VOLVO

Press Release

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Volvo Cars launches Powershift - Two Transmissions in One

- Fully-automatic and sequential six-speed transmission
- Twin wet clutches give extremely fast and smooth changes
- About eight percent lower fuel consumption
- Optimised for powerful diesel engines

Two-litre turbodiesel versions of the Volvo C30, S40 and V50 are now also available with a fully-automatic transmission. This new Powershift transmission is a six-speed unit. It features twin wet clutches that provide gearchanging comfort on a par with that of a fully-automatic transmission, yet with the performance one expects of a manual gearbox. What is more, it significantly cuts fuel consumption compared with a conventional automatic transmission.

The Powershift transmission has been developed by Volvo Cars in cooperation with its transmission partner Getrag. Powershift operates in principle as two parallel manual gearboxes. It has twin wet clutches that work independently of one another. One clutch controls the odd gears (1, 3, 5 and reverse) while the other handles the even ratios (2, 4 and 6). The two clutches operate alternately, with one engaging while the other disengages. This means that at the same time as the engine gets full power and maximum thrust in first gear, second gear is placed in readiness to be engaged. And when second gear has been engaged, third gear is readied, and so on. This promotes a continuous flood of power without any disruption in power delivery or any torque loss, resulting in extremely fast and silky-smooth gearchanges while maintaining acceleration throughout the gearchanging process.

Eight percent lower fuel consumption than a conventional automatic transmission
Apart from gearchanging comfort and high performance, Powershift contributes to noticeably lower fuel consumption.

"According to our measurements, Powershift contributes to a fuel consumption saving of about eight percent compared with a conventional automatic transmission," says Magnus Jonsson, Senior Vice President, Research & Development, Volvo Cars. "And that is an important benefit in the hunt to keep lowering the negative impact on the environment."

The Powershift function is based on the technology used in a manual gearbox but with the difference that the two wet clutches are each linked with their own input shaft. One shaft spins inside the other. The inner shaft regulates the output shaft for first, third, fifth and reverse gears, while the outer shaft controls second, fourth and sixth gears. The clutch function is operated by an electro-hydraulic control unit that ensures that one clutch is shut while the other is open, and vice versa.
Each clutch functions like a slip clutch. A piston pushes a number of clutch plates against each other and locks them together through the resultant friction.

Automatic or sequential gearchanging without any loss in torque
Powershift gives the driver an automatic transmission that permits sequential gearchanges, just like with Volvo's Geartronic transmission. The difference is that with Powershift even manual gearchanges take place without any time or power losses.

Since Powershift, unlike a conventional automatic transmission, does not need a torque converter, planetary gears or multiple wet clutches, there is also none of the added torque losses that these

features bring.

Optimal choice for powerful diesel engines
Thanks to the use of twin wet clutches, the Powershift transmission can handle high torque levels and in principle has no limitations on choice of ratio. This makes it an ideal partner for today's modern, powerful diesel engines.
The version of Powershift that Volvo is now launching is dimensioned to handle torque levels up to 450 Nm. In the versions of the Volvo C30, S40 and V50 in which it is fitted, Powershift is mated to the 2-litre four-cylinder turbodiesel which delivers a power output of 136 hp and 320 Nm of torque.

"With Powershift we can now offer automatic transmission with our two-litre diesel engine," says Magnus Jonsson. "And it's not just any old automatic transmission: lower fuel consumption allied to increased comfort and higher performance sounds like an impossible equation. But with Powershift we have shown this is perfectly possible."

Descriptions and facts in this press material relate to Volvo Cars' international car range. Described features might be optional. Vehicle specifications may vary from one country to another and may be altered without prior notification.

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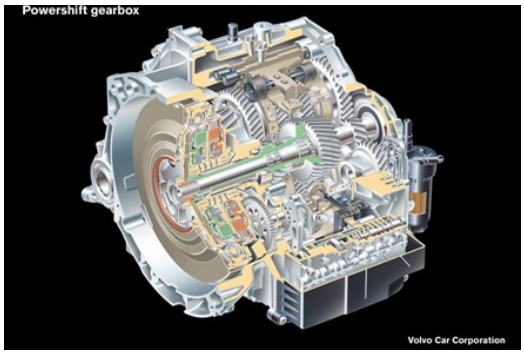

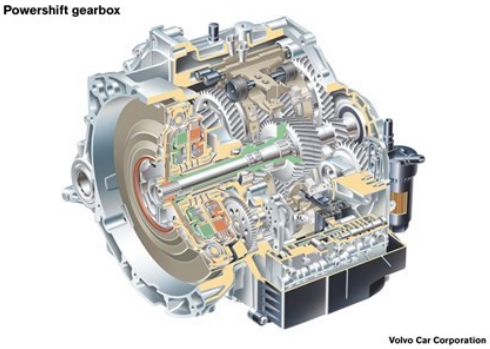

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