

On Target



For Ford and Lincoln wholesalers and the collision repair industry

2023 Ford F-150® Highlights New Safety Technology

As part of the effort from Ford Motor Company to provide collision technicians with important information on the proper repair procedures for its vehicles, we present some updated material regarding a key component of the supplemental restraint system (SRS) as found on the 2023 F-150®: the adaptive energy absorption steering column.

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.

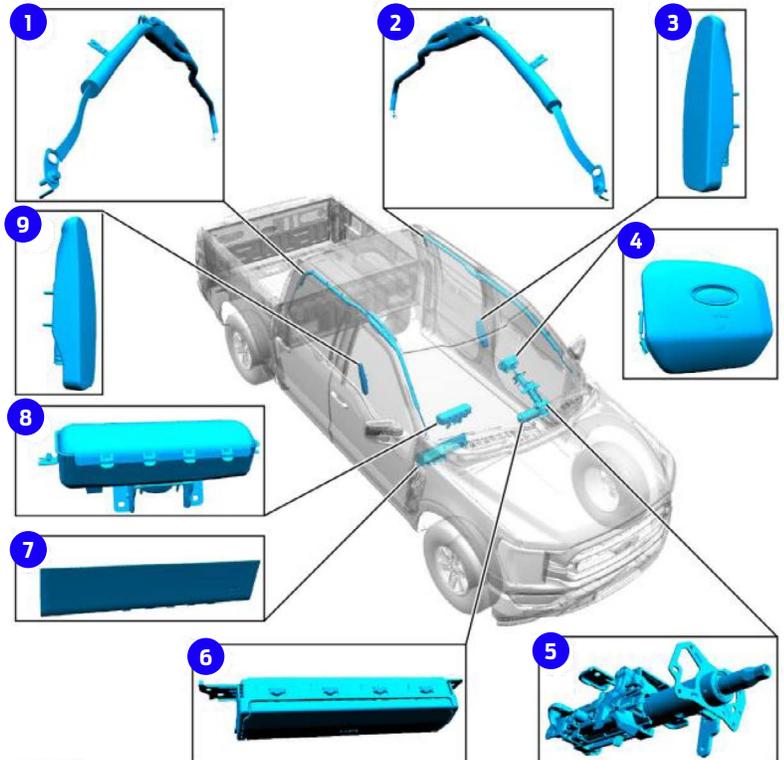
For more information, refer to the following sub-sections under **Section 501-20B: Airbag and Seatbelt Pretensioner Supplemental Restraint System (SRS)**:

- Component Location
- Operation and Component Description
- Inspection and Repair After an SRS Deployment

The adaptive energy absorption steering column includes a device that, once deployed, reduces the amount of force necessary to collapse the steering column during a crash event. The deployable device is activated by the restraints control module (RCM), depending on the driver seat position and the force of the crash. After deployment, a new steering column **must** be installed.

If a vehicle has been in a crash, inspect the restraints control module and impact sensor mounting area for any damage or deformation. Also inspect the related components for any cracks, damage or loose fasteners. If the mounting area is damaged, restore the area(s) to the original production configuration. After repairing these areas, the RCM and/or impact sensor in that location **must** be replaced with a new component, regardless of whether the airbags have deployed. Failure to follow these instructions may result in serious personal injury or death in a subsequent collision.

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Airbag & Seatbelt Pretensioner Supplemental Restraint System

Item	Description
1	Passenger side curtain airbag
2	Driver side curtain airbag
3	Driver side airbag
4	Driver airbag
5	Adaptive energy absorption steering column
6	Driver knee airbag (if equipped)
7	Passenger knee airbag (if equipped)
8	Passenger airbag (includes canister vent)
9	Passenger side airbag



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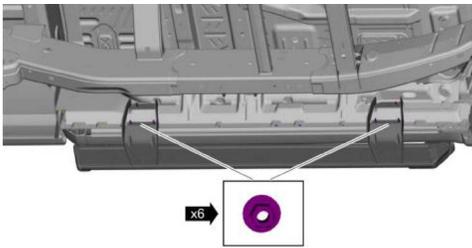
I-CAR® Repairers Realm Video Dives into Running Board Repair on F-150®

In the last issue of *On Target* (2023 - Vol. 3), we presented a detailed look at the sectioning options provided by Ford Motor Company through an I-CAR *Repairers Realm* video of a cab corner repair on a Ford F-150®.

To conclude the sectioning topic, Senior Ford Damageability Engineer Gerry Bonanni and I-CAR technicians Scott VanHulle and Jason Hauboldt get together for a follow-up video, this time focusing specifically on repairs related to the tabs where the studs mount for the running board on the F-150®.

"We've gotten a lot of questions [on this repair] on the repairability technical support website," noted VanHulle. He also stated the video should hopefully be a good resource to help the industry finally grasp how many different things they can repair on the truck, including and especially any running board damage.

As with the first video, the three commented as a recording of the running board repair played for them.



This image shows the general orientation of this repair on the vehicle.

In the video, Bonanni noted the repair came from vehicles in the oil-drilling fields of Canada, where the trucks would bottom out at high speeds while traveling across the fields and rip the running board away from the inner rocker panel. The actual inner rocker panel remained undamaged, but the mounting studs were ripped away.

Bonanni further explained that when repair procedures were being dimensioned out for the current F-150—as far back as 2013—an attempt was made to include replacement of only the steel stud if it were missing or damaged. However, Bonanni noted the production tooling that installs the stud is highly specialized and no suitable, equivalent type of tooling was found that could install the stud in the same way as it was installed at the factory.

"If a stud is broken out or fallen out, this is really the only repair that we could see that was feasible," said Bonanni.

VanHulle noted when this type of damage began to appear, repair facilities were engaging in an extremely invasive repair, cutting off the entire body-side panel of the vehicle—even if it was undamaged—to gain access to the part, since it is the inner-most part of the rocker assembly.

"We want to try to go with the least-invasive repair that we can," said Bonanni. "We allow sectioning on the inner rocker panel of this vehicle.



Video participants (left to right): Jason Hauboldt (I-CAR), Gerry Bonanni (Ford Motor Company) and Scott VanHulle (I-CAR).

If we can section it versus replacing the entire piece, you're into a far-less invasive repair."

Hauboldt noted that several different tools were used in the repair, and that the type and number of tools would differ depending on the specific damage. For example, if the damage to the running board meant the stud had torn completely off and was missing, you may not have to switch as often between as many different tools. "But with any repair, it's good to have a lot of tools at your disposal because of all of the different contours and angles," said Hauboldt. "It's not always easy to get in there and cut *only* what you want to cut."



The use of different tools can help accommodate repairs over different types of contours and angles. Staying on the raised portion of the inner rocker panels allows the repairer to avoid the adhesive layer in the pinch-weld area.

"The idea was the technician has the option, the flexibility to do the repair as he or she sees fit," said Bonanni, reiterating his position that the sectioning cut-line diagrams provided in the official *Ford Workshop Manual* (WSM) are suggestions, and specific cutlines are left to the technician's skill level and the type of damage on the vehicle, as long as you stay 50mm away from hinge, striker or restraint anchoring points.

Hauboldt commented that if you can stay on the raised portion of the inner rocker panel where the running board attaches, you can avoid the adhesive in between the pinch-weld in that area.

"The key strength here is the rivets. The adhesive is important, but the rivets comprise the main strength in this area," said Bonanni. VanHulle noted that on Ford and Lincoln vehicles, rivets are important structural components and are **not** merely used "to hold the vehicle together while the glue dries."

Bonanni agreed and further noted that the adhesive is primarily used for NVH and corrosion protection, with the rivets providing the main strength. Bonanni also reiterated not to deviate from rivet and mandrel patterns set forth in the WSM.

VanHulle said while it is not a typical repair that they have seen on other vehicles, it is a very practical repair that could also help prevent older vehicles from being declared a total loss. Another good point brought up in the video is to try some practice welds ahead of time and ensure your welder is dialed in to the specific repair. It was also noted to avoid tuning the welder while you are already engaged in the repair as it could lead to uneven welds.

Proper welder tuning is part of the overall repair research and planning that should be conducted before any work is started on the vehicle, as it will provide a good foundation for an efficient and proper repair.



The near-finished repair with the new attachment in place.

It should be noted that while there is no specific procedure for this repair in the official *Ford Workshop Manual* (WSM)—found on FordServiceInfo.com—there is one currently being authored, but no time frame for publication was available at time of print. Please check the WSM often as repair procedures could be updated without notice. *On Target* plans to include an update when this repair procedure is officially published.

A video library containing this and other *Repairers Realm* topics can be found at I-CAR.com/Repairers-Realm.

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

Ford Bronco® – Front Door Side-Impact Sensor



On Target begins a series examining the proper removal of impact sensors on the Ford Bronco®, focusing this time on the front door side-impact sensor.

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](https://fordserviceinfo.com).

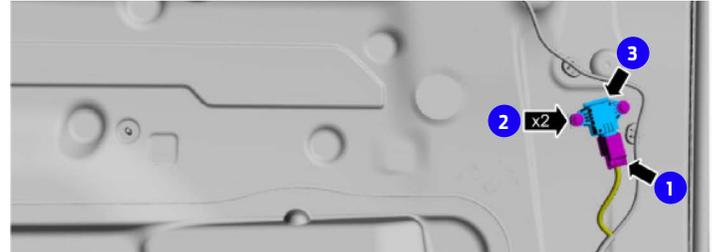
For more information, refer to **Section 501-20B: Supplemental Restraint System – Removal and Installation**.

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

Before beginning any service procedures (as found in the WSM), refer to health and safety warnings as found in **Section 100-00: General Information**. Failure to follow this instruction may result in serious personal injury.

1. Refer to Pyrotechnic Device Health and Safety Precautions (**Section 100-00: General Information, Description and Operation**).
2. Depower the SRS (refer to **Section 501-20B: Supplemental Restraint System, General Procedures**).
3. Remove the front door trim panel (refer to **Section 501-05: Interior Trim and Ornamentation, Removal and Installation**).

4. Remove the front door side-impact sensor:
 1. Disconnect the electrical connector
 2. Remove the bolts (torque: 22lbs. in / 2.5Nm)
 3. Remove the sensor



Left-hand side shown; right-hand side similar

To install a new sensor, reverse the removal procedure steps. Please note that the impact sensor mating surfaces must be smooth and allow for a flush attachment to each other.

For more information on this, or the repair of any Ford or Lincoln vehicle, visit [FordCrashParts.com](https://fordcrashparts.com).

Supplemental Restraint System (SRS): Component Descriptions

On Target presents more component descriptions and definitions regarding the supplemental restraint system, as found in the official *Ford Workshop Manual*.

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](https://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 – Description and Operation

Seatbelt Retractor and Pretensioner

The seatbelt retractor and pretensioner is a pyrotechnic device that removes excess webbing slack from the seatbelts when deployed. The retractor and pretensioner are serviced together with the front row outboard seatbelt assembly.

For any concerns regarding seatbelt retractor function, refer to **Section 501-20A: Seatbelt Systems, Diagnosis and Testing**.

(To diagnose any DTCs), refer to **Section 501-20B: Supplemental Restraint System, Diagnosis and Testing**.)

Side Air Curtain

The side air curtain is a single-stage airbag that is designed to provide head and upper-body protection to the vehicle occupant(s) during certain crashes.

Side Airbag

The side airbag is a single-stage airbag that is designed to provide protection for the seat occupant's torso. It deploys upon receipt of current flow and is attached to the outboard side of each front seat. It is used in conjunction with the side air curtain.

Clockspring

The clockspring allows for continuous electrical connections between the driver airbag and the restraints control module (RCM). A spiral-wound cable wraps around the center of the clockspring and as the steering wheel is turned, the spiral cable inside expands or contracts in diameter as the 2 halves of the clockspring turn.

Extended Power Module

The battery energy control module B (BECMB) supplies system voltage to the RCM and occupant classification system module (OCSM), based on high-speed controller area network 1 (HS-CAN1) inputs and the ignition input.

The BECMB requires programmable module installation (PMI) when being replaced. Refer to the diagnostic scan tool instructions to carry out PMI.

Restraints Control Module

The RCM monitors various sensor inputs and uses that data for controlling SRS outputs such as event notification function and airbag deployment.

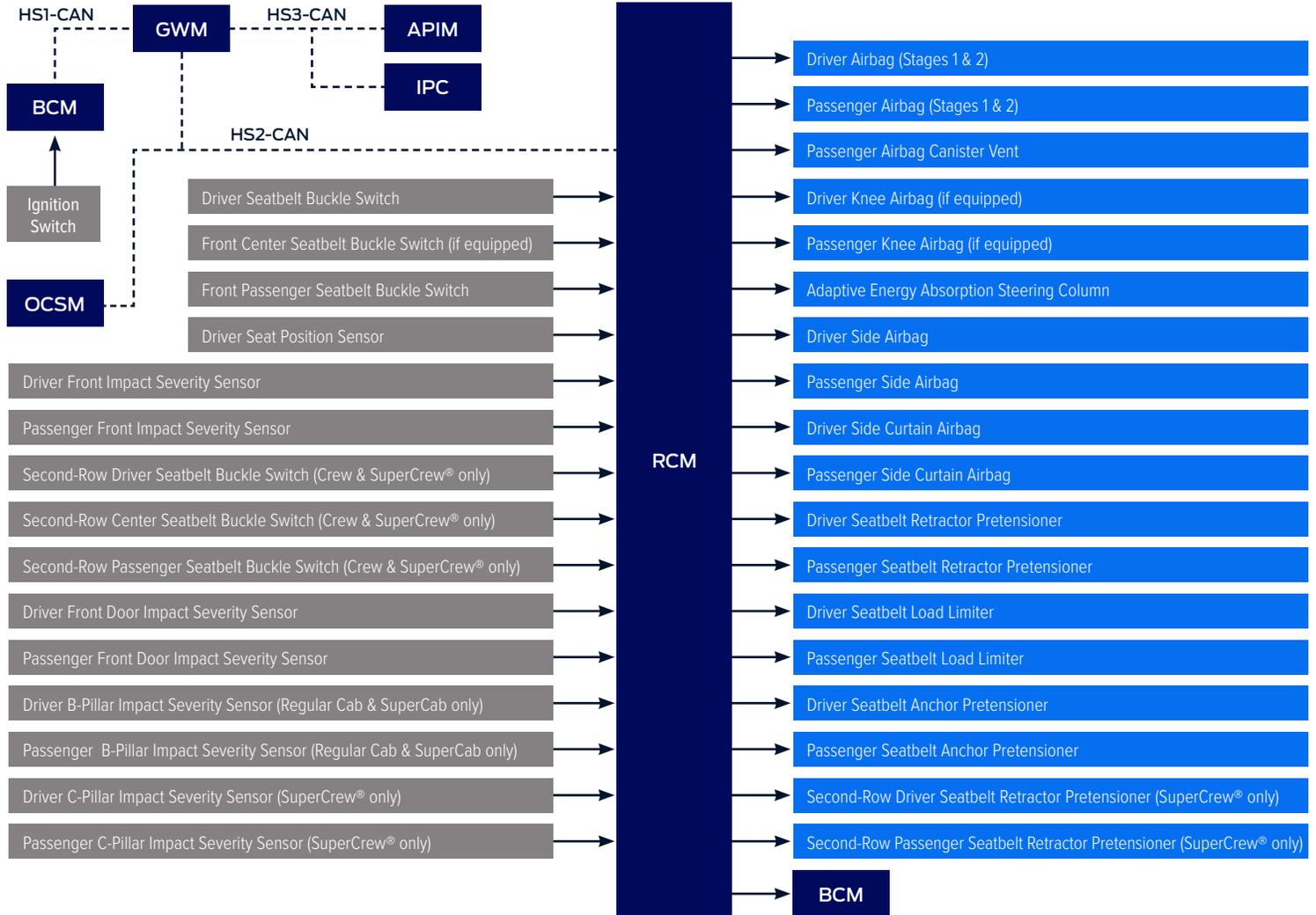
The RCM includes a backup power supply. This feature provides sufficient backup power to deploy the airbags in the event the ignition circuit is lost or damaged during impact. The backup power supply depletes its stored energy approximately one minute after power and/or ground has been removed from the RCM.

The RCM requires PMI when being replaced. Refer to the diagnostic scan tool instructions to carry out PMI.

Additional details on SRS repairs from the *Ford Workshop Manual* will continue in future volumes of *On Target*, focusing on clockspring adjustments, de-powering and re-powering the vehicle, 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.

2023 Ford F-150® Highlights New Safety Technology



System Diagram - Supplemental Restraint System					
Name	Description	Name	Description	Name	Description
APIM	SYNC® module	RCM	restraints control module	GWM	gateway module A
BCM	body control module	OCSM	occupant classification system module	IPC	instrument panel cluster
HS1-CAN	high-speed controller area network 1	HS2-CAN	high-speed controller area network 2	HS3-CAN	high-speed controller area network 3

Continued from page 1

Deployable devices such as airbags, pretensioners and inflatable belt inflators may deploy alone or in various combinations depending on the impact event. Always refer to the appropriate workshop manual procedure(s) prior to carrying out vehicle repairs that affect the SRS and seatbelt system.

The SRS must be fully operational and free of faults before the vehicle can be released to the customer.

Precise tolerances are required when manufacturing a steering column. NEVER install a repaired, rebuilt or remanufactured steering column. ALWAYS install a new steering column. Failure to follow this direction can result in steering column failure.

Install a new adaptive energy absorption steering column if any of the following conditions are met:

- Steering wheel is bent, loose or damaged
- Steering column functionality is binding, bent or sticking
- Steering column bearings display brinelling or other damage
- Steering shaft is bent, loose or damaged
- Any abnormal steering column movement is detected

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

Exterior Components on the Ford Maverick®

On Target continues providing vehicle-specific exterior component details on the Ford Maverick pickup. This time, we provide a look at the body-side panels and the front panels, aprons and side members.

For previous installments, see [On Target, 2022 - Vol. 1](#) and [On Target, 2023 - Vol. 3](#).

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**.

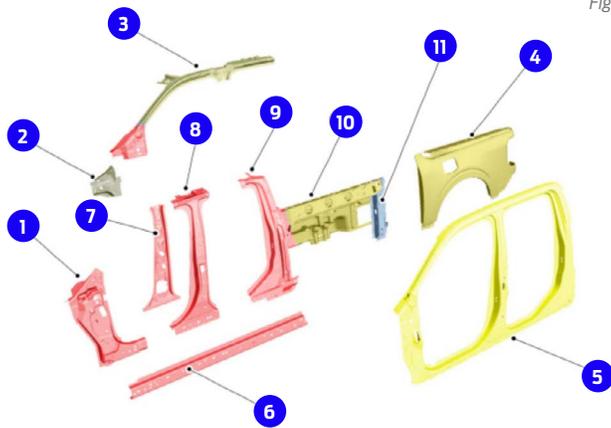


Figure 1

Body Side Panels [Figure 1]

Item	Description	Steel Type
1	A-pillar reinforcement	Boron steel
2	Gusset	Dual-phase (DP) 600 steel
3	A-pillar reinforcement and roof side-rail reinforcement	Boron and Dual-phase (DP) 600 steel
4	Pickup box side outer-panel	Mild steel
5	Body side outer-panel	Mild steel
6	Rocker panel reinforcement	Boron steel
7	B-pillar inner	Boron steel
8	B-pillar	Boron steel
9	Body side inner-panel	Boron steel
10	Quarter panel assembly	Mild steel
11	Reinforcement	High-strength low-alloy (HSLA) 420 steel

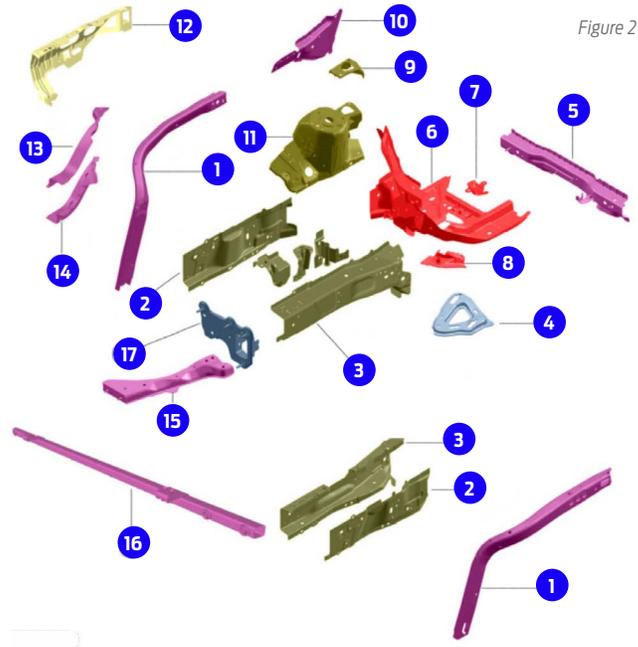


Figure 2

Front Panels Aprons and Side Members [Figure 2]

Item	Description	Steel Type
1	Fender apron brace	Dual-phase (DP) 800 steel
2	Side member (outer)	Dual-phase (DP) 600 steel
3	Side member (inner)	Dual-phase (DP) 600 steel
4	Reinforcement	High-strength low-alloy (HSLA) 420 steel
5	Reinforcement	Dual-phase (DP) 800 steel
6	Apron assembly	Boron steel
7	Bracket	Boron steel
8	Bracket	Boron steel
9	Bracket	Mild steel
10	Reinforcement	Dual-phase (DP) 800 steel
11	Tower apron assembly	Mild steel
12	Fender reinforcement	Mild steel
13	Reinforcement	Dual-phase (DP) 800 steel
14	Support	Dual-phase (DP) 800 steel
15	Floor side member assembly	Dual-phase (DP) 800 steel
16	Radiator support	Dual-phase (DP) 800 steel
17	Bumper mounting bracket	High-strength low-alloy (HSLA) 420 steel

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

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



Forging Ahead: 2023 in Review

As 2023 concludes, we look back at some of the main stories *On Target* included throughout the year.

The first volume of *On Target*—distributed in early spring—provided details on the Ford F-150® Lightning®, the first full-size, all-electric pickup truck from Ford Motor Company. Utilizing an I-CAR® [Repairs Realm video installment](#), Ford Senior Damageability Engineer Gerry Bonanni joined I-CAR technicians in detailing specific items unique to the Lightning. Volume 1 also included information on the [job aids](#) for advanced driver assistance systems (ADAS), blind spot information system (BLIS®), attributes of [Ford OEM glass](#) provided by [Carlex](#), and more.

Summer saw the release of [Volume 2](#), which included in-depth repair material on the Ford Bronco® Raptor® SUV, as well as a detailed look at the Ford [BlueCruise*](#) technology. Additional information was also provided on the [Emergency Response Guide \(ERG\)](#) for the Ford Mustang® Mach-E® SUV. Carlex also provided steps on [how to properly locate the correct OEM replacement glass](#) by utilizing the engineering part number located within the glass trademark. Ford and I-CAR also introduced the [Entry Level Tech Guide](#), which was designed to support entry-level collision repair technicians as they build their knowledge and skillset within the industry.

*Driver-assist features are supplemental and do not replace the driver's attention, judgment and need to control the vehicle. It does not replace safe driving. See Owner's Manual for details and limitations. Available Feature. Ford BlueCruise requires a Connected Service plan, FordPass® App, and modem activation. Equipped Ford vehicles come with either a 90-day trial or a 3-year BlueCruise Connected Service plan, after which purchase is required. See [ford.com/bluecruise](#) for more details. BlueCruise driver-assist features are supplemental and do not replace safe driving or driver's attention, judgment and 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.

As summer turned to fall, the [third volume](#) focused on sectioning options as allowed by Ford, using the F-150® as an example. Bonanni, once again joining I-CAR® technicians, stressed that the sectioning cut-line diagrams in the *Ford Workshop Manual (WSM)*—available through [FordServiceInfo.com](#)—represent suggestions, and that the repairer is free to determine where to section based on their skills and the type of damage on the vehicle, as long as they stay 50mm away from any striker, hinge or anchor points. ADAS component calibration information was also provided, as well as additional repair details on the Ford Lightning®, Mustang® Mach-E® and Maverick® pickup. I-CAR, teaming up with the Collision Repair Education Foundation™, also announced the [CollisionCareers](#) website, an online hub resource meant to connect individuals to rewarding opportunities within the collision repair industry.

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 2024.



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 *OnTarget* 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: cphep@fordcrashparts.com

The Crash Parts Corner

DID YOU KNOW THAT ...

Ford Motor Company has an official position statement warning against the use of non-OEM glass on Ford and Lincoln Vehicles?

Ford Motor Company vehicles contain many state-of-the-art features that enhance occupant safety and the driving experience. Windshield and side glass play an integral role in the performance and functionality of these features. During repairs that involve glass removal and replacement, it is critical that the vehicle be restored to proper operating condition.

The original glass used on Ford Motor Company vehicles is designed and built to provide enhanced fit, function, safety and structural integrity. The quality, performance and safety of aftermarket replacement windshield and side glass may not meet the Ford Motor Company specifications and may result in safety features not functioning properly and reduced customer satisfaction in the performance of their vehicle. For these reasons, Ford Motor Company does not approve the use of aftermarket windshield or side replacement glass. Only by using Ford Original Equipment Carlex replacement glass can you be confident of the fit, function, safety and structural integrity of the repair.

For more information on Ford/Carlex 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.



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