Figure 1: Mercedes-Benz E-Class Cabriolet with AIRCAP® © 2010 Daimler AG

Not a hair out of place, even at 100 miles.

With the AIRCAP®, Mercedes-Benz offers for its E-Class Convertible an automatic draft stop that can be activated at the push of a button, thus greatly reducing turbulence in the interior. Actuated is the AIRCAP® by a maxon drive system.

The AIRCAP® distinctively differentiates from conventional angular wind deflectors. It is entirely embedded into the car body and completely concealed into the windshield frame when deactivated. In activated state, an aerodynamically shaped wind deflector extends on top of the windshield without disfiguring the automobile's esthetic side line. The AIRCAP® comprises two main components; an electrically operated wind deflector built into the windshield frame and a wind blocker located between the rear head cushions. Its activation increases the air's free flow over the car interior which results in dramatically reduced air pressure and reverse air flow . It can be activated while driving (up to speeds of 160 km/h – or 100 mph) and can be used all the way up to the car's top speed. The result is increased driving comfort and clearly reduced wind noise. And, as weather conditions and temperatures call for – or just to give free rein to a boundless convertible feeling – the AIRCAP® can again be deactivated at the push of a button.

The Drive System

A drive system, designed by maxon motor GmbH in Sexau, Germany, takes care of moving the AIRCAP®. Its core piece is a motor/gear combination especially designed for the application based on a maxon A-max 22 DC motor and a customized gearbox with three separate reduction stages. Prominent characteristics are compact, robust design; high-capacity, silent, highly dynamic ganging, self-locking output in both end positions and handling-optimized, screwless assembly into the windshield frame. Behind the concept stand extraordinary high requirements related to comfort, miniature installation space and screwless assembly technique suitable for high volume production.

Result is a drive system that claims just 22 mm of installation height and drives the three outputs for bracing, adjustment of the lamella module and latching of the AIRCAP® in a fix, coordinated and synchronized ratio. In retracted position, the lamella module is being braced and interlocked flush to the car body's surface, in extended end position it is being mechanically interlocked. While being deployed, the drive overcomes wind ram pressures well beyond 250 km/h (155 mph) by torques of up to 7 Nm.

Figure 2: Mercedes-Benz E-Class Cabriolet with extended AIRCAP® © 2010 Daimler AG

As to acoustics and ganging, the drive fulfills the same high requirements, as Mercedes-Benz requires for interior passenger compartment instruments. Besides the high-end demands on power density, dependability and comfort, the drive also complies to the rigid constraints on optimized serial production. Thus, the entire drive assembly can be mounted into the windshield frame without the use of screws. Alike, the individual components, such as anti-vibration motor receptacle, motor, gear pinion, bipartite hull etc. are assembled with in an especially designed procedure.

Figure 3: Mercedes-Benz Benz E-Class Cabriolet, E 350 CGI BlueEFFICIENCY, detailed view of extended AIRCAP® © 2010 Daimler AG

Figure 4: maxon motor AIRCAP® Drive © 2010 maxon motor

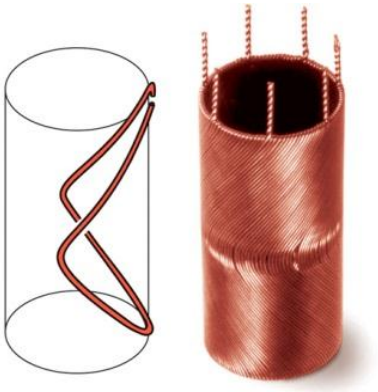

Figure 5 The heart of the maxon motors is the worldwide patented ironless winding. This motor principle offers unique advantages; no magnetic detent and low electromagnetic disturbances. Its efficiency of up to 90% surpasses other motor systems by far. © 2010 maxon motor

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