

ADVANTAGES AND DISADVANTAGES OF DUAL-CLUTCH TRANSMISSIONS

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Dual-clutch transmissions (DCT) are becoming increasingly popular in modern vehicles due to their efficiency and dynamic performance. They combine the advantages of both manual and automatic transmissions, allowing for high efficiency without significant compromises in comfort or drivability.

Advantages of dual-clutch transmissions:

1. *Gear shift speed.* One of the main advantages of DCTs is their very fast and smooth gear shifts, which occur without power loss. Gear changes happen without pauses, significantly enhancing the vehicle's dynamic performance, especially during rapid acceleration.

2. *Fuel efficiency.* Thanks to the high precision of gear shifting, dual-clutch transmissions help maintain optimal engine speed across a wide range, positively affecting fuel consumption. This makes the vehicle more economical compared to traditional automatic transmissions.

3. *Improved dynamics.* DCTs provide better acceleration performance, making driving more enjoyable and exciting, particularly in sports cars. The smoothness and immediacy of gear changes improve vehicle control.

Disadvantages of dual-clutch transmissions:

1. *Complex design and high maintenance costs.* DCTs have a complex structure that includes two clutches, increasing both production and repair costs. In case of failure, repairs may be significantly more expensive compared to traditional automatics or manual transmissions.

2. *Driver adaptation period.* For some drivers, operating a vehicle with a DCT may feel unusual, especially at low speeds. Minor delays in gear shifting may cause discomfort, particularly when turning or driving in urban traffic. This is especially noticeable in stop-and-go traffic where smooth crawling can be challenging for some DCT systems. Drivers often need time to get used to the different feel compared to conventional automatics.

3. *Overheating under high loads.* During aggressive driving or in high-temperature conditions, dual-clutch transmissions may overheat. This can lead to reduced efficiency or even failure, especially if operational guidelines are not followed.

Dual-clutch transmissions offer many advantages, such as high shifting speed and fuel efficiency. However, they also come with drawbacks, including high repair costs and some inconveniences in urban use. Choosing this type of transmission depends on performance expectations, maintenance costs, and driving style.