Global 4WD and AWD light vehicle market- forecasts to 2029

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Introduction

Although AWD (All Wheel Drive) and 4WD (Four Wheel Drive) operate in a similar way in that all four wheels of the vehicle can be driven through a transfer case, there are differences.

The main difference is that with AWD, the transfer case is not controlled by the driver. It is usually computer controlled. As such, the computer determines when the power is transferred from two wheels to four. In other words, AWDs are electronically controllable systems for four-wheel drives for cars. Because these systems are controllable, they can interact better with other subsystems in the car. The system software can be typically customised to meet each carmaker’s particular needs in terms of driving characteristics and traction.

With 4WD, the driver can decide – by using a switch - whether just two wheels or all four are driven from the transfer case.

Impelled by demands for better fuel economy, emissions and reduced NVH (noise, vibration and harshness) – and greater integration with other vehicle control systems – 4WD drivetrains are becoming ever more sophisticated. Containing key analysis of the macro-industry factors currently affecting the 4WD sector, this intelligence service provides the latest information on VMs' activities and suppliers' technology going into the latest 4WD systems.

PESTER analysis

Political

- *The two main political or policy drivers affecting the automotive industry in recent years have surrounded safety and the need to reduce fuel consumption and emissions.*

SUVs, the most prominent 4WD vehicles on the road – have been severely criticised on both accounts on many occasions in the recent past. Addressing these issues has been at the heart of most of the recent technical developments in the SUV market.

Traditional body-on-frame SUVs have long received a poor press for their destructive impact on small cars – and pedestrians – in crashes, while their poor fuel consumption figures have become the scourge of environmental campaigners in more recent years. Whether it is safety or fuel emissions/ consumption issues which have forced a change in the design and manufacture of SUVs, things have certainly changed in terms of SUV design in the last decade.

Some body-on-frame vehicles remain – especially in the Pick-up market and at the heavier end of the SUV market, notably with many North American models – but the switch to monocoque bodies in the SUV or crossover market is unmistakeable. Even the new Range Rover, for so long the pinnacle of the European SUV market, is now made with a monocoque structure. Cutting out the separate chassis frame from the old vehicle – and switching to an aluminium monocoque structure – is said to have contributed around [redacted]% of the total weight saving on the new vehicle. Around [redacted]kg of weight has been saved on the new vehicle (on a like-for-like performance basis, in this case the weight saving of the aluminium D[redacted]u or PLA platform engendered the new L[redacted] TDV[redacted] with the same performance as its predecessor L[redacted] TDV[redacted] model, from which the [redacted]kg figure was derived) which has greatly improved its fuel consumption figures compared to its predecessor model.

Companies

Like their counterparts in other automotive supply sectors, those engaged in 4WD have not experienced entirely smooth passages, even during the good times. Now fuel price hikes and financial uncertainties have taken them further into uncharted waters.

On the one hand, major players most reliant on the North American full-size light truck market face the implications of a significant shift in buying patterns. Yet nimbler operators with greater emphasis on electronic control set-ups, for example, may be better placed to follow the market. All admit that times are hard, and they are unsure about the immediate future.

American Axle & Manufacturing, Inc

American Axle & Manufacturing Inc is a Tier [redacted] supplier that designs, engineers, manufactures, tests and validates drive-line and drivetrain systems and related components and modules, chassis systems and metal-formed products for light trucks, SUVs, passenger cars, CUVs and commercial trucks. In 2012 its sales amounted to US$[redacted]b delivered by [redacted] employees from [redacted] facilities in [redacted] countries. Full year 2013 sales were up nearly [redacted]% to US$[redacted]bn.

American Axle's product portfolio is organised into four primary sectors:

- Driveline systems including: rear axles, front axles, TracRite® axle differentials, SmartBar™ electronic stabilizer system, torque transfer device, driveshafts, independent rear drive axles and constant velocity joints
- Drivetrain systems including: transfer cases, power transfer units, and TracRite® transmission differentials
- Powertrain components including: transmission/transfer case components, intake manifolds, oil pans and bell housings
- Chassis system components including: sub-frames, upper/lower control arms, bushings, anti-roll bars

Products

The nature of American Axle's business - it has the strapline Delivering Power - means that AWD products are produced throughout its four primary product sectors, but mainly housed within its Drivetrain systems division.

Technologies

Alfa Romeo Q[redacted]

Q[redacted] full-time 4WD features a [redacted]-speed Tiptronic-style automatic gearbox with driver sequential override. Supplied by Aisin, it has default, sport and winter modes. A Torsen self-locking centre differential delivers [redacted]:5[redacted] default front-rear torque split to engender sporting handling character, and continually modulates torque distribution across a range from 7[redacted]:2[redacted] to [redacted]:7[redacted]. Torque is fed via a PTU (power take-off unit) to the RDM (Rear Drive Module), both with gears by ZF.

This set-up functions in league with switchable VDC (Vehicle Dynamic Control), which the driver can disengage at will. Alfa's VDC is a 'sporting system' with high intervention thresholds, leaving the driver in command until near to critical limits. VDC intervenes to re-establish directional stability if the car starts to slide.

Sensors continuously detect yaw (the car's rotation about its vertical axis), lateral acceleration and steering input. By contrasting these data with predetermined parameters, the system verifies whether the car is cornering within its grip limits or the front or rear wheels are about to lose adhesion – understeer or oversteer. To restore the intended trajectory, VDC brakes the appropriate wheel/s individually and reduces engine output via the throttle, generating a yaw effect to counteract the yaw destabilising the car.

The scope of the arrangement embraces:

- ABS (Anti-lock Braking System): the Bosch [redacted].[redacted] system has four active sensors, four channels and a hydraulic control unit with [redacted] solenoids. Active sensors are less susceptible to electromagnetic interference and road surface temperature. Furthermore, the sensors are able to process wheel input signals directly, rather than sending them to the control unit. Thus the system detects speeds far closer to zero and activates faster.

Markets

The vast majority of vehicles with 4WD systems, whether full-time or part-time, are SUVs and pick-up trucks and the growing number of Crossover vehicles, especially in the US. In addition, there is an increasing number of 4WD/AWD cars, notably the Audi Quattro and All-road ranges; Audi's sister brand Volkswagen offers the Passat Alltrack which is a similar concept to the Audi All-roads, ie a car with a slightly raised axle height for improved ground clearance and a 4WD system. Other premium brands, such as Porsche, Mercedes and BMW, also have 4WD or AWD versions of some of their mainstream cars, but typically without a raised ride height. Even Jaguar now offers AWD on its latest XF and XJ, and will soon offer its own SUV. Conversely, there is a significant proportionj mof some SUVs (especially amongst those made for the southern states in the US market and some "soft-roader" SUVs from the Japanese and Korean brands) which are available in 2WD-only configuration; Land Rover even offers a 2WD-only version of the Range Rover Evoque, although sales of this version are very low. A similar "rule" applies to some of the smaller pick-ups, especially those made in South America, India, South Africa and various emerging markets. In addition, we have recently seen the rapid growth of the B-segment SUV/crossover market, especially in Europe but in other markets too. This segment includes vehicles like the Peugeot 2008 and Renault Captur which do not have 4WD, and some like the Ford EcoSport which has 4WD in Brazil, but not on the versions offered for sale in Europe. A slightly larger and very successful vehicle, the Nissan Qashqai, was offered in both 2WD and 4WD formats, although the new 2014 version only has 2WD with Nissan customers who want 4WD being directed to the X-Trail instead,

For these reasons, to get to the size of the 4WD/AWD market, it is not simply a matter of taking the proportion of vehicle build in a given location which is accounted for by SUVs and, in some cases, pick-ups; these volumes need to be **deflated** by the proportion of SUVs and Pickups which are produced with only 2WD and then **increased** by the proportion of the conventional car market which has 4WD.

Market volumes of 4WD systems fitted to newly-assembled passenger cars and light vehicles, 2[redacted]-2[redacted], ('[redacted]s units)

Market	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2024	2029
North America	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Mercosur	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Western Europe	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Central Europe	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Russia	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Japan	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
China	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
India	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Korea	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Thailand	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Other Asia	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Iran	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
South Africa	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Australia	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total [redacted] markets	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Source: just-auto, LMC Automotive and industry sources

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