

■ The last few years have seen the world of transmissions almost turn upside down. There's been more change, more technological breakthrough and more innovation than ever before. The traditional manual and automatic gearbox technology is now competing with a raft of new initiatives, including DCTs, AMTs and CVTs. Such change and intense competition has led to different transmission suppliers and OEMs to back different technology. As a result, it's now become accepted that over the next 15 years some transmissions will succeed, while others will fade out.

Getrag, the largest independent maker of manual transmissions, is backing DCTs to have the biggest impact. "Dual-clutch transmission combines the comfort advantages one gets in automatic gearboxes with the efficiency benefits from a manual," explains Bernd Eckl, R&D vice-president at Getrag. "It is clear from both physics and mechanics that the manual is the most efficient transmission in the world. Combining a manual and automatic has to be the optimum solution: Efficiency with comfort, and fuel economy advantages of up to 15 percent."

The development of the dual-clutch transmission has led some industry figures to think that the days of the conventional manual and automatic are over. Eckl

disagrees, despite his unwavering support for DCTs: "It is not the end of automatic or manual transmissions. But there will be dramatic changes in what types of transmissions drive different markets around the world."

Getrag estimates that at present the global market is roughly split 60:40 for automatic over manual. By 2015, that map will have changed. Eckl forecasts that in the next decade, manual gearboxes will swallow an increased 56 percent global share because "heavy growing markets such as India and China will embrace the manual". Getrag's favored DCT will have taken 15 percent of the market by 2015, while CVT – limited to only Japan – will remain marginal with only a one percent stake. The big loser is the conventional automatic, which could have its 60 percent share of the global market today cut to just over a quarter by 2015.

Getrag's VP of R&D qualifies the forecast: "Automatics will lose the most market share due to the fact that most of the manual's growth will come from new markets in Asia. In developed markets - especially in North America - DCTs will replace a lot of today's automatic gearboxes."

A second casualty of the rise of DCTs will be AMTs, as Eckl confirms: "I think in the passenger car industry, there will not be any



VW DSG system has been a big success



## BERND ECKL, GETRAG

**"With competition coming from DCTs, the AMT will lose share and may not even exist by 2015 to 2020"**

## ZERO HERO

Not all believe that AMTs will be wiped out by DCTs in passenger car applications by the end of the next decade. Introducing the ZeroShift transmission, an automatic-manual box that Bill Martin, ZeroShift's founder and MD, promises will be the "next big thing".

He continues: "The in-gear efficiency of a manual is higher than any other gearbox type, and that high efficiency level translates into performance, economy and reduced emissions. The problem with conventional manual gearboxes, and the automated version, is not the in-gear but the shift. In the ideal world, an AMT with the shift quality problem resolved – and without causing any compromise to the technology – is the Holy Grail for transmission makers. ZeroShift is exactly that transmission system."

From the start of the project, Martin and his team of engineers set about solving the shift quality problem that feature on today's

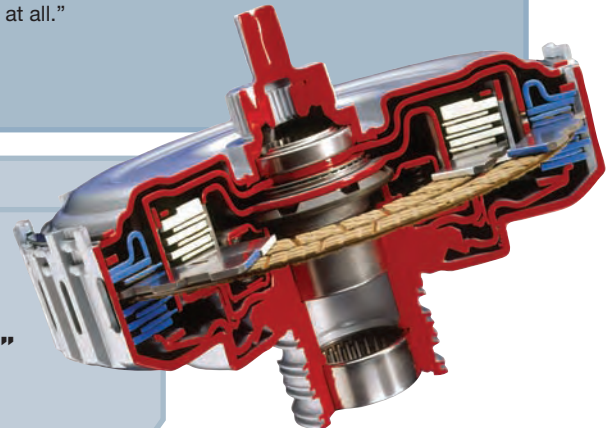
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## THE NUMBERS GAME

As technology has progressed, so too have the number of gears available for the driver to select. For so long, three-speed automatics and four-speed manuals were the order of the day. Today, the industry is up to eight gears, and there's even rumor that a nine-speed is being developed. "The world has got a little over-excited over the number of speeds in a transmission," admits Steve Gifford from BorgWarner.

Getrag's VP for R&D, Bernd Eckl, agrees: "There is no fuel, financial or weight benefit to a nine-speed gearbox. It makes no sense. You might as well develop a CVT. Eight-speed transmissions make sense in diesel applications, while seven speeds for gasoline engines is good enough – there's no need for more speeds because there's no fuel economy benefit. As for hybridization, I think eight-speed makes no sense at all."



The BorgWarner dual-clutch module 'box'