



PENRITE

# TECHNICAL BULLETIN DCT Transmissions

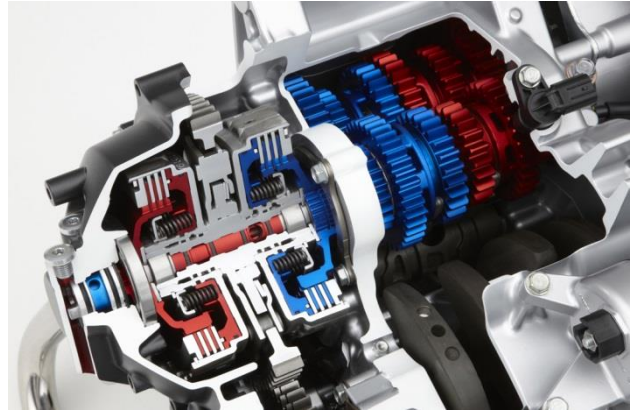
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## History

**DCT (Dual Clutch Transmission)** is a transmission that uses two separate clutches for odd and even gear sets.

They are primarily driven like an automatic transmission with the ability to be used like a manual transmission shifting gears semi automatically. Originally developed pre-WWII, they were first used by Porsche and Audi in racing cars during the 1980's.

The first production car to use this system was a Volkswagen Golf Mark 4 RS32 in 2003. Since then, many manufacturers have adopted this technology with transmission manufacturers such as Borg Warner, Getrag, Eaton, LuK, ZF Friedrichshafen AG and others producing DCT type transmissions.



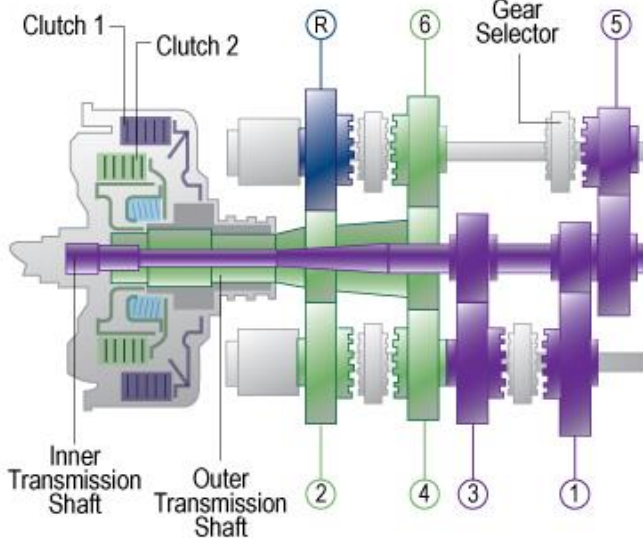
## DCT Types

There are several types of DCT available. Some use a "WET" Clutch system where the clutches are bathed in transmission fluid (similar to a motorcycle wet clutch) and some use a "DRY" clutch arrangement. The wet clutch system is more favourable for higher engine torque loads whereas the dry clutch system is more fuel efficient but suits drivetrains with less torque loads. There are also several ways the clutches are installed in the transmission as they use hydraulic, electric and electro-hydraulic actuation to engage the clutches rather than a pedal in a normal manual transmission.

## How do they work?

A dual-clutch transmission offers the function of two manual gearboxes in one. In a normal manual gearbox, when a driver wants to change from one gear to another they first presses down the clutch pedal. This operates a single clutch, which disconnects the engine from the gearbox and interrupts power flow to the transmission. Then the driver uses the gear lever to select a new gear, a process that involves moving a toothed collar from one gear wheel to another gear wheel of a different size. Devices called synchronisers match the gears before they are engaged to prevent grinding. Once the new gear is engaged, the driver releases the clutch pedal, which re-connects the engine to the gearbox and transmits power to the wheels. So, in a conventional manual transmission, there is not a continuous flow of power from the engine to the wheels.

A dual-clutch gearbox, uses two clutches, but has no clutch pedal. The clutches are controlled by sophisticated electronics and hydraulics, similar to the way modern automatic transmissions are controlled. In a DCT, both clutches operate independently of one another. One clutch controls the odd gears (first, third, fifth and reverse), while the other controls the even gears (second, fourth and sixth). With this arrangement, gears can be changed faster than what can be done with a conventional manual transmission gears without interrupting the power flow from the engine to the transmission.



In DCTs where the two clutches are arranged concentrically, the larger outer clutch drives the odd numbered gears, while the smaller inner clutch drives the even numbered gears. Shifts can be accomplished without interrupting torque distribution to the driven road wheels, by applying the engine's torque to one clutch at the same time as it is being disconnected from the other clutch. Since alternate gear ratios can pre-select an odd gear on one gear shaft while the vehicle is being driven in an even gear, (and vice versa). With a DCT, shifts can be made more smoothly than with a single-clutch AMT, making a DCT more suitable for conventional road cars.



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### Auto Manufacturers using DCT Transmissions

Volkswagen ( <i>DSG</i> )	BMW	Kia	Chrysler
Jeep	Ford ( <i>Powershift</i> )	GM	Honda
Hyundai ( <i>EcoShift</i> )	Lotus	McLaren	Mitsubishi ( <i>TC-SST</i> )
Nissan	PSA	Porsche ( <i>PDK</i> )	Renault
Lamborghini	Ferrari	Fiat ( <i>Euro</i> )	Bugatti
Audi ( <i>S-Tronic</i> )	Skoda ( <i>DSG</i> )	Seat ( <i>DSG</i> )	Smart
John Deere	Dodge		

### Transmission Fluid

DCT's use a specialised transmission fluid depending on the type of transmission they are. These are normally specified by the manufacturer of the vehicle. With many DCT's having a wet clutch system, they require fluids that are compatible with the clutch material and provide the correct frictional characteristics along with the protection for the gearbox itself.

The owners handbook or workshop service manual should always be referred to for the correct specification of fluid that meets or exceeds the manufacturers requirements.

### Penrite DCT Fluid

Penrite DCT Fluid is a fully synthetic, multi-vehicle, Dual Clutch Transmission fluid suitable for use in DCT transmissions that use a wet clutch system. It is suitable for 6 & 7 Speed transmissions manufactured from 2003 onwards. It provides anti-shudder performance, smooth shifting and excellent transmission response resulting in fuel economy benefits and wear protection of the transmission internals.



**New**  
 Penrite DCT Fluid  
 Available in 4 LT & 20 LT



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**PENRITE DCT Fluid is suitable for the following vehicles**

**VW TL 052 182**

- 2007-11 Audi A3 1.8 8P turbo
- 2013- Audi A3 1.8 8V turbo 4WD
- 2004-09 Audi A3 2.0 TDI 8P
- 2011-13 Audi A3 2.0 TDI 8P
- 2013- Audi A3 2.0 TDI 8V
- 2010-13 Audi A3 2.0 TFSI 8P
- 2005-09 Audi A3 2.0 TFSI 8P
- 2010-13 Audi A3 2.0 TFSI Quattro 8P 4WD
- 2004-09 Audi A3 3.2 Quattro 8P 4WD
- 2012- Audi Q3 2.0 TDI Quattro 4WD
- 2012- Audi Q3 2.0 TFSI Quattro 4WD
- 2013- Audi Q3 1.4 TFSI Quattro turbo 4WD
- 2013- Audi RS Q3 2.5 TFSI Quattro 4WD
- 2009-14 Audi S3 2.0 TFSI Quattro 4WD
- 2012- Audi TT 2.0 TDI Quattro 8J 4WD
- 2006-09 Audi TT 2.0 TFSI 8J
- 2010-13 Audi TT 2.0 TFSI 8J
- 2013- Audi TT 2.0 TFSI 8J
- 2008- Audi TT 2.0 TFSI Quattro 8J 4WD
- 2011- Audi TT 2.5 RS Quattro 8J 4WD
- 2006-09 Audi TT 3.2 Quattro 8J 4WD
- 2007-10 Skoda Octavia 1.9 TDI
- 2007-11 VW Eos FSI 2.0
- 2007-11 VW Eos TDI 2.0
- 2007-09 VW Golf 1.4 TSI (NZ)
- 2004-09 VW Golf 1.9 TDI
- 2004-10 VW Golf 2.0 TDI
- 2009- VW Golf 103TDI 2.0
- 2013- VW Golf 110TDI 2.0
- 2007-09 VW Golf GT 1.4
- 2007-09 VW Golf GT Sport TDI 2.0
- 2009- VW Golf GTI 2.0 TSI
- 2005-09 VW Golf GTI 2.0
- 2009-13 VW Golf R 2.0 TDI 4Motion 188kW 4WD
- 2013- VW Golf R 2.0 TSI 4Motion 206kW 4WD
- 2006-10 VW Golf V R32 3.2 4WD
- 2007-08 VW Jetta 1.4 TSI (NZ)
- 2006-09 VW Jetta 2.0 TDI
- 2009- VW Jetta 2.0 TDI
- 2006-09 VW Jetta 2.0 Turbo FSI
- 2009-12 VW Jetta 2.0 Turbo FSI
- 2012- VW Jetta 2.0 Turbo TSI
- 2013- VW Passat 2.0 TDI 4Motion 130kW 4WD
- 2006- VW Passat 2.0 TDI 103kW
- 2007-09 VW Passat 2.0 TDI 125kW
- 2009- VW Passat 2.0 TDI 125kW
- 2013- VW Passat 2.0 TDI 130kW
- 2006-10 VW Passat 3.2 V6 4Motion 184kW 4WD
- 2010- VW Passat 3.6 V6 4Motion 220kW 4WD
- 2009- VW Passat CC 125TDI 2.0
- 2009- VW Passat CC V6 FSI 3.6 4WD
- 2008-11 VW Passat R36 3.6 4WD
- 2009-11 VW Scirocco 2.0 TSI (NZ)
- 2012- VW Scirocco R 2.0 TSI
- 2010- VW T5 2.0 TD
- 2012- VW T5 2.0 TSI
- 2010- VW T5 2.0 TD Twin turbo
- 2010- VW T5 2.0 TD Twin turbo 4WD
- 2011- VW Tiguan 2.0 TDI 4WD
- 2013- VW Tiguan 118TSI 1.4 S/Charged
- 2013- VW Tiguan 132TSI 4WD
- 2010- VW Tiguan 155TSI 4WD
- 2007-09 VW Touran 2.0 TDI (NZ)

**VW TL 052 529**

- 2012- Audi A4 2.0 TDI Quattro B8 4WD
- 2013- Audi A4 2.0 TFSI Quattro B8 4WD
- 2013 Audi A4 3.0 Quattro B8 S/Charged 4WD
- 2010- Audi A4 3.0 TDI Quattro 4WD

- 2007-10 Skoda Octavia 2.0 TDI 4WD
- 2007-09 Skoda Octavia 2.0 TDI
- 2009-13 Skoda Octavia 2.0 TDI
- 2009-11 Skoda Octavia RS 2.0 TFSI
- 2006- Skoda Octavia/Scout 2.0 TDI 4WD (NZ)
- 2010-13 Skoda Octavia v RS 2.0 TFSI (NZ)
- 2010-12 Skoda Octavia 2.0 TDI 4WD
- 2014- Skoda Octavia 2.0 TFSI
- 2009- Skoda Superb 2.0 TDI 103kW
- 2012- Skoda Superb 2.0 TDI 103kW 4WD
- 2009- Skoda Superb 2.0 TDI 125kW
- 2009- Skoda Superb 3.6 V6 FSI 4WD
- 2014- Skoda Superb 2.0 TDI 125 kW 4WD
- 2012- Skoda Yeti 1.8 TSI 4WD
- 2011- Skoda Yeti 2.0 TDI 4WD
- 2005-09 VW Caddy 1.9 TD
- 2011- VW Caddy 2.0 TD
- 2011- VW Caddy 2.0 TD 4WD
- 2012-13 VW CC 125TDI 2.0
- 2013- VW CC 130TDI 2.0
- 2012- VW CC V6 FSI 3.6 4WD
- 2007-10 VW Cross Touran 2.0 TD (NZ)
- 2006-09 VW Eos 3.2 V6 (NZ)
- 2011- VW Eos 103TDI 2.0
- 2011- VW Eos 155TSI 2.0
- 2009- Audi A5 2.0 Quattro 4WD
- 2008- Audi A5 3.0 Quattro V6 TD 4WD
- 2013- Audi A7 3.0 TDI 4WD
- 2011-13 Audi A5 3.0 TFSI Quattro V6 S/Charged 4WD
- 2008-12 Audi A5 3.2 Quattro V6 4WD
- 2011- Audi A6 2.8 Quattro 4G V6 4WD
- 2011- Audi A6 3.0 TDI Quattro 4G V6 4WD
- 2011- Audi A6 3.0 TFSI Quattro 4G S/Charged 4WD
- 2011-12 Audi A7 3.0 TDI V6 4WD
- 2013- Audi A7 3.0 TFSI V6 S/Charged 4WD
- 2011-13 Audi A7 3.0 TFSI V6 4WD
- 2009- Audi Q5 2.0 TDI Quattro 8R 4WD
- 2009- Audi Q5 2.0 TFSI 8R Quattro 4WD
- 2009- Audi Q5 3.0 TDI Quattro 8R V6 4WD
- 2009-13 Audi Q5 3.2 FSI Quattro 8R V6 4WD
- 2013- Audi R8 4.2 V8 FSI Quattro 4WD
- 2013- Audi R8 5.2 FSI Quattro V10 4WD
- 2012- Audi RS4 Quattro B8 4.2 V8 4WD
- 2010- Audi RS5 Quattro 4.2 FSI 8T 4WD
- 2009- Audi S4 3.0 TSI Quattro B8 4WD
- 2010- Audi S5 3.0 Quattro 8T S/charged V6 4WD
- 2012- Audi S6 4.0 Quattro 4G V8 Twin turbo 4WD
- 2012- Audi S7 4.0 Quattro 4G V8 Twin turbo 4WD

**BMW 83 22 2 147 477**

- 2007-13 BMW M3 E90/E92/E93 4.0 S65
- 2011-13 BMW M5 F10 4,4 V8 S63T

**Ford M2C936-A.**

- 2008-10 Chrysler Sebring 2.0 TD
- 2009-10 Dodge Avenger 2.0 TD
- 2008-11 Dodge Journey 2.0 TD 4WD
- 2009-11 Ford Focus LV 2.0 TD
- 2011- Ford Focus LW 2.0 Duratorq TD
- 2013- Ford Kuga 2.0 TD 4WD
- 2010-12 Ford Mondeo MB/MC 2.0 TD
- 2011- Ford Mondeo MC 2.0
- 2013- Ford Mondeo 2.0 TD
- 2009-11 Volvo C30 2.0 TD MY10-
- 2009-10 Volvo S40 2.0D TD MY10
- 2011- Volvo S60 1.6 T4 Turbo
- 2011- Volvo S60 2.0 T5 Turbo
- 2009-11 Volvo S80 D5 2.4 TD 4WD MY10
- 2009-10 Volvo S80 T6 3.0 Turbo 4WD MY11-
- 2009-13 Volvo S80 V8 4.4 4WD MY10
- 2009-10 Volvo V50 2.0D TD MY10
- 2011- Volvo V60 T4 1.6 Turbo



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2011- Volvo V60 T5 2.0 Turbo  
2010-13 Volvo V70 T6 3.0 4WD  
2011- Volvo XC60 T5 2.0 Turbo  
2010-11 Volvo XC70 3.2 4WD  
2009-10 Volvo XC70 D5 2.4 TD 4WD

#### Mercedes Benz

2013- Mercedes A180 (W176) 1.6 Turbo  
2013- Mercedes A200 CDI (W176) 1.8 TD  
2013- Mercedes A200 (W176) 1.6 Turbo  
2013- Mercedes A250 (W176) 2.0 Turbo  
2012- Mercedes B180 (W246) 1.6 Turbo  
2012- Mercedes B200 CDI (W246) 1.8 TD  
2012- Mercedes B200 (W246) 1.6 Turbo  
2012- Mercedes B250 (W246) 2.0 Turbo  
2013- Mercedes CLA45 AMG (C117) 2.0 Turbo  
2013- Mercedes CLA200 (C117)

#### Mitsubishi Dia-Queen SSTF-1

2008- Mitsubishi Lancer CJ Ralliart 2.0 Turbo 4WD  
2008-11 Mitsubishi Lancer Evolution X 2.0 Turbo 4WD  
2012-14 Mitsubishi Lancer Evolution CJ 2.0 Turbo

#### Porsche Oil No. 999.917.080.00

2012-14 Porsche 911 Carrera 4 (991) 3.4 4WD  
2012-14 Porsche 911 Carrera (991) 3.4 4WD

#### Recommendations

Penrite recommend **"The Right Oil for the Right Application"**.

To find the right engine oil, transmission, brake, steering, suspension fluid, grease or coolant for your vehicle, please visit the Penrite Lube Guide by clicking on the following link -

[Click Here](#) to visit the Penrite Recommendation Guide, which will ensure you receive the correct oil for your vehicle

2012 Porsche 911 Carrera (991) 3.8  
2012-14 Porsche 911 Carrera 4S (991) 3.8 4WD  
2012-14 Porsche 911 Carrera S (991) 3.8 4WD  
2009-12 Porsche 911 Carrera 4 (997) 3.6 4WD  
2009-12 Porsche 911 Carrera (997) 3.6  
2009-12 Porsche 911 Carrera 4S (997) 3.8 4WD  
2011-12 Porsche 911 Carrera GTS (997) 3.8  
2009-11 Porsche 911 Carrera S (997) 3.8  
2009-12 Porsche 911 Targa 4S (997) 3.8 4WD  
2014- Porsche 911 Turbo (991) 3.8 Twin Turbo 4WD  
2014- Porsche 911 Turbo S (991) 3.8 Twin Turbo 4WD  
2010-13 Porsche 911 Turbo (997) 3.8  
2010-13 Porsche 911 Turbo S (997) 3.8 4WD  
2013- Porsche Boxster 2.7  
2009-12 Porsche Boxster 2.9  
2012-13 Porsche Boxster S 2.7  
2012- Porsche Boxster S 3.4  
2009-12 Porsche Boxster S/Spyder 3.4  
2012- Porsche Cayman 2.7  
2009-12 Porsche Cayman 2.9  
2009-12 Porsche Cayman S/R 3.4  
2012- Porsche Cayman S 3.4  
2013- Porsche Panamera 4S (970) 3.0 4WD  
2010-14 Porsche Panamera 4 (970) 3.6 4WD  
2009-13 Porsche Panamera 4S (970) 4.8 4WD  
2010-14 Porsche Panamera (970) 3.6  
2012- Porsche Panamera GTS (970) 4.8 4WD  
2009-14 Porsche Panamera S (970) 4.8  
2009-14 Porsche Panamera Turbo (970) 4.8



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