JANUARY NEWSLETTER

From the Secretary General

www.rcar.org

2020 New year greetings RCAR members.

The January 2020 newsletter includes a record number of articles from 17 RCAR members. Included in this issue is an item from Working Group leader Jose regarding the about to be released RCAR. Damageability/Repairability Design Guide. This is a major review that will generate a lot of interest in the car industry. There is a good mixture of articles on safety, repair, ADAS and special events spanning 4 continents.

Also Included, in the contribution from CIRI China, is a summary of the successful engagement that RCAR and the working group leaders had with the Chinese OEMs in Beijing prior to the annual conference.

As usual, my contact for any feedback or questions is rmcdonald@rcar.org

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New RCAR Design guide 2020 – a message from the Damageability/Repairability Working Group leader

Since its birth in 2008, the RCAR Design Guide has been an important reference document for car manufacturers when designing their new models.

In the guide, they have found the research results of the RCAR centres regarding design details and other factors that influence the repairability of cars after an accident.

Improving the repairability of the vehicles means that the insurance companies can offer lower insurance premiums, which improves the competitiveness of their vehicles. In this way, it produces a circle of collaboration between insurers and car manufacturers that is very positive for both parties.

Given the high level of interest that the Guide generates in the marketplace, at the beginning of last year, the Repairability working group undertook the task of completely updating this document.

After more than a year of intense work and collaboration of the centres that are part of the Repairability Working Group, the New Design Guide will be published soon in 2020.

This document will have a modern look and content fully aligned with the current demands of the vehicle repair sector.

The New Guide includes gas, electric and hybrid cars and it also deals with ADAS (Automated Driving Assistance Systems) and the ultrasonic sensors, cameras and radars that play a key role in its operation.

The Guide is intended to be a living document, to be continually updated by information from all RCAR members, coordinated by the Repairability working group, to ensure it maintains, its relevance.

As Chairman of REPAIRABILITY W.G., I want to take advantage of this little article to thank all the people and members of RCAR who have participated in the development of the New Design Guide for their work and the high professionalism of their contributions.

I would also like to encourage all RCAR centres to continue contributing with new topics that keep this Guide up to date and make it more useful and important every day.

From,
Jose Manuel Garcia Conde, Working Group Leader, Cesvimap

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Repair instead of replace – better for the environment and better for all concerned

Spare parts for repairs to cars are bad for the environment because of the high CO2 emissions generated by their production and disposal. AXA and its partners therefore back repair methods with less impact on natural resources: Wherever possible damage to vehicles should be repaired rather than simply swapping out whole components. This way everyone benefits – especially the environment.

There are more than 6 million vehicles driving on Switzerland's roads, including 4.6 million passenger cars. While serious accidents are fortunately becoming increasingly infrequent, minor damage to bodywork, windshields, and headlights is on the increase. However, even minor damage is often not repaired. Instead, whole components are simply replaced with new ones, despite the availability of alternative options.

Replacing whole components is bad for the environment and for the bottom line: on the one hand, spare parts are very expensive in the automotive sector – with costs tending to rise – while on the other hand, producing and disposing of spare parts entails high CO2 emissions and consumption of resources. AXA therefore backs repair methods that have less impact on resources. Unlike conventional methods, these "micro repairs", as they are known, involve actually repairing damaged components rather than simply swapping them out.

Quality is the top priority

"As Switzerland's biggest motor vehicle insurer, we pay out more than CHF 700 million for car repairs every year. So, we play an important part in the economy, and we also want to be a responsible player when it comes to sustainability. That's why we encourage environmentally friendly repair methods wherever technically possible. Of course, we never compromise on quality – our top priority," says Alfred Egg, Head of Claims at AXA Switzerland.

AXA works with selected partners who offer and facilitate high-quality repairs. In a pilot trial conducted in 2019, AXA teamed up with André Koch AG, the trade association "Carrosserie Suisse", the training partner "Clearcarrep", and 14 partner garages to put alternative repair methods to the test. Now AXA is rolling out the successful approach to some 150 partner companies throughout German-speaking Switzerland.

Shorter repair times at lower cost

The results of the pilot trial present a clear picture: Approaches such as micro repairs and opting for "repair instead of replace" have advantages for all concerned. Body shops can get more repairs done within the same period of time, thus enabling their staff to maintain their skills and increasing the profitability of the business. Where micro repairs are an option, the cost of claims is reduced by an average of CHF 400, which has a positive impact on insurance premiums and so also benefits customers. In addition, shorter repair times and downtimes allow cars to get back on the road sooner, reducing the length of time businesses and drivers are kept waiting.

More emphasis on skilled workmanship and less of a throwaway mentality

"Our customers are very pleased if damage can be repaired quickly. If they have to wait for expensive spare parts, it means their car is left standing in the garage for longer and they have to drive a replacement car. However, minor damage can often be repaired completely within hours, without compromising on quality. This means companies need staff with the necessary expertise and skills for the job. For now at least, Switzerland still has this skills base and we should continue to promote those skills," says Richard Schöller of André Koch AG.

Felix Wyss, Chairman of Carrosserie Suisse, also supports the approach: "Body shops, which employ a lot of people in Switzerland, stand to benefit more themselves if they can carry out repairs. Cases of major damage are becoming increasingly uncommon and can't really be repaired anyway. Most claims involve minor damage. If we repair these instead of replacing parts, everyone benefits," says Wyss.

A plus for the environment

Ultimately, the environment is the biggest winner: More emphasis on skilled workmanship and less of a throwaway mentality helps reduce pressure on resources and cut CO2 emissions.

A key aspect of this approach is initial and ongoing training within body shop businesses. In training courses and periodic regional meetings AXA also discusses experiences and possible improvement measures with its partner garages on an ongoing basis.

The badly dented rear wing panel on the right was successfully beaten back into shape.

Calculation: Replacement = CHF 5,850, Repair = CHF 2,510

7th „Allianz Autotag“ at AZT: digital methods for accident investigation

Experts from Allianz, the automotive industry, academia and the authorities discussed the topic of digital accident investigation for modern vehicles at the 7th “Allianz Autotag” on September 19, 2019.

The CEO and other board members of Allianz Germany opened the “Allianz Autotag” giving insights into the future of mobility and the role of insurance and introducing the focus topic of using vehicle data for clarifying accident causes. The relevance of this topic was illustrated by a live crash of a car on a pedestrian dummy which was conducted by AZT: https://www.youtube.com/watch?v=pA67O6_9VrM.

In the presentations and discussions during the event, Allianz formulated its positions with regard to transparency and uniform standards for data stored in the car which are listed in the following summary:

- Allianz is calling for greater transparency regarding the data stored in the vehicle in the event of a traffic accident. Vehicle owners must be able to obtain information about the data stored in their car in a simple and straightforward manner.
- The standards currently being developed by the European Union for future accident data storages and driving mode storages must be suitable for clearing traffic accidents of modern vehicles. A short time window of a few seconds before and after the accident is sufficient for this purpose.
- In particular, interventions by driver assistance systems must be stored if they are closely related in time to an accident event. This is necessary because driver assistance systems increasingly influence the course of accidents.
- In the case of material damage, it should be up to the person affected to decide whether the data of his vehicle should be used to investigate the accident. If people are injured or killed, or if a criminal act is involved, the public interest in clarifying the question of liability prevails. In this case, the data may also be used against the will of the person concerned.
- Allianz recommends an independent trustee to whom the data required for accident investigation will in future be transferred in the case of highly and fully automated vehicles. No interested party should have exclusive access to this data - neither one of the parties involved in the accident nor the vehicle manufacturer or insurer.

These positions and further details are included in a press release to the event (only in German language).

Panel discussion on the storage and use of vehicle data with representatives from authorities and insurance

Crash test with pedestrian dummy "PRIMUS breakable" by CTS

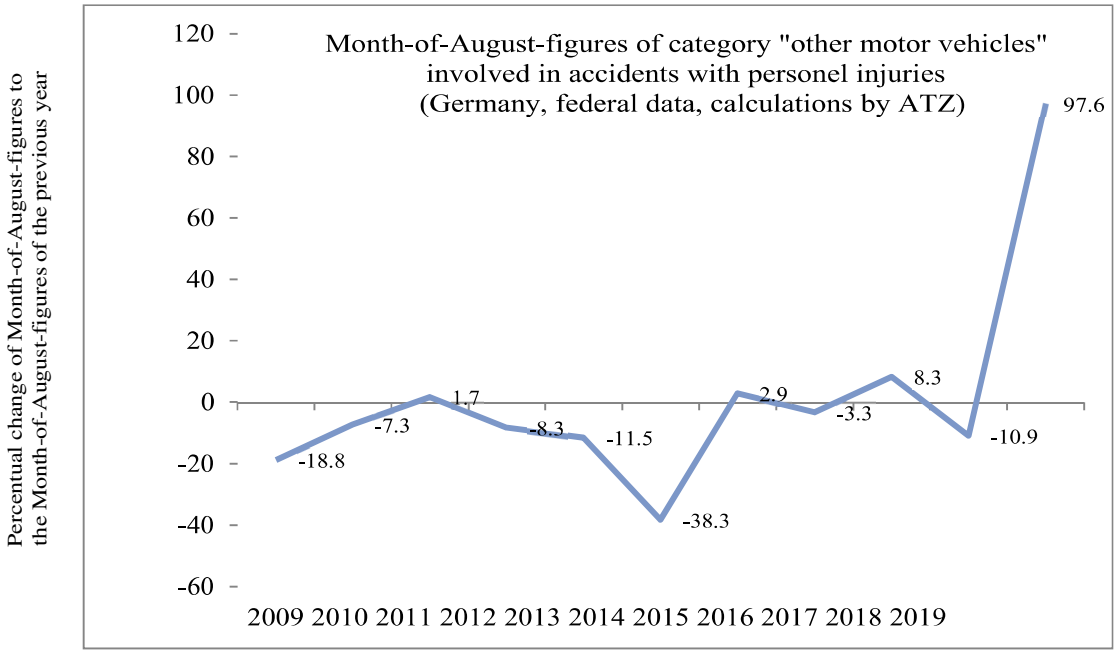
Electro-Scooters – New road risks require new statistics-supplements

Hardly a couple of years have passed, when e-scooters were to form an utmost notable new category of motor vehicles on our roads. Laments came from metropoles around the world as to the "chaos" that was brought into urban traffic. Wild sidewalk drop-offs made rental scooter users the new bad guys for both, pedestrians and cyclists. Media response for accidents was formidable, and following few years of low regulation, most cities went for uplifting age restrictions or sideway bans. However, offers and users of low powered electro two-wheelers grew rapidly and as a matter of fact this new class of micro vehicles provides new chances in micro mobility. The question is: Are the accident figures a reasonable result that comes from introducing a new road risk that wasn't present before, or do we face a disproportionately high hazard spot that asks for precise revision? The answer is all but impossible without holding robust mobility and accident follow-up data.

Long before German authorities started legalizing e-scooters (that is vehicles limited to 20 km/h here) this summer, scientific discussions run referring to the legal frame. The AZT and other safety experts were successful in their demand to cancel the idea of bringing 12 year olds to drive motor vehicles (albeit final chosen 14 is against all former age restrictions, either) – and merely AZT, together with the German Association of Transport Psychologists, were to admonish the authorities to record and deliver proper accident data. But new parameter introduction into federal statistics is far from being trivial, in terms of IT, police training, or regulatory amendments. E-scooters vanished in "other motor vehicles". Now, the German summer months brought regional accident figures – collected by the police of single cities and states, such as Bavaria – that gave evidence to the need of federal (national wide) uniform definition, classification, and registration of e-scooter accidents. A new vehicle category for road accident records is now in preparation at the federal bureau of statistics.

This is the first step to allow in-depth analyses of accident circumstances and weighing risks. But international comparability and harmonization of European statistics must follow. It is the turn of the European Road Safety Observatory (ERSO) now, to react to the new road risk with significant and standardized documentation. Same is with the WHO's annual road safety reports. To be dependent on anecdotal, media, or local project data is inadmissible for loss prevention work. Maybe, highest accident severities – fatalities – are still not the dominant factor in scooter claims, but severely and slightly injured drivers (head injuries as a result of single accidents not in the least) are, indeed. A plausibility data analysis with German Month-of-August-figures over the last ten years could prove that – with introducing the scooter accident into the "Others"-category – the percentual change (month-versus-comparison- month) of the number of drivers that are involved in accidents with personal injuries is to spring with rapidity.

The AZT therefor made a focus issue out of e-scooter safety. Scooter-pedestrian impact tests are in preparation for early 2020, technical measures (braking behaviors et al.) are in progress in order to give customer advice on how to enjoy scooter rides safely. First results are available at the following link: https://azt-automotive.com/en/topics/E-ScooterChristmas. AZT recommends using cycle helmets, never driving with a second person onboard, strictly following the cycle-lane-use-rule (means not driving on sidewalks), strictly following the alcohol-BAC-limit-rules, training the driving beforehand off-road, and using expert help in vehicle safety checks (since self-made build-together is a source of implementing technical faults). And AZT recommends: E-scooters are no toys for fun-sport in public spaces. They are motor vehicles. Any misbehavior discovered by police will lead to troubles with your car license.



Development of "other motor vehicles" involved in accidents with personel injuries in Germany

Regional Workshops Day 2019

CESVI ARGENTINA held the XV Regional Workshop Day on December 12, 2019, an event that aims at improving and promoting innovative safe repair practices.
This event brought together 75 people, including representatives of insurance companies, approved body shops, approved glass replacement workshops, and developing workshops.
The day began with an off-road driving practice in a special circuit by CESVI road safety instructors. Then, staff from the technical area, offered various lectures and workshop activities among which the following stand out:

The owners of developing workshops were given a talk about the competitiveness of the workshop to improve the quality and customer service they offer.
Due to the sudden increase in the Argentine automotive fleet of vehicles with hybrid motorization, a talk was made about them, with special emphasis on safety at the time of repair.
On a body-part, a quick- drying was applied, which has the particularity of curing in a few minutes without the need of baking and a polishing work was carried out showing how to improve productivity in the workshop.

In addition, a calibration of the advanced driver assistance systems (ADAS) of a Hyundai Kona was performed live, which had been tested under the RCAR protocol a few days ago. Complementing the technical issues, a special investigation on repair techniques and their consequences was presented in a comparative side impact study of three Volkswagen up.
Also, the owners of two body repair shops shared their experiences after having begun to experience the development path marked by CESVI.
The context of the insurance market, the accident rate evolution and its impact on repair shops were analyzed. In response to the set reality, CESVI presented its new Fast track module, recently incorporated into the ORION Claims Management System, which speeds up the burden of claims that only involves glass and wheels.

As part of the value chain in the quick settlement of claims, the remote survey modality was presented that seeks to expedite the management of claims and improve customer satisfaction.

To conclude, a select group of workshops were recognized in the following categories:

- Great backround in the market for more tan 5 consecutive years.
- Great background in the market for more tan 10 consecutive years.
- Development in training.
- Evolution.
- Better safety glass installation center.
- Better metal and paint shops

CESVI ARGENTINA advances with the crash tests of reparability of hybrid vehicles

In Argentina during 2018, the automotive fleet of electric hybrid vehicles has increased by 405%. Given this important growth and with the certainty that this type of technology will continue to advance in the country, CESVI ARGENTINA has worked during 2019 to establish the changes and opportunities necessary to adapt to the new paradigm.

One of the most important activities of our Experimentation Center is the performance of the repair tests under the RCAR (Low-speed structural crash test) protocol. Therefore, we have worked with the objective of achieving the optimal update of the impact procedures for this type of vehicles.

Taking as reference the experience in this type of activity of the automotive terminals and the most important test centers in the world, improvements were established in the following procedures:
One of the most important activities of our Experimentation Center is the performance of the repair tests under the RCAR protocol (Low-speed structural crash test). Therefore, we have worked with the objective of achieving the optimal update of the impact procedures for this type of vehicles. Taking as reference the experience in this type of activity of the automotive terminals and the most important test centers in the world, improvements were established in the following procedures:

- Use of new personal safety protection elements and the use of insulated tools for the corresponding voltajes, both of the personnel making the impact and of the technicians performig the repairs.
- Safe handling of hybrid and electric vehicles in the pre-impact preparation stage.
- Safe handling of hybrid and electric vehicles in the post-impact repair stage.
- Set HV (high Voltage) battery location.
- Safe handling of hybrid and electric vehicles during the impact development.
- Identification of the type of battery.
- Incorporation of a voltage and temperature measurement device for the HV battery.
- Identification of the location of the manual system disconnection service and HV wiring.
- Recommended connection location to monitor HV isolation.
- Instructions to load/unload the HV system safely.
- Acquisition of information on the chemical properties of the battery coolant.
- Fire extinguishing protocol through the knowledge of the HV battery compounds.

CESVI acquired a TOYOTA PRIUS unit that was impacted on December 18, 2019, becoming the first test for this type of vehicles carried out in the country. With the advice of the terminal, our technicians worked on the adaptations in the procedures related to the new technology and safety, which were implemented in the trial.
Currently, our Experimentation Department is working on the damage analysis stage.
All the things that have been learned and experienced are a starting point for the application and development of the insurance and repair market in Argentina.

Micromobility - Security challenges would change in times of new modes in traffic

An unprecedented study carried out by CESVI BRASIL in 2019 brings warnings about the advance of micromobility.

The objective was to unveil the performance of new modes of transport, such as bicycles and electric scooters in large urban centers. In the first phase of the study, CESVI assessed the area in which electric scooters and bicycles can be hidden in vehicle mirrors.

In the second phase, we observed more than 1,200 cyclists and scooter drivers, on Avenida Paulista, on August 28, and on Brigadeiro Faria Lima Avenue, on August 30, from 8:00 am to 5:00 pm.

These routes are exponents in the use of micromobility vehicles and can serve as a reference for other large capitals.

After analyzing in the previous phases, the behavior of the driver of a vehicle and the behavior of the user of micromobility, we proceeded to the 3rd phase where the objective was to analyze the braking time of the scooter in a situation of sudden pedestrian crossing.

On the occasion, 20 volunteers participated in the simulation at CESVI Brasil facilities It was identified that, in a sudden situation of pedestrian crossing, the driver of the scooter can only brake the equipment when driving it at a speed of 10 km / h, as the braking time and space are not sufficient at a speed higher than this.

With the conclusions of this study, it was possible to have a better perception of how these vehicles are interacting with traffic and to point out possible points of attention for society, public authorities and road safety.

Dynamic braking test developed at 20 Km / h

Dynamic braking test developed at 10 Km /h

CESVI Brasil Workshop on Bradesco insurance electric and hybrid vehicles

CESVI BRASIL, developed a technical study on the new challenges that insurance companies may encounter

in relation to electric vehicles. Generating a technical report with the needs of the insurer under the theme of

electric and hybrid vehicles in Brazil.

After generating the technical content, a Workshop was held at Bradesco Seguros, to disseminate the information obtained in the study, where CESVI had the opportunity to bring technical knowledge about electric vehicles, aimed at the insurance sector, with lectures, vehicle exhibition electric and debate table to interact with the public and answer questions on the subject.

CESVI BRASIL raised several interesting data, which help the insurer in its processes, one of those data raised by the CESVI study and discussed in the Workshop, was the question of the value of the high voltage battery compared to the value of the vehicle. Where batteries have an average of 41% of the vehicle's value, which can be more expensive than the car itself.

However, the good news is that some automakers are already making the battery available with the possibility of partial replacement, to lower repair costs. This type of information helps the insurer to understand the points of attention in pricing and even at the time of the claim, also demonstrating the factors that can reduce repair costs.

Practical demonstration of vehicle operation

Leaders of the Seguradora Bradesco and CESVI Brasil project

CESVI Brasil technical training for MAPFRE insurance company and partner automotive repair shops

CESVI Brasil, after participating in a know-how transfer program at CESVIMAP, trained and updated all MAPFRE insurance Brazil inspectors specialized in automobiles. In addition, training in automobiles and training in claims regulation for heavy vehicles and motorcycles was also part of the insurer's training grid. The auto repair shops that were ambassadors of the insurance company were also technically trained, the training given was focused on the repair of plastic parts and the use of stretch bench to recover the dimensions of the vehicles within the original standards.

The insurance company training project trained 132 accident inspectors and 84 automotive repair shops. For the training, all the technical resources of CESVI Brasil were used, always focusing on the practical part combined with the technical knowledge necessary to clearly and objectively meet the inspectors' need.

Last class graduated in 2019

Knowledgetransfer between CESVIMAP

instructors and CESVI Brasil instructors

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CESVIMAP opens a new electric vehicle charger test zone

The charging process for electric vehicles is of vital importance. CESVIMAP has decided to conduct thorough research into this process, focusing on linked charging points (domestic or in places of work).

This innovative "electric vehicle charger test zone", created in our facilities, comprises 4 single-phase charging points and 5 tri-phase charging points. In the single-phase points, different PMR, Personal Mobility Vehicles, can be charged, such as scooters, electric bicycles and mopeds. The tri-phase charging points are designed for larger vehicles - passenger cars and vans. They are all monitored in real time and this surveillance can be carried out from any device connected to the Internet.

CESVIMAP basically evaluates usability and functional features, such as:

- Operability: ease of installation and handling, correct charging of all vehicles, etc.
- Function: what electric and mechanical protections are incorporated, voltages and charging time.
- Communications: how the user is informed about the charging process, connectivity via app or web, information provided for the user...
- Performance: the facility has been monitored to evaluate its energy management, measuring: active and reactive power by phase, intensity by phase and tri-phase value, total active and reactive energies.

CESVIMAP's research also covers what the inside of the chargers are made up of. The chargers are installed by specialist professionals, and meet current regulations for health and safety. To meet the regulations, specific electrically insulated tools are also used.

The advantage of the modular structure of this zone of CESVIMAP is that it is easy to instal the chargers and to change the models under study. An analysis is also made of each car's charge with each different charger.

CESVIMAP continues to advance in its research into the sphere of the electric vehicle, destined to mark a small revolution in the world of sustainable mobility.

CESVIMAP lends its support to COP25 against climate change

As part of MAPFRE's fight against climate change, at COP 25, the 2019 Climate Summit, it organised a debate with CESVIMAP, FundaciónMAPFRE, DGT (Spain's Directorate of Road Traffic) and “Stop Accidentes” under the title “Road Safety for a sustainable world”.

José María Cancer, General Director at CESVIMAP, MAPFRE's R+D centre, in his contribution to the debate, explained about the contribution of this centre of world reference for the design of sustainable vehicle repair methods and for the improvement of car design, to make cars safer and easily repairable. Cancer went into details with some figures, as a "magnificent example of circular economy". Thanks to the use of recovered parts, the company "has saved over 47,500 tons of CO2 and has generated an annual saving of 825 tons of glass and 1,200 tons of plastic in the MAPFRE repair shops in Spain”. He also commented on the importance of promoting zero emissions vehicles and encouraging the use of alternative transport, such as bicycles, electric skateboards and shared vehicles, one of the main CESVIMAP initiatives to promote safe, healthy and sustainable mobility, taking advantage of the wide range of alternatives in existence.

The debate was streamed and was followed live by an additional number of over 8,000 people from all over the world.

José María Cancer at COP25

enerTIC Award 2019 and 2019 Dubai World Congress Prize for self-driving

The Cities Timanfaya Project (Intelligent Concept for Integrated, Ecological and Safe Transport) has won the seventh annual enerTIC Awards 2019, in the category of ‘Smart Mobility’. These prizes recognise "programmes in development phase designed to publicise good practices serving to improve energy efficiency and sustainability".

With a million euro budget, the project, developed in Spain, promotes organic, autonomous, safe transport on the island of Lanzarote, positioning Spanish technology at the cutting edge of R+D+i worldwide.

Autonomous electric micro-bus

Managed and coordinated by the Asociación Española de la Carretera (AEC), (Spanish Highway Association), under the technical leadership of Madrid's Carlos III University and 2RK Consultores en Transporte Inteligente, alongside MAPFRE España, CESVIMAP, GMV, Vázquez y Torres Ingeniería, SGS – GMR and Albufera Energy Storage; 20 PhDs and 40 specialised university graduates are taking part in its development.

The bus has no driver post and has up to four safety systems. A fault in any of these systems is enough for the vehicle to come to a halt automatically.

The Cities Timanfaya Project is "a revolution within the very revolution that autonomous transport means on the planet, since it is applying the knowledge and experience acquired to transport as a whole and accelerating the current conceptual change about mobility in the tourist sector, redirecting it towards safer and more efficient electric driving".

Unlike other vehicles which perform small short linear journeys along specific lanes, such as those which link the car parks to the terminals of British airport Heathrow, Cities Timanfaya "applies this totally innovative technology to a winding 14 kilometre route in the heart of a natural park, with steep hills and which also has no road marking or road signs to help the bus guide itself during the trip". As a result of all of this, Cities Timanfaya "will not only convert the island of Lanzarote into a worldwide point of reference for quality tourism, it will also position Spanish technology at the forefront of international R+D+i".

In addition, the autonomous vehicle developed by CESVIMAP in conjunction with Carlos III University and INSIA, as mentioned in the previous RCAR Newsletter, has been awarded second prize at the 2019 Dubai World Congress for self-driving competition.

RCAR 2019 in Beijing

From 13th October until 18th October, CIRI was the first time host for the RCAR annual conference in Beijing.there are 17 RCAR members from 13 countries attending this great conference.

More than 50 presentations were shared and decussed at the conference. The main themes are autonomous and connected vehicles, ADAS and Cyber security, damageability and repairability and other subjects. The 2019 RCAR annual conference was highly praised by the international community. It has made positive contributions to China's automobile export and the development of China's automobile insurance industry.

In addition, during the annual conference of RCAR, all delegates visited CIRI and made high comments on the Crash test center, repair test center and flooded vehicle test room. At the same time, NiO EV, Chery EV, Geely EV and other Chinese brands presented Chinese automobile technology to all delegates.

We wish AXA the best of luck in the organisation and presentation of thrilling topics from the world of the automobile: AXA is taking on organisation of RCAR 2020 in Switzerland.

The Conference of RCAR Members with Chinese OEMs and Insurers

On October 11, 2019, the RCAR annual conference first came to China Beijing. CIRI took advantage of this opportunity and organized an international conference on auto insurance and safety technology. This conference has a great influence in China.
More than 250 experts from automobile insurance and safety technology, domestic and foreign research institutes, universities, OEMs and RCAR attended the meeting. With the theme of automobile insurance and safety technology development, the conference focuses on vehicle safety technology and insurance development direction. The Experts have exchanged research results from all countries. It is a multi-industry, interdisciplinary and high-level exchange conference.

The meeting is held in the form of main forum, sub forum and Salon. At the main forum, the Secretary General of RCAR Robert McDonald, IIHS David Zuby, AZT Carsten Reinkemeyer, CESVIMAP Ruben Aparicio-Mourelo Alonso, and Thatcham Richard Billyeald, they introduced RCAR working groups on behalf of the steering committee. And they respectively shared the development history of RCAR organization, research and achievements of RCAR in promoting automobile safety, body structure, repairability, damageability, P-safe, etc. In addition, Experts from CIRI, PICC and Ping An respectively made in-depth discussions on the China's insurance automobile

safety index (C-IASI), automobile risk and intelligent loss assessment; In the automatic driving, experts described the research progress of automatic driving test and Evaluation Technology.

In the sub forum with the theme of vehicle risk research and vehicle optimization design, experts from Chang'an Automobile, Geely Automobile and BYD automobile respectively made wonderful sharing on the low-speed collision design, the vehicle safety development and the new energy vehicle safety development and artificial intelligence on the reform of insurance claims.
Finally, Jareon Lee from KART and Richard Billyeald from Thatcham introduced the application of vehicle insurance group rating in different countries.

In the sub forum with the theme of risk characteristics of new energy vehicles and intelligent vehicles, experts from Chery Automobile, Chang'an Automobile, BAIC motor and Volkswagen China respectively made wonderful sharing on the research on the automatic driving development, electric vehicle damageability and repairability, the impact of new technology on insurance group rating. And David Zuby introduced the impact of new energy vehicles and ADAS functions on insurance claims.

In addition, at the salon, the participants also focused on the theme of Integration of insurance and automobile safety and discussed on the development direction in the future.

Centro Zaragoza celebrates its 30th Anniversary

Centro Zaragoza celebrated its 30th Anniversary last September 2019 with a full agenda attended by representatives of its partner insurance companies; as well as the Management Team of the Confederation of Employers and Industries of Aragón (Spain) -CEOE Aragón-, and members of the Confederation's Industry, Transport and Digital Economy committees.

On behalf of CEOE, the day was headed by the vice-president of CEOE Aragón and CEOE Zaragoza, Víctor Sanz; the general secretary of the Zaragoza Confederation, Ana López, as well as the presidents of the three participating committees: José Luis Latorre, from Digital Economy; José María Rivera, from Transport and Logistics; and Antonio García, from Industry.

The celebration opened with a welcome ceremony by David Casademont and Ramón Nadal, president and vice-president of Centro Zaragoza respectively.

Then, Carlos Arregui, general manager; Juan Luis de Miguel, director of research and Jesús Carcas, director of engineering made a presentation of the center. They explained the activities that Centro Zaragoza carries out in research and experimentation on the characteristics, manufacture and repair of vehicles and their accessories. On this basis, a wide and varied work has been developed in its facilities that are 30 years old, consolidating us as a reference company in the automotive sector, contributing to the reduction of the cost of material damages, the prevention of traffic accidents and, therefore, the improvement in road safety.

Mariano Bistuer, institutional relations director, guided the guests on a visit of the facilities, concluding the event with a cocktail where attendees had the opportunity to share thoughts, as well as to search for new alliances and business opportunities that represent progress for the sector.

t's been the first 30 years of an exciting future. We are facing new technological challenges in the automotive sector, which are advancing very quickly, such as: advanced driving assistance systems, better known as A.D.A.S., the electric vehicle, the autonomous vehicle, the connected vehicle or the new personal mobility vehicles, which make up a new exciting stage, in which the sector can count on the research work of Centro Zaragoza.

Event attendees

Low speed crashes, whiplash injuries

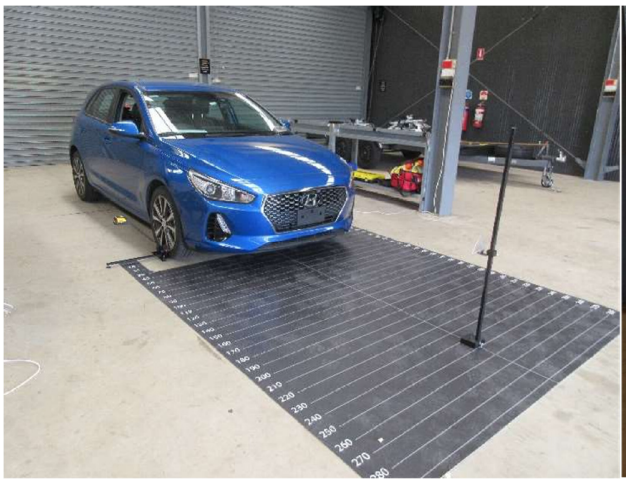
Due to the Increasing demand of biomechanical expert reports of low speed collisions in Spain, required Centro Zaragoza to extend its service of traffic accident investigation and reconstruction within this field, that combines knowledge from engineers and physicians. Centro Zaragoza started in 2016 with this new product of biomechanics reports, focused on low speed impacts, after developing and validating a reliable methodology, based on experimental work: low speed crash test, that allows us to quickly analyse real cases, with high reliability and in a very cost efficient manner. The main goal of these reports is to quantify the "severity of the crash" by calculating the most relevant physical parameters, such as delta-V and mean acceleration of the crashed cars that, according to a wide consensus within the scientific community, are the best predictors of cervical injury risk for the occupants of the vehicles involved in a collision.

When we started to analyse crash severity and injury risk, in real accidents in Spain, we realised that rear end collisions were not the only type of collision leading to cervical injury claims. In fact, almost half of the claims in our market came from not a front to rear collisions, like front to lateral collisions, front to front and, more often, probably due to high popularity of roundabouts in Spain, accidents where vehicle contacts where lateral slides, more a friction between car sides than an impact, occurred. Therefore, two different algorithms were developed for delta-v and acceleration calculation, one for rear end collisions, where fortunately a wide database of crashes existed, with public data available, and another one for other types of collisions.

With the goal of continuous improvement in mind we carried out, at the second semester of 2019, a new set of crash tests between SUVs (Sport Utility Vehicles), which are an increasing type of vehicle In Spanish market, that presents obvious differences in weight, dimensions, structural stiffness and, maybe also, in exterior panels rigidity, with regards to traditional passenger cars, so we needed information of the behaviour of these type of vehicles in low speed collisions. Information from these tests have been incorporated in our algorithm, improving the accuracy to the collision analysis when SUVs are involved.

Preparation of a crash test involving two SU

Testing of ADAS Radar Calibration Equipment



Vehicle ready for calibration

Radar target

After testing ADAS camera calibration equipment for windshield mounted cameras last summer, the IAG Research Centre this year extended their focus on equipment that can calibrate radar based sensors for Advanced Driver Assistance Systems.

To conduct the testing, IAG rented again a pit lane section of the Sydney Motor Sports Park in Eastern Creek, NSW. These facilities provide a clean and appropriately sized workshop and a pit lane that is long enough to conduct AEB testing directly at the front door. This venue is different from the usual test track that IAG uses for the official AEB testing, but since in this investigation only relative tests between different setups should be tested, the comparability was sufficient.

The team contacted three reputable providers of ADAS calibration equipment and conducted one testing week with each one of these products. Unlike the camera based systems last year, the radar based units haven't been on the market for a long time. Therefore, the amount and variety of vehicles that can currently be calibrated is significantly lower. Out of these reasons, not all the calibration sets could be tested using the same three vehicles.

With each of the vehicles, a baseline run of AEB testing was conducted as well as an assessment of the Adaptive Cruise Control (ACC), the Lane Keep Assist (LKA) and Lane Departure Warning (LDW). After this, all vehicles had a wheel alignment carried out, the radar sensors checked concerning their alignment and a pre scan performed.

After that, the following procedure was carried out three times for each vehicle:

- Pre scan
- Calibration
- Post scan
- Test drive with ACC, LKA, LDW performance assessment
- AEB testing

Handling and setup of the calibration equipment showed itself to be similarly hasslefree as the camera based units. Unlike the large variety of pattern boards for the camera units, for the radar units we altogether saw just two generic tyes of targets, metal cones of different sizes and flat metallic boards.

Overall, the calibrations went well with the vehicles and the majority showed no decrease in performance in the vehicle tests. On one vehicle, however, we saw changes in the overall AEB system performance even though the calibration finished with a success message and no fault codes were visible in the vehicle systems. This is an aspect, we have to investigate further, since users would assume that the vehicle performs optimally after a successful calibration. Moreover, some of the vehicles tested use a combination of camera and radar sensor input for their AEB systems. According to their repair manuals, both systems can be calibrated independently and do not need to be calibrated at the same time. Our tests, however, showed that for at least one vehicle, the overall system performance could be increased by calibrating camera and radar sensors in one go.

The IAG Research Centre will investigate this further and report in the next RCAR Working Group meetings.

Safety content to support our customers that two caravans and trailers

The IAG Research Centre has recently produced a series of road safety content to support customers who tow caravans and trailers. It was identified that there was a lack of readily available towing-specific safety information through our insurance brands. Through IAG's NRMA Insurance brand, we identified four initial topics where we will be able to share tips and information to help to improve road safety for our customers. The first topics we will cover are:

- Towing safety checklist
- Towing Visibility. Understanding where blind spots occur and how to be aware of this when using your caravan or trailer
- Caravan and trailer weight distribution, and how to load these in the most effective way
- Towing safety technology available, including aftermarket solutions. For this topic, we engaged with Bosch Australia who were able to provide video content, demonstrating how their technology can help to avoid losing control when towing a caravan or trailer.

The first piece of content, 'Towing-safety checklist' went live in December on Facebook, as well as more detailed content on the new Hub website, an online magazine style website, hosting informative and entertaining content (https://go.nrma.com.au/Checklist). The rest will go live in the near future.

Three all-electric vehicles earn IIHS safety awards

Tesla picked up its first award from the Insurance Institute for Highway Safety (IIHS), as the 2019 Model 3, its less expensive sedan, qualified for *TOP SAFETY PICK*+. The Chevrolet Bolt, meanwhile earned a *TOP SAFETY PICK* award.

The Model 3 and the Bolt joined one other all-electric plug-in vehicle, the Audi e-tron, in the 2019 IIHS winner's circle. A hydrogen fuel cell vehicle, the Hyundai Nexo, also recently qualified for an award.

"Vehicles with alternative powertrains have come into their own," IIHS Chief Research Officer David Zuby says. "There's no need to trade away safety for a lower carbon footprint when choosing a vehicle."

To earn a 2019 *TOP SAFETY PICK* award, a vehicle needed good ratings in the driver-side small overlap front, moderate overlap front, side, roof strength and head restraint tests, as well as a good or acceptable rating in the passenger-side small overlap test. It also needed an available front crash prevention system with an advanced or superior rating and good- or acceptable-rated headlights.

The Tesla Model 3 is one of three all-electric vehicles to earn a 2019 safety award from IIHS.

For 2019's top-tier award, *TOP SAFETY PICK*+, good ratings were required in the passenger-side small overlap test and the headlight evaluation.

IIHS has tightened its awards criteria for 2020 and is planning to announce the initial crop of winners during the first quarter. This year, good crashworthiness across the board, available front crash prevention that earns an advanced or superior rating in both vehicle-to-vehicle and vehicle-to-pedestrian evaluations, and good or acceptable headlights are required for both awards. For a vehicle to qualify for a *TOP SAFETY PICK*+ award, the good or acceptable headlights must come standard.

For more information, visit https://www.iihs.org/news.

IIHS hosts first-responder emergency extrication training program

IIHS hosted the extrication training for the fourth time.

More than 50 Virginia first responders practiced cutting into vehicles during a recent training session at the IIHS Vehicle Research Center in Ruckersville, Virginia. The annual event gives emergency personnel hands-on training in extricating crash victims from today's tough-to-cut-through cars.

The September event marks the fourth time the National Auto Body Council has conducted its First Responder Emergency Extrication (FREE) program at the IIHS facility. It's one of about 50 such events the council holds nationwide each year.

The VRC is a fitting location for the training session, since IIHS vehicle testing and safety awards are partly responsible for the beefed-up structures and added features that make today's

Fire departments from across Virgnia took part in the training session organized by the National Auto Body Council. The event gives first responders hands-on experience cutting through modern vehicles.

vehicles safer but also add more complexity to rescue work. People are more likely to survive serious crashes, but it can take more knowledge and skill for first responders to help people out of their vehicles.

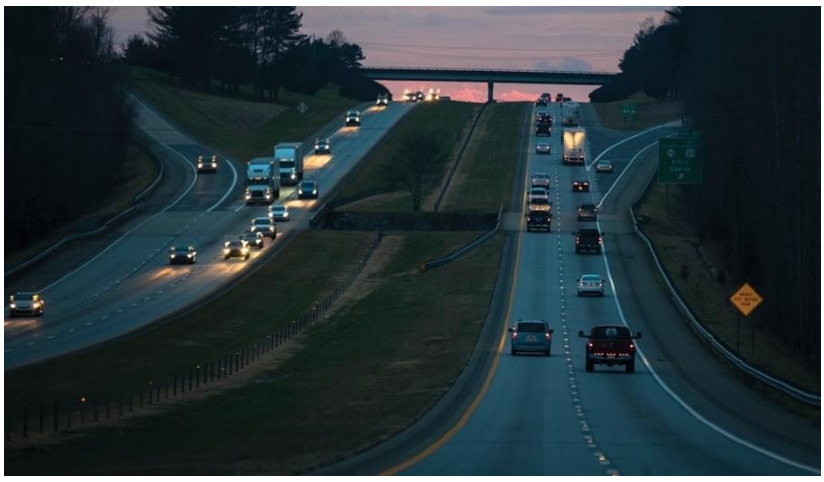
The introduction of the IIHS roof strength test in 2010, for instance, prompted manufacturers to enhance support structures to keep vehicle roofs from collapsing in a rollover. IIHS front and side crash tests encouraged automakers to design occupant compartments that are better able to resist intrusion.

The tough materials that make newer cars safer require different techniques and sometimes stronger tools to lever open. Undeployed airbags, high-voltage batteries and alternative fuels can also pose unfamiliar hazards.

For the recent training session, State Farm Insurance donated a 2011 Nissan Altima, 2011 Honda Civic, 2012 Chevrolet Malibu, 2011 Volkswagen Routan and 2012 Nissan Versa, and M&M Auto Parts donated a 2006 Ford Fusion for the rescue workers to dismantle. IIHS also provided a 2016 Tesla Model S for an orientation about its unique features, though it was not cut apart.

For more information, visit https://www.iihs.org/news

Automakers accelerate push to make vehicles safer



Automakers are making vehicles more crashworthy about 3 times faster today than they did in the mid-1990s, but those improvements and new safety features still take decades to filter into most vehicles on the road.

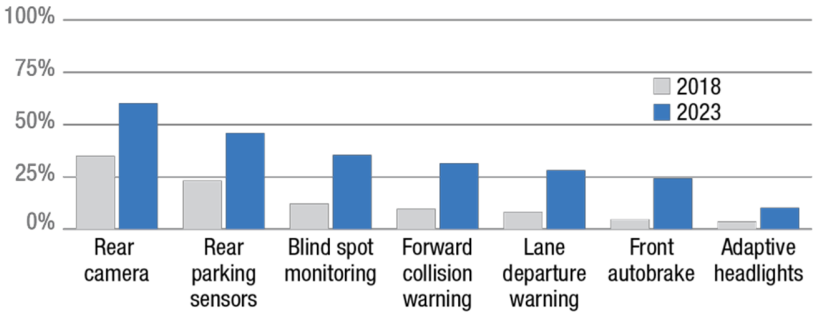
Government mandates, voluntary manufacturer commitments and independent safety ratings can have dramatic influence on how quickly automakers make such improvements and how quickly they become widespread in the U.S. fleet, new studies from the Highway Loss Data Institute (HLDI) show.

The first HLDI analysis looked at four IIHS ratings evaluations: moderate overlap front, side, roof strength and driver-side small overlap front.

While the percentage of the tested vehicles that earn a good rating in the oldest test — the moderate overlap — has increased an average of 2 percentage points per year, the rate of increase has accelerated to 6 percentage points per year for the newer driver-side small overlap test, HLDI's analysis shows.

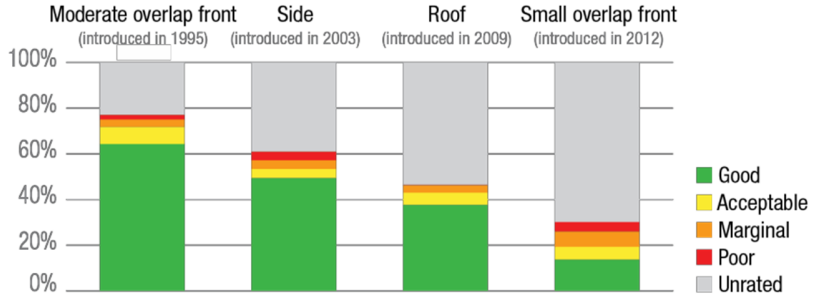
Nevertheless, it still takes decades for improvements to impact the entire fleet of registered vehicles. Drivers don't immediately abandon older vehicles when automakers make safer ones.

Predicted registered vehicles equipped with advanced safety features by calendar years 2018 and 2023



Even 23 years after its introduction, the percentage of the U.S. fleet with a good rating in the moderate overlap test is only 64 percent. Six years after the introduction of the driver-side small overlap test, only 14 percent of the fleet earns a good rating in that evaluation.

Crash test ratings for all registered vehicles in calendar year 2018



A parallel study of the speed at which advanced safety features make their way into the overall U.S. fleet suggests that government mandates and voluntary manufacturer commitments also have a powerful impact on the pace of change.

In this study, researchers looked at the estimated availability and installation of rear cameras, rear parking sensors, blind spot monitoring, forward collision warning, front automatic emergency braking, lane departure warning and curve-adaptive headlights from the years these features were introduced through calendar year 2050.

With the exception of curve-adaptive headlights, these features have been filtering into the broader fleet at a faster rate in recent years than they were earlier. Not surprisingly, two features slated for universal adoption by government mandate or voluntary manufacturer commitment — rear cameras and front autobrake — are spreading even faster.

Meanwhile, a third HLDI study suggests that as advanced features become widespread, they will slow future improvements in the fleet. That's because crash avoidance systems are asssociated with fewer total loss claims. Thus, vehicles that are equipped with them persist in the fleet longer than vehicles that lack them.

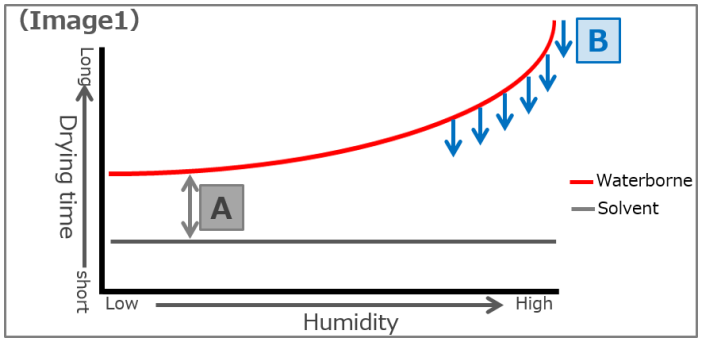
For more information, visit https://www.iihs.org/news.

Relationship between temperature, humidity and drying time of waterborne paint

Although it is generally said that waterborne paint is the better choice for the environment and human health when compared with solvent-based paint, the hurdle is relatively high for introducing waterborne paint due to its longer drying time. And it has been found that drying time of waterborne paint is greatly affected by humidity although the effect of the temperature on the extent of drying time is unknown.

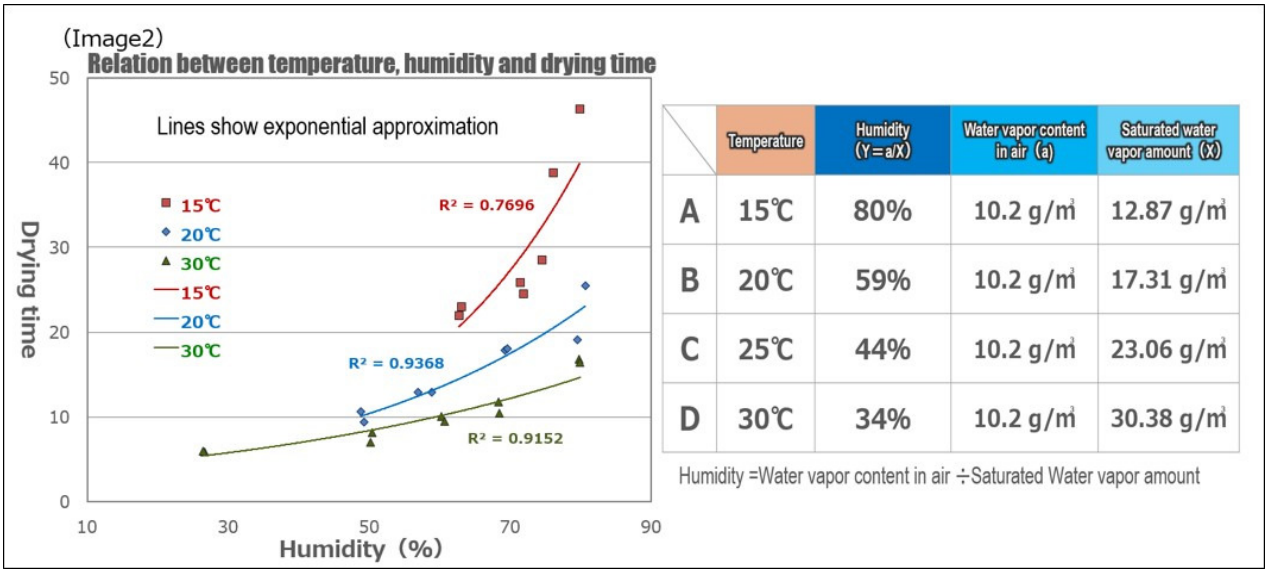
As shown in “Image1” below, the fundamental gap in the physical properties of water and organic solvents cannot be bridged. However, even when the humidity of the outside air is high, optimizing the temperature inside the paint booth may prevent the drying time from being extended. Fortunately, we were able to use one of OEM’s paint booth at which we were able to freely adjust the temperature and humidity. We utilized this booth to study the relationships among temperature, humidity and drying time. Then, we examined a method for setting the optimal temperature inside the booth applying the study results aiming to reduce the drying time.

(Image1)



This “Image2” shows the study results of temperature, humidity and drying time. You can see that drying time is greatly affected not only by humidity but also by temperature. Humidity is the ratio of the amount of water vapor actually present in the atmosphere to the amount that would be present if the air were saturated at the prevailing temperature and pressure. Therefore, increasing the temperature decreases the humidity.

(Image2)

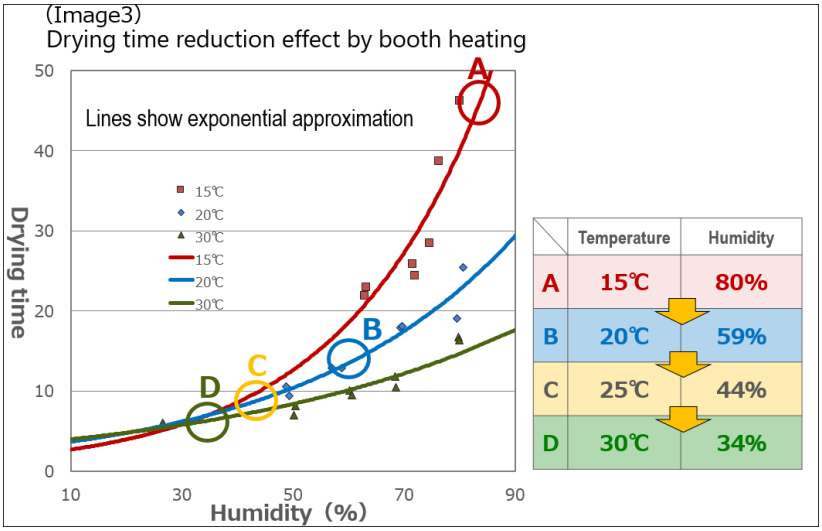


	Temperature	Humidity (Y=a/X)	Water vapor content in air (a)	Saturated water vapor amount (X)
A	15℃	80%	10.2 g/m³	12.87 g/m³
B	20℃	59%	10.2 g/m³	17.31 g/m³
C	25℃	44%	10.2 g/m³	23.06 g/m³
D	30℃	34%	10.2 g/m³	30.38 g/m³

Humidity =Water vapor content in air ÷Saturated Water vapor amount

It showed clear effect of shortening the drying time when heating the booth. Initially, it will be point A in “Image3” if the temperature is 15 degrees and the humidity is 80%. Heating to 25 degrees theoretically reduces humidity to 44%. This corresponds to point C in the image. The drying time was reduced from 46 minutes to 9 minutes, achieving nearly 80% reduction.

(Image3)
Drying time reduction effect by booth heating



	Temperature	Humidity
A	15℃	80%
B	20℃	59%
C	25℃	44%
D	30℃	34%

Next, we looked into the effectiveness of the hot air dryer. Although it has shorten the drying time, its drying quality was inferior to that of booth heating. This is because booth heating provided wider application of heat to the entire panel at same time, while the hot air dryer provided heat only to the limited area close to its outlet from which the hot air blew.

These study results showed that the most effective method was to firstly raise the booth temperature to the limit and then use the hot air dryer. The temperature limit inside the booth is up to about 25 degrees considering the technician's working environment. It is said, however, that painting at a humidity of 40% or less may cause some paint failures such as rough finishes. Therefore, we found it was effective to stop the heating process when the humidity reached 40% atthe temperature of 25 degrees or lower, and use a hot air dryer to reduce working hours and ensure a better quality.

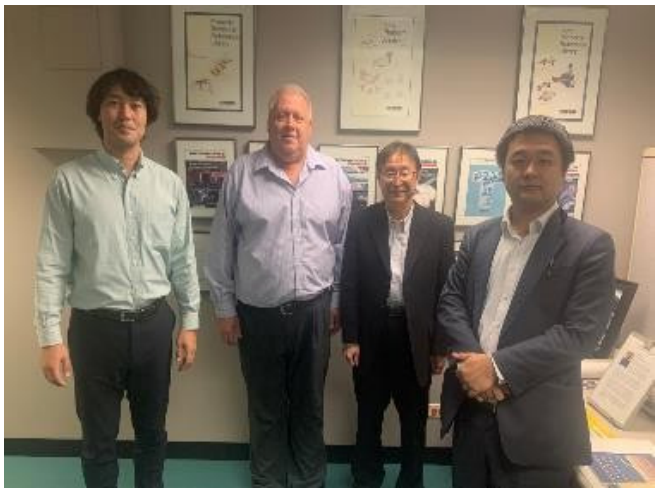
Collecting repair information from foreign market

JKC's Repair Development Department (RDD) is actively collecting the latest information on repair methods from the overseas BP market. Useful information gained through business trips is used to develop new repair methods which are provided to the Japanese auto insurance companies.

In recent years, we have been studying the European market through visiting Automechanika held in Germany every other year and also visiting BP workshops in the European countries. We made such visits in 2016 and 2018. During our 2016 visit, we were able to obtain a valuable technical information from the tool manufacturer we visited. Through trial and error, the visit has led our RDD to successfully develop “warm adhesive repair technique”, a repair method specialized for aluminum panels.

In early December 2019, we made a business trip to the United

States and were able to collect and understand the latest information of BP repair market in the United States. We visited Tech-Cor, which has strong reputation in developing useful repair methods. We are grateful to Tech-Cor for its kind support for arranging our visits and valuable exchange sessions with I-CAR and Tech-Cor's BP workshops.



For considering our future training system, we were able to obtain useful information from I-CAR which is strong in training repair technicians and developing new repair methods by working with OEMs. For example, many of the repair methods developed with the OEMs are incorporated into I-CAR's training programs, such as creating curriculum systematically tailored to the market needs and providing many useful training videos.

When we visited Tech-Cor, we were able to see the demonstration of plastic welding repair, a repair method widely used in the United States. This method, however, is not common in Japan, but we gained some hints on spreading this method in the Japanese market. Through the business connections we created with the US tool manufacturers, we also hope that improved repair methods will be developed in Japan in the near future.

Expanding the repair standards

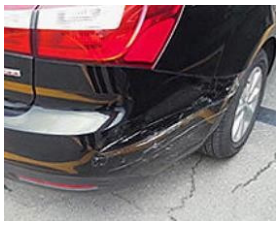
for minor damage from bumper to the outer panel

KIDI conducted a technical study for repair standards of minor damages, and the revised standard was carried out by the Financial Supervisory Service, one of the government agencies.

The revision of the terms of auto insurance for the minor damage on the bumper was applied in 2016. It requires repair for bumper instead of replacement for the minor damage, and in the case of other types of damage, repair will be possible through replacement. However, if the repair cost is greater than the cost of the replacement parts, and if there is a concern about the occurrence of defects after the restoration repair, the replacement work shall be considered. Through the improvement of the system, the replacement rate of front bumper dropped from 41% in 2015 to 30.5% in 2017.

Type 1 (Repair)

Type 2 (Repair)



Type 3 (Repair)

Replacement

In May 2019, the repair standards for exterior panels (bonnet, front fender, front door, rear door, rear fender, trunk lid, tailgate) are revised which is expanding version of repair standards for bumper minor damage. In the event of other damage, the repair method can be determined by considering in terms of the safety, repair quality and economic consideration of vehicle repair. However, if the repair cost is greater than the cost of the replacement parts and if there is a concern of a defect after the restoration repair, the replacement work shall be considered. Through the revision of the system, the exchange rate of outer panels was reduced by about 5 % according to the Korean insurance statistics.

Type 1 (Repair)

Type 2 (Repair)

Type 3 (Repair)

Replacement

Practical and effective consideration of vehicle offset in vehicle tests

Within the framework of the Working Group P-Safe, many members performed vehicle tests according to RCAR's Parking AEB procedure. While determination of the vehicle offset in car-to-car test method for a circular path is well described, their consideration may not be trivial in practice. For this reason, KTI developed a practical and cost-effective solution to take into account vehicle offset during Parking AEB tests.

Offset effect on test vehicle and target positioning

The vehicle offset describes the deviation in lateral and longitudinal direction of the test vehicle relative to its starting point, when the test vehicle moves back and forth in a circular path under constant steering angle. The effect bases on self-steering behaviour (over / under steering), which is influenced by the slip angle. Figure 1 demonstrates the offset effect of a vehicle, when it manoeuvers back and forth in a circular path, beginning from point 0 till point 4.

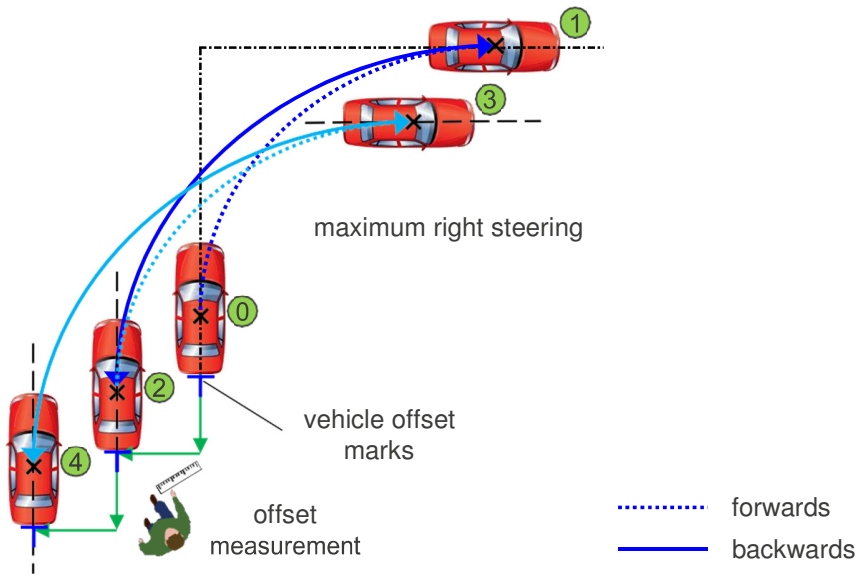


Figure 1: Offset phenomena in example for maximum right steering

Basically, there are two approaches to realize the correct positioning between test vehicle and target in accordance to the test scenarios.

1. Arranging the target on a fixed location and try to position the test vehicle on the correct (considering the determined offset) 'start position' for every single test run by using a differential GPS.
2. Arranging the target in the right position – according to the scenario – at the determined 'impact point' in relation to the starting point of the vehicle.

Either way the vehicle offset has to be taken into account to manoeuvre the test vehicle to the correctly anticipated 'impact point'. Therefore the accuracy in determining and considering the vehicle offset is important.

Vehicle offset consideration at KTI

KTI applies the second approach to perform P-AEB vehicle tests. To monitor the position of the test vehicle and the target, a two-dimensional reference system (grid, pattern) is applied on the ground. For determination of the movement of the test vehicle, a line laser mounted at the boot lid projects a laser line (parallel to the grid) on the ground. A constant steering angle (during the whole test) is very important, the steering wheel is blocked by a custom made tool which is mounted on the windshields inner side and the steering angle is adjusted by vehicle diagnosis system.

The following step-by-step manual describes how to consider vehicle offset in test scenarios in a practical and cost- effective way:

1. Apply a reference system (grid; at least a line) on the ground. Additional lines for short range (30°) may be helpful.
2. Mount a line laser on the boot lid and adjust it rectangular to longitudinal axis of the test vehicle to project a reference line of it onto the reference system.
3. After applying maximum steering block steering wheel and monitor its angle.
4. Arrange the test vehicle parallel to the reference system to initial position (A) and mark 'impact point' on the ground (e.g. symbol "┬") and impact position on the vehicle.
5. Move the test vehicle according to the appropriate test scenario forward to starting point (B) through an arc of 30° or 90°.
6. Transfer the vehicle offset in lateral and longitudinal direction relative to the marked 'impact point' from step 3.
7. Arrange the target onto the new (anticipated offset) 'impact point' in the correct orientation towards the initial position of the test vehicle.
8. Start P-AEB test by driving test vehicle towards the target (C).
9. Repeat step 3 to 7 for additional tests.

Figure 2 illustrates the consideration of the vehicle offset according to KTI's approach exemplary for car-to-car test scenario '10° B-Pillar' at maximum right steering. Test vehicle is moving from initial position (A) to start position (B) while expected / anticipated 'impact point' is transferred from its original position by considering vehicle offset. Subsequently test vehicle moves backwards to impact position (C). By this method an accuracy for lateral and longitudinal position of less than 1 cm can be realized.

The right part of Figure 2 shows photos of the test equipment (line and angle laser, jig for marking impact position) and the described scenario '10° B-Pillar' with a VW Tiguan.

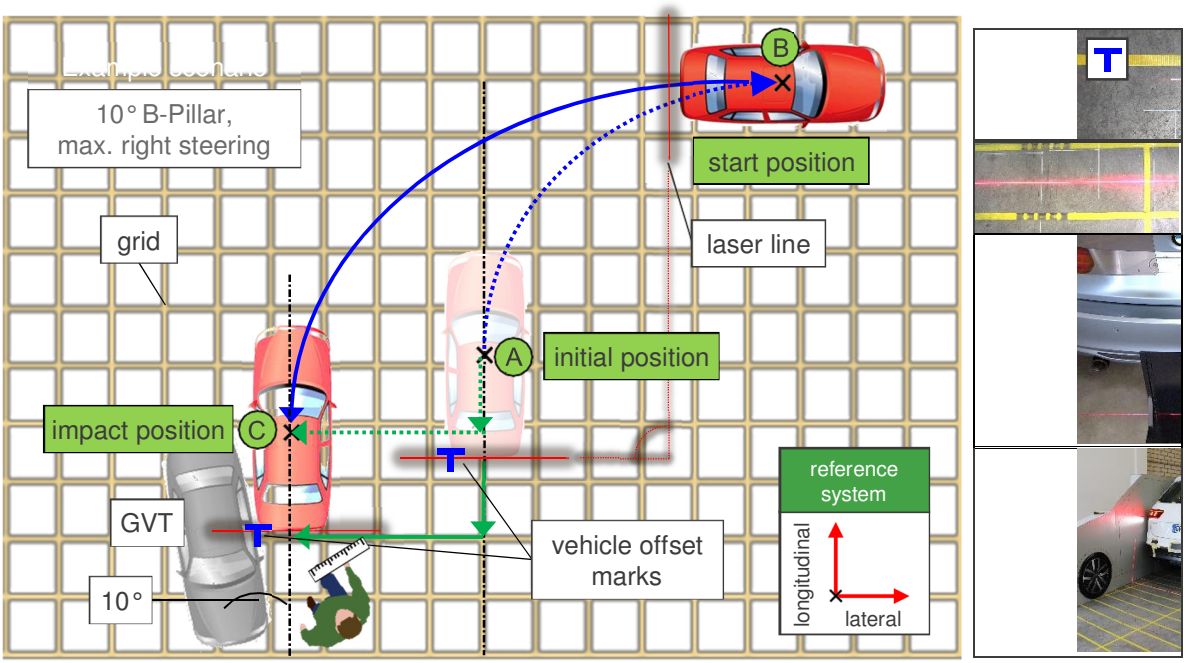


Figure 2: Offset consideration by using 2-dimensional reference system and low budget test equipment

Conclusion and outlook

The implementation of dynamic and accurate vehicle tests demand requirements of specific measurement equipment. KTI has developed a convenient and cost effective solution that meets all requirements in terms of accuracy.

According to our experiences in P-AEB tests, the requirements of the RCAR P-AEB procedure can be met with a position accuracy of approximately 1 cm by using the above mentioned approach, resulting in a lower budget for test environment and set-up. Nevertheless, which approach is used, the accuracy in the performance of driving tests must not be neglected.

For further details regarding this approach and test set-up, please do not hesitate to contact us.

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MRC Malaysia in European Training Program 2019

MRC Malaysia organised an overseas training and industry visit to France and to the UK from November 30, 2019 to December 10, 2019. Participated by 12 delegates who are from various stakeholders in our industry in Malaysia i.e. from vehicle manufacturers (Perodua and Honda), Etiqa Insurance (one of the largest general insurer in Malaysia) and independent bodyshops. This European training program were took place in three different venues including visits to CESVI France research centre, Thatcham UK, and ITAS Automotive Training.

Left: Delegates at Thatcham Research's Automotive Academy, UK. Right: Delegates at ITAS Automotive Training, UK.

At Thatcham Research's Automotive Academy, UK, the delegates were divided into two groups. The delegates from the first group were sitting for their Vehicle Damage Accessor (VDA) and IMI UK Certification while the other delegates were participating in the Technical Update Courses of which including an overview on Advanced Driver-assistance Systems (ADAS), High Voltage Awareness and Aluminium Repair Awareness.

The delegates also visited the ITAS Automotive Training Academy in Milton Keynes, UK. ITAS provides bodyshop approval programmes, world-class bodyshop training, ground-breaking software and critical data analysis. Their body and paint programmes create best-in-class repair networks, bringing commercial value and delivering the best possible post-accident experience. They operate bodyshop approval programmes in the UK, across Europe and internationally.

The delegates then continued their program over the English Channel to CESVI France research centre in Poitiers, France. They were received with a warm welcomed by Nadia Bestaoui, the Technical Director of CESVI France. Understanding how an insurance funded research centre in France supports vehicle research for the benefit of their repairers and policy holders was just one of the valuable insights that was gained from this extensive overseas visit.

MRC is very grateful for the support from these organisations to allow our clients to visit and learn from other established training and research companies.

Left: Nadia Bestaoui and the team from CESVI France with the delegates from Malaysia. Right: Vehicle repair demonstration by CESVI France.

MRC Malaysia collaborates in a series of automotive events in Bali, Indonesia.

MRC Malaysia's research team has participated in a series of automotive events in Bali, Indonesia from November 19 to November 22, 2019. The MRC team, represented by Head of Research, Hairul Abdul Majid and Research Analyst, Akmal Hakeem Maamor, together with the research collaborators from Universiti Teknikal Malaysia Melaka (UTeM) and Universiti Malaysia Pahang (UMP) were presenting the progress of the 2 research papers of the ASEAN NCAP Collaborative Holistic Research (ANCHOR II) projects.

The research papers titles are ""Comprehensive Assessment on Advanced Driver-assistance Systems (ADAS) Vehicle Safety Assist Technology based on South-east Asia Environment, Road Conditions and Driving Behaviours" and "Effect of Blind Spot Detection Technology on Lane-Change Crashes".

Left: Stop the Crash Bali event with researchers from Universiti Malaysia Pahang. Right: International Conference on Sustainable Mobility with researchers from Malaysian Institute of Road Safety Research and Universiti Teknikal Malaysia Melaka.

A series of automotive events were taken place during that week. One of the event highlights was the launch of “Stop the Crash Bali”. This event is a collaborative effort between Global NCAP and ASEAN NCAP. The event hosts live demonstrations of crash avoidance technologies in support of the United Nations Global Goals and the Decade of Action for Road Safety. Launched at the Garuda Wisnu Kencana Cultural Park in Bali, the event has a special focus on the life saving benefits of Electronic Stability Control (ESC), Autonomous Emergency Braking (AEB), Anti-lock Braking Systems (ABS) for motorcycles and Blind Spot Detection (BSD).

This is the third event after Stop the Crash ASEAN in Kuala Lumpur in 2016 and in Bangkok in 2017. During the Kuala Lumpur event, the Government of Malaysia announced the mandatory fitment of Electronic Stability Control in new passenger cars by June 2018. It is hoped that this event will be a catalyst for the Indonesian Government to initiate the same outcome for vehicle safety in the Republic of Indonesia.

In conjunction to the “Stop the Crash Bali” event, a number of other automotive forums and conferences were took place and were participated by the MRC research team. In this Automotive Engineering Week 2019, the the 11th ASEAN Automobile Safety Forum (AASF 2019) , the 4th International Conference on Sustainable Mobility (ICSM 2019) and the 6th International Conference on Electric Vehicular Technology (ICEVT 2019) where all held.

Yongda Automobiles Services Group (China) visited to Samsung Fire & Marine Insurance R&D Center

In November 2019, total 11 guests from Yongda Automobiles Services Group in China including the vice-president of the new energy sector (electric vehicle) and the major executives of the automotive group (AUDI, GM, BMW, etc.) has visited the headquarter and the R&D Center of Samsung Fire & Marine Insurance (SFMI).

Back in 2016, Mr. Yingjie Cai, the CEO of Yongda Group was invited to SFMI for the first time with the aim of strengthening business alliance in China. After his visit, top executives and major employees from the automotives and the financial divisions in Yongda Group have continuously participated in the visiting program of the R&D Center every year. The R&D Center generally demonstrated the short introduction of the R&D Center's activities to contribute to SFMI, and also provided technical training programs such as the cost-effective repair technique on body and new material parts, the advanced diagnosis process, and the vehicle crash tests. Most of technical training programs combines the observation and practice for the trainees.

In this visit, the visitors has experienced two types of repair processes: the joining technique of heterogeneous panels of an electric vehicle and the restoration repair technique of aluminum panels and plastic parts (bumpers and brackets). Also a car-to-car crash test was conducted to introduce the damage assessment for the auto insurance rate calculation and the BI status related to injury mechanisms in a minor car accident. Finally, the AEB calibration process was demonstrated. They also visited the SFMI Auto Care Center (the former Driving Center launched by the R&D Center in 2012) which is a facility for both the reduction of damage loss and the satisfaction of customers by providing cosmetic repair service and free repair estimation.

Yongda Automobiles Services Group (China) visited to Samsung Fire & Marine Insurance R&D Center

Vehicle Manufacturer ADAS Sustainability Summit

Frankfurt – 11th December 2020

The safety benefits of ADAS in preventing and mitigating crashes is clear, however there is growing concern from insurers that this effect is being undermined by the challenges around repairing vehicles fitted with ADAS, and the fitting and calibration of sensors. Research indicates that a substantial proportion of forward-facing cameras do not undergo calibration after common windshield repairs, potentially jeopardising the ability of safety systems to provide support in critical situations, but with no indication of the issue to the driver. Further research also raises doubts of Where RADAR units are mounted behind painted bumper covers, such as with blind-spot warning systems, there is an increasing trend that even after minor scrapes the bumper cover must be replaced not repaired, resulting in large amounts of plastic going into landfill, threatening the global environment.

In order for the safety benefits of ADAS to be fully realised, full system capability must be sustained throughout the life of the vehicle, and must therefore be resilient to general wear and tear over 10+ years, as well as being managed effectively and economically, to the benefit of the consumer, during servicing and repair. In order to open a constructive and positve dialogue on the subject, RCAR members Thatcham Research (UK), Allianz Zentrum fur Technik (Germany) and the Insurance Institute for Highway Safety (USA) invited all of the major vehicle manufacturers, ADAS technology suppliers and representatives from Euro NCAP, to a summit meeting in Frankfurt on 11th December 2019 to present the industry's concerns, discuss potential solutions and agree a way forwards.

David Zuby (IIHS, USA) highlights the ADAS calibration problems being seen in the USA

The main proposals were: A standard instrument panel tell-tale light to warn of a loss of ADAS functionality and to be the primary indicator for a repair and/or service requirement for the system; self-aligning systems that are tolerant to minor mis-alignment and a broad range of environmental conditions; and for RADAR units to not be mounted behind painted panels where the influence of repairs and painting cannot realistically be controlled to a sufficient degree to guarantee continued ADAS functionality. The RCAR centres presented an overview of the sustainability challenges, examples and evidence of the effect of these issues, and proposed solutions; Euro NCAP presented a picture of how solutions may be captured within future protocols; and there was a panel discussion in order to explore some of the topics in more depth.

The presentations were well received, and all parties entered into the spirit of the discussion with a positive and open-minded attitude. Some valuable points were raised around the implementation of the proposed solutions, and there was encouraging evidence of some steps already being taken to address the issues raised. There

Richard Billyeald (Thatcham Research, UK) presents potential solutions to the ADAS repair challenges

was a consensus that this type of forum for RCAR and the automotive industry to engage on specific topics was mutually beneficial and should be considered for future discussions. In parallel, the RCAR members agreed at the annual conference held in Beijing in October, that an ADAS Repair Working Group should be created, and this will meet for the first time in Los Angeles in February, chaired by the Korea Automobile Insurance Repair and Training Centre.

Further information can be obtained through the aforementioned working group – see the section on the RCAR website for contact details.

Cesvi Mexico study of repairability and driving assistance systems incorporated into the Hyundai Ioniq hybrid car

To collaborate in the decrease in the frequency and severity of traffic accidents in streets and highways of the country, is one of the pillars that support the investigations carried out by Cesvi México (Center for Experimentation and Road Safety Mexico). In that sense, its experts have initiated a series of tests and analysis of the performance of ADAS devices (Advanced driver-assistance systems) of vehicles that incorporate them as standard and that logically circulate in our territory.

One such study vehicle has turned out to be the Hyundai Ioniq 2020 hybrid sedan, which underwent automatic emergency braking exercises (AEB) at 20, 30 and 45 km / hr; lane conservation tests, adaptive cruise control, pedestrian detection, among other tests.

"As Cesvi is the technical arm of the insurance sector," said Osiel Velázquez Rodríguez, Operations Director of Cesvi Mexico, "we have to do various investigations that show us the operation of the technologies that vehicles now have. For now, they are innovations that incorporate high-end cars, but after a few years, ADAS systems will be devices as common as a stereo with bluetooth or a reverse camera, and the repair and insurance sectors should be ready to meet the demands of valuation, replacement, installation, repair, calibration services, among others linked to these technologies ".

In addition, in terms of reparability, the Hyundai Ioniq was subjected to two low speed crash tests, one front and one rear, which have yielded very valuable information for Cesvi engineers.

In details of the experiments, these were developed in the impact zone of the Experimentation Center located in Toluca and recorded 15.43 km / hr in the previous impact and 15.48 km / hr in the subsequent impact. In this regard, Rubén Moreno Torres, Manager of Autos del Cesvi, explained that the damages generated to the vehicle allow them to analyze which parts are susceptible to repair and with which techniques and which should definitely be replaced.

Mr. Moreno Torres clarified that Cesvi does not establish a criterion to assess the damages generated in the crash tests, but that when it happens on the street, it would be the decision of each insurance professional to determine the magnitude of the damages and replace or repair the affected parts . "For example, in our case, when opening the driver's door, the dashboard doubled due to the sliding of the same piece. In a real situation, this may not happen, it all depends on the magnitude, intensity and location of the damage, "he emphasized..

With Expo Cesvi 2020 the new era of remote training for automotive collision workshops begins

From the realization of the next Expo Cesvi 2020, which will take place from February 20 to 22, Cesvi Mexico (Center for Experimentation and Road Safety) will mark the consolidation of a new era of remote training for automotive workshops specialized in the repair of damaged vehicles in Mexico.

With the development of an intense 3.0 technology program in the Repair Workshop, the Experimentation Center gives way to a new process to train dozens of multi-brand automotive workshops, distribution agencies and insurance networks, which will begin a new stage in the training of repair professionals specialized in bodywork and painting techniques in our country.

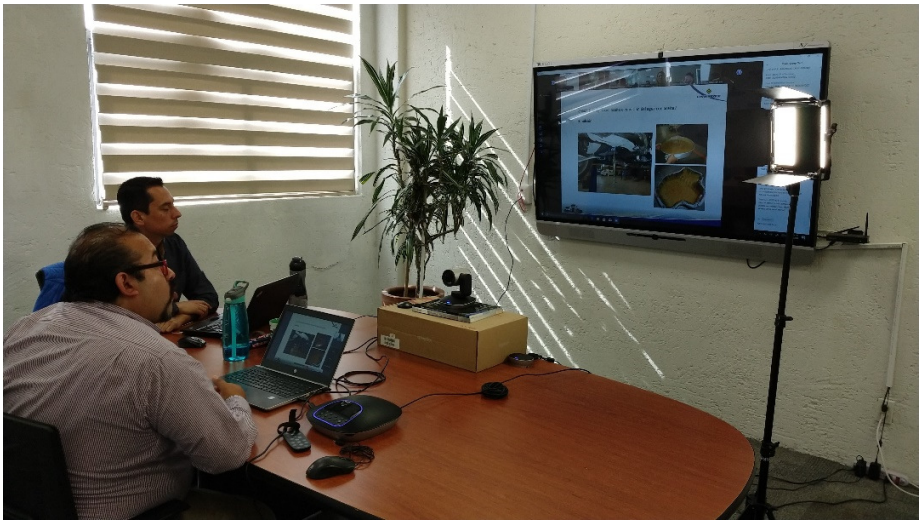
So far, about a thousand experts in collision repair have already been able to receive Cesvi's training, which at the time represented a pleasant surprise for the experts of this organization.

With this system, Cesvi will be able to give more than 30 training sessions to dozens of workshops throughout the Mexican Republic throughout this year with optimal results.

Osiel Velázquez, Deputy Director of Operations of CESVI Mexico, reported the above and explained the

benefits that this model will offer to specialized repair workshops, among which are:

- Savings in time and money (transfer, accommodation and per diem)
- Displacement Reduction
- Time optimization at the Repair Center.
- Access from any device.
- Use of modern teaching techniques and updated content.
- Comfort for the customer.



Mr. Velázquez added, during the press conference in which the details of the 2020 edition of Expo Cesvi were announced, that under the distance training model, the manager predicted that there will also be more workshops making safe repairs with this model, since it can be taken on any device, at any time and in any place, which will allow to surpass the 1,000 workshops that Cesvi trains every year today and the 4,000 professionals who today learn their activity with this specialized center every year.

In addition, Mr. Osiel Velázquez explained the importance of the so-called ADAS Systems, (Advanced Driver Assistance Systems) and their importance in road safety in Mexico.

Velázquez Rodríguez commented that in 60% of automobile accidents, the accident occurs because the driver fails to notice the presence of a pedestrian, vehicle or obstacle just before the impact. He explained that ADAS devices help to reduce the severity of the accident and that being already a technology in more and more cars in common use, Cesvi training will also emphasize knowledge and understanding of such systems.

"Recent studies have shown that these mechanisms allow to reduce the number of road accidents by 60% and between 40 and 50% in urban areas," he said.

Meanwhile Ricardo Ramírez, Commercial Deputy Director of Cesvi Mexico, mentioned the surprises that will be in this edition of Expo Cesvi 2020 and highlighted the completion of the Sixth Cycle of

Road Safety Conferences, and revealed that it will be a pick up truck that will be raffled for All people attending the exhibition. He added that to encourage pre-registration, two tickets will be given to those who do so and show their badge at the entrance.

Likewise, he mentioned the results of the 2019 edition and the presence of 80 companies that will exhibit the newest technology focused on professional repair of injured vehicles.

The director commented that the organizing committee expects a 20% growth in the number of visitors who would attend the event this 2020, which would allow it to exceed 15,000 people on the WTC exhibition floor during these three days.

For his part, Ángel Martínez, CEO of Cesvi Mexico, said that this edition of Expo Cesvi 2020 will bring together hundreds of directors and owners of automotive workshops, as well as companies linked to this industry from inside the republic and abroad.