

**31 - COLLISION INFORMATION.....2**

## 31 - Collision Information

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**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.

## SAFETY NOTICE – COMPRESSED NATURAL GAS VEHICLE

Any service required on the Compressed Natural Gas (CNG) cylinder tanks must be done by a certified CNG service technician.

Collision repair facilities must work closely in conjunction with a certified CNG service technician to be certain CNG components are serviced correctly and all safety concerns are followed.

ANY service that is required on the Compressed Natural Gas, purging of the fuel tube system must be done refer to the service information (Refer to 14 - Fuel System/Fuel Delivery/Standard Procedure).

**WARNING:** Before performing any service or repair on Compressed Natural Gas (CNG) equipped vehicles, the following warnings and safety precautions must be read and followed:

- The CNG system should be serviced only by qualified natural gas vehicle technicians
- Natural gas vapors at atmospheric pressure are lighter than air and will rise and disperse in open areas. In enclosed areas, natural gas vapor may collect and form a combustible mixture. If the vehicle is routinely placed in an enclosed area, the area should be provided with adequate ventilation or a natural gas detection system. For long term storage, the manual shutoff valve and each individual fuel control valve should be closed.
- A fire or explosion could result if a source of ignition or flame is present with natural gas in a confined-unventilated area. Provide proper ventilation when servicing CNG vehicles.
- Natural gas contains an odor additive. Occasionally, mild natural gas odors may be noticed during engine starting and after engine shut down. This is because of small quantities of unburned gas in the engine intake and exhaust manifolds. While these are normal, as are gasoline odors in similar circumstances, a persistent odor of natural gas indicates a leak is present. Have the vehicle checked immediately for source of leak. If a leak is determined to exist, do not bring the vehicle into an unventilated area.
- Do not attempt to weld any part of the fuel cylinders or any other fuel system component.
- Do not attempt to modify any fuel system component or replace any component with parts that do not meet FCA US LLC corporation requirements.
- Do not apply any paint or undercoating material to any fuel system component.
- Do not attempt to force open or tamper with any fuel tubes or valves. A sudden release of high-pressure gas may occur resulting in bodily injury.
- Do not park or service vehicle near any source of excessive heat or open flames.
- Do not use a paint oven to cure any paint repairs as CNG fuel cylinders on these vehicles are equipped with pressure relief safety devices. These devices will vent to the atmosphere at approximately 103°C (217°F).
- When a vehicle has been involved in an accident which may have caused damage or dislocation to the CNG system, the system should be inspected and pressure tested. This should be done before being returned to service.
- Any fuel system component, including the cylinders, that have been subjected to fire, may not be returned to service due to reduced pressure capability.
- U.S. Requirements: Each CNG fuel cylinder manufactured on or after March 27, 1995 must be removed and reinspected after a motor vehicle accident or fire and at least every 36 months or 36,000 miles (whichever comes first) for damage and deterioration in accordance with Motor Vehicle Safety Standard No. 304 Compressed Natural Gas Fuel Containers And Compressed Gas Association (CGA), Arlington, VA. Guidelines C-6.4. Retest markings must be stamped on the cylinder neck or marked on a label securely affixed to the cylinder and overcoated with epoxy near the original test date. Reheat treatment or repair of rejected cylinders is not authorized. The fuel cylinder expires and must be removed from service fifteen years from the date of manufacture. A label on the fuel filler door states the cylinder expiration date. A similar label is attached to each fuel cylinder. If there is a question about the proper inspection of the CNG cylinder, contact the manufacturer as identified on the cylinder label.
- Canadian Requirements: The cylinder must be reinspected after a motor vehicle accident or fire and at least every 36 months or 36,000 miles (whichever comes first) for damage and deterioration in accordance with Canadian Standards Association (CSA) B51-97, Part 2 High-Pressure Cylinders For The Onboard Storage Of Natural Gas As A Fuel For Automotive Vehicles And Compressed Gas Association (CGA), Arlington, VA. Guidelines C-6.4. Retest dates must be stamped on the exposed metallic surface of the cylinder neck or marked on a label securely affixed to the cylinder and overcoated with epoxy near the original test date. Reheat treatment or repair of rejected cylinders is not authorized. The fuel cylinder expires and must be removed

from service fifteen years from the date of manufacture. A label on the fuel filler door states the first cylinder expiration date. It is recommended that the fuel system components be inspected periodically for leaks or excessive wear.

- Fuel the vehicle using a NGV 1 certified fill nozzle as specified on the label inside the fuel filler door. Do not attempt to fuel the vehicle with any other type of nozzle
- Before any part of the CNG fuel system is opened for repair, the system must be purged of all natural gas. Refer to FUEL TUBE PURGING in the service information.

**WARNING:** THE MANUAL SHUT-OFF VALVES ARE NON SERVICEABLE. DO NOT REMOVE THE MANUAL SHUT-OFF VALVE FROM THE CNG CYLINDER TANKS. REMOVAL OF THE VALVE MAY CAUSE ONE OR MORE OF THE FOLLOWING: THE COMPRESSED GAS IN THE CYLINDER TANK MAY RUSH OUT RAPIDLY ENOUGH TO CAUSE THE VALVE OR THE CYLINDER TANK TO BECOME A PROJECTILE; MAY CAUSE A FLAME AT THE TANK OR A FIRE TO OTHER NEAR BY COMBUSTIBLES; MAY CAUSE AN EXPLOSION OF THE CNG CYLINDER TANK; MAY DISPLACE OR DEplete AIR IN A CONFINED WORK SPACE; OR MAY CAUSE LEAKED CNG TO COLLECT IN CEILING LIKE AREAS IN SUFFICIENT QUANTITIES AND MIXTURE TO BECOME COMBUSTIBLE OR EXPLOSIVE .

**WARNING:** NEVER STORE A CNG VEHICLE OR CYLINDER TANK UNATTENDED IN A FACILITY NOT SPECIFICALLY DESIGNED FOR THE STORAGE OF NATURAL GAS.

**WARNING:** The first high pressure component to be serviced, must be loosened slowly, so that the pressure inside the fuel system can adjust to ambient pressure.

**WARNING:** Extreme care must be taken when servicing the CNG tank. Any type of minor damage to the CNG tank (for example, a .025 in nick, scratch or dent) can render the CNG tank unusable. Any damage, regardless of how minor, requires the tank to be officially inspected and re-certified. Before working around the CNG tank perform a visual inspection to ensure no damage is present, if any damage is discovered, do not service this vehicle until a certified Inspector can certify that the CNG tank is safe.

Removal of the CNG tanks from the vehicle, by a certified CNG technician, would allow the vehicle to be handled with the standard safety concerns as a gasoline vehicle.

If a physical inspection of the CNG cylinder tanks is required refer to the service information (Refer to 14 - Fuel System/Fuel Delivery/CYLINDER, Fuel/Inspection).

## 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.

## Position Statements

## RECONDITIONED WHEEL USAGE

### FCA US LLC Position

FCA US LLC does not recommend that customers use “reconditioned” wheels (wheels that have been damaged and repaired) because they can result in a sudden catastrophic wheel failure which could cause loss of control and result in injury or death.

### For clarification:

- Cosmetic refinishing for the purpose of repairing a superficial flaw is an acceptable procedure providing it is limited to paint or clear coat only, the wheel is not modified in any way, and there is no exposure to paint curing heat over 93 degrees Celsius (200 degrees Fahrenheit).
- Damaged wheels are those which have been bent, broken, cracked or sustained some other physical damage which may have compromised the wheel structure.
- . Repaired indicates that the wheel has been modified through bending, welding, heating, straightening, or material removal to rectify damage.
- Re-plating of chrome plated wheels, or chrome plating of original equipment painted or polished wheels is not an acceptable procedure as this may alter mechanical properties and affect fatigue life. Additionally, FCA US LLC Global Warranty Administration does not allow refinishing of wheels under warranty.

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

Release Date: August 11, 2010

For more information, log on to [www.MoparRepairConnection.com](http://www.MoparRepairConnection.com).

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## REPLACEMENT SEAT COVERS AND SEAT COVER REPAIRS

### FCA US LLC Position

FCA US LLC vehicles, systems and components are engineered, tested and manufactured to help protect vehicle occupants based upon government mandated and internal corporate requirements relative to durability, noise vibration & harshness, occupant protection and vehicle safety.

Supplemental Seat-Mounted Side Air Bags provide enhanced protection to help protect an occupant during a side impact. When the seat-mounted side air bag deploys, it opens the seam between the front and side of the seat's trim cover. Modifications to the seat system, including the seat cover, may change the way the air bag deploys, which could adversely affect the performance of the Supplemental Seat-Mounted Side Air Bag causing serious injury.

"Modifications" include:

- Any change to the seat back cover such as material, thread, stitch design and alterations or misplacement of the features which guide the deploying air bag into position.
- Any non-approved seat-cover replacements.

Only Authentic Mopar® Repair Parts, and approved Mopar® accessories such as Katzkin® Leather seat covers, are designed, engineered, manufactured and tested to the FCA US LLC internal and government mandated standards. The use of parts not specifically designed and tested by FCA US LLC may compromise the integral balance between these safety systems.

FCA US LLC only approves of repairs or modifications to the supplemental seat-mounted side air bag system, including the seat system or seat cover, where Authentic Mopar Repair Parts or Mopar Accessories are used for Chrysler, Jeep® Dodge and Ram vehicles. Any unapproved repairs or modifications performed not using Mopar parts, or not following FCA US LLC approved published repair guidelines and procedures, may increase the risk of injury to current or future vehicle owners and occupants.

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

Release Date: June 21, 2011

For more information, log on to [www.MoparRepairConnection.com](http://www.MoparRepairConnection.com).

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## **SALVAGED AIR BAGS OR OTHER SALVAGED RESTRAINT SYSTEM COMPONENT USAGE**

### **FCA US LLC Position**

FCA US LLC does not support the use of any Supplemental Restraint System (SRS) component, seatbelt component, or any other occupant protection component which has been removed from a vehicle previously damaged, flooded, burned, scrapped or removed from use for any other reason – commonly referred to as “salvage parts”.

Restraint system components are engineered, tested and manufactured to protect vehicle occupants based upon both government mandated and internal corporate requirements relative to vehicle safety and occupant protection. New Mopar® replacement parts are required to be equivalent to the originally installed parts and are tested to ensure these requirements are met. While some salvage parts may visually appear equivalent, there can be dramatic differences in the design and functional characteristics which could have a negative effect on the vehicle occupants in a future collision event. These specific design and functional characteristics can only be determined through destructive testing.

### **Salvage components may have been affected by:**

- Crash impact loads
- Incorrect, improper or inadequate disassembly and removal procedures
- Weathering or environmental exposure outside of that expected during normal use
- Flooding
- Smoke or heat damage
- Abuse

Additionally, salvage components are not traceable should a component recall be required in the future.

It is in the best interest of the current or future vehicle owner and/or occupants that repairs to the SRS, seatbelt and occupant protection system are made using new original equipment parts. Anything less than this may expose operators and occupants to unnecessary risk.

This statement supersedes any previously released information by FCA US LLC. Release Date: August 11, 2010

For more information, log on to [www.MoparRepairConnection.com](http://www.MoparRepairConnection.com).

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## SCAN TOOL POSITION STATEMENT

FCA US LLC vehicles, systems and components are engineered, tested and manufactured to help protect vehicle occupants. They are engineered to meet or exceed both government mandated and internal corporate requirements relative to durability, Noise Vibration and Harshness (NVH) and vehicle safety. Use of the Mopar® wiTECH vehicle diagnostic tester (Mopar Scan Tool) is an important part of FCA US vehicle service and maintenance. This tool contains software that aftermarket tools may not contain and can assess whether any FCA US vehicle's safety and security systems contain active or stored Diagnostic Trouble Codes (DTCs).

Safety and security related systems, such as antilock brakes, Supplemental Restraint Systems (SRS) - air bags, Occupant Restraint Controller (ORC), seat belts, active head restraints, forward facing camera and radar, blind spot monitoring, and other automated electronic driver assistance systems, MUST be tested for fault codes (DTCs) that could be active (current) or stored following a collision. Use of the Mopar wiTECH vehicle diagnostic tester is necessary before and after collision repair.

ANY of the following conditions could trigger DTCs prior to or during collision repairs, which could result in improper vehicle performance:

- Vehicle is involved in an accident or collision, even though the damage may appear minor
- Vehicle has been in an accident with or without air bag deployment
- Voltage loss, including battery disconnects and hybrid battery disabling
- Significant vehicle disassembly including, but not limited to, bumpers, door handles, headlamps and mirrors
- Interior trim repair or removal
- Glass removal and replacement operations

Any repairs performed without using Mopar parts and not following published repair guidelines and procedures, may expose current or future vehicle owners and occupants to unnecessary risk.

If faults were stored in the DTC memory for any safety or security system, then these systems MUST be serviced according to the repair procedures in Service Information. After performing repairs, recheck the system to determine if any active or stored DTCs remain; if so, take appropriate service action to ensure proper function.

### SRS AIR BAG SQUIB STATUS

Multistage air bags with multiple initiators (squibs) MUST be checked to determine that all squibs were used during the deployment event. The Driver Air Bag (DAB) and Passenger Air Bag (PAB) are deployed by electrical signals generated by the Occupant Restraint Controller (ORC) through the driver or passenger squib circuits (up to 3) to the initiators in the air bag inflators. Typically, all initiators are exhausted and all potentially hazardous chemicals are burned during an air bag deployment event.

However, it is possible for only one initiator to be exhausted; therefore, you MUST always confirm that all initiators have been cycled to minimize the risk of improper handling or disposal of potentially live pyrotechnic or hazardous materials. This procedure must be performed using the Mopar wiTECH diagnostic scan tool or at a company such as Collision Diagnostic Services that diagnostically remotely scans the vehicle using FCA US scan tools in conjunction with their patented asTech device, to verify the status of all air bag squibs, prior to removing deployed air bags from the vehicle for disposal.

- Service Information can be obtained at [www.oem1stop.com](http://www.oem1stop.com)
- Mopar wiTECH scan tools can be purchased from <https://mopar.snapon.com>

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## STRUCTURAL REPAIR PARTS USAGE

### FCA US LLC Position

FCA US LLC vehicles, systems and components are engineered, tested and manufactured to protect vehicle occupants based upon both government mandated and internal corporate requirements relative to durability, Noise/Vibration/Harshness (NVH), occupant protection and vehicle safety.

The overall structural integrity of the vehicle is dependent on its inherent design specifications. Sheet metal and glass are critical elements in the design of specific crush zones that allow the energy of a collision to be absorbed in a predictable way and maximize the effectiveness of the restraint system to protect the occupants. The use of parts not specifically designed and tested by FCA US LLC may compromise the integral balance between these safety systems.

Only Authentic Mopar® Repair Parts and glass are designed, engineered, manufactured and tested to the FCA US LLC internal and government mandated standards and are the only ones equivalent to the originally installed parts.

FCA US LLC does not approve of or recognize structural repair procedures where Authentic Mopar Parts are not used for Chrysler, Jeep® Dodge and Ram vehicles. Any repairs performed not using Mopar parts, and not following published repair guidelines and procedures, may expose current or future vehicle owners and occupants to unnecessary risk.

When restoring a collision damaged vehicle to pre-loss condition, consideration must be given to the following:

- All structural distortion has been identified and corrected using appropriate structural straightening equipment (“frame rack”) and a three-dimensional measuring system.
- All damaged panels have been repaired or replaced.
- All replaced panels provide the as-built structural equivalence and corrosion protection of the original panels.
- Unless partial replacement procedures are documented in a FCA US LLC publication, structural panels must be installed in their entirety – partial replacement or “sectioning” of panels may compromise vehicle structure.
- FCA US LLC does not support the use or re-use of any structural component which has been removed from a vehicle previously damaged, flooded, burned, scrapped or removed from use for any other reason - commonly referred to as “salvage parts”.
- While some salvage parts may “appear” equivalent, there can be dramatic differences in the design and functional characteristics which cannot be determined by a visual inspection and which could have a negative effect on the vehicle occupants in a future collision event.
- Salvage components may have been affected by crash impact loads, incorrect, improper or inadequate disassembly and removal procedures, weathering or environmental exposure outside of that expected during normal use.
- Salvage components are not traceable should a component recall be required in the future.

This statement supersedes any previously released information by FCA US LLC. Release Date: August 11, 2010

For more information, log on to [www.MoparRepairConnection.com](http://www.MoparRepairConnection.com).

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## USE OF HEAT DURING REPAIR

### FCA US LLC Position

#### **FCA US LLC Service Engineering's position on the use of heat during collision repair is as follows:**

- Any damaged body panel or frame component, which is to be repaired, must be repaired using the "cold straightening" method. No heat may be used during the straightening process.
- During rough straightening prior to replacement, damaged panels or frame components may be heated to assist in body/frame realignment. This application of heat, if absolutely necessary, 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 vehicles. High-strength materials can be substantially and negatively affected from heat input which will not be obviously known to the repairer or consumer. Additionally, application of heat will alter or destroy material coatings utilized for corrosion protection and which may not be restorable.

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 FCA US LLC.

Release Date: August 11, 2010

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## 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.
- **If the driver airbag is deployed** - If the Driver AirBag (DAB) has been deployed, the clockspring and the steering column must be replaced.
- **If the passenger airbag is deployed** - If the Passenger AirBag (PAB) has been deployed, the instrument panel trim cover must also be replaced.
- **If a seat belt tensioner is deployed** - The seat belt tensioners are deployed in conjunction with the front airbags, but can also be deployed with side curtain airbags (also known as Side AirBag Inflatable Curtains/ SABIC). The seat belt tensioners must be replaced if either front airbag has been deployed, and must be inspected if either side curtain airbag has been deployed.
- **If a side curtain airbag is deployed** - If a side curtain airbag (also known as Side AirBag Inflatable Curtains/ SABIC) has been deployed, the headliner as well as the upper A, B and C-pillar trim on the same side of the vehicle as the deployed airbag must also be replaced. On vehicles with an optional sunroof, the sunroof drain tubes and hoses must be closely inspected following a side curtain airbag deployment.

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.

## SQUIB CIRCUIT DAMAGE

In addition to the preceding guidelines, be aware that the heat created by the initiator during an airbag or tensioner deployment will cause collateral damage to the connected wiring (squib circuits) and connector insulators. There are two methods by which an airbag or seat belt tensioner may be connected to the vehicle electrical system. The first method involves a short pigtail harness and connector insulator that are integral to the airbag or tensioner unit and are replaced as a unit with the service replacement airbag or seat belt tensioner. This connection method typically requires no additional wiring repair following a deployment.

However, the second connection method involves a wire harness takeout and connector insulator that are connected directly to the airbag or tensioner initiator or squib. These direct-connect type take outs and connector insulators **MUST** be repaired following an airbag or seat belt tensioner deployment using the approved Supplemental Restraint System Wiring Repairs procedure. ([Refer to 10 - Restraints - Standard Procedure](#)).

## AIRBAG SQUIB STATUS

Multistage airbags with multiple initiators (squibs) must be checked to determine that all squibs were used during the deployment event. The Driver AirBag (DAB) and Passenger AirBag (PAB) in this vehicle are deployed by electrical signals generated by the Occupant Restraint Controller (ORC) through the driver or passenger squib 1 and squib 2 circuits to the two initiators in the airbag inflators. Typically, both initiators are used and all potentially hazardous chemicals are burned during an airbag deployment event. However, it is possible for only one initiator to be used; therefore, it is always necessary to confirm that both initiators have been used in order to avoid the improper handling or disposal of potentially live pyrotechnic or hazardous materials. The following procedure should be performed using a diagnostic scan tool to verify the status of both airbag squibs before either deployed airbag is removed from the vehicle for disposal.

**CAUTION:** Deployed front airbags have 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 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.

1. 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, outboard of the steering column.
2. Turn the ignition switch to the On position.
3. Using the scan tool, read and record the active (current) Diagnostic Trouble Code (DTC) data.

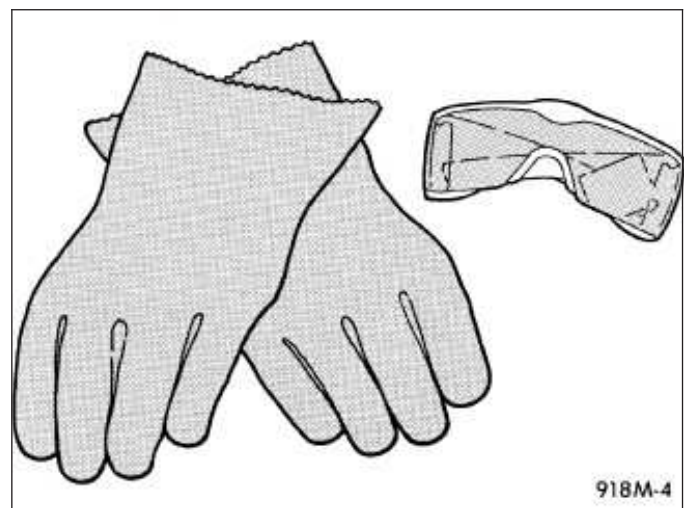
Using the active DTC information, refer to the **Airbag Squib Status** table to determine the status of both DAB squibs and both PAB squibs.

AIRBAG SQUIB STATUS		
IF THE ACTIVE DTC IS:	CONDITIONS	SQUIB STATUS
Driver or Passenger Squib 1 open	<b>AND</b> the stored DTC minutes for both Driver or Passenger squibs are within 15 minutes of each other	Both Squib 1 and 2 were used.
Driver or Passenger Squib 2 open		
Driver or Passenger Squib 1 open	<b>AND</b> the stored DTC minutes for Driver or Passenger Squib 2 open is <b>GREATER</b> than the stored DTC minutes for Driver or Passenger Squib 1 by 15 minutes or more	Squib 1 was used; Squib 2 is live.
Driver or Passenger Squib 2 open		
Driver or Passenger Squib 1 open	<b>AND</b> the stored DTC minutes for Driver or Passenger Squib 1 open is <b>GREATER</b> than the stored DTC minutes for Driver or Passenger Squib 2 by 15 minutes or more	Squib 1 is live; Squib 2 was used.
Driver or Passenger Squib 2 open		
Driver or Passenger Squib 1 open	<b>AND</b> Driver or Passenger Squib 2 open is <b>NOT</b> an active code	Squib 1 was used; Squib 2 is live.
Driver or Passenger Squib 2 open	<b>AND</b> Driver or Passenger Squib 1 open is <b>NOT</b> an active code	Squib 1 is live; Squib 2 was used.

**NOTE:** If none of the Driver or Passenger Squib 1 or 2 open are active codes, the status of the airbag squibs is unknown. In this case the airbag should be handled and disposed of as if the squibs were both live.

**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.



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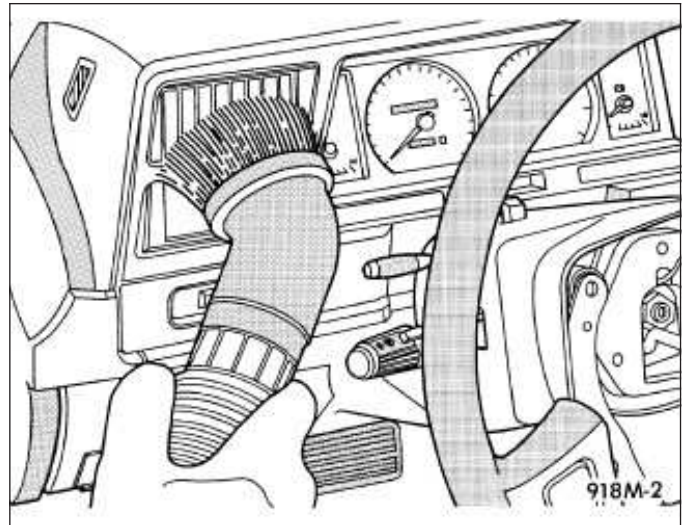
**WARNING:** To avoid serious or fatal injury, if you experience skin irritation during cleanup, run cool water over the affected area. Also, if you experience irritation of the nose or throat, exit the vehicle

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 have initiators (squibs) in the airbag inflator that 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 the AIRBAG SQUIB STATUS heading within this information. 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.





## POST COLLISION SCAN TOOL INSPECTION

Before any repair decisions are made, access to FCA US LLC service information is required. Diagnostic Trouble Codes (DTCs) do not identify which part needs to be replaced, rather DTCs are a piece of the diagnostic process that will lead a trained and qualified technician to the correct test to accurately diagnose the damage. Be certain of proper battery support when scanning.

**Collision damage pre-scan before repairs-** All vehicles that are in a collision need to have a diagnostic scan done at the beginning of the repair process, preferably during the estimating process, to determine damaged systems that may not be obvious. If proper battery support is not possible due to collision damage the scan should be performed during the repair process as soon as the battery can support the system and operate safely. After the repair process is completed the vehicle will need to be scanned again to be certain the systems involved are functioning properly. A Malfunction Indicator Light (MIL) may not illuminate for a particular system yet a DTC may be present, active or stored, compromising the proper function of the system. Identifying system faults will significantly reduce unexpected repairs at or near the end of the repair process. It will reduce the need for additional charges and benefit the vehicle being delivered without delay. The use of the Mopar scan tool wiTECH™ will be necessary to access DTC's. and to perform many of the programming and initialization of modules. If the wiTECH™ scan tool is not available it can be obtained through an FCA US dealership service center or through a company such as Collision Diagnostics Services that can remotely use the wiTECH™ scan tool in conjunction with their patented asTech™ device. DTC identification is only part of the repair process as it will most likely be necessary to access the service and diagnostic information to understand proper operation, wiring and diagnosis and testing of the system and DTC.

The vehicle will also need to have a diagnostic scan done upon the completion of repairs to determine that all systems are functioning properly and if any of the systems are in need of repair, reprogramming or initialization.

### Pre-Scan Process

1. Conduct a customer consultation.
  - a. Gain customer authorization to scan the vehicle and to share the data with the appropriate parties involved (sublet technician, insurer, repair facility personnel).
2. Check for Malfunction Indicator Lamps (MILs) and/or information display messages.
  - a. The 12-volt electrical system must be enabled to identify any MILs.
  - b. Not all systems will illuminate MILs, even if there is damage to that system.
3. Document any MILs and/or information display messages.
4. Identify Driver Assistance Systems (DAS) which the vehicle is equipped with. These systems include but are not limited to Adaptive Cruise Control (ACC), Forward Collision Warning (FCW), Lane Sensing.
5. Document the DAS the vehicle is equipped with.
6. Document potential damage to DAS component(s), DAS mounting location(s), damage that may affect DAS , or parts that will need to be removed and installed near DAS.
7. Identify any calibration, initialization and aiming requirements for DAS parts, including required calibration, initialization and aiming requirements following removal and installation.
  - a. FCA US LLC service information as found on TechCONNECT
  - b. Mopar TECH AUTHORITY
  - c. RTS - OEM Calibration Requirements Search (<https://rts.i-car.com/oem-calibration-requirements-search.html>)
8. Identify enable and disable switches.
  - a. The system may require enablement/disablement for calibration procedure.
  - b. If the system is turned off, it may not be able to be calibrated.
  - c. Systems that can be enabled or disabled should be documented, so that the system can be set to the customer's preferences.
9. Perform the pre-scan.
  - a. A pre-scan is not possible if the 12-volt electrical system and vehicle communication networks are disabled or cannot be maintained throughout the scan.
  - b. If the pre-scan is not possible due to vehicle damage, it should be done as soon as the repair progress allows it to be done safely.
10. Document DTCs and other data.
  - a. Does not include black box info, speed of accident/accident recreation.
  - b. Include pending, current and past DTCs.
11. Access the service information to identify system(s) affected by DTCs.
  - a. Access the FCA vehicle specific service and diagnostic information.
  - b. Check FCA vehicle specific information for service bulletins and recalls information that relate to DTCs.
12. Determine likely related and unrelated DTCs.
  - a. Key cycles/time stamps/freeze frame data.

**Post Repair Calibrations and Post Scan Process**

1. Perform all required calibration/initialization/aiming steps, following the FCA service information procedures.
  - a. Some systems will require the vehicle to be driven to perform calibration/ initialization/aiming within the require driving parameters.
  - b. Some systems will not detect issues within the system until the vehicle is driven within the required parameters.
  - c. Some systems will require special tools and/or aiming equipment for calibration/initialization/aiming equipment
  - d. Some systems will require both.
2. Perform post-scan.
3. If related DTC's return, access the diagnostic information to troubleshoot the cause of the error.

## RECALIBRATION OF SENSORS AND MODULES

During the collision repair process, depending on the type and location of the damage, sensors and modules of electronic systems that are removed and/or replaced. These system sensors, modules and motors may require recalibration, relearning, initialization or verification testing.

**These systems and components may include but are not limited to-**

- Occupant restraint systems such as- air bags, seat belt tensioners. impact sensors and Occupant Restraint Controller (ORC)
- Vehicle safety systems such as- Lane Departure Warning (LDW), Adaptive Cruise Control (ACC), Anti-lock Brake System (ABS) and park assist
- Vehicle options such as- power liftgate, power roof systems, power windows and power seat systems.
- Vehicle standard functions such as- Body Control Module (BCM), Powertrain Control Module (PCM) and door module

Access to the service information will be necessary to perform the procedures. The service information can be found on techCONNECT™ and techAUTHORITY™.

The procedures may require one or a combination of-

**The procedures may require one or a combination of-**

- wiTECH™ scan tool
- Specialty tools or equipment (for example; Forward Facing Camera (FFC))
- Established driving parameters
- Operation of the component's switches

If the wiTECH™ scan tool is not available it can be obtained through an FCA US dealership service center or through a company such as Collision Diagnostics Services that can remotely use the wiTECH™ scan tool in conjunction with their patented asTech™ device.

## COMPRESSED NATURAL GAS VEHICLE

Any service required on the Compressed Natural Gas (CNG) cylinder tanks must be done by a certified CNG service technician.

Collision repair facilities must work closely in conjunction with a certified CNG service technician to be certain CNG components are serviced correctly and all safety concerns are followed.

ANY service that is required on the Compressed Natural Gas, purging of the fuel tube system must be done refer to the service information (Refer to 14 - Fuel System/Fuel Delivery/Standard Procedure).

**WARNING:** Before performing any service or repair on Compressed Natural Gas (CNG) equipped vehicles, the following warnings and safety precautions must be read and followed:

- The CNG system should be serviced only by qualified natural gas vehicle technicians
- Natural gas vapors at atmospheric pressure are lighter than air and will rise and disperse in open areas. In enclosed areas, natural gas vapor may collect and form a combustible mixture. If the vehicle is routinely placed in an enclosed area, the area should be provided with adequate ventilation or a natural gas detection system. For long term storage, the manual shutoff valve and each individual fuel control valve should be closed.
- A fire or explosion could result if a source of ignition or flame is present with natural gas in a confined-unventilated area. Provide proper ventilation when servicing CNG vehicles.
- Natural gas contains an odor additive. Occasionally, mild natural gas odors may be noticed during engine starting and after engine shut down. This is because of small quantities of unburned gas in the engine intake and exhaust manifolds. While these are normal, as are gasoline odors in similar circumstances, a persistent odor of natural gas indicates a leak is present. Have the vehicle checked immediately for source of leak. If a leak is determined to exist, do not bring the vehicle into an unventilated area.
- Do not attempt to weld any part of the fuel cylinders or any other fuel system component.
- Do not attempt to modify any fuel system component or replace any component with parts that do not meet FCA US LLC corporation requirements.
- Do not apply any paint or undercoating material to any fuel system component.
- Do not attempt to force open or tamper with any fuel tubes or valves. A sudden release of high-pressure gas may occur resulting in bodily injury.
- Do not park or service vehicle near any source of excessive heat or open flames.
- Do not use a paint oven to cure any paint repairs as CNG fuel cylinders on these vehicles are equipped with pressure relief safety devices. These devices will vent to the atmosphere at approximately 103°C (217°F).
- When a vehicle has been involved in an accident which may have caused damage or dislocation to the CNG system, the system should be inspected and pressure tested. This should be done before being returned to service.
- Any fuel system component, including the cylinders, that have been subjected to fire, may not be returned to service due to reduced pressure capability.
- U.S. Requirements: Each CNG fuel cylinder manufactured on or after March 27, 1995 must be removed and reinspected after a motor vehicle accident or fire and at least every 36 months or 36,000 miles (whichever comes first) for damage and deterioration in accordance with Motor Vehicle Safety Standard No. 304 Compressed Natural Gas Fuel Containers And Compressed Gas Association (CGA), Arlington, VA. Guidelines C-6.4. Retest markings must be stamped on the cylinder neck or marked on a label securely affixed to the cylinder and overcoated with epoxy near the original test date. Reheat treatment or repair of rejected cylinders is not authorized. The fuel cylinder expires and must be removed from service fifteen years from the date of manufacture. A label on the fuel filler door states the cylinder expiration date. A similar label is attached to each fuel cylinder. If there is a question about the proper inspection of the CNG cylinder, contact the manufacturer as identified on the cylinder label.
- Canadian Requirements: The cylinder must be reinspected after a motor vehicle accident or fire and at least every 36 months or 36,000 miles (whichever comes first) for damage and deterioration in accordance with Canadian Standards Association (CSA) B51-97, Part 2 High-Pressure Cylinders For The Onboard Storage Of Natural Gas As A Fuel For Automotive Vehicles And Compressed Gas Association (CGA), Arlington, VA. Guidelines C-6.4. Retest dates must be stamped on the exposed metallic surface of the cylinder neck or marked on a label securely affixed to the cylinder and overcoated with epoxy near the original test date. Reheat treatment or repair of rejected cylinders is not authorized. The fuel cylinder expires and must be removed

from service fifteen years from the date of manufacture. A label on the fuel filler door states the first cylinder expiration date. It is recommended that the fuel system components be inspected periodically for leaks or excessive wear.

- Fuel the vehicle using a NGV 1 certified fill nozzle as specified on the label inside the fuel filler door. Do not attempt to fuel the vehicle with any other type of nozzle
- Before any part of the CNG fuel system is opened for repair, the system must be purged of all natural gas. Refer to FUEL TUBE PURGING in the service information.

**WARNING:** THE MANUAL SHUT-OFF VALVES ARE NON SERVICEABLE. DO NOT REMOVE THE MANUAL SHUT-OFF VALVE FROM THE CNG CYLINDER TANKS. REMOVAL OF THE VALVE MAY CAUSE ONE OR MORE OF THE FOLLOWING: THE COMPRESSED GAS IN THE CYLINDER TANK MAY RUSH OUT RAPIDLY ENOUGH TO CAUSE THE VALVE OR THE CYLINDER TANK TO BECOME A PROJECTILE; MAY CAUSE A FLAME AT THE TANK OR A FIRE TO OTHER NEAR BY COMBUSTIBLES; MAY CAUSE AN EXPLOSION OF THE CNG CYLINDER TANK; MAY DISPLACE OR DEplete AIR IN A CONFINED WORK SPACE; OR MAY CAUSE LEAKED CNG TO COLLECT IN CEILING LIKE AREAS IN SUFFICIENT QUANTITIES AND MIXTURE TO BECOME COMBUSTIBLE OR EXPLOSIVE .

**WARNING:** NEVER STORE A CNG VEHICLE OR CYLINDER TANK UNATTENDED IN A FACILITY NOT SPECIFICALLY DESIGNED FOR THE STORAGE OF NATURAL GAS.

**WARNING:** The first high pressure component to be serviced, must be loosened slowly, so that the pressure inside the fuel system can adjust to ambient pressure.

**WARNING:** Extreme care must be taken when servicing the CNG tank. Any type of minor damage to the CNG tank (for example, a .025 in nick, scratch or dent) can render the CNG tank unusable. Any damage, regardless of how minor, requires the tank to be officially inspected and re-certified. Before working around the CNG tank perform a visual inspection to ensure no damage is present, if any damage is discovered, do not service this vehicle until a certified Inspector can certify that the CNG tank is safe.

Removal of the CNG tanks from the vehicle, by a certified CNG technician, would allow the vehicle to be handled with the standard safety concerns as a gasoline vehicle.

If a physical inspection of the CNG cylinder tanks is required refer to the service information (Refer to 14 - Fuel System/Fuel Delivery/CYLINDER, Fuel/Inspection).

## 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 alcohol-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.

## BED LINER REPAIR

### Dual Cartridge Gun Repair

**WARNING:**

- Eye protection should be used when servicing components. Personal injury can result.
- Use an OSHA approved breathing mask when mixing epoxy, grinding, and spraying paint or solvents in a confined area. Personal injury can result.
- Avoid prolonged skin contact with resin, petroleum, or alcohol based solvents. Personal injury can result.
- Do not venture under a hoisted vehicle that is not properly supported on safety stands. Personal injury can result.

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

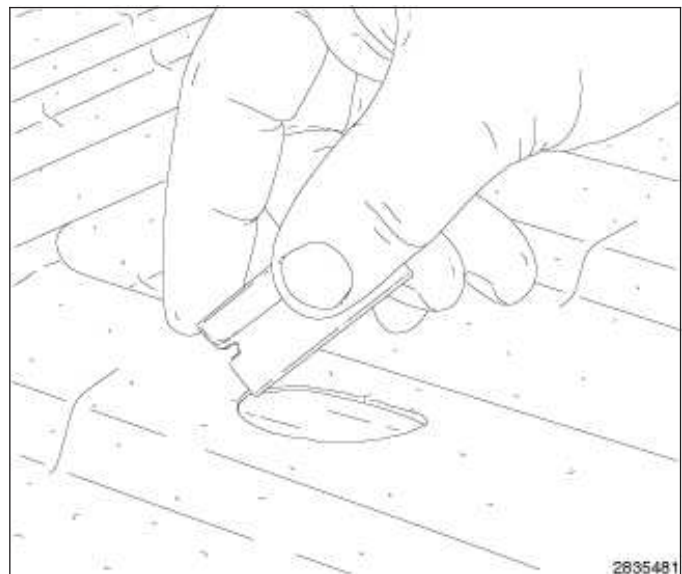
Dual cartridge repair will require use of dispenser and materials readily available through Ultimate Linings Ltd..

- Dual cartridge caulk gun
- Quick Fix Kit (dual cartridge repair material)
- Texture pad
- Bed liner Conditioner

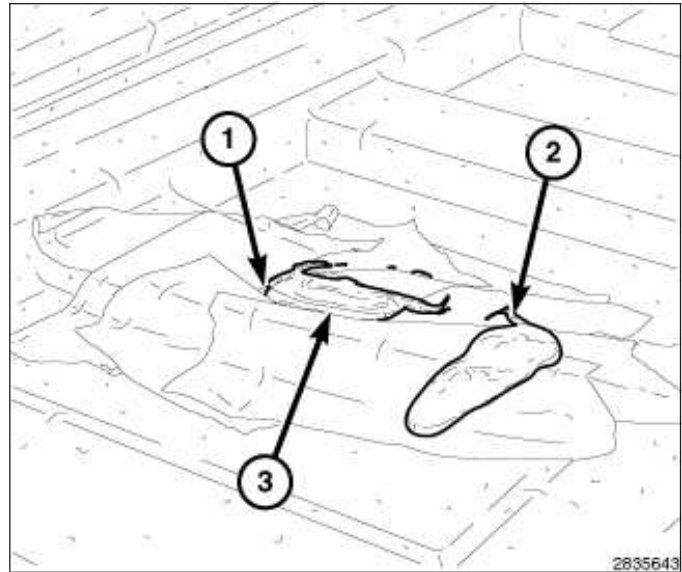
All other tools and materials should be readily available shop supplies.

**NOTE:** When repairing an area more than 30cm. (12 in.) long it is best to do in shorter sections.

1. Carefully cut around the tear or gouge and remove the loose material with a flat bladed tool.
2. Use prep solvent to clean the effected area.
3. Mask off tightly to the repair area.



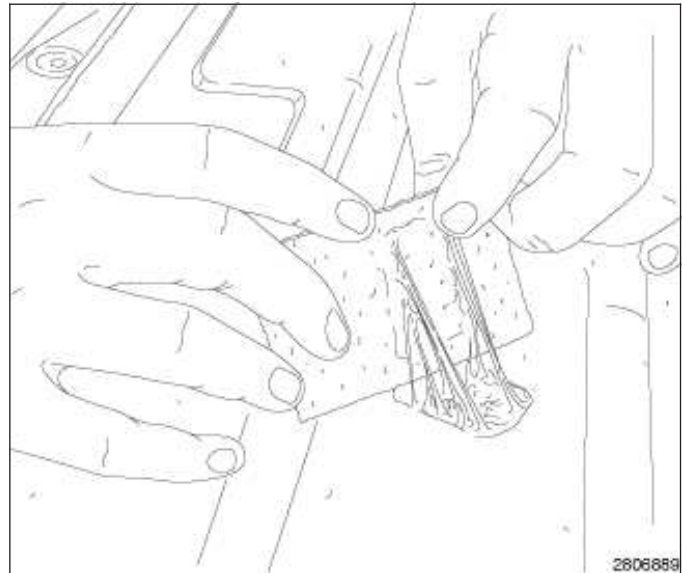
4. Install mixing tip on cartridge and purge 2.5cm. (1in.) of repair material . This will allow proper mix.
5. Fill area slightly higher than the bed liner height. Do not overfill.
6. Carefully remove masking tape.
7. Apply mold release or similar product to texture pad.



**NOTE:** Wait 7-8 minutes for material to partially set before proceeding to next step. If repair material is sticking to texture pad more time is needed, refer to Figure 1.

**NOTE:** For best results do not try to spread out the material all at once. Steps 8-11 may need to be repeated several times.

8. Apply firm and even pressure for 30 seconds. This will force repair material out to the sides of repair area.
9. Release the pressure and let the pad set in place for 30 seconds .
10. Re-apply pressure for 30 seconds, then remove the pad.
11. Use the edge of the texture pad to feather out the edges of the repair.
12. When the repair is complete, wait 10 minutes then apply bed liner conditioner to the area.



## Spray On Repair

### WARNING:

- Eye protection should be used when servicing components. Personal injury can result.
- USE a fresh air supply system whenever possible, if not available use an OSHA approved respirator.
- Avoid prolonged skin contact with resin, petroleum, or alcohol based solvents. Personal injury can result.

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

**CAUTION:** Bedliner material is designed to be permanent. Improper masking of vehicle and surrounding area will result in damage.

**NOTE:** A designated area, such as an undercoating stall or equivalent , should be used to prevent overspray from contaminating other objects and areas.

Spray repair will require use of dispenser and materials readily available through **Ultimate Linings Ltd.**

- Quick Liner® Spray gun dispenser
- Qwik Liner® Spray Cartridge repair material.
- Bedliner Conditioner
- Edge cutting wire tape

All other tools and materials should be readily available shop supplies.

1. Wash the entire cargo bed area and dry thoroughly.
2. Mask off all areas that will not be coated. This includes the vehicle and the surrounding area.

**NOTE:** When replacing box sections mask at seams or backtape to feature lines whenever possible. Unmask these areas immediately after spraying.

**NOTE:** If there is not a natural break to tape to it will be necessary to use wire tape .

**NOTE:** If equipped with bed rails, mask off. Do not remove to apply bedliner material. Proper tolerances will lost.

3. Sand all areas to be coated with 80 grit sand paper or equivalent.
4. Gouge or scrape repairs should be feather edged with a dual action sander or equivalent.
5. Remove the sanding residue with a blow gun and wash entire area with prep solvent.
6. Tailgates will require removal of the access cover and masking off the fastener threads and inner handle area. Hold the access cover in place and elevated by using magnets.
7. Load cartridge into applicator gun , install mixing tip and set air pressure to 110 psi.
8. Purge 13mm. (0.50 in.) of cartridge to be certain of proper mixing .

**NOTE:** Do not use the last 13mm. (0.50 in. ) of cartridge to be certain of proper mix.

9. Apply with tip 60 -75 cm. (2-2.5 feet) away from surface to a total film build of 90 - 120 mils.
10. Once the area is covered, increase your spray distance to approximately 1.2 m. (4ft.). Drop coat the entire area for a uniform finish.

**WARNING:** Do not remove edge cutting wire tape with bare hands. To prevent injury use pliers or equivalent.

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

**NOTE:** Do not wait more than 24 hours to unmask.

**NOTE:** If the bedliner has bridged onto the masking tape it will be necessary to use a utility knife to score the liner before separating.

11. Unmask the area .

## NON-STRUCTURAL SHEET METAL REPAIR

### Safety Notice

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

Proper service and repair is important to the safe, reliable operation of all motor vehicles. The service procedures 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 and 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.

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).

#### 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  $\pm 5\%$ . 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

JOINT AND REPAIR TYPES	REFERENCE
Backer Panel Joint	<a href="#">Backer Panel Joint</a>
Door Skin	<a href="#">Door Skin Replacement</a>
Body Side Aperture/Quarter Panel	<a href="#">Body Side Aperture</a>
Metal Fatigue/Stress Cracks	<a href="#">Metal Fatigue Stress Crack</a>

## 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.

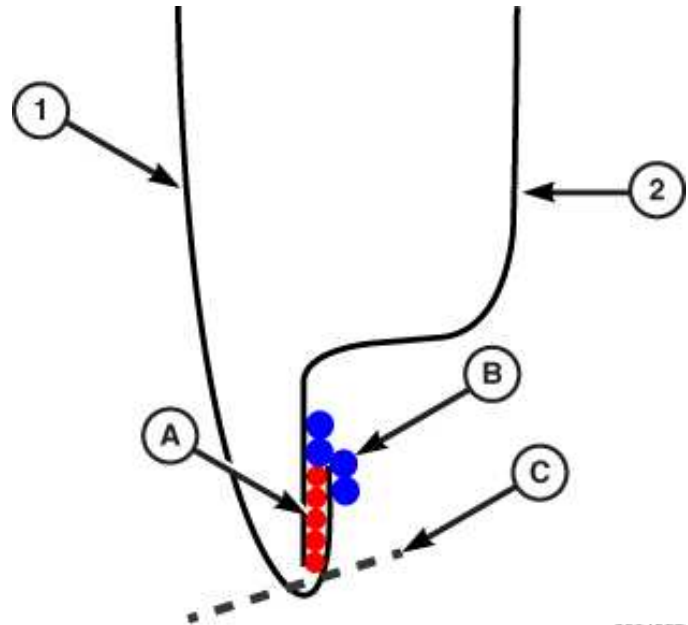
7. Apply a 10 - 13 mm. (3/8 - 1/2 in.) bead of structural adhesive to the bare metal mating surfaces of the backer panels. Evenly apply the adhesive over the complete bonding surface. Apply a 10 - 13 mm. (3/8 - 1/2 in.) bead of structural adhesive to bare metal mating surfaces. Use a body filler applicator 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 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.
9. Dry fit the new panel for margin and beltline alignment. Determine where to place clamps to hold the panel in place, as necessary.



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)

**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.

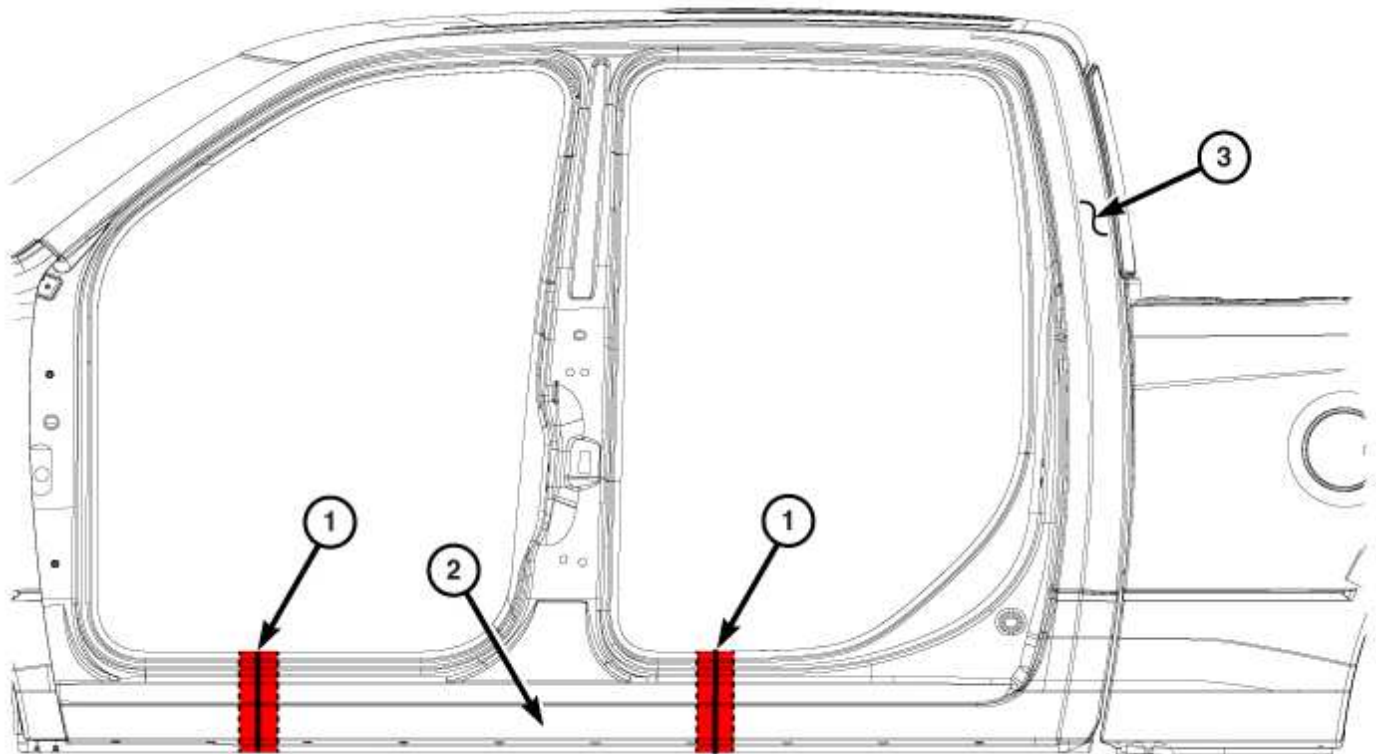
19. Weld the butt-joint with Gas Metal Arc Welding (GMAW), if a belt cut was used. Clean and dress welds accordingly.
20. Apply fiber-reinforced waterproof body filler to the section seam, as necessary. When cured sand and apply conventional body filler and block sand.
21. Apply an epoxy or anti-corrosion 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).

## Side Aperture

**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 GMAW (Gas Metal Arc Welding). 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 refer to the Weld / Weld Bonding section, (Refer to Collision Information - Standard Procedure). GMAW (plug or puddle) welds may be used in place of STRSW (Squeeze Type Resistance Spot Welding) 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 25mm. (1in.) 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. Reference the vehicle specific Body Repair Manual to verify if any specific locations or warnings apply to body side aperture

sectioning locations.



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### Body Side Aperture

- 1 - SECTION JOINT WITH BACKER PANEL
- 2 - ROCKER PANEL
- 3 - 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 8mm. (5/16in.) hole.
9. With the aid of an assistant, dry fit the panel. Apply clamps to hold panel in place, making note of locations. Install screws 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. For further information refer to the Weld / Weld Bonding section, (Refer to Collision Information - Standard Procedure).

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

**Installation:**

12. Install backer panels, refer to [Backer Panel Joint](#).
13. Apply 10 - 13mm. (3/8 - 1/2in.) 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.
15. With the aid of an assistant place the panel to the vehicle. If the panel needs to be adjusted, slide the panel.

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

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 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
Panel Removal	<a href="#">Panel Removal</a>
Key Points of a Welding Repair	<a href="#">Key Points of a Welding Repair</a>
Requirements of a Welding Repair	<a href="#">Requirements of a Welding Repair</a>
Modified Lap Joint	<a href="#">Modified Lap Joint</a>
Types of Welding (STRSW, GMAW and Weld Bonding)	<a href="#">Types of Welding</a>
Weld Processes (STRSW, GMAW and Weld Bonding)	<a href="#">Weld Processes</a>
Minimum Weld Nugget Requirement Chart	<a href="#">Minimum Weld Nugget Chart</a>

INDEX	REFERENCE
Training and Qualification	<a href="#">Training and Qualification</a>

## 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

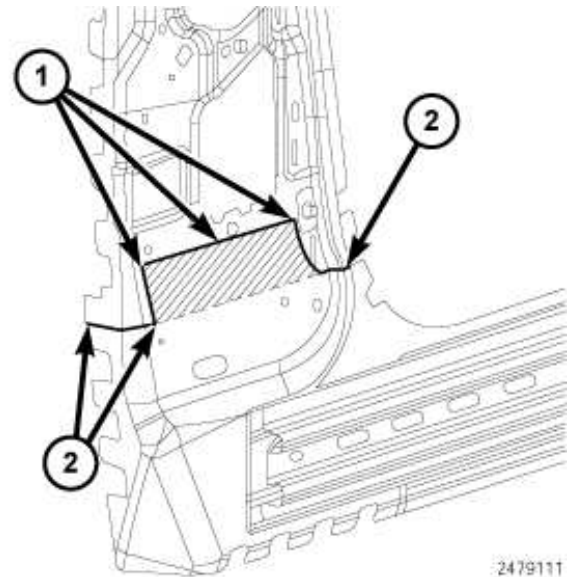
A significant amount of structural adhesive is used at the OEM to improve joint strength. It may be difficult to determine if the material between the panels is an adhesive or a sealer, and for this reason, the following guideline should be used: **If in doubt, use a two-component, corrosion inhibiting, 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.

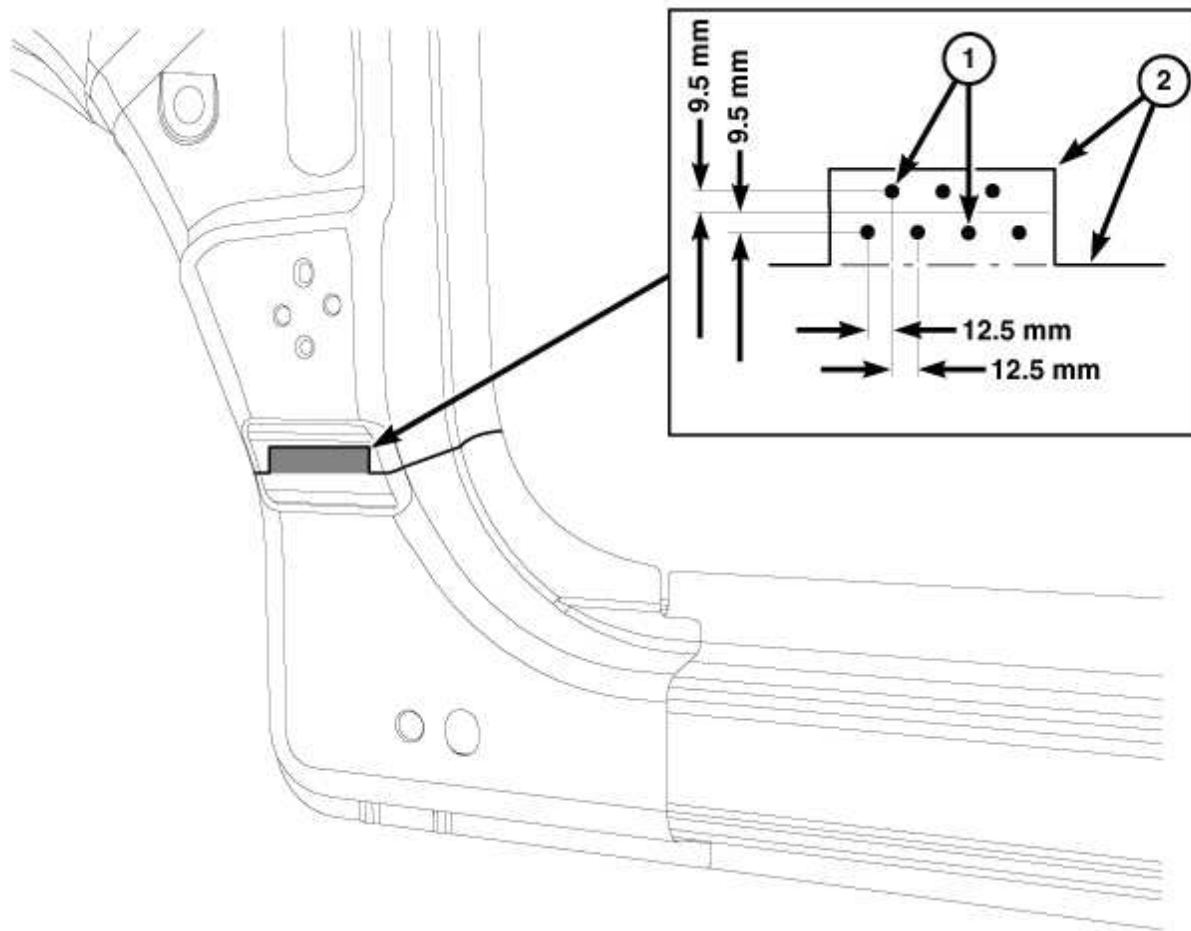
The repair joint is a combination lap-joint (1) and butt-joints (2) – the panels are lapped in the flat areas and butted in contoured locations and at weld flanges. The graphic better illustrates this process.



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**Modified Lap Joint**

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



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### 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 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 galvaneal 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	
<b>ELECTRODE TYPE</b> (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
<b>ELECTRODE SIZE</b>	0.035	0.045	0.023 - 0.025	0.035	0.035	0.045
<b>ELECTRODE MAKER</b>	Lincoln®	Lincoln® NR-211-MP	Lincoln®		Lincoln®	Lincoln® NR-211-MP
<b>WIRE FEED SPEED</b> (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
<b>TRAVEL SPEED</b> (in/min)			10			
<b>VOLTAGE</b>	19-20	15-18	16-19	18-19	19-20	15-18
<b>POLARITY</b>	DCEP	DCEN	DCEP	DCEP	DCEP	DCEN
<b>GAS FLOW (cfh)</b>	25-35	N/A	25-35	25-35	25-35	N/A
<b>ELECTRICAL STICKOUT (in)</b>	1/2 - 5/8	3/8 - 1/2	1/2 - 5/8	5/8 - 3/4	1/2- 5/8	3/8 - 1/2
<b>GAS TYPE</b>	75% Ar 25% CO2	N/A	75% Ar 25% CO2	100% Ar	75% Ar 25% CO2	N/A
<b>TYPE OF ARC TRANSFER</b>	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 vernier 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 possess 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

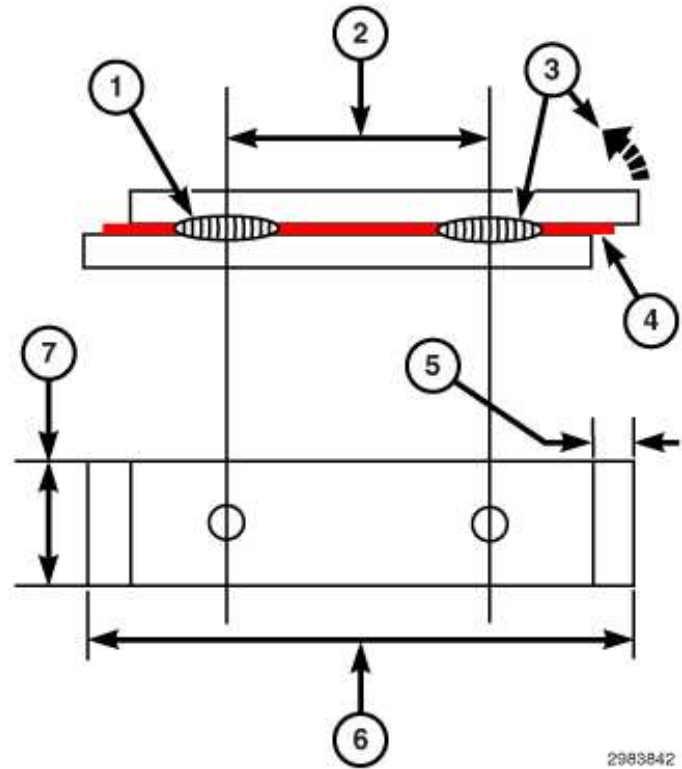
- Sealers are materials placed on top of a seam to control water and air intrusion.
- Adhesives, providing structural improvements, are found between panels welded together. Adhesives also provide the qualities of sealers when applied correctly.
- The FCA US LLC recommendation is to replace any suspected 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 whether 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 Examples

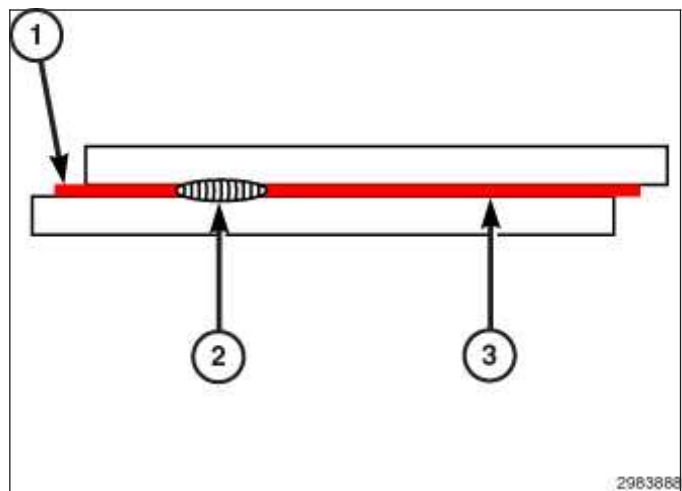
Current Level Low for Both Welds



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**Weld Coupon**

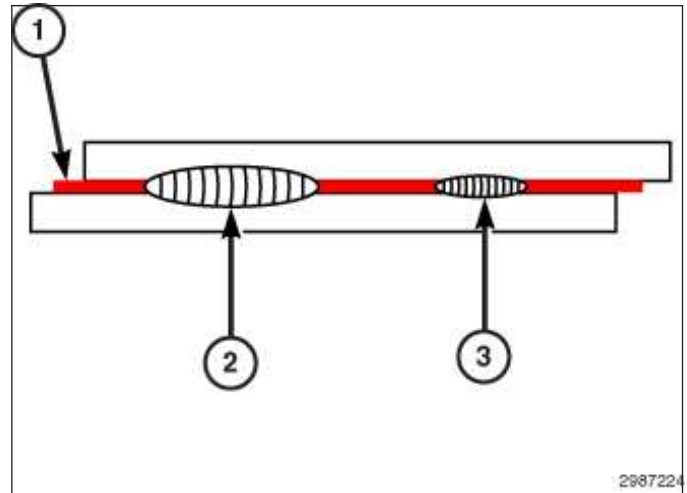
- 1 - FIRST WELD TOWARD END OF COUPON, AT LEAST 12.5 mm. (0.5 in.) FROM ANY EDGE
- 2 - DISTANCE MUST EQUAL THE SPACING FROM THE REPAIR WELD TO THE CLOSEST EXISTING WELD ON THE VEHICLE
- 3 - TEST THE SECOND WELD BY PEELING APART IN DIRECTION SHOWN (USING PLIERS OR EQUIVALENT)
- 4 - STRUCTURAL ADHESIVE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



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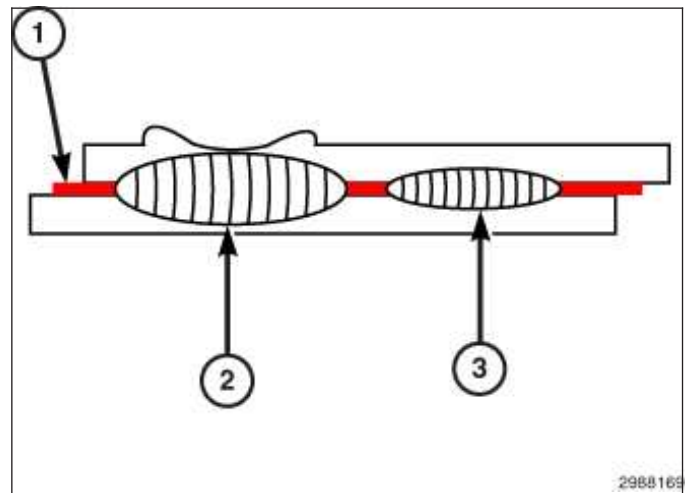
- 1 - STRUCTURAL ADHESIVE
- 2 - WELD TOO SMALL
- 3 - WELD NON-EXISTENT

Current Level Medium for Both Welds



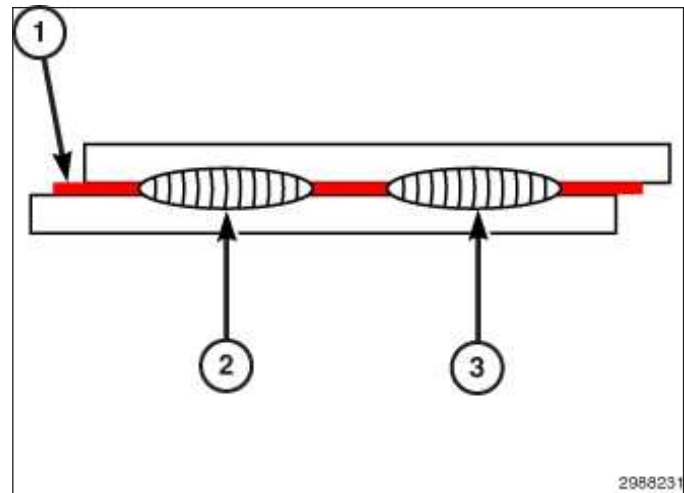
- 1 - STRUCTURAL ADHESIVE
- 2 - WELD CORRECT SIZE
- 3 - WELD TOO SMALL

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, galvanized, 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 contaminants 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:** Galvanized 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., galvanized, 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).

## BODY SIDE REPAIR

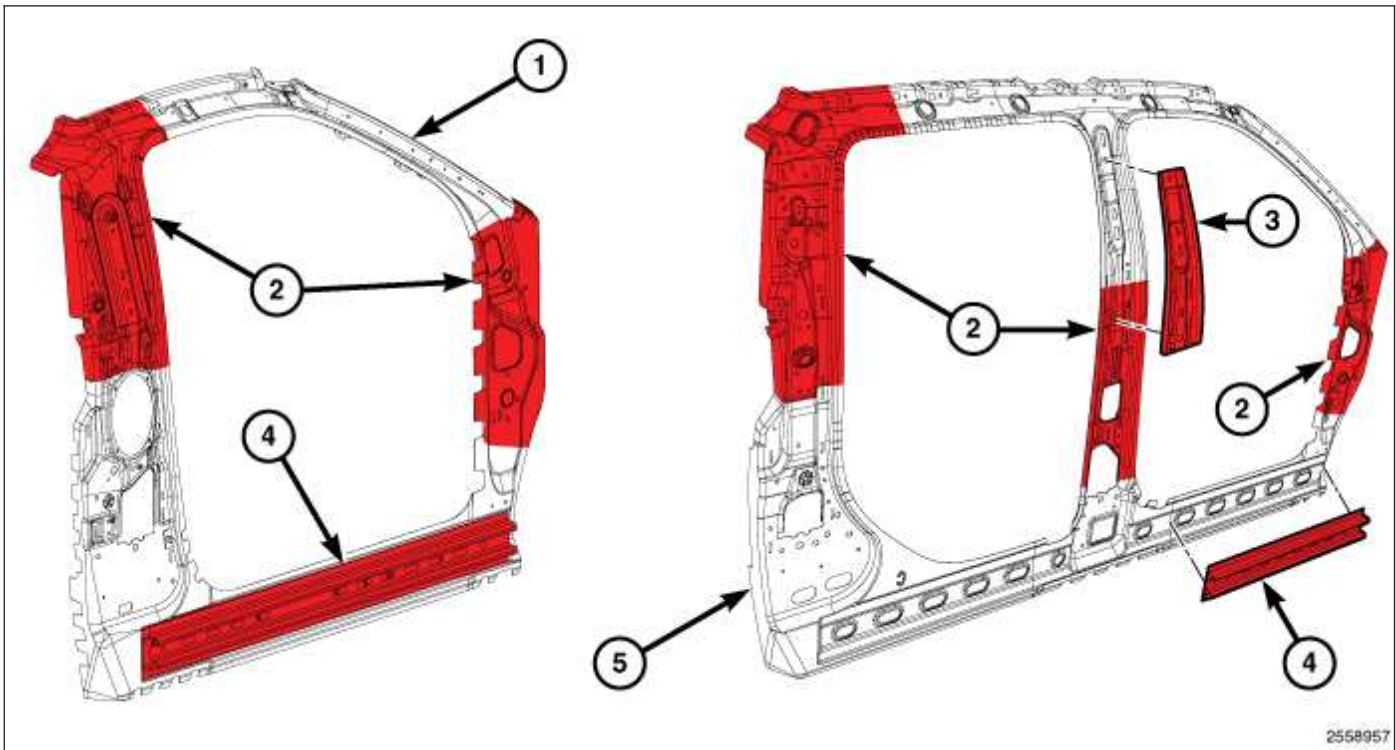
### CAUTION:

- 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.

**NOTE:** 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 inner aperture panel on the Ram truck may be sectioned in several areas providing the prescribed methods below are adhered to. Since the inner panel is a structural component, it is important that the overall cab integrity is maintained during a repair.

The outer aperture panel (class "A" surface) may be installed following the guidelines published in the FCA US LLC "Non-Structural Sheet Metal Repair Manual" publication. The location of the joint should not be performed at a door hinge or striker mounting location.



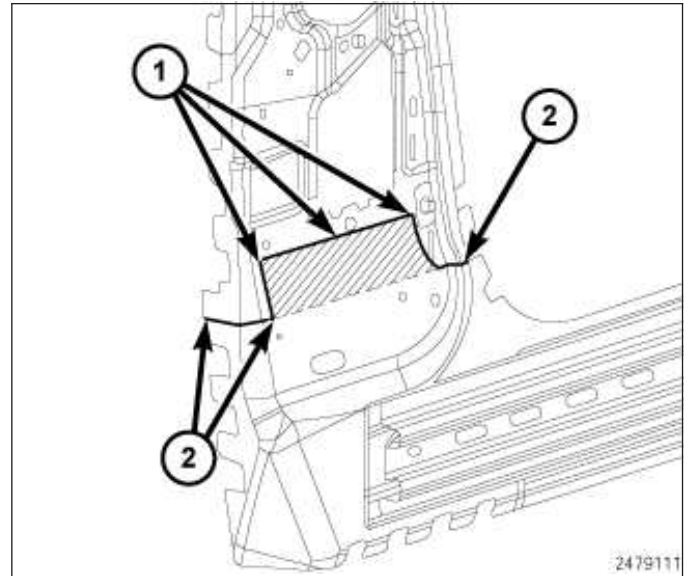
- 1 - STANDARD CAB  
 2 - **DO NOT SECTION THESE AREAS**  
 3 - REINFORCEMENT - SHOULDER MOUNT (REMOVE BEFORE SECTIONING UPPER B-PILLAR)  
 4 - FRAME REINFORCEMENT (DO NOT SECTION THESE PARTS)  
 5 - CREW CAB SHOWN, QUAD CAB SIMILAR

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

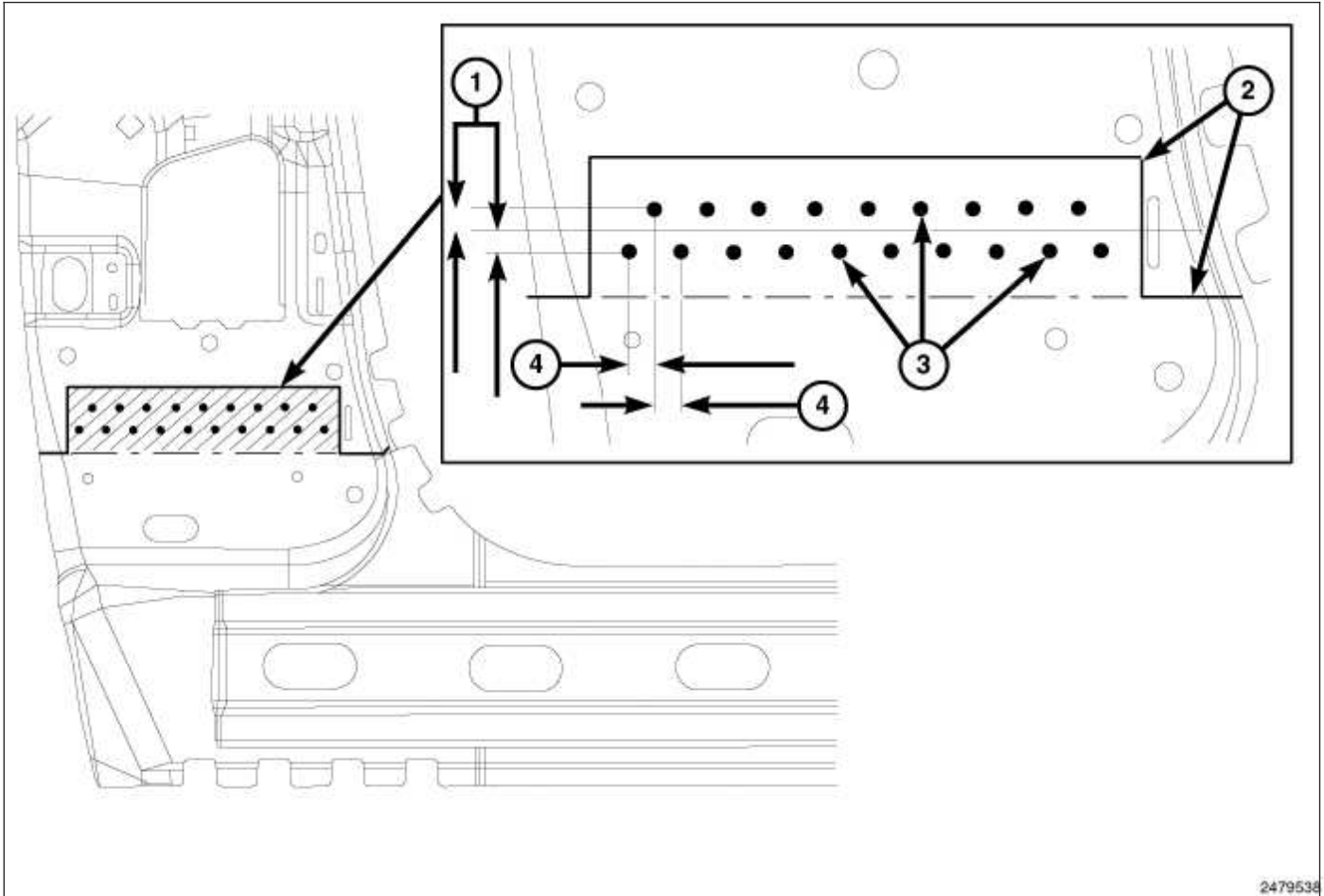
The inner aperture should not be sectioned within 152.5 mm (6 in.) of the back glass opening, door striker, or door hinge locations. Further, the joint should whenever possible be performed in as "flat" an area as possible to simplify the repair. While the joint may include "holes" and formations, it 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.



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



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

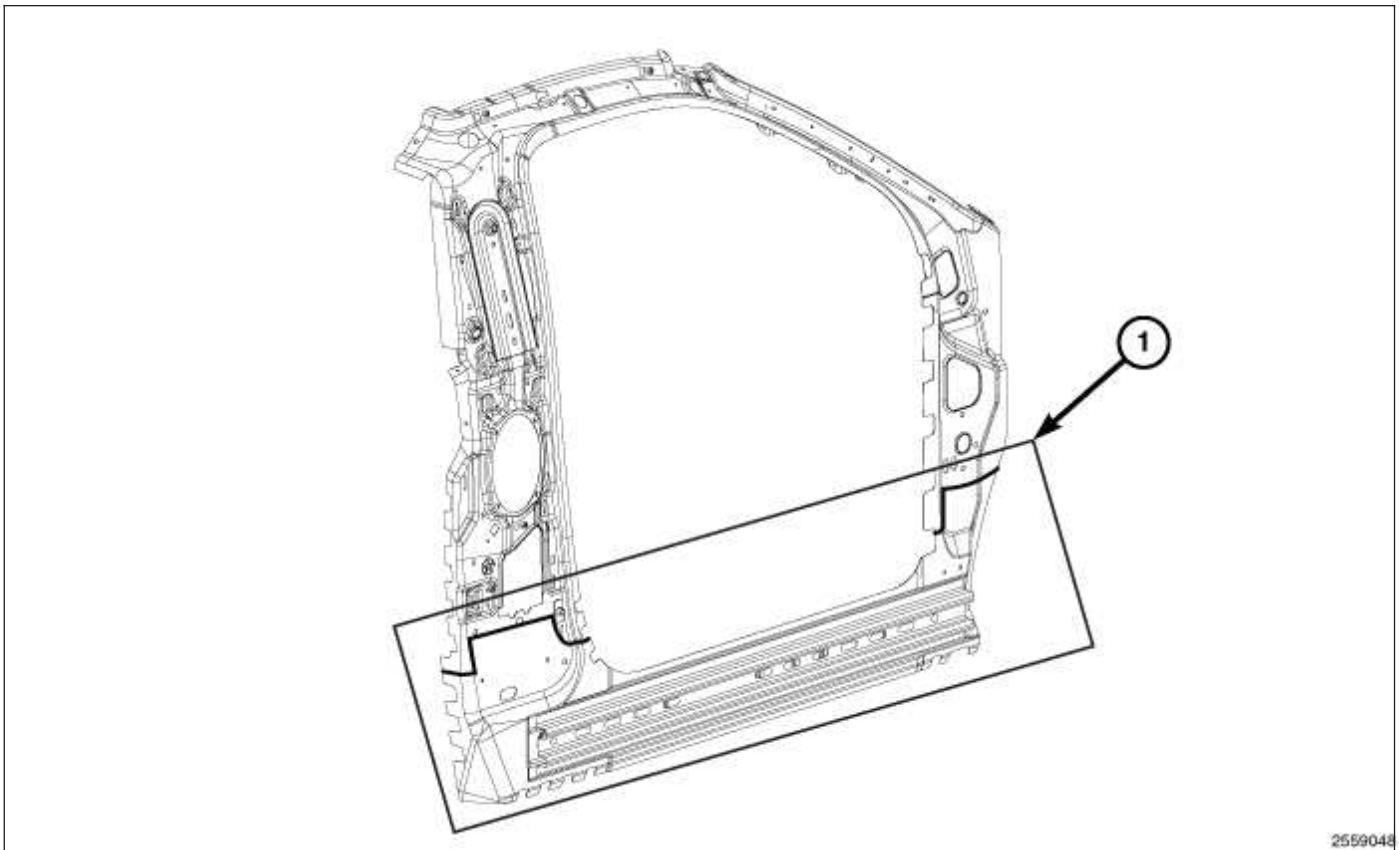


2479534

- 1 - 9.5 mm (0.375 in.)
- 2 - MIG SEAM WELD
- 3 - MIG PLUG WELDS
- 4 - 12.5 mm (0.5 in.)

In the lap-jointed area, staggered MIG plug welds are used to augment the joint and both edges of the lapped panels should be welded.

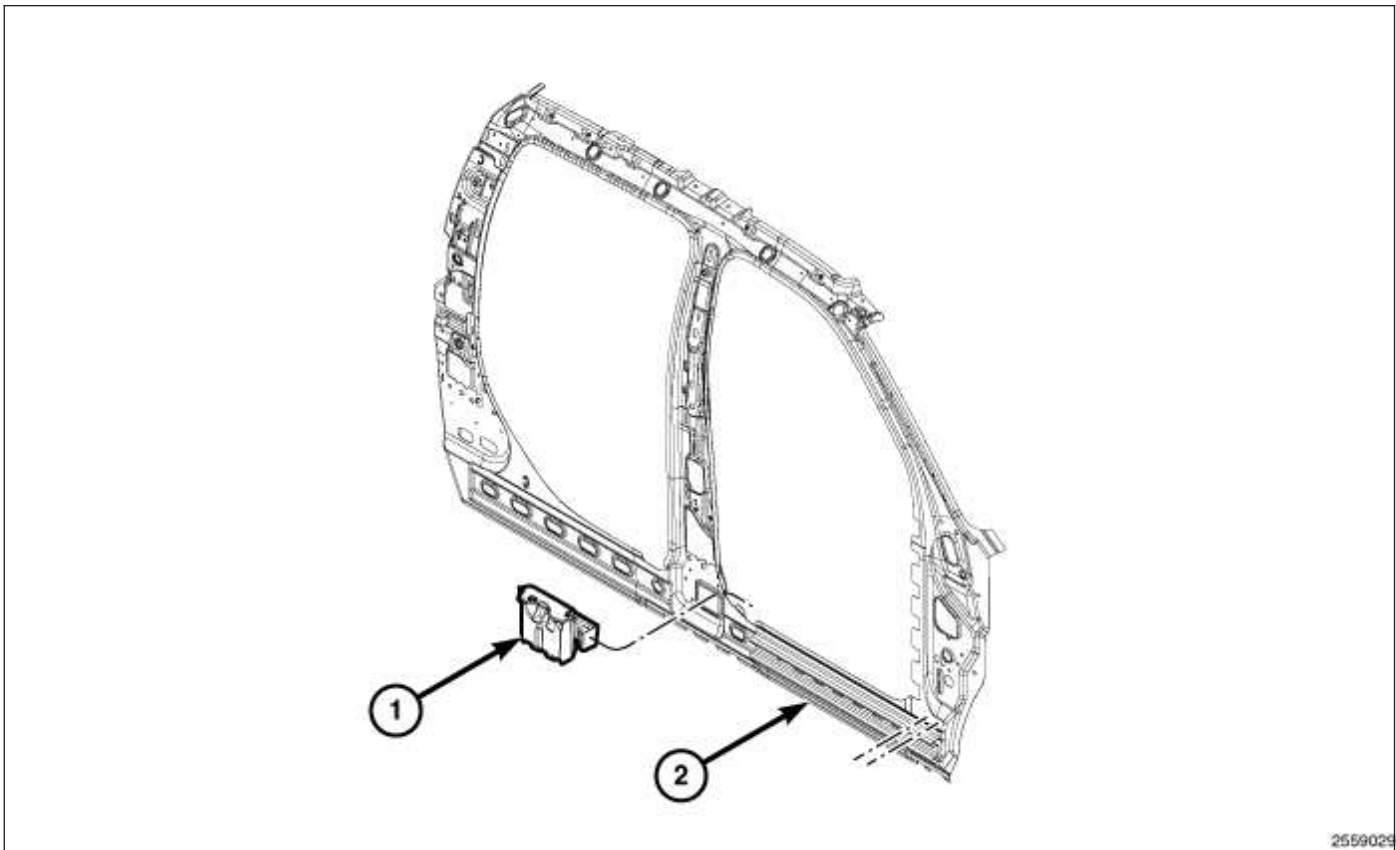
The MIG plug welds, or “puddle welds”, should be made after drilling 8 mm (5/16 in) holes and should be staggered 12.5 mm (0.5 in.) apart following the centerline of the lap and should be alternating above and below the centerline 9.5 mm (0.375 in.).



1 - CLEAN WELDS

**CAUTION:** Do not apply any corrosion protection to the weld zones until the outer panel is fully installed and all welding is completed as materials are flammable.

When all welding is completed, the welds should all be thoroughly cleaned.



- 1 - B-PILLAR IMPACT BLOCK  
2 - ROCKER REINFORCEMENT

When completing the remaining repair, make sure that any impact blocks (1) (base of the B-pillar) or rocker reinforcements (2) are installed before the outer panel is attached. The impact block in the base of the B-pillar is secured in production by an expandable coating which is activated during e-coating. Since the repair process cannot duplicate this, the block must be installed and secured between the panels to avoid an NVH issue. The impact block can be secured with either windshield urethane or structural adhesive applied liberally to ensure there is adequate contact.

As with any FCA US LLC repair, squeeze type resistance spot welding is the preferred method to duplicate OE welds whenever possible. All sealers at welded locations must provide corrosion protection and if uncertain whether the material is a sealer or adhesive, use an approved structural adhesive per the manufacturer's directions.

**CAUTION:** Use Mopar Cavity wax kit part # 68042969AA, or equivalent, AFTER all welding is complete as material is flammable.

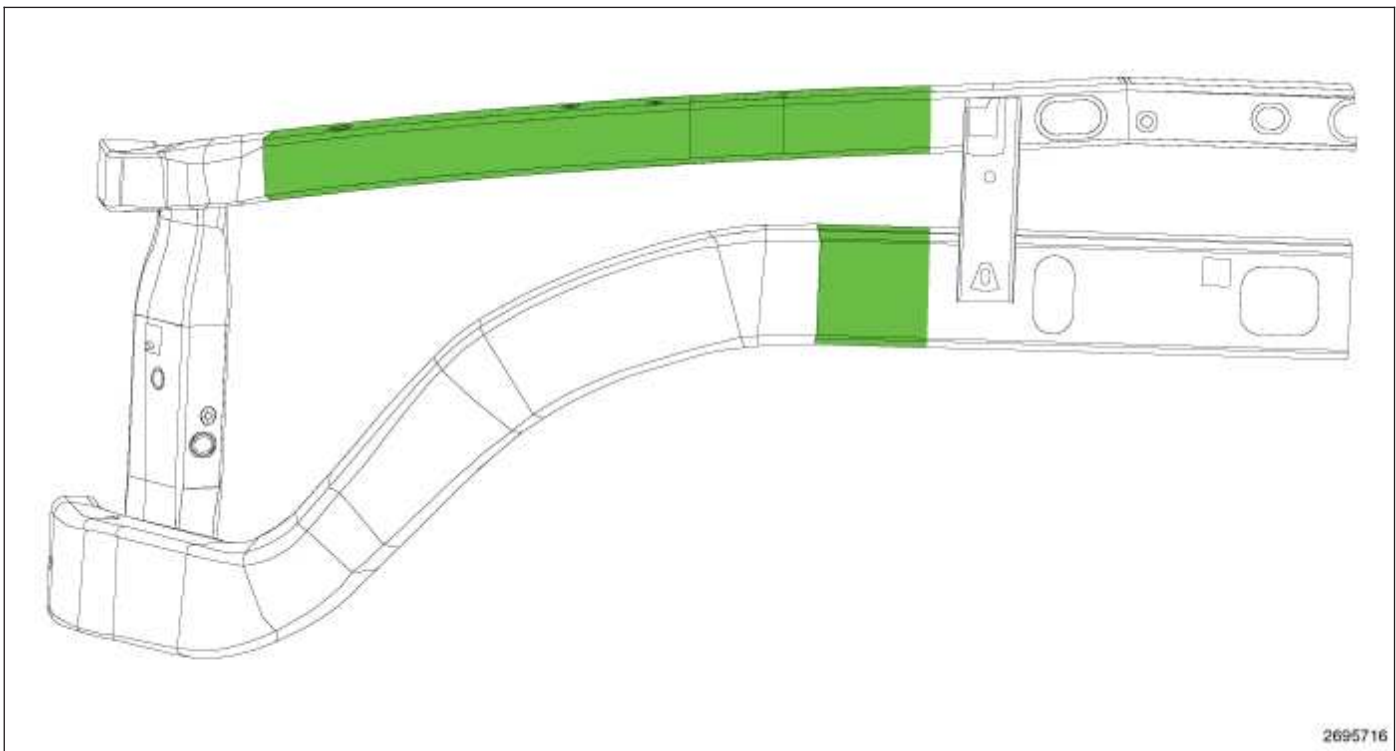
After attachment of the outer panel is complete and all weld zones are thoroughly cleaned, apply corrosion protection Mopar Cavity wax kit part # 68042969AA, or equivalent, to the weld zones.

## HYDROFORM FENDER RAIL REPAIR

**CAUTION:** This repair procedure assumes damage to the right or left hydroform fender rail. Prior to any repairs, the vehicle must be mounted on the appropriate frame repair equipment ("frame rack"), checked with three dimensional measuring equipment, and necessary pull corrections made. If damage exists in the hydroform fender rail, or cab beyond the area covered by this service procedure after dimensional corrections are made, the hydroform must be replaced in its entirety.

**CAUTION:** Inspect the tire winch assembly for damage. If any one or more of the following are evident, replace the winch assembly.

- Indications of cracked or bulging plastic.
- Housing flanges are bent or cracked.
- If winch was loose before repair.
- If the rivet heads are separated from the housing in any way.



Sectioning cut lines are allowed in the green areas shown.

1. Before proceeding with this repair procedure review the required service warnings and precautions.
2. Remove all parts needed to gain access to the repair area. (Refer to appropriate Service Information - Removal Procedures.)
3. Disconnect and isolate the battery negative cable.

**CAUTION:** Do not use any flame or plasma cutting equipment to cut the frame in this procedure. The inaccurate and high temperatures achieved during flame or plasma cutting will change the metal characteristics and may weaken the frame or repair location.

4. Using a reciprocating saw or equivalent, cut the fender rail and shotgun at a straight and square section of the hydroform and remove.
5. Smooth and square the cut edges.
6. Using the damaged structure as a reference cut the service part at the same location as the first cut. Smooth and square the cut edges.

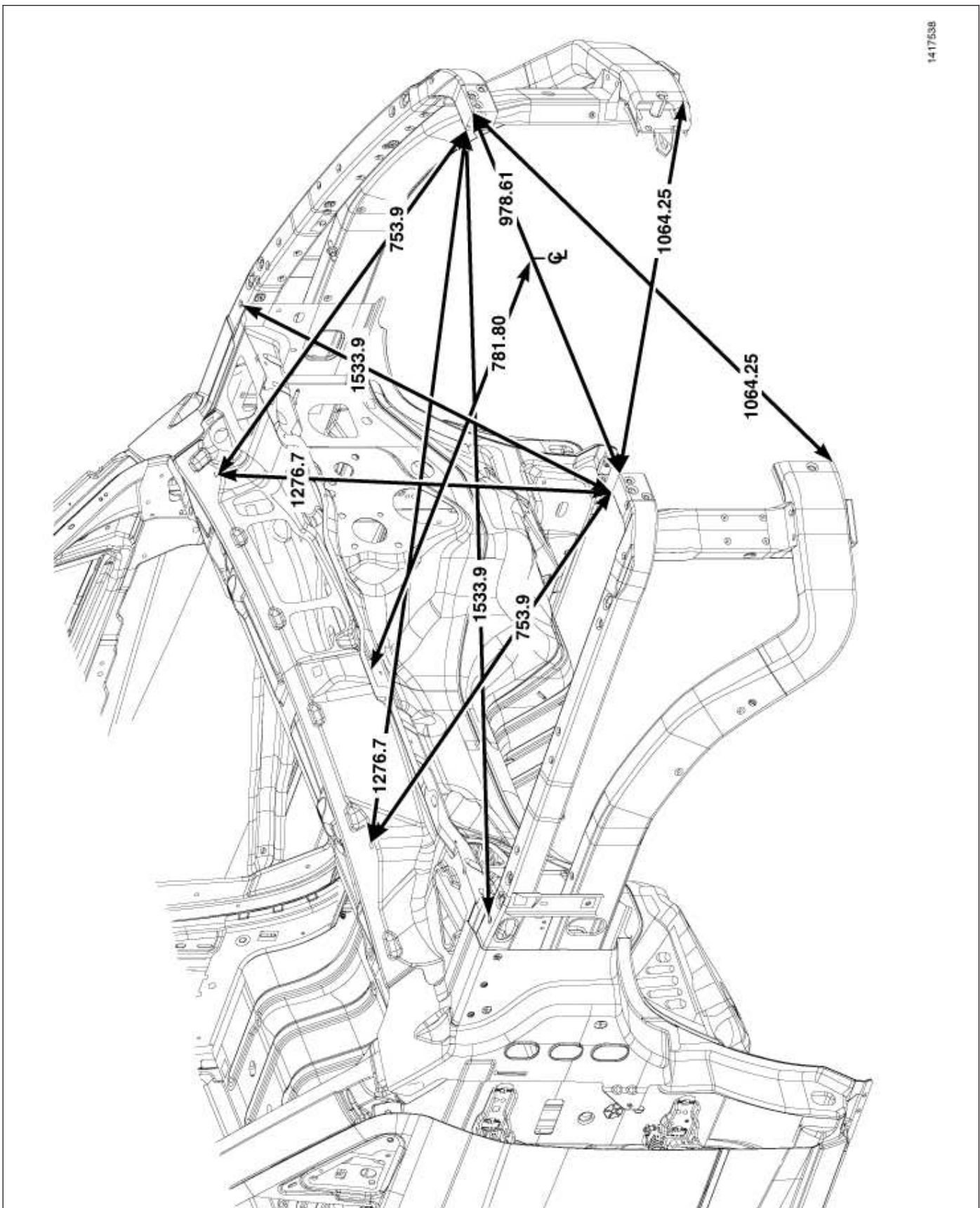
**NOTE:** The repair structure should butt up to the remaining structure and provide the same overall vehicle geometry.

7. Fabricate 51 mm (2.0 in.) long repair inserts using scrap from the old structure or the replacement part. It will be necessary to split the inserts on each of their four sides to fit into the hydroform.
8. Remove any paint or e-coat from the inserts and also to the interior and exterior of the hydroforms.

9. Drill plug weld holes as described below.
  - On the upper rail, drill one 13 mm (0.5 in.) hole on each side of the rail, 13 mm (0.5 in.) from the butt joint of the tubes.
  - On the lower rail, drill one 13 mm (0.5 in.) hole on the top and bottom sides of the rail 13 mm (0.5 in.) from the butt joint of the tube.
  - On the lower rail, drill two 13 mm (0.5 in.) holes on the inner and outer sides of the rail 13 mm (0.5 in.) from the butt joint of the tube.

**CAUTION:** Shield the surrounding area and components from exposure to the welding spatter and heat.

10. Install the insert 1" into the replacement part and tack into place with a weld.



### Engine Compartment/Body Structure

11. Insert the service part into place and using the appropriate measuring equipment, verify the front end sheet metal bracket's location in all three (X,Y, and Z) planes of space.
12. Complete all 360° plug welds.

**NOTE:** Before the final welding, use three dimensional measuring equipment to ensure the part is in the correct location. Verify that tap plate extrusion at the bottom of the vertical post lines up with the isolator and hole in the frame perch mount. Also ensure the lower radiator closure tube is bolted into the forward shotgun ends.

13. Complete welding by making a 360° butt weld around the fender rails.
14. Metal finish the exposed welds on the hydroforms.
15. Dress the welded area and apply corrosion resistant coatings inside and out.
  - a. Inside the rail, inject a creeping wax based rust inhibitor compound to the inside of the hydroforms ensuring 100% coverage including the mating face between the fender rail sections and insert such that corrosion protection is restored in the internal cavity.
  - b. Apply a durable top coat to the outside of the repair area.
16. Complete other repairs.
17. Install all removed parts. (Refer to appropriate Service Information – Installation Procedures.)
18. Reconnect the battery negative cable.



## 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 contaminants, 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 whether 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.

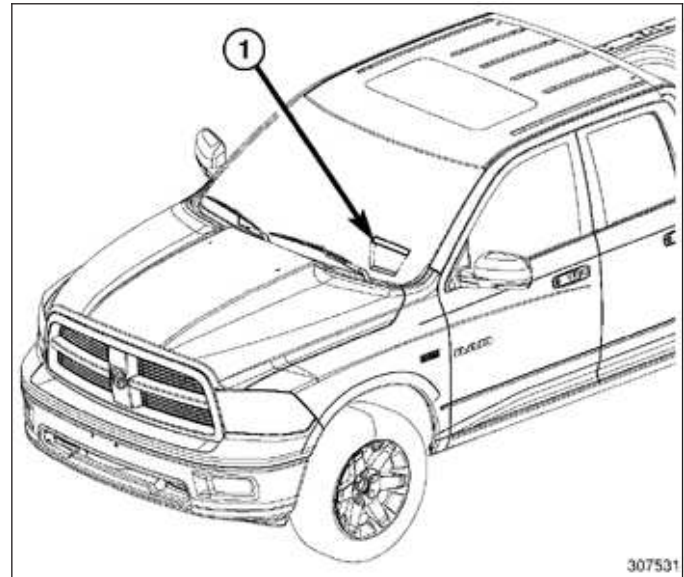
## Technical Specifications

## VEHICLE IDENTIFICATION NUMBER

The Vehicle Identification Number (VIN) plate (1) is located on the lower windshield fence near the left a-pillar. The VIN contains 17 characters that provide data concerning the vehicle. Refer to the VIN decoding chart to determine the identification of a vehicle.

The VIN is also imprinted on the:

- Equipment Identification Plate.
- Vehicle Safety Certification Label.
- Frame rail.



To protect the consumer from theft and possible fraud the manufacturer is required to include a Check Digit at the ninth position of the VIN. 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
2010 RAM TRUCK	<a href="#">2010 VIN DECODING INFORMATION</a>
2011 RAM TRUCK	<a href="#">2011 VIN DECODING INFORMATION</a>
2012 RAM TRUCK	<a href="#">2012 VIN DECODING INFORMATION</a>
2013 RAM TRUCK	<a href="#">2013 VIN DECODING INFORMATION</a>
2014 RAM TRUCK	<a href="#">2014 VIN DECODING INFORMATION</a>
2015 RAM TRUCK	<a href="#">2015 VIN DECODING INFORMATION</a>
2016 RAM TRUCK	<a href="#">2016 VIN DECODING INFORMATION</a>
2017 RAM TRUCK	<a href="#">2017 VIN DECODING INFORMATION</a>
2018 RAM TRUCK	<a href="#">2018 VIN DECODING INFORMATION</a>

## 2010 VIN DECODING INFORMATION

POSITION	INTERPRETATION	CODE = DESCRIPTION
1, 2, 3		1D7 = Chrysler Group LLC - Truck 3D7 = Chrysler De Mexico - Truck 3D6 = Chrysler De Mexico - Truck

POSITION	INTERPRETATION	CODE = DESCRIPTION
4	Gross Vehicle Weight Rating	<p><b>*Active Belts (ASP) Front Air Bags (OSP) Without Side Inflatable Restraints</b></p> <p>C = 6001 - 7000 lbs (2722 - 3175 KG)                      D = 7001 - 8000 lbs (3176 - 3628 KG)                      E = 8001 - 9000 lbs (3629 - 4082 KG)                      F = 9001 - 10000 lbs (4083 - 4535 KG)</p> <p><b>*Active Belts (ASP) Front Air Bags (OSP) With Side Inflatable Restraints Front Row</b></p> <p>H = 6,001-7,000 lbs. (2722 - 3175 KG)                      J = 6001 - 7000 lbs (2722 - 3175 KG)                      K = 7001 - 8000 lbs (3176 - 3628 KG)                      L = 8001 - 9000 lbs (3629 - 4082 KG)                      M = 9001 -10000 lbs (4083 - 4535 KG)</p> <p><b>*Active Belts (ASP) Front Air Bags (OSP) With Side Inflatable Restraints All Rows</b></p> <p>R = 6001 - 7000 lbs (2722 - 3175 KG)                      S = 7001 - 8000 lbs (3176 - 3628 KG)                      T = 8001 - 9000 lbs (3629 - 4082 KG)                      U = 9001 - 10000 lbs (4083 - 4535 KG)</p> <p><b>*Active Belts (ASP) Trucks Over 10000# (4536 KG) GVWR</b></p> <p>3 = 10001 - 14000 lbs (4536 - 6350 KG)</p> <p><b>Incomplete Vehicles</b></p> <p>W = Incomplete Vehicles With Hydraulic Brakes</p>
5	Vehicle Line	<p>B= Ram Pickup Light Duty (4x2)                      V= Ram Pickup Light Duty (4x4)                      P = Ram Pickup Heavy Duty (4x2) (2500)                      T = Ram Pickup Heavy Duty (4x4) (2500)                      M = Ram Pickup Heavy Duty (4x2) (3500)                      Y = Ram Pickup Heavy Duty (4x4) (3500)</p>
6	Series	<p>1 = 1500                      8 = 1500 HEV (Hybrid Electric Vehicle)                      2 = 2500                      3 = 3500 With Sales Code "AR9" = Single Rear Wheels                      4 = 3500 With Sales Code "WLA" = Dual Rear Wheels</p>
7	Body Style	<p>C = Crew Cab                      E = Regular Cab                      G= Quad Cab                      H = Mega Cab</p>
8	Engine	<p>K = 3.7L 6 CYL Gasoline Non – Turbo (EKG)                      P = 4.7L 8 CYL Gasoline Non – Turbo (EVE)                      T = 5.7L 8 CYL Gasoline Non – Turbo (EZD)                      L = 6.7L 6 CYL Diesel (ETJ)</p>

POSITION	INTERPRETATION	CODE = DESCRIPTION
9	Check Digit	0 through 9 or X
10	Model Year	A = 2010
11	Plant Location	S = Warren Truck Assembly G = Saltillo Assembly
12 – 17	Vehicle Build Sequence	A six digit number assigned by assembly plant.

## 2011 VIN DECODING INFORMATION

POSITION	INTERPRETATION	CODE = DESCRIPTION
1, 2, 3	WMI (World Manufacturer Identifier)	1D6 = Chrysler Group LLC - Truck 1D7 = Chrysler Group LLC - Truck 3D6 = Chrysler Group LLC - Truck 3D7 = Chrysler De Mexico - Truck
4	Gross Vehicle Weight Rating	J = 6001 - 7000 lbs (2722 - 3175 KG) K = 7001 - 8000 lbs (3176 - 3628 KG) L = 8001 - 9000 lbs (3629 - 4082 KG) M = 9001 - 10000 lbs (4083 - 4535 KG) R = 6001 - 7000 lbs (2722 - 3175 KG) S = 7001 - 8000 lbs (3176 - 3628 KG) T = 8001 - 9000 lbs (3629 - 4082 KG) U = 9001 - 10000 lbs (4083 - 4535 KG) W = Incomplete Vehicles With Hydraulic Brakes 3 = 10001 - 14000 lbs (4536 - 6350 KG)
5	Vehicle Line	B = Ram Pickup Light Duty (4x2) (1500) V = Ram Pickup Light Duty (4x4) (1500) P = Ram Pickup Heavy Duty (4x2) (2500) T = Ram Pickup Heavy Duty (4x4) (2500) M = Ram Pickup Heavy Duty (4x2) (3500) Y = Ram Pickup Heavy Duty (4x4) (3500) F = Ram Cab Chassis (4x2) (3500) Z = Ram Cab Chassis (4x4) (3500) A = Ram Cab Chassis (4x2) (4500 / 5500) U = Ram Cab Chassis (4x4) (4500 / 5500)
6	Series	1 = 1500 8 = 1500 HEV (Hybrid Electric Vehicle) 2 = 2500 3 = 3500 With Sales Code "AR9" = Single Rear Wheels 4 = 3500 With Sales Code "WLA" = Dual Rear Wheels 6 = 4500 With Sales Code "WLA" = Dual Rear Wheels 7=5500 With Sales Code "WLA" = Dual Rear Wheels

POSITION	INTERPRETATION	CODE = DESCRIPTION
7	Body Style	C = Crew Cab E = Regular Cab G = Quad Cab H = Mega Cab
8	Engine	K = 3.7L 6 CYL Gasoline Non – Turbo (EKG) P = 4.7L 8 CYL Gasoline Non – Turbo (EVE) T = 5.7L 8 CYL Gasoline Non – Turbo (EZC,EZE,EZH) L = 6.7L 6 CYL Diesel (ETJ)
9	Check Digit	0 through 9 or X
10	Model Year	B = 2011
11	Plant Location	S = Warren Truck Assembly G = Saltillo Assembly
12 – 17	Vehicle Build Sequence	A six digit number assigned by assembly plant.

### 2012 VIN DECODING INFORMATION

#### Positions 1 - 3: World Manufacturer Identifier

1	2	3	Manufacturer	Vehicle Type
1	C	4	Chrysler Group LLC (USA)	MPV
1	C	6	Chrysler Group LLC (USA)	Truck
1	C	7	Chrysler Group LLC (USA)	Incomplete Vehicle (Cab Chassis)
2	C	4	Chrysler Canada	MPV
2	C	6	Chrysler Canada	Truck
2	C	7	Chrysler Canada	Incomplete Vehicle (Cab Chassis)
3	C	4	Chrysler de Mexico	MPV
3	C	6	Chrysler de Mexico	Truck
3	C	7	Chrysler de Mexico	Incomplete Vehicle (Cab Chassis)

#### 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	Active Belts, No Air Bags	Active Belts, GVWR > 10,000 lbs.
	Pounds	Kilograms					
Hydraulic	1 - 3000	(0 - 1360 KG)					
Hydraulic	3001 - 4000	(1361 - 1814 KG)					
Hydraulic	4001 - 5000	(1815 - 2267 KG)	A	G	N	V	
Hydraulic	5001 - 6000	(2268 - 2721 KG)	B	H	P	X	

Brake System	GVWR Range		Active Belts, Air Bags	Active Belts, Air Bags, Side Bags-Front Row	Active Belts, Air Bags, Side Bags-All Rows	Active Belts, No Air Bags	Active Belts, GVWR > 10,000 lbs.
	Pounds	Kilograms					
Hydraulic	6001 - 7000	(2722 - 3175 KG)	C	J	R	Y	
Hydraulic	7001 - 8000	(3176 - 3628 KG)	D	K	S	Z	
Hydraulic	8001 - 9000	(3629 - 4082 KG)	E	L	T	1	
Hydraulic	9001 - 10000	(4083 - 4535 KG)	F	M	U	2	
Hydraulic	10001 - 14000	(4536 - 6349 KG)					3
Hydraulic	14001 - 16000	(6350 - 7256 KG)					4
Hydraulic	16001 - 19500	(7257 - 8845 KG)					5
Hydraulic	19501 - 26000	(8846 - 11793 KG)					6

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

Dodge Ram 1500 (DS) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Series
D	6	A	D	7	A	Regular Cab Short Bed	ST
D	6	B	D	7	B		SLT
D	6	C	D	7	C		Sport
D	6	D	D	7	D	Regular Cab Long Bed	ST
D	6	E	D	7	E		SLT
D	6	F	D	7	F		ST
D	6	G	D	7	G	Quad Cab	SLT
D	6	H	D	7	H		Sport
D	6	J	D	7	J		Laramie
D	6	K	D	7	K	Crew Cab	ST
D	6	L	D	7	L		SLT
D	6	M	D	7	M		Sport
D	6	N	D	7	N		Laramie
D	6	P	D	7	P		Longhorn

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

Dodge Ram 2500 (DJ) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Series
D	4	A	D	5	A	Regular Cab	ST
D	4	B	D	5	B		SLT
D	4	C	D	5	D	Crew Cab Short Wheel Base	ST
D	4	D	D	5	E		SLT
—	—	—	D	5	E		Powerwagon
D	4	F	D	5	F		Laramie
D	4	G	D	5	G		Longhorn
D	4	H	D	5	H		ST
D	4	J	D	5	J	Crew Cab Long Wheel Base	SLT
D	4	K	D	5	K		Laramie
D	4	L	D	5	L		Longhorn
D	4	M	D	5	M		SLT
D	4	N	D	5	N	Mega Cab	Laramie
D	4	P	D	5	P		Longhorn

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

Dodge Ram 3500 (D2) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Series
D	2	C	D	3	C	Crew Cab Short Bed	ST
D	2	D	D	3	D		SLT
D	2	E	D	3	E		Laramie
D	2	F	D	3	F		Longhorn
—	2	G	D	3	G	Crew Cab Long Bed	ST
D	2	H	D	3	H		SLT
D	2	J	D	3	J		Laramie
D	2	K	D	3	K		Longhorn
D	2	L	D	3	L	Mega Cab	SLT
D	2	M	D	3	M		Laramie
D	2	N	D	3	N		Longhorn

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

Dodge Ram 3500 (D2) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Series
D	P	A	D	R	A	Regular Cab	ST
D	P	B	D	R	B		SLT



Dodge Ram 3500 (D2) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Series
D	P	G	D	R	G	Crew Cab Long Bed	ST
D	P	H	D	R	H		SLT
—	P	J	D	R	J		Laramie
D	P	K	D	R	K		Longhorn
D	P	L	D	R	L	Mega Cab	SLT
D	P	M	D	R	M		Laramie
D	P	N	D	R	N		Longhorn

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

Dodge Ram 3500 (DD) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
D	8	A	D	9	A	Regular Cab	Short
D	8	C	D	9	C	Crew Cab	Standard

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

Dodge Ram 3500 (DD) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
D	S	A	D	T	A	Regular Cab	Short
D	S	B	D	T	B		Long
D	S	C	D	T	C	Crew Cab	Standard

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

Dodge Ram 4500 (DP) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
D	K	A	D	L	A	Regular Cab	Short
D	K	B	D	L	B		Standard
D	K	C	D	L	C		Long
D	K	D	D	L	D		Extra Long
D	K	E	D	L	E	Crew Cab	Short
D	K	F	D	L	F		Long

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

Dodge Ram 5500 (DP) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
D	M	A	D	N	A	Regular Cab	Short
D	M	B	D	N	B		Standard
D	M	C	D	N	C		Long
D	M	D	D	N	D		Extra Long
D	M	E	D	N	E	Crew Cab	Short
D	M	F	D	N	F		Long

**Position 8: Engine**

Code	Displacement	Cylinders	Fuel	Turbo	Sales Codes
G	3.6 Liter	6	Gasoline	No	ERB
P	4.7 Liter	8	Gasoline	No	EVE
T	5.7 Liter	8	Gasoline	No	EZC, EZH
2	5.7 Liter	8	Gasoline/ Compressed Natural Gas	No	EZF
L	6.7 Liter	6	Diesel	Yes	ETJ

**Position 9: Check Digit**

0 through 9 or X

**Position 10: Model Year**

C = 2012

**Position 11: Assembly Plant**

Code	Plant
G	Saltillo Assembly
S	Warren Truck Assembly

**Position 12 - 17: Plant Sequence Number**

A six digit number assigned by assembly plant.

## 2013 VIN DECODING INFORMATION

## Positions 1 - 3: World Manufacturer Identifier

1	2	3	Manufacturer	Vehicle Type
1	C	4	Chrysler Group LLC (USA)	MPV
1	C	6	Chrysler Group LLC (USA)	Truck
1	C	7	Chrysler Group LLC (USA)	Incomplete Vehicle (Cab Chassis)
2	C	4	Chrysler Canada	MPV
2	C	6	Chrysler Canada	Truck
2	C	7	Chrysler Canada	Incomplete Vehicle (Cab Chassis)
3	C	4	Chrysler de Mexico	MPV
3	C	6	Chrysler de Mexico	Truck
3	C	7	Chrysler de Mexico	Incomplete Vehicle (Cab Chassis)

## Position 4: Brake System &amp; 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	Active Belts, No Air Bags	Active Belts, GVWR > 10,000 lbs.
	Pounds	Kilograms					
Hydraulic	1 - 3000	(0 - 1360 KG)					
Hydraulic	3001 - 4000	(1361 - 1814 KG)					
Hydraulic	4001 - 5000	(1815 - 2267 KG)	A	G	N	V	
Hydraulic	5001 - 6000	(2268 - 2721 KG)	B	H	P	X	
Hydraulic	6001 - 7000	(2722 - 3175 KG)	C	J	R	Y	
Hydraulic	7001 - 8000	(3176 - 3628 KG)	D	K	S	Z	
Hydraulic	8001 - 9000	(3629 - 4082 KG)	E	L	T	1	
Hydraulic	9001 - 10000	(4083 - 4535 KG)	F	M	U	2	
Hydraulic	10001 - 14000	(4536 - 6349 KG)					3
Hydraulic	14001 - 16000	(6350 - 7256 KG)					4
Hydraulic	16001 - 19500	(7257 - 8845 KG)					5
Hydraulic	19501 - 26000	(8846 - 11793 KG)					6

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

Dodge Ram 1500 (DS) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Series
D	6	A	D	7	A	Regular Cab Short Bed	ST
D	6	B	D	7	B		SLT
D	6	C	D	7	C		Sport
D	6	D	D	7	D	Regular Cab Long Bed	ST
D	6	E	D	7	E		SLT
D	6	F	D	7	F	Quad Cab	ST
D	6	G	D	7	G		SLT
D	6	H	D	7	H		Sport
D	6	J	D	7	J		Laramie
D	6	K	D	7	K	Crew Cab	ST
D	6	L	D	7	L		SLT
D	6	M	D	7	M		Sport
D	6	N	D	7	N		Laramie
D	6	P	D	7	P		Longhorn

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

Dodge Ram 2500 (DJ) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Series
D	4	A	D	5	A	Regular Cab	ST
D	4	B	D	5	B		SLT
D	4	C	D	5	D	Crew Cab Short Wheel Base	ST
D	4	D	D	5	E		SLT
—	—	—	D	5	E		Powerwagon
D	4	F	D	5	F		Laramie
D	4	G	D	5	G		Longhorn
D	4	H	D	5	H	Crew Cab Long Wheel Base	ST
D	4	J	D	5	J		SLT
D	4	K	D	5	K		Laramie
D	4	L	D	5	L		Longhorn
D	4	M	D	5	M	Mega Cab	SLT
D	4	N	D	5	N		Laramie
D	4	P	D	5	P		Longhorn

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

<b>Dodge Ram 3500 (D2) Left Hand Drive Truck Single Rear Wheels</b>							
<b>2WD</b>			<b>4WD</b>			<b>Cab Type</b>	<b>Series</b>
D	2	C	D	3	C	Crew Cab Short Bed	ST
D	2	D	D	3	D		SLT
D	2	E	D	3	E		Laramie
D	2	F	D	3	F		Longhorn
—	2	G	D	3	G	Crew Cab Long Bed	ST
D	2	H	D	3	H		SLT
D	2	J	D	3	J		Laramie
D	2	K	D	3	K		Longhorn
D	2	L	D	3	L	Mega Cab	SLT
D	2	M	D	3	M		Laramie
D	2	N	D	3	N		Longhorn

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

<b>Dodge Ram 3500 (D2) Left Hand Drive Truck Dual Rear Wheels</b>							
<b>2WD</b>			<b>4WD</b>			<b>Cab Type</b>	<b>Series</b>
D	P	A	D	R	A	Regular Cab	ST
D	P	B	D	R	B		SLT
D	P	G	D	R	G	Crew Cab Long Bed	ST
D	P	H	D	R	H		SLT
—	P	J	D	R	J		Laramie
D	P	K	D	R	K		Longhorn
D	P	L	D	R	L	Mega Cab	SLT
D	P	M	D	R	M		Laramie
D	P	N	D	R	N		Longhorn

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

<b>Dodge Ram 3500 (DD) Left Hand Drive Truck Single Rear Wheels</b>							
<b>2WD</b>			<b>4WD</b>			<b>Cab Type</b>	<b>Wheel Base</b>
D	8	A	D	9	A	Regular Cab	Short
D	8	C	D	9	C	Crew Cab	Standard

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

Dodge Ram 3500 (DD) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
D	S	A	D	T	A	Regular Cab	Short
D	S	B	D	T	B		Long
D	S	C	D	T	C	Crew Cab	Standard

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

Dodge Ram 4500 (DP) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
D	K	A	D	L	A	Regular Cab	Short
D	K	B	D	L	B		Standard
D	K	C	D	L	C		Long
D	K	D	D	L	D		Extra Long
D	K	E	D	L	E	Crew Cab	Short
D	K	F	D	L	F		Long

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

Dodge Ram 5500 (DP) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
D	M	A	D	N	A	Regular Cab	Short
D	M	B	D	N	B		Standard
D	M	C	D	N	C		Long
D	M	D	D	N	D		Extra Long
D	M	E	D	N	E	Crew Cab	Short
D	M	F	D	N	F		Long

**Position 8: Engine**

Code	Displacement	Cylinders	Fuel	Turbo	Sales Codes
G	3.6 Liter	6	Gasoline	No	ERB
P	4.7 Liter	8	Gasoline	No	EVE
T	5.7 Liter	8	Gasoline	No	EZC, EZH
2	5.7 Liter	8	Gasoline/CNG	No	EZF
L	6.7 Liter	6	Diesel	Yes	ETK, ETJ

**Position 9: Check Digit**

0 through 9 or X

**Position 10: Model Year**

D= 2013

**Position 11: Assembly Plant**

Code	Plant
G	Saltillo Assembly
S	Warren Truck Assembly

**Position 12 - 17: Plant Sequence Number**

A six digit number assigned by assembly plant.

**2014 VIN DECODING INFORMATION****Positions 1 - 3: World Manufacturer Identifier**

1	2	3	Manufacturer	Vehicle Type
1	C	4	Chrysler Group LLC (USA)	MPV
1	C	6	Chrysler Group LLC (USA)	Truck
1	C	7	Chrysler Group LLC (USA)	Incomplete Vehicle (Cab Chassis)
2	C	4	Chrysler Canada	MPV
2	C	6	Chrysler Canada	Truck
2	C	7	Chrysler Canada	Incomplete Vehicle (Cab Chassis)
3	C	4	Chrysler de Mexico	MPV
3	C	6	Chrysler de Mexico	Truck
3	C	7	Chrysler de Mexico	Incomplete Vehicle (Cab Chassis)

**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	Active Belts, No Air Bags	Active Belts, GVWR > 10,000 lbs.
	Pounds	Kilograms					
Hydraulic	1 - 3000	(0 - 1360 KG)					
Hydraulic	3001 - 4000	(1361 - 1814 KG)					

Brake System	GVWR Range		Active Belts, Air Bags	Active Belts, Air Bags, Side Bags-Front Row	Active Belts, Air Bags, Side Bags-All Rows	Active Belts, No Air Bags	Active Belts, GVWR > 10,000 lbs.
	Pounds	Kilograms					
Hydraulic	4001 - 5000	(1815 - 2267 KG)	A	G	N	V	
Hydraulic	5001 - 6000	(2268 - 2721 KG)	B	H	P	X	
Hydraulic	6001 - 7000	(2722 - 3175 KG)	C	J	R	Y	
Hydraulic	7001 - 8000	(3176 - 3628 KG)	D	K	S	Z	
Hydraulic	8001 - 9000	(3629 - 4082 KG)	E	L	T	1	
Hydraulic	9001 - 10000	(4083 - 4535 KG)	F	M	U	2	
Hydraulic	10001 - 14000	(4536 - 6349 KG)					3
Hydraulic	14001 - 16000	(6350 - 7256 KG)					4
Hydraulic	16001 - 19500	(7257 - 8845 KG)					5
Hydraulic	19501 - 26000	(8846 - 11793 KG)					6

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

Ram 1500 (DS) Left Hand Drive Truck Single Rear Wheels							
2WD		4WD			Cab Type	Series	
R	6	R	—	—	Regular Cab Short Bed	MPG	
R	6	A	R	7		A	ST
R	6	B	R	7		B	SLT
R	6	C	R	7		C	Sport
R	6	D	R	7	Regular Cab Long Bed	ST	
R	6	E	R	7		E	SLT
R	6	F	R	7	Quad Cab	ST	
R	6	G	R	7		G	SLT
R	6	H	R	7		H	Sport
R	6	J	R	7		J	Laramie
R	6	K	R	7	Crew Cab Short Bed	ST	
R	6	L	R	7		L	SLT
R	6	M	R	7		M	Sport
R	6	N	R	7		N	Laramie
R	6	P	R	7		P	Longhorn



Ram 1500 (DS) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Series
R	6	S	R	7	S	Crew Cab Long Bed	ST
R	6	T	R	7	T		SLT
R	6	U	R	7	U		Sport
R	6	V	R	7	V		Laramie
R	6	W	R	7	W		Longhorn

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

Ram 2500 (DJ) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Series
R	4	A	R	5	A	Regular Cab	ST
R	4	B	R	5	B		SLT
R	4	C	R	5	C	Crew Cab Short Wheel Base	ST
R	4	D	R	5	D		SLT
—	—	—	R	5	E		Powerwagon
R	4	F	R	5	F		Laramie
R	4	G	R	5	G		Longhorn
R	4	H	R	5	H	Crew Cab Long Wheel Base	ST
R	4	J	R	5	J		SLT
R	4	K	R	5	K		Laramie
R	4	L	R	5	L		Longhorn
R	4	M	R	5	M	Mega Cab	SLT
R	4	N	R	5	N		Laramie
R	4	P	R	5	P		Longhorn

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

Ram 3500 (D2) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Series
R	2	A	R	3	A	Regular Cab	ST
R	2	B	R	3	B		SLT
R	2	C	R	3	C	Crew Cab Short Bed	ST
R	2	D	R	3	R		SLT
R	2	E	R	3	E		Laramie
R	2	F	R	3	F		Longhorn
—	2	G	R	3	G	Crew Cab Long Bed	ST
R	2	H	R	3	H		SLT
R	2	J	R	3	J		Laramie
R	2	K	R	3	K		Longhorn

Ram 3500 (D2) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Series
R	2	L	R	3	L	Mega Cab	SLT
R	2	M	R	3	M		Laramie
R	2	N	R	3	N		Longhorn

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

Ram 3500 (D2) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Series
R	P	A	R	R	A	Regular Cab	ST
R	P	B	R	R	B		SLT
R	P	G	R	R	G	Crew Cab Long Bed	ST
R	P	H	R	R	H		SLT
—	P	J	R	R	J		Laramie
R	P	K	R	R	K		Longhorn
R	P	L	R	R	L	Mega Cab	SLT
R	P	M	R	R	M		Laramie
R	P	N	R	R	N		Longhorn

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

Ram 3500 (DD) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
R	8	A	R	9	A	Regular Cab	Short
R	8	C	R	9	C	Crew Cab	Standard

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

Ram 3500 (DD) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
R	S	A	R	T	A	Regular Cab	Short
R	S	B	R	T	B		Long
R	S	C	R	T	C	Crew Cab	Standard

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

Ram 4500 (DP) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
R	K	A	R	L	A	Regular Cab	Short
R	K	B	R	L	B		Standard
R	K	C	R	L	C		Long
R	K	D	R	L	D		Extra Long
R	K	E	R	L	E	Crew Cab	Short
R	K	F	R	L	F		Long

Positions 5 - 7 define the following: Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series

Ram 5500 (DP) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
R	M	A	R	N	A	Regular Cab	Short
R	M	B	R	N	B		Standard
R	M	C	R	N	C		Long
R	M	D	R	N	D		Extra Long
R	M	E	R	N	E	Crew Cab	Short
R	M	F	R	N	F		Long

**Position 8: Engine**

Code	Displacement	Cylinders	Fuel	Turbo	Sales Codes
G	3.6 Liter	6	Gasoline	No	ERB
J	6.4 Liter	8	Gasoline	No	ESG, ESH, ESA, ESB
M	3.0 Liter	6	Diesel	Yes	EXF
T	5.7 Liter	8	Gasoline	No	EZC, EZH
L	6.7 Liter	6	Diesel	Yes	ETK, ETJ
2	5.7 Liter	8	CNG	No	EZF

**Position 9: Check Digit**

0 through 9 or X

**Position 10: Model Year**

E= 2014

**Position 11: Assembly Plant**

Code	Plant
G	Saltillo Assembly
S	Warren Truck Assembly

**Position 12 - 17: Plant Sequence Number**

A six digit number assigned by assembly plant.

**2015 VIN DECODING INFORMATION**

**POSITIONS 1 - 3: WORLD MANUFACTURER IDENTIFIER**

1	2	3	MANUFACTURER	VEHICLE TYPE
1	C	6	Chrysler Group LLC (USA)	Truck
1	C	7	Chrysler Group LLC (USA)	Incomplete Vehicle (Cab Chassis)
3	C	6	Chrysler de Mexico	Truck
3	C	7	Chrysler de Mexico	Incomplete Vehicle (Cab Chassis)

**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	Active Belts, No Air Bags	Active Belts, GVWR > 10,000 lbs.
	Pounds	Kilograms					
Hydraulic	6001 - 7000	(2722 - 3175 KG)		J	R		
Hydraulic	8001 - 9000	(3629 - 4082 KG)		L	T		
Hydraulic	9001 - 10000	(4083 - 4535 KG)		M	U		
Hydraulic	10001 - 14000	(4536 - 6349 KG)					3
W	Incomplete Vehicle with Hydraulic Brakes						

**POSITIONS 5 - 7**

Ram 1500 (DS) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			CAB TYPE	SERIES
R	6	R	—	—	—		
R	6	A	R	7	A	ST	
R	6	B	R	7	B	SLT	
R	6	C	R	7	C	Sport	

Ram 1500 (DS) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			CAB TYPE	SERIES
R	6	D	R	7	D	Regular Cab Long Bed	ST
R	6	E	R	7	E		SLT
R	6	Z	—	—	—	Quad Cab	HFE
R	6	F	R	7	F		ST
R	6	G	R	7	G		SLT
R	6	H	R	7	H		Sport
R	6	J	R	7	J		Laramie
R	6	K	R	7	K		ST
R	6	L	R	7	L		SLT
R	6	M	R	7	M	Sport	
R	6	N	R	7	N	Laramie	
R	6	P	R	7	P	Longhorn	
—	—	—	R	7	X	SSV	
R	6	Y	R	7	Y	Off Road Truck	
R	6	S	R	7	S	Crew Cab Long Bed	ST
R	6	T	R	7	T		SLT
R	6	U	R	7	U		Sport
R	6	V	R	7	V		Laramie
R	6	W	R	7	W		Longhorn

Ram 2500 (DJ) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Series
R	4	A	R	5	A	Regular Cab	ST
R	4	B	R	5	B		SLT
R	4	C	R	5	C	Crew Cab Short Wheel Base	ST
R	4	D	R	5	D		SLT
—	—	—	R	5	E		Powerwagon
R	4	F	R	5	F		Laramie
R	4	G	R	5	G		Longhorn
R	4	H	R	5	H	Crew Cab Long Wheel Base	ST
R	4	J	R	5	J		SLT
R	4	K	R	5	K		Laramie
R	4	L	R	5	L		Longhorn
R	4	M	R	5	M	Mega Cab	SLT
R	4	N	R	5	N		Laramie
R	4	P	R	5	P		Longhorn

Ram 3500 (D2) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Series
R	2	A	R	3	A	Regular Cab	ST
R	2	B	R	3	B		SLT
R	2	C	R	3	C		ST
R	2	D	R	3	D	Crew Cab Short Bed	SLT
R	2	E	R	3	E		Laramie
R	2	F	R	3	F		Longhorn
—	2	G	R	3	G		ST
R	2	H	R	3	H	Crew Cab Long Bed	SLT
R	2	J	R	3	J		Laramie
R	2	K	R	3	K		Longhorn
R	2	L	R	3	L		SLT
R	2	M	R	3	M	Mega Cab	Laramie
R	2	N	R	3	N		Longhorn

Ram 3500 (D2) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Series
R	P	A	R	R	A	Regular Cab	ST
R	P	B	R	R	B		SLT
R	P	G	R	R	G	Crew Cab Long Bed	ST
R	P	H	R	R	H		SLT
—	P	J	R	R	J		Laramie
R	P	K	R	R	K		Longhorn
R	P	L	R	R	L	Mega Cab	SLT
R	P	M	R	R	M		Laramie
R	P	N	R	R	N		Longhorn

Ram 3500 (DD) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
R	8	A	R	9	A	Regular Cab	Short
R	8	C	R	9	C	Crew Cab	Standard

Ram 3500 (DD) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
R	S	A	R	T	A	Regular Cab	Short
R	S	B	R	T	B		Long
R	S	C	R	T	C	Crew Cab	Standard

Ram 4500 (DP) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
R	K	A	R	L	A	Regular Cab	Short
R	K	B	R	L	B		Standard
R	K	C	R	L	C		Long
R	K	D	R	L	D		Extra Long
R	K	E	R	L	E	Crew Cab	Short
R	K	F	R	L	F		Long

Ram 5500 (DP) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
R	M	A	R	N	A	Regular Cab	Short
R	M	B	R	N	B		Standard
R	M	C	R	N	C		Long
R	M	D	R	N	D		Extra Long
R	M	E	R	N	E	Crew Cab	Short
R	M	F	R	N	F		Long

**POSITION 8: ENGINE**

Code	Displacement	Cylinders	Fuel	Turbo	Sales Codes
G	3.6 Liter	6	Gasoline	No	ERB
J	6.4 Liter	8	Gasoline	No	ESG, ESH, ESA, ESB
M	3.0 Liter	6	Diesel	Yes	EXF
T	5.7 Liter	8	Gasoline	No	EZC, EZH
L	6.7 Liter	6	Diesel	Yes	ETK, ETJ
2	5.7 Liter	8	CNG	No	EZF

**POSITION 9: CHECK DIGIT**

0 through 9 or X

**POSITION 10: MODEL YEAR**

F = 2015

**POSITION 11: ASSEMBLY PLANT**

Code	Plant
G	Saltillo Assembly
S	Warren Truck Assembly

**POSITION 12 - 17: PLANT SEQUENCE NUMBER**

A six digit number assigned by assembly plant.

2016 VIN DECODING INFORMATION

POSITIONS 1 - 3: WORLD MANUFACTURER IDENTIFIER

1	2	3	MANUFACTURER	VEHICLE TYPE
1	C	6	Chrysler Group LLC (USA)	Truck
1	C	7	Chrysler Group LLC (USA)	Incomplete Vehicle (Cab Chassis)
3	C	6	Chrysler de Mexico	Truck
3	C	7	Chrysler de Mexico	Incomplete Vehicle (Cab Chassis)

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	Active Belts, No Air Bags	Active Belts, GVWR > 10,000 lbs.
	Pounds	Kilograms					
Hydraulic	6001 - 7000	(2722 - 3175 KG)		J	R		
Hydraulic	8001 - 9000	(3629 - 4082 KG)		L	T		
Hydraulic	9001 - 10000	(4083 - 4535 KG)		M	U		
Hydraulic	10001 - 14000	(4536 - 6349 KG)					3
<b>W</b>	<b>Incomplete Vehicle with Hydraulic Brakes</b>						

POSITIONS 5 - 7

Ram 1500 (DS) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			CAB TYPE	SERIES
R	6	R	—	—	—	Regular Cab Short Bed	HFE
R	6	A	R	7	A		ST
R	6	B	R	7	B		SLT
R	6	C	R	7	C		Sport
R	6	D	R	7	D	Regular Cab Long Bed	ST
R	6	E	R	7	E		SLT
R	6	Z	—	—	—	Quad Cab	HFE
R	6	F	R	7	F		ST
R	6	G	R	7	G		SLT
R	6	H	R	7	H		Sport
R	6	J	R	7	J		Laramie



Ram 1500 (DS) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			CAB TYPE	SERIES
R	6	K	R	7	K	Crew Cab Short Bed	ST
R	6	L	R	7	L		SLT
R	6	M	R	7	M		Sport
R	6	N	R	7	N		Laramie
R	6	P	R	7	P		Longhorn
—	—	—	R	7	X		SSV
R	6	Y	R	7	Y		Off Road Truck
R	6	S	R	7	S	Crew Cab Long Bed	ST
R	6	T	R	7	T		SLT
R	6	U	R	7	U		Sport
R	6	V	R	7	V		Laramie
R	6	W	R	7	W		Longhorn

Ram 2500 (DJ) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Series
R	4	A	R	5	A	Regular Cab	ST
R	4	B	R	5	B		SLT
R	4	C	R	5	C	Crew Cab Short Wheel Base	ST
R	4	D	R	5	D		SLT
—	—	—	R	5	E		Powerwagon
R	4	F	R	5	F		Laramie
R	4	G	R	5	G		Longhorn
R	4	H	R	5	H	Crew Cab Long Wheel Base	ST
R	4	J	R	5	J		SLT
R	4	K	R	5	K		Laramie
R	4	L	R	5	L		Longhorn
R	4	M	R	5	M	Mega Cab	SLT
R	4	N	R	5	N		Laramie
R	4	P	R	5	P		Longhorn

Ram 3500 (D2) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Series
R	2	A	R	3	A	Regular Cab	ST
R	2	B	R	3	B		SLT
R	2	C	R	3	C	Crew Cab Short Bed	ST
R	2	D	R	3	D		SLT
R	2	E	R	3	E		Laramie
R	2	F	R	3	F		Longhorn

Ram 3500 (D2) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Series
—	2	G	R	3	G	Crew Cab Long Bed	ST
R	2	H	R	3	H		SLT
R	2	J	R	3	J		Laramie
R	2	K	R	3	K		Longhorn
R	2	L	R	3	L	Mega Cab	SLT
R	2	M	R	3	M		Laramie
R	2	N	R	3	N		Longhorn

Ram 3500 (D2) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Series
R	P	A	R	R	A	Regular Cab	ST
R	P	B	R	R	B		SLT
R	P	G	R	R	G	Crew Cab Long Bed	ST
R	P	H	R	R	H		SLT
—	P	J	R	R	J		Laramie
R	P	K	R	R	K		Longhorn
R	P	L	R	R	L	Mega Cab	SLT
R	P	M	R	R	M		Laramie
R	P	N	R	R	N		Longhorn

Ram 3500 (DD) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
R	8	A	R	9	A	Regular Cab	Short
R	8	C	R	9	C	Crew Cab	Standard

Ram 3500 (DD) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
R	S	A	R	T	A	Regular Cab	Short
R	S	B	R	T	B		Long
R	S	C	R	T	C	Crew Cab	Standard

Ram 4500 (DP) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
R	K	A	R	L	A	Regular Cab	Short
R	K	B	R	L	B		Standard
R	K	C	R	L	C		Long
R	K	D	R	L	D		Extra Long
R	K	E	R	L	E	Crew Cab	Short
R	K	F	R	L	F		Long

Ram 5500 (DP) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
R	M	A	R	N	A	Regular Cab	Short
R	M	B	R	N	B		Standard
R	M	C	R	N	C		Long
R	M	D	R	N	D		Extra Long
R	M	E	R	N	E	Crew Cab	Short
R	M	F	R	N	F		Long

**POSITION 8: ENGINE**

Code	Displacement	Cylinders	Fuel	Turbo	Sales Codes
G	3.6 Liter	6	Gasoline	No	ERB
J	6.4 Liter	8	Gasoline	No	ESG, ESH, ESA, ESB
M	3.0 Liter	6	Diesel	Yes	EXF
T	5.7 Liter	8	Gasoline	No	EZC, EZH
L	6.7 Liter	6	Diesel	Yes	ETK, ETJ
2	5.7 Liter	8	CNG	No	EZF

**POSITION 9: CHECK DIGIT**

0 through 9 or X

**POSITION 10: MODEL YEAR**

G = 2016

**POSITION 11: ASSEMBLY PLANT**

Code	Plant
G	Saltillo Assembly
S	Warren Truck Assembly

**POSITION 12 - 17: PLANT SEQUENCE NUMBER**

A six digit number assigned by assembly plant.

**2017 VIN DECODING INFORMATION****POSITIONS 1 - 3: WORLD MANUFACTURER IDENTIFIER**

1	2	3	MANUFACTURER	VEHICLE TYPE
1	C	6	Chrysler Group LLC (USA)	Truck
1	C	7	Chrysler Group LLC (USA)	Incomplete Vehicle (Cab Chassis)
3	C	6	Chrysler de Mexico	Truck
3	C	7	Chrysler de Mexico	Incomplete Vehicle (Cab Chassis)

**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	Active Belts, No Air Bags	Active Belts, GVWR > 10,000 lbs.
	Pounds	Kilograms					
Hydraulic	6001 - 7000	(2722 - 3175 KG)		J	R		
Hydraulic	8001 - 9000	(3629 - 4082 KG)		L	T		
Hydraulic	9001 - 10000	(4083 - 4535 KG)		M	U		
Hydraulic	10001 - 14000	(4536 - 6349 KG)					3
<b>W</b>	<b>Incomplete Vehicle with Hydraulic Brakes</b>						

**POSITIONS 5 - 7**

Ram 1500 (DS) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			CAB TYPE	SERIES
R	6	A	R	7	A	Regular Cab Short Bed	ST
R	6	B	R	7	B		SLT
R	6	C	R	7	C		Sport
R	6	D	R	7	D	Regular Cab Long Bed	ST
R	6	E	R	7	E		SLT
R	6	Z	—	—	—	Quad Cab	HFE
R	6	F	R	7	F		ST
R	6	G	R	7	G		SLT
R	6	H	R	7	H		Sport
R	6	J	R	7	J		Laramie
R	6	K	R	7	K		Crew Cab Short Bed
R	6	L	R	7	L	SLT	
R	6	M	R	7	M	Sport	
R	6	N	R	7	N	Laramie	
R	6	P	R	7	P	Longhorn	
—	—	—	R	7	X	SSV	
R	6	Y	R	7	Y	Off Road Truck	
R	6	S	R	7	S	Crew Cab Long Bed	ST
R	6	T	R	7	T		SLT
R	6	U	R	7	U		Sport
R	6	V	R	7	V		Laramie
R	6	W	R	7	W		Longhorn

Ram 2500 (DJ) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Series
R	4	A	R	5	A	Regular Cab	ST
R	4	B	R	5	B		SLT
R	4	C	R	5	C	Crew Cab Short Wheel Base	ST
R	4	D	R	5	D		SLT
—	—	—	R	5	E		Powerwagon
R	4	F	R	5	F		Laramie
R	4	G	R	5	G		Longhorn
R	4	H	R	5	H	Crew Cab Long Wheel Base	ST
R	4	J	R	5	J		SLT
R	4	K	R	5	K		Laramie
R	4	L	R	5	L		Longhorn
R	4	M	R	5	M	Mega Cab	SLT
R	4	N	R	5	N		Laramie
R	4	P	R	5	P		Longhorn

Ram 3500 (D2) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Series
R	2	A	R	3	A	Regular Cab	ST
R	2	B	R	3	B		SLT
R	2	C	R	3	C	Crew Cab Short Bed	ST
R	2	D	R	3	D		SLT
R	2	E	R	3	E		Laramie
R	2	F	R	3	F		Longhorn
—	2	G	R	3	G	Crew Cab Long Bed	ST
R	2	H	R	3	H		SLT
R	2	J	R	3	J		Laramie
R	2	K	R	3	K		Longhorn
R	2	L	R	3	L	Mega Cab	SLT
R	2	M	R	3	M		Laramie
R	2	N	R	3	N		Longhorn

Ram 3500 (D2) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Series
R	P	A	R	R	A	Regular Cab	ST
R	P	B	R	R	B		SLT
R	P	G	R	R	G	Crew Cab Long Bed	ST
R	P	H	R	R	H		SLT
—	P	J	R	R	J		Laramie
R	P	K	R	R	K		Longhorn

Ram 3500 (D2) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Series
R	P	L	R	R	L	Mega Cab	SLT
R	P	M	R	R	M		Laramie
R	P	N	R	R	N		Longhorn

Ram 3500 (DD) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
R	8	A	R	9	A	Regular Cab	Short
R	8	C	R	9	C	Crew Cab	Standard

Ram 3500 (DD) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
R	S	A	R	T	A	Regular Cab	Short
R	S	B	R	T	B		Long
R	S	C	R	T	C	Crew Cab	Standard

Ram 4500 (DP) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
R	K	A	R	L	A	Regular Cab	Short
R	K	B	R	L	B		Standard
R	K	C	R	L	C		Long
R	K	D	R	L	D		Extra Long
R	K	E	R	L	E	Crew Cab	Short
R	K	F	R	L	F		Long

Ram 5500 (DP) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
R	M	A	R	N	A	Regular Cab	Short
R	M	B	R	N	B		Standard
R	M	C	R	N	C		Long
R	M	D	R	N	D		Extra Long
R	M	E	R	N	E	Crew Cab	Short
R	M	F	R	N	F		Long

Ram 3500 (DF) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
R	C	A	R	D	A	Regular Cab	Short
R	C	B	R	D	B	Crew Cab	Standard

**POSITION 8: ENGINE**

Code	Displacement	Cylinders	Fuel	Turbo	Sales Codes
G	3.6 Liter	6	Gasoline	No	ERB
J	6.4 Liter	8	Gasoline	No	ESG, ESH, ESA, ESB
M	3.0 Liter	6	Diesel	Yes	EXF
T	5.7 Liter	8	Gasoline	No	EZC, EZH
L	6.7 Liter	6	Diesel	Yes	ETK, ETJ
2	5.7 Liter	8	CNG	No	EZF

**POSITION 9: CHECK DIGIT**

0 through 9 or X

**POSITION 10: MODEL YEAR**

H = 2017

**POSITION 11: ASSEMBLY PLANT**

Code	Plant
G	Saltillo Assembly
S	Warren Truck Assembly

**POSITION 12 - 17: PLANT SEQUENCE NUMBER**

A six digit number assigned by assembly plant.

**2018 VIN DECODING INFORMATION****POSITIONS 1 - 3: WORLD MANUFACTURER IDENTIFIER**

1	2	3	MANUFACTURER	VEHICLE TYPE
1	C	6	Chrysler Group LLC (USA)	Truck
1	C	7	Chrysler Group LLC (USA)	Incomplete Vehicle (Cab Chassis)
3	C	6	Chrysler de Mexico	Truck
3	C	7	Chrysler de Mexico	Incomplete Vehicle (Cab Chassis)

**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	Active Belts, No Air Bags	Active Belts, GVWR > 10,000 lbs.
	Pounds	Kilograms					
Hydraulic	6001 - 7000	(2722 - 3175 KG)		J	R		
Hydraulic	8001 - 9000	(3629 - 4082 KG)		L	T		

Brake System	GVWR Range		Active Belts, Air Bags	Active Belts, Air Bags, Side Bags-Front Row	Active Belts, Air Bags, Side Bags-All Rows	Active Belts, No Air Bags	Active Belts, GVWR > 10,000 lbs.
	Pounds	Kilograms					
Hydraulic	9001 - 10000	(4083 - 4535 KG)		M	U		
Hydraulic	10001 - 14000	(4536 - 6349 KG)					3
<b>W</b>	<b>Incomplete Vehicle with Hydraulic Brakes</b>						

**POSITIONS 5 - 7:**

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

Ram 1500 (DS) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Series
R	6	A	R	7	A	Regular Cab Short Bed	ST
R	6	B	R	7	B		SLT
R	6	C	R	7	C		Sport
R	6	D	R	7	D	Regular Cab Long Bed	ST
R	6	E	R	7	E		SLT
R	6	Z	—	—	—	Quad Cab	HFE
R	6	F	R	7	F		ST
R	6	G	R	7	G		SLT
R	6	H	R	7	H		Sport
R	6	J	R	7	J		Laramie
R	6	K	R	7	K	Crew Cab Short Bed	ST
R	6	L	R	7	L		SLT
R	6	M	R	7	M		Sport
R	6	N	R	7	N		Laramie
R	6	P	R	7	P		Longhorn
—	—	—	R	7	X		SSV
R	6	Y	R	7	Y		Rebel
R	6	S	R	7	S	Crew Cab Long Bed	ST
R	6	T	R	7	T		SLT
R	6	U	R	7	U		Sport
R	6	V	R	7	V		Laramie
R	6	W	R	7	W		Longhorn

Ram 2500 (DJ) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Series
R	4	A	R	5	A	Regular Cab	ST
R	4	B	R	5	B		SLT



Ram 2500 (DJ) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Series
R	4	C	R	5	C	Crew Cab Short Wheel Base	ST
R	4	D	R	5	D		SLT
—	—	—	R	5	E		Power Wagon
R	4	F	R	5	F		Laramie
R	4	G	R	5	G		Longhorn
R	4	H	R	5	H	Crew Cab Long Wheel Base	ST
R	4	J	R	5	J		SLT
R	4	K	R	5	K		Laramie
R	4	L	R	5	L		Longhorn
R	4	M	R	5	M	Mega Cab	SLT
R	4	N	R	5	N		Laramie
R	4	P	R	5	P		Longhorn

Ram 3500 (D2) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Series
R	2	A	R	3	A	Regular Cab	ST
R	2	B	R	3	B		SLT
R	2	C	R	3	C	Crew Cab Short Bed	ST
R	2	D	R	3	D		SLT
R	2	E	R	3	E		Laramie
R	2	F	R	3	F		Longhorn
R	2	G	R	3	G	Crew Cab Long Bed	ST
R	2	H	R	3	H		SLT
R	2	J	R	3	J		Laramie
R	2	K	R	3	K		Longhorn
R	2	L	R	3	L	Mega Cab	SLT
R	2	M	R	3	M		Laramie
R	2	N	R	3	N		Longhorn

Ram 3500 (D2) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Series
R	P	A	R	R	A	Regular Cab	ST
R	P	B	R	R	B		SLT
R	P	G	R	R	G	Crew Cab Long Bed	ST
R	P	H	R	R	H		SLT
R	P	J	R	R	J		Laramie
R	P	K	R	R	K		Longhorn
R	P	L	R	R	L	Mega Cab	SLT
R	P	M	R	R	M		Laramie
R	P	N	R	R	N		Longhorn

Ram 3500 (DD) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
R	8	A	R	9	A	Regular Cab	Short
R	8	C	R	9	C	Crew Cab	Standard

Ram 3500 (DD) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
R	S	A	R	T	A	Regular Cab	Short
R	S	B	R	T	B		Long
R	S	C	R	T	C	Crew Cab	Standard

Ram 4500 (DP) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
R	K	A	R	L	A	Regular Cab	Short
R	K	B	R	L	B		Standard
R	K	C	R	L	C		Long
R	K	D	R	L	D		Extra Long
R	K	E	R	L	E	Crew Cab	Short
R	K	F	R	L	F		Long

Ram 5500 (DP) Left Hand Drive Truck Dual Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
R	M	A	R	N	A	Regular Cab	Short
R	M	B	R	N	B		Standard
R	M	C	R	N	C		Long
R	M	D	R	N	D		Extra Long
R	M	E	R	N	E	Crew Cab	Short
R	M	F	R	N	F		Long

Ram 3500 (DF) Left Hand Drive Truck Single Rear Wheels							
2WD			4WD			Cab Type	Wheel Base
R	C	A	R	D	A	Regular Cab	Short
R	C	B	R	D	B	Crew Cab	Standard

**POSITION 8: ENGINE**

Engine Code	M	G	T	2	J	L
Displacement	3.0L	3.6L	5.7L	5.7L	6.4L	6.7L
	Turbo			CNG		Turbo
Cylinders	V6	V6	V8	V8	V8	I6
Fuel	Diesel	Gas	Gas	Gas/CNG	Gas	Diesel

<b>Manufacturer</b>	FCA	FCA	FCA	FCA	FCA	Cummins, Inc.
Ram 1500	240	305	395			
Ram 2500			383	383	410	370
Ram 3500			383		410	385
Ram Chassis Cab					370	325

**POSITION 9: CHECK DIGIT**

0 through 9 or X

**POSITION 10: MODEL YEAR**

J = 2018

**POSITION 11: ASSEMBLY PLANT**

<b>Code</b>	<b>Plant</b>	<b>City</b>	<b>State</b>	<b>Country</b>
G	Saltillo Truck Assembly	Saltillo	Coahuila	Mexico
S	Warren Truck Assembly	Warren	MI	USA

**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 BIW exploded 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.

**NOTE:** Corrosion protection must be restored after repair.

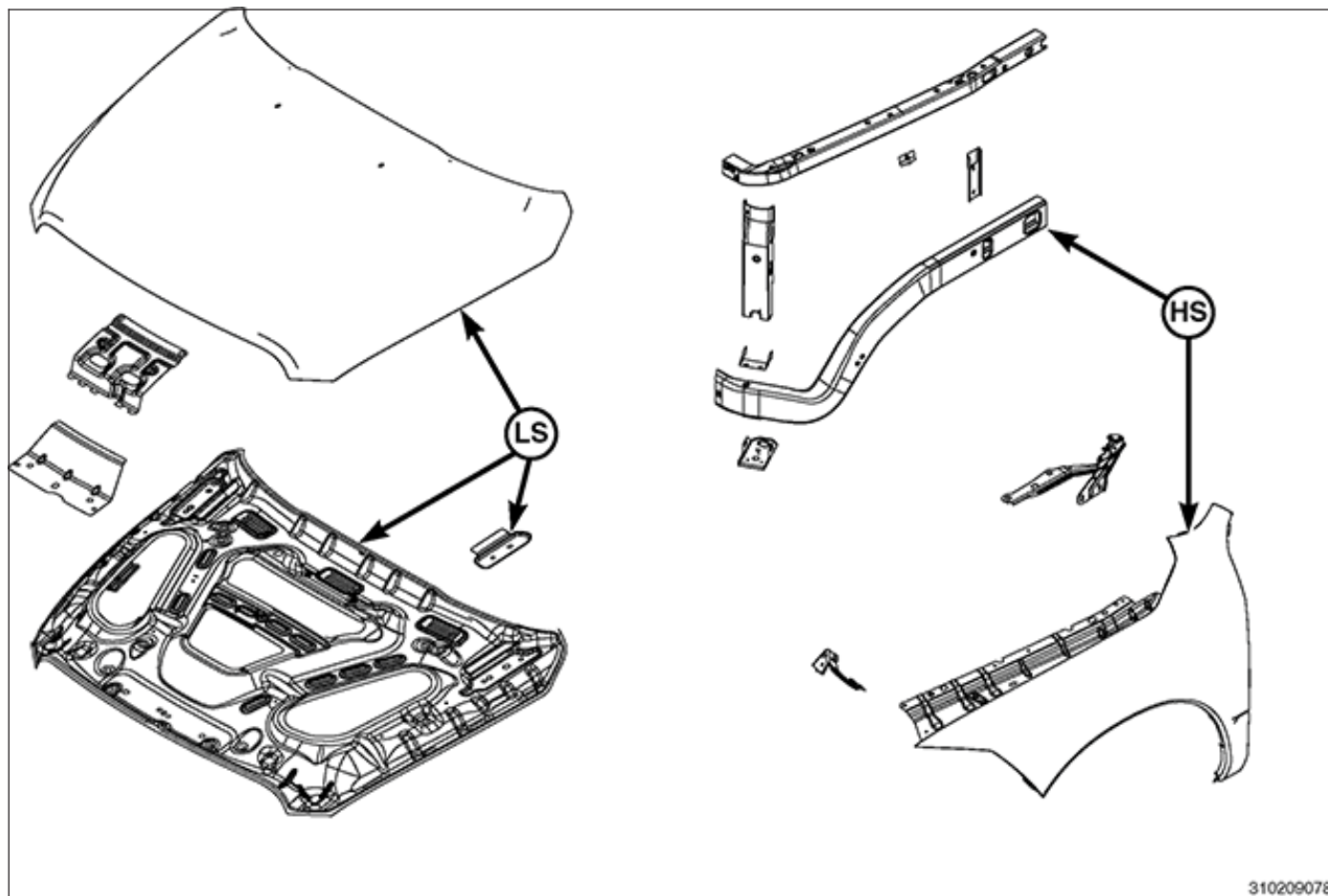
- **LS** - Good repairability and weldability (least sensitive to heat). May be attached using the preferred Squeeze Type Resistance Spot Welding (STRSW) process, weld bonding where appropriate, or MIG welding. Materials have a tensile strength of less than 270 MPa.
- **HS** - Some repairability and 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.

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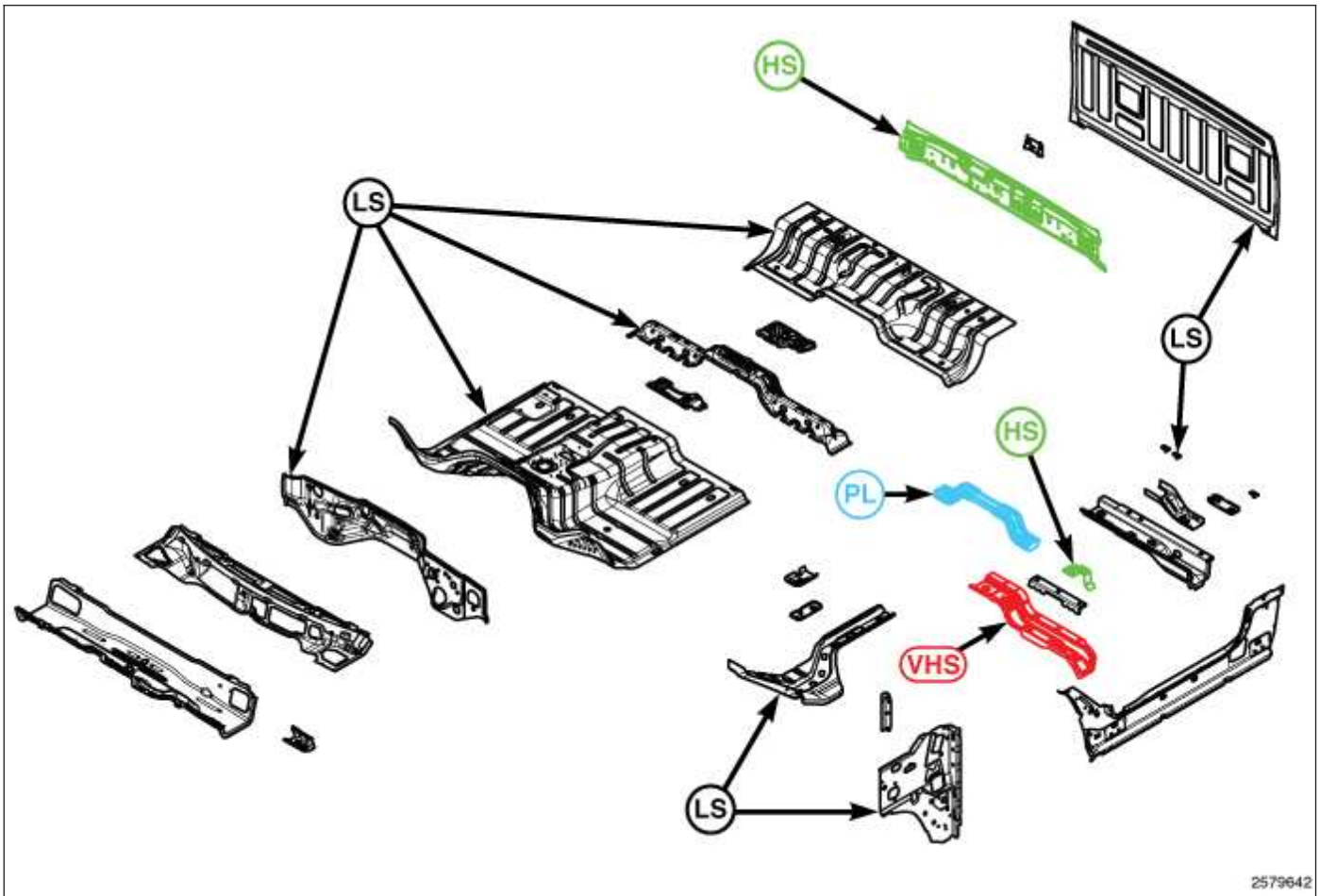
Additional information on sectioning of components will also be identified in publications such as the FCA US LLC Non-Structural Sheet Metal Repair Guide (81-316-0610) and Structural Sectioning Guide (81-316-0859).

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

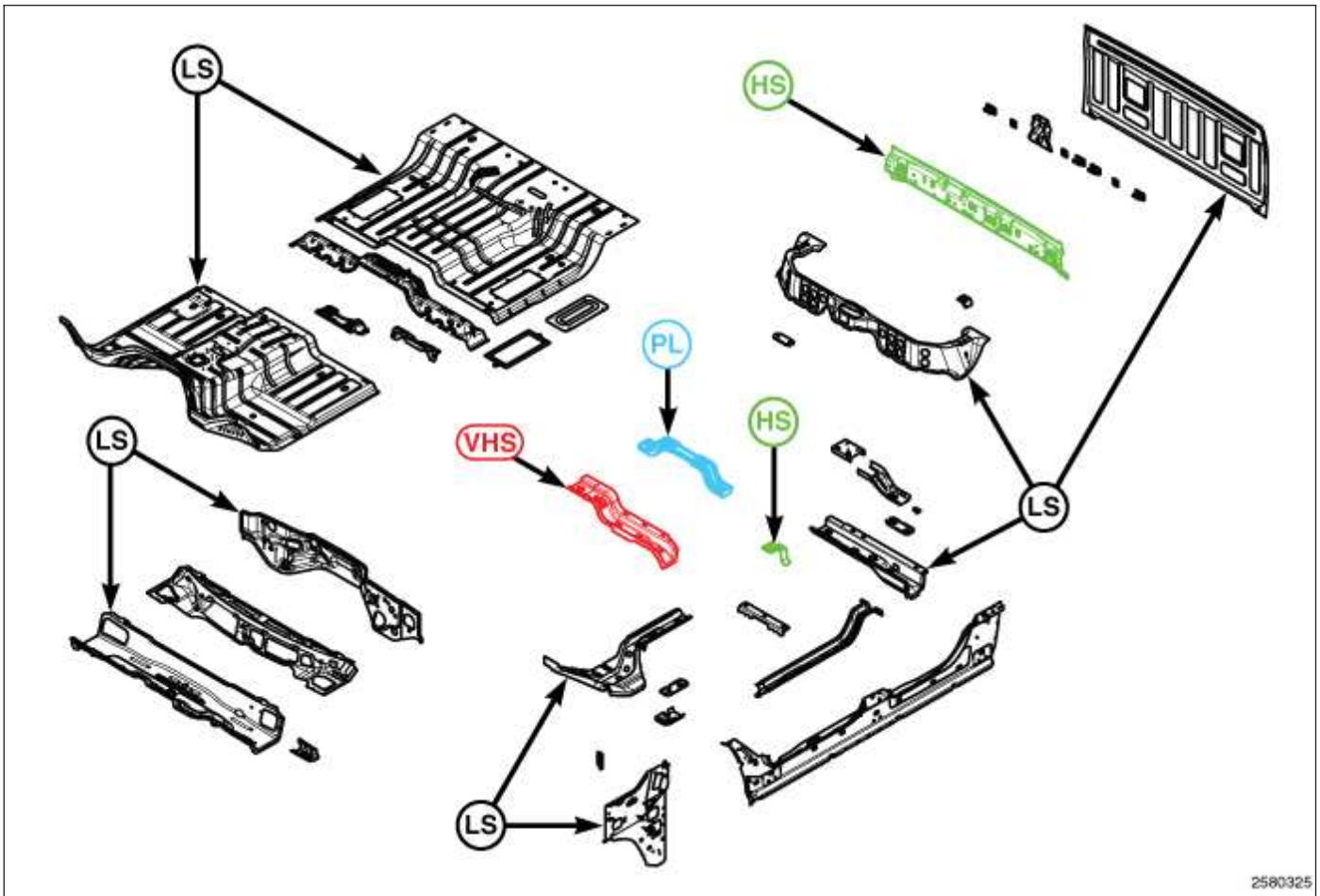


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BODY IN WHITE COMPONENT IDENTIFICATION - FRONT END

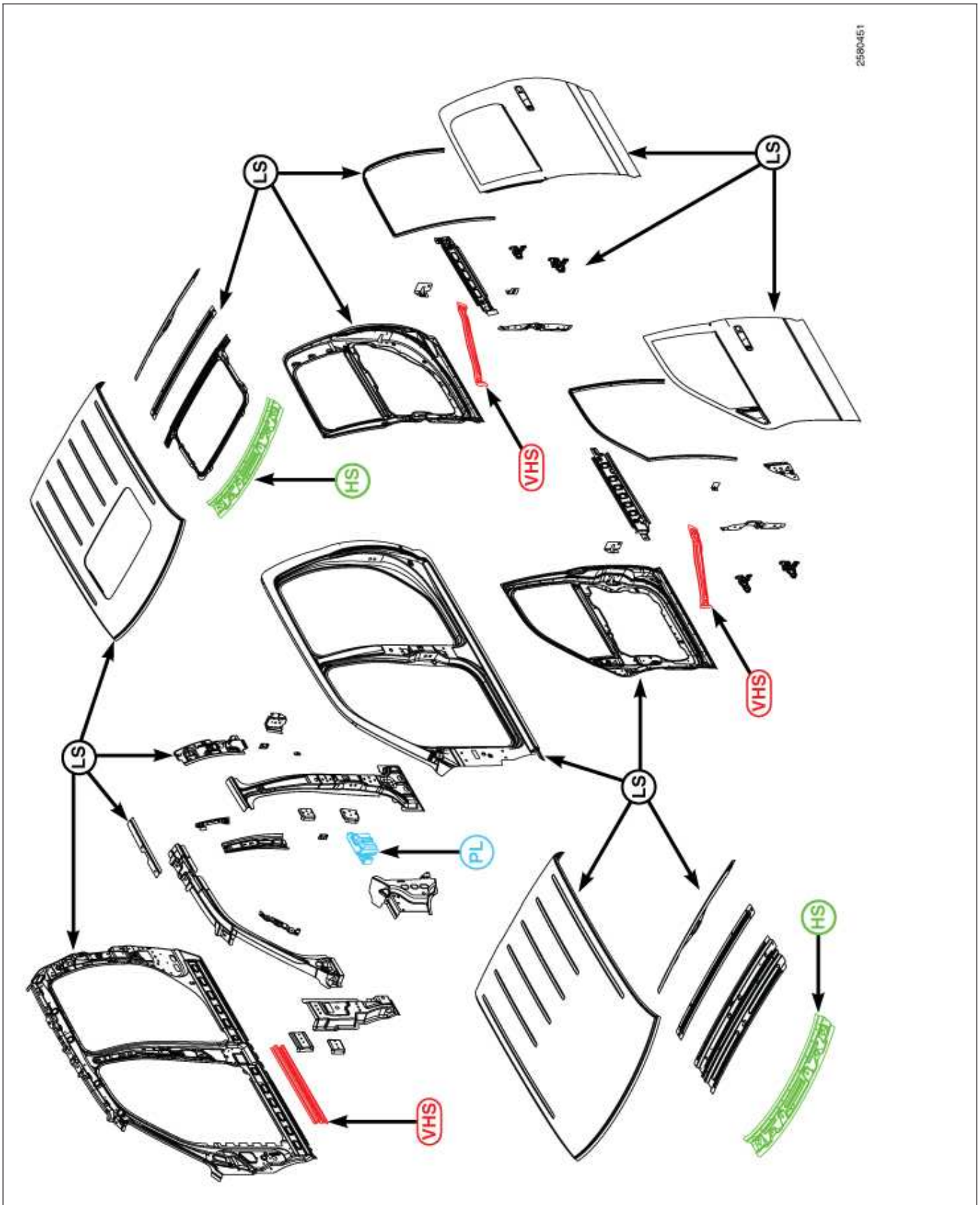


BODY IN WHITE COMPONENT IDENTIFICATION - UNDERBODY - STANDARD CAB



2580325

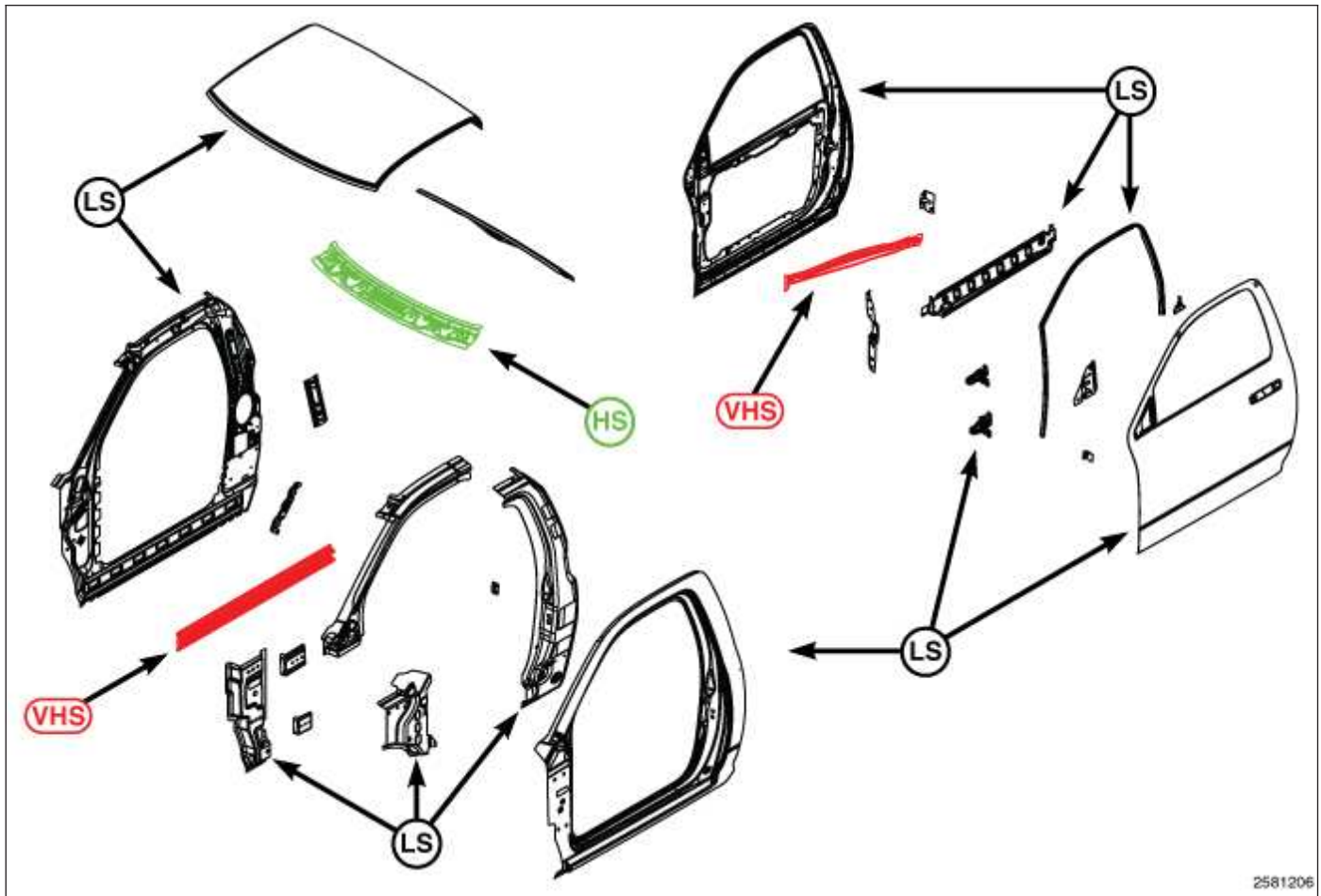
BODY IN WHITE COMPONENT IDENTIFICATION - UNDERBODY - CREW CAB



BODY IN WHITE COMPONENT IDENTIFICATION - BODY SIDE APERTURE, DOOR AND ROOF - CREW CAB

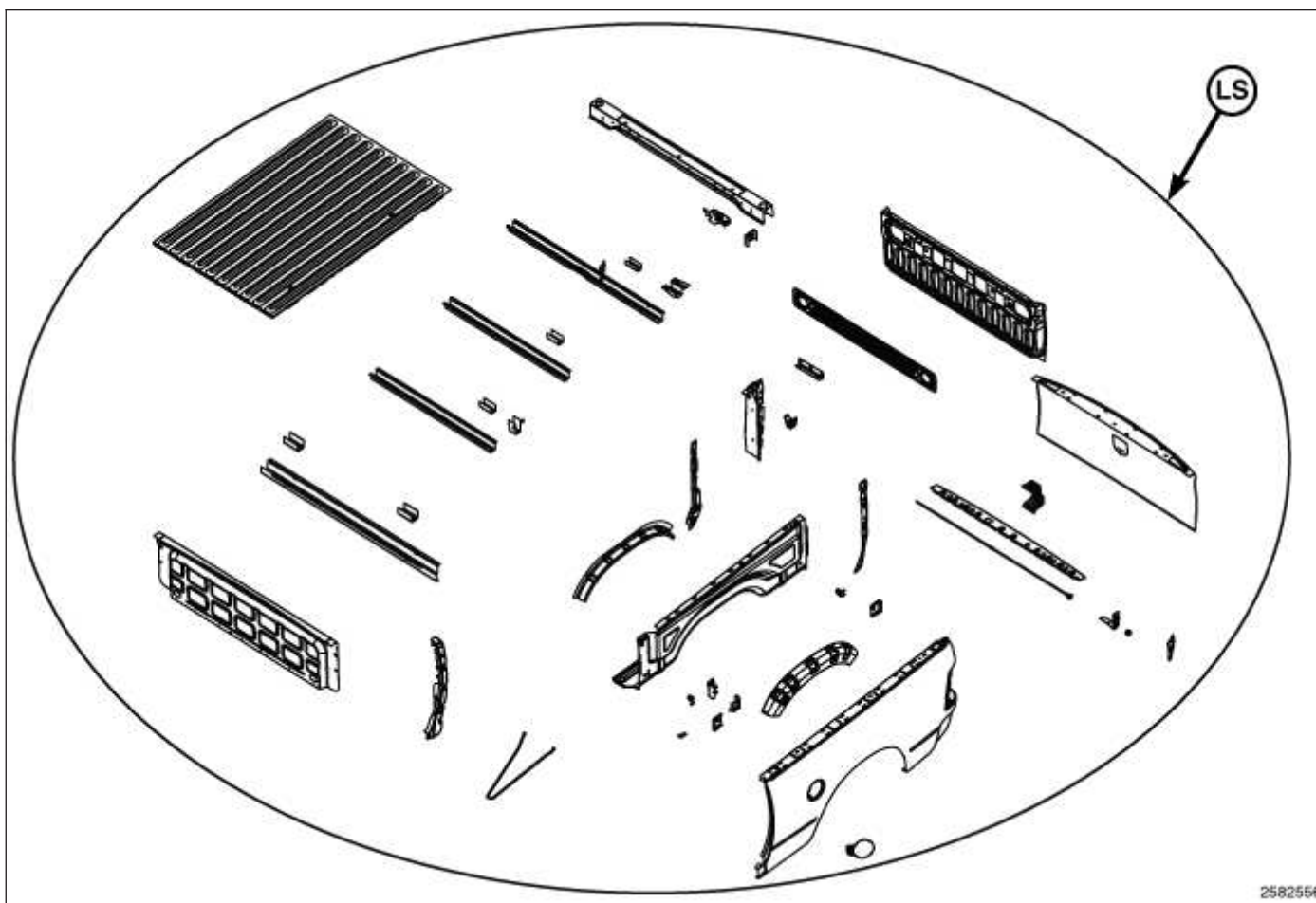
**NOTE:** Crew cab shown, mega cab similar.





2581206

BODY IN WHITE COMPONENT IDENTIFICATION - BODY SIDE APERTURE, DOOR AND ROOF - STANDARD CAB

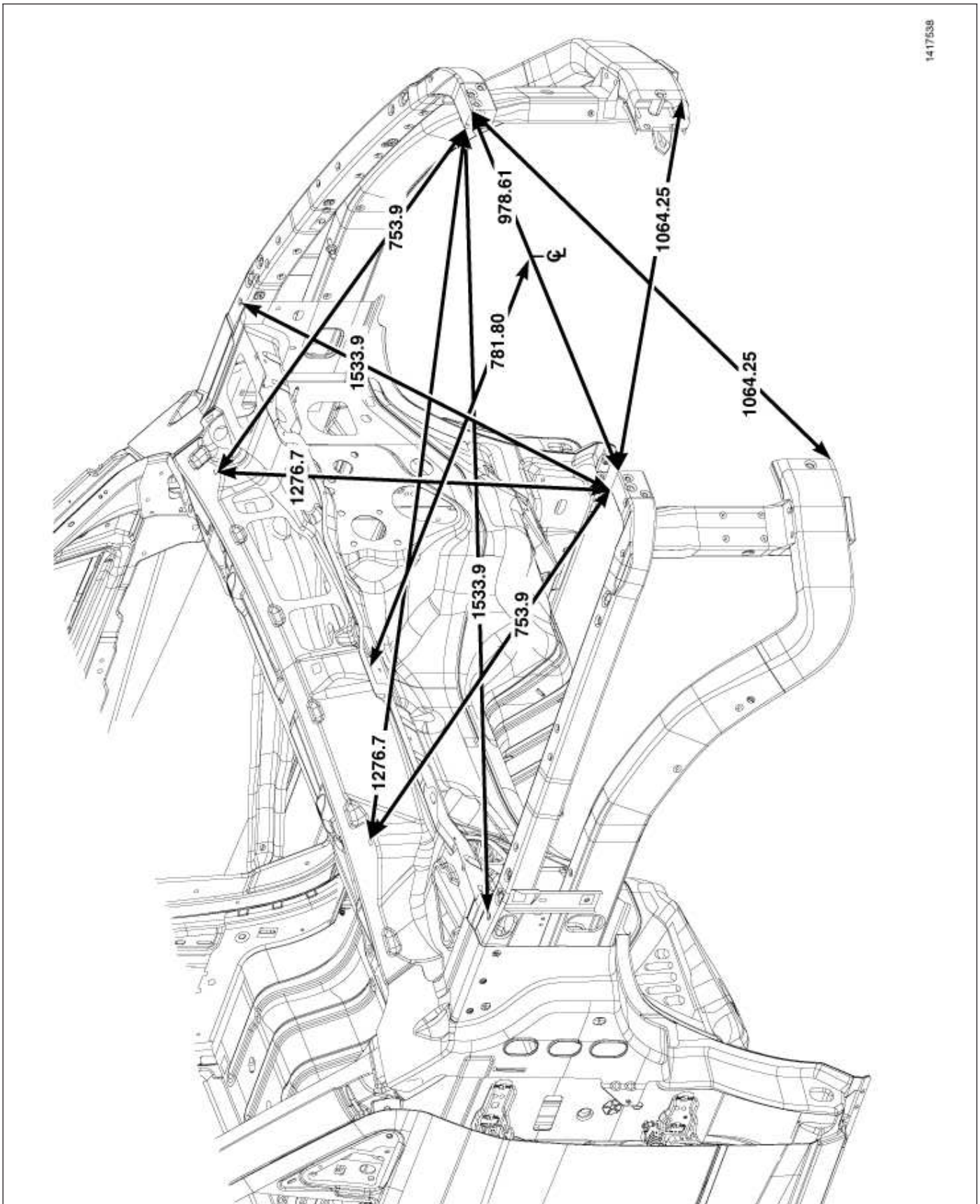


BODY IN WHITE COMPONENT IDENTIFICATION - PICKUP BOX - 6.3' SHOWN, 8.0' TYPICAL, RAMBOX SIMILAR

**BODY OPENING DIMENSIONS**

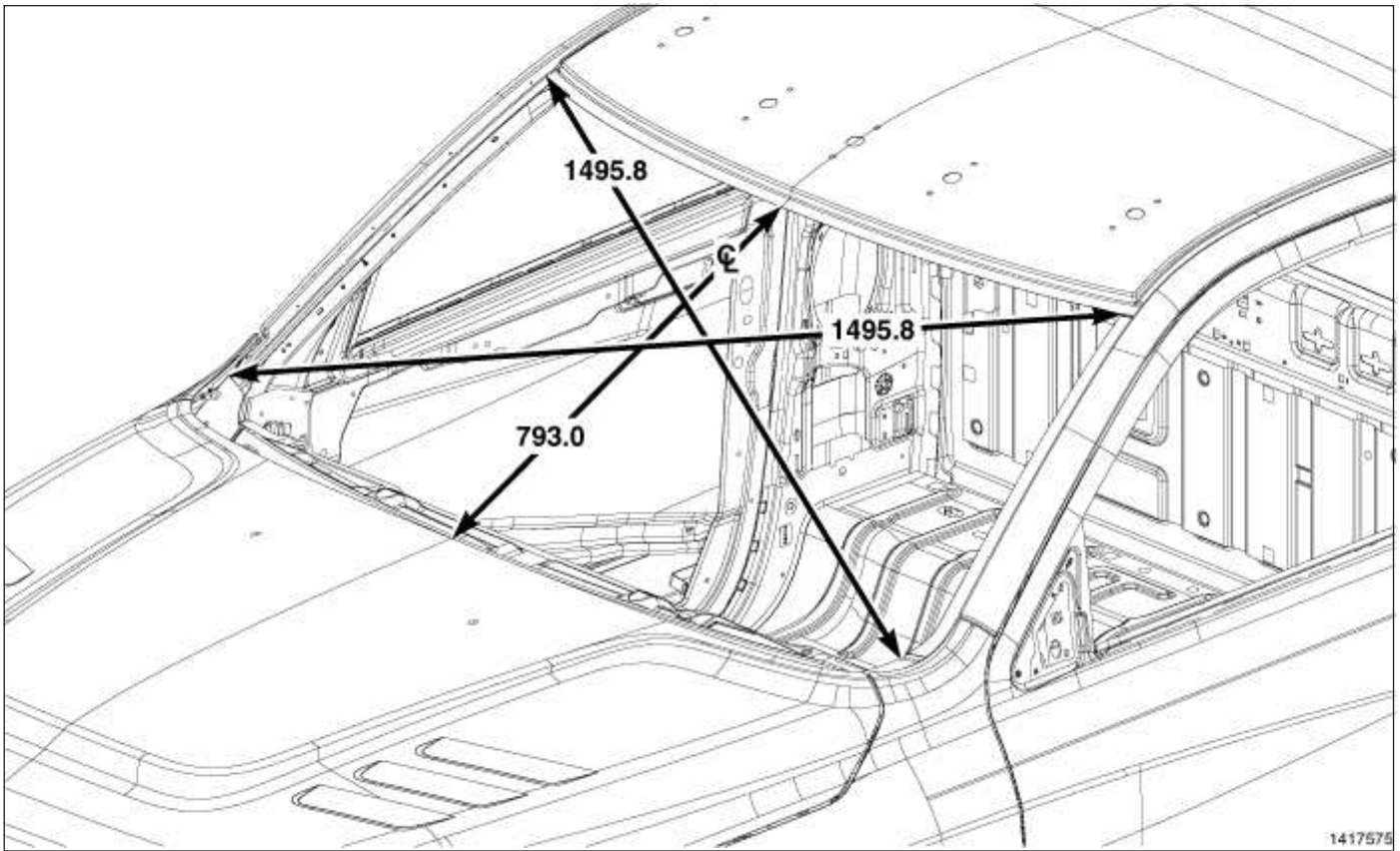
**BODY OPENING DIMENSIONS INDEX**

DESCRIPTION	FIGURE
Engine Compartment/Body Structure	<a href="#">Figure 1</a>
Windshield Opening - All	<a href="#">Figure 2</a>
Door Openings – Standard Cab	<a href="#">Figure 3</a>
Door Openings – Crew and MegaCab	<a href="#">Figure 4</a>
Rear Window Opening - All	<a href="#">Figure 5</a>
Pickup Box – 6.3' Box (Plan View)	<a href="#">Figure 6</a>
Pickup Box – 8.0' Box (Plan View)	<a href="#">Figure 7</a>
Pickup Box – Tail Gate Opening - All	<a href="#">Figure 8</a>

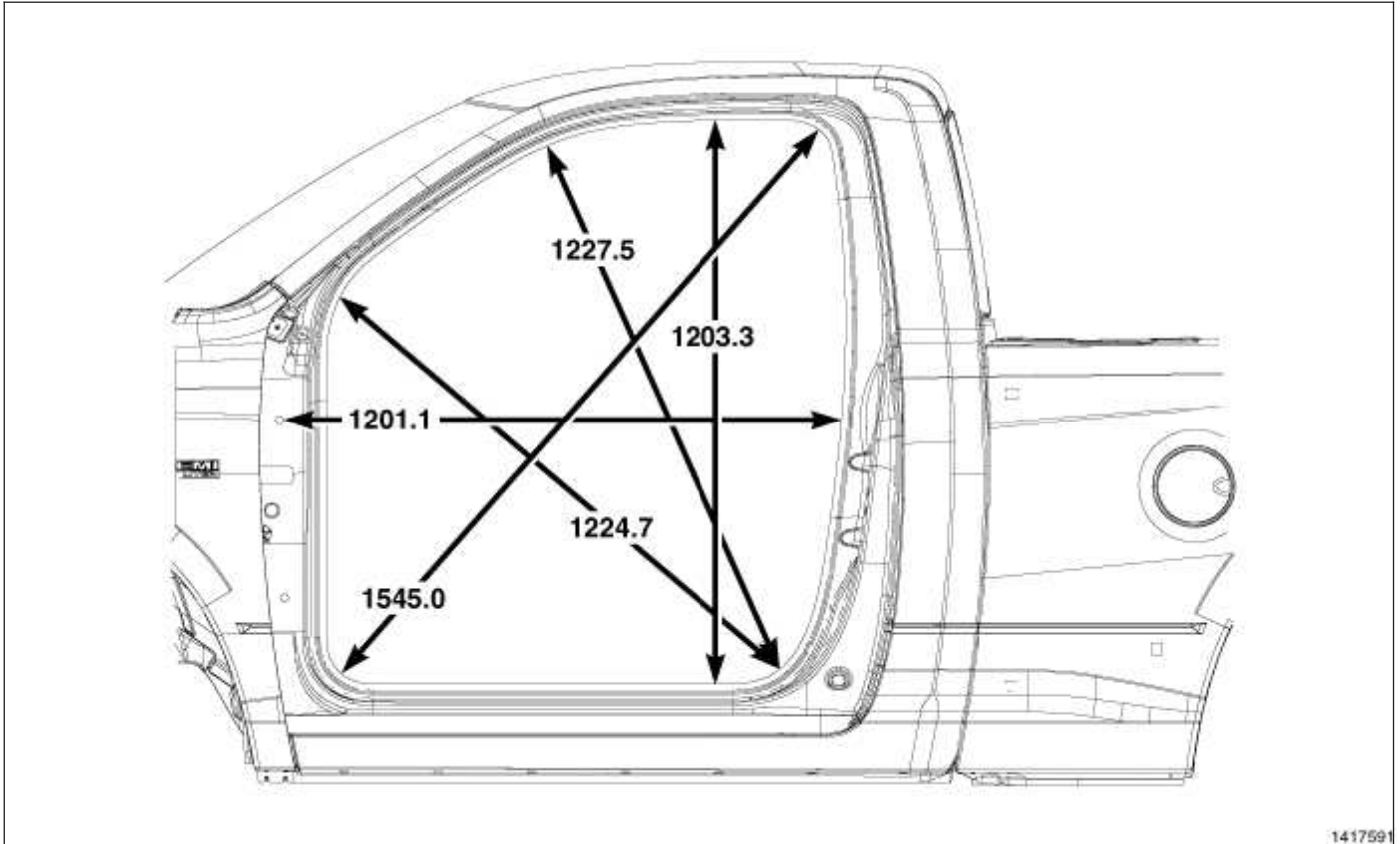


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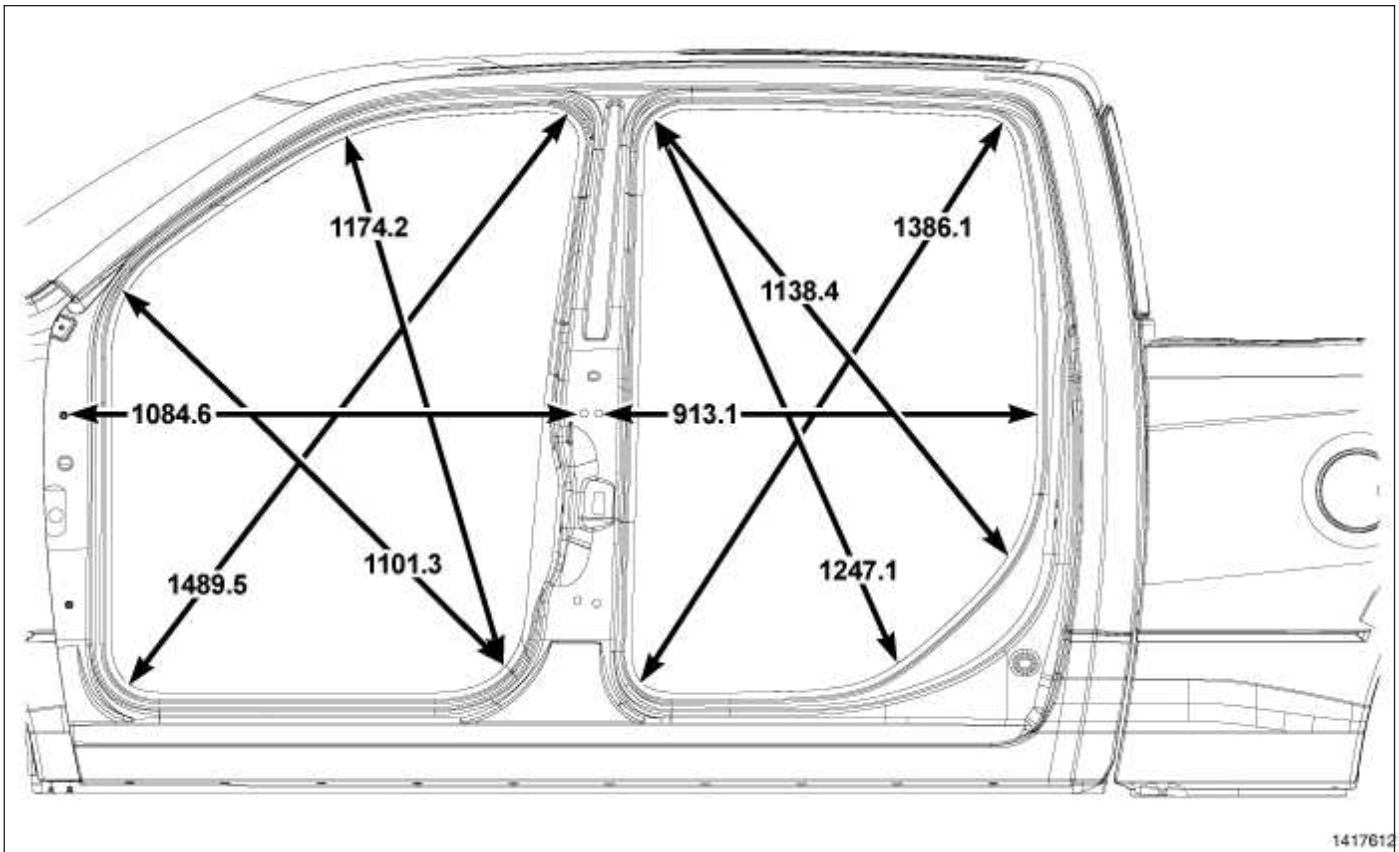
Engine Compartment/Body Structure



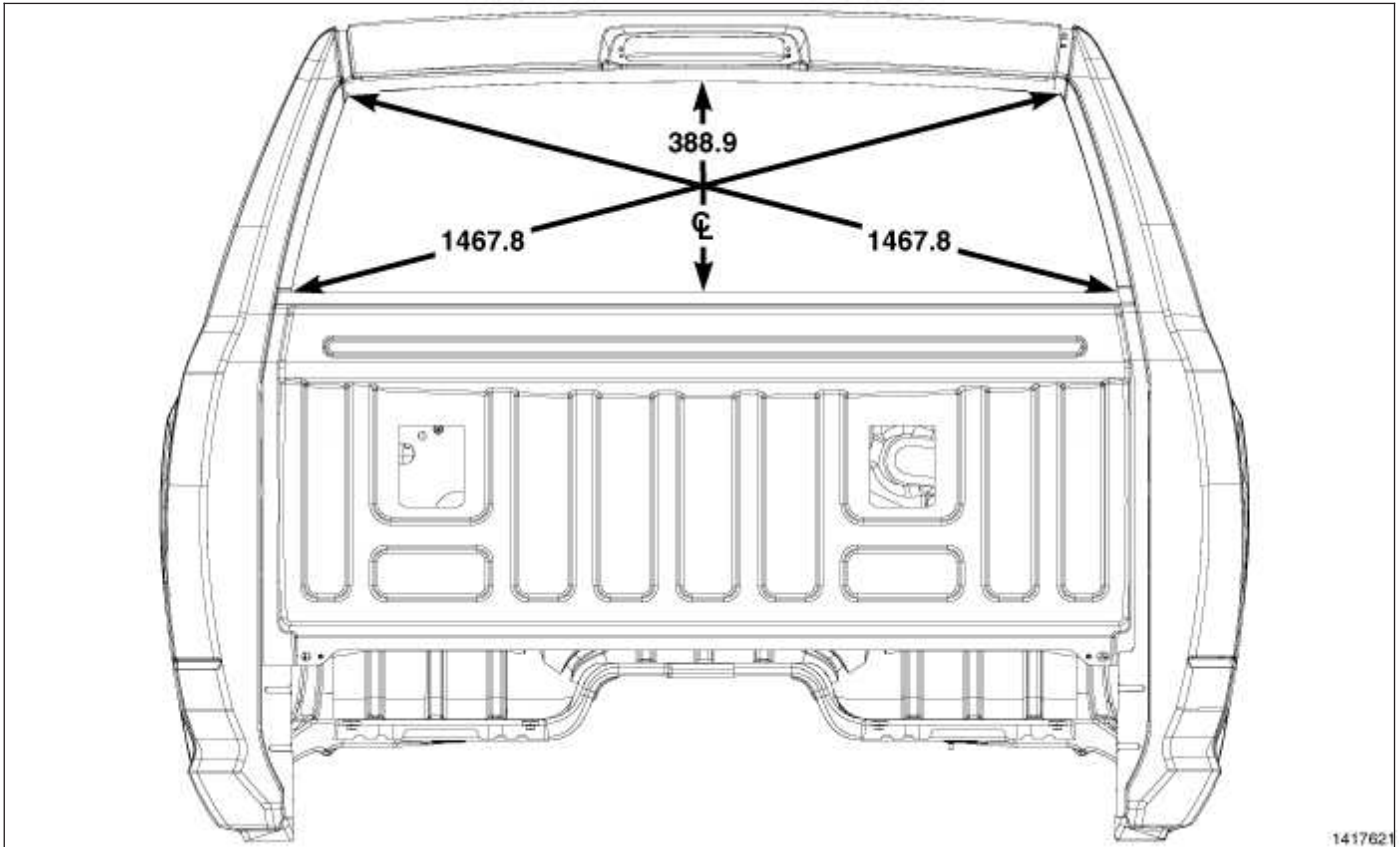
Windshield Opening - All



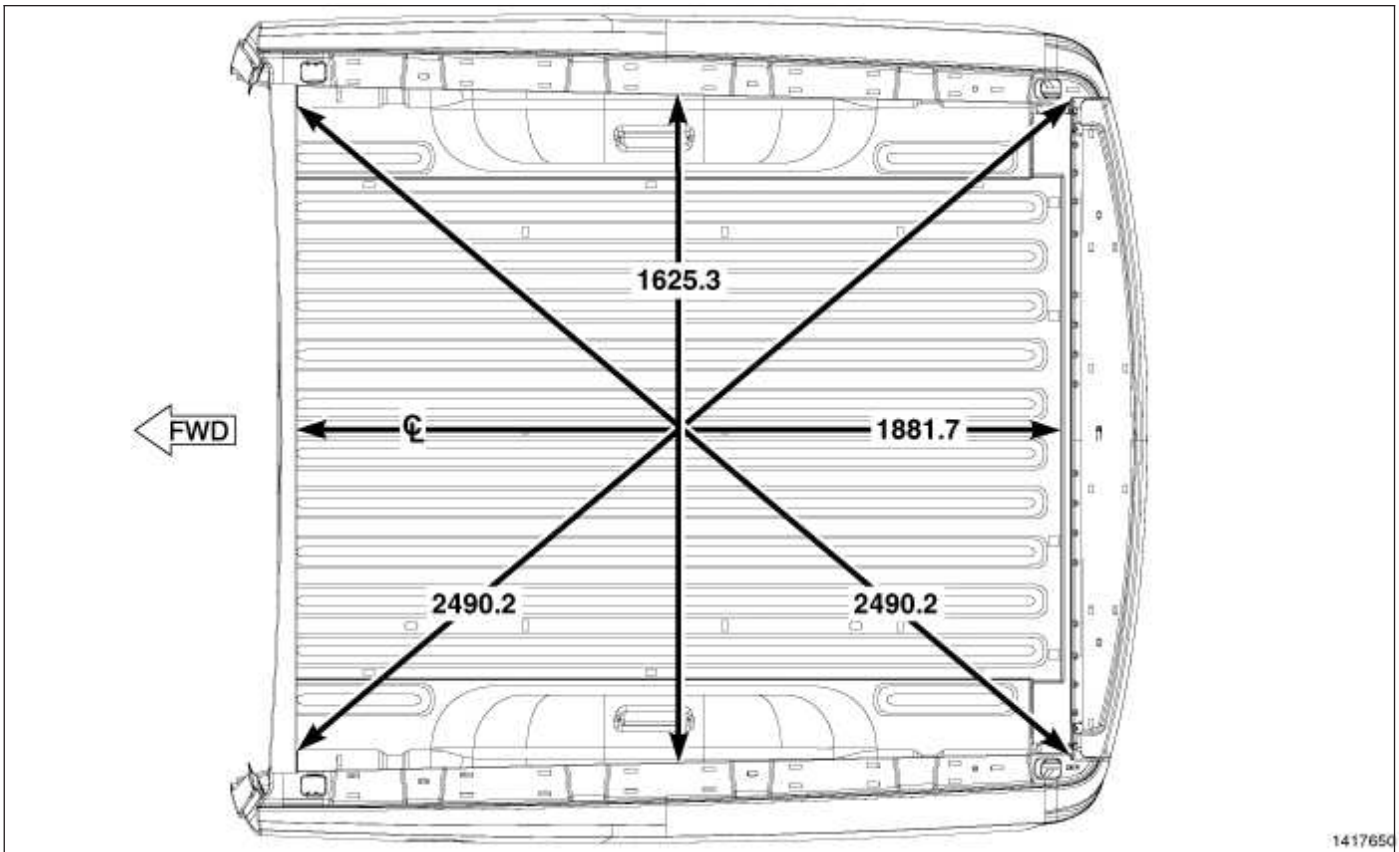
Door Openings – Standard Cab



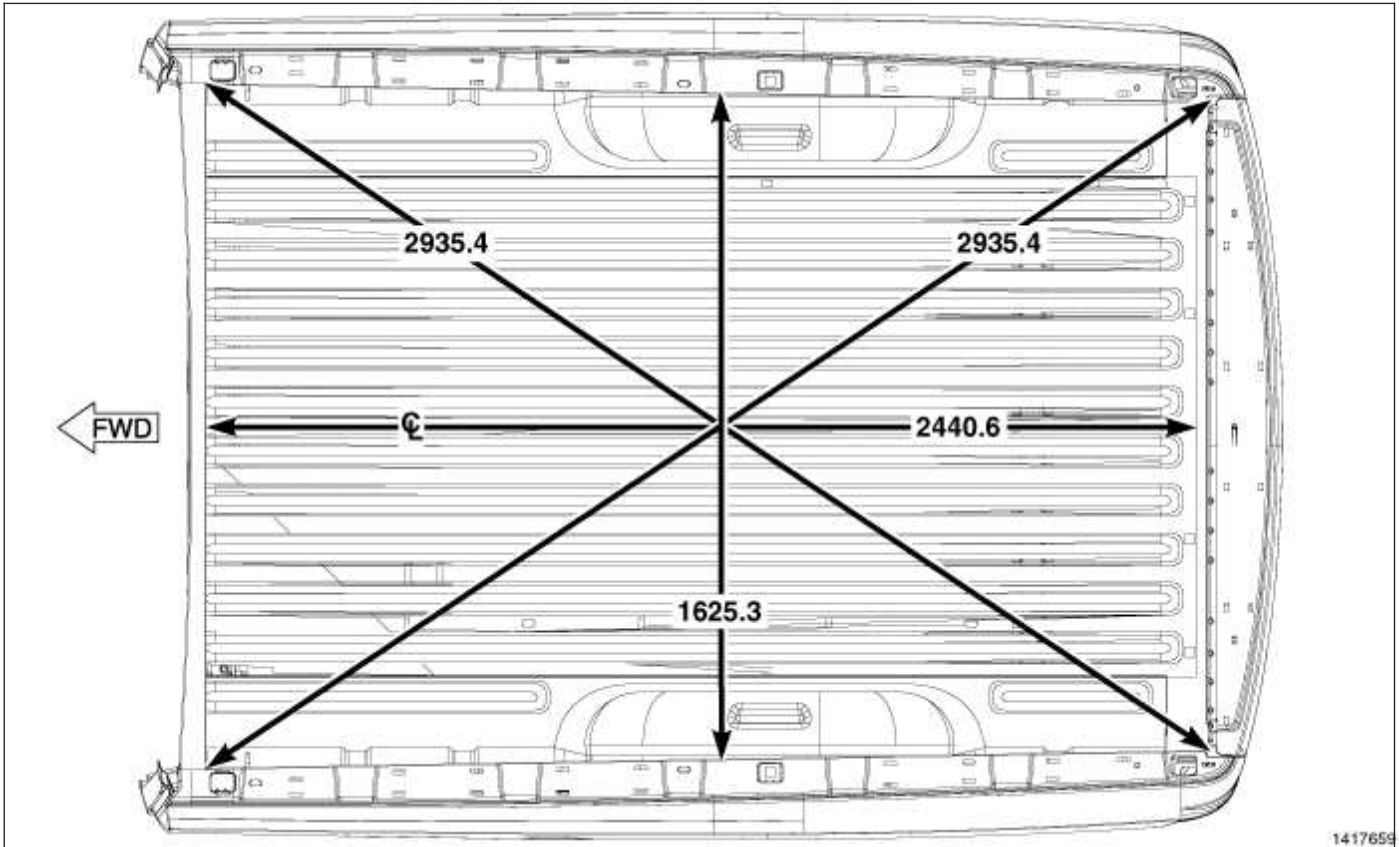
Door Openings – Crew and Mega Cab



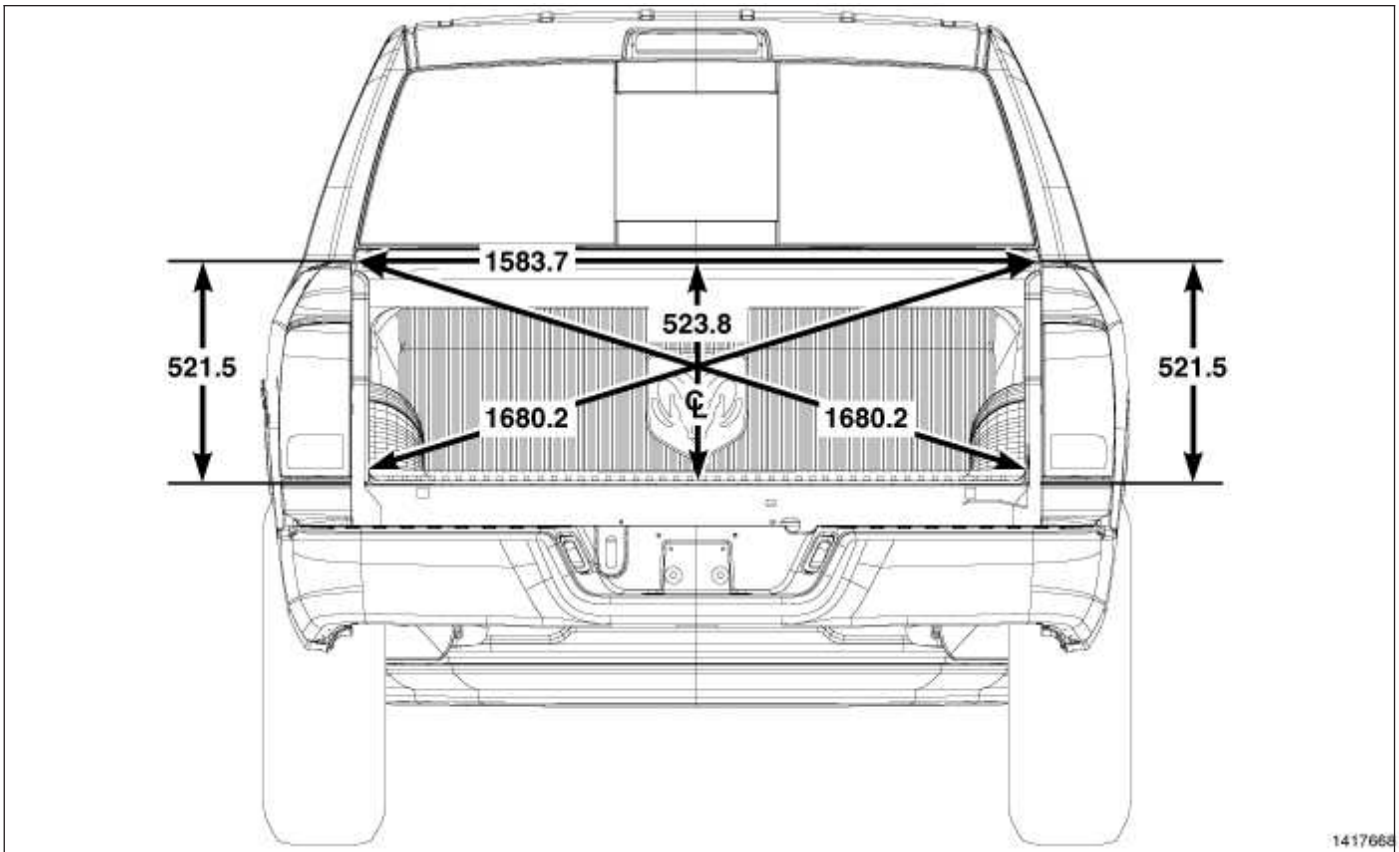
Rear Window Opening - All



Pickup Box – 6.3' Box (Plan View)



Pickup Box – 8.0' Box (Plan View)



Pickup Box – Tail Gate Opening - All

**FRAME DIMENSIONS**

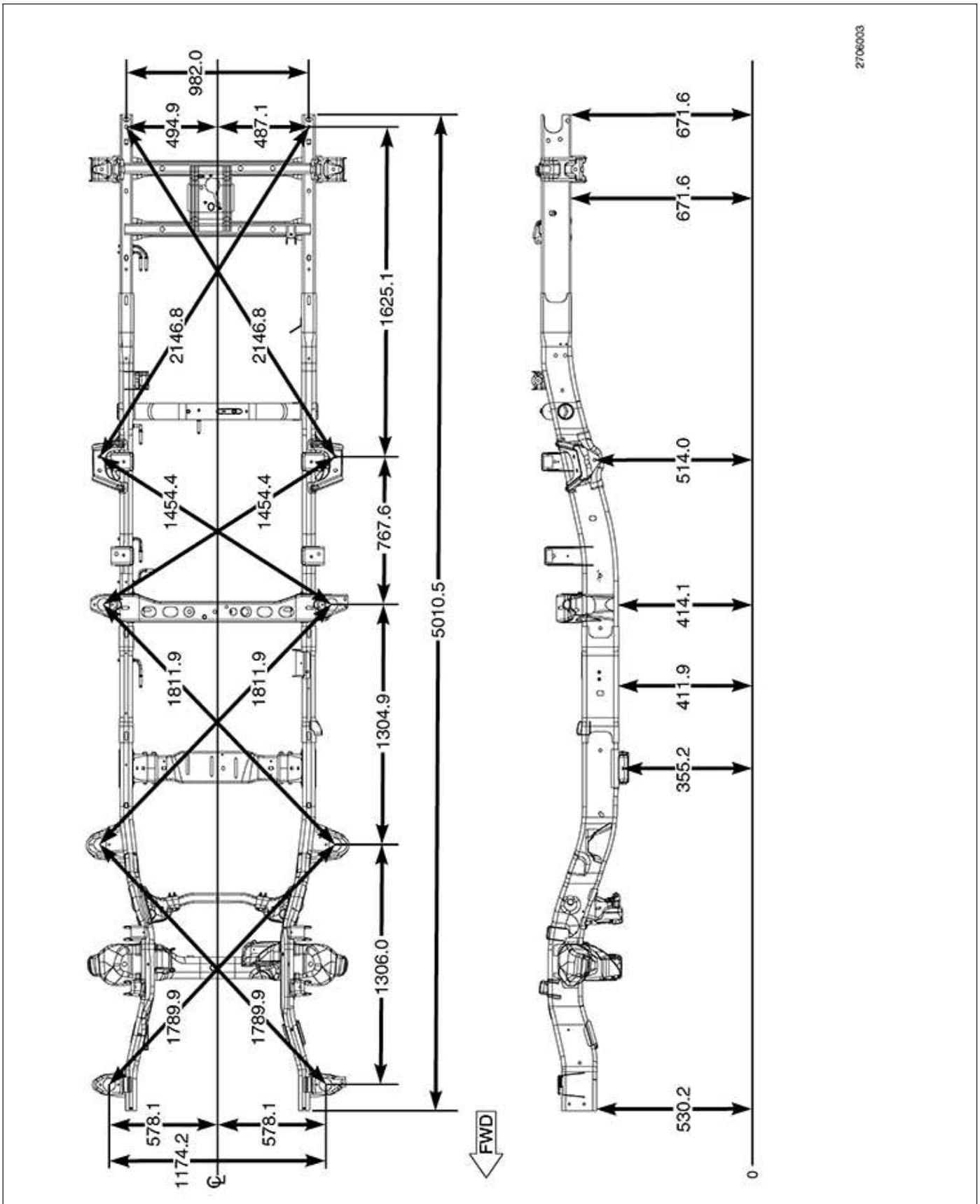
**NOTE:** Frame dimensions are listed in metric scale. All dimensions are from center to center of Principal Locating Point (PLP), or from center to center of PLP and fastener location.

**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**

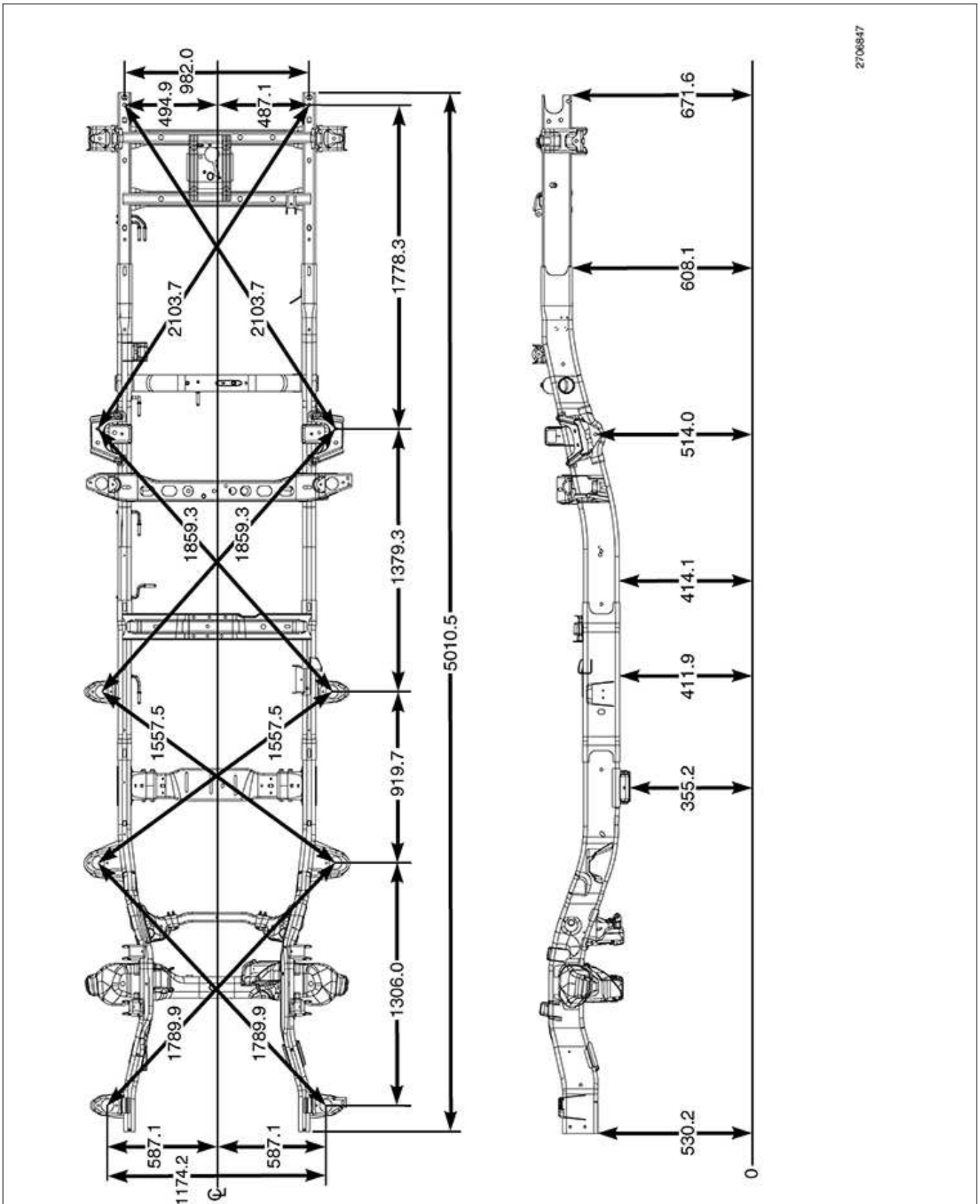
DESCRIPTION	FIGURE
140.5 in. Wheelbase – Regular Cab – 8.0 ft. Box	Figure 1
149.4 in. Wheelbase – Crew Cab – 6.3 ft. Box	Figure 2
160.5 in. Wheelbase – Mega Cab – 6.3 ft. Box	Figure 3
169.4 in. Wheelbase – Crew Cab – 8.0 ft. Box	Figure 4



2706003

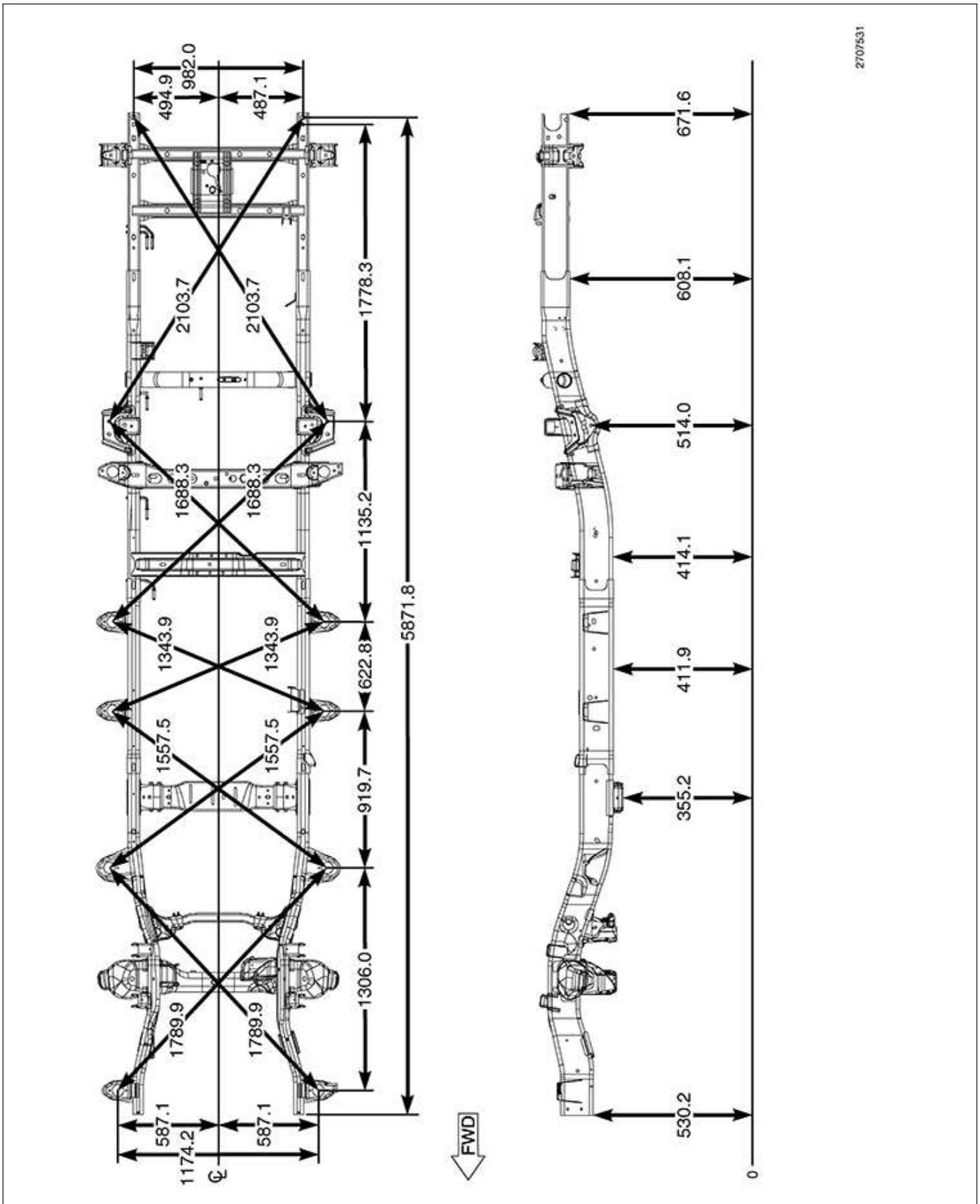
140.5 in. Wheelbase – Regular Cab – 8.0 ft. Box





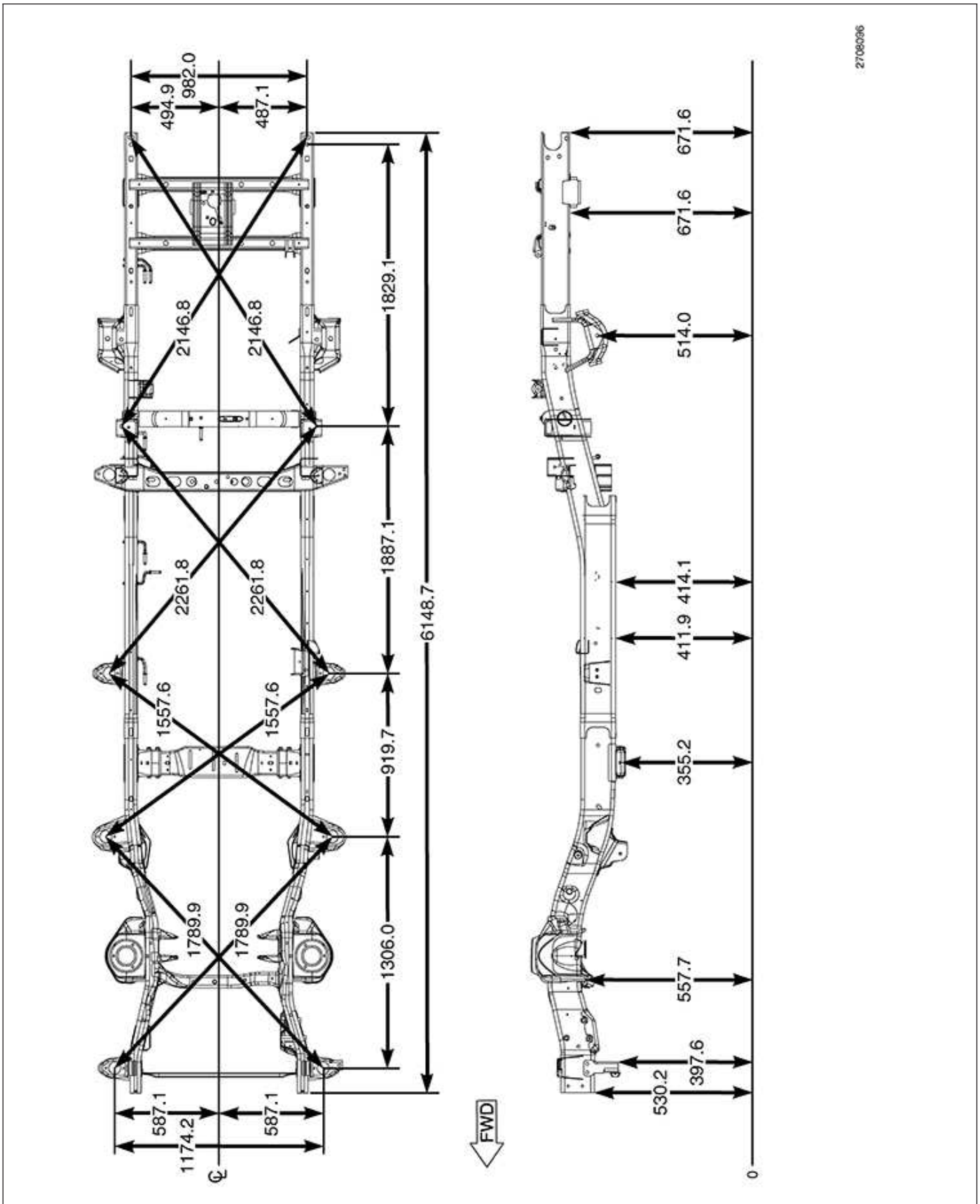
2706847

149.4 in. Wheelbase – Crew Cab – 6.3 ft. Box



2707531

160.5 in. Wheelbase – Mega Cab – 6.3 ft. Box



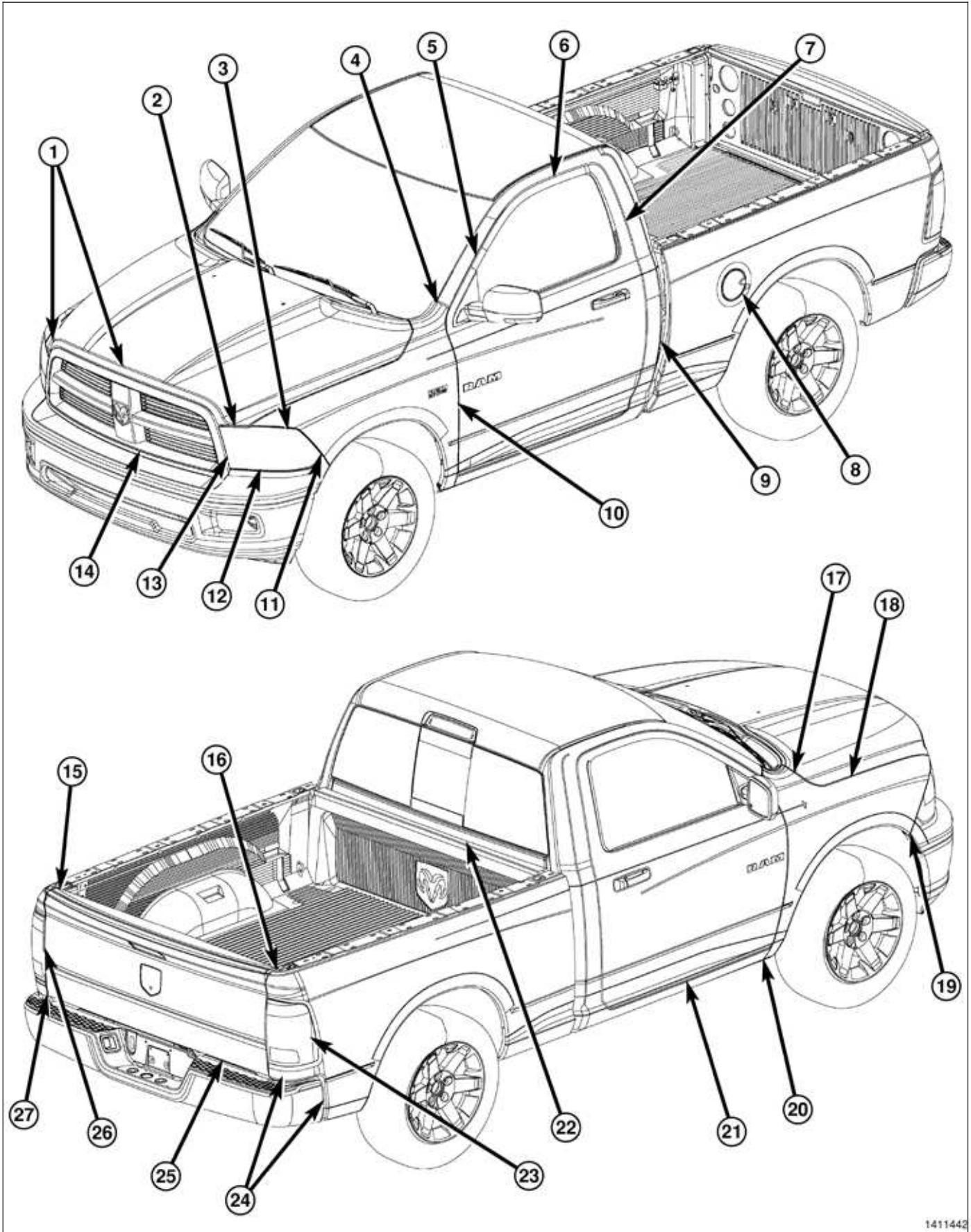
27080366

169.4 in. Wheelbase – Crew Cab – 8.0 ft. Box

## GAP AND FLUSH DIMENSIONS

### GAP AND FLUSH DIMENSIONS INDEX

DESCRIPTION	FIGURE
Regular Cab	<a href="#">Figure 1</a>
Crew/Mega Cab	<a href="#">Figure 2</a>



Regular Cab

<b>NOTE:</b> All measurements are in millimeters.			
<b>O/F = Over Flush</b>		<b>U/F = Under Flush</b>	
<b>U/D = Up/Down</b>		<b>F/A = Fore/Aft</b>	
<b>DIMENSION</b>	<b>DESCRIPTION</b>	<b>GAP</b>	<b>FLUSH</b>
1	Hood to grille (along top)	7.0 +/- 2.0 transition to 4.5 after corner	Hood O/F 7.0 @ center to 5.5 @ corner to 1.0 around corner +/- 2.0
2	Headlamp to hood	7.0 +/- 2.0 Parallel within 2.0 Side to side within 3.0	Headlamp O/F 4.0 +/- 2.0 Parallel within 2.0 Side to side within 2.0
3	Fender to headlamp	2.5 +/- 2.0 Parallel within 2.0 Side to side within 3.0	Fender O/F 2.0 +/- 2.0 Parallel within 2.0 Side to side within 3.0
4	Fender to a-pillar	3.0 +/- 1.5 Parallel within 1.5 Side to side within 2.0	Fender O/F 0.75 +/- 1.5 Parallel within 1.5 Side to side within 2.0
5	Aperture to front door @ a-pillar	4.5 +/- 1.5 Parallel within 1.5 Front to back within 1.5	Aperture O/F 1.5 +/- 1.5 Parallel within 1.5 Front to back within 1.5
6	Aperture to front door @ roof	4.5 +/- 1.5 Parallel within 1.5 Front to back within 1.5	Aperture O/F 1.5 +/- 1.5 Parallel within 1.5 Front to back within 1.5
7	Aperture to rear door @ roof	4.5 +/- 1.5 Parallel within 1.5 Front to back within 1.5	Aperture O/F 1.5 +/- 1.5 Parallel within 1.5
8	Box outer to fuel filler door	4.5 +/- 1.5 Parallel within 1.5	0.0 +/- 1.5 Parallel within 1.5
9	Cab to box	35.0 +/- 4.0 Parallel within 3.0	Cab O/F 6.0 +/- 4.0 Parallel within 3.0
10	Fender to front door	4.5 +/- 1.5 Parallel within 1.5 Top to bottom within 1.5	Box outer O/F 0.5 +/- 1.5 Parallel within 1.5 Top to bottom within 1.5
11	Fascia to fender	Net to 2.0 Parallel within 2.0	0.0 +/- 2.0 Parallel within 2.0
12	Headlamp to fascia	4.5 +/- 2.0 Parallel within 2.0 Side to side within 3.0	0.0 +/- 2.0 Parallel within 2.0 Side to side within 2.0
13	Grille to headlamp	3.7 +/- 2.0 Parallel within 2.0 Side to side within 3.0	—
14	Grille to fascia	3.5 +/- 2.0 Parallel within 2.0 Side to side within 2.0	—
15	Deflector to tailgate inner	F/A 0.0 +2.0/- 0.0	—

<b>NOTE:</b> All measurements are in millimeters. <b>O/F = Over Flush</b> <b>U/D = Up/Down</b>			
		<b>U/F = Under Flush</b> <b>F/A = Fore/Aft</b>	
DIMENSION	DESCRIPTION	GAP	FLUSH
		Parallel within 2.0	
16	Box cab to tailgate deflector	—	U/D 0.0 +/- 2.0
17	Fender to hood @ cowl	4.5 +/- 1.5 Parallel within 1.5 Side to side within 2.0	Fender U/D-U/F 0.75 +/-1.5 Cross/car 0.0 +/- 1.5
18	Fender to hood	4.5 +/- 1.5 Parallel within 1.5 Side to side within 2.0	Fender O/F 0.5 +/- 1.5
19	Wheel flare to fascia	1.0 +2.0/- 1.0 Parallel within 2.0	0.0 +/- 2.0 Parallel within 2.0
20	Fender to sill	4.5 +/- 1.5 Parallel within 1.5 Side to side within 2.0	Fender O/F 1.0 +/- 1.5
21	Sill to front door	6.0 +/- 1.5 Parallel within 1.5 Front to back within 1.5	Sill O/F 4.5 +/- 1.5 Parallel within 1.5 Front to back within 1.5
22	Cab to box	32.0 +/- 3.5 Parallel within 3.0	—
23	Box outer to tail lamp	2.5 +/- 2.0 Parallel within 2.0	0.0 +/- 2.0
24	Rear bumper to box outer	F/A 30.4 +/- 5.0 Parallel within 5.0 U/D 26.0 +/- 3.0 Parallel within 4.0	+/- 1.5 Parallel within 1.5
25	Bumper to tailgate	33.4 +/- 3.0 Parallel within 4.0	—
26	Tail lamp to tailgate	5.0 +/- 2.0 Parallel within 2.0 Side to side within 2.0	Tail lamp O/F 1.5 +/- 2.0
27	Box outer to tailgate	5.0 +/- 1.5 Parallel within 1.5 Side to side within 1.5	Box outer O/F 1.5 +/- 1.5 Parallel within 1.5 Side to side within 1.5





<b>NOTE:</b> All measurements are in millimeters. <b>O/F = Over Flush</b> <b>U/D = Up/Down</b>			
		<b>U/F = Under Flush</b> <b>F/A = Fore/Aft</b>	
DIMENSION	DESCRIPTION	GAP	FLUSH
1	Hood to grille (along top)	7.0 +/- 2.0 transition to 4.5 after corner	Hood O/F 7.0 @ center to 5.5 @ corner to 1.0 around corner +/- 2.0
2	Headlamp to hood	7.0 +/- 2.0 Parallel within 2.0 Side to side within 3.0	Headlamp O/F 4.0 +/- 2.0 Parallel within 2.0 Side to side within 2.0
3	Fender to headlamp	2.5 +/- 2.0 Parallel within 2.0 Side to side within 3.0	Fender O/F 2.0 +/- 2.0 Parallel within 2.0 Side to side within 3.0
4	Fender to a-pillar	3.0 +/- 1.5 Parallel within 1.5 Side to side within 2.0	Fender O/F 0.75 +/- 1.5 Parallel within 1.5 Side to side within 2.0
5	Aperture to front door @ a-pillar	4.5 +/- 1.5 Parallel within 1.5 Front to back within 1.5	Aperture O/F 1.5 +/- 1.5 Parallel within 1.5 Front to back within 1.5
6	Aperture to front door @ roof	4.5 +/- 1.5 Parallel within 1.5 Front to back within 1.5	Aperture O/F 1.5 +/- 1.5 Parallel within 1.5 Front to back within 1.5
7	Aperture to rear door @ roof	4.5 +/- 1.5 Parallel within 1.5 Front to back within 1.5	Aperture O/F 1.5 +/- 1.5 Parallel within 1.5
8	Quarter panel to rear door	4.5 +/- 1.5 Parallel within 1.5 Top to bottom within 1.5	0.0 +/- 1.5 Parallel within 1.5
9	Ram box to box outer	5.0 +/- 2.0	Flush +/- 2.0
10	Box outer to fuel filler door	4.5 +/- 1.5 Parallel within 1.5	Box Outer O/F 0.5 +/- 1.5 Parallel within 1.5
11	Cab to box	35.0 +/- 4.0 Parallel within 3.0	Cab O/F 6.0 +/- 4.0 Parallel within 3.0
12	Front door to rear door above belt	4.5 +/- 1.5 Parallel within 1.5 Top to bottom within 1.5	0.0 +/- 1.5 Parallel within 1.5
13	Front door to rear door below belt	4.5 +/- 1.5 Parallel within 1.5 Top to bottom within 1.5	Front Door O/F 1.0 Between belt and Character line +/- 1.5 Parallel within 1.5 1.0 to 0.0 below Character line +/- 1.5
14	Fender to front door	4.5 +/- 1.5 Parallel within 1.5 Top to bottom within 1.5	Fender O/F 1.0 +/- 1.5 Parallel within 1.5 Top to bottom within 1.5

<b>NOTE: All measurements are in millimeters.</b> <b>O/F = Over Flush</b> <b>U/D = Up/Down</b>			
		<b>U/F = Under Flush</b> <b>F/A = Fore/Aft</b>	
<b>DIMENSION</b>	<b>DESCRIPTION</b>	<b>GAP</b>	<b>FLUSH</b>
15	Fascia to fender	Net to 2.0 Parallel within 2.0	0.0 +/- 2.0 Parallel within 2.0
16	Headlamp to fascia	4.5 +/- 2.0 Parallel within 2.0 Side to side within 3.0	0.0 +/- 2.0 Parallel within 2.0 Side to side within 2.0
17	Grille to headlamp	3.7 +/- 2.0 Parallel within 2.0 Side to side within 3.0	—
18	Grille to fascia	3.5 +/- 2.0 Parallel within 2.0 Side to side within 2.0	—
19	Deflector to tailgate inner	F/A 0.0 +2.0/- 0.0 Parallel within 2.0	—
20	Box cab to tailgate deflector	—	U/D 0.0 +/- 2.0
21	Cab to box	32.0 +/- 3.5 Parallel within 3.0	—
22	Front door belt to rear door belt	U/D Alignment: 0 +/- 2.0	—
23	Fender to hood @ cowl	4.5 +/- 1.5 Parallel within 1.5 Side to side within 2.0	Fender U/D-U/F 0.75 +/-1.5 Cross/Car 0.0 +/- 1.5
24	Fender to hood	4.5 +/- 1.5 Parallel within 1.5 Side to side within 2.0	Fender O/F 0.5 +/- 1.5
25	Wheel flare to fascia	1.0 +2.0/- 1.0 Parallel within 2.0	0.0 +/- 2.0 Parallel within 2.0
26	Fender to sill	4.5 +/- 1.5 Parallel within 1.5 Side to side within 2.0	Fender O/F 1.0 +/- 1.5
27	Sill to front door	6.0 +/- 1.5 Parallel within 1.5 Front to back within 1.5	Sill O/F 4.5 +/- 1.5 Parallel within 1.5 Front to back within 1.5
28	Sill to rear door	6.0 +/- 1.5 Parallel within 1.5 Front to back within 1.5	Sill O/F 4.5 +/- 1.5 Parallel within 1.5 Front to back within 1.5
29	Box outer to tail lamp	2.5 +/- 2.0 Parallel within 2.0	0.0 +/- 2.0

**NOTE:** All measurements are in millimeters.

O/F = Over Flush

U/F = Under Flush

U/D = Up/Down

F/A = Fore/Aft

DIMENSION	DESCRIPTION	GAP	FLUSH
30	Rear bumper to box outer	F/A 30.4 +/- 5.0 Parallel within 5.0 U/D 26.0 +/- 3.0 Parallel within 4.0	+/- 1.5 Parallel within 1.5
31	Bumper to tailgate	33.4 +/- 3.0 Parallel within 4.0	—
32	Box outer to tailgate	5.0 +/- 1.5 Parallel within 1.5 Side to side within 1.5	Box Outer O/F 1.5 +/- 1.5 Parallel within 1.5 Side to side within 1.5
33	Tail lamp to tailgate	5.0 +/- 2.0 Parallel within 2.0 Side to side within 2.0	Tail Lamp O/F 1.5 +/- 2.0

## 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.

**NOTE:** Because of late model changes to the available paint colors Refer to 00 - Vehicle Data/Vehicle Information/Vehicle Certification Label - Description.

PAINT COLOR INFORMATION	INFORMATION LOCATION
2010 - Paint Color Chart	<a href="#">2010 PAINT COLORS</a>
2011 - Paint Color Chart	<a href="#">2011 PAINT COLORS</a>
2012 - Paint Color Chart	<a href="#">2012 PAINT COLORS</a>
2013 - Paint Color Chart	<a href="#">2013 PAINT COLORS</a>
2014 - Paint Color Chart	<a href="#">2014 PAINT COLORS</a>
2015 - Paint Color Chart	<a href="#">2015 PAINT COLORS</a>
2016 - Paint Color Chart	<a href="#">2016 PAINT COLORS</a>
2017 - Paint Color Chart	<a href="#">2017 PAINT COLORS</a>
2018 - Paint Color Chart	<a href="#">2018 PAINT COLORS</a>

## 2010 PAINT COLORS

### EXTERIOR COLORS

EXTERIOR COLOR	COLOR CODE
Austin Tan Pearl Coat	FKL
Blazing Saddle Pearl Coat	JUS
Bright Silver Metallic Clear Coat	WS2
Bright White Clear Coat	GW7
Brilliant Black Crystal Pearl Coat	AXR
Deep Cherry Pearl Coat	JRP
Deep Water Blue Pearl Coat	GBS
Flame Red Clear Coat	PR4
Hunter Green	JGX
Inferno Red Pearl Coat	ARH/ARJ
Light Graystone Pearl Coat	EDA
Mango Tango Pearl Coat	HVG
Mineral Grey Metallic Clear Coat	CDM
Rugged Brown Pearl Coat	GTW
Sagebrush Pearl Coat	JGX
Stone White Clear Coat	SW1
Torred Clear Coat	ZR3
White Gold Metallic Clear Coat	HWL

**INTERIOR COLORS**

<b>INTERIOR COLOR</b>	<b>COLOR CODE</b>
Dark Slate Gray	DV
Dark Slate Gray/Medium Graystone	V3
Dark Slate Gray/Russet	DE
Light Pebble Beige/Bark Brown	KT

**2011 PAINT COLORS****EXTERIOR COLORS**

<b>EXTERIOR COLOR</b>	<b>COLOR CODE</b>
Austin Tan Pearl Coat	PKL
Black	DX8
Blackberry	HBV
Blazing Saddle	PUS
Bright Silver Metallic Clear Coat	WS2
Bright White Clear Coat	GW7
Brilliant Black Crystal Pearl Coat	AXR
Deep Cherry Red Crystal Pearl Coat	JRP
Deep Forest Green	JGT
Deep Water Blue Pearl Coat	GBS
Flame Red Clear Coat	PR4
Gold Rush	JYK
Inferno Red Pearl Coat	ARH
Light Graystone Pearl Coat	EDA
Mango Tango Pearl Coat	HVG
Mineral Gray Metallic Clear Coat	CDM
Rugged Brown Pearl Coat	GTW
Sarsaparilla Sage	JGX
White Gold Metallic	HWL

**INTERIOR COLORS**

<b>INTERIOR COLOR</b>	<b>COLOR CODE</b>
Dark Slate Gray	DV
Dark Slate Gray/ Medium Graystone	V3
Dark Slate Gray/ Russet	DE
Light Pebble Beige/ Bark Brown	KT

**2012 PAINT COLORS****EXTERIOR COLORS**

<b>EXTERIOR COLOR</b>	<b>COLOR CODE</b>
Black	DX8
Bright Silver Metallic Clear Coat	WS2
Bright White Clear Coat	GW7
Deep Cherry Red Crystal Pearl Coat	JRP
Deep Molten Red Pearl Coat	BR8
Flame Red Clear Coat	PR4
Mineral Gray Metallic Clear Coat	CDM
Sagebrush Pearl Coat	JGX
Saddle Brown Pearl Coat	JUS
Tequila Sunrise Pearl Coat	KJA
True Blue Pearl Coat	KBU
White Gold Metallic	HWL

**INTERIOR COLORS**

<b>INTERIOR COLOR</b>	<b>COLOR CODE</b>
Dark Slate Gray	DV
Dark Slate Gray/ Medium Graystone	V3
Dark Slate Gray/ Russet	DE
Light Pebble Beige/ Bark Brown	KT

**2013 PAINT COLORS****EXTERIOR COLORS**

<b>EXTERIOR COLOR</b>	<b>COLOR CODE</b>
Deep Cherry Red Pearl Coat	JRP
Flame Red Clear Coat	PR4
Copperhead Pearl Coat	KLB
Prairie Pearl coat	KFA
Western Brown Pearl Coat	KEP
Black Gold Pearl Coat	LUG
True Blue Pearl Coat	KBU
Bright Silver Metallic Clear Coat	WS2
Mineral Grey Metallic Clear Coat	CDM
Maximum Steel Metallic Clear Coat	KAR
Black Clear Coat	DX8
Bright White Clear Coat	GW7

## INTERIOR COLORS

INTERIOR COLOR	COLOR CODE
Black	X9
Black/Diesel Gray	X8
Canyon Brown/Light Frost Beige	U1
Black/Cattle Tan	XT

## 2014 PAINT COLORS

## EXTERIOR COLORS

EXTERIOR COLOR	COLOR CODE
Black Clear Coat	DX8
Bright White Clear Coat	GW7
Deep Cherry Red Pearl Coat	JRP
Maximum Steel Metallic Clear Coat	KAR
True Blue Pearl Coat	KBU
Blue Streak	KCL
Western Brown Pearl Coat	KEP
Prairie Pearl Coat	KFA
Granite Crystal Pearl Coat	LAU
Black Gold Pearl Coat	LUG
Flame Red Clear Coat	PR4
White Gold	QWL
Bright Silver Metallic Clear Coat	WS2

## INTERIOR COLORS

INTERIOR COLOR	COLOR CODE
Black	X9
Black/Diesel Gray	X8
Canyon Brown/Light Frost Beige	U1
Black/Cattle Tan	XT

## 2015 PAINT COLORS

## EXTERIOR COLORS

EXTERIOR COLOR	COLOR CODE
Black Clear Coat	DX8
Bright White Clear Coat	GW7
White Gold Clear Coat	HWL
Deep Cherry Red Pearl Coat	JRP
Maximum Steel Clear Coat	KAR

EXTERIOR COLOR	COLOR CODE
True Blue Pearl Coat	KBU
Blue Streak Pearl Coat	KCL
Western Brown Pearl Coat	KEP
Prairie Pearl Coat	KFA
Black Forest Green	KGZ
Granite Crystal Metallic Coat	LAU
Flame Red Clear Coat	PR4
Bright Silver Metallic Clear Coat	WS2

**INTERIOR COLORS**

INTERIOR COLOR	COLOR CODE
Black	X9
Black/Diesel Gray	X8
Canyon Brown/Light Frost Beige	U1
Black/Cattle Tan	XT
Black/Radar Red	XR

**2016 PAINT COLORS****EXTERIOR COLORS**

EXTERIOR COLOR	COLOR CODE
Timberline Green Pearl Coat	AGW
Brilliant Black Pearl Coat	AXR
Midnight Blue Pearl Coat	BB8
Black Clear Coat	DX8
Detonator Yellow Clear Coat	EYB
Bright White Clear Coat	GW7
Deep Cherry Red Crystal Pearl Coat	JRP
Maximum Steel Clear Coat	KAR
True Blue/GTS-R Blue Pearl Coat	KBU
Blue Streak Pearl Coat	KCL
Western Brown/Deep Auburn Pearl Coat	KEP
Prairie Pearl Coat	KFA
Black Forest Green Pearl Coat	KGZ
Granite Crystal Metallic Coat	LAU
Black Gold Pearl Coat	LUG
Light Green	PGC
School Bus Yellow	PL1
Flame Red Clear Coat	PR4
Green Angles	P06
Bright Red	P12



EXTERIOR COLOR	COLOR CODE
Dark Brown	P18
Agriculture Red Clear Coat	P61
Omaha Orange	P62
Yellow	P63
Cream	P64
Bright Green Clear Coat	P68
Robin Egg Blue Clear Coat	P69
Construction Yellow Clear Coat	P71
Holland Blue Clear Coat	P72
Tree Green	P73
National Fire Safety Yellow	P74
Power Tan	P81
Bright Silver Metallic Clear Coat	WS2

### INTERIOR COLORS

INTERIOR COLOR	ORDER CODE	COLOR CODE
Black	X9	DX9
Black/Diesel Gray	X8	DX9/LA8
Black/Light Frost Beige	XL	DX9/HL1
Black/Cattle Tan	XT	DX9/LT5
Canyon Brown/Light Frost Beige	U1	LU7/HL1

### 2017 PAINT COLORS

#### EXTERIOR COLORS

EXTERIOR COLOR	COLOR CODE
Timberline Green Pearl Coat	AGW
Brilliant Black Pearl Coat	AXR
Midnight Blue Pearl Coat	BB8
Black Clear Coat	DX8
Detonator Yellow Clear Coat	EYB
Rugged Brown/Luxury Brown Pearl Coat	GTW
Bright White Clear Coat	GW7
Deep Cherry Red Crystal Pearl Coat	JRP
Maximum Steel Clear Coat	KAR
True Blue/GTS-R Blue Pearl Coat	KBU
Blue Streak Pearl Coat	KCL
Western Brown/Deep Auburn Pearl Coat	KEP
Prairie Pearl Coat	KFA
Black Forest Green Pearl Coat	KGZ
Granite Crystal Metallic Coat	LAU

EXTERIOR COLOR	COLOR CODE
Velvet Red/Red Pearl/Passion Red	NRV
Light Green	PGC
School Bus Yellow	PL1
Flame Red Clear Coat	PR4
Pearl White Pearl Coat	PWQ
Green Angles	P06
Bright Red	P12
Dark Brown	P18
Agriculture Red Clear Coat	P61
Omaha Orange	P62
Yellow	P63
Cream	P64
Bright Green Clear Coat	P68
Robin Egg Blue Clear Coat	P69
Construction Yellow Clear Coat	P71
Holland Blue Clear Coat	P72
Tree Green	P73
National Fire Safety Yellow	P74
Power Tan	P81
Bright Silver Metallic Clear Coat	WS2

**INTERIOR COLORS**

INTERIOR COLOR	ORDER CODE	COLOR CODE
Black	X9	DX9
Black/Diesel Gray	X8	DX9/LA8
Black/Light Frost Beige	XL	DX9/HL1
Black/Cattle Tan	XT	DX9/LT5
Canyon Brown/Light Frost Beige	U1	LU7/HL1

**2018 PAINT COLORS****EXTERIOR COLORS**


EXTERIOR COLOR	COLOR CODE
Timberline Green Pearl Coat	AGW
Brilliant Black Pearl Coat	AXR
Midnight Blue Pearl Coat	BB8
Black Clear Coat	DX8
Detonator Yellow Clear Coat	EYB
Rugged Brown / Luxury Brown Pearl Coat	GTW
Bright White Clear Coat	GW7
Maximum Steel Clear Coat	KAR

EXTERIOR COLOR	COLOR CODE
True Blue/GTS-R Blue Pearl Coat	KBU
Blue Streak Pearl Coat	KCL
Black Forest Green Pearl Coat	KGZ
Granite Crystal Metallic Coat	LAU
Velvet Red / Red Pearl / Passion Red	NRV
Light Green	PGC
School Bus Yellow	PL1
Flame Red Clear Coat	PR4
Pearl White Pearl Coat	PWQ
Green Angles	P06
Bright Red	P12
Dark Brown	P18
CaseRed Clear Coat	P61
Omaha Orange	P62
Yellow	P63
Cream	P64
Bright Green Clear Coat	P68
Robin Egg Blue Clear Coat	P69
Construction Yellow Clear Coat	P71
Holland Blue Clear Coat	P72
Tree Green	P73
National Fire Safety Yellow	P74
Power Tan	P81
Walnut Brown	RUW
Bright Silver Metallic Clear Coat	WS2

**INTERIOR COLORS**

INTERIOR COLOR	ORDER CODE	COLOR CODE
Black	X9	DX9
Black/Diesel Gray	X8	DX9/LA8
Black/Light Frost Beige	XL	DX9/HL1
Black/Cattle Tan	XT	DX9/LT5
Canyon Brown/Light Frost Beige	U1	LU7/HL1
Indigo/Light Frost Beige	C1	LC5/HL1
Light Frost Beige/Ruby	U7	HL1/LR5

## VEHICLE CERTIFICATION LABEL

<b>MFD BY FCA US LLC</b>		DATE OF MFG: 8-08		
GVRW: 02012 KG	GAWR: 01080 KG	GAWR: 00998 KG		
04435 LB	FRONT: 02380 LB	REAR: 02200 LB		
THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S.A FEDERAL MOTOR VEHICLE SAFETY. BUMPER AND THEFT PREVENTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.			VIN: 1B3HB48A39D132596	TYPE: PASSENGER CAR
			MDH: 08113 980AA	PAINT: PQD
			VEHICLE MADE IN U.S.A.	TRIM: ZSDV
				4658843

000874415

**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.

**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.
- **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.

### Identifying Sealers

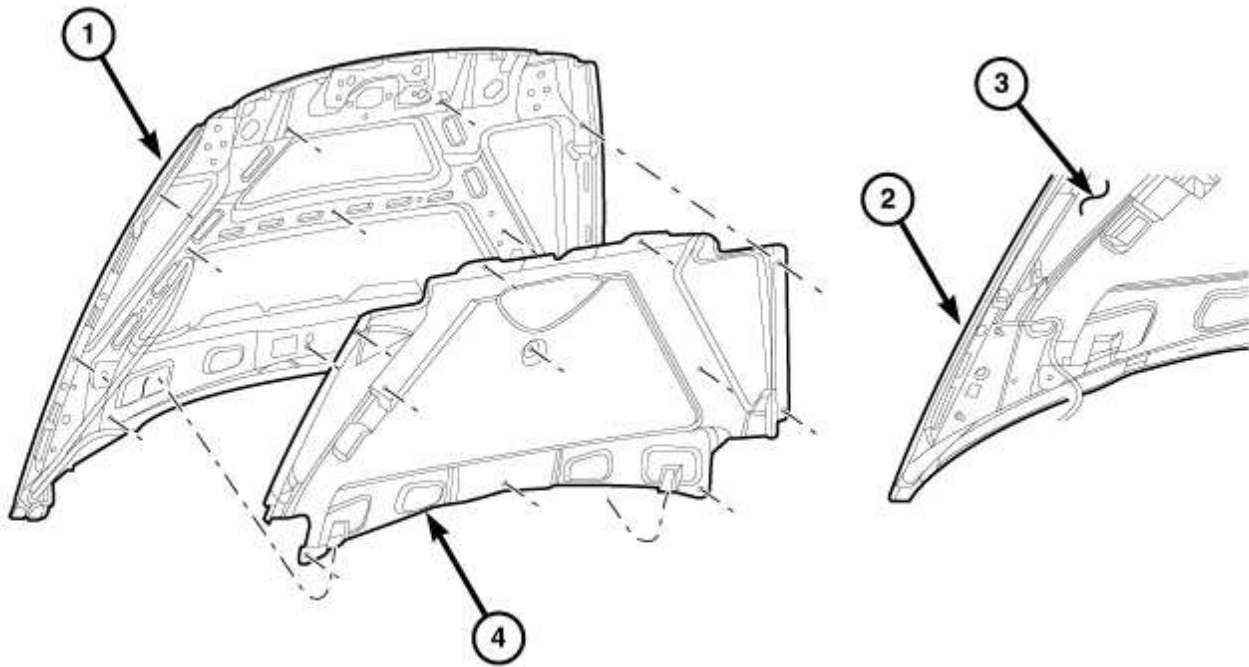
- Several types of sealers and sound deadeners are used during assembly. Therefore, specific applications may not be identified in this publication. General applications and the various types of products for repair will be featured to identify and replace OEM sealers and sound deadeners.

### 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 be certain of a 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

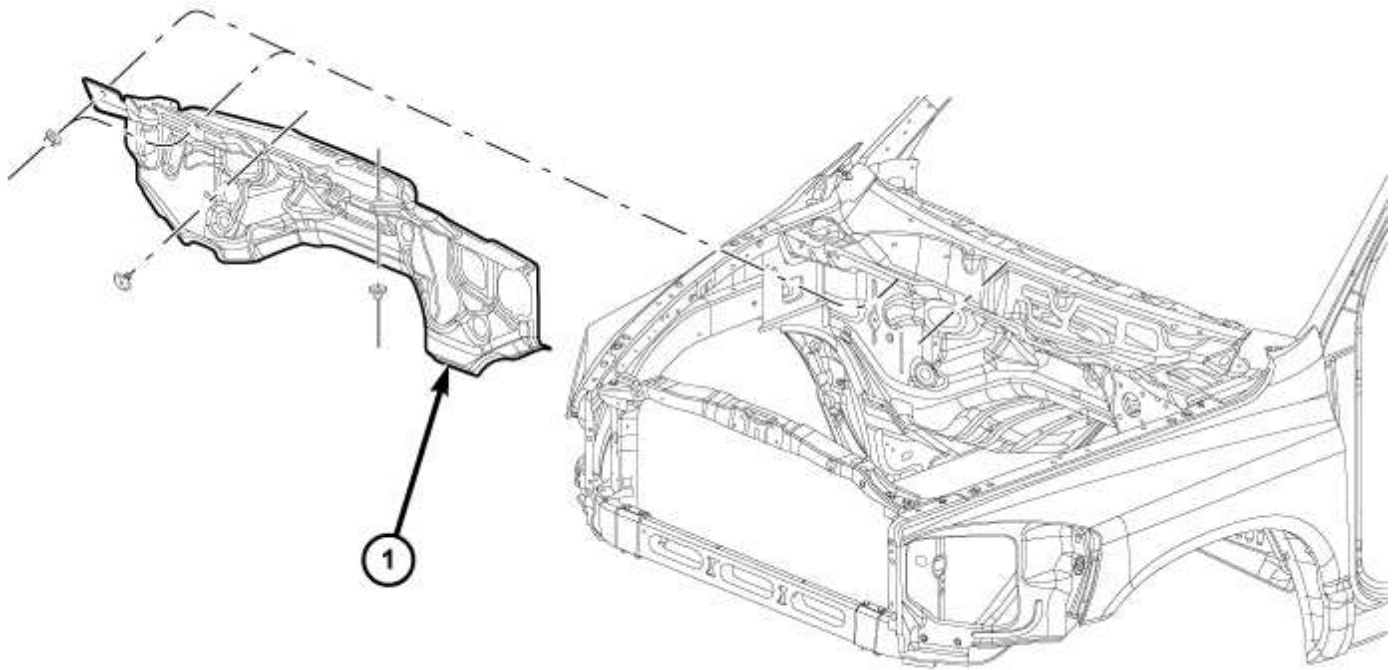
DESCRIPTION	FIGURE
HOOD	Figure 1
DASH PANEL (1 OF 2)	Figure 2
DASH PANEL (2 OF 2)	Figure 3
COWL	Figure 4
FLOOR PAN TUNNEL	Figure 5
FRONT FLOOR PAN	Figure 6
REAR FLOOR PAN – STANDARD CAB	Figure 7
REAR FLOOR PAN – QUAD CAB	Figure 8
REAR FLOOR PAN – CREW CAB	Figure 9
FRONT DOORS	Figure 10
OUTER BODY SIDE – QUAD CAB	Figure 11
CAB BACK	Figure 12
ROOF – STANDARD CAB	Figure 13
ROOF – QUAD CAB	Figure 14
ROOF – CREW CAB	Figure 15



HOOD

2696767

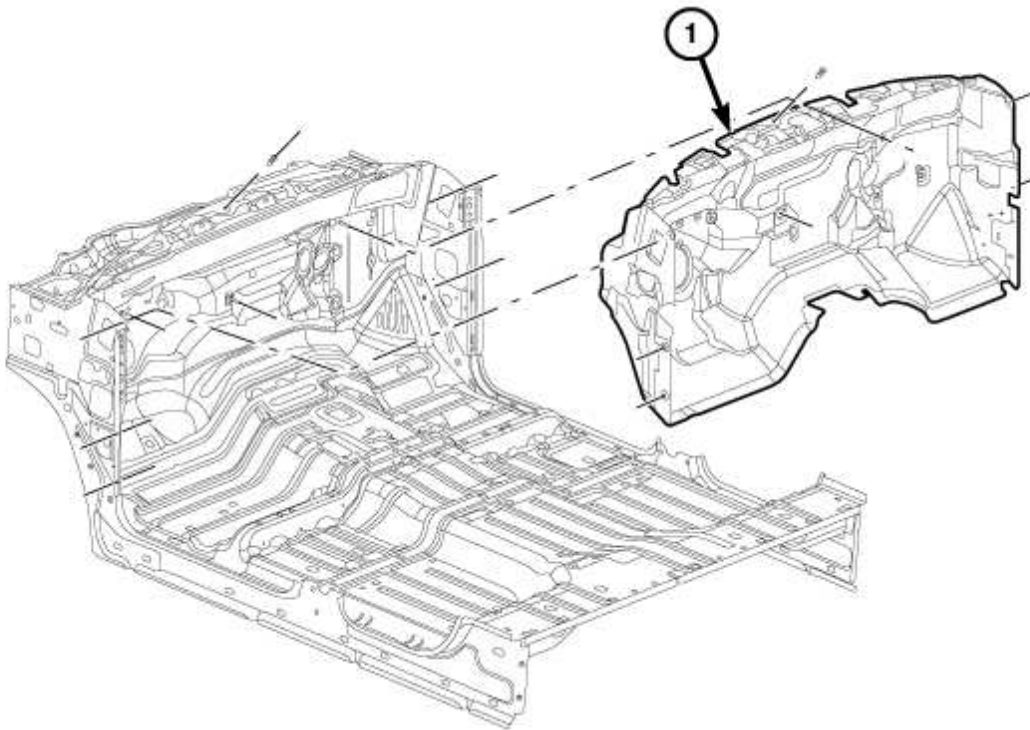
- 1 - HOOD
- 2 - HOOD
- 3 - HOOD SILENCER PAD
- 4 - HOOD SILENCER PAD



2696783

DASH PANEL (1 OF 2)

1 - DASH PANEL SILENCER PAD

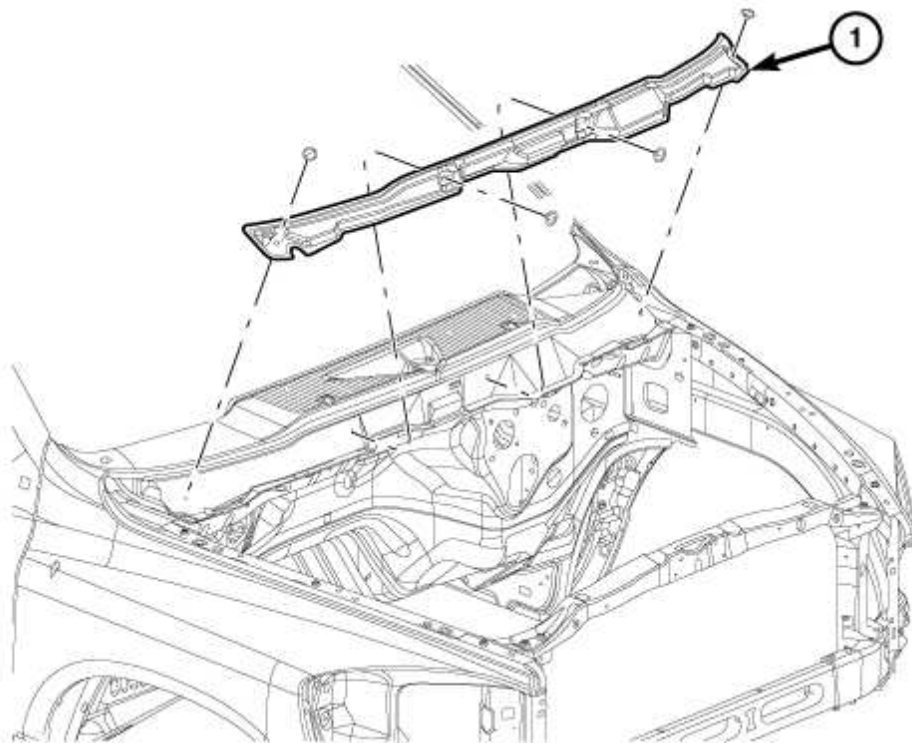


2696903

DASH PANEL (2 OF 2)

**NOTE:** Quad cab shown, standard and crew cabs typical

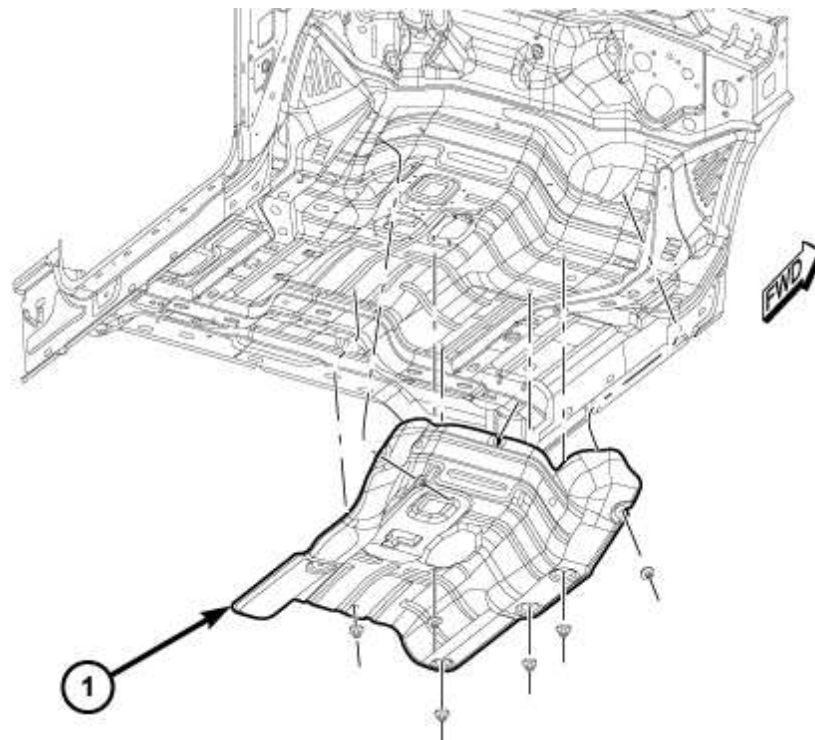
1 - DASH PANEL SILENCER PAD



2696943

COWL

1 - COWL SCREEN SILENCER PAD



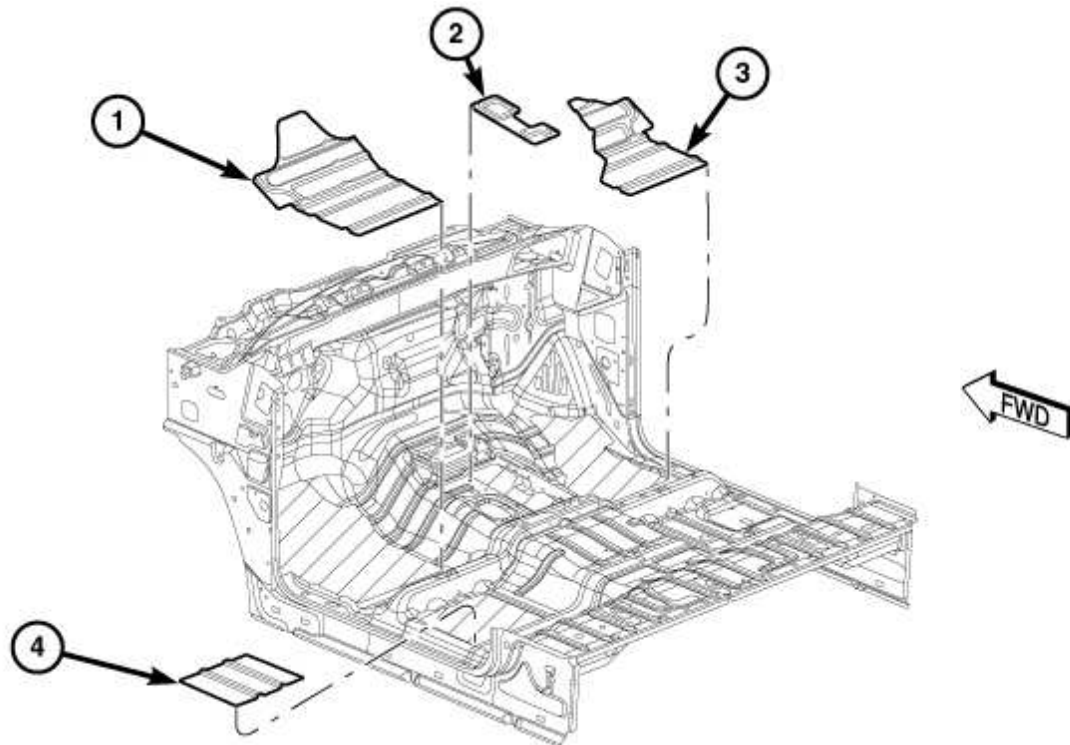
2696959

FLOOR PAN TUNNEL

**NOTE:** Standard cab shown, quad and mega cabs similar

1 - FLOOR PAN TUNNEL SILENCER PAD



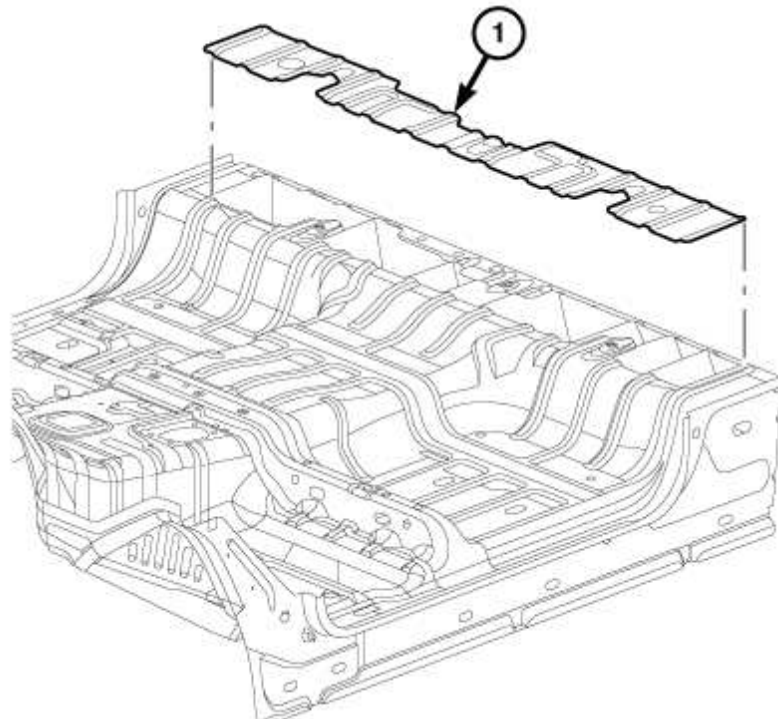


2697007

**FRONT FLOOR PAN**

**NOTE:** Standard cab shown, quad and crew cabs typical.

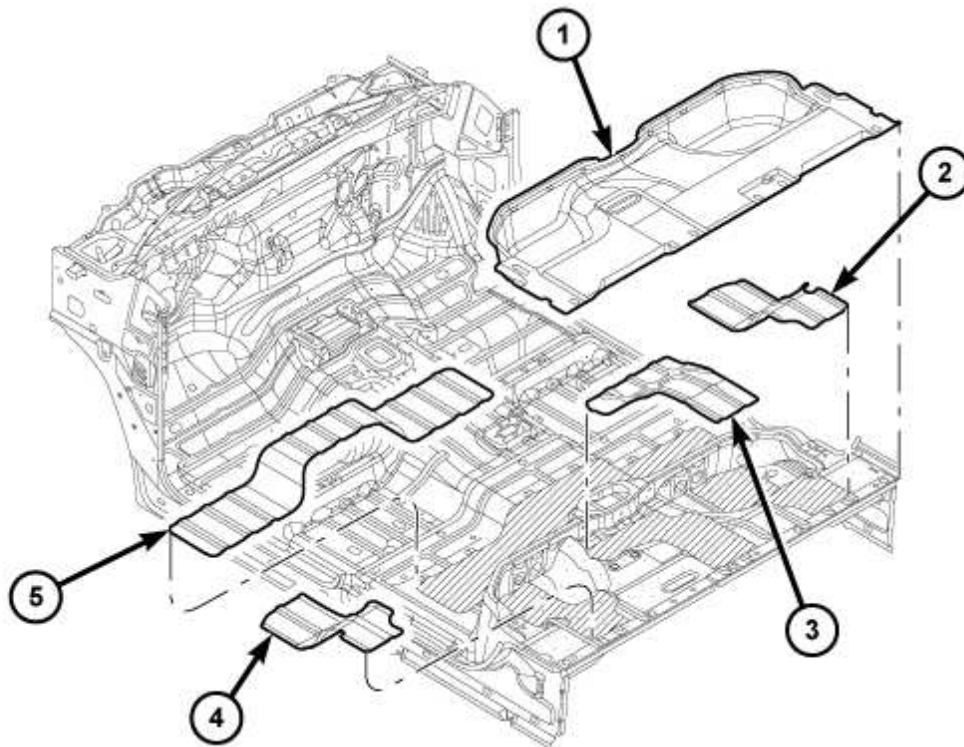
- 1 - LEFT FRONT FLOOR PAN SOUND DEADENER PAD
- 2 - FRONT FLOOR PAN TUNNEL SOUND DEADENER PAD
- 3 - RIGHT FRONT FLOOR PAN SOUND DEADENER PAD
- 4 - LEFT FRONT FLOOR PAN UNDER SEAT SOUND DEADENER PAD



2697026

**REAR FLOOR PAN – STANDARD CAB**

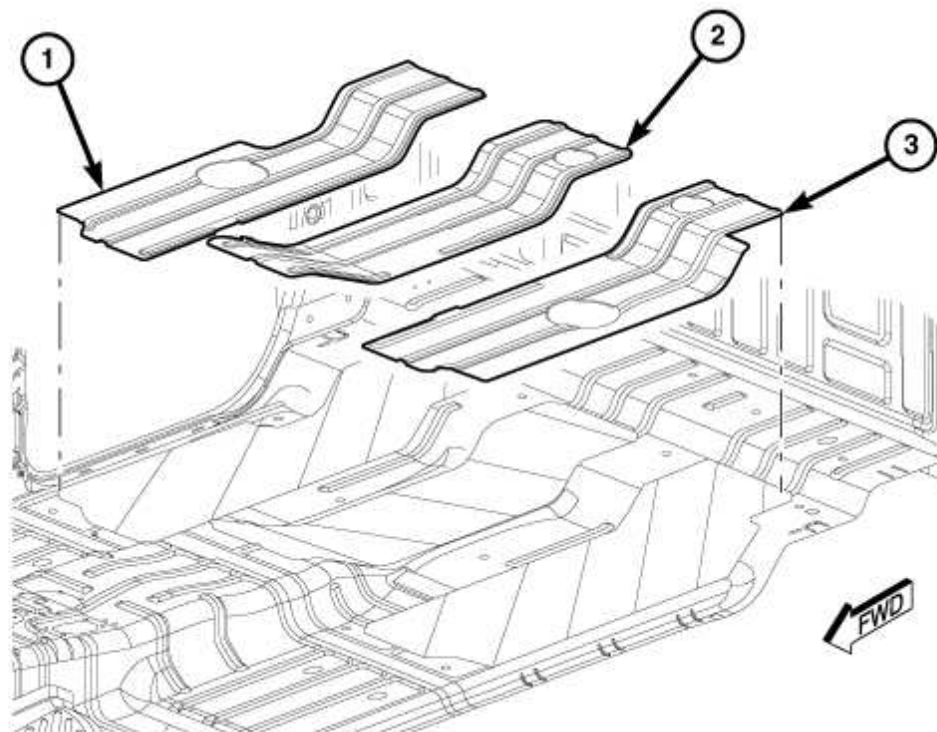
- 1 - REAR FLOOR PAN SOUND DEADENER



2697080

**REAR FLOOR PAN – QUAD CAB**

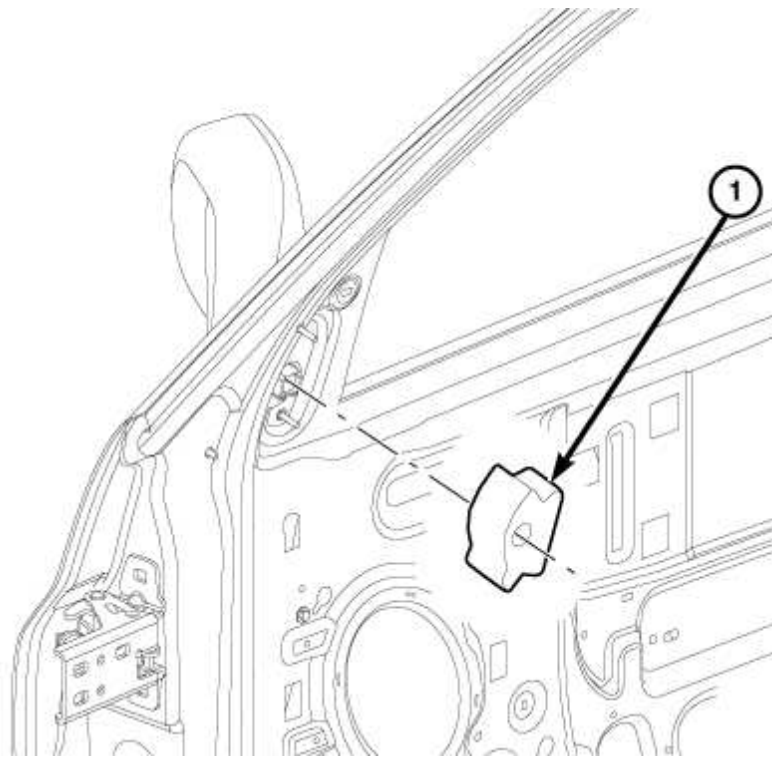
- 1 - REAR BIN SILENCER
- 2 - RIGHT REAR FLOOR PAN SOUND DEADENER PAD
- 3 - CENTER REAR FLOOR PAN SOUND DEADENER PAD
- 4 - LEFT REAR FLOOR PAN SOUND DEADENER PAD
- 5 - REAR FRONT FLOOR PAN SOUND DEADENER PAD



2697092

**REAR FLOOR PAN – CREW CAB**

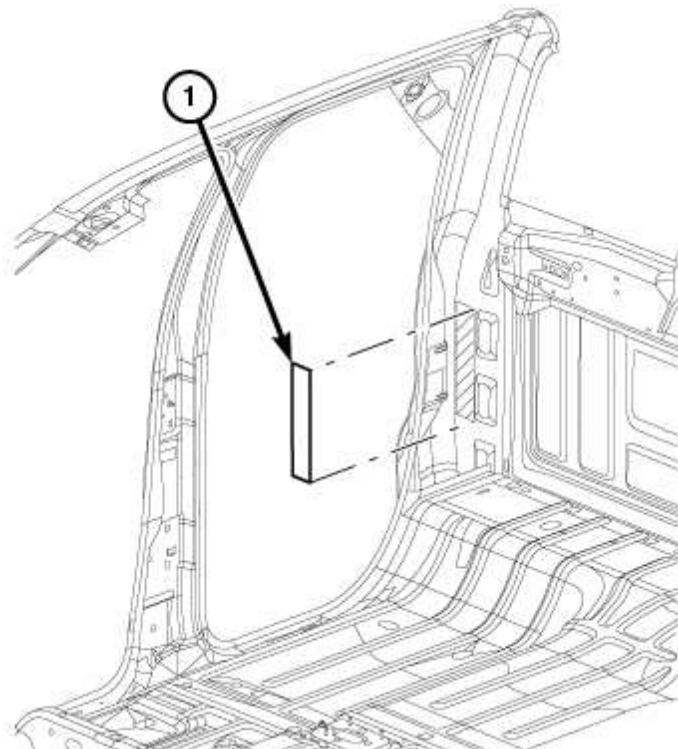
- 1 - RIGHT REAR FLOOR PAN SOUND DEADENER PAD
- 2 - CENTER FLOOR PAN SOUND DEADENER PAD
- 3 - LEFT REAR FLOOR PAN SOUND DEADENER PAD



2697114

**FRONT DOORS**

1 - MIRROR FLAG FOAM PAD

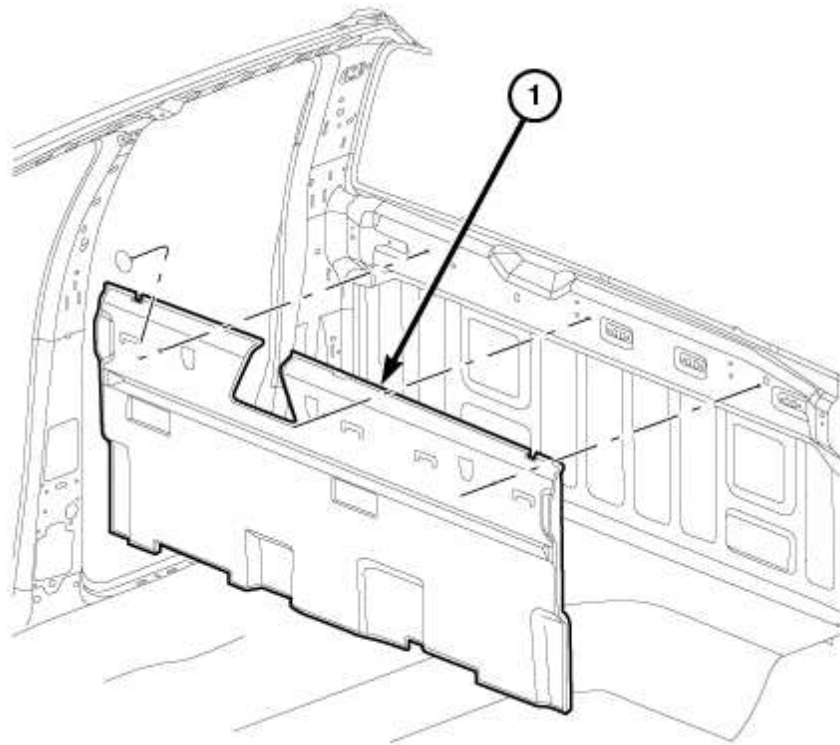


2697171

**OUTER BODY SIDE – QUAD CAB**

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

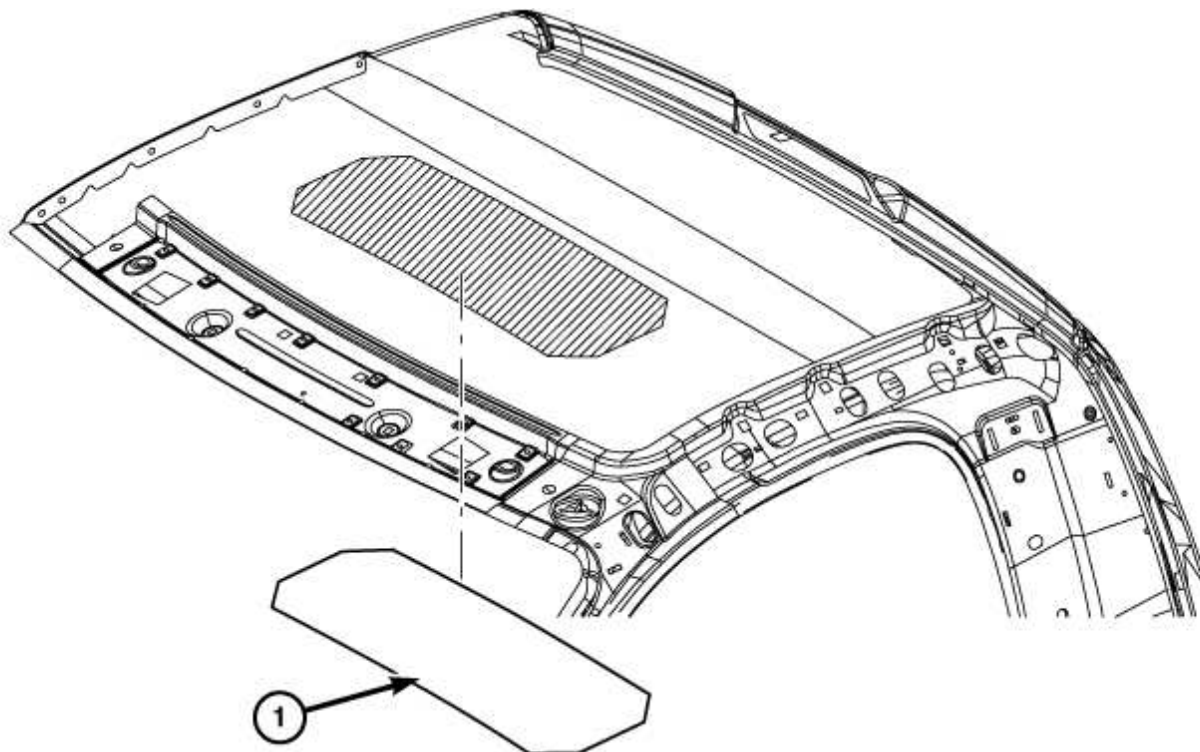
1 - BODY SIDE OUTER/FRONT EXTENSION PANEL SOUND DEADENER PAD



2697162

CAB BACK

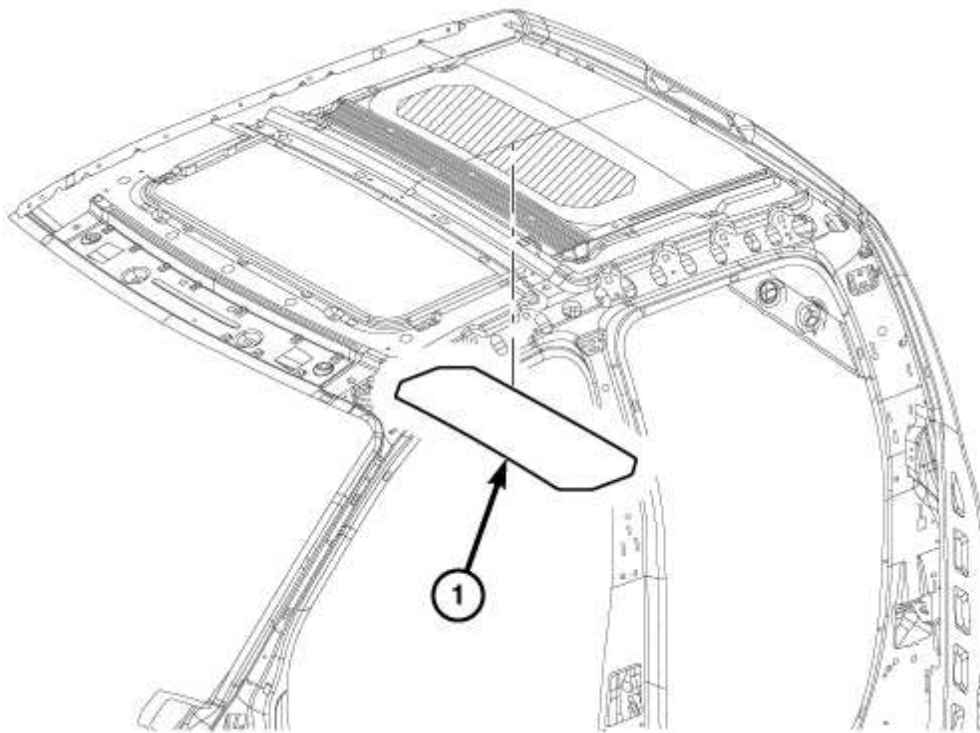
**NOTE:** Quad cab shown, standard and crew cabs typical  
1 - CAB BACK PANEL SILENCER PAD



2697191

ROOF - STANDARD CAB

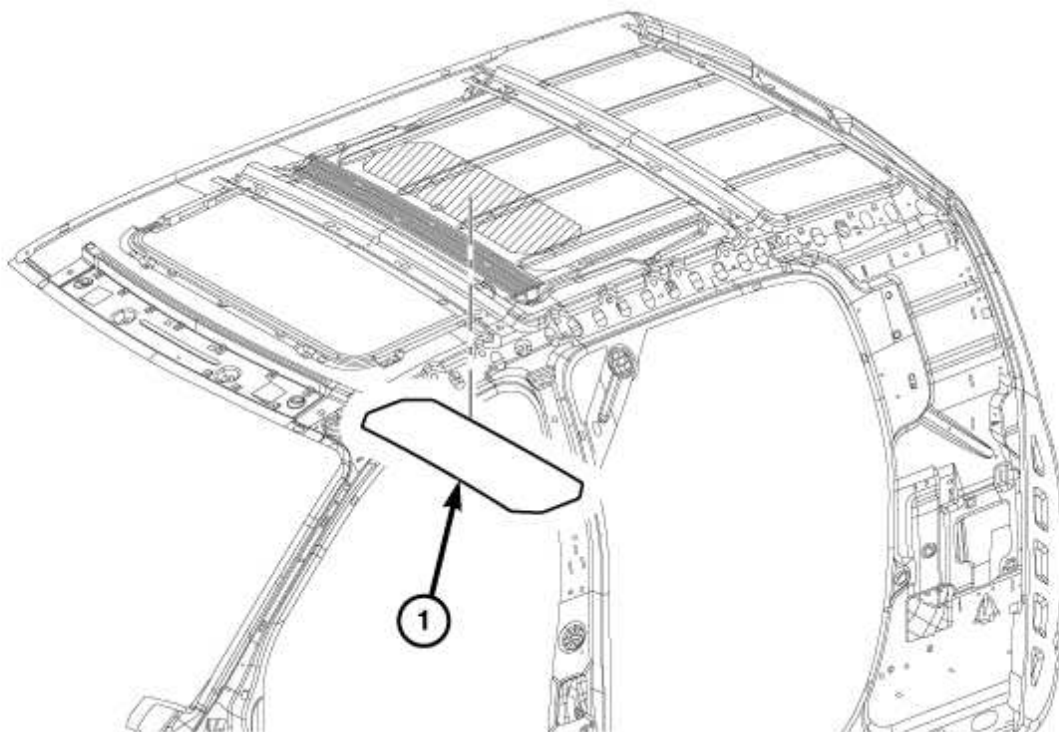
1 - ROOF PANEL SOUND DEADENER PAD



2697205

ROOF - QUAD CAB

1 - ROOF PANEL SOUND DEADENER PAD



2697213

ROOF - CREW CAB

1 - ROOF PANEL SOUND DEADENER PAD

## SEALER LOCATIONS

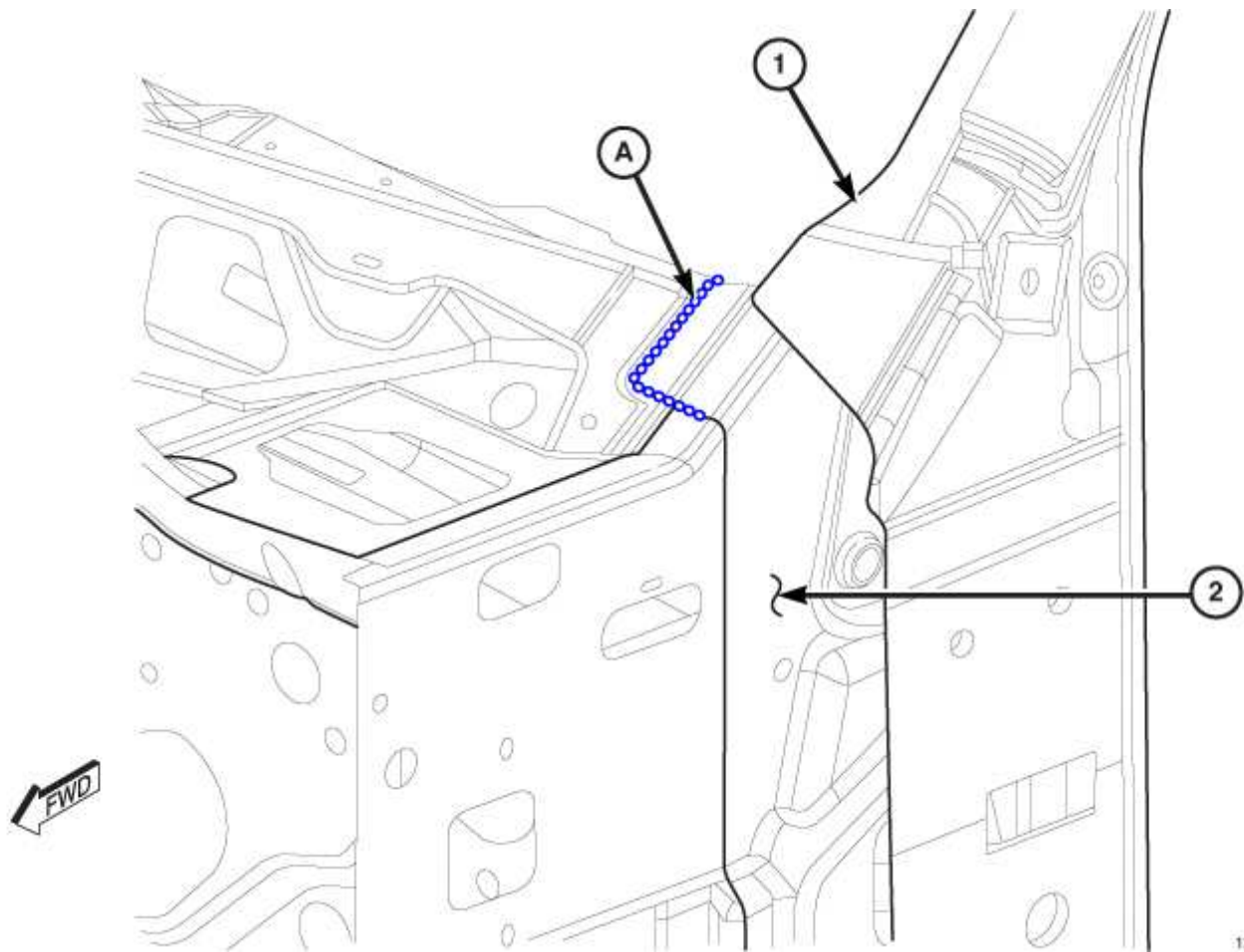
All repairs where panels were replaced have voids that must be filled with sealant. Sealant should be applied to all skips, pin holes, in sealers and weld burn through holes on the interior and exterior of the vehicle that would

permit leakage of water, air or exhaust fumes. Typical areas of the exterior that must be sealed are listed in this section. Areas of the interior that must be sealed are floor pans, wheelhouses, dash panel, and cowl sides.

**NOTE: Preferred Mopar Product:**

- Paintable Seam Sealer—Part No. 04318026

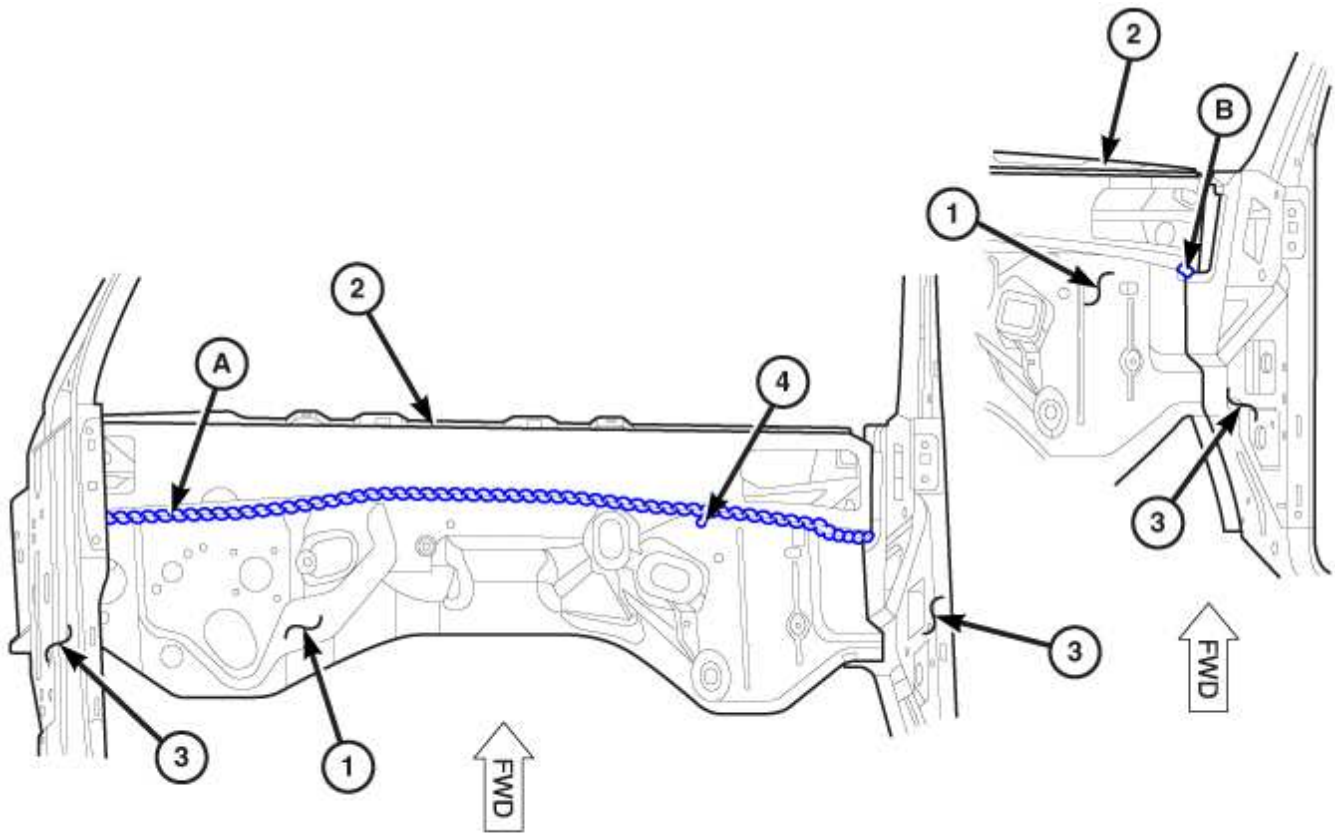
DESCRIPTION	FIGURE
Inner Body Side Panel and Cowl Side Panel	Figure 1
Dash Panel/Cowl Side Panel (1 of 2)	Figure 2
Dash Panel/Cowl Side Panel (2 of 2)	Figure 3
Dash Panel/Front Floor Pan/Cowl Side Panel (1 of 2)	Figure 4
Dash Panel/Front Floor Pan/Cowl Side Panel (2 of 2)	Figure 5
Dash Panel/Front Floor Pan	Figure 6
Front Floor Pan/Rear Floor Pan	Figure 7
Rear Floor Pan/Cab Back Panel	Figure 8
Inner Body Side Panel/Outer Body Side Panel (Above "C" Pillar)	Figure 9
Cab Back Panel/Outer Body Side Panel	Figure 10
Box Floor Panel/Box Front Panel	Figure 11
Box Floor Panel/Box Floor Extension	Figure 12
Hood	Figure 13
Front Door – Standard Cab	Figure 14
Front Door – Crew/Mega Cab	Figure 15
Rear Door	Figure 16
Tailgate	Figure 17



Inner Body Side Panel and Cowl Side Panel

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

- A - SEAM SEALER
- 1 - INNER BODY SIDE PANEL
- 2 - COWL SIDE PANEL



Dash Panel/Cowl Side Panel (1 of 2)

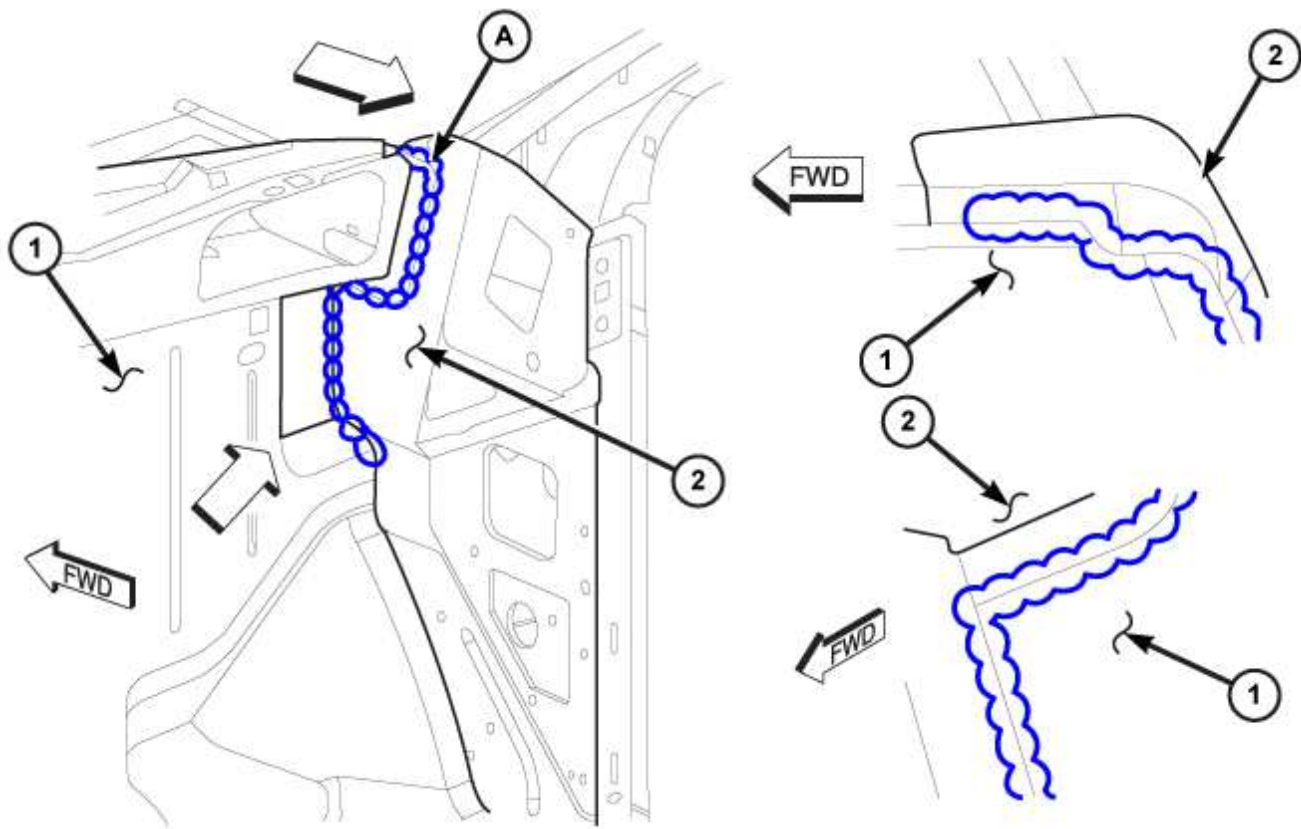
1227763

**NOTE:** Right side shown left side similar. Keep sealer off of instrument panel locating studs.

**NOTE:** Keep instrument panel locating stud free of sealer.

- A - SEAM SEALER
- B - THUMB GRADE SEALER
- 1 - UPPER DASH PANEL
- 2 - LOWER PLENUM
- 3 - COWL SIDE PANEL



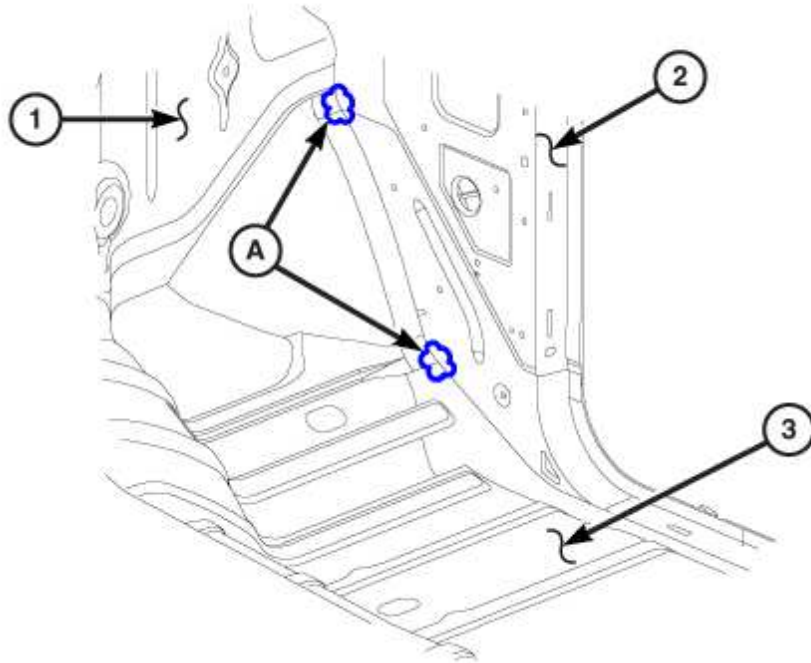


1240633

Dash Panel/Cowl Side Panel (2 of 2)

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

- A - SEAM SEALER
- 1 - DASH PANEL
- 2 - COWL SIDE PANEL

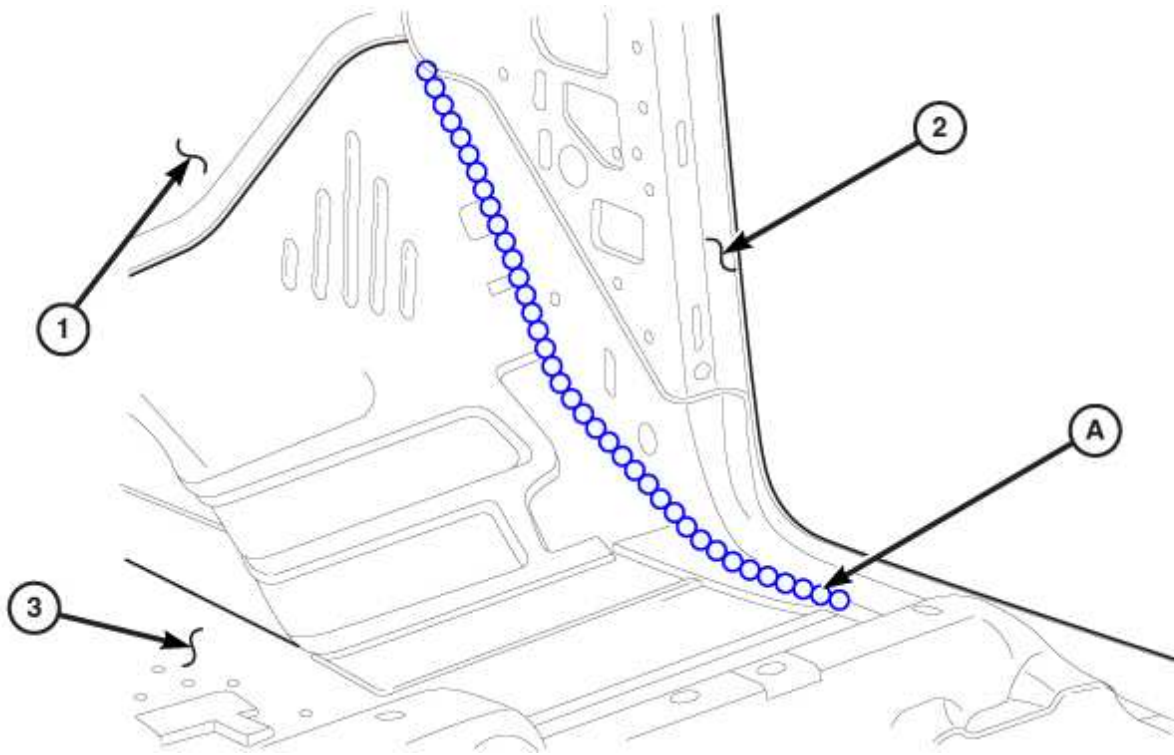


1240866

Dash Panel/Front Floor Pan/Cowl Side Panel (1 of 2)

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

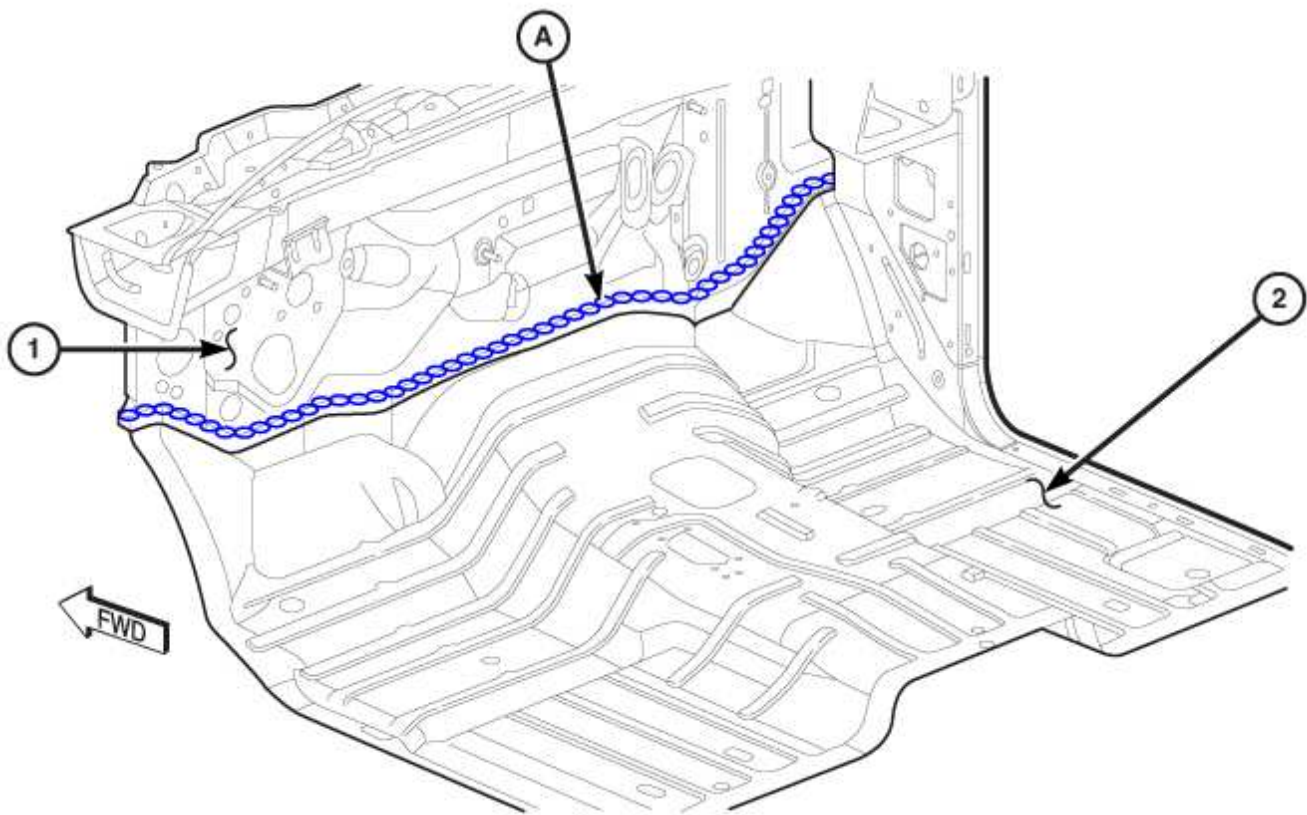
- A - SEAM SEALER
- 1 - DASH PANEL
- 2 - COWL SIDE PANEL
- 3 - FRONT FLOOR PAN



2694429

Dash Panel/Front Floor Pan/Cowl Side Panel (2 of 2)

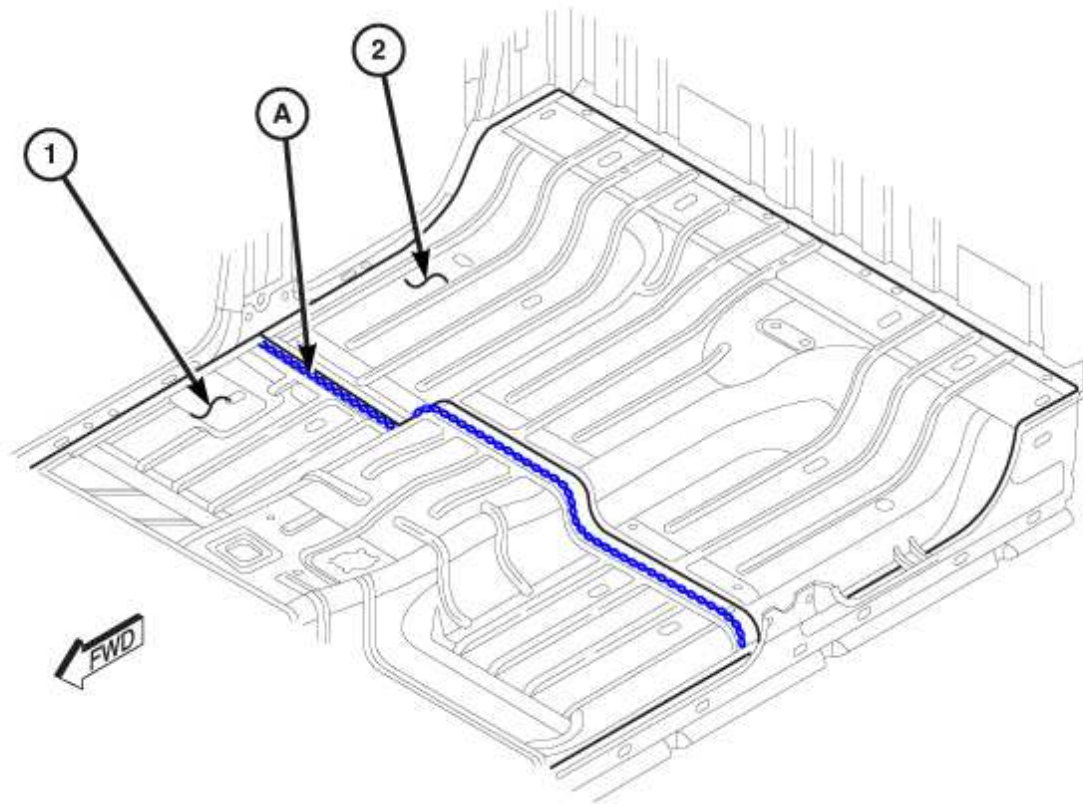
- A - SEAM SEALER
- 1 - DASH PANEL
- 2 - COWL SIDE PANEL
- 3 - FRONT FLOOR PAN



1240893

**Dash Panel/Front Floor Pan**

- A - SEAM SEALER
- 1 - DASH PANEL
- 2 - FRONT FLOOR PAN

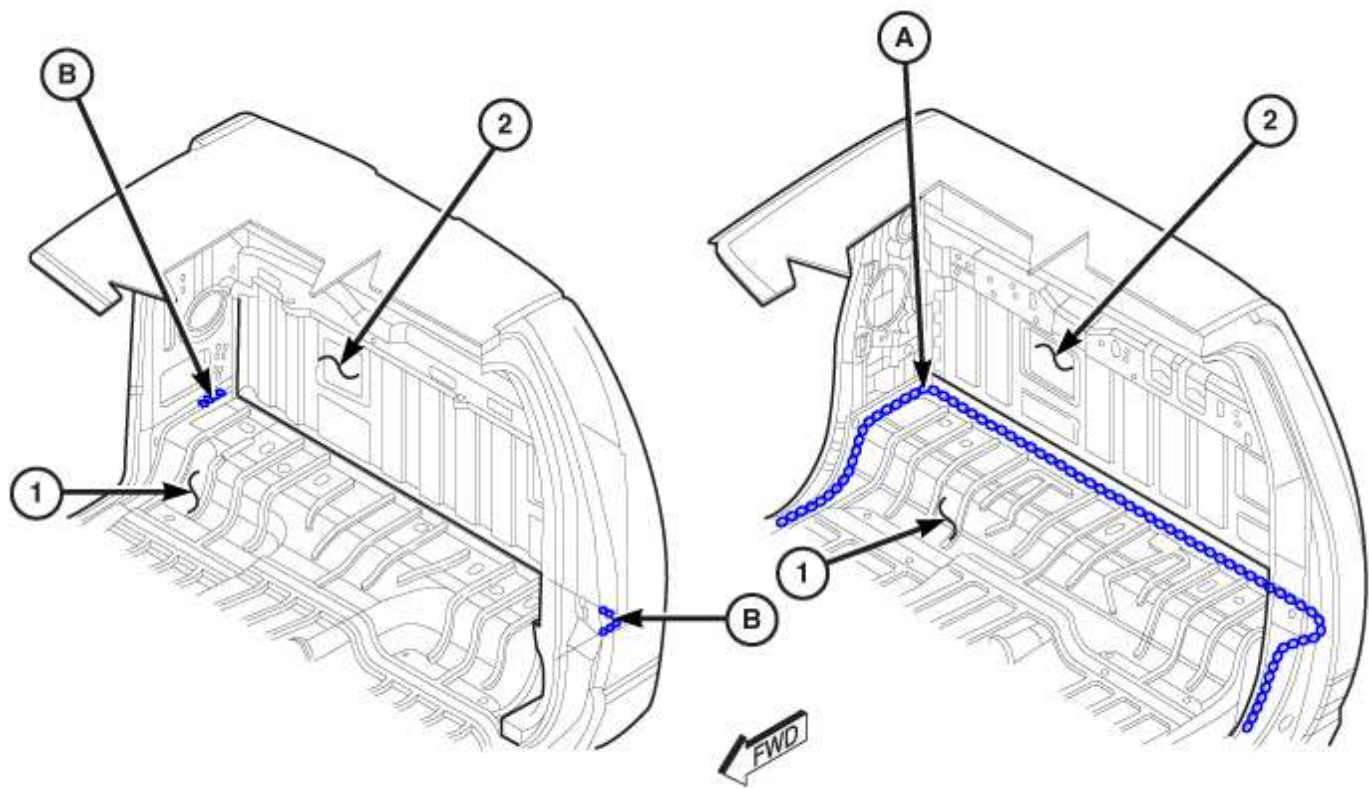


Front Floor Pan/Rear Floor Pan

1240902

**NOTE:** Crew cab shown, standard and mega cabs similar.

- A - SEAM SEALER
- 1 - FRONT FLOOR PAN
- 2 - REAR FLOOR PAN

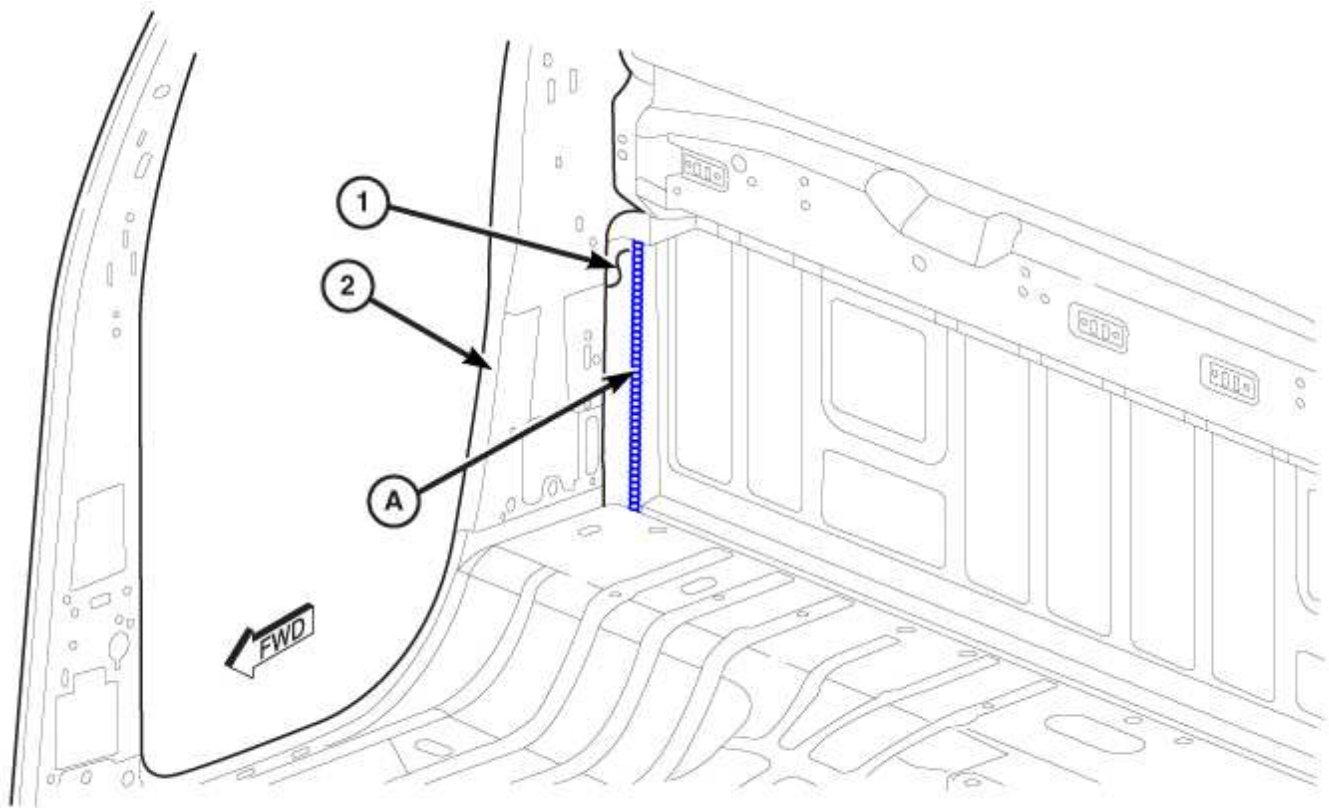


1240911

### Rear Floor Pan/Cab Back Panel

**NOTE:** Standard cab shown, crew and mega cabs similar.

- A - SEAM SEALER
- B - THUMB GRADE SEALER
- 1 - REAR FLOOR PAN
- 2 - CAB BACK PANEL

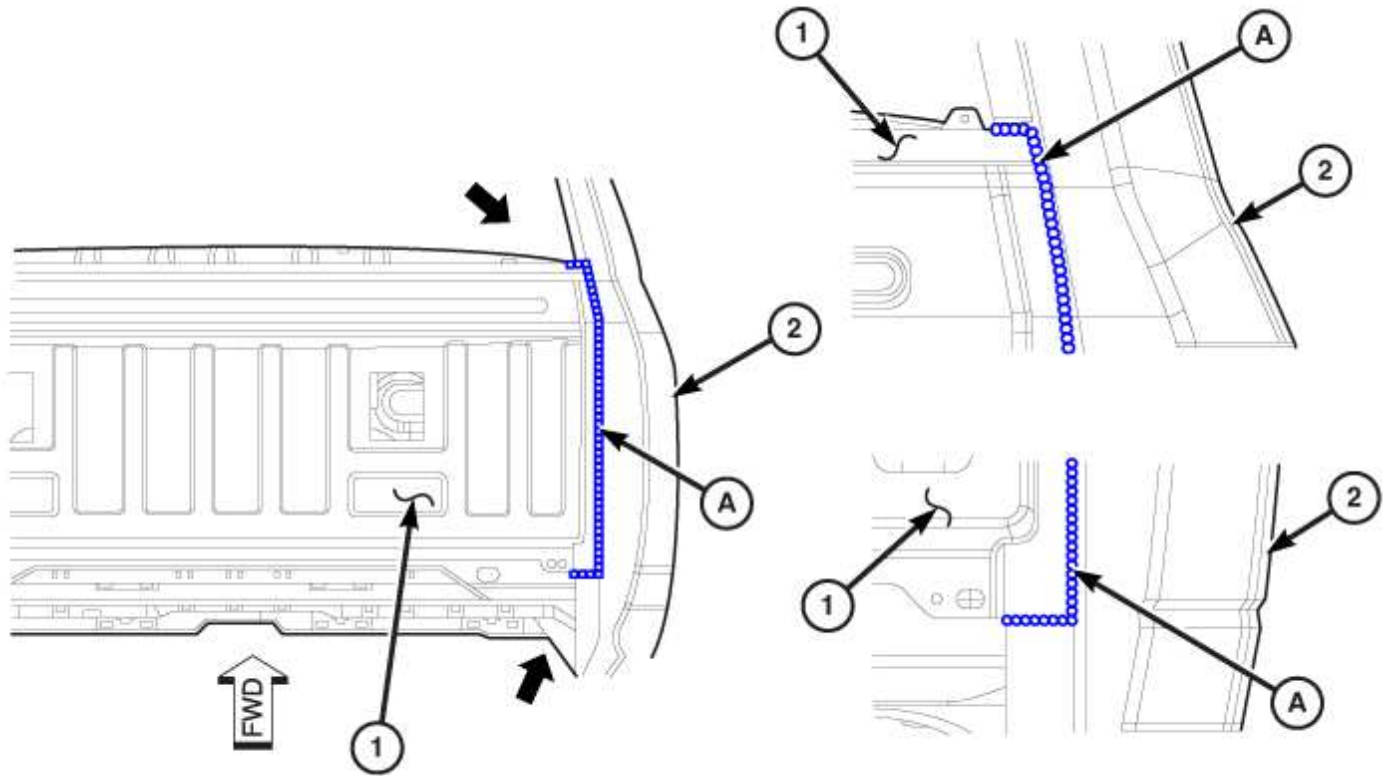


1240921

### Inner Body Side Panel/Outer Body Side Panel (Above "C" Pillar)

**NOTE:** Quad cab shown, standard, crew and mega cabs similar.

- A - SEAM SEALER
- 1 - INNER BODY SIDE PANEL
- 2 - OUTER BODY SIDE PANEL



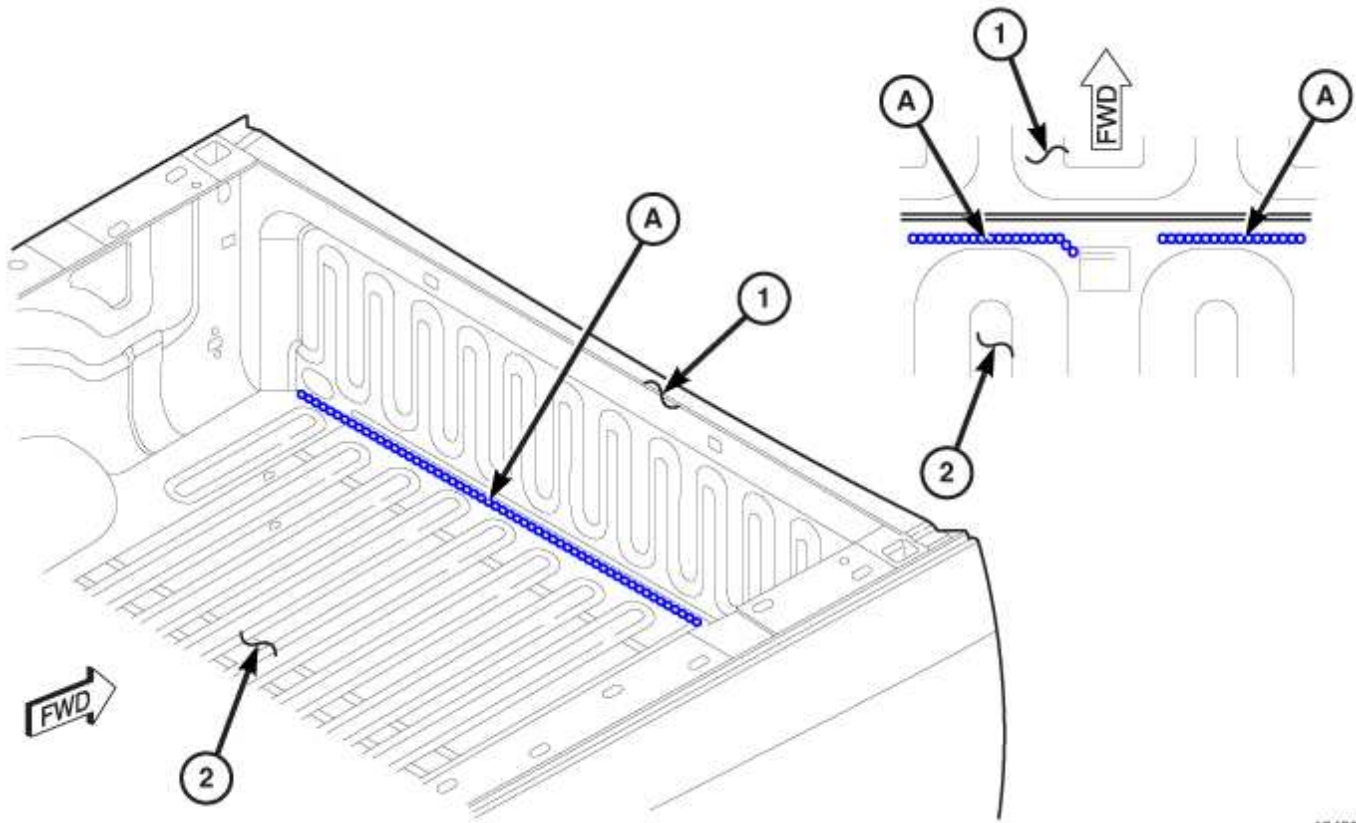
1240930

**Cab Back Panel/Outer Body Side Panel**

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

- A - SEAM SEALER
- 1 - CAB BACK PANEL
- 2 - OUTER BODY SIDE PANEL

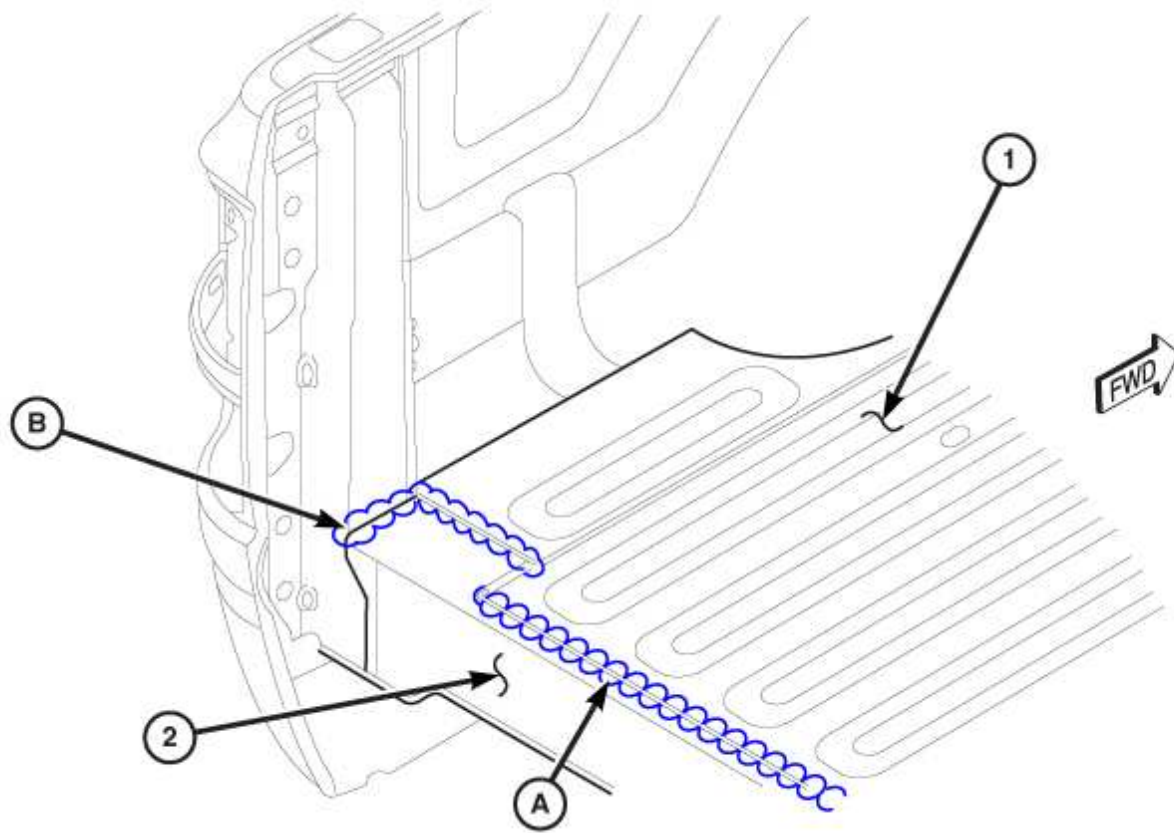




1240952

**Box Floor Panel/Box Front Panel**

- A - SEAM SEALER
- 1 - BOX FRONT PANEL
- 2 - BOX FLOOR PANEL

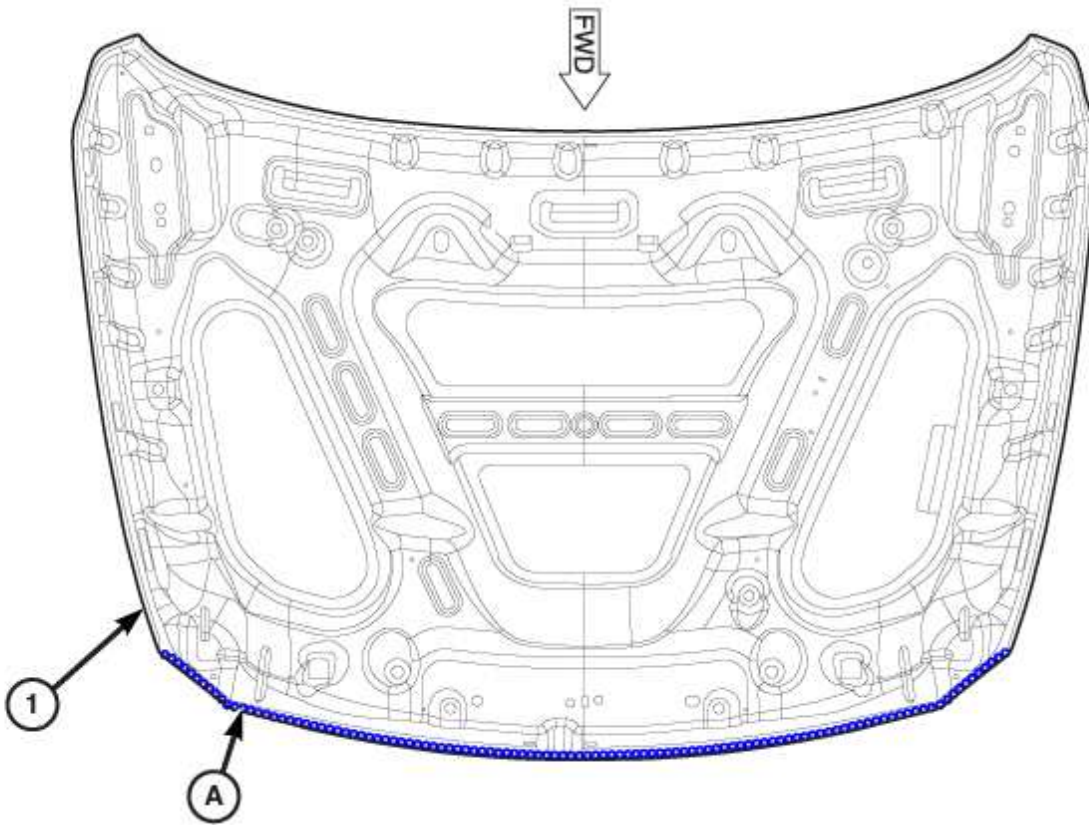


1240983

Box Floor Panel/Box Floor Extension

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

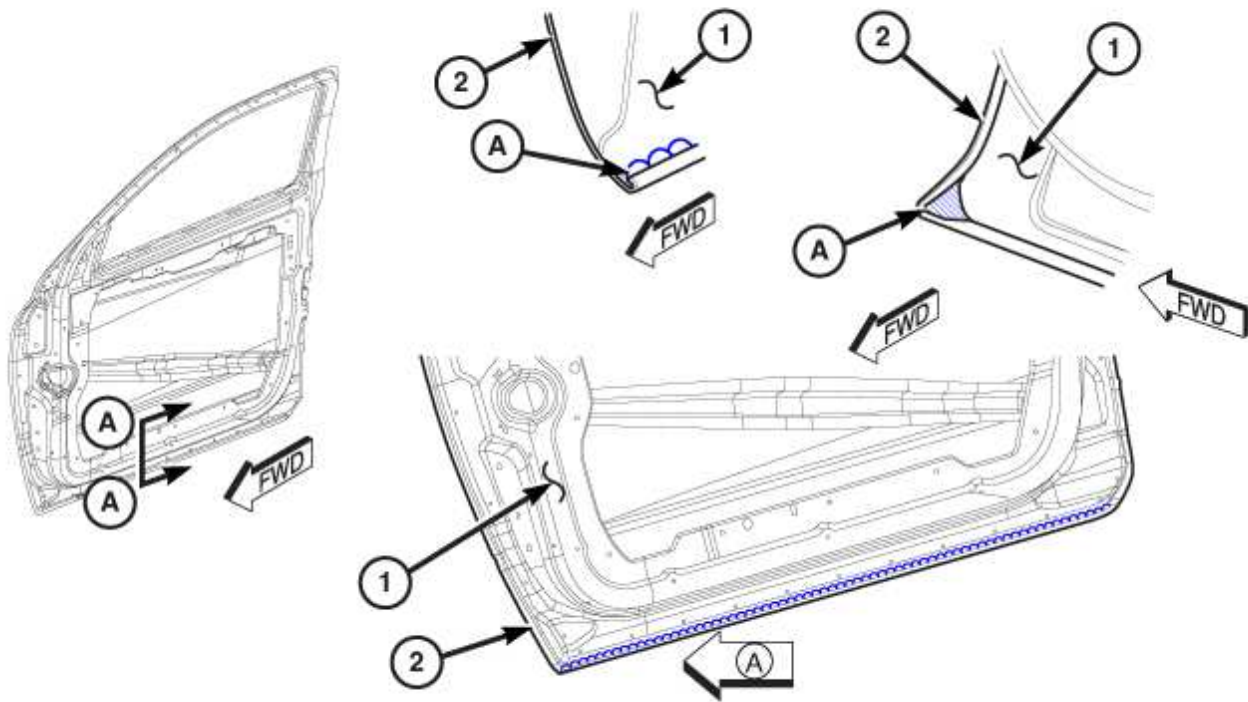
- A - SEAM SEALER
- B - SEAM SEALER
- 1 - BOX FLOOR PANEL
- 2 - BOX FLOOR EXTENSION



1240971

**Hood**

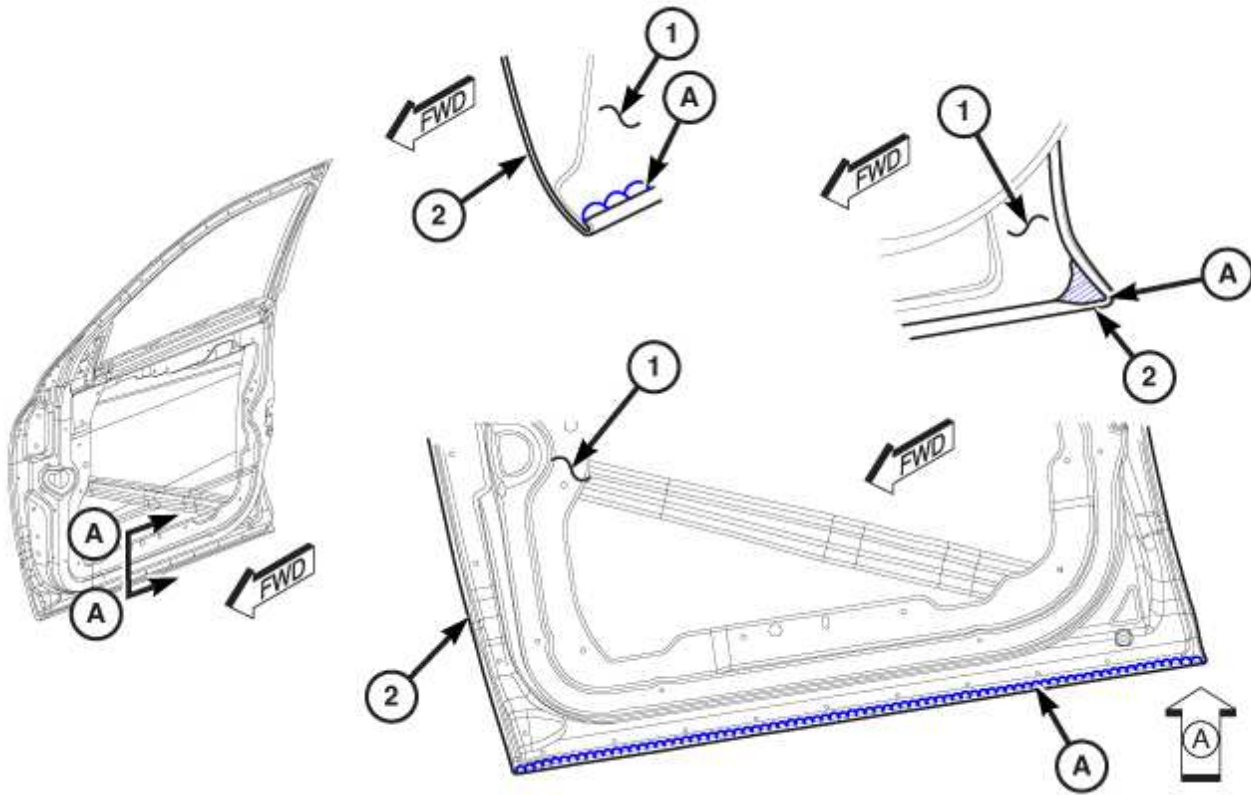
- A - SEAM SEALER
- 1 - HOOD PANEL (INNER/OUTER)



1240980

**Front Door – Standard Cab**

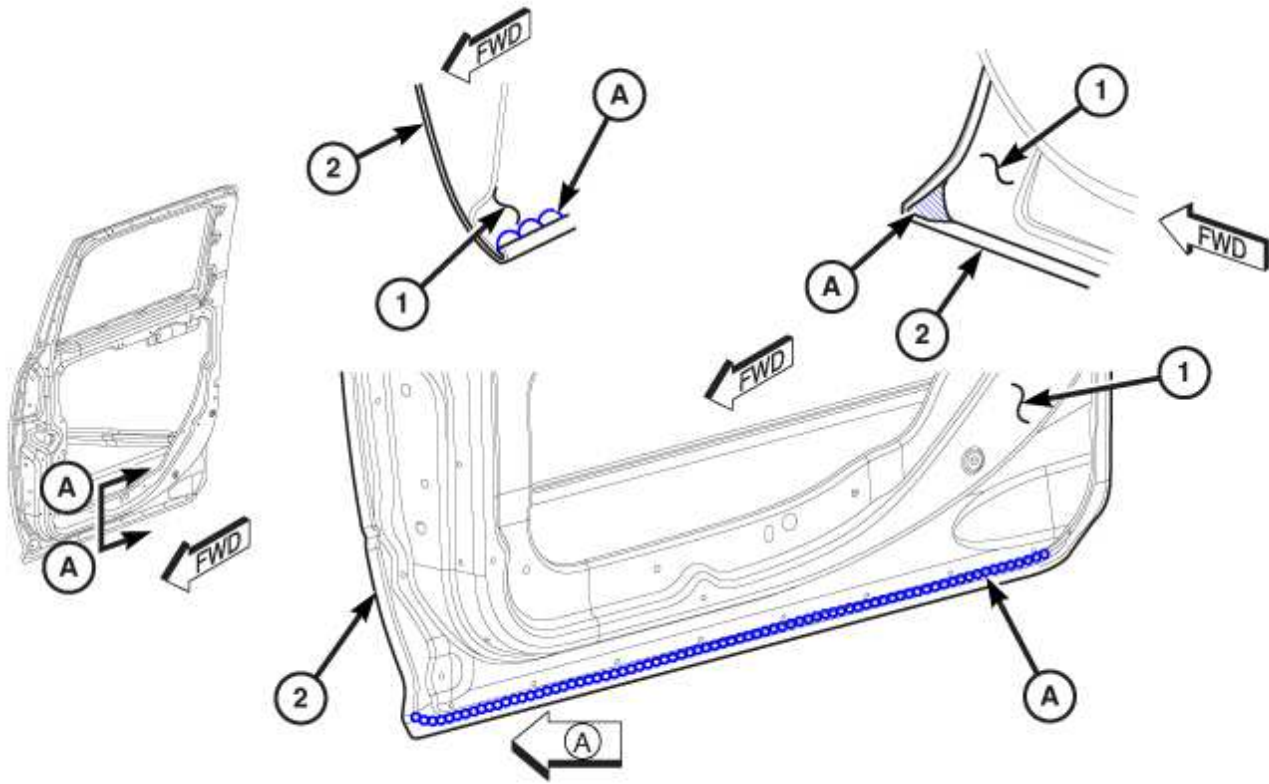
- A - SEAM SEALER
- 1 - INNER DOOR PANEL
- 2 - OUTER DOOR PANEL



1240990

Front Door – Crew and Mega Cab

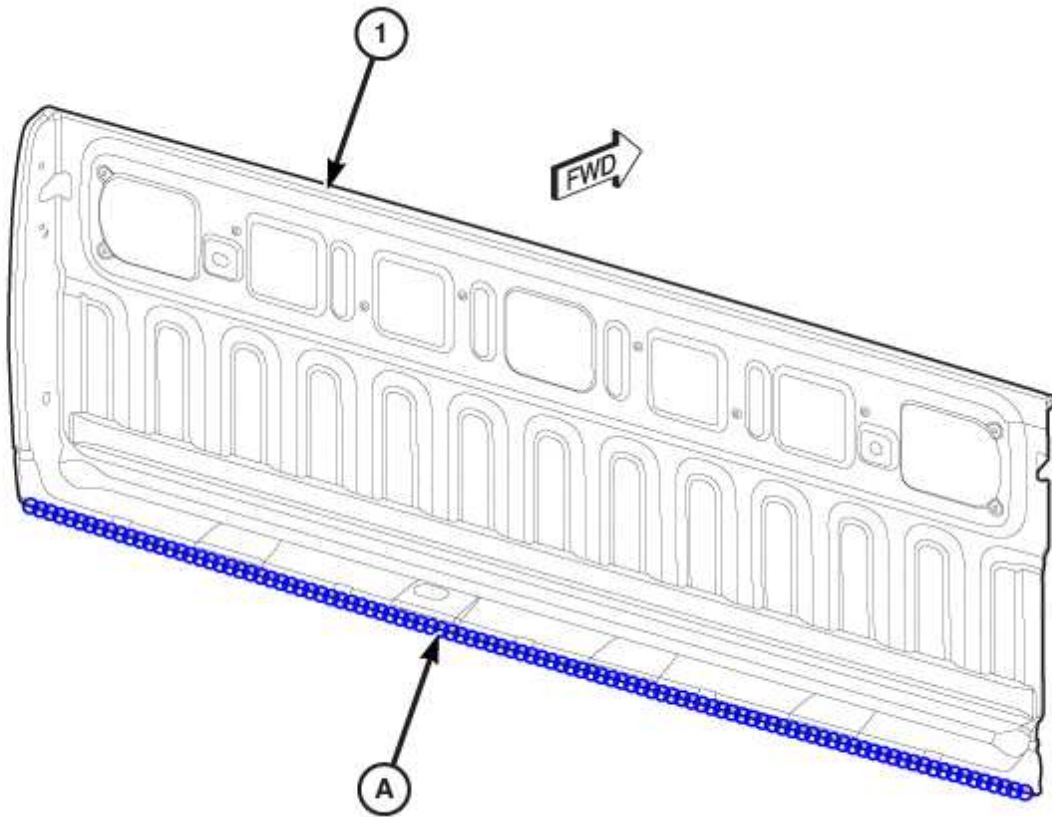
- A - SEAM SEALER
- 1 - INNER DOOR PANEL
- 2 - OUTER DOOR PANEL



1240999

Rear Door

- A - SEAM SEALER
- 1 - INNER DOOR PANEL
- 2 - OUTER DOOR PANEL



1241012

Tailgate

- A - SEAM SEALER
- 1 - TAILGATE PANEL (INNER/OUTER)

### STRUCTURAL ADHESIVE LOCATIONS

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

Structural adhesive is applied by itself or in conjunction with Squeeze Type Resistance Spot Welds 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.

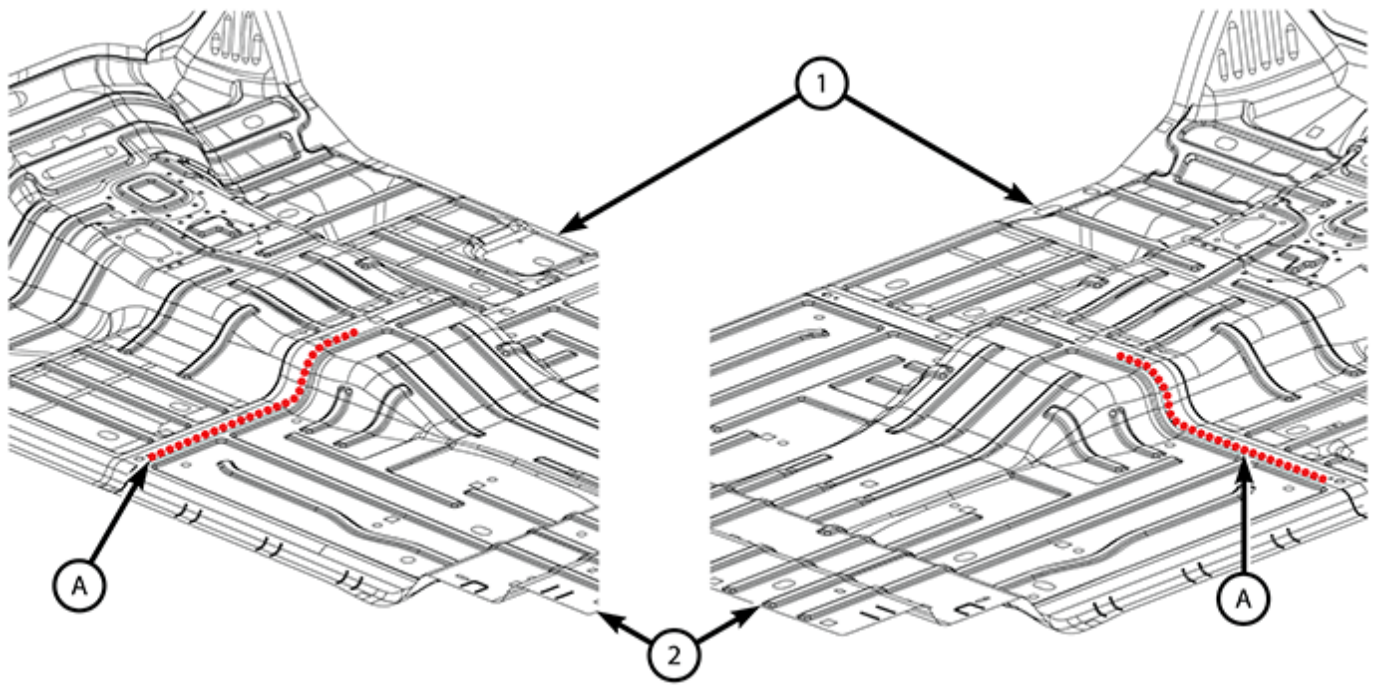
**FCA US LLC approved replacement materials include -**

- **Structural Adhesives** : Fusor 112B, 3M 08116.
- **Anti-Flutter Adhesives (flexible)** : Fusor 121 (flexible foam), 3M 04724 (NVH dampening material) and Crest CCF (Flexi-Foam).

DESCRIPTION	FIGURE
Front Floor – Mega Cab	<a href="#">Figure 1</a>
Body Side Aperture Inner – Mega Cab	<a href="#">Figure 2</a>
Dash/Cowl/Plenum	<a href="#">Figure 3</a>
Cab Complete – Standard (1 of 2)	<a href="#">Figure 4</a>
Cab Complete – Standard (2 of 2)	<a href="#">Figure 5</a>
Cab Complete – Crew (1 of 5)	<a href="#">Figure 6</a>
Cab Complete – Crew (2 of 5)	<a href="#">Figure 7</a>
Cab Complete – Crew (3 of 5)	<a href="#">Figure 8</a>

DESCRIPTION	FIGURE
Cab Complete – Crew (4 of 5)	<a href="#">Figure 9</a>
Cab Complete – Crew (5 of 5)	<a href="#">Figure 10</a>
Cab Complete – Mega (1 of 5)	<a href="#">Figure 11</a>
Cab Complete – Mega (2 of 5)	<a href="#">Figure 12</a>
Cab Complete – Mega (3 of 5)	<a href="#">Figure 13</a>
Cab Complete – Mega (4 of 5)	<a href="#">Figure 14</a>
Cab Complete – Mega (5 of 5)	<a href="#">Figure 15</a>
Front Doors - Short	<a href="#">Figure 16</a>
Front Doors - Long	<a href="#">Figure 17</a>
Rear Doors - Full	<a href="#">Figure 18</a>
Tailgate	<a href="#">Figure 19</a>
6.3' Box Tub	<a href="#">Figure 20</a>
6.3' Box Floor	<a href="#">Figure 21</a>
8.0' Box Body in White	<a href="#">Figure 22</a>
8.0' Box Tub	<a href="#">Figure 23</a>
8.0' Box Floor	<a href="#">Figure 24</a>
Miscellaneous Components – Standard Cab Only	<a href="#">Figure 25</a>
Front Floor- Crew Cab	<a href="#">Figure 26</a>
Underbody Complete – Crew Cab	<a href="#">Figure 27</a>
Body Side Aperture Complete – Standard Cab	<a href="#">Figure 28</a>
Body Side Aperture Outer – Crew Cab (1 of 2)	<a href="#">Figure 29</a>
Body Side Aperture Outer – Crew Cab (2 of 2)	<a href="#">Figure 30</a>

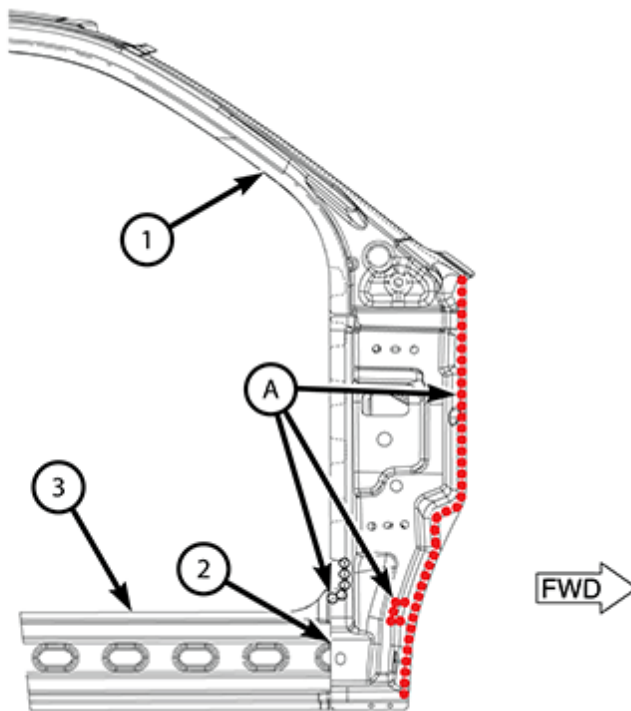




3102056540

**Front Floor – Mega Cab**

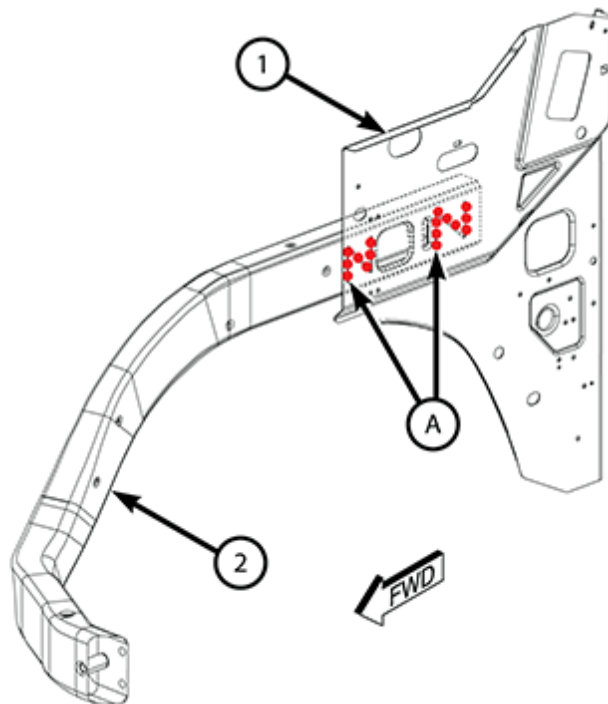
- A - STRUCTURAL ADHESIVE
- 1 - FRONT FLOOR PAN
- 2 - REAR FLOOR PAN



3102056541

Body Side Aperture Inner – Mega Cab

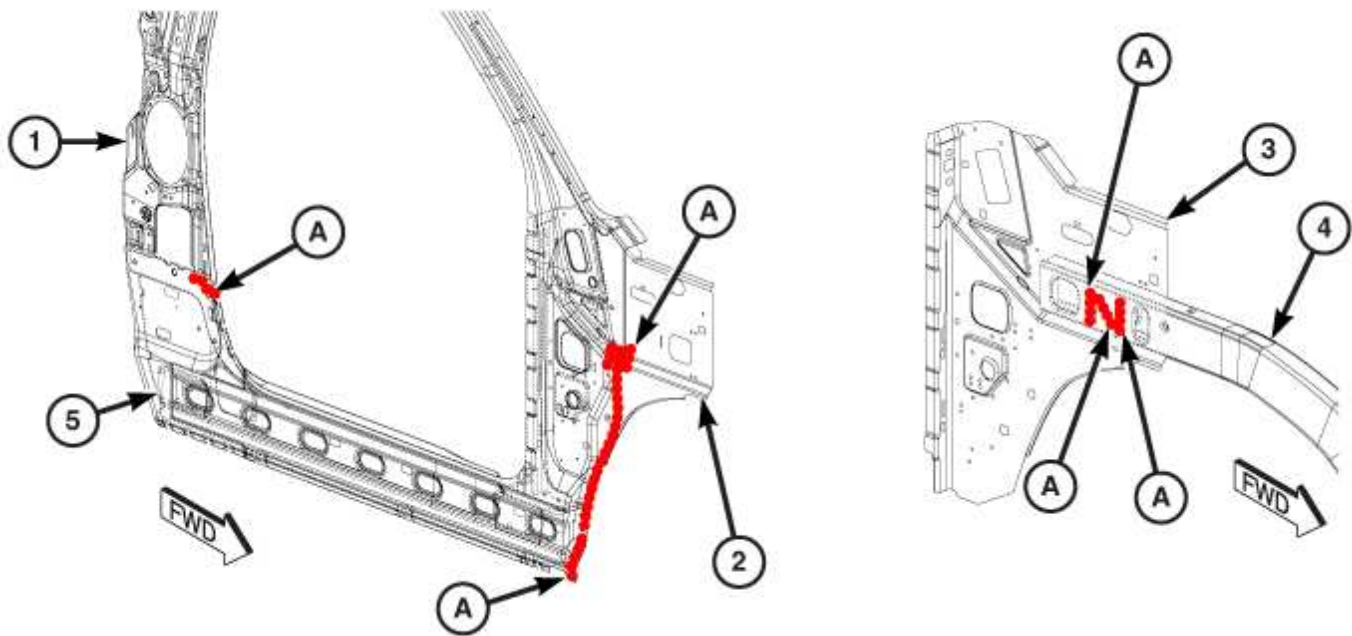
- A - STRUCTURAL ADHESIVE
- 1 - A-PILLAR REINFORCEMENT
- 2 - DOOR HINGE REINFORCEMENT
- 3 - INNER BODY SIDE PANEL



3102056542

Dash/Cowl/Plenum

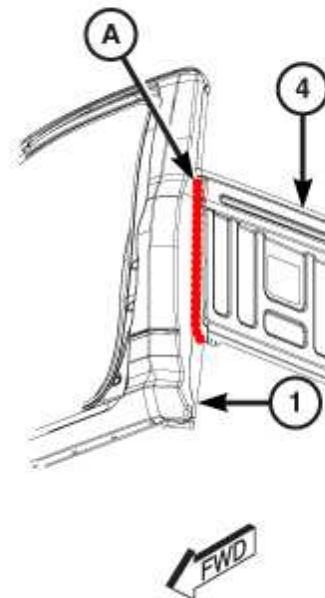
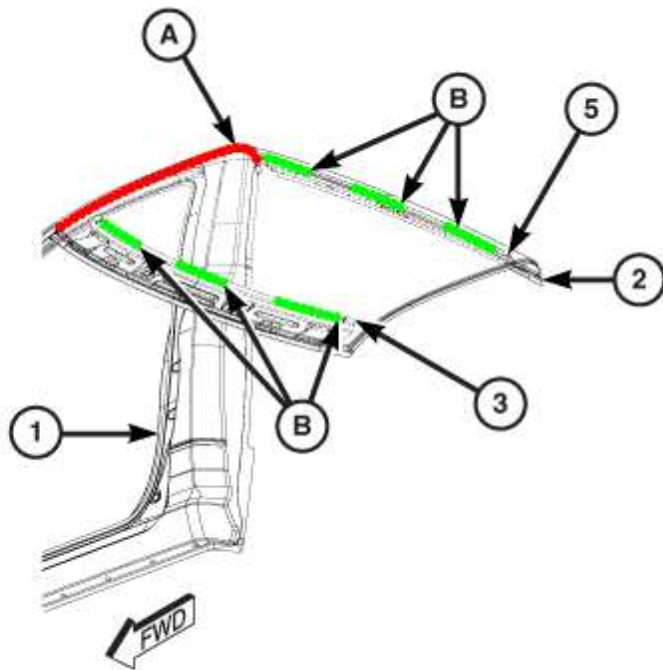
- A - STRUCTURAL ADHESIVE
- 1 - COWL SIDE PANEL
- 2 - RADIATOR AND FRONT FENDER TUBE



2679186

**Cab Complete – Standard (1 of 2)**

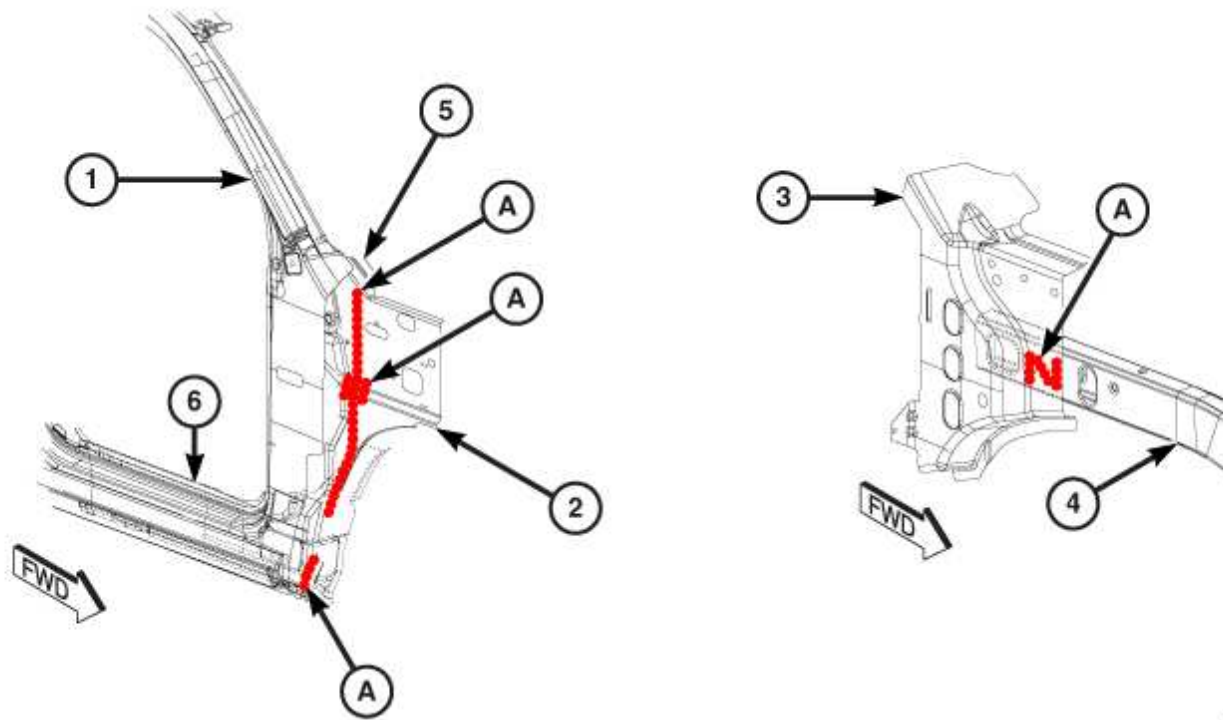
- A - STRUCTURAL ADHESIVE
- 1 - INNER BODY SIDE PANEL
- 2 - COWL SIDE PANEL
- 3 - APERTURE FRONT EXTENSION PLATE
- 4 - FENDER/RADIATOR TUBE
- 5 - CAB FLOOR SILL



Cab Complete – Standard (2 of 2)

2679243

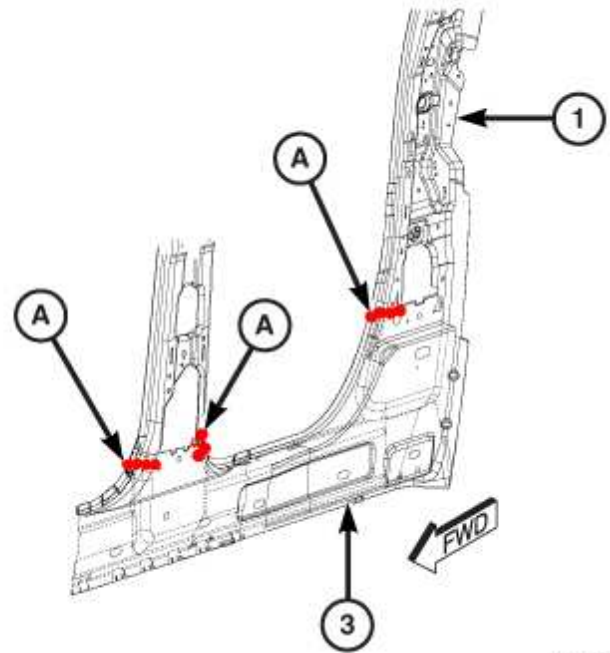
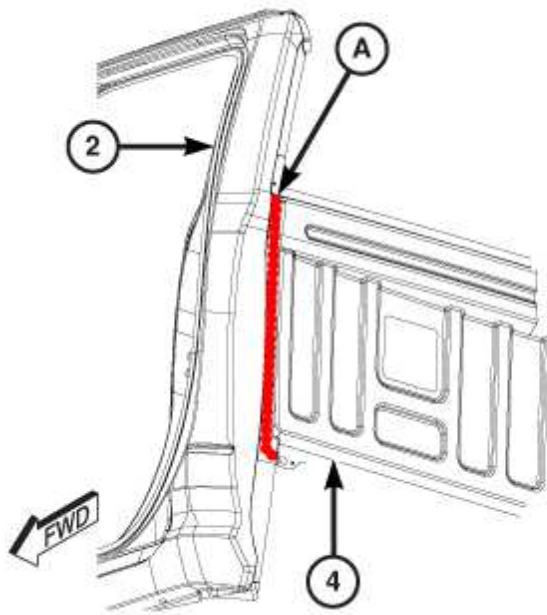
- A - STRUCTURAL ADHESIVE
- B - ANTI-FLUTTER ADHESIVE
- 1 - OUTER BODY SIDE PANEL
- 2 - ROOF PANEL
- 3 - FRONT ROOF HEADER
- 4 - CAB BACK PANEL
- 5 - REAR ROOF HEADER



2691145

**Cab Complete – Crew (1 of 5)**

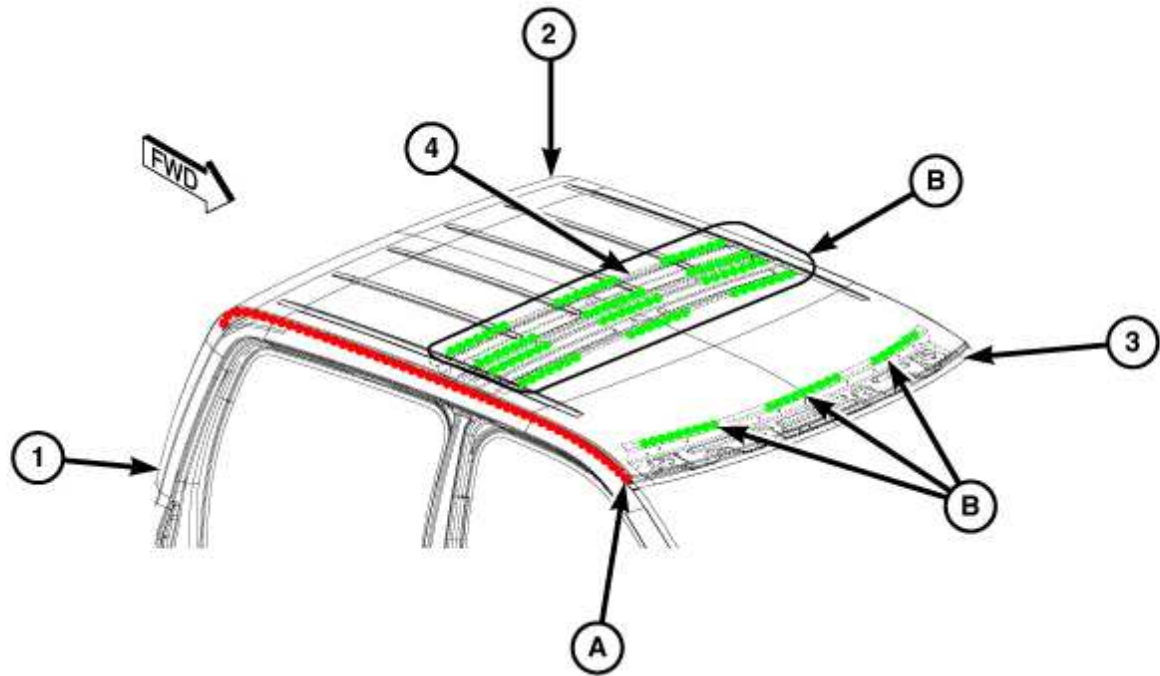
- A - STRUCTURAL ADHESIVE
- 1 - INNER BODY SIDE PANEL
- 2 - COWL SIDE PANEL
- 3 - APERTURE FRONT EXTENSION PLATE
- 4 - FENDER/RADIATOR TUBE
- 5 - OUTER BODY SIDE PANEL
- 6 - CAB FLOOR SILL



2691153

**Cab Complete – Crew (2 of 5)**

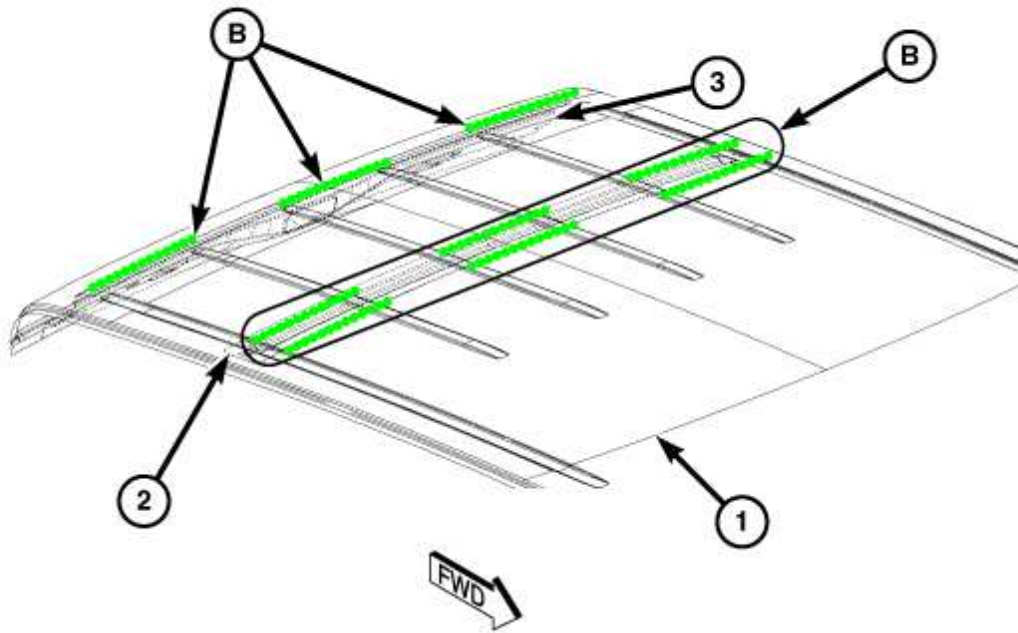
- A - STRUCTURAL ADHESIVE
- 1 - INNER BODY SIDE PANEL
- 2 - OUTER BODY SIDE PANEL
- 3 - CAB FLOOR SILL
- 4 - CAB BACK PANEL



2691161

**Cab Complete – Crew (3 of 5)**

- A - STRUCTURAL ADHESIVE
- B - ANTI-FLUTTER ADHESIVE
- 1 - OUTER BODY SIDE PANEL
- 2 - ROOF PANEL
- 3 - FRONT ROOF HEADER
- 4 - B-PILLAR ROOF BOW

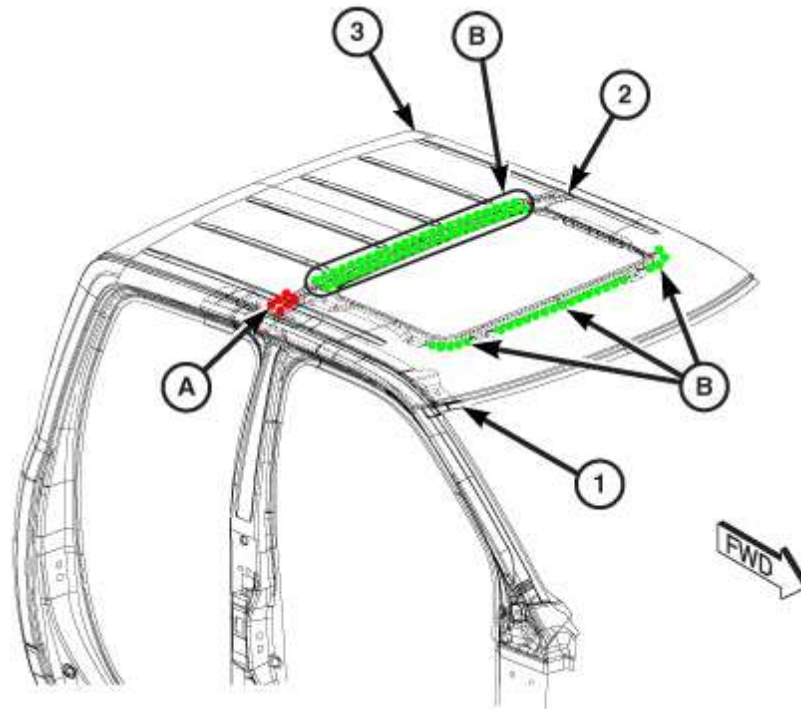


2691170

**Cab Complete – Crew (4 of 5)**

- B - ANTI-FLUTTER ADHESIVE
- 1 - ROOF PANEL
- 2 - 2ND ROOF BOW
- 3 - REAR ROOF HEADER

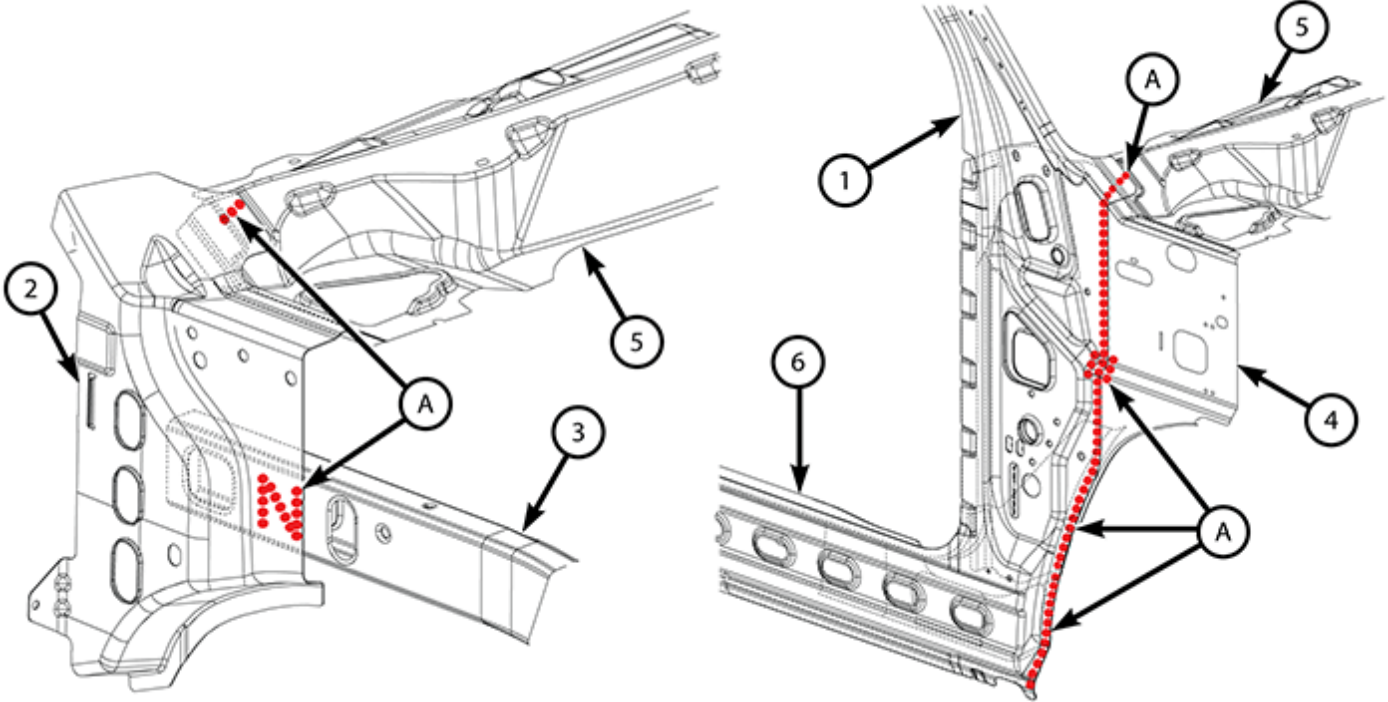




2691179

**Cab Complete – Crew (5 of 5)**

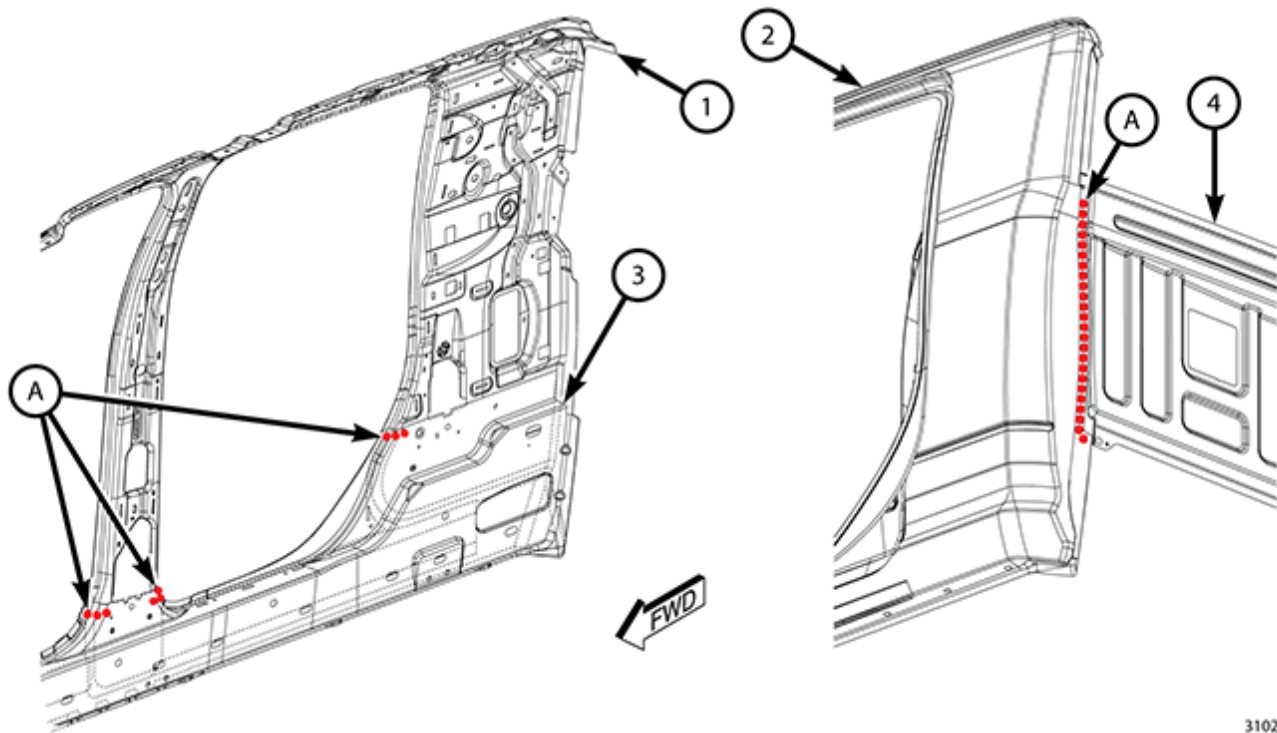
- A - STRUCTURAL ADHESIVE
- B - ANTI-FLUTTER ADHESIVE
- 1 - A-PILLAR REINFORCEMENT
- 2 - SUNROOF REINFORCEMENT
- 3 - SUNROOF ROOF PANEL



3102056535

**Cab Complete – Mega (1 of 5)**

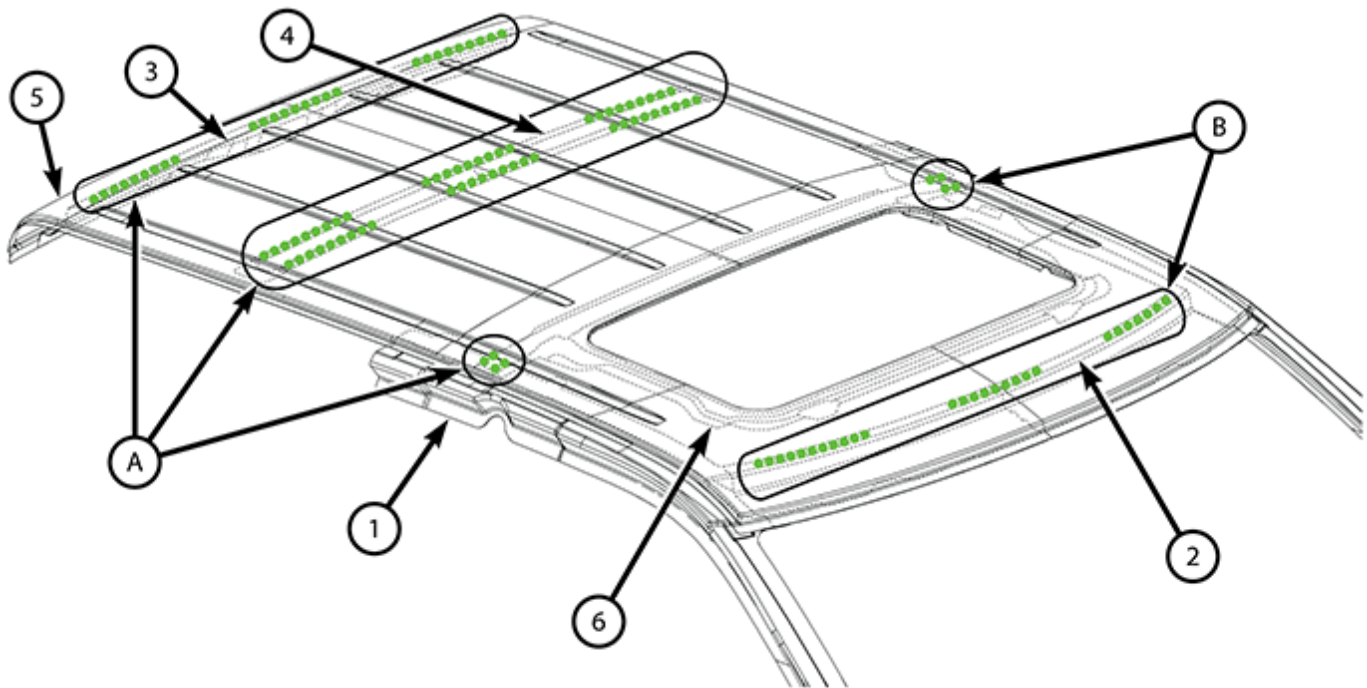
- A - STRUCTURAL ADHESIVE
- 1 - INNER BODY SIDE PANEL
- 2 - FRONT APERTURE EXTENSION PLATE
- 3 - RADIATOR AND FRONT FENDER TUBE
- 4 - COWL SIDE PANEL
- 5 - COWL BAR PANEL
- 6 - CAB FLOOR SILL



3102056536

**Cab Complete – Mega (2 of 5)**

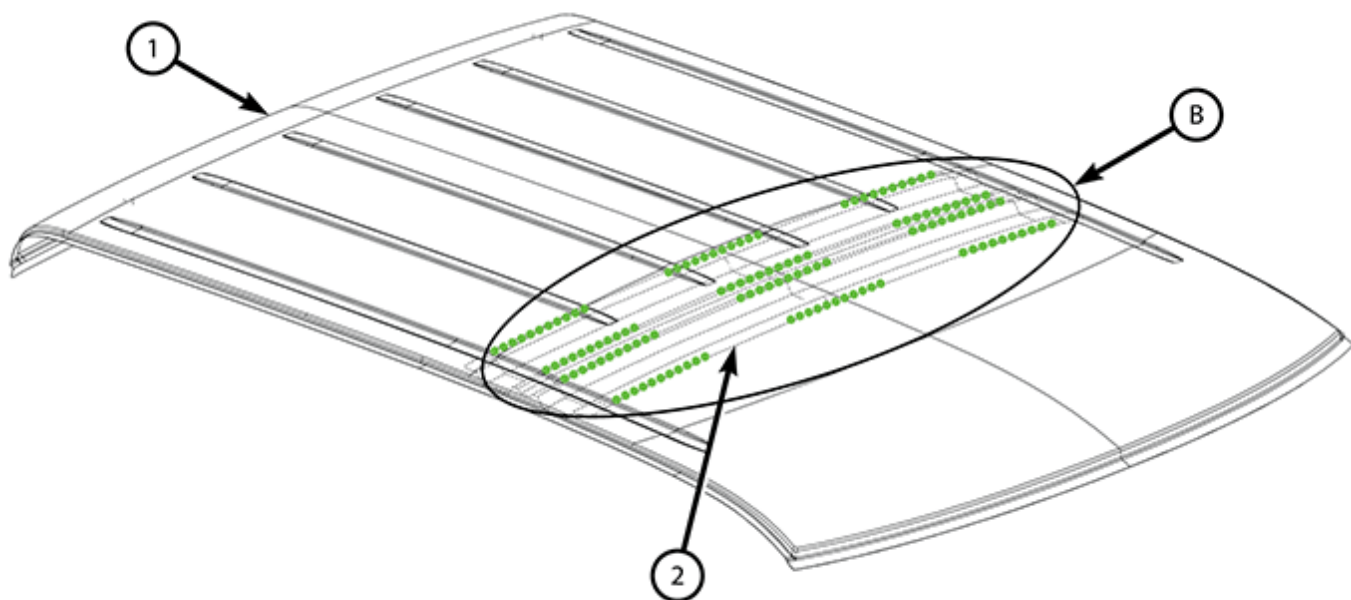
- A - STRUCTURAL ADHESIVE
- 1 - INNER BODY SIDE PANEL
- 2 - OUTER BODY SIDE PANEL
- 3 - CAB FLOOR SILL
- 4 - CAB BACK PANEL



3102056537

**Cab Complete – Mega (3 of 5)**

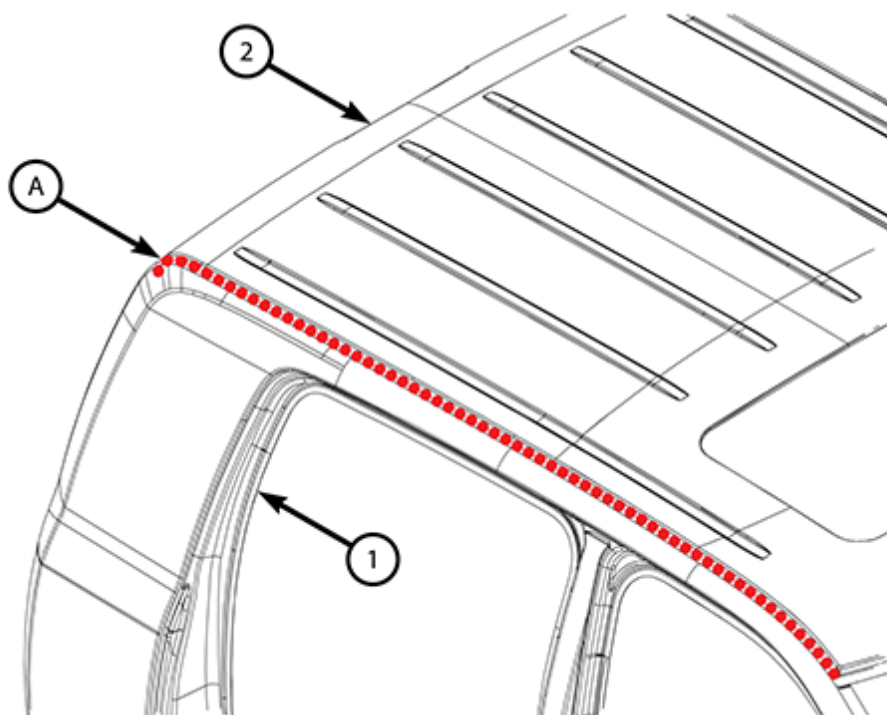
- B - ANTI-FLUTTER ADHESIVE
- 1 - A-PILLAR REINFORCEMENT
- 2 - ROOF HEADER (FRONT)
- 3 - ROOF HEADER (REAR)
- 4 - ROOF BOW (2ND)
- 5 - ROOF PANEL (SUNROOF)
- 6- REINFORCEMENT (SUNROOF)



3102056538

**Cab Complete – Mega (4 of 5)**

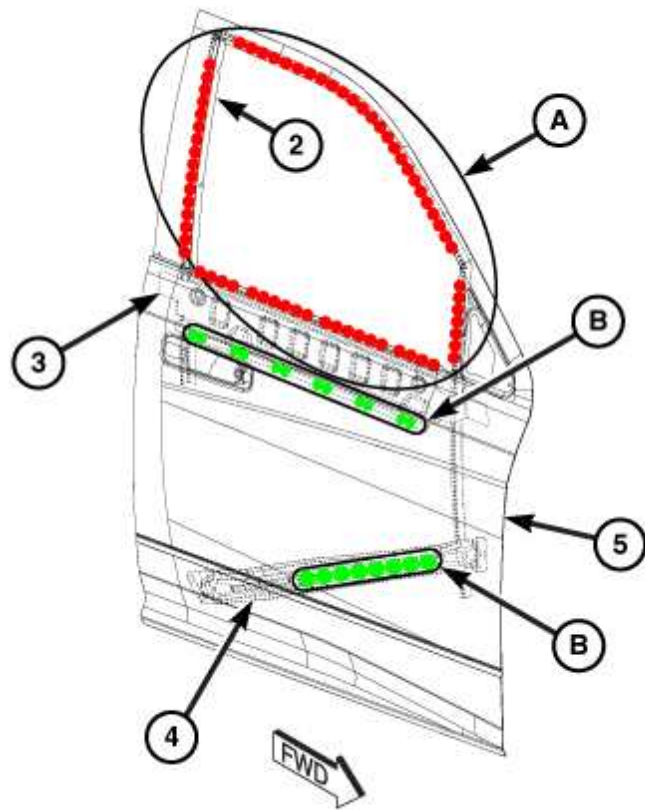
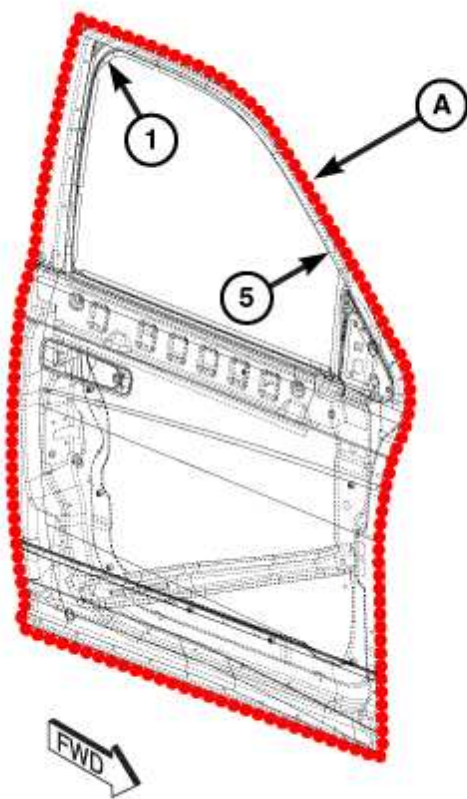
- B - ANTI-FLUTTER ADHESIVE
- 1 - ROOF PANEL (WITHOUT SUNROOF)
- 2 - ROOF BOW (1ST) (WITHOUT SUNROOF)



3102056539

**Cab Complete – Mega (5 of 5)**

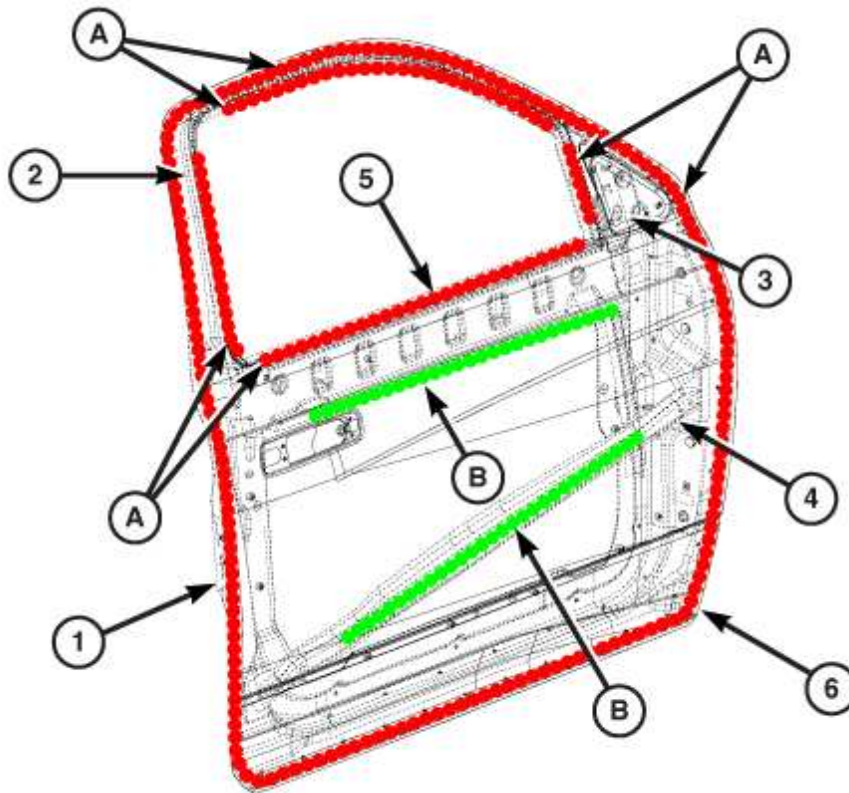
- A - STRUCTURAL ADHESIVE
- 1 - OUTER BODY SIDE PANEL
- 2 - ROOF PANEL



1225795

### Front Doors - Short

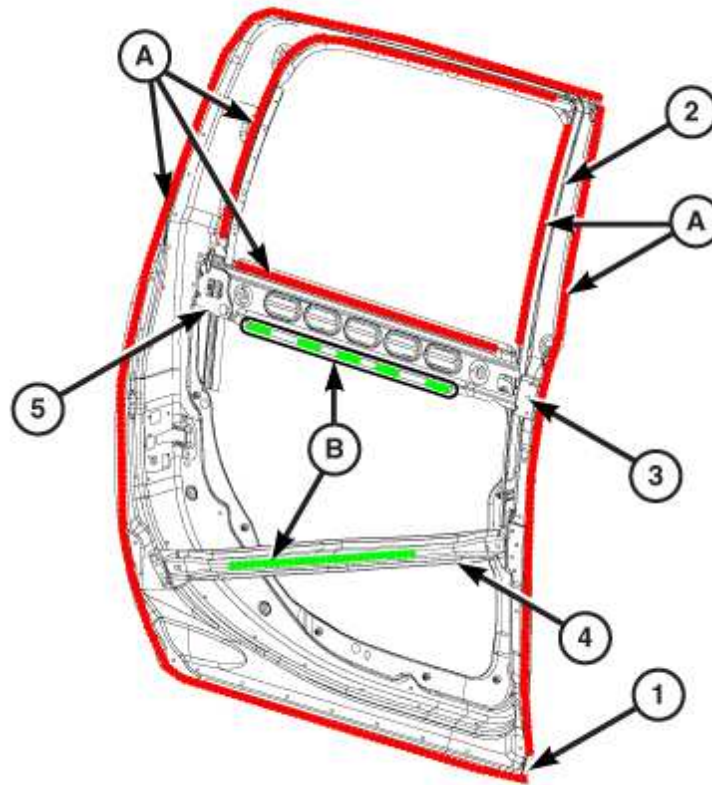
- A - STRUCTURAL ADHESIVE
- B - ANT-FLUTTER ADHESIVE
- 1 - INNER DOOR PANEL
- 2 - GLASS RUN CHANNEL
- 3 - DOOR BELT OUTER REINFORCEMENT
- 4 - IMPACT BEAM
- 5 - OUTER DOOR PANEL



1225805

**Front Doors - Long**

- A - STRUCTURAL ADHESIVE
- B - ANT-FLUTTER ADHESIVE
- 1 - INNER DOOR PANEL
- 2 - GLASS RUN CHANNEL
- 3 - MIRROR MOUNT REINFORCEMENT
- 4 - DOOR IMPACT BEAM
- 5 - DOOR BELT OUTER REINFORCEMENT
- 6 - OUTER DOOR PANEL

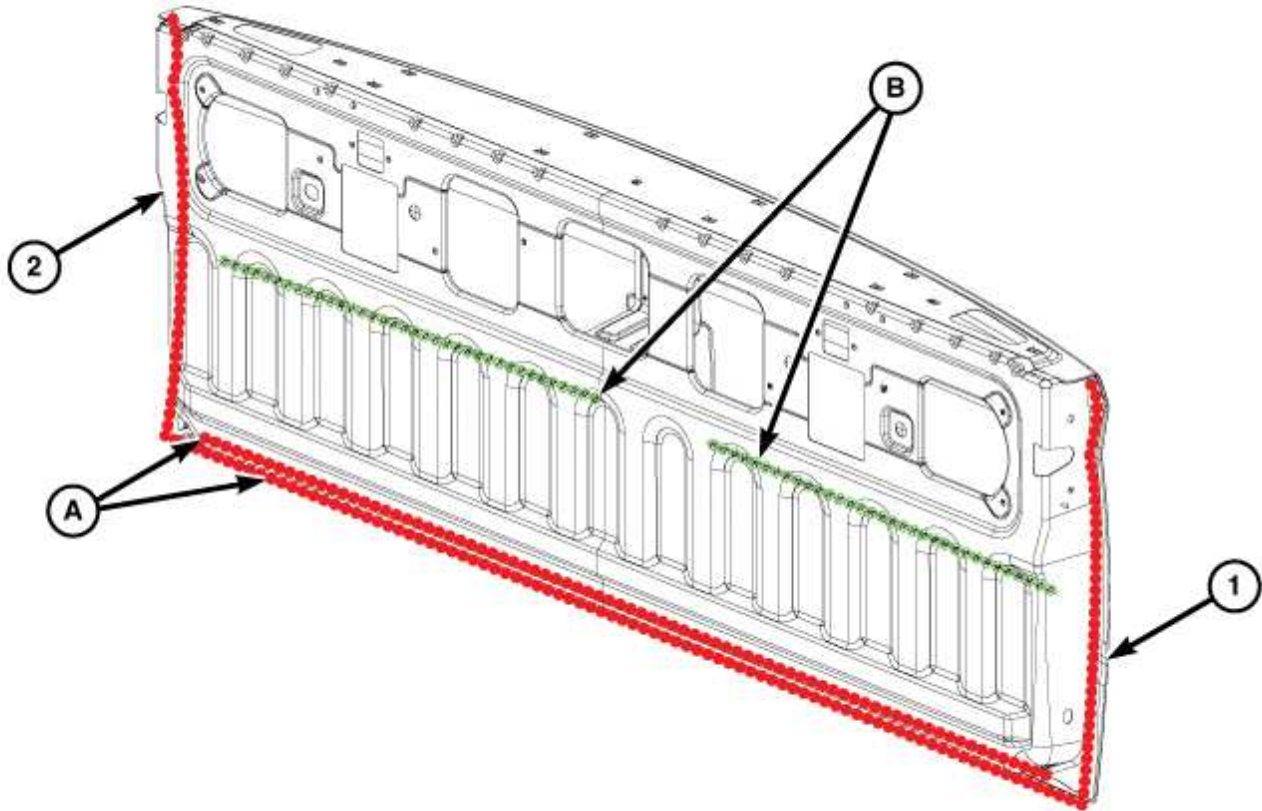


1225825

**Rear Doors - Full**

- A - STRUCTURAL ADHESIVE
- B - ANT-FLUTTER ADHESIVE
- 1 - INNER DOOR PANEL
- 2 - GLASS RUN CHANNEL
- 3 - DOOR BELT OUTER REINFORCEMENT
- 4 - IMPACT BEAM
- 5 - OUTER DOOR PANEL

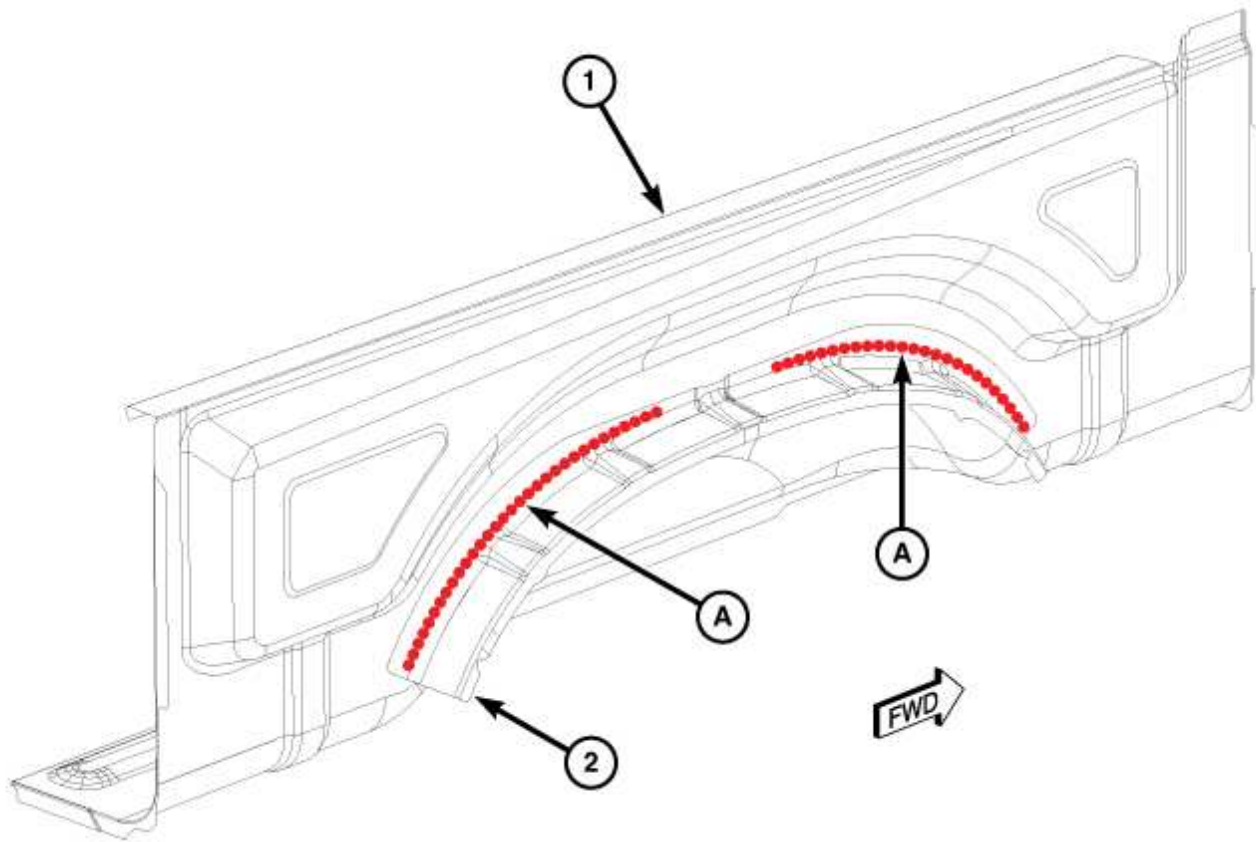




1225835

**Tailgate**

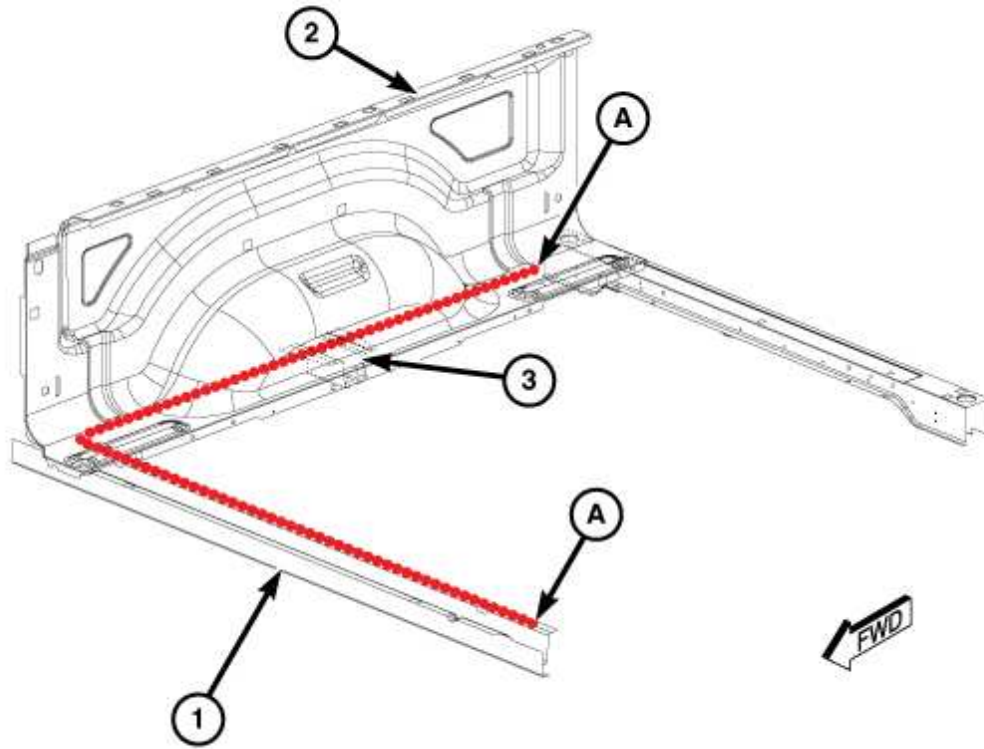
- A - STRUCTURAL ADHESIVE
- 1 - OUTER TAILGATE PANEL
- 2 - INNER TAILGATE PANEL



2690619

6.3' Box Tub

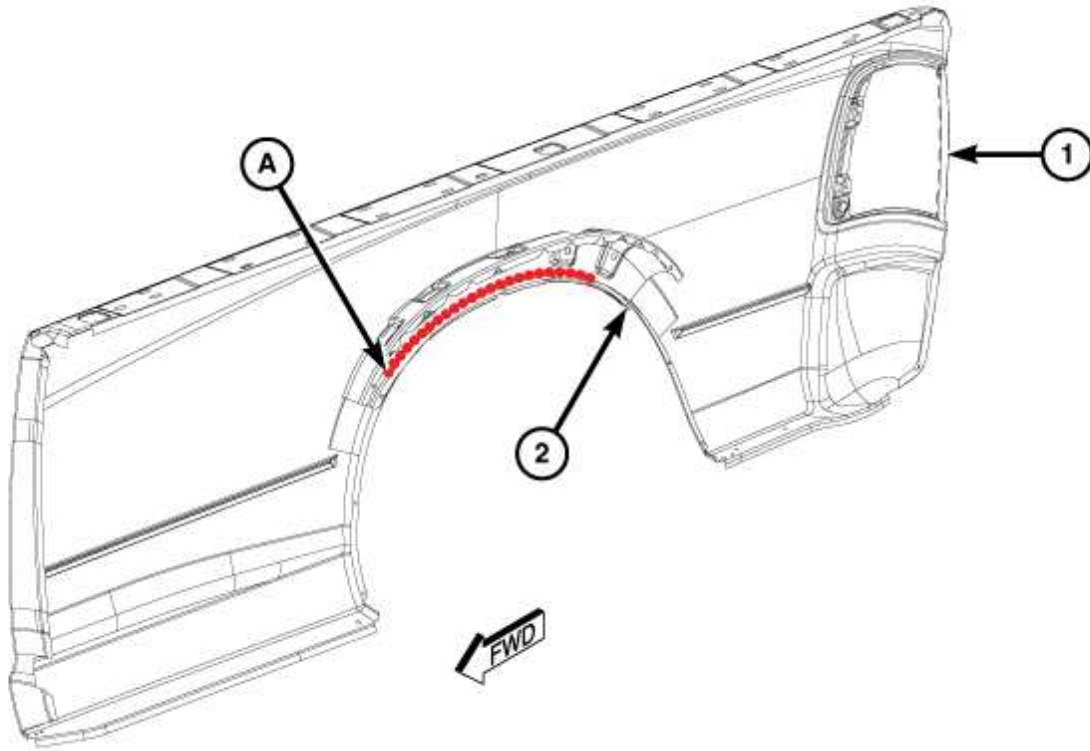
- A - STRUCTURAL ADHESIVE
- 1 - INNER BOX SIDE PANEL
- 2 - INNER WHEELHOUSE



2690675

**6.3' Box Floor**

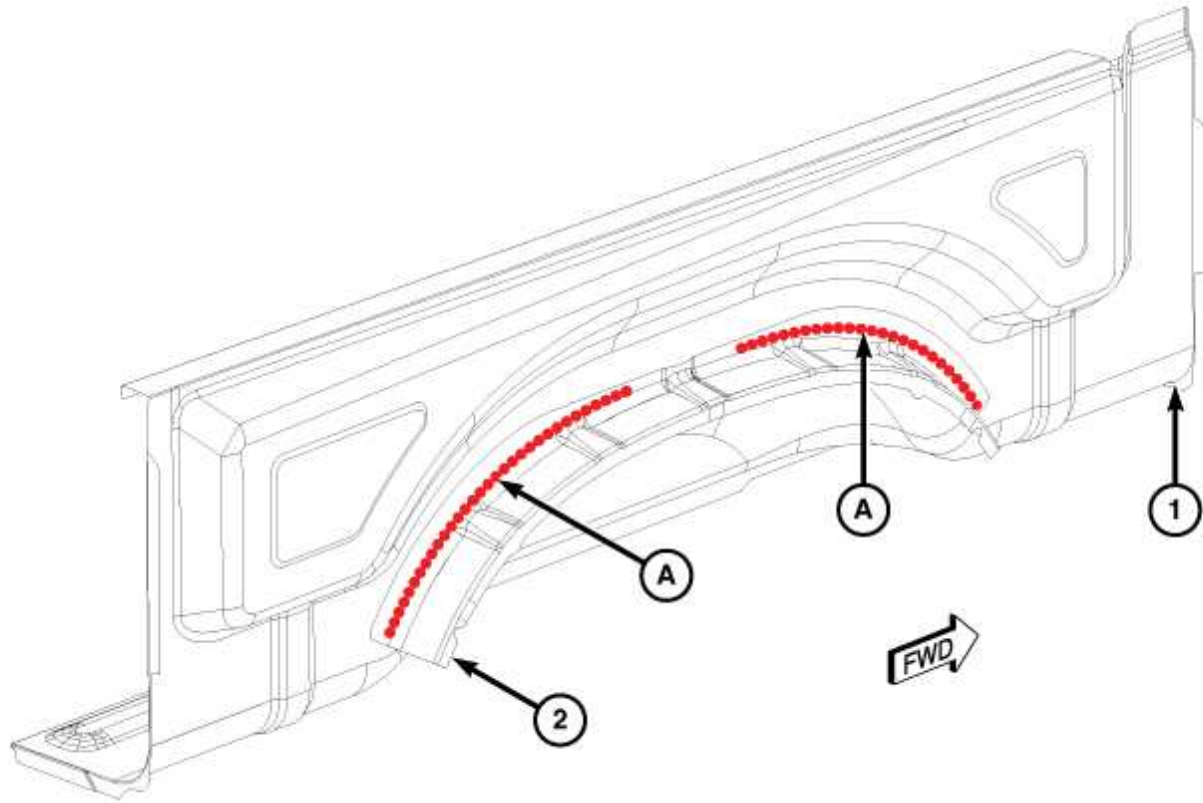
- A - STRUCTURAL ADHESIVE
- 1 - FRONT CROSSMEMBER
- 2 - INNER BOX SIDE PANEL
- 3 - PAINT CARRIER BRACKET



2690689

**8.0' Box Body in White**

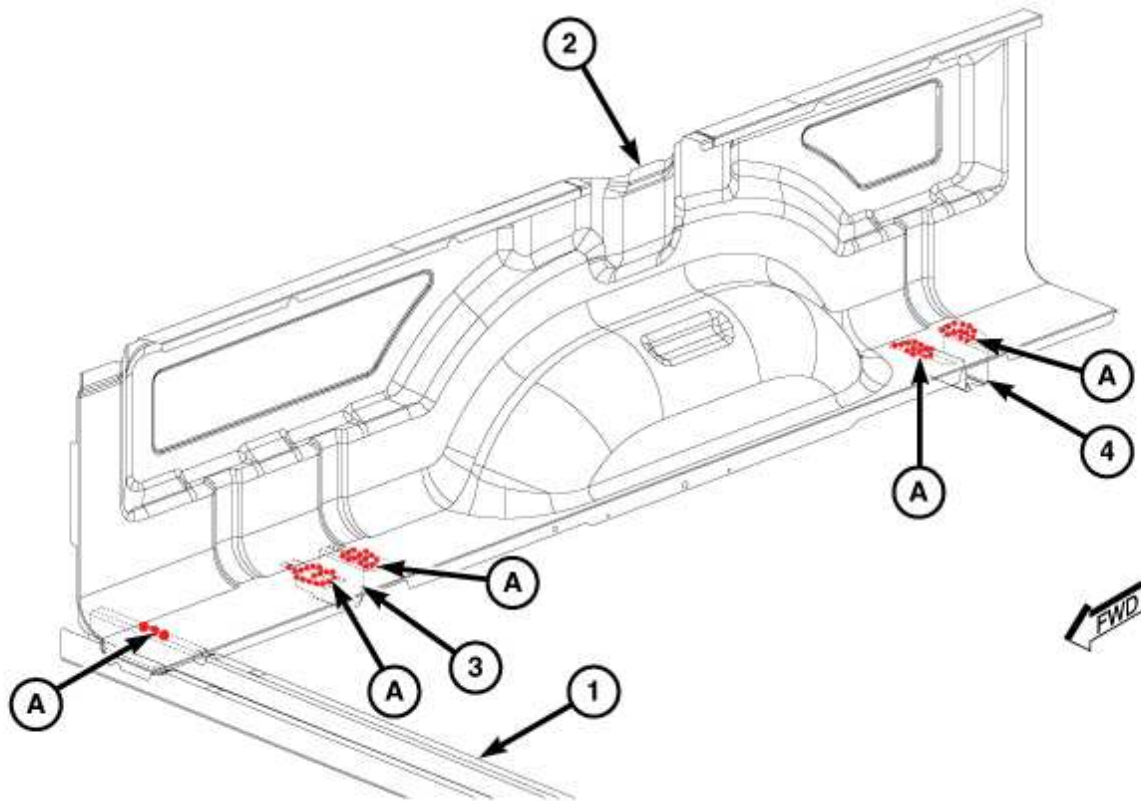
- A - STRUCTURAL ADHESIVE
- 1 - OUTER BOX SIDE PANEL
- 2 - OUTER WHEELHOUSE



8.0' Box Tub

2698702

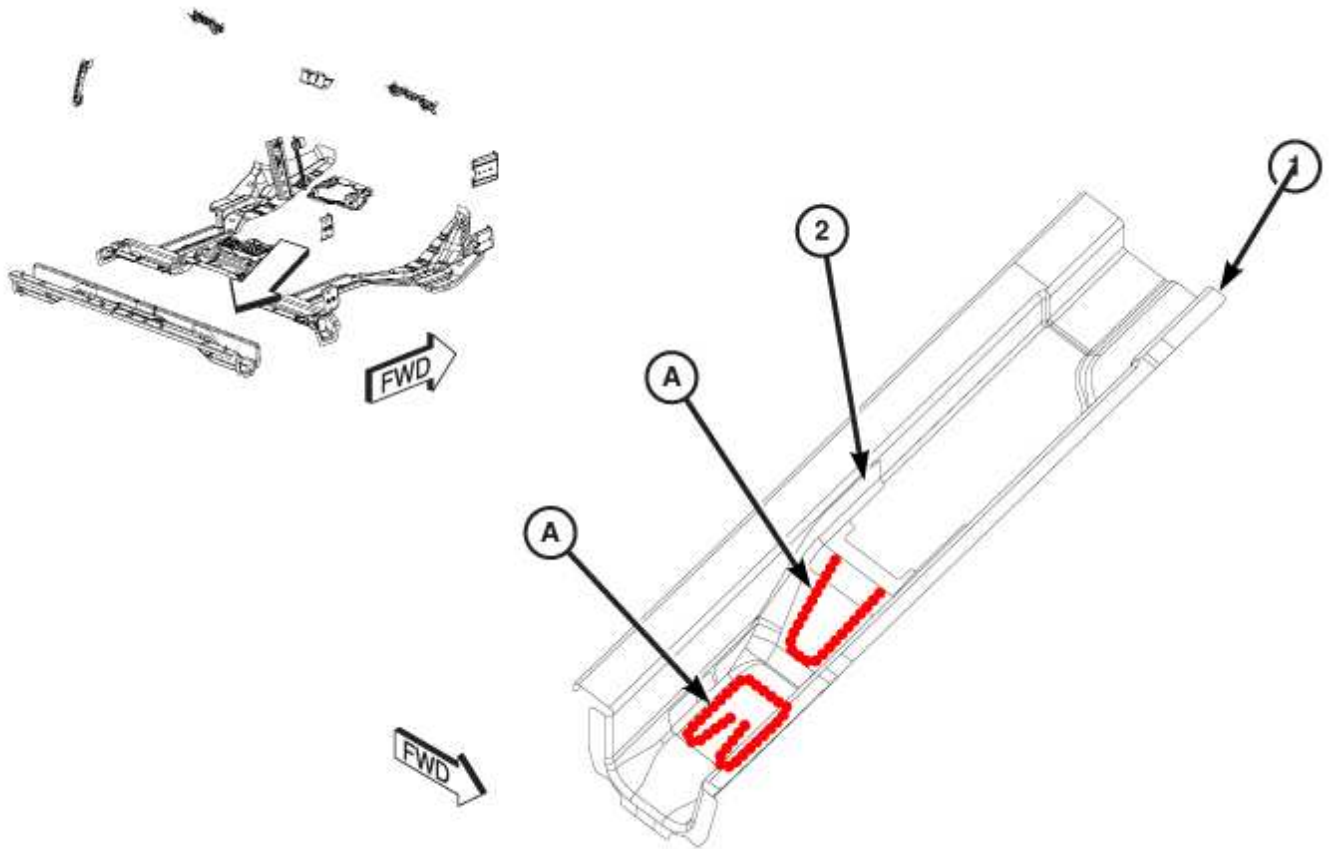
- A - STRUCTURAL ADHESIVE
- 1 - INNER BOX SIDE PANEL
- 2 - INNER WHEELHOUSE



2698723

**8.0' Box Floor**

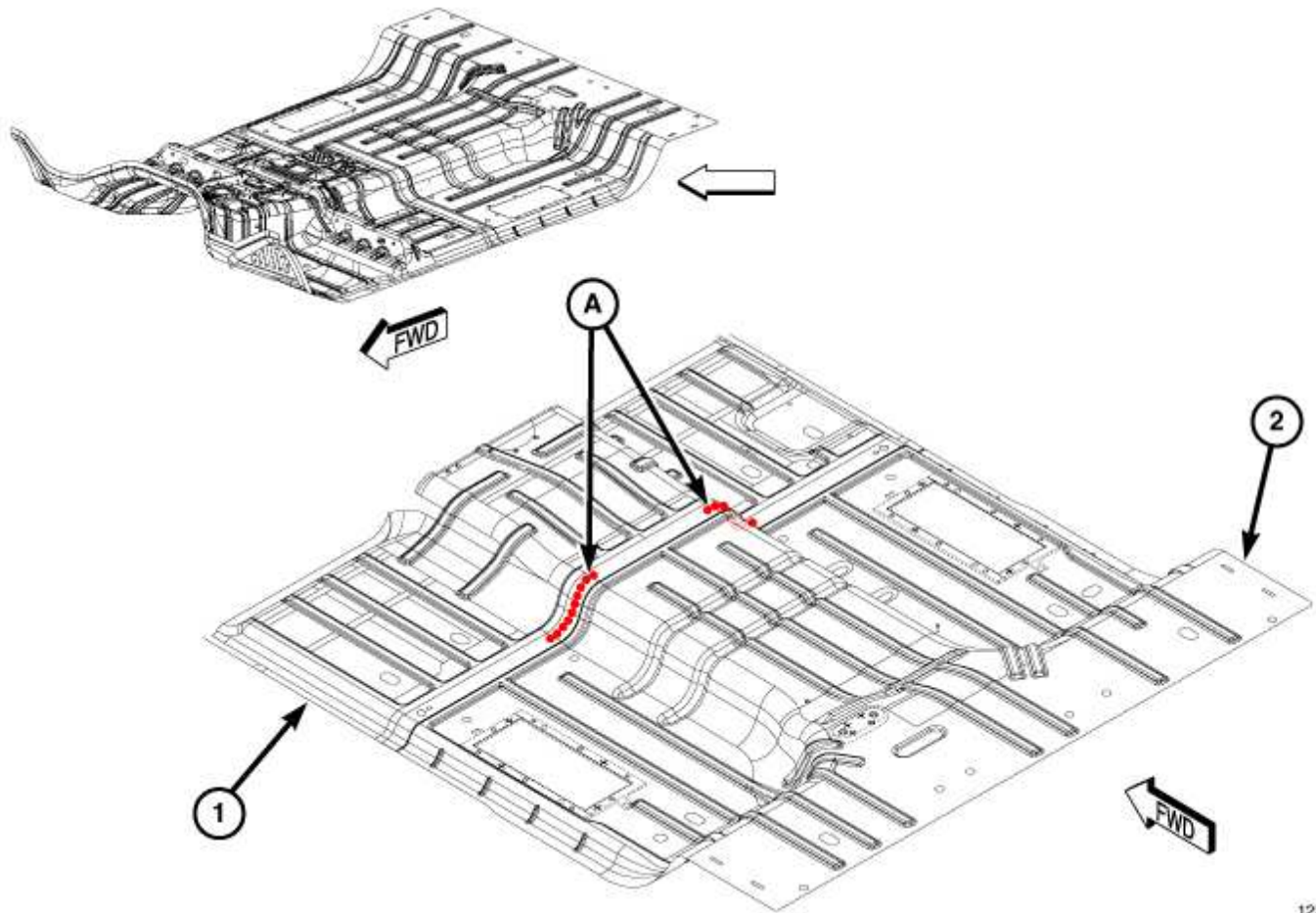
- A - STRUCTURAL ADHESIVE
- 1 - FRONT CROSSMEMBER
- 2 - INNER BOX SIDE PANEL
- 3 - CROSSMEMBER END SUPPORT BRACKET
- 4 - CROSSMEMBER END BRACKET



**MISCELLANEOUS COMPONENTS - STANDARD CAB ONLY**

- A - STRUCTURAL ADHESIVE
- 1 - REAR FLOOR CROSSMEMBER
- 2 - UNDERBODY HOLD-DOWN REINFORCEMENT

1225561

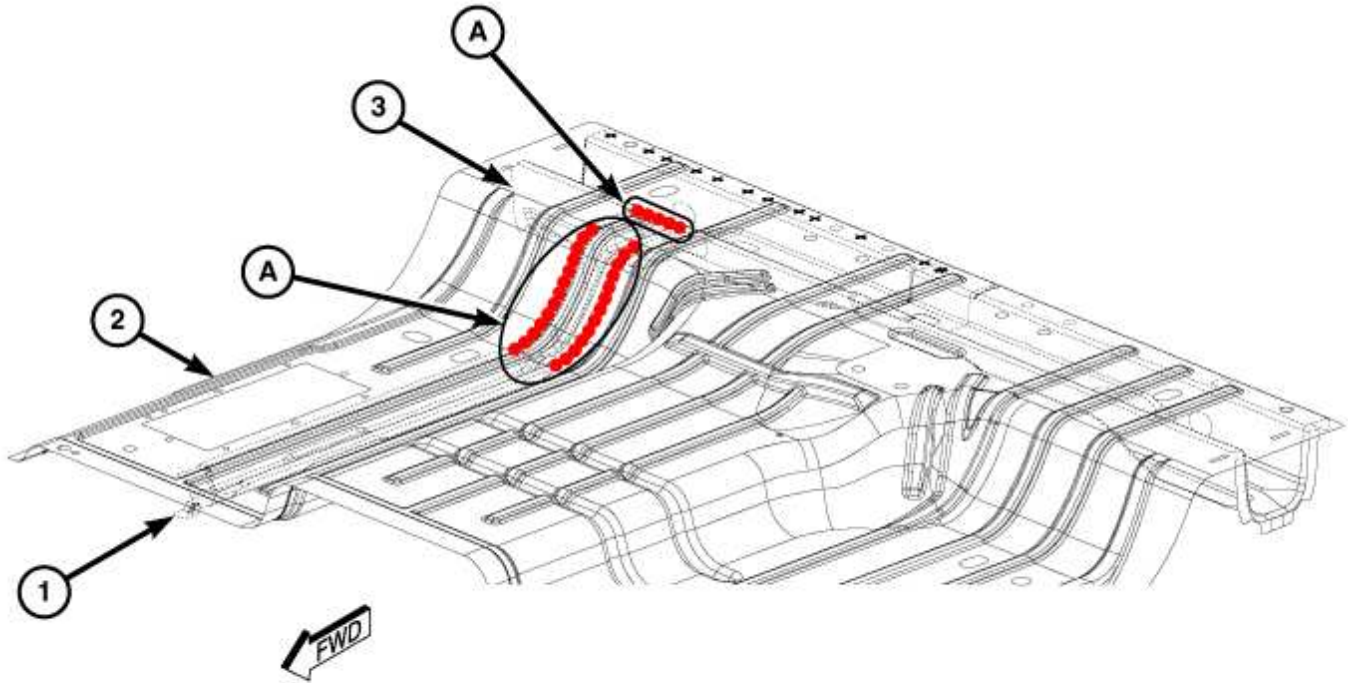


1225579

**Front Floor – Crew Cab**

- A - STRUCTURAL ADHESIVE
- 1 - FRONT FLOOR PAN
- 2 - REAR FLOOR PAN

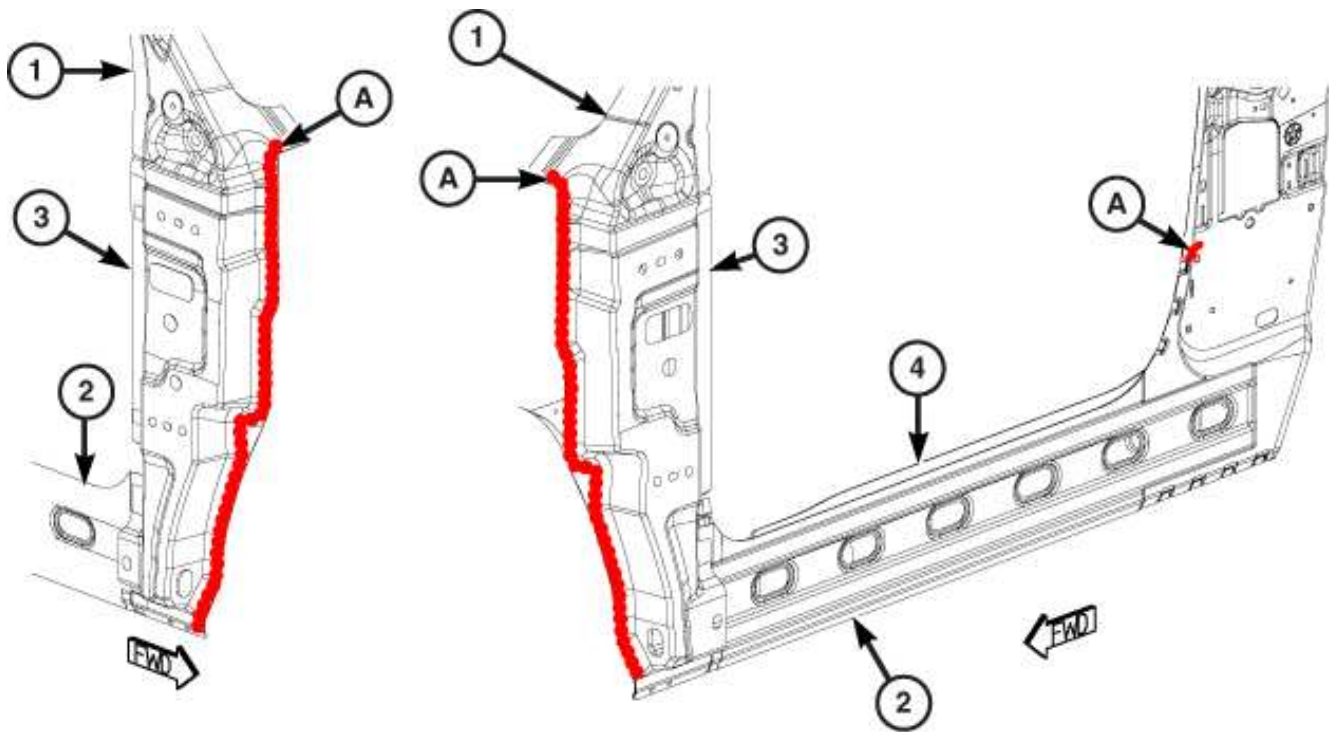




1073042

**Underbody Complete – Crew Cab**

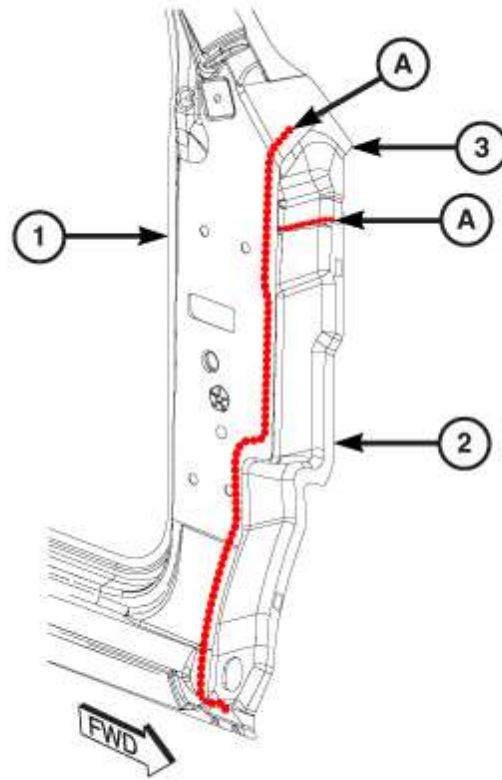
- A - STRUCTURAL ADHESIVE
- 1 - FLOOR SUPPORT
- 2 - REAR FLOOR PAN
- 3 - REAR FLOOR CROSSMEMBER



2571205

**Body Side Aperture Complete – Standard Cab**

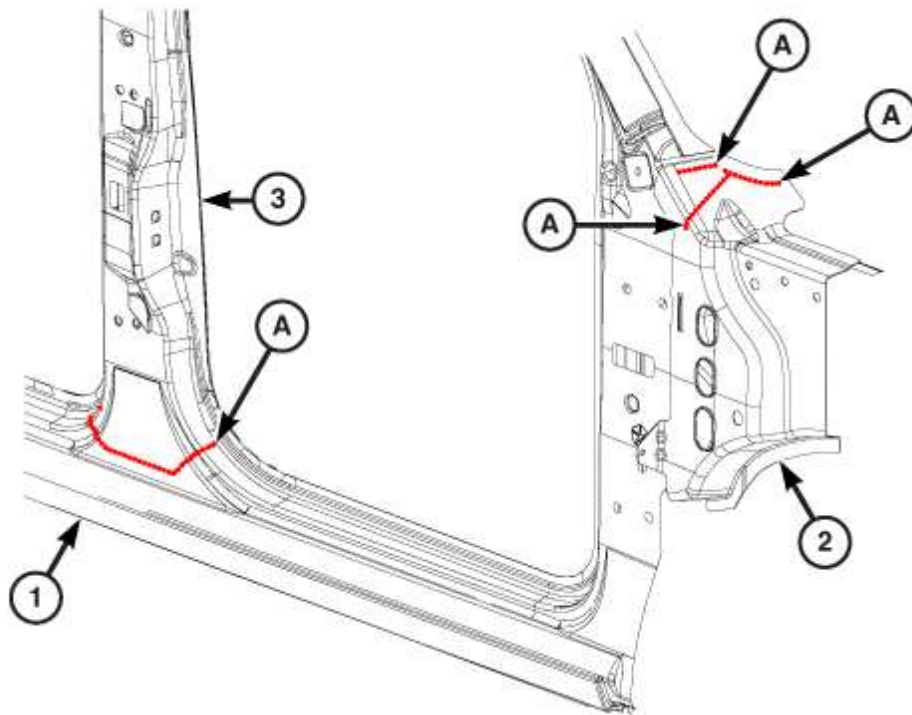
- A - STRUCTURAL ADHESIVE
- 1 - A-PILLAR REINFORCEMENT
- 2 - INNER BODY SIDE PANEL
- 3 - DOOR HINGE REINFORCEMENT
- 4 - CAB SILL



2698515

**Body Side Aperture Outer – Crew Cab (1 of 2)**

- A - STRUCTURAL ADHESIVE
- 1 - OUTER BODY SIDE PANEL
- 2 - DOOR HINGE REINFORCEMENT
- 3 - A-PILLAR REINFORCEMENT



2670323

**Body Side Aperture Outer – Crew Cab (2 of 2)**

- A - STRUCTURAL ADHESIVE
- 1 - OUTER BODY SIDE PANEL
- 2 - APERTURE FRONT EXTENSION PLATE
- 3 - B-PILLAR REINFORCEMENT

# INDEX