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Automatic transmissions technologies

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Less fuel consumption and reduced CO2 emission compared to a manual transmission -more dynamic driving due to the particularly fast automatic transmission gearshift operations - more safety due to automatic transmission functions such as automatic protection against stalling when starting off uphill - more comfort thanks to automatic shifting saving the driver from the trouble of applying the clutch in stop-and-go traffic. The following systems are built-in safety features so that the transmission cannot be damaged in the event of driver error.

Let us introduce you to the main types: ECS - AMT - AT - DCT – CVT

ECS: Using this first stage of automation, the driver can drive off without pressing the clutch pedal even with a manual transmission. The use of this type of robotization is drastically decreasing worldwide.

AMT: Automated manual transmission. The AMT increases efficiency by automatically selecting the optimal shifting point as well as comfort by eliminating the clutch pedal.

AT: Automatic step transmission. The AT changes gear automatically using shifting programs stored in the control unit. That way, driving off smoothly is possible even if an engine has low torque. This system uses a fluid coupling (ATF oil) in place of a friction clutch. It uses a highly -complex torque converter to transmit the engine’s rotational energy while gear shifts are controlled by the vehicle’s computer and accomplished with a planetary gear set and a series of clutches and brakes. Late-model cars are equipped with transmissions boasting eight or even nine forward gears. The ultra-late Hybrid model contains inside (mounted on the main shaft) a powerful electric engine/generator and software that “feel the way”; this additional program is called Coasting.

DCT:

Dual-clutch transmission: In a DCT, the gears are already engaged prior to shifting. This allows gears shift speeds that even the fastest driver cannot achieve with manual gear changes.
Think of it as a hybrid between a fully automatic and manual transmission. A semi-automatic uses a similar mechanical layout to a conventional transmission, but uses a system of hydraulics actuators to change gears. In a Dual-Clutch Transmission (DCT), there are two separate clutches for both odd and even gears, which allows for incredibly fast shifts. These gearboxes can generally be operated in a fully automatic mode, or manually shifted via paddles on the steering wheel.

CVT: Continuously variable transmission: An automatic transmission without fixed shifting points. It offers additional driving comfort because the transmission operates continuously instead of shifting between fixed gears. Therefore, driving off, and driving characteristics in general, are particularly smooth. It uses a system with one belt and two conic pulleys to produce an infinite range of ratios. The car's computer decides how to adjust the pulleys to create the optimal ratio for the particular driving situation.

Wanna keep your transmission in top condition for life? Just keep it clean!

Modern automatic transmissions are quite complex electro-hydraulic-mechanical systems relying on increasingly tight specifications for each of its parts, including the automatic transmission fluid (ATF). Large material debris may eventually find their way in the transmission during assembly or sloppy maintenance and, unless trapped by oil filter or magnetic traps, will cause early mechanical failure. However, the major causes of transmission malfunction are "burnt out" ATF due to overheating and particle contamination of ATF due to wear. These are associated with the mid-life symptoms, such as erratic valve performance, harsh shifts or shift flares. Transmission cleanliness has a significant impact on shift quality and general transmission longevity. The International Standardization Organization for Standardization (ISO) uses special cleanliness codes to describe oil cleanliness level. The safe ISO cleanliness level for ATF is considered to be 19/16 or better, and the anything above 21/18 is considered dangerous and the transmission should be flashed as soon as possible to prevent mechanical damage. In order to keep your transmission clean, transmission oil change and eventual transmission flash are highly recommended each 60,000 km. Do it, you will appreciate how much smoother and more precise the gear shifts become and how

much more power goes to the wheels afterwards.

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