

# THE • NATURAL

## 1992 • 400E

*Since it was introduced as a 1986 model, the 300E has been one of our favorite cars. It has been acclaimed as the best sedan in the world. Now, with a V8 engine, the new 400E is even better.*

**T**hink back to 1990. When the 300CE got its terrific 217-hp four-valve six, some folks wondered why the 300E sedan had to make do with the old 177-hp two-valve engine. Now we know why. MBAG had already decided to give its mid-range sedan something more appealing to American drivers—a 268-hp, 32-valve, 4.2-liter V8!

MBAG acknowledges that the 400E is their Lexus-fighter, and in fact it was developed at the suggestion of MBNA President Erich Krampe. The car was plainly designed (the pun is accurate) to keep the price as modest as possible yet maintain traditional comfort and safety levels. A leather interior is standard, as is a passenger-side airbag. The 400E's list price is \$55,800. A similarly equipped 1992 Lexus LS400 costs about \$10,000 less. The comparison is really more involved, but proven Mercedes-Benz engineering, safety features, and durability—not to mention its intangible *savoir faire*—make the 400E worth the difference. And next to a \$49,500 300E, the 400E's 51-percent more horsepower and 57-percent more torque make it as tempting as German chocolate.

### Chassis Changes

Many of the chassis modifications that went into the 500E are used in the 400E, too, although the higher-volume 400E is built in-house rather than in collaboration with Porsche. Obviously the engine bay had to be widened. The "frame legs", which disperse front impact loads across the car in case of an accident, were revised. A larger exhaust system

demanding underbody changes. To enhance weight distribution and yield space for the CAN (controller area network) computer bus, the battery is in the trunk.

The 400E's front suspension employs a reinforced wishbone plus the lower ball joint, wheel bearings, brake calipers, and other parts from the SL. The steering gear is revised to clear the lower engine. At the stern a reinforced crossmember carries a taller-ratio (2.24:1) differential plus stiffer springs, different shock absorbers, and a larger-diameter anti-sway bar. Brakes are uprated, too. The fronts use four-piston calipers from the 300CE, while the two-piston rears are shared with the 500E. All four brake discs are vented.

The new eight-hole wheels, similar to those of the S-class, are 6.5-inches wide (instead of 8) and carry 195/65-15 tires, the same size as the 300E. Michelin MXV's were on the cars that we drove. MBAG engineers say they chose the relatively narrow 195/65's to keep the 300E fender design and because they don't consider the 400E a sporty car. Smaller wheels and tires cost less, too. In rainy climes and bumpy roads slender tires are good, but if you're blessed with smooth, dry roads and enjoy performance driving, we'd suggest fatter ZR-rated tires, maybe 205/60's.

### M119 Powerplant

The 4.2-liter V8 is a twin to the one in the new 400SEL but makes less horsepower, 268 at 5,700 rpm, because of space constraints on the E's exhaust system. Peak torque, 295 ft-lb, appears at 3,900 revs. (For reference, the 500E's 5-liter M119 makes 322 hp and 354 lb-ft of torque.)

As with all recent MBAG V8's, the M119 engine has an aluminum block and heads. To increase space for intake and exhaust ports, four larger

head bolts per cylinder supplant the M117's six bolts. A double-row timing chain drives the four camshafts. The pent-roof combustion chamber has the spark plug set almost in the center of the four valves. Valve positions in the heads allow a narrower engine and better gas flow; these four-valve heads circulate 32-percent more volume than a comparable two-valve head.

Each intake camshaft employs the electro-hydraulic variable timing mechanism to vary valve overlap, thus enhancing mid-range torque, high-rpm power, and a placid idle—and lowering emissions. Valve overlap is the time during which the exhaust valve and the intake valve are open simultaneously, to promote gas flow. Before variable camshaft timing, engines were stuck with one compromise setting. Variable overlap changes intake cam timing about 25 degrees. At idle, high rpm, and under high load, overlap is near zero. The intake valves open and close later in the cycle. Between 2,000 and 4,700 rpm, under ordinary loads, the intake valves open and close earlier, lengthening valve overlap.

Except when actually changing, cam timing is always either fully retarded or fully advanced. The shift takes about a second to occur.

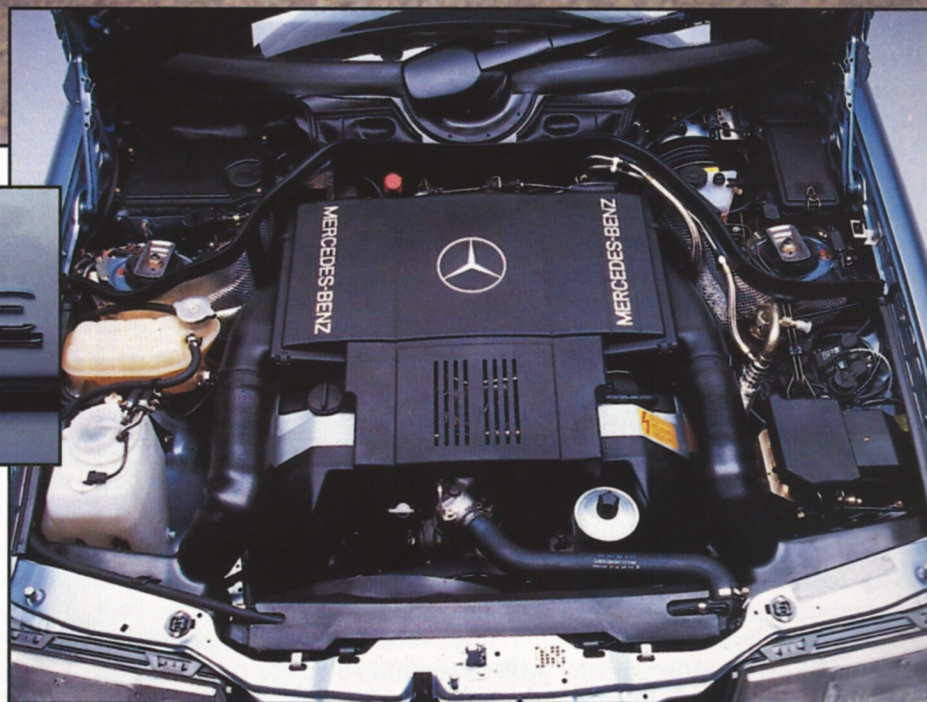
Electronically the 400E's engine is right up to date, using the CAN described in our previous article on the S-class cars. As in those cars and the 500E, the new LH-Jetronic fuel injection discards the previous CIS-E's plate-and-orifice metering system in favor of a hot-wire air mass sensor, for lower air flow resistance and superior reliability. The electronic injection system varies injection timing to suit engine load and includes an anti-knock sensor. The exhaust catalyst heating function reduces cold start emissions, the toughest standards to meet.





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*The only exterior clues to the 400E's potential are the eight-hole wheels and modest trunk lid emblem. All is revealed only when hood—or throttle—is opened.*



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Left: Leather interior is standard, with new-style, smaller steering wheel. Below is the view that many people will see of the 400E.



## Electronic Features

ASR (automatic wheel-spin control) is optional equipment. If the wheel sensors indicate drive wheel spin below 25 mph, ASR applies the brakes and attenuates engine power by retarding ignition timing and closing the throttle. Above 25 mph, ASR cuts power first, then applies the brakes if necessary. A dashboard switch resembling a frosted donut permits extra slippage. During winter testing in Austria, MBAG found that under certain conditions ASR could force a car to a stop. Tirechain crossbars or lumps of snow stuck to the tires could vary their rotational speed enough to signal ASR to apply the brakes and reduce power until the car eventually stopped! The donut switch permits you to "loosen up" ASR for use with chains or should snow clump on the tires—and lets you hang the tail out a bit—up to 50 kph (31 mph), where it reverts to the regular setting.

The 4-speed automatic transmission starts in first gear. An electronic link to the ignition/fuel injection module momentarily slackens power for graceful shifts.

## Inside the 400E

The 400E offers both a passenger-side airbag and a normal glove compartment. The new right-side airbag bursts out of the dash above the glove box. The new S-class steering wheel encloses a more compact airbag. Since the 400E eschews the 500E's rear console, it seats five instead of four.

Curb weight is up about 350 lb from the 300E, but the 400E weighs about 1,000 lb less than a 400SE. Fuel mileage estimates range from 20 mpg highway and 15 mpg city to 21 mpg combined, more than a 300E, less than a 400SE.

## Driving Sensations

The much improved torque and power are notable at both ends of the speed scale. Toe the accelerator gently from a stop, and low-rpm torque and the first-gear start make the 400E scoot! Yet thanks to variable intake cam timing, the engine still pulls strongly at well over 100 mph. Top speed is electronically dictated at 149. Purely in the interest of science, you understand, we had to try the governor. Finding a place to do 150 mph safely on a public highway is difficult, merely demonstrating how academic top speed really is. Anyway, traffic obliged us to lift at 145, with



the motor clearly eager for more.

Far more significant is the torque, accessible anytime, on command, for safer passing and stronger performance on hills and under load. Although it's an imperfect comparison (40 to 80-mph times would signify much more), at 7 seconds the 400E is quicker than the 300E to 60 mph by 1.7 seconds.

The transmission shifts quickly and smoothly, up or down, as if linked to your brain. When you want to pass, just squeeze your right foot down. You can trust this transmission to act swiftly and decisively. The throttle pedal has two subtle downshift detents, the first for one gear down, the second for two (assuming appropriate speed). Mercedes-Benz has finally built an automatic transmission that is at least as competent and smooth as any other.

The V8 exploits more of the handling and roadholding potential of the excellent W124 chassis. The 400E's power and torque make it much easier than a 300E to drive rapidly over secondary roads. With less power in the six, you braked a little deeper, went through corners a little faster, and got on the throttle earlier. In a 400E you needn't try so hard. When we explored some twisty secondary roads, our hosts, having graciously assigned us a 400E and themselves a 300E, plainly had to work harder than we did.

The 400E just feels natural.

### Is the 400E for You?

If you crave a truly amazing supercar sedan, buy a 500E—if you can find one. If you want a car that's nearly as good for 23,400 fewer dollars, the 400E is for you. MBNA thinks likewise. They expect to import 6,000 400E's next year (and roughly the same number of 300E's) but only 600 500E's.

The 400E will appear in U.S. and Japanese showrooms by Christmas (hint, hint) but won't be sold in Europe for another year. Meanwhile, no one at MBAG would comment on whether or not the V8 will go into the W124 coupe and wagon or the new convertible, but it would make sense, wouldn't it?

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## 400E Technical Specifications

### Engine

Type	M119 V8, 4-valves/cyl, aluminum block and heads, DOHC, automatic intake camshaft advance
Bore x stroke, in (mm)	3.62x3.11 (92.0x78.9)
Displacement, cu in (cc)	256.1 (4,196)
Compression ratio	10.0:1
Maximum engine rpm	6,000
Main bearings	5
Net power, hp @ rpm	268 @ 5,700
Net torque, lb-ft @ rpm	295 @ 3,900
Fuel injection	LH CIS, all-electronic
Fuel required	Premium lead-free
Fuel capacity, U.S. gal	18.5 (incl. 2.4 gal reserve)
Cooling system, qt	16.4
Oil capacity, qt	8.5 (with filter change)
Alternator	14V/110A
Battery	12V/100Ah
Ignition	Breakerless, fully electronic, anti-knock control

### Transmission

Type	W4A 040 4-spd automatic, 1st-gear start
Gear ratios	3.87, 2.25, 1.44 and 1.00:1
Rear axle ratio	2.24:1

### Suspension

Front	Damper struts, coil springs, anti-sway bar, negative-offset steering
Rear	Multi-link, coil springs, anti-sway bar, gas-pressurized shock absorbers
Wheels	6.5Jx15H2, alloy, eight vent
Tires	195/65R15 91V steel-belted radial
Steering	Recirculating ball, power assist, steering damper; 3.1 turns lock to lock
Brakes	Ventilated front and rear discs, fixed caliper, vacuum boosted, two-step tandem master cylinder
Parking brake	Foot-operated, hand release

### Weight

Curb weight, lb	3,660
Pounds per hp	13.66
Drag coefficient	0.31
Frontal area, sq ft	21.8

### Performance

0-60 mph, seconds	7.0 (2 aboard)
Maximum speed, mph	149

### Standard Equipment

ABS, driver's side airbag, front passenger side airbag, SRS supplemental restraint system, leather upholstery, Becker Grand Prix AM/FM/cassette radio, alarm system, burl walnut interior trim, central locking, cruise control, power windows (one-touch down), power driver's seat w/two-position memory, halogen headlights w/wipers and washers, leather-covered wheel and shift knob, outside thermometer, power steering, quartz clock, rear seat head restraints w/remote retraction, power adjustable steering column w/memory, tachometer, first-aid kit, telephone pre-wiring (w/antenna), tinted glass, heated windshield washers, etc. Factory options include metallic paint (no charge), rear level control (\$665), sunroof (no charge), orthopedic seats (\$405 ea), ASR (\$2,565), reinforced front seats (\$30 ea), heated front seats (\$873), heated rear seats (\$872), rear reading lamps (\$85), and a power rear window shade (\$390 and definitely decadent). Dealer-installed options include a 10-disc CD changer (\$1,200) and an integrated, hands-free, dash-mounted cellular telephone (\$910). As this is written, gas guzzler tax had not been determined.