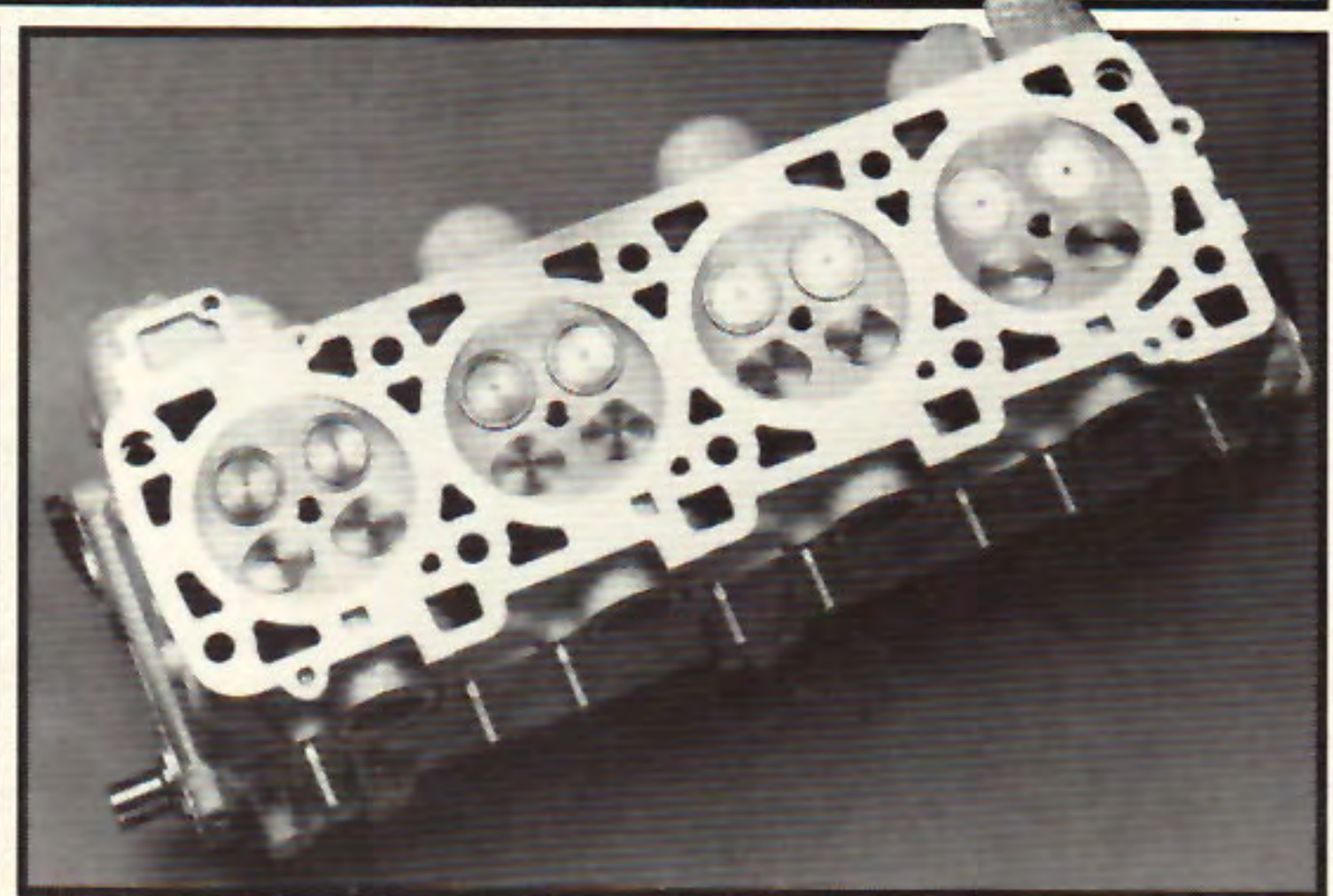
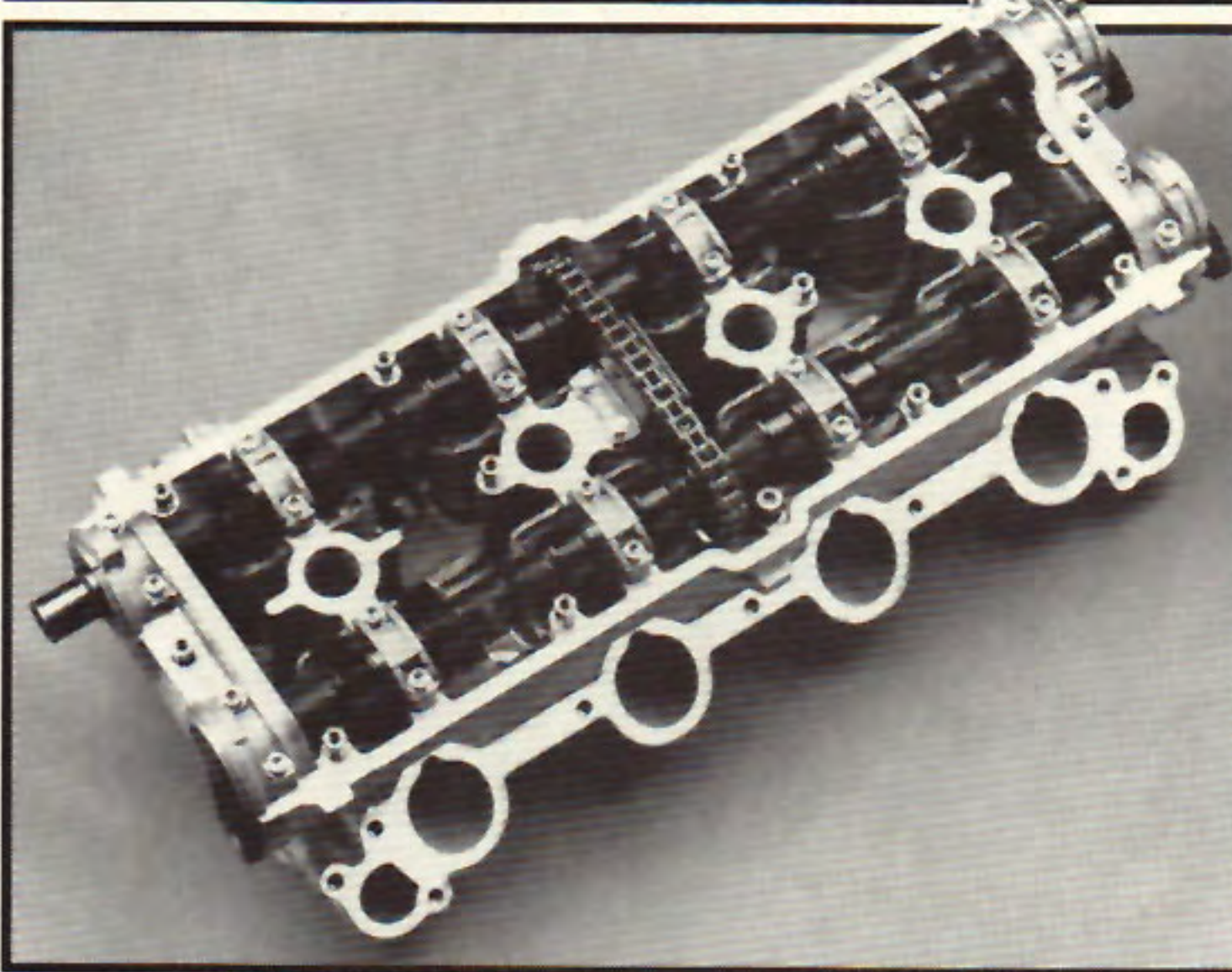
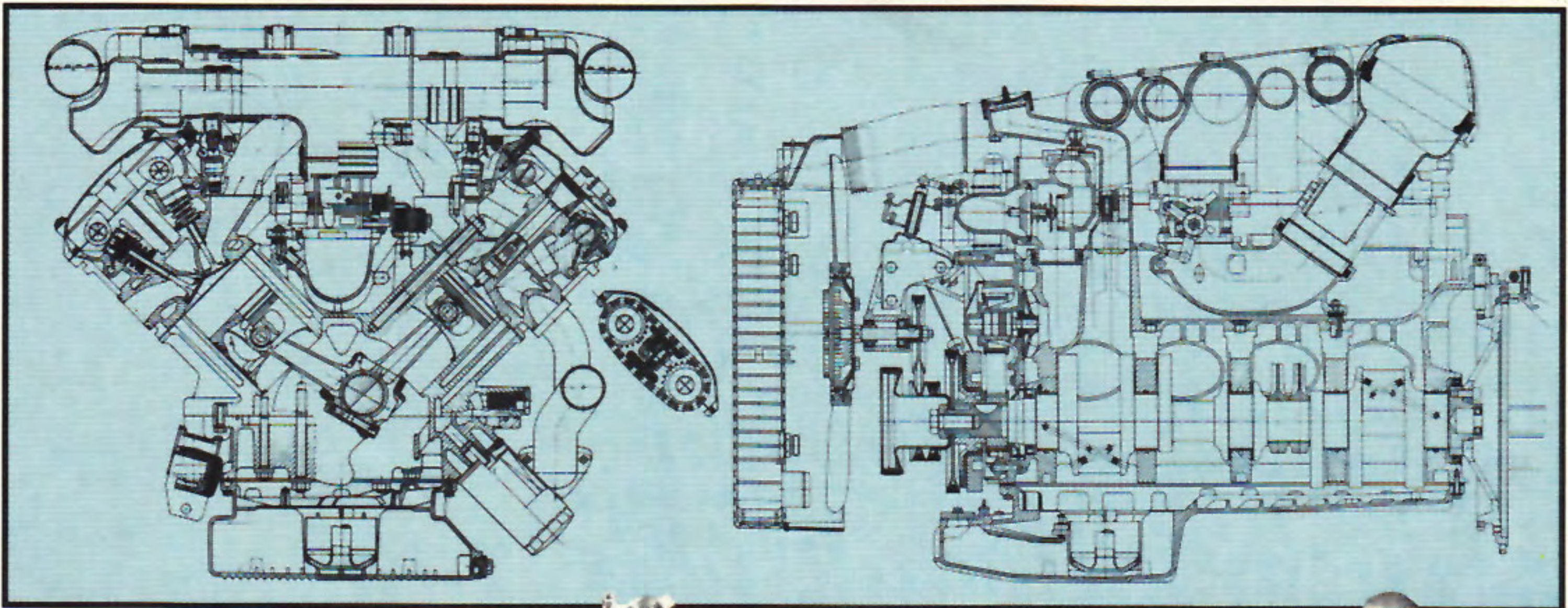
exhaust camshafts are driven directly by the long rubber belt, and they lie in the same location used in the single-overhead-cam head. The intake camshafts are positioned several inches inboard and are driven by a short run of single-row roller chain that loops around both of the camshafts in each head (see drawing). Each of the chains is positioned centrally along the length of its head and has its own automatic tensioner-damper device.

Hydraulic lifters between the cam lobes and the valves make periodic lash adjustment unnecessary. Many manufacturers favor a separate, bolt-on carrier for the camshafts and the lifters, but Porsche has incorporated this function in the elaborate aluminum cylinder-head castings.

Unfortunately, you can't see much of the heads' mechanical beauty when you raise the hood: they are shrouded by an intake manifold that looks like something designed to accompany the Mormon Tabernacle Choir. It comprises two massive plenums running lengthwise, a huge air-filter housing across the back, eight pipe-organ-like runners, and one more tube that connects the plenums with a central air meter. To take maximum advantage of the harmonic-resonance effects inside the intake manifold, no two consecutively firing cylinders draw from the same plenum. This system, together with the 928's low hood, necessitates two different tuned lengths, a design feature that in itself helps spread the ram-tuning torque boost over a broader rpm range. To save weight, all the intake-manifold pieces are cast magnesium.

The new race-bred valvetrain is only one item in a long list of updates for the 928's V-8. The cylinder bores are three millimeters larger, bumping the displacement from 4.7 to 5.0 liters. The main-bearing webs are meatier so that they can withstand higher loadings. The compression ratio has been increased to 10.0:1 (up from last year's 9.3:1). The Bosch electronic fuel injection is now signaled by a hot-wire mass-airflow sensor. The ignition is the latest Bosch Motronic system; it selects from a map of 256 combinations of spark advance and fuel-air ratio. The new exhaust system is a true dual-pipe design, featuring lightweight stainless-steel-tubing headers, a catalyst that is much larger in frontal area and volume, a higher loading of platinum and rhodium (the noble metals inside a catalytic converter), and a twelve-percent reduction in full-load back pressure.

The fancy hardware does indeed make a significant difference, both in what goes into the engine and in what comes out. Fuel economy is slightly better with either the five-speed manual or the four-speed automatic (although the correction factors used to determine the 1985 EPA ratings produce lower window-sticker figures). The torque curve now has a nice, fat hump at a very usable 2800 rpm, and it's both flatter (overall) and higher on the scale than

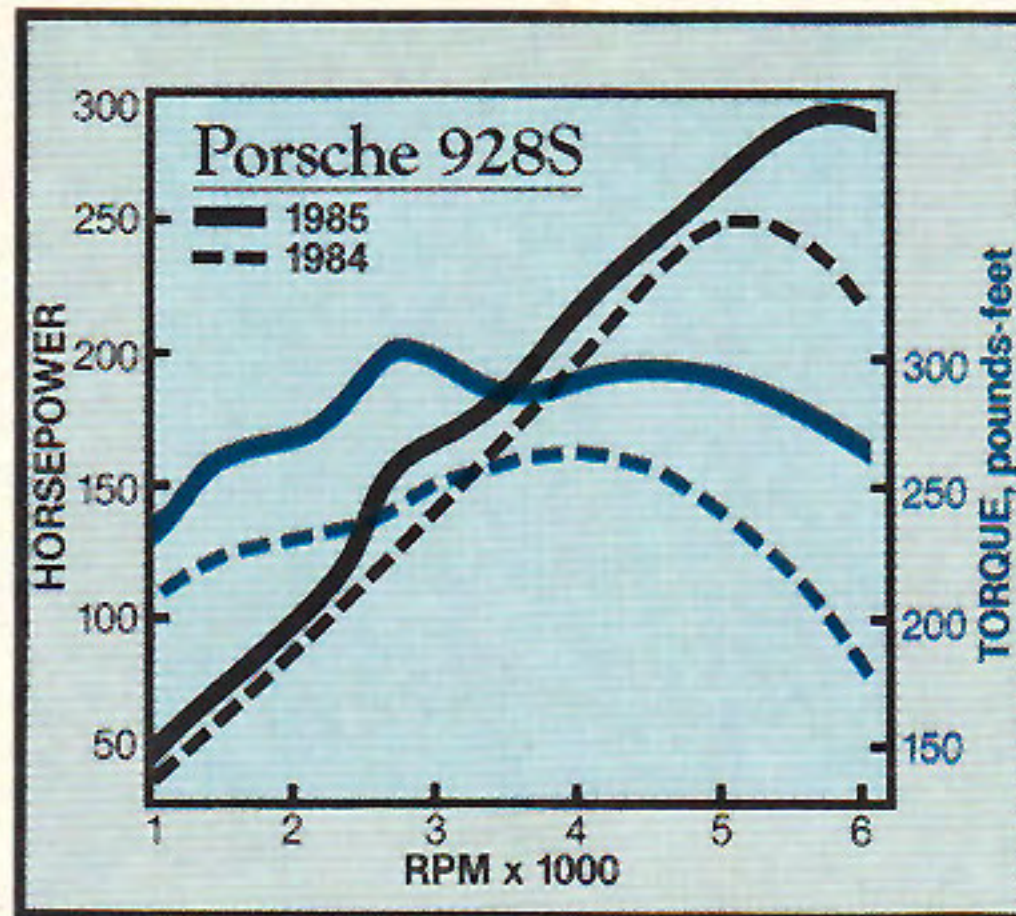


Porsche's clever two-stage cam-drive system allowed the addition of twin-cam cylinder heads without a complete redesign of the 928 V-8.

the 4.7-liter engine's output curve. Rated horsepower is up to 288 hp, a 23-percent improvement, and its peaking speed has been raised by 500 rpm.

Although we haven't yet been given an opportunity to conduct full test procedures, our initial driving experiences in American-spec 928s and Porsche's own performance figures make it clear that this car is now a proud member of the 150-mph club. The manual-transmission version is particularly brilliant in its throttle response, whether you're chugging along at 2000 rpm in third or hammering at the atmosphere at 4500 rpm in fifth.

The rationale for the new four-valve engine goes well beyond simple torque-curve plumping. A very potent 944 Turbo will be here in a few months—capable of exceeding 150 mph, according to reliable reports—and it wouldn't be appropriate for that upstart to fly by Porsche's flagship in top-speed and acceleration performance. Furthermore, it is Porsche's stated intention to eliminate systematically the performance differences that currently exist between U.S.-spec and European models. (The new Turbo will be a "world" car, equipped with the same basic hardware for all markets.) Equalizing U.S. and German



| | | |
|-----------------------------|---|----------|
| Engine type | V-8, aluminum block and heads | |
| Bore x stroke | 3.94 x 3.11 in, 100.0 x 78.9mm | |
| Displacement | 303 cu in, 4957cc | |
| Compression ratio | 10.0:1 | |
| Engine-control system | Bosch Motronic | |
| Valve gear | belt-and-chain-driven double overhead cams, hydraulic lifters, four valves per cylinder | |
| Power (SAE net) | 288 bhp @ 5750 rpm | |
| Torque (SAE net) | 302 lb-ft @ 2400 rpm | |
| Redline | 6000 rpm | |
| Mfr.'s performance ratings: | auto | manual |
| Zero to 60 mph | 6.6 sec | 6.1 sec |
| Standing 1/4-mile | 14.9 sec | 14.2 sec |
| Top-gear passing, 30-50 mph | 2.2 sec | 8.2 sec |
| 50-70 mph | 3.0 sec | 8.6 sec |
| Top speed | 152 mph | 155 mph |
| Fuel economy, EPA city | 16 mpg | 15 mpg |
| EPA highway | 22 mpg | 22 mpg |

performance was no small feat in the 928's case, since it has been such a strong autobahn runner for so long. Fortunately, instead of slowing the home-market car down to U.S. levels of speediness, Porsche undertook the more ambitious task of pulling the American model up by its bootstraps. This upgrading is also a shrewd investment in the future, because the new four-valve head will fit the 944 engine as well; we will likely see a sixteen-valve four-cylinder from Porsche within two years. By then, the four-valve crowd will be much larger. Today, however, racy cylinder heads are still very special, and they do go a long way toward making \$50,000 for an automobile seem almost reasonable.

Unfortunately, there remains one small chink in Porsche's armor. The European 928S is still a superior automobile because anti-lock brakes were added to its standard-equipment list for the 1984 model year. We feel strongly that such hardware should be part of the 288-horsepower, 155-mph, \$50,000 deal in the U.S., and that opinion has been registered with Mr. Cook of PCNA. Porsche's best customers are here in America, and they deserve the best 928s that the Zuffenhausen factory is capable of building.