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TYPES OF AUTOMATIC TRANSMISSIONS

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Automatic transmission is becoming increasingly popular today. This is quite understandable as it is much more convenient for everyday use, and many of its "teething problems" from the early years have long been solved. Modern automatic transmission can be extremely fast as well as extremely efficient. There are several different types of AT, each with its own features and advantages.

1. Torque Converter Transmission (TCT). TCT is one of the most common types of automatic transmissions. It uses a hydraulic system to control gears, providing smooth and comfortable gear shifts. Hydromechanical AT usually has a wide range of gears and can be easily adapted to various types of engines. Operating principle: TCT uses pressurized hydraulic fluid to control gear shifting mechanisms. When the driver presses the gas or brake pedal, sensors send signals to the hydraulic system, which then shifts gears according to the current speed and driving mode of the vehicle. Advantages: TCT has several advantages, such as smooth gear shifts, high driving comfort, adaptability to various road conditions and driving styles. It also usually has a wide range of gears, making them versatile for different types of vehicles. Disadvantages: One of the main disadvantages of TCT is power loss due to the hydraulic system, which can lead to a slight increase in fuel consumption compared to other types of AT. It may also be more complicated to maintain and require more frequent technical servicing.

2. Automated Manual Transmission (AMT). AMT is a combination of mechanical and automatic transmission. It uses computers to control gear shifting, providing fast and precise gear changes. AMT can be equipped with manual control modes, allowing the driver to choose gears manually. Operating principle: AMT uses electronic and mechanical devices to control gear shifting. It is similar to manual transmission but

does not require driver intervention for gear shifting. Instead, the control system (robot) automatically shifts gears based on algorithms and data on current driving conditions.

Advantages: AMT has several advantages, such as fast and precise gear shifts, fuel savings due to engine optimization, the ability for manual control mode for a sporty driving style, as well as convenience and comfort in daily use.

Disadvantages: One of the main disadvantages of AMT is expensive maintenance and repairs due to the complexity of the system and the higher amount of electronics. Some models may also exhibit delays or jerks during gear shifts, which can be irritating for the driver.

3. Continuously Variable Transmissions (CVT). CVT uses a special system of belts or chains for smooth gear changes without stepped shifting. This provides smoother acceleration and fuel efficiency. CVT also has the ability to automatically adapt to the driver's driving style.

Operating principle: CVT uses metal chains or belt that connect two cones with variable diameters. Varying the diameter of the cones changes the gear ratio, allowing smooth regulation of speed and torque output. This enables continuously variable gear to work without jerks or delays.

Advantages: CVT has several advantages, such as smooth and continuously variable gear, optimal use of engine power through constant adjustment of the gear ratio, fuel savings due to engine optimization at different speeds, and a high level of comfort while driving.

Disadvantages: Some drivers may experience some weird sensation during acceleration due to the lack of clear gear steps. Additionally, CVT may be less suitable for vehicles with high engine torque or for a sporty driving style due to the peculiarities of the system.

Thus, it is possible to conclude that the main types of automatic transmissions have their own peculiarities that make them suitable for different types of vehicles and driving styles. Understanding the differences between these types of AT will help drivers choose the most suitable option for their vehicle without hindering the basic performance of a vehicle.

References

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