

Mercedes-Benz.

ACTIVE AND PASSIVE SAFETY

There is a Mercedes-Benz slogan: "Engineered like no other car".

For all the glamour and prestige that surround the three-pointed star, careful scrutiny reveals to the earnest observer that the legend depends totally and absolutely on the continuing ideal of keeping Mercedes-Benz owners alive to enjoy another day. That in itself is not commercial selfishness, except that it must recognise the truth of the fact that once you have owned a Mercedes-Benz, then anything else is significantly and personally less than you desire for yourself. That is the kind of car it is.

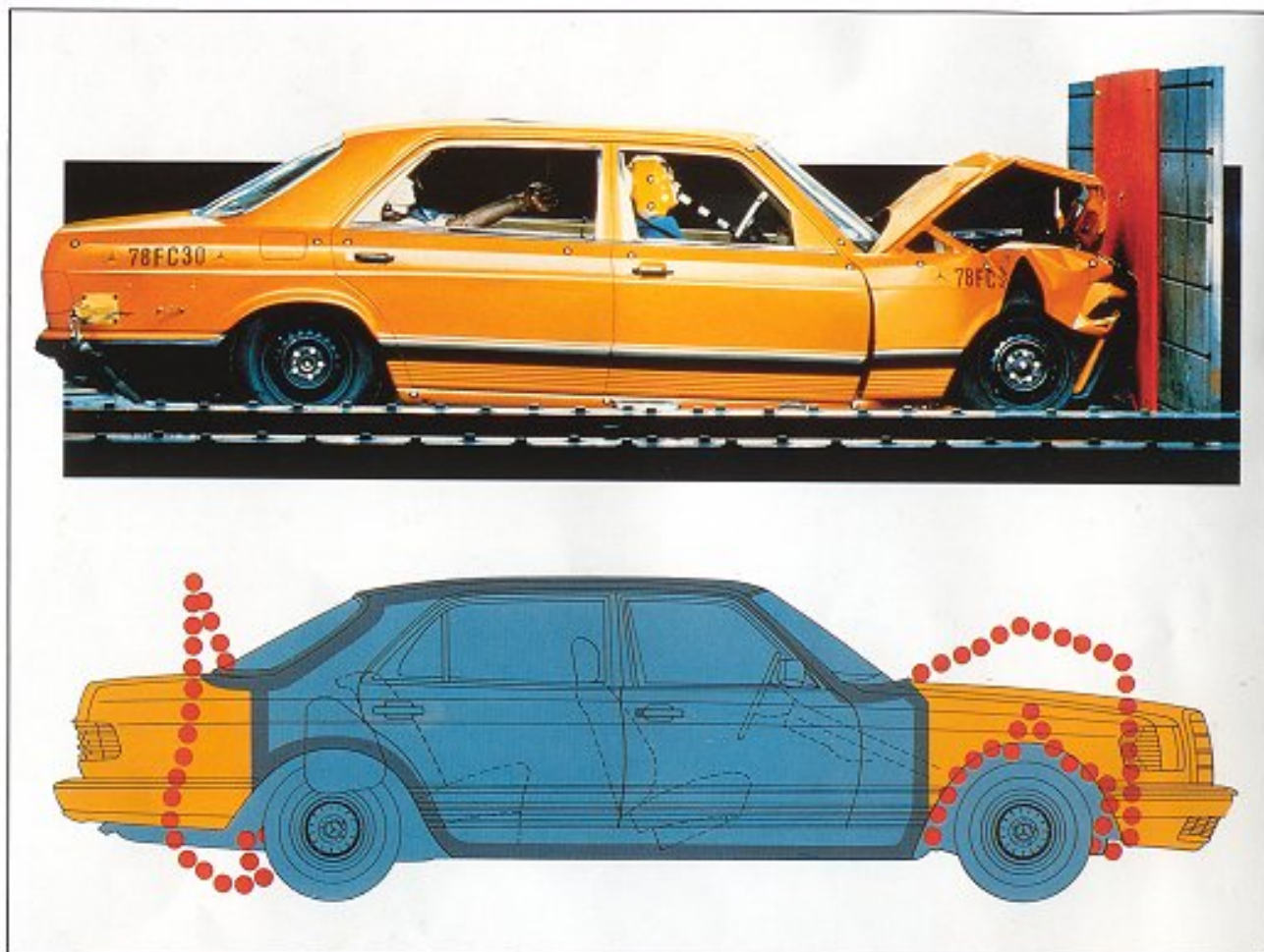
So, given the original ideals of excellence, then how did we evolve the enormous emphasis on passenger safety that has been part of Mercedes-Benz philosophy through the years.

Simply, the machines that issue from engineering concepts reflect—predictably—not the cleverness of our marketing people, not the flair of the stylist, although both those have their place. It is rather a product of the inner need of people who long ago dedicated their soul to the science of the automobile.

In terms of safety, Mercedes-Benz long ago recognised that the operator is fallible, and that they must aim to structure the product so that it will resist the most formidable disaster that can impose upon it.

Active and passive safety are doctrines almost three decades old. But even today Mercedes-Benz take perfectly good motor cars and roll them over, or slam them into a wall.

None of this is always necessary anymore.



It is possible with computers to duplicate the many crash situations and the effects those crashes would have on a vehicle and its occupants.

But we continue to do it—while using computers to draw finite element pictures of body stress and suspension loading.

The Mercedes-Benz safety principle is

three decades old. It says, simply, that the prime responsibility of the car is to protect the inhabitants in a cell that will resist the enormous kinetic forces that invade it. Thus the integrity of the Mercedes-Benz safety cell must remain intact.

But of course, it must—begin with a car that can start avoiding the accident in the first place.

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THE ANTI-LOCK BRAKING SYSTEM

It began in 1958. Engineers at Daimler-Benz AG, started investigations into the possibilities of a system that would prevent a car's road wheels locking in an emergency stop. Remember that this was only a short time after disc brakes had been invented and used in motor racing—but still it was difficult to stop a car under emergency braking, without locking all or some of its wheels and sliding into disaster.

Shortly it became an obsession with the engineering department, on the basis that theoretically it was quite possible to provide a system with which the driver could keep his vehicle completely steerable while braking as hard as possible.

They were right.

After two decades, we now have a passenger car that can be savagely braked and accurately steered at the same time, responding accordingly. How different is this from the age old doctrine that if you were on a loose or wet surface and you braked hard, you would proceed inexorably into the accident.

The ABS (Anti-lock Braking System) first became available with the 'New S-Class' cars. For those who have not experienced it, the ABS system is the most amazing variation of motor vehicle dynamics and kinetics we have seen since the turn of the century.

Mercedes-Benz first demonstrated the potential of such a system back in 1970. Typically, the next eight years of joint development with Bosch resulted in seven million kilometres of testing, on the basis that the intangibles had been

removed before offering the system to the public.

The concern of the team was obviously, that they had to overcome problems with existing systems. While an ordinary car, with an ordinary braking system, will lock one or more wheels under emergency braking, and then have its suspension geometry affected by this to the extent that directional stability is upset. The ABS system would complement the existing braking system by sensing the pedal load, wheel acceleration, and other factors, to the point where its computer could instruct the hydraulic unit to reduce the pressure of the brake fluid in the brake lines.

It took eight years of intensive research for us to develop a system that could do that on wet, dry, or loose (or any) surfaces, and maintain the ability of the driver to steer the car at the same time. Happily—like so many of the unseen, unhonored and unsung safety features of today's Mercedes-Benz, ABS will rarely be tested by most of our owners.

But the day may come when an owner of a Mercedes-Benz fitted with ABS may find themselves in a potentially dangerous driving situation. It will be at that precise moment that he discovers the safety benefit of ABS.



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ENGINES AND TRANSMISSIONS

In an era when four-cylinder engines are sometimes more fashionable than functional, the Mercedes-Benz M102 demands attention.

It was first released as a 2.3 litre fuel-injected petrol engine in the 230E Mercedes-Benz—the first new four-cylinder petrol engine produced by the company since 1963.

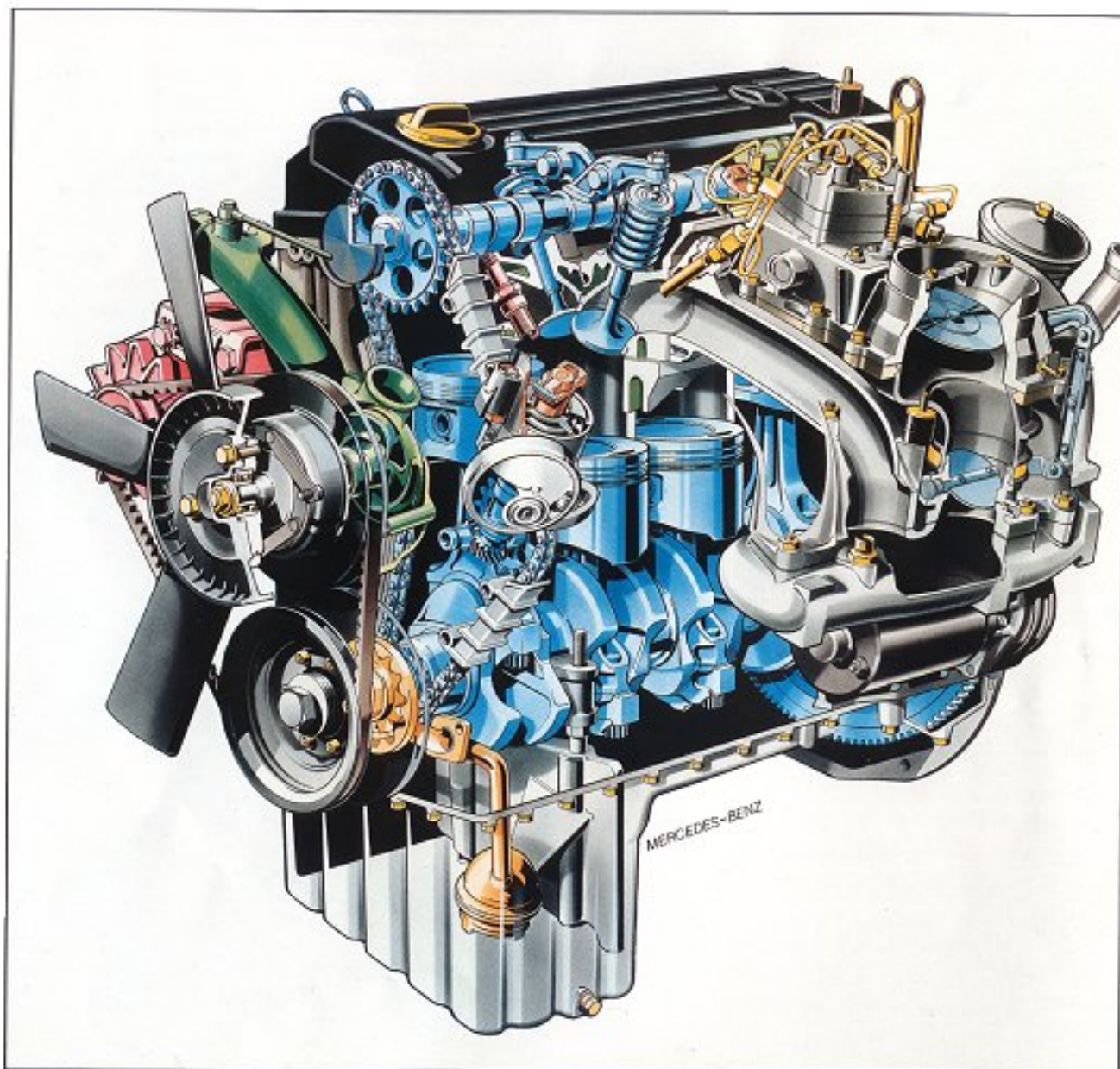
The cost of producing a new engine these days, of whatever size, can be financially daunting. The sheer weight of the investment in plant, tooling, machining, equipment, technology testing etc, can lead to compromise.

Yet Mercedes-Benz began, in 1978, to design a totally new engine that would fall between 1.7 and 2.7 litres, which would deliver the power, torque and fuel consumption characteristics demanded by the market of the eighties. The engine would have to be in the forefront of design for at least a decade, used in various capacities and in various models of the line.

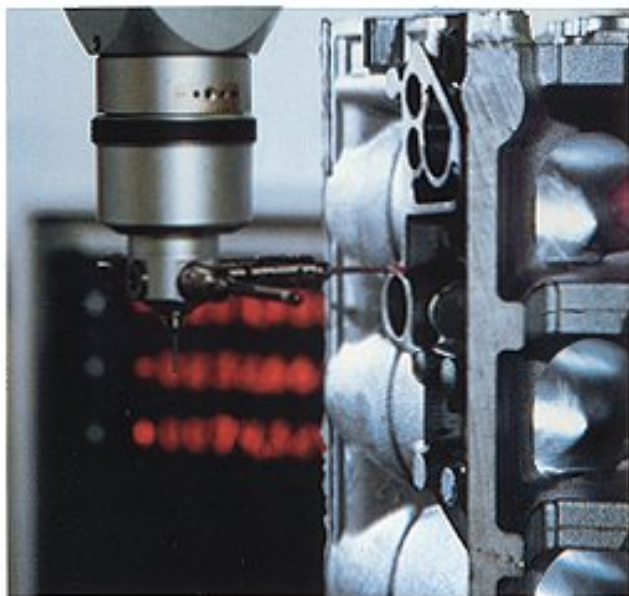
It is a most advanced and interesting engine. The first Mercedes-Benz four-cylinder fitted with hemispherical combustion chambers, and cross-flow cylinder head, feeding fuel in one side and exhaust out the other; light weight; an engine that could be fitted into the 230E chassis at a lay-over angle; a five-bearing crankshaft to stand heavy loads; fuel injection, and transistorised ignition.

Then there is the exceptional lightweight 3.8 litre alloy V8 of the 'New S-Class' cars.

It was a courageous step for Mercedes-Benz to commit to the enormous investment required for a new V8, given the hindsight of today's sometimes-emotional commitment to the credo that the fewer



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cylinders the better. The decision was typical of Mercedes-Benz, the prime consideration being efficiency, not the number of cylinders, and if it took eight, then that is the way it would be.

Mercedes-Benz is familiar with eight cylinders...or twelve. Or, for that matter, turbo-charging, or fuel injection, or diesel design.

The same with transmissions.

Four-speed automatic transmissions had been talked about in the motor industry for years and some have tried in the past to produce them. We believe that there is no better gearbox in the world than the Mercedes-Benz four-speed automatic transmission with torque converter.

The reason four-speed automatic transmissions became part of the Daimler-Benz design philosophy is because of the constant pressure the company applies to itself to do things better.

