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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.

USE OF HEAT DURING REPAIR

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

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

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

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

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

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

Standard Procedure

SERVICE AFTER A SUPPLEMENTAL RESTRAINT SYSTEM DEPLOYMENT

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

- **Following ANY major vehicle impact damage in the vicinity of an impact sensor or the ORC** - It is critical that the mounting surfaces and mounting brackets for the Occupant Restraint Controller (ORC), front impact sensors and side impact sensors located within the proximity of the impact damage be closely inspected and restored to their original conditions. Because the ORC and each impact sensor are used by the SRS to monitor or confirm the direction and severity of a vehicle impact, improper orientation or insecure fastening of these components may cause airbags not to deploy when required, or to deploy when not required.
- **Following ANY airbag deployment event** - The Lower Anchors and Tethers for CHildren (LATCH) provisions, the upper tether anchors and all interior trim panels must also be inspected.
- **If an active head restraint is deployed** - An inertia-based Active Head Restraint (AHR) unit that is undamaged following a deployment automatically resets itself. These units are designed with the intention of reuse. (Refer to 10 - Restraints/RESTRAINT, Active Head - Standard Procedure).
- **If the driver airbag is deployed** - If the Driver AirBag (DAB) has been deployed, the DAB, the clockspring, the steering column assembly including the intermediate shaft and coupler, both front seat belt anchor tensioners, both front seat belt retractor and tensioner assemblies, both rear outboard seat belt retractor and tensioner assemblies (if equipped), any front seat belt buckle in use and all rear seat belt retractors and buckles in use must be replaced. The front impact sensors and the steering wheel must also be inspected.
- **If the knee airbag is deployed** - If the driver Knee AirBag (KAB) has been deployed, the KAB and the instrument panel steering column opening cover must also be replaced. The instrument panel must also be inspected.
- **If the passenger airbag is deployed** - If the Passenger AirBag (PAB) has been deployed, the PAB, the PAB wire harness or connector and the instrument panel must be replaced.
- **If a seat airbag is deployed** - If a Seat AirBag (SAB) has been deployed, the SAB, the seat back frame, the seat back foam, the seat back trim cover and the side impact sensors on the same side of the vehicle as the deployed airbag must be replaced. Both front seat belt anchor tensioners, both front seat belt retractor and tensioner assemblies, any front seat belt buckle in use and all rear seat belt retractors and buckles in use must be replaced.
- **If a seat belt tensioner is deployed** - The seat belt retractor and anchor tensioners are deployed in conjunction with the front airbags. All seat belt tensioners must be replaced if any airbag in the vehicle except the driver KAB has been deployed.
- **If a side curtain airbag is deployed** - If a side curtain airbag (also known as a Side AirBag Inflatable Curtain/ SABIC) has been deployed, the SABIC, the trim on the upper A, B and C-pillars as well as the side impact sensors on the same side of the vehicle as the deployed airbag must be replaced. The headliner, both front seat belt anchor tensioners, both front seat belt retractor and tensioner assemblies, any front seat belt buckle in use and all rear seat belt retractors and buckles in use must be replaced. The deploy brackets on the B-pillar and C-pillar for the same side of the vehicle as the deployed airbag 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) which must be checked to determine that all squibs were used during the deployment event. The Driver AirBag (DAB) and Passenger AirBag (PAB) in these vehicles 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 having two initiators (squibs) in the airbag inflator may or may not have live pyrotechnic material within the inflator. Do not dispose of these airbags unless you are certain of complete deployment. Refer to 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. Transition the ignition status to On.
3. Using the scan tool, read and record the active (current) Diagnostic Trouble Code (DTC) data.

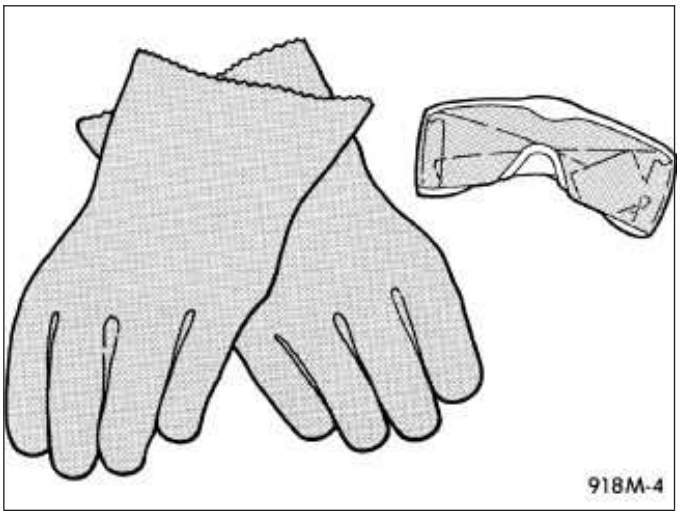
Using the active DTC information, refer to the **Airbag Squib Status** table to determine the status of both DAB squibs and both PAB squibs.

AIRBAG SQUIB STATUS		
IF THE ACTIVE DTC IS:	**CONDITIONS**	**SQUIB STATUS**
Driver or Passenger Squib 1 open	**AND** 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	**AND** the stored DTC minutes for Driver or Passenger Squib 2 open is GREATER 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	**AND** the stored DTC minutes for Driver or Passenger Squib 1 open is GREATER 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	**AND** Driver or Passenger Squib 2 open is NOT an active code	Squib 1 was used; Squib 2 is live.
Driver or Passenger Squib 2 open	**AND** Driver or Passenger Squib 1 open is NOT an active code	Squib 1 is live; Squib 2 was used.

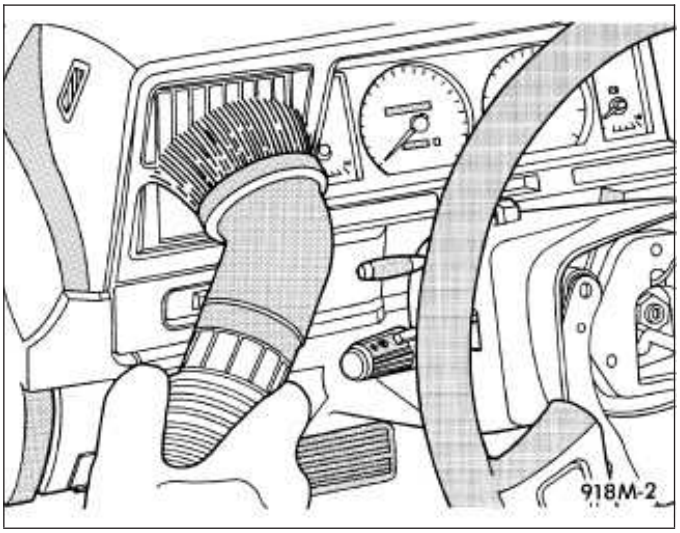
NOTE: If none of the Driver or Passenger Squib 1 or 2 open are active codes, the status of the airbag squibs is unknown. In this case the airbag should be handled and disposed of as if the squibs were both live.

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.



WARNING: To avoid serious or fatal injury, if you experience skin irritation during cleanup, run cool water over the affected area. Also, if you experience irritation of the nose or throat, exit the vehicle for fresh air until the irritation ceases. If irritation continues, see a physician.



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

CAUTION: Deployed front airbags having two initiators (squibs) in the airbag inflator may or may not have live pyrotechnic material within the inflator. Do not dispose of these airbags unless you are certain of complete deployment. Refer to 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.

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: Matte paint finishes must never be finesse sanded, buffed or polished. Once a matte finish has been sanded or becomes glossed, the panel will have to be repainted to restore the matte finish.

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.

MATTE FINISH CARE AND PROTECTION

Matte paint is a unique exterior treatment that gives your Fiat 500X a distinctive appearance. Matte finishes are different from other automotive paints and need special care to maintain their appearance. Typical gloss paints use a high gloss clear-coat finish that reflects light and gives a shiny appearance. A matte finish uses a different coating that diffuses light, providing a unique “flat” finish. Unlike a typical high gloss clear-coat, damage to the matte coating (such as scratches or wear from aggressive cleaning) cannot be polished or buffed out. Once an area is damaged or becomes shiny, the “flat” appearance cannot be restored.

PARTS/EQUIPMENT REQUIRED:

Quantity	Description	Mopar Part Number
1	Swissvax™ Brand Opaque Products And/Or Dr. Beasley’s™ Brand Matte Series And/Or Equivalent	—
2	Wash Buckets With Grit Guard Inserts	—
1	Glass Cleaner	04318014AB
1	Total Clean	04318020AD
1	Windshield Washer Solvent	04318068AB
1	Super Kleen Bug, Tar & Spot Remove	04886330AC
1	Meguiars M34 Mirror Glaze Final Inspection	—
1	Car Wash Soap Designed Specifically for Matte Paint	—
1	Soft Car Wash Mitt, Wash Pad Or Microfiber Sponge	—
1	Hose And Sprayer With Shut-off Nozzle (Optional: Pressure Washer With 45 Degree Or Larger Tip And Pressure Less Than 1200 PSI Held At Least 12 Inches From The Paint)	—
1	Microfiber Cloth	—

Treating your matte finish paint regularly with paint protection will protect the finish, make it easier to keep clean, and prevent water spots from forming. Use products made specifically for matte paint such as Swissvax Opaque Matte Paint Wax and Dr. Beasley’s Matte Paint and Sealant.

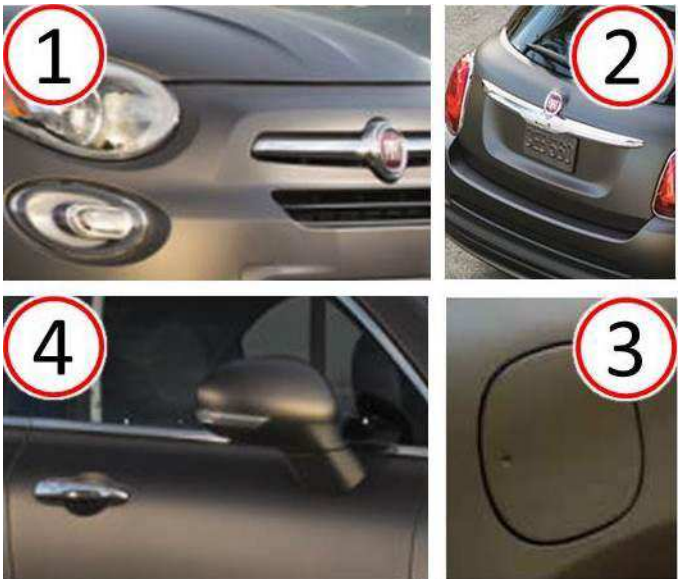
MATTE FINISH PROTECTION:

- Be sure to follow the manufacturer’s recommendations. Always test the product in a hidden area before using in a visible area.
- Apply the product evenly with a minimum amount of wiping to prevent burnishing the matte finish.

NOTE: Lightly wipe the surface in a forward and backward motion; avoid circular motions, which can leave swirls in the finish.

AREAS THAT REQUIRE ADDITIONAL CARE:

- Areas such as fuel door, door handles, door edges, liftgate, and hood that are touched regularly are more prone to texture changes. These areas will develop a shiny, smooth appearance due to polishing from repetitive contact. It is preferable to use clean gloves; otherwise, ensure hands are clean and free of oils or lotions.
- Gasoline will degrade the top coat of the matte finish. Spills and drips around the fuel door will result in shiny areas in the pattern of the contamination. Always use clean towels to protect the painted surface around the fuel door from inadvertent fuel drips or splashes.
- Water spots may form on the fuel door, hood and rear fascia liftgate surface which will permanently change surface texture if allowed to repeatedly dry and leave mineral deposits. The deposits and efforts to clean the area will polish the surface and result in shiny lines.



Areas Requiring Additional Care

1- Hood and Fascia
2- Liftgate
3- Fuel Filler Door
4- Door Handles and Mirrors

GENERAL MAINTENANCE TIPS:

To maintain your vehicle's matte paint appearance for many years to come, please refer to the following care and maintenance tips-

DO NOT:

- Do not use commercial car wash facilities or their shine enhancement products. Most car wash brushes, large mechanized towels and shine enhancement products can damage matte paint.
- Do not use wax, detail spray, Armor All® or any products made for high gloss paint. Only use products specifically developed for matte finish paint.
- Do not use products that are even mildly abrasive, such as polishes, glazes or rubbing compounds.
- Do not use mechanical cleaners or polishers.
- Do not use terry cloth, cloth or paper towels.
- Do not rub the finish vigorously. This will burnish the paint finish, causing a permanent shiny spot. Shiny spots cannot be removed.
- Do not wipe the vehicle in a circular motion; lightly wipe the surface in a forward and backward motion.
- Do not use any products that are not listed under the Parts/Equipment required area of this service bulletin.

DO:

- Remove foreign substances such as insect remains, tar and road debris using a soft applicator and a mild solvent; saturate and soak area before cleaning - rub lightly.
- Hand-wash with a soft wash mitt and mild cleaning products safe for matte paint (see Matte Finish Care Resources).
- Use microfiber cleaning cloths with alcohol-based and ammonia-free window cleaner for basic surface clean-up.

SPOT CLEANING:

The preferred method for removing dirt and debris is pressure washing (see Washing Your Car), but for those times when you need to do a quick spot cleaning to remove tree sap or road debris before it causes damage to the finish, follow these recommendations:

GENERAL SPOT CLEANING PROCEDURE:

- Apply alcohol-based window cleaner or matte paint cleaner to a cloth and surface to be cleaned; do not wipe a dry towel on paint finish - a dry towel will damage the finish.

- Soak the spot and allow the foreign substance to soften.
- Lightly wipe the surface in a forward and backward motion; avoid circular motions, which can leave swirls in the finish.
- Rinse with water so cleaning product does not remain on finish.
- Repeat if necessary.

REMOVING NATURAL STAINS AND ROAD DEBRIS:

- Spray the stained area with water to remove any loose debris.
- Spray the area with an alcohol-based window cleaner, matte paint cleanser, or a solution of 50% alcohol / 50% deionized water.
- Apply cleaning product on a damp microfiber sponge or microfiber towel.
- Wipe car finish lightly to remove debris.
- Dry with a clean, damp microfiber soft cloth.
- Lightly wipe the surface in a forward and backward motion; avoid circular motions, which can leave swirls in the finish.

REMOVING TAR OR TREE SAP:

- Spray the stained area with water to remove any loose debris.
- Dampen remaining debris with tar remover and allow it to soak.
- In a controlled indoor environment, apply tar remover to a damp microfiber soft cloth and follow manufacturer's recommendations.
- Lightly wipe the surface in a forward and backward motion to remove debris; avoid circular motions, which can leave swirls in the finish. Minimize rubbing and let the solvent do the work.
- Once debris is removed, wash with matte paint finish soap, using a damp microfiber soft cloth, then rinse well with water.
- Dry with a clean, damp microfiber soft cloth.

NOTE: Saturate a microfiber soft cloth with tar remover and place it on the debris to soak for five minutes before washing.

PRE-WASHING/WASHING:

Inspect the entire vehicle for areas with heavy soiling or spots, and if necessary, treat these areas first.

NOTE: Always test cleaning products in a hidden area before using in a visible area.

HAND WASH FOR BEST RESULTS:

- For hand washing, park the vehicle in a cool shaded area out of direct sunlight. Read the following procedures thoroughly and prepare your equipment and supplies before soaping up the car

PRESSURE WASHING:

- Pressure washing, with pressure no greater than 8273 kPa (1200 psi), is the best way to remove heavy soiling before washing your vehicle. Use a 45 degree or larger fan tip and hold it at least 30 cm (12 in) from the paint.

WHEELS

- If you plan to clean the wheels, do this before washing the car. Use a Mopar Tire and Wheel Cleaner developed for cleaning coated alloy wheels. **Do not drive the vehicle until the product has set to prevent it from contacting the matte finish. Follow the manufacturer's instructions.**

WASH PROCEDURE:

- Pre-rinse the vehicle with a hose or pressure washer to cool it and to remove large pieces of dirt that can scratch the paint.

  NOTE: Keep the hose nearby for frequent rinsing.
- Prepare one bucket (with dirt separator grid at the bottom) with matte paint car wash solution and water, according to manufacturer's recommendations.
- Fill a second bucket with clean water for rinsing the wash mitt. When washing the vehicle, always rinse the wash mitt to ensure it is clean before placing it into the wash solution.
- Soak the soft car wash mitt, wash pad or microfiber sponge in the wash solution.
- Wash the vehicle lightly, working in small sections from the top to the bottom.
- Wash a section of the vehicle then rinse completely before moving to another section.
- Continue the wash and rinse steps for each section until the car is clean.

NOTE: Keep the clean sections wet as you finish the next section. This thoroughly rinses any remaining soap residue and prevents water spots from forming.

DRYING:

- For best appearance, use a clean damp chamois, sponge cloth or microfiber towel to dry your vehicle before it

air dries. If the paint surface is starting to air dry, dampen the areas that you are not drying. Water blades are not recommended for drying the matte finish.

PAINT TOUCH-UP

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

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

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

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

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

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

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 - 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 some offer anti-corrosion properties, so primers on bare metals are not necessary. Most acrylics have a fast room temperature cure, and are stable with regards to temperature and moisture during cure. However, both of these can effect shelf life. Mix ratio is modestly important although the performance properties can vary with a change in mix ratio. 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 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. The mix ratio can vary by ± 50% and still cure. However, the performance properties will vary when the mix ratio is incorrect. Epoxies are more forgiving than urethanes with regards to mix ratio accuracy.
- **Urethane Adhesive -** Typically flexible and bond well to plastics. However, they usually require primers on metal surfaces to protect against corrosion. Urethanes have good seam sealing and NVH qualities and are frequently the optimal choice for seam sealers. They are sensitive to moisture during cure, packaging and storage. Single component urethanes usually have a much shorter shelf life than two component urethanes. Mix ratios are critical for urethanes. In most cases it cannot vary more than ± 5%. Therefore, hand mixing is not recommended. Urethanes are the most unforgiving of the three chemistries with regards to mix ratio accuracy.

Non-Structural Sheet Metal Repair Table

JOINT AND REPAIR TYPES	REFERENCE
Backer Panel Joint	Backer Panel Joint
Door Skin	Door Skin Replacement
Body Side Aperture/Quarter Panel	Body Side Aperture/Quarter Panel
Metal Fatigue/Stress Cracks	Metal Fatigue Stress Crack

Backer Panel Joint

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

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

Preparation:

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

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

   NOTE: It will be difficult to abrade the underside mating surface of the original panel, however this is an important step and should be done effectively.
2. Create a 50mm. (2in.) 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 25mm. (1in.) 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 - 1.6mm. (1/32 - 1/16in.) 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: Refer to the structural adhesives manufacturer for information on work, handling and curing times.
7. Apply a 10 - 13mm. (3/8 - 1/2in.) 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 - 13mm. (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 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.

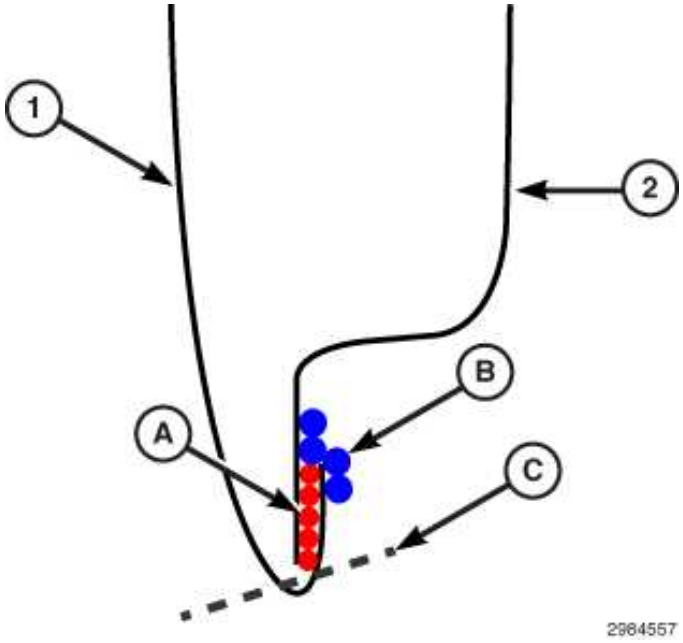
16. Apply inner panel corrosion inhibiting materials (Mopar Cavity Wax part #6804292970 or equivalent).

Door Skin Replacement

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

Preparation:

1. Belt cut skins will require determining and cutting of the sectioning locations on the original panel and on the replacement panel.
2. Remove the door skin by grinding the outer edge (C) until the seam is perforated.
3. Cut around weld nuggets and spot welds with a spot weld cutting bit or similar weld removal tool.
4. 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.
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. 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 25mm. (1in.) of the belt cut location.

12. Apply a 10 - 13mm. (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.

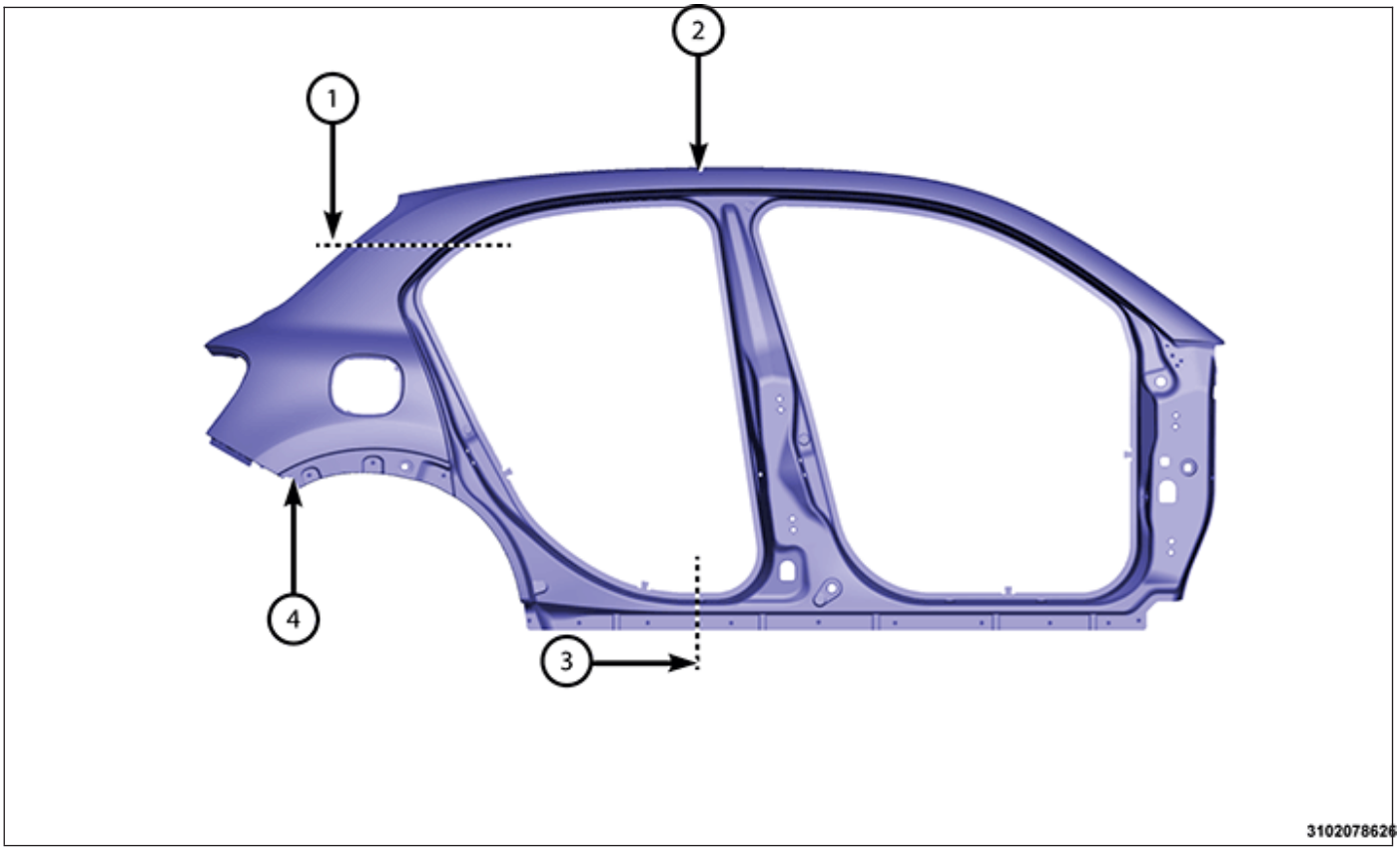
NOTE: When applying adhesives be certain any and all drain holes remain open and clear of obstructions.

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 GMAW (Gas Metal Arc Welding), 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).

Body Side Aperture/Quarter Panel



1 - UPPER CUT LINE
2 - BODY SIDE APERTURE
3 - LOWER CUT LINE
4 - QUARTER PANEL

Overview: Recommended repair procedure for body side aperture / quarter panel replacement include butt joints with a welded backer panel and 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 on Weld Bonding, (Refer to 31 - Collision Information - Standard Procedure), Weld / Weld bonding. 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 that may apply to the body side aperture / quarter panel sectioning locations. For detailed body side aperture/quarter panel replacement procedure (Refer to 31- Collision/Standard Procedure/Sectioning Locations and Component Procedure/Body Side Aperture Quarter Panel).

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 3mm. (1/8in.) 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. Stitch weld the seam/crack closed using GMAW. Follow welding guidelines as found in Weld/Weld Bonding, (Refer to Collision Information - Standard Procedure).
4. Dress the welds as necessary. **Careful not to thin the base metal.**
5. 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.
6. Apply inner panel corrosion inhibiting materials (Mopar Cavity Wax part #68042970AA , or equivalent).

WELDING AND WELD BONDING

Safety Notice

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

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

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

Safety Precautions

WARNING:

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

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

Welding

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

Adhesives:

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

Introduction

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

INDEX	REFERENCE
Panel Removal	Panel Removal
Key Points of a Welding Repair	Key Points of a Welding Repair
Requirements of a Welding Repair	Requirements of a Welding Repair
Modified Lap Joint	Modified Lap Joint
Types of Welding (STRSW, GMAW and Weld Bonding)	Types of Welding

INDEX	REFERENCE
Weld Processes (STRSW, GMAW and Weld Bonding)	Weld Processes
Minimum Weld Nugget Requirement Chart	Minimum Weld Nugget Chart
Training and Qualification	Training and Qualification

Panel Removal

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

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

Key Points of a Welding Repair

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

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

Requirements of a Welding Repair

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

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

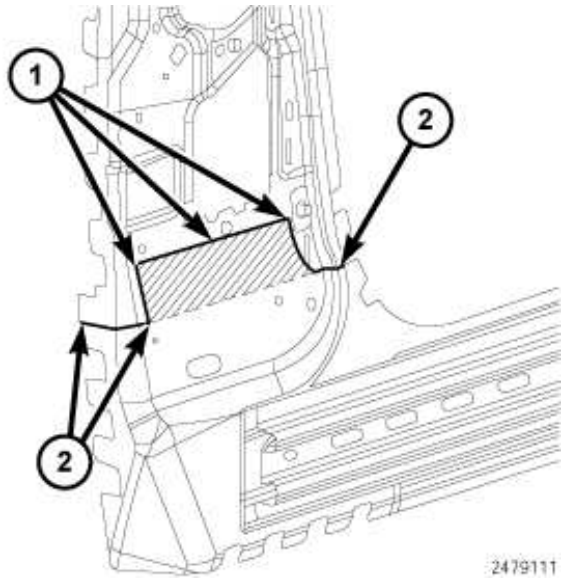
A significant amount of structural adhesive is used at the OEM to improve joint strength. It may be difficult to determine if the material between the panels is an adhesive or a sealer, and for this reason, the following guideline should be used: **If in doubt, use a two-component, corrosion inhibiting,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

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

Modified Lap Joint

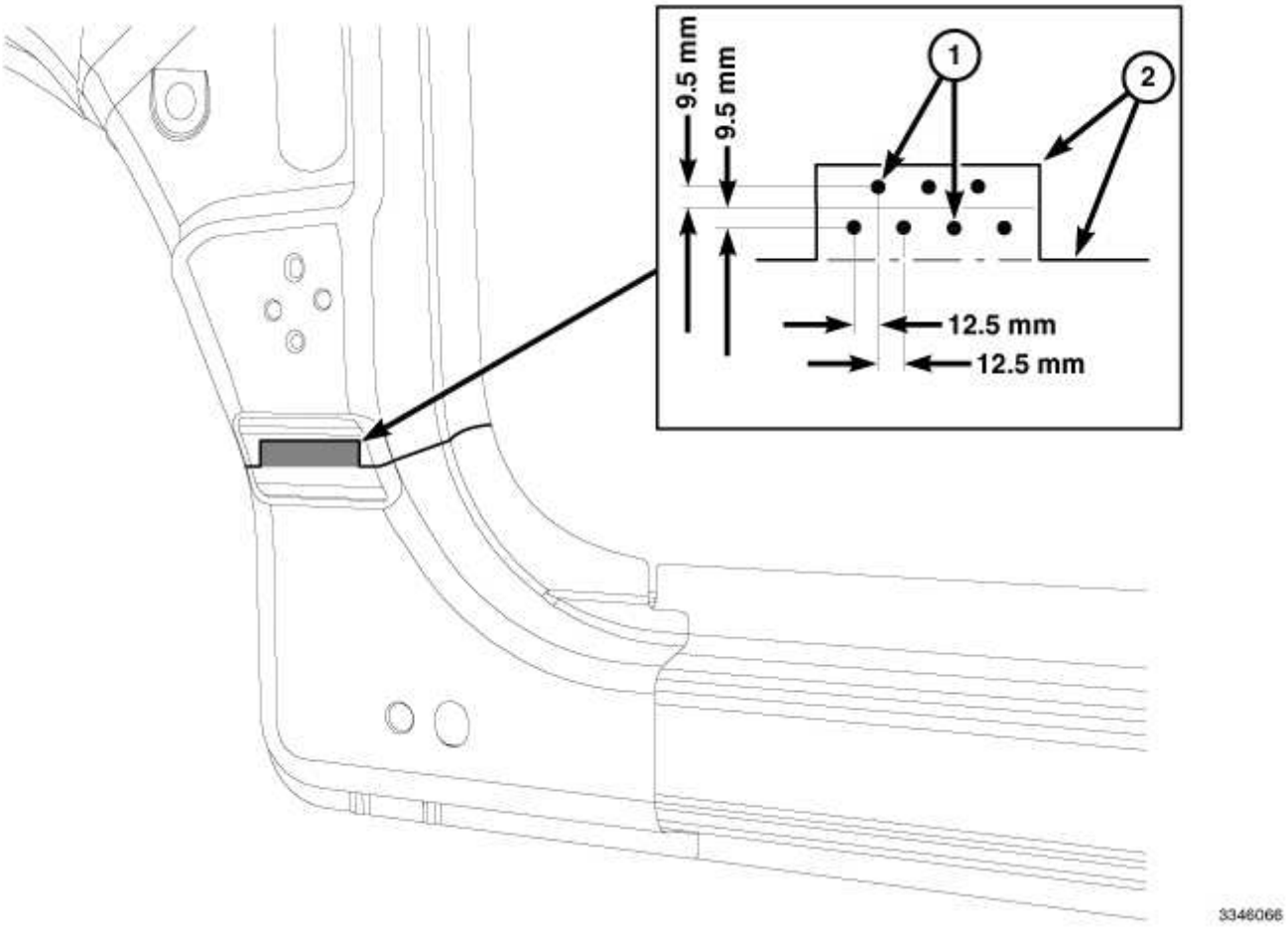
NOTE: Parts shown for example purposes only. Emphasis is on joint design and proper plug weld placement.

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



Modified Lap Joint

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



Plug Weld Layout

1 - MIG PLUG WELDS
2 - MIG SEAM WELD

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

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

Types of Welding

Squeeze Type Resistant Spot Welding (STRSW)

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

Gas Metal Arc Welding (GMAW) or "MIG"

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

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

Flux Core Arc Welding (FCAW)

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

Metal Active Gas (Mag) Brazing

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

Weld Bonding

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

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

Weld Processes

Squeeze Type Resistance Spot Welding (STRSW)

Applications

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

Equipment Requirements

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

Gas Metal Arc Welding (GMAW) or ″MIG″

Applications

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

Weld Process

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

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

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

Always process to the Thinner Material Thickness (TMT)

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

NOTE:

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

Equipment Requirements

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

Limitations

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

Testing

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

Post Weld Procedures

- When welding has been completed, welds in cosmetic locations must be dressed.
- Welds will need to be smoothed down to the height of the surrounding panel without any thinning of the sheet metal. This can be accomplished using one of many sanding or grinding products available in the aftermarket.

- Slag must always be removed prior to refinishing to restore corrosion protection and appearance.
- Corrosion inhibiting materials must be applied to seal the weld zone from future corrosion.

Minimum Weld Nugget Requirement Chart

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

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

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

Equipment Limitations

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

Access Limitations

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

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

Preparation

- Prior to making repairs with STRSW, weld coupons must be created for testing. The test joint must be an exact duplicate of the original joint, including layering and adhesive application. The testing is required to ensure the repair restores the vehicle to its originally produced condition using the minimum weld nugget requirement chart.
- To correctly identify the material being welded or tested, the technician must posses an accurate material thickness gauge.
- No "improvements" to the vehicle design are allowed as this could have a negative impact on the vehicle as a whole. The repair should mirror what was used on the vehicle at the assembly plant.
- Note, the weld is affected by more than just the thickness or number of panels being welded, but also material coatings. Zinc based anti-corrosion coatings (i.e., galvannealing, galvanizing), sealers, adhesives, and E-coat will affect welder performance.
- When preparing an E-coated panel for STRSW the E-coat must be removed from both of the mating flanges within 25 mm. (1 in.) of any flange. Corrosion protection is required anytime you remove E-coat. A scuffing disc should be used to remove the E-coat without damaging other sheet metal coatings
- With advancements in technology some STRSW welders now have computer controlled programs. These technologically advanced welders are capable of measuring the thickness and resistance of the panels being welded including multiple tiers and types of metal. The computer program is able to process the information to provide the proper spot weld consistently.
- If the panel originally had structural adhesives it should be reapplied prior to welding. The adhesive should have a corrosion inhibitor and cover all bare metal.
- Prior to creating weld coupons and the final body repairs, all coatings and dirt/road debris must be removed.

Testing

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

material thickness, and joint configurations have a direct impact on nugget size.

Weld Bonding

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

Application

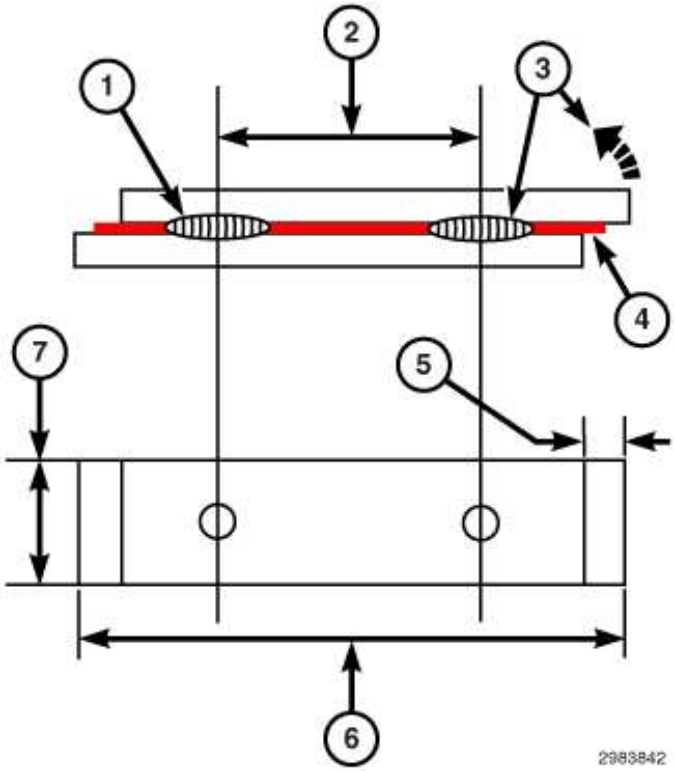
- Weld bonding is the STRSW welding process utilizing structural adhesive between the panels that are resistance welded together. The adhesive creates a very stiff structure, while the welding eliminates concerns of the adhesives' peel strength.
- Additionally, the adhesive acts as a sealer and provides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

Sealers and Adhesives

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

Test Weld Coupon

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

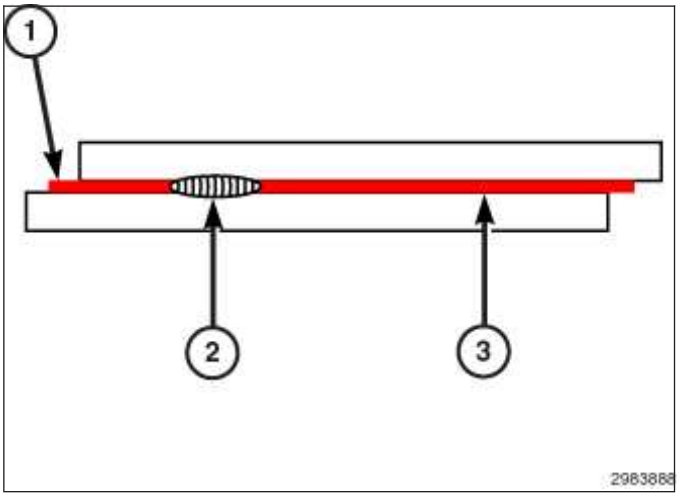


Weld Coupon

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

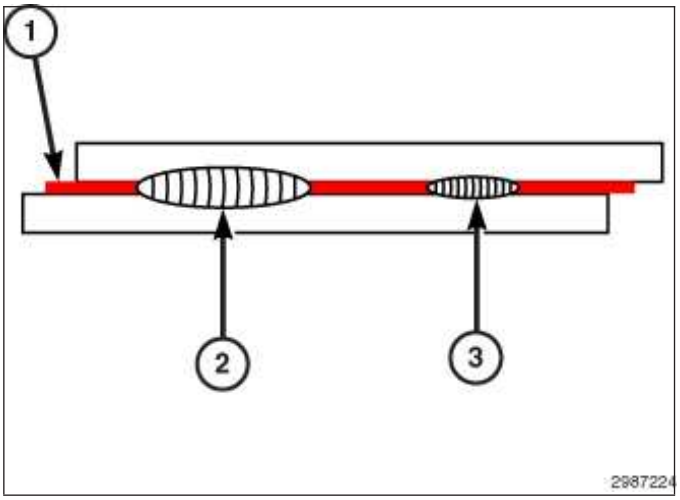
Weld Examples

Current Level Low for Both Welds



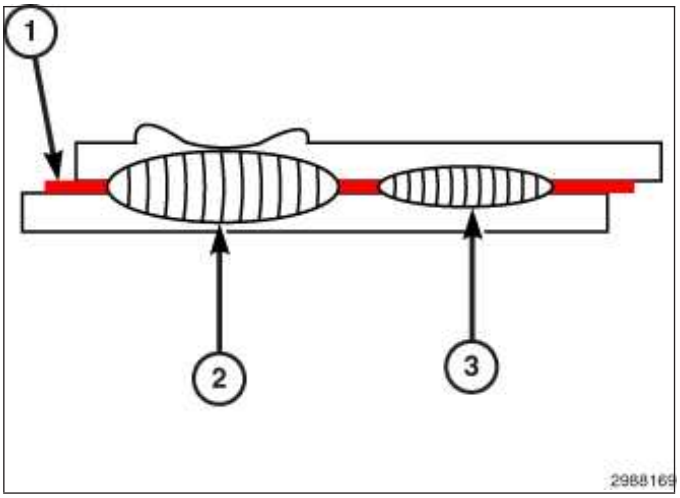
1 - STRUCTURAL ADHESIVE
2 - WELD TOO SMALL
3 - WELD NON-EXISTENT

Current Level Medium for Both Welds



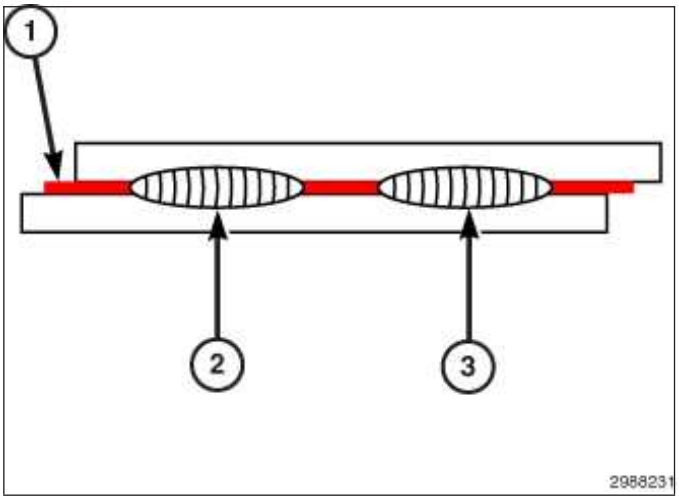
1 - STRUCTURAL ADHESIVE
2 - WELD CORRECT SIZE
3 - WELD TOO SMALL

Current Level High for Both Welds



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

Current Level Adjusted to Provide Acceptable Welds



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

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

NOTE: Galvanneal and galvanized coated steel will require more force

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

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

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

Final Weld Preparation

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

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

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

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

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

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

Training and Qualification

Training

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

Training must be considered a two-fold process:

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

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

Qualification

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

SECTIONING LOCATIONS AND COMPONENT PROCEDURES

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

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

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

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

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

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

CAUTION:

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

Service assemblies for body components may be disassembled if utilization of the subcomponents is more appropriate to the repair or to reduce vehicle disruption. The structural and non-structural metal on the Fiat 500X (FB) may be sectioned in several areas providing the prescribed methods below are adhered to.

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

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

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

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

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

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

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

For information on the tools and operations symbols, utilized throughout the sectioning and component procedures, refer to General Repair Symbols in the following table.

DESCRIPTION	INFORMATION
General Panels and Framework	General Panel and Framework

DESCRIPTION	INFORMATION
General Repair Symbols	Repair Symbols
Body Side Aperture Panel Sill Sectioning	Sill Sectioning Removal and Installation
Body Side Aperture Panel Upper Sectioning	Upper Sectioning Removal and Installation
Body Side Aperture Quarter Panel	Quarter Panel Removal and Installation
Body Side Inner Components **DO NOT SECTION**	Body Side Inner Components Do Not Section
B-Pillar Reinforcement	B-Pillar Reinforcement Removal and Installation
Center Floor Pan	Center Floor Pan Removal and Installation
Cowl Side Reinforcement	Cowl Side- Reinforcement Removal and Installation
Front Fender	Front Fender Removal and Installation
Front Fender Bracket	Front Fender Bracket Removal and Installation
Front Frame Rail	Front Frame Rail Removal and Installation
Front Frame Rail Sectioning	Front Frame Rail Sectioning Removal and Installation
Front Siderail Plate	Front Siderail Plate Removal and Installation
Front Wheelhouse	Front Wheelhouse Removal and Installation
Fuel Filler Door Reinforcement	Fuel Filler Door Reinforcement Removal and Installation
Liftgate Opening Trough	Liftgate Opening Trough Removal and Installation
Load Path Beam	Load Path Beam Removal and Installation
Quarter Panel	Quarter Panel Removal and Installation
Quarter Panel Extension	Quarter Panel Extension Removal and Installation
Quarter Panel Inner	Quarter Panel Inner Removal and Installation
Rear Closure Panel	Rear Closure Panel Removal and Installation
Rear Floor Pan	Rear Floor Pan Removal and Installation
Rear Floor Pan Extension	Rear Floor Pan Extension Removal and Installation
Rear Frame Rail	Rear Frame Rail Removal and Installation
Rear Frame Rail Sectioning	Rear Frame Rail Sectioning Removal and Installation
Rear Wheelhouse Inner	Rear Wheelhouse Inner Removal and Installation
Rear Wheelhouse Outer	Rear Wheelhouse Outer Removal and Installation
Rear Wheelhouse Outer Extension	Rear Wheelhouse Outer Extension Removal and Installation
Rear Wheelhouse Reinforcement	Rear Wheelhouse Reinforcement Removal and Installation
Roof Bow	Roof Bow Removal and Installation
Roof Panel	Roof Panel Removal and Installation
Taillamp Mounting Panel	Taillamp Mounting Panel Removal and Installation

GENERAL PANELS AND FRAMEWORK

VEHICLE REPAIRS

Vehicle identification data

The vehicle is equipped with the following identification plates:

- V.I.N. plate.
- Body paintwork color identification plate.

- Chassis marking.
- Engine marking.

For further details (Refer to 00 - Vehicle Data/Vehicle Information Vehicle Data).

NOTE: **After a repair operation, it may be necessary to replace the panel components that have the vehicle identification number on them or the number may be damaged.**

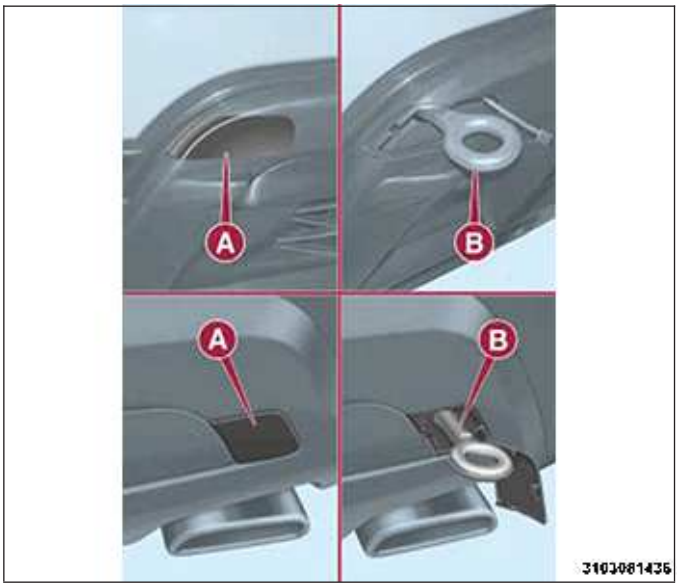
In that case, you must follow the laws in force in the country in which the vehicle is registered to carry out the restoration of that marking.

A similar procedure should be carried out if the plate containing the vehicle identification number is damaged or removed.

Vehicle towing points

WARNING: **When towing the vehicle you must comply with the specific traffic regulations, relating to the tow hook and the actions to take towing on the road. Thoroughly clean the threaded holes before screwing the hook. Before starting to tow, be sure to screw down the tow hook tightly. Make sure the ignition key is inserted into the relative ignition switch and that the steering lock is not engaged. With the engine off you do not have the help of the brake booster and power steering, so you need to exert more effort on both the brake pedal and on the steering wheel.**

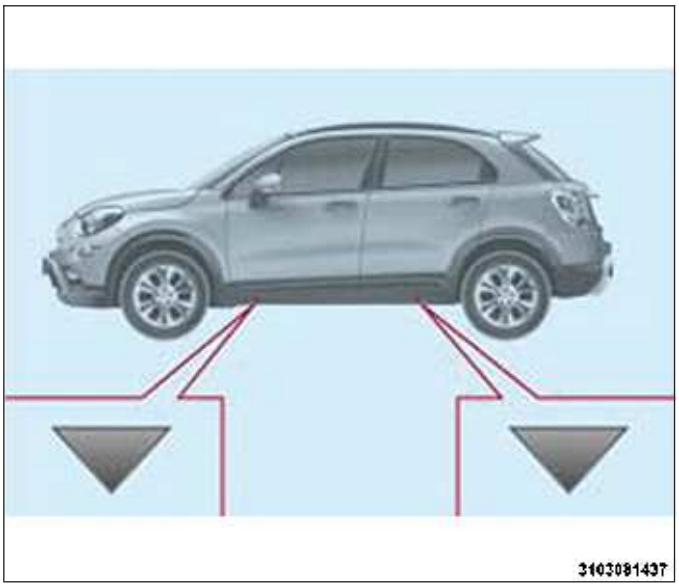
The vehicle is equipped with two threaded housings, one at the front and one at the front and rear (A), for the installation of towing hook (B). The tow hook is located in the tool kit provided with the vehicle, located in the tool kit inside the trunk.



Vehicle lifting points

To raise the vehicle using lifting arms or with a workshop lift, place the ends of the arms or the lift only in the areas indicated in the figure.

WARNING: Before raising the vehicle with the portable lifts, engage the hand brake and block the wheels by placing wedges in front of the front wheels and behind the rear wheels. After lifting the vehicle, support it with suitable safety stands.



General safety instructions

The activities related to the repair of the body involve the use of specialty equipment and work tools as well as the handling of substances and chemicals to be treated in accordance with the supplier's recommendations.

Special attention should be paid to:

- The proper use of materials, tools and equipment: Before performing any operation, carefully read the instruction manuals and carefully follow the instructions and the safety regulations prescribed.
- Regarding the areas equipped for work, which must be equipped with a ventilation system that guarantees legally admissible levels relative to fresh air exchange, filtration of harmful substances (solvents) and dust suppression.
- Handling of hazardous substances are to be used according to the instructions and recommendations of the supplier.
- The collection and disposal of waste is to be carried out in accordance with current regulations.

When working with and handling dangerous and hazardous substances it is imperative that appropriate accident prevention measures must be taken (wearing protective clothing, masks, gloves, goggles etc.).

Vehicle repair procedures stages

The vehicle repair procedures stages usually consist of the following stages:

- Checking vehicle measurements
- Cutting/removing damaged elements and preparing the body for welding
- Welding replacement parts
- Preparing for painting
- Painting
- Restoring anti corrosion conditions
- Sound insulation, sealants

Check and restore specified vehicle measurements-

This is the first stage of the repair operation during which the distortion suffered by the body is measured and evaluated and the elements involved are identified.

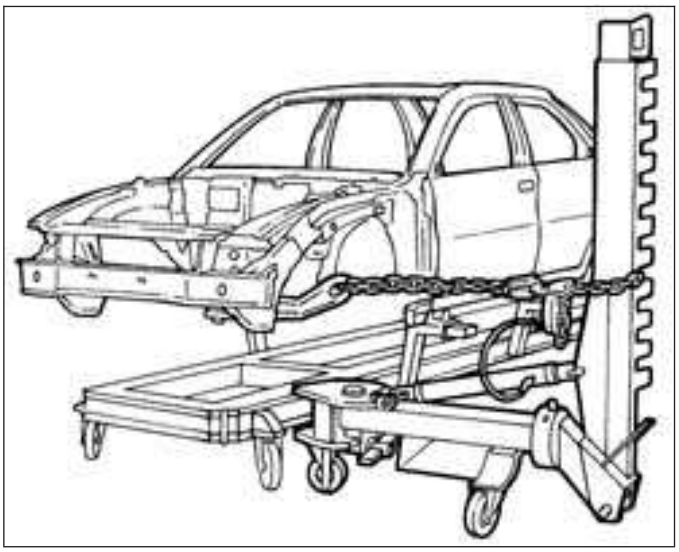
The first actual repair operation is also carried out during this stage: pulling the body to restore the correct dimensions before cutting and removing the damaged elements.

Pulling the body-

Pulling the body to restore its dimensions is carried out on the alignment bench (frame rack), where it is possible to secure the body using clamps and connections to be fitted in accordance with the specific instructions for each vehicle, which come with the bench (rack).

Templates, positioned in the recommended places, are used to check the body measurements either using the measurements given by the manufacturer of the template for each model or, alternatively, those for the vehicle given in the "Specifications" section.

Example of a possible alignment bench (frame rack).



General repair instructions

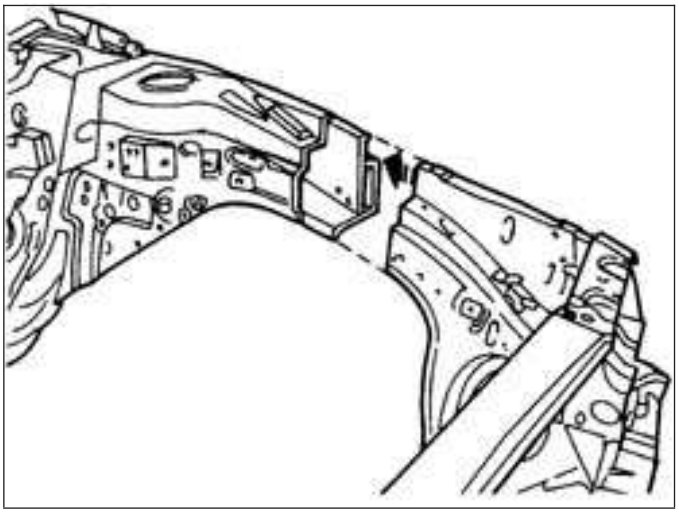
CAUTION: Before performing any work on the car disconnect the battery terminals.

For safety reasons and for a better quality repair, IT IS FORBIDDEN TO:

- Replace the structural parts of the body without using a repair bench. The use of the bench makes it possible to guarantee the restructuring of the vehicle with the original manufacturing measurements, ensuring the correct positioning of the components that make up the front and the rear part of the vehicle.
- Heat the structural parts of the body to straighten them.
- Cut and weld any bodywork component and reinforcement, edge to edge, on the same line.

Remove the damaged components by cutting them along the joints, following the cutting lines given in the Collision Manual. Correctly carried out, this operation involves a difference of several centimeters between the two cutting lines in order to distribute the fusion spots created by the welding.

The diagram illustrates a possible implementation.



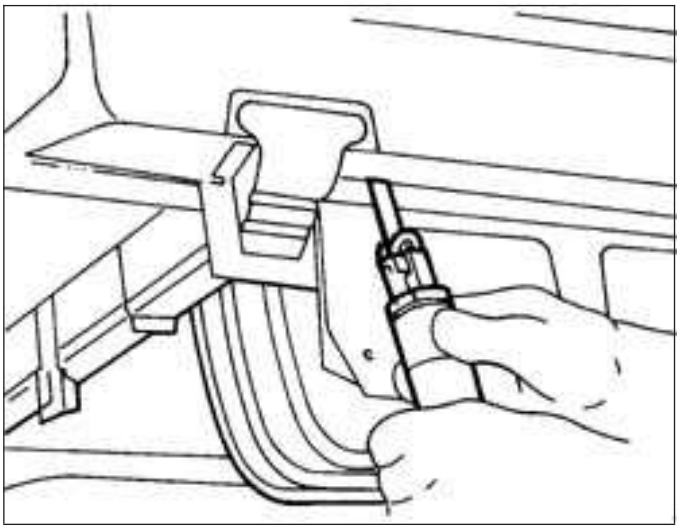
WARNING: Removing the damaged components is the repair stage during which the most potentially dangerous equipment is used. Before carrying out any operation, carefully read the instruction manual and the safety instructions and warnings given by the manufacturer together with the equipment, and strictly follow all safety precautions.

The use of the following is required for removing damaged panels:

- Power reciprocating/jig saws
- Circular saws
- Pneumatic chisels (only if necessary)
- Plasma cutting systems
- Electric drills

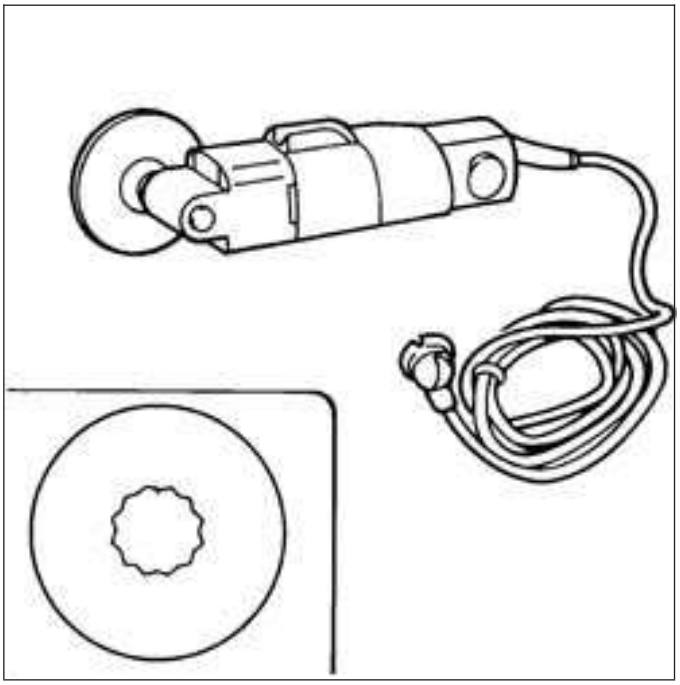
- Milling machines for spot weld removal
- Grinders
- Hammers and dolly blocks
- Disc grinders
- Air extractor fans

Power reciprocating/jig saw- This type of saw makes it possible to make fast, precision cuts with the possibility of regulating the speed of the blade so that it can be adapted to suit different situations.



Example of the use of a power reciprocating/jig saw.

Vibrating circular saw- A vibrating saw is used in situations which require high precision cutting; for example, the panel in a box section is to be replaced, overlapping on the panel that should not be damaged. By adjusting the speed and the number of oscillations it is possible to achieve the precision required, according to the usage conditions. The high safety level for this instrument means that it is advisable to use it as an alternative to other types of saws.

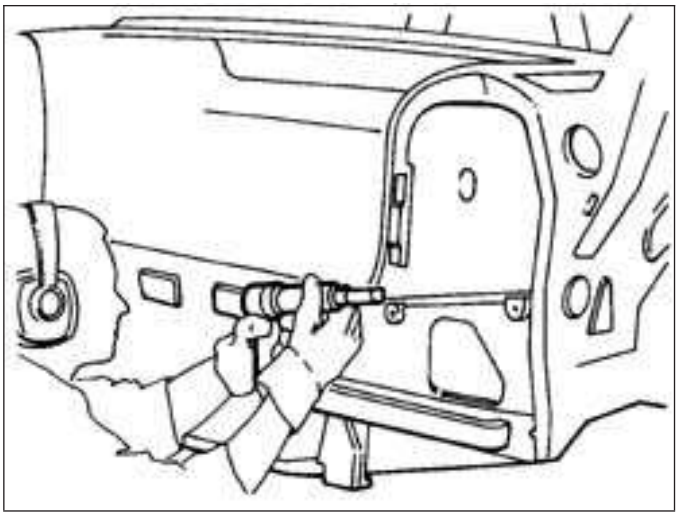


Example of a vibrating circular saw.

Pneumatic chisel- The pneumatic chisel is used to remove pieces of sheet metal. Its use is indicated when:

- It is not possible to use the power saw, the spot weld removal milling machine or the drill (for example, when behind the sheet metal to be cut there is another that must not be damaged)
- It is possible to separate the welded panel directly by inserting the chisel tip between the two panels along the join, in order to leave no edges to be removed at a later stage.

The different tips which can be fitted increase its versatility of use.

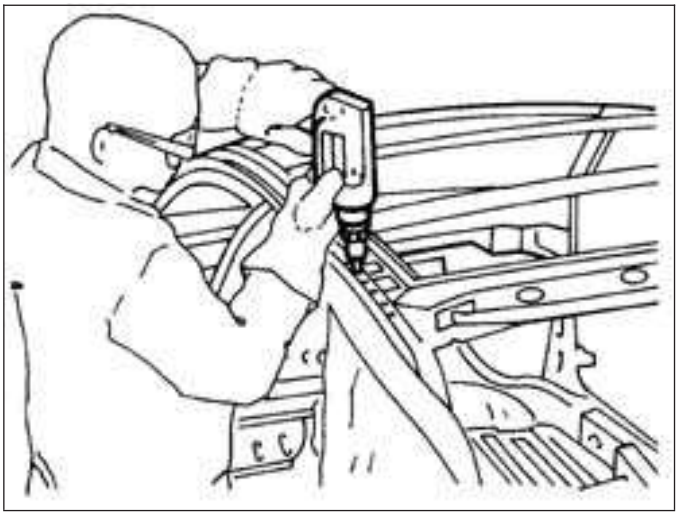


Example of application of pneumatic chisel.

Plasma cutting system-This cutting system, produced through the combined effect of an electrical arc and gas or a gas mixture, is used if very large panels have to be removed. Depending on the thickness of the panel and the depth of the cut, the value of the current and flow of gas can be adjusted in accordance with the instruction manual supplied by the manufacturer.

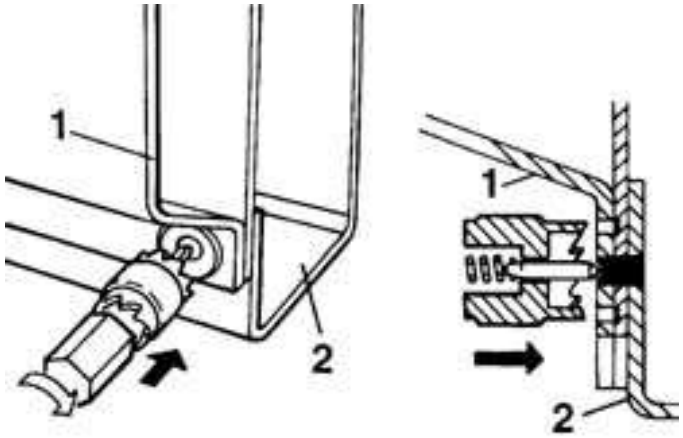
WARNING: The use of plasma cutting systems requires the use of an extraction system to remove harmful gases and fumes.

Electric drill- Electric drills are normally used in cases where a milling machine cannot be used. The correct use of the drill for removing spot welds, where multiple panels are overlapping is illustrated below. The tip to be used for these operations is identical to the one fitted on the milling machine. The spot weld must be marked using a drift punch, in order to provide support for the centering point, thereby preventing the cutter from slipping and damaging the surrounding area; the cutter should then be pushed until it reaches slightly deeper than the thickness of the panel to be removed (see diagram below).



Example of the use of an electric drill.

Example of the correct use of a milling tip.



1- Panel to be detached.
2- Box section panel preventing the use of the milling wheel.

Milling machine (for spot weld removal)-

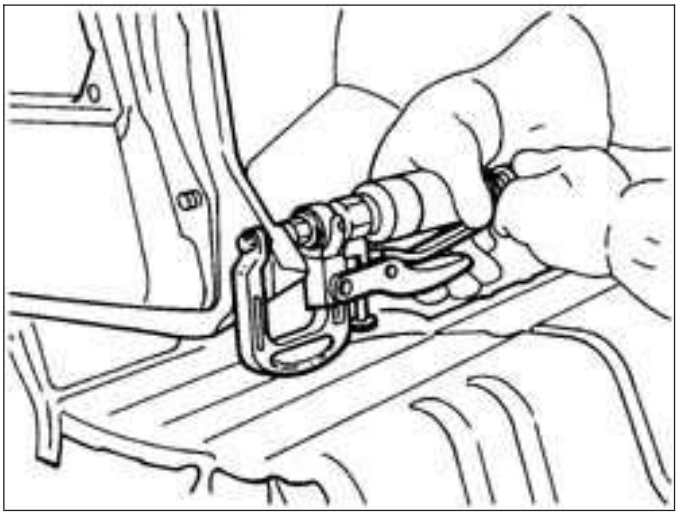
A milling machine for removing spot welds is used after the panel to be replaced has been cut to allow the removal of the metal off-cuts remaining on the edges of the body.

The milling machine works on the panel, cutting it as far as the panel underneath and insulating the spot weld.

After removing all the spot welds, the piece cut off can be removed using pliers.

A cutting speed of around 1000 rpm should be used to perform the operation.

Adjust the milling depth using the special screw.



Example of the use of a milling machine.

CAUTION: Do not drill matching components. If holes have been made accidentally, close them using (MIG) welding. The presence of holes decreases the resistance of the component involved and can also increase penetration by water and corrosive agents.

Lever and dolly block- These tools are used when panels need to be hammered straight in order to provide a reaction point supporting the panel. The dolly blocks are designed so that they can be adapted to suit the different shapes of the panel and, when the work area permits, they can replace the hammer.

The levers have the same usage instructions as the dolly blocks, however they are designed so that they can be introduced through openings and restricted spaces into areas that are difficult to reach.

Dolly blocks and levers are also used to remove distortions from the edge of panels that are not removed, thereby allowing them to be matched with replaced panels, preventing the structure from being weakened.

Welding replacement parts

CAUTION: If you need to carry out any welding or machining that could trigger flames near the fuel system components, fuel or other flammable parts of the vehicle, remove the component from the vehicle and plug the open lines connections. Disconnect the electrical connections of the control units (IE, ABS, Air Bag, Air Conditioner, Body Computer, etc.) that could be damaged during processing.

The welding of the body elements can be carried out, depending on the requirements, with different methods:

- Spot welding
- Wire welding (MIG)
- Brazing

Equipment-

The equipment used for these operations are:

- Welding machines with clamps - Squeeze Type Resistant Spot Welding (STRSW)
- Continuous wire welding - Metal Inert Gas (MIG)
- Oxy-acetylene torches (brazing)

General information on electric spot welding-

During spot welding the heat required to melt the metal is provided by the resistance to the flow of current which the metal opposes.

Spot welding is carried out on panels where the join edges are overlapping and takes place through localized fusion of the metal that makes up the panel so no weld metal is required for this type of welding. In areas where three or more panels are overlapping, the spot welding must be repeated a second time.

The type of join that is produced is discontinuous; the weld spots must be correctly spaced in order to confer good mechanical resistance, in accordance with the precise instructions (see the tables below).

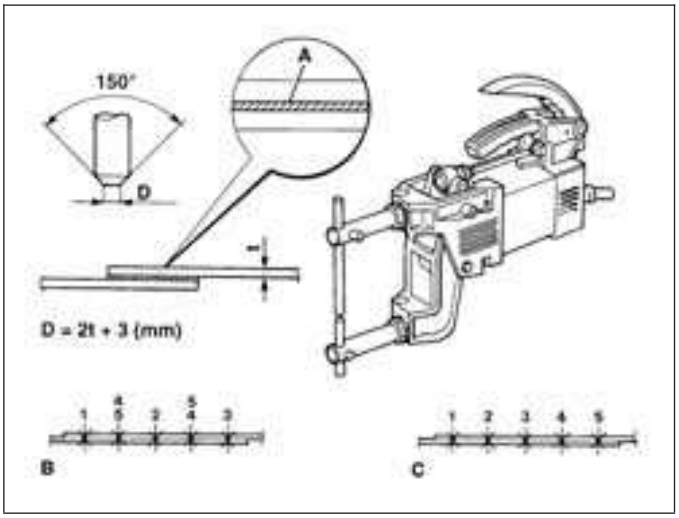
Spot welding-

In the case of spot welding, check:

- That the arms are correctly aligned
- That the diameter of the ends of the electrodes are correct
- The flatness and correct matching of the edges of the weld
- The correct welding sequence.

CAUTION: Before welding, apply electro-weldable galvanized coating/weld through primer to the edges of the join in order to protect the box sections from corrosion.

1. Electro-weldable galvanized coating
2. Correct welding sequence
3. Incorrect welding sequence
4. Size of the electrode



Spot welder, geometric specifications of the electrode depending on the thickness of the panel and the welding sequence.

1. Table for determining the distance of the spot welds from the edges of the panels according to their thickness.
2. Table of reference values for the correct spacing of spot welds depending on the thickness of the panel.

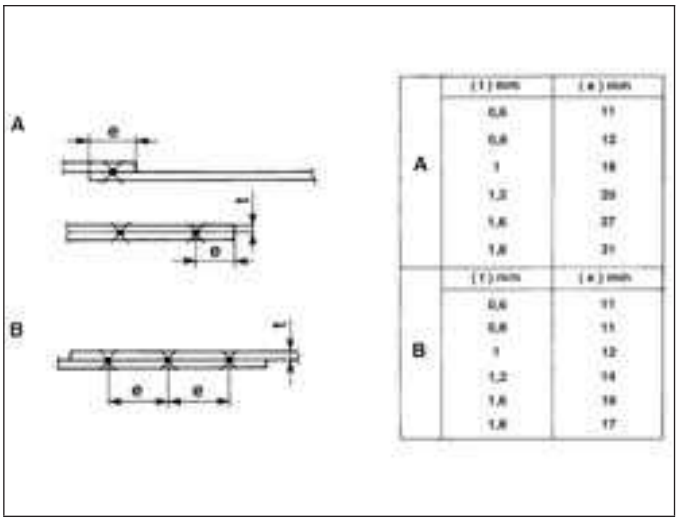
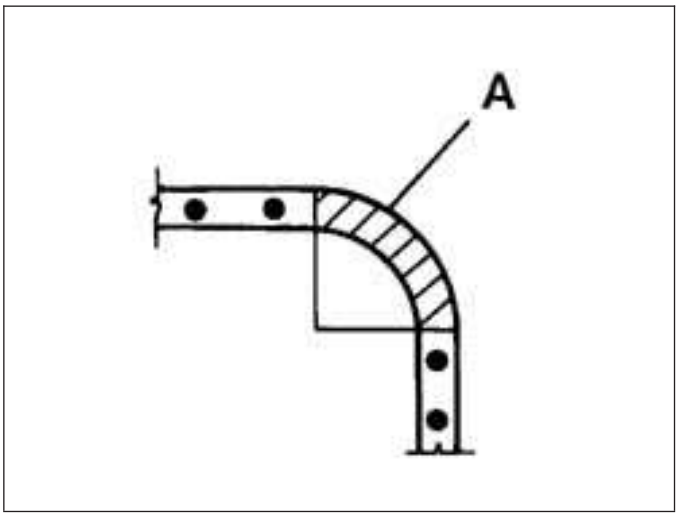


Table of reference values for carrying out spot welding.

CAUTION: Do not weld corner shaped surfaces. If welds are made on this type of surface it produces a concentration of tension that causes it to break.

1. Area where welding should not be carried out



Example of correct spot welding at corners.

Seam welding (MIG)-

NOTE: MIG welding should be used for parts where spot welding cannot be used.

When seam (MIG) welding, check:

- The speed of the wire
- The correct execution of the seam welding beads (alternation of welding sections)

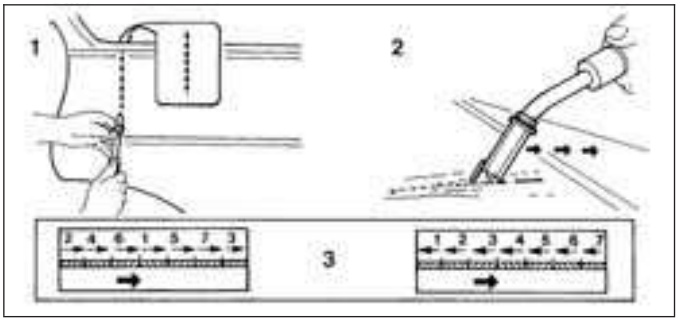
In this welding system the electrode (an automatic advance continuous wire) is protected by an atmosphere of inert gases (this is where the initials MIG come from - Metal Inert Gas). - The continuous advance of the wire (which constitutes both the electrode and the weld metal), allows long welds to be made with no interruptions. The flow of inert gases sent to the welding area eliminates the air surrounding the fusion bath, preventing the oxidation of the metal. It also carries out the function of a protective coating for coated electrode welding. For these reasons, MIG welding differs from welding carried out with a coated electrode due to the absence of slag on the weld bead. Neither is it affected by the porosity that may be seen with normal arc welding.

WARNING: The use of MIG welding systems requires use of an extraction system to remove the harmful gases and fumes.

Operating methods-

In order to butt weld two panels correctly using a MIG welder: grind or dress the panel thoroughly, position the equipment so that when carrying out the welding the torch outer casing does not become twisted or folded in such a way that could obstruct the advance of the wire. Wear protective clothing and a suitable mask with an anti-glare visor (standard no. 8 glass for currents of 40-60A and no. 9 for currents of 80-200A). Be certain to have good electrical contact. Regulate the flow of gas in accordance with the instructions from the equipment's manufacturer.

Make two tack welds at the ends of the join line and one in the middle, then make tack welds in between the two sections defined in this way. The spot welds should be 25 - 30 mm apart.



The figure shows the correct application of the welding (1).

NOTE: The correct gap is about 1 mm.

Carrying out welding (2) using an inert gas electrode (MIG) to join adjacent panels.

It is not advisable to seam weld initially because, in addition to being difficult in practical terms, it may cause the panel to become distorted as a result of the build up of heat involved.

The difficulty in carrying out a single seam weld is that the torch must be moved fairly slowly to produce good penetration of the weld but sufficiently quickly so as not to run the risk of "burning" the panel.

Moving the torch too quickly also leads to a poor fusion of the weld seam because, after grinding the seam, an insufficient layer of filler material remains to guarantee the strength of the joint.

After initially welding the panel, use a rigid disc grinder to grind the weld spots level with the panel.

At this point the alignment of the panels must be checked and, if necessary, corrected using a hammer and dolly block.

Then proceed with filling the gaps between the various spot welds through alternating welding sections, keeping the torch at an angle of about 60° (see previous diagram).

1. Tack welding the joint. The tack welds at the back of the panel are illustrated. Grinding the joint tack welds.
2. Welding.
3. The illustration shows two alternatives for the correct welding sequence in order to prevent the distortion of the panel.

The advantage of the welding operation is confirmed by the appearance of the rear of the weld seam which must show a series of spherical caps side by side for the entire length of the joint.

The MIG welder can also be used for joining overlapping panels where only one side is accessible.

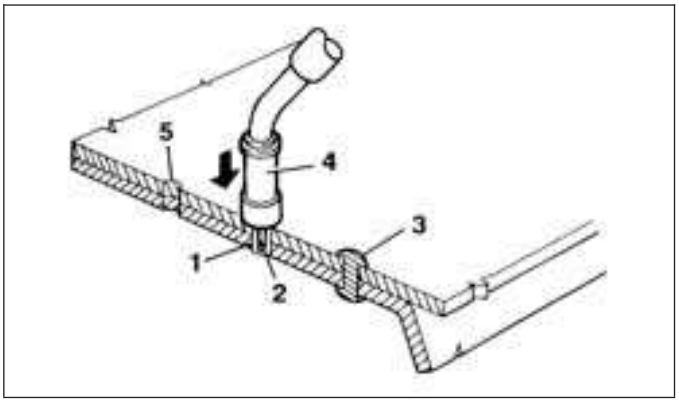
To carry out spot welding, the panels must adhere perfectly and the torch must be perpendicular to the surface.

In this way the action of the electrode initially melts the first panel, then the second, where a crater is produced which is filled by the advance of the electrode.

In order to carry out this operation correctly, the welding machine must be regulated to current values that are suitable for the thickness of the panels being worked on with the torch resting on its supports and pressure on the surface to facilitate the panels being brought close together.

If the panels are thicker than 1.5 - 2.5 mm, make an initial 0.6 mm hole at the sites of the plug welds.

1. Panel join area
2. Electrode
3. Plug weld
4. Torch
5. Hole (only for thick panels)

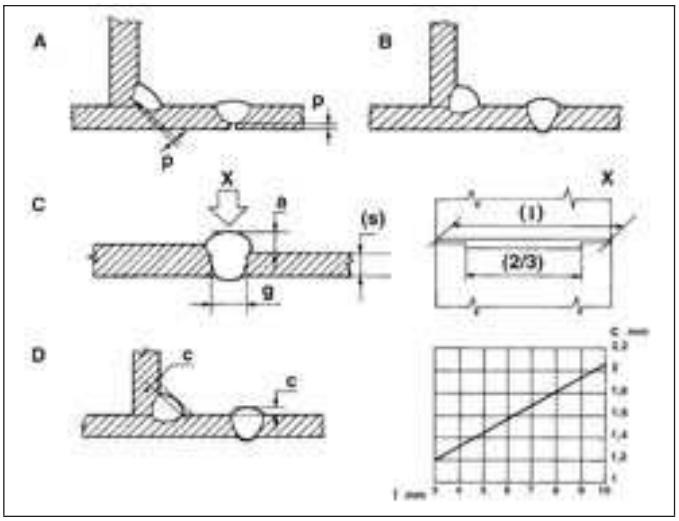


Carrying out welding using an inert gas electrode (MIG) to join overlapping.

General rules for visible welding-

The following are important rules to be reckoned with:

- Incomplete penetration (p) should be 15-30% of the thickness of the panel (see figure below - point A incorrect welding, point B correct welding).
- The height of the seam (a) should be 60% of the thinnest thickness (s), the clearance (g) between the panels before welding should be 20% of the thinnest thickness for at least two thirds of the length (l) of the seam (see diagram below, point C and detail X). the diagram illustrates the value of the convexity (c) of the seam depending on the length (l) of the weld section.
- The convexity (e) of the shape of the weld seam section should depend on the length of the actual seam (see diagram below, point D).



Examples of welding.

Brazing-

Welding using brazing applies only if it is necessary to replace sheet metal that was previously welded with this type of welding and should only be carried out at the points recommended by the manufacturer.

This type of welding does not guarantee mechanical properties that are comparable with the other systems described previously and therefore does not apply to the joining structural components.

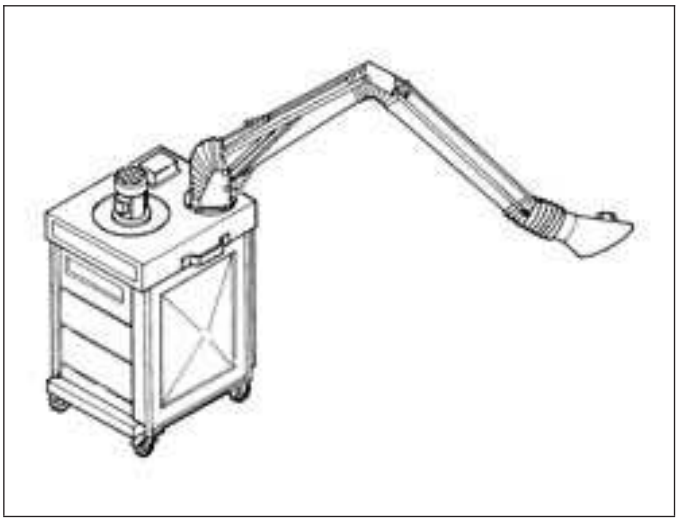
WARNING: When using oxy-acetylene torches for brazing observe the safety rules on their use and be certain that they operate safely. The use of this welding system requires the use of an air extraction system for the elimination of smoke and noxious gases.

Air filtration and purification systems-

When carrying out work that produces fumes, gases and dusts which are dangerous to the mechanic, air filtration and purification systems must be used.

These systems are designed for the various requirements to handle different volumes of air that require purification. The operation of these systems is usually based on the combined action of mechanical and electro-static filtration and purification using activated charcoal.

Filtration takes place in two stages: mechanical elimination, using mesh filters, of the largest particles of dust, then ionization of the air flow, which statically charges the particles of dust. These are then eliminated from the flow through an electrostatic process.



Example of mobile air filtration and purification system.

The flow of air is then purified by passing through activated charcoal filters. In these systems, in addition to the specific efficiency, the ease of handling and noise levels have been improved and are never exceeds a level of discomfort.

PAINTING

General information-

Painting the body has two basic objectives: protecting the surfaces of the panels from the elements and an aesthetic function of providing color and shine.

The large number of chemical products used in painting operations require that special care must be taken over their handling and usage.

These painting operations involve the emission of paint fumes and solvent vapors which, if inhaled by the technician, could seriously affect the health and should only be performed in specialty spray booths.

The technician should always wear a mask and protective clothing.

For operations that do not take very long, filtration masks must be used. For longer operations, pressurized masks must be used for total protection.

Equipment-

The following equipment is used during painting operations:

- Filtration masks and protective clothing
- Masking and taping machines
- Spray booths and baking ovens
- Spray guns
- Infrared lamps
- Polishing machines

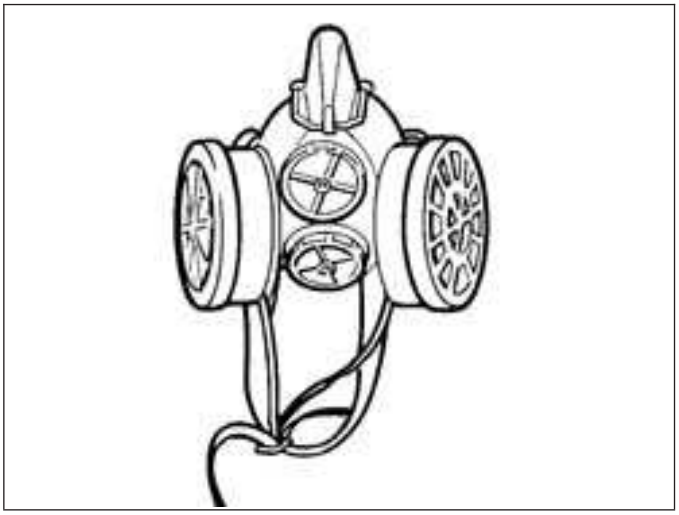
Protective clothing-

When carrying out painting operations, suitable protective clothing must be worn to protect the technician from contact with harmful substances.

It is also advisable to use a barrier cream on any exposed areas (face, hands, arms), which must be removed at the end of the painting operations.

Filtration mask-

This type of mask only protects the technician's respiratory system and protective goggles and headgear should also be worn at the same time. Its use is recommended for small retouching operations.



Example of a filtration mask

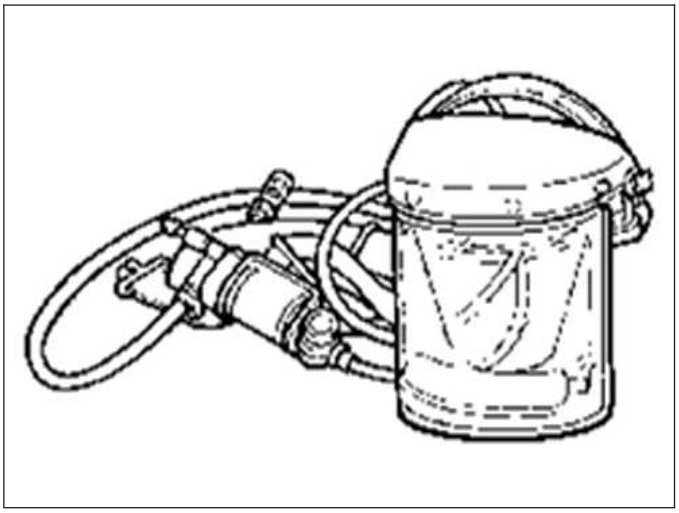
Pressurized mask-

This type of mask guarantees protection of the face and hair and is supplied with fresh air from the compressed air system used for the spray gun.

The air is purified further with a degree of separation close to 100%, by an activated charcoal filter fitted to the operator's belt.

The slight excess pressure created inside the helmet prevents the penetration of paint vapors.

The use of this mask is advisable for long painting operations.



Example of a pressurized mask

Spray booth-

Spray booths are used for painting operations and for baking prepared parts. If the extent of the damage repaired is medium or large, it would be helpful to have a special spray booth and a hot air circulation oven for drying the paint.

The area should be equipped with an air conditioning system and filtered by purifiers, mainly comprising activated charcoal filters.

The optimum painting conditions that should be maintained in the booth during the painting stage are as follows:

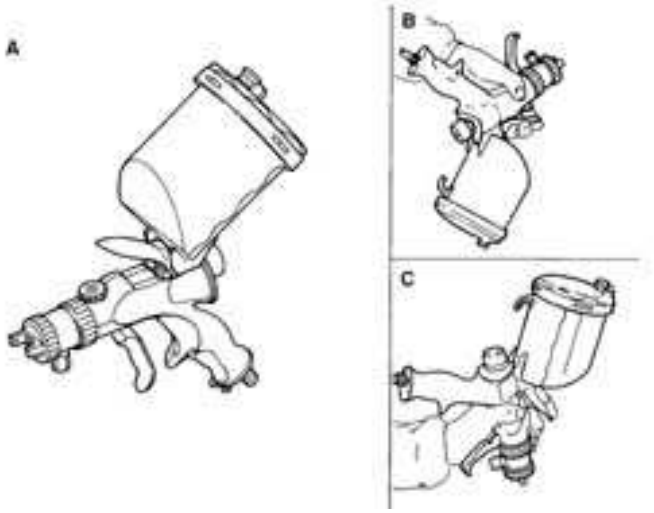
- Constant temperature between 22 - 25 °C (71 - 77 °F)
- Constant relative humidity of 75 - 80%

The area in question could be:

- A combined painting and drying booth
- A separate painting booth and drying oven

Spray guns-

Developments in the study of ergonomics and spray painting techniques have led to a new type of High air Volume and Low atomization Pressure (HVLP) spray gun that allows a considerable reduction in paint overspray. This type of spray gun has been designed to be lighter with a grip that reduces fatigue and eliminates cramp and with controls that require far less effort than conventional spray guns. The handling of the spray gun is also made easier by the even weight distribution and by the improved less bulky design that allows greater control over the part being worked on. The most interesting aspect of this spray gun is the supply system that allows painting in any direction, even with the cup facing downwards, also improving the cleaning procedures with considerable savings in terms of time and materials. The possibility of painting from the top or the bottom, in addition to preventing the formation of areas that are too wet or too dry, also allows access to areas of the bodywork that are difficult to reach. Special care has been taken over the ease of adjustment. This requires minimal, simple movements. This spray gun is extremely efficient, combining a very fine atomization capacity for any product, even water soluble, used by technicians at a pressure of 0.7 g (10 PSI) or below. Thanks to these capabilities for using paint materials, it has been possible to achieve a considerable economic saving and improved working conditions.



Use of the spray gun
A - Method of normal usage
B - Use from the bottom to the top
C - Use from the top to the bottom

Portable infrared (IR) lamps-

If the operation is restricted to small retouches, then the use of an oven is not practical. In these cases the paint can be dried using special infrared lamps fitted on parabolic mirrors. The use of one or more lamps positioned so that the surface that has been retouched is subject to an even temperature allows the paint film to bake and the result is comparable to that achieved in an oven.

This type of lamp greatly reduces drying times, thereby also reducing energy consumption. The lamp should only be used when the paint has already dried to the extent that dust is kept to the outside of the applied finish (flashed off).

Polishing machines-

The paint should only be polished after the paint has been baked and after it has cooled down to ambient temperature.

Polishing is also necessary if there are defects in the paint work such as dust, overspray, sagging, orange peel or small scratches.

To remedy these defects, there are numerous products to be applied either manually or mechanically using a polishing machine.

The tool should be parallel to the surface to be polished and should not be at an angle, in order to prevent the paint from overheating and producing circular concentric grooves.

Correct use of the polisher.

Painting cycles-

It should be pointed out that all painting operations must be carried out using appropriate equipment.

It is recommended to use the specific environmentally-friendly solvents for cleaning the equipment.

There is a body paint color identification plate on the vehicle, normally inside the hood or the luggage compartment lid/tailgate, which contains the original color identification code for repainting or touching up.

The products used must comply to the laws in force in terms of safety, hygiene and the environment. In the absence of these, must meet European Community standards. It is the responsibility of the final user to check beforehand that the conditions of usage are compatible with the recommendations in the supplier safety documents.

As far as the practical aspects are concerned, suppliers must certify that the aesthetic/functional features (e.g. mechanical properties, resistance to ageing and protection against corrosion) meet the corporate technical specifications when applied in accordance with the methods indicated in detail in the "product technical chart". Conformity with corporate specifications guarantees that the manufactured article will be in line with the original painting process quality standards.

This certification implies absolute adherence to the instructions laid down for the individual products on Safety Data Sheet that the supplier is obliged to deliver to the user in compliance with the legislation in force in the territory (for Italy pursuant to Legislative Decrees 52/97 and 285/98 and subsequent amendments and additions).

BODYWORK REPAIRS (PANEL SUPPORT)

If a body panel is being replaced, check that dimensions, materials and surface treatment (galvanizing, cataphoresis, e-coating) of the replacement part conform to the manufacturer's specifications.

NOTE: Visually inspect the condition and suitability for use of the replacement sheet metal parts. If there are small dimples, it is permissible to restore the appearance and level the defect with a small amount of putty after straightening (insofar as possible) using levers, files, etc. It can be applied after cleaning (painting through cataphoresis or e-coating) the surface near the defect; after it has completely hardened, dry sand using P180–P220 grade sandpaper.

Painting a panel secured to the bodywork by a mechanical fastening-

- Clean the replacement panel with a low Volatility Organic Compound (VOC) to remove any dust or grease that may be present.
- Gently dry sand the entire surface to be painted, using P320 grade sandpaper and a rotary/orbital power sander equipped with an dust extractor.

NOTE: Take care not to nick/remove the cataphoretic painting (e-coating).

- Remove any residues of dust using compressed air and clean the entire surface using a low VOC detergent or an anti-static product.
- If during the above described operations (point 2) the sheet metal is accidentally stripped by the removal of the cataphoresis (e-coat) and zinc coating, anti-corrosion protection must be restored by spraying a thick epoxy primer on the affected areas.
- If appropriate, seal the joints by applying (single or two component) sealant that hardens at ambient temperature.
- Apply a filler, prepared previously following the instructions on the product technical chart, by spraying 2 crossover coats, at intervals of a few minutes, until the thickness recommended on the product technical chart is reached (2 - 4 crossover coats). Wait for 10 to 15 minutes at ambient temperature before starting the drying process.
- Dry the base coat in an oven at a temperature of 40° - 60° C (104° - 140° F) about 30 - 40 minutes.
- When it is dry (and the panel is cold), dry sand the surface using P400 grade sandpaper to remove any defects.
- Remove any residues of dust using compressed air and clean the entire surface firstly using a low VOC detergent and then finish off with an anti-static cloth.
- Prepare the paint (single stage or two stage) and/or the clear coat for spraying following the instructions on the technical chart for the product and use it within the recommended time.
- Apply the paint in 2 crossover coats with a few seconds in between until the desired thickness and color matching is achieved.
- Leave the paint to dry at ambient temperature, following the instructions on the supplier's technical chart for the time and conditions.
- For aesthetic finishes with single stage paint, dry in the oven at a temperature of 60° C (140° F) for 40 minutes. Alternatively, dry using an IR ray lamp, following the instructions described by the manufacturer (distance of radiant panel from the surface to be dried; exposure time).
- For two stage paint aesthetic finishes, proceed with the application of the clear coat (opaque base coat) prepared previously in accordance with the instructions on the technical chart with 2 or 3 crossover coats with intervals of a few seconds in between.
- Dry in the oven at a temperature of 60° C (140° F) for 40 minutes. Alternatively, dry using an IR ray lamp, following the instructions described by the manufacturer (distance of radiant panel from the surface to be dried; exposure time).
- Polish the surface at least 24 hours after the last coat has baked (and the panel is cold).

Painting a replacement panel secured to the bodywork by welding -

NOTE: Before spot welding the panels, apply electro-weldable galvanizing protection to the ground edges of the join area (as described in the Service Manual).

- Clean the replacement panel with a low VOC detergent to remove any dust or grease that may be present.
- Fasten the replacement body panel to the bodywork by welding, preserving the integrity of the surrounding surfaces/elements by masking them and - wherever possible - by disassembling them.
- Wait until the work surfaces have cooled down, then proceed with removing the spatter and oxides that have formed in the proximately of the welding seam.
- Brushing and dry sanding with P80 - P120 grade sandpaper.
- If the welding is visible and it is therefore necessary to restore the aesthetic aspect and continuity of the profiles, fill the joint and once it has totally hardened level it out using dry P100 - P120 grit sandpaper on a pneumatic random orbital sander.
- If during these operations the sheet metal is accidentally stripped by the removal of the cataphoresis (e-coat) and zinc coating, anti-corrosion protection must be restored by spraying a high build epoxy primer on the affected areas.
- Remove any residues of dust using compressed air and clean the entire surface using a low VOC detergent or an anti-static product.
- If appropriate, seal the joints by applying (single or two component) sealant that hardens at ambient temperature.
- Apply a filler primer, prepared previously following the instructions on the product technical chart, by spraying 2 crossover coats, at intervals of a few minutes, until the thickness recommended on the product technical chart is reached (2 - 4 crossover coats). Wait for 10 to 15 minutes at ambient temperature before starting the drying process.
- Dry the primer coat in an oven at a temperature of 40° - 60° C (104° - 140° F) for about 30 - 40 minutes.
- Inspect the surface that has been worked on and remove any defects by dry-sanding the surface using P400 grade sandpaper.

- Remove any residues of dust using compressed air and clean the entire surface firstly using a low VOC detergent and then finish off with an anti-static cloth.
- Prepare the paint (single stage or two stage) and/or the clear coat for spraying following the instructions on the technical chart for the product and use it within the recommended time.
- Apply the paint in 2 crossover coats with a few seconds in between until the desired thickness and color matching is achieved.
- Leave the paint to dry at ambient temperature, following the instructions on the supplier's technical chart for the time and conditions.
- For aesthetic finishes with single stage paint, dry in the oven at a temperature of 60° C (140° F) for 40 minutes. Alternatively, dry using an IR ray lamp, following the instructions described by the manufacturer (distance of radiant panel from the surface to be dried; exposure time).
- For aesthetic finishings with a two stage paint, proceed to apply the clear coat prepared earlier following the instructions provided in the technical sheet with 2 or 3 cross-coats and with a flash time of a few seconds between coats.
- Dry in the oven at a temperature of 60° C (140° F) for 40 minutes. Alternatively, dry using an IR ray lamp, following the instructions described by the manufacturer (distance of radiant panel from the surface to be dried; exposure time).
- Polish the surface at least 24 hours after the last coat has baked (and the panel is cold).

Partial repainting (one or more parts) of the bodywork-

- Protect the areas not involved in the painting operation by masking.
- Restore the aesthetic appearance (profile and surface appearance) of the damaged panel. Lastly, level the area worked on using filler which can be applied after cleaning the surface using special detergent if the damage caused has not exposed the panel or if the panel has been exposed, the corrosion protection should be restored through the local application of an epoxy primer.
- After the filler is completely set, dry sand using P180 - P220 grade sandpaper.
- Then smooth the area to be re-painted with P150 or P220 grit sandpaper, widening the perimeter of the area to be worked on with a slight surface unevenness tapering off towards the exterior, taking care to eliminate all traces of oxidation from the stripped sheet metal.
- Remove any residues of dust using compressed air and clean the entire surface using a low VOC detergent or an anti-static product.
- If appropriate, seal the joints by applying (single or two component) sealant that hardens at ambient temperature.
- Apply a primer filler, prepared previously following the instructions on the product technical chart, by spraying 2 crossover coats, at intervals of a few minutes, until the thickness recommended on the product technical chart is reached (2 - 4 crossover coats). Wait for 10 to 15 minutes at ambient temperature before starting the drying process
- Dry in an oven at a temperature of 40° - 60° C (104° - 140° F) for about 30 - 40 minutes.
- Check the surface that has been worked on and remove any defects by dry-sanding the surface using P 400 grade sand paper.
- Remove any residues of dust using compressed air and clean the entire surface firstly using a low VOC detergent and then finish off with an anti-static cloth.
- Prepare the paint (single stage or two stage) and/or the clear coat for spraying following the instructions on the technical chart for the product and use it within the recommended time.
- Apply the paint in 2 crossover coats with a few seconds in between until the desired thickness and color matching is achieved.
- Leave the paint to dry at ambient temperature, following the instructions on the supplier's technical chart for the time and conditions.
- For aesthetic finishes with single coat paint, dry in the oven at a temperature of 60° C (140° F) for 40 minutes. Alternatively, dry using an IR ray lamp, following the instructions described by the manufacturer (distance of radiant panel from the surface to be dried; exposure time).
- For aesthetic finishes with a two stage paint, proceed to apply the clear coat prepared earlier following the instructions provided in the technical sheet with 2 or 3 cross-coats and with a flash time of a few seconds between coats.
- Dry in the oven at a temperature of 60° C (140° F) for 40 minutes. Alternatively, dry using an IR ray lamp, following the instructions described by the manufacturer (distance of radiant panel from the surface to be dried; exposure time)
- Polish the surface at least 24 hours after the last coat has baked (and the panel is cold).

PAINTING PLASTIC COMPONENTS PROCEDURE

(Thermoplastic type Poleofinica (PP) example: fascias)

Painting a replacement bumper (fascia)-

In the case of replacement, check that the replacement part complies with the corporate technical specifications in terms of dimensions, materials and surface treatment (black base with solvent or water adhesion promoter 3 ± 0.5 gloss with adhesion promoter and aesthetic finish function).

NOTE: In the presence of small surface defects, the aesthetic appearance of the part may be restored by levelling out the defect by filling it with filler. This may be done after cleaning of the surface around the defect; after total hardening, smooth with P320 - P400 grit dry sandpaper.

- **Degrease the bumper (fascia) as a precaution to remove any dust or grease using detergent (example: isopropyl alcohol).**
- **Gently sand the surface using fine grade sandpaper (example: P600), taking care not to remove too much of the adhesion promoter film.**

NOTE: If anti-static liquids are used, first check their compatibility with the black coating because some of them may be particularly aggressive and even cause its removal with the result that the aesthetic finish does not adhere.

- Blow through with compressed air (filtered and purified) and clean using anti-static cloths/special detergents.
- Mask the areas not being painted in the body tint (example: rubbing strips, lower section, etc.).
- Prepare the paint (single stage or two stage) and/or the clear coat for spraying following the instructions on the technical chart for the product and use it within the recommended time
- Apply the paint in 2 crossover coats with a few seconds in between until the desired thickness and color matching is achieved.
- Leave the paint to dry at ambient temperature, following the instructions on the supplier's technical chart for the time and conditions.
- For aesthetic finishes with single stage paint, dry in the oven at a temperature of 60° C (140° F) for 40 minutes. Alternatively, dry using an IR ray lamp, following the instructions described by the manufacturer (distance of radiant panel from the surface to be dried; exposure time).
- For aesthetic finishes with a two stage paint, proceed to apply the clear coat prepared earlier following the instructions provided in the technical sheet with 2 or 3 cross-coats and with a flash time of a few seconds between coats.
- Dry in the oven at a temperature of 60° C (140° F) for 40 minutes. Alternatively, dry using an IR ray lamp, following the instructions described by the manufacturer (distance of radiant panel from the surface to be dried; exposure time).
- Wait until the treated surface has cooled down, then remove the masking.

NOTE: When removing the masking at the joints between parts that are not painted and those which are, in order to prevent peeling, it is advisable to remove the masking after drying.

- Take care over the non painted (black) parts to prevent the unpainted parts on show turning white.
- Polish the surface using fine abrasive paste and/or polish.

Partial repainting of a bumper-

- Blow compressed air through the affected area involved in the repair to allow the complete removal of the aesthetic finish that has been affected.
- Mask the areas not being painted in the body color.
- Apply the primer and filler adhesion promoter, prepared previously following the instructions on the product technical chart, by spraying 2 crossover coats, at intervals of a few minutes, until the thickness recommended on the product technical chart is reached (2 - 4 crossover coats). Wait 10-15 minutes at ambient temperature before proceeding with drying.
- If needed, restore the aesthetic appearance (profile and surface aspect) of the affected component. Lastly, use filler to level the area being worked on.
- After the filler has completely set, dry-sand using P320 - P400 grade sandpaper.
- Then smooth the area to be re-painted with P150 or P220 grit sandpaper, widening the perimeter of the area to be worked on with a slight surface unevenness tapering off towards the exterior.
- Remove any residues of dust using compressed air and clean the entire surface using a low VOC detergent or an anti-static product.
- Dry in the oven at a temperature of 40° - 60° C (104° - 140° F) for about 30 - 40 minutes.
- Inspect the surface previously worked on and remove any defects by dry sanding the surface using P 400 grade sandpaper.
- Remove any residues of dust using compressed air and clean the entire surface firstly using a low VOC

detergent and then finish off with an anti-static cloth.
- Prepare the paint (single stage or two sage) and/or the clear coat for spraying following the instructions on the technical chart for the product and use it within the recommended time.
- Apply the paint in 2 crossover coats with a few seconds in between until the desired thickness and color matching is achieved.
- Allow the paint to dry at ambient temperature, following the instructions on the supplier's technical chart for the time and conditions.
- For aesthetic finishes with single coat paint, dry in the oven at a temperature of 60° C (140° F) for 40 minutes. Alternatively, dry using an IR ray lamp, following the instructions described by the manufacturer (distance of radiant panel from the surface to be dried; exposure time).
- For aesthetic finishes with a two stage paint, proceed to apply the clear coat prepared earlier following the instructions provided in the technical sheet with 2 or 3 cross-coats and with a flash time of a few seconds between coats.
- Proceed with drying in the oven at a temperature of 60° C (140° F) for 40 minutes. Alternatively, dry using an IR ray lamp, following the instructions described by the manufacturer (distance of radiant panel from the surface to be dried; exposure time).
- Polish the surface using fine abrasive paste and/or polish.

PAINTING A THERMOSETTING PLASTIC COMPONENT (KMC-BMC-SMC)-

If a thermosetting element is being replaced, check that dimensions, materials and surface treatment (insulating primer) of the replacement part conform to the company's technical specifications.

Replacement-

Visually check the integrity and suitability for use of the replacement part.

NOTE: In the presence of small surface defects, the aesthetic appearance of the part may be restored by levelling out the defect by filling it with filler. This may be done after cleaning of the surface around the defect; after total hardening, smooth with P320 - P400 grit dry sandpaper.

Repair-
- Restore the appearance (profile and surface appearance) of the affected area.
- Blow compressed air on the affected repair area.
- Level the surface using filler; it can be applied after cleaning the surface using appropriate detergent.
- After the filler is completely set, dry sand using P320 - P400 grade sandpaper.

Painting-
- Mask the areas not being painted, as appropriate; then overhaul the surface involved using P150 or P220 grade abrasive paper extending the perimeter of the area being worked on, in the case of a repair operation, through surface shading towards the outside.
- Remove any residues of dust using compressed air and clean the entire surface using a low VOC detergent or an anti-static product.
- Apply the primer coat, prepared previously following the instructions on the product technical chart, by spraying 2 crossover coats, at intervals of a few minutes, until the thickness recommended on the product technical chart is reached (2 - 4 crossover coats). Wait 10-15 minutes at ambient temperature before proceeding with drying.
- Dry in the oven at a temperature of 40° - 60° C (104° - 140° F) for about 30 - 40 minutes.
- Inspect the surface that has been worked on and remove any defects by dry-sanding the surface using P400 grade sandpaper.
- Remove any residues of dust using compressed air and clean the entire surface first using a low VOC detergent and then finish off with an anti-static cloth.
- Prepare the paint (single stage or two stage) and/or the clear coat for spraying following the instructions on the technical chart for the product and use it within the recommended time.
- Allow the paint to dry at ambient temperature, following the instructions on the supplier's technical chart for the time and conditions.
- For aesthetic finishes with single stage paint, dry in the oven at a temperature of 60° C for 40 minutes. Alternatively, dry using an IR ray lamp, following the instructions described by the manufacturer (distance of radiant panel from the surface to be dried; exposure time).
- For aesthetic finishes with a two stage paint, proceed to apply the clear coat prepared earlier following the instructions provided in the technical sheet with 2 or 3 cross-coats and with a flash time of a few seconds between coats.
- Dry in the oven at a temperature of 60° C (140° F) for 40 minutes. Alternatively, dry using an IR ray lamp,

following the instructions described by the manufacturer (distance of radiant panel from the surface to be dried; exposure time).
- Polish the surface using fine abrasive paste and/or polish.

PAINTING A THERMOPLASTIC COMPONENT-

For the repair/painting, identify the specific product line for the materials constituting the surfaces on which the operation is to be carried out. Then proceed by following the instructions given on the technical charts, and the operating methods described in the previous paragraphs.

Restoring corrosion protection/sound insulation/sealant treatments

WARNING: When using chemical products, strictly follow the safety instructions on the safety data sheet that the supplier must supply to the user.

The treatments carried out on the body in order to produce the necessary corrosion resistance, sound insulation and sealant properties may be damaged or destroyed during the repair operations.

They must be restored during the appropriate repair operations in order to restore the vehicle to its original condition.

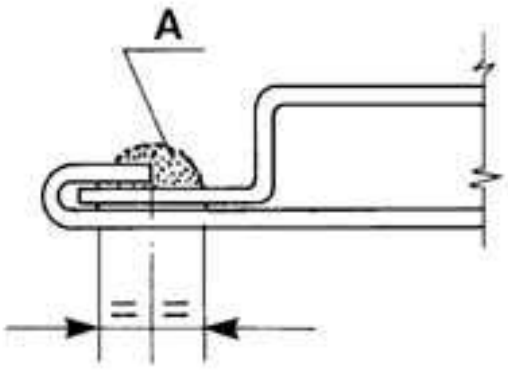
Tooling-

The following equipment is used:
- Pneumatic guns for sealant product extrusion
- Foam injection systems
- Wax based oil injection systems

In box sections that are replaced or repaired by welding or overheating, the internal anti corrosion protection must be renewed by:
- Applying rust converter to hot spots or welded areas which must dry for at least 24 hours at ambient temperature 20 ° C (68° F)
- Applying wax protection in the replaced or repaired box section (type PPG 853.764 or an equivalent product)
- Renewing the rigid expanded polyurethane foam in the box sections (example: BOSTON PUR foam, TORGGLER - Merano Schiuma P.U.R. - or an equivalent product)
- Renewing the sealer for the joints and seams, where necessary
- Sealing the flanges for the moving parts (example doors and hood) supplied as replacement parts according to the following instructions; clean the area of the spare part which has undergone cataphoretic treatment, using heptane or anti-silicone/anti-static solvents

- Applying a bead of SIKAFLEX 221 SIKA (*) polyurethane sealant of the shape and in the position illustrated in the diagram
- Leave the sealant to dry for 24 hours at ambient temperature 20° C (68° F) or 40 minutes at 60° C (140° F)
- Carrying out the normal painting cycle for the component. Apply sound deadening product or stone chipping paint to the outer parts replaced or repaired, as necessary

(*) Alternatively, use a similar 3M product or other equivalent products, following the supplier's instructions.

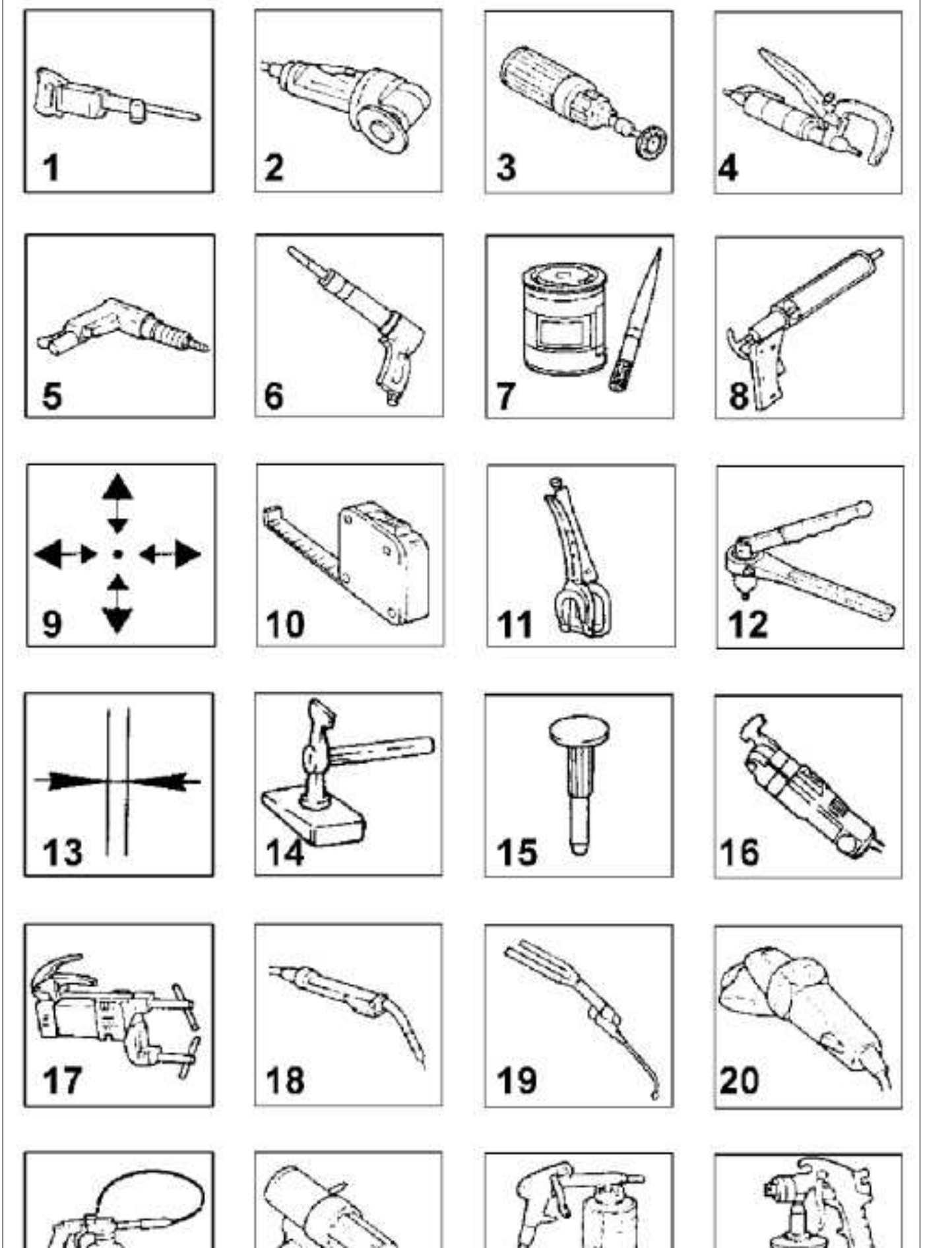


Example of sealant application
A - Sealant

SYMBOLS REMOVAL AND INSTALLATION

NOTE: The following is the graphic index chart and description of the symbols that appear in the repair

procedures.

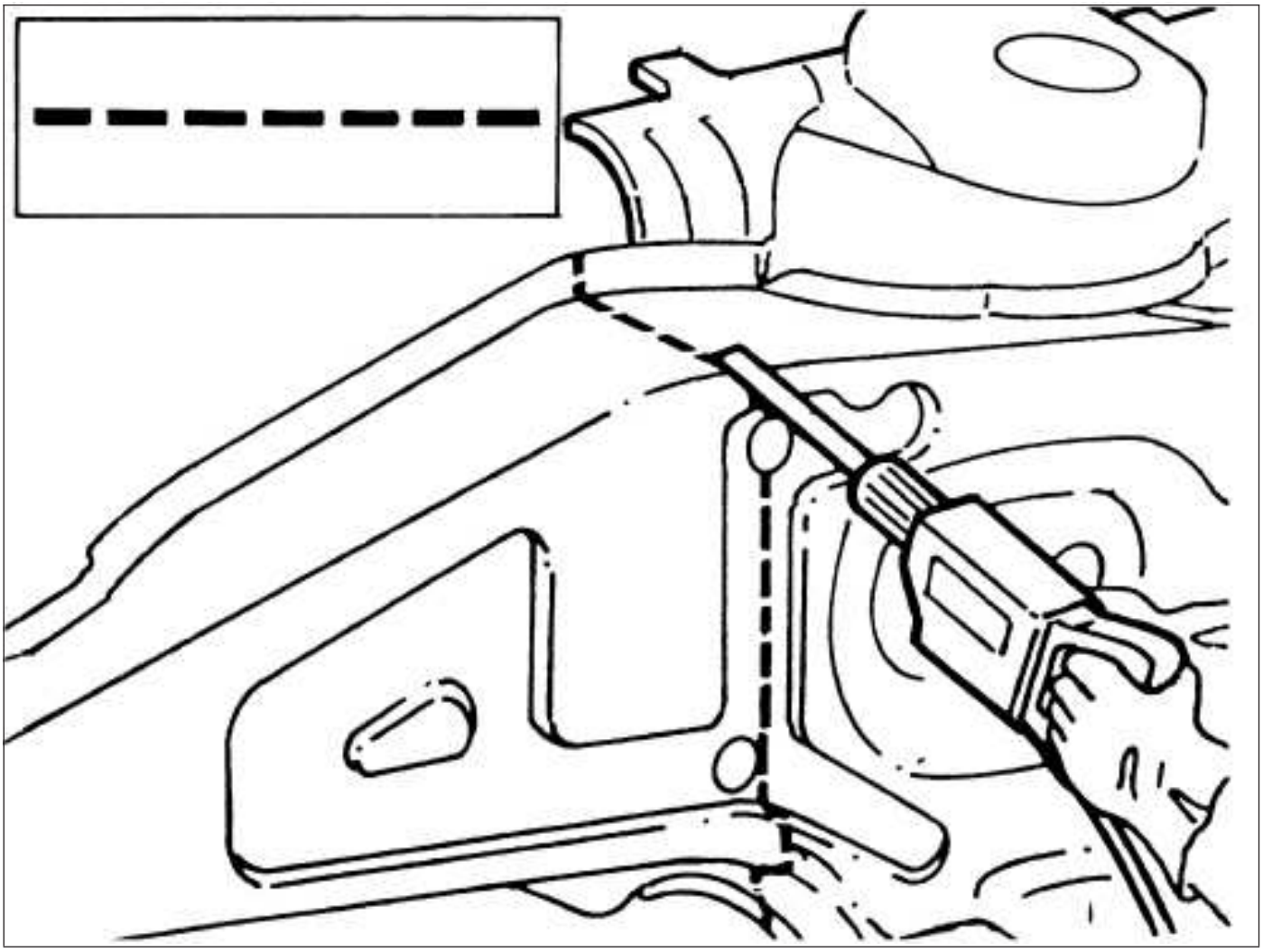


SYMBOLS

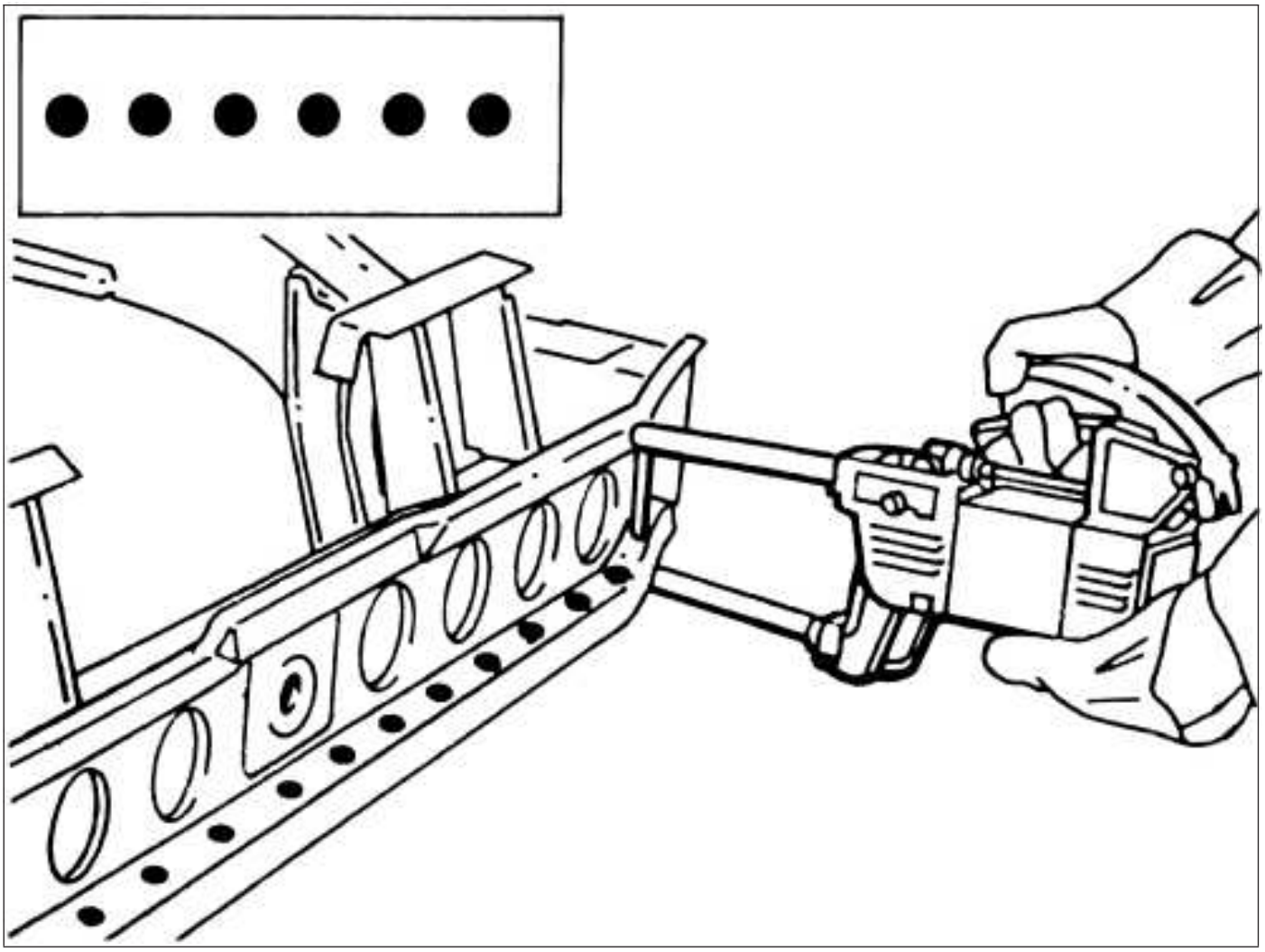
1- Cutting with reciprocating saw	15- Removing spot welds with hammer and chisel
2- Cutting with circular blade saw	16- Removing treatment with power knife
3- Cleaning with rotary brush	17- Spot welding
4- Removing spot welds with spot weld removal tool	18- MIG welding
5- Removing spot welds with drill. Drilling for MIG welding	19- Welding with oxy-acetylene torch
6- Removing body panel with chisel. Drilling for MIG welding	20- Grinding
7- Applying electro-weldable/weld through protections	21- Applying rust-proofing protection
8- Applying high thickness electro-weldable/weld through protections	22- Application of sealants
9- Centering components	23- Application of underbody protection
10- Measurement	24- Application of paint
11- Fastening components	25- Application of protective waxes
12- Fastening threaded rivets	26- Application of foam products
13- Checking alignment gaps	27- Heating with hot air
14- Straightening edges with hammer and dolly block	28- Removing metal off-cuts

MACHINING SYMBOLS

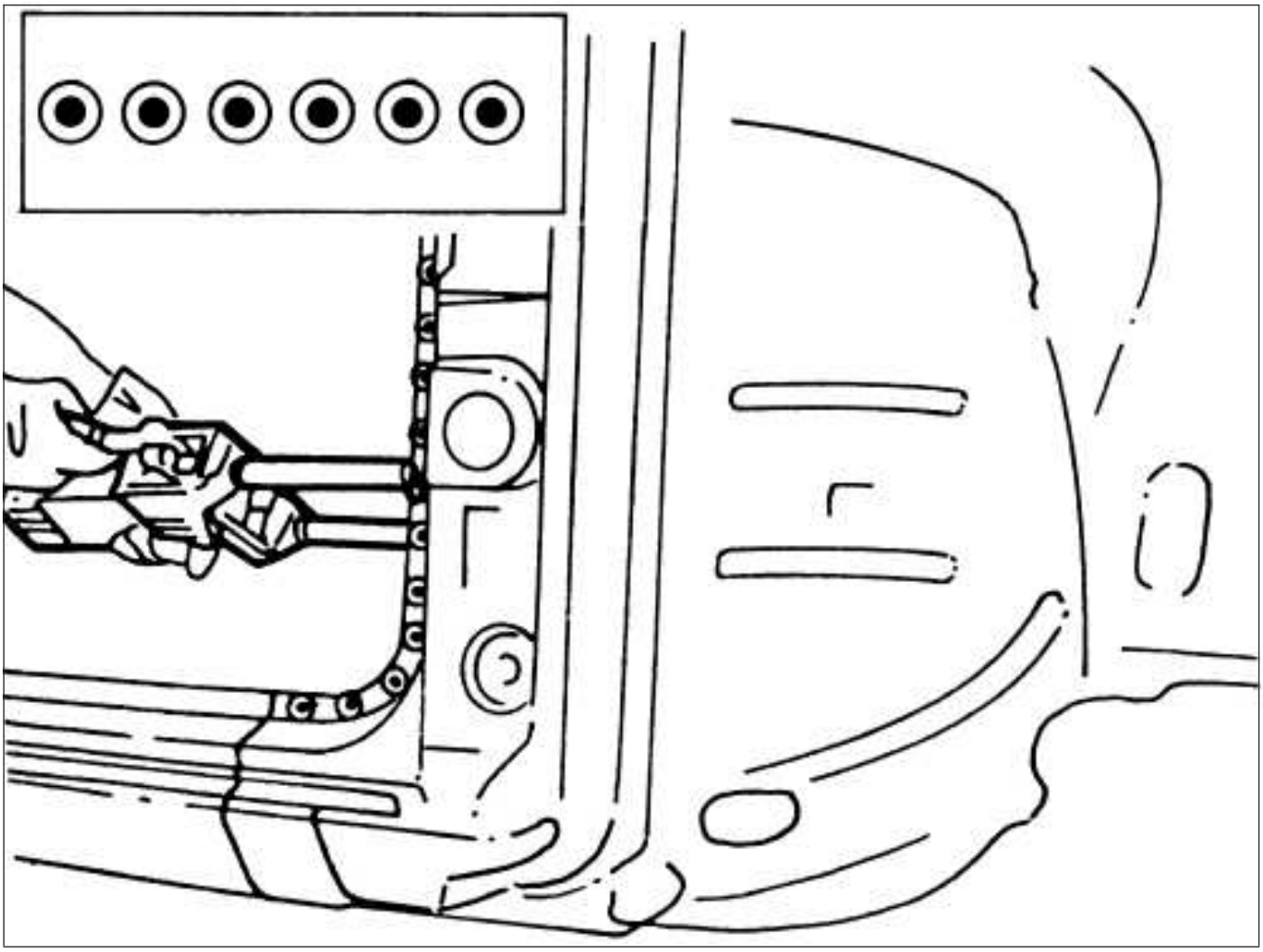
Shown below are the symbols of the processes that are described in the repair procedures with an example of their application. In the illustrations for the procedures, next to the number of the procedure steps for welding operations, sometimes there are numbers between parentheses that indicate the number of spot welds to be made or to filled by MIG welding.



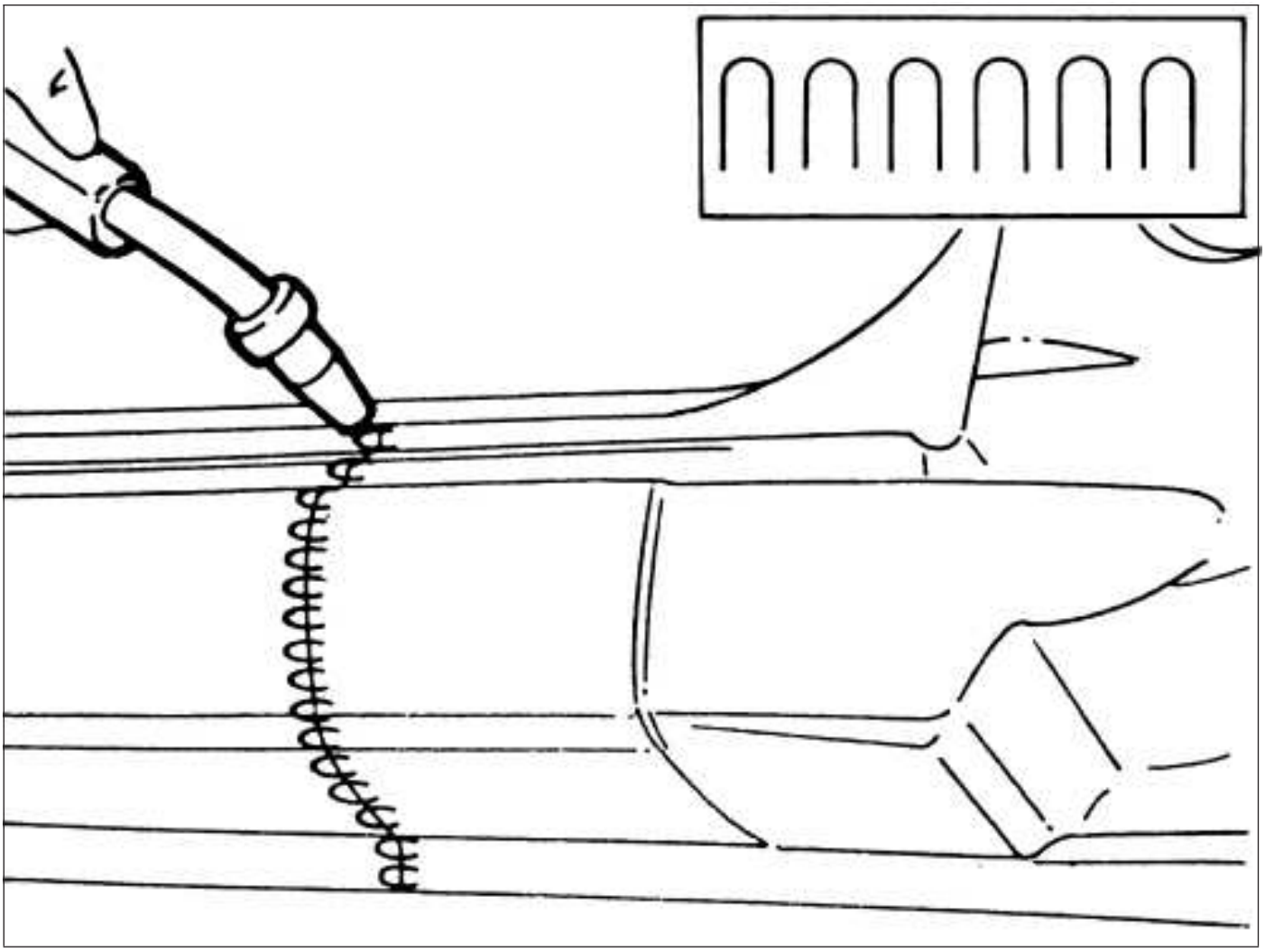
Cutting with a power saw or chisel



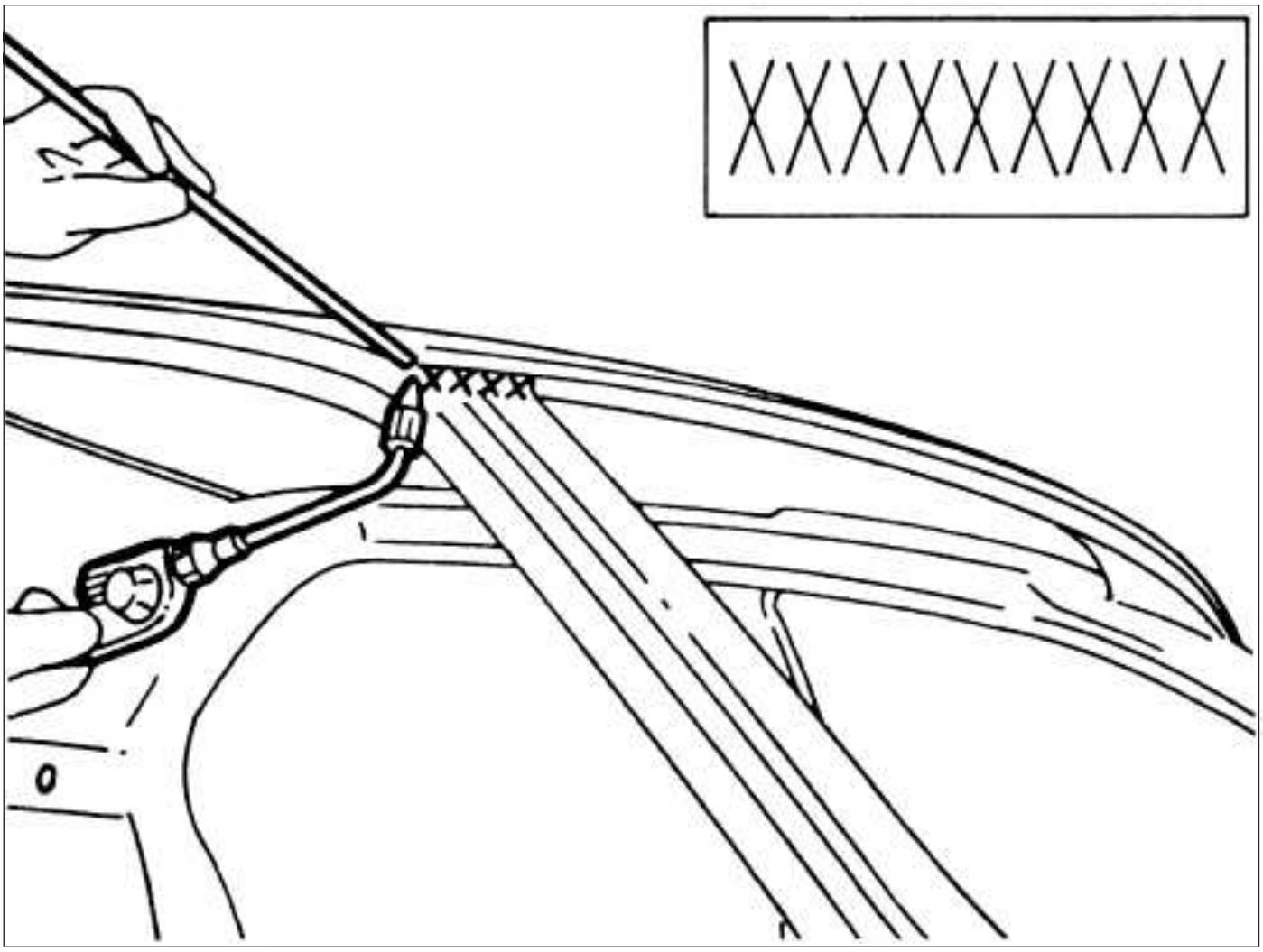
Spot welding



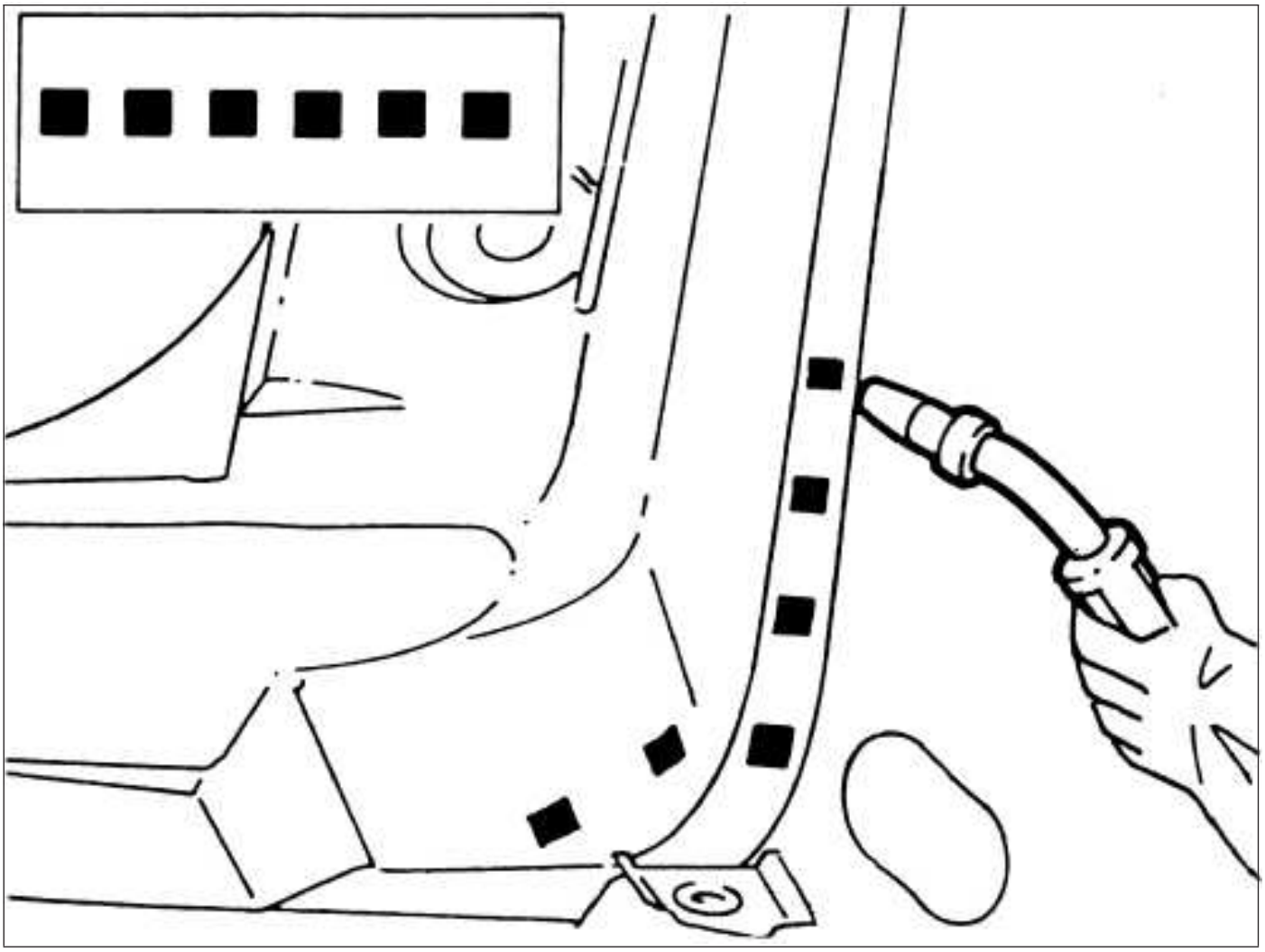
Spot welding (three panels)



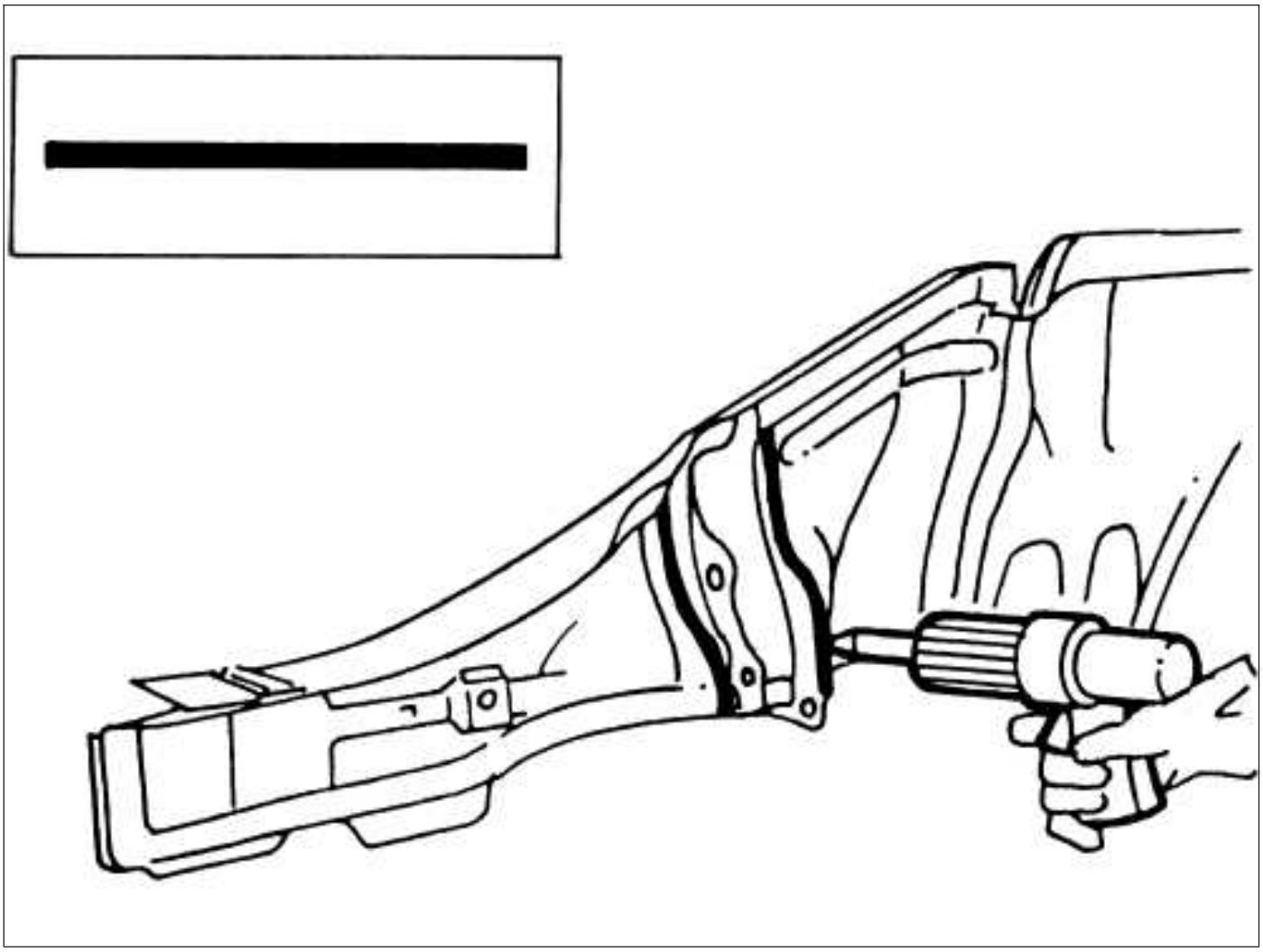
MIG welding - seam – sections



Brazing



MIG fill/plug welding



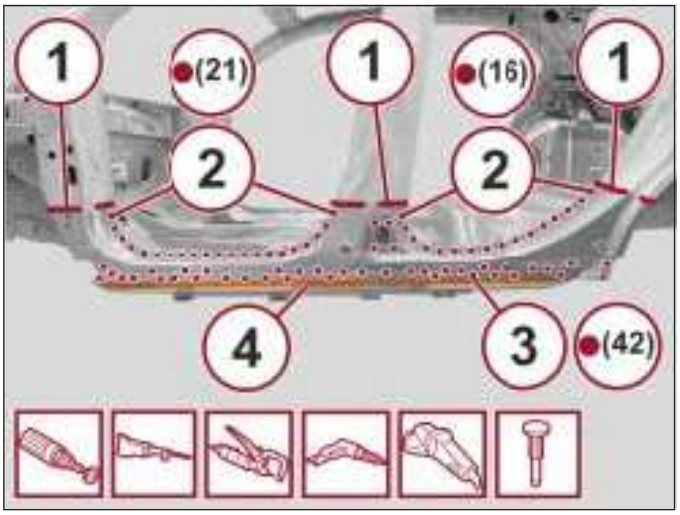
Sealing

Body Side Aperture Panel/Sill

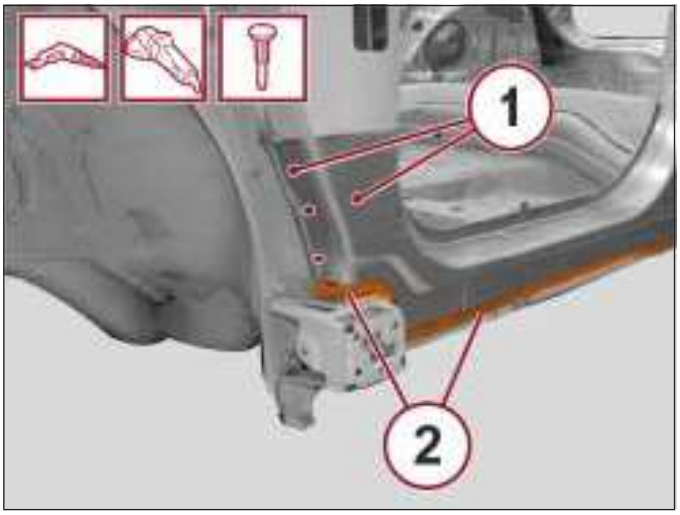
REMOVAL

1. Remove the front fender (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Front Fender).
2. Remove the front door lower hinge in accordance to the service information.
3. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
4. Straighten the body as necessary.

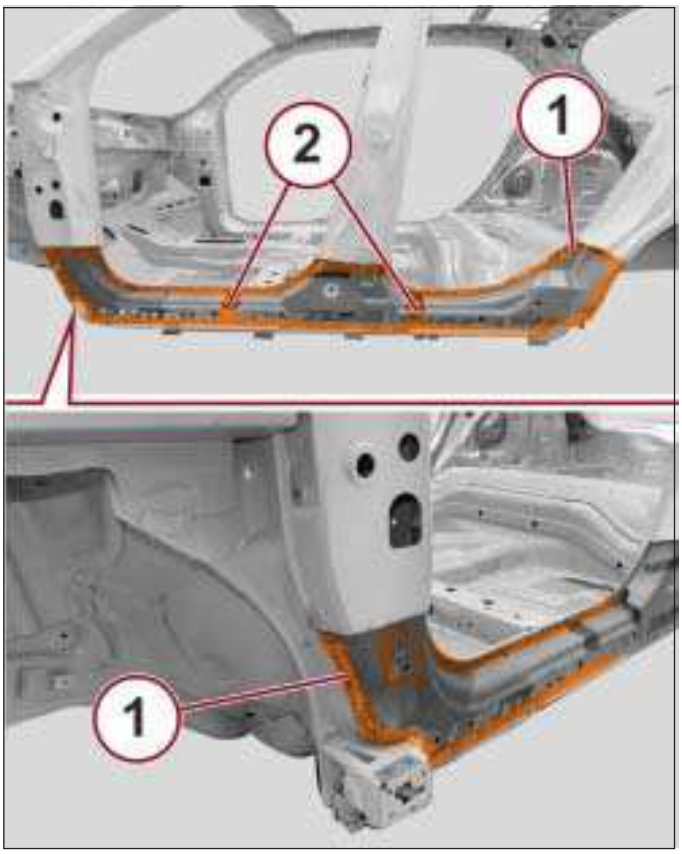
5. With the use of a rotary brush, remove the sealer (where applied) and paint to gain access to the spot welds.
6. With the use of a reciprocating saw, cut along the cut lines (1) shown on the body side aperture sill.
7. With the use of a spot weld cutting tool, release the spot welds (2) shown in the figure.
8. With the use of a drill, release the spot welds (3) shown in the figure.
9. With the use of a disc grinder, remove the weld (4) shown in the figure.
10. With the use of a chisel and hammer, remove the welds previously released and areas where there is adhesive joining the sheet metal.



11. With the use of a drill, release the spot welds (1) shown in the figure.
12. With the use of a grinding wheel, remove the weld (2) shown in the figure.
13. With the use of a chisel and hammer, remove the welds previously released spot welds and areas where there is structural adhesive is present.
14. Remove the sill and cutouts from the vehicle.

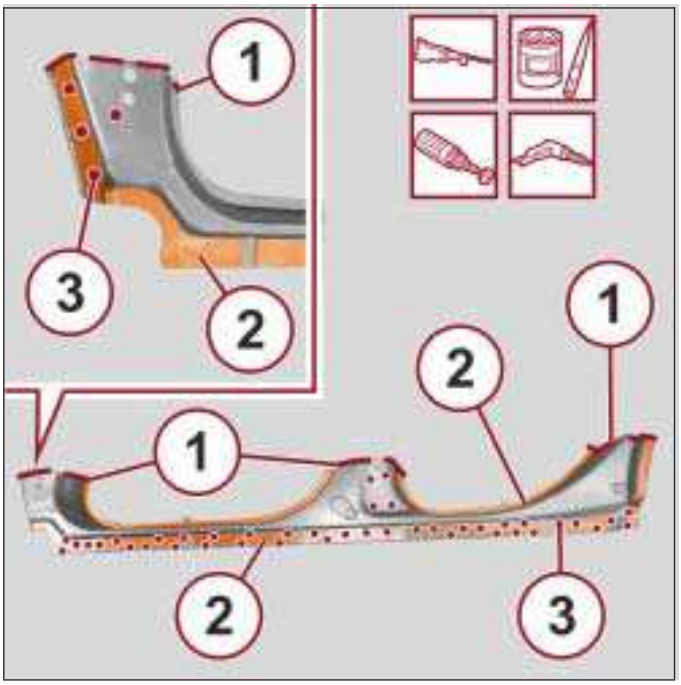


15. With the use of a hammer and dolly block, straighten the edges of the mating components.
16. With the use of a disc grinder, remove any residue of the spot welds.
17. With the use of a rotary brush, clean the previously treated areas.
18. Apply electro-weldable paint/weld through primer to the areas (1) highlighted.
19. Apply structural adhesive to the joining sheet metal areas (2).

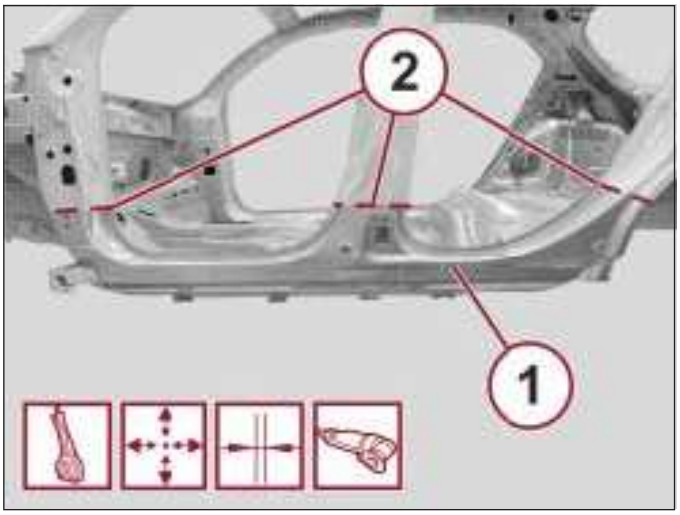


INSTALLATION

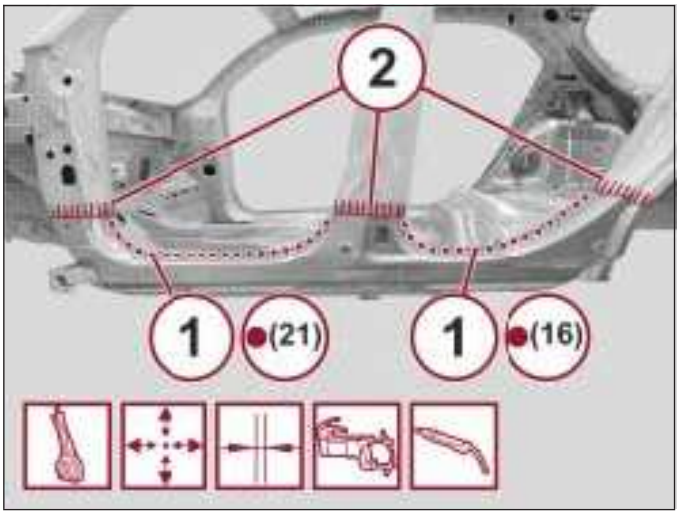
1. Cut the body side aperture service part sill area at the cut lines (1) as indicated in the figure, leaving enough length to for overlapping.
2. Remove the anti-corrosion treatment from the entire perimeter (2) of the inner and outer part using a rotary brush.
3. With the use of a drill, drill holes (3) in the area shown.
4. Apply elctro-weldable paint/weld through primer to the boarders of the areas to be welded.



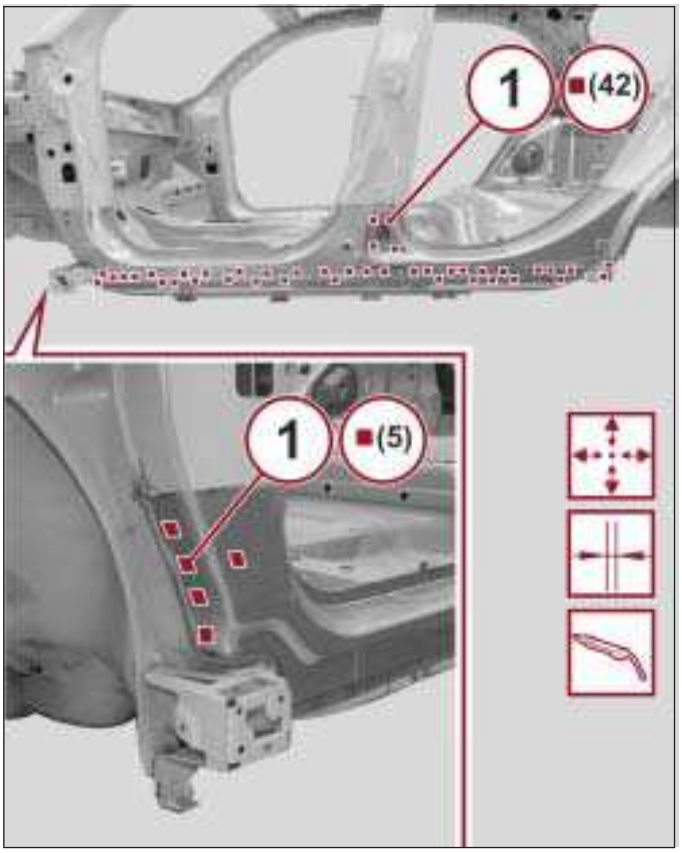
5. Position the outer service part (1) correctly on the vehicle and secure it with the self-locking clamps.
6. Check the alignment and surrounding gaps.
7. With the use of a circular saw, cut the edges of the panel metal (2) to obtain a perfect butt joint line.
8. Remove the external service part and the excess pieces of cutoff sheet metal used for the adjustment.
9. Create and install 50 mm (2 in.) backer panels to the butt joint areas (2).



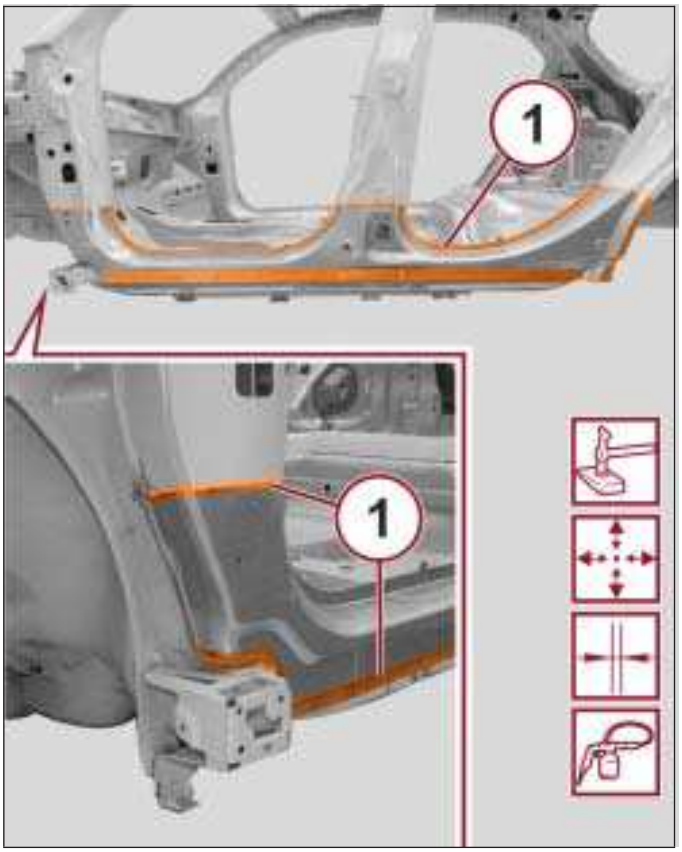
10. Position the body side aperture sill service part correctly on the vehicle and secure it with the self-locking clamps.
11. Check the alignment and surrounding gaps.
12. With the use of a spot welder, apply spot welds to the areas (1) indicated in the figure.
13. With the use of a MIG welder, apply seam welds to the butt joint areas (2) indicated in the figure.



14. Check the alignment and surrounding gaps.
15. With the use of a MIG welder, apply plug welds filling in the areas (1) shown in the figure.



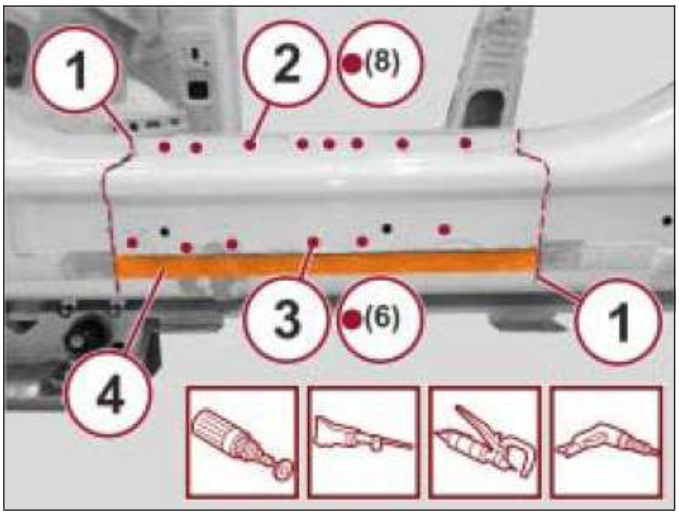
16. Correct any distortions to the sheet metal using a hammer and dolly block.
17. With the use of a disc grinder, smooth the welds.
18. With the use of a rotary brush. clean the previously welded areas.
19. Apply corrosion protection to the areas involved in the welding.
20. Apply seam sealer to the seams between the service part and the vehicle in the areas (1) indicated.
21. Install the front door lower hinge.
22. Install the front fender (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Front Fender).



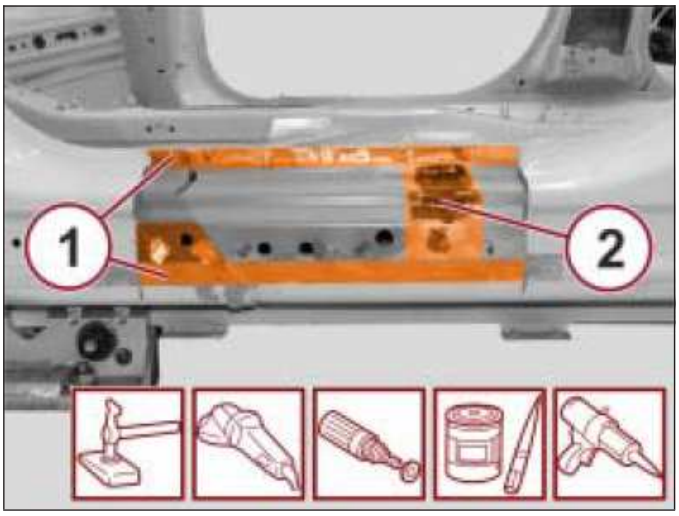
Body Side Aperture Panel/Sill Sectioning

REMOVAL

1. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
2. Straighten the body as necessary.
3. With the use of a rotary brush, remove the paint to gain access to the spot welds.
4. With the use of a reciprocating saw, cut along the cut lines (1) shown on the body side aperture sill area.
5. With the use of a spot weld cutting tool, release the spot welds (2) shown in the figure.
6. With the use of a drill, release the spot welds (3) shown in the figure.
7. With the use of a rotary brush, remove the sealant (4).



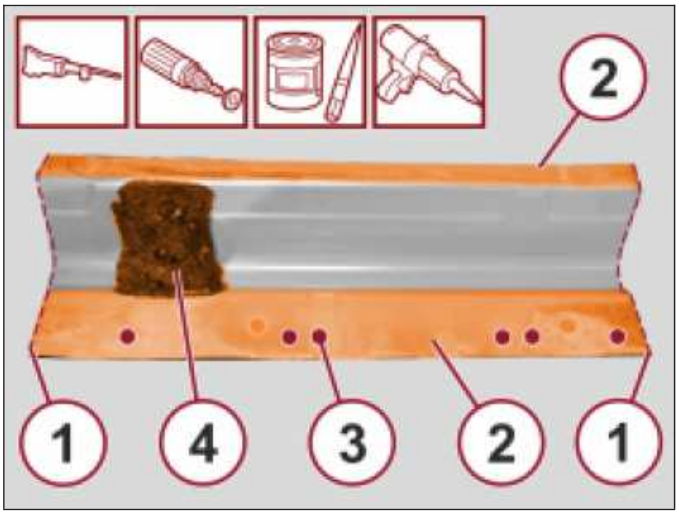
8. With the use of a hammer and dolly block, straighten the edges of the mating components.
9. With the use of a disc grinder, remove any residue of the spot welds.
10. With the use of a rotary brush, clean the previously treated areas.
11. Apply electro-weldable paint/weld through primer to the areas (1) highlighted.
12. Apply structural adhesive to the area (2) shown in the figure.



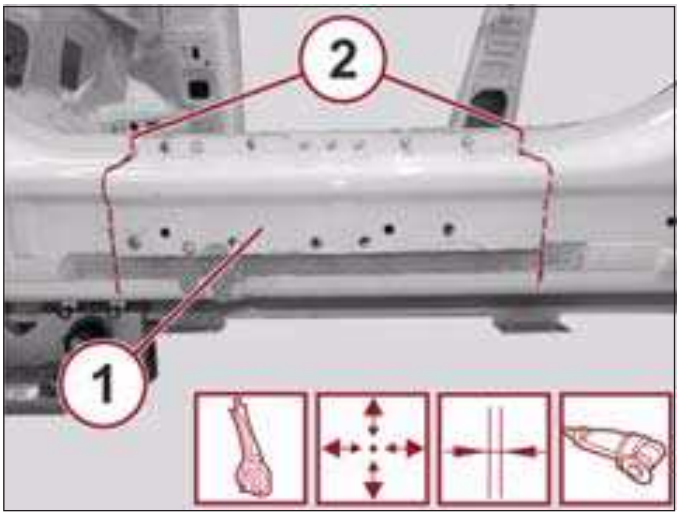
INSTALLATION

NOTE: Be certain to leave the service panel long enough to allow for overlapping.

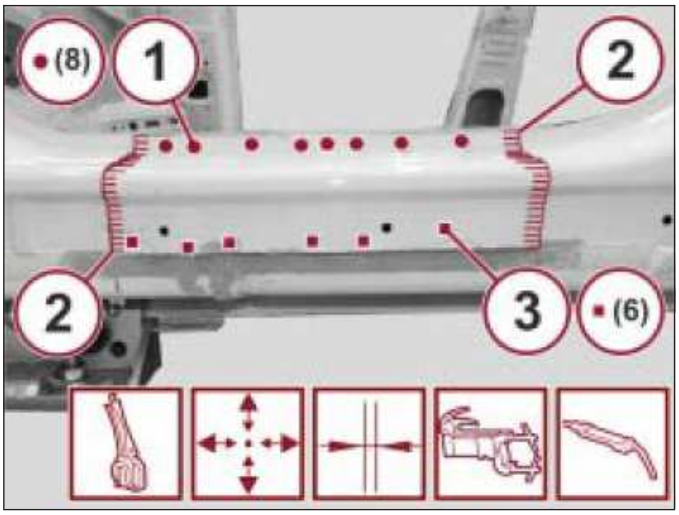
1. Cut the body side aperture sill service part at the cut lines (1) shown in the figure. Be certain that the section of the panel remains for overlapping.
2. Remove the anti-corrosion treatment from the entire perimeter (2) of the inside and outside of the service part using a rotary brush.
3. With the use of a drill, drill holes (3) in the areas shown in the figure.
4. Apply elctro-weldable paint/weld through primer to the boarders of the areas to be welded.
5. Apply structural adhesive to the area (4) shown in the figure.



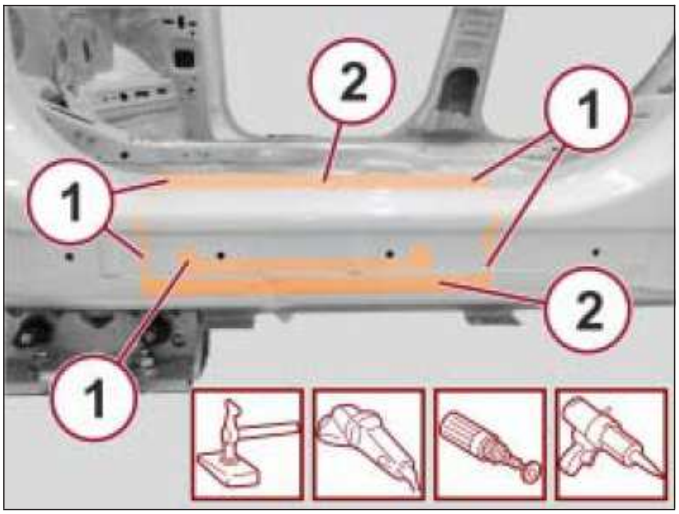
6. Position the service part (1) correctly on the vehicle and secure it with the self-locking clamps.
7. Check the alignment and surrounding gaps.
8. With the use of a circular saw, cut the edges (2) so that the join lines are perfect.
9. Remove the service part, the excess panels and the components used for adjustment.
10. Create and install 50 mm (2 in.) backer panels to the butt joint areas (2).



11. Position the body side aperture sill service part correctly on the vehicle and secure it with the self-locking clamps.
12. Check the alignment and surrounding gaps.
13. With the use of a spot welder, apply spot welds to the areas (1) indicated in the figure.
14. With the use of a MIG welder, apply seam welds to the butt joint areas (2) indicated in the figure.
15. With the use of a MIG welder, apply plug welds filling in the areas (3) shown in the figure.



16. Correct any distortions to the sheet metal using a hammer and dolly block.
17. With the use of disc grinder, smooth the welds.
18. With the use of a rotary brush, clean the previously welded areas.
19. Apply corrosion protection to the areas (1) involved in the welding.
20. Apply seam sealer to the seams between the service part and the vehicle in the areas (2) indicated.

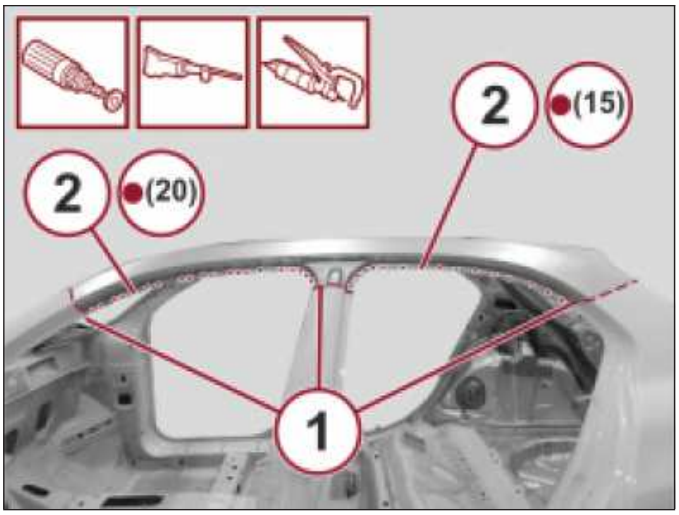


Body Side Aperture/Upper Section

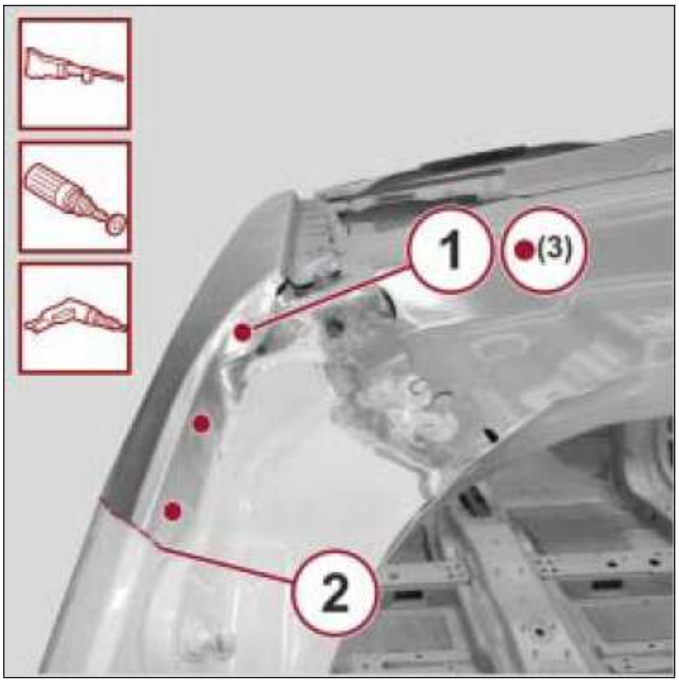
REMOVAL

1. Remove the roof panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Roof Panel).
2. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
3. Straighten the body as necessary.

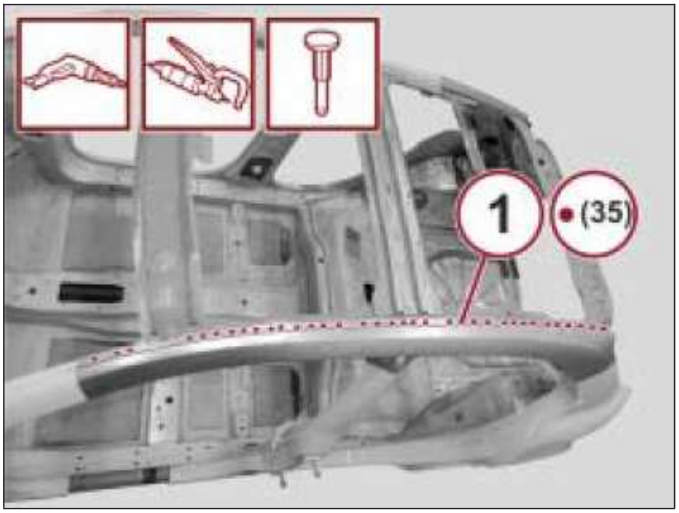
4. With the use of a rotary brush, remove the paint and gain access to the spot welds.
5. With the use of a reciprocating saw, cut along the cut lines (1) shown in the figure.
6. With the use of a spot weld cutting tool, release the spot welds (2).



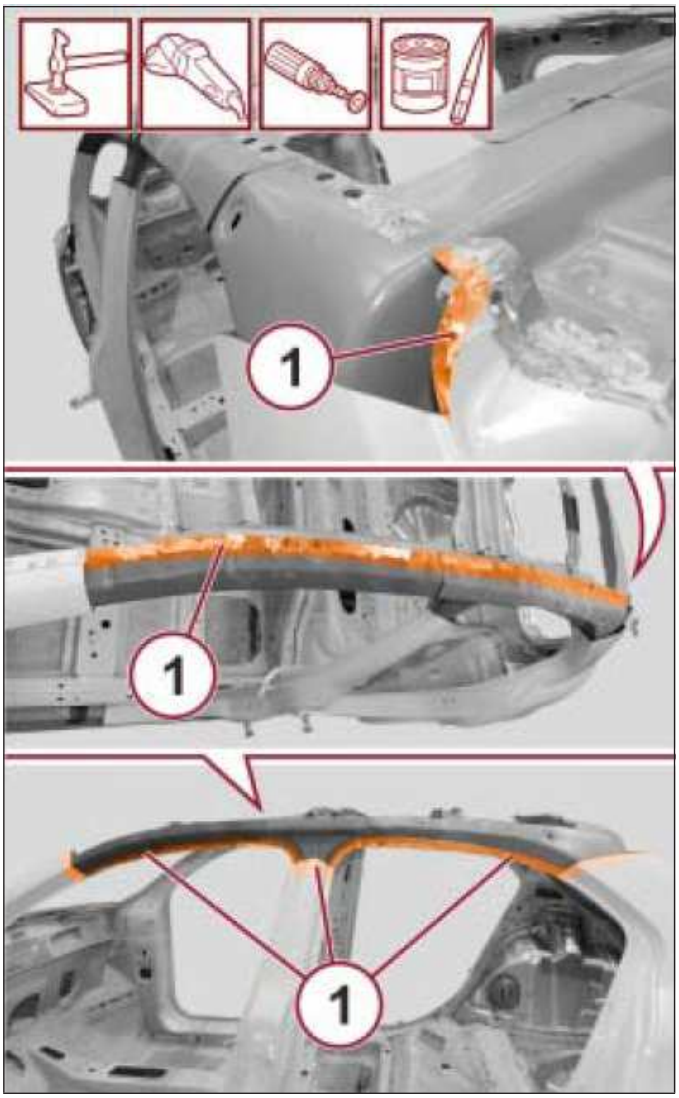
7. With the use of a rotary brush, remove the paint and gain access to the spot welds.
8. With the use of a drill, release the spot welds (1) shown in the figure.
9. With the use of a reciprocating saw, cut along the cut line (2) shown in the figure.



10. With the use of a spot weld cutting tool, release the spot welds (1).
11. With the use of a drill, release the spot welds not accessible with the spot weld cutting tool.
12. With the use of a chisel and hammer, remove the welds previously released.
13. Remove the off-cuts from the vehicle.



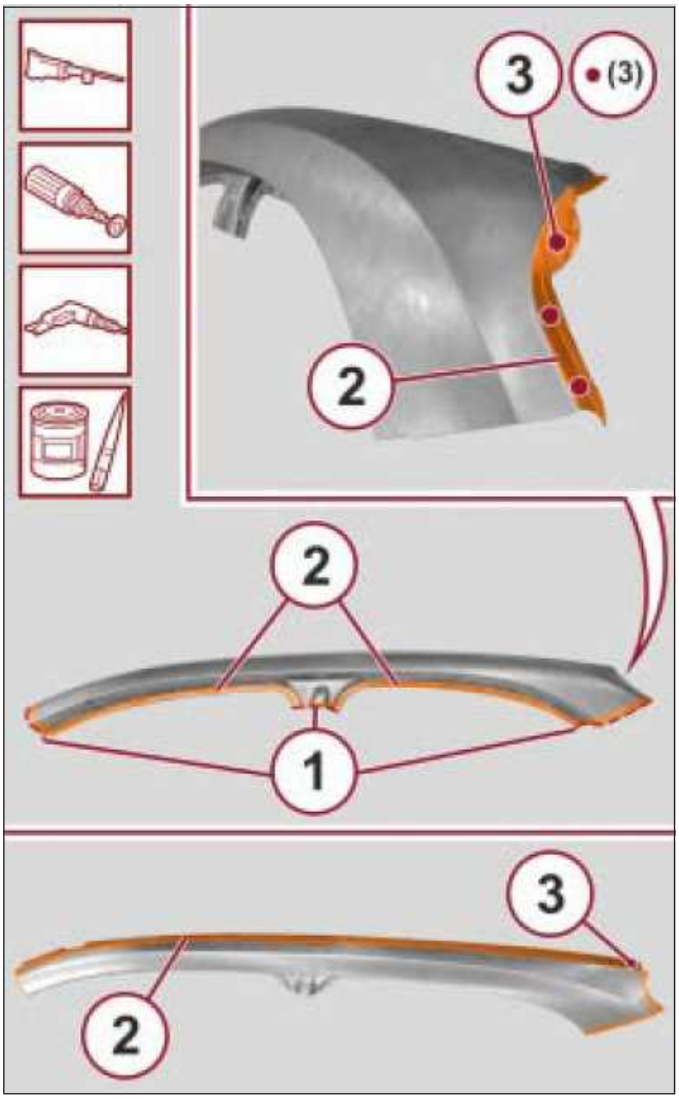
14. With the use of a hammer and dolly block, straighten the edges of the mating components.
15. With the use of a disc grinder, remove any residue of the spot welds.
16. With the use of a rotary brush, clean the previously treated areas.
17. Apply electro-weldable paint/weld through primer to the areas (1) highlighted.



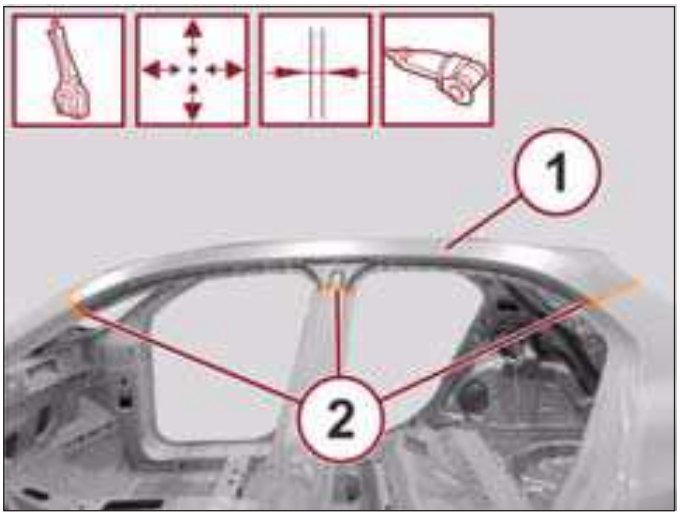
INSTALLATION

NOTE: Be certain to leave the service part long enough to allow for overlapping.

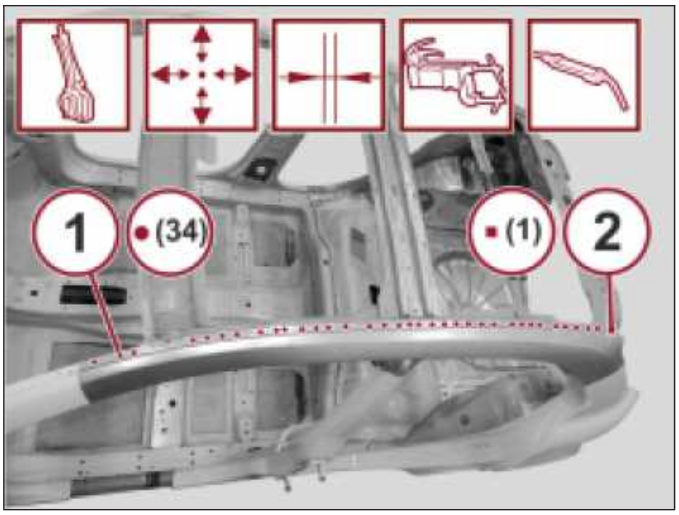
1. Cut the service part at the cut lines (1) as indicated in the figure, leaving enough panel for overlapping.
2. Remove the anti-corrosion treatment from the entire perimeter (2) of the inside and outside of the service part using a rotary brush.
3. With the use of a drill, drill holes (3) in the areas shown.
4. Apply elctro-weldable paint/weld through primer to the edges of the areas to be welded.



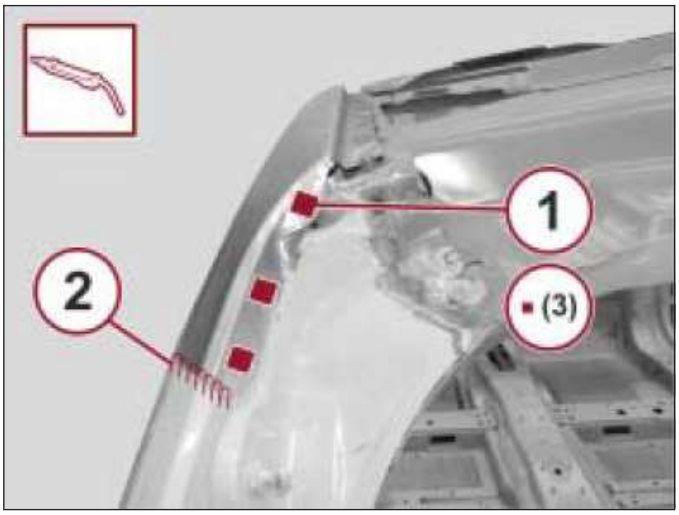
5. Position the service part (1) correctly on the vehicle and secure it with the self-locking clamps.
6. Check the alignment and surrounding gaps.
7. With the use of a circular saw, cut the edges of the panel (2) so that the join line is perfect.
8. Remove the service part, the excess panels and the components used for the adjustments.
9. Create and install 50 mm (2 in.) backer panels to the butt joint areas.



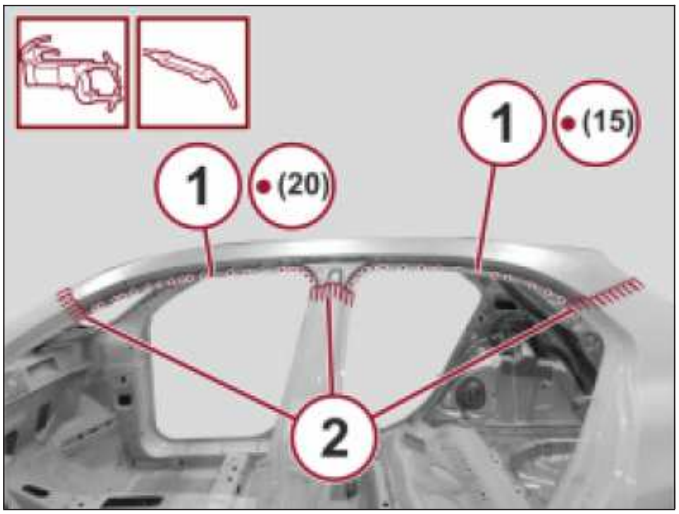
10. Position the service part correctly on the vehicle and secure it with the self-locking clamps.
11. Check the alignment and surrounding gaps.
12. With the use of a spot welder, apply spot welds to the areas (1) shown in the figure.
13. With the use of a MIG welder, apply plug welds filling in the area (2) shown in the figure.



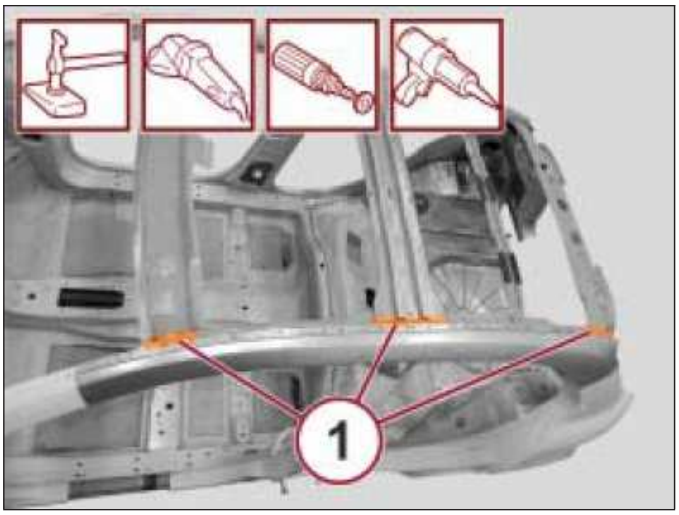
14. With the use of a MIG welder, apply plug welds filling in the areas (1) shown in the figure.
15. With the use of a MIG welder, apply seam welds to the butt joint area (2) indicated in the figure.



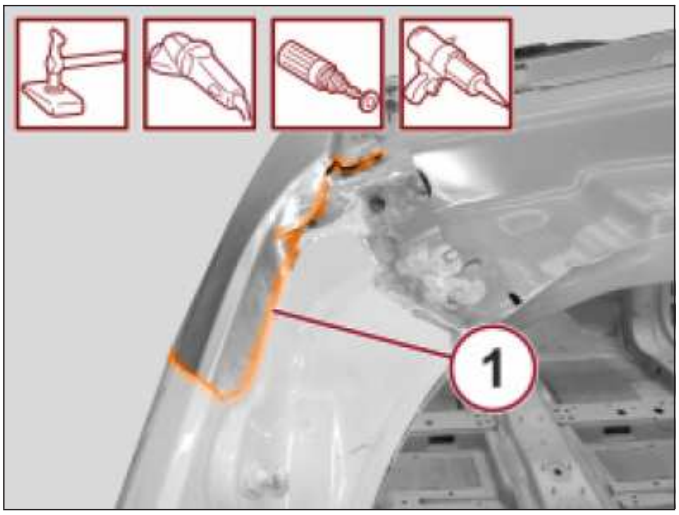
16. With the use of a spot welder, apply spot welds to the areas (1) indicated in the figure.
17. With the use of a MIG welder, apply seam welds to the butt joint areas (2) indicated in the figure.



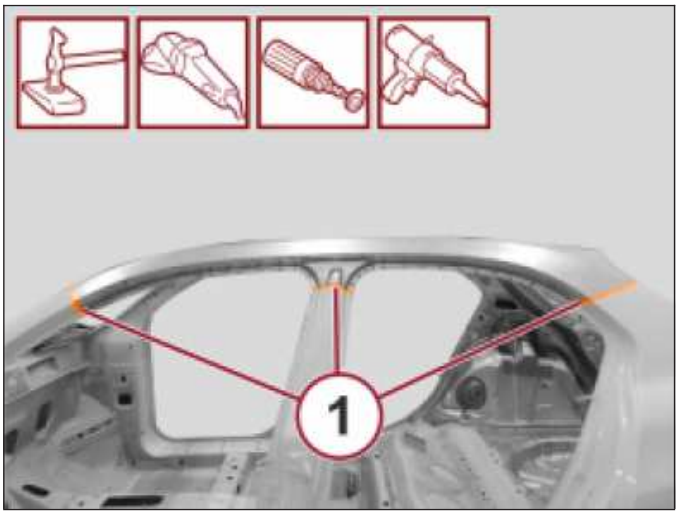
18. Correct any distortions to the sheet metal using a hammer and dolly block.
19. With the use of a disc grinder, smooth the welds.
20. With the use of a rotary brush, clean the previously welded areas.
21. Apply corrosion protection to the areas involved in the welding.
22. Apply seam sealer to the seams between the parts and the vehicle in the areas (1) indicated.



23. Correct any distortions to the sheet metal using a hammer and dolly block.
24. With the use disc grinder, smooth the welds.
25. With the use of a rotary brush, clean the previously welded areas.
26. Apply corrosion protection to the areas involved in the welding.
27. Apply seam sealer to the seams between the parts and the vehicle in the areas (1) shown in the figure.



28. Correct any distortions to the sheet metal using a hammer and dolly block.
29. With the use of a disc grinder, smooth the welds.
30. With the use of a rotary brush, clean the previously welded areas.
31. Apply corrosion protection to the areas involved in the welding.
32. Apply seam sealer to the seams between the parts and the vehicle in the areas (1) indicated.
33. Install the roof panel (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Roof Panel).

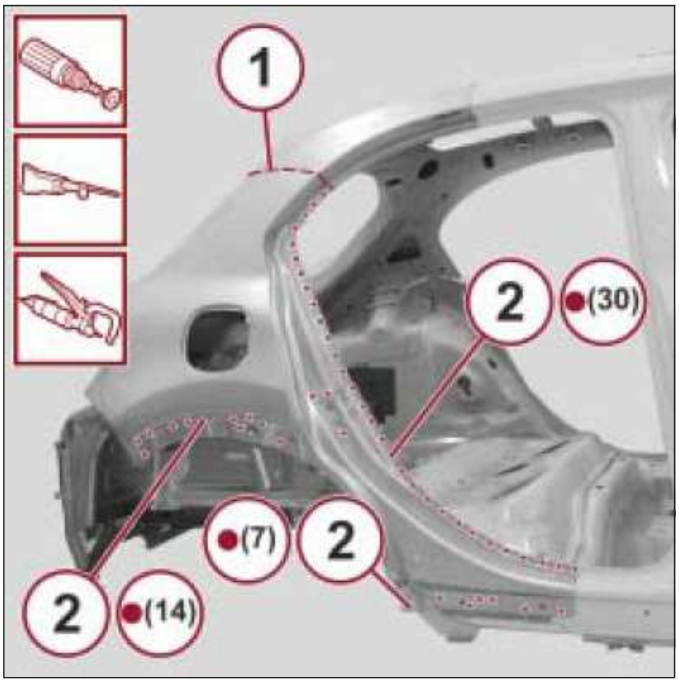


Body Side Aperture/Quarter Panel

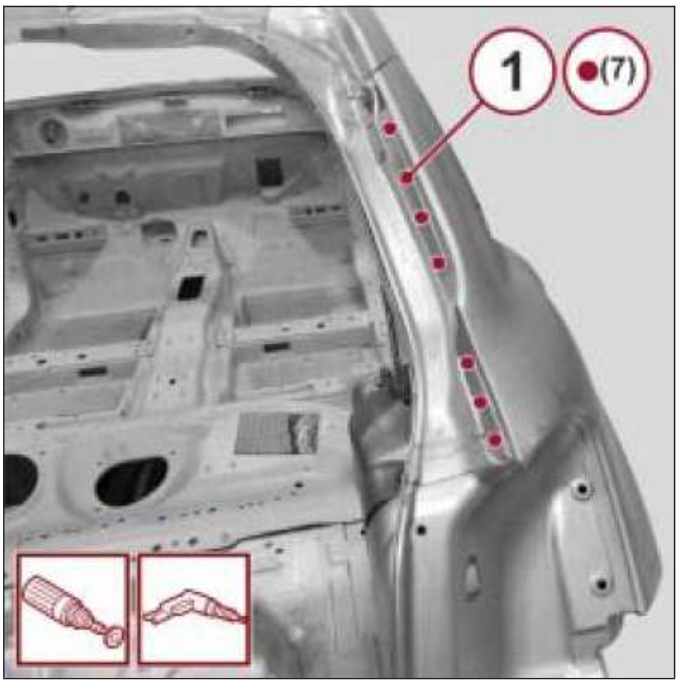
REMOVAL

1. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
2. Straighten the body as necessary.

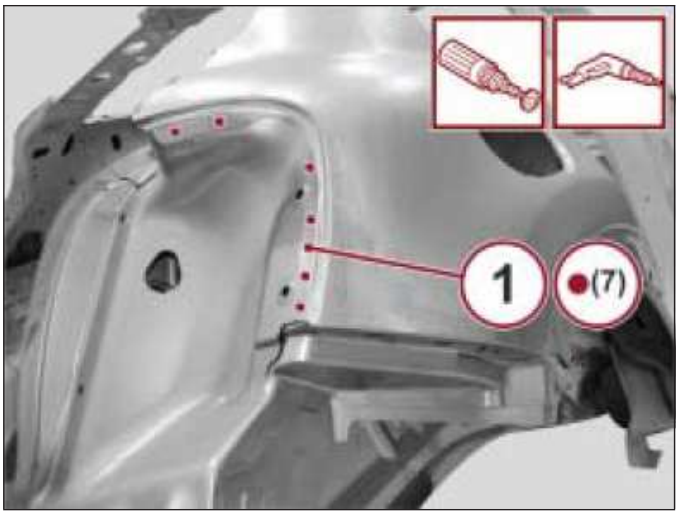
3. With the use of a rotary brush, remove the paint to gain access to the spot welds.
4. With the use of a reciprocating saw, cut along the cut lines (1) shown in the figure.
5. With the use of a spot weld cutting tool, release the spot welds (2) shown in the figure.



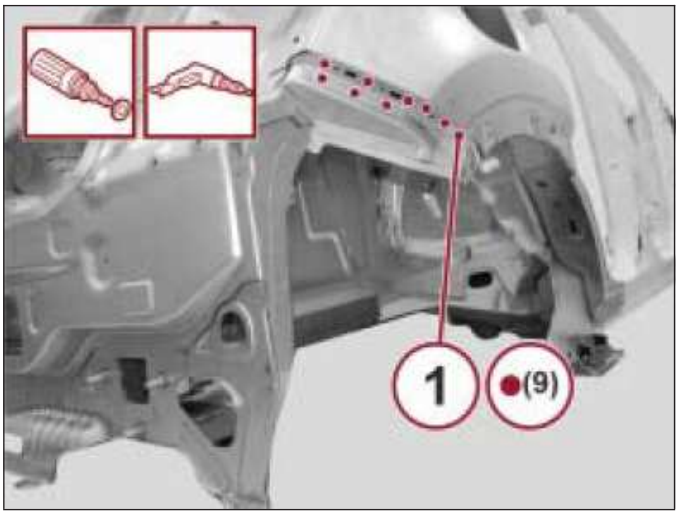
6. With the use of a drill, release the spot welds (1) shown in the figure.



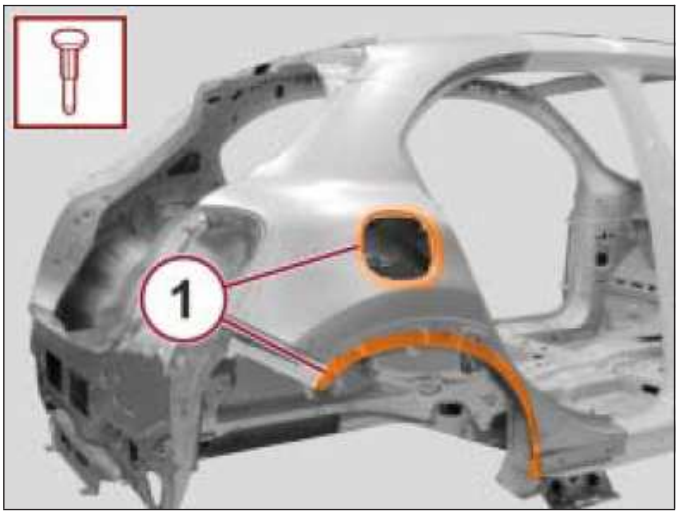
7. With the use of a drill, release the spot welds (1) shown in the figure.



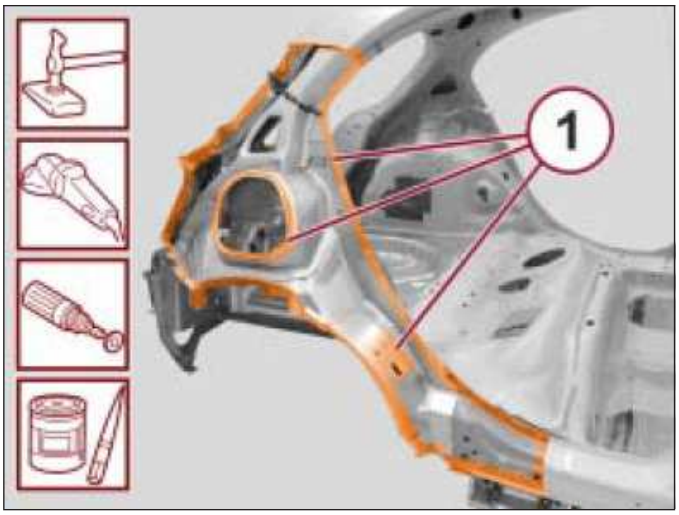
8. With the use of a drill, release the spot welds (1) shown in the figure.



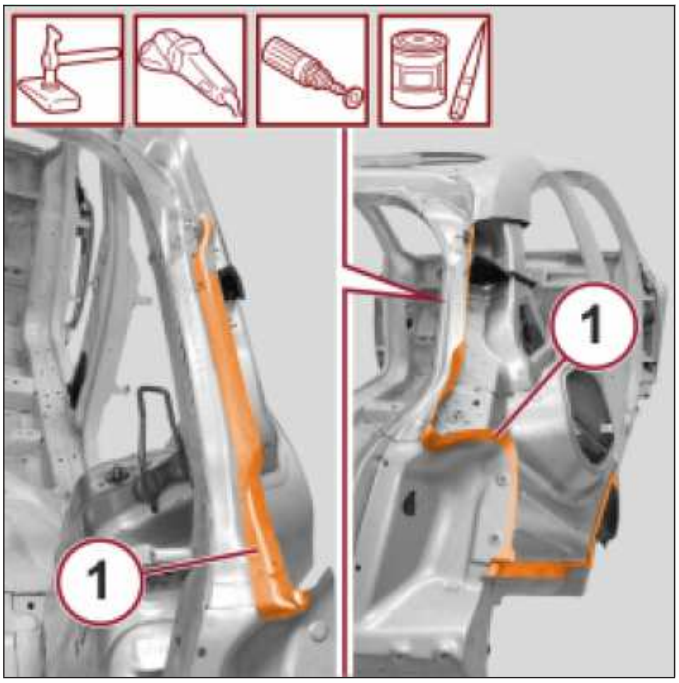
9. With the use of a chisel and hammer, release the beads of adhesive in the areas shown (1).
10. With the use of a chisel and hammer, remove the welds previously released.
11. Remove the body side aperture quarter panel and clippings from the vehicle



12. With the use of a hammer and dolly block, straighten the edges of the mating components.
13. With the use of a disc grinder, remove any residue of the adhesives and spot welds.
14. With the use of a rotary brush, clean the previously treated areas.
15. Apply electro-weldable paint/weld through primer to the areas (1) highlighted.



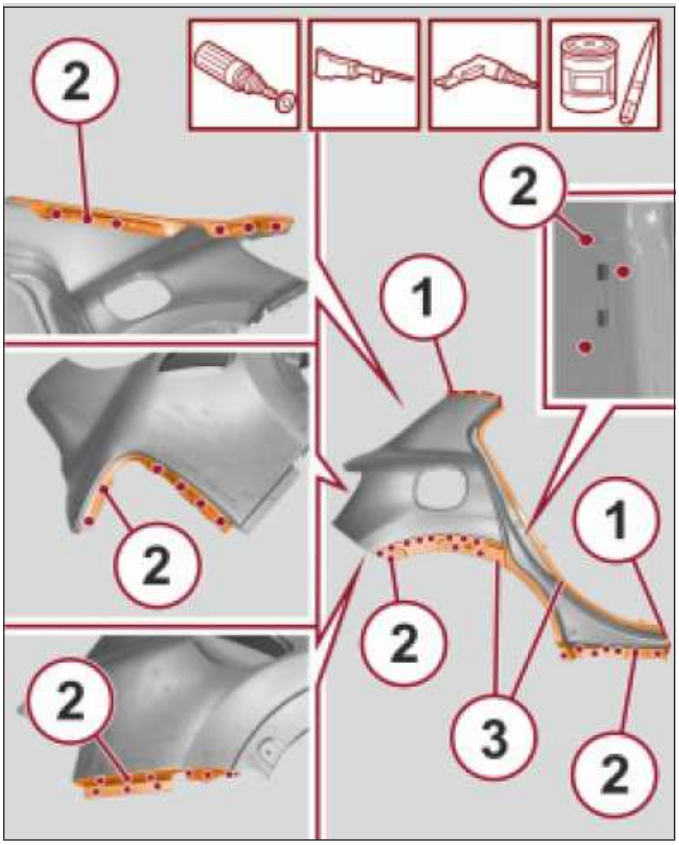
16. With the use of a hammer and dolly block, straighten the edges (1) of the mating components.
17. With the use of a disc grinder, remove any residue of the adhesive and spot welds.
18. With the use of a rotary brush, clean the previously treated areas.
19. Apply electro-weldable paint/weld through primer to the areas (1) highlighted.



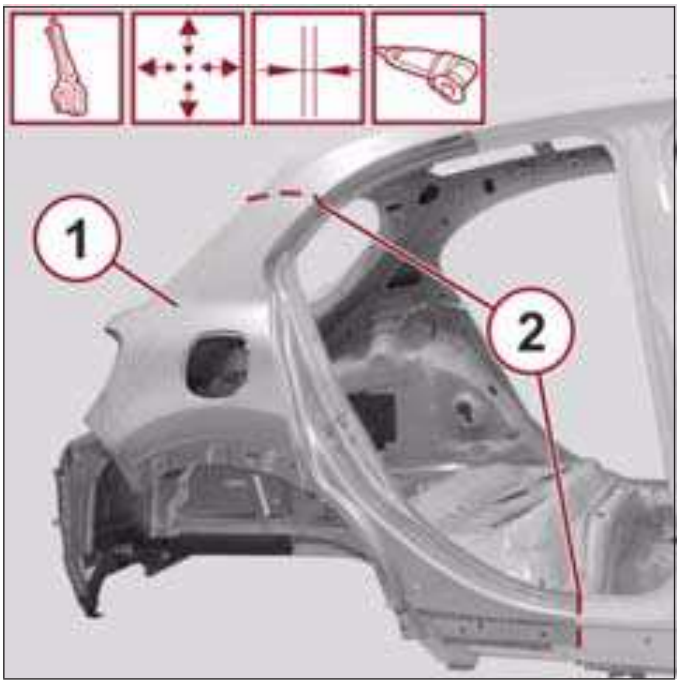
INSTALLATION

1. Remove the anti-corrosion treatment from the entire perimeter of the inside and outside of the service part using a rotary brush.

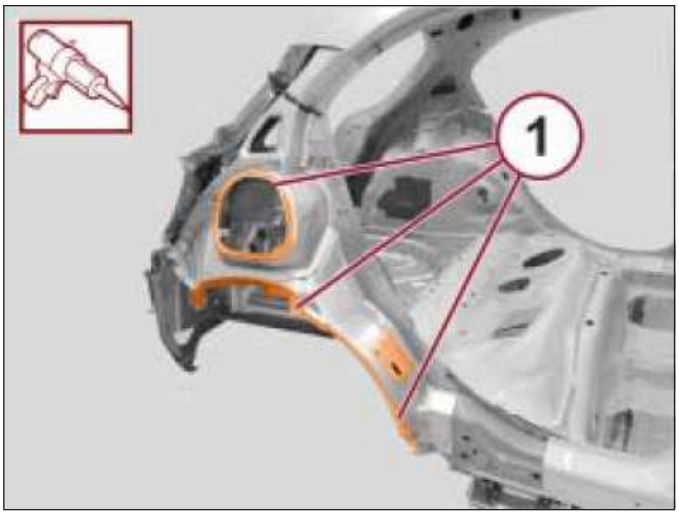
   NOTE: Be certain to leave the service panel long enough to allow for overlapping.
2. Cut the service part at the cut lines (1) as indicated in the figure, leaving enough length to for overlapping.
3. With the use of a drill, drill holes (2) in the area shown.
4. Apply elctro-weldable paint/weld through primer to the boarders of the areas (3) to be welded.



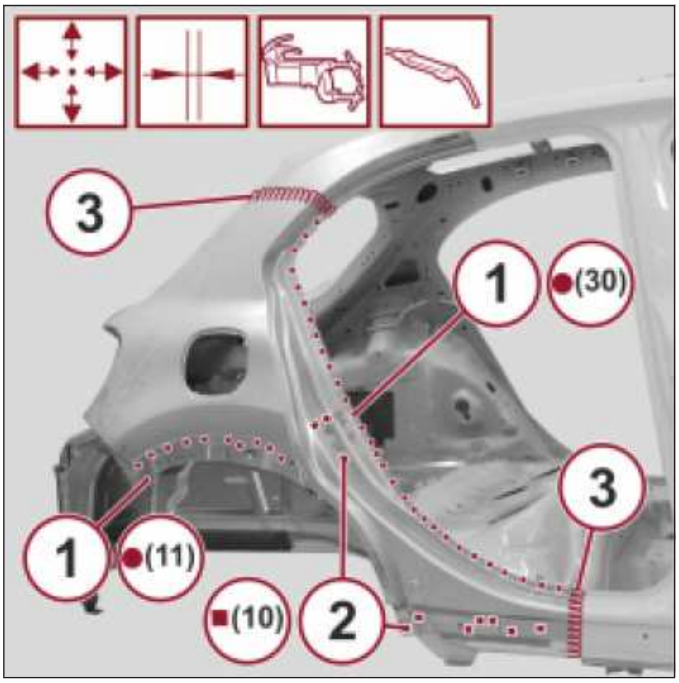
5. Position the service part (1) correctly on the vehicle and secure it with the self locking clamps.
6. Check the alignment and surrounding gaps.
7. With the use of a circular saw, cut the edges (2) so that the join line is perfect.
8. Remove the service part, the excess panels and the components used for adjustment.
9. Create and install 50 mm (2 in.) backer panels to the butt joint areas.



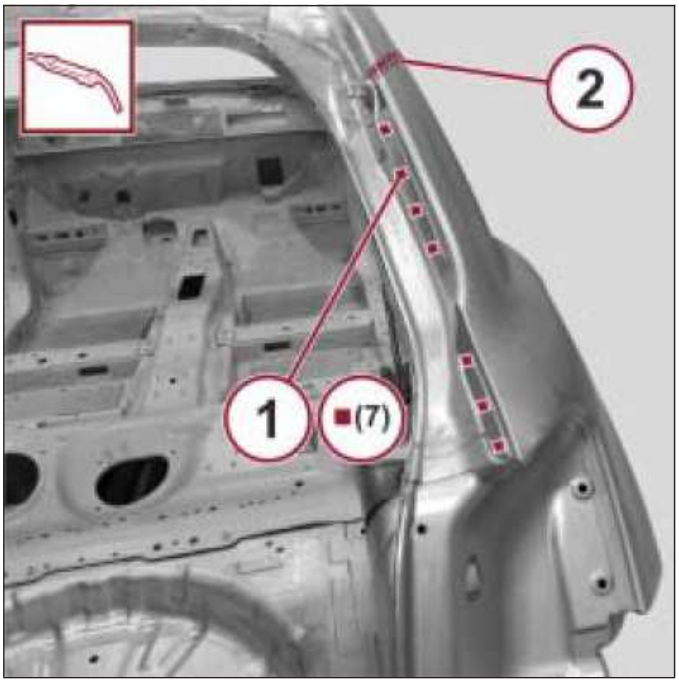
10. Apply structural adhesive to the areas (1) shown in the figure.



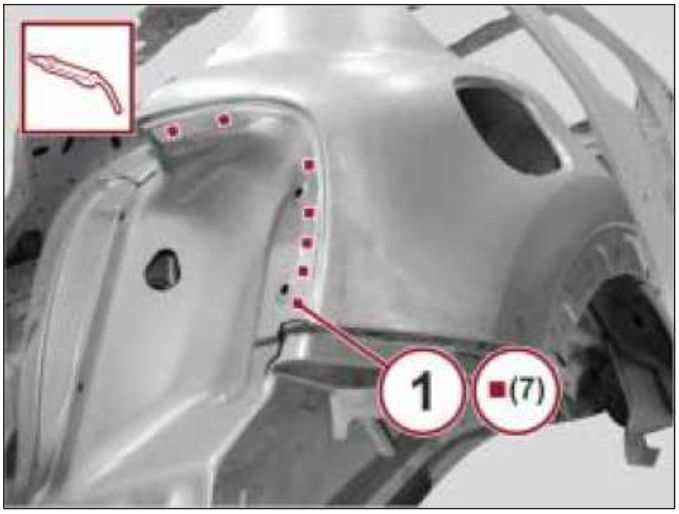
11. Position the service part correctly on the vehicle and secure it with the self-locking clamps.
12. Check the alignment and surrounding gaps.
13. With the use of a spot welder, apply spot welds to the areas (1) shown in the figure.
14. With the use of a MIG welder, apply plug welds filling in the areas (2) shown in the figure.
15. With the use of a MIG welder, apply seam welds to the butt joint area (3) indicated in the figure.



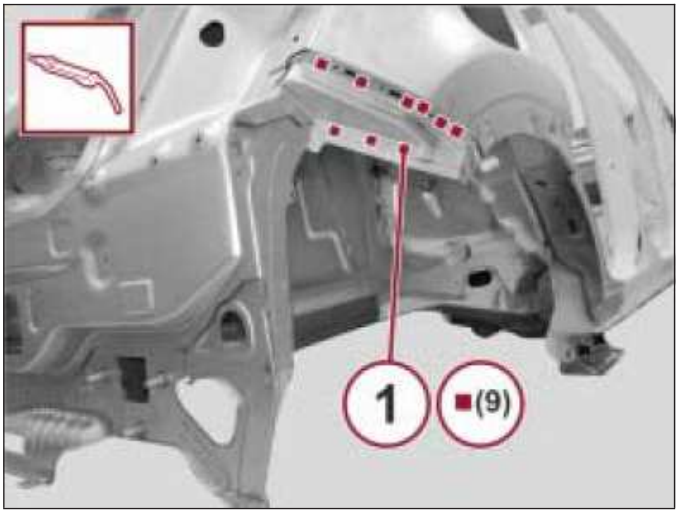
16. With the use of a MIG welder, apply plug welds filling in the areas (1) shown in the figure.
17. With the use of a MIG welder, apply seam welds to the butt joint area (2) shown in the figure.



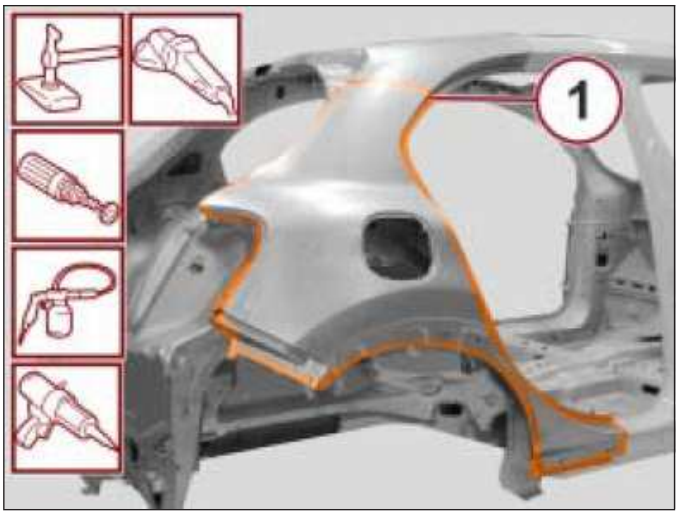
18. With the use of a MIG welder, apply plug welds filling in the areas (1) shown in the figure.



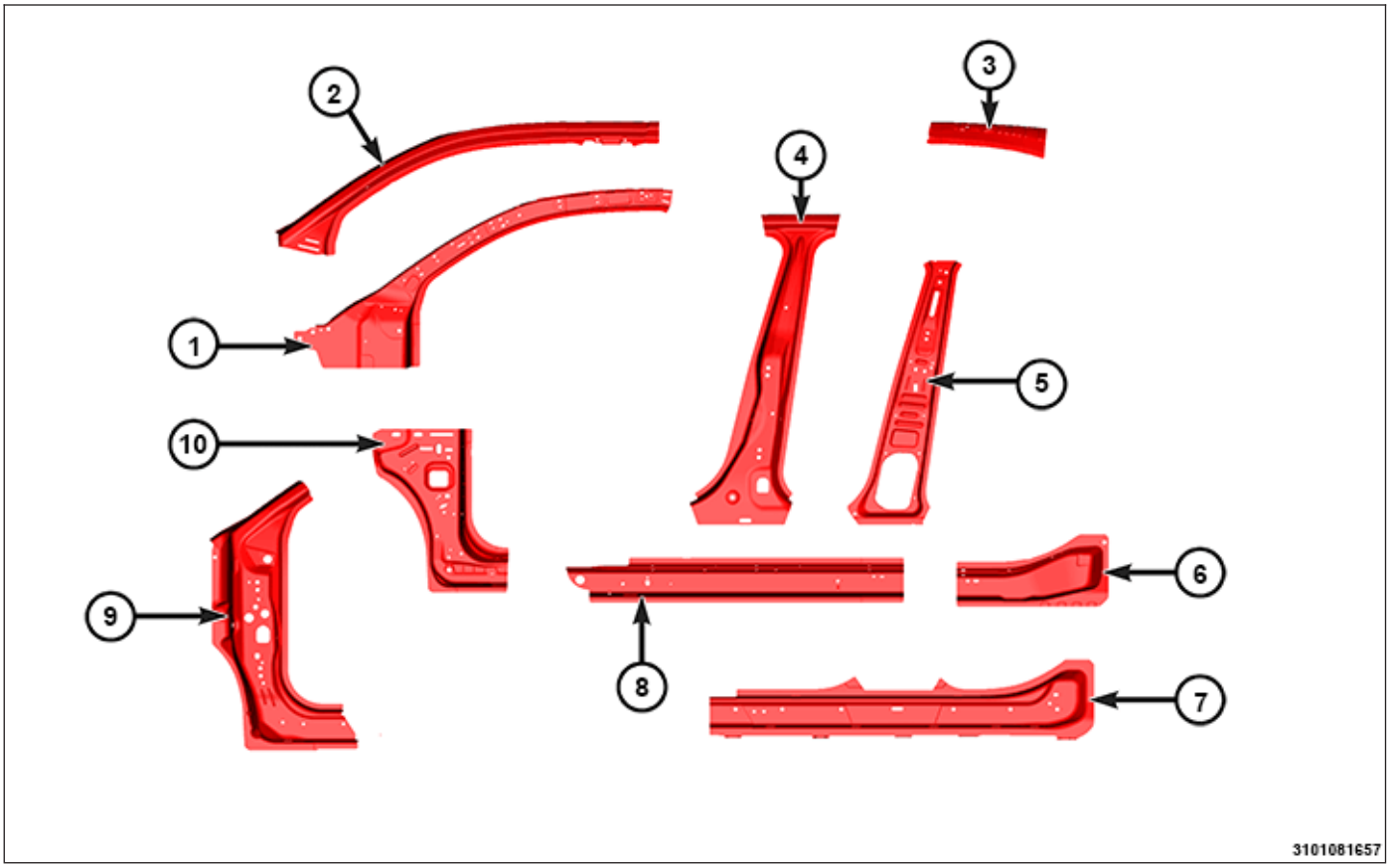
19. With the use of a MIG welder, apply plug welds filling in the areas (1) shown in the figure.



20. Correct any distortions to the sheet metal using a hammer and dolly block.
21. With the use of a disc grinder, smooth the welds.
22. With the use of a rotary brush, clean the previously welded areas.
23. Apply corrosion protection to the areas involved in the welding.
24. Apply seam sealer to the seams between the service part and the vehicle in, the areas (1) shown in the figure.



Body Side Inner Components Do Not Section



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

1 - A-PILLAR INNER PANEL
2 - A-PILLAR OUTER PANEL
3 - UPPER SIDE MEMBER REINFORCEMENT
4 - B-PILLAR OUTER REINFORCEMENT
5 - B-PILLAR INNER REINFORCEMENT
6 - INNER SILL REINFORCEMENT (INNER REAR)
7 - SILL OUTER REINFORCEMENT

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

8 - SILL INNER REINFORCEMENT (FRONT)

9 - COWL SIDE REINFORCEMENT

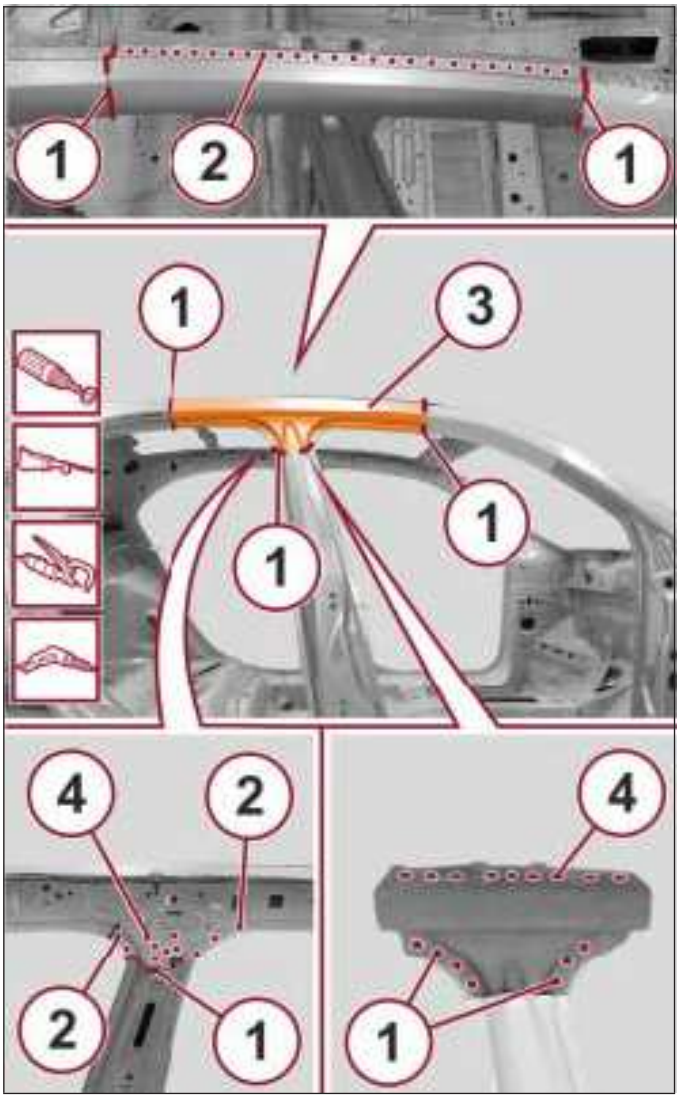
10 - COWL SIDE PANEL

Due to the usage of VHS steel on the inner components and reinforcements sectioning of these parts are not allowed, complete replacement of the component or reinforcement is the only acceptable repair. It will be necessary to use a **Tungsten Carbide Drill Bit** to release the spot welds along the areas where these parts join other components.

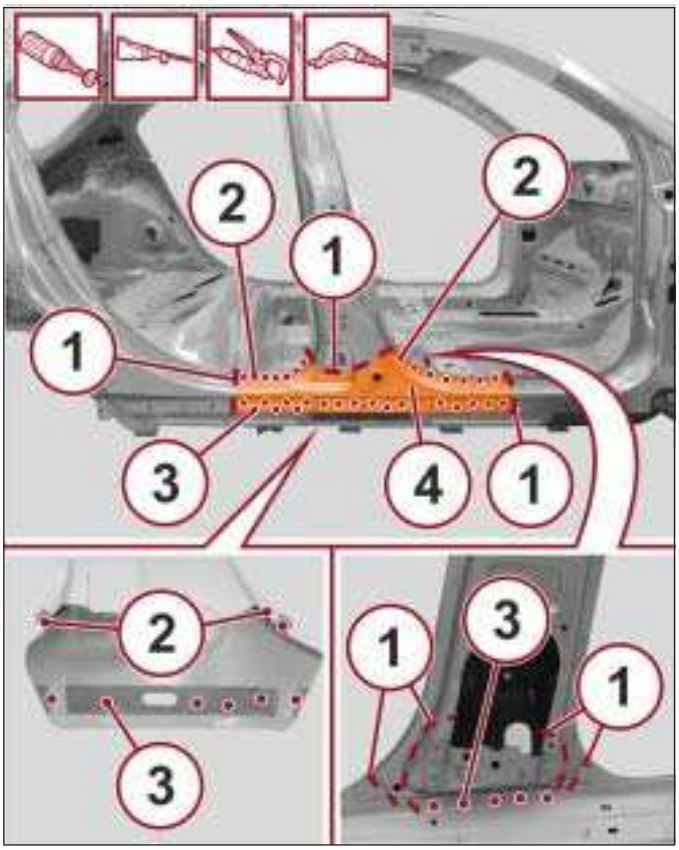
B-Pillar Reinforcement

REMOVAL

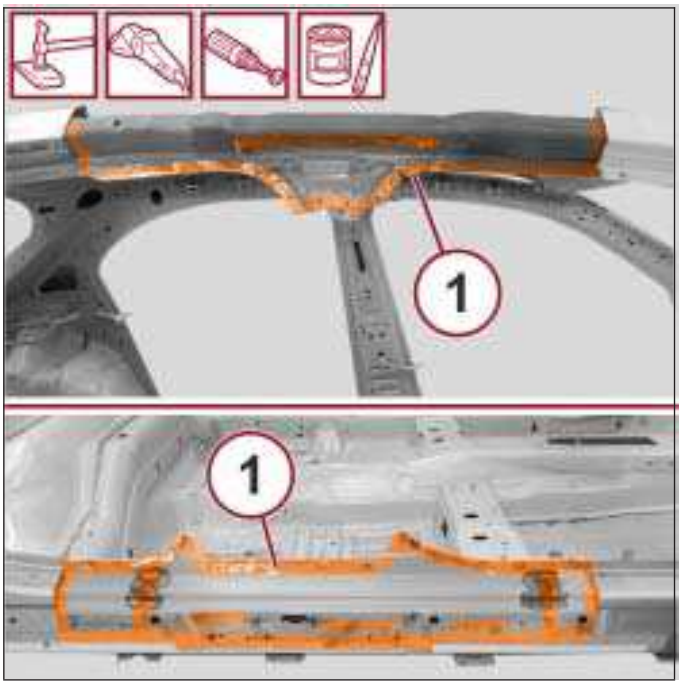
1. Remove the roof panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Roof Panel).
2. Remove the roof bow (Refer to 31 - Standard Procedure/Sectioning Locations and Component Procedures/ Roof Bow).
3. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
4. Straighten the body as necessary.
5. With the use of a rotary brush, remove the paint and gain access to the spot welds.
6. With the use of a reciprocating saw, cut along the cut lines (1) shown in the figure.
7. With the use of a spot weld cutting tool, release the spot welds (2) shown in the figure.
8. Remove the cutout b-pillar section (3) shown in the figure.
9. With the use of a drill, release the spot welds (4) that can not be accessed with the spot weld cutting tool.



10. With the use of a rotary brush, remove the paint and gain access to the spot welds.
11. With the use of a reciprocating saw, cut along the cut lines (1) shown in the figure.
12. With the use of a spot weld cutting tool, release the spot welds (2) shown in the figure. .
13. With the use of a drill, release the spot welds (3) that can not be accessed with the spot weld cutting tool.
14. Remove the cutout b-pillar section (4) shown in the figure and release the welding points below.
15. Remove the b-pillar.



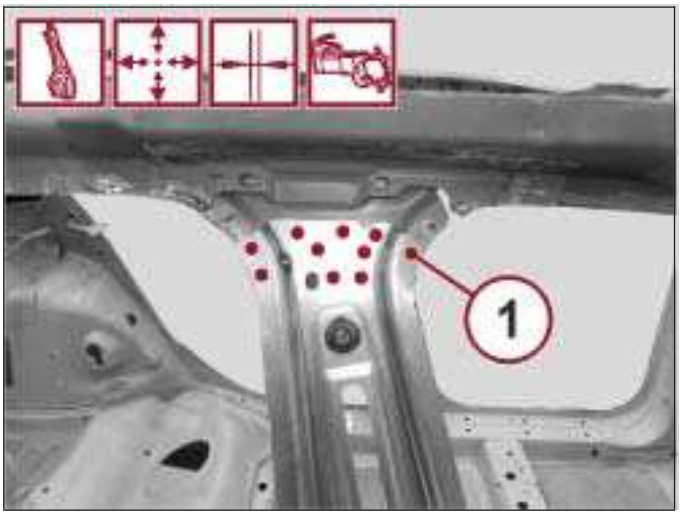
16. With the use of a hammer and dolly block, straighten the edges of the mating components.
17. With the use of a disc grinder, remove any residue of the spot welds.
18. With the use of a rotary brush, clean the previously treated areas.
19. Apply electro-weldable paint/weld through primer to the areas (1) to be welded.



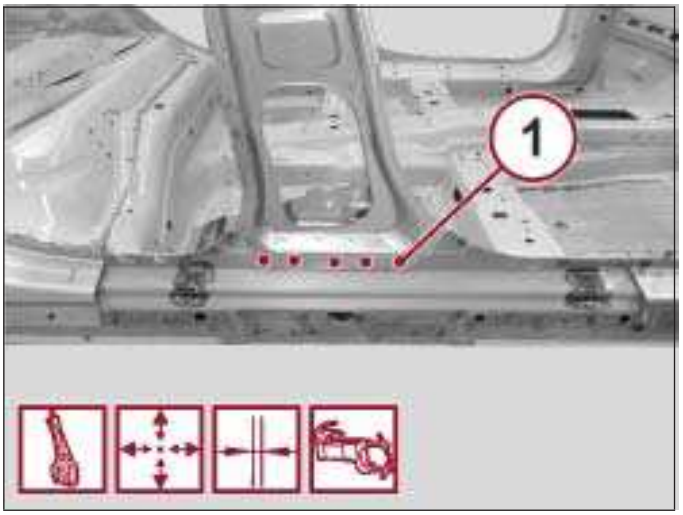
INSTALLATION

1. Remove the anti-corrosion treatment from the entire perimeter (1) of the inside and outside of the service part using a rotary brush.
2. With the use of a drill, drill holes (2) in the areas shown.
3. Apply elctro-weldable paint/weld through primer to the edges involved with welding.

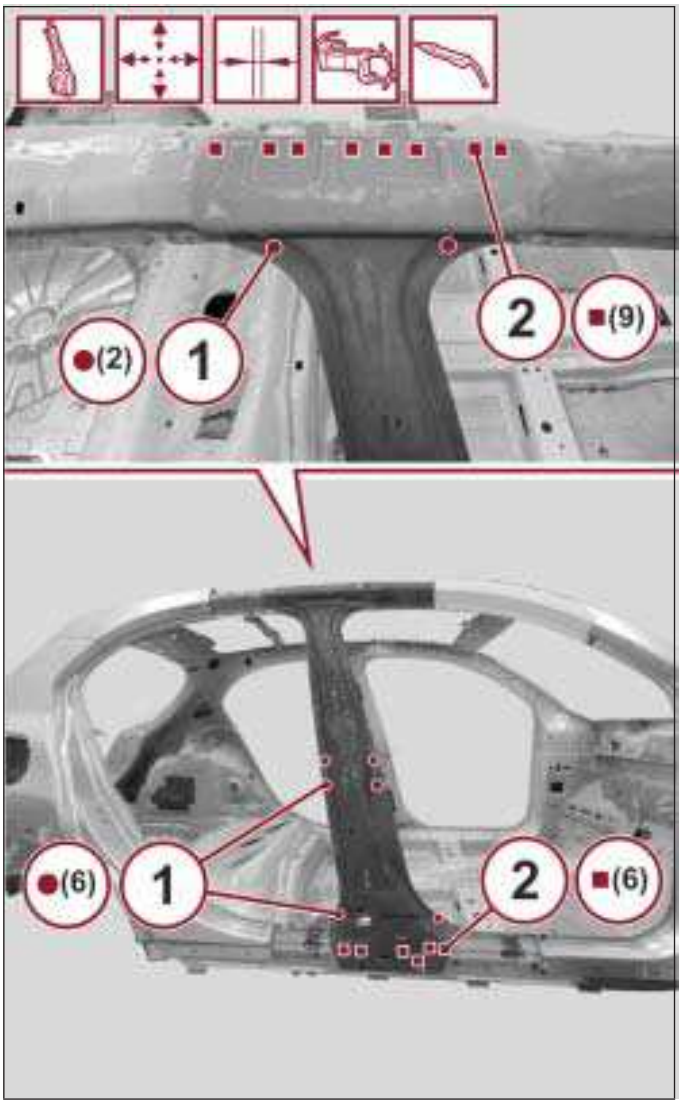
4. Correct any distortions to the sheet metal using a hammer and dolly block.
5. Use a grinding disc to smooth the welds.
6. Use a rotary brush to clean the previously welded areas.
7. Apply corrosion protection to the areas involved in the welding.
8. Position the inner b-pillar service part correctly on the vehicle and secure it with the self-locking clamps.
9. Check the alignment and surrounding gaps.
10. With the use of a spot welder, apply spot welds to the areas (1) indicated in the figure.



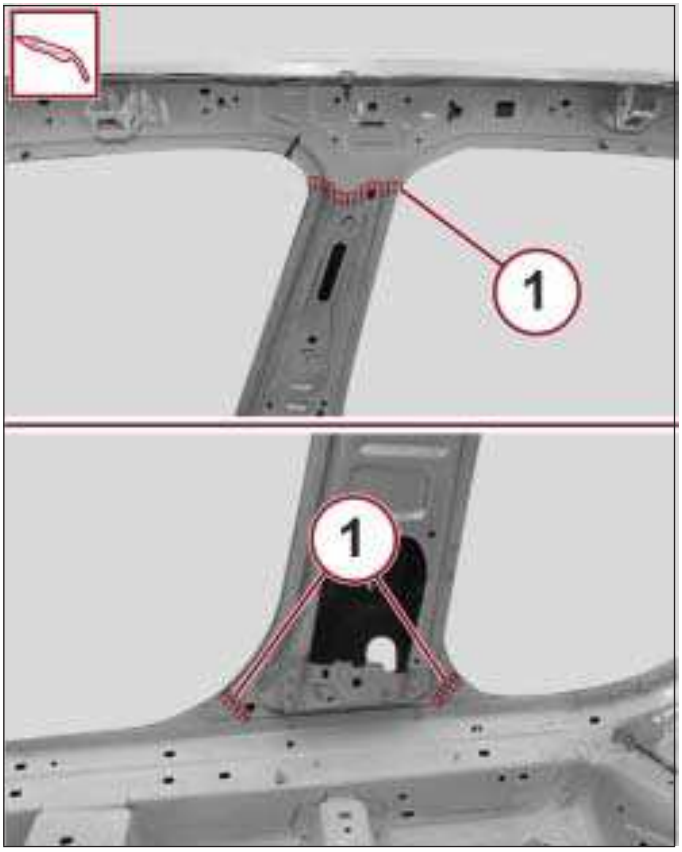
11. Position the inner b-pillar service part correctly on the vehicle and secure it with the self-locking clamps.
12. Check the alignment and surrounding gaps.
13. With the use of a spot welder, apply spot welds to the areas (1) indicated in the figure.



14. Correct any distortions to the sheet metal using a hammer and dolly block.
15. Use a grinding disc to smooth the welds.
16. Use a rotary brush to clean the previously welded areas.
17. Apply corrosion protection to the areas involved in the welding.
18. Position the service part correctly on the vehicle and secure it with the self-locking clamps.
19. Check the alignment and surrounding gaps.
20. With the use of a spot welder, apply spot welds to the areas (1) shown in the figure.
21. With the use of a MIG welder, apply plug welds to the areas (2) indicated in the figure.

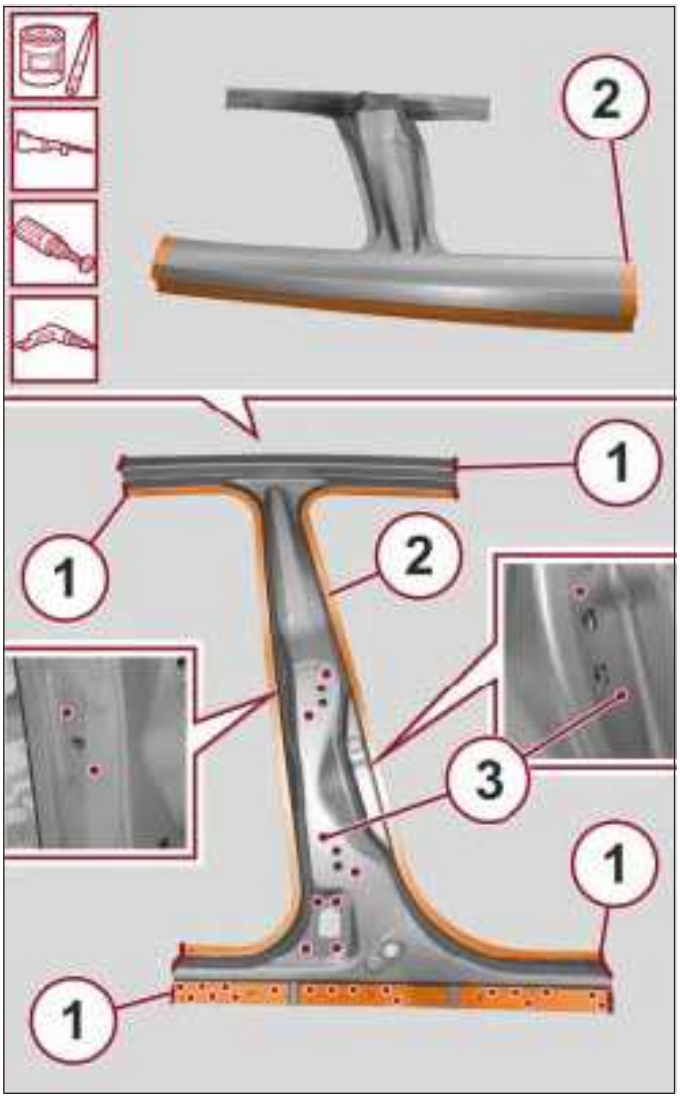


22. With the use of a MIG welder, apply seam welds to the areas (1) indicated in the figure.
23. Correct any distortions to the sheet metal using a hammer and dolly block.
24. Use a disc grinder to smooth the welds.
25. Use a rotary brush to clean the previously welded areas.
26. Apply corrosion protection to the areas involved in the welding.

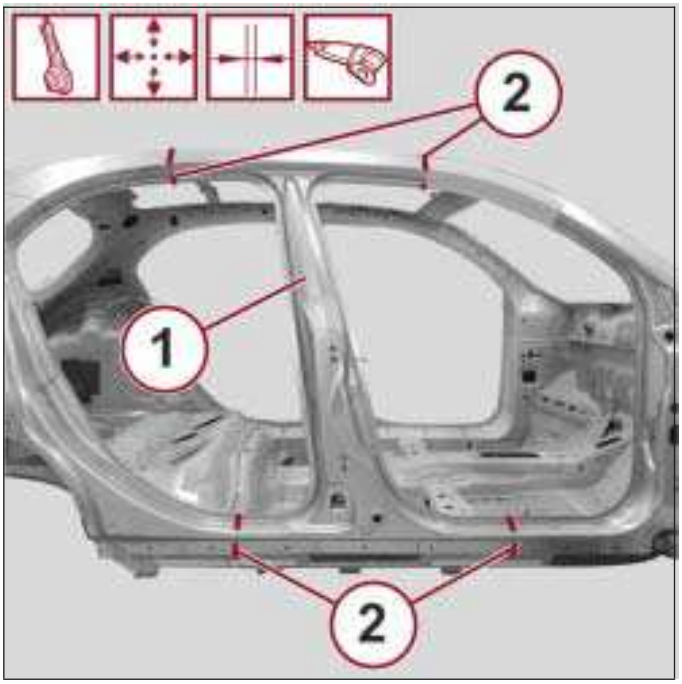


NOTE: Be certain to leave the service part long enough to allow for overlapping.

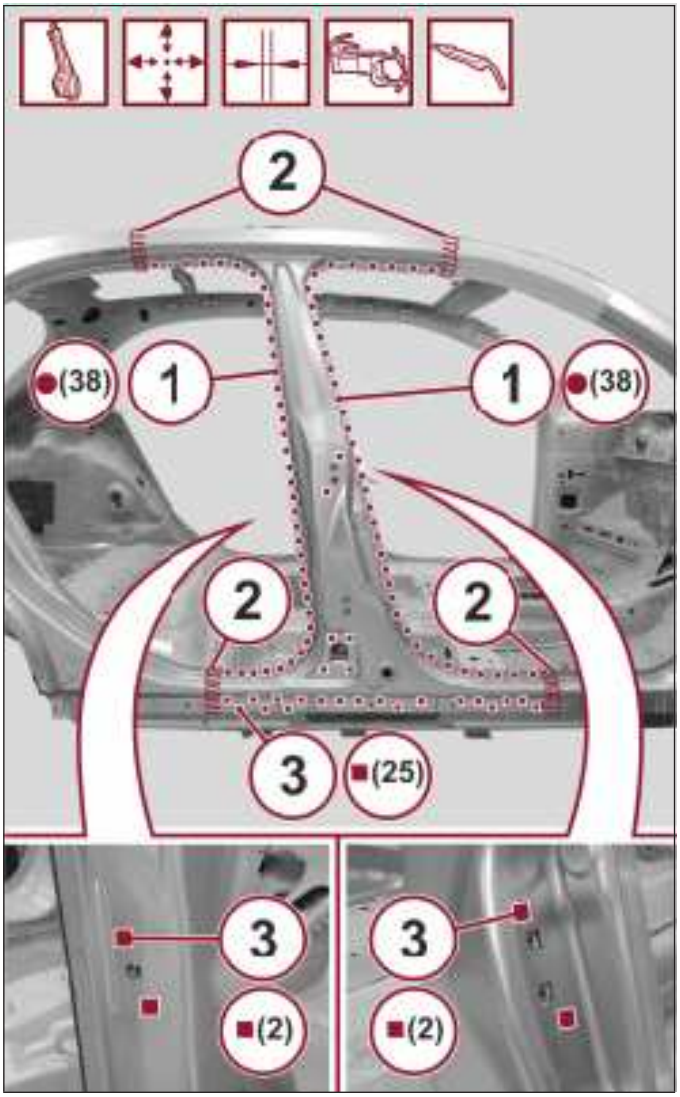
27. Cut the outer B-pillar service part at the cut lines (1) leaving enough length for overlap.
28. Remove the anti-corrosion treatment from the entire perimeter (2) of the inside and outside of the service part using a rotary brush.
29. With the use of a drill, drill holes (3) in the area shown.
30. Apply elctro-weldable paint/weld through primer to the edges to be welded.



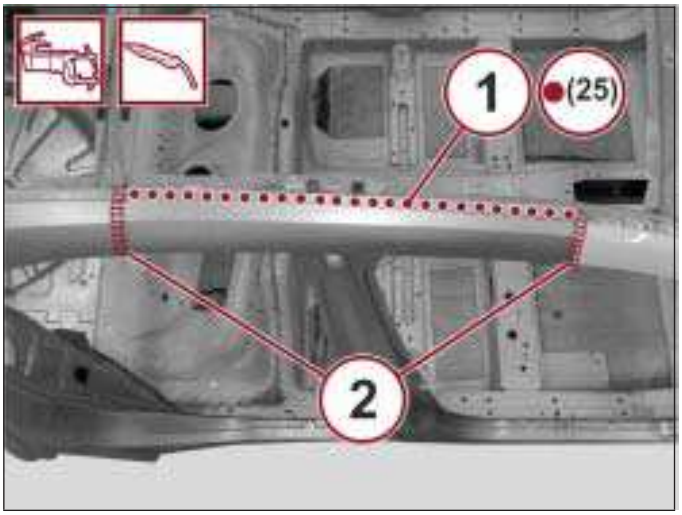
31. Position the service part correctly on the vehicle and secure it with the self-locking clamps.
32. Check the alignment and surrounding gaps.
33. With the use of a circular saw, cut the edges of the panel metal (2) to obtain a perfect joint line.
34. Remove the external service part, the excess pieces of cutoff sheet metal and the components used for the adjustment.
35. Create and install 50 mm (2 in.) backer panels to the butt joint areas (2).



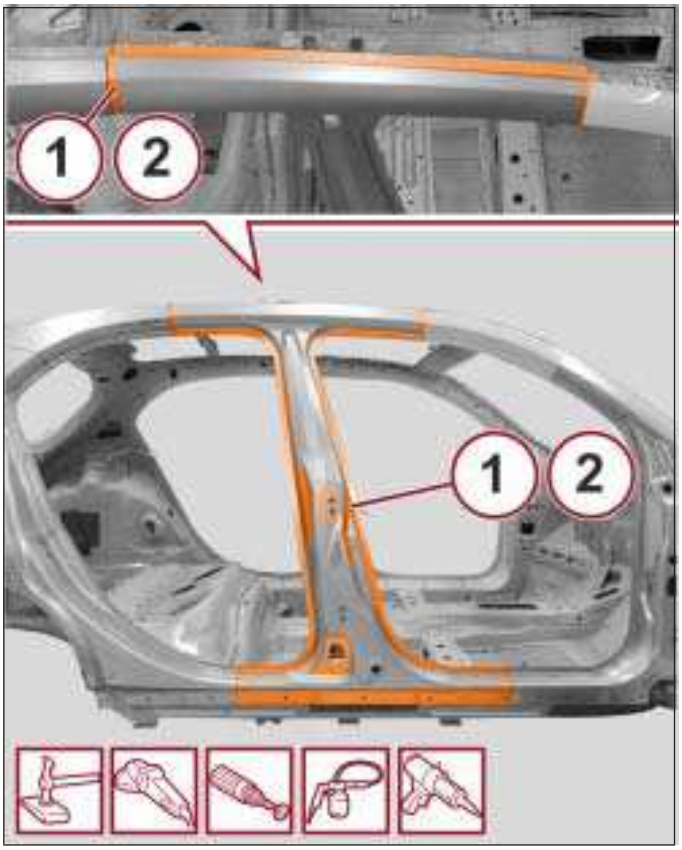
36. Position the b-pillar external service part correctly on the vehicle and secure it with the self-locking clamps.
37. Check the alignment and surrounding gaps.
38. With the use of a spot welder, apply spot welds to the areas (1) shown in the figure.
39. With the use of a MIG welder, apply seam welds to the butt joint areas (2) shown in the figure.
40. With the use of a MIG welder, apply plug welds to the areas (3) indicated in the figure.



41. With the use of a spot welder, apply spot welds to the areas (1) shown in the figure.
42. With the use of a MIG welder, apply seam welds to the butt joint areas (2) shown in the figure.



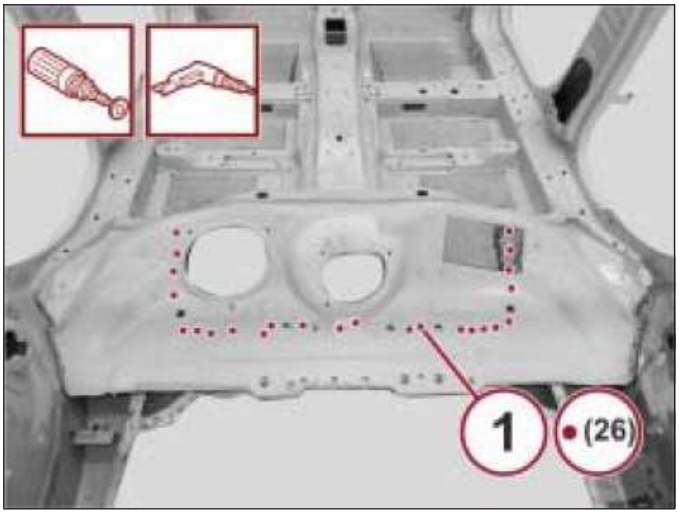
43. Correct any distortions to the sheet metal using a hammer and dolly block.
44. Use a disc grinder to smooth the welds.
45. Use a rotary brush to clean the previously welded areas (1).
46. Apply corrosion protection to the areas (2) involved in the welding.
47. Apply seam sealer to the seams between the service parts and the vehicle.
48. Install the roof bow (Refer to 31 - Standard Procedure/Sectioning Locations and Component Procedures/ Roof Bow).
49. Install the roof panel (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Roof Panel).



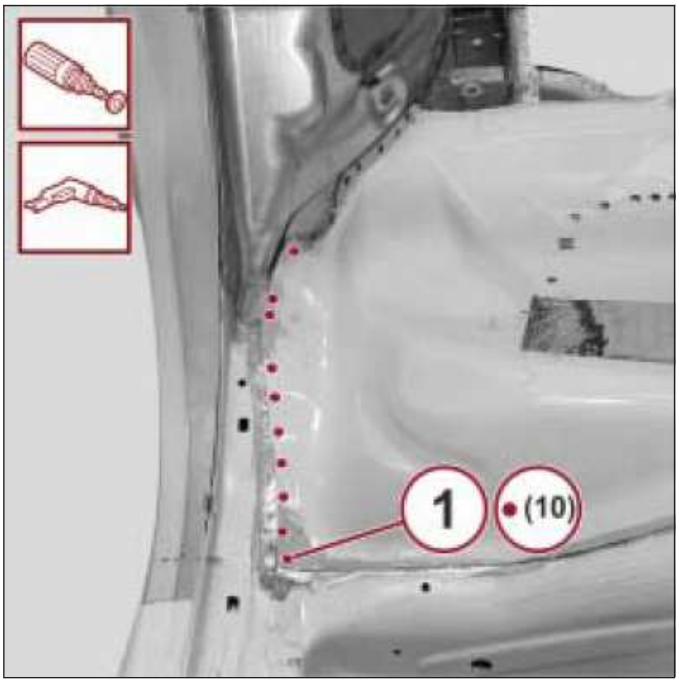
Center Floor Pan

REMOVAL

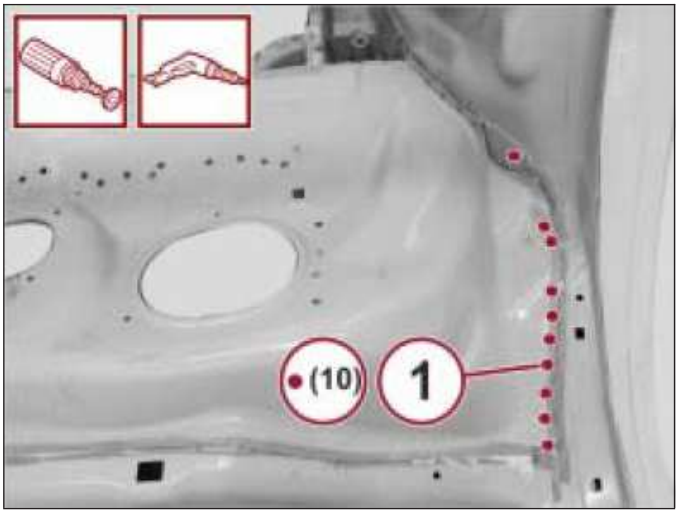
1. Remove the rear closure panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Closure Panel).
2. Remove the rear floor pan (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Floor Pan).
3. Remove both floor pan extensions (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Floor Pan Extension).
4. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
5. Straighten the body as necessary.
6. With the use of a rotary brush, remove the paint and gain access to the spot welds.
7. With the use of a drill, remove the spot welds (1) shown in the figure.



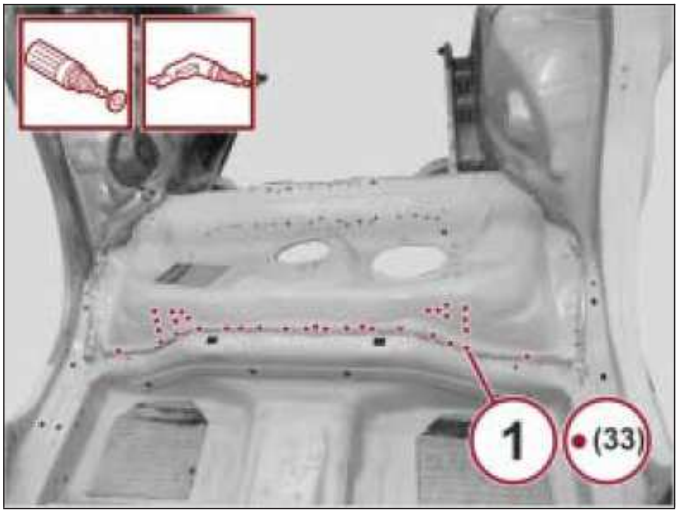
8. With the use of a drill, remove the spot welds (1) shown in the figure.



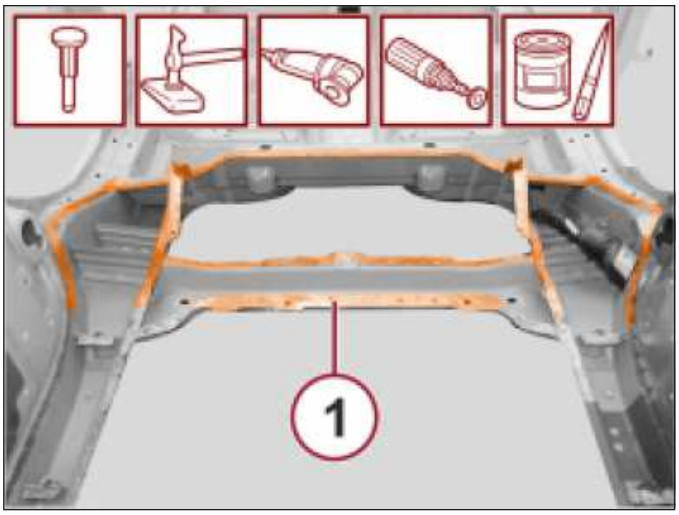
9. With the use of a drill, remove the spot welds (1) shown in the figure.



10. With the use of a drill, remove the spot welds (1) shown in the figure.

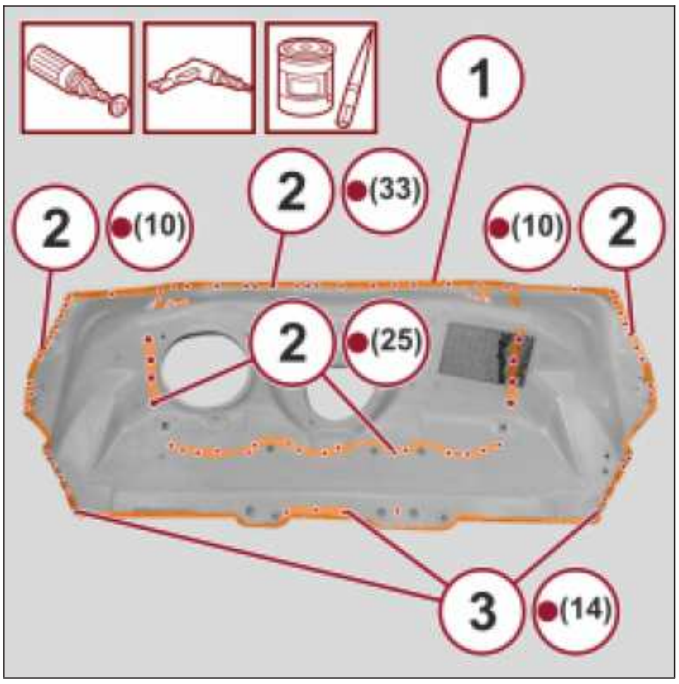


11. Use a chisel and hammer to remove the previously released spot welds.
12. With the use of a hammer and dolly block, straighten the edges (1) of the mating components.
13. With the use of a disc grinder, remove any residue of the spot welds.
14. With the use of a rotary brush, clean the previously treated areas (1).
15. Apply electro-weldable paint/weld through primer to the areas (1) to be welded.

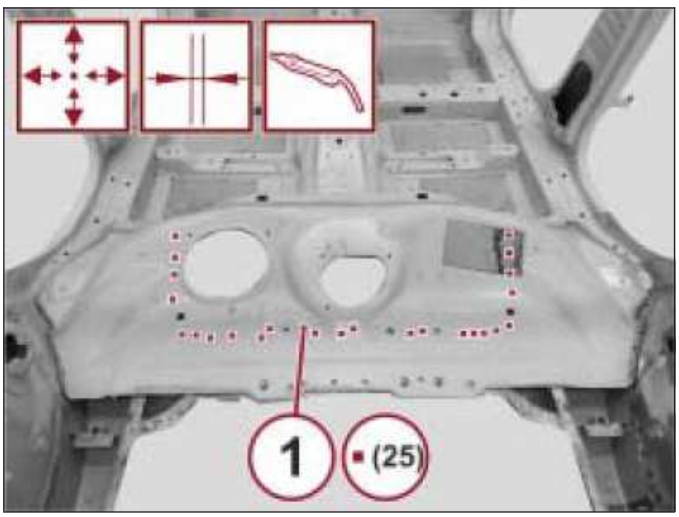


INSTALLATION

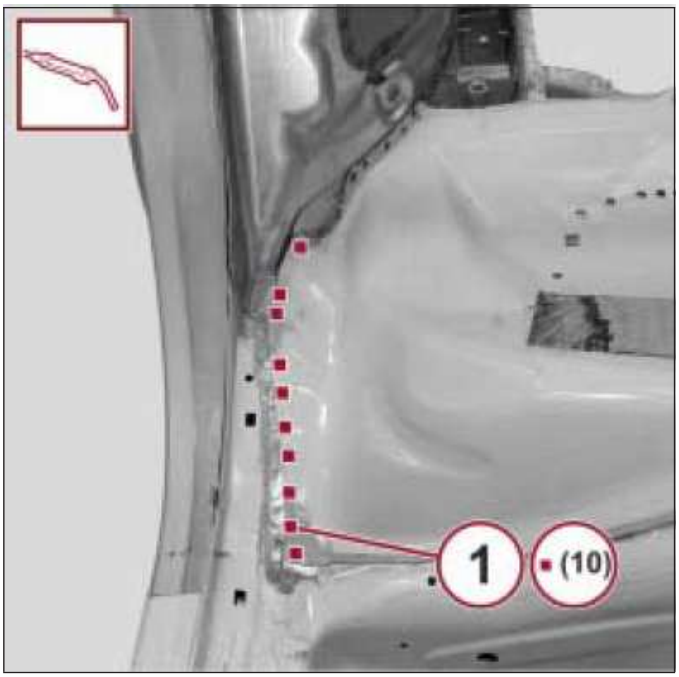
1. With the use of a rotary brush, remove the anti-corrosion treatment around the entire perimeter (1) of the inside and outside of the service parts.
2. With the use of a drill, drill holes (2) in the areas shown.
3. With the use of a drill, drill holes (3) in the areas shown. These are necessary for securing the rear element of the floor and the corners of the rear frame rail.
4. Apply electro-weldable paint/weld through primer to the edges to be welded.



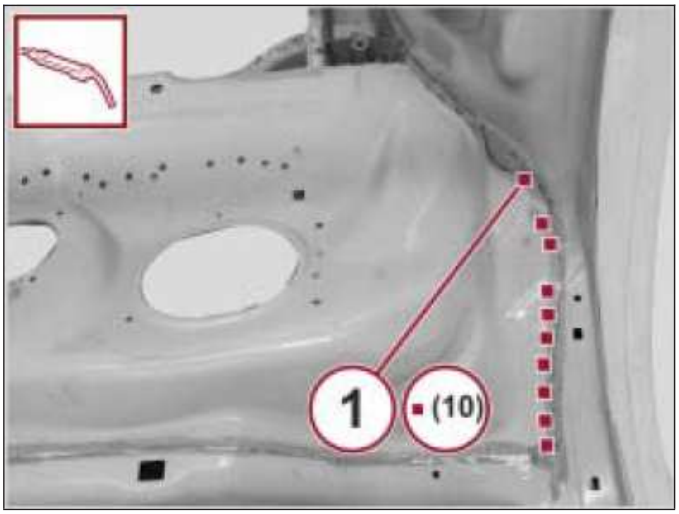
5. Position the center floor pan service part correctly on the vehicle and secure it with the self-locking clamps.
6. Check the alignment and surrounding gaps.
7. With the use of a MIG welder, apply plug welds to the areas (1) shown in the figure.



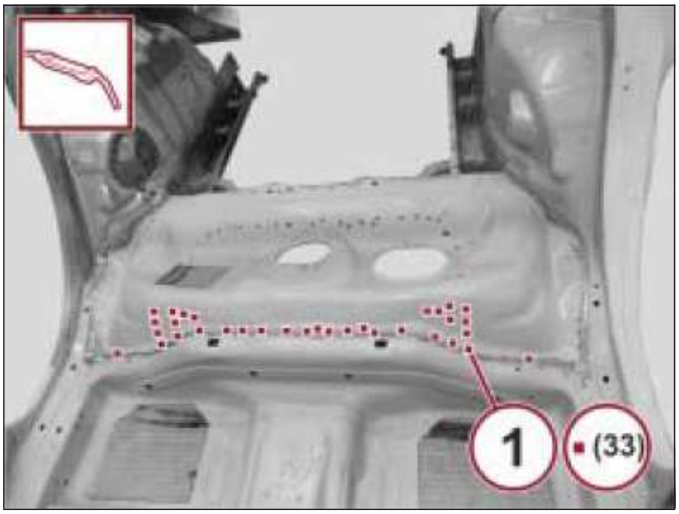
8. With the use of a MIG welder, apply plug welds to the areas (1) shown in the figure.

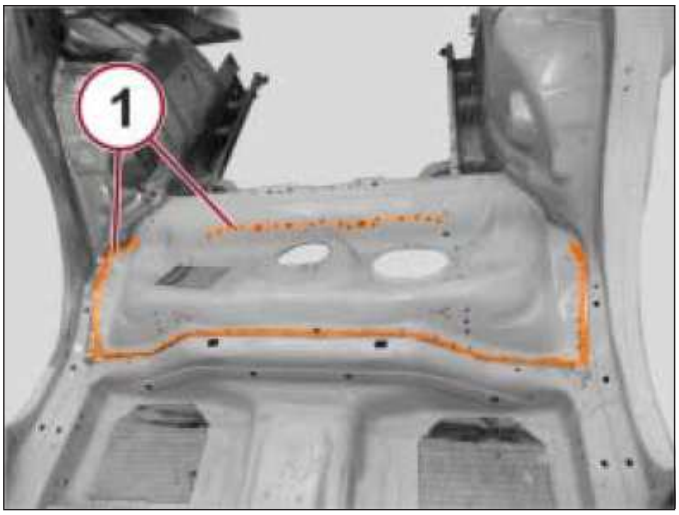


9. With the use of a MIG welder, apply plug welds to the areas (1) shown in the figure.



10. With the use of a MIG welder, apply plug welds to the areas (1) shown in the figure.



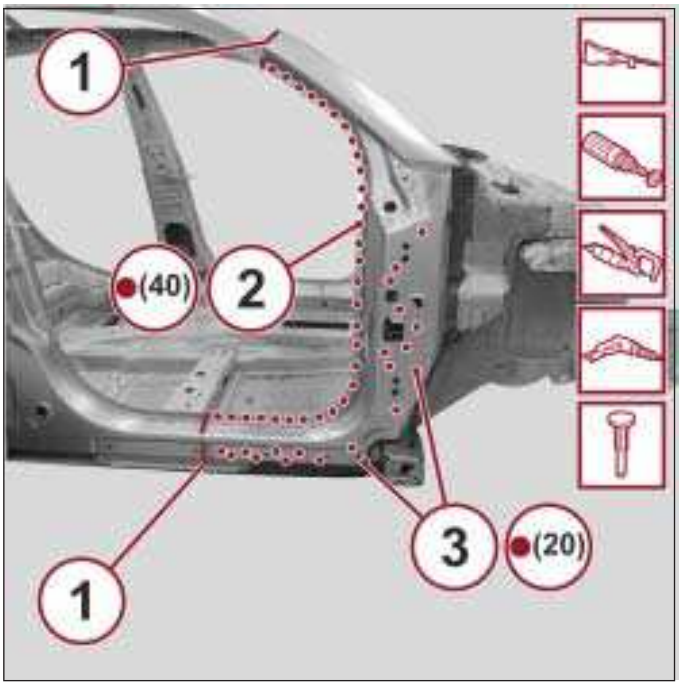


11. Correct any distortions of the sheet metal using a hammer and dolly block.
12. With the use of a disc grinder, smooth the welds.
13. With the use of a rotary brush, clean the previously welded areas (1).
14. Apply corrosion protection to the areas involved in the welding.
15. Apply seam sealer to the seams between the service part and the vehicle in the areas (1) shown.
16. Install both floor pan extensions (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Floor Pan Extension).
17. Install the rear floor pan (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Rear Floor Pan).
18. Install the rear closure panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Closure Panel).

Cowl Side Reinforcement

REMOVAL

1. Remove the front fender (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Front Fender).
2. Remove the load path beam (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Load Path Beam).
3. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
4. Straighten the body as necessary.

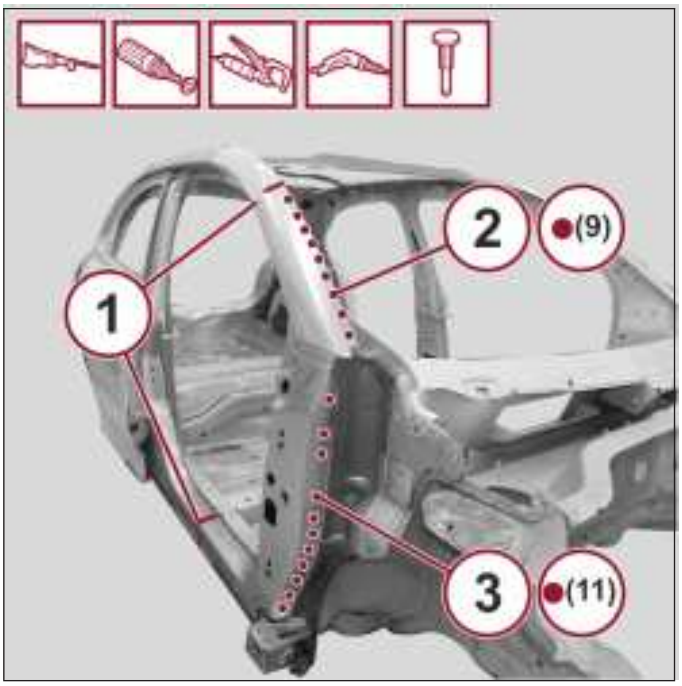


NOTE: Use care to only cut the outer part of sheet metal.

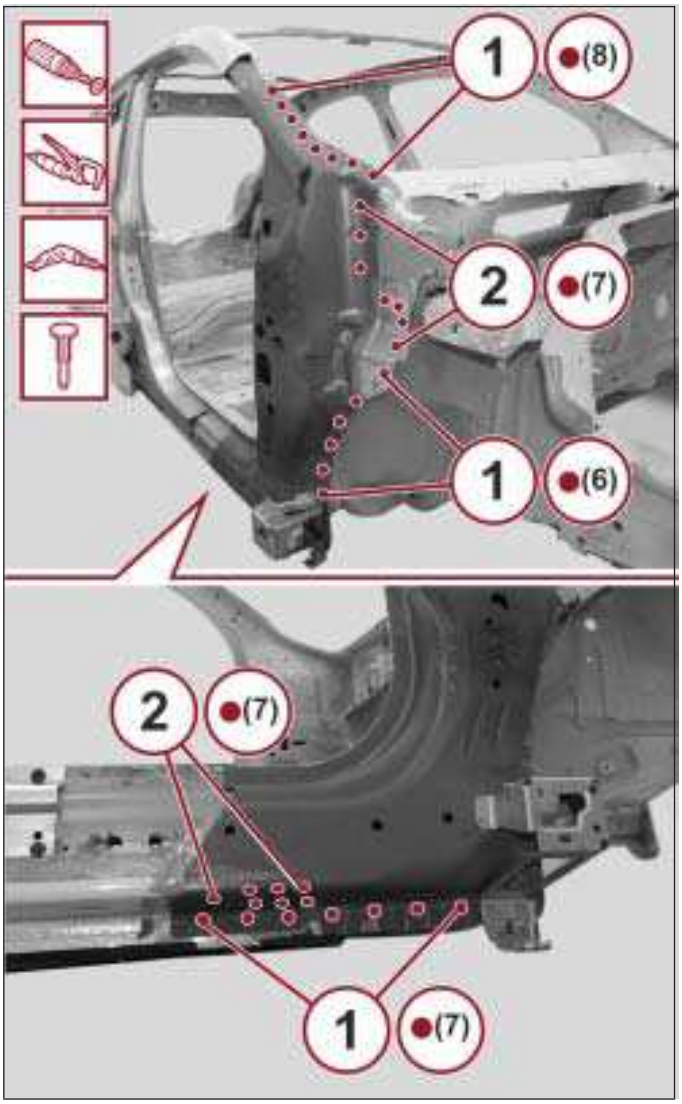
5. With the use of a reciprocating saw, cut along the cut lines (1) shown in the figure.
6. With the use of a rotary brush, remove the paint and gain access to the spot welds.
7. With the use of a spot weld cutting tool, release the spot welds (2).
8. With the use of a drill, release the spot welds (3) not accessible with the spot weld cutting tool.
9. With the use of a chisel and hammer, remove the welds previously released.

NOTE: Use care to only cut the outer part of sheet metal.

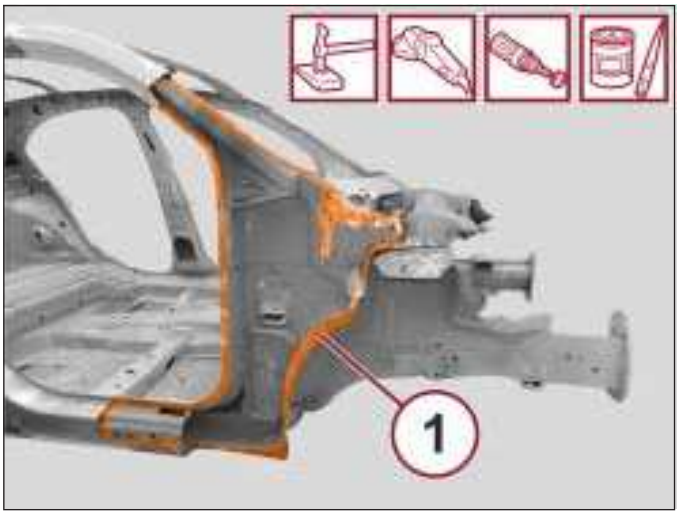
10. With the use of a reciprocating saw, cut along the cut lines (1) shown in the figure.
11. With the use of a rotary brush, remove the paint and gain access to the spot welds.
12. With the use of a spot weld cutting tool, release the spot welds (2).
13. With the use of a drill, release the spot welds (3), not accessible with the spot weld cutting tool.
14. Use a chisel and hammer to remove the welds previously released.
15. Remove the outer part from the vehicle.



16. With the use of a rotary brush, remove the paint and gain access to the spot welds.
17. With the use of a spot weld cutting tool, release the spot welds (1) shown in the figure.
18. With the use of a drill, release the spot welds (2) shown in the figure.
19. With the use of a chisel and hammer, remove the welds previously released.
20. Remove the cowl side reinforcement from the vehicle.

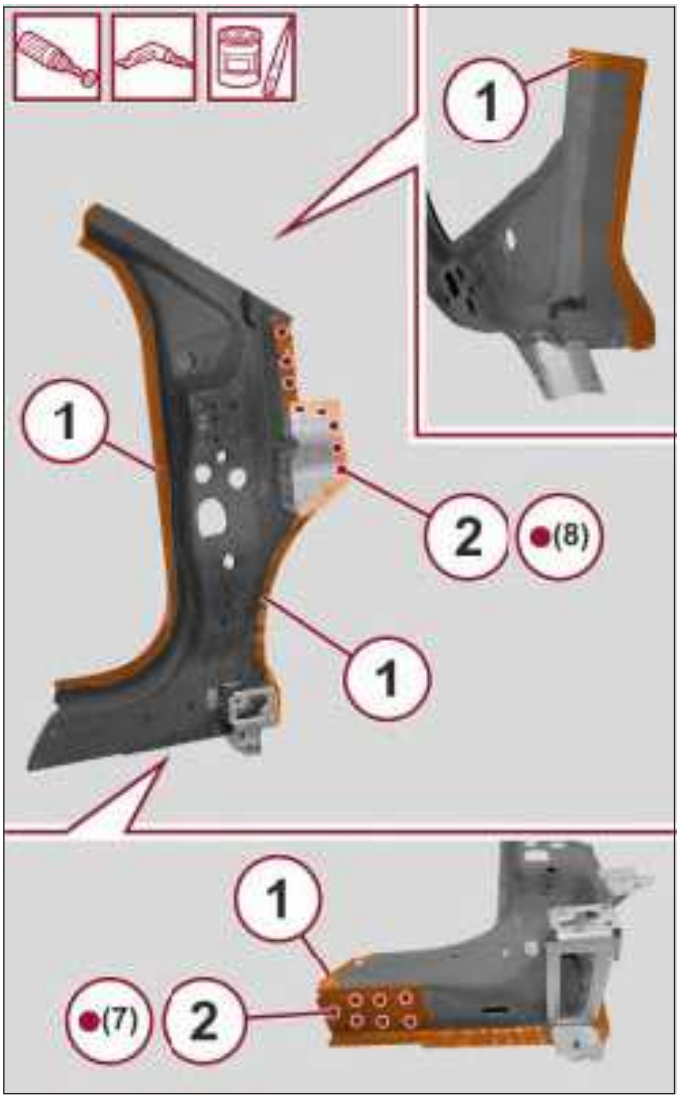


21. With the use of a hammer and dolly block, straighten the edges of the mating components.
22. With the use of a disc grinder, remove any residue of the spot welds.
23. With the use of a rotary brush, clean the previously treated areas.
24. Apply electro-weldable paint/weld through primer to the areas (1) to be welded.



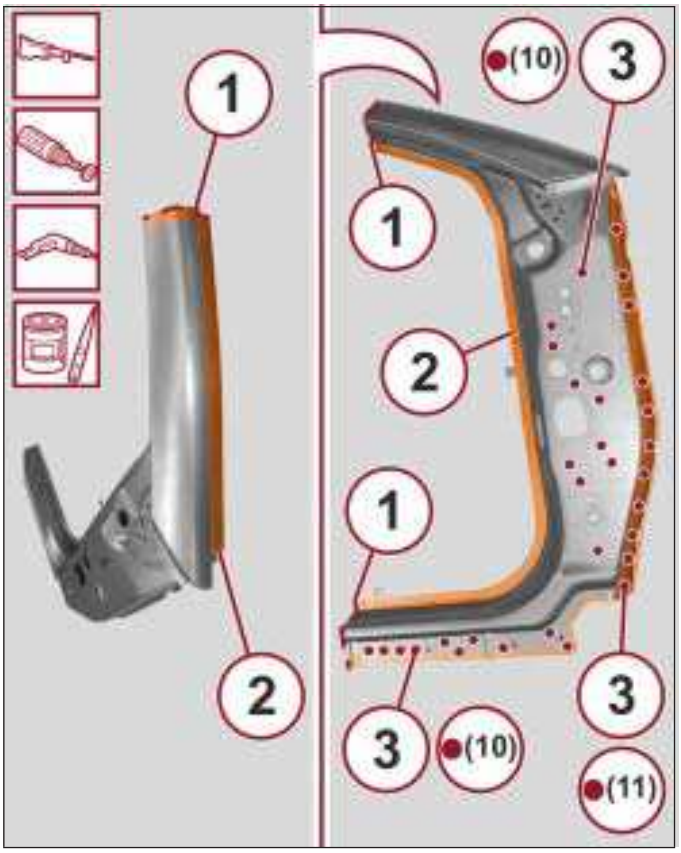
INSTALLATION

1. Remove the anti-corrosion treatment from the entire perimeter (1) of the inside and outside of the service part, using a rotary brush.
2. With the use of a drill, drill holes (2) in the points indicated.
3. Apply elctro-weldable paint/weld through primer to the edges involved.

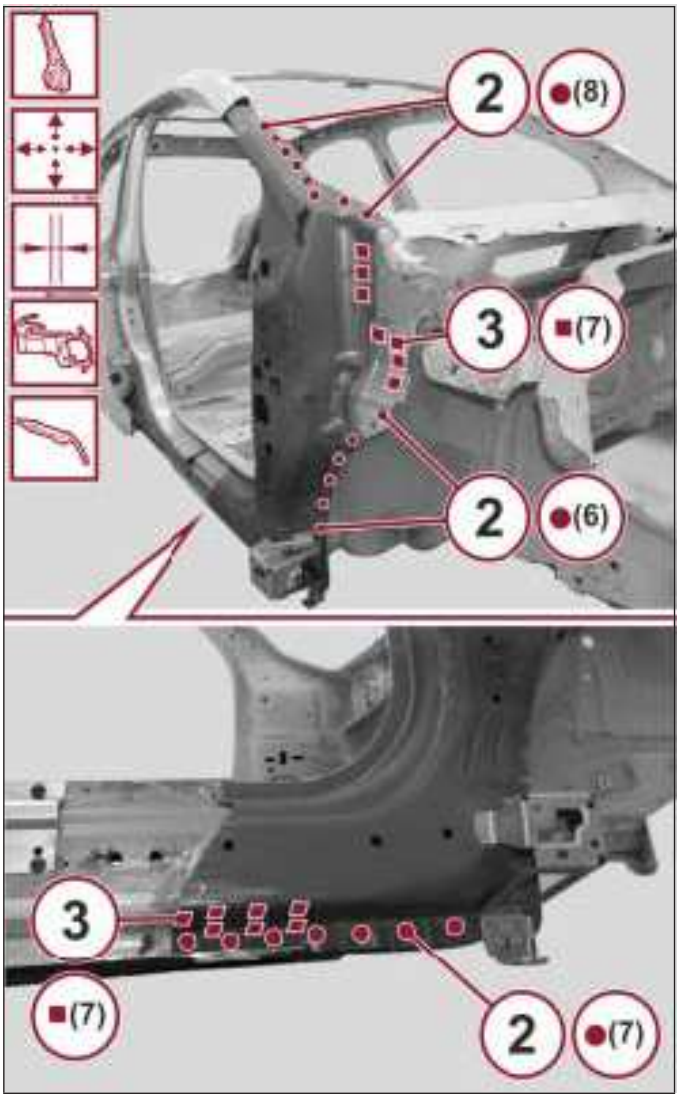


NOTE: Be certain to leave the service panel long enough to allow for overlapping.

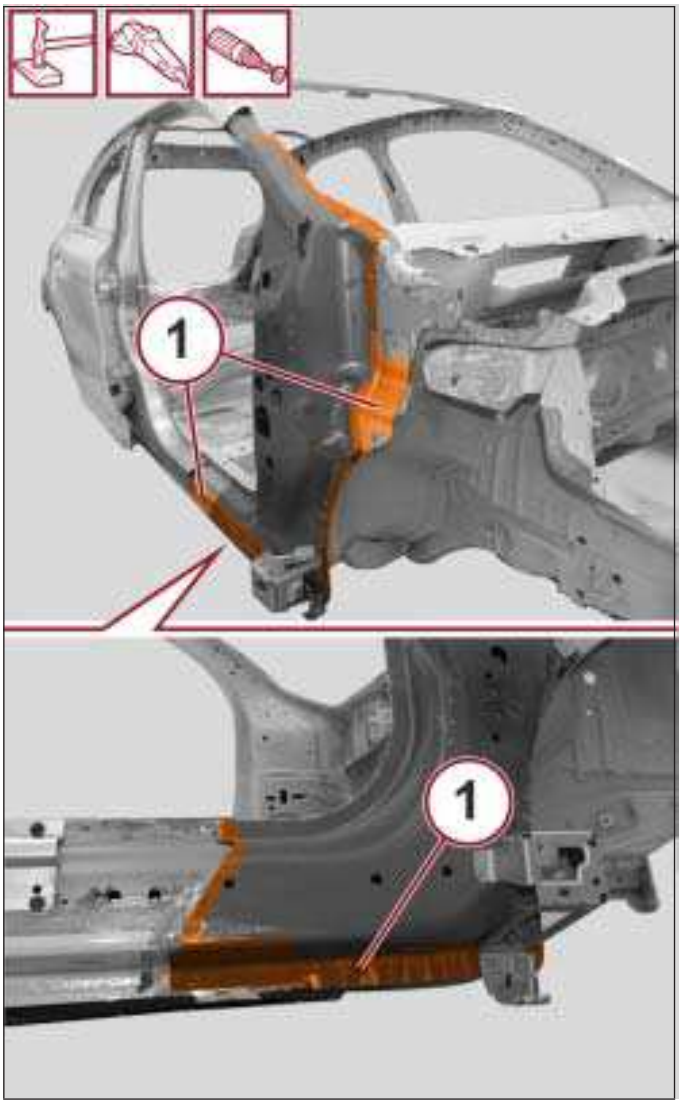
4. With the external service part placed on a workbench cut at the cut lines (1) as indicated in the figure.
5. Remove the anti-corrosion treatment from the entire perimeter (2) of the inner and outer part using a rotary brush.
6. With the use of a drill, drill holes (3) in the area shown.
7. Apply elctro-weldable paint/weld through primer to the edges of the areas to be welded.



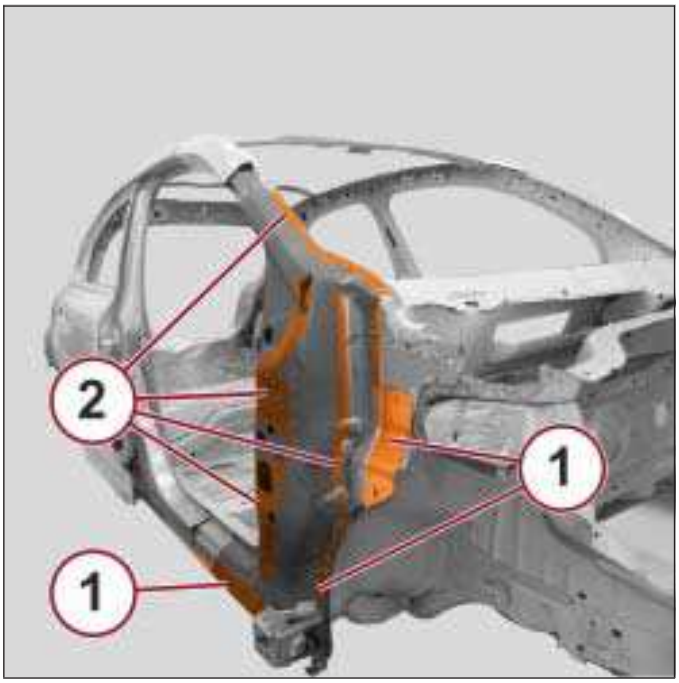
8. Position the cowl side reinforcement correctly on the vehicle and secure it with the self-locking clamps.
9. Check the alignment and surrounding gaps.
10. With the use of a spot welder, apply spot welds to the areas (2) indicated in the figure.
11. With the use of a MIG welder, apply plug welds filling in the holes (3) previously made.



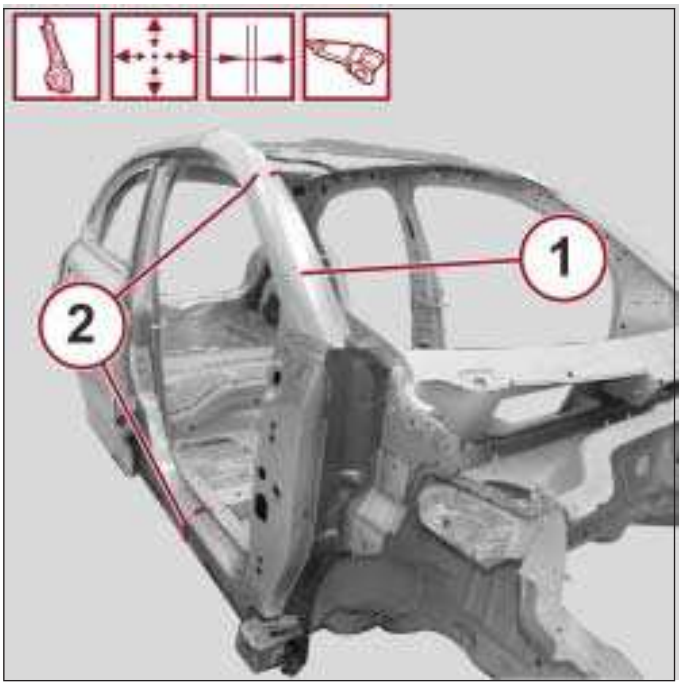
12. Correct any distortions to the sheet metal using a hammer and dolly block.
13. Use a grinding disc to smooth the welds (1).
14. Use a rotary brush to clean the previously welded areas.



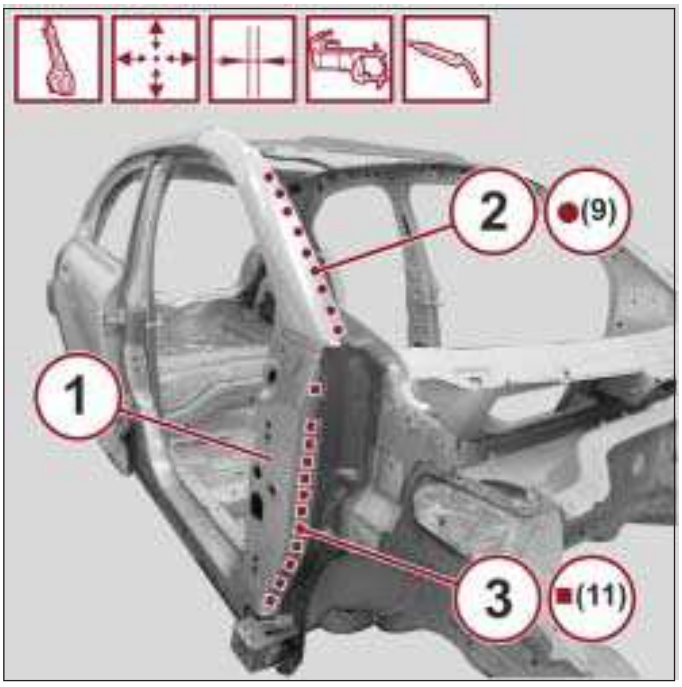
15. Apply corrosion protection to the areas (1) involved in the welding.
16. Seal the seams between the cowl side reinforcement and the vehicle.
17. Apply elctro-weldable paint/weld through primer to the areas (2) indicated.



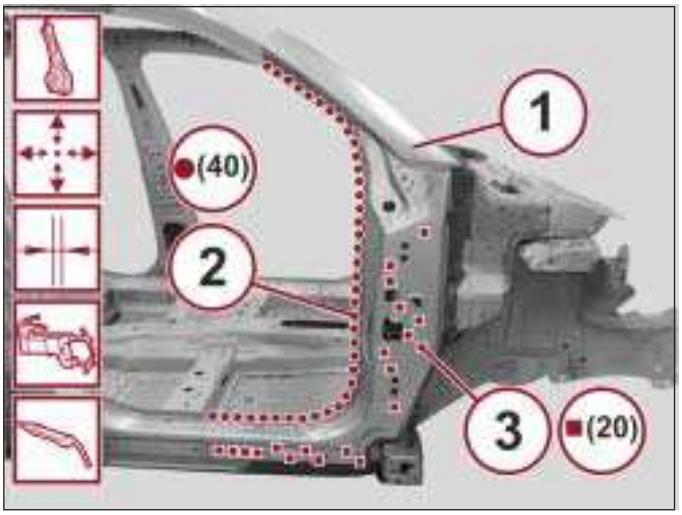
18. Position the outer service part (1) correctly on the vehicle and secure it with the self-locking clamps.
19. Check the alignment and surrounding gaps.
20. With the use of a circular saw, cut the edges (2) of the panel to obtain a perfect joint line.
21. Remove the external service part, the excess pieces of cutoff sheet metal and components used for the adjustment.
22. Create and install 50 mm (2 in.) backer panels to the butt joint areas (2).



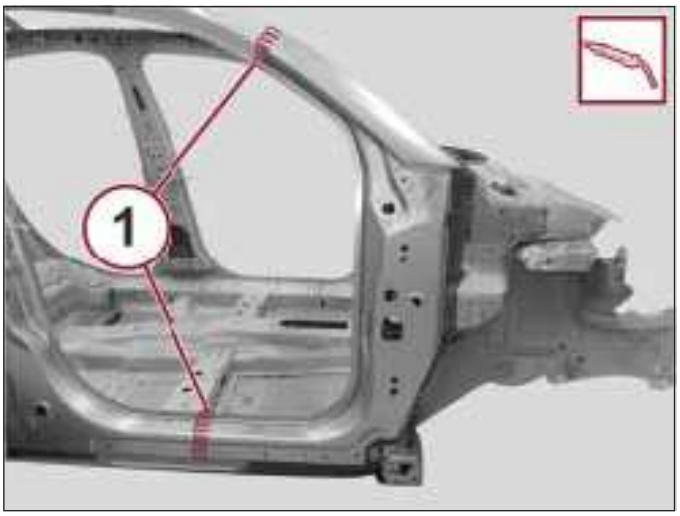
23. Position the external service part (1) correctly on the vehicle and secure it with the self-locking clamps.
24. Check the alignment and surrounding gaps.
25. With the use of a spot welder, apply spot welds to the areas (2) indicated in the figure.
26. With the use of a MIG welder, apply plug welds filling in the holes (3) previously made.



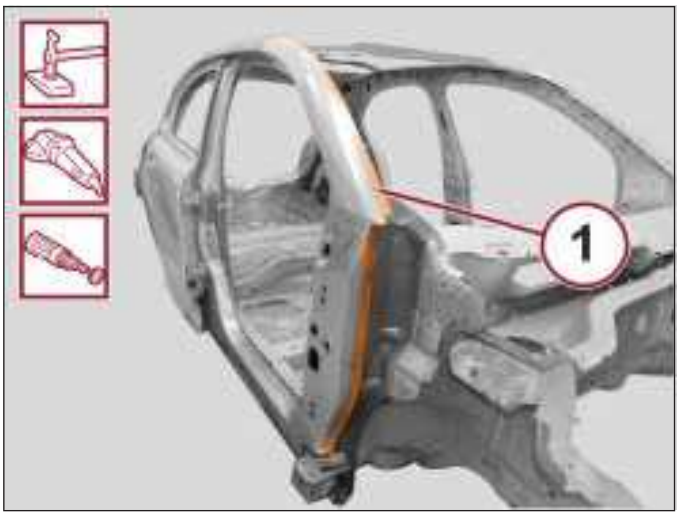
27. Position the external part (1) correctly on the vehicle and secure it with the self-locking clamps.
28. Check alignment and surrounding gaps.
29. With the use of a spot welder, apply spot welds to the areas (2) indicated in the figure.
30. With the use of a MIG welder, apply plug welds filling in the holes (3) previously made.



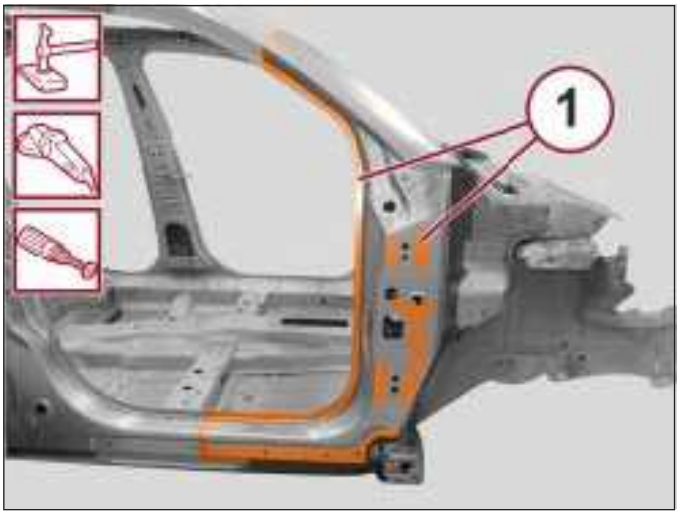
31. With the use of a MIG welder, apply seam welds to the butt joint areas (1).



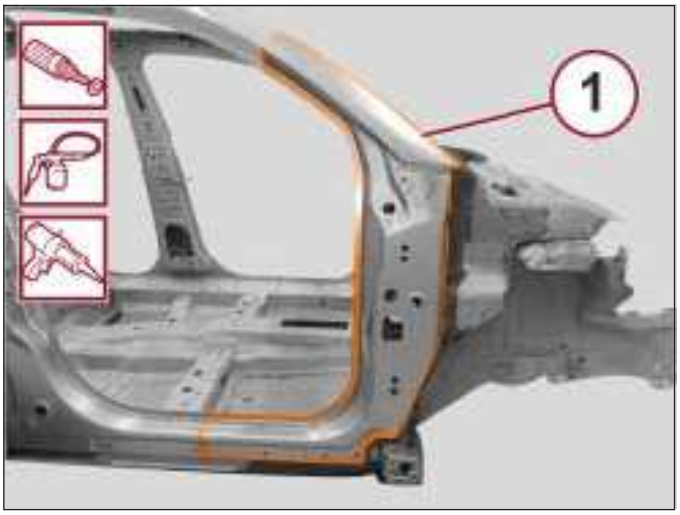
32. Correct any distortions to the sheet metal using a hammer and dolly block.
33. Use a grinding disc to smooth the welds in the area highlighted (1).
34. Use a rotary brush to clean the previously welded areas.



35. Correct any distortions to the sheet metal using a hammer and dolly block.
36. Use a grinding disc to smooth the welds in the area highlighted (1).
37. Use a rotary brush to clean the previously welded areas.



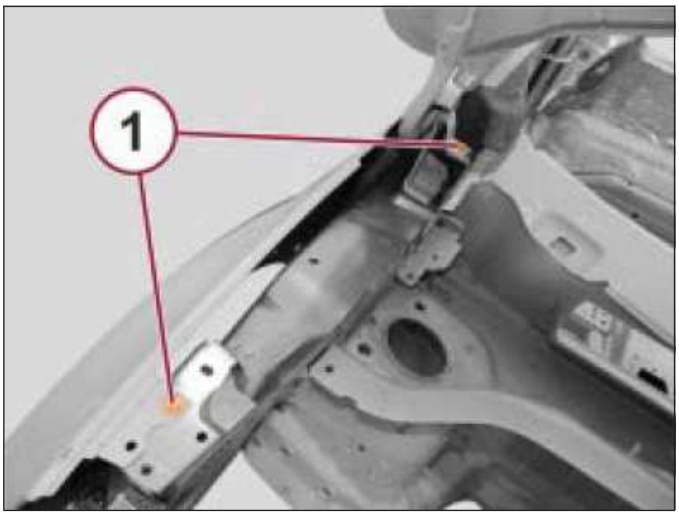
38. Apply corrosion protection to the areas involved in the welding.
39. Apply seam sealer to the seams between the internal part and the vehicle in the area highlighted (1).
40. Proceed with the painting stage.
41. Install the load path beam (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Load Path Beam).
42. Install the front fender (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Front Fender).



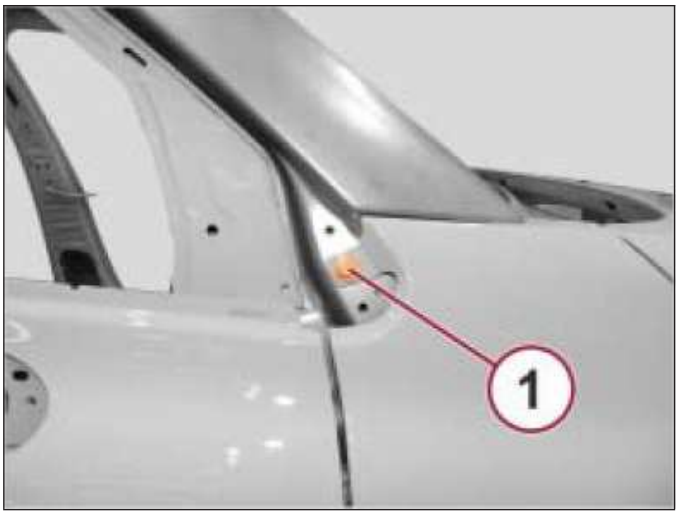
Front Fender

REMOVAL

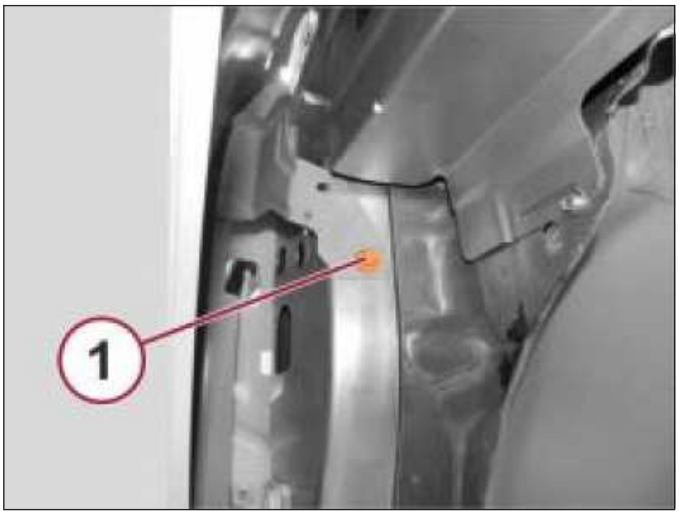
1. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
2. Straighten the body as necessary.
3. Open and support the hood.
4. Apply adhesive tape to the surrounding body panels to protect against damage.
5. Remove the three upper bolts (1) securing the fender.



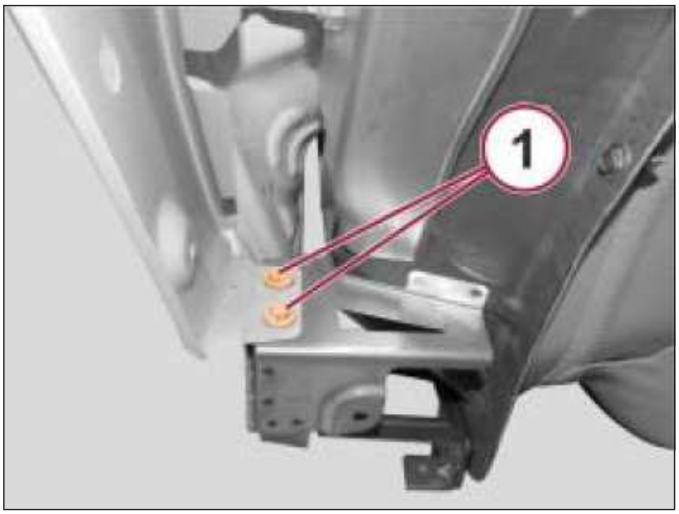
6. Open the front side door.
7. Remove the bolt (1) from the door opening.



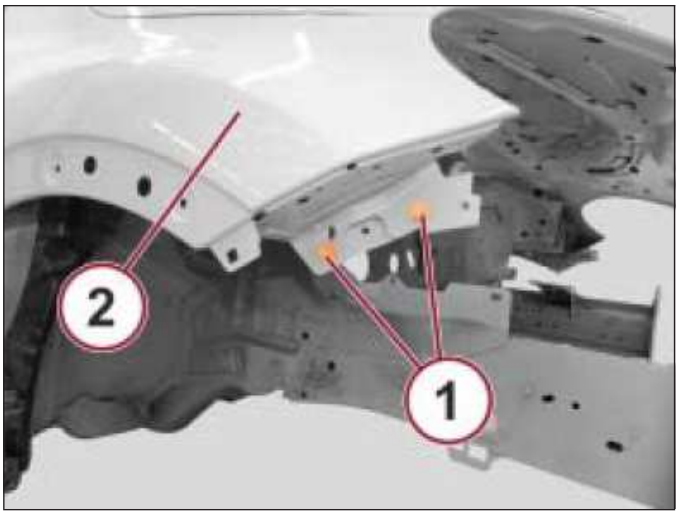
8. With the use of a rotating brush, remove the protective sealant.
9. Remove the bolt (1) from the wheel housing.



10. Remove the two lower bolts (1) securing the fender.

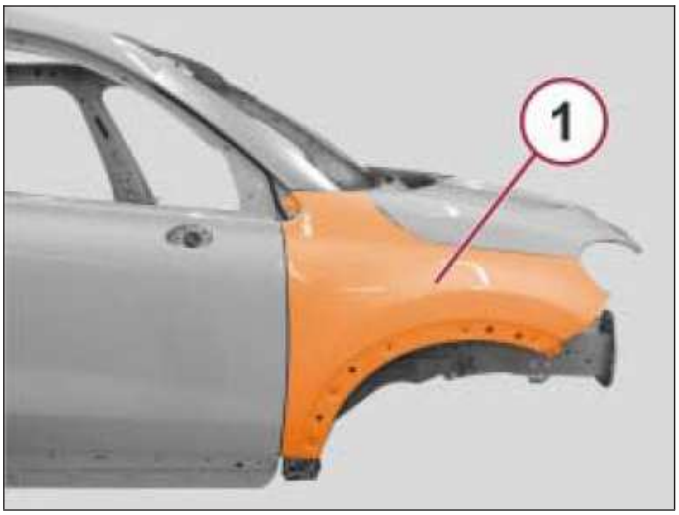


11. Remove the two lower bolts (1) securing the fender (2) to the support bracket.
12. Remove the fender from the vehicle.



INSTALLATION

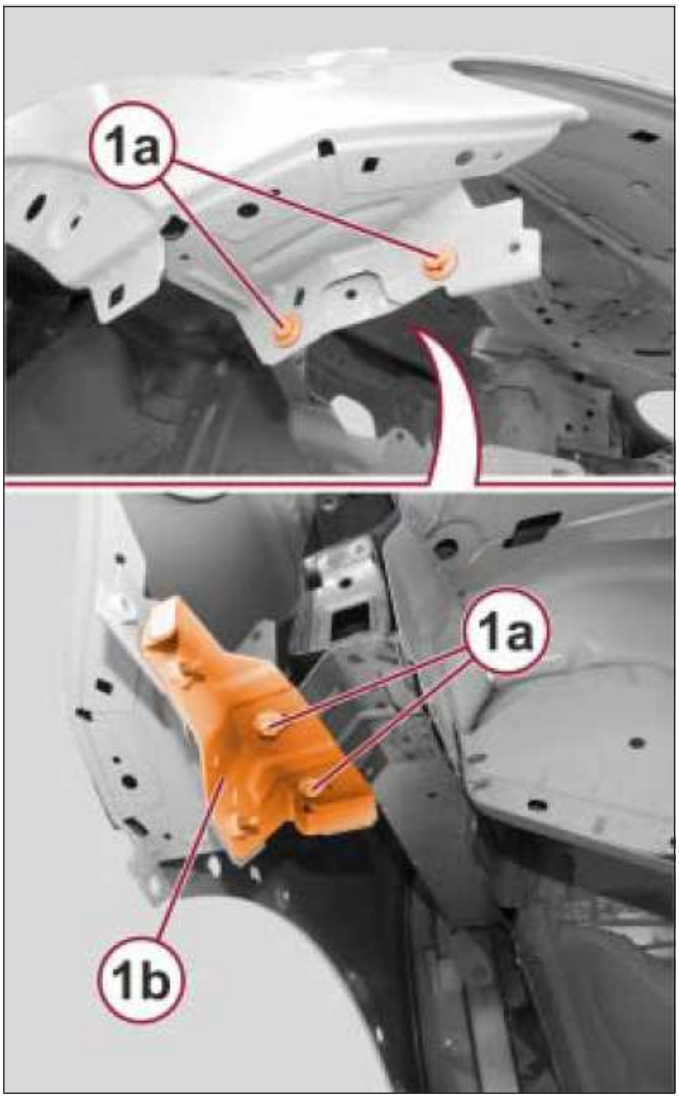
1. Inspect the fender to be certain there is no damage.
2. Remove any sealant residue from the body and fender.
3. Restore any sealant between the body and fender.
4. Position the fender on the vehicle and loosely install the bolts.
5. Check the alignment of the fender to the door and the hood.
6. Tighten the fender bolts securely.



Front Fender Bracket

REMOVAL

1. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
2. Straighten the body as necessary.
3. Remove the bolts (1a).
4. Remove the bracket (1b).



INSTALLATION

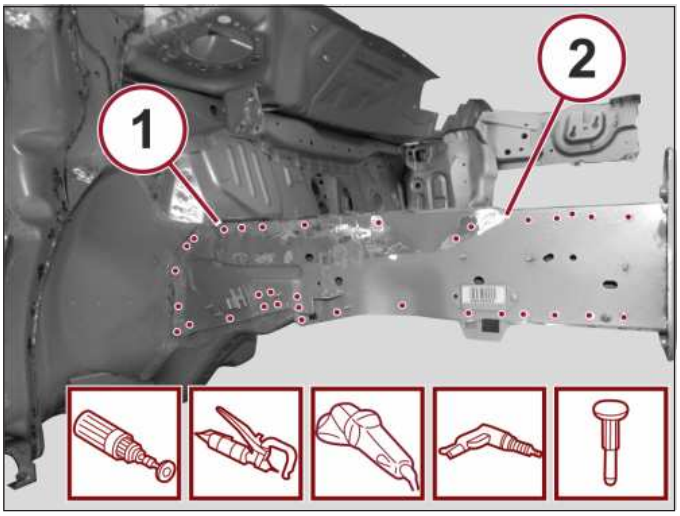
1. Check that the front fender mounting bracket is not damaged.
2. Position the fender bracket (1b).
3. Install the bolts (1a) and tighten securely.

Front Frame Rail

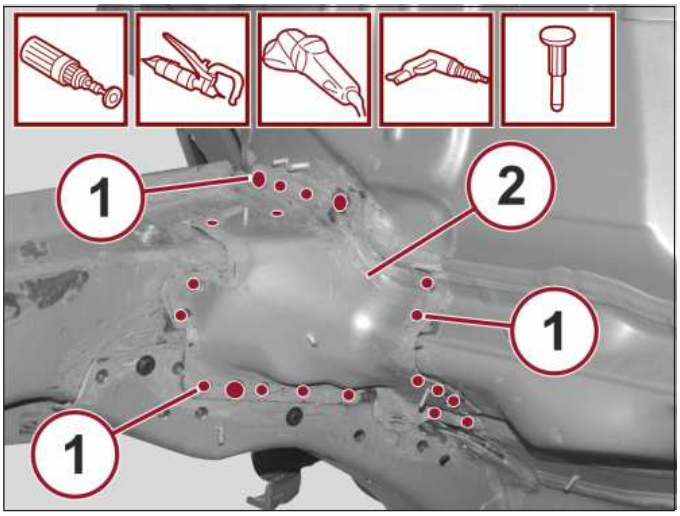
REMOVAL

1. Remove upper load path beam (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Load Path Beam).
2. Remove the front wheelhouse (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Front Wheelhouse).
3. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
4. Straighten the body as necessary.

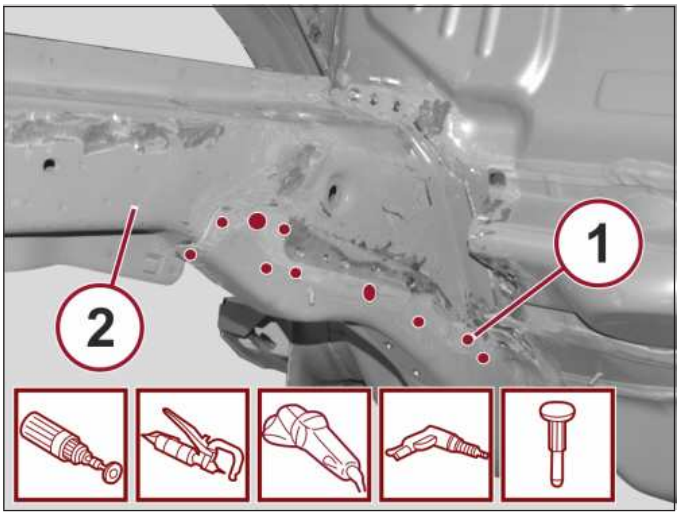
5. Use a rotary brush to remove the paint and gain access to the spot welds.
6. With the use of a spot weld cutting tool, release the spot welds (1) shown in the figure.
7. Grind the spot welds not accessible with a drill.
8. Use a chisel and hammer to remove the welds previously released.
9. Remove the part (2) from the vehicle.



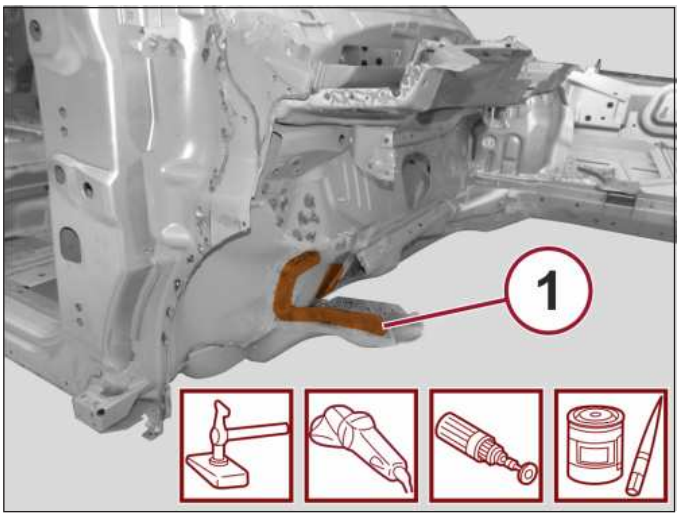
10. Use a rotary brush to remove the paint and gain access to the spot welds.
11. With the use of a spot weld cutting tool, release the spot welds (1) shown in the figure.
12. Grind the spot welds not accessible with a drill.
13. Use a chisel and hammer to remove the welds previously released.
14. Remove the inner part (2) from the vehicle.



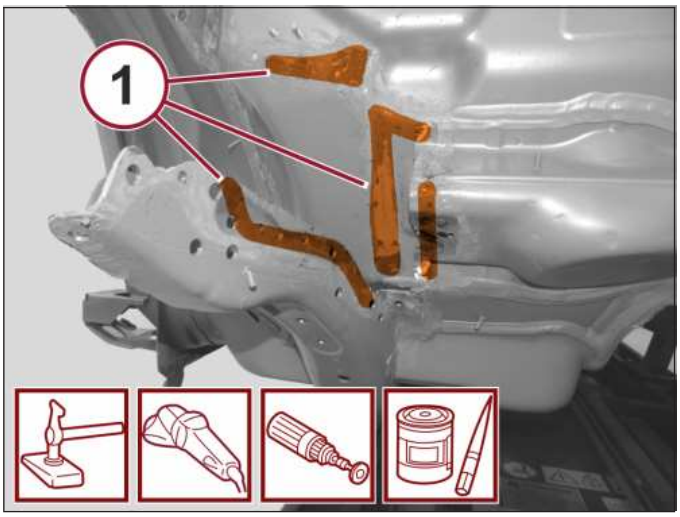
15. Use a rotary brush to remove the paint and gain access to the spot welds.
16. With the use of a spot weld cutting tool, release the spot welds (1) shown in the figure.
17. Grind the spot welds not accessible with a drill.
18. Use a chisel and hammer to remove the welds previously released.
19. Remove the part (2) from the vehicle.



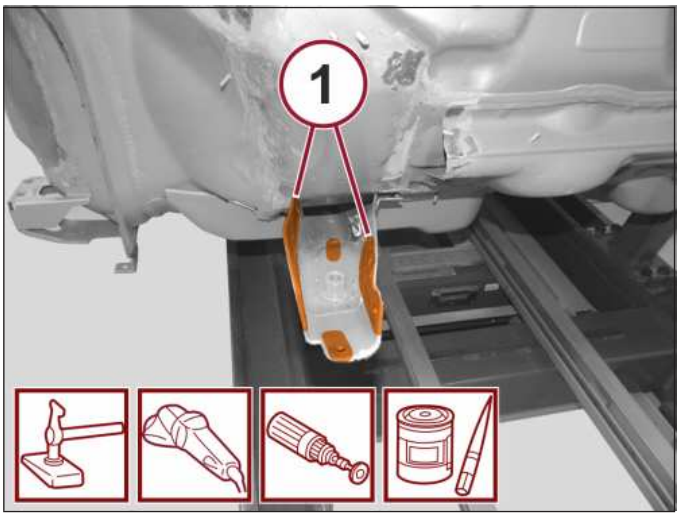
20. With the use of a hammer and dolly block, straighten the edges of the mating components.
21. With the use of a disc grinder, remove any residue of the spot welds.
22. Use a rotary brush and clean the previously treated areas.
23. Apply electro-weldable paint/weld through primer to the areas shown (1).



24. With the use of a hammer and dolly block, straighten the edges of the mating components.
25. With the use of a disc grinder, remove any residue of the spot welds.
26. Use a rotary brush and clean the previously treated areas.
27. Apply electro-weldable paint/weld through primer to the areas shown (1).

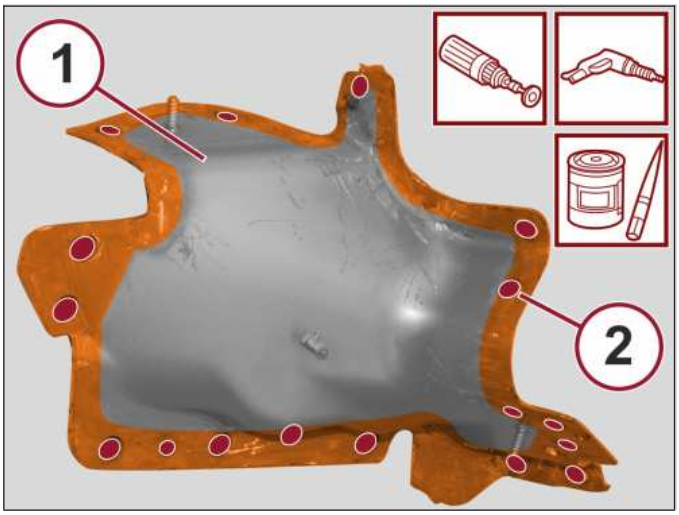


28. With the use of a hammer and dolly block, straighten the edges of the mating components.
29. With the use of a disc grinder, remove any residue of the spot welds.
30. Use a rotary brush and clean the previously treated areas.
31. Use a rotary brush and clean the previously treated areas.
32. Apply electro-weldable paint/weld through primer to the areas shown (1).

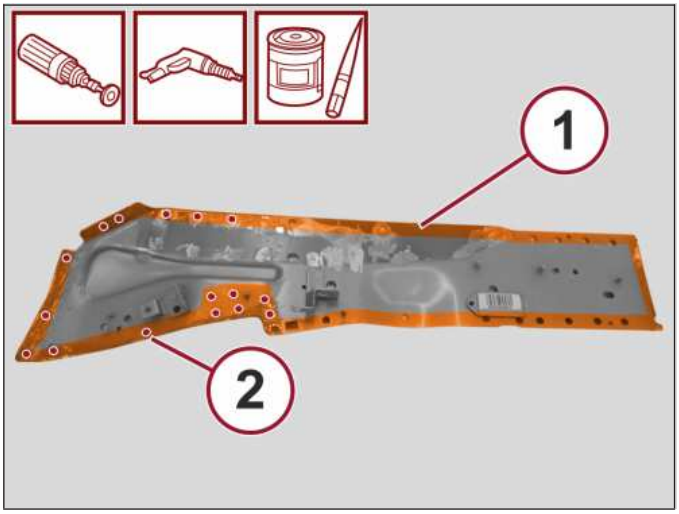


INSTALLATION

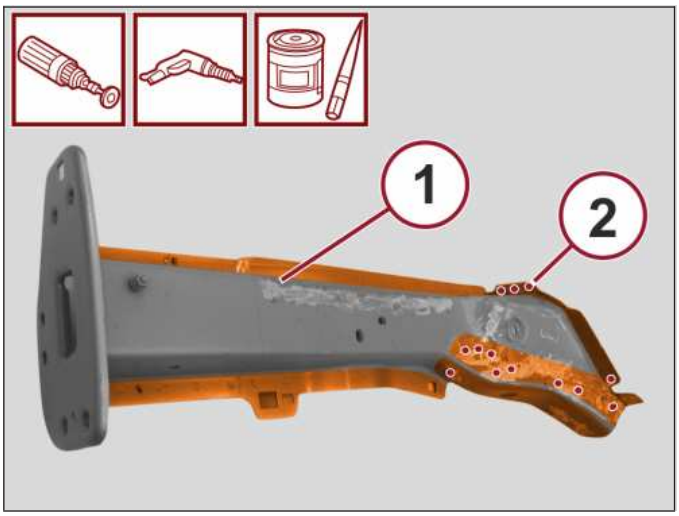
1. Remove the anti-corrosion treatment from the entire perimeter of the inside and outside of the internal support (1) using a rotary brush.
2. Drill out the part at the indicated points (2).
3. Apply elctro-weldable paint/weld through primer to the areas involved.



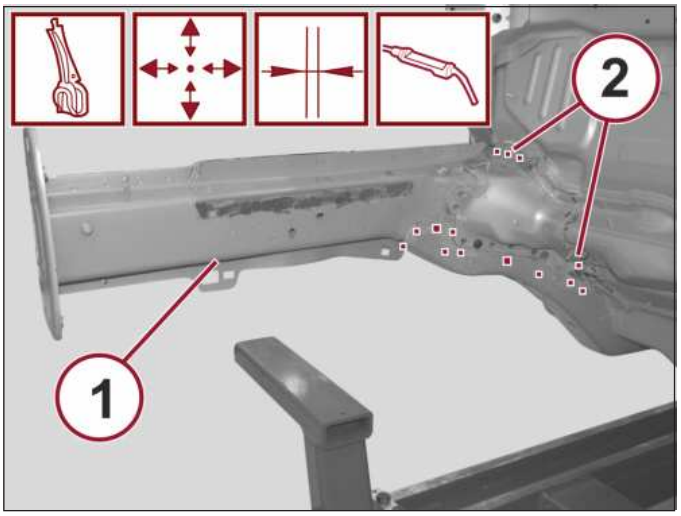
4. Remove the anti-corrosion treatment from the entire perimeter (1) of the inside and outside part using a rotary brush.
5. Drill out the part at the indicated points (2).
6. Apply elctro-weldable paint/weld through primer to the areas involved.



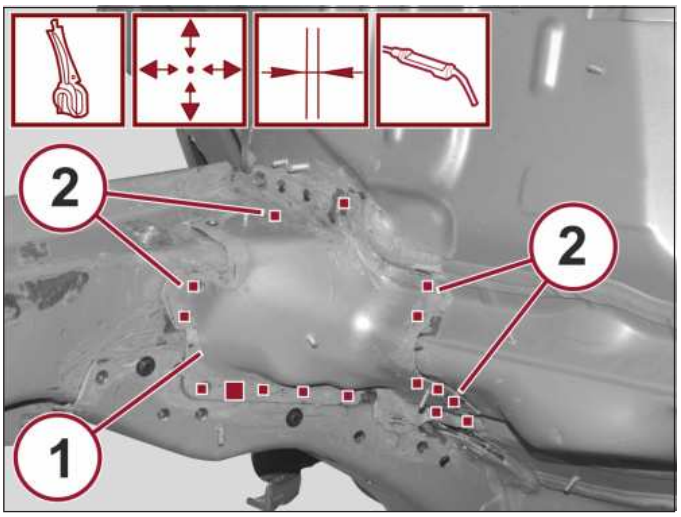
7. Remove the anti-corrosion treatment from the entire perimeter of the inside and outside of the service part internal (1) using a rotary brush.
8. Drill out the part at the indicated points (2).
9. Apply elctro-weldable paint/weld through primer to the areas involved.



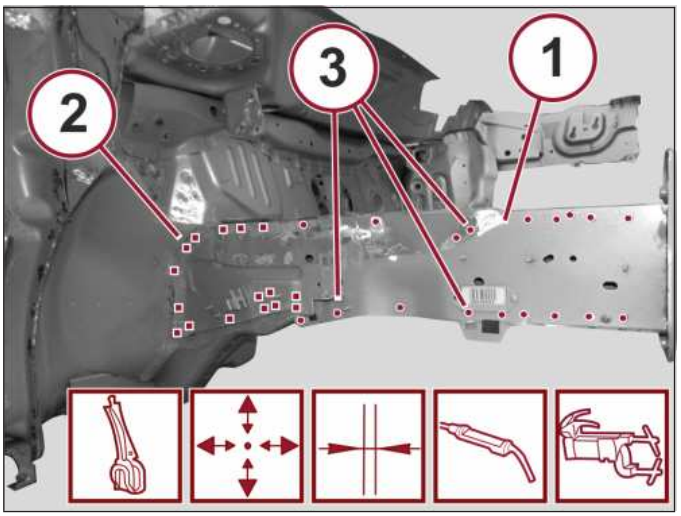
10. Position the service parts (1) correctly on the vehicle and secure it with the self-locking clamps.
11. Check that the alignment and surrounding gaps are correct.
12. With the use of a MIG welder, apply plug welds to fill in the holes (2) made previously.



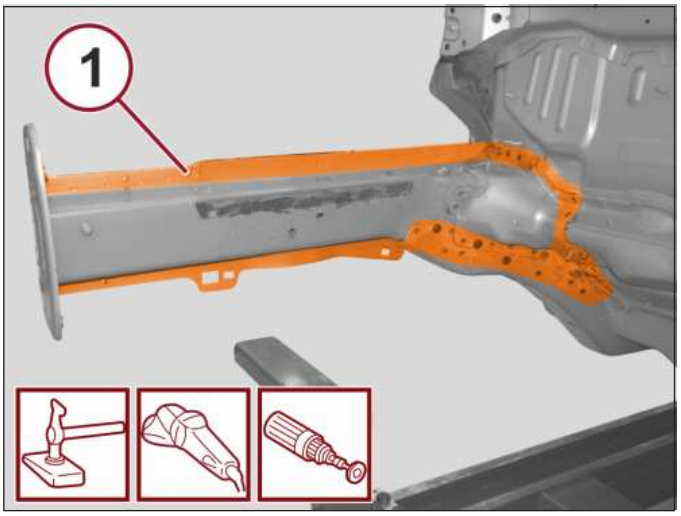
13. Position the service part (1) correctly on the vehicle and secure it with the self-locking clamps.
14. Check that the alignment and surrounding gaps are correct.
15. With the use of a MIG welder, apply plug welds to fill in the holes (2) made previously.



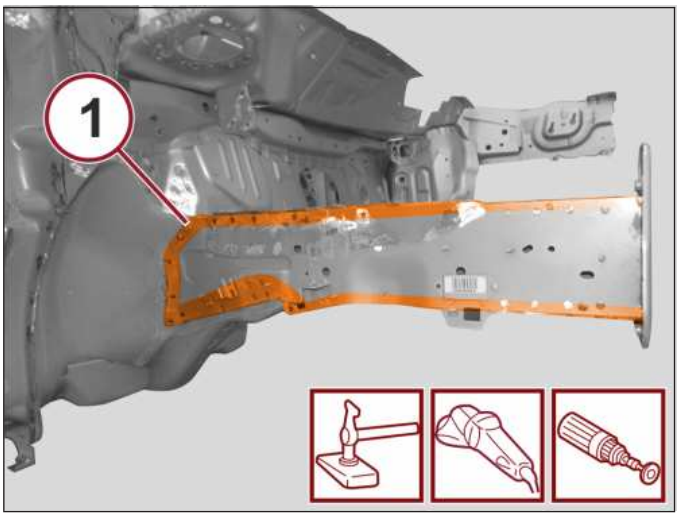
16. Position the service parts (1) correctly on the vehicle and secure it with the self-locking clamps.
17. Check that the alignment and surrounding gaps are correct.
18. With the use of a MIG welder, apply plug welds to fill in the holes (2) made previously.
19. Use a spot welder to weld the points (3) indicated in the figure.



20. Correct any distortions to the panel using a hammer and dolly block.
21. With the use of a grinding disc, smooth the welds along the perimeter (1).
22. Use a rotary brush to clean the previously welded areas.



23. Correct any distortions to the panel using a hammer and dolly block.
24. With the use of a grinding disc, smooth the welds along the perimeter (1).
25. Use a rotary brush to clean the previously welded areas.
26. Apply corrosion protection to the areas involved in the welding.
27. Apply seam sealer to the seams between the service part and the vehicle.
28. Install the front wheelhouse (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Front Wheelhouse) .
29. Install upper load path beam (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Load Path Beam).

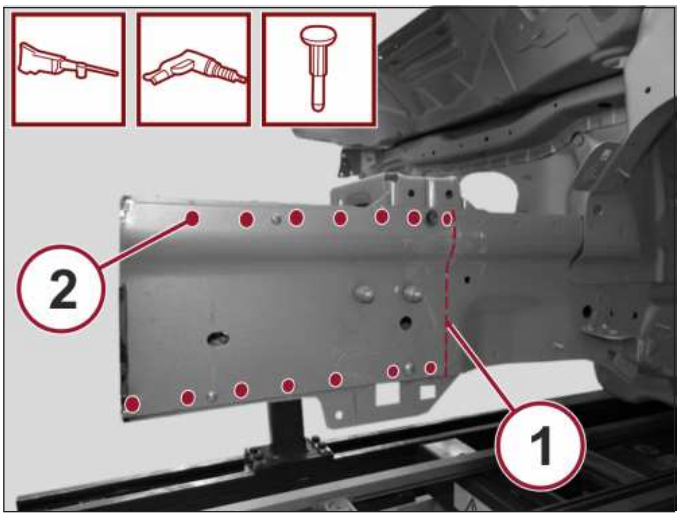


Front Frame Rail Sectioning

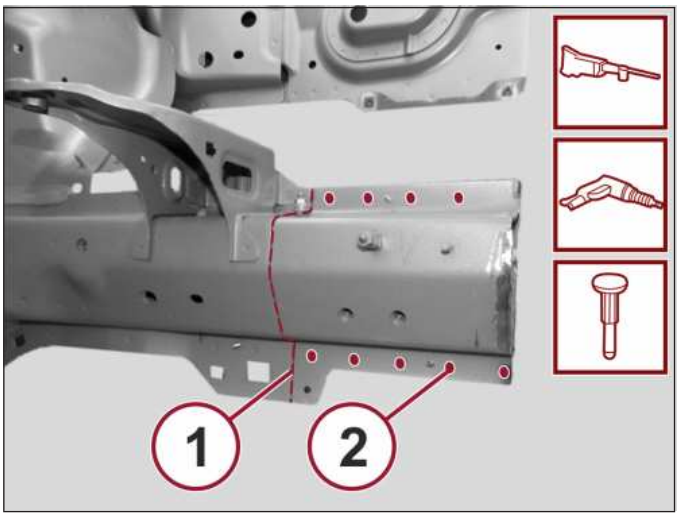
REMOVAL

1. Remove the front bumper reinforcement in accordance with the service information.
2. Remove the front siderail plate (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Front Siderail Plate)).
3. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
4. Straighten the body as necessary.

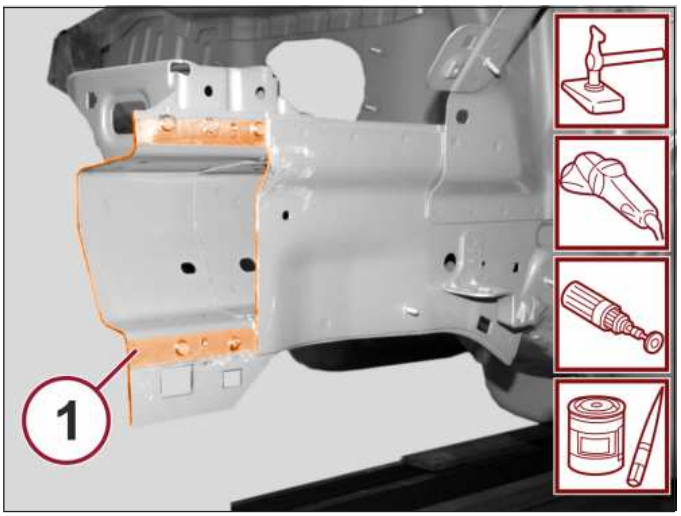
5. Use a reciprocating saw following the cut line (1) shown in the figure.
6. With the use of a drill, release the spot welds (2) shown in the figure.
7. Use a chisel and hammer to remove the welds previously released.



8. Use a reciprocating saw following the cut line (1) shown in the figure.
9. With the use of a drill, release the spot welds (2) shown in the figure.
10. Use a chisel and hammer to remove the welds previously released.
11. Remove the cut parts from the vehicle.

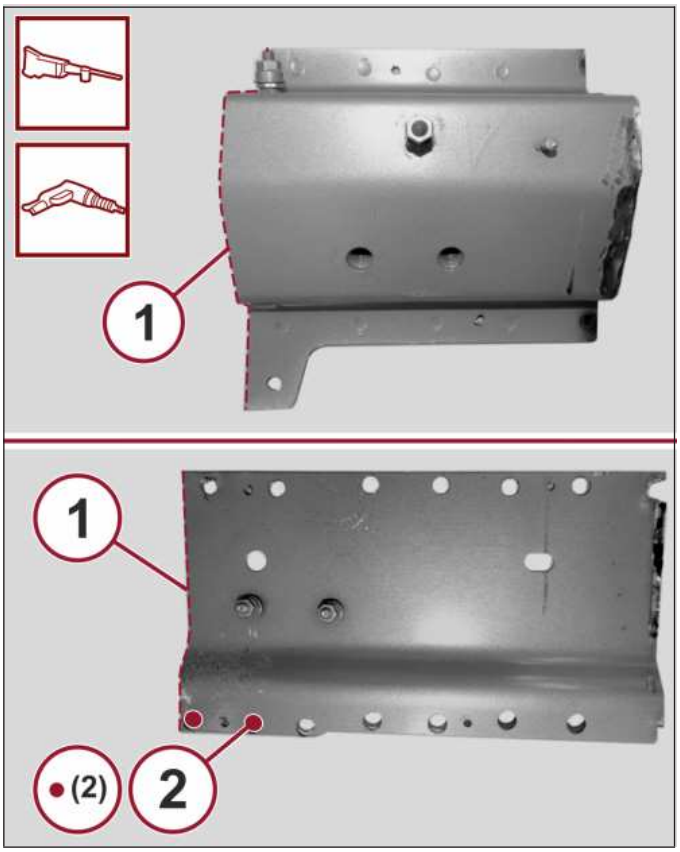


12. With the use of a hammer and dolly block, straighten the edges of the mating components.
13. With the use of a disc grinder, remove any residue of the spot welds.
14. Use a rotary brush to clean the previously treated areas.
15. Apply electro-weldable paint/weld through primer to the areas (1) to be welded.

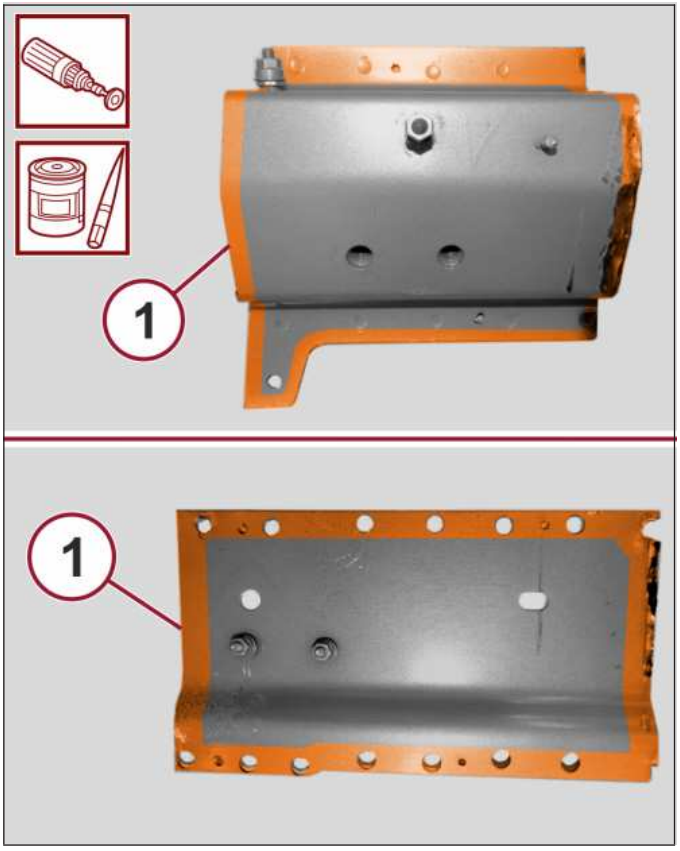


INSTALLATION

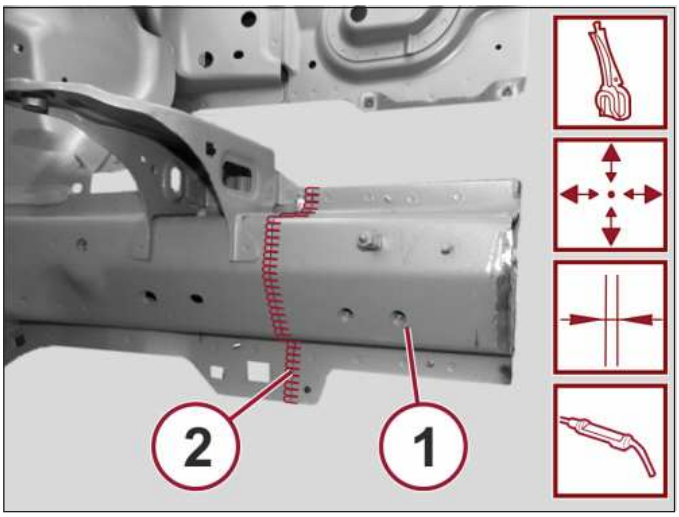
1. Use the reciprocating saw and cut the parts along the cut lines (1) shown in the figure to adjust them to the required size.
2. Use a drill to drill holes in the location points shown (2).



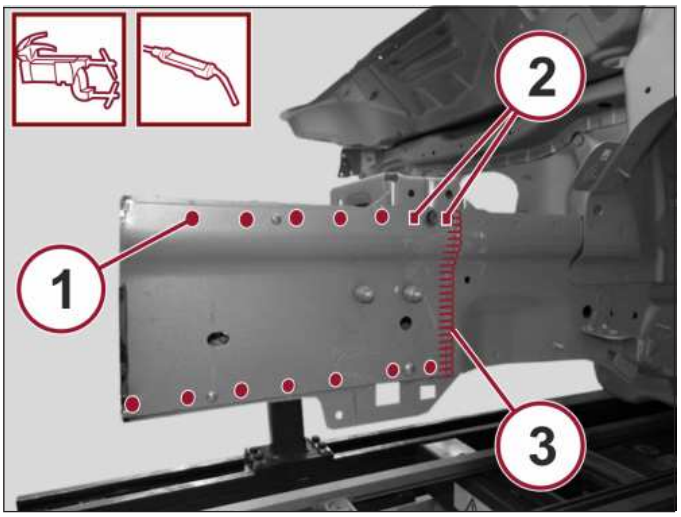
3. Remove the anti-corrosion treatment from the entire perimeter (1) of the inside and outside of the service part using a rotary brush.
4. Apply elctro-weldable paint/weld through primer to the areas involved.



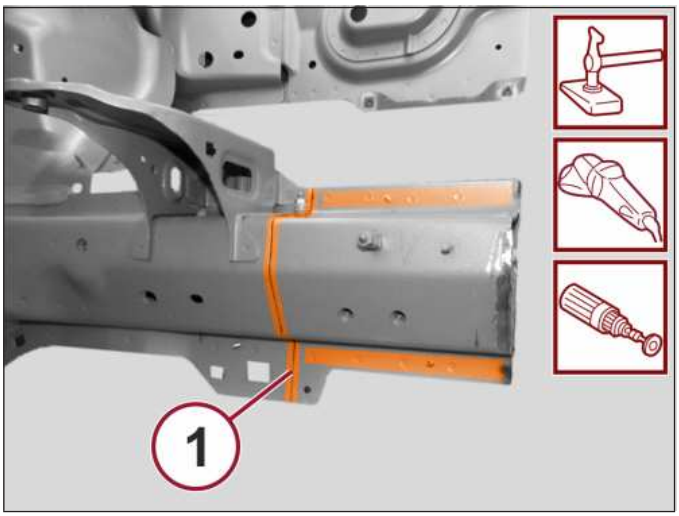
5. Create and install 50 mm (2 in.) backer panels to the butt joint areas (2).
6. Position the service parts (1) correctly on the vehicle and secure it with the self-locking clamps.
7. Check alignment and surrounding gaps.
8. With the use of a MIG welder, apply seam welds to the butt joint area (2) indicated in the figure.



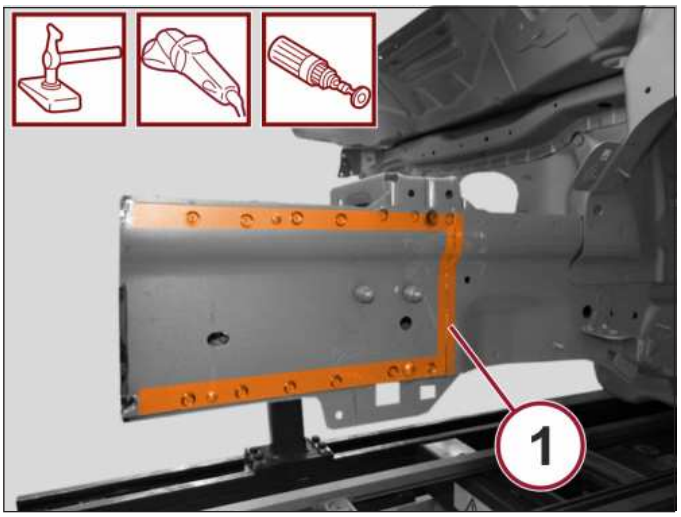
9. Use a spot welder to perform the spot welds (1) where indicated.
10. With the use of a MIG welder, apply plug welds to fill in the holes (2) made previously.
11. With the use of a MIG welder, apply seam welds to the butt joint area (3) indicated in the figure.



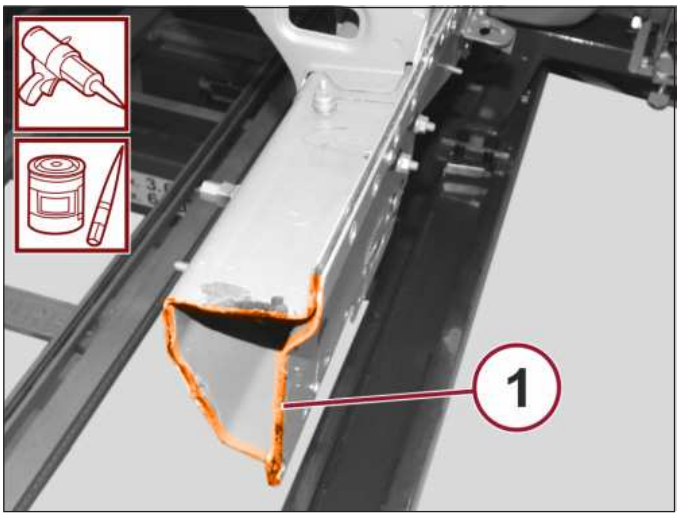
12. Correct any distortions to the sheet metal using a hammer and dolly block.
13. Use a grinding disc to smooth the welds along the perimeter (1).
14. Use a rotary brush to clean the previously welded areas.



15. Correct any distortions to the sheet metal using a hammer and dolly block.
16. Use a grinding disc to smooth the welds along the perimeter (1).
17. Use a rotary brush to clean the previously welded areas.



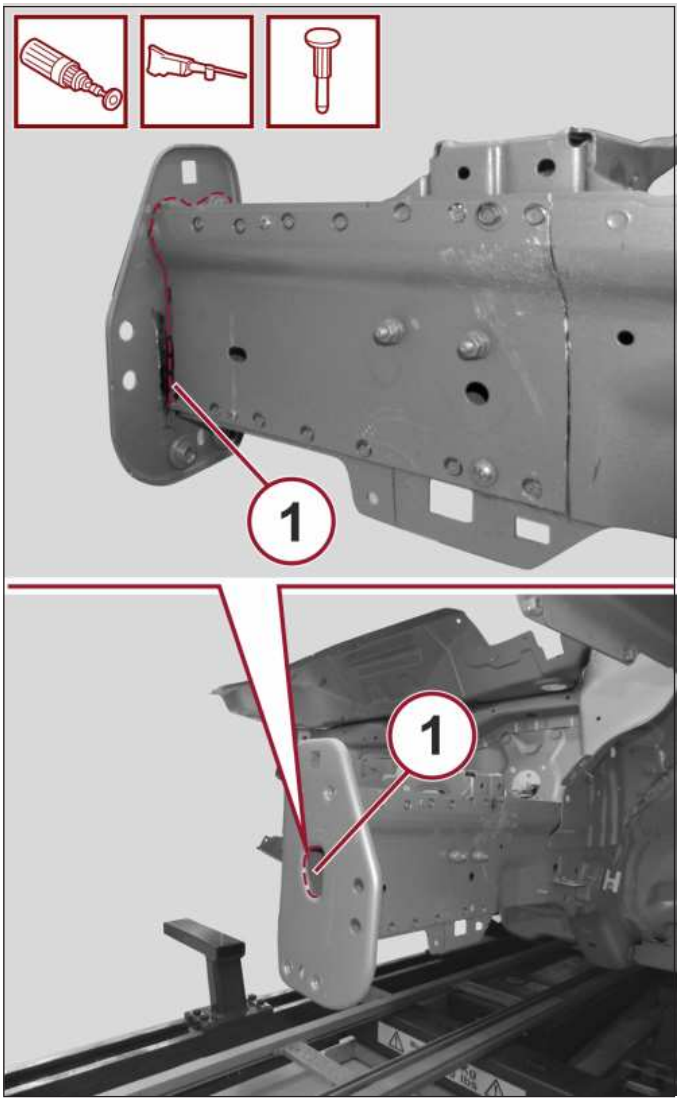
18. Apply corrosion protection to the areas involved in the welding.
19. Apply elctro-weldable paint/weld through primer to the ends of the parts (1).
20. Install the front siderail plate (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Front Siderail Plate).
21. Install the front bumper reinforcement in accordance to the service information.



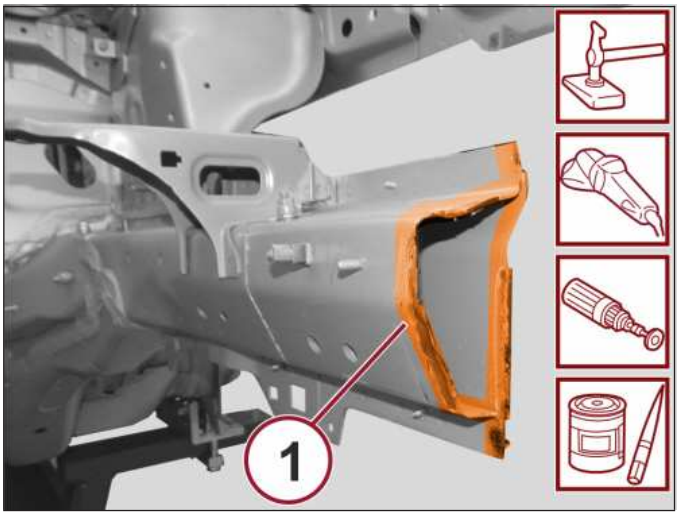
Front Siderail Plate

REMOVAL

1. Remove the front fender (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Front Fender).
2. With the use of a rotary brush, remove the paint and gain access to the plate welds.
3. With the use of a reciprocating saw, follow the cut lines (1) shown in the figure.
4. With the use of a chisel and hammer, remove the plate.
5. Remove the plate from the vehicle.

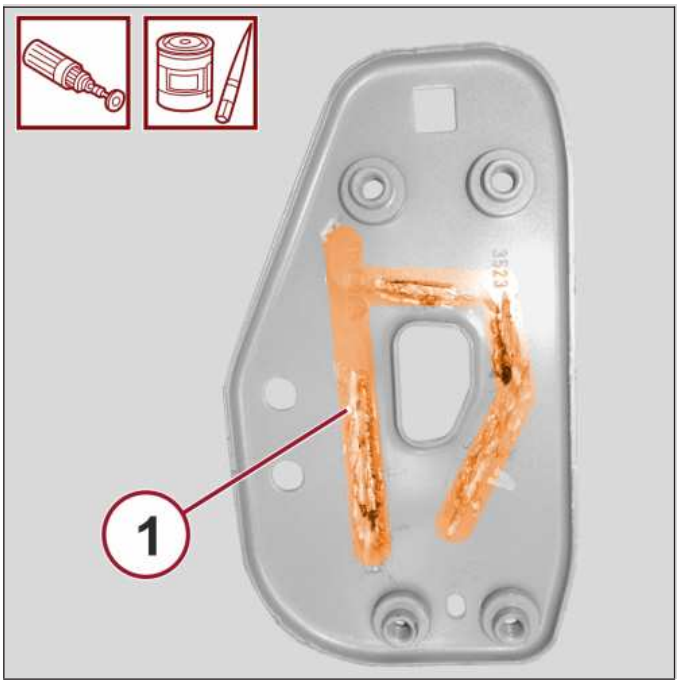


6. Straighten the edges of the front frame rail with the use of a hammer and dolly block.
7. With the use of a grinding wheel, remove any welding residue.
8. Use a rotary brush and clean the previously treated areas.
9. Apply electro-weldable paint/weld through primer to the area (1) to be welded.

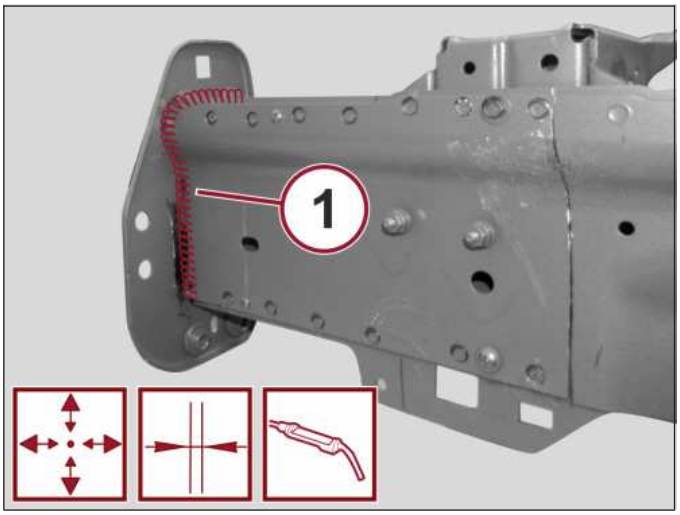


INSTALLATION

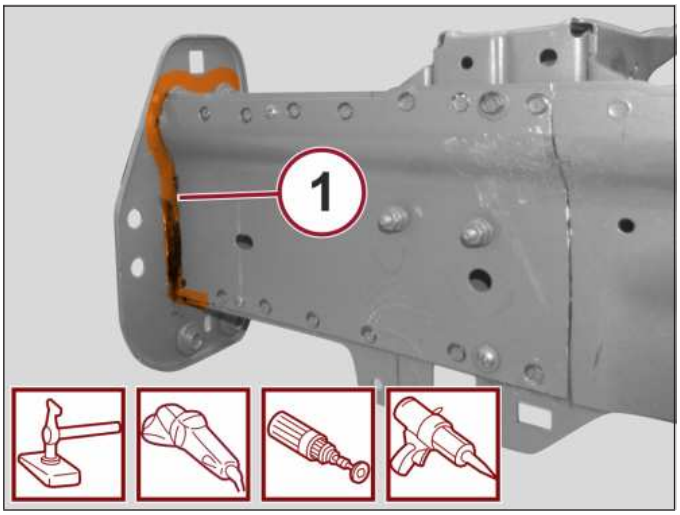
1. Remove the anti-corrosion treatment from the entire inner area of the service part using a rotary brush.
2. Apply electro-weldable paint/weld through primer to the area (1) to be welded.



3. Correctly position the service part on the vehicle correctly and check correct alignment and squaring.
4. Use a MIG welder to seam-weld the areas (1) indicated in the figure.



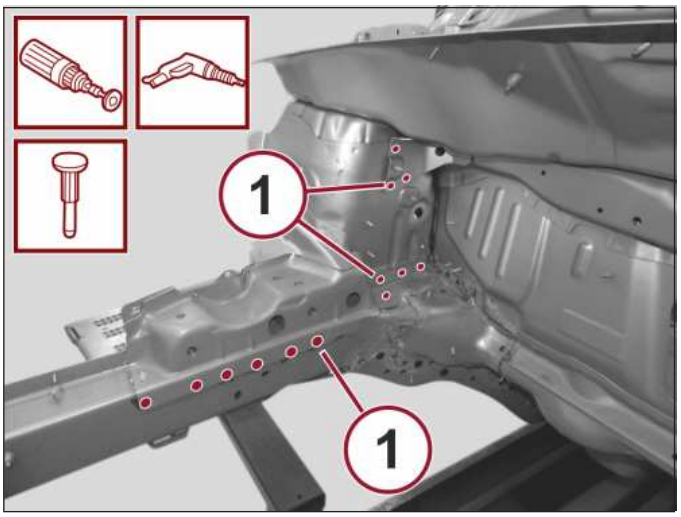
5. Correct any distortions to the sheet metal using a hammer and dolly block.
6. Use a disc grinder to smooth the welds (1).
7. Use a rotary brush to clean the previously welded areas.
8. Apply corrosion protection to the areas affected in welding.
9. Apply seam sealer to the joint lines between the service part and vehicle.
10. Install the front fender (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Front Fender).



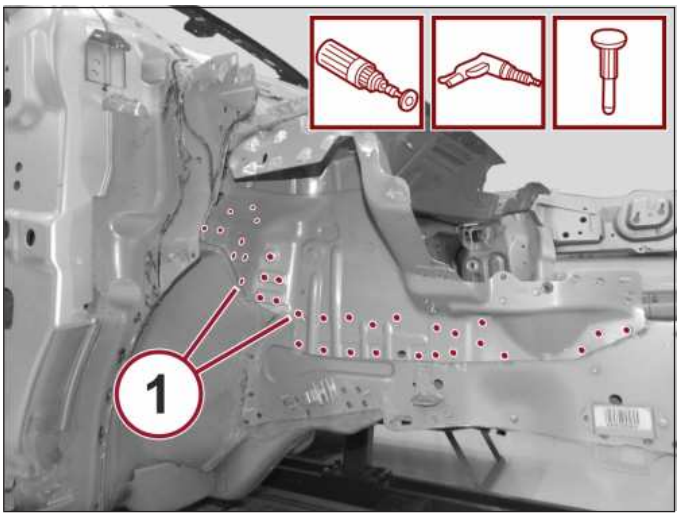
Front Wheelhouse

REMOVAL

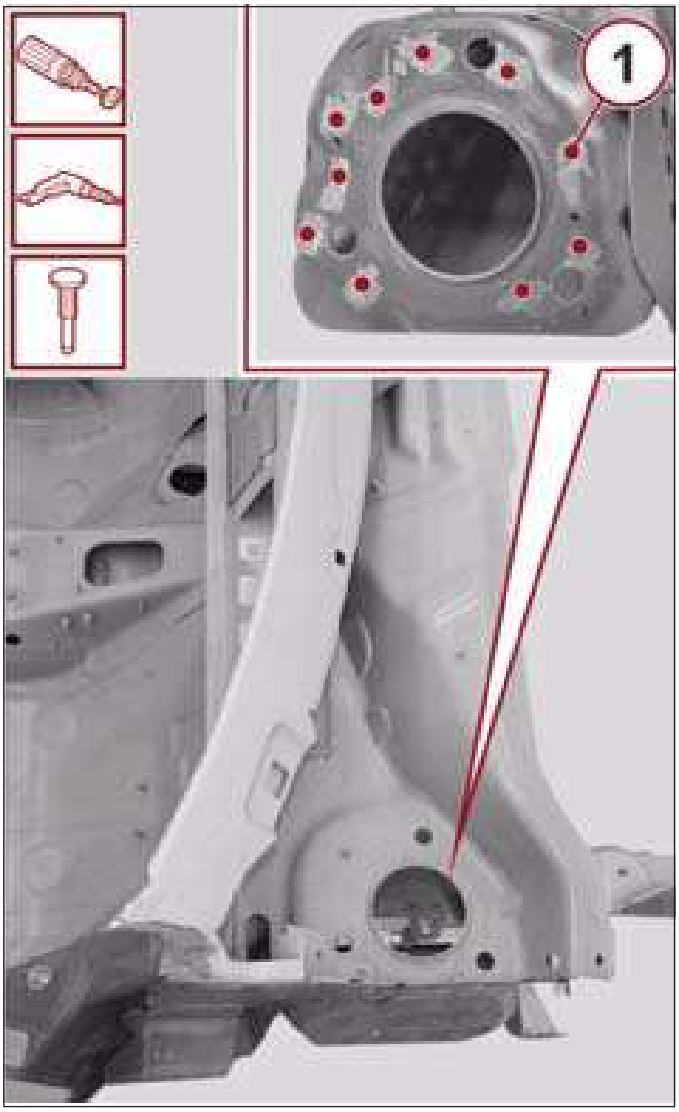
1. Remove upper load path beam (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Load Path Beam).
2. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
3. Straighten the body as necessary.
4. Use a rotary brush to remove the paint and gain access to the spot welds (1).
5. With the use of a drill, release the spot welds (1) shown in the figure.
6. Use a chisel and hammer to remove the welds previously released.
7. Remove the strut tower reinforcement from the vehicle.



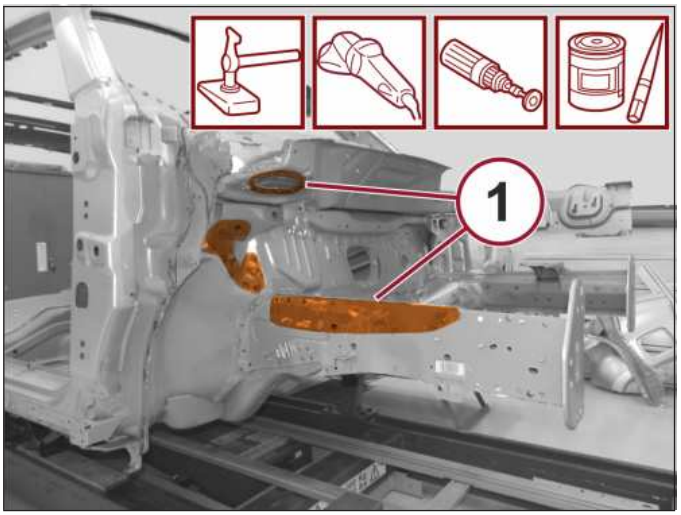
8. Use a rotary brush to remove the paint and gain access to the spot welds (1).
9. With the use of a drill, release the spot welds (1) shown in the figure.
10. Use a chisel and hammer to remove the welds previously released.



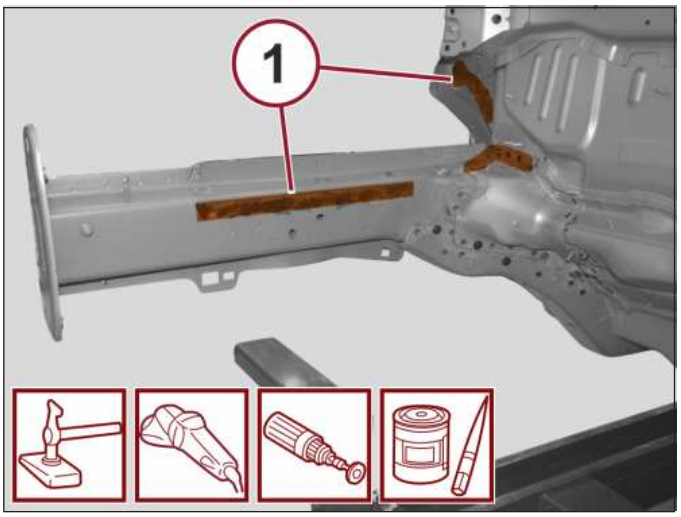
11. Use a rotary brush to remove the paint and gain access to the spot welds (1).
12. With the use of a drill, release the spot welds (1) shown in the figure.
13. Use a chisel and hammer to remove the welds previously released.
14. Remove the part from the vehicle.



15. With the use of a hammer and dolly, straighten the edges of the mating components.
16. With the use of a disc grinder, remove any residue of the spot welds.
17. Use a rotary brush and clean the previously treated areas.
18. Apply electro-weldable paint/weld through primer to the areas shown (1).

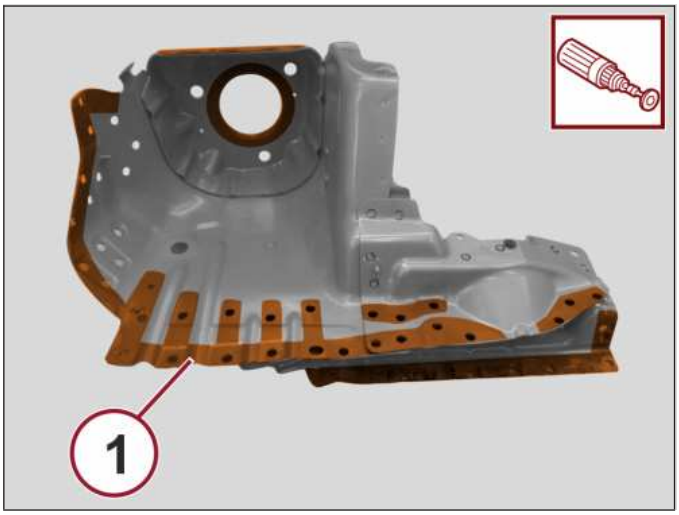


19. With the use of a hammer and dolly block, straighten the edges of the mating components.
20. With the use of a disc grinder, remove any residue of the spot welds.
21. Use a rotary brush and clean the previously treated areas.
22. Apply electro-weldable paint/weld through primer to the areas shown (1).

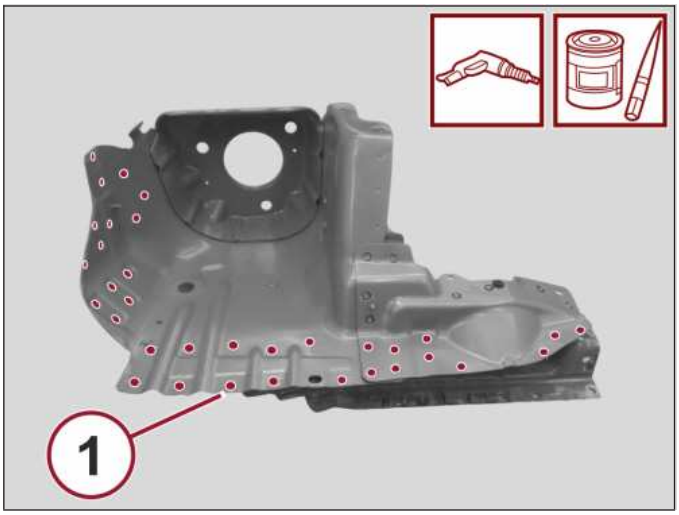


INSTALLATION

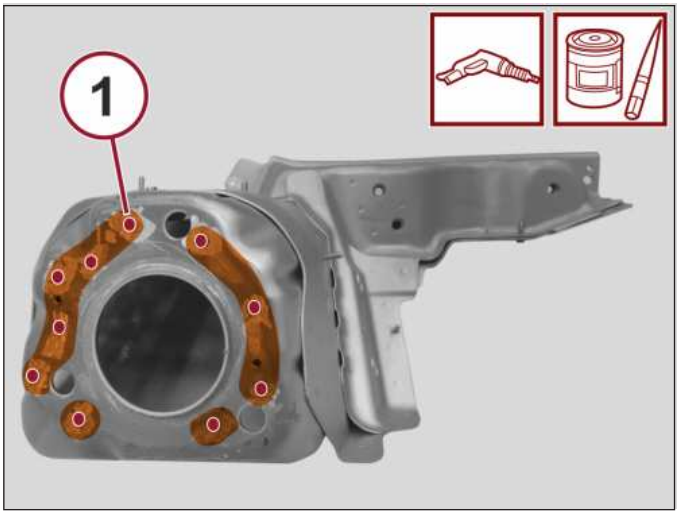
1. Remove the anti-corrosion treatment from the entire perimeter of the inside and outside of the service part using a rotary brush.



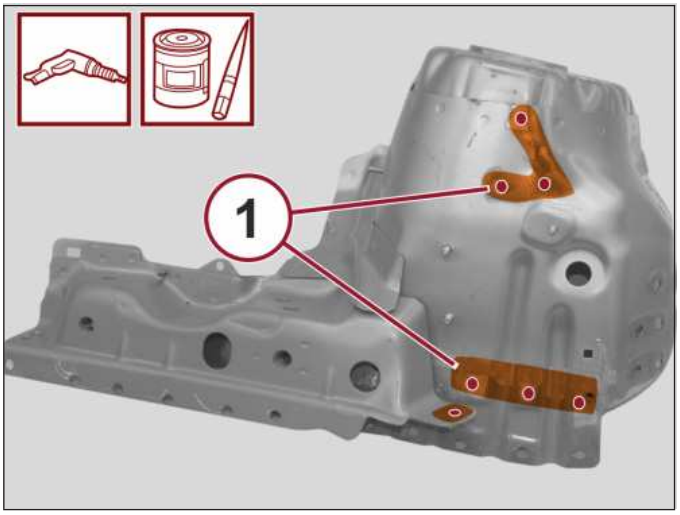
2. Drill out the part at the indicated points (1).
3. Apply elctro-weldable paint/weld through primer to the areas involved.



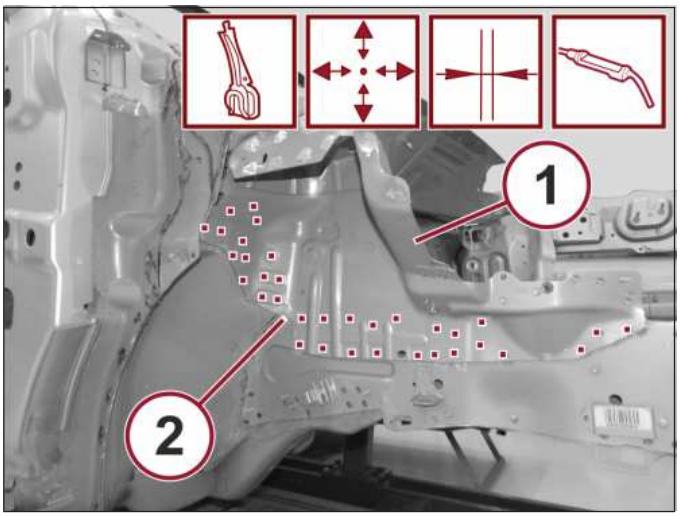
4. Drill out the part at the indicated points (1).
5. Apply elctro-weldable paint/weld through primer to the areas involved.



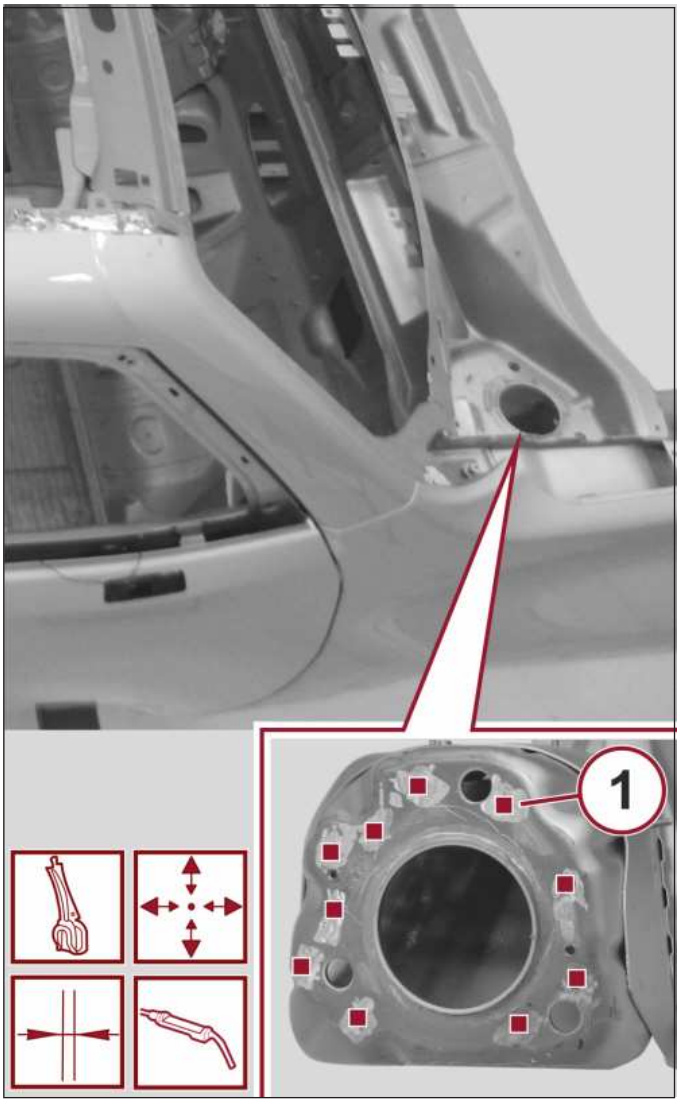
6. Drill out the part at the indicated points (1).
7. Apply elctro-weldable paint/weld through primer to the areas involved.



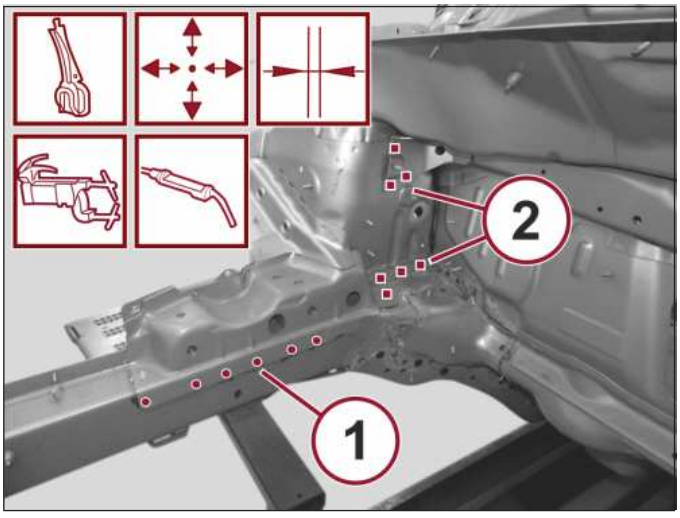
8. Position the service parts (1) correctly on the vehicle and secure it with the self-locking clamps.
9. Check alignment and surrounding gaps.
10. With the use of a MIG welder, apply plug welds to fill in the holes (2) made previously.



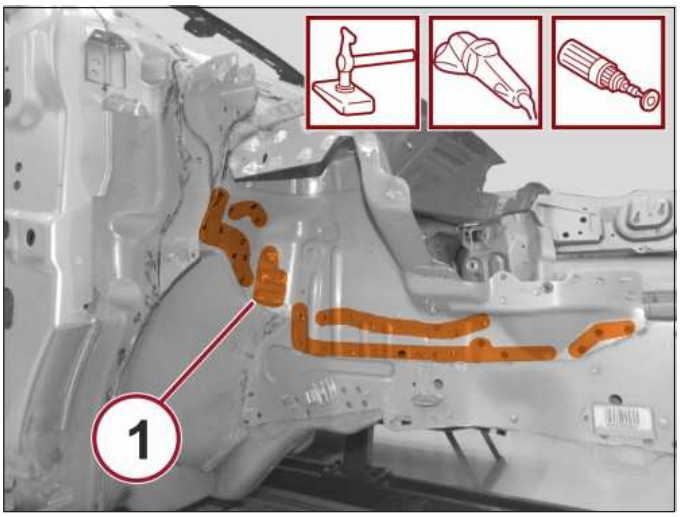
11. Position the service parts correctly on the vehicle and secure it with the self-locking clamps.
12. Check alignment and surrounding gaps.
13. With the use of a MIG welder, apply plug welds to fill in the holes (1) made previously.



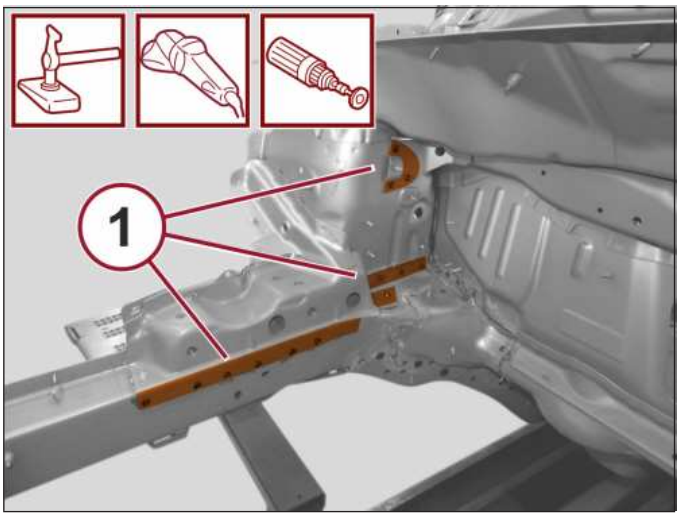
14. Position the service parts correctly on the vehicle and secure it with the self-locking clamps.
15. Check alignment and surrounding gaps.
16. Use a spot welder to weld the points indicated in the figure (1).
17. With the use of a MIG welder, apply plug welds to fill in the holes (2) made previously.



18. Correct any distortions to the panel using a hammer and dolly block.
19. Use a grinding disc to smooth the welds (1).
20. Use a rotary brush to clean the previously welded areas.



21. Correct any distortions to the panel using a hammer and dolly block.
22. Use a grinding disc to smooth the welds (1).
23. Use a rotary brush to clean the previously welded areas.
24. Apply corrosion protection to the areas involved in the welding.
25. Apply seam sealer to the seams between the service part and the vehicle.
26. Install the upper load path beam (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Load Path Beam).

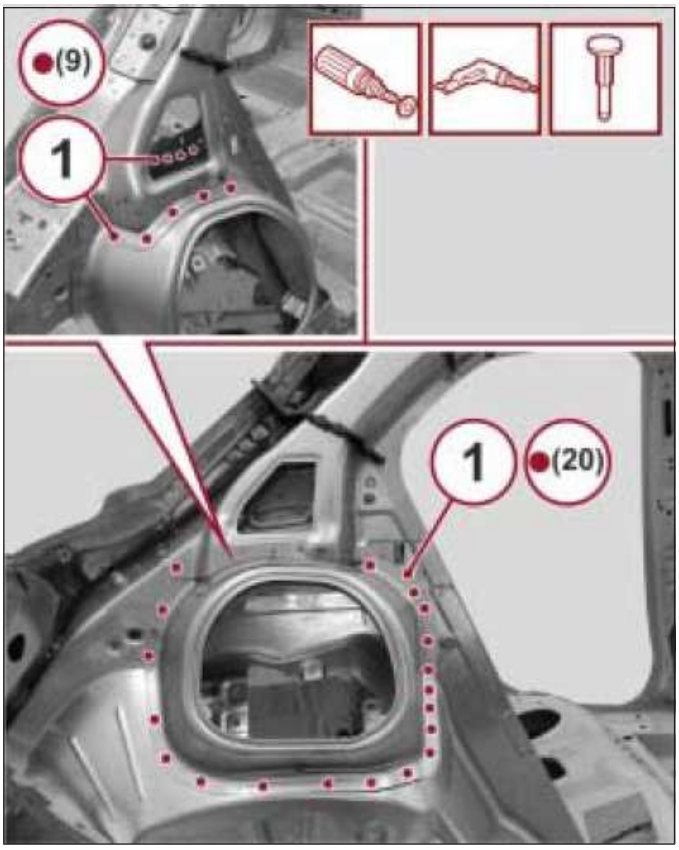


Fuel Filler Door Reinforcement

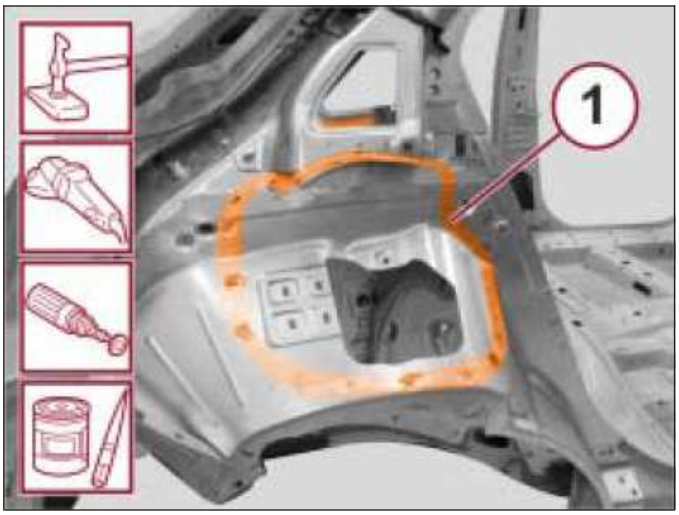
REMOVAL

1. Remove the quarter panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Body Side Aperture/Quarter Panel).
2. Be certain the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
3. Straighten the body as necessary.

4. With the use of a rotary brush, remove the paint and access to the spot welds.
5. With the use of a drill, release the spot welds (1) shown on the figure.
6. Use a hammer and chisel to remove the welds previously released.
7. Remove the fuel door reinforcement from the vehicle.

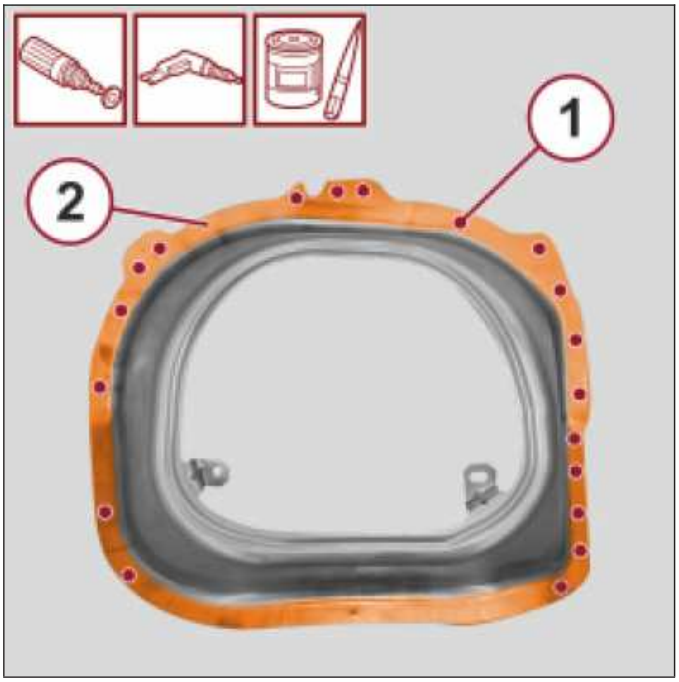


8. With the use of a hammer and dolly block, straighten the edges of the mating components.
9. With the use of a disc grinder, remove any residue of the spot welds.
10. With the use of a rotary brush, clean the previously treated areas.
11. Apply electro-weldable paint/weld through primer to the highlighted areas (1).

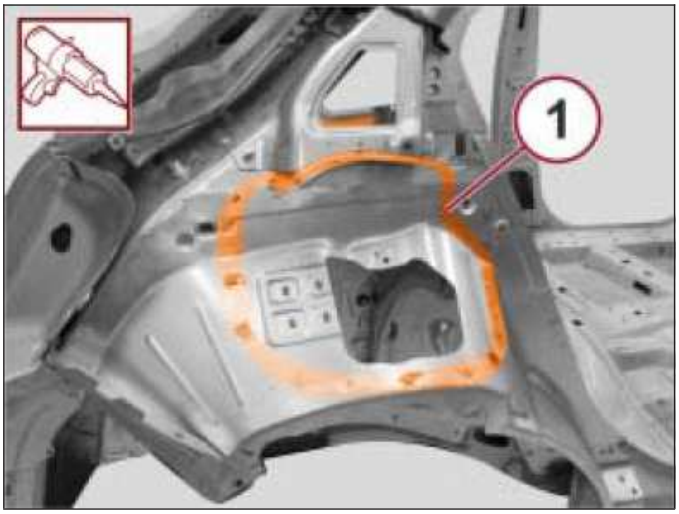


INSTALLATION

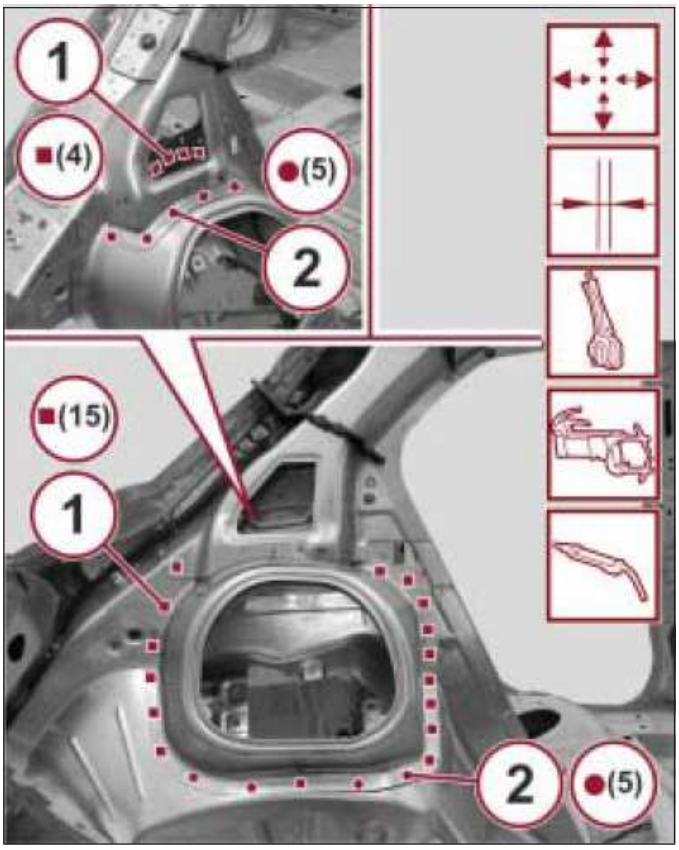
1. Remove the anti-corrosion treatment from the entire perimeter of the inside and outside of the service part using a rotary brush.
2. With the use of a drill, drill holes at the indicated points (1).
3. Apply elctro-weldable paint/weld through primer to the highlighted border areas (2) involved in welding.



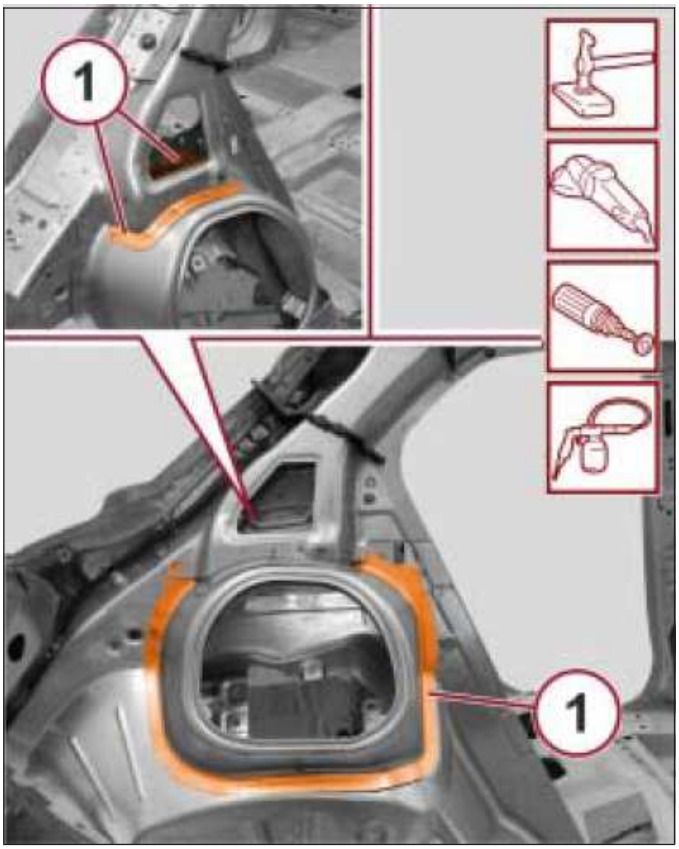
4. Apply structural adhesive to the area (1) shown in the figure.



5. Position the service part correctly on the vehicle and secure it with the self-locking clamps.
6. Check the alignment and surrounding gaps.
7. With the use of a MIG welder, apply plug welds filling in the areas (1) shown in the figure.
8. With the use of a spot welder, apply spot welds at the indicated points (2).



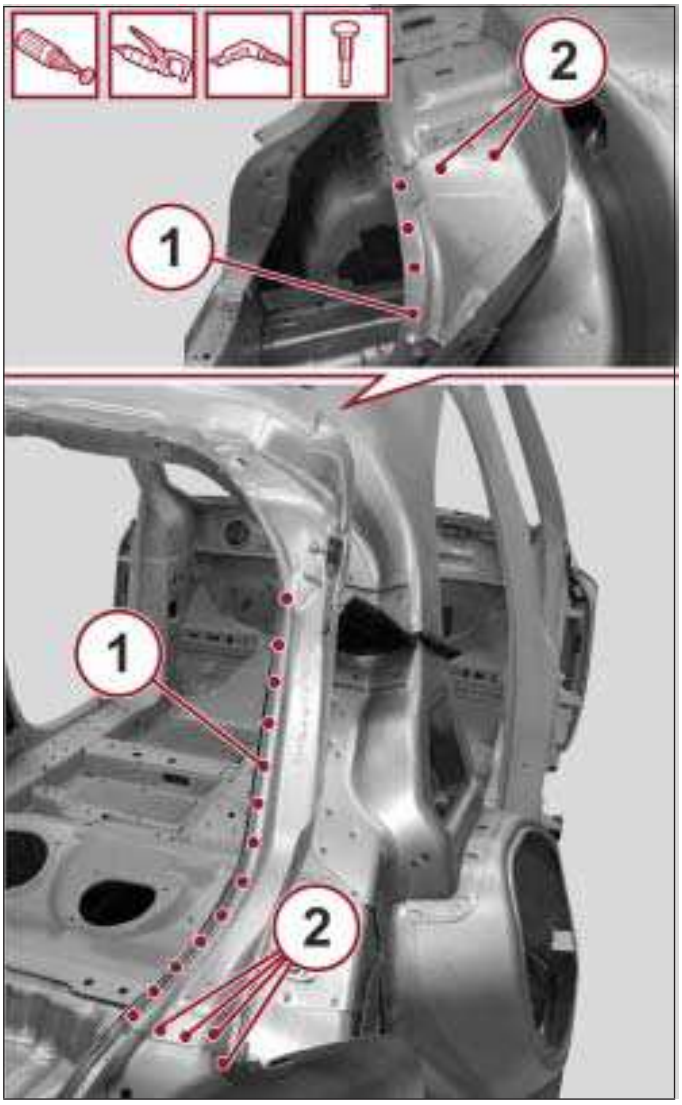
9. Correct any distortions to the sheet metal using a hammer and dolly block.
10. With the use of a disc grinder, smooth the welds.
11. With the use of a rotary brush, clean the previously welded areas.
12. Apply corrosion protection to the areas (1) involved in the welding.
13. Install the quarter panel (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Body Side Aperture/Quarter Panel).



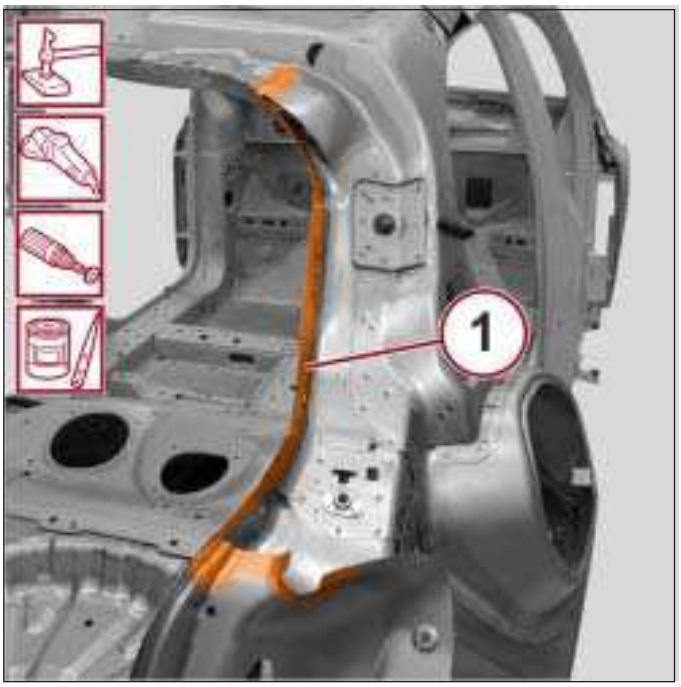
Liftgate Opening Trough

REMOVAL

1. Remove the roof panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Roof Panel).
2. Remove the quarter panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Body Side Aperture/Quarter Panel).
3. Remove the body side aperture upper section (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Body Side Aperture Panel Upper Section).
4. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
5. Straighten the body as necessary.
6. With the use of a rotary brush, remove the paint and gain access to the spot welds.
7. With the use of a spot weld cutting tool, release the spot welds (1) shown in the figure.
8. With the use of a drill, release the spot welds (2) shown in the figure.
9. With the use of a chisel and hammer, remove the spot welds previously released.
10. Remove the liftgate opening trough and cutouts from the vehicle.

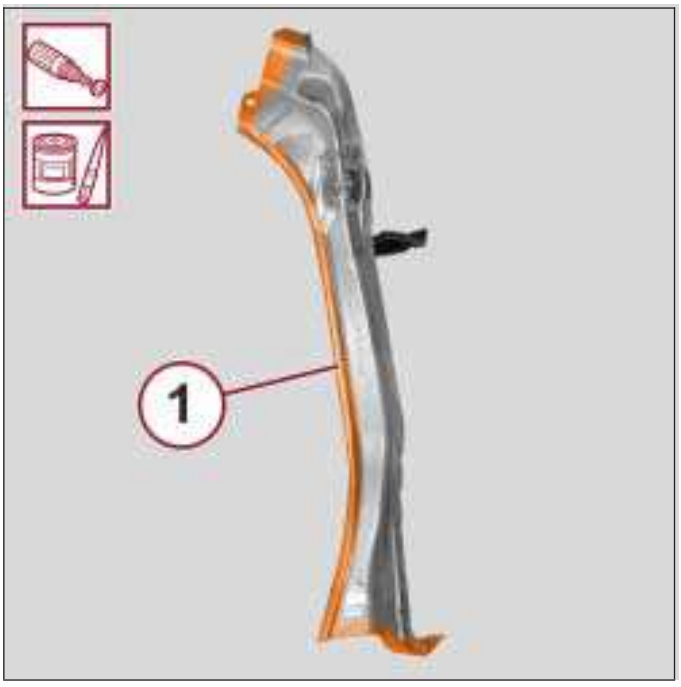


11. With the use of a hammer and dolly block, straighten the edges of the mating components.
12. With the use of a disc grinder, remove any residue of the spot welds.
13. With the use of a rotary brush, clean the previously treated areas.
14. Apply electro-weldable paint/weld through primer to the areas (1) to be welded.

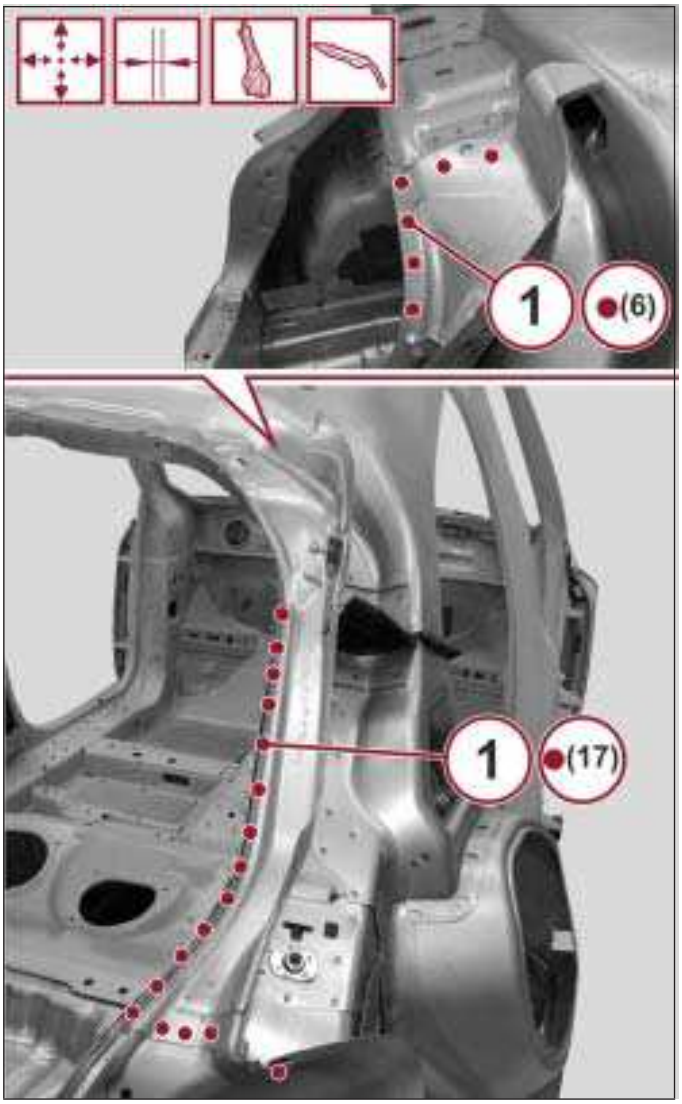


INSTALLATION

1. Remove the anti-corrosion treatment from the entire perimeter of the inside and outside of the service part using a rotary brush.
2. Apply elctro-weldable paint/weld through primer to the boarders (1) involved in welding.



3. Position the service part correctly on the vehicle and secure it with the self-locking clamps.
4. Check the alignment and surrounding gaps.
5. With the use of a spot welder, apply spot welds to the areas (1) indicated in the figure.
6. Correct any distortions to the sheet metal using a hammer and dolly block.
7. Use a disc grinder to smooth the welds.
8. Use a rotary brush to clean the previously welded areas.
9. Apply corrosion protection to the areas involved in the welding.
10. Install the body side aperture upper section (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Body Side Aperture Panel Upper Section).
11. Install the quarter panel (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Body Side Aperture/Quarter Panel) .
12. Install the roof panel (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Roof Panel).

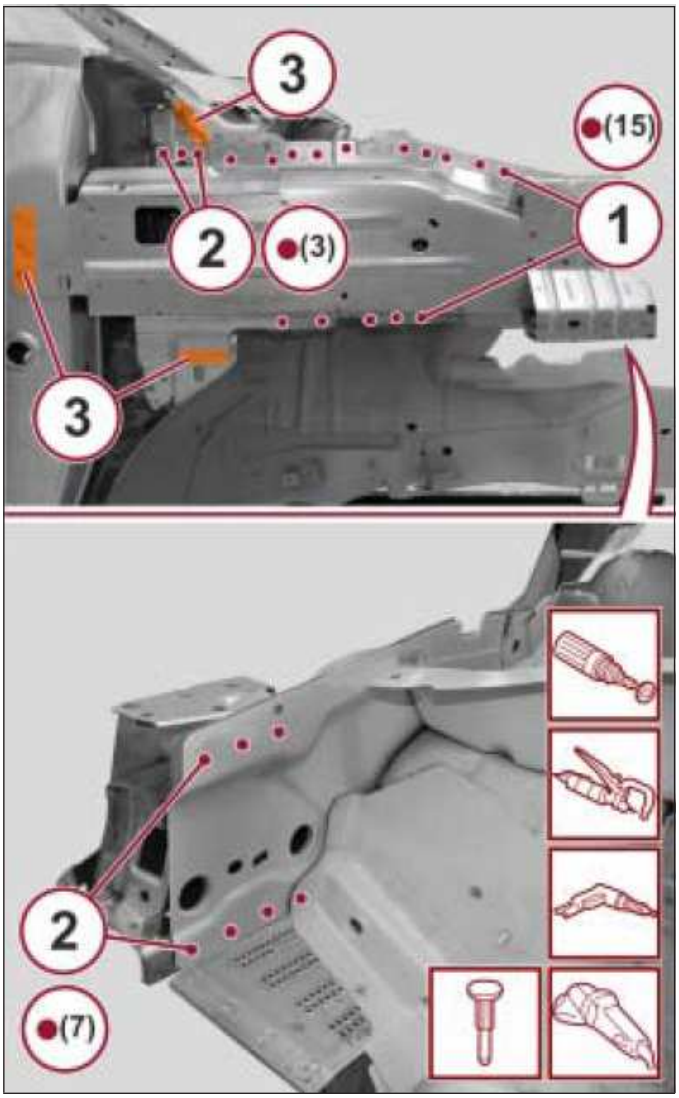


Load Path Beam

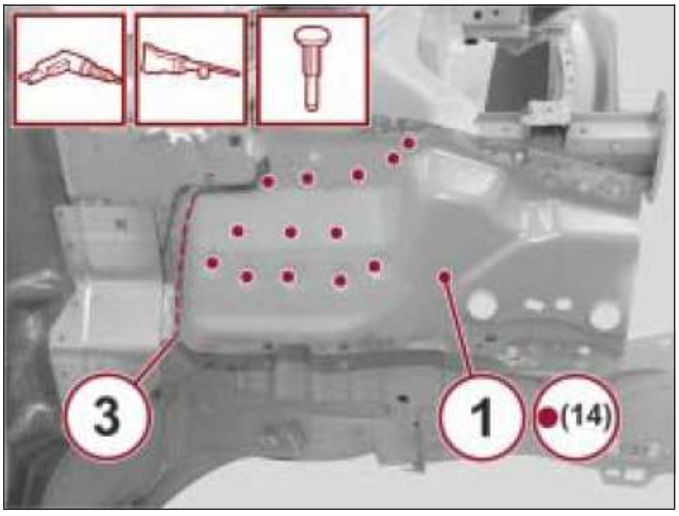
REMOVAL

1. Remove the front fender (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Front Fender).
2. Remove the front fender bracket (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Front Fender Bracket).
3. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
4. Straighten the body as necessary.

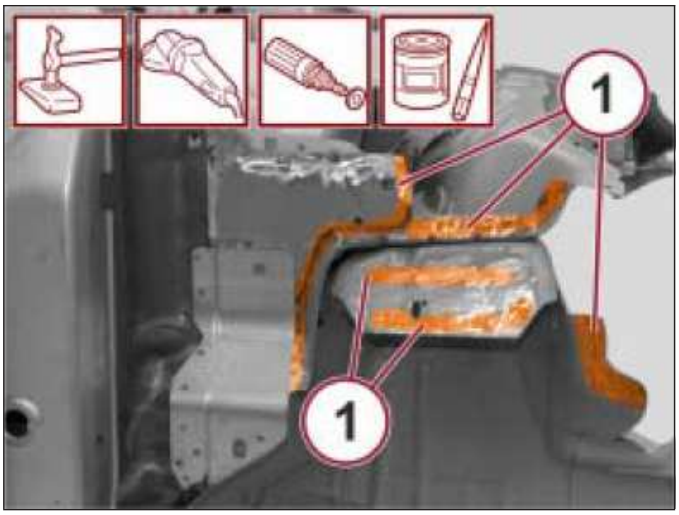
5. With the use of a rotary brush, remove the paint and gain access to the spot welds.
6. With the use of a spot weld cutting tool, release the spot welds (1) shown in the figure.
7. With the use of a drill, remove the spot welds (2) shown in the figure.
8. With the use of a disc grinder, remove the welds (3) shown in the figure.
9. With the use of a chisel and hammer, remove the welds previously released.
10. Remove the cutouts from the vehicle.



11. With the use of a drill, release the spot welds (1) shown in the figure.
12. With the use of a reciprocating saw, cut along the cut line (3).
13. With the use of a chisel and hammer, remove the welds previously released.
14. Remove the cutouts from the vehicle.

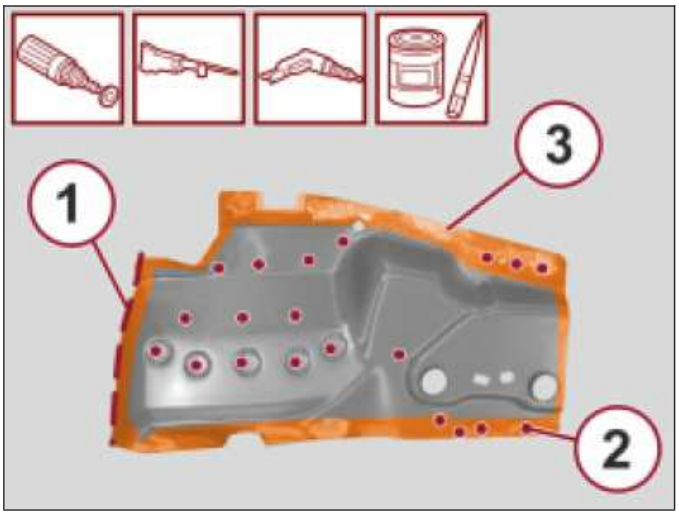


15. With the use of a hammer and dolly block, straighten the edges (1) of the mating components.
16. With the use of a disc grinder, remove any residue of the spot welds.
17. With the use of a rotary brush, clean the previously treated areas (1).
18. Apply electro-weldable paint/weld through primer to the areas (1) to be welded.

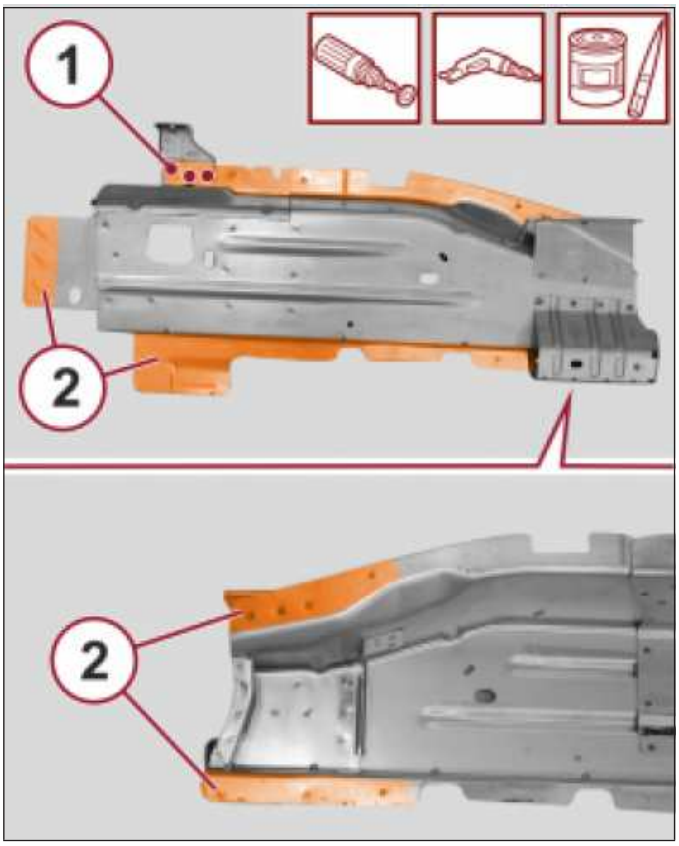


INSTALLATION

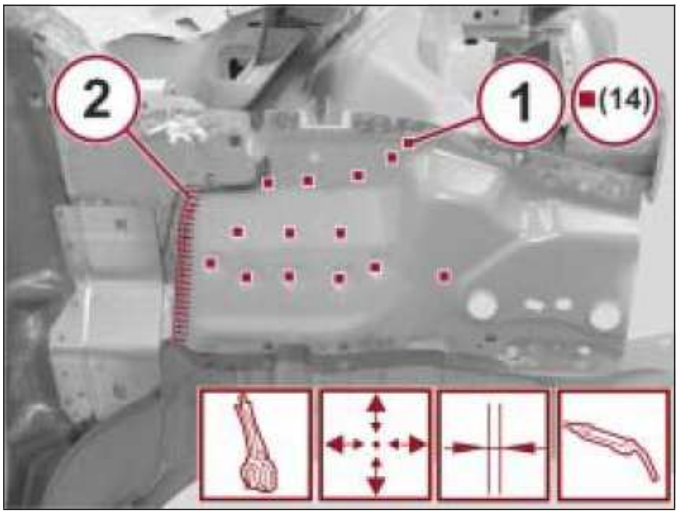
1. With the use of a rotary brush, remove the anti-corrosion treatment from the entire perimeter of the inside and outside of the service part.
2. Cut the inner service part to the length suitable to be fitted correctly
3. With the use of a drill, drill holes (2) in the service part.
4. Apply electro-weldable paint/weld through primer to the edges (3) to be welded.



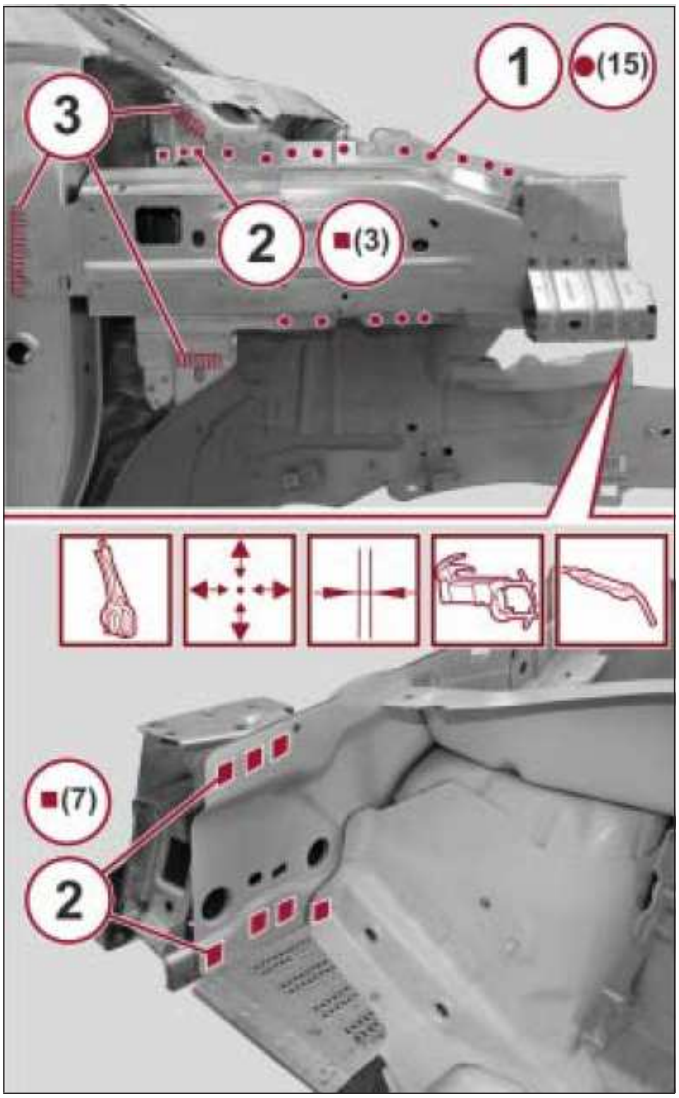
5. With the use of a rotary brush, remove the anti-corrosion treatment around the entire perimeter of the inside and outside of the outer service part.
6. With the use of a drill, drill holes (1) in the service part.
7. Apply electro-weldable paint/weld through primer to the edges (2) to be welded.



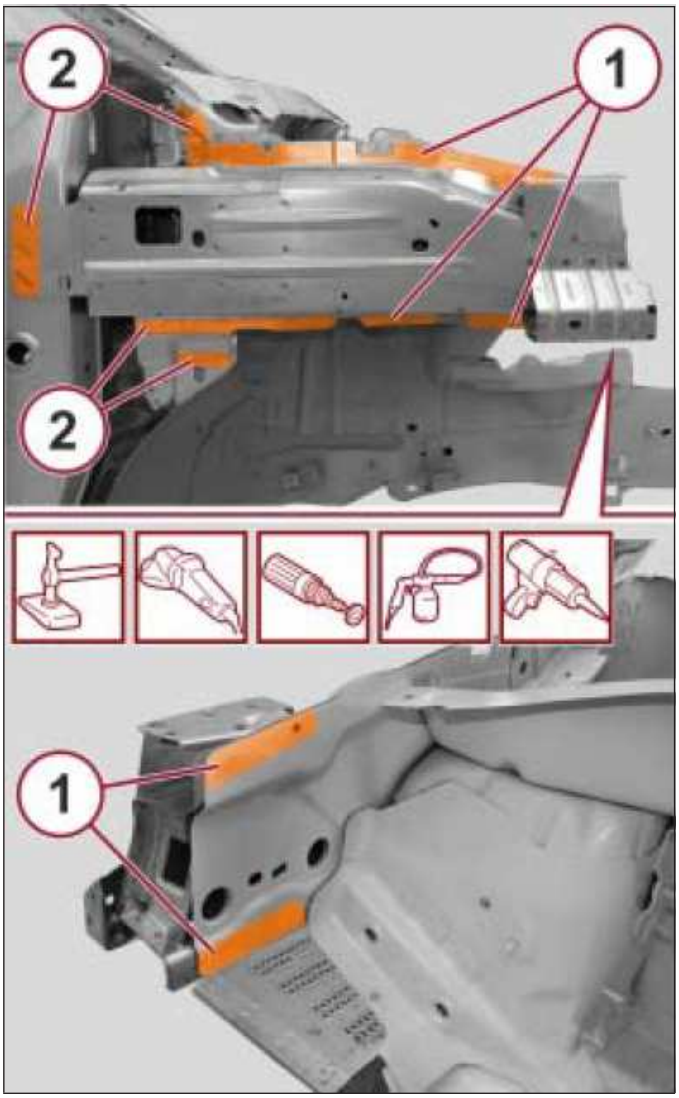
8. Position the inner service part correctly on the vehicle and secure it with the self-locking clamps.
9. Check the alignment and surrounding gaps.
10. With the use of a MIG welder, apply plug welds filling in the areas (1) shown in the figure.
11. With the use of a MIG welder, seam weld in the areas (2) shown in the figure.



12. Position the outer service part correctly on the vehicle and secure it with the self-locking clamps.
13. Check alignment and surrounding gaps.
14. With the use of a spot welder, apply spot welds to the areas (1) shown in the figure.
15. With the use of a MIG welder, apply plug welds filling in the areas (2) shown in the figure.
16. With the use of a MIG welder, apply seam weld to the area (3) shown in the figure.



17. Correct any distortions of the sheet metal using a hammer and dolly block.
18. With the use of a disc grinder, smooth the welds.
19. With the use of a rotary brush, clean the previously welded areas.
20. Apply corrosion protection to the areas (1) involved in the welding.
21. Apply sealant to the areas (2) indicated in the figure.
22. Install the front fender bracket (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Front Fender Bracket).
23. Install the front fender (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Front Fender).

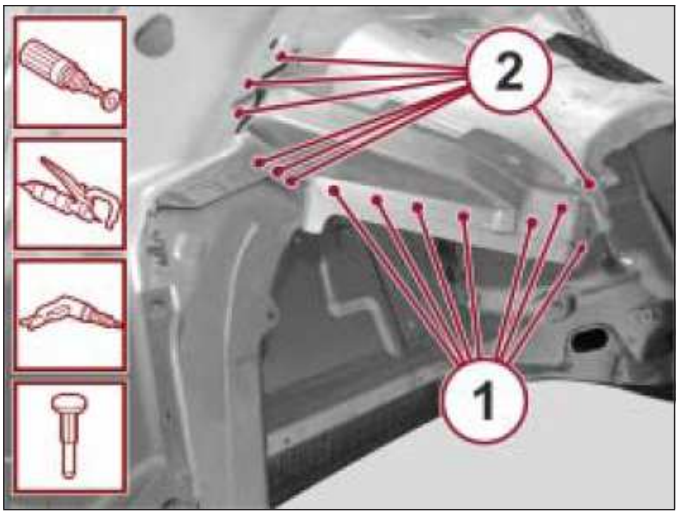


Quarter Panel Extension

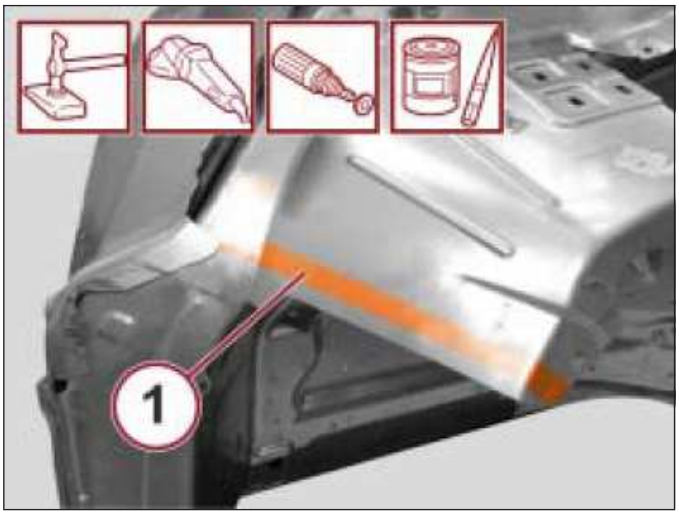
REMOVAL

1. Remove the quarter panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Body Side Aperture/Quarter Panel).
2. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
3. Straighten the body as necessary.

4. With the use of a rotary brush, remove the paint and gain access to the spot welds.
5. With the use of a spot weld cutting tool, release the spot welds (1) shown in the figure.
6. With the use of a drill, release the spot welds (2) shown in the figure.
7. With the use of a chisel and hammer, remove the spot welds previously released.
8. Remove the quarter panel extension from the vehicle.

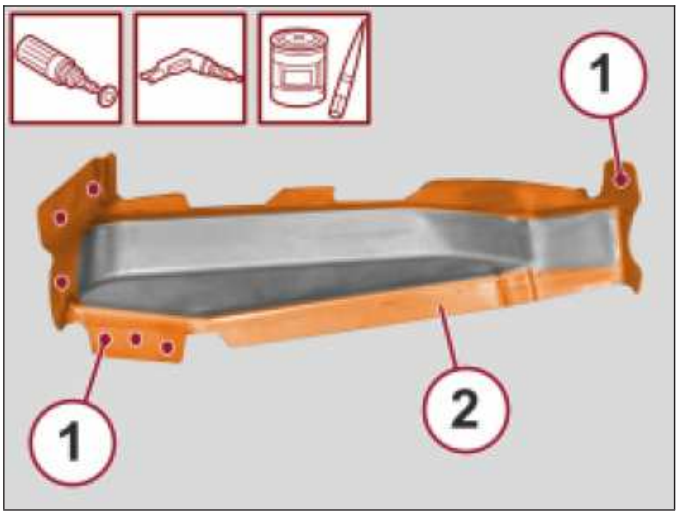


9. With the use of a hammer and dolly block, straighten the edges of the mating components.
10. With the use of a disc grinder, remove any residue of the spot welds.
11. With the use of a rotary brush, clean the previously treated areas.
12. Apply electro-weldable paint/weld through primer to the areas (1) to be welded.

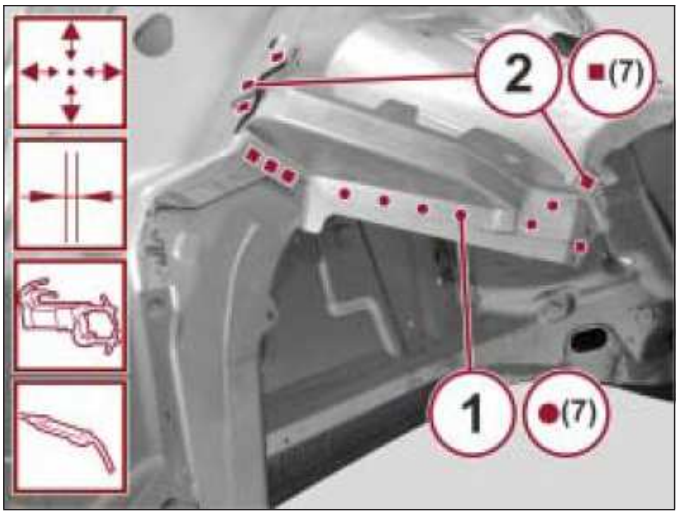


INSTALLATION

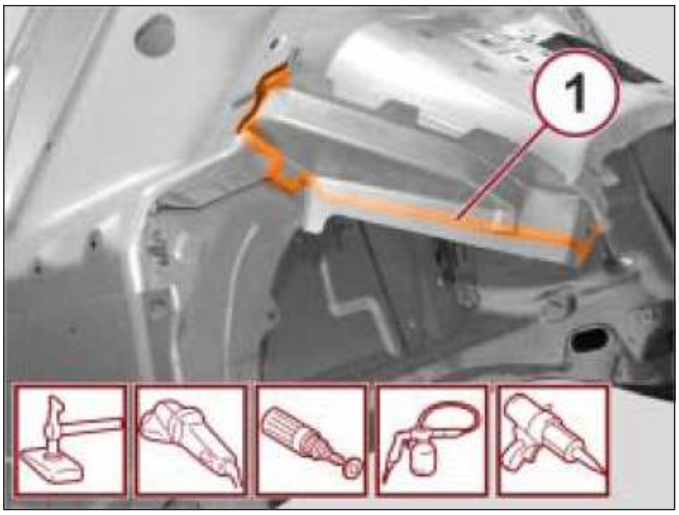
1. Remove the anti-corrosion treatment from the entire perimeter of the inside and outside of the service part using a rotary brush.
2. With the use of a drill, drill holes at the points (1) indicated.
3. Apply elctro-weldable paint/weld through primer to the boarders (2) involved in welding.



4. Position the service part correctly on the vehicle and secure it with the self-locking clamps.
5. Check the alignment and surrounding gaps.
6. With the use of a spot welder, apply spot welds to the areas (1) indicated in the figure.
7. With the use of a MIG welder, apply plug welds filling in the holes (2) indicated in the figure.



8. Correct any distortions to the sheet metal using a hammer and dolly block.
9. Use a grinding disc to smooth the welds.
10. Use a rotary brush to clean the previously welded areas.
11. Apply corrosion protection to the areas involved in the welding.
12. Apply seam sealer to the seams (1) between the service part and the vehicle in the areas shown.
13. Install the quarter panel (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Body Side Aperture/Quarter Panel).

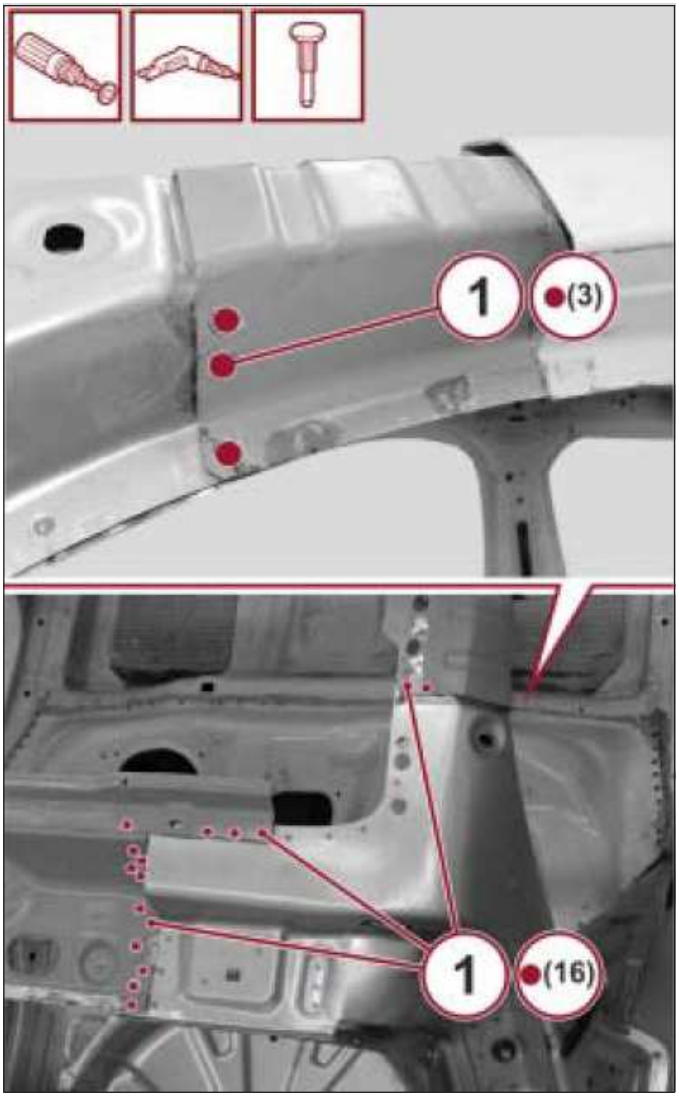


Quarter Panel Inner

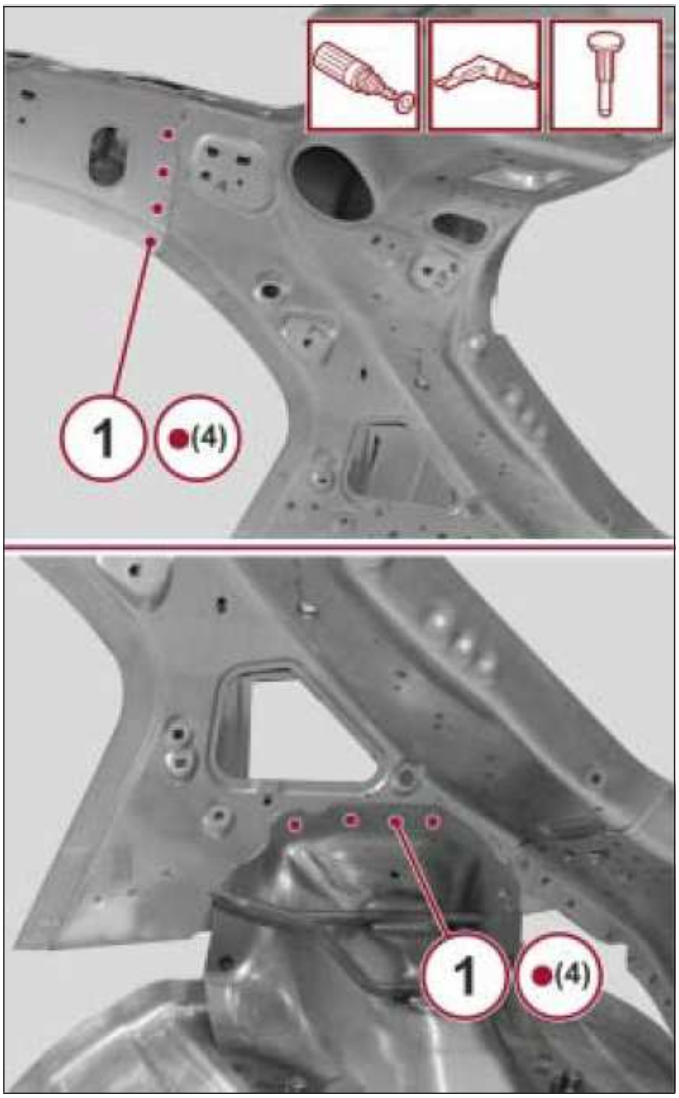
REMOVAL

1. Remove the roof panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Roof Panel).
2. Remove the body side aperture upper section (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Body Side Aperture Panel/Upper Sectioning) .
3. Remove the quarter panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Body Side Aperture Panel/Quarter Panel).
4. Remove the quarter panel extension (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Quarter Panel Extension).
5. Remove the taillamp mounting panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Taillamp Mounting Panel).
6. Remove the liftgate opening trough (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Liftgate Opening Trough).
7. Remove the outer rear wheelhouse (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Outer Rear Wheelhouse).
8. Remove the rear closure panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Closure Panel).
9. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
10. Straighten the body as necessary.

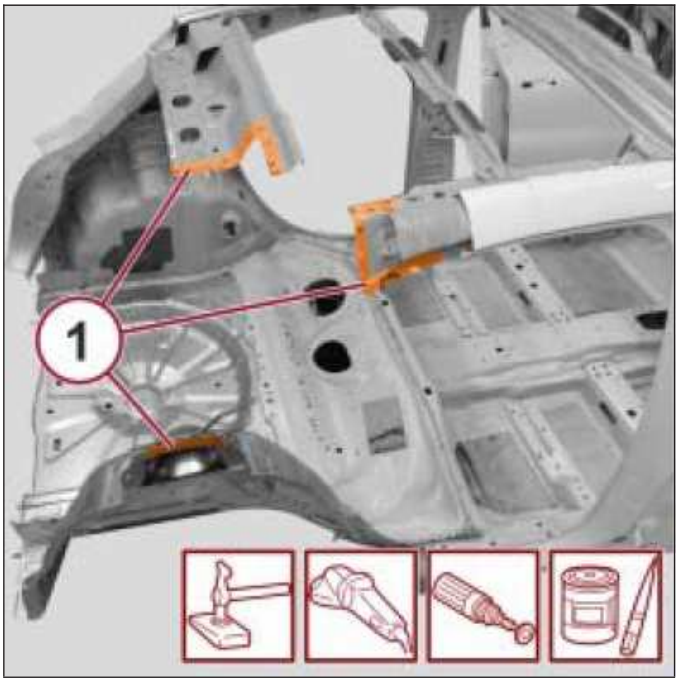
11. With the use of a rotary brush, remove the paint and gain access to the spot welds.
12. With the use of a drill, release the spot welds (1) shown in the figure.
13. With the use of a chisel and hammer, remove the spot welds previously released.



14. With the use of a rotary brush, remove the paint and gain access to the spot welds.
15. With the use of a drill, release the spot welds (1) shown in the figure.
16. With the use of a chisel and hammer, remove the spot welds previously released.



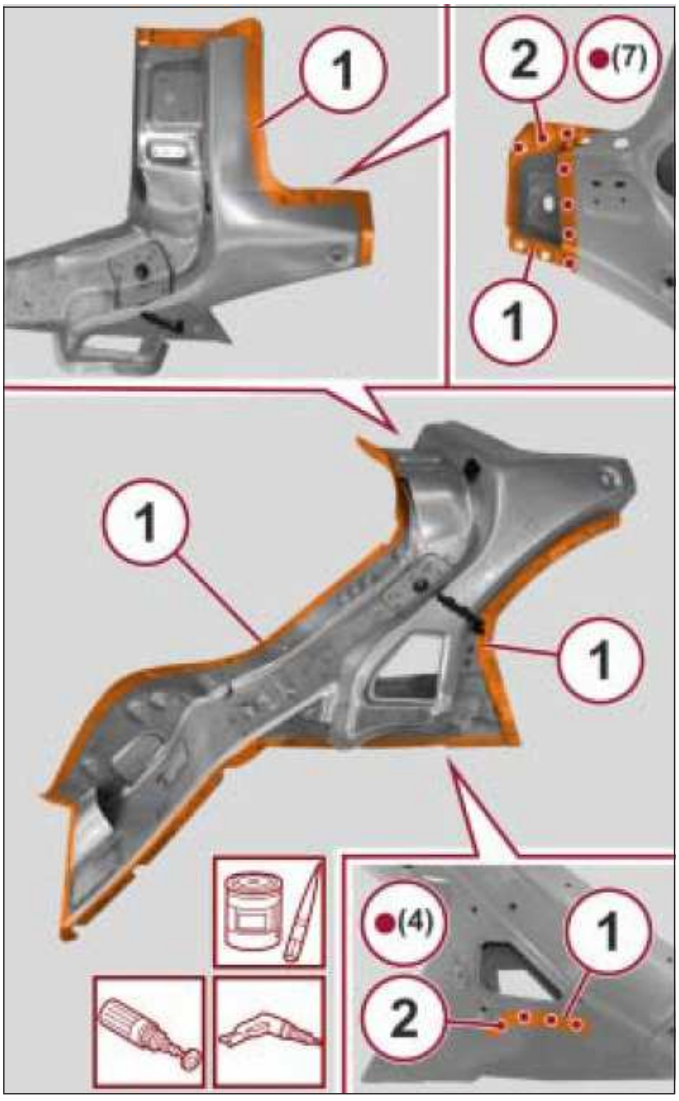
17. With the use of a hammer and dolly block, straighten the edges of the mating components.
18. With the use of a disc grinder, remove any residue of the spot welds.
19. With the use of a rotary brush, clean the previously treated areas.
20. Apply electro-weldable paint/weld through primer to the areas (1) indicated.



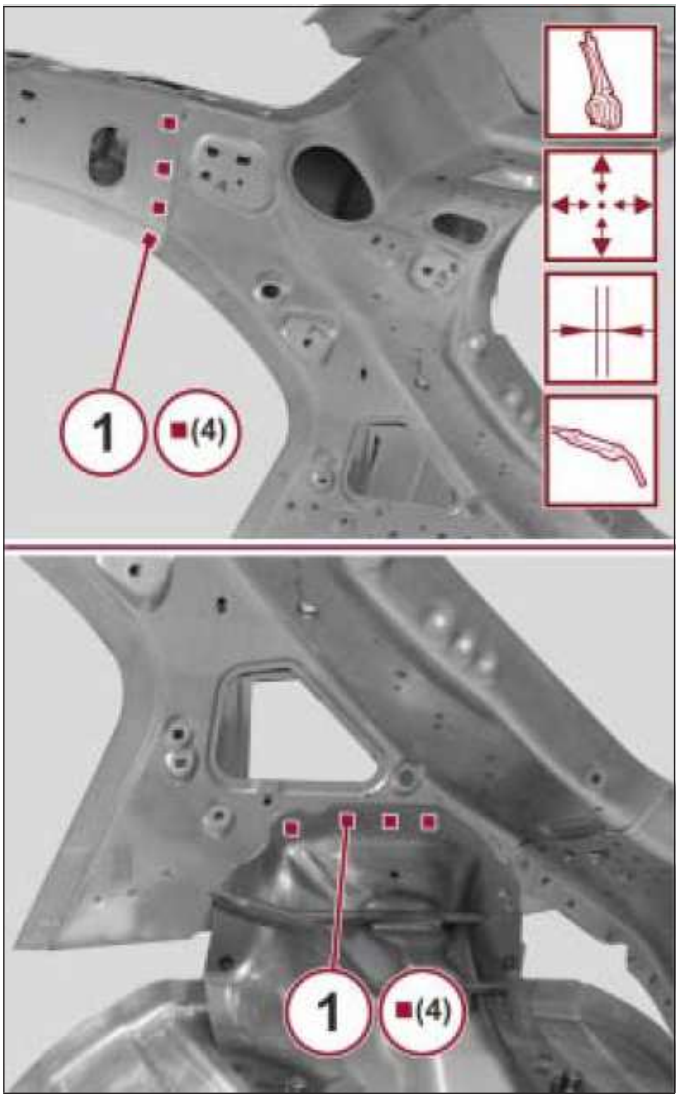
INSTALLATION

1. Remove the anti-corrosion treatment from the entire perimeter of the inside and outside of the service part (1) using a rotary brush.
2. With the use of a drill, drill holes at the points (2) indicated.

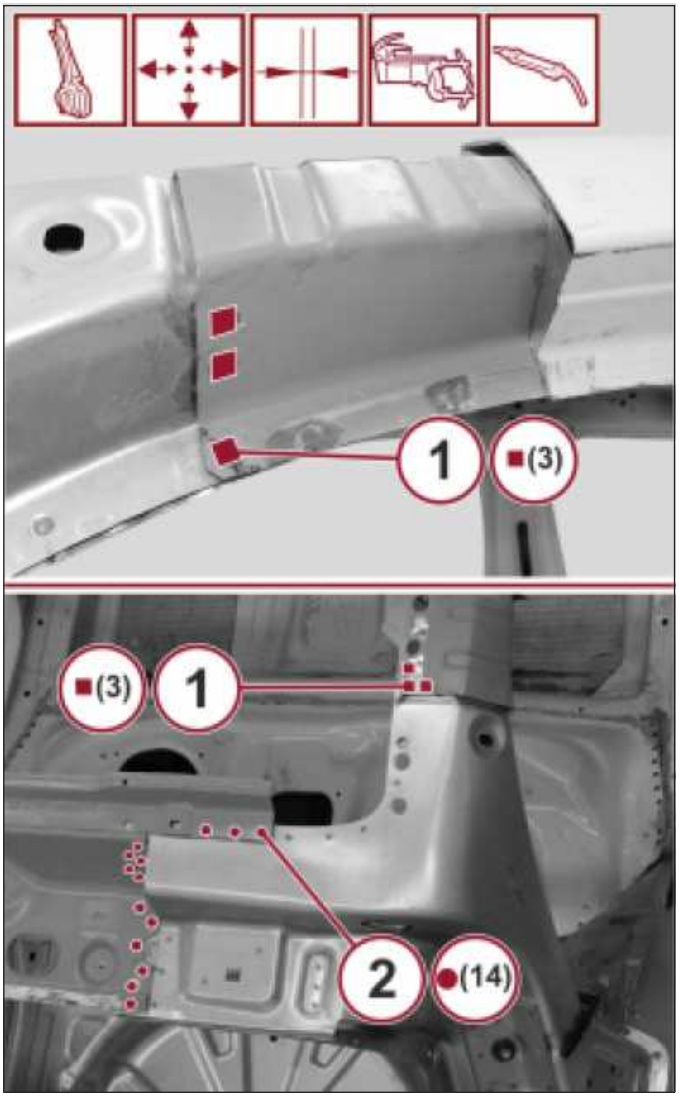
   NOTE: Make holes next to the openings made before on the body, in order to guarantee the subsequent correct coupling and welding of the metal panels.
3. Apply elctro-weldable paint/weld through primer to the boarders involved in welding.



4. Position the service part correctly on the vehicle and secure it with the self-locking clamps.
5. Check the alignment and surrounding gaps.
6. With the use of a MIG welder, apply plug welds filling in the holes (1) shown in the figure.



7. Position the service part correctly on the vehicle and secure it with the self-locking clamps.
8. Check the alignment and surrounding gaps.
9. With the use of a MIG welder, apply plug welds filling in the holes (1) indicated in the figure.
10. With the use of a spot welder, apply spot welds to the areas (2) indicated in the figure.
11. Correct any distortions to the sheet metal using a hammer and dolly block.
12. With the use of a disc grinder, smooth the welds.
13. With the use of a rotary brush, clean the previously welded areas.
14. Apply corrosion protection to the areas involved in the welding.
15. Install the rear closure panel (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Rear Closure Panel).
16. Install the outer rear wheelhouse (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Outer Rear Wheelhouse).
17. Install the liftgate opening trough (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Liftgate Opening Trough).
18. Install the taillamp mounting panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Taillamp Mounting Panel).
19. Install the quarter panel extension (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Quarter Panel Extension).

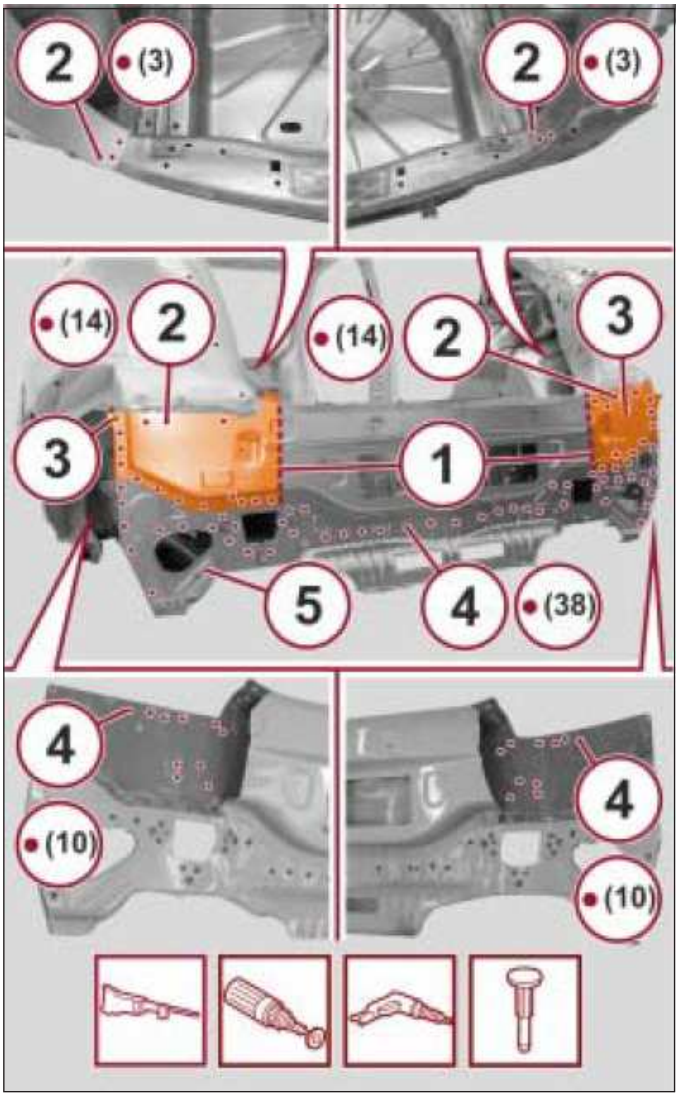


20. Install the quarter panel (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Body Side Aperture Panel/Quarter Panel).
21. Install the upper body side aperture (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Body Side Aperture Panel/Upper Sectioning).
22. Install the roof panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Roof Panel).

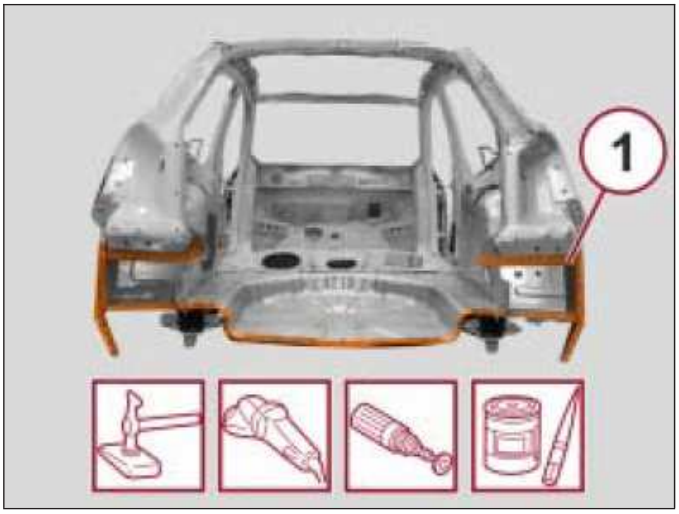
Rear Closure Panel

REMOVAL

1. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
2. Straighten the body as necessary.
3. With the use of a rotary brush, remove the paint and gain access to the spot welds.
4. With the use of a reciprocating saw, cut along the cut lines (1) shown in the figure.
5. With the use of a drill, release the spot welds (2) highlighted in the figure.
6. Remove the off-cuts of the outer portions (3) of the rear closure panel.
7. With the use of a drill, release the spot welds (4) highlighted in the figure.
8. Use a chisel and hammer to remove the areas previously released.
9. Remove the rear closure panel.
10. Remove the inner portion of the closure panel.

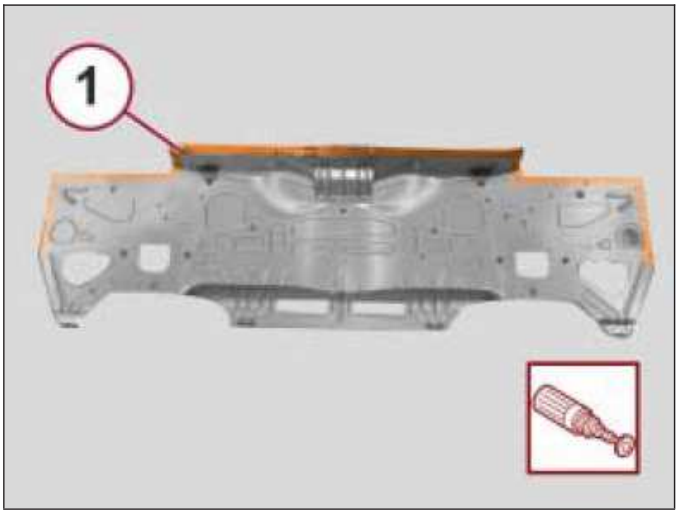


11. With the use of a hammer and dolly block, straighten the edges of the mating components.
12. With the use of a disc grinder, remove any residue of the spot welds.
13. With the use of a rotary brush, clean the previously treated areas.
14. Apply electro-weldable paint/weld through primer to the boarders (1) to be welded.

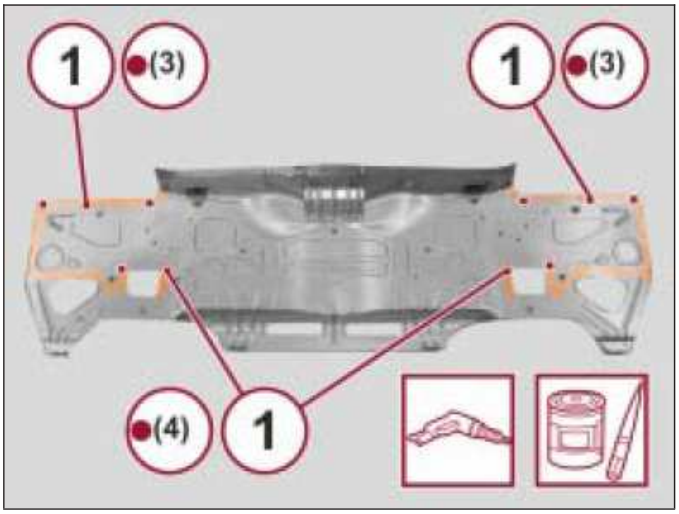


INSTALLATION

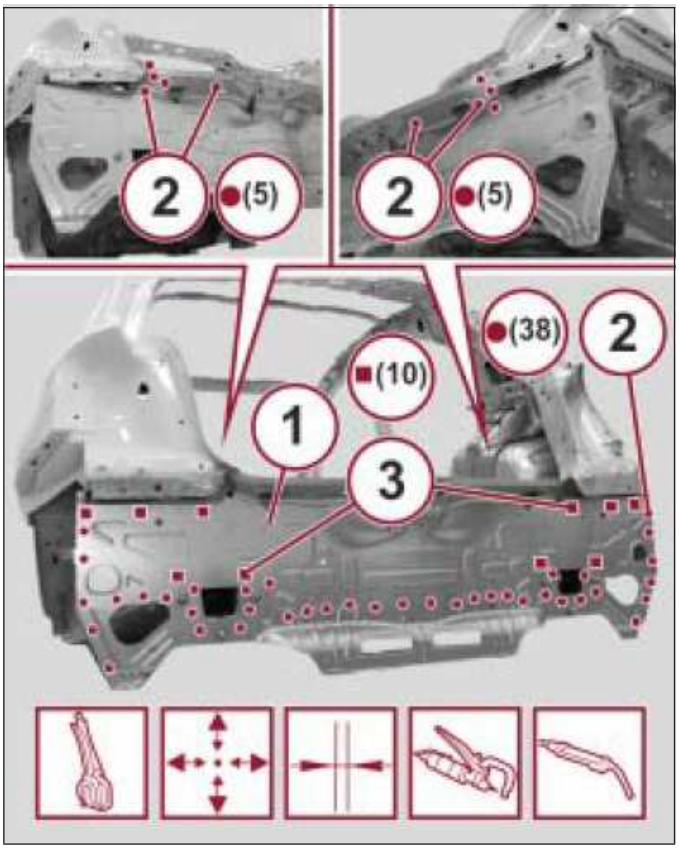
1. With the use of a rotary brush, remove the anti-corrosion treatment around the entire perimeter (1) of the inside and outside of the service part.



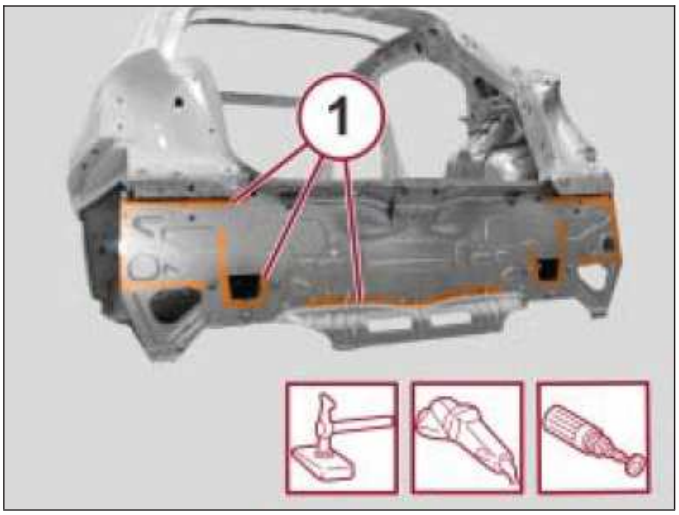
2. Drill out the internal service part at the points (1) indicated.
3. Apply electro-weldable paint/weld through primer to the edges involved.



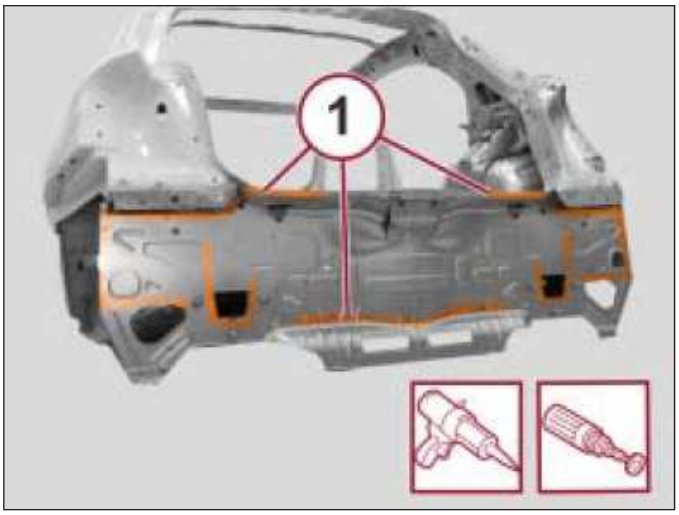
4. Position the inner service part (1) correctly on the vehicle and secure it with the self-locking clamps.
5. Check the alignment and surrounding gaps.
6. With the use of a spot welder, apply spot welds in the areas (2) shown in the figure.
7. With the use of a MIG welder, apply plug welds filling in the holes (3) made previously.



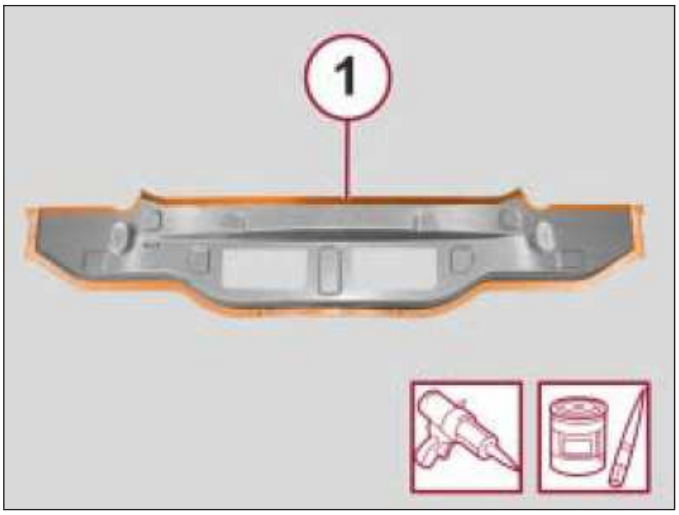
8. Correct any distortions of the sheet metal using a hammer and dolly block.
9. With the use of a grinding disc, smooth the welds.
10. With the use of a rotary brush, clean the previously welded areas (1).



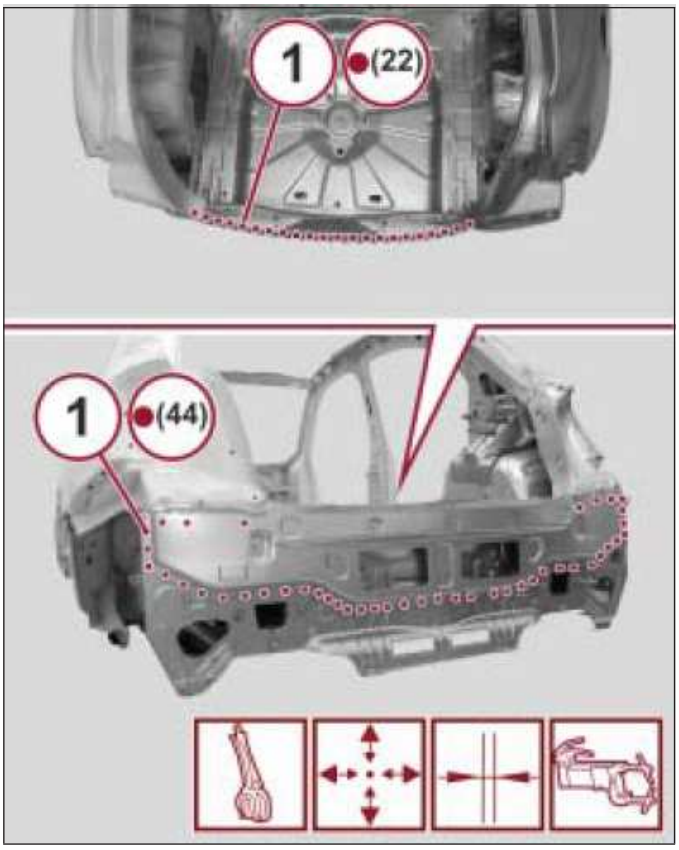
11. Apply corrosion protection to the areas (1) involved in the welding.
12. Apply seam sealer to the seams between the service part and the vehicle.



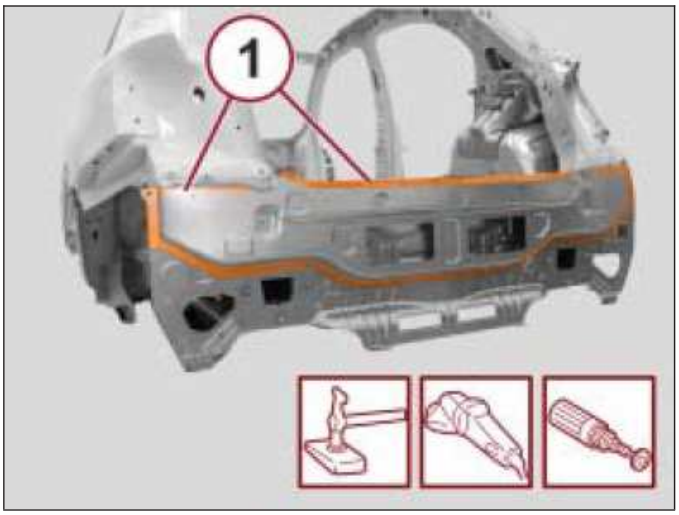
13. With the use of a rotary brush, remove the anti-corrosion treatment around the entire perimeter (1) of the inside and outside of the outer service part (1).
14. Apply electro-weldable paint/weld through primer to the boarders involved.



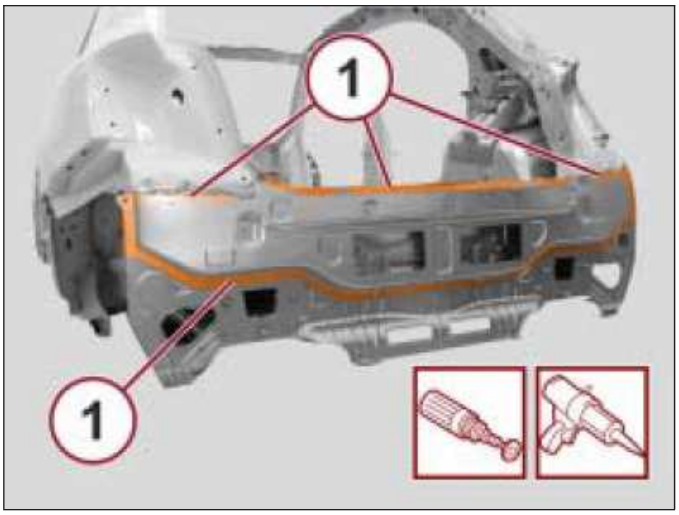
15. Position the outer service part correctly on the vehicle and secure it with the self-locking clamps.
16. Check the alignment and surrounding gaps.
17. With the use of a spot welder, apply spot welds in the areas (1) shown in the figure.



18. Correct any distortions of the sheet metal using a hammer and dolly block.
19. With the use of a grinding disc, smooth the welds in the highlighted areas (1).
20. With the use of a rotary brush, clean the previously welded areas.



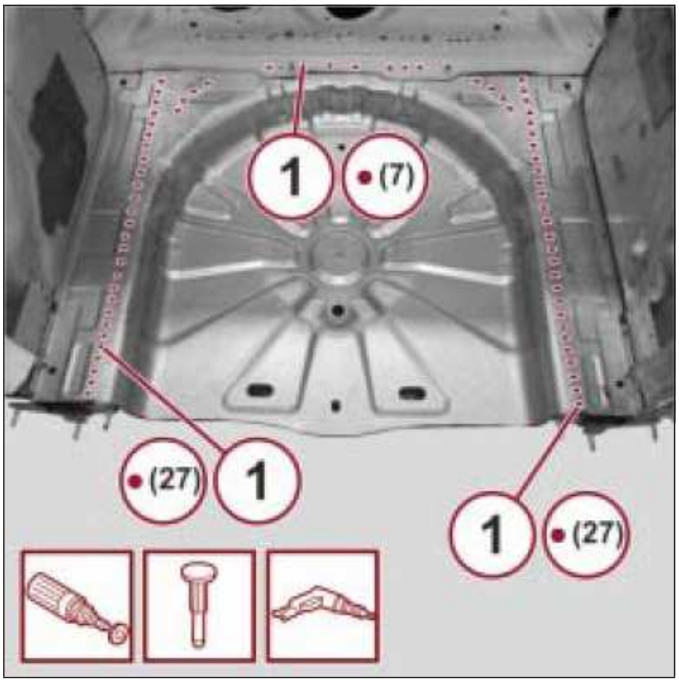
21. Apply corrosion protection to the areas (1) involved in the welding.
22. Apply seam sealer to the seams between the service parts and the vehicle.



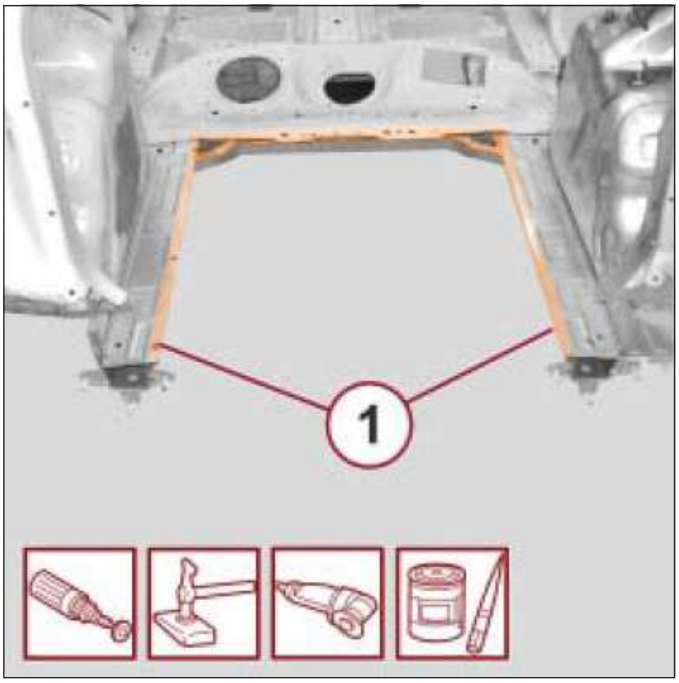
Rear Floor Pan

REMOVAL

1. Remove the rear closure panel (Refer to 31 - Collision/Standard Procedure/Sectioning Procedures and Component Procedures/ Rear Closure Panel).
2. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
3. Straighten the body as necessary.
4. With the use of a rotary brush, remove the paint and gain access to the spot welds.
5. With the use of a drill, release the spot welds (1) not accessible with a spot weld removal tool.
6. Use a hammer and chisel to remove the spot welds previously released.
7. Leave the front and side panels in place and remove the rear floor pan.

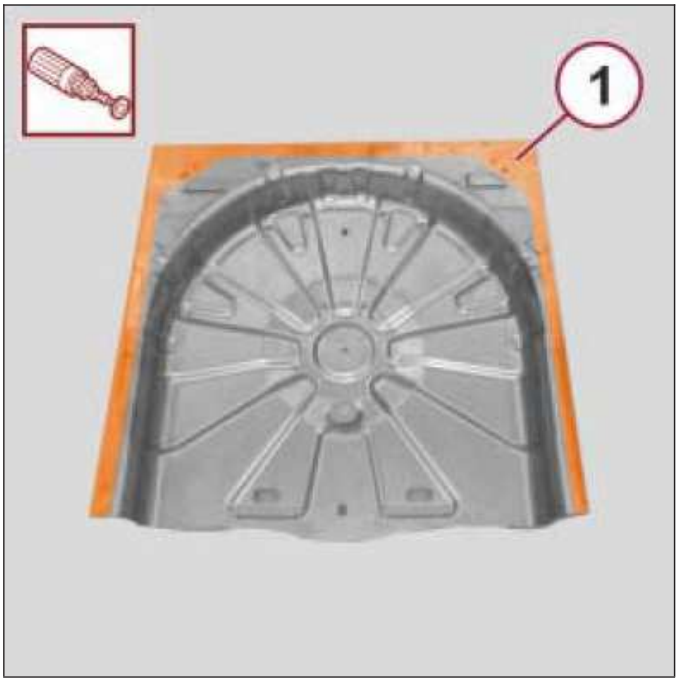


8. With the use of a rotary brush, clean the previously treated areas (1).
9. With the use of a hammer and dolly block, straighten the edges (1) of the mating components.
10. With the use of a disc grinder, remove any residue of the spot welds.
11. Apply electro-weldable paint/weld through primer to the ground areas (1).

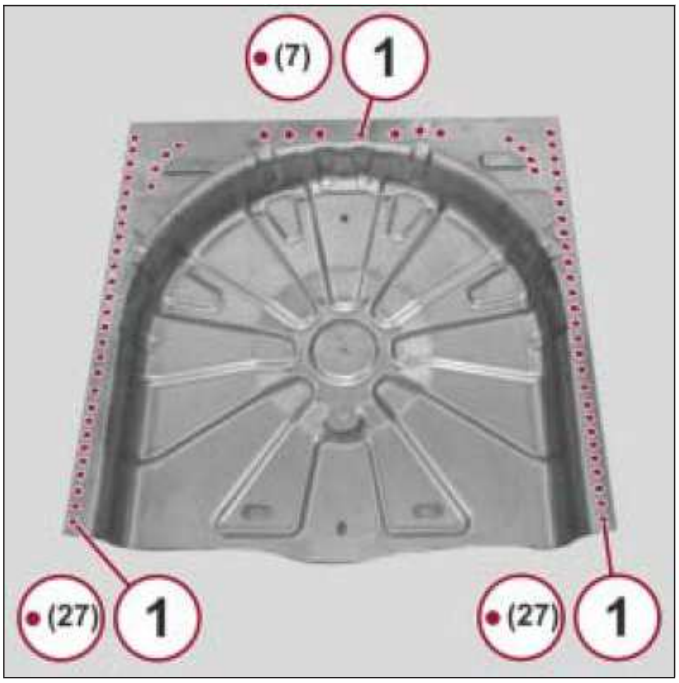


INSTALLATION

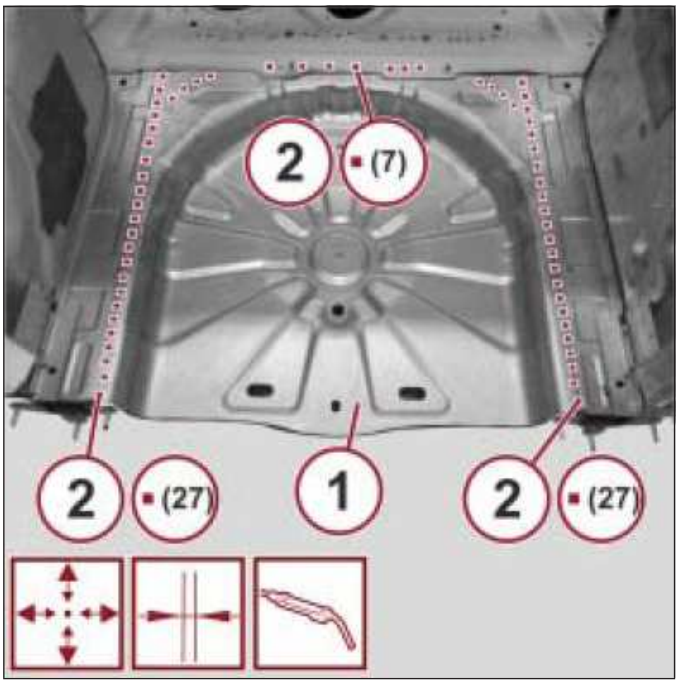
1. With the use of a rotary brush, remove the anti-corrosion treatment around the entire perimeter (1) of the inside and outside of the service parts.



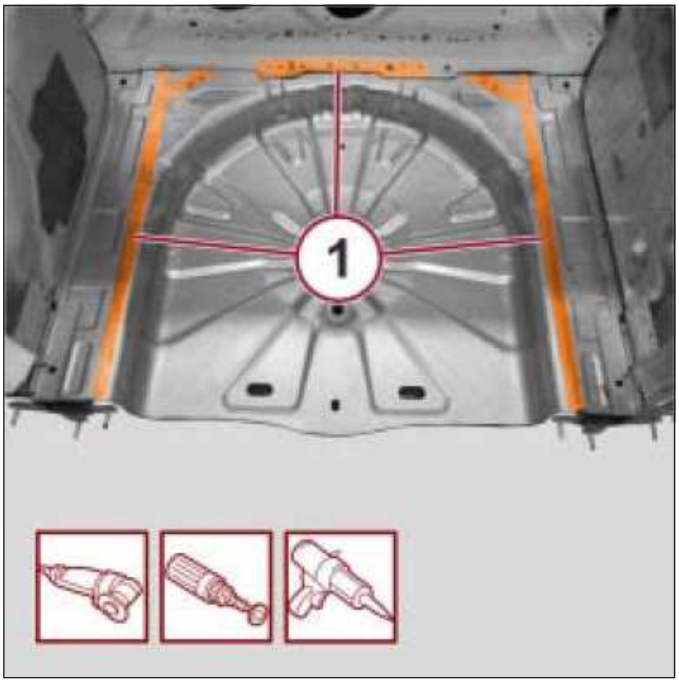
2. With the service part positioned on a work bench, drill the service part in line to the spot welds (1).
3. Apply electro-weldable paint/weld through primer to the points previously treated.



4. Position the rear floor pan service part into position on the vehicle.
5. Check the alignment and surrounding gaps.
6. Insert the edges of the rear floor pan (1) beneath the related front and side panels.
7. With the use of a MIG welder, apply plug welds filling in the openings (2) made previously.



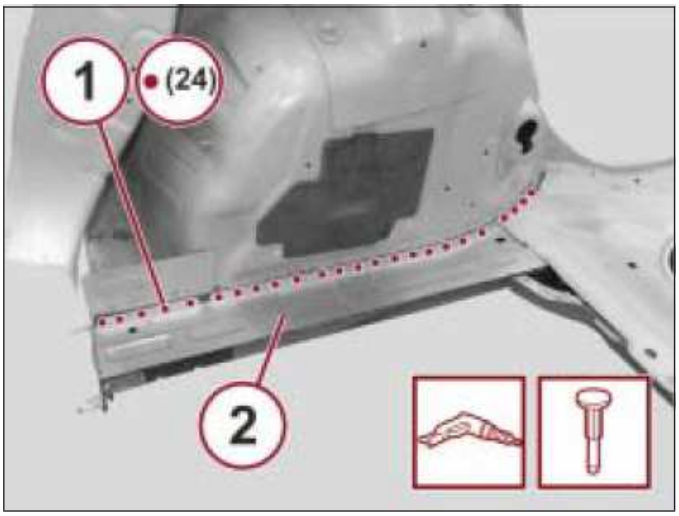
8. With the use of a disc grinder, smooth the welds in the affected area (1).
9. With the use of a rotary brush, clean the previously treated areas.
10. Apply corrosion protection to the areas involved with the welding.
11. Apply seam sealer to the join lines.
12. Install the rear closure panel (Refer to 31 - Collision/ Standard Procedure/Sectioning Procedures and Component Procedures/ Rear Closure Panel).



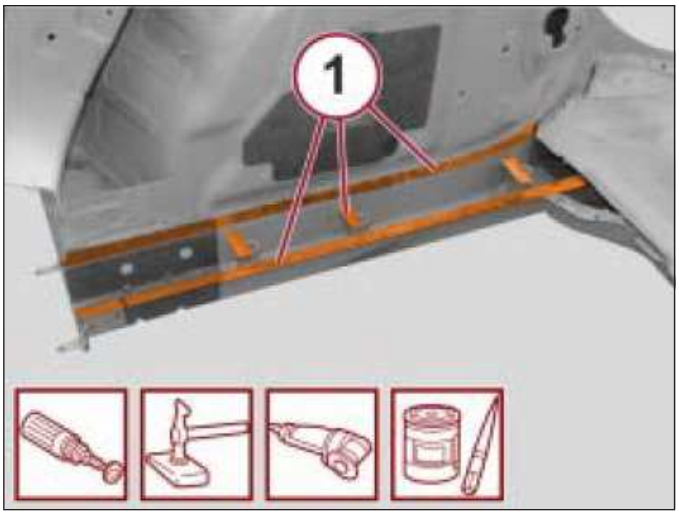
Rear Floor Pan Extension

REMOVAL

1. Remove the rear closure panel (Refer to 31 - Collision/Standard Procedure/Sectioning Procedures and Component Procedures/ Rear Closure Panel).
2. Remove the rear floor pan (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Floor Pan).
3. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
4. Straighten the body as necessary.
5. With the use of a drill, release the spot welds (1) shown in the figure.
6. With the use of a chisel and hammer, remove the spot welds previously released.
7. Remove the rear floor pan extension (2) from the vehicle.

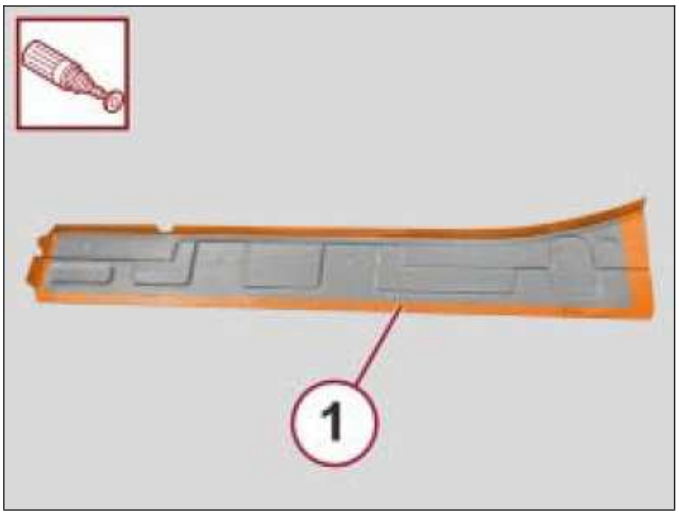


8. With the use of a rotary brush, clean the previously treated areas.
9. With the use of a hammer and dolly block, straighten the edges of the mating components.
10. With the use of a disc grinder, remove any residue of the spot welds.
11. Apply electro-weldable paint/weld through primer to the ground areas (1).

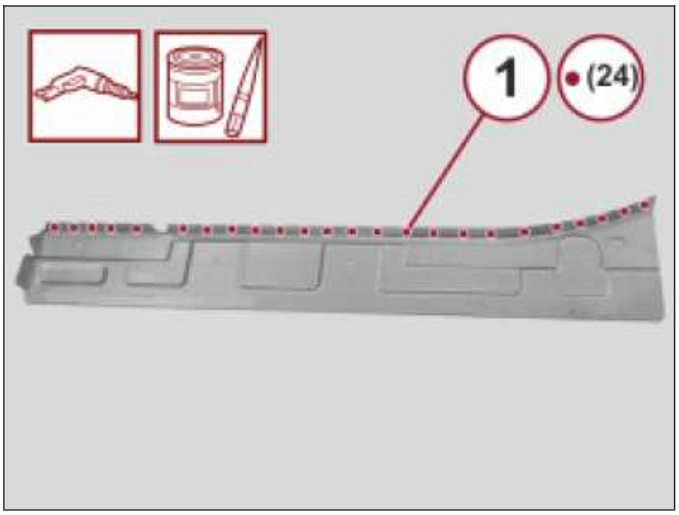


INSTALLATION

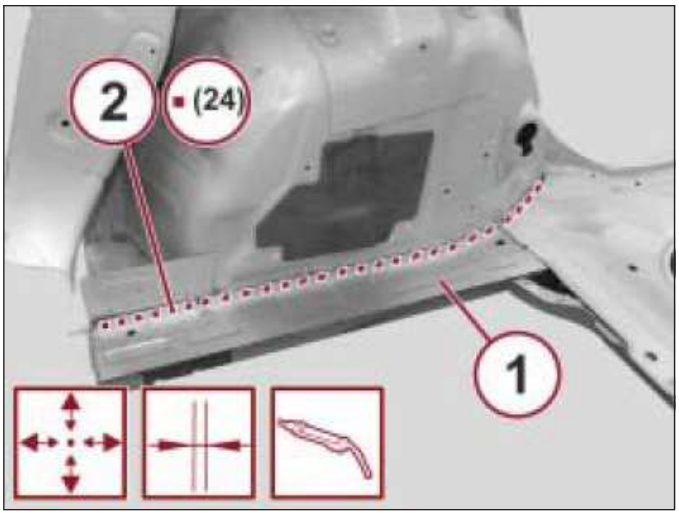
1. Remove the anti-corrosion treatment from the entire perimeter of the inside and outside of the service part (1) using a rotary brush.



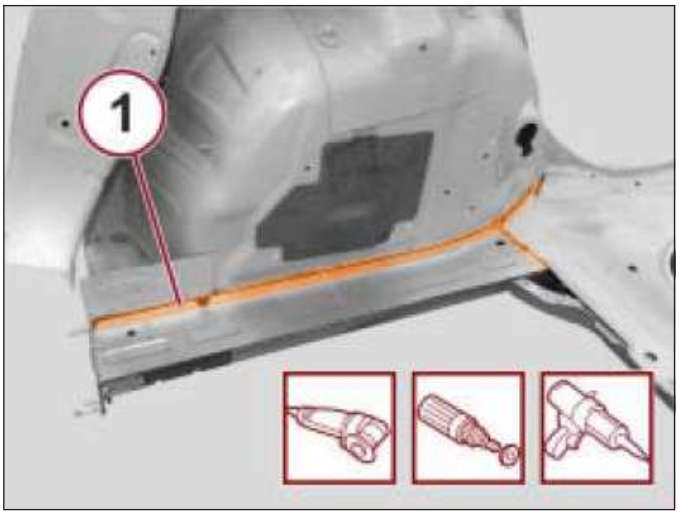
2. With the use of a drill and the service part placed on a work bench, drill holes at the points (1) indicated.
3. Apply elctro-weldable paint/weld through primer to the locations drilled.



4. Position the service part (1) correctly on the rear frame rail and floor pan.
5. Check alignment and surrounding gaps.
6. With the use of a MIG welder, apply plug welds filling in the holes (2) made previously.



7. With the use of a disc grinder, smooth the welds.
8. With the use a of rotary brush, clean the areas previously treated.
9. Apply corrosion protection to the areas involved in the welding.
10. Install the rear floor pan (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Rear Floor Pan).
11. Apply seam sealer to the join lines.
12. Install the rear closure panel (Refer to 31 - Collision/ Standard Procedure/Sectioning Procedures and Component Procedures/ Rear Closure Panel) .

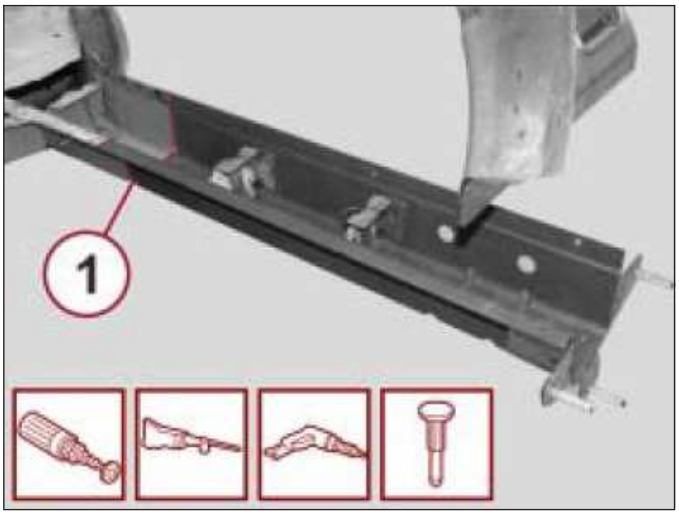


Rear Frame Rail

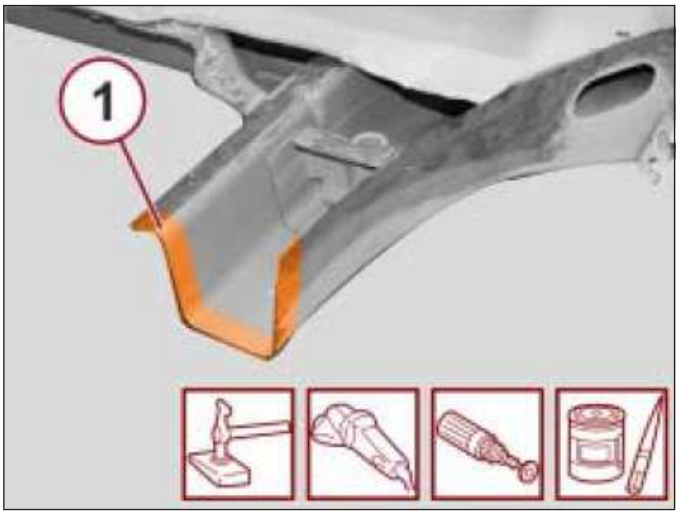
REMOVAL

1. Remove the rear closure panel (Refer to 31 - Collision/Standard Procedure/Sectioning Procedures and Component Procedures/ Rear Closure Panel).
2. Remove the rear floor pan (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Floor Pan).
3. Remove the rear floor pan extension (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Floor Pan Extension).
4. Remove the body side aperture/quarter panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Body Side Aperture Quarter Panel).
5. Remove the fuel filler door reinforcement (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Fuel Filler Door Reinforcement).
6. Remove the quarter panel extension (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Quarter Panel Extension).
7. Remove the taillamp mounting panel (Refer to 31 - Collision Standard Procedure/Sectioning Locations and Component Procedures/ Taillamp Mounting Panel).
8. Remove the rear outer wheelhouse (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Wheelhouse Outer).
9. Remove the rear outer wheelhouse extension (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Wheelhouse Outer Extension).
10. Remove the rear inner wheelhouse (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Inner Wheelhouse).
11. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).

12. Straighten the body as necessary.



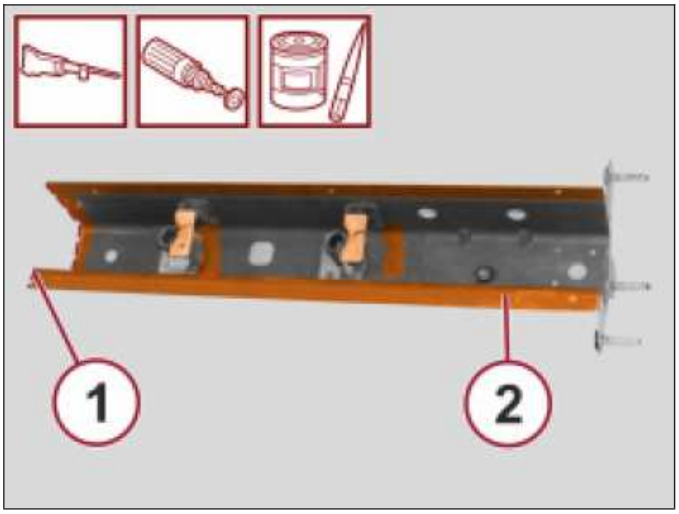
13. With the use of a rotary brush, remove the paint and gain access to the spot welds.
14. With the use of a reciprocating saw, follow the cut lines (1) shown in the figure.
15. With the use of a drill, release any spot welds.
16. Use a chisel and hammer to remove the welds previously released.
17. Remove the rear frame rail and off cuts from the vehicle.



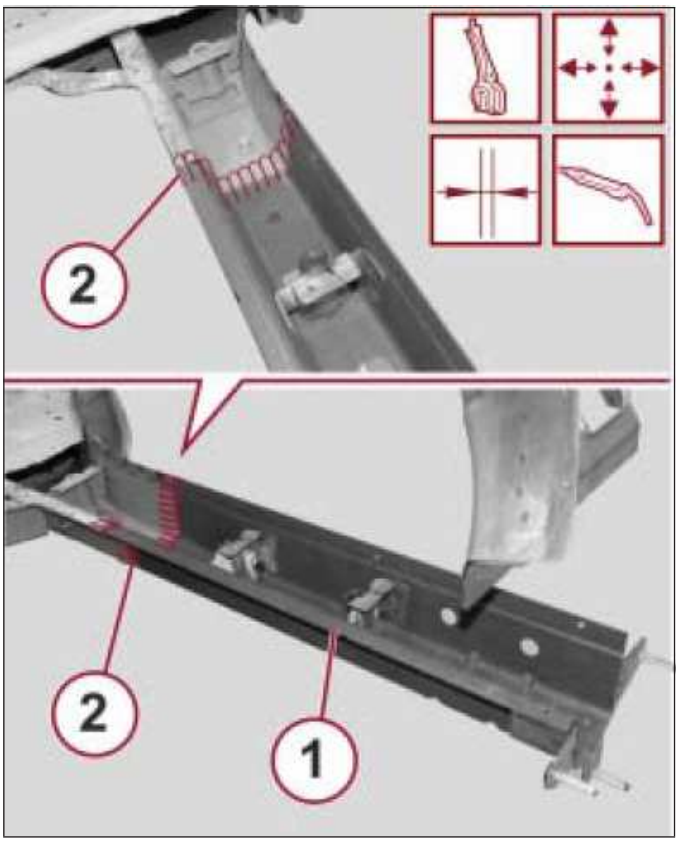
18. With the use of a hammer and dolly block, straighten the edges of the mating components.
19. With the use of a disc grinder, remove any residue of the spot welds.
20. With the use of a rotary brush, clean the previously treated areas.
21. Apply electro-weldable paint/weld through primer to the areas (1) to be welded.

INSTALLATION

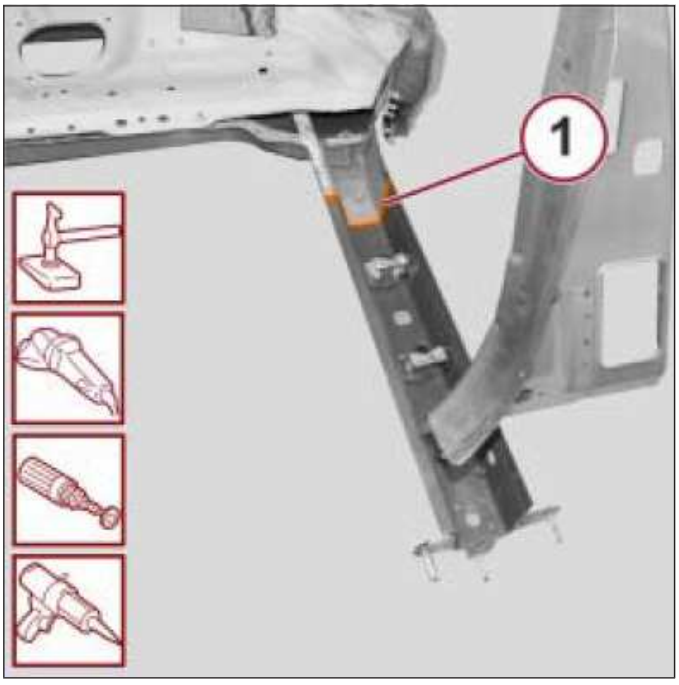
1. Cut the rear frame rail service part along the cut line (1), being certain the join line is perfect.
2. Remove the anti-corrosion treatment from the entire perimeter (2) of the inside and outside of the service part using a rotary brush.
3. Apply elctro-weldable paint/weld through primer to the areas involved.



4. Position the service part (1) correctly on the vehicle and secure it with the self-locking clamps.
5. Check the alignment and surrounding gaps.
6. With the use of a MIG welder, apply seam welds to the butt joint area (2).



7. Correct any distortions to the sheet metal using a hammer and dolly block.
8. With the use of a disc grinder, smooth the welds.
9. With the use of a rotary brush, clean the previously welded areas.
10. Apply corrosion protection to the areas involved in the welding.
11. Apply seam sealer to the seam (1) between the service part and the vehicle as shown in the figure .
12. Install the rear inner wheelhouse (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Inner Wheelhouse).
13. Install the rear outer wheelhouse extension (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Wheelhouse Outer Extension).
14. Install the rear outer wheelhouse (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Wheelhouse Outer).



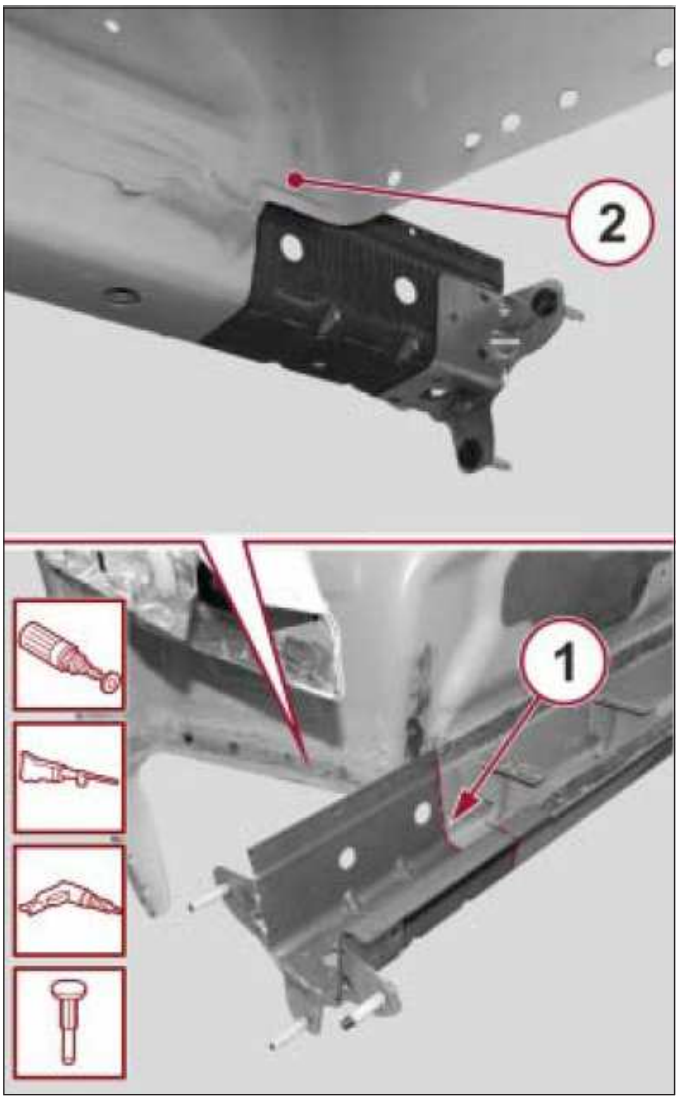
15. Install the taillamp mounting panel (Refer to 31 - Collision Standard Procedure/Sectioning Locations and Component Procedures/ Taillamp Mounting Panel).
16. Install the quarter panel extension (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Quarter Panel Extension).
17. Install the fuel filler door reinforcement (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Fuel Filler Door Reinforcement).
18. Install the body side aperture/quarter panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Body Side Aperture Quarter Panel).
19. Install the rear floor pan extension (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and

Component Procedures/ Rear Floor Pan Extension).
20. Install the rear floor pan (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Floor Pan).
21. Install the rear closure panel Rear Closure Panel).

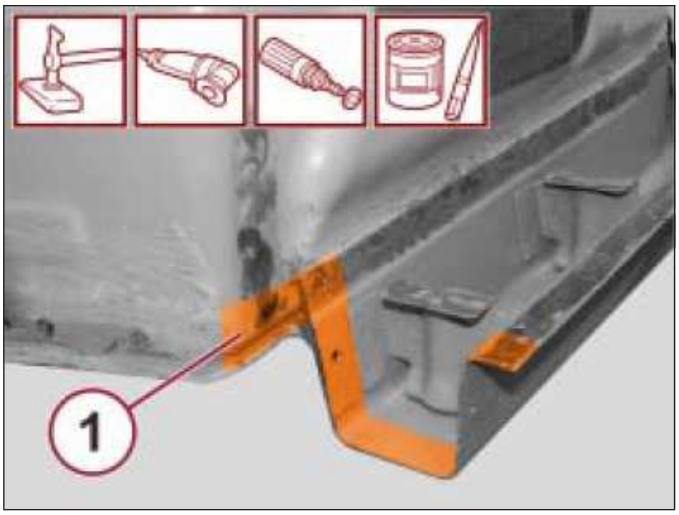
Rear Frame Rail Sectioning

REMOVAL

1. Remove the rear closure panel (Refer to 31 - Collision/Standard Procedure/Sectioning Procedures and Component Procedures/Rear Closure Panel).
2. Remove the rear floor pan (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/Rear Floor Pan).
3. Remove the rear floor pan extension (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/Rear Floor Pan Extension).
4. Remove the rear wheelhouse reinforcement (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/Rear Wheelhouse Reinforcement).
5. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
6. Straighten the body as necessary.
7. With the use of a rotary brush, remove the paint and gain access to the spot welds.
8. With the use of a reciprocating saw, cut along the cut line (1) shown in the figure.
9. With the use of a drill, release the spot welds (2) shown in the figure.
10. With the use of a chisel and hammer, remove the welds previously released.

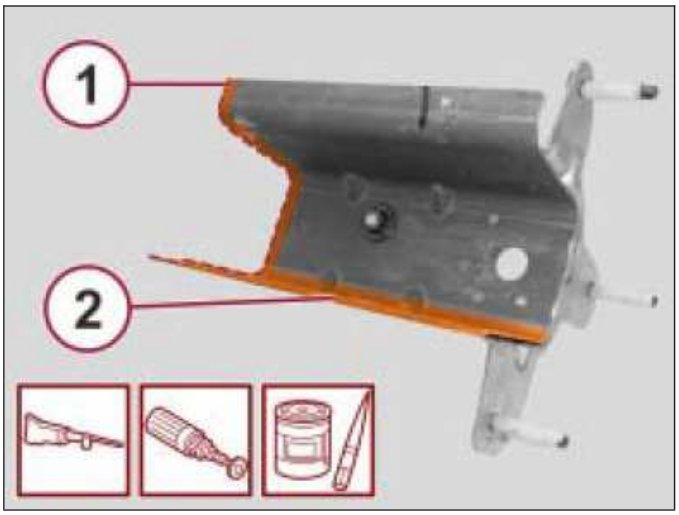


11. With the use of a hammer and dolly block, straighten the edges of the mating components.
12. With the use of a disc grinder, remove any residue of the spot welds.
13. With the use of a rotary brush, clean the previously treated areas.
14. Apply electro-weldable paint/weld through primer to the areas (1) to be welded.

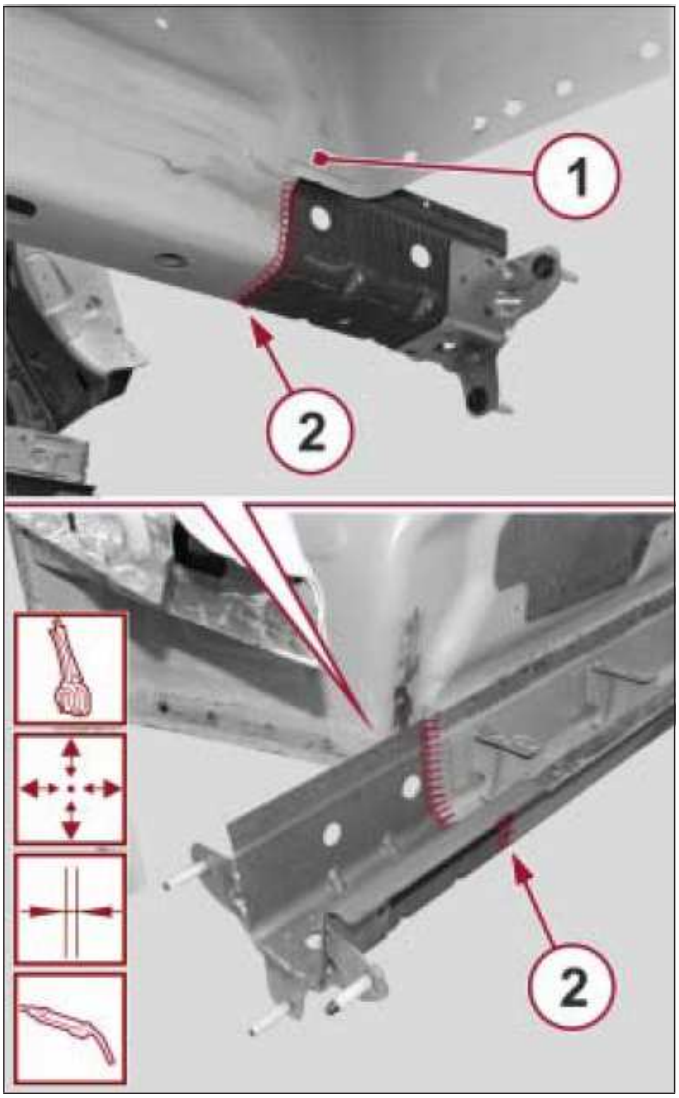


INSTALLATION

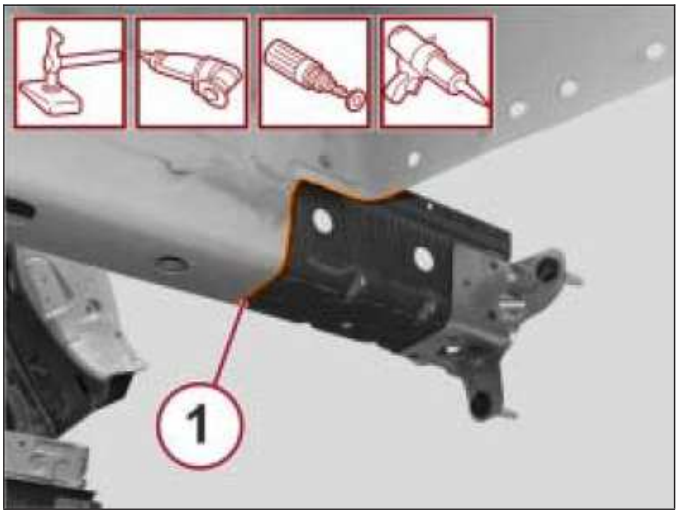
1. Cut the rear frame rail service part along the cut line (1) so that the join line is perfect.
2. Remove the anti-corrosion treatment from the entire perimeter (2) of the inside and outside of the service part using a rotary brush.
3. Apply elctro-weldable paint/weld through primer to the areas involved.



4. Position the service part correctly on the vehicle and secure it with the self-locking clamps.
5. Check the alignment and surrounding gaps.
6. With the use of a MIG welder, apply plug welds filling n the areas (1) in the figure.
7. With the use of a MIG welder, apply seam welds to the butt joint area (2).



8. Correct any distortions to the sheet metal using a hammer and dolly block.
9. With the use of a disc grinder, smooth the welds.
10. With the use of a rotary brush, clean the previously welded areas.
11. Apply corrosion protection to the areas involved in the welding.
12. Apply seam sealer to the seams between the parts and the vehicle in the areas (1) shown.
13. Install the rear floor pan extension (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Floor Pan Extension).
14. Install the rear floor pan (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Rear Floor Pan).

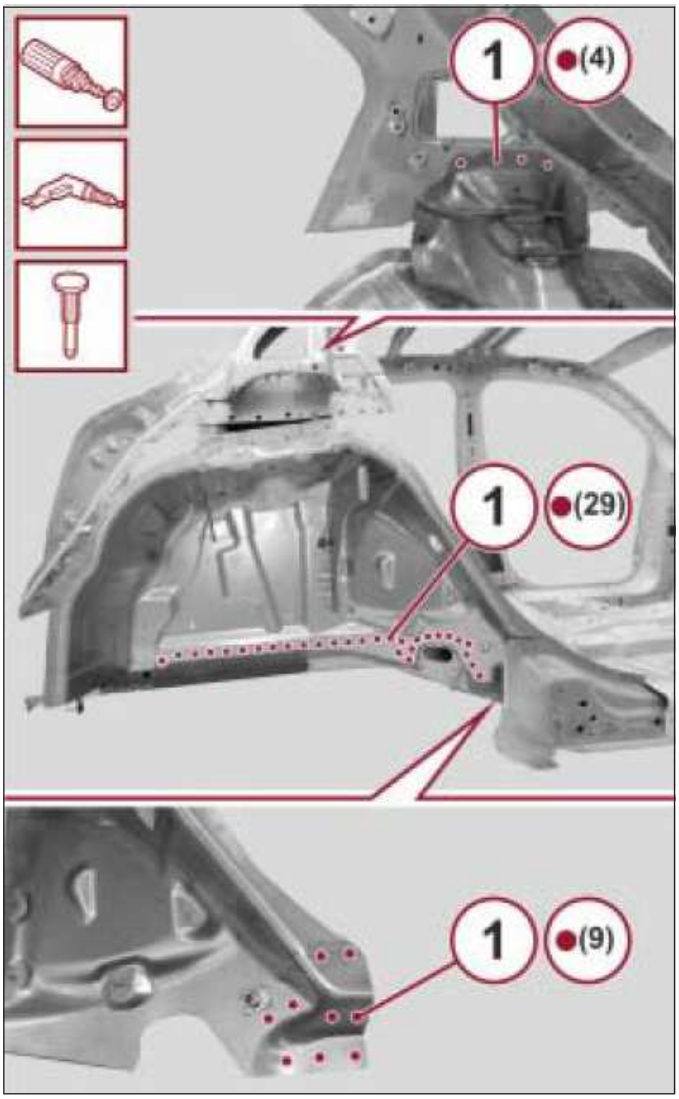


15. Install the rear wheelhouse reinforcement (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Wheelhouse Reinforcement).
16. Install the rear closure panel (Refer to 31 - Collision/Standard Procedure/Sectioning Procedures and Component Procedures/ Rear Closure Panel).

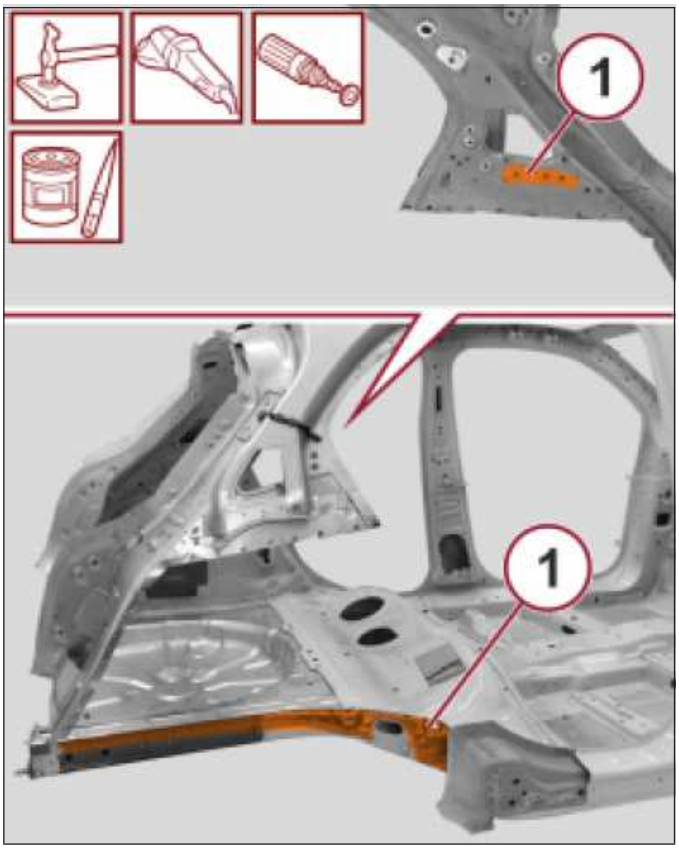
Rear Wheelhouse Inner

REMOVAL

1. Remove the quarter panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Body Side Aperture/Quarter Panel).
2. If servicing the right side, remove the fuel door reinforcement (Refer to 31- Collision/Standard Procedure/ Sectioning Locations and Component Procedures/ Fuel Filler Door Reinforcement).
3. Remove the quarter panel extension (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Quarter Panel Extension).
4. Remove the outer rear wheelhouse (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Wheelhouse Outer).
5. Remove the taillamp mounting panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Taillamp Mounting Panel).
6. Remove the rear outer wheelhouse extension (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Wheelhouse Outer Extension).
7. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
8. Straighten the body as necessary.
9. With the use of a rotary brush, remove the paint and access to the spot welds.
10. With the use of a drill, release the spot welds (1).
11. Use a chisel and hammer to remove the welds previously released.
12. Remove the part from the vehicle.

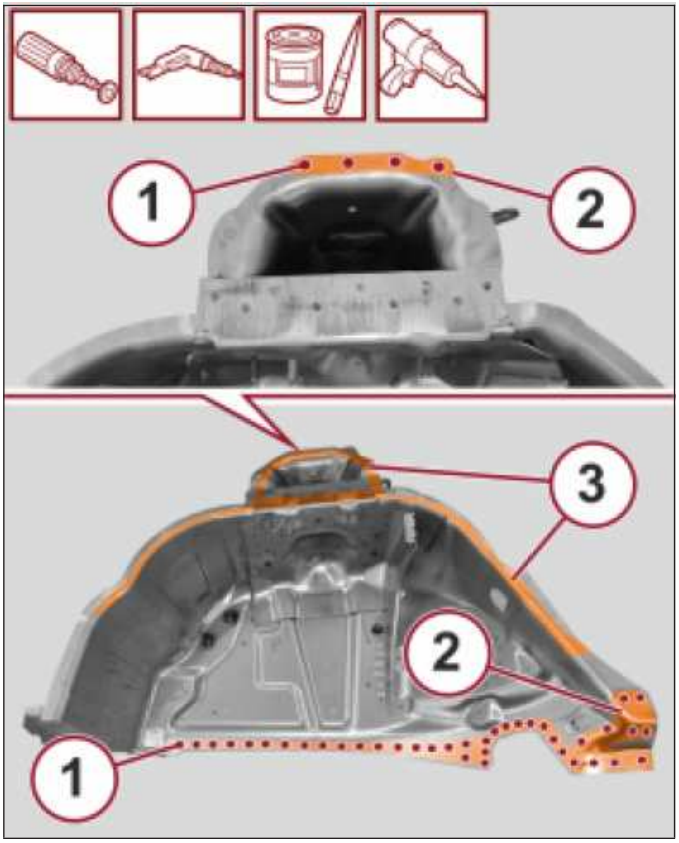


13. With the use of a hammer and dolly block, straighten the edges of the mating components.
14. With the use of a disc grinder, remove any residue of the spot welds.
15. With the use of a rotary brush, clean the previously treated areas.
16. Apply electro-weldable paint/weld through primer to the highlighted areas (1) .

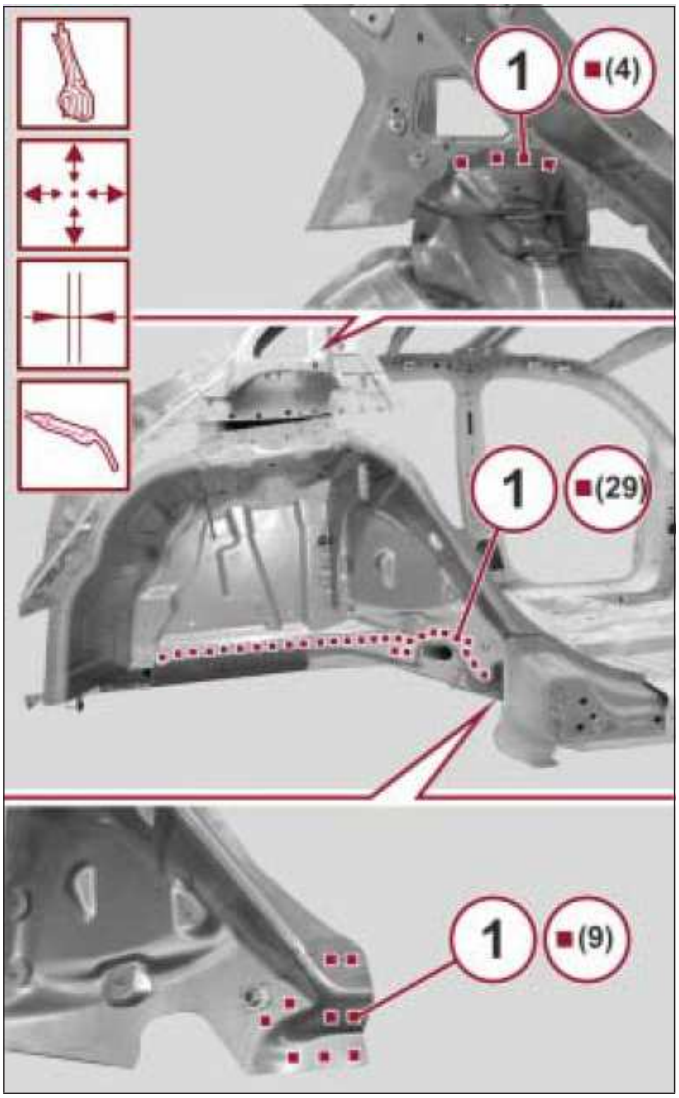


INSTALLATION

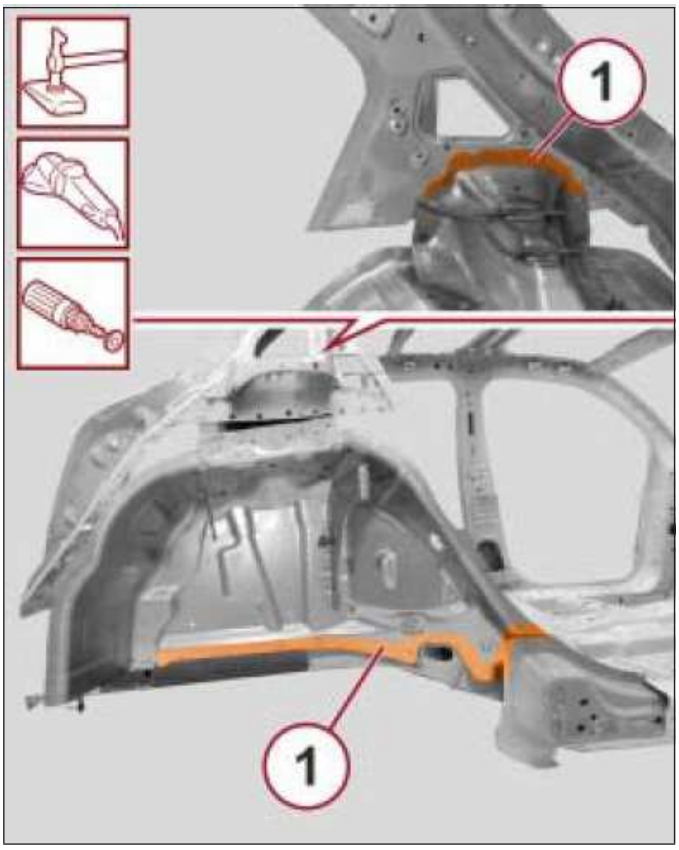
1. Remove the anti-corrosion treatment from the entire perimeter of the inside and outside part using a rotary brush.
2. With the use of a drill, drill holes at the indicated points (1).
3. Apply elctro-weldable paint/weld through primer to the involved edges (2).
4. Apply structural adhesive to the indicated areas (3).



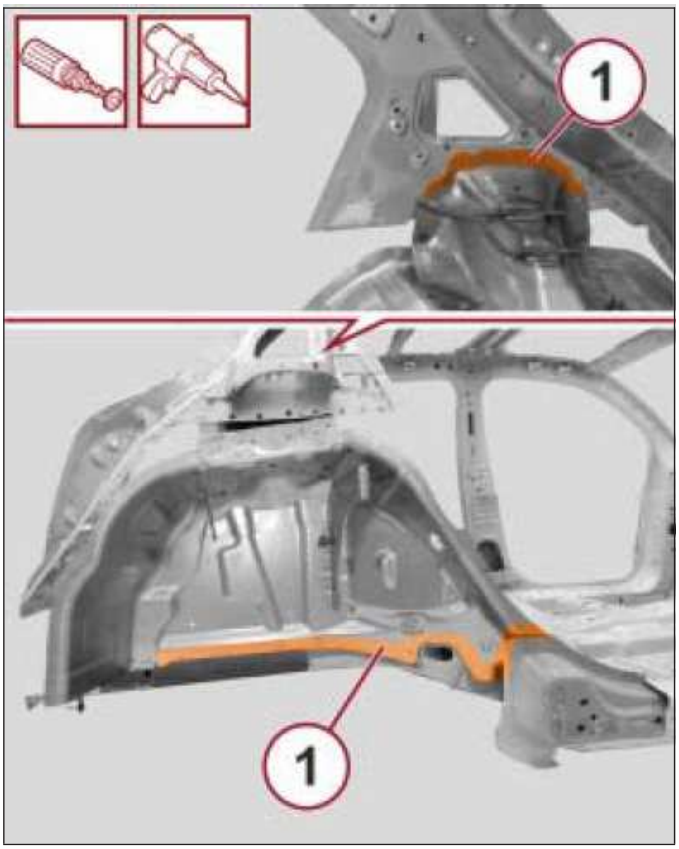
5. Position the service part correctly on the vehicle and secure it with the self-locking clamps.
6. Check alignment and surrounding gaps.
7. With the use of a spot welder, apply spot welds at the indicated points (1).
8. With the use of a MIG welder, apply plug welds filling in the holes (2) previously made.



9. Correct any distortions to the sheet metal using a hammer and dolly block.
10. Use a grinding disc to smooth the welds in the highlighted area (1).
11. Use a rotary brush to clean the previously welded areas.



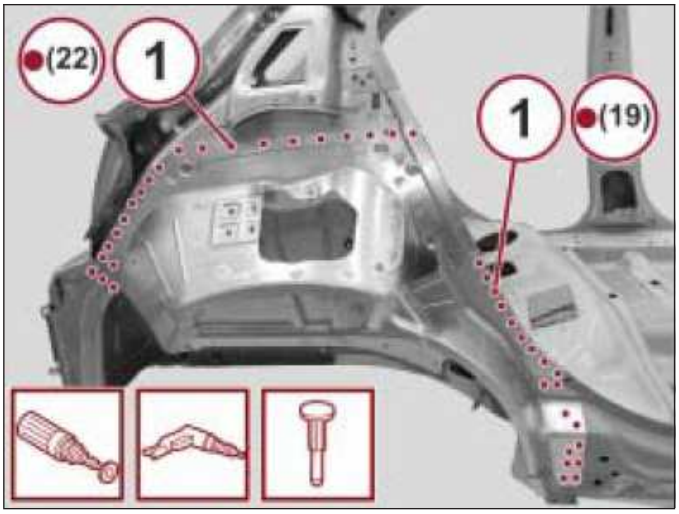
12. Apply corrosion protection to the areas (1) involved in the welding.
13. Apply seam sealer to the seams between the service part and the vehicle.
14. Install the rear outer wheelhouse extension (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Wheelhouse Outer Extension).
15. Install the taillamp mounting panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Taillamp Mounting Panel).
16. Install the outer rear wheelhouse (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Wheelhouse Outer).
17. Install the quarter panel extension (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Quarter Panel Extension).
18. If servicing the right side, install the fuel door reinforcement (Refer to 31- Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Fuel Filler Door Reinforcement).
19. Install the quarter panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Body Side Aperture/Quarter Panel).



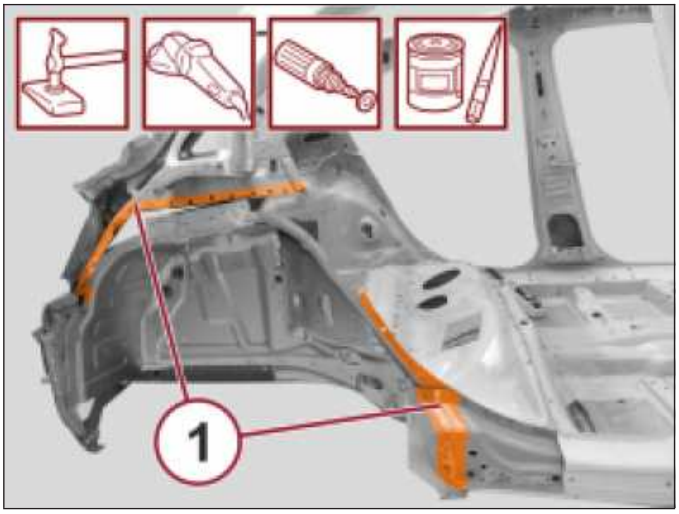
Rear Wheelhouse Outer

REMOVAL

1. Remove the quarter panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Body Side Aperture/Quarter Panel).
2. Remove the quarter panel extension (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Quarter Panel Extension).
3. If servicing the right side, remove the fuel door reinforcement (Refer to 31- Collision/Standard Procedure/ Sectioning Locations and Component Procedures/ Fuel Filler Door Reinforcement).
4. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
5. Straighten the body as necessary.
6. With the use of a rotary brush, remove the paint and access to the spot welds.
7. With the use of a drill, release the spot welds (1).
8. Use a chisel and hammer to remove the welds previously released.
9. Remove the cutout sheet metal.

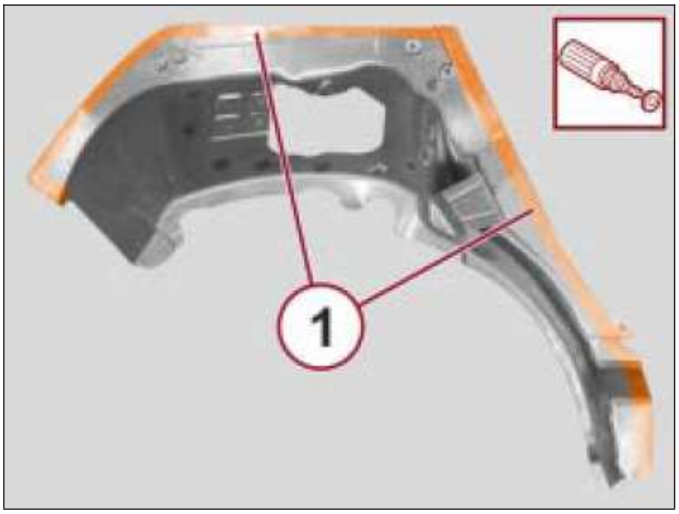


10. With the use of a hammer and dolly block, straighten the edges of the vehicle.
11. With the use of a disc grinder, remove any residue of the spot welds.
12. With the use of a rotary brush, clean the previously treated areas.
13. Apply electro-weldable paint/weld through primer to the highlighted areas (1).

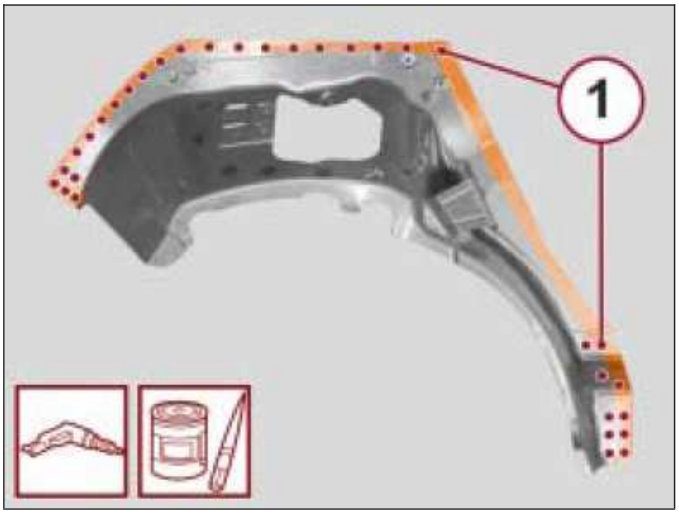


INSTALLATION

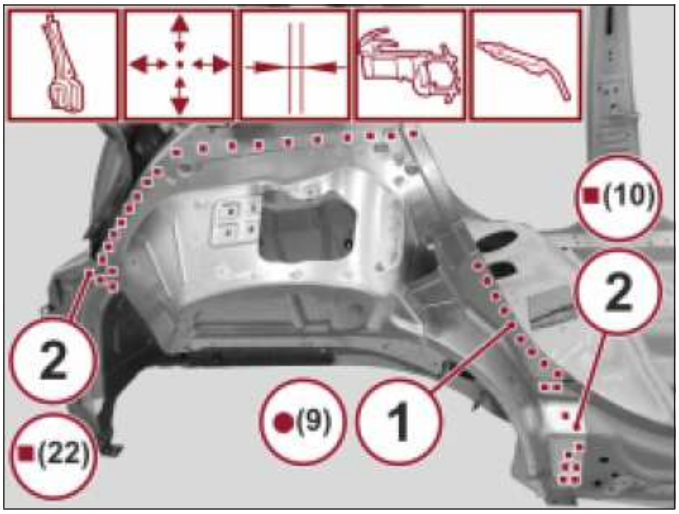
1. Remove the anti-corrosion treatment from the entire perimeter (1) of the inside and outside of the service part using a rotary brush.



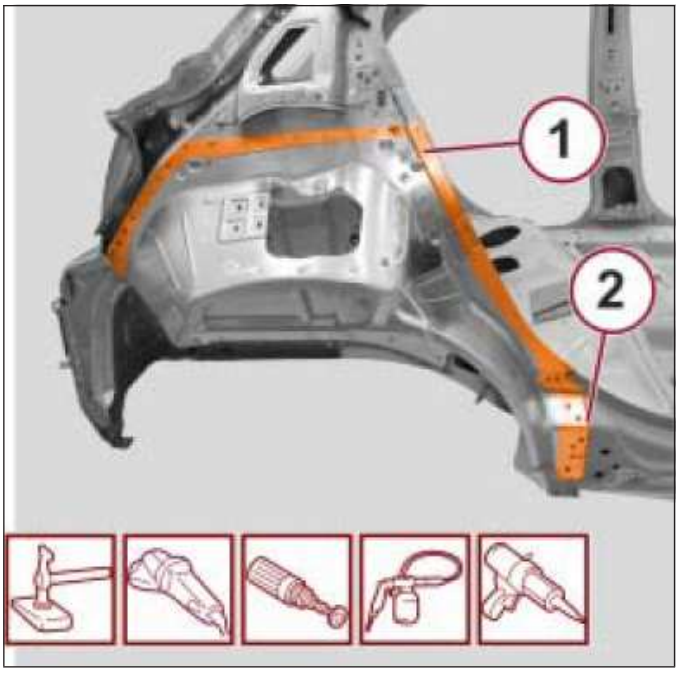
2. With the use of a drill, drill holes at the indicated points (1).
3. Apply elctro-weldable paint/weld through primer to the areas involved in welding.



4. Position the part correctly on the vehicle and secure it with the self-locking clamps.
5. Check the alignment and surrounding gaps.
6. With the use of a spot welder, apply spot welds at the indicated points (1).
7. With the use of a MIG welder, apply plug welds, filling in the holes (2) previously made.



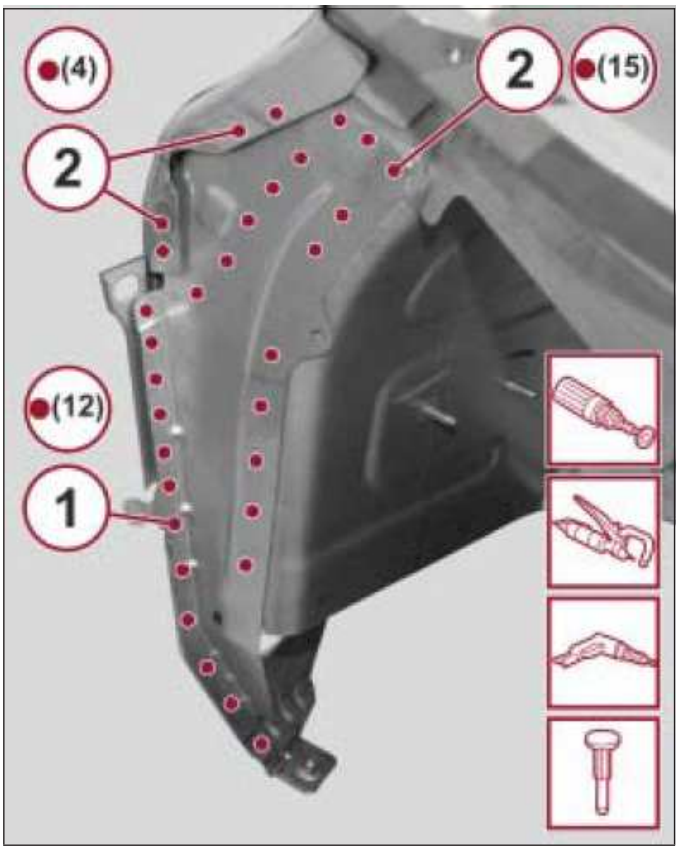
8. Correct any distortions to the sheet metal using a hammer and dolly block.
9. Use a disc grinder to smooth the welds.
10. Use a rotary brush to clean the previously welded areas.
11. Apply corrosion protection to the areas (1) involved in the welding.
12. Apply seam sealer to the seams between the service part and the vehicle.
13. Install the quarter panel extension (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Quarter Panel Extension).
14. If servicing the right side, install the fuel door reinforcement (Refer to 31- Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Fuel Filler Door Reinforcement).
15. Install the quarter panel (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures Body Side Aperture/Quarter Panel).



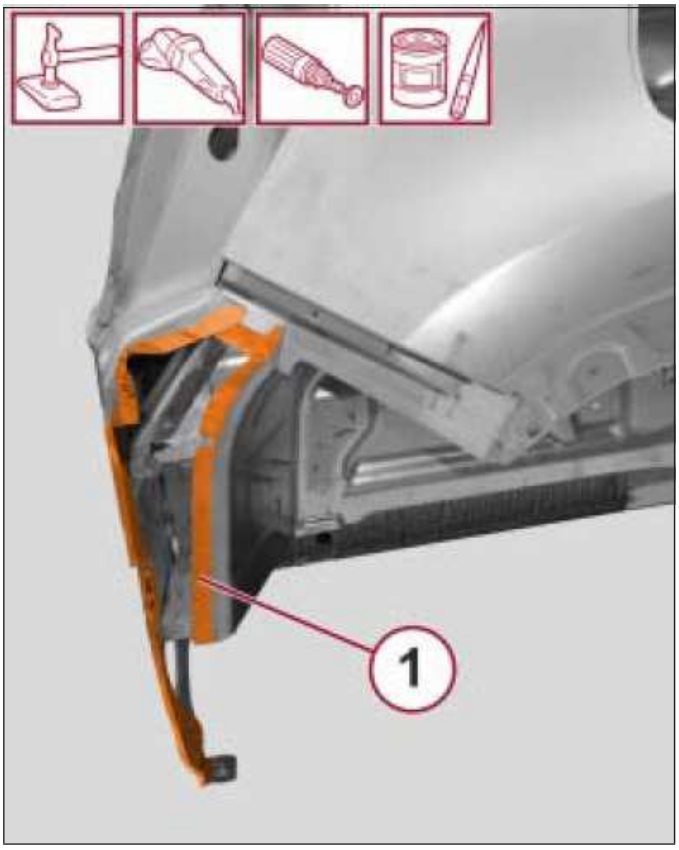
Rear Wheelhouse Outer Extension

REMOVAL

1. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
2. Straighten the body as necessary.
3. With the use of a rotary brush, remove the paint and access to the spot welds.
4. With the use of a spot weld cutting tool, release the spot welds (1) shown in the figure.
5. With the use of a drill, release the spot welds (2).
6. With the use of a chisel and hammer, remove the spot welds previously released.
7. Remove the rear outer wheelhouse extension from the vehicle.

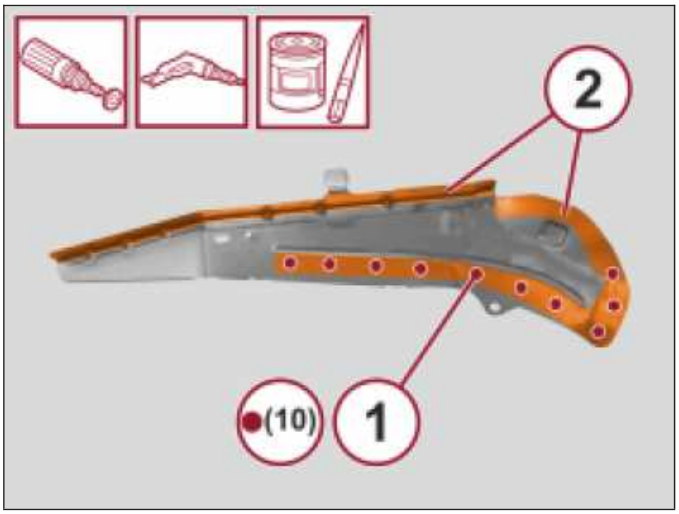


8. With the use of a hammer and dolly block, straighten the edges of the vehicle.
9. With the use of a disc grinder, remove any residue of the spot welds.
10. With the use of a rotary brush, clean the previously treated areas.
11. Apply electro-weldable paint/weld through primer to the highlighted areas (1).

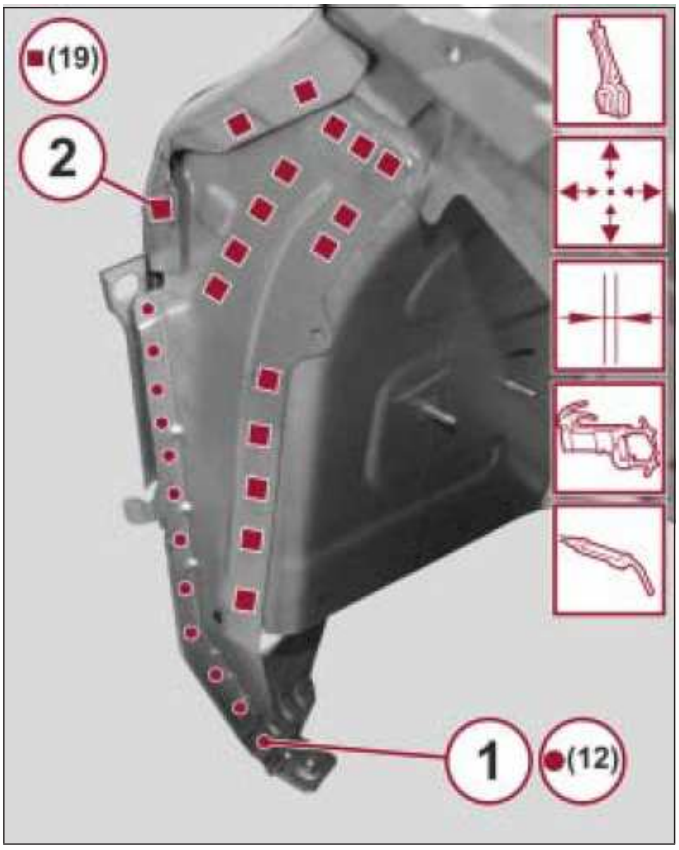


INSTALLATION

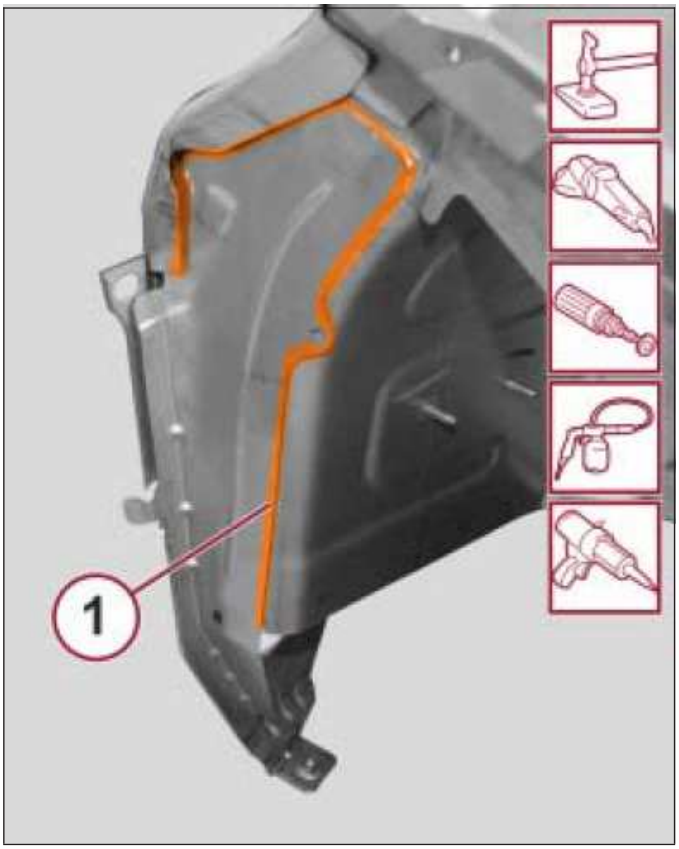
1. Remove the anti-corrosion treatment from the entire perimeter of the inside and outside of the service part using a rotary brush.
2. With the use of a drill, drill holes at the indicated points (1).
3. Apply elctro-weldable paint/weld through primer to the areas (2) involved in welding.



4. Position the part correctly on the vehicle and secure it with the self-locking clamps.
5. Check alignment and surrounding gaps.
6. With the use of a spot welder, apply spot welds at the indicated points (1).
7. With the use of a MIG welder, apply plug welds, filling in the holes (2) previously made.



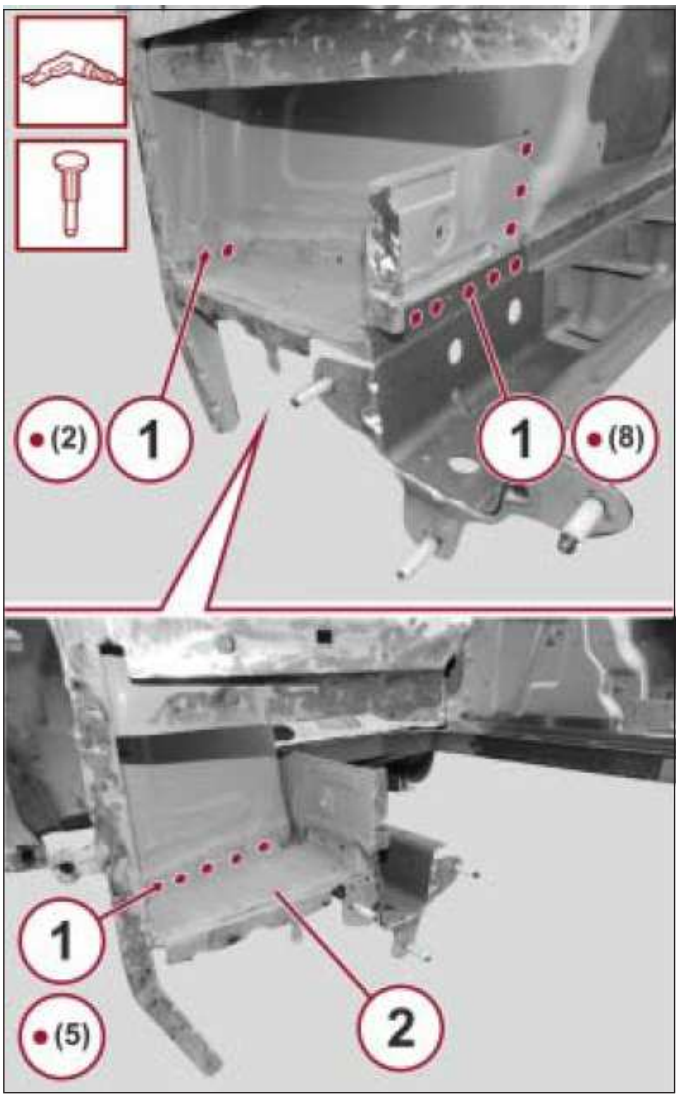
8. Correct any distortions to the sheet metal using a hammer and dolly block.
9. Use a disc grinder to smooth the welds.
10. Use a rotary brush to clean the previously welded areas.
11. Apply corrosion protection to the areas involved in the welding.
12. Apply seam sealer to the seams (1) between the service part and the vehicle.



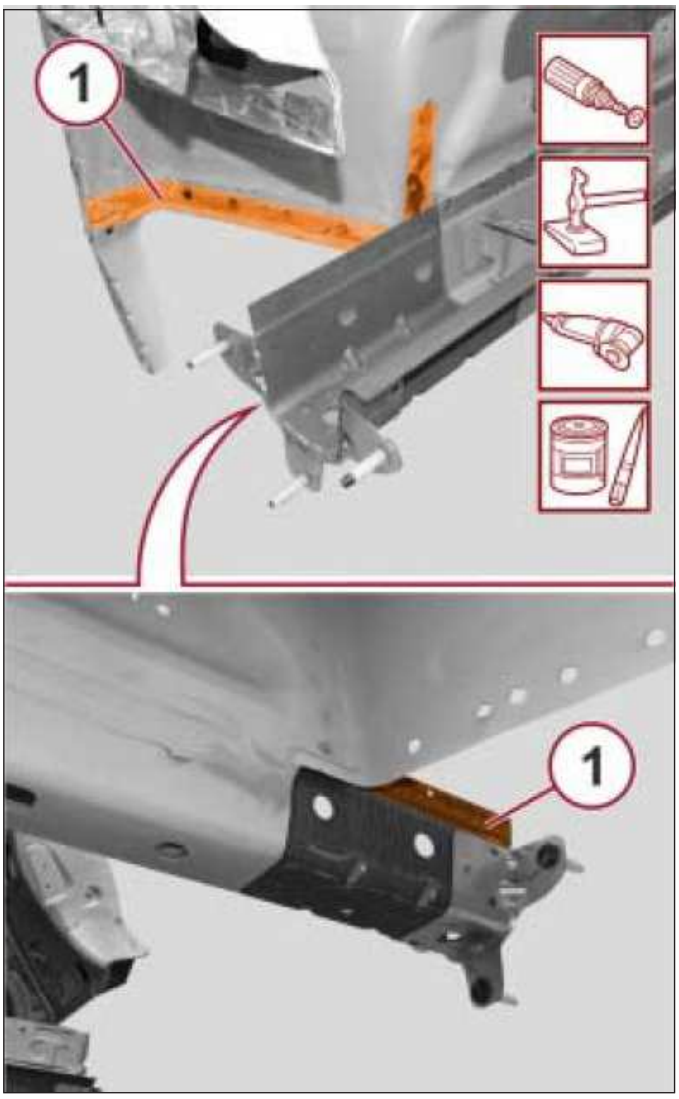
Rear Wheelhouse Reinforcement

REMOVAL

1. Remove the rear closure panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Closure Panel).
2. Remove the rear floor pan (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Floor Pan).
3. Remove the floor pan extension (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Floor Pan Extension).
4. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
5. Straighten the body as necessary.
6. With the use of a drill, release the spot welds (1) shown in the figure.
7. With the use of a hammer and chisel, remove the previously released spot welds.
8. Remove the rear wheelhouse reinforcement (2) from the luggage compartment on the affected side of the vehicle.

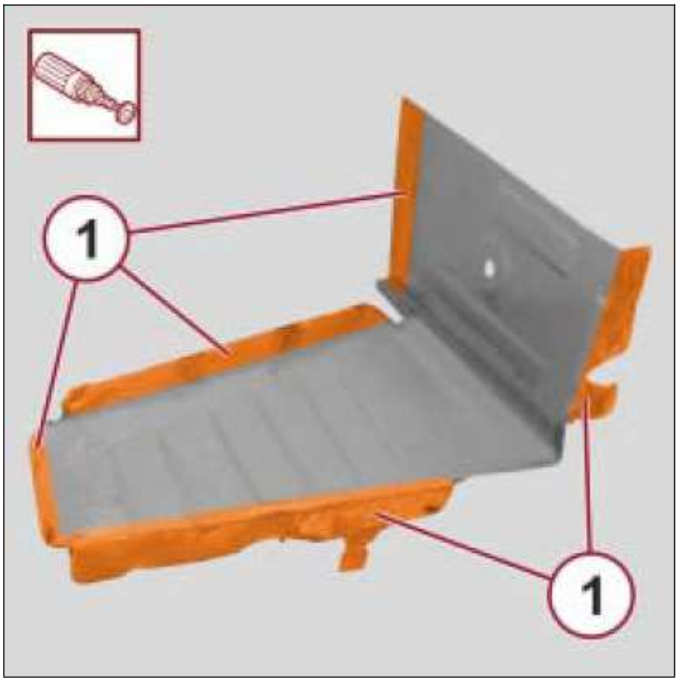


9. With the use of a rotary brush, clean the previously treated areas.
10. With the use of a hammer and dolly block, straighten the edges of the mating components.
11. With the use of a disc grinder, remove any residue of the spot welds.
12. Apply electro-weldable paint/weld through primer to the ground areas (1) to be welded.



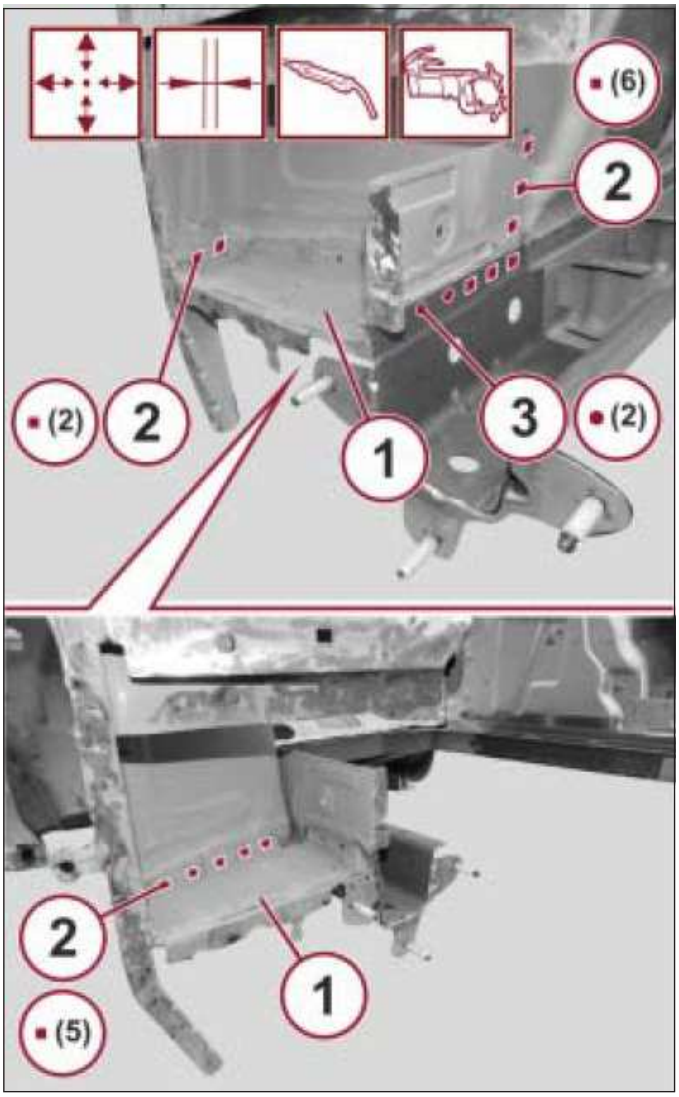
INSTALLATION

1. Remove the anti-corrosion treatment from the entire perimeter (1) of the inside and outside of the service part using a rotary brush.

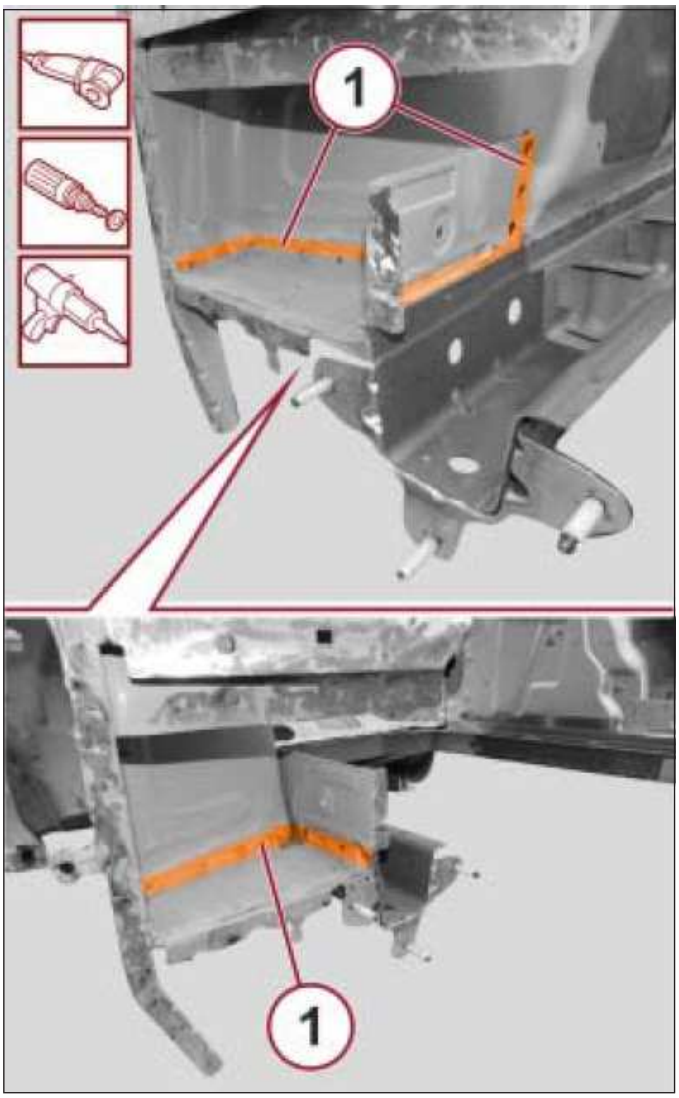


2. With the service part placed on a workbench, use a drill to drill holes (1) in the area shown.
3. Apply elctro-weldable paint/weld through primer to the boarders involved.

4. Position the service part (1) on the vehicle.
5. Check the alignment and surrounding gaps.
6. With the use of a MIG welder, apply plug welds filling the holes (2) previously made.
7. With the use of a spot welder, apply spot welds to the areas (3) shown in the figure.



8. Use a disc grinder to smooth the welds.
9. Use a rotary brush to clean the previously welded areas.
10. Apply corrosion protection to the areas involved in the welding.
11. Apply seam sealer to the seams (1) between the service part and the vehicle.
12. Install the floor pan extension (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Rear Floor Pan Extension).
13. Install the rear floor pan (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Rear Floor Pan).
14. Install the rear closure panel (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Rear Closure Panel).

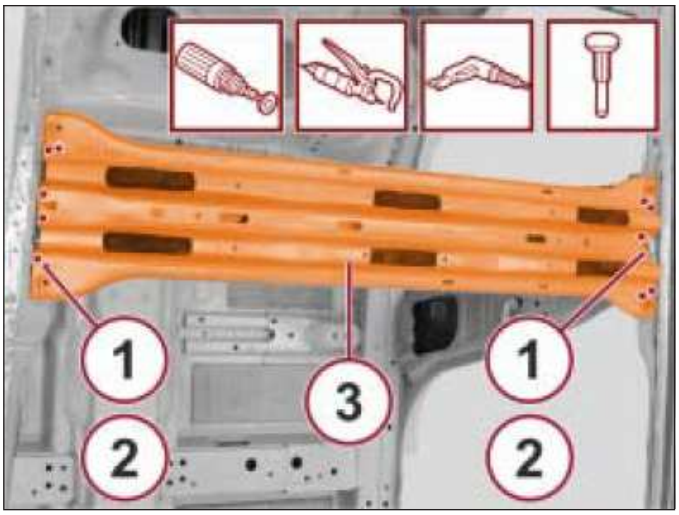


Roof Bow

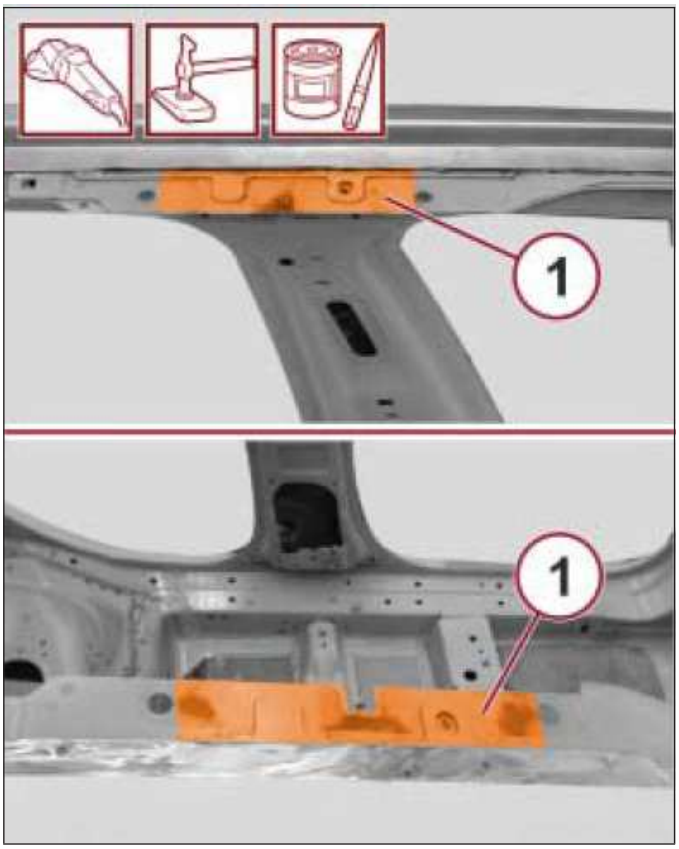
REMOVAL

1. Remove the roof panel (Refer to 31 - Collision/Standard Procedure/Sectioning Locations and Component Procedures/ Roof Panel).
2. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
3. Straighten the body as necessary.

4. With the use of a rotary brush, remove the paint and gain access to the spot welds.
5. With the use of a spot weld cutting tool, release the spot welds (1) shown in the figure.
6. With the use of a drill equipped with a spot weld cutting bit, release the spot welds (2) shown in the figure.
7. Use a chisel and hammer to remove the spot welds previously released.
8. Remove the supporting roof bow (3).

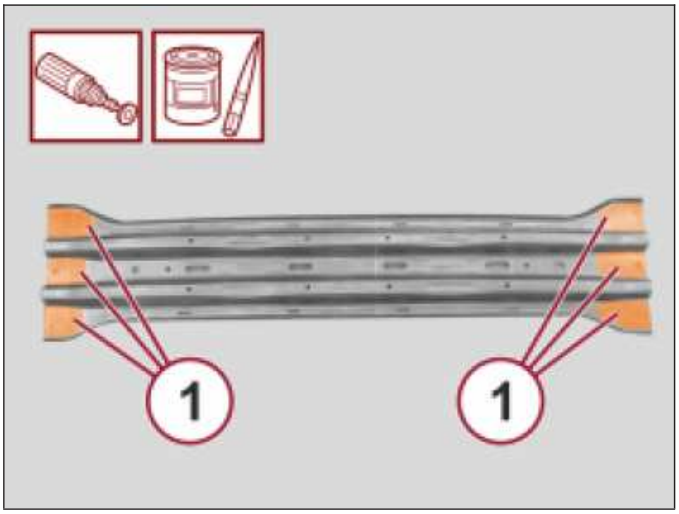


9. With the use of a disc grinder, remove any residue of the spot welds.
10. With the use of a hammer and dolly block, straighten the contour and deformations of the sheet metal as necessary.
11. Apply electro-weldable paint/weld through primer to the areas (1) affected.

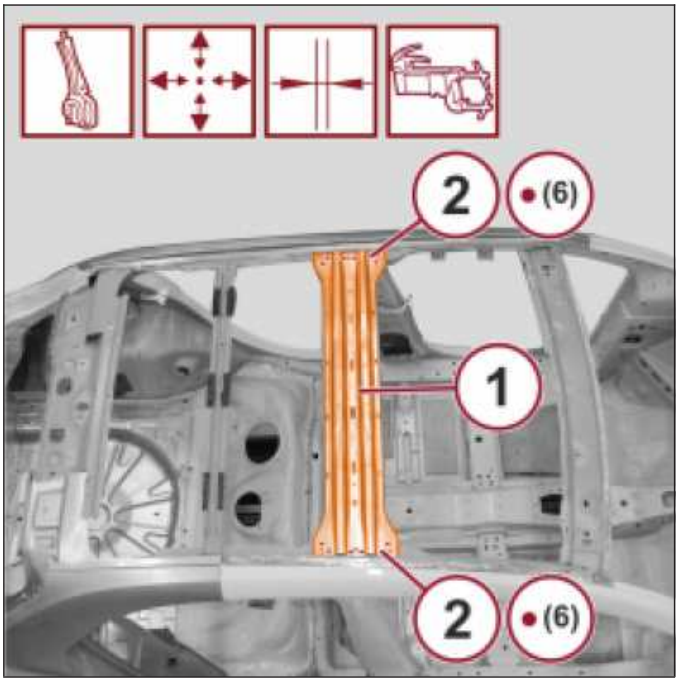


INSTALLATION

1. Remove the anti-corrosion coating from the service part in the areas (1) indicated.
2. Apply electro-weldable paint/weld through primer to the areas (1) that contact the body.



3. Position the service part (1) correctly on the vehicle and secure it with the self-locking clamps.
4. Check the alignment of the part is correct.
5. With the use of a spot welder, weld the points (2) shown in the figure.
6. With the use of a disc grinder, smooth the spot welds.
7. With the use of a rotary brush, clean the previously treated areas.
8. Install the roof panel (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Roof Panel).

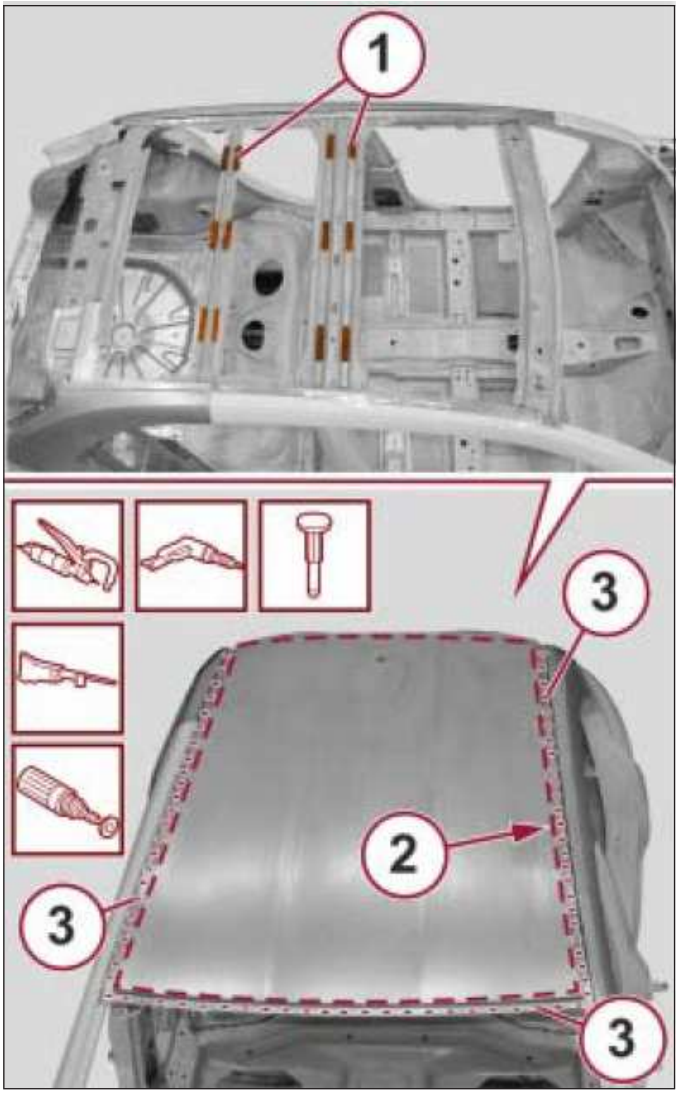


Roof Panel

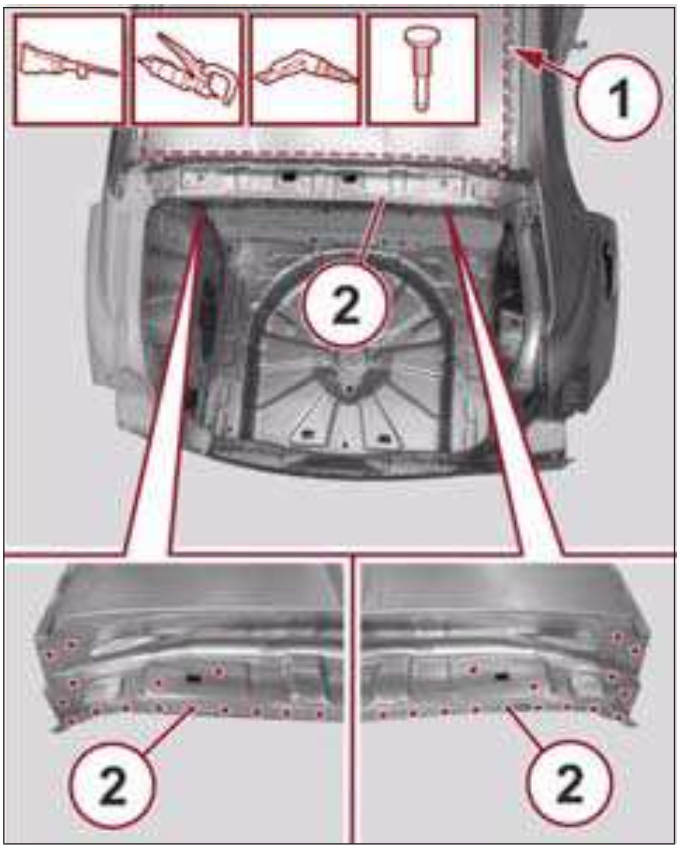
REMOVAL

1. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
2. Straighten the body as necessary.

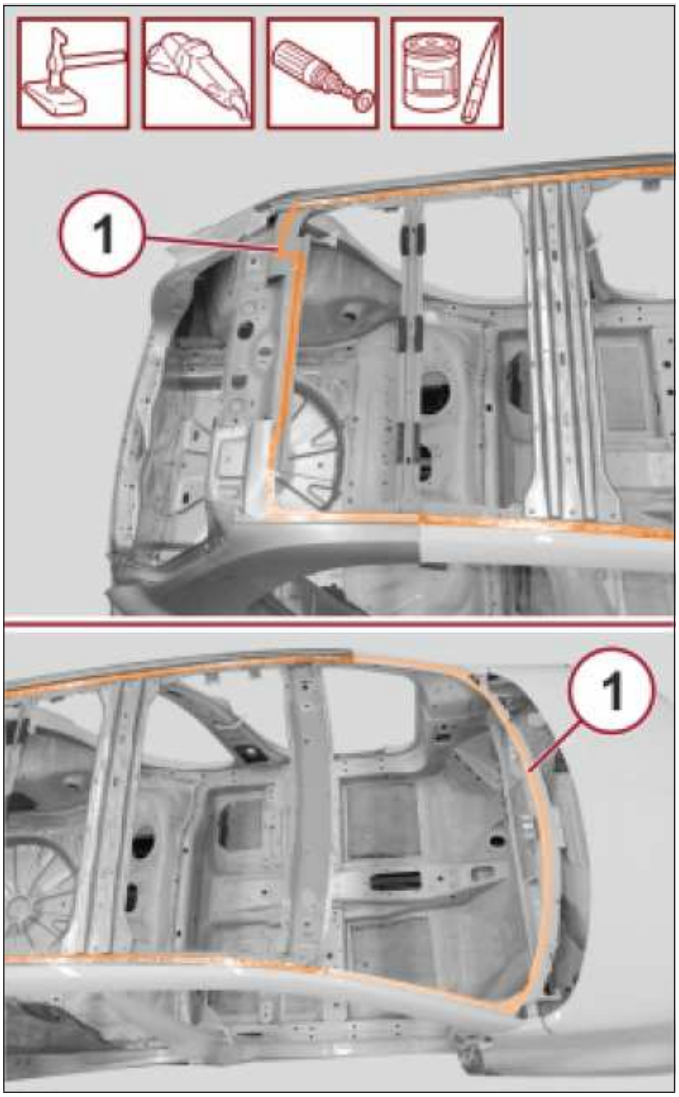
3. With the use of a vibrating knife equipped with an appropriate blade, cut the sealant (1) between the roof bows and the roof.
4. With the use of a rotary brush, remove the paint and gain access to the spot welds.
5. With the use of a reciprocating saw, cut the roof along the cut lines (2) using care not headers and roof bows.
6. With the use of a spot weld cutting tool, release the spot welds (3) shown in the figure.
7. With the use of a drill, release the spot welds not accessible with the spot weld cutting tool.
8. Use a hammer and chisel to remove the areas previously released.
9. Remove the cutouts of sheet metal.



10. With the use of a reciprocating saw, cut the roof along the cut line (1) using care not headers and roof bows.
11. With the use of a spot weld cutting tool, release the spot welds (2) shown in the figure.
12. With the use of a drill, release the spot welds not accessible with the spot weld cutting tool.
13. Use a chisel and hammer to remove the areas previously released.
14. Remove the cutouts of sheet metal.

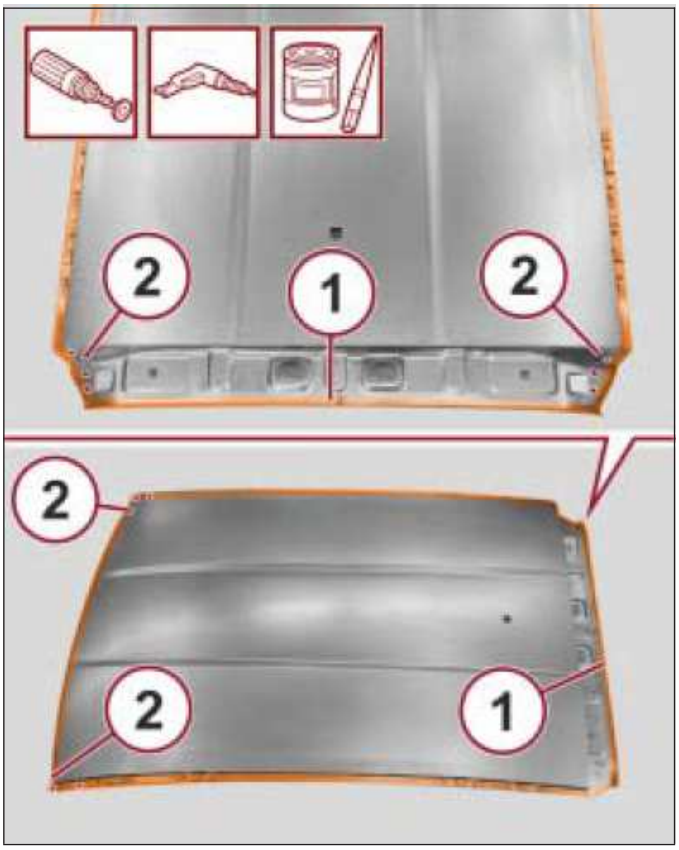


15. With the use of a hammer and dolly block, straighten the edges of the mating components.
16. With the use of a disc grinder, remove any residue of the spot welds.
17. Remove the sealant from the roof bows.
18. With the use of a rotary brush, clean the previously treated areas.
19. Apply electro-weldable paint/weld through primer to the areas (1) to be welded.

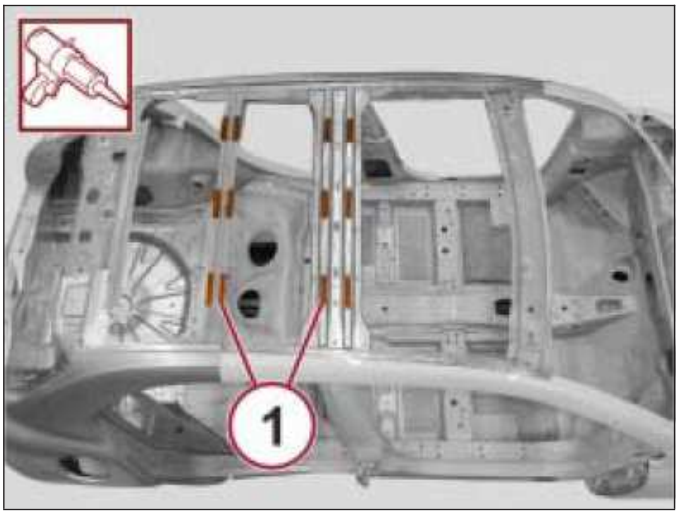


INSTALLATION

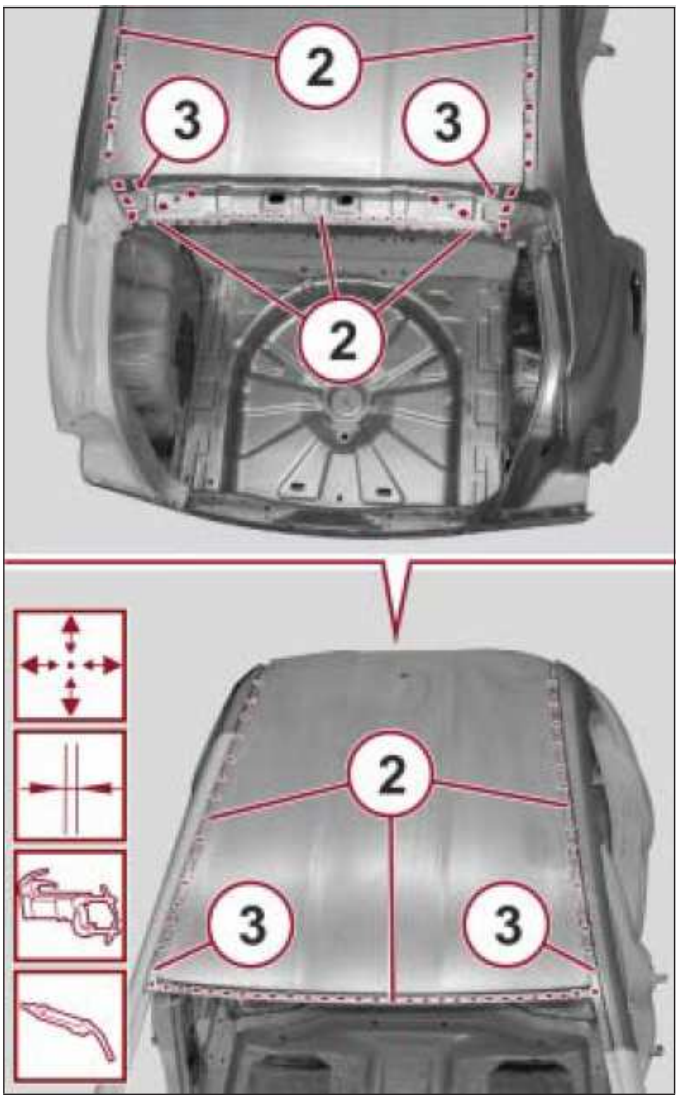
1. With the use of a rotary brush, remove the anti-corrosion treatment around the entire perimeter (1) of the inside and outside of the service part.
2. Use a drill to drill the part at the points (2) indicated.
3. Apply electro-weldable paint/weld through primer to the boarders to be welded.



4. Apply a beads of sealant (1) along the roof bows.



5. Position the service part correctly on the vehicle and secure it with the self-locking clamps.
6. Check the alignment and surrounding gaps.
7. With the use of a spot welder, weld the points (2) indicated in the figure.
8. With the use of a MIG welder, apply plug welds to fill in the holes (3) made previously.

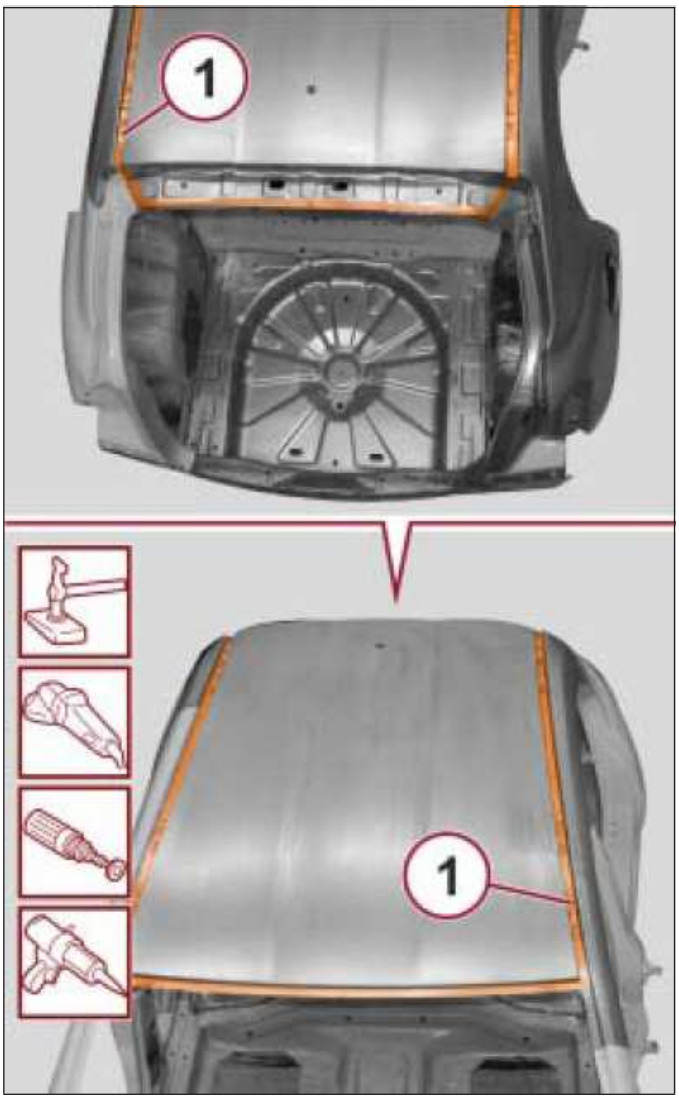


9. Correct any distortions of the panel using a hammer and dolly block.
10. With the use of a disc grinder, smooth the welds.
11. With the use of a rotary brush, clean the previously welded areas.
12. Apply corrosion protection to the areas (1) involved in the welding.
13. Apply seam sealer to the seams between the service part and the vehicle.

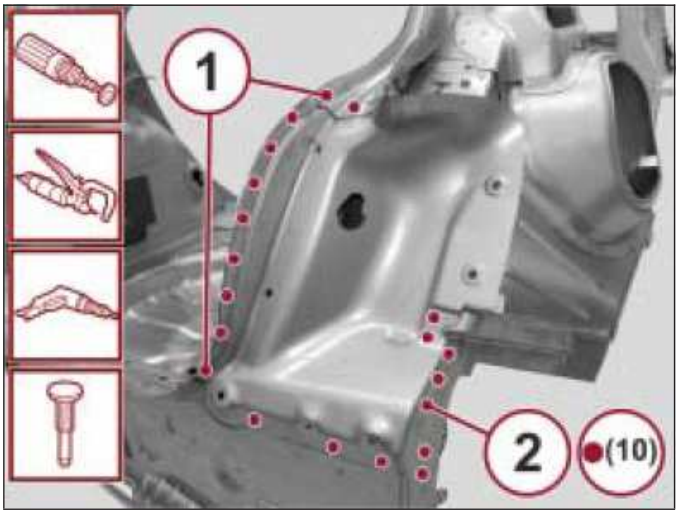
Taillamp Mounting Panel

REMOVAL

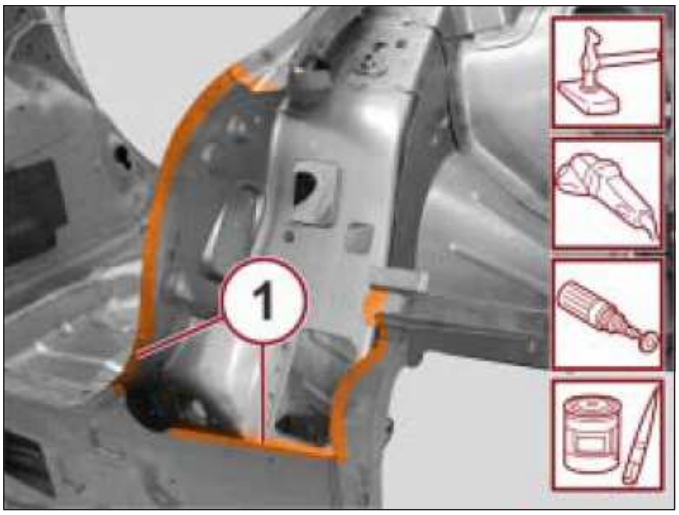
1. Remove the quarter panel (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Body Side Aperture/Quarter Panel).
2. Be certain that the components connected are not distorted by checking the body alignment measurements with suitable equipment (reference rigs, templates or gauges).
3. Straighten the body as necessary.



4. With the use of a rotary brush, remove the paint and access to the spot welds.
5. With the use of a spot weld cutting tool, release the spot welds (1).
6. With the use of a drill, release the spot welds (2).
7. Use a hammer and chisel to remove the welds previously released.
8. Remove the taillamp mounting panel and cutouts from the vehicle.

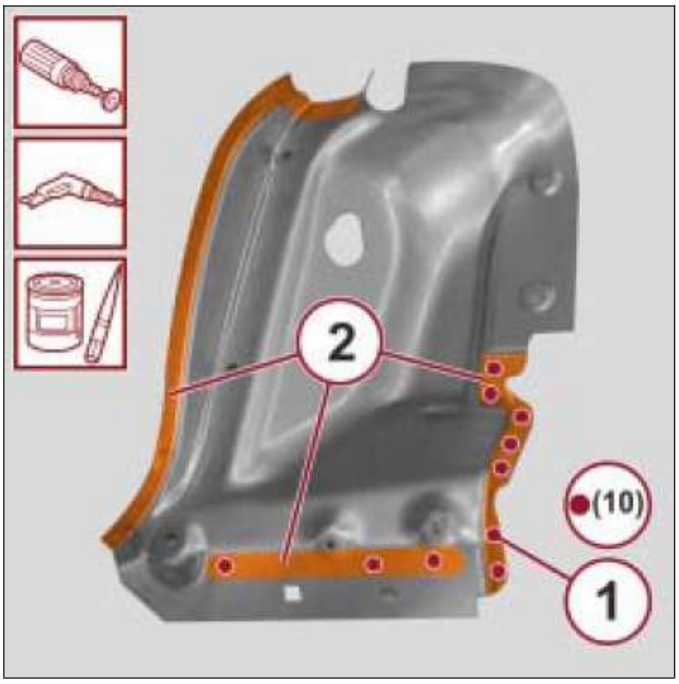


9. With the use of a hammer and dolly block, straighten the edges of the mating components.
10. With the use of a disc grinder, remove any residue of the spot welds.
11. With the use of a rotary brush, clean the previously treated areas.
12. Apply electro-weldable paint/weld through primer to the highlighted areas (1).

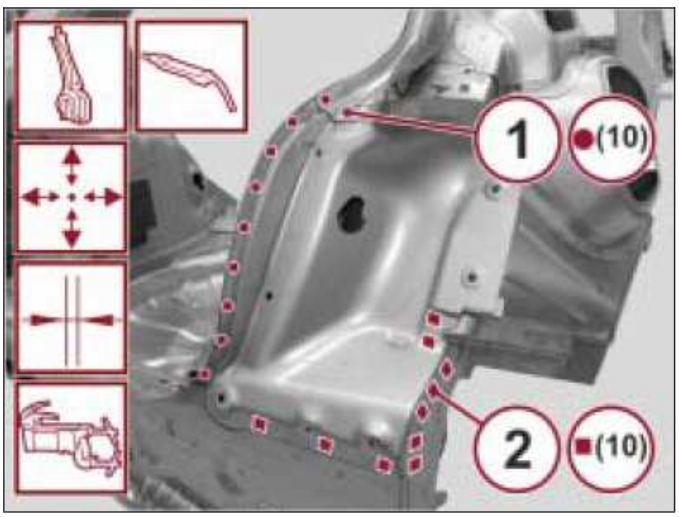


INSTALLATION

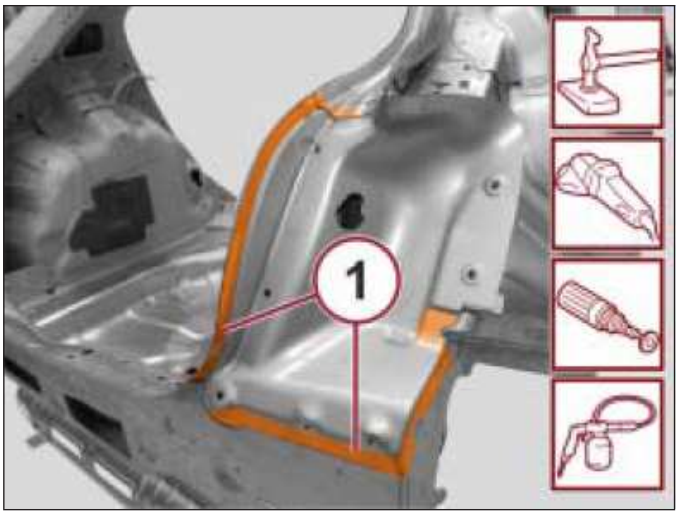
1. Remove the anti-corrosion treatment from the entire perimeter (1) of the inside and outside of the service part using a rotary brush.
2. With the use of a drill, drill holes at the indicated points (1).
3. Apply elctro-weldable paint/weld through primer to the highlighted border areas (2) involved in welding.



4. Position the service part correctly on the vehicle and secure it with the self-locking clamps.
5. Check the alignment and surrounding gaps.
6. With the use of a spot welder, apply spot welds (1) to the areas shown in the figure.
7. With the use of a MIG welder, apply plug welds filling in the areas (2) shown in the figure.



8. Correct any distortions to the sheet metal using a hammer and dolly block.
9. With the use of a disc grinder, smooth the welds.
10. Use a rotary brush to clean the previously welded areas.
11. Apply corrosion protection to the areas (1) involved in the welding.
12. Install the quarter panel (Refer to 31 - Collision/ Standard Procedure/Sectioning Locations and Component Procedures/ Body Side Aperture/Quarter Panel).



CORROSION PROTECTION

Corrosion Protection Restoration

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

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

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

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

Pre-refinish

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

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

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

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

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

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

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

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

Refinish

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

Post-refinish

All new panels, and repair areas, must have inner panel corrosion protection applied after the painting operation is complete, but before all the trim is reinstalled. Mopar Cavity Wax No. 68042970AA, or 3M Rustfighter #08891

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

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

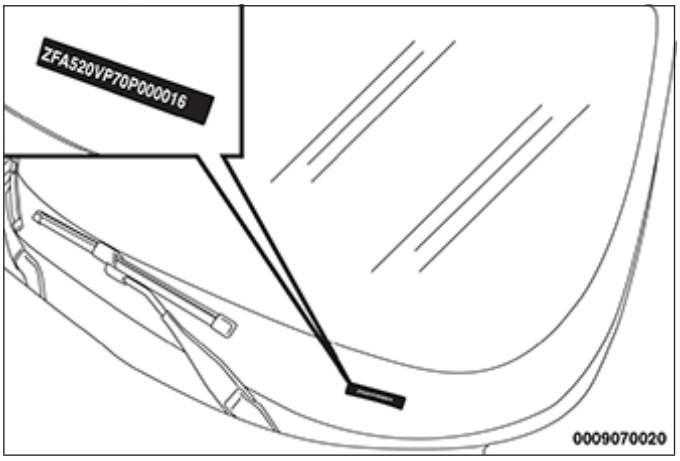
Following this arrangement, choice of materials, and proper application, the repaired vehicle should be as well protected against corrosion as it was prior to the repair.

Specifications

VEHICLE IDENTIFICATION NUMBER

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

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



POSITIONS 1 - 3: WORLD MANUFACTURER IDENTIFIER

1	2	3	Manufacturer	Vehicle Type
Z	F	B	Fiat Group Automobiles S.p.A.	MPV
Z	A	C	Fiat Group Automobiles S.p.A.	MPV

POSITION 4: BRAKE SYSTEM & GVWR

Brake System	GVWR Range		Active Belts, Front Air Bags	Active Belts, Air Bags, Side Bags- Front Row	Active Belts, Air Bags, Side Bags 1st and 2nd Rows	Active Belts, No Air Bags	Active Belts, GVWR > 10, 000 lbs. (4536 kg)
	Pounds	Kilograms					
Hydraulic	3001-4000	(1361-1814 kg)	V	X	Y	Z	
Hydraulic	4001-5000	(1815-2267 kg)	A	B	C	0	
Hydraulic	5001-6000	(2268 - 2721 kg)	D	E	F	1	
Hydraulic	6001 - 7000	(2722 - 3175 kg)	G	H	J	2	
Hydraulic	7001 - 8000	(3176 - 3628 kg)	K	L	M	3	
Hydraulic	8001 - 9000	(3629 - 4082 kg)	N	P	R	4	
Hydraulic	9001 - 10000	(4083 - 4535 kg)	S	T	U	5	
Hydraulic	INCOMPLETE VEHICLES		W				
Hydraulic	BUS		7				

Positions 5 - 7:

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

FIAT 500X (334) MPV (NAFTA MARKET)

FWD			AWD			BODY TYPE	DRIVE POSITION	SERIES
F	X	A	—	—	—	Sport Utility - 4 Door	Left Hand Drive	POP
F	X	B	F	Y	B			EASY (US-Mex), SPORT (Can)
F	X	C	F	Y	C			LOUNGE
F	X	D	F	Y	D			TREKKING
F	X	E	F	Y	E			TREKKING PLUS

POSITION 8: ENGINE

Code	Displacement	Cylinders	Fuel	Turbo	Sales Codes
H	1.4 Liter	4	Gasoline	Yes	EAM
T	2.4 Liter	4	Gasoline	No	ED6

POSITION 9: CHECK DIGIT

0 through 9 or X

POSITION 10: MODEL YEAR

G = 2016

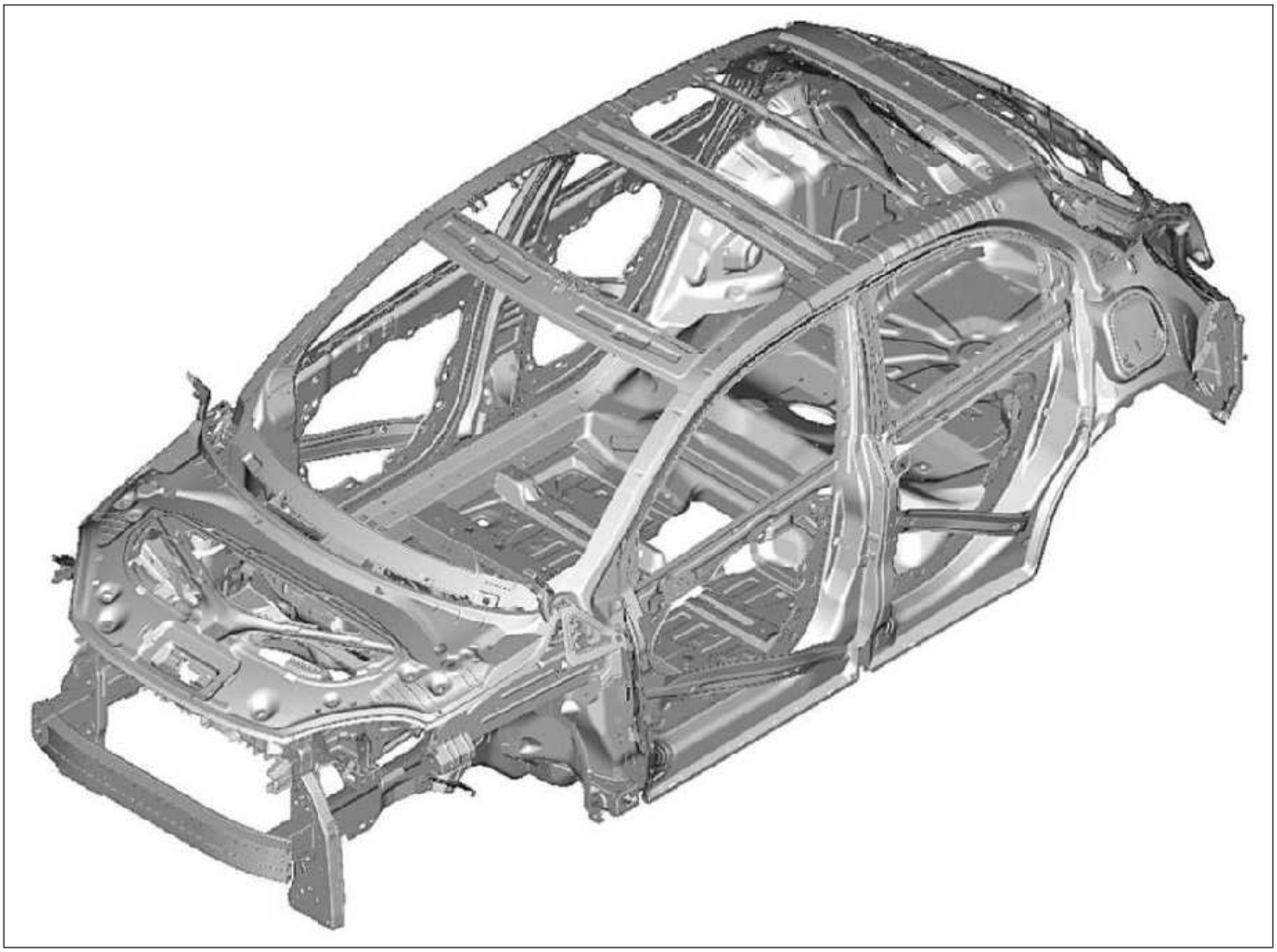
POSITION 11: ASSEMBLY PLANT

CODE	PLANT
P	MELFI (ITALY)

POSITION 12 - 17: PLANT SEQUENCE NUMBER

A six digit number assigned by assembly plant.

STANDARDIZED STEEL IDENTIFICATION



Material used for vehicle body

The vehicle has a body based on floor panel developed with a shared FCA US LLC and FCA Italy S.p.A.'s platform. With a unibody structure, the upper body structure and frame are designed as a single unit, enabling the structure more mass-efficient and more rigidity.

It was possible to produce a body with high rigidity and performance characteristics through the widespread use of high-strength steel and the use of structural adhesives. High-strength steels are adopted on approximately 70 percent of the vehicle to maximize the vehicle's dynamics and it's performance in the event of an accident and optimizing the efficiency of weight.

The 500X is the first utility vehicle to use such a high percentage of high-strength steel. The aluminium hood, front crossmember and rear bumper reinforcement contribute towards weight optimization. Particularly noteworthy is the application of hot-stamped high-resistance steel in the upper structure and underbody. The result is a form with overall rigidity which minimizes noise and vibration and provides occupants with a sense of safety and stability. What's more, the chassis' advanced structural interfaces (i.e. suspension and cradle area) are designed to ensure high rigidity at those points, thus eliminating low-frequency noise in the passenger compartment.

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.

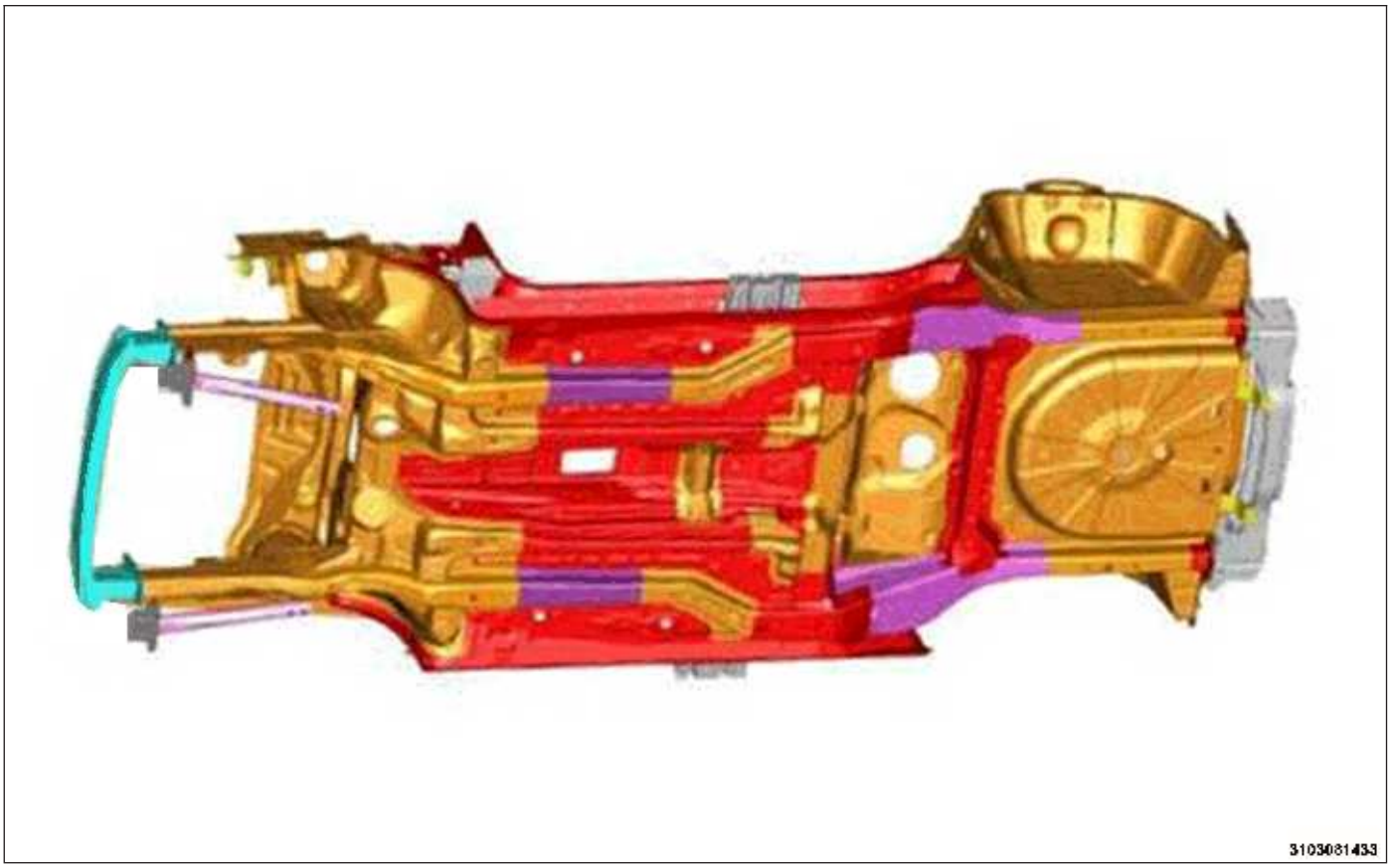
Failure to follow these instructions may result in serious or fatal injury.

- **Low Carbon Steel (LC)** - 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.
- **Aluminum (AL)** - Stamped aluminum sheet metal panels may be repairable with specialized tools and techniques.
- **Plastic (PLAST)** - 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.
- **Press Hardened Steel (PHS), Austentic Steel (AUST), Ultra High Strength Steel (UHSS), and Advanced High Strength Steel (AHSS)** - 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.
- **High Strength Steel (HSS)** - 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.

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

Information on component replacement and sectioning of components will be identified in Sectioning Locations and Component Procedures (Refer to 31 - Collision Information/Standard Procedure/Sectioning Locations and Component Procedures.

NOTE: Corrosion protection must be restored after repair.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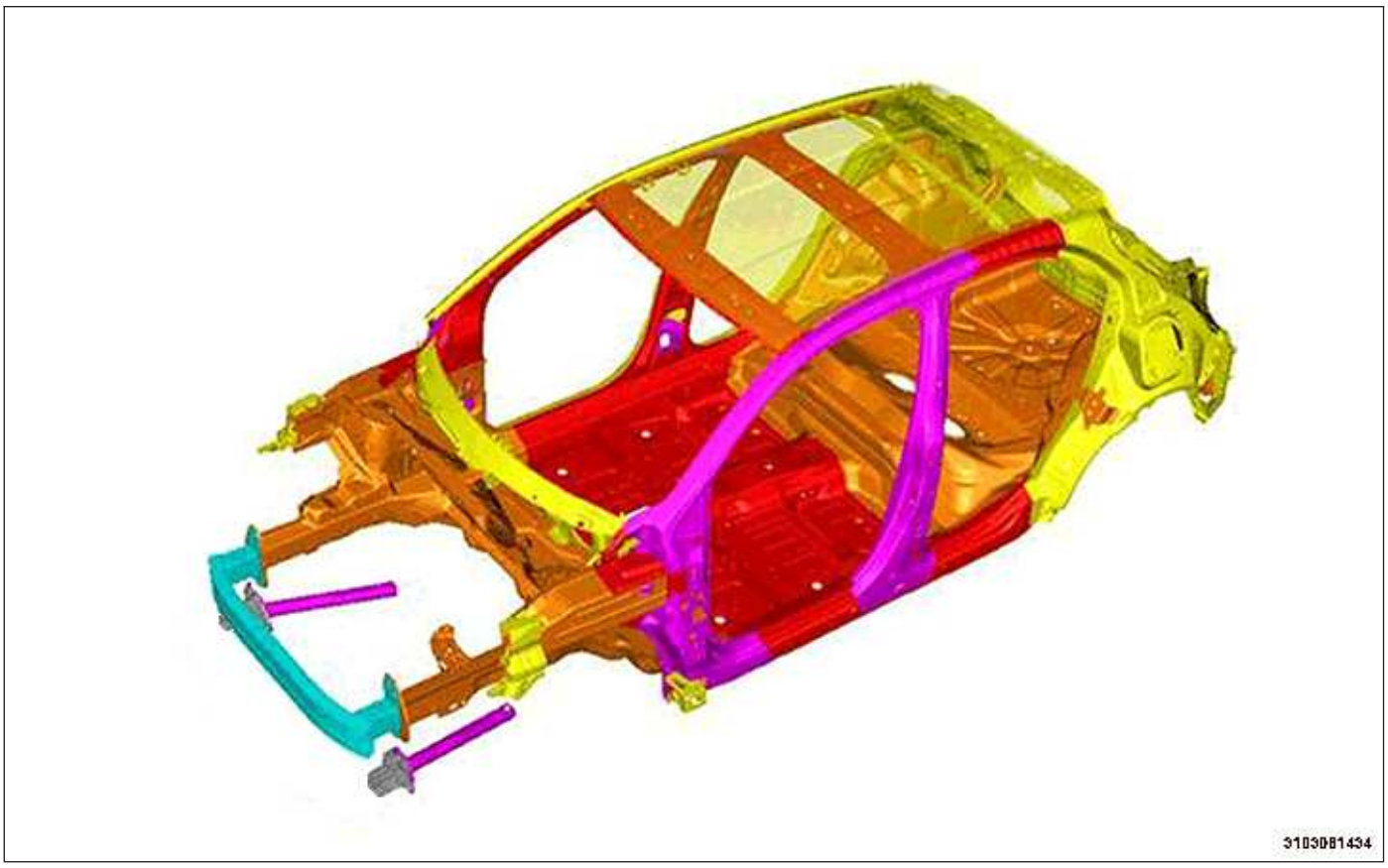
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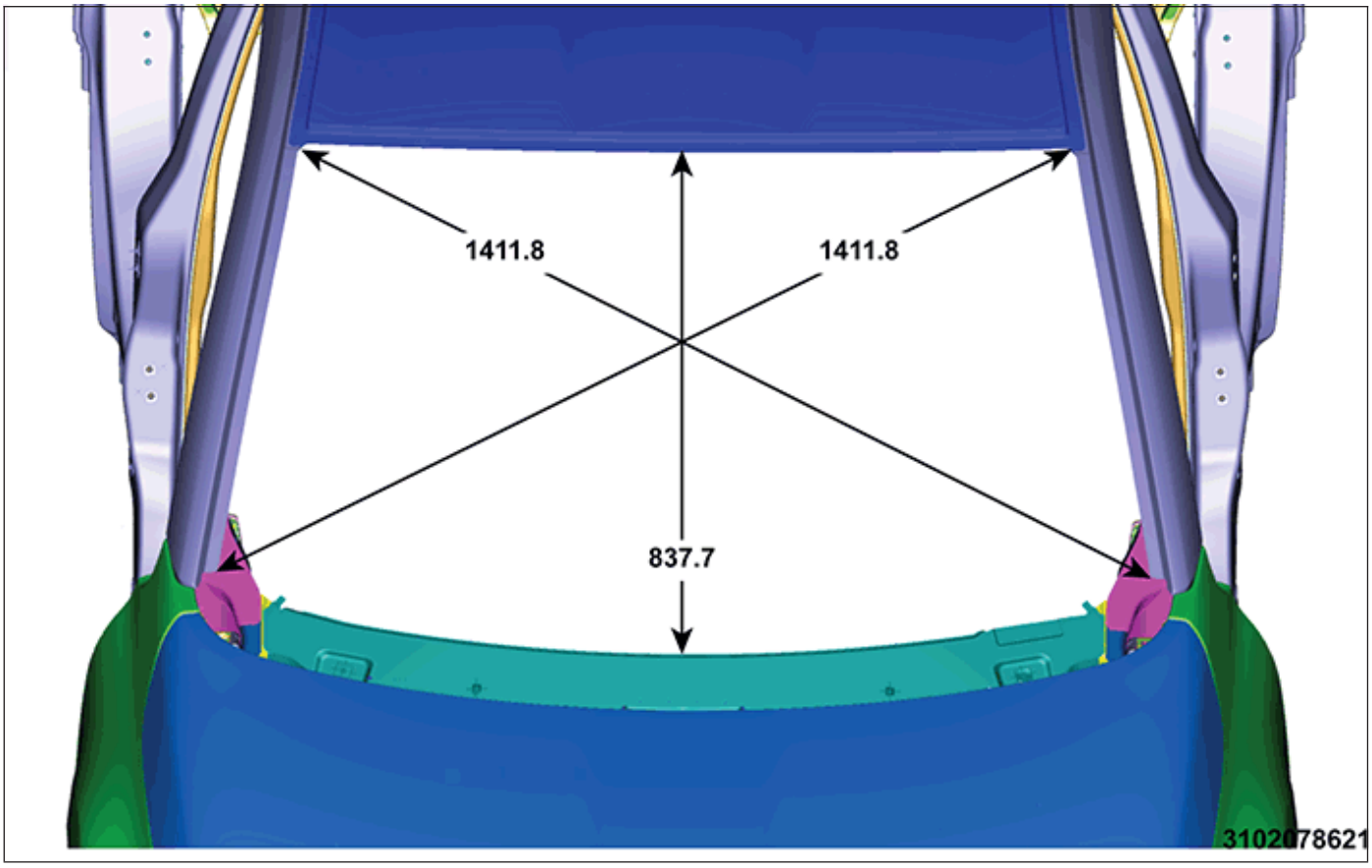
BODY OPENING DIMENSIONS

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

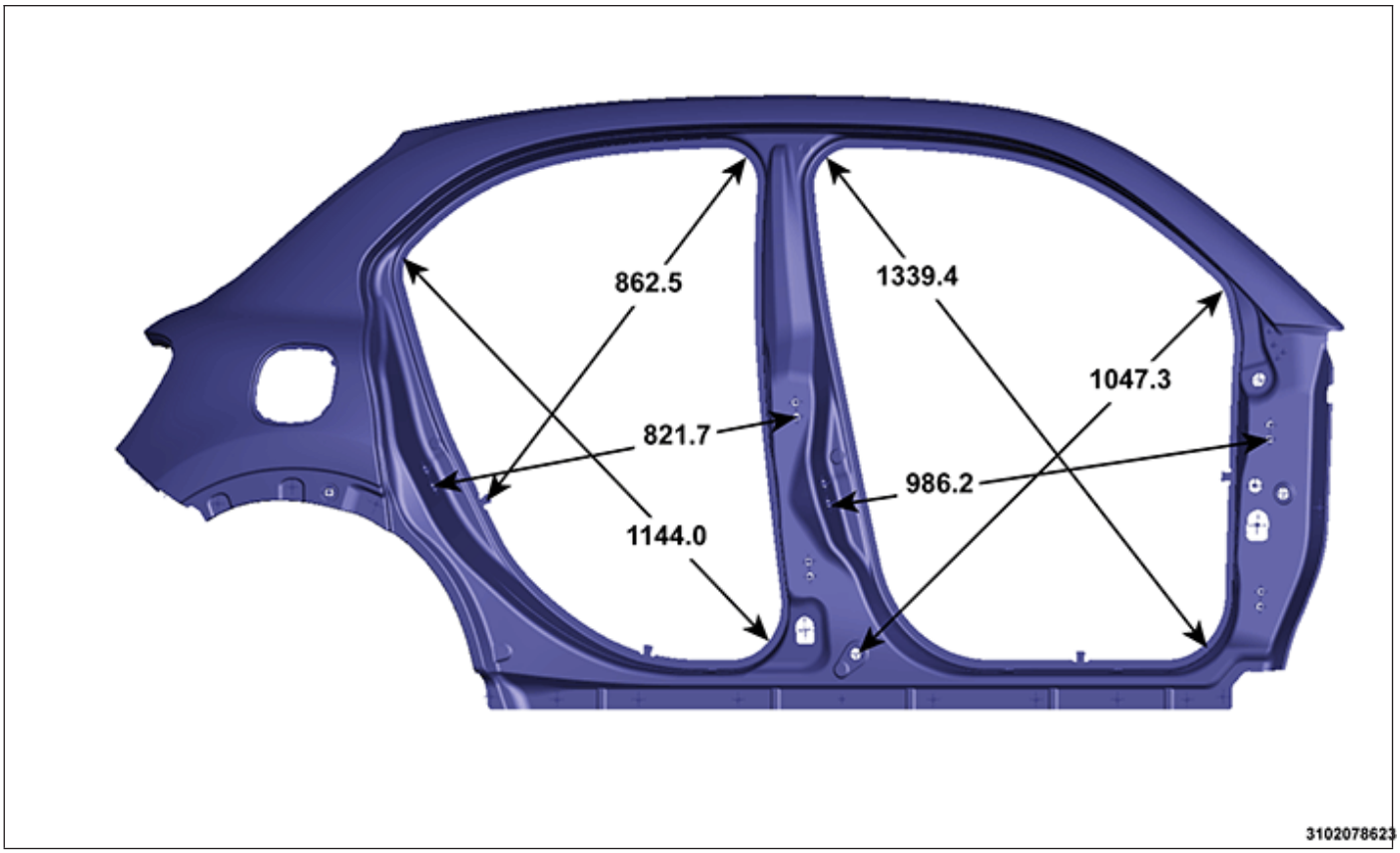
VEHICLE PREPARATION –

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

DESCRIPTION	FIGURE
WINDSHIELD OPENING	Figure 1
BODY SIDE OPENING	Figure 2
LIFTGATE OPENING	Figure 3

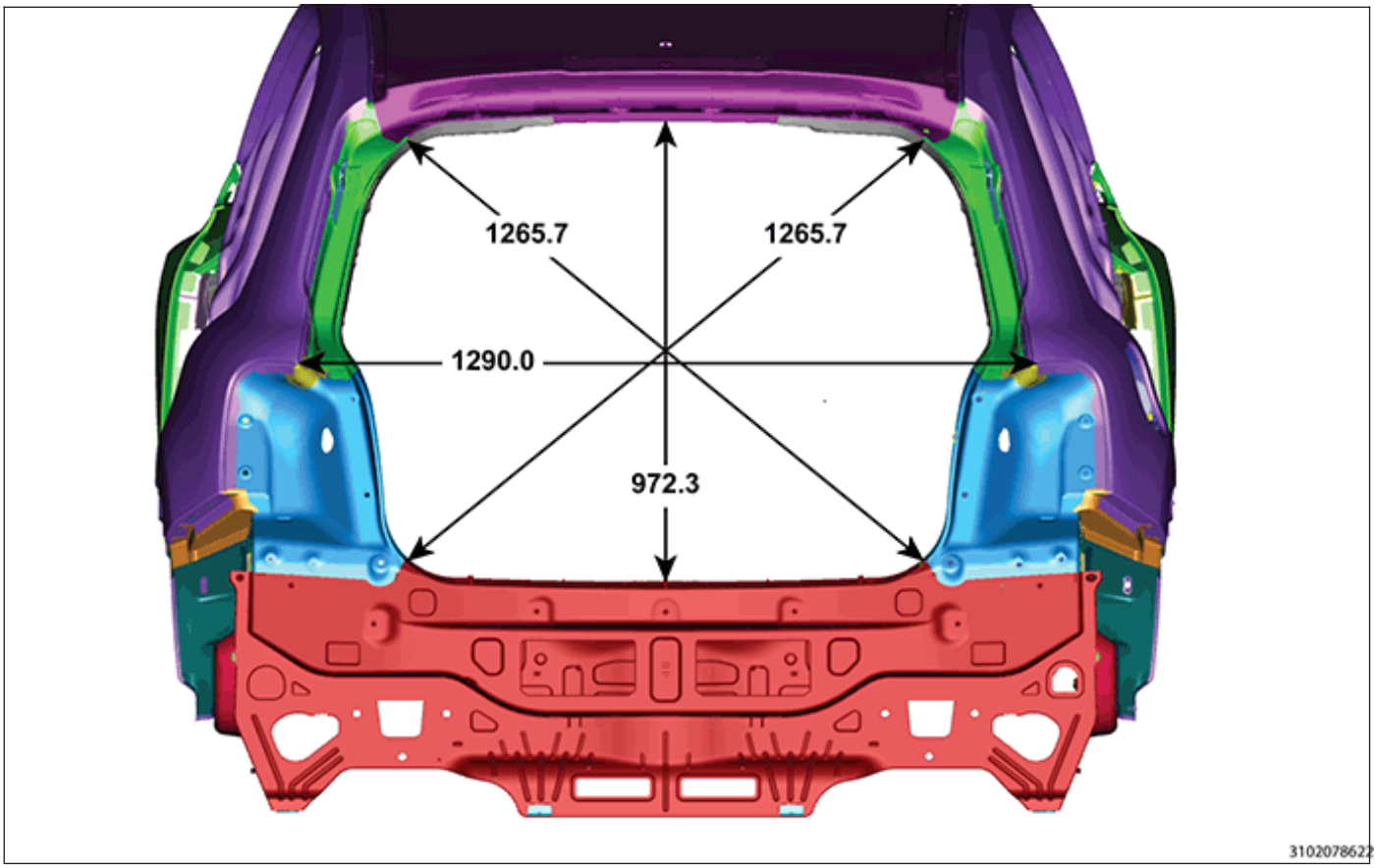


Windshield Opening



Body Side Openings

NOTE: Right side shown, left side similar.



Liftgate Opening

FRAME DIMENSIONS

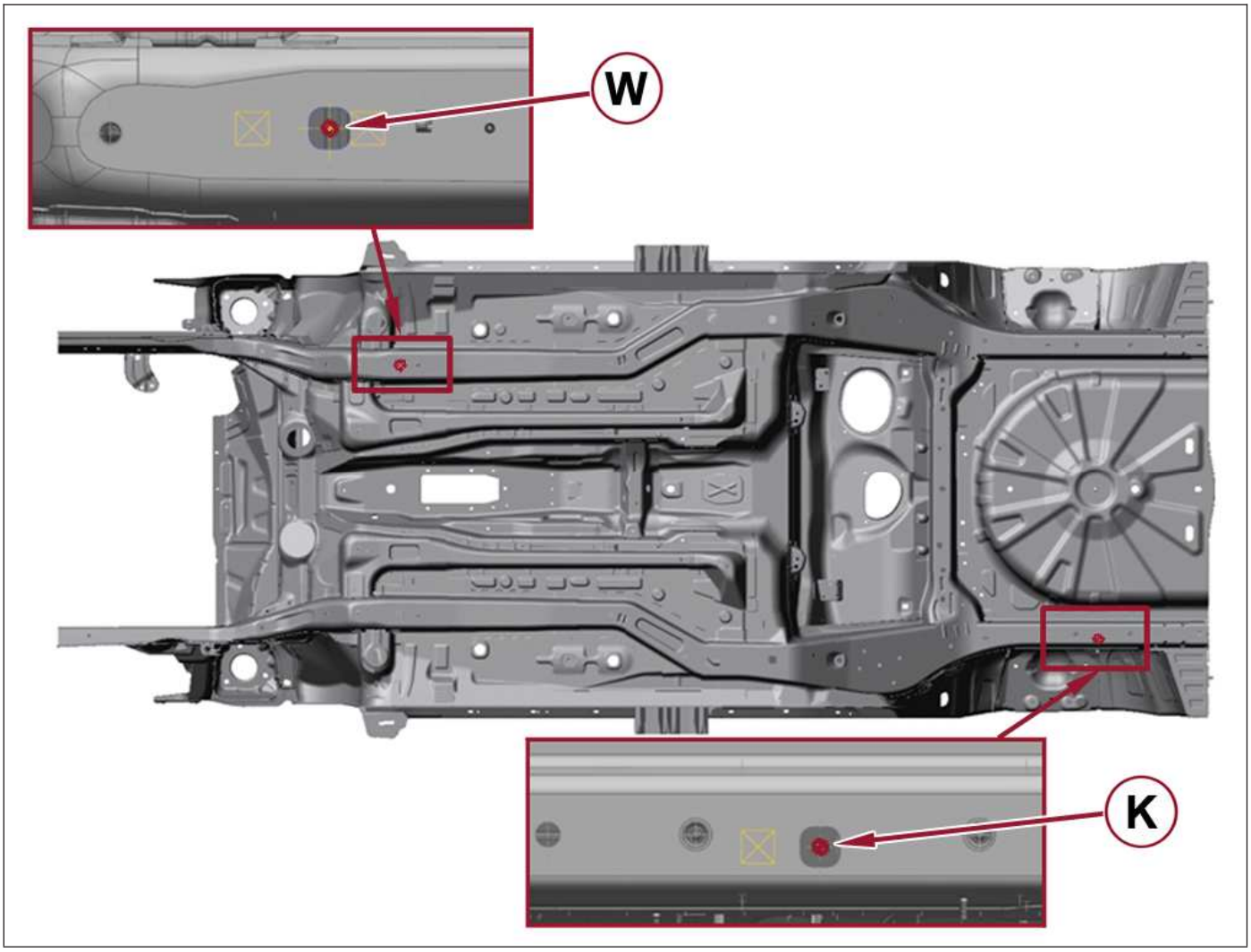
This shows the characteristic vehicle dimensions in order to ensure the best results are achieved when carrying out repair operations. The comparison dimensions, expressed in millimeters (mm), may be subject to differences (about 2 mm). Repairers must use their experience to decide whether this is due to impact damage or manufacturing tolerances.

NOTE: All dimensions are from center to center of Principal Locating Point (PLP), or from center to center of PLP and fastener location.

VEHICLE PREPARATION –

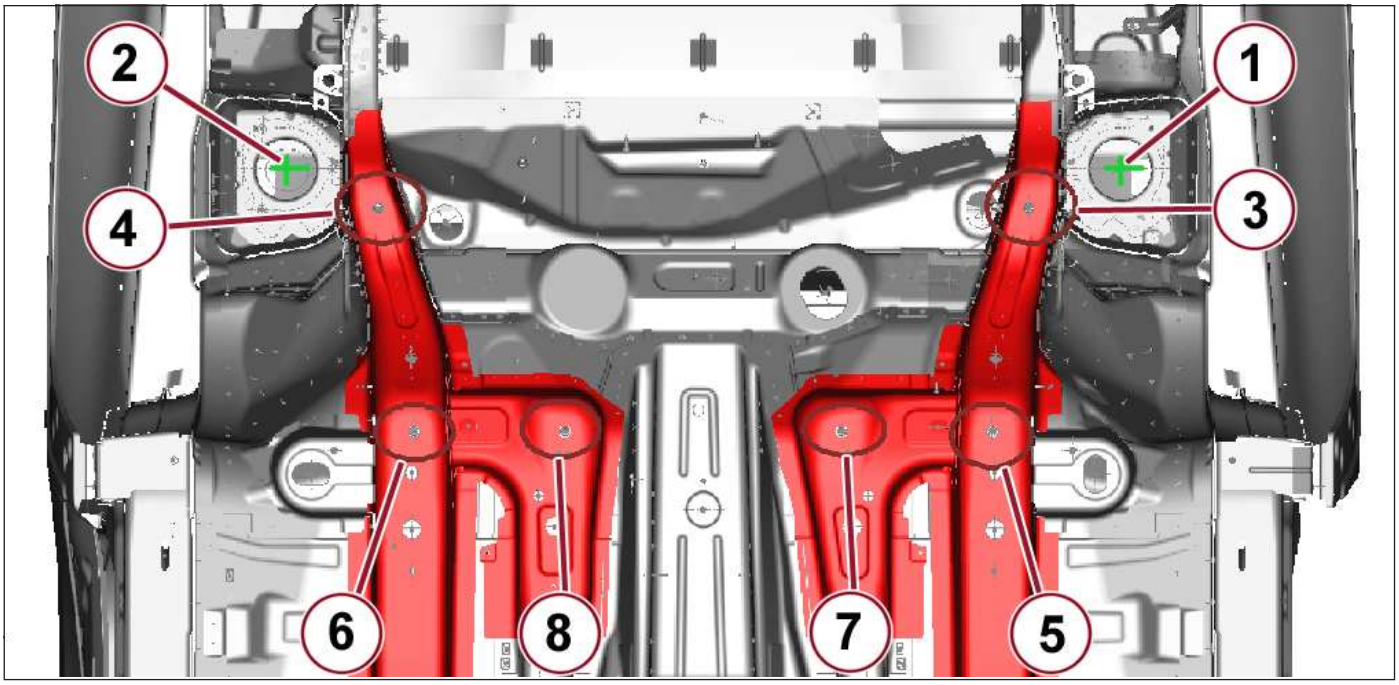
Position the vehicle on a level work surface. Using screw or bottle jacks, adjust the vehicle PLP heights to the specified dimension above a level work surface. Vertical dimensions can be taken from the work surface to the locations indicated were applicable.

DESCRIPTION	FIGURE
Reference point identification	Figure 1
Front suspension	Figure 2
Front bumper Reinforcement mounting to front frame rails	Figure 3
Fascia mounting to fender and headlight to body	Figure 4
Engine mounting	Figure 5
Instrument panel mounting	Figure 6
Front seat mounting	Figure 7
Rear seat mounting	Figure 8
Fuel tank mounting	Figure 9
Rear drive components mounting	Figure 10
Rear suspension mounting	Figure 11
Rear suspension mounting	Figure 12
Under hood dimensions	Figure 13

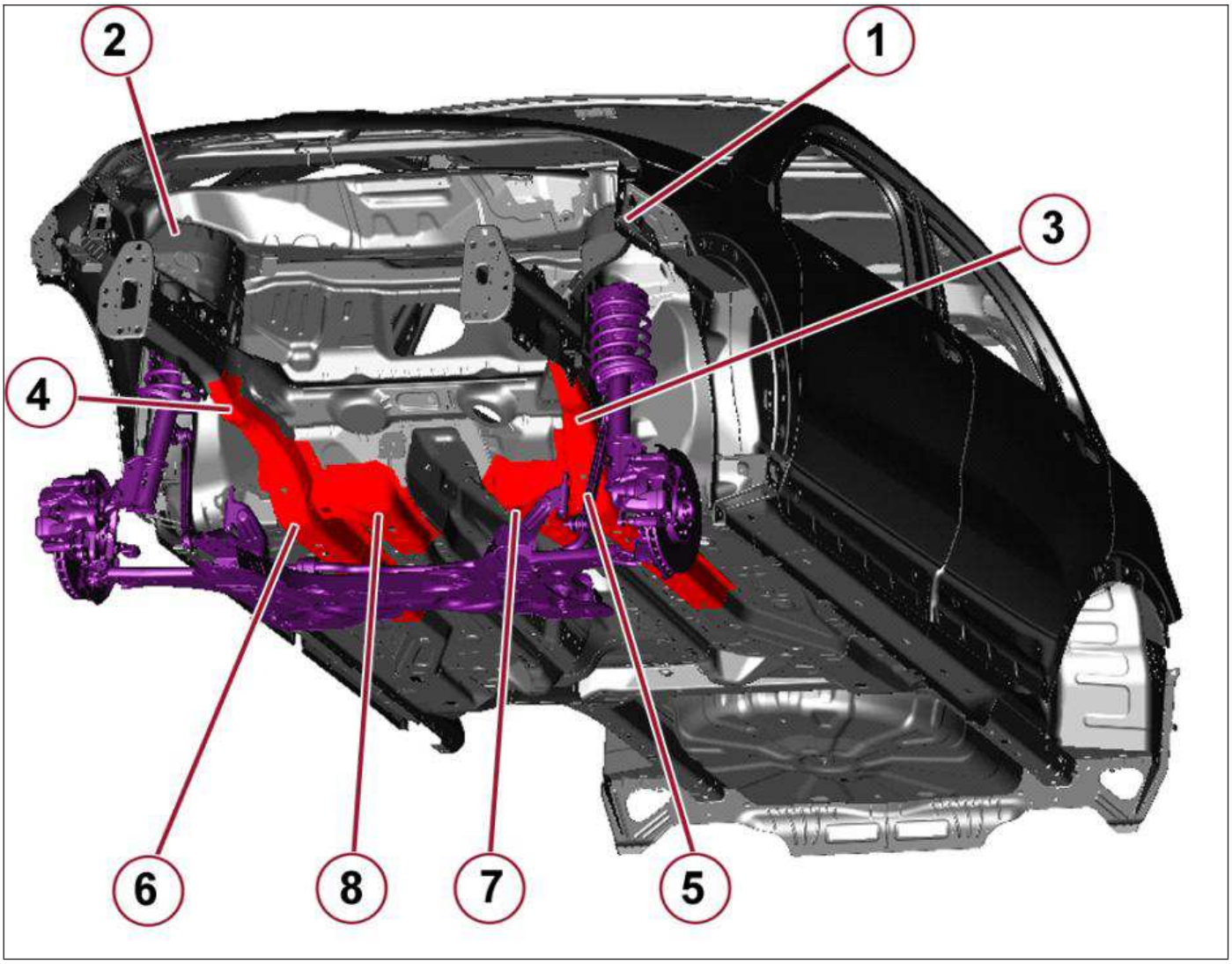


Reference Point Identification

	X	Y	Z
W	497.0	-398.0	-83.0
K	2738.0	470.5	103.9

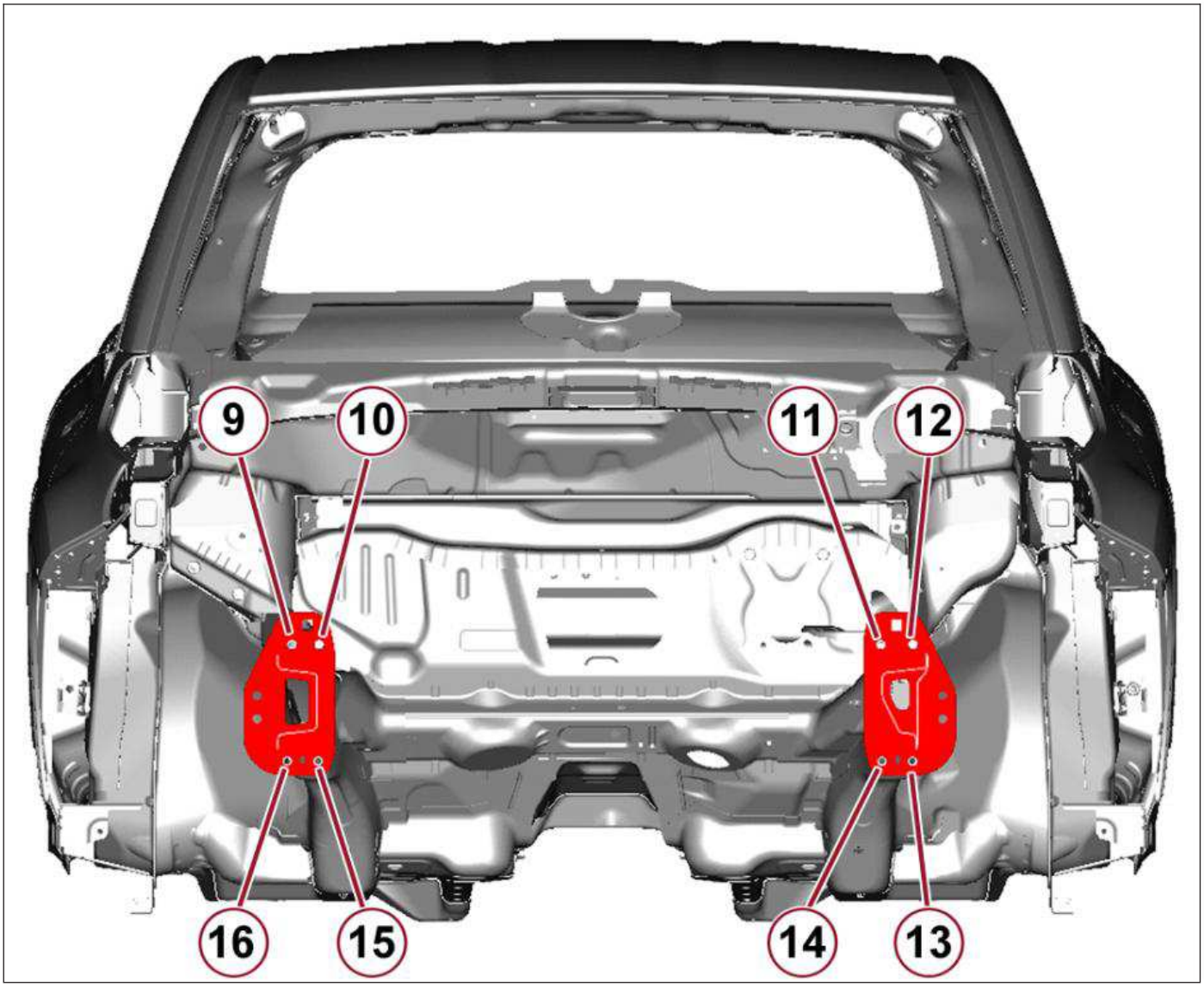


Front Suspension – View 1 of 2



Front suspension – View 2 of 2

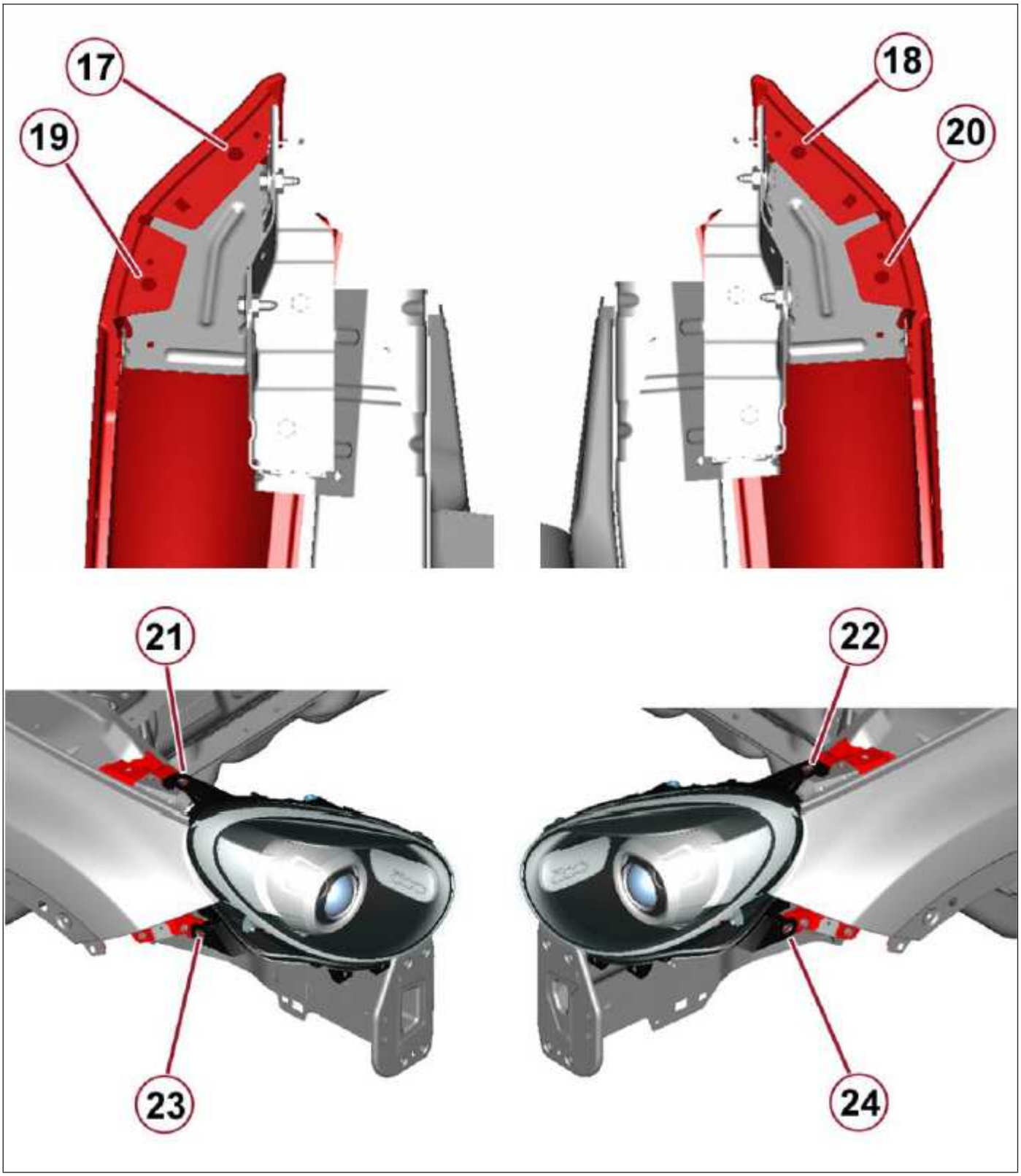
	W			K		
Ref	X	Y	Z	X	Y	Z
1	-488.6	-170.9	652.2	-2729.6	-1039.4	465.3
2	-488.6	966.9	652.2	-2729.6	98.4	465.3
3	-437.0	-45.5	177.0	-2678.0	-914.0	-9.9
4	-437.0	841.5	177.0	-2678.0	-27.0	-9.9
5	-133.0	3.0	0.0	-2374.0	-865.5	-186.9
6	-133.0	793.0	0.0	-2374.0	-75.5	-186.9
7	-133.0	208.5	27.0	-2374.0	-660.0	-159.9
8	-133.0	587.5	27.0	-2374.0	-281.0	-159.9



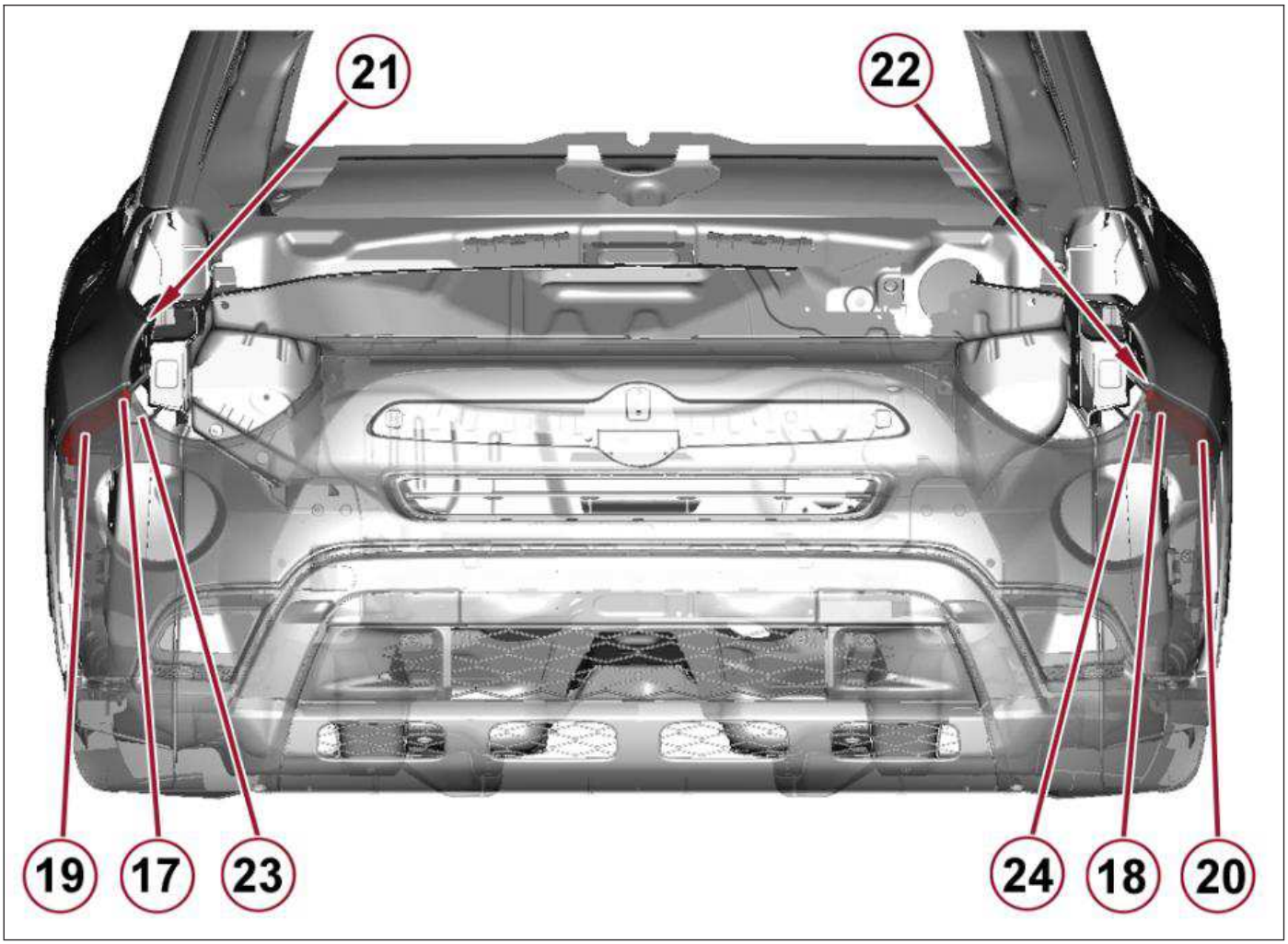
Front bumper reinforcement mounting to front frame rails

	W			K		
Ref	X	Y	Z	X	Y	Z
9	-1082.9	879.8	386.9	-3323.9	11.3	200.0
10	-1082.9	837.7	386.9	-3323.9	-30.8	200.0
11	-1082.9	-35.4	386.9	-3323.9	-903.9	200.0

12	-1082.9	-85.2	387.0	-3323.9	-953.7	200.0
13	-1082.9	-84.8	205.5	-3323.9	-953.3	18.6
14	-1082.9	-37.1	205.6	-3323.9	-905.6	18.7
15	-1082.9	839.4	205.6	-3323.9	-29.1	18.7
16	-1082.9	887.1	205.6	-3323.9	18.6	18.7

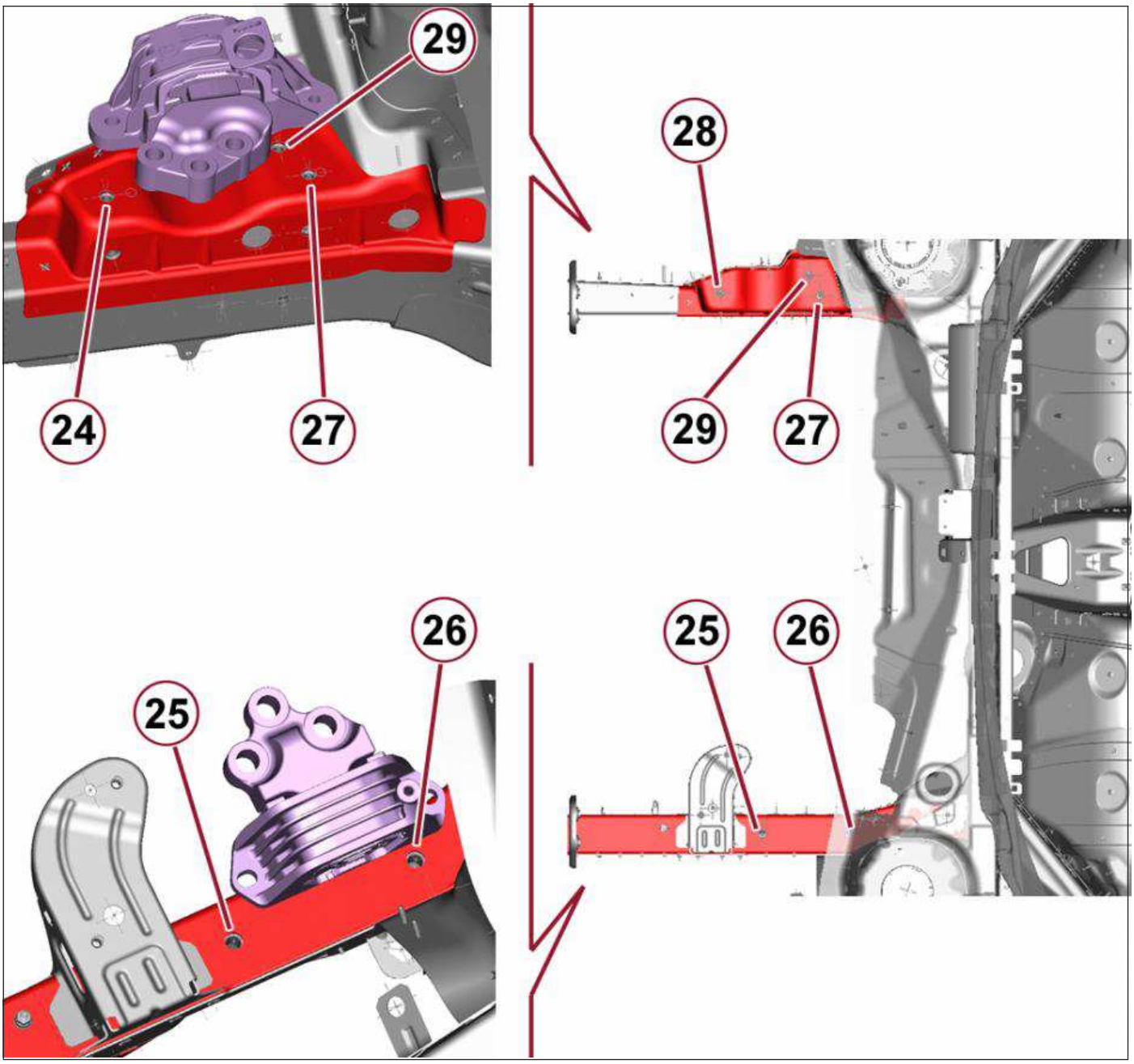


Fascia mounting to fender and headlight to body– View 1 of 2



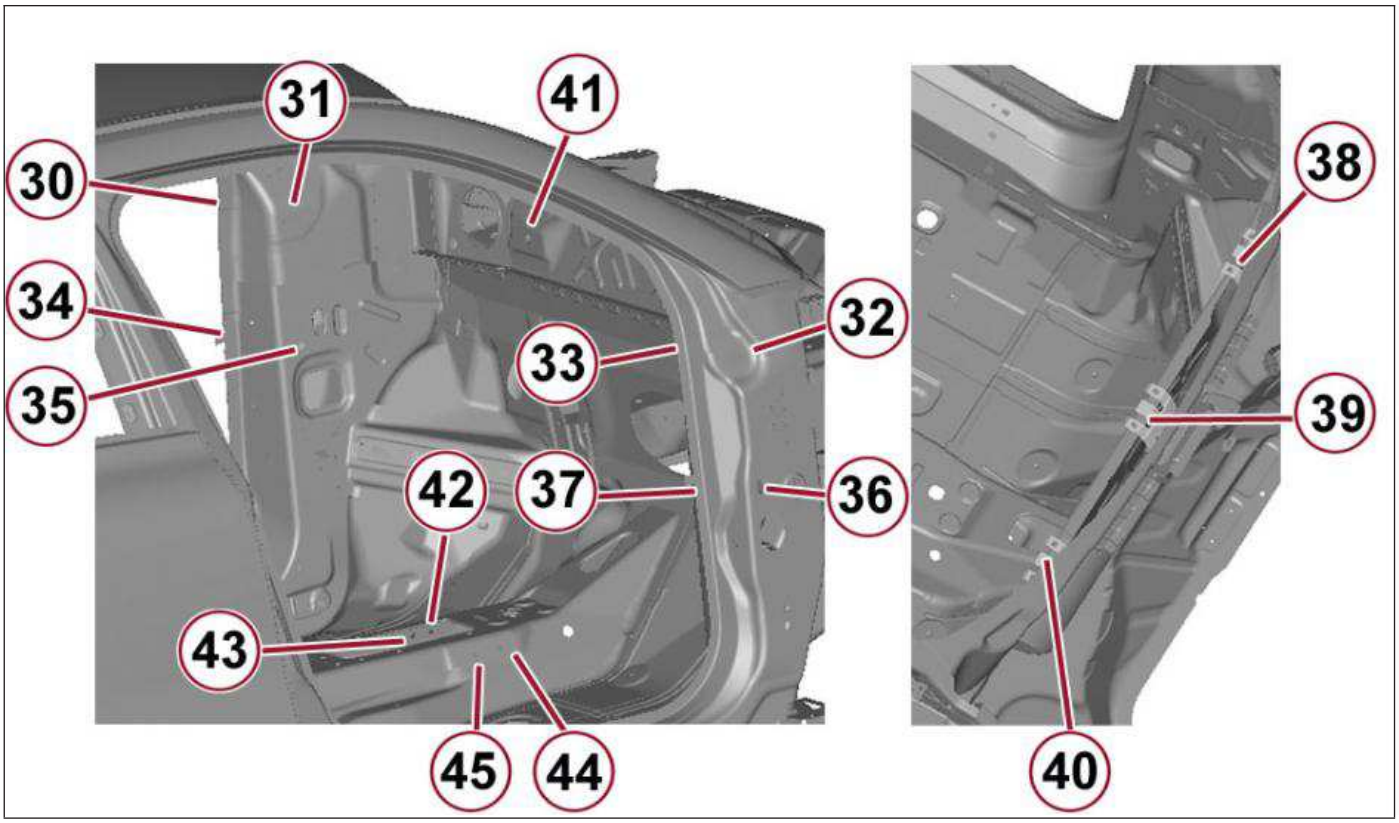
Fascia mounting to fender and headlight to body– View 2 of 2

	W			K		
Ref	X	Y	Z	X	Y	Z
17	-883.2	1090.0	545.2	-3124.2	321.5	358.3
18	-883.2	-394.0	545.2	-3124.2	-1262.5	358.3
19	-804.3	1242.8	499.7	-3045.3	374.3	312.8
20	-804.3	-446.8	499.7	-3045.3	-1315.3	312.8
21	-785.6	1084.7	692.2	-3026.6	216.2	505.3
22	-785.6	-288.7	692.2	-3026.6	-1157.2	505.3
23	-901.9	1168.7	507.2	-3142.9	300.2	320.3
24	-901.9	-372.7	507.2	-3142.9	-1241.2	320.3

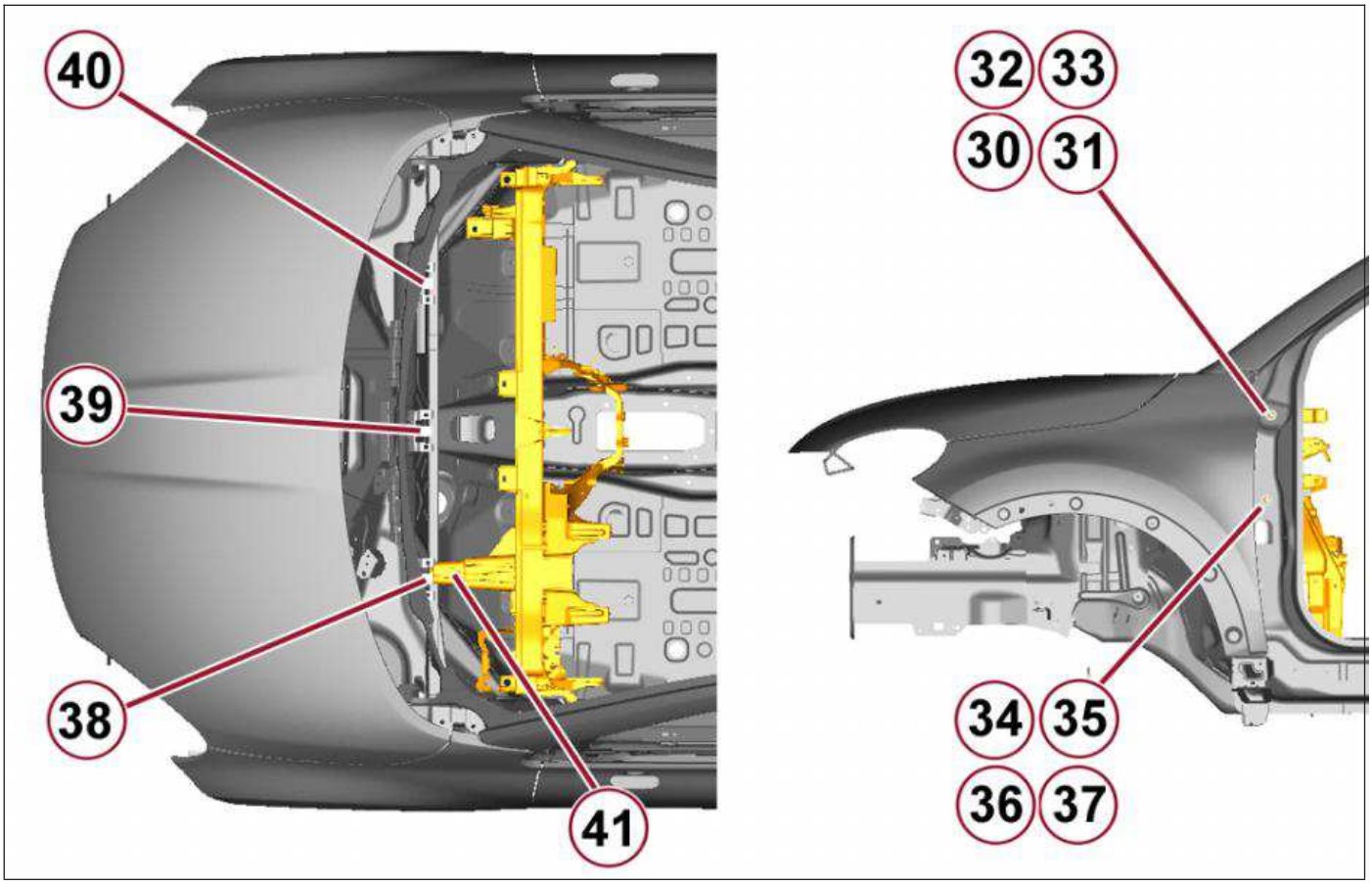


Engine mounting

	W			K		
Ref	X	Y	Z	X	Y	Z
25	-744.5	-70.1	347.7	-2985.5	-938.7	160.8
26	-591.5	-70.1	347.7	-2832.5	-938.7	160.8
27	-643.0	873.8	409.2	-2884.0	5.3	222.3
28	-817.5	878.3	409.2	-3058.5	9.8	222.3
29	-661.5	909.3	409.2	-2902.5	40.8	222.3



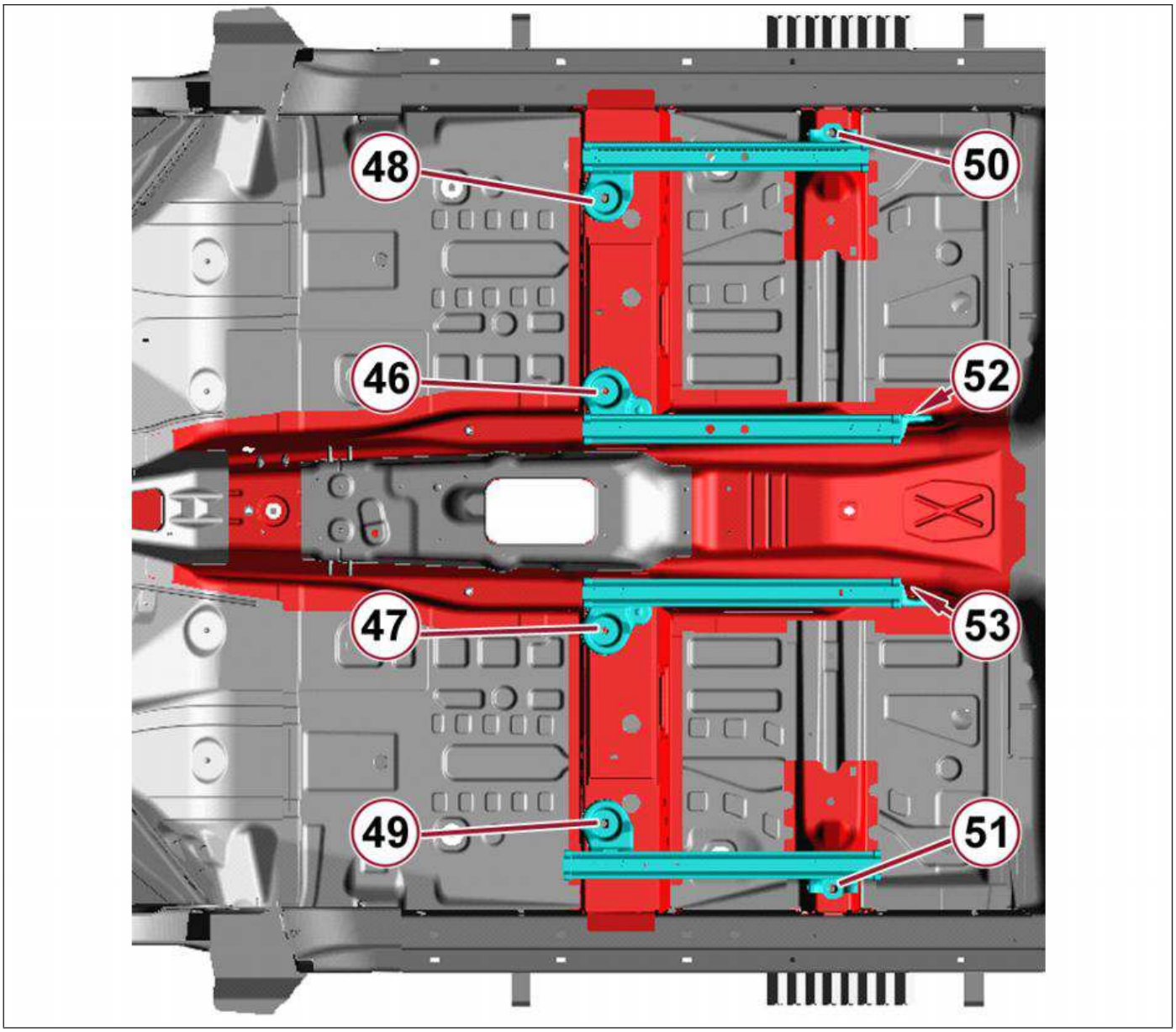
Instrument panel mounting – View 1 of 2



Instrument panel mounting – View 2 of 2

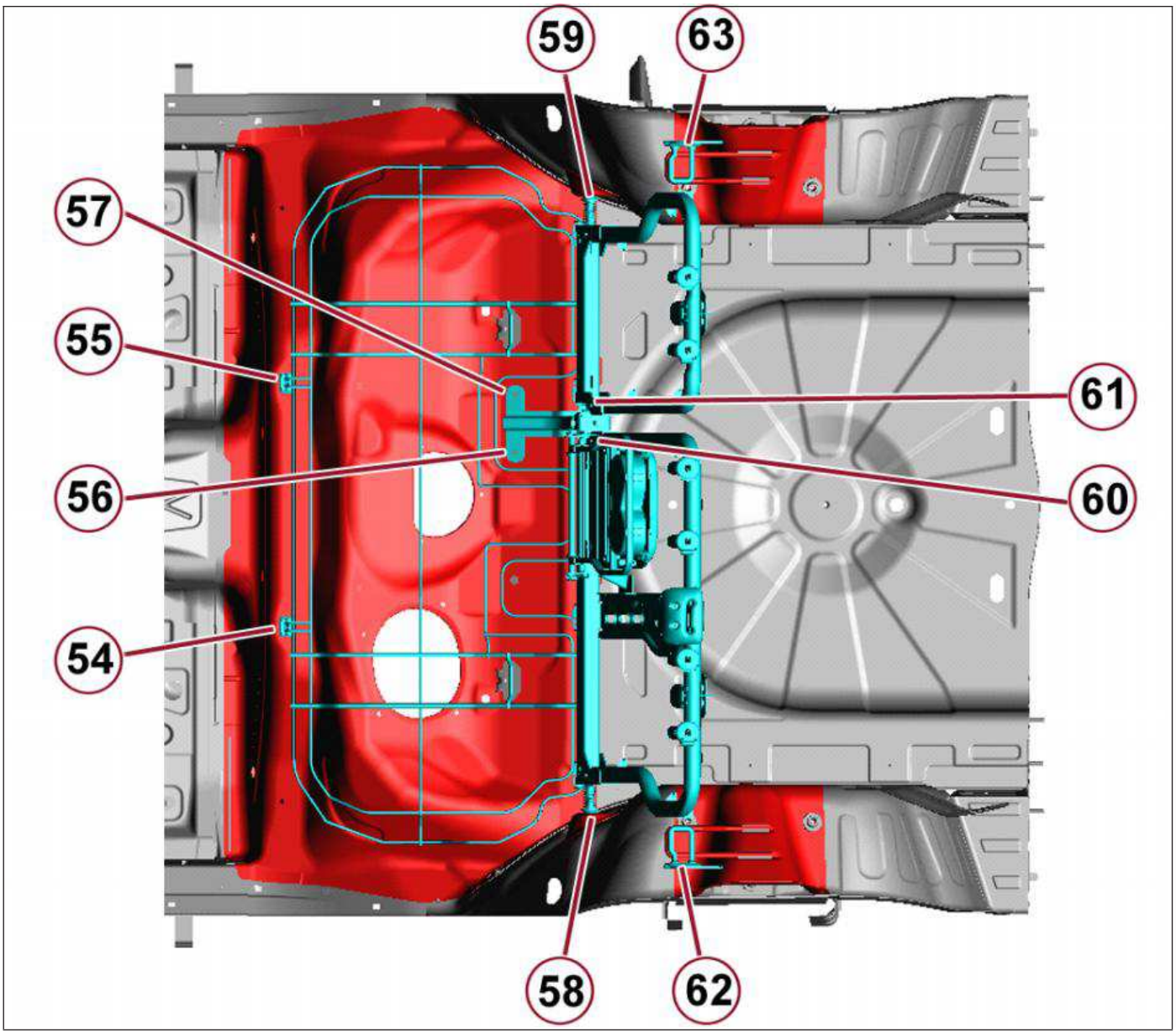
	W	K

Ref	X	Y	Z	X	Y	Z
30	-44.0	-395.0	737.0	-2285.0	-1263.5	550.1
31	-44.0	-228.9	737.0	-2285.0	-1098.5	550.1
32	-44.0	1191.0	737.0	-2285.0	322.5	550.1
33	-44.0	1024.9	737.0	2285.0	156.4	550.1
34	-54.5	-400.0	527.0	-2295.5	-1268.5	340.1
35	-92.0	-234.3	560.0	-2333.0	-1097.4	373.1
36	-54.5	1196.0	527.0	-2295.5	327.5	340.1
37	-92.0	1024.9	560.0	-2333.0	156.4	373.1
38	-300.0	82.4	800.0	-2541.0	-786.1	613.1
39	-312.9	360.1	822.3	-2553.9	-508.4	635.3
40	300.0	713.6	800.0	-2541.0	-154.9	613.1
41	-325.4	65.0	699.2	-2566.4	-803.4	512.3
42	74.1	309.1	160.4	-2166.9	-560.5	-26.3
43	109.0	308.9	160.5	-2132.0	-560.8	-26.2
44	107.3	498.5	159.7	-2133.7	-370.0	-27.3
45	59.3	498.5	159.7	-2133.7	-370.0	-27.3



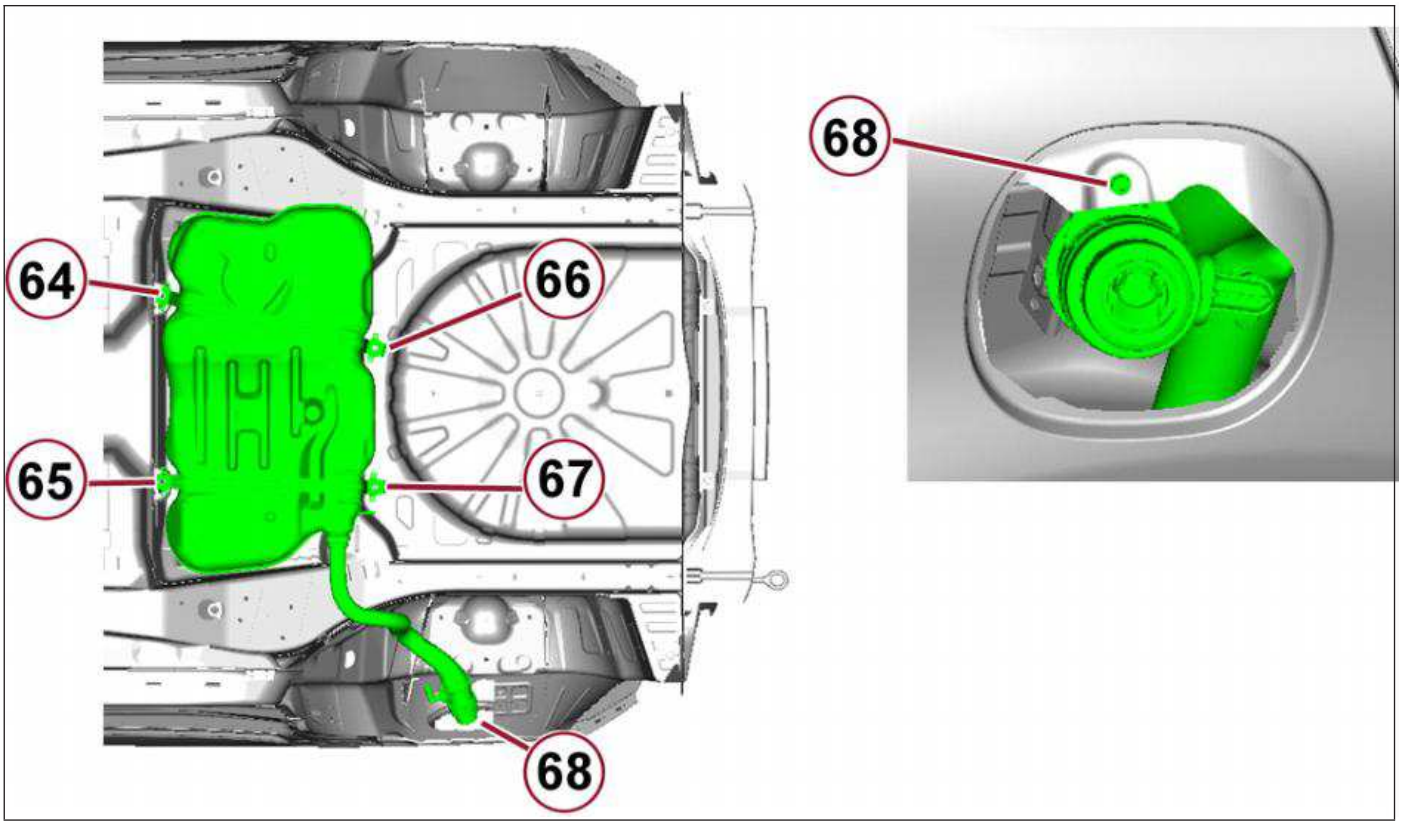
Front seat mounting

	W			K		
Ref	X	Y	Z	X	Y	Z
46	498.0	588.0	119.9	-1743.0	-280.5	-67.0
47	498.0	208.0	119.9	-1743.0	-660.5	-67.0
48	498.0	893.0	119.9	-1743.0	24.5	-67.0
49	498.0	-97.0	119.9	-1743.0	-965.5	-67.0
50	859.1	996.5	99.0	-1381.9	128.0	-88.0
51	859.1	-200.5	99.0	-1381.9	-1069	-88.0
52	937.4	534.0	62.8	-1303.6	-334.5	-124.2
53	937.4	262.0	62.8	-1303.6	-606.5	-124.2



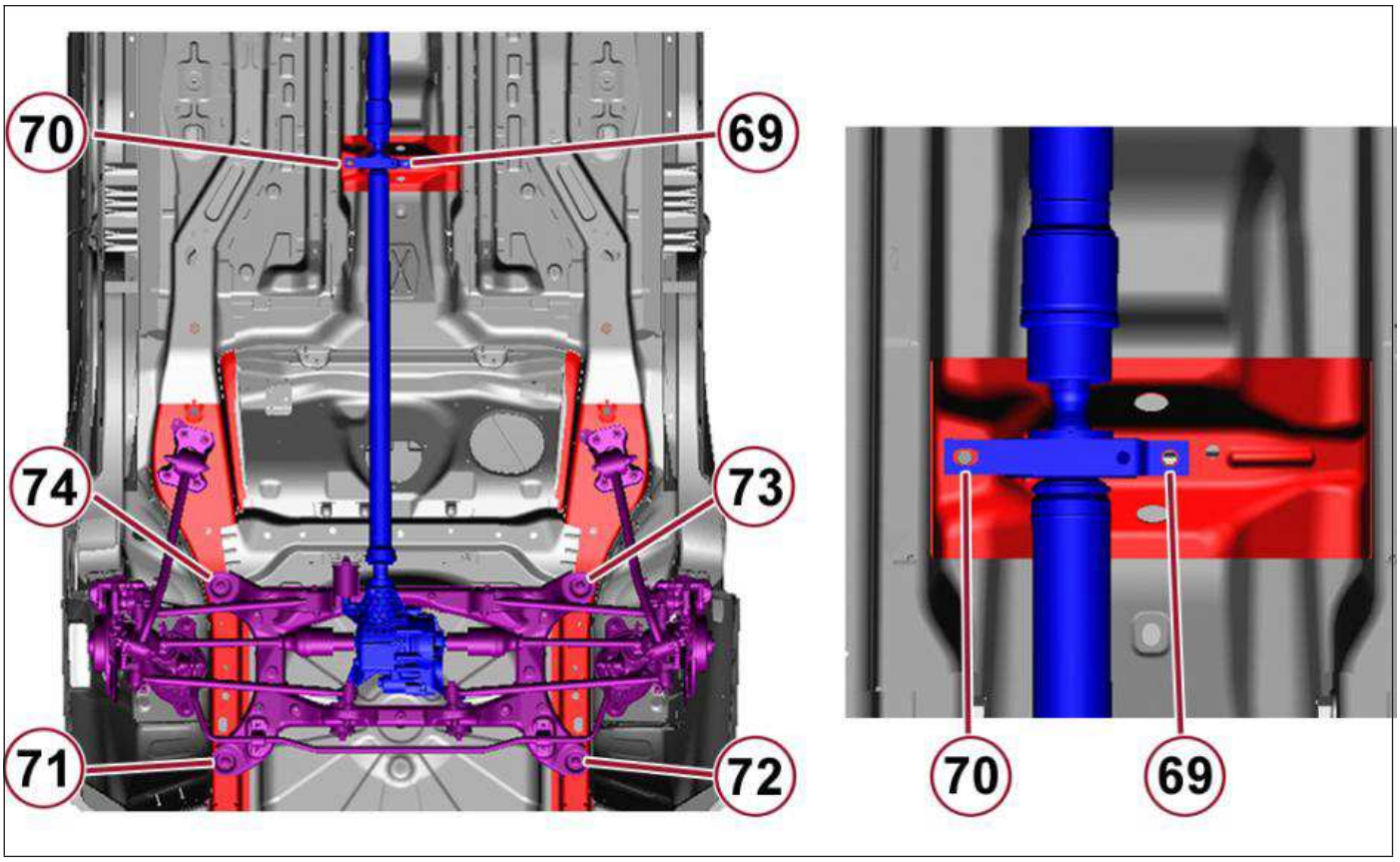
Rear seat mounting

	W			K		
Ref	X	Y	Z	X	Y	Z
54	1265.2	181.0	255.8	-975.8	-687.5	68.9
55	1265.2	615.0	255.8	-975.8	-253.5	68.9
56	1674.2	492.0	231.1	-566.8	-376.5	44.2
57	1674.2	593.6	231.1	566.8	-275.0	44.2
58	1805.4	-142.5	420.5	-435.6	-1011.0	233.6
59	1805.4	938.5	420.5	-435.6	70.0	233.6
60	1802.6	505.5	261.4	-438.4	-363.0	74.5
61	1802.6	573.0	261.4	-438.4	-295.5	74.5
62	1943.8	-201.6	819.9	-297.2	-1070.1	633.0
63	1943.8	997.6	819.9	-297.2	129.1	633.0



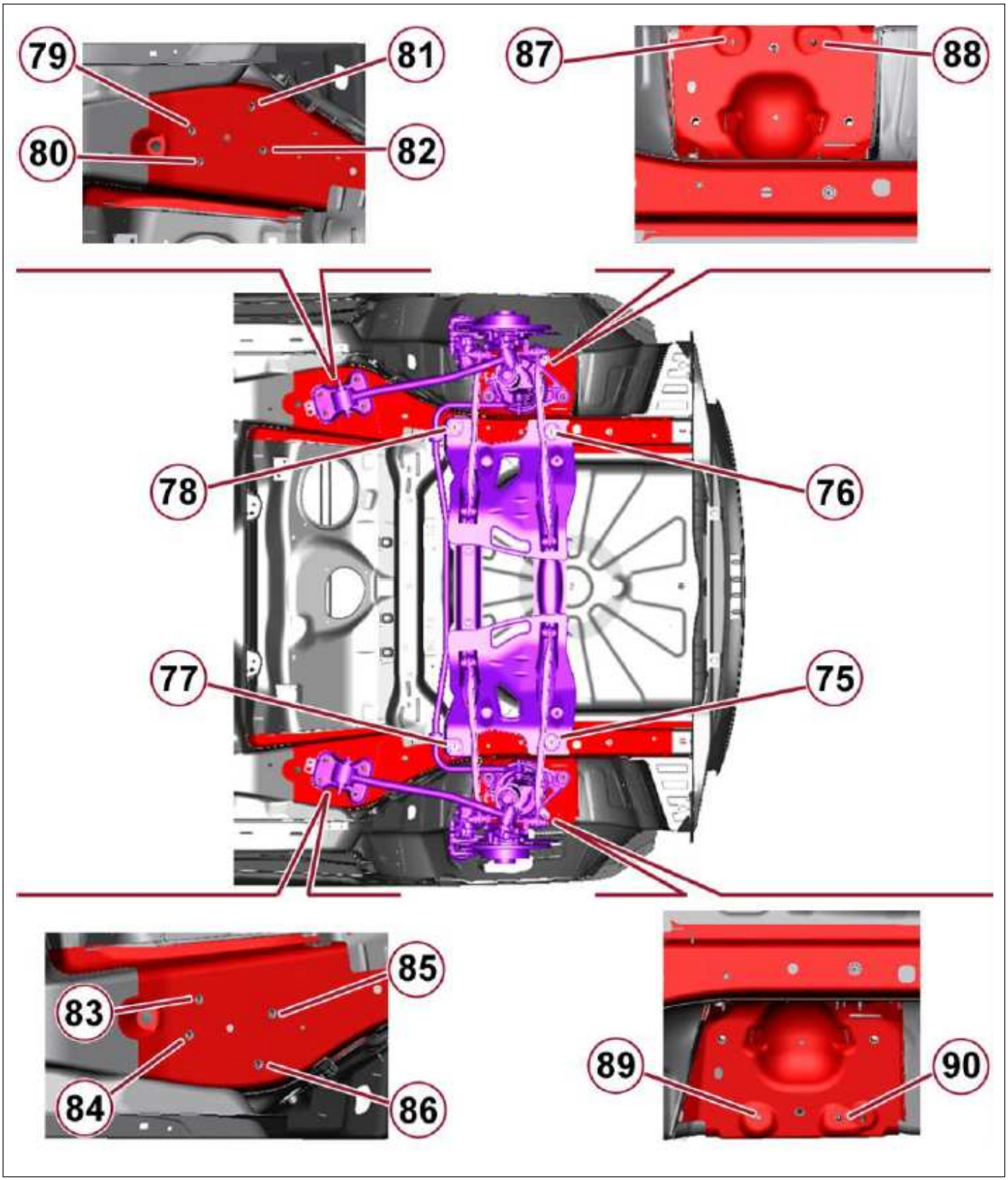
Fuel tank mounting

	W			K		
Ref	X	Y	Z	X	Y	Z
64	1275.0	151.8	119.7	-966.0	-716.7	-67.2
65	1275.0	620.4	119.7	-966.0	-248.1	-67.2
66	1810.9	283.0	258.6	-430.1	-585.5	71.7
67	1810.3	634.3	257.1	-430.7	-234.2	70.2
68	2024.9	1127.9	683.7	-216.1	259.4	496.8



Rear drive component mounting

	W			K		
Ref	X	Y	Z	X	Y	Z
69	748.5	383.4	101.4	-1492.5	-485.1	-85.6
70	748.5	531.3	71.5	-1492.5	-337.2	-115.4
71	2338.0	861.0	186.9	97.0	-7.5	0.0
72	2338.0	-65.0	186.9	97.0	-933.5	0.0
73	1875.0	874.0	186.9	-366.0	5.5	0.0
74	1875.0	-78.0	186.9	-366.0	-946.5	0.0

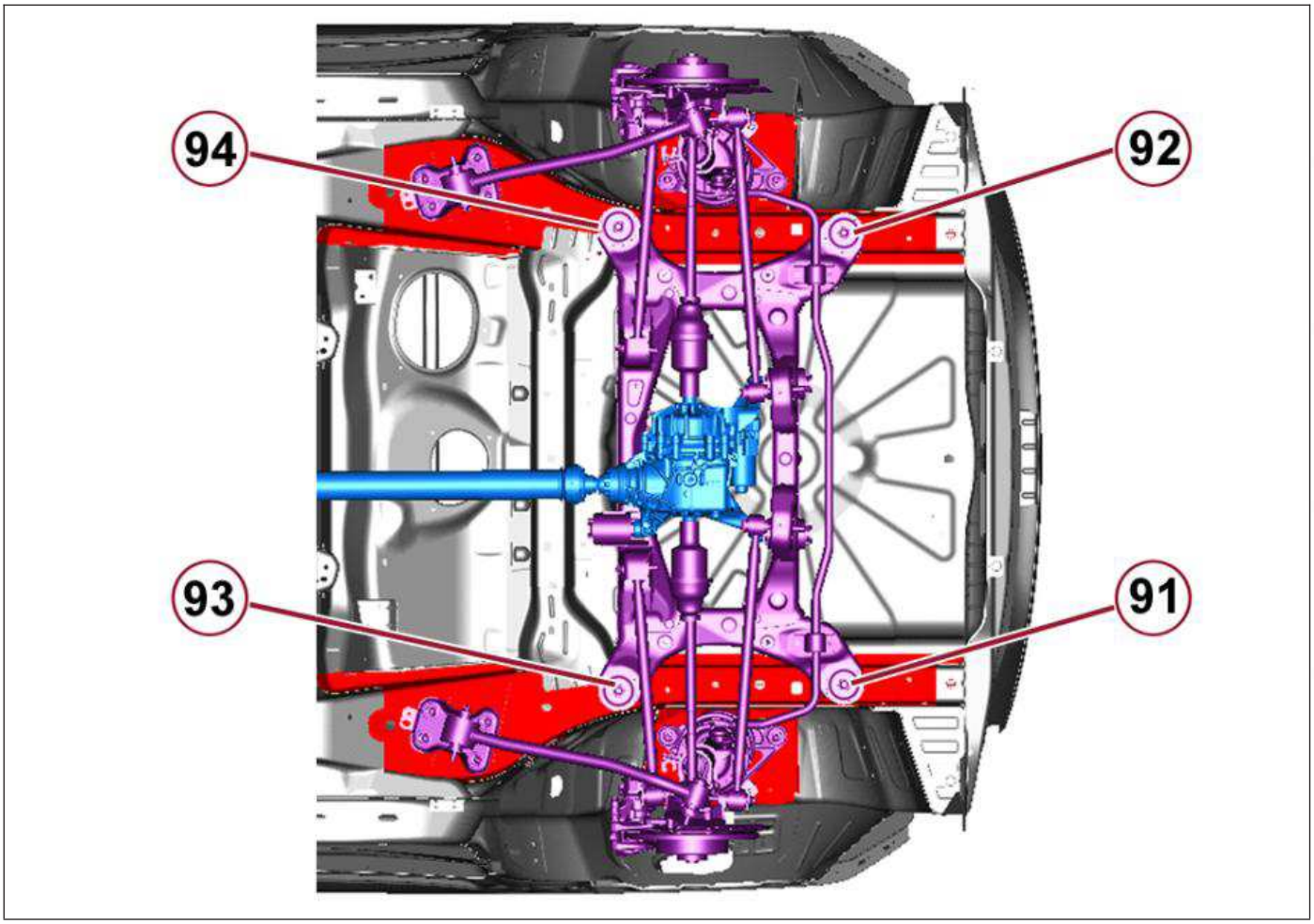


Rear suspension mounting 1 of 2

NOTE: **"*" Front Wheel Drive (FWD) dimension.**

	W			K		
Ref	X	Y	Z	X	Y	Z

75*	2165.0	861.0	186.9	-76.0	-7.5	0.0
76*	2165.0	-65.0	186.9	-76.0	-933.5	0.0
77*	1875.0	874.0	186.9	-366	5.5	0.0
78*	1875.0	-78.0	186.9	-366	-946.5	0.0
79	1472.2	-175.2	79.4	-768.8	-1043.7	-107.6
80	1487.1	-120.0	84.1	-753.9	-988.5	-102.8
81	1580.0	-219.7	113.9	-661.0	-1088.2	-73.0
82	1601.1	-141.4	120.7	-639.9	-1009.9	-66.3
83	1487.1	916.0	84.1	-753.9	47.5	-102.8
84	1472.2	971.2	79.4	-768.8	102.7	-107.6
85	1601.1	937.4	120.7	-639.9	68.9	-66.3
86	1580.0	1015.7	113.9	-661.0	147.2	-73.0
87	2032.6	-283.0	682.8	-208.4	-1151.5	495.9
88	2149.1	-282.6	672.6	-91.9	-1151.1	485.7
89	2032.6	1079.0	682.8	-208.4	210.5	495.9
90	2149.1	1078.6	672.6	-91.9	210.1	485.7

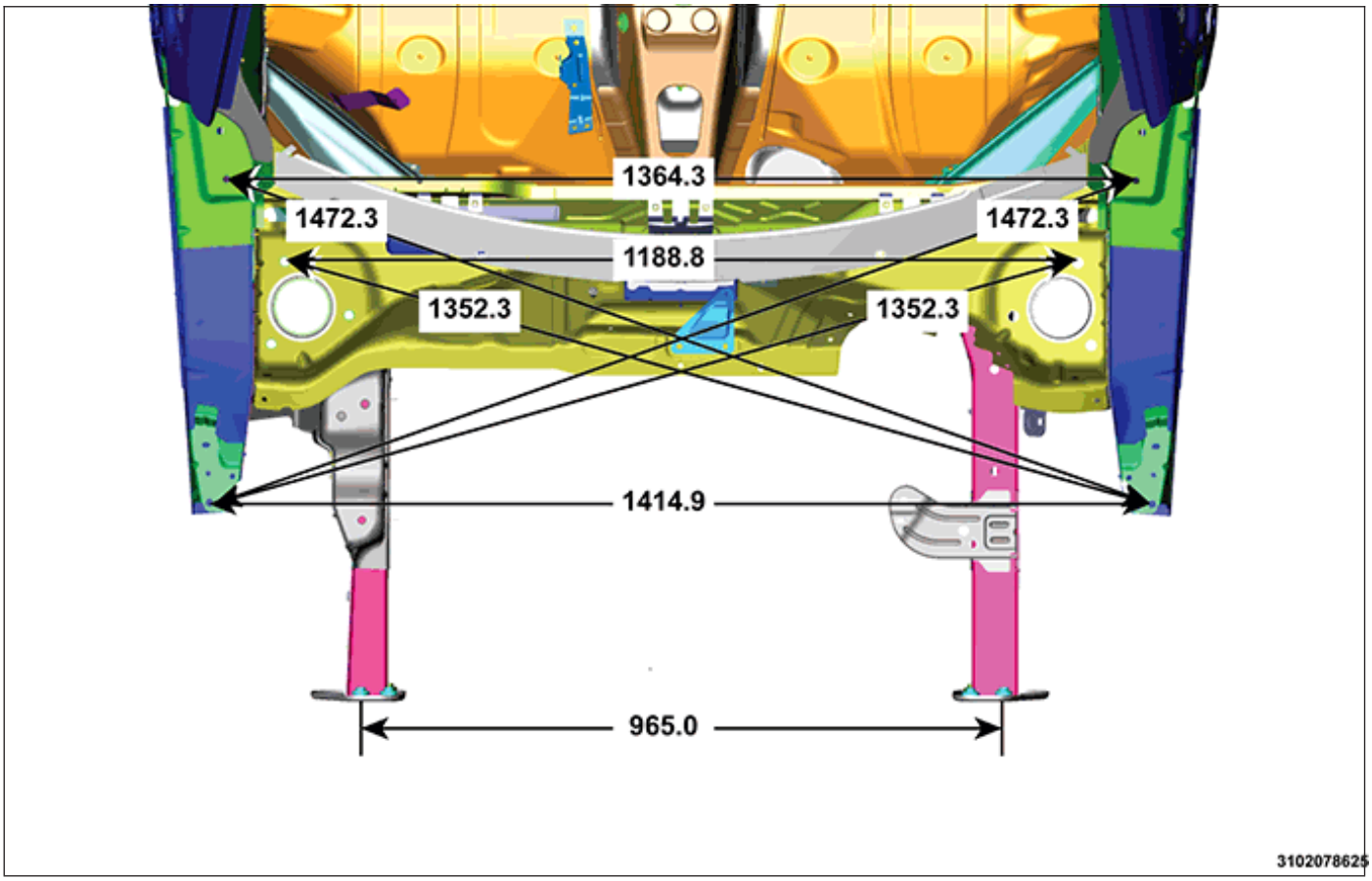


Rear suspension mounting 2 of 2

NOTE: "*" All Wheel Drive (AWD) dimension.

	W	K

Ref	X	Y	Z	X	Y	Z
91*	2338.0	861.0	186.9	97.0	-7.5	0.0
92*	2338.0	-65.0	186.9	97.0	-933.5	0.0
93*	1875.0	874.0	186.9	-366.0	5.5	0.0
94*	1875.0	-78.0	186.9	-366.0	-946.5	0.0



Under Hood Dimensions

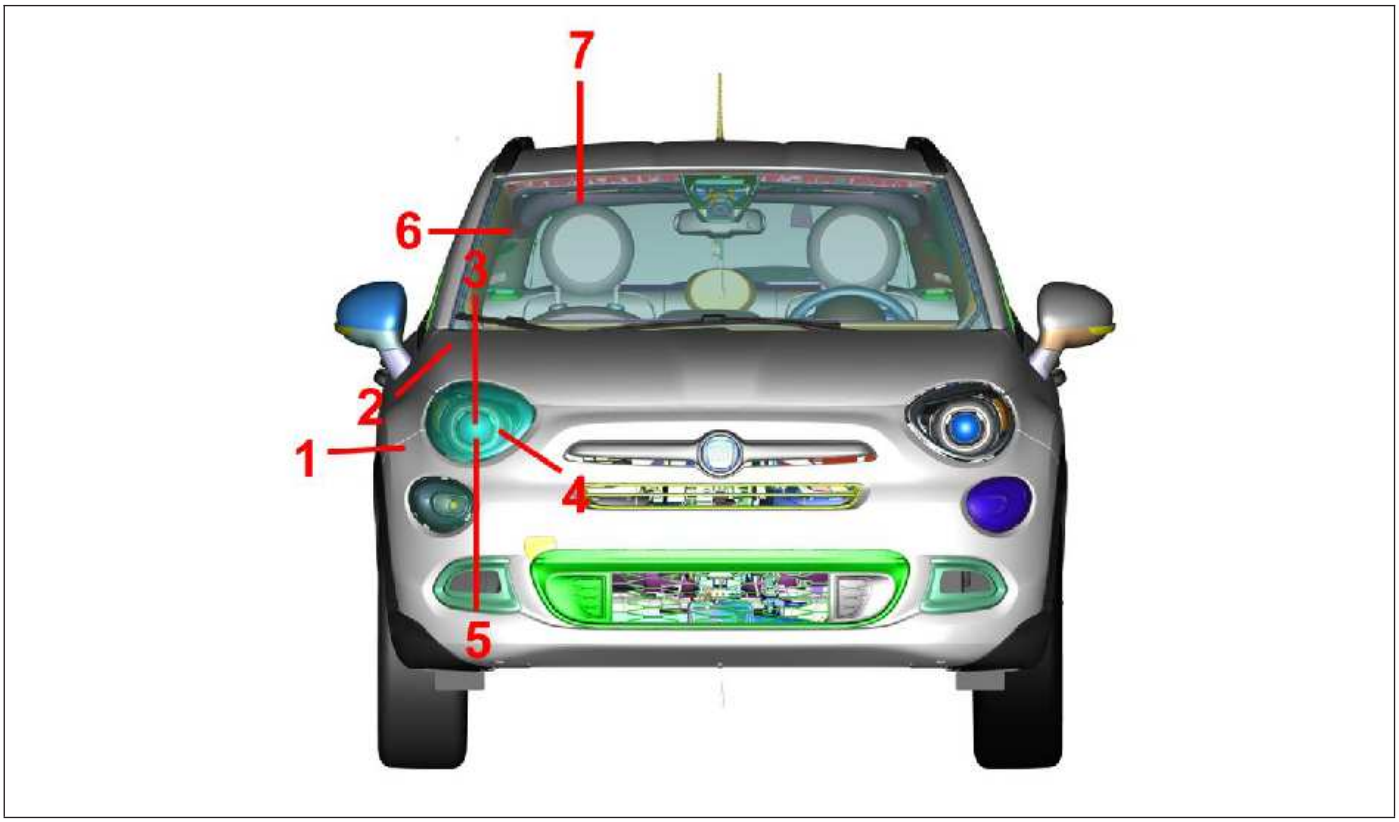
BODY GAP AND FLUSH MEASUREMENTS

ADJUSTMENT OF MOVING PARTS

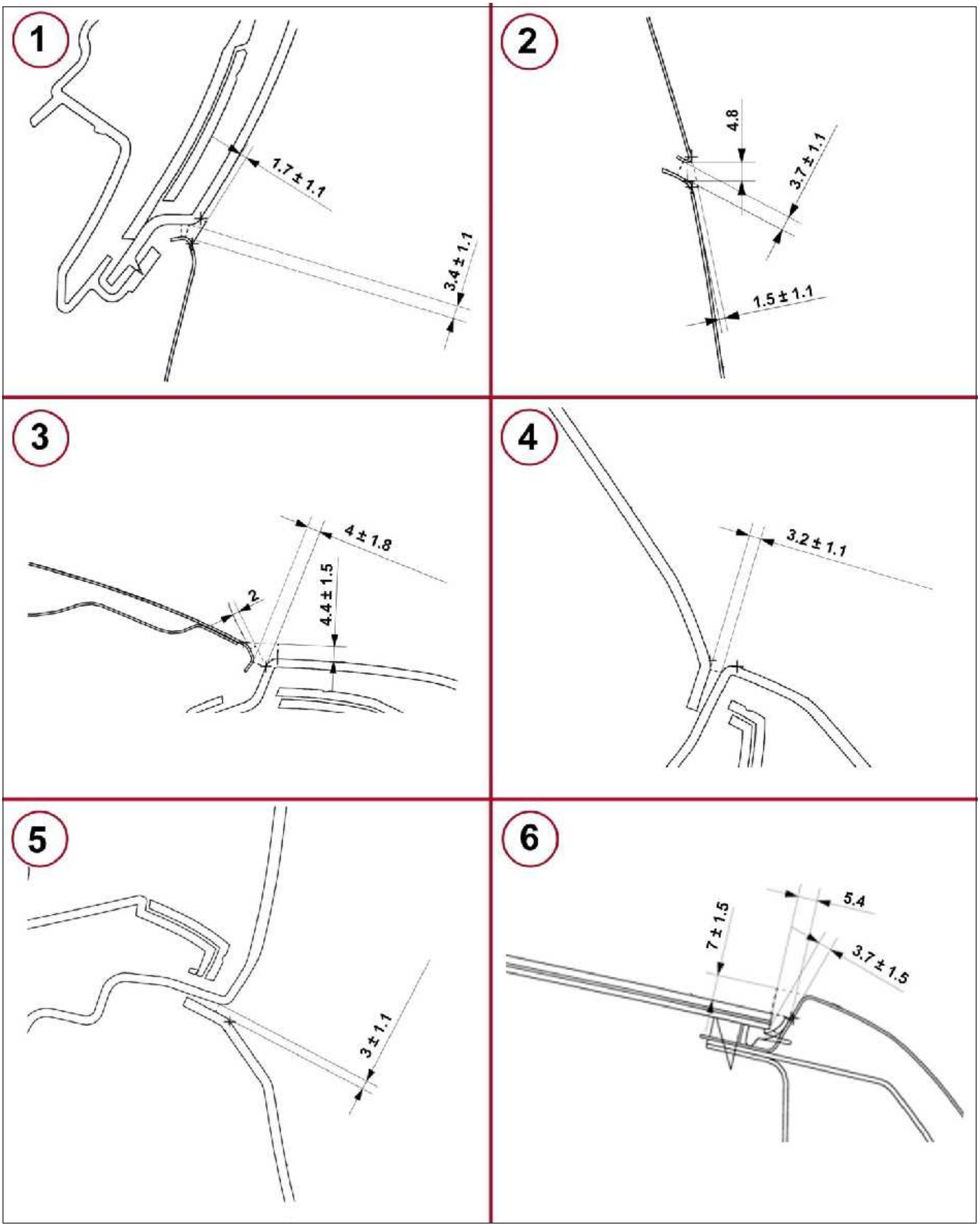
Measurements for the adjustments of moving parts

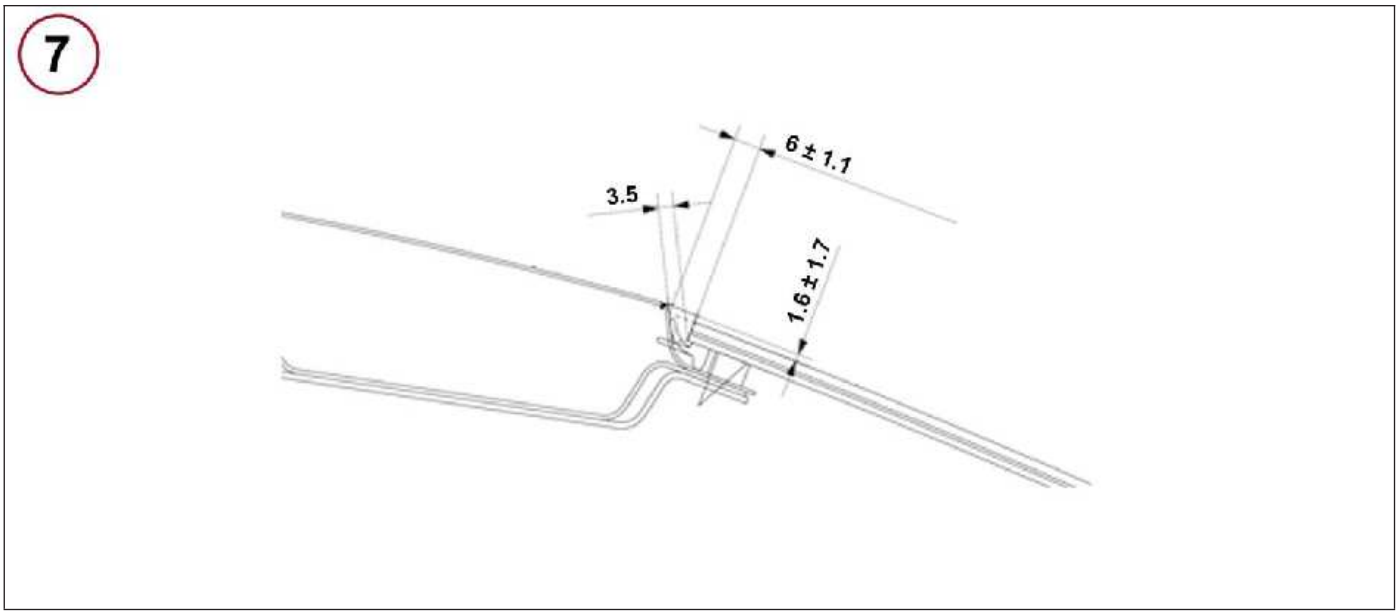
To facilitate and verify moving parts disassembly operations, the existing gaps are shown (in millimeters) to allow appropriate adjustment.

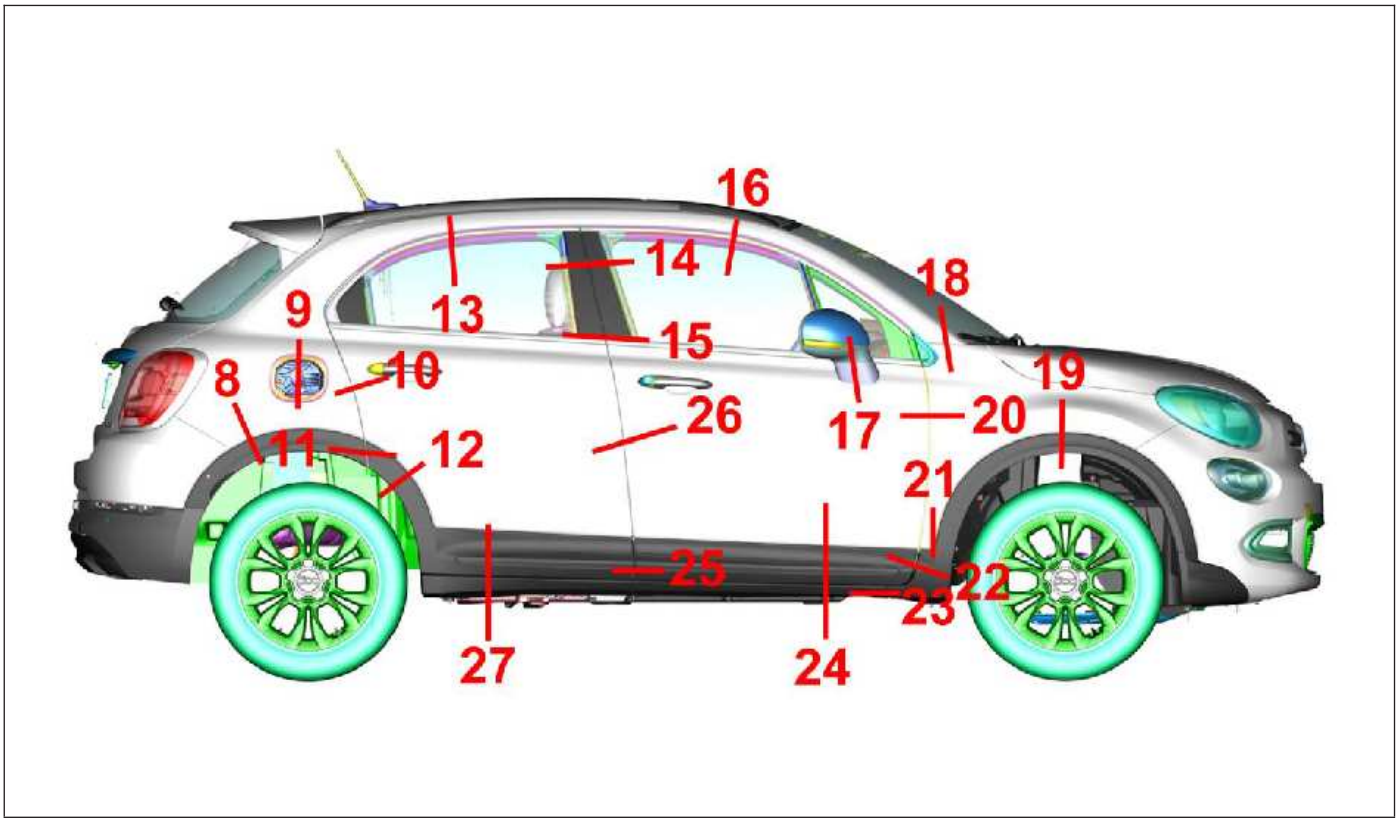
The adjustment procedure is explained in the sections describing moving part removal and installation procedures.



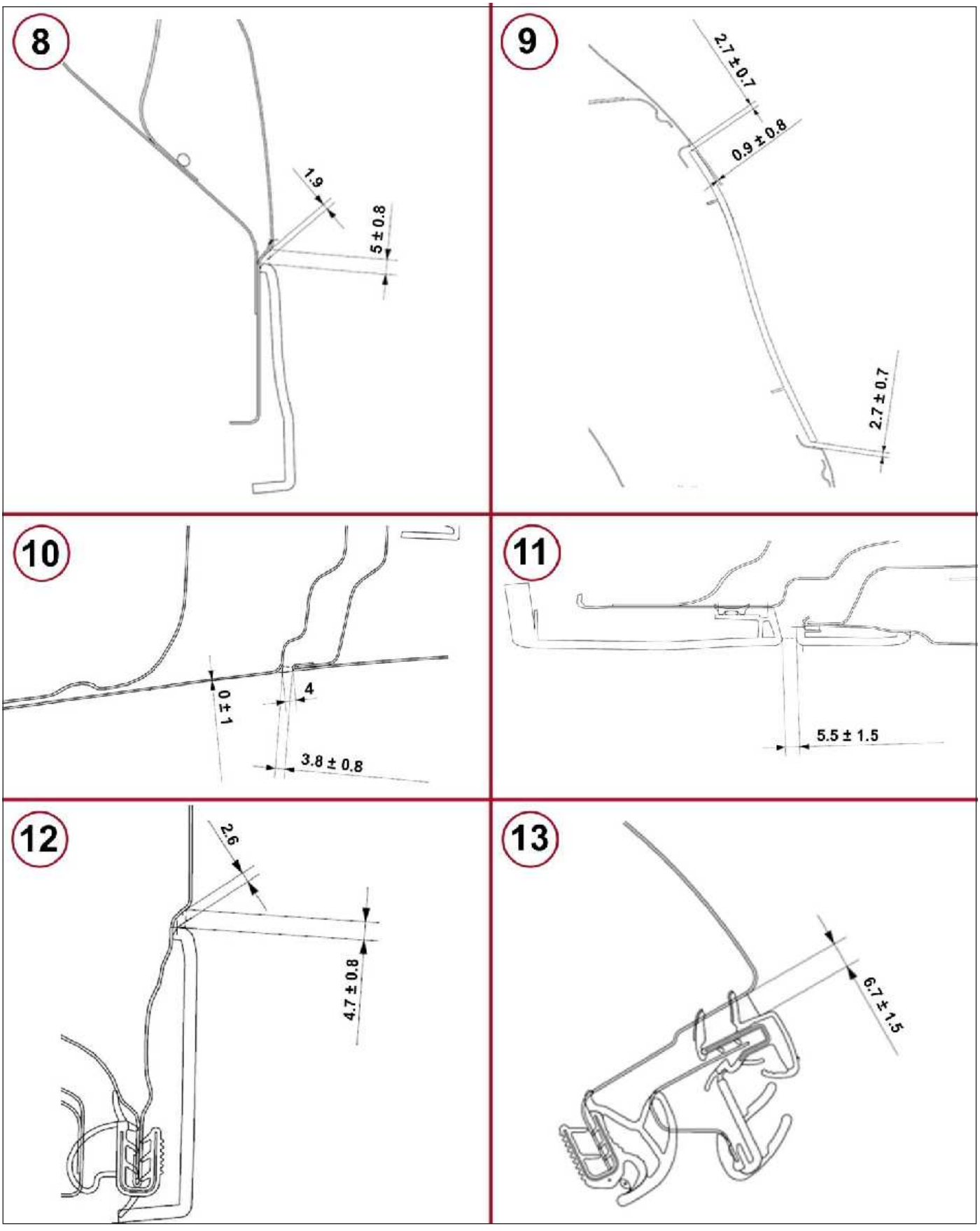
Front view of the vehicle with the position for measuring the gaps between the moving parts


1
1.7 ± 1.1
3.4 ± 1.1
2
4.8
3.7 ± 1.1
1.5 ± 1.1
3
4 ± 1.8
2
4.4 ± 1.5
4
3.2 ± 1.1
5
3 ± 1.1
6
7 ± 1.5
5.4
3.7 ± 1.5

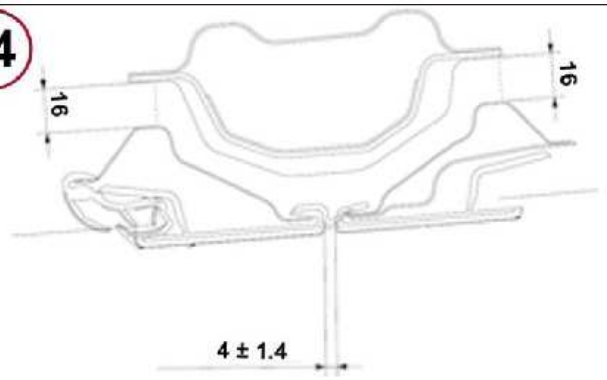




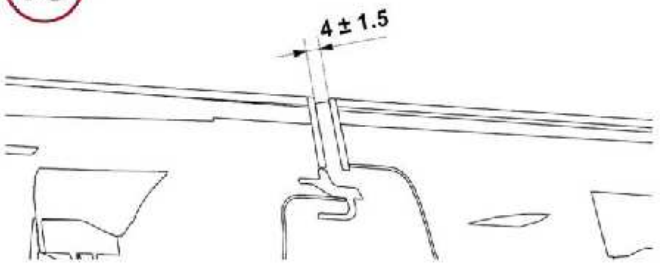
Side view of the vehicle with the position for measuring the gaps between the moving parts


8
1.9
5 ± 0.8
9
2.7 ± 0.7
0.9 ± 0.8
2.7 ± 0.7
10
0 ± 1
4
3.8 ± 0.8
11
5.5 ± 1.5
12
2.6
4.7 ± 0.8
13
6.7 ± 1.5

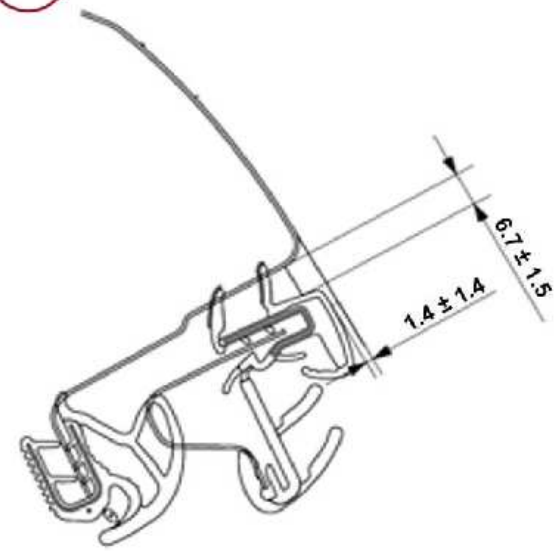
14



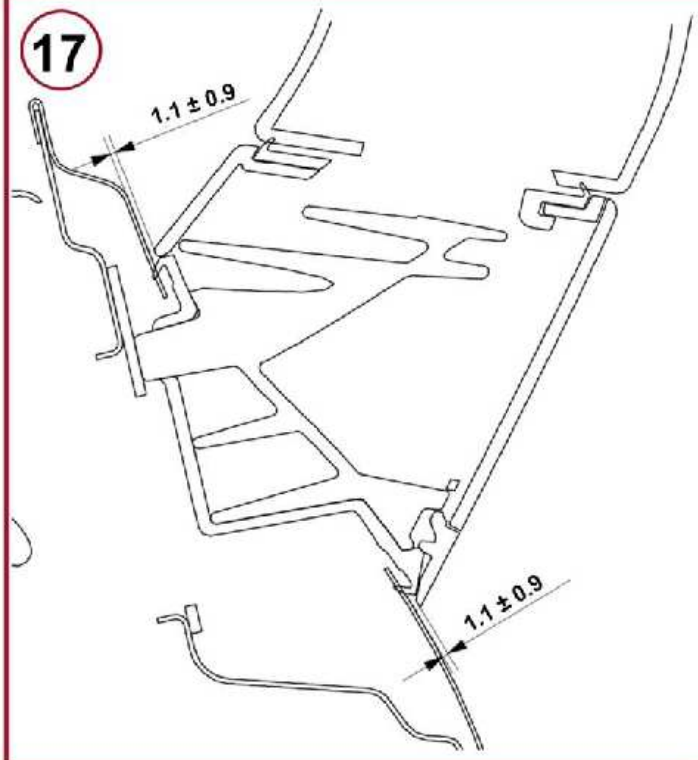
15



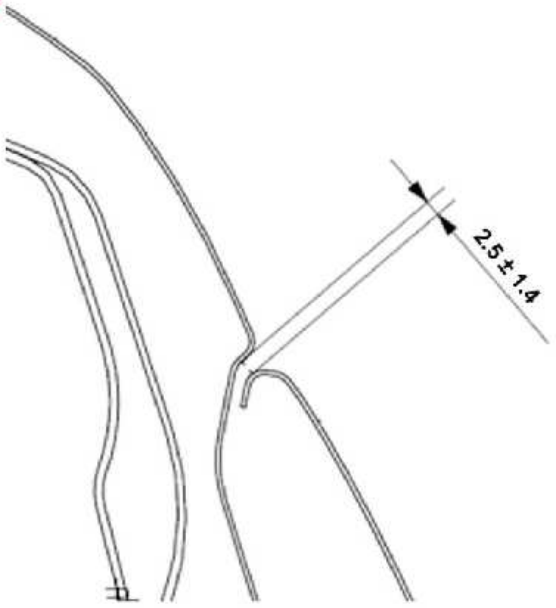
16



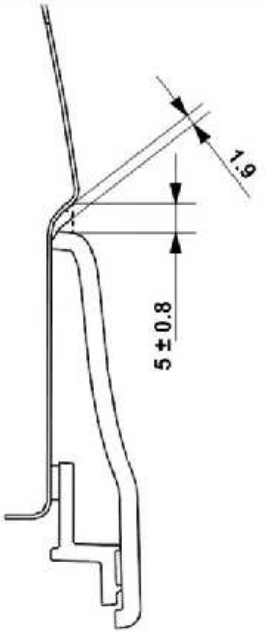
17



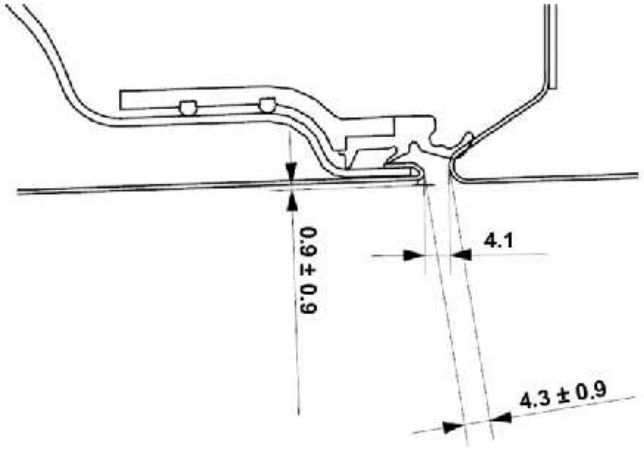
18



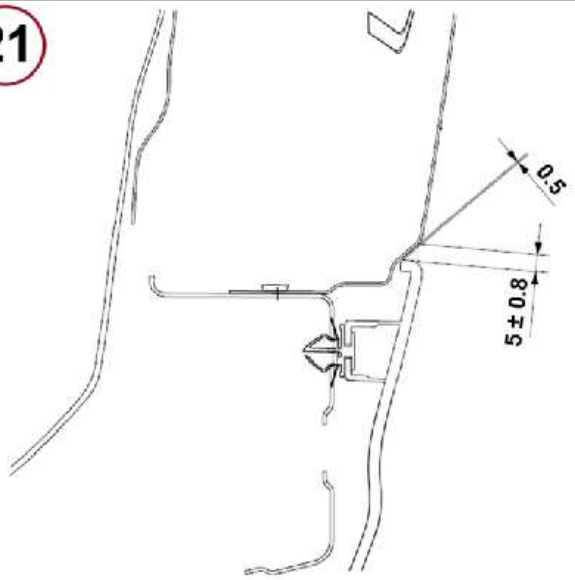
19



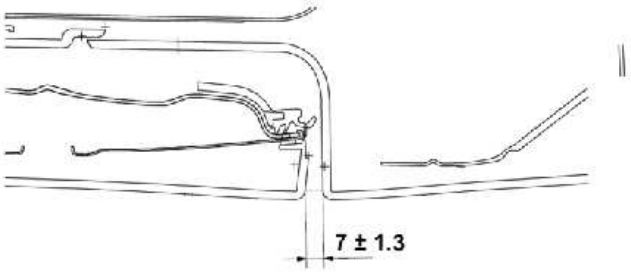
20



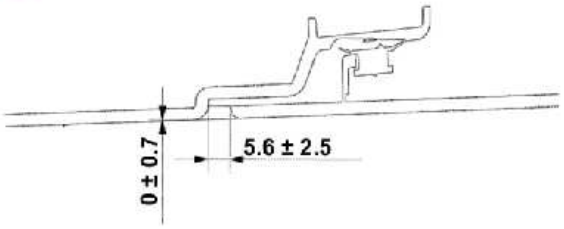
21



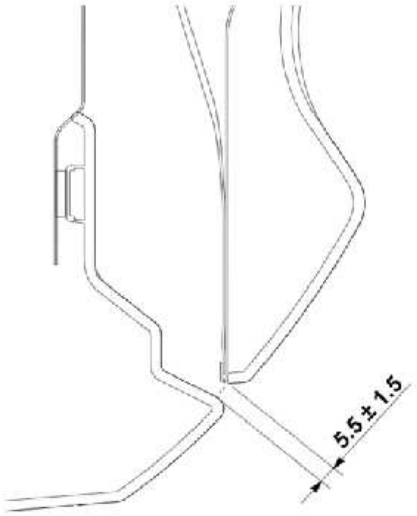
22

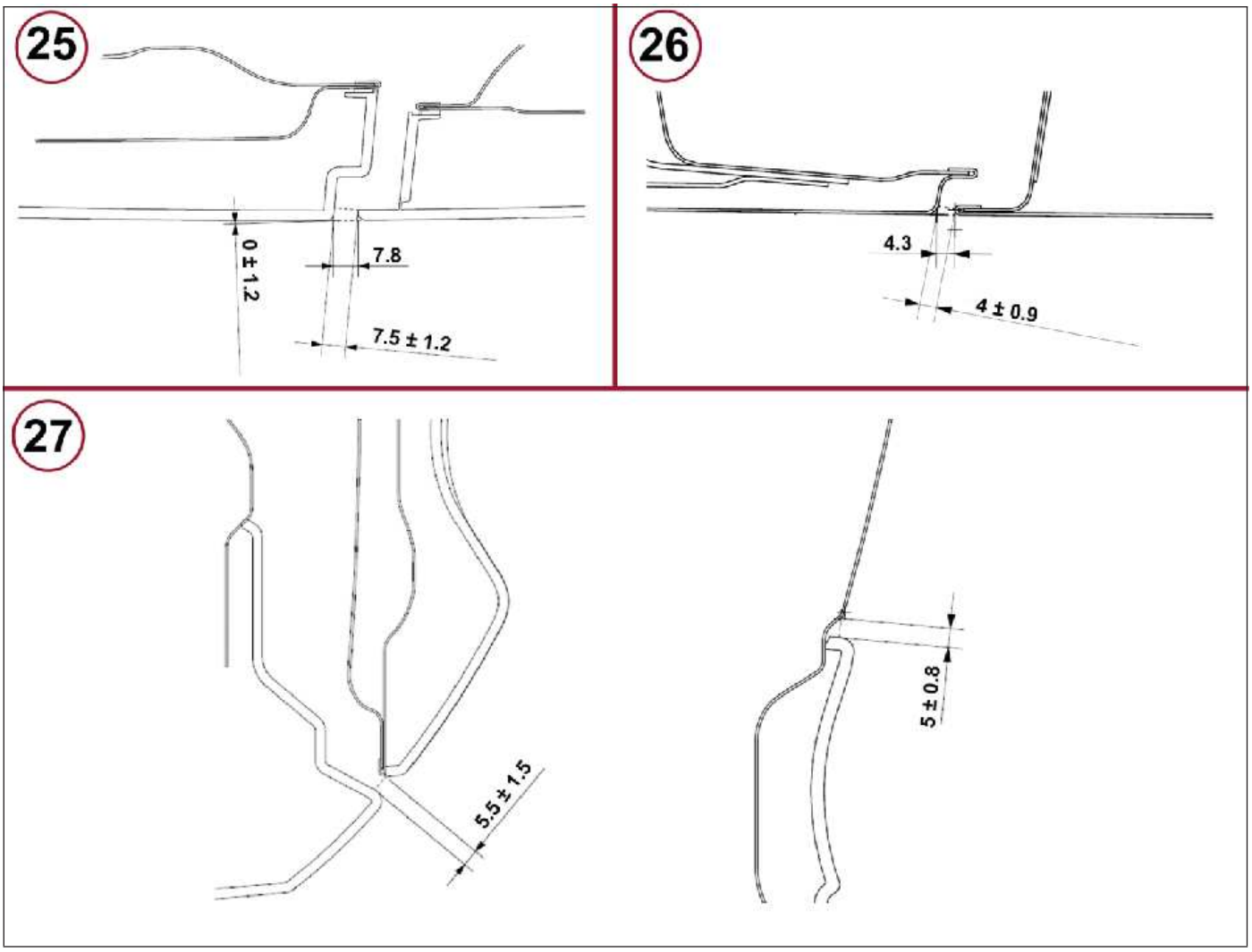


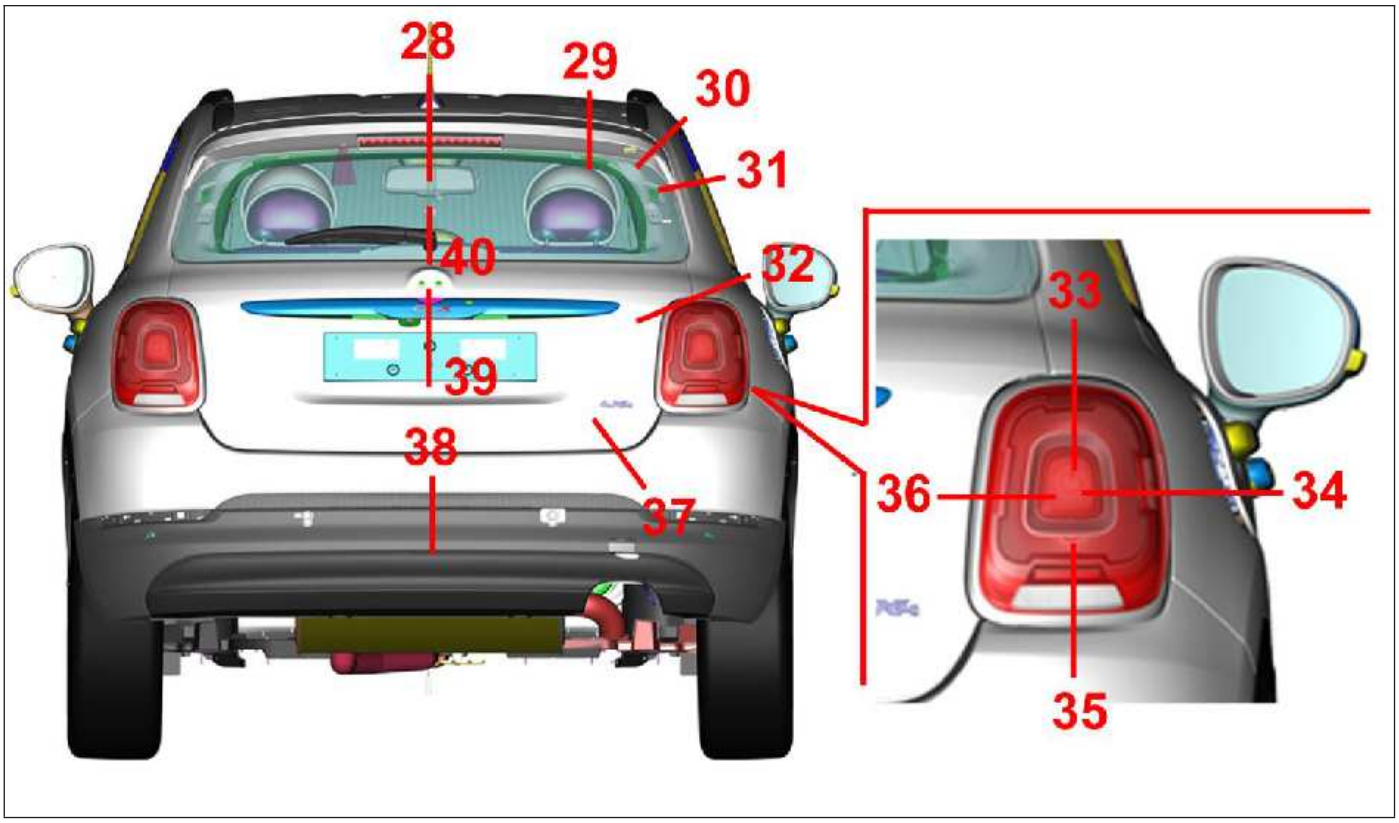
23



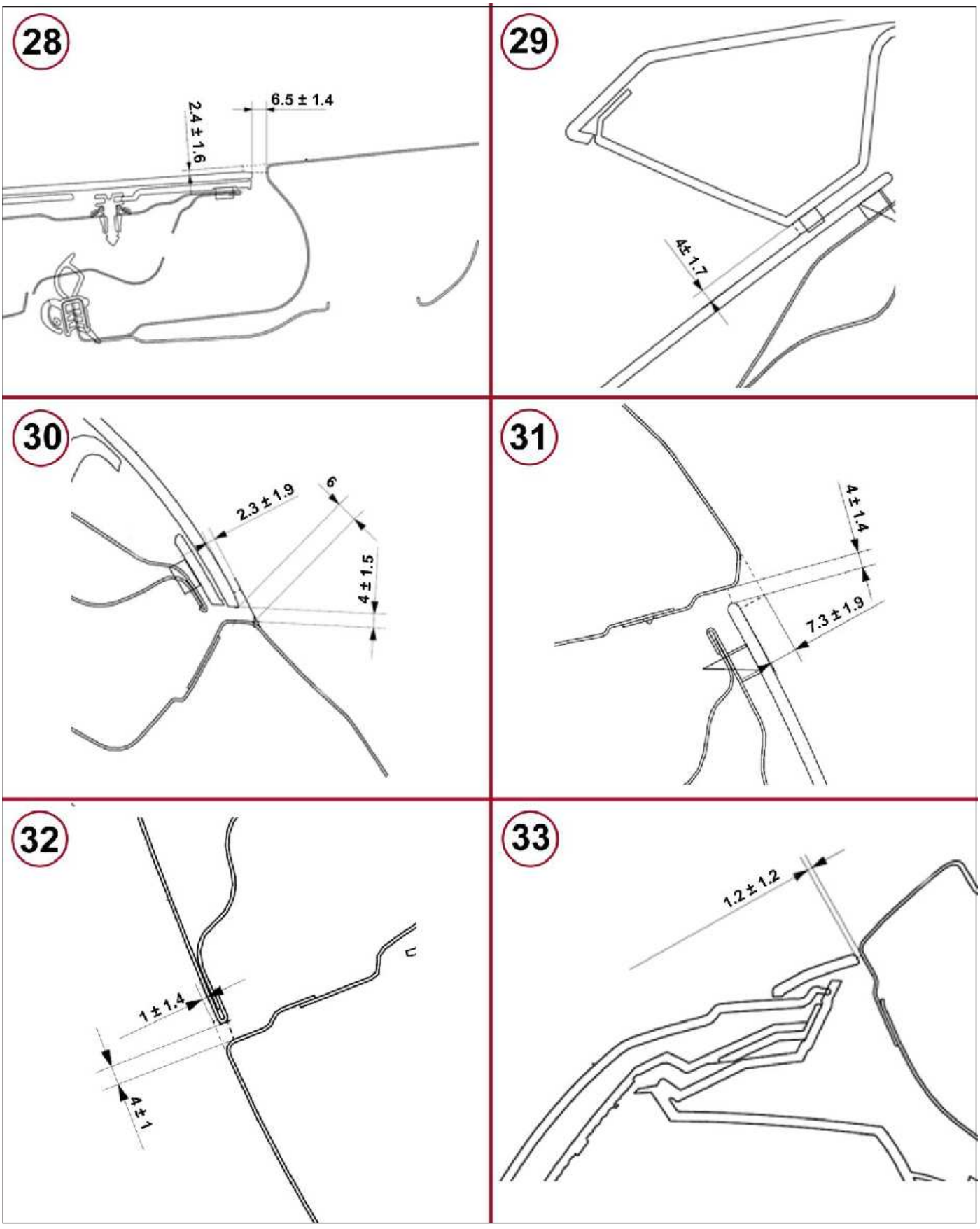
24

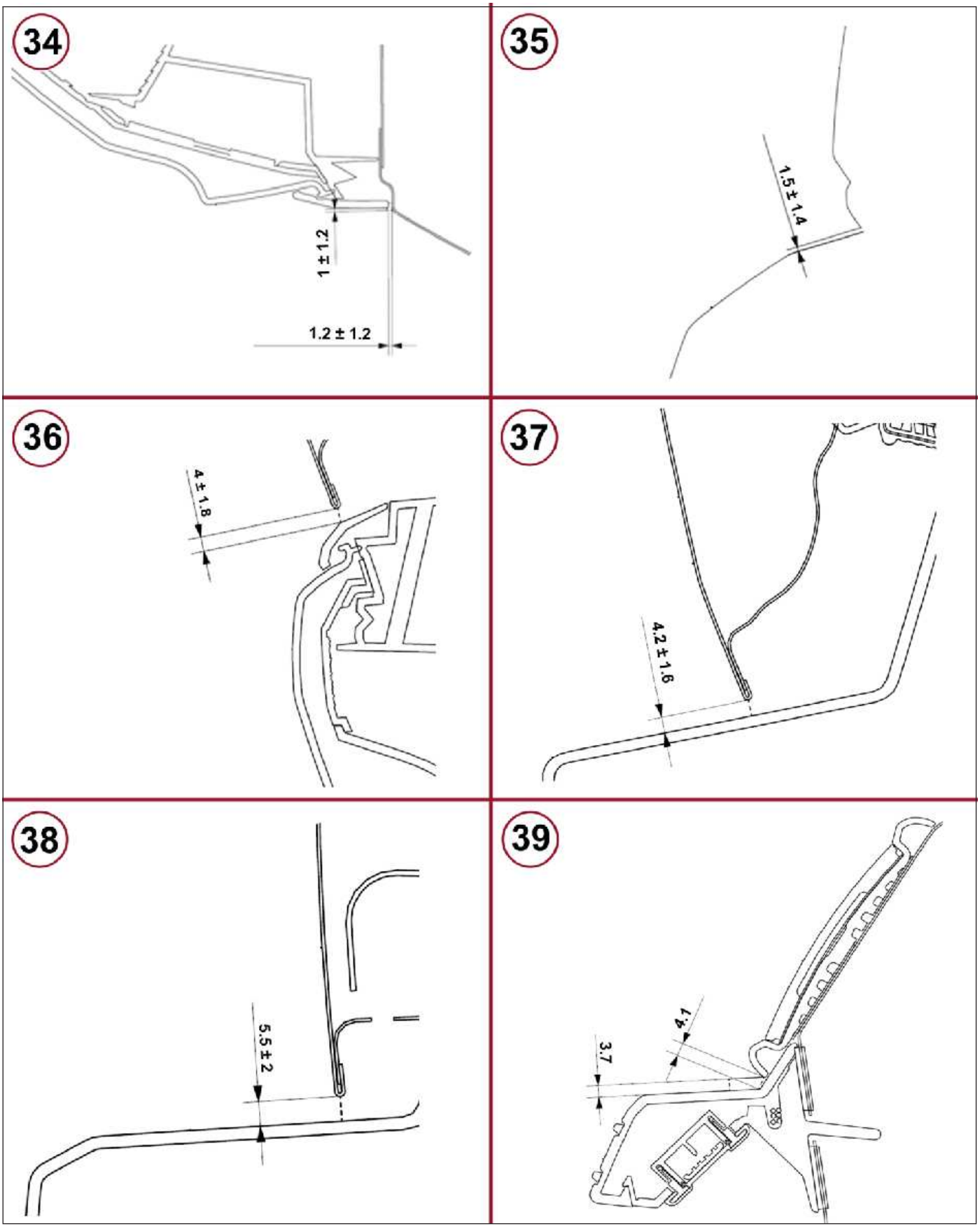


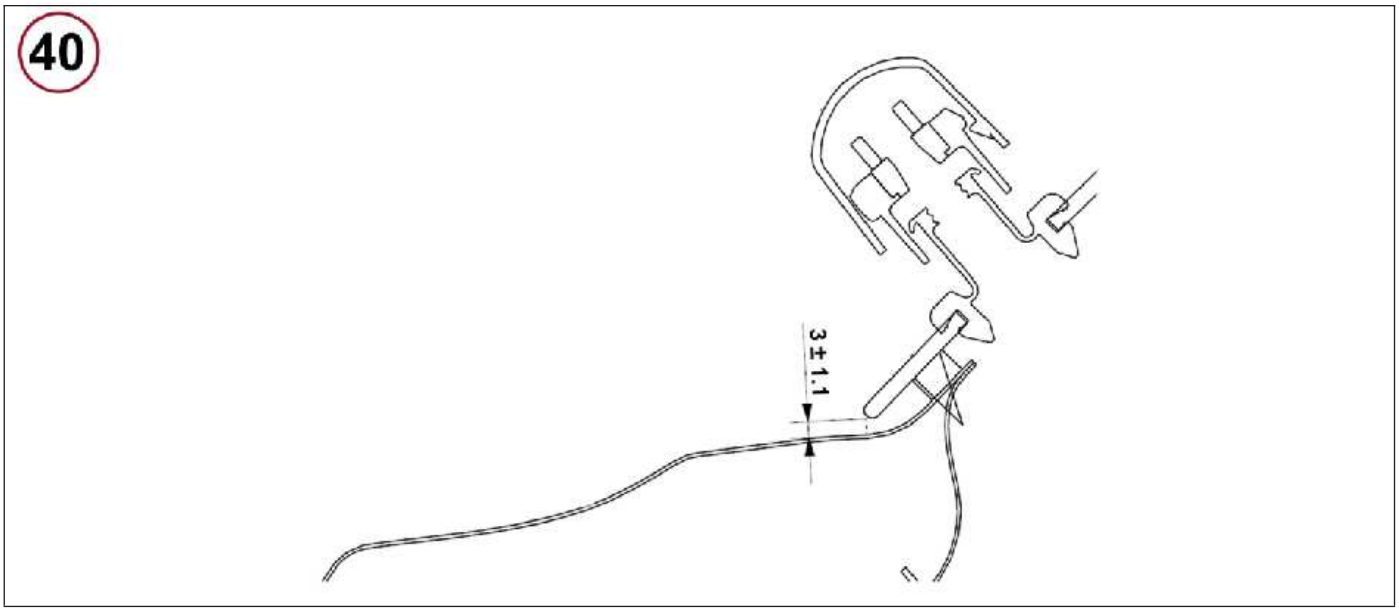

25
0 ± 1.2
7.8
7.5 ± 1.2
26
4.3
4 ± 0.9
27
5.5 ± 1.5
5 ± 0.8

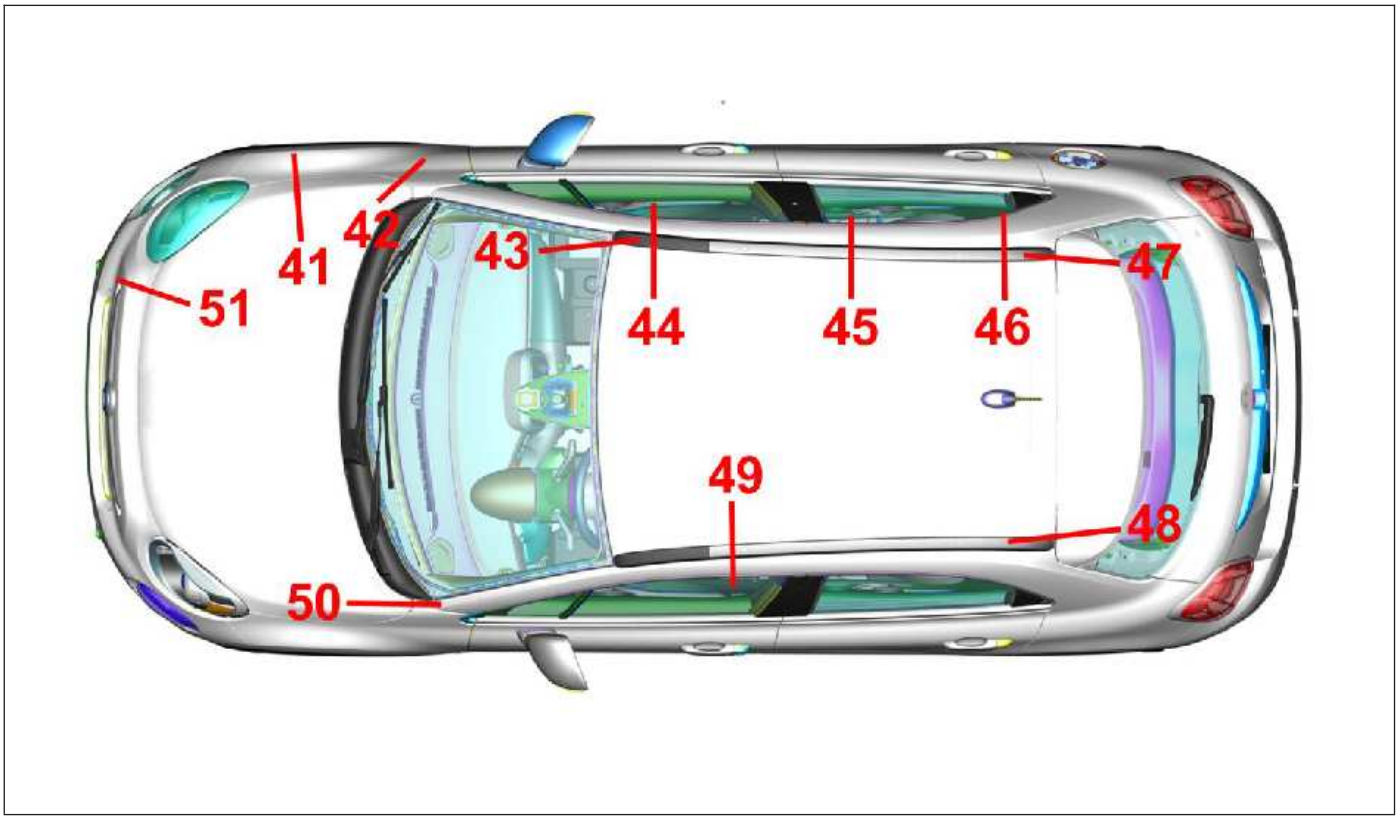


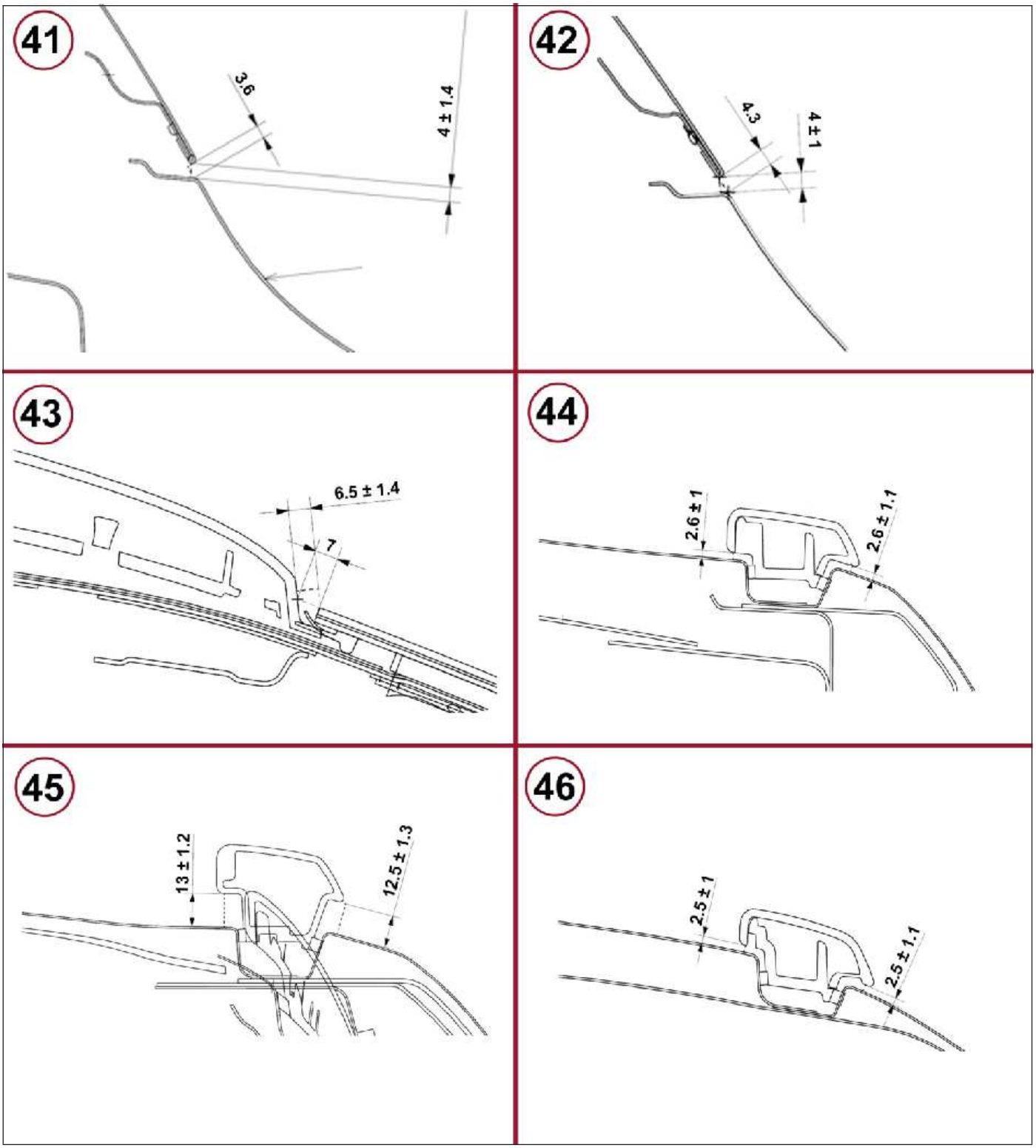
Rear view of the vehicle with the position for measuring the gaps between the moving parts

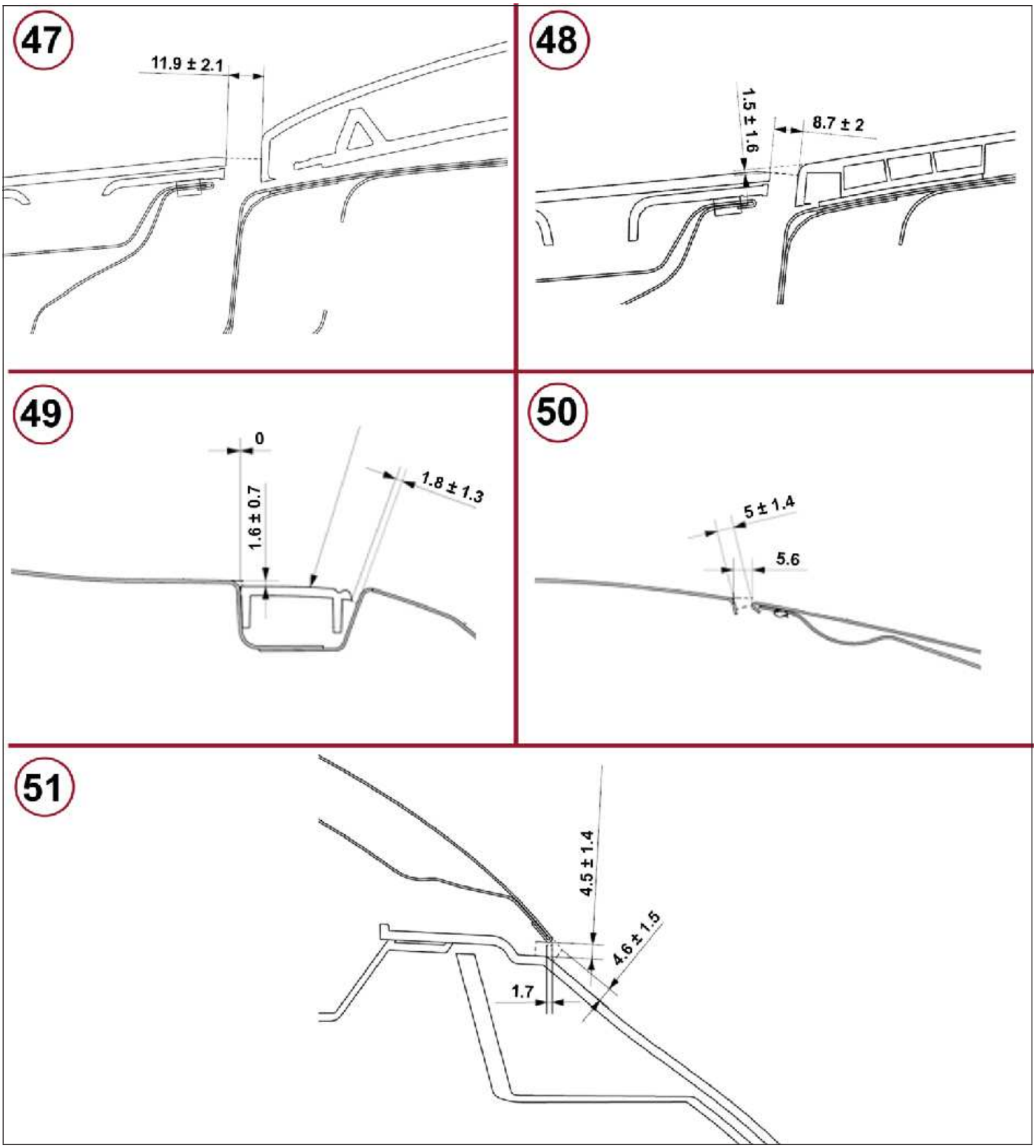

28
6.5 ± 1.4
2.4 ± 1.6
29
4± 1.7
30
2.3 ± 1.9
6
4 ± 1.5
31
4 ± 1.4
7.3 ± 1.9
32
1 ± 1.4
4 ± 1
33
1.2 ± 1.2

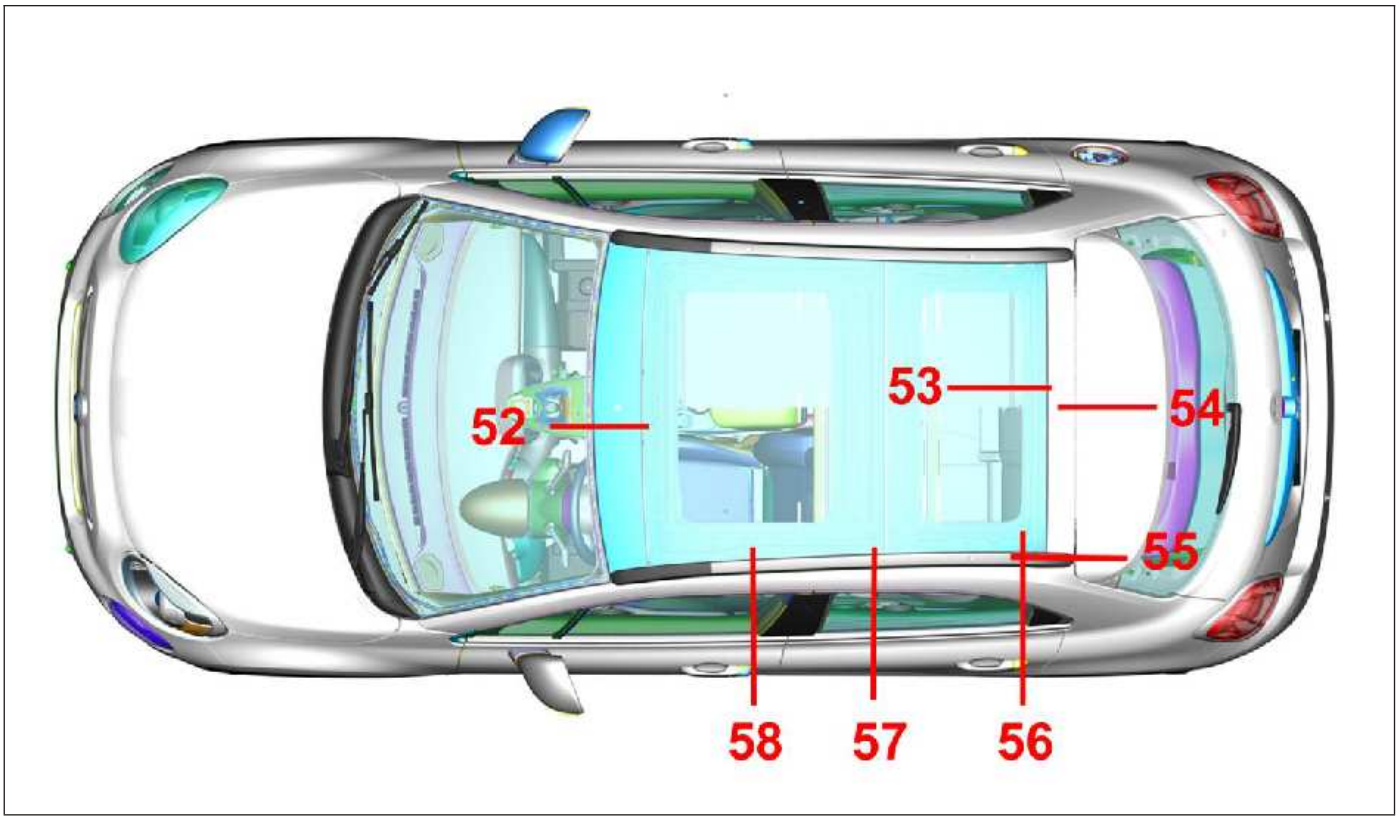

34
1 ± 1.2
1.2 ± 1.2
35
1.5 ± 1.4
36
4 ± 1.8
37
4.2 ± 1.6
38
5.5 ± 2
39
3.7
1.2

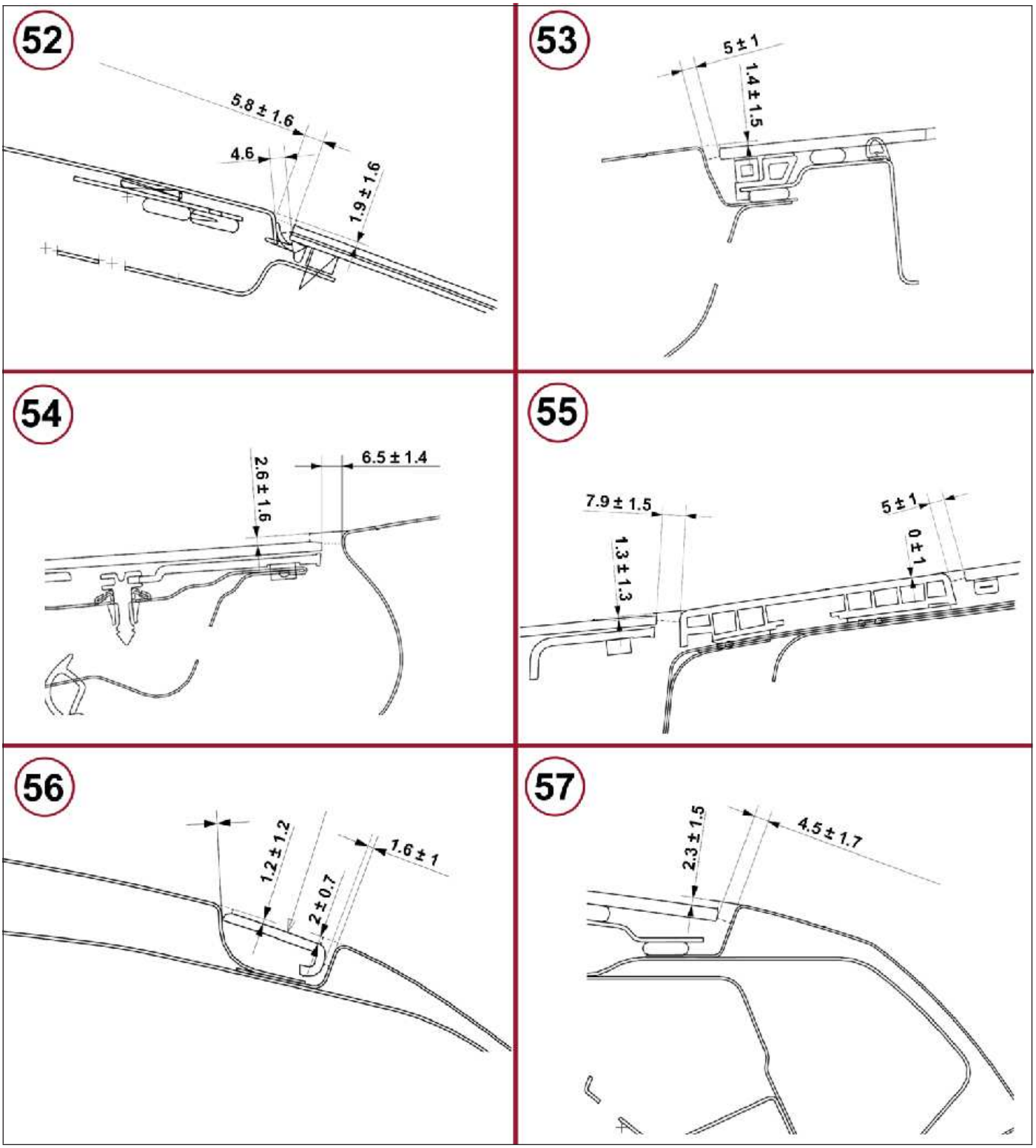

40
3±1.1

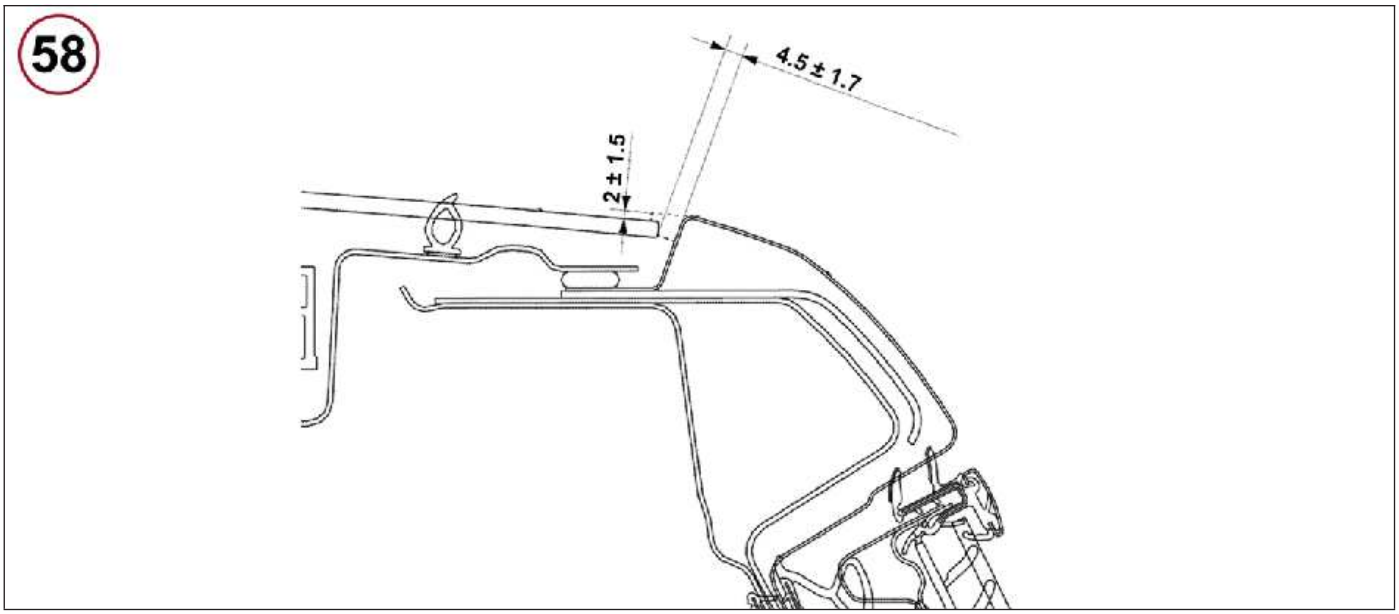

41
42
43
44
45
46
47
48
49
50
51


41
3.6
4 ± 1.4
42
4.3
4 ± 1
43
6.5 ± 1.4
7
44
2.6 ± 1
2.6 ± 1.1
45
13 ± 1.2
12.5 ± 1.3
46
2.5 ± 1
2.5 ± 1.1


47
11.9 ± 2.1
48
1.5 ± 1.6
8.7 ± 2
49
0
1.6 ± 0.7
1.8 ± 1.3
50
5 ± 1.4
5.6
51
4.5 ± 1.4
4.6 ± 1.5
1.7


52
53
54
55
58
57
56


52
5.8 ± 1.6
4.6
1.9 ± 1.6
53
5 ± 1
1.4 ± 1.5
54
2.6 ± 1.6
6.5 ± 1.4
55
7.9 ± 1.5
1.3 ± 1.3
5 ± 1
0 ± 1
56
1.2 ± 1.2
2 ± 0.7
1.6 ± 1
57
2.3 ± 1.5
4.5 ± 1.7


58
4.5 ± 1.7
2 ± 1.5

PAINT CODES

Because of late model changes to the available paint colors for each vehicle the current color codes can be found on the Vehicle Certification Label. (Refer to 31 - Collision/Specifications/Vehicle Certification Label)

EXTERIOR COLORS

EXTERIOR COLOR	PAINT CODE
Blu Venezia (Blue Metallic)	PB1
Verde Toscana (Green Metallic)	PGG
Grigio Arte (Gray Clear Coat)	PJ1
Arancio (Orange)	PKP
Pearl Red Tri-Coat	PRB
Rosso Passione (Red Hypnotique Clear Coat)	PR2
Grigio Argento (Gray Metallic)	PSN
Bronzo Magnetico (Bronze Metallic)	PUL
Bronzo Magnetico Opaco (Matte Bronze)	PUM
Bianco Gelato (White Clear Coat)	PWV
Nero Cinema (Black Clear Coat)	PX8
Giollo Tristrato (Tri-Coat Yellow)	PY3

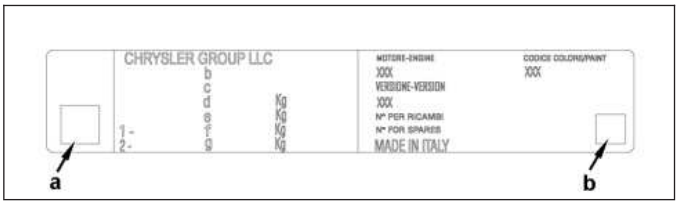
INTERIOR COLORS

INTERIOR COLOR	COLOR CODE
Dark Slate Gray/Light Pebble Beige	DK
Brown	U5
Black/Gray	XH
Black	X9
Black/Red	X4

VEHICLE CERTIFICATION LABEL

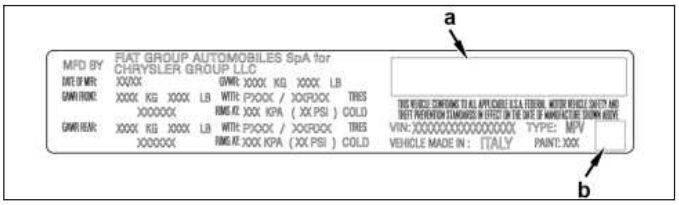
EEC

1. Space reserved for the labeling of the symbol of the corrected absorption coefficient of smoke (diesel engines only)
2. Data Matrix with the information written on the plates



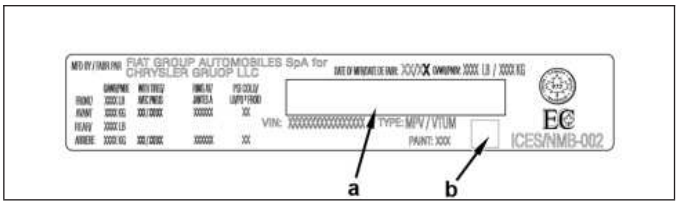
USA

1. Space for the VIN code
2. Data Matrix with the information written on the plates



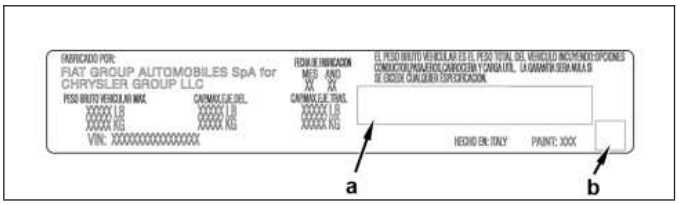
CANADA

1. Space for the VIN code
2. Data Matrix with the information written on the plates



MEXICO

1. Space for the VIN code
2. Data Matrix with the information written on the plates



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

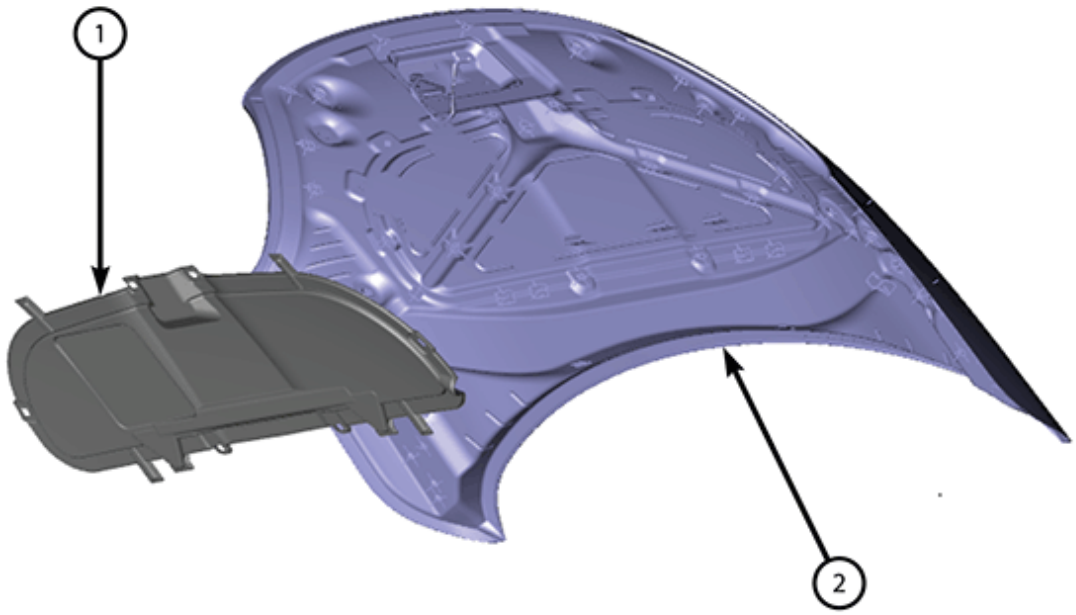
- Several types of sealers and sound deadeners are used during assembly. Therefore, specific applications may not be identified in this publication. General applications and the various types of products for repair will be featured to identify and replace OEM sealers and sound deadeners.

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 insure tight fit and proper seal.
- Equalize 2K Products according to adhesive manufacturer’s recommendations.
- Always follow manufacturer’s recommendations for storage, usage and application to achieve best performance of the product.

SOUND DEADENER LOCATIONS

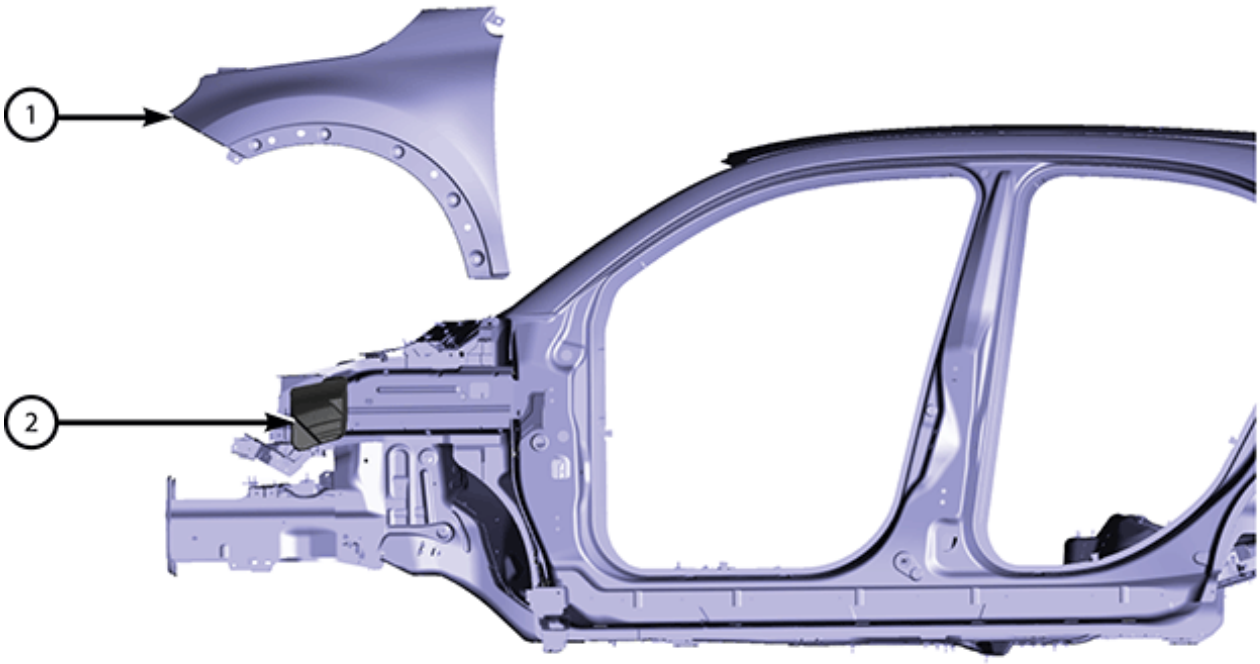
DESCRIPTION	FIGURE
HOOD	Figure 1
FRONT FENDER	Figure 2
FRONT FRAME RAILS	Figure 3
DASH PANEL (EXTERIOR)	Figure 4
DASH PANEL CROSSMEMBER	Figure 5
DASH PANEL (INTERIOR 1 of 2)	Figure 6
DASH PANEL (INTERIOR 2 of 2)	Figure 7
FRONT FLOOR (1 of 2)	Figure 8
FRONT FLOOR (1 of 2)	Figure 9
TUNNEL (EXTERIOR)	Figure 10
REAR WHEELHOUSE	Figure 11
REAR FLOOR (1 of 3)	Figure 12
REAR FLOOR (2 of 3)	Figure 13
REAR FLOOR (3 of 3)	Figure 14
ROOF PANEL	Figure 15



3102078630

Hood

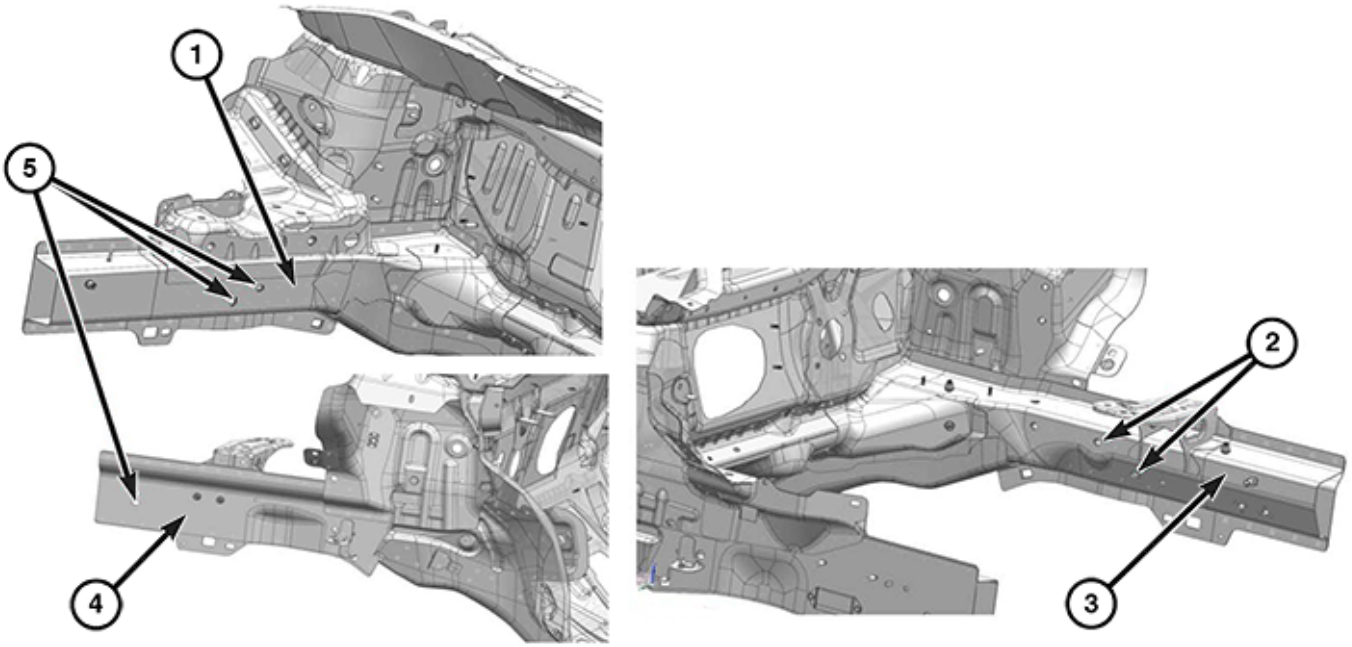
1 - Hood
2 - Hood Insulator Pad



3102078629

Front Fender

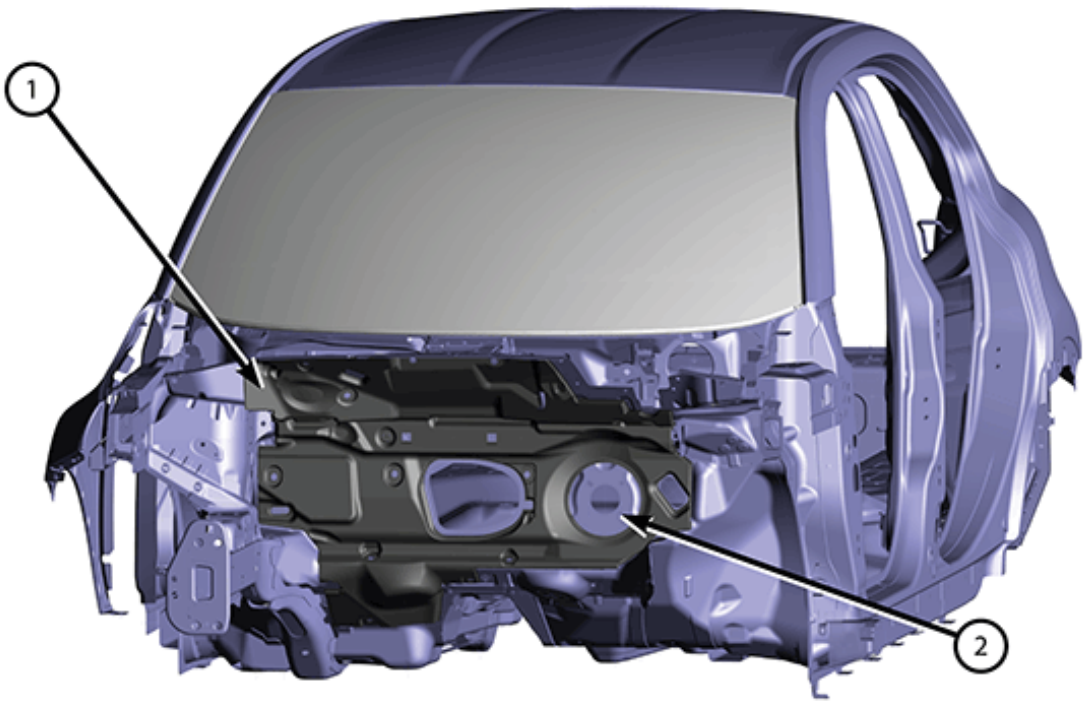
1 - Front Fender
2 - Fender Insulator



3103081424

Front Frame Rails

1 - Right Front Frame Rail (Inner)
2 - TESA Plug (30x30)
3 - Left Front Frame Rail (Inner)
4 - Left Front Frame Rail (Outer)
5 - TESA Plug (30x30)



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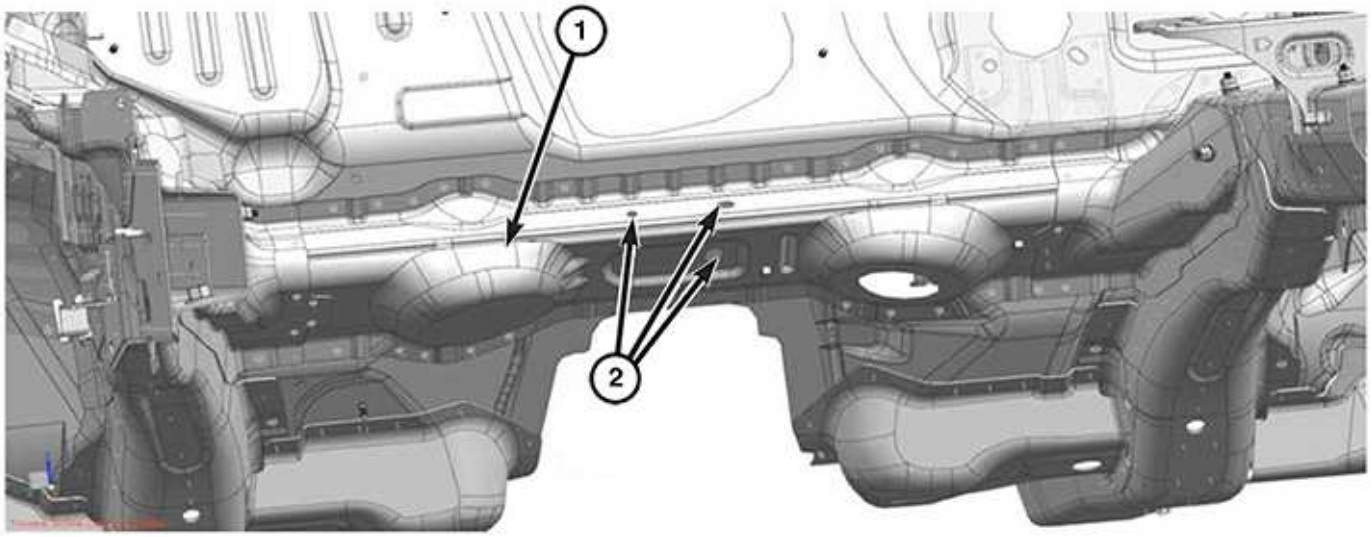
Dash Panel (Exterior)

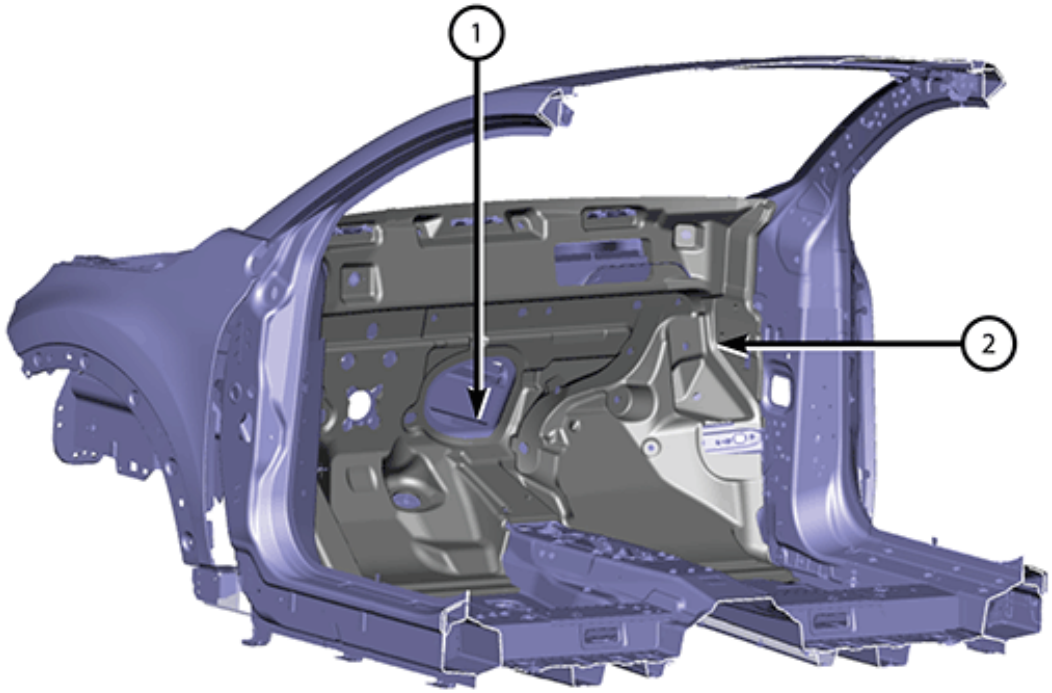
1 - Dash Silencer Pad
2 - Dash Panel



3103081428

Dash Panel Crossmember

1 - Dash Panel Crossmember
2 - TESA Plug (30x30)



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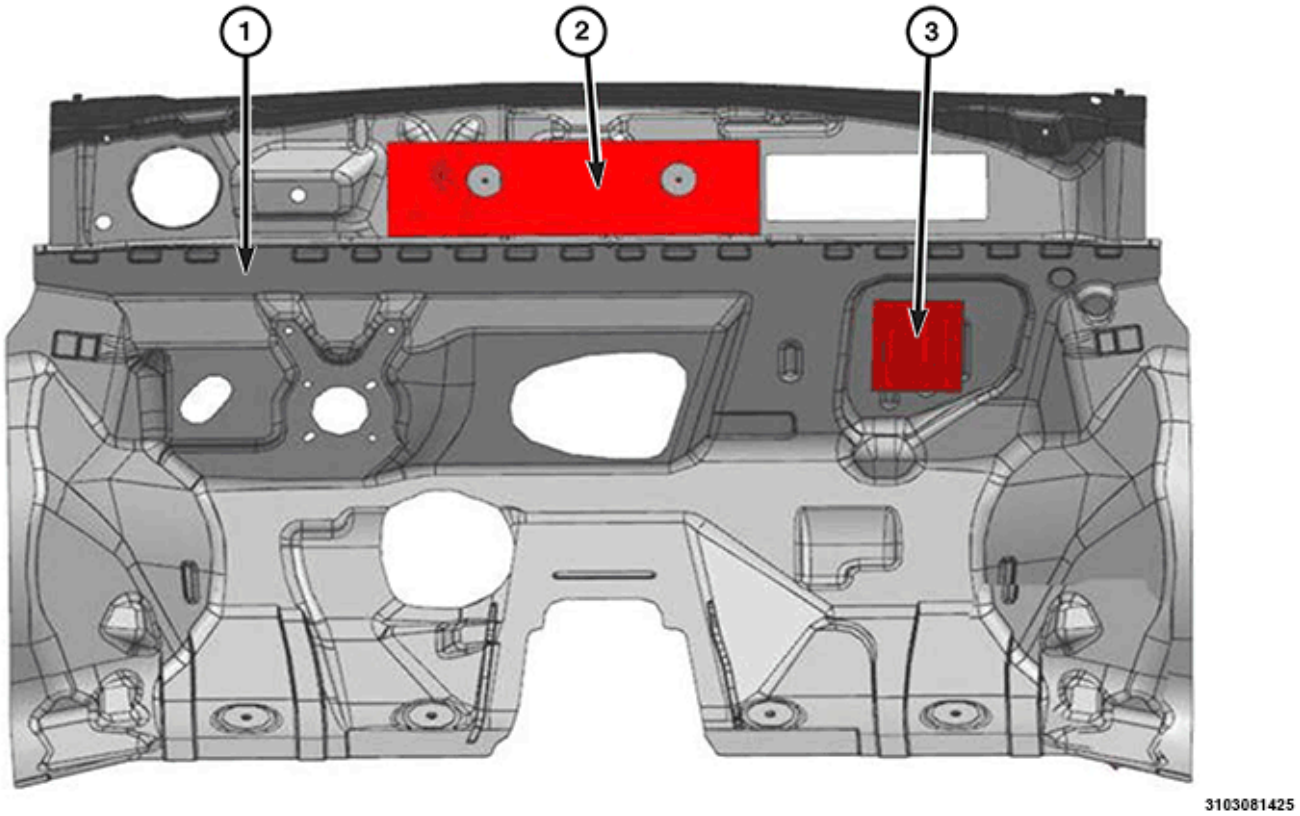
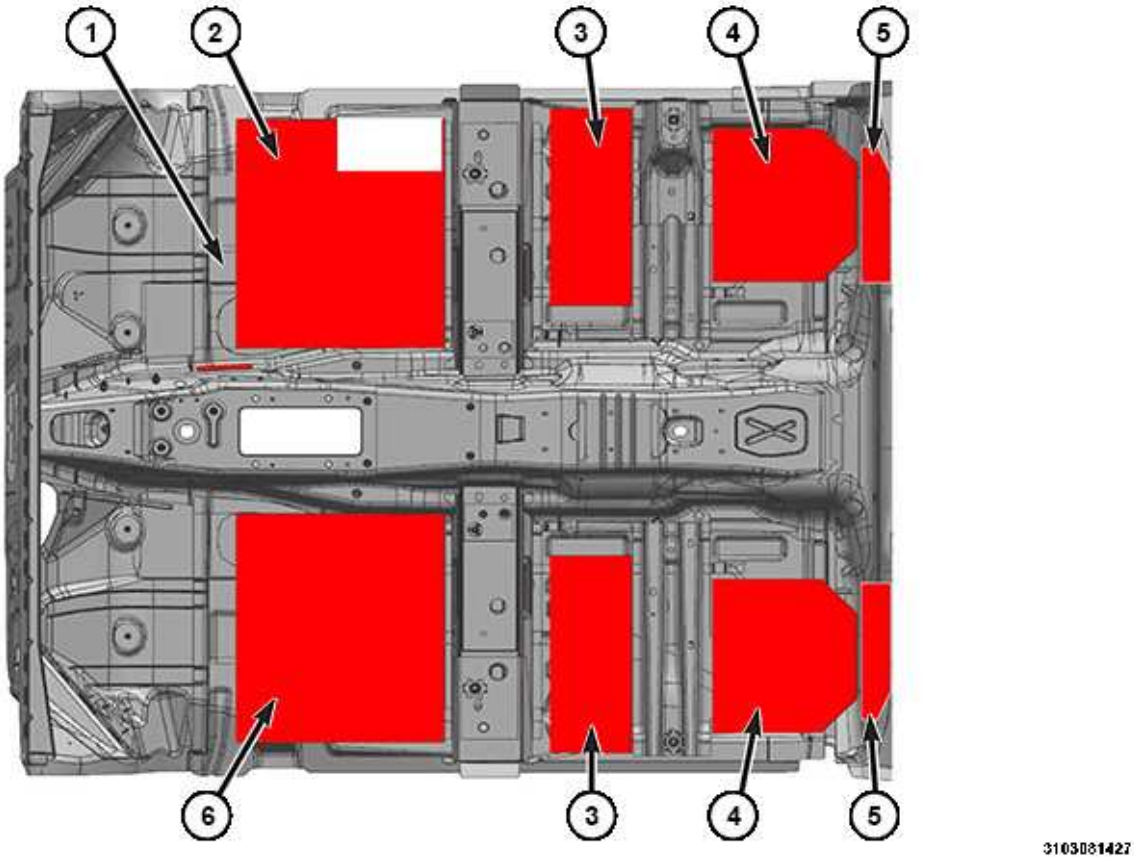
Dash Panel (Interior 1 of 2)

1 - Dash Panel
2 - Dash Silencer Pad



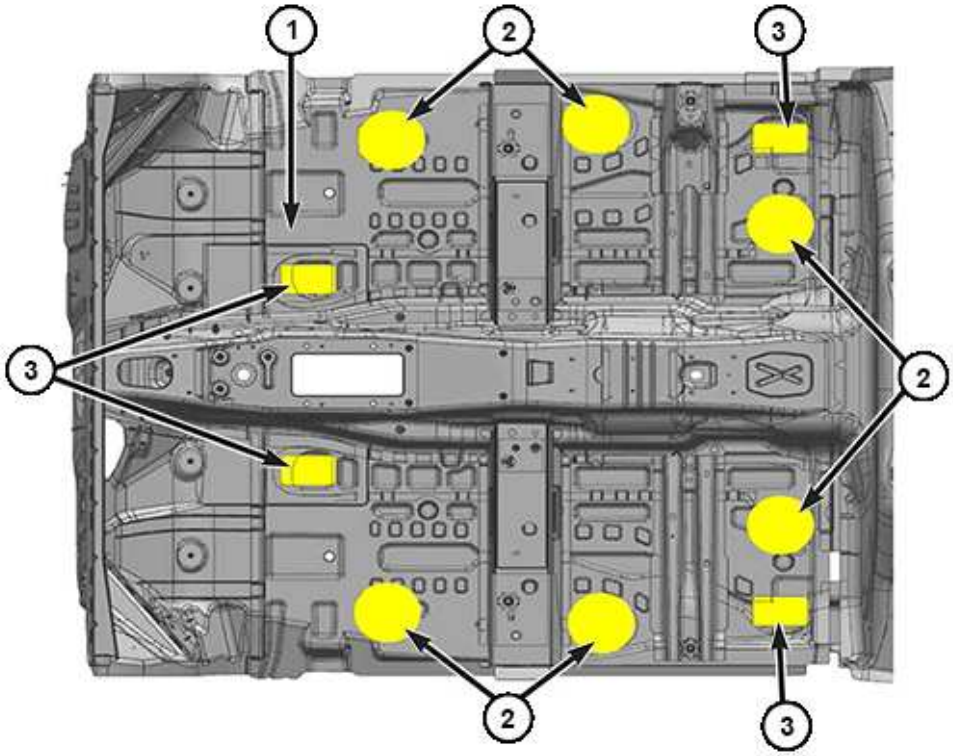
Dash Panel (Interior 2 of 2)

1 - Dash Panel
2 - Mastic Pad (115x415x1.8)
3 - Mastic Pad (100x125x1.8)



Front Floor (1 of 2)

1 - Front Floor
2 - Mastic Pad (400x705x1.8)
3 - Mastic Pad (150x380x1.8)
4 - Mastic Pad (260x295x1.8)
5 - Mastic Pad (180x265x1.8)
6 - Mastic Pad (380x440x1.8)



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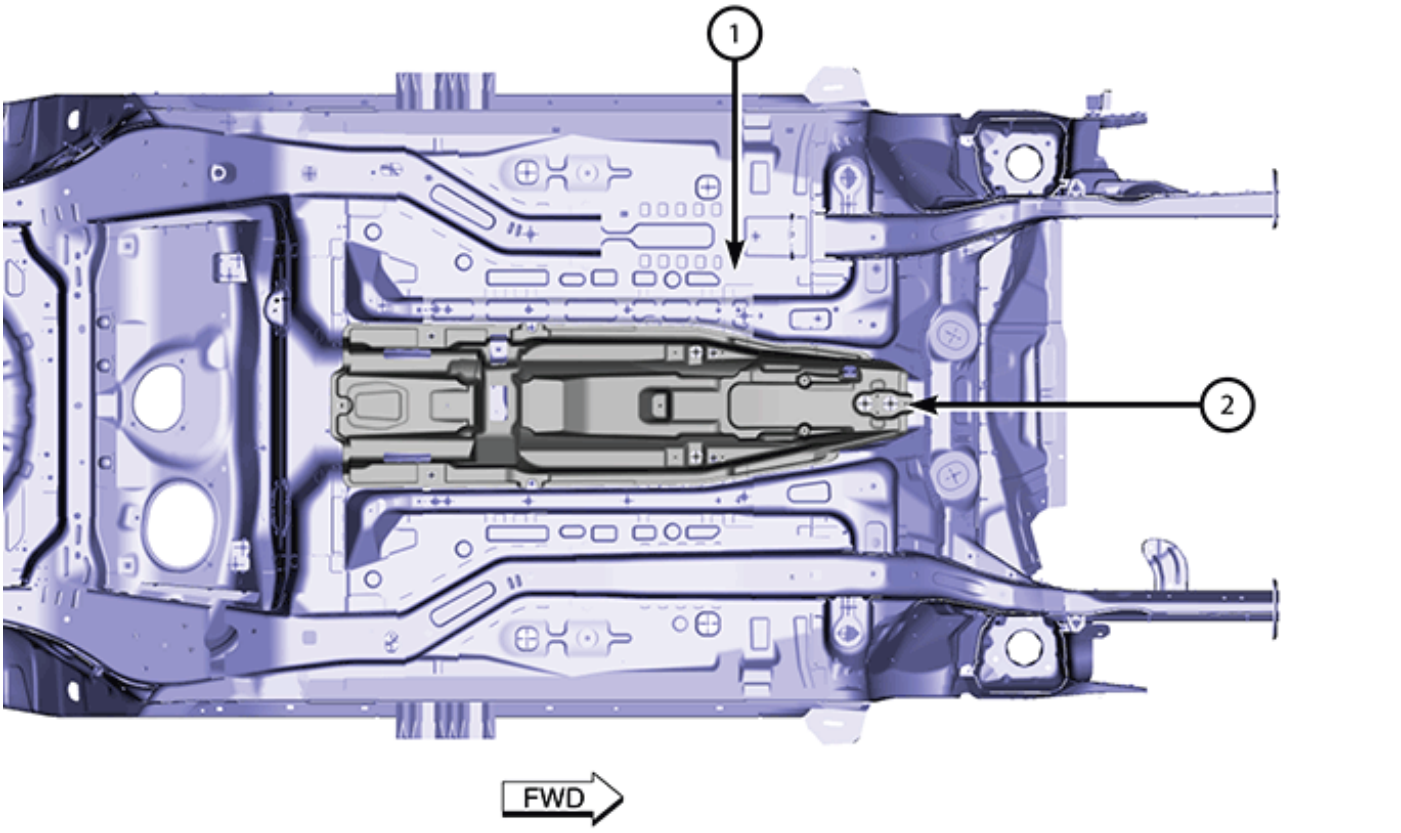
Front Floor (2 of 2)

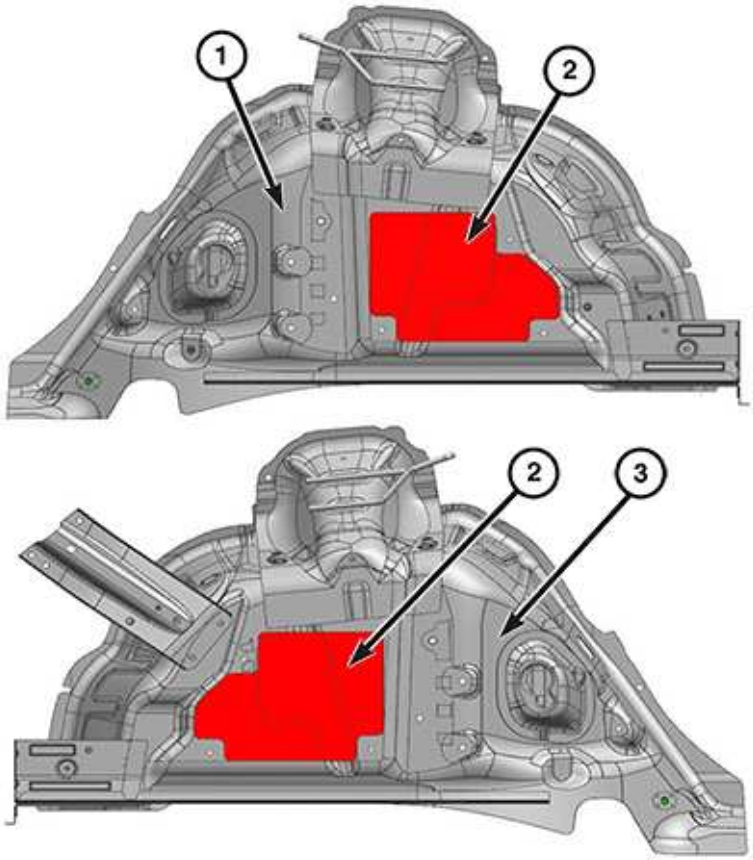
1 - Front Floor
2 - Plastic (42.7)
3 - TESA Plug (Slot 50x65)



3102078633

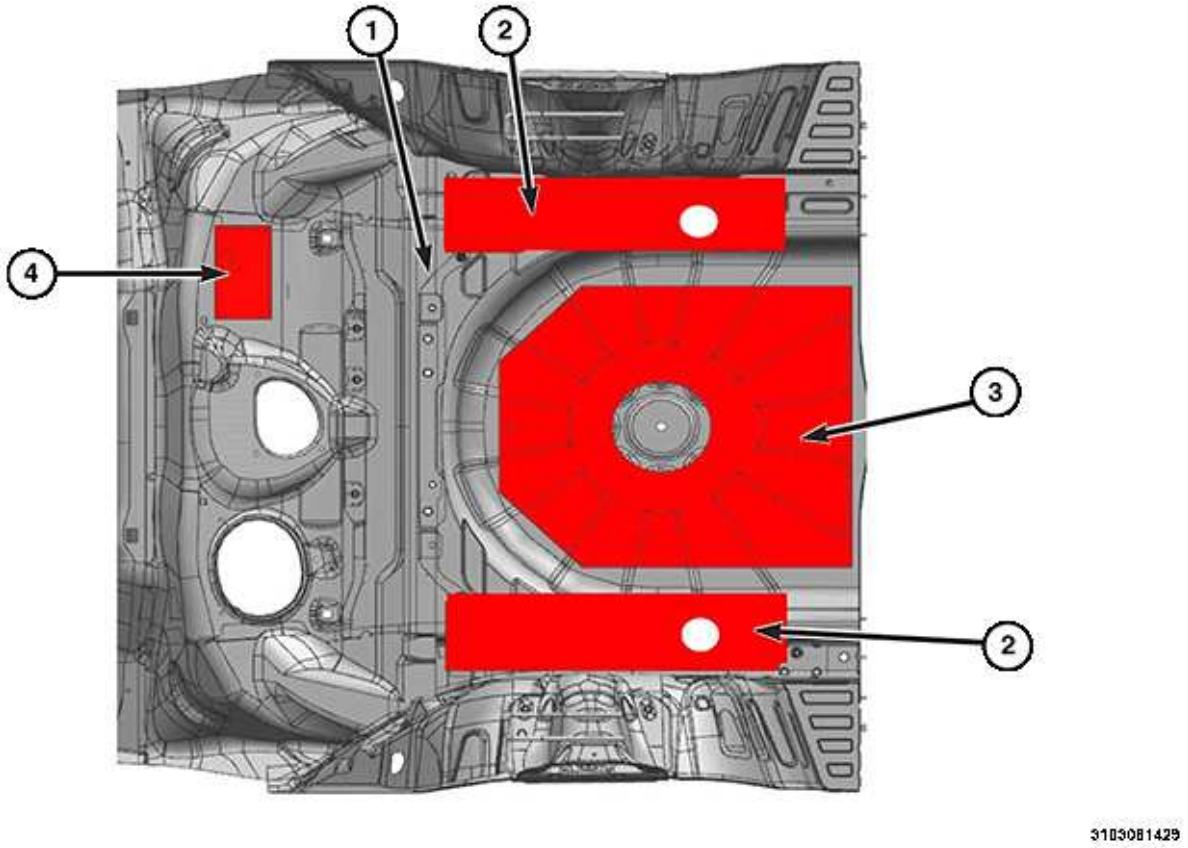
Tunnel

1 - Tunnel (Exterior)
2 - Outer Tunnel Insulator



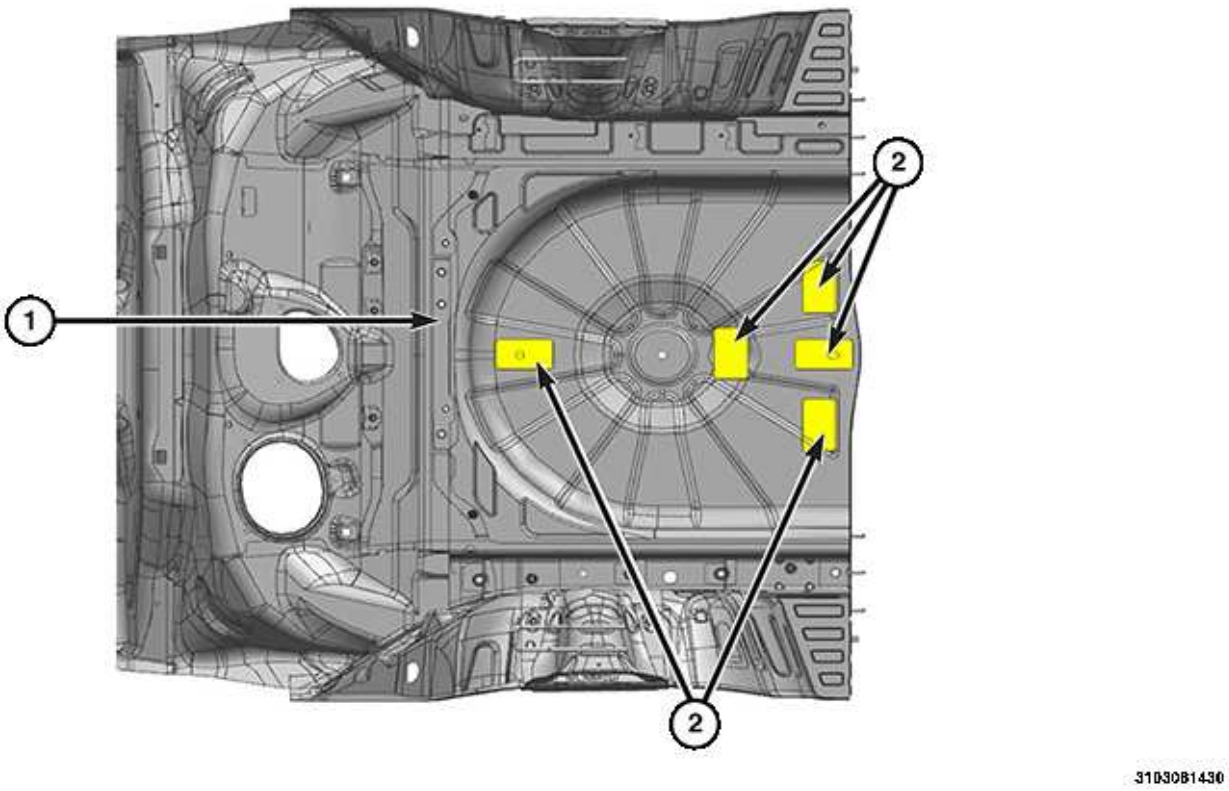
Rear Wheelhouse

1 - Right Rear Inner Wheelhouse
2 - Mastic Pad (200x241x1.8)
3 - Left Rear Inner Wheelhouse



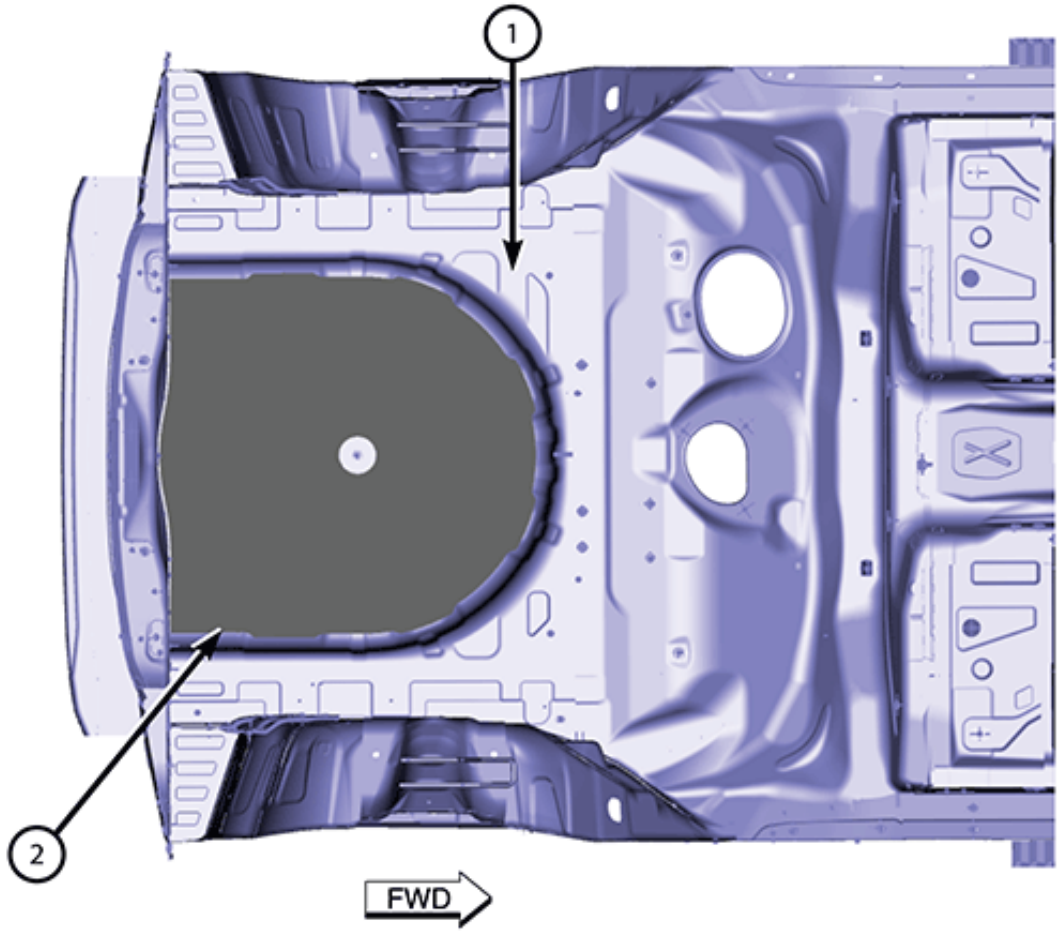
Rear Floor (1 of 3)

1 - Rear Floor
2 - Mastic Pad (117x600x1.8)
3 - Mastic Pad (560x690x1.8)
4 - Mastic Pad (115x186x1.8)



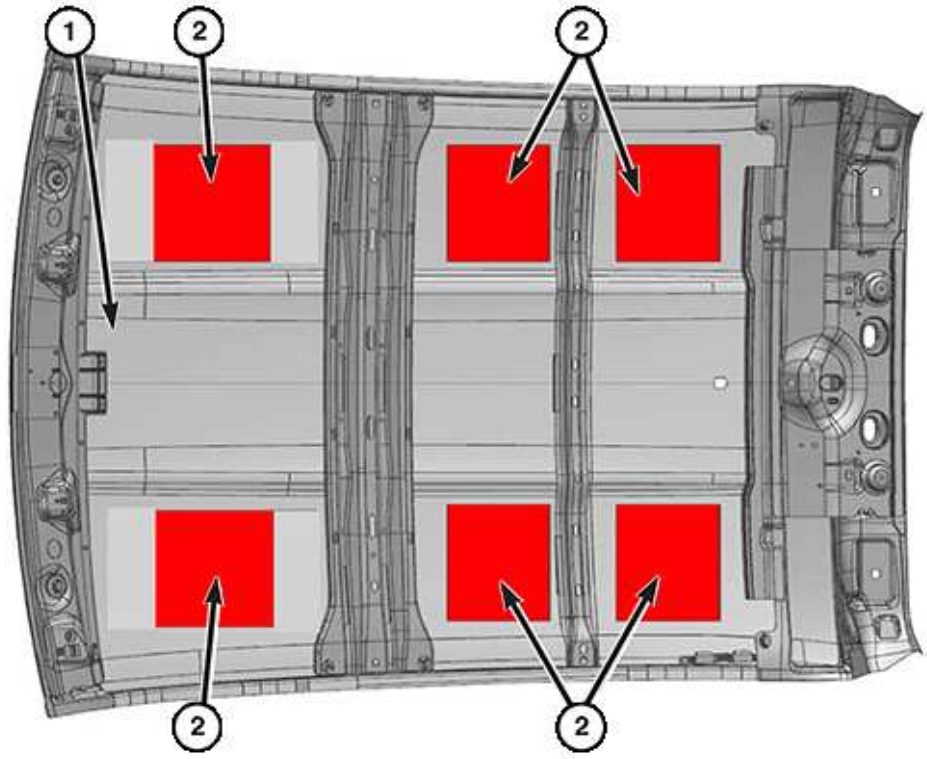
Rear Floor (2 of 3)

1 - Rear Floor
2 - Asphalt Paper (70x70x2)



Rear Floor (3 of 3)

1 - Rear Floor
2 - Spare Tire Well Silencer



31D30B1432

Roof Panel

1 - Roof Panel
2 - Mastic Pad (200x200x1.8)

STRUCTURAL ADHESIVE, FLEXIBLE ADHESIVES AND SEAM SEALER LOCATIONS

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

NOTE: For structural adhesives and anti-flutter adhesive locations and usage refer to the specified component procedure (Refer to 31 - Collision Information/Standard Procedure/Sectioning Locations and Component Procedures).

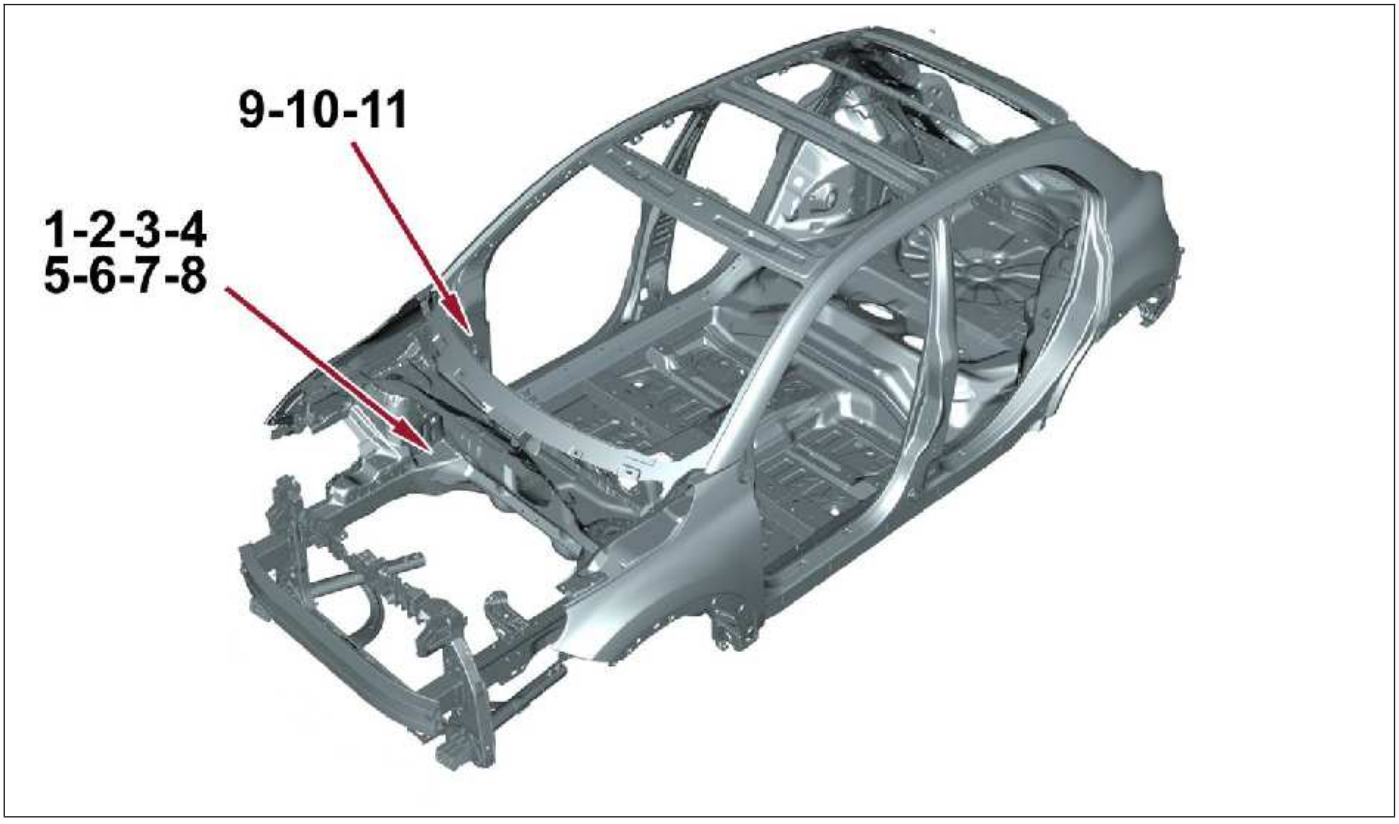
- **Structural adhesives** are applied by itself or in conjunction with Squeeze Type Resistance Spot Welds and is to be re-assembled in the same manner as vehicle build. Any situation where it is undetermined weather it is structural adhesives or seam sealer always default to structural adhesive .
- **Anti-flutter adhesives** are applied to areas of the vehicle where adhesive properties with flexibility are required. Typically found on supports and braces throughout the closure panels, roof and body side gas fill areas.
- **Seam sealers** are only to be used topically, never within weld flanges or hem flanges. All sealers being replaced should duplicate the factory style sealer in shape and size.

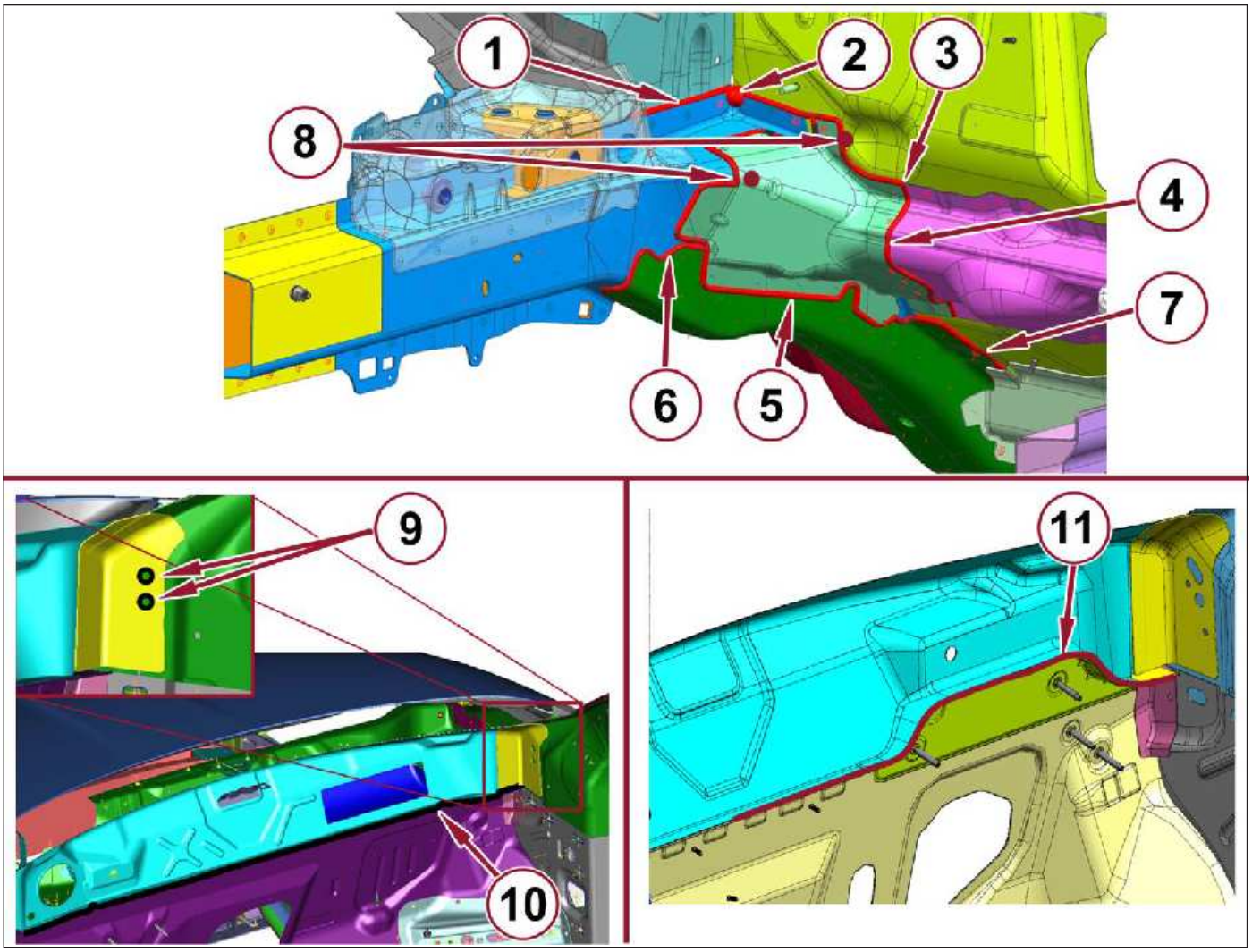
For additional information on Corrosion Protection, and Sealer and Sound Description, **(Refer to Collision Information - Standard Procedure)**.

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– CFF Flexi-Foam.
- **Seam Sealer :** Mopar #04318026, Fusor 129, 3M 08308.

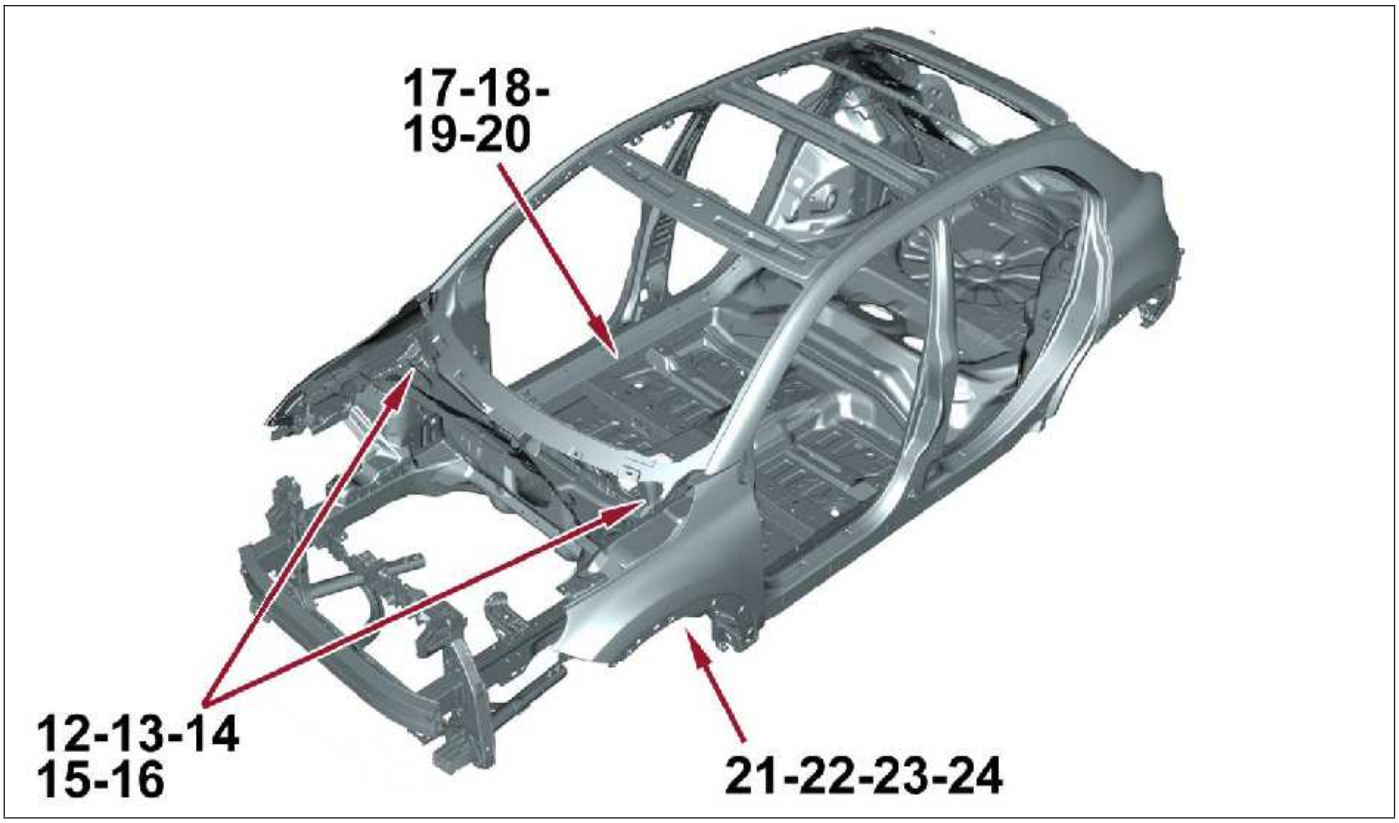
When it is not specified, the sealant is the hot hardening type for interiors.





Detailed applications of sealant in areas 1 to 11

1	Front Frame Rail / Strut Tower
2	Front Fame Rail / Dash Panel (High Consistency Heat Hardening Filler)
3	Front Fame Rail Extension / Dash Panel
4	Dash Panel Crossmember / Front Fame Rail Extension
5	Front Fame Rail Reinforcement / Front Fame Rail Extension
6	Front Fame Rail / Front Fame Rail Reinforcement
7	Front Fame Rail Reinforcement / Dash Panel
8	Front Fame Rail / Front Fame Rail Extension (High Consistency Heat Hardening Filler)
9	2 Holes (50 mm diameter) Upright Windshield Link
10	Dash Panel / Plenum Panel
11	Dash Panel / Plenum Panel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12-13-14
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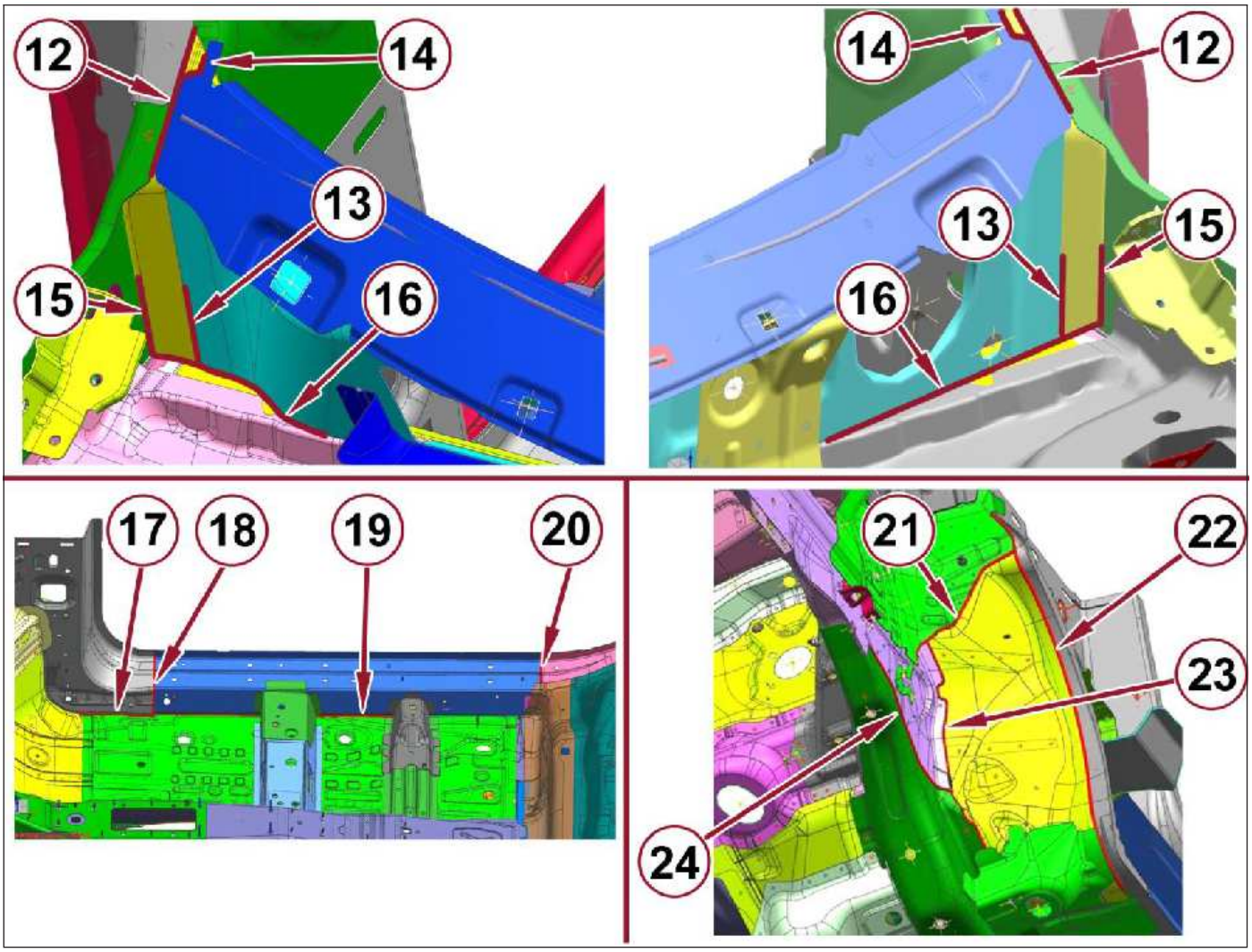
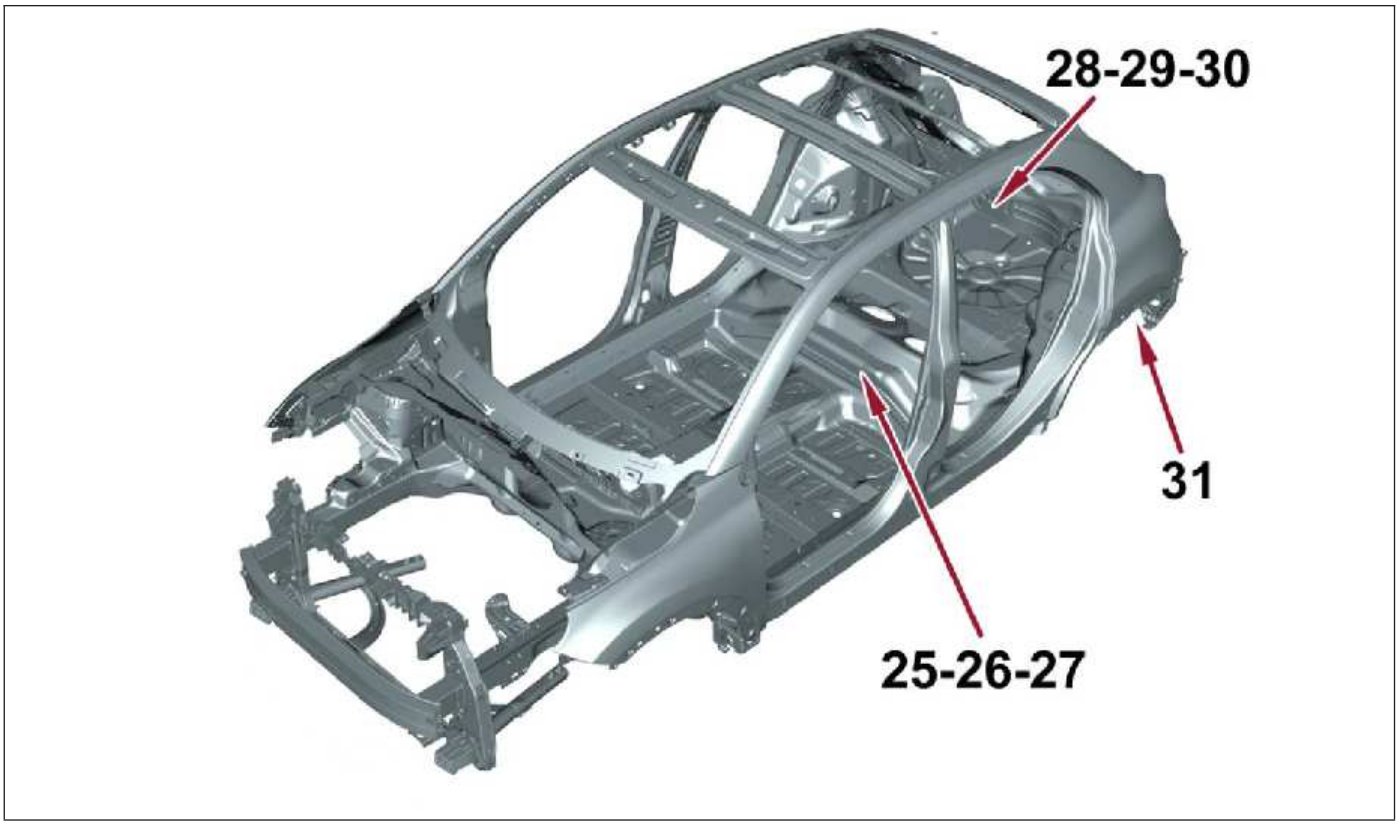
21-22-23-24



Detailed applications of sealant in areas 12 to 24

12	Cowl Side Panel / Windshield Link / Dash Crossmember
13	Dash Crossmember / Dash Panel Extension
14	Dash Crossmember / Cowl Side Panel
15	Cowl Side Panel / Dash Panel Extension
16	Dash Panel Crossmember / Plenum Panel
17	Cowl Side Panel / Front Floor Pan
18	Cowl Side Panel / Sill Reinforcement
19	Sill Reinforcement / Front Floor Pan
20	Front Area Sill Reinforcement / Rear Area Sill Reinforcement
21	Dash Panel / Strut tower / Strut Tower Reinforcement
22	Cowl Side Panel / Dash Panel
23	Frame Side Rail / Dash Panel
24	Frame Side Rail / Front Frame Rail Reinforcement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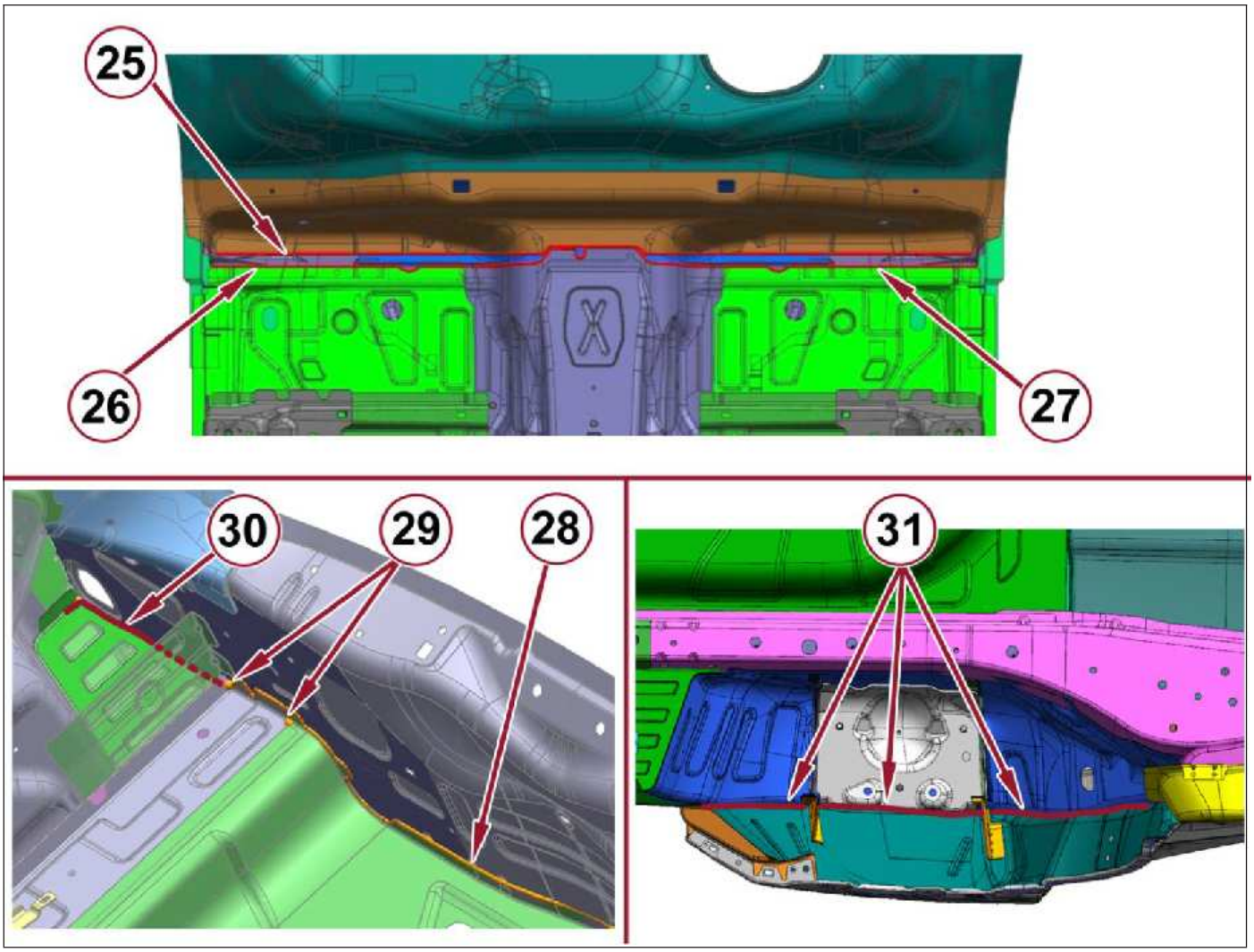
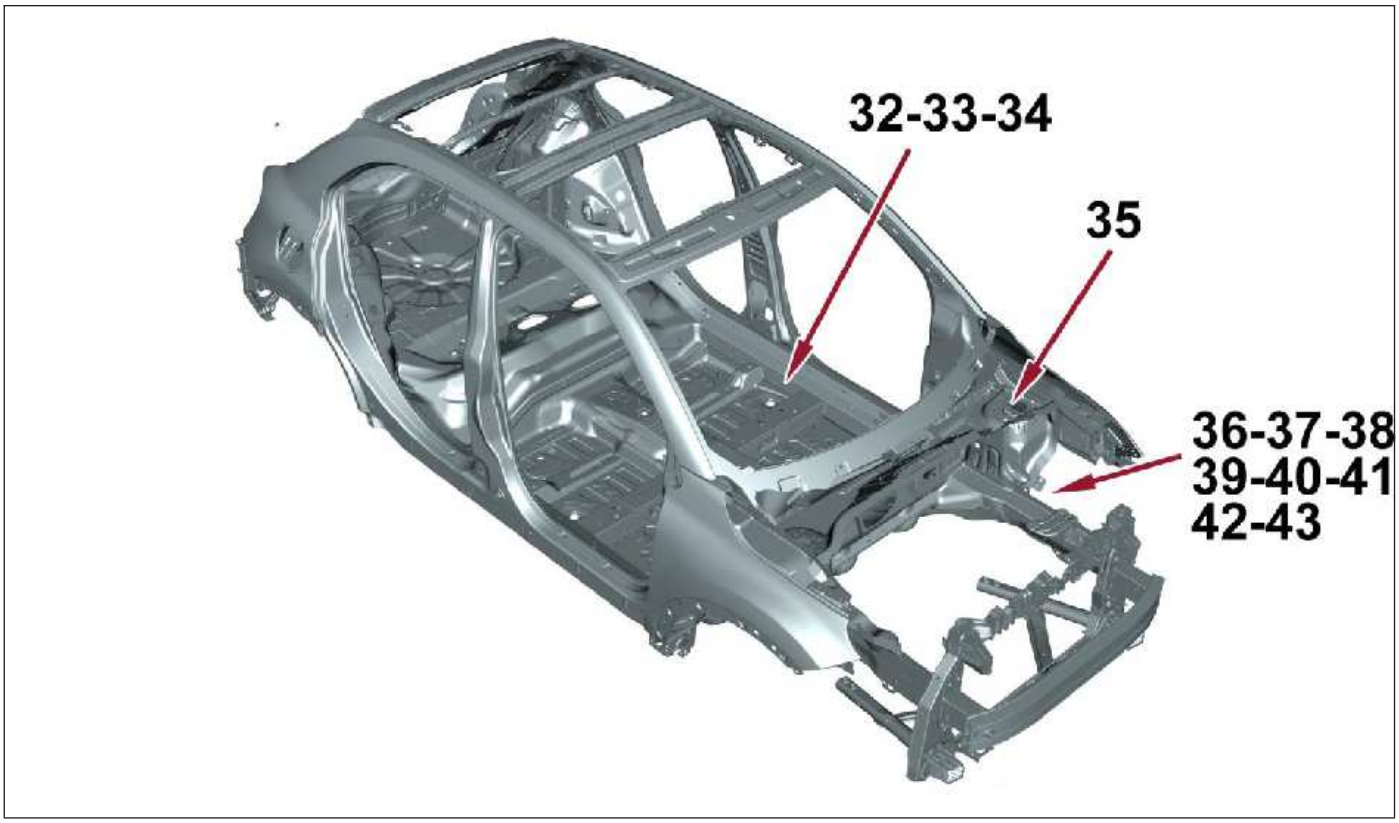
25-26-27



Detailed applications of sealant in areas 25 to 31

25	Rear Seat Crossmember / Front Floor Pan / Tunnel
26	Rear Seat Crossmember / Front Floor Pan / Tunnel
27	Rear Seat Crossmember / Front Floor Pan / Tunnel
28	Rear Closure Panel / Rear Floor
29	Rear Closure Panel / Rear Floor Extension
30	Rear Closure Panel / Floor Pan Bracket
31	Left Rear Inner Wheelhouse / Left Rear Outer Wheelhouse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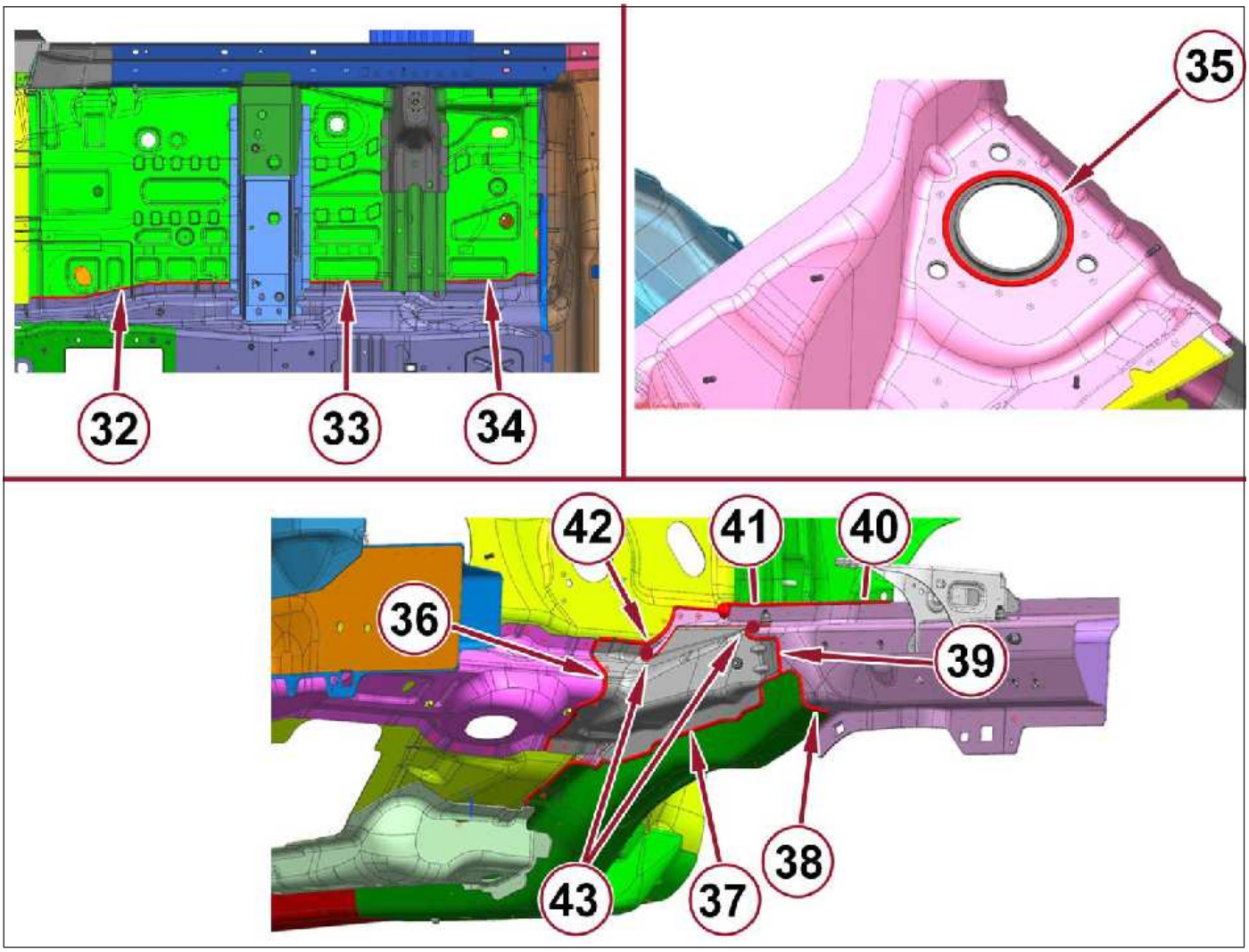
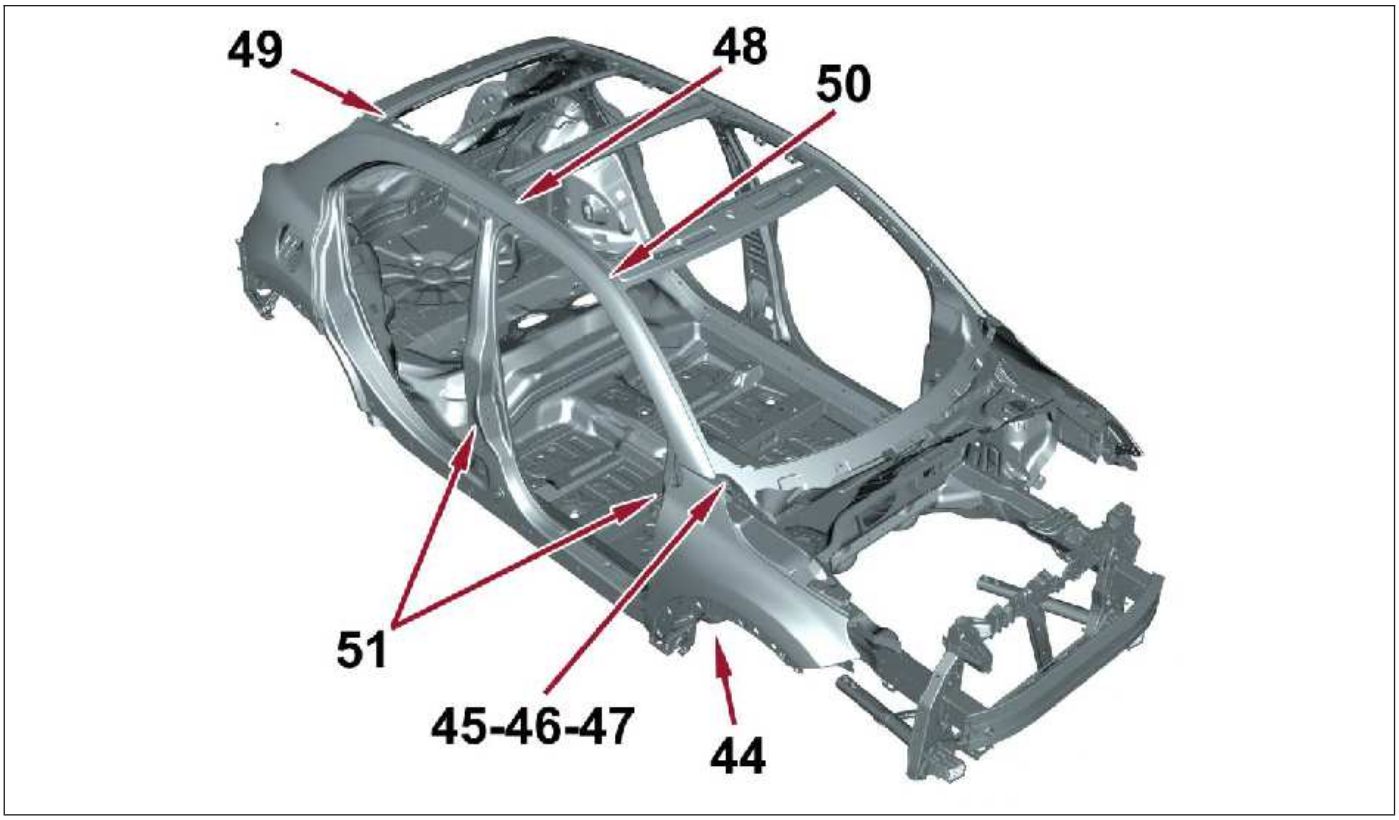
36-37-38
39-40-41
42-43



Detailed applications of sealant in areas 32 to 43

32	Tunnel / Front Floor Right and Left
33	Tunnel / Front Floor
34	Tunnel / Front Floor
35	Plenum Panel / Shock Tower Cap
36	Dash Panel Crossmember / Front Fame Rail Extension
37	Front Frame Rail Extension / Front Frame Rail Reinforcement
38	Front Frame Rail / Front Frame Rail Reinforcement
39	Front Frame Rail / Front Frame Rail Extension
40	Front Frame Rail / Strut Tower
41	Front Frame Rail / Dash Panel (High Consistency Putty Filler Hardener Hot)
42	Front Fame Rail Extension / Dash Panel
43	Front Fame Rail Extension / Front Frame Rail (High Consistency Heat Hardening Filler)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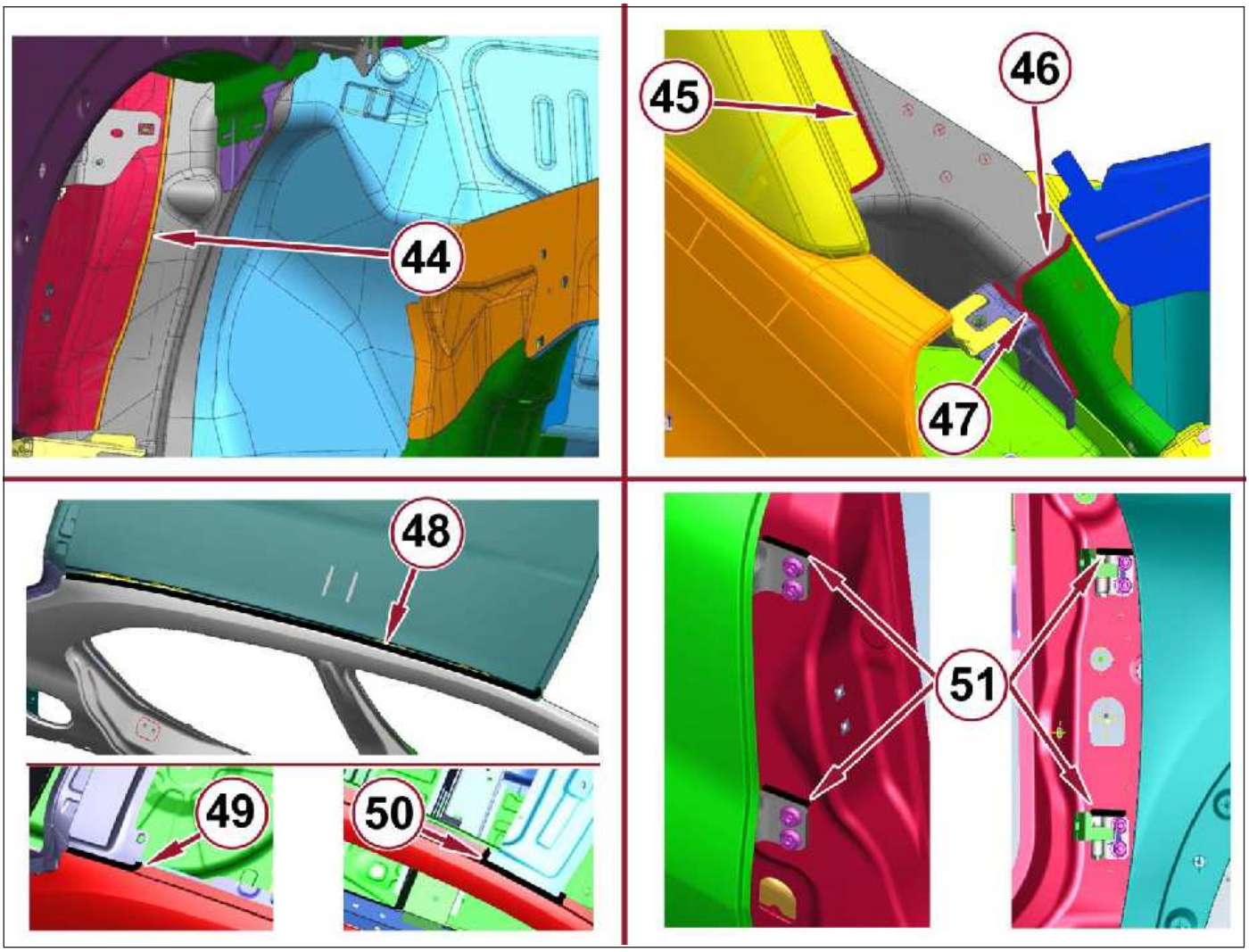

Detailed applications of sealant in areas 44 to 51

44	Cowl Side Panel / Body Side Aperture
45	Body Side Aperture / Cowl Side Panel
46	Cowl Side Panel / Windshield Link
47	A-pillar Reinforcement / Fender Mounting Bracket / Windshield Link
48	Roof Panel / Body Side Aperture
49	Roof Rear Header / Body Side Aperture
50	Windshield Header / Body Side Aperture
51	Upper and Lower Hinges of Front and Rear Doors (10 mm section)


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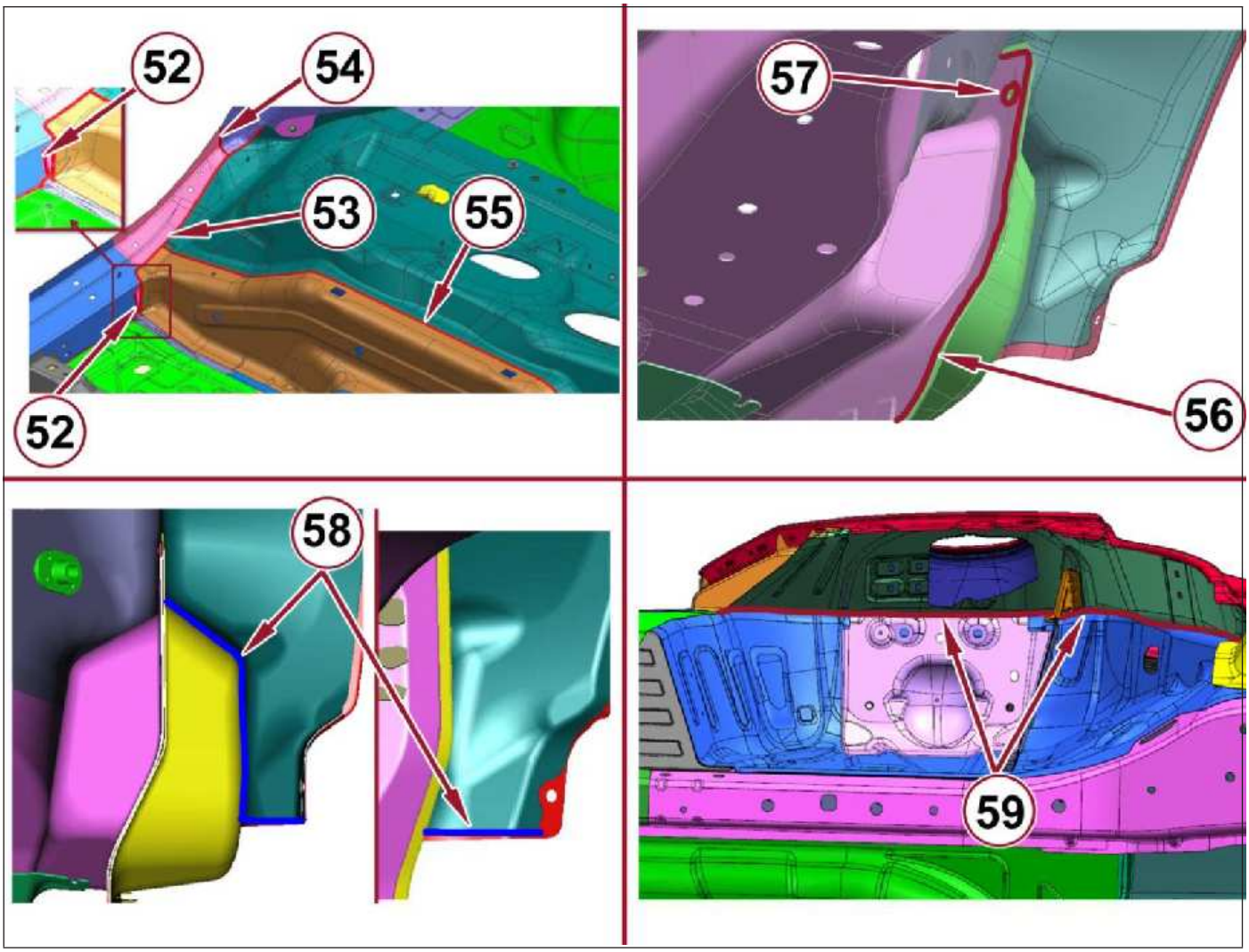
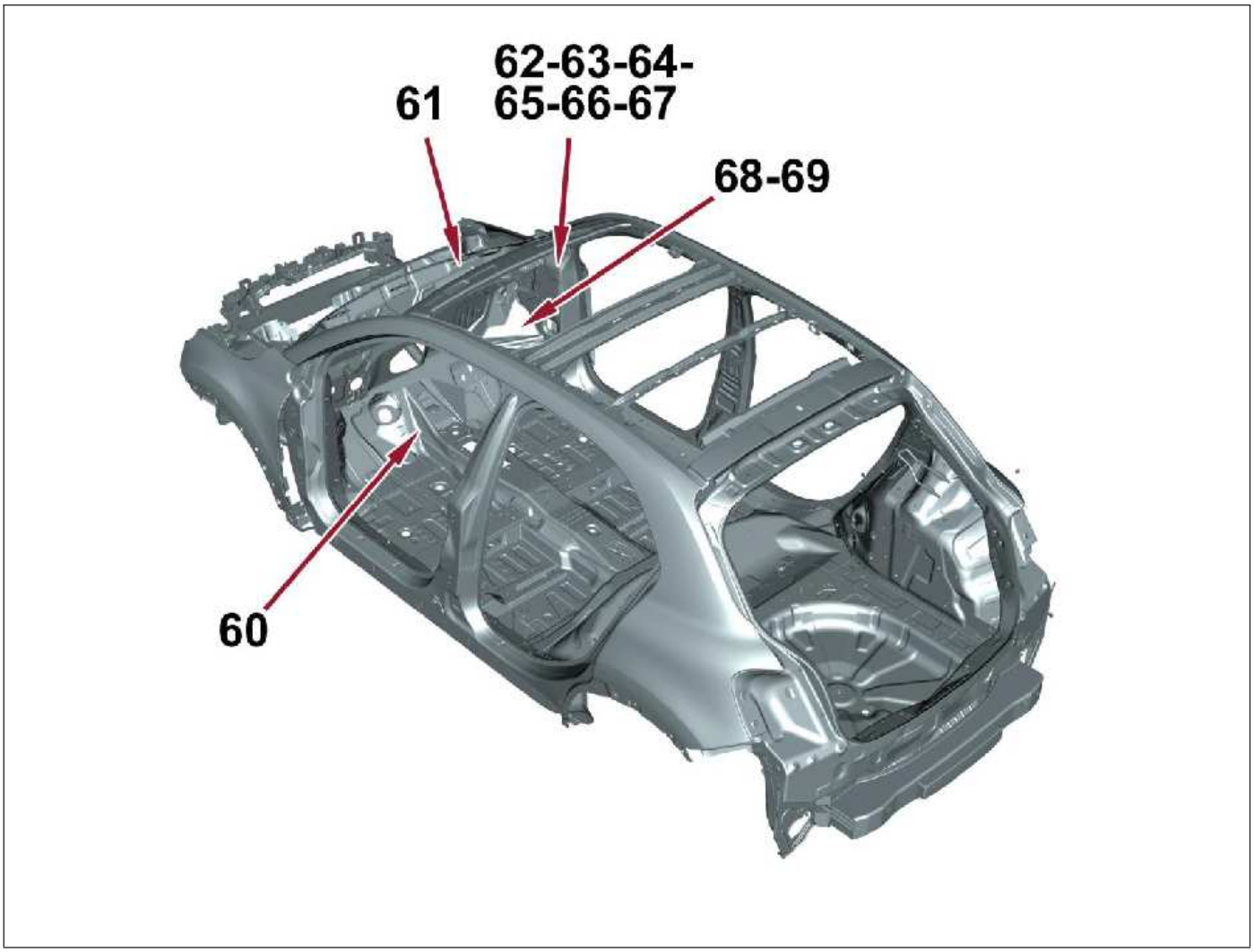
56-57
52-53-54-55



Detailed applications of sealant in areas 52 to 59

52	Sill Reinforcement Front Area / Sill Reinforcement Rear Area
53	Center Floor Pan / Rear Sill Reinforcement
54	Rear Wheelhouse / Center Floor Pan
55	Rear Seat Crossmember / Rear Floor Pan Reinforcement / Rear Sill Reinforcement
56	Rear Sill Reinforcement (Inner) / Rear Sill Reinforcement (Outer)
57	Rear Sill Reinforcement (Inner) / Rear Sill Reinforcement (Outer)
58	Rear Wheelhouse / Rear Sill Reinforcement
59	Right Rear Inner Wheelhouse / Right Rear Outer Wheelhouse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61 65-66-67
68-69
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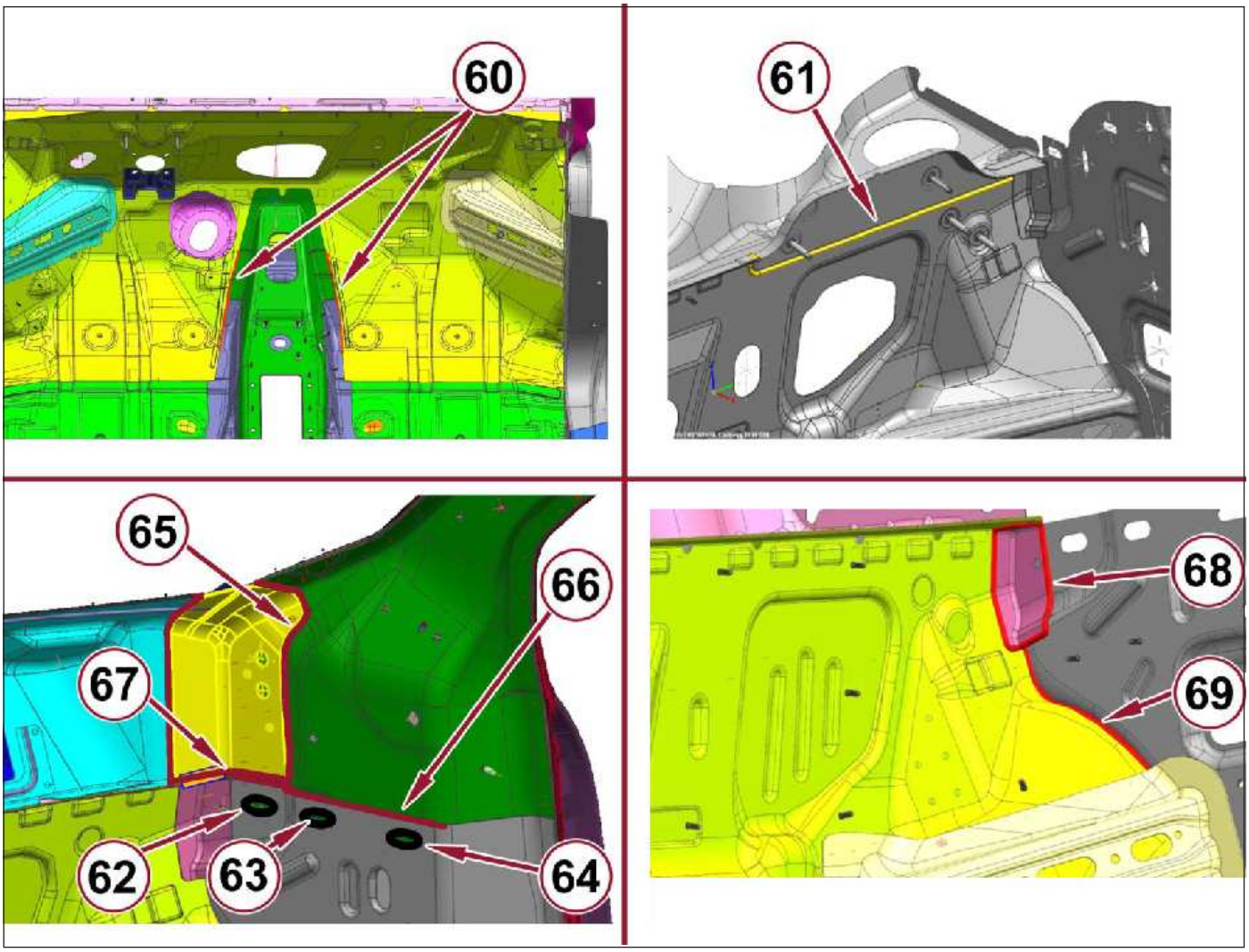
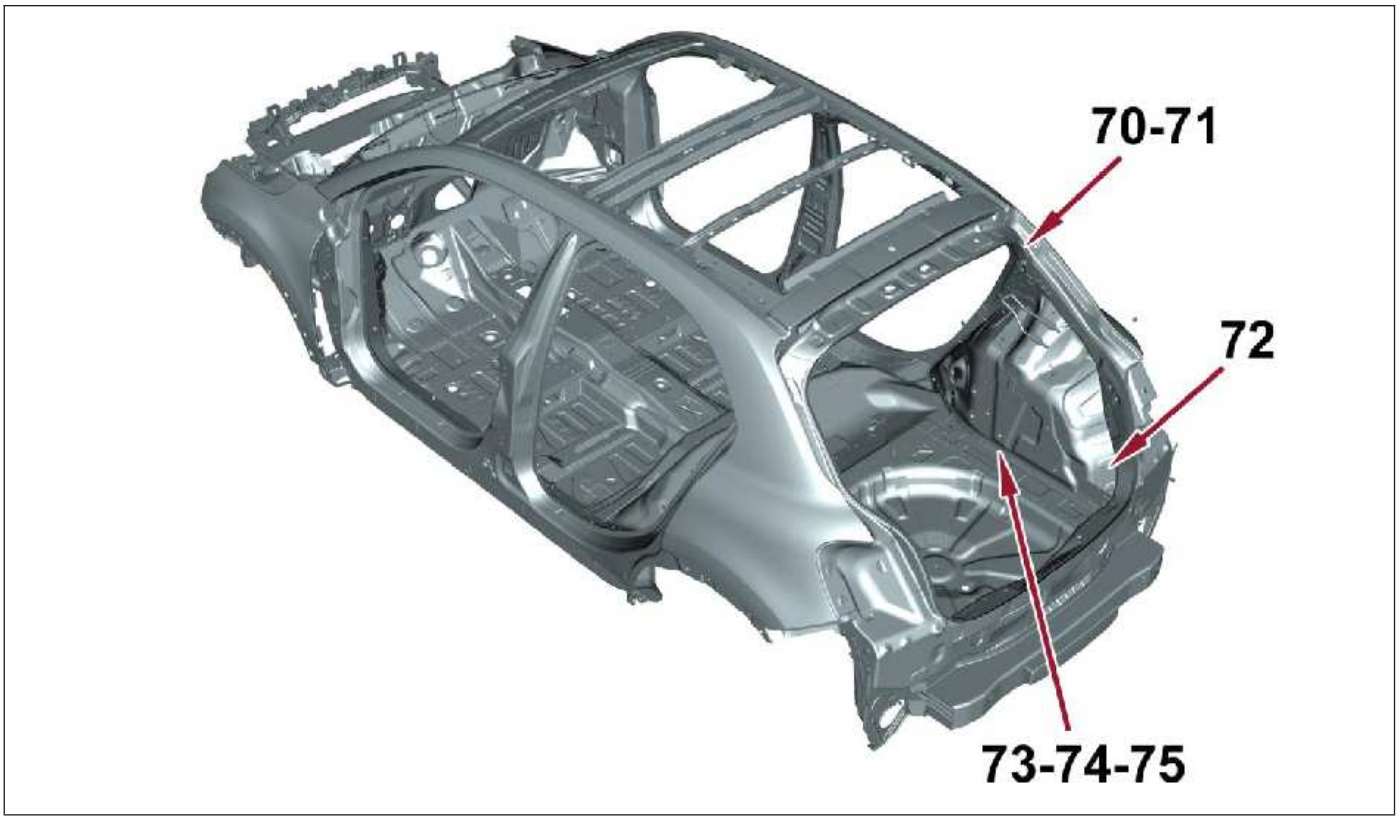


Detailed applications of sealant in areas 60 to 69

60	Tunnel / Dash Panel
61	Upper Instrument Panel / Upper Extension Panel (Not Utilized on NAFTA Versions)
62	Cowl Side Panel Slot / A-pillar Inner Panel
63	Cowl Side Panel Slot / A-pillar Inner Panel
64	Cowl Side Panel Slot / A-pillar Inner Panel
65	Upright Windshield Link / A-pillar Inner Panel
66	Cowl Side Panel / A-pillar Inner Panel
67	Upright Windshield Link / Cowl Side Panel (High Consistency Heat Hardening Filler)
68	Dash Panel / Cowl Side Panel / Side Panel Insert
69	Dash Panel / Cowl Side Panel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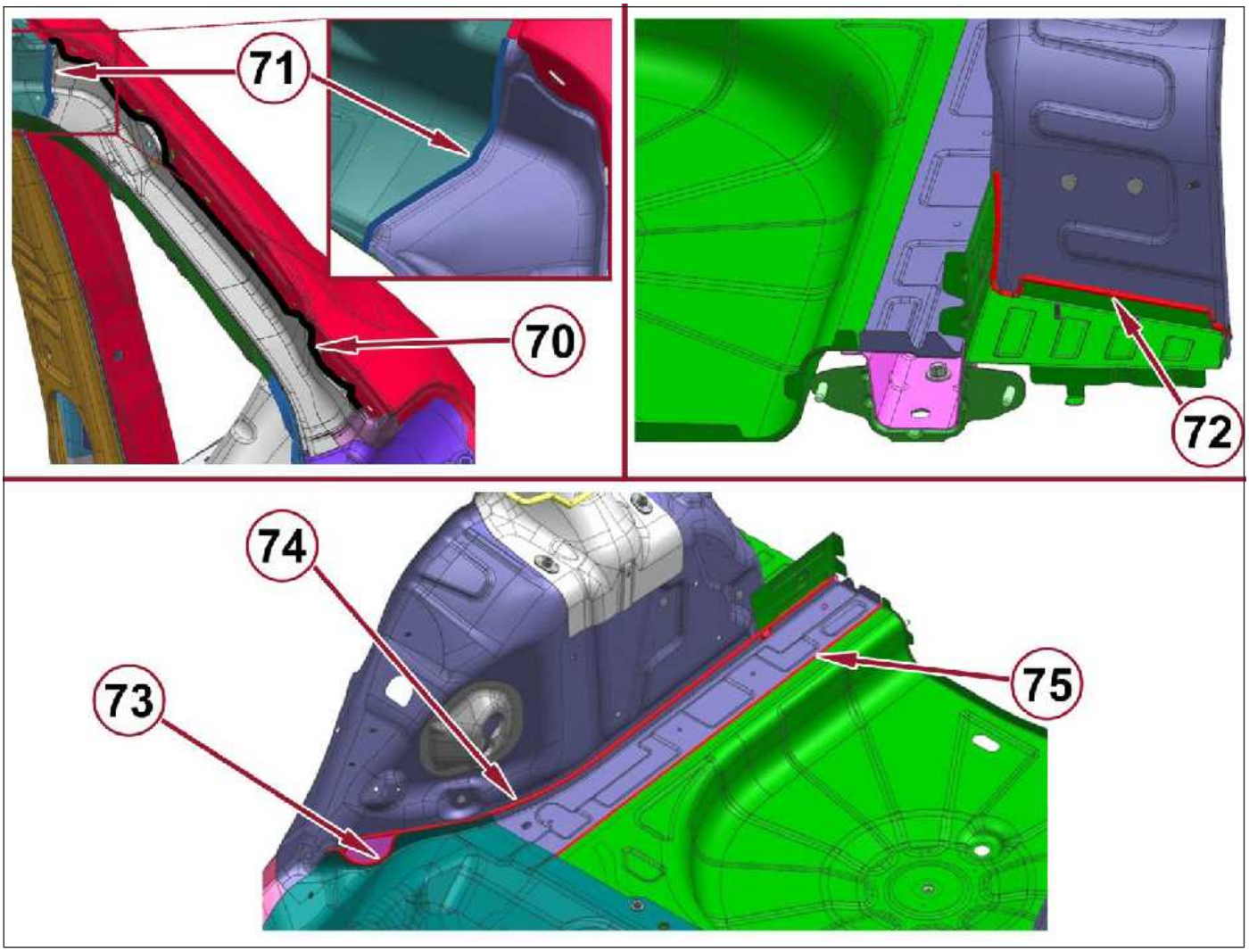
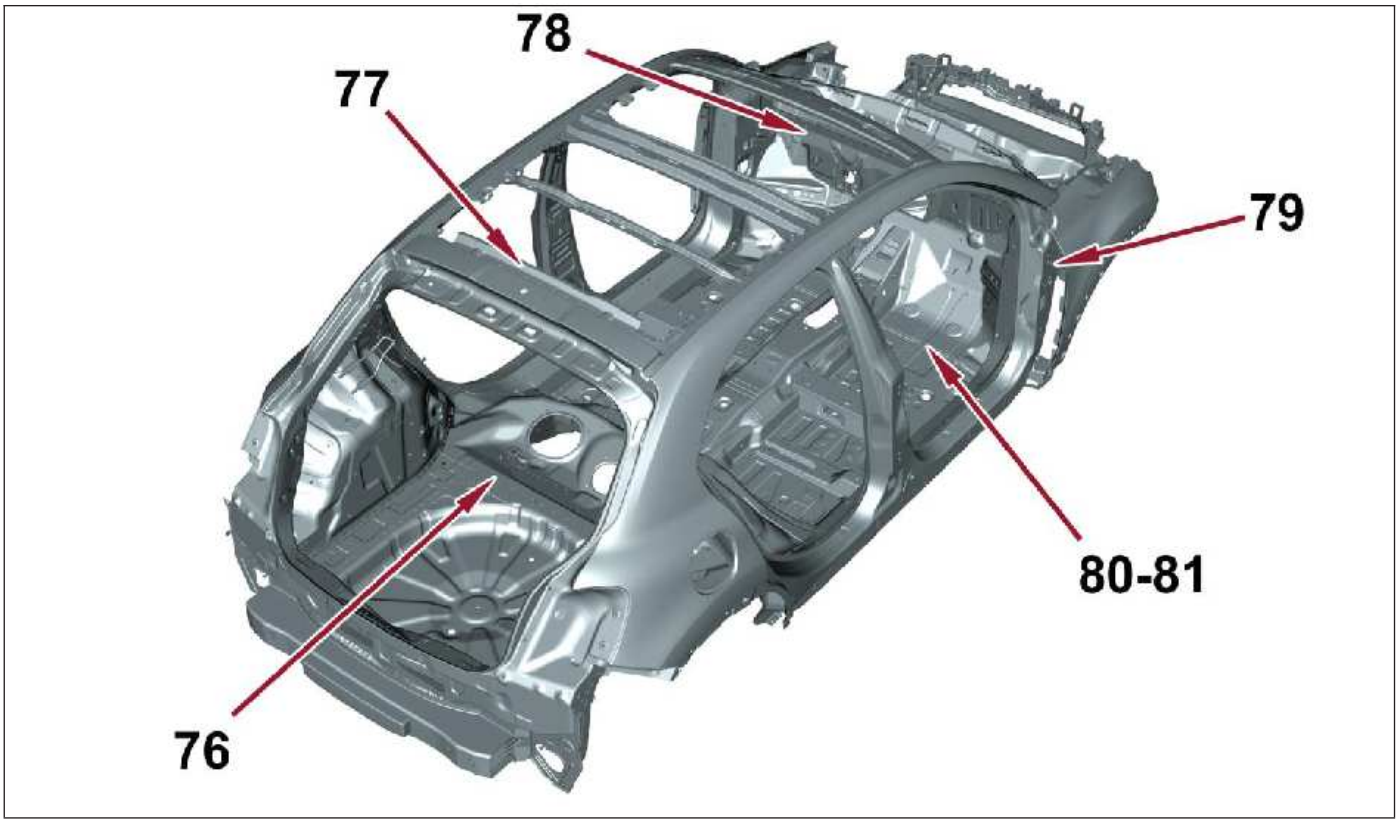
73-74-75



Detailed applications of sealant in areas 70 to 75

70	Liftgate Opening Trough / Body Side Aperture
71	Liftgate Opening Trough / Roof Panel
72	Floor Pan Bracket / Inner Wheelhouse
73	Rear Rail / Center Floor Pan / Inner Wheelhouse
74	Rear Rail / Rear Floor Extension / Inner Wheelhouse
75	Rear Floor Pan / Rear Floor Extension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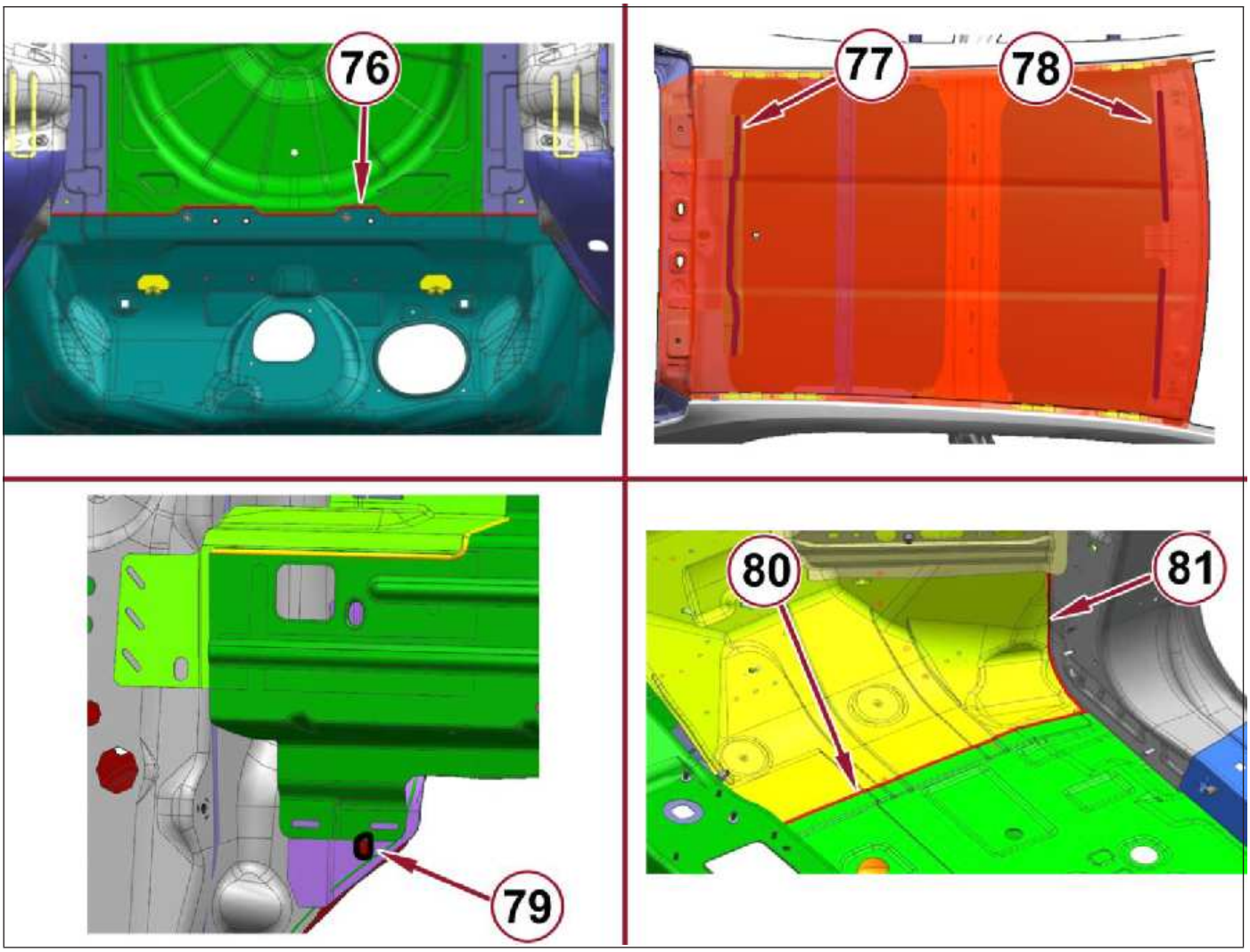
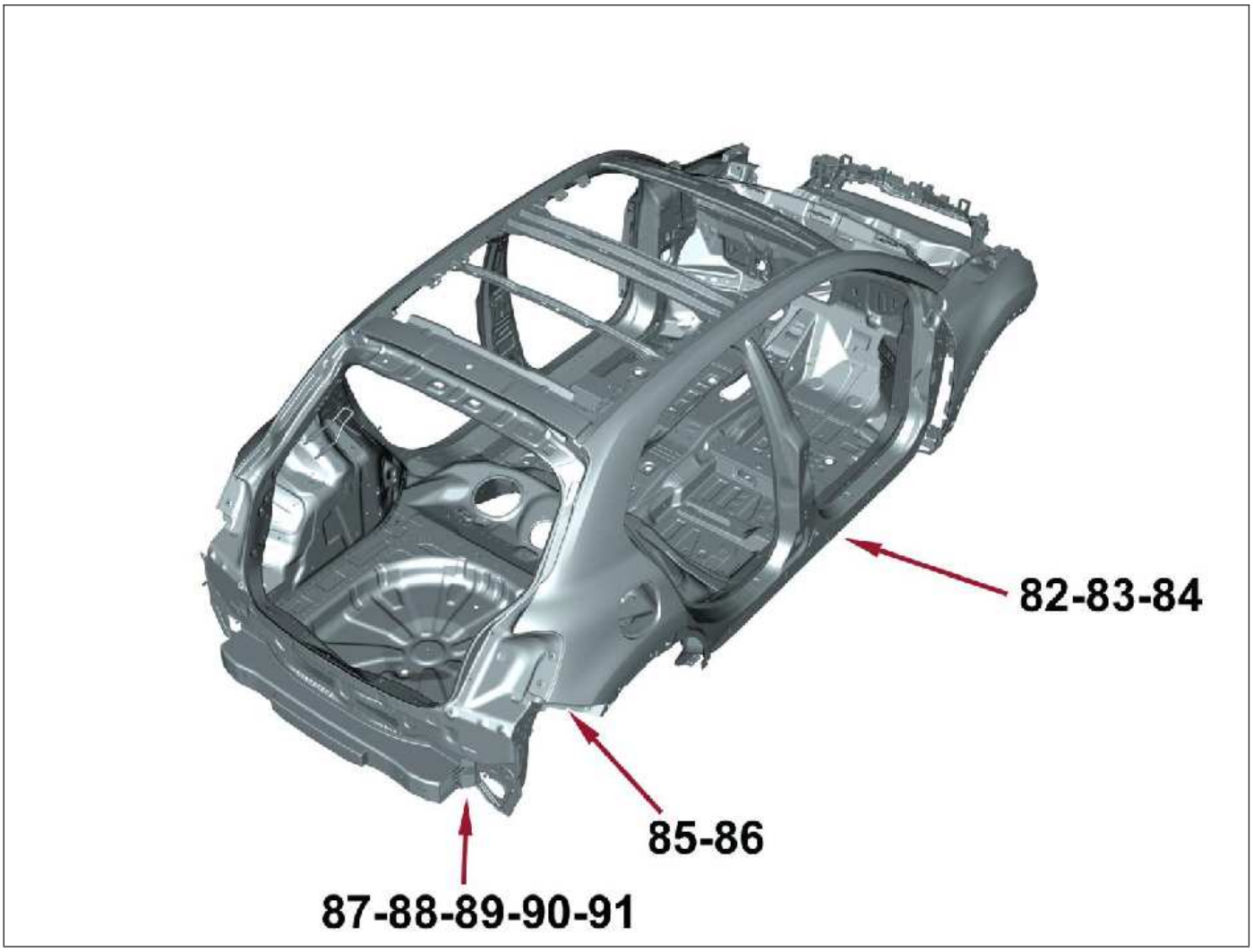


Detailed applications of sealant in areas 76 to 81

76	Center Floor Pan / Rear Floor Pan
77	Roof Rear Header / Roof Panel
78	Windshield Header Panel / Roof Panel
79	Slot on A-Pillar Reinforcement
80	Front Floor / Dash Panel
81	Cowl Side Panel / Dash Panel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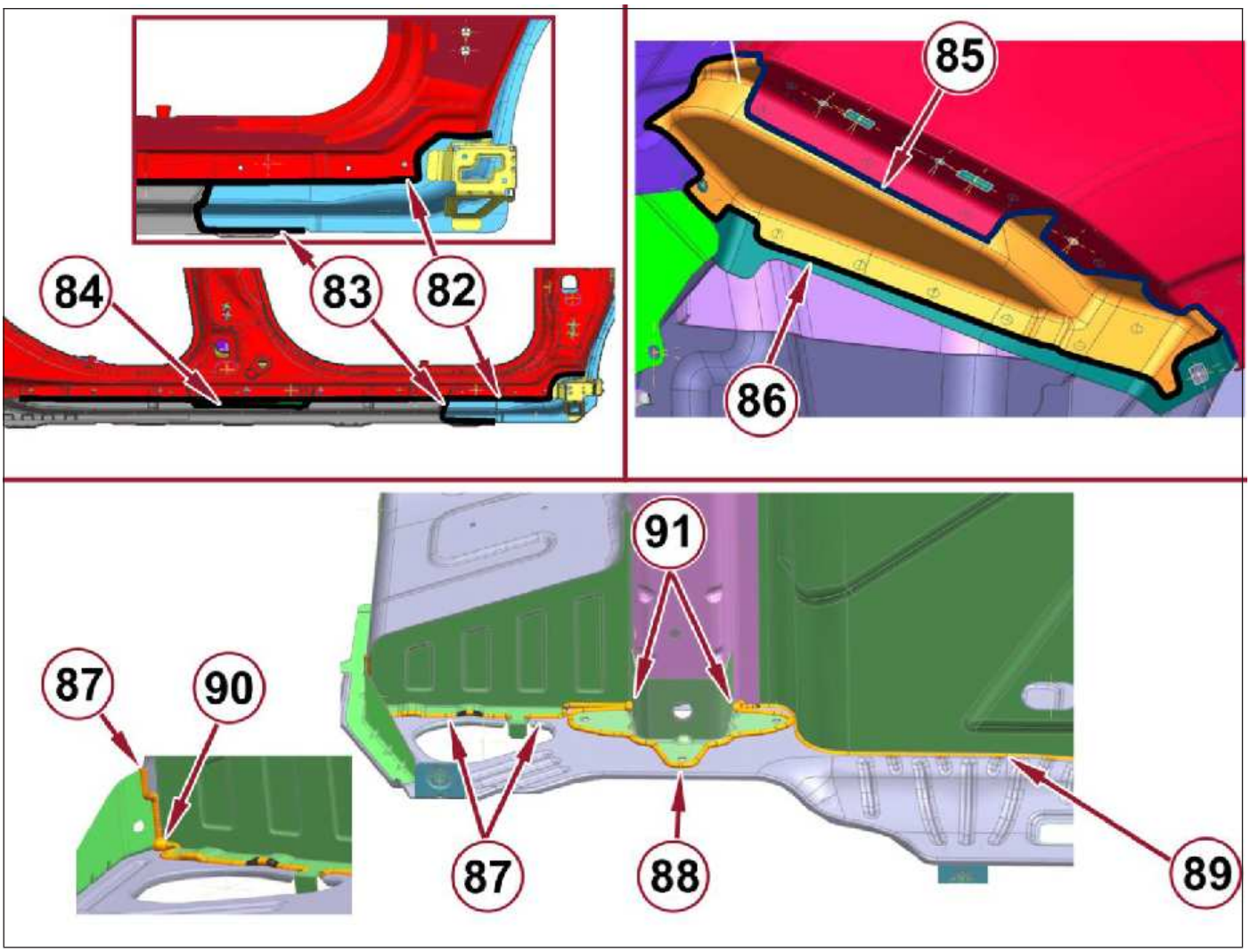
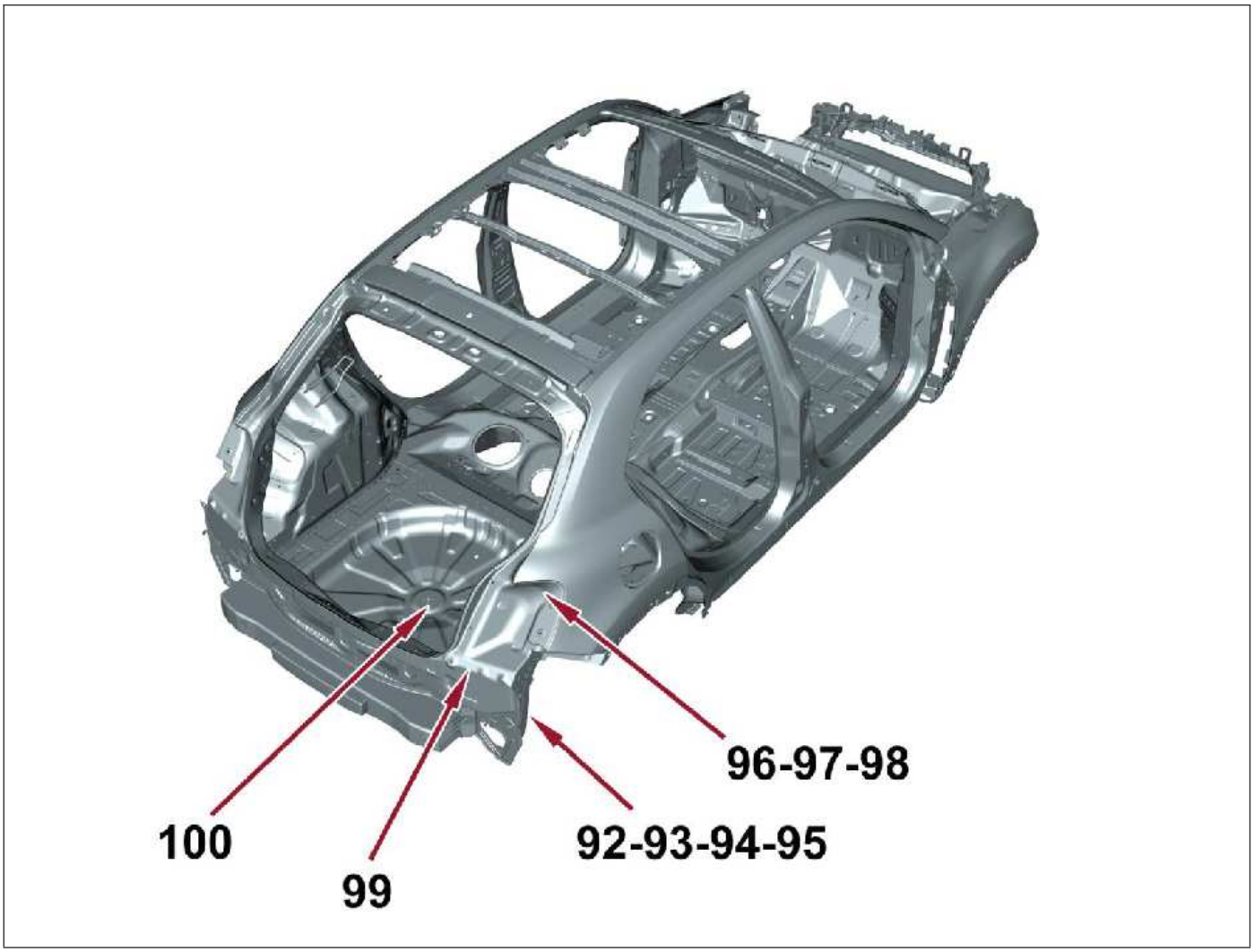


Detailed applications of sealant in areas 82 to 91

82	Body Side Aperture / Cowl Side Panel
83	Body Side Aperture / Cowl Side Panel / Sill Reinforcement
84	B-pillar Reinforcement / Sill Reinforcement
85	Body Side Aperture / Body Side Aperture Extension
86	Body Side Aperture Extension / Taillamp Mounting Panel / Outer Wheelhouse
87	Floor Pan Bracket / Rear Closure Panel
88	Rear Bumper Mounting Bracket / Rear Closure Panel
89	Rear Closure Panel / Rear Floor Pan
90	Floor Pan Bracket / Complete Rear Closure Panel (High Consistency Heat Hardening Filler)
91	Rear Bumper Mounting Bracket / Complete Rear Closure Panel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92-93-94-95
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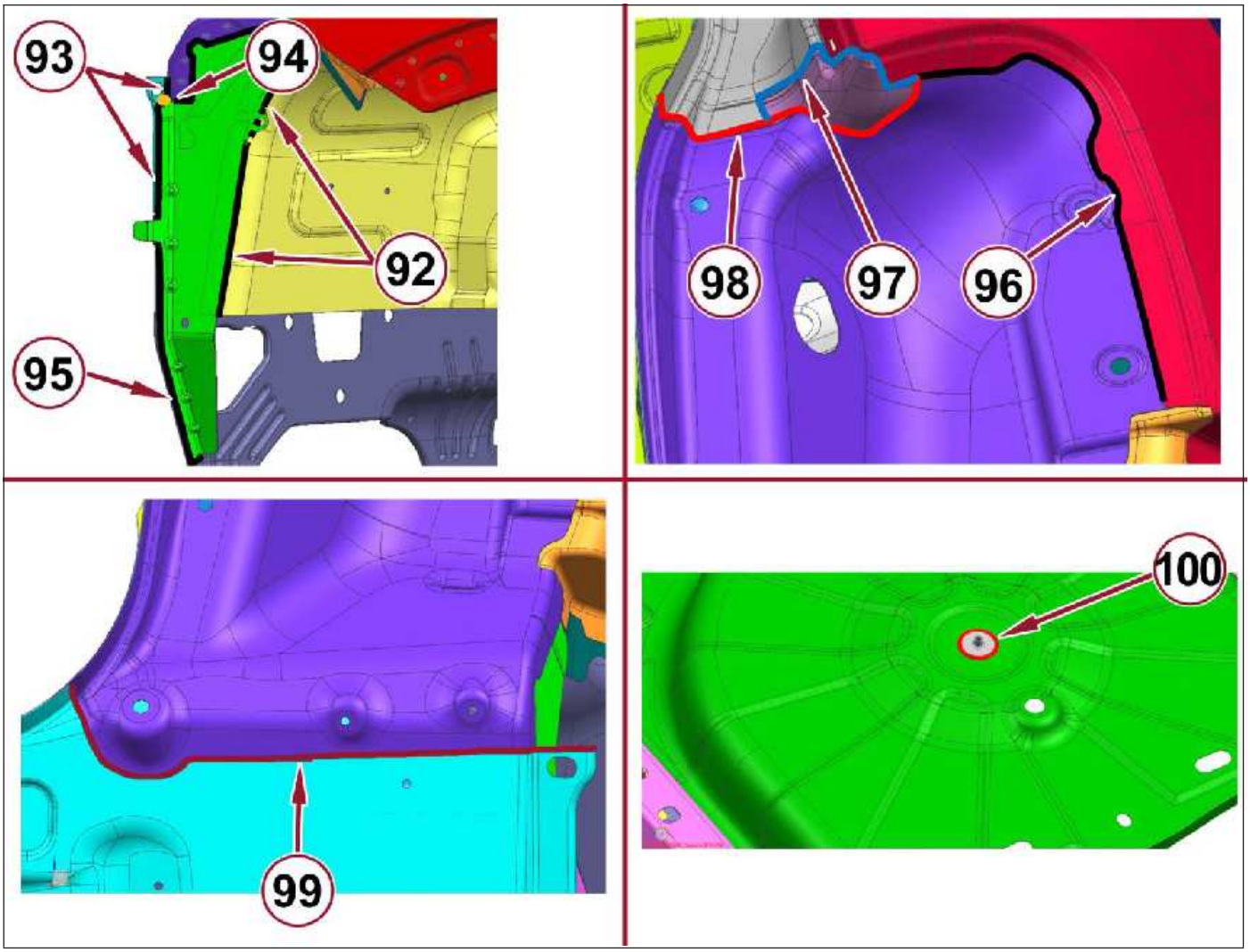
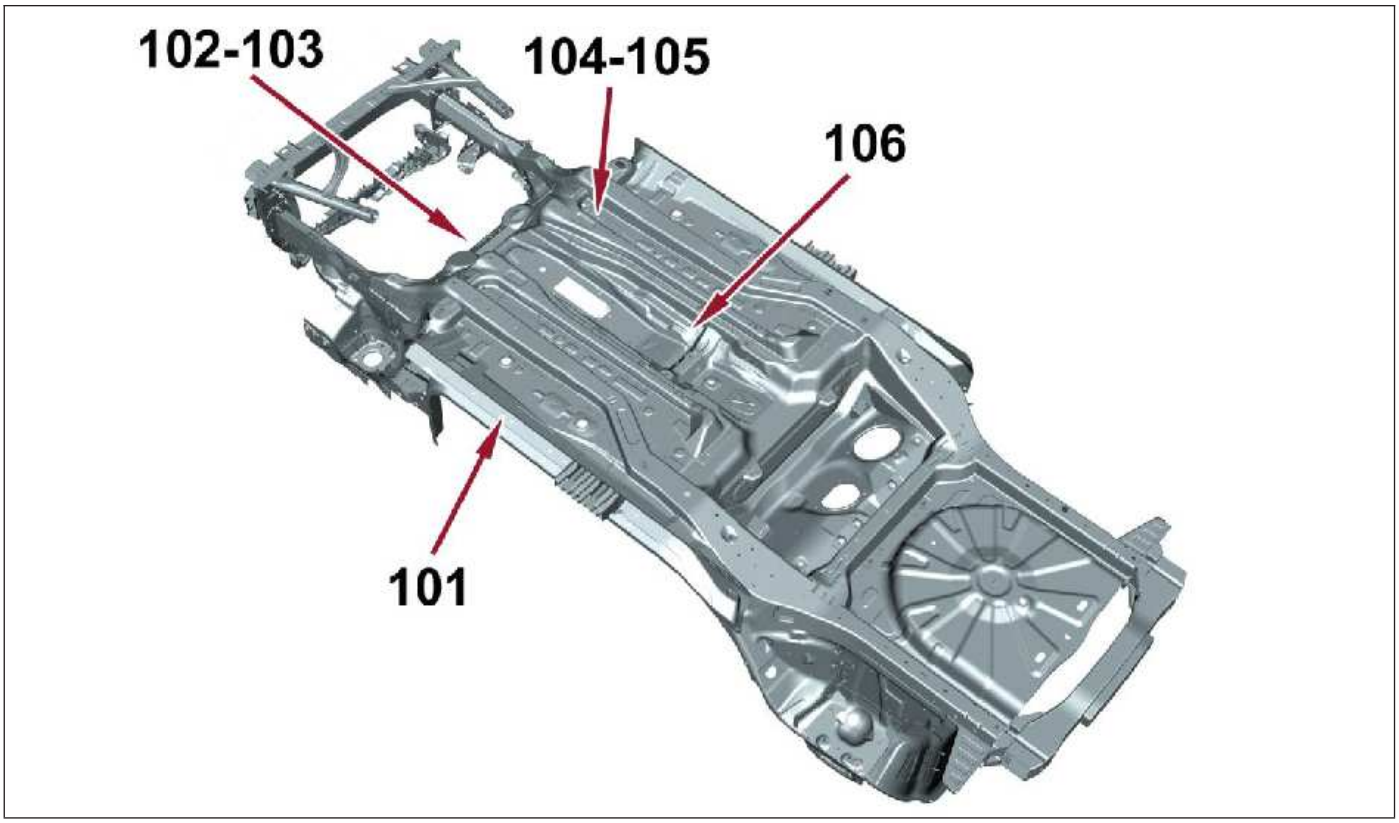


Detailed applications of sealant in areas 92 to 100

92	Rear Wheelhouse Extension / Rear Wheelhouse
93	Taillamp Mounting Panel / Rear Closure Panel
94	Rear Closure Panel / Rear Wheelhouse Extension / Mounting Panel (High Consistency Heat Hardening Filler)
95	Rear Wheelhouse Extension / Rear Closure Panel
96	Taillamp Mounting Panel / Quarter Panel
97	Liftgate Opening Trough / Liftgate Opening Trough Extension / Quarter Panel
98	Liftgate Opening Trough / Liftgate Opening Trough Extension / Taillamp Mounting Panel
99	Taillamp Mounting Panel / Rear Closure Panel
100	Rear Floor / Spare Wheel Bracket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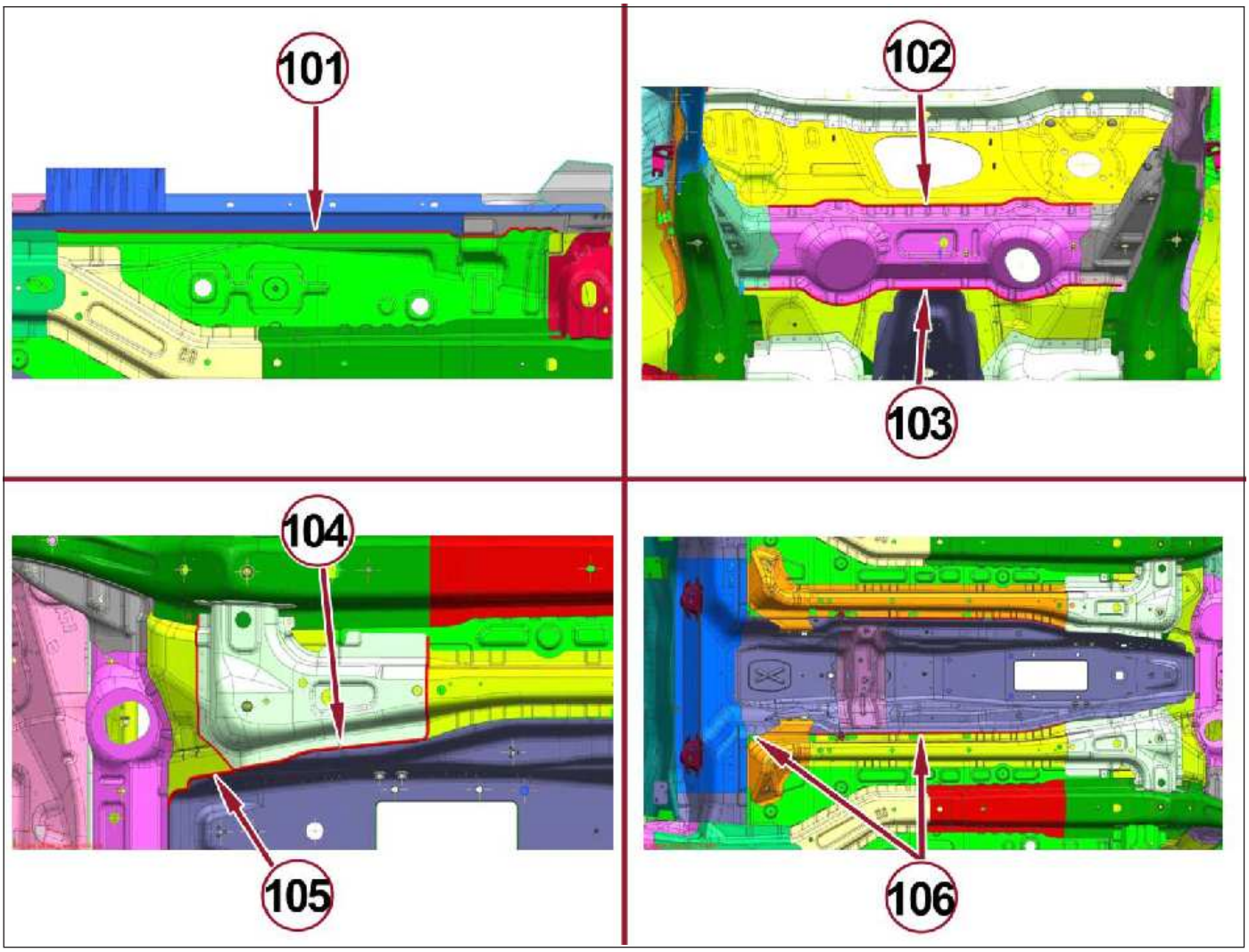
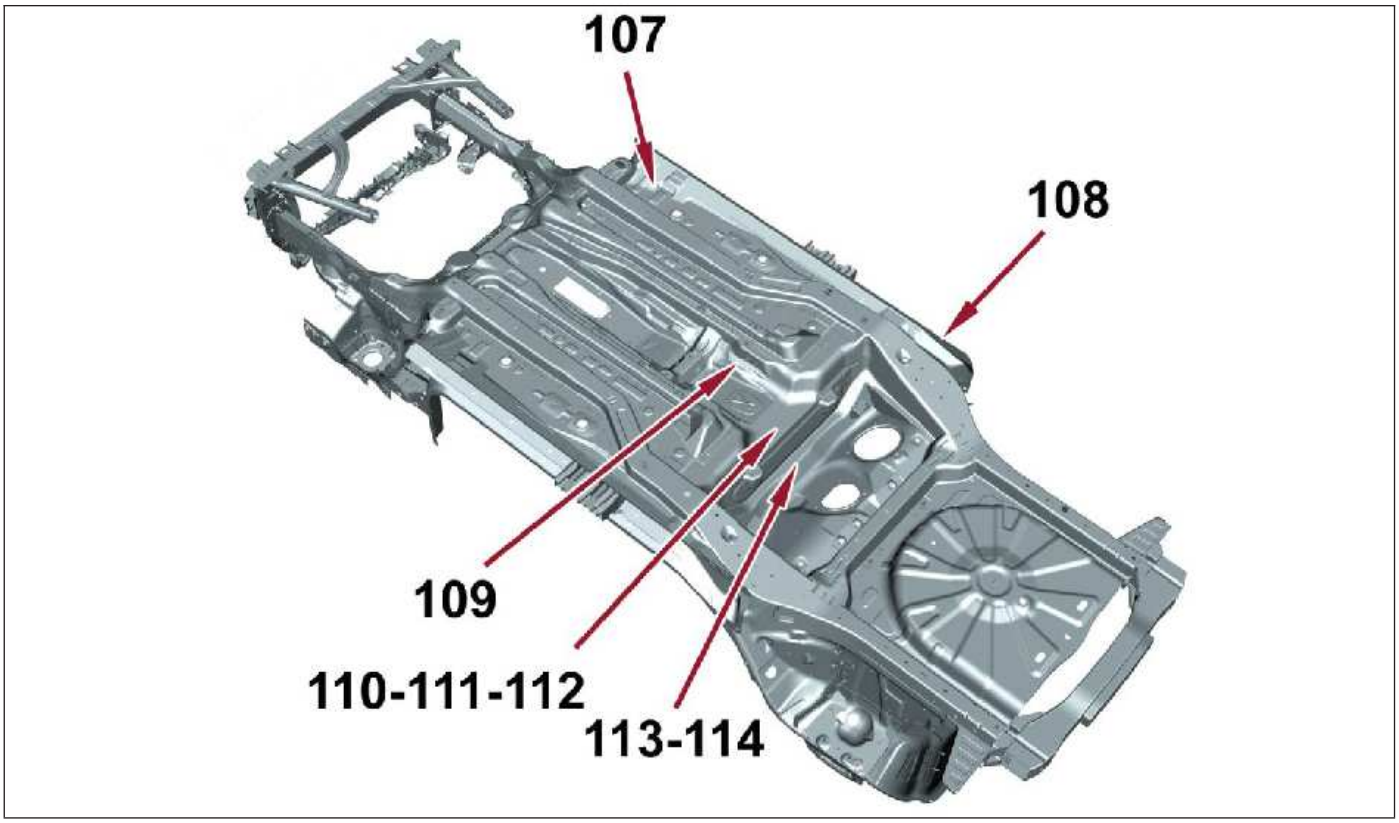
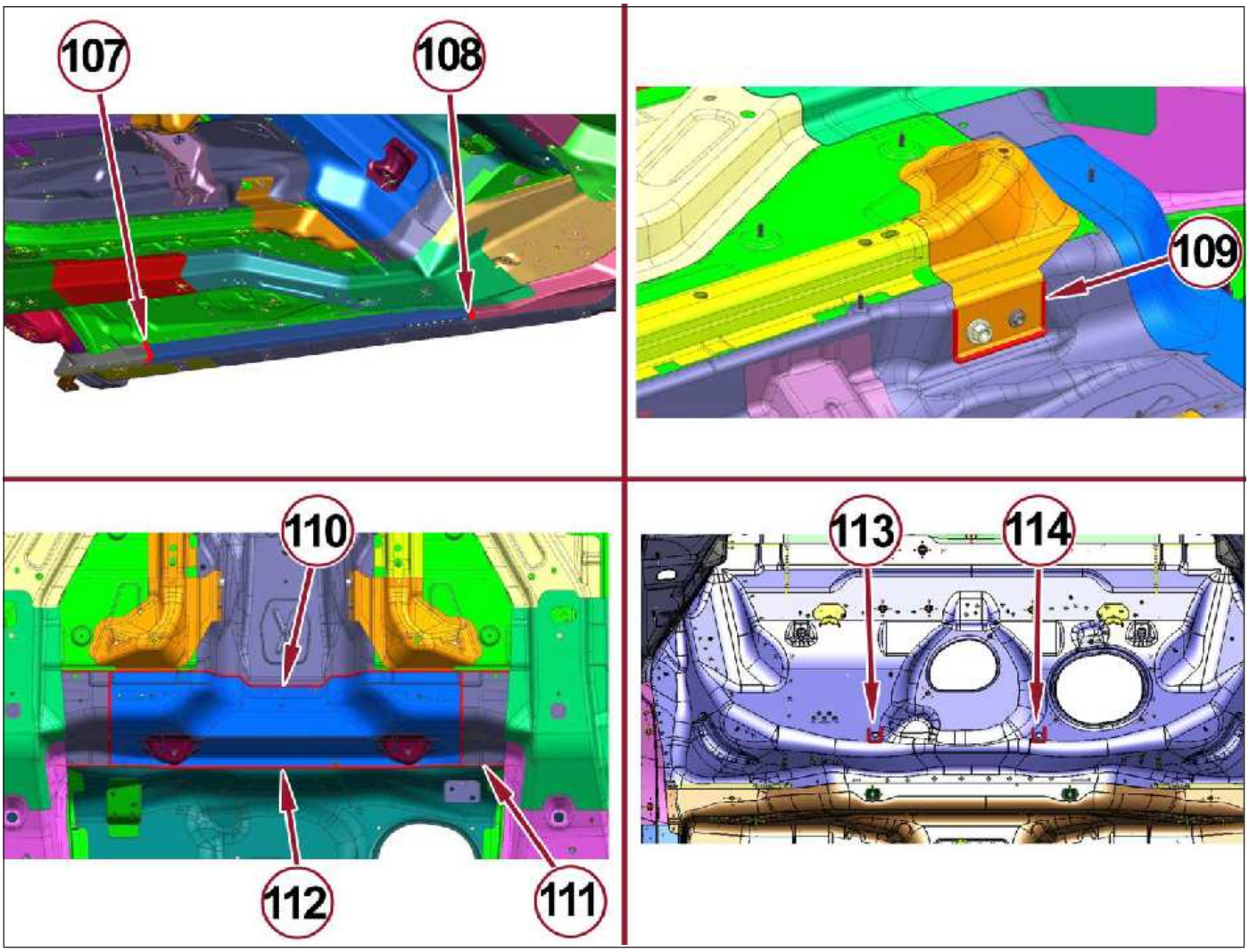


Detailed applications of sealant in areas 101 to 106

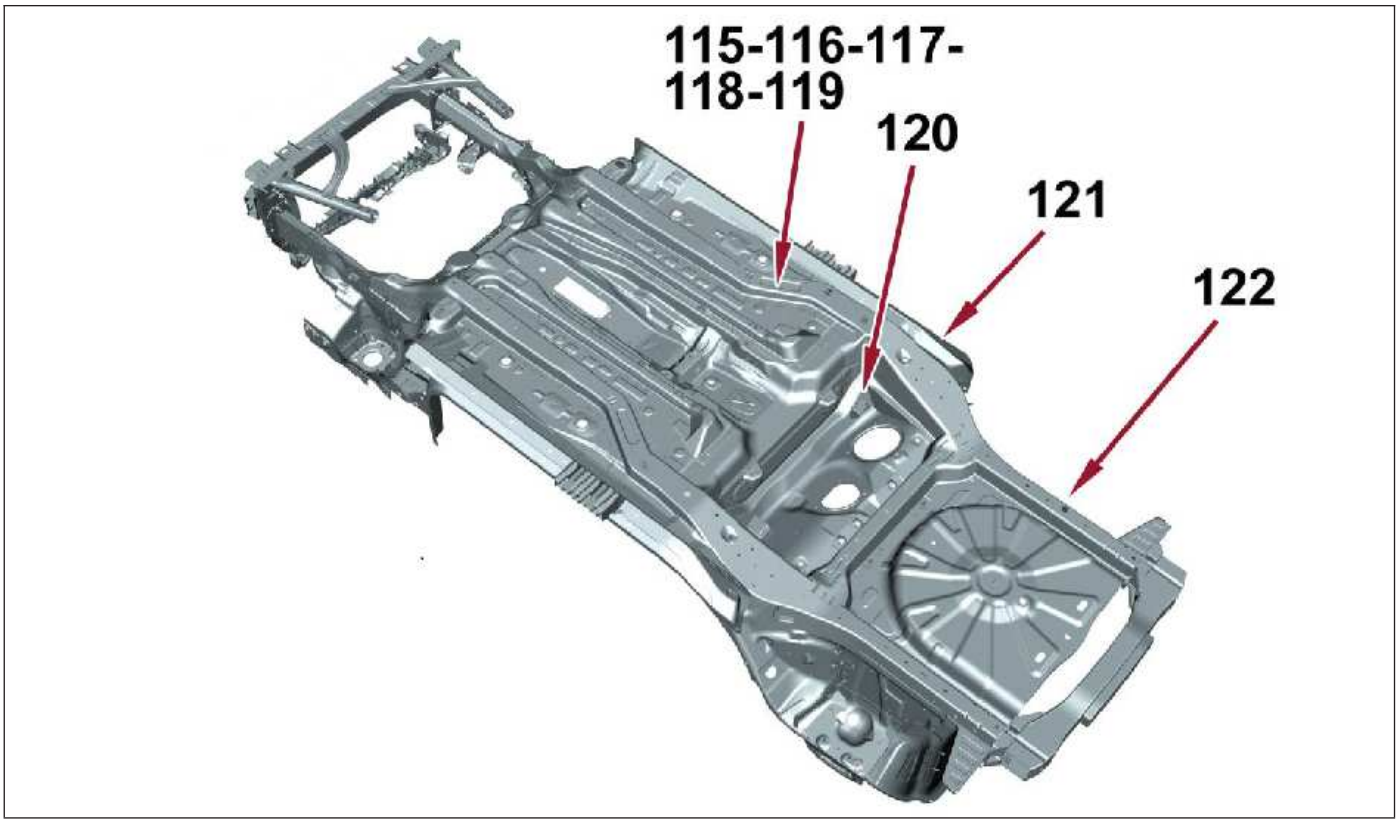
101	Inner Sill Panel / Front Floor
102	Dash Panel / Floor Pan Crossmember
103	Dash Panel / Floor Pan Crossmember
104	Crossmember Suspension Support / Front Area on Tunnel Floor
105	Front Area on Tunnel Floor / Dash Panel
106	Tunnel / Front Floor Pan Rail

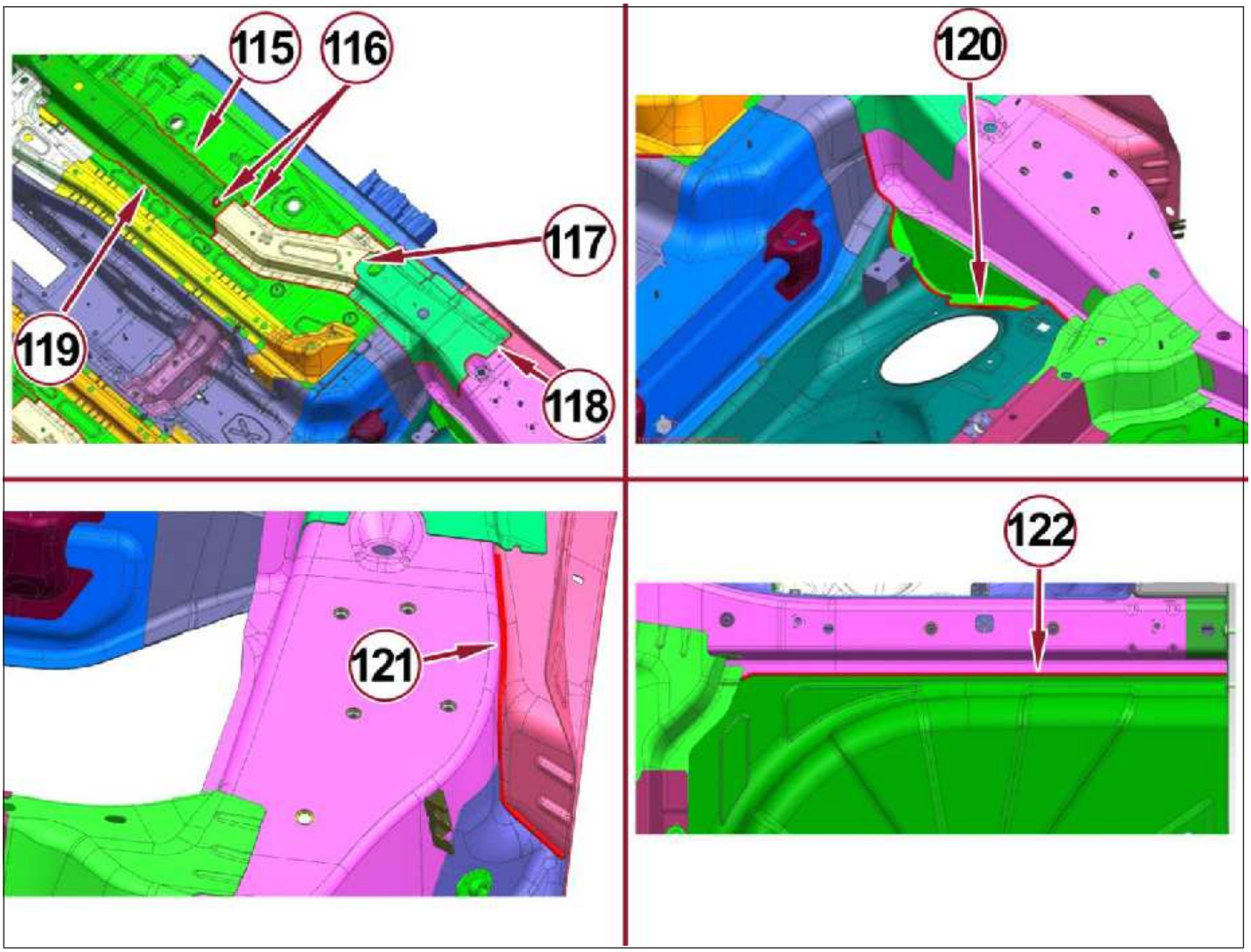

107
108
109
110-111-112
113-114



Detailed applications of sealant in areas 107 to 114

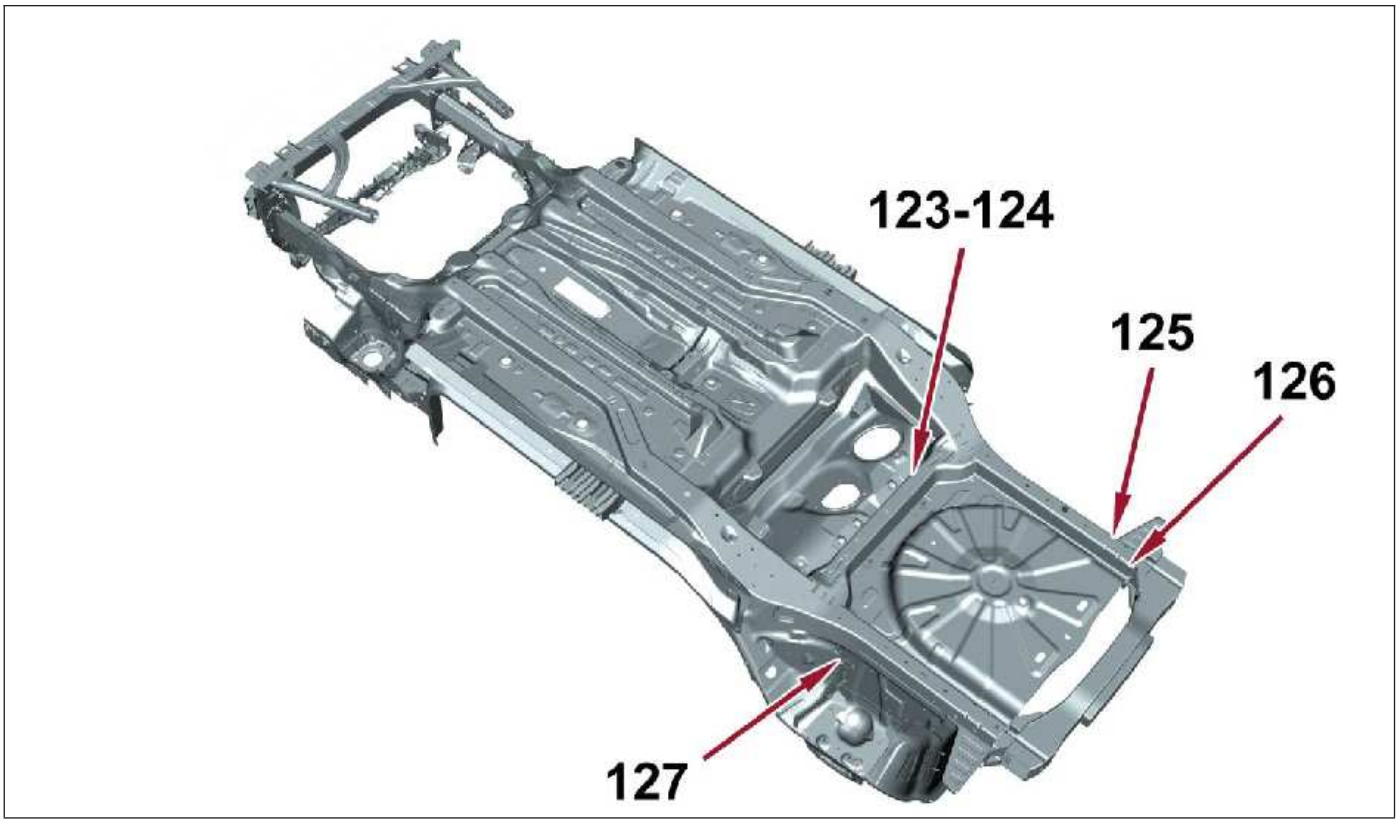
107	Front Floor Pan Rail Extension / Front Inner Sill
108	Front Floor Pan Rail Extension / Rear Inner Sill
109	Tank Protection Bracket
110	Rear Floor Crossmember / Tunnel / Rear Floor
111	Rear Floor Pan Reinforcement / Tunnel / Front Floor
112	Rear Floor Front / Rear Floor Pan Reinforcement
113	Rear Floor (Front)
114	Rear Floor (Front)

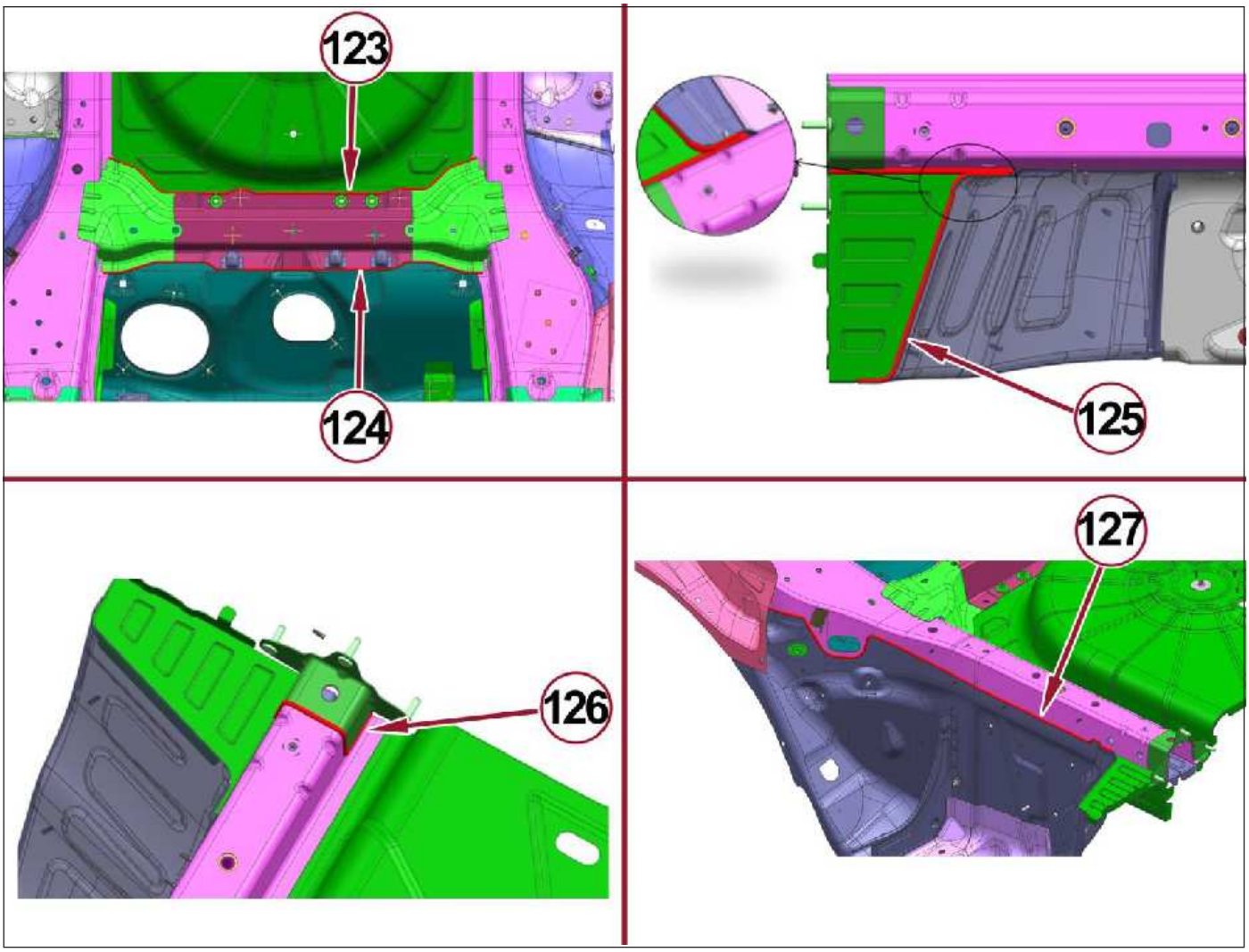

115-116-117-
118-119
120
121
122



Detailed applications of sealant in areas 115 to 122

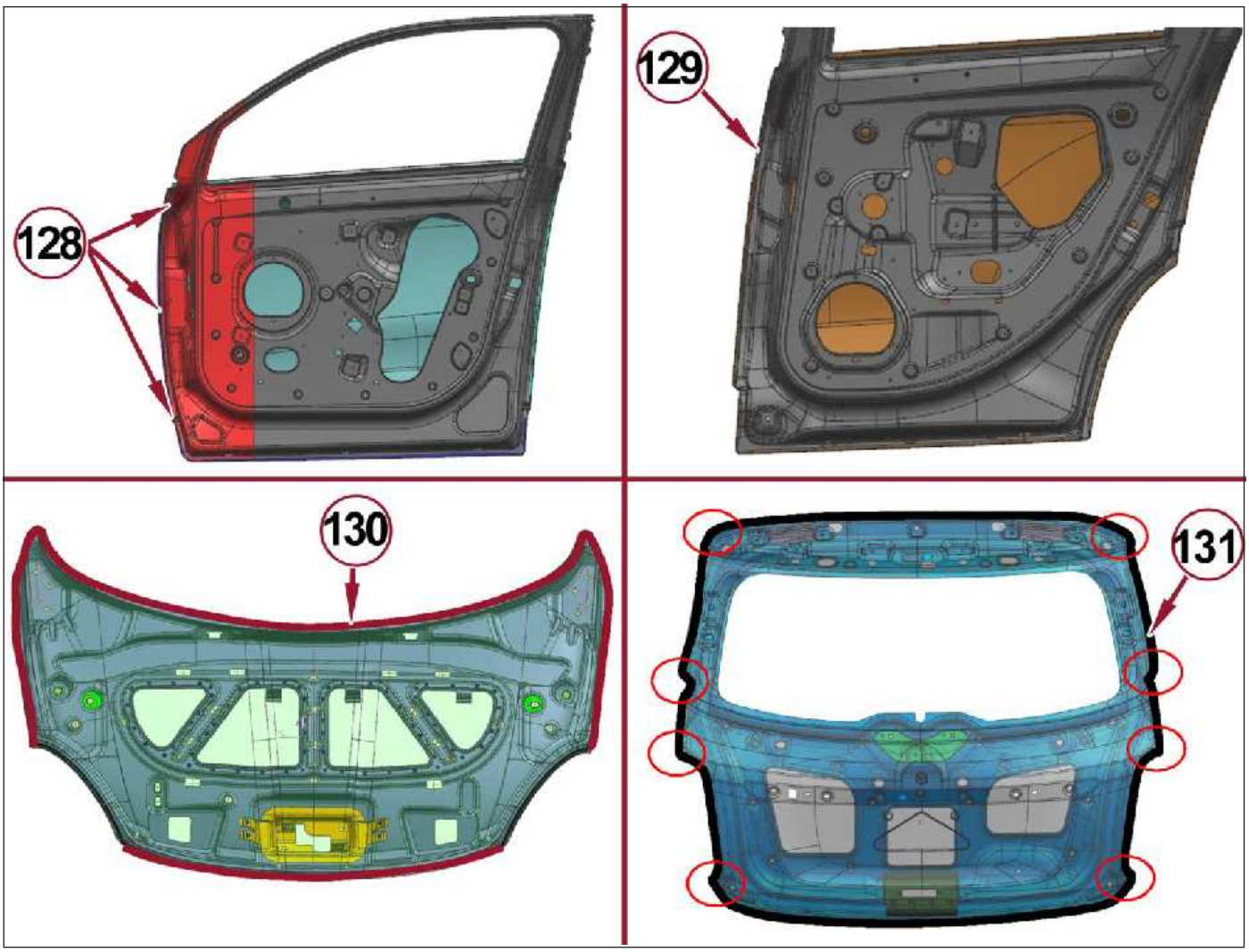
115	Front Floor / Front Floor Pan Rail
116	Front Floor / Front Floor Pan Rail
117	Front Floor / Front Floor Pan Rail
118	Rear Frame Rail / Front Floor Pan Rail Extension
119	Front Floor / Front Floor Pan Rail
120	Floor Sidemember Closeout
121	Rear Frame Rail / Rear Inner Sill
122	Rear Frame Rail / Rear Floor Pan


123-124
125
126
127



Detailed applications of sealant in areas 123 to 127

123	Rear Floor Crossmember / Rear Floor Crossmember Extension
124	Rear Floor Crossmember / Rear Floor Pan
125	Rear Wheelhouse Reinforcement / Inner Wheelhouse / Rear Frame Rail
126	Rear Frame Rail / Rear Bumper Mounting Bracket
127	Inner Wheelhouse / Rear Frame Rail



Detailed applications of sealant in areas 128 to 131

128	Inner Front Door / Outer Door Panel
129	Inner Rear Door / Outer Door Panel
130	Inner Hood / Outer Hood Panel
131	Inner Liftgate Panel / Outer Liftgate Panel