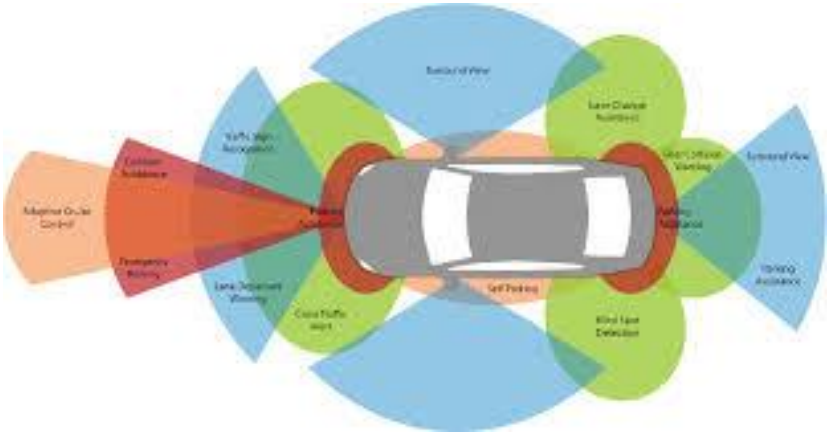
ADAS AWARENESS IN THE AUSTRALIAN COLLISION REPAIR INDUSTRY



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WHITE PAPER

Introduction

The motor vehicle body repair industry is experiencing the most significant era of change in its history. The "Technical Tsunami®" is disrupting and altering the existing collision repair model at a faster and greater rate than ever before. The industry over the last 10 years has witnessed changes to vehicle structures, drivetrains and safety systems being introduced that are outpacing learning and awareness requirements in correct collision repair.

These improvements encompass structural design through the introduction and use of advanced and mixed materials, more advanced Supplement Restraint Systems (SRS), the move to hybrid and electrified drivetrains and now an ever-increasing technological focus on Advanced Driver Assist Systems (ADAS) that challenge the ability of the collision repair industry to deliver complete, safe and quality repairs.

With the safety of the motoring public being at the forefront of new vehicle technologies, the observed lack of knowledge, understanding and skills required is affecting the proficiency of insurers and repairers to ensure the latest technology is repaired to function, as designed, and as such is being compromised.

It is the responsibility of the entire inter-industry to work together in delivering safe outcomes and this paper outlines many of these technologies and highlight serious issues that may lead to compromising repair quality and safety. The process of ongoing dialogue to ensure new technology and the correct repair methodology is recognised must begin now.

Why Action is Required

New technologies will continue to impact the safety and quality of repairs and the reliance on these technologies will increase year on year. Traditionally collision repair estimates were based on visual inspections, measuring and the experience levels of estimators and insurance assessors to determine the severity of damage. With technology available and currently within new vehicles, this practice requires change.

The relatively unchanged concepts in vehicle structures and technologies during the last 40 years of the twentieth century enabled this practice to continue without concern. However, at the turn of the century, vehicle structures changed and with it the requirement to learn new skills in collision repairs became crucial. For an industry with no historical 'culture of learning' the task to educate was slow. In 2012 the Australian Training Qualifications for apprentices were reviewed to include High Strength Steels, the first change since 2005 directly aimed at providing correct education for apprentices in vehicle body structural repair.

I-CAR Australia on its introduction into the collision repair industry in 2005 set about providing post qualification training to the collision repair industry at all levels with varying degrees of uptake. The initial early adopters of the training were in large the insurance companies, with IAG and Suncorp committing to a much-needed professional development program for assessors. Within the space of 10 years the insurance training grew to include approximately 75% of insurance assessors in Australia committed to training and learning.

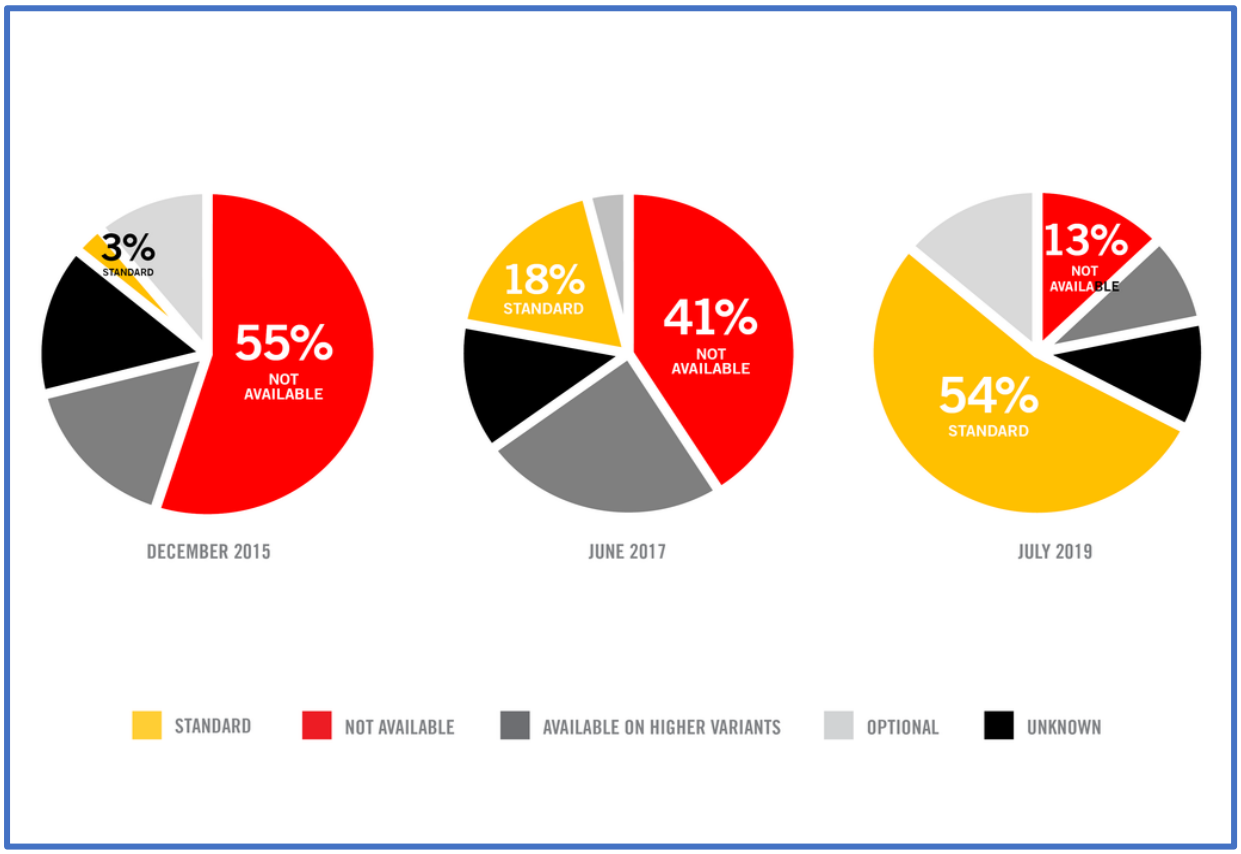
Repairers have been slower to react with training numbers at only 10% of those within the first 10 years of operation. However, over the last 3 years the level of training is increasingly steadily, and collision repairers are beginning to now understand the rapid change in the vehicles being repaired

daily. Their focus on new technologies, how to survive in the coming decade and delivering a safe product is growing. The ongoing impact of technology is creating a dynamic environment in the collision repair industry as stakeholders grapple with major impacts on their workplaces and the cost of doing business.

The consumer is now more strategically placed to make informed decisions on insurance, repairers and vehicle brands through digitally enabled consumer awareness. As each of these stakeholders become more aware of each other's place in the Australian collision repair market, the understanding of delivering protection to the consumer grows. Australasian New Car Assessment Program (ANCAP), various state government agencies and education facilities are all entering into researching the effect of autonomous vehicles on road safety and infrastructure changes that will be required into the future.

However, a significant portion of the insurance and repair industry continue to ignore new ADAS repair requirements as the need to change is perceived to be a number of years away. The reality is the systems are here now, action is required now, and delays may result in injuries and potential fatalities among Australia's motoring public.

ANCAP's latest market analysis based on sales of Australian new light vehicles shows the standard fitment of Autonomous Emergency Braking (AEB) has increased rapidly – rising from 18% to 54% in just two years.[1]. From 2020 any OEM aspiring to achieve a five-star ANCAP rating must provide AEB as standard!

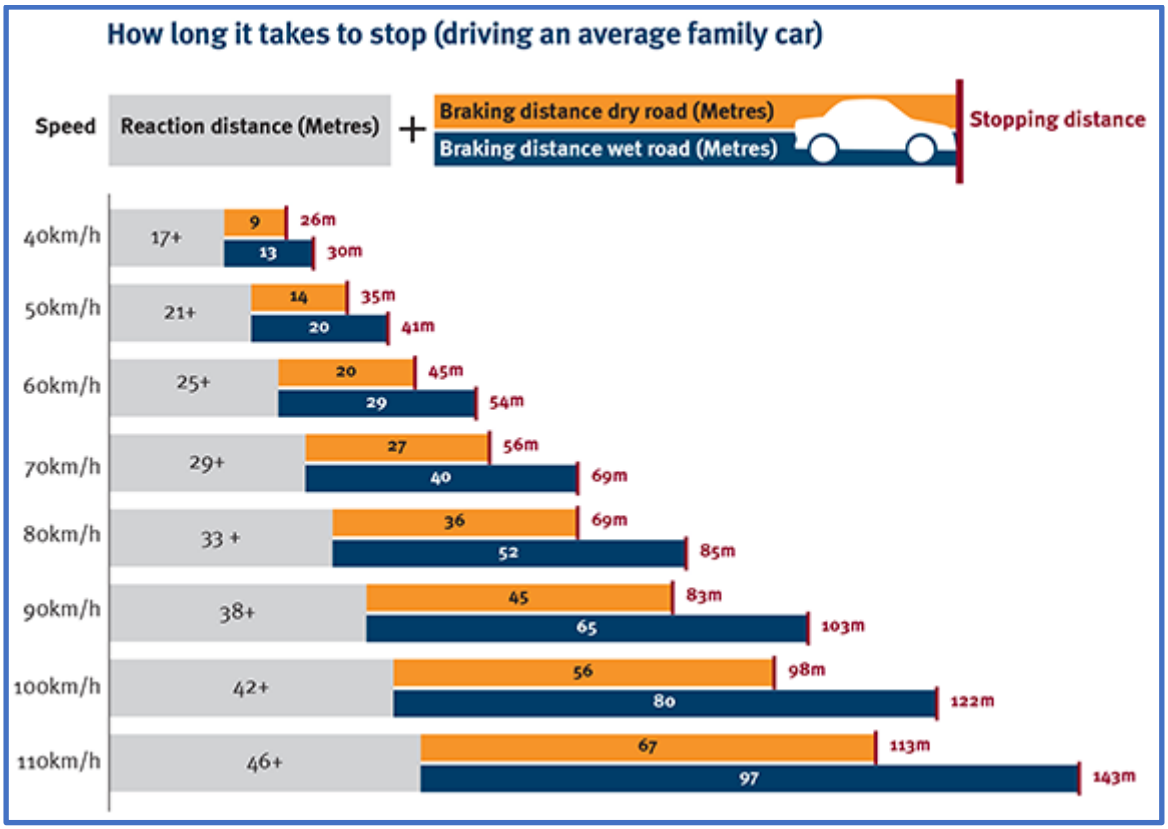


**Courtesy ANCAP October 2019*

According to ANCAP, 60 of the top 100 selling models now offer AEB as standard equipment. The Toyota Corolla, Mazda 3 and Kia Cerato, as well as the highest selling light commercial vehicles, the Ford Ranger and Toyota Hilux, all include AEB as standard equipment.

AEB works by using sensors including radar, lidar and cameras and then synchronising the data received to measure the distance to any vehicle in front, and then reacts if that distance shortens suddenly. Incorrect calibration will impact the accuracy of information being processed without providing any Malfunction Indicator Lamp (MIL) notification on a dashboard.

Any sensor component being either radar, lidar or camera, that is out of alignment or uncalibrated will return incorrect data to the safety systems, therefore delivering data that is useless and incapacitates the ADAS on the vehicle. The danger of these uncalibrated systems working incorrectly is escalated as speed increases and reaction times are then heavily affected [2]. The risk for occupants travelling at 100km/h compared to those travelling at 60km/h in an emergency situation is greatly increased under an uncalibrated system.



** Courtesy QLD Government*

ADAS has been designed to assist drivers in such situations where emergency action may be required. This will in turn reduce the severity of many impacts in numerous situations and ultimately reduce injuries to vehicle occupants.

The complexity of ADAS requires an understanding of the various components and their requirement to be correctively calibrated. In order to work as designed after a collision, the entire system must be calibrated if any component within the communication network of ADAS is removed or damaged. The

OEMs who import vehicles into Australia have released numerous statements in relation to this and unfortunately many of these have been ignored. The FCAI released a statement in January 2020 underpinning their position and reinforcing that OEM instruction, regardless of their country of origin, are pertinent to ensuring complete and safe repairs for collision damaged vehicles. [3]

Without an understanding of how ADAS works, many of the important sections within the collision repair supply chain will contribute to repairs that are incomplete and do not meet the Motor Vehicle Insurance and Repair Industry Code of Conduct [4]. This states Insurers and Repairers agree they have a responsibility to ensure vehicle repairs are authorised and carried out in a professional manner and to ensure that the safety, structural integrity, presentation and utility of the vehicle are restored.

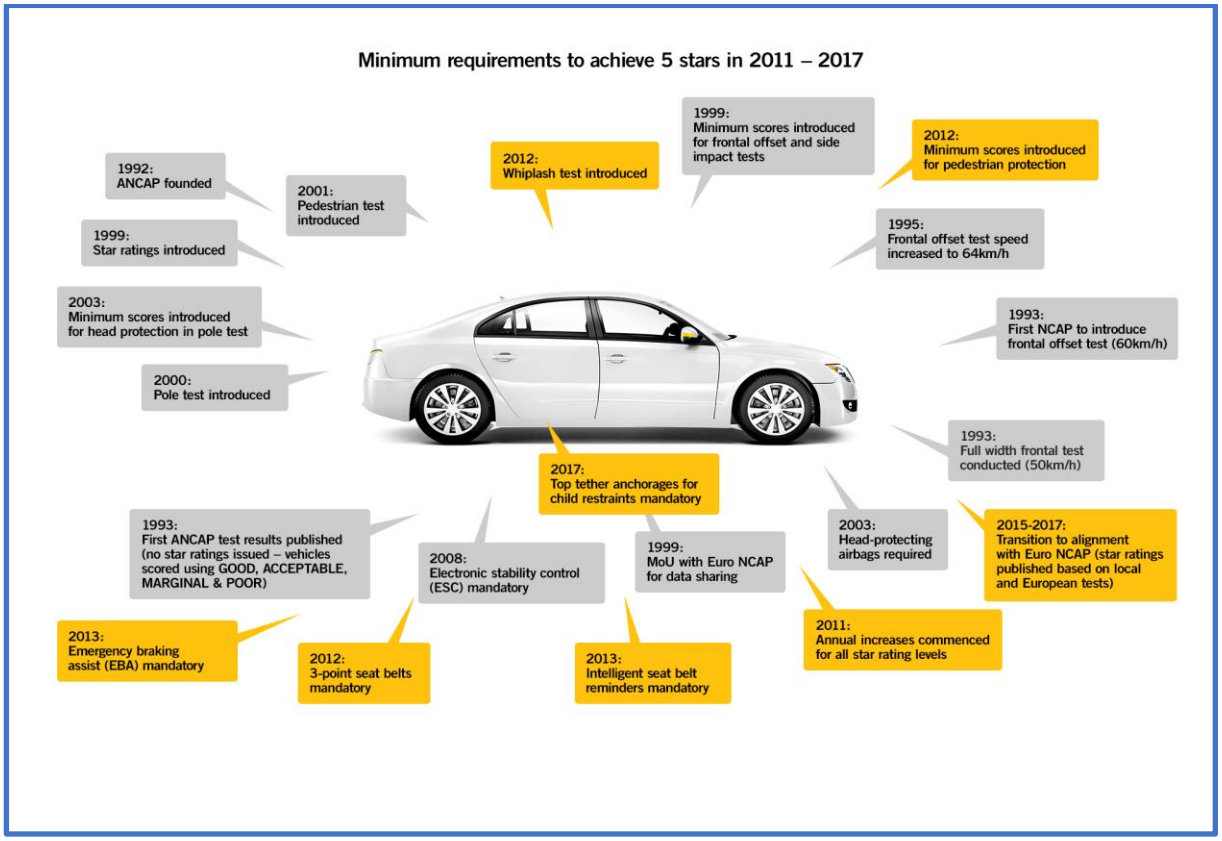
Ensuring Safety After Completed Repairs

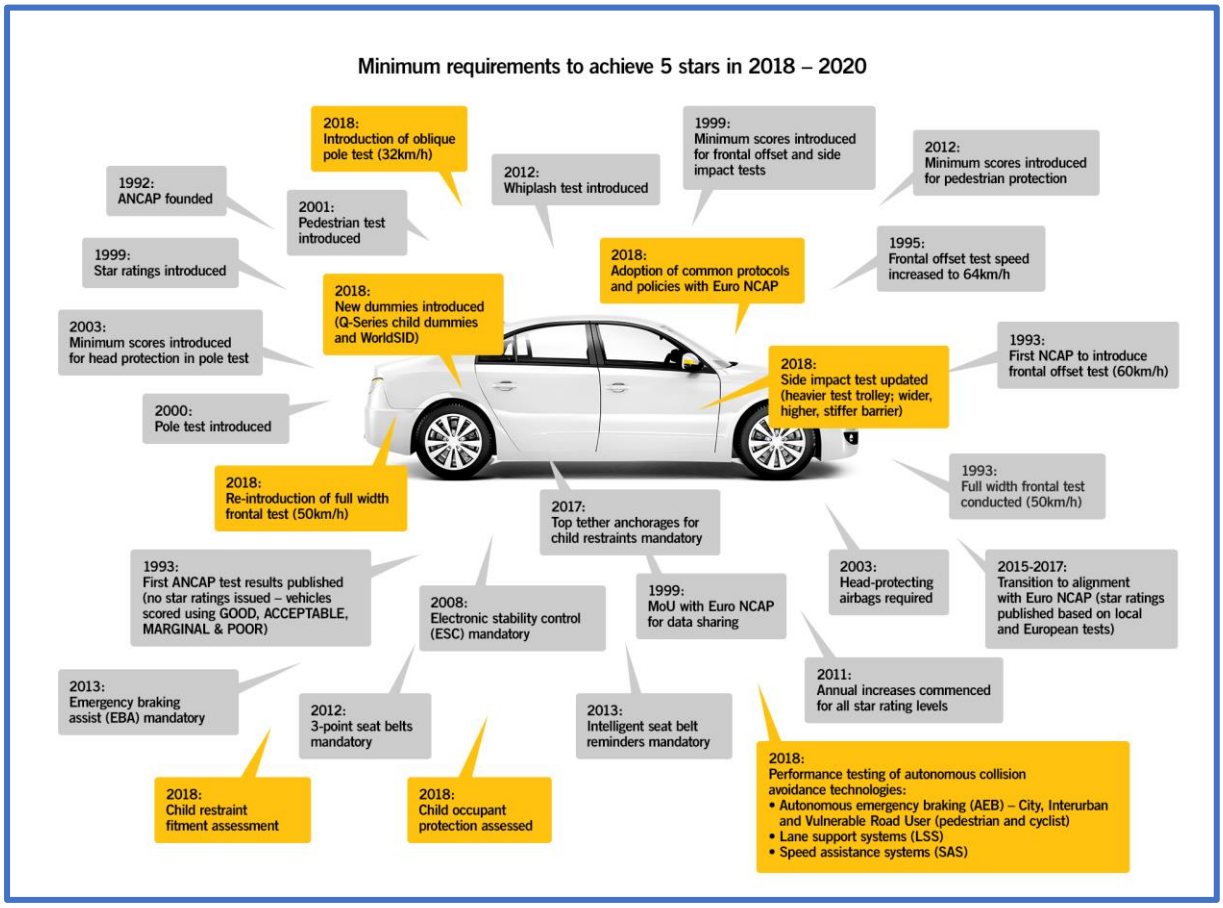
The collision repair industry has long been an industry where knowledge across all roles within the industry has traditionally been passed on from tradespeople to apprentices. The natural career path leads experienced technicians to become equipment representatives, insurance assessors and on occasion business owners during the course of their working life. Over the decades, this has been achieved with a generally stable outcome as vehicle technology had not significantly changed over many years until the early 2000s.

Today, the challenges and changes are significant, and the industry is lagging behind in ensuring technology is understood across all levels. The collision repair industry is changing on every level with requirements for training, equipment, enhancement of business skills, improvement in facility process and systems to meet the needs to deliver complete, safe and quality repairs. The most important requirement to deliver change in upskilling and knowledge about these technologies, remains a low priority for repairers and insurance companies.

To ensure that the consumer is protected not only now, but into the future, the entire industry must work together to meet the challenge of change. Every change that occurs is working towards a more autonomous driving future, that will require more electronics and more connected systems. This will require an industry wide acceptance of the change to deliver the correct outcomes in collision repair.

It has been well documented that there has been an ongoing reduction in both severity and insurance claims over the last number of years, due in part to better motor vehicle technology available to the consumer. The long-term observation will continue as the Australian fleet age becomes younger (currently 9.8 years old), the technology currently available is further improved and is more readily available across all models to meet new Australian safety standards as determined by ANCAP.



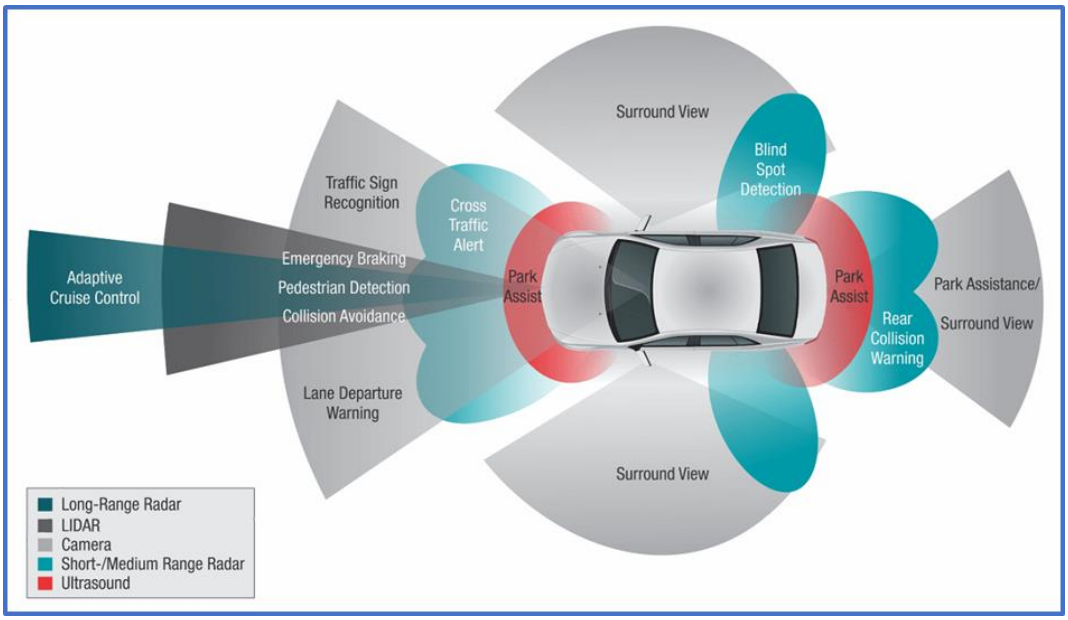


**Courtesy ANCAP*

ANCAP has realised the growing need to address and change their safety ratings as OEMs introduce new technology into their fleets. 2020 will raise the safety levels required for Australian vehicles as AEB will be required to achieve a 5-star ANCAP rating, this in line with international trends.

While there continues to be, in certain situations, a trend to utilising potentially out of date data (by utilising what is seen to be similar vehicles repair information) when assembling repair information will lead to potentially dangerous post repair outcomes. While vehicles may at times share a common structural platform, their electronic data will be fundamentally different and requires specific procedures based not only on the level of ADAS technology but also the style of system used. Is radar used in conjunction with cameras, is lidar exclusively used or other combinations of sensors and cameras as best determined by each manufacturer for each model in its range?

Many of the systems within ADAS such as Blind Spot Detection, Cross Traffic Alert, Lane Keeping Warning and Assist, Adaptive Cruise Control and Parking Assist, to name a few, utilise common sensors. While these sensors are utilised in different systems they are also affected through improper or non-calibration after a repair. The outcome will be consistent incorrect information being relayed to the central processors that may cause the safety systems built into the vehicle to not perform as designed. If the vehicle carried a 5-star ANCAP rating as a result of these systems being incorporated and are not functioning correctly, then the vehicle has not had its safety of utility restored.

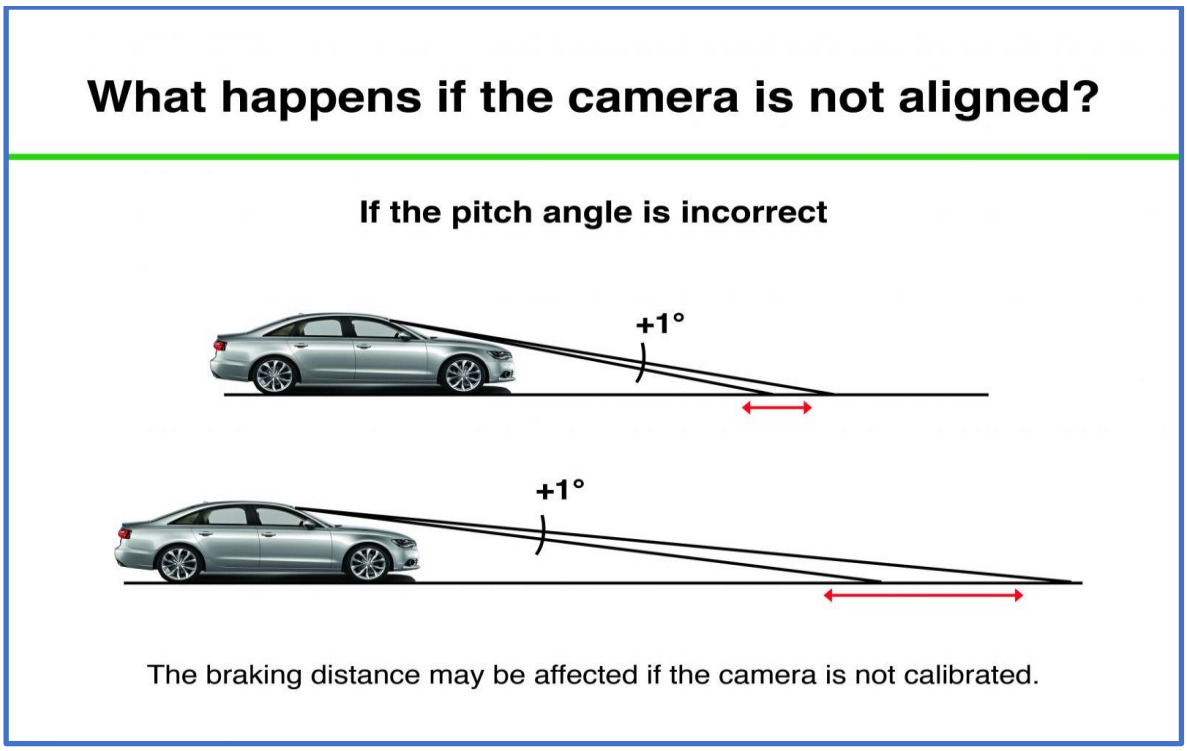


**Sample ADAS on a vehicle*

When detection system sensors have been removed or replaced, calibration is generally required using vehicle-specific diagnostic equipment. Calibration of these sensors is particularly vital, because the measurements taken from these points determine if a signal should be sent to indicate any approaching vehicle. The calibration essentially informs the computer of the sensor's exact position so that proper calculations can be made in relation to the vehicle's location in its surrounds.

Scan tools are required to calibrate systems as they also determine if any faulty components need to be replaced. Test drives are required for some calibrations including but not limited to Adaptive Cruise Control, Lane Departure Warning and Assist as these systems are activated above 60km/h. Even

though scan tools are required in the calibration process they cannot determine if a sensor is out of alignment, so correct repairs to locating mounts are critical where sensors are placed!



**Courtesy Texa S.p.A*.

ADAS relies heavily on multiple imaging and sensor processors working together to provide an accurate position of where the vehicle is in relation to its surroundings. Calibration is critical in ensuring the information being processed is precise. Even a 1-degree ADAS misalignment of a radar, camera or sensor could drastically affect the ability of an AEB system to perform as designed, especially at highway speeds.

The system also requires that all systems are synchronised to ensure the correct information is received and processed to determine the correct position of the vehicle in relation to its surroundings. When combined with higher speeds, the accuracy of this information becomes more critical as risks are greatly heightened as speed increases when a vehicle must assist in an emergency situation.

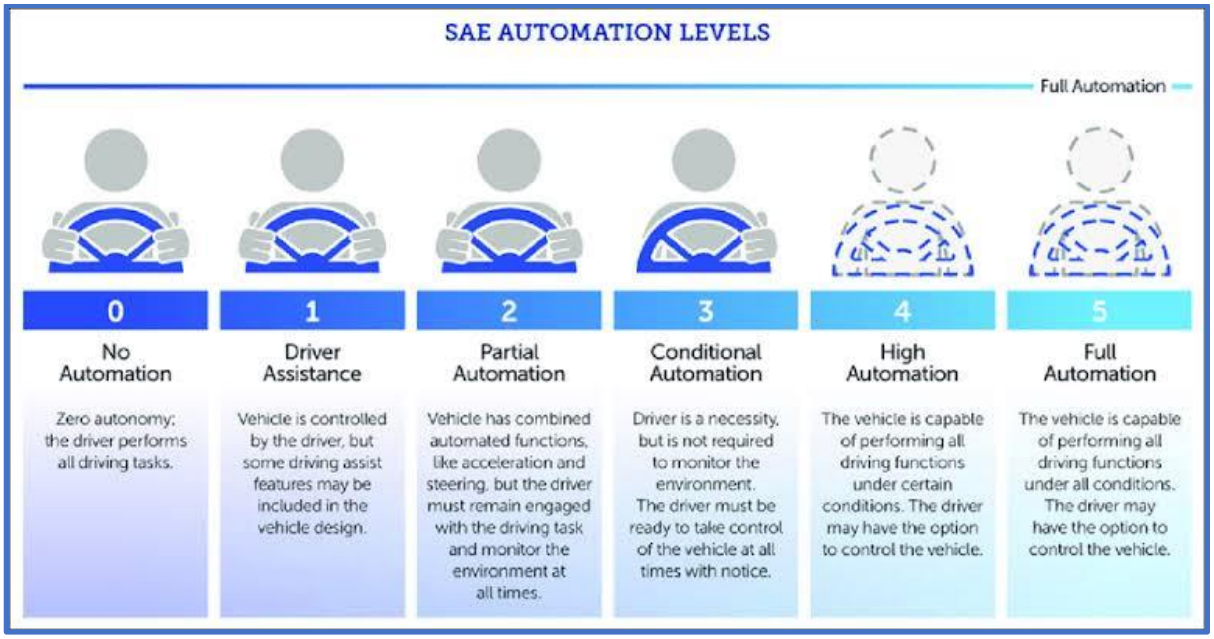


**Image courtesy NHTSA 2017*

As we move towards an autonomous driving future and we move through SAE Partial Automation Level 2 to SAE High Automation Level 4 within this decade, there will be an increased demand on ensuring skills and knowledge are sufficient to repair vehicles correctly

Incorrect Repairs, who is Responsible?

The Australian collision repair industry has multiple suppliers within the network who must work together in delivering safe and quality repairs to the consumer, while attempting to provide a sustainable industry for all involved. New legislation for data sharing for repair procedures is one step in the right direction and other parties must also step up to the challenge. There will be additional responsibility for repairers and insurers in ensuring vehicles being repaired are completed by suitably trained and equipped professionals.

By ensuring those involved not only have the correct information but the correct training and tooling to do the required work the resulting outcomes will benefit all within the supply chain and deliver to the consumer the best result. The allocation for complete and safe repairs must cover these base requirements as a minimum mandatory standard before work is provided or commenced. Anything short of this will not change the current situation or help transform the entire industry as is needed.

In the short-term the cost to industry will be seen to be excessive as training, equipment and correct triage of repairs must become the new blueprint for repair processes. With the introduction of technology continuing at a never before seen rate, the investment in time to understand the changes will affect every sector across the industry. Most significantly repair facilities will require new equipment, changed operating procedures and new training requirement. Whilst repair severities are reducing, the cost of smaller repairs will increase as many ADAS components are in the most susceptible areas for damage in a collision.

Insurers will be affected if the perpetuation to not address and understand the impact of electronic technology in new vehicles. The cost incurred from potential incomplete repairs as customers become better informed of unaddressed safety issues on cars may well be enormous. As most insurers propose lifetime guarantees, the long-term cost may well outweigh the short-term gains achieved currently.

There is a strong underlying sentiment across the industry that the role of diagnosing ADAS and other electronic technology in the modern vehicle is too great a challenge for body repair technicians to fully understand. Auto electricians are often seen as the ideal technicians to ensure repairs are completed correctly although many auto electricians struggle at times with collision repair incidents and rectifying faults. The focus on delivering complete and safe repairs within individual collision repair facilities will face many hurdles, especially if those in the supply chain ignore the impact that is occurring.

Focus on Safety

OEMs continue to improve safety within their vehicles and consumers are buying vehicles that deliver certain safety criteria and standards with the knowledge that they will be kept safe in the unfortunate incidence of a collision. Equipment suppliers produce and work with OEMs to ensure their equipment meets the demanding standards required to repair vehicles as technology demands.

From a repairer/insurer perspective there is a major disconnect from what ***needs*** to be done to what is ***being*** done. The focus on safety is not being addressed as diligently as it should. Over the last 14 years since the introduction of I-CAR into Australia there has been a much clearer understanding of structural integrity that has flowed through the entire industry from apprentice training to post-qualification training for assessors and body repair technicians. Although this area of knowledge is still not fully understood by all of the industry, it is much better identified by industry. This area of technology will continue with further advancements with mixed materials being the next challenge in structural integrity.

It is the responsibility of those authorising repairs and those performing repairs to be well informed on what is required to deliver complete, safe and quality repairs to the consumer. With ADAS now in vehicles and its standard availability set to be across many more models, the industry is falling short in its understanding of what needs to be done.

The ongoing resistance to accept the repair requirements of ADAS technology is thwarting the change required to ensure customer safety after a collision repair. Best estimates place the current Australian fleet equipped with a level of ADAS between 18% - 20% and this will increase dramatically in the short term with new car sales exceeding 1 million every year since 2015. The local car parc now covers 67 brands and as of 2016 consisted of 16 million vehicles [6] (Car, SUV, Light truck). From 2020 a high percentage of these vehicles will require AEB to receive a 5-star ANCAP rating.

A focus on ensuring safety systems are restored and functioning as designed will deliver long term benefits for vehicle occupants, repairers and insurers through providing an uncompromising service that will assist in promoting the change required. Without a commitment to accepting change and the adapting to the needs of the new customer, the collision and insurance industry will remain as they are today: on the wrong side of the fence.

Technologies powering ADAS and active safety systems are now integral and critical components of vehicle design and function as are the mix of metals that enable structural integrity.

The OEMs will continue to develop technology to deliver ever-increasing safety requirements to protect the motoring public. Ensuring these systems are restored to operate as designed must be the priority of all within the collision industry, this can only be provided through acceptance and recognition of the task ahead.

What Can be Done?

ADAS technology will have a major impact in reducing collisions, large and small. To ensure the ongoing benefits of ADAS are maintained, the commitment to understanding calibrations must be implemented now.

Those who will lead the change will:

- Address and understand ADAS technology and ensure repairs are complete
- Work with repairers who show a real commitment to approved training
- Ensure professionals representatives are educated on the risk of incomplete repairs
- Meet the standard required in modern OEM repair and technology
- Review your carparc and the growth of ADAS in your customer vehicles
- Won't procrastinate in accepting change
- Set a target and work towards a safer option for consumers
- Bring OEMs, Insurers and Repairers together to discuss
- Address the impact to the motoring public

There will potentially be wholesale changes required at every level and the level of change happening warrants a complete review of business everywhere. The importance of identifying shortcomings within a supply chain will assist in understanding the changes required. These may include training, cultural habits, continuing old practices where new ones are essential and having the ability to adapt as quickly as the technology being worked with.

The changes required will not only be metropolitan based but cover rural and remote locations as well, on a national basis those communities are as important as the larger ones. Technology is not slowing down and it is incumbent on the inter-industry to work together to find a solution for the future.

Is it the job of a few repair businesses to develop these capabilities so others may follow and change to suit their needs as history has shown? Or does the industry work together to develop an all-encompassing sustainable strategy that will adapt to everchanging advancements.

ADAS is one emerging technology on the road to autonomous driving and much of the required technology will become more readily available within affordably priced vehicles. The volume of vehicles being sold internationally is allowing much more technology to become available across multiple models within a manufacturers range of vehicles.

It is the responsibility of the collision repair industry supply chain to be invested in ensuring sustainability and diligence is provided when repairs are required, regardless of the severity of the damage sustained. Proof of capability, awareness of technology and provision of equipment required should be the first considerations in repairing vehicles within any network.

As the transition to mobility continues it is safe to assume that there will be more innovative ADAS technologies, more demand on industry to meet the repair requirement with action and this will be required ***now***.

References

(1) *James Goodwin, ANCAP CEO, October 2019*
(2*) https://www.qld.gov.au/transport/safety/road-safety/driving-safely/stopping-distances*
(3) *FCAI Issuance of Position Statements for Collision Repair in Australia, January 2020*
(4) *The Motor Vehicle Insurance and Repair Industry Code of Conduct, 2017*
(5) *FCAI New Vehicle Statistics, 2017*