

ACCESSORIES & EQUIPMENT

Collision Repair - CTS Sedan

SPECIFICATIONS

DIMENSIONS - BODY

Point-To-Point Measurements

Point-to-point measurements are for reference only. All measurements are given in millimeters. Use these measurements for diagnosing and estimating. Point-to-point measurements are duplicated with tram bar pointers set at equal lengths. All the marks, holes, slots, and fasteners are measured to the center. All dimensions are symmetrical unless otherwise specified.

Engine Compartment

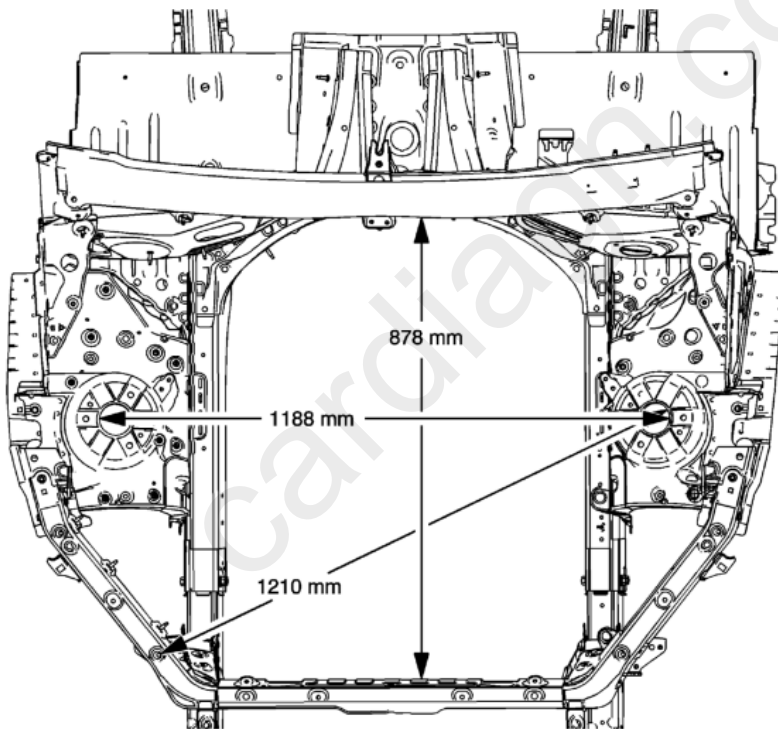


Fig. 1: Engine Compartment

Courtesy of GENERAL MOTORS COMPANY

Rear End

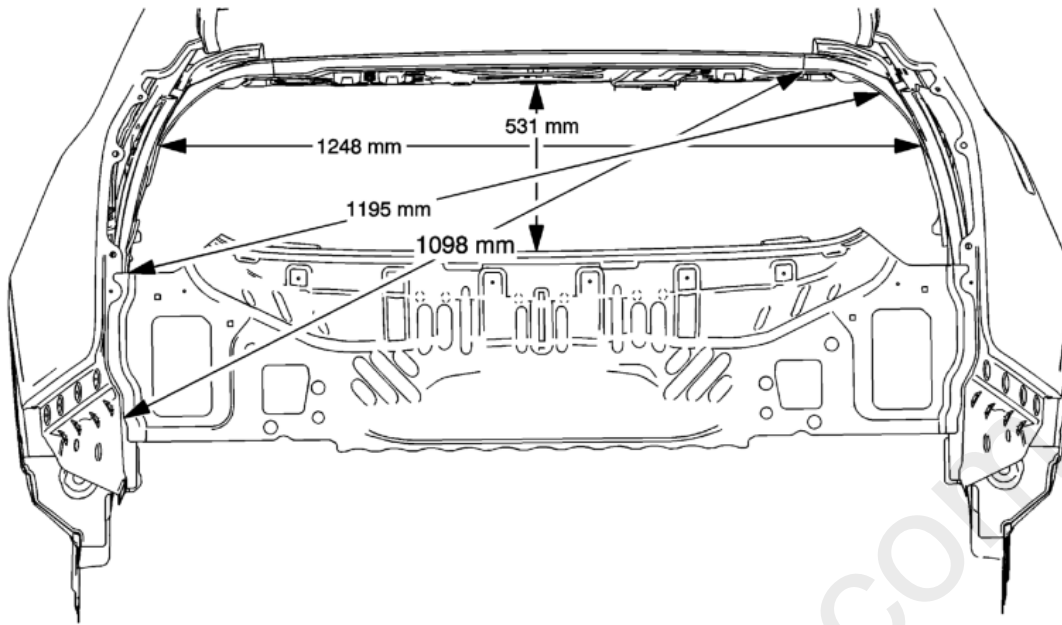


Fig. 2: Rear End
 Courtesy of GENERAL MOTORS COMPANY

Side

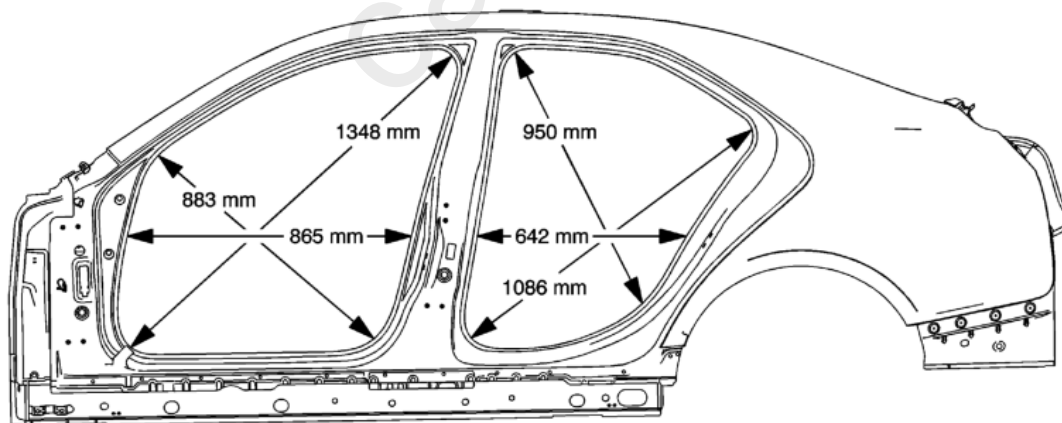


Fig. 3: Side
Courtesy of GENERAL MOTORS COMPANY

VISUAL IDENTIFICATION

STRUCTURE IDENTIFICATION

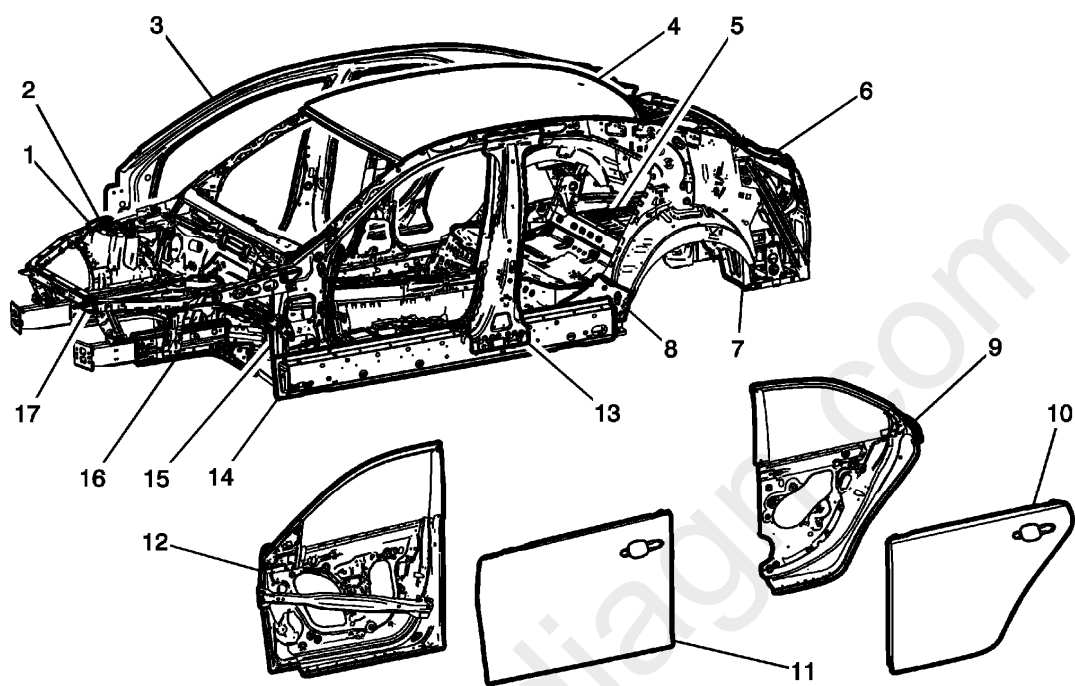


Fig. 4: Structure Identification
Courtesy of GENERAL MOTORS COMPANY

Structure Identification

Number	Description	Material	Procedure
1	Front Upper Side Rail	<u>Mild Steel</u>	<u>Front Compartment Upper Side Rail Replacement</u>
2	Front Wheelhouse Panel	<u>Aluminum Panel Bonding</u>	<u>Front Wheelhouse Panel Replacement (Complete), Front Wheelhouse Panel Replacement (Partial)</u>
3	Outer Bodyside Panel	<u>Mild Steel</u>	• <u>Quarter Outer Panel Sectioning</u> • <u>Center Pillar Sectioning - Outer</u> • <u>Rocker Outer Panel Sectioning</u>

			• <u>Front Hinge Pillar Body Sectioning (Lower), Front Hinge Pillar Body Sectioning (Upper)</u>
4	Roof Outer Panel	<u>Mild Steel</u>	<u>Roof Outer Panel Replacement</u>
5	Rear Floor Panel	<u>High Strength Low Alloy Steel</u>	<u>Rear Compartment Floor Panel Sectioning</u>
6	Body Rear End Panel	<u>Mild Steel</u>	<u>Body Rear End Panel Replacement</u>
7	Quarter Panel	<u>Mild Steel</u>	• <u>Quarter Outer Panel Sectioning</u> • <u>Quarter Inner Panel Sectioning (Lower), Quarter Inner Panel Sectioning (Upper)</u> • <u>Rear Wheelhouse Inner Panel Replacement</u>
8	Rear Lower Side Rail	<u>Dual Phase Steel</u>	• <u>Underbody Rear Side Rail Replacement</u> • <u>Underbody Rear Side Rail Sectioning</u>
9	Rear Door Inner Reinforcement Beam	<u>Ultra High Strength Steel</u>	Not Serviced
10	Rear Outer Door Panel	Aluminum	Not Serviced
11	Front Outer Door Panel	Aluminum	Not Serviced
12	Front Door Inner Reinforcement Beam	<u>Ultra High Strength Steel</u>	Not Serviced
13	Center Pillar	<u>Ultra High Strength Steel</u>	• <u>Center Pillar Outer Panel Reinforcement Replacement</u> • <u>Center Pillar Inner Panel Replacement</u>
14	Rocker Panel	<u>Ultra High Strength Steel</u>	• <u>Rocker Outer Panel Reinforcement Replacement</u> • <u>Rocker Inner Panel Reinforcement Replacement</u>
15	Front Hinge Pillar	<u>Dual Phase Steel</u>	<u>Body Hinge Pillar Lower Reinforcement Replacement</u>
16	Front Lower Side Rail	<u>Ultra High Strength Dual Phase Steel</u>	<u>Front Compartment Front Rail Replacement</u>
			<u>Front Compartment Front</u>

REPAIR INSTRUCTIONS

FRONT WHEELHOUSE PANEL REPLACEMENT (COMPLETE)

Removal Procedure

WARNING: Refer to Approved Equipment for Collision Repair Warning .

WARNING: Refer to Foam Sound Deadeners Warning .

WARNING: Refer to Battery Disconnect Warning .

NOTE: The front wheelhouse panel is cast aluminum and it is rivet bonded to the front lower frame rail (Ultra High Strength Steel) and hinge pillar upper extensions (Dual Phase Steel). The front wheelhouse is serviced as a complete assembly that includes the hinge pillar upper extension, which is rivet bonded to the front wheelhouse panel.

NOTE: This procedure describes how to replace the complete front wheelhouse assembly, using recommended adhesive and rivets to attach the assembly to the front lower frame rail. The assembly requires welding at the cowl on the upper hinge pillar extension.

NOTE: Partial replacement of the front wheelhouse assembly can be done by replacing only the front wheelhouse panel (cast aluminum). The front wheelhouse panel will need to be separated from the complete wheelhouse service assembly and replaced using adhesive and rivets.

1. Disable the SIR system and then disconnect the negative battery cable. Refer to SIR Disabling and Enabling .
2. Remove all related panels and components.

NOTE: Inspect the front of the cowl for damage. If the metal surface is damaged, the cowl panel must be repaired to restore the structural integrity of the vehicle.

3. Repair as much of the damage as possible. Refer to Dimensions - Body.
4. Remove the Sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-

Corrosion Treatment and Repair .

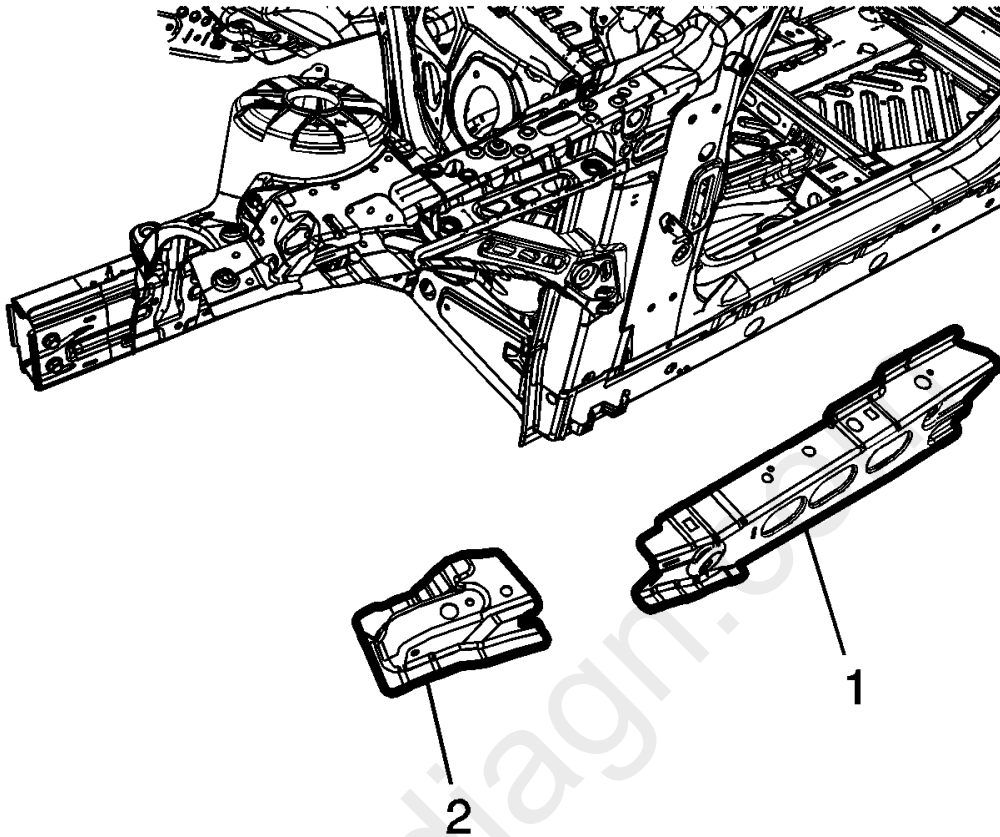


Fig. 5: Front Upper Outer Rail And Front Tie Bar Attachment Bracket
Courtesy of GENERAL MOTORS COMPANY

NOTE: Record the number and location of welds for installation of the service assembly.

5. Remove all necessary factory welds and then remove the front upper outer rail (1) and the front tie bar attachment bracket (2), to access rivets and hinge pillar upper extension welds.

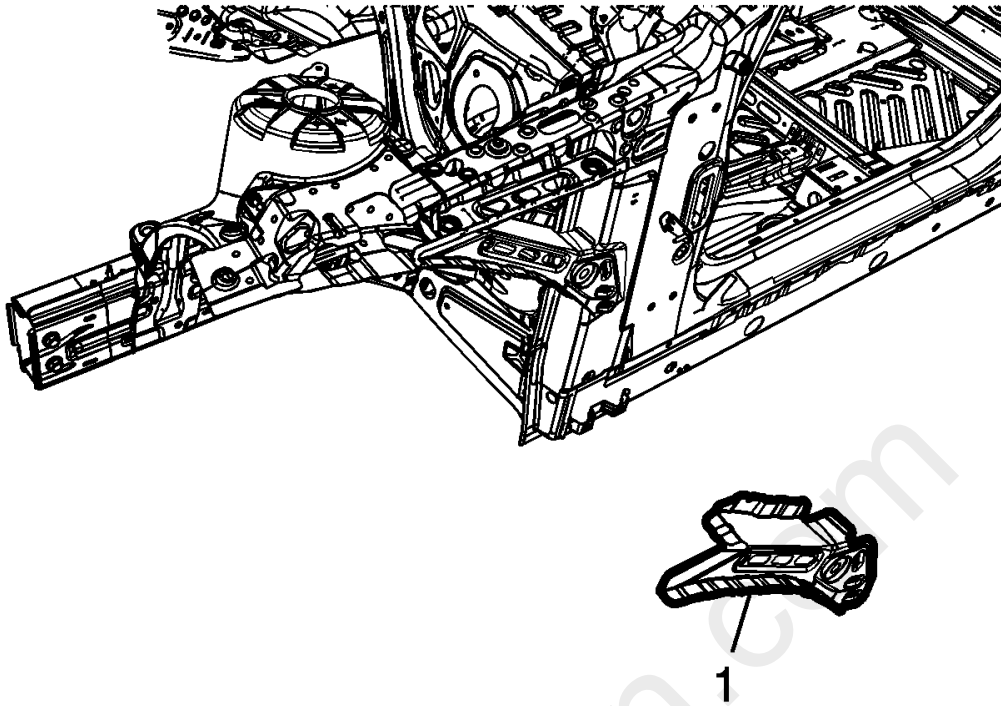


Fig. 6: Upper Outer Rail Reinforcement Bracket
Courtesy of GENERAL MOTORS COMPANY

NOTE: Record the number and location of welds for installation of the service assembly.

6. Remove all necessary factory welds for the upper outer rail reinforcement bracket and then remove the upper outer rail reinforcement bracket (1), then remove the welds from the hinge pillar upper extensions from the cowl area.

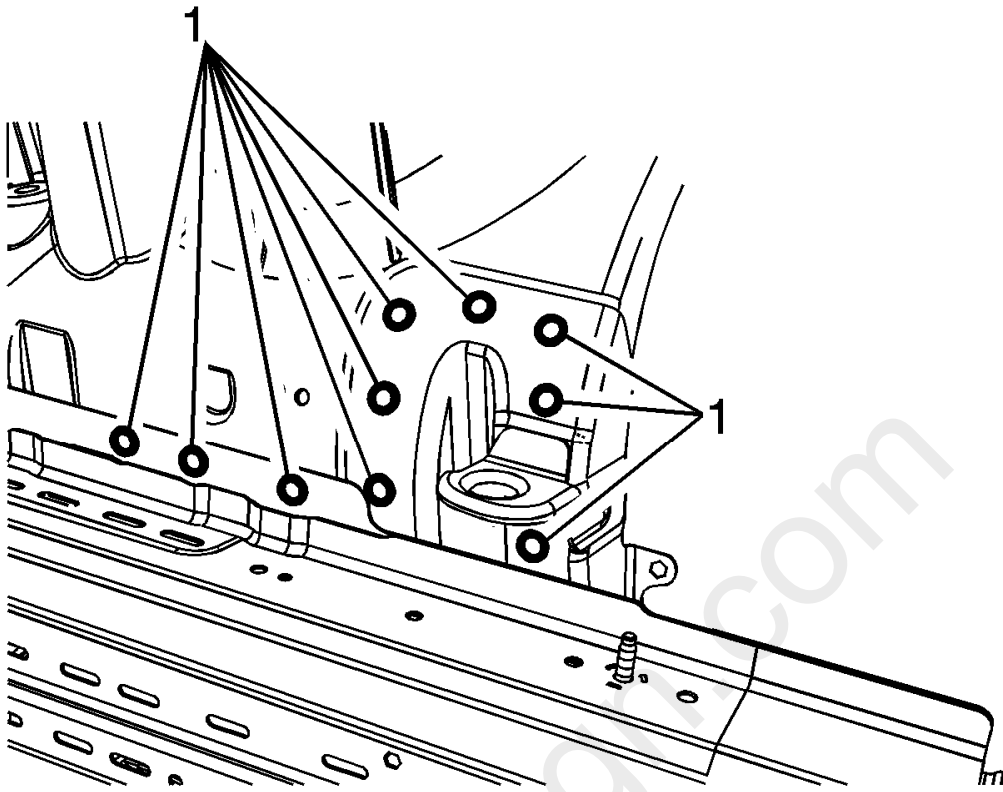


Fig. 7: Front Wheelhouse Assembly
Courtesy of GENERAL MOTORS COMPANY

NOTE: Record the number and location of the rivets for installation of the service assembly.

NOTE: The rivets can be removed by using a chisel and hammer to remove the head of the rivet and then driving out the remainder of the rivet with a punch and hammer, or drilled out with a suitable drill bit and drill

7. Locate, mark and remove the factory rivets that attach the front wheelhouse assembly to the structure (1).

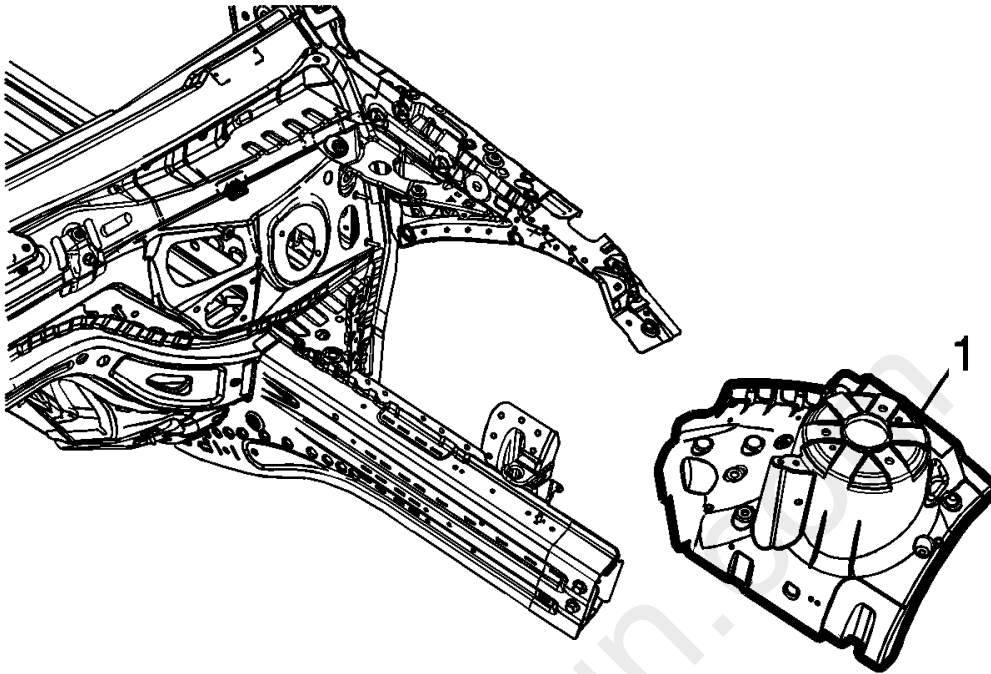


Fig. 8: Front Wheelhouse Assembly Removed
Courtesy of GENERAL MOTORS COMPANY

NOTE: The adhesive material will release from the structure by applying heat to approximately 200°C (400°F). A noticeable popping sound can normally be heard when the adhesive releases.

8. To complete the removal of the front wheelhouse panel, apply heat to the adhesive material to cause the adhesive to release and then remove the wheelhouse assembly from the vehicle (1).

Installation Procedure

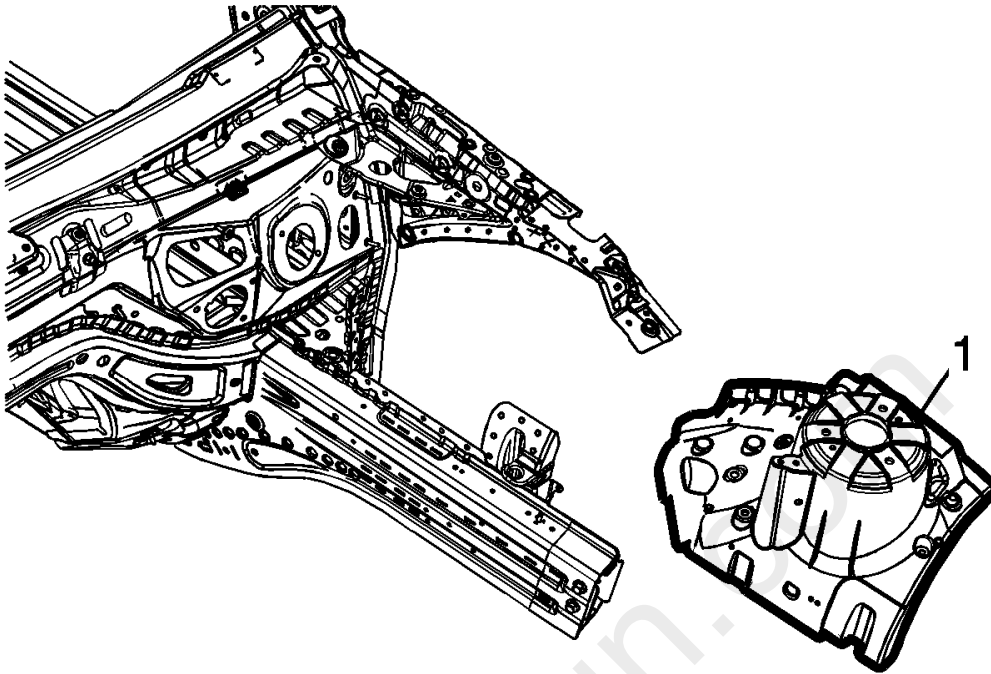


Fig. 9: Front Wheelhouse Assembly Removed
Courtesy of GENERAL MOTORS COMPANY

NOTE: Note: Proper alignment of the wheelhouse assembly is important. The use of 3-dimensional measuring equipment is recommended when installing the part.

1. Prior to applying adhesive, or welding, fit the wheelhouse assembly to the structure and check for proper alignment (1).

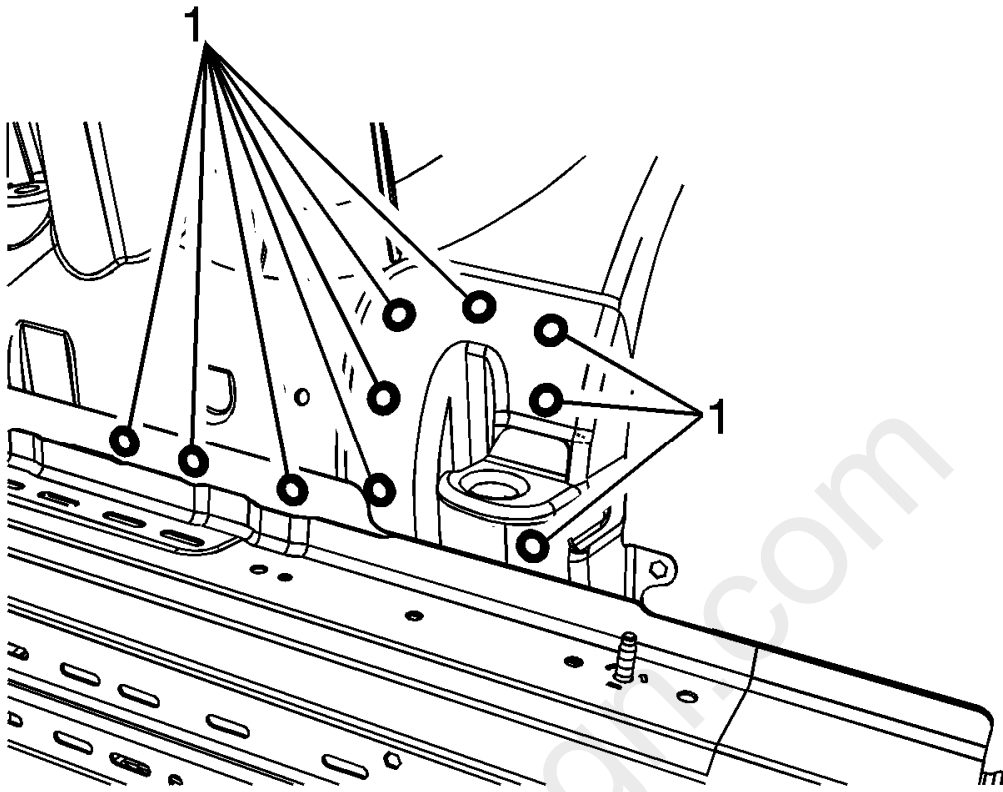


Fig. 10: Front Wheelhouse Assembly
Courtesy of GENERAL MOTORS COMPANY

2. With the part properly located and aligned, mark the locations for the rivets and welds recorded from the original part and drill the holes for the rivets (1).
3. Remove the part from the vehicle to clean and prepare the surfaces for bonding and welding.

NOTE: Leave the Elpo-coating on the adhesive bonding surfaces of the service part to allow additional protection of the aluminum from galvanic corrosion.

4. Scuff sand the bonding surfaces on the service part to remove the gloss of the Elpo-coating.
5. Using a grinding disk, or equivalent, prepare a bare steel surface on the bonding areas of the vehicle structure.
6. Clean and prepare all welding surfaces.

NOTE: Refer to adhesive manufacturer's recommendation for specific application and curing recommendations.

7. Apply a bead of adhesive to all bonding surfaces on the vehicle structure and service part, per the adhesive manufacturer's recommendations. Refer to **Aluminum Panel Bonding**.

NOTE: **Completely cover all bare surfaces with the adhesive.**

8. Using a small brush, spread a coat of the adhesive to cover the entire adhesive bonding surface, to ensure proper corrosion protection.

NOTE: **Do not allow the adhesive to cure off the vehicle, prior to installing and aligning the part. Refer to adhesive manufacturer's recommendations for specific cure times.**

9. Apply a bead of adhesive to the mating surface of the service part, per the adhesive manufacturer's recommendations.

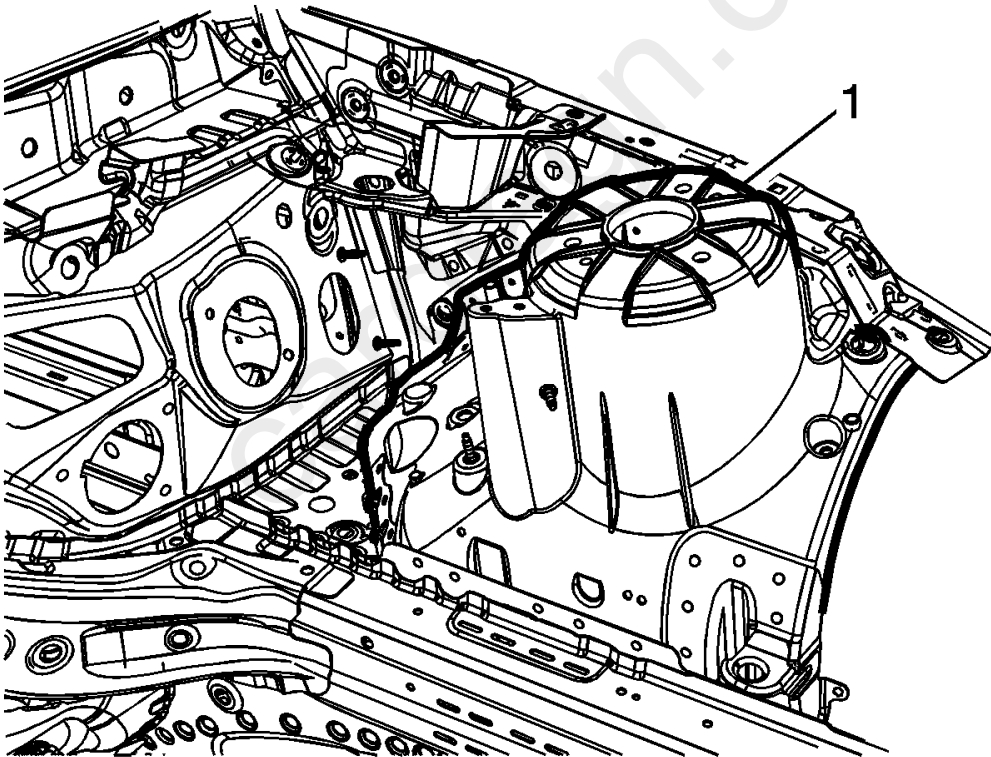


Fig. 11: Checking For Proper Alignment Of Wheelhouse Assembly
Courtesy of GENERAL MOTORS COMPANY

NOTE: Do not pull the panels apart after joined together. Slide the panels against each other to realign the panels, or proper joint strength may be affected.

NOTE: Proper alignment of the wheelhouse assembly is important. The use of 3-dimensional measuring equipment is recommended when installing the part.

10. Install the service part to the vehicle structure and check for proper alignment (1).
11. Install the rivets along the bonding joint, at the original locations. Refer to the electronic parts catalog for the recommended rivets.
12. Weld the service part at the original weld locations, as necessary.
13. Install front tie bar attachment bracket, front outer upper rail and upper outer rail reinforcement bracket.
14. Clean all welded surfaces.
15. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
16. Paint the repaired area. Refer to **Basecoat/Clearcoat Paint Systems** .
17. Install all related panels and components.
18. Enable the SIR system and then connect the negative battery cable. Refer to **SIR Disabling and Enabling** .

FRONT WHEELHOUSE PANEL REPLACEMENT (PARTIAL)

Removal Procedure

WARNING: Refer to **Approved Equipment for Collision Repair Warning** .

WARNING: Refer to **Foam Sound Deadeners Warning** .

WARNING: Refer to **Battery Disconnect Warning** .

NOTE: The front wheelhouse panel is cast aluminum and it is rivet bonded to the front lower frame rail (Ultra High Strength Steel) and hinge pillar upper extensions (Dual Phase Steel). The front wheelhouse is serviced as a complete assembly that includes the hinge pillar upper extension, which is rivet bonded to the front wheelhouse panel.

NOTE: This procedure describes how to perform a partial replacement of the front wheelhouse assembly, using recommended adhesive and rivets to attach the assembly to the front lower frame rail and upper hinge pillar extension. This

procedure can be used to replace the front wheelhouse panel (cast aluminum), when the upper hinge pillar extension is not damaged, or can be repaired. The hinge pillar upper extension can left attached to cowl area.

1. Disable the SIR system and then disconnect the negative battery cable. Refer to SIR Disabling and Enabling .
2. Remove all related panels and components.

NOTE: Inspect the front of the cowl for damage. If the metal surface is damaged, the cowl panel must be repaired to restore the structural integrity of the vehicle

3. Repair as much of the damage as possible. Refer to Dimensions - Body.
4. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair .

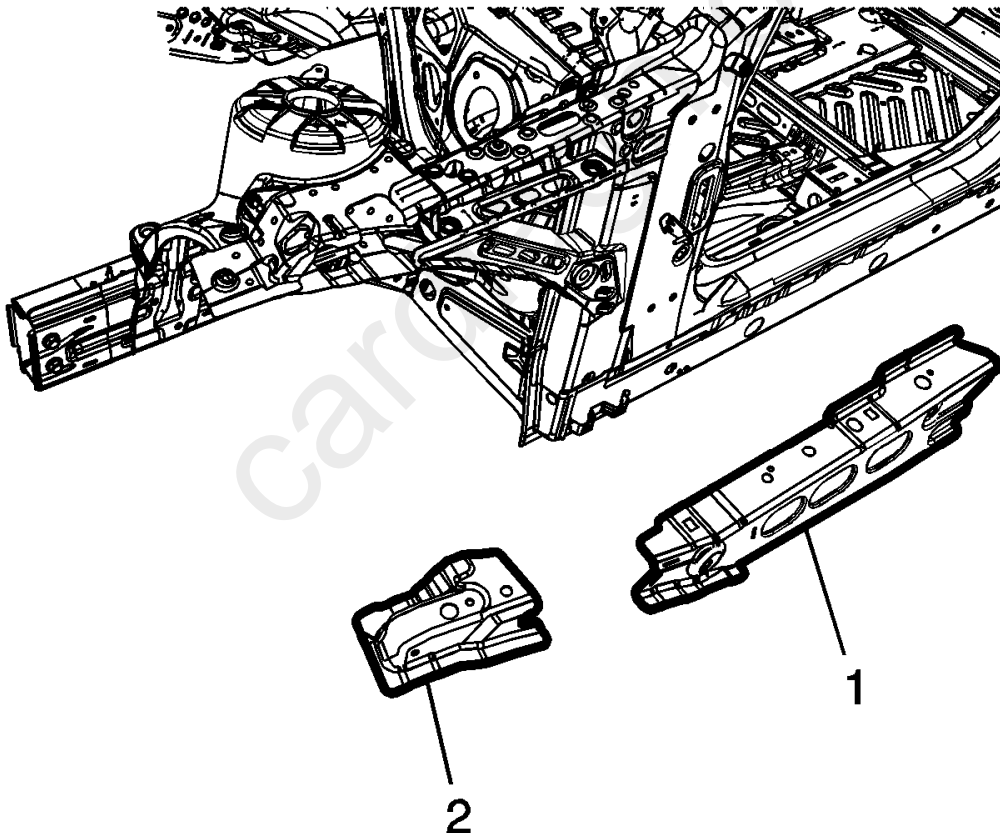


Fig. 12: Front Upper Outer Rail And Front Tie Bar Attachment Bracket
Courtesy of GENERAL MOTORS COMPANY

NOTE: Record the number and location of welds for installation of the service assembly.

5. Remove all necessary factory welds and then remove the front upper outer rail (1) and the front tie bar attachment bracket (2), to access rivets and hinge pillar upper extension welds.

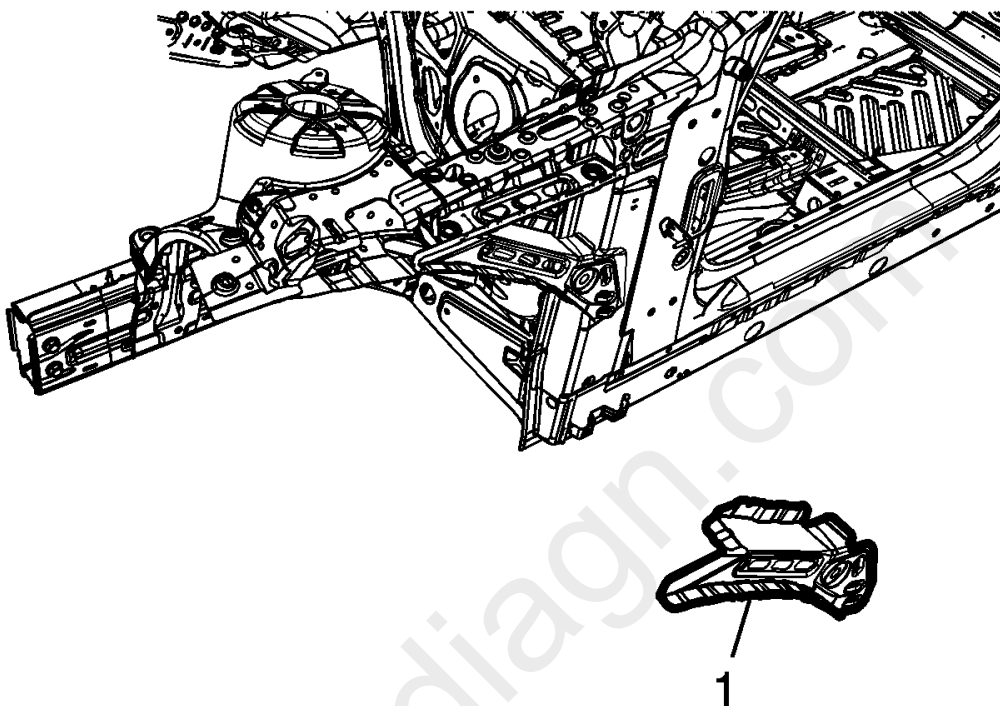


Fig. 13: Upper Outer Rail Reinforcement Bracket
Courtesy of GENERAL MOTORS COMPANY

NOTE: Record the number and location of welds for installation of the service assembly.

6. Remove all necessary factory welds for the upper outer rail reinforcement bracket and then remove the upper outer rail reinforcement bracket (1).

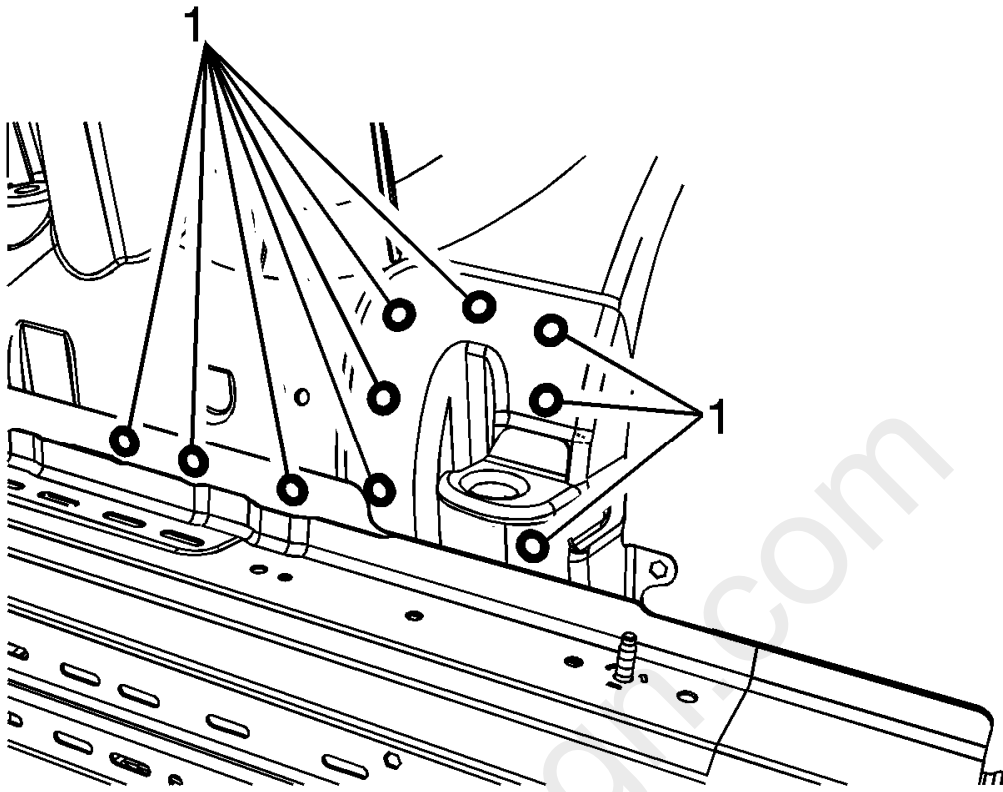


Fig. 14: Front Wheelhouse Assembly
Courtesy of GENERAL MOTORS COMPANY

NOTE: Record the number and location of the rivets for installation of the service assembly.

NOTE: The rivets can be removed by using a chisel and hammer to remove the head of the rivet and then driving out the remainder of the rivet with a punch and hammer, or drilled out with a suitable drill bit and drill.

7. Locate, mark and remove the factory rivets that attach the front wheelhouse assembly to the structure (1).

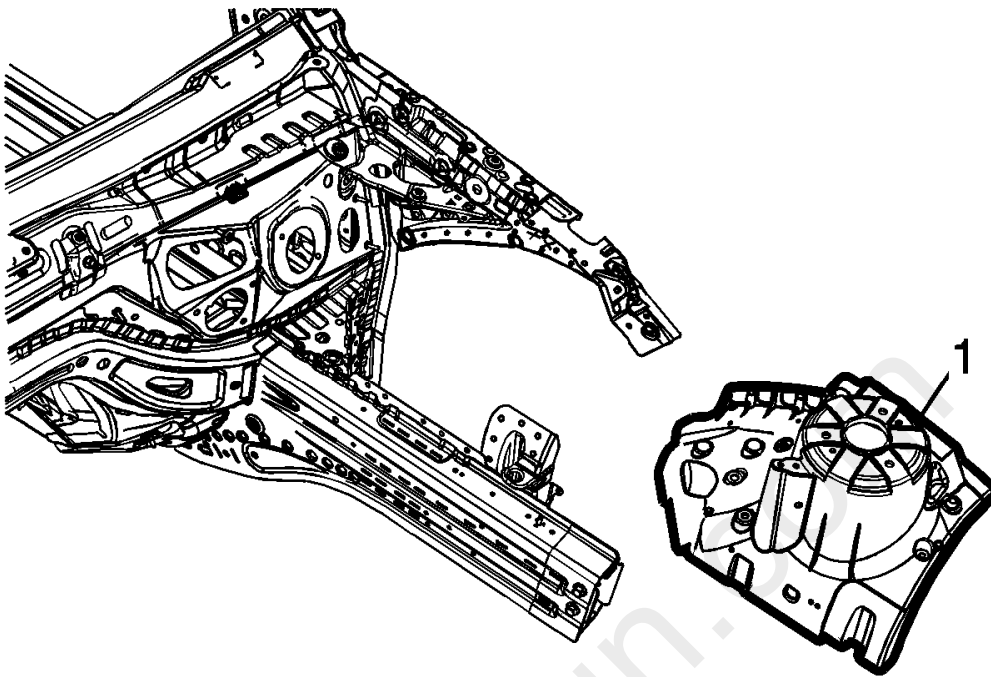


Fig. 15: Front Wheelhouse Assembly Removed
Courtesy of GENERAL MOTORS COMPANY

NOTE: The adhesive material will release from the structure by applying heat to approximately 200°C (400°F). A noticeable popping sound can normally be heard when the adhesive releases.

8. To complete the removal of the front wheelhouse panel, apply heat to the adhesive material to cause the adhesive to release and then remove the wheelhouse assembly from the vehicle (1).

Installation Procedure

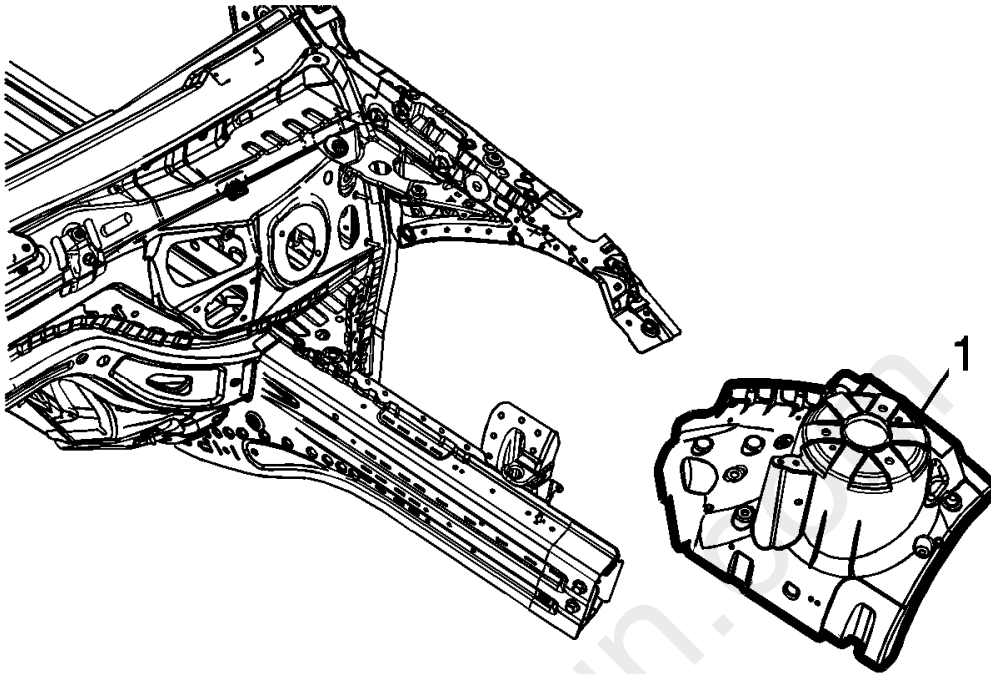


Fig. 16: Front Wheelhouse Assembly Removed
Courtesy of GENERAL MOTORS COMPANY

NOTE: Note: Proper alignment of the wheelhouse assembly is important. The use of 3-dimensional measuring equipment is recommended when installing the part.

1. Prior to applying adhesive, or welding, fit the wheelhouse assembly to the structure and check for proper alignment (1).

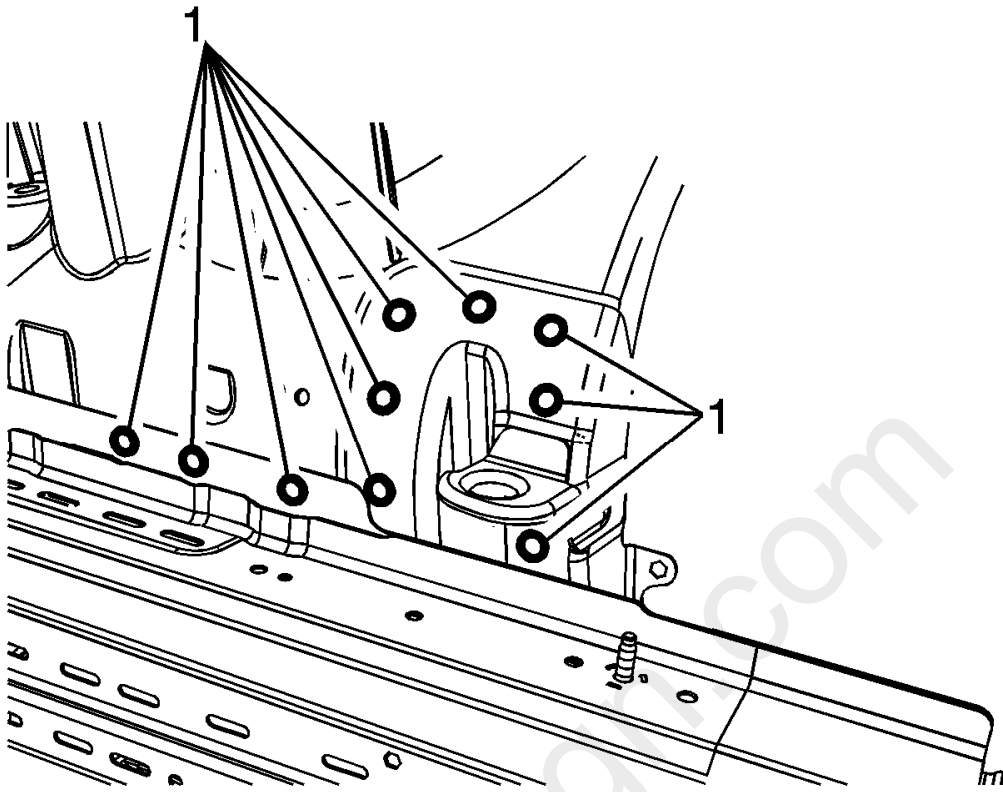


Fig. 17: Front Wheelhouse Assembly
Courtesy of GENERAL MOTORS COMPANY

2. With the part properly located and aligned, mark the locations for the rivets and welds recorded from the original part and drill the holes for the rivets (1).
3. Remove the part from the vehicle to clean and prepare the surfaces for bonding and welding.

NOTE: **Leave the Elpo-coating on the adhesive bonding surfaces of the service part to allow additional protection of the aluminum from galvanic corrosion.**

4. Scuff sand the bonding surfaces on the service part to remove the gloss of the Elpo-coating.
5. Using a grinding disk, or equivalent, prepare a bare steel surface on the bonding areas of the vehicle structure.
6. Clean and prepare all welding surfaces.

NOTE: **Refer to adhesive manufacturer's recommendation for specific application and curing recommendations.**

7. Apply a bead of adhesive to all bonding surfaces on the vehicle structure and service part, per the adhesive manufacturer's recommendations. Refer to **Aluminum Panel Bonding**.

NOTE: **Completely cover all bare surfaces with the adhesive.**

8. Using a small brush, spread a coat of the adhesive to cover the entire adhesive bonding surface, to ensure proper corrosion protection.

NOTE: **Do not allow the adhesive to cure off the vehicle, prior to installing and aligning the part. Refer to adhesive manufacturer's recommendations for specific cure times.**

9. Apply a bead of adhesive to the mating surface of the service part, per the adhesive manufacturer's recommendations.

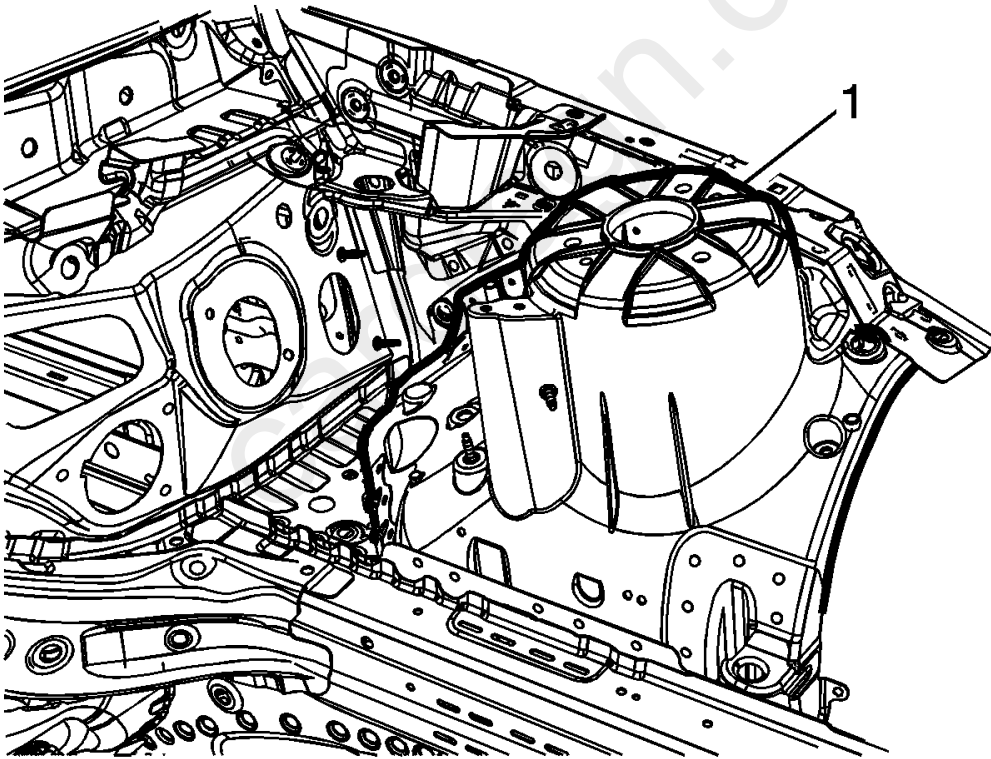


Fig. 18: Checking For Proper Alignment Of Wheelhouse Assembly
Courtesy of GENERAL MOTORS COMPANY

NOTE: Do not pull the panels apart after joined together. Slide the panels against each other to realign the panels, or proper joint strength may be affected.

NOTE: Proper alignment of the wheelhouse assembly is important. The use of 3-dimensional measuring equipment is recommended when installing the part.

10. Install the service part to the vehicle structure and check for proper alignment (1).
11. Install the rivets along the bonding joint, at the original locations. Refer to the electronic parts catalog for the recommended rivets.
12. Install front tie bar attachment bracket, front outer upper rail and upper outer rail reinforcement bracket.
13. Clean all welded surfaces.
14. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
15. Paint the repaired area. Refer to **Basecoat/Clearcoat Paint Systems** .
16. Install all related panels and components.
17. Enable the SIR system and then connect the negative battery cable. Refer to **SIR Disabling and Enabling** .

FRONT COMPARTMENT UPPER SIDE RAIL REPLACEMENT

Removal Procedure

WARNING: Refer to **Approved Equipment for Collision Repair Warning** .

WARNING: Refer to **Foam Sound Deadeners Warning** .

WARNING: Refer to **Battery Disconnect Warning** .

1. Disable the SIR system and then disconnect the negative battery cable. Refer to **SIR Disabling and Enabling** .
2. Remove all related panels and components.
3. Repair as much of the damage as possible to factory specifications. Refer to **Dimensions - Body**
4. Remove the sealers and anti-corrosion materials from the repair area. Refer to **Anti-Corrosion Treatment and Repair**

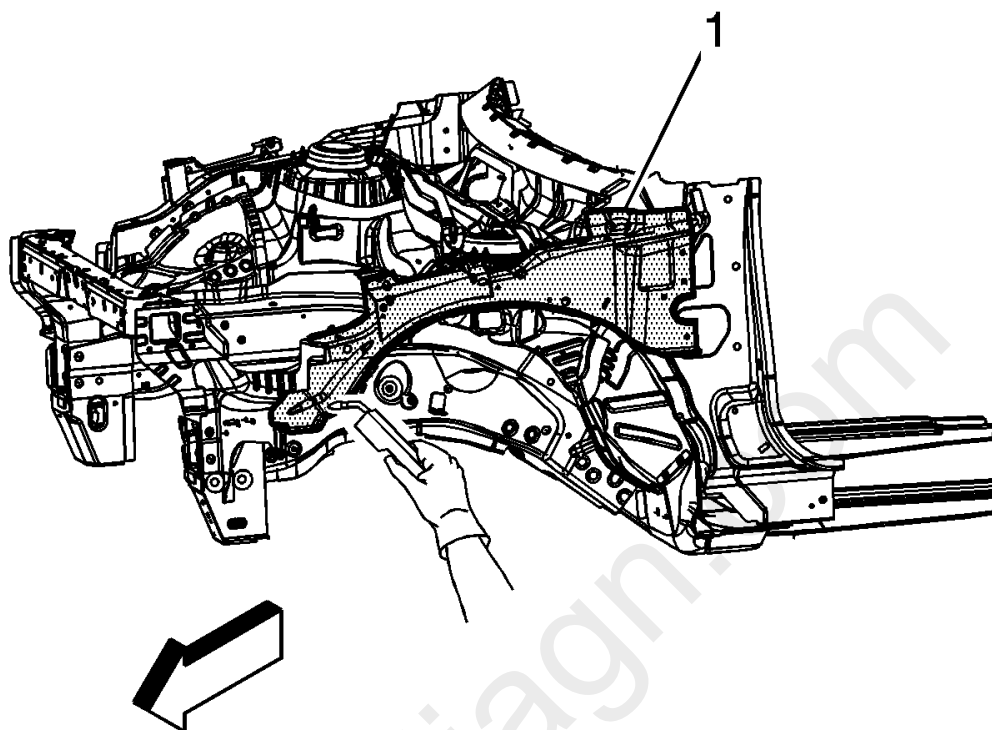


Fig. 19: Welding Upper Rail

Courtesy of GENERAL MOTORS COMPANY

NOTE: Record the number and location of welds for installation of the service assembly. Do not damage any inner panel reinforcements.

5. Remove factory welds as required. Note the number and location of the welds for installation of the front upper rail (1).

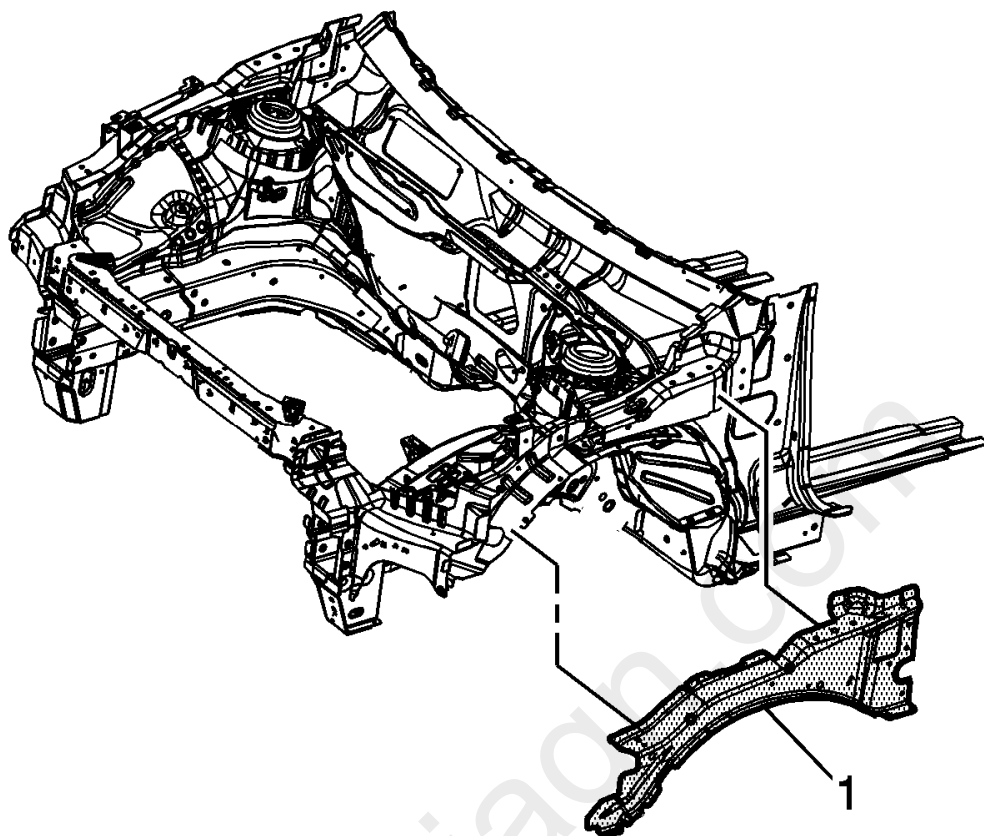


Fig. 20: Upper Rail

Courtesy of GENERAL MOTORS COMPANY

6. Remove the damaged front upper rail (1).

Installation Procedure

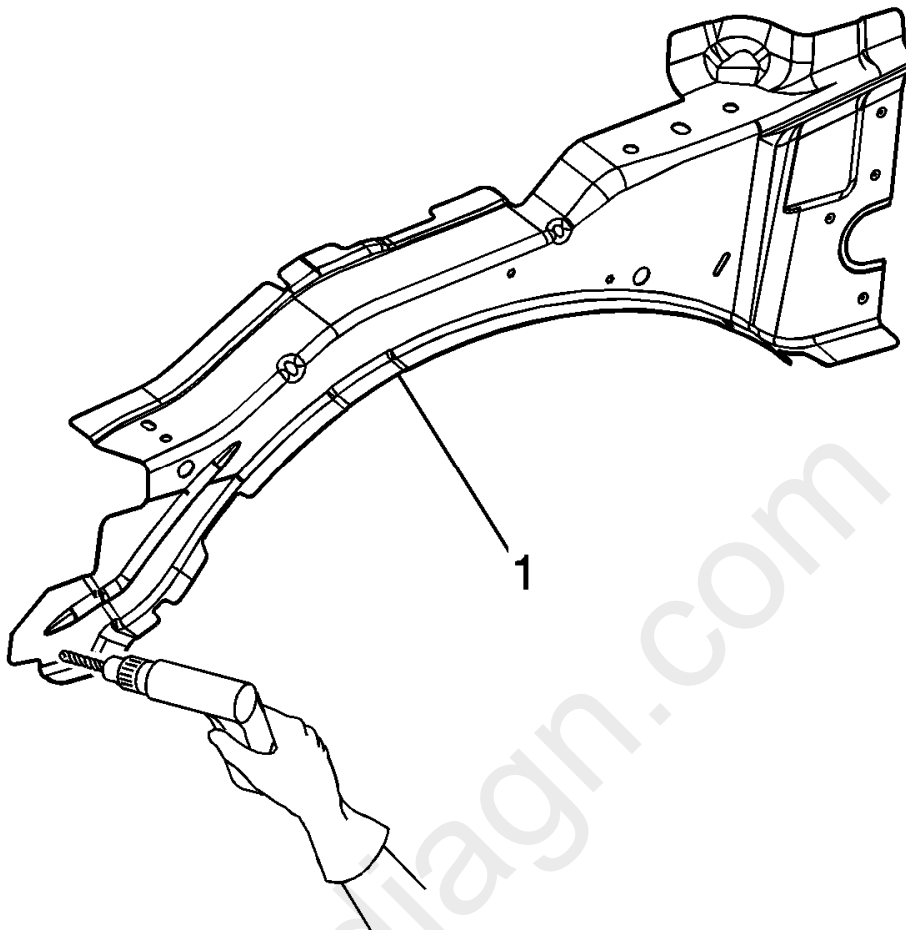


Fig. 21: Drilling Plug Weld Holes In Replacement Upper Rail
Courtesy of GENERAL MOTORS COMPANY

1. Prepare all mating surfaces as necessary.

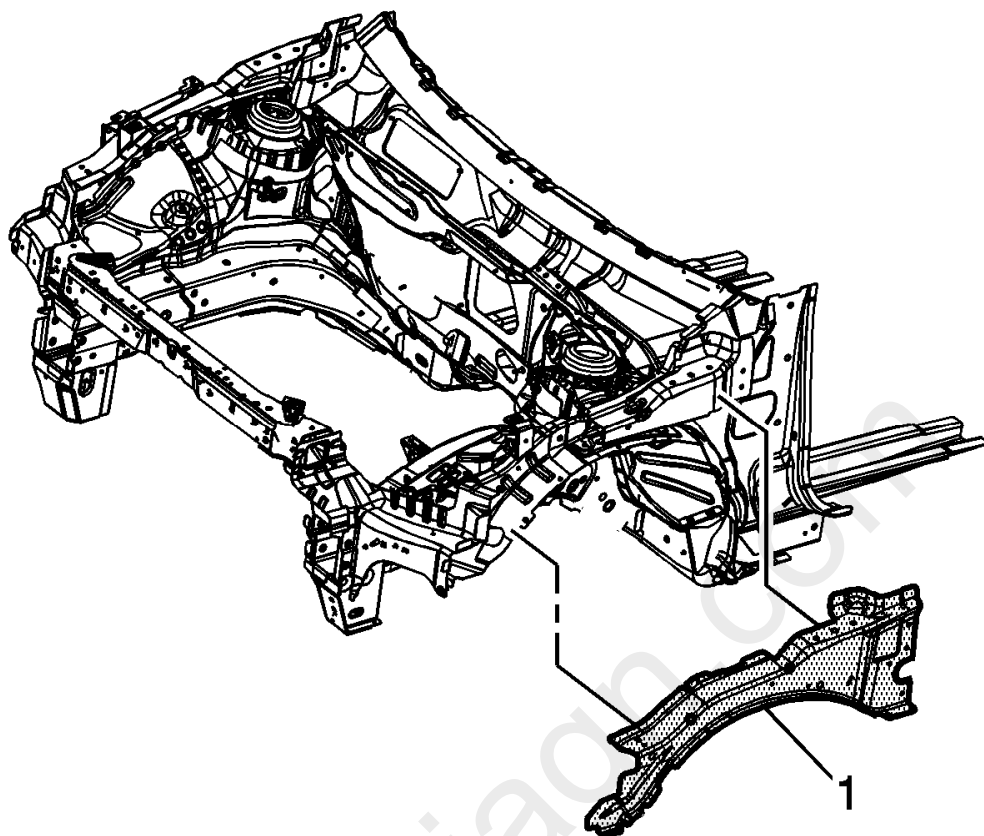


Fig. 22: Upper Rail

Courtesy of GENERAL MOTORS COMPANY

2. Position the front upper rail on the vehicle. Clamp the rail in place and verify that it is in the correct location (1).

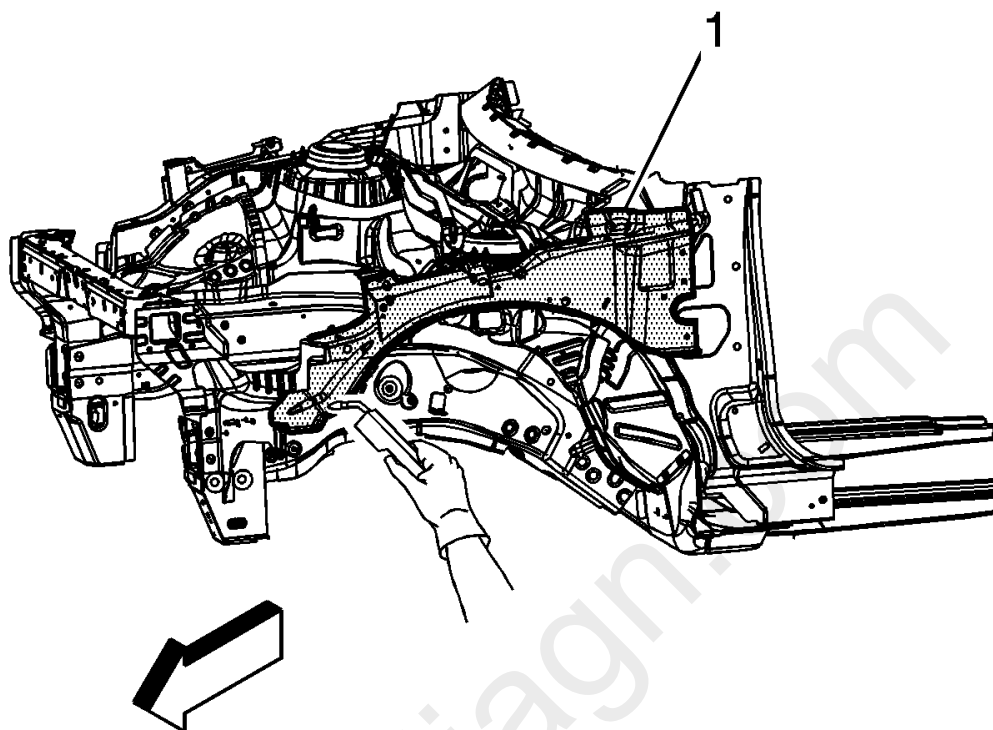


Fig. 23: Welding Upper Rail

Courtesy of GENERAL MOTORS COMPANY

3. Weld accordingly at the original factory weld locations (1).
4. Clean and prepare all welded surfaces.
5. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair**
6. Paint the repair area. Refer to **Basecoat/Clearcoat Paint Systems**
7. Install all related panels and components.
8. Enable the SIR system and connect the negative battery cable. Refer to **SIR Disabling and Enabling**

FRONT COMPARTMENT FRONT RAIL REPLACEMENT

Removal Procedure

WARNING: Refer to **Approved Equipment for Collision Repair Warning** .

WARNING: Refer to Foam Sound Deadeners Warning .

WARNING: Refer to Battery Disconnect Warning .

NOTE: The front compartment lower rail assembly is made of Ultra High Strength Steel. Sectioning or repair of Ultra High Strength Steel is not recommended. It should be replaced as a complete assembly at factory locations. Refer to [Ultra High Strength Steel](#)

1. Disable the SIR system and then disconnect the negative battery cable. Refer to SIR Disabling and Enabling .
2. Remove all related panels and components.
3. Repair as much of the damage as possible. Refer to Dimensions - Body.
4. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair .

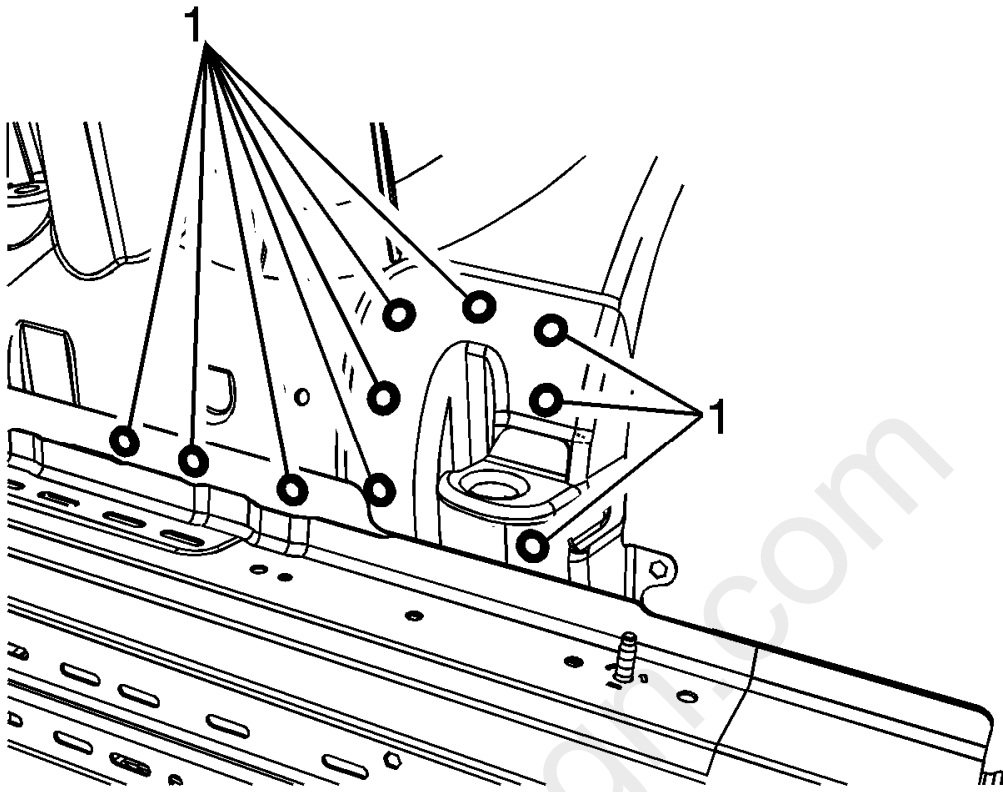


Fig. 24: Front Wheelhouse Assembly
Courtesy of GENERAL MOTORS COMPANY

NOTE: Note the front lower frame rail is attached to the front wheelhouse assembly (cast aluminum) using adhesive bonding and rivets. Do not damage the front wheelhouse during removal of the front lower frame rail.

NOTE: The rivets can be removed by using a chisel and hammer to remove the head of the rivet and then driving out the remainder of the rivet with a punch and hammer, or drilled out with a suitable drill bit and drill.

5. Locate, mark and remove the factory rivets that attach the front wheelhouse assembly to the front lower frame rail (1).

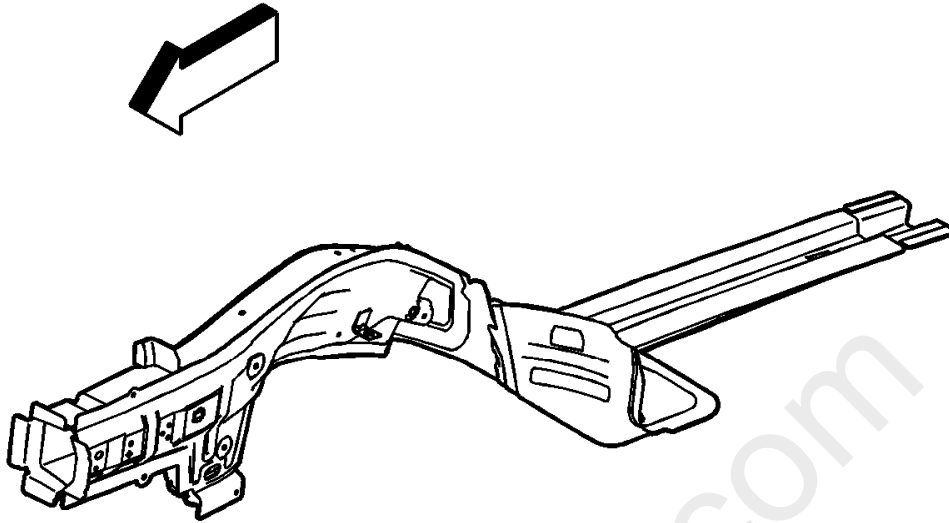


Fig. 25: Drilling 8 mm (5/16 in) Plug Weld Holes - Front Rail
Courtesy of GENERAL MOTORS COMPANY

NOTE: Note the number and location of the factory welds for installation of the full rail service part.

NOTE: The inner side rail gussets, outer side rail gussets, side rail rear extension need to be removed when replacing the front lower frame rail.

6. Remove welds from the inner side rail gussets (1), outer side rail gussets (2), and rear side rail extension (3) from the front lower frame rail assembly, and then remove the parts.

NOTE: Note the number and location of the factory welds for installation of the full rail service part.

7. Remove the factory welds from the front lower frame rail, as necessary.

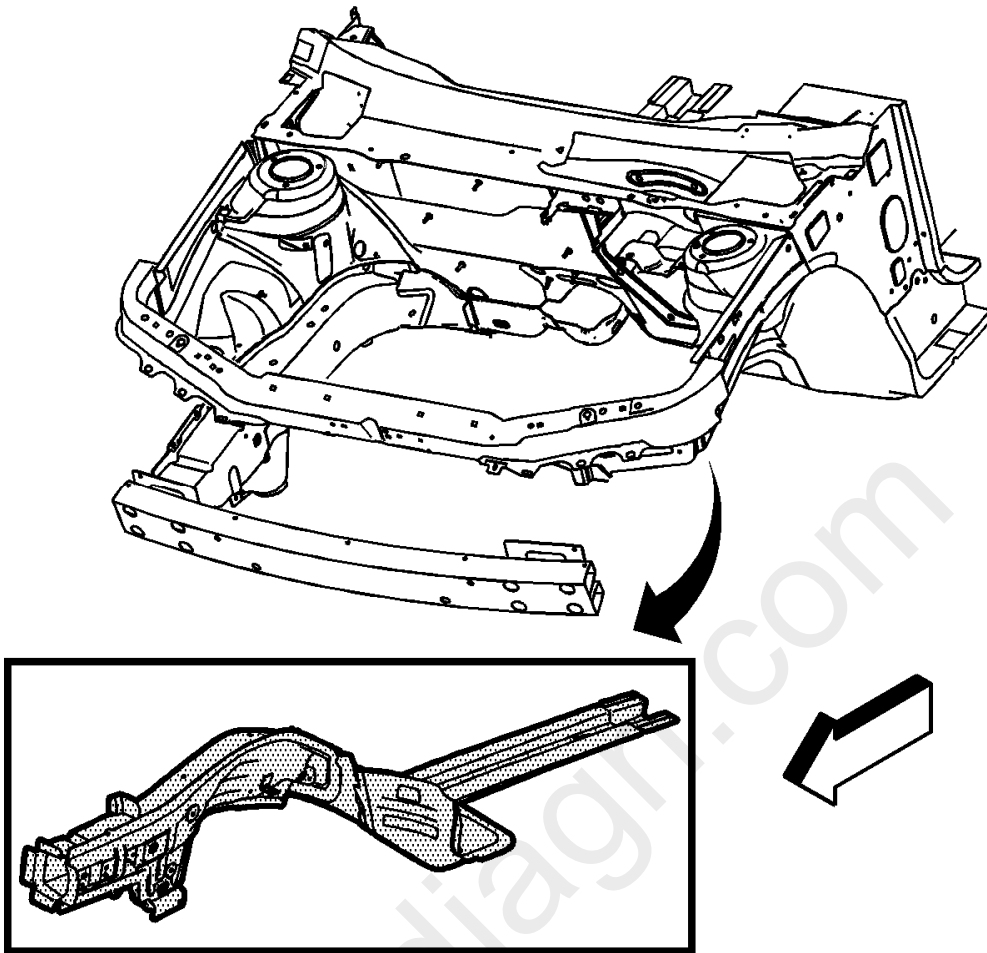


Fig. 26: Removing Full Rail

Courtesy of GENERAL MOTORS COMPANY

NOTE: The adhesive material will release from the structure by applying heat to approximately 200°C (400°F). A noticeable popping sound can normally be heard when the adhesive releases.

NOTE: Adhesive and welds will need to be removed from the tabs that attach the frame rail to the cowl reinforcement, before the rail can be removed.

8. To complete the removal of the front wheelhouse panel, apply heat to the adhesive material to cause the adhesive to release, and then remove the part (1).

Installation Procedure

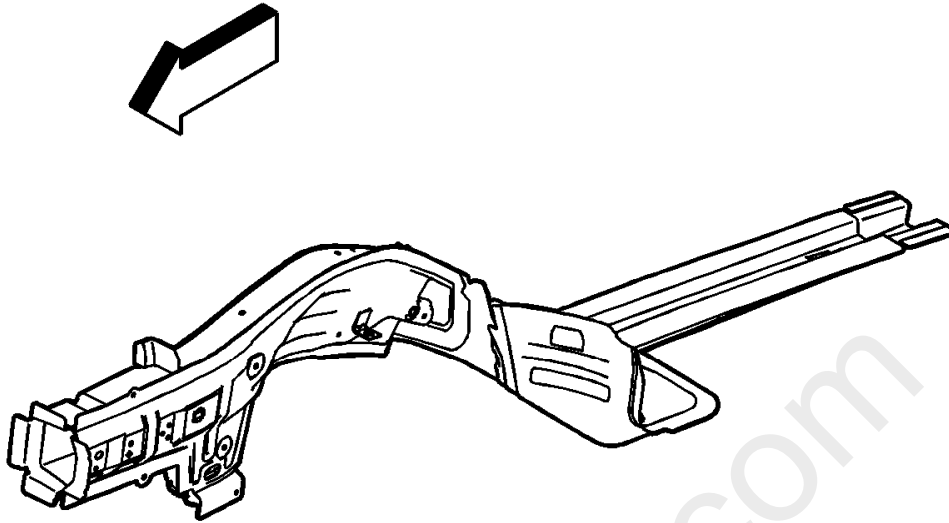


Fig. 27: Drilling 8 mm (5/16 in) Plug Weld Holes - Front Rail
Courtesy of GENERAL MOTORS COMPANY

NOTE: The inner side rail gussets, outer side rail gussets and rear side extension will need to be reinstalled after the front lower frame rail is attached to the vehicle structure.

1. Remove the inner side rail gussets, outer side rail gussets and rear side rail extension from the service part, prior to installing the service part.

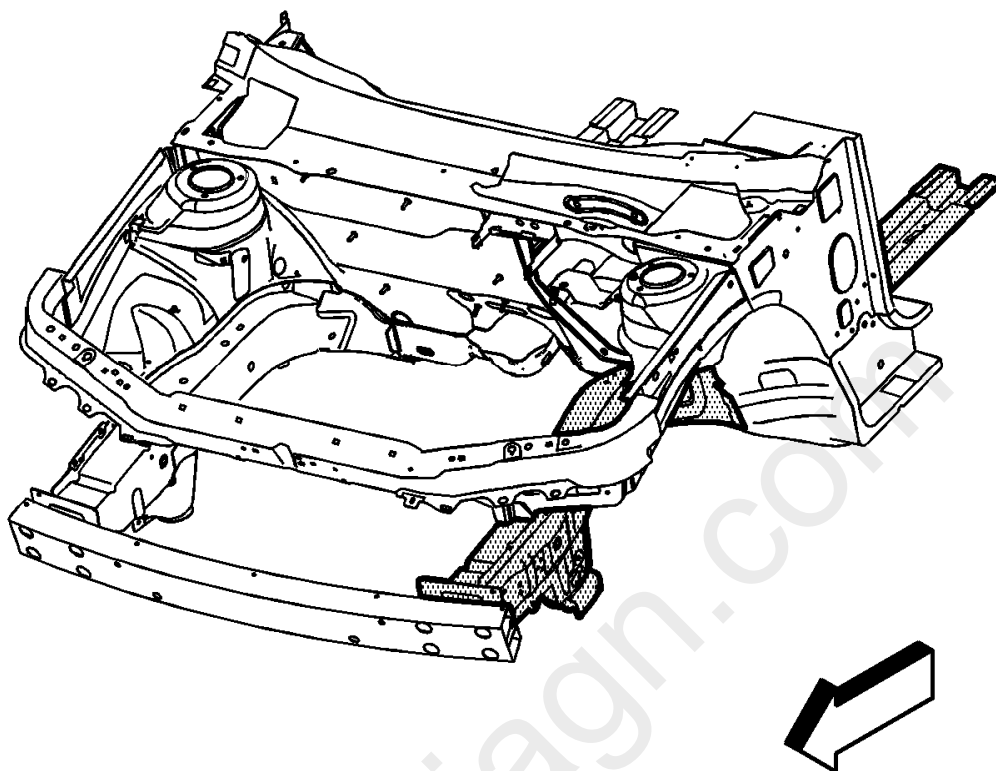


Fig. 28: Locating And Drill Out All Necessary Factory Welds - Front Rail
Courtesy of GENERAL MOTORS COMPANY

NOTE: Proper alignment of the front lower frame rail is important. The use of 3-dimensional measuring equipment is recommended when installing the part.

2. Prior to applying adhesive, or welding, fit the front lower frame rail to the structure and check for proper alignment.

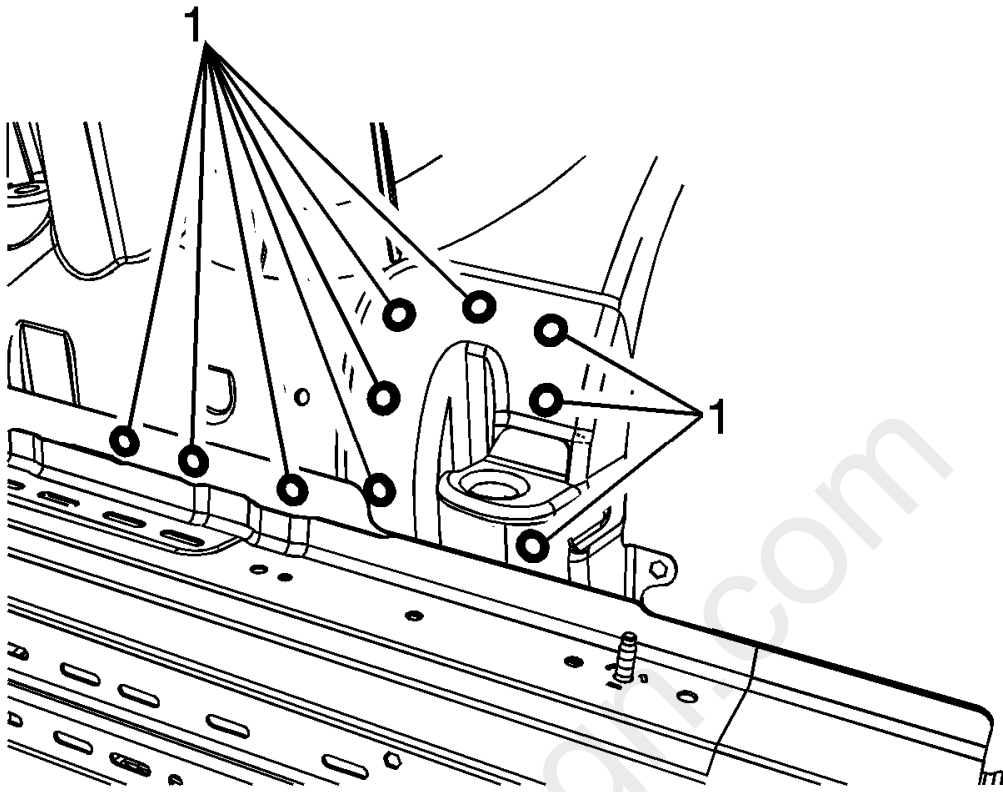


Fig. 29: Front Wheelhouse Assembly
Courtesy of GENERAL MOTORS COMPANY

3. With the part properly located and aligned, mark the locations for the rivets and welds recorded from the original part and drill the holes for the rivets (1).
4. Remove the part from the vehicle to clean and prepare the surfaces for bonding and welding.
5. Clean and prepare all bonding and welding surfaces.

NOTE: Refer to adhesive manufacturer's recommendation for specific application and curing recommendations.

6. Apply a bead of adhesive to all bonding surfaces on the vehicle structure and service part, per the adhesive manufacturer's recommendations. Refer to Aluminum Panel Bonding.

NOTE: Completely cover all bare surfaces with the adhesive.

7. Using a small brush, spread a coat of the adhesive to cover the entire adhesive bonding surface, to ensure proper corrosion protection.

NOTE: Do not allow the adhesive to cure off the vehicle, prior to installing and aligning the part. Refer to adhesive manufacturer's recommendations for specific cure times.

8. Apply a bead of adhesive to the mating surface of the service part, per the adhesive manufacturer's recommendations.

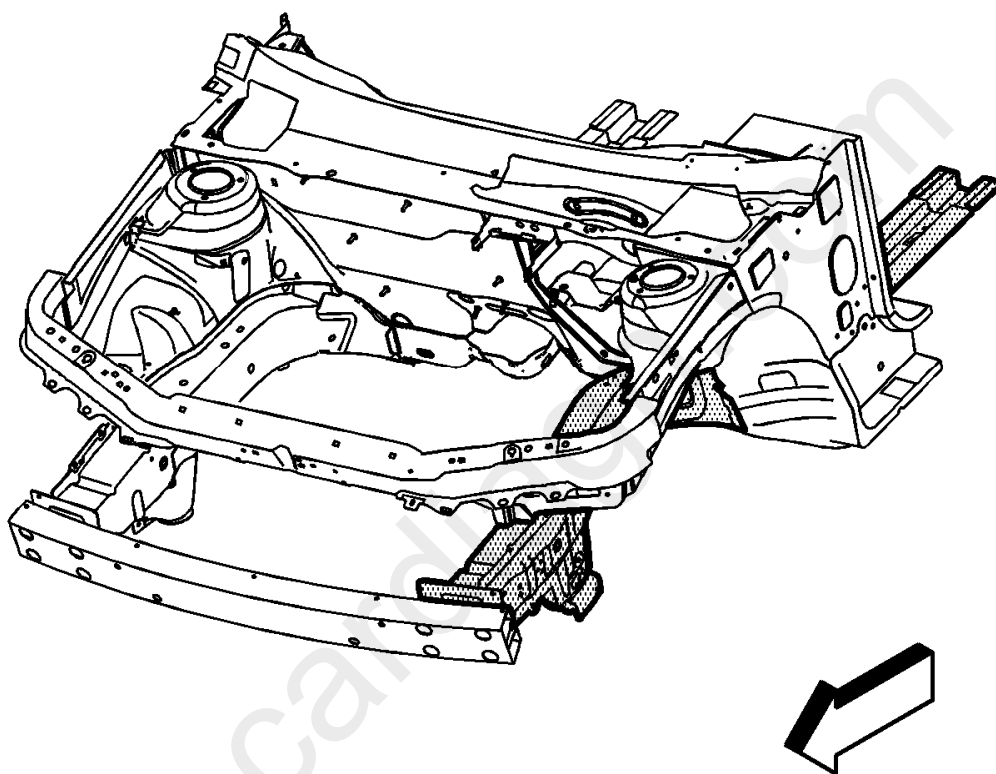


Fig. 30: Locating And Drill Out All Necessary Factory Welds - Front Rail
Courtesy of GENERAL MOTORS COMPANY

NOTE: Do not pull the panels apart after joined together. Slide the panels against each other to realign the panels, or proper joint strength may be affected.

NOTE: Proper alignment of the wheelhouse assembly is important. The use of 3-dimensional measuring equipment is recommended when installing the part.

9. Install the service part to the vehicle structure and check for proper alignment.

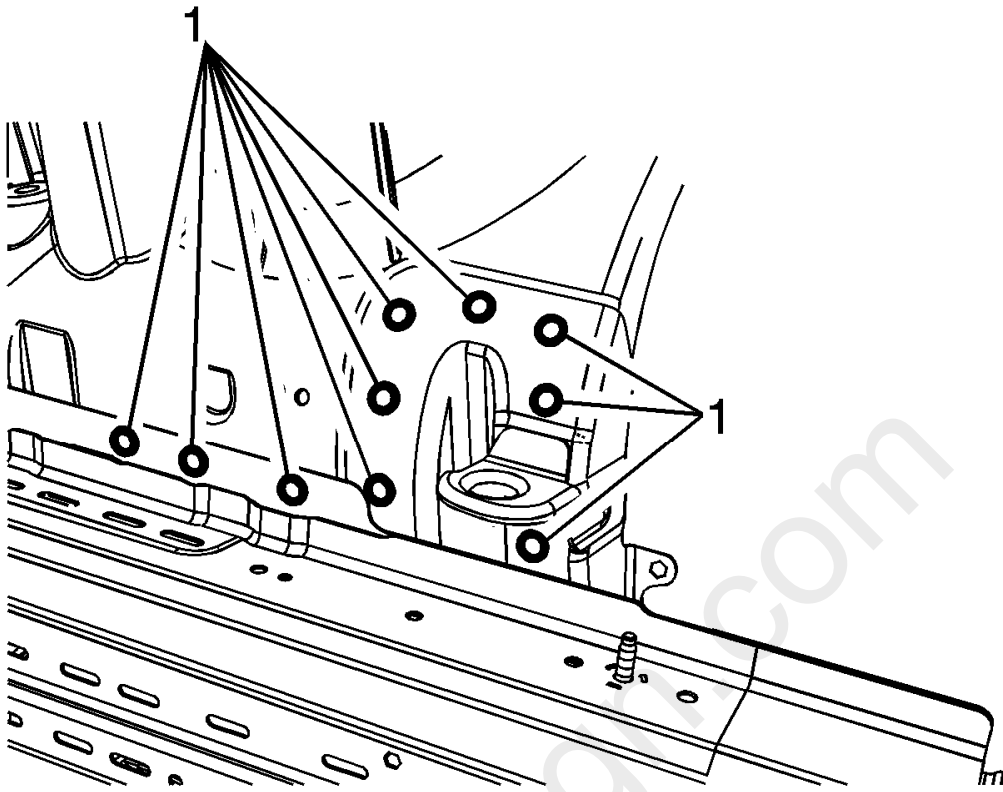


Fig. 31: Front Wheelhouse Assembly
Courtesy of GENERAL MOTORS COMPANY

10. Install the rivets along the bonding joint, at the original locations. Refer to the electronic parts catalog for the recommended rivets.
11. Weld the service part at the original weld locations, as necessary.
12. Install inner side rail gussets, outer side rail gussets and rear side rail extension removed from the service part.
13. Clean and prepare all of the welded surfaces.
14. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
15. Paint the repaired area. Refer to **Basecoat/Clearcoat Paint Systems** .
16. Install all related panels and components.
17. Enable the SIR system and then connect the negative battery cable. Refer to **SIR Disabling and Enabling** .

FRONT HINGE PILLAR BODY SECTIONING (LOWER)

Removal Procedure

WARNING: Refer to Approved Equipment for Collision Repair Warning .

WARNING: Refer to Foam Sound Deadeners Warning .

WARNING: Refer to Battery Disconnect Warning .

NOTE: There are sectioning procedures available for various locations of the body side outer panel. The sectioning procedure and location should be chosen based on the extent of damage to the vehicle and other inner reinforcements that need to be replaced. Sectioning should be performed only in the recommended areas. Failure to do so may compromise the structural integrity of the vehicle. Refer to other service procedures for additional sectioning locations.

1. Disable the SIR system. Refer to SIR Disabling and Enabling .
2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection .
3. Remove all related panels and components.
4. Repair as much of the damage as possible . Refer to Dimensions - Body.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair

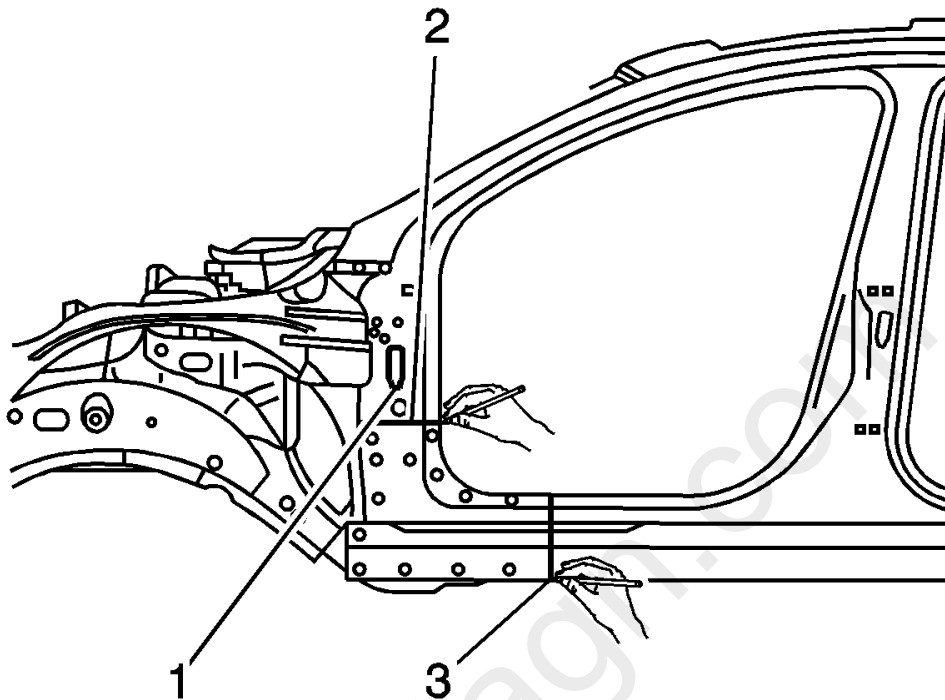


Fig. 32: Sectioning Straight Area Along Rocker Panel
Courtesy of GENERAL MOTORS COMPANY

NOTE: Record the number and location of the original welds for installation of the service assembly.

6. Measure down 100 mm from the door wiring conduit hole lower edge (1) and mark the cut location (2) on the body side outer front hinge pillar. Mark another cut location in the straight area on the body side outer rocker panel 330 mm rearward from front edge of the body side panel at the rocker (3).
7. Perform additional sectioning procedures as needed, depending on damage to vehicle. Refer to **Quarter Outer Panel Sectioning**, **Rocker Outer Panel Sectioning**, or **Center Pillar Sectioning - Outer**.

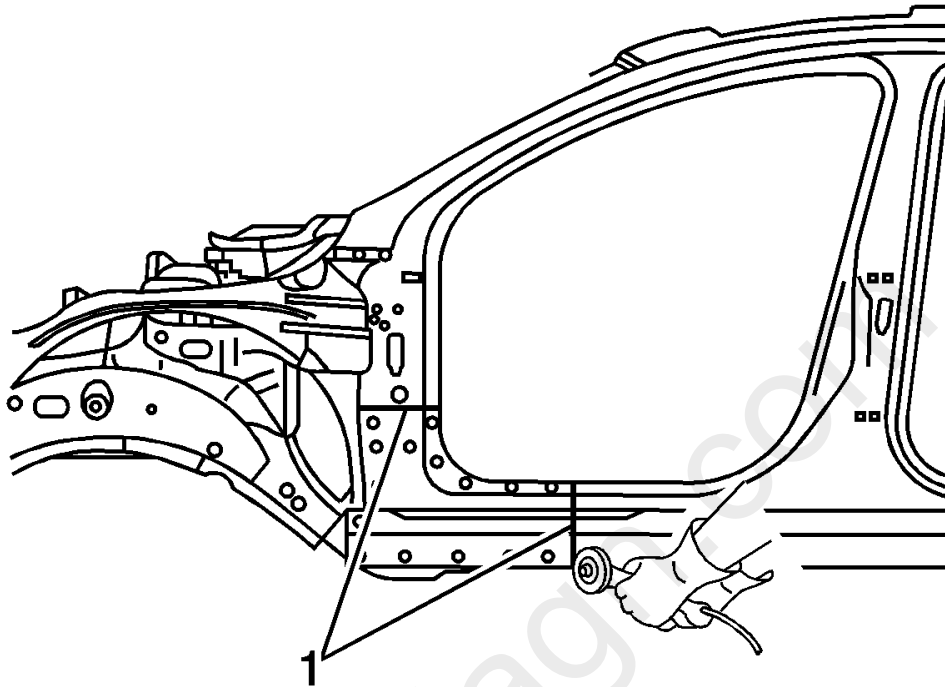


Fig. 33: Cutting Where Sectioning Is Performed
Courtesy of GENERAL MOTORS COMPANY

NOTE: Do not damage or cut the front hinge pillar reinforcement, or outer rocker panel reinforcement. The outer rocker panel reinforcement is made of Ultra High Strength Steel. Sectioning, or repair of Ultra High Strength Steel is not recommended. Refer to Ultra High Strength Steel.

8. Cut the outer body side panel where sectioning is to be performed (1).

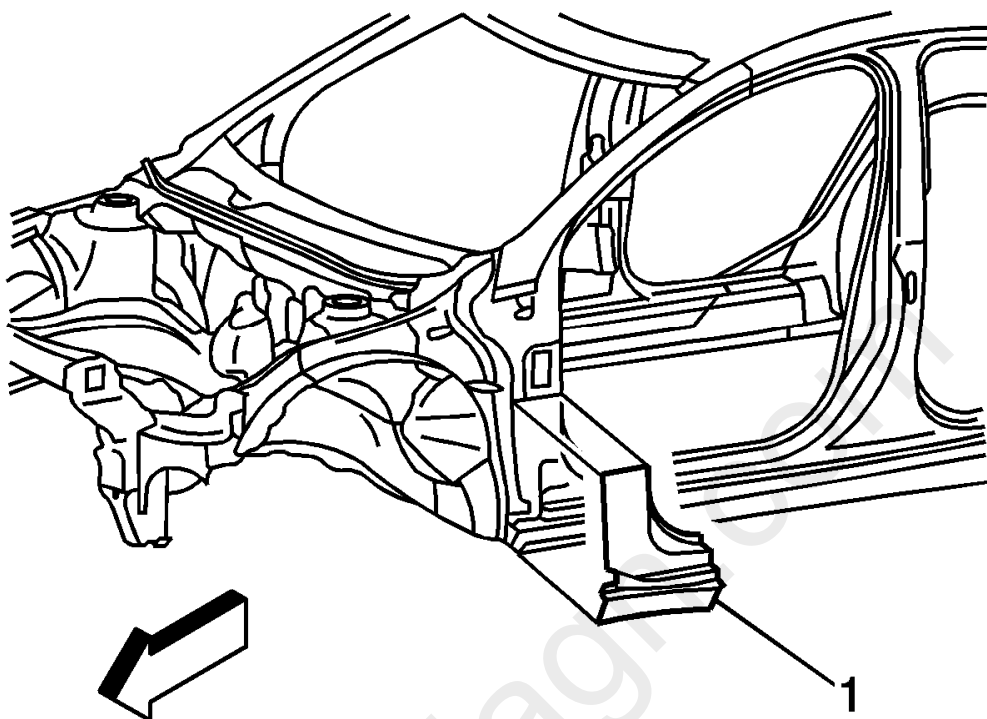


Fig. 34: View Of Outer Front Pillar
Courtesy of GENERAL MOTORS COMPANY

9. Remove the damaged front hinge pillar body.

Installation Procedure

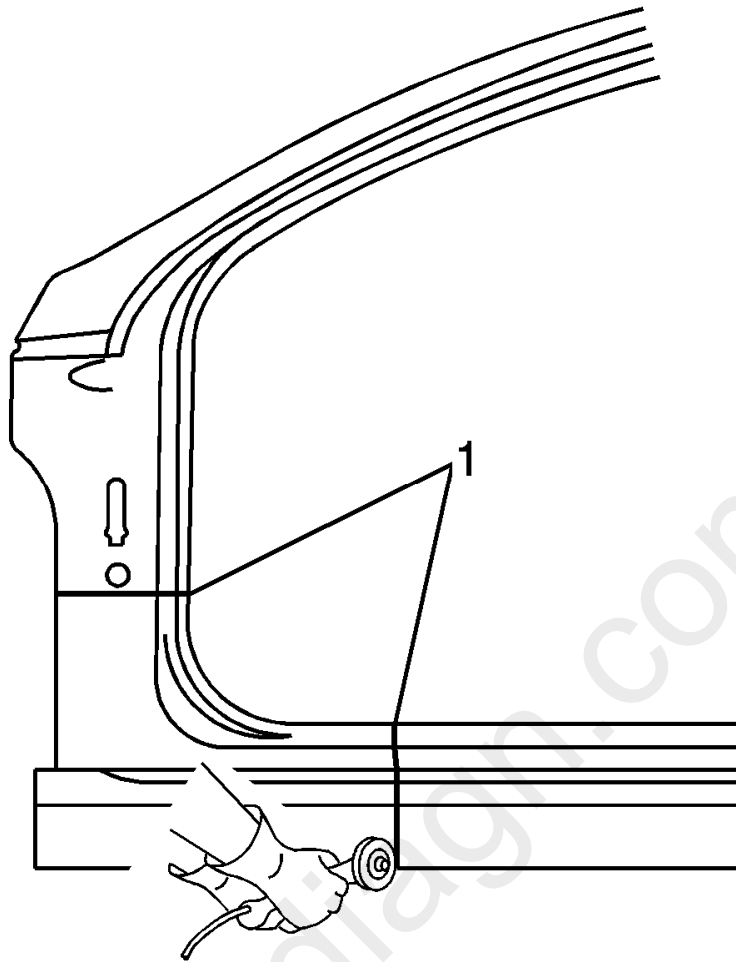


Fig. 35: Cutting Replacement Hinge Pillar
Courtesy of GENERAL MOTORS COMPANY

1. From the service part, cut the panel in corresponding locations to overlap the remaining original panel by 25 mm (1 in) at each joint location (1).
2. Prepare all matting surfaces as necessary.
3. Apply Weld-Thru Coating to all matting surfaces. Refer to **Anti-Corrosion Treatment and Repair** .

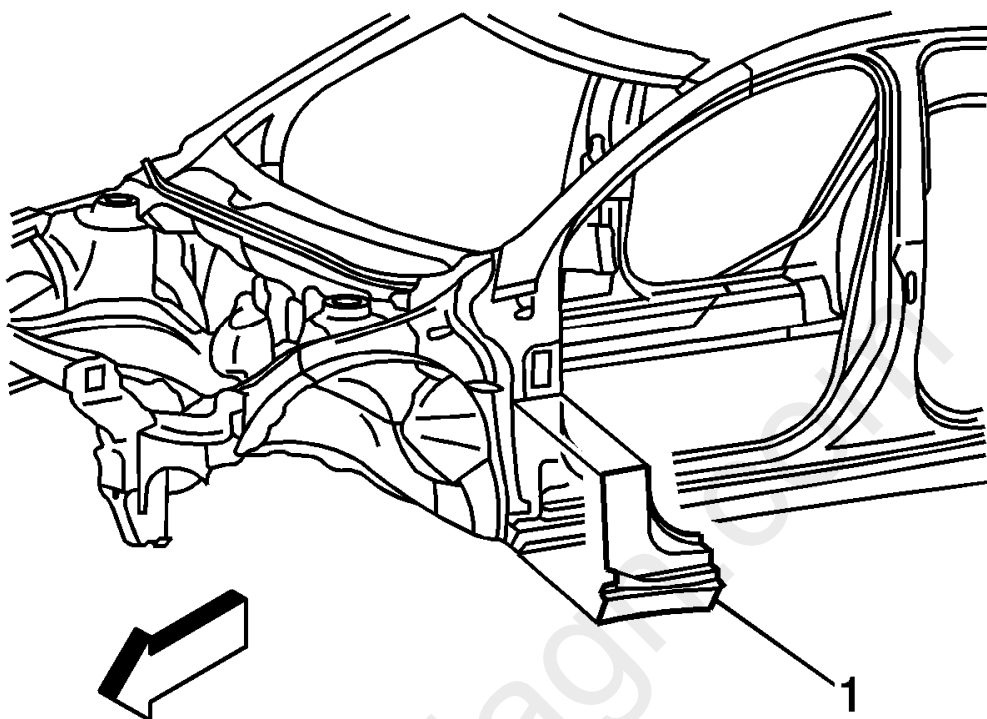


Fig. 36: View Of Outer Front Pillar
Courtesy of GENERAL MOTORS COMPANY

4. Position the outer front pillar to the vehicle using 3-dimensional measuring equipment (1). Clamp the pillar in place.

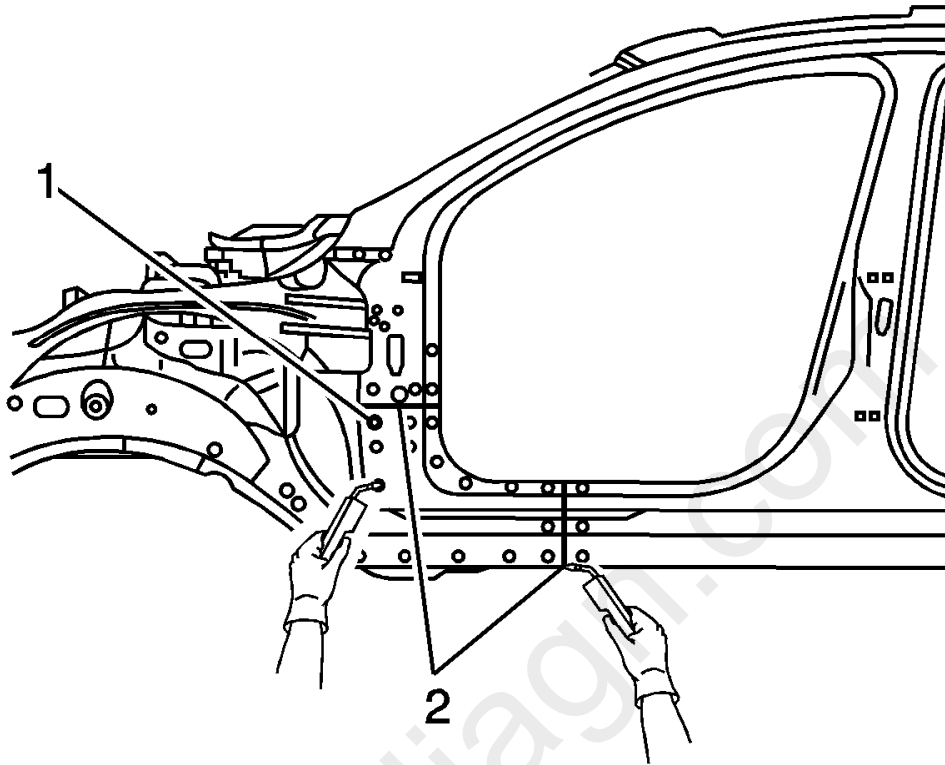


Fig. 37: Welding Outer Front Pillar
 Courtesy of GENERAL MOTORS COMPANY

5. Weld the perimeter of the part at the original spot weld locations (1). To create a solid weld with minimum heat distortion, make stitch welds along the 25 mm overlap joints, with equal gaps between the welds. Then go back and complete the welds, to create a solid weld joint (2).
6. Clean and prepare all of the welded surfaces.
7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
8. Paint the repaired area. Refer to **Basecoat/Clearcoat Paint Systems** .
9. Install all of the related panels and components.
10. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection** .
11. Enable the SIR system. Refer to **SIR Disabling and Enabling** .

FRONT HINGE PILLAR BODY SECTIONING (UPPER)

Removal Procedure

WARNING: Refer to Approved Equipment for Collision Repair Warning .

WARNING: Refer to Foam Sound Deadeners Warning .

WARNING: Refer to Battery Disconnect Warning .

WARNING: Refer to Glass and Sheet Metal Handling Warning .

NOTE: This procedure was developed to allow access for the complete replacement of the front body hinge pillar reinforcement. There are sectioning procedures available for various locations of the body side outer panel. The sectioning procedure and location should be chosen based on the extent of damage to the vehicle and other inner reinforcements that need to be replaced. Sectioning should be performed only in the recommended areas. Failure to do so may compromise the structural integrity of the vehicle. Refer to other service procedures for additional sectioning locations.

1. Disable the SIR system. Refer to SIR Disabling and Enabling .
2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection .
3. Remove all related panels and components.
4. Repair as much of the damage as possible . Refer to Dimensions - Body.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair .

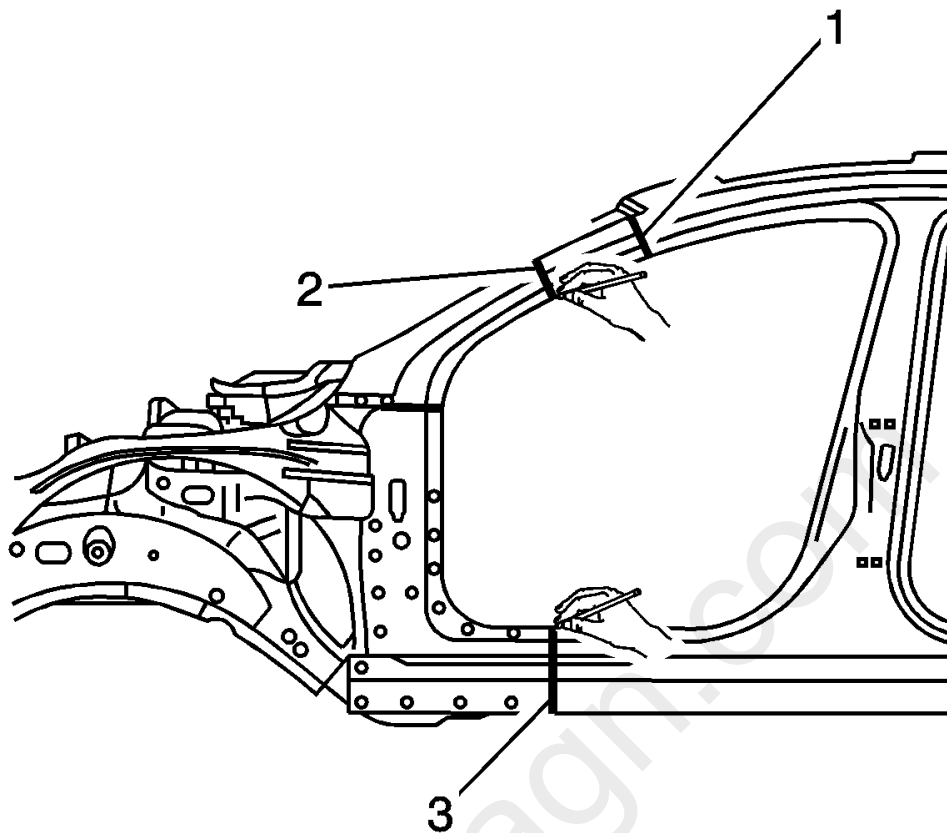


Fig. 38: Measuring And Cutting Location On Front Hinge Pillar
 Courtesy of GENERAL MOTORS COMPANY

NOTE: Sectioning can be performed anywhere in the straight area along the rocker panel.

6. On the "A" pillar, measure up 400 mm from front edge of body side panel at the bottom of the "A" pillar (1). Mark this cut location on the front hinge pillar (2). Mark a cut location in the straight area of the rocker panel 330 mm rearward from front edge of the body side panel at the rocker (3).
7. Perform additional sectioning procedures as needed depending on damage to vehicle. Refer to Quarter Outer Panel Sectioning, Rocker Outer Panel Sectioning, or Center Pillar Sectioning - Outer.

NOTE: Record the number and location of the original welds for installation of the service assembly.

8. Remove the front compartment upper side rail for access to welds and to remove the front hinge pillar outer panel. Refer to Front Compartment Upper Side Rail Replacement.

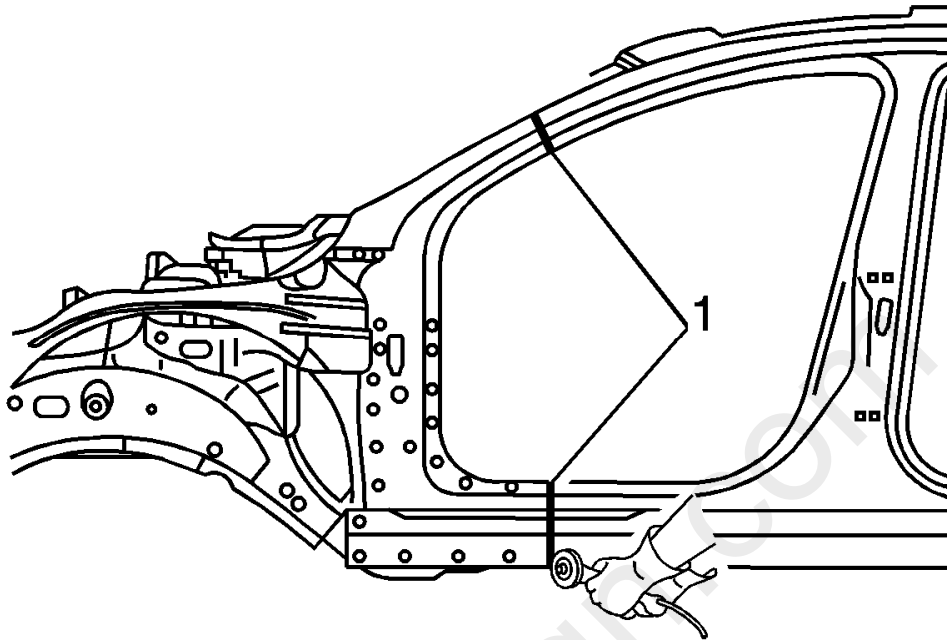


Fig. 39: Identifying Front Hinge Pillar Body Sectioning Area
Courtesy of GENERAL MOTORS COMPANY

NOTE: Do not damage or cut the upper roof pillar reinforcements or rocker outer panel reinforcements. The upper roof pillar reinforcements and rocker outer panel reinforcements are made of Ultra High Strength Steel. Sectioning, or repair of Ultra High Strength Steel is not recommended. Refer to Ultra High Strength Steel.

9. Cut the front hinge pillar body where sectioning is to be performed (1).

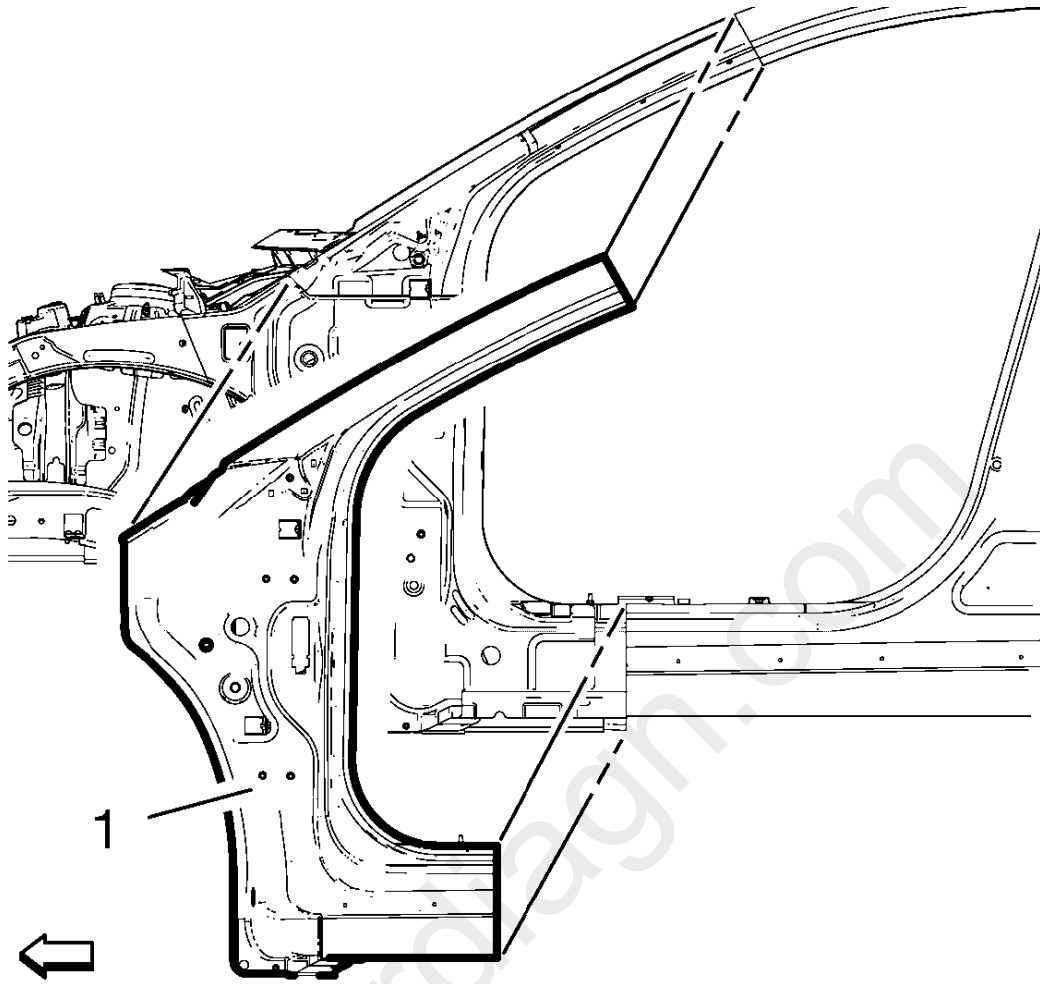


Fig. 40: Front Hinge Pillar Body
Courtesy of GENERAL MOTORS COMPANY

10. Remove the damaged front hinge pillar body (1).

Installation Procedure

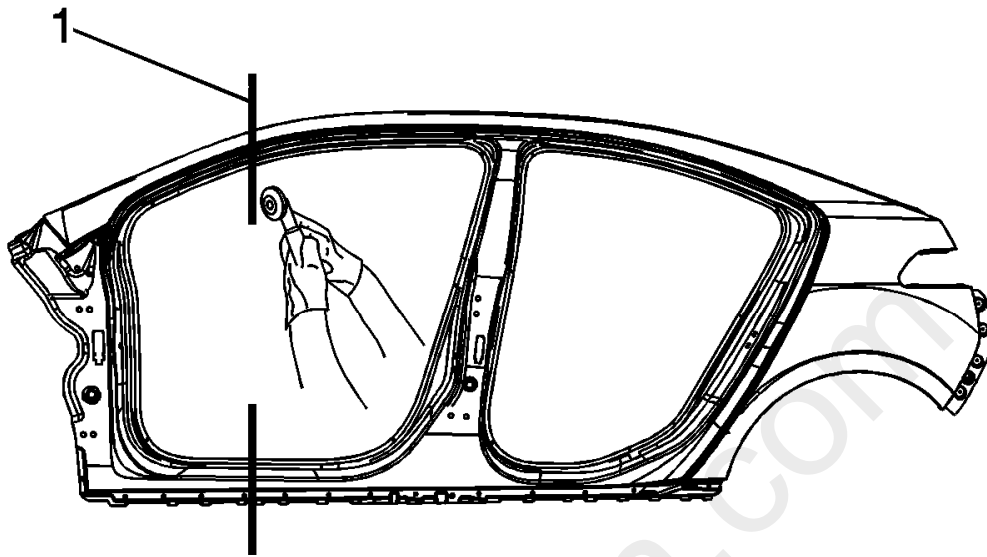


Fig. 41: Cutting Service Part In Corresponding Locations To Overlap Remaining Original Panel
Courtesy of GENERAL MOTORS COMPANY

1. From the service part, cut the panel in corresponding locations to overlap the remaining original panel by 25 mm (1 in) at each joint location (1).
2. Prepare all mating surfaces as necessary.
3. Apply GM-approved weld-thru coating or equivalent to all mating surfaces. Refer to **Anti-Corrosion Treatment and Repair** .

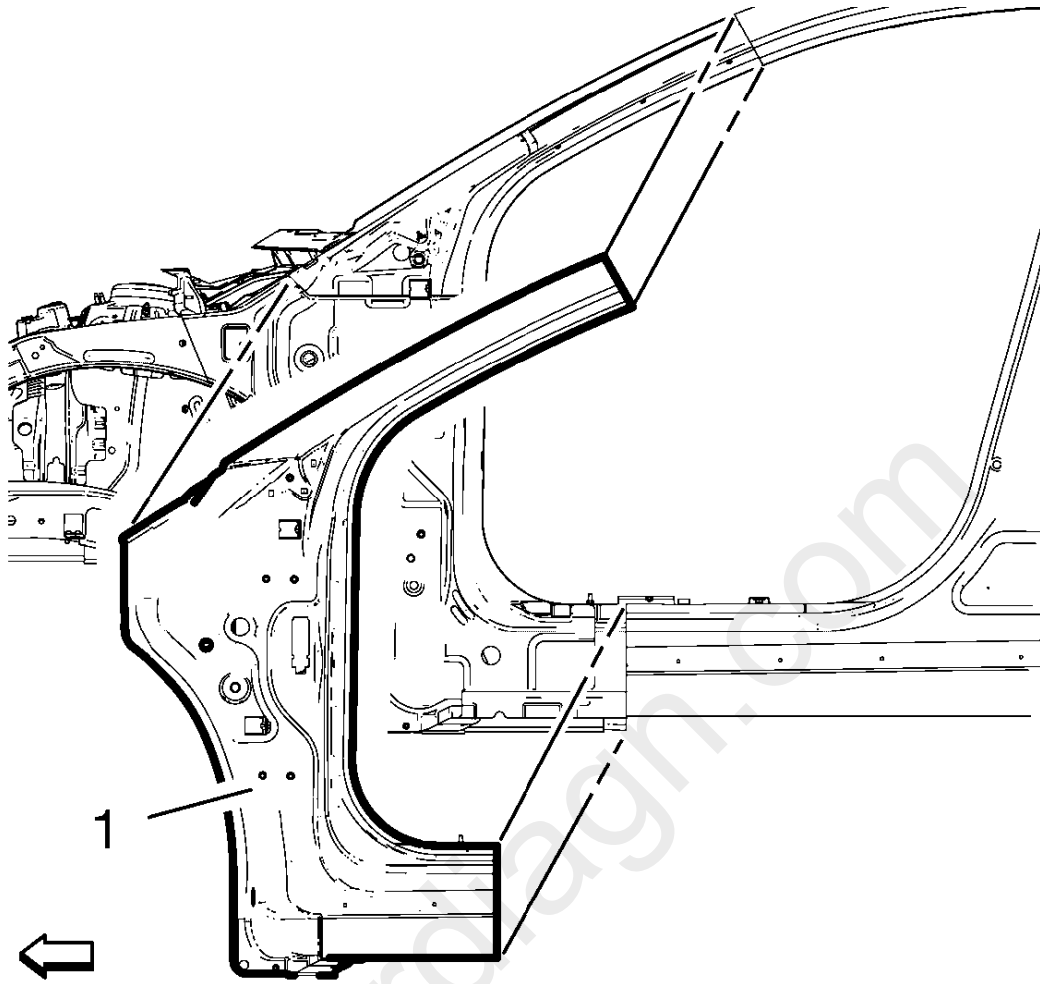


Fig. 42: Front Hinge Pillar Body

Courtesy of GENERAL MOTORS COMPANY

4. Position the outer front pillar to the vehicle using 3-dimensional measuring equipment (1). Clamp the pillar in place.

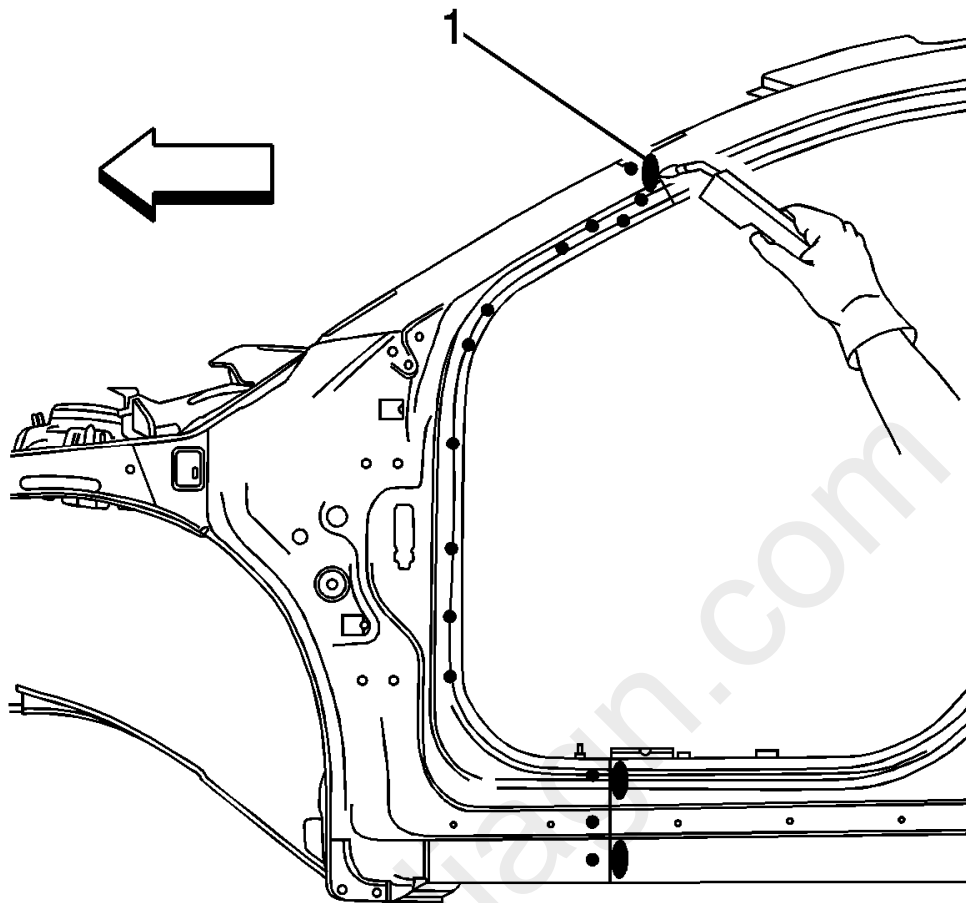


Fig. 43: Stitch Welding Joint

Courtesy of GENERAL MOTORS COMPANY

5. Weld the perimeter of the part at the original spot weld locations. To create a solid weld with minimum heat distortion, make stitch welds along the 25 mm overlap joints, with equal gaps between the welds. Then go back and complete the welds, to create a solid weld joint (1).
6. Install the front compartment upper side rail for access to welds and to remove the front hinge pillar outer panel. Refer to **Front Compartment Upper Side Rail Replacement** .
7. Clean and prepare all of the welded surfaces.
8. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
9. Paint the repaired area. Refer to **Basecoat/Clearcoat Paint Systems** .
10. Install all of the related panels and components.
11. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection** .
12. Enable the SIR system. Refer to **SIR Disabling and Enabling** .

BODY HINGE PILLAR LOWER REINFORCEMENT REPLACEMENT

Removal Procedure

WARNING: Refer to Approved Equipment for Collision Repair Warning .

WARNING: Refer to Foam Sound Deadeners Warning .

WARNING: Refer to Battery Disconnect Warning .

WARNING: Refer to Glass and Sheet Metal Handling Warning .

1. Disable the SIR system and then disconnect the negative battery cable. Refer to SIR Disabling and Enabling .
2. Remove all related panels and components.
3. Visually inspect the damage. Repair as much of the damage as possible. Refer to Dimensions - Body.
4. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair .

NOTE: There are sectioning procedures available for various locations of the body side outer panel. The sectioning procedure and location should be chosen based on the extent of damage to the vehicle and other inner reinforcements that need to be replaced. Sectioning should be performed only in the recommended areas. Failure to do so may compromise the structural integrity of the vehicle. Refer to other service procedures for additional sectioning locations.

NOTE: Record the number and location of the original welds for installation of the service assembly.

5. Remove factory welds as required.

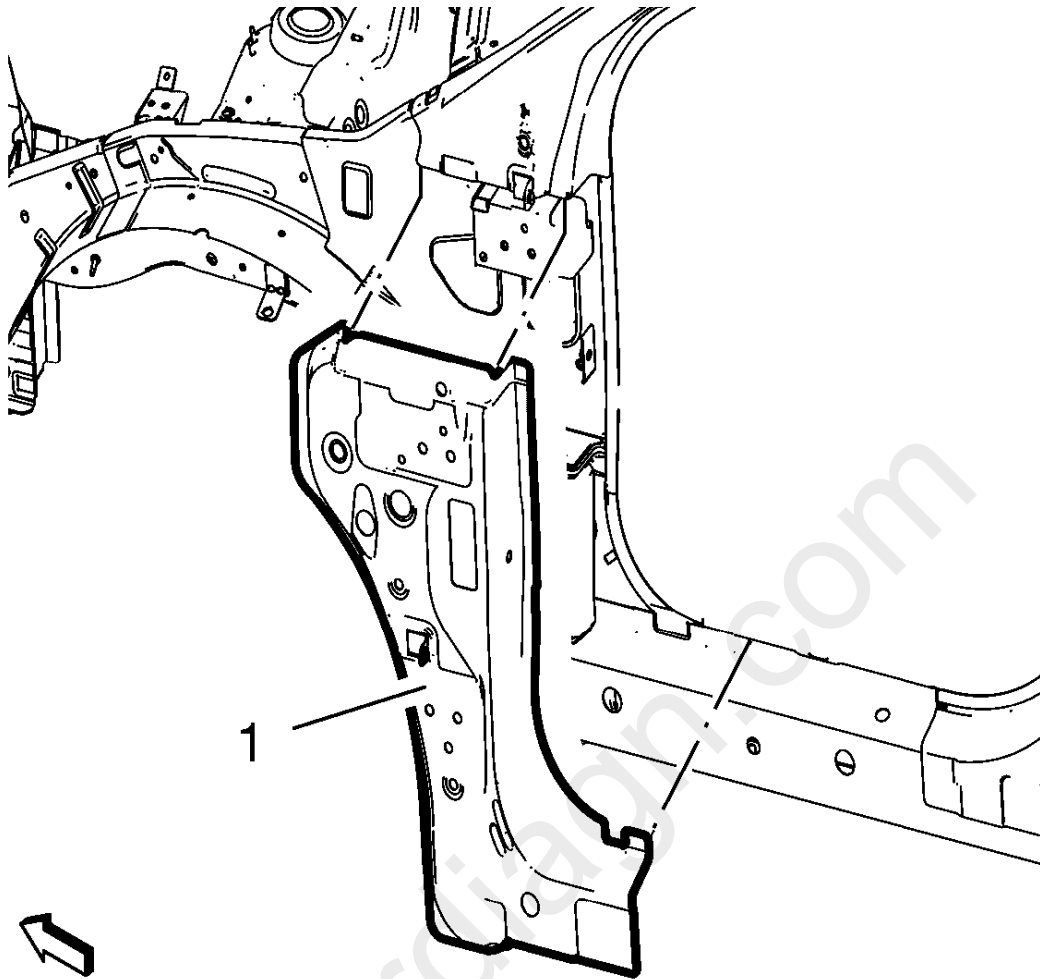


Fig. 44: Body Hinge Pillar Lower Reinforcement
Courtesy of GENERAL MOTORS COMPANY

6. Remove the damaged body hinge pillar lower reinforcement (1).

Installation Procedure

1. Prepare all mating surfaces as necessary.

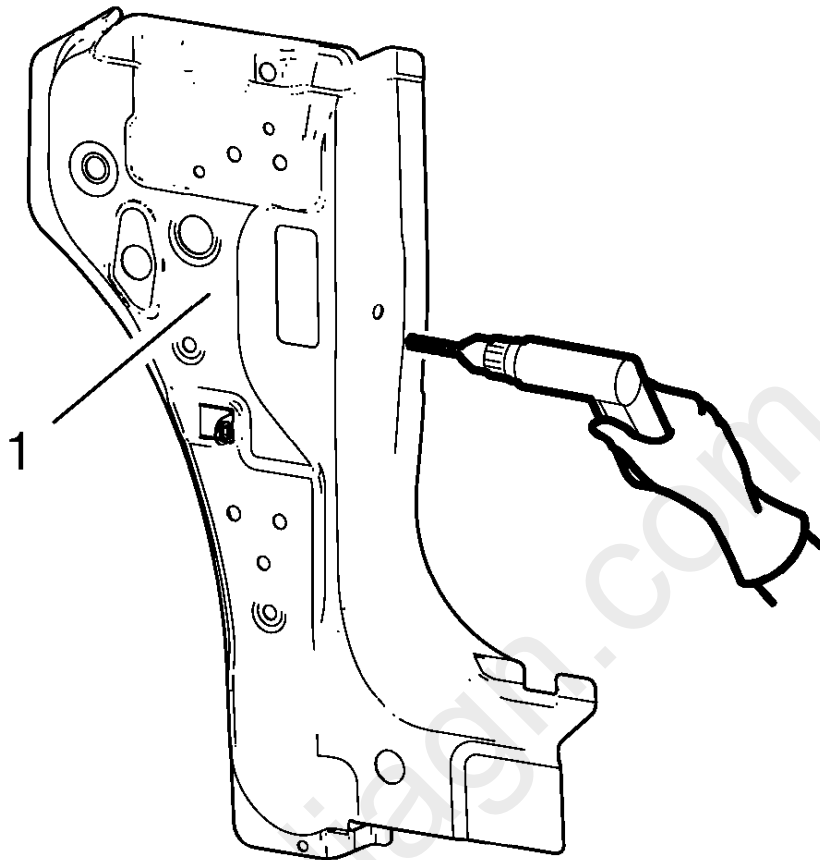


Fig. 45: Drilling Hole For Plug Welding Body Hinge Pillar Lower Reinforcement
Courtesy of GENERAL MOTORS COMPANY

2. Clean and prepare the attaching surfaces for welding (1).

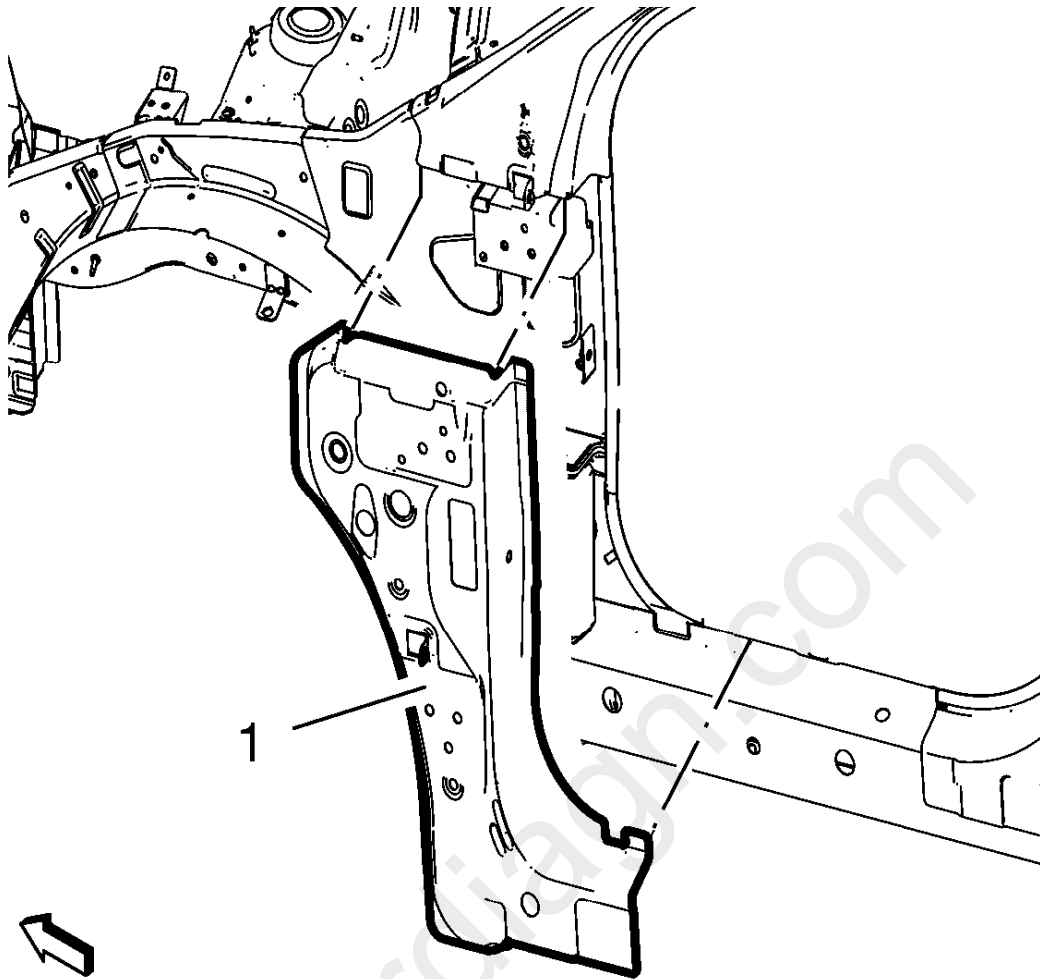


Fig. 46: Body Hinge Pillar Lower Reinforcement
Courtesy of GENERAL MOTORS COMPANY

3. Position the body hinge pillar lower reinforcement (1) on the vehicle.
4. Verify the fit of the body hinge pillar lower reinforcement.

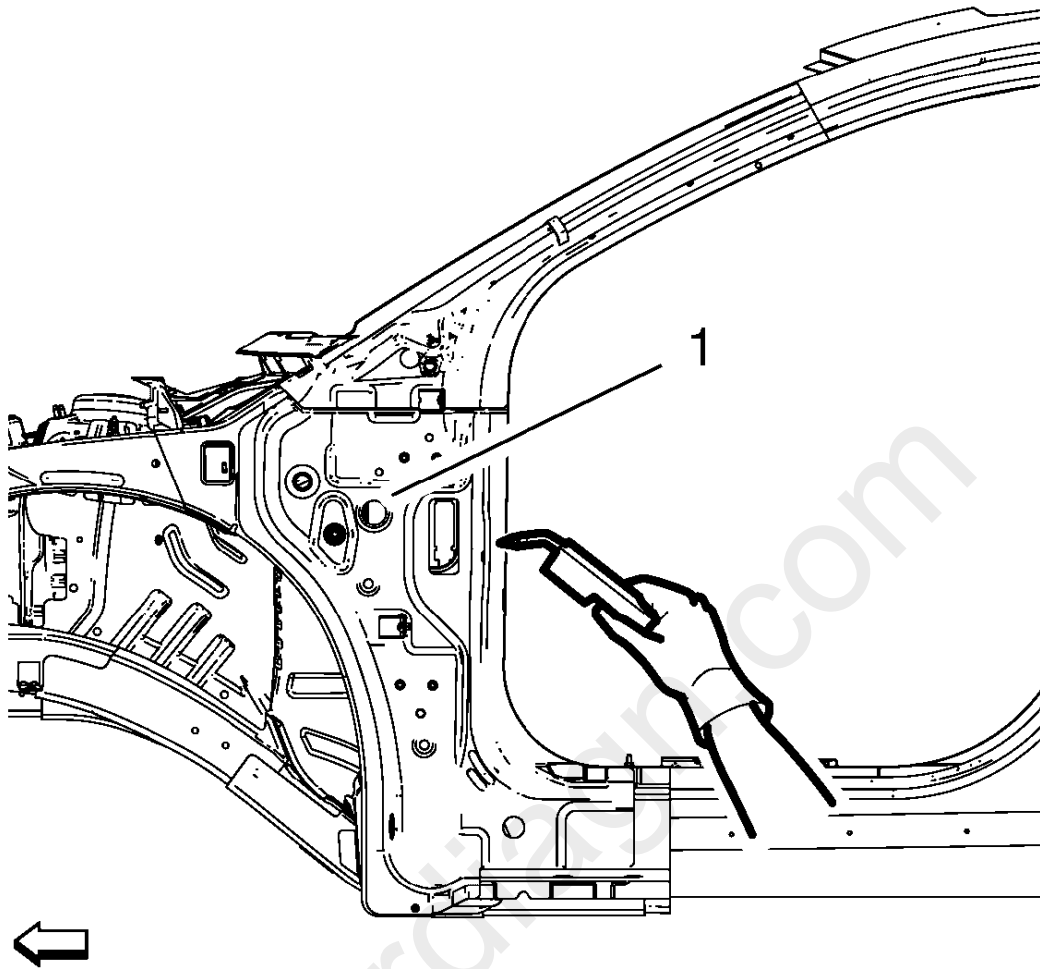


Fig. 47: Welding Body Hinge Pillar Lower Reinforcement
 Courtesy of GENERAL MOTORS COMPANY

5. Weld the body hinge pillar lower reinforcement (1) accordingly at original weld locations.
6. Clean all of the welded surfaces.
7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
8. Install the body side outer panel. Refer to the appropriate service procedures as required based on the specific amount of vehicle damage.
9. Paint the repaired area. Refer to **Basecoat/Clearcoat Paint Systems**
10. Install all of the related panels and components.
11. Enable the SIR system and then connect the negative battery cable. Refer to **SIR Disabling and Enabling** .

ROOF OUTER PANEL REPLACEMENT

Removal Procedure

WARNING: Refer to Approved Equipment for Collision Repair Warning .

WARNING: Refer to Foam Sound Deadeners Warning .

WARNING: Refer to Battery Disconnect Warning .

1. Disable the SIR system and then disconnect the negative battery cable. Refer to SIR Disabling and Enabling .
2. Remove all related panels and components.
3. Repair as much of the damaged area as possible. Refer to Dimensions - Body.
4. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair .

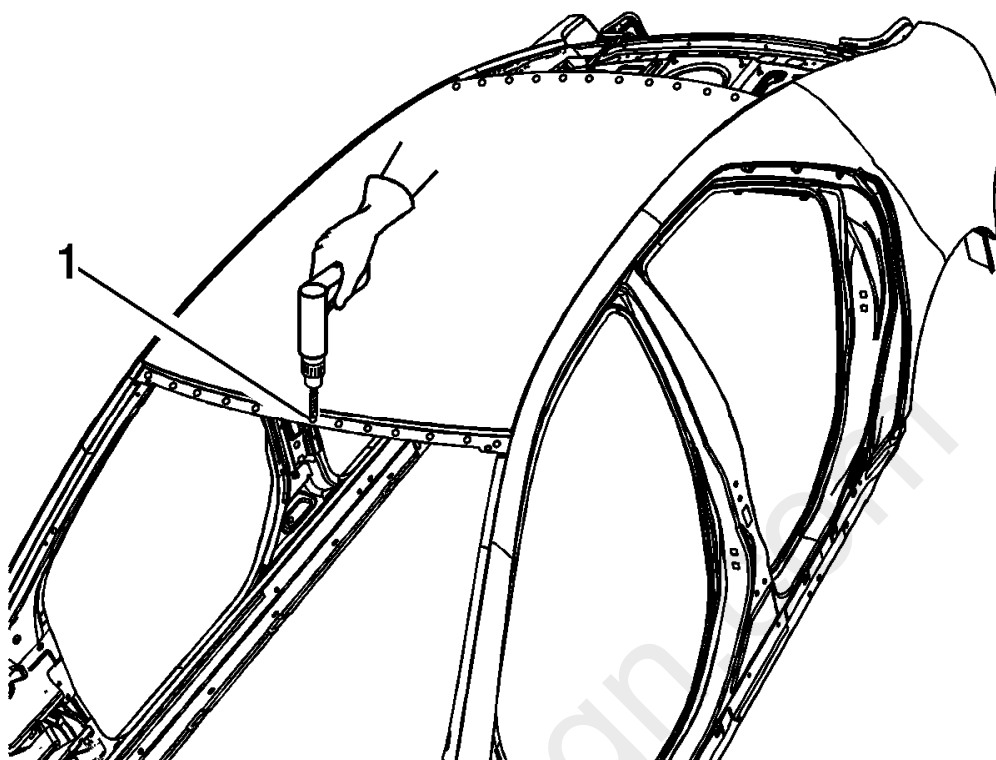


Fig. 48: Drilling Factory Welds
Courtesy of GENERAL MOTORS COMPANY

NOTE: Record the number and location of the original welds for installation of the service assembly.

5. Remove welds at the front and rear window opening of the roof panel (1).

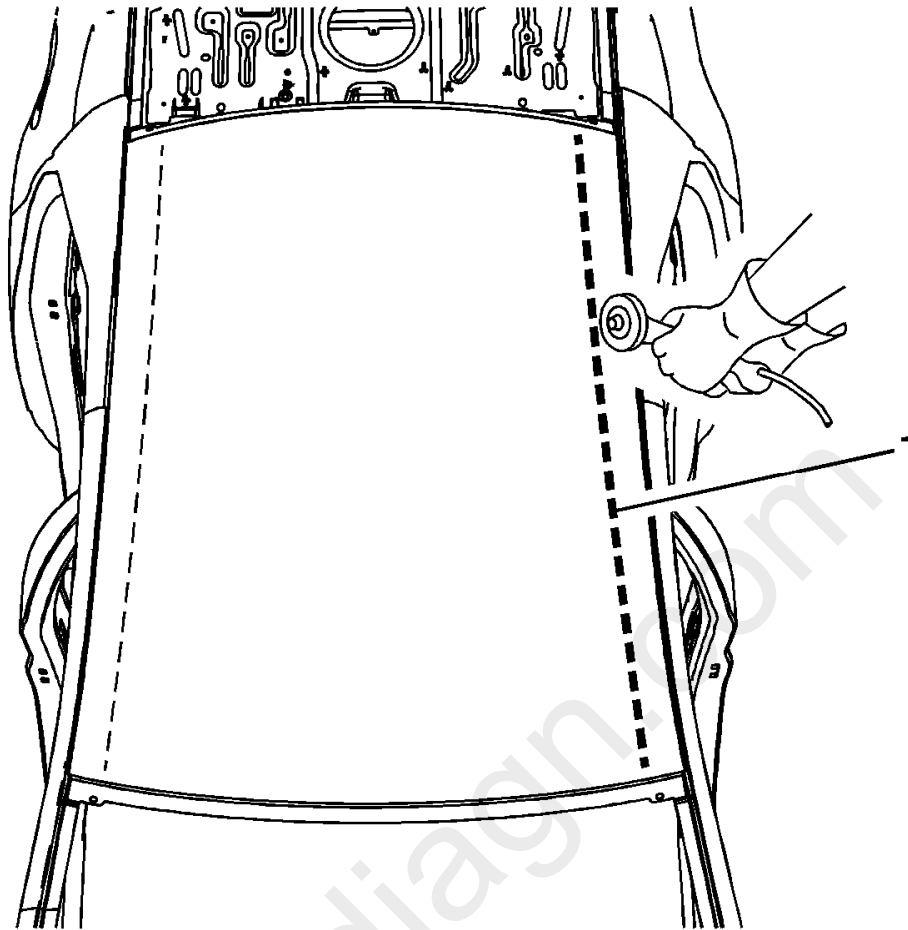


Fig. 49: Cutting Panel 30 mm Inboard Of Roof Edge
Courtesy of GENERAL MOTORS COMPANY

NOTE: Use care when cutting to protect adjacent panels. Cut inboard of the side frame structure.

6. On the side rail area of the roof use a cut off wheel or equivalent to cut the panel 30 mm inboard of the roof edge (1).
7. Remove the center portion of the panel.

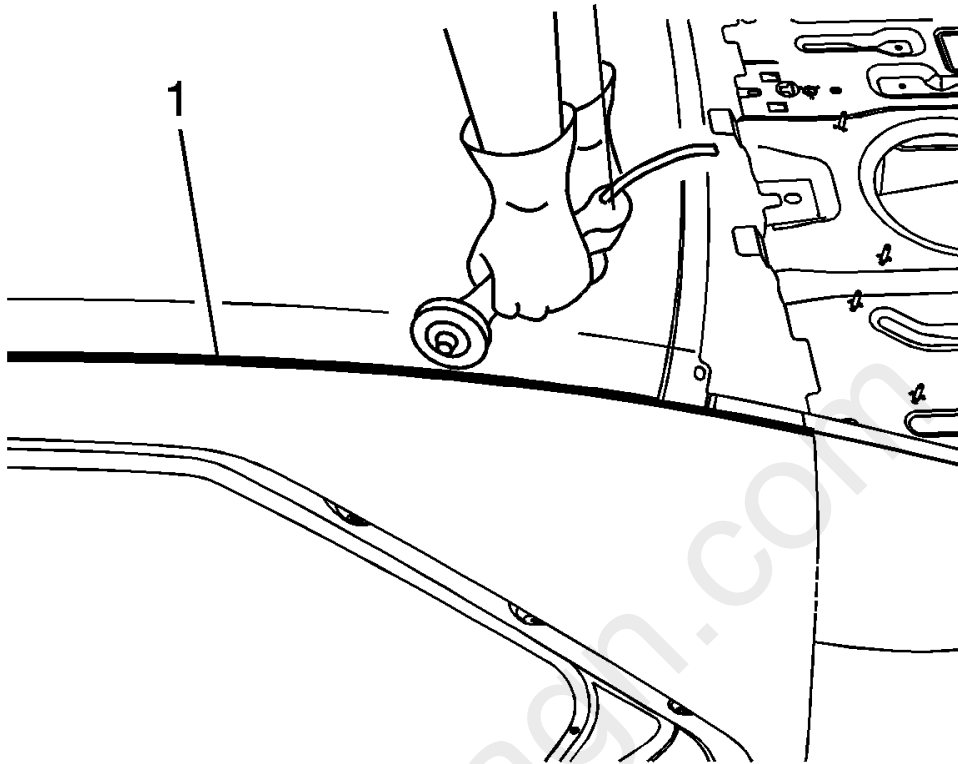


Fig. 50: Grinding Out MIG Braze Joint
Courtesy of GENERAL MOTORS COMPANY

8. To separate the remaining portion of the panel use a cut off wheel or equivalent to grind out the MIG braze joint (1).
9. Remove the remaining portion of the original panel.

Installation Procedure

1. Test fit the service panel to the vehicle, to create locating holes for accurate location of the panel.

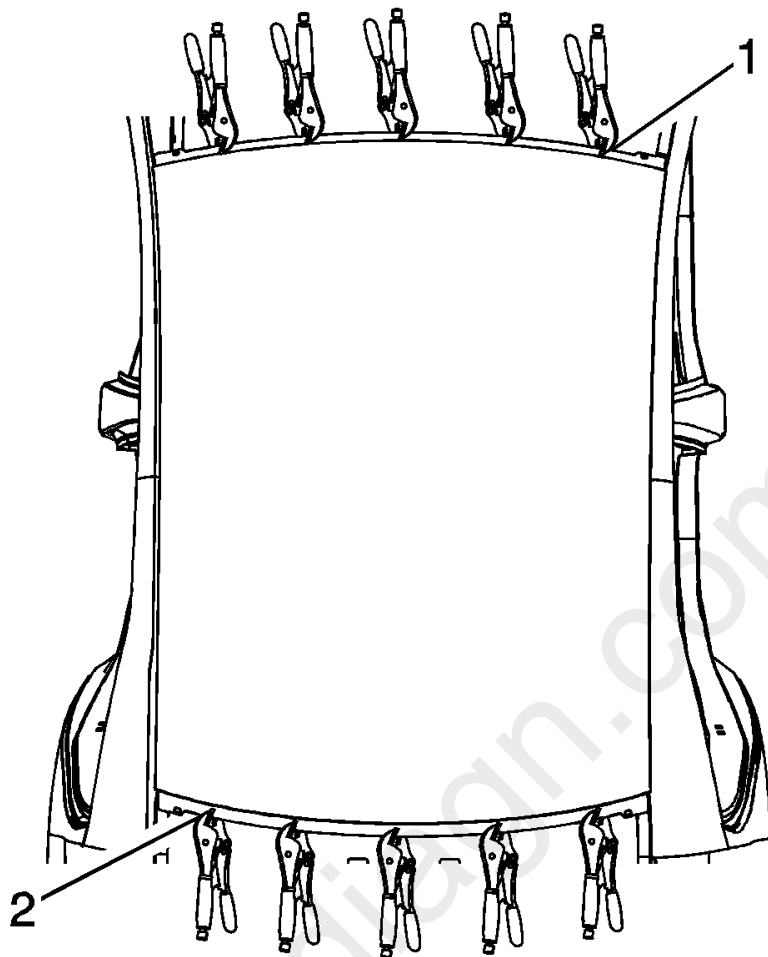


Fig. 51: Clamping Panel Into Position
Courtesy of GENERAL MOTORS COMPANY

2. Clamp the panel into position in the rear window opening (1). Adjust the bow of the roof front to rear. Clamp in place in the windshield opening area (2).

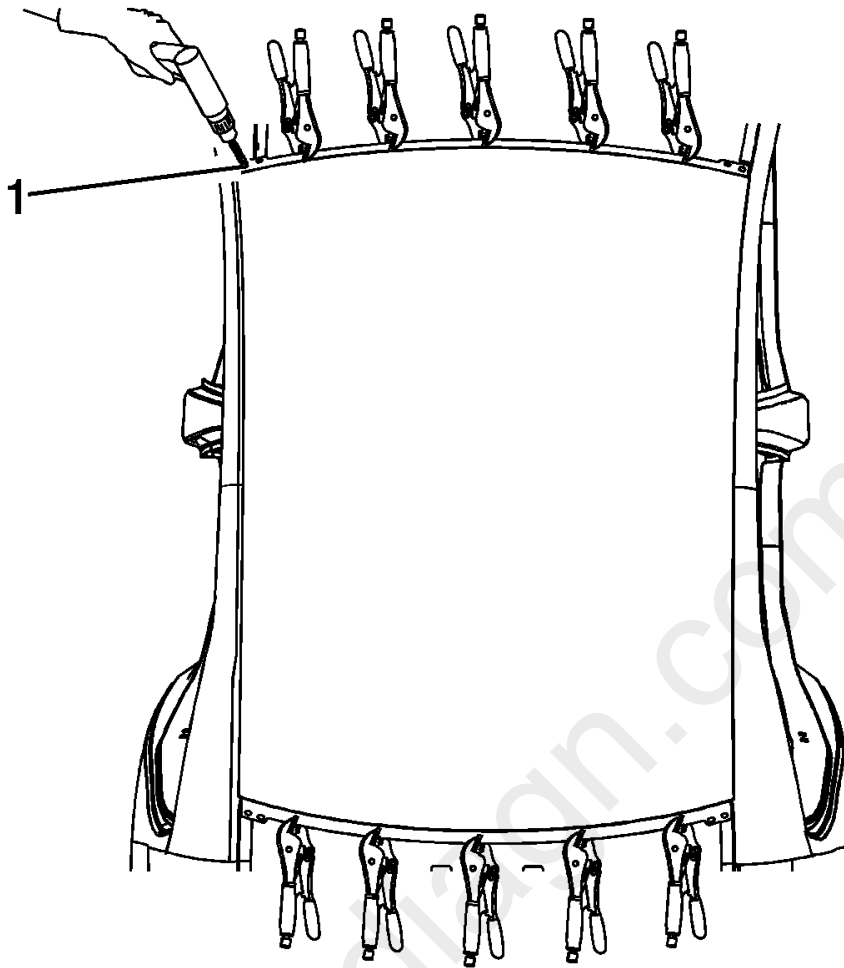


Fig. 52: Drilling 3.2 mm (1/8 in) Hole In Each Corner Of Panel
Courtesy of GENERAL MOTORS COMPANY

3. With the service panel clamped in position drill a 3.2 mm (1/8 in) hole in each corner of the panel in the front and rear window openings (1).
4. Remove the service panel from the vehicle.

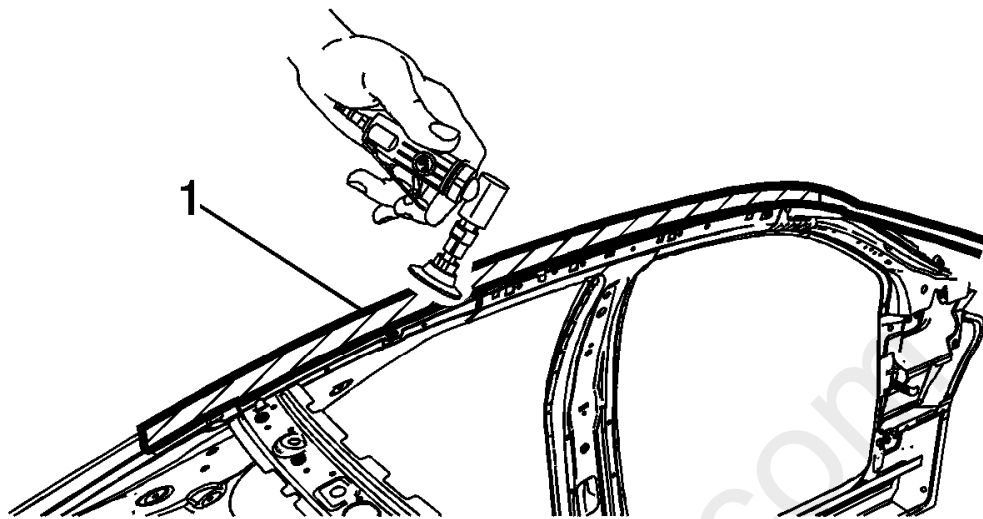


Fig. 53: Preparing Roof Rail Area With Abrasive Wheel
Courtesy of GENERAL MOTORS COMPANY

5. Prepare the roof rail area of the vehicle with an abrasive wheel or equivalent (1).
6. Clean and prepare the front and rear window attaching surfaces for welding. Refer to **Anti-Corrosion Treatment and Repair** .
7. Prepare the roof side rail bond areas. Refer to adhesive manufacturers preparation instructions.

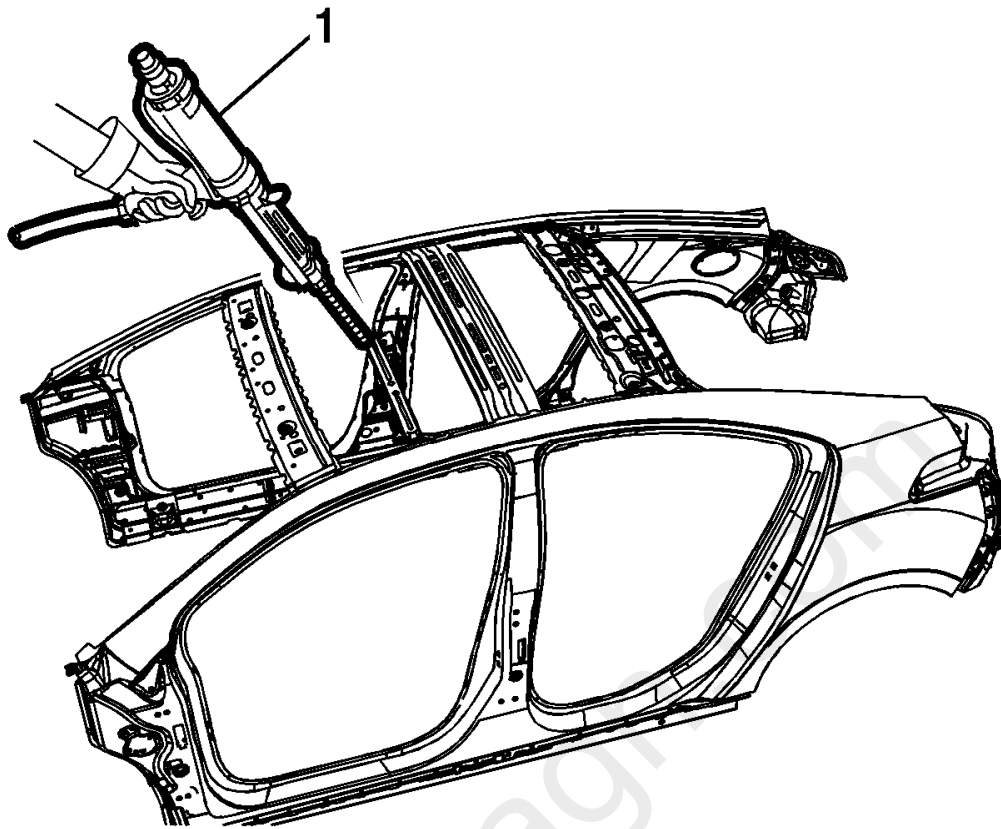


Fig. 54: Applying Fusor Super Flexible Anti-Flutter Foam Fast Set
Courtesy of GENERAL MOTORS COMPANY

8. Apply flexible anti-flutter foam, or equivalent, to the roof bows (1) in the locations noted from the original panel.

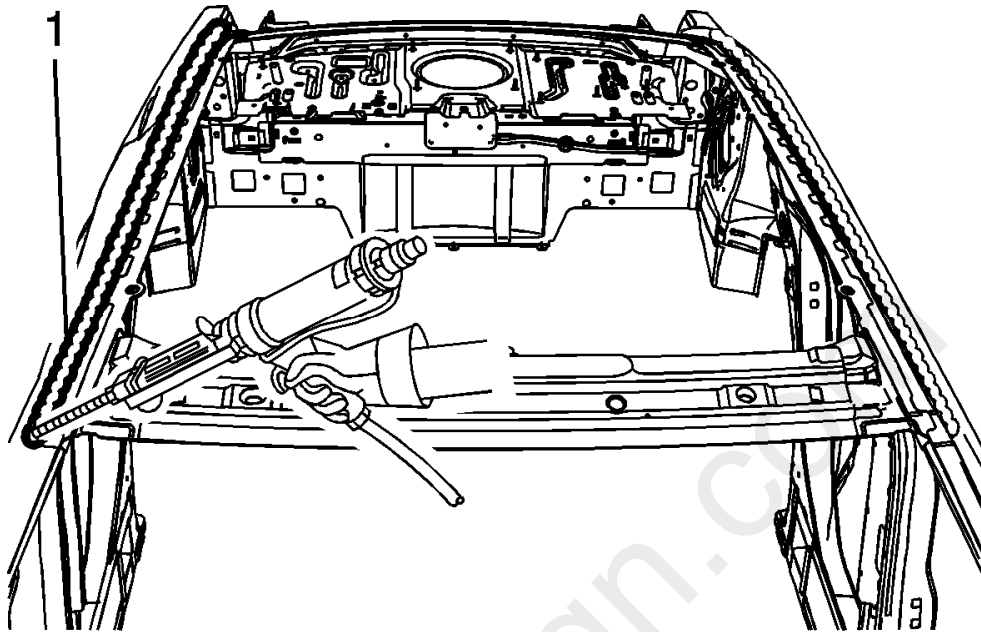


Fig. 55: Applying Bead Of Metal Panel Bonding Adhesive
Courtesy of GENERAL MOTORS COMPANY

9. Apply a 12 mm (1/2 in) bead of metal panel bonding adhesive **Metal Panel Bonding (Steel)** to the left and right roof rails (1).
10. With the help of a second person lower the service panel straight down onto the vehicle.

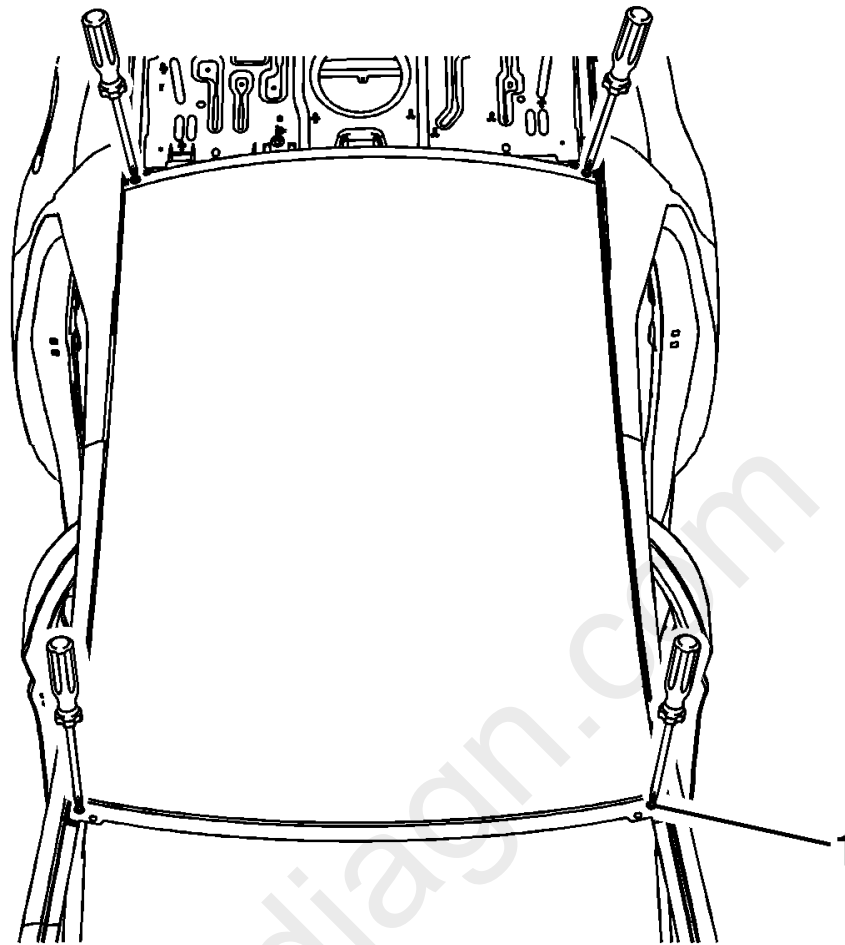


Fig. 56: Aligning Roof Panel With Awls
Courtesy of GENERAL MOTORS COMPANY

NOTE: This step will insure the proper location and contour to the vehicle.

11. Insert an awl or equivalent tool into the four holes drilled in the window openings in step 3 (1).
12. Clamp the roof in place in the front and rear window openings.
13. Clean up the excess urethane from the surface.

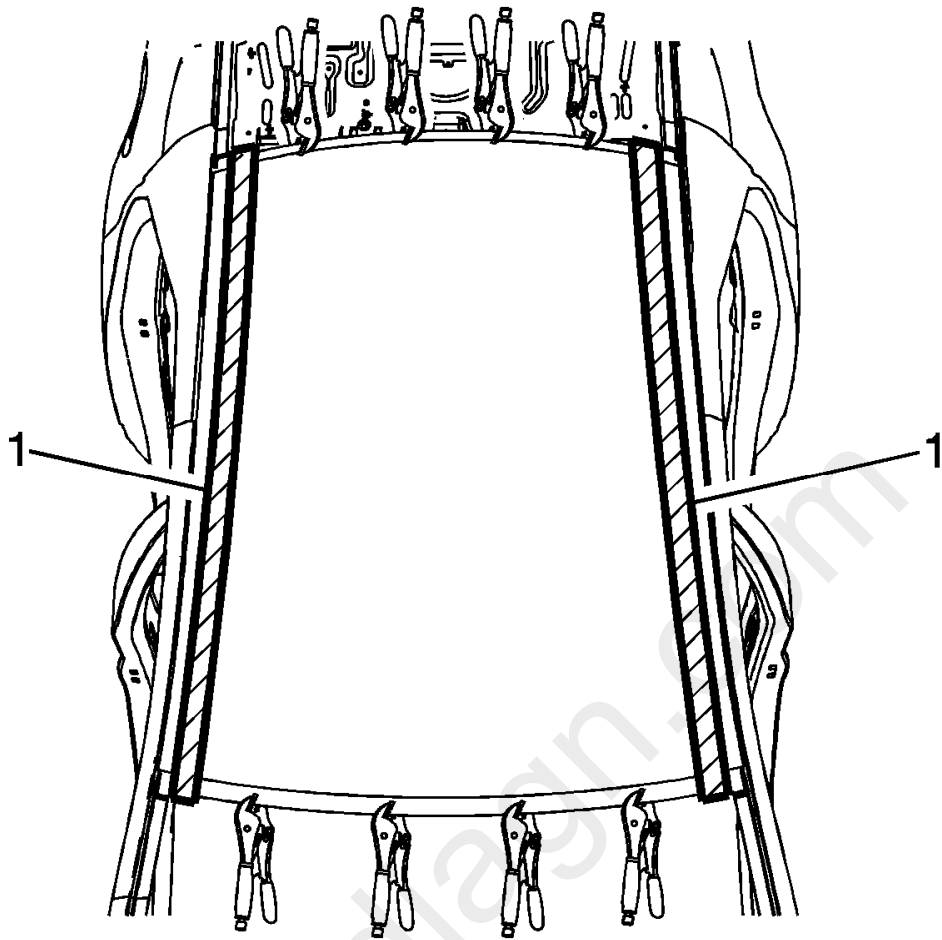


Fig. 57: Installing 25 mm (1 in) Wide Ratchet Strap Across Roof
Courtesy of GENERAL MOTORS COMPANY

14. Install 25 mm (1 in) wide ratchet strap or equivalent across the roof inboard of the bond area (1). Apply light even pressure to the bond area.
15. Allow adhesive to completely cure per manufacturers instructions. Remove the ratchet straps.

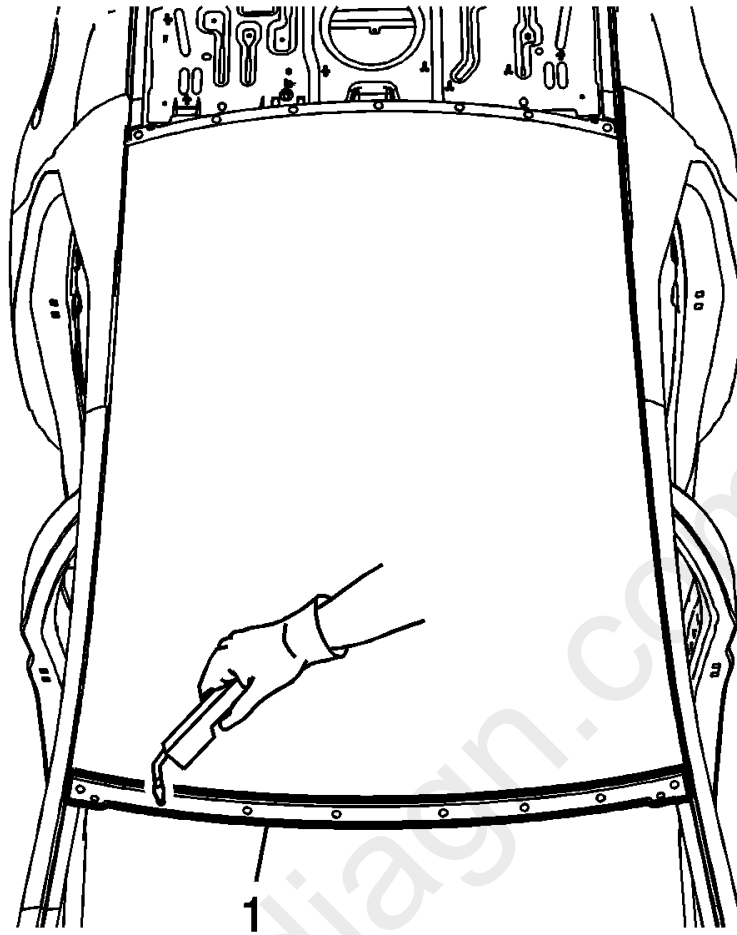


Fig. 58: Plug Weldding Panel

Courtesy of GENERAL MOTORS COMPANY

16. Weld along window openings (1) accordingly.
17. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
18. Use a high quality seam sealer to fill the gap between the outer roof panel and the body side roof rail. Follow the manufacturers instructions.
19. Paint the repaired area. Refer to **Basecoat/Clearcoat Paint Systems** .
20. Install all of the related panels and components.
21. Enable the SIR system and then connect the negative battery cable. Refer to **SIR Disabling and Enabling** .

ROCKER INNER PANEL REINFORCEMENT REPLACEMENT

Removal Procedure

WARNING: Refer to **Approved Equipment for Collision Repair Warning** .

WARNING: Refer to Foam Sound Deadeners Warning .

WARNING: Refer to Battery Disconnect Warning .

NOTE: The rocker inner panel reinforcement is made of Ultra High Strength Steel. Sectioning, or repair of Ultra High Strength Steel is not recommended. It should be replaced as a complete assembly at factory locations. Refer to [Ultra High Strength Steel](#)

1. Disable the SIR system and then disconnect the negative battery cable. Refer to SIR Disabling and Enabling .
2. Remove all related panels and components.
3. Repair as much of the damaged area as possible. Refer to Dimensions - Body.
4. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair .

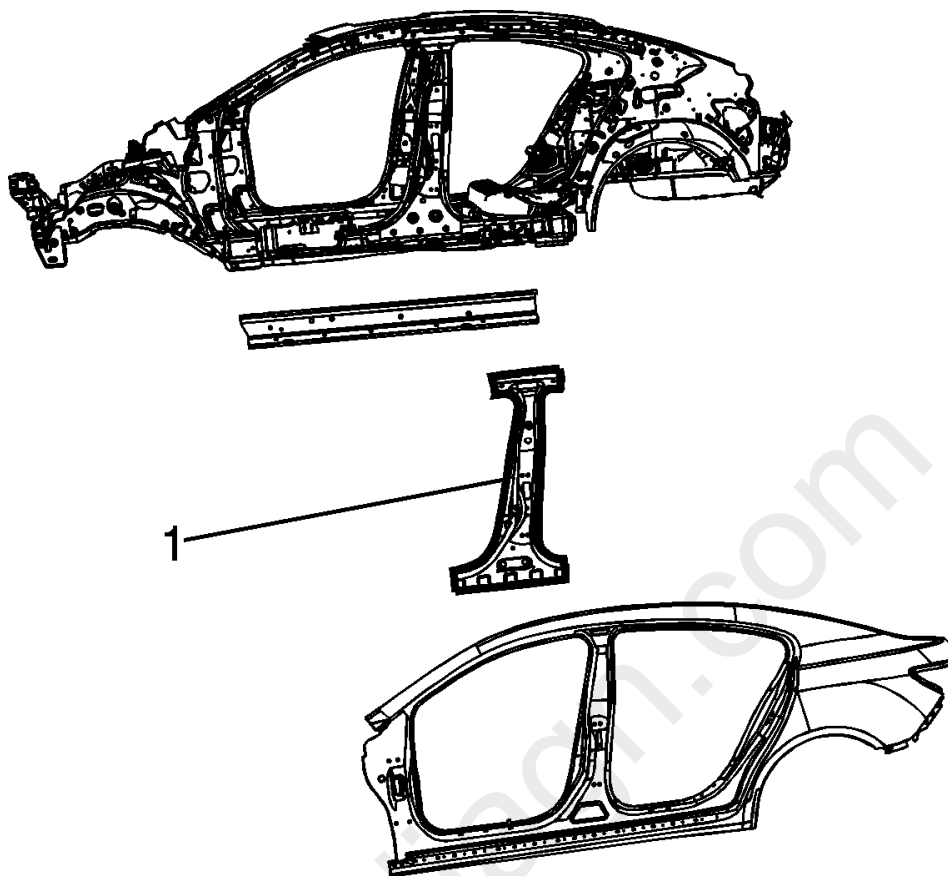


Fig. 59: Center Pillar Reinforcement
Courtesy of GENERAL MOTORS COMPANY

NOTE: There are sectioning procedures available for various locations of the body side outer panel. The sectioning procedure and location should be chosen based on the extent of damage to the vehicle and other inner reinforcements that need to be replaced. Sectioning should be performed only in the recommended areas. Failure to do so may compromise the structural integrity of the vehicle. Refer to service procedures for recommended sectioning locations.

5. The body side outer panel, center pillar reinforcement, rocker panel outer reinforcement and front hinge pillar reinforcement will need to be removed to gain access to the rocker inner panel reinforcement (1). Refer to the appropriate service procedures as required based on the specific amount of vehicle damage.

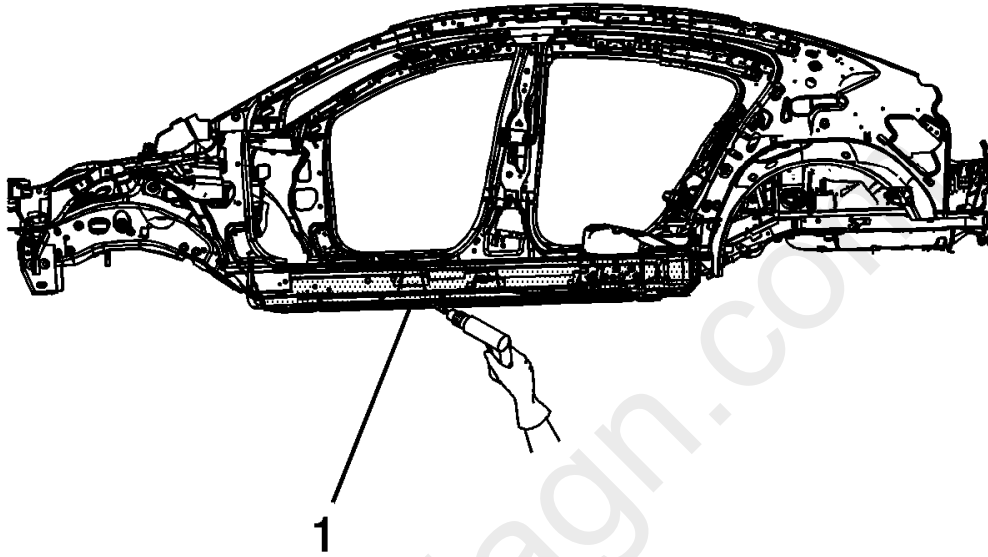


Fig. 60: Drilling Rocker Inner Panel Reinforcement Factory Welds
Courtesy of GENERAL MOTORS COMPANY

NOTE: Record the number and location of welds for installation of the service assembly.

6. Remove all the necessary factory welds (1).
7. Remove the damaged rocker inner panel reinforcement.

Installation Procedure

1. Prepare the mating surfaces as necessary.
2. Apply Weld-Thru Coating to all mating surfaces. Refer to **Anti-Corrosion Treatment and Repair**.
3. Position the rocker reinforcement in place, use 3-dimensional measuring equipment, clamp in place.

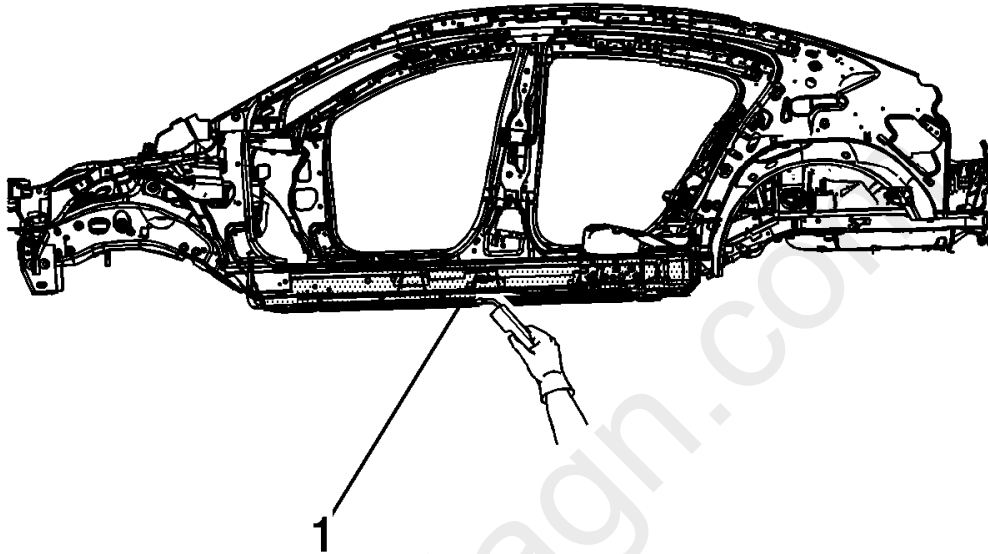


Fig. 61: Welding Rocker Reinforcement
 Courtesy of GENERAL MOTORS COMPANY

4. Weld accordingly at the original weld locations (1).
5. Install the body side outer panel, center pillar reinforcement, rocker panel outer reinforcement and front hinge pillar reinforcement. Refer to the appropriate service procedures as required based on the specific amount of vehicle damage.
6. Clean all of the welded surfaces.
7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
8. Paint the repaired area. Refer to **Basecoat/Clearcoat Paint Systems**
9. Install all of the related panels and components.
10. Enable the SIR system and then connect the negative battery cable. Refer to **SIR Disabling and Enabling** .

ROCKER OUTER PANEL REINFORCEMENT REPLACEMENT

Removal Procedure

WARNING: Refer to Approved Equipment for Collision Repair Warning .

WARNING: Refer to Foam Sound Deadeners Warning .

WARNING: Refer to Battery Disconnect Warning .

NOTE: The rocker outer panel reinforcement is made of Ultra High Strength Steel. Sectioning, or repair of Ultra High Strength Steel is not recommended. It should be replaced as a complete assembly at factory locations. Refer to [Ultra High Strength Steel](#)

1. Disable the SIR system and then disconnect the negative battery cable. Refer to SIR Disabling and Enabling .
2. Remove all related panels and components.
3. Repair as much of the damaged area as possible. Refer to Dimensions - Body.
4. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair .

NOTE: There are sectioning procedures available for various locations of the body side outer panel. The sectioning procedure and location should be chosen based on the extent of damage to the vehicle and other inner reinforcements that need to be replaced. Sectioning should be performed only in the recommended areas. Failure to do so may compromise the structural integrity of the vehicle. Refer to service procedures for recommended sectioning locations.

5. The body side outer panel, center pillar reinforcement and front hinge pillar reinforcement will need to be removed to gain access to the rocker outer panel reinforcement. Refer to the appropriate service procedures as required based on the specific amount of vehicle damage.

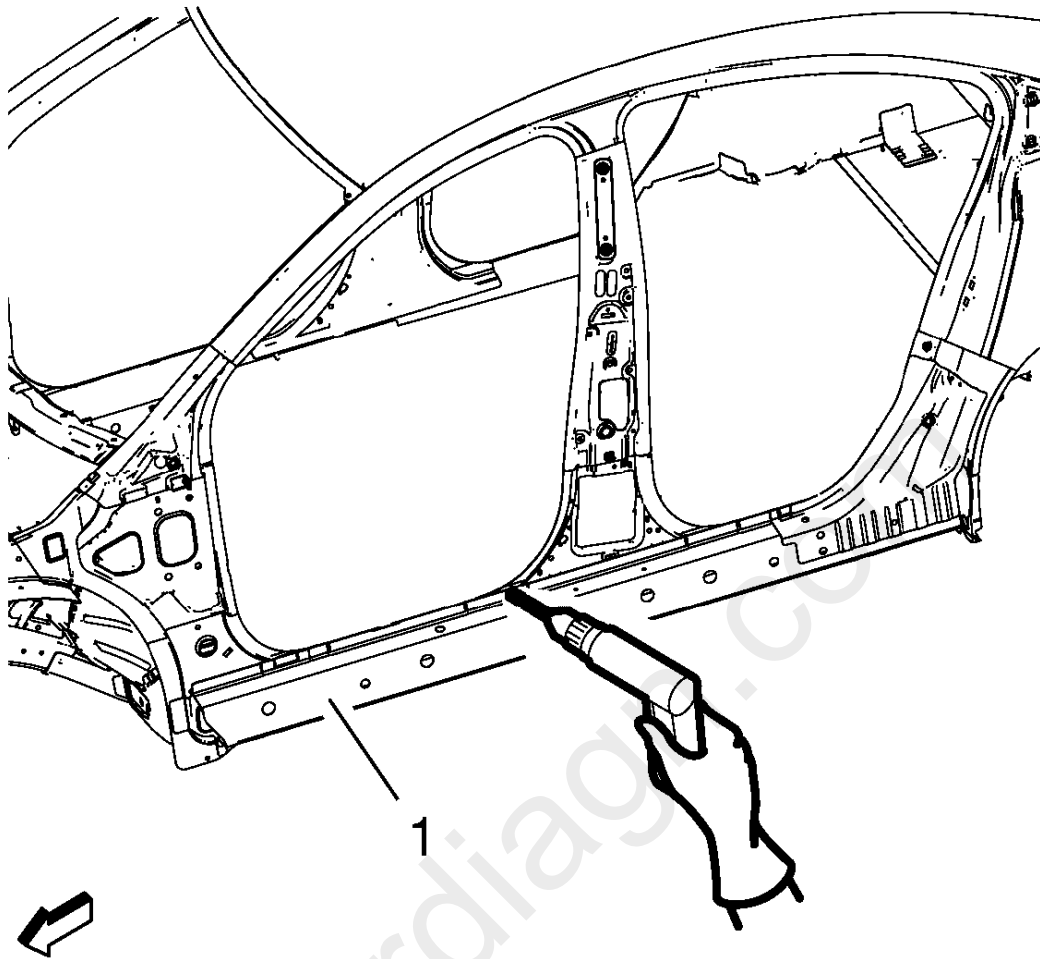


Fig. 62: Drilling Factory Welds Of The Body Side Outer Panel Reinforcement
Courtesy of GENERAL MOTORS COMPANY

NOTE: Do not damage or cut the inner rocker panel reinforcement. The inner rocker panel reinforcement is made of Ultra High Strength Steel. Sectioning, or repair of Ultra High Strength Steel is not recommended. Refer to Ultra High Strength Steel.

6. Remove all necessary welds of the body side outer panel reinforcement (1).

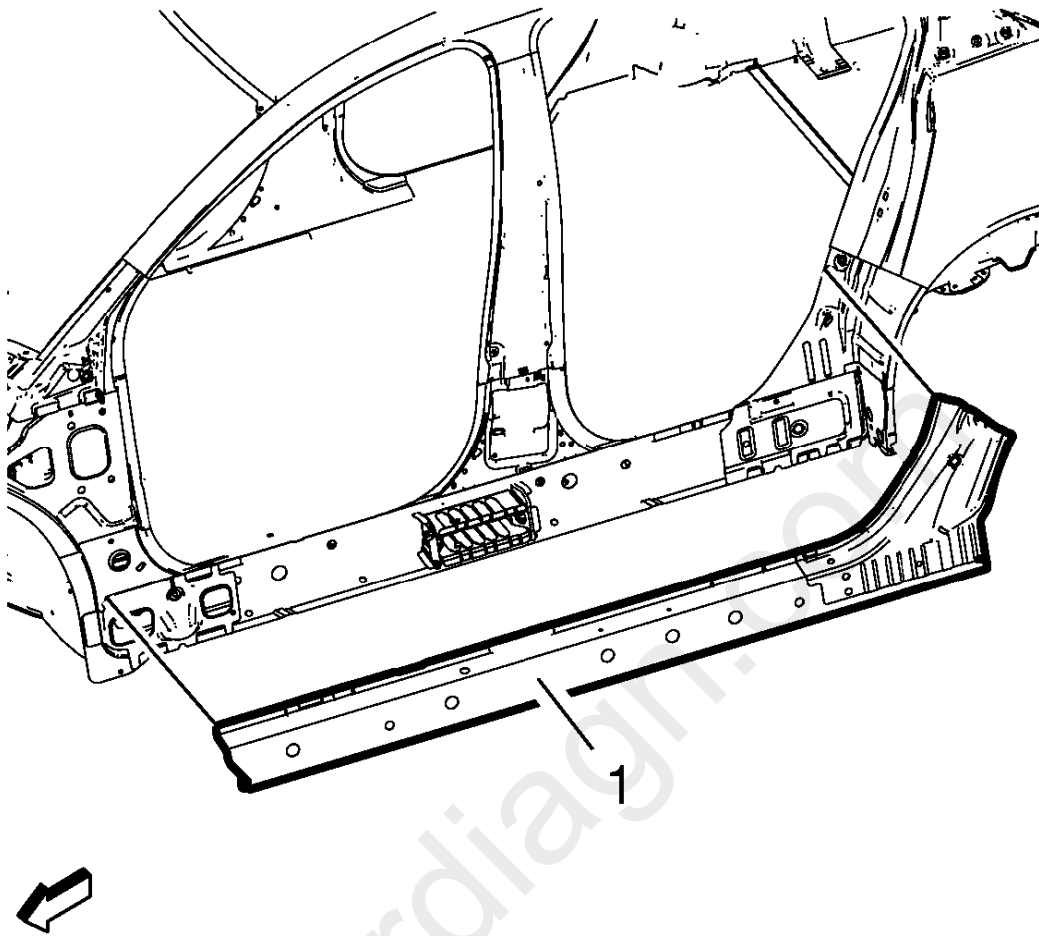


Fig. 63: Body Side Outer Panel Reinforcement
Courtesy of GENERAL MOTORS COMPANY

NOTE: Record the number and location of welds for installation of the service assembly.

7. Remove the damaged body side outer panel reinforcement (1).

Installation Procedure

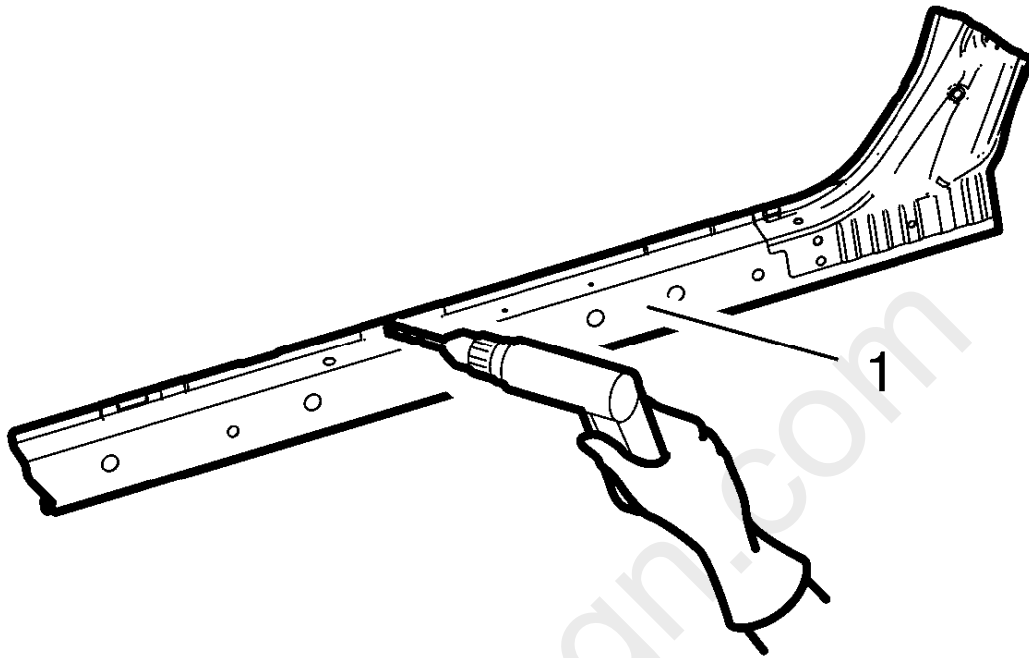


Fig. 64: Drilling Hole For Plug Welding New Body Side Outer Panel Reinforcement
Courtesy of GENERAL MOTORS COMPANY

1. Clean and prepare the attaching surfaces for welding.

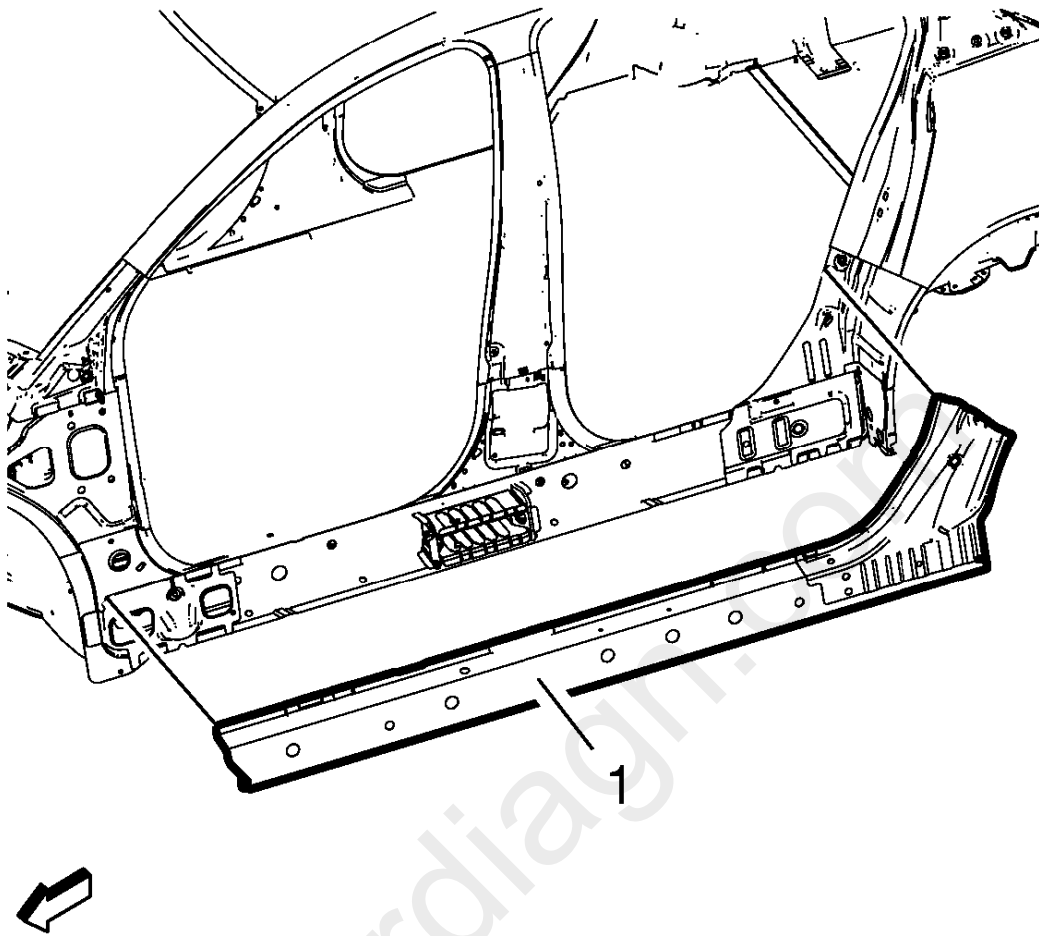


Fig. 65: Body Side Outer Panel Reinforcement
Courtesy of GENERAL MOTORS COMPANY

2. Position the body side outer panel reinforcement (1) on the vehicle.
3. Verify the fit of the body side outer panel reinforcement.
4. Clamp the body side outer panel reinforcement into position.

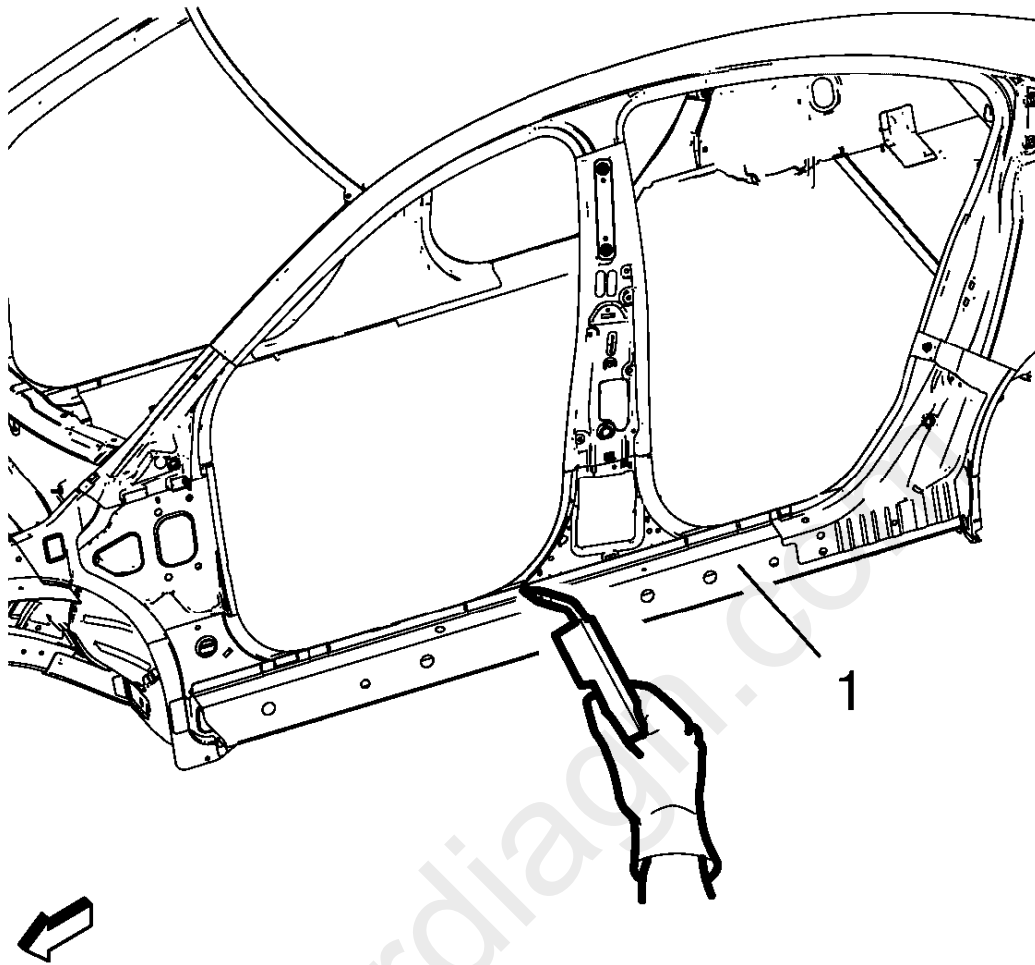


Fig. 66: Welding Body Side Outer Panel Reinforcement
Courtesy of GENERAL MOTORS COMPANY

5. Weld the body side outer panel reinforcement (1) accordingly.
6. Clean all of the welded surfaces.
7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
8. Install the body side outer panel, center pillar reinforcement and front hinge pillar reinforcement. Refer to the appropriate service procedures as required based on the specific amount of vehicle damage.
9. Paint the repaired area. Refer to **Basecoat/Clearcoat Paint Systems**
10. Install all of the related panels and components.
11. Enable the SIR system and then connect the negative battery cable. Refer to **SIR Disabling and Enabling** .

ROCKER OUTER PANEL SECTIONING

Removal Procedure

WARNING: Refer to Approved Equipment for Collision Repair Warning .

WARNING: Refer to Foam Sound Deadeners Warning .

WARNING: Refer to Battery Disconnect Warning .

NOTE: This procedure was developed to allow access for the complete replacement of the rocker outer panel reinforcement. There are sectioning procedures available for various locations of the body side outer panel. The sectioning procedure and location should be chosen based on the extent of damage to the vehicle and other inner reinforcements that need to be replaced. Sectioning should be performed only in the recommended areas. Failure to do so may compromise the structural integrity of the vehicle. Refer to other service procedures for additional sectioning locations.

1. Disable the SIR system. Refer to SIR Disabling and Enabling .
2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection .
3. Remove all related panels and components.
4. Repair as much of the damaged area as possible. Refer to Dimensions - Body.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair .

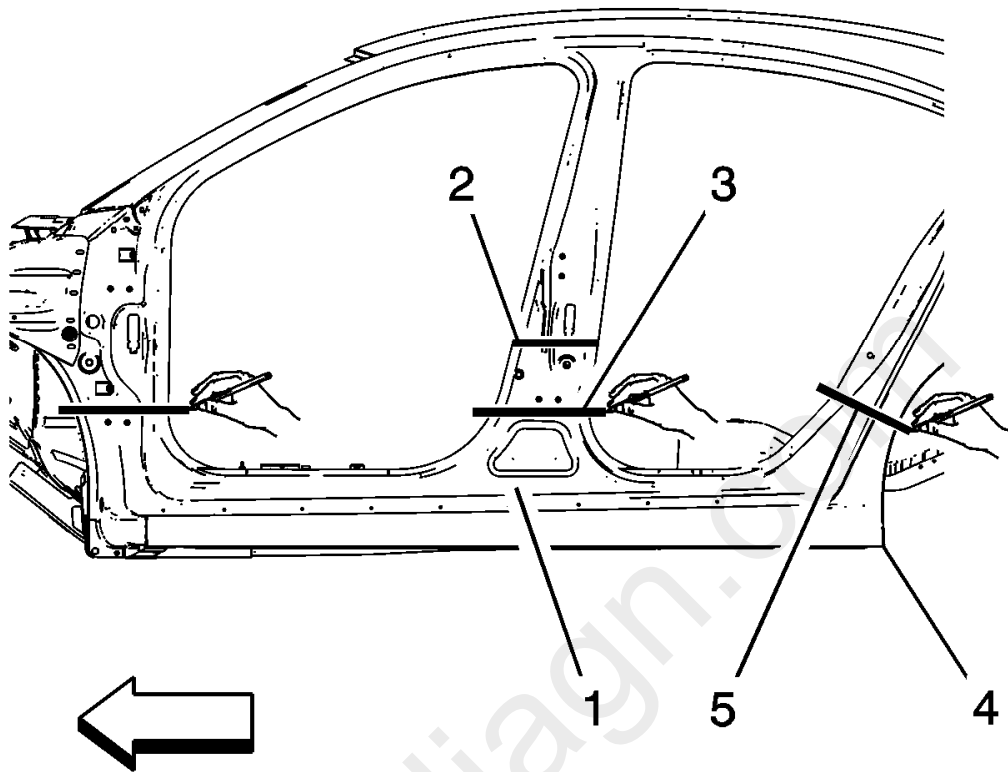


Fig. 67: Rocker Panel Cut Lines

Courtesy of GENERAL MOTORS COMPANY

6. Create cut lines on the rocker outer panel (1). To avoid cutting into hidden reinforcements within the center pillar panel, measure 100 mm down from bottom of electrical conduit hole (2), mark a cut line (3). To avoid a cutting into a sound deadener baffle within the lock pillar panel, measure 350 mm up from the bottom of the rocker panel (4), mark a cut line (5).
7. Perform additional sectioning procedures as needed, depending on damage to vehicle. Refer to **Quarter Outer Panel Sectioning**, **Front Hinge Pillar Body Sectioning (Lower)**, **Front Hinge Pillar Body Sectioning (Upper)**, or **Center Pillar Sectioning - Outer**.

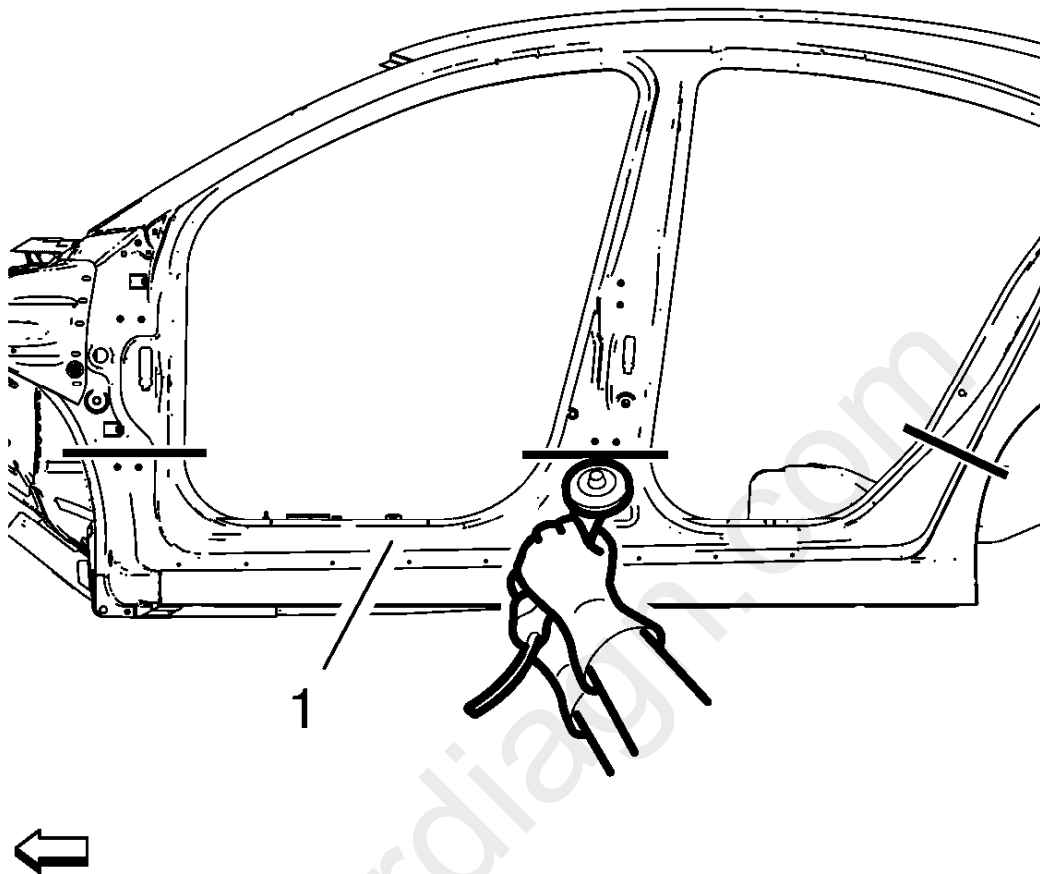


Fig. 68: Cutting Rocker Outer Panel
Courtesy of GENERAL MOTORS COMPANY

NOTE: Do not damage or cut the front hinge pillar reinforcements, or outer rocker panel reinforcements. The front hinge pillar reinforcements and outer rocker panel reinforcements are made of Ultra High Strength Steel. Sectioning, or repair of Ultra High Strength Steel, is not recommended. Refer to Ultra High Strength Steel.

8. Cut the rocker outer panel (1) where sectioning is to be performed.

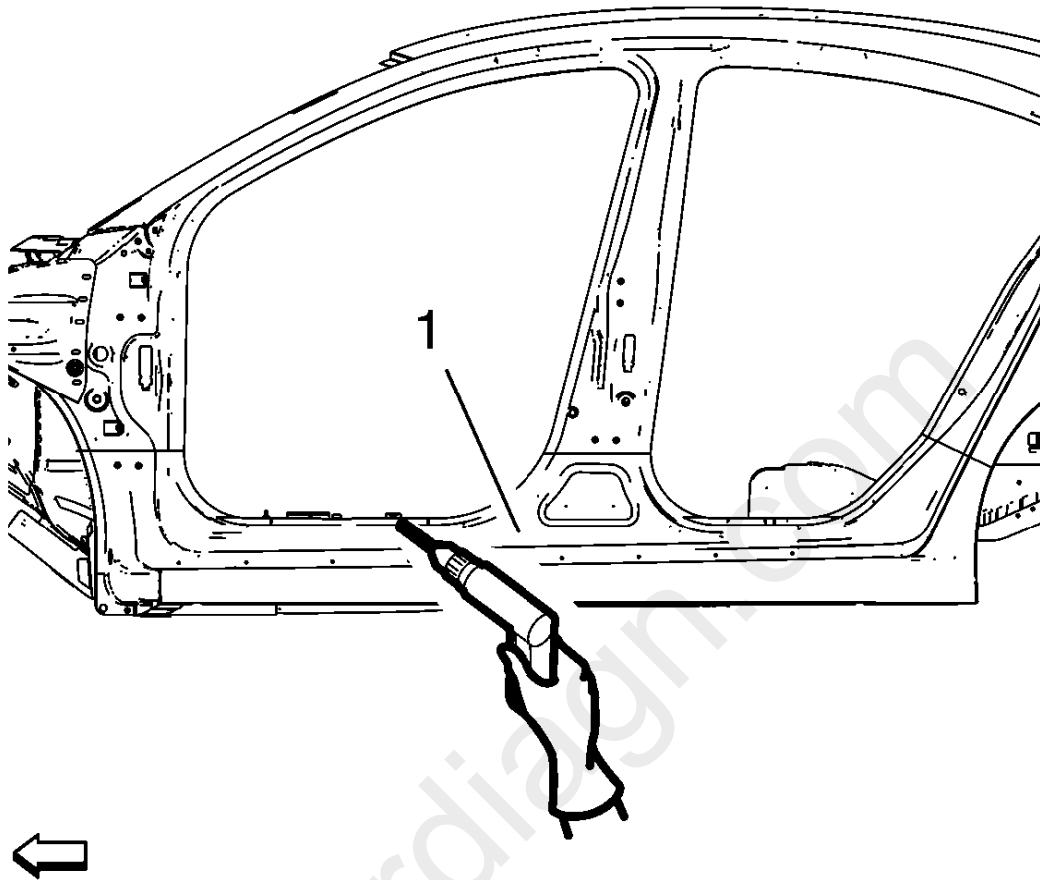


Fig. 69: Drilling Factory Welds Of Rocker Outer Panel
Courtesy of GENERAL MOTORS COMPANY

9. Remove all the necessary factory welds of the rocker outer panel (1).

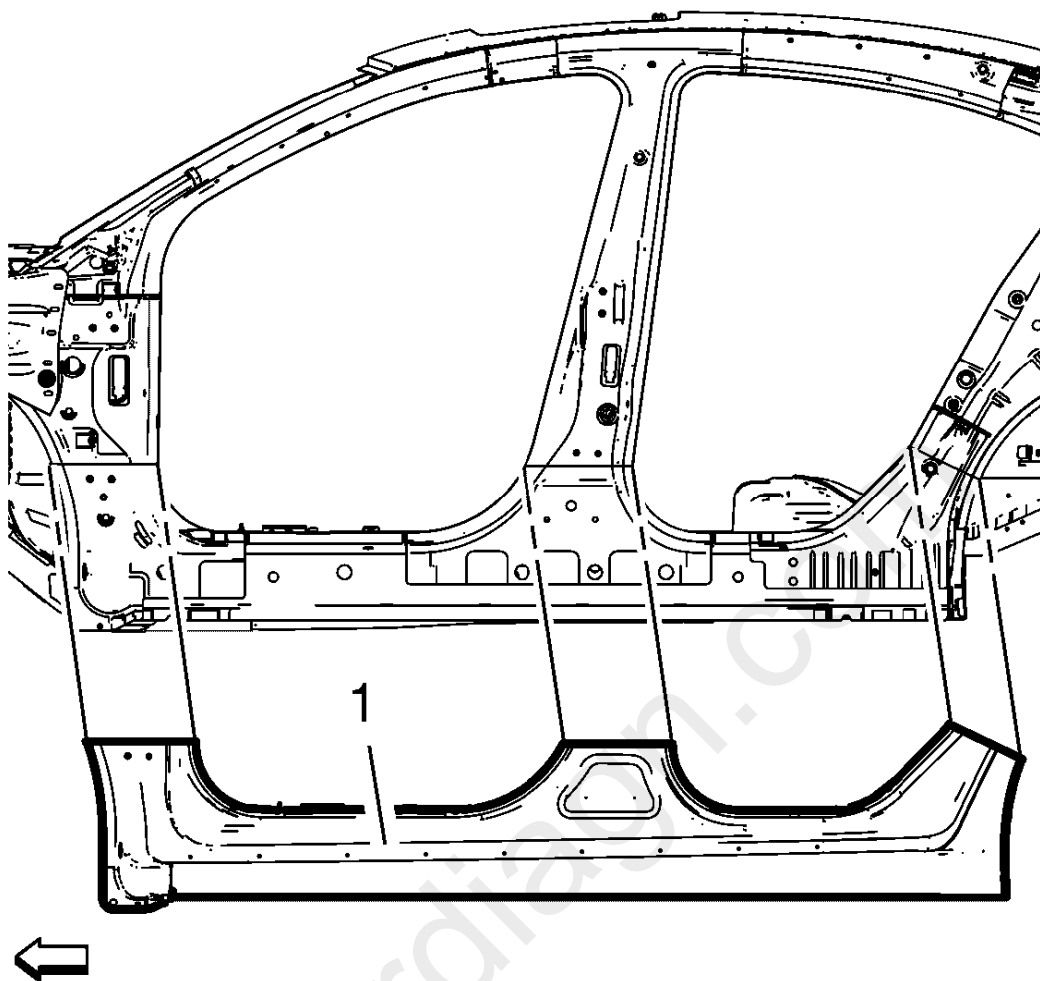


Fig. 70: Rocker Outer Panel

Courtesy of GENERAL MOTORS COMPANY

NOTE: Record the number and location of welds for installation of the service assembly.

10. Remove the damaged rocker outer panel (1).

Installation Procedure

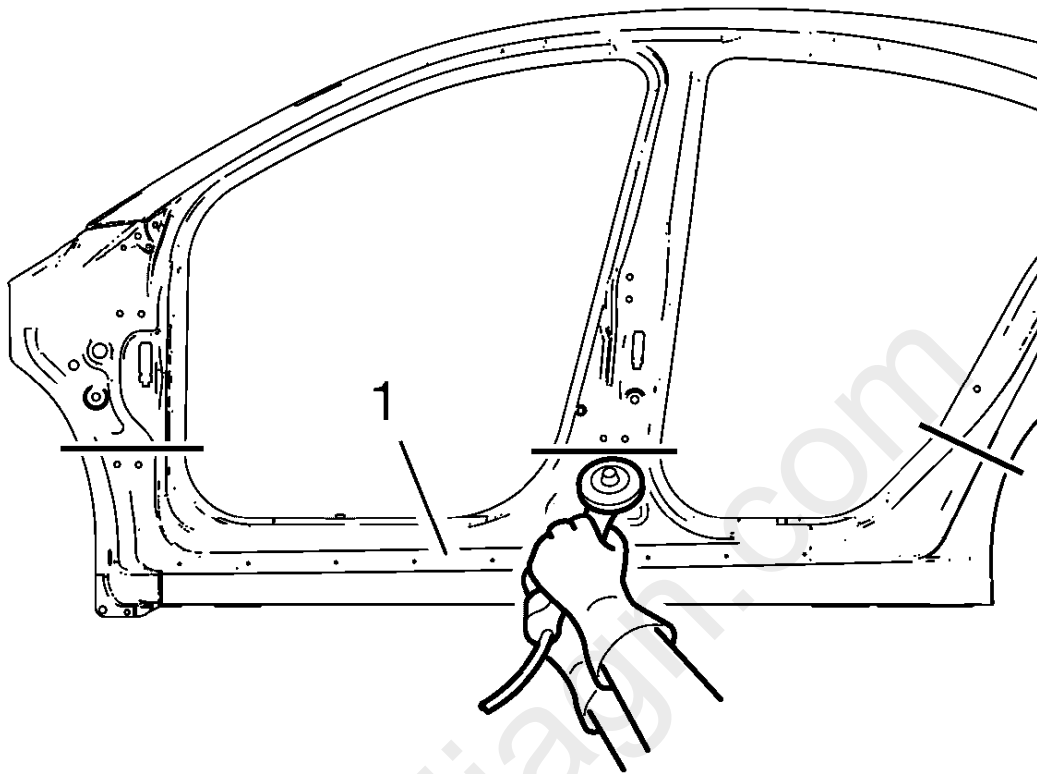


Fig. 71: Cutting Rocker Outer Panel
Courtesy of GENERAL MOTORS COMPANY

1. From the service part (1), cut the panel in corresponding locations to overlap the remaining original panel by 25 mm (1 inch) at each joint location.
2. Prepare all mating surfaces, as necessary.

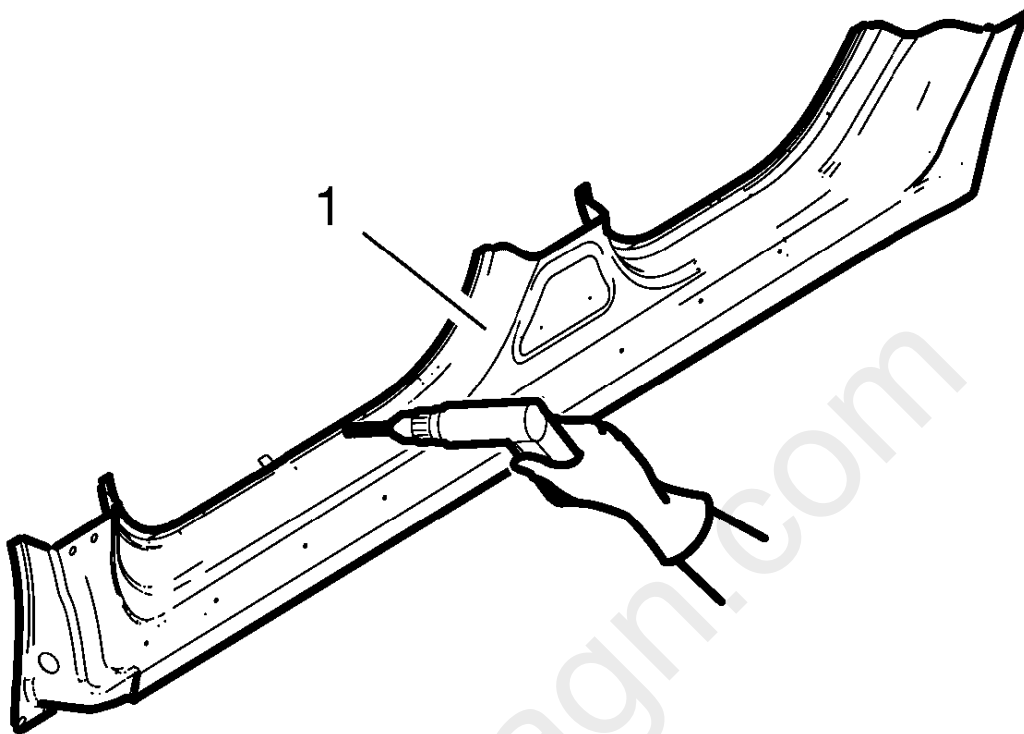


Fig. 72: Drilling Hole For Plug Welding New Rocker Outer Panel
Courtesy of GENERAL MOTORS COMPANY

3. Clean and prepare the attaching surfaces for welding.
4. Apply Weld-Thru Coating to all mating surfaces. Refer to **Anti-Corrosion Treatment and Repair** .

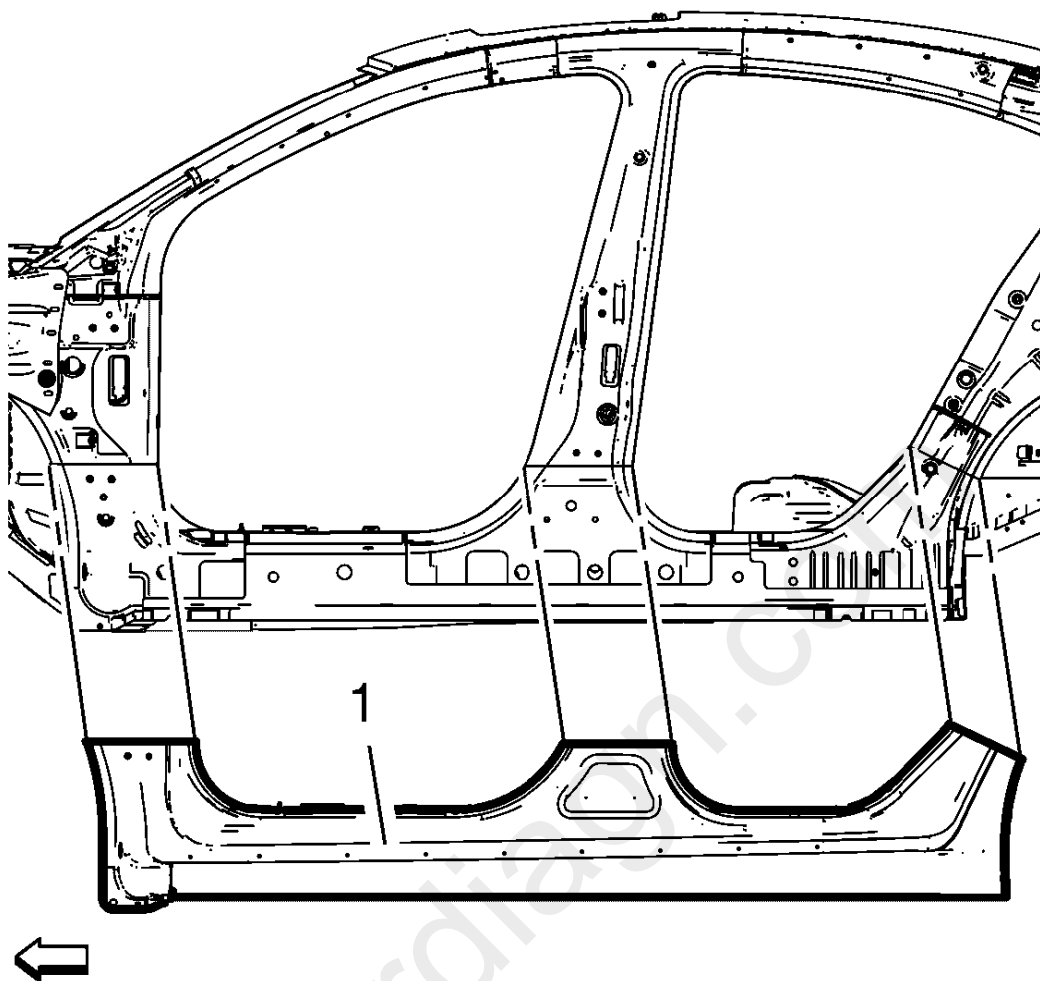


Fig. 73: Rocker Outer Panel

Courtesy of GENERAL MOTORS COMPANY

5. Position the rocker outer panel section (1) to the vehicle using 3-dimensional measuring equipment. Clamp the pillar in place.

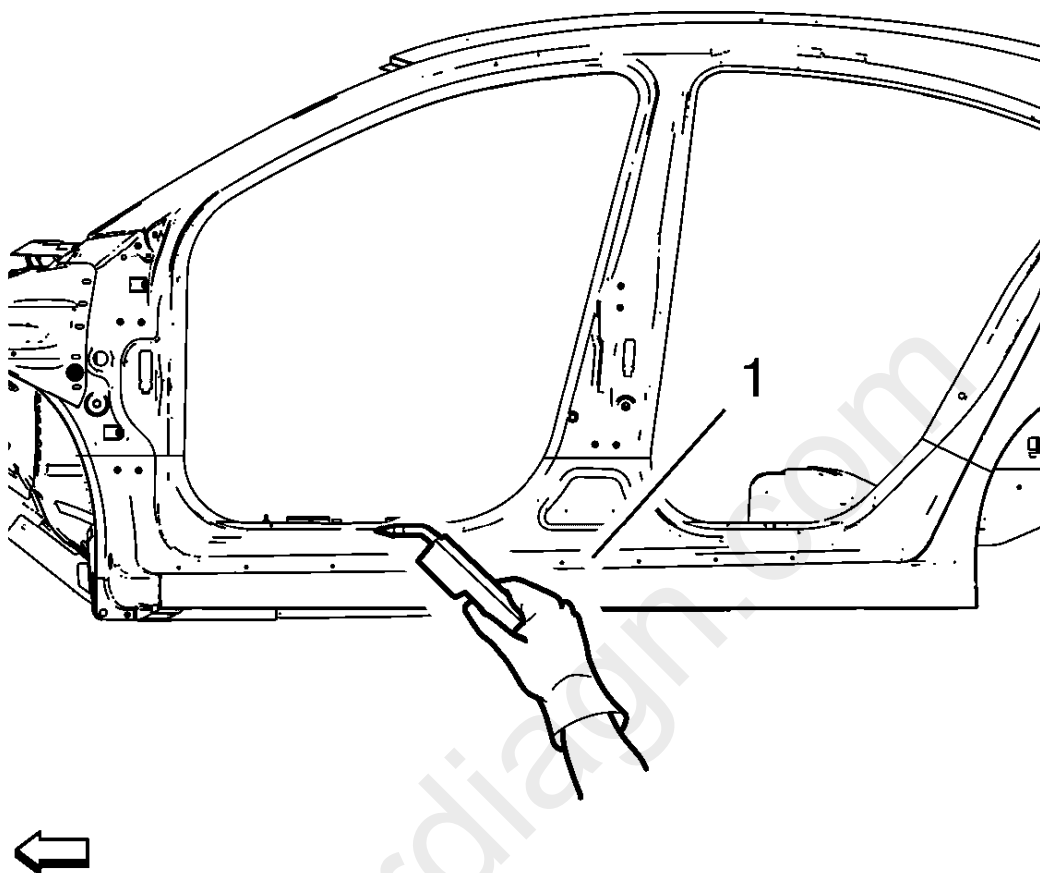


Fig. 74: Welding Rocker Outer Panel
Courtesy of GENERAL MOTORS COMPANY

6. Weld the perimeter of the part at the original weld locations (1).

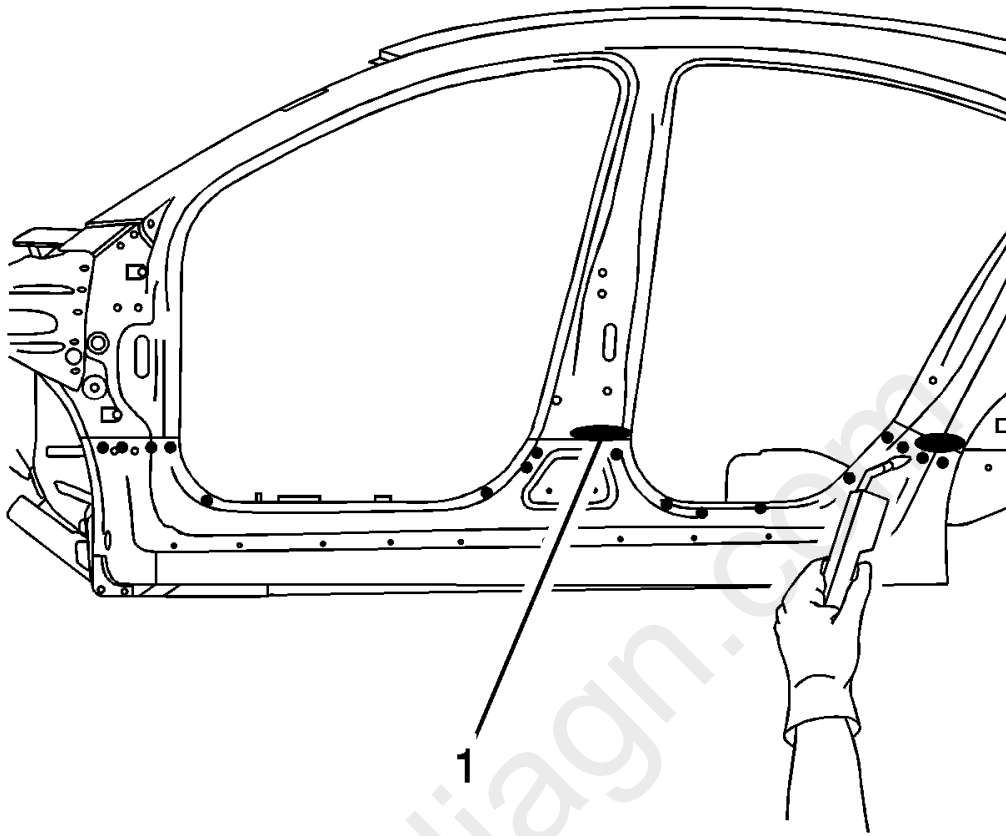


Fig. 75: Welding Replacement Part In Place
Courtesy of GENERAL MOTORS COMPANY

7. To create a solid weld with minimum heat distortion, make stitch welds along the 25 mm overlap joints, with equal gaps between the welds. Then go back and complete the welds, to create a solid weld joint (1).
8. Clean and prepare all of the welded surfaces.
9. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
10. Paint the repaired area. Refer to **Basecoat/Clearcoat Paint Systems** .
11. Install all of the related panels and components.
12. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection** .
13. Enable the SIR system. Refer to **SIR Disabling and Enabling** .

REAR COMPARTMENT FLOOR PANEL SECTIONING

Removal Procedure

WARNING: Refer to Approved Equipment for Collision Repair Warning .

WARNING: Refer to Foam Sound Deadeners Warning .

WARNING: Refer to Battery Disconnect Warning .

NOTE: The upper flanges of the rear compartment floor panel are trapped between the rear lower frame rail and rear frame rail upper reinforcement, on both sides of the panel. This procedure describes how to perform a partial replacement of the rear compartment floor panel, by creating a 25 mm (1 in) flange on both sides of the original panel and should be used when the rear frame rail and frame rail reinforcement do not require replacement. Complete panel replacement can be done when the rear frame rails, or frame rail reinforcements have been removed.

1. Disable the SIR system and then disconnect the negative battery cable. Refer to SIR Disabling and Enabling .
2. Remove all related panels and components.

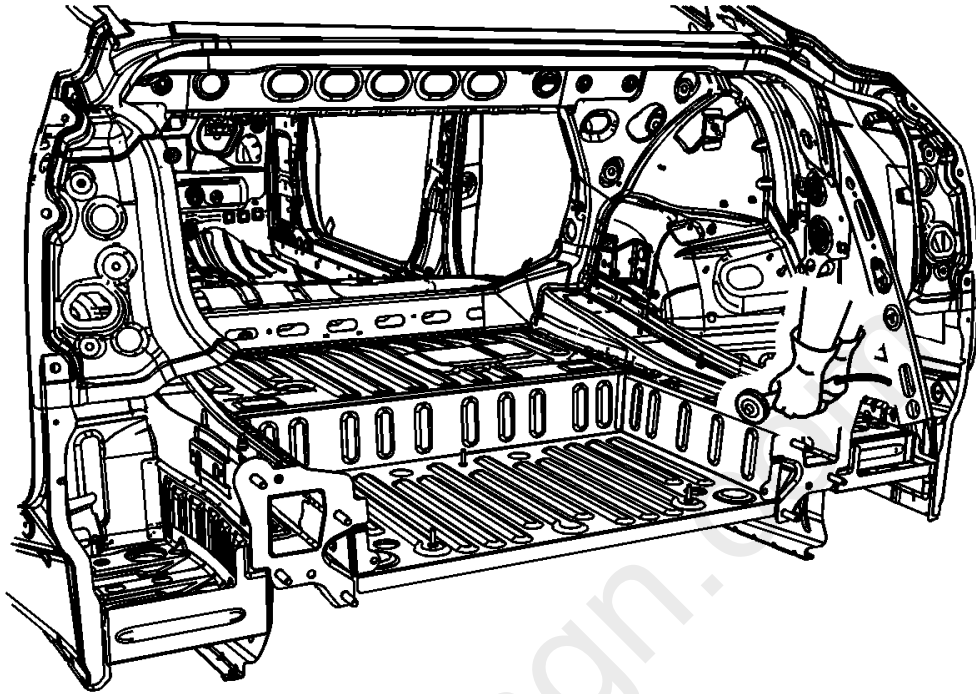


Fig. 76: Body Rear End Panel

Courtesy of GENERAL MOTORS COMPANY

3. Repair as much of the damage as possible. Refer to **Dimensions - Body**.
4. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair**.
5. Remove the body rear end panel (1). Refer to **Body Rear End Panel Replacement**.

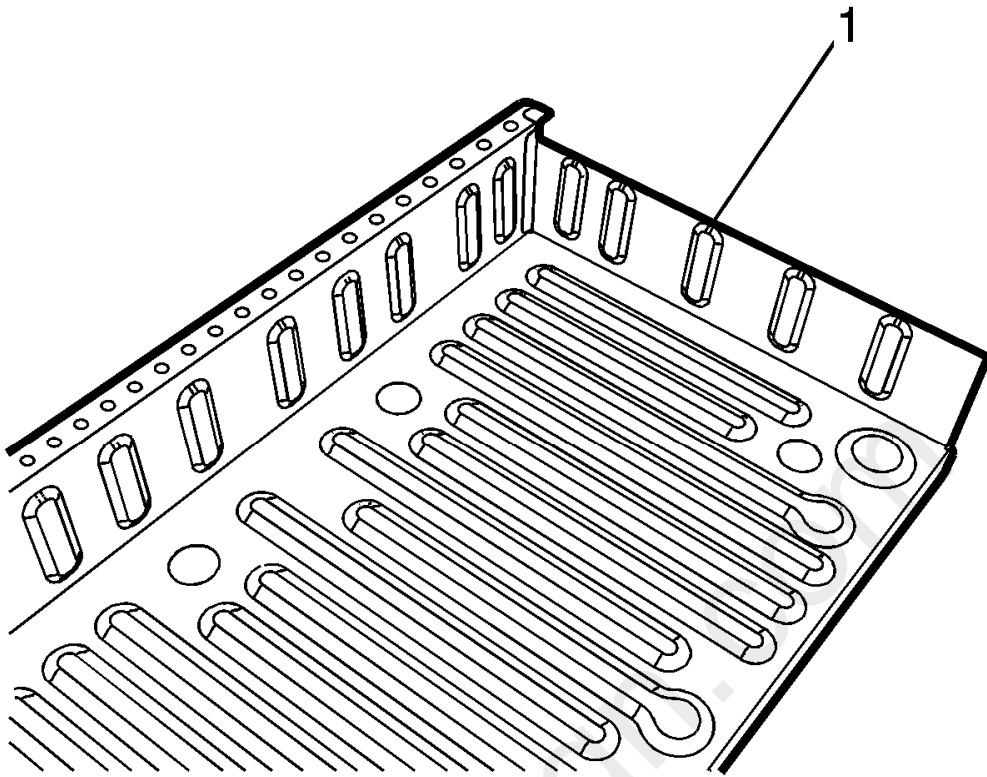


Fig. 77: Rear Frame Rail Upper Extension
Courtesy of GENERAL MOTORS COMPANY

6. Apply a 25 mm (1 in) wide piece of masking tape to the rear compartment panel along the top side of the panel, below the rear frame rail upper extension, on both sides (1).
7. Create a 25 mm (1 in) weld flange on both sides of the floor panel, to attach the replacement panel. Cut along the bottom of the tape, below the rear frame rail upper reinforcement (1).

NOTE: Do not damage any inner panels or reinforcements.

8. Cut the rear compartment panel, vertically at the forward corners, leaving two 25 mm (1 in) flanges to attach the replacement floor.

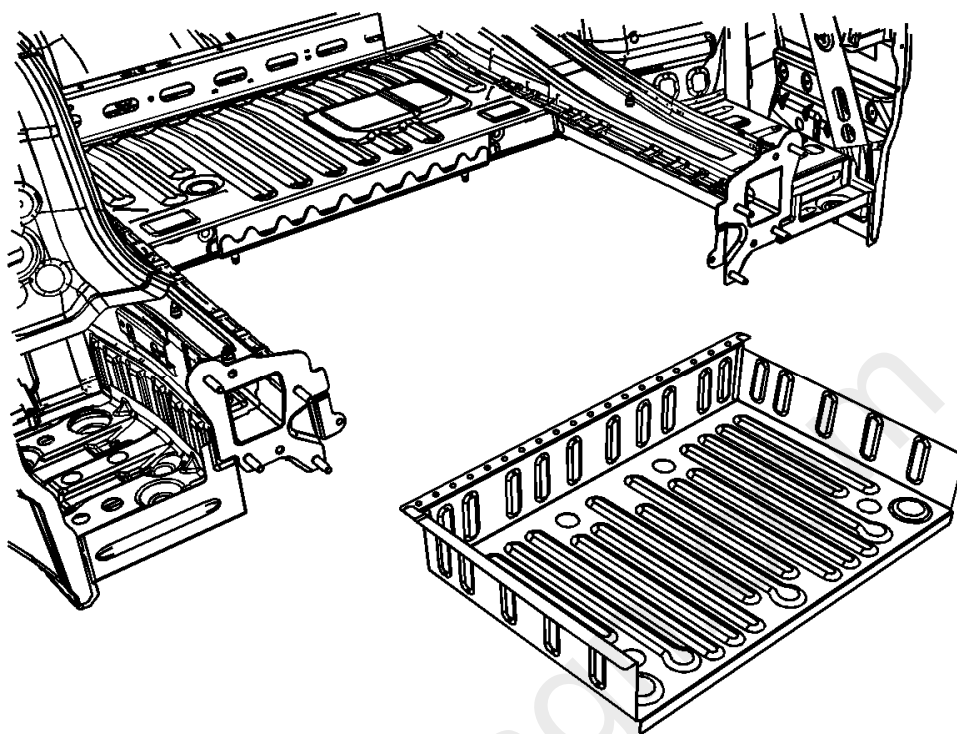


Fig. 78: Rear Floor Panel

Courtesy of GENERAL MOTORS COMPANY

NOTE: Record the number and location of welds for installation of the service assembly.

9. Locate, mark, and remove the factory weld along the forward edge of the rear floor panel.
10. Remove the damaged rear compartment panel from the vehicle.

Installation Procedure

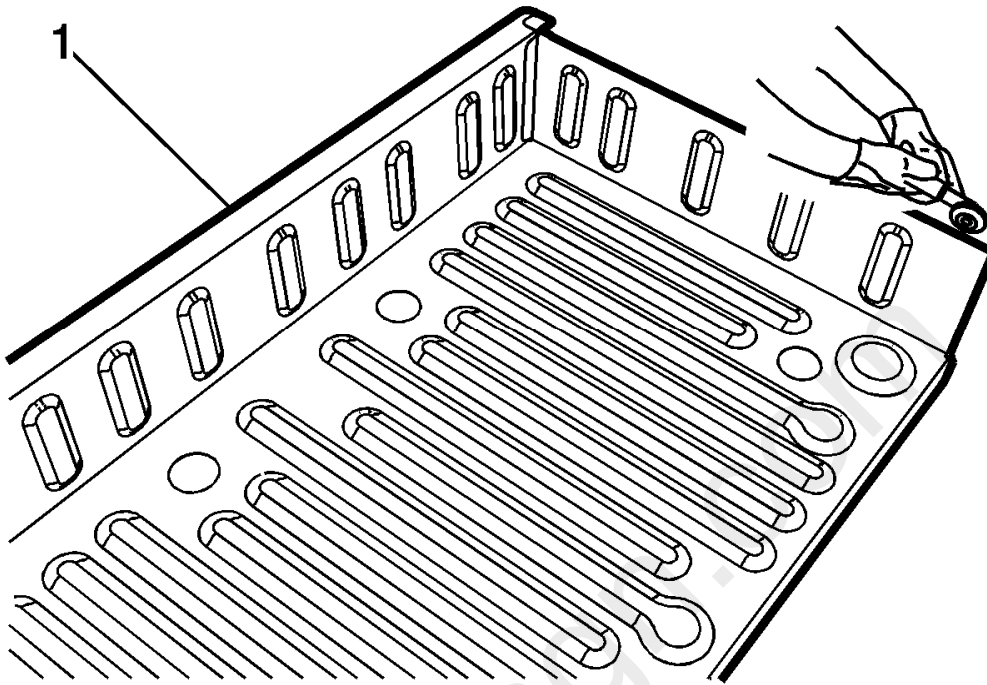


Fig. 79: Cutting Top Flange Off Rear Compartment Panel
Courtesy of GENERAL MOTORS COMPANY

NOTE: To create the service part to fit properly, the upper edge of the replacement floor panel will need to be removed on both sides.

1. Cut the top flange off of the rear compartment panel replacement part, along the sides only (1). This will create a 25 mm (1 in) overlap joint to fit over the flange that was left from the original panel.

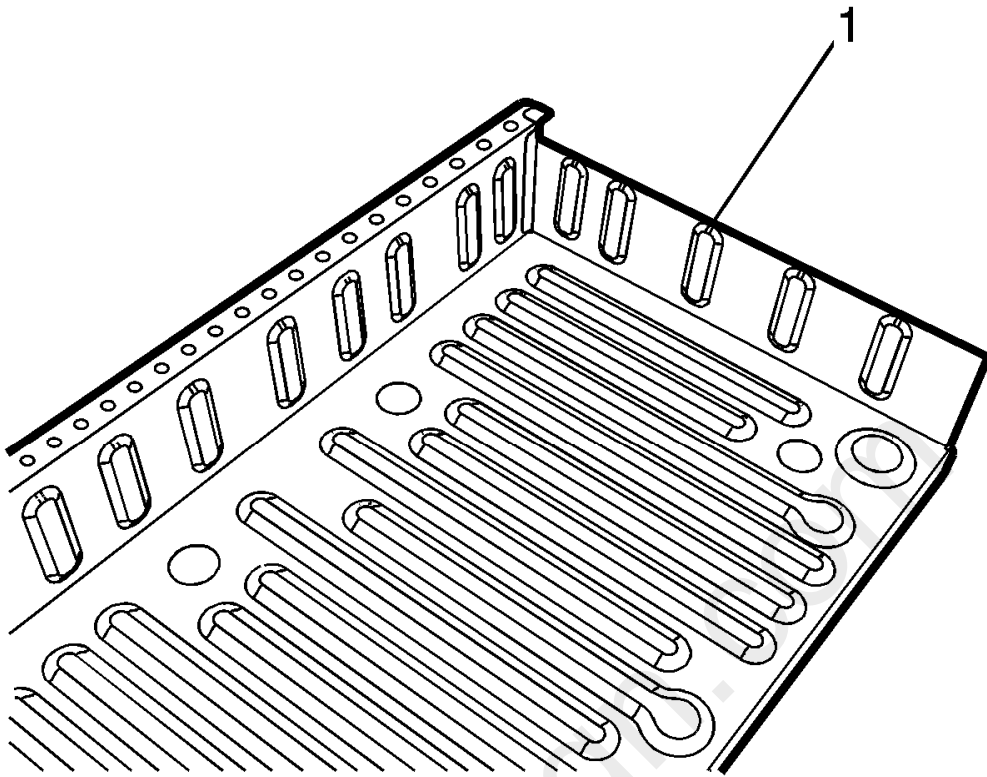


Fig. 80: Prepare All Welding Surfaces
Courtesy of GENERAL MOTORS COMPANY

2. Clean and prepare all welding surfaces (1). Place 8 mm (5/16 in) holes 40 mm (1 1/2 in) apart along the sides of the panel that will overlap the flanges left from the original panel, to MIG plug weld the replacement part.
3. Install and align the service part as necessary.

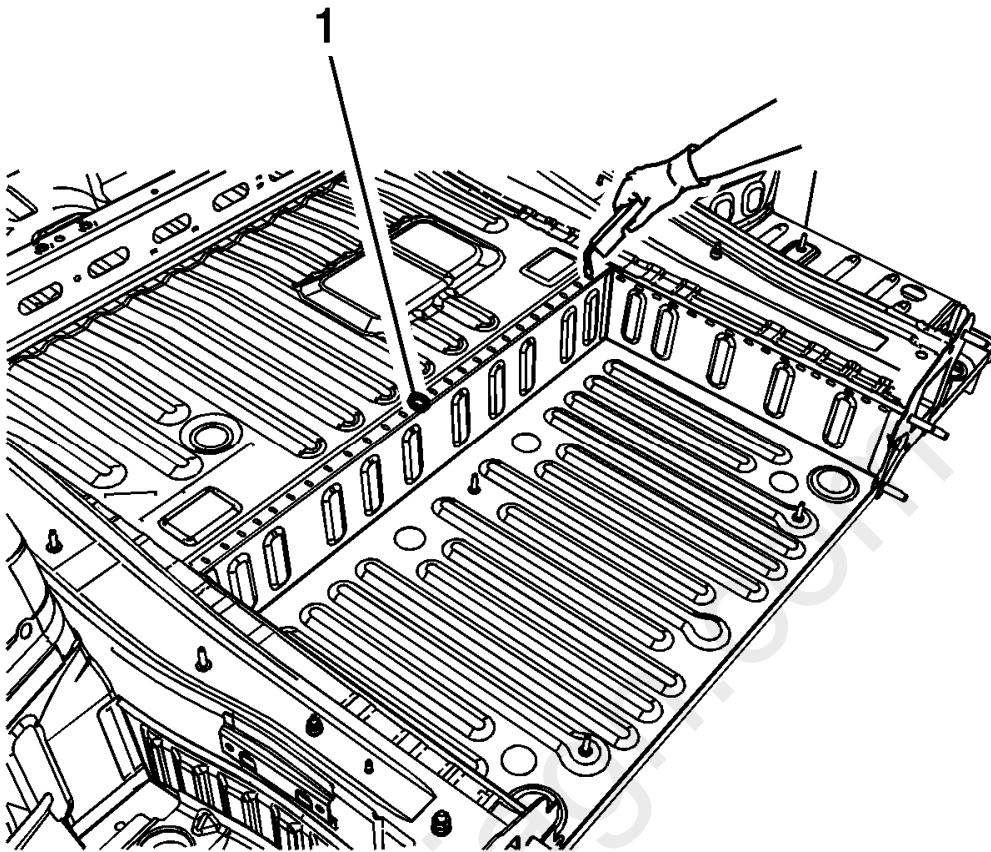


Fig. 81: Welding Service Part
Courtesy of GENERAL MOTORS COMPANY

4. Weld the service part along the front edge, at the original weld locations (1).

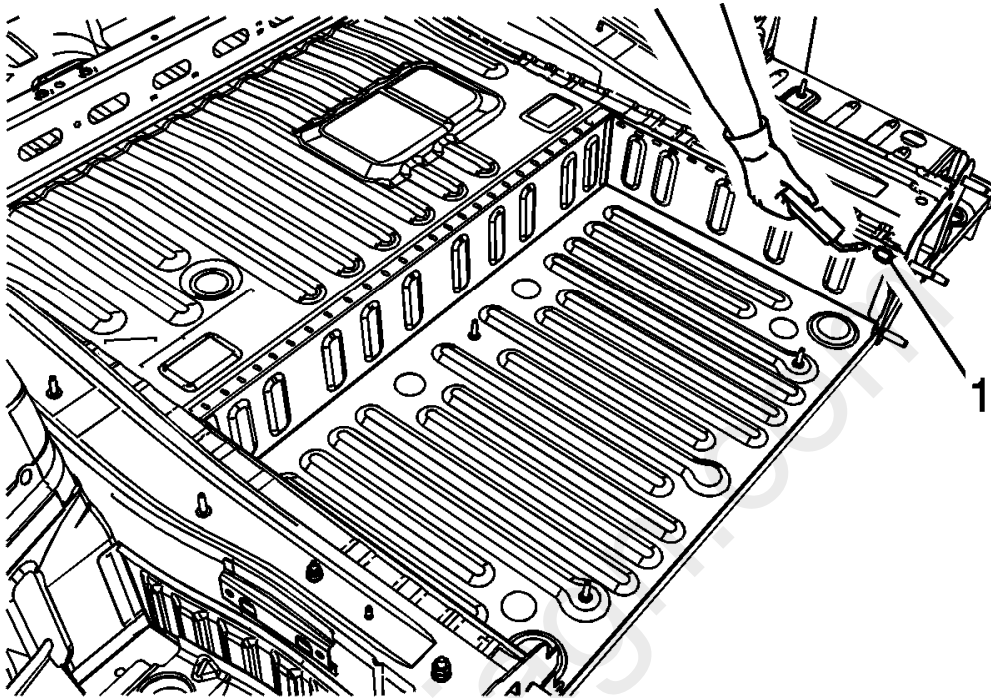


Fig. 82: MIG Plug Weld Overlap Joint
 Courtesy of GENERAL MOTORS COMPANY

5. MIG plug weld on the sides of the replacement part, along the 25 mm (1 in) overlap joint (1).
6. Replace the body rear end panel. Refer to **Body Rear End Panel Replacement**.
7. Clean and prepare all welded surfaces.

NOTE: **Apply sealer along the top edge of the 25 mm (1 in) overlap joint, where the rear compartment panel was sectioned.**

8. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
9. Paint the repaired area. Refer to **Basecoat/Clearcoat Paint Systems** .
10. Install all related panels and components.
11. Enable the SIR system and then connect the battery negative cable. Refer to **SIR Disabling and Enabling** .

REAR WHEELHOUSE INNER PANEL REPLACEMENT

Removal Procedure

WARNING: Refer to Approved Equipment for Collision Repair Warning .

WARNING: Refer to Foam Sound Deadeners Warning .

WARNING: Refer to Battery Disconnect Warning .

1. Disable the SIR system and then disconnect the negative battery cable. Refer to SIR Disabling and Enabling .
2. Remove all related panels and components.
3. Repair as much of the damaged area as possible. Refer to Dimensions - Body.
4. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair .

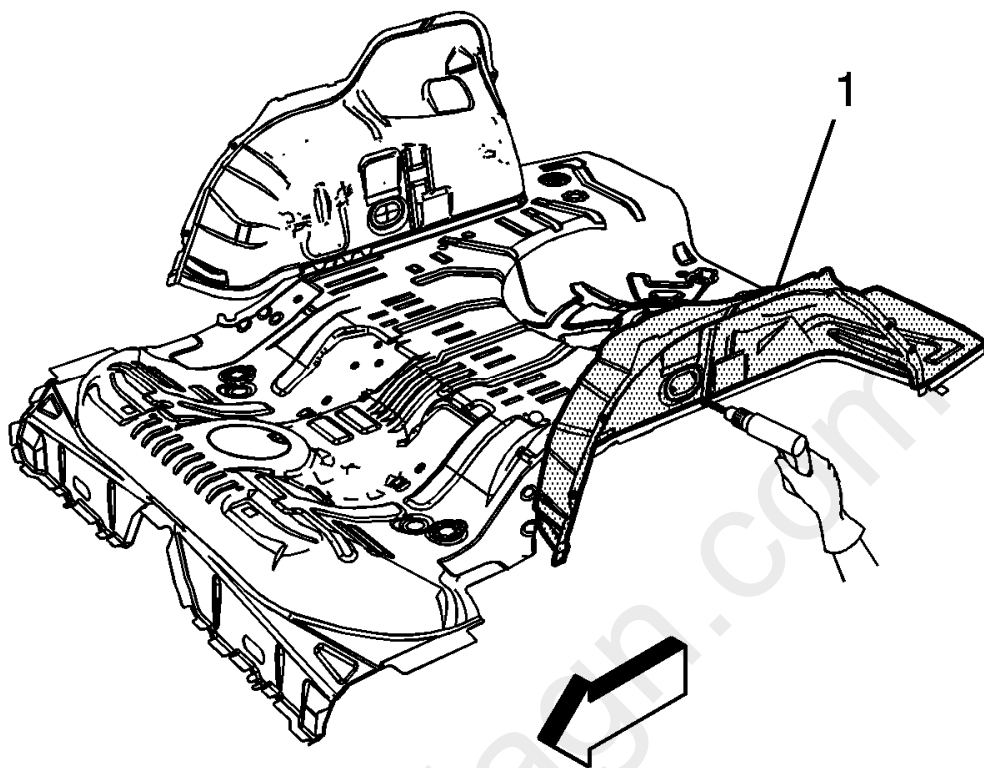


Fig. 83: Drilling Out Rear Inner Wheelhouse Factory Welds
Courtesy of GENERAL MOTORS COMPANY

NOTE: Record the number and location of welds for installation of the service assembly.

5. Remove all the necessary factory welds (1).

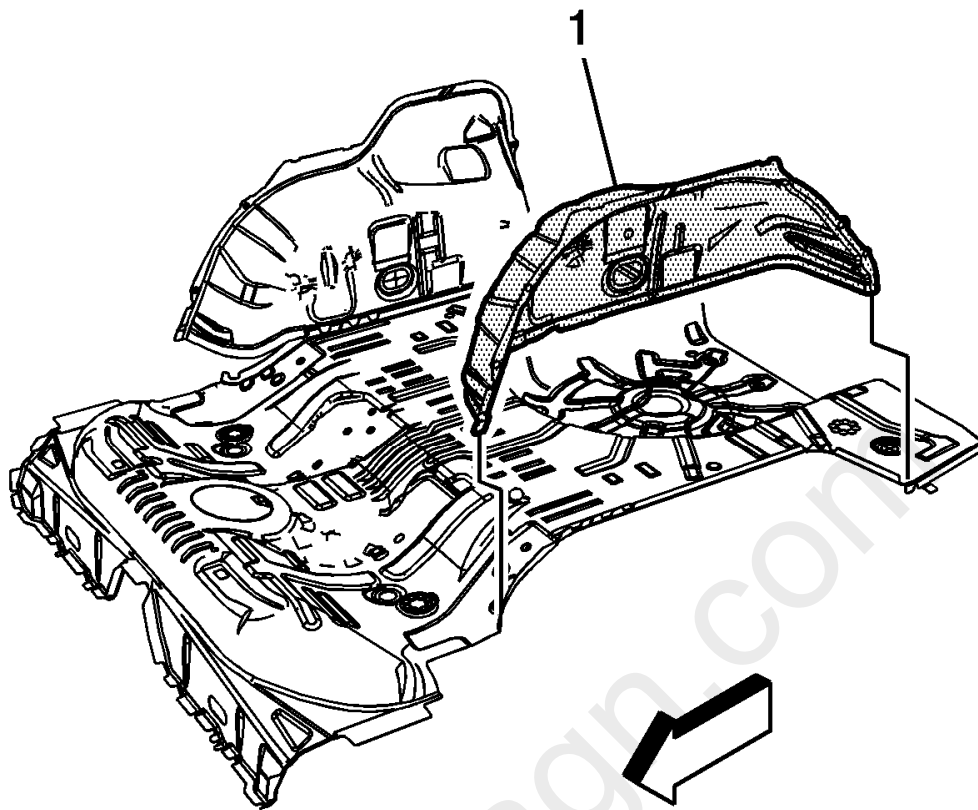


Fig. 84: Rear Inner Wheelhouse
Courtesy of GENERAL MOTORS COMPANY

6. Remove the rear inner wheelhouse (1).

Installation Procedure

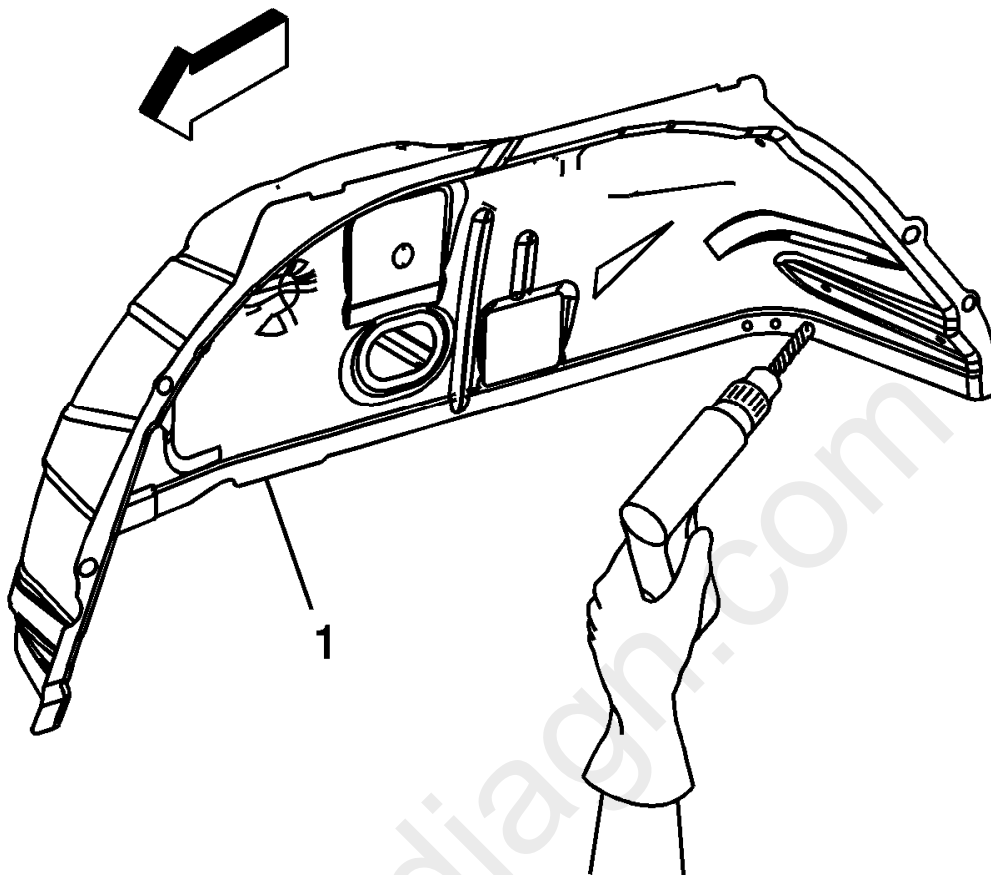


Fig. 85: Drilling Plug Weld Holes In Replacement Rear Inner Wheelhouse
Courtesy of GENERAL MOTORS COMPANY

1. Prepare all mating surfaces for welding as necessary (1).
2. Apply Weld-Thru Coating to all mating surfaces. Refer to **Anti-Corrosion Treatment and Repair** .

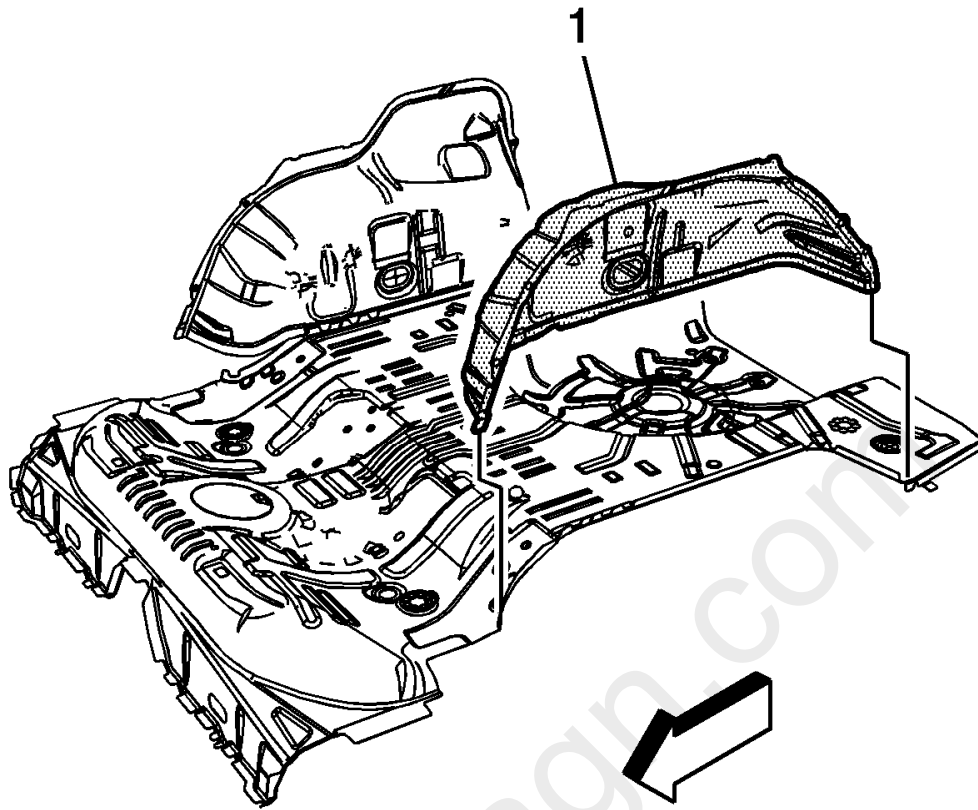


Fig. 86: Rear Inner Wheelhouse
Courtesy of GENERAL MOTORS COMPANY

3. Position the rear inner wheelhouse to the vehicle (1).
4. Weld accordingly at the original weld locations.
5. Clean all of the welded surfaces.
6. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
7. Paint the repaired area. Refer to **Basecoat/Clearcoat Paint Systems**
8. Install all of the related panels and components.
9. Enable the SIR system and then connect the negative battery cable. Refer to **SIR Disabling and Enabling** .

QUARTER OUTER PANEL SECTIONING

Removal Procedure

WARNING: Refer to Approved Equipment for Collision Repair Warning .

WARNING: Refer to Foam Sound Deadeners Warning .

WARNING: Refer to Battery Disconnect Warning .

1. Disable the SIR system and then disconnect the negative battery cable. Refer to SIR Disabling and Enabling .
2. Repair as much of the damaged area as possible.
3. Visually inspect the damage. Repair as much of the damage as possible. Refer to Dimensions - Body.
4. Remove the sealers and anti-corrosion materials from the repair area as necessary. Refer to Anti-Corrosion Treatment and Repair .

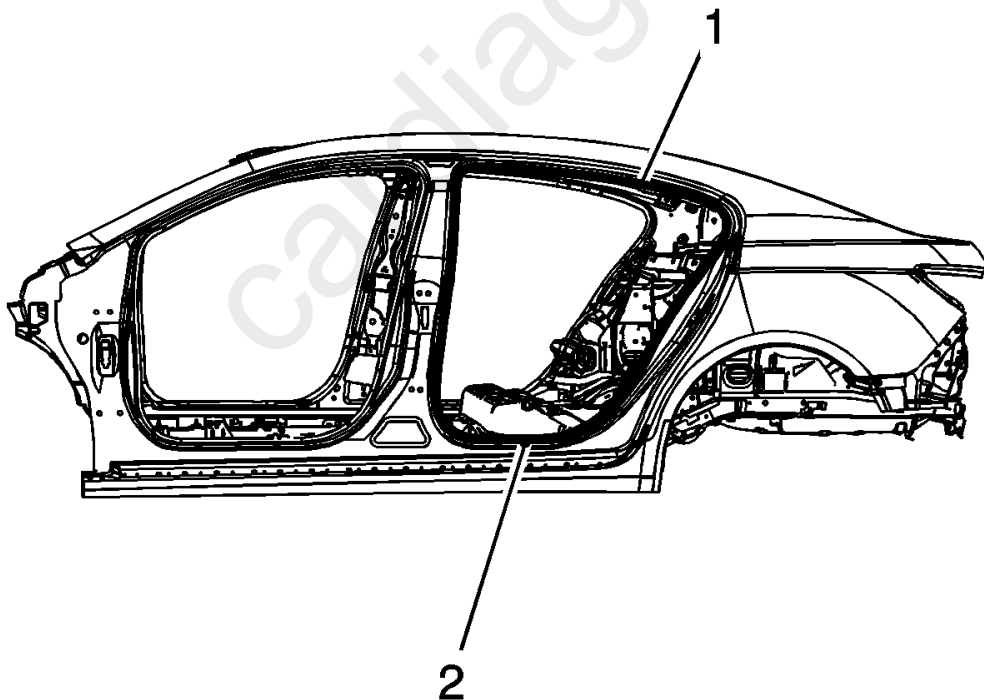


Fig. 87: Quarter Outer Panel Cut Locations

Courtesy of GENERAL MOTORS COMPANY

NOTE: There are sectioning procedures available for various locations of the body side outer panel. The sectioning procedure and location should be chosen based on the extent of damage to the vehicle and other inner reinforcements that need to be replaced. Sectioning should be performed only in the recommended areas. Failure to do so may compromise the structural integrity of the vehicle. Refer to service procedures for recommended sectioning locations.

5. Section the sail panel and the rocker panel.

- At the sail panel, measure from the top outer corner of the back glass opening down 100 mm. Scribe a line. This is the cut location (1).
- Scribe a line 350 mm forward of the rear edge of the rocker. This is the cut location (2).

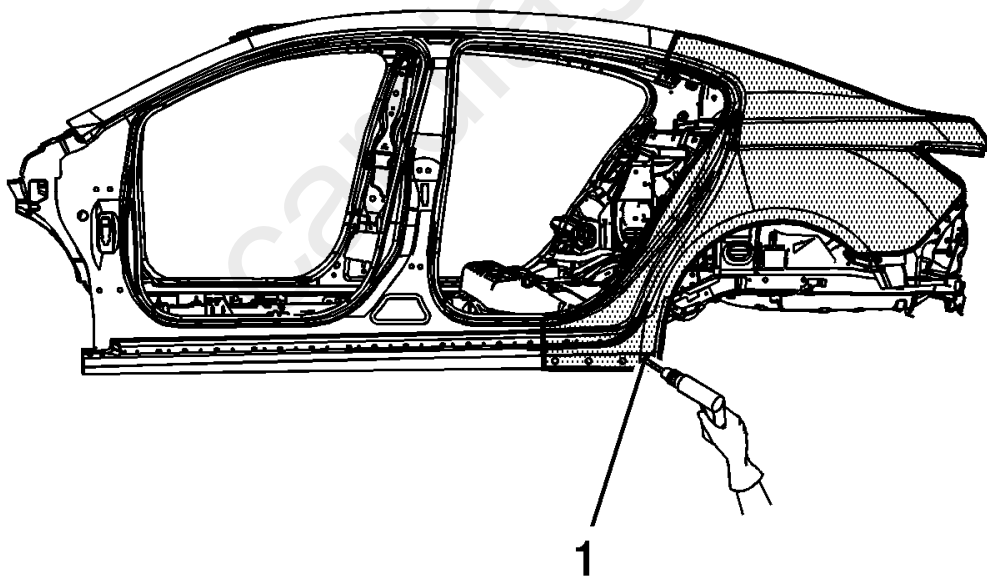


Fig. 88: Drilling Out Quarter Outer Panel Factory Welds
Courtesy of GENERAL MOTORS COMPANY

NOTE: Record the number and location of welds for installation of the service assembly.

6. Remove all factory welds (1).

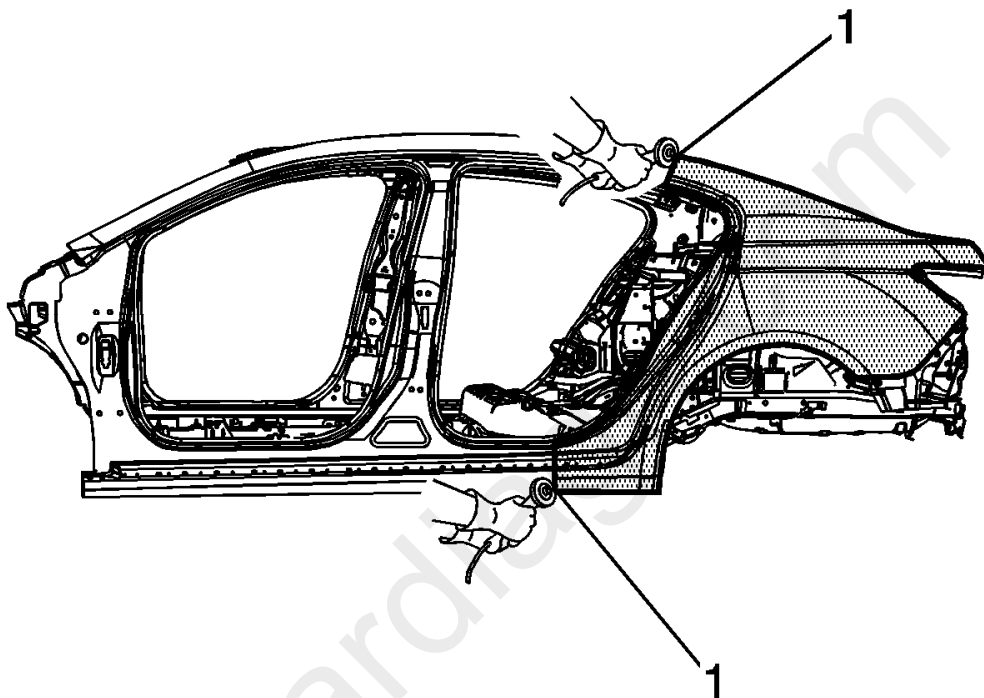


Fig. 89: Cutting Quarter Outer Panel
Courtesy of GENERAL MOTORS COMPANY

NOTE: Do not damage any other panel or reinforcements when cutting at the marked locations.

7. Cut the panel at the marked locations (1).

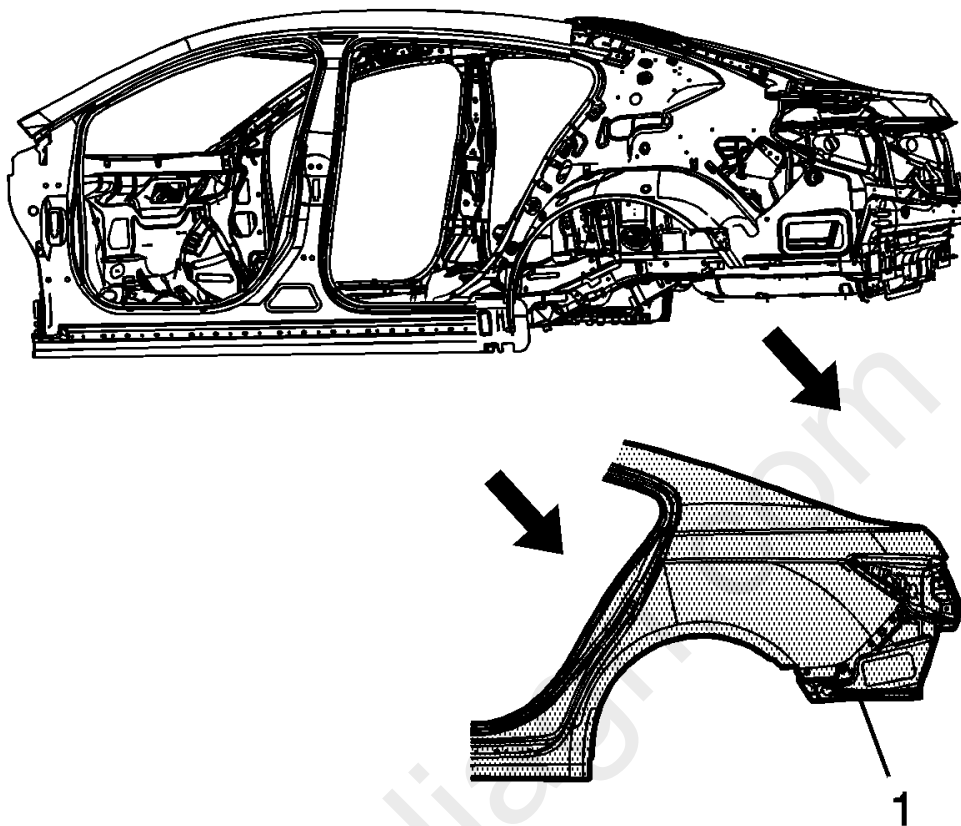


Fig. 90: Quarter Outer Panel

Courtesy of GENERAL MOTORS COMPANY

NOTE: There is high strength adhesive attaching the quarter outer panel to the outer wheel house along the entire length of the quarter panel wheel opening. Heat must be used to release this adhesive. It will make an audible noise when it releases.

8. Remove the lower quarter panel (1).

Installation Procedure

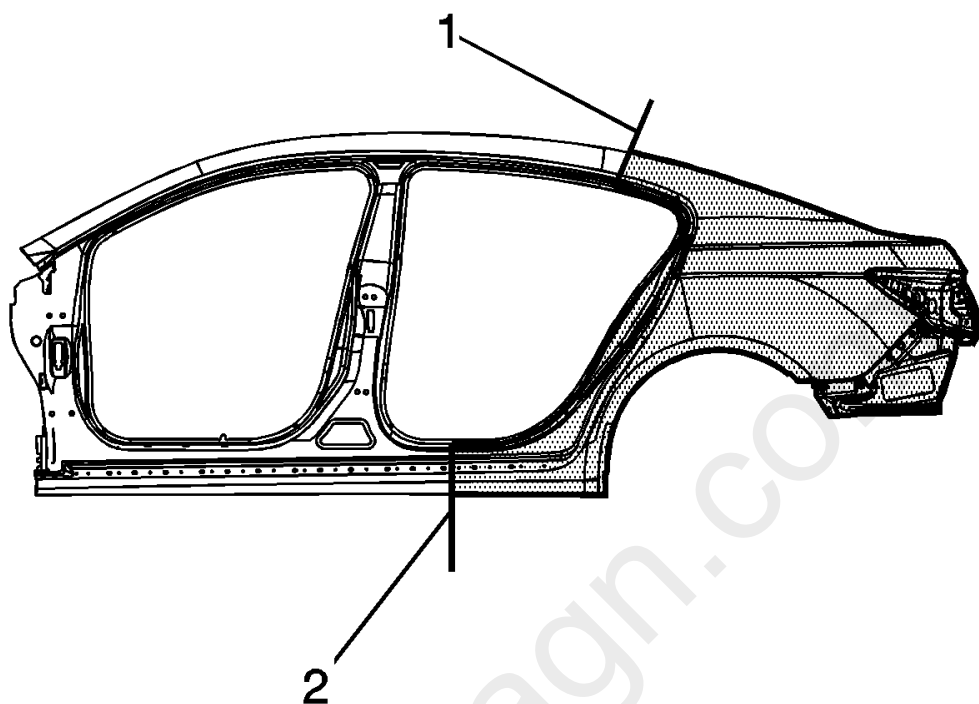


Fig. 91: Marking Cut Lines On Service Quarter Outer Panel
Courtesy of GENERAL MOTORS COMPANY

1. From the service part, cut the panel in corresponding locations to overlap the remaining original panel by 25 mm (1 in) at each joint location (1,2).

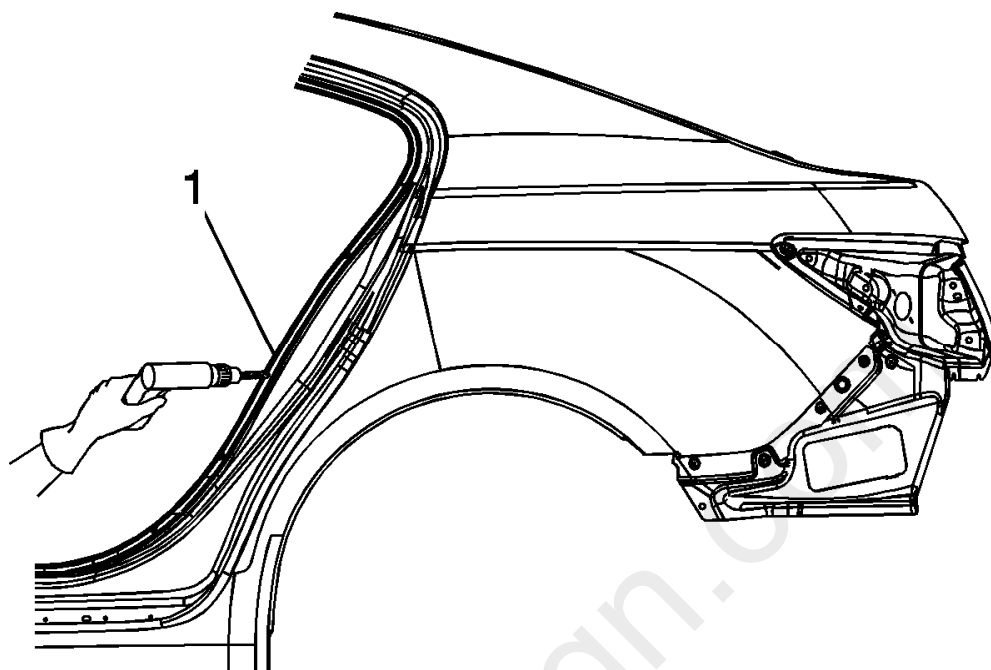


Fig. 92: Drilling Plug Weld Holes In Service Quarter Outer Panel
Courtesy of GENERAL MOTORS COMPANY

2. Drill 8 mm (5/16 in) plug weld holes as necessary in locations noted from the original quarter panel (1).

NOTE: If the location of the original plug weld holes cannot be determined, or if structural Weld-Thru adhesive is present, space the plug weld holes every 40 mm (1 1/2 in) apart.

3. Prepare all mating surfaces for welding, as necessary.
4. Apply GM approved Weld-Thru coating or equivalent to all mating surfaces. Refer to **Anti-Corrosion Treatment and Repair** .

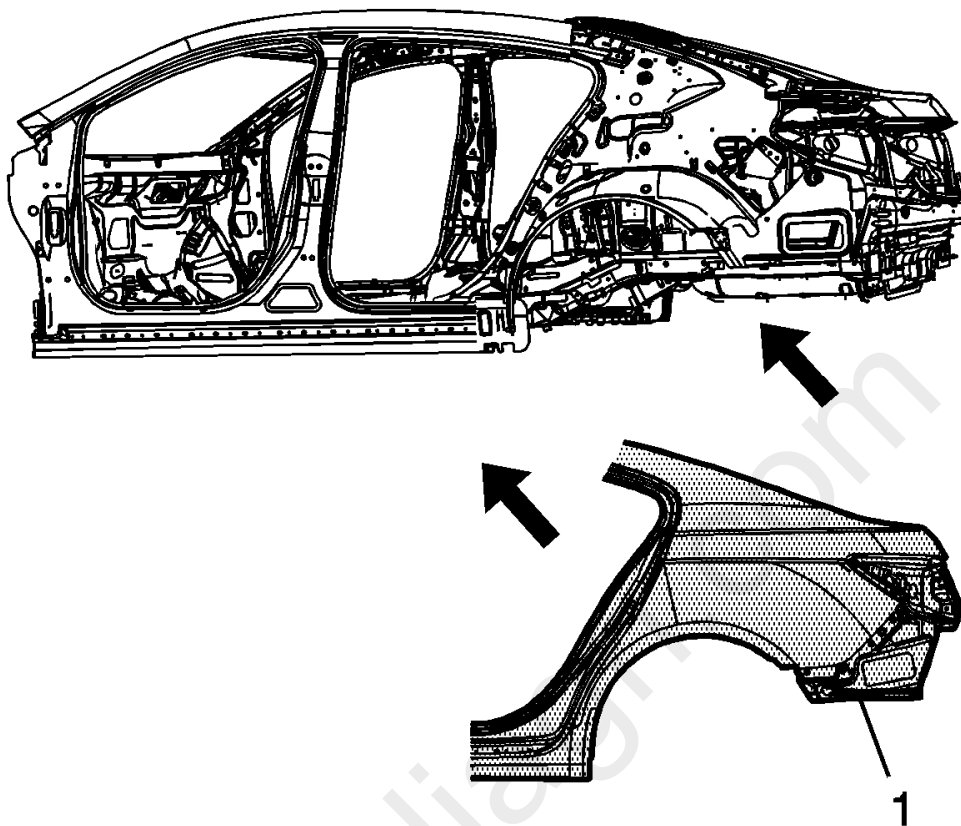


Fig. 93: Quarter Outer Panel

Courtesy of GENERAL MOTORS COMPANY

NOTE: Apply panel bonding adhesive to the entire joint between the outer wheelhouse panel and the quarter outer panel.

5. Position the new service panel and clamp in place (1).
6. Perform the sectioning procedure.

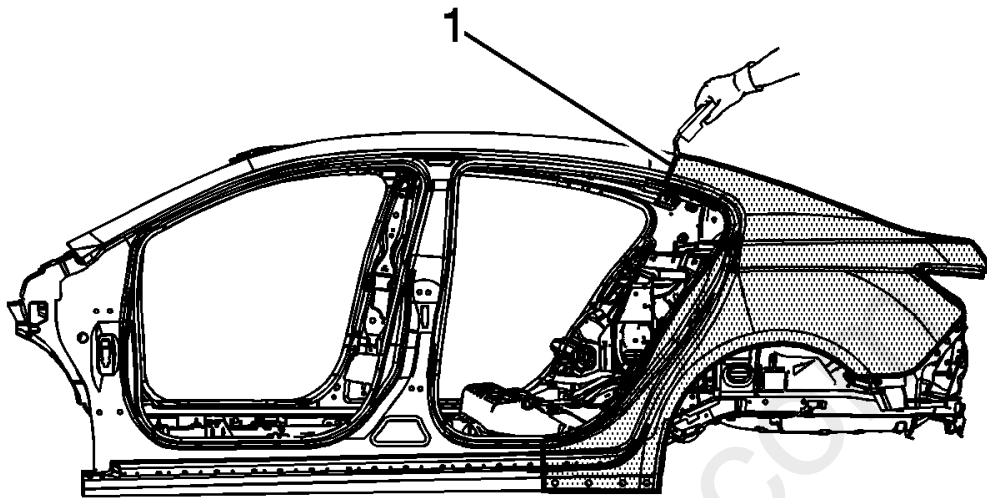


Fig. 94: Welding Quarter Outer Panel
Courtesy of GENERAL MOTORS COMPANY

7. Weld accordingly at the original weld locations (1).
8. To create a solid weld with the minimum heat distortion, make a 25 mm (1 in) stitch weld along the seam with gaps of 25 mm (1 in) gaps between them. Go back and complete the stitch weld.
9. Clean and prepare all welded surfaces.

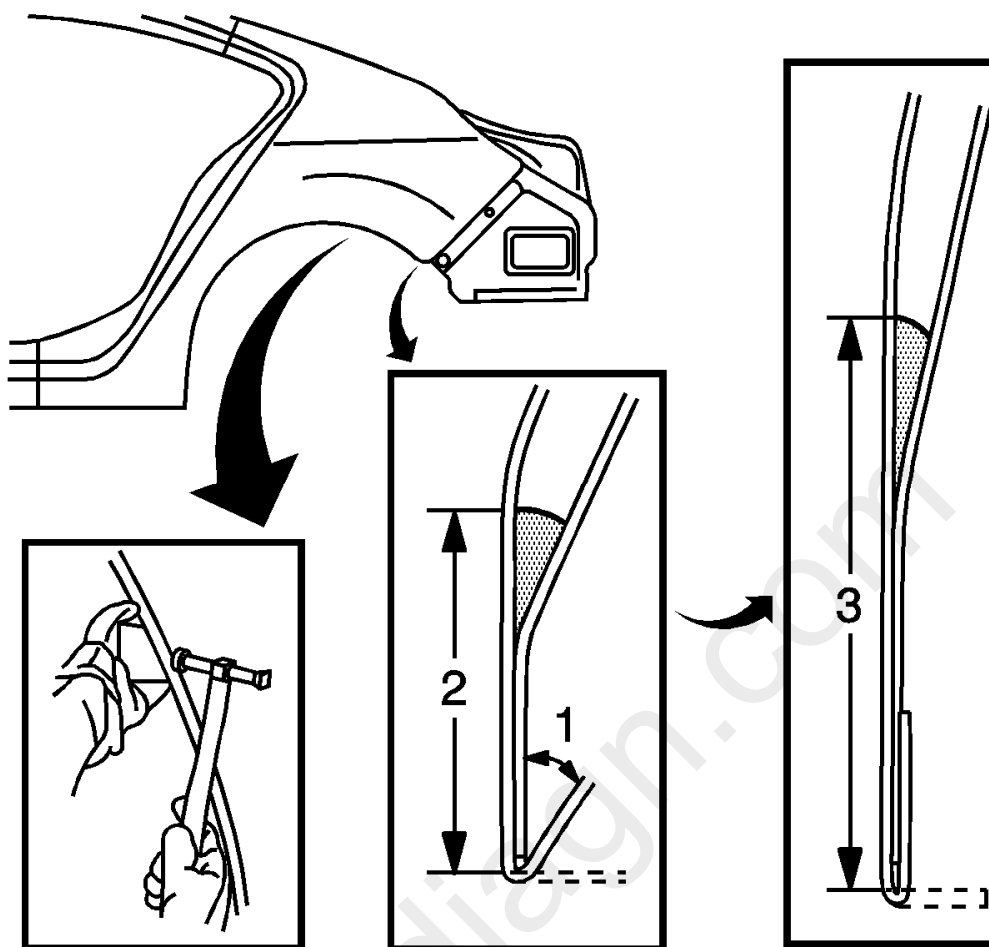


Fig. 95: Pre-Flanging Wheel Housing
 Courtesy of GENERAL MOTORS COMPANY

10. Pre-flange wheel housing. Using a flat faced body hammer, bend over the flanged edge 45 degrees (1) and at the same time holding a hard rubber block against it. Use the structural adhesive in the area (2).
11. Bend the wheel arch (3).
12. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
13. Paint the repair area. Refer to **Basecoat/Clearcoat Paint Systems** .
14. Install all related panels and components.
15. Enable the SIR system and then connect the negative battery cable. Refer to **SIR Disabling and Enabling** .

QUARTER INNER PANEL SECTIONING (LOWER)

Removal Procedure

WARNING: Refer to **Approved Equipment for Collision Repair Warning** .

WARNING: Refer to Foam Sound Deadeners Warning .

WARNING: Refer to Battery Disconnect Warning .

WARNING: Refer to Collision Sectioning Warning .

WARNING: Refer to Glass and Sheet Metal Handling Warning .

1. Disable the SIR system and then disconnect the negative battery cable. Refer to SIR Disabling and Enabling .
2. Remove all related panels and components.
3. Repair as much of the damage as possible.
4. Remove the sealers and anti-corrosion materials from the repair area as necessary. Refer to Anti-Corrosion Treatment and Repair .

NOTE: There are sectioning procedures available for various locations of the body side outer panel. The sectioning procedure and location should be chosen based on the extent of damage to the vehicle and other inner reinforcements that need to be replaced. Sectioning should be performed only in the recommended areas. Failure to do so may compromise the structural integrity of the vehicle. Refer to service procedures for recommended sectioning locations.

5. The body side outer panel will need to be removed to perform the quarter inner panel lower sectioning procedure. Refer to the appropriate service procedures to remove the body side outer panel, based on the specific amount of vehicle damage.

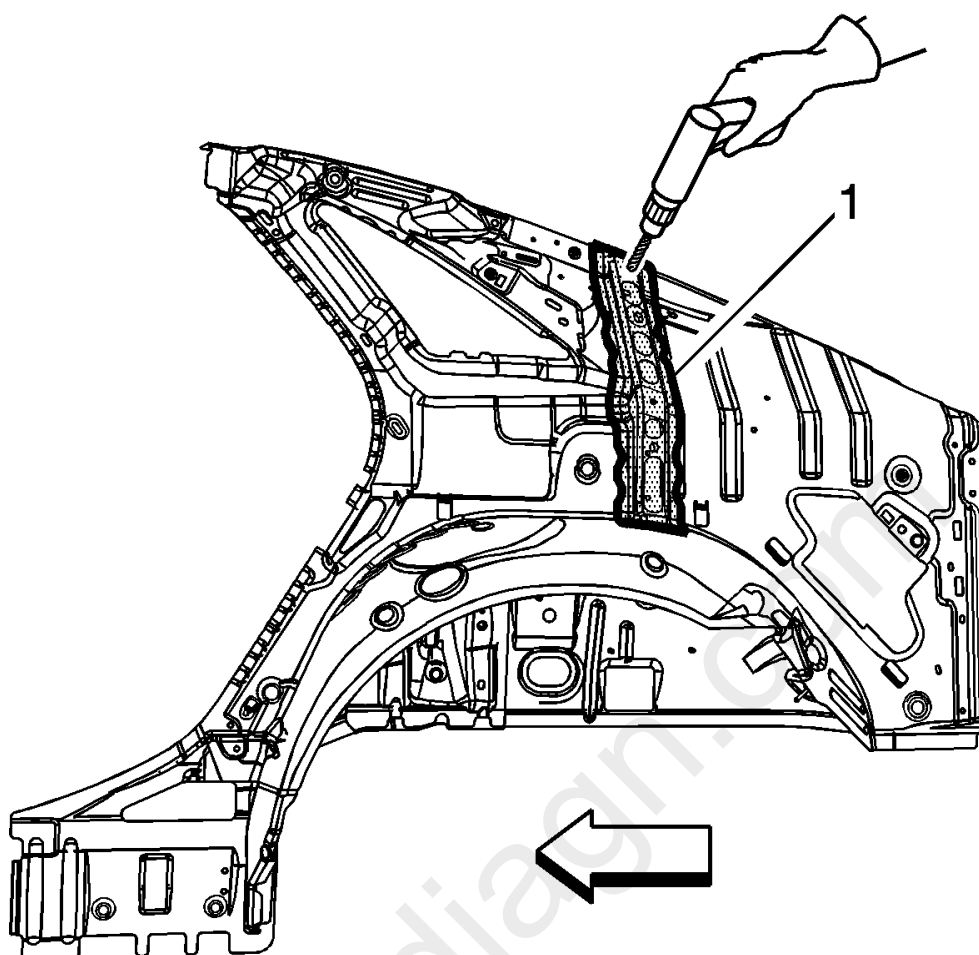


Fig. 96: Drilling Out Body Lock Pillar Upper Reinforcement
Courtesy of GENERAL MOTORS COMPANY

NOTE: The quarter inner panel upper reinforcement will need to be removed to perform the sectioning procedure. If the reinforcement is damaged during removal it may need to be replaced. Record the number and location of welds for installation of the part.

6. Remove factory welds for the quarter inner panel upper reinforcement, as required (1).

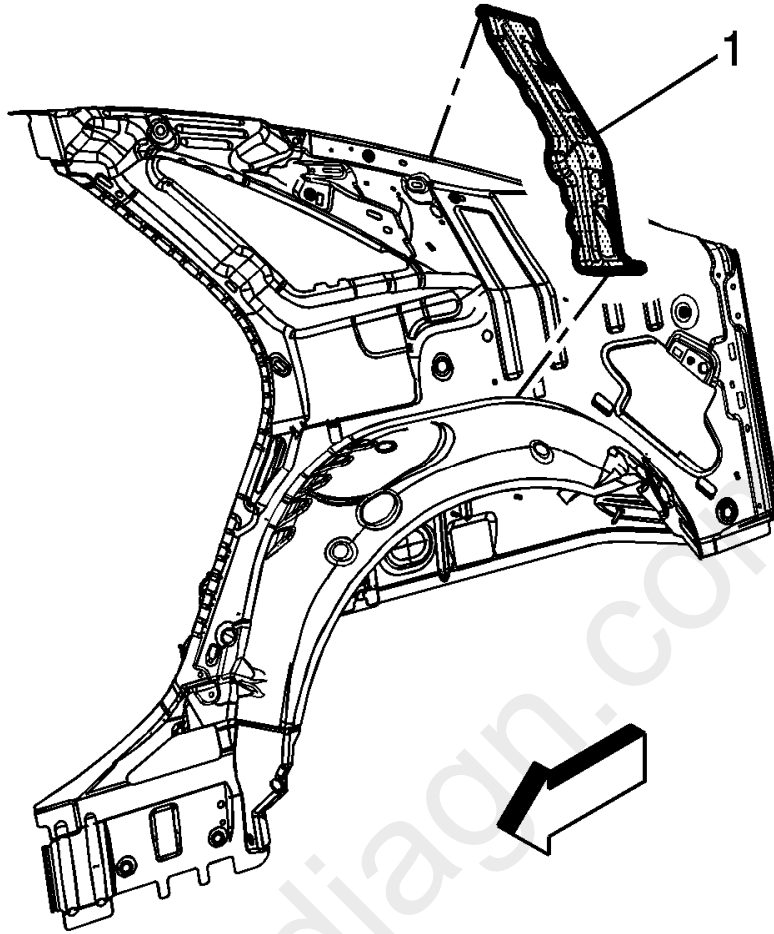


Fig. 97: Quarter Inner Panel Reinforcement
Courtesy of GENERAL MOTORS COMPANY

7. Remove the quarter inner panel reinforcement (1).

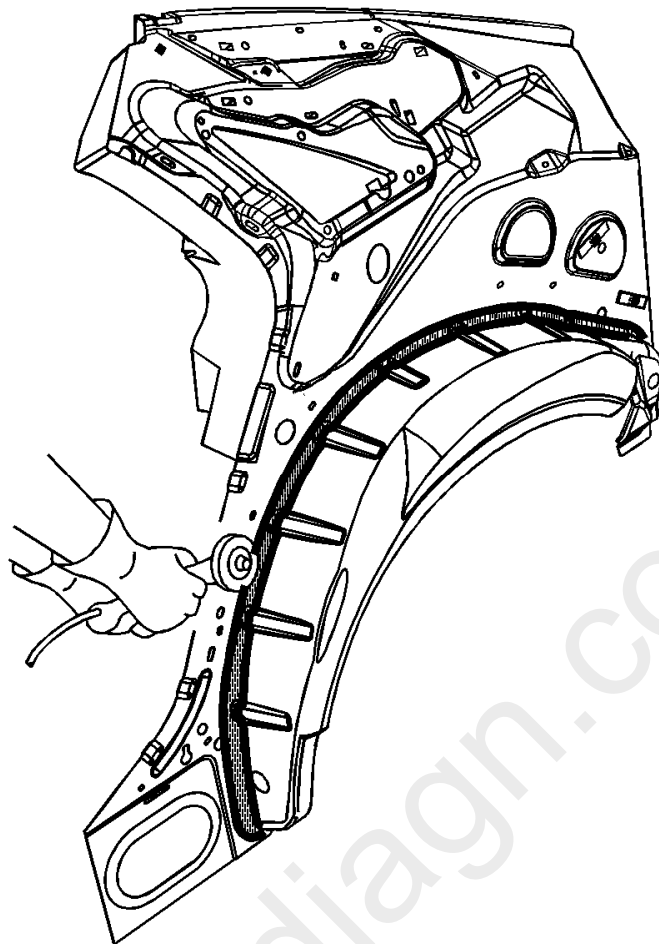


Fig. 98: Cutting Wheelhouse Along Corner Of Bend
Courtesy of GENERAL MOTORS COMPANY

8. Cut the inner panel along inner edge of outer wheelhouse.
9. Remove the damaged section of the wheelhouse.

Installation Procedure

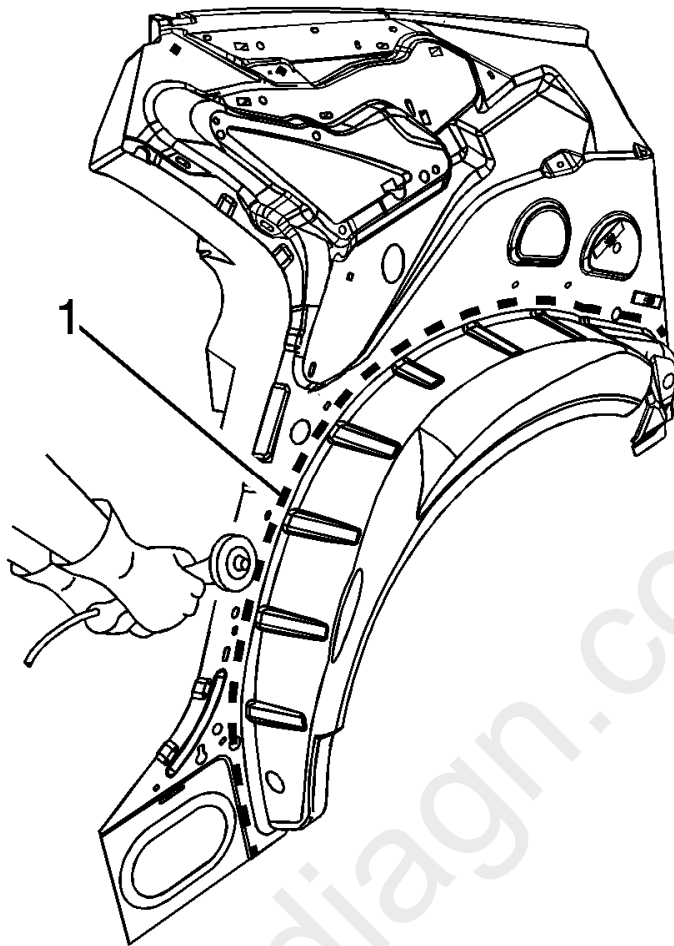


Fig. 99: Drilling 8 Mm (5/16 In) Plug Weld Holes Every 40 Mm (1 1/2 In) Along Vertical Flange
Courtesy of GENERAL MOTORS COMPANY

1. Trim the service part to leave approximately 25 mm (1 in) vertical flange (1).
2. Prepare all mating surfaces for welding as necessary.
3. Position the rear wheelhouse portion of the inner panel on the vehicle.
4. Clamp the part in place and verify that it is the correct location.

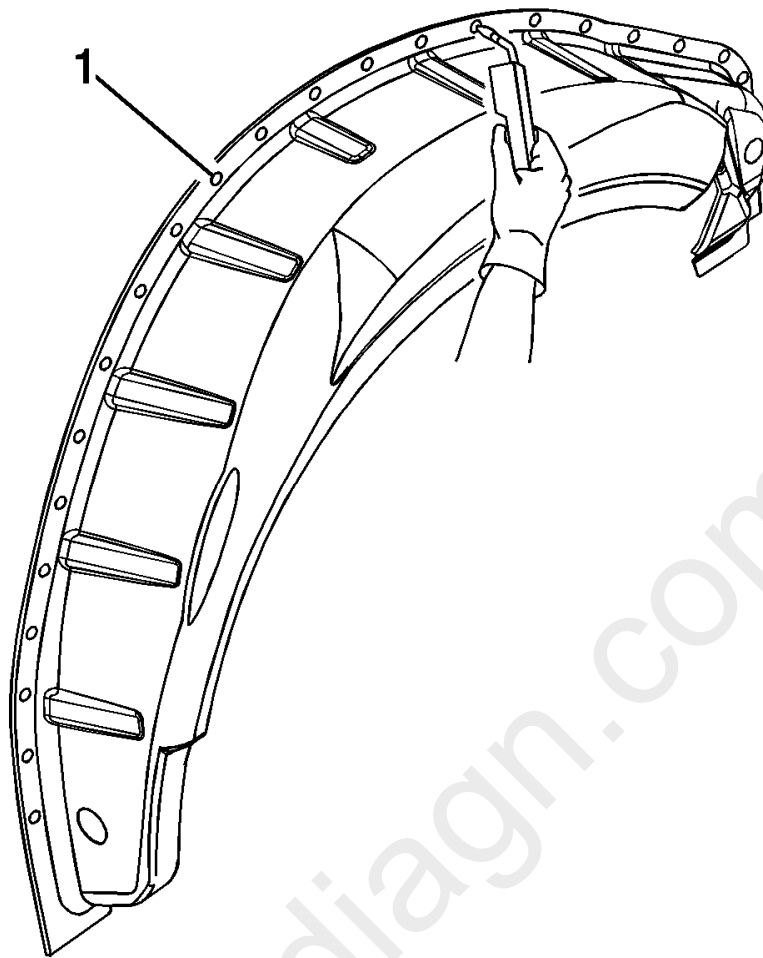


Fig. 100: Identifying Plug Weld
Courtesy of GENERAL MOTORS COMPANY

5. Weld the part accordingly (1) using MIG plug welds approximately 40 mm apart.

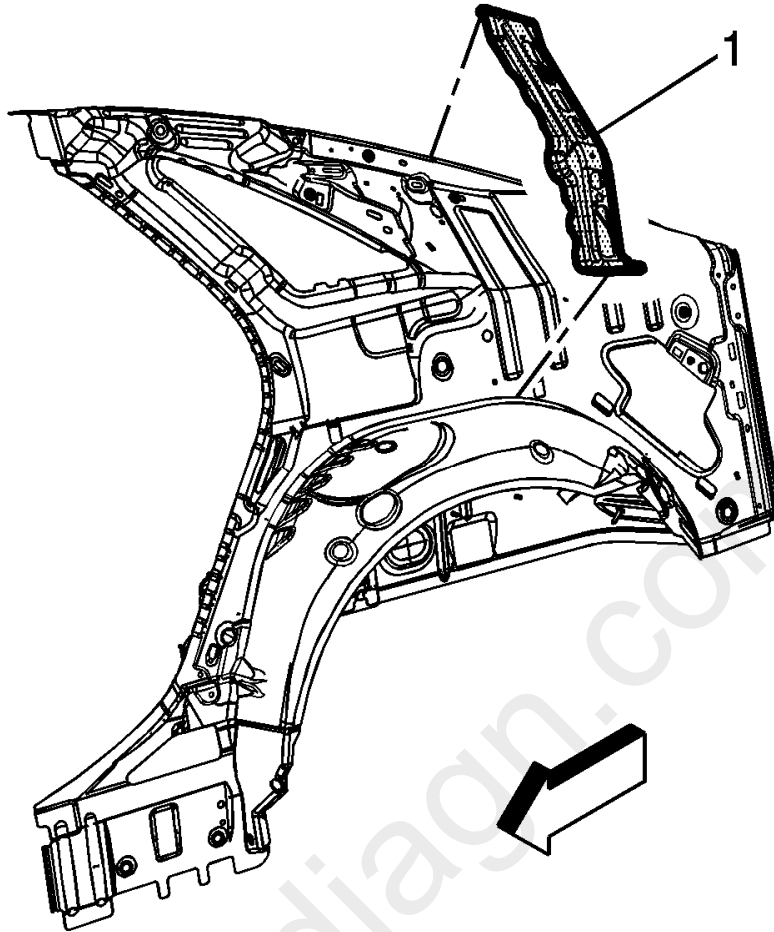


Fig. 101: Quarter Inner Panel Reinforcement
Courtesy of GENERAL MOTORS COMPANY

6. Install the quarter inner panel reinforcement (1).
7. Clean and prepare all welded surfaces.
8. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
9. Paint the repaired area. Refer to **Basecoat/Clearcoat Paint Systems** .
10. Install all related panels and components.
11. Enable the SIR system and then connect the negative battery cable. Refer to **SIR Disabling and Enabling** .

QUARTER INNER PANEL SECTIONING (UPPER)

Removal Procedure

WARNING: Refer to **Approved Equipment for Collision Repair Warning** .

WARNING: Refer to Foam Sound Deadeners Warning .

WARNING: Refer to Battery Disconnect Warning .

WARNING: Refer to Collision Sectioning Warning .

WARNING: Refer to Glass and Sheet Metal Handling Warning .

1. Disable the SIR system and then disconnect the negative battery cable. Refer to SIR Disabling and Enabling .
2. Remove all related panels and components.
3. Repair as much of the damage as possible.
4. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Dimensions - Body

NOTE: There are sectioning procedures available for various locations of the body side outer panel. The sectioning procedure and location should be chosen based on the extent of damage to the vehicle and other inner reinforcements that need to be replaced. Sectioning should be performed only in the recommended areas. Failure to do so may compromise the structural integrity of the vehicle. Refer to service procedures for recommended sectioning locations.

5. The body side outer panel will need to be removed to perform the quarter inner panel lower sectioning procedure. Refer to the appropriate service procedures to remove the body side outer panel, based on the specific amount of vehicle damage.

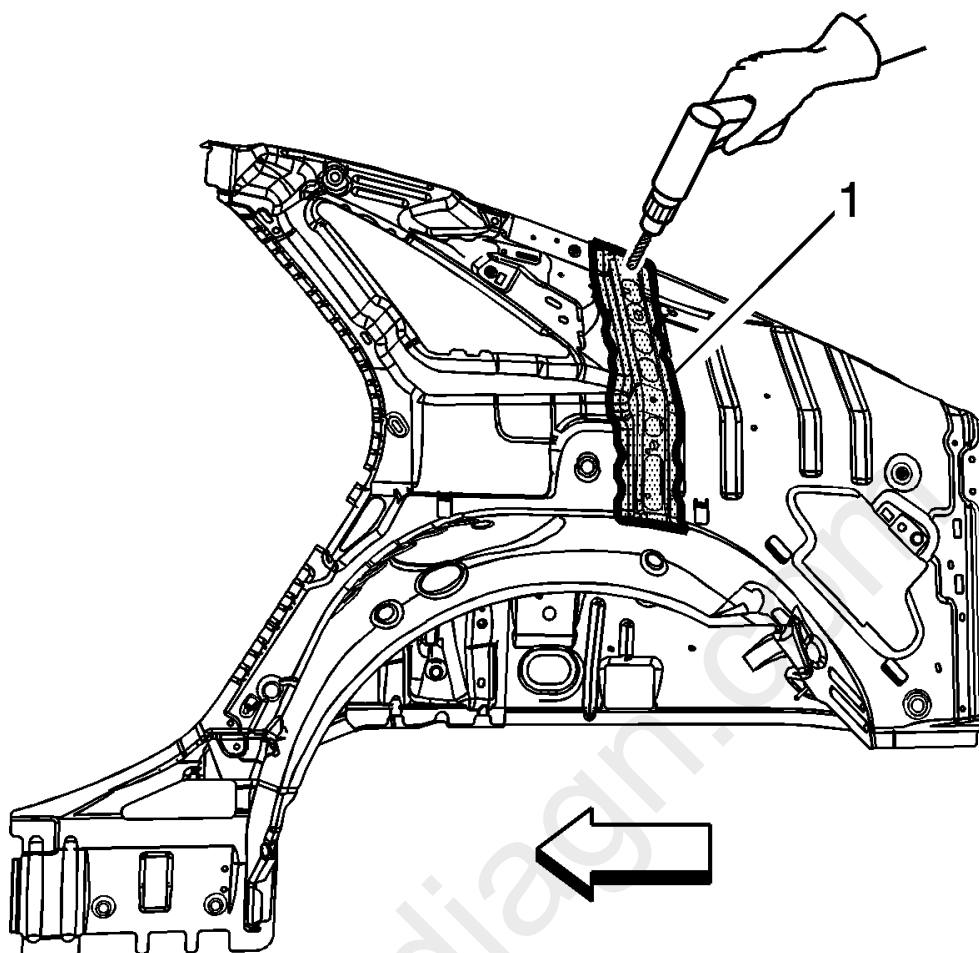


Fig. 102: Drilling Out Body Lock Pillar Upper Reinforcement
Courtesy of GENERAL MOTORS COMPANY

NOTE: The quarter inner panel upper reinforcement will need to be removed to perform the sectioning procedure. If the reinforcement is damaged during removal it may need to be replaced. Record the number and location of welds for installation of the part.

6. Remove factory welds for the quarter inner panel upper reinforcement, as required (1).

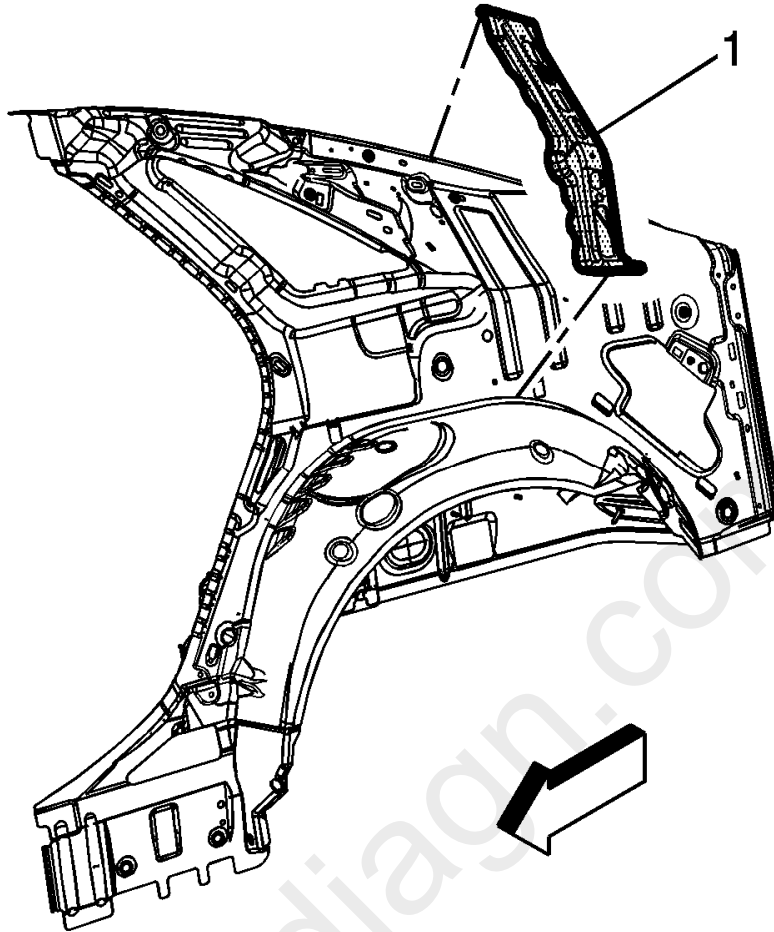


Fig. 103: Quarter Inner Panel Reinforcement
Courtesy of GENERAL MOTORS COMPANY

7. Remove body lock pillar upper reinforcement (1).

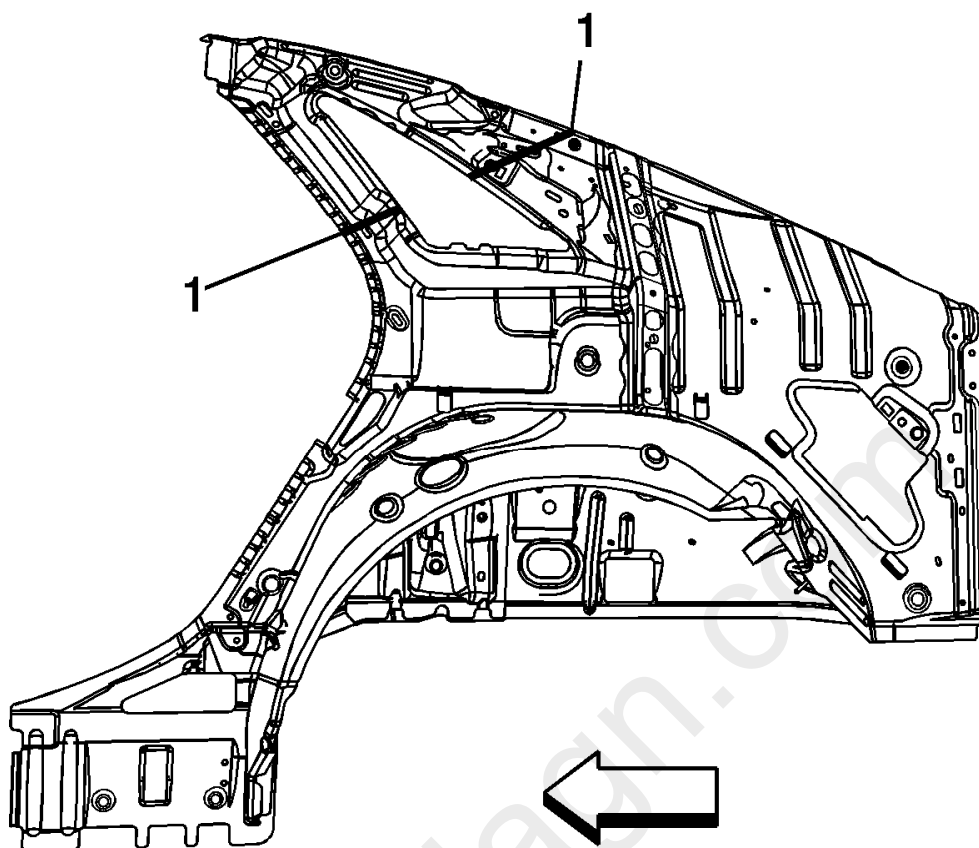


Fig. 104: Body Side Inner Panel Cuts
Courtesy of GENERAL MOTORS COMPANY

8. Cut body side inner panel where sectioning is to be performed (1).

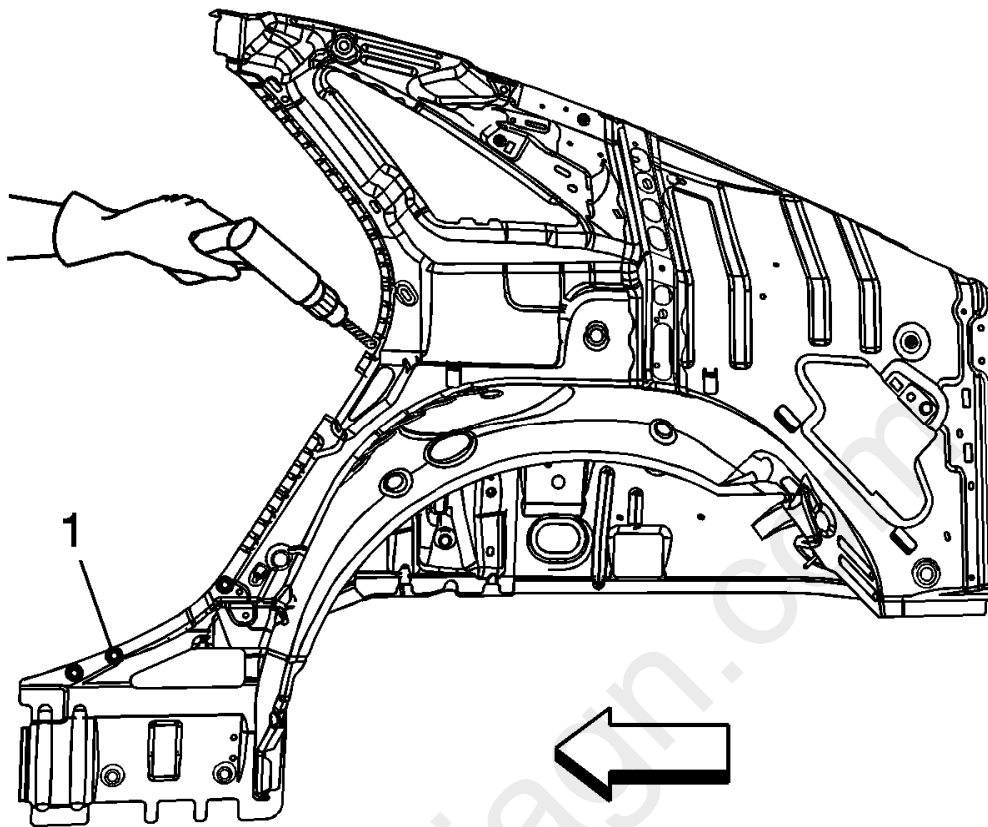


Fig. 105: Body Side Inner Panel Welds
Courtesy of GENERAL MOTORS COMPANY

9. Remove factory welds, as required (1).
10. Remove the damaged body side inner panel.

Installation Procedure

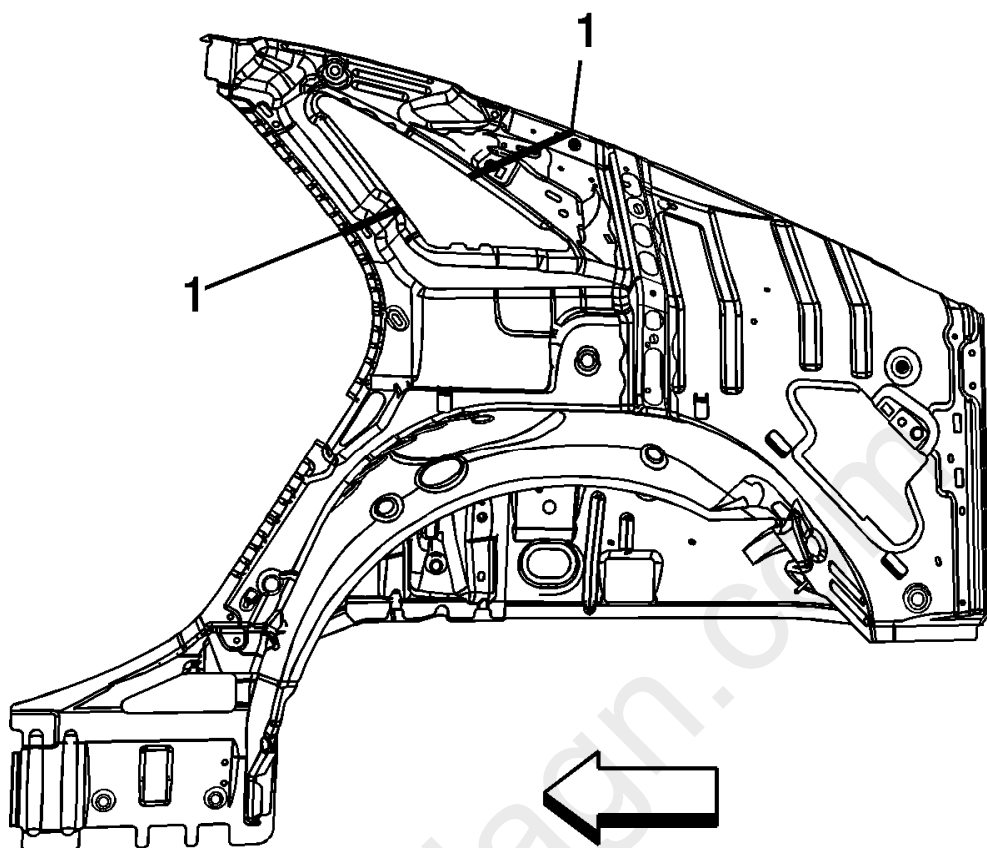


Fig. 106: Body Side Inner Panel Cuts
Courtesy of GENERAL MOTORS COMPANY

1. From the service part, cut the panel in corresponding locations to overlap the remaining original panel by 25 mm (1 in) at each joint location (1).

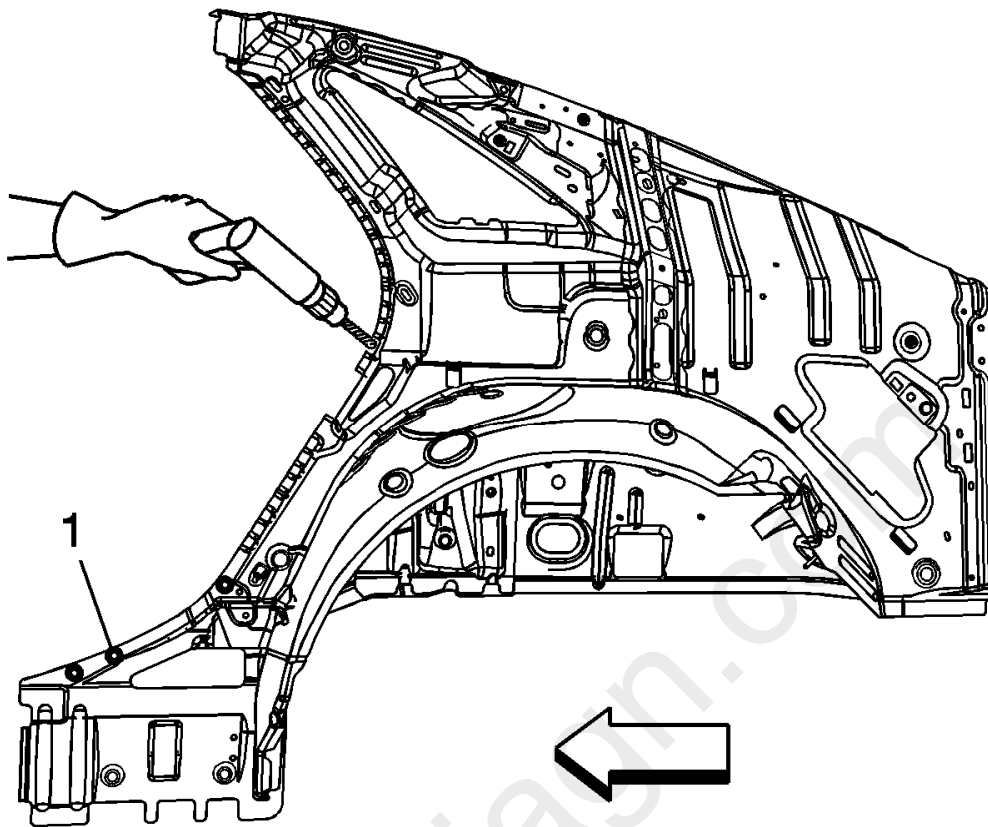


Fig. 107: Body Side Inner Panel Welds
Courtesy of GENERAL MOTORS COMPANY

2. Prepare all mating surfaces for welding, as necessary.
3. Position the body side inner panel to the vehicle.
4. Clamp the part in place and verify that it is the correct location.

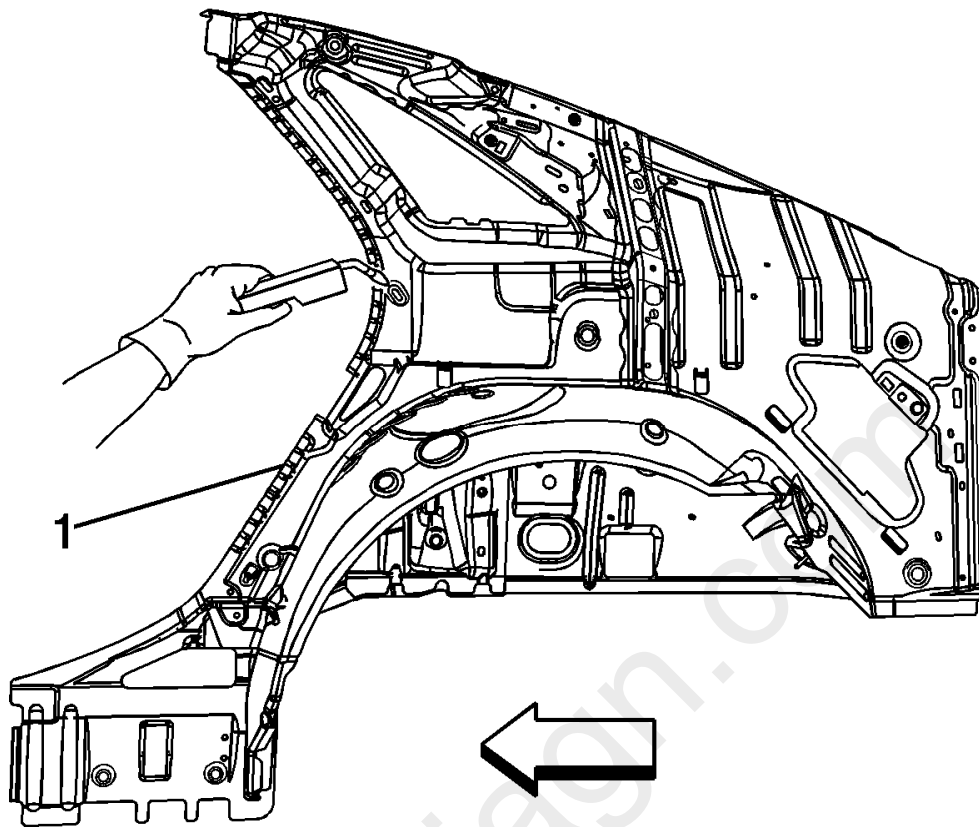


Fig. 108: Plug Welding Inner Body Side Panel
Courtesy of GENERAL MOTORS COMPANY

5. Weld the perimeter of the part at the original weld locations (1).

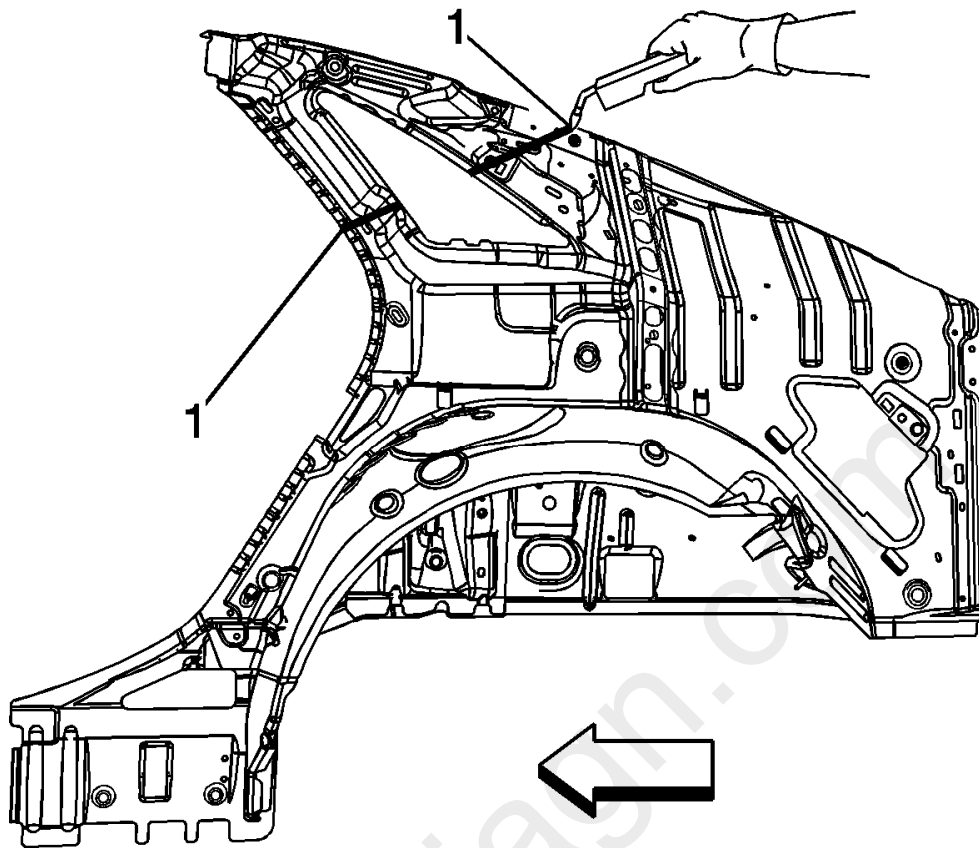


Fig. 109: Stitch Welding Inner Body Side Panel
Courtesy of GENERAL MOTORS COMPANY

6. To create a solid weld with minimum heat distortion, make stitch welds along the 25 mm (1 in) overlap joints, with equal gaps between the welds. Then go back and complete the welds to create a solid weld joint (1).

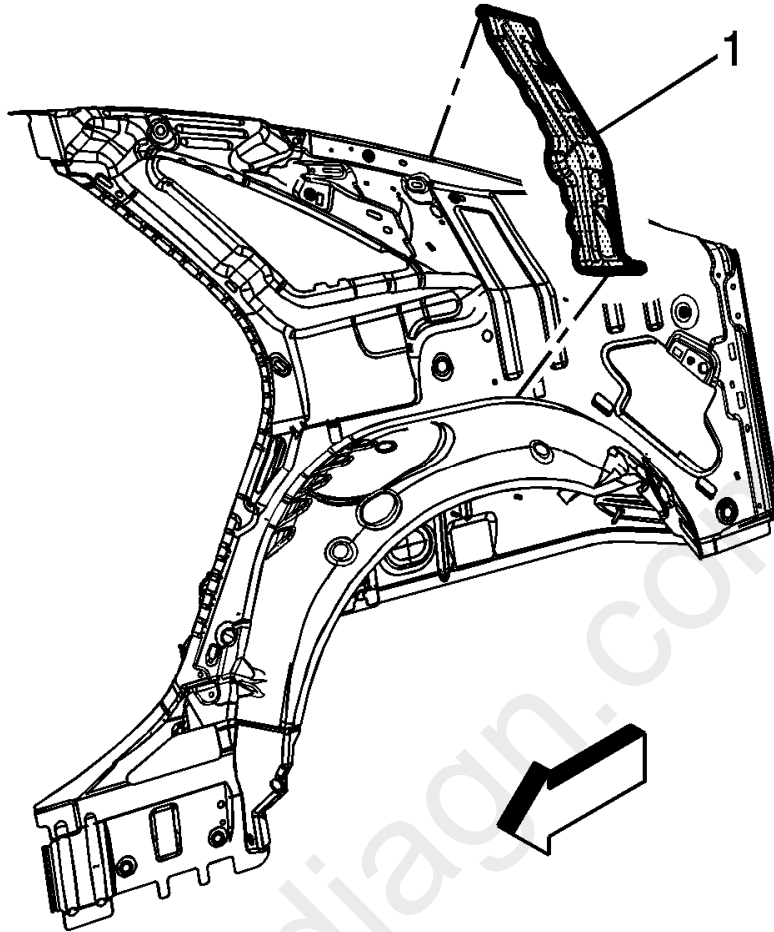


Fig. 110: Quarter Inner Panel Reinforcement
Courtesy of GENERAL MOTORS COMPANY

7. Install the quarter inner panel upper reinforcement (1).
8. Clean and prepare all welded surfaces.
9. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
10. Paint the repaired area. Refer to **Basecoat/Clearcoat Paint Systems** .
11. Install all related panels and components.
12. Enable the SIR system and then connect the negative battery cable. Refer to **SIR Disabling and Enabling** .

UNDERBODY REAR SIDE RAIL REPLACEMENT

Removal Procedure

WARNING: Refer to **Approved Equipment for Collision Repair Warning** .

WARNING: Refer to Foam Sound Deadeners Warning .

WARNING: Refer to Battery Disconnect Warning .

1. Disable the SIR system. Refer to SIR Disabling and Enabling .
2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection .

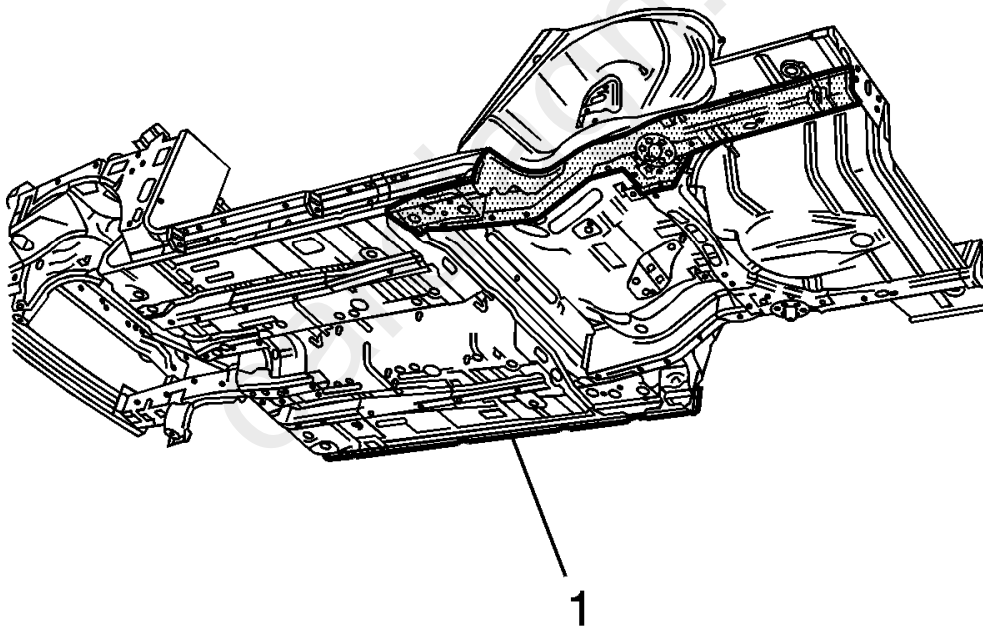


Fig. 111: Underbody Rear Side Rail
Courtesy of GENERAL MOTORS COMPANY

3. Remove all related panels and components (1).
4. Repair as much of the damaged area as possible. Refer to Dimensions - Body

5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .

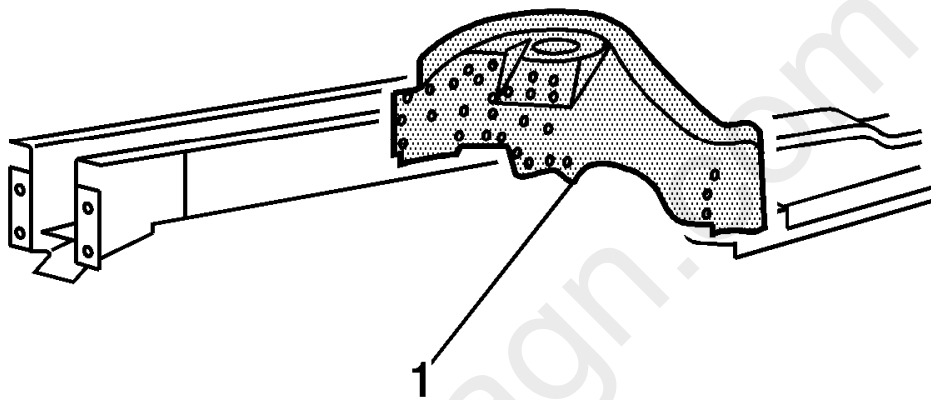


Fig. 112: Removing Shock Reinforcement Wheel House Extension
Courtesy of GENERAL MOTORS COMPANY

6. Remove the shock reinforcement wheel house extension (1).

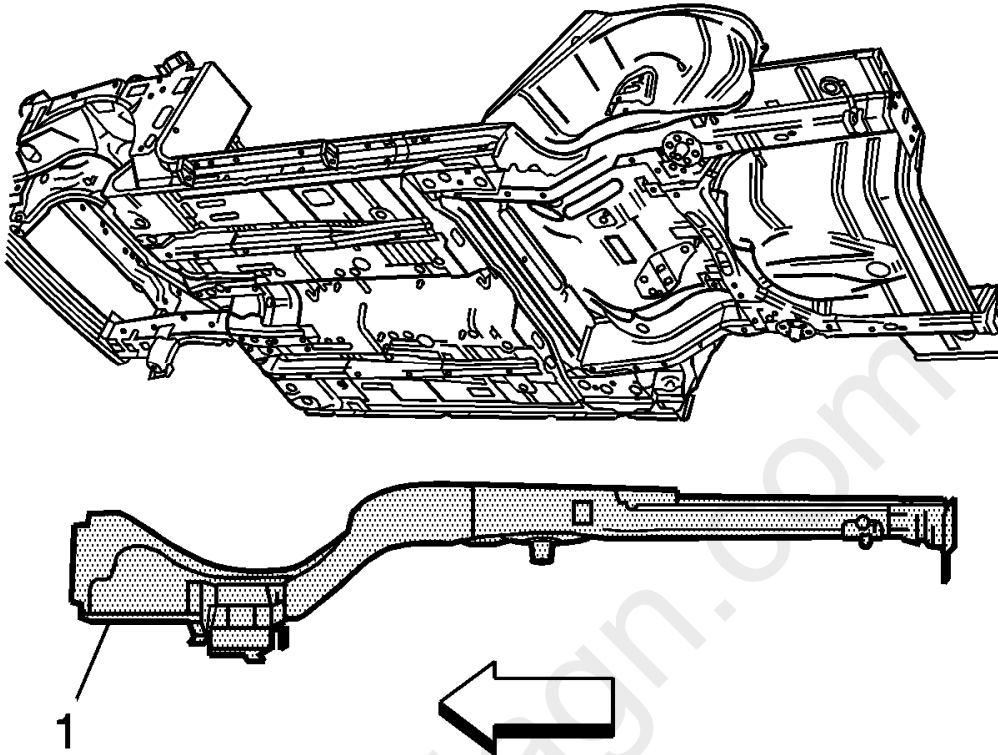


Fig. 113: Underbody Rear Side Rail
Courtesy of GENERAL MOTORS COMPANY

NOTE: Note the number and location of the factory welds for installation of the full rail service part.

7. Remove the rear rail (1).

Installation Procedure

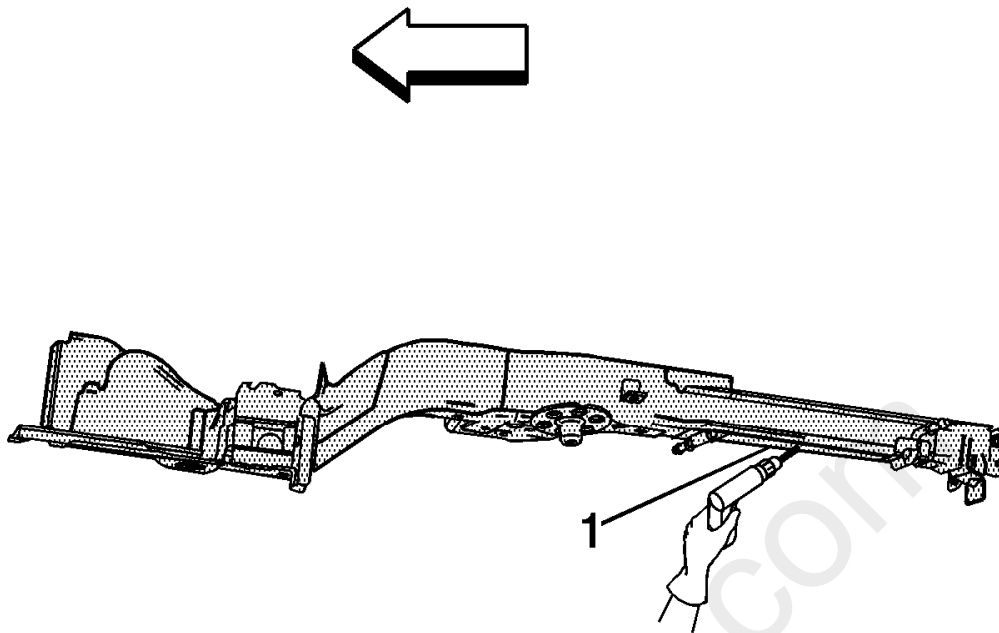


Fig. 114: Drilling Plug Weld Holes In Replacement Underbody Rear Side Rail
Courtesy of GENERAL MOTORS COMPANY

NOTE: If the location of the original welds cannot be determined, space the replacement welds every 40 mm (1 1/2 in) apart.

1. Prepare all mating surfaces as necessary.
2. Apply GM-approved weld-thru coating or equivalent to all mating surfaces. Refer to **Anti-Corrosion Treatment and Repair**

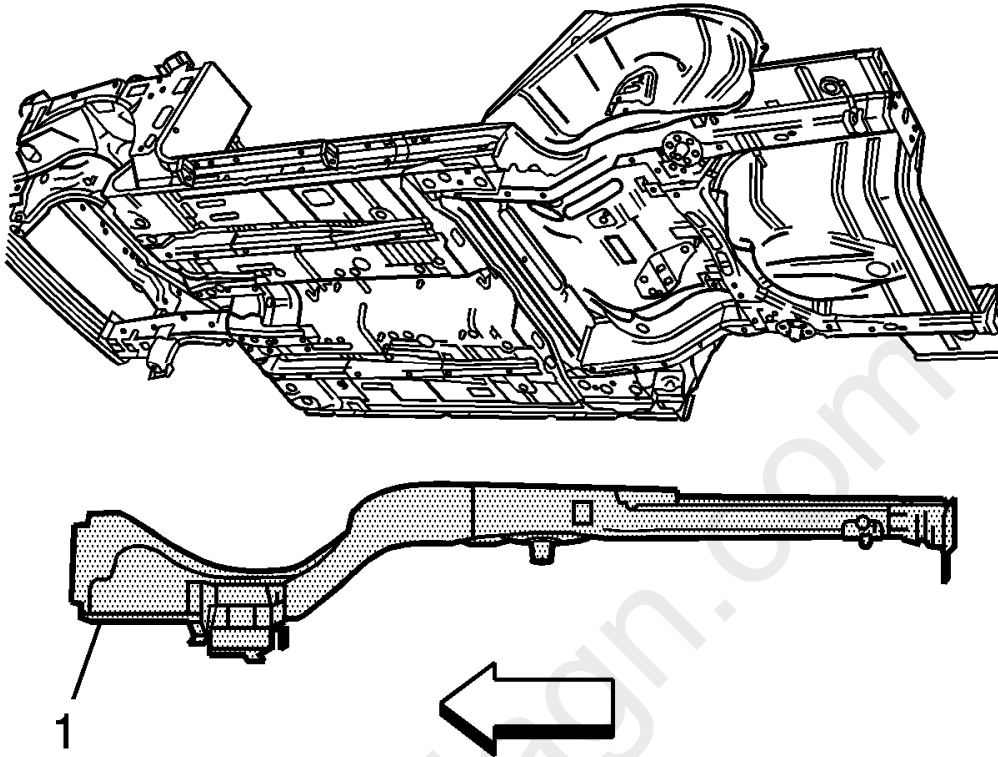


Fig. 115: Underbody Rear Side Rail
Courtesy of GENERAL MOTORS COMPANY

3. Position the rear rail to the vehicle using 3-dimensional measuring equipment. Clamp the rail in place (1).

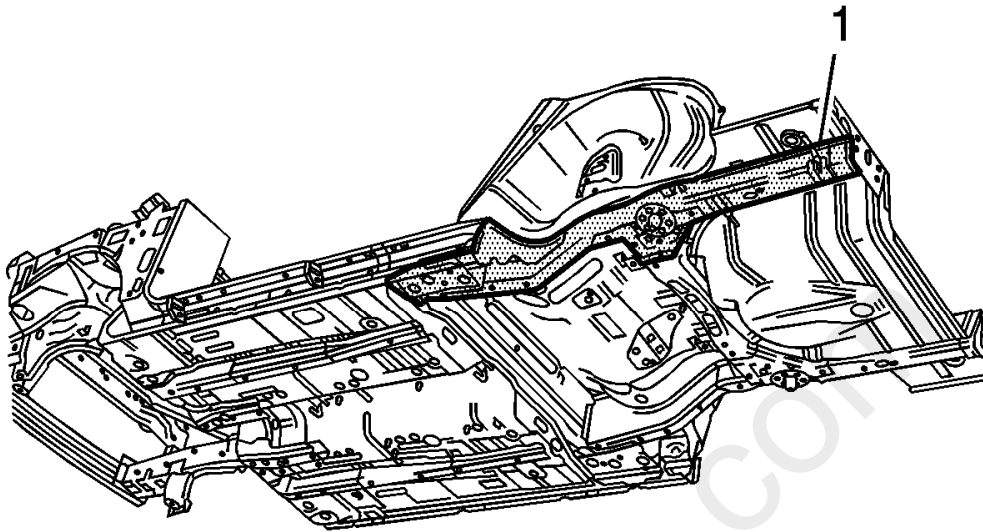


Fig. 116: Underbody Rear Side Rail In Position For Welding
Courtesy of GENERAL MOTORS COMPANY

4. Weld the perimeter of the part at the original weld locations (1).

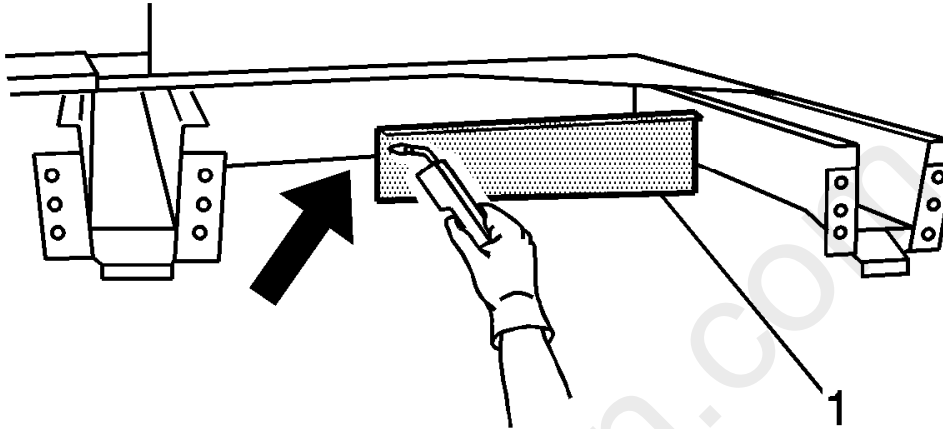


Fig. 117: Install The Five Bar (1) - Rear Side Underbody Rail (Extended Sedan)
 Courtesy of GENERAL MOTORS COMPANY

5. Install the 5 bar (1).
6. Clean and prepare all of the welded surfaces.
7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
8. Paint the repaired area. Refer to **Basecoat/Clearcoat Paint Systems** .
9. Install all related panels and components.
10. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection** .
11. Enable the SIR system. Refer to **SIR Disabling and Enabling** .

UNDERBODY REAR SIDE RAIL SECTIONING

Removal Procedure

WARNING: Refer to **Approved Equipment for Collision Repair Warning** .

WARNING: Refer to Foam Sound Deadeners Warning .

WARNING: Refer to Battery Disconnect Warning .

1. Disable the SIR system. Refer to SIR Disabling and Enabling .
2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection .
3. Remove all related panels and components.
4. Repair as much of the damaged area as possible. Refer to Dimensions - Body .
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair .

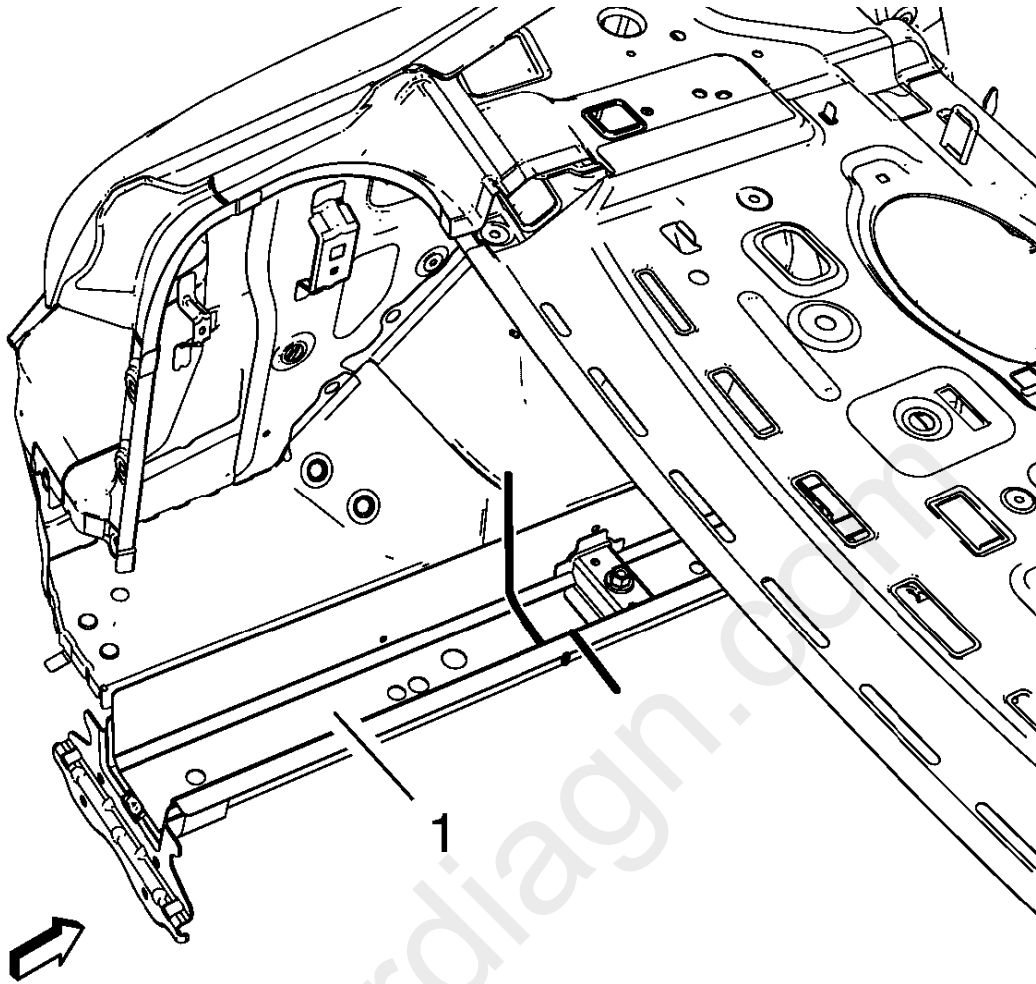


Fig. 118: Locating Cut Lines On Rear Side Rail
Courtesy of GENERAL MOTORS COMPANY

6. Create cut lines on the rear side rail (1).

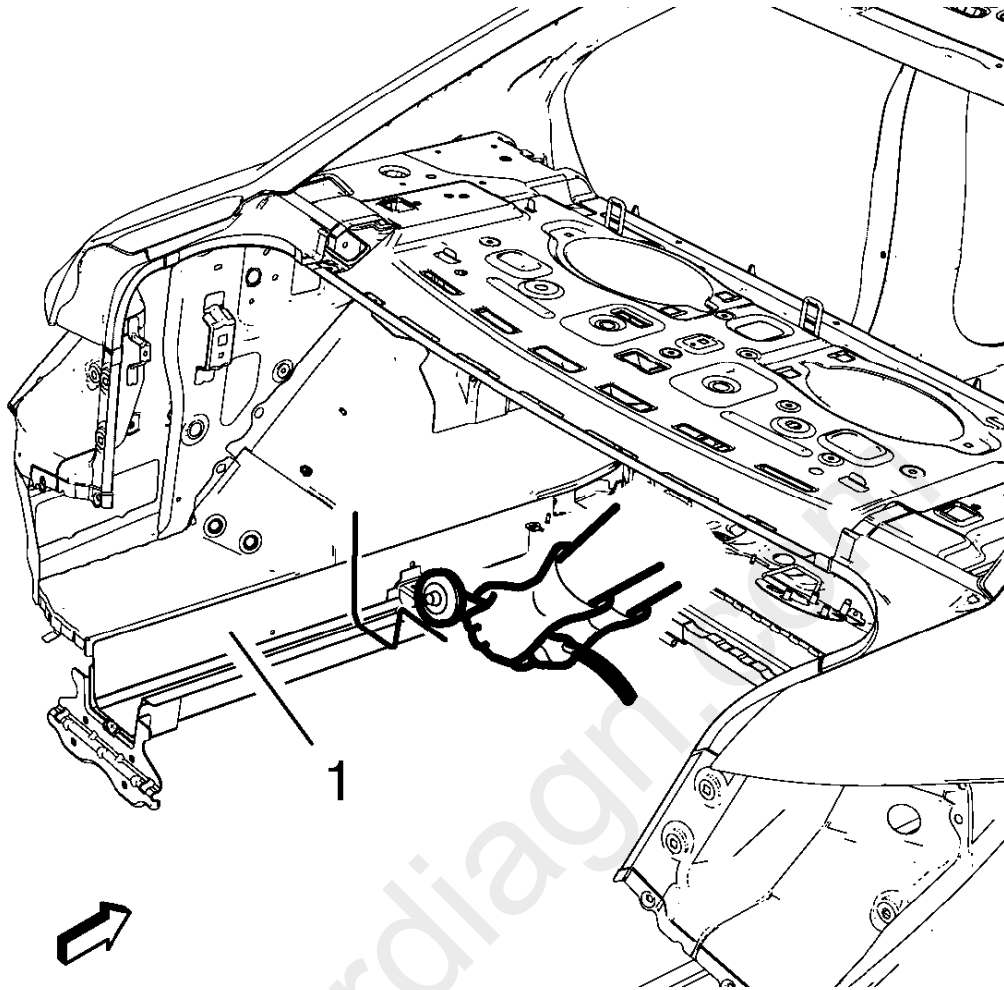


Fig. 119: Cutting Rear Side Rail
Courtesy of GENERAL MOTORS COMPANY

NOTE: Do not damage any other panels or reinforcements.

7. Cut the panel (1) where sectioning is to be performed.

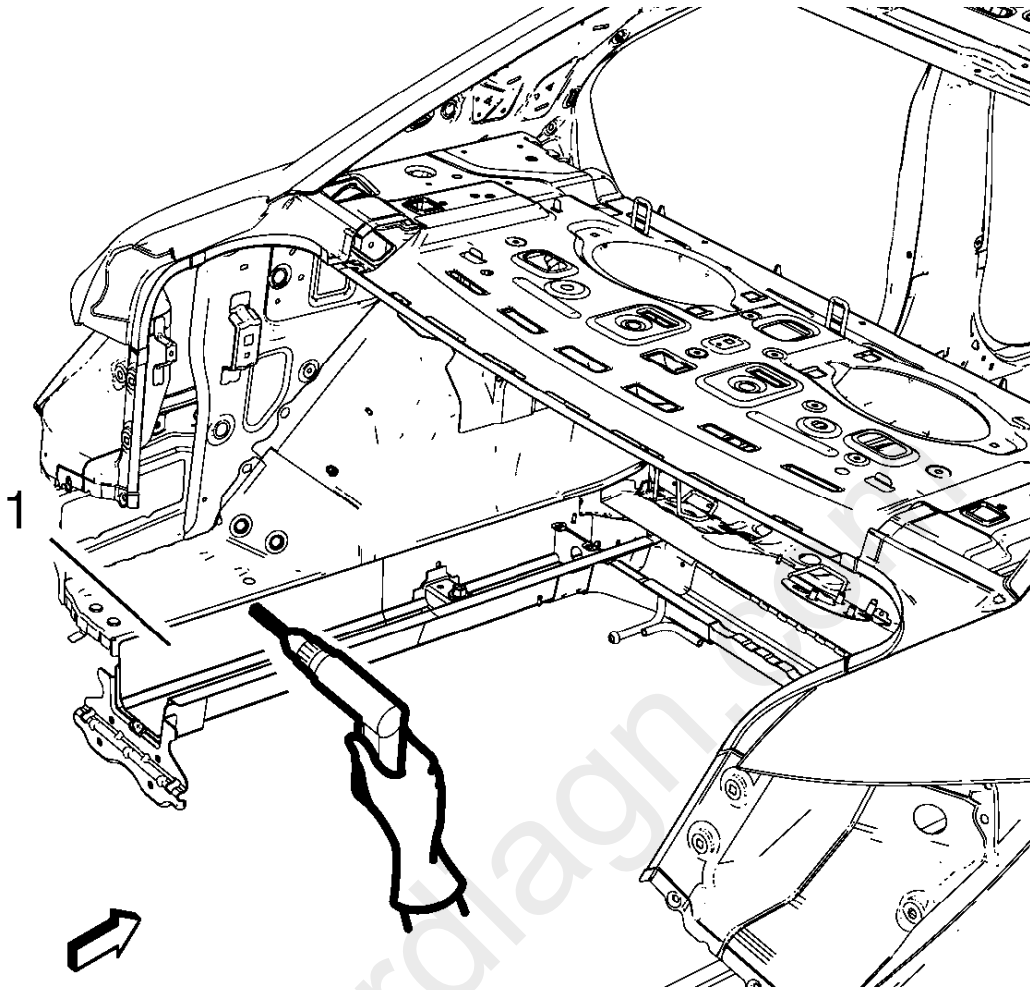


Fig. 120: Drilling Factory Welds Of Rear Side Rail
Courtesy of GENERAL MOTORS COMPANY

8. Note the number and location of the factory welds for installation of the rail service part (1).

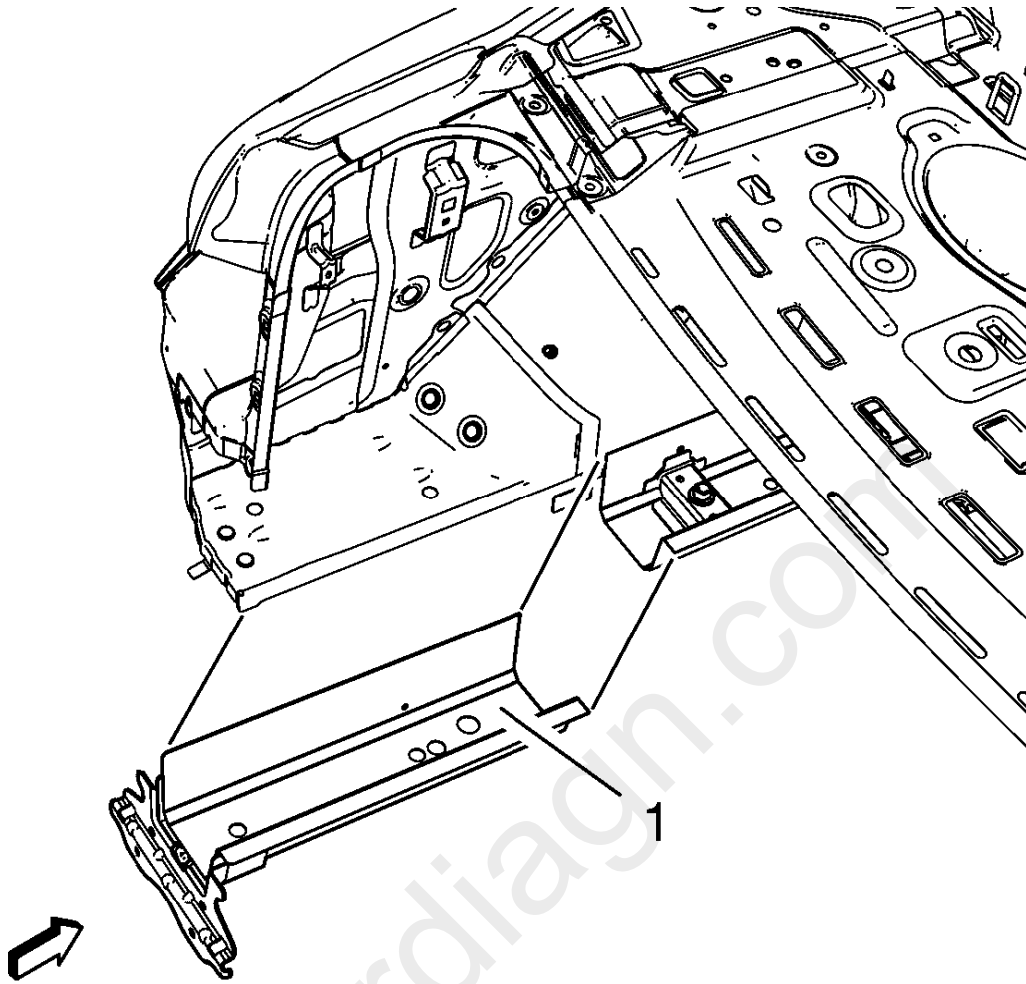


Fig. 121: Rear Side Rail
Courtesy of GENERAL MOTORS COMPANY

9. Remove the damaged rear side rail (1).

Installation Procedure

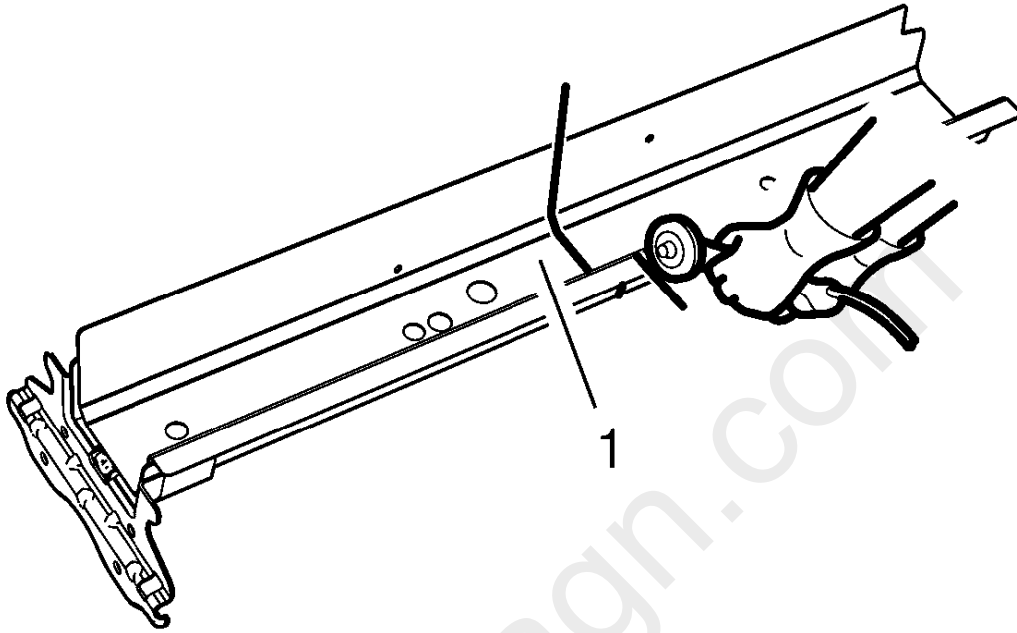


Fig. 122: Cutting New Rear Side Rail
Courtesy of GENERAL MOTORS COMPANY

1. Cut the rear side rail (1) in corresponding locations to fit the remaining original panel. The sectioning joint should be trimmed to allow a gap of one-and-one-half-times the metal thickness at the sectioning joint.
2. Prepare all mating surfaces as necessary.
3. Apply GM-approved weld-thru coating or equivalent to all mating surfaces. Refer to **Anti-Corrosion Treatment and Repair**

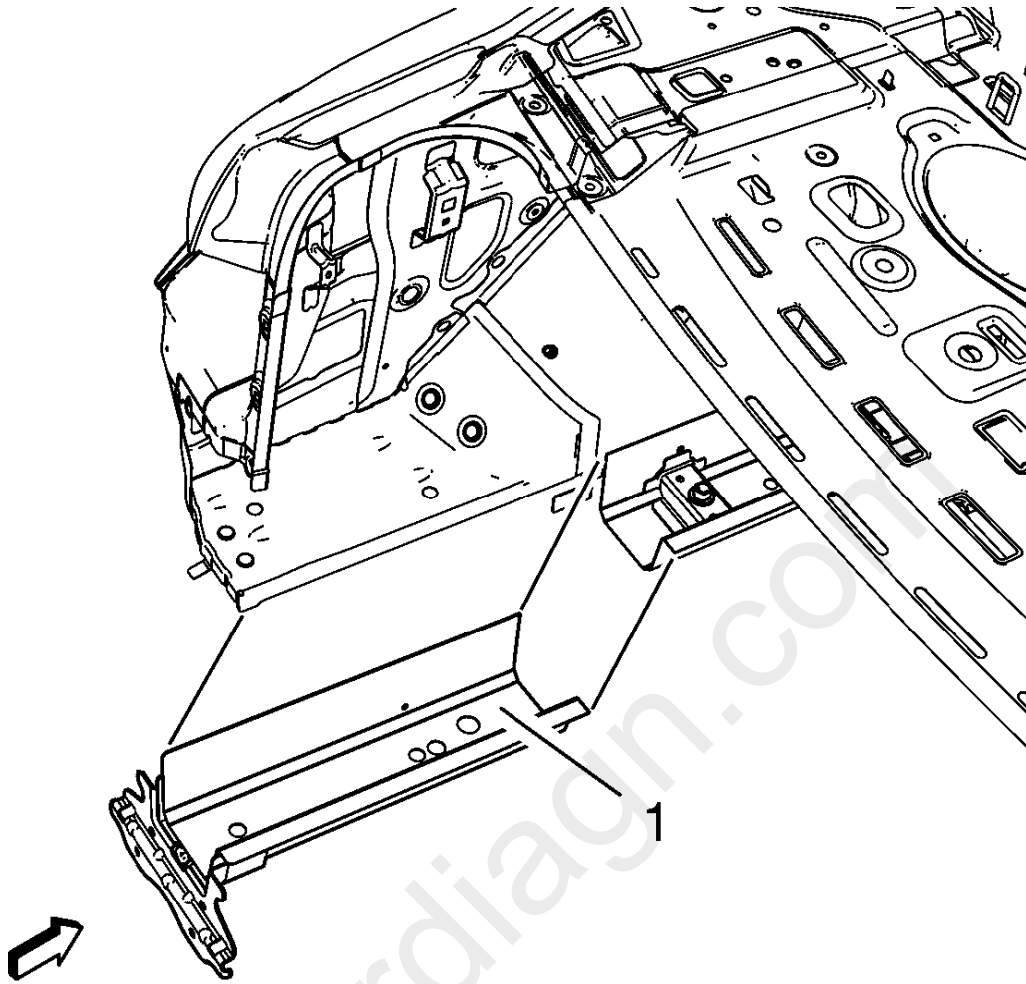


Fig. 123: Rear Side Rail

Courtesy of GENERAL MOTORS COMPANY

4. Position the sectioned rail to the vehicle using 3-dimensional measuring equipment. Clamp the rail in place.

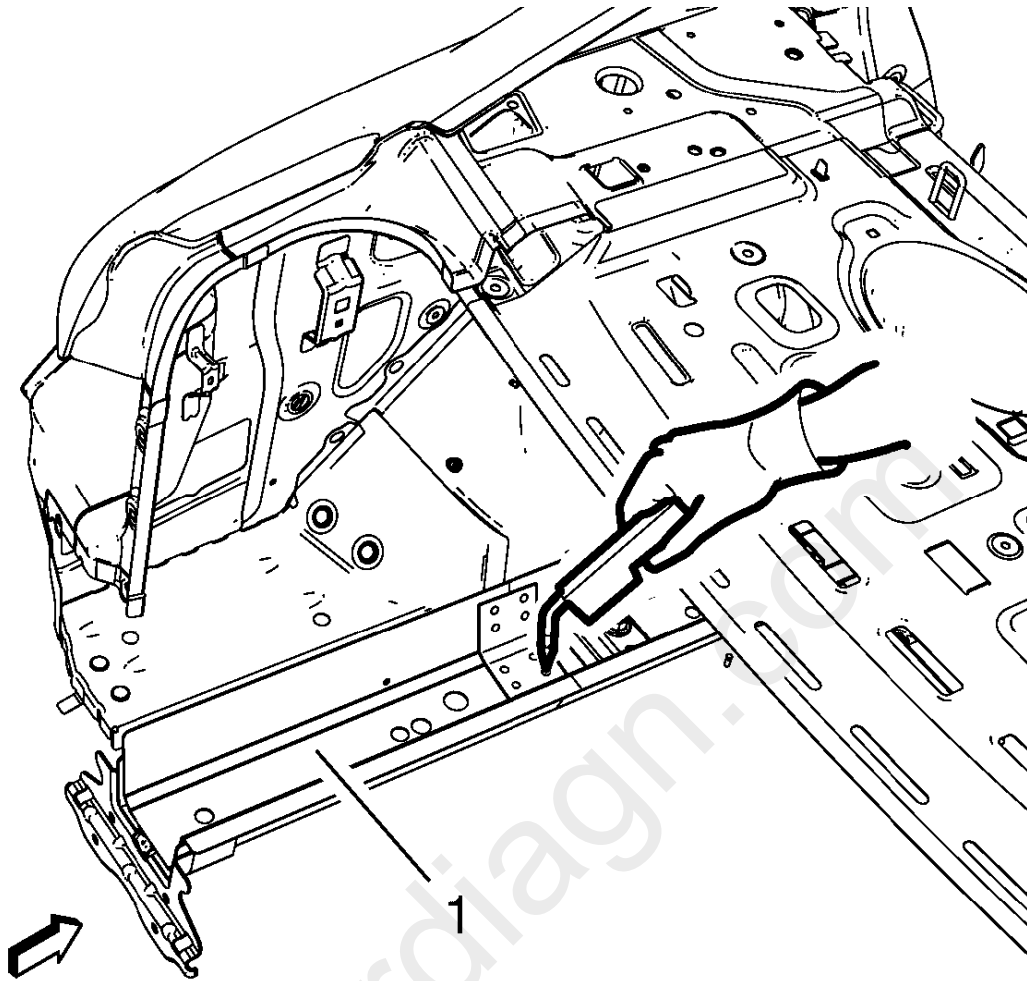


Fig. 124: Welding Rear Side Rail

Courtesy of GENERAL MOTORS COMPANY

5. Position the backing plate inside the rail (1). Weld accordingly.
6. To create a solid weld with minimum heat distortion, make 25 mm (1 in) stitch welds along the seam with 25 mm (1 in) gaps between them. Then go back and complete the stitch weld.
7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
8. Paint the repaired area. Refer to **Basecoat/Clearcoat Paint Systems** .
9. Install all related panels and components.
10. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection** .
11. Enable the SIR system. Refer to **SIR Disabling and Enabling** .

BODY REAR END PANEL REPLACEMENT

Removal Procedure

WARNING: Refer to Approved Equipment for Collision Repair Warning .

WARNING: Refer to Foam Sound Deadeners Warning .

WARNING: Refer to Battery Disconnect Warning .

1. Disable the SIR system and then disconnect the negative battery cable. Refer to SIR Disabling and Enabling .
2. Remove all related panels and components.
3. Repair as much of the damaged area as possible. Refer to Dimensions - Body.
4. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair .

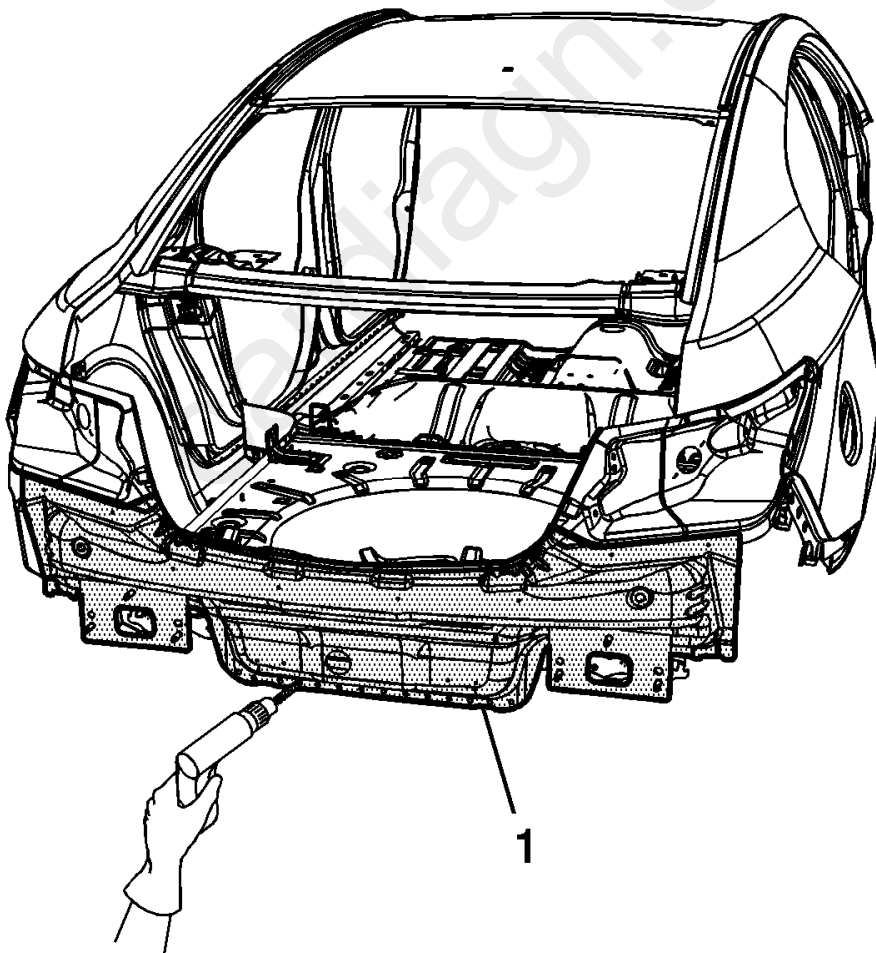


Fig. 125: Drilling Out Body Rear End Panel Factory Welds
Courtesy of GENERAL MOTORS COMPANY

NOTE: Record the number and location of welds for installation of the service assembly.

5. Remove all the necessary factory welds (1).

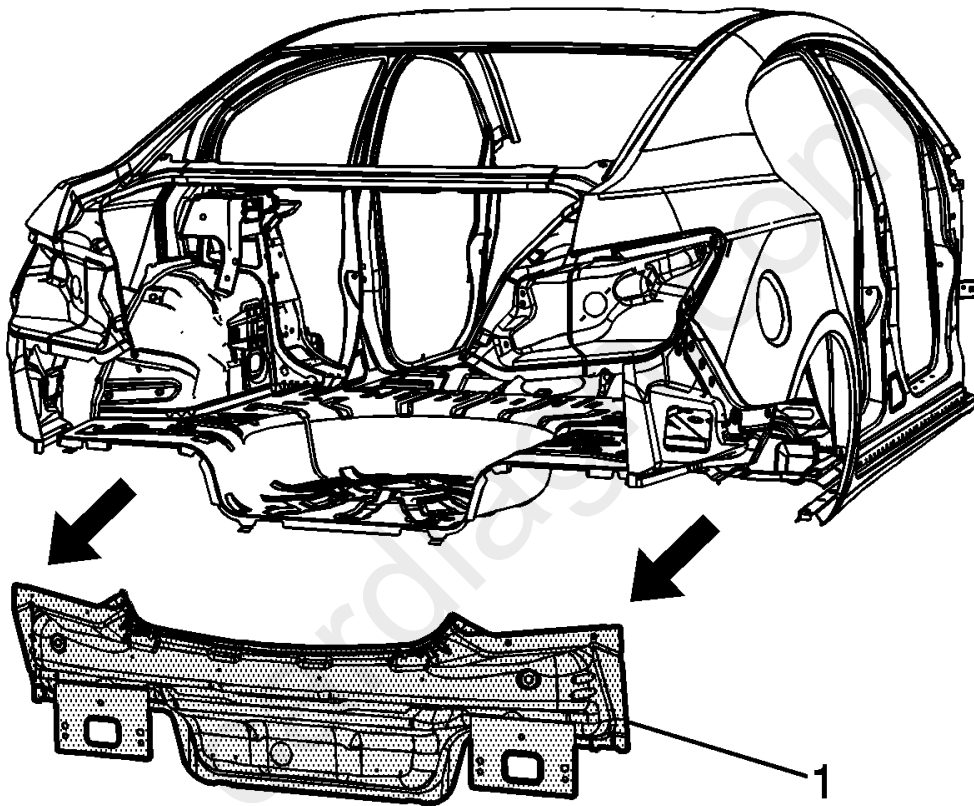


Fig. 126: Rear End Panel
Courtesy of GENERAL MOTORS COMPANY

6. Remove the rear end panel (1).

Installation Procedure

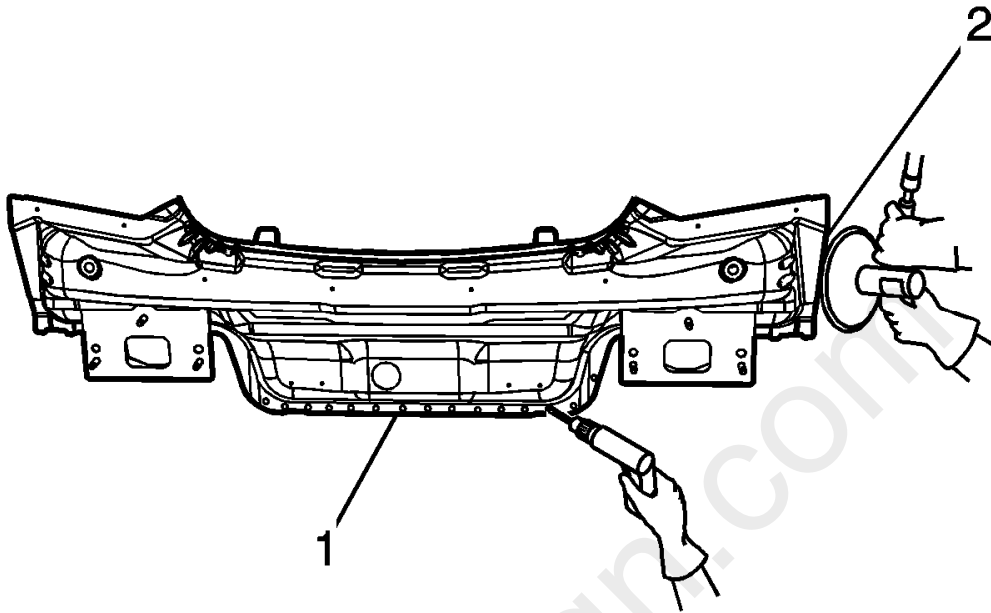


Fig. 127: Drilling Plug Weld Holes Replacement Rear End Panel
Courtesy of GENERAL MOTORS COMPANY

1. Clean and prepare all mating surfaces as necessary (2).
2. Apply Weld-Thru Coating to all mating surfaces. Refer to **Anti-Corrosion Treatment and Repair** .

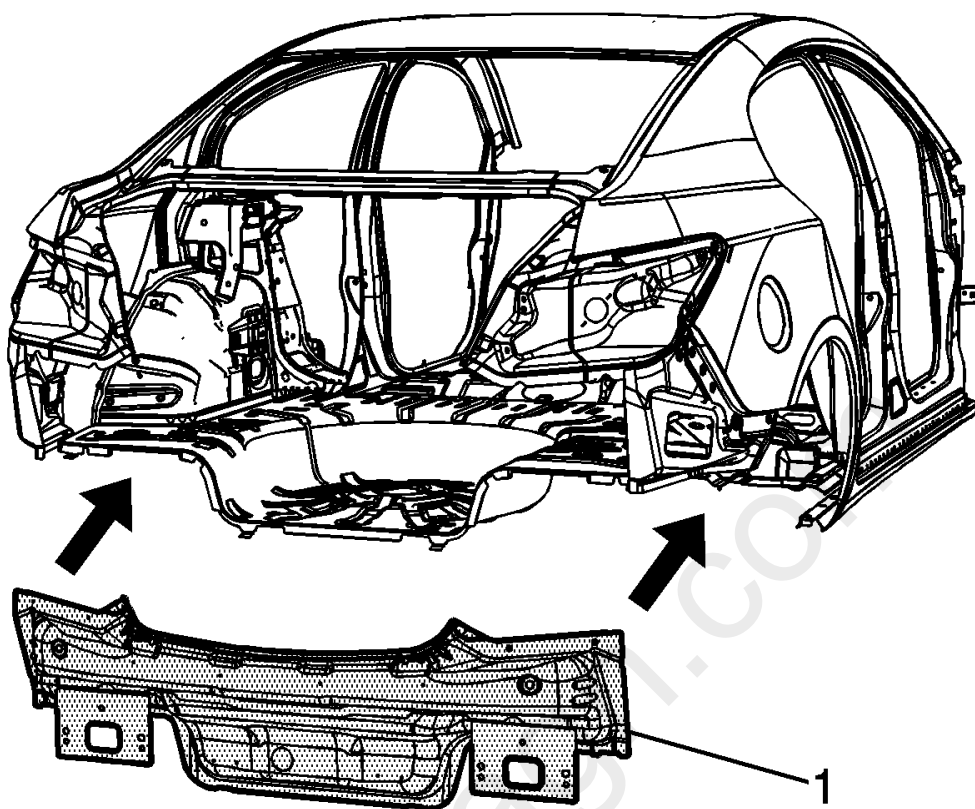


Fig. 128: Rear End Panel

Courtesy of GENERAL MOTORS COMPANY

3. Position the rear end panel on the vehicle. Use 3-dimensional measuring equipment to inspect the panel (1).

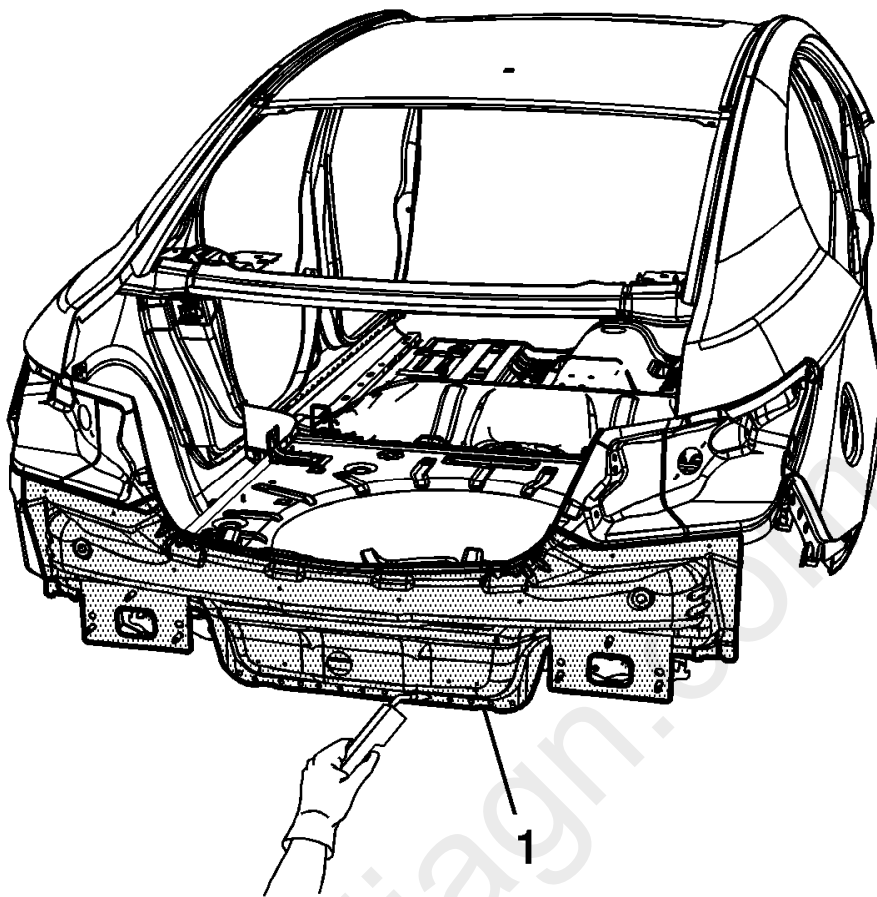


Fig. 129: Welding Rear End Panel
Courtesy of GENERAL MOTORS COMPANY

4. Weld accordingly at the original weld locations (1).
5. Clean all of the welded surfaces.
6. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
7. Paint the repaired area. Refer to **Basecoat/Clearcoat Paint Systems**
8. Install all of the related panels and components.
9. Enable the SIR system and then connect the negative battery cable. Refer to **SIR Disabling and Enabling** .

CENTER PILLAR INNER PANEL REPLACEMENT

Removal Procedure

WARNING: Refer to **Approved Equipment for Collision Repair Warning** .

WARNING: Refer to Foam Sound Deadeners Warning .

WARNING: Refer to Battery Disconnect Warning .

NOTE: The center pillar inner panel reinforcement is made of Ultra High Strength Steel. Sectioning, or repair of Ultra High Strength Steel is not recommended. It should be replaced as a complete assembly at factory locations. Refer to Ultra High Strength Steel

1. Disable the SIR system and then disconnect the negative battery cable. Refer to SIR Disabling and Enabling .
2. Remove all related panels and components.
3. Repair as much of the damaged area as possible. Refer to Dimensions - Body.
4. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair .

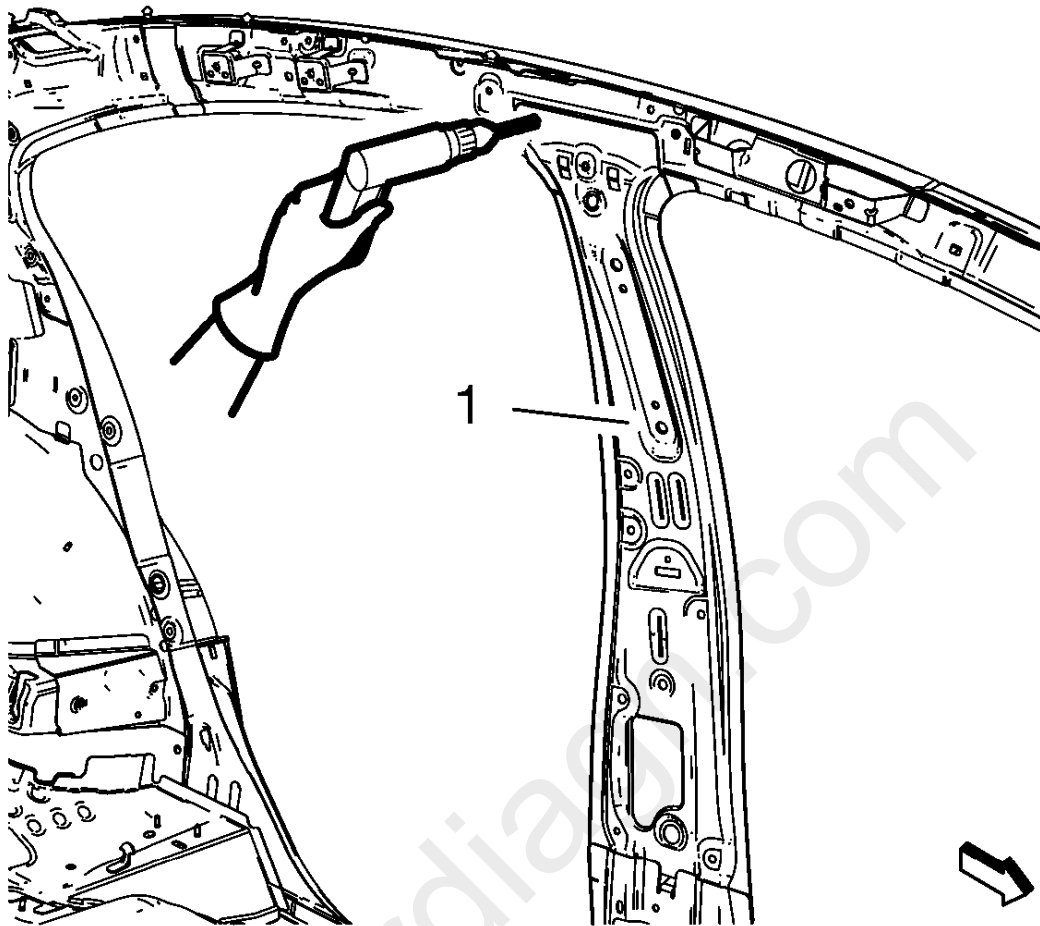


Fig. 130: Drilling Factory Welds From Upper Center Pillar Inner Panel
Courtesy of GENERAL MOTORS COMPANY

NOTE: Record the number and location of welds for installation of the service assembly.

5. Remove all the necessary factory welds (1).

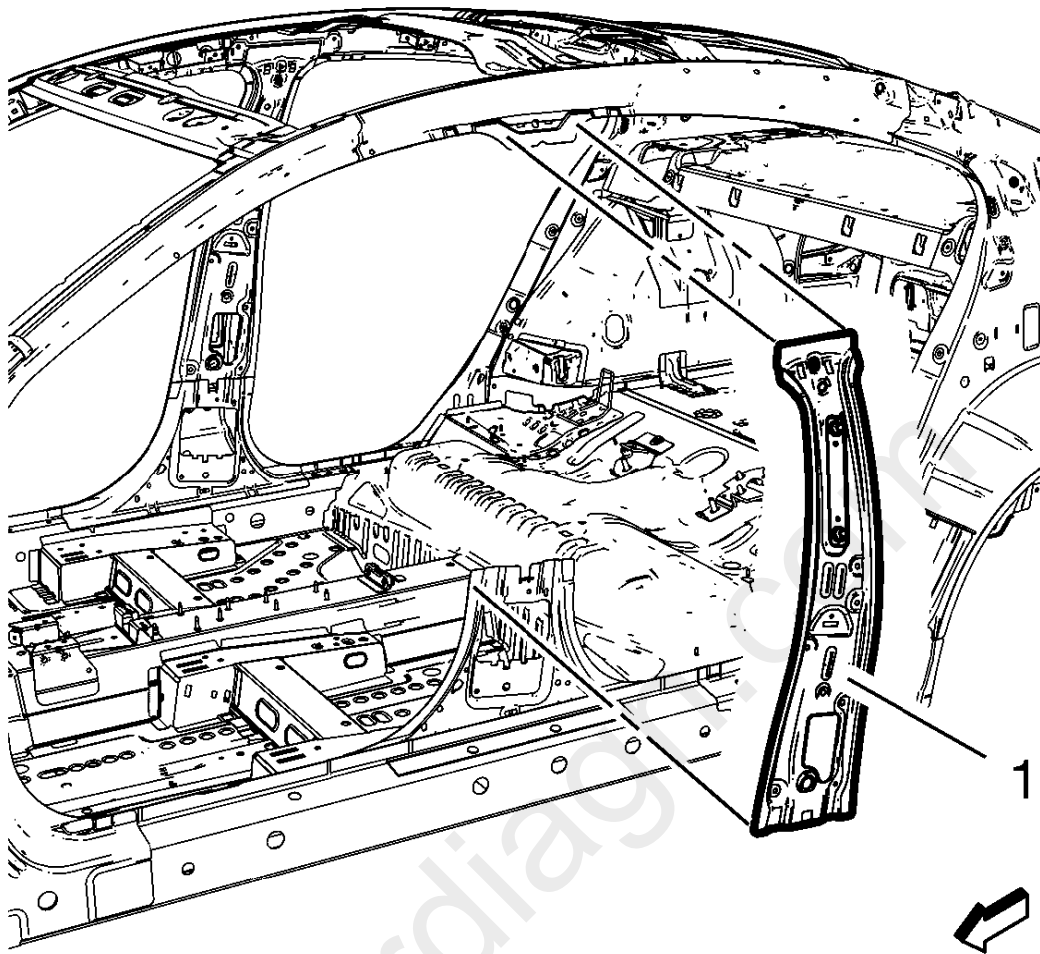


Fig. 131: Center Pillar Inner Panel
Courtesy of GENERAL MOTORS COMPANY

6. Remove the damaged center pillar inner panel (1).

Installation Procedure

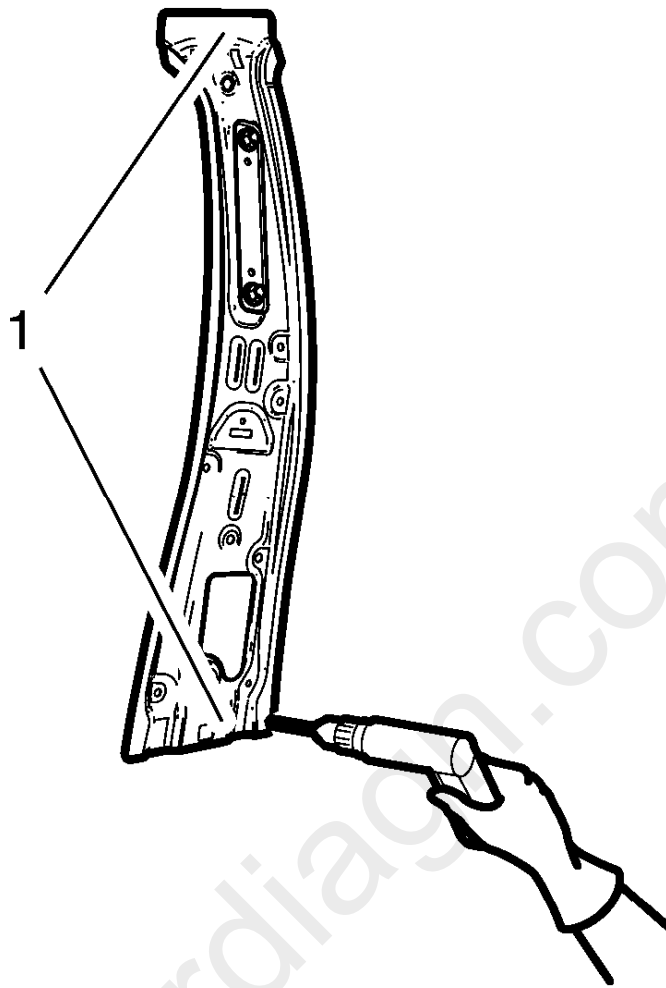


Fig. 132: Drilling Holes Plug Welding Holes In New Center Pillar Inner Panel
Courtesy of GENERAL MOTORS COMPANY

1. Clean and prepare the attaching surfaces for welding.

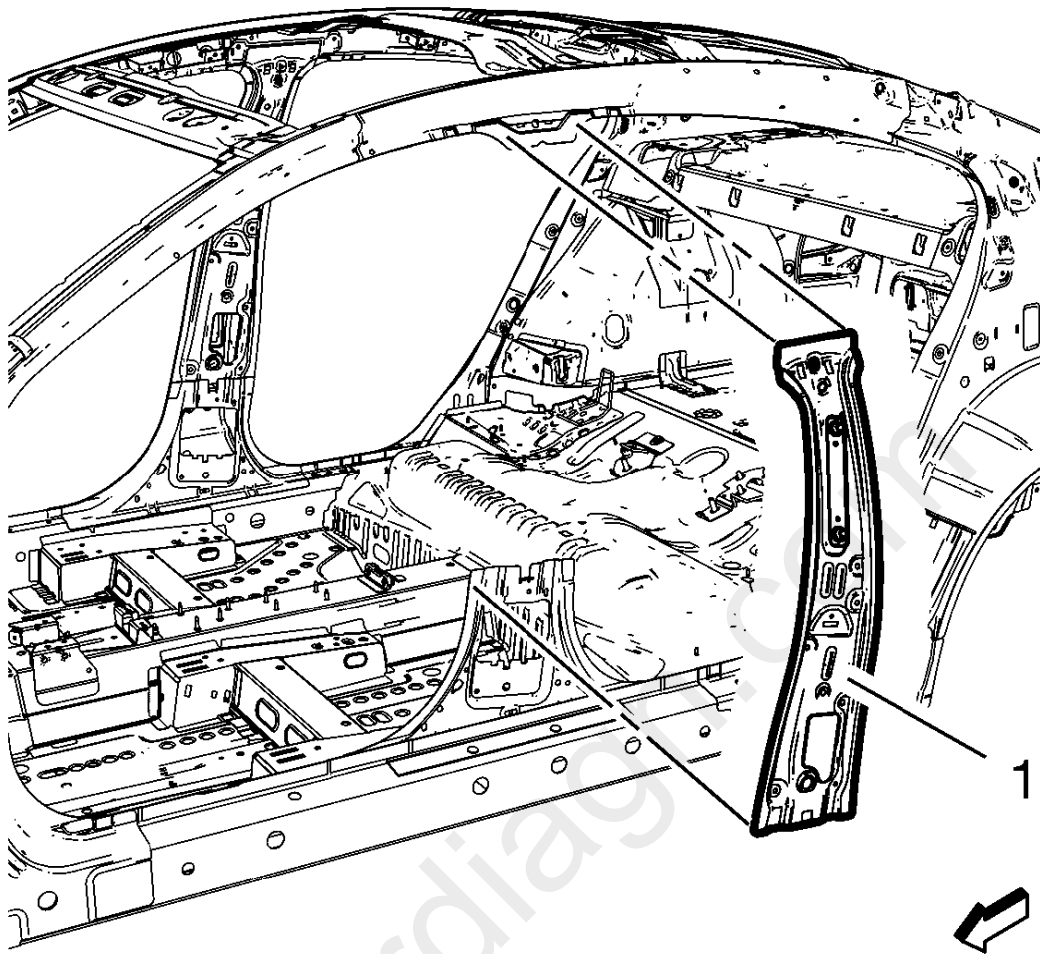


Fig. 133: Center Pillar Inner Panel
Courtesy of GENERAL MOTORS COMPANY

2. Position the center pillar inner panel (1) on the vehicle.
3. Verify the fit of the panel.
4. Clamp the center pillar inner panel into position.

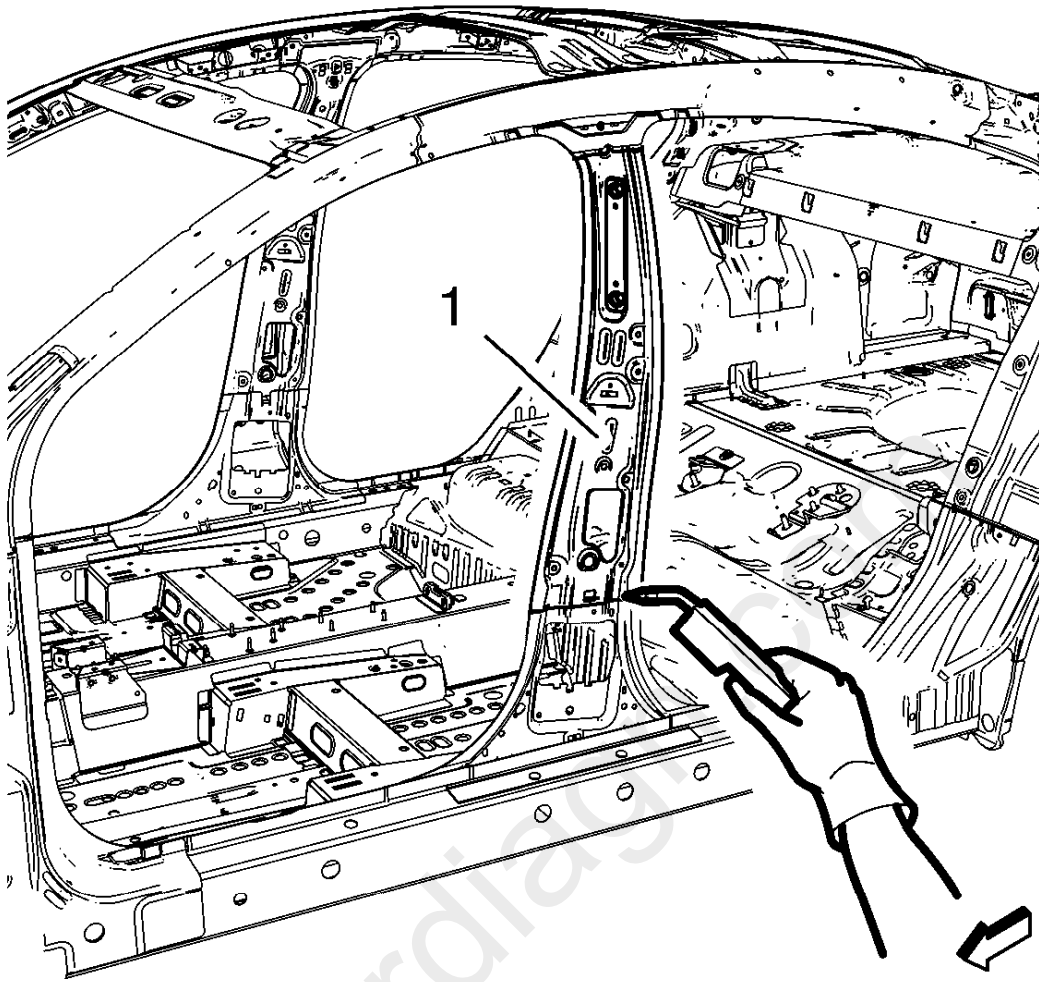


Fig. 134: Welding Upper And Lower Center Pillar Inner Panel
Courtesy of GENERAL MOTORS COMPANY

5. Weld accordingly at original weld locations (1).
6. Clean all of the welded surfaces.
7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
8. Paint the repaired area. Refer to **Basecoat/Clearcoat Paint Systems** .
9. Install all related panels and components.
10. Enable the SIR system and then connect the negative battery cable. Refer to **SIR Disabling and Enabling** .

CENTER PILLAR OUTER PANEL REINFORCEMENT REPLACEMENT

Removal Procedure

WARNING: Refer to Approved Equipment for Collision Repair Warning .

WARNING: Refer to Foam Sound Deadeners Warning .

WARNING: Refer to Battery Disconnect Warning .

NOTE: The center pillar outer panel reinforcement is made of Ultra High Strength Steel. Sectioning, or repair of Ultra High Strength Steel is not recommended. It should be replaced as a complete assembly at factory locations. Refer to Ultra High Strength Steel.

1. Disable the SIR System and then disconnect the negative battery cable. Refer to SIR Disabling and Enabling .
2. Remove all related panels and components.
3. Repair as much of the damaged area as possible. Refer to Dimensions - Body.
4. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair .

NOTE: There are sectioning procedures available for various locations of the body side outer panel. The sectioning procedure and location should be chosen based on the extent of damage to the vehicle and other inner reinforcements that need to be replaced. Sectioning should be performed only in the recommended areas. Failure to do so may compromise the structural integrity of the vehicle. Refer to service procedures for recommended sectioning locations.

5. Remove body side center pillar section. Refer to Center Pillar Sectioning - Outer.

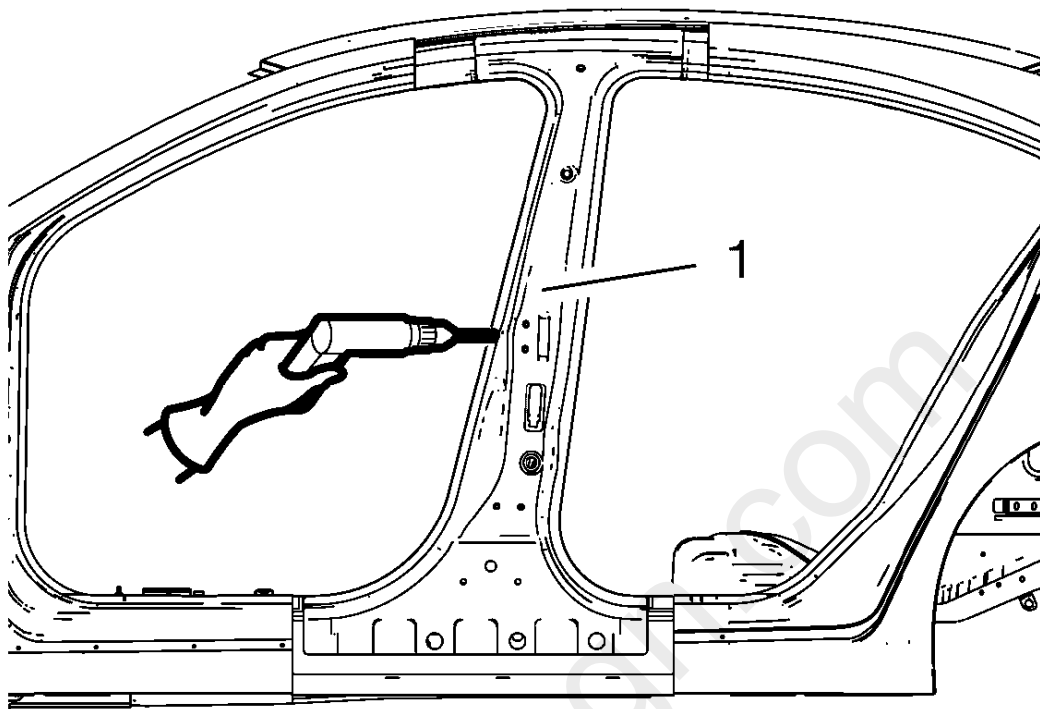


Fig. 135: Drilling Factory Welds Of Center Pillar Reinforcement
Courtesy of GENERAL MOTORS COMPANY

NOTE: Record the number and location of welds for installation of the service assembly.

6. Remove all necessary factory welds (1).

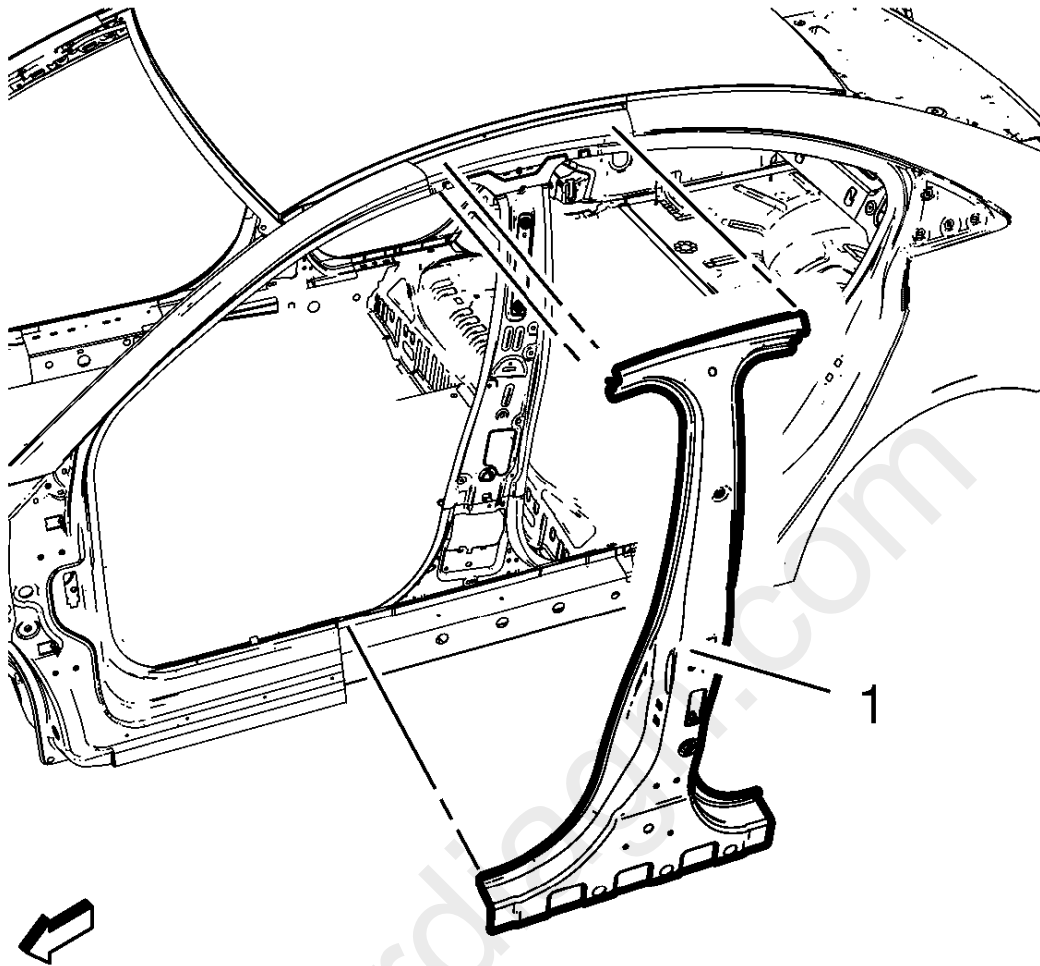


Fig. 136: Center Pillar Reinforcement
Courtesy of GENERAL MOTORS COMPANY

7. Remove the damaged center pillar reinforcement (1).

Installation Procedure

1. Prepare all mating surfaces, as necessary.
2. Align the center pillar reinforcement.

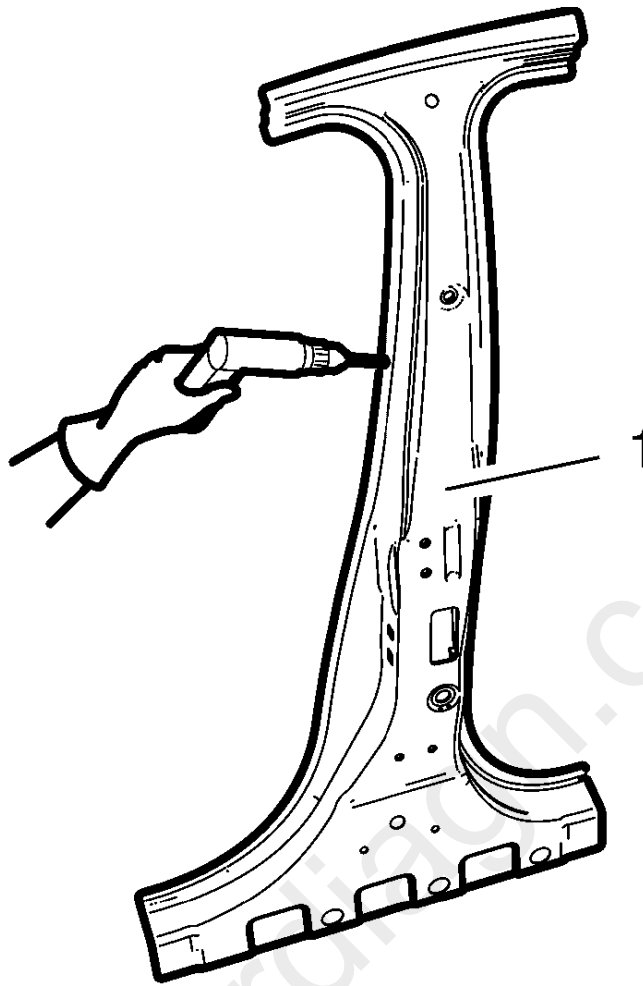


Fig. 137: Drilling Plug Weld Holes For New Center Pillar Reinforcement
Courtesy of GENERAL MOTORS COMPANY

3. Drill 8 mm (5/16 in) for plug welding along the edges of the center pillar reinforcement (1) as noted from the original panel.
4. Clean and prepare the attaching surfaces for welding.

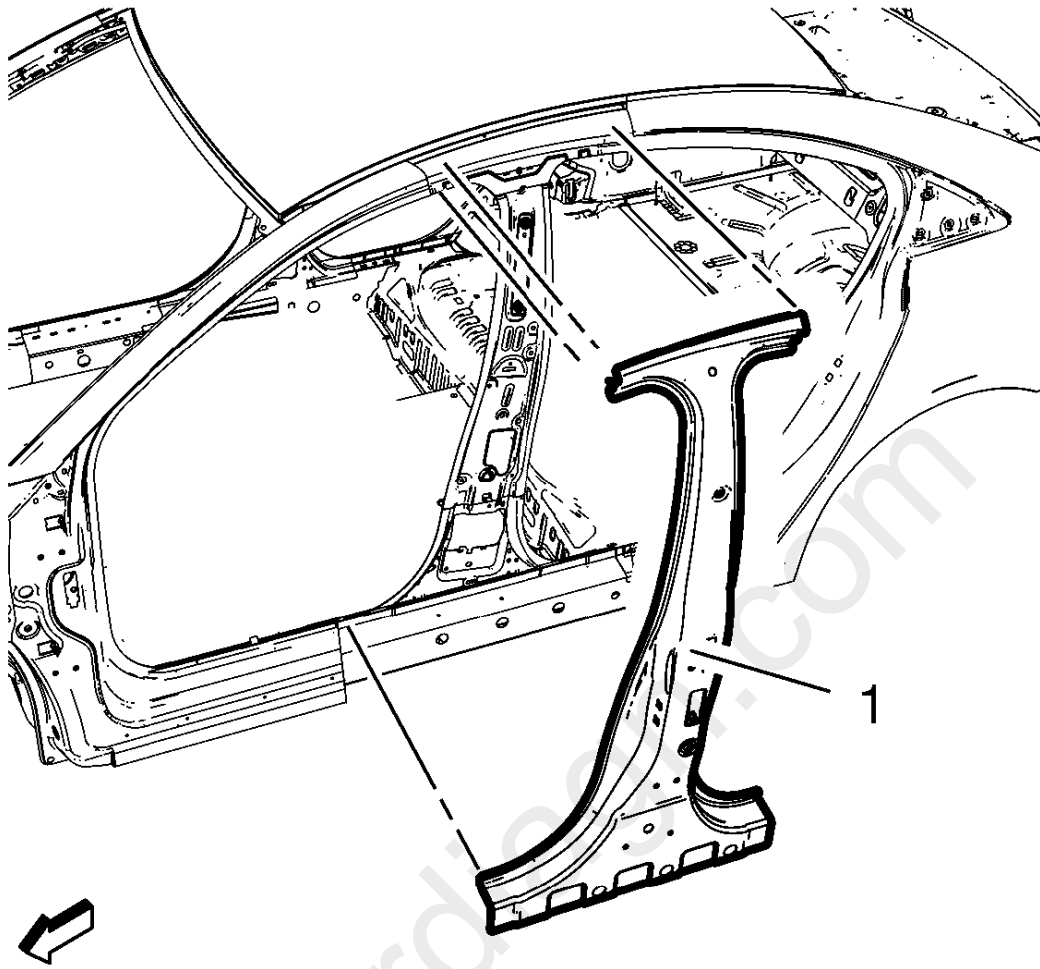


Fig. 138: Center Pillar Reinforcement
Courtesy of GENERAL MOTORS COMPANY

5. Position the center pillar reinforcement (1) on the vehicle using 3-dimensional measuring equipment.
6. Verify the fit of the center pillar reinforcement.
7. Clamp the center pillar reinforcement into position.

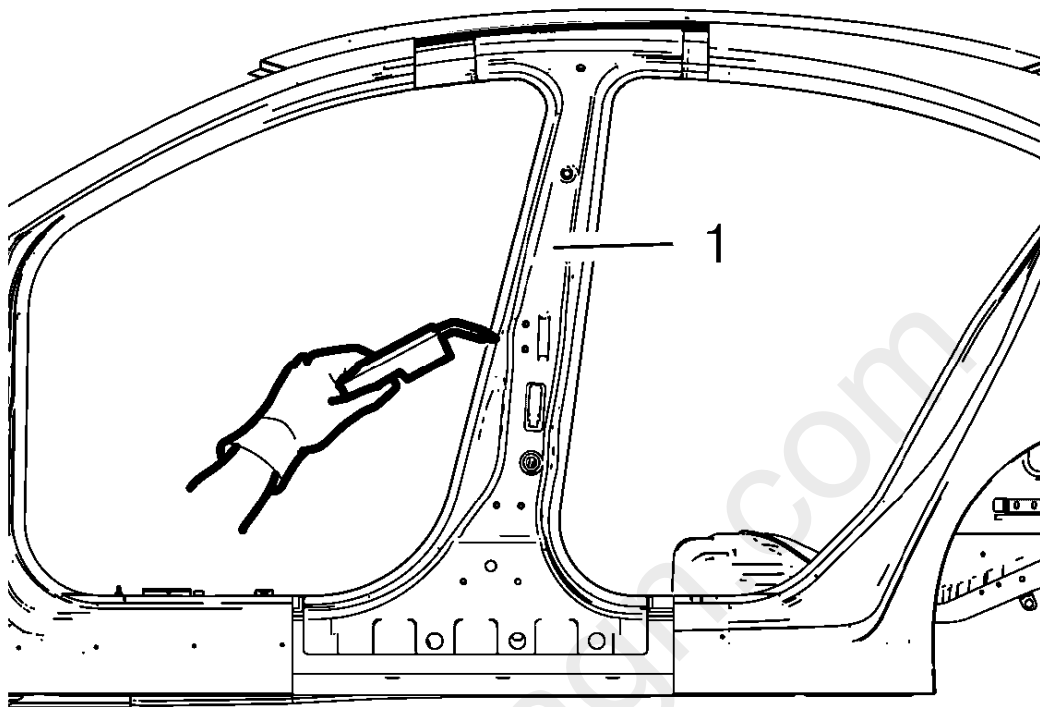


Fig. 139: Welding Center Pillar Reinforcement
 Courtesy of GENERAL MOTORS COMPANY

8. Weld accordingly at the original weld locations (1).
9. Complete body side center pillar sectioning. Refer to **Center Pillar Sectioning - Outer**.
10. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
11. Paint the repaired area. Refer to **Basecoat/Clearcoat Paint Systems** .
12. Install all related panels and components.
13. Enable the SIR system and then connect the negative battery cable. Refer to **SIR Disabling and Enabling** .

CENTER PILLAR SECTIONING - OUTER

Removal Procedure

WARNING: Refer to Approved Equipment for Collision Repair Warning .

WARNING: Refer to Foam Sound Deadeners Warning .

WARNING: Refer to Battery Disconnect Warning .

NOTE: This procedure was developed to allow access for the complete replacement of the center pillar outer panel reinforcement without removing the roof panel. There are sectioning procedures available for various locations of the body side outer panel. There are sectioning procedures available for various locations of the body side outer panel. The sectioning procedure and location should be chosen based on the extent of the damage to the vehicle and other inner reinforcements that need to be replaced. Sectioning should be performed only in the recommended areas. Failure to do so may compromise the structural integrity of the vehicle. Refer to other service procedures for additional sectioning locations.

1. Disable the SIR system. Refer to SIR Disabling and Enabling .
2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection .
3. Remove all related panels and components.
4. Repair as much of the damaged area as possible. Refer to Dimensions - Body.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair .

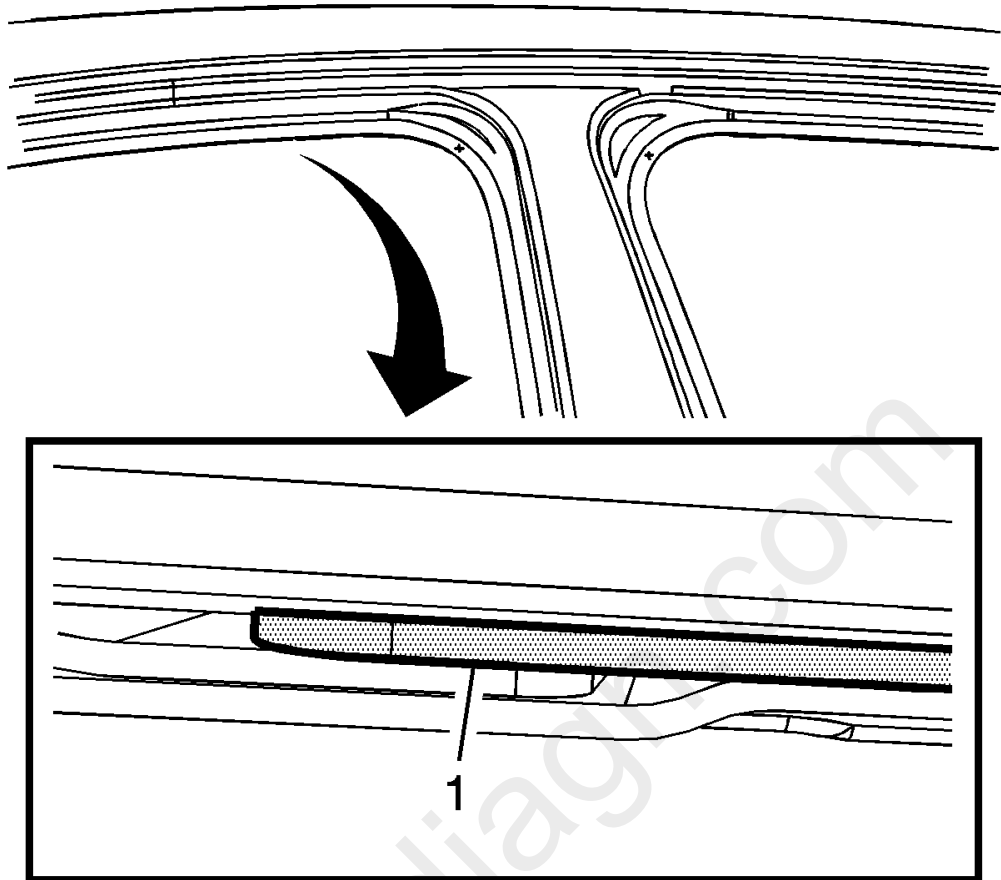


Fig. 140: Removing Weatherstrip

Courtesy of GENERAL MOTORS COMPANY

6. Remove the weather-strip and measure rearward from the front edge of the roof panel 430 mm and mark a vertical line on the bodyside (1).

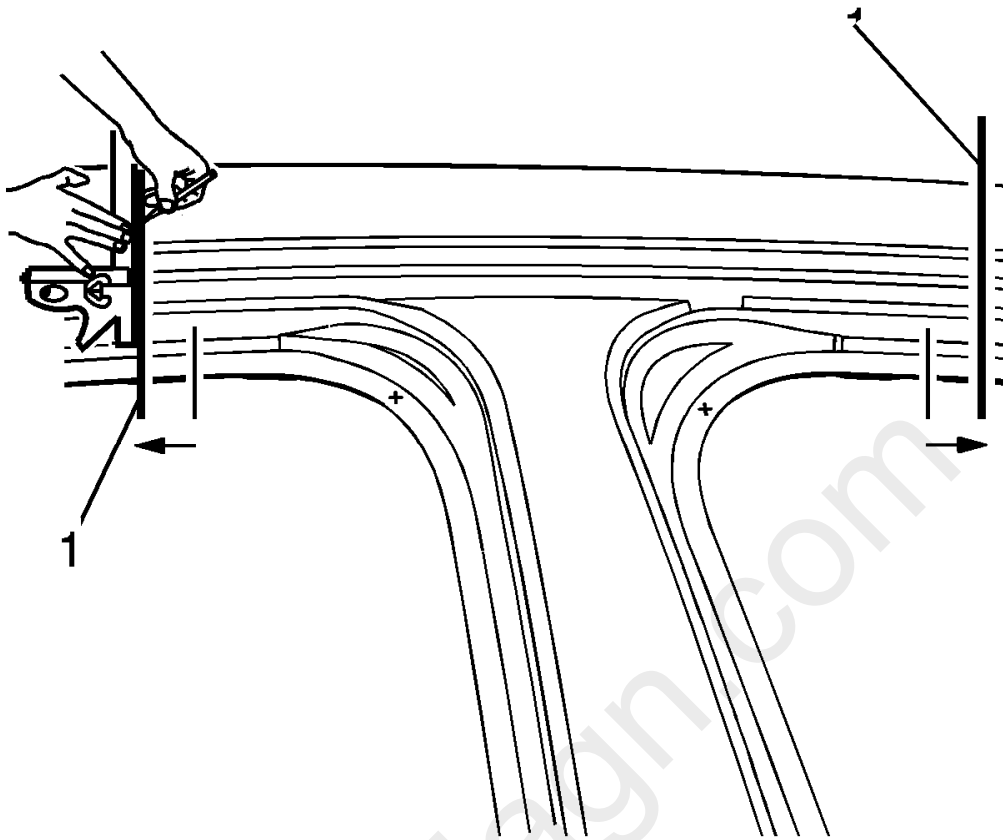


Fig. 141: Vertical Line Marks

Courtesy of GENERAL MOTORS COMPANY

7. Measure rearward from the front edge of the roof panel 800 mm and mark a second vertical line on the bodyside (1).

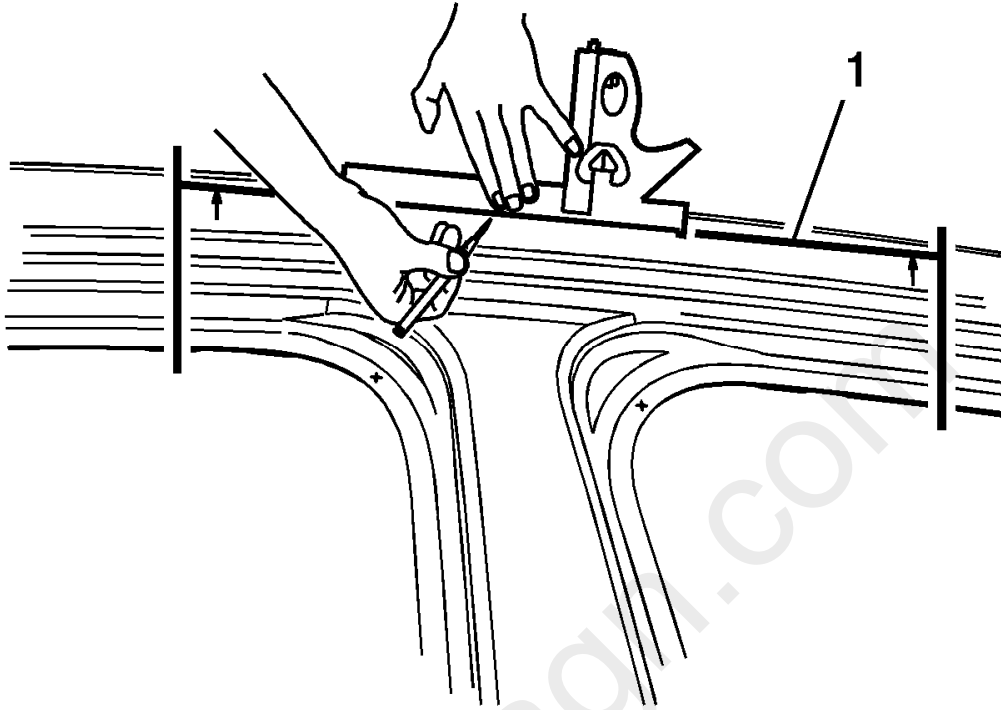


Fig. 142: Measuring Up 1 Inch From Door Opening Feature Line And Mark A Horizontal Line.
Courtesy of GENERAL MOTORS COMPANY

NOTE: Record the number and location of the original welds for installation of the service assembly.

8. Measure down 25 mm (1 in) from the upper edge of the body side outer panel and mark a horizontal line (1). This is the cut line.

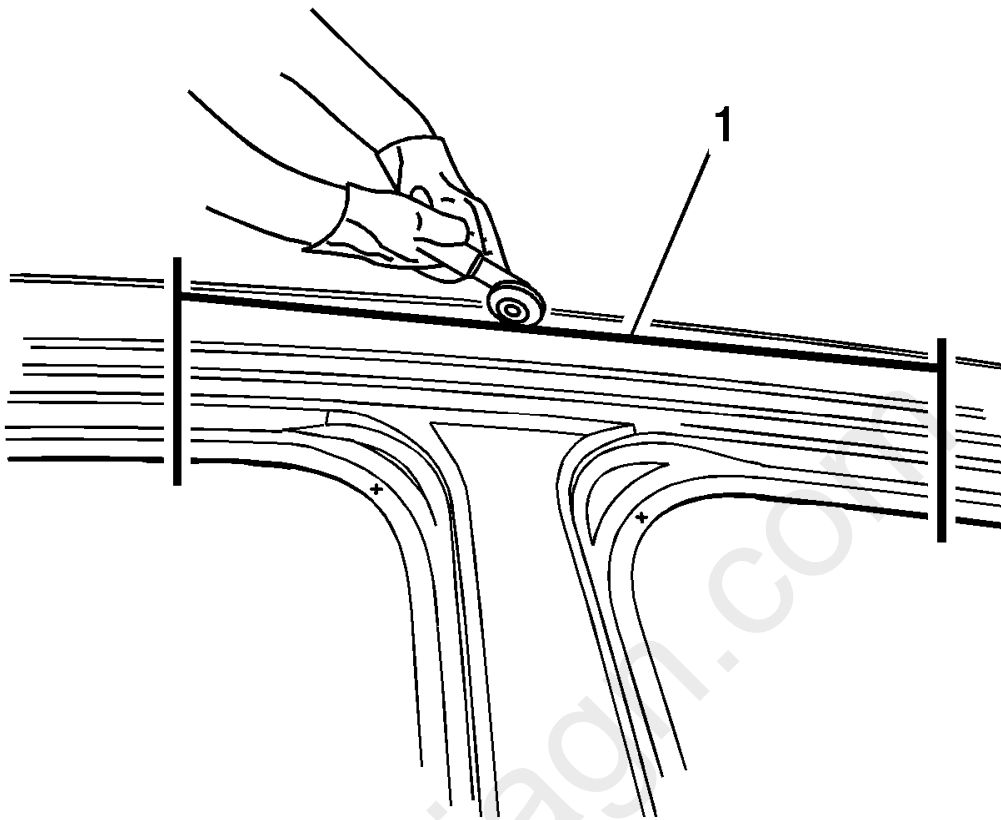


Fig. 143: Cutting Access Window In Center Pillar
Courtesy of GENERAL MOTORS COMPANY

NOTE: Do not damage or cut the upper roof pillar reinforcements. The upper roof pillar reinforcement is made of Ultra High Strength Steel. Sectioning or repair of Ultra High Strength Steel is not recommended. Refer to **Dimensions - Body**.

9. Cut access window (1) in the center pillar outer.
10. Perform additional sectioning procedures as needed depending on damage to vehicle. Refer to **Quarter Outer Panel Sectioning**, **Rocker Outer Panel Sectioning**, or **Front Hinge Pillar Body Sectioning (Lower)**, **Front Hinge Pillar Body Sectioning (Upper)**.

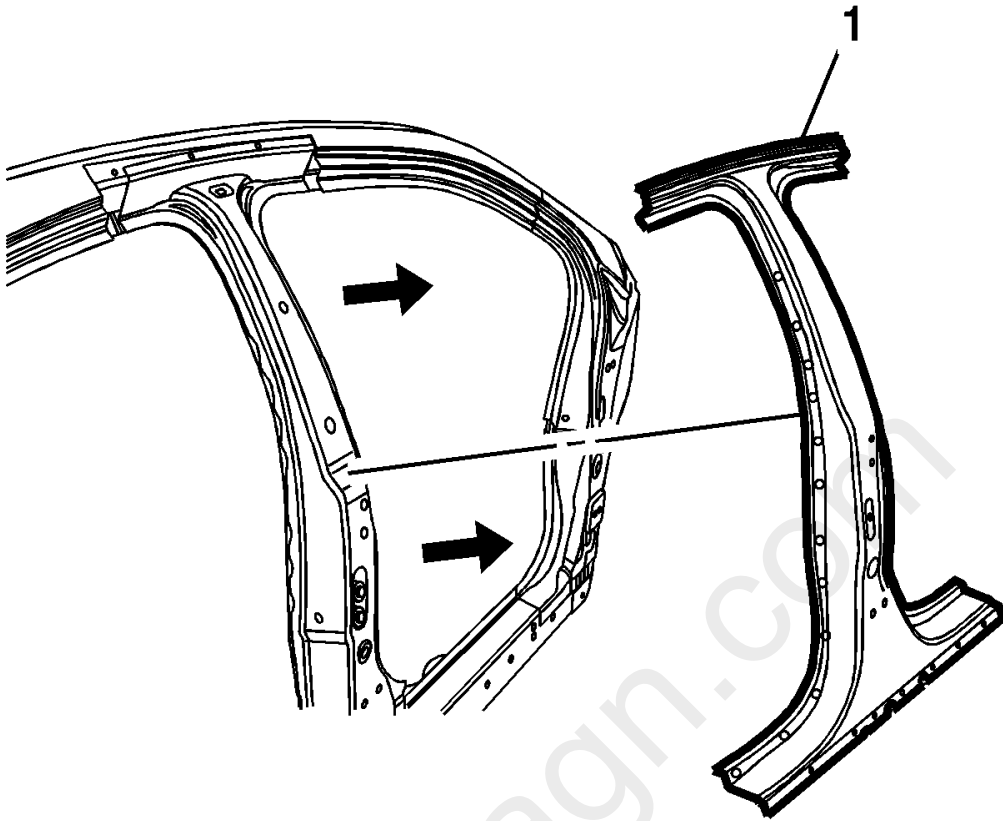


Fig. 144: Removing Damaged Center Pillar Outer Panel Section
Courtesy of GENERAL MOTORS COMPANY

11. Remove the damaged center pillar outer panel section (1).

Installation Procedure

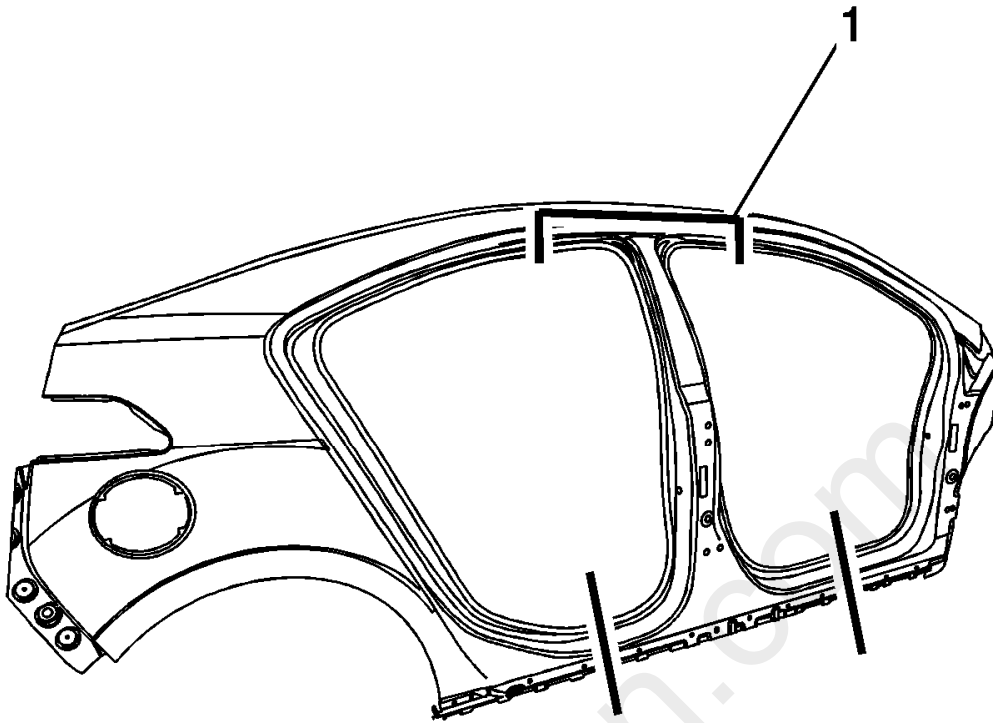


Fig. 145: Cutting Panel In Corresponding Locations
Courtesy of GENERAL MOTORS COMPANY

1. From the service part, cut the panel in corresponding locations to overlap the remaining original panel by 25 mm (1 in) at each joint location (1).

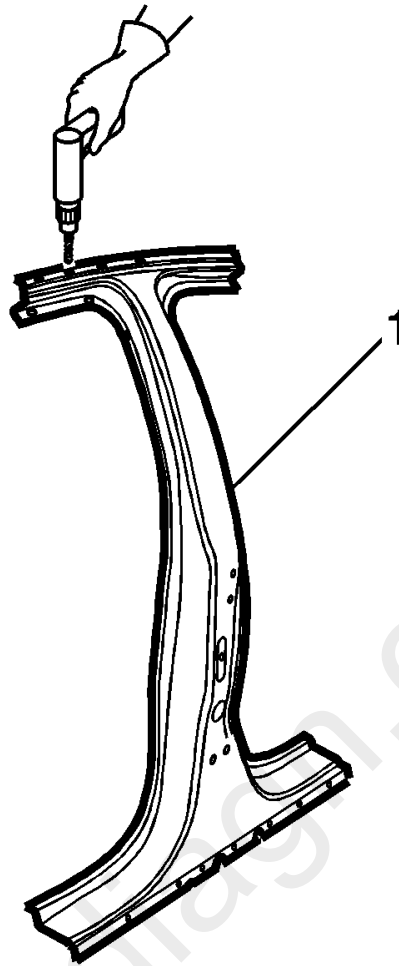


Fig. 146: Drilling Plug Weld Holes In Service Part
Courtesy of GENERAL MOTORS COMPANY

2. Prepare all mating surfaces for welding, as necessary (1).
3. Apply GM approved Weld -Thru Coating or equivalent to all mating surfaces. Refer to **Anti-Corrosion Treatment and Repair** .

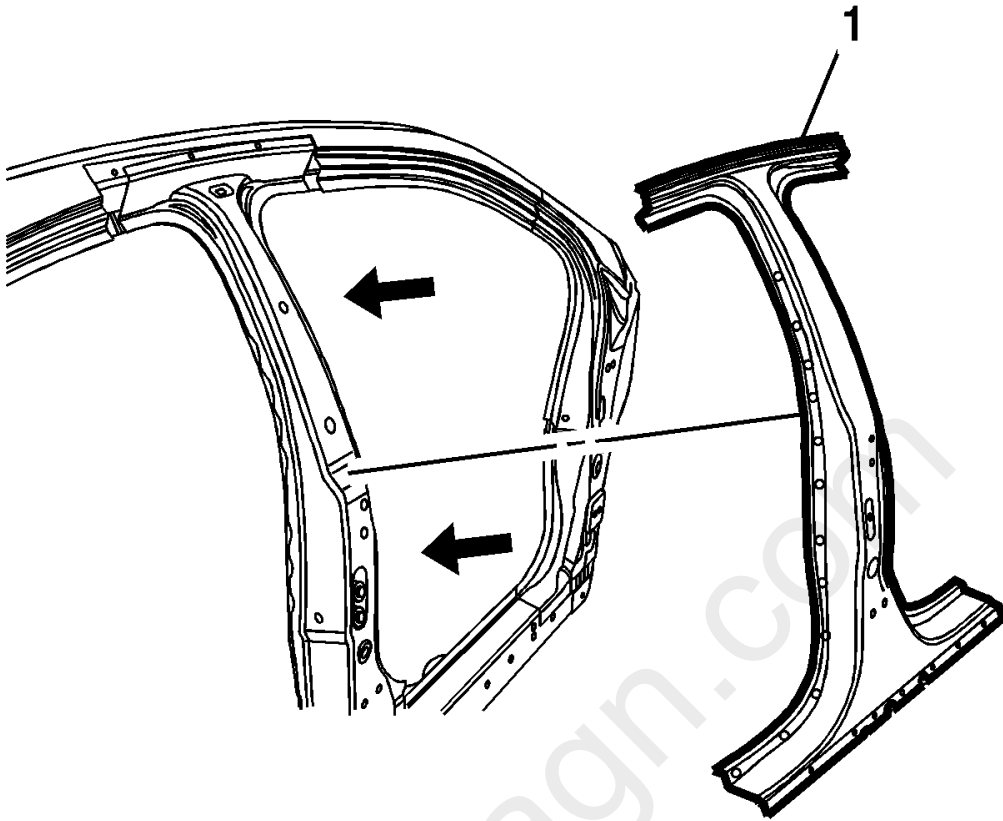


Fig. 147: Positioning Outer Center Pillar
Courtesy of GENERAL MOTORS COMPANY

4. Position the outer center pillar (1) to the vehicle using 3-dimensional measuring equipment. Clamp the pillar in place.

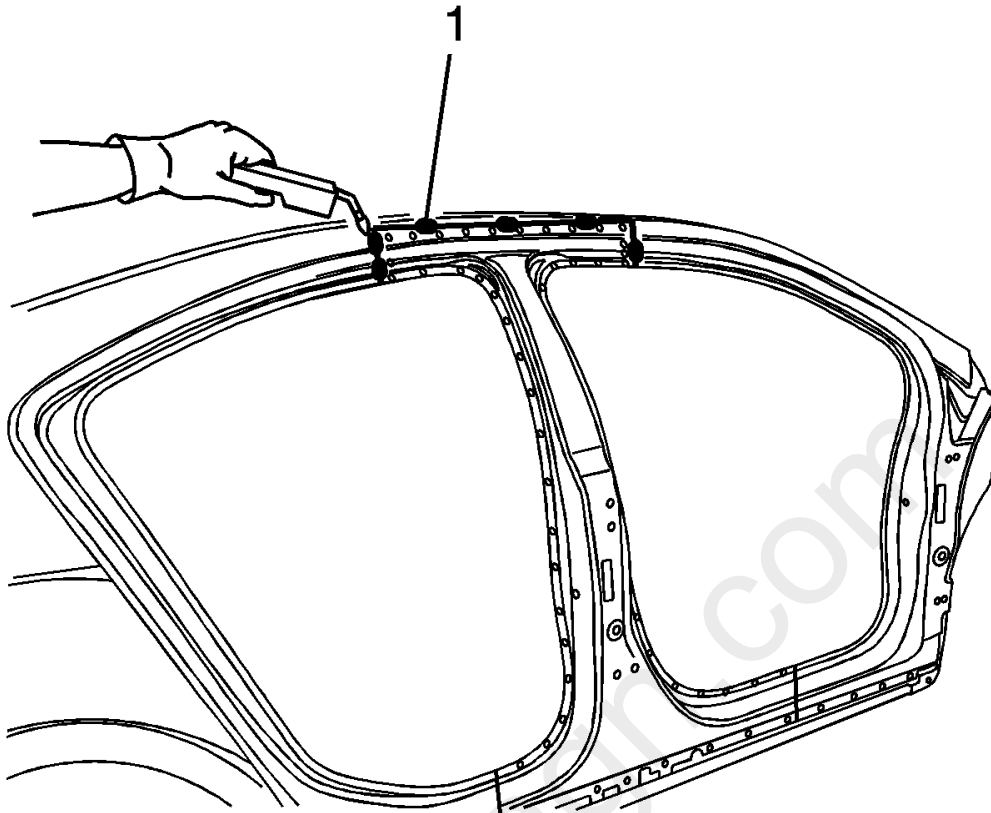


Fig. 148: Installing Outer Center Pillar
 Courtesy of GENERAL MOTORS COMPANY

5. Weld the perimeter of the part at the original spot weld locations. To create a solid weld with minimum heat distortion, make stitch welds along the 25 mm overlap joints with equal gaps between the welds. Then go back and complete the welds to create a solid weld joint (1).
6. Clean and prepare all of the welded surfaces.
7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
8. Paint the repaired area. Refer to **Basecoat/Clearcoat Paint Systems** .
9. Install all of the related panels and components.
10. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection**
11. Enable the SIR system. Refer to **SIR Disabling and Enabling** .

RESISTANCE SPOT WELDED FULL PANEL REPLACEMENT

NOTE: Use this procedure for all panels that are replaced at the factory seams, unless

a specific procedure exists in the Collision Repair section of this vehicle's service information.

Removal Procedure

WARNING: Refer to Approved Equipment for Collision Repair Warning .

1. Disable the SIR system. Refer to SIR Disabling and Enabling .
2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection .
3. Remove all related panels and components.
4. Repair as much of the damage as possible to factory specifications.

WARNING: Refer to Foam Sound Deadeners Warning .

5. Note the location and remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair .

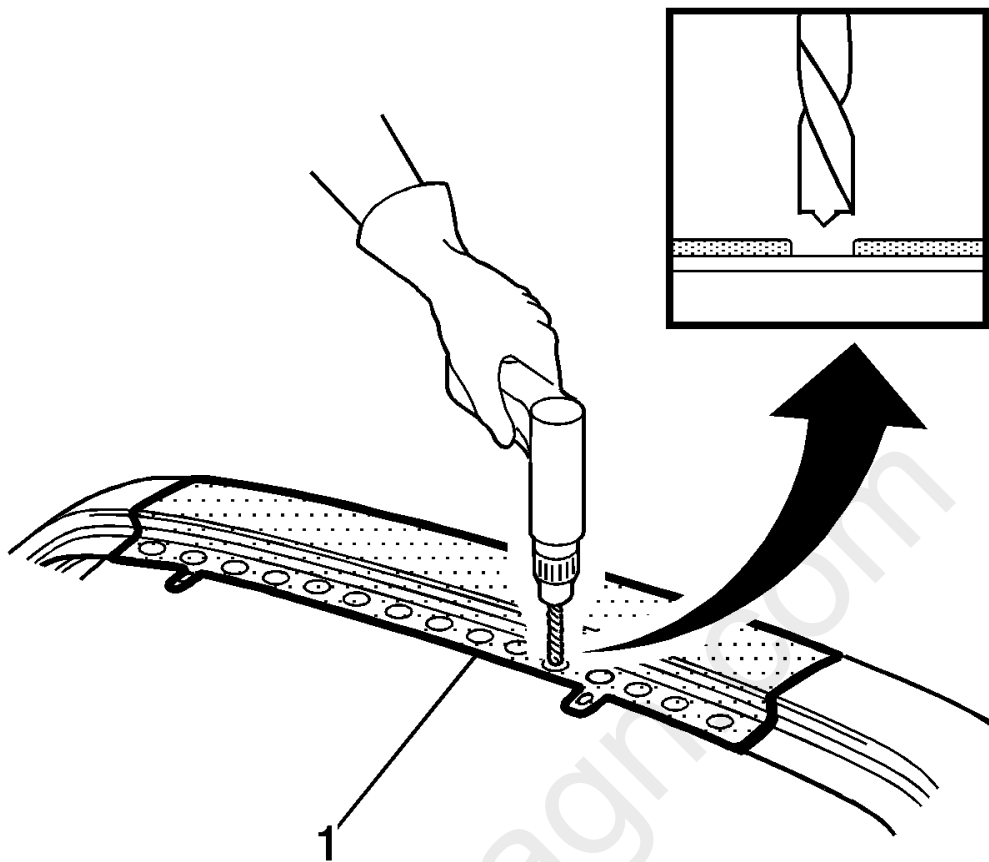


Fig. 149: Drilling Out Factory Welds (Full Panel)
Courtesy of GENERAL MOTORS COMPANY

NOTE: Do not damage any inner panels or reinforcements.

6. Locate and drill out all factory welds (1). Note the number and location of the welds for installation of the service part.

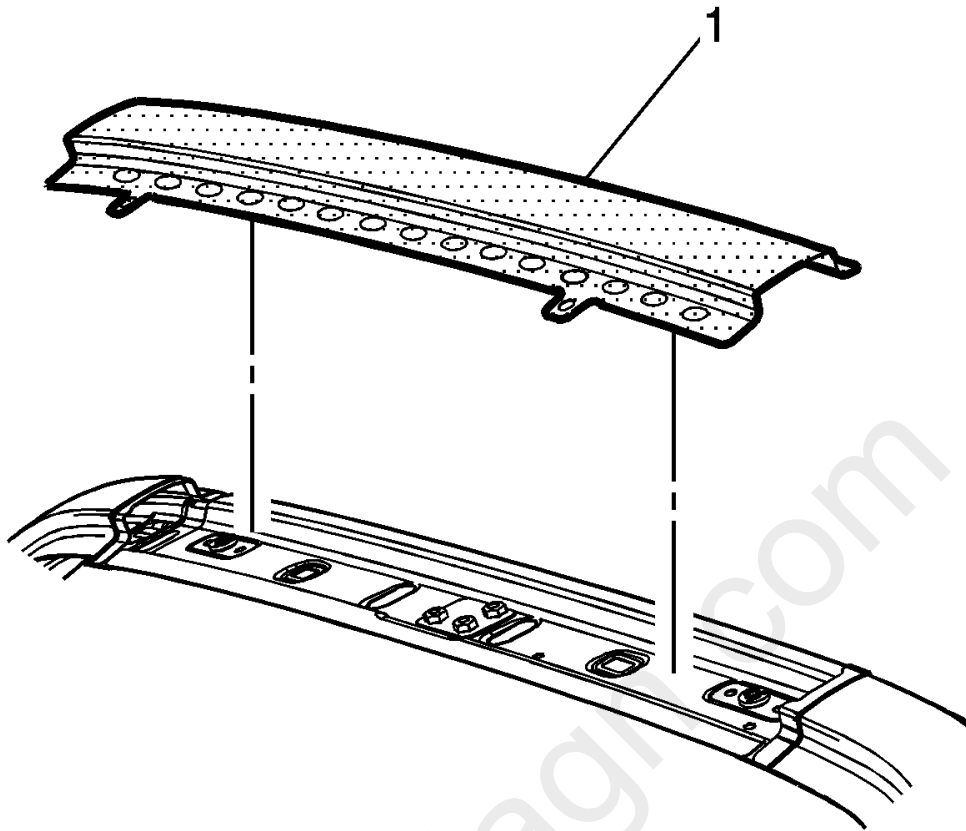


Fig. 150: View Of Damaged Part (Full Panel)
Courtesy of GENERAL MOTORS COMPANY

7. Remove the damaged part (1).

Installation Procedure

NOTE: If the location of the original plug weld holes cannot be determined, space the plug weld holes every 40 mm (1 1/2 in) apart. Where structural adhesive was present, space the plug weld holes every 20 mm (3/4 in) apart.

1. Prepare all mating surfaces as necessary.
2. Apply GM-approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to **Anti-Corrosion Treatment and Repair**.
3. Position the service part. Clamp in place.

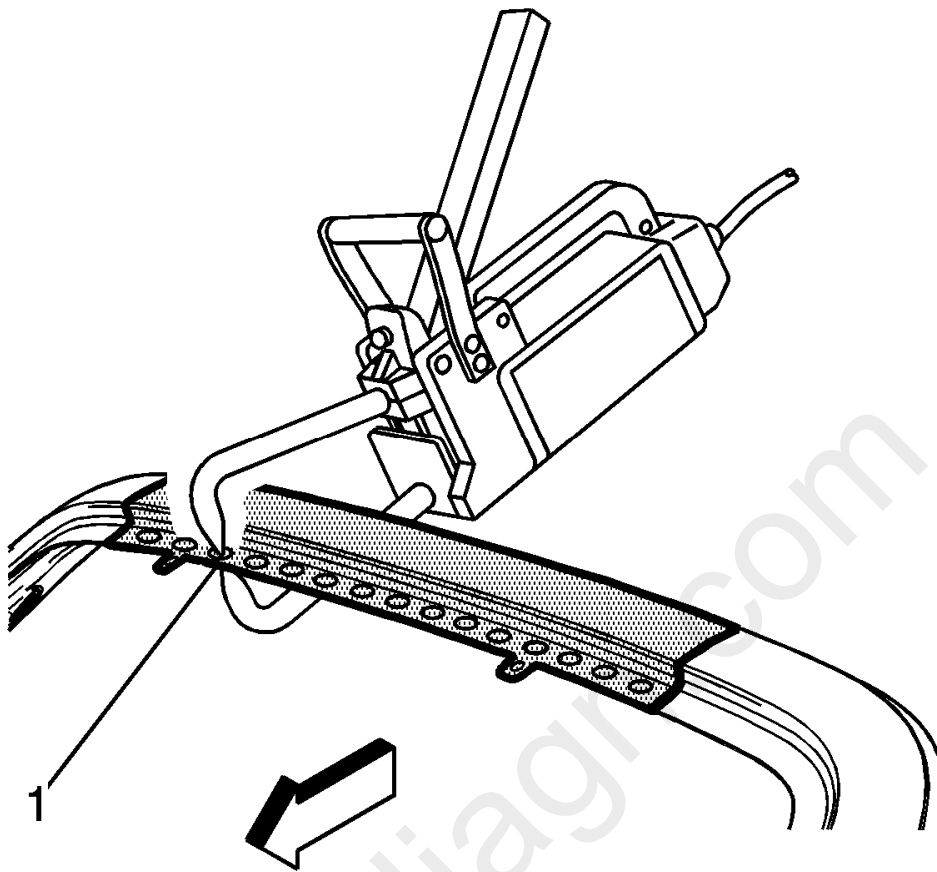


Fig. 151: Welding New Part (Full Panel)
Courtesy of GENERAL MOTORS COMPANY

4. Apply welds accordingly (1).
5. Clean and prepare all welded surfaces.
6. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
7. Paint the repair area. Refer to **Basecoat/Clearcoat Paint Systems** .
8. Install all related panels and components.
9. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection** .
10. Enable the SIR system. Refer to **SIR Disabling and Enabling** .

MIG WELDED FULL PANEL REPLACEMENT

Removal Procedure

WARNING: Refer to **Approved Equipment for Collision Repair Warning** .

NOTE: Use this procedure for all panels that are replaced at the factory seams, unless a specific procedure exists in the Collision Repair section of this vehicle's service information.

1. Disable the SIR system. Refer to **SIR Disabling and Enabling** .
2. Disconnect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection** .
3. Remove all related panels and components.
4. Repair as much of the damage as possible to factory specifications.

WARNING: Refer to **Foam Sound Deadeners Warning** .

5. Note the location and remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .

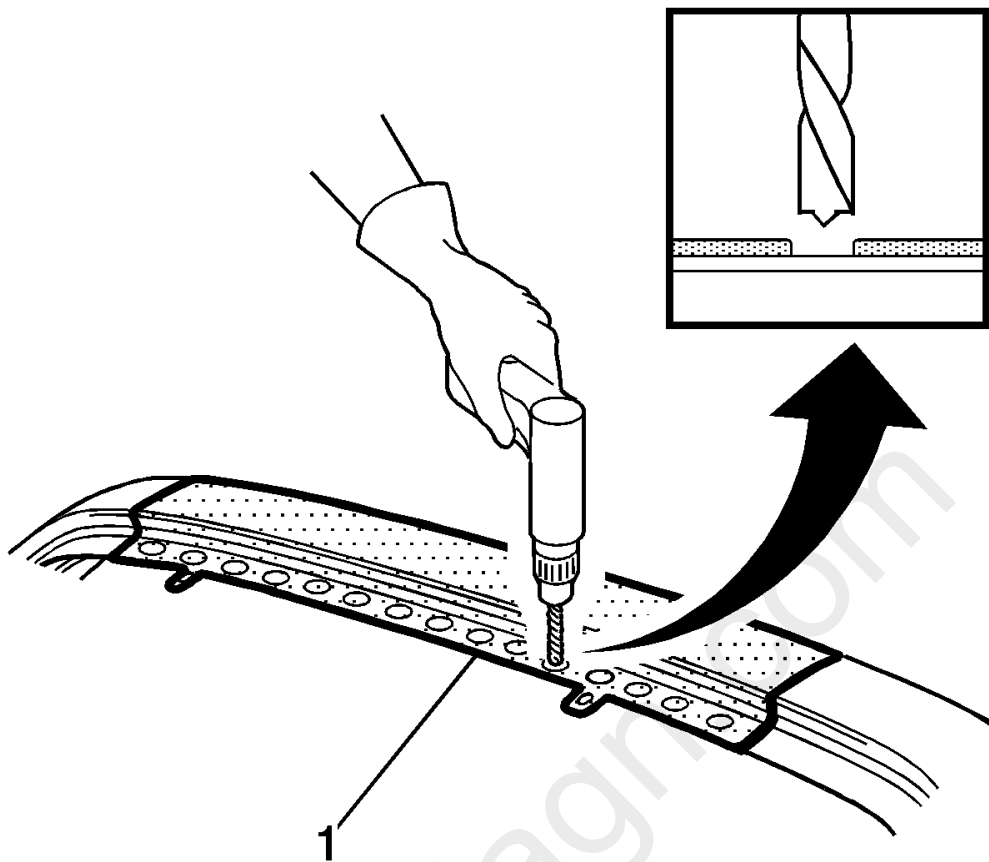


Fig. 152: Drilling Out Factory Welds (Full Panel)
Courtesy of GENERAL MOTORS COMPANY

NOTE: Do not damage any inner panels or reinforcements.

6. Locate and drill out all factory welds (1). Note the number and location of the welds for installation of the service part.

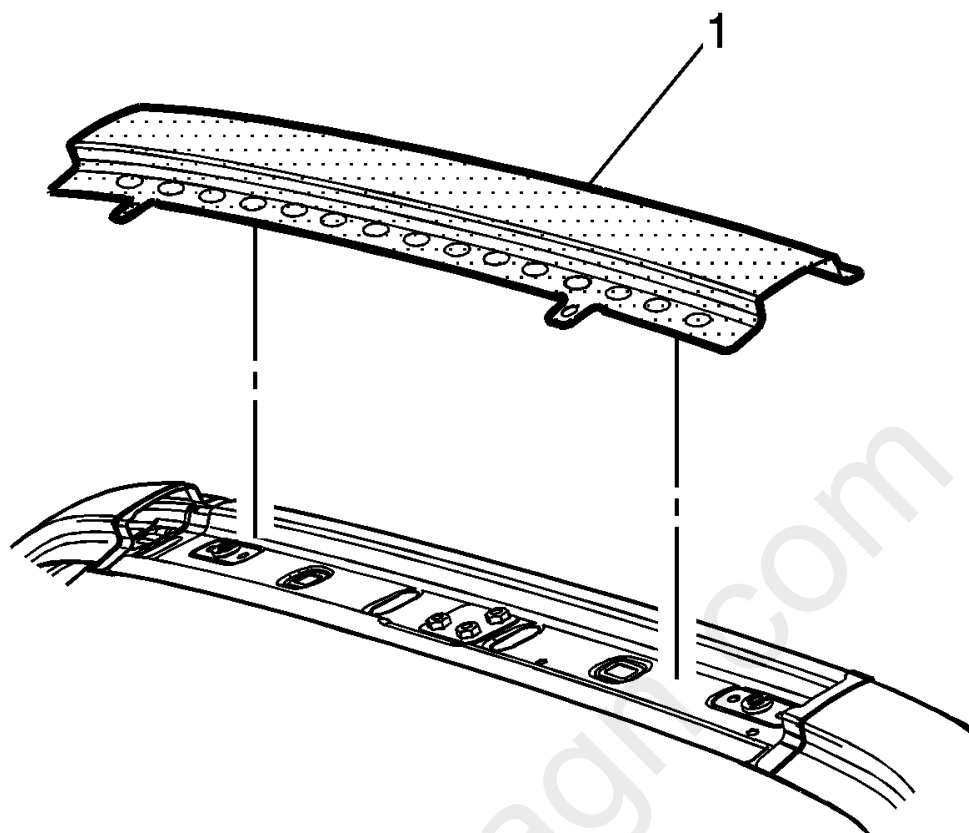


Fig. 153: View Of Damaged Part (Full Panel)
Courtesy of GENERAL MOTORS COMPANY

7. Remove the damaged part (1).

Installation Procedure

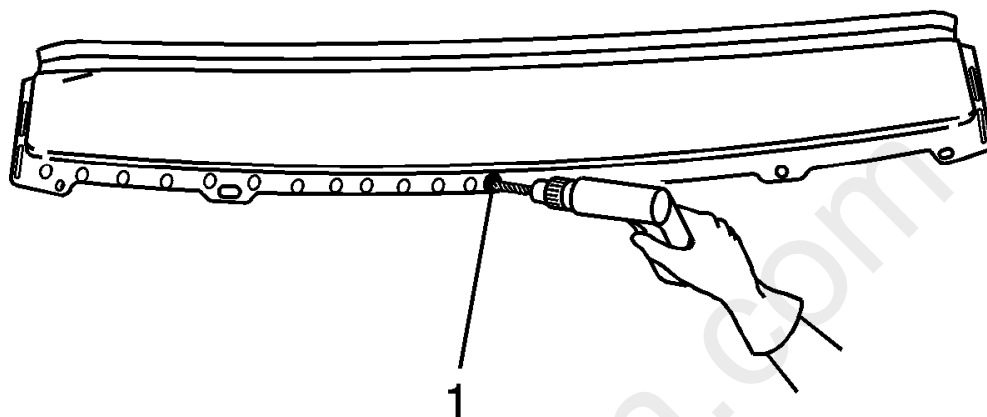


Fig. 154: Drilling Plug Weld Holes (Full Panel)
Courtesy of GENERAL MOTORS COMPANY

NOTE: If the location of the original plug weld holes can not be determined, space the plug weld holes every 40 mm (1 1/2 in) apart. Where structural adhesive was present, space the plug weld holes every 20 mm (3/4 in) apart.

1. Drill 8 mm (5/16 in) plug weld holes in the service part as necessary in the locations noted from the original panel (1).
2. Prepare all attachment surfaces as necessary.
3. Prepare all mating surfaces as necessary.
4. Apply GM-approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to **Anti-Corrosion Treatment and Repair**.
5. Position the service part. Clamp in place.

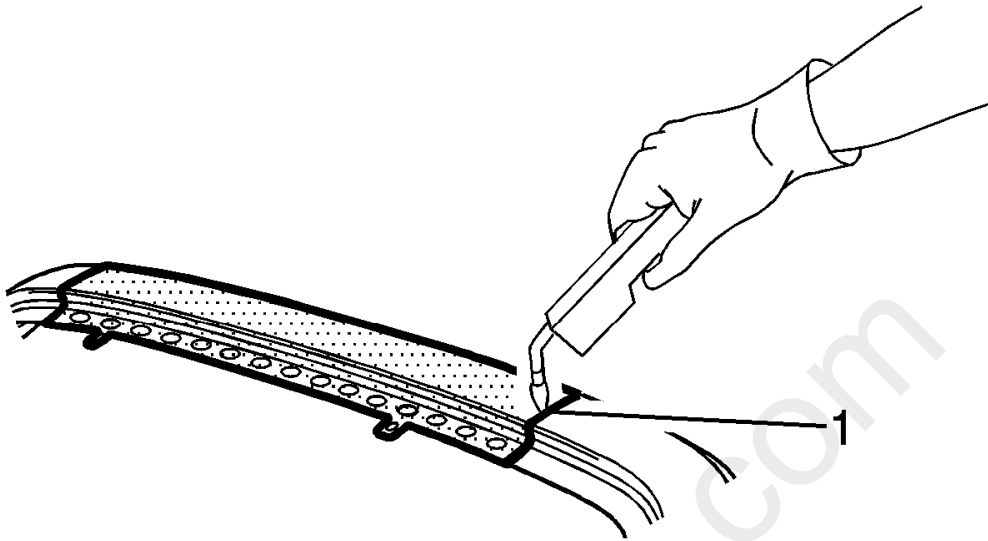


Fig. 155: Plug Welding Service Part (Full Panel)
Courtesy of GENERAL MOTORS COMPANY

6. Plug weld accordingly (1).
7. Clean and prepare all welded surfaces.
8. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
9. Paint the repair area. Refer to **Basecoat/Clearcoat Paint Systems** .
10. Install all related panels and components.
11. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection** .
12. Enable the SIR system. Refer to **SIR Disabling and Enabling** .

DESCRIPTION AND OPERATION

ALUMINUM PANEL BONDING

This information is intended to provide general guidelines for adhesive bonding of aluminum panels. Panel

bonding of aluminum is only recommended when the panel is originally bonded to the vehicle.

The adhesives listed in this document are known to meet the General Motors specifications and requirements for bonding of aluminum body panels.

Bonding procedures in general are applicable only at factory joints.

The use of adhesive to section aluminum panels is not recommended by General Motors.

Rivets, or other mechanical fasteners, may be used in combination with adhesive bonding of aluminum panels. The specified rivets, or fasteners, should be used with adhesive, when replacing the original panel.

Two types of adhesives are listed here. Impact Resistant Adhesive is used in joints in frame rail assemblies and strut tower assemblies and other body structure joints that have critical strength requirements. The factory applied Impact Resistant Adhesive is purple in color when cured. The only adhesive available for servicing these joints is Dow Betamate 2098. The other bonding adhesives are non-impact resistant, offer a lower strength rating and can be used in all other joints that are not originally made with Impact Resistant Adhesive

NOTE: Always follow the adhesive manufacturer's instructions for application, handling, and curing for the specific product.

Adhesives currently meeting the performance requirements include the adhesive products listed below meet these guidelines:

Aluminum Panel Bonding Impact Resistant

Manufacturer and Part Number	Description
Dow 2098	Betamate 2098 Impact Resistant Adhesive Available only from Dow at 800-375-0605

Aluminum Panel Bonding Non Impact Resistant

Manufacturer and Part Number	Description
GM P/N 12378566 (US)	Fast Set Panel Bonding Adhesive
GM P/N 88901674 (Canada)	
Lord Fusor P/N 110B/111B	
GM P/N 12378567 (US)	Medium Set Panel Bonding Adhesive
GM P/N 88901675 (Canada)	
Lord Fusor P/N 108B/109B	
3M P/N 8116	Panel Bonding Adhesive
Ashland Plio Grip Panel 60	Panel Bonding Adhesive

DUAL PHASE STEEL

This information provides repair recommendations and general guidelines for steel classified as Dual Phase Steel, also known as DP. This type of steel normally has a tensile strength below 780 MPa.

General Motors recommends the following when repairing or replacing this type of steel during collision repair.

NOTE: **The use of heat to repair damage is not recommended for this classification of steel.**

Recommended Repairs

- Cold repairs can be performed on this type of steel, unless the damage includes kinks. If the damage includes kinks, the part should be replaced.
- Sectioning or partial replacement of this type of steel is recommended only at approved locations, in a specific sectioning procedure.
- This type of steel can be used as a sleeve, or backer plate, when recommended in a specific sectioning procedure.
- Squeeze Resistance Spot Welding can be used to replace factory spot welds, where applicable.
- MIG plug welding and MIG stitch welding can be used on this type of steel.
- MIG Brazing can be used on this type of steel.

HIGH STRENGTH LOW ALLOY STEEL

This information provides repair recommendations and general guidelines for steel classified as High Strength Low Alloy Steel, also known as HSLA. This type of steel normally has a tensile strength range from 300-700 MPa.

General Motors recommends the following when repairing or replacing this type of steel during collision repair.

Recommended Repairs

- Cold repairs can be performed on this type of steel, unless the damage includes kinks. If the damage includes kinks, the part should be replaced.
- Controlled use of heat can be used to repair damage, if the heat does not exceed 650°C (1200°F). The heat should be applied a maximum of 2 times, for up to 90 seconds.
- Sectioning or partial replacement of this type of steel is recommended only at approved locations, in a specific sectioning procedure.
- This type of steel can be used as a sleeve, or backer plate, during sectioning procedures.
- Squeeze Resistance Spot Welding can be used to replace factory spot welds, where applicable.
- MIG plug welding and MIG stitch welding can be used on this type of steel.
- MIG Brazing can be used on this type of steel.

METAL PANEL BONDING (STEEL)

This is intended to provide general guidelines for adhesive bonding of exterior panels as an alternative to Metal-Inert Gas (MIG) welding. Panel bonding may be seen as an alternative to MIG welding to provide full panel replacement in regards to collision repair procedures. The benefits of panel bonding is:

- No heat or burn damage when additional welding is not required
- Corrosion protection
- Can act as a sealant
- Improved process for complicated shapes (wheelhouse area)

The General Motors specification for metal bonding adhesives is GM 6449G. The scope of this specification is intended to provide the performance guidelines of structural adhesive systems used to repair (metallic) automotive bodies in the aftermarket. These types of adhesives are intended for use when bonding replacement body panels as an option to welding as the attachment means. GM information outlines the use of room temperature cure acrylic adhesives that contain glass bead technology.

Bonding procedures in general are applicable only to a factory seams type approach.

Sectioning or partial paneling of full panels is not supported by General Motors unless specifically documented in a Service Bulletin or Manual.

Applicable components for this technology are EXTERIOR PANELS ONLY, including door skins, tail panels, roof outer panels and quarter panels.

IMPORTANT: Do not use adhesives for vehicle underbody or upper body structure type repairs such as structural rails, shock/strut towers, floor pans, upper fender rails, body side pillars, door rings-side or rear, rocker panels, unless specifically documented in a GM Service Bulletin or Manual. If in doubt, use only the procedures referenced in the Service Manual for the specific vehicle being repaired.

Always follow the system manufacturer's instructions for application, handling, and curing.

Adhesives currently meeting the performance requirements include General Motors materials and products manufactured by Lord Adhesives. At this time, ONLY the adhesive products listed below meet this guideline:

Metal Panel Bonding (Steel)

Manufacturer and Part Number	Description
GM P/N 12378566 (US)	Fast Set Panel Bonding Adhesive
GM P/N 88901674 (Canada)	
Lord Fusor P/N 110B/111B	
GM P/N 12378567 (US)	Medium Set Panel Bonding Adhesive
GM P/N 88901675 (Canada)	
Lord Fusor P/N 108B/109B	
3M P/N 8116	Panel Bonding Adhesive
Ashland Plio Grip Panel 60	Panel Bonding Adhesive

MILD STEEL

This information provides repair recommendations and general guidelines for steel classified as Mild Steel. This type of steel normally has a tensile strength less than 270 MPa. This includes the common steel names of:

- Mild Steel
- Bake Hardenable Steel (BH)
- Solid Solution Strengthened Steel

General Motors recommends the following when repairing or replacing this type of steel during collision repair.

Recommended Repairs:

- Cold repairs can be performed on this type of steel, unless the damage includes kinks. If the damage includes kinks, the part should be replaced.
- Controlled use of heat can be used to repair damage, if the heat does not exceed 650°C (1200°F). The heat should be applied a maximum of 2 times, for up to 90 seconds.
- Sectioning or partial replacement of this type of steel is recommended only at approved locations, in a specific sectioning procedure.
- This type of steel can be used as a sleeve, or backer plate, when recommended in a specific sectioning procedure.
- Squeeze Resistance Spot Welding can be used to replace factory spot welds, where applicable
- MIG plug welding and MIG stitch welding can be used on this type of steel.
- MIG Brazing can be used on this type of steel.

ULTRA HIGH STRENGTH DUAL PHASE STEEL

This information provides repair recommendations and general guidelines for steel classified as Ultra High Strength Dual Phase Steel, also known as DPX. This type of steel normally has a tensile strength of 780 MPa, or greater.

General Motors recommends the following when repairing or replacing this type of steel during collision repair.

NOTE:

- **Repair of this type of steel is not recommended.**
- **This type of steel should be replaced at factory joints only. Sectioning or partial replacement is not recommended.**
- **The use of heat to repair damage is not recommended for this type of steel.**
- **Stitch Welding is not recommended for this type of steel (unless replacing a factory installed stitch weld).**
- **This type of steel should not be used as a backing reinforcement or a sleeve for a sectioning joint.**

Recommended Repairs:

- Squeeze Resistance Spot Welding can be used to replace factory spot welds, where applicable.

- MIG plug welding can be used to replace factory spot welds.
- MIG Brazing can be used to replace factory spot welds.

ULTRA HIGH STRENGTH STEEL

This information provides repair recommendations and general guidelines for steel classified as Ultra High Strength Steel, also known as UHSS. This type of steel normally has a tensile strength of 780 MPa, or greater.

This includes the common steel names of

- Ultra High Strength Dual Phase Steel (DPX)
- Martensitic Steel (M)
- Boron/Press Hardened Steel (B)
- Multi-Phase Steel (MP)
- TRIP Steel (TR)

General Motors recommends the following when repairing or replacing this type of steel during collision repair.

NOTE:

- **Repair of this type of steel is not recommended.**
- **This type of steel should be replaced only, at factory joints. Sectioning or partial replacement is not recommended.**
- **The use of heat to repair damage is not recommended for this type of steel.**
- **Stitch Welding is not recommended for this type of steel (unless replacing a factory installed stitch weld).**
- **This type of steel should not be used as a backing reinforcement or a sleeve for a sectioning joint.**

Recommended Repairs

- Squeeze Resistance Spot Welding can be used to replace factory spot welds, where applicable.
- MIG plug welding can be used to replace factory spot welds.
- MIG Brazing can be used to replace factory spot welds.