



RESCUE GUIDELINE.

FOR BMW PLUG-IN HYBRID VEHICLES.

**BMW
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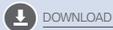
EDITORIAL.

In the future, BMW will be offering many series that include plug-in hybrid models, which feature both an electric motor and an internal combustion engine, thus combining maximum performance with low consumption. The energy required by the electric motor is supplied by a high-voltage battery. With the percentage of plug-in hybrid vehicles on the rise, it's safe to assume that you, the emergency crews, will be recovering more and more vehicles with high-voltage batteries following an accident. This Rescue Guideline plays a key role in ensuring you're well prepared for situations such as these.

The German Association of the Automotive Industry (VDA) has drawn up a list of key recommendations for on-site emergency team operations. This list addresses general questions relating to the potential dangers of vehicles with high-voltage systems. However, as with conventional vehicles, different models have different requirements. This also applies to high-performance BMW plug-in hybrid vehicles, which combine the benefits of electric motors with those of internal combustion engines. We'll explain what that means exactly and what the resulting recommendations are for you. You can rest assured that our engineers take the safety of emergency crews into account when developing all of the BMW plug-in hybrid vehicles.

Working closely with many experts, we developed two documents that are crucial to how you behave at the scene of an accident: the Rescue Manual and the Rescue Data Sheet.

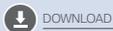
Both documents are available for download free of charge at the bottom of the page of the following Web sites:



DOWNLOAD

<https://oss.bmw.de/index.jsp>

The VDA answers frequently asked questions. The most up-to-date version can be downloaded at the following address:



DOWNLOAD

<https://www.vda.de/en/topics/security-and-standards/rescue/rescue-recovery-vehicles-with-high-voltage-systems>

We have also developed this Rescue Guideline to supplement these documents. Using the plug-in hybrid model of the BMW X5 as an example, this manual introduces the basic principles behind the BMW plug-in hybrid vehicles and their key safety aspects. Please use this manual to obtain a general overview. The Rescue Data Sheet and Rescue Manual contain detailed and binding instructions for what to do in concrete situations involving an accident, which we hope are infrequent.



CONTENTS.

The following chapter introduces the principles behind BMW plug-in hybrid vehicles using the BMW X5 xDrive40e as an example, after which you will find an overview of the safety aspects that are relevant to you, the emergency crews. The various tasks are depicted in the context of an accident:

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1.

BMW PLUG-IN HYBRID VEHICLES.

DIFFERENT VEHICLES, ONE PRINCIPLE: SAFETY FIRST.

BMW plug-in hybrid vehicles combine the benefits of internal combustion engines with electric motors. The result is unrivaled efficiency with exceptional performance. The energy required for the electric motor is stored in the high-voltage battery, which can be conveniently charged at home or on the go with a charging cable. The battery is also charged through recovery of braking energy during the drive, which occurs, for instance, when the driver releases the gas pedal or applies the brakes and the movement of the vehicle generates excess energy.

The high-voltage system is intrinsically safe and, as a rule, automatically shuts off in the event of an accident, virtually eliminating electrical hazard. The system components are connected via orange high-voltage cables, making them recognizable at first glance.

THE RESULT: BMW plug-in hybrid vehicles are also setting new benchmarks in terms of safety.



BMW PLUG-IN HYBRID VEHICLES: A FAMILY WITH PLENTY OF RELATIVES.

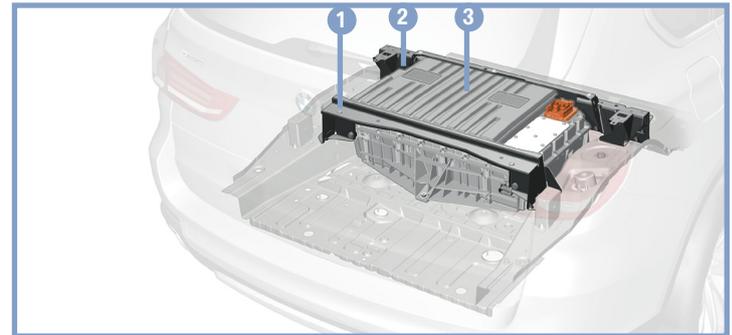
From sports cars to sedans and SUVs, the range of BMW plug-in hybrid vehicles is constantly growing. All of the models are constructed differently, requiring a unique positioning of the high-voltage battery in each. On the following pages, we'd like to show you how to locate the high-voltage battery using the BMW X5 xDrive40e as an example.

1. LOCATING THE HIGH-VOLTAGE BATTERY.

In BMW plug-in hybrid vehicles, the high-voltage batteries are usually located as deep in the luggage compartment as possible, as is the case with the BMW X5 xDrive40e. This offers several advantages: all of the space in the luggage compartment can be used and the low center of gravity improves driving behavior. This also has a positive impact on safety.

The vehicle architecture may demand that the battery be installed below the floor assembly or behind a bulkhead in the luggage compartment.

In the BMW X5 xDrive40e, the battery is located under the luggage compartment cover. Another two 12 V batteries may also be installed in the vehicle.



In the BMW X5 xDrive40e, the battery is located under the luggage compartment cover. In sedans and coupes, the high-voltage battery may be installed in other locations, including above the rear axle.

- 1** UPPER REAR CROSSBEAM.
- 2** UPPER FRONT CROSSBEAM.
- 3** HIGH-VOLTAGE BATTERY UNIT.

BMW PLUG-IN HYBRID VEHICLES.

2. EXTERNAL INDICATORS.

BMW plug-in hybrid vehicles can be identified from the outside through an additional “fuel tank cap,” which conceals the charging socket. Additional lettering may also be a visible sign that it’s a vehicle with an electric motor.



The key indicator that it’s a plug-in hybrid vehicle is the charger socket lid at the front on the left-hand side **1**. In the case of the BMW X5 xDrive40e, the “eDrive” lettering is visible at the rear **2** and on the housing of the internal combustion engine **3**. The front side doors bear the model designation “xDrive 40e” **4**, if not excluded at the request of the customer.

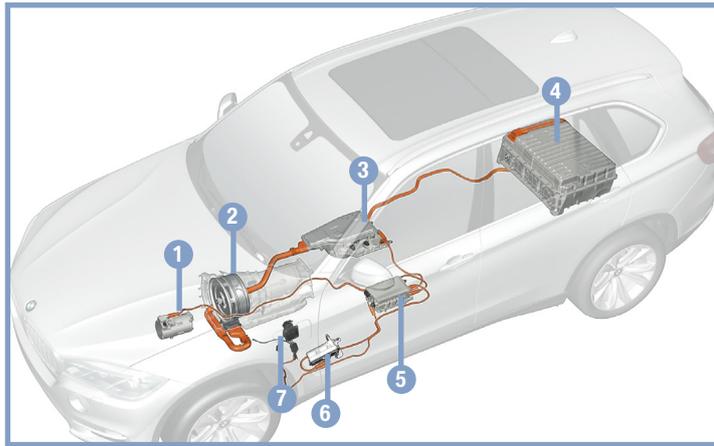


There are also a few features inside the BMW X5 xDrive40e that reveal that it’s a plug-in hybrid vehicle: the “eDrive” lettering on the plaque **A**, e-Drive button **B** as well as the door sill panel **C**.

THE HIGH-VOLTAGE BATTERY. DEVELOPED BY BMW. FOR GREATER SAFETY.

The high-voltage battery provides the electric motor and other components such as the starter generator and the air-conditioning compressor with the energy they require. Unlike many other manufacturers, BMW develops its own batteries, thus ensuring greater safety and exceptional performance and seamlessly combining driving dynamics and sustainability.

The high-voltage battery is installed at various locations in BMW plug-in hybrid vehicles, always with the aim of protecting it from external influences. This increases the safety of the occupants and the emergency crews.



- 1 ELECTRIC AIR-CONDITIONING COMPRESSOR.**
- 2 ELECTRIC MOTOR.**
- 3 ELECTRICAL MACHINERY ELECTRONICS.**
- 4 HIGH-VOLTAGE BATTERY.**
- 5 CONVENIENT CHARGING ELECTRONICS.**
- 6 ELECTRIC HEATING.**
- 7 HIGH-VOLTAGE CHARGER SOCKET.**

The typical construction of a BMW plug-in hybrid vehicle using the BMW X5 xDrive40e as an example. The location of high-voltage components may vary depending on the vehicle architecture.

PLUG-IN HYBRIDS ARE RELATIVELY NEW. THE PROCEDURES ARE WELL KNOWN.

The innovative BMW plug-in hybrid systems combine two high-performance drives: a powerful electric motor with lithium-ion high-voltage battery and a new generation of internal combustion engines. What that means for you, the emergency crews: in addition to new safety indications for electric vehicles, the well-known guidelines for dealing with conventional vehicles with internal combustion engines also need to be followed. We have compiled the aspects that are relevant to you in this manual.

SUMMARY: MODERN PLUG-IN HYBRID VEHICLES ALSO TAKE SAFETY ONE STEP FURTHER.

BMW plug-in hybrid vehicles combine two drives: an electric motor and an internal combustion engine. The way in which the two units work together is extraordinary. The resulting requirements for you, the emergency crews, are not. That's because the associated procedures are much like those of the tried-and-true hybrid vehicles, which have been around for years.

There are of course new aspects to be taken into account when it comes to the BMW plug-in hybrid vehicles. But you can rest assured that, when it came to developing these highly efficient vehicles, safety took top priority from the very start – not only for the occupants, but also for you, the emergency crews.



2.

OVERVIEW OF THE BMW PLUG-IN HYBRID VEHICLE SAFETY FEATURES.

BMW PLUG-IN HYBRID VEHICLES OFFER BOTH OCCUPANTS AND EMERGENCY CREWS MAXIMUM SAFETY.

Although BMW plug-in hybrid vehicles feature many driver assistance systems, they can still be involved in an accident. So what does that mean for you? Will there be any risks involved during rescue, recovery, and extinguishing operations? Can an electrical, thermal, or toxic hazard ever be completely ruled out? On the following pages, we would like to provide you with answers to key questions.

Even before their market launch, BMW plug-in hybrid vehicles demonstrated a high level of safety for occupants and rescue crews in extensive tests. So you can rest assured that

BMW PLUG-IN HYBRID VEHICLES ALSO OFFER EMERGENCY CREWS EXCEPTIONAL SAFETY.



ELECTRICAL HAZARD. DON'T BE AFRAID TO TOUCH.

You may be wondering whether you're at risk of an electric shock when touching BMW plug-in hybrid vehicles after an accident. Because safety was a top priority from the outset when designing the vehicle, you can rest assured that the system is safe to touch:

BMW plug-in hybrid vehicles are intrinsically safe, which means that the system switches itself off in the event of an accident. At the same time, the cables outside of the high-voltage battery and the components of the high-voltage system automatically discharge in just a few seconds. By the time you arrive at the scene of the accident, there will no longer be any electrical potential in the orange cables outside of the high-voltage battery. We've also taken other measures: the entire high-voltage system is self-contained.

THAT MEANS:

It's completely isolated and has no conductive connection to the body. Furthermore, all high-voltage components in the vehicle are positioned in such a way that they will only be damaged in the event of an extremely serious accident. Take, for example, the high-voltage battery, which is located at the rear of the vehicle and therefore outside of the crash zone for most accidents. Almost no external forces can affect it on impact. The battery modules are also positioned inside a housing, further increasing safety. All of these measures virtually exclude just about any risk for rescue crews like you, provided the relevant guidelines and protection measures are followed.

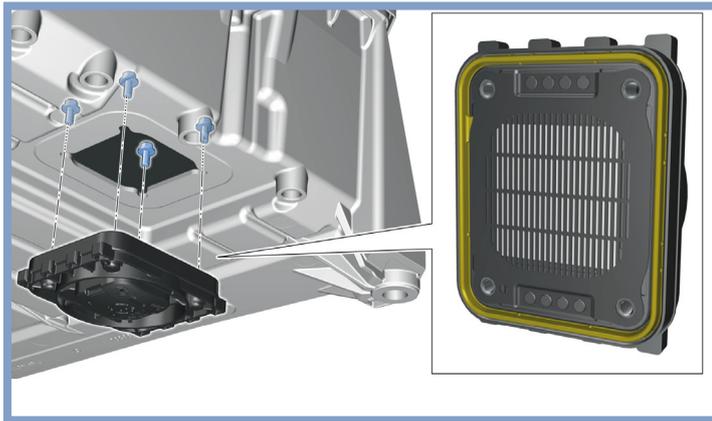
Regarding the general risk of shock associated with the high-voltage system, the German Association of the Automotive Industry (VDA) has clearly concluded that:



“There is virtually no risk of personal injury caused by an electric shock, though this is dependent on the type of accident.”¹

THERMAL HAZARD DUE TO THE HIGH-VOLTAGE BATTERY: AT LEAST AS SAFE AS CONVENTIONAL VEHICLES.

Safety played a key role in the development of BMW plug-in hybrid vehicles. A range of systems and measures that ensure safety in regular operation and in the event of a fire have been incorporated into the vehicle. The high-voltage system is designed to withstand accidents to a degree that exceeds what is legally required. The high-voltage battery has a variety of features such as the degassing unit that ensure controlled extraction of fire gases from the high-voltage battery.



Degassing unit ensures that fire gases are discharged from the high-voltage battery in a controlled manner.

LITHIUM-ION BATTERIES ARE ALSO SAFE IN THE EVENT OF A FIRE.

The renowned DEKRA Competence Center has this to say about the safety of electric and hybrid vehicles:

! “We’ve carried out extensive tests, including fire behavior, temperature development, formation of smoke, extinguishing options, and analysis of run-off extinguishing water and its effect on the environment. We have concluded that electric and hybrid vehicles fitted with lithium-ion electric vehicle batteries are at least as safe as vehicles with conventional drive systems in the event of a fire.”²

It’s safe to say that burning gasoline is worse than batteries when it comes to smoke and fire. The combination of an electric motor and a conventional engine therefore does not generally represent any additional risk. The German Association of the Automotive Industry (VDA) has concluded:

! “There is little to no risk of explosion associated with high-voltage batteries due to the corresponding safety technology.”³

HEALTH RISKS RESULTING FROM FIRE GASES: BURNING BEHAVIOR SIMILAR TO THAT OF CONVENTIONAL VEHICLES.

The same plastics are used in BMW plug-in hybrid vehicles as in other models in their range. There are therefore no significant differences in the burning behavior and extinguishing characteristics. As is the case with conventional vehicle fires, harmful gas mixtures are released and should not be inhaled. The general rule is therefore:

AS WITH CONVENTIONAL VEHICLES, PERSONAL PROTECTIVE EQUIPMENT AND BREATHING APPARATUSES SHOULD BE WORN.

SUMMARY: BMW PLUG-IN HYBRID VEHICLES ARE AS SAFE AS CONVENTIONAL CARS.

The materials used in the BMW plug-in hybrid vehicles are no different from those used in the models with an internal combustion engine. So it can be said that BMW plug-in hybrid vehicles are as safe as conventional vehicles.



3.1.

RESCUE.

ELECTRICAL HAZARDS.

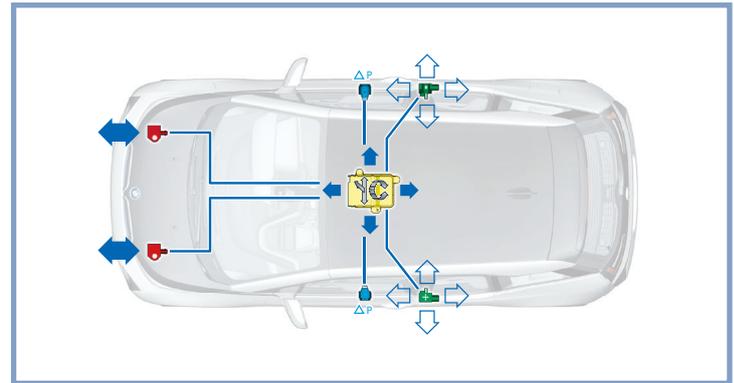
BMW PLUG-IN HYBRID VEHICLES OFFER THE BEST PROTECTION AGAINST DANGEROUS CURRENT THEMSELVES.

People don't always recognize the dangers of electrical current, since they can't smell, hear, or see it. So how can you be sure that you won't come into contact with electrical current in a BMW plug-in hybrid vehicle that has been involved in an accident? The vehicle itself offers the best protection, as it has already taken numerous safety measures on your behalf: the crash safety module instantly detects an accident. As a rule, the intrinsically safe high-voltage system automatically switches off in the event of an accident.

The battery and all of the other high-voltage components are labeled as high-voltage units. The connecting cables are generally orange, so that you, the emergency crews, can always see which components belong to the high-voltage system.

THE FIRST STEP IN PROTECTION IS RECOGNIZING AN ACCIDENT.

The crash safety module is a key element, permanently monitoring and evaluating all of the signals transmitted by the sensors installed in the vehicle. These not only instantly detect an accident, but also the direction of the crash and the strength of the impact. The air bags are also deployed as needed.



TRIPLE-SAFETY HIGH-VOLTAGE SYSTEM: SWITCH OFF, DISCONNECT, DISCHARGE.

The high-voltage system is intrinsically safe and, as a rule, automatically shuts off in the event of an accident. The high-voltage battery disconnects from the high-voltage system, ensuring no more electrical potential is present. At the same time, the cables and the components of the high-voltage system discharge in seconds. The entire high-voltage system is then discharged, virtually eliminating any electrical hazard.

- The high-voltage system is completely isolated and has no conductive connection to the body.
- As a result, you can generally touch the body without exposing yourself to the risk of electrical shock.
- The high-voltage battery is located inside a housing. It can be installed in a variety of locations, including the rear of the vehicle. It's generally positioned at a location where it's protected from shocks that could lead to critical internal damage.



DOS AND DON'TS.



Do not touch damaged high-voltage cables or components. The cables are always orange and located outside of the car interior.



When in doubt, call the relevant rescue coordination center for qualified electricians.

For more information, please refer to the Rescue Manual and the chapter entitled “RECOVERY” in this brochure.

SUMMARY: BMW PLUG-IN HYBRID VEHICLES INCLUDE MANY SAFETY FEATURES FOR AVOIDING RISKS.

A BMW plug-in hybrid vehicle is packed with innovative safety features. The system is completely isolated so that no electrical potential is connected to the body. The high-voltage system is also intrinsically safe and, as a rule, automatically switches off in the event of an accident. At the same time, the high-voltage system discharges in just a few seconds. By the time you arrive at the scene of the accident, there will usually no longer be any electrical potential left in the orange cables and high-voltage components.



3.2.

RESCUE.

PRACTICAL TIPS.

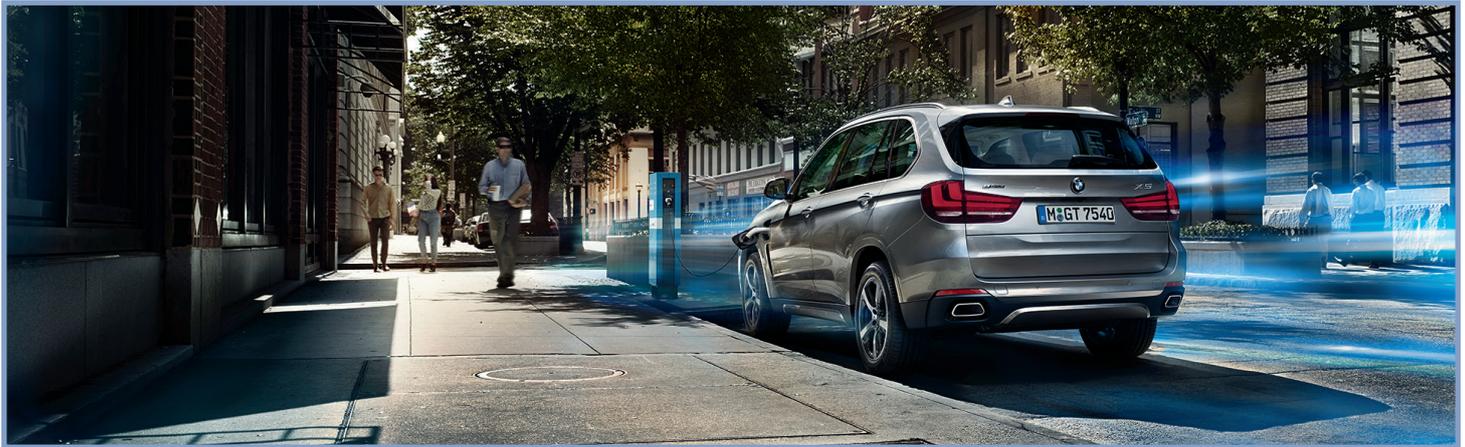
PRACTICAL TIPS.

BMW PLUG-IN HYBRID VEHICLES ARE NEW. BUT THE PROCEDURE FOR RESCUING OCCUPANTS IS TRIED AND TRUE.

Aside from your own safety, you do, of course, also have to focus on rescuing vehicle occupants. The general rule is that the same materials are used in a BMW plug-in hybrid vehicle as in all of the other models in the same range. What's important is that the rescue procedure is not associated with any additional difficulties for you.

NO SPECIAL CHALLENGES FOR RESCUE CREWS.

During the development stage, we also thought about what would be the easiest possible way of rescuing occupants. The use of rescue cutters and spreaders is therefore not a problem.



NOTHING NEW TO RESCUE CREWS – BUT NEW TO BMW PLUG-IN HYBRID VEHICLES.

As with conventional vehicles, you also have to switch off BMW plug-in hybrid vehicles and prevent them from rolling away. Due to the new control concept, you may find some switches in unfamiliar places. The control concepts are described with illustrations in each vehicle's Rescue Manual and Emergency Services Data Sheet.



- 1 PRESS THE “P” BUTTON (1).
- 2 PUSH THE SWITCH (2) UPWARDS TO ENGAGE THE ELECTRONIC PARKING BRAKE.

SUMMARY: BMW PLUG-IN HYBRID VEHICLES ARE SAFE FOR OCCUPANTS, EVEN DURING RESCUE OPERATIONS.

The rescue and recovery operations for the BMW plug-in hybrid vehicles are identical to those of other models in the range. The recommendations found in the Rescue Data Sheet also apply here. Modern, high-tech cutters are required to cut through the body, as older hydraulic cutters may not be up to the task.



4. EXTINGUISH.

EXTINGUISH.

EXTENSIVELY TESTED IN FIRE SIMULATIONS: LITHIUM-ION BATTERIES IN ELECTRIC CARS.

The more cars with electric motors and high-voltage batteries there are on the roads, the more likely you are to be confronted with a fire in one of them. This gives rise to several questions: How much fire and smoke will there be? Is there a risk of explosion? Can fire departments even extinguish these kinds of fires? The results of extinguishing tests carried out by DEKRA reveal:



ELECTRIC CARS WITH LITHIUM-ION BATTERIES ARE ALSO SAFE IN THE EVENT OF A FIRE.

LITHIUM-ION BATTERIES CAN ALSO CATCH FIRE. BUT NOT AS INTENSELY AS GASOLINE.

In the tests carried out by DEKRA, three batteries were set on fire using gasoline. After several minutes of exposure to flames exceeding 800°C, they finally caught fire. There was “less smoke and fire than with diesel or gasoline.”⁴ According to DEKRA, this resulted in smaller flash fires that were less intense than those seen in gasoline fires. While the fire generated excess pressure inside the batteries, the pressure was released through the integrated valves.

BRANDSchutz, the German publication for fire departments, was pleased with the results:

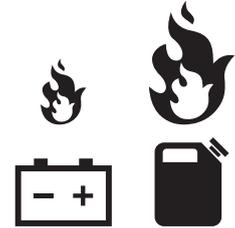


„There were no explosions. There was much less smoke generated by the burning batteries than there is with burning gasoline or diesel or a vehicle fire. The same applies to heat radiation. The temperatures tended to stay below those of the burning fuel.”⁵

EXTINGUISH.

A FIRE IS EASY TO EXTINGUISH – WITH WATER.

In principle, a lithium-ion battery fire can be extinguished with a lot of water. What's more, all standard and authorized extinguishing agents can be used in accordance with the relevant safety guidelines and recommended safe distances.



SUMMARY: BMW PLUG-IN HYBRID VEHICLES ALSO OFFER MAXIMUM SAFETY IN THE EVENT OF A FIRE.

“Electric and hybrid cars with lithium-ion electric vehicle batteries are at least as safe as gasoline and diesel vehicles in the event of a fire.”⁶

Furthermore, electrolyte is unlikely to leak out, and the pollution resulting from the extinguishing water is no higher than when extinguishing fires in other cars. By taking the usual safety precautions and observing safe distances, the safety of lithium-ion batteries can also be ensured in the event of a fire.



5. RECOVER.

RECOVER.

RECOVERING BMW PLUG-IN HYBRID VEHICLES IS NEARLY ALWAYS THE SAME AS RECOVERING CONVENTIONAL VEHICLES.

In this case, “recovery” means removing the vehicle from the scene of the accident, rather than transporting it back to the workshop. Nevertheless, this also requires moving the vehicle. And, of course, it’s important to know whether this is possible without extreme measures.

THE GENERAL RULE IS:

In nearly all cases, BMW plug-in hybrid vehicles are intrinsically safe, even during recovery, so they can almost always be handled like a conventional vehicle. If you have any questions, we recommend following the instructions in the Rescue Data Sheet and Rescue Manual.



RECOVER.

THE HIGH-VOLTAGE SYSTEM USUALLY SWITCHES OFF BY ITSELF IN THE EVENT OF AN ACCIDENT.

In the event of an accident, you can generally assume that the high-voltage system is switched off. This is ensured by the crash safety cutoff mechanism. As BMW plug-in hybrid vehicles are intrinsically safe, the vehicle can be recovered by any fire department or authorized towing service.

IF YOU OBSERVE THE GUIDELINES, YOU CAN'T GO WRONG.

It goes without saying that the general emergency rescue guidelines must also be observed when recovering BMW plug-in hybrid vehicles. For example, the ground cable (black negative cable) on the 12-volt battery should be disconnected. Further information can be found in the Rescue Manual and Rescue Data Sheet.

MOVING THE VEHICLE DURING RECOVERY.

Depending on the situation, it may be necessary to move the vehicle. The car shouldn't be towed any further than is absolutely essential. The best way to move the vehicle is with all four wheels stationary, which is why we recommend using, for instance, a recovery crane.

RECOVER.

THERE ARE EXCEPTIONS – BUT VERY RARELY.

As with conventional vehicles, there are also a few exceptions with cars featuring an electric motor. For example, a BMW plug-in hybrid vehicle may not be in an intrinsically safe state. To exclude any and all risks, we strongly advise you to take no further action before consulting the instructions in the Rescue Data Sheet and Rescue Manual.



RECOVERY FROM WATER.



RECOVERY AFTER A FIRE.



DAMAGE TO THE HIGH-VOLTAGE BATTERY.

SUMMARY: BE ON THE SAFE SIDE WHEN RECOVERING A VEHICLE.

BMW plug-in hybrid vehicles can nearly always be recovered like conventional vehicles, as the high-voltage system usually switches off in the event of an accident. In a few exceptional cases, the clear instructions in the Rescue Manual will assist you. A few precautionary measures are usually all it takes to keep you safe.



6.

**BREAKDOWN ASSISTANCE
AND MINOR ACCIDENTS.**

BMW PLUG-IN HYBRID VEHICLES ARE SAFE IN THE EVENT OF AN ACCIDENT. AS WELL AS A BREAKDOWN.

Thanks to a variety of measures, occupants of BMW plug-in hybrid vehicles can rest assured that they're not exposed to an electrical hazard. This applies to accidents and, of course, breakdowns. But does it also apply to you as you're providing breakdown assistance?

YOU'LL BE PLEASED TO KNOW THAT THE ANSWER IS

“yes,” as it's generally safe to assume that the vehicle is intrinsically electrically safe in the event of a breakdown. However, you should still take a few safety precautions.



THESE INSTRUCTIONS HELP YOU TO HELP OTHERS: THE RESCUE DATA SHEET.

Because BMW plug-in hybrid vehicles are intrinsically safe, no problems will occur in the event of a breakdown. As a rule, please do not touch the high-voltage components or the orange cables.

YOU SHOULD THEN FOLLOW THE RECOMMENDATIONS OF THE RESCUE DATA SHEET:

- Proceed as described in the Rescue Data Sheet: if the engine is running or the display is active, press the “START/STOP” button on the instrument cluster to turn off the ignition.
- Then, also as described in the Rescue Data Sheet, disconnect the 12-volt battery and unlock the High-voltage disconnect (service plug) to switch off the high-voltage system.
- No work should be carried out on the high-voltage components. This should only be done by those qualified to work on vehicles with high-voltage systems. This also applies if high-voltage components are damaged or damage is ascertained while providing breakdown assistance. Work on high-voltage components may only be carried out in a certified specialist workshop.
- Even after the high-voltage system has been switched off, there may still be residual voltage. However, this will dissipate in a few seconds.

A BREAKDOWN DOESN'T HAVE TO BE A PROBLEM, PROVIDED YOU FOLLOW THESE TIPS.

It's generally safe to assume that BMW plug-in hybrid vehicles are intrinsically safe in the event of a breakdown or minor accident.

A FEW TIPS TO HELP YOU PROVIDE ON-SITE ASSISTANCE:

- If the 12-volt onboard electrical system is still working, you can make the vehicle roll by starting it with the "START/STOP" button, activating the brake, and switching the selector lever to "N."
- Jump-starting or charging the vehicle via the 12-volt onboard electrical system in the event of a breakdown is not permitted.
- The vehicle may not be towed by the axles, because the electric motor could supply current to the high-voltage system. The car may only be transported on a flatbed vehicle.
- The car shouldn't be towed any further than is absolutely essential. The best way to move the vehicle is with all four wheels stationary, which is why we recommend using, for instance, a recovery crane.
- To bring the vehicle out of a danger zone, you may pull it at a walking pace over a short distance.
- Secure the vehicle during transport, for example using tension straps pulled through the wheel rims.
- Please observe national regulations.

SUMMARY: MINOR ACCIDENTS SHOULDN'T BE A PROBLEM. EVEN WHEN IT COMES TO SAFETY.

In most cases, there's no risk involved in providing breakdown assistance for BMW plug-in hybrid vehicles. If you observe a few ground rules, such as not touching the high-voltage cables, the basic procedures are no different from those of vehicles with conventional drive systems.

According to the Verwaltungs-Berufsgenossenschaft gesetzliche Unfallversicherung (VBG – German social accident insurance institution for the administrative sector), the general rule for providing breakdown assistance for electric vehicles is:



“There is no risk involved in providing breakdown assistance for vehicles with high-voltage systems, provided no attempts are made to eliminate errors by interfering with the high-voltage system.”⁷



7.

STORING THE VEHICLE.

STORING THE VEHICLE.

STORING BMW PLUG-IN HYBRID VEHICLES: FOLLOW THESE GUIDELINES AND YOU CAN'T GO WRONG.

If a BMW plug-in hybrid vehicle is not taken straight to a BMW i service workshop after an accident, it must be stored in an outdoor parking area reserved for vehicles involved in an accident. This will not result in any unpleasant surprises. This is because, as an intrinsically safe vehicle, the same safety regulations apply as with conventional vehicles.

Please be sure to leave ample space between the vehicle and other vehicles, buildings, and flammable objects. It goes without saying that the parking area should be accessible for the fire department and secured against unauthorized access. You should also mark the BMW plug-in hybrid vehicle as an electric vehicle.





8.

RESOURCES.



RESOURCES.

- P. 12 | **1** German Association of the Automotive Industry (VDA): Accident assistance and recovering vehicles with high-voltage systems.
<https://www.vda.de/en/topics/security-and-standards/rescue/rescue-recovery-vehicles-with-high-voltage-systems>
- P. 14 | **2** DEKRA e. V., press release no. 142 dated October 29, 2012.
- P. 14 | **3** German Association of the Automotive Industry (VDA): Accident assistance and recovering vehicles with high-voltage systems.
<https://www.vda.de/de/themen/sicherheit-und-standards/retten-und-bergen/unfallhilfe-und-bergen-bei-fahrzeugen-mit-hochvolt-systemen.html>
- P. 24 | **4** DEKRA e. V., press release no. 142 dated October 29, 2012.
- P. 24 | **5** Markus Egelhaaf et al.: "Löschversuche an Lithium-Ionen-Traktionsbatterien," BRANDSchutz 2/2013, p. 109.
www.kohlhammer-feuerwehr.de
- P. 25 | **6** DEKRA e. V., press release no. 142 dated October 29, 2012.
- P. 34 | **7** Flyer on breakdown assistance for electric and hybrid vehicles by the VBG, dated June 2011.



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