Global light vehicle electronic braking market- forecasts to 2029

April 2015
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This a sample PDF.

This analysis has been curtailed as it is an illustrative sample. The table of contents represent what is present in the full version of this report.

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Introduction

Electronic braking systems are rapidly gaining share in the automotive industry as automakers look to benefits of improved performance at low cost.

Although advances in friction materials and caliper designs have helped improve braking performance, the main improvements in braking in recent years have come from electronic control, firstly anti-lock braking systems (ABS), then electronic stability control (ESC) and now brake-by-wire.

As the world’s largest producer of electronic braking systems, Bosch has played a major role in promoting these developments. In 1978, the company launched the first electronically controlled ABS. Nine years later, Bosch introduced the traction control system. Its next major innovation was the electronic stability program (ESP), itself an ESC system.

Bosch ABS

While ABS prevents vehicle wheels from locking during braking, and traction control stops the wheels from spinning on acceleration, ESP reduces the risk of skidding in all traffic situations. Although ESP is already standard equipment on many luxury cars, an increasing number of mid-range and small-cars are being fitted with the unit as optional fitment.

Worldwide, nearly 90 per cent of vehicles weighing up to six metric tons have ABS, and more than 80 per cent have ESP. Bosch engineers told us: “We are seeing ABS being replaced by ESP, in part due to legislation and regulations. As more and more hybrid and all-electric vehicles enter the market, brake systems will have to be adapted to the special needs of these cars. This year we will launch our portfolio of regenerative braking systems for these vehicles.”

Continental AG is another major manufacturer of electronic brake systems.
PESTER analysis

Political

• *In the emerging markets, there is a growing acceptance for advanced automotive braking technologies.*

More and more governments are defining clear road safety targets in terms of fatality and injury reduction. Consequently, crash avoidance technologies are now acknowledged as being an integral part of a system approach to road safety.

• *The Brazilian ABS legislation demonstrates how governments can and will take action to introduce important technologies to the marketplace.*

In markets like China where road safety is a significant and growing issue, it is critical that drivers have advanced technologies and learn how to use or interact with them. A big challenge ahead is not just equipping vehicles properly but changing the mindset of vehicle drivers and other road users in understanding that the rules of the road are very important.

• *China is catching-up fast because of the increasing fleet and the resulting increase of serious accidents.*

Here, we expect a huge demand for active safety. In other countries with similar market-behaviour it will be the same although demand may rise a little bit slower.

• *The move toward standardisation across a number of market drivers should help make product requirements more uniform globally yet the process can be a slow one.*

For example, we have seen manufacturers talking with governmental and industry bodies to influence drive technologies like AEB into the market. We have also seen more co-operation and communication between the European Union and the US recently regarding proposed regulation or NCAP upgrades hence we expect markets like Brazil and China will follow suit in time.
Companies

Aisin Seiki Co., Ltd.

Aisin Seiki develops and manufactures brake products. Its brake and chassis related products group designs and produces a number of products, including:

- Brake booster and master cylinders;
- Disc brakes;
- Drum brakes;
- Anti-lock braking system;
- Electronic stability control.

More specifically, its brake products include:

- Brake master cylinder with brake assist;
- ABS modulator;
- ESC modulator;
- Hydraulic booster;
- Disc brake calliper;
- Brake pad;
- Disc brake rotor (brake disc);
- High carbon disc rotor;
- Brake assembly;
- Electric parking brake; and
- Foot release type parking brake pedal.

Aisin Seiki supplies products for light vehicles, small- and medium-size trucks, buses and industrial vehicles.

Its subsidiary, Aisin Seiki Foshan Electronics Company, located in Foshan City of Guangdong Province, China has expanded its production bases for drive system parts (transmissions, clutches, etc.), brake parts and body parts (door parts, sunroofs, etc.).

Advics

Advics designs and produces ABS, stability control systems, brake boosters, master cylinders, disc brakes, drum brakes and other related components.
Advics Co was formed in July 2001 by combining the brake operations of Denso, Aisin Seiki and Sumitomo Electric Industries in Japan to develop new brake technologies and modules. Each partner holds an equity stake; Aisin Seiki has ☐% Denso and Sumitomo each have ☐% and Toyota holds the remaining ☐%. The company’s brake customers in Japan include Toyota, Nissan, Mazda, Suzuki, Honda, Mitsubishi and Daihatsu.

Based in Aisin’s headquarters in Kariya, Aichi prefecture, Advics operates four technical centres in Japan (two in Kariya and one each in Hyogo and Fujioka-cho).
Markets

Drivers

In addition to consumer demand, the market for electronic braking systems is affected by both the regulatory environment and influence from bodies such as Euro NCAP (New Car Assessment Programme).

In June 2012, a new rating scheme of the European New Car Assessment Programme (Euro NCAP) for the years 2013 to 2017 was announced. Trendsetting assistance systems like Autonomous Emergency Braking (AEB) and Lane Departure Warning (LDW) were taken stronger into account into the assessment scheme and from 2014 are key to achieving a top Euro NCAP 5-star Rating. More specifically, from 2016, it will not be possible to achieve at Euro NCAP five star rating without the fitment of a LDW and/or AEB system.

AEB systems help to avoid crashes or reduce their severity by warning the driver of an impending impact and supporting his braking response. The technology generally uses radar for long-range sensing and either vision sensors or lasers for short range sensing. Several vehicle manufacturers now have (or will shortly have) systems on the market but they don’t all work across the full speed range. Lower-cost vehicles typically avoid the expensive radar systems by offering only operation at city speeds, which represent a high proportion of relevant impacts.

During an interview with just-auto, Andrew Brown is vice president & chief technologist for Delphi Automotive discussed certain safety aspects that Delphi is currently evaluating. He told us that there is a significant trend starting in Europe that will certainly happen in the US and other regions - that is the idea of making commercial vehicles safer using active safety technologies. He added: “Among these technologies are AEB and lane departure warning (LDW) systems, which became a mandatory equipment in Europe for certain new commercial vehicles beginning November, and for all new heavy-duty commercial vehicles by November, 2016.”
Technologies

Introduction

The apparently simple issue of braking continues to be a major issue for chassis system designers. Drivers are of course concerned that in an emergency, their vehicles should stop as quickly as possible. There is a practical limit to braking performance, set by the ability of the tyre contact patches to transmit the forces involved without sliding. However, advances in tyre design, complemented by the ability of electronically controlled braking systems to distribute effort according to wheel load (if, for example, the brakes are applied while the vehicle is cornering), mean that limit is now potentially very high, at least on dry road surfaces. This is throwing the onus very much back to the braking system developers.

Any conventional braking system is, in engineering terms, a mechanism for reducing vehicle speed by converting its kinetic energy into heat. The alternative has recently emerged, in hybrid-driveline vehicles, of regenerative braking – of converting the kinetic energy into electrical energy that is stored in a system buffer device (a battery or ultracapacitor). However, even such hybrid vehicles retain substantial friction braking systems because it would not be cost-effective to engineer a regenerative system with the power capacity to cope with the maximum emergency-braking case. It is normal, in such vehicles, for the control system to treat the brake pedal input as a demand for a given deceleration rate and to respond with a predetermined mixture of regeneration and conventional braking.

Like steer-by-wire, BBW technology has already been offered, specifically by Mercedes in some of its top-range models. The alternative, seen as a longer-term prospect, is electro-mechanical braking (EMB) in which the brake calipers are applied electrically, via a highly geared linkage, and the hydraulics are eliminated altogether (which is presented as a notable advantage).
Forecasts

This section sets out our estimates and forecasts of OE electronic braking systems fitted to newly-assembled passenger cars and light vehicles across X of the world’s largest light vehicle markets - which collectively account for more than X% of world light vehicle production. Our forecasts range is from 2009 through to 2019 with spot forecasts for 2024 and 2029.

Here, our forecasts are divided into the following three groups:

◦ Anti-lock braking systems
◦ Electronic stability control systems
◦ Electric parking brakes

Each forecast group sets out first the market fitment/penetration percentage rates followed by market volumes ('Xs).

Our forecasts are not extrapolative but dependent on the underlying drivers of supply and demand.

Each forecast is based on vehicle data prepared by our partner, LMC Automotive. The vehicle data (passenger cars and light commercial vehicles) includes:

◦ North America - US, Canada and Mexico;
◦ Mercosur - Brazil and Argentina;
◦ Western Europe - Germany, Italy, France, UK, Spain, Portugal, Netherlands, Belgium, Sweden, Austria, Finland and Morocco;
◦ Central Europe - Turkey, Bulgaria, Czech Republic, Poland, Slovakia, Hungary, Romania, Serbia and Slovenia;
◦ Russia;
◦ Japan;
◦ China;
◦ India;
◦ Korea;
◦ Thailand;
◦ Other Asia - Indonesia, Malaysia, Taiwan and Philippines;
◦ Iran;
◦ South Africa;
◦ Australia.

These forecasts are updated quarterly or as and when major changes require assumptions to be amended. Full revision history for all of our forecast pages within this section allow you to see what has changed and when.
Finally, according to Continental, the following summarises the initiatives underway in the European Union, US and Japan on respect of electronic braking systems.

**EU**

Electronic stability control mandatory from/by:

- **Mandatory since November 2011 for all new types of vehicles.**
NHTSA proposals

In April 2012, NHTSA proposed to update existing safety standards to ensure drivers can better stop a vehicle in the event both the brake and accelerator pedals are depressed at the same time.

NHTSA research indicates a "Brake-Throttle Override" requirement will help reduce the risks of high-speed unintended acceleration and prevent crashes involving a stuck or trapped accelerator pedal by allowing the driver to maintain control through normal application of the vehicle's brakes.

The NHTSA proposal aims to minimise the risk that drivers will lose control of their vehicles as a result of either accelerator control system disconnections or accelerator pedal sticking or floormat entrapment. The proposal would amend Federal Motor Vehicle Safety Standard (FMVSS) No. 1, Accelerator Control Systems, by updating the throttle control disconnection test procedures for all passenger cars, multipurpose passenger vehicles, trucks and buses, regardless of weight.

For vehicles that have Electronic Throttle Control (ETC) and a gross vehicle weight rating (GVWR) less than 10,000 lbs. (4,536 kilograms) or less, the proposal would also require manufacturers include a Brake-Throttle Override (BTO) system to ensure the vehicle would stop if both the brake and the accelerator pedals are simultaneously applied. Many manufacturers are already including BTO systems in their vehicle fleets.
### Market volumes of electric parking brakes fitted to newly-assembled passenger cars and light vehicles, 2009-2029, (‘000s units)

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**Source:** just-auto, LMC Automotive and industry sources
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