



## ROAD RESEARCH REPORT: MERCEDES-BENZ 250 SE

Another tour de force from Daimler-Benz—a fast new sedan with the functional grace of the 230 SL, and the elegance of the luxury 600.

The Mercedes-Benz 250 SE (“E” for *Einspritz*, or fuel injection) is a superb automobile in every sense of the word. Not that this surprises us, because in our experience there’s never been a Mercedes that wasn’t a regular paragon of automotive virtue—a sort of four-wheeled Caesar’s wife. But even though we’ve come to *expect* each new model from Daimler-Benz to be the best thing of its kind, we still find ourselves knocked out by the performance, quality, comfort, and enlightened engineering concepts that flow together in the cars that wear the silver star.

Unfortunately—for the average citizen, at least—the 250 SE will probably cost him something in the vicinity of \$7000, and this will keep it out of reach for all but a few of America’s millions of new-car buyers. On the other hand, *every* Mercedes-Benz shares the basic engineering features and general character of the 250 SE, making it possible for a much broader segment of the car-buying public to enjoy the fundamental benefits—if not the more sophisticated delights—of Mercedes-Benz ownership.

However, this close “family” relationship can be a two-edged sword. The owner of a 200-series sedan is undoubtedly pleased to find that his four-thousand dollar Mercedes shares many appointments and design



features with the twenty-thousand dollar 600 Limousine, but we sometimes wonder if the 600 owner feels the same way.

Similarly, we face something of a dilemma in presenting our evaluation of the new 250 SE. It is a fantastically good car. It *does* have a number of features and innovations to help distinguish it from preceding models offered by Daimler-Benz. And yet, the things that set it apart from other cars—the things that make it such a superior automobile—are not unique to the 250 SE specifically; they are unique to Mercedes-Benz. At the risk of sounding over-cryptic, we see the 250 SE this way: it is a new Mercedes, and it is a better Mercedes, but it is *not* a sharply different Mercedes. And interestingly enough, that's exactly why we like it so much.

### GENERAL COMMENTS

Our introduction to the 250 SE came last September, just before the Frankfurt Auto Show, when Daimler-Benz flew us to Germany for several days so that we could test their full line of cars at the new Hockenheim road racing circuit. We were there primarily to test the 250 SE, since it was the only completely new car being introduced, although the entire Mercedes-Benz line

had been re-vamped and expanded to include a total of 17 different models.

Until the announcement of this expanded line, all of the Mercedes four- and six-cylinder cars had shared a common body shell, as well as many other basic components. The company's management felt that there was a growing need for a better spread of models between the lowest and highest price ranges, and, at the same time, they wanted to sharpen the differences between their various price groups. This led to the creation of a separate 250/300 line of cars with its own styling treatment, engineering features, and slightly longer wheelbase.

As the range of Mercedes-Benz models now stands, it starts at the bottom with the 200 and 200 D four-cylinder cars, then steps up one level to the six-cylinder 230 and 230 S. These two lines share the same body shell and are virtually identical in appearance to the 190 and 220 sedans that they replace. Next come the brand new 250 S and 250 SE sedans, followed by the 250 SE coupes and convertibles. With the addition of larger engines and more luxury, the various 250 SE models are transformed into the very expensive 300 SE series—with the whole array topped off by the 300 SEL (Long), which has a stretched wheelbase and is very,

very expensive. Standing off to one side of this neatly ordered group is the 230 SL sports car, and somewhere, high in the economic stratosphere, the 600 super-luxury car.

The price of our test car was \$7222, and it requires some explanation. The base price of the 250 SE is \$6020, but our test car was equipped with automatic transmission (\$339), power steering (\$198), full leather upholstery (\$308), and one of those super-Omigod German AM/FM/SW radios (\$235), all of which ran the price up to such heights that the M-B people were quite explicit in their desire that we call specific attention to the presence of these more expensive options.

The list of available options is an impressive one, anyway. One can have air-conditioning, electric windows, an electrically-operated sliding metal sunroof, an armrest between the front seats, front seat head rests, and heat-resistant glass. Not to mention your choice of floor- or column-shift for the manual transmission, a four-speed automatic transmission, power steering, et cetera, et cetera.

The 250 SE is a much better looking car than its predecessor, having lost the vestigial tailfins and the rest of the "reminiscent-of-Rambler" touches that seemed so out-of-place. It's a happy blend of the 230 SL and the very expensive 250/300 SE coupes. It is almost an inch longer than the old 220, just over half-an-inch wider, and almost two and a half inches lower. Although these dimensional changes don't seem like much, efficient design of the passenger compartment has greatly increased the interior space—particularly shoulder room, and leg room for rear seat passengers. The flat roof, low belt line, and much larger glass area all hark back to the 230 SL. The windshield alone features 17% more glass area, and total glass area is up 12% over the 220.

The interior design is also improved, particularly the instrument panel, but aside from that, it is still difficult to distinguish the interior of this Mercedes from that of any built since 1951. The company's emphasis on "design" rather than "styling" is evident both inside and out, and we think the car could be improved if some honorable compromise could be reached between the two.

The car is very impressive-looking, as any high-quality, meticulously constructed machine must be—but it doesn't *grab* anybody . . . except long-time Mercedes buffs. For instance, the Rover 2000 TC tested elsewhere in this issue drew ten times the appreciative glances and comments that we got with the Mercedes.

### **POWER TRAIN, CHASSIS, SUSPENSION**

The 250 SE engine, while similar to the old 220 engine, is different enough to warrant its being called "new." It is a physically large, single overhead camshaft 6-cylinder engine . . . like the 220, but with a 2 mm larger bore (now 82), a 6mm longer stroke (now 78.8), 301cc more displacement (now 2496cc, or 152.3 cu. in.), larger valves, larger ports, and 36 more horsepower (now 170). In itself, this is nothing revolutionary, and could have been achieved by merely enlarging the old engine. The noteworthy and noticeable improvement comes from changing from four main bearings to seven, which makes the engine not only smoother throughout its operating range, but also allows it to sustain higher rpm with no impairment of reliability. Most of the major components—heads, crankcase, crankshaft, et. al.—had to be completely redesigned.

There is no plain 250; the 250 S is equipped with a



two-barrel carburetor and develops 146 bhp @ 5600 rpm. The SE features Mercedes-Benz' famous fuel injection, an intermittent type controlled by six individual plungers (one for each cylinder), and spraying into each port several inches upstream from the valves. (The 300 SE engine is further enlarged to an under-square 85 x 88mm, and develops 195 bhp from its 2996cc.) Both the 250 S and 250 SE have viscous-drive fans that disengage below preset temperatures, and an alternator to replace the old generator. Another feature is a combination oil cooler/heat exchanger; it tends to equalize the temperatures of the coolant (limited by a thermostat) and the lubricant (which runs cooler).

The standard 250 SE transmission is a 4-speed, all-synchromesh unit with the shift lever on the steering column. A floor-mounted shifter is available at an extra cost. Daimler-Benz' 4-speed automatic transmission is optional—this is a hyper-efficient unit, more like a normal 4-speed transmission with a hydraulic clutch than the American concept of three speeds plus a torque-multiplying converter.

The power reaches the ground through one of the



most ingenious rear suspensions on any passenger car in the world. In that it is basically a swing-axle system, it has shortcomings—mainly camber changes that occur with vertical wheel movement, and, therefore, cornering power that varies with the road's surface and the car's roll angle. However, Mercedes' engineers have refined this suspension to the point where our objections are rather more theoretical than actual. An innovation on the 300 SLR racing car, the low-pivot swing axle, has since been applied to all passenger cars. This in itself minimizes camber change resulting in oversteer, and various compensating devices have also been applied to reduce the rear roll couple, making the front end take more of the cornering effort. Air suspension, with a tank filled by manifold vacuum, has been used on the big cars, and a simple transverse coil spring has been employed on the less expensive models. Now Mercedes has devised the best of both systems: a transverse compensator with self-contained oil for shock damping, and air supplied by a pump linked to the axles. Thus, whenever the rear suspension is compressed, it pumps itself level again. No matter what the load of passengers and/or luggage, this hydro-

pneumatic mechanism maintains the car at its static ride height—the rear end doesn't sag and the headlights don't shine uselessly up into the sky. The compensator is standard equipment on the 250 series, but is an option on less expensive Mercedes and can even be installed as an aftermarked accessory.

The 250's front suspension is a conventional arrangement of unequal-length A-arms and coil springs. Enough weight is on the front end (nearly a ton) that we recommend the optional power steering without hesitation. In fact, it's almost a necessity.

Until now, the 600 was the only Mercedes with 4-wheel disc brakes—even the 230 SL sports car utilizes rear drum brakes. To solve the problem of handbrake linkage, Mercedes has adopted the solution Porsche pioneered with Ate-Dunlop discs: the rear disc is made as a hat section, and within the "crown" of the hat is a normal—though small—drum brake with mechanically actuated shoes. Servo assist and dual master cylinders are standard equipment. The rear brakes have more leverage than is common, even with discs, but a pressure-limiting valve shuts off braking action to prevent  
(Text continued on page 95; Specifications overleaf)

## Road Research Report: Mercedes-Benz 250 SE

Distributor: Mercedes-Benz of North America  
158 Linwood Plaza  
Fort Lee, New Jersey

### PRICES

Price as tested: \$7222.00

### ENGINE

Water-cooled six-in-line, cast iron block, aluminum head, 7 main bearings  
Bore x stroke..... 3.23 x 3.10 in, 82.0 x 78.8 mm  
Displacement..... 158.3 cu in, 2496 cc  
Compression ratio..... 9.3 to one  
Carburetion..... Port-type intermittent fuel injection  
Valve gear..... Chain-driven single overhead camshaft  
Valve diameter..... Intake 1.62 in, exhaust 1.46 in  
Valve lift..... Intake .380 in, exhaust .370 in  
Valve timing (at .015 in clearance)  
Intake opens..... 11 BTC  
Intake closes..... 53 ABC  
Exhaust opens..... 47 BBC  
Exhaust closes..... 21 ATC  
Power (SAE)..... 170 bhp @ 5600 rpm  
Torque..... 173.6 lbs-ft @ 4500 rpm  
Specific power output..... 1.07 bhp per cu in, .681 bhp per liter  
Usable range of engine speeds..... 600-6300 rpm  
Electrical system..... 12-volt, 55 amp-hr battery, 490-watt alternator  
Fuel recommended..... Premium  
Mileage..... 14-18 mpg  
Range on 21.7-gallon tank..... 304-391 miles

### DRIVE TRAIN

Transmission..... 4-speed, automatic, hydraulic coupling  
Gear Ratio Over-all mph/1000 Max mph  
Rev 4.15 16.93 -4.4 -28  
1st 3.98 16.24 4.6 29  
2nd 2.52 10.28 7.3 46  
3rd 1.58 6.45 11.6 73  
4th 1.00 4.08 17.9 109  
Final drive ratio..... 4.08 to one

### CHASSIS

All steel unitized chassis-body  
Wheelbase..... 108.2 in  
Track..... F 58.3, R 58.4 in  
Length..... 192.9 in  
Width..... 71.3 in  
Height..... 56.7 in  
Ground clearance..... 5.9 in  
Curb weight..... 3381 lbs  
Test weight..... 3918 lbs  
Weight distribution front/rear..... 51/49%  
Pounds per bhp (test weight)..... 23.4  
Suspension F: Ind., unequal-length wishbones, anti-sway bar  
R: Ind., low-pivot swing axle, automatic ride compensator  
Brakes..... F: 10.8-in discs, R: 11.0-in discs, 430 sq in swept area  
Steering..... Recirculating ball  
Turns, lock to lock..... 3.25  
Turning circle..... 42.8 ft  
Tires and wheels..... 7.35 x 14 Continental Super Record on 6J rim

### MAINTENANCE

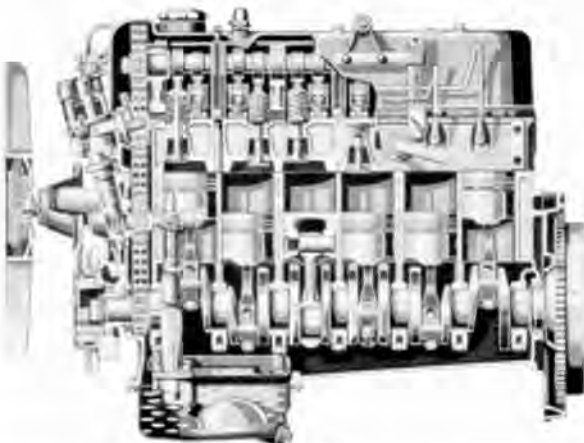
Crankcase capacity..... 6 qts  
Oil change interval..... 6000 miles  
Grease fittings..... 18

### ACCELERATION

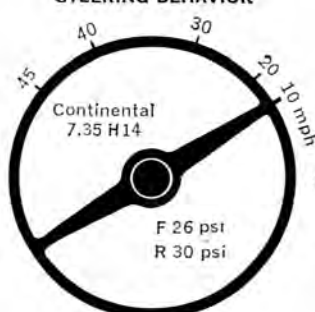
Zero to	Seconds
30 mph	3.9
40 mph	5.7
50 mph	8.4
60 mph	11.1
70 mph	14.4
80 mph	19.3
90 mph	25.2
100 mph	33.4
Standing 1/4-mile	77 mph in 17.7



These two views of the 250 SE engine show the fuel injection porting and pump drive, the seven-main-bearing crankshaft, the viscous-drive fan hub, and the single overhead camshaft.

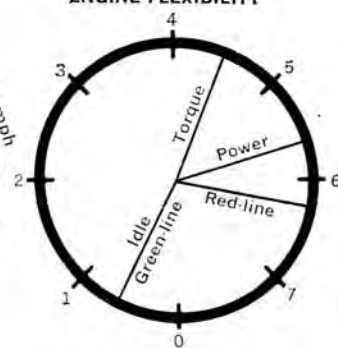


### STEERING BEHAVIOR

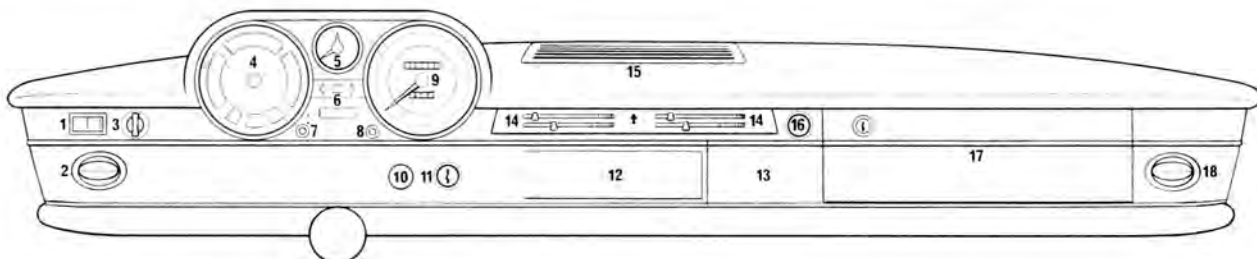


Wheel position to maintain 400-foot circle at speeds indicated.

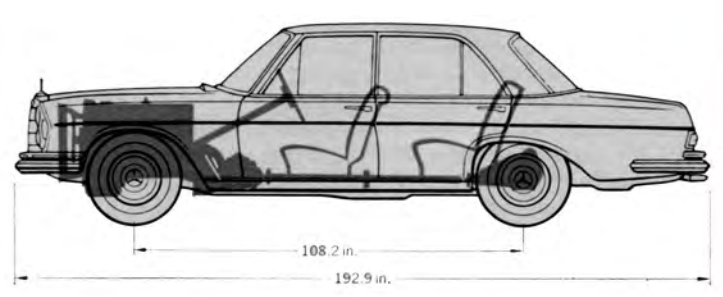
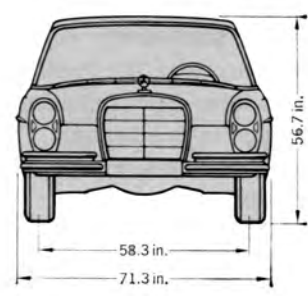
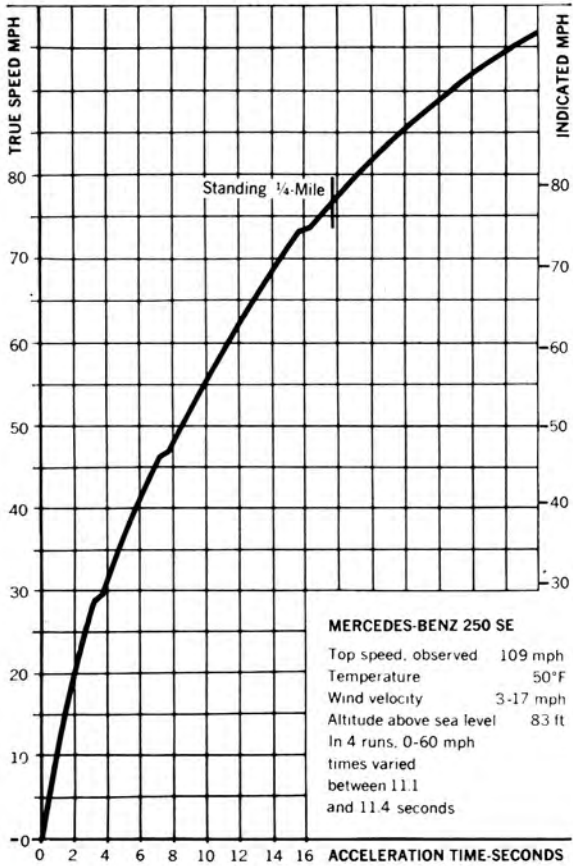
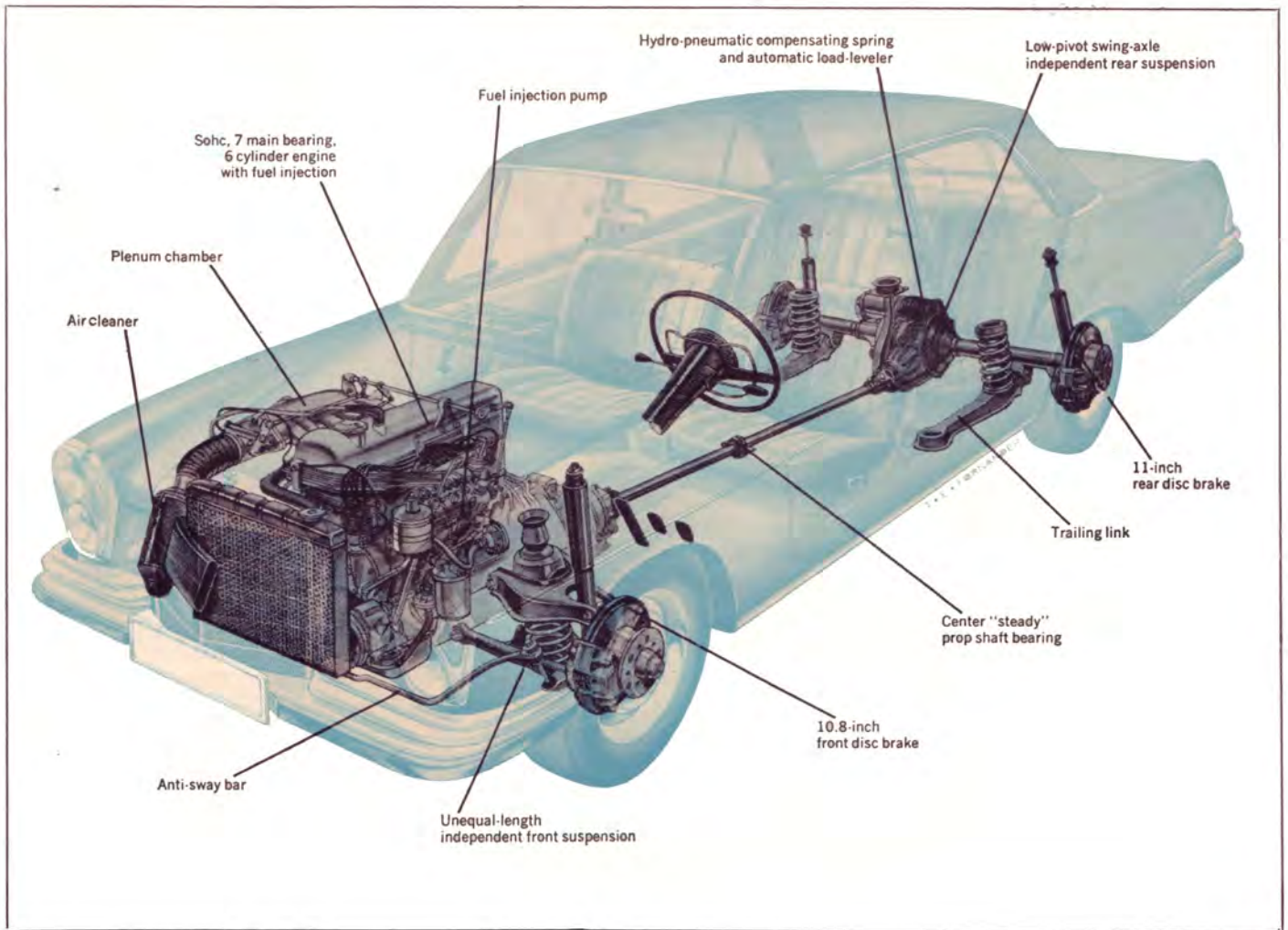
### ENGINE FLEXIBILITY



RPM in thousands



(1) Overhead light switch, (2) and (18) Side window ventilation, (3) Headlight switch, (4) Water temperature gauge, fuel gauge, fuel reserve light, oil pressure gauge, handbrake light, generator light, (5) Electric clock, (6) Turn indicator lights, (7) Panel lights, (8) Mileage reset knob, (9) Speedometer, odometer, tripmeter, (10) Emergency flashing light switch, (11) Ignition and starting switch, (12) Radio, (13) Ashtray, (14) Heating and ventilation controls, (15) Radio speaker, (16) Lighter, (17) Glove compartment.



wheel lock-up.

As their statement on automotive safety in last month's *C/D* indicated, Mercedes' chassis are immensely strong in the center section, with energy-absorbing panels at either end. Technically, it is a unit construction chassis-body, although the passenger "bay" almost constitutes a separate monocoque structure.

### THE INTERIOR

Like everything else about the 250 SE, the interior layout is a refined, improved version of traditional M-B practice. One is automatically impressed with the obvious high quality of every single switch, gauge, control, carpet, and piece of upholstery. Sometimes the function of a component is not as impressive as its fit and finish—as in the case of the vague automatic-transmission shift-linkage and its barely visible quadrant, or the heater controls that would try the patience of a non-German saint—but by and large it's an impressive place to sit. Visibility is excellent, and the interior noise-level is quite low. We were generally agreed that this was one of the tightest bodies we'd ever tested.

The seats are as good as any in the world, and the two fronts feature a great three-way system of adjustment. A D-ring at the front of each seat controls generous fore-and-aft movement, a similar ring on the side controls vertical adjustment, and a rotating knob controls an infinitely adjustable "non-click" recliner mechanism for each backrest. The relationship of the seat to the controls is above reproach, and the enthusiastic driver can really feel that he's running things when he slides into the seat and takes command. Two passengers of normal stature can be quite comfortable in the rear seat, even when the front seats are at the limit of their rearward travel, but that's about it, since things get a little cramped with three adults in the rear.

The classic Mercedes-Benz steering wheel dominates the view ahead, and, although the firm's engineers defend its safety-oriented design with some passion, it is ugly, out-of-date, and simply out-of-place. Surely, a steering wheel can be made both safe and attractive. There is no tachometer, which seems a bit odd in view of the very sporty nature of the car and its engine, but the rest of the instruments and indicators are complete and well thought-out. High beam, turn signals and windshield wipers are all controlled by a single lever on the left

side of the steering column, and our staff generally approved, though one member invariably managed to get two or three things going simultaneously every time he touched the lever.

The interior, as well as the engine and luggage compartment, has a number of very useful courtesy and map lights, and the instrument panel is very well illuminated. There are plenty of strategically located assist (panic) handles, and though the seats do a good job of holding the occupants in their places, the handles can be very reassuring on a fast ride through the mountains. The window-cranking mechanism has been designed for minimum effort, and, as a result, one has to do a lot of winding. The vent windows are operated by a fore-and-aft lever, and they work like a charm—exactly the opposite of the long-ratio window cranks.

The available trunk space has much the same effect on long-distance passenger-carrying capacity as the rear seat—it'll hold quite a bit, but not enough for five normally-burdened travellers. The space is well laid out, with a minimum of odd nooks and crannies, but the overall dimensions are such that a typical collection of suitcases—like our test set of American Tourister—won't go in together. It's frustrating as hell, because you can see that the space is there, but you can never get all of your stuff in—one solution might be fitted luggage, or soft cloth bags that can be forced to fit.

### DRIVING IMPRESSIONS

The initial driver impressions in the 250 SE are, (1) the great comfort, quiet, and security of the interior, (2) the absolute integrity of the various components of the running gear and their accurate and faithful responsiveness to the controls, and (3) the smooth, droning push of the engine.

The 250 SE has a taut, all-one-piece feeling on a twisting country road that comes—at first—as something of a surprise. This is particularly true for people who've never driven a Mercedes before. Just driving the car down main street, or for a few miles along an uneventful freeway, makes it feel kind of heavy and a little ponderous. The automatic transmission seems to take forever to shift—like an old Hydra-Matic—and when it does, the shifts are hard and a little jerky. Nothing about the car, under these circumstances, betrays its high-

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speed handling capability.

But taken out of town, off the freeway, and given its head, it shows the other side of a distinctly split personality. Held in gear, and driven in the highest rpm ranges, the engine is surprisingly responsive, and supplies plenty of power for almost any maneuver you can think of. The chassis *feels* so strong, and so completely reliable, that you're tempted to intentionally abuse it, simply to find out what its limits really are. Given a certain amount of abuse, it makes no serious complaint, merely stopping as hard as you want it to stop, or mildly protesting your stupid line on a tight corner with more squeal from the tires than usual.

But it wants to be driven smoothly. It'll give you the best ride you ever had in your life, if you'll just time your shifts properly, make the transitions from brakes to throttle to brakes to steering as smoothly as you possibly can. It is capable of sustained high speeds on any kind of surface—from the glossy new asphalt at Hockenheim to a torturous little dirt road in upstate New York.

It really seems to be a neutral-steer car. At very low speeds it'll plow in a sharp corner, but as the speeds increase, it becomes more and more neutral, and when you finally reach the limit of adhesion—which happened to us only once, and that was on the race track—all four wheels let go at the same time. The tail end can be hung out, intentionally, but the car never showed us any tendency to oversteer—on the race track, on the factory test track, or on the road.

Paradoxically, the Mercedes four-speed automatic transmission is a lot better for enthusiastic driving than it is around town. Its tendency to wind forever between upshifts, and the stiffness of those shifts, tend to make it sort of annoying for the driver who's become accustomed to the smooth, effortless efficiency of Chrysler's three-speed Torque-Flite, or GM's Turbo Hydra-Matic. But when you've decided that you're going to have a go at the world record for the run between your home town and the lake on the other side of the mountain—you won't mind a bit. The automatic can be shifted manually, and although there's no tachometer, the engine noise is pretty fierce at full throttle, and it tells you when to shift in no uncertain terms. Both up and downshifts can be made crisply and quickly at full throttle, and we only wish the thing worked as well when relaxed as it

does under pressure.

The power steering is unquestionably the best in the world. We've known engineers in Detroit who've devoted a lot of time, talent, and their company's money to the problem of making Detroit-type power steering as accurate, sensitive and responsive as the Mercedes unit. The difference is that the Mercedes-Benz system is a power *assist*—a device that *helps* you turn the wheels. Conversely, the American aim is to provide a device that turns the wheels for you. As one GM engineer said, "When you turn the steering wheel on one of our cars, you're not turning the front wheels, you're turning a valve!"

Mercedes' habit of installing very short final drive ratios in all of their cars, and running their engines at comparatively high rpm, is what makes them go so fast for their weight and displacement. Unfortunately, it also makes them noisier than most cars in their price class. The 250 SE is definitely quieter than anything else in the line, except the 600, but it is noisy by American standards—or by Rover 2000 standards, for that matter.

Road noise is also greater than one would expect to find in a car of this type. Like the Rover 2000, there is a noticeable amount of drumming and thumping being transmitted through the structure from the wheels all the time. We've been told that almost any old creak of a car would seem to give a smooth ride, if you could damp out *all* sound—as with silencing ear muffs. The Mercedes seems to bear this out, because it gives an initial impression of harshness and stiffness over things like pavement expansion strips or holes—an inaccurate impression, it turns out, because you don't actually *feel* the bumps, but you *do hear* them.

We have never had a complaint about the Mercedes disc-front, drum-rear brake system, and the 250 SE, with discs at all four wheels, is even better. The car has enormous stopping power, and although not quite as fast or directionally stable as the Rover in our series of eighty to zero stops, it proved itself to be better than any other sedan we've ever driven. An interesting point—the best braking performance we've experienced on sedans so far<sup>7</sup> has been with the following cars, in order; the Rover 2000 TC, the Mercedes-Benz 250 SE, the Mercedes-Benz 600, and the Rolls-Royce Silver Cloud. (The first three with four-wheel discs, and the last



## MERCEDES-BENZ CONTINUED

with the world's most expensive drums.) Nothing else has been in the same league.

Last fall, we'd heard countless reasonable and thought-provoking rationales from GM people about why disc brakes aren't yet as good as drums for heavy cars. We'd almost started to believe them, but then we tested the 250 SE—and while we were at it, we put a few hundred more hard miles on a 600 Limousine. Baloney, gentlemen. Disc brakes *are* better than drums, in virtually *any* application we know of, and the sooner they appear on every American car built, the better.

One of the things that contributes to the Mercedes' superior over-the-road performance is the fact that the tires are big enough and strong enough for the load they have to carry. This is a major contribution to both braking and cornering, and it's another area where our own industry has resolutely kept its head in the sand. The Mercedes 250 SE, like every Mercedes, is fitted with tires that will support the full weight of the automobile, with all of the people and luggage it was designed to hold, and do it at normal pressures. There was never any discussion of "the average load" or the fact that "nobody ever drives that fast anyway." The engineers knew how fast their car would go, and what kind of loads it might have to carry, and they specified original-equipment tires that would carry the maximum load at the maximum speed. GM, Ford, Chrysler, and American Motors, please note.

### SUMMARY

Elsewhere in this issue, we call the Rover 2000 TC the best sedan we've ever tested, and it is. But while the Rover 2000 is an exciting, dynamic concept in any language, the more expensive Rover 3-Liter is an obsolete carriage that shares

nothing with its little brother except its name plate and the high quality of its materials and craftsmanship.

Mercedes-Benz, on the other hand, builds every one of its products—all 17 cars, plus myriad trucks and buses—to the same exacting and demanding standards of safety, performance, and quality. So, though the Rover 2000 TC may well be the best sedan around, Mercedes-Benz builds the best *complete line* of automobiles that money can buy. They're expensive, and they may not suit every taste, but they're uniformly superior to any similar range of automotive types and models for sale today.

We'd like to see Daimler-Benz do something with the 250 SE that would smack the complacent public right in the eye. It simply isn't right for a car as good as this one to drive around the United States in such relative obscurity.

In the beginning, we remarked that it was hard to distinguish this newest Mercedes from any other contemporary Mercedes. It's a faster, quieter, better-looking version of the model that preceded it, with several very worthwhile innovations, but it doesn't reflect any dynamic change or sweeping breakthrough at Daimler-Benz. It simply shows us something that their engineers have believed for a long time—that there is seldom more than one "Best," and if you find yourself with a winning combination, don't mess around with it. We only wish that they had done more to dramatize that "Best" quality—the quality that is so much a part of this car.

The Mercedes-Benz 250 SE is an extraordinarily good car, which is a pretty impressive fact. But it's important to remember that the 250 SE is only the "Upper-Medium" priced representative of a whole line of extraordinary cars. Now *that's* impressive. **CJD**



A lay-down driver can bring the front seat back to lock with the rear.

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