

NEWSLETTER

NEWS FROM 14
RCAR INSURANCE
RESEARCH CENTRES

FOLKSAM

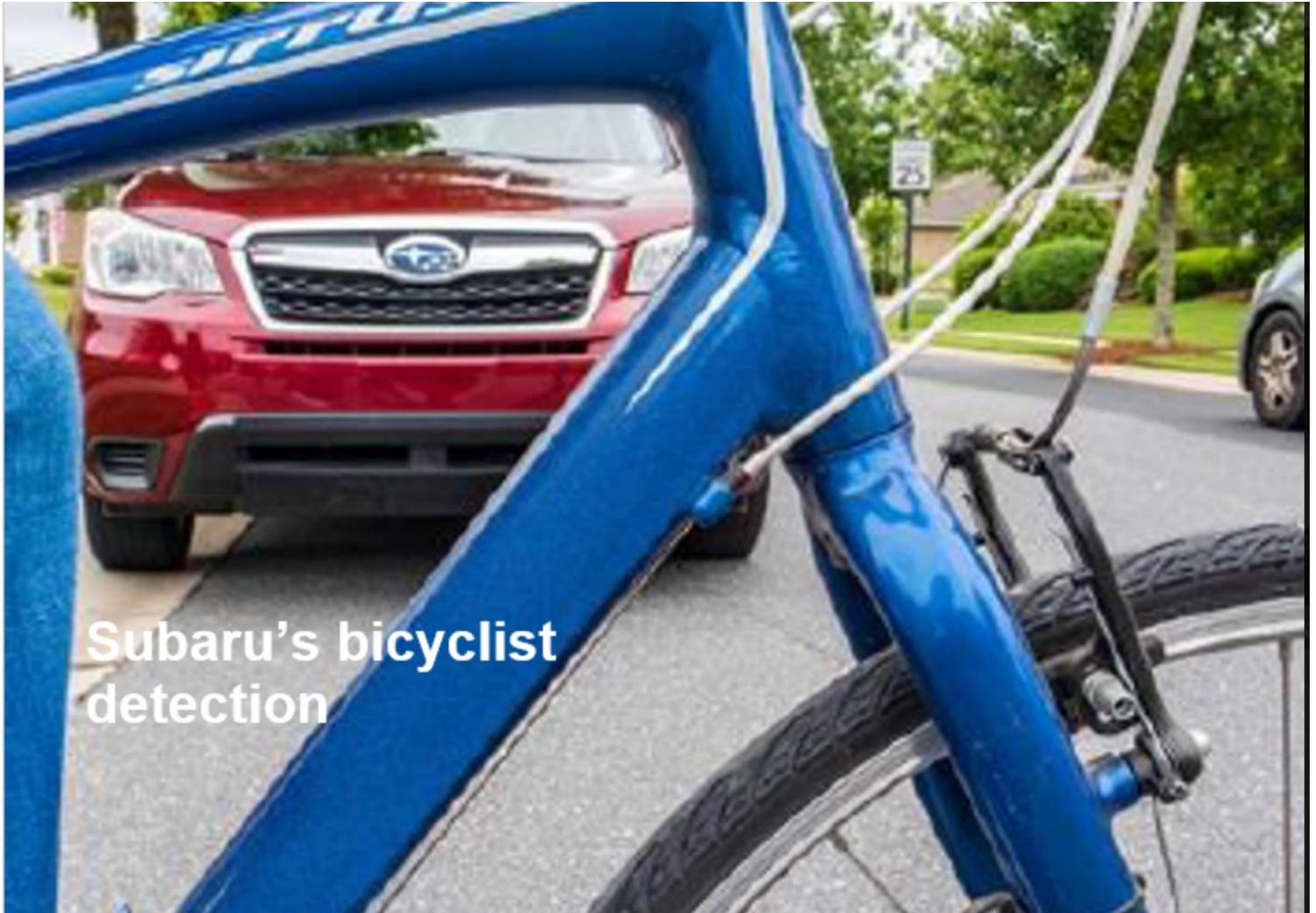
Test method -
rearward facing CRS

STATE FARM

Data reveals drop
in catalytic
converter theft

MRC MALAYSIA

Electric vehicles in
Malaysia



Subaru's bicyclist
detection

Hello RCAR members.

Welcome to the new look January 2024 RCAR newsletter. I am very pleased to see that we have 28 contributions from 14 RCAR research centres on a wide range of insurance relevant topics. As usual, my contact for any feedback or questions is rmcdonald@rcar.org



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RCAR Research Centres



Allianz Zentrum für Technik (AZT), Germany



Finans Norge Forsikringsdrift / Bilskadekontoret, Norway



Folksam Sweden



Thatcham Research United Kingdom



Liikennevakuutuskeskus (LVK), Finland



The Jiken Center Co., Ltd. Japan



IAG Research Centre Australia



CESVIMAP Spain



Generali Jeniot Italy



Centro Zaragoza Spain



KTI Germany



KIDI / KART South Korea



State Farm Research USA



CESVI Argentina



Insurance Institute for Highway Safety (IIHS), USA



CESVI Mexico



CESVI France



CESVI Colombia



MRC Malaysia



AXA Versicherungen AG Switzerland



Samsung Traffic Safety Research Institute, South Korea



CIRI Auto Technology Institute, Chin

Change in Management of Allianz Center for Technology



The history of AZT's management shows that innovative thinking and continuity are not a contradiction in terms. In the 52 years of the company's existence, Dr. Christoph Lauterwasser was only the third Managing Director of the AZT after AZT founder Prof. Dr. Max Danner (Managing Director AZT from 1971 to 1992) and his successor Prof. Dr. Dieter Anselm (Managing Director AZT from 1993 to 2007) and has very successfully managed the Allianz research centre since 2007.

He continued important topics at AZT such as repair research, crash tests and the AZT paint calculation system and took up new aspects in the dynamic field of automotive technology such as assisted driving, electromobility or IT security in vehicles and continuously developed these further together with the AZT team. In addition, Christoph Lauterwasser always wanted AZT to be an integral part of the automotive and repair industry and to advance the various issues wherever possible in dialogue with industry partners and to share expert knowledge. During his time, road safety issues were also regularly addressed in public and corresponding exchange formats such as the Allianz Motor Day were established.

As already announced at the 11th Allianz Motor Day, Dr. Christoph Lauterwasser, who will remain part of the AZT team until the end of April 2024, has now officially handed over the baton to his successor Dr. Christian Sahr with effect from January 1st 2024. As mechanical engineering graduate specialising in automotive engineering, he completed his doctorate in the field of vehicle body development and most recently spent several years heading up the vehicle business unit at FEV Europe GmbH, a leading global engineering service provider in vehicle and powertrain development and digital mobility. "In Christian Sahr, we have found a very good successor for the management of AZT, who has the relevant expertise and industry knowledge. I wish him and the entire AZT team all the best and every success for the tasks ahead," said Christoph Lauterwasser to his successor. Christian Sahr has already been part of AZT for six months and has been able to gain a good overview of his future field of activity. "I am joining a very well organised team. I would like to thank you for the warm welcome and look forward to continuing and further developing the AZT's topics together with the employees, customers and partners." As for his predecessor, it is an important concern for Christian Sahr to continue and further expand the excellent cooperation with the other RCAR institutes.



Christoph Lauterwasser und Christian Sahr after the announcement of the change of Managing Directors during the 11th Allianz Motor Day

At the same time, the management of AZT is becoming more diverse: Dr. Stefanie van den Bergh, Head of Central Functions in the Claims Division of Allianz Versicherungs-AG, is taking on the role of the second AZT Managing Director. Stefanie van den Bergh replaces Christopher Iwanowski, who has taken on the role of Chief General Manager Transformation at Allianz Australia. "I would like to thank Christoph Lauterwasser for his fantastic work for and with AZT over the last 16 years. He has continuously expanded and improved AZT's pioneering role in mobility research. And I am very much looking forward to the coming years of collaboration and further development of the AZT with Christian Sahr," said Stefanie van den Bergh.



Dr. Stefanie van den Bergh (Head of Central Functions in the Claims Department of Allianz Versicherungs-AG and second Managing Director of AZT since January 1st 2024)

11th Allianz Motor Day: „Car Data - My Decision?“

What data does my car store? Who has access to it? What are the risks involved? And what benefits do I actually have as a consumer when I share my vehicle data? These are all relevant questions that are becoming even more important because of the recently passed EU Data Act and these questions have been discussed at the 11th Allianz Motor Day at AZT.

As already established in previous years, the Allianz Motor Day again took place as a combination of on-site event at AZT and an online stream. In the first part, which was mainly aimed at the audience in Germany, Frank Sommerfeld (CEO of Allianz Versicherungs-AG) first presented the issues facing car drivers in connection with vehicle data and the role battery data plays in determining the value of an electric vehicle. He also discussed the results of the current Allianz consumer survey on the subject of vehicle data with the following key findings:

- Every second respondent is willing to make their data available for insurance services
- One in two drivers fears misuse of data
- Three-quarters demand clear deletion procedures for personal vehicle data

Lucie Bakker (Chief Claims Officer at Allianz-Versicherungs-AG) and Christoph Lauterwasser (Managing Director AZT) then presented the potential of using vehicle data for fast and customer-oriented claims processes. Natallia Dziamchuk (expert for IT security at AZT) explained to the audience what opportunities

and risks arise from the use of the smartphone as a car key (virtual key) and AZT demonstrated this use case as a live demo.

After a short break, Claudia Bechstein, the moderator of the event, opened the second, international part. In a keynote speech, Klaus-Peter Röhler (Member of the Board of Management of Allianz SE) explained the importance of the EU Data Act for the handling of vehicle data and its future significance for consumers and companies. In the following panel discussion, the main topic of the event "Car Data - My Decision?" was discussed by various experts from the automotive, regulatory and insurance sectors.



Expert panel on the topic of „Car Data - My Decision?“

During the event and in the content of the accompanying press material, Allianz formulated the following positions on the topic of vehicle data, among others:

- Allianz welcomes the EU Data Act – but sees further need for regulation on secure exchange of vehicle data.
- Vehicle owners should have full control and sovereignty: they decide who can use the data from their vehicle for specific purposes.
- Allianz calls for a regulated marketplace for data exchange and for vehicle manufacturers to demand fair prices for providing data.
- The new regulation can strengthen the European digital economy and make our transport systems more sustainable, safer and more effective.
- Allianz sees major customer benefits: the EU Data Act enables even more individualized and risk-based insurance premiums, improved accident prevention and smarter claims management in motor insurance.

A recording of the event and press material (including speeches by the participating Allianz board members and press releases on the topic) can be accessed via the following link:

[11th Allianz Motor Day - Live and Digital! | Allianz Deutschland \(techcast.cloud\)](https://techcast.cloud/11th-Allianz-Motor-Day-Live-and-Digital/)

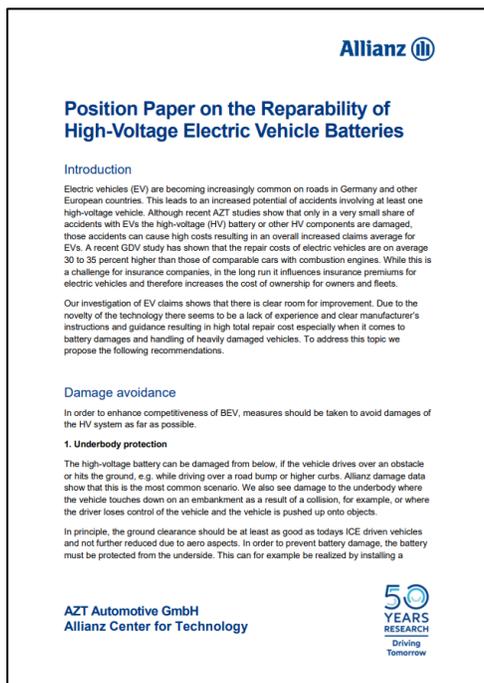
Position Paper on the Reparability of High-Voltage Electric Vehicle Batteries

With the rise of electric vehicles (EVs) the number of accidents with at least one high-voltage vehicle involved, is increasing as well. As a result the question of reparability is coming into the spotlight.

On one hand it is strongly influencing the sustainability of the technology, on the other hand it is driving cost of ownership and therefore attractiveness of buying EVs. To address those challenges AZT has published a position paper. Based on our claims experience, we give recommendations on how to avoid expensive damages, e.g. by better protecting the high-voltage battery against underside damage. Second, in case of a damage, we line out how to improve reparability, for example by adjusting the battery design or improving access to battery data.

We hope this position paper starts the discussion on the topic and as a result leads to more sustainable claims repair.

The full text of the paper is available for download here: [Position Paper High-Voltage Batteries](#)



Position Paper on the Reparability of High-Voltage Electric Vehicle Batteries

Further progress in sustainability in motor insurance

At the 10th Allianz Motor Day in 2022 Allianz has addressed the press on the subject of sustainability in motor insurance. Since autumn 2022, the topic of sustainability in claims in all its facets has continuously been on our agenda and the awareness of the need to find resilient and good solutions has increased significantly.

After we presented the first preliminary results of our "Repair vs Replace" study, which we conducted

together with Allianz SE and service providers from the UK, the associated report was finalised and published at the beginning of 2023 ([download here](#)). While a comparably structured first study by AZT almost 15 years ago received relatively little attention, it is now clear that the framework conditions have changed completely: Following the Allianz Motor Day 2022, we were asked by vehicle manufacturers, paint manufacturers and suppliers for in-depth discussions on the topic of sustainability in the body shop environment. We also had the opportunity to present our findings at various congresses and events. And this is still ongoing.

In addition, Allianz Motor Day 2022 was also the starting signal for the following further activities in the area of sustainability in claims management that AZT is conducting or part of:

- Together with Allianz SE as the global holding company and the German Allianz Versicherungs-AG, we are supervising Niclas Kurzmann, who is doing his doctorate on "Sustainability in Claims" at the Technical University of Munich since April 2023. First results of the research of Niclas Kurzmann mentioned above have already been published. A study was carried out which compares the ecological footprint of repairs to typical insurance claims for e-vehicles and vehicles with combustion engines. The key findings can be downloaded [here](#).
- At AZT, we investigated the special features and challenges of repairs with used OEM spare parts in practice. We were able to support a project by Allianz Versicherungs-AG with valuable tips and tangible examples for this method, which has only been used in isolated cases in Germany to date.
- The certification of body shops will very soon be a high priority. In order to achieve a solution that is as robust as possible but still accepted throughout the market, we are in intensive dialogue with associations, paint and vehicle manufacturers, body shops and numerous other participants to promote a joint certification approach.



Project Study "Sustainability in Vehicle Repair & Replacement"

In our view, sustainability will also become increasingly important within RCAR. In our view, one way to become active here is to continuously maintain and update the RCAR Repair Design Guide, which has been established for years: a repair-friendly vehicle is very important, not only from an insurance point of view but also from a sustainability perspective. With a constantly updated RCAR Repair Design Guide to which all RCAR institutes contribute, we can all approach vehicle manufacturers and intensively promote the examples listed there and thus present arguments in favour of repair-friendly and thus sustainable vehicles.

CESVI ARGENTINA held the First Automotive Repair Expo at its premises

Within of a special day with the attendance of mechanics, representatives of insurance companies and the after-sales areas of the main automakers, guests from all over the country gathered at CESVI's facilities to participate in the 1st Automotive Repair Expo organized by the Center, which included working spaces where the main vendors of tools, equipment and supplies of the repair market carried out technical demonstrations, lectures, exhibitions and launches of new products.

One of the pillars that support the mission of our Road Safety and Experimentation Center is the **safe repair** and, since its beginnings, it has worked to promote it through training, experimentation studies and audits.

As a further step in this area of research and development, this first automotive repair exhibition was held under the slogan "**Productivity in Times of Crisis**". Each of the lectures, product presentations and live demonstrations were focused on this concept of time enhancement without losing quality.

The participating vendors -**3M, ALM Group / Texa, Bosch, Doble A, EcoWagen, EMYVEC / Martech, Glasurit, Henkel, Norton Abrasives, Pilkington, Sherwin - Williams Automotive Finishes, Sika**- had their exclusive space inside CESVI's experimentation workshop, where they could show their latest technologies and products in an intense day of exchanging experiences, procedures and techniques.

At the same time, CESVI specialists gave different talks on electromobility, side airbag pressure sensors, productivity calculation in the workshop per square meter and the Orion System and damages estimation with artificial intelligence.



CESVI ARGENTINA is very satisfied for having been able to bring together the whole value chain of automotive repair: insurance companies, certified workshops, other workshops and market vendors. We understand that this expo format is a step forward in quality for the sector, which allows to hold technical talks and introduce the latest technologies into a interactive and exchange space promoted from CESVI.

The event included the presentation of CESVI awards to the best repair shops and safety windshields installation centers in Argentina, an increasingly federal network that is also extending to neighboring countries. This distinction is granted according to the evaluating diagnosis carried out during the year.



For further information: <https://home.cesvi.com.ar/Posts/ViewPost/CrashTest231Diciembre>

Influence of CESVI Colombia to reduce motorcycle accidents in Colombia

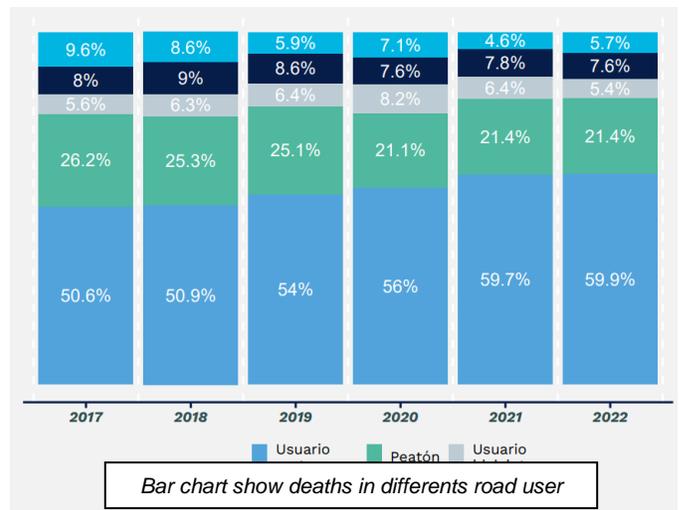


The last years has been increase the number of motorcycles in Colombia, because these is the best option to guarantee fast journeys around the City, so because this vehicle is cheap, has a low gas consumption, and its handling to move around the town is easy, reason why the customer of motorcycles advantage over the car to make a decision to use this

system of trasportation consequently this preferency show that now days the number of motorcycles is high that the cars, this is according

to the agency of trasport of Colombia “RUNT – Registro único Nacional de Tránsito”, the motorcycles has the first position to participation on the vehicle fleet, as a consequence now days there are a ratio of 4 motorcycles to 1 car (61% of participation on the vehicle fleet) over the highways in Colombia.

The araise of the motorcycles also has been increase the traffic accidents, the reports official government that the number of dead and injured people has been increase too. According to research with National Agency of road Safety (ANSV) in Colombia the percentage of motorcyclist deads from 2017 has increased arround 60% register in 2022. At the last point the motorcyclist is behind the main road user with deats over our country, that aspect worry to healty agencys. The next bar chart show the increase of motorcyclist dead sinse 2017 to 2024.

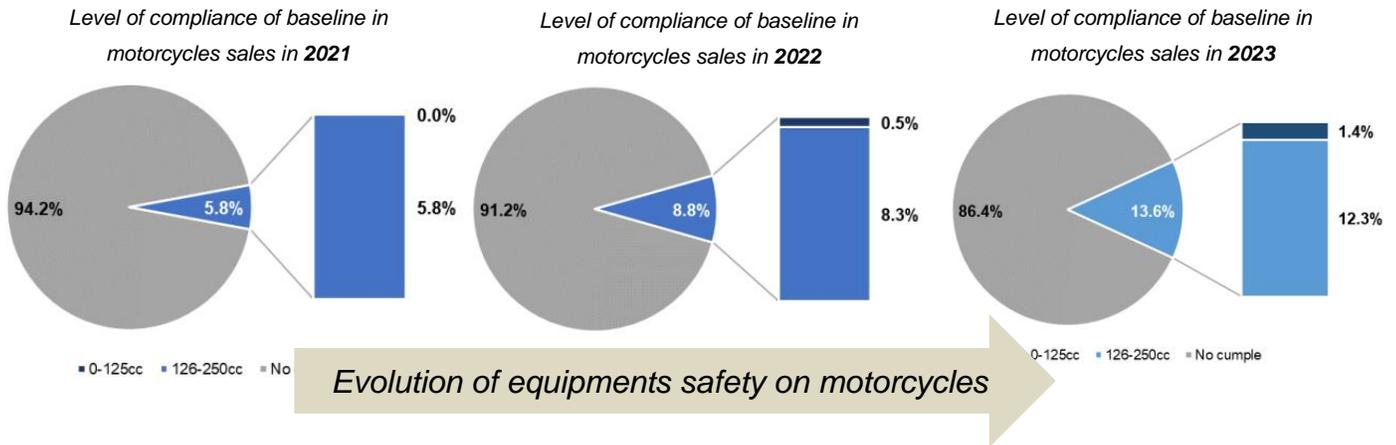


With the last information let show that we have a regression in road safety with the motorcyclist, so is necessary too analyce the risk factors in aspects like how much is safety the motorcycles gives by brands and undersrtand if the motorcyclist have knowledge about road safety. Cesvi Colombia has developed a research to know what is the safety on the motorcycles in Colombia´n market to give push to the motorcycle manufacturer to give on safety motorcycles in over roads, all is according to the international regulations.

The European Union regulations classify motorcycles according to the relationship between power in kilowatts (kW), also the curb weight in kilograms (kg). With these aspects the classification of categories was: mopeds, 3-wheeled mopeds, motorcycles, motorcycles with sidecar, motorized tricycle, light quadricycle and heavy quadricycle. At the same time The FHWA (Federal Highway Administration) of the United States presents a classification of interest for all motorized vehicles with 2 or 3 wheels.

The regulation 168 of the European Parliament and the Council of January 15, 2013 of the European Union, in the safety requirements for the marketing of motorcycles, requires that these vehicles in the category of motorcycles classified in A1 (0 cc to 125 cc) should have ABS systems or combined brakes system like is known as CBS, also their have automatic activation of the light in daytime. To motorcycles classified in A2, which is equivalent in Colombia to cylinder capacities greater than 125 cc, the ABS brake system and automatic switching light on the daytime or position lights should be mandatory. With these parameters we developed a checklist with the minimum safety equipment or baseline to assess all models of motorcycles over Colombia's market.

Cesvi Colombia has developed this evaluation since 2021 and the results keep show that it has had a raise in the safety equipments, however is not enough.



Based on these findings, we can conclude that only the **13.6%** of the units sold (650,000) during the past of 2023 in Colombia achievement the baseline, suggested by CESVI Colombia.

According to the researchs develop since 2021 by the CESVI Colombia, we suggested a baseline of equipment with the purpose of improve the safety standard on motorcycles while contributing to reduce traffic accidents.

As a result, the Colombian Ministry of Transportation has issued resolution 20223040062115 of October 13, 2022, which aims to close the gaps with what is required at the international level in braking systems. This will be mandatory the CBS systems to the 150 cc and ABS for motorcycles larger than. This resolution will work from 2025 and is mandatory.

40th anniversary of CESVIMAP



CESVIMAP celebrates 40 years of life, following MAPFRE's decision in 1983 to provide in-depth training to its experts in repair and new technologies for all types of vehicles: cars, motorcycles, trucks, vans, bicycles, etc. It also studies new material and bodywork joining systems, processes for repairing plastics - and avoid the manufacture of new parts- or how to make painting operations more efficient and profitable. For three decades it has been researching the reconstruction of traffic accidents and fires, in order to understand and explain their causes and evolution in court.

This center demonstrated its processes in repair workshops open to the public, in Majadahonda and Alcalá de Henares. The CESVIMAP philosophy was demonstrated in other centers around the world: Cesvi Argentina (1996), Cesvi México (1998), Cesvi France (1999) and Cesvi Colombia (1999).

Since 1983, CESVIMAP has tested nearly 800 vehicles in a specific area for carrying out crash tests, and completed more than 650 research projects on the main after-sales topics.

Its research is applied in classroom and online training, also at a university level, to more than 90,000 students, in approximately 6,000 courses. The recipients of this knowledge are vehicle manufacturers, leasing companies, car sharing companies, automotive suppliers, law enforcement agencies, etc.

It is aimed at different professional profiles in the automotive sector: surveyors, managers, workshop leaders, receptionists, bodyworkers, painters, electro-mechanics, teachers at vocational training institutes -the route normally used by those working in the after-sales sector to gain access to work in workshops-, authorized end-of-life treatment centers, etc.

CESVIMAP is part of the MAPFRE Open Innovation (MOi) model. It collaborates with university research through various projects with prestigious universities, such as the Pontifical University of Comillas-ICAI, the Carlos III University of Madrid, or the Catholic University of Ávila. Also with entrepreneurs, start-ups, innovators, incubation and acceleration programs of major automakers, in short, those main players who define the mobility of the future.

This center develops the numerical simulation of bodily injuries in traffic accidents, incorporates digital twins in its research (virtual replica of a product or scenario, with real-time data, captured by sensors or Big Data), verifies, through artificial intelligence, damages in cars, models vehicles through finite element calculations, etc.

It also participates, along with 16 national and international partners, in the BATRAW Project of the Horizon Europe Program. This project recycles batteries recovered from electric vehicles and uses their raw materials (cobalt, lithium, graphite...) which are scarce in the European Union, to contribute to reducing the carbon footprint associated with electromobility. **In 2023, the MAPFRE's R&D center's research and commitment to sustainability won eight awards in recognition of its professional excellence and commitment to mobility and the circular economy.**

With CESVIMAP, MAPFRE is building the future of mobility. A future where people are the protagonists, and where all technology, present or to be invented, facilitates a safer mobility environment.



The event was attended by the Chairman of MAPFRE, Antonio Huertas, the regional representative of Mobility of Castilla y León, María González, and the Mayor of Ávila, Jesús S. Cabrera, among other authorities.



In 2023 CESVIMAP has obtained 8 awards recognizing its research activity in mobility and circular economy.

IBIS IBERIA 2023

IBIS Iberia 2023 has been the first international conference in the automotive repair business organized by CESVIMAP and IBIS Worldwide. Under the motto “*Sustainable strategies for success*”, IBIS Iberia has addressed the challenges and opportunities facing the Iberian repair market.

Defined by its protagonists as “*the best after-sales sector meeting in 2023*”, it took place in Ávila, in September, exposing, before hundreds of professionals, the challenges and opportunities of the aftermarket sector in the Spanish and Portuguese markets.

400 managers from the main after-sales companies attended this international meeting, which included speakers and participants from Spain, USA, France, Great Britain, Italy, Malta and Portugal.

“*Unmatched experience*” – in the opinion of the almost 400 professionals attending – “*record call for an extensive representation of sector actors: insurance companies, workshop networks, employers, technological solutions providers, spare parts dealers, etc.*” They have been part of the impressions gathered by attendees and the specialized press.

The analysis of the current situation of aftermarket took place in several conferences and round tables: The main players in the insurance sector, sustainability in repair, challenges of B2B after-sales, profitability and efficiency of the value chain, search for qualified talent, the challenges facing the workshop faces in the face of new mobility, the value chain in the distribution of spare parts and the insurance sector were debated.

Jason Moseley, IBIS Worldwide' CEO: “*CESVIMAP and IBIS are making history*”. José María Cancer, CESVIMAP director, also highlighted the great opportunity for attendees to listen to interesting presentations and excellent networking.

The first edition of IBIS IBERIA began the night before with a welcome cocktail in an extraordinary palace in Avila. A magnificent event, which amplified the relationships between IBIS Worldwide and CESVIMAP, partners such as Global Media Partner, as IBIS ambassadors and as Global Innovation Partner. It was the IBIS event with the largest and most diverse attendance of all those held to date in Latin America, North America, Turkey, the Middle East and Asia.



Growing digitalization at CESVIMAP

The digitalization of companies is one of the most crucial elements for the success and growth of companies. It advances their business models, achieves greater efficiency and resilience, and allows them to explore new opportunities and generate new sources of revenue.

CESVIMAP disseminates its knowledge digitally, with a new LMS, *Learning Management System*. Although it was in 2001 when the MAPFRE's center began providing online training, in 2023 it completely revamped its LMS.

The new software makes it possible to manage and evaluate scheduled training activities, simplifies content management, and adapts to CESVIMAP's needs. It improves the total control of the system and is flexible.

Likewise, this LMS allows the creation of a specific classroom for the subject, as a project that expands the possibility of a mere digital book, adding the interaction functions typical of an LMS. and creating projects in which teachers and students interact.



These new works allow to include all kinds of multimedia content, share work processes with students, and make them more didactic and easier to understand. Likewise, each digital work can be updated, with new technologies or tools incorporated in the workshops, as well as aiding sustainability.

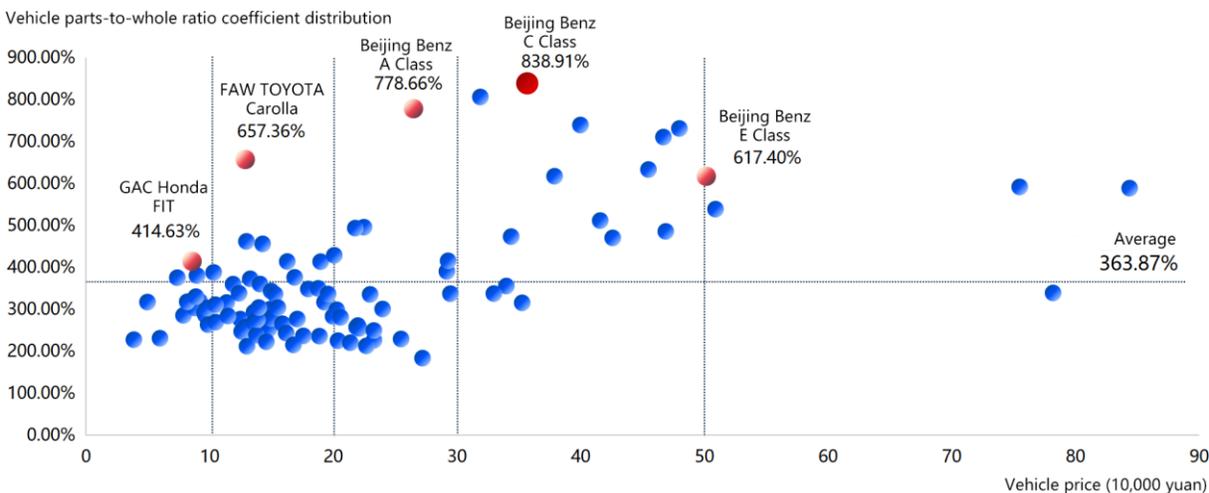
Chinese Market Automotive Parts-to-Whole

Price Ratio Study

The automotive parts-to-whole price ratio refers to the ratio of the sum of all vehicle accessory prices to the selling price of the entire vehicle. The commonly used vehicle accessory burden index refers to the ratio of the sum of the products of the prices and loss rates of the top 18 accessories with the highest claim amounts in car insurance to the selling price of the entire vehicle.

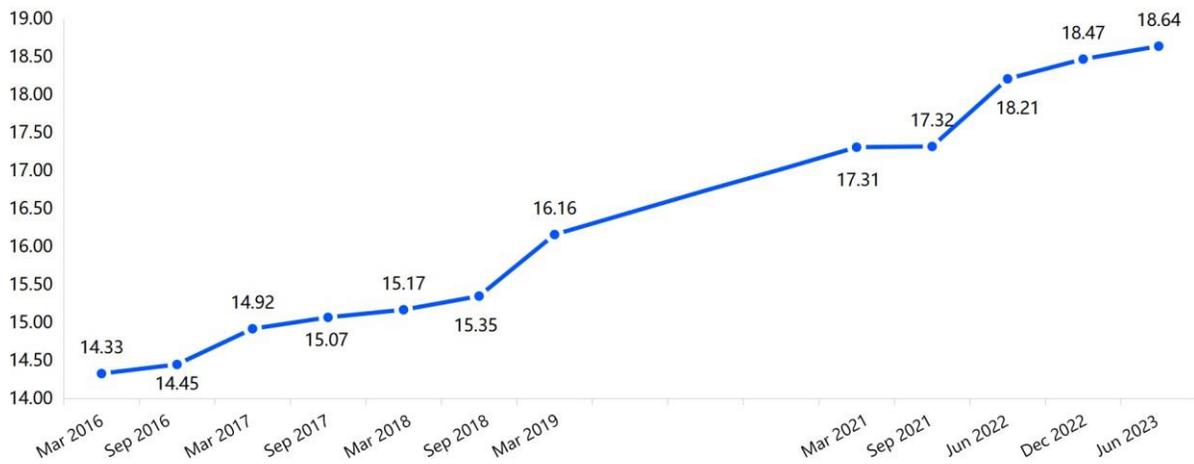
The August 2023 research results for the latest automotive parts-to-whole price ratio index indicate that the 100-index for June in the Chinese market is 363.87%, reflecting a 0.41% decrease from the data in December 2022. In terms of the commonly used car accessory burden index, compared to the data from December 2022, the 100-index continues to rise by 0.92% in August 2023, indicating an increase of approximately 30.08% compared to the data from March 2016. In general, the mean parts-to-whole price ratio coefficients for imported and joint venture brand models are noticeably higher than those for domestic brand models.

In terms of new energy vehicles, the latest research estimates that the mean parts-to-whole price ratio for the power battery pack of 50 pure electric models is 48.85%, showing a decrease of 1.52% compared to the data from December 2022. The analysis also reveals that the parts-to-whole price ratio for ternary lithium battery packs is higher than that for lithium iron phosphate mixed battery packs.



Vehicle parts-to-whole price ratio coefficient distribution

Commonly used accessories burden 100 index



Note: The 18 commonly used accessories in this issue are headlights, front bumpers, rear bumpers, hoods, front fenders, front door shells, rear door shells, grilles, trunk lids/tailgates, taillights, front windshields, radiator frame, reversing mirror, radiator, front bumper frame, condenser, front fog lamp, main airbag

Commonly used accessories
burden 100 index

The 2023 China-Japan-Korea Technical Seminar successfully organized

From October 16th to 18th, 2023, the China-Japan-Korea Technical Seminar was successfully held in Beijing, China. During the event, technical professionals from CIRI, JKC, and KART respectively presented their research results and engaged in face-to-face exchanges with underwriting, actuarial, and claims personnel from major Chinese auto insurance companies.



Group photo of participants from
China, Japan and Korea

CIRI Released Its Latest C-IASI Testing Regulations (2023 Edition)

After three years of development, multiple rounds of discussions and approvals, the Chinese Insurance Automobile Safety Index (C-IASI) Testing Regulations (2023 Edition), organized by CIRI with the participation of numerous universities, over 20 automotive companies, and more than 10 insurance companies, were officially released to the public in August 2023. The regulations are scheduled to be used for on-road evaluations starting from March 2024. The 2023 edition is the third evaluation protocol implemented by C-IASI since its initiation in 2017. This version introduces new test conditions such as RCAR P-AEB test conditions, frontal MPDB test conditions, and passenger-side 25% small overlap front collision conditions.

See more: www.ciasi.org.cn



Centro Zaragoza collaborates with Interpol in the training field

The 43rd edition of the "Training Workshop on Stolen Vehicle Identification and Investigation Techniques" was recently held, a training program that Interpol carries out worldwide in collaboration with Centro Zaragoza, as part of the "Formatrain" project.

International experts and technicians from Centro Zaragoza gave this training on illicit vehicle trafficking, aimed at police authorities from different Interpol members with the objective of improving the process of recovering stolen vehicles.

Centro Zaragoza provides the insurance sector with a complete range of services ranging from prevention and localization to the identification, recovery and legalization of stolen vehicles. To carry out this work, which is fostered by Centro Zaragoza's Stolen Vehicles Committee, we have highly specialized personnel, whose main objective is to provide technical and operational support to the State Security Forces and Corps (FCSE), regional and local police, both at the administrative level and in the operations carried out in the field.

In the international field, Centro Zaragoza has a team of collaborators, through whom it is possible to identify and recover stolen vehicles of interest to Spanish insurance companies, both in countries within and outside the Schengen area. In this regard, it is worth mentioning the collaboration agreement we have with the General Secretariat of Interpol, through which we provide technical support in training to police agencies around the world.



#SostenibilidadalCubo, Centro Zaragoza's initiative to promote the circular economy

Centro Zaragoza has created an initiative to promote circular economy and sustainability in the automotive aftermarket. Our commitment to a sustainable development model has its own name, #SostenibilidadalCubo.

It has been two years since Centro Zaragoza contemplated in its Strategic Plan a firm commitment to the development of activities marked in its roadmap with the aim of promoting the transition to a production and consumption model based on the circular economy and sustainability, and during this time, we are proud of the actions carried out and the results obtained.

These include the "CZ Sustainable Workshop" certification, the research on the repair and recycling of highly sensorized vehicle components and the sustainable design of electric and connected vehicles, the adhesion to Renault Spain's PERTE VEC, the testing and distribution of fire blankets as a

sustainable solution to extinguish fires in vehicles, the creation of new training programs to help the sector align with the principles of circular economy, the promotion of internal actions in relation to waste reduction and energy saving, as well as dissemination actions to raise awareness and promote good practices in sustainability. And, in coherence with these actions, the process of obtaining ISO 14001 certification to implement an environmental management system.

#SostenibilidadalCubo will identify the actions promoted by Centro Zaragoza to raise the sector's awareness of the importance of managing their organizations under the premise of sustainability, betting on the balance between social and environmental progress and economic growth.



Consumer tests of all-season tires

All-season tires have previously not been approved for use as winter tires in Sweden but since 2019 they are allowed. The influence on safety of all-season tires has been discussed in Swedish media the latest years. To study their performance in critical conditions, VTI (Swedish National Road and Transport Research Institute) and Folksam Research conducted brake tests on packed snow and ice with 14 different all-season tires and compared with winter tires. The tires were selected to represent available all-season tires on the Swedish market. The winter tires used were of central European type and Nordic studless winter tires, commonly used in Sweden during winter.

The results clearly show that the spread in performance among the all-season tires tested was large as some manufacturers aim for grip on asphalt and others on snow. In general, the grip on snow was worse compared with traditional winter tires of both Nordic and central European type. The ice grip was even worse than on snow. The tests showed that the worst characteristic of all-season tires is braking performance on ice. The braking distance on ice was 20-50 percent longer for the all-season tires compared to the Nordic studless reference tire in the test. On snow, the results were slightly better, with 8-40 percent longer braking distance compared to the Nordic reference tire.

The test was presented at the IAVSD symposium in Canada 2023.

Tire type	Snow	Ice
Nordic studless	-	-
Central European winter tires	+10%	+34%
All-Season 3PMSF	+14%	+32%



Percentage longer braking distance compared to the reference tire (Nordic stud-less winter tire). Average values for each tire type are given. (Hjort et.al 2023)

Reference: Hjort M., Brzuelius F., Kharrazi S., Ydenius A (2023) All-season tires – investigation of braking performance in summer and winter conditions. IAVSD Symposium, 21-25 August, Ottawa, Canada.

Folksam test method – rearward facing CRS (Child restraint system)

To increase the safety of young children in cars, studies have shown that the most effective strategy is to increase the use of rearward facing child restraints (CRS) for children up to 4-5 years age. Since 2015, Folksam has conducted consumer tests of rearward facing CRS aimed to guide consumers to pick the safest restraints. The Folksam CRS rating program 2023 included the evaluation of three categories, first the ability to enable rearward facing use to at least 4-5 years of age, second the presence of safety features that lower injury risk in case of a crash and finally the inclusion of design features known to minimize user mistakes that reduce the protective abilities of the CRS.

In contrast to other existing programs the Folksam CRS rating program focuses on promoting rearward facing child restraints for children up to the age of 4-5 years. The results clearly show the importance of this kind of test as large variations among the CRSs tested were found. The tested CRSs show differences in

weight and body length approvals, seatback height (difference of 13 cm) and leg space (difference of 28 cm). Three out of thirteen tested CRSs did not have any approval from the voluntary Swedish Plus Test that includes neck loadings (which are not included in the ECE R129 regulation). The two CRSs with the lowest points were convertible seats that increases the risk of turning the CRS forward facing too early. The best performing CRSs allowed rearward facing up to 4-5 years age.

The Folksam CRS rating program was presented and published at the POCC conference in Munich 2023.



Axeid One2



BeSafe Stretch

CRS no	Child seat (CRS)	Attachment	Rearward points	Safety points	Misuse points	Total points	Total grade
1	Avionaut Sky 2.0	Seat belt	6 ●	8.5 ●	3 ●	17,5	3/Good
2	Axeid Minikid 3	Seat belt	10.5 ●	10 ●	2.5 ●	23	4/Good
3	Axeid Minikid 4	Seat belt	10.5 ●	9 ●	2.5 ●	22	4/Good
4	Axeid One 2	Isofix	9.5 ●	9 ●	3.5 ●	22	4/Best
5	Beemoo Reverse I-Size	Isofix	4 ●	7.5 ●	3.5 ●	15	2
6	BeSafe iZi Twist i-Size	Isofix	2 ●	9 ●	3.5 ●	14.5	2
7	BeSafe Stretch	Seat belt	10.5 ●	10.5 ●	3 ●	24	4/Best
8	Britax Römer Swingfix M I-Size	Isofix	2 ●	6.5 ●	3.5 ●	12	2
9	Bugaboo Owl by Nuna	Isofix	2 ●	7 ●	1.5 ●	10.5	2
10	Joie i-Prodigi i-Size	Isofix	6.5 ●	8 ●	3.5 ●	18	3/Good
11	Joie i-Spin Safe	Isofix	4 ●	8 ●	3.5 ●	15.5	2
12	Klippan Opti 129	Seat belt	8 ●	8 ●	2 ●	18	3/Good
13	Maxi-Cosi Emerald i-Size	Isofix	6 ●	7.5 ●	1.5 ●	15	2

Rating results in the Folksam CRS consumer test 2023.

Reference: Ydenius, A., Klingegård, M, Kullgren, A., Stigson, H. (2023) The Folksam safety rating program for CRS promoting rearward facing seating. Protection of Children in Cars Conference 2023, Munich, Germany.*

The new jeniot approach to black box road test using a GNSS record system

Generali jeniot, the dedicated IoT service company of Generali Group, is very mindful to technological applications that allow to operate in an increasingly efficient manner in the research and development phase of telematic products, both for Generali itself and external customers.

One of jeniot’s main research areas concerns black boxes, which are used very extensively for issues such as post-theft recovery and reconstruction of road accidents; These devices are also able to continuously monitor the vehicle accelerations during each journey (in terms of fractions of g) and consequently evaluate how the car is driven: since it is statistically known that a virtuous driving style reduces the probability of incurring in an accident, Generali Italia telematic contracts offer discounts to customers with high scores (better driving style) when renewing the insurance premium.

Black boxes differ in some technical characteristics, but they always contain a tri-axis accelerometer, a satellite localization system and a data transmission module; each of these elements must operate adequately and efficiently to ensure the complete functionality of the box: it is therefore jeniot's task to validate their complete reliability.

In this sense, the Technology Center has implemented a system that allows to address road tests in a best way. Up until now, in fact, a circulating vehicle was needed not only to calibrate the device under test (black box or other telematic devices), but also for the subsequent phases, for example the collection of driving data. Through road trips jeniot can, for example:

- verify the quality of the satellite signal acquisition and the occurrence of data losses, in order to assess the precise location accuracy of the vehicle and also the entire reconstruction of its route;
- generate statistics about the driving behaviour based on variables such as the type of route, time slots, day of the week and “driving style”; about this last point, the frequency of events like harsh turns, braking and accelerations, mixed with the other variables, is integrated in a special algorithm developed by jeniot to calculate the driving "score", aggregated or specific for each journey performed and, consequently, the more or less “virtuous behaviour” of the driver.

With this in mind, the Technology Center added to its testing equipment a *Global navigation satellite system record device* for the capture of a very wide range of live-sky satellite signals.



The elements of jeniot GNSS record system

In its simplest way of working, a GNSS “record & replay” device is a compact element (weighing just over 1kg) capable of continuously and autonomously acquiring the position of a satellite constellation and their movements for the entire time that it is set in recording mode using the specific antenna. These records are then stored and maintained in the device's memory, so that they can be reproduced at any time through the

“play” antenna, which radiates the original signals with a wide, hemispherical coverage.

In jeniot scenarios, during the “record phase”, travel data are collected through specific trips on the road with the desired characteristics (such as mentioned above based on the type of route, duration and distance, more or less aggressive driving behaviour, potholes and so on); additional data such as vehicle accelerations are acquired using complementary instrumentation. This will generate an archive of valid trips that can be kept as standard, according to jeniot purposes and needs.

In a second moment, working directly inside the Center, in a dedicated area (a cabin shielded from satellite signal coverage), each of the recorded trips can be reproduced as many times as wanted by irradiating the original signal towards the telematic device under test, which will be forced to “read” the data as an input, i.e., if it had actually carried out that journey. In this way, by creating an archive of trips over time to be used as a standard, each device can, if desired, be subjected to the same standardized protocol at any time.



The system reproducing a previously acquired trip, inside the Center

Of course, there are further non-negligible advantages:

- The replicated trips are always exactly the same, without external variables, making the results perfectly comparable even over time, and thus eliminating the human factor;
- The time necessary for this testing phase is significantly reduced, consequently optimizing development procedures and the associated costs;
- The use of road vehicles is reduced, as well as fuel consumption and CO₂ emissions into the atmosphere, with an impulse to environmental sustainability.

The GNSS record device can be used to validate the functionalities not only of black boxes, but of all kinds of devices equipped with satellite locator (including anti-theft tracking devices and smartphones with *Pay As You Drive app*) and of natively connected vehicles.

Using this tool, jeniot further expands the potential of the tests that carries out, combining technology, savings, and environmental benefits.



EV battery boom: Second life or landfill?

Overview

We are partnering with Edith Cowan University (ECU) through a cooperative research center called iMOVE to investigate the second lives of EV batteries. This project explores the current best practices for HEV battery second lives globally and aims to map out viable business models for repurposing batteries, based on existing local and international experience. While EVs currently represent just 1% of our insured vehicles, their volume is poised to surge in the coming years. By anticipating growth of EVs, we are acting early to ensure we're ready for this influx.

When a car assessed as unrepairable for Australian roads, it heads to salvage yards for auction, and in this regard, there's no difference for EVs. As part of the project, we are investigating the auction process for EVs to maximize salvage value. Specifically, the key focus of the project will be to investigate the following questions:

- What are the possibilities of a second life and how can we make them a reality?
- What drives the cost of this second life?
- What are the technical hurdles and leading reuse technologies?

Scope of work

Mainly, there are three project stages:

Stage I: Exploring EV Battery "Next Life" Possibilities: this stage will involve a comprehensive review of current and emerging practices for EV battery waste management, focusing on the 3Rs (Recycle, Refurbish, Repurpose) and their "next life" potential.

Stage II: Examining the Supply Chain for EV Battery "Next Life": this stage will map out the key players involved in the second-life market supply chain, including automotive manufacturers, battery performance testers, repurpose/remanufacturers, utility companies, and more. By drawing upon both local and international experiences, we aim to identify the crucial barriers and enablers for establishing a circular value supply chain.

Stage III: Evaluating Business Models for EV Battery "Next Life" Opportunities: second life batteries can play a key role in developing a sustainable renewable energy future and providing economic benefits to utilities, companies and consumers. During this stage, a desktop review of existing business models of EV batteries second life options will be conducted.

Overall, this project aims to provide a comprehensive and insightful analysis of EV battery "next life" possibilities through a focused, research-driven approach. We invite you all to provide any input or direct us to similar work around the world in shaping a sustainable and profitable approach to second life of EV batteries and salvage.

Better detection of large trucks, motorcycles would improve front crash prevention

Front crash prevention systems combining forward collision warning and automatic emergency braking (AEB) aren't as good at preventing crashes with large trucks and motorcycles as they are crashes with cars, two new studies from the Insurance Institute for Highway Safety (IIHS) show.

In the first study, researchers compared police-reported rear-end crash rates for model year 2016-20 passenger vehicles with and without AEB and forward collision warning when the struck vehicle was another passenger vehicle, a medium or heavy truck, or a motorcycle.



The researchers found that front crash prevention was associated with a 53% reduction in rear-end crashes involving another passenger vehicle, a 38% reduction in rear-end crashes with medium or heavy trucks and a 41% reduction in rear-end crashes with motorcycles.

If front crash prevention systems were as good at addressing crashes with big trucks and motorcycles as they are at averting crashes with passenger vehicles, they could prevent an additional 6,000 crashes a year.

In the second study, IIHS partnered with Transport Canada to gauge how various front crash prevention systems react to different vehicles and surrogate targets. The study showed that systems aren't as good at detecting motorcycle targets, trucks and other large vehicles as they are at detecting a standard passenger car target.

When IIHS first began evaluating front crash prevention systems 10 years ago, few vehicles were equipped with forward collision warning or AEB. Even fewer systems qualified for an advanced or superior rating. Today practically every new passenger vehicle has the feature thanks to a voluntary manufacturer commitment. Virtually every vehicle tested in recent years earns the Institute's highest rating of superior in the vehicle-to-vehicle evaluation.

To make sure systems are equally adept at preventing crashes with large trucks and motorcycles and to address rear-end crashes that happen at higher speeds, IIHS is conducting a new vehicle-to-vehicle front crash prevention evaluation, with plans to publish the first updated ratings this year.

Vehicles with higher, more vertical front ends pose greater risk to pedestrians.

Vehicles with especially tall front ends are most dangerous to pedestrians, but a blunt profile makes medium-height vehicles deadly too, new research shows.

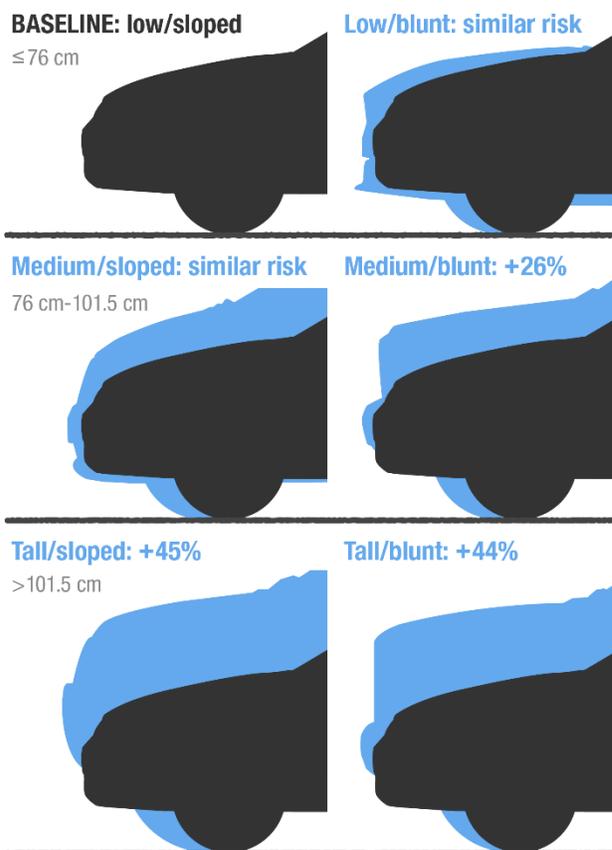
Whatever their nose shape, pickups, SUVs and vans with a hood height greater than 101.5 cm are about 45% more likely to cause fatalities in pedestrian crashes than cars and other vehicles with a hood height of 76 cm or less and a sloping profile, an IIHS study of nearly 18,000 pedestrian crashes found. However, among vehicles with hood heights between 76 cm and 101.5 cm, a blunt, or more vertical, front end increases the risk to pedestrians.

Pedestrian crash deaths have risen 80% in the U.S. since hitting their low in 2009. While speeding and poorly designed infrastructure have helped fuel the increase, safety advocates have also drawn a connection to the growing portion of the U.S. vehicle fleet made up of pickups and SUVs.

To examine the connection between fatality risk and vehicle size and shape, IIHS researchers identified 17,897 crashes involving a single passenger vehicle and a single pedestrian and calculated key front-end measurements for the crash-involved vehicles.

Vehicles with hoods more than 101.5 cm off the ground at the leading edge and a grille sloped at an angle of 65 degrees or less were 45% more likely to cause pedestrian fatalities than those with a similar slope and hood heights of 76 cm or less. Vehicles with hood heights of more than 101.5 cm and blunt front ends angled at greater than 65 degrees were 44% more likely to cause fatalities.

While sloping front ends did not reduce the risk posed by vehicles with the tallest hoods, they did make a difference for vehicles with hood heights of 76-101.5 cm. Compared with low and sloped vehicles, medium-height vehicles with blunt fronts were 26% more likely to cause pedestrian fatalities. In contrast, the risk of a fatality was about the same for medium-height vehicles with sloped fronts as for low vehicles with either blunt or sloped fronts.



Subaru's bicyclist detection shows positive results

Early versions of Subaru's EyeSight crash avoidance system prevented real-world crashes with bicyclists traveling parallel to the road, an IIHS study shows. However, they were only modestly successful in reducing crashes with bicyclists overall.

EyeSight is a suite of advanced driver assistance features that includes AEB and other technologies and is enabled by two cameras mounted behind the windshield. It was one of the earliest crash avoidance systems capable of preventing bicycle crashes, but the first two generations of the system were designed to detect only bicycles traveling in a parallel path to the vehicle.



The system reduced such parallel crashes by 29% but had only a minor impact on crashes with bicyclists overall. To be most effective, front crash prevention systems need to prevent crashes with bicycles that are crossing in front of the vehicle.

For the study, researchers compared bicycle crash rates for Subaru models with EyeSight with crash rates for the same models without the system during 2014-2020.

The equipped models all had the first or second version of the EyeSight system, which was designed only to prevent crashes with bicycles traveling in a parallel path to the vehicle.

As expected, the systems were better at preventing the parallel crashes they were designed to avoid than crashes of other types. Rates of police-reported parallel crashes were 29% lower for vehicles equipped with EyeSight than for unequipped vehicles. Perpendicular crash rates and overall crash rates were 5% and 9% lower for equipped vehicles, respectively, but neither of those reductions was statistically significant.

Past research has shown that crossing crashes account for the majority of bicycle crashes in the U.S. and Europe, though parallel crashes are overrepresented among those in which the bicyclist is killed. Recent updates to EyeSight could make it more effective at recognizing cyclists in the most common crash scenario.

For more information on all these topics, visit <https://www.iihs.org/news>

**Research on repair/replacement guideline
for EV battery case with minor damage**

EV batteries have been included on the list of depreciation parts for automobile insurance property damage liabilities. Therefore, repair of the battery is expected to increase instead of the whole battery pack replacement. Batteries mounted under EVs are prone to minor damage to the external case. Establishing reasonable criteria for battery repair/replacement is crucial in insurance repair scenarios. As of 2022, about 0.5% of all EVs had their batteries replaced, with 77% of accidents being related to bottom scratches on the case. Recognizing this, KART conducted tests simulating minor damage to EV battery cases when vehicles pass over speed bumps, curbs, road debris, creating guidelines for repairing/replacing damaged battery cases.

Initially, a survey was conducted on manufacturer-specific repair standards and parts supply for external cases of high-voltage battery varied by manufacturer, as shown in the table below. Moreover, many EV battery replacement accidents are due to scratches resulting from exposed battery cases. Except for a few manufacturer, parts for repairing external cases are not readily available.

< High-voltage battery repair criteria and battery case supply by car manufacturers >

No.	CM	Repair/replacement criteria	Battery case		Electric apparatus repair
			Replacement criteria	Parts supply	
1	Hyundai/Kia	Provided	No specific criteria	Yes	Possible
2	BMW	Not provided	Over 5mm deformation	Yes	Possible
3	Tesla	Not provided	No specific criteria	No	Impossible
4	Mercedes	Provided	Over 2mm deformation	No	Impossible
5	Volvo	Provided	Over 8mm deformation	No	Impossible

Subsequently, tests were conducted to replicate minor damages to the battery bottom caused by speed bumps and road debris, analyzing the damage and battery performance based on impact levels. Test vehicles were Porter EV(light commercial vehicle) and Kona EV(small SUV), and the test velocity was 10~30km/h. Results showed no under-scratch damage during the speed bump test, with only minor scratches occurring during the road debris and curb tests.

	Speed bump(10~20cm)	Curb(10~20cm)	Road debris(16cm)
Collision target	 <p>Speed bump</p> <p>Height : ①10cm(standard), ②15cm, ③ 20cm</p>	 <p>Curb</p> <p>Height : ①10cm, ②20cm,</p>	 <p>Road debris</p> <p>Width : 40cm</p> <p>Height : 16cm</p>

Test mode	Test result			
	Test vehicle	Damage on the battery	Result of diagnosis	Note
Speed bump(10~30kph)	Porter EV	No damage	No abnormalities	
	Kona EV	No damage	No abnormalities	
Curb(10kph)	Porter EV	Lower case dent and scratch	No abnormalities	Replace the case
Road debris(10kph)	Porter EV	Lower case scratch	No abnormalities	Replace the case

However, the impact levels were low (maximum speed change of 0.7-8.7km/h), and no abnormalities were detected in battery performance and safety. Guidelines for repairing/replacing external cases with minor damages were established, taking into account the results of accident replication tests and considering manufacturer/model-specific repair manuals for domestically sold EVs.

<p><Condition for application of minor damage></p> <ul style="list-style-type: none"> - Speed change in the event of collision or floor accident less than 15km/h (fire or flooding is not applicable) - Applicable to vehicle high-voltage battery diagnostics without fault code(DTC) - Application in case of damage to the lower case of high-voltage battery (include fastening) . No tearing/crack/perforation of case appearance(lower case, fastening, etc.) . No leakage of high voltage battery coolant and electrolyte . Repairable damage where the manufacturer supplies repair parts related to the high voltage battery (If any repair/maintenance manuals are available)

< Repair method for the high-voltage battery case by minor damage types >

	Battery case minor damage type		
	Type1	Type2	Type3
Damage Depth	- Damaged area : No more than 1 - Dent/scratch : 1mm or less	- Damaged area : 2 or more - Dent/scratch : 1mm or more	- Case-body junction damage - Connector crimping or deformation - Damage and deformation of electrical wiring fixing devices
Repair Method	No repair required	<u>Replace damaged case</u> (Precise diagnosis is required after repair)	<u>(Repair) damaged part/case replacement</u> <u>(Replace) whole battery pack replacement</u>
	※ If a battery-related fault code is detected, it is important to perform a thorough diagnosis		※ Classification of reparability based on diagnostic results and availability of spare parts

Study on the criteria for determining the damage of belongings in the vehicle

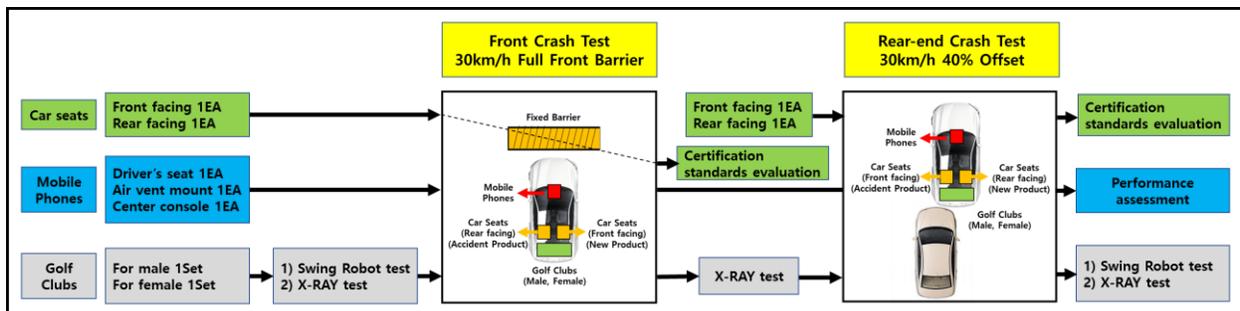
In the period between January 2020 and December 2022, a total of 8,503 cases of compensation for damaged belongings (such as car seats, golf clubs, and mobile phones) resulting from traffic accidents were reported by 10 insurance companies in South Korea. The distribution for the damaged belongings revealed that car seats accounted for 84.7%, followed by golf clubs at 13.9%, and mobile phones at 1.2%.

An analysis of automotive repair severity indicated that front-end damages, including the replacement of side member reinforcements and wheelhouse repairs, constituted approximately 87% of the cases. In the case of rear-end damages, including back panel replacement and trunk floor panel repairs, these accounted for about 92%. The severity of rear-end damages closely resembled the repair severity identified through the 15km/h RCAR rear-end crash test.

Despite some accidents being relatively minor, such as bumper replacements, certain drivers assert claims for compensation for damaged belongings due to their psychological compensation. However, the lack of objective criteria for assessing item damage leads to compensations being granted based on the driver's assertions, irrespective of the accident's severity. This results in societal cost and disputes, the need for objective (technical) criteria for assessing damages to mitigate such issues.

In this study conducted front and rear-end crash tests at speeds of 30km/h for the evaluation the damage to belongings as shown in the figure below. The belongings were evaluated by a specialized testing agency before/after the collision test to determine whether the belongings were damaged.

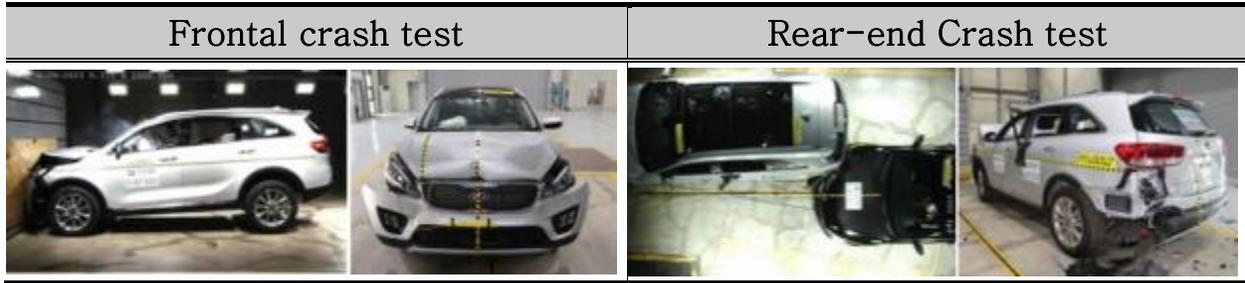
* The test speed was set to higher so that a higher depth of breakage can occur than the statistical analysis results.



- Type of belongings and vehicle mounting location :
 - Car Seats: 2sets in the second-row seats (one is new product and other one is accident product)
 - Golf Clubs: 1set for male and 1set for female in the trunk
 - Mobile Phones: 1EA on the driver's seat, 1EA on the air vent mount, and 1EA in the center console

- Method for Assessing Damage:
 - Car Seats: Comparison of safety certification standards and thread evaluation results, with front (50km/h) and rear (30km/h) assessments based on seat orientation.
 - Golf Clubs: 1) X-RAY (internal crack inspection)
2) Swing Robot Test (evaluation based on performance indicators such as distance and smash factor)
 - Mobile Phones: Performance assessment conducted by a professional engineer from the manufacturer's official service center.

<Crash test and vehicle damage photos>



Results of the crash tests revealed that all tested items showed no physical damage or performance abnormalities. Car seats remained securely in place, meeting all safety certification standards. Golf clubs exhibited no internal cracks, and there was no difference in swing performance before and after the collision. Mobile phones showed no external cracks or performance issues. The study findings were shared with car seat brands and insurance companies.

Electric Vehicles in Malaysia.

In Malaysia, the sales of Electric Vehicles are growing exponentially high beginning in early 2023. Vehicle manufacturers from China, Japan, South Korea, USA and Europe making their mark in this emerging industry. For vehicle manufacturers from China especially, such as BYD, Chery, Geely, GWM and Neta, offer a range of affordable and eco-friendly EVs with advanced technological features in the market.



China EV manufacturers in Malaysia.

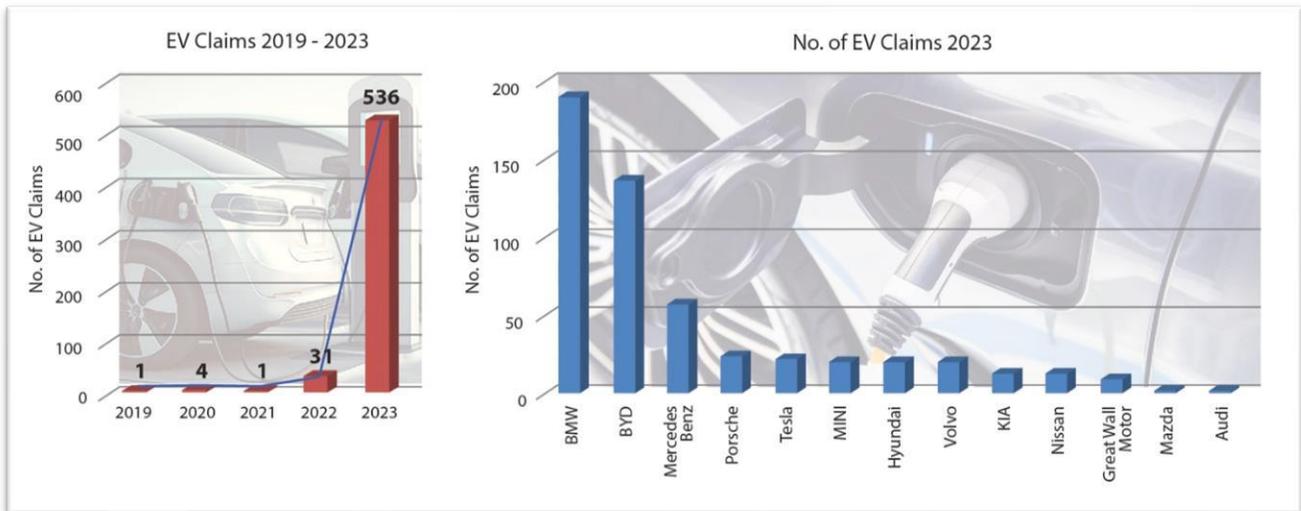
Aligned with this, MRC Malaysia has embarked to provide various courses in EV training particularly on skills, awareness and knowledge necessary to safely and effectively repair EVs. With a warm response from the industry players, we have an opportunity to further expand the EV's training courses. MRC Malaysia went to Automechanika Shanghai and Beifang Automotive Training Company in Handan, China in December 2023 to explore for the latest technology in EV training equipment, training design and training expertise.



MRC Malaysia visited Automechanika Shanghai and Beifang Automotive Training Company in Handan, China.

On the other matter, based on MRC's record of claim transactions (iCAP), it shows a significant increase in EVs accident claims. In conjunction with this EV trend, MRC Malaysia has initiated a study on EV accident claims to determine any impact on insurance claim cost.

The study will explore the current accident scenarios of EVs in Malaysia, delving into the issues of the accidents and their repercussions, such as the impact of claims costs in EV repair and the intricate of expensive EV components that lead to total loss of EV claims. This study is expected to be completed in August 2024.



In conclusion, the EV industry in Malaysia has experienced rapid growth. It is crucial to address the rising accident trend and the subsequent total loss claims involving expensive EV components. By addressing these issues, Malaysia can foster a safer and more sustainable environment for the continued growth of the EV industry.



Simple Insights® articles help keep customers prepared in their day to day travels

State Farm provides [Simple Insights®](#), short articles to assist policyholders and the general public with topics pertaining to home and auto insurance, safety and life planning. The State Farm Enterprise Research department supports these articles with vehicle-based topics to support safer operation, understanding of vehicle repair, maintenance, technologies and occupant safety. The articles are reviewed and updated as necessary to keep up with the ever-changing U.S. vehicle environment. “Clicking” on the article of interest will open the topic with greater levels of information.

These articles cover the scope of all the vehicles we insure including automotive, motorcycle, RV, ATV and boats. Additional articles are in place to share out on all risks that we insure for.



State Farm is a large insurer of pleasure boats in the U.S. market.

Good Neighbor Stories also share research results

State Farm also uses [Good Neighbor Stories®](#) to share out research results and topical information to our customers for their awareness. These articles are also supported in their development by the Enterprise Research Dept. Here is a an October release pertaining to the reduction seen in catalytic converter thefts in the U.S. market.



State Farm data reveals drop in catalytic converter theft

State Farm auto claims data shows a dramatic drop in catalytic converter theft claims for the first half of this year compared to last year. This is good news in a story that first gained traction when [State Farm claims data indicated a significant increase in catalytic converter thefts](#) over the last several years.

State Farm's most recent data (January 1 to June 30, 2023) shows a decline in thefts for the first time since 2019. There were around **14,500** claims the first half of this year, down from the same time last year when State Farm received over **23,000** catalytic converter theft claims.

Additional claims data from first half of year 2023:

- **14,500 claims**, totaling approximately **\$41.7 million** USD paid to customers to repair car and replace the stolen part
- Average claim in first half of 2023 is nearly \$2,900

For comparison:

- 2019: 2,500 claims, \$4.7M, \$1,900 ave claim
- 2020: 10k claims, \$20.9M, \$2,100 ave claim
- 2021: 32k claims, \$73.7M, \$2,300 ave claim
- 2022: 45k claims, \$115.4M, \$2,500 ave claim
- 2023: 14,500 claims, \$41.7M, \$2,900 ave claim (first half of 2023 only)

Top 10 states (first half 2023):

1. California with over 5,400 claims and \$17.8M paid
2. Texas with 1,450 claims and \$5.1M paid
3. Illinois with nearly 1,300 claims and a cost of \$2.9M paid
4. Colorado with nearly 670 claims at \$2.0M paid
5. New York with over 500 claims and \$1.5M paid
6. Pennsylvania with over 480 claims and \$1.1M paid
7. Georgia with 410 claims and \$898K paid
8. Minnesota with 400 claims and \$934K paid
9. Florida with 330 claims and \$896K paid
10. Washington with 320 claims and \$773K paid

As a reminder, State Farm encourages drivers to continue following these tips to prevent theft:

- Park inside a garage or in well-lit areas.
- Install a sensitive alarm system.
- Have a security camera pointing at your car in its usual parking spot.
- Engrave your VIN on your car's catalytic converter.
- To protect yourself, speak with your State Farm agent to make sure that your auto insurance policy covers the theft of your entire vehicle or of its parts through [comprehensive coverage](#).

Aluminium Mega Casting

Background

Many Vehicle Manufacturers (VMs) have recently stated their intention to introduce large, one-piece aluminium castings into their vehicle designs, capable of replacing numerous existing vehicle components; this component is referred to as a 'mega cast'. A mega cast is manufactured using large High-Pressure Die-Cast (HPDC) machines, whereby molten aluminium is injected into a high-pressure mould to produce large die-cast body parts, such as an entire one-piece chassis assembly, designed to be fitted into a vehicle structure.

Given that a single mega cast can combine anywhere from 50 to 100 individual components of the body structure into one large chassis sub-assembly part, it's understandable why VMs are considering implementing mega castings into future designs. As a result of the reduced number of parts, there are significant cost savings – another key motive of why mega casting technology is gaining momentum. For instance, while it isn't possible to compare exact repair costs, Tesla have stated that the use of a single rear under body mega cast allowed them to cut related costs by 40%.

In addition to this, incorporating a mega cast into vehicle designs offers VMs additional benefits, including greater design flexibility, a refined manufacturing process, shorter production times, and reduced vehicle mass. This also helps VMs achieve sustainability targets due to aluminium being recyclable, and a lighter vehicle could reduce energy consumption and improve energy efficiency. There are other potential material gains, with the use of lighter materials counterbalancing the additional weight of new technology that's included in electric vehicles – for example, the average mass of a high voltage battery is ~500kg.

Although implementing a mega casting into vehicle design offers numerous benefits for VMs, many questions remain about the feasibility and complexity of assessing mega casting damage that will cause uncertainty around claims and repair options.

Tesla Model Y

At present, the only vehicle in the UK car parc that features a mega casting in its body structure design is the Tesla Model Y. Unlike other countries where a Model Y can feature two separate mega castings, one at the front and one at the rear, the UK model currently only features a single mega casting (image 1) located at the rear of the vehicle. Fortunately, Tesla have recently removed all restrictions on the supply of structural / safety

Image 1



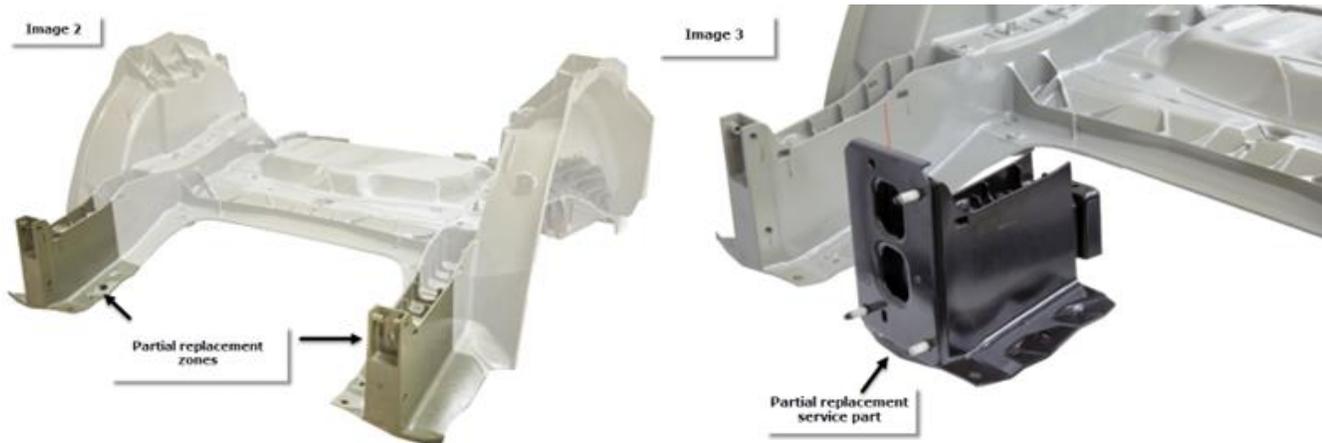
Single Mega Casting

related parts along with access to repair information via a free of charge subscription to the Tesla Service portal for the UK aftermarket repair sector. This now means that structurally damaged Tesla vehicles can be repaired outside of the Tesla franchised / approved repair network.

In the case of the Model Y, there are partial replacement scenarios available (image 2 / 3), dependent on where the impact has occurred. The guidance describes in detail which sections of the vehicle rear casting can be replaced, and also sets out the parts that can be purchased to do so – such as the rear chassis leg sections of the mega cast.

The Tesla repair support has set a high standard for other VMs to provide similarly useful guidance for body shop repairs.

It's not yet clear how repair teams can be certain whether the energy of the collision might have caused further damage to the vehicle beyond the point of impact, simply because it isn't as simple as removing and examining specific components. A component of this scale may even prove difficult when testing for cracks using non-destructive penetrant dye as the cracks might not be sufficient to surface problems hidden from the naked eye.



Thatcham Research – Viewing through the lens of the Insurer

With all new technologies it is important to understand the potential risk affecting factors for all relevant areas of the insurer workflow. The adoption of mega casting technology requires a focussed view through a combined lens of Safety, Damageability and Sustainable Repair, this approach ensures that our research delivers the Automotive Risk Intelligence that enables effective decision making throughout the insurer workflow along with a targeted approach to effectively influence vehicle design and sustainable repair strategies with Vehicle Manufacturers.

Our Research so far:

- Mega casting adoption (current)
 - o Tesla Model Y – UK market vs other regions
 - o Geely (Zeekr 009)
 - o NIO et5
- Mega casting adoption (future)
 - o Toyota
 - o Volkswagen / Audi Group
 - o Volvo / Polestar (Geely)
- Tesla Model Y
 - o Repair methods – availability and quality
 - o Parts – availability and costs

Research – next steps:

- Tesla Model Y repairability:
 - o Remove and refit rear mega casting

- Carry out partial replacement scenarios
- Identify risks associated with safe, sustainable repair

- Tesla Model Y damageability:
 - Damageability testing
 - Field research – damageability in real world scenarios

- RCAR collaboration:
 - Mega casting agenda topic for the repairability / damageability WG