VOLUME 4 - 2024 | fordcrashparts.com

On Target

Ford Parts

For Ford and Lincoln wholesalers and the collision repair industry

Tips on Ford Mustang® Mach-E® SUV Anchor Points

On Target provides some important collision repair and safety information for the Ford Mustang Mach-E SUV including immobilization, and stabilization while lifting the vehicle.

Please note the following information is intended as a general guideline and is not all-inclusive. For more in-depth repair information on this and other Ford and Lincoln vehicles, consult the *Ford Workshop Manual*, found at FordServiceInfo.com. Check back often as repair procedures can change without notice.

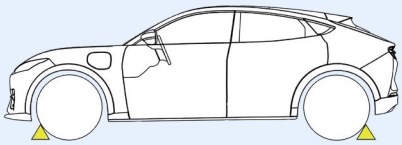
Electric Vehicle (EV) Safety Notes:

- **Always assume the vehicle's high-voltage system is powered up.** Cutting, crushing, or touching high-voltage components can result in serious injury or death.
- De-powering the high-voltage system does not dissipate voltage inside the battery, which remains live and dangerous. Contact with the high-voltage battery pack internals may result in serious personal injury or death.
- To prevent the risk of high-voltage shock, always precisely follow all warnings and service instructions including instructions to depower the system. The high-voltage system utilizes high-voltage cables to its components and modules. The high-voltage cables and wiring are identified by **orange** harness tape or **orange** wire covering. All high-voltage components are marked with high-voltage warning labels with a high-voltage symbol. Failure to follow these instructions may result in serious personal injury or death.
- The high-voltage system must be de-energized once the "Emergency Tow" feature is enabled and the battery energy control module (BECM) information is downloaded to the diagnostic tool (if necessary).

Immobilization

Be careful not to damage the battery pack while stabilizing or lifting the vehicle.

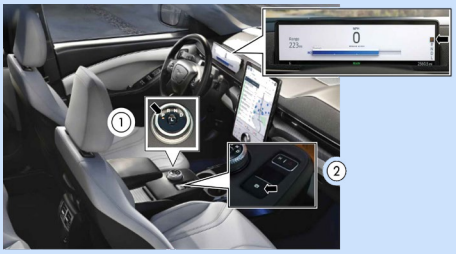
1. Position wheel and tire chocks.



2. Put the vehicle into Park position and ensure the parking brake is engaged.

The **red** warning lamp flashes during operation and illuminates when the parking brake is applied.

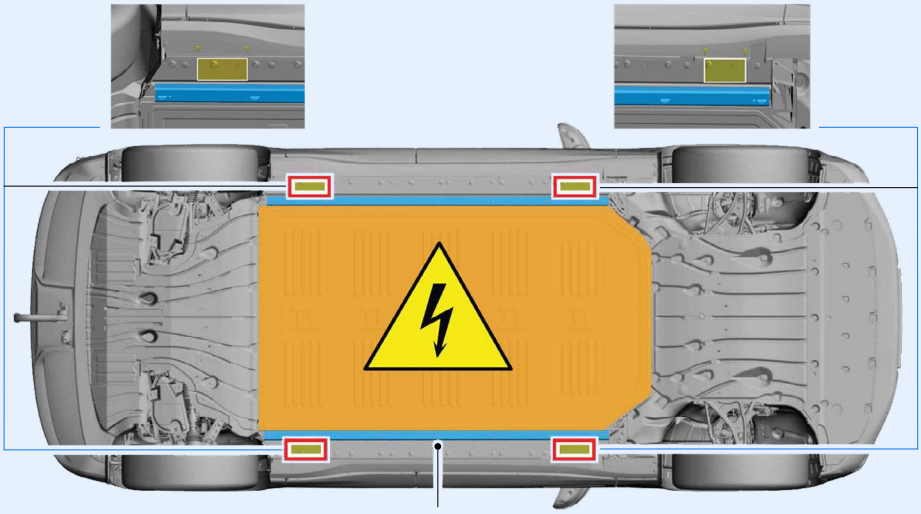
The electric parking brake can still be applied even when the power is off and it may also engage when the vehicle is shifted into Park (P).

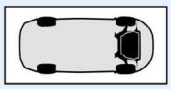


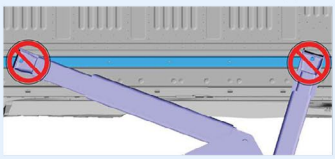
Stabilization / Lifting

The vehicle should be lifted or manipulated only by personnel that are properly trained and equipped. Use caution to ensure you never come into contact with the high-voltage battery (HVB) or other high-voltage components while lifting or manipulating the vehicle.

The HVB is located behind an underbody air shield underneath the vehicle. When lifting or stabilizing the vehicle, only use the designated lift areas, as shown.







NEVER USE THE HVB TO LIFT OR STABILIZE THE VEHICLE.

For more information on electric vehicles, or the repair of any Ford or Lincoln vehicle, visit FordCrashParts.com.

IN THIS ISSUE

I-CAR® Marks 45 Years of Collision Repair Industry Collaboration

As I-CAR celebrates its 45th anniversary, the industry continues to be impacted by groundbreaking advancements in collision repair. For nearly half a century, I-CAR has responded to evolving vehicle technology by equipping professionals with essential knowledge and skills for quality vehicle repairs while fostering key relationships, including collaborating with Ford Motor Company. Several milestones marked in 2024 highlight I-CAR's enduring influence on the industry and the benefit of these longstanding relationships:

- Worked with Ford to create nine new repair courses in 2024 for Ford vehicles
- Recognized Ford as the first organization to receive the I-CAR Chairman's Award
- Launched I-CAR Academy, a comprehensive entry-level technician training program
- Celebrated the one-year anniversary of *Collision Careers* talent attraction initiative
- Launched the Repairability Technical Support (RTS) app for real-time technician support

Continued Association with Ford

I-CAR strengthened its relationship with Ford, introducing four new online repair courses tailored for the 2023 Super Duty,® 2024 Mustang,® 2024 Ranger,® and 2024 Nautilus.® These courses allow technicians to navigate the complexities of these modern vehicles, helping to ensure they are well-prepared for repair challenges.

Ford also made history as the first organization to receive the I-CAR Chairman's Award, a testament to its outstanding commitment to excellence in collision repair. This honor underscores Ford's leadership and dedication to ongoing training and professional development.

Training for the Next Generation

The launch of the I-CAR Academy—a comprehensive entry-level technician training program offering a consistent curriculum for both collision repair centers and career & technical schools—was another milestone event. The curriculum forms the foundation for the I-CAR Pro-Level program, Platinum Technician certification, and OEM/supplier initiatives. It gives students and job seekers the resources and support they need to start their careers in collision repair.

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Supplemental Restraint System – Clockspring Removal/Installation

On Target continues providing information on the supplemental restraint system (SRS)—using the 2024 Ford Bronco® as an example vehicle—as found in the official *Ford Workshop Manual.* In this installment we look at removal and installation procedures for the clockspring.

Please note the following information is intended as a general guideline and is not all-inclusive. For more in-depth repair information on this and other Ford and Lincoln vehicles, consult the *Ford Workshop Manual*, found at FordServiceInfo.com. Check back often as repair procedures could be updated without notice. Always ensure you are looking up the correct model-year vehicle for proper collision repair information.

Section 501-20B: Supplemental Restraint System, Removal and Installation

Removal

WARNING: The following procedure prescribes critical repair steps required for correct restraint system operation during a crash. Be sure to follow all notes and steps carefully. Failure to follow these instructions may result in incorrect operation of the restraint system and increases the risk of serious personal injury or death in a crash.

Before beginning any service procedure, refer to health and safety warnings in Section 100-00, General Information. Failure to follow this instruction may result in serious personal injury.

Note: Removal steps in this procedure may also contain installation details.

1. Refer to Pyrotechnic Device Health and Safety Precautions (**Section 100-00, General Information**)
2. Remove the following items:
   a. Steering wheel (refer to **Section 211-04: Steering Column, Removal and Installation**)
   b. Steering column shrouds (refer to **Section 501-05: Interior Trim and Ornamentation, Removal and Installation**)
3. Referencing Figure 1, disconnect the clockspring electrical connector (1), then remove the clockspring screws (2). Remove the clockspring (3).

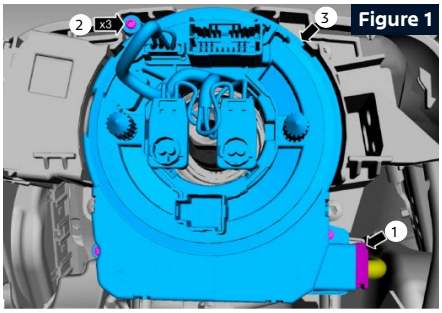

Figure 1

Installation

If installing a new clockspring, **do not** remove the clockspring anti-rotation key until the steering wheel is installed. If the anti-rotation key has been removed before installing the steering wheel, the clockspring **must** be centered. **Failure to follow this instruction may result in component damage and/or system failure.**

1. Before installing the clockspring, position the turn signal level to the 'off' position and ensure the turn signal cancel tab is also in the 'off' position (**Figure 2**).

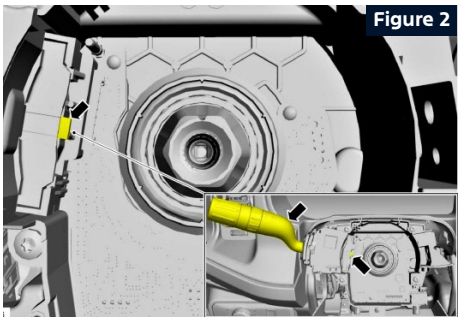
Figure 2

Note: Illustration shows the turn signal cancel tab in the 'off' position.

2. Reverse the steps of the removal procedure. If needed, perform a clockspring adjustment (refer to **Section 501-20B, Supplemental Restraint System, General Procedures**).

[Editor's Note: For details on clockspring adjustments, consult *On Target*, 2024 - Vol. 3.]

3. Install the steering wheel. Remove the anti-rotation key from the new clockspring after installing the steering wheel.


Figure 3

Additional details on SRS repairs will continue in future volumes of *On Target*, focusing on re-powering procedures, pyrotechnic device disposal and more.

For questions on this or the proper repair of any Ford or Lincoln vehicle, contact the Ford Crash Parts Hotline at cphelp@fordcrashparts.com.

Electronic 3-Dimensional Structural Measuring Steps from Spanesi®

Courtesy of Jeramy Holloway, Director of Aftersales, Spanesi Americas

Collision repair shops have been using electronic measuring equipment to diagnose and repair structural misalignment for several years now, but knowing *exactly* where to place this critical piece of technology into the collision repair process can provide many benefits, such as improving shop efficiency, increasing average sales per repair order and reducing liability after the vehicle leaves the shop.

In this installment, we will look at the first step of a three-step process that will help you understand when to get the measuring machine out and how to be properly compensated for the work you are doing.

Step 1: Diagnosis

The diagnosis step is the most critical as it generates the report that tells us if we are in or out of specification by comparing the current condition of the vehicle to the original factory dimensions. The collision repair industry has been using the term *pre- and post-scan* for several years to describe the process of performing an electronic health check before and after a repair, and the structural diagnosis step can very much be considered a *structural pre-scan* since it is determining if the structural condition of the vehicle is correct.

After determining and documenting the condition of the vehicle structure, we can then move on to determining if the wheel alignment is within specification, which is normally a prerequisite for performing many types of advanced driver assistance system (ADAS) calibrations. Until we have checked all these boxes—checking the vehicle structure,

then wheel alignment and then any required calibrations associated with those repairs—we really don't have proof that any of those items meet the target condition to return the vehicle to the road.

By determining a clear path for the vehicle to flow through the repair process, we have already increased shop efficiency.

One of the four following conditions could be the result of a structural pre-scan:

Scenario 1: We find no damage. The vehicle will flow through the repair shop skipping the structural department. We now have proof that the structure of the vehicle was unharmed.

Scenario 2: We find minor damage that can be corrected without the use of a frame straightening bench. We have a solid structural diagnosis to help us build a repair plan that allows us to be compensated for the repair work being performed.

Scenario 3: We find major damage that requires the use of a frame straightening bench. We include in our repair plan the necessary steps to repair or replace the compromised structural parts.

Scenario 4: We find structural misalignment that causes the vehicle to be a total loss. We part ways with the vehicle prior to ordering any parts or performing any more work, saving invaluable time.

In addition to the actual measuring procedure, other billable operations that are directly related to a structural pre-scan may include:

1. Any parts needed to be removed from the vehicle to access measuring points such as lower shields, wheels and facias.
2. Removal of any damaged parts that are preventing access to measuring points such as smashed body panels and bumper reinforcements.
3. Time and cost to obtain OEM repair procedures to understand any vehicle-specific information, such as how many points to measure and any measuring-related operations, such as any specific structural anchoring or holding requirements or the use of special adaptors or jigs.

For more information, visit spanesi-americas.com.

Details on the second and third steps in this process will continue in future volumes of *On Target.*

Ford Escape® Body and Frame

On Target provides vehicle-specific information on the 2024 Ford Escape, including details on the front floor components.

Please note the following information is intended as a general guideline and is not all-inclusive. For more in-depth repair information on this and other Ford and Lincoln vehicles, consult the *Ford Workshop Manual*, found at FordServiceInfo.com.

For more information, refer to **Section 501-26: Body Repairs – Vehicle Specific Information and Tolerance Checks, Description and Operation**.

- Front frame rails constructed of high-strength dual-phase (DP) 600 steel
- Rear frame rails constructed of Boron ultra-high-strength steel

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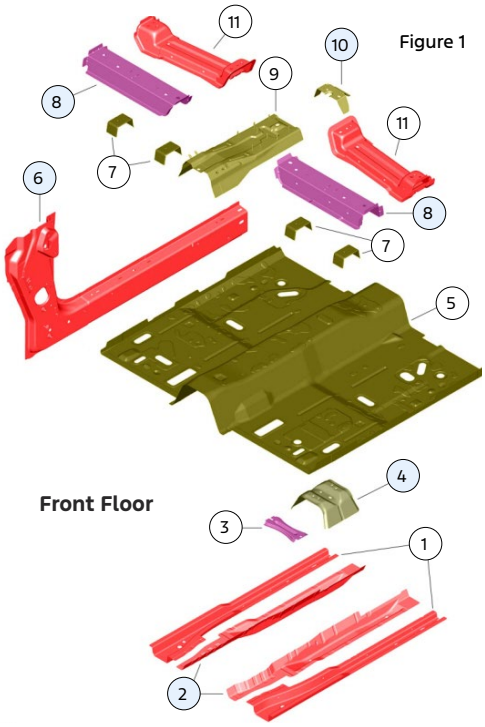

Figure 1

Front Floor

Item	Description	Steel Type
1	Lower side member	Boron steel
2	Lower side member extension	Boron steel
3	Crossmember	Dual-phase (DP) 800 steel
4	Reinforcement	Dual-phase (DP) 600 steel
5	Floor pan assembly	Mild steel
6	Side member	Boron steel
7	Seat mount bracket brace	Mild steel
8	Front upper crossmember	Dual-phase (DP) 800 steel
9	Tunnel reinforcement	Mild steel
10	Bracket support	Mild steel
11	Crossmember assembly	Boron steel

Celette® Offers Innovative Repair Equipment

Working with global car manufacturers for over 65 years, Celette has cemented its technical know-how to deliver highly productive and innovative body repair equipment.

Celette designs technologically advanced products with the aim of offering solutions for repairing accident damage as well as increasing body shop profitability by reducing repair cycle time.

Some of Celette's repair equipment includes:

Full-Aluminum Range Sevenne: Crafted with precision and designed for durability, the full-aluminum range represents Celette's commitment to excellence and innovation.

- Lightweight and easily maneuverable
- Engineered for strength and durability
- Combines an ergonomic design with modern aesthetics
- Safe to use in aluminum repair bays

MZx Composite Jigs: An evolution of the MZ+, Celette's precisely printed composite reinforced jigs offer extreme accuracy at a fraction of the weight.

- Precisely printed composite material reinforced with metal inserts
- Total weight is under 40 lbs. but strong enough for every vehicle collision repair
- Able to reach difficult mounting on vehicles
- Can be combined with other Celette vehicle positioning equipment

Universal Celette Cameleon System

A revolutionary concept for structural repair and measurement of damaged vehicles, the Cameleon system offers repair technicians a set of fully customizable tools to build accurate jigs for any vehicle. Using Celette's proprietary 3D software, repairers gain access to a robust work vehicle database. In addition, diagnostic pre- and post-repair scanning reports can be created for documentation and customer transparency.

For more information, visit celette.com or their online catalog.

Ford Escape® Body and Frame (continued)

- Fender reinforcement tube constructed of dual-phase (DP) 800 high-strength steel
- Fender apron assembly constructed of dual-phase (DP) 600 high-strength steel
- Liftgate outer panel constructed of mild steel
- Body structure constructed of Boron, dual-phase (DP) and high-strength steels
- Roof panel reinforcements constructed of dual-phase (DP) 600, smart and high-strength, low-alloy (HSLA) 380 steel
- Bolted, removable front fenders, hinged doors and hood
- Bodyside outer panels constructed of mild steel
- Mastic pads used on floor pan for sound deadening

On Target plans to include more construction details on the Escape in future volumes.

For more information on the Escape, or any Ford or Lincoln vehicle, contact the Ford Crash Parts Hotline at cphelp@fordcrashparts.com or visit I-CAR's RTS Portal at RTS.i-car.com.

Center and Rear Floor

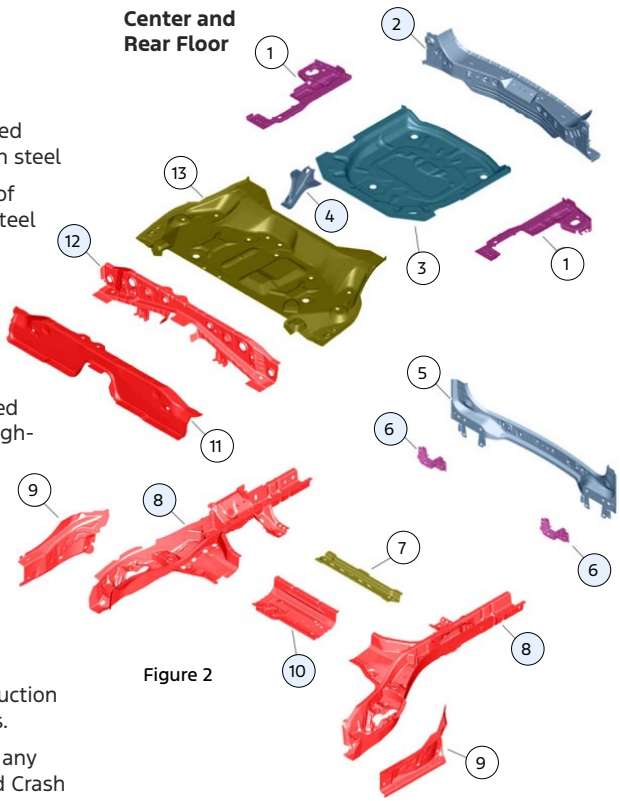

Figure 2

Item	Description	Steel Type
1	Rear floor pan extension	Dual-phase (DP) 800 steel
2	Back panel assembly	High-strength, low-alloy (HSLA) 300 steel
3	Rear floor pan assembly	Bake hardened (BH) 240 steel
4	Spare tire carrier support	High-strength, low-alloy (HSLA) 380 steel
5	Lower back panel assembly	High-strength low-alloy (HSLA) 340 steel
6	Rear side member bumper bracket	Dual-phase (DP) 800 steel
7	Rear crossmember assembly	Mild steel
8	Rear side member	Boron steel
9	Rear side member reinforcement	Boron steel
10	Crossmember	Boron steel
11	Center floor pan brace	Boron steel
12	Center floor pan reinforcement	Boron steel
13	Center floor pan assembly	Mild steel

Let Your Customers Know You're Ford Certified

The Ford Certified Collision Network (FCCN) supports collision centers in delivering a higher standard of quality collision repairs. Becoming a part of the FCCN represents your commitment to delivering a superior repair experience to your Ford and Lincoln customers.

The FCCN includes many benefits, such as access to Ford OE collision repair procedures, repair process assessment and consultation, a technical support center and access to marketing tools that allow certified shops to let their Ford and Lincoln customers know that they are serious about abiding by proper Ford collision repair procedures and providing the best repair possible.

To gain access to the FCCN—and Ford Certified Glass Network (FCGN) marketing materials available to shops—users will first need to log in to their Entegral profile, and from there, access the 'Ford Resource Library.' Under 'Documents' will be an entry noted as 'FCCN Marketing Materials.'

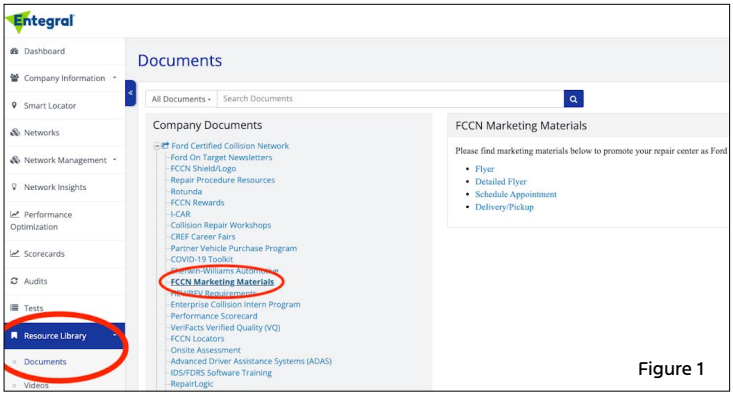

Figure 1

Clicking on it will provide access to various FCCN-branded marketing pieces, including the official shield/logo.

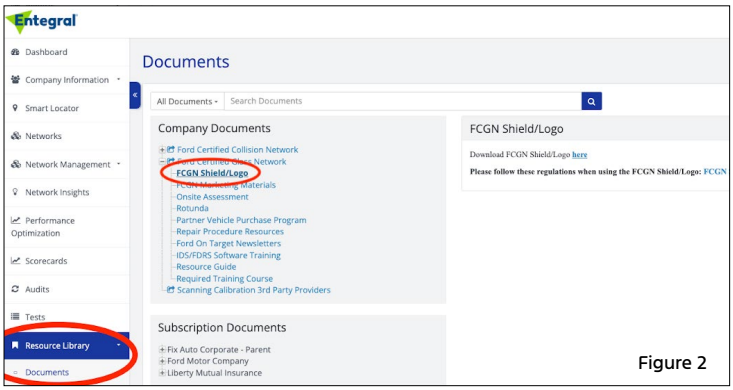

Figure 2

To learn more about the FCCN, visit Ford.com/Ford-Certified-Collision-Network or call (833) 837-7694.

I-CAR® Marks 45 Years of Collision Repair Industry Collaboration (continued)

Addressing the Technician Shortage

I-CAR continued its efforts to address the severe shortage of skilled collision repair technicians with *Collision Careers*. This digital program has recruited future technicians, connecting them to education and career opportunities in collision repair, using innovative methods. First-year achievements include nationwide outreach, strategic partnerships, and the launch of an advertising campaign aimed at raising awareness of collision repair as a career choice.

Advancing Repair Technologies

To further support new technicians and the challenges they face, I-CAR launched the Repairability Technical Support (RTS) app, a virtual toolbox for technicians. This mobile version of the RTS online platform is a comprehensive resource that offers real-time support and solutions for industry professionals in any situation.

Looking Ahead

Yet again, I-CAR has reaffirmed its unwavering commitment to the collision repair sector. With each event and initiative, I-CAR expanded the accessibility of its programs, empowered shops and schools with vital resources, helped jobseekers discover new career paths, and continued its pursuit of complete, safe and quality repairs for the ultimate benefit of the consumer.

For more information about I-CAR, please visit I-CAR.com.

The Crash Parts Corner

Did You Know That ...

With the implementation of advanced driver assistance systems (ADAS), the importance of using OEM glass and OEM-approved repair procedures—including proper preparation of the substrate or pinch weld to receive the new fixed glass—will only increase when it comes to ensuring safe, quality repairs.

The official *Ford Workshop Manual*—found on FordServiceInfo.com—provides a lot of important details regarding windshield repairs and replacement. It should be referenced often as repair procedures can change without notice.

The procedure provides options for repairers to choose the best repair method for the type of glass being replaced:

Cold-Knife Method can be used to cut the urethane from the outside of a vehicle, provided the blade can reach the urethane bead.

Power Tool Method uses various power tools from inside the vehicle using a cutting or paddle-type blade.

Piano Wire Method uses piano wire to cut the urethane from inside and outside a vehicle with the help of an assistant.

If utilizing the cold-knife method, apply tape to protect the perimeter of the window opening from paint damage. Multiple layers of tape may be required.

"The *Workshop Manual* provides a lot of important details with regard to windshield repairs and replacement," said Gerry Bonanni, senior damage-ability engineer for Ford Motor Company. "Another very important note for repairers is if the windshield is damaged and is equipped with a camera bracket **or** adhesive moulding, the glass **cannot be reused**," stated Bonanni. "It must be discarded. A new windshield is required in both instances."

To ensure the correct OEM replacement glass is being utilized, visit the Carlex OEM replacement glass search tool at Carlex.com/automotive-replacement-glass.

For more information on Ford OEM glass, including job aids, repair videos and more, visit FordCrashParts.com/Glass.

For more information on the Ford Certified Glass Network, or to join the program, visit Collision.Ford.com/FordCertifiedGlassNetwork or call (833) 837-7694.

Continuing Forward: 2024 in Review

As 2024 comes to a close, we look back at some of the main stories *On Target* included throughout the year.

Distributed in early spring, the first volume of *On Target* provided details on a new repair section in the official *Ford Workshop Manual* on high-voltage battery (HVB) minor damage inspection. The new section—**414-03A: High-Voltage Battery, Mounting and Cables Diagnosis and Testing – High-Voltage Battery Minor Damage Inspection**—includes color-coded diagrams identifying the individual parts of the HVB and what level of minor damage due to curb or road hazard strikes are repairable. Volume 1 also included information on four new Ford/I-CAR® repair courses, details on the Ford Mustang Mach-E® exterior body panels, and blind spot information system, training updates from 3M® and color-matching technology updates from AkzoNobel.

Volume 2, a summer release, reminded repairers of the sectioning options available to them on the refreshed 2024 Ford Ranger® and Gerry Bonanni, Ford senior damageability engineer, provided some insights and tips to help properly repair the vehicle. Also included in Volume 2 were updates from I-CAR on the addition of five new Ford repair courses covering the Ford F-150,® 2025 Ford Explorer,® 2025 Lincoln Aviator® and two new courses on the Ford Mustang® Mach-E® SUV. Additional details on the Ford BlueCruise* system, Ford Maverick® exterior components, equipment updates from Rotunda, and information on the 3M® Repairstack® inventory feature were also provided.

Released in the fall, Volume 3 opened with a deep-dive discussion on variations in OEM service parts, with Gerry Bonanni joining I-CAR technicians as part of their *Repairers Realm* video series. Sectioning options on the 2024 Ford Bronco®—in both 3-door and 5-door configurations—were also provided. Additional repair procedures were provided on the supplemental restraint system, focusing on clockspring adjustments, as were reminders on Ford and Lincoln collision assistance, available through the FordPass® and The Lincoln Way® apps. PPG® discussed its new *Moonwalk*® paint-mixing system, while I-CAR noted the expansion of its I-CAR Academy training program directly to body shops.

Current and past issues of *On Target* are available on FordCrashParts.com, OEM1stop.com, and I-CAR's RTS Portal at RTS.i-car.com.

On Target plans to produce four new volumes—detailing critical, OEM-approved repair procedures and other important information—in 2025.

*Available feature. Equipped Ford vehicles come with either a complimentary trial period or an included duration, after which purchase of a BlueCruise subscription is required. Modem activation is required for subscription purchase and for initial activation of BlueCruise (for pre-2024 model-year vehicles). See ford.com/bluecruise for details. BlueCruise is a driver-assist feature and does not replace safe driving or driver's attention, judgment, or need to control the vehicle. Only remove hands in a hands-free Blue Zone. Always watch the road and be prepared to resume control. See Owner's Manual for details and limitations.

On Target

Scheduled to be published four times a year, *On Target* aims to provide Ford and Lincoln dealership parts departments and independent collision repair shops with the technical information needed to deliver efficient, high-quality repairs to Ford and Lincoln vehicle owners.

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On Target Digital

Download *On Target* for free at FordCrashParts.com, or by clicking the Ford page on OEM1Stop.com

Genuine Parting Thoughts

Have an idea? We'd love to hear from you. Your comments and article suggestions can be sent to **cphelp@fordcrashparts.com.**