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## FORD SUPPLEMENTAL RESTRAINT SYSTEM DETAILED

Continuing its efforts to help repairers become more familiar with the detailed steps needed to complete approved, proper and safe vehicle repairs, *On Target* begins a new series of repair directives covering Supplemental Restraint Systems (SRS)—using the 2020 Ford F-150 as an example—straight from 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 [Motorcraftservice.com](http://Motorcraftservice.com).

### SECTION 501-20B: OVERVIEW

The restraints control module (RCM) continually receives and monitors inputs from the occupant classification system module (OCSM), battery energy control module B (BECMB) and various other hard-wired switches and sensors.

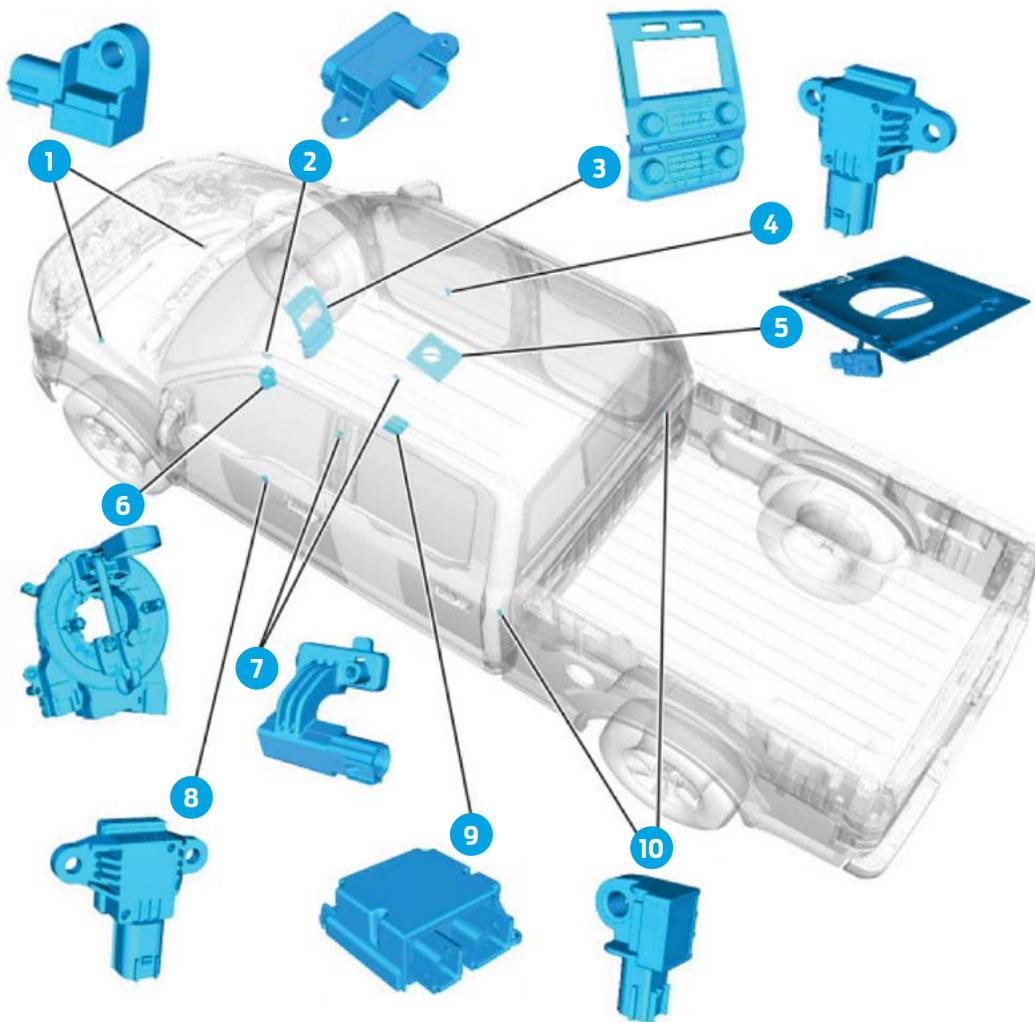
If the RCM detects a sudden vehicle deceleration and/or lateral deceleration based on the information received from the various sensors, and determines that deployment is necessary, the RCM applies voltage and current to deploy the appropriate SRS components.

The SRS utilizes connector position assurance (CPA) tabs on deployable component connectors. The tabs disengage the shorting bars of the deployable component from its electrical pins and keep the harness connector securely attached to the deployable component.

If the connector is attached to the deployable component yet the tab is not fully seated, the pins of the connector will still contact the deployable component pins. However, because the tab is not fully seated and the shorting bars are still applied to the deployable component pins, the RCM detects a fault (circuit resistance below threshold) during self-diagnostics when the vehicle is powered on (airbag warning indicator is illuminated).

The RCM requires programmable module installation (PMI), as does the BECMB. Refer to the diagnostic scan tool instructions to carry out PMI.

Additional installments on SRS will continue in future volumes of *On Target*.



NOTE: Early build shown; later build similar.

### SECTION 501-20B: COMPONENT LOCATION (PART 1 OF 3)

ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	LH and RH front impact severity sensors	6	Clockspring
2	Battery energy control module B (BECMB)	7	Seat position sensor
3	Front controls interface module (FCIM) (includes passenger airbag deactivation (PAD) indicator)	8	Driver front door side impact sensor
4	Passenger front door side impact sensor	9	RCM
5	Occupant classification system module (OCSM) (includes occupant classification system (OCS) sensor and gel-filled bladder)	10	LH and RH B-pillar side-impact sensors (SuperCab) / LH and RH C-pillar side-impact sensors (SuperCrew)

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## 2020 LINCOLN AVIATOR/FORD EXPLORER: FRAME ASSEMBLY OVERVIEW

In previous issues (2019 - Vol. 3 and 2019 - Vol. 4), *On Target* debuted important information on the 2020 Lincoln Aviator/Ford Explorer. Here, we continue with a general overview of the Aviator frame.

Please note that the following repair information is intended as a 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 [Motorcraftservice.com](http://Motorcraftservice.com).

**Section 502-00: Uni-Body, Sub-Frame and Mounting System, Description and Operation.**

### OVERVIEW

The **front subframe** is bolted to the body and is used to:

- Aid in structural support
- Provide mounting surfaces for the steering gear
- Provide mounting surfaces for the front suspension tower control arms, the engine mounts and for the front stabilizer bar

The **rear subframe** is bolted to the body and is used to:

- Aid in structural support
- Provide mounting surfaces for the rear suspension lower arms and upper arms

The **transmission support crossmember** is bolted to the body and is used to:

- Provide support for the transfer case and transmission

For body dimension specifications, refer to Body and Frame (**Section 501-26: Body Repairs – Vehicle Specific Information and Tolerance Checks, Description and Operation**).

In upcoming issues, *On Target* will continue detailing repair information related to the Aviator frame, including an in-depth review of the multi-step process of removing the front subframe.



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## BLIS® TECHNOLOGY OVERVIEW



Figure 1

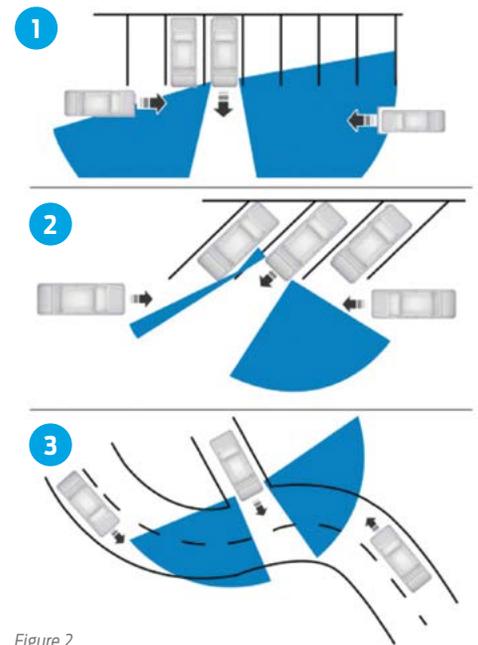


Figure 2

More details are provided by *On Target* concerning the Blind Spot Information System (BLIS®) technology--utilizing the Ford F-150 as an example--and taken straight from the official *Ford Workshop Manual*, to help repairers familiarize themselves with the exact steps needed to bring vehicles back to proper working order.

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 [Motorcraftservice.com](http://Motorcraftservice.com).

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

### BLIS®

BLIS® aids the driver in assessing whether another vehicle is present within a specific area (blind spot) to either side of the vehicle, extending rearward approximately 13 feet beyond the rear bumper, when driving on roads and highways. The system is not designed to prevent contact with other vehicles or objects. BLIS® uses exterior mirror LEDs to alert the driver that another vehicle has been detected when his/her vehicle is in a forward gear and the speed is greater than 5mph.

### BLIS® WITH TRAILER TOW

BLIS® with Trailer Tow is designed to aid the driver in detecting vehicles that may have entered the detection area zone A (Figure 1), an area on both sides of the vehicle and trailer, extending rearward from the exterior mirrors to the end of the trailer. When a trailer is outfitted with Blind Spot Trailer through the message center, the BLIS® with Trailer Tow System becomes active when driving forward above 6mph.

### CTA (CROSS-TRAFFIC ALERT)

When the vehicle is in REVERSE (R) and backing out of a front-in parking space or backing towards the road, the Cross-Traffic Alert (CTA) system alerts the driver of vehicles that are approaching from the side. The CTA system can detect a vehicle approaching from 45 feet away at speeds up to 37mph, and uses the exterior mirror BLIS® LEDs, a warning chime from the audio speakers and a message in the instrument panel cluster (IPC) message center to notify the driver. (Figure 2)

**NOTE:** If a MyKey® restricted key is in use, the BLIS® and CTA system cannot be turned off through the IPC.

**NOTE:** The BLIS® and CTA automatically turn off when the trailer is electrically connected to the vehicle. To activate BLIS® with Trailer Tow, with a trailer connected to the vehicle, the trailer must be selected, or the trailer information must be entered using the IPC message center.

Additional information on BLIS® will continue in future installments of *On Target*.

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## MORE DETAILS ON FORD LANE KEEPING SYSTEM



*On Target* continues its detailed look at the Ford Lane Keeping System (LKS), using the current F-150 as an example. This time, we examine at the image processing module A defrost heater and the system display.

Please note that 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 [Motorcraftservice.com](http://Motorcraftservice.com).

For more information, consult **Section 419-07: Lane Keeping System, Description and Operation**

### IPMA CAMERA WINDSHIELD DEFROST HEATER

The camera windshield defrost heater keeps the windshield in front of the IPMA clear of frost and ice. The IPMA uses input from the front camera and the ambient air temperature to turn the heater on and off. Voltage and ground are supplied to the heater by the IPMA, and it may be commanded on if the ambient temperature is below 5°C (41°F).

With the exception of Raptor, the IPMA camera windshield defrost heating element is integral to the windshield and cannot be serviced without replacing the windshield. For Raptor, the heating element is a resistive-type heater grid that is adhered to the inside of the windshield directly in front of the IPMA camera. Before replacing the heated-windshield element or the IPMA for any related concern, verify the integrity of the wiring, connectors and terminals on the jumper harness.

### SYSTEM DISPLAY

When the LKS is turned on, an overhead graphic of a vehicle with lane markings is displayed in the instrument panel cluster. If the lane keeping aid mode is selected when the system is on, arrow markings pointing toward the lane lines are also displayed. When the system is off, the lane marking graphics are not displayed. Additional graphics appear in the display if the adaptive cruise control is enabled. While the system is on, the color of the lane markings changes to indicate the systems status:

**Gray:** Indicates the system is temporarily unable to provide lane keeping aid or alert activation on the indicated side(s). This may be caused by

- The vehicle speed is under the activation limit
- High sun load on the IPMA camera lens
- Too close to lane markings
- Lane markings are too narrow or too wide
- Road has missing or poor lane markings in the front camera field-of-view
- Following vehicle in front too closely
- IPMA camera blocked
- Windshield is dirty or damaged
- Standing water on road
- Environmental conditions (significant sun angles, shadows, snow, heavy rain or fog)
- Turn signal is active
- Vehicle is in a dynamic maneuver
- Tight curves on the road

**Green:** Indicates the system is available or ready to provide a lane keeping aid or alert activation on the indicated side(s).

**Yellow:** Indicates the system is providing, or has just provided, a lane keeping aid activation.

**Red:** Indicates the system is providing, or has just provided, a lane keeping alert activation.

Previous entries on this topic can be found in *On Target*, 2019 - Vol. 3 and 2019 - Vol. 4, and additional details are planned in future issues.



## FORD NETWORK NEARS 100 PERCENT GOLD CLASS® RECOGNITION

Shops registered in the Ford Certified Collision Network (FCCN) have reached a 99.7 percent level of I-CAR Gold Class® recognition in 2020, placing them among the best-in-class for OEM and insurance network participants.

Gold Class recognition is the highest role-relevant training achievement recognized by the collision repair industry. Combined with the additional educational requirements of the FCCN program, the training helps to maintain up-to-date knowledge and skills that contribute to proper repairs, improved business performance and risk reduction.

“The Ford Motor Company continues to work closely with I-CAR through its *Sustaining Partner Program*,” said Ford Collision Marketing Manager Dean Bruce. “This past year, our FCCN shops reached new heights in not only achieving Gold Class recognition, but also through interactions with I-CAR’s ‘Ask RTS’ website portal (Repairability Technical Support). FCCN centers continue to engage in Ford-recommended solutions including I-CAR RTS and training resources.”

Ford-specific inquiries to I-CAR’s RTS portal and the “Ask I-CAR” website increased dramatically in 2020 compared to the previous year, another indication of the important relationship between Ford and I-CAR. Through mid-October, hits to the “Ask I-CAR” website were up over 1,876 percent versus the full-year results for 2019. Additionally, the number of Ford questions submitted to “Ask I-CAR” in the same period rose over 50 percent from those recorded the year before.

Shops interested in enrolling in the FCCN—or updating existing profiles—should visit [Collision.Ford.com/FordCertifiedCollisionNetwork](http://Collision.Ford.com/FordCertifiedCollisionNetwork).

To begin taking required courses, visit [I-CAR.com](http://I-CAR.com) and click on the MyI-CAR® log-in at the top of the page. For any questions, contact the I-CAR Customer Care Team at 800-422-7872 or [CustomerCare@I-CAR.com](mailto:CustomerCare@I-CAR.com).



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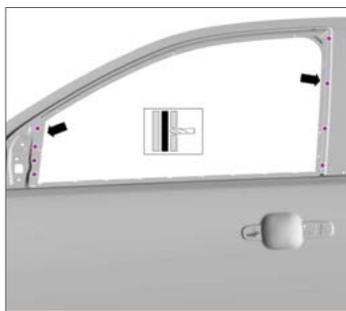


Figure 1

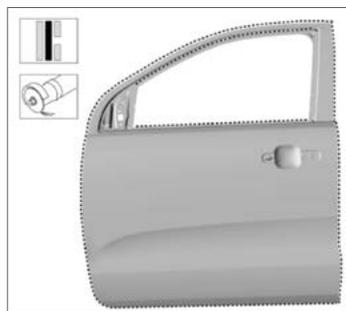


Figure 2

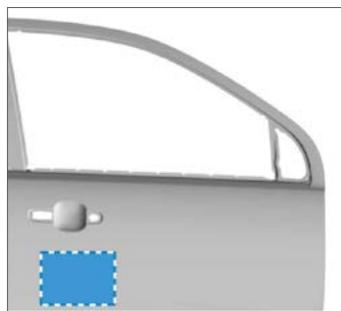


Figure 3

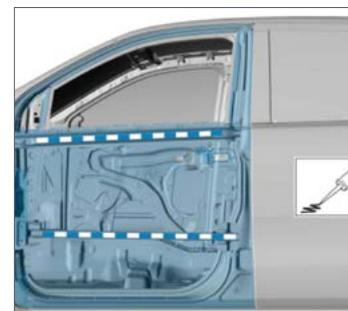


Figure 4

## 2019 FORD RANGER: FRONT DOOR SKIN PANEL

*On Target* concludes its series on Ford Ranger repairs with a look at the front door skin panel, including comments by Ford Senior Damageability Engineer Gerry Bonanni.

Please note that the following repair 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 [Motorcraftservice.com](http://Motorcraftservice.com).

### SECTION 501-29: SIDE PANEL SHEET METAL REPAIRS, REMOVAL AND INSTALLATION

#### Special Tool(s) / General Equipment

- Scraper for Straight Edges
- Grinder
- Hot Air Gun
- Knife
- 8 mm Drill Bit
- MIG/MAG Welding Equipment
- Spot-Weld Drill Bit
- Locking Pliers

#### Materials

- Metal Bonding Adhesive TA-1, TA-1-B, 3M™ 08115, LORD Fusor® 108B
- Seam Sealer TA-2-B, 3M™ 08308, LORD Fusor® 805DTM
- Flexible Form Repair 3M™ 08463, LORD Fusor® 121

#### REMOVAL

**NOTE:** Left-hand side of vehicle shown; right-hand side similar. Crew Cab shown; SuperCab similar.

“Repairers should first check the door for proper alignment to all body lines and door gaps, and adjust as necessary,” said Bonanni. Repairers should follow **Section 501-3**. Continue to inspect the door, including the hinges for excessive wear or damage, and rebuild as necessary.

Repairers are then instructed to remove the following components:

- Exterior door handle (**Section 501-14**)
- Door window glass (**Section 501-11**)
- Exterior mirror (**Section 501-09**)
- Door (**Section 501-03**)
- Front door exterior trim (**Section 501-08**)
- Door weatherstrip

“After removing those components, technicians should remove the seam sealer from the door hem flange, using a hot air gun and a scraper for straight edges. Then, using the spot-weld drill bit, remove the spot welds,” instructed Bonanni. (**Figure 1**)

Carefully grind the **outer layer only** of the door hem flange as indicated (**Figure 2**). The door skin panel can now be removed, as well as the remaining portion of the outer door panel hem flange.

#### INSTALLATION

“To begin installation, repairers should straighten any door shell distortion as necessary, using the hammer-and-dolly method,” said Bonanni.

Sand to remove all adhesive for contact points and thoroughly clean, and then drill new plug-weld holes. Install a locally obtained butyl NVH patch as indicated (**Figure 3**), and apply adhesive (TA-1, TA-1-B, 3M™ 08115, LORD Fusor® 108B).

Technicians are then instructed to install, clamp and partially close the hem flanges. Remove the clamps after partially closing the flange and perform a soft install of the door on the vehicle, checking for proper fit and alignment, and adjusting as necessary. Install the plug welds using the MIG and MAG welding equipment.

Remove the door to complete the hem flanging process.

“Repairers are notified to **not** remove any residual adhesive that squeezes out,” said Bonanni. “It should be smoothed into the hem flange seam to act as sealer.”

Metal finish all plug welds as necessary, and sand and clean for primer application. Apply a Ford-approved primer to the flange area and seal all seams to production level. Refinish the door shell using a Ford-approved paint system.

Install the door (**Section 501-03**) and apply NVH foam as indicated (**Figure 4**). Refinish the door using a Ford-approved paint system, re-install all the previously removed components and install a new door frame finisher.

For previous Ranger-focused repairs, visit [FordCrashParts.com/On-Target](http://FordCrashParts.com/On-Target).

FOR REPAIR QUESTIONS ON THE RANGER, OR ANY FORD OR LINCOLN VEHICLE, CONTACT THE FORD CRASH PARTS HOTLINE AT [cphelp@fordcrashparts.com](mailto:cphelp@fordcrashparts.com) OR VISIT I-CAR'S RTS PORTAL AT [RTS.I-CAR.COM](http://RTS.I-CAR.COM).



## FORD GT SPECIAL SERVICE MESSAGES

As we did earlier this year, *On Target* offers another Special Service Message (SSM) regarding repairs on the high-performance Ford GT.

**SSM 48250 (2017 – 2020 Ford GT) – Replacement Carbon Fiber Exterior Body Panels and Parts**

All exterior body panels and aerodynamic features on the Ford GT are made of a carbon fiber composite material. Replacement exterior carbon fiber panels and parts are released and shipped with a bare and unfinished surface. The carbon fiber components will require finishing to match the production level part being serviced.

Additional Special Service Messages on the Ford GT are planned for future issues of *On Target*.



## A TRULY UNPRECEDENTED YEAR IN REVIEW

AS 2020 COMES TO A CLOSE, WE LOOK BACK AT SOME OF THE IMPORTANT STORIES ON TARGET OFFERED DURING THE YEAR.

The first volume of *On Target* for 2020—released in the spring, just prior to the COVID-19 pandemic—highlighted three new Ford *Collision Report* videos on such topics as [ADAS](#), [Ford OE glass](#) and specific repairs to the Ford Transit [side panel](#), which was also the focus of an additional, in-depth companion article. Volume 1 included another installment on proper Ford diagnostic methods straight from the *Ford Workshop Manual*, as well as repair procedures for the 2020 Ranger B-pillar outer panel and vehicle-specific body construction on the 2020 Lincoln Corsair. The issue also contained a detailed look at PPG's [MVP Business Solutions program](#).

The [second volume](#) (summer) saw the release of two new Ford position statements, warning of the dangers of using [non-OEM structural rivets](#) and [non-OEM glass](#). Ford removing the core charge on nearly 3,500 part numbers was another featured story, as was a list of [recommended disinfecting products and procedures](#) to help safeguard against COVID-19. While continuing with repair information on the Ford Ranger and Lincoln Corsair, the issue also featured the introduction of a new series looking at the Blind Spot Information System (BLIS®).

As summer turned to fall, [Volume 3](#) contained the list of [battery-electric vehicle requirements](#) for the [Ford Certified Collision Network](#), including the list of required and recommended [I-CAR](#) courses. The issue also detailed the fight against counterfeit parts, introducing *On Target* readers to the [Automotive Anti-Counterfeiting Council](#)®, and provided resources to help stop counterfeit parts with information on [Ford Global Brand Protection](#) and the [National Intellectual Property Rights Coordination Center](#).

New and past issues of *On Target* are available on [FordCrashParts.com](#), [OEMIstop.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 2021.

## INSIDE THE INDUSTRY

### Suit Filed Over R2R Expansion in MA

The Alliance for Automotive Innovation has filed a federal lawsuit seeking to overturn the expanded “Right to Repair” law Massachusetts voters approved in November. The suit claims the law’s requirements take effect too soon, and that it both conflicts with federal law and is unconstitutional. Supporters say the law—expected to take effect with 2022 model-year vehicles—will give owners greater control of the telematics data their vehicles transmit, but vehicle manufacturers and the National Highway Traffic Safety Administration cited security concerns in opposing the measure.

### VMT Rebounds Slowly

Motorists logged an estimated 251.3 billion miles on U.S. roadways in August, a 12.3 percent decline from the same month a year ago. That’s according to the Federal Highway Administration, which reports travel for the year is down 15.3 percent versus 2019. Traffic volume plunged 39.8 percent in April, the first full month COVID-19-related restrictions were in place.

### Coatings Makers Report Lower Q3 Sales

Several automotive refinish manufacturers have reported third-quarter sales declines when compared to 2019. AkzoNobel says its Automotive and Specialty Coatings revenue was down 12 percent, and that the segment is off by 17 percent for the year. Axalta reports a 9.0 percent drop in its Refinish net sales for the three-month period, but also notes demand continued to recover from Q2. PPG says third-quarter sales of its automotive refinish coatings slid 10 percent versus last year, but that volume was significantly improved from the previous quarter.

### New President for AASP

The Alliance of Automotive Service Providers has selected Tom Elder as president of its national board. Elder is currently treasurer and past president of AASP/New Jersey and has served as vice president of the national association since 2018.

### ABAT Eases Customer Complaint Process

The Auto Body Association of Texas has created a form its shops can share with customers who are unhappy with how their auto insurer handled the collision repair process. It lets customers easily report a number of frequently heard complaints, including refusing to reimburse for the use of OEM repair procedures. Shops will submit the completed forms to the Texas Department of Insurance (TDI) and the customer’s state legislators. The association says the effort stems from the TDI saying it hears complaints from shops but not consumers.



## 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 [OEMIstop.com](#).

## GENUINE PARTING THOUGHTS

Have an idea?

We’d love to hear from you. Your comments and article suggestions can be sent to:

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