

Tech Talk tips / techniques / training

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Different gearboxes require different gear oils

Different gearboxes have completely different requirements. Not using the right product can cause serious performance issues and even render the vehicle un-driveable. Gear oils also come with industry/manufacture's specifications and not using a product that has been proven to offer the correct performance can cause severe damage.

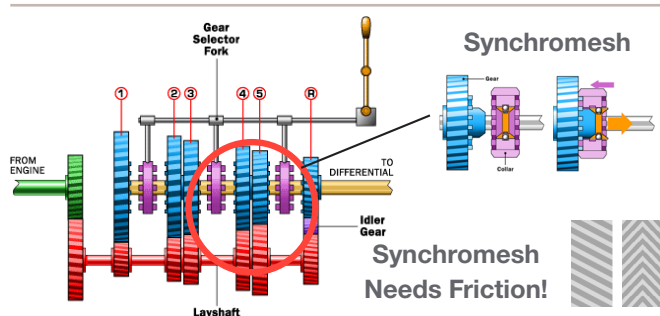


Manual Transmissions

The manual gearbox consists of a series of constantly engaged, helical gears. The gears themselves do not move but instead are engaged by the movement of a special gearing system called synchromesh. When you put your foot on the clutch and move the gear stick into the next gear, you are actually moving the synchronisers and not the gears themselves.

The synchroniser is entirely dependent on friction to do this job properly. If the frictional characteristics of the fluid you choose are not right, then shifting performance can be radically lowered, or worse, you might find that you are unable to engage any gears at all. Traditional manual gearboxes will require an oil with fundamental performance of API GL-4 and less commonly GL-5. However, with advancements in technology most OEMs will stipulate additional requirements such as friction and durability, this has led to a sharp increase in OEM specifications. When considering the need for different viscosity grades, the product range starts to grow rapidly and the use of a proven multi-vehicle oil can help reduce this complexity.

Manual Transmission Diagram



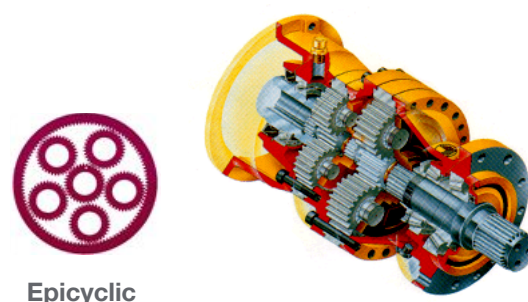
Conventional Automatic Transmissions

The conventional automatic gearbox is significantly more complicated and is based around epicyclic gear sets and instead of a mechanical clutch, automatic gearboxes require the use of what's called a torque converter.

In order for a gearbox to be automatic, it needs to have a complex hydraulic control system which places another set of demands on the lubricating oil. As if that wasn't complicated enough, automatic transmissions use brake bands and clutch plates to different gears. If the frictional characteristics of the fluid aren't right then these systems cannot engage. Generally speaking, if you are going to have a problem caused by a transmission fluid, then you are likely to notice it immediately as you won't be able to get the vehicle off the driveway. When we look towards the demands on the oil, these are specific according to each manufacturer.

Therefore the market is awash with many different specifications. The use, of a proven multi-vehicle oil, assessed against the widest range of specifications can help reduce the need for a growing range.

Conventional Automatic Transmission Diagram



CVT (Continuously Variable Transmissions)

In a CVT, conventional gears are replaced by two variable size drums and a drive belt or chain. The belt or chain runs in a groove formed between the sides of each drum. The diameter of each drum is controlled by the transmission computer through the action of hydraulic cylinders, applying or reducing oil pressure to the movable part of each drum. The efficiency and durability of the pulley system used in CVTs depends on the system's friction performance. Also, some of these transmission systems do not use a conventional clutch but instead use a torque converter, just like the conventional automatic.

CVT transmissions account for approximately 6% of the UK vehicle parc with the average sump size being 5.5 litres (this is compared to an average of 3 litres for manual transmissions and 6 litres for a conventional automatic). The CVT fluid must be changed according to the manufacturer's recommended service interval and anytime it is found to be faulty (periodic checks should be performed to make sure that the CVT is kept in good working order).



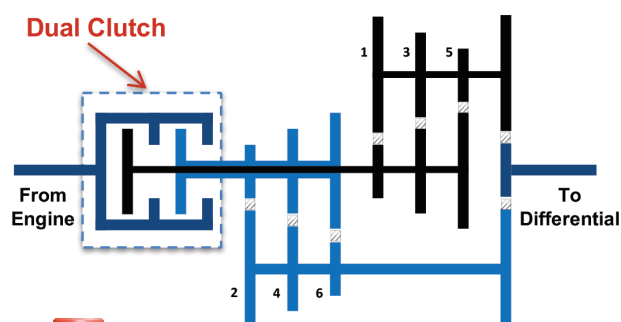
DCT (Dual Clutch Transmissions)

A dual-clutch transmission or DCT is a type of semi-automatic automotive transmission. It uses two separate clutches for odd and even gear sets. It can fundamentally be described as two separate manual transmissions (with their respective clutches) contained within one housing and working as one unit.

There are two fundamental types of clutches utilised in dual-clutch transmissions; either two wet multi-plate clutches which are bathed in oil, or two dry single-plate clutches. In terms of lubrication, the "dry" conventional type requires conventional manual gearbox oil, however, the "wet" type has some extra requirements for oil so that the oil does not influence the friction characteristics of the clutch which can cause the clutch to slip and ultimately not work at all.

DCT transmissions account for approximately 3% of the UK vehicle parc and the average sump size is of 6.4 litres (the manual transmission average is 3 litres with the conventional automatic average being 6 litres). The DCT fluid must be changed according to the manufacturer's recommended service interval and anytime it is found to be faulty. Periodical checks should be performed to make sure that the DCT is kept in good working order.

Dual Clutch Transmission Diagram



**"Wet" Clutch
Special Requirements**

**"Dry" Clutch
Manual Transmission Oils**

How can I make sure I get it right?

The safest way to select the right engine oil is to use Comma's application tool at www.CommaOil.com. Here you will find product recommendations with our 100% compatibility guarantee for engine oil and antifreeze & coolant for European vehicles going back over 30 years. It also covers brake fluid, transmission and power steering fluid recommendations.

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