

MATRIX

THE WORKSHOP MAGAZINE

01/2024

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mega macs X
and the CSC-Tool SE
are now getting
significantly cheaper

SERMI and CSM

Even more hurdles in the
name of security

Tesla diagnostics

Now also for
Model 3 and
Model Y

Hybrid diversity

Banish any
uncertainty amongst
customers



HELLA GUTMANN

Come what may

Dear Reader,

The word e-mobility is on everyone's lips and it has indeed long been an integral part of our everyday lives. One thing is certain: BEVs are not going to disappear from our roads because after January 1, 2035 no new registration of cars with combustion engines that emit greenhouse gases will be allowed in the EU. This is the EU Commission's decision in the name of climate protection. The result will be a ban on fossil petrol or diesel in new vehicles. However, there are many possibilities still available. Just think of synthetic fuels, or consider hybrid vehicles (see [page 12](#)) and there also exists a great variety of potential combinations. So we can certainly question whether our vehicle fleet really has to become purely electric and whether combustion engines will totally disappear – this probably won't happen. In any case, EU policy has left a loophole in all the proceedings by setting up a review of the law scheduled for 2026.

The master mechanics at an independent workshop that we recently visited are also starting to ask themselves such questions and are already drawing their own personal conclusion: they see the solutions as follows – a wide range of brands, high-voltage expertise and strong partners. Then whatever develops, we will be prepared. It is no coincidence that a mega macs X forms the central interface in the workshop, whether it's for high-voltage work with the MT-HV or for ADAS calibrations with the CSC-Tool SE. Cornerstones such as the Technical Call Centre and macs Remote Services provide the necessary assurance that even difficult tasks can be undertaken on all makes. One such example would be whenever access to manufacturer data or programming is required (see [page 10](#)).

Access to vehicle and repair data is increasingly becoming a challenge and turning into a real obstacle course for those in search of such information. All in the name of security. The first hurdle, i.e. the security gateway locks, is expertly handled by Hella Gutmann on behalf of its customers. And then there is the second hurdle, which is the SERMI lock imposed by the EU and which focuses on vehicle theft protection. You can find out how together we can overcome this hurdle, too, on [page 8](#).

I sincerely hope you enjoy reading all of our magazine,



Bernd Schretter
Hella Gutmann Sales Management for DACH (Germany, Austria, Switzerland)



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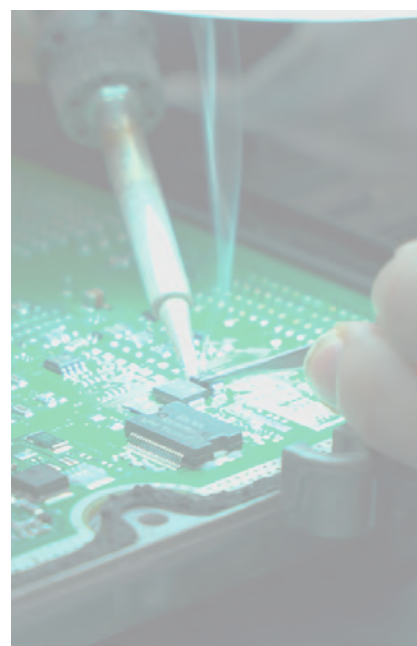
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READY FOR ELECTRIC MOBILITY
Invitation to participate in the latest free HELLA webinar



May 7, 2024 – 9 am
May 13, 2024 – 4 pm
May 14, 2024 – 9 am

THE WORKSHOP'S FRIEND

Every issue dealt with in HELLA's regular online webinars is guaranteed to be informative and inspiring. And all friends of the company are cordially invited to take part for free from the comfort of their own computers and to chat with the experts during the webinar.

'Ready for electromobility' is the title of the 60-minute webinar, which will take place on three different dates in May. The speakers are technical trainers and experts in the high-voltage sector, for example from HELLA's OE product development department. The information they provide also includes details on the status of battery regulations and covers international

standards and the battery passport. It goes without saying that the current stock and growth curve of electric vehicles (BEV) in Europe and also worldwide will not be neglected in the talks.

In the comprehensive and practical part of the webinar, the technical trainers and Hella Gutmann experts share their knowledge about the general structure of high-voltage batteries. Voltage measurements are carried out on a demonstration model of a dismantled round cell battery in compliance with all regulations, and module replacement is discussed. Particular importance is naturally placed on the 'Safety First'

aspect. The technical trainer provides information about precautions applicable in the workshop and also deals with the required qualification levels. This is definitely a webinar that can help to make the decision to further your own high-voltage expertise.

For all those who cannot take part in the live broadcasts, the webinar will be recorded as usual and will then be available in the Hella Tech World.

Simply scan the QR code or register at
www.hella.com/techworld/en/Training/HELLA-Webinare-60286/



Nothing beats personal contact. The Hella Gutmann team is looking forward to seeing you again at these trade fairs!

Trade fair planner 2024

Date	Name	Website
19.–21.04.	WM SE Stuttgart	www.wm.de
03.–05.05.	WM SE Berlin	www.wm.de
25.–26.05.	PV Live Essen	www.pvautomotive.de
07.–08.06.	Heil & Son	www.heil-kfzteile.de
30.–31.08.	SAS Fribourg	www.swissautomotiveshow.ch
30.08.–01.09.	WM SE Dortmund	www.wm.de
10.–14.09.	Automechanika Frankfurt	www.automechanika.de
20.–21.09.	Berg Stendal	www.berg-autoteile.de
12.–13.10.	Neimcke Traunstein	www.neimcke.de
18.–20.10.	WM SE Munich	www.wm.de
26.–27.10.	Hartje Hoya	www.hartje.de
26.–27.10.	AAG Colertechnika Münster	www.aagtechnika.de
23.–24.11.	Stahlgruber Exhibition Nuremberg	www.stahlgruber.de
23.–24.11.	Coparts Frankfurt	www.coparts.de

Soon no cars without radar and the like

From July, it will be mandatory for all new vehicles to be equipped with active ADAS. This means that nothing works any more without a calibration tool.

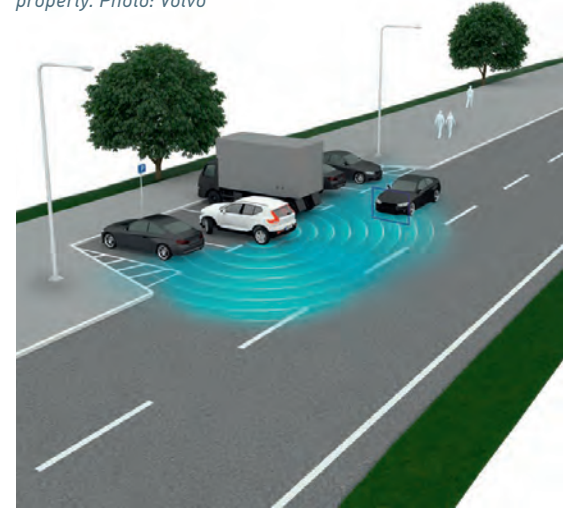
According to the EU Commission, driver assistance systems (ADAS) on European roads could save around 25,000 lives and prevent around 140,000 serious injuries by the time we reach 2038. For this reason, since the summer of 2022, manufacturers of vehicles for the European market have been obliged to equip newly homologated models with certain assistance systems. From July 7, 2024, this equipment requirement will be extended to all new vehicles. Such equipment includes a whole range of both radar-based and camera-based ADAS.

The mandatory ADAS features include, for example, Emergency Brake Assist,

Emergency Lane Keeping Assist from 60 km/h, Intelligent Speed Assist and Reversing Assist. The EU also requires all new vehicles to have an accident data memory (black box), a drowsiness and attention warning system and, as a precautionary measure, a device for retrofitting an alcohol detector.

For workshops, this means there will be no more new cars without front, side and rear cameras or without radar sensors. And what is more: inevitably the need for their calibration will continue to rise. Investing in a calibration device is essential and should be done sooner rather than later.

Driver assistance systems have been proven to reduce accidents – but they have to work properly. Photo: Volvo



The 2024 CSC-Tool SE Performance Set includes the wheel sensor, the five most frequently ordered front camera calibration panels and the Radar Kit I EVO.

Perfectly positioned for calibration with this performance set

The addition of a calibration tool to the mega macs is essential and our special offer bundle is now cheaper than ever!

The CSC-Tool SE is a classic among the calibration tools. It incorporates almost ten years of experience with the calibration pioneer, the Camera & Sensor Calibration Tool, CSC-Tool for short, which has been given the SE suffix in its second generation. Both generations of the device have proven themselves many thousands of times over with mega macs users worldwide: a solid, well-engineered jig that is easy to operate

thanks to numerous small refinements and which can be stowed away in the workshop to save space. Admittedly it has no digital aids, but it is cost-effective and there are no extra running costs. If required at a later date, the CSC-Tool-SE module kit can be supplemented at any time with calibrations for 360° monitoring of vehicle surroundings.

For all mega macs users who have been putting off their investment in a calibration tool, Hella Gutmann is now making the long overdue decision to purchase easier with the 2024 CSC-Tool SE Performance Set. The smart bundled set is available for around 35% less than the previous list price. It includes the

CSC-Tool SE device including measuring tape, the SE wheel sensor required for correct alignment to the geometric vehicle axis, the centrally adaptable Radar Kit I EVO for the adjustment and calibration of almost all remote radar heads and also five carefully selected front camera calibration panels. The latter are the most frequently ordered calibration panels in Europe and they cover a total of more than 20 brands.

The offer for the 2024 CSC-Tool SE Performance Set is valid until June 30, 2024. As usual, your point of contact is the local trade outlets for workshop equipment.

Future requirements for SoH assessment of traction batteries

No problem for anyone who works with the mega macs X



The Battery Quick Check is started using the mega macs HV Battery Diagnostics PRO function and runs through an overall process certified by the TÜV Rheinland (German Technical Inspection Association). No time-consuming driving is involved.

Government subsidies and the announcement that no new combustion engines are to be registered in the EU from 2035 onwards have boosted new car sales of BEVs and PHEVs in recent

years. These vehicles are now increasingly finding their way onto the used car market. The state of health (SoH) of the battery thus becomes a criterion in this scenario. After all, word has got around that high-voltage batteries firstly are expensive and secondly they can age very differently depending on their users' profiles.

Workshop professionals who work with mega macs X and have a go-e Wallbox at their disposal are ideally equipped to meet the increasing demand for SoH detection in the future. The 'Battery Quick Check' can be ordered and started as a service via the mega macs menu item 'HV Battery Diagnostic PRO'. After a few

operator-guided steps, the technician can move on to other tasks because the measurement and transfer process runs completely automatically during a partial battery charge. The SoH report is then sent by email to the workshop PC. It can also be downloaded via the Hella Gutmann service portal macs365.



The relevant webinar provides a good impression of the overall process.

Register now at www.hella-gutmann.com/soh-webinar



Workshop upgrade made easy

After purchasing a mega macs X, simply send back your old device to receive a credit note.

With up to 1,500 euros in credit notes and voucher bonuses, the switch to state-of-the-art diagnostic equipment including high-voltage functions is now very easy to complete. The trade-in offer applies to all those who invest in a mega macs X in the software configuration X³ or higher. After all, technical compatibility and speed are the things that count.

Even the X³ version of this top-class, modular, diagnostic device from Hella Gutmann offers pioneering possibilities, such as the diagnosis of vehicles with DoIP and Ethernet vehicle electrical systems – including, of course, all common hybrid and electric vehicles. The integrated functions 'Automatic Diagnostics' using artificial intelligence (AI) and 'High-Voltage Battery Diagnostics PRO' are currently unique on the market.

As part of the trade-in promotion, you can look forward to credit notes combined with either the non-cash benefit of a 'go-e Wallbox' as basic equipment for carrying out the HV Battery Diagnostics PRO or with purely monetary credits, scaled in accordance with the selected mega macs X configuration X³, X⁴ or X⁵.

And a voucher for a training course at the HELLA Academy is always thrown in, too.

Professional diagnostic devices with OBD connectors from any manufacturer (including Hella Gutmann) with an original purchase value of 1,990 euros or more are recognised for the trade-in.

HERE'S HOW IT'S DONE

Once the mega macs X has been purchased or leased from a regional dealer, the trade-in process including payment is handled directly with Hella Gutmann as the contact partner. This means that you simply send the old device with the completed form to the Hella Gutmann head office within four weeks of receiving your mega macs X. Proof of purchase for the returned old device could be requested if need be.

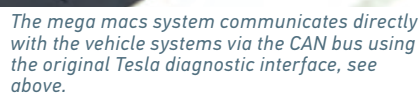


Detailed information at www.hella-gutmann.com/de/trade-in



With the Tes01 adapter additional functions can be opened up on Model S, X, 3 and Y

With the Tes01 adapter additional functions can be opened up on Model S, X, 3 and Y



The functions include reading/deleting error codes, reading parameters and also the basic settings of many systems. Nevertheless, it is undisputed that the vehicle diagnostics of Tesla vehicles via the OBD interface reaches its

By using the new 'Tes01' adapter, it is possible to connect the VCI of the mega macs to one of three manufacturer diagnostic interfaces installed in the vehicles and thus connect it directly to the vehicle data bus (CAN bus). This 20-pin diagnostic interface is installed in the passenger footwell of the Tesla vehicle models S, X, 3 and Y from model year 2020 and is easily accessible after removing the inner sill panelling. Important: no plug connection in the wiring harness has to be disconnected when the adapter is connected, so there are no potential sources of error. However, a separate power supply via the cigarette lighter is required. An appropriate cable is part of the new adapter. This has been designed with integrated strain relief, kink protection and a solid housing for

[illegible]

A completely new feature is the parameter insight into 11 important vehicle systems of Model 3 and Model Y, whose structure of the vehicle electrical system differs significantly from Model S and X. If you know how, you can use the vehicle's own service function for many diagnostic functions in an extremely convenient way. Information such as stored error codes can be called up here, but basic settings can also be made, camera calibrations initiated and even actuator tests can be carried out.

- Only the Tesla adapter Tes01 corresponds in its pin assignment to the communication method of current mega macs devices. It is also required for future Battery Quick Checks via the HV Battery Diagnostics PRO with the mega macs X.

- Hella Gutmann customers are explicitly informed about 'Diagnostic options for Tesla vehicles' via a special communication.

It is most obvious that workshops, on their way to equal opportunity repairs, have yet another hurdle to overcome. But working together with Hella Gutmann makes it all easier.

In the name of security

New measures against unauthorised access to data in and for young vehicles are increasingly turning the diagnostic process into an obstacle race. But operating as a team, we will nevertheless reach the finishing line.

As we proceed along the road to future mobility with its autonomous driving and countless software-controlled functions, concerns about possible data misuse are increasing. And rightly so, because we all know the consequences of hacker attacks, aka cyber attacks, be it on the company network or on our smartphones and the like. It was also a cyber attack that prompted the Fiat-Chrysler Group to implement the first security gateway in a vehicle electrical system almost 10 years ago in order to prevent unauthorised access. We all know the consequences: the FCA example set a precedent. Today more and more vehicle manufacturers are securing the complex software architectures in new models against

unauthorised access. And now all the relevant authorisations for the workshop professional cost time and money. Every manufacturer has a slightly different system. An exhausting obstacle course for the independent multi-brand workshop – unless you have a supportive friend behind you.

Hella Gutmann takes on the first hurdle, security gateway blocking, on behalf of its customers.

Hella Gutmann took action several years ago, concluding the appropriate contracts with car manufacturers and creating secure interfaces.

Both the registration for CSM (Cyber Security Management) and also everyday use are completely free of charge. Today all mega macs users, who have invested just 5 minutes of their time to register online as a CSM user, benefit from this arrangement.

It means that, from that point on, such users will automatically and virtually unnoticed pass through the security lock of the vehicle electrical system's gateway implemented in the vehicles by the car manufacturers. "Diagnostics as usual" is then the motto, even for the youngest vehicles that roll into the workshop.

But let's not forget: this is all about accessing a wide range of data and

information in the vehicles themselves in order to be able to carry out as usual vehicle diagnostics including parameter views, basic settings and calibrations. The CSM embedded in the mega macs software now works for the following 17 makes: **Abarth, Alfa Romeo, Audi, Chrysler, Cupra, Dacia, Dodge, Fiat, Hyundai, Jeep, Kia, Mercedes-Benz, RAM, Renault, Seat, Skoda, Volkswagen.** Which data is locked in which vehicles depends solely on the manufacturer's strategy. There are a number of brands that have so far not bothered with cyber security locks.

The second hurdle, in the form of additional SERMI barriers, can be overcome together with Hella Gutmann.

The situation in Europe differs when it comes to certain measures on vehicle systems that can be categorised as anti-theft systems. This is because access regarding OE data is now protected separately by law via the so-called SERMI scheme. SERMI, short for **SE**curity related **R**epair and **M**aintenance **I**nformation, is based on the EU Type Approval Regulation 2018/858 and requires all vehicle manufacturers to pay particular care and attention to the theft protection measures safeguarding their new vehicles sold in the EU. Only persons with a proven legitimate

and professional interest is to be able to access this safety-critical data. Since April 1, 2024, this proof must be provided in Germany via an electronic certificate whenever such SERMI details are accessed. In Germany, among other establishments, the SERMA GmbH (Security-related Repair and Maintenance Authorisation), which was founded by the ZDK (German Federation for Motor Trades and Repairs), is entrusted with the task of conformity assessment (see below).

Unfortunately, there is no clear cross-brand definition of which vehicle systems should be categorised as theft or security-relevant. However, it is defined that the idea behind SERMI is not focused on systems for driver or passenger safety, but rather specifically on the security relating to anti-theft systems. Overlapping of the two areas, however, makes categorisation somewhat difficult. It remains to be seen how vehicle manufacturers – also in view of increasing autonomous functions – will use the SERMI lock for their new vehicle generations.

At least one employee in the workshop needs to have the digital SERMI certificate

A secure solution: just like many other special tasks performed on customer

vehicles, SERMI-critical measures can also be carried out remotely via, of course, Hella Gutmann Remote Services. However, legislation requires that all parties involved in a remote process have a security certificate when intervening in vehicle software systems that are behind the SERMI lock. In other words, this ruling applies not only to the remote technician, but also to the person who is involved in the remote measure performed on the vehicle. In order to be able to utilise full remote services in the future, at least one workshop employee should therefore be the holder of a SERMI certificate.

In the case of a remote service on a SERMI-relevant system, both certificates will be requested in a defined process before access to the relevant manufacturer data is authorised. In order to comply with this, both parties must have their digital certificates ready on their smartphones on the SERMI app. These are checked using a security procedure with newly generated QR codes before the process can begin.



A current coverage list at www.hella-gutmann.com/de/manuals#54|||9

shows all vehicle models that, thanks to CSM, can be diagnosed as usual with mega macs.



i Apply for SERMI certification. Where and how?

Three conformity assessment bodies are currently recognised in Germany: SERMA, KIWA and Global Network Group TIC. In Austria it is only KIWA. Automotive businesses that have identified themselves as such can apply for a licence and for the authorisation of at least one employee. The initial authorisation, which is subject to a fee, is first of all to be valid for 5 years and schedules an unannounced on-site inspection of the registered workshops and persons. After a positive review of the application, the employee/employees receives/receive the personalised electronic certificate including all documents directly on their smartphone via an app.

Documents such as the business registration, a current extract from the commercial register and proof of existing liability insurance are all accepted as identification relating to an automotive business. Personal details of the person(s) to be authorised, including a simple police clearance certificate attesting to good conduct, must also be provided.

Hella Gutmann bundles all the information required by workshops on the subject of SERMI certification on its own SERMI support page, which is available in many languages and which is constantly updated:



www.hella-gutmann.com/sermi

Find the list of conformity assessment bodies (CAB) of all EU countries at:
www.vehiclesermi.eu/req.html#req



Wide variety of brands and high-voltage expertise

"It's hard to imagine that mobility will become exclusively electric. But whatever comes along, we will master it," so says the business of Kellner and Huber in Mühldorf with confidence.

Finding solutions to tricky challenges requires not only skill, but also creative, flexible thinking. All of this is available at Kellner and Huber in Mühldorf am Inn. Starting out with a new building around 30 years ago, this independent workshop in south-east Bavaria has made a name for itself as a highly flexible problem solver. Private and fleet customers make use of this and occasionally so do other workshops. The workshop's parking area and forecourt bear witness to the broad portfolio of vehicle types and brands dealt with here – from vintage cars through all-electric e-scooters used by the Post Office right up to the brand new Tesla.

Only when it comes to workshop equipment does the independent workshop of Kellner and Huber not rely on brand diversity. This becomes apparent when the first roller door

is opened: masses of high-tech equipment in Hella Gutmann green can be seen in the lamp adjustment and calibration area. It includes the mega compaa HG4 emission measuring station with particle counter, the CSC-Tool SE with a good supply of calibration panels, the Radar Kit EVO and 360° calibration equipment for the monitoring of vehicle surroundings. And at the heart of all this technology is a mega macs X with MT-HV.

Technological focus on mega macs X

It can do everything. We don't need any other diagnostic equipment," is the clear statement from the workshop team. After consistently good experiences with previous generations of mega macs, the company immediately seized the opportunity 4 years ago when retail

partner Neimcke presented the new mega macs X. "Soon all employees were only using the mega macs X. The old devices were just lying around, so we sold them," smiles senior boss Edgar Huber.

Thanks to its proximity to the motorway, its towing service and accident damage repair, even very young vehicles find their way into the Kellner and Huber independent workshop. This makes the DoIP-compatible diagnostic tool mega macs X all the more valuable. The Mühldorf mechanics only use the remote service on offer to unlock some replaced control units and key codings. "The tests we have been able to carry out with the macs remote device from the firm of Neimcke have worked very well so far and have been completely successful. Such services – including the technical hotline – are extremely





For high-voltage work with mega macs X and MT-HV, the designated lamp adjustment and calibration area can be safeguarded in accordance with regulations.



important factors that strengthen us as an independent workshop," the employees of the family business wholeheartedly agree.

Routine calibrations

As the volume of features using driver assistance systems has risen sharply, the CSC tool is in constant use – and not just by the 3 master mechanics. It goes without saying that it is also used by the workshop trainees because nothing beats learning a good routine. It is not just by chance that trainees from the Kellner and Huber workshop have repeatedly been honoured as the best in their year in their district and throughout their state.

At the moment 3 trainees are also working on a successful future under the auspices of this workshop. Moreover, mastermind and senior boss Edgar Huber is supported by 2 young master mechanics, his son Thomas and Christian Krebold. All 3 master craftsmen have the highest qualification for high-voltage work 3S.

3 champions with the 3S high-voltage qualification

This seems quite unusual for a comparatively small family business, but it is explained by the many yellow postal delivery vehicles to be seen in the surrounding car parks: these are the so-called StreetScooters, purely electric vehicles used by the Deutsche Post DHL. The workshop of Kellner and Huber looks after a fleet of around 100 vehicles, which are used for letter and parcel delivery in the surrounding districts. As working vehicles, they are subjected to daily wear and tear, with the corresponding amount of damage occurring. "The electric drives themselves run completely fault-free, but apart from that we repair everything that can break down or wear out. All that can start with handles and different kinds of operating elements and go through to the brakes, and sometimes even the high-voltage batteries," the young master craftsmen explain. The MT-HV measurement technology module is used in conjunction with the mega macs X for all voltage disconnections and measurements, such as

routine battery voltage measurements. "The combination of these 2 devices covers absolutely everything. It means you can work quickly and effectively," was the unanimous verdict.

According to the Hubers, the investment for all work equipment and the safeguarding of the high-voltage workstation, including the regular training courses with their contractual partner, the Post Office, is in the 5-figure range. However, it was the right decision in order to secure the future because workshops offering high-voltage expertise have already been able to create a promising mainstay for future business. Today, private customers with their hybrids, plug-in hybrids and purely electric cars are increasingly finding their way to the Mühldorf industrial estate.

Around 10% of workshop jobs now deal with high-voltage vehicles – with a very small proportion of those handling purely electric cars, a fact pointed out by the senior boss: "The vast majority of e-cars is still too young. There is simply nothing wrong with them, and the batteries are still within the manufacturer's warranty. But if that changes, we are ready and waiting with a comprehensive HV routine." The Kellner and Huber team will also be able to offer its customers the Battery Quick Check with an official SoH status report. The hardware necessary for all this is already there.



Three champions with the 3S qualification: E. Huber, Ch. Krebold and T. Huber (from left to right) ensure, among other things, the HV mainstay of the independent workshop. Yellow StreetScooters from the Post Office are among their regular guests.



Expertise for all makes – even for electric and hybrid vehicles



This emblem identifies current VW models as fully-fledged, plug-in hybrids. An eTSI signifies the mild hybrid. However, with every manufacturer, the 'e' means something different.

Photo: VW

Hybrid diversity

Parallel, serial, mild, full, self-charging, with and without connector (plug) – the numerous variants on offer only cause confusion among end customers.

Most people are now familiar with how an electric car drives and how it works in principle. But there is a lot of dangerous superficial knowledge circulating about hybrid drives. This leaves room for assumptions and prejudices such as "Hybrid vehicles are economic nonsense because two engines are installed together, meaning twice the consumption of resources and much more weight that has to be lugged around." These are prejudices that workshops can at least put into perspective.

But by just differentiating all the various kinds of hybrids, a little more light can be shed on the subject. Because the word hybrid covers so much. It describes the interaction of two different types of equipment. A hybrid vehicle drive is therefore one in which two different engines can power the vehicle. This makes the question of whether so-called micro-hybrids are really hybrid vehicles superfluous. The answer is no, at least not in relation to driving. And a definite 'yes and no' for the electric drive with range

extender. It falls under the term serial hybrid because the wheels are driven by a single engine.

The situation is different with the three parallel hybrid types: mild, full and plug-in. Nevertheless, there is still plenty of room for confusion, not least because of the very different designations used by manufacturers. There is also diversity in the technical implementation, for example in the type and arrangement of the electric motor, the battery size, the charging and of the vehicle electrical system voltage. The only common feature of the usual drive hybrids we see today is the combination of combustion engine and electric engine. Which species the vehicle ultimately belongs to depends on what and how much each of these engines can do.

Mild hybrid – electrically assisted combustion engine

Even in the mild hybridisation variant, only one of the two engines, namely the combustion engine, is responsible for the

The starter alternator integrated between the engine and transmission can basically do more than its name suggests – it can also drive.



Photo: Mercedes-Benz

drive. A small electric engine essentially provides support, for example when starting, moving off for the first few metres or when accelerating. A tried-and-tested move by manufacturers for the strategic downsizing of the combustion engine used, thus opening up the possibility of operating it in a window of more economical engine speed. It is even possible to temporarily switch off cylinders or the entire combustion engine for so-called coasting, as practised in the new Tiguan eTSI from Volkswagen.

A belt-driven starter-alternator (BSA), which is coupled to the crankshaft via a

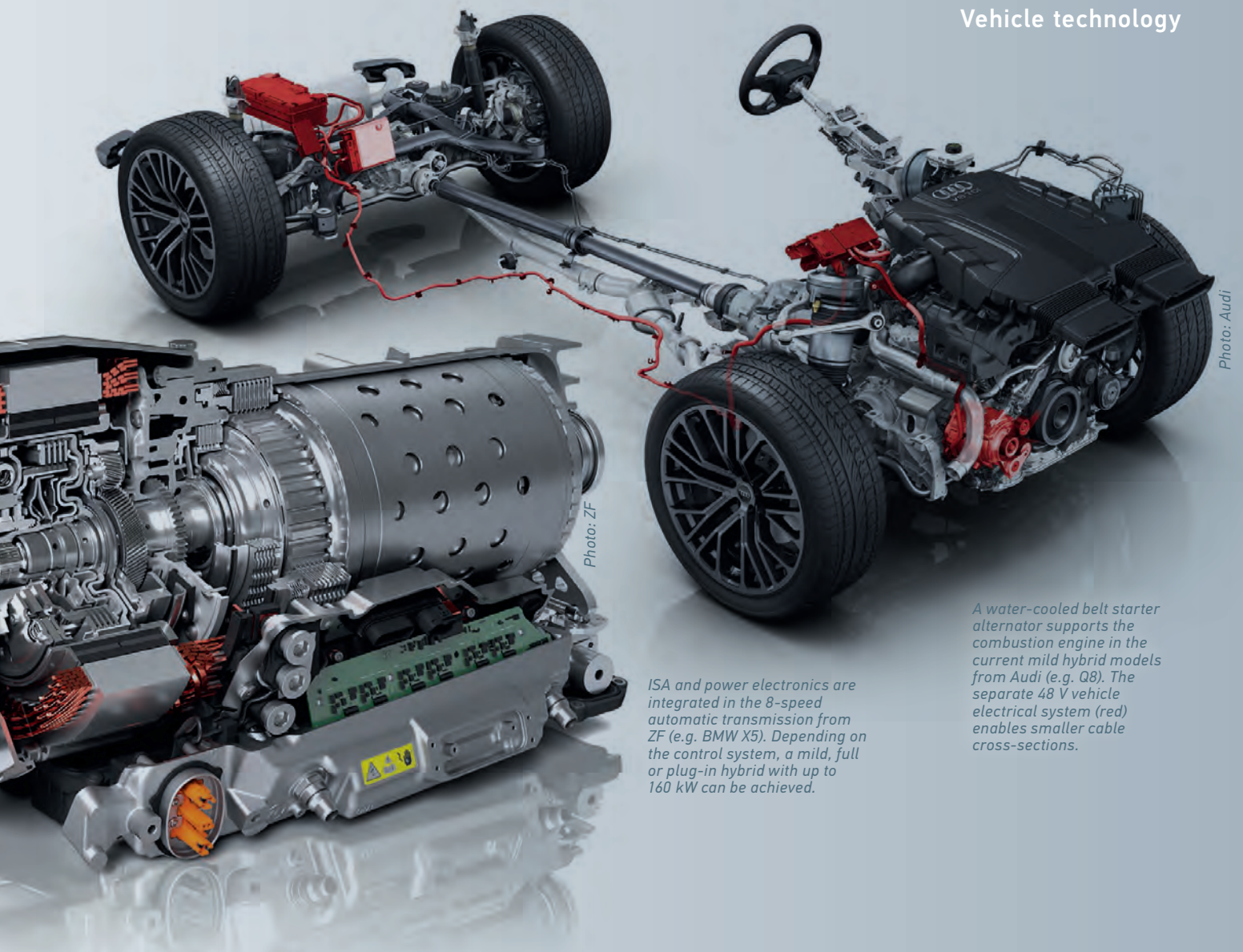


Photo: Audi

A water-cooled belt starter alternator supports the combustion engine in the current mild hybrid models from Audi (e.g. Q8). The separate 48 V vehicle electrical system (red) enables smaller cable cross-sections.

ISA and power electronics are integrated in the 8-speed automatic transmission from ZF (e.g. BMW X5). Depending on the control system, a mild, full or plug-in hybrid with up to 160 kW can be achieved.

Photo: ZF

ribbed belt as an external unit like an alternator, is sufficient for this type of e-support. With outputs of up to 14 kW, BSAs are air or water-cooled, depending on the manufacturer. However, performance-reduced ISAs (see p. 14) are also used, especially when models are also offered as full or plug-in hybrids. A 48-volt battery (rarely 12 V) serves as a storage unit to provide the energy generated while driving for starting and boosting the combustion engine. For work on mild hybrids with dual-voltage vehicle electrical systems, i.e. 12/48-volt, the law does not require workshop employees to have a high-voltage qualification, as voltages below 60 volts DC or 30 volts AC are considered to be low-voltage in cars.

Full hybrid – sometimes combustion engine, sometimes an electric one

A fully-fledged hybrid, i.e. a full hybrid, can do much more than a mild hybrid, but works according to the same parallel drive principle, in other words the combustion engine and the electric engine both act individually or together on the drive shaft.

Excess energy generated while driving is buffered in a high-voltage battery (300 to 600 V), which is also its only charging option.

The cross-brand and internationally common designation **HEV (Hybrid Electric Vehicle)** covers vehicles in which the electric engine is also capable of moving the vehicle in the flow of traffic. With a typical full hybrid, all-electric driving is possible up to a range of approx. 50 km. But what and how much the electric engine hybrid really has to achieve to be worthy of

the HEV designation is not stipulated anywhere. Depending on the conceptual objective set for each individual vehicle, there are considerable differences in the design of the components. These variations are governed by the make and the model. They become apparent under load, for example, because when the electric engine or battery reach their limits, the system switches quickly and automatically to the combustion engine. The larger torques required for electric driving cannot be transmitted via a belt drive, i.e. a BSA. However, they can via the



In the new Tiguan eHybrid, VW uses an advanced 6-speed DSG with an integrated 85 kW electric engine.

Photo: VW

starter alternator (ISA), integrated into the drivetrain, which is also known as the crankshaft starter alternator (CSA). This is installed either on the crankshaft output instead of the flywheel or directly after the clutch or on the transmission input shaft. The latter variant has the additional advantage that the drag torque of the combustion engine is eliminated in electric mode.

Thanks to the increasingly compact design of the electric engine, which is positioned in a ring around the crankshaft output, it is now possible to integrate it into the drivetrain so that it is barely visible from the outside, in some cases even directly in the transmission. On

longitudinal engines, this is under the clutch bell housing, on transverse engines with dual-clutch



ZF has been building a classic ISA that fits between the engine and transmission since 2008.

gearboxes (DSG) in the housing. So much for the visual misconception of some end customers that the hybrid vehicle contains two separate, heavy engines, each positioned in its own housing. The truth of the matter is that the layman will not discover an electric engine in the full hybrid.

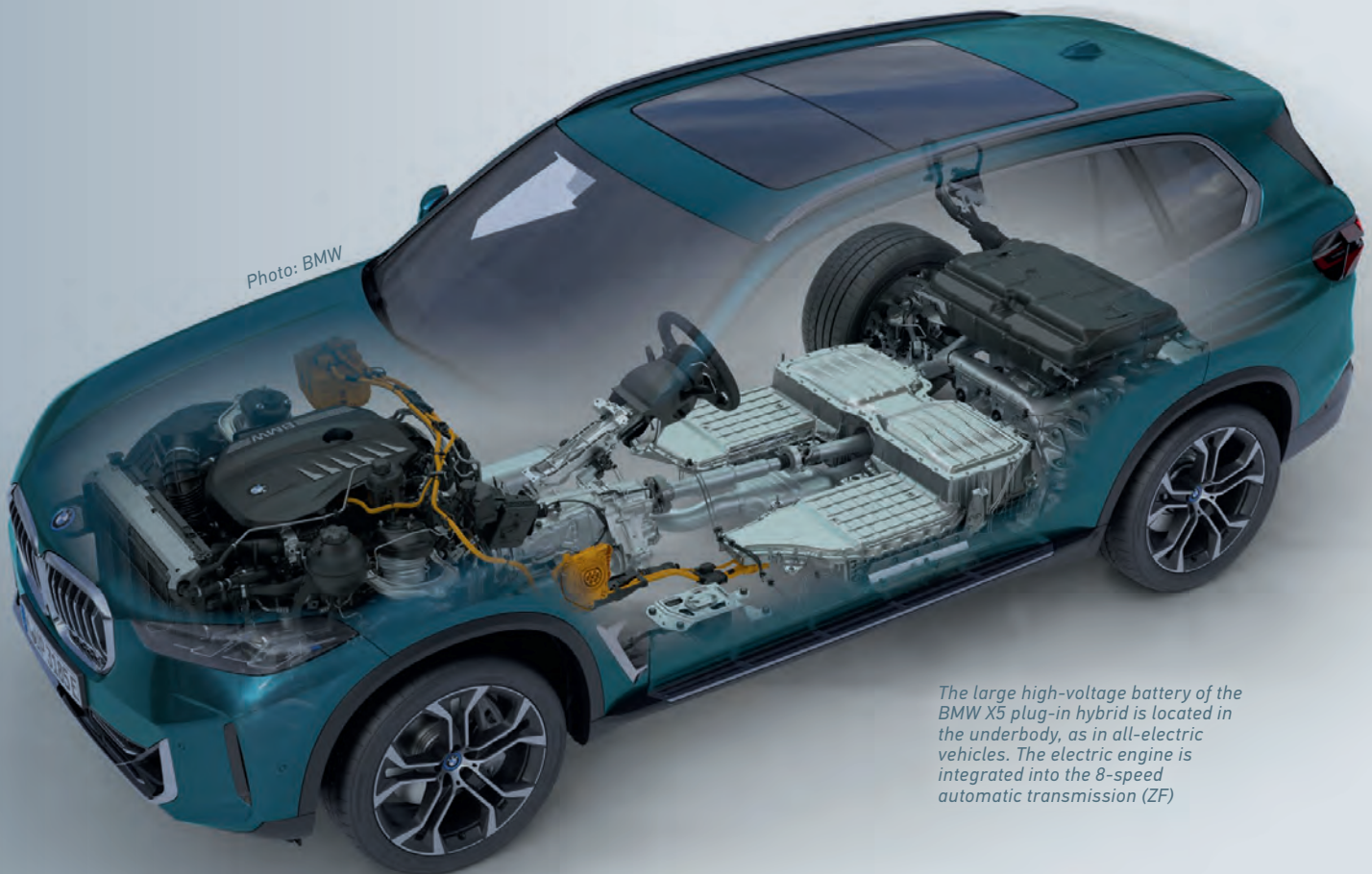
Plug-in hybrid – full hybrid with socket connection

The desire for more range in electric mode can only be fulfilled with comparatively larger high-voltage batteries and has thus brought the **PHEV (Plug-In-Hybrid Electric Vehicle)** onto the scene. These high-voltage batteries with a storage capacity of around 20 to 30 kWh are often located in the underbody, as is the case in purely electric vehicles (BEV). And these want to be charged. This explains the main difference to the full hybrid: the plug-in charging option that gives the vehicle its name. The vehicle's own charger makes this possible. According to the manufacturers, current PHEVs can already cover around 100 to 120 km under electric power. But for long distances, in any case, the combustion engine has to kick in.

However, we are currently experiencing an increasing reticence as regards the buying of PHEVs. In addition to the loss of state subsidies, the high price and the considerable additional weight of the vehicles are having a negative impact. It has also been recognised that the running costs and the CO₂ footprint of PHEVs are heavily dependent on the driving styles. The PHEV can only score points if the majority of journeys are within the electric range. Nevertheless, it is regarded as a transitional technology to the BEV, so that even vehicle manufacturers who have been rather hesitant to date are adding new plug-in variants to their model portfolios.

In any case, manufacturers' marketing strategies remain flexible. One such example is when plugless parallel hybrids are presented in a particularly user-friendly light as 'self-charging'. BMW, on the other hand, declares the following with pride: "All our hybrids can also be charged at the socket." In other words, you won't find a full hybrid without a connector with the Bavarian car makers.

Only time will tell whether hybrid drives and indeed which of their technical constellations will make it into the future.



The large high-voltage battery of the BMW X5 plug-in hybrid is located in the underbody, as in all-electric vehicles. The electric engine is integrated into the 8-speed automatic transmission (ZF)

Photo: Mercedes-Benz

Photo: BMW

Specialists for high-tech tasks

CheckPoints are specialists from whom other workshops can also benefit – and soon they will also be able to meet special challenges revolving around electric vehicles.



High-tech equipment to really showcase: the aet-CheckPoint in Reutlingen is also a competent point of contact for other workshops.

With all the CheckPoint specialist knowledge, first-class workshop equipment, remote setups to the Hella Gutmann headquarters and thanks to the right connections to the manufacturers, even difficult tasks can be mastered. Tasks for which the typical independent multi-brand workshop often lacks the time and the necessary routine, so that the only unwelcome solution is to go to the authorised dealer workshop in question. "Not true," says Martin Muffler, Head of CheckPoint at Hella Gutmann. "At least if one of our CheckPoint partners is based in the region."

There are now around 70 such automotive businesses with the CheckPoint label, workshops that are particularly committed and that are found spread out across Germany and its neighbouring countries. Very often, but not always, these are body and paint shops whose particular challenges are naturally characterised by a wide variety of brands and also by extremely young vehicles brought in by their customers. Today it is no longer possible for workshop businesses to limit themselves to classic bodywork. Diagnostics,

component coding, basic settings and calibrations in accordance with the manufacturer's specifications are, of course, all part of everyday life. Just think of the networked functions that are now integrated into the exterior mirrors alone.

Permanent service provider for others

These CheckPoints always offer their services to other independent garages without any 'ifs and buts', whether it's a matter of adjusting and calibrating a Matrix lamp, activating software and components or carrying out a particularly difficult diagnosis. This gives rise to a pleasant and comparatively flexible alternative to the service provided by a car brand dealership. No worrying about getting an appointment at short notice, no cost levels that make it almost impossible to pass on to the end customer. On the contrary, we're talking good cooperation and good service at a fair fixed price. Why not give it a try?

NEW: CheckPoint with e-expertise

Slowly but surely, a new challenge is coming to independent garages:

the manufacturer's warranty is expiring on more and more hybrid and electric vehicles and these are then turning into second-hand cars. Even a workshop that was previously well positioned thanks to good workshop equipment such as mega macs, macsRemote and the occasional assistance from the Technical Call Centre usually still lacks the routine – at least for tasks that require the highest high-voltage qualification of 3S.

However, it is becoming increasingly important to be able to offer end customers all-round e-services. Therefore active and committed CheckPoints will become an increasingly important point of contact when it comes to covering this range of services. The new CheckPoint e-expertise quality seal is associated with cross-brand, high-voltage expertise at the highest level.



Where the nearest CheckPoint is located, and which services are available there can be found easily and without obligation on the website. **www.checkpoint-hella-gutmann.com**



The range of services includes maintenance and calibration of emissions measuring devices.

A growing network of mobile technicians provides cross-brand service throughout Germany

Keeping workshop downtime to a minimum and providing support and a high quality of service and products where regional technicians reach their limits. This is the guiding principle followed by TecMotive's mobile technicians. They travel all over Germany every day to do this.

Calibration of lamp adjustment stations in accordance with DAkkS (German Accreditation Body).

Whether it's a question of device calibration, maintenance or professional product instruction: the specialists take on special orders for work that cannot or may not be carried out by a workshop's own personnel. Technical services include assembly, maintenance, calibration and repair of workshop equipment. They relate not only to devices of different brands, but also to workstations that comply with guidelines, for example those dealing with lamp

adjustment, exhaust gas testing, wheel alignment/chassis measurement or ADAS calibration.

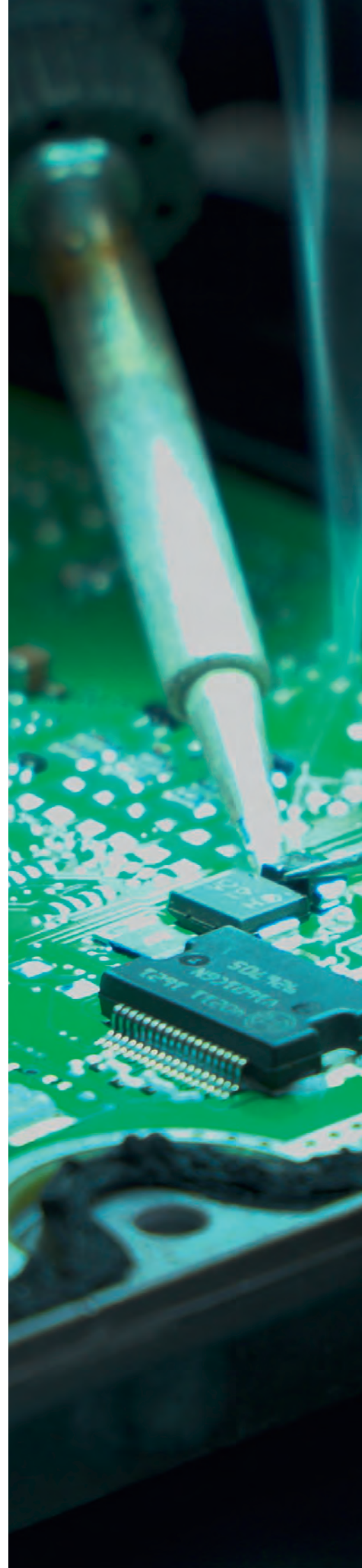
Maintenance and certified inspection of CSC tools

TecMotive offers a service that may well be unique in Germany especially for the quality assurance of ADAS calibration tools including maintenance, adjustment and certified verification of measurement accuracy. In close cooperation with certified partners, TechMotive also performs complete workshop audits if required, in addition to approving test stations in accordance with guidelines.

It goes without saying that, as a wholly-owned Hella Gutmann subsidiary, TecMotive also fulfils the tasks typical of traditional factory customer service for Hella Gutmann products. On request, TecMotive technicians are available to assist users and retailers step-by-step – from working together on assembly right up to giving instruction on the correct and safe use of devices, rail and ADAS calibration systems.



More at
www.tecmotive.com



Having it repaired instead of throwing it away

That really pays off: professional repair service for electronic components such as infotainment/navigation, dashboards and control units

faurecia clarion
ELECTRONICS

Modern vehicles contain a huge amount of electronics and this continues to increase. A growing potential for sources of error, especially in older vehicles. Defective electronic parts are usually only replaced, because replacing is easier than repairing. But sustainability works in a different way.

Then there's the cost aspect. On average, the repair service for electronic components such as infotainment, dashboards, control units etc. is around 50 to 80% cheaper than the new part – provided, that is, that the new spare part is available. In an age of scarce resources and disrupted global supply chains, it is unfortunately not uncommon for spare parts for vehicle repairs to be unavailable.

Then it's good to have a competent partner at hand, someone who can carry out a professional repair of electronic components. Clarion, a company in the FORVIA network, specialises in such repairs and can offer its services to international workshops. A national telephone contact is of course available for enquiries from Germany, Austria and Switzerland. However, online commissioning is faster and available 24/7. Simply check out the fixed price on the website, order the repair online and

hand over the device to the courier sent by the repair service. Thanks to binding fixed prices, independent of the actual defect and spare part costs, the end customer can be informed of the price immediately.

Good value for money – satisfied customers

A high level of specialisation, an excellent stock of around 15,000 components that are always available and a team of more than 30 highly qualified technicians at the Clarion Repair Centre enable high-quality repairs to be carried out at short notice. In total, more than 30,000 repairs are carried out each year. So as to foster customer satisfaction, repairs are mostly carried out above and beyond the obvious defect. Once the housing is opened, other parts and components that tend to fail over time are also replaced if necessary. The result is a professionally remanufactured component that is as functional as a new replacement part. Clarion provides additional assurance with a 24 months' warranty on all repairs.

The process of commissioning a repair job could not be simpler: check out the fixed price on the website, order the repair online and hand over the device to the courier sent by the repair service.



For detailed information with coverage lists, simply scan or check out details at www.reparlab.com/de



Step 01
Online repair request



Step 02
Same day pickup of the product by UPS. For applications submitted before 12 p.m.



Step 03
Receipt of the device in our repair workshop in the north-east of France



Step 04
Repair, calibration and control



Step 05
Return the repaired device to the dealer.



Step 06
Reinstallation of the product in the car, 24 month guarantee!

REPAIR PROCEDURE

Most repairs are completed within a few days, including the transport times organised by Clarion. In particularly urgent cases, an express service can also be requested.

HELLA ACADEMY

The knowledge workshop



Technical training courses. From the workshop for the workshop. Now at 5 locations.

There is something for everyone in the HELLA Academy training programme. Perhaps even in your area, as a fifth location has just been opened in Nuremberg. The HELLA Academy's technical training courses are made by practitioners for practitioners and are, of course, constantly adapted to changing needs.

An overview of all training courses with detailed content descriptions and requirements can be found on the website **www.hella-academy.com**. After registering for free, registered users can view the training calendar, book their chosen training course online and even manage all of their workshop team's further training measures. Alternatively, the training team is available in person at training@hella-gutmann.com or by telephone at the following number: +49 7668 99 00-888.

The complete range of training courses is offered at the HELLA Academy headquarters in Erwitte. Selected training courses are also available in Potsdam, Reutlingen, Regensburg and Nuremberg. As at the Erwitte location, experienced trainers from HELLA and Hella Gutmann share their expertise with participants at these venues.

Because of the high demand, more high-voltage training sessions for HV 1S, HV 2S and HV 3S qualifications are currently being scheduled. The content of these courses is based on the DGUV guideline (German Social Accident Insurance) in force since January 1, 2022.

HYBRID & HIGH-VOLTAGE – FUP IN GERMAN = COMPETENT AND TRAINED PERSON (1S)

The 3-hour HV 1S online training course plays a special part, as this qualification leading to the status of (FUP), a 'competent and trained person', can be acquired without having to travel anywhere. No previous completed vocational training is required for students wishing to take part.

HYBRID & HIGH VOLTAGE – EXPERTISE IN HV TECHNOLOGY IN A DE-ENERGISED STATE (2S)

The 2-day classroom training with many practical exercises on various kinds of vehicles is reserved for people with basic knowledge of automotive electrics. The main topics are:

- Basics of electrics/electronics
- Components found in HV technology
- Hybrid technologies
- Hazards, first aid and protective measures
- Responsibility and labelling requirements
- Disconnecting from the voltage

HYBRID & HIGH VOLTAGE – WORKING ON LIVE HV COMPONENTS (3S)

Requirements for participation in this 3-day classroom training course with many practical exercises on various kinds of vehicles are a minimum age of 18 years, the 2S qualification, a medical examination certificate (G 25) and first aider training. Topics of this course include:

- Protective measures against electric shocks and fault arcs
- Tools, protective, testing and auxiliary equipment
- HV concept and vehicle technology
- Working on live HV systems



More at **www.hella-academy.com**

Good to know

HELLA range of starters and alternators, also for non-road vehicles

HELLA has been a reliable partner for starters and alternators to workshop customers worldwide for more than 35 years. With more than 1,500 part numbers for cars and commercial vehicles, the range achieves an impressive total coverage of over 85%. All starters and alternators are available exclusively as new HELLA parts without a core deposit and are clearly labelled with the same extra info in the online catalogue. They combine the advantages of easy handling with proven quality: by dispensing with the core deposit system, old parts no longer have to be returned. And at the same time, these starters and alternators meet the high quality requirements of the HELLA Competence Centre.

New to the range are now starters and alternators for the so-called 'off-highway' vehicles, which are used away from public land and roads. These include agricultural vehicles such as tractors and harvesters, construction machinery such as tracked or crawler vehicles, excavators, wheel loaders, skid-steer loaders and cranes, industrial trucks such as forklift trucks and telescopic forklift trucks, and the entire marine segment with yachts, ships and boats.



Further information here and at www.hella.com/startersalternators



New parts without a core deposit – now also for off-highway vehicles

Carry out a virtual test and then buy with confidence

New online Eliver tool for auxiliary lamps and work lamps from HELLA

With the revised online comparison tool ELIVER for auxiliary lamps and work lamps, nobody is left in the dark any more; because what could be more

useful than trying out the lamp of your choice in advance in a realistic environment on the road or off-road or in a field or in a meadow?

So, for example, the various models of the HELLA VALUEFIT Blade auxiliary lamps with the central blade can be experienced on the screen or on a mobile device. On offer are the stylish LED auxiliary high beam lamps with the reference number 25 or 50 and also the position light in white or white/amber in sizes 7" and 9", either round or square. The round designs are also available with either a chrome or black housing. Such options give you the freedom to create your own

individual look, but don't forget, you're going to be spoilt for choice.

These difficult choices between a total of 18 models of the HELLA VALUEFIT Blade series alone, and also all the other auxiliary lamps and work lamps from HELLA have been minimised since the relaunch of the online Eliver tool because now the light distributions can be simulated even more easily with just a click. A practical function for comparing two lamps is also available. The result is that exactly the right model can be found for everyone's individual vehicle.



The Eliver tool can be accessed via www.hella.com/eliver and can be used straight away.





TRACKING DOWN THE FAULT

Providing workshops with efficient support when they are troubleshooting customer vehicles is a given at Hella Gutmann. With state-of-the-art, manufacturer-specific expertise, the team of experts, made up of around 90 people from the Technical Call Centre, takes at least 2,000 workshops a day through to a solution using remote diagnostics.

Workshops submit their queries on the telephone or by using the automatic mega macs help program, and are confident in the knowledge that they will be successfully and reliably guided through the repair procedure.

Here are two recent examples from the exciting day-to-day working lives of our Hella Gutmann experts.



Lots more troubleshooting can be found every month in the Hella Gutmann newsletter. Register for this now at www.hella-gutmann.com/newsletter



Diagnostics case # 39

OPEL INSIGNIA-B 1.6 16V CDTI

with engine identification letter D 16 DTH (LVL), year of construction 2019



Photo: Opel/Vauxhall

TRANSFERABILITY: All Opel models with this engine.

PROBLEM: The oil pressure warning lamp was activated at times.

ERROR CODES: Error P0523 'Engine oil pressure sensor – circuit faulty' was stored in the engine control unit.

WORKSHOP MEASURES: A check of the cabling between the oil pressure sensor and the engine control unit and also measurement of the oil pressure did not reveal any faults, so only the oil pressure sensor was replaced. But during the subsequent test drive, the warning lamp came on once again. Also the same error code was saved in the control unit. Replacing the oil pressure switch, the oil pump and the oil pressure control valve did not resolve the problem.

EXPERT TIP: As all potential mechanical causes have been ruled out, the fault can only be electrical – in the worst case, a fault in the engine control unit. Then a temporary interruption of the control of the oil pressure control valve or contact resistance in the cabling could both be possible. For this reason, the cabling and the voltage and ground supply of the engine control unit should be checked again carefully.

TROUBLESHOOTING: The mechanic found what he was looking for in the voltage and ground supply for the engine control unit. After cleaning and preserving the heavily corroded ground screw connection on the left-hand suspension strut dome, the fault did not recur.

CONCLUSION: It is not clear why the faulty ground supply for the engine control unit only led to a fault with the oil pressure, but it shows that such fundamental causes of faults should always be taken into consideration.



D

Diagnostics case #40

RENAULT TWINGO-III 0.9 TCE

with engine identification letter H4B, year of construction 2016



Photo: Renault

TRANSFERABILITY: All Renault Twingo-III with H4B engine.

PROBLEM: Lack of power and activated engine warning lamp while car is being driven.

ERROR CODES: The errors DTC 22D277 'Boost pressure system – incorrect air flow in system' and DTC 226322 'Boost pressure control – control deviation' were stored in the engine control unit.

WORKSHOP MEASURES: After deleting the error memory, a test drive was carried out to view the parameters in the engine control unit. The value of the boost pressure sensor deviated sporadically from the target boost pressure. The same errors were also saved once again. All boost pressure hoses and the charge air cooler were checked for leaks but had no results.

EXPERT TIP: The arrangement of the engine above the rear axle causes water spray to swirl around. Sooner or later, this leads to a deterioration of both the mechanical and electrical components of the turbocharger. As a result of corrosion on the rod, the control rod can no longer be moved freely by the boost pressure actuator. Water can also penetrate the plug connections of the turbocharger and lead to contact resistances or short circuits. In the best case, the connectors can be cleaned and the rod made operational again. In the worst case, the charger must be replaced, as the boost pressure control unit cannot be replaced on its own. We also recommend fitting a splash guard to the rear axle.

TROUBLESHOOTING: The inspection of the charger revealed exactly those defects described here. By cleaning the components, it was possible to avoid replacing the charger.



DID YOU KNOW?

In our online document library, you will find manuals, data sheets, instructions, coverage lists and much more!

Knowing where, for example, means finding out which vehicle models, including e-vehicles, are included in the current mega macs software and which new ones have been added, or which secured vehicles can be easily diagnosed thanks to CSM.

The website www.hella-gutmann.com/de/manuals#54 has a comprehensive library of manuals, data sheets, references and lists for Hella Gutmann diagnostic devices, tools, software and more. In the selection screen, simply select under "Country" Germany and under "Media type" the required information and download it with a click. The range of media is listed alphabetically in German and extends from A as in "Abdeckungslisten" (cover lists) to W as in "Wartungslisten" (maintenance lists).

- Instructions
- Assembly instructions
- Cyber Security Management (CSM)
- Safety data sheets
- Software
- Software news
- Tolerance lists
- Maintenance and adjustment
- Important information

Example 1: Under Cyber Security Management there are instructions on how to create a new user account on the various mega macs devices.

Example 2: The current coverage list of the secured vehicle models that can be unlocked for free by mega macs is under Coverage lists.



Our recommendation:
simply take a look!



D

Win a SoftyBag from HELLA!



In this issue, we are giving away **10 iconic SoftyBags from HELLA**. Whether you want to enjoy spring, simply chill out during your lunch break or watch the matches of the upcoming European Football Championship, the SoftyBag will be your favourite companion when you are looking for effortless relaxation.

The SoftyBag fills up in seconds. Simply move the bag through the air a few times with sweeping strokes and then seal the buckle.

Enjoy...

Taking part is as easy as pie, as always: answering the 4 questions correctly reveals the solution we are looking for. Our tip: the answers can all be found in this Matrix. Observant readers should be able to easily put together the right letters. Simply send your solution with the subject line **"Matrix 01-2024 Gewinnspiel"** and your full address, phone number, date of birth and email address to gewinnspiel@hella-gutmann.com!

The closing date for entries is **June 1, 2024**.

The correct solution for the competition in the 02-2023 Matrix issue was: **SERMI**. All winners have been notified in writing.

Good luck!



QUESTION 1

What is the topic of the next HELLA webinar?

- Electromobility (P)
- Starters and alternators (I)
- Thermal management (A)

QUESTION 2

When does the obligation of manufacturers regarding SERMI start to apply in Germany?

- Januar 1, 2024 (O)
- April 1, 2024 (H)
- Januar 1, 2025 (B)

QUESTION 3

The electrification of the combustion drive to a mild hybrid takes place

- always via a belt starter alternator (BSA) (R)
- mostly via Integrated Starter-Generators (ISG) (C)
- depending on the vehicle manufacturer via RSG or ISG (E)

QUESTION 4

A Battery Quick Check is carried out exclusively

- in a stationary state with any diagnostic tester (Z)
- in a stationary state via mega macs X and go-e wallbox (V)
- by recording while driving (M)

Solution:



You must be 18 or over to participate in this competition. We assume no liability for the accuracy of this information. The judges' decision is final. Personal data is only transmitted for processing the competition and for notifying the winners. All data submitted to us will be deleted after the competition has been finalised. By taking part in the competition, the participant agrees to this arrangement.

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