HOW DUAL-CLUTCH TRANSMISSIONS WORK

Dual-clutch transmissions are similar to manual transmissions, except that one clutch couples the even (2, 4 and 6) gears to the engine while another links the odd gears (1, 3, 5) and reverse to the engine. During gear shifting, one clutch disengages the current operating gear the instant before the other clutch engages the next operating gear. As a result, the power flow from the engine is virtually uninterrupted, as opposed to the 0.5-2.0 seconds of power interruption that occurs when changing gears with a traditional manual transmission.

The Volkswagen dual-clutch gearbox DSG (Direct Shift Gearbox™) blurs the boundaries between automatic and manual gearboxes. The driver has the option to either select when to shift or allow shifting to be fully automated by the vehicle’s on-board computers – a feature that is now quite common in modern vehicles with automatic transmissions.

The difference between the dual-clutch gearbox DSG and the majority of automatic transmissions is how the gear-shifting process occurs. It operates with the ease of an automatic transmission but its innovative design offers a more dynamic, smoother acceleration that eliminates shift shock (jerkiness). In addition, since power interruption is eliminated, the engine is more efficient at driving the wheels.

A particular feature of the DSG is that it can only operate sequentially. In other words, it can only shift to the next gear in the sequence. For example, it cannot shift directly from 3rd gear to 5th gear, but must follow the sequence and first shift to 4th gear, then to 5th gear.

Gear changes using the DSG are performed at the exact moment that they are needed in order to shift the engine into a more fuel-saving range. This more efficient shifting process means that the DSG is more efficient than a traditional automatic transmission, and may even be more efficient than a manual transmission, because it reduces the power interruption from the engine. This in turn improves acceleration and responsiveness, reducing fuel consumption and CO₂ emissions.