Formula 1 Tech Transferred To Mercedes-Benz Hybrids

by **Philippe Crowe** | **July 10, 2014**

Mercedes-Benz' involvement in Formula 1 translates into new hybrid and lightweight solutions for the brand's road-going cars.

"Technologies like direct fuel injection found their way in to series production via the Silver Arrows of the 1950s", said Prof Thomas Weber, Member of the Daimler Board of Management responsible for Group Research and Head of Mercedes-Benz Cars Development. "Today, the challenges and complexities faced by F1 are quite similar to those faced by us in designing and developing advanced road cars like the S 500 PLUG IN HYBRID: to translate efficiency into superior performance."

After entering Formula 1 as a works team in 2010, Mercedes-Benz said it did what it does best: worked hard and invested in engineering. While the team built itself towards on-track competitiveness, a technical challenge for 2014 had begun where the in-house engineering expertise of Mercedes-Benz was to play a decisive role. A development loop was completed from production to KERS (2009), the first foray of hybrids into F1, to vehicle production (AMG SLS Electric Drive) and to a fully Hybrid F1 2014 (W05 Hybrid). The company added partnerships from projects such as KERS nurtured to achieve in-house expertise and on-track leadership.

Development was rapid, said Mercedes, and offered these facts:

- The first development system of KERS in 2007 weighed 107 kilograms, and achieved an energy efficiency of 39 percent.
- By 2009, it was at 25.3 kilograms and 70 percent efficiency.
- By 2012, the system weighed less than 24 kilograms and achieved 80 percent efficiency.

As the 2014 season approached, cooperation between Mercedes AMG Petronas and Mercedes-Benz Cars intensified and one of today's key area of cooperation has to do with hybrid development.

As F1 has to make drastic steps in improving efficiency, so does the car community. The development teams on both sides are in constant contact in their quest of further improving efficiency, explained Mercedes. Both said they benefit from in-house competence in regard to technologies like electric motors, batteries, and control systems, as do the other teams successfully racing the F1 Mercedes-Benz power unit.

As the W05 Hybrid is about 35 percent more efficient than its predecessor, Mercedes said so is the upcoming S 500 PLUG IN HYBRID: it offers 325 kilowatt of power, sprints in only 5.2 seconds from zero to 100 kilometers per hour (62 mph), and can go 33 kilometers (20.5 miles) on electric power. It has certified fuel consumption of 2.8 liters per 100 kilometers (84 mpg). And Mercedes added it achieves excellent efficiency in real word driving as well.

Per the German company, key elements for this performance are a bi-turbo V6 and a highly sophisticated hybrid powertrain.

The next step in hybrid development, said Mercedes, will be wireless battery charging. This "unplugged" technology will go into fleet testing with the S 500 Plug in HYBRID soon, in order to offer a real S-Class solution in terms of comfort and ease of operating in the near future. Mercedes explained he system consists of two components: a secondary coil integrated into the under tray of the car and a primary coil integrated into a floor plate that can be placed on a garage floor for instance. Electrical energy is transmitted contact-free without the need for a cable, at a power rate of 3.6 kilowatt and with a degree of efficiency of 90 percent. Daimler and BMW have agreed on jointly developing common technology for wireless recharging high-voltage batteries of electric drive and plug-in hybrid vehicles.

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