

501-28 Roof Sheet Metal Repairs
Removal and Installation

2021 F-150

Procedure revision date: 10/8/2020

Roof Panel - Regular Cab

Special Tool(s) / General Equipment

| |
|---|
| Scraper for Straight Edges |
| Spherical Cutter |
| Grinder |
| Self-Piercing Rivet (SPR) Remover/Installer |
| Belt Sander |
| Blind Rivet Gun |
| Hot Air Gun |
| Knife |
| Air Body Saw |
| Locking Pliers |

Materials

| Name | Specification |
|---|---------------|
| Metal Bonding Adhesive TA-1, TA-1-B, 3M™ 08115, LORD Fusor® 108B | - |
| Roof Ditch Sealer 3M™ 08307, LORD Fusor® 129 | - |

Removal

 **WARNING:** Electric vehicles damaged by a crash may have compromised high voltage safety systems and present a potential high voltage electrical shock hazard. Exercise caution and wear appropriate Personal Protective Equipment (PPE) safety gear, including high voltage safety gloves and boots. Remove all metallic jewelry, including watches and rings. Isolate the HV system as directed by the Ford Emergency Response Guide for the vehicle. Failure to follow these instructions may result in serious personal injury or death.

NOTICE: Battery electric vehicle (BEV), hybrid electric vehicle (HEV) and plug-in hybrid electric vehicle (PHEV) contain a high-voltage battery. Before cutting or welding near the high-voltage battery it must be removed to avoid damage.

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

Refer to: [Health and Safety Precautions](#) (100-00 General Information, Description and Operation).

Refer to: [High Voltage System Health and Safety Precautions - Overview](#) (100-00 General Information, Description and Operation).

NOTICE: Adequately protect all glass, exterior finish and interior trim from contamination during entire repair procedure.

NOTE: *Aluminum body panels are highly receptive to heat transfer. With the extensive use of structural adhesives and non-structural sealers used in vehicle construction, the potential of heat transfer could impact adhesives and sealers in non-associated panels during the repair process. Many repairs areas that utilize structural adhesive may be separated after fastener removal by using a panel chisel along the joint/flange. Using heat not exceeding 425° F to loosen a bonded panel should only be done when all panels in the joint will be replaced and new adhesive applied.*

2. Depower the SRS.

Refer to: [Supplemental Restraint System \(SRS\) Depowering](#) (501-20B Supplemental Restraint System, General Procedures).

3. Remove the headliner.

Refer to: [Headliner - Regular Cab](#) (501-05 Interior Trim and Ornamentation, Removal and Installation).

4. Remove the windshield and rear window glass.

Refer to: [Fixed Glass](#) (501-11 Glass, Frames and Mechanisms, General Procedures).

5. Remove the high mount stop lamp.

Refer to: [High Mounted Stoplamp](#) (417-01 Exterior Lighting, Removal and Installation).

6. Remove the roof mouldings.

Refer to: [Roof Moulding](#) (501-08 Exterior Trim and Ornamentation, Removal and Installation).

7. Remove the side curtain air bag.

Refer to: [Side Curtain Airbag - Regular Cab](#) (501-20B Supplemental Restraint System, Removal and Installation).

8. Remove the satellite radio antenna.

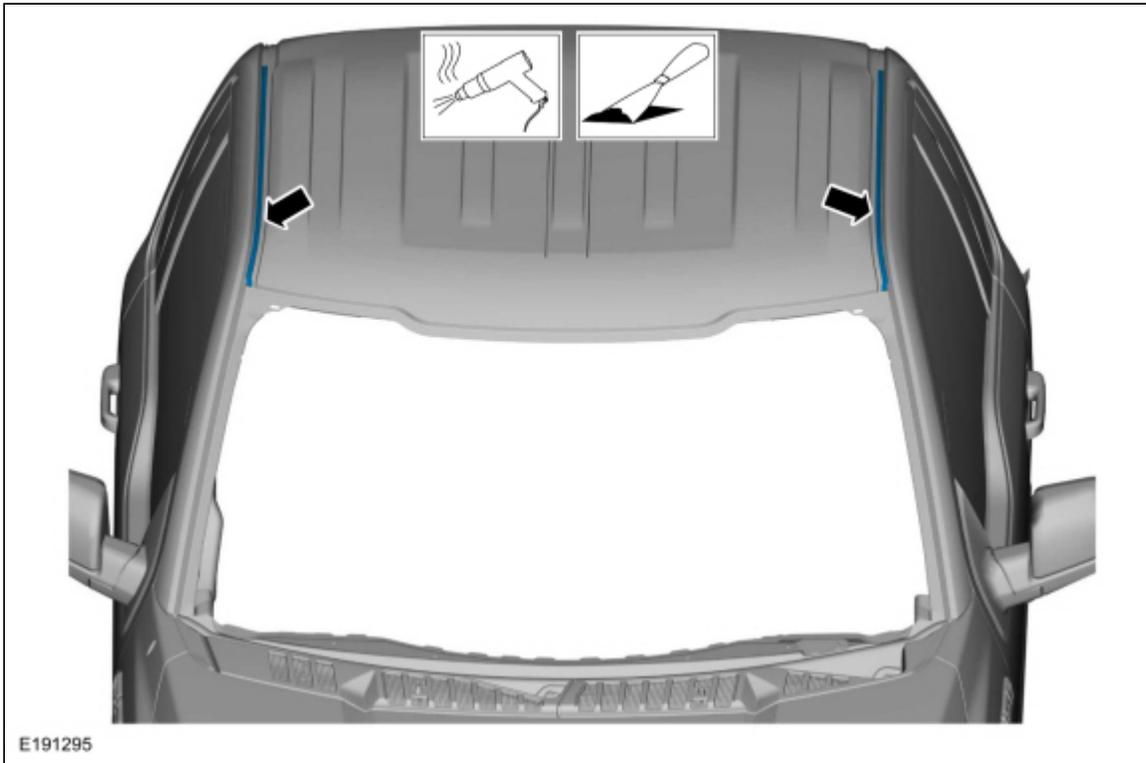
Refer to: [Satellite Radio / Global Positioning System \(GPS\) Antenna Cable](#) (415-00 Information and Entertainment System - General Information, Removal and Installation).

9. Remove the roof ditch sealer.

Use the General Equipment: Hot Air Gun

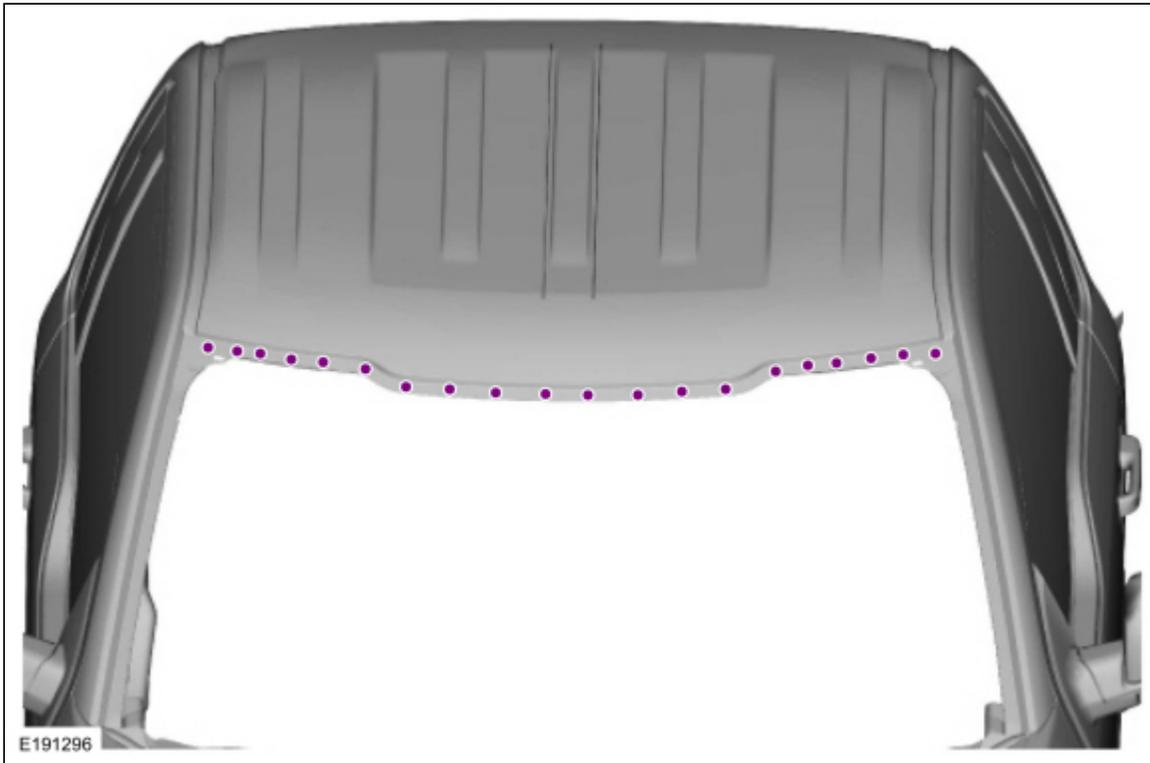
Use the General Equipment: Scraper for Straight Edges





- 10. Remove the front header SPR fasteners.
Use the General Equipment: Self-Piercing Rivet (SPR) Remover/Installer
Use the General Equipment: Belt Sander



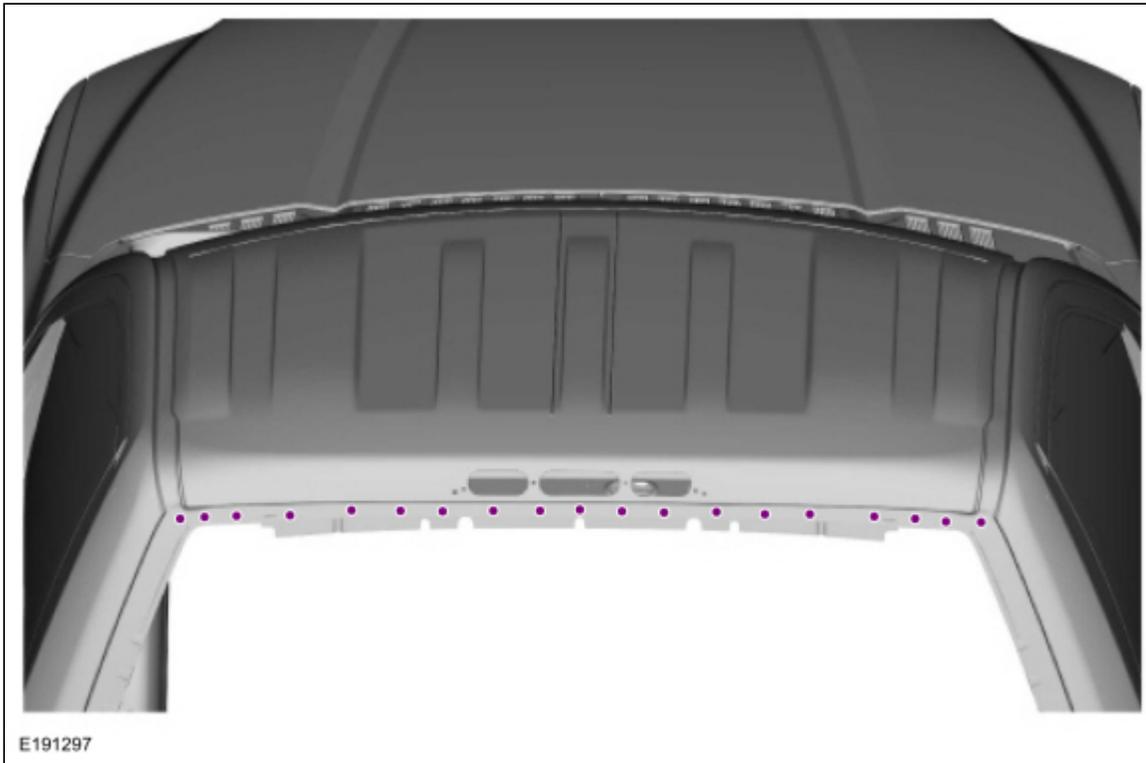


- 11. Remove the rear header SPR fasteners.
Use the General Equipment: Self-Piercing Rivet (SPR) Remover/Installer
Use the General Equipment: Belt Sander

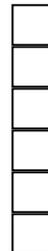
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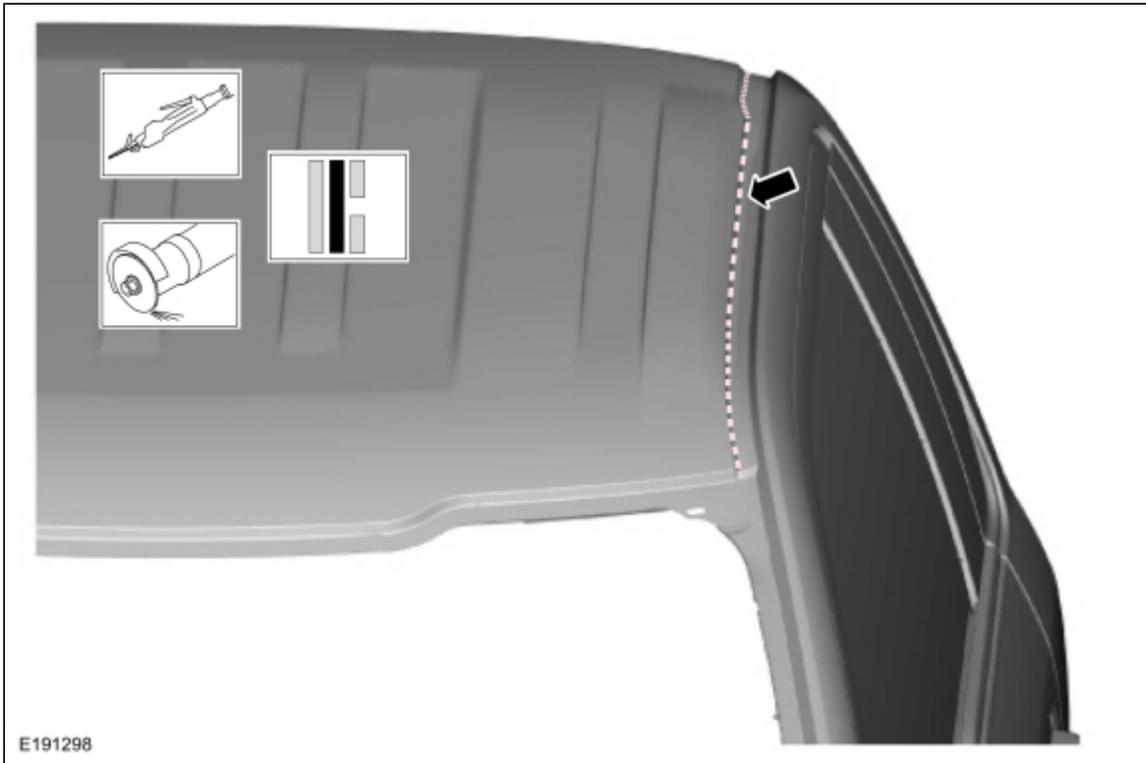
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- 12. Carefully cut the roof **outer panel only** in the area shown (inboard on the roof ditch). Both sides.
Use the General Equipment: Air Body Saw
Use the General Equipment: Spherical Cutter



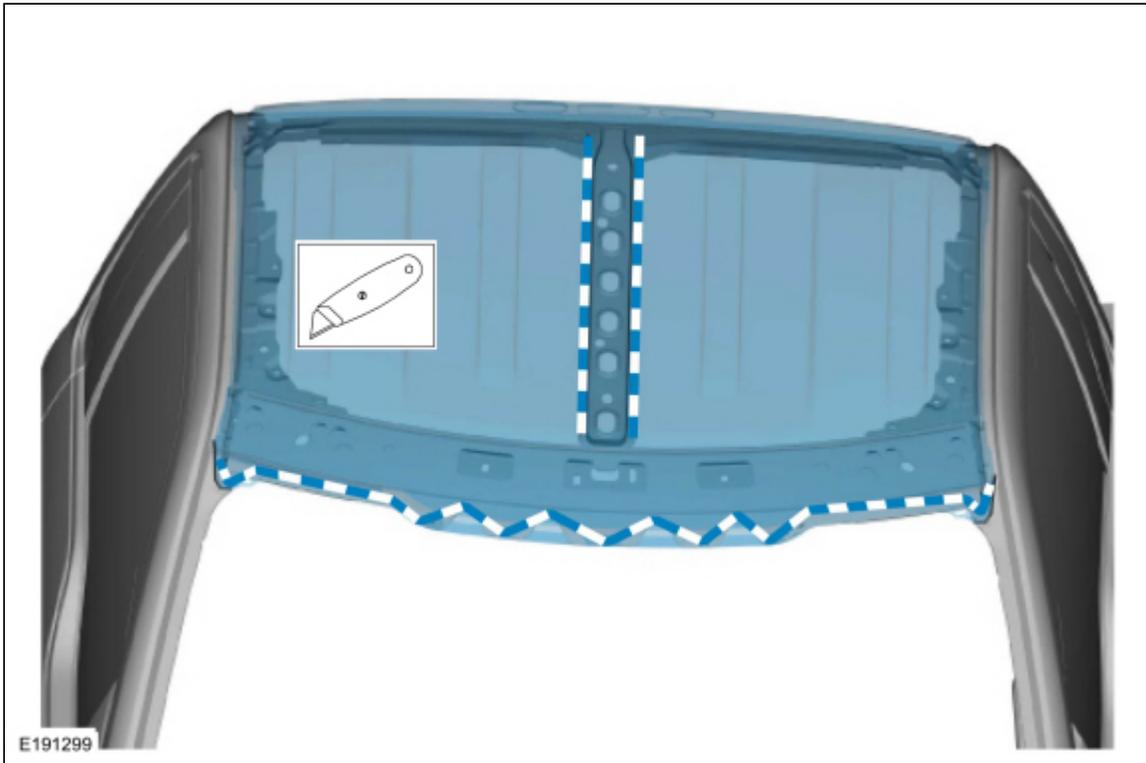


- 13. Leave as much foam as possible intact on the roof bows.
Use the General Equipment: Knife



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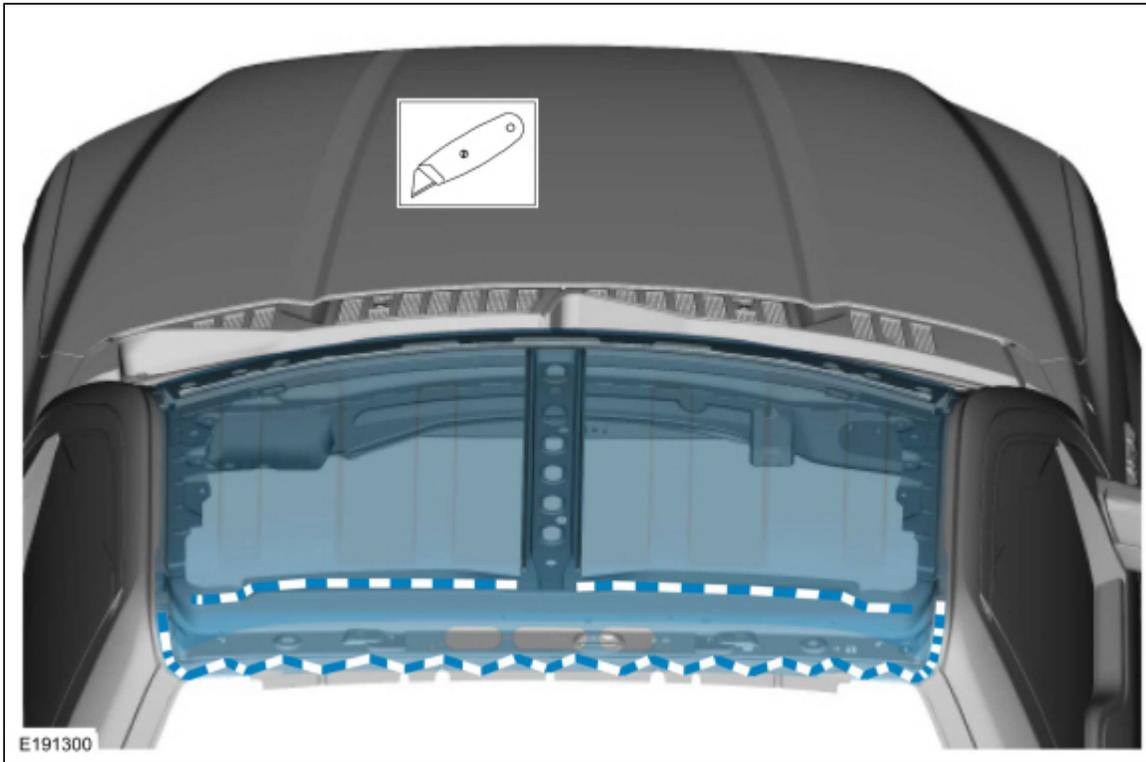


- 14. Separate the roof outer panel from the rear header panel.
Use the General Equipment: Knife



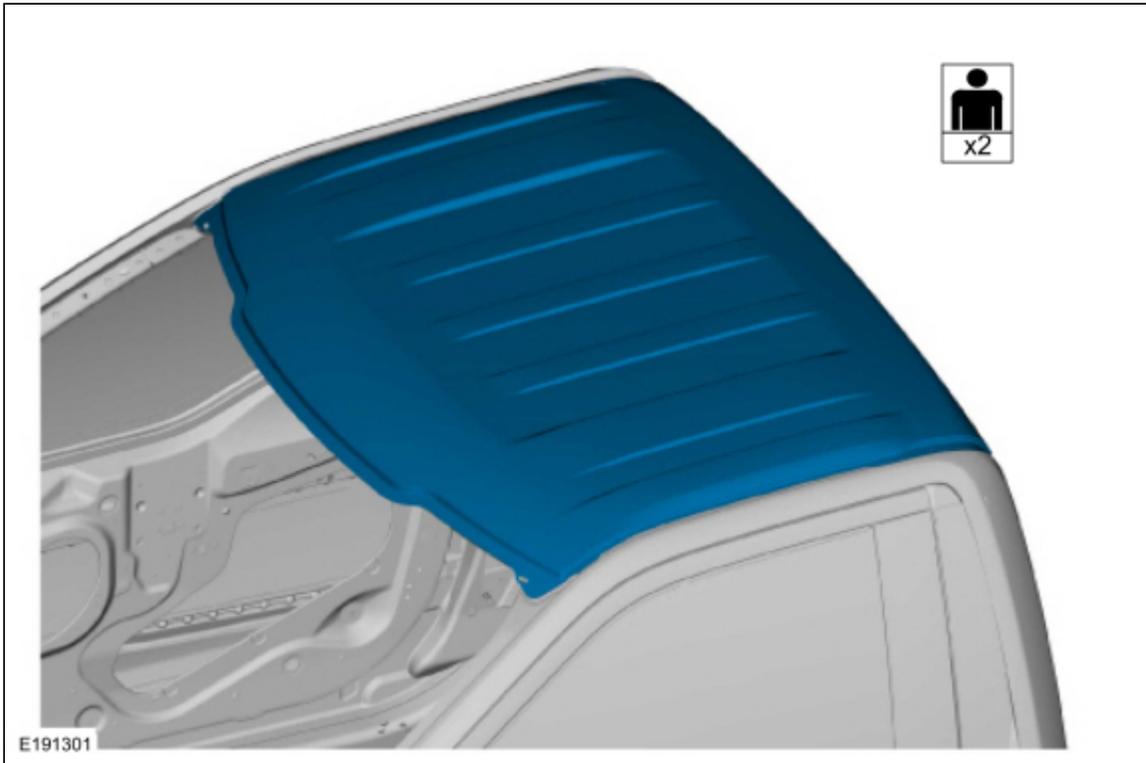
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15. With the help of an assistant, remove the roof outer panel.





16. **NOTE:** Carefully grind the area smooth removing remaining portions of the factory laser weld. use caution to avoid thinning of the metal.

Using a grinder or air chisel, carefully remove the remaining portion of the roof panel flange and laser weld bead.
Use the General Equipment: Grinder



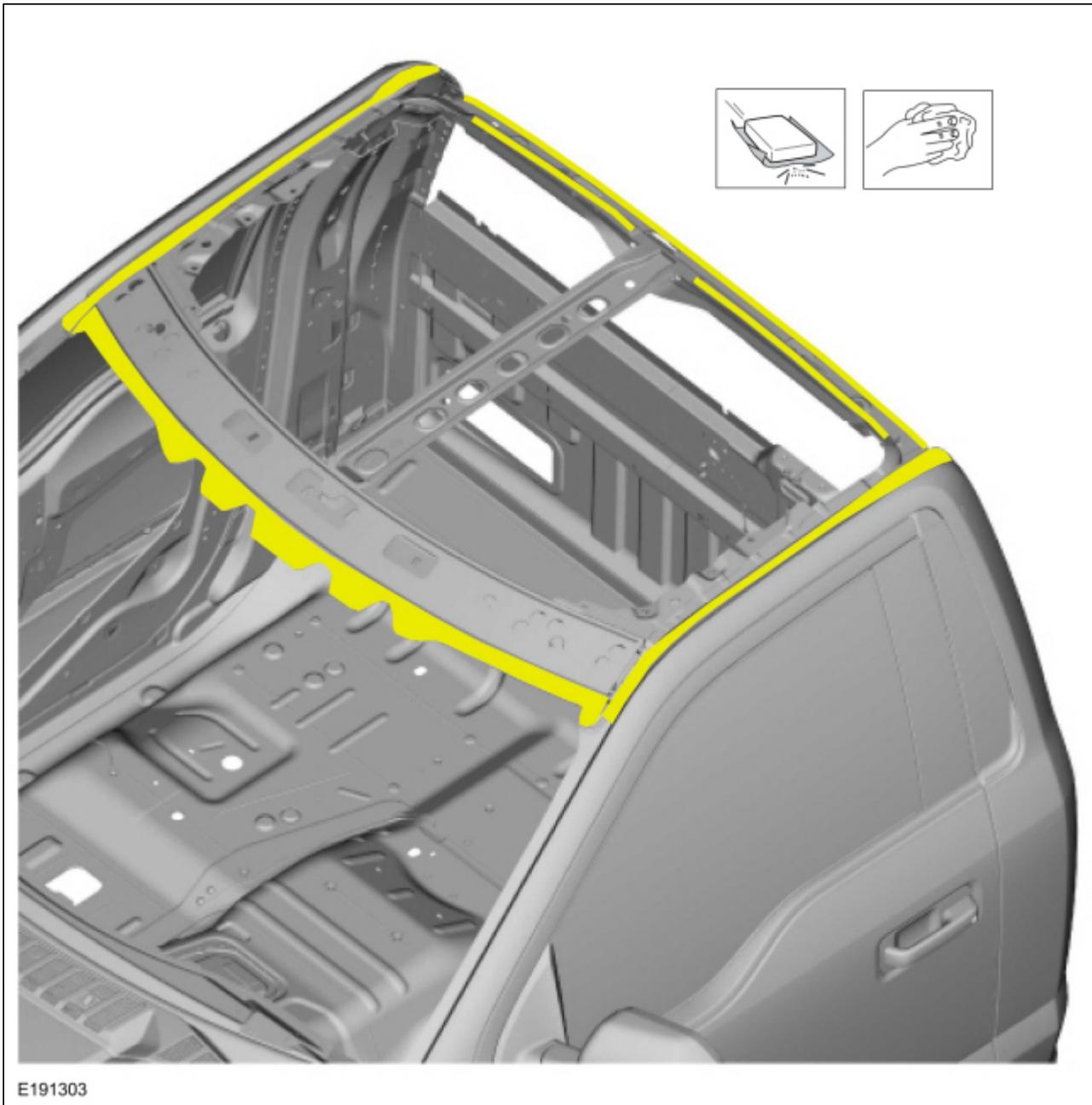


Installation

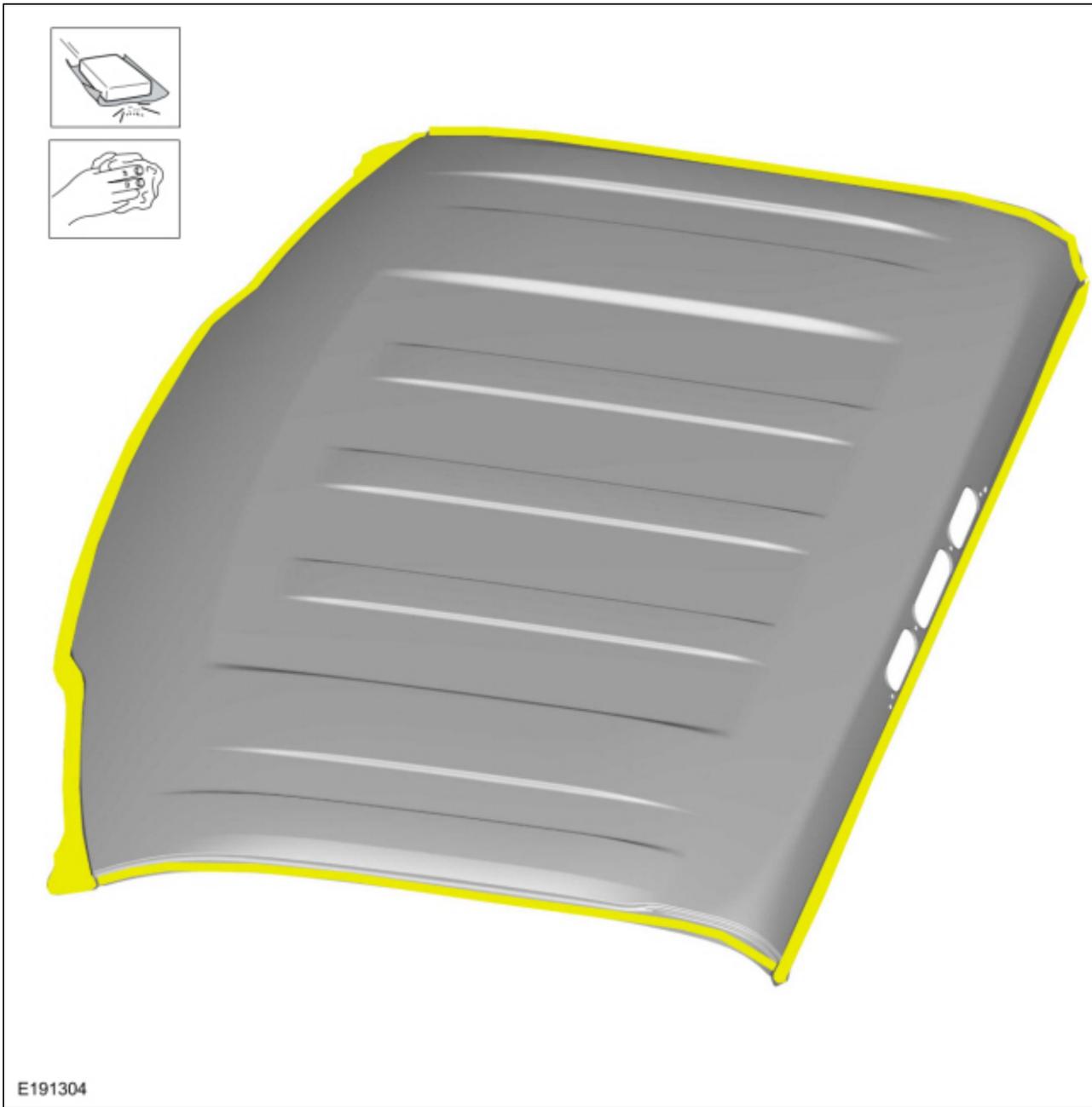
NOTICE: Adequately protect all glass, exterior finish and interior trim from contamination during entire repair procedure.

1. Use a hammer and dolly dedicated to aluminum repair to repair any damage to the body side flange to roof mating surfaces.
Refer to: [Special Repair Considerations for Aluminum Repairs](#) (501-25 Body Repairs - General Information, Description and Operation).
2. Sand and clean the roof mating surfaces.
Use the General Equipment: Grinder



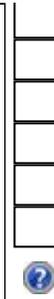
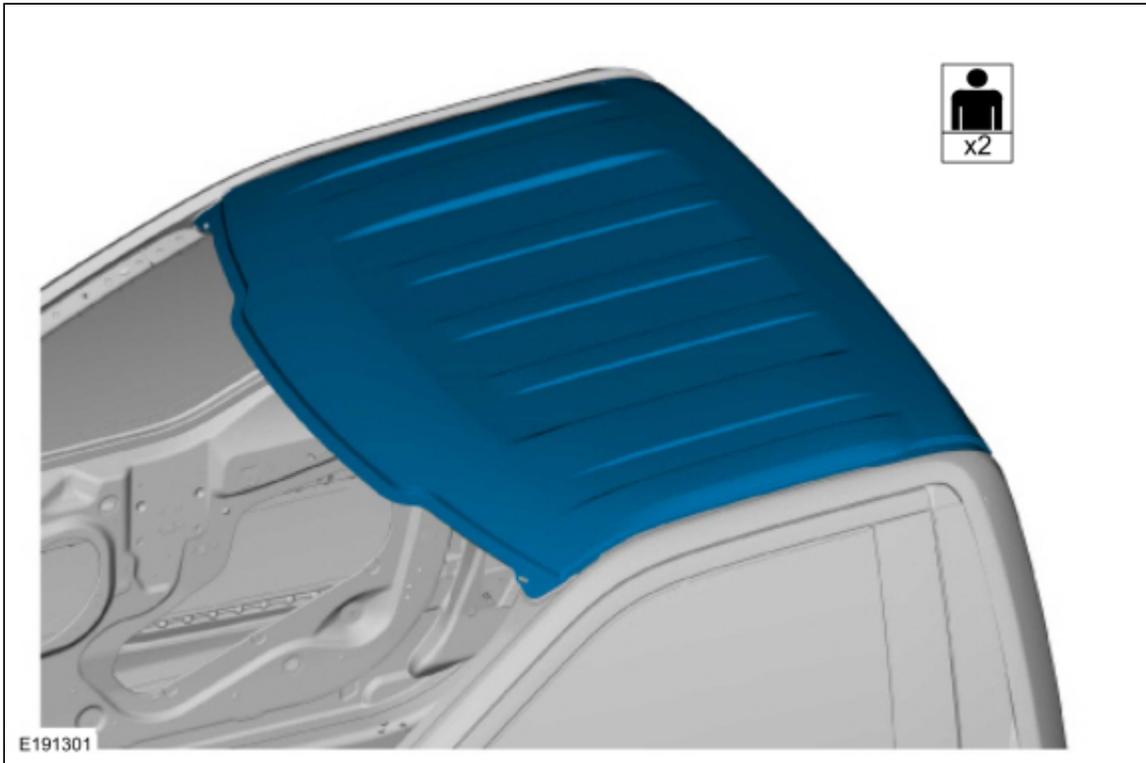


3. Sand to remove the e-coat and clean the roof panel mating surface using 80 grit sandpaper.



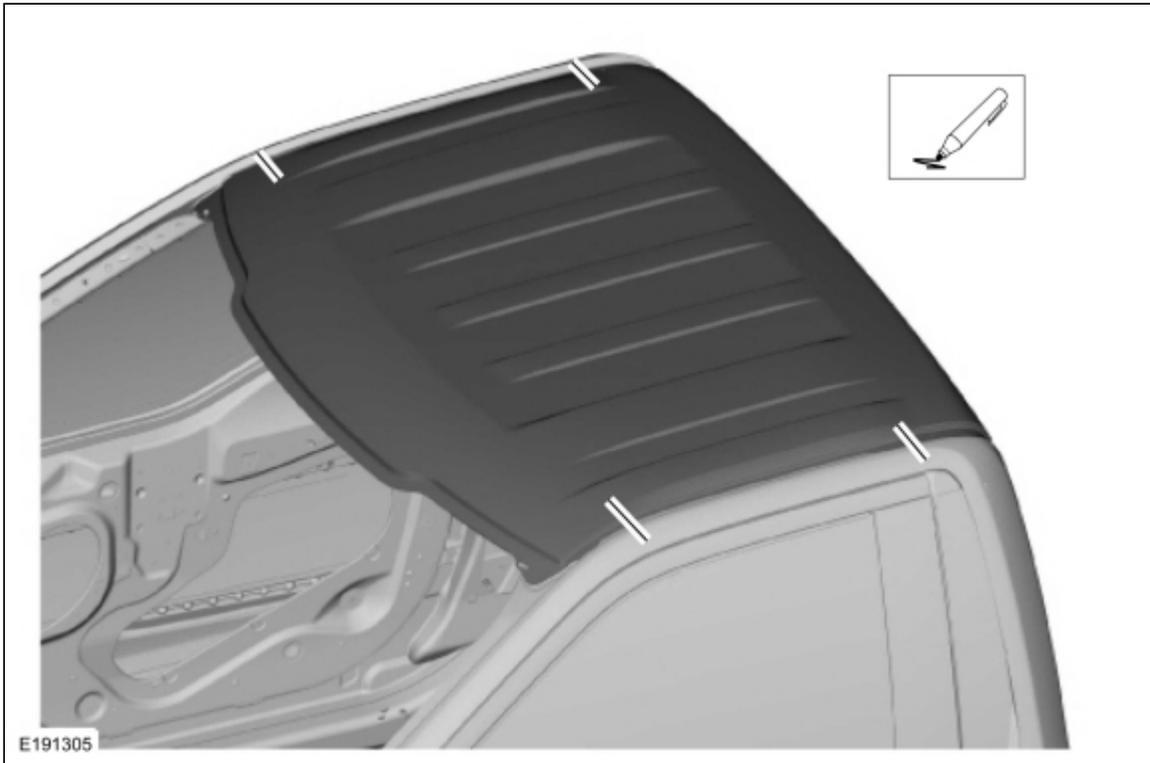
4. With the help of an assistant, install the roof outer panel.





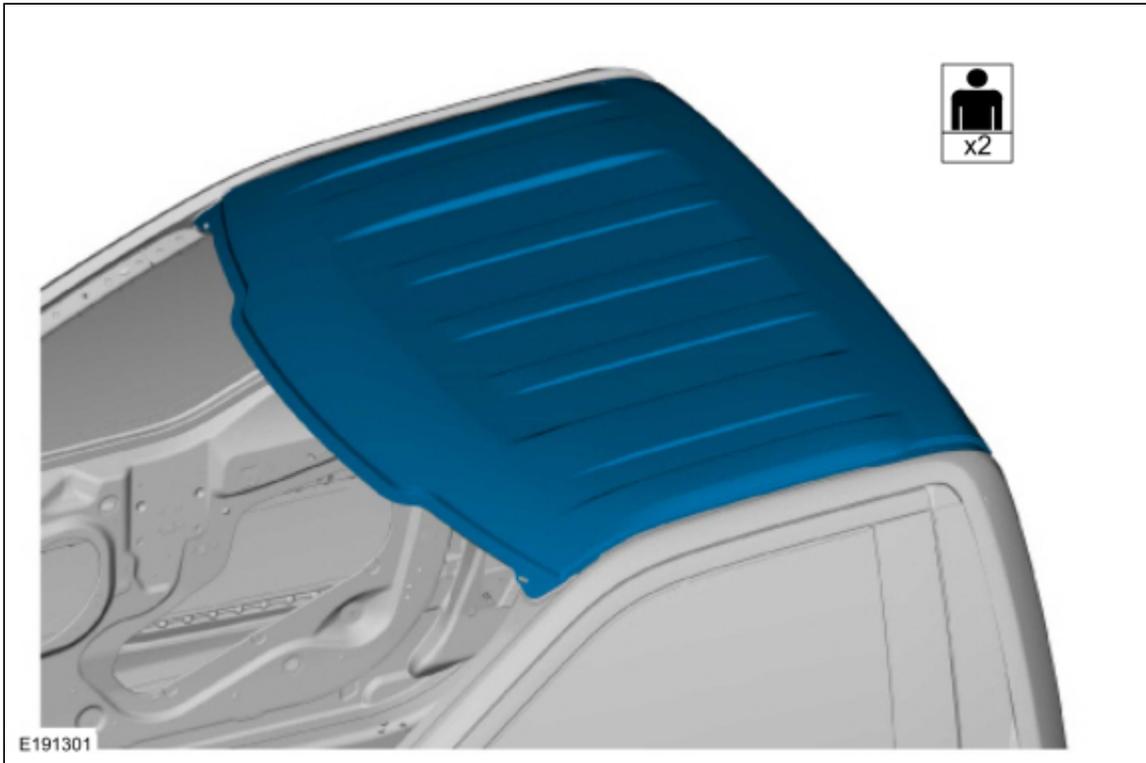
5. Properly align and index mark the roof panel to the vehicle.





6. With the help of an assistant, install the roof outer panel.

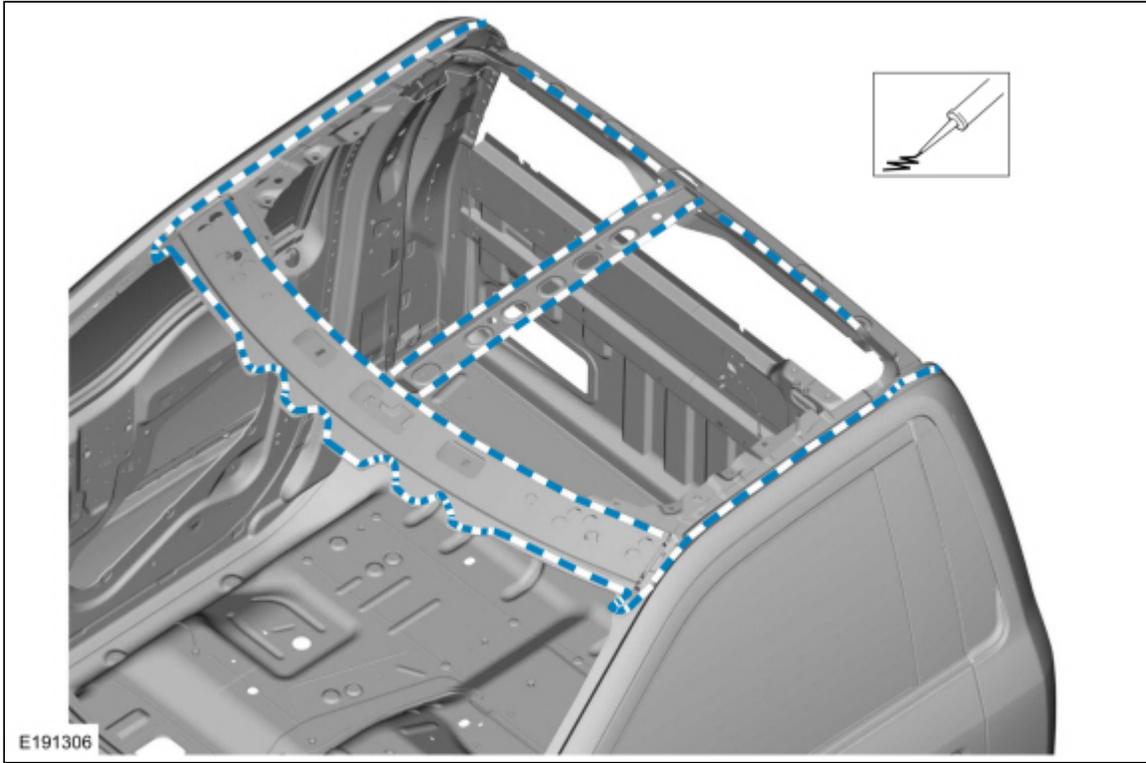




7. Apply adhesive.

Material: Metal Bonding Adhesive / TA-1, TA-1-B, 3M™ 08115, LORD Fusor® 108B

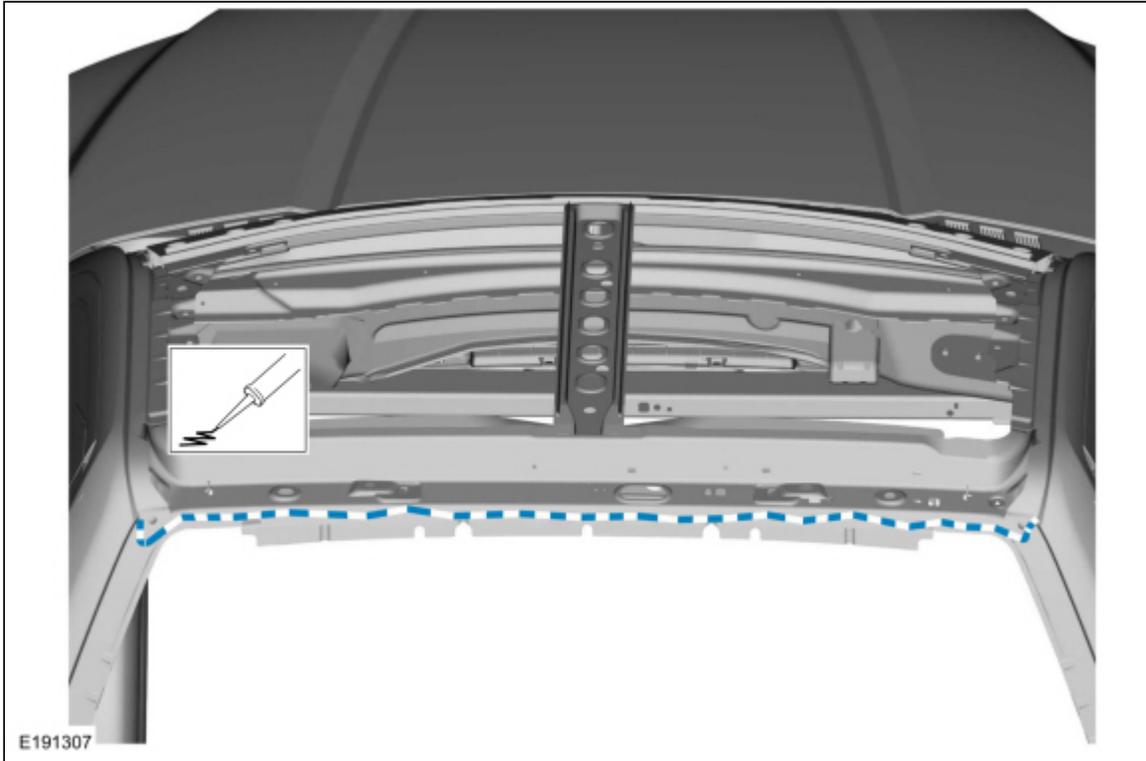




8. Apply adhesive.

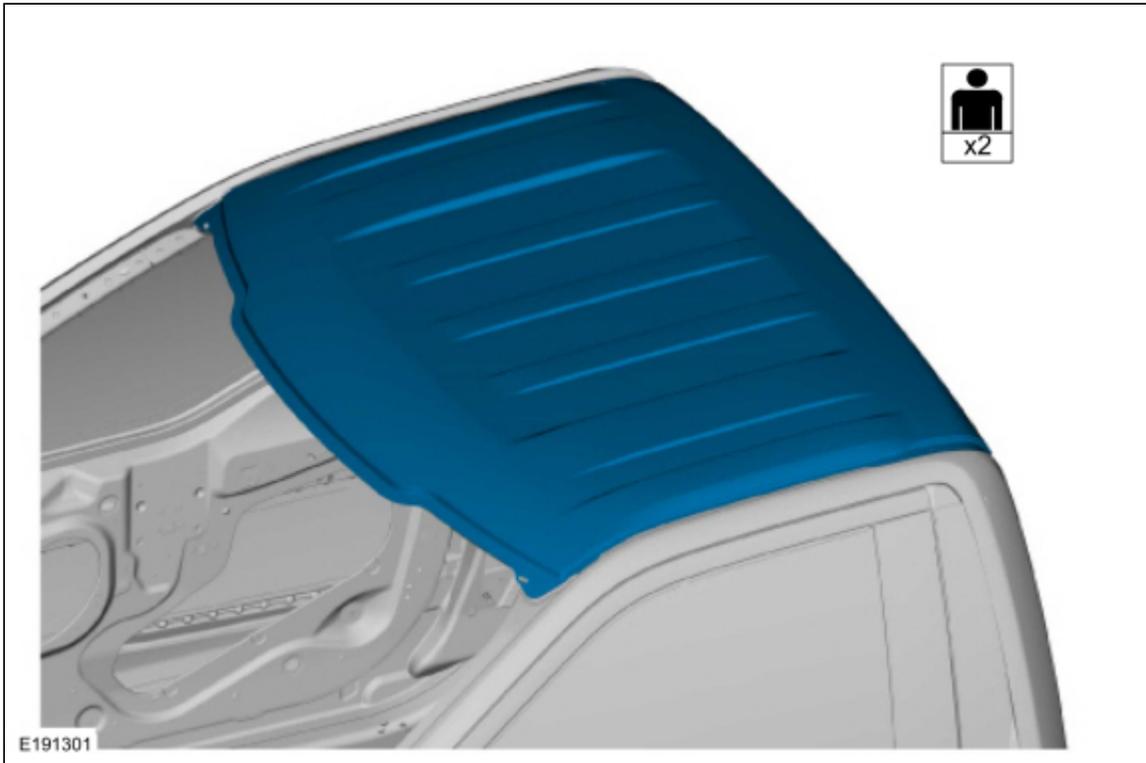
Material: Metal Bonding Adhesive / TA-1, TA-1-B, 3M™ 08115, LORD Fusor® 108B





9. With the help of an assistant, install the roof panel.



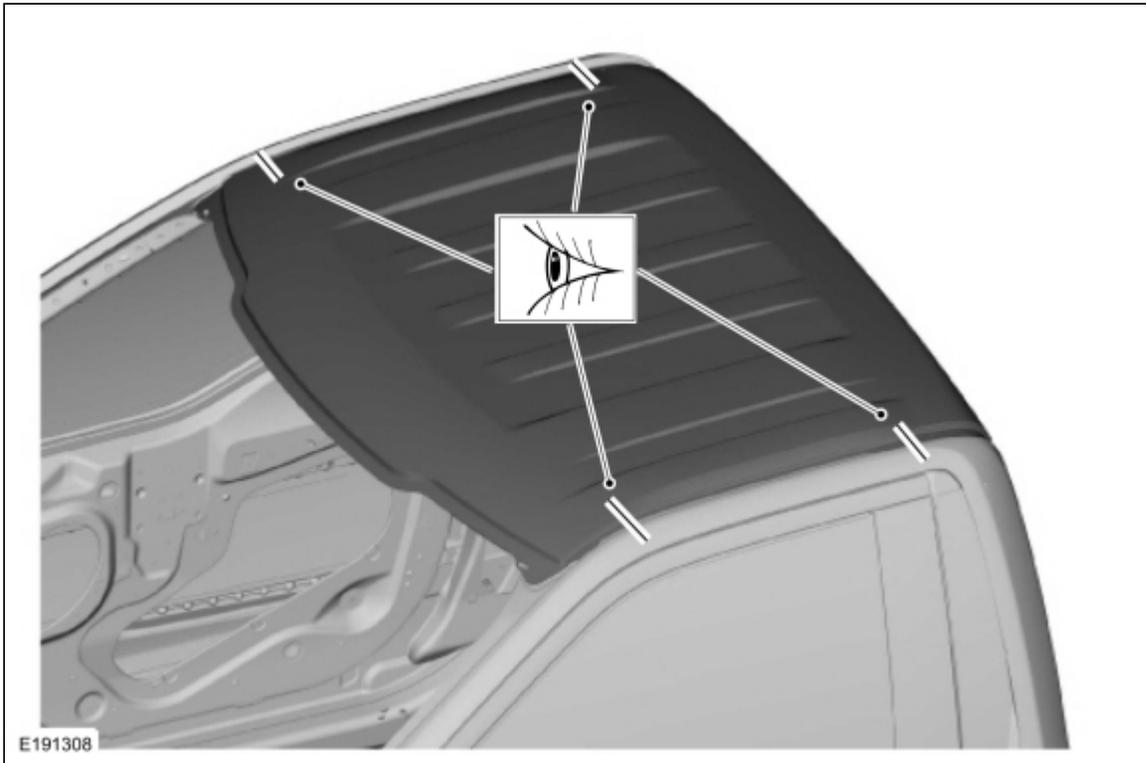


10. **NOTE:** Do not lift the roof panel to align to index marks. Slide the panel in position to reduce the possibility of breaking the adhesive bond.

NOTE: Check for full adhesive contact. Add additional adhesive to the roof bows if necessary.

Properly align the roof panel to the index marks.

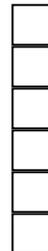


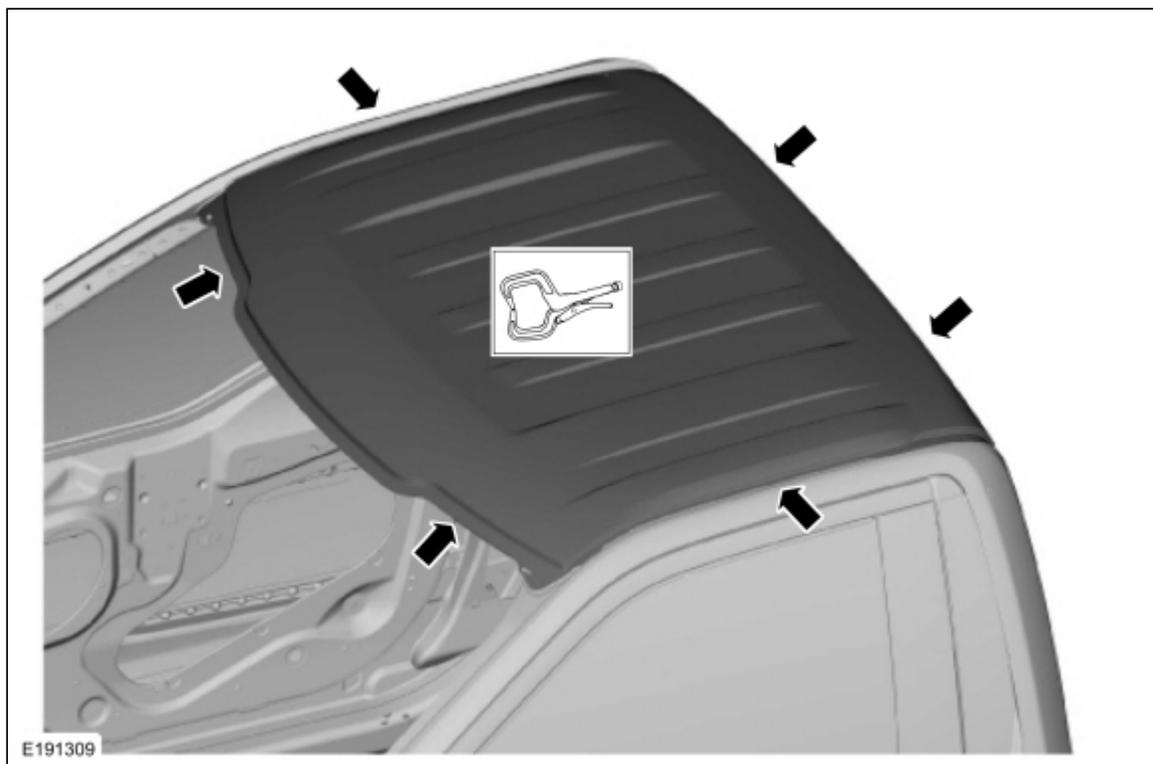


11. **NOTE:** Do not remove excess adhesive squeeze-out in the roof ditch area, smooth in to the joint to act as additional sealer.

Clamp in position.

Use the General Equipment: Locking Pliers





12. **NOTE:** SPR fasteners may not be placed directly over original SPR location. They must be placed adjacent to original location matching original quantity.

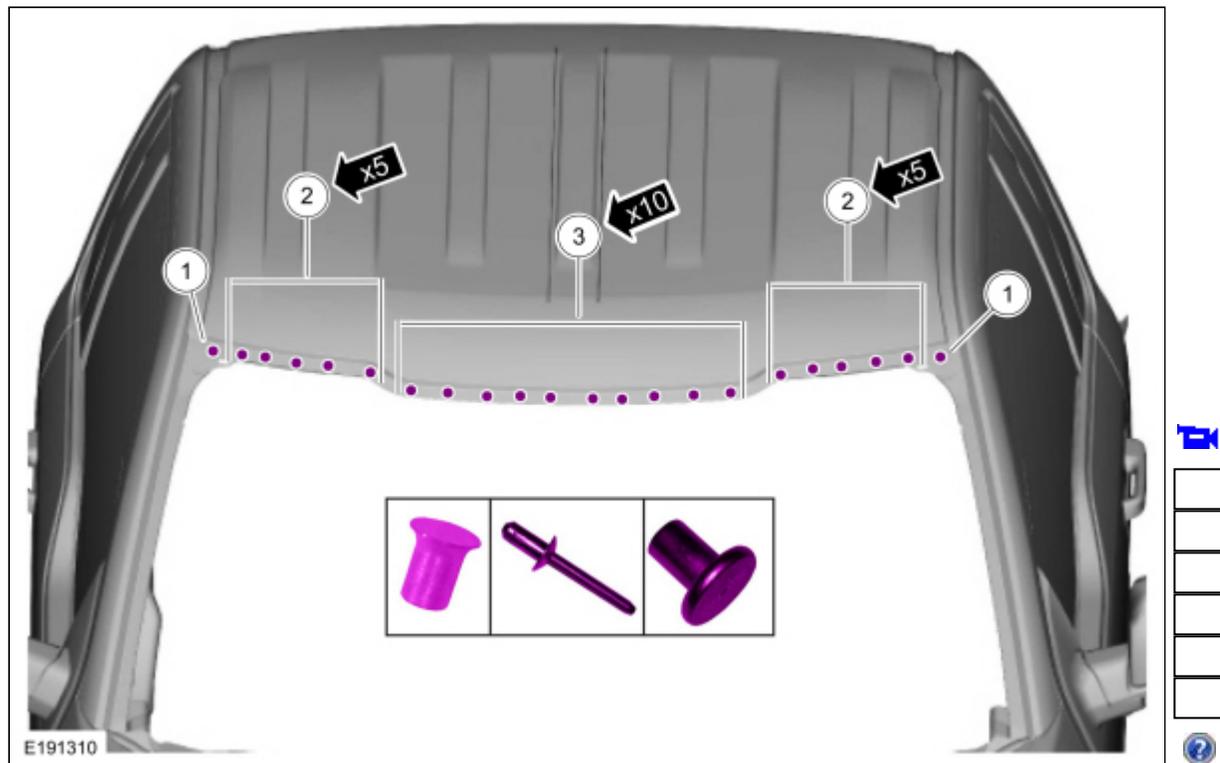
NOTE: Blind or solid rivets may be used in place of SPR in the original SPR location after enlarging hole to 6.5 mm.

Install the fasteners.

| Item | SPR Number | SPR Code | Henrob®, Car-OLiner®, CMO®, Chief®, Spanesi®, Wielander and Schill® Mandrel | Pro-Spot® Mandrel | Blind Rivet | Solid Rivet | Rivnut® |
|------|--------------|----------|---|-------------------|-------------|--------------|---------|
| 1 | W708713-S900 | AS | DZ09-025/H | SA-0400/SA-0401 | - | W790376-S900 | - |
| 2 | W717186-S900 | EN | DG11-220/H | SA-0400/SA-0402 | - | W790377-S900 | - |
| 3 | W708713-S900 | AS | DZ09-025/H | SA-0400/SA-0401 | - | W790376-S900 | - |

Refer to: [Joining Techniques](#) (501-25 Body Repairs - General Information, General Procedures).

Use the General Equipment: Self-Piercing Rivet (SPR) Remover/Installer
 Use the General Equipment: Blind Rivet Gun



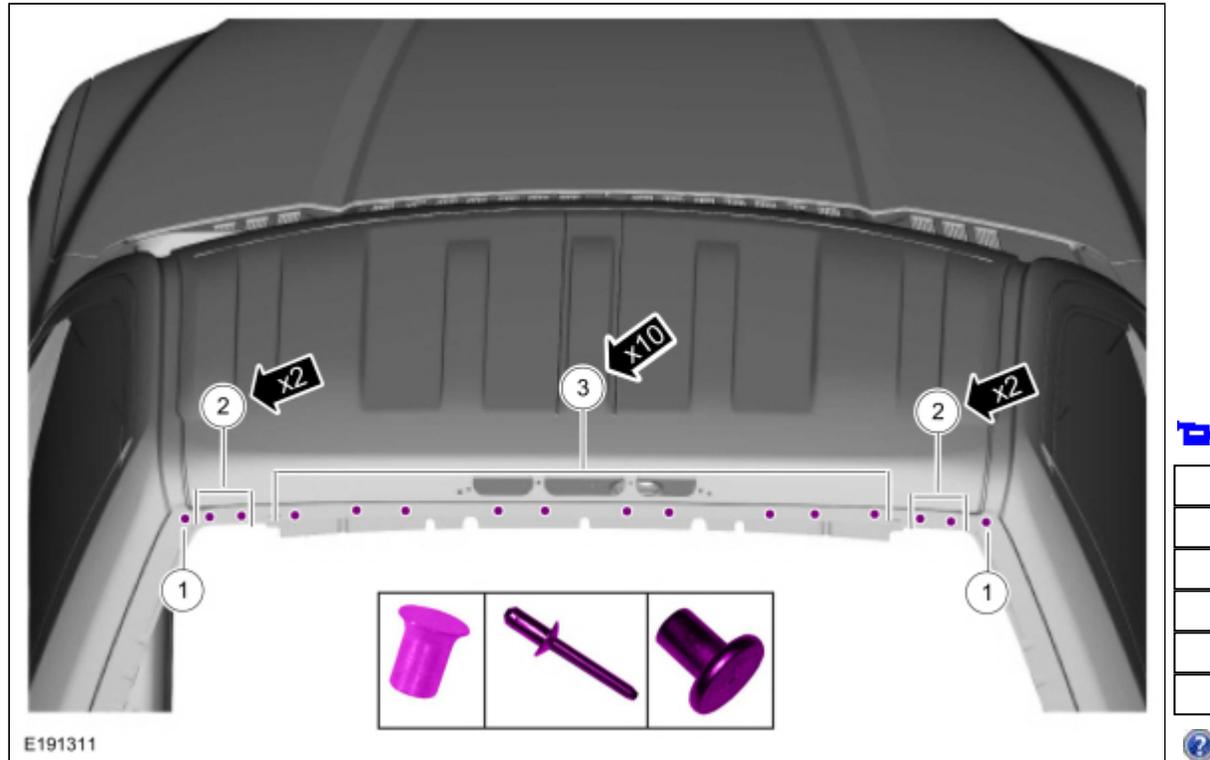
13. **NOTE:** SPR fasteners may not be placed directly over original SPR location. They must be placed adjacent to original location matching original quantity.

NOTE: Blind or solid rivets may be used in place of SPR in the original SPR location after enlarging hole to 6.5 mm.

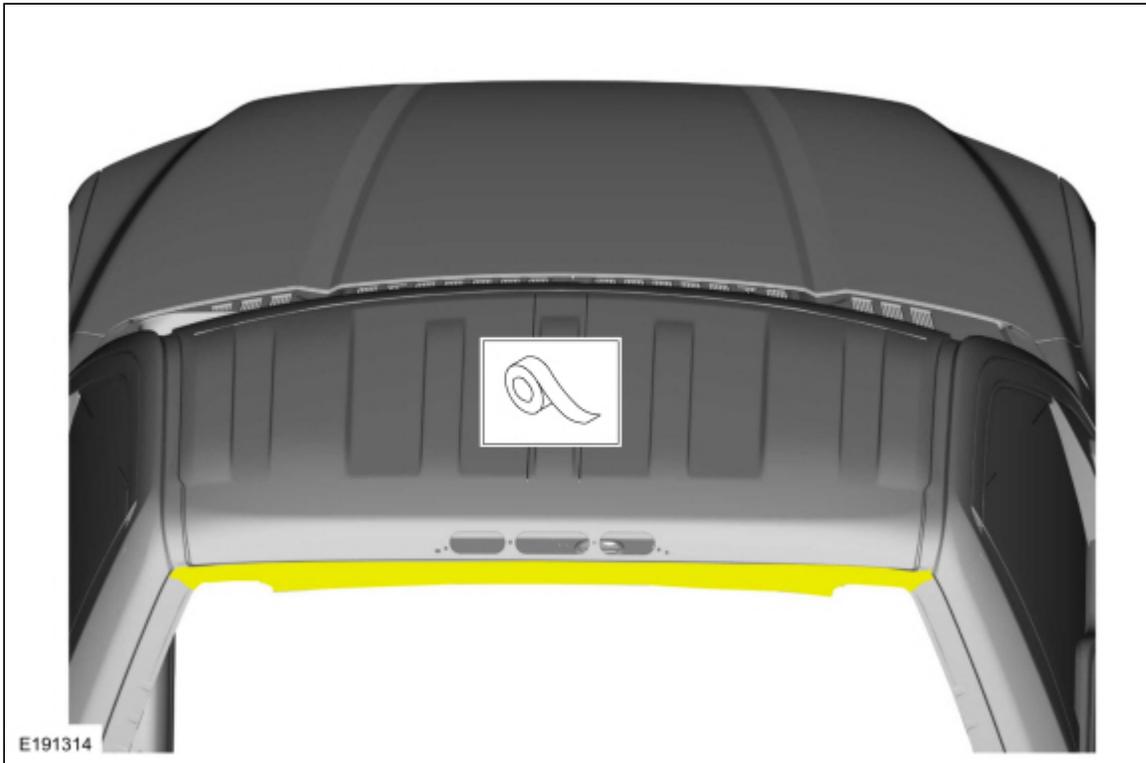
Install the fasteners.

| Item | SPR Number | SPR Code | Henrob®, Car-OLiner®, CMO®, Chief®, Spanesi®, Wielander and Schill® Mandrel | Pro-Spot® Mandrel | Blind Rivet | Solid Rivet | Rivnut® |
|------|--------------|----------|---|-------------------|-------------|--------------|---------|
| 1 | W709559-S900 | AT | DZ07-000/H | SA-0400/SA-0401 | - | W790376-S900 | - |
| 2 | W710246-S900 | BN | DP10-200/H | SA-0400/SA-0401 | - | W790376-S900 | - |
| 3 | W708713-S900 | AS | DZ09-025/H | SA-0400/SA-0401 | - | W790376-S900 | - |

Refer to: [Joining Techniques](#) (501-25 Body Repairs - General Information, General Procedures).
 Use the General Equipment: Self-Piercing Rivet (SPR) Remover/Installer
 Use the General Equipment: Blind Rivet Gun

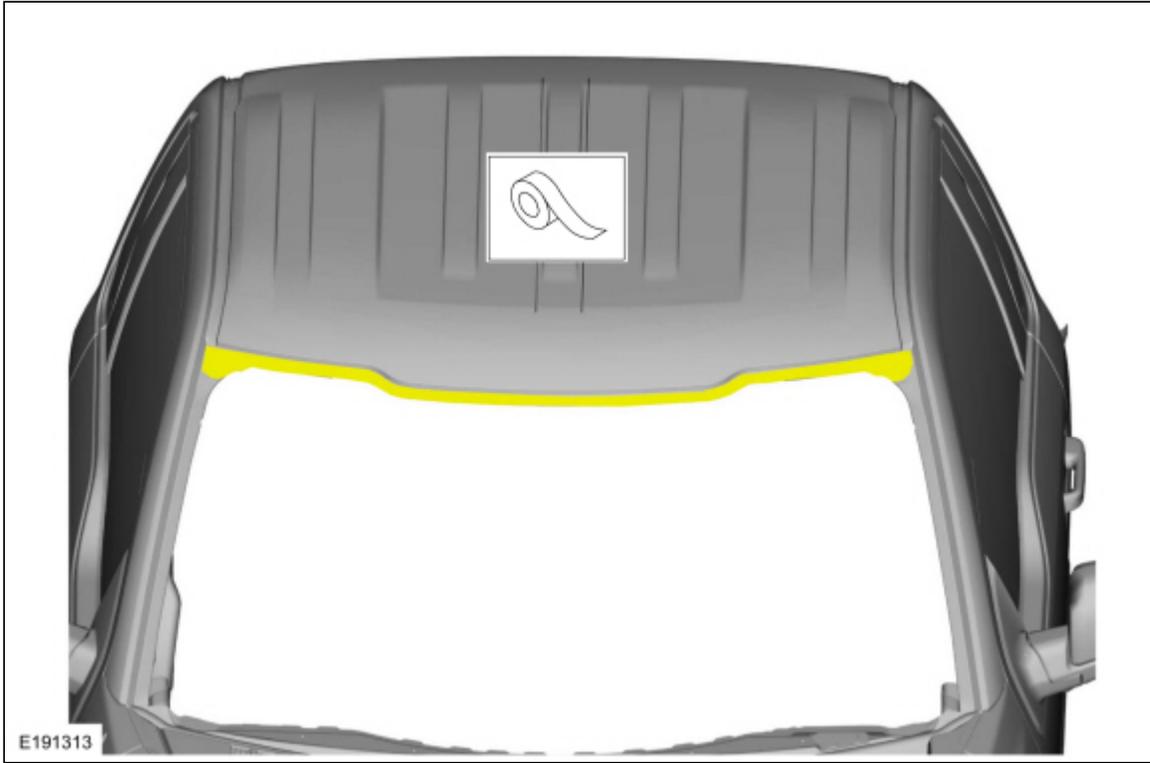


14. Sand and prime the front and rear window opening channels using a Ford approved epoxy based primer.
15. Mask off the rear window glass channel.



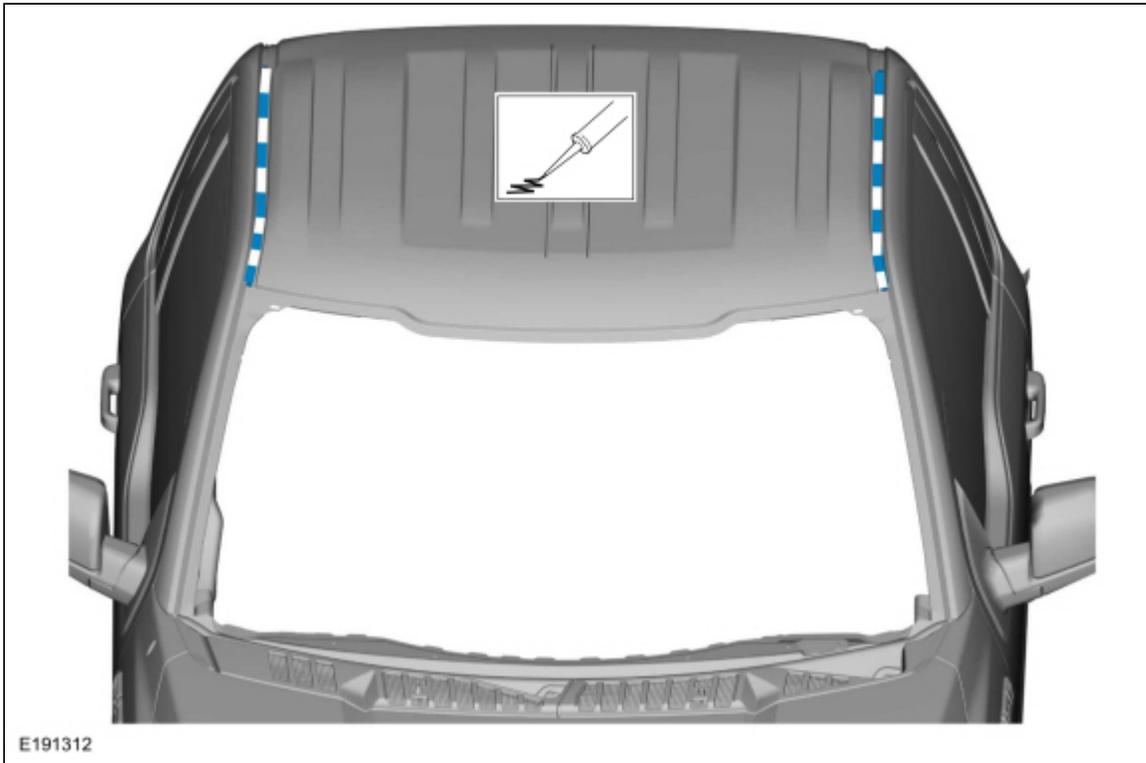
16. Mask off the front window glass channel.





17. Apply roof ditch sealer following manufacturer's directions.
Material: Roof Ditch Sealer / 3M™ 08307, LORD Fusor® 129





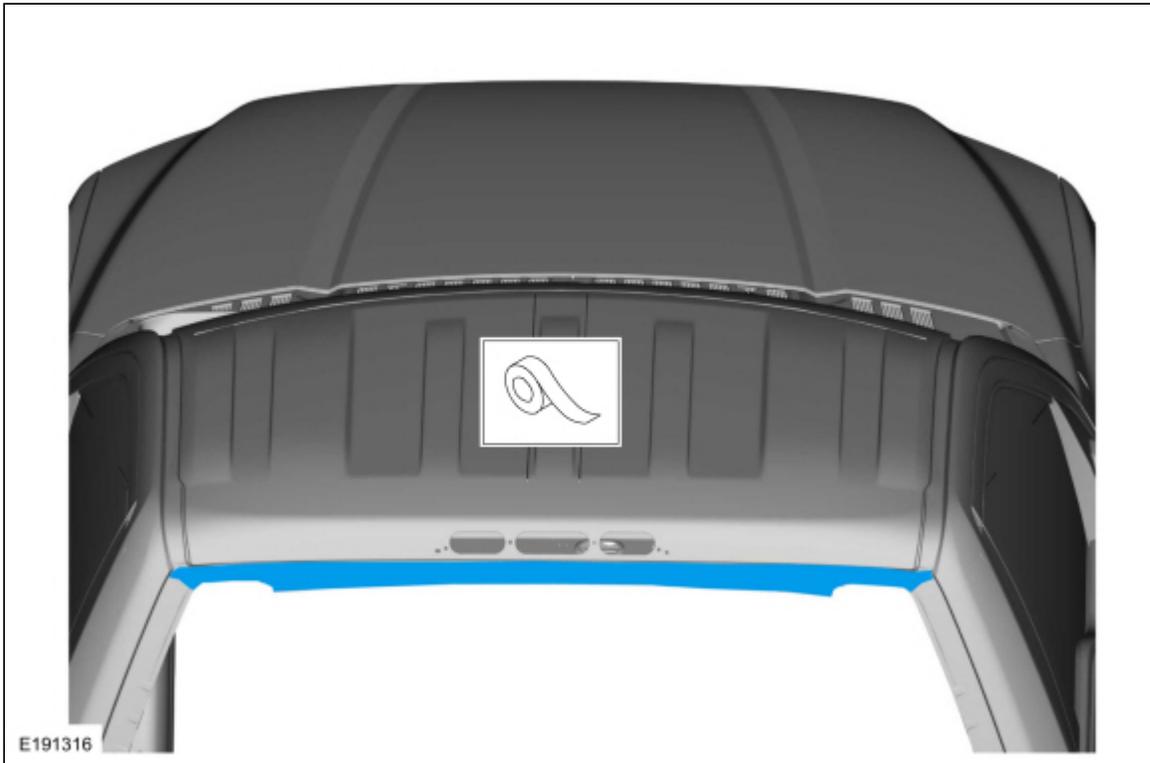
18. Refinish the entire repair area using a Ford approved paint system and standard refinishing techniques.

19. Remove the masking in the rear window glass channel.



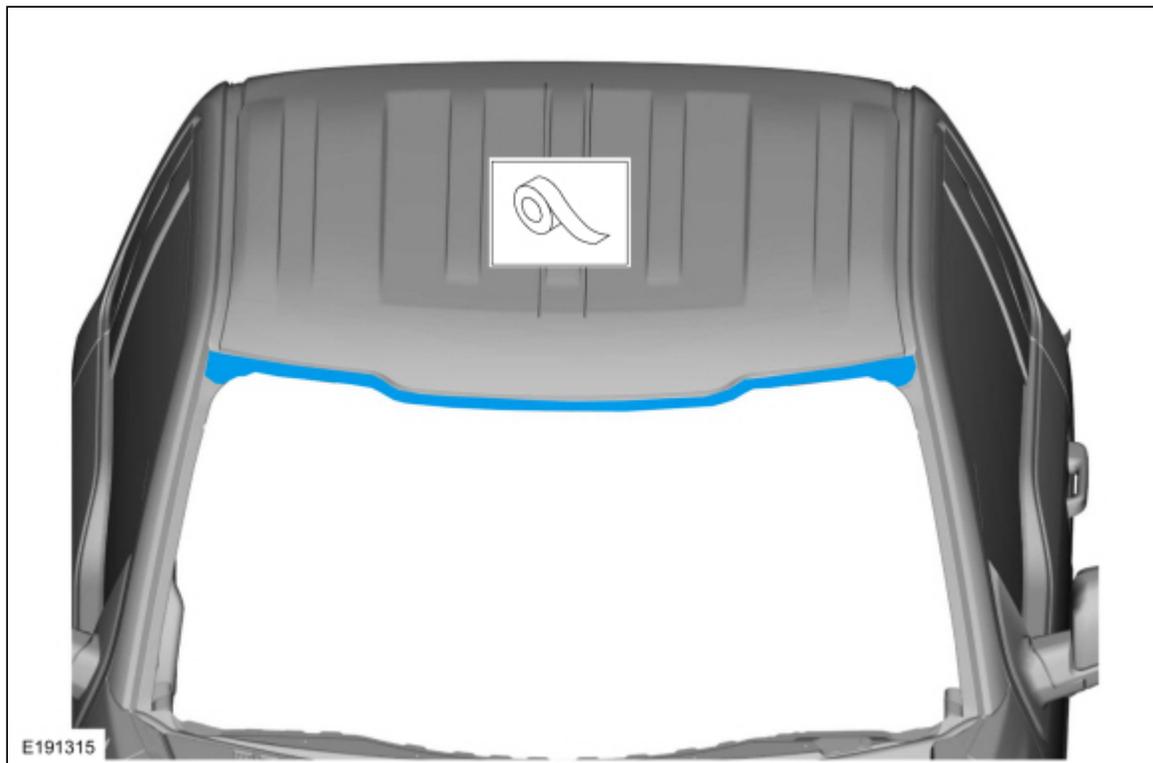
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20. Remove the masking from the front window glass channel.





21. Install the satellite radio antenna.
Refer to: [Satellite Radio / Global Positioning System \(GPS\) Antenna Cable](#) (415-00 Information and Entertainment System - General Information, Removal and Installation).
22. Install the windshield and rear window glass.
Refer to: [Fixed Glass](#) (501-11 Glass, Frames and Mechanisms, General Procedures).
23. Install the roof mouldings.
Refer to: [Roof Moulding](#) (501-08 Exterior Trim and Ornamentation, Removal and Installation).
24. Install the high mount stop lamp.
Refer to: [High Mounted Stoplamp](#) (417-01 Exterior Lighting, Removal and Installation).
25. Install the side curtain airbags.
Refer to: [Side Curtain Airbag - Regular Cab](#) (501-20B Supplemental Restraint System, Removal and Installation).
26. Install the headliner.
Refer to: [Headliner - Regular Cab](#) (501-05 Interior Trim and Ornamentation, Removal and Installation).
27. Repower the SRS.
Refer to: [Supplemental Restraint System \(SRS\) Repowering](#) (501-20B Supplemental Restraint System, General Procedures).

