MOPAR®

At your service

2017 CHRYSLER PACIFICA

REPAIR MANUAL

31 - Collision Information

Warning

SAFETY NOTICE

CAUTION: All service and rebuilding instructions contained herein are applicable to, and for the convenience of, the automotive trade only. All test and repair procedures on components or assemblies in non-automotive applications should be repaired in accordance with instructions supplied by the manufacturer of the total product.

Proper service and repair is important to the safe, reliable operation of all motor vehicles. The service produces recommended and described in this publication were developed for professional service personnel, and are effective methods for performing vehicle repair. Following these procedures will help ensure efficient economical vehicle performance and service reliability. Some service procedures require the use of special tools designed for specific procedures. These special tools should be used as recommended throughout this publication.

Special attention should be exercised when working with spring-or tension-loaded fasteners and devices such as E-Clips, Circlips, Snap rings, etc., since careless removal may cause personal injury. Always wear safety goggles when working on vehicles or vehicle components.

It is important to note that this publication contains various Cautions and Warnings. These should be read carefully in order to minimize risk of personal injury or the possibility that improper service methods may damage the vehicle or render it unsafe. It is important to note that these Cautions and Warnings cover only the situations and procedures FCA US LLC has encountered and recommended. FCA US LLC cannot possibly know, evaluate, and advise the service trade of all conceivable ways in which service may be performed, or of the possible hazards of each. Consequently, FCA US LLC has not undertaken any such broad service review. Accordingly, anyone uses a service procedure or tool that is not recommended in this publication must be certain that neither personal safety, nor vehicle safety, will be jeopardized by the service methods they select.

WARNING: There are necessary safety factors to follow when working with components made of magnesium and components made of a combination of materials utilizing magnesium that must be followed.

- Do not grind on the component. The grinding residue is highly combustible.
- In the event of a fire, a D-class rated fire extinguisher is necessary to extinguish.
- Do not expose the component to open flame or temperature in excess of 260° C. (500° F).

Failure to follow these instructions may cause serious injury or death.

NOTE: Due to the usage of magnesium, do not attempt to repair the liftgate inner panel on this vehicle. For further information refer to Collision Information Liftgate Inner Panel DO NOT REPAIR (Refer to 31 - Collision/Standard Procedure/Non-Structural Sheet Metal Repair/Liftgate Inner Panel DO NOT REPAIR).

USE OF HEAT DURING REPAIR

WARNING: FCA US LLC engineering's position on the use of heat during collision repair is as follows:

- **Any body panel or frame component damaged which is to be repaired and reused, must be repaired using the "cold straightening" method. No heat may be used during the straightening process.**
- **During rough straightening prior to panel replacement, damaged panels or frame components may be heated to assist in body/frame realignment. The application of heat must be constrained to the parts which will be replaced and not allowed to affect any other components.**

This "no heat" recommendation is due to the extensive use of high strength and advanced high strength steels in FCA US LLC products. High-strength materials can be substantially and negatively affected from heat input which will not be obviously known to the repairer or consumer.

Ignoring these recommendations may lead to serious compromises in the ability to protect occupants in a future collision event, reduce the engineered qualities and attributes, or decrease the durability and reliability of the vehicle.

This statement supersedes any previously released information by the FCA US LLC.

Failure to follow these instructions may result in serious or fatal injury.

Standard Procedure

SERVICE AFTER A SUPPLEMENTAL RESTRAINT SYSTEM DEPLOYMENT

Any vehicle which is to be returned to use following a Supplemental Restraint System (SRS) component deployment must have the deployed restraints replaced. In addition, the following guidelines MUST be observed.

- **Following ANY major vehicle impact damage in the vicinity of an impact sensor or the ORC** - It is critical that the mounting surfaces and mounting brackets for the Occupant Restraint Controller (ORC), front impact sensors and side impact sensors located within the proximity of the impact damage be closely inspected and restored to their original conditions. Because the ORC and each impact sensor are used by the SRS to monitor or confirm the direction and severity of a vehicle impact, improper orientation or insecure fastening of these components may cause airbags not to deploy when required, or to deploy when not required.
- **Following ANY airbag deployment event** - The Lower Anchors and Tethers for CHildren (LATCH) provisions, the upper tether anchors and all interior trim panels must also be inspected.
- **If the driver airbag is deployed** - If the Driver AirBag (DAB) has been deployed, the DAB, the clockspring and stalk unit, the steering column assembly including the intermediate shaft and coupler, both front seat belt anchor buckle tensioners, both front seat belt retractor and tensioner assemblies, any front seat belt buckle in use and all rear seat belt retractors and buckles in use must be replaced. The front impact sensors and the steering wheel must also be inspected.
- **If the knee airbag is deployed** - If the Knee AirBag (KAB) has been deployed, the KAB and the instrument panel steering column opening cover must also be replaced. The instrument panel must also be inspected.
- **If the passenger airbag is deployed** - If the Passenger AirBag (PAB) has been deployed, the PAB, the PAB wire harness or connector, and the instrument panel must be replaced.
- **If a seat airbag is deployed** - If a Seat AirBag (SAB) has been deployed, the SAB, the seat back frame, the seat back foam, the seat back trim cover and the side impact sensor on the same side of the vehicle as the deployed airbag must be replaced. Both front seat belt anchor buckle tensioners, both front seat belt retractor and tensioner assemblies, any front seat belt buckle in use and all rear seat belt retractors and buckles in use must be replaced.
- **If a seat belt tensioner is deployed** - The seat belt retractor and anchor latch plate tensioners are deployed in conjunction with the front airbags. All seat belt tensioners must be replaced if any airbag in the vehicle except the Knee AirBag (KAB) has been deployed.
- **If a side curtain airbag is deployed** - If a side curtain airbag (also known as a Side AirBag Inflatable Curtain/ SABIC) has been deployed, the SABIC, the trim on the upper A, B, C and D-pillars as well as the side impact sensor on the same side of the vehicle as the deployed airbag must be replaced. The headliner, both front seat belt anchor buckle tensioners, both front seat belt retractor and tensioner assemblies, any front seat belt buckle in use and all rear seat belt retractors and buckles in use must be replaced.

The components identified with the deployed SRS components in the preceding list are not intended for reuse and will be damaged or weakened as a result of an airbag deployment, which may or may not be obvious during a visual inspection. All other vehicle components should be closely inspected following any SRS component deployment, but are to be replaced only as required by the extent of the visible damage incurred.

DIAGNOSIS AND TESTING - SUPPLEMENTAL RESTRAINT SYSTEM

The hard wired circuits between modules and components related to the Supplemental Restraint System (SRS) may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the SRS or the electronic controls and communication between other modules and devices that provide features of the SRS. The most reliable, efficient and accurate means to diagnose the SRS or the electronic controls and communication related to SRS operation, as well as the retrieval or erasure of a DTC requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

In addition to a diagnostic scan tool that contains the latest version of the proper diagnostic software, certain diagnostic procedures for the SRS may require the use of the SRS Load Tool special tool along with the appropriate Load Tool Jumpers and Adapters. Refer to the appropriate diagnostic information.

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbags, airbag curtains, knee blocker, seat belt tensioner, impact sensor or instrument panel component

diagnosis or service. Disconnect the IBS/negative battery cable assembly from the negative battery post, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

SUPPLEMENTAL RESTRAINT SYSTEM VERIFICATION TEST

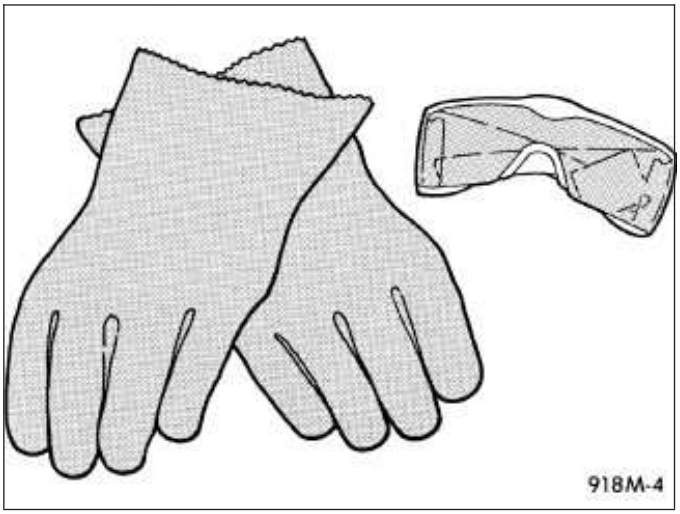
WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbags, airbag curtains, knee blocker, seat belt tensioner, impact sensor or instrument panel component diagnosis or service. Disconnect the IBS/negative battery cable assembly from the negative battery post, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

NOTE: The following procedure should be performed using a diagnostic scan tool to verify proper Supplemental Restraint System (SRS) operation following the service or replacement of any SRS component. Refer to the appropriate diagnostic procedures.

1. During the following test, the negative cable remains disconnected and isolated from the battery, as it was during the Supplemental Restraint System (SRS) component removal and installation procedures.
2. Be certain that the diagnostic scan tool contains the latest version of the proper diagnostic software. Connect the scan tool to the 16-way Data Link Connector (DLC). The DLC is located on the driver side lower edge of the instrument panel, near the steering column opening cover and outboard of the steering column.
3. Transition the status of the ignition switch to On and exit the vehicle with the scan tool.
4. Check to be certain that nobody is in the vehicle, then connect the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), connect the IBS connector.
5. Using the scan tool, read and record the active (current) Diagnostic Trouble Code (DTC) data.
6. Next, use the scan tool to read and record any stored (historical) DTC data.
7. If any DTC is found in Step 5 or Step 6, refer to the appropriate diagnostic information.
8. Use the scan tool to erase the stored DTC data. If any problems remain, the stored DTC data will not erase. Refer to the appropriate diagnostic information to diagnose any stored DTC that will not erase. If the stored DTC information is successfully erased, go to Step 9.
9. Transition the status of the ignition switch to Off for about 15 seconds, and then back to On. Observe the airbag indicator in the instrument cluster. It should light from four to six seconds, and then go out. This indicates that the SRS is functioning normally and that the repairs are complete. If the airbag indicator fails to light, or lights and stays On, there is still an active SRS fault or malfunction. Refer to the appropriate diagnostic information to diagnose the problem.

CLEANUP PROCEDURE

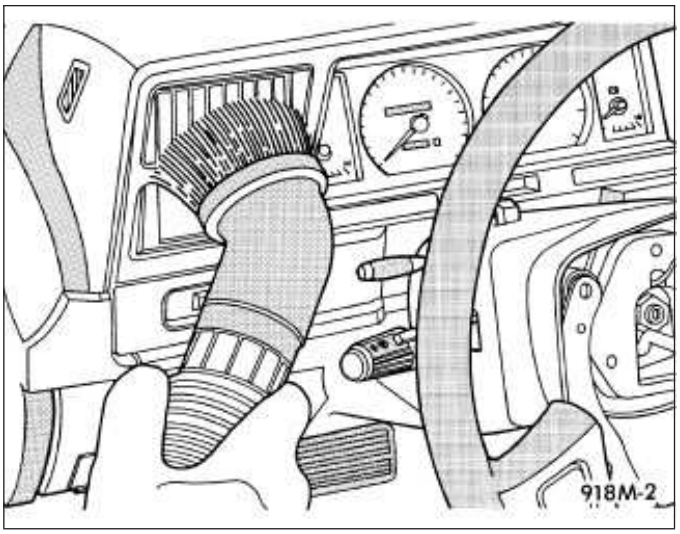
Following a Supplemental Restraint System (SRS) component deployment, the vehicle interior will contain a powdery residue. This residue consists primarily of harmless particulate by-products of the small pyrotechnic charge that initiates the propellant used to deploy a SRS component. However, this residue may also contain traces of sodium hydroxide powder, a chemical by-product of the propellant material that is used to generate the inert gas that inflates the airbag. Since sodium hydroxide powder can irritate the skin, eyes, nose, or throat, be certain to wear safety glasses, rubber gloves, and a long-sleeved shirt during cleanup.



WARNING: To avoid serious or fatal injury, if you experience skin irritation during cleanup, run cool water over the affected area. Also, if you experience irritation of the nose or throat, exit the vehicle

for fresh air until the irritation ceases. If irritation continues, see a physician.

1. Begin the cleanup by using a vacuum cleaner to remove any residual powder from the vehicle interior. Clean from outside the vehicle and work your way inside, so that you avoid kneeling or sitting on a non-cleaned area.
2. Be certain to vacuum the heater and air conditioning outlets as well. Run the heater and air conditioner blower on the lowest speed setting and vacuum any powder expelled from the outlets.



CAUTION: Deployed front airbags having two initiators (squibs) in the airbag inflator may or may not have live pyrotechnic material within the inflator. Do not dispose of these airbags unless you are certain of complete deployment. Refer to AIRBAG SQUIB STATUS. All damaged, ineffective, or non-deployed Supplemental Restraint System (SRS) components which are replaced on vehicles are to be handled and disposed of properly. If an airbag or seat belt tensioner unit is ineffective or damaged and non-deployed, refer to the Hazardous Substance Control System for information regarding the potentially hazardous properties of the subject component and the proper safe handling procedures. Then dispose of all non-deployed and deployed airbags and seat belt tensioners in a manner consistent with state, provincial, local and federal regulations.

3. Next, remove the deployed SRS components from the vehicle. Refer to the appropriate service removal procedures.
4. You may need to vacuum the interior of the vehicle a second time to recover all of the powder.

BASECOAT/CLEARCOAT FINISH

CAUTION: Do not use abrasive chemicals, abrasive compounds or harsh alkaline based cleaning solvents on the painted surfaces of a vehicle. Failure to follow this caution can result in damage to vehicle finish.

The original equipment paint finish is a multi step process that involves multi step cleaning, applying electro deposition primer (E-coat), anti-chip primer, basecoat, and clearcoat steps.

On most vehicles a two-part paint application (basecoat/clearcoat) is used. The vehicle's "color" paint that is applied over primer is called basecoat. A clearcoat paint is then applied to protect the basecoat from ultraviolet light and provides a durable high-gloss finish.

FINESSE SANDING, BUFFING, AND POLISHING

CAUTION: Do not remove more than 0.5 mils of clearcoat finish when sanding, hand buffing or polishing. Basecoat paint must retain clearcoat for durability.

CAUTION: If the finish has been finesse sanded in the past, it cannot be repeated. Failure to follow this caution can result in damage to vehicle finish.

NOTE: Finesse sanding should only be performed by a trained automotive paint technician.

Minor acid etching, orange peel, or smudging in a clearcoat or single-stage finish can be reduced with light finesse sanding, hand buffing and polishing. Use a Paint Thickness Gauge #PR-ETG-2X or equivalent to determine clearcoat or single-stage paint thickness before and after the repair.

PAINT TOUCH-UP

If the painted metal surface of a vehicle becomes scratched or chipped to metal, it should be touched-up as soon as possible to avoid corrosion.

WARNING: Use an OSHA approved respirator and safety glasses when spraying paint or solvents. Failure to follow this warning may result in possible personal injury or death.

When repairing painted metal surfaces, for best results, use MOPAR® Scratch Filler/Primer, Touch-Up Paints and Clear Top Coat.

1. Scrape any loose paint and corrosion from inside the scratch or chip.

   WARNING: Avoid prolonged skin contact with petroleum or alcohol–based cleaning solvents. Failure to follow this warning can result in possible personal injury or death.

   NOTE: Skin contact with petroleum or alchohol-based cleaning solvents can be avoided by wearing nitrile gloves.
2. Clean affected area with MOPAR® Tar/Road Oil Remover or equivalent, and allow to dry.
3. Fill the inside of the scratch or chip with a coat of filler/primer. Do not overlap primer onto good surface finish. The applicator brush should be wet enough to puddle-fill the scratch or chip without running. Do not stroke brush applicator on body surface. Allow the filler/primer to dry hard.
4. Cover the filler/primer with color touch-up paint. Do not overlap touch-up color onto the original color coat around the scratch or chip. Butt the new color to the original color, if possible. Do not stroke applicator brush on body surface. Allow touch-up paint to dry hard.
5. On vehicles with clearcoat, apply clear top coat to touch-up paint with the same technique as described in step 4. Allow clear top coat to dry hard. If desired, the clearcoat can be lightly finesse sanded (1500 grit) and polished with rubbing compound.

NET, FORM AND PIERCE REPAIR

CAUTION: Failure to follow these recommendations could result in damage or failure to the part and the related parts.

Net, form and pierce is a manufacturing process which takes place during the original build of the vehicle. The original part will have a beveled platform that will decrease toward the fastener location mounting hole. Replacement parts in these areas may not include bevel (form) or fastener hole (pierce) and will need to be adapted for proper fit and finish.

The primary locations which may utilize net, form and pierce are:

- fender reinforcement (at front end module mount)
- fender tower mounts
- hood hinge (lower half)
- rear body header (liftgate hinge mounts)
- strut tower (at upper control arm mount)

NOTE: Shock tower is net, pierce only.

NOTE: The thickness of shims is not to exceed the original thickness of the factory bevel. If more shims are needed damage is still present and must be repaired properly.

If the replacement part did not come with a fastener hole, one of equal size and location will have to be drilled. Body shims should be used in the fender reinforcement to front end module. The hood hinge area, fender tower mounts, and rear body header will utilize washers as spacers where a specific spacer does not exist. The shims and spacers should be sealed between each other and to the stationary surface. Care should be taken when smoothing sealer around washers to give an undetectable repair. Refinish the repair area per the paint manufacturer's recommendations for corrosion resistance and appearance purposes.

RIVET NUT PROCEDURE

CAUTION: Failure to follow these recommendations could result in damage to the vehicle

Rivet nuts are used for parts installations, when access to the back mounting area is limited or boxed in. It is important to achieve a full seat on the first attempt due to the lack of accessibility on the back side of the rivet nut. Poor seating of the rivet nut will result in part failure, loose parts and possible water leaks.

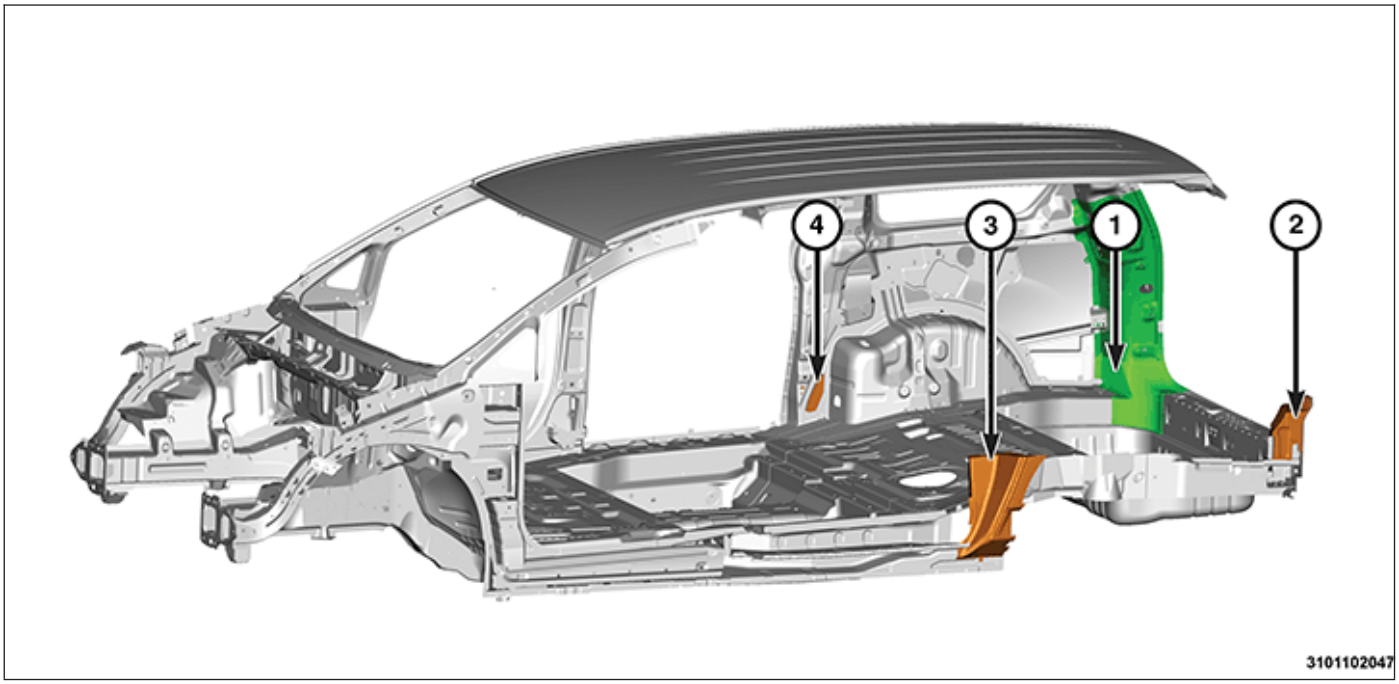
The use of a commercially available threaded insert tool will be necessary. There are several styles and types readily available. Examples of multi fit choices are the Matco® 203F and the Snap On® HP650M, or you may select one with equivalent capabilities. If a multi fit option is not chosen, it must be capable of a thread size of **M6×1.00**. Follow the tool manufacturer recommended directions for proper installation.

POLYURETHANE FOAM REMOVAL

CAUTION: All NVH foam must be removed from the repair area of the vehicle, as material is flammable.

PolyURethane (PUR) foam, is used in certain locations of the vehicle for Noise Vibration Harshness (NVH) purposes and structural strengthening. The PUR foam creates a hazard in the repair process as it can be flammable. Damage location and extensiveness will vary in the repairs to be performed. Therefor, it is necessary for the technician to determine if the location of the foam will create a hazard and remove it as necessary.

The locations of PUR foam, used throughout the vehicle, can be found in the Sound Deadener Locations (Refer to 31 - Collision Information/Locations/Sound Deadener Locations).



NOTE: Vehicle and PUR foam locations are shown for example purposes only.

Often the foam can be removed during the removal of the damaged components. If this is not possible, examine to see if access is possible through existing holes or openings. The example above shows the left side C-pillar PUR foam (3) shown for clarity and the right side C-pillar PUR foam (4) accessible through an existing opening. It also shows the left side D-pillar PUR foam (2) shown for clarity and that it is not accessible in the D-pillar area (1).

PUR foam removal options-

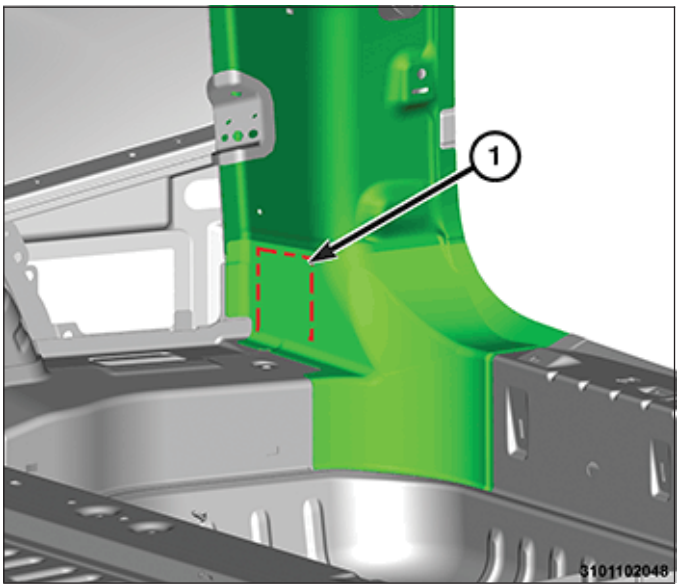
1. When the components to be replaced are removed from the vehicle.
2. Through openings in the adjacent components.

NOTE: Only use the following options when the first two options are not possible.

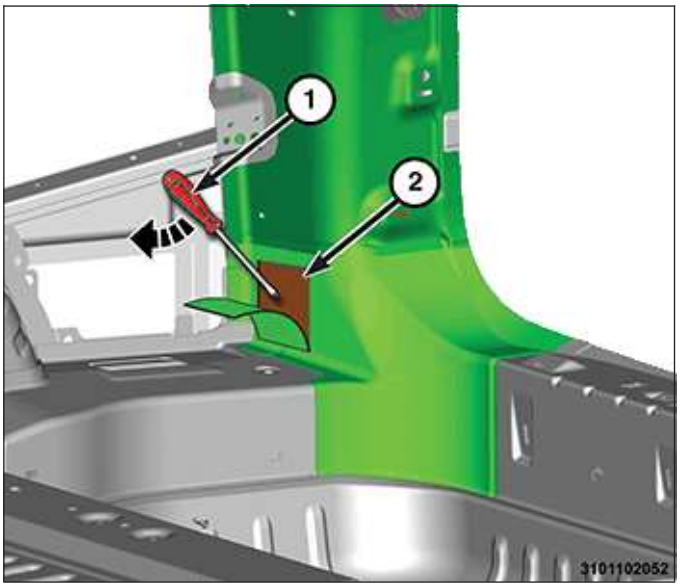
3. Gain access by performing one of the following procedures.Determine which procedure will work best in the situation, either the Window Access Procedure or Hole Access Procedure.

Window Access Procedure

1. Remove or protect components and the surrounding areas from sparks and welding spatter as necessary
2. With the use of a cut-off wheel, cut a “U” shaped access point (1) in the area of the PUR foam location.



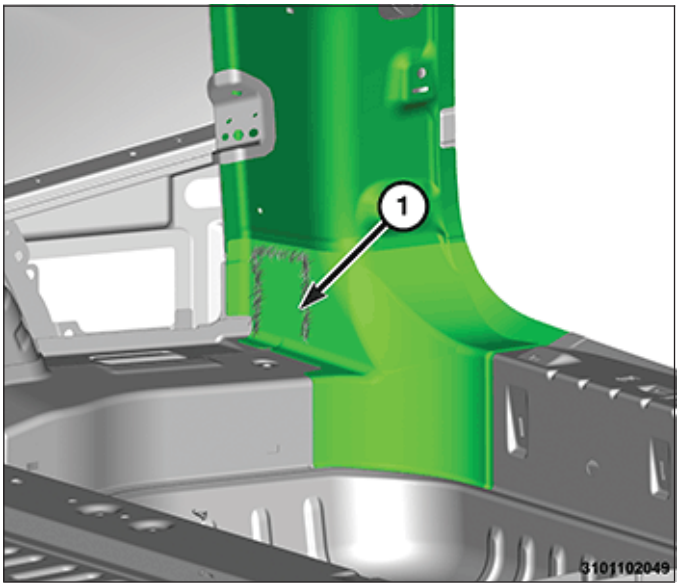
3. Carefully, pry open the window to gain access to the PUR foam (2).
4. With the use of a flat bladed tool (1) or equivalent, remove the foam from the cavity.



5. Close the window back into the original position.
6. Close the access hole by either welding or alternatively with a structural adhesive patch.

Weld

a. Grind the edges to remove the coatings to expose the bare metal.
b. Stitch weld the window (1) closed using the appropriate method as found in Standardized Steel Identification (Refer to 31 - Collision Information/Specifications/Standardized Steel Identifications).
c. With the use of a grinding disc, smooth the weld.



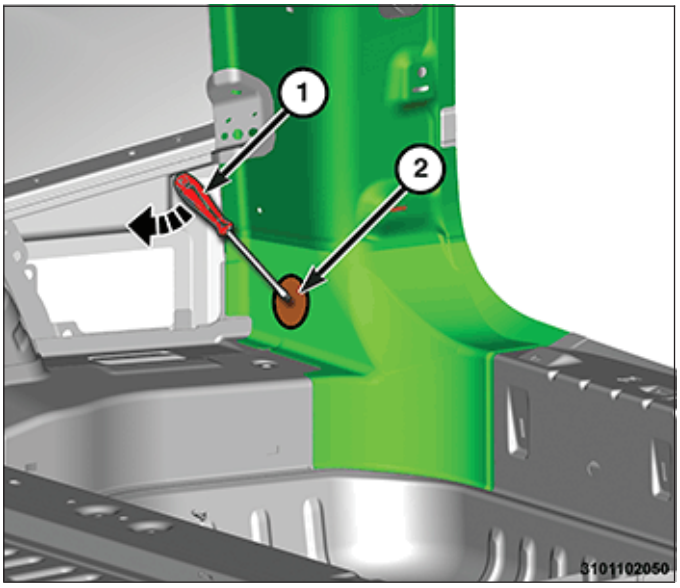
NOTE: For additional information on recommended structural adhesives and cure times refer to (Refer to 31 - Collision Information/Standard Procedure/Non-Structural Sheet Metal Repair/Types of Structural Adhesives).

Structural Adhesive

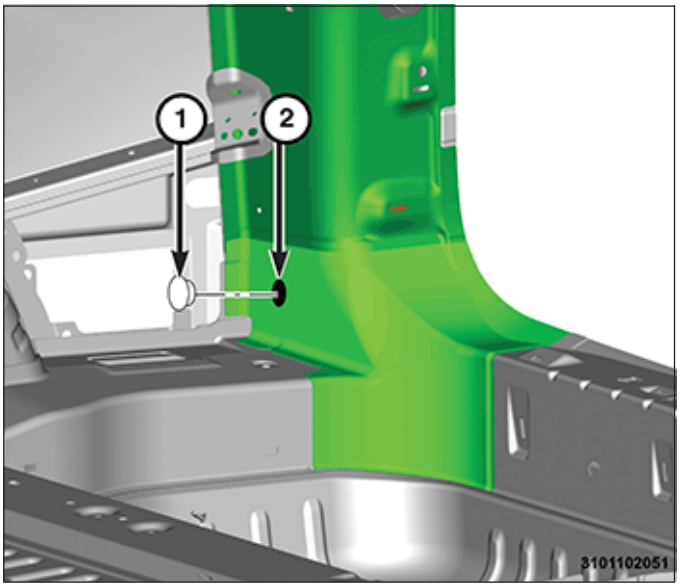
a. Create a metal patch 25 mm (1 in) larger than the opening.
b. Grind 13 mm (0.5 in) of the outer edge of the patch and the opening to expose bare metal.
c. Apply structural adhesive to the bare metal on the patch.
d. Position the patch to the opening and clamp into place.
e. Remove any squeeze-out adhesive and allow to cure per recommendations.
7. Refinish as necessary.
8. Apply inner panel corrosion inhibiting materials (Mopar Cavity Wax part #68042970AA, or equivalent).

Hole Access Procedure

1. Drill a 25 mm (1 in.) access hole (2) in the necessary area
2. With the use of a flat bladed tool (1) or equivalent, remove the foam from the cavity.



3. Touch up the edges with an epoxy primer and allow to cure fully.
4. Touch up with paint and allow to cure fully.
5. Install a 25 mm (1 in.) body plug.



NON-STRUCTURAL SHEET METAL REPAIR

Safety Notice

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It is important to note this publication contains various **Cautions** and **Warnings**. These should be read carefully in order to minimize risk of personal injury or the possibility that improper service may damage the vehicle or render it unsafe. It is important to note that these cautions and warnings cover only the situations and procedures FCA US LLC has encountered and recommended. FCA US LLC cannot possibly know, evaluate, and advise the service trade of all conceivable ways in which service may be performed, or the possible hazards of each. Consequently, FCA US LLC has not undertaken any broad service review. Accordingly, anyone that uses a service procedure or tool that is not recommended in this publication must be certain that neither personal safety, nor vehicle safety will be jeopardized by the service methods they select.

Safety Precautions

WARNING: Always wear an approved respirator, as well as skin and eye protection per adhesive manufacturer recommendations as stated in the product Safety Data Sheets (SDS).

WARNING: There are necessary safety factors to follow when working with components made of magnesium and components made of a combination of materials utilizing magnesium that must be followed.

- Do not grind on the component. The grinding residue is highly combustible.
- In the event of a fire, a D-class rated fire extinguisher is necessary to extinguish.
- Do not expose the component to open flame or temperature in excess of 260° C. (500° F).

Failure to follow these instructions may cause serious injury or death.

NOTE: Due to the usage of magnesium, do not attempt to repair the liftgate inner panel. For further information refer to Liftgate Inner Panel DO NOT REPAIR (Refer to 31 - Collision/Standard Procedure/Non-Structural Sheet Metal Repair/Liftgate Inner Panel DO NOT REPAIR).

Adhesives:

- Safety Data Sheets (SDS) must be available and understood before adhesives are handled.
- All personnel should be instructed on the proper procedures to prevent skin contact with solvents, curing agents, and uncured base adhesives, which could cause allergic reactions or sensitization.

Types of Structural Adhesives

Overview: There are three basic chemistries used in the collision repair industry. The types of adhesives used include Acrylic, Epoxy and Urethane. To achieve optimal results, it is best to use the chemistry that bonds best to the substrate being repaired, is easiest to use and offers the most permanent, non-detectable repair at the most economical repair cost. All three chemistries have their strengths and weaknesses.

NOTE: Structural adhesives that meet FCA US LLC's approved replacement materials specifications include - LORD Fusor 2098, LORD Fusor 112B and 3M 08116

Adhesive Types:

- **Acrylic Adhesives -** Bond all types of bare metals and are excellent for cross bonding aluminum to steel. They have good Noise Vibration Harshness (NVH) properties and offer anti-corrosion properties, so primers must be removed in the bond area. Most acrylics have a fast room temperature cure and respond well to force curing. They are stable with regards to temperature and moisture during cure. However, both of these can effect shelf life. Acrylics are the most forgiving of the three chemistries with regards to mix ratio accuracy.
- **Epoxy Adhesives -** Bond well to ridged and semi-ridged plastics, steel and aluminum and are generally easy to sand and feather edge. Some may be too ridged for flexible substrates and they often require primers on bare metal applications. Epoxies can be heat cured to increase strength and accelerate the curing process. They have a long and stable shelf life. Always purge the air out of the cartridges and use mix nozzles.

- **Urethane Adhesive -** Typically flexible and bond well to plastics. However, they usually require primers on metal surfaces to protect against corrosion. Urethanes have good seam sealing and NVH qualities and are frequently the optimal choice for seam sealers. They are sensitive to moisture during cure, packaging and storage. Single component urethanes usually have a much shorter shelf life than two component urethanes. Mix ratios are critical for urethanes. In most cases it cannot vary more than ± 5%. Therefore, hand mixing is not recommended. Urethanes are the most unforgiving of the three chemistries with regards to mix ratio accuracy.

LORD Fusor 2098 Curing Chart

Cure Time x Cure Temperature = Lap Shear Strength Pounds Per Square Inch (PSI)

CURE TIME	CURE TEMPERATURE		
	10°C (50°F)	21°C (70°F)	38°C (100°F)
30-minutes	X	X	X
1-hour	X	X	49 psi
2-hours	X	X	1369 psi
3-hours	X	X	1561 psi
3.5-hours	X	X	1752 psi
4-hours	X	24 psi	2713 psi
5-hours	X	90 psi	X
6-hours	X	292 psi	X
7-hours	X	646 psi	X
8-hours	39 psi	915 psi	X
16-hours	754 psi	1758 psi	X
1-day	1571 psi	2656 psi	X

LORD Fusor 112B Curing Chart

Cure Time x Cure Temperature = Lap Shear Strength Pounds Per Square Inch (PSI)

CURE TIME	CURE TEMPERATURE		
	10°C (50°F)	21°C (70°F)	38°C (100°F)
30-minutes	X	X	8 psi
1-hour	X	X	1039 psi
2-hours	X	X	1927 psi
3-hours	X	424 psi	2036 psi
3.5-hours	X	1610 psi	2024 psi
4-hours	X	1680 psi	2009 psi
5-hours	X	1854 psi	2079 psi
6-hours	X	1904 psi	1867 psi
7-hours	X	1760 psi	1750 psi
8-hours	24 psi	1686 psi	1746 psi
16-hours	1771 psi	2001 psi	1897 psi
1-day	1891 psi	1809 psi	1677 psi

Non-Structural Sheet Metal Repair Table

JOINT AND REPAIR TYPES	REFERENCE
Backer Panel Joint	Backer Panel Joint
Door Skin	Door Skin Replacement
Liftgate Inner Panel **DO NOT REPAIR**	Liftgate Inner Panel DO NOT REPAIR
Liftgate Outer Panel	Liftgate Outer Panel
Body Side Aperture / Quarter Panel	Side Aperture / Quarter Panel
Metal Fatigue/Stress Cracks	Metal Fatigue/Stress Crack

Backer Panel Joint

Overview: Backer panel procedures may be used to achieve a smooth joint between panel sections. The backer panel works well in areas where there is not enough room to smooth or feather in an overlap joint. The backer panel joint is a common repair for rocker panels, quarter panels and body side apertures.

NOTE: OEM panel replacement such as a quarter panel, side aperture and rocker panel will always require the weld bonding procedure at the pinch weld flange area(s).

Preparation:

NOTE: Be certain vehicle is evenly supported at normal suspension points.

1. Restore structural dimensions as well as all related mating flanges.

   NOTE: It will be difficult to abrade the underside mating surface of the original panel, however this is an important step and should be done effectively.
2. Create a 50 mm. (2 in.) backer panel out of an unused portion of original or new sheetmetal panel, whichever contains the appropriate shape. Be certain it has a precise fit to the back of the panels it will join.
3. All paint, primer, adhesive and any other corrosion protective coatings must be removed from the mating surfaces as well as the backer panels themselves, prior to application of adhesive. Grind a 25 mm. (1 in.) contact area on all panels where backer panel bonding will take place. The metal should be completely bare and shiny in appearance, if the metal appears pewter in color all of the galvanized coating has not been removed.
4. Pre-fit the backer panel to the panel(s) being joined, to ensure proper fit. If screws will be used to hold the panels in place during curing, dry fit them now to be certain of proper fit later. There should be a 0.8 - 1.6 mm. (1/32 - 1/16 in.) gap between the two outer panels, no gap on backer panels.
5. Without a mixing tip attached, purge a small amount of structural adhesive from the cartridge. This will ensure an even flow of both components.
6. Attach a mixing tip and dispense a mixing tube's length of adhesive from the cartridge.

   Application:

   NOTE: Review temperature curing chart before application of any adhesive.

   NOTE: Refer to the structural adhesives manufacturer for information on work, handling and curing times.
7. Apply a 10 - 13 mm. (3/8 - 1/2 in.) bead of structural adhesive to the bare metal mating surfaces of the backer panels. Evenly apply the adhesive over the complete bonding surface. Apply a 10 - 13 mm. (3/8 - 1/2 in.) bead of structural adhesive to bare metal mating surfaces. Use a body filler applicator to level the adhesive, making sure to cover all bare metal to protect against corrosion.
8. Position the new backer panel(s), making sure not to separate after contact. Lifting will create air bubbles and weaken the bond. **Adjustments must be made by sliding, not lifting the panel(s).**
9. Clamp tightly and evenly. Adhesive has glass beads that will prevent complete squeeze out. Install screws to the "hard to clamp areas".
10. Remove excess adhesive from all joints prior to adhesive cure.
11. Allow adhesive to cure, per manufacturer recommendations. When fully cured, expect the acrylic adhesive to be a little tacky, as this is a normal characteristic of the adhesive.
12. Remove clamps and screws.
13. Repeat procedure for installation of new panel.

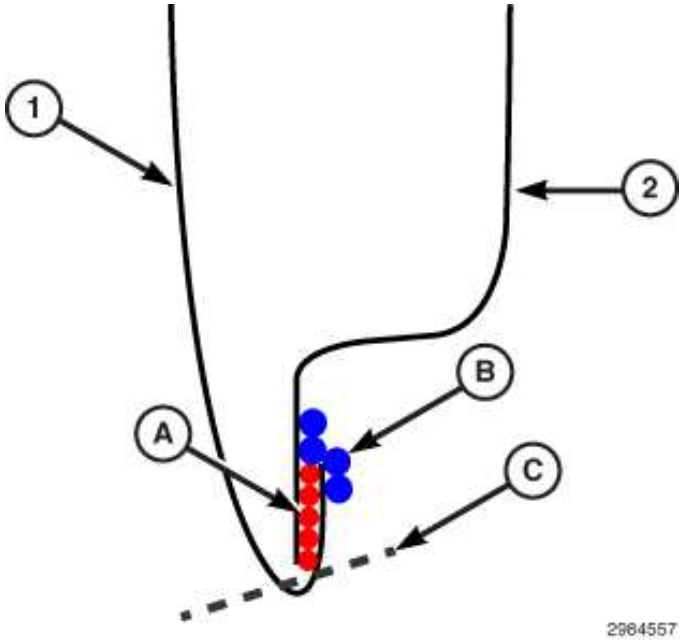
14. Remove any remaining adhesive with a grinder or abrasive disc. All adhesive must be removed from the cosmetic repair area to ensure proper adhesion of further repair and refinish materials.
15. Bevel the center of the screw holes and apply fiber-reinforced waterproof body filler to the screw holes and section seam. When cured, sand and apply conventional body filler and block sand as necessary. Prime and paint per paint manufacturer recommendations.
16. Apply inner panel corrosion inhibiting materials (Mopar Cavity Wax part #6804292970 or equivalent) to panel areas that do not have foam injected in them.

Door Skin Replacement

Overview: Depending on the type of door to be repaired, a full skin or a belt cut will be required. Belt cut replacement is necessary when a door with a full skin, around the window opening, has an angle that makes it to difficult to get tools into to do a quality hem flange installation. A butt-joint is used at this seam.

Preparation:

1. Belt cut skins will require determining and cutting of the sectioning locations on the original panel and on the replacement panel.
2. Remove the door skin by grinding the outer edge (C) until the hem flange is perforated.
3. Cut around weld nuggets and spot welds with a spot weld cutting bit or similar weld removal tool, if necessary.
4. If panel is attached with adhesive you may use heat, from a heat gun or inductor only, up to 204°C. (400F°). This will aid in loosening the bond.
5. With an air chisel and a flat bladed bit, remove outer skin and any remaining hem flange.
6. Grind any remaining weld nuggets flush with door frame, and remove all adhesive, paint, E-coating and corrosion protective coatings from the area where the **structural adhesive** will be applied, and where the 'butt-joint" is to take place. The metal should be completely bare and shiny in appearance, if the metal appears pewter in color all of the galvanized coating has not been removed.
7. Straighten door flange and any remaining damage on door shell using the hammer and dolly method.
8. The area of the new door skin that will make contact with the door shell will need to be scuffed with a course abrasive pad or ground with a 50 grit grinding disc. This will vary upon adhesive manufacturers, be certain to check adhesive manufacturer recommendations.



Door Skin

NOTE: Drain holes must remain clear of obstructions from adhesives and sealers.

1 - DOOR SKIN (OUTER)
2 - DOOR SHELL (INNER)
A - STRUCTURAL ADHESIVE
B - SEAM SEALER
C - HEM FLANGE CUT LINE (BOTTOM EDGE SHOWN, SURROUNDING EDGES TYPICAL)

9. Dry fit the new panel for margin and beltline alignment. Determine where to place clamps to hold the panel in place, as necessary.

CAUTION: Be certain the fit is good from the skin to door and door to door opening. Cured adhesive is extremely strong and will not allow for "adjustments".

10. Without a mixing tip attached, purge a small amount of structural adhesive from the cartridge. This will ensure an even flow of both components.
11. Attach a mixing tip and dispense a mixing tube's length of adhesive from the cartridge.

NOTE: Refer to the structural adhesives manufacturer for information on work, handling and curing times.

Installation:

NOTE: Do not apply adhesive within 25 mm. (1 in.) of the belt cut location.

12. Apply a 10 - 13 mm. (3/8 - 1/2 in.) bead of structural adhesive to bare metal mating surfaces. Use a body filler

applicator to level the adhesive, making sure to cover all bare metal to protect against corrosion.

NOTE: When applying adhesives be certain any and all drain holes remain open and clear of obstructions.

13. Apply a second bead of adhesive to ensure proper bead thickness.
14. Position the new panel. If repositioning is necessary slide the panel, do not lift or separate panels. **Adjustments must be made by sliding, not lifting the panel(s).** Apply clamps to hold panel in position, as necessary.

NOTE: There are many tools readily available to aid in the hem flange folding process.

15. Roll the hem flange over. Remove excess adhesive. This will save time, as compared to waiting until cured.
16. Re-check door gap and flushness to the vehicle opening and adjust as necessary.
17. Allow the adhesive to cure per manufacturer recommendations. When fully cured, expect the adhesive to be a little tacky, as this is a normal characteristic of the adhesive. Remove clamps, if used.
18. Remove any excess cured adhesive with a grinder or abrasive disc. All adhesive must be removed from the cosmetic repair area to ensure proper adhesion of repair and refinish materials.
19. Weld the butt-joint with Gas Metal Arc Welding (GMAW), if a belt cut was used. Clean and dress welds accordingly.
20. Apply fiber-reinforced waterproof body filler to the section seam, as necessary. When cured sand and apply conventional body filler and block sand.
21. Apply an epoxy or anti-corrosion primer. When cured, lightly scuff.
22. Seam seal the entire door. Duplicate the factory seam sealer. Apply a discrete bead around the rest of the door to seal and protect, maintaining the original appearance.
23. Prime and paint per paint manufacturers recommendations.
24. Apply inner panel corrosion inhibiting materials (Mopar Cavity Wax part #68042970AA , or equivalent).

Liftgate Inner Panel DO NOT REPAIR

WARNING: There are necessary safety factors to follow when working with components made of magnesium and components made of a combination of materials utilizing magnesium that must be followed.

- Do not grind on the component. The grinding residue is highly combustible.
- In the event of a fire, a D-class rated fire extinguisher is necessary to extinguish.
- Do not expose the component to open flame or temperature in excess of 260° C. (500° F).

Failure to follow these instructions may cause serious injury or death.

NOTE: Due to the usage of magnesium, do not attempt to repair the liftgate inner panel.

The liftgate inner panel is a combination of magnesium and aluminum alloys. The usage of this type of material

utilized in this application requires unique guidelines that must be adhered to.

Appearance-

- The textured finish differs from a smooth finish typically found on closure panels.
- The texture is produced from the casting of the component as compared to smooth stamped sheet metal.
- This finish is completely normal and acceptable.
- Do not remove the textured finish to produce a smooth finished appearance.

Workability-

- Do not grind the material, it will create combustible magnesium residue.
- Do not make any repairs to liftgate inner panel other than for refinishing purposes.
- Any sanding of the component is to be done with a scuff pad not a sanding disc. The only exception is as prescribed in the liftgate outer panel procedure.
- Refinish per paint manufacturer's recommendations.

Liftgate Outer Panel

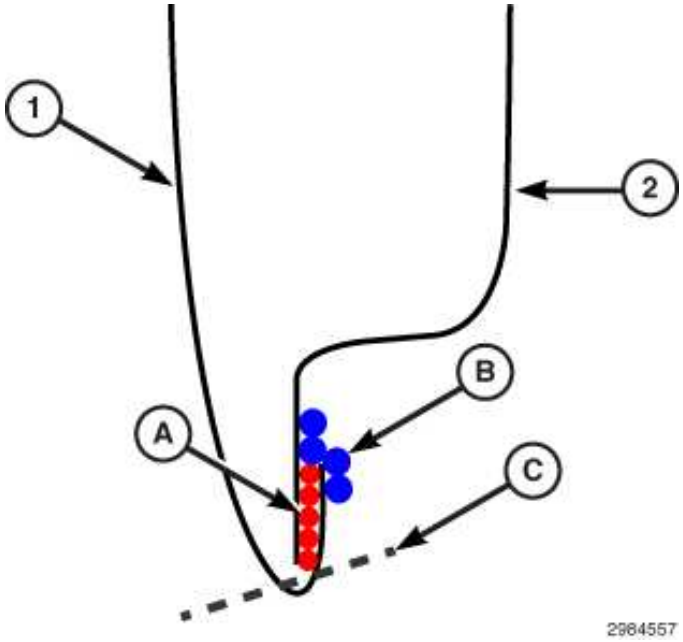
Overview: The liftgate outer panel can be replaced if necessary. Special care needs to be taken in regards to the liftgate outer panel made of aluminum and the inner magnesium panel. For more information on the liftgate inner panel refer to Liftgate Inner Panel DO NOT REPAIR (Refer to 31 - Collision/Standard Procedure/Non-Structural Sheet Metal Repair/Liftgate Inner Panel DO NOT REPAIR).

NOTE: When working with aluminum use dedicated tools, grinding discs and sandpaper to prevent steel cross contamination with the aluminum. Cross contamination of these two materials will cause galvanic corrosion.

Preparation:

NOTE: When grinding the liftgate outer panel hem flange stop immediately upon perforation. This will prevent any grinding on the magnesium liftgate inner panel which should not be ground at all.

1. Remove the liftgate outer panel by grinding the outer edge (C), with a 60 grit grinding disc, just until the hem flange is perforated.
2. If panel is attached with adhesive you may use heat, from a heat gun up to 204°C. (400F°). This will aid in loosening the bond.
3. With an air chisel and a flat bladed bit, remove outer skin and any remaining hem flange.
4. On the liftgate inner panel, with the use of 80 grit sand paper, remove all adhesive from the area where the **structural adhesive** will be applied. The metal should be completely bare.
5. The area of the new liftgate outer panel, that will make contact with the liftgate inner panel will need to be scuffed with an abrasive pad . This will vary upon adhesive manufacturers, be certain to check adhesive manufacturer recommendations.
6. Dry fit the new panel for margin and proper alignment. Determine where to place clamps to hold the panel in place, as necessary.



NOTE: Door skin shown. Liftgate is similar.

NOTE: Drain holes must remain clear of obstructions from adhesives and sealers.

1 - OUTER PANEL
2 - INNER PANEL
A - STRUCTURAL ADHESIVE
B - SEAM SEALER
C - HEM FLANGE CUT LINE (BOTTOM EDGE SHOWN, SURROUNDING EDGES TYPICAL)

CAUTION: Be certain the fit is good from the inner panel to the outer panel and the component to the vehicle's opening. Cured adhesive is extremely strong and will not allow for "adjustments".

7. Without a mixing tip attached, purge a small amount of structural adhesive from the cartridge. This will ensure an even flow of both components.
8. Attach a mixing tip and dispense a mixing tube's length of adhesive from the cartridge.

NOTE: Refer to the structural adhesives manufacturer for information on work, handling and curing times.

Installation:

9. Apply a 10 - 13 mm. (3/8 - 1/2 in.) bead of structural adhesive to bare metal mating surfaces. Use a body filler applicator to level the adhesive, making certain to cover all bare metal to protect against corrosion.

NOTE: When applying adhesives be certain any and all drain holes remain open and clear of obstructions.

10. Apply a second bead of adhesive to ensure proper bead thickness.
11. Position the new panel. If repositioning is necessary slide the panel, do not lift or separate panels. **Adjustments must be made by sliding, not lifting the panel(s).** Apply clamps to hold panel in position, as necessary.

NOTE: There are many tools readily available to aid in the hem flange folding process.

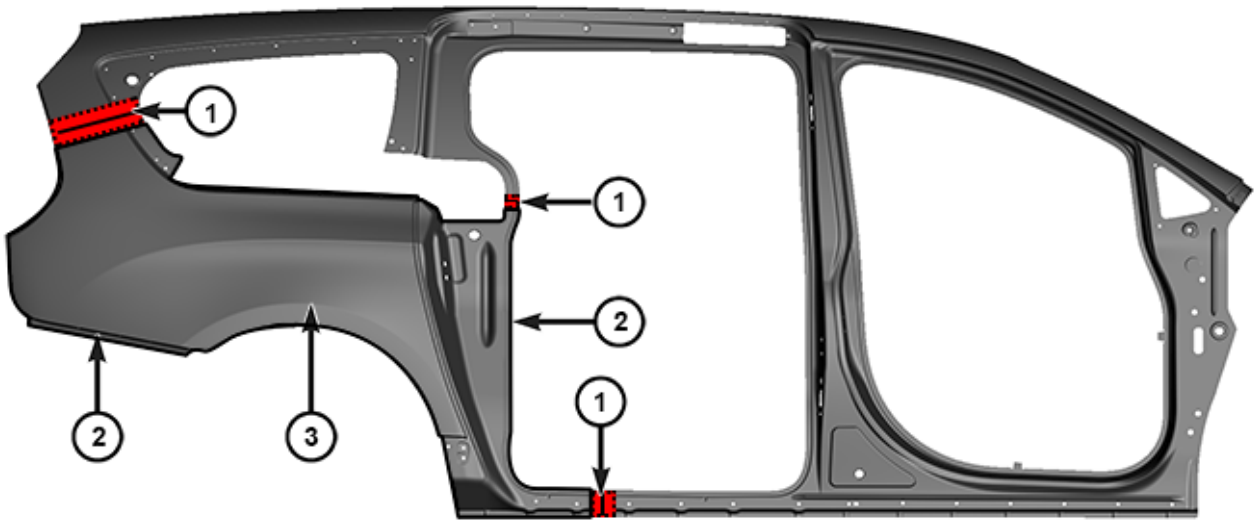
12. Roll the hem flange over. Remove any excess adhesive. This will save time, as compared to waiting until cured.
13. Re-check gap and flushness to the vehicle opening and adjust as necessary.
14. Allow the adhesive to cure per manufacturer recommendations. When fully cured, expect the adhesive to be a little tacky, as this is a normal characteristic of the adhesive. Remove clamps, if used.
15. Remove any excess cured adhesive with a grinder or abrasive disc. All adhesive must be removed from the cosmetic repair area to ensure proper adhesion of repair and refinish materials.

16. Apply an epoxy or anti-corrosion primer. When cured, lightly scuff.
17. Seam seal the entire door. Duplicate the factory seam sealer. Apply a discrete bead around the rest of the door to seal and protect, maintaining the original appearance.
18. Prime and paint per paint manufacturers recommendations.
19. Apply inner panel corrosion inhibiting materials (Mopar Cavity Wax part #68042970AA , or equivalent).

Body Side Aperture / Quarter Panel

Overview: FCA US LLC's recommended repair procedure for body side aperture / quarter panel replacement include butt joints using backer panels with structural adhesive at the sectioning joint, or a welded backer panel with a welded butt joint using Gas Metal Arc Welding (GMAW). Resistance spot welding with structural adhesive, referred to as weld bonding, should be used at all pinch welds and may be used at the drain trough and tail panel areas as well. With the exception of the sectioning joint, the rule to follow is "Re-assemble as it was built from the OEM". For further information on Weld / Weld Bonding, (Refer to Collision Information - Standard Procedure). GMAW (plug or puddle) welds may be used in place of Squeeze Type Resistance Spot Welding (STRSW) only in areas that specifically use spot welds and in areas that access limitations will not allow STRSW. GMAW cannot be used in the weld bonding process. Never weld with GMAW within 25 mm. (1 in.) of any area where structural adhesive is used. The weld "heat zone" will destroy the properties of the adhesive.

Vehicle design will determine if the sectioning location is to be in the pillar or the roof line area. For locations and warnings that may apply to the body side aperture / quarter panel sectioning locations reference Sectioning Procedures (Refer to Collision Information / Standard Procedure).



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Body Side Aperture/Quarter Panel

1 - SECTION JOINT WITH BACKER PANEL
2 - WELD BONDING (AREAS WHERE ACCESSIBLE)
3 - REAR BODY SIDE APERTURE

Preparation:

NOTE: Be certain vehicle is evenly supported at normal suspension points.

1. Restore structural dimensions as well as all related mating flanges.
2. Once sectioning locations have been established, cut original and replacement panels at the pre-determined locations. Remove spot welds within sectioned parameter.

NOTE: Be careful not to destroy any areas that may be able to be used as backer panels.

3. If panel is attached with adhesive, you may use heat, from a **non-flame** heat source, up to 204°C. (400F°). This will aid in loosening the bond.
4. Use an air chisel with a flat bladed bit to remove original panel.
5. Using a hammer and dolly, restore any and all damage to mating surfaces.
6. Create backer panels to be used at butt joints. Refer to Backer Panel Joint.

NOTE: It will be difficult to abrade the underside mating surface of the original panel, where backer panel is to be used, however this is important step and should be done effectively.

7. Grind all mating surfaces with a 50 grit grinding disk. Remove all adhesive, sealers, paint, E-coating and corrosion protective coatings from the area where the structural adhesive and welds will be applied. The metal should be completely bare and shiny in appearance, if the metal appears pewter in color all of the galvanized coating has not been removed.
8. Pre- drill any GMAW plug / puddle weld holes that may be necessary, with a 8 mm. (5/16 in.) hole.
9. With the aid of an assistant, dry fit the panel. Apply clamps or Clecos to hold panel in place, making note of locations. Install screws or Clecos where accessibility prohibits the use of clamps. This will aid in proper alignment during installation.
10. Without a mixing tip installed, purge a small amount of structural adhesive from the cartridge. This will ensure an even flow of both components.
11. Attach a mixing tip and dispense a mixing tube's length of adhesive from the cartridge.

NOTE: Using scrap metal and adhesive, make test coupon samples and perform peel test to ensure your STRSW equipment is ready to apply welds as required. The Weld/Weld Bonding section will provide further information on peel testing and equipment set-up, (Refer to Collision Information - Standard Procedure)

NOTE: Refer to the structural adhesives manufacturer for information on work, handling and curing times.

LORD Fusor 2098 Curing Chart

Cure Time x Cure Temperature = Pounds Per Square Inch

CURE TIME	CURE TEMPERATURE				
	10°C (50°F)	21°C (70°F)	38°C (100°F)	65°C (150°F)	65°C (200°F)
10-minutes	X	X	X	5.7 psi	1689.4 psi
20-minutes	X	X	0.0 psi	1199.3 psi	3175.2 psi
40-minutes	X	X	0.0 psi	2710.0 psi	3574.7 psi
1-hour	X	X	49.1 psi	2925.7 psi	X
2-hours	X	X	1368.7 psi	3776.1 psi	X
4-hours	X	23.8 psi	2713.2 psi	X	X
5-hours	X	90.4 psi	X	X	X
6-hours	X	292.0 psi	X	X	X
8-hours	39.1 psi	914.5 psi	X	X	X
16-hours	754.1 psi	1758.2 psi	X	X	X
1-day	1571.1 psi	2656.2 psi	X	X	X

Installation:

12. Install backer panels, refer to Backer Panel Joint
13. Apply 10 - 13 mm. (3/8 - 1/2 in.) bead of structural adhesive to the area where the two panels are to be bonded and weld bonded. **Do not apply to areas that will only be STRSW or GMAW welded.**
14. Smooth the adhesive with a body filler spreader or equivalent, to cover all bare metal surfaces. Apply a second bead of adhesive to ensure proper adhesive thickness.

NOTE: Adjustments must be made by sliding, not lifting the panel(s). Lifting will cause air bubbles and weaken the bond.

15. With the aid of an assistant place the panel to the vehicle. If the panel needs to be adjusted, slide the panel.

16. Install clamps and screws to locations determined during the dry fit process.
17. Remove all squeeze out of adhesive, prior to curing.

    NOTE: Structural adhesive manufacturers will vary on time allowed for completion of STRSW in weld bond zones. Check and follow adhesive manufacturer recommendations.
18. Apply STRSW to weld bond area immediately.
19. Once fully cured, remove clamps and screws. When fully cured, expect adhesive to remain a little tacky, as this is a normal characteristic of the adhesive.
20. Complete STRSW and / or GMAW (plug / puddle) welds.
21. Finish / Dress the welds as necessary. If screws were necessary bevel the screw holes. Prepare the joint and screw holes by grinding the area with 50 grit grinding disc. Get in seams as best as possible without thinning the metal.
22. Remove any excess cured adhesive with a grinder or abrasive disc. All adhesive must be removed from the cosmetic repair area to ensure proper adhesion of repair and refinish materials.
23. Apply fiber-reinforced waterproof body filler to screw holes and joint. Complete the repair using conventional body filler, and block sanding.
24. Apply an epoxy or anti-corrosion primer. When cured, lightly scuff and then apply seam sealer as necessary.
25. Prime and paint per paint manufacturer recommendations.
26. Apply inner panel corrosion inhibiting materials (Mopar Cavity Wax part #68042970AA, or equivalent).

Metal Fatigue/Stress Crack

Overview: On rare occasions you may encounter metal fatigue, also referred to as stress cracks. This will appear as a crack starting at an edge and trailing away. Follow these steps for a proper repair:

1. Locate the trailing end of the crack and drill a 3 mm. (1/8 in.) hole at the very point at which it stops. This is referred to as "Stop Drilling".
2. Remove all contaminants and coatings including primer, paint and anti-corrosion, from the repair area. Surface should be clean and shiny (if pewter in color then anti-corrosion has not been removed).
3. Identify the type of metal to be welded and the recommended welding process for that metal as found in Standardized Steel Identification (Refer to 31 - Collision Information/Specifications/Standardized Steel Identification)).
4. Stitch weld the seam/crack closed using the recommended welding process and in accordance with the welding guidelines as found in Weld/Weld Bonding (Refer to 31 - Collision Information/Standard Procedure/Welding and Weld Bonding).
5. Dress the welds as necessary. **Careful not to thin the base metal.**
6. Depending on the location and visibility of the repair surface refinishing will vary from body filler, finishing and painting to simply applying an epoxy or anticorrosion primer and rubberized undercoating, Mopar part #05093417AA or equivalent.
7. Apply inner panel corrosion inhibiting materials (Mopar Cavity Wax part #68042970AA , or equivalent).

WELDING AND WELD BONDING

Safety Notice

CAUTION: All Service and rebuilding instructions contained herein are applicable to, and for the convenience of, the automotive repair industry only

The service procedures recommended and described in this publication were developed for professional service personnel, and are effective methods for performing vehicle repair.

It is important to note this publication contains various **Cautions** and **Warnings**. These should be read carefully in order to minimize risk of personal injury or the possibility that improper service may damage the vehicle or render it unsafe. FCA US LLC cannot possibly know, evaluate and advise the service trade of all conceivable ways in which service may be performed, or the possible hazards of each. Consequently, FCA US LLC has not undertaken any broad service review. Accordingly, anyone that uses a service procedure or tool that is not recommended in this publication must be certain that neither personal safety, nor vehicle safety will be jeopardized by the service methods they select.

Safety Precautions

WARNING:

- **When Welding and/or working with Adhesives always wear safety goggles and gloves to prevent contact with chemicals and to prevent weld spatter, sparks, and sharp metal from causing bodily injury.**
- **Wear an approved respirator while welding and during the application of adhesives to prevent inhalation of harmful vapors.**
- **Always remove NVH (Noise Vibration and Harshness) foam from welding repair area, as material is flammable.**

WARNING: Failure to follow these instructions may result in possible serious or fatal injury

Welding

- Comply with all federal, state and local regulations to avoid any injuries due to shock, fires, fumes, sparks and liquids.
- All flammable materials or liquid should be stored in tightly sealed and labeled containers, and used only in well ventilated areas.
- No spark producing equipment should be permitted in any area where flammable materials are being handled or stored.

Adhesives:

- Safety Data Sheets (SDS) must be available and understood before adhesives are handled.
- All personnel should be instructed on the proper procedures to prevent skin contact with solvents, curing agents, and uncured base adhesives, which could cause allergic reactions or sensitization.

Introduction

The purpose of this document is to clearly explain the welding options available to the collision repair technician and how to determine that welding repairs are made properly. The primary types of welding covered in this section are Squeeze Type Resistant Spot Welding (STRSW), Gas Metal Arc Welding (GMAW), Metal Active Gas (MAG) Brazing and Weld Bonding (a combination of STRSW and structural adhesive). Proper training and weld testing are required to ensure that a safe, high quality, vehicle repair is made.

INDEX	REFERENCE
Training and Qualification	Training and Qualification

Panel Removal

WARNING: Always Wear Safety Goggles, Work Gloves, Hearing Protection and a Dust Mask when removing welded panels this way. Failure to follow these instructions could result in serious or fatal injury.

When removing panels and components for replacement, care must be taken not to damage the underlying component. On welded and "Weld Bonded" panels spot welds must be removed using a spot weld cutting type tool, or equivalent. On panels that are adhesive bonded or weld bonded it is acceptable to use heat up to **204°C. (400°F.)**, from a **Non-Open Flame** heat source such as a heat gun. This will loosen the bond, so less damage is inflicted to the mating surface. After panel is removed, any remaining weld nugget should be ground smooth. Cut-off wheels should not be used, as there is potential to remove material from the base material which would weaken the final repair. Place an air hammer with a flat bladed chisel bit (or equivalent) in between panels and remove the panel. Care should be taken as to not damage mating flanges and the surrounding components.

Key Points of a Welding Repair

- Poor fit up will adversely affect weld quality and may result in a weld failure due to excessive metal stretching around the nugget.
- Clamps/Clecos should be used to bring parts together and hold them in position.
- Clamps/Clecos should be insulated when using STRSW to control weld current shunting (This can be accomplished with specialized clamps or by placing a insulating material such as cardboard between the clamp jaws and the panels.)
- Number, size and location of welds should closely duplicate the original assembly. Do not place the new spot weld directly on the original spot weld location. Placement of a new weld over an original weld location may lead to metal fatigue or poor weld quality.
- Surface of the steel parts should be clean and free of scale, rust, paint, cured adhesives/sealers and any other contaminants that could adversely affect the quality of the weld joint. This includes the removal of any E-coat applied to the service part within 25 mm. (1 in.) of any welds.
- Proper corrosion protection must be installed when repairs are complete, (Refer to 31 - Collision Information/ Standard Procedure/Corrosion Protection).
- If the joint originally had adhesive, all E-coat must be removed where the adhesive is to be reapplied.
- "Weld-thru" primers are not recommended anywhere.
- Do not remove base material from the base panel when releasing welds.

NOTE: FCA US LLC recommends the same quantity of welds as the original panel, but placement of the new weld should NOT be put directly on the original spot weld location. Placement of a new weld over an original weld location may lead to metal fatigue or poor weld quality.

Requirements of a Welding Repair

The number one requirement of any welding repair is to restore the vehicle to its OEM condition. Materials and technologies should duplicate original OEM conditions as much as possible. To meet this requirement, the technician must ensure the following:

- Panel layering (shingling) is the same as original
- Part fit up is correct
- Equivalent sealers and/or adhesives are utilized
- Welds are replaced in the same size, quantity and location
- "Weld-thru" primers are NOT recommended
- Structural adhesives and sealers must be replaced where they were located

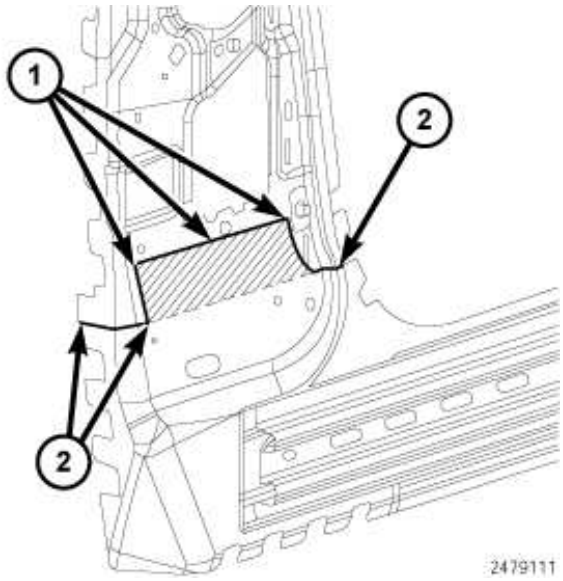
A significant amount of structural adhesive is used at the OEM to improve joint strength. It may be difficult to determine if the material between the panels is an adhesive or a sealer, and for this reason, the following guideline should be used: **If in doubt, use a two-component, corrosion inhibiting, structural adhesive.** GMAW welding is not recommended within 25 mm. (1 in.) of the adhesive as it creates heat that will destroy the adhesive. STRSW on the other hand, can weld through the adhesive and will not destroy its properties.

NOTE: Structural adhesives that meet FCA US LLC materials recommendations for adhesive strength and corrosion protection qualities include Lord Fusor #2098, Lord Fusor #112B and 3M #08116 .

Modified Lap Joint

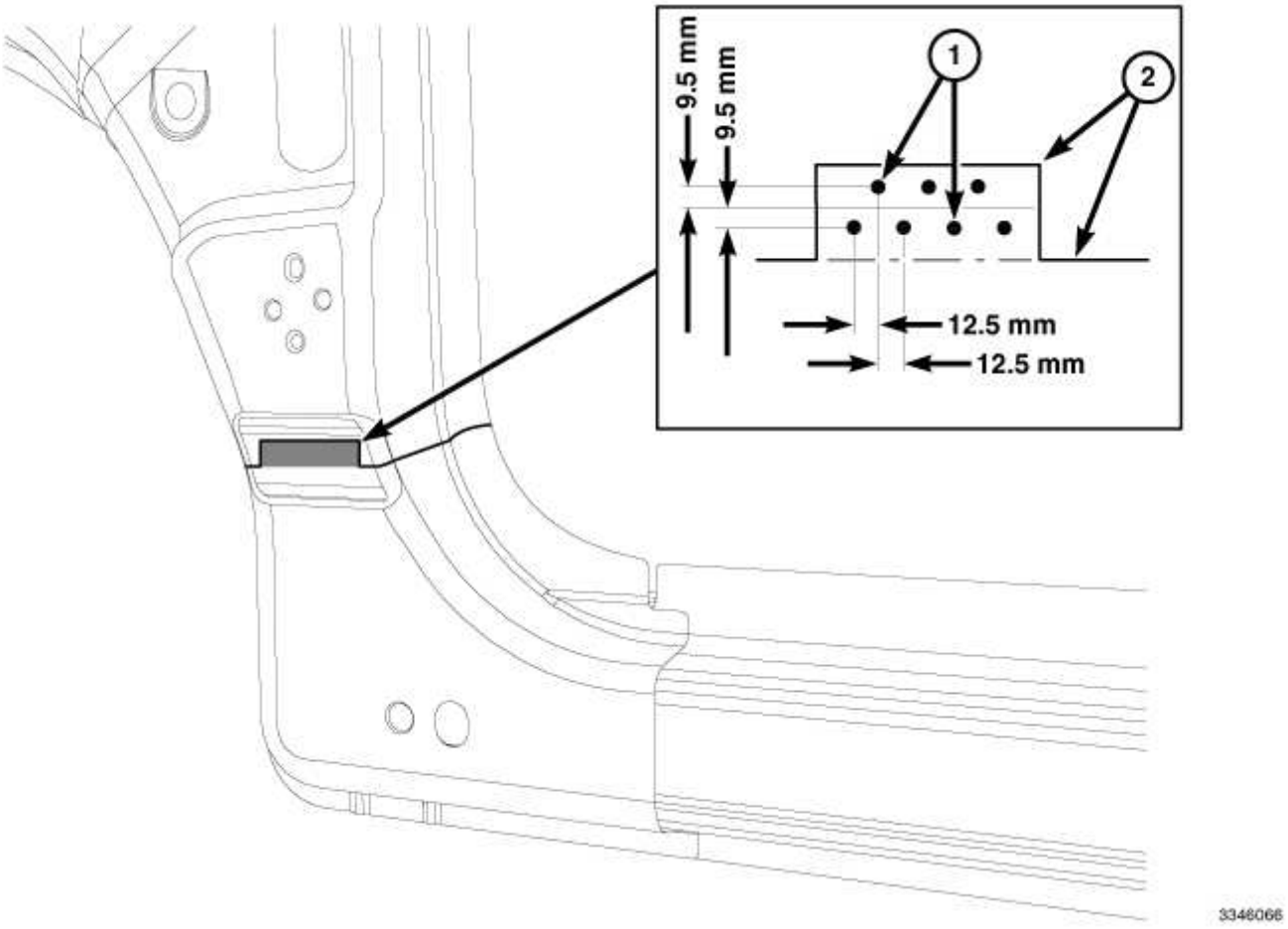
NOTE: Parts shown for example purposes only. Emphasis is on joint design and proper plug weld placement.

The repair joint is a combination lap-joint (1) and butt-joints (2) – the panels are lapped in the flat areas and butted in contoured locations and at weld flanges. The graphic better illustrates this process.



Modified Lap Joint

1 - LAP-JOINT WELDS
2 - BUTT-JOINT WELDS



Plug Weld Layout

1 - MIG PLUG WELDS
2 - MIG SEAM WELD

The MIG plug welds, or "puddle welds" should be made after drilling 8 mm (5/16 in) holes and should be staggered 12.5 mm (0.5 in) apart following the centerline of the lap and should be alternating above and below the centerline 9.5 mm (3/8 in.).

In the lap-jointed area, staggered MIG plug welds (1) are used to augment the joint and **all edges** of the lapped panel seam (2) should be **completely** welded.

Types of Welding

Squeeze Type Resistant Spot Welding (STRSW)

- STRSW relies on the resistance of the material being welded to create heat as a current is passed through. The materials being welded are squeezed together, and as current passes through, resistance causes heat buildup. The force of the tips and the heat from the current allow the materials to fuse together. The current is removed and the force from the welding tips is held during a cool down cycle. When the cool down cycle is complete, the pressure is released and the next weld is positioned.
- Learning how to create weld coupons, refer to Test Weld Coupon and then performing a destructive test using these coupons, is the key to successfully using STRSW. FCA US LLC requires a physical test using test coupons and the methods outlined in this document to test welds prior to making repairs.
- Tip condition is very important for producing proper welds. Inspect tips often and either dress or change per equipment manufacturer recommendations.
- High-quality welding equipment must be used or welds may be inadequate. Also, the equipment must be able to produce repeatable welds from the beginning of the repair to the end.

Gas Metal Arc Welding (GMAW) or ″MIG″

- GMAW is an arc welding process where the electrode wire is fed through a weld gun and is surrounded by a shielding gas. The term MIG comes from early uses on aluminum where argon was used as shielding gas and

the process was referred to as Metal Inert Gas welding. The GMAW process is currently the most common in the uni-body repair environment.

Flux Core Arc Welding (FCAW)

- FCAW is an arc welding process where electrode wire is fed through a weld gun and is not surrounded by a shielding gas.
- The welding zone is protected by the use of flux that is located in the center of electrode wire.
- The surface of the completed will have slag left behind from the flux that will need to be removed prior to any refinishing process

Metal Active Gas (Mag) Brazing

- MAG brazing, also known as mig brazing is a brazing process where the electrode wire is fed through a weld gun and is surrounded by argon as shielding gas.
- The application of the process is similar to GMAW. However, it utilizes a different electrode and shielding gas and does not melt of the base material.
- Due to the lower melting point of the electrode, it produces a much smaller heat affected zone than GMAW.

Weld Bonding

- A method of joining metals using STRSW in conjunction/combination with a structural adhesive.
- Weld bonding provides the customer with a superior repair as compared to the traditional plug/puddle welding process using GMAW. Structural adhesive should not be used in a joint that did not originally contain it.
- The repair joint or seam should duplicate the OE build as closely as possible, unless otherwise stated in the collision information.

NOTE: FCA US LLC DOES NOT approve or endorse the use of structural adhesives alone in the replacement of body panels.

Weld Processes

Squeeze Type Resistance Spot Welding (STRSW)

Applications

- With advancements in equipment technologies, such as computer program controlled and inverters, STRSW is not restricted to light gauge sheet metal any longer. Heavier gauges of high strength and coated steel, currently used in vehicle structures, can now be welded in the field, providing destructive testing is performed on each combination. This is to ensure quality welds are being maintained.

Equipment Requirements

- Equipment must produce two sided welds
- Equipment must have been tested to SAE J2667 with satisfactory results obtained
- Equipment must have the capability to create welds that comply with the Minimum Weld Nugget Requirement Chart
- Technician must have the appropriate sheet metal measuring equipment to ensure their welds meet the minimum weld nugget size for the actual panels being welded

Gas Metal Arc Welding (GMAW) or ″MIG″

Applications

- Sheet metal repairs where STRSW is not available or practical, and truck frame repairs.
- The most common usage of GMAW on uncoated or galvanneal coated steel will utilize a 75% Argon - 25% CO2 shielding gas mix, and AWS specification ER70S6 wire. When welding galvanized material, Flux Core Arc Welding (FCAW) using AWS specification E71T-GS wire should be used to avoid weld porosity from the zinc in the galvanizing.

Weld Process

COMPONENT PARTS	TRUCK FRAME		BODYSHELL EXTERIOR & UNDERBODY PANELS			
	Zinc and Zinc Iron Alloy coated sheet steels					
WELDING PROCESS	GAS METAL ARC (Note: 1)	FLUX CORED ARC	GAS METAL ARC (Note: 1)	MAG BRAZE (Note: 2)	GAS METAL ARC (Note: 1)	FLUX CORED ARC
Material Type	High Strength and Structural Quality Steels which includes HSLA, Martensitic, and Dual Phase materials					

COMPONENT PARTS	TRUCK FRAME		BODYSHELL EXTERIOR & UNDERBODY PANELS			
Material Thickness Range	2 mm - 4 mm		0.6 mm - 1.02 mm		>1.02 mm - 3.0 mm	
ELECTRODE TYPE (AWS SPEC. A5.18)	AWS CLASS. ER70S-6	AWS CLASS. E71T-11	AWS CLASS. ER70S-6	AWS CLASS. ERCuAl-A2	AWS CLASS. ER70S-6	AWS CLASS. E71T-11
ELECTRODE SIZE	0.035	0.045	0.023 - 0.025	0.035	0.035	0.045
ELECTRODE MAKER	Lincoln®	Lincoln® NR-211-MP	Lincoln®		Lincoln®	Lincoln® NR-211-MP
WIRE FEED SPEED (in/min)	245-250 Vertical Down 70-90 Flat & Horizontal	110 Vertical Down 70-90 Flat & Horizontal	95-115 All Welds	150-155 Flat & Horizontal	245-250 Vertical Down 70-90 Flat & Horizontal	110 Vertical Down 70-90 Flat & Horizontal
TRAVEL SPEED (in/min)			10			
VOLTAGE	19-20	15-18	16-19	18-19	19-20	15-18
POLARITY	DCEP	DCEN	DCEP	DCEP	DCEP	DCEN
GAS FLOW (cfh)	25-35	N/A	25-35	25-35	25-35	N/A
ELECTRICAL STICKOUT (in)	1/2 - 5/8	3/8 - 1/2	1/2 - 5/8	5/8 - 3/4	1/2- 5/8	3/8 - 1/2
GAS TYPE	75% Ar 25% CO2	N/A	75% Ar 25% CO2	100% Ar	75% Ar 25% CO2	N/A
TYPE OF ARC TRANSFER	Short Circuit		Short Circuit	Pulse	Short Circuit	

These Procedure Specifications are appropriate as of this publication. Procedures may be superseded with new spec's at a later date.

Always process to the Thinner Material Thickness (TMT)

All persons performing welding must be qualified to weld in all positions.

NOTE:

1. Must remove Zinc Coating on both sides of metal at the weld zone.
2. MAG Braze welding process requires use of Pulse Arc® or STT® welding machine.

Equipment Requirements

- The preferred GMAW welder will be a 220V. unit with minimum output capacity of 150 amps (250 amps suggested to avoid equipment limitations).

Limitations

- Welds must be "dressed", or ground down before applying topcoats.
- GMAW cannot weld through paints, sealers, or adhesives. Additionally, the zinc used in coated steels can lead to reduced weld strength due to porosity. This porosity problem on materials with heavy coatings can be dealt with by using FCAW.
- Due to the heat affected zone, structural adhesives cannot be applied within 25mm. (1in.) of GMAW welds.

Testing

- Weld coupons identical to the repair situation need to be created to help set up the welding equipment and weld process. These coupons then should be destructively tested to ensure proper quality welds are being made.

Post Weld Procedures

- When welding has been completed, welds in cosmetic locations must be dressed.
- Welds will need to be smoothed down to the height of the surrounding panel without any thinning of the sheet metal. This can be accomplished using one of many sanding or grinding products available in the aftermarket.
- Slag must always be removed prior to refinishing to restore corrosion protection and appearance.
- Corrosion inhibiting materials must be applied to seal the weld zone from future corrosion.

Metal Active Gas (MAG) Brazing

Applications

- Is the recommended method for attaching steel that is greater than 600 MPa when accessibility to perform STRSW or weld bonding is not possible.
- It has a reduced heat affected zone as compared to GMAW.
- The lower heat involved will not affect the strength properties of the metal being welded

Flux Core Arc Welding (FCAW)

Applications

- • Thicker gauge coated steels where the thickness of the metal is between 1.02 mm and 4 mm and tensile strength is below 600 MPa, such as truck frames.
- This type of welding is recommended for galvanized or zinc coated steels, due to porosity issues caused when welding with GMAW.
- AWS specification E71T-GS wire is recommended.

Minimum Weld Nugget Requirement Chart

*Governing Metal Thickness (GMT)	**Minimum Weld Nugget Diameter
0.64 mm. - 0.79 mm.	3.5 mm.
0.8 mm. - 0.99 mm.	4.0 mm.
1.0 mm. - 1.29 mm.	4.5 mm.
1.3 mm. - 1.59 mm.	5.0 mm.
1.6 mm. - 1.89 mm.	5.5 mm.
1.9 mm. - 2.29 mm.	6.0 mm.
2.3 mm. - 2.69 mm.	6.5 mm.
2.7 mm. - 3.04 mm.	7.0 mm.

*Governing Metal Thickness (GMT) = The minimum weld nugget for two thickness welds shall be based on the thinner of the two sheets being welded. The minimum weld nugget diameter for three thickness welds shall be based on the middle gauge of the three panels being welded (not necessarily the middle panel).

**Minimum nugget diameter should be measured with a venire caliper. If the weld is not round, measure the major and minor diameter and average.

Equipment Limitations

- Each brand/model is limited to material capacity that can be welded.
- The facility power supply will impact equipment performance.

Access Limitations

- Due to the existing structure of the vehicle being repaired, each weld must be evaluated for feasibility. Due to power limitations of the equipment, tongs that are long and deep enough for certain welds may not be available, and the weld will need to be made by another method.

CAUTION: All NVH foam must be removed from the repair area of the vehicle, as material is flammable.

Preparation

- Prior to making repairs with STRSW, weld coupons must be created for testing. The test joint must be an exact duplicate of the original joint, including layering and adhesive application. The testing is required to ensure the repair restores the vehicle to its originally produced condition using the minimum weld nugget requirement chart.
- To correctly identify the material being welded or tested, the technician must posses an accurate material thickness gauge.
- No "improvements" to the vehicle design are allowed as this could have a negative impact on the vehicle as a whole. The repair should mirror what was used on the vehicle at the assembly plant.
- Note, the weld is affected by more than just the thickness or number of panels being welded, but also material coatings. Zinc based anti-corrosion coatings (i.e., galvannealing, galvanizing), sealers, adhesives, and E-coat will affect welder performance.
- When preparing an E-coated panel for STRSW the E-coat must be removed from both of the mating flanges within 25 mm. (1 in.) of any flange. Corrosion protection is required anytime you remove E-coat. A scuffing

disc should be used to remove the E-coat without damaging other sheet metal coatings
- With advancements in technology some STRSW welders now have computer controlled programs. These technologically advanced welders are capable of measuring the thickness and resistance of the panels being welded including multiple tiers and types of metal. The computer program is able to process the information to provide the proper spot weld consistently.
- If the panel originally had structural adhesives it should be reapplied prior to welding. The adhesive should have a corrosion inhibitor and cover all bare metal.
- Prior to creating weld coupons and the final body repairs, all coatings and dirt/road debris must be removed.

Testing
- Weld coupons identical to the repair situation need to be made prior to performing any repair. These coupons must be tested (peel test) to determine if the weld nugget meets the minimum size outlined above in the Minimum Weld Nugget Requirement Chart. Keep in mind that different material coatings, coating thickness, material thickness, and joint configurations have a direct impact on nugget size.

Weld Bonding

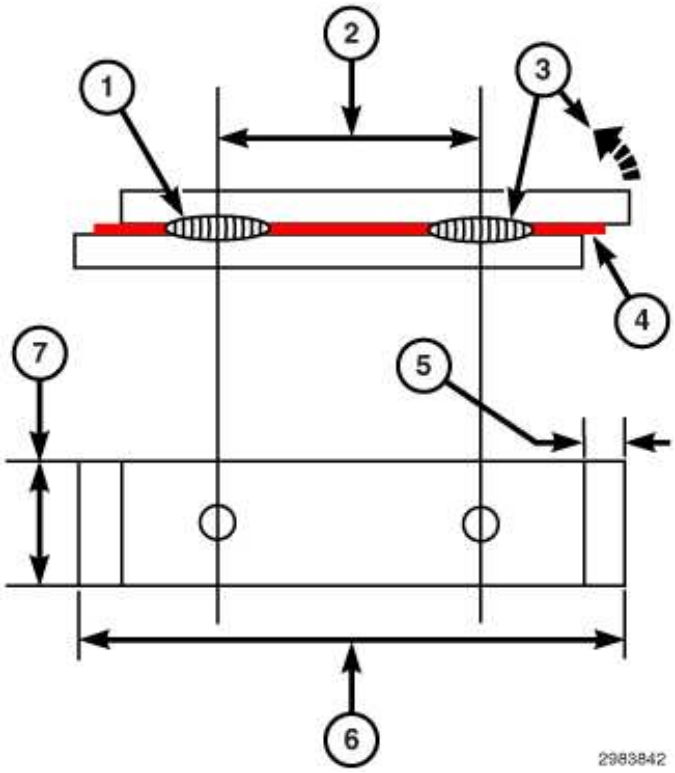
NOTE: Structural adhesive manufacturers will vary on time allowed for completion of STRSW in weld bond zones. Check and follow adhesive manufacturer recommendations.

Application
- Weld bonding is the STRSW welding process utilizing structural adhesive between the panels that are resistance welded together. The adhesive creates a very stiff structure, while the welding eliminates concerns of the adhesives' peel strength.
- Additionally, the adhesive acts as a sealer and provides a high level of corrosion protection.

Sealers and Adhesives
- Sealers are materials placed on top of a seam to control water and air intrusion.
- Adhesives, providing structural improvements, are found between panels welded together. Adhesives also provide the qualities of sealers when applied correctly.
- The FCA US LLC recommendation is to replace any suspected adhesive with a two-component, corrosion inhibiting structural adhesive when any repairs are made, providing the STRSW process is applicable.

Test Weld Coupon

NOTE: **Periodically check the electrodes tips to determine wether the faces have been contaminated, damaged or increased in size. If any of these conditions have occurred, replace or re-face the electrode tips per equipment manufacturer recommendations.**

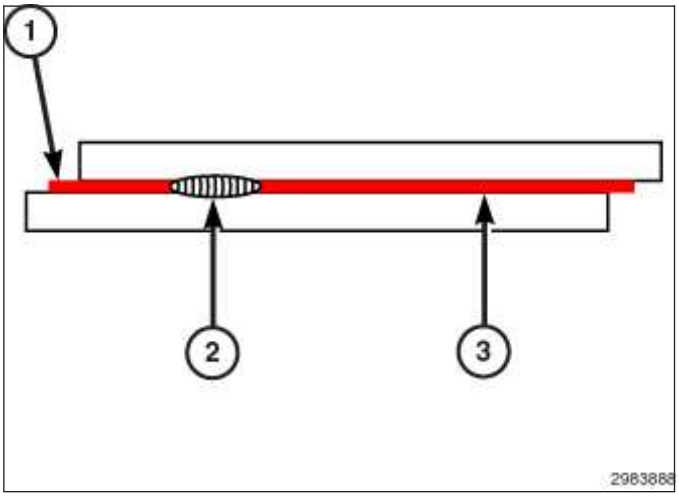


Weld Coupon

1 - FIRST WELD TOWARD END OF COUPON, AT LEAST 12.5 mm. (0.5 in.) FROM ANY EDGE
2 - DISTANCE MUST EQUAL THE SPACING FROM THE REPAIR WELD TO THE CLOSEST EXISTING WELD ON THE VEHICLE
3 - TEST THE SECOND WELD BY PEELING APART IN DIRECTION SHOWN (USING PLIERS OR EQUIVALENT
4 - STRUCTURAL ADHESIVE
5 - APPROXIMATELY 13 mm. (0.5 in.)
6 - APPROXIMATELY 100 mm. (4 in.)
7 - APPROXIMATELY 25 mm. (1 in.)

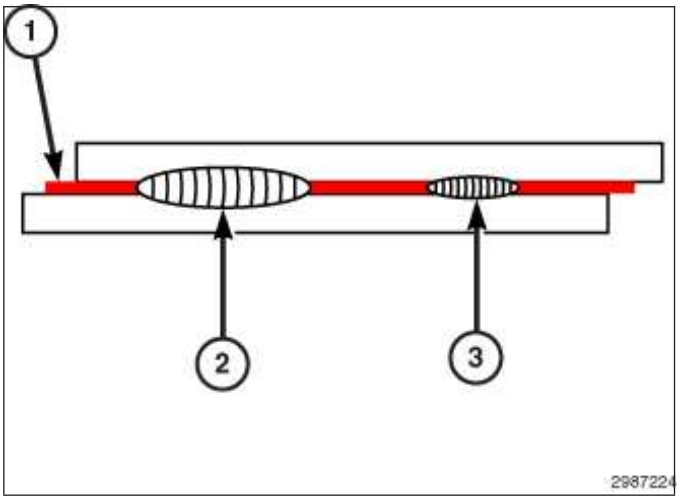
Weld Examples

Current Level Low for Both Welds



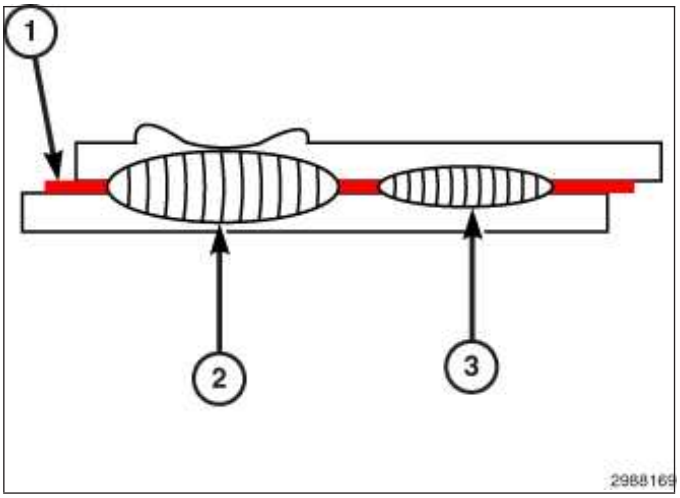
1 - STRUCTURAL ADHESIVE
2 - WELD TOO SMALL
3 - WELD NON-EXISTENT

Current Level Medium for Both Welds



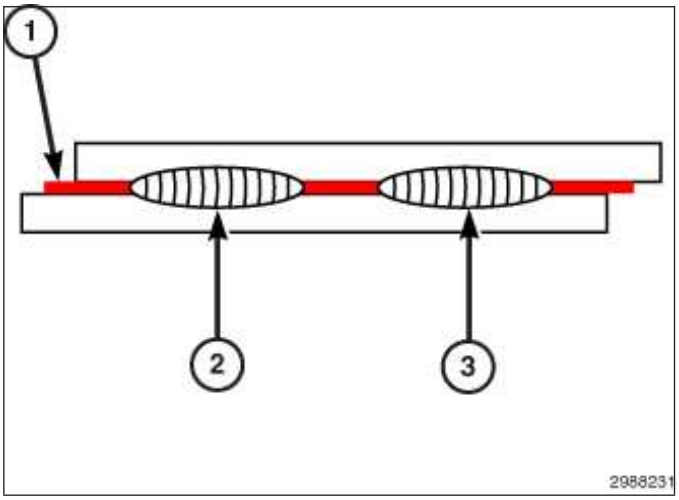
1 - STRUCTURAL ADHESIVE
2 - WELD CORRECT SIZE
3 - WELD TOO SMALL

Current Level High for Both Welds



1 - STRUCTURAL ADHESIVE
2 - WELD HAS HEAVY EXPULSION OF METAL AND SURFACE MARKINGS
3 - WELD CORRECT SIZE

Current Level Adjusted to Provide Acceptable Welds



1 - STRUCTURAL ADHESIVE
2 - WELD CORRECT SIZE
3 - WELD CORRECT SIZE

1. Select the proper spot welding tong/arm which provides the best access to the areas of the vehicles where the spot welds are to be made.
2. Obtain metal of the same thickness and coating (i.e., bare, galvanneal, or galvanized) to be welded. This metal will be used for spot welder set up. Damaged sheet metal taken from the vehicle being repaired may be used if it is from the area from which the work is to take place. The sheet metal must be flat, free of cracks, wrinkles and scored metal.
3. Using the procedure outlined in Test Weld Coupon, prepare the test coupons.
4. Clean and prepare both mating coupons. If using adhesives, verify the recommendations of the adhesive manufacturer. All contaminates such as rust scale, dirt, paint, and existing sealers and adhesives must be removed. Remove any E-coat within 25 mm. (1 in.) of where the welds are to be placed.
5. If the panel joint originally contained structural adhesive, it should be applied to the coupon at this time.
6. Install the equipment manufacturers recommended electrode tips.
7. Adjust the welding electrode tip force, and clamp time per manufacturer recommendations.

NOTE: Galvanneal and galvanized coated steel will require more force

8. As shown in Test Weld Coupon, place first weld at a position at least 12.5 mm. (0.5 in.) away from end weld coupons. Then make the second weld. The weld spacing should be the same distance as the original welds or the closest existing weld, whichever is the least on the vehicle being repaired.
9. Destructively test the **second** weld to determine the size of the resistance spot weld produced (see examples

in Test Weld Coupon. If the weld is insufficient, adjust the welder per the welder manufacturer recommendations and repeat steps 7, 8 and 9 until the proper weld size is achieved.

NOTE: If the first weld becomes too ″hot″ before the second weld reaches the correct size, reduce the current settings for the first weld and continue increasing the current setting for the second weld until the proper size for the second has been reached.

Final Weld Preparation

CAUTION: All NVH foam must be removed from the repair area of the vehicle, as material is flammable.

1. Visually verify that mating flanges are free of scale, rust, dirt, paint and cured adhesives/sealers, as well as wrinkles. If cracked, wrinkled or scored metal exists the condition needs to be corrected at this time.
2. E-coat within 25 mm. (1 in.) needs to be removed for STRSW. If Weld Bonding, E-coat should be ground off completely along seam.

   NOTE: Corrosion resistance coating (i.e., galvanneal, galvanized) should not be removed during cleanup of components.
3. Verify that the welder control settings are the same required to produce the second weld on the test coupons.
4. If adhesive is to be used, apply it at this time. Clamp the component to the vehicle.

   NOTE: Insulated clamps should be used, as not to shunt the weld current.

   NOTE: During the welding of the component it will be necessary to visually verify that the weld being made is not placed directly over an existing weld.
5. Perform the welds on the vehicle.

   NOTE: Structural adhesive manufacturers will vary on time allowed for completion of weld bond zones. Check and follow adhesive manufacturer recommendations. Reference the time temperature chart (Refer to Non-Structural Sheet Metal Repair/Types of Structural Adhesives).
6. If adhesive was used, clean up any excessive squeezeout prior to adhesive curing.

Training and Qualification

Training

As with any equipment, proper training is required, and in the case of welding equipment this is no exception. The goal of automobile facilities and technicians is to restore the vehicle to its OEM condition.

Training must be considered a two-fold process:

- The technician must be well versed in how the equipment operates, how adjustments are made and what effects those adjustments have on the weld. The technician must also clearly understand the maintenance of the equipment and the impact of poor maintenance on welds and equipment longevity.
- The second and most important, aspect of the training, is weld quality confirmation. Destructive testing of weld coupons must be performed to ensure the minimum weld size is created. Physical appearance of the weld is not enough to determine the quality of the weld. Additionally, poor welds may also reduce the durability, or quality , of the repaired vehicle in time.

It is required that technicians have received training regardless of the welding equipment or method they utilize. Both training in the specific field of welding, and the particular equipment, are necessary to ensure safe, durable, quality welds are obtained.

Qualification

To demonstrate welding skill, it is highly important that technicians obtain certification from an organization such as the American Welding Society (AWS) or a certificate from the Inter-Industry Conference on Auto Collision Repair (ICAR).

SECTIONING LOCATIONS AND PROCEDURES

WARNING: Sectioning of components may only be performed in the described areas if damage to component does not extend past sectioning location. Should damage extend past sectioning location entire component replacement is the only acceptable repair

WARNING: FCA US LLC engineering's position on the use of heat during collision repair is as follows:

- **Any body panel or frame component damaged which is to be repaired and reused, must be repaired using the "cold straightening" method. No heat may be used during the straightening process.**
- **During rough straightening prior to panel replacement, damaged panels or frame components may be heated to assist in body/frame realignment. The application of heat must be constrained to the parts which will be replaced and not allowed to affect any other components.**

This "no heat" recommendation is due to the extensive use of advanced high strength steels in FCA US LLC products. High-strength materials can be substantially and negatively affected from heat input which will not be obviously known to the repairer or consumer.

Ignoring these recommendations may lead to serious compromises in the ability to protect occupants in a future collision event, reduce the engineered qualities and attributes, or decrease the durability and reliability of the vehicle.

This statement supersedes any previously released information by the FCA US LLC.

Failure to follow these instructions may result in serious or fatal injury.

CAUTION:

- **All restraint systems should be disabled before beginning repairs.**
- **Electronic modules located within 305 mm (12 in.) of any welding should be isolated.**
- **Protect vehicle from weld spatter damage.**
- **Vehicle service manual should be referenced for guidelines and warnings.**

Service assemblies for body components may be disassembled if utilization of the subcomponents is more appropriate to the repair or to reduce vehicle disruption. The structural and non-structural metal on the Chrysler Pacifica Minivan (RU) may be sectioned in several areas providing the prescribed methods below are adhered to.

The joint should whenever possible be performed in as "flat" an area as possible to simplify the repair. While the joint may include "holes" and formations, it is suggested they be avoided but where this is not possible, the technician must ensure that the additional material thickness does not impede installation of fasteners, etc. that the hole exists for.

All dimensions are to be restored to factory specifications prior to full or partial component replacement.

CAUTION: NVH foam should be removed from the weld area, as material may be flammable.

CAUTION: Do not apply any corrosion protection or NVH foam prior to completion of welding, as materials are flammable.

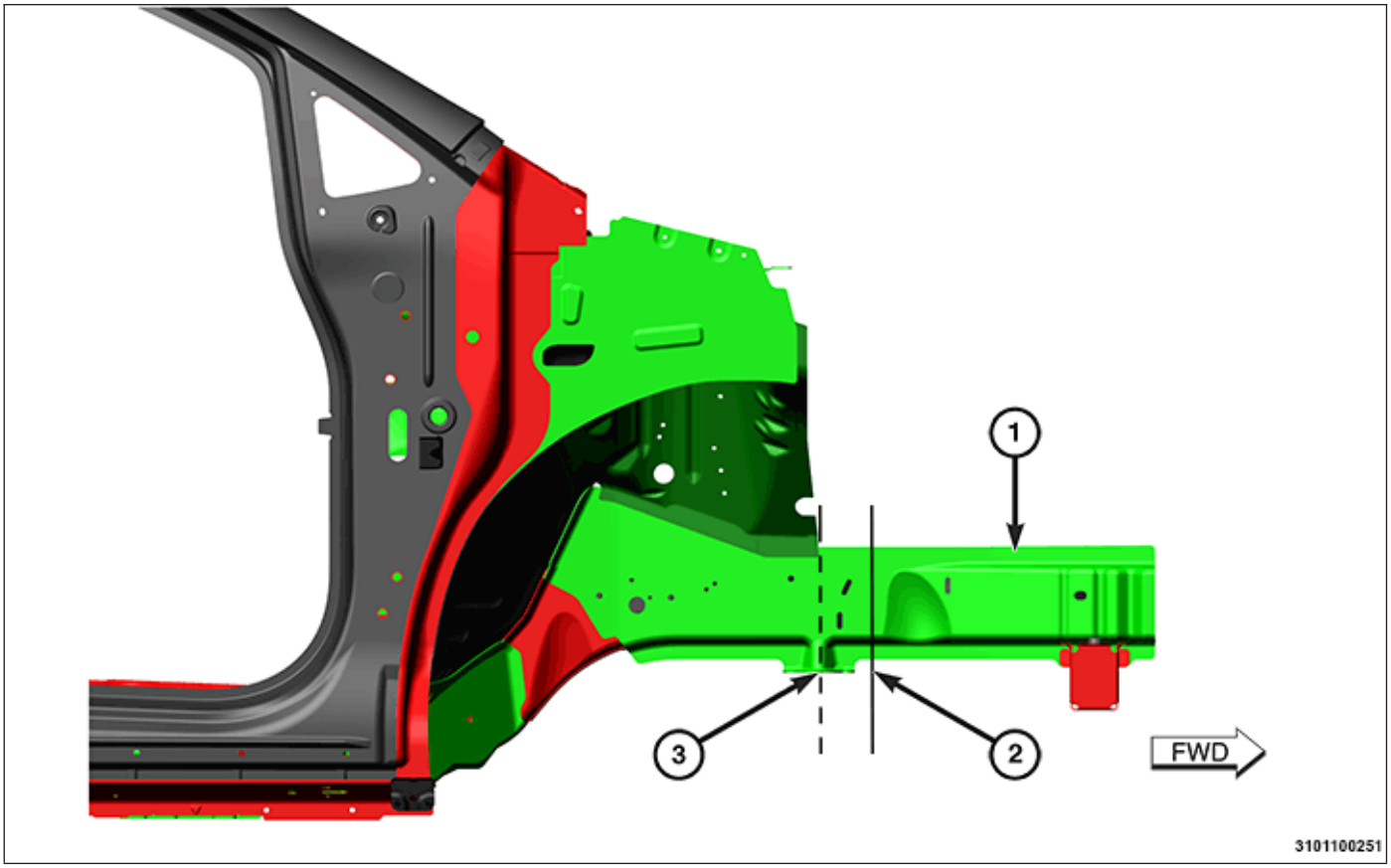
The described sectioning locations only explain joint location and type. All other welds along the sectioned portion of the component must be replaced. Squeeze Type Resistance Spot Welding (STRSW) is the method to be used. If accessibility prevents application of spot welds, MIG plug welds are to be used. Welding of structural panels through 3 or more tiers of panel stack ups will require 9.5 mm. plug welds. Exterior panels should be installed using 8 mm. plug welds. For further information (Refer to Collision Information - Specifications) Weld Process.

When welding is completed apply inner panel rust proofing, such as Mopar Cavity Wax Kit (part #68042969AA), Mopar Wax Refill (part #68042970AA), or equivalent. Apply to the inner cavity areas in two applications with a 30-minute flash period between the applications. Pay particular attention to areas which have been welded. Corrosion protection should always be restored to manufacturer specifications. For further information on Corrosion Protection, (Refer to Collision Information - Standard Procedure).

Finish, sealers, adhesives and silencers should be reapplied or replaced to OEM locations and specifications, (Refer to Collision Information - Locations).

DESCRIPTION	FIGURE
FRONT RAIL	Front Rail
FRONT RAIL PHEV	Front Rail PHEV
BODY SIDE APERTURE	Body Side Aperture
INNER BODY SIDE COMPONENTS **DO NOT SECTION AREAS**	Inner Body Side Components-Do Not Section
INNER QUARTER PANEL	Inner Quarter Panel
LIFTGATE TROUGH AND D-PILLAR REINFORCEMENTS	Liftgate Trough And D Pillar Reinforcements
ROOF D-PILLAR COMPOSITE REINFORCEMENTS	Roof D-pillar Composite Reinforcements
THIRD ROW SEAT TUB	Third Row Seat Tub
REAR RAIL	Rear Rail

Front Frame Rail



NOTE: Right side shown, left side similar.

1 - Outer Front Frame Rail (590 MPa)
2 - Sectioning Cut Line
3 - Measure From Center Of The Front Cradle Bolt Hole

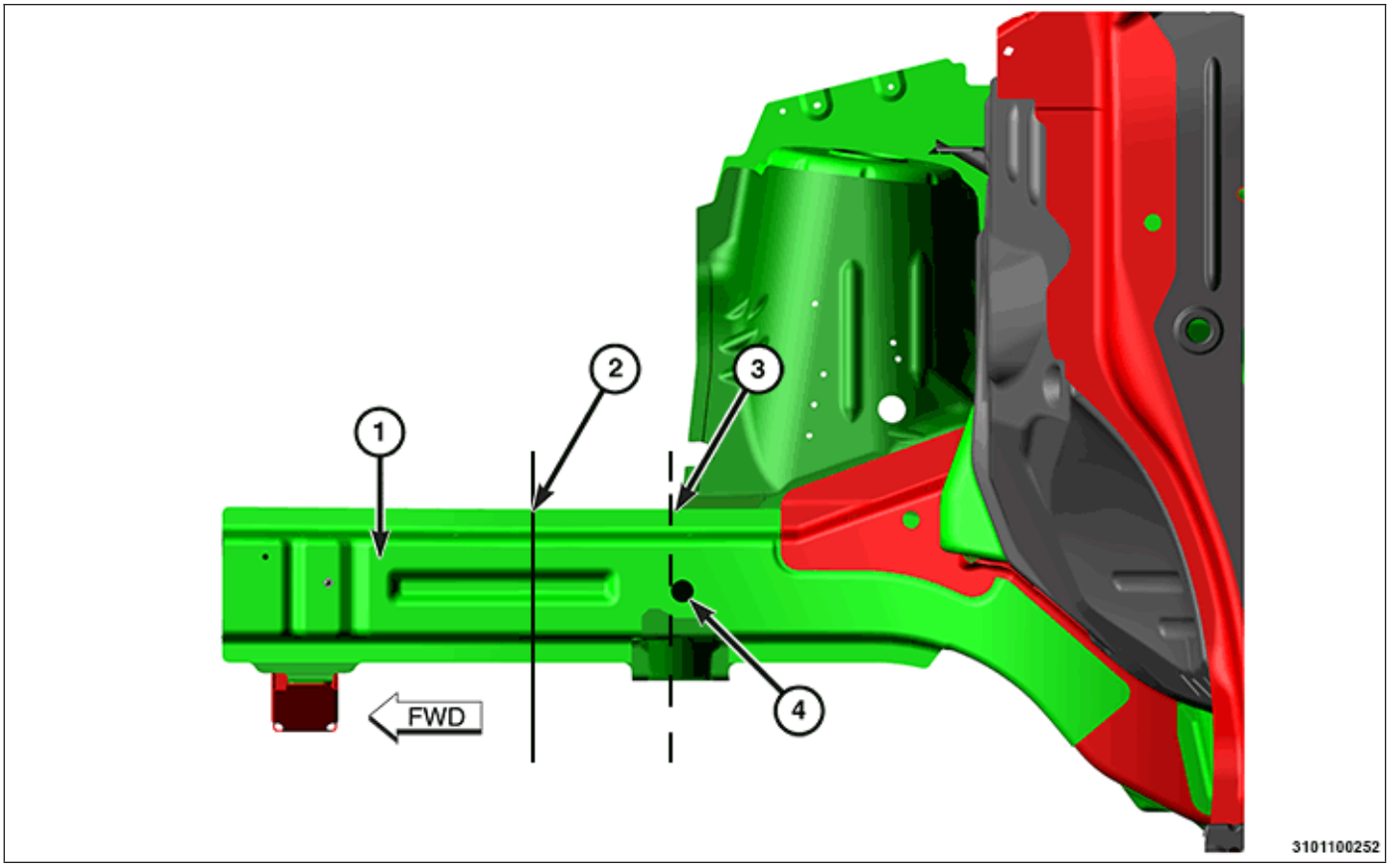
WARNING: Sectioning of components may only be performed in the described areas if damage to component does not extend past sectioning location. Should damage extend past sectioning location entire component replacement is the only acceptable repair

WARNING: Failure to follow these directions may result in serious or fatal injury

NOTE: It will be necessary to order the complete front rail and create the sectioning pieces at the same cut lines.

NOTE: To prevent warping, apply 25 mm. (1 in.) stitch welds until the sectioning joint is completely welded.

The outer front frame rail (1) sectioning cut line (2) is located 75 mm. (3 in.) forward of the front suspension crossmember mounting bolt hole (3). A butt-joint with 13 mm. (0.5 in.) weld backer is to be used.

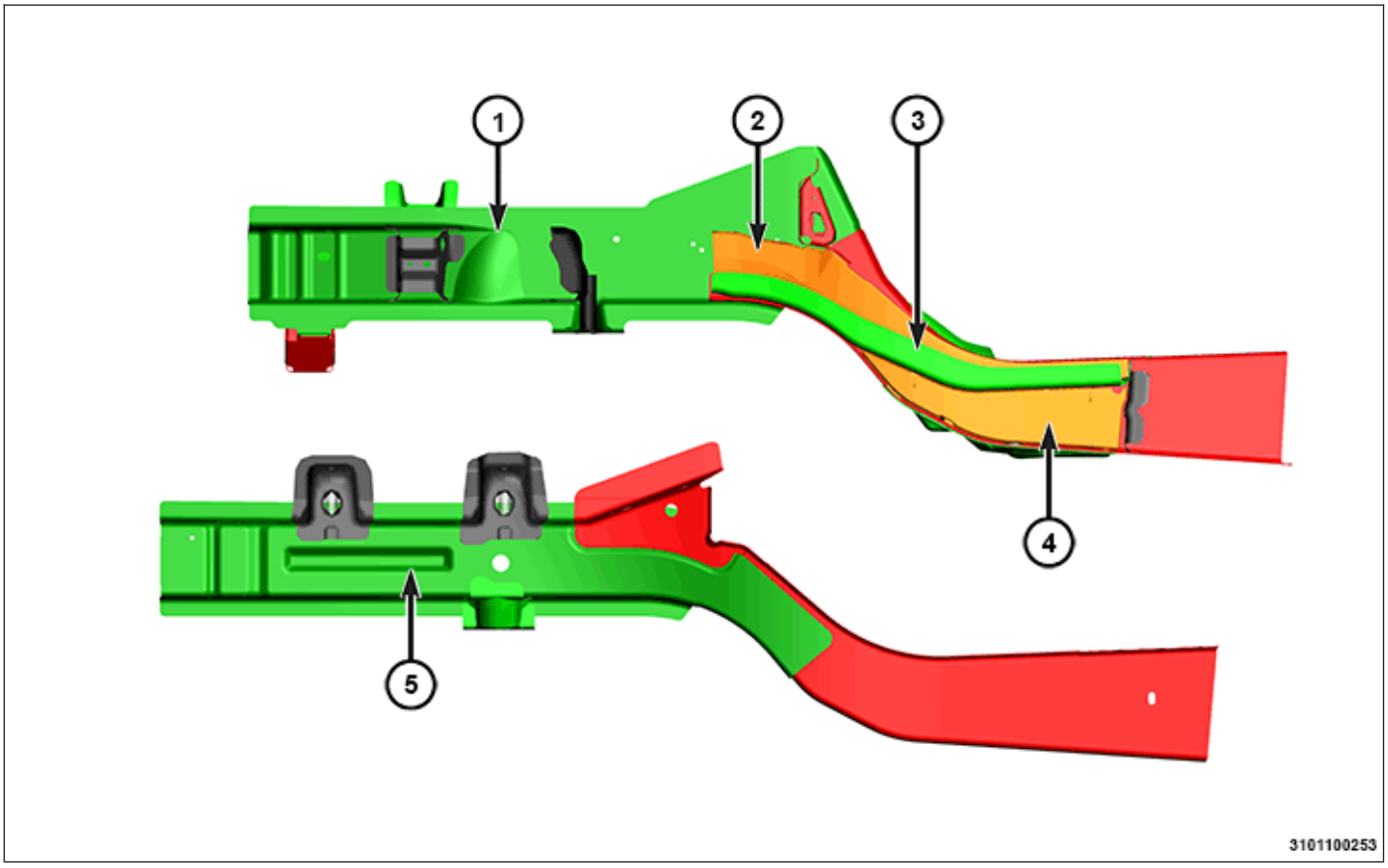


NOTE: Right side shown, left side similar.

1 - Inner Front Frame Rail (590 MPa)
2 - Sectioning Cut Line
3 - Measure From The front Edge Of The Principle Location Point (PLP)
4 - PLP Hole

The inner front frame rail (1) sectioning cut line (2) is located 127 mm. (5 in.) forward of the front edge (3) of the round PLP (4). A butt-joint with a 13 mm. (0.5 in.) weld backer is to be used.

Power Hybrid Electric Vehicle (PHEV) Front Frame Rail



NOTE: Right side shown, left side similar.

1 - PHEV Front Frame Rail Assembly (shown with Inner Front Frame Rail removed for clarity)
2 - Front Frame Rail Upper Composite Insert
3 - Side Front Frame Rail To Dash Panel Reinforcement (410 MPa)
4- Front Frame Rail Lower Composite Insert
5- Front Frame Rail Assembly

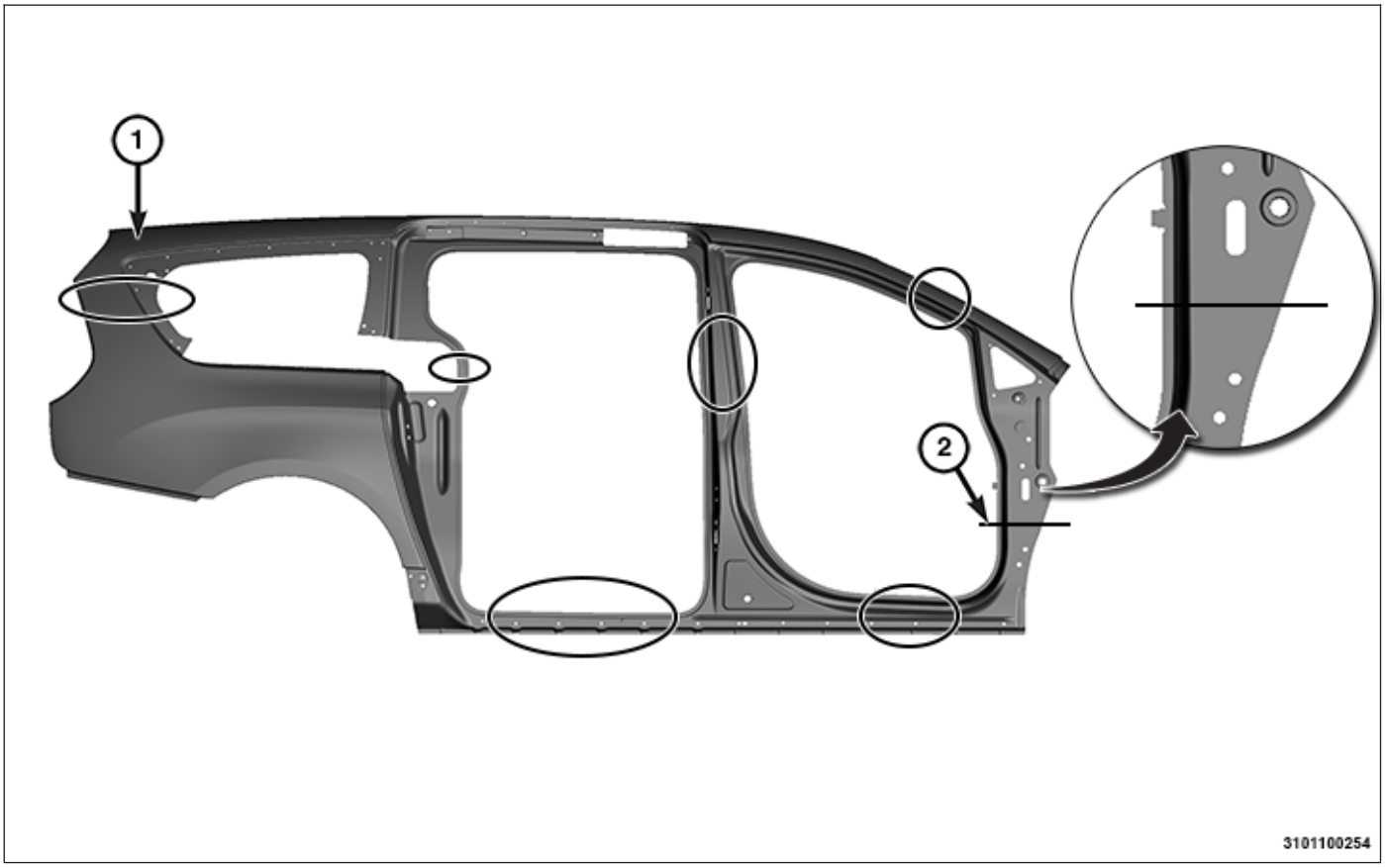
WARNING: Composite Reinforcements must be installed to maintain component strength standards.

NOTE: PHEV front rail will utilize the same sectioning locations as the standard front rail.

NOTE: It will be necessary to order the complete front rail and create the sectioning portions at the same cut lines.

The PHEV Front Rail (1) will differ from the other models of RU. The PHEV will contain two composite reinforcements. An upper composite insert (1) above the side front frame rail to dash panel reinforcement (3) and a lower composite insert (4).

Body Side Aperture



Outer Body Side Aperture

NOTE: Right side shown, left side typical

NOTE: The Cowl Side Hinge Pillar area is dedicated to where it is to be sectioned, as compared to the general locations within the outlined areas.

1 - Outer Body Side Aperture (270 MPa)
2 - Outer Body Side Aperture Hinge Pillar Sectioning Location

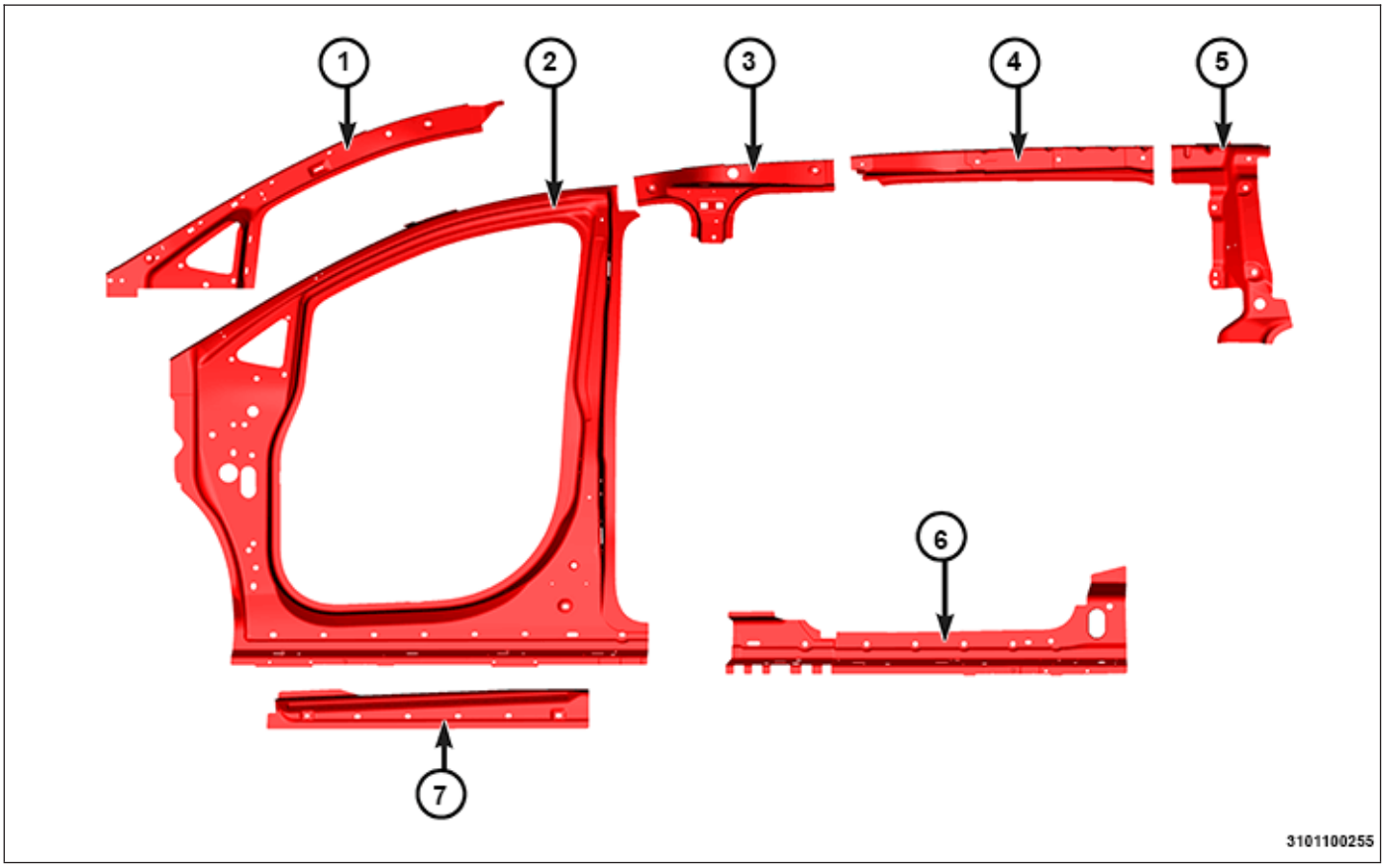
The Outer Body Side Aperture has many areas in which it may be sectioned in.

The cowl side is to be sectioned above the lower door hinge fastener holes. All other outlined areas represent general sectioning areas and may be sectioned within.

NOTE: To prevent warping, apply 25 mm. (1 in.) stitch welds until the sectioning joint is completely welded.

A Butt-joint with a 13 mm (0.5 in.) welded backer panel is to be used in all sectioning areas of the outer body side aperture

Inner Body Side Components - Do Not Section



Do Not Section

NOTE: **Left side shown, right side similar**

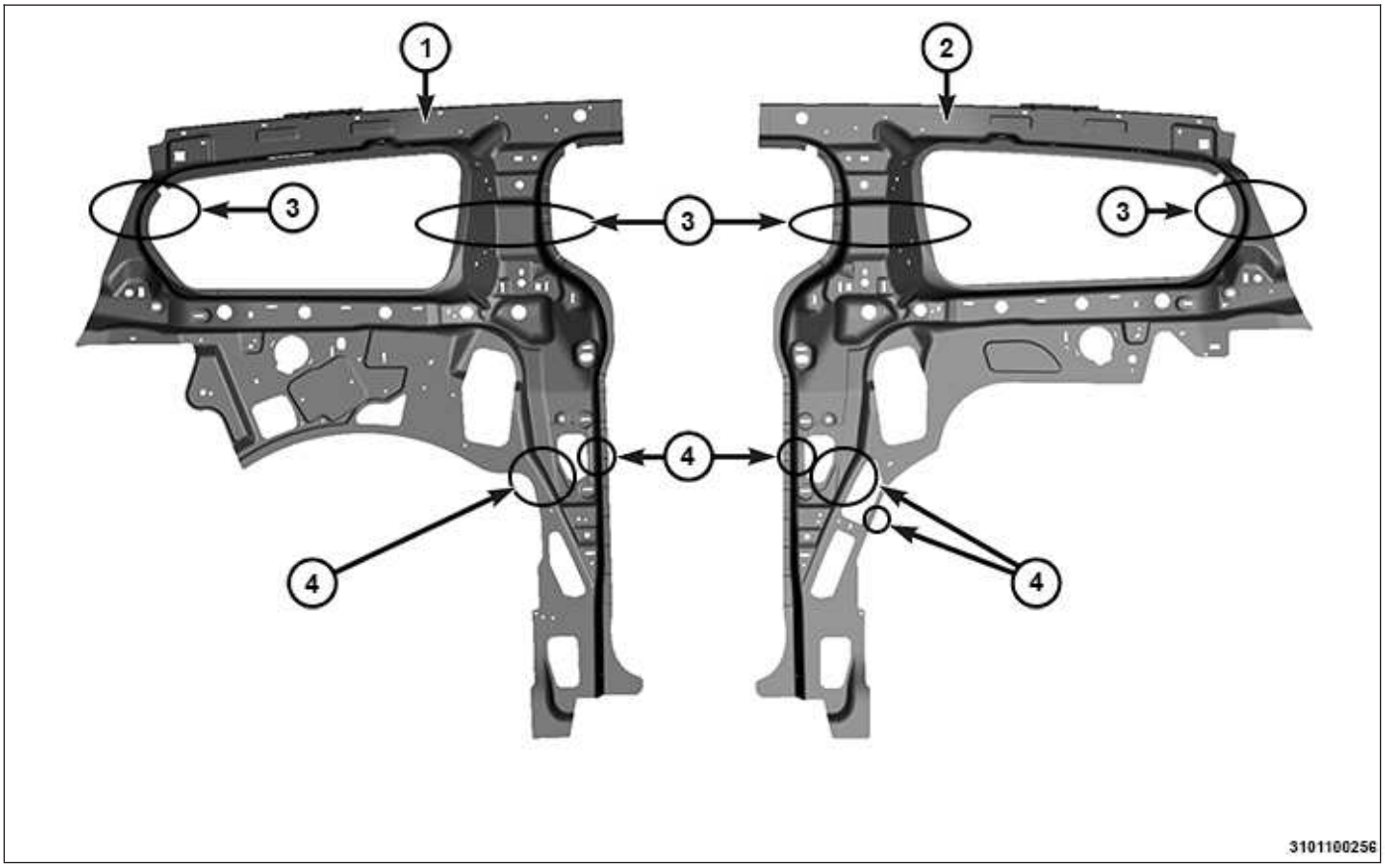
VERY HIGH STRENGTH STEEL (VHS) REINFORCEMENTS AND PANELS — DO NOT SECTION

1- A-pillar Inner Panel (1300 MPa)
2- Bodyside Front Door Ring Reinforcement (1300 MPa)
3- T-bone Roof Side Rail Inner Panel (1300 MPa)
4- Sliding Door Track Upper Reinforcement (780 MPa)
5- C-pillar Outer Upper Reinforcement (690 MPa)
6- Sill Outer Rear Reinforcement (780 MPa)
7- Sill Outer Front Reinforcement (1300 MPa)

Due to the usage of VHS on the inner components and reinforcements sectioning of these parts are not allowed. Complete replacement of the component or reinforcement is the only acceptable repair.

It will be necessary to use a **Tungsten Carbide Drill Bit** to release the spot welds along the areas where these parts join other components.

Inner Quarter Panel



Inner Quarter Panels

1 - Right Inner Quarter Panel (270 MPa)
2 - Left Inner Quarter Panel (270 MPa)
3 - Upper Sectioning Location (Secondary)
4 - Lower Sectioning Location (Primary)

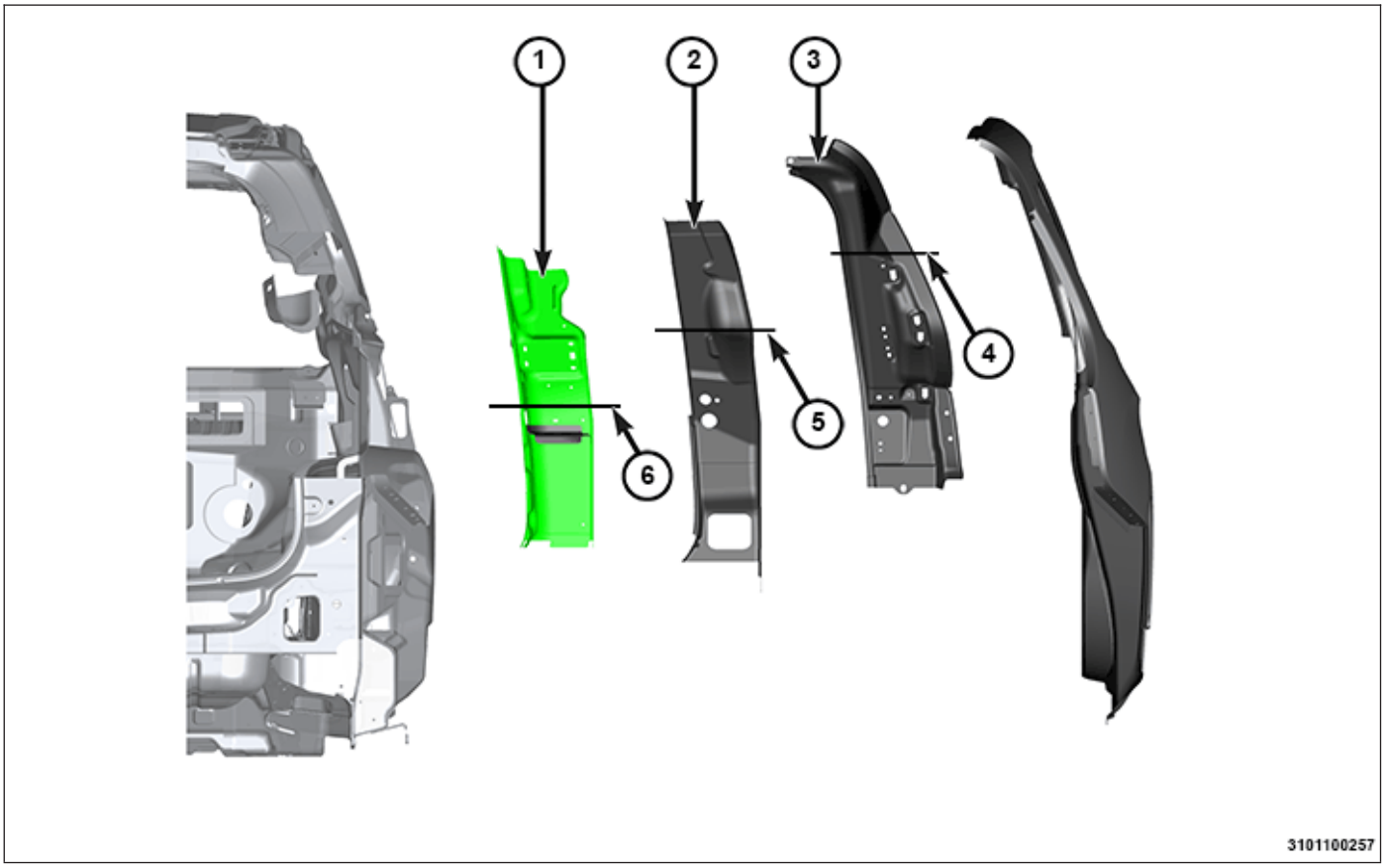
Outlined areas represent general sectioning areas within.

Sectioning along the lower portions (4) is the preferred locations. When damage extent makes it necessary, section in the upper secondary locations (3).

NOTE: To prevent warping, apply 25 mm. (1 in.) stitch welds until the sectioning joint is completely welded.

The inner quarter panel is to be sectioned using modified lap joints. Further information on “Modified Lap Joints“ can be found in the “Welding and Weld Bonding” section (Refer to Collision Information/Standard Procedure/Welding and Weld Bonding).

Liftgate Trough And D-Pillar Reinforcements



Drain Trough and D-pillar

NOTE: Right side shown, left side similar.

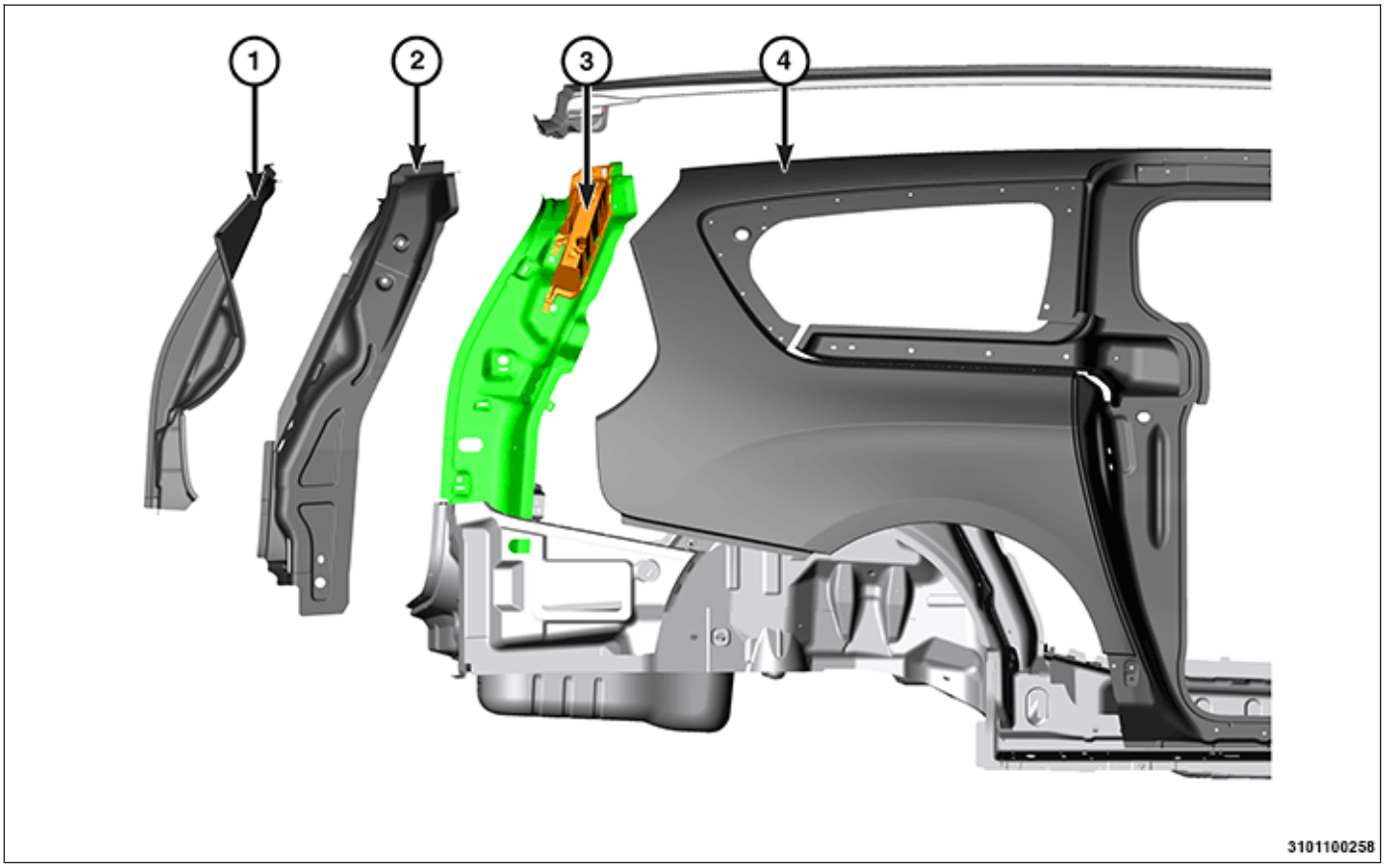
1- Inner D-pillar Reinforcement (590 MPa)
2- Outer D-pillar Reinforcement (270 MPa)
3- Liftgate Drain Trough (270 MPa)
4- Inner d-pillar Sectioning Location
5- Outer D-pillar Sectioning Location
6- Liftgate Drain Trough Sectioning Location

Lower damage to the liftgate opening and access to the to sill components are the most common need for sectioning in these areas. Sectioning in these areas will allow for partial replacement without disturbing unnecessary components

NOTE: To prevent warping, apply 25 mm. (1 in.) stitch welds until the sectioning joint is completely welded.

When sectioning these areas a “Modified lap joint” is to be used. Further information on “Modified Lap Joints “ can be found in the “Welding and Weld Bonding” section (Refer to Collision Information/Standard Procedure/Welding and Weld Bonding).

Roof D-pillar Composite Reinforcement



Composite Reinforcement

1- Drain Trough Panel
2- D-pillar Outer Reinforcement
3- D-pillar Composite Reinforcement
4- Outer Bodyside Aperture Panel

WARNING: Composite Reinforcements must be installed to maintain roof strength standards

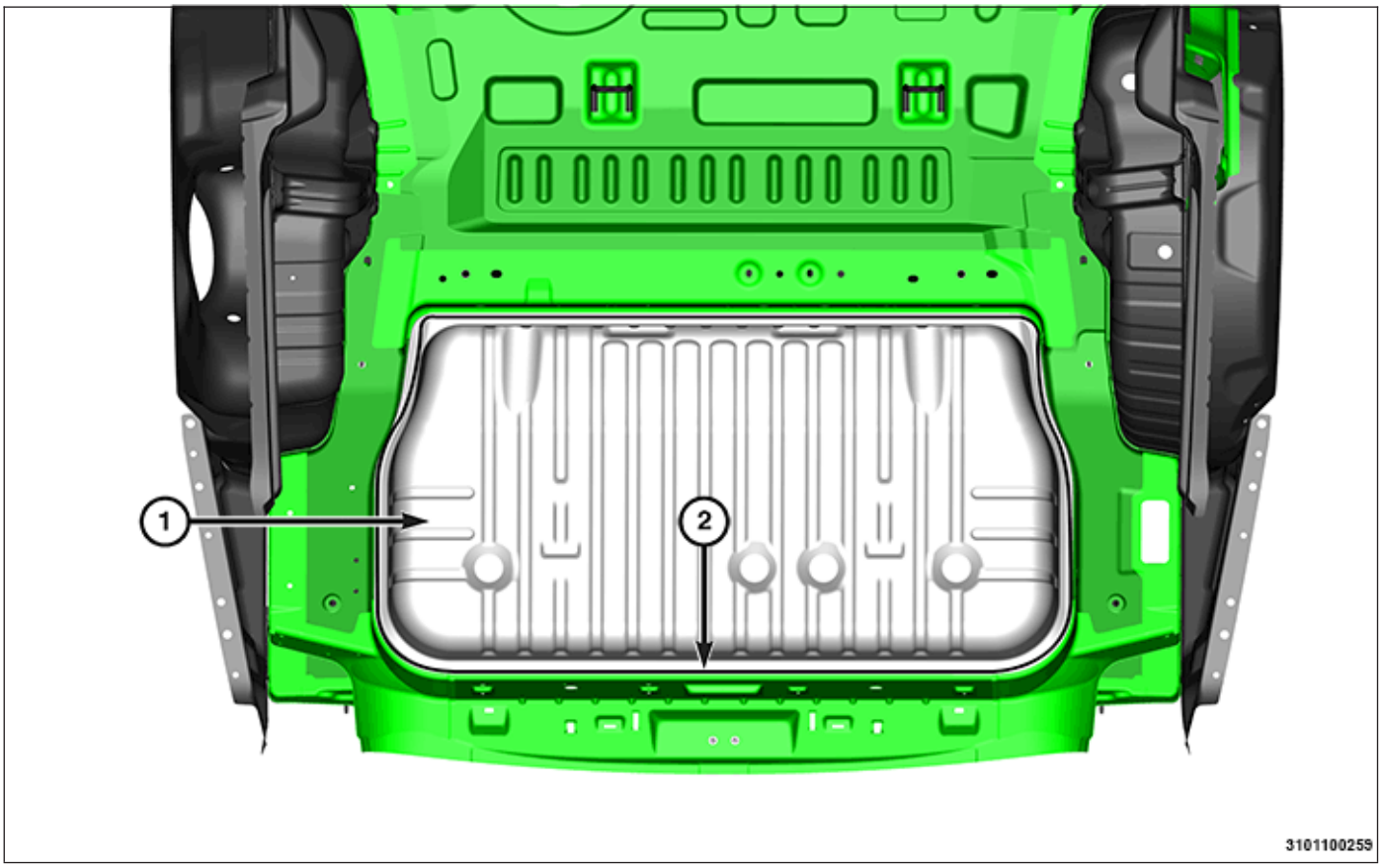
WARNING: Failure to follow these directions may result in serious or fatal injury

If the D-pillar composite reinforcement (3) or any component that makes contact with the reinforcement is replaced it will need to be secured. **Composite Reinforcements absolutely must be reinstalled**.

Replace the new or the re-used undamaged, D-pillar composite reinforcement with structural adhesive during the repair process. Approved structural adhesive include LORD Fusor 112B and 3M 08116.

When mounting the D-pillar composite reinforcement (3) align the front alignment tab with the corresponding hole in the D-pillar inner upper reinforcement.

Third Row Seat Tub

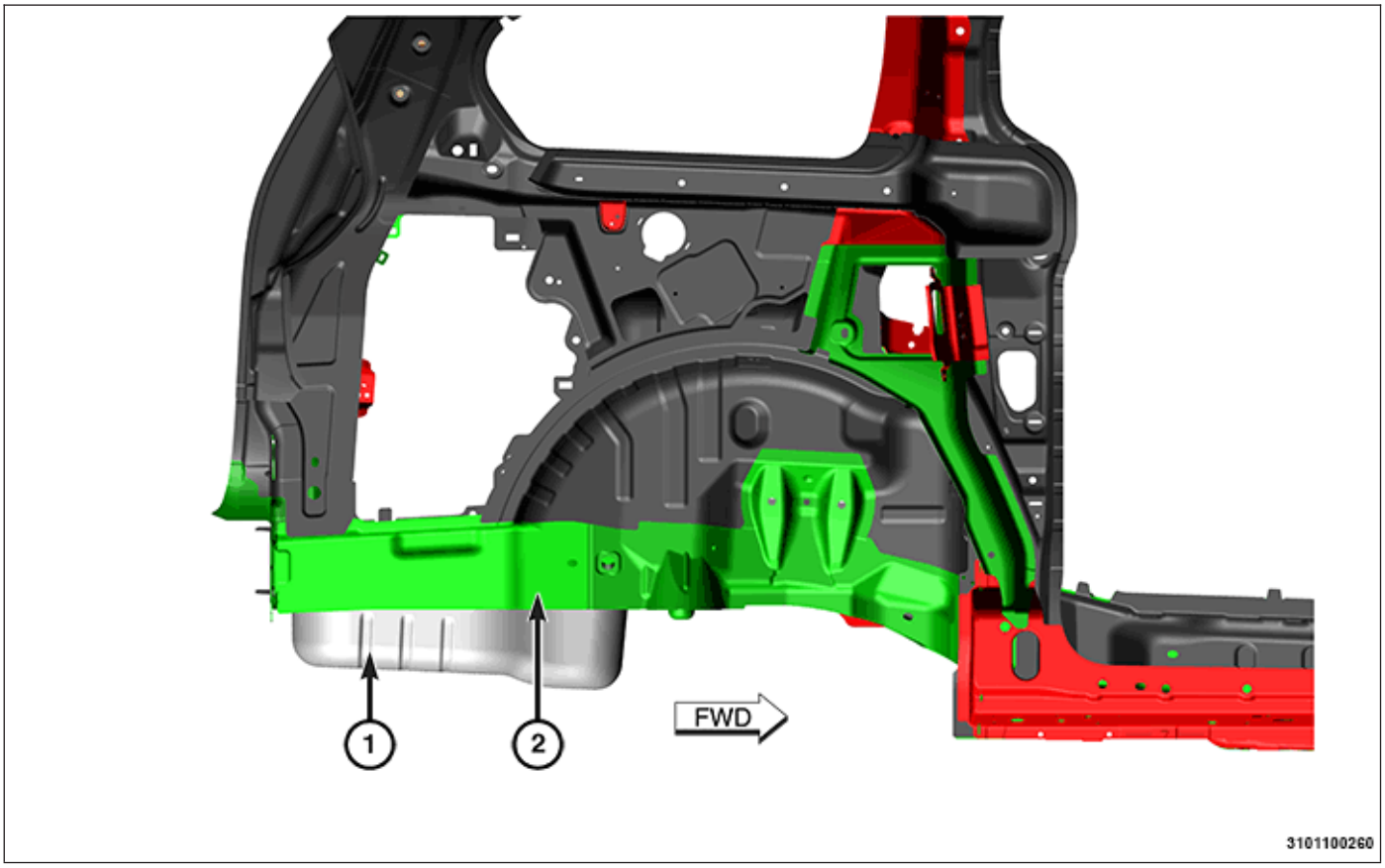


Third Row Seat Tub

1 - Third Row Seat Tub (270 MPa)
2 - Urethane Adhesive

NOTE: The Third row seat tub is attached with a bead of windshield grade urethane around the entire perimeter.

Rear Rail



Rear Rail Cover

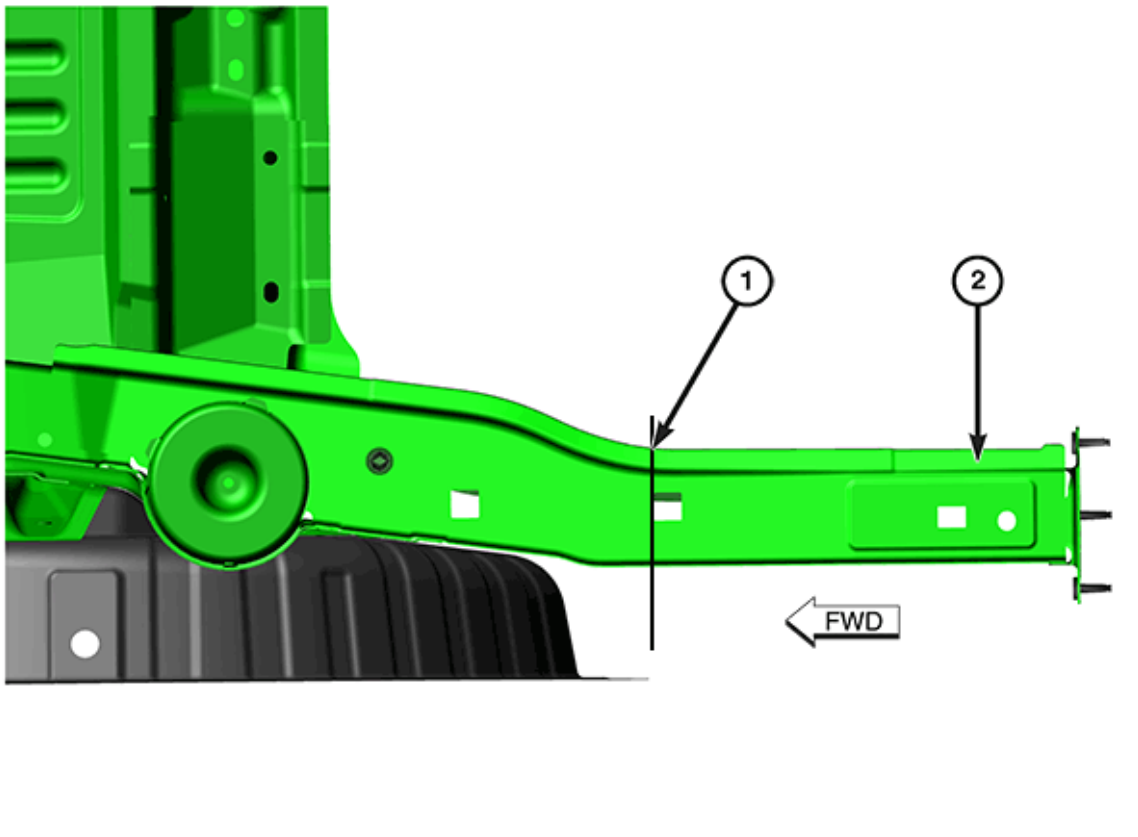
NOTE: Right side shown, left side similar.

1 - Third Row Seat Tub (270 MPa)
2 - Rear Rail Cover (590 MPa)

WARNING: Sectioning of components may only be performed in the described areas if damage to component does not extend past sectioning location. Should damage extend past sectioning location entire component replacement is the only acceptable repair

WARNING: Failure to follow these directions may result in serious or fatal injury

Remove the 3rd row seat tub assembly (1) and the rear rail cover (2).



Rear Rail Lower Closeout

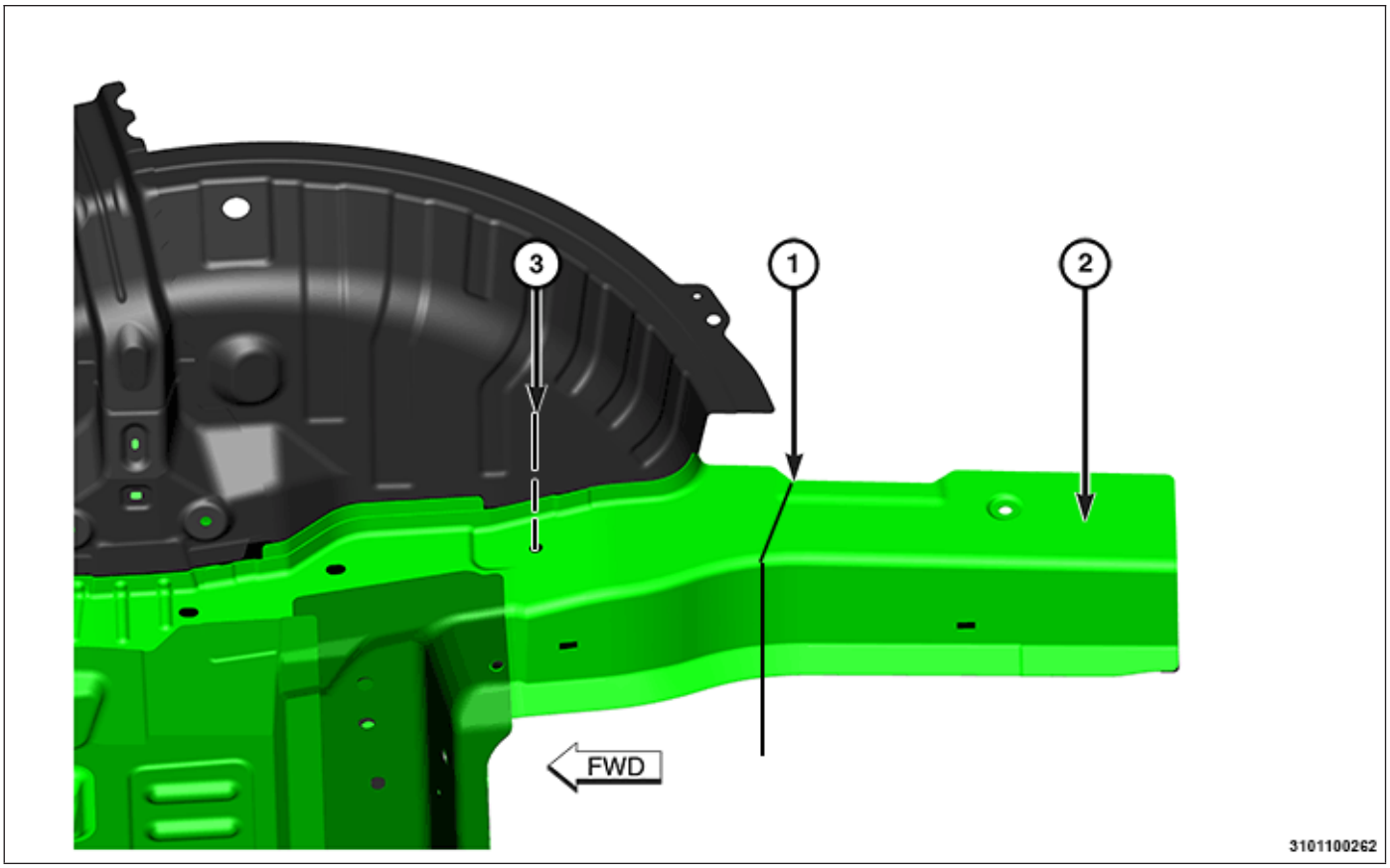
NOTE: Right side shown, left side similar.

1 - Rear Rail Lower Closeout Cut Line
2 - Rear Rail Lower Closeout (590 MPa)

CAUTION: To prevent damage to the Inner Reinforcement , extreme care must be taken while cutting the rail.

NOTE: It will be necessary to order the complete rear rail and create the sectioning portions at the same cut lines.

The rear rail lower closeout (2) sectioning cut line (1) is located at the forward edge of the square Principle Location Point (PLP).



NOTE: **Right side shown, left side similar.**

1 - Rear Rail Cut Line
2 - Rear Rail (590 MPa)
3 - Third Row Seat Belt Anchor Bolt Hole

CAUTION: **To prevent damage to the Inner Reinforcement , extreme care must be taken while cutting the rail.**

NOTE: **It will be necessary to order the complete rear rail and create the sectioning portions at the same cut lines.**

The rear rail (2) sectioning cut line (1) is located 231 mm (9 in.) rearward of the center of the 3rd row seat belt anchor fastener hole (3).

NOTE: **To prevent warping, apply 25 mm. (1 in.) stitch welds until the sectioning joint is completely welded.**

A butt-joint with a 13 mm (0.5 in) weld backer is to be used.

CORROSION PROTECTION

Corrosion Protection Restoration

"Corrosion protection" encompasses all the materials and coatings which protect a vehicle from corrosion and include:

- Coated steels
- E-coat primer on the complete body
- Body sealing to eliminate water and air intrusion where panels join
- Structural adhesives in some joints
- Chip resistant primer applications on the entire body
- Paint application
- Underbody corrosion protection
- Inner panel corrosion protection added to repair areas

Corrosion protection must be restored during a repair anytime it may have been compromised. All areas that have been subjected to structural pulls, clamping, straightening, welding, or any other any other operation that may have imparted damage to the corrosion protection system will need to be addressed.

In the repair process corrosion protection is addressed in three phases: pre-refinish, refinish and post-refinish.

Pre-refinish

In the pre-finish phase, structural adhesives, seam sealers and other applied coatings are installed. Sheet metal seams are sealed to prevent water intrusion into the "dry" areas of the vehicle, such as passenger compartment, and also to prevent intrusions of contaminates, such as water and road salt, into seams causing corrosion. Lap joints, hem flanges, and any panel mating locations need to be addressed during the repair and treated to duplicate the original vehicle build.

All bare metal should be epoxy primed prior to applying seam sealer, following the refinish material provider's instructions for doing so, unless the manufacture of the sealer specifically states otherwise.

When working around pinch weld flanges, seam sealer should be installed to duplicate the original appearance and function. If it is unclear whether the original sealing material **between** the flanges is strictly a sealer or structural adhesive, always default to a structural adhesive such as LORD Fusor 2098, LORD Fusor 112B, or 3M 08116. For additional information related to weld-bonding and welding around adhesives and sealers, (Refer to 31 - Collision Information - Standard Procedure).

Roof and closure panels will require the use of anti-flutter foam. Where inner panel supports meet external panels, the proper replacement materials in these areas are Mopar part No. 04864015AB, or equivalent, or LORD Fusor 121, or 3M 04274 Noise Vibration Harshness (NVH) dampening material.

Any disturbed or removed NVH foam needs to be replaced. Use Mopar part No. 05142864AA, LORD Fusor 130, or 3M 8463.

All hem flanges on closure panels should be sealed whether sealer is apparent or not. This includes those disturbed during the repair, and those on new replacement panels. Either duplicate the existing bead in shape or size, or where one is not obvious, seal the hem flange in a discrete fashion. Hem flanges should be sealed using Mopar part No.04318026, LORD Fusor 129, or 3M 08308.

Lap joints, such as in floor pans, should be sealed to duplicate the sealer visible, but also addressed on any exterior surface by sealing the lap wether visible or not.

NOTE: FCA US LLC does not recommend the use of any type of ″weld-thru″ primer during repairs. Weld-bonding with corrosion protecting adhesives or sealers, along with final application of inner panel corrosion protection is the proper method.

Refinish

All painted surfaces should be coated using a FCA US LLC approved refinish material. The refinish process includes application of undercoats, primers (filler & sealer), basecoats and clearcoat. These approved materials have been tested to the same material standards as the production materials.

Post-refinish

All new panels, and repair areas, must have inner panel corrosion protection applied after the painting operation is complete, but before all the trim is reinstalled. Mopar Cavity Wax No. 68042970AA, or 3M Rustfighter

#08891 should be applied to all interior cavities, weld flanges, hem flanges as well as any are affected by the repair especially where any type of welding was performed. Inner panel corrosion protection should be applied using "pressure pot" equipment with wands which provide 360-degree material coverage for closed cavities, and directional spray wands for visible coverage (Mopar kit #04271235). Additionally, the corrosion protecting material must be applied in two coats with a minimum 30-minute flash time between applications.

Wheel wells and underbody panels which have been involved in the repair process should also have a final undercoating applied. Use Mopar No. 05093417AA, or equivalent, and apply with "pressure pot" style application equipment.

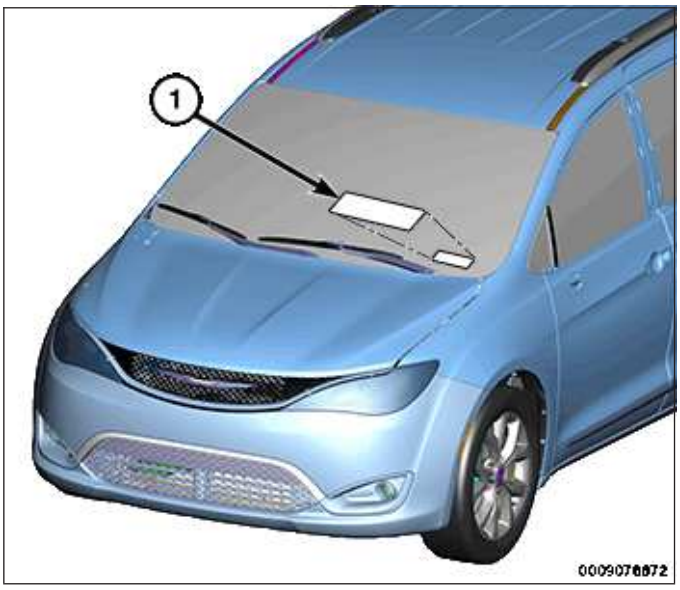
Following this arrangement, choice of materials, and proper application, the repaired vehicle should be as well protected against corrosion as it was prior to the repair.

Specifications

VEHICLE IDENTIFICATION NUMBER

The Vehicle Identification Number (VIN) can be viewed through the windshield at the upper left corner (1) of the instrument panel, near the left windshield pillar. The VIN consists of 17 characters in a combination of letters and numbers that provide specific information about the vehicle. Refer to the vehicle identification number decoding charts below, for decoding information.

To protect the consumer from theft and possible fraud the manufacturer is required to include a Check Digit at the ninth position of the vehicle identification number. The check digit is used by the manufacturer and government agencies to verify the authenticity of the vehicle and official documentation. The formula to use the check digit is not released to the general public.



VEHICLE IDENTIFICATION INFORMATION	DECODING CHARTS
2017 CHRYSLER PACIFICA	2017 VIN DECODING INFORMATION

2017 VIN DECODING INFORMATION

POSITIONS 1 - 3: WORLD MANUFACTURER IDENTIFIER

1	2	3	Manufacturer	Vehicle Type
2	C	4	FCA Canada Inc	MPV

POSITION 4: BRAKE SYSTEM & GVWR

Brake System	GVWR Range		Active Belts, Air Bags	Active Belts, Air Bags, Side Bags-Front Row	Active Belts, Air Bags, Side Bags-All Rows
	Pounds	Kilograms			
Hydraulic	6001 - 7000	(2722 - 3175 KG)	—	—	R

Positions 5 - 7:

Define the following: brand, marketing name, drive wheels, cab/body type, drive position, and price series.

Chrysler Pacifica (RU) MPV

FWD			BODY TYPE	POSITION	SERIES
C	1	B	Extended Wagon	Left Hand Drive	Touring L
C	1	C			LX
C	1	D			Touring
C	1	E			Touring L Plus
C	1	F			Limited
C	1	G			Limited Platinum
C	1	H			Hybrid Touring
C	1	J			Limited Platinum Hybrid

POSITION 8: ENGINE

Code	Displacement	Cylinders	Fuel	Turbo	Sales Codes
7	3.6 Liter	6	PHEV Hybrid	No	EH3
G	3.6 Liter	6	Gasoline	No	ERC, ERF

POSITION 9: CHECK DIGIT

0 through 9 or X

POSITION 10: MODEL YEAR

H = 2017

POSITION 11: ASSEMBLY PLANT

Code	Plant
R	Windsor Assembly

POSITION 12 - 17: PLANT SEQUENCE NUMBER

A six digit number assigned by assembly plant.

STANDARDIZED STEEL IDENTIFICATION

In an effort to reduce confusion over the large number of steel grades in use, and the repairability and weldability concerns involved with each, FCA US LLC has instituted new nomenclature which is applicable to material call-outs and Body In White (BIW) views released for use in the repair industry.

All materials listed in the key may not be used on a given model, nor may every panel be identified in the blow-up (ex: some groups do not show fascias).

WARNING: FCA US LLC engineering's position on the use of heat during collision repair is as follows:

- **Any body panel or frame component damaged which is to be repaired and reused, must be repaired using the "cold straightening" method. No heat may be used during the straightening process.**
- **During rough straightening prior to panel replacement, damaged panels or frame components may be heated to assist in body/frame realignment. The application of heat must be constrained to the parts which will be replaced and not allowed to affect any other components.**

This "no heat" recommendation is due to the extensive use of advanced high strength steels in FCA US LLC products. High-strength materials can be substantially and negatively affected from heat input which will not be obviously known to the repairer or consumer.

Ignoring these recommendations may lead to serious compromises in the ability to protect occupants in a future collision event, reduce the engineered qualities and attributes, or decrease the durability and reliability of the vehicle.

This statement supersedes any previously released information by the FCA US LLC.

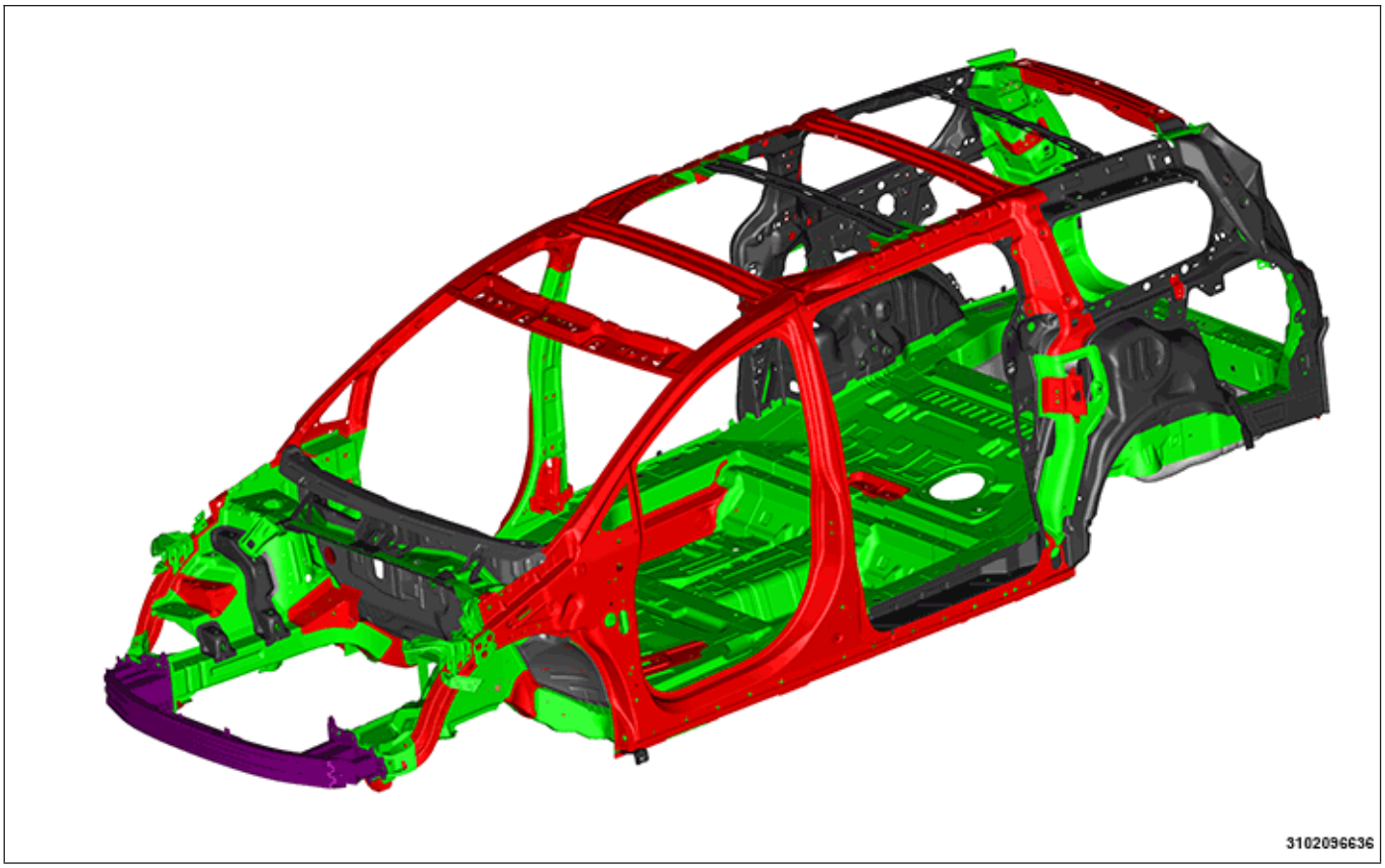
Failure to follow these instructions may result in serious or fatal injury.

Information on sectioning of components will be identified in **Non-Structural Sheet Metal Repair, Weld / Weld Bonding and Sectioning Procedures**, (Refer to Collision Information - Standard Procedure).

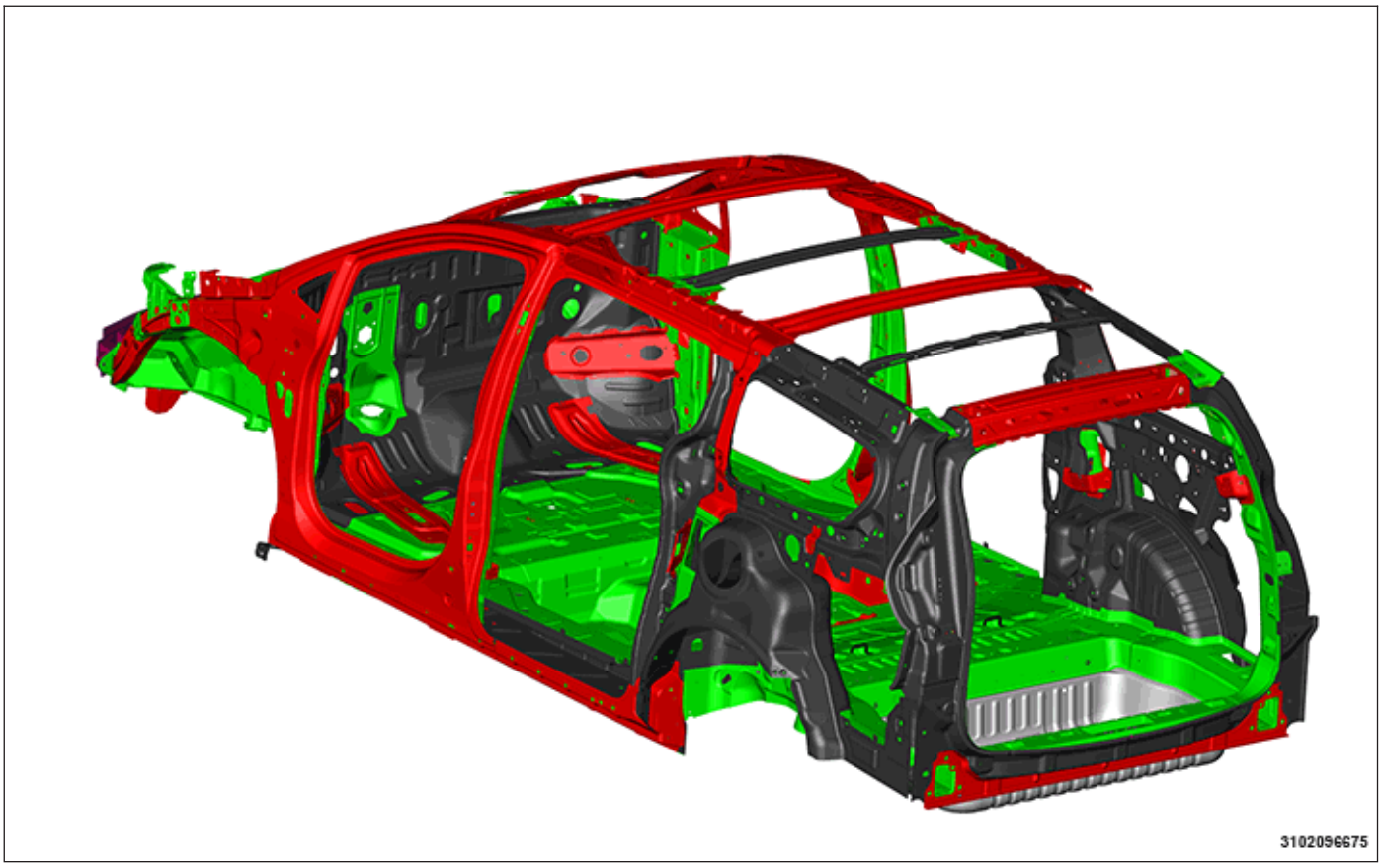
NOTE: Corrosion protection must be restored after repair.

COLOR KEY	DESCRIPTION	COLOR
LS	Low-Strength Steel	Dark Grey
HS	High-Strength Steel	Green
VHS	Very High-Strength Steel	Red
LM	Laminated Steel	Light Grey
AL	Sheet Aluminum	Purple
MG	Magnesium	Brown
PL	Plastic	Light Blue
PL-R	Fiber Reinforced Plastic	Dark Blue
CO	Composite Material	Orange

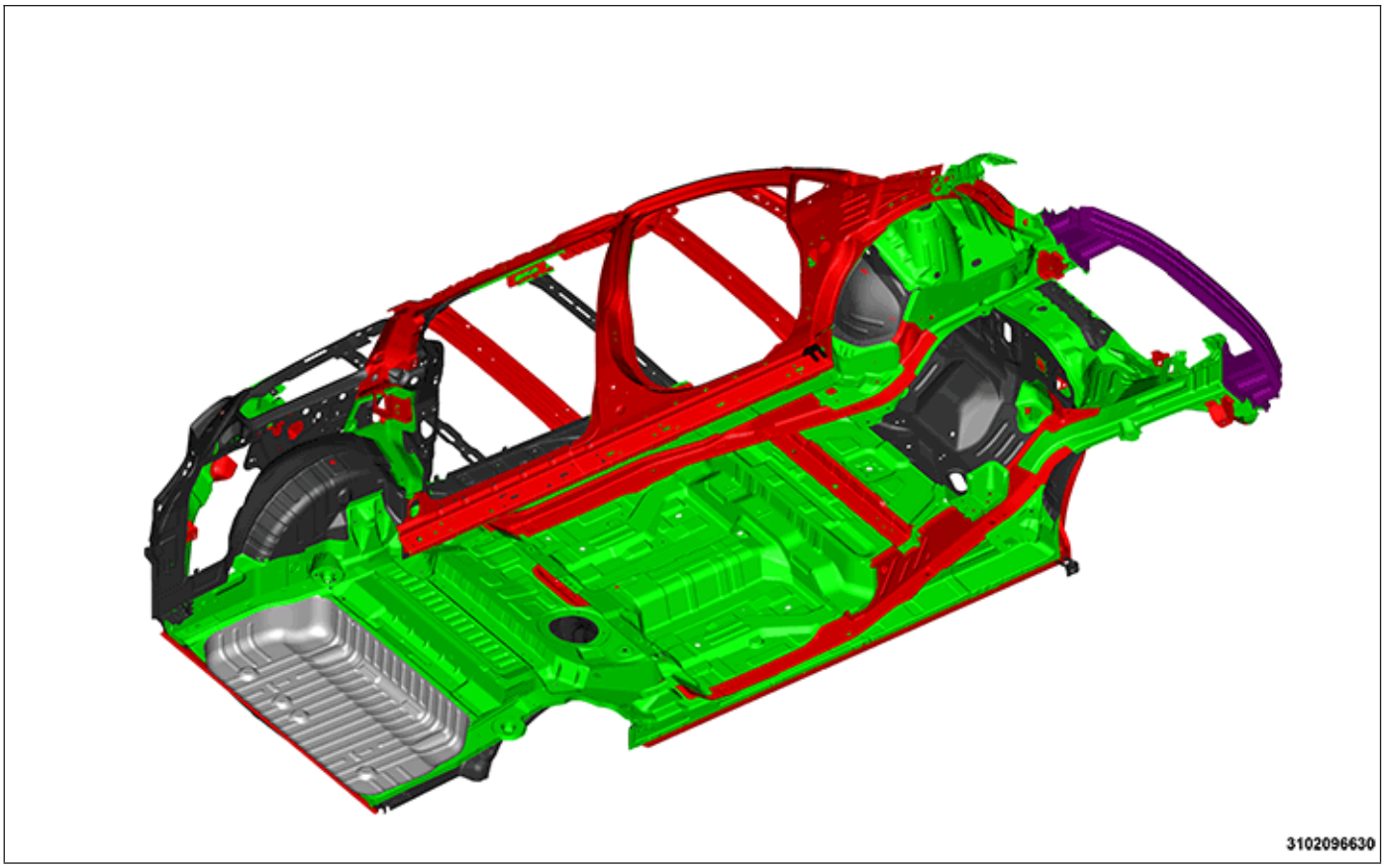
- **LS** - Good repairability and weldability (least sensitive to heat). May be attached using the preferred Squeeze Type Resistance Spot Welding (STRSW) process, weld bonding where appropriate, or MIG welding. Materials have a tensile strength of less than 270 MPa.
- **HS** - Some repairability and good weldability (the higher the strength of the steel, the greater the sensitivity to heat). May be attached using STRSW, weld bonding, and MIG welding. Material tensile strength range between 270 MPa and 600 MPa and includes DP590.
- **VHS** - Very limited repairability and weldability (very sensitive to heat). Attach only at OE defined locations using OE defined procedures. Material tensile strengths are greater than 600 MPa. This category includes hot-stamped boron materials which are also termed “press hardened.” Specialized cutters are required with many materials in this group. May be attached using STRSW, weld bonding and Metal Active Gas (MAG) brazing to minimize heat affected zone.
- **LM** - Good repairability but no weldability. May be attached by rivet bonding or urethane. Only install a laminated steel component using urethane if the OE component was installed with urethane.
- **AL** - Stamped aluminum sheet metal panels may be repairable with specialized tools and techniques.
- **MG** - Magnesium - no repairability, replacement components only.
- **PL and PL-R** - Some repairability depending upon the type of plastic involved, the degree of damage, and the component function. Cosmetic components such as fascias (PL) have a higher degree of repair allowed than those components which can carry components and loads. Where PL-R components are bonded to steel structure, FCA US LLC will identify the proper adhesive to attach the replacement panel. Repair materials for PL are commonly available in the collision repair market.
- **CO** - Composite materials may be fiber reinforced (ex: Kevlar) panels or co-molded assemblies of steel and plastic. Any of these require specialized repair materials and processes.



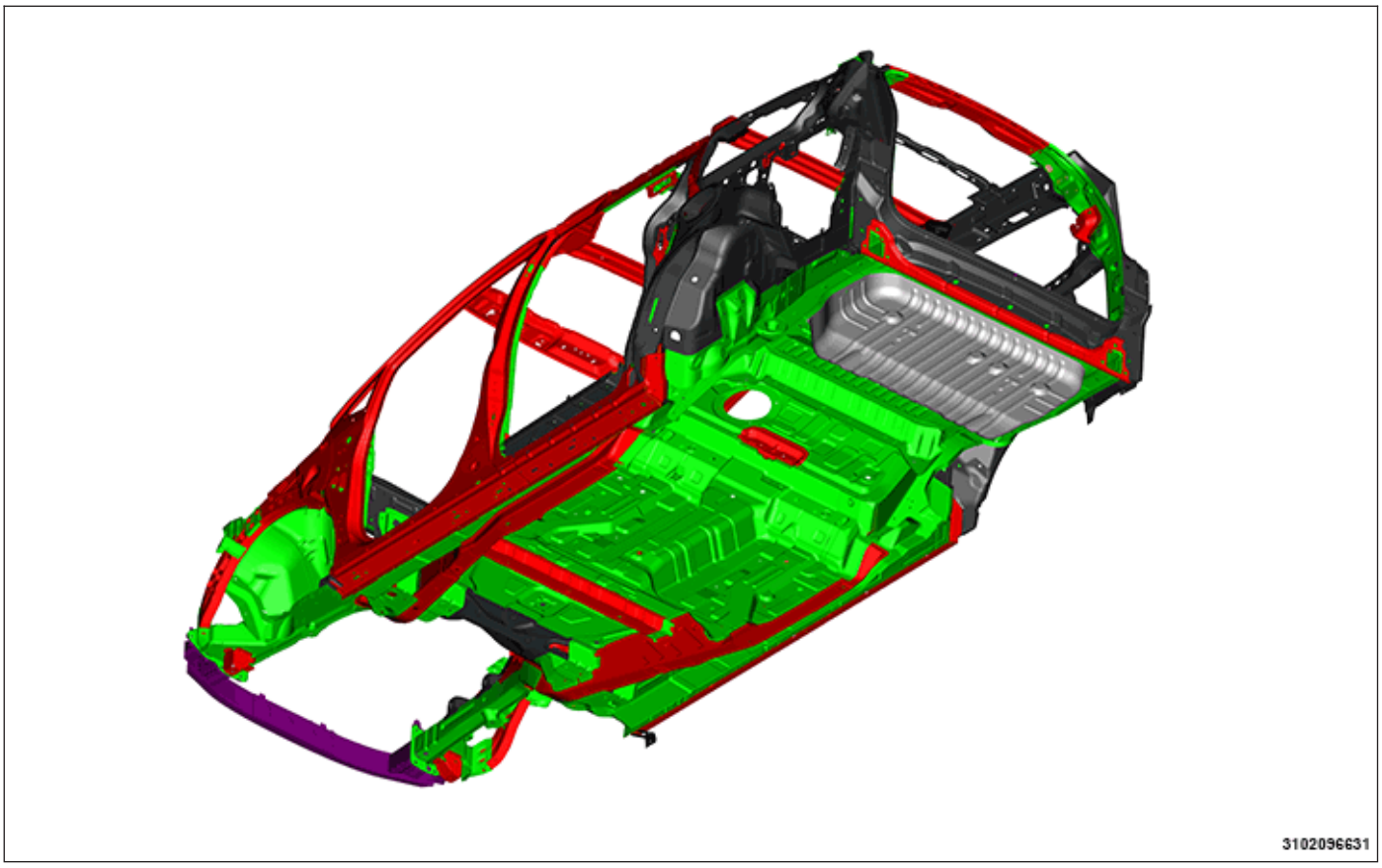
BODY IN WHITE COMPONENT IDENTIFICATION - TOP VIEW FRONT



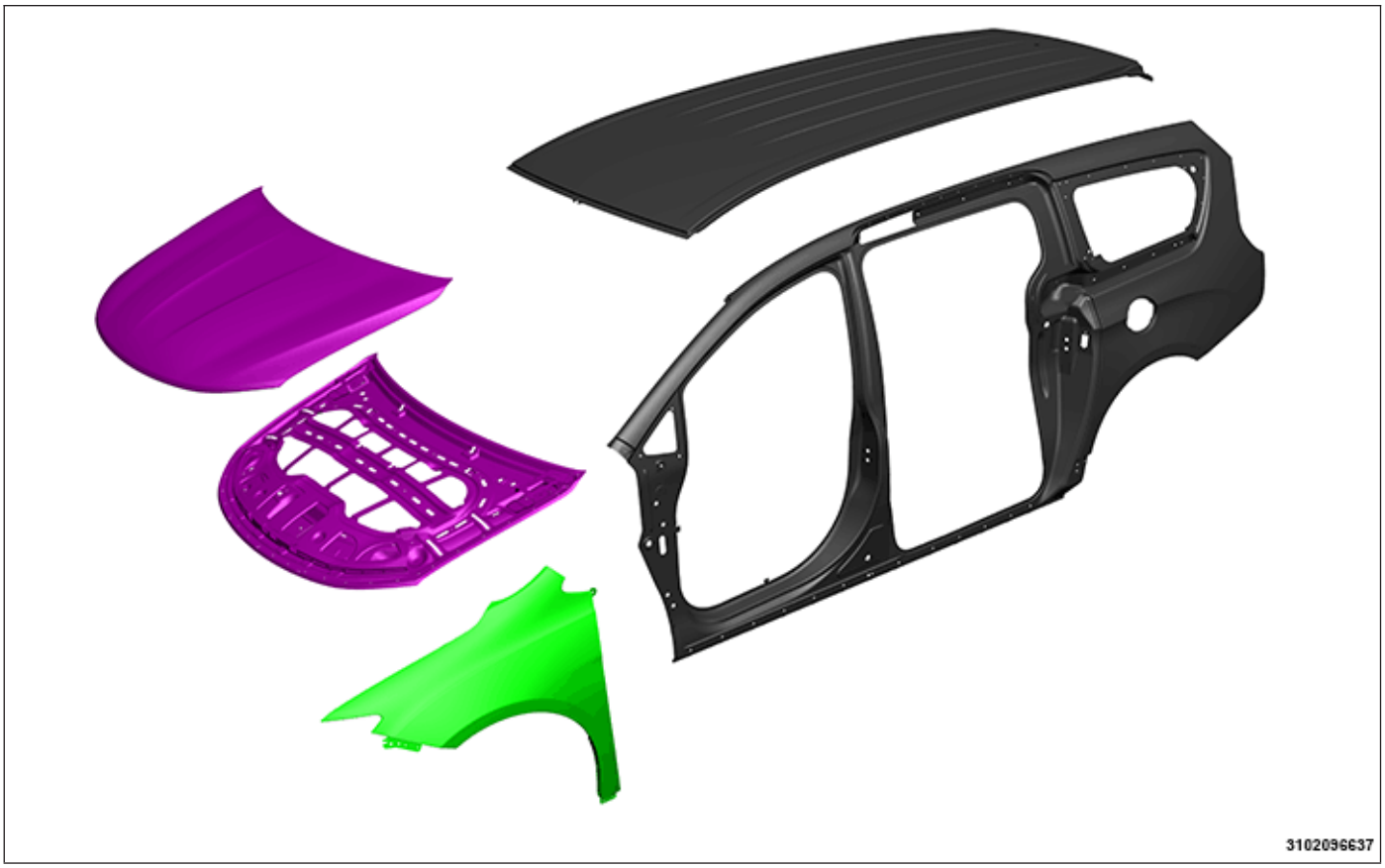
BODY IN WHITE COMPONENT IDENTIFICATION - TOP VIEW REAR



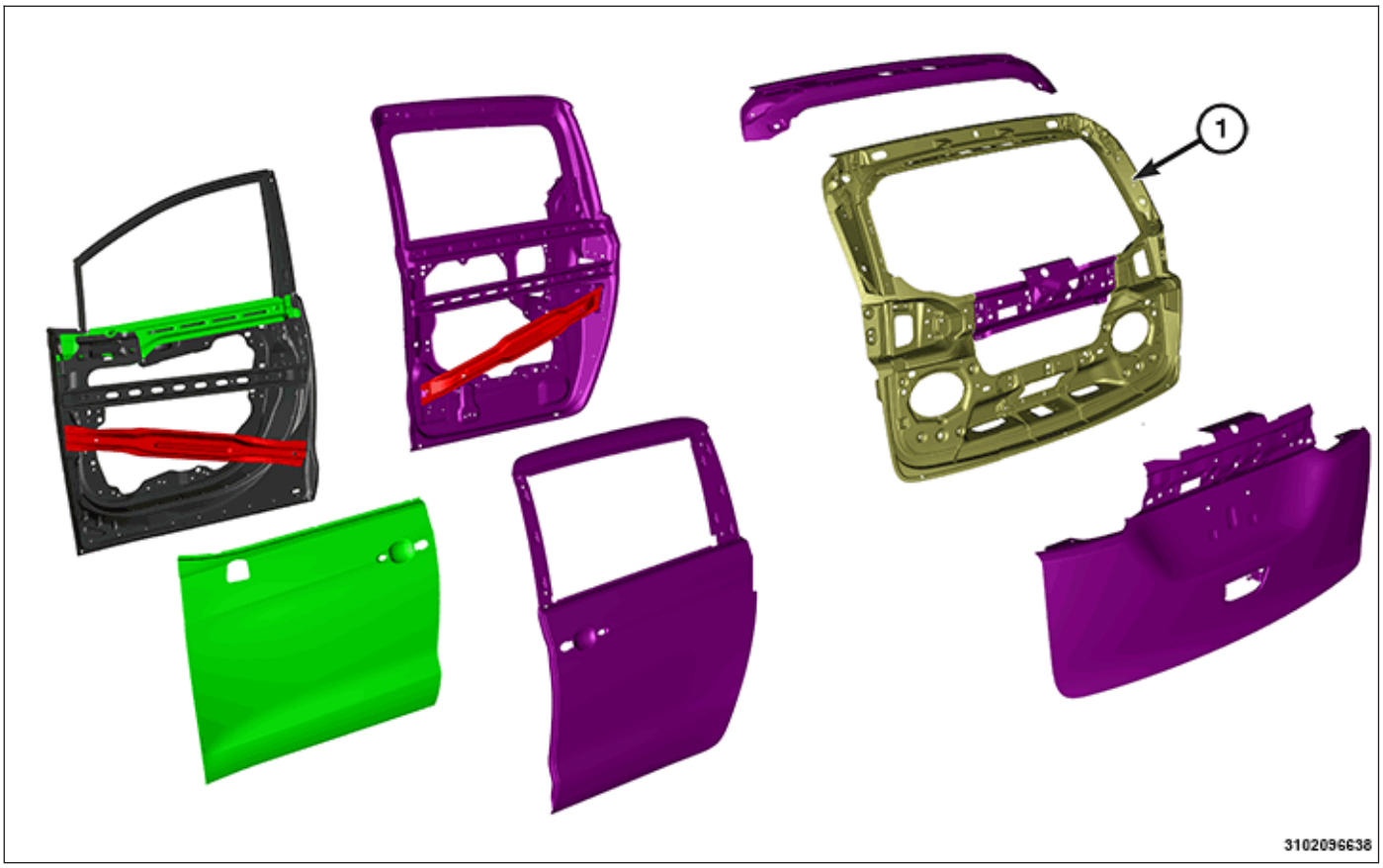
BODY IN WHITE COMPONENT IDENTIFICATION - BOTTOM VIEW FRONT



BODY IN WHITE COMPONENT IDENTIFICATION - BOTTOM VIEW REAR



HOOD, FENDER, ROOF AND OUTER BODY SIDE APERTURE



FRONT DOOR, SLIDING DOOR AND LIFTGATE

WARNING: **There are necessary safety factors to follow when working with components made of magnesium and components made of a combination of materials utilizing magnesium that must be followed.**

- Do not grind on the component. The grinding residue is highly combustible.
- In the event of a fire, a D-class rated fire extinguisher is necessary to extinguish.
- Do not expose the component to open flame or temperature in excess of 260° C. (500° F).

Failure to follow these instructions may cause serious injury or death.

NOTE: **Due to the usage of magnesium, do not attempt to repair the liftgate inner panel (1). For further information refer to Liftgate Inner Panel DO NOT REPAIR (Refer to 31 - Collision/Standard Procedure/Non-Structural Sheet Metal Repair/ Liftgate Inner Panel DO NOT REPAIR).**

NOTE: **The liftgate inner panel (1), shown as magnesium (brown), is a combination of magnesium and aluminum alloys.**

The textured finish of the liftgate inner panel differs from a smooth finish typically found on closure panels.

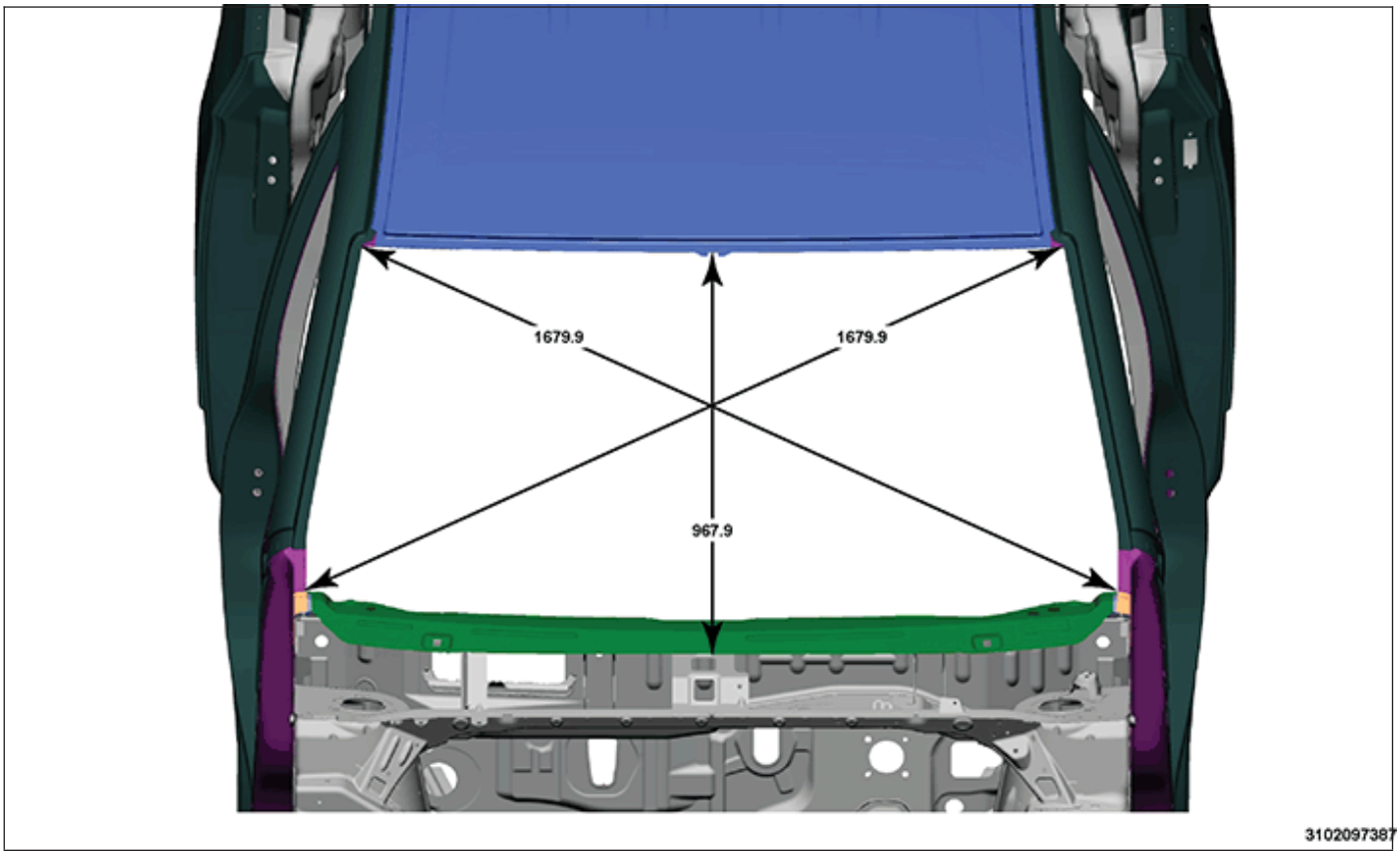
- The texture is produced from the casting of the component as compared to smooth stamped sheet metal.
- This finish is completely normal and acceptable.
- Do not remove the textured finish to produce a smooth finished appearance.

BODY OPENING DIMENSIONS

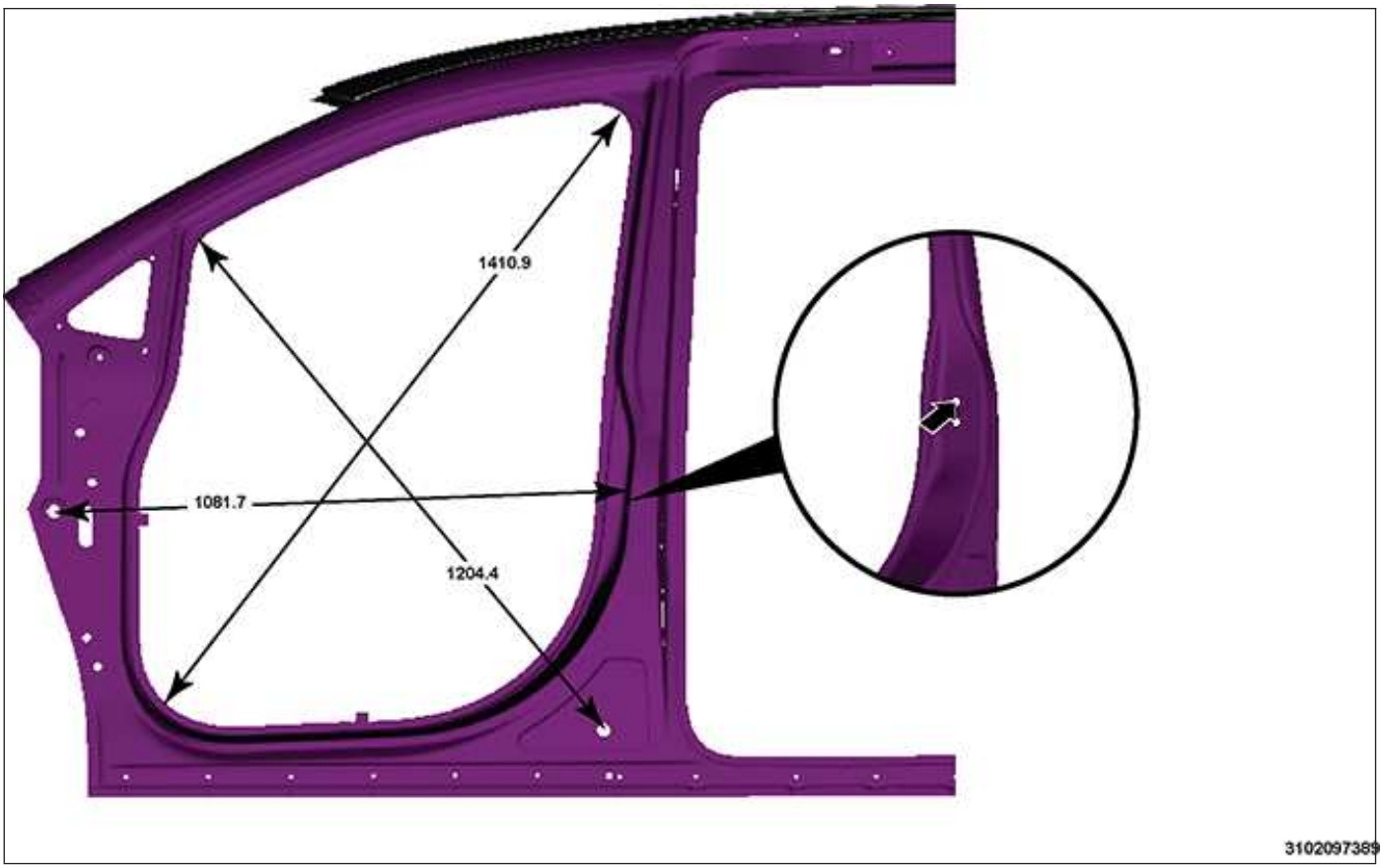
NOTE: Body opening dimensions are listed in metric scale millimeter (mm). Principal Locating Points (PLP), fastener locations, and holes are measured to center, unless noted otherwise.

Position the vehicle on a level work surface. Remove any weatherstrips, door strikers or any other parts that may interfere with the reference point.

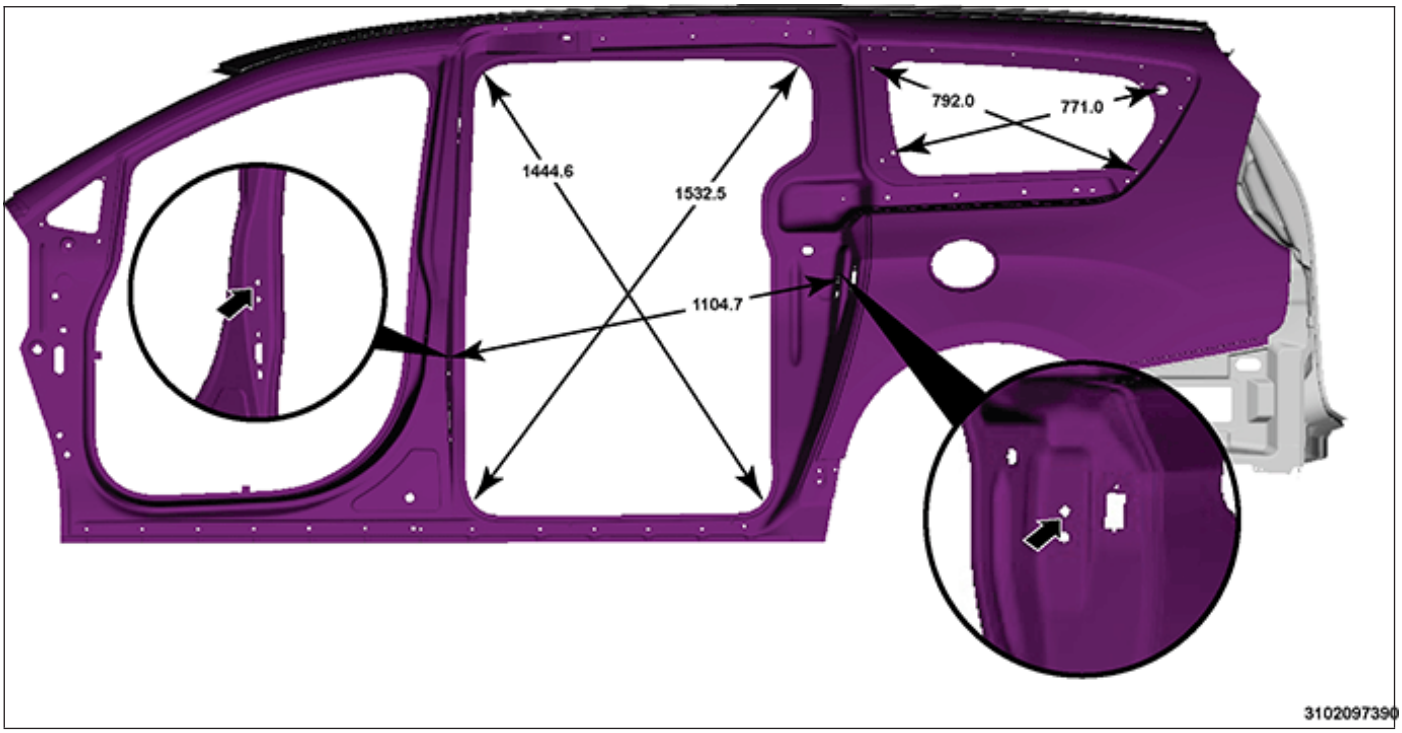
DESCRIPTION	FIGURE
Windshield Opening	Figure 1
Front Door Opening	Figure 2
Sliding Door and Quarter Glass Opening	Figure 3
Liftgate Opening	Figure 4



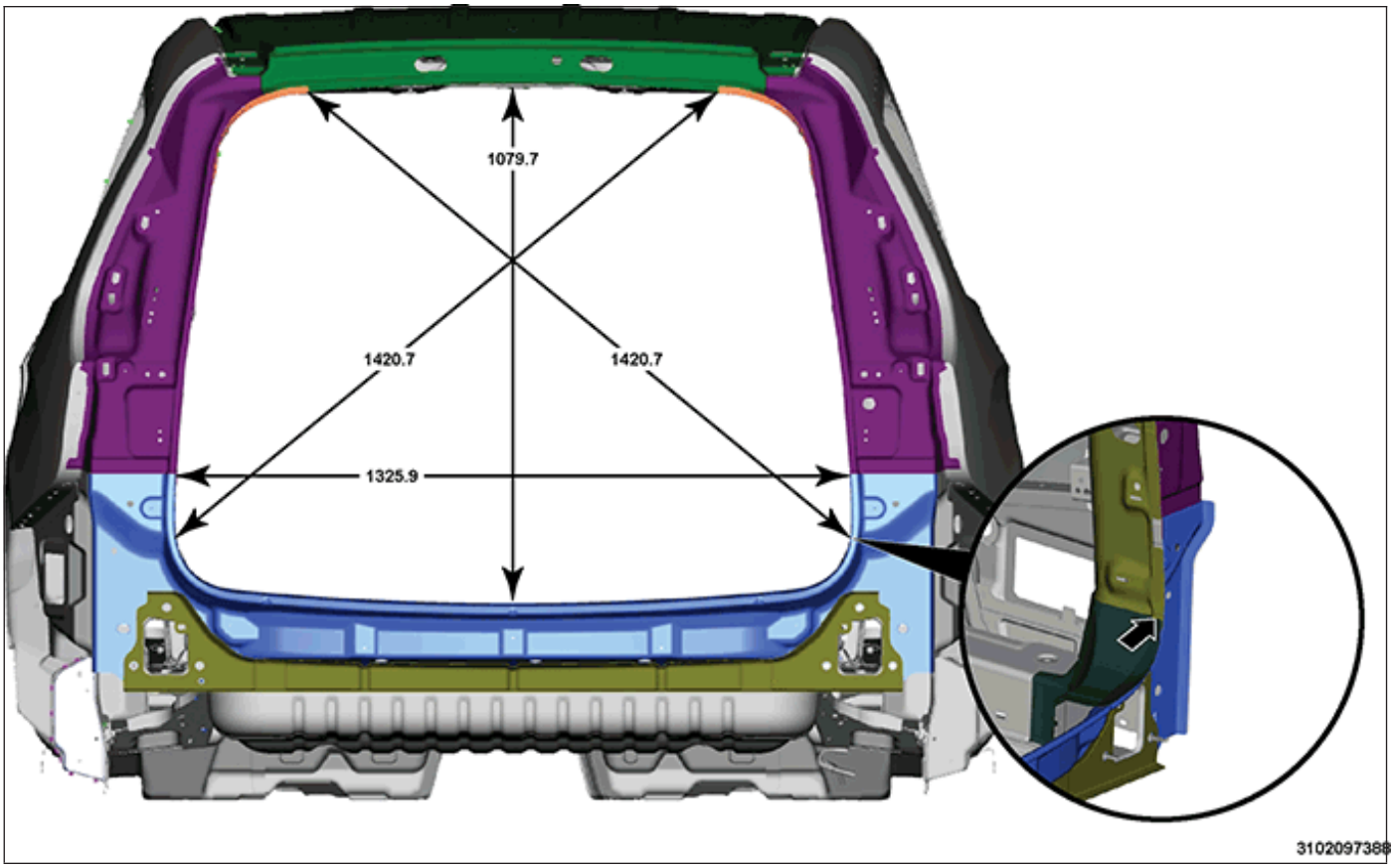
Windshield Opening



Front Door Opening



Sliding Door and Quarter Glass Opening



Liftgate Opening

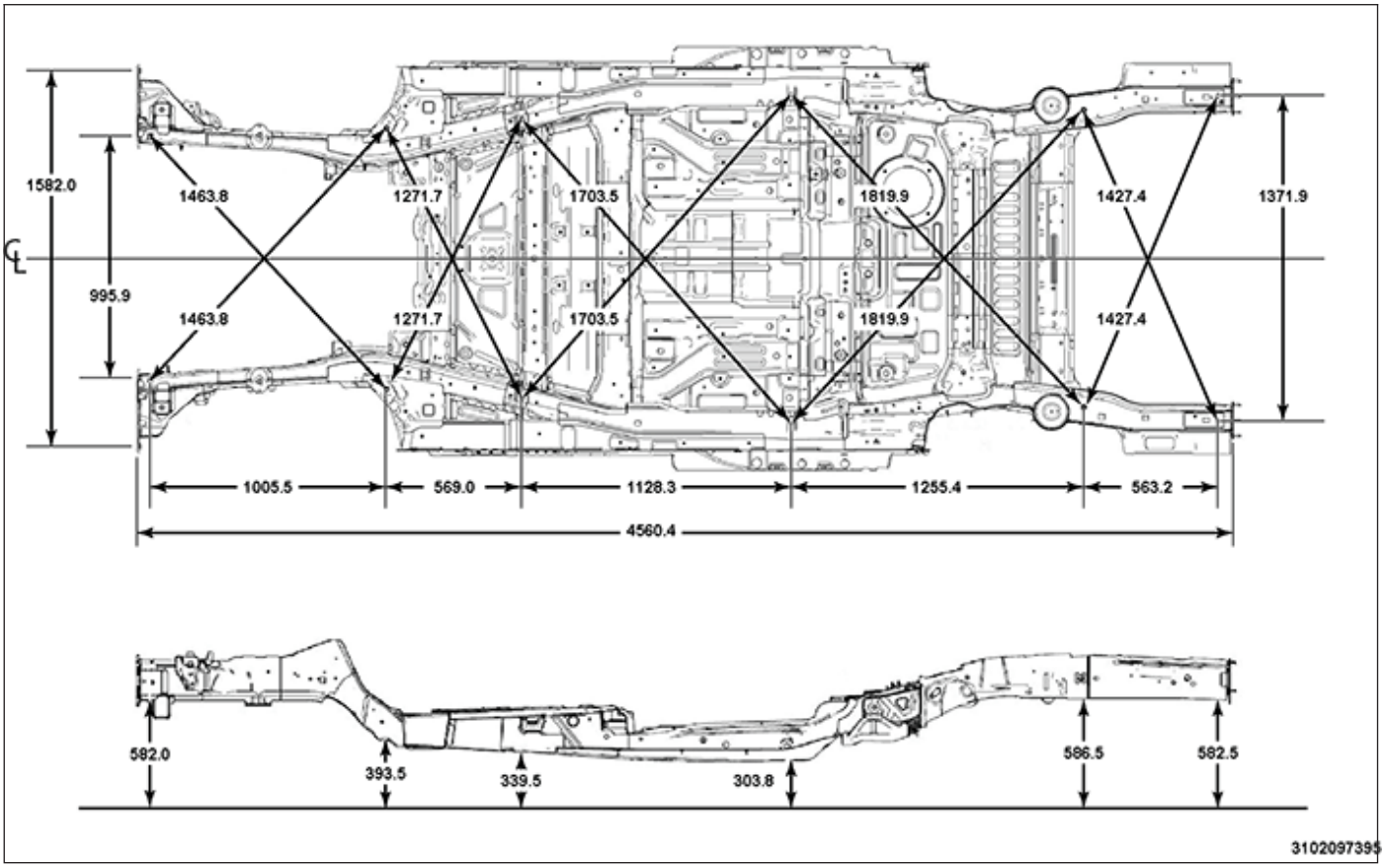
FRAME DIMENSIONS

NOTE: Frame dimensions are listed in metric scale millimeter (mm). All dimensions are from center to center of Principal Locating Point (PLP), or from center to center of PLP and fastener location.

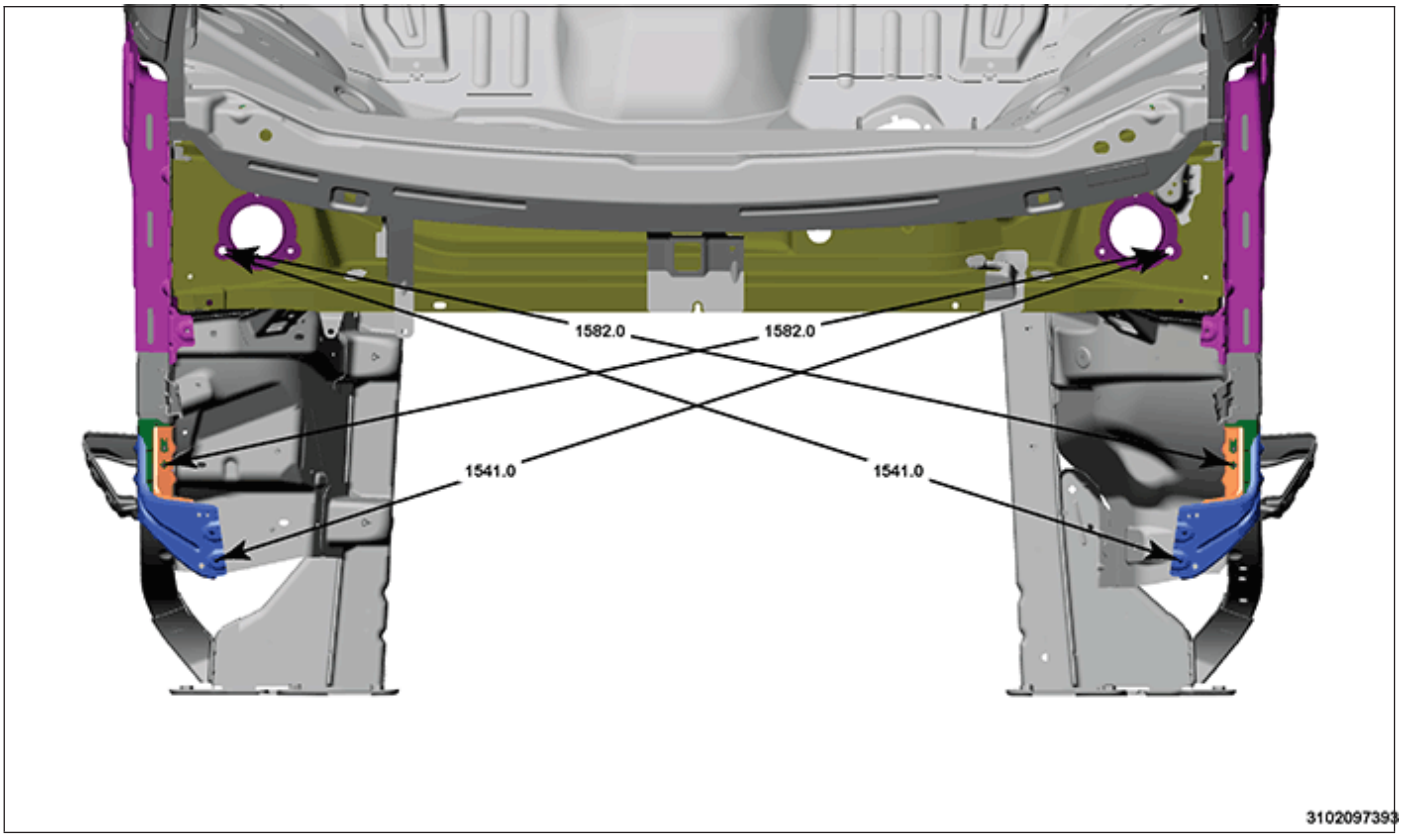
VEHICLE PREPARATION-

Position the vehicle on a level work surface. Using screw or bottle jacks, adjust the vehicle PLP heights to the specified dimension above a level work surface. Vertical dimensions can be taken from the work surface to the locations indicated were applicable.

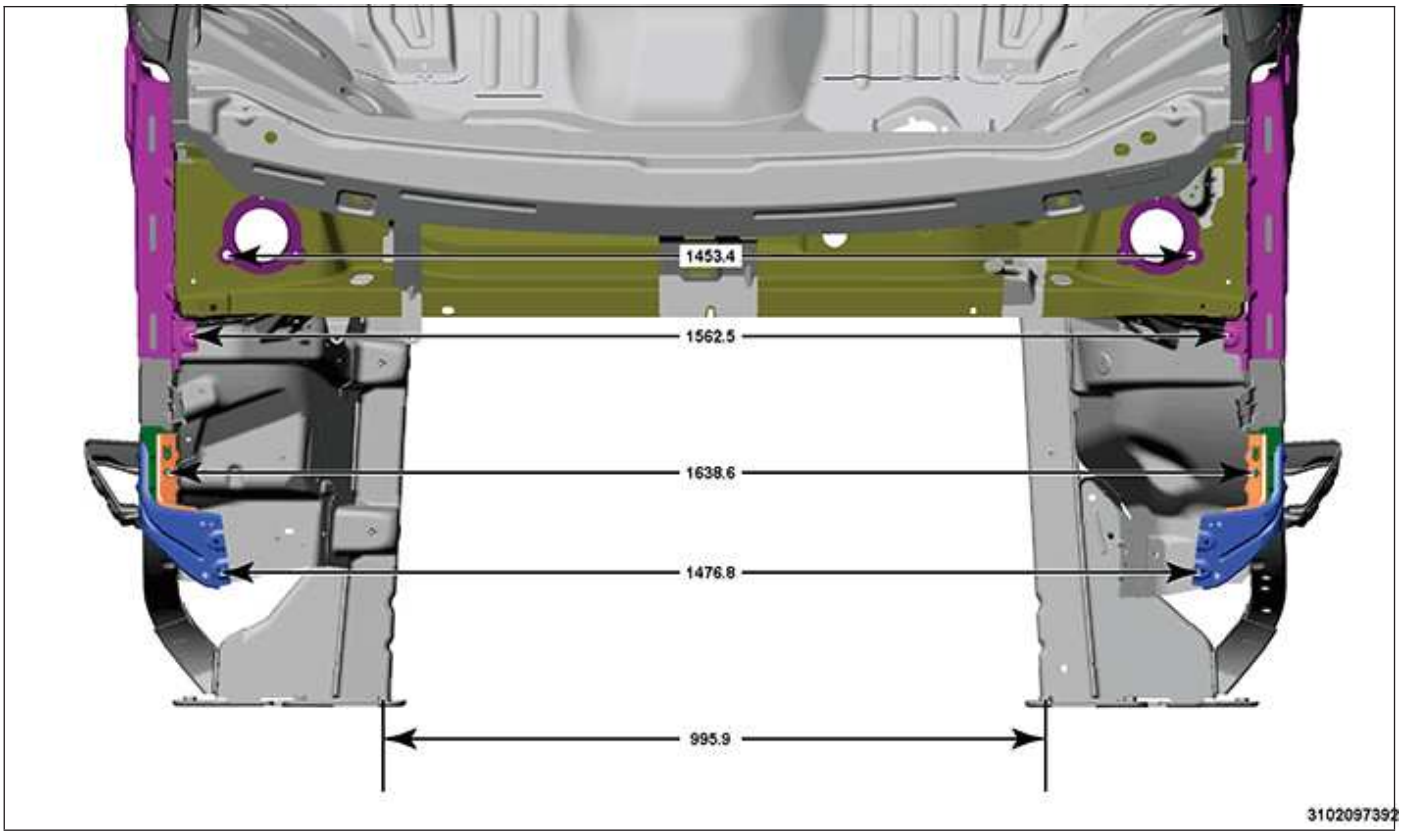
INDEX



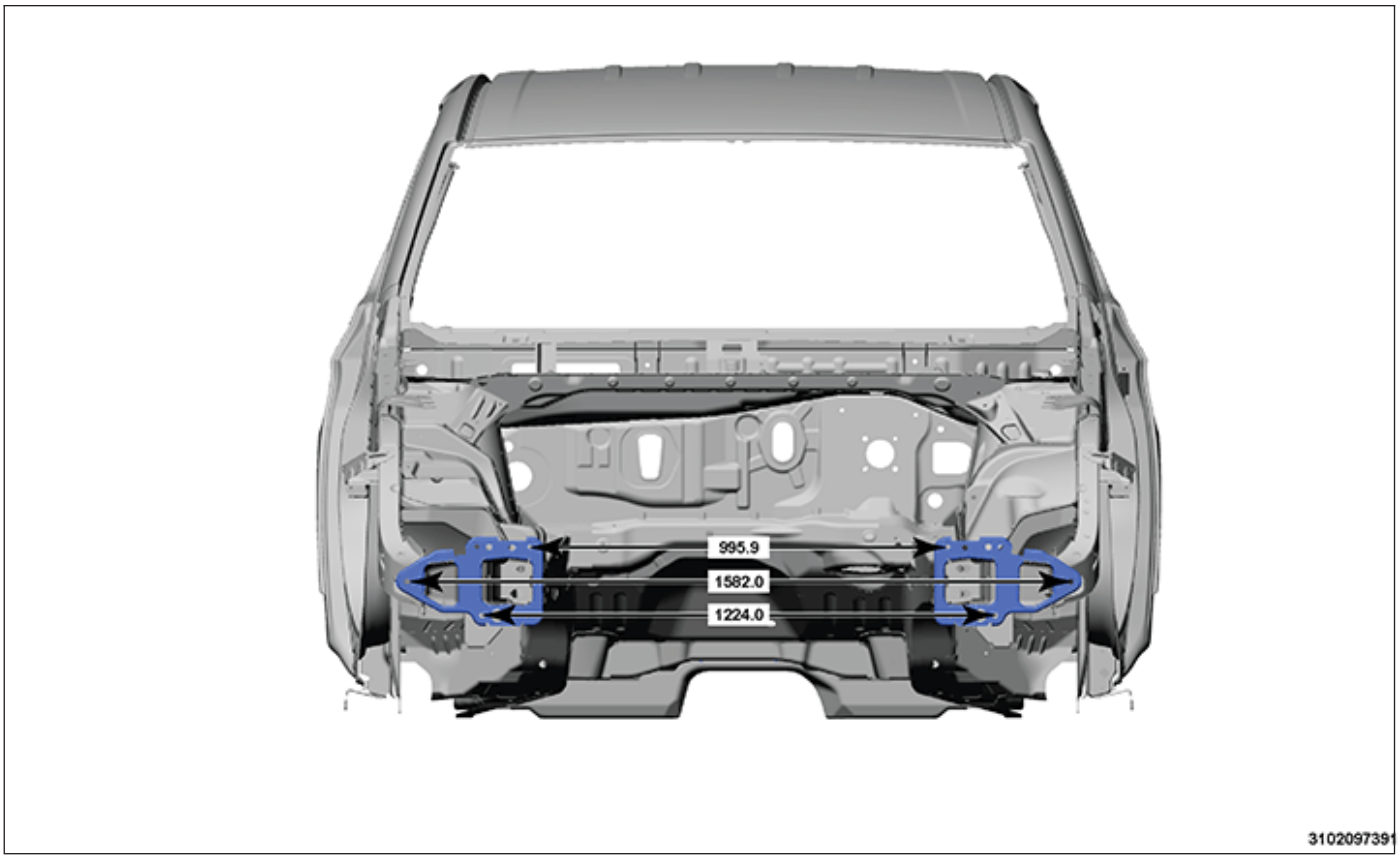
Under Body Dimensions



Under Hood Dimensions (1 of 2)

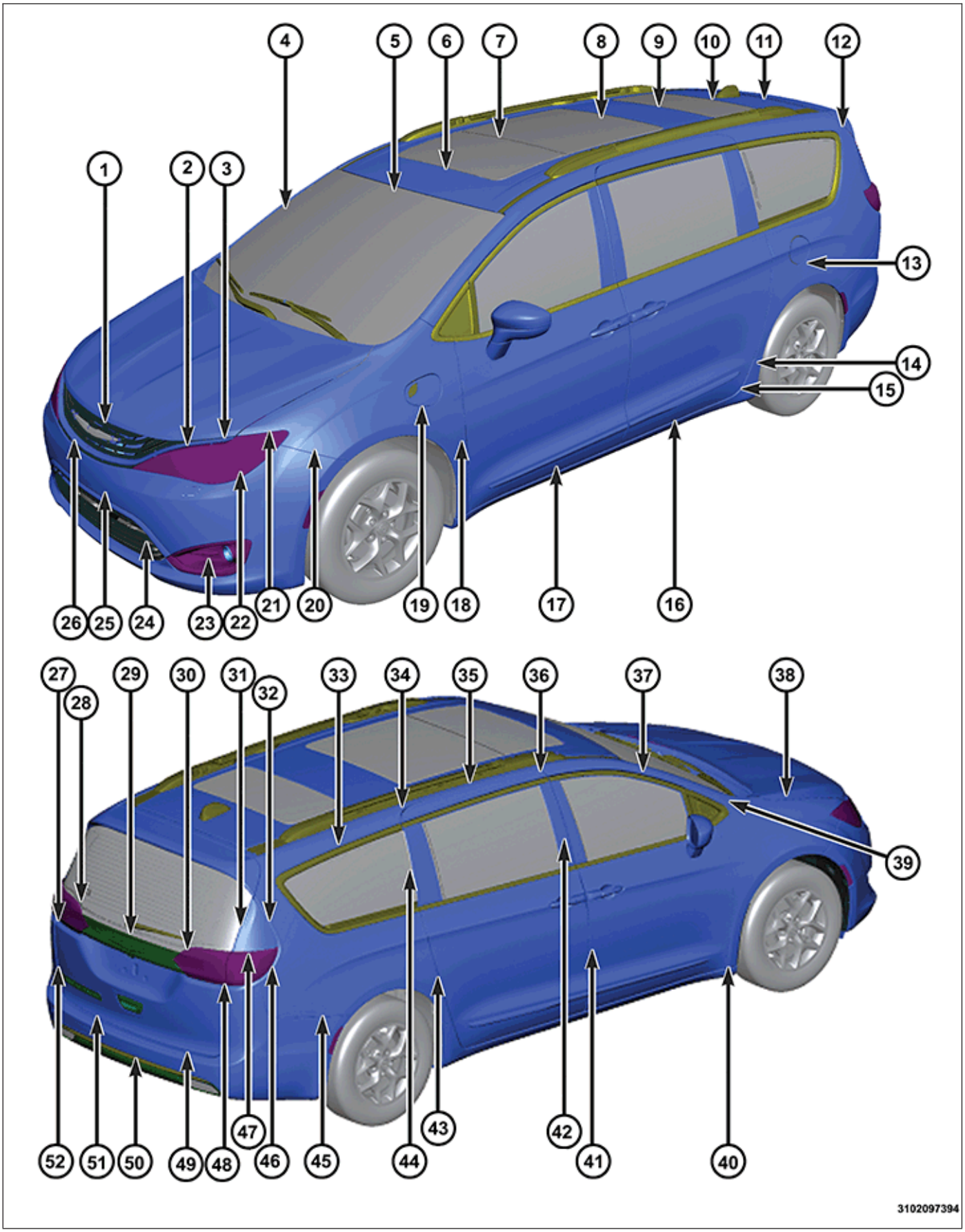


Under Hood Dimensions (2 of 2)



Front View Dimensions

GAP AND FLUSH DIMENSIONS



NOTE: All dimensions are in millimeters.

- **O/F = Over Flush**
- **U/F = Under Flush**
- **U/D = Up/Down**
- **F/A = Fore/Aft**

DIMENSION	DESCRIPTION	GAP	FLUSH
1	Hood to Grill	Varies +/- 2.0 Inboard	—
2	Upper Fascia Applique to Headlamp	2.5 +/- 1.0 U/D 2.5 +/- 1.5 Cross Car	Applique O/F Inboard 4.0 +/- 1.5 Transition to U/F Outboard 4.0 +/- 1.5
3	Upper Fascia Applique to Hood	Outboard 7.0 +/- 1.5	Applique U/F 5.0 +/- 1.5
4	Windshield to Body Side Aperture	4.0 +/- 2.0 0.0 to seal	—
5	Windshield to Roof	4.0 +/- 1.5 0.0 to seal	Windshield U/F 1.5+/- 1.5 Transition to 2.0 +/- 1.5 Outboard
6	Front Power Sunroof Glass to Roof	0.0 to seal	Front Sunroof Glass U/F 1.5 +/- 1.5 Consistent within 1.0
7	Front Power Sunroof Glass to Fixed Sunroof Glass	0.0 to seal	Front Sunroof Glass O/F 1.5 +/- 1.5 Consistent within 1.0
8	Fixed Sunroof Glass to Roof	0.0 to seal	Front Sunroof Glass O/F 1.5 +/- 1.5
9	Rear Fixed Sunroof Glass (front) to Roof	0.0 to seal	Rear Sunroof Glass U/F 1.5 +/- 1.5
10	Rear Fixed Sunroof Glass (rear) to Roof	0.0 to seal	Rear Sunroof Glass O/F 1.5 +/- 1.5
11	Liftgate to Roof	7.0 +/- 1.0 Parallel within 1.0	Liftgate U/F 1.5 +/- 1.0 Consistent within 1.0
12	Liftgate to Body Side Aperture	4.0 +/- 1.0 Parallel within 1.0	Liftgate U/F 5.0 +/- 1.0
13	Fuel Door to Body Side Aperture	2.5 +/- 1.0 Consistent within 1.0	Fuel Door U/F 1.0 +/- 1.0 Consistent within 1.0 Character line 0.0 +/- 1.0
14	Body Side Aperture to Sill Moulding	1.0 +/- 0.0	Body Side Aperture O/F 0.5 +/- 1.0 at front Transition to 0.0 at rear
15	Sliding Door to Sill Moulding	4.0 Parallel within 1.5	Sliding Door O/F 0.5 +/- 1.0
16	Sliding Door to Sill Moulding	4.5 +/- 1.5 Parallel within 1.5	Sliding Door U/F 5.0 +/- 1.5
17	Front Door to Sill Moulding	4.5 +/- 1.5 Parallel within 1.5	Front Door U/F 2.0 +/- 1.5 at front Transition to 6.0 at rear
18	Fender to Front Door	4.0 +/- 1.0 Parallel within 1.0	Fender O/F 0.5 +/- 1.0 below character line 0.0 +/- 1.0 at top
19	Charge Port Door to Fender	2.5 +/- 0.5 Parallel within 0.5	Charge Port Door U/F 0.5+/-0.5

DIMENSION	DESCRIPTION	GAP	FLUSH
20	Fascia to Fender	0.0 +/- 0.5	Fascia U/F 0.5 +/- 0.5
21	Headlamp to Fender	1.0 +/- 1.0	Lamp U/F 1.0 +/- 1.0 at top Transition to U/F 1.5 at Fascia
22	Headlamp to Fascia	1.0 +1.5/- 1.0 Consistent within 1.5	Lamp U/F inboard 3.5 +/- 1.0 Transition to 6.0 to 1.0 outboard
23	Fog Lamp to Fascia	1.0 +/- 0.5	Lamp U/F inboard 15.0 +/- 1.0 Transition to 11.0 +/- 1.0 outboard
24	Lower Grill to Fascia	0.5 +/- 0.5	Grill U/F 3.0 +/- 1.0
25	Lower Fascia Applique to Fascia	0.5 +/- 0.5	Applique O/F 8.5 +/- 1.0
26	Upper Grill to Fascia	0.5 +/- 0.5	—
27	Liftgate Lamp to Liftgate	1.5 +/- 1.0 Parallel within 1.0	Lamp O/F 4.5 +/- 1.0 at lower outboard
28	Liftgate Lamp to Liftgate Glass	4.0 +/- 1.5 Parallel within 1.5	Lamp O/F 2.5 +/- 1.5 outboard Transition at top Lamp 0.0 outboard
29	Liftgate Applique to Liftgate Glass	4.0 +/- 1.5 Parallel within 1.5	Applique O/F 1.5 +/- 1.5 Consistent within 1.5
30	Liftgate Lamp to Liftgate Applique	1.0 +/- 1.0 Consistent within 1.0	Lamp O/F 1.5 +/- 1.5
31	D-pillar Applique to Liftgate Glass	5.5 +/- 1.5 Parallel within 1.5	Applique U/F 0.0 +/- 1.5 at top Transition to Lamp U/F 0.5 to 0 at bottom Consistent within 1.5
32	D-pillar Applique to Body Side Aperture	1.5 +/- 1.0 Consistent within 1.0	Applique U/F 2.0 +/- 1.0 at top Transition to O/F 1.5 +/- 1.0 at bottom
33	Quarter Glass Moulding to Body Side Aperture	0.0 to seal	Varies +/- 1.5
34	Body Side Aperture to Sliding Door (Front and Rear)	5.5 +/- 1.5 (front only) Transition to 4.0 Parallel within 1.5	Front and rear 0.0 +/- 1.5 Consistent within 1.5
35	Body Side Aperture to Sliding Door (Center)	4.0 +/- 1.5 Parallel within 1.5	1.0 +/- 1.5 Body Side Aperture U/F 1.0 Consistent within 1.5
36	Front Door Moulding to Sliding Door Moulding	5.0 +/- 1.5	0.0 +/- 1.5 Consistent within 1.5
37	Front Door Window Moulding to Body Side Aperture	0.0 to seal	Moulding U/F 3.0 +/- 1.5 at front Transition to U/F 2.0 at rear
38	Hood to Fender	3.5 +/- 1.0 Parallel within 1.0 Side to side within 1.5	Hood U/F 1.0 +/- 1.0 Transition to 2.0 at incline and 1.0 at rear

DIMENSION	DESCRIPTION	GAP	FLUSH
39	Fender to A-pillar	2.0 +/- 1.0 Parallel within 1.0 Side to side within 1.0	0.0 +/- 1.0
40	Fender to Sill Moulding	2.0 +/- 1.0 2.5 at notch	0.0 +/- 1.0 at front Transition to Fender U/F 1.5 at rear
41	Front Door to Sliding Door	5.0 +/- 1.0 Parallel within 1.0	Front Door O/F below character line 0.5 +/- 1.0 Front Door above character line 0.0 +/- 1.0
42	Front Door Applique to Sliding Door Front Applique	5.0 +/- 1.5 Parallel within 1.5	0.0 +/- 1.5 Consistent within 1.5
43	Sliding Door to Body Side Aperture	4.0 +/- 1.0 Parallel within 1.0	Sliding Door O/F below character line 0.5 +/- 1.0 Sliding Door above character line 0.0 +/- 1.0
44	Sliding Door Rear Applique to Quarter Glass	5.5 +/- 1.5 Parallel within 1.5 0.0 to seal	Applique O/F 3.5 +/- 1.5 Consistent within 1.5
45	Body Side Aperture to Rear Fascia	F/A and U/D 0.0 to 0.5	Fascia at Taillamp U/F 0.5 +/- 0.5 Transition to 0.0 at Wheelhouse
46	Tail Lamp to Body Side Aperture	1.5 +/- 1.0 Consistent within 1.0	Lamp O/F 4.0 +/- 1.0 at inboard Transition to 4.5 to 4.0 at top
47	Tail Lamp to D-pillar Applique	4.0 +/- 1.5 Parallel within 1.5	Lamp Varies +/- 1.5
48	Tail Lamp to Liftgate Lamp	4.5 +/- 1.5 Parallel within 1.5 Side to side within 2.0	0.0 +/- 1.5 at top Transition to Tail Lamp O/F 1.0 to 0.0 at bottom
49	Liftgate to Rear Fascia	4.0 +/- 1.5 Parallel within 1.5	—
50	Rear Fascia Applique to Lower Fascia	0.5 +/- 0.5	Applique U/F 1.0 +/- 1.0 (Single Exhaust) Applique O/F inboard 15.5 +/- 1.0 transition to 3.5 outboard (Dual Exhaust)
51	Rear Liftgate to Upper Fascia	4.0 +/- 1.5 Parallel within 1.5	—
52	Rear Liftgate to Upper Fascia	5.5 +/- 1.5	0.0 at top Transition to Fascia O/F 3.0 at bottom

PAINT CODES

Exterior vehicle body color(s) are identified on the Vehicle Certification Label or the Body Code Plate.

The first digit of the paint code listed on the vehicle indicates the sequence of application, i.e.: P = primary coat, Q = secondary coat. The color names provided in the Paint and Trim Code Description chart are the same color names used on most repair product containers.

PAINT COLOR INFORMATION	INFORMATION LOCATION
2017 - Paint Color Chart	2017 PAINT CODES

2017 PAINT CODES

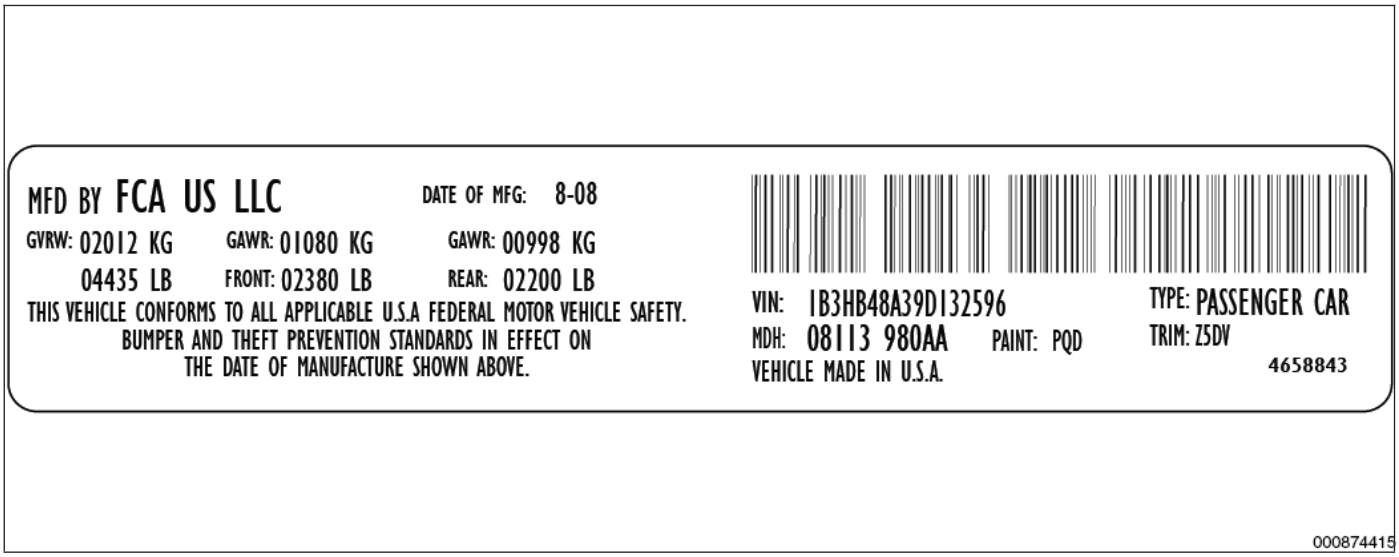
EXTERIOR COLORS

EXTERIOR COLOR	COLOR CODE
Brilliant Black Crystal Pearl Coat	AXR
Dark Cordovan Pearl Coat	GUV
Bright White Clear Coat	GW7
Billet Silver Metallic Clear Coat	JSC
Jazz Blue Pearl Coat	KBX
Crystal Blue Pearl Coat	KDB
Granite Crystal Metallic Clear Coat	LAU
Velvet Red Peal Coat	NRV
Silver Teal Pearl Coat	PQA
Light Toffee Silver	PTE
Cement White	PW2

INTERIOR COLORS

INTERIOR COLOR	OPTION CODE	COLOR CODE
Bark Brown / Alloy / Toffee	G2	GTV / PD2 / PL5
Black / Alloy	XP	DX9 / PD2
Black / Diesel	X7	DX9 / LA3
Black / Deep Mocha	X8	DX9 / ML8

VEHICLE CERTIFICATION LABEL



NOTE: Typical example of label shown.

A vehicle certification label is attached to every FCA US LLC vehicle. The label certifies that the vehicle conforms to all applicable Federal Motor Vehicle Standards. The label also lists:

- Month and year of vehicle manufacture.
- Gross Vehicle Weight Rating (GVWR). Gross Axle Weight Ratings (GAWR) The gross front and rear axle weight ratings are based on a minimum rim size and maximum cold tire inflation pressure.
- Vehicle Identification Number (VIN).
- Type of vehicle.
- Type of rear wheels.
- Bar code.
- Month, Day and Hour (MDH) of final assembly.
- Paint and Trim codes.
- Country of origin.

The label is located on the driver-side door shut-face.

Material Locations

SEALERS AND SOUND DEADENERS

Terminology

- **Work Time :** The length of time a sealer can continue to be applied or tooled effectively.
- **Set Time :** Time when there is no longer product transfer.
- **Handling Time :** The time when a part can be safely transported and sealer can no longer be tooled or repositioned.
- **Full Cure Time :** Time when a sealer has reached full strength.
- **Paintable Time :** Established time when refinish materials can safely be applied to a sealer.

Sealers

- **Brushable :** Single component sealer applied with a brush.
- **Flowable :** Sealer with low viscosity and self-leveling characteristics.
- **Pumpable :** A two component or one component sealer that seals interior and exterior joints and voids.
- **Resistance Weld-through :** Sealer / adhesive that can be used in conjunction with resistance spot welding.
- **Sealer Tape :** Preformed sealer. Can be welded through.
- **Sprayable :** Sealer applied with a pneumatic dispenser to duplicate original textured appearance.
- **Thumb Grade :** Heavy bodied sealer for sealing large gaps and filling voids. Should remain soft and pliable.

Sound Deadeners

- **Non-Structural Flexible Acoustical :** Flexible foam with sealing and sound deadening properties.
- **Non-Structural Ridged Acoustical :** Ridged foam with sealing and sound deadening properties.
- **Mastic Pads :** Sound deadener pad that is preformed to fit a specific area.
- **Structural Ridged Foam :** Joint reinforcement foam with sound deadening properties.

Identifying Sealers

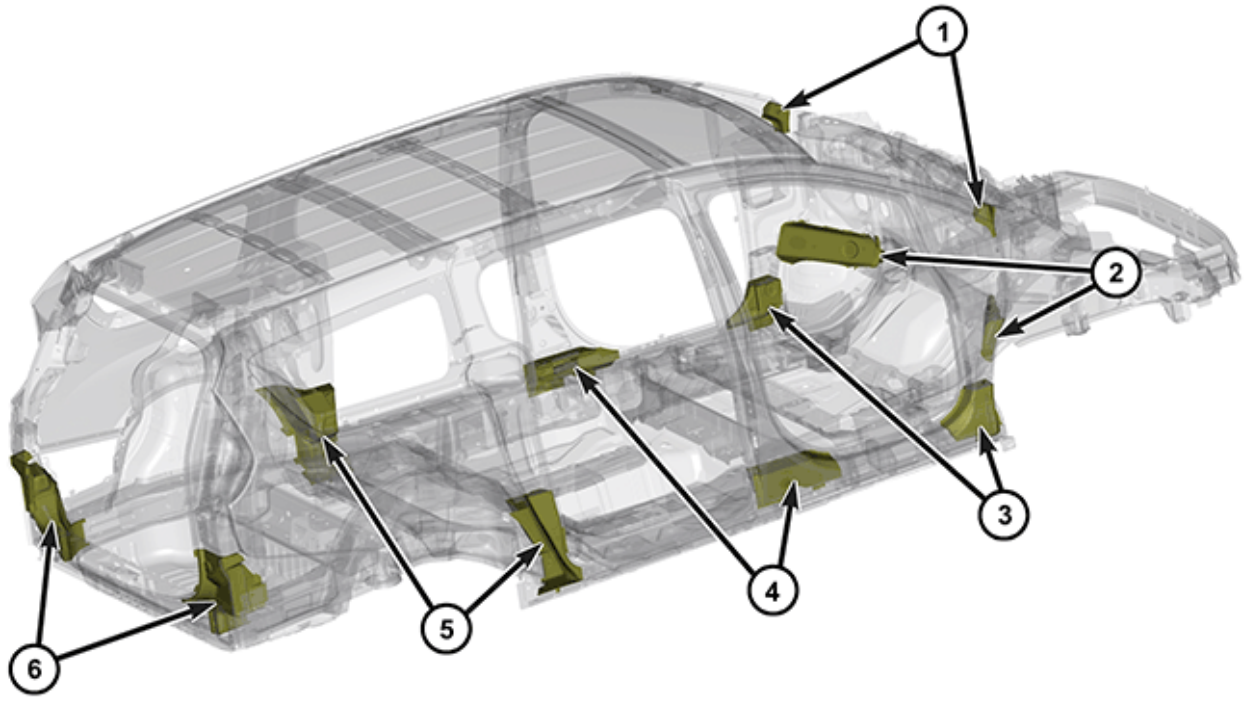
- Several types of sealers and sound deadeners are used during assembly. Therefore, specific applications may not be identified in this publication. General applications and the various types of products for repair will be featured to identify and replace OEM sealers and sound deadeners.

Helpful Sealer Tips

- Check shelf life or expiration date prior to beginning sealer applications.
- Be sure "work time" is appropriate for sealer application.
- Temperature, humidity and thickness of sealer will affect the work, set and paintable times.
- Test fit replacement panels prior to installation to insure tight fit and proper seal.
- Equalize 2K Products according to adhesive manufacturer’s recommendations.
- Always follow manufacturer’s recommendations for storage, usage and application to achieve best performance of the product.

SOUND DEADENER LOCATIONS

DESCRIPTION	FIGURE
PUR Foam Locations	Figure 1
Hood	Figure 2
Front Wheelhouse	Figure 3
Fender	Figure 4
Dash Panel Outer	Figure 5
Dash Panel Inner (1 of 4)	Figure 6
Dash Panel Inner (2 of 4)	Figure 7
Dash Panel Inner (3 of 4)	Figure 8
Dash Panel Inner (4 of 4)	Figure 9
Second Row Seat Tub and Mid Floor Pan	Figure 10
Rear Wheelhouse Stuffers	Figure 11
Rear Wheelhouse (1 of 2)	Figure 12
Rear Wheelhouse (2 of 2)	Figure 13
Rear Rail	Figure 14
Inner Quarter Panel	Figure 15
Closure and Liftgate Opening Panel	Figure 16



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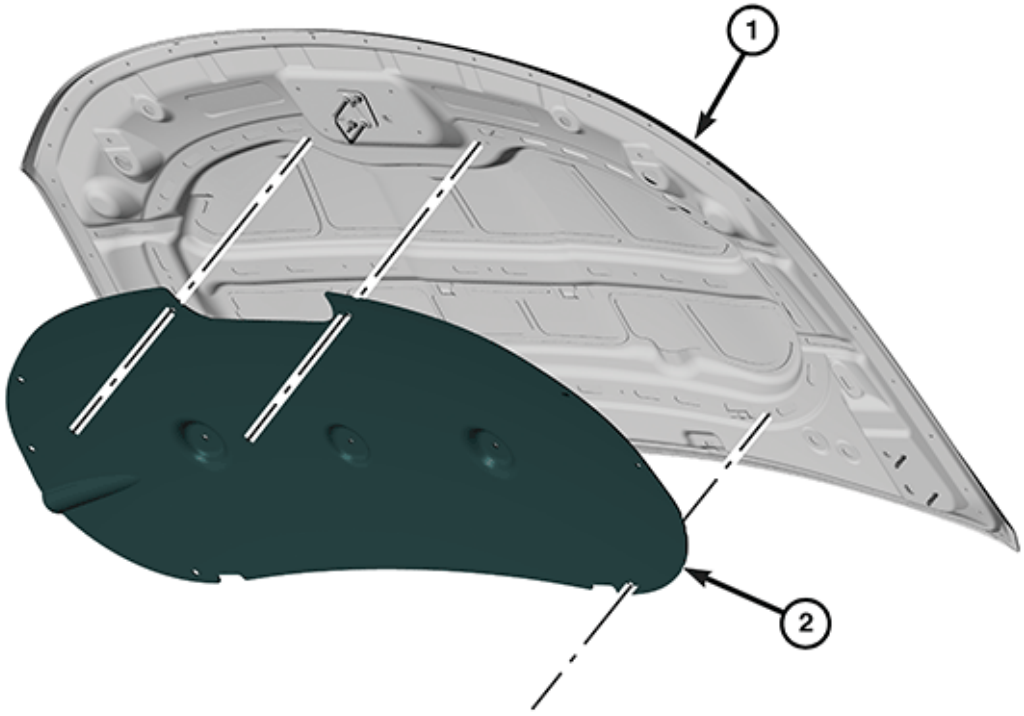
PUR Foam Locations

1- A-pillar
2- Dash Reinforcement
3- Lower Cowl/Sill
4- B-pillar/Sill
5- C-pillar/Sill
6- D-pillar/Closeout Panel



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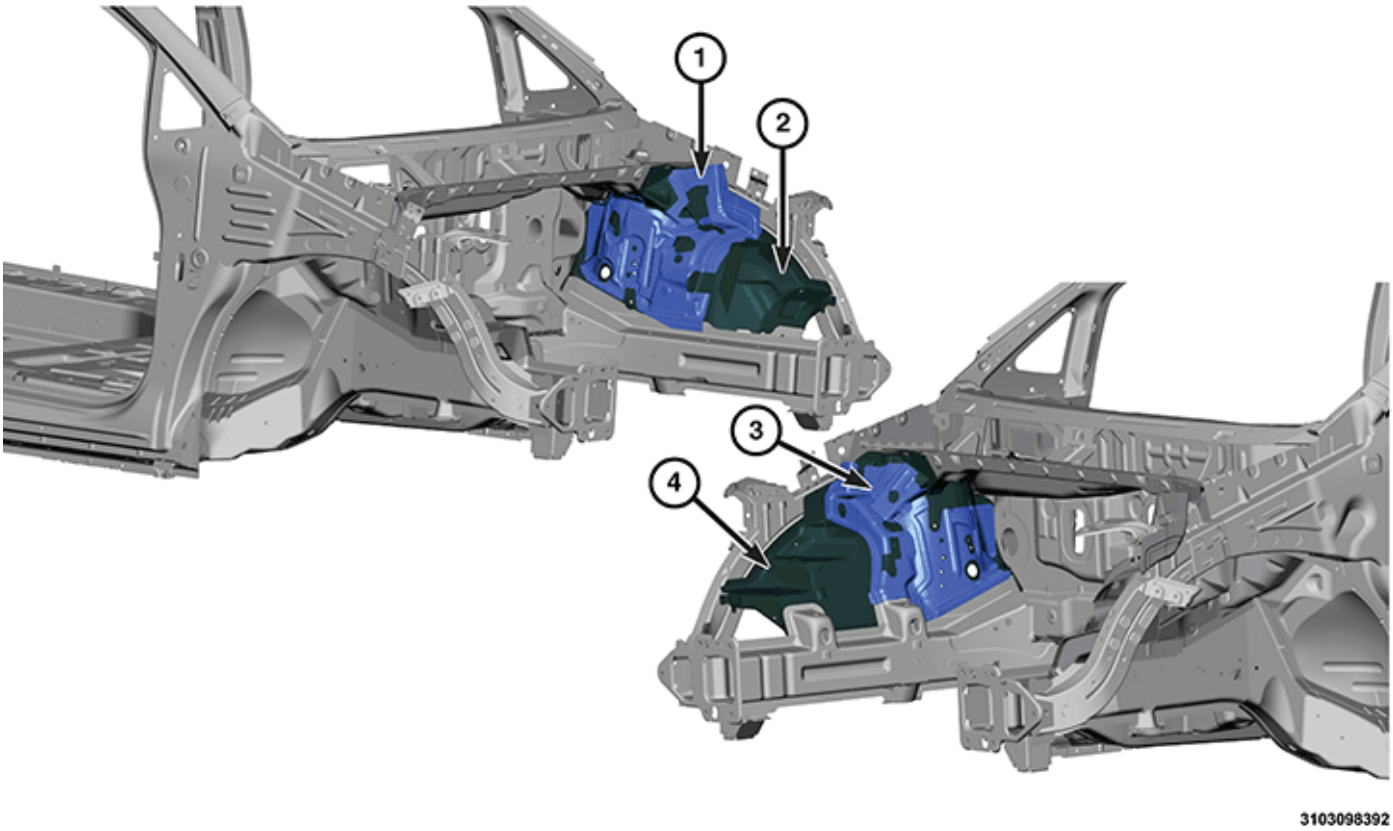
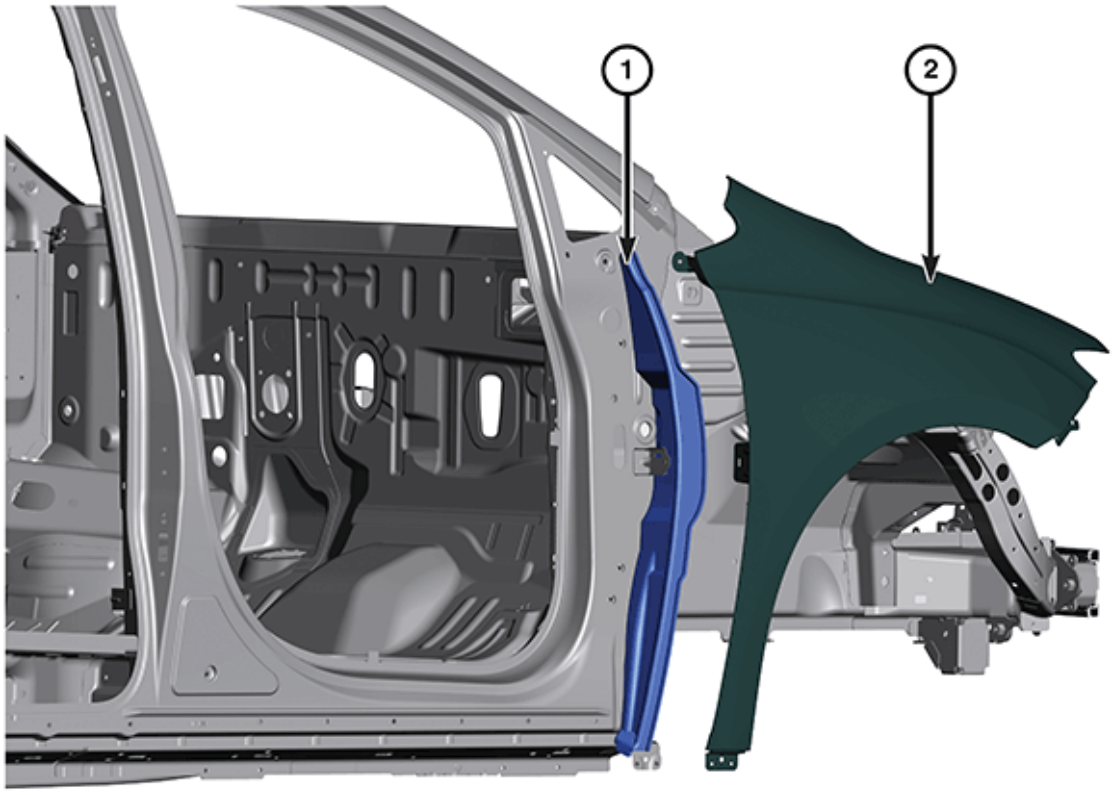
Hood

1- Hood
2- Hood Silencer



Front Wheelhouse

1- Left Front Wheelhouse Silencer
2- Left Front Wheelhouse Panel
3- Right Front Wheelhouse Silencer
4- Right Front Wheelhouse Panel



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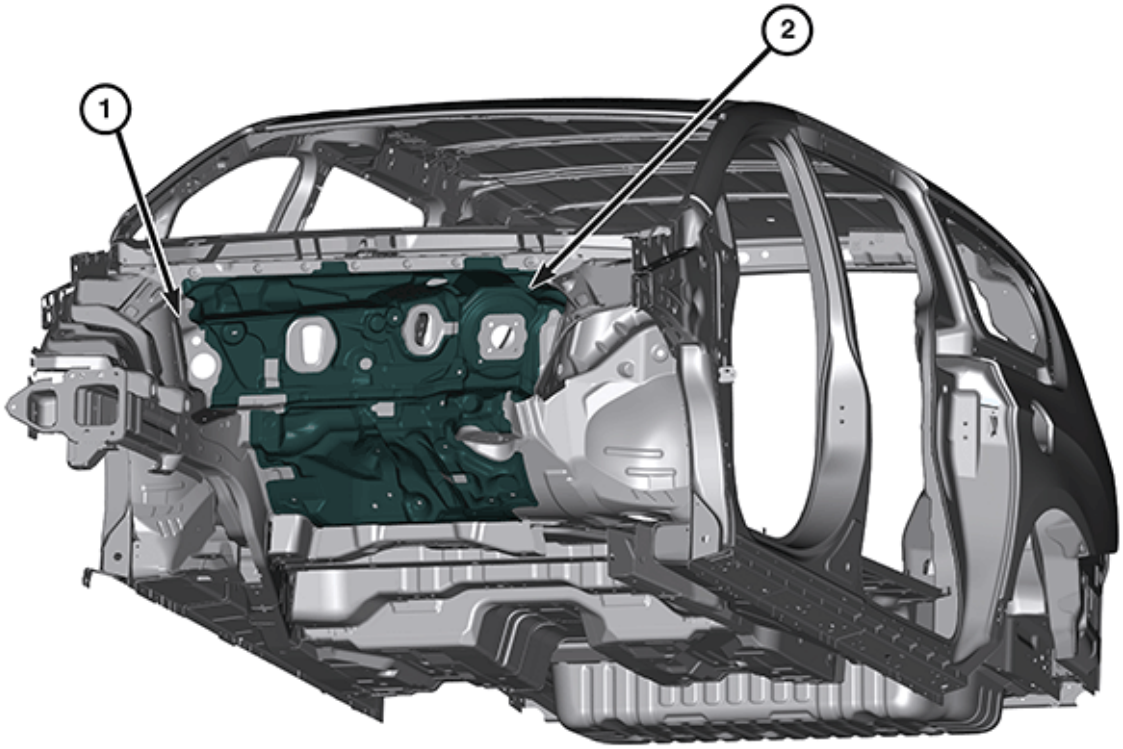
Fender

1- Cowl Side to Fender Silencer
2- Fender



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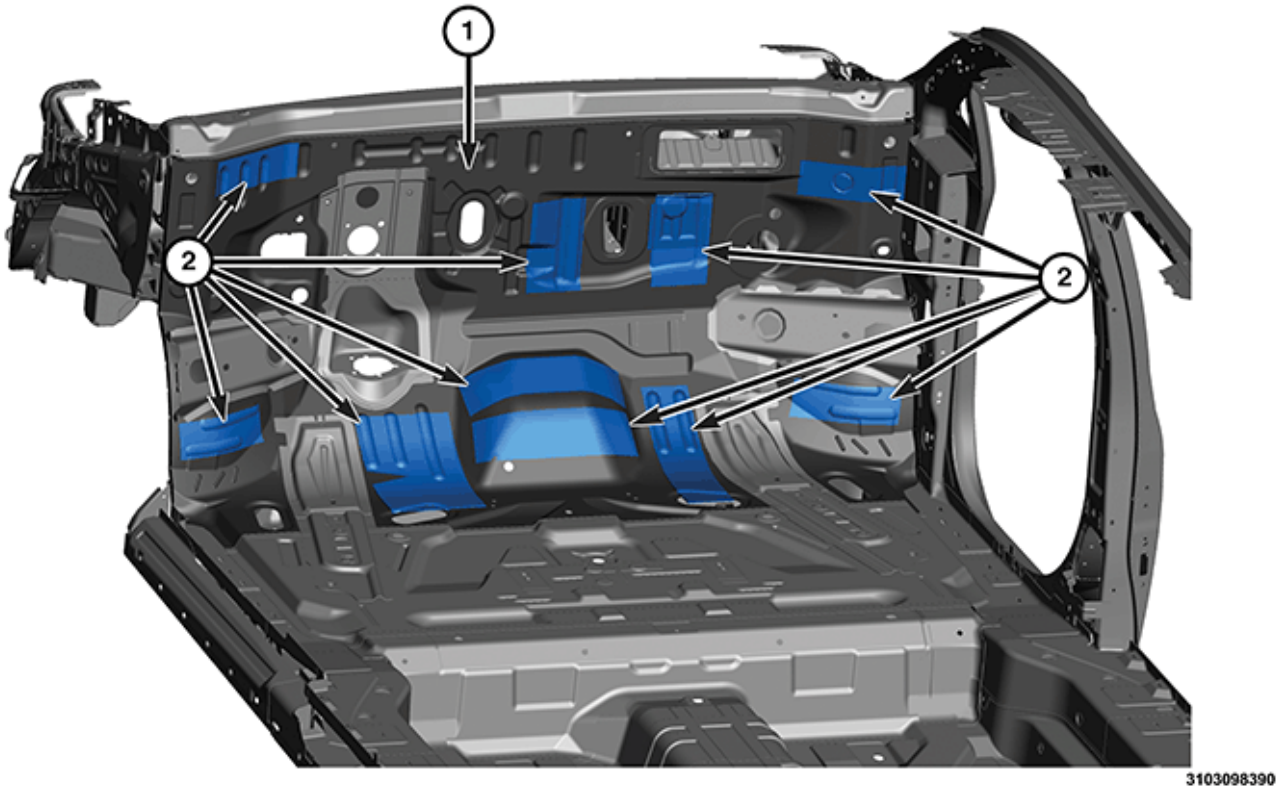
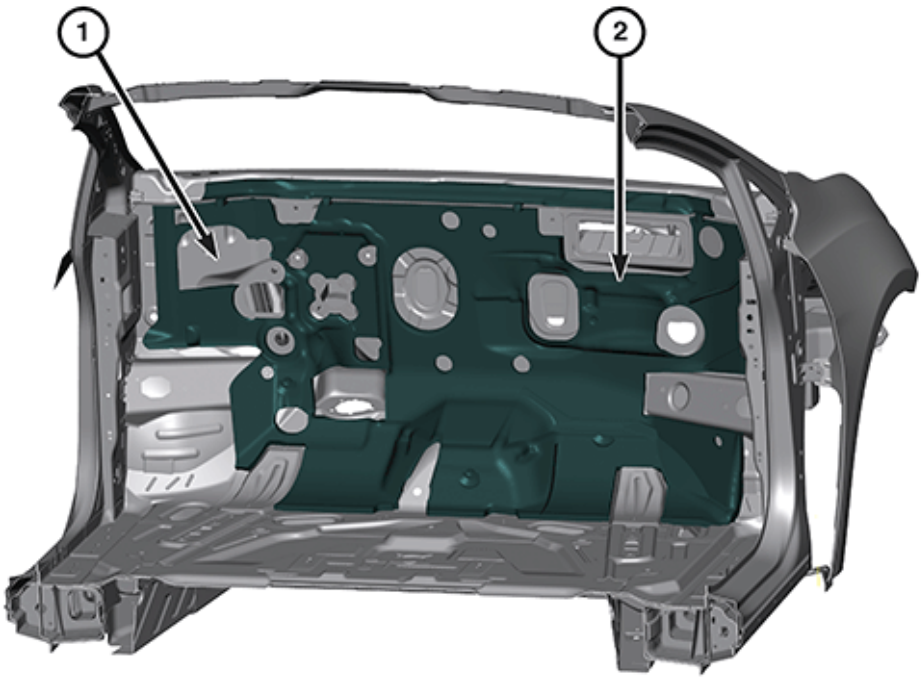
Dash Panel Outer

1- Dash Panel Outer
2- Dash Panel Silencer



Dash Panel Inner (1 of 4)

1- Dash Panel Inner
2- Dash Panel Mastic Pads



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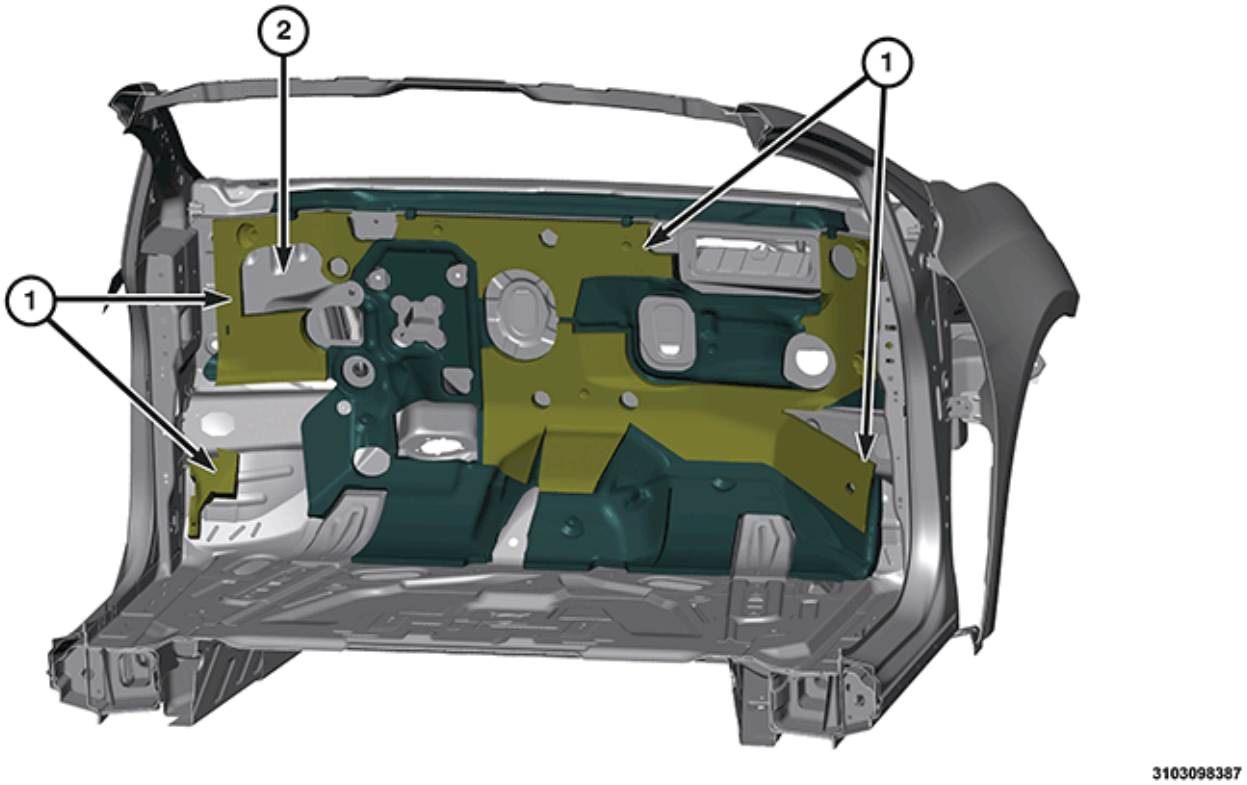
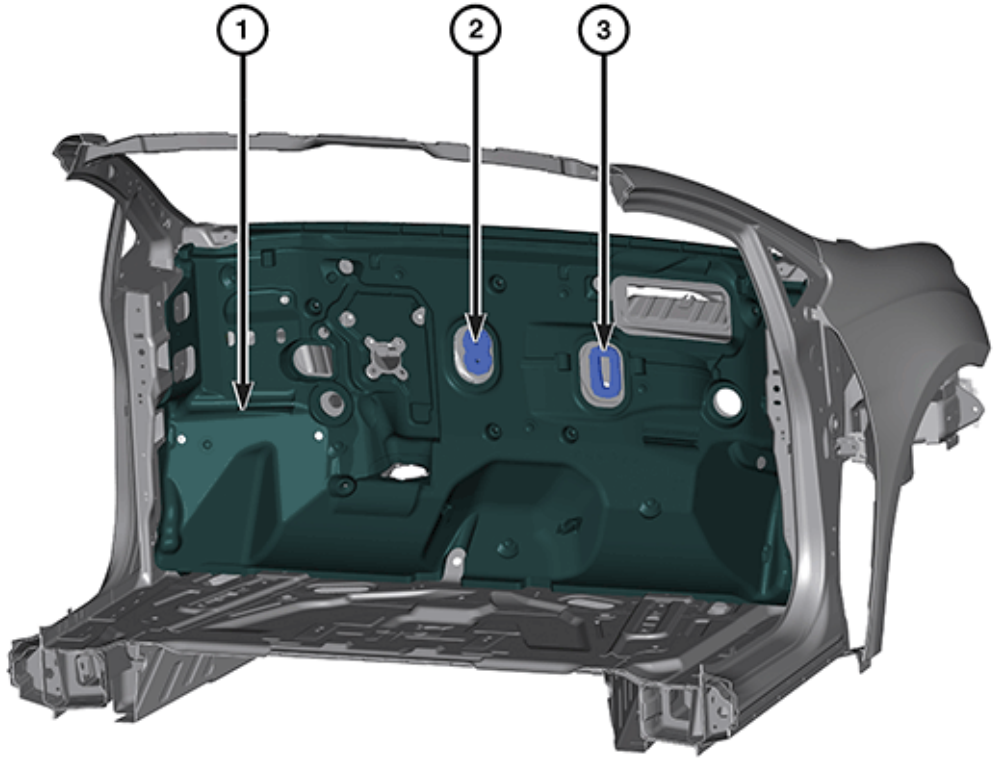
Dash Panel Inner (2 of 4)

1- Dash Panel Inner
2- Dash Panel Silencer Fiber Pad



Dash Panel Inner (3 of 4)

1- Dash Silencer Fiber Pads
2- Dash Panel Inner



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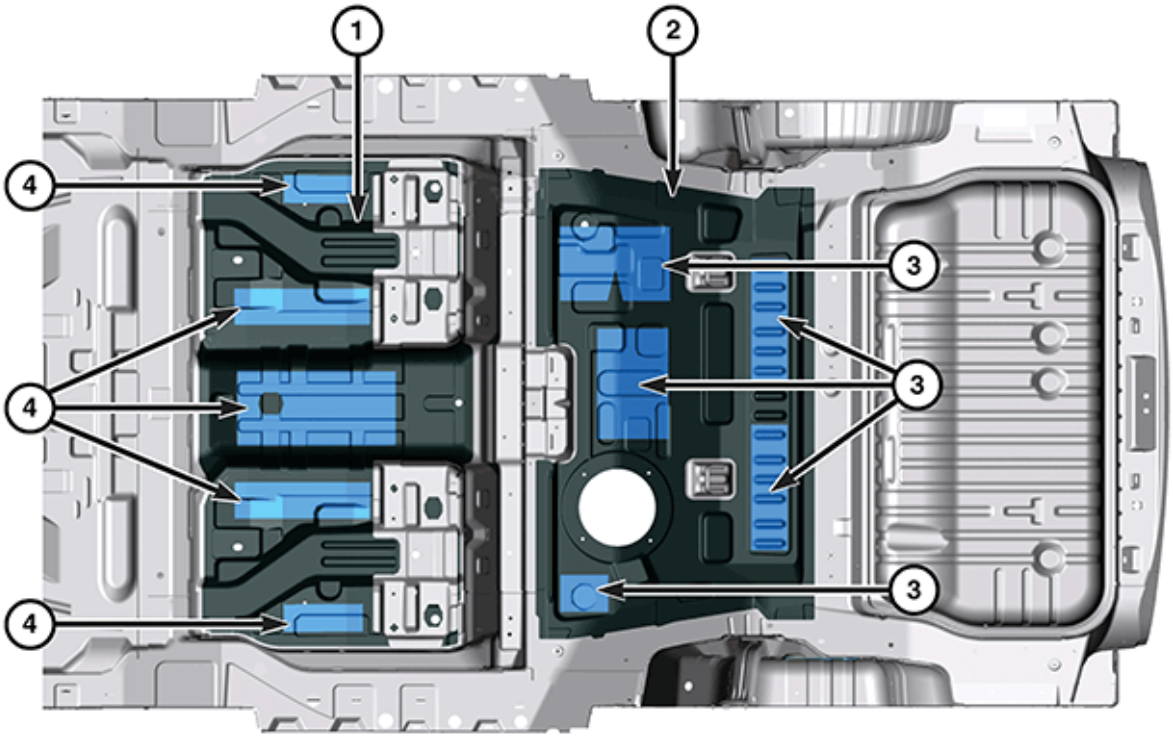
Dash Panel Inner (4 of 4)

1- Dash Panel Silencer
2- Heater Line Closeout Insulation
3- A/C Line Closeout Insulation



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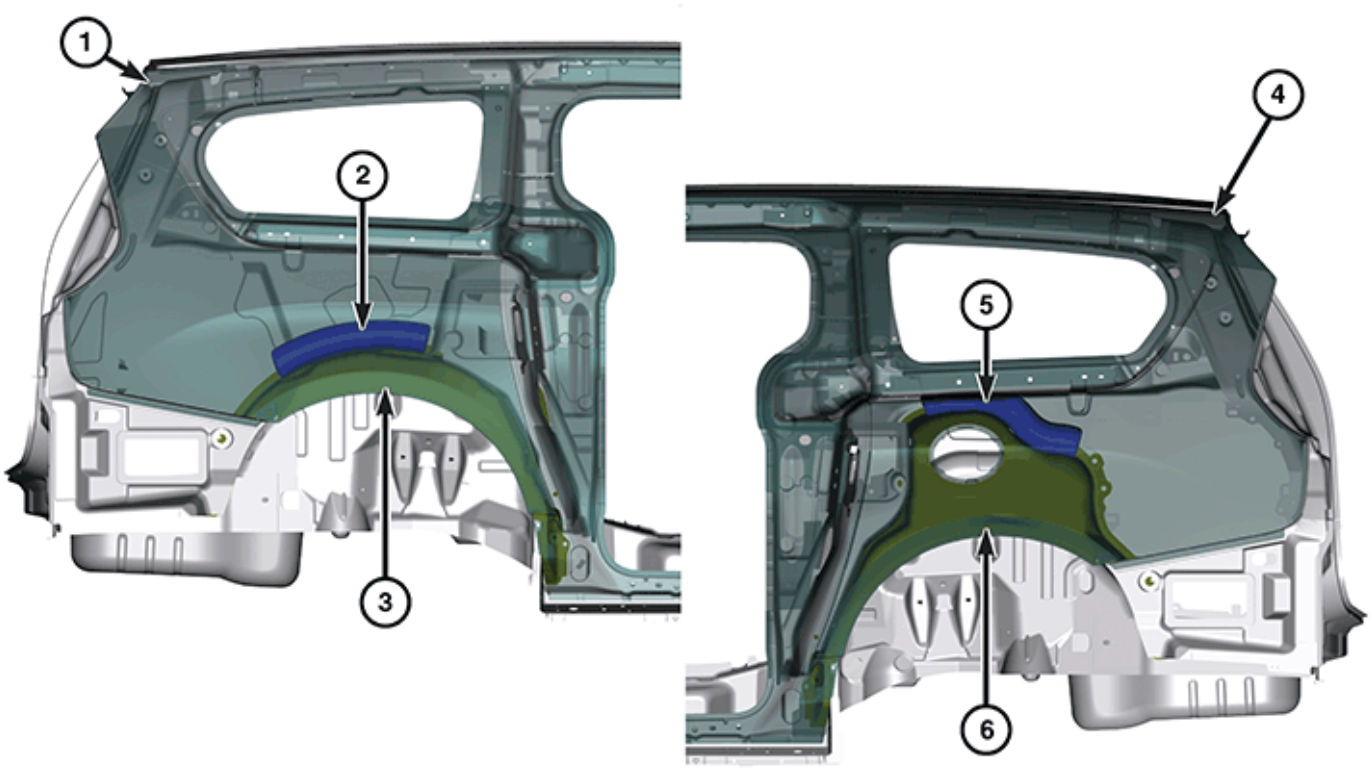
Second Row Seat Tub and Mid Floor Pan

1- Second Row Seat Tub
2- Mid Floor Pan
3- Mid Floor Mastic Pads
4- Second Row Seat Tub Mastic Pads



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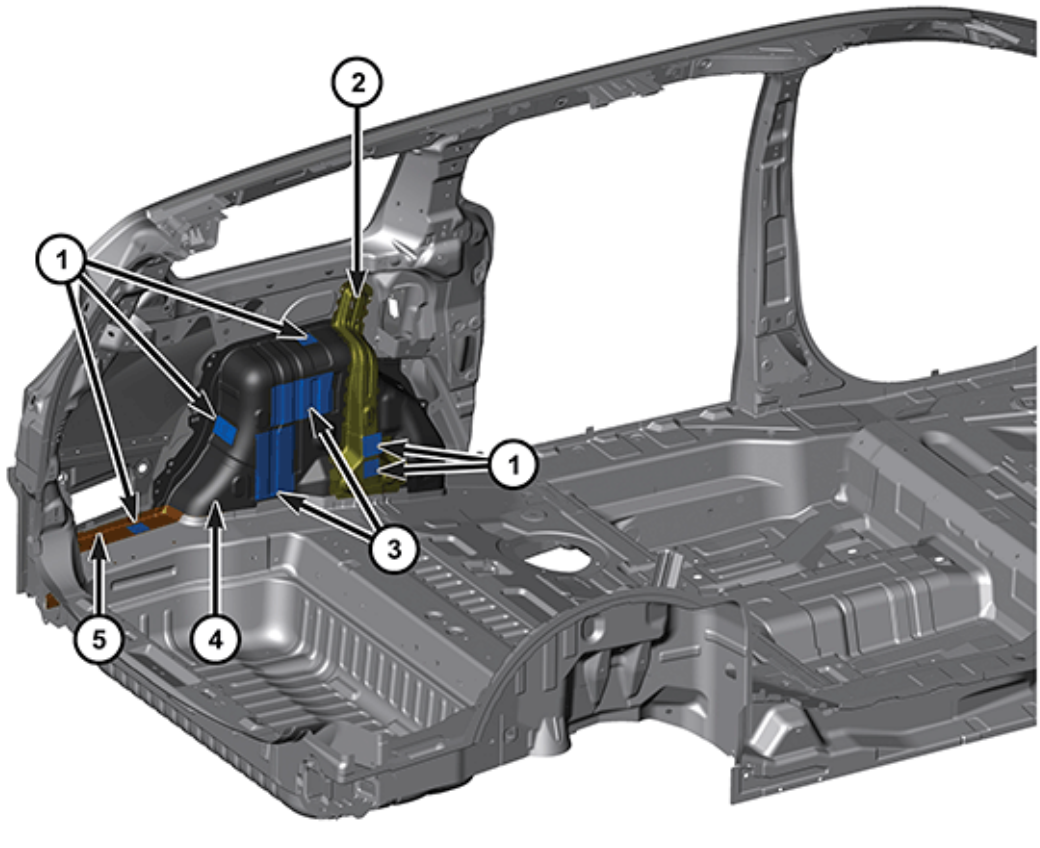
Rear Wheelhouse Stuffers

1- Right Body Side Aperture
2- Right Wheelhouse Stuffer
3- Right Outer Wheelhouse
4- Left Body Side Aperture
5- Left Wheelhouse Stuffer
6- Left Outer Wheelhouse



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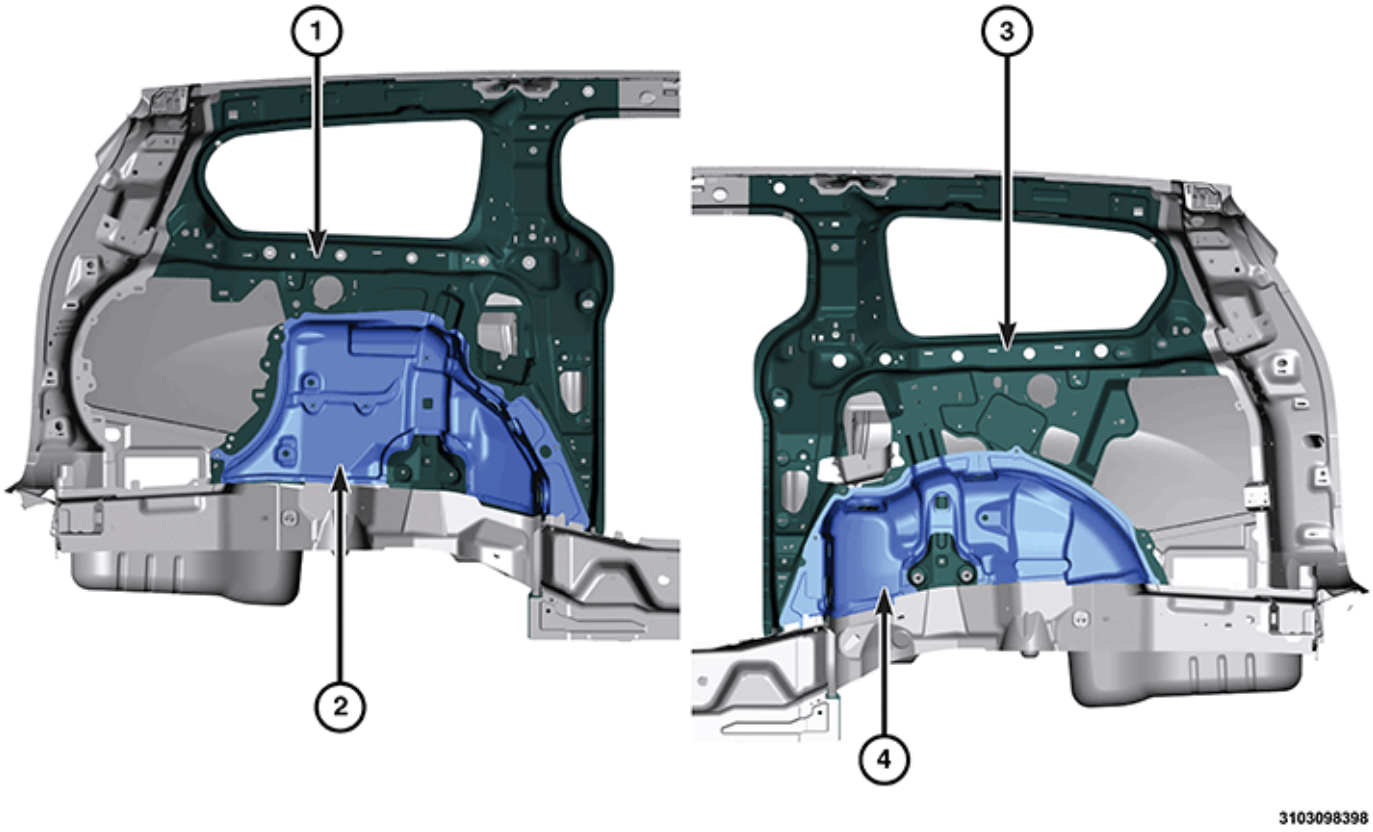
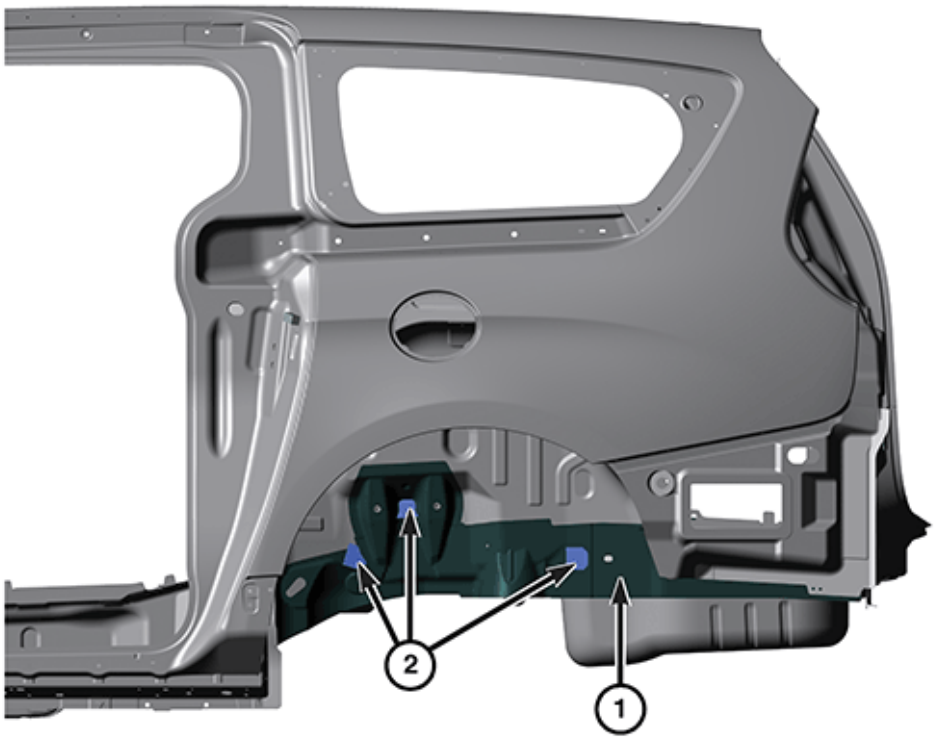
Rear Wheelhouse (1 of 2)

1- Foil Butyl Tape
2- Shock Reinforcement
3- Mastic Pads
4- Inner Wheelhouse Panel
5- Rear Rail Cover



Rear Wheelhouse (2 of 2)

1- Left Inner Quarter Panel
2- Left Inner Wheelhouse Silencer
3- Right Inner Quarter Panel
4- Right Inner Wheelhouse Silencer



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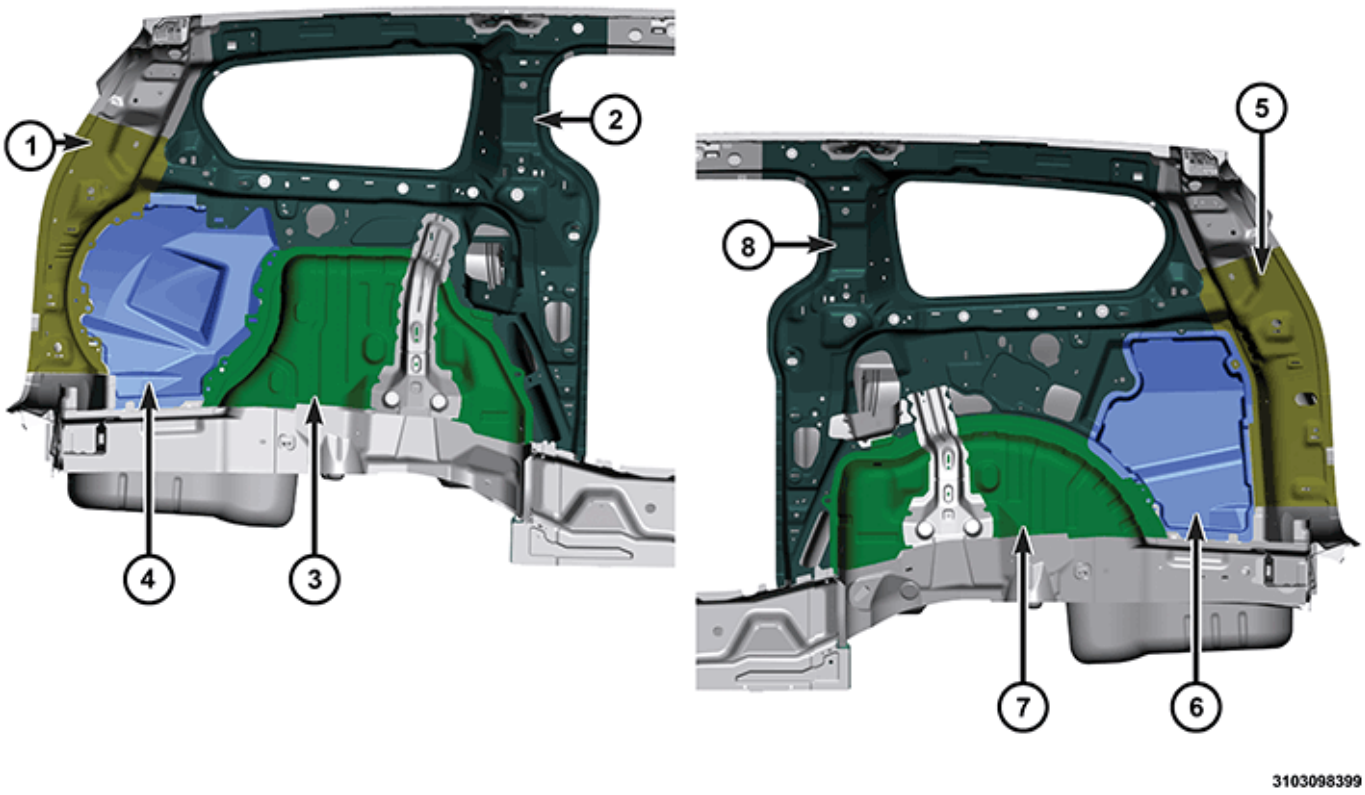
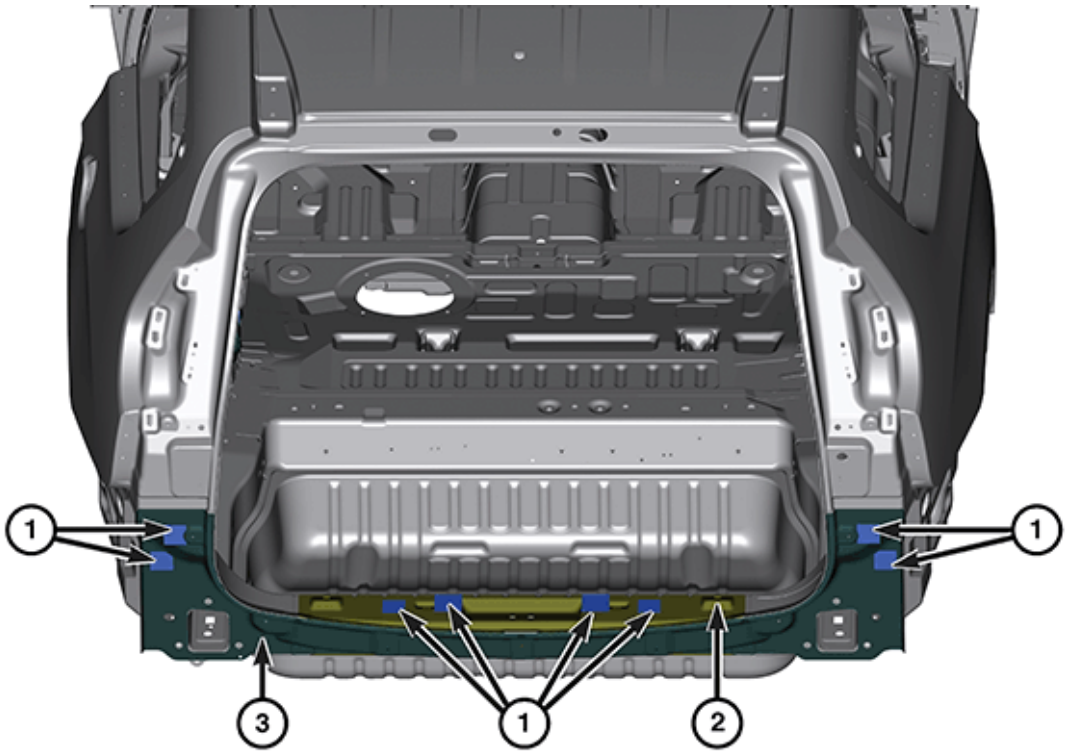
Rear Rail

1- Rear Rail
2- Foil Butyl Tape



Inner Quarter Panel

1- Right D-pillar Lower Reinforcement
2- Right Inner Quarter Panel
3- Right Inner Wheelhouse Panel
4- Right Rear Quarter Closeout Insulation
5- Left D-pillar Lower Reinforcement
6- Left Inner Quarter Panel
7- Left Inner Wheelhouse Panel
8- Left Rear Quarter Closeout Insulation



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Closure and Liftgate Opening Panel

1- Foil Butyl Tape
2- Closure Rear Inner Panel
3- Liftgate Opening Lower Panel

STRUCTURAL ADHESIVE, FLEXIBLE ADHESIVES AND SEAM SEALER LOCATIONS

Structural adhesives, flexible adhesives and seam sealers should only be applied by trained technicians. Follow the manufactures instructions for proper applications of products.

Structural adhesive is applied by itself or in conjunction with Squeeze Type Resistance Spot Welds (STRSW) and is to be re-assembled in the same manner as vehicle build. Any situation where it is undetermined weather it is structural adhesives or seam sealer always default to structural adhesive.

Anti- flutter adhesive is applied to areas of the vehicle where adhesive properties with flexibility are required. Typically found on supports and braces throughout the closure panels, roof and body side gas fill areas.

Seam sealers are only to be used topically, never within weld flanges or hem flanges. All sealers being replaced should duplicate the factory style sealer in shape and size.

For additional information on Corrosion Protection, (Refer to Collision Information - Standard Procedure).

For additional information on Sealer and Sound Description, (Refer to Collision Information-Locations).

FCA US LLC approved replacement materials include –

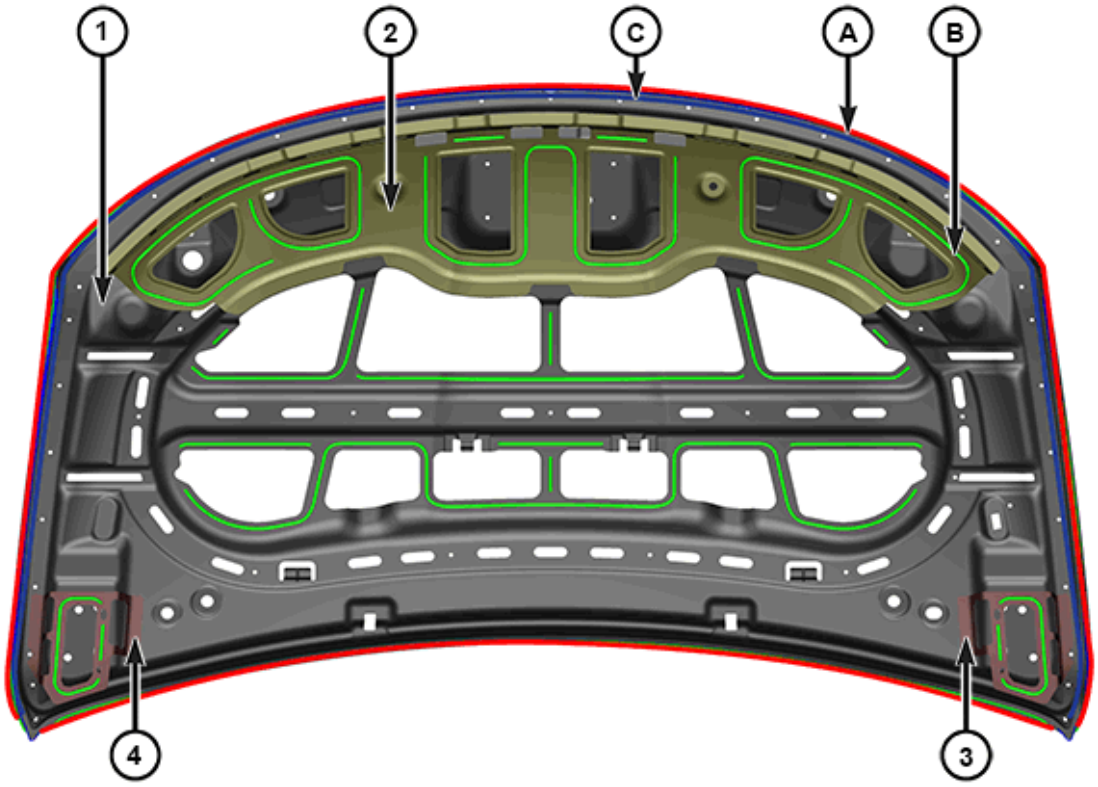
- **Structural Adhesives:** LORD Fusor 2098, LORD Fusor 112B and 3M 08116.
- **Anti-Flutter Adhesives:** LORD Fusor #121 or #124 (Flexible Foam), 3M #8463 Flexible Foam, Crest – CFF Flexi-Foam.
- **Seam Sealer:** Mopar #04318026, Fusor 129, 3M 08308.

MATERIAL TYPE	COLOR
Structural Adhesive	Red
Anti-Flutter Adhesive	Green

MATERIAL TYPE	COLOR
Seam Sealer	Blue

DESCRIPTION	FIGURE
Hood	Figure 1
Front Door	Figure 2
Sliding Door	Figure 3
Liftgate	Figure 4
Front Wheelhouse Panel	Figure 5
Engine Box	Figure 6
Engine Box (Lower View)	Figure 7
Front Wheelhouse Outer	Figure 8
Cowl Side Panel and Load Path Beam	Figure 9
Cowl Side Panel	Figure 10
Plenum/Dash Panel	Figure 11
Cowl Plenum/Dash Panel	Figure 12
Dash Panel (Interior)	Figure 13
Sill Inner Reinforcement	Figure 14
Dash Panel and Front Floor (Interior) (1 of 2)	Figure 15
Dash Panel and Front Floor (Interior) (2 of 2)	Figure 16
Front Floor Underbody	Figure 17
Inner A-pillar Panel	Figure 18
Front Door Ring Reinforcement (1 of 2)	Figure 19
Front Door Ring Reinforcement (2 of 2)	Figure 20
Body Side Aperture Front	Figure 21
Sill Inner Reinforcement	Figure 22
Rear Sill Inner Panel	Figure 23
Rear Sill	Figure 24
Front Door Ring (Inner Lower)	Figure 25
Door Lower Track and Lower B-pillar	Figure 26
Roof Panel With Sunroof (1 of 3)	Figure 27
Roof Panel With Sunroof (2 of 3)	Figure 28
Roof Panel With Sunroof (3 of 3)	Figure 29
Roof Panel Standard (1 of 2)	Figure 30
Roof Panel Standard (2 of 2)	Figure 31
Center and Mid Floor (Interior) Rear View	Figure 32
Center and Mid Floor (Interior) Front View	Figure 33
Center Floor and Front Floor Pan Underbody	Figure 34
Center and Mid Floor (Interior)	Figure 35
Upper Sliding Door Track Upper Reinforcement	Figure 36
Body Side Aperture (Top)	Figure 37
Mid Floor Pan	Figure 38
Floor Pan and Third Row Seat Tub Underbody (1 of 2)	Figure 39

DESCRIPTION	FIGURE
Mid Floor Pan and 3rd Row Seat Tub Underbody (2 of 2)	Figure 40
C-pillar and Outer Sill Panel	Figure 41
Rear Inner Wheelhouse	Figure 42
Rear Frame Rail	Figure 43
Rear Crossmember and Third Row Crossmember	Figure 44
Rear Inner Wheelhouse	Figure 45
Inner Wheelhouses	Figure 46
Left Rear Quarter Inner Panel	Figure 47
Right Rear Quarter Inner Panel	Figure 48
Outer Wheelhouses	Figure 49
Third Row Seat Tub	Figure 50
Closure Inner Panel	Figure 51
Rear Rail Reinforcement	Figure 52
Rear Interior	Figure 53
Rear Header Panel	Figure 54
Outer D-pillar	Figure 55
Closure Inner Extension	Figure 56
Rear Quarter Panel Extension	Figure 57
Liftgate Drain Trough Panel	Figure 58
Rear Closure Outer Panel	Figure 59
Rear Closure and Liftgate Drain Trough	Figure 60



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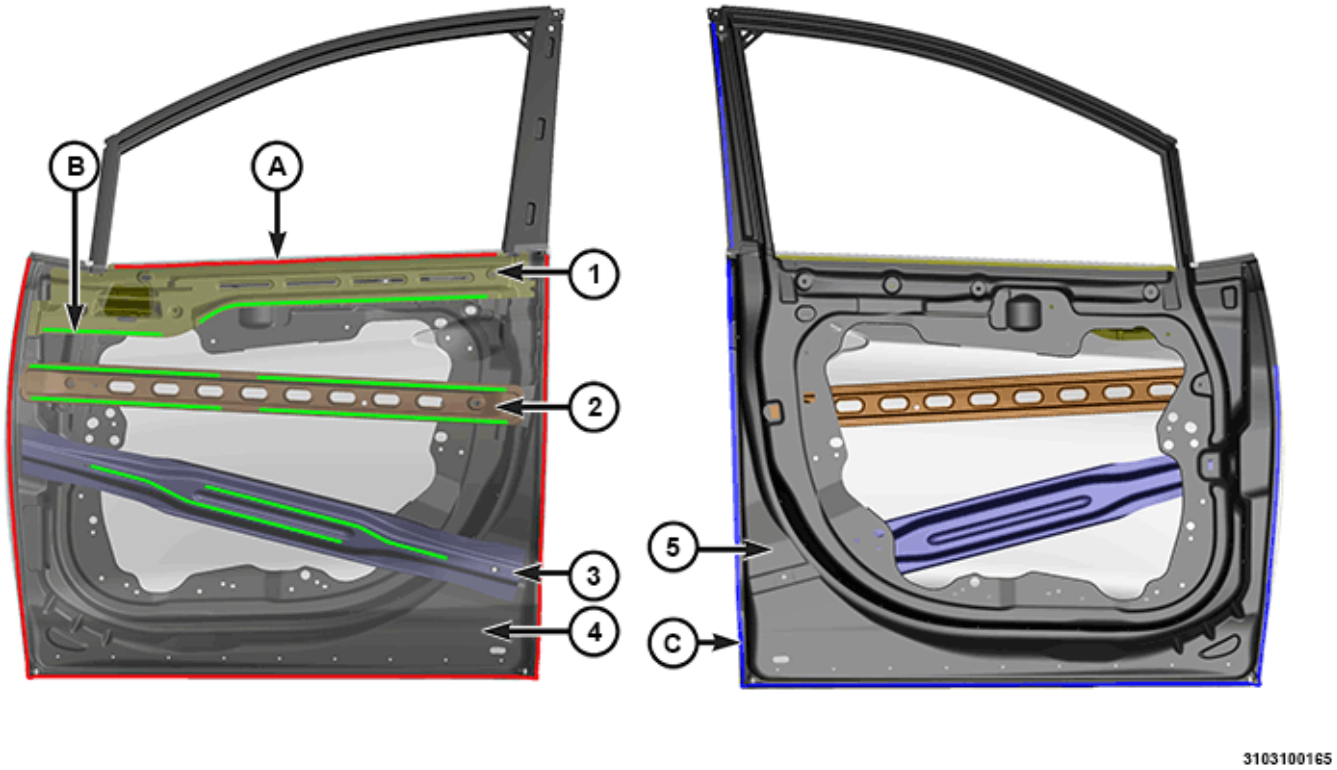
Hood

1- Inner Hood Panel
2- Inner Hood Slam Reinforcement
3- Left Hood Hinge Reinforcement
4- Right Hood Hinge Reinforcement
A- Structural Adhesive
B- Anti-Flutter Adhesive
C- Seam Sealer



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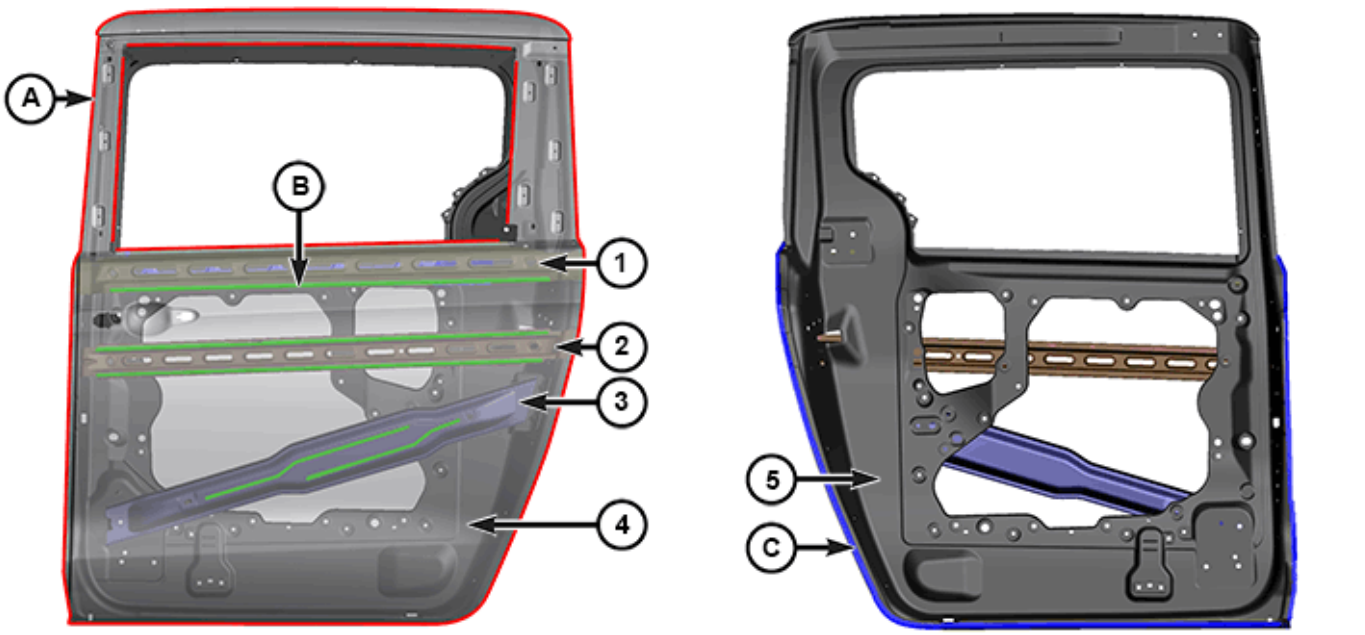
Front Door

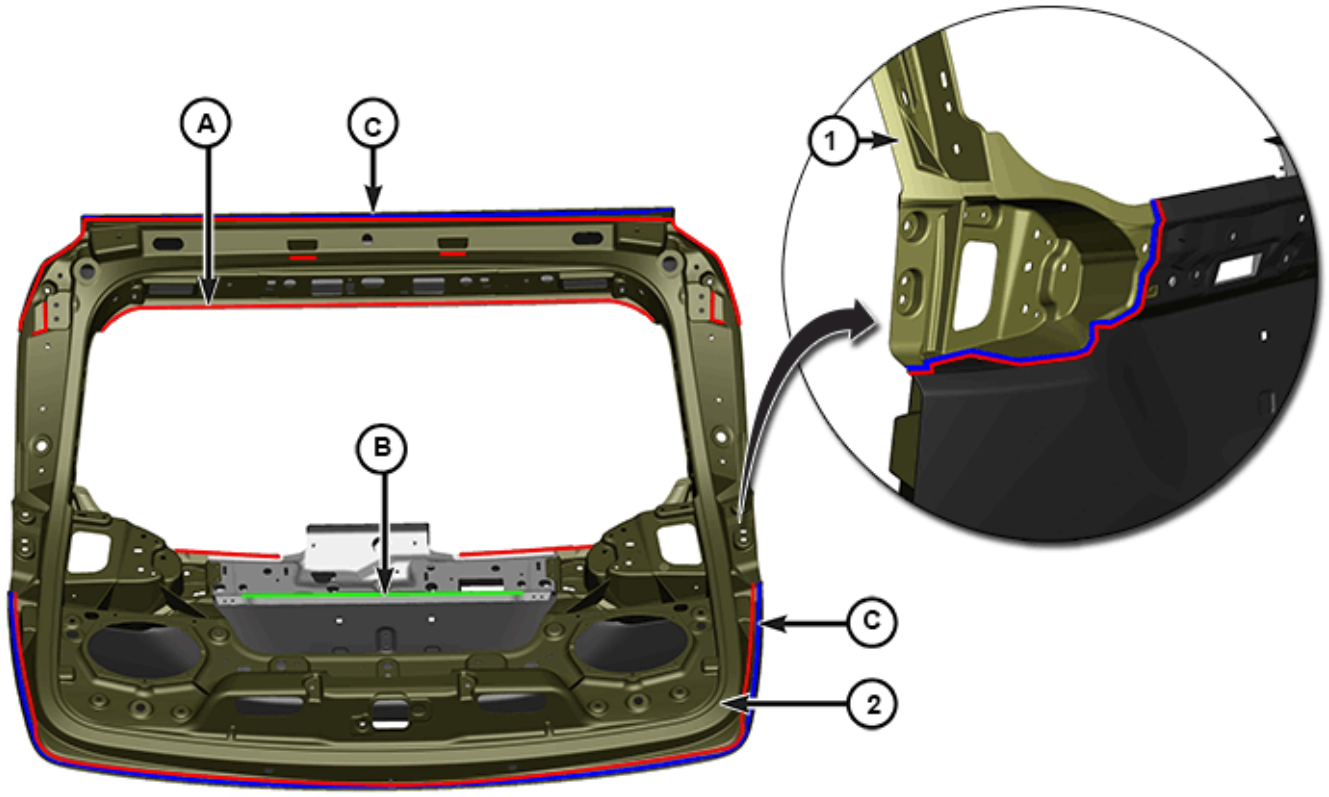
1- Outer Belt Reinforcement
2- Stiffener Beam
3- Impact Reinforcement Beam
4- Front Door Outer Panel (Transparent for clarity)
5- Inner Front Door Panel
A- Structural Adhesive
B- Anti-Flutter Adhesive
C- Seam Sealer



3103100164

Sliding Door

1- Outer Belt Reinforcement
2- Anti-Flutter Beam
3- Impact Reinforcement Beam
4- Sliding Door Outer Panel (Transparent for clarity)
5- Sliding Door Inner Panel
A- Structural Adhesive
B- Anti-Flutter Adhesive
C- Seam Sealer



Liftgate

NOTE: Left side Taillamp Pocket (1) shown, right side similar

1- Liftgate Taillamp Pocket
2- Liftgate Inner Panel
A- Structural Adhesive
B- Anti-Flutter Adhesive
C- Seam Sealer

WARNING: There are necessary safety factors to follow when working with components made of magnesium and components made of a combination of materials utilizing magnesium that must be followed.

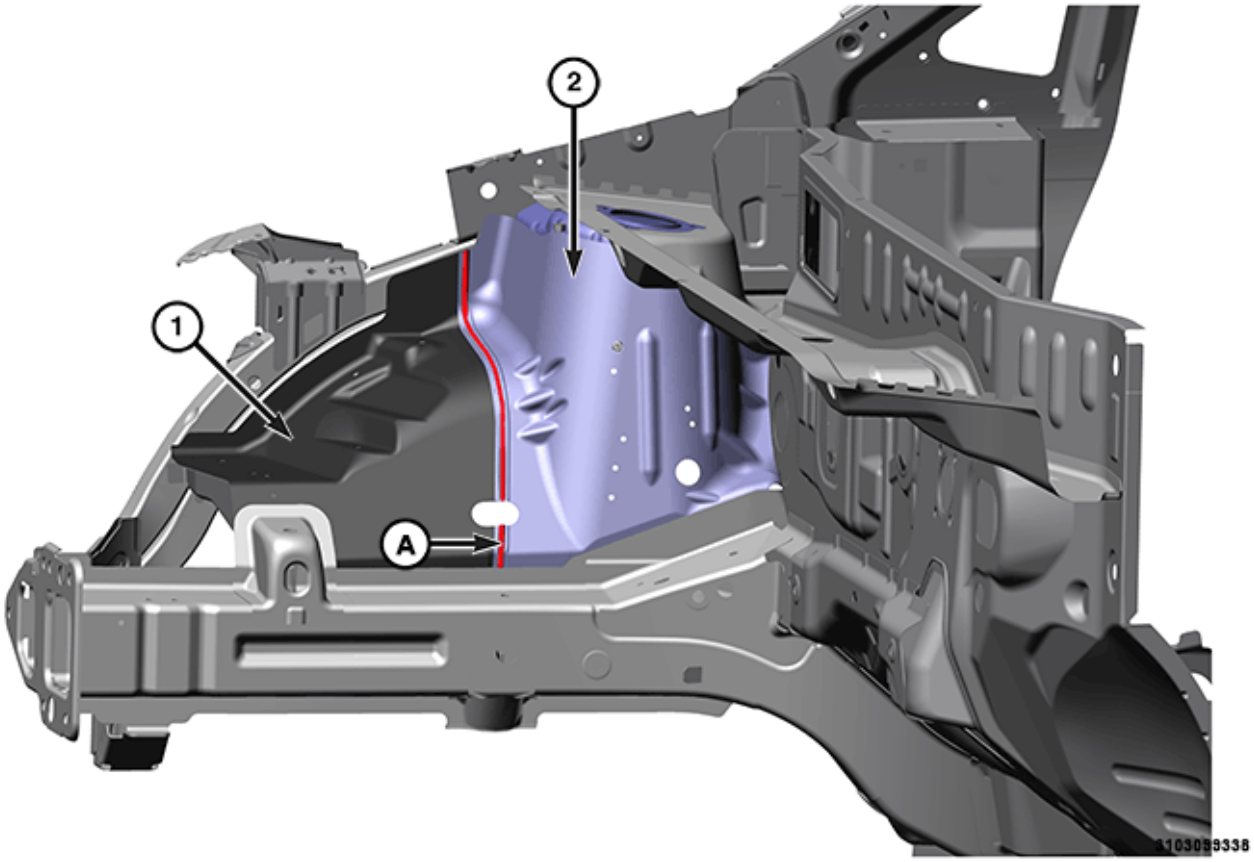
- Do not grind on the component. The grinding residue is highly combustible.
- In the event of a fire, a D-class rated fire extinguisher is necessary to extinguish.
- Do not expose the component to open flame or temperature in excess of 260° C. (500° F).

Failure to follow these instructions may cause serious injury or death.

NOTE: Due to the usage of magnesium, do not attempt to repair the liftgate inner panel (1) and liftgate taillamp pocket (2). For further information refer to Inner Liftgate DO NOT REPAIR (Refer to 31 - Collision/Standard Procedure/Non-Structural Sheet Metal Repair/Inner Liftgate Do Not Repair).

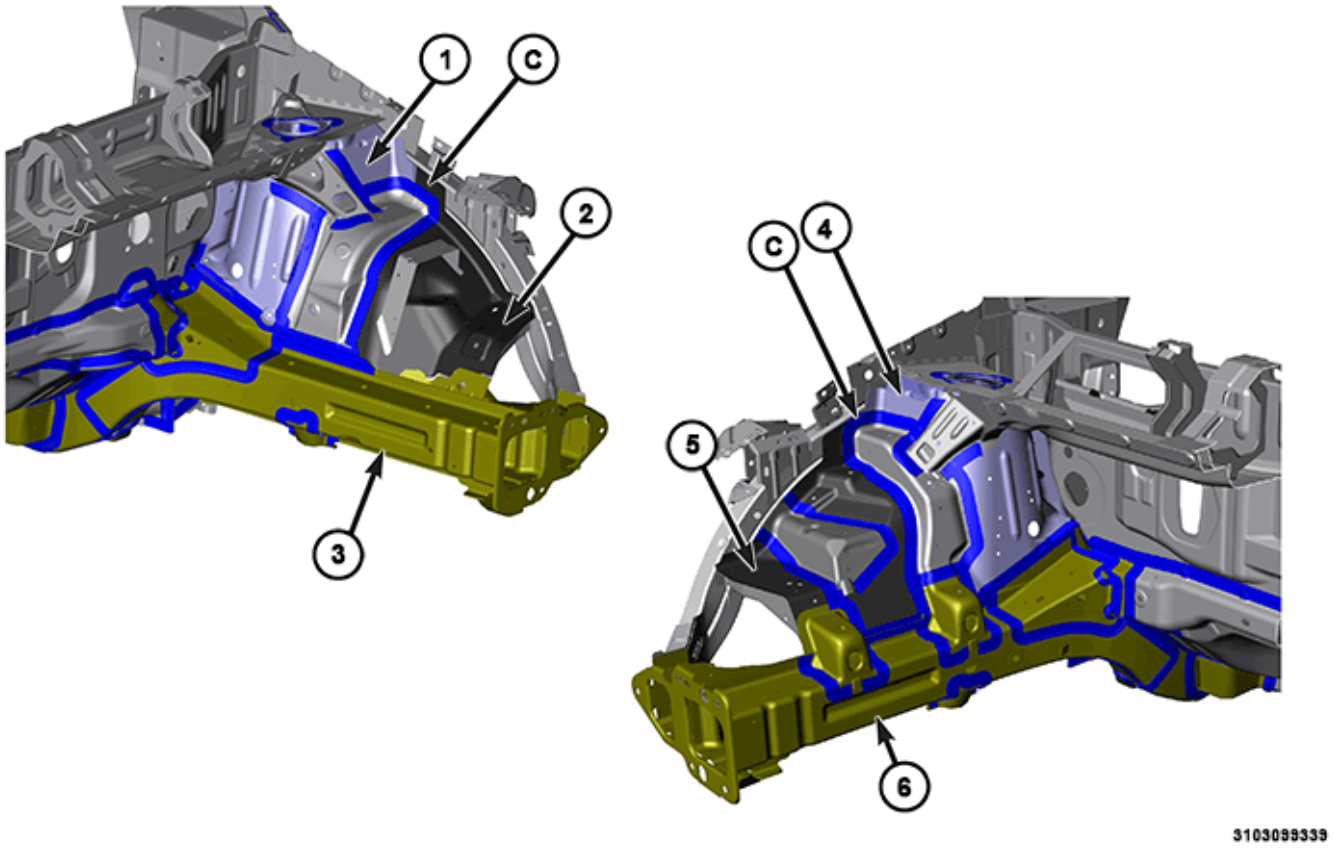
The textured finish differs from a smooth finish typically found on closure panels.

- The texture is produced from the casting of the component as compared to smooth stamped sheet metal.
- This finish is completely normal and acceptable.
- Do not remove the textured finish to produce a smooth finished appearance.



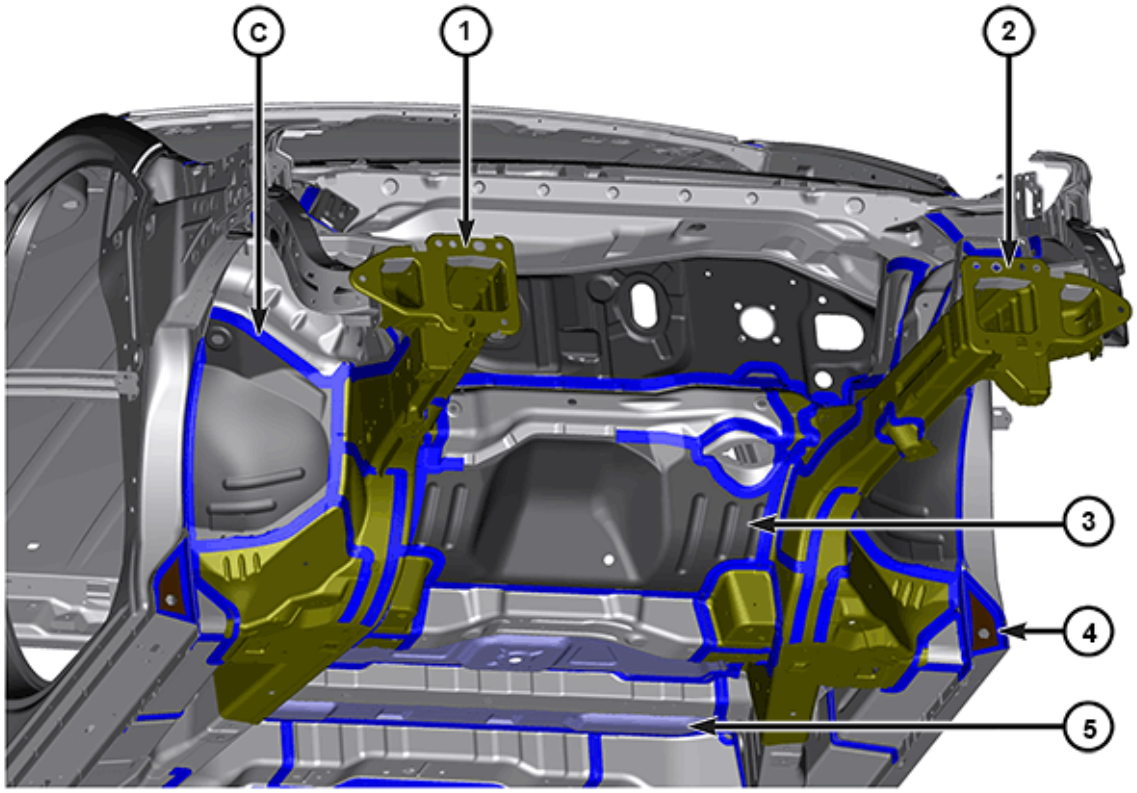
Front Wheelhouse Panel

1- Front Wheelhouse Panel
2- Front Suspension Tower
A- Structural Adhesive



Engine Box

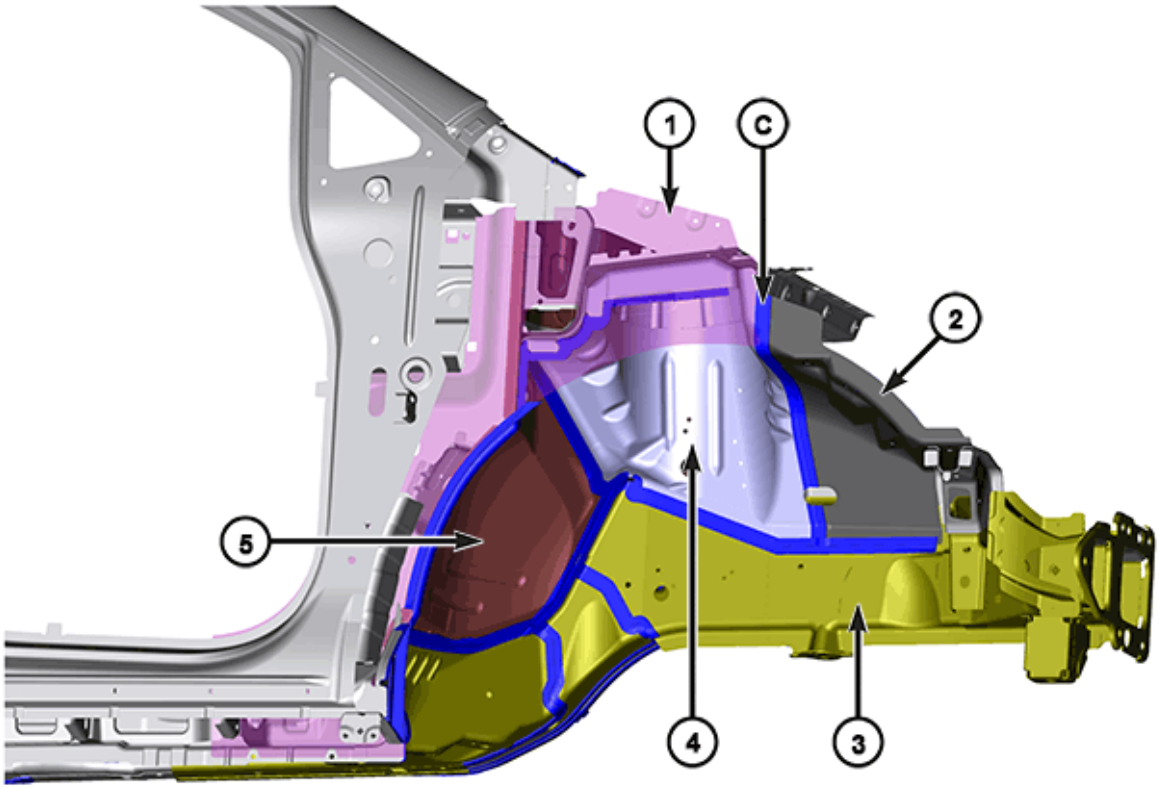
1- Left Suspension Tower
2- Left Front Wheelhouse Panel
3- Left Front Frame Rail
4- Right Suspension Tower
5- Right Front Wheelhouse
6- Right Front Frame Rail
C- Seam Sealer



3103100155

Engine Box (Lower View)

1- Right Front Rail
2- Left Front Rail
3- Dash Panel
4- Outer Sill Front End Cap
5- Front Floor Pan
C- Seam Sealer

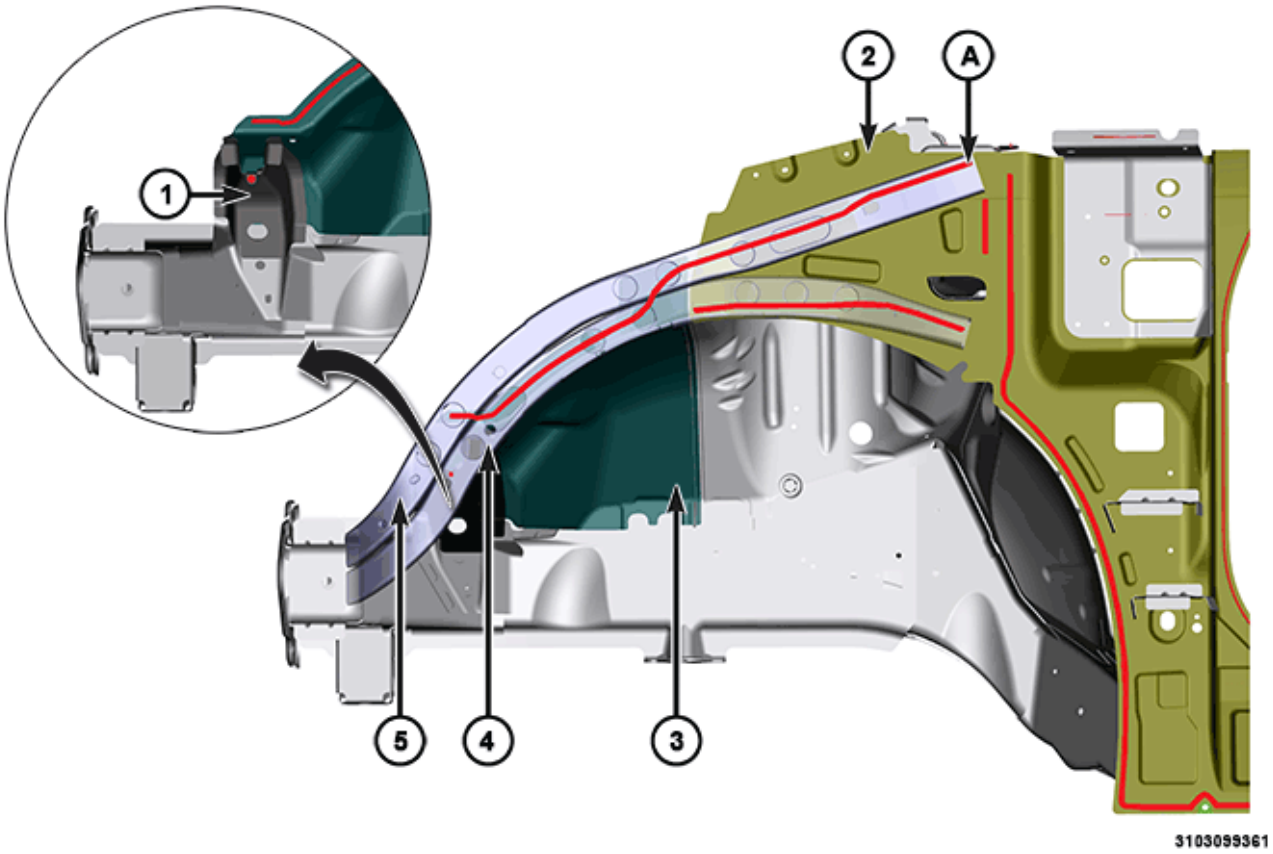


3103099340

Front Wheelhouse Outer

NOTE: Right side shown. Left side similar.

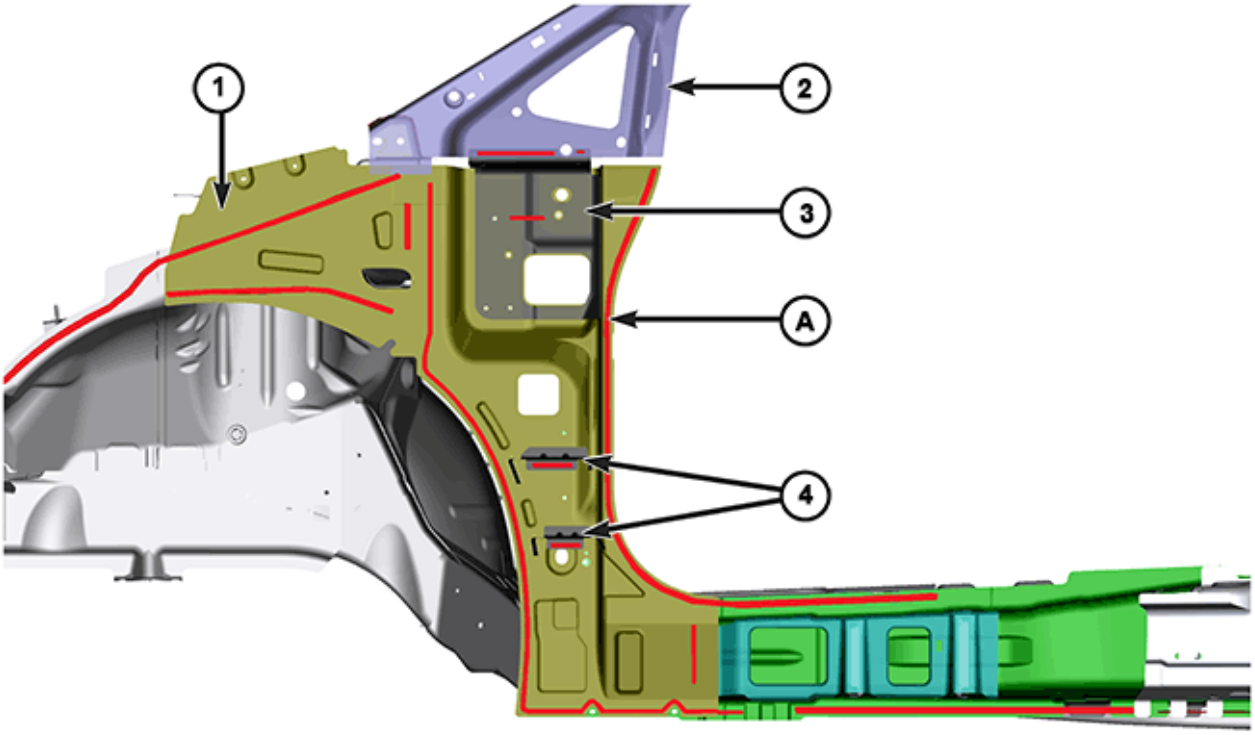
1- Cowl Side Panel (Transparent for clarity)
2- Front Wheelhouse
3- Front Frame Rail
4- Front Suspension Tower
5- Dash Panel
C- Seam Sealer



Cowl Side Panel and Load Path Beam

NOTE: Left side shown, right side similar.

1- Load Beam Bracket
2- Cowl Side Panel
3- Front Wheelhouse Panel
4- Lower Load Beam
5- Upper Load Beam
A- Structural Adhesive



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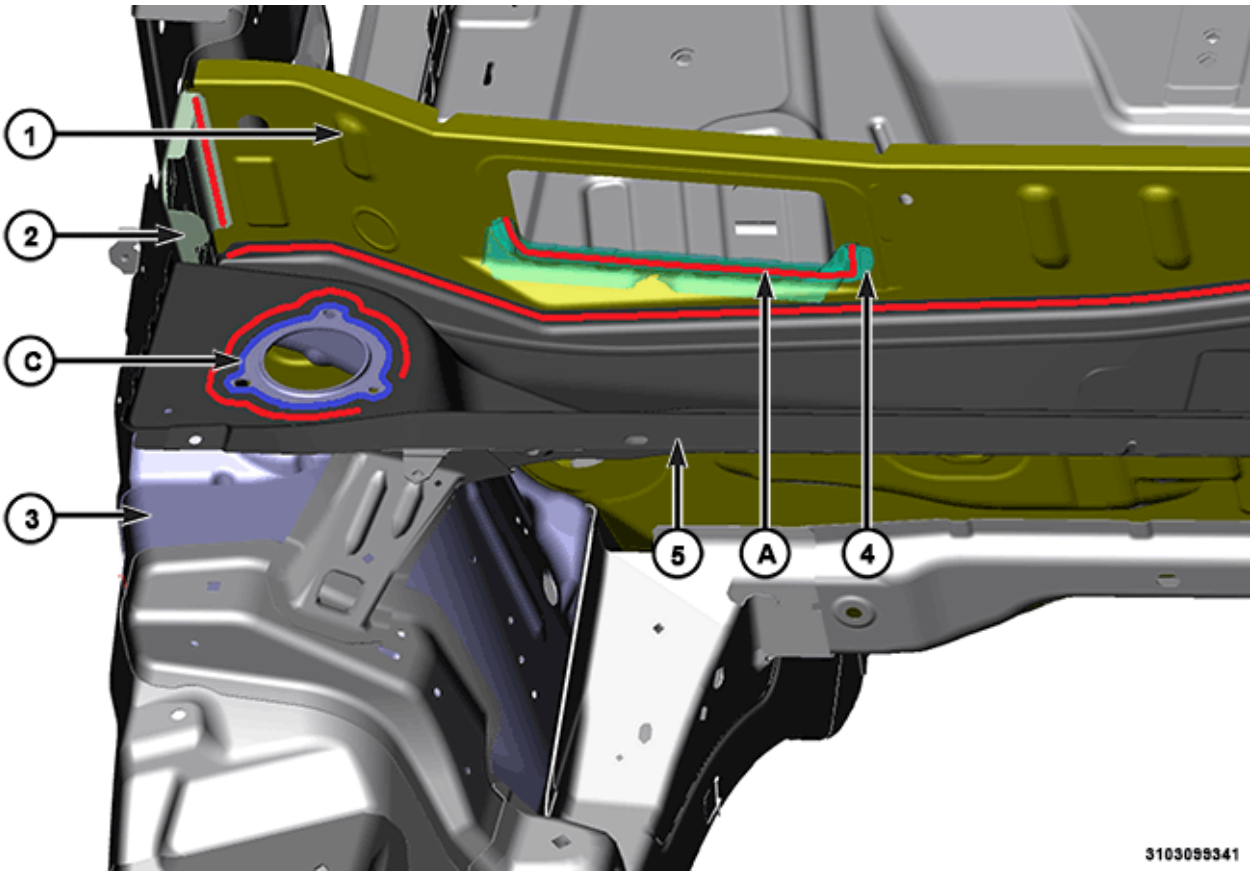
Cowl Side Panel

NOTE: Left side shown, right side similar.

1- Cowl Side Panel
2- Inner A-pillar Panel
3- Instrument Panel Tapping Plate Bracket
A- Structural Adhesive

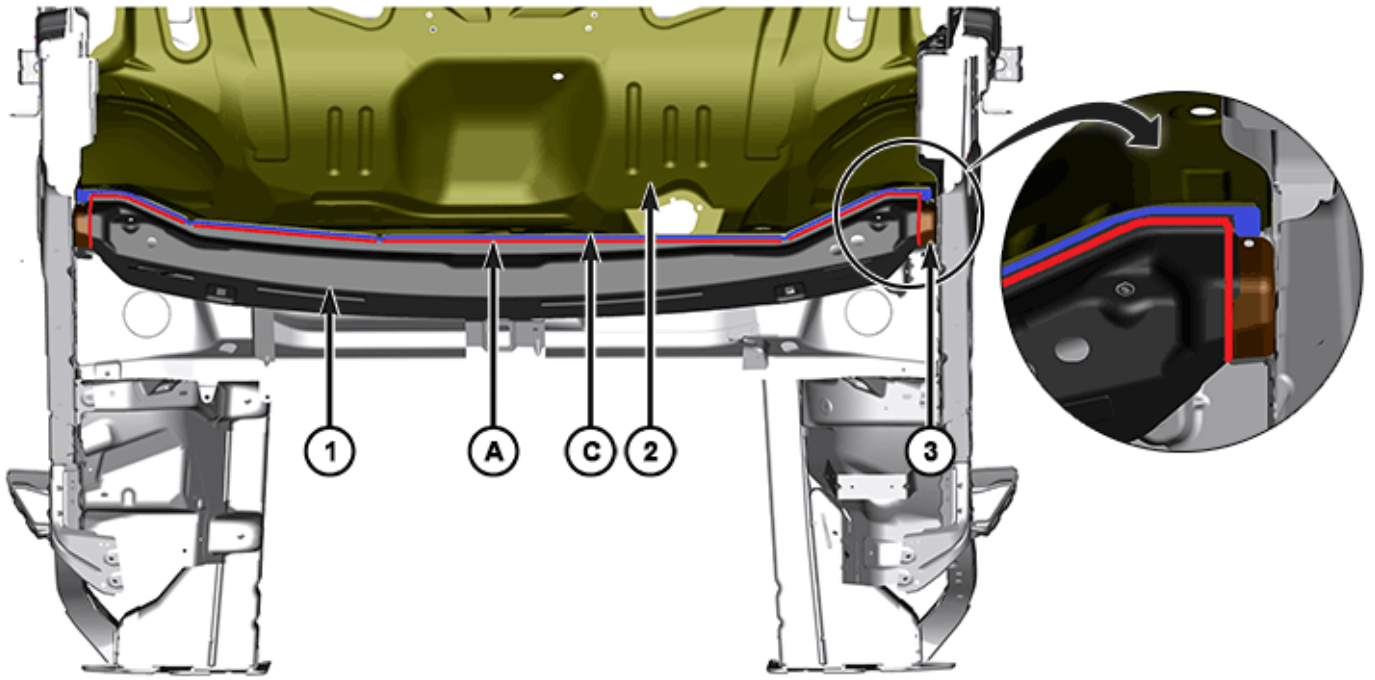


Plenum/Dash Panel

NOTE: Right side view shown, left side similar.

NOTE: HVAC Inlet Air Dam (4) is located on right side only

1- Dash Panel
2- Plenum Side Gusset
3- Front Suspension Tower
4- HVAC Inlet Air Dam (Transparent for clarity)
5- Cowl Plenum Lower
A- Structural Adhesive
C- Seam Sealer



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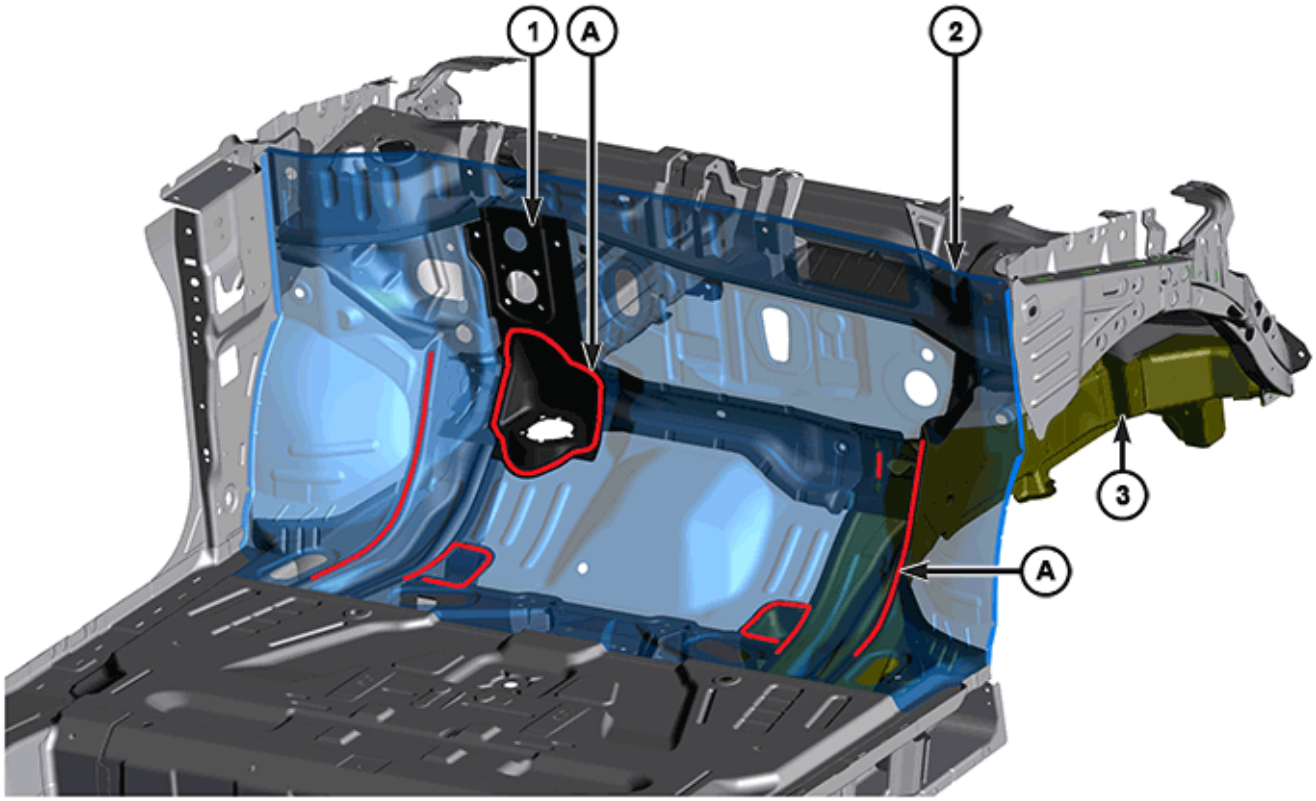
Cowl Plenum/Dash Panel

1- Cowl Plenum Panel
2- Dash Panel
3- A-pillar Flag Reinforcement
A- Structural Adhesive
C- Seam Sealer



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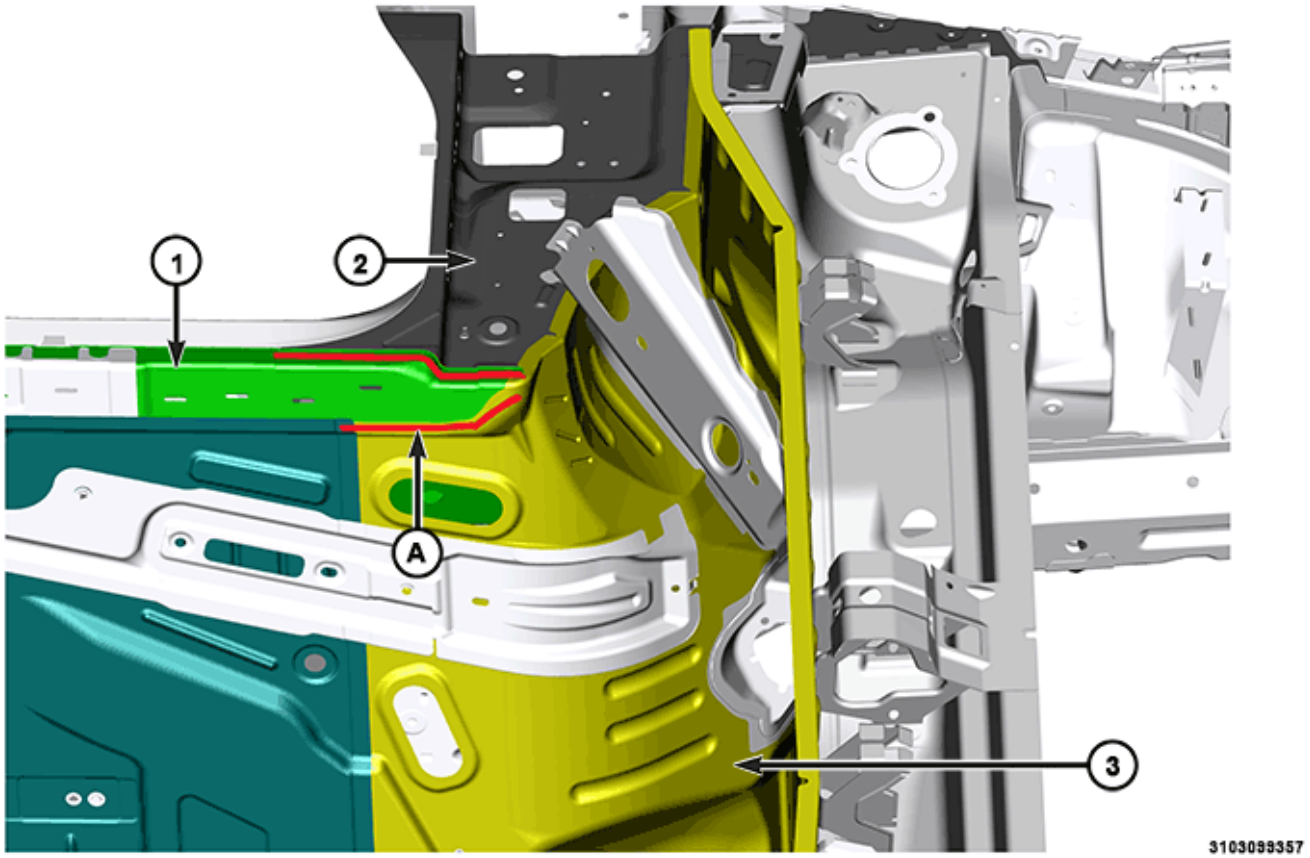
Dash Panel (Interior)

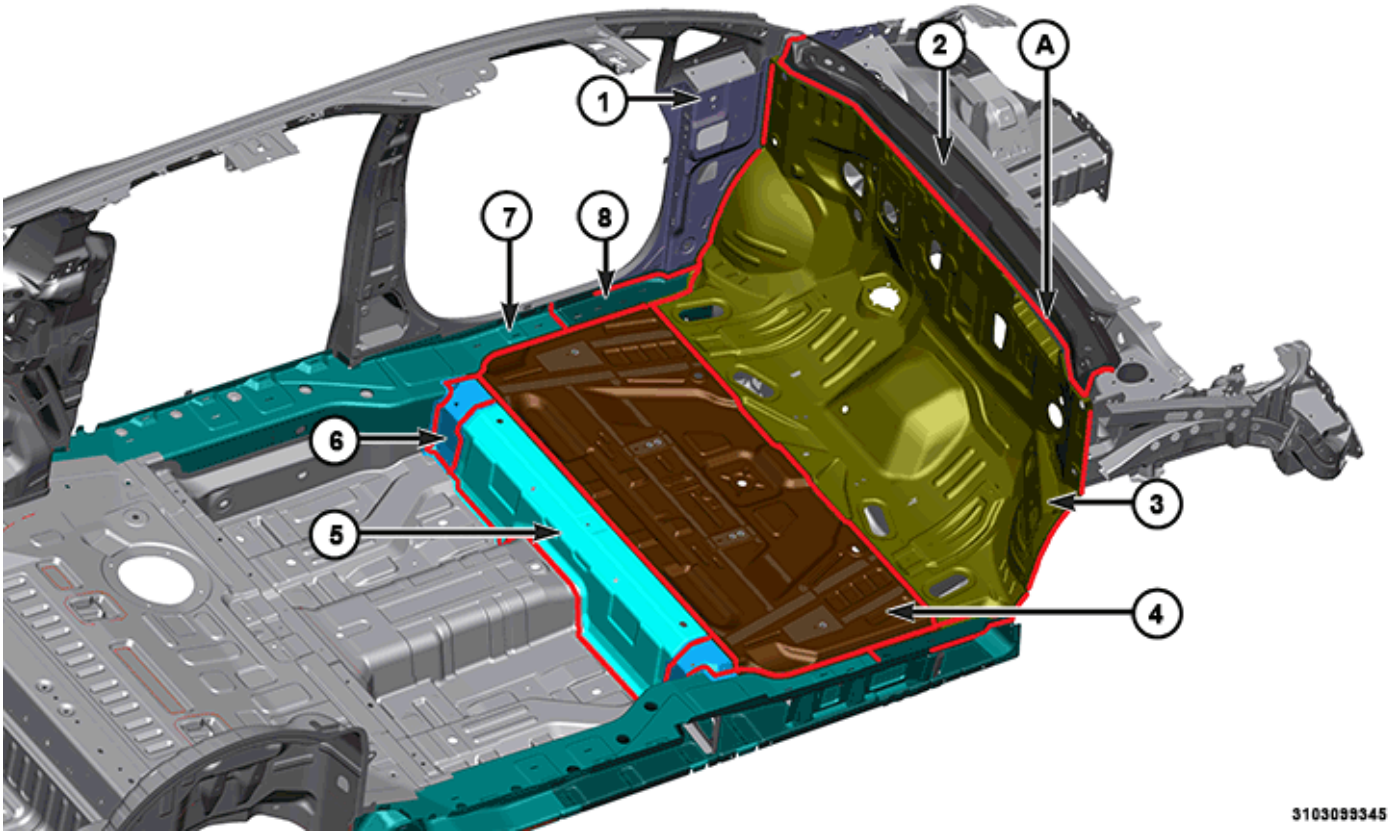
1- Break Pedal Bracket Reinforcement
2- Dash Panel (Transparent for clarity)
5- Front Frame Rail
A- Structural Adhesive



Sill Inner Reinforcement

NOTE: Left side view shown, right side similar.

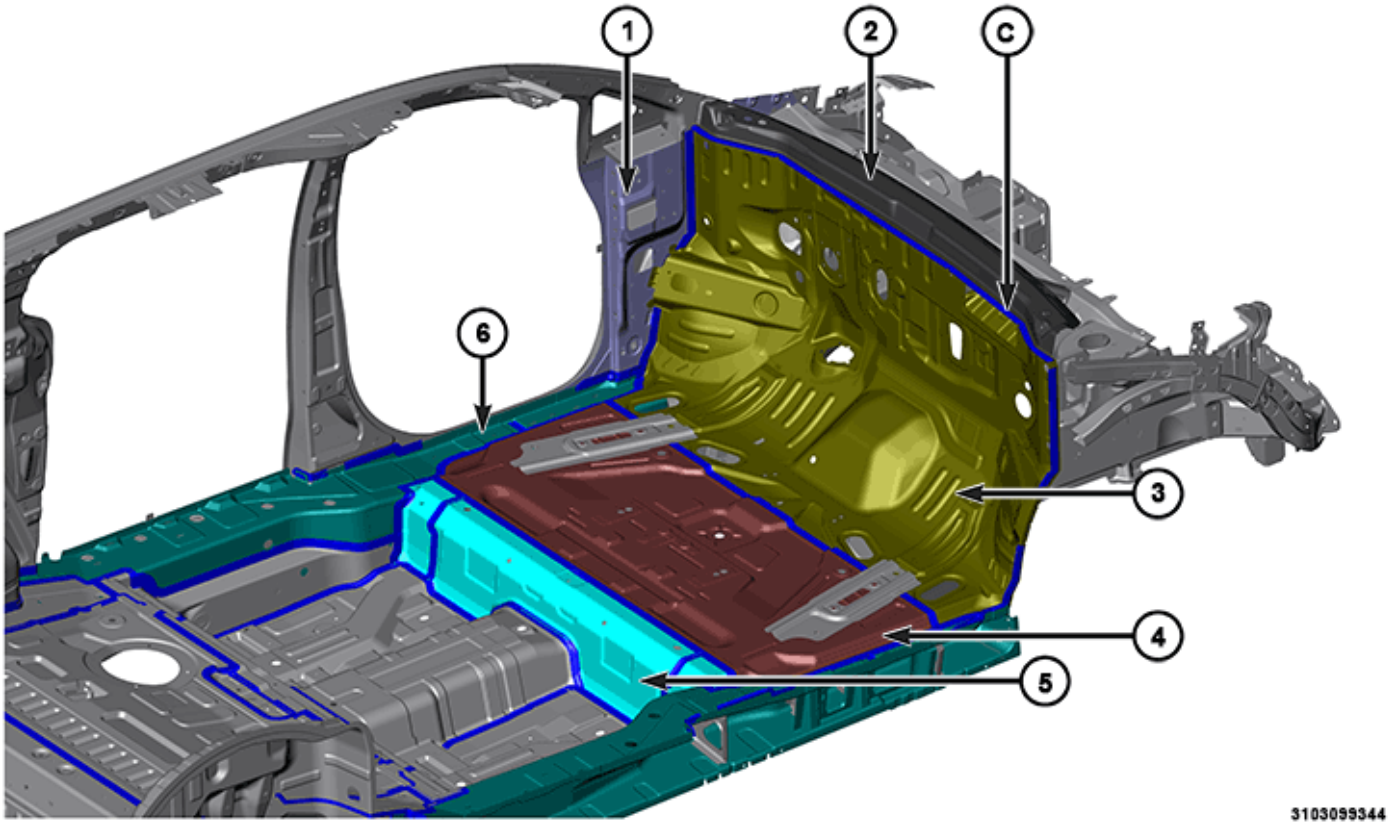
1- Sill Inner Reinforcement
2- Cowl Side Panel
3- Dash Panel
A- Structural Adhesive



Dash Panel and Front Floor (Interior) (1 of 2)

NOTE: Left side view shown, right side similar.

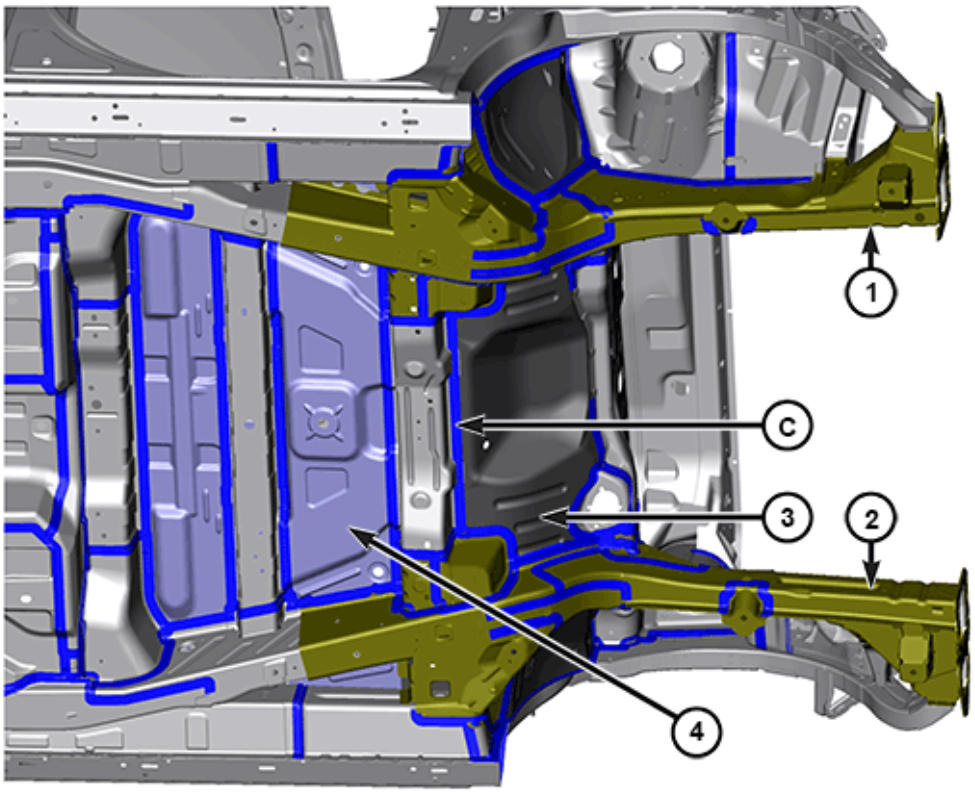
1- Cowl Side Panel
2- Cowl Plenum Panel
3- Dash Panel
4- Front Floor Pan
5- Second Row Seat Tub Front Crossmember
6- Second Row Seat Tub Front Crossmember Extension
7- Inner Sill Panel
8- Sill Inner Reinforcement
A- Structural Adhesive



Dash Panel and Front Floor (Interior) (2 of 2)

NOTE: Left side view shown, right side similar.

1- Cowl Side Panel
2- Cowl Plenum Panel
3- Dash Panel
4- Front Floor Pan
5- Second Row Seat Tub Front Crossmember
6- Inner Sill Panel
C- Seam Sealer



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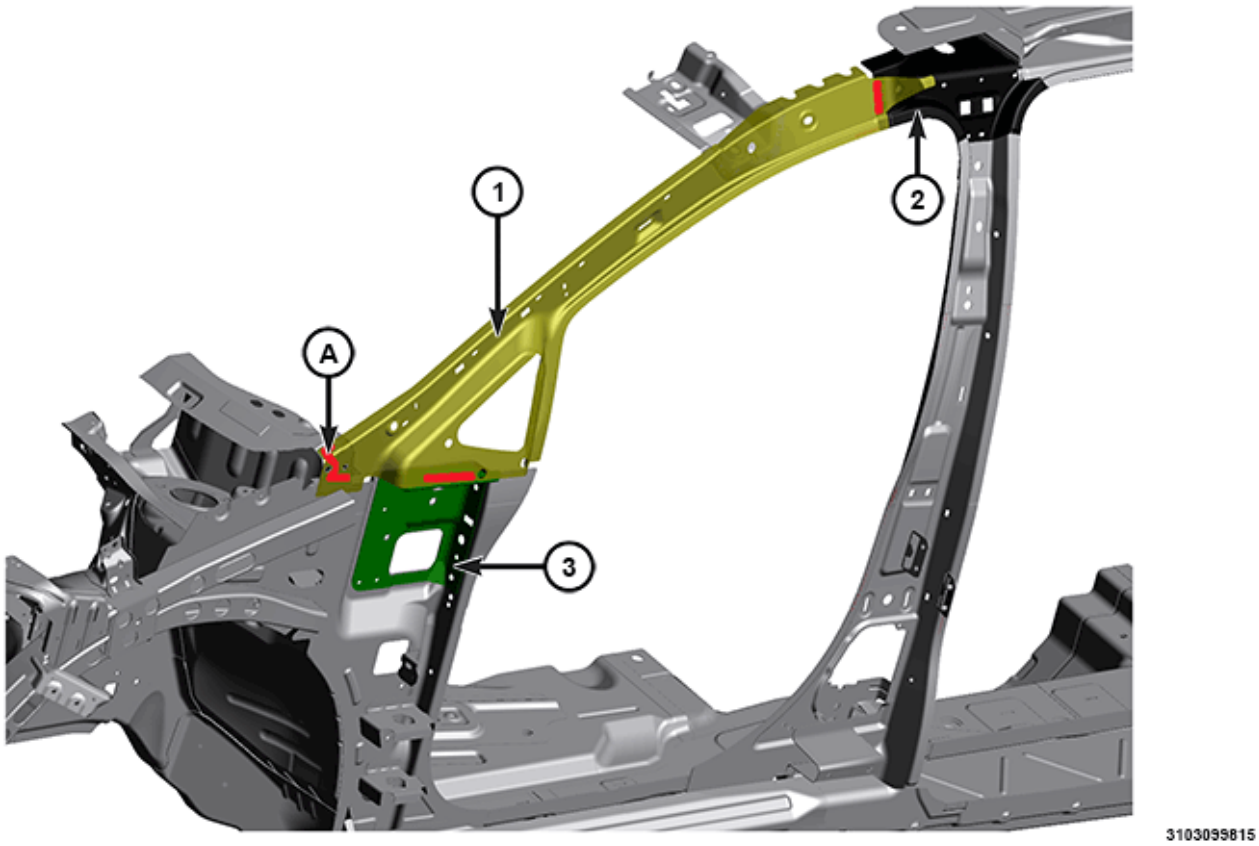
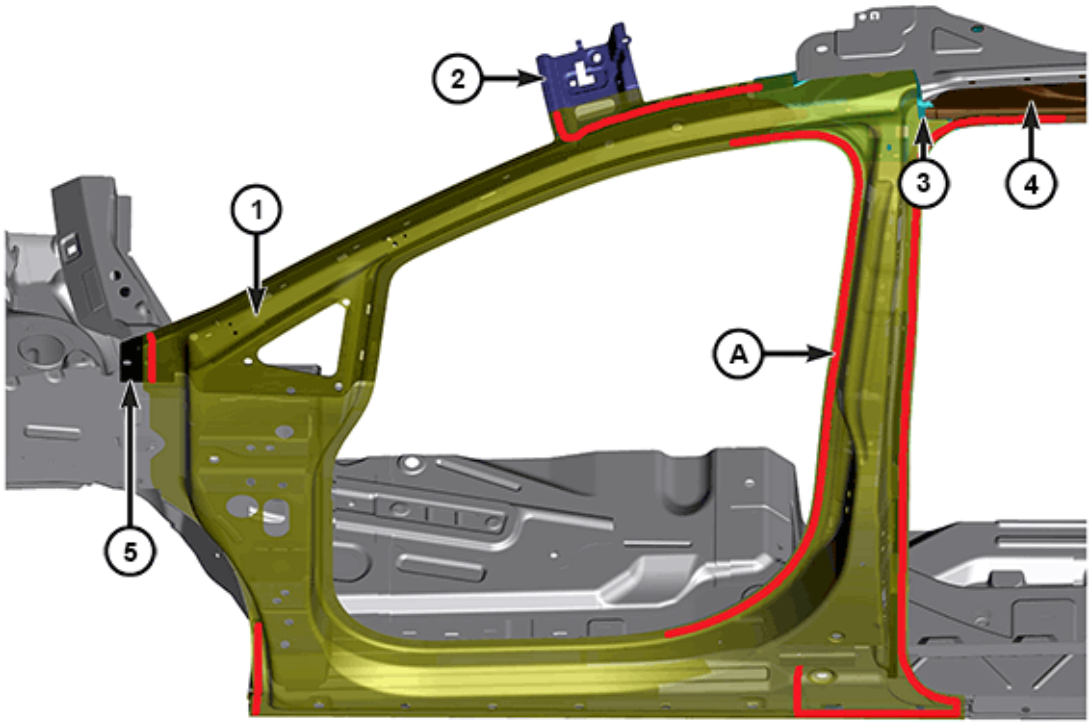
Front Floor Underbody

1- Right Front Rail
2- Left Front Rail
3- Dash Panel
4- Front Floor Pan
C- Seam Sealer



Inner A-pillar Panel

1- Inner A-pillar Panel (Transparent for clarity)
2- T-bone Roof Side Rail Inner
3- Instrument Panel Tapping Plate Bracket
A- Structural Adhesive



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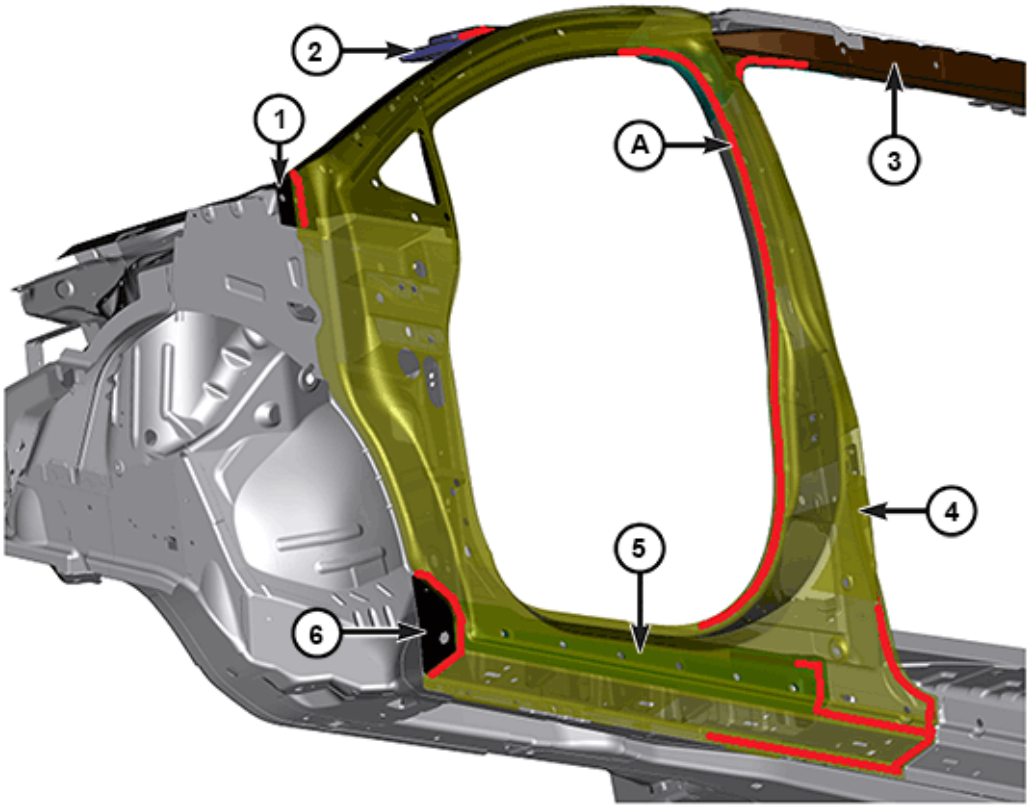
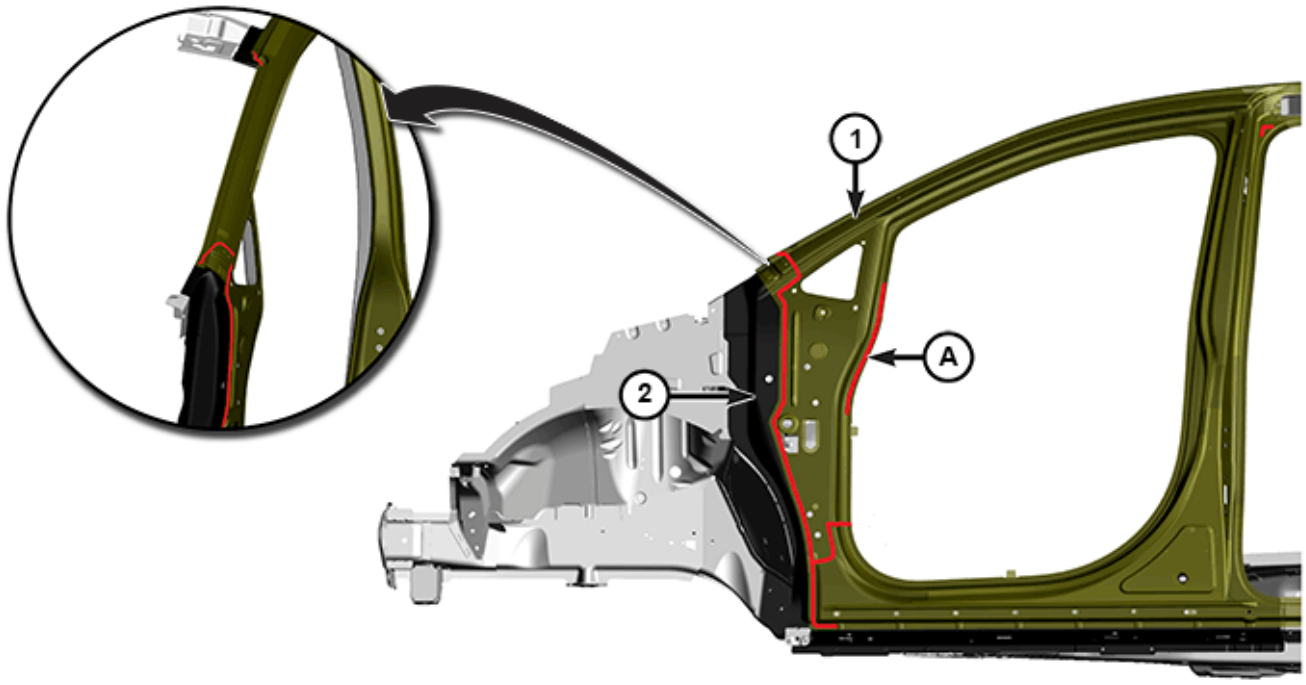
Front Door Ring Reinforcement (1 of 2)

1- Front Door Ring Reinforcement (Transparent for clarity)
2- Front Header Extension
3- T-bone Roof Side Rail Inner
4- Upper Sliding Door Track Reinforcement
5- A-pillar Inner Panel
A- Structural Adhesive



Front Door Ring Reinforcement (2 of 2)

1- A-pillar Inner Panel
2- Front Header Extension
3- Upper Sliding Door Track Reinforcement
4- Front Door Ring Reinforcement (Transparent for clarity)
5- Outer Sill Front Reinforcement
6- Outer Sill Front End Cap
A- Structural Adhesive



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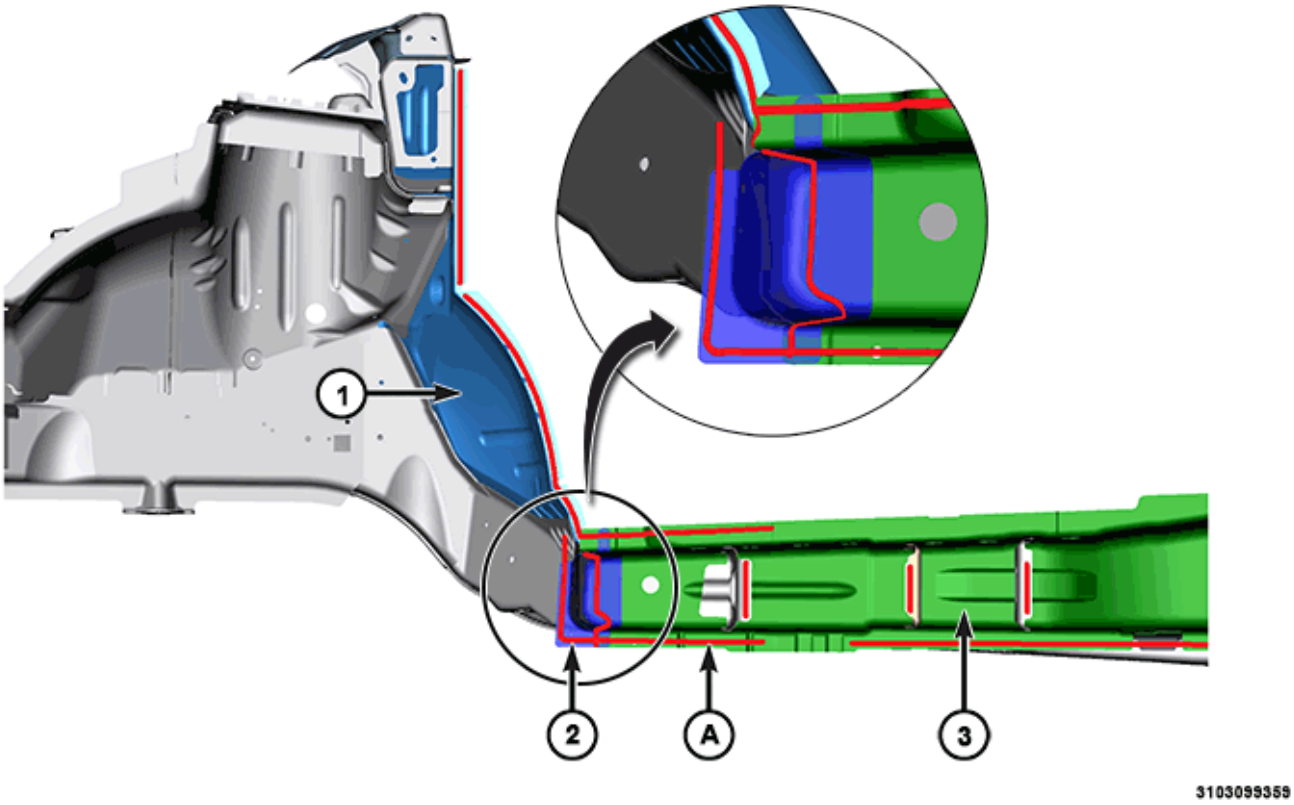
Body Side Aperture Front

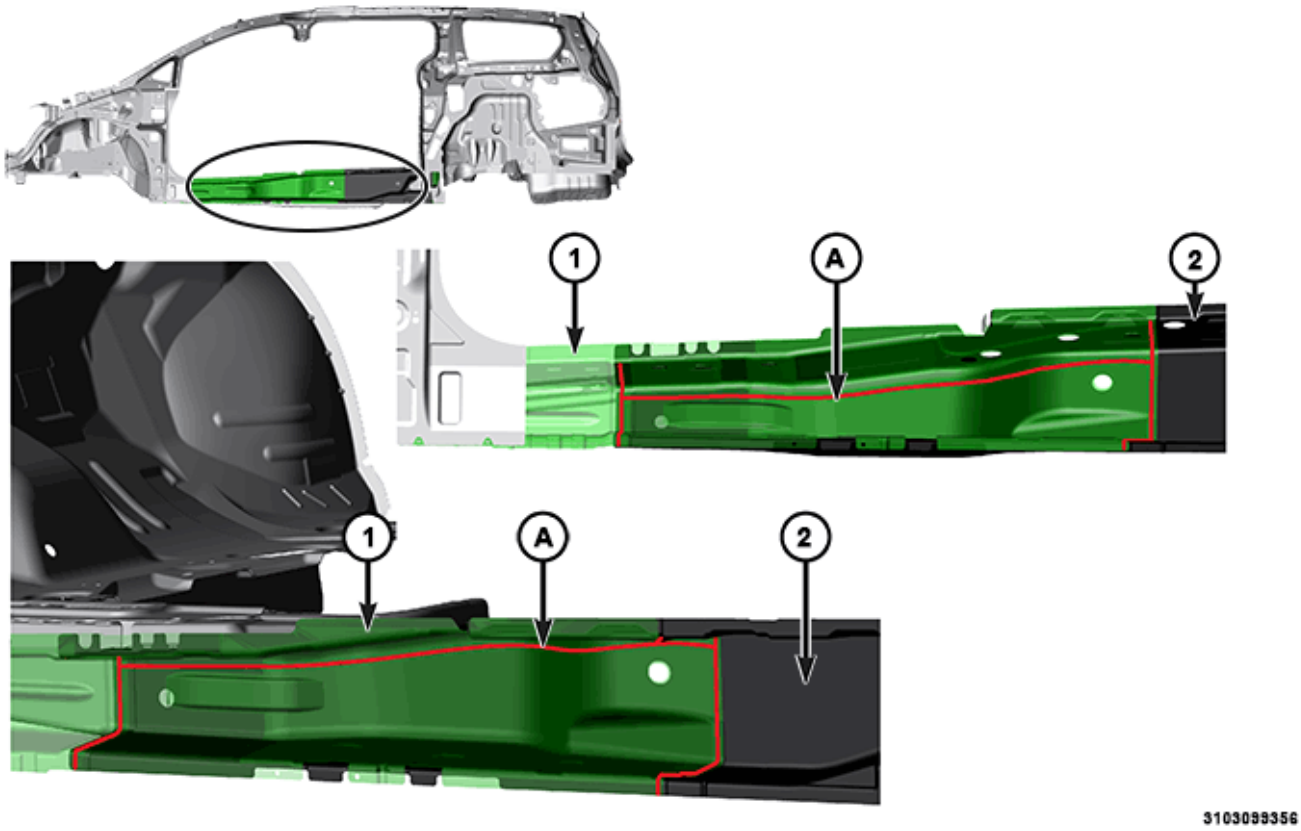
1- Body Side Aperture (Transparent for clarity)
2- Front Door Ring Reinforcement
A- Structural Adhesive



Sill Inner Reinforcement

NOTE: Left side shown, right side similar.

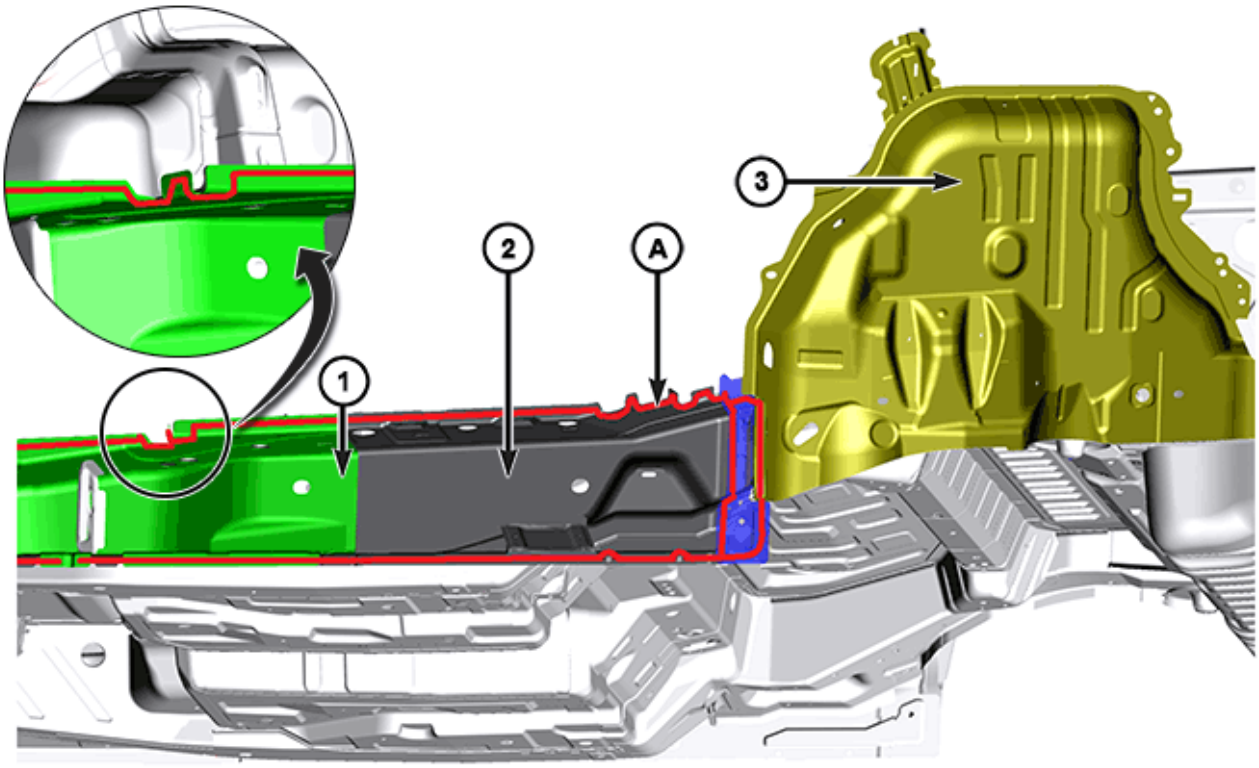
1- Dash Panel
2- Inner Sill Front End Cap (Transparent for clarity)
3- Inner Sill Reinforcement
A- Structural Adhesive



Rear Sill Inner Panel

NOTE: Left side shown. right side similar.

1- Sill Inner Reinforcement (Transparent for clarity)
2- Rear Inner Sill Panel
A- Structural Adhesive



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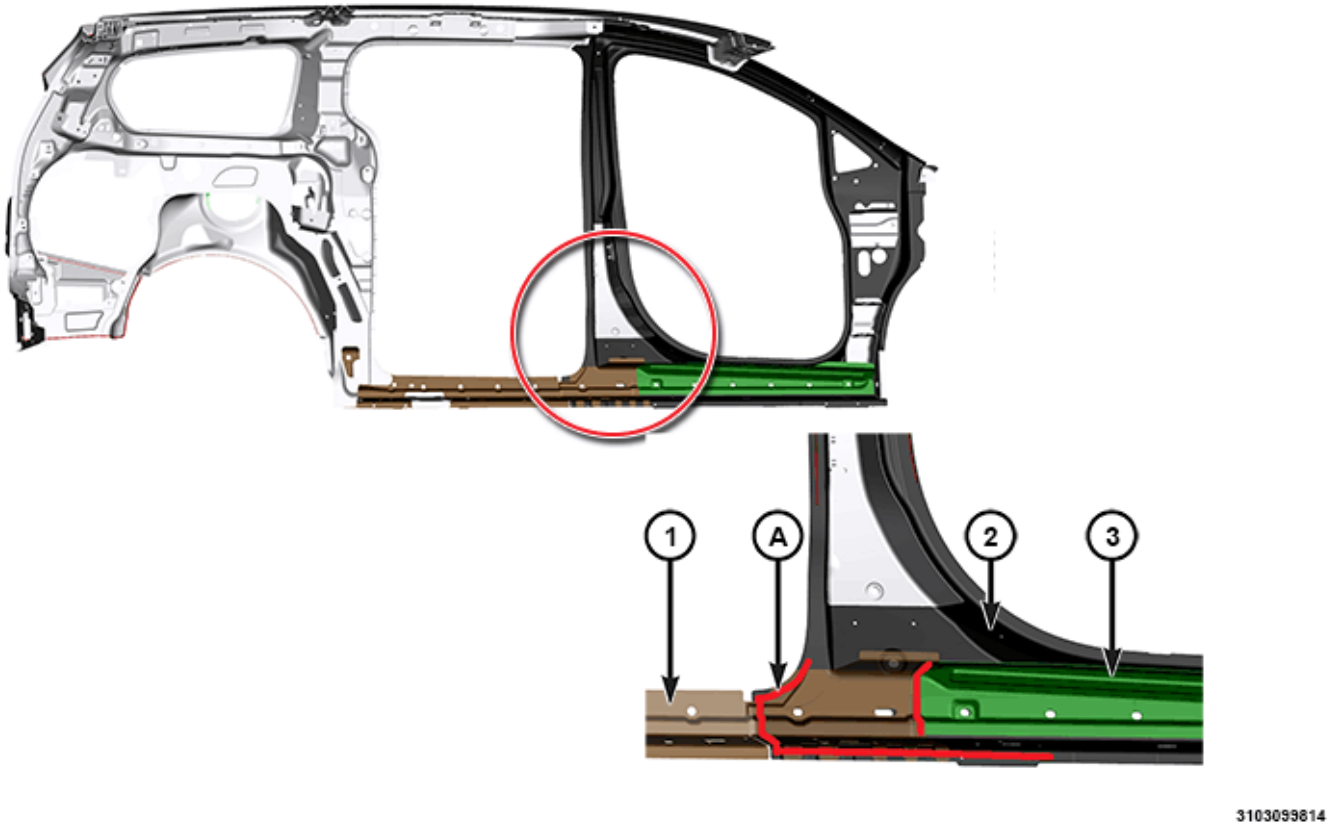
Rear Sill

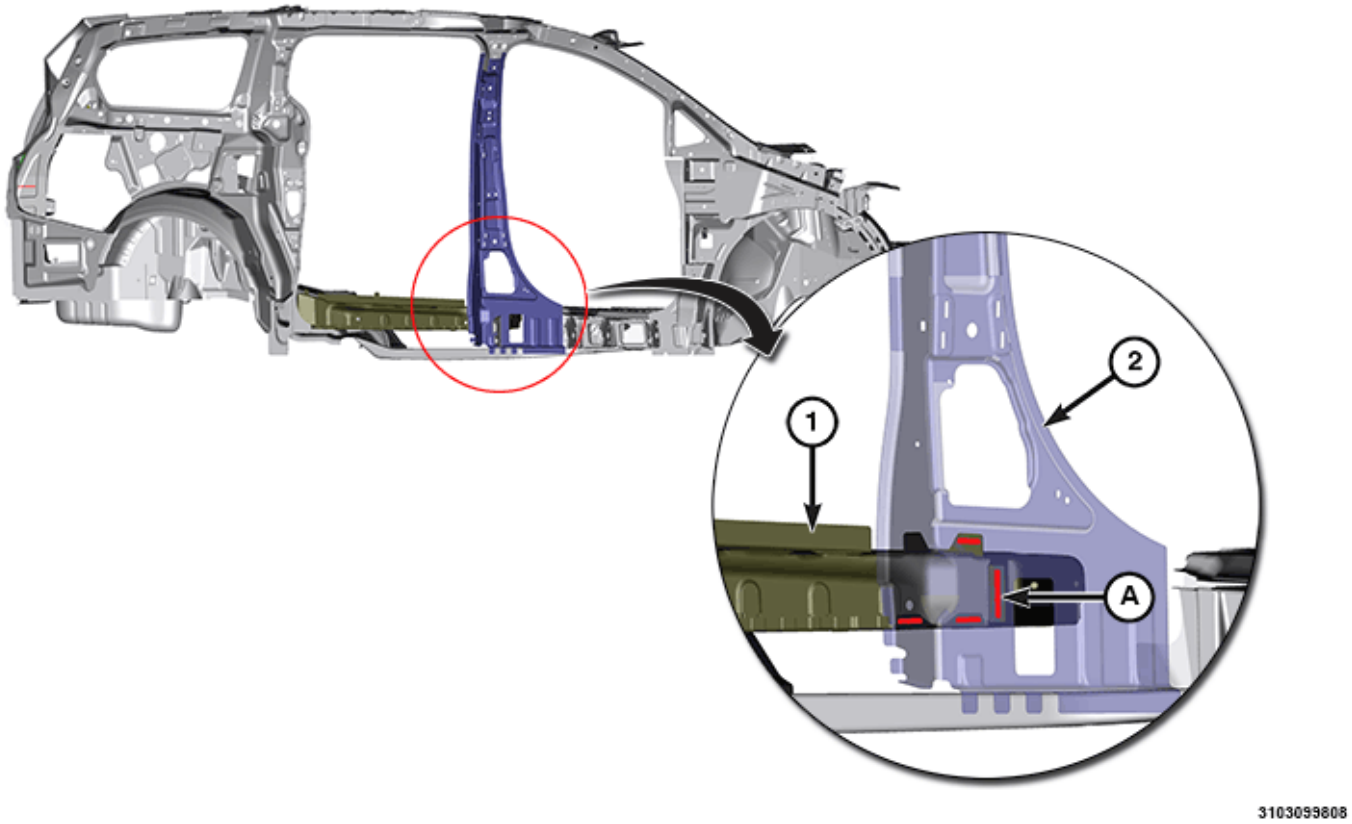
NOTE: Left side shown, right side similar.

1- Sill Inner Reinforcement
2- Sill Inner Panel
3- Inner Wheelhouse Panel
A- Structural Adhesive



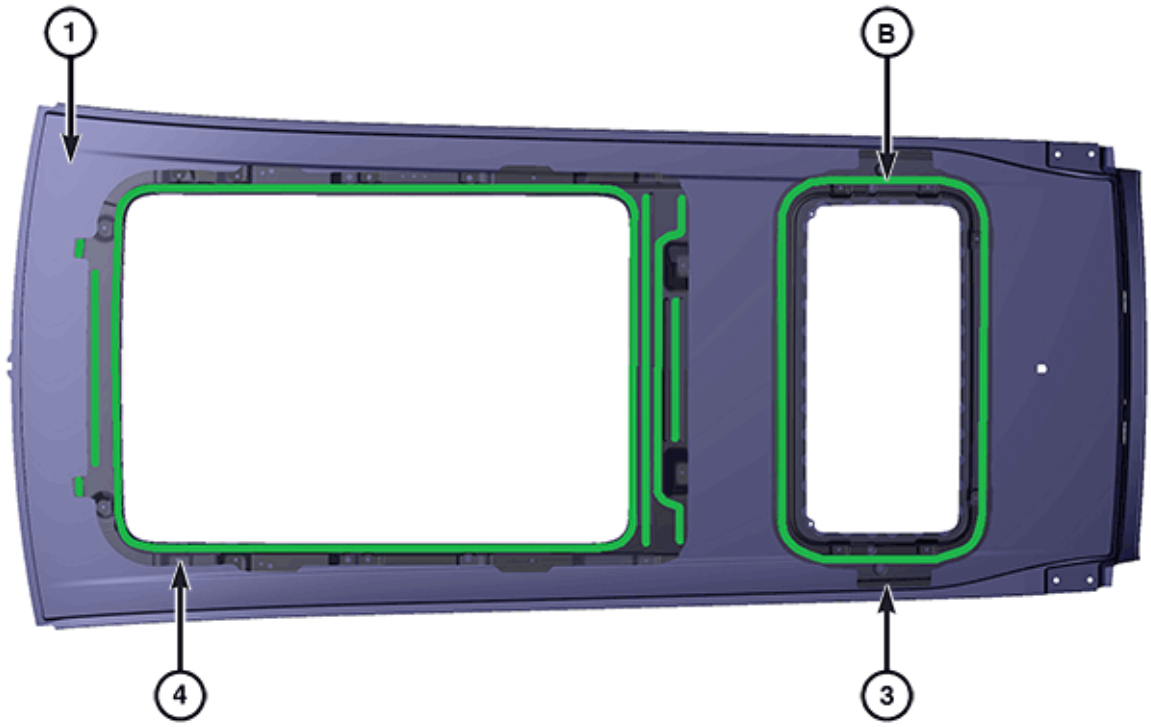
Front Door Ring (Inner Lower)

1- Sill Outer Rear Reinforcement (Transparent for clarity)
2- Front Door Ring Reinforcement
3- Sill Outer Front Reinforcement
A- Structural Adhesive



Sliding Door Lower Track and Lower B-pillar

1- Sliding Door Lower Track
2- Inner B-pillar Panel (Transparent for clarity)
A- Structural Adhesive



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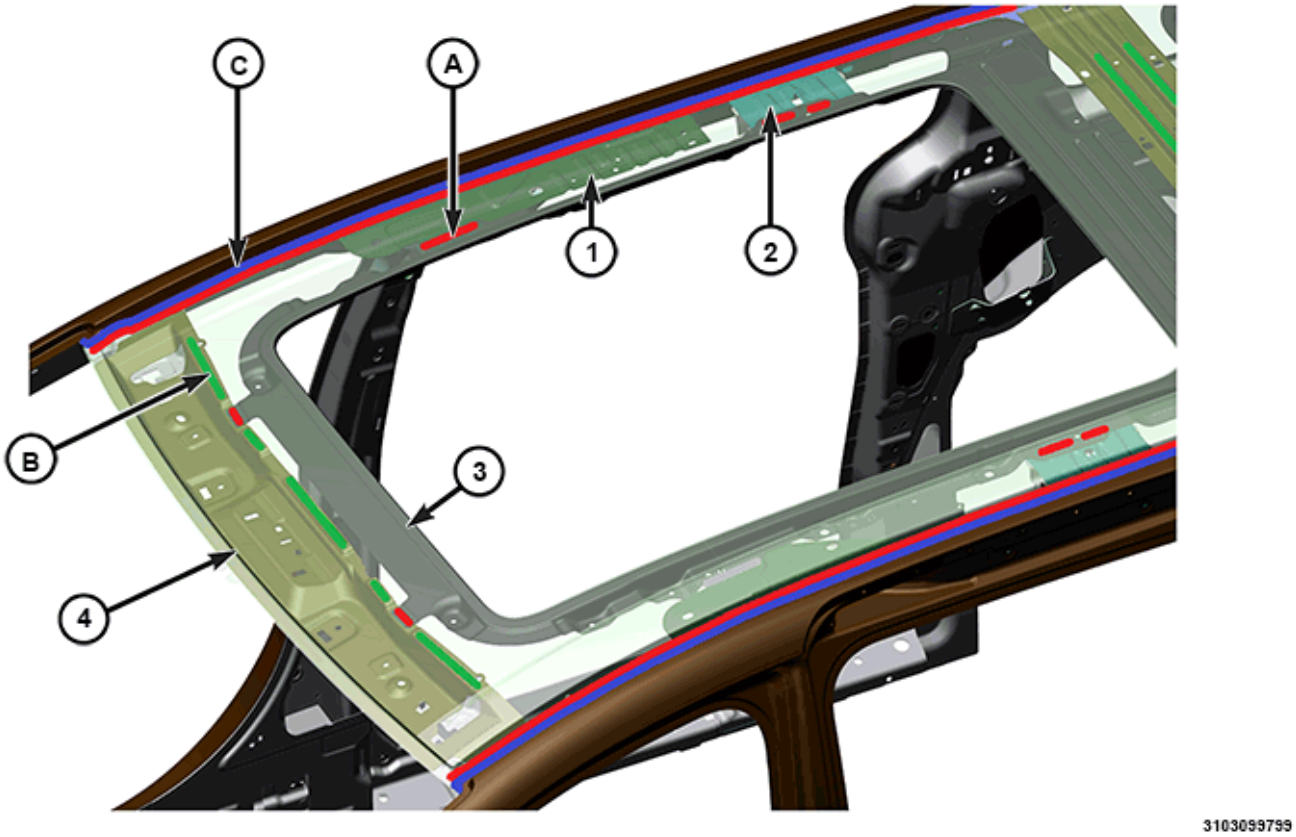
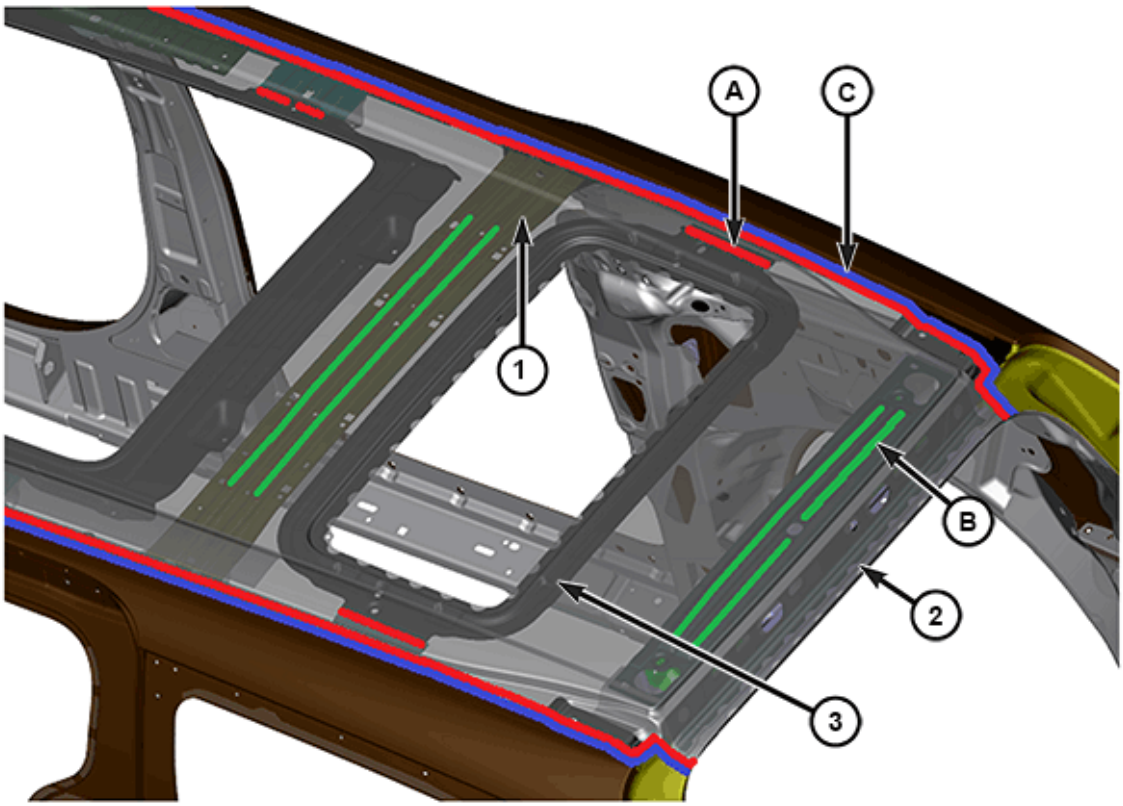
Roof Panel With Sunroof (1 of 3)

1- Roof Panel
2- Front Sunroof Reinforcement Ring (Transparent for clarity)
3- Rear Sunroof Reinforcement Ring (Transparent for clarity
B- Anti Flutter Adhesive



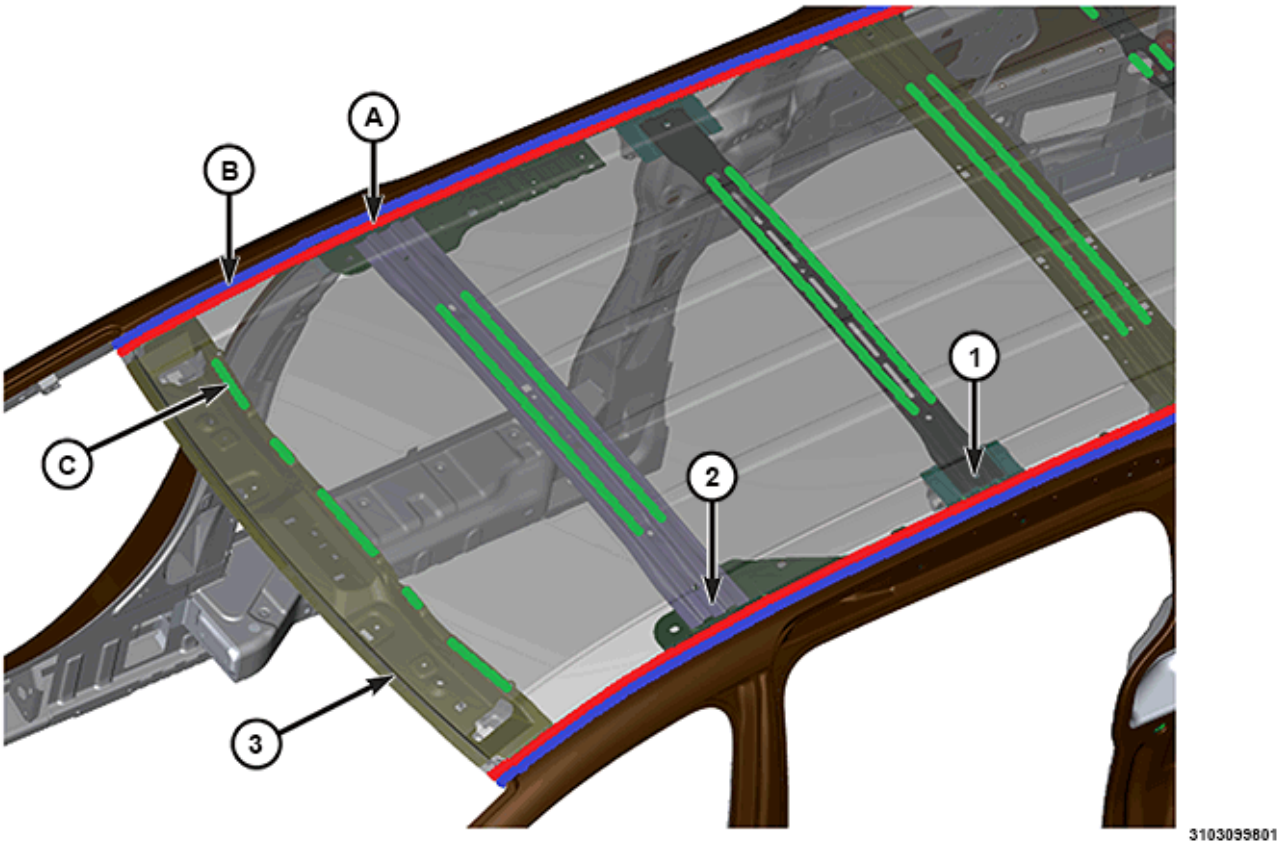
Roof Panel With Sunroof (2 of 3)

1- Outer Roof Rail
2- Inner Roof Rail
3- Front Sunroof Reinforcement Ring
4- Front Header Panel
A- Structural Adhesive
B- Anti Flutter Adhesive
C- Seam Sealer



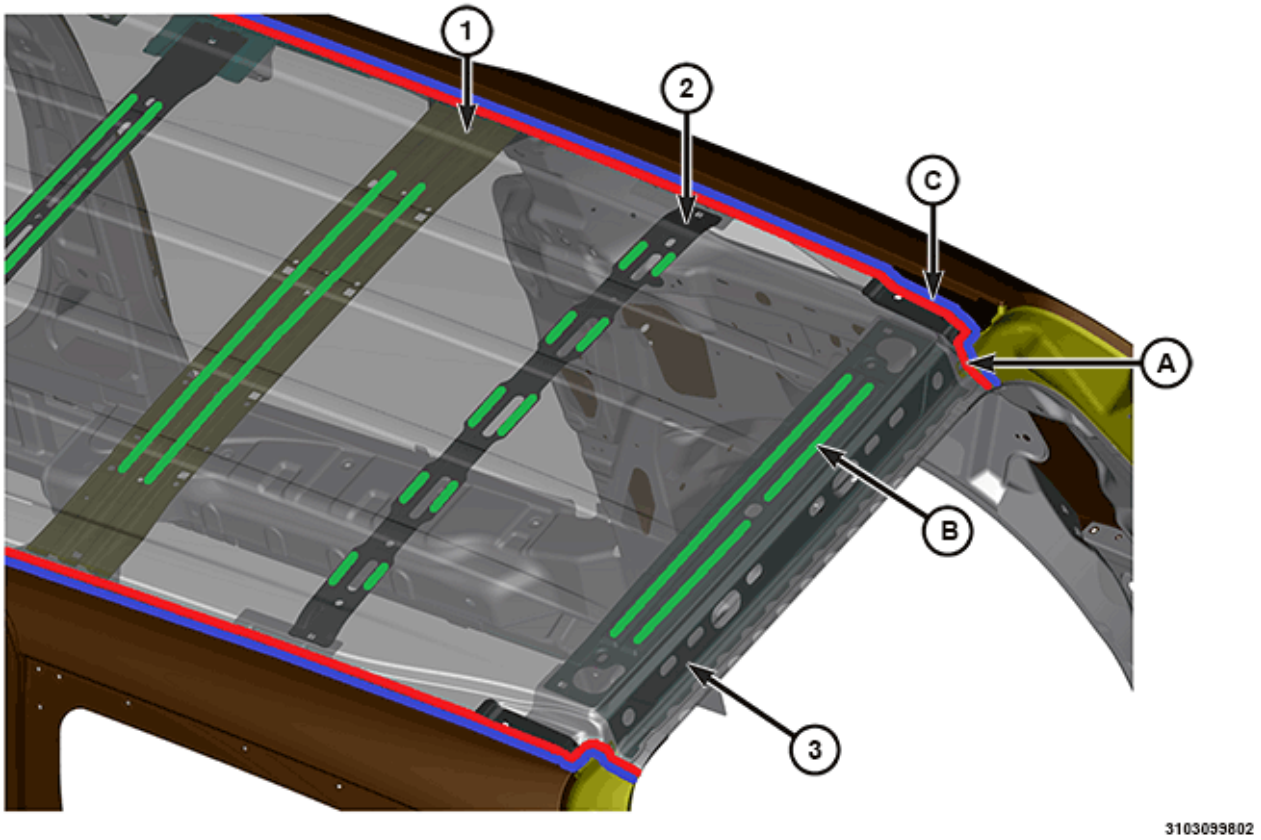
Roof Panel With Sunroof (3 of 3)

1- C-pillar Roof Bow
2- Rear Header Panel
3- Rear Sunroof Reinforcement Ring
A- Structural Adhesive
B- Anti Flutter Adhesive
C- Seam Sealer



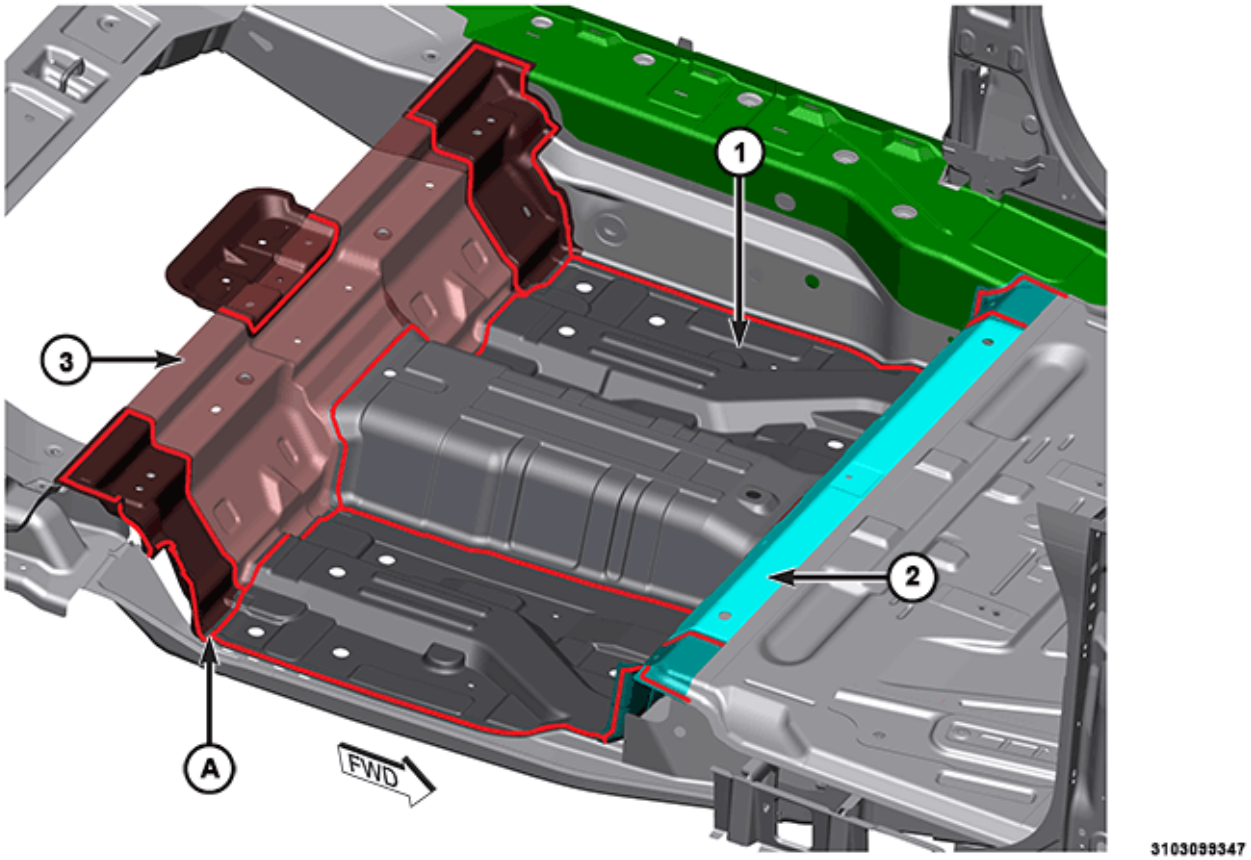
Roof Panel Standard (1 of 2)

1- Center Roof Bow
2- B-pillar Roof Bow
3- Front Header Panel
A- Structural Adhesive
B- Anti Flutter Adhesive
C- Seam Sealer



Roof Panel Standard (2 of 2)

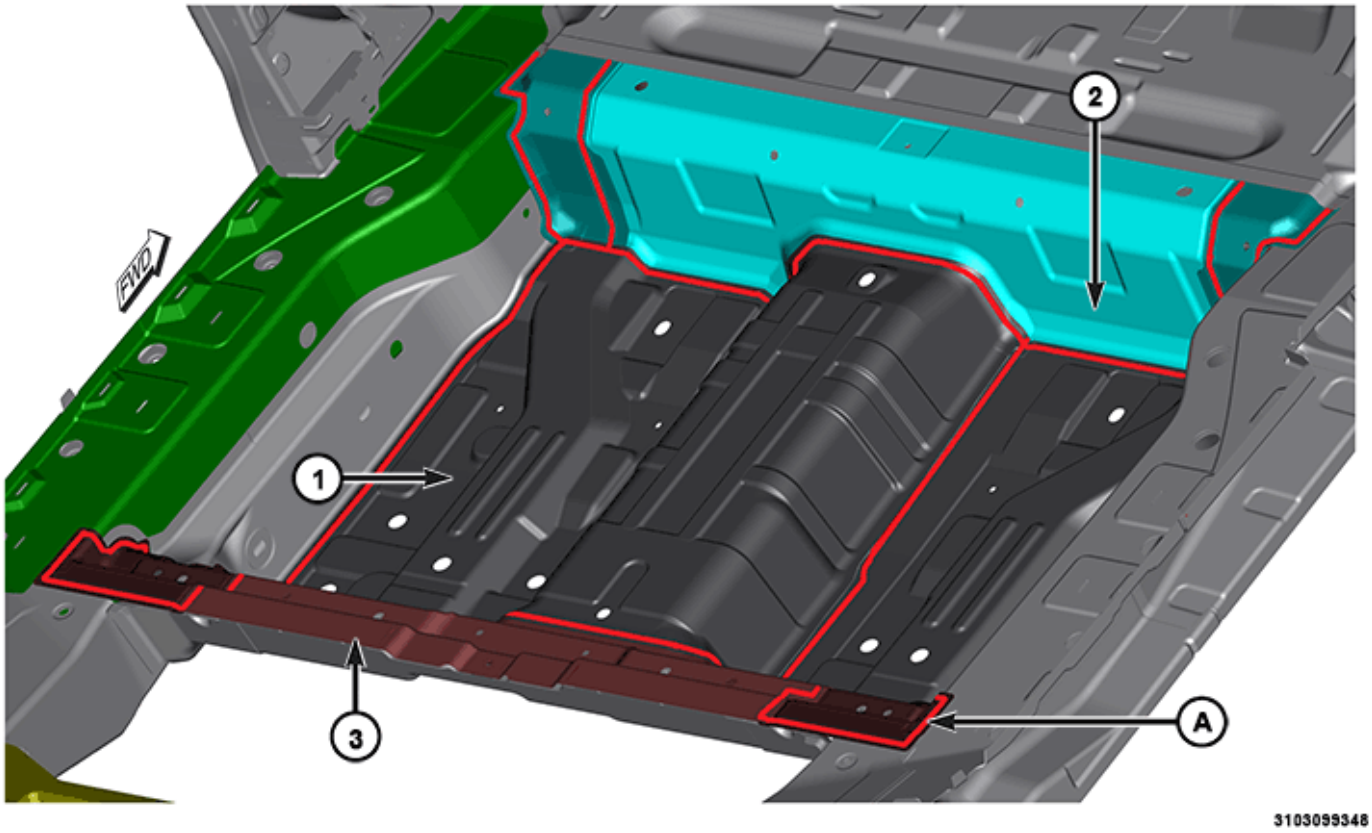
1- C-pillar Roof Bow
2- Rear Roof Bow
3- Rear Header Panel
A- Structural Adhesive
B- Anti Flutter Adhesive
C- Seam Sealer



Center and Mid Floor (Interior) Rear View

NOTE: Left side view shown, right side similar.

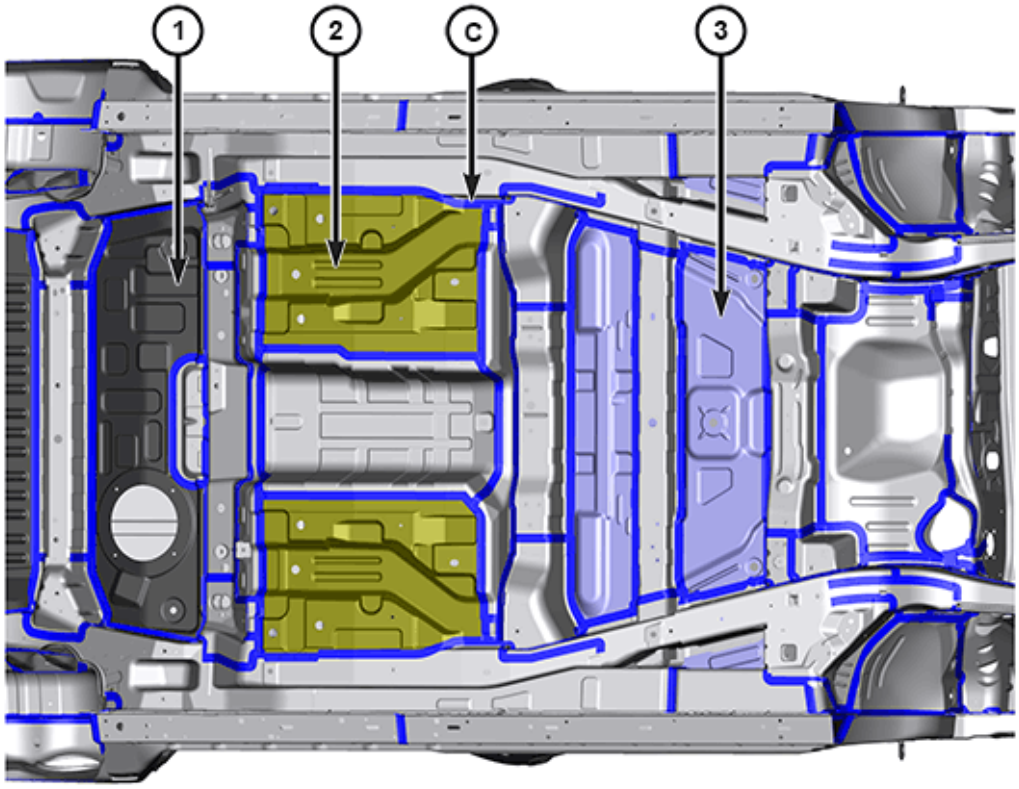
1- Center Floor Pan
2- Second Row Seat Tub Front Crossmember
3- Second Row Seat Tub Rear Crossmember
A- Structural Adhesive



Center and Mid Floor (Interior) Front View

NOTE: Left side view shown, right side similar.

1- Center Floor Pan
2- Second Row Seat Tub Front Crossmember
3- Second Row Seat Tub Rear Crossmember
A- Structural Adhesive



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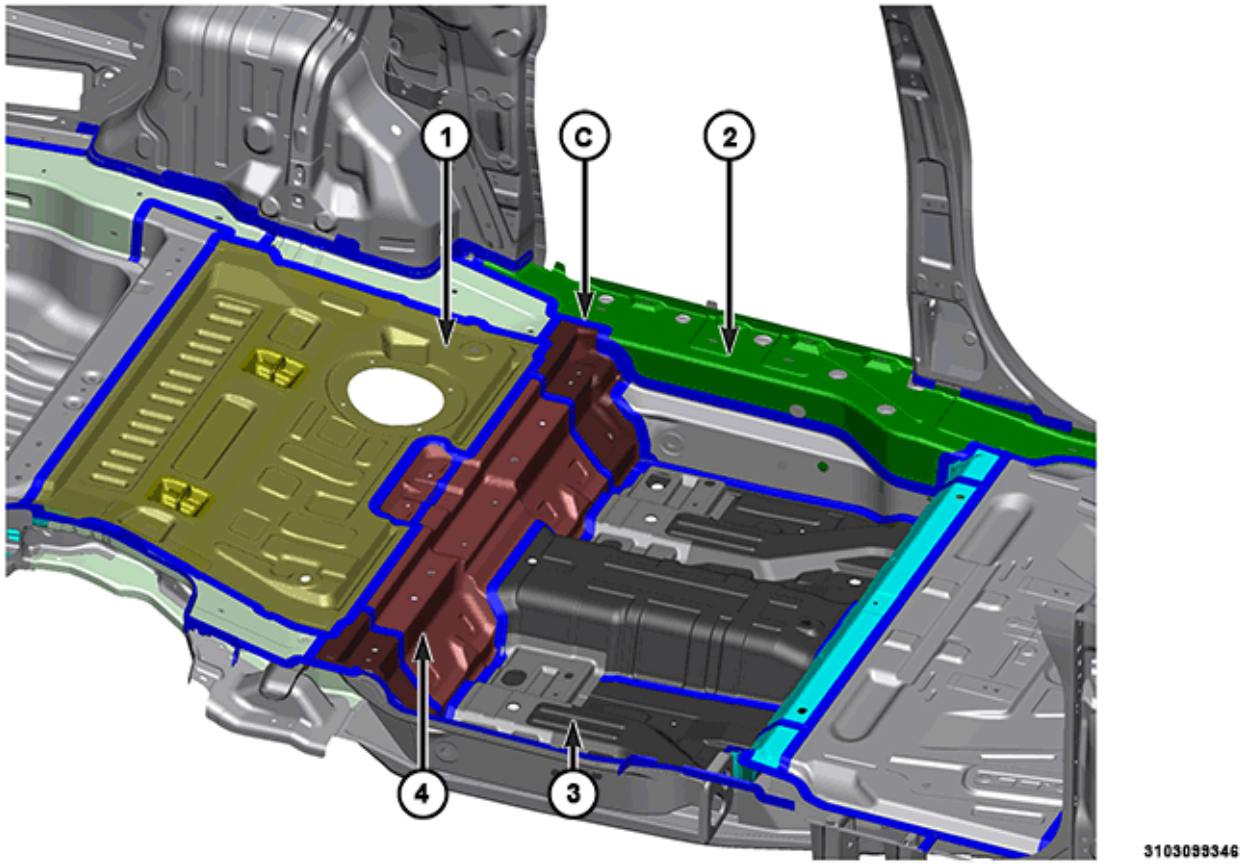
Center Floor and Front Floor Pan Underbody

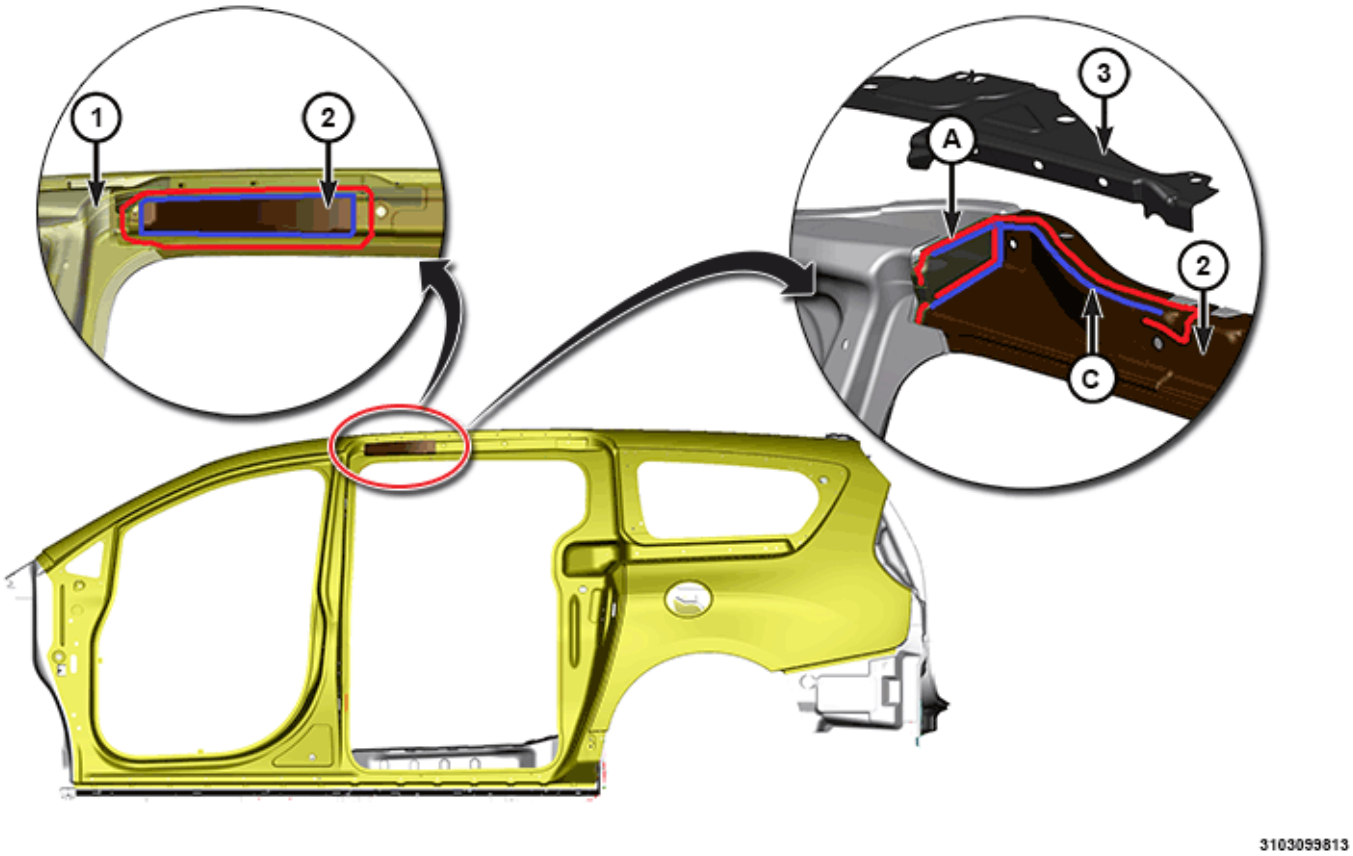
1- Mid Floor Pan
2- Center Floor Pan
3- Front Floor Pan
C- Seam Sealer



Center and Mid Floor (Interior)

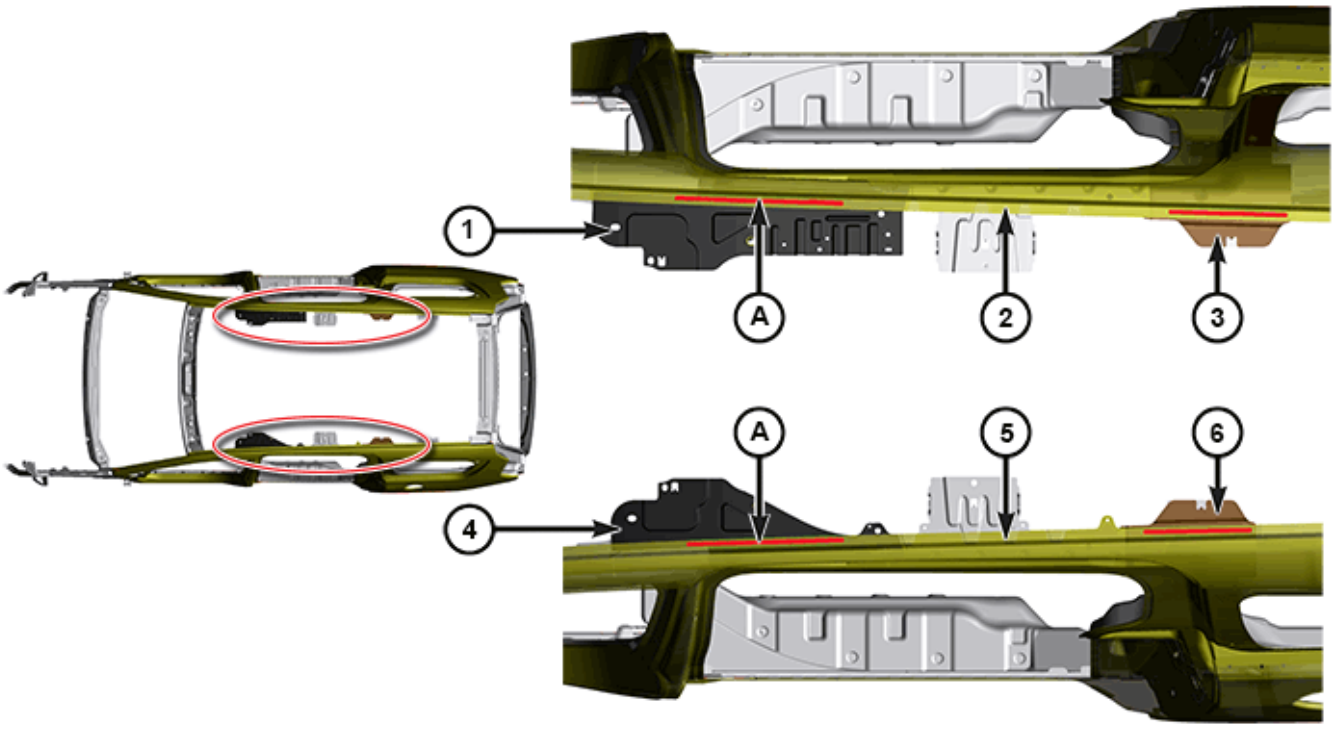
NOTE: Left side view shown, right side similar.

1- Mid Floor Pan
2- Inner Sill Panel
3- Center Floor Pan
4- Second Row Seat Tub Rear Crossmember
C- Seam Sealer



Upper Sliding Door Track Upper Reinforcement

1- Body Side Aperture
2- Upper Sliding Door Track Reinforcement
3- Roof Rail Outer Upper Panel
A- Structural Adhesive
C- Seam Sealer



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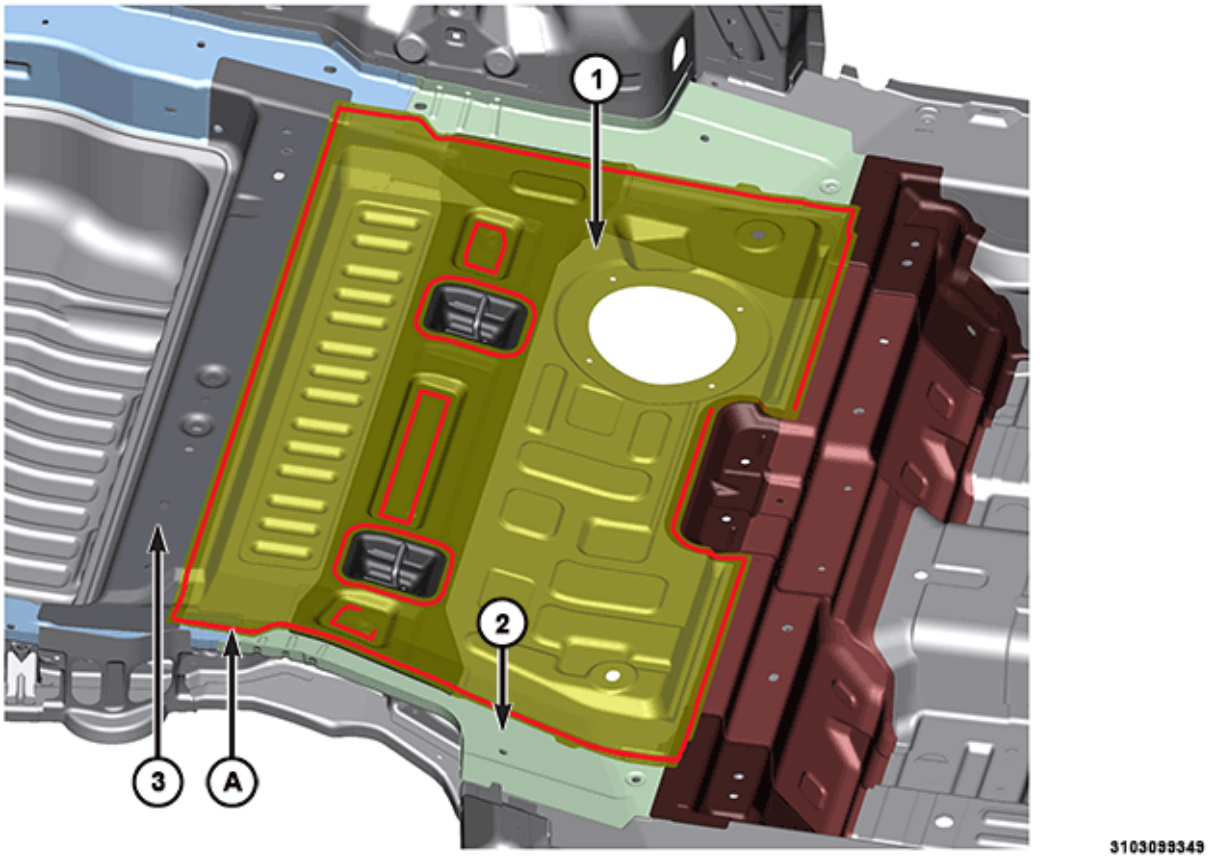
Body Side Aperture (Top)

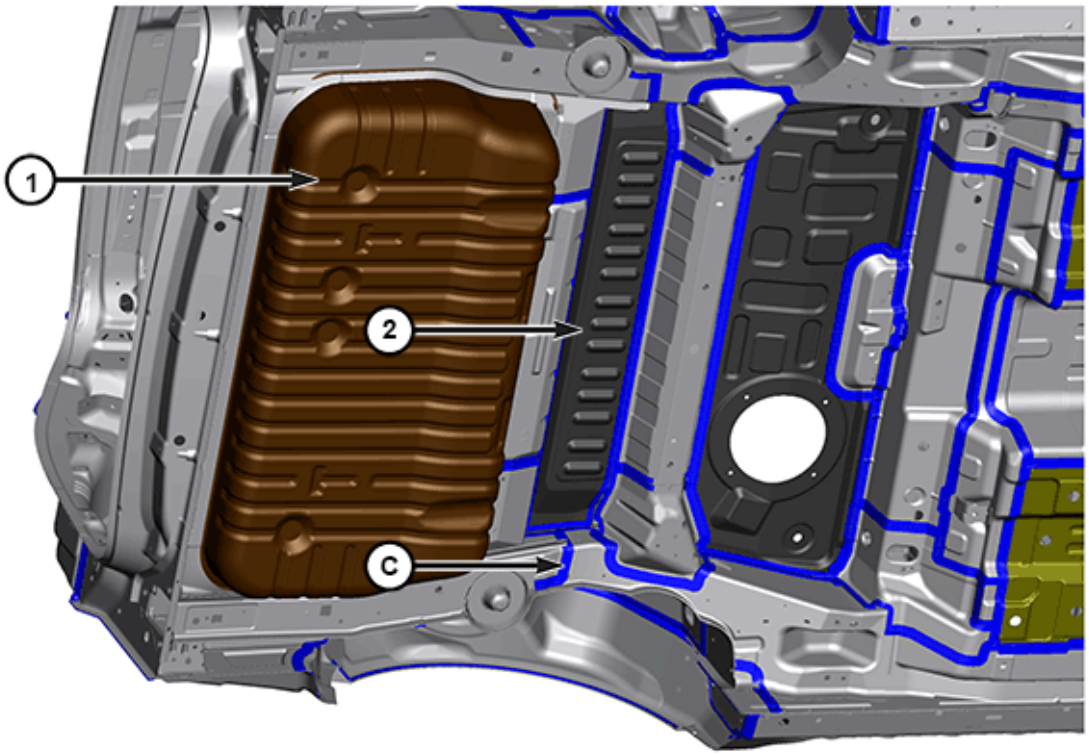
1- Right Roof Rail Outer Upper Panel
2- Right Body Side Aperture Panel (Transparent for clarity)
3- Right C-pillar Outer Upper Reinforcement
4- Left Roof Rail Outer Upper Panel
5- Left Body Side Aperture (Transparent for clarity)
6- Left C-pillar Outer Upper Reinforcement
A- Structural Adhesive



Mid Floor Pan

NOTE: Left side view shown, right side similar.

1- Mid Floor Pan
2- Rear Frame Rail
3- Third Row Crossmember
A- Structural Adhesive



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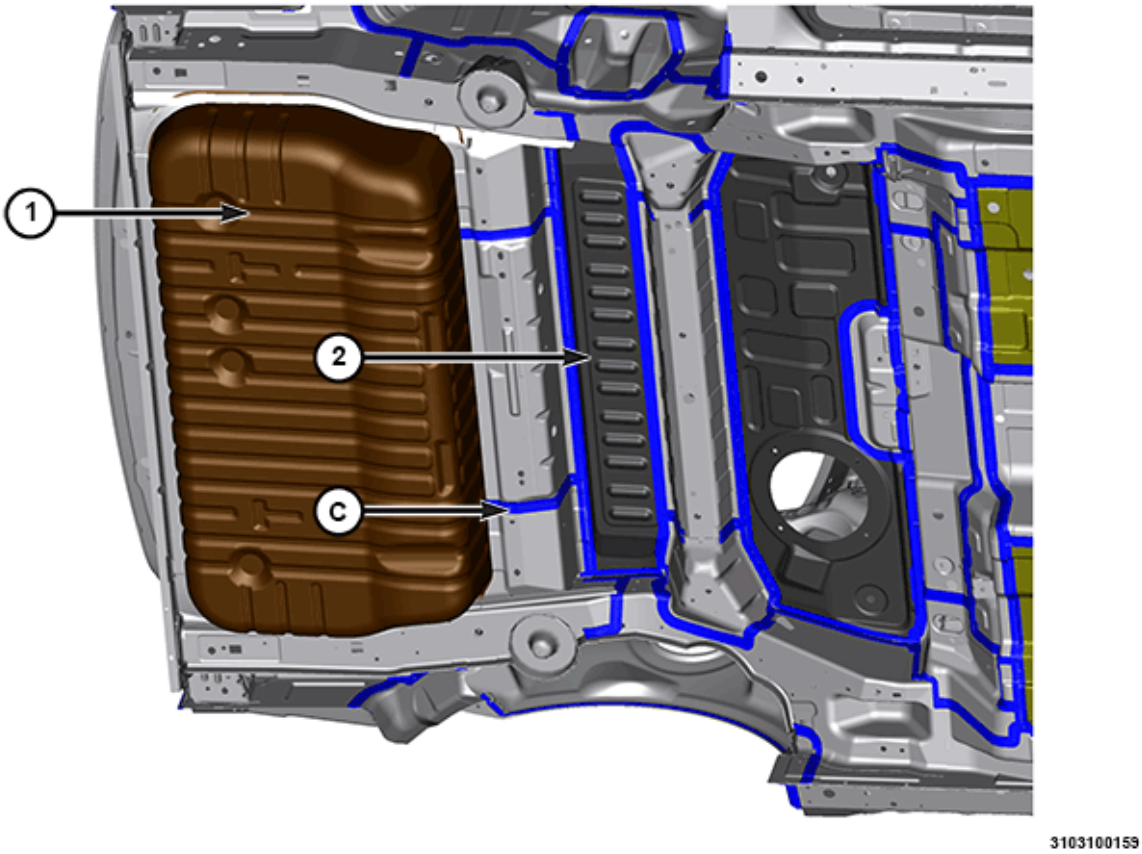
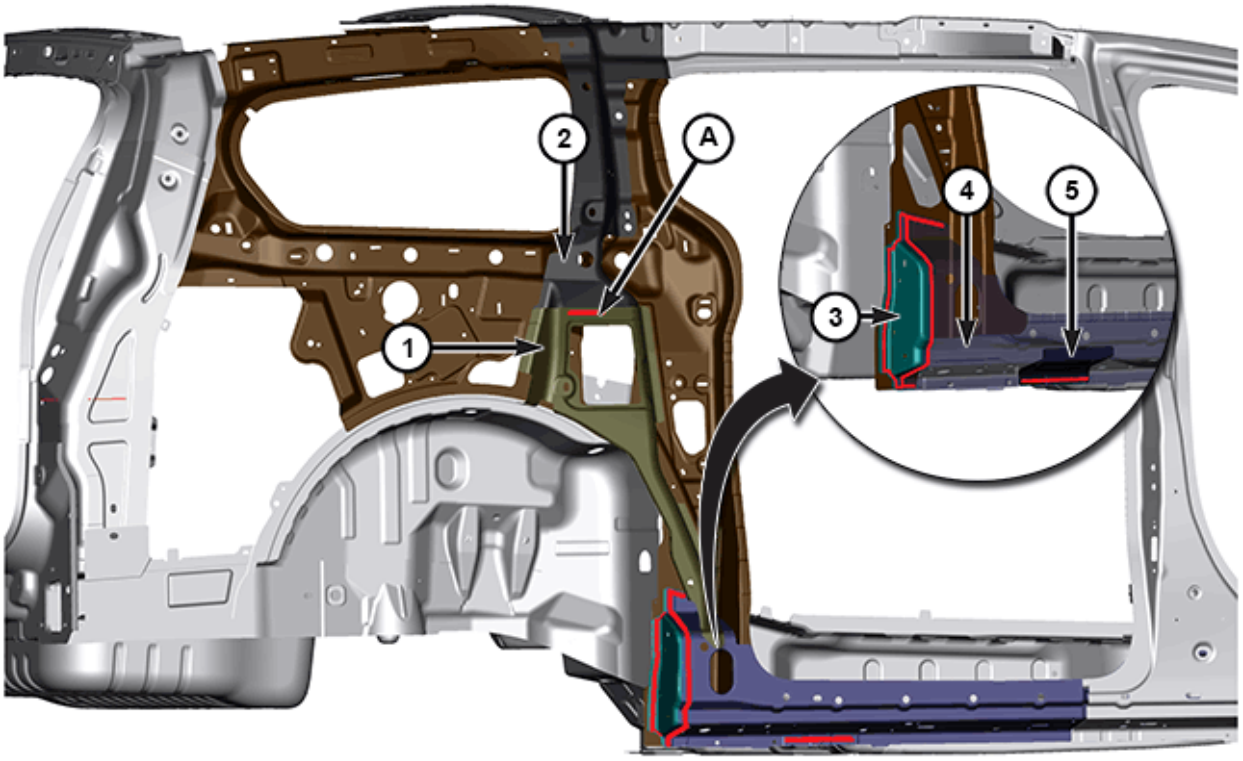
Mid Floor Pan and Third Row Seat Tub Underbody (1 of 2)

1- Third Row Seat Tub
2- Mid Floor Pan
C- Seam Sealer



Mid Floor Pan and 3rd Row Seat Tub Underbody (2 of 2)

1- Third Row Seat Tub
2- Mid Floor Pan
C- Seam Sealer



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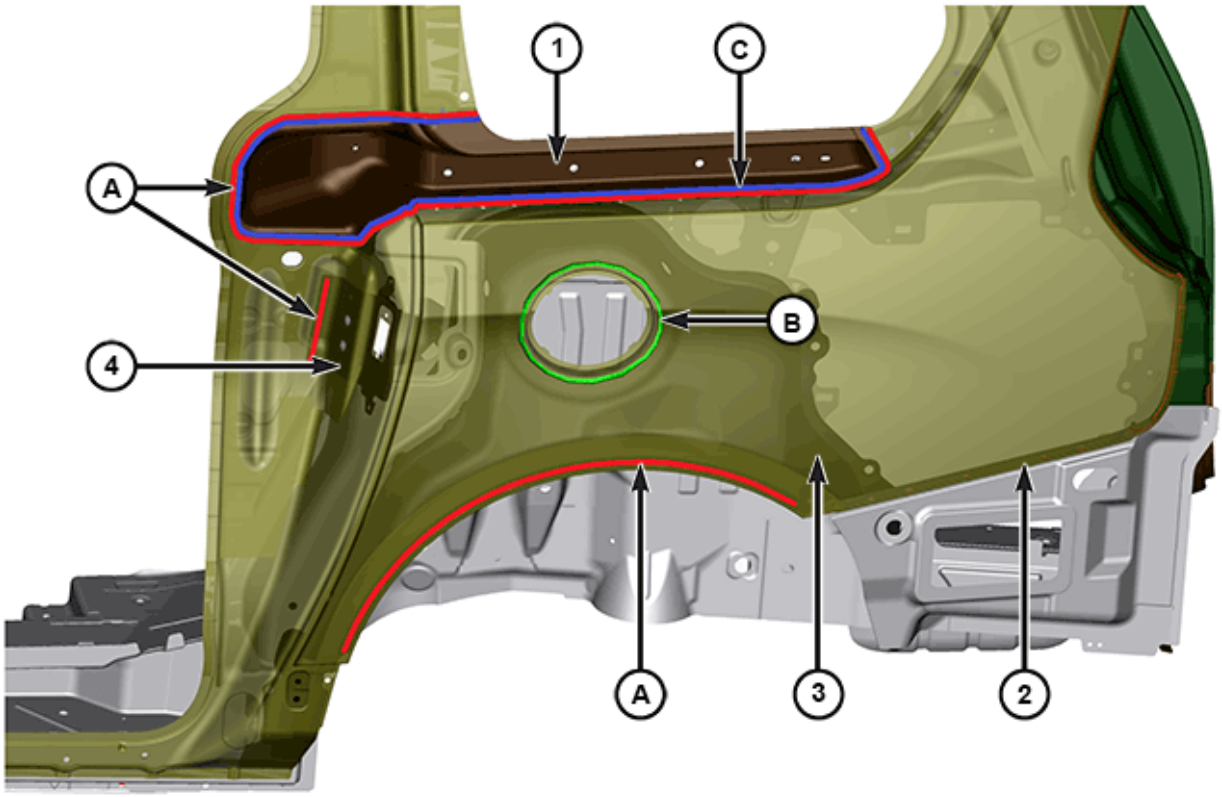
C-pillar and Outer Sill Panel

1- C-pillar Lower Panel
2- C-pillar Upper Panel
3- Outer Sill Rear End Cap
4- Sill Outer Panel (Transparent for clarity)
5- Jack Location Reinforcement
A- Structural Adhesive



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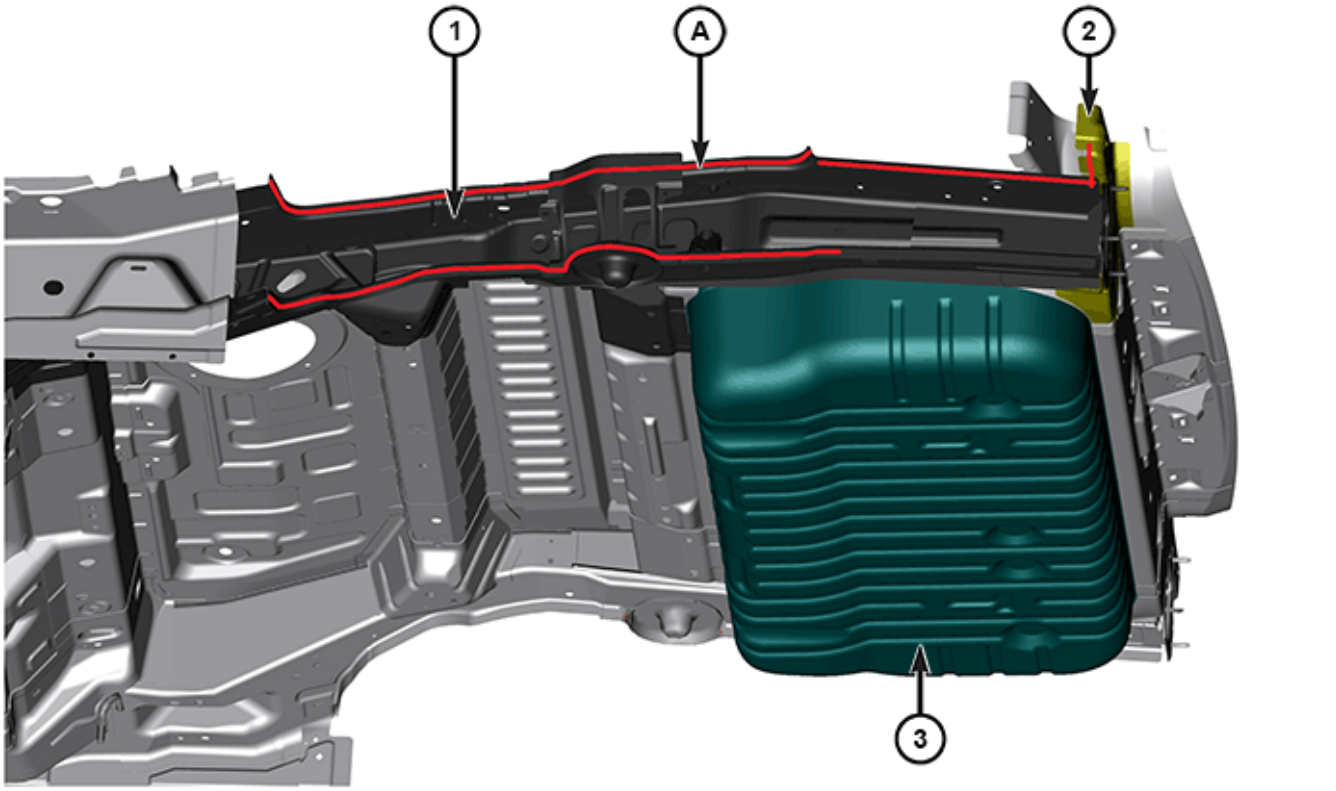
Rear Body Side Aperture/Quarter Panel

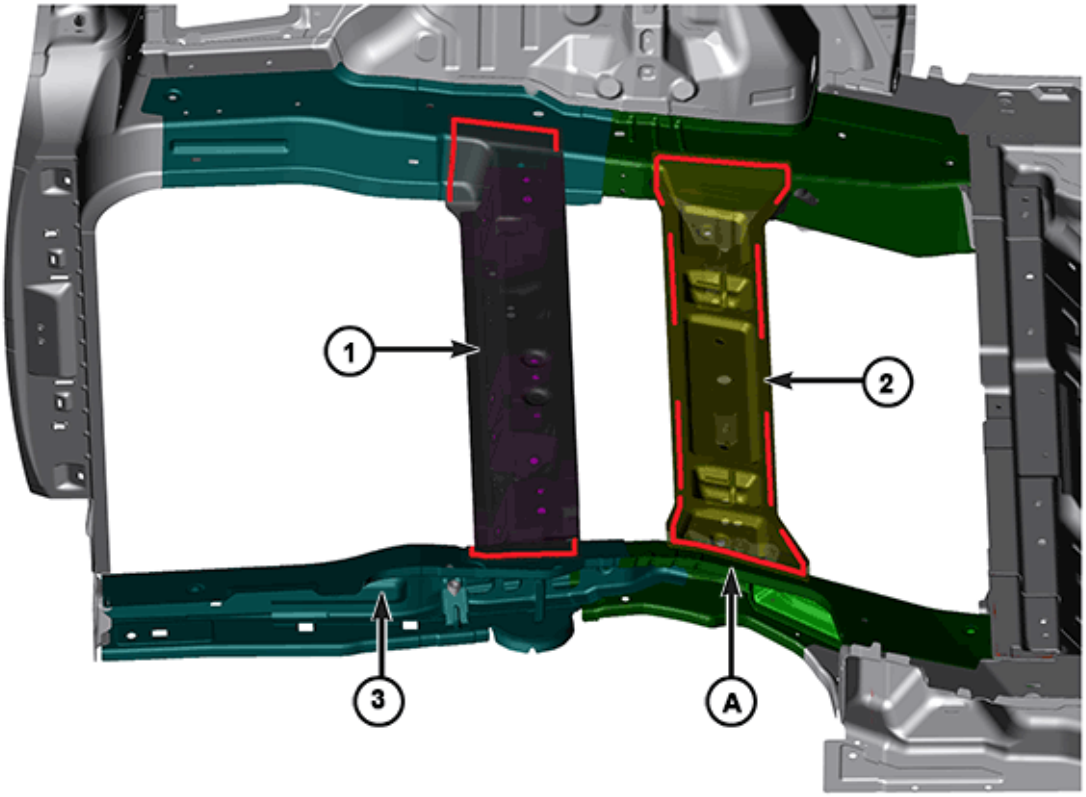
1- Sliding Door Lower Track Center Reinforcement
2- Rear Body Side Aperture/Quarter Panel (Transparent for clarity)
3- Outer Wheelhouse Panel
4- Sliding Door Striker Reinforcement
A- Structural Adhesive
B- Anti-Flutter Adhesive
C- Seam Sealer



Rear Frame Rail

NOTE: Left side shown, right side similar.

1- Rear Frame Rail
2- Rear Closure Reinforcement
3- Third Row Seat Tub
A- Structural Adhesive

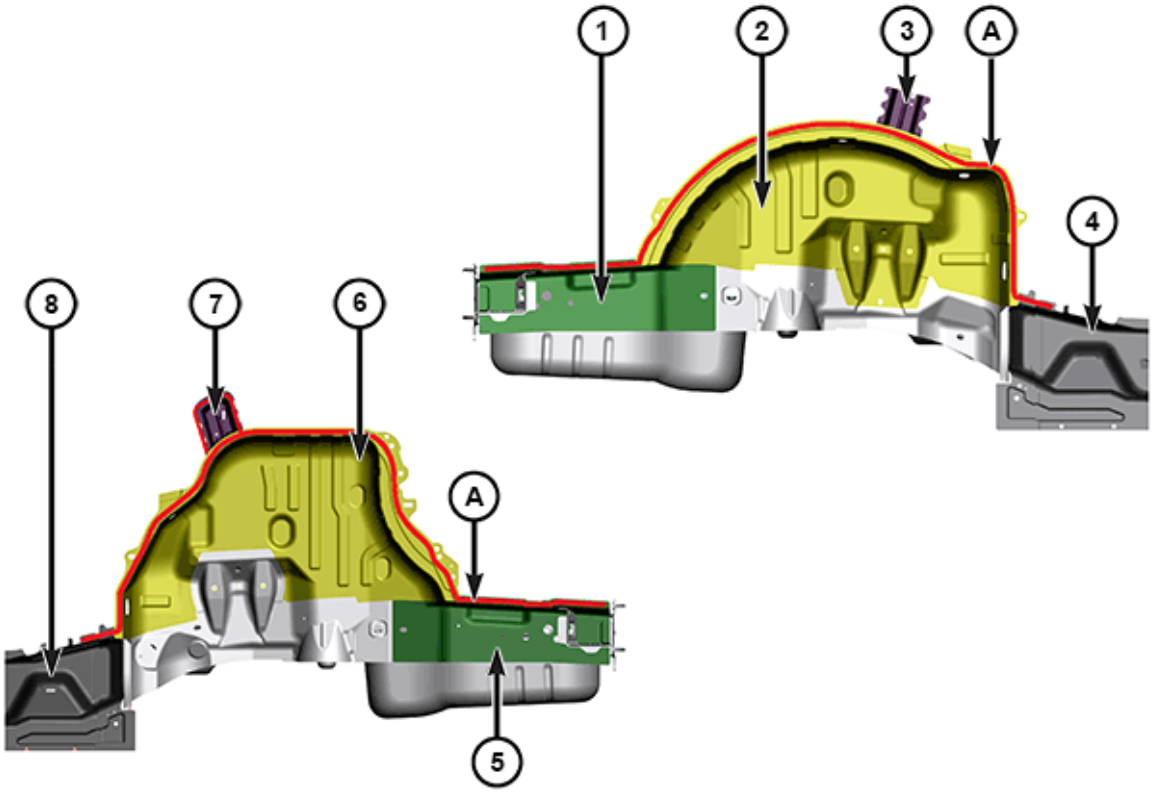


3103099352

Rear Crossmember and Third Row Crossmember

NOTE: Left side view shown, right side similar.

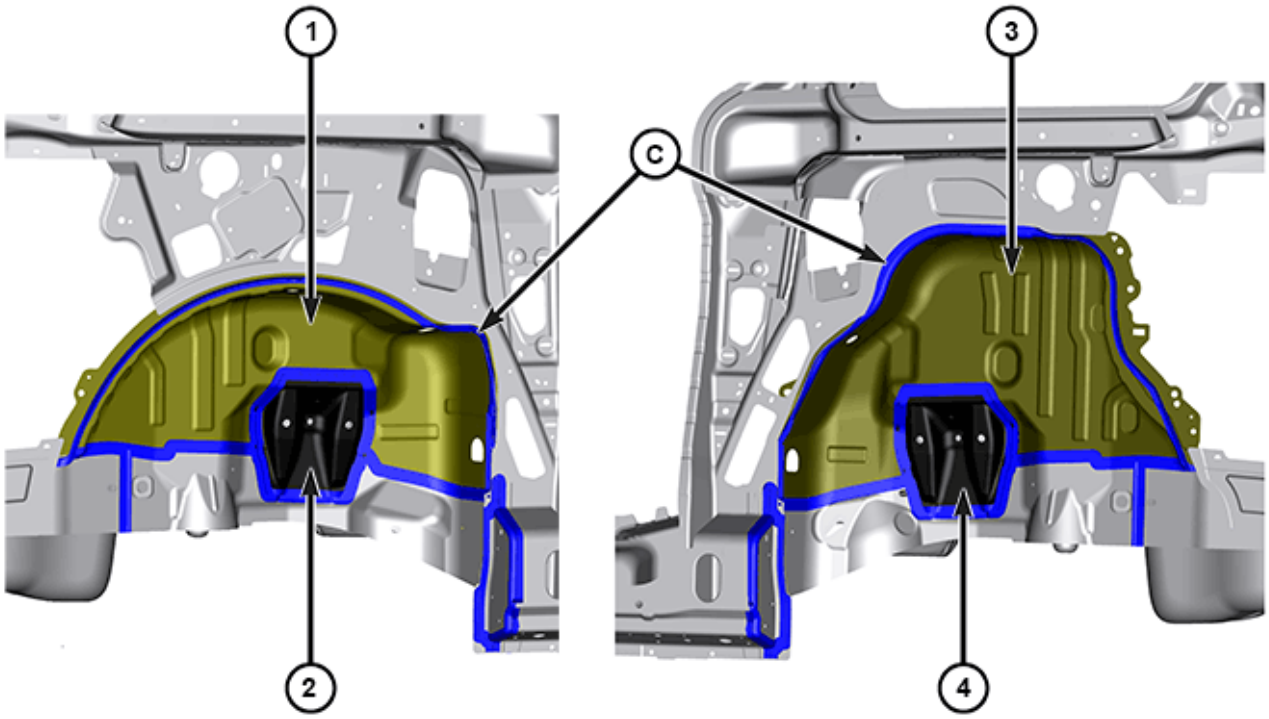
1- Third Row Crossmember (Transparent for clarity)
2- Rear Under Seat Crossmember (Transparent for clarity)
3- Rear Frame Rail
A- Structural Adhesive



310309979

Rear Inner Wheelhouse

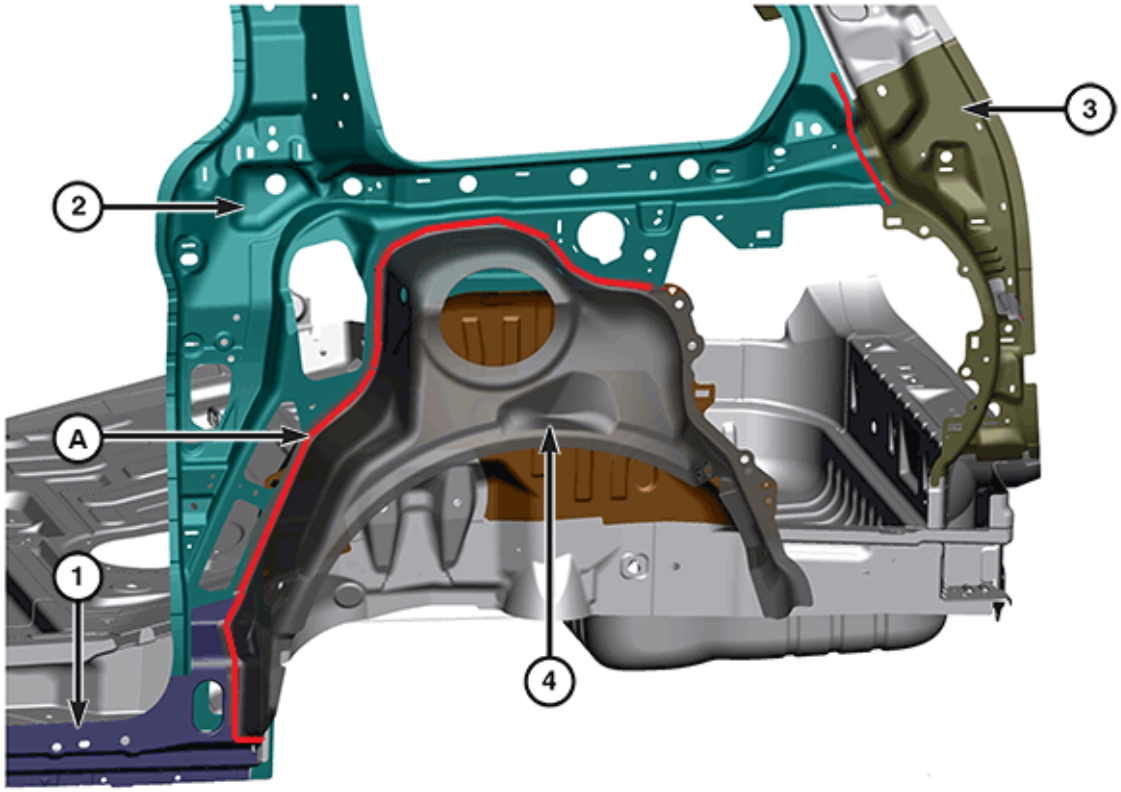
1- Right Rear Rail Cover
2- Right Rear Inner Wheelhouse
3- Right Shock Tower Reinforcement
4- Right Rear Inner Sill Panel
5- Left Rear Rail Cover
6- Left Rear Inner Wheelhouse
7- Left Shock Tower Reinforcement
8- Left Rear Inner Sill Panel
A- Structural Adhesive



3103100160

Inner Wheelhouses

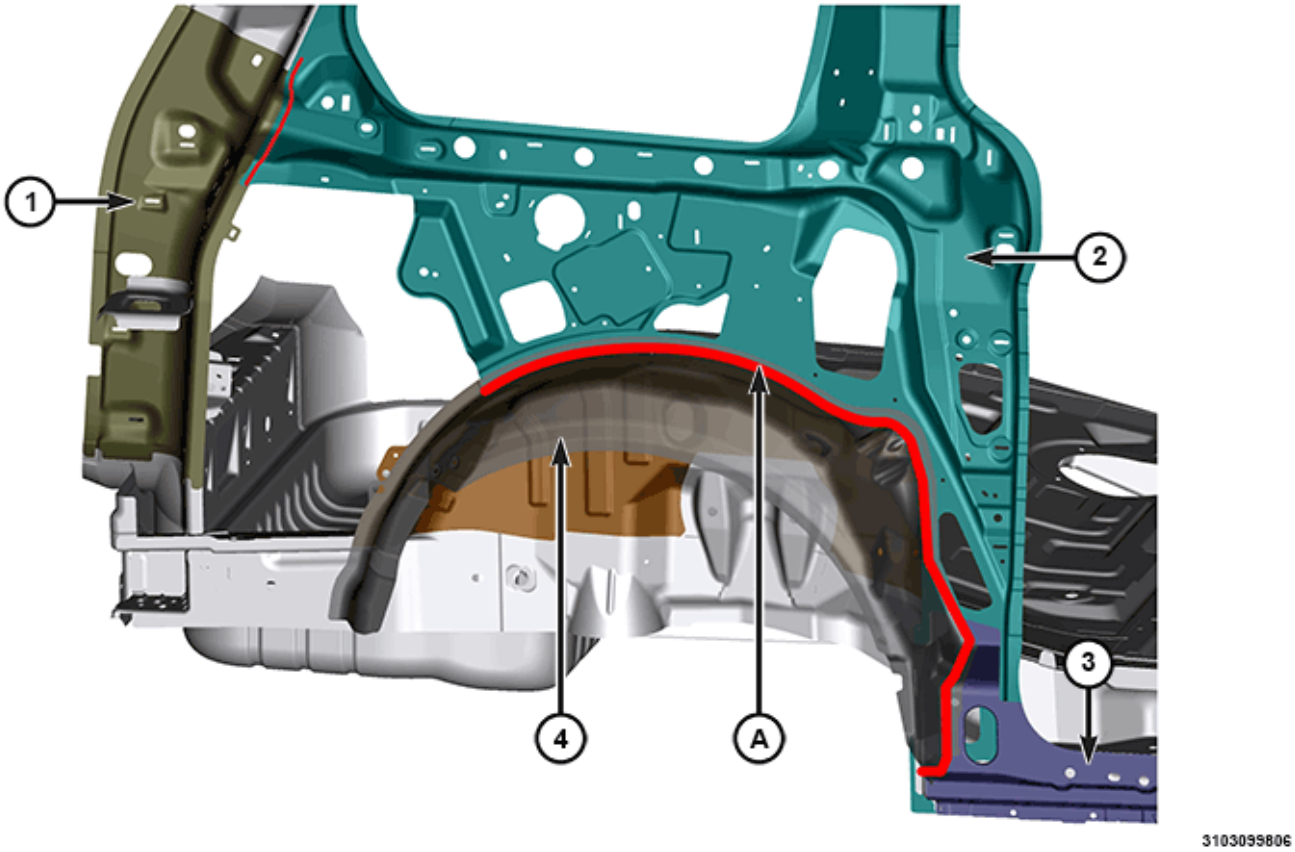
1- Right Inner Wheelhouse
2- Right Rear Shock Reinforcement
3- Left Inner Wheelhouse
4- Left Rear Shock Reinforcement
C- Seam Sealer



3103099805

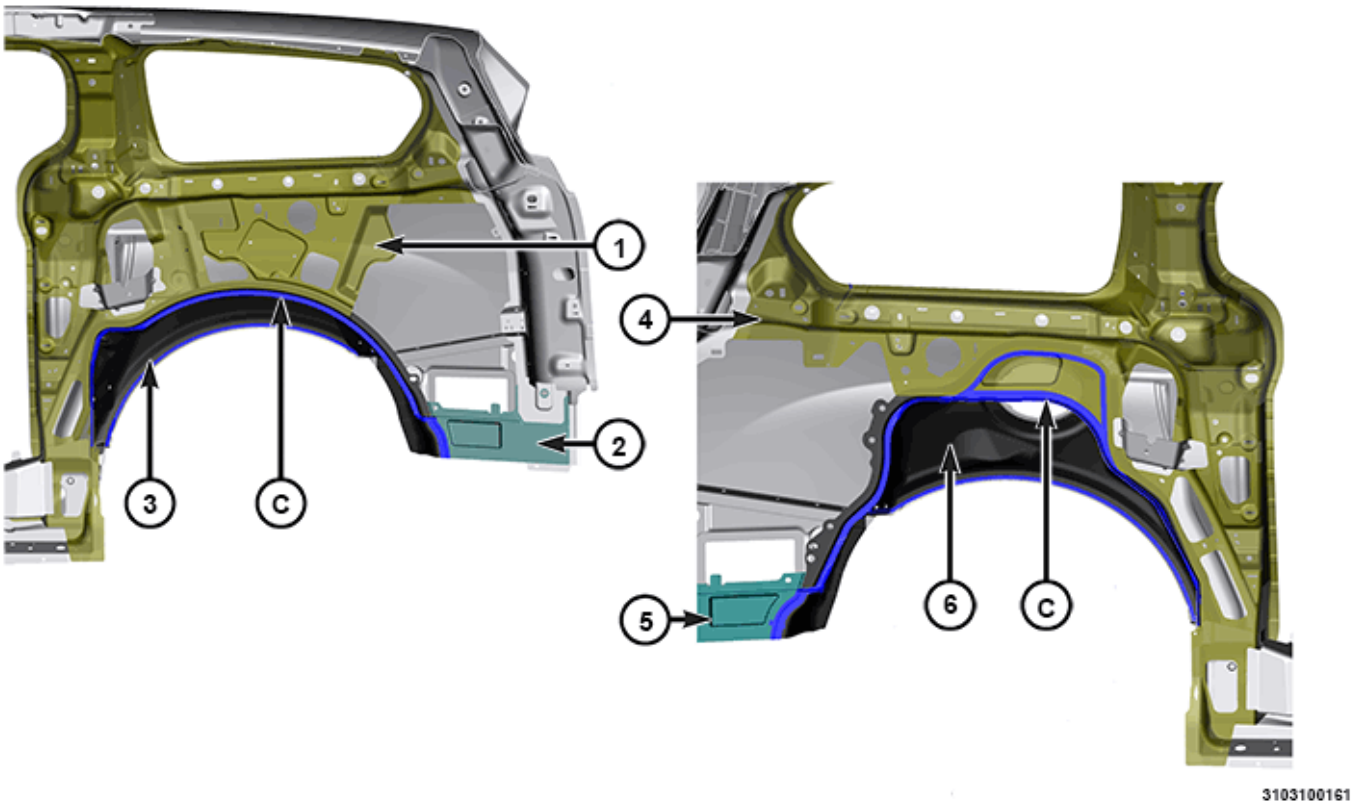
Left Rear Quarter Inner Panel

1- Left Sill Outer Reinforcement
2- Left Rear Inner Quarter Panel
3- Left D-pillar Lower Reinforcement
4- Left Outer Wheelhouse Panel (Transparent for clarity)
A- Structural Adhesive



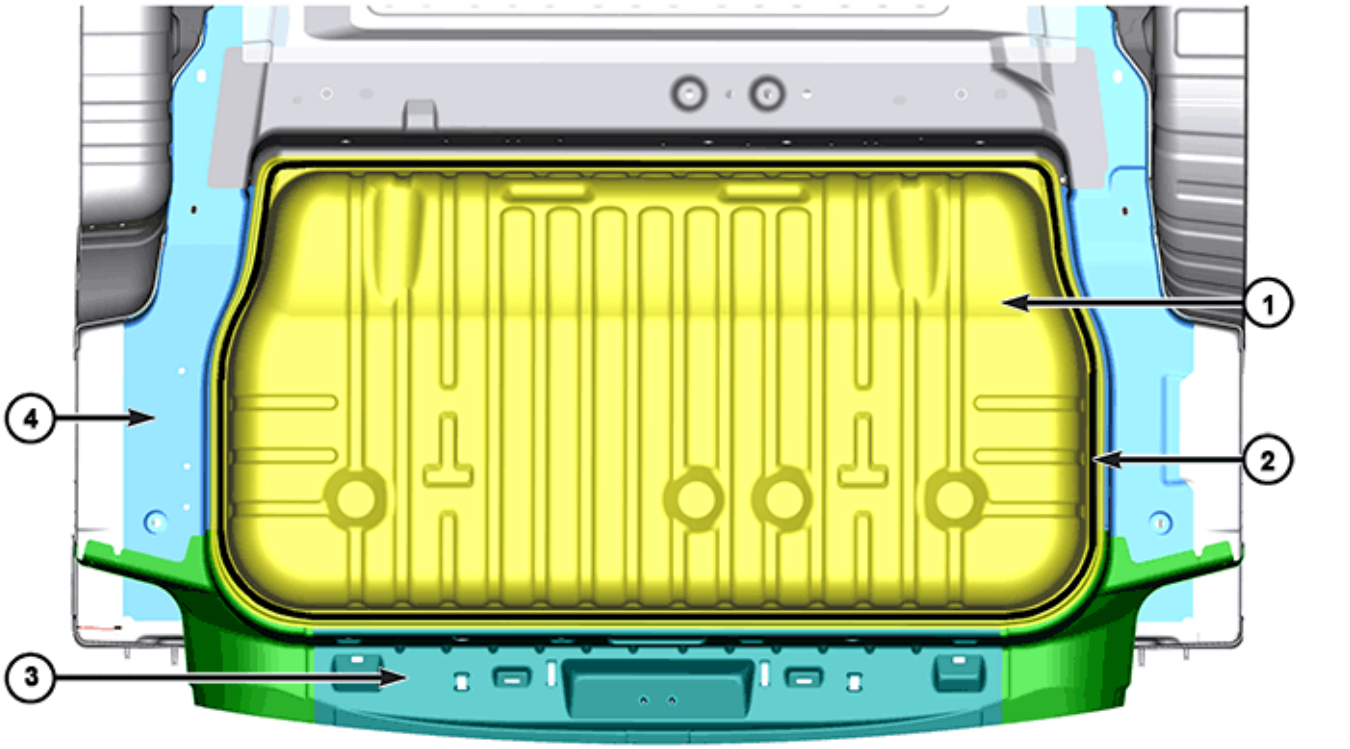
Right Rear Quarter Inner Panel

1- Right D-pillar Lower Reinforcement
2- Right Rear Inner Quarter Panel
3- Right Sill Outer Reinforcement
4- Right Outer Wheelhouse Panel (Transparent for clarity)
A- Structural Adhesive



Outer Wheelhouses

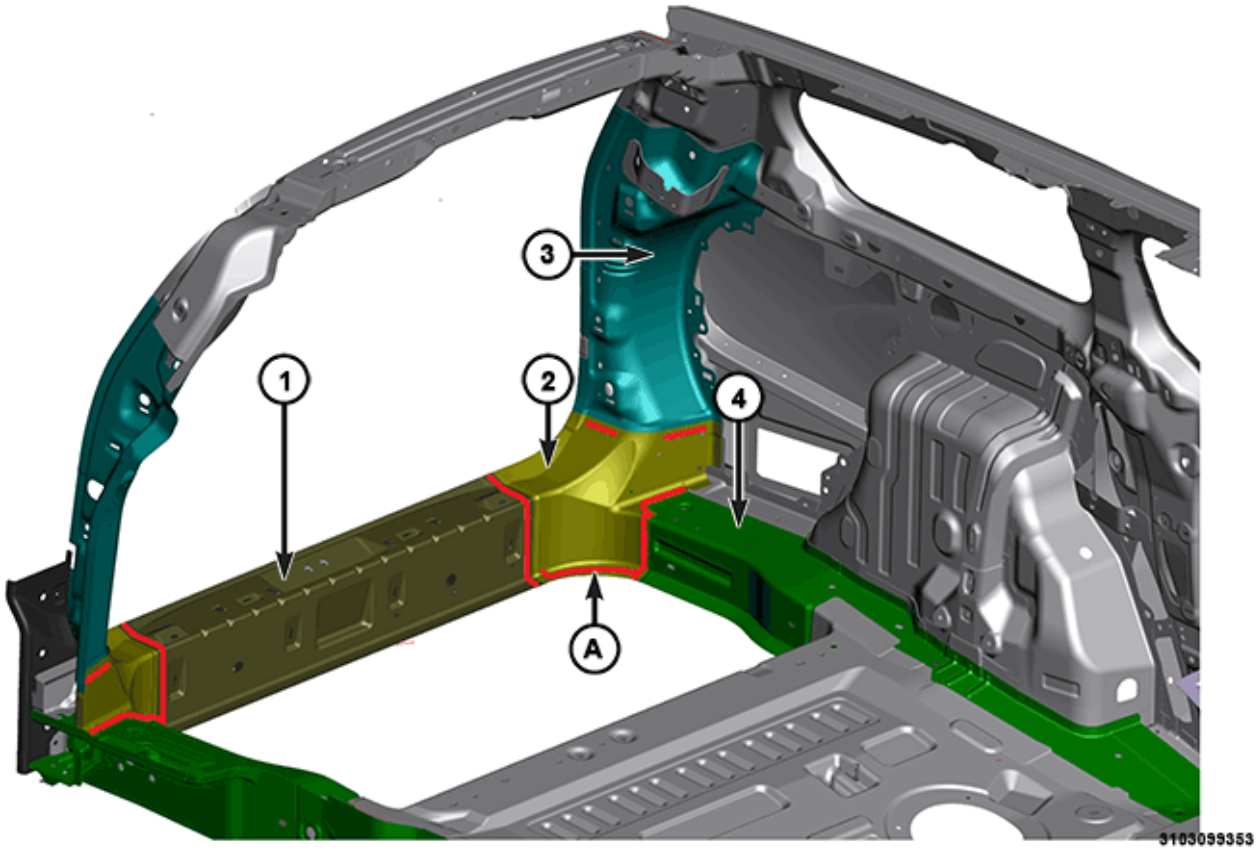
1- Right Inner Quarter Panel (Transparent for clarity)
2- Right Outer Wheelhouse Extension
3- Right Outer Wheelhouse
4- Left Inner Quarter Panel (Transparent for clarity)
5- Left Outer Wheelhouse Extension
6- Left Outer Wheelhouse
C- Seam Sealer



3103099351

Third Row Seat Tub

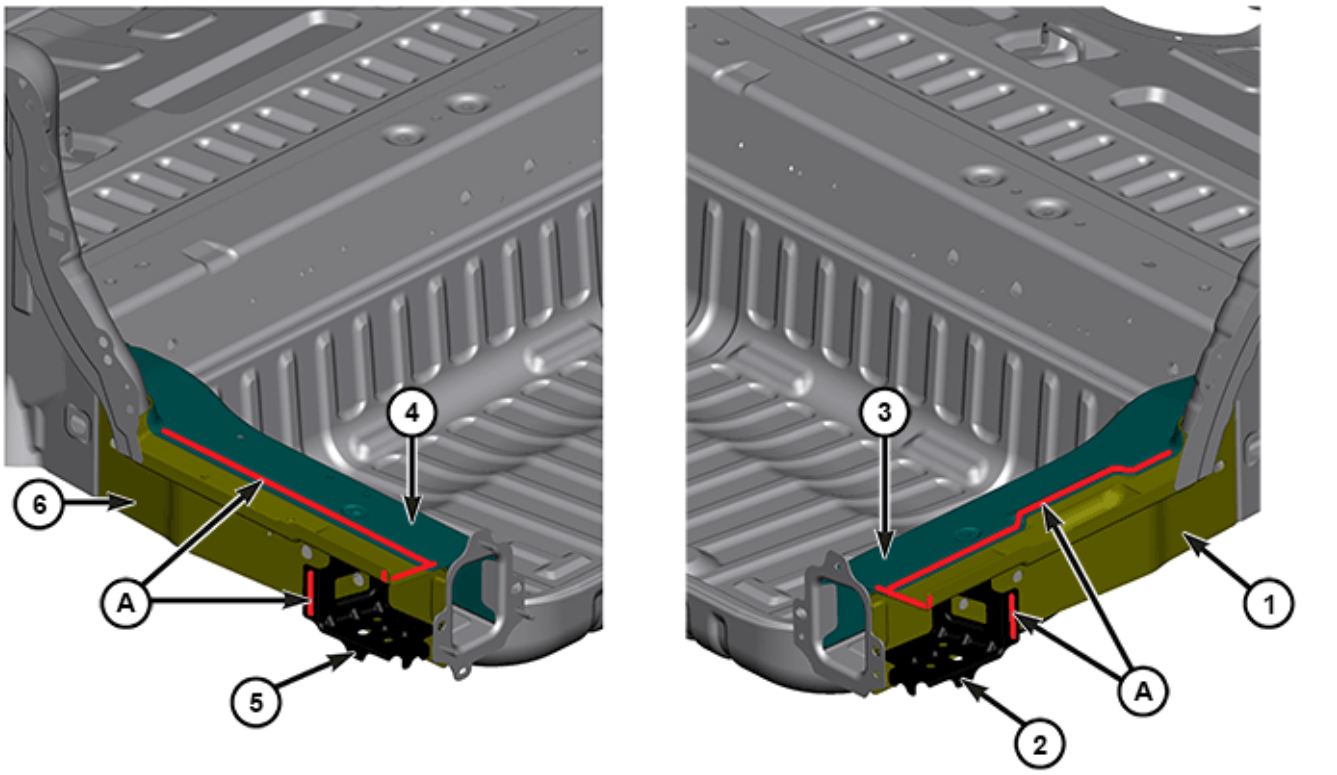
1- Third Row Seat Tub (Transparent for clarity)
2- Urethane
3- Rear Closure Panel
4- Rear Rail Reinforcement



Rear Closure Inner Panel

NOTE: Left side shown. right side similar.

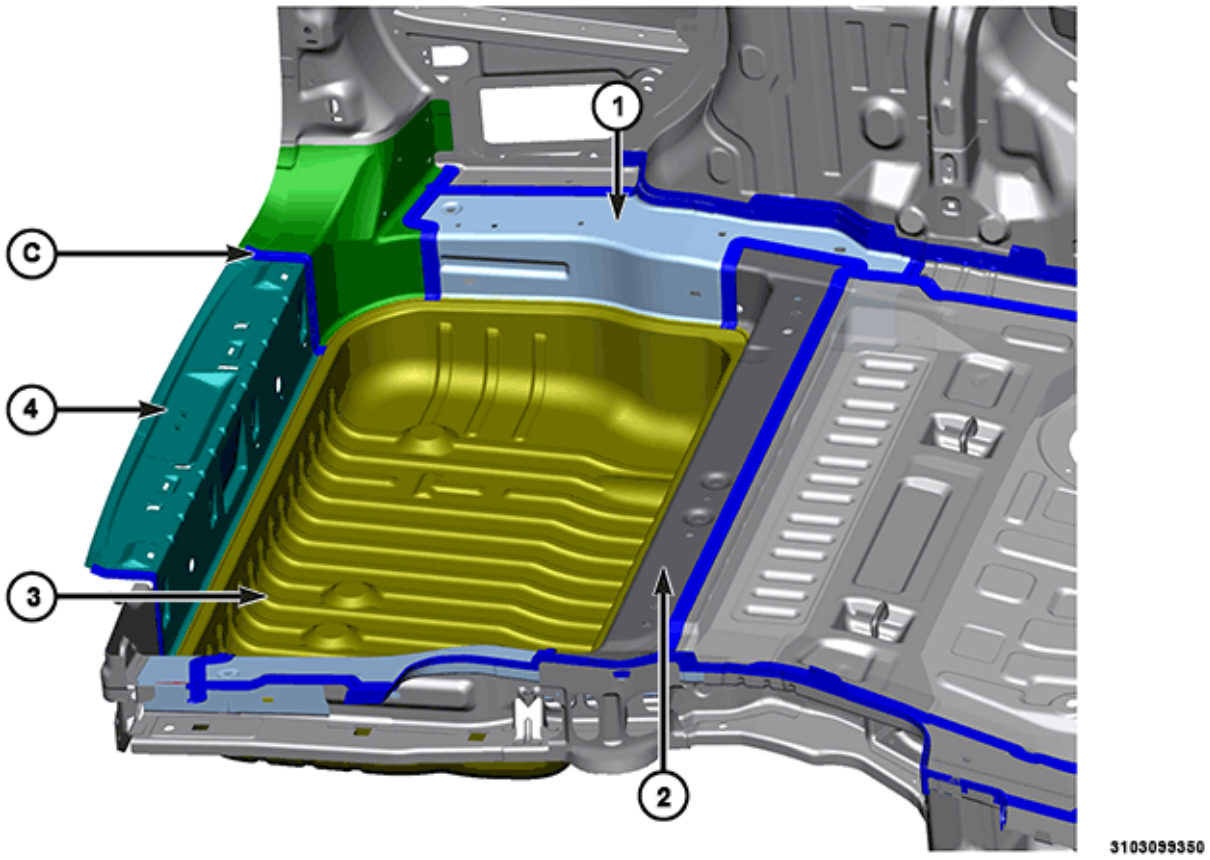
1- Rear Closure Inner Panel
2- Rear Closure Inner Extension (Transparent for clarity)
3- D-pillar inner Reinforcement
4- Rear Frame Rail Reinforcement
A- Structural Adhesive



3103039820

Rear Rail Reinforcement

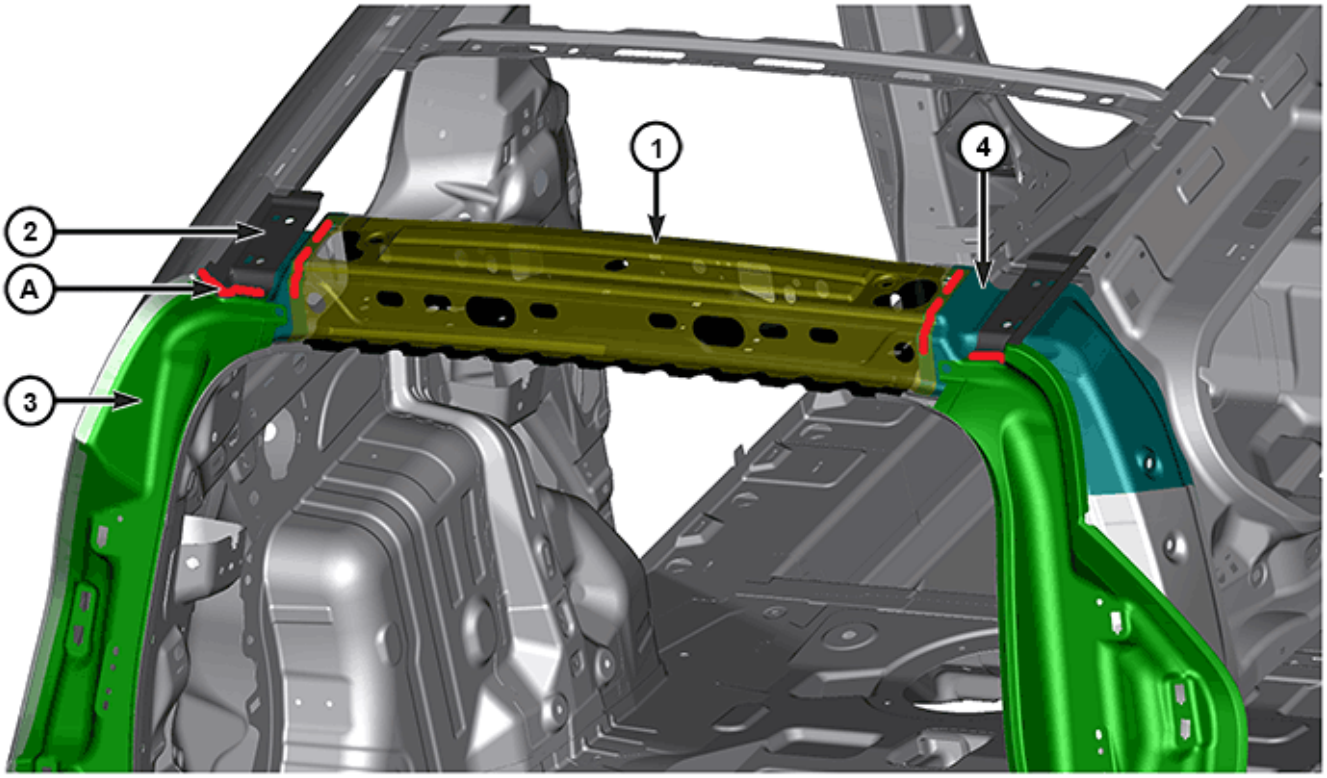
1- Right Rear Rail Cover
2- Right Rear Rail Gusset
3- Right Rear Rail Reinforcement
4- Left Rear Rail Reinforcement
5- Left Rear Rail Gusset
6- Left Rear Rail Cover
A- Structural Adhesive



Rear Interior

NOTE: Left side view shown, right side similar.

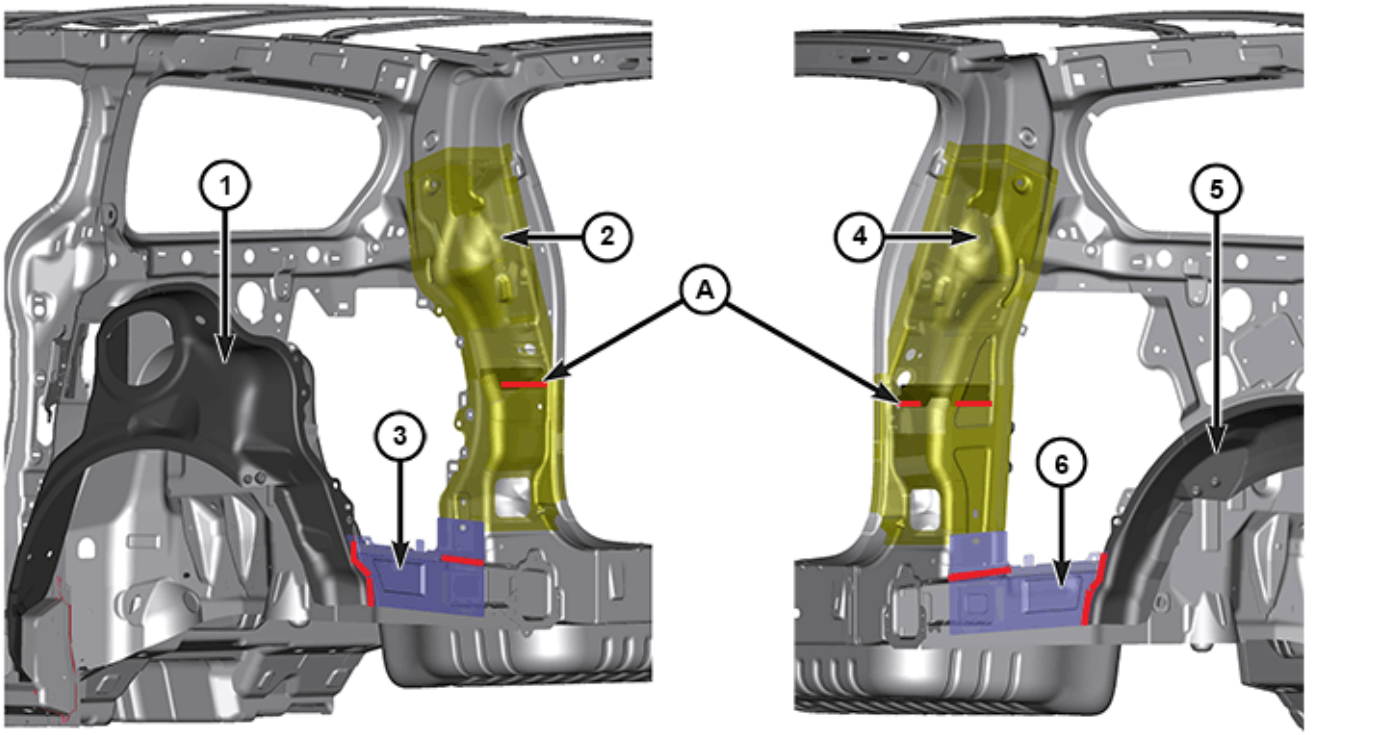
1- Rear Frame Rail Reinforcement
2- Third Row Crossmember
3- Third Row Seat Tub
4- Rear closure Inner Panel
C- Seam Sealer



3103099803

Rear Header Panel

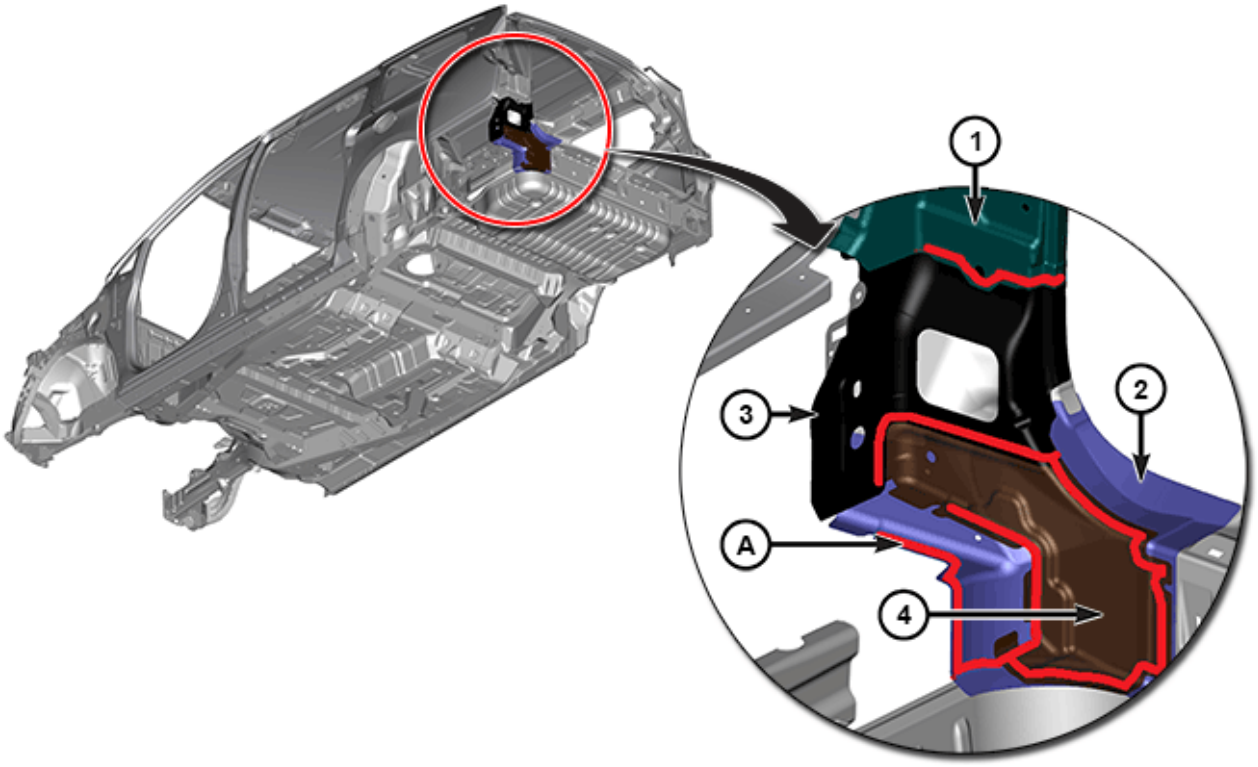
1- Rear Header Panel (Transparent for clarity)
2- Hinge Closeout
3- Drain Trough Panel (Transparent for clarity)
4- D-pillar Reinforcement
A- Structural Adhesive



3103095804

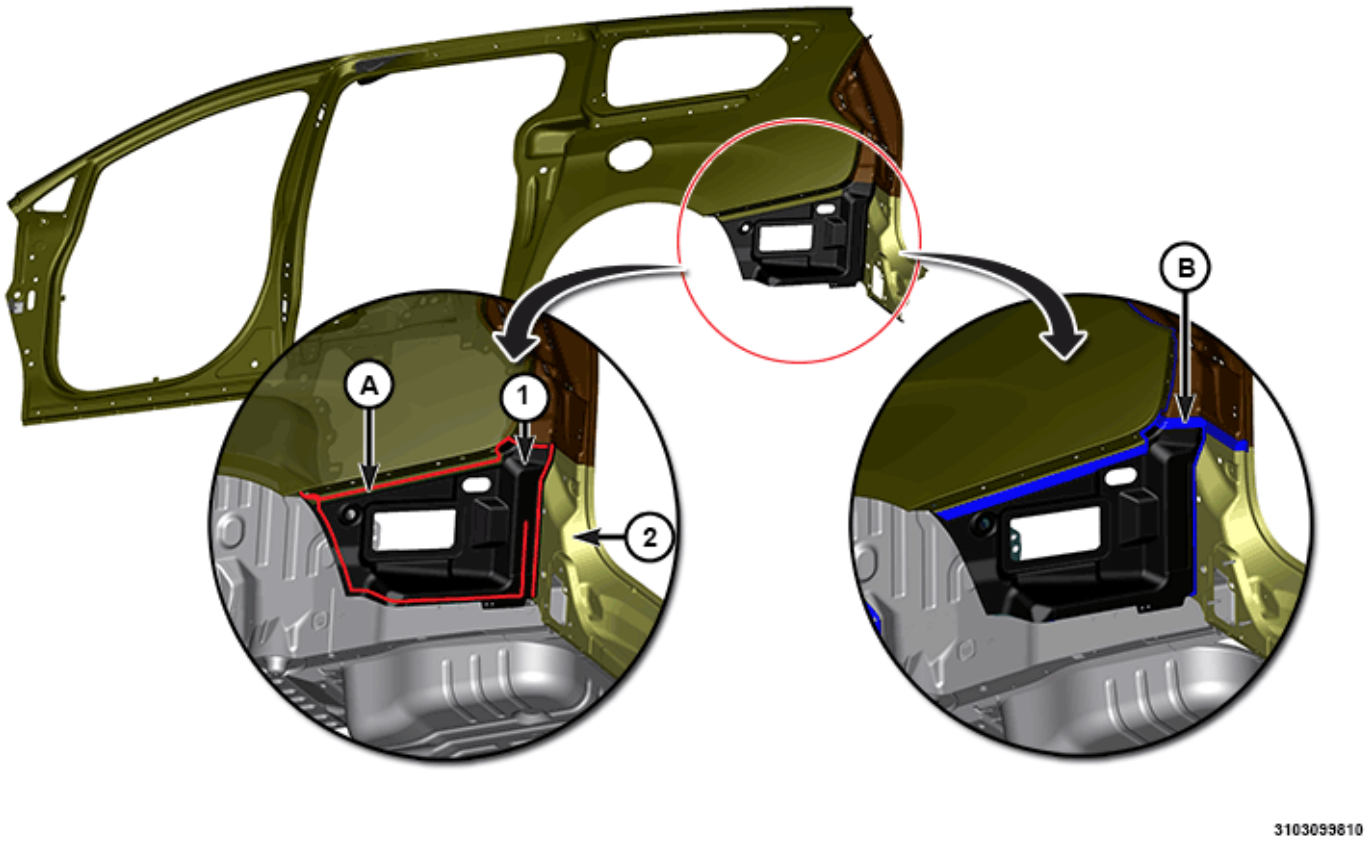
Outer D-pillar

1- Left Outer Wheelhouse
2- Left D-Pillar Outer Reinforcement (Transparent for clarity)
3- Left Outer Wheelhouse Extension (Transparent for clarity)
4- Right D-pillar Outer Reinforcement (Transparent for clarity)
5- Right Outer Wheelhouse
6- Right Outer Wheelhouse Extension (Transparent for clarity)
A- Structural Adhesive



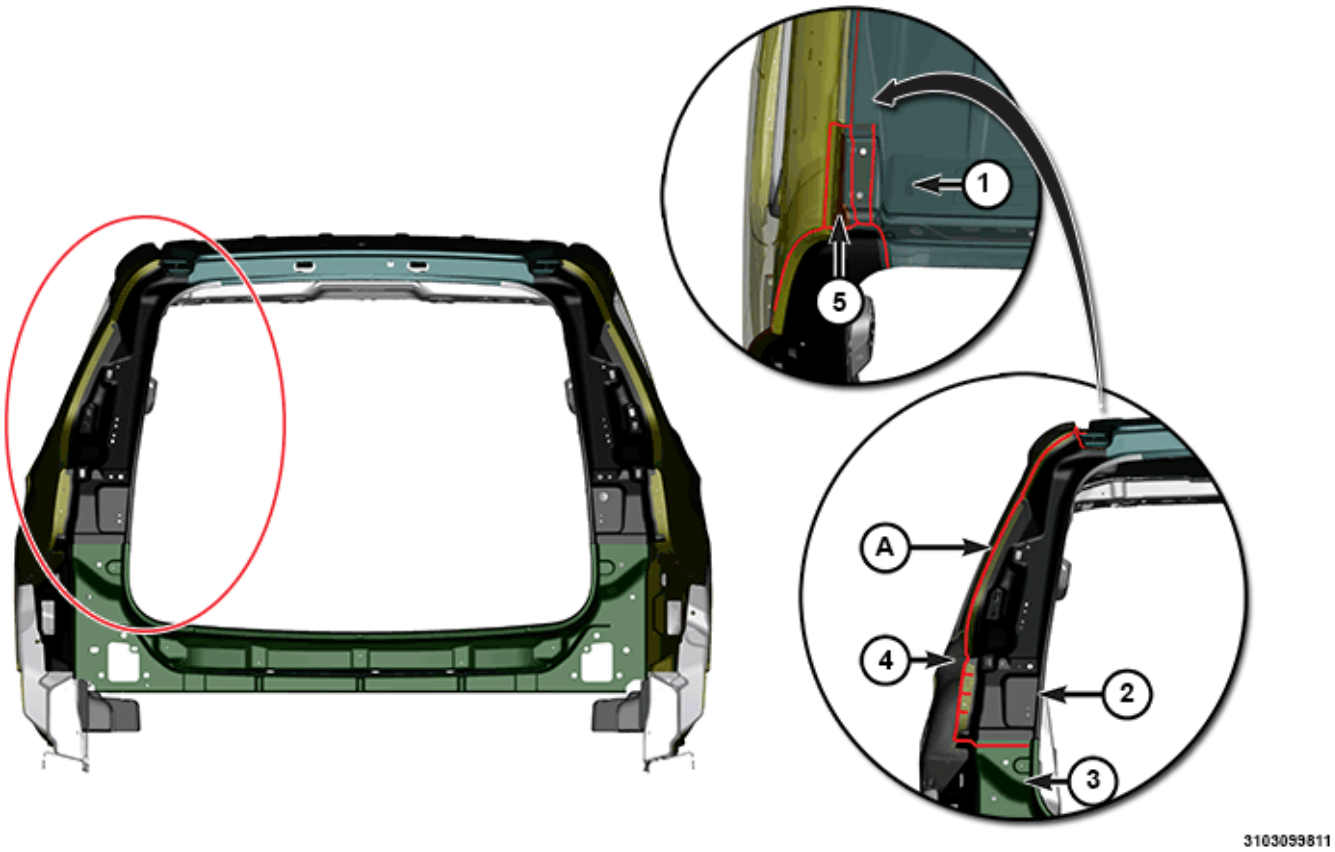
Rear Closure Inner Extension

1- Drain Trough Panel
2- Rear Closure Inner Extension
3- D-pillar Outer Reinforcement
4- Rear Closure Exterior Reinforcement (Transparent for clarity)
A- Structural Adhesive



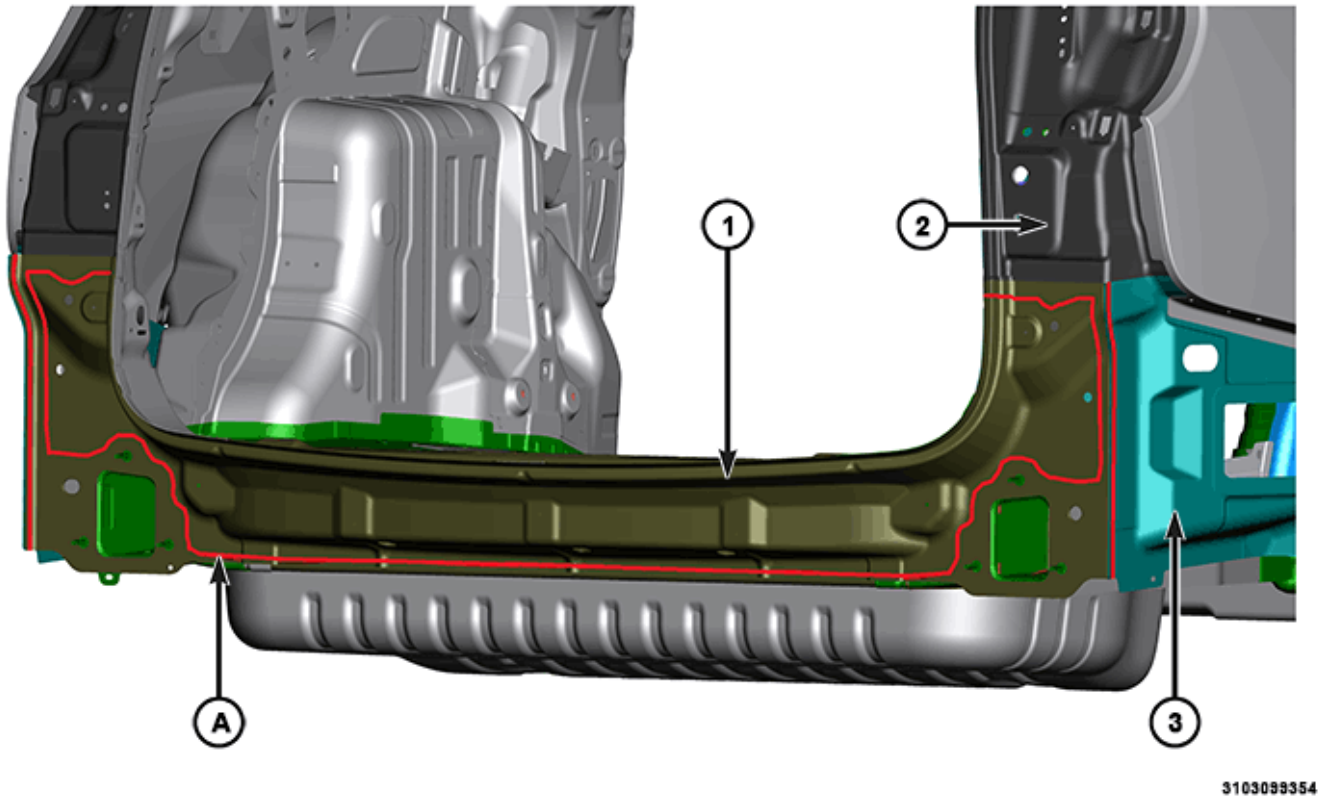
Rear Quarter Panel Extension

1- Rear Quarter Panel Extension
2- Rear Closure Panel
A- Structural Adhesive
C- Seam Sealer



Liftgate Drain Trough Panel

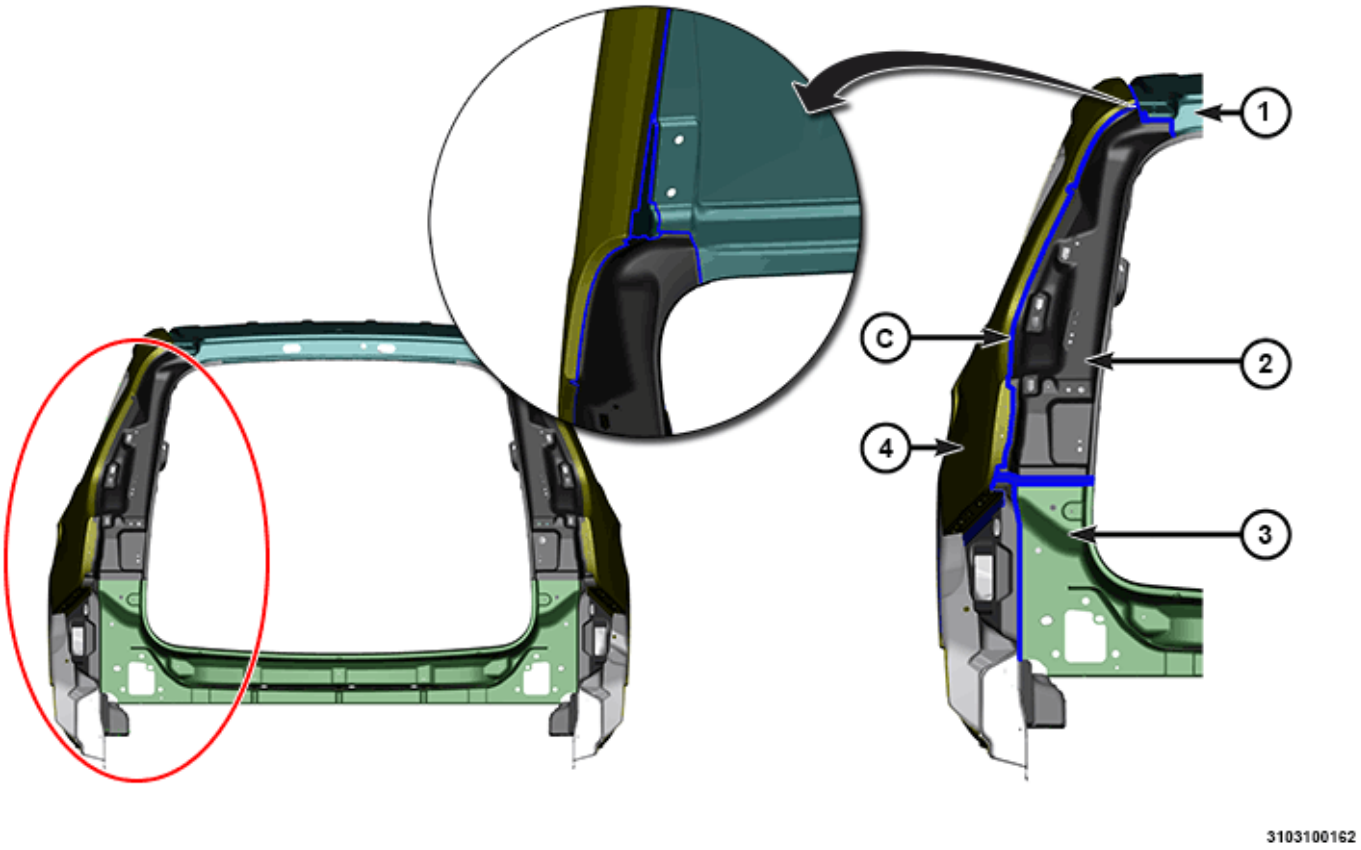
1- Roof Panel (Transparent for clarity)
2- Liftgate Drain Trough Panel
3- Rear Closure Outer Panel (Transparent for clarity)
4- Rear Body Side Aperture/Quarter Panel (Transparent for clarity)
5- D-pillar Upper Reinforcement
A- Structural Adhesive



Rear Closure Outer Panel

NOTE: Right view side shown, left side similar.

1- Rear Closure Outer Panel (Transparent for clarity)
2- Liftgate Opening Drain Trough
3- Rear Bodyside Extension Panel
A- Structural Adhesive



Rear Closure and Liftgate Drain Trough

1- Roof Panel
2- Liftgate Drain Trough Panel
3- Rear Closure Panel
4- Body Side Aperture/Quarter Panel
C- Seam Sealer