



ADAS SYSTEMS GROW IN IMPORTANCE

Now many new driver aids rely on windscreen-mounted cameras

WHAT IS ADAS AND WHY IS IT SO IMPORTANT TO YOUR FLEET?

Advanced driver assistance systems are growing more and more common on modern cars as the road to autonomy continues. *Matt de Prez* reports

Advanced driver assistance systems (ADAS) are rapidly becoming commonplace in the new car market. Almost all car manufacturers are offering some form of ADAS across their model range, with many fitting the technology as standard to certain models.

Euro NCAP research shows that a correctly working automatic emergency braking (AEB) system, a type of ADAS, leads to a 38% reduction in rear-end collisions.

Peter Marsden, managing director of National Windscreens, says: "ADAS technology has the capability to reduce both the frequency and the severity of accidents and should therefore have a dramatic impact on the number and size of claims received by insurers in the future."

It's thought that windscreen-mounted ADAS technology is currently fitted to approximately 10% of vehicles on UK roads, with this proportion likely to rise to 40% by 2020.

For fleet vehicles the figures are likely to be much higher as the age of the vehicles will be much less than the overall UK car parc.

Marsden explains: "Fleets will have a higher percentage of ADAS-enabled vehicles due to the age of the vehicles in those fleets. ADAS is a relatively new technology and with fleets being predominately less than four years old, these technologies are seen in a higher proportion compared to the whole of the UK car parc."

"For car fleets, and particularly rental fleets, the figure will be significantly more than 10%. Anecdotal evidence from National Windscreens' customers shows in excess of 25% of car fleets having ADAS fitted."

2,500+
the number of lives ADAS
will have saved between
2014 and 2030 according
to a report from KPMG

**BELOW: Rob using a
diagnostic tool to talk
to the car**



"ADAS offers fleets the potential to reduce at fault accidents. This cuts the risk of injury to people and helps keep vehicles on the road"

*Peter Marsden, managing director,
National Windscreens*



The technology is now present in a number of key fleet models, including the Vauxhall Astra, Nissan Qashqai, Ford Mondeo and Mercedes-Benz C-Class.

In a report entitled 'Connected and Autonomous Vehicles – The UK Economic Opportunity', KPMG predicts that between 2014 and 2030, ADAS technology will save more than 2,500 lives and prevent in excess of 25,000 serious accidents.

Similarly, Thatcham Research says that it found, through analysing UK insurance data, third-party injury claims on the Volkswagen Golf VII (with AEB) were 45% lower than its equivalent without AEB.

"ADAS offers fleets the potential to reduce at fault accidents. This cuts the risk of injury to people and helps keep vehicles on the road. The overall benefit for fleets is therefore improved productivity and reduced costs," says Marsden.

It's not just car drivers that can benefit from ADAS. The van sector is also catching up. Volkswagen was the first manufacturer to offer AEB as standard on a number of its van products, while Mercedes-Benz and Ford have the technology available as an option.

In the truck world things have moved more quickly; since 2015 all newly registered heavy goods vehicles weighing in excess of 7.5 tonnes must have AEB fitted under EU law, and some safety organisations are lobbying Government to mandate it on all new vehicles.

While AEB may be the most common form of ADAS fitted to vehicles, it is far from being alone. For example, there's lane keep assist which steers the car back on course if the driver drifts out of the current lane with no indication. Less

intrusive systems such as lane departure warning or collision warning will alert the driver to a dangerous situation, but take no mitigating action.

ADAS isn't just about preventing accidents; it also offers a suite of assistance features, such as adaptive cruise control, road sign recognition and automatic high-beam activation.

Several manufacturers now combine a number of ADAS features to offer a degree of self-driving. Mercedes-Benz has Drive Pilot and Volvo offers Pilot Assist. Both systems allow the car to accelerate, decelerate and keep in a given lane, although the driver must remain fully alert and keep a grip of the steering wheel.

The key to all of these systems, and many more, is a combination of camera, radar and laser sensors which are often located behind a car's windscreen.

As the software used in ADAS gets more advanced, vehicles are able to understand their surroundings far easier. The latest systems, for example, can detect and differentiate between pedestrians, cyclists and street furniture – both at night and in the daytime – then categorise them by risk, accounting for movement, speed and trajectory. All this is done in milliseconds.

This technology is integral to the development of autonomous driving vehicles.

Vehicles can be categorised as being level 0-5 in terms of automation:

Level 0 is where the driver has full control of the vehicle.

Level 1 offers a specific function controlled by the car – most likely a conventional cruise control system.

**ABOVE: Aligning the
CSC (Camera Sensor
Calibration) tool with the
vehicle**

Level 2 is where the industry is currently. The driver is able to disengage totally from physically operating the vehicle in certain conditions but must be ready to re-take control at any time.

Level 3 allows the vehicle to remain in control for longer, even in safety-critical situations – but the driver remains responsible for the vehicle at all times. Most manufacturers are looking to bypass this stage and move straight to the next level.

Level 4 is where the car is fully autonomous in certain scenarios, such as traffic jams or motorways with no requirement for the driver to intervene.

Level 5 is full-autonomy with no driver input required in any scenario.

The majority of car manufacturers expect to be offering autonomous vehicles at level 3 or 4 by 2021 and current predictions place full autonomy at level 5 by around 2030.

That said, some of the technology will be with us by next year. In 2018 Audi will launch its Front Laser Scanner, offering a system called Traffic Jam Pilot. It will be the first Level 3 hands off 'automated' driving system where the driver can disengage from the driving task.

Marsden says: "ADAS technology is moving so quickly that the next few years will likely see many changes from improved accuracy and range of current systems to developments of completely new systems."

He believes the main development will be the filtering down of ADAS features to vehicles lower in the range, rather than just the top end vehicles.

STAY FOCUSED TO ENSURE ADAS SYSTEMS REMAIN ON THE MONEY

Many factors can disturb a windscreen-mounted camera position. Correct calibration is vital to get the most from the technology. *Sarah Tooze* reports

When specifying advanced driver assistance systems (ADAS) or choosing a vehicle which has ADAS as standard, such as autonomous emergency braking (AEB), fleet managers and their drivers need to be aware that this is not 'fit and forget' technology.

There is a maintenance requirement for such systems, particularly after accidents and windscreen replacement.

If a windscreen is replaced, fleets will need to ensure that the windscreen-mounted camera, which is often a key part of ADAS, is calibrated in accordance with the vehicle manufacturer's instructions (for systems that don't self-calibrate). Failure to do this could mean that the system doesn't work correctly.

Alistair Carlton, technical manager at National Windscreens, says: "During a replacement of a windscreen the camera is moved from a known position to an unknown position, however small that change may be.

"Trigonometry shows that a one-degree alteration of the camera position at the windscreen means a 1.7 metre deviation 100 metres down the road. The process of calibration realigns that deviation back to the centre line."

But it isn't simply each time a windscreen is replaced that calibration is required. Anything that may affect the directional view of the camera down the road will mean that it needs calibrating.

Carlton also explains that the thrust axis – the invisible line the car follows down the road – is determined by the alignment of the wheels so any deterioration of alignment over time or realignment during tyre replacement will mean the camera needs calibrating. Similarly, the replacement of

RIGHT: Replacement of a windscreen is almost certain to mean the camera will require recalibration

BELOW: Chip repair may not require recalibration but care must be taken to ensure it is not within the camera's field of view



"A one-degree alteration of the camera position at the windscreen means a 1.7 metre deviation 100 metres down the road"

Alistair Carlton, technical manager at National Windscreens



suspension parts due to either wear and tear or accident damage may affect wheel alignment and therefore camera alignment.

A simple windscreen repair will not result in the camera needing to be calibrated because the camera position won't have changed.

However, it is worth noting that a windscreen chip repair should not be carried out within the field of view of the camera.

Making sure drivers understand when and why calibration is needed is incumbent on windscreen repairers who have signed up to the ADAS Glazing Code of Practice.

The voluntary code provides a recommended set of guidelines for replacing or refitting windscreens on vehicles fitted with ADAS and was developed by Thatcham Research, in conjunction with industry bodies, such as the Society of Motor Manufacturers and Traders (SMMT), and windscreen repair and replacement specialists, such as National Windscreens.

It is being updated to cover not only the repair of windscreen-mounted ADAS but all ADAS systems (see panel).

Types of calibration

Fleet managers need to be aware that there is more than

one type of calibration.

The type of calibration required depends on the vehicle manufacturer and the system they have installed.

Calibration can either be 'static' (around 75% of all calibrations), 'dynamic' (around 25% of all calibrations) or, in rare cases, a combination of both static and dynamic.

Carlton explains: "Static calibration places a 'target board' in front of the vehicle at a precise distance from the camera. The position of the board is also perpendicular to the thrust axis of the vehicle and is aligned horizontally and vertically. Using diagnostic software that communicates with the vehicle's ECU (engine control unit) the position of the board is set and any deviations from the previous position calculated and compensated for."

This type of calibration needs to be carried out in workshop conditions where there is a level floor and stable, uniform lighting.

Dynamic calibration, meanwhile, "requires the vehicle to be placed into a calibration mode by the diagnostic software and taken on a drive cycle where the system will request certain driving conditions are undertaken", according to Carlton. "Once a set amount of criteria has been fulfilled (dependent on vehicle manufacturer) the camera will be calibrated."

However, the drawback with this type of calibration is that it

KEY QUESTIONS

- Which of my vehicles have ADAS?
- Does my windscreen repairer have the necessary equipment and are its technicians sufficiently trained to carry out calibration?
- Can windscreen replacement and calibration be done at the same appointment to reduce downtime?
- How much will calibration cost?
- Do my drivers understand the importance of calibration?

can be affected by a number of external variables.

Carlton says: "Are the white lines in good condition, can the camera see them? Is it raining, snowing or is there very low sun hindering the camera's view of the road lines? Is there heavy traffic resulting in difficulties fulfilling the driving criteria?"

Under the ADAS Glazing Code of Practice, repairers are required to understand the type of calibration required and the appropriate equipment needed to carry it out.

They must make it clear to the customer whether they can calibrate the vehicle's ADAS





sensor system using their own technology or using a sub-contractor.

If the repairer is unable to calibrate the system they must make it clear to the customer that they are responsible for getting the system calibrated elsewhere and that they should not rely on the ADAS functioning correctly until the system has been successfully calibrated.

They must also make the driver aware that they may be held liable if 'any adverse event' occurs as a result of their failure to calibrate, and their insurance company should be notified of the position.

Clear pricing policy

The code of practice requires windscreens repairers to have 'a clear calibration pricing policy'.

The average cost to replace a windscreen "increases significantly" with the fitment of ADAS technology, according to Thomas Hudd, operations manager – repair technology centre at Thatcham Research. "A windscreen replacement can increase by anything up to 123%, when estimated calibration costs are factored in," he says.

Peter Marsden, managing director of National Windscreens, says that his company provides fleet managers with a fixed price for every calibration, irrespective of vehicle model and location in the UK.

"We make sure that the fleet manager always knows what the exact charge of each calibration will be," he says. "This price is agreed with each fleet customer from the outset."

However, he points out the biggest cost to the fleet is vehicle off the road time if the driver has to make two appointments – one for the windscreen replacement and then another for calibration.

With 108 fitting and calibration centres, National Windscreens is able to provide windscreen replacement and calibration in one visit.

"National Windscreens has invested more than £2 million to date in ADAS technology to become what we believe is the biggest provider of ADAS calibration throughout the country," Marsden says.

Windscreen replacement and camera calibration can be carried out in less than two hours at a National Windscreens centre and customers will receive a calibration certificate.

"Making an appointment to see a franchised dealer for calibration following windscreen replacement means waiting to get an appointment at the dealership and then taking a driver and vehicle off the road for a second time for calibration," Marsden says.

"Just as importantly, if the vehicle is used in the meantime then the ADAS systems may not be working as intended."

This means "there are safety benefits from the windscreen replacement and calibration being carried out in one visit.

Protecting the vehicle warranty

National Windscreens is able to calibrate more than 90% of car models that require it and uses recognised diagnostic



ABOVE: Aligning the CSC (Camera Sensor Calibration) tool at the rear of the car

equipment – the Hella Gutmann Solution CSC (camera and sensor calibration) tool – so there should be no adverse impact on the vehicle warranty by having the calibration done by National Windscreens rather than at a franchised dealer.

A Hella Gutmann spokesperson says: "My opinion would be that a manufacturer could not refuse to honour a warranty if a camera or radar system was calibrated by HGS equipment. Our equipment performs the calibration to OEM methods using approved calibration panels.

"To refuse to honour existing warranties using the criteria suggested would, in my opinion, go completely against European Block Exemption rulings."

Certificate in Automotive Glazing

Currently, 30% of National Windscreens technicians have been through Hella Gutmann-approved training and a number have been awarded the new NVQ 3 Certificate in Automotive Glazing, which has been updated by the national awarding body the Glass Qualifications Authority (GQA), in conjunction with National Windscreens, to cover ADAS requirements.

"With 40% of all vehicles on the road predicted to have ADAS fitted by 2020 the demand for calibration is set to continue to grow very quickly," says Marsden. "An extensive training programme is now in place to run throughout 2018, ensuring that National Windscreens remain well placed to meet this demand."

NEW ADAS CODE OF PRACTICE

Thatcham Research is working with industry stakeholders, including windscreen repair and replacement specialists National Windscreens, on a new code of practice which will cover calibration requirements for both windscreen and body-mounted ADAS.

Thomas Hudd, operations manager – repair technology centre at Thatcham Research, says: "The repair challenges presented by ADAS on a vehicle – from the current scarcity of information regarding the presence of ADAS and equipment necessary for calibration to the lack of clarity on the circumstances where calibration is required or not – are just some of the issues the new code will address.

"High priority will be given to reaching an agreement on a means of making uniform data freely available to allow repairers to better identify the presence and location of ADAS technologies."

£2m
invested in
ADAS technology



One
visit for windscreen
replacement and calibration



108
fitting & calibration
centres



A World Leader in ADAS camera calibration

Windscreen
mounted ADAS
camera is critical to
car safety systems

Camera
calibration is
always required
after windscreen
replacement

75%

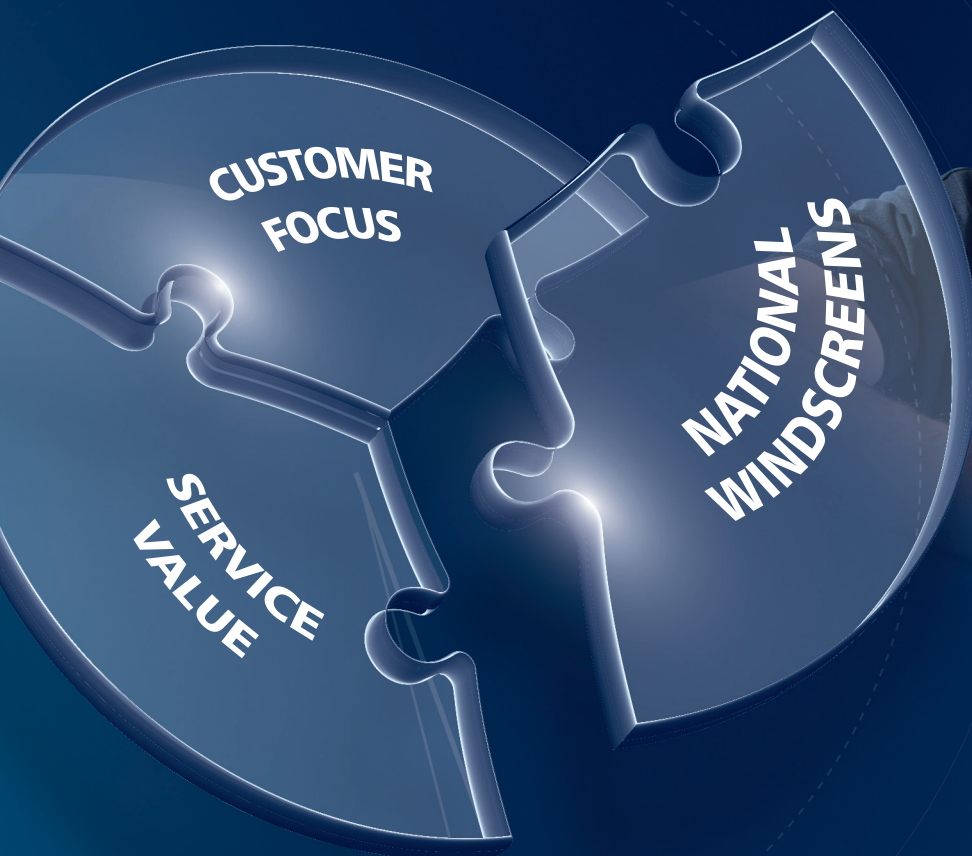
of cameras require
calibration in a
workshop



Find out more at
nationalwindscreens.co.uk/adas

**National
Windscreens**

The Perfect Fit for your fleet



- ✓ Target same/next day 'time to serve'
- ✓ Seamless European coverage
- ✓ On average, only 11 miles / 20 minutes from any of your fleet drivers
- ✓ A **World Leader** in ADAS camera calibration



Find out more at
nationalwindscreens.co.uk/fleet

NationalTM
Windscreens