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Mercedes-Benz History: In-Depth Look at Automatic Transmissions from Mercedes-Benz

THE AUTOMATIC TRANSMISSION, FEATURED AS STANDARD IN THE MERCEDES-BENZ 300 SE, WAS PRESENTED IN AUGUST 1961



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"The ultimate driving experience", proclaimed the brochure for the first automatic transmission developed in-house by Mercedes-Benz back in 1961. Several years of intensive development work went into the four-speed automatic clutch which was premiered in April 1961 as an optional extra for the 220 SEb model of the 111 series. The automatic transmission even featured as standard in the Mercedes-Benz 300 SE which was presented in August 1961. This opened a special chapter in the brand's success

story running through 125 years of the automobile.

Mercedes-Benz decided to build its own automatic transmission in keeping with the company's commitment to maintaining its innovative strength – a constant factor throughout the brand's history: as the automatically shifting transmission has a decisive influence on the character of an automobile, the development engineer striving for the best can only be content with a solution tailored precisely to the brand's own vehicles.

Instead of a torque converter the new transmission had a hydraulic start-up clutch, which offered the advantage of reduced power loss. The secondary four-speed planetary gear system comprised two planetary sets, three multi-disc clutches and three band brakes.

Automatic gear-shifting in the history of Mercedes-Benz

Mercedes-Benz had already produced vehicles with partially automated gear shifting prior to this development. The model 770 (model series W 07), which went down in automotive history as the "Grand Mercedes", featured semi-automatic vacuum-power shifting for the overdrive gear, for example. This function of the Maybach overdrive transmission was controlled via a lever on the steering wheel.

And while the Mercedes-Benz engineers were already at work on the company's first automatic transmission, the "Hydrak" hydraulic automatic clutch was presented in the summer of 1957. The new automatic clutch was initially available as an optional extra for the 220 S and 219 models. The system comprised a hydraulic start-up clutch, a conventional single-plate dry clutch for engagement and disengagement during gear-shifting and a freewheel to bypass the hydraulic clutch.

Genuine automatic transmissions also emerged at this time, initially produced by external suppliers. From the autumn of 1955, Mercedes-Benz offered the model 300 c with a three-speed converter transmission from Borg-Warner, for example.

1961: the first automatic transmission from the inventor of the automobile

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Mercedes-Benz introduced its first automatic transmission to be developed in-house on the model 220 SEb in April 1961. The automatic transmission came as an optional extra for this model, while featuring as standard on the model 300 SE of model series 112 which was presented in August 1961.

Further Mercedes-Benz models subsequently benefited from this refined, convenient and efficient transmission of the available engine power. From August 1962 the four-speed automatic transmission was available for the 220 and 220 S models subject to an additional charge of DM 1400, for example.

The four-speed automatic transmission was also optionally available for the Mercedes-Benz 230 SL Roadster (W 113) as of 1963 – a first among the sports cars from Mercedes-Benz. Finally, the prestigious Mercedes-Benz 600 limousine was available exclusively with the automatic transmission as of 1964.

75 years after Carl Benz invented the automobile, the launch of the automatic transmission marked a further milestone in the brand's history and the starting point for an outstanding series of innovations. The engineering and technology relating to automatic gear-changing has been subject to ongoing development at Mercedes-Benz since 1961.

The automatic transmissions have been built at the Hedelfingen factory since November 1961. The 100,000th automatic transmission for passenger cars from Mercedes-Benz was produced here in 1966, the output subsequently topping 500,000 by 1971 and one million in 1975. This development provides a clear illustration of the automatic transmission's success. The registration figures reveal a similar picture: by 1964, just three years after the automatic transmission from Mercedes-Benz was unveiled, 14.5 percent of all passenger cars delivered by the brand were fitted with this type of transmission, the figure even rising to over 20 percent when the petrol engines are considered on their own. This share rose continually, until automatic and transmissions each accounted for around 50 percent of delivered cars in the mid-1980s.

The future of the automatic transmission

A new automatic transmission from Mercedes-Benz was premiered in the S-Class saloons of the 116 model series in August 1972. It was designed as a converter transmission, rather than an automatic clutch. The transmission with hydraulic torque converter was initially offered as an optional extra. The 450 SE and 450 SEL models which were available as of 1973 featured this automatic transmission as standard.

The Roadster and Coupé models of the 107 SL series and mid-range models of the 114 and 115 model series ("Stroke/8") were also available with the converter transmission. The high-powered models with V8 engines were initially fitted with a three-speed transmission, while other engine variants were combined with a four-speed automatic transmission. As of 1980, four-speed transmissions were standard for all passenger cars from

Mercedes-Benz which were delivered with automatic transmissions.

The automatic transmission was always a key focus of engineers' and developers' efforts to make automobiles from Mercedes-Benz yet more comfortable, sporty and economical. An important step in this process was the development of five-speed automatic transmissions, for example, which were premiered in October 1990 as optional extras for the 300 E-24 model, the 300 E-24 Estate, the 300 CE-24 Coupé (all belonging to model series 124) and the 300 SL-24 (R 129).

The NAG automatic transmission set new standards when it was presented in 1995. This five-speed automatic transmission from Mercedes-Benz with electronic control and torque converter lock-up clutch offered unprecedentedly smooth and easy gear shifting. The light and comparatively compact transmission was initially introduced for the models fitted with V8 and V12 engines. From the summer of 1996 it became available for numerous classes of vehicle from the comprehensive passenger car programme.

Among the exceptions was the A-Class: the compact rear end and the special arrangement of the drive unit necessitated the development of special transmissions for the A-Class. The front automatic transmission was duly introduced as an optional extra for the A-Class (W 168) as of the summer of 1998. This transmission offered five speeds, had an electronic control system and was the shortest and lightest five-speed automatic transmission in the world, measuring 315 millimetres in length and weighing in at 68 kilogrammes.

As an alternative for the A-Class, Mercedes-Benz offered the ACS automatic clutch system, which operated along the same lines as the Hydrak from 1957: when the driver took his foot off the accelerator and moved the shift lever, the system identified the wish for a gear change and opened the clutch by means of an electric motor.

In the next generation of the A-Class (model series 169) and in the B-Class (T 245) the front automatic transmission was replaced by a continuously variable automatic transmission (CVT) which performed gear shifting unnoticeably.

In 2003 Mercedes-Benz presented the world's first standard production seven-speed automatic transmission for passenger cars, the 7G-TRONIC. It was initially introduced as a standard feature for the E 500 (W 211), S 430 and S 500 (W 220), CL 500 (C 215) und SL 500 (R 230) models, replacing the previous five-speed automatic transmission.

In addition to reducing fuel consumption substantially, this transmission also performed faster, smoother and easier gear-shifting than previous automatic transmissions. This innovation highlighted the Stuttgart-based automobile brand's technology leadership once again.

The 7G-TRONIC, designed for high continuous torque of 700 Newton metres, represents the fifth generation of automatic transmissions from the Mercedes-Benz brand. The popularity of the automatic transmission developed in tandem with its technical evolution. By 2004, the automatic transmission was standard for the S-Class, while around 88 percent of E-Class customers ordered their vehicles with an automatic transmission and the corresponding share for the C-Class stood at around 65 percent – with the underlying trend remaining upward.

Another seven-speed option was the innovative AMG SPEEDSHIFT MCT 7-speed sports transmission which was jointly developed by engineers of the high-performance AMG brand and Mercedes-Benz. It was premiered in the SL 63 AMG (R 230), which was launched in April 2008. This transmission employed a compact, wet start-up clutch instead of the conventional torque converter. In conjunction with the double-declutching and RACE START functions, the resultant direct connection to the powertrain gave rise to an extremely emotional and highly dynamic driving experience. The

abbreviation "MCT" stands for multi-clutch technology and alludes to the fact that gear-shifting is performed exclusively by clutch elements. This high-tech transmission was designed for high torque values and maximum engine speeds of up to 7200 rpm. Its extremely light weight of 80 kilogrammes was made possible by the use of the lightweight material magnesium, among other measures.

In 2010 Mercedes-Benz presented the 7G-TRONIC PLUS seven-speed automatic transmission in the new generation of the CL-Class (model series 216). This transmission operates even more smoothly, quickly and economically than the first generation of the 7G-TRONIC. Its efficiency has been optimised by measures such as an engine connection offering a further reduction in converter slip and markedly diminished gear friction losses. The various innovations enable engine speeds to be lowered when the vehicle is in ECO mode, making a crucial contribution to reduced fuel consumption.

A particularly innovative development is the automatic transmission in the F 800 Style research vehicle which was presented in 2010: in the hybrid version of the technology flagship, the Mercedes-Benz engineers have integrated the entire high-torque hybrid module rated at around 80 kW (109 hp) into the housing of the 7G-TRONIC seven-speed automatic transmission. With solutions of this ilk, Mercedes-Benz is boldly moving forward the brand's long traditions of technical expertise in the field of automatic gear-shifting.

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benzaholic

I remember the 4-speed automatics used in the 80s allowed for push-starting the vehicle, and one or both of the 5-speed versions were noted for their robustness and power handling. I believe the Porsche 928 licensed MB's automatic transmission. Isn't the current, soon-departing 5-speed automatic in Chrysler vehicles derived from the MB design?

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