The Motor Road Test No. 33/59 (Continental)

Make: Mercedes-Benz **Type:** 220 SE

Makers: Daimler-Benz AG., Stuttgart-Unterturkheim, Germany.

Concessionnaires : Mercedes-Benz (Great Britain), Ltd., Great West Road, Brentford, Middlesex.

Test Data

CONDITIONS : *Weather : Cool and dry with moderate breeze. (Temperature 48°-52° F., Barometer 29.7 in. Hg.) Surface : Dry concrete. Fuel : Belgian and British premium grade pump petrols (approximately 95-96 Research Method Octane Rating).*

INSTRUMENTS (Kilometre calibrations).

Speedometer at 30 m.p.h.	3% fast
Speedometer at 60 m.p.h.	accurate
Speedometer at 90 m.p.h.	1% fast
Distance recorder	1% slow

WEIGHT

Kerb weight (unladen, but with oil, coolant and fuel for approx. 50 miles)	27 cwt.
Front/rear distribution of kerb weight	54/46
Weight laden as tested	30¾ cwt.

MAXIMUM SPEEDS

Flying half mile

Mean of four opposite runs ..	105.0 m.p.h.
Best one-way time equals ..	107.5 m.p.h.

"Maximile" Speed (Timed quarter mile after one mile accelerating from rest.)

Mean of four opposite runs ..	100.6 m.p.h.
Best one-way time equals ..	103.6 m.p.h.

Speed in gears (Permitted maxima)

Max. speed in 3rd gear	75 m.p.h.
Max. speed in 2nd gear	48 m.p.h.
Max. speed in 1st gear	30 m.p.h.

FUEL CONSUMPTION

39.0 m.p.g. at constant 30 m.p.h. on level.
35.1 m.p.g. at constant 40 m.p.h. on level.
31.5 m.p.g. at constant 50 m.p.h. on level.
28.0 m.p.g. at constant 60 m.p.h. on level.
23.5 m.p.g. at constant 70 m.p.h. on level.
20.0 m.p.g. at constant 80 m.p.h. on level.
17.0 m.p.g. at constant 90 m.p.h. on level.
15.0 m.p.g. at constant 100 m.p.h. on level.

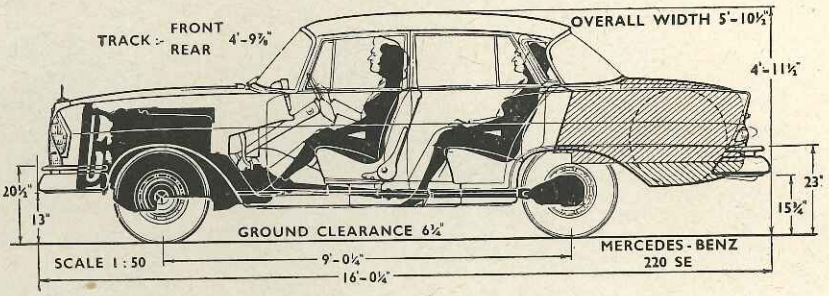
Overall Fuel Consumption for 830 miles, 42.3 gallons, equals 19.6 m.p.g. (14.4 litres/100 km.).

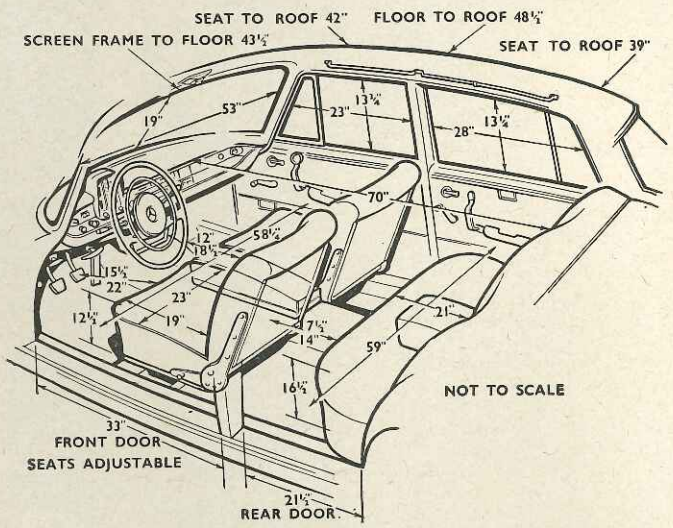
Touring Fuel Consumption (m.p.g. at steady speed midway between 30 m.p.h. and maximum, less 5% allowance for acceleration) 23.4.

Fuel tank capacity (maker's figure) 14¼ gallons.

STEERING

Turning circle between kerbs	
Left	34½ feet
Right	34¼ feet
Turns of steering wheel from lock to lock	3





ACCELERATION TIMES from standstill

0-30 m.p.h.	3.8 sec.
0-40 m.p.h.	6.3 sec.
0-50 m.p.h.	8.4 sec.
0-60 m.p.h.	12.8 sec.
0-70 m.p.h.	16.7 sec.
0-80 m.p.h.	23.6 sec.
0-90 m.p.h.	33.4 sec.
0-100 m.p.h.	58.1 sec.
Standing quarter mile	19.2 sec.

ACCELERATION TIMES on upper ratios

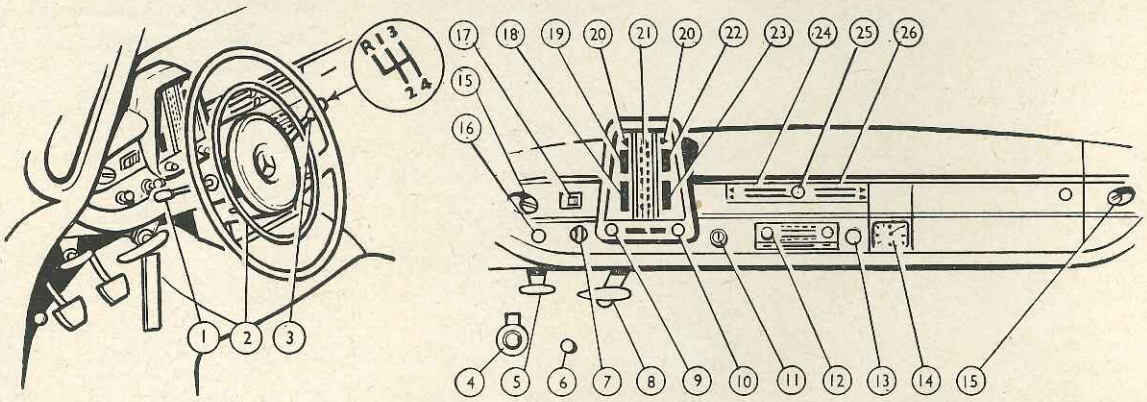
	Top gear	3rd gear
10- 30 m.p.h.	9.7 sec.	5.5 sec.
20- 40 m.p.h.	9.1 sec.	6.0 sec.
30- 50 m.p.h.	8.6 sec.	4.8 sec.
40- 60 m.p.h.	9.6 sec.	5.6 sec.
50- 70 m.p.h.	10.8 sec.	7.7 sec.
60- 80 m.p.h.	11.4 sec.	—
70- 90 m.p.h.	16.0 sec.	—
80-100 m.p.h.	34.5 sec.	—

BRAKES from 30 m.p.h.

0.98 g retardation (equivalent to 30½ ft. stopping distance) with 65 lb. pedal pressure
0.91 g retardation (equivalent to 33 ft. stopping distance) with 50 lb. pedal pressure
0.34 g retardation (equivalent to 88½ ft. stopping distance) with 25 lb. pedal pressure

HILL CLIMBING at sustained steady speeds

Max. gradient on top gear	1 in. 8.7 (Tapley 255 lb./ton)
Max. gradient on 3rd gear	1 in. 5.1 (Tapley 430 lb./ton)
Max. gradient on 2nd gear	1 in. 3.4 (Tapley 635 lb./ton)



1, Direction indicator switch. 2, Horn ring. 3, Gear lever. 4, Windscreen wiper/washer switch. 5, Bonnet catch. 6, Headlamp dip switch. 7, Head, side and parking lights switch. 8, Handbrake. 9, Trip adjuster. 10, Panel light rheostat switch. 11, Ignition, starter and steering lock switch. 12, Radio controls. 13, Cigar lighter. 14, Clock. 15, Demister vents for side windows. 16, Windscreen wipers switch. 17, Rear interior light switch. 18, Fuel contents gauge. 19, Water thermometer. 20, Direction indicator warning light. 21, Speedometer and distance recorder. 22, Oil pressure gauge. 23, Warning lights for headlamp main beam, choke and dynamo charge. 24, Cold air inlet and demister control. 25, Heater and fan controls. 26, Air vent control.

The MERCEDES-BENZ 220SE

GROUPING of head, fog and parking lamps in neat enclosures is a feature of the latest Mercedes-Benz model — the fresh air intake for the interior heater is visible at the base of the windscreen.

A Very Fast yet Flexible German 2·2 litre Luxury Saloon with Petrol Injection

THE autostrada gatekeeper in Italy who charged too high a toll during our road test of the latest Mercedes-Benz saloon could be forgiven. Wide and long (five inches longer than the previous models) with generous room for five people, a huge boot and a vast expanse of bonnet, the 220SE appears to anyone inside or out as a car with much more than 2,195 c.c. of engine. What is more, the impression holds good whether one is sitting behind the wheel pressing the accelerator or in another car trying to keep up. The Bosch fuel injection system, which raises the factory price in Germany by nearly £150 and the total in Britain by £200, gives the "Sport Einspritz" version of the 220 not only an impressive top speed but competitive acceleration and extraordinary flexibility.

Cars with bigger engines than this have not proved easy to sell in Germany, where road tax is levied on capacity. With a store of experience to draw on, the Daimler-Benz engineers have concentrated on obtaining power and torque from a limited swept volume, but without sacrificing the qualities required of a large, luxurious vehicle. The result is a car that will accelerate from rest to 60 m.p.h. in under 13 seconds, allow passengers to converse normally while a speed of 100 m.p.h. is maintained over long stretches of Autobahn and return an overall fuel consumption of 19.6 m.p.g.

The most recent 220 series is changed in more ways than a quick glance might suggest, but the power unit deserves priority of comment. Acceleration tests in top gear from 10 m.p.h. do not always form part of *The Motor* road tests nowadays, when the useful top-gear speed range of many fast cars has moved up until even 20 m.p.h. is a dubious proposition at full throttle. On German and Italian fuels of between 96 and 99 octane rating the fuel-injected engine of the 220SE would lose all trace of roughness at about 6 m.p.h. in top, accelerating from below that speed to the maximum of over 100 m.p.h. with no pinking. Between 90 m.p.h., corresponding to the peak of the power curve at 5,000 r.p.m., and the maximum at 6,000 r.p.m., the presence of a hard-working engine can be felt ("heard" would be an exaggeration) from inside the car. At all other times the smoothness of performance matches a quite exceptional response to the rod-and-bellcrank accelerator control. Acceleration right up to 90 m.p.h. is in what would ordinarily be regarded as the 3-litre class, and such features as an oil/water heat exchanger are clearly designed in the expectation that the car will be driven very fast for long continuous periods. Oil consumption over a mixture of main road, mountain and autostrada driving on the Continent worked out at around 300 miles per pint for a car with 9,000 miles on the distance recorder.

An elaborate induction system is made more so by arrangements for cold starting which include a magnetically-controlled extra fuel injector operating when the engine temperature is less than 35° C. The combination of this with normal fuel valves responding to engine temperature, speed and barometric pressure occasionally produced rather hesitant morning starts, and the idling speed fluctuates considerably. A badly adjusted injector pump had to be replaced in the course of our test. When warm, the engine "ticks over" at about 800 r.p.m. with the pump gear working far from silently. That this is noticeable only from outside, or when a window is open and the car is standing beside a reflecting wall, pays solid tribute to the engineers responsible for sound-proofing and chassis design.

From casual examination the new 220 saloon may appear not particularly different from the old. Experience over all kinds of roads from Autobahn to cobbles, dry, wet and snow-covered, shows that the new hull on a slightly shorter wheel base has many and useful improvements to offer.

The Mercedes is a big car. To a driver sitting in it for the first time the acreage of bonnet seems very big, yet in common with the best large cars its behaviour on the road quickly dispels any illusion of unwieldiness. Second only to performance, the most striking thing about the 220SE is its controllability. The steering mechanism is very efficient mechanically, although castor action is strong, and with a hydraulic damper in its linkage the steering is free from kick-back yet retains the sensitiveness which enables a driver to feel a slippery road, and is accurate to a degree that goes well with the car's handling properties. These are unusual. The independent rear suspension developed, in its latest form, after competition experience in sports cars, has contributed to greater comfort and allows the factory to ensure that every individual car is set up to give the intended handling characteristics.

On the test car the setting was at times near the borderline between over- and under-steer (it is claimed that an extreme of either can be obtained), with a very slight bias to over-steer which in Daimler-Benz circles is regarded as a better safety valve on slippery roads. Invulnerable to cross-winds, the car can appear on first acquaintance to have a wandering tendency which in fact is mainly traceable to the driver; a velvet glove in this case shows better results than an iron fist. Once the appropriate driving method has become habit the Mercedes emerges as a car to be driven fast with great confidence. Roadholding is of a high order, both cornering and traction on really slippery surfaces like snow or wet black cobblestone being much aided by a new pattern of German Dunlop nylon-cord tyre. In the dry, deliberate attempts to slide the tail resulted eventually in producing a little reluctant jarring of the back wheels if the road was rough. The steering lock, incidentally, approaches the standard more often associated with small family cars, rather than a big five-seater.

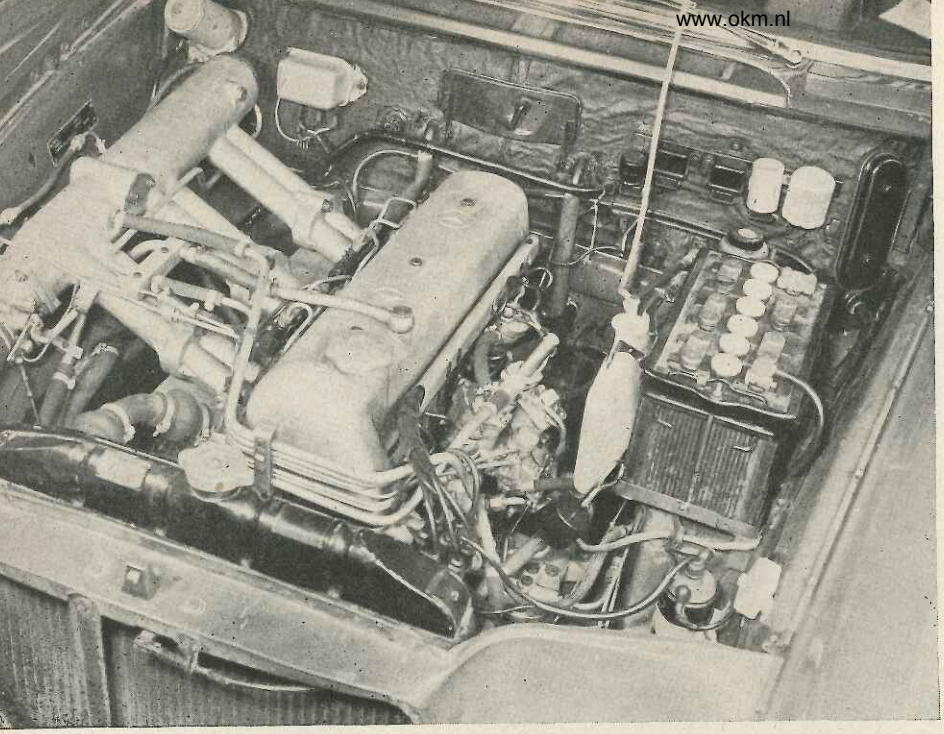
The road behaviour is unusual in several ways, not least in having extremely little cornering roll but most pronounced lifting or dipping of the nose under acceleration or braking respectively. Weight transference sets a limit on the ultimate effectiveness of the brakes, especially if they have

In Brief

Price in Britain £1,898 plus purchase tax £791 19s. 2d. equals £2,689 19s. 2d.
Price with carburetters (including purchase tax), £2,490 4s. 2d.

Capacity	2,195 c.c.
Unladen kerb weight ...	27 cwt.
Acceleration:	
20-40 m.p.h. in top gear ...	9.1 sec.
0-50 m.p.h. through gears	8.4 sec.
Maximum direct top gear gradient	1 in 8.7
Maximum speed ...	... 105.0 m.p.h.
"Maximile" speed ...	... 100.6 m.p.h.
Touring fuel consumption ...	23.4 m.p.g.

Gearing: 18.0 m.p.h. in top gear at 1,000 r.p.m., 37.6 m.p.h. at 1,000 ft./min. piston speed.



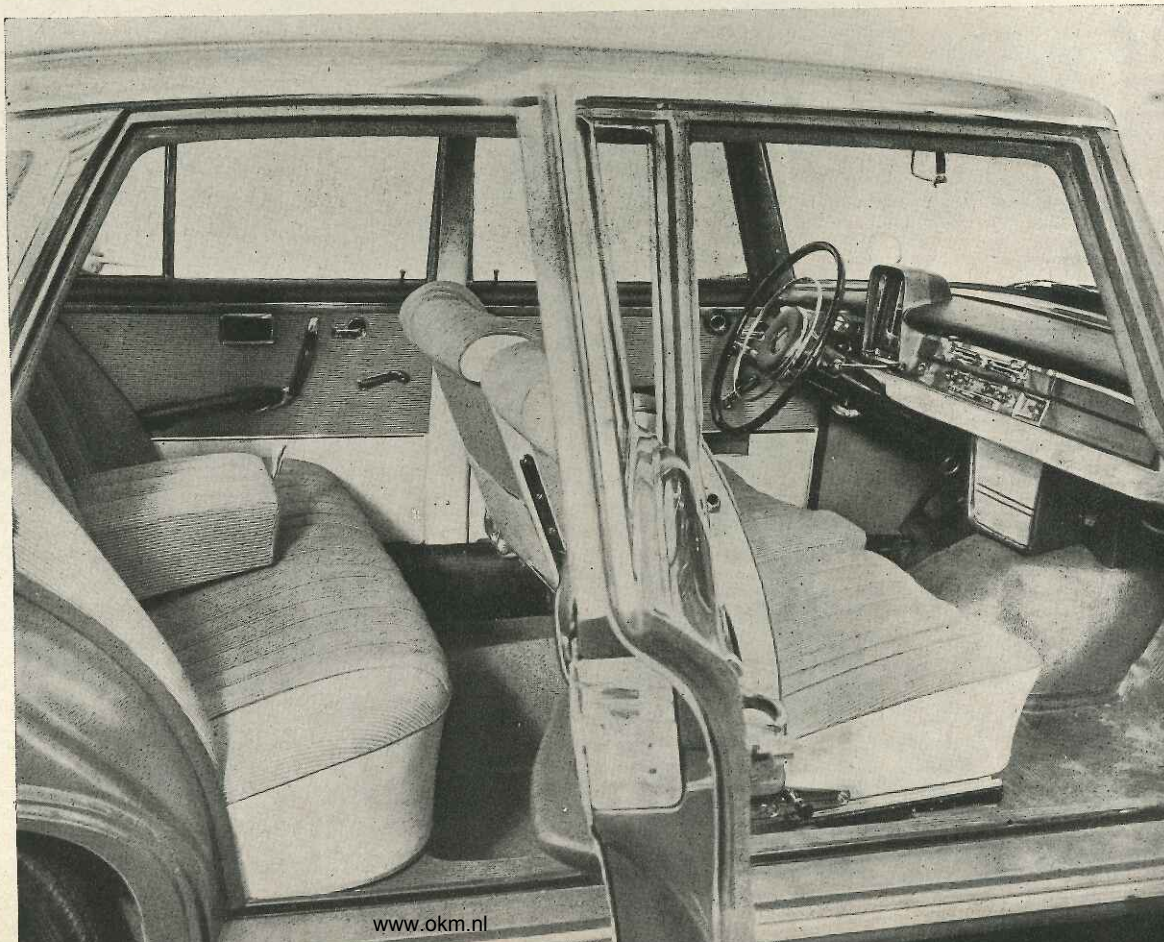
PETROL INJECTION into the inlet ports permits the use of a long individual "ram pipe" to each of the six cylinders, slight tilting of the overhead camshaft engine making room for straight pipes instead of the curved design used formerly

to be used in emergency with the car slightly off a straight course. The best Tapley reading recorded is probably optimistic, on account of the pitching motion, as one rear wheel tended to lock rather easily. In normal use the brakes are very light indeed with none of the woolliness of some vacuum servo systems. Although one traverse of the Alps and some fast main road motoring did not show up any sign of fade, hard application from high speed would cause some juddering by the time the car was travelling at 30 m.p.h. or so. With 100-m.p.h. performance and a potential laden weight of more than 30 cwt. it might be better equipped with disc brakes than with even the heavily finned alloy drum system now used.

As for the transmission, the normal clutch (an automatic clutch is available) is light and slip-free, although apparent poor assembly caused failure of the slave cylinder cup washer. The synchromesh on all four forward gears is unbeatable and the ratios quite well chosen; second is a compromise which can be used for starting and has an all-out limit of 48 m.p.h. The steering-column gearchange works easily but might seem more positive without the necessary pause for the synchromesh to allow engagement, and the reverse catch has too weak a spring.

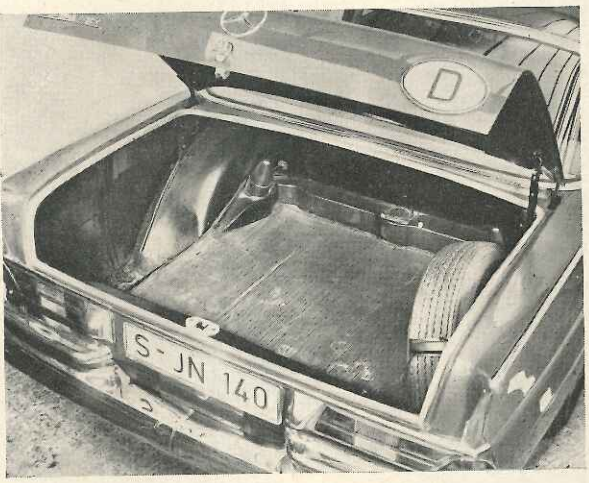
Riding comfort, especially in the front seats, despite the soft suspension, is excellent and improves relatively as the road gets worse. Separate front seats are properly shaped for lateral support (the lack of roll is a help, too) and adjustable over a wide range of legroom and backrest angle. They are well forward in relation to the door opening, so that a short man finds it easier to get in and out with the seat slid back from his normal driving position, and a telescopic steering column would be a pleasant refinement for so well-equipped a car. The difficult aim of fitting all human shapes is not quite achieved, for a long unbroken journey found one driver in need of more padding behind the small of his back. For rear seat passengers, however, there is ample space in all dimensions and large window area makes it possible for everybody to see out without being perched too high for comfort.

Few cars leaving the factory at less than £1,500 can be as well provided with passenger amenities, large and small. Amongst the larger ones the heating and ventilation deserve special comment, for although the maximum temperature of incoming air in cold weather was at first disappointing this is an integral system not intended to work by hit-or-miss mixture of hot air on the feet and cold through the windows. Air is drawn in through a finely-filtered scuttle intake high enough to avoid exhaust fumes. Its quantity can be regulated, as can the proportion going to interior or windscreen demisters. There are separate temperature controls for right and left sides of the car and some warm air is directed to the feet of back-seat passengers. If the scuttle intake is blocked by snow, a trap door can admit air from the engine compartment. To avoid completely any need for opening windows, stale air goes through the porous headlining to be sucked out of slots just ahead of the rear window. A variable-speed blower raises the intake blast to gale force if required. For more traditional ventilation there are hinged panels in the front windows which are made easier to open (and more thief-proof when shut) by knurled plastic knobs, but they will let



ROOMINESS of the interior is shown by this photograph, in which crash padding above and below the facia as well as on the steering wheel hub can be seen. The separately adjustable front seats are fitted with variable rake backrests.

INSIDE the square-cut tail of the body, a huge luggage locker with counter-balanced lid has a flat rubber-matted floor. The spare wheel is clamped at one side of the luggage compartment.



in water if open at all in wet weather.

Two-speed windscreen wipers have a normal facia switch or can be operated by pressing the windscreen washer pedal—both work well at any road speed, giving clear vision through most of the screen. Electrical equipment is comprehensive. A single switch on the panel ahead of the driver commands side lamps, head lamps, fog lamps, fog and head together, left and right hand parking lamps (of lower wattage) with no risk of confusion. An automatic reversing lamp, front and rear interior lights, a headlamp flasher to supplement the horn, a cigarette lighter shielded to avoid scorching the facia, dipping driving mirror, head-height grab rails with coat hooks and padded sun visors with a built-in mirror are all standard equipment. Both top and bottom of the facia, as well as the flat steering-wheel boss are padded for safety, and the door handles are recessed.

Rather surprisingly, the instrument cluster has succumbed to stylists' treatment, especially the speedometer, which is a wide vertical "thermometer" strip with an angled top giving very vague readings. Notwithstanding a gimmick that changes the colour of the strip from yellow to red when the speed exceeds 30 m.p.h., the speedometer would be more helpful with a horizontal scale or an arc. It is in fact equivalent to a complete circular dial less than 1½ in. in diameter, or a semi-circular one three inches across—for a range of 110 m.p.h. With a fuel-injection engine it is essential to maintain fuel continuously in the pumps; running the pipes dry entails considerable work before the engine can be restarted. No reserve tank is therefore possible, but the regular Mercedes feature of a red warning light on the fuel gauge takes on a new importance.

Accessibility and maintenance are most unlikely to be of direct concern to a 220SE owner, except where they affect the cost of service. A total of 20 chassis greasing points (including eight on the door hinges) is perhaps less important than the recommended interval of 3,000 kilometres, or nearly 2,000 miles, between servicing appointments. Executives to whom time and constant availability of their personal transport are important will probably be well up in the queue for a fast, safe, comfortable and, over a long period, probably economical motorcar.

Specification

Engine

Cylinders	6
Bore	80 mm.
Stroke	72.8 mm.
Cubic capacity	2,195 c.c.
Piston area	46.7 sq. in.
Valves	single overhead camshaft
Compression ratio	8.7/1
Carburetter	Bosch fuel injection into ports
Fuel pump	Rear-mounted electrical pump
Ignition timing control	Centrifugal and vacuum
Oil filter	Full flow (also oil-to-water heat exchanger)
Max. power (gross) at	134 b.h.p. (120 net) ... 5,000 r.p.m.
Piston speed at max. b.h.p.	2,385 ft./min.

Transmission

Clutch	Single dry plate
Top gear (s/m)	4.10
3rd gear (s/m)	6.27
2nd gear (s/m)	9.68
1st gear (s/m)	14.92
Reverse	16.07
Propeller shaft	Divided open
Final drive	Hypoid bevel gearing, rubber mounted
Top gear m.p.h. at 1,000 r.p.m.	18.0
Top gear m.p.h. at 1,000 ft./min. piston speed	37.6

Chassis

Brakes	Ate hydraulic with vacuum servo (leading and trailing shoes)
Brake drum internal diameter	9.05 in. (Al-fin front drums)
Friction lining area	165 sq. in.
Suspension:	
Front	Independent by coil springs, wishbones and anti-roll torsion bar
Rear	Low-pivot divided axle i.r.s. with coil springs and control auxiliary spring.
Shock absorbers	Telescopic (made under de Carbon licence)
Steering gear	Recirculating ball
Tyres	6.70—13 "Nylon-Sport"

Coachwork and Equipment

Starting handle	None
Battery mounting	Alongside engine on left
Jack	Bevel-geared screw pillar type
Jacking points	2 external sockets on each side of body

Standard tool kit: Pliers, screwdriver, Phillips screwdriver, 3 open-jaw spanners, box spanner and tommy bar, drain plug key, hexagon key, wheel brace, jack.

Exterior lights: 2 headlamps, 2 sidelamps, 2 stop/tail lamps, 2 foglamps, 2 reversing lamps, 4 parking lamps.

Number of electrical fuses	12
Direction indicators:	Self-cancelling flashers

Windscreen wipers: Electrical two-speed, self-parking, with secondary switch combined with windscreen washer pedal.

Windscreen washers	Pedal operated
Sun visors	Two

Instruments: Speedometer with non-decimal trip and total distance recorders, fuel contents gauge, coolant thermometer, oil pressure gauge, clock.

Warning lights	Dynamo charge, headlamp main beam, turn indicators

Locks:

With ignition key	Ignition/starter switch and steering

With other keys: (1) Either front door and petrol filler, (2) glove box and luggage locker.

Glove lockers	One with lockable lid
Map pockets	Two in doors
Parcel shelves	One behind rear seat
Ashtrays	One front, two rear
Cigar lighters	One

Interior lights: One front with courtesy switches, one rear, 2 in luggage locker.

Interior heater: Fresh-air heater and screen de-mister (separate left- and right-side temperature controls).

Car radio	Optional extra (Becker)
Extras available	Radio, white-wall tyres
Upholstery material	Cloth
Floor covering	Rubber at front, carpets at rear

Exterior colours standardized: Six (19 more single and dual colours at extra cost).

Alternative body styles	None

Maintenance

Sump	9¾ pints, S.A.E. 20 summer, S.A.E. 10W winter
Gearbox	2½ pints Automatic Transmission Fluid
Rear axle	4½ pints S.A.E. 90 hypoid gear oil
Steering gear lubricant	S.A.E. hypoid gear oil
Cooling system capacity (with heater)	20 pints (2 drain taps)
Chassis lubrication	By grease gun every 1,800 miles to 20 points

Ignition timing: Set by stroboscope to 32° before t.d.c. at 4,000 r.p.m. in neutral.

Contact-breaker gap	0.012 in.

Sparking plug type: Bosch W225T23 or Beru D225/14/3 (for sustained high speeds use 240 rating).

Sparking plug gap	0.020 to 0.023 in.

Valve timing: Inlet opens 33° before t.d.c. and closes 69° after b.d.c.; exhaust opens 57° before b.d.c. and closes 25° after t.d.c.

Tappet clearances (cold):

Inlet	0.003 in.
Exhaust	0.006 in.
Front wheel toe-in	0 to 0.080 in.
Camber angle	0° 20' to 0° 40'
Castor angle	2¼° to 2¾°
Steering swivel pin inclination	5½°

Tyre pressures (normal):

Front	23 lb.
Rear	26 lb.

High speeds with full load:

Front	30 lb.
Rear	37 lb.

Brake fluid	Ate blue, or Lockheed heavy duty
Battery type and capacity	12 volt, 60 amp. hr.
Miscellaneous	Fuel injection pump lubricated with engine oil