

OnTarget



For Ford and Lincoln wholesalers and the collision repair industry

Ford Debuts New Repair Section on High-Voltage Battery Minor Damage and Inspection

On Target is charged to begin providing to collision repairers details from a newly expanded sub-section in the official *Ford Workshop Manual* (WSM) that focuses on inspecting and repairing minor high-voltage battery damage that may be found on the Ford Mustang Mach-E® SUV due to curb strikes or running over hazards on the road.

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.

The newly created section—featuring a date of 1/25/24—is titled **Section 414-03A: High-Voltage Battery, Mounting and Cables Diagnosis and Testing – High-Voltage Battery Minor Damage Inspection.**

Repairers should also familiarize themselves with the following previously published sub-sections under this topic in the WSM:

- High-Voltage Battery Guardrail
- High-Voltage Battery Tray Surface Repair
- High-Voltage Battery Tray Replacement

(Editor's Note: *On Target* plans to include excerpts from these sections in forthcoming volumes).

NOTE: Diagnostics within the WSM and with this procedure assume a certain skill level and knowledge of Ford-specific diagnostic methods. Refer to Diagnostic Methods in **Section 100-00, General Information, Description and Operation.**

Inspection and Verification

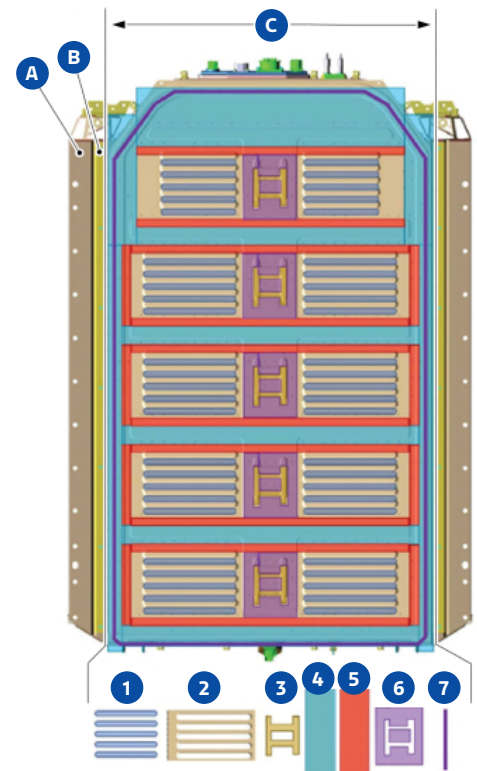
WARNING: To prevent the risk of high-voltage shock, always precisely follow all warnings and service instructions, including those on how to de-power the system. The high-voltage systems use high-voltage cables to connect their components and modules. The high-voltage cables and wiring are identified by **orange** harness tape or **orange** wire coverings. All high-voltage components are marked with high-voltage warning labels displaying a high-voltage warning symbol. Failure to follow these instructions may result in serious personal injury or death.

1. Refer to High-Voltage System Health and Safety Precautions – Overview (**Section 100-00, General Information, Description and Operation**)
2. Using the Ford Diagnostic & Repair System (FDRS) tool, verify if any DTCs are present. Follow the diagnostic procedures related to the present DTCs.
3. With the vehicle in NEUTRAL, position it on a hoist (refer to **Section 100-02, Jacking and Lifting – Electric Motor**).
4. Inspect the bottom of the High-Voltage Battery (HVB). Use **Figure 1** to identify the repair required depending on the zone location of the damage.

On Target plans to include more details on this procedure in future volumes.

For more information on the Mustang Mach-E, 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.

Figure 1
High-Voltage Battery (HVB)
Minor Damage Inspection



Item	Description
A	Zone A - HVB side structure
B	Zone B - HVB guardrail
C	Zone C - HVB
1	5.5 mm (0.21 in) maximum allowable internal HVB tray dent depth
2	1.75 mm (0.06 in) maximum allowable internal HVB tray dent depth
3	2.0 mm (0.77 in) maximum allowable internal HVB tray dent depth
4	Any size dent in this area is acceptable and does not require any action (no impact to internal HVB components)
5	Dents are not allowed in this area and any size dent will require a HVB tray replacement
6	0.75 mm (0.02 in) maximum allowable internal HVB tray dent depth
7	Racetrack embossment

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Ford and I-CAR® Launch New Collision Repair Courses

Ford Motor Company and I-CAR® (Inter-Industry Conference on Auto Collision Repair) have once again collaborated to introduce four new Ford collision repair courses. These online courses—launched earlier this year—were designed in alignment with Ford repair procedures to equip repair professionals with the skills needed to maintain and repair the latest Ford and Lincoln vehicles.

The courses include:

Ford 2023 Super Duty® New-Model Training (85 mins):

This course delves into intricate repair procedures and cutting-edge technologies specific to the 2023 Super Duty model, ensuring technicians are well-equipped for 2023 model-year complexities.

Ford 2024 Mustang® New-Model Training (90 mins):

Offering a comprehensive exploration of repair procedures and sophisticated technologies unique to the 2024 Mustang, this course provides in-depth knowledge for navigating the intricacies of this iconic model.

Ford 2024 Ranger® New-Model Training (85 mins):

Essential for professionals repairing the 2024 Ranger, this course covers distinct repair procedures and advanced technologies associated with this model, addressing evolving industry demands.

Lincoln 2024 Nautilus® Training Overview (30 mins):

This short course provides a thorough overview of fixes and evolving tech for the 2024 Nautilus, so technicians are prepared for the advanced technology and new model design.

John Van Alstyne, CEO & President of I-CAR, expressed his enthusiasm for the training collaboration, stating, "These new Ford repair courses demonstrate our commitment to equipping repair professionals not only with the core knowledge and skills associated with our industry credentialing programs, but also offer a growing portfolio of vehicle-specific training that helps the industry apply that knowledge and skills appropriately to OEM and model-specific nuances. By staying ahead of the curve and embracing the latest automotive technologies with Ford, we're ensuring technicians are prepared to deliver the highest-quality repairs."

By providing comprehensive training on vehicle-specific technology, Ford and I-CAR empower repair professionals to help deliver safe, precise and efficient repairs, benefiting both customers and the collision repair industry.

For more information on all of the Ford repair courses offered through I-CAR—including the newly created ones—visit [I-CAR.com/Ford](https://www.i-car.com/Ford).



3M Announces New Skills Development Center

3M is proud to announce the addition of its [3M™ Skills Development Center](#), a new, 15,000-square-foot, state-of-the-art training facility in St. Paul, Minnesota. The center—which opened late last fall—is dedicated to educating and upskilling technicians across all experience levels on updated automotive collision repair and refinishing processes through intensive, hands-on training.

"With rapidly changing vehicle technology and a shortage of qualified collision repair technicians, investment in training is crucial to today's aftermarket," said Dave Gunderson, president, 3M Automotive Aftermarket Division. "Whether technicians are here to deepen their skills, challenge their own experiences or learn from experts to broaden their knowledge of

collision repair, we want the 3M Skills Development Center to be the source of continuing education for industry leaders."

The facility builds on 3M's commitment to investing in training for skilled trades and its suite of online training programs available through the [3M™ Collision Repair Academy](#), offering a dedicated physical space for technicians to experience comprehensive and hands-on training courses led by seasoned collision repair experts.

Core to the new center are [multi-day training courses](#) for technicians that are focused on body repair, paint preparation and refinishing. The facility will allow 3M to accommodate over 100 training sessions annually, providing hands-on education to over 1,000 technicians

3M Science. Applied to Life.™

and associated industry professionals, ranging from seasoned experts to students who are exploring careers in collision repair and attending vocational training for the first time. "The 3M Skills Development Center takes our training to a new level and helps give technicians the capabilities they need to upskill their talents and exceed value for their shops," said Jason Scharton, senior manager, Global Expertise Delivery, 3M. "We firmly believe that the best-trained teams deliver the best results. Nurturing your talent through continued training and education is an invaluable return on investment."

For more information, visit 3m.com/collision-repair-academy.



Exterior Component Details on Ford Mustang Mach-E® SUV

In this installment of vehicle-specific information on the Ford Mustang Mach-E SUV, we examine the body-side inner panels and the front panels, aprons and side members.

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.

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

On Target plans to include more construction details on the Mustang Mach-E in future volumes, including some of the special tools needed for service, as found on Ford's Rotunda website.

For more information on the Mach-E, 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.

Body-Side Inner Panels

Item	Description	Steel Type
1	B-Pillar	Boron Steel
2	Roof Side Rail Reinforcement	Martensitic Steel and Dual-Phase (DP) 600 Steel
3	Drain Trough Bracket	Mild Steel
4	Drain Trough	Mild Steel
5	Drain Trough Bracket	Mild Steel
6	Inner Quarter Panel Outer Reinforcement	High-Strength Low-Alloy (HSLA) 500 Steel and Mild Steel
7	Filler Panel	Boron Steel
8	A-Pillar	Boron Steel
9	B-Pillar Inner	Boron Steel
10	Rocker Panel Reinforcement	Boron Steel
11	Reinforcement	Boron Steel
12	A-Pillar Reinforcement	Boron Steel
13	A-Pillar Reinforcement	Boron Steel
14	Inner Quarter Panel	Mild Steel

Front Panels, Aprons and Side Members

Item	Description	Steel Type
1	Support	Dual-Phase (DP) 800 Steel
2	Fender Apron Brace	Dual-Phase (DP) 600 Steel
3	Reinforcement	High-Strength Low-Alloy (HSLA) 420 Steel
4	Apron Assembly	Transformation Induced Plasticity Steel (TRIP)
5	Reinforcement	Transformation Induced Plasticity Steel (TRIP)
6	Reinforcement	Dual-Phase (DP) 600 Steel
7	Side Member	Dual-Phase (DP) 600 Steel
8	Side Member Reinforcement	Dual-Phase (DP) 600 Steel
9	Bumper Mounting Bracket	High-Strength Low-Alloy (HSLA) 420 Steel
10	Side Member Inner	Dual-Phase (DP) 600 Steel
11	Floor Side Member Assembly	Dual-Phase (DP) 600 Steel
12	Bracket	Bake Hardened (BH) 210 Steel
13	Bracket	Bake Hardened (BH) 210 Steel

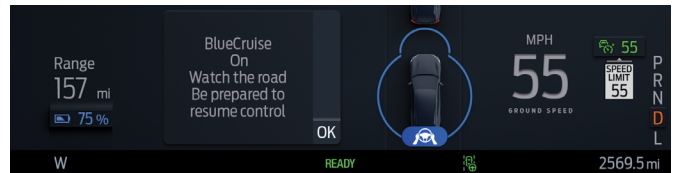
Ford BlueCruise System

In an effort to help technicians correctly repair vehicles that contain this feature, here are more technical details regarding the Ford BlueCruise* technology, utilizing the Ford Mustang Mach-E® SUV as an example vehicle.

More information can be found in **Section 419-03A: Cruise Control, Description and Operation** of the official *Ford Workshop Manual*—accessible through FordServiceInfo.com or the Ford Professional Technician Society (PTS) site—where BlueCruise is referred to as Active Drive Assist with Intelligent Adaptive Cruise Control.

Please note the vehicle owner's guide contains important information on the active drive assist with intelligent adaptive cruise control (ACC) system, including complete illustrations and graphic displays on control indicators and numerous warnings that need to be reviewed and followed.

Based on vehicle options and availability, Intelligent ACC can contain several features, such as Lane Centering, Stop-and-Go, Speed Sign Recognition with Navigation and Highway Assist that contains active drive assist.



Steering Wheel Switch Function

The ACC steering-wheel-mounted switches are momentary contact switches that toggle up and down for the cruise control switch state. Pressing and releasing the steering wheel cruise control ON or OFF switch turns the cruise control system on. Pressing and releasing "+" on the "Set +/-" switch will set the vehicle's speed and store it in memory for later use. The adaptive cruise control indicator illuminates, and the message center displays the set speed and gap setting graphic.

There are two ways to change the set speed. The first way is to accelerate or brake to the desired speed and press and release the SET cruise control switch until the desired set speed is shown on the message center. The second way is by tapping the SET+ or the SET- switch while in the set mode, increasing or decreasing the displayed set speed by 1.6 kmh (1 mph) per tap. If the respective switch is pressed and held, the displayed set speed continues to increase or decrease until the switch is released. The ACC system may apply the brakes to slow the vehicle down to the new set speed. The set speed displays continuously in the message center while the ACC system is active.

Pressing and releasing the OFF switch or switching the ignition to OFF, turns the ACC system off. The ACC set speed memory is erased.

Applying the brake pedal or pressing the CNCL switch puts the ACC system in standby mode and the last set speed is displayed in the message center with a strike through. Pressing the RES switch when the ACC system is in standby mode causes the vehicle to accelerate to the last set speed. The set speed continuously displays in the message center while the ACC system is active. The RES switch does not function if the OFF switch is pressed, the ignition is cycled OFF or if the current vehicle speed is below the minimum operational speed.

The ACC system has the capability for the driver to change from ACC to standard cruise control. The LH 5-way steering wheel switch is used to switch from the ACC system to standard cruise

control system within the message center. For information on selecting the standard cruise control in the message center, refer to owner's literature. Once the driver has selected the standard cruise control in the message center, the ACC indicator is replaced by the standard cruise control indicator. The vehicle no longer responds to lead vehicles or automatic braking.

Lane Centering

The ACC with the lane centering system uses radar and camera sensors to assist in keeping the vehicle within the lane by applying a continuous assistance steering torque input toward the center of the lane. When the system is active in the alert mode and the vehicle unintentionally drifts out of its lane, the system provides an alert by vibrating the steering wheel. In aid mode, the system provides steering assistance by counter steering the vehicle back into the lane. Refer to the owner's literature for additional information.

The lane centering feature uses radar and camera sensors to help keep the vehicle in the center of the lane on highways by applying continuous assistance steering torque.

The IPC message center indicates status of lane centering.

- Gray indicates the system is on but inactive.
- Green indicates the system is active and applying steering torque assistance input to keep the vehicle in the center of the lane.
- Amber with an audible tone and then gray indicates a system automatic cancellation.

Lane centering activates when all the following requirements occur:

- Hands on the steering wheel at all times.
- ACC with stop-and-go is on.
- Lane centering assist is enabled in information and entertainment unit display screen.
- System detects both lane markings. If the system does not detect valid lane markings, the system stays inactive until valid markings are available.

Lane centering may not operate correctly if any of the following conditions exist:

- Vehicle is not centered in the lane.
- Lane is too narrow or wide.
- System does not detect at least any marking or when lanes merge or split.
- Limited steering torque input is applied.
- Driving area is under construction or new infrastructure.
- Modifications to the steering system made.
- Spare tire in use.
- High wind conditions.

Lane centering automatic cancellation happens when:

- Lane is too narrow or wide.
- System cannot detect valid lane markings.
- Lane markings cross over one another.

For more lane centering information,

Refer to: **Section 419-07: Lane Keeping System, Description and Operation.**

On Target plans to include more details on BlueCruise in future volumes.

For more information, contact the Ford Crash Parts Hotline at cphelp@fordcrashparts.com.

*Available feature. Includes a three-year connected service plan with regular map updates after which purchase is required. Requires FordPass® App and modem activation. Driver-assist features are supplemental and do not replace the driver's attention, judgment and need to control the vehicle. Ford BlueCruise is a hands-free highway driving feature. Only remove hands from the steering wheel when in a Hands-Free Blue Zone. Always watch the road and be prepared to resume control of the vehicle. It does not replace safe driving. See Owner's Manual for details and limitations.



AkzoNobel

AkzoNobel Installs Latest Technology at Ford Paint and Body Technology Center

AkzoNobel, a supporter of the Ford Paint and Body Technology Center (PBTC) for more than two decades, recently strengthened that support of the facility by providing it with a complete product refresh.

"We welcome our relationship with Ford through support of the PBTC," said Patrick Corbett, AkzoNobel technical consultant. "We saw an opportunity to work directly with Ford Senior Damageability Engineer Gerry Bonanni to reassess the needs within the facility to re-align with the current scopes of work. Through this collaboration, our team updated the paint mixing equipment and installed the latest advancements in coatings technology that are available to Ford dealership repair facilities."

Among the advancements is the AkzoNobel MIXIT™ Cloud platform that supports color retrieval and formula development utilizing a spectrophotometer, as well as process methods that consistently meet the needs of the dynamic collision repair industry. Through this process, AkzoNobel has met industry challenges and provided robust and expeditious solutions to body shops it serves in the field, including many Ford repair facilities.

"Working closely with Ford and our OEM partners has allowed us to develop paints and coatings that will not interfere with the sensitive equipment related to advanced driver assistance systems (ADAS)," said Corbett.

AkzoNobel empowers the refinish technician to measure, search and create their own colors digitally, which allows the refinisher to adapt to any variation of an OEM color code they may encounter. The process recognizes deviations from the color standard with utilization of spectral graphs created from measuring the factory color in the collision repair facility. Once this data is processed by MIXIT Cloud, an optimized color formula is developed and stored digitally to further populate the color space, enhancing accuracy for future repair jobs while providing solutions for current jobs. This process allows dealerships to gain efficiencies within the collision repair and refinish processes, while enhancing accuracy and customer satisfaction.

For more information, visit sikkensvr.com.



Blind Spot Information System (BLIS®) Details

On Target presents its final segment on the proper operation of Ford BLIS® by looking at blocked sensor indicators and component descriptions, straight from the *Ford Workshop Manual*. For previous installments, refer to past issues of *On Target*, available on FordCrashParts.com

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, consult **Section 419-04: Side and Rear Vision – Description and Operation**.

Blocked Sensor

NOTES:

- Blockage sensing becomes active after the wipers are activated.
- A blocked state is not a system fault, but a normal mode of operation under blocked conditions.

An excessive build-up of materials on the rear lamp assemblies, such as mud or snow, as well as heavy rain, can cause the BLIS® or cross-traffic alert (CTA) system functionality to degrade. If a blocked state is detected, the side obstacle detection control module left-hand (SODL) and right-hand (SODR) sense the performance degradation and enter the additional missed targets. Upon entering a blocked state, the SODL and/or SODR will send a status message over the medium-speed controller area network (MS-CAN) to the gateway module (GWM). The GWM then sends the status message to the instrument panel cluster (IPC) on the high-speed controller area network 3 (HS-CAN3). The message center displays BLIND SPOT NOT AVAILABLE SENSOR BLOCKED or CROSS TRAFFIC NOT AVAILABLE SENSOR BLOCKED and the left-hand and right-hand exterior mirror BLIS®/CTA LEDs illuminate.

The message center warning can be cleared by the driver, but the amber BLIS® off reconfigurable telltale (RTT) in the IPC will

remain illuminated. A blocked state will self-clear when blockage sensors detect performance has returned to normal operation. The ignition can also be cycled off to clear the blocked state. If the blockage is still present after the ignition cycle, or after some drive time the system detects again that it is blocked, the blocked sensor message will display again in the message center and the amber BLIS® off IPC RTT will illuminate.

Due to the nature of radar technology, it is possible to get a blocked sensor warning without the radar sensor being blocked. This is rare and is known as a false blockage warning. This condition will either self-clear or clear after an ignition cycle.

Component Description

SODL / SODR

The SODL and SODR are radar-based sensors that are located in the rear lamp assemblies. These sensors detect targets for the BLIS® and CTA system. The modules can store DTCs for the BLIS® or CTA system when a concern exists. The SODL and SODR communicate through the MS-CAN.

The SODL and SODR require programmable module installation (PMI) when replaced (**Section 418-01: Module Configuration**).

DRIVER DOOR MODULE / PASSENGER DOOR MODULE (DDM / PDM)

The DDM and PDM supply voltage and ground to illuminate their respective exterior mirror BLIS®/CTA LED based on messages received from the SODL and SODR. The modules can store BLIS®/CTA LED and lost communication DTCs for the BLIS®/CTA LED system when a concern exists. The DDM and PDM communicate through the MS-CAN.

The DDM and PDM require PMI when replaced (**Section 418-01: Module Configuration**).

For questions on this or the proper repair of 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.

2024 Industry Events Calendar

April 10	AASP-MN Collision Repair Alliance Meeting (Hybrid)	St. Cloud, MN
April 17	Collision Industry Conference General Meeting	Seattle, WA
April 24-25	HD Repair Forum Annual Conference	Frisco, TX
May 6-8	Women's Industry Network Annual Conference (Hybrid)	Newport Beach, CA
May 31 - June 1	Midwest Collision Trade Show & Conference	Overland Park, KS
July 9	Collision Repair Education Foundation Annual Golf Outing	Littleton, CO
July 10	Collision Industry Conference General Meeting	Denver, CO
July 12-13	Auto Body Association of Texas Trade Show	Irving, TX
Sep 19-21	AGRRR™ Auto Glass Week™	Orlando, FL
Nov 5	Collision Industry Conference General Meeting	Las Vegas, NV
Nov 5-7	Automotive Aftermarket Products Expo (AAPEX)	Las Vegas, NV
Nov 5-8	Specialty Equipment Market Association (SEMA) Show	Las Vegas, NV

The Crash Parts Corner

Did You Know That ...

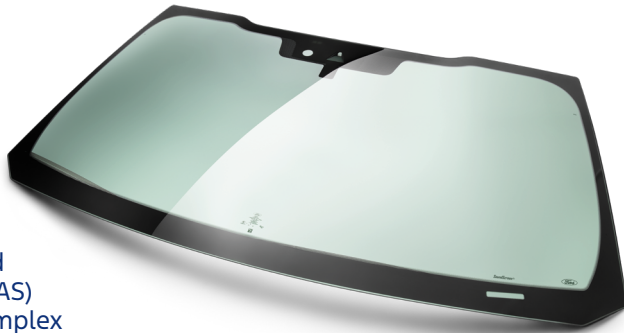
The critical role of Ford OE glass in collision repair will continue to grow, as advanced driver assistance systems (ADAS) become more widespread, complex and more deeply integrated into other vehicle systems?

Only by using Ford Original Equipment Carlex replacement glass can you be confident of the fit, function, safety and structural integrity of the repair since it is designed to fit the vehicle's specific needs and restore the vehicle to proper operating conditions.

Ford OE Carlex glass offers a wealth of helpful characteristics, including:

Thickness and Strength

Instead of shattering into pieces, Ford OE windshields will fragment, due to the vinyl sandwiched in between the two panels of glass. In the event of a forceable object projecting itself onto the windshield during driving conditions, the OE windshield is designed to withstand a certain level of damage, without that projectile penetrating the cockpit area of the vehicle.



Camera & Safety Systems

The OE windshield is specifically designed to integrate with the vehicle's camera systems. Tight OEM tolerances and control are required on glass surface shape, color, thickness and distortion to ensure camera functionality. Most vehicle manufacturers require glass suppliers to perform 100 percent inspection for see-through distortion and Carlex uses the latest laser inspection technology available.

For more information on Ford/Carlex OEM glass, including job aids, repair videos and more, visit [FordCrashParts.com/Glass](https://fordcrashparts.com/glass).

For more information on the Ford Certified Glass Network, or to join the program, visit [Collision.Ford.com/FordCertifiedGlassNetwork](https://collision.ford.com/fordcertifiedglassnetwork) or call (833) 837-7694.



Parts



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](https://fordcrashparts.com), or by clicking the Ford page on [OEM1Stop.com](https://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.