

Cultivated sportiness with Plug-in Hybrid or fuel cell electric drive

- **Plug-in Hybrid or fuel-cell electric drive with superior driving performance and zero local emissions**
- **Flexible multi drive platform with optimized crash characteristics**
- **New display concept focusing on electric drives**
- **HMI with cam touchpad for intuitive and precise operation**
- **Even greater active safety and convenience: DISTRONIC PLUS with new Traffic Jam Assistant**
- **Even greater passive safety: PRE-SAFE 360°**

In the future, it will be more important than ever to bring mobility and environmental protection into harmony. The world's population will continue to grow, in particular in the metropolitan areas. This will result in an increased demand for mobility and consequently increased traffic density. According to the latest studies, the total number of automobiles in the world will double to roughly 1.8 billion vehicles by 2030. As the inventor of the automobile, Mercedes-Benz has also assumed responsibility for its continued development — with respect to efficient and clean drive solutions without compromising comfort, safety, functionality, and driving fun.

The research and development work of the Mercedes engineers is by no means restricted to current customer wishes and legal requirements, however. Long-term trends — in the technology domain as well as on the social and cultural level — are identified scientifically and adapted specifically for the development of automobiles. Systematic and goal-oriented futurology is thus an essential foundation of the innovative power of Mercedes-Benz, which takes on concrete form in research vehicles emblazoned with the star.

Mercedes-Benz brings pioneering concepts to life in its research vehicles, which is why it has continually set trends for the future in recent decades. The latest example is the F 800 Style. It features numerous technical innovations that are already at a near-series or even series-ready stage of development. Examples of this include the drive system options based on either Plug-in Hybrid or fuel cell technology.

Multi drive system platform for two different drive concepts

The F 800 Style is suitable for use with a variety of drive system options thanks to its flexible multi drive platform, as the following example with two technically independent variants demonstrates:

- As the Plug-in Hybrid, the F 800 Style offers electric mobility with zero local emissions in urban settings. Over longer distances, a gasoline engine equipped with the latest-generation direct-injection technology is supported by the hybrid module, thereby enabling a high-performance and efficient driving experience
- The F-CELL variant is equipped with a fuel cell unit that runs on hydrogen for electric driving with zero local emissions. The only emission from electric cars powered by a fuel cell is water vapor

According to Dr. Thomas Weber, member of the Board of Management of Daimler AG with responsibility for Group Research and Mercedes-Benz Cars Development, “Hybrid and fuel cell electric drives are two important elements of our broad drive system portfolio, which enables us to satisfy all of the requirements of our customers throughout the world for the mobility of today, tomorrow, and beyond. Our road to sustainable mobility is a three-lane highway. The spectrum encompasses the optimization of vehicles with advanced combustion engines, further gains in efficiency through tailored hybridization, and driving with zero local emissions through the use of fuel cell or battery-powered vehicles.”

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F 800 Style with Plug-in Hybrid: A three-liter car disguised as a sports car

Mercedes-Benz is setting new standards for future sustainable mobility with the F 800 Style. Thanks to a powerful and high-torque hybrid module, the F 800 Style Plug-in Hybrid can run almost exclusively on electricity in the city and therefore without generating any local emissions. Because it has a high torque right from the moment it starts, the vehicle has the same driving performance as a car with a V6 gasoline engine when operating in electric mode. It has an electric range of 30 kilometers. The efficient drive system and a CO₂ bonus for the battery-electric driving mode help the F 800 with Plug-in Hybrid to a certified fuel consumption of only 2.9 liters of gasoline per 100 kilometers. This corresponds to extremely low CO₂ emissions of only 68 grams per kilometer. Thanks to its outstanding efficiency, the F 800 Style equipped with a Plug-in Hybrid nevertheless performs like a powerful sports car. The car accelerates from zero to 100 km/h in only 4.8 seconds, and its top speed is electronically limited to 250 km/h. “The F 800 Style is thus the first three-liter car to feature such sporty performance while at the same time offering room for five passengers,” says Dr. Weber. Its drive unit consists of a V6 gasoline engine with an output of approximately 220 kW (300 hp) with next-generation direct injection and a hybrid module with an output of about 80 kW (109 hp) so that it delivers a total power of around 300 kW (409 hp). The lithium-ion battery with a storage capacity of >10 kWh can be recharged either at a charging station or a household power socket.

The powerful electric drive enables the F 800 Style to drive at speeds of up to 120 km/h solely on electric power. The low-noise electric drive, which produces zero local emissions, thus covers the entire urban transportation spectrum and a large portion of the interurban spectrum. The vehicle has a cruising range of up to 30 kilometers in electric mode. Extreme efficiency is also a characteristic of the new 3.5 liter gasoline engine. The V6 engine features innovative spray-

guided gasoline direct injection with high-precision piezo injectors. Thanks to the drive unit's high efficiency, the 45 liter fuel tank in the F 800 Style Plug-in Hybrid is sufficient for a high combined range of around 700 kilometers.

Versatile modular hybrid system

The electric drive components in the F 800 Style with the Plug-in Hybrid once again demonstrate the versatility of Mercedes-Benz' intelligent, extensively scalable modular hybrid system. The hybrid system can be expanded in various ways, depending on performance needs and the area of application. For example, hybrid modules of various performance classes and batteries delivering the associated capacities can be combined with the most frequently produced gasoline and diesel engines from Mercedes. All hybrid modules are compatible with the 7G-TRONIC automatic transmission.

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All variants of the hybrid drive system can be realized on the basis of these components: from mild hybrids to hybrids that also enable all-electric driving in addition to the boost, start/stop and recuperation functions. Another option is the Plug-in Hybrid used in the F 800 Style, which had previously been presented in similar form at the IAA 2009 in the Vision S 500 Plug-in Hybrid. With this particularly high-performance version of the Mercedes hybrid drive system, the battery can be charged via a household outlet, thus increasing the model's electric range.

From a design standpoint, the hybrid module with around 80 kW output in the F 800 Style differs only slightly from the 44 kW variant used in the Vision S 500 Plug-in Hybrid. Whereas the lithium-ion battery in the Vision S 500 Plug-in Hybrid was placed behind the rear seats, the electric storage unit is now located under the rear seat in the F 800 Style. This installation location ensures the greatest possible crash safety, good driving dynamics thanks to the vehicle's low center of gravity, and unrestricted space in the interior of the vehicle. The 45 liter gasoline tank is mounted behind the rear seat backrests, again in the interest of crash safety and to save space. The result is a generous 440 liters of trunk space. In designing the F 800 Style with Plug-in Hybrid, the Mercedes engineers particularly focused on improving the possibilities of driving exclusively with electricity in urban traffic. As a result, thanks to the high power reserves, the F 800 Style in e-mode easily masters all kinds of city traffic while producing no local emissions.

Clutch avoids engine drag losses

One system-specific attribute of the familiar hybrid concept from the S 500 Plug-in Hybrid is the clutch integrated between the combustion engine and the electric motor. This device decouples the two components in the pure electric drive mode, thereby ensuring the highest level of efficiency without engine drag losses. Moreover, because it is fully integrated into the converter housing of the seven-speed 7G-TRONIC automatic transmission, this clutch does not take up any additional space.

A drive battery based on lithium-ion technology is used in the F 800 Style with Plug-in Hybrid. It is cooled via a separate cooling water loop connected to the research vehicle's climate control system to ensure that the battery is cooled within an optimal temperature window. The plug-in battery of the F 800 Style can be charged both at charging stations and via a conventional household outlet, making the F 800 Style a full-fledged electric car. The vehicle's charging outlet is framed by lighting elements that indicate the battery's charge status. A slowly pulsing light indicates that charging is active; a constant light means that the battery is fully charged.

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Powerful hybrid module: Electric mobility not only for inner cities

The high-performance battery with its storage capacity of >10 kWh and the hybrid module delivering approximately 80 kW/109 hp enable the F 800 Style to reach speeds of up to 120 km/h when running solely on electricity. Such speeds are fully sufficient for drives in the city as well as when covering longer distances. The high torque is available from the very first turn of the electric motor, giving the F 800 Style impressive performance. The vehicle is a dynamic high-performer, yet highly efficient, nearly silent, and produces zero local emission.

The gasoline engine automatically adds its power to that of the electric motor when traveling at high speeds or when the battery range of approximately 30 kilometers is reached. The vehicle electronics synchronize the speed of the combustion engine and the hybrid module so that the clutch engages without jerking and imperceptibly to the driver. What's more, the sophisticated interplay with the combustion engine enables numerous additional functions that positively impact fuel consumption, emissions and vehicle agility.

In addition to an ECO start-stop function, these also include the so-called boost effect, which has the electric motor providing powerful support to the combustion engine during the acceleration phase. The vehicle's hybrid module uses regenerative braking — the recovery of energy when braking — to provide additional energy to the battery when the car is in motion. The clutch enhances efficiency here as well, as it enables complete energy recuperation without engine drag losses.

Efficient gasoline engine with spray-guided piezo direct injection

Boasting an output of around 220 kW (300 hp), the V6 gasoline engine underscores the sporty nature of the F 800 Style. The engine is very efficient, thanks to its spray-guided direct injection system with highly precise piezo injectors. In 2006 Mercedes-Benz became the world's first automotive brand to introduce spray-guided gasoline direct injection as standard. The system improves thermodynamic efficiency to enable better fuel utilization and therefore reduced fuel

consumption. A key advantage comes to the fore when the engine is in its stratified operating mode, in which it runs with high excess air and thus achieves excellent fuel efficiency.

Because the combustion process was consistently enhanced, the Mercedes direct injection engine can maintain this advantageous “lean operation” across a wider engine speed and load range. In addition, it supplies fuel to the combustion chambers several times in succession at intervals of a fraction of a second during each power stroke. In this way, it was possible to further improve mixture formation, combustion, and fuel efficiency.

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Driving pleasure without pollutant emissions:

The F 800 Style with electric drive based on fuel cell technology

Thanks to its well-conceived layout, the F 800 Style also offers great handling and driving pleasure as well as room for up to five occupants in the variant equipped with an electric drive based on fuel cell technology. The vehicle’s electric motor develops around 100 kW (136 hp) as well as a strong torque of approximately 290 Nm. The fuel cell generates the traction current by chemically reacting hydrogen with oxygen on board the vehicle. This process creates no pollutant emissions and produces only water vapor.

The Stuttgart-based automaker has been researching the use of electric drive systems with fuel cells in automobiles since 1994. As a result, it has gained an outstanding amount of expertise in this area. Mercedes-Benz has already presented the world’s first fuel-cell automobile to be manufactured under series conditions: the new B-CLASS F-Cell. The first units of this small-batch model will be handed over to customers in 2010.

As is the case with hybrid drive technology, the Mercedes engineers have also developed a modular building block system for vehicles with battery and fuel cell drives. The modular system makes it possible to efficiently utilize shared parts in all electric vehicles. These components range from the electric motor and transmission to the battery, high-voltage safety systems, high-voltage wiring, and software. In F-CELL vehicles, specific components such as the fuel cell stacks can be used in a wide variety of automobiles. The F 800 Style’s fuel cell and electric motor, for example, are also used in the B-Class F-CELL. The fuel cell variant of the F 800 Style has an electronically limited top speed of 180 km/h.

The F 800 Style benefits from Daimler’s outstanding expertise in the area of fuel cell technology, which extends all the way to the production of fuel cell cars and commercial vehicles. The latest Mercedes-Benz Citaro fuel cell bus is driven by two passenger car F-CELL systems of the same type that is found in the B-Class F-CELL.

Zero emissions even over long distances

The F 800 Style's fuel cell electric drive was designed in such a way that it can be fully accommodated in the front of the vehicle. The front end's compact package was made possible through the consistent downsizing of all F-CELL components. The components include a very quiet, yet powerful and highly efficient electric turbocharger for the air supply. Because the turbocharger is very quiet, complicated and voluminous soundproofing is not needed.

The compact components also make it possible to integrate the electric drive and fuel cell into a rear-wheel drive vehicle with the dimensions of a conventional sedan. To save space, the electric motor in such vehicles is located between the two rear wheels, while the lithium-ion battery is installed behind the backrest of the rear seat. To provide them with the best protection possible, the four hydrogen tanks are placed in the transmission tunnel between the passengers as well as underneath the rear seat.

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The hydrogen for operating the fuel cell is stored in four onboard tanks at a pressure of 700 bars. The tanks can store up to 5.2 kilograms of the gaseous fuel, which is enough for a range of almost 600 kilometers. This long range is made possible through the well-thought-out integration of the tanks into the vehicle, creating the first automotive architecture that is consistently geared toward accommodating alternative drives. The tanks are hermetically sealed so that no hydrogen can escape even if the vehicle is not used for extended periods.

Increased efficiency through the recovery of braking energy

The electric motor transforms kinetic energy into electrical energy every time the brakes are engaged or the driver takes his or her foot off the gas pedal. The motor does this by recovering the energy, which it then stores in the battery. The electric motor uses electricity from the battery whenever the motorist is maneuvering in tight areas, driving in cities, caught in stop-and-go traffic, or making short trips. If the energy storage unit does not have enough capacity, the fuel cell is automatically switched on. The vehicle's smart drive management system decides whether to use the electric energy from the lithium-ion battery, the fuel cell, or both systems together with the aim of achieving the highest efficiency in every situation.

F 800 Style with further innovations for more comfort and safety

In addition to a multi drive platform that is unparalleled for large sedans and the combination of different alternative drive technologies, the F 800 Style features many other technological innovations. These include innovative comfort and safety-related features, such as the Traffic Jam Assistant developed on the basis of the DISTRONIC PLUS proximity radar system, and the especially convenient and precise HMI operating and display system featuring a cam touchpad. The display unit in the F 800 Style features numerous additional functions that go beyond those normally present in a conventional instrument cluster. The F 800 Style's operation and display concept focuses for the first time primarily on electric driving functions.

Cam touchpad operating concept: full Internet access in the car

Provided a high-performance infrastructure is available, motorists will be able to make greater use of the Internet in automobiles in the future. In late 2008, Mercedes-Benz already provided a glance at what fully Internet-based infotainment systems in cars will look like, with myCOMAND. myCOMAND makes many new functions possible, including Internet telephony, personal Internet-based music databases, and offboard navigation systems that always employ the latest maps and also use the traffic information available on the Web when selecting routes. However, increasingly extensive infotainment functions in automobiles will require not only correspondingly large bandwidths for the communication networks, but also increasingly high-performance input and operating concepts within the vehicle. Page 7

Mercedes-Benz is presenting another particularly user-friendly innovation in the F 800 Style in the form of a new human-machine interface (HMI) equipped with a cam touchpad. The feature is a well-conceived system expansion for COMAND. The HMI unit here consists of a touchpad on the center console and a camera that records video images of the user's hand as it works the pad. The live image of the hand is presented in transparent form in the central display above the console. The key advantage of this solution is that icons that would be covered by the hand with conventional cell phones, for example, remain visible.

Users see their hands glide across the touchscreen as a "transparent" contour, allowing them to operate the functions of the current menu by applying a slight pressure. The touchpad can be operated with several fingers at the same time, and operating it feels similar to touching the keys of a notebook computer. Because the user interface is depressed by a few millimeters when touched, the activities carried out with the fingers are physically confirmed by the sense of touch.

The cam touchpad unit recognizes finger movements on the pad surface such as wiping, pushing, turning, and zooming, thus enabling intuitive regulation of the climate control system, phones, audio and navigation systems, and Internet access. The unit enhances active safety as well, because it is very easy and convenient to use and therefore does not distract the motorist as much from the actual task of driving.

Infrared camera transmits transparent image of the hand to central display

An infrared camera records the image of the hand and transmits it to the central display of the HMI with cam touchpad. The camera also detects the direction in which the hand is moving. The hand is always shown in the display when it is nearing the touchpad, but not when it is gliding across the center console. In this way, the system makes sure that the driver is not distracted by unexpected depictions in the central display. The camera is located in the center console, and the image it records is reflected by a mirror in such a way that it is focused on the touchpad. The center console has a black cover that is transparent to infrared light and protects the image channel against dust and other environmental influences.

Easy, convenient, and precise operation

The HMI with cam touchpad can be used more easily, more conveniently, and with greater precision than conventional touchscreen operating concepts. As a result, the user's hand can remain at an ergonomically beneficial position on the center console, since the driver does not have to bend forward to reach the central display in order to operate the touchscreen. The system offers another benefit in that the display in the F 800 Style is not smudged by fingerprints, as is the case with a touchscreen.

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The cam touchpad also offers clear advantages over conventional touchpad units in which hand or finger positions are generally depicted only by a point in the display. This lack of precision makes it very risky to enter information while driving, because doing so diverts the motorist's attention too much from the road. By contrast, the HMI with cam touchpad can be easily and safely operated even while driving. Test persons have confirmed that the HMI with cam touchpad is much easier to use than conventional systems, and that this is especially due to the transparent depiction of the hand. Unlike conventional touchpads, which determine the finger's position on the pad by sensing capacitance, the Mercedes-Benz system uses infrared radiation to follow the movements on the touchpad. The hand therefore does not have to directly touch the cam touchpad in order to enter information, enabling drivers to use the system even when wearing gloves or using a pen. In addition, the cam touchpad developed by the Mercedes engineers optimally augments the LINGUATRONIC voice control system.

Range on Map: Graphic range depiction during electric operation

The Range on Map function represents yet another extremely user-friendly innovation from Mercedes-Benz. This feature shows the remaining possible travel radius during electric vehicle operation as a 360° map depiction in the display. The system combines information about the current battery charge level with data from the navigation system, which also enables topographical attributes specific to the area in question to be taken into account, thus providing the driver with even more precise information about the remaining range.

The new operating and display concept from Mercedes-Benz that is used in the F 800 Style is a solution that provides exemplary clarity. The engineers have thus achieved the goal of successfully developing a comprehensive and easy-to-operate information and control system for future automobiles equipped with electric or partially electric drive systems.

The following is an overview of the features of the HMI with cam touchpad:

- Permanently visible depiction of the separate and combined ranges of the electric motor and the combustion engine
- When a destination is entered into the navigation system, the display shows whether

there is sufficient electrical energy available to reach the destination or how far it is possible to drive in pure electric mode until the combustion engine is automatically switched on

- To provide the driver with a quick overview, the Range on Map system shows the available electric driving range on a map
- If the battery has to be recharged, an integrated display shows the relationship between battery charging time and energy content
- Visualization of the energy flow (outflow of energy as well as inflow of energy through energy recovery)
- Because the vehicle does not make any noise when in electric driving mode, the motor's readiness after "ignition" is shown to the driver on the display
- An electronic eco-trainer motivates the motorist to drive in an efficient manner that helps extend the vehicle's range
- Mercedes-Benz has designed the future-oriented HMI with cam touchpad in such a way that the number of functions can be expanded. In the future the system will, for example, also show the location of public charging stations and guide the driver to the next charging station if desired

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Mirror display is easy on the eyes

One of the chief factors causing fatigue during long trips is what in medical textbooks is referred to as "accommodation" — the strain of refocusing of the eyes when frequently switching the field of vision back and forth between near objects such as the dashboard display and objects farther away on the road. The eyes use muscle power to change their focus levels, which makes them very tired over time. The innovative display system was developed to eliminate the differences between close proximity visibility and visibility over longer distances, and therefore also to further enhance the physiological safety that is typically ensured by Mercedes.

With the SERVO-HMI display, the engineers have developed an optimized human-machine interface (HMI). It has been used before, in the F 700 research vehicle in 2007. The system displays driving and vehicle information via a mirror in the instrument cluster so that they appear to be farther away. The display with the instrument panel is mounted horizontally in the dashboard. A mirror guides the light from the display onto the instrument panel, where it is visible to the driver. The distance the eye looks into is thus extended, which means less switching between near and far focus for the eyes — a contribution to driving safety that has been confirmed by scientific studies.

The comfort for an automobile's driver and passengers is defined not least by the vehicle's versatile interior, which is designed with the users' needs in mind. The interior also features a state-of-the-art infotainment system for passengers in the rear, which is integrated in the fold-away backrest of the middle seat in the rear.

Intelligent measures further reduce driver stress

Now more than ever, mobility has become an indispensable part of everyday life in modern societies, and people are therefore spending more and more time on the move — especially in cars. With this in mind, Mercedes-Benz assigns especially high priority to making the driving experience as comfortable and safe as possible. An important contribution is made by systems that ease the stress on drivers and thus improve their physiological well-being. Particularly stressful for drivers is having to constantly repeat the same actions in traffic jams: start to move — roll slowly — apply the brakes — stop — start again and so forth. Page 10

Back in 2006, Mercedes-Benz introduced DISTRONIC PLUS, the world's first proximity and speed control system, which operates even when the car is standing still — and greatly reduces stress on the driver in congested traffic. DISTRONIC Plus regulates the distance from the car in front even at very low speeds, all the way to a standstill. When the car in front begins moving again, a tap on the gas pedal or the cruise control lever is all it takes for DISTRONIC PLUS to begin again to regulate the speed and distance from the driver up ahead.

DISTRONIC PLUS Traffic Jam Assistant: Cars that drive themselves in traffic jams

With its new Traffic Jam Assistant feature in the F 800 Style, Mercedes-Benz has become the world's first automaker to implement a system that is capable of automatically following the vehicle in front of it into curves. At speeds of up to about 40 km/h, the system takes care of both longitudinal and transverse movements so that drivers do not have to steer themselves. The driver can just sit back and relax — with hands on the steering wheel. Drivers can, of course, override the system at any time. Sensitive sensors notice if the driver moves the steering wheel, thus automatically deactivating the system's lateral control function. When the 40 km/h mark is exceeded, the steering torque that keeps the vehicle in its lane is gradually reduced to a point at which the system smoothly disengages.

For the Traffic Jam Assistant feature, the Mercedes engineers supplemented the tried and tested DISTRONIC PLUS with proximity radar sensor by adding the “eyes” of a stereo camera. The camera and the electronic system monitor and analyze the area in front of the vehicle out to a distance of about 50 meters. The camera recognizes lane markings as well as the vehicle in front, which is also measured in terms of its position and width. As long as the vehicle in front is moving within its lane, the F 800 Style follows the vehicle by means of the measurement data from the camera. But should the driver in front move out of the lane or initiate a turn to the right or left, the assistance system limits the lateral control function to keep the F 800 Style in its own lane. In heavy traffic the Traffic Jam Assistant significantly boosts the driver's comfort by reducing the stress of driving. The system thus contributes to the further improvement of active safety because the driver can remain alert longer and retain the ability to react quickly.

PRE-SAFE 360° improves safety in rear-end collisions

While the Traffic Jam Assistant heightens active safety, simply because the driver is able to stay alert longer, the innovative protective system known as PRE-SAFE 360° further improves passive safety. PRE-SAFE 360° was realized for the first time in the ESF 2009 experimental safety vehicle from Mercedes-Benz, which was a world first, and it is also being used in the F 800 Style. It is based on the well-known PRE-SAFE® system presented by Mercedes-Benz in 2002. If PRE-SAFE® recognizes a critical driving situation, the system activates occupant protection measures in advance.

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The enhanced PRE-SAFE 360° monitors not only what is on either side of the vehicle, but also the area behind the vehicle. The system uses short-range and multimode sensors to monitor the area of up to 60 meters behind the vehicle. If the system for early recognition of accidents determines that a collision is unavoidable, the brakes are activated about 600 milliseconds before the impact.

Braking a stationary vehicle that is hit in the rear helps prevent secondary accidents such as those that result when such a vehicle is hit and catapulted in an uncontrolled manner into an intersection or a pedestrian crossing. This application of the brakes can also reduce the severity of possible injuries to the passengers' cervical vertebrae because the vehicle, and therefore the occupants' bodies, are subjected to a lower acceleration. The driver always retains control in a vehicle fitted with PRE-SAFE 360°, however. For example, the brake is immediately released if the driver hits the gas pedal knowing that there is sufficient space in front of his or her own vehicle to avoid the rear impact.

The protective effect of PRE-SAFE 360° supports that of the NECK-PRO crash-responsive head restraints. As soon as the sensors detect a rear-end impact of a predefined severity, the system releases pre-tensioned springs inside the head restraints. These move the padded surface of the head restraints slightly forward and upward within milliseconds, thus supporting the driver's and front passenger's heads sooner than conventional head restraints.

Rear pivot-and-slide doors ensure maximum entry comfort

A particularly customer-friendly innovation of the F 800 Style is its rear doors. Whereas the front doors are attached to the A-pillar as normal and open toward the front, the rear doors slide backward when opened.

The Mercedes-Benz engineers created an entirely new opening mechanism for the F 800 Style: Each rear door is suspended from an interior swivel arm mounted on the C-pillar. When the pivot-and-slide door is opened, it is moved away from the body a little by means of a mechanically coupled kinematic system of translation and rotation and then glides back.

Because the rear doors slide back close to the vehicle body and the front doors are

comparatively compact, it is much easier to get into and out of the automobile in tight parking spaces. Dispensing with a B-pillar makes the entire space between the A-pillar and the C-pillar freely accessible when the doors are open, and the big opening gives the passengers maximum freedom of movement. The front and rear doors can be opened entirely independently of one another. There are two locks interlocking the front doors, one installed up on the roof frame and another below on the sills. The pivot-and-slide doors are locked by means of a central lock in the rear and in the front sections of the doors with corresponding slotted guides.

The highest level of crash safety even with reduced body weight

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Thanks to the optimized body design, both variants of the F 800 Style also meet the highest safety standards. Despite the fact that the design does not feature a B-pillar, the research car's lightweight body structure is very stable and torsionally rigid. The Mercedes engineers achieved the mix of high load-bearing capacity and effective lightweight design by means of intelligent hybrid-metal construction using high-strength steels in combination with extruded aluminum components.

In addition, very rigid (sandwich) compound components with lightweight aluminum honeycomb cores were used for the underbody and the transmission tunnel. The weight- and crash-optimized modules are designed to accommodate drive system and storage components. For example, the two hydrogen tanks of the F 800 Style with fuel-cell drive, which are installed lengthwise, one above the other, save space and are well protected in the stable transmission tunnel.

Successful transfer from research to series production

Mercedes-Benz has presented 13 research vehicles since the early 1980s. The range of fascinating and pioneering automobiles that was unveiled — beginning with Auto 2000 in 1981 and leading up to today's F 800 — offers proof of the consistency and foresight with which Mercedes-Benz engineers address the core issues of research and technology in order to develop innovative solutions for the future.

Many systems that were first used in research vehicles and viewed as revolutionary at the time can now be found in production cars, including the DISTRONIC proximity-controlled cruise control system, which was first installed in the F 100 in 1991 and made its series production debut in the S-Class in 1998. Active Body Control, which is found today in the CL-, S- and SL-Classes, is another example of the successful transfer of technology from research vehicles to series production cars, as are the windowbag and the cornering light function. The F 500 Mind served as the model for the further development of hybrid power. The vehicle combined the V8 diesel engine of an S-Class with an electric motor. At the time, this duo formed the most high-performance, highest-torque hybrid drive system for rear-wheel drive passenger cars.

The immediate predecessor of the new F 800 Style — the F 700 presented in 2007 at the IAA in Frankfurt — is the world's first car that can register road conditions in advance and compensate for bumps and potholes by means of its active PRE-SCAN chassis, which ensures further significant improvement of suspension comfort. Another technological highlight is the pioneering DIESOTTO drive presented in the F 700. The four-cylinder engine with only 1.8 liters of displacement combines the strengths of the low-emission gasoline engine and the low fuel consumption of the diesel. Its CO₂ emissions of a mere 127 grams per kilometer correspond to consumption of only 5.3 liters of gasoline per 100 kilometers.

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The F 800 Style is continuing this approach. Like its predecessors, the model features key drive, comfort, and safety system innovations, as well as an emotional design, all of which point the way forward for series production of future Mercedes-Benz vehicles that will continue to impressively combine fascination and responsibility.