National Windscreens

ADAS Report

April 2025

Contents

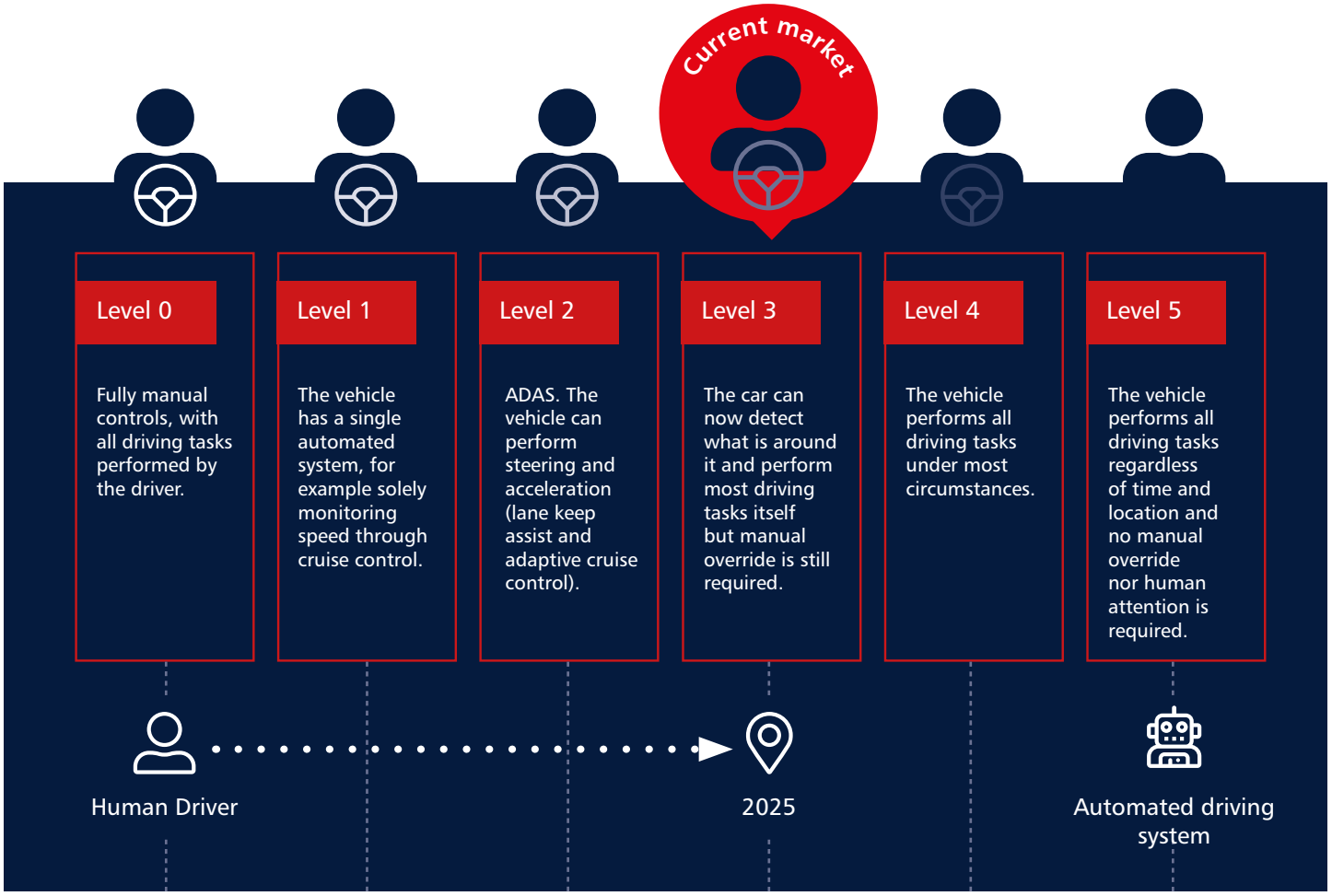
National Windscreens

The Increasing Complexity & Connectivity of ADAS;

what challenges does this present for maintaining a great customer experience?

The mainstream adoption of ADAS (Advanced Driver-Assistance Systems) technology is having a dramatic impact on how windscreens are repaired and replaced. ADAS are developed to automate, adapt, and enhance vehicle technology for improved safety and driving. Each leap forward is creating a safer environment on the road, with motorists receiving a growing list of active safety support features.

According to the ADAS scale devised by Society of Automotive Engineers (SAE), the market is approximately 3/5th of the way to full autonomy. The shift towards autonomous driving is changing the way that repairs are conducted. This report aims to explore the current, and future, influence of ADAS technology across the automotive industry, and the resulting implications for drivers, fitters, fleets and insurers.



Legislation and standards

The governance and legislation regarding autonomous technology and ADAS in particular is now critical to ensure the continued maintenance of these safety systems to an appropriate standard.

Thatcham Research has published UK insurance Industry Requirements for the safe repair of ADAS-equipped vehicles the motor insurance and repair industries with clarity to ensure the safe calibration and repair of ADAS-equipped vehicles. However, legislation to enforce calibration standards is still, undoubtedly required.

Thatcham Research were responsible for the release of a set of Insurance Industry Requirements (IIR) for the safe repair of ADAS-equipped vehicles. The requirements come as the number of ADAS-enabled vehicles on UK roads is set to grow exponentially as carmakers increasingly fit the latest driver assistance technology to new models. This guidance was brought in to protect policy holders, ADAS manufacturers and insurers. The pace that the market is changing with new procedures and technology driving an ever-evolving industry, the right processes and controls must be in place to effectively repair a customer's vehicle to the manufacturers standard.

Thatcham were recently consulted by the Law Commission regarding the introduction of a new Automated Vehicles Act to ensure the safe adoption of vehicles with self-driving capability. The legislation and governance of the machinery, software, and the security of the ADAS equipment will become increasingly stringent due to the risks.

Thatcham Research
Safer cars, fewer crashes

Rob Roberts, Technical Lead commented: "Continued investment in equipment, technicians and training is absolutely necessary in order to keep providing a truly UK-wide calibration service.

"We are working hard to educate and train our staff on the developing legislation, technology and standards regarding glass replacement and calibration equipment. As well as the technicians, we ensure that support staff in our customer facing contact centres are also kept up to date, appreciating that accurate and comprehensive communication with customers from the first point of contact is critical to providing a positive experience."

The EU introduced new rules in 2022 that require new cars that are homologated to be equipped with:

- Intelligent Speed Assist (ISA)
- Fatigue and drowsiness detector
- Emergency braking
- Rear camera with cross traffic alert
- Lane Departure Warning
- Seatbelt alert in the rear seats
- Black Box
- Integrated breathalyzer

Adrian Watson, Head of Engineering Research, Thatcham Research:

"The continued advancement of active safety and driver assistance technologies rely on the correct functioning of underlying ADAS and their associated sensors. It is essential that the whole industry continues to develop its repair strategies and capabilities to maintain system performance throughout the lifecycle of the vehicle."

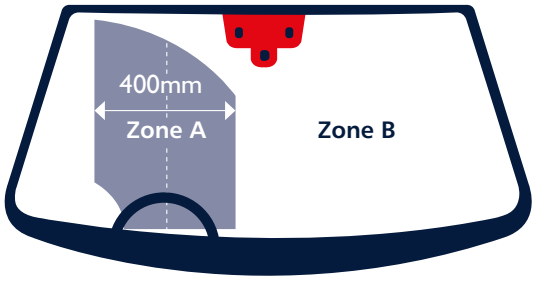
What the BSI standards mean for windscreen repair and replacement

In March 2022, the British Standards Institution (BSI) issued updated standards regarding the code of practice of automotive windscreen repair. As an aftermarket glass repair replacement (AGRR) company in the UK, National Windscreens has a duty to understand the influence of these changes that will have a direct impact on the decisions made by the technicians, and what that means for customers.

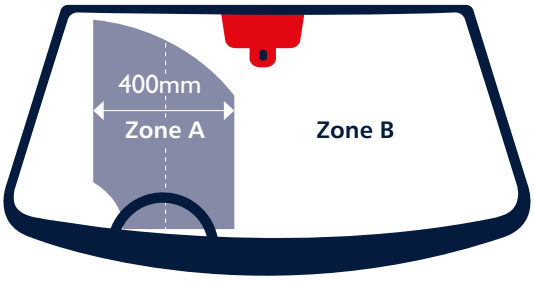
The BSI standards released BS AU 242b:2022, which features significant changes to the windscreen zones for repair, also with recommendations aimed to preserve the correct functionality and operation of windscreen mounted and incorporated technologies with ADAS, Heads Up Display (HUD) following a windscreen repair.

Red area indicates where repairs can not be made:

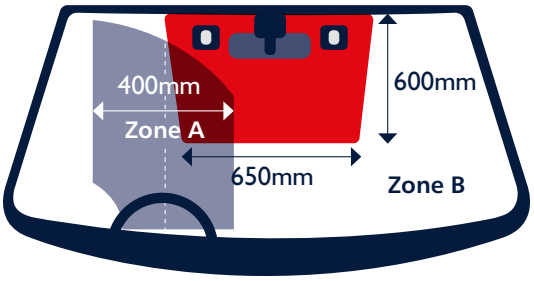
Passenger car and light commercial: Multiple cameras



Passenger car and light commercial: Single camera

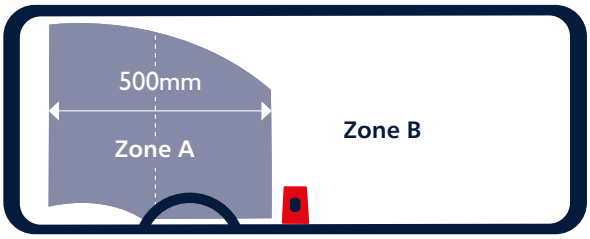


Passenger car and light commercial: Camera zone extends beyond the obvious exclusion zone



Zone shown is an example. Zones vary from manufacturer to manufacturer

HGV and coach



Zones apply regardless of wiper configuration

Permission to reproduce extracts from British Standards is granted by BSI Standards Limited (BSI). No other use of this material is permitted. British Standards can be obtained from BSI Knowledge knowledge.bsigroup.com

Cameras, radars, & the need for accuracy

Windscreen-mounted ADAS cameras are critical to car safety systems, and calibration is always required after windscreen replacement to ensure that the integrity of the vehicle is maintained, and the safety features are working as intended.

Rob Roberts said: "With vehicle complexity and connectivity increasing fast and ADAS becoming more commonplace, the technician training and accreditation requirements have grown phenomenally. Calibration equipment is continually evolving, new features are added to vehicles constantly, and EVs now require a whole range of new processes to ensure safety of the technicians as they work on the vehicle.

Rob Roberts, Technical Lead at National Windscreens commented: "The workshop environment guarantees a flat surface, a large enough space, and the correct lighting to accommodate all static calibrations. Different vehicles require different target panels for camera and radar calibrations. The target panels need to be aligned to the vehicle at the same distances and heights as the OEM equipment, to allow the camera or radar ECU to calibrate and operate correctly. This is driving the demand for larger workshops equipped with the correct technology and trained staff to perform static calibrations."

"Technicians must achieve higher levels of expertise in all aspects of replacement and calibration than ever before. When a windscreen needs to be replaced, any cameras also have to be calibrated at the same time to ensure the safety systems continue to work as intended. The technology is constantly monitoring the surrounding environment to keep the vehicle occupants and other road users safe.

"For example, if the radar (located on the front bumper) is 2 degrees out, then the reading at 250m will be incorrect by 8.725m, thus making ADAS calibration critical."

Static calibration is currently driving the market

ADAS calibration is carried out in either static or dynamic situations. Static calibrations are carried out in workshops or controlled environments with adequate lighting and level ground to ensure accuracy.

Dynamic calibrations are carried out whilst the vehicle is in motion, using a diagnostics device that connects to the vehicles OBD port. A lot of these calibrations wont commence until the vehicle is being driven at speeds of 40MPH. And rely upon adequate road markings, and road signs. Also the cameras detect other road users during the calibration process, such as other vehicles, cyclists and pedestrians.

The surrounding environment is critical for the calibration, including making sure that the tyre pressure is correct before the procedures take place, as it affects the level of the vehicle.

Around 75% of cameras currently require a static assessment of the vehicle in a workshop which improves the accuracy of the safety features when the windscreen is replaced.

The infrastructure demands are changing rapidly; 15% of windscreen replacements used to be in fitting centres, but that figure has doubled to almost 30% in recent years.

This has increased the time the work takes and requires a much greater proportion of vehicles to visit a dedicated windscreen workshop rather than rely on the convenience of a mobile service.

Some ADAS features which should be considered during calibration

- Automated Emergency Braking (AEB)
- Lane Departure Warning (LDW)
- Road Sign detection
- Fatigue and drowsiness detector
- Intelligent Speed Assist
- Forward collision warning

Software and hardware

One of the ADAS technology issues that requires careful management is any delay of calibration software being available for new vehicle models. Software is provided by the manufacture for each individual model to enable calibration to be undertaken. In some cases, software can take several months to reach the after-market, so close relationships with dealerships and manufactures are critical for AGRR specialists, so they can effectively manage the situation during any initial period of release.

Rob Roberts comments: "There is a sizable investment in the calibration equipment for all of our 100+ UK centres. There is a vast range of calibration equipment which creates a significant challenge to the smaller fitting operations, who will struggle to generate the volume of business required to justify purchasing the various brands of equipment."

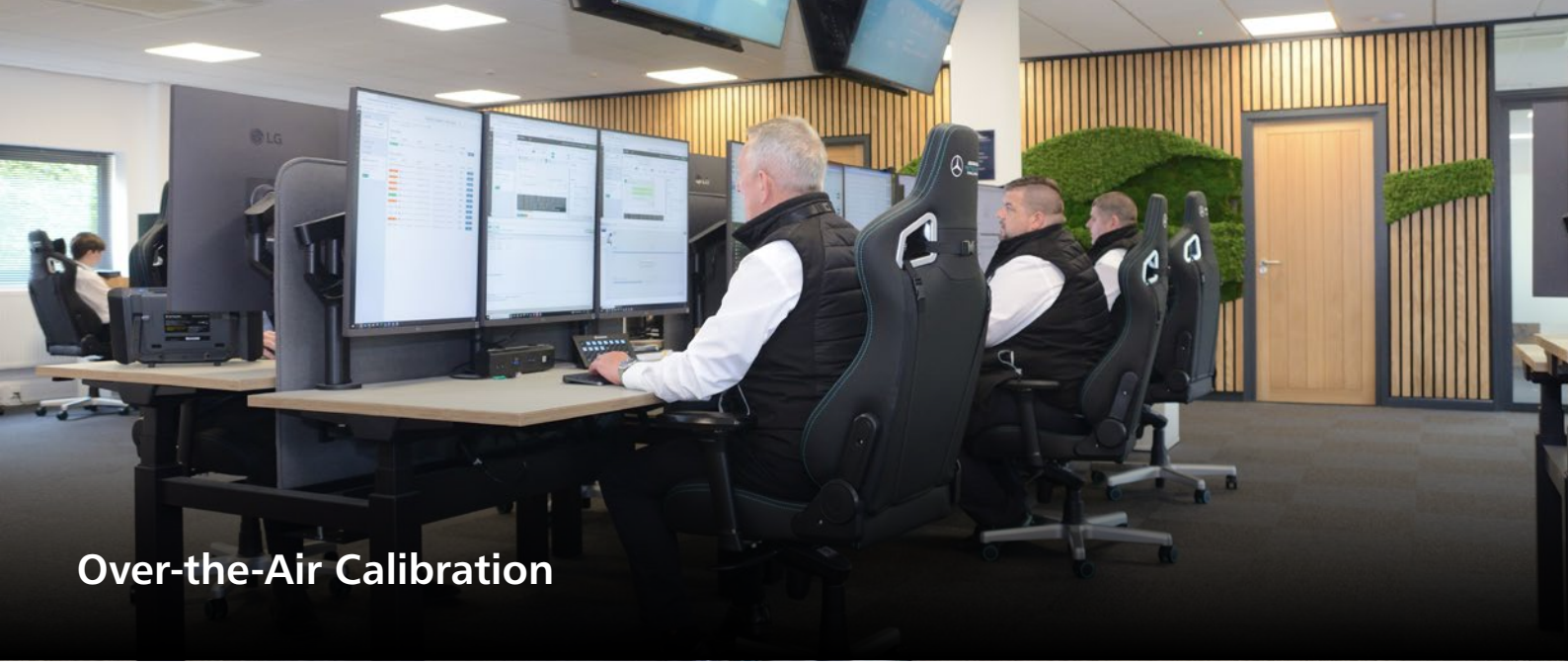
We continually invest in our ADAS infrastructure throughout the UK, researching and developing new equipment, changes to our booking software and online booking, as well as training and developing our staff. ADAS calibrations are completed on 25% of all our completed work, so investment, progression, and training are important.

HELLA GUTMANN

Hella Gutmann has been a key partner to National Windscreens during the ADAS journey of the last decade. As pioneers of aftermarket ADAS Calibration Equipment over 10 years ago Hella Gutmann continue to lead the way and allow businesses to keep ahead of the technology curve and automotive trends.

Julian Goulding, Head of Garage Equipment, Hella UK, comments:

"We have seen ADAS fitment develop from optional extras to mandatory fit following several directives from the EU, this presents an enormous challenge for businesses to retain their business model. As our parent company Hella is a tier one supplier to the OE manufacturers and also produces many of the components involved in ADAS systems, this puts Hella Gutmann in a strong position to enable the service, repair and calibration of these systems and return the vehicle in a safe and fully functioning condition. Accuracy is essential when calibrating ADAS systems, especially as advancements in vehicle systems are constantly demanding more and more accuracy from their fitted sensors.



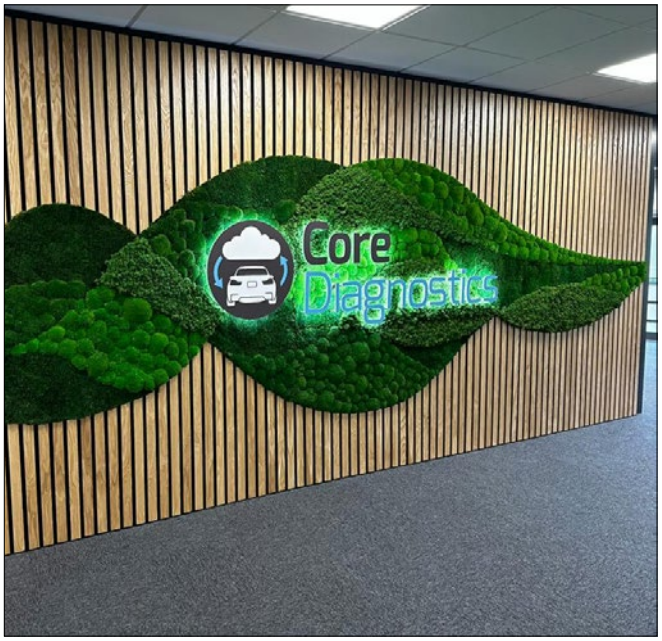
Over-the-Air Calibration

With the rapid emergence of new vehicle models and even entirely new manufacturers equipped with Advanced Driver Assistance Systems (ADAS), it has become critical to ensure comprehensive market coverage.

An increasing number of vehicle manufacturers are using security gateways to prevent un-authorised access to the vehicles systems The security handshake required by the ECU and calibration equipment in this case is provided using a live internet connection with a licensed provider. This can bring further complexities such as a reliance on 4/5g signal, which can prove difficult, as well as additional investment in this technology and training to use it.

Rob Roberts said: "To facilitate over-the-air calibration, we work with Core Diagnostics, one of the UK's leading remote service providers, to support the full spectrum of vehicle makes and models on the roads. As vehicle technology evolves, many manufacturers have implemented advanced cybersecurity gateways to protect against unauthorised access. While these protocols could traditionally pose challenges, our collaboration with Core Diagnostics enables secure, remote access, making the process of accessing and calibrating vehicle systems seamless and efficient.

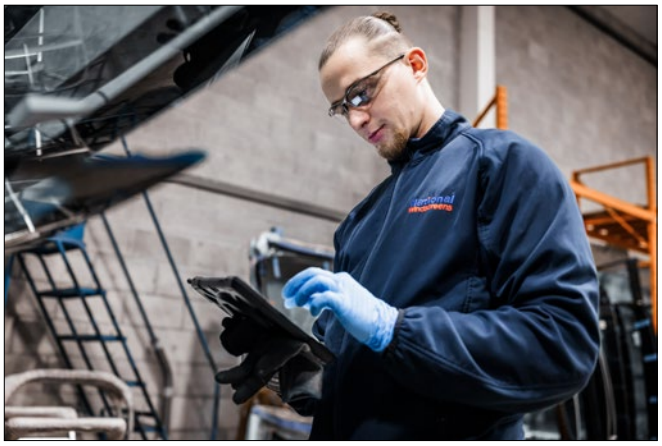
"Additionally, manufacturers are increasingly adopting new communication protocols such as DOIP (Diagnostics Over Internet Protocol) and CAN-FD (Controller Area Network – Flexible Data Rate) to meet the demands of faster, more data-intensive safety systems. The Core Diagnostics remote calibration solution supports these protocols. By conducting calibrations in-house through our remote partner, we eliminate the need to transport vehicles which minimises delays for our customers and reduces our carbon footprint by decreasing vehicle logistics," said Rob.



Empowering Technicians

"Hella Gutmann's calibration systems have always been designed as a modular system allowing our partners to adapt quickly and efficiently to new vehicle trends and technology changes. In addition to our standard equipment and to allow our partners maximum capabilities we also now have our Core Diagnostics remote solution, which addresses diagnostic access to newer vehicles that the latest aftermarket tools cannot.

"This solution allows further expansion to the standard vehicle coverage and gives our partners the capabilities to realistically be in a position to take on virtually any vehicle work, knowing they have the confidence to complete the required calibration requirement at the end of the repair, returning a vehicle back to a customer with a fully functioning safety system."



Cyber Security

An increasing consideration for ADAS vehicles is cyber security. Currently, the ECU security system will only allow limited access unless presented with a 'handshake' by the software which will then allow full access to the ECU. The ECUs can send 30,000 messages a second, and soon the different vehicles will be 'talking' to each other to share information regarding their surroundings.

The future of Advanced Driver Assistance Systems (ADAS) is intrinsically linked to enhanced vehicle connectivity enabled by 5G networks. This next-generation communication infrastructure will allow vehicles equipped with compatible hardware to seamlessly share data in real-time. For instance, an Audi will be able to communicate directly with other Audi vehicles, exchanging information such as traffic conditions, hazards, or route updates. This interconnected network will support dynamic navigation adjustments and proactive safety measures, significantly improving the overall driving experience and road efficiency.

Evolving Infrastructure

Understanding the landscape of ADAS and its growing influence on motoring is vital to remain at the forefront of the technology.

Automotive Glass Repair and Replacement (AGRR) organisations need to develop the infrastructure that ADAS demands. One key aspect is the length of time that vehicles fitted with ADAS need to be in the workshop to undertake both replacement and calibration.

- Expansion of fitting centre size – ADAS technology is driving the requirements for fitting bays and increased car parking spaces to.
- Comfortable customer facilities - Larger receptions, Wi-Fi, desks at which customers can work whilst they wait and relaxing waiting areas.
- Customer communication – The extra time and complexity of ADAS technology requires communication with the customer.
- Courtesy cars – The increased amount of time can necessitate policyholders requiring a courtesy car whilst the work is carried out.
- Charging for EVs – The proliferation of electric vehicles is driving the need for fitting centres to charge the policyholders vehicles.

This is part of a transition away from a quick stop workshop or mobile service model, towards more European style of a dealership approach, focusing on customer experience that also may need to

In Europe, mobile glass servicing is virtually non-existent, with most customers expecting to take their vehicle to a workshop and then pick it up at the end of the day. The increased penetration of ADAS technologies and static calibration is already shifting the UK glass aftermarket in that direction.

Effective communication with drivers from insurers and automotive glass repair and replacement specialists is critical to making sure customer expectations are set realistically in this respect and hence ensure a happy experience. The message is clear, ADAS equipped vehicles will in the majority of cases need to be worked on in a workshop and the time required to complete the work will be significantly increased by calibration requirements.

ADAS - Training and research

ADAS technology has changed the demands and skill requirements for windscreen technicians dramatically. From the calibration of windscreen-mounted cameras to safe handling of high-voltage EV components, the demands on technicians have evolved far beyond the traditional skills of glass repair and replacement.

ADAS technology requires in-depth training and often manufacturer-specific or third-party certification, depending on the brand of vehicle and the systems used within. Technicians must be multi-skilled, with an understanding of vehicle electronics, calibration procedures, and diagnostic tools.

Rob Roberts comments: "Technicians now require ongoing education and training to maintain an up-to-date understanding of the increasingly complex areas of ADAS calibration, and the changes in vehicle models and technology. To ensure the new trainee technicians are fully informed, they start their learning and development at the dedicated Training Centre in Leicester.

"At the Leicester centre, our trainees and technicians gain a good understanding of theoretical and practical automotive glazing technology and processes through their initial training. As they develop, trainees will have the opportunity to learn the techniques and skills that can lead to gaining qualifications in Automotive Glazing, at NVQ levels 2 and 3.

"In addition, the GQA Level 2 Diploma in Automotive Glazing, ADAS, Hybrid & EV Vehicles has been specifically designed to reflect the real-world skills and technical understanding needed to work safely and competently on modern vehicles. It covers traditional automotive glazing alongside the increasingly complex areas of ADAS calibration and working with hybrid and electric vehicle systems, the diploma equips technicians with the expertise needed to maintain high safety standards."

Research and Development

Rob continues: "We are continuously researching, innovating, and refining our ADAS training, equipment, and processes to meet the evolving demands of the automotive industry. Over the years, ADAS systems and calibration requirements have advanced significantly. What once consisted of basic warning and alert systems has now evolved into highly sophisticated systems capable of controlling vehicle functions when necessary. These systems involve seamless communication between multiple control modules, underscoring their complexity.

"To stay ahead of these advancements, we collaborate closely with our suppliers and equipment manufacturers to ensure that the tools, technologies, and software we use are consistently up-to-date and equipped to handle the demands of modern vehicles," said Rob.

ADAS - What does the future hold?

As of 2024, approximately 70% of new cars manufactured in the UK are equipped with Automatic Emergency Braking (AEB) as a standard feature. New ADAS rules for vehicles manufactured for 2022 mean that most new vehicles will now include ADAS systems. The global ADAS market is expected to increase from $27.2 billion in 2021 to $74.9 billion by 2030 according to a report by US-based Markets and Markets.

The challenges of ADAS are adding time and complexity to the process of replacing windscreens. The challenge for AGRR organisations is to work closely with insurers and fleets to make sure policyholders understand the changes in the process and the additions brought about by ADAS calibration.

Failing to perform thorough and precise calibration during replacement poses safety risks, so calibration and replacement should be treated as a single, unified procedure. Making sure the customer has this message clearly communicated at the start of the process is critical to delivering a good customer experience. Although the vehicle is now likely to be in the workshop and required for a longer than previously, when the reasons and implications for vehicle safety are explained, most customers are happy that the more comprehensive and involved process is in place, according to anecdotal evidence from National Windscreens.

Rob Roberts, continued: "ADAS and vehicle complexity is changing at an increasing pace, so there is a big onus on dedicating time and resources to keeping up with these developments through close relationships with vehicle manufacturers and global automotive suppliers. Relaying these developments to all our colleagues, through training and updates, ensures we have a full understanding as an organisation.

"The growing influence of ADAS technology will bring specific pressures on the AGRR sector and insurers. Our priority has to be informing all our customers, insurers, fleet and policyholders, about the developing ADAS technology and the implications that will have on the customer journey."

National Windscreens

National Windscreens are global leaders in ADAS technology, with 100+ ADAS centres across the UK.

We provide windscreen replacement and camera calibration at the same time and location, meaning motorists will be able to drive away from our centres after only one visit.

National Windscreens has the largest UK fitting centre & ADAS calibration network in its field, operating more than 100 centres and employing over 800 mobile technicians. The independently owned company provides service coverage to the whole of the British Isles and its capacity ensures it also offers seamless European coverage – National Windscreens is a founding member of the Automotive Glass Europe® network which offers vehicle glazing services throughout Europe.

The business has combined gross revenue of £112 million with UK contact centres that can handle over 1,000,000 calls per year. The organisation partners with major insurers and fleet suppliers to ensure their customers receive excellent customer service every time.

Visit **www.nationalwindscreens.co.uk** to find out more.