

2010 ACCESSORIES & EQUIPMENT

Collision Repair - Equinox & Terrain

SPECIFICATIONS

DIMENSIONS - BODY

Description

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

Under Hood Opening Dimensions

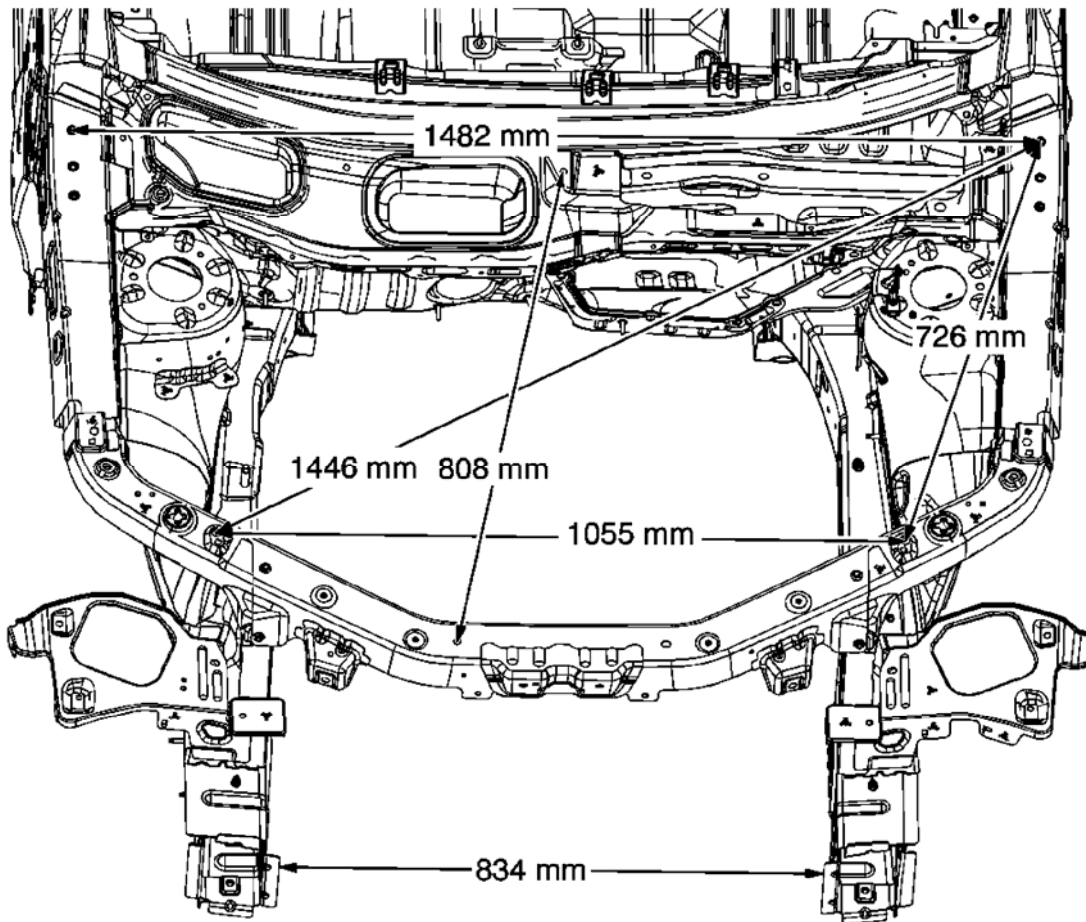


Fig. 1: Under Hood Opening Dimensions
Courtesy of GENERAL MOTORS CORP.

Body Side Opening Dimensions (Equinox)

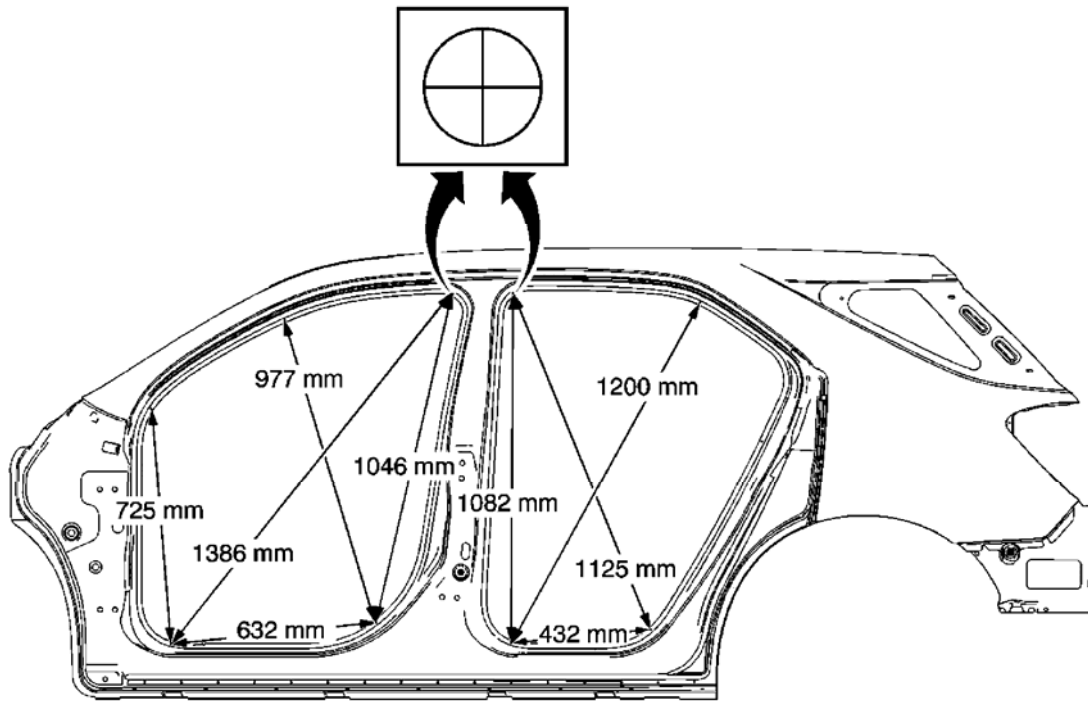


Fig. 2: Body Side Opening Dimensions (Equinox)
Courtesy of GENERAL MOTORS CORP.

Rear Body Dimensions

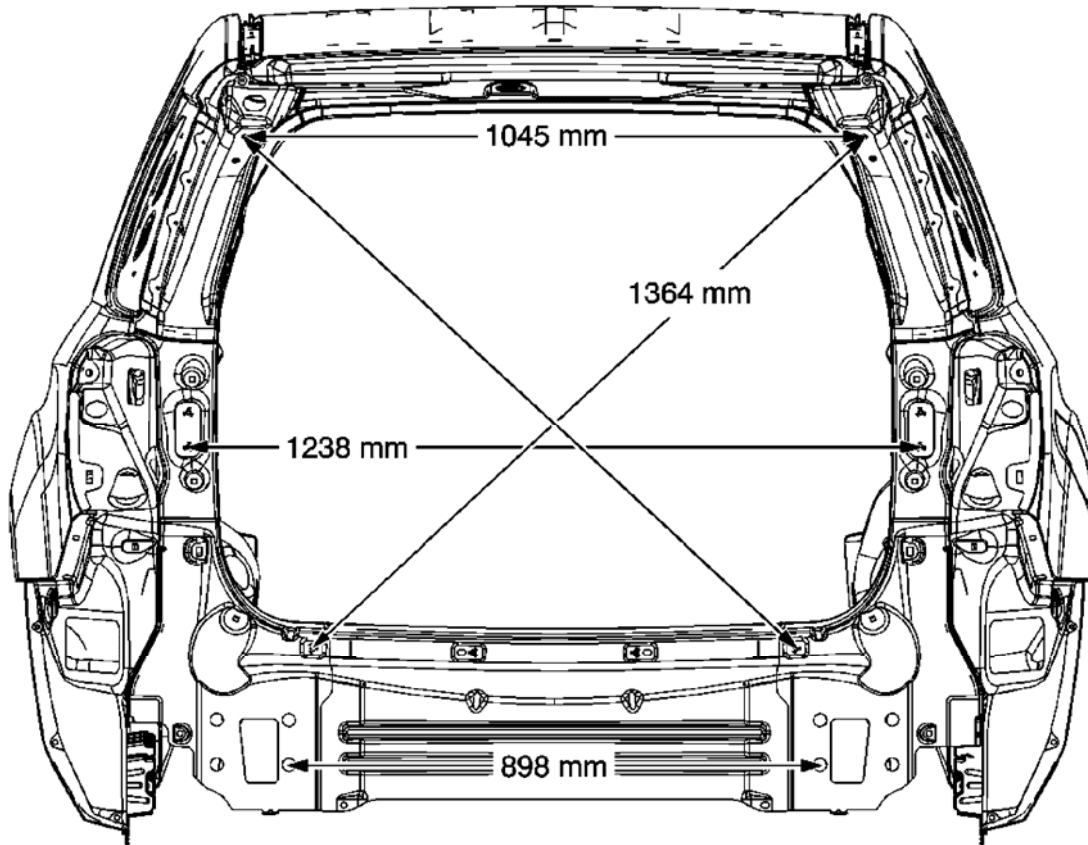


Fig. 3: Rear Body Dimensions
Courtesy of GENERAL MOTORS CORP.

VISUAL IDENTIFICATION

STRUCTURE IDENTIFICATION

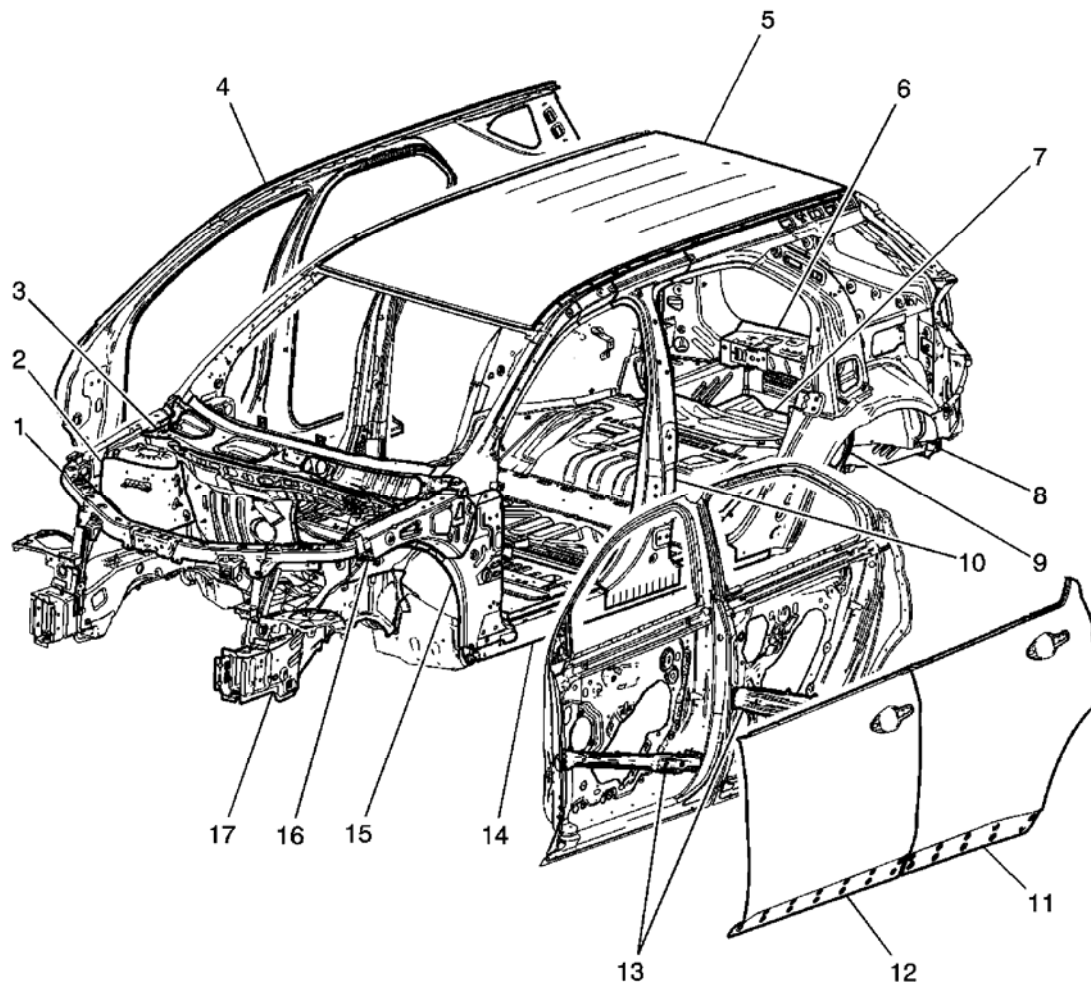


Fig. 4: Structure Identification
 Courtesy of GENERAL MOTORS CORP.

Structure Identification (Coupe)

Number	Description	Materials	Procedure
1	Radiator Support Assembly	<u>Mild Steel</u>	<u>Front End Upper Tie Bar Replacement</u>
2	Front Wheelhouse Assembly	<u>Mild Steel</u>	<u>Front Wheelhouse Panel Replacement</u>
3	Plenum Upper	<u>Mild Steel</u>	<u>Plenum Upper Panel Replacement</u>
4	Body Side Outer	• Body Side Outer <u>Mild Steel</u> • A-Pillar and Roof Rail Reinf's <u>Dual Phase Steel</u>	• <u>Center Pillar Outer Panel Reinforcement Replacement</u> • <u>Quarter Outer Panel Sectioning</u>

5	Roof Outer Panel	<u>Mild Steel</u>	<u>Roof Outer Panel Replacement</u>
6	Rear End Panel	<u>Mild Steel</u>	<u>Body Rear End Panel Replacement</u>
7	Rear Floor Panel	<u>Mild Steel</u>	<u>Rear Floor Panel Replacement</u>
8	Rear Rail Assembly	<u>Mild Steel</u>	• <u>Rear Rail Replacement</u> • <u>Rail Replacement - Rear Section</u>
9	Rear Wheelhouse	<u>Mild Steel</u>	<u>Rear Inner Wheelhouse Replacement</u>
10	Center Pillar	• Reinf - C/Plr Otr, Reinf - C/Plr Inr Lwr, Reinf - C/Plr Ctr <u>Mild Steel</u> • C/Plr Inr, Reinf - C/Plr Inr, Reinf - C/Plr Otr Upr <u>Dual Phase Steel</u>	<u>Center Pillar Outer Panel Reinforcement Replacement</u>
11	Rear Side Door	<u>Mild Steel</u>	<u>Rear Side Door Outer Panel Replacement</u>
12	Front Side Door	<u>Mild Steel</u>	<u>Front Side Door Outer Panel Replacement</u>
13	Side Door Impact Beams	<u>Ultra High Strength Steel</u>	Not Serviced
14	Rocker Panel	<u>Ultra High Strength Steel</u>	<u>Rocker Inner Panel Reinforcement Replacement</u>
15	Front Panel	<u>Mild Steel</u>	• <u>Front Inner Hinge Pillar Body Replacement</u> • <u>Front Hinge Pillar Body Sectioning</u>
16	Upper Rail	<u>Mild Steel</u>	<u>Front Compartment Upper Side Rail Replacement</u>
17	Front Rail Assembly	<u>Mild Steel</u>	• <u>Front Compartment Front Rail Replacement</u> • <u>Front Compartment Inner Side Rail Replacement</u> • <u>Underbody Outer Front Side Rail Replacement</u>

REPAIR INSTRUCTIONS

FRONT END UPPER TIE BAR REPLACEMENT

Removal Procedure

WARNING: Refer to Approved Equipment for Collision Repair Warning .

WARNING: Refer to Glass and Sheet Metal Handling Warning .

NOTE: Before beginning the repair, refer to Metal Panel Bonding for proper adhesive applicator preparations and general information.

1. Disable the supplemental inflatable restraint (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. Refer to Dimensions - Body.
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 .

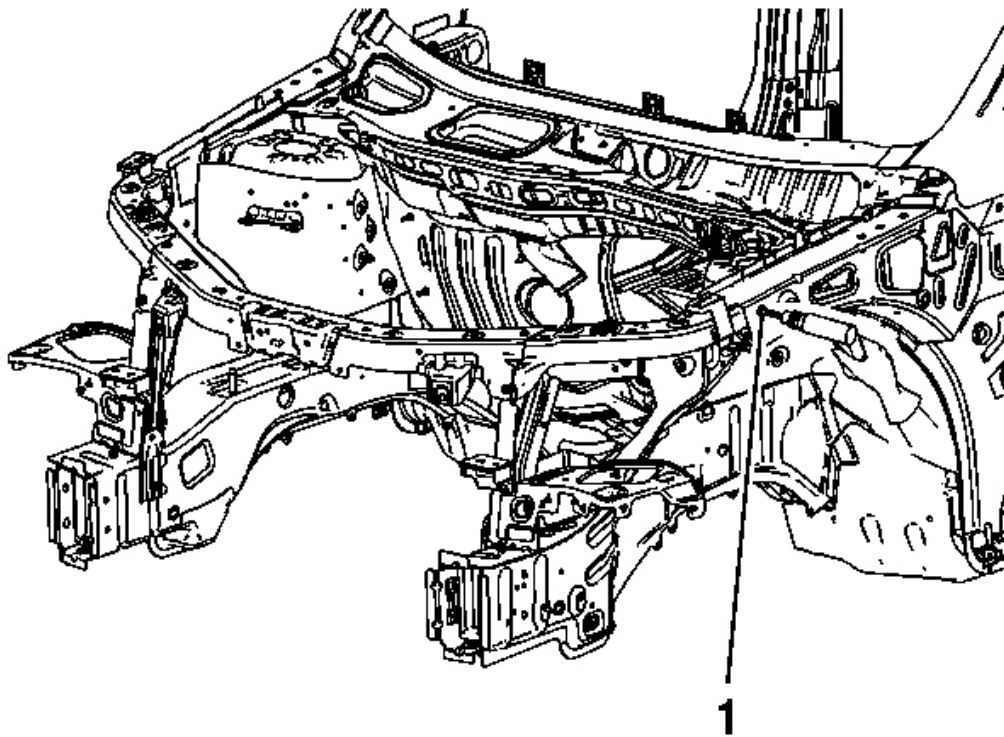


Fig. 5: Locating Factory Welds
Courtesy of GENERAL MOTORS CORP.

NOTE: Do not damage any inner panels or reinforcements. Record the number and location of the original welds for installation of the service part.

6. Locate and drill out all factory welds (1).

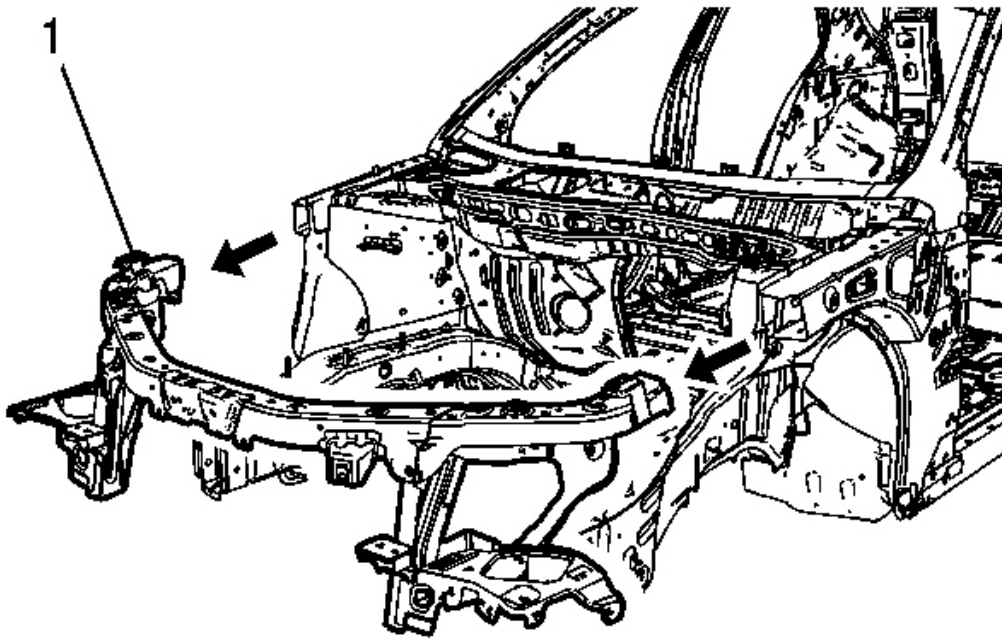


Fig. 6: Damaged Tie Bar Assembly
Courtesy of GENERAL MOTORS CORP.

7. Remove the damaged tie bar assembly (1).

Installation Procedure

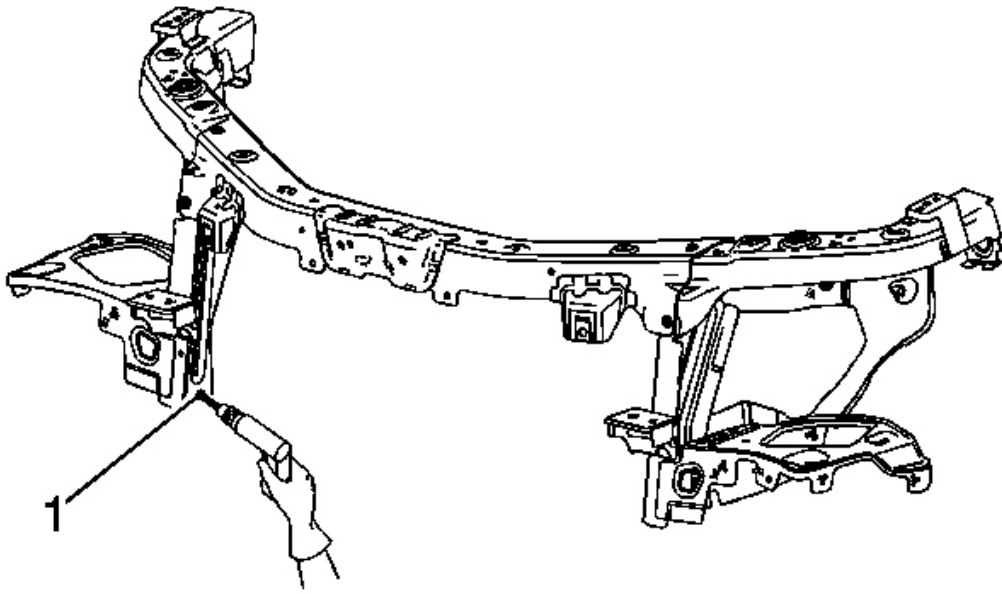


Fig. 7: Drilling Plug Welds

Courtesy of GENERAL MOTORS CORP.

NOTE: If the location of the original plug welds cannot be determined or structural weld- thru adhesive was present, space plug weld holes every 40 mm (1 1/2 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 mating surfaces as necessary.
3. Apply GM-approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to **Anti-Corrosion Treatment and Repair** .

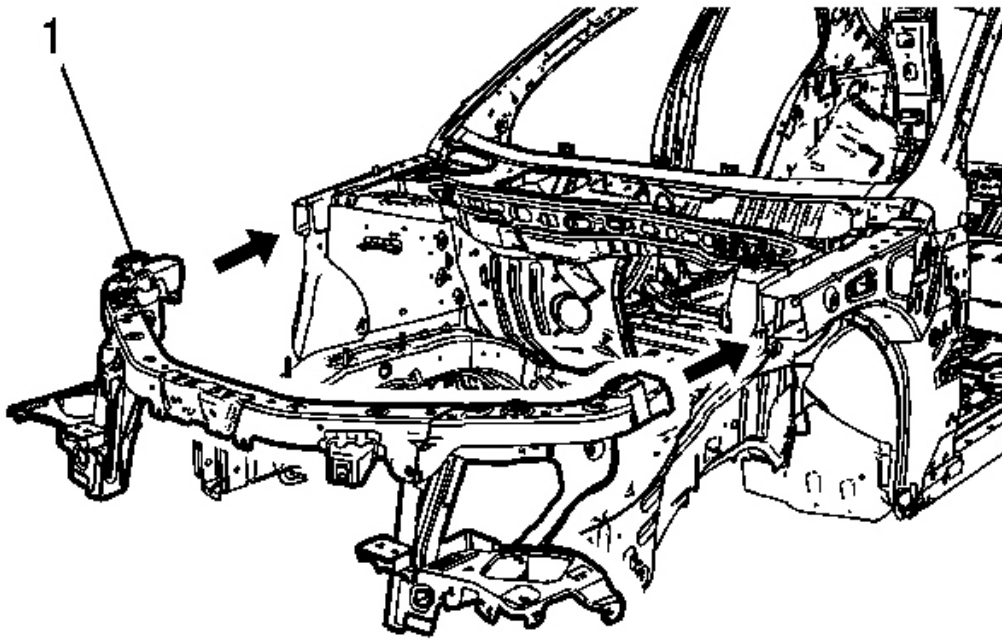


Fig. 8: Positioning Tie Bar Assembly
Courtesy of GENERAL MOTORS CORP.

4. Position the tie bar assembly to the vehicle using 3-dimensional measuring equipment (1). Clamp the tie bar assembly into place.

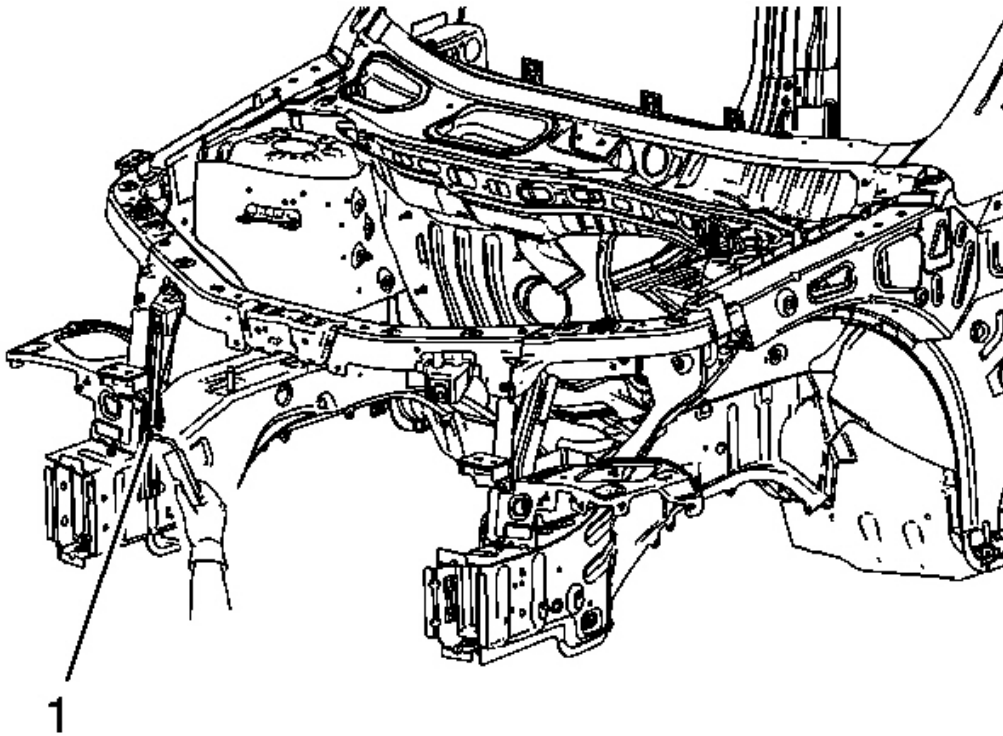


Fig. 9: Plug Welding

Courtesy of GENERAL MOTORS CORP.

5. Plug weld accordingly (1).
6. Clean and prepare all 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 repair 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** .

FRONT WHEELHOUSE PANEL REPLACEMENT

Removal Procedure

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

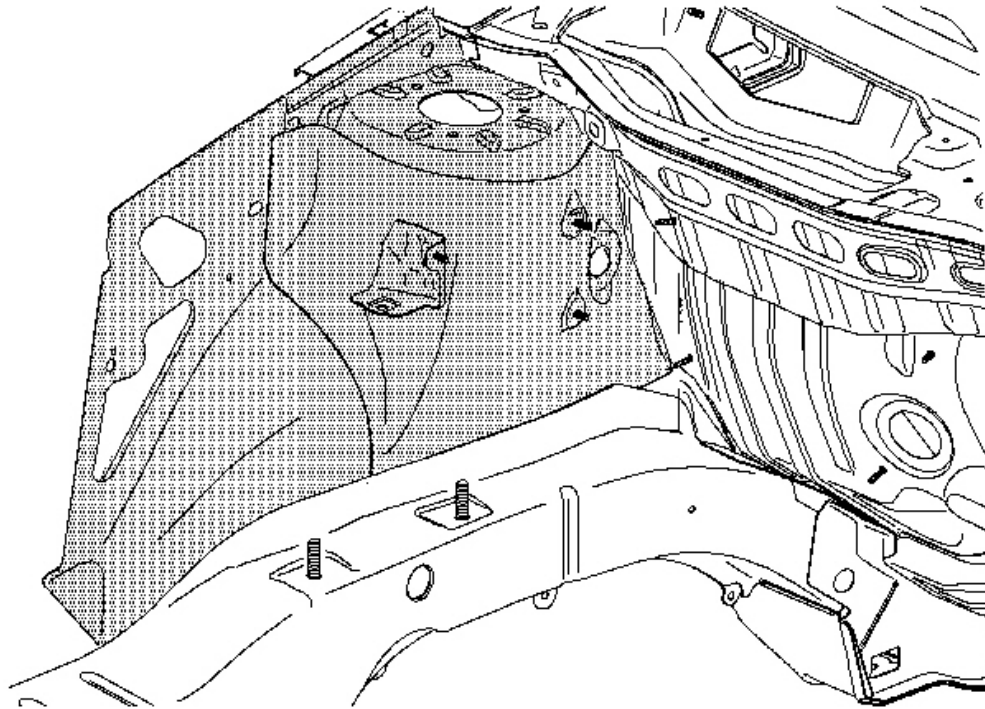


Fig. 10: View of Front Wheelhouse
Courtesy of GENERAL MOTORS CORP.

1. Disable the supplemental inflatable restraint (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. Refer to **Dimensions - Body**.
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** .

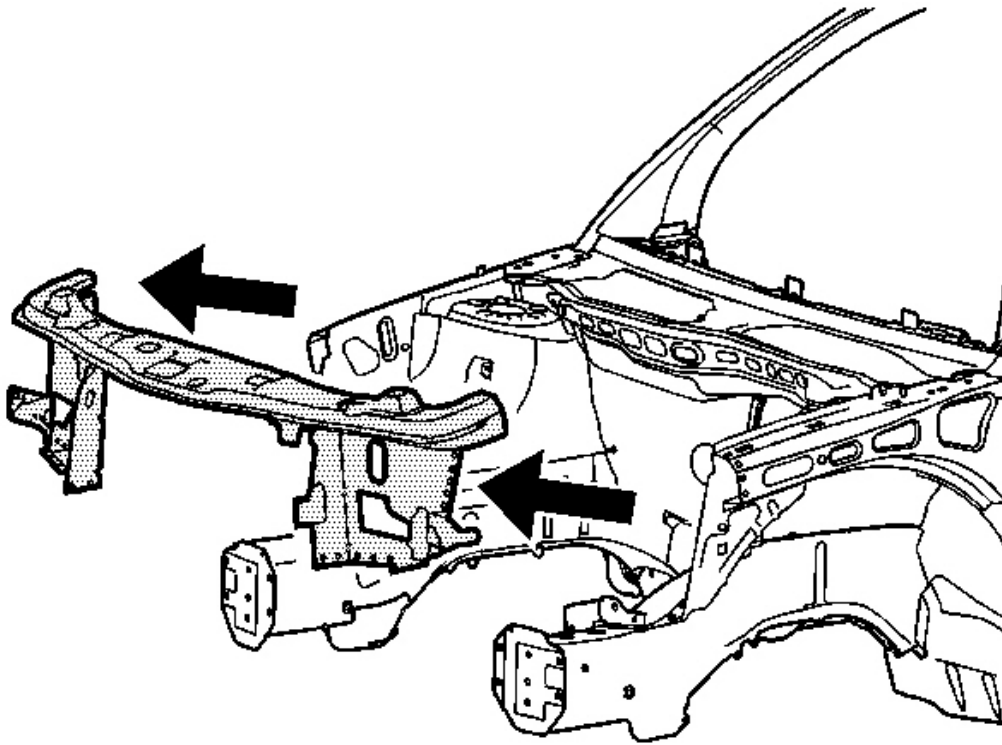


Fig. 11: View Of Tie Bar Assembly
Courtesy of GENERAL MOTORS CORP.

6. Remove the front tie bar. Refer to **Front End Upper Tie Bar Replacement**.

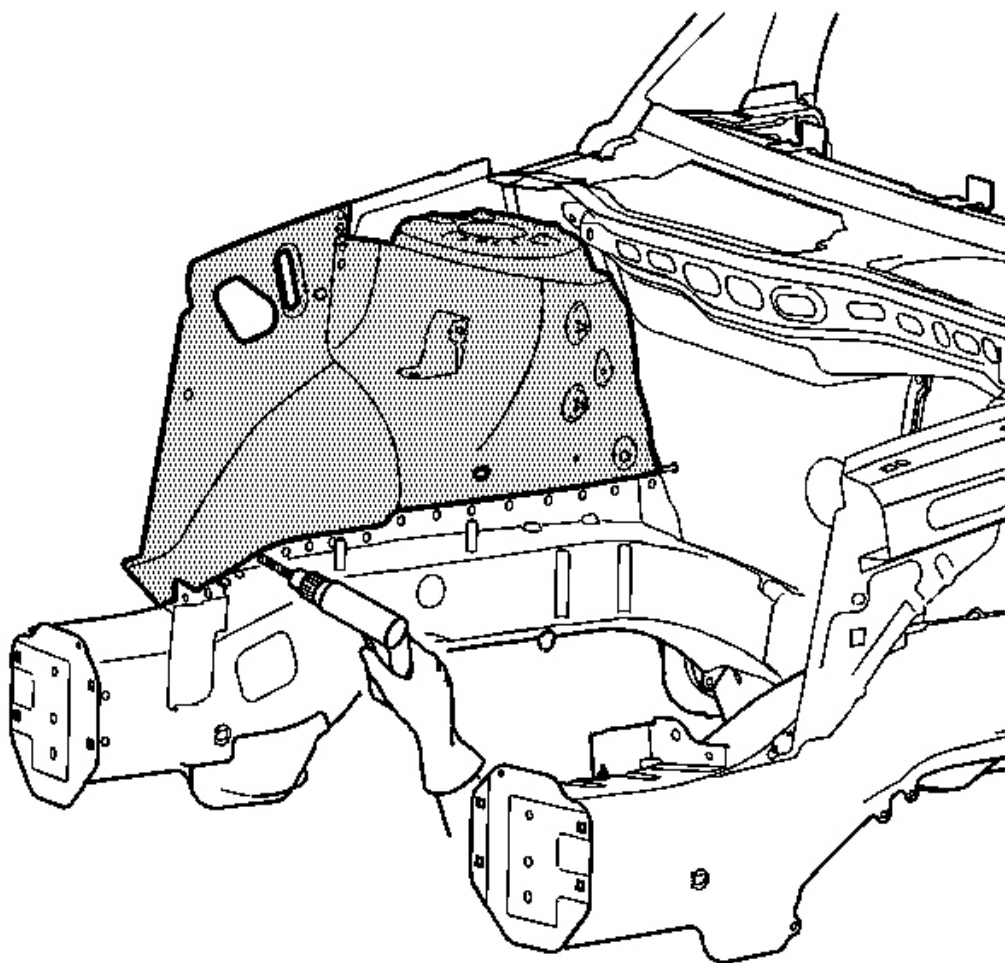


Fig. 12: Drilling Out Factory Welds On Front Wheelhouse
Courtesy of GENERAL MOTORS CORP.

NOTE: Do not damage any inner panels or reinforcements.

7. Locate and drill out all factory welds. Note the number and location of the welds for installation of the front wheelhouse.

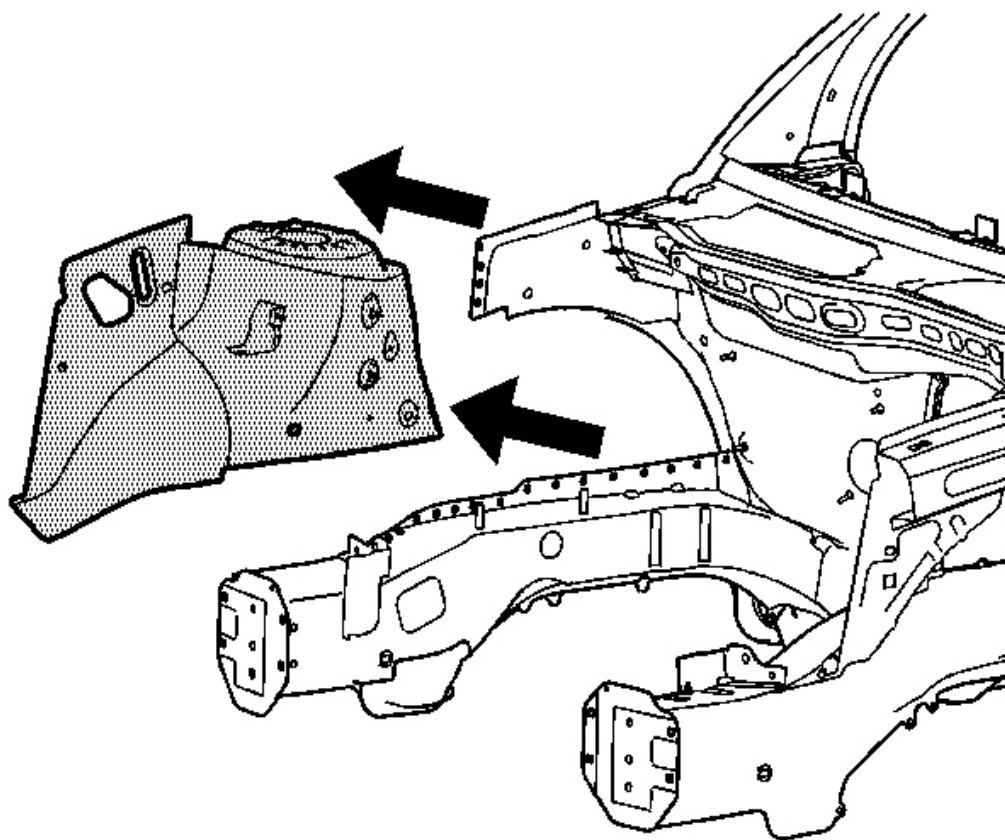


Fig. 13: View Of Front Wheelhouse
Courtesy of GENERAL MOTORS CORP.

8. Remove the damaged front wheelhouse.

Installation Procedure

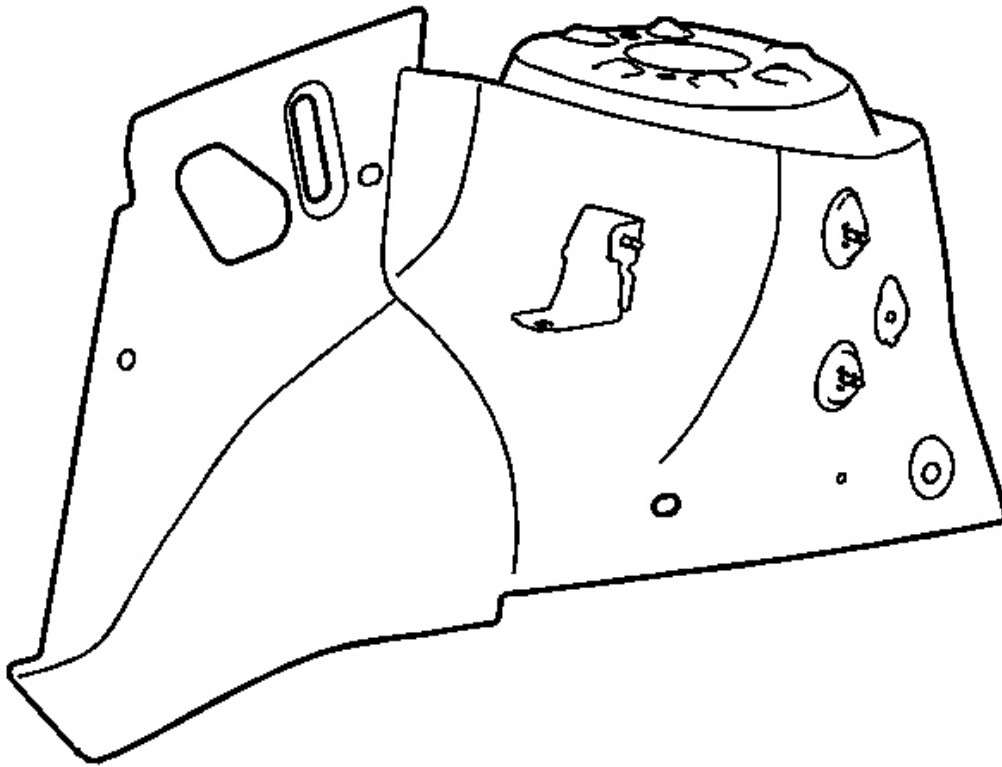


Fig. 14: View Of Front Wheelhouse
Courtesy of GENERAL MOTORS CORP.

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. Some panels may have structural weld-thru adhesive. It is necessary to replace the weld-thru adhesive with an additional spot weld between each factory spot weld.

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

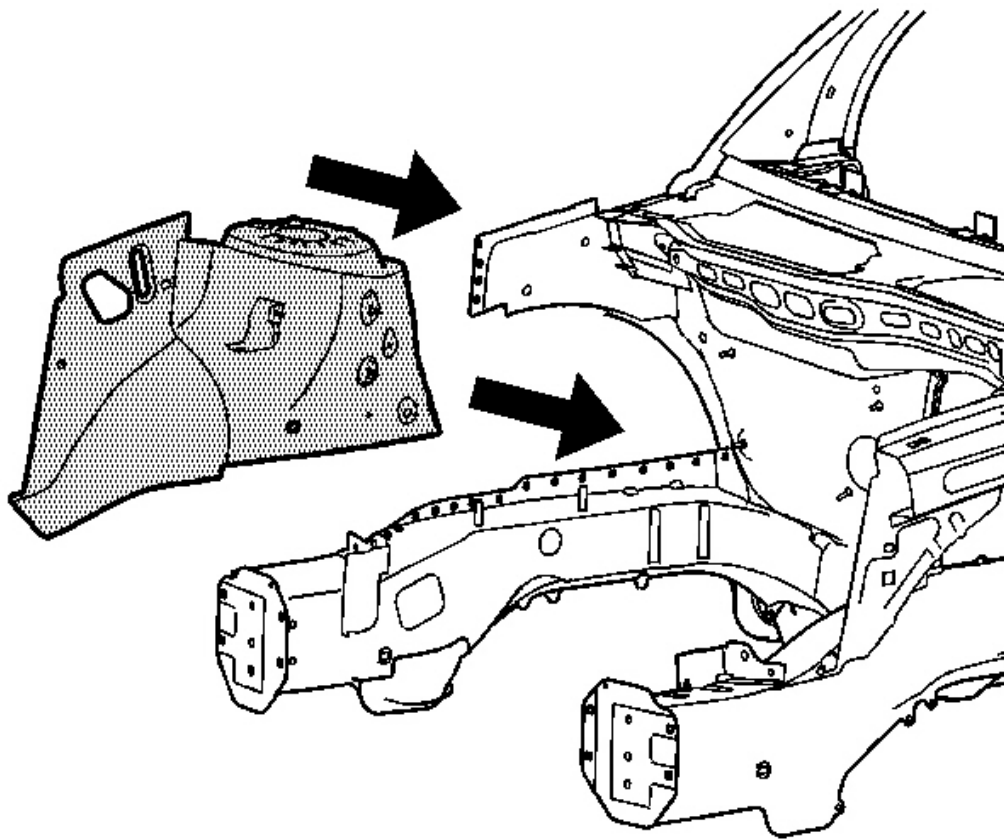


Fig. 15: View Of Front Wheelhouse
Courtesy of GENERAL MOTORS CORP.

4. Position the front wheelhouse to the vehicle using 3-dimensional measuring equipment. Clamp the front wheelhouse into place.

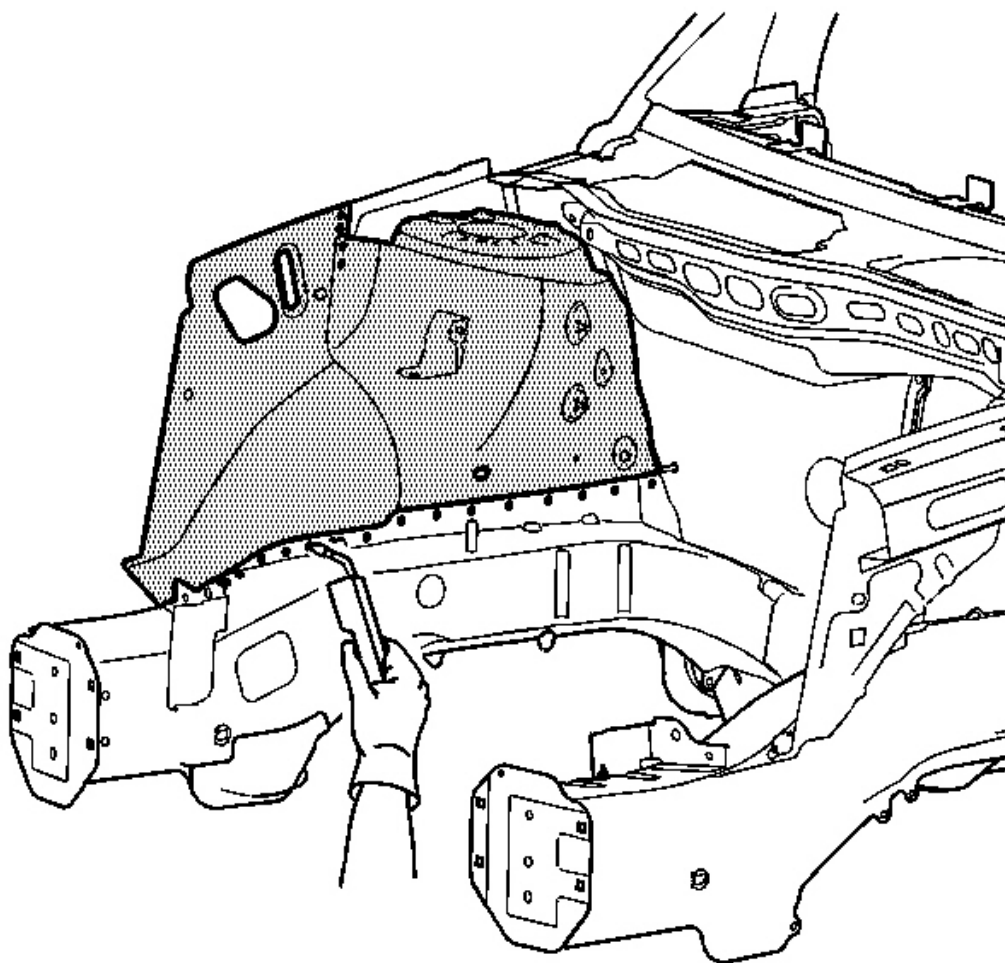


Fig. 16: Plug Welding Front Wheelhouse
Courtesy of GENERAL MOTORS CORP.

5. Plug weld accordingly.

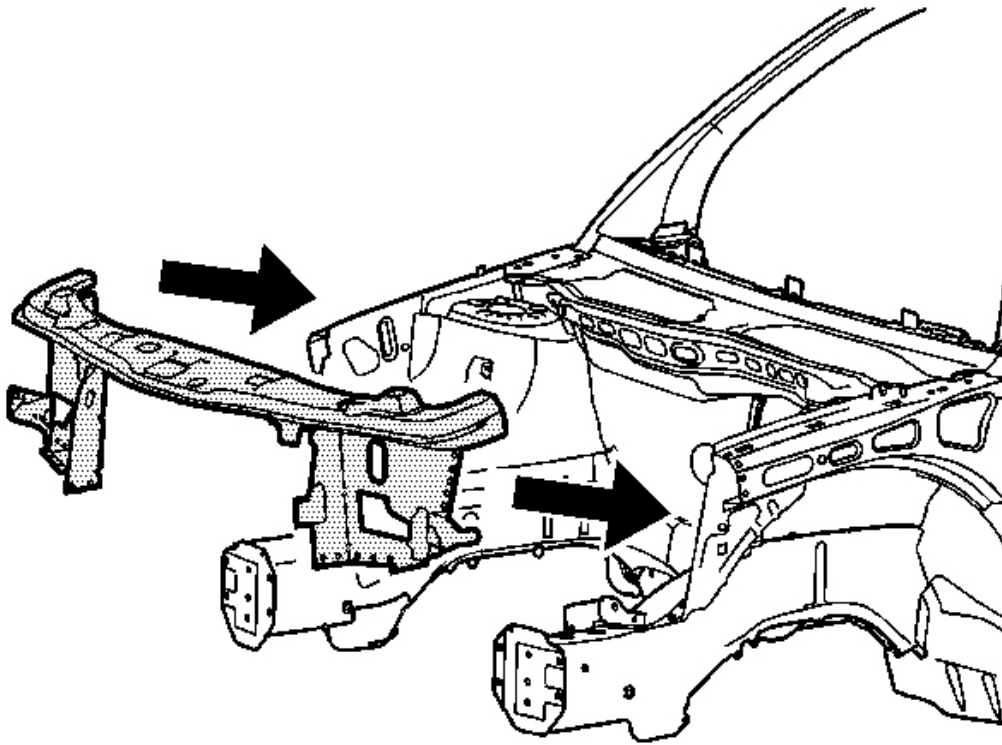


Fig. 17: Identifying Tie Bar Assembly
Courtesy of GENERAL MOTORS CORP.

6. Replace the tie bar. Refer to **Front End Upper Tie Bar Replacement**.
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**.

FRONT COMPARTMENT UPPER SIDE RAIL REPLACEMENT

Removal Procedure

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

WARNING: Refer to Glass and Sheet Metal Handling Warning .

NOTE: Before beginning the repair, refer to Metal Panel Bonding for proper adhesive applicator preparations and general information.

1. Disable the supplemental inflatable restraint (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. Refer to Dimensions - Body.
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 .

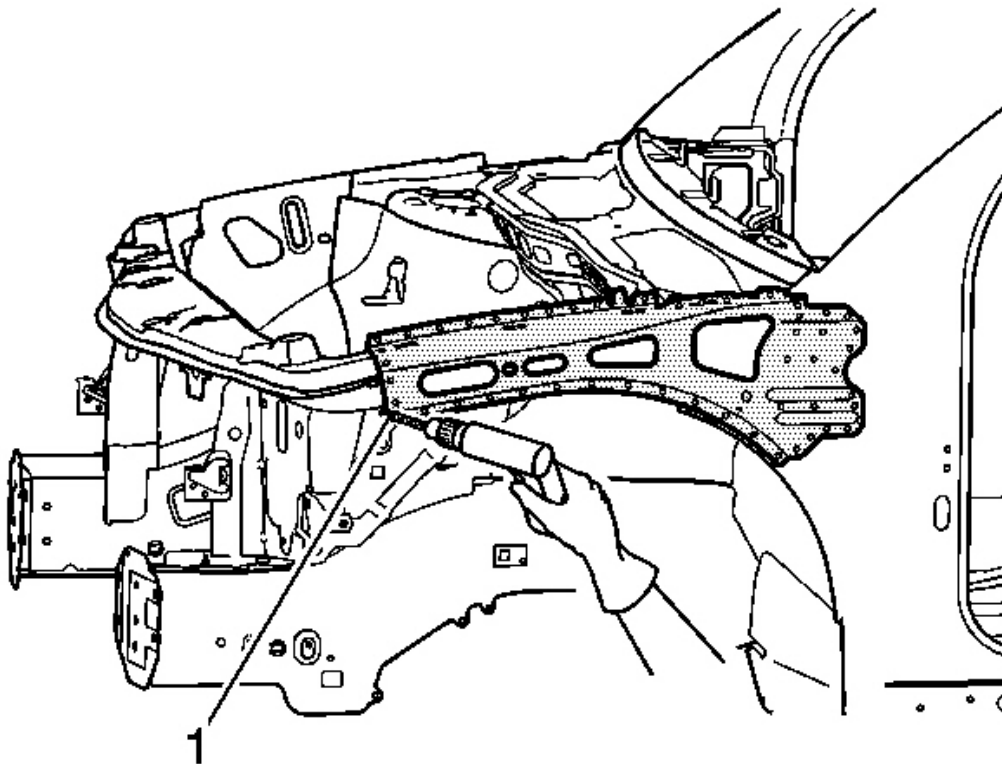


Fig. 18: Drilling Out Factory Welds
Courtesy of GENERAL MOTORS CORP.

NOTE: Do not damage any inner panels or reinforcements. Record the number and location of the original welds for installation of the service part.

6. Locate and drill out all factory welds (1).

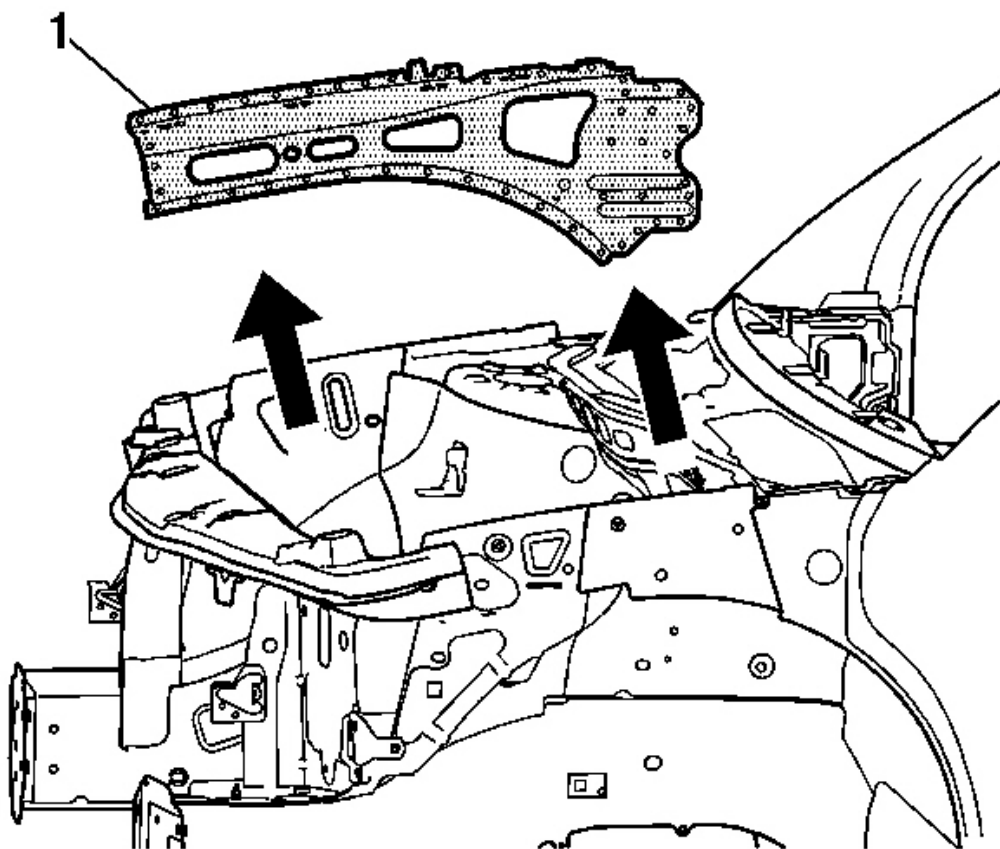


Fig. 19: Removing Damaged Front Upper Outer Rail
Courtesy of GENERAL MOTORS CORP.

7. Remove the damaged front upper outer rail (1).

Installation Procedure

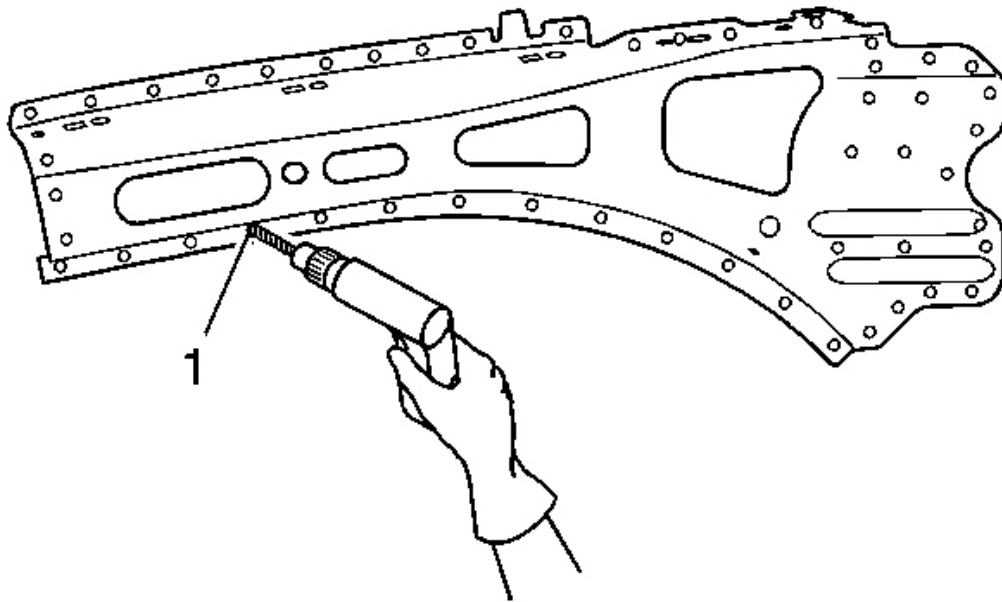


Fig. 20: Drilling Plug Weld Holes

Courtesy of GENERAL MOTORS CORP.

NOTE: If the location of the original plug welds cannot be determined or structural weld- thru adhesive was present, space plug weld holes every 40 mm (1 1/2 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 mating surfaces as necessary.
3. Apply GM-approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to **Anti-Corrosion Treatment and Repair** .

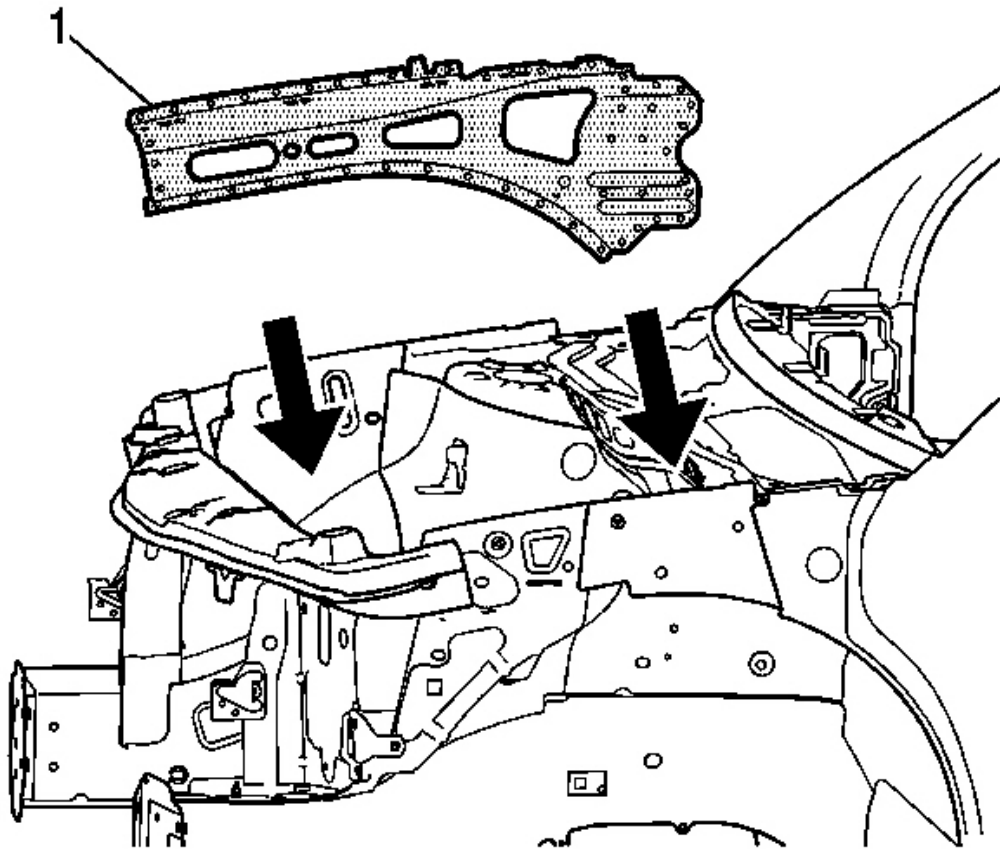


Fig. 21: Positioning Front Upper Outer Rail
Courtesy of GENERAL MOTORS CORP.

4. Position the front upper outer rail to the vehicle using 3-dimensional measuring equipment (1). Clamp the front upper outer rail into place.

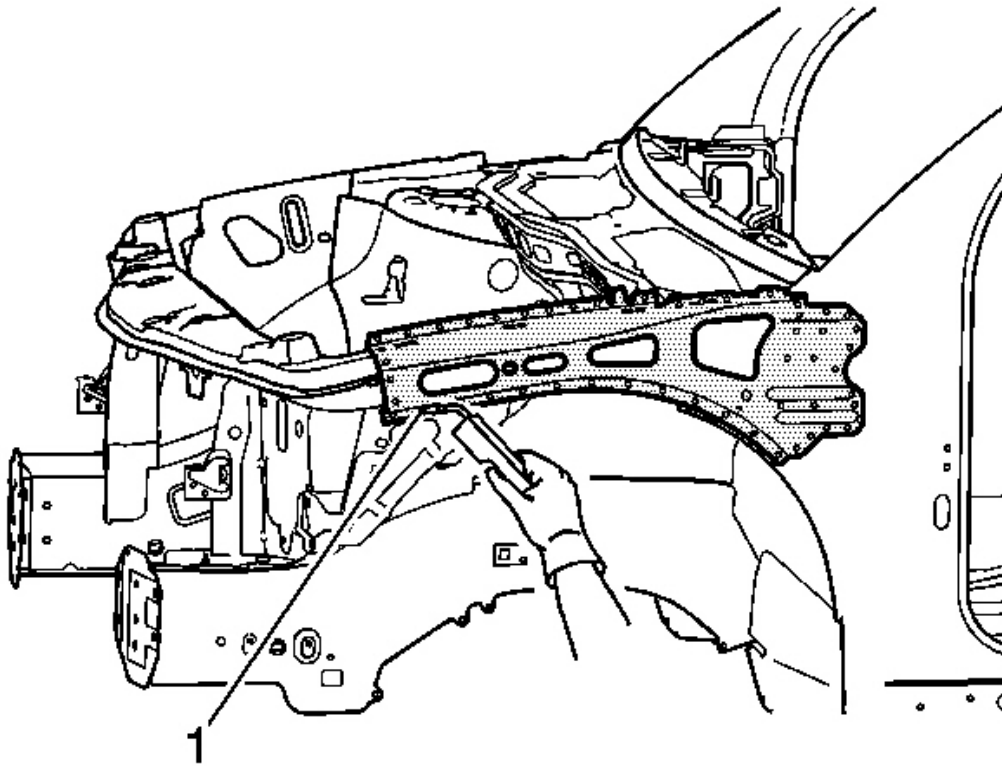


Fig. 22: Plug Welding

Courtesy of GENERAL MOTORS CORP.

5. Plug weld accordingly (1).
6. Clean and prepare all 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 repair 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** .

PLENUM UPPER PANEL REPLACEMENT

Removal Procedure

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

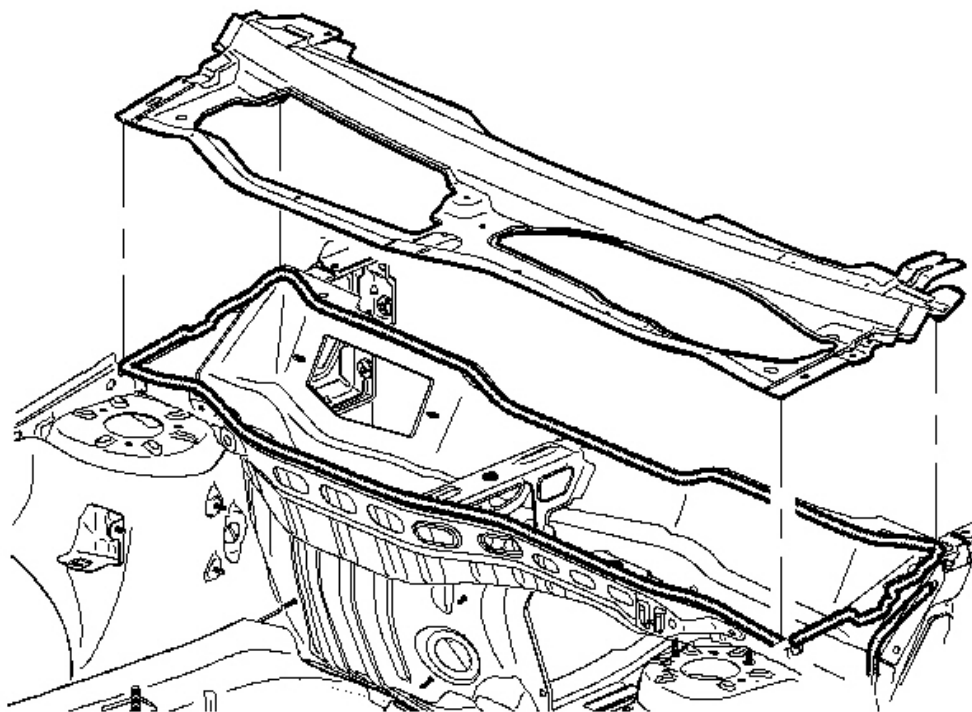


Fig. 23: View of Plenum Upper Panel
Courtesy of GENERAL MOTORS CORP.

1. Disable the supplemental inflatable restraint (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. Refer to **Dimensions - Body**.
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** .

NOTE: Do not damage any inner panels or reinforcements.

6. Locate and drill out all factory welds. Note the number and location of the welds for installation of the plenum top panel.
7. Remove the damaged plenum top panel.

Installation Procedure

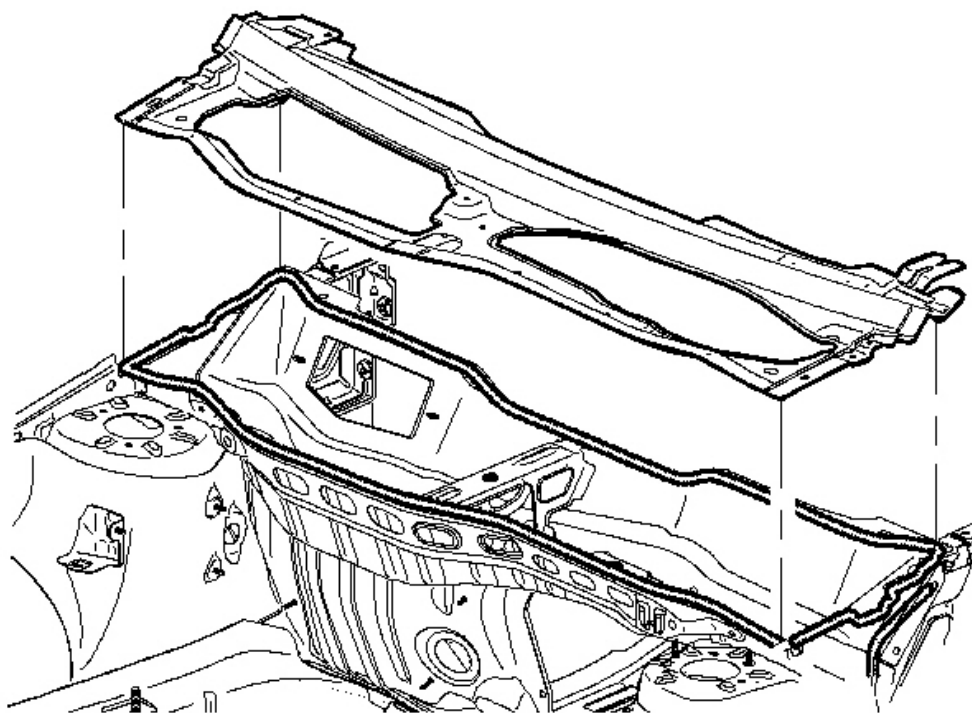


Fig. 24: View of Plenum Upper Panel
Courtesy of GENERAL MOTORS CORP.

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.

Some panels may have structural weld-thru adhesive. It is necessary to replace the weld-thru adhesive with an additional spot weld between each factory spot weld.

1. Drill 8 mm (5/16 in) plug weld holes in the service part as necessary in the locations noted from the original panel.
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** .
4. Position the plenum top panel to the vehicle using 3-dimensional measuring equipment. Clamp the plenum top panel into place.
5. Plug weld accordingly.
6. Clean and prepare all 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 repair 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** .

FRONT COMPARTMENT FRONT RAIL REPLACEMENT

Removal Procedure

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

1. Disable the supplemental inflatable restraint (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. Refer to **Dimensions - Body**.
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** .

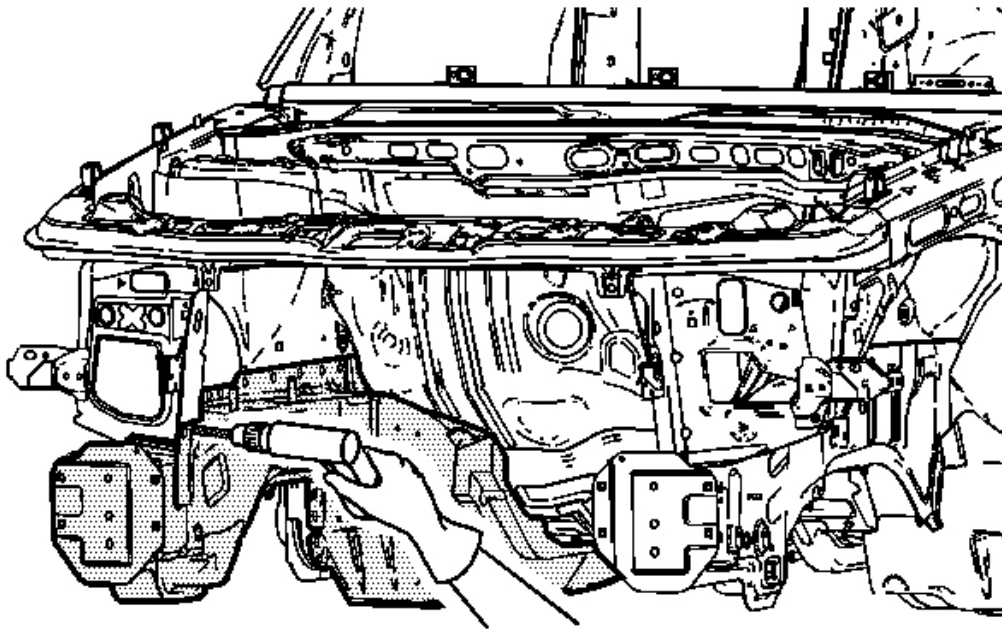


Fig. 25: Drilling Out Factory Welds On Front Lower Rail
Courtesy of GENERAL MOTORS CORP.

NOTE: Do not damage any inner panels or reinforcements.

6. Locate and drill out all factory welds. Note the number and location of the welds for installation of the front lower rail.

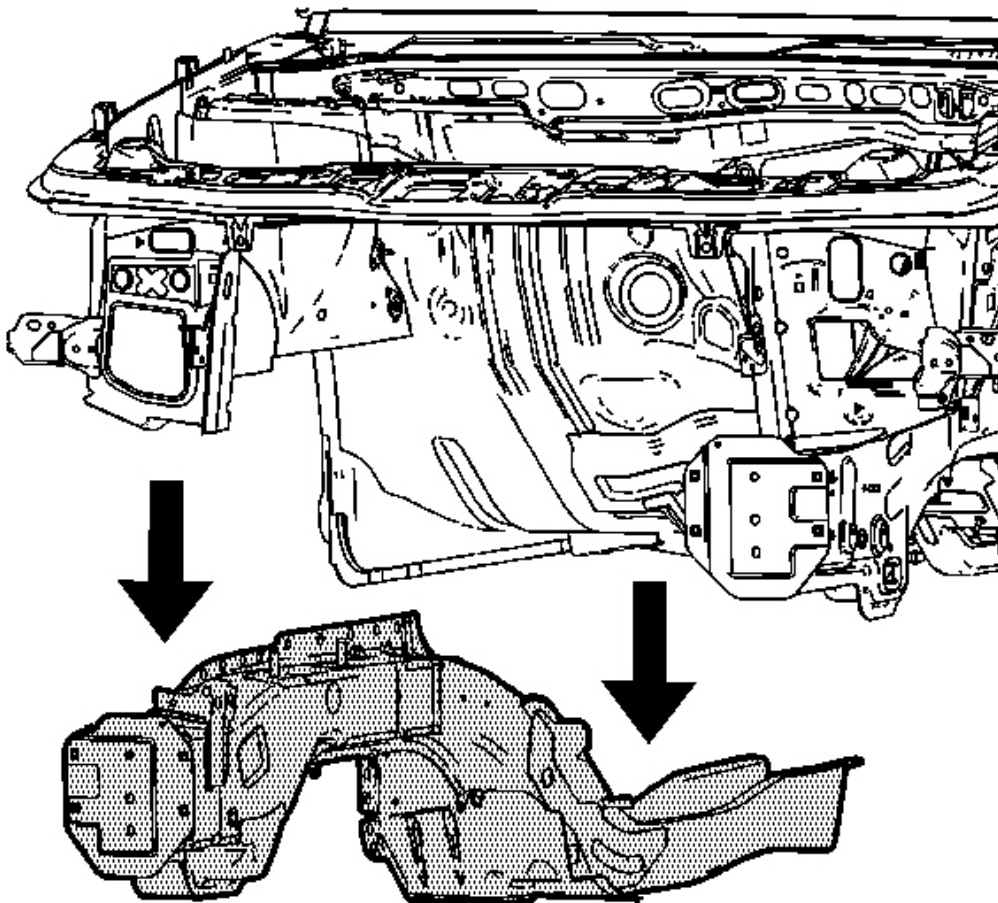


Fig. 26: View Of Front Lower Rail
Courtesy of GENERAL MOTORS CORP.

7. Remove the damaged front lower rail.

Installation Procedure

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. Some panels may have structural weld-thru adhesive. It is necessary to replace the weld-thru adhesive with an additional spot weld between each factory spot weld.

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

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** .

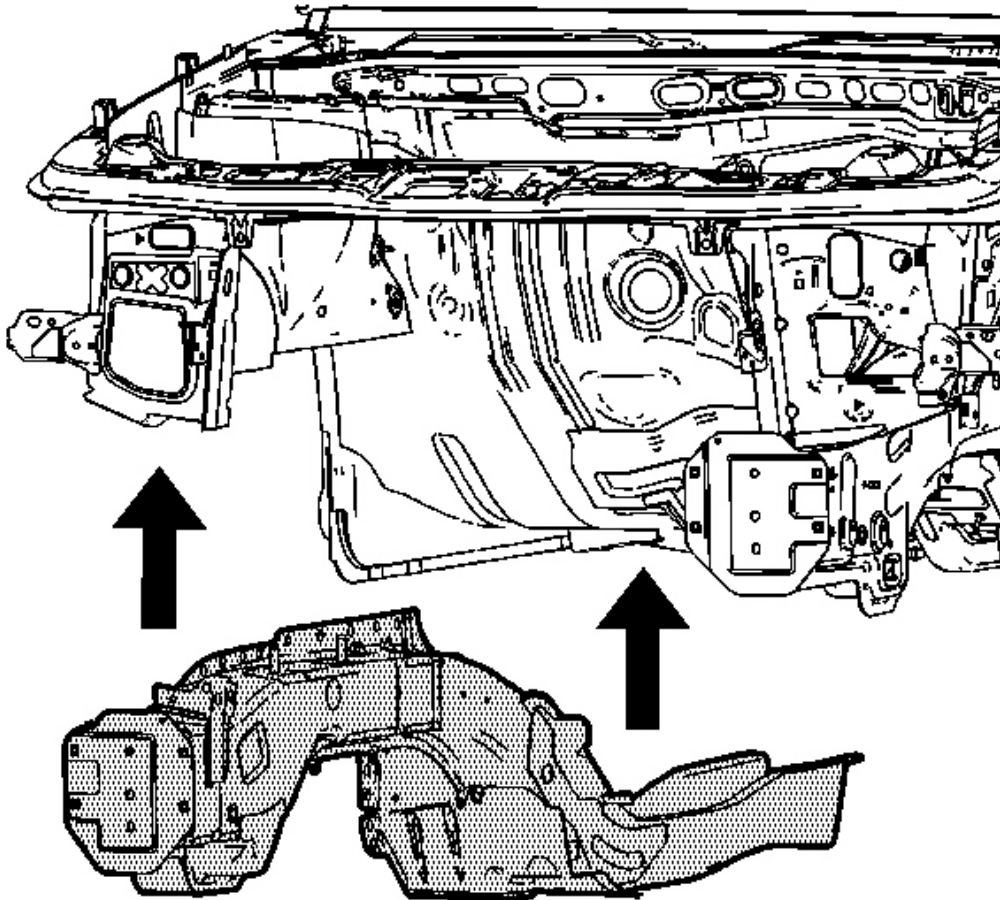


Fig. 27: Identifying Front Lower Rail
Courtesy of GENERAL MOTORS CORP.

4. Position the front lower rail to the vehicle using 3-dimensional measuring equipment. Clamp the front lower rail into place.

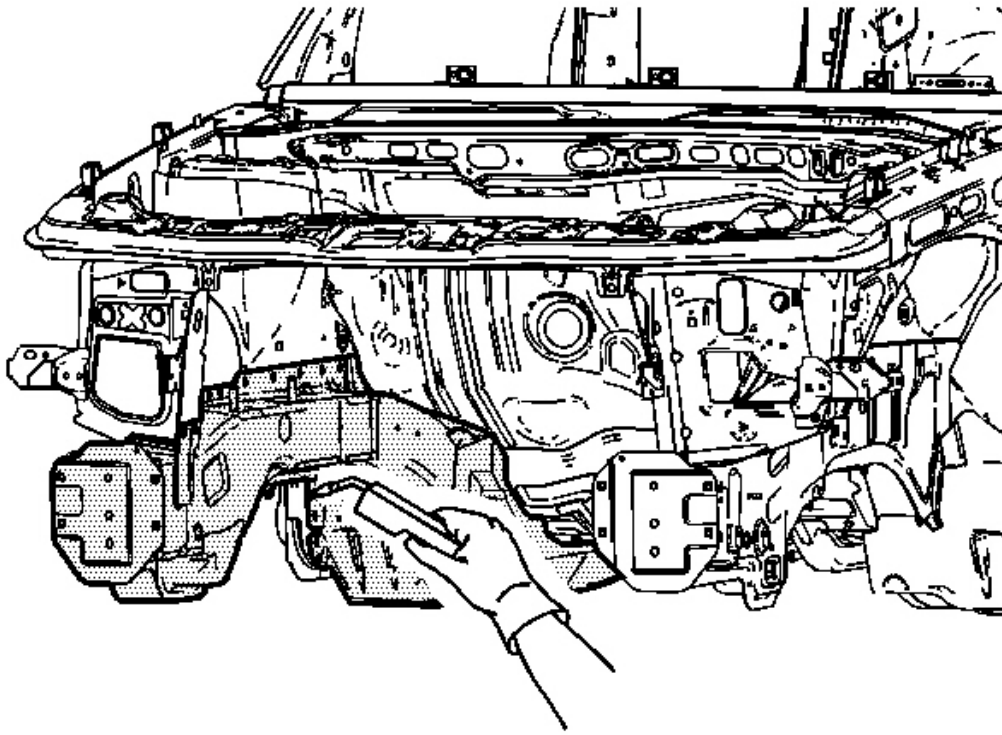


Fig. 28: Plug Welding Front Lower Rail
Courtesy of GENERAL MOTORS CORP.

5. Plug weld accordingly.
6. Clean and prepare all 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 repair 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** .

FRONT COMPARTMENT INNER SIDE RAIL REPLACEMENT

Removal Procedure

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

WARNING: Refer to Glass and Sheet Metal Handling Warning .

NOTE: Before beginning the repair, refer to Metal Panel Bonding for proper adhesive applicator preparations and general information.

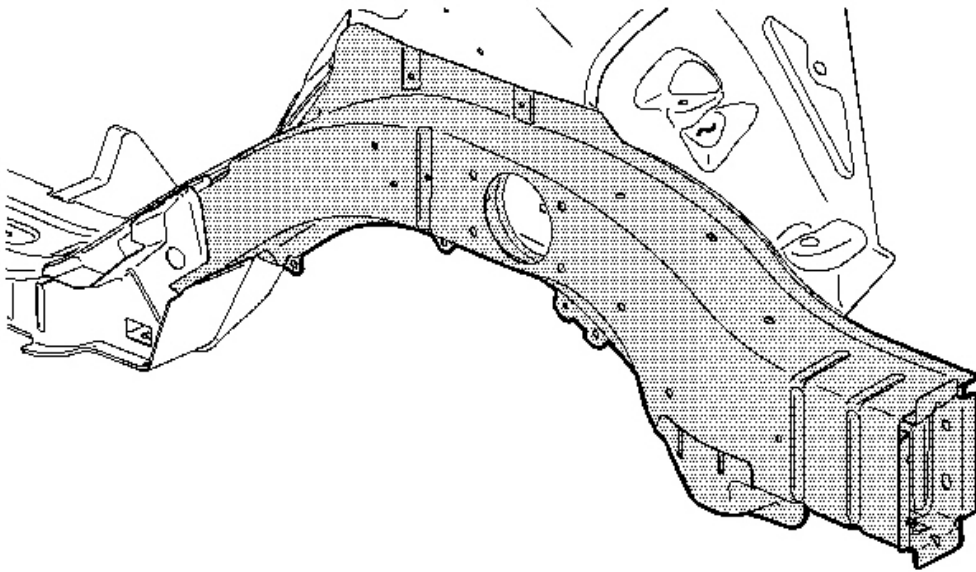


Fig. 29: View of Front Lower Inner Rail - Front Half
Courtesy of GENERAL MOTORS CORP.

1. Disable the supplemental inflatable restraint (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. Refer to **Dimensions - Body**.
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**.

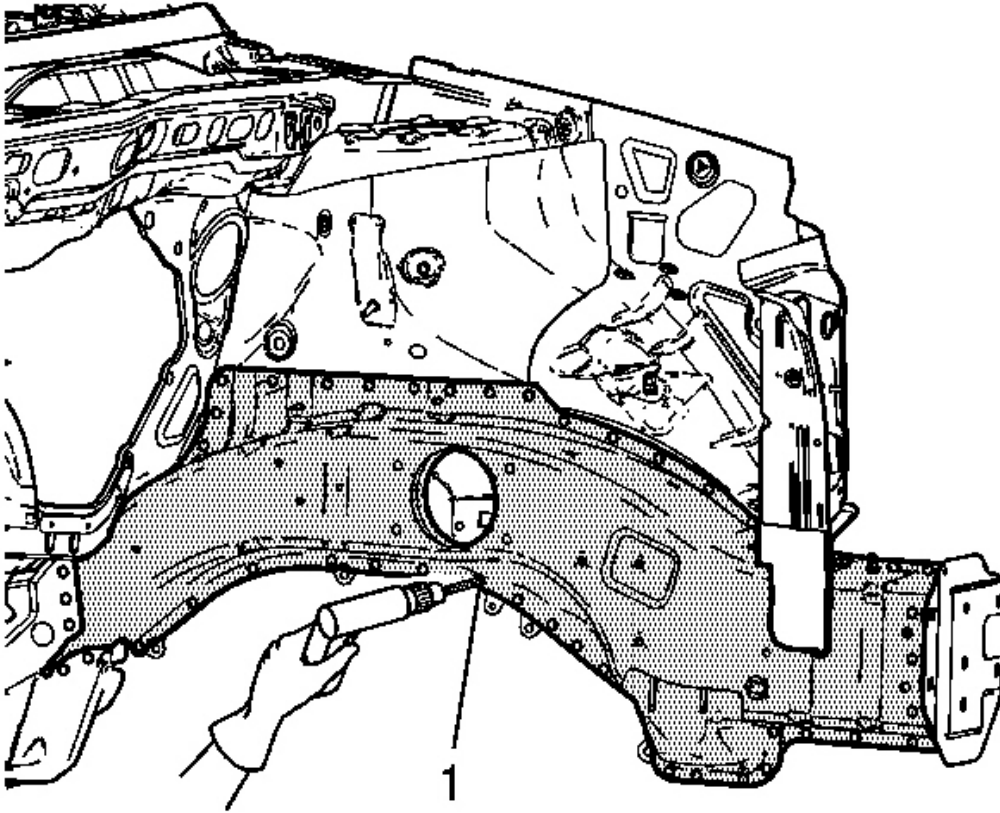


Fig. 30: Drilling Out Factory Welds
Courtesy of GENERAL MOTORS CORP.

NOTE: Do not damage any inner panels or reinforcements. Record the number and location of the original welds for installation of the service part.

6. Locate and drill out all factory welds (1).
7. Remove the rear engine cradle mount.
8. Separate the front and rear sections of the tower rail. Care must be taken not to damage the inner side plate.

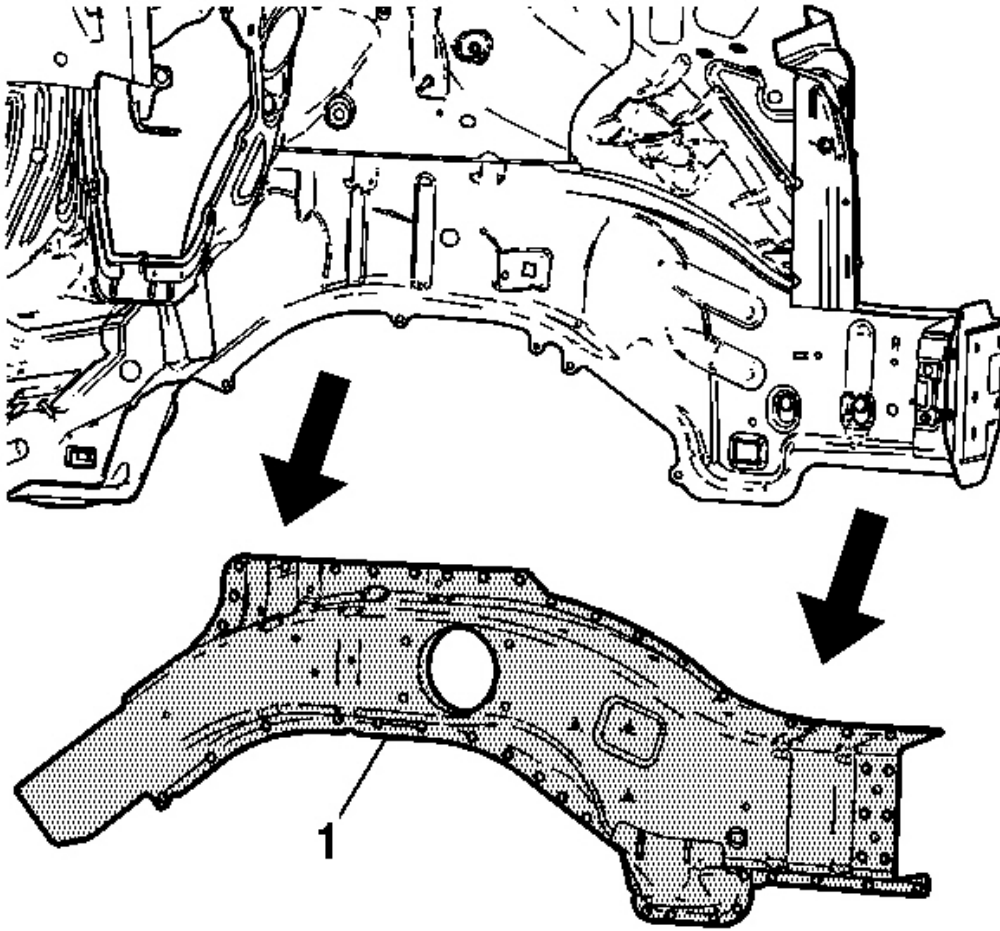


Fig. 31: Identifying Front Lower Inner Rail - Front Half
Courtesy of GENERAL MOTORS CORP.

9. Remove the damaged front lower inner rail - front half (1).

Installation Procedure

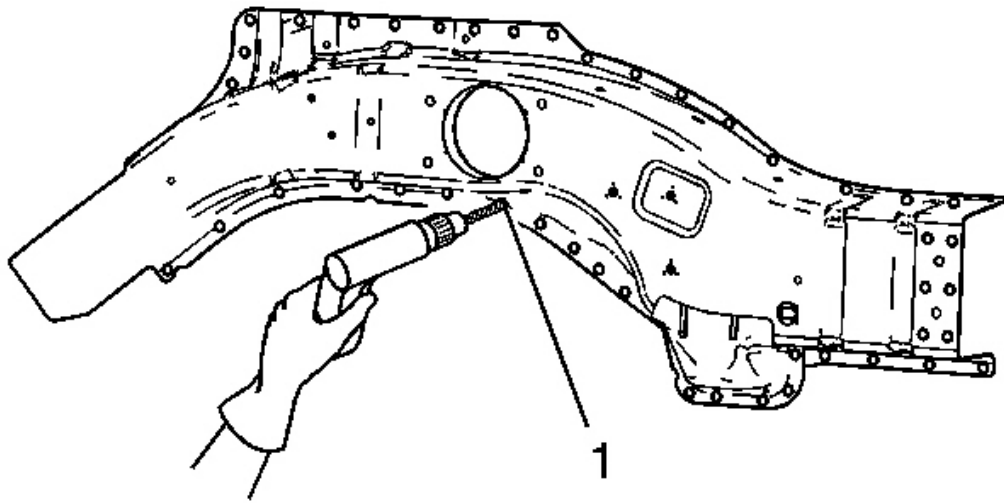


Fig. 32: Drilling Plug Weld Holes
Courtesy of GENERAL MOTORS CORP.

NOTE: If the location of the original plug welds cannot be determined or structural weld- thru adhesive was present, space plug weld holes every 40 mm (1 1/2 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 mating surfaces as necessary.
3. Apply GM-approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to **Anti-Corrosion Treatment and Repair** .

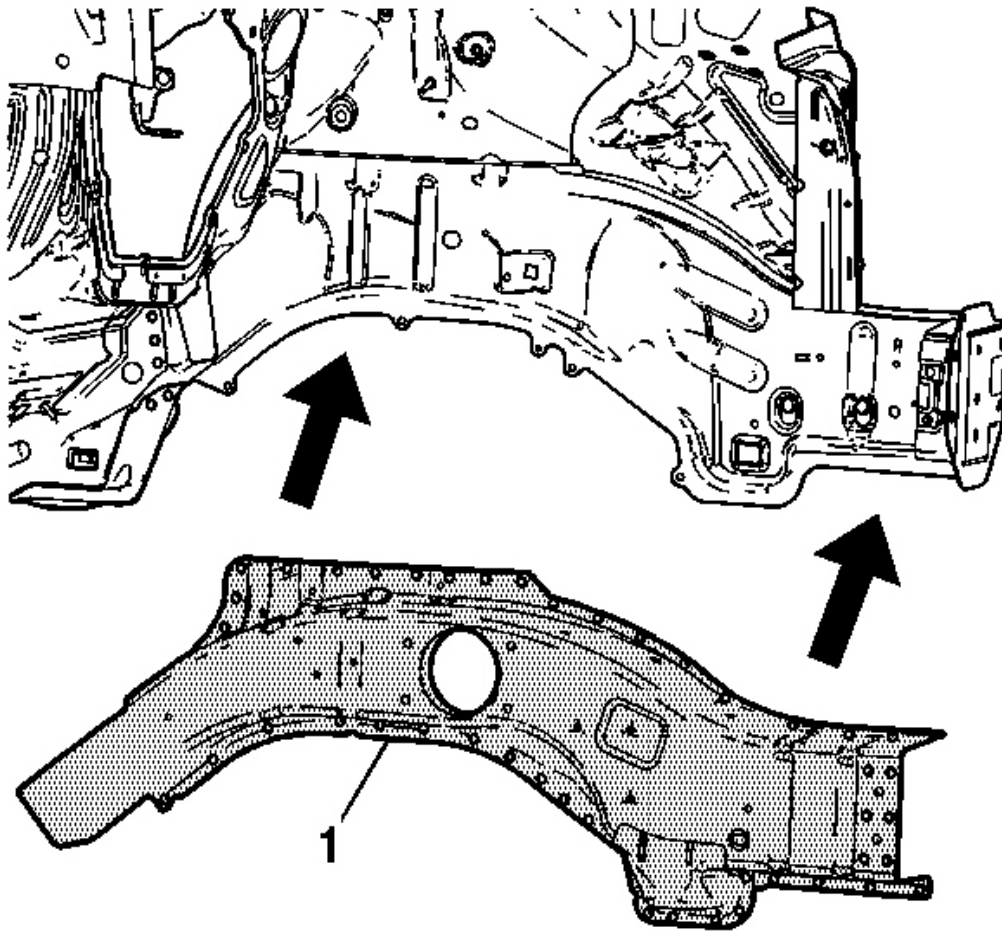


Fig. 33: Positioning Front Lower Inner Rail - Front Half
Courtesy of GENERAL MOTORS CORP.

4. Position the front lower inner rail - front half to the vehicle using 3-dimensional measuring equipment (1). Clamp the front lower inner rail - front half into place.

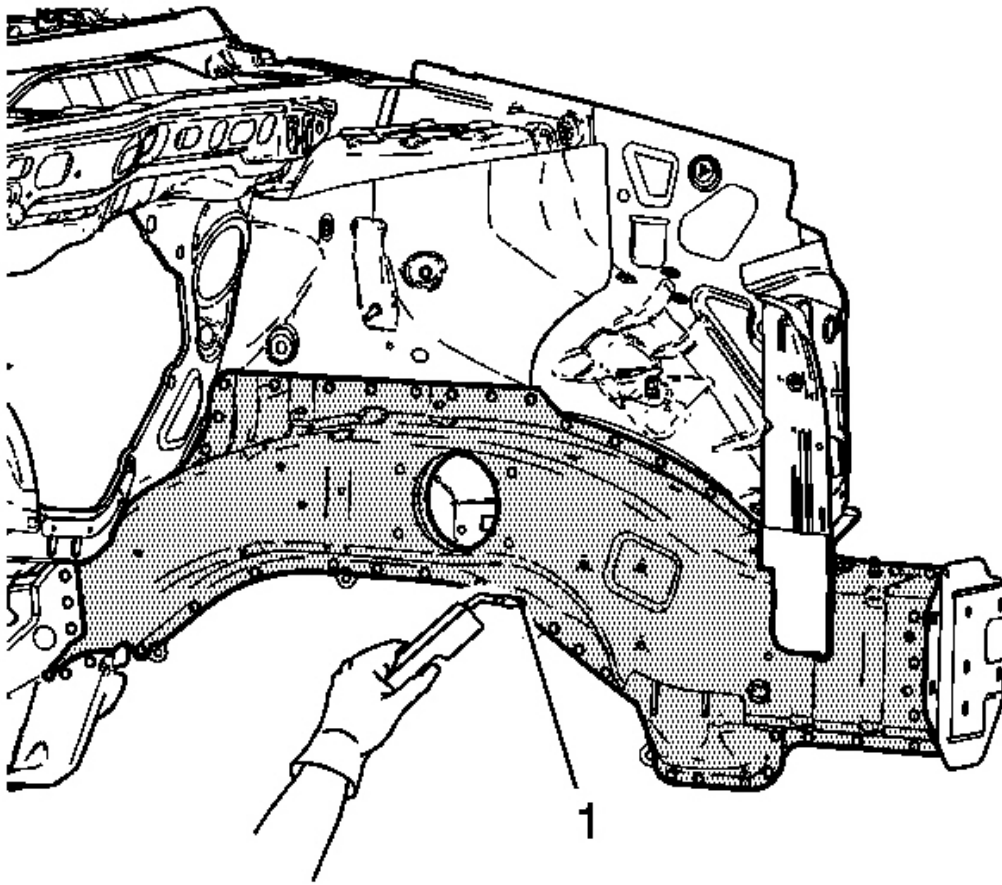


Fig. 34: Plug Welding
Courtesy of GENERAL MOTORS CORP.

5. Plug weld accordingly (1).
6. Install the rear engine cradle mount.
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** .

UNDERBODY OUTER FRONT SIDE RAIL REPLACEMENT

WARNING: Refer to Approved Equipment for Collision Repair Warning .

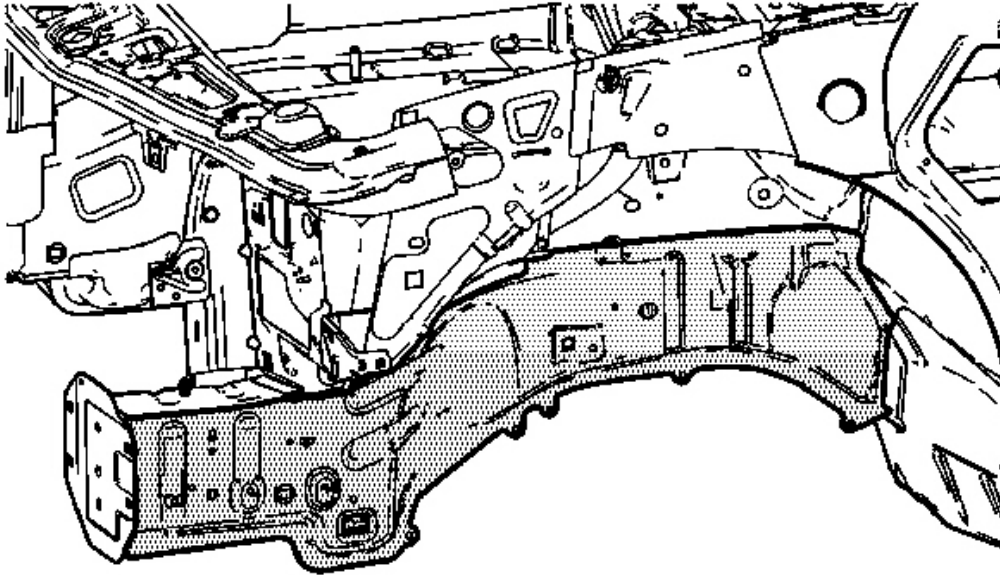


Fig. 35: View Of Front Lower Outer Rail
Courtesy of GENERAL MOTORS CORP.

1. Disable the supplemental inflatable restraint (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. Refer to Dimensions - Body.
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 .

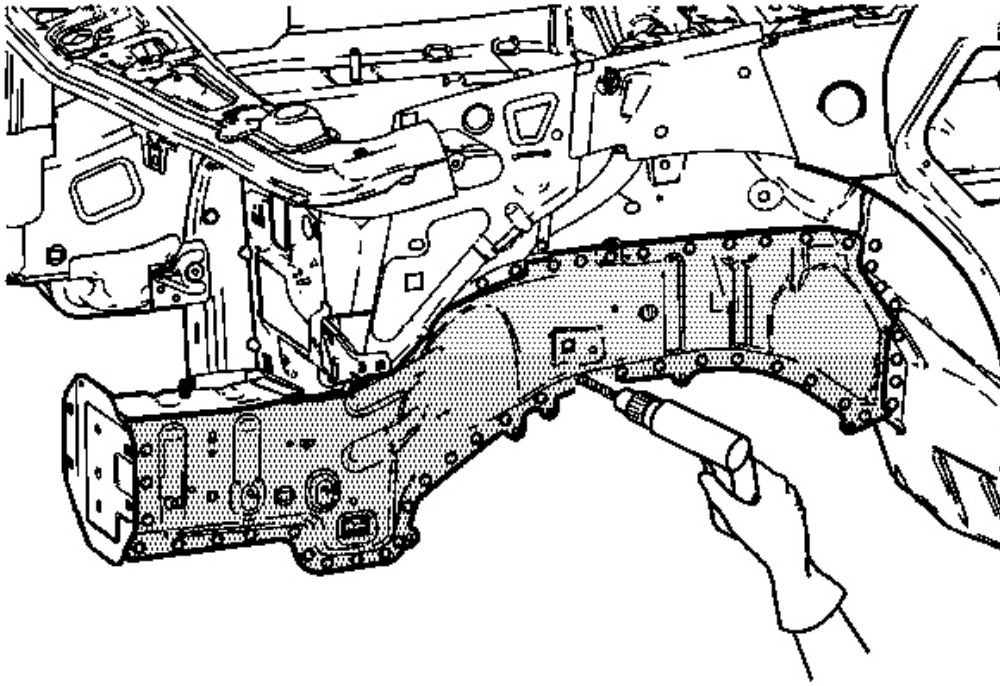


Fig. 36: Drilling Out Factory Welds On Front Lower Outer Rail
Courtesy of GENERAL MOTORS CORP.

NOTE: Do not damage any inner panels or reinforcements.

6. Locate and drill out all factory welds. Note the number and location of the welds for installation of the front lower outer rail.
7. Remove the rear engine cradle mount.

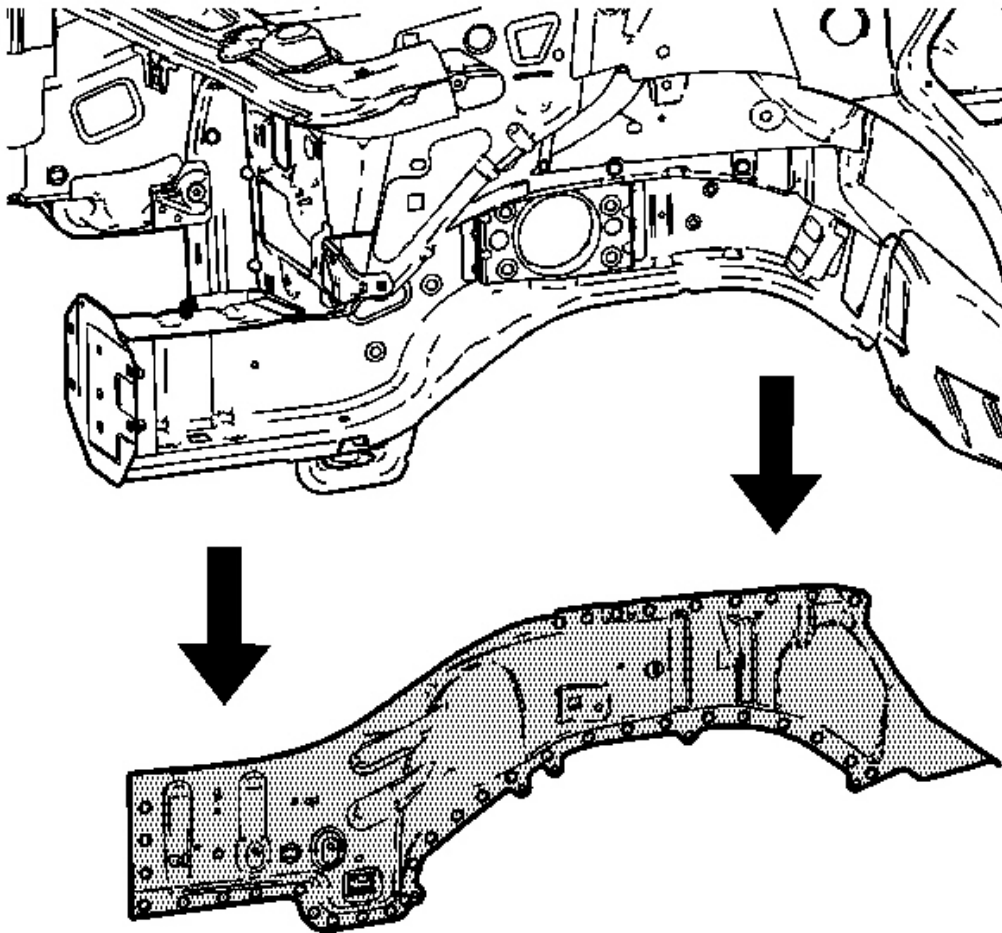


Fig. 37: View Of Front Lower Outer Rail
Courtesy of GENERAL MOTORS CORP.

8. Remove the damaged front lower outer rail.

Installation Procedure

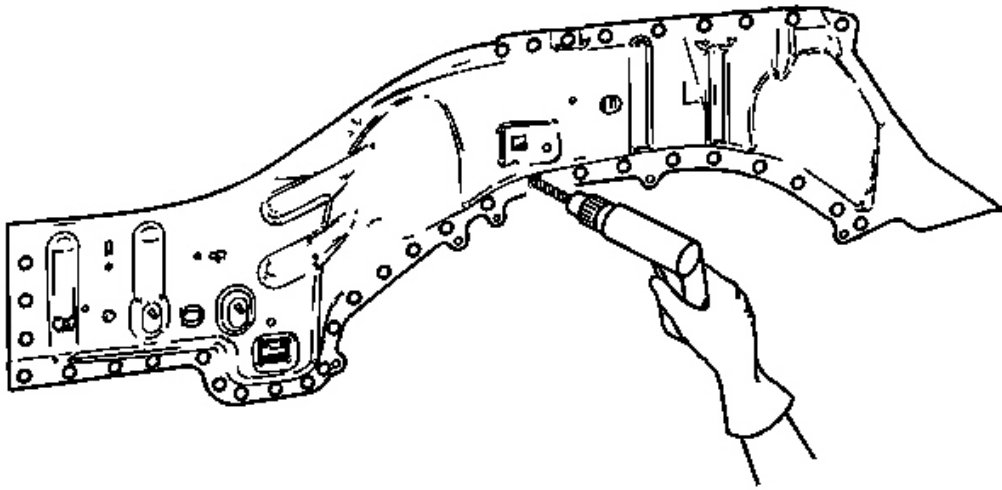


Fig. 38: Drilling Plug Weld Holes On Front Lower Outer Rail
Courtesy of GENERAL MOTORS CORP.

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.
Some panels may have structural weld-thru adhesive. It is necessary to replace the weld-thru adhesive with an additional spot weld between each factory spot weld.

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

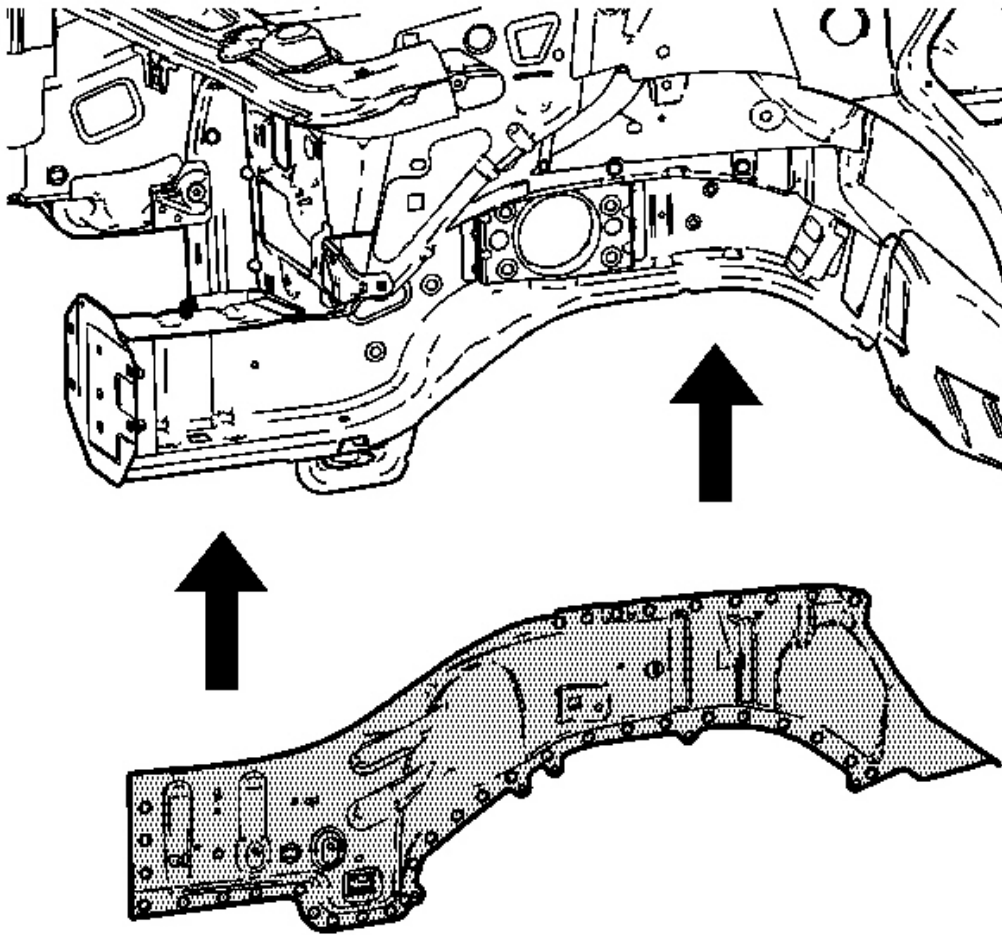


Fig. 39: Locating Front Lower Outer Rail
Courtesy of GENERAL MOTORS CORP.

4. Position the front lower outer rail to the vehicle using 3-dimensional measuring equipment. Clamp the front lower outer rail into place.

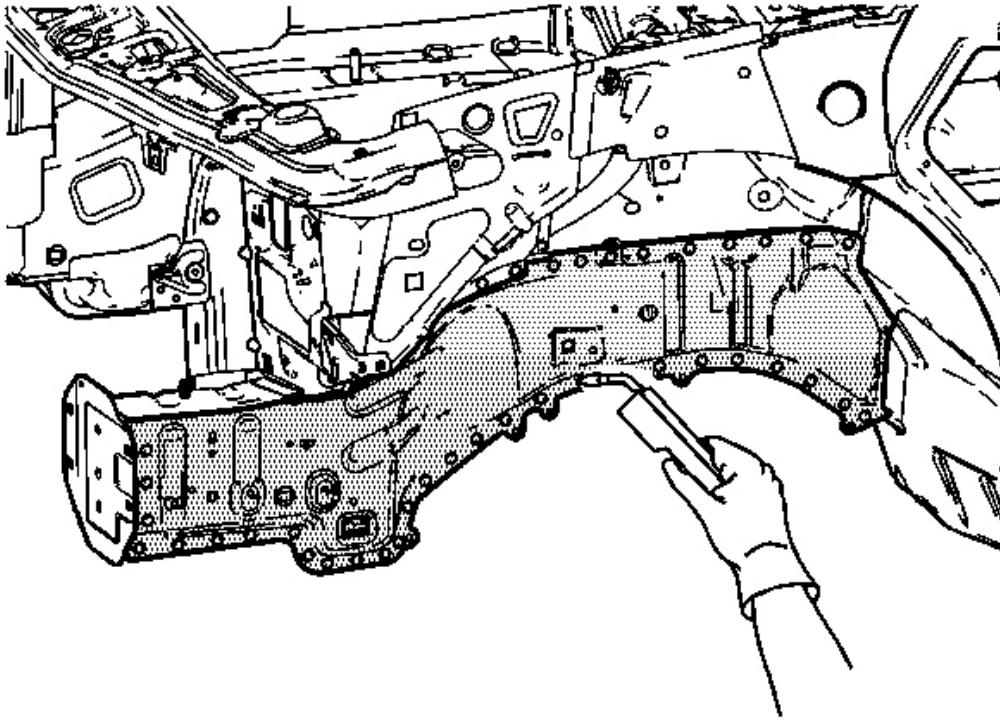


Fig. 40: Plug Welding Front Lower Outer Rail
Courtesy of GENERAL MOTORS CORP.

5. Plug weld accordingly.
6. Install the rear engine cradle mount.
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** .

FRONT INNER HINGE PILLAR BODY REPLACEMENT

Removal Procedure

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

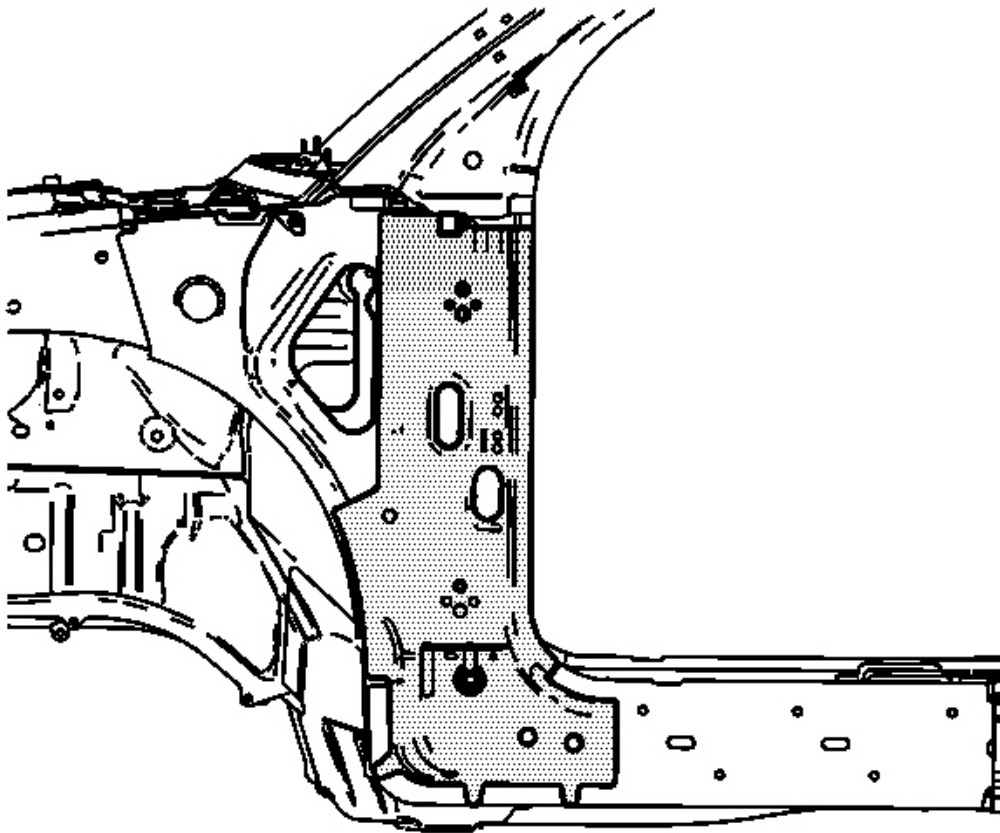


Fig. 41: View Of Hinge Pillar Inner Reinforcement
Courtesy of GENERAL MOTORS CORP.

1. Disable the supplemental inflatable restraint (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. Refer to **Dimensions - Body**.
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** .
6. Remove the damaged portion of the body side.

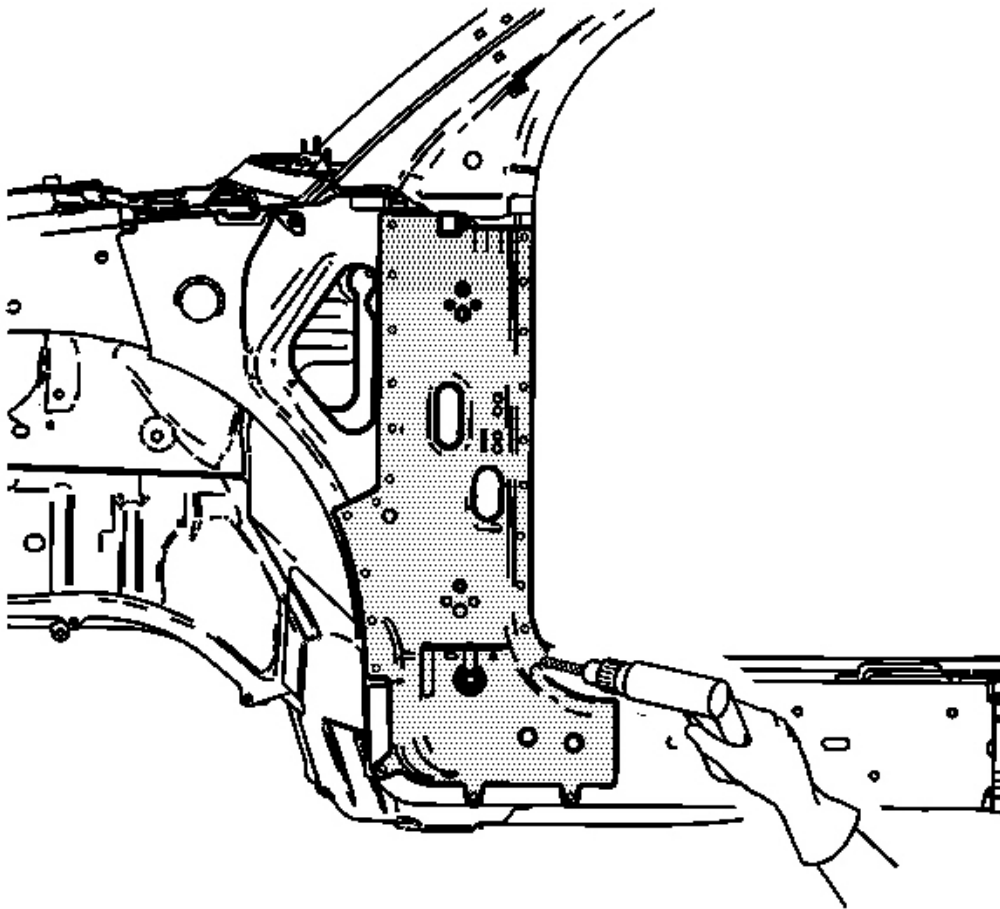


Fig. 42: Drilling Out Factory Welds On Hinge Pillar Inner Reinforcement
Courtesy of GENERAL MOTORS CORP.

NOTE: Do not damage any inner panels or reinforcements.

7. Locate and drill out all factory welds. Note the number and location of the welds for installation of the hinge pillar inner reinforcement.

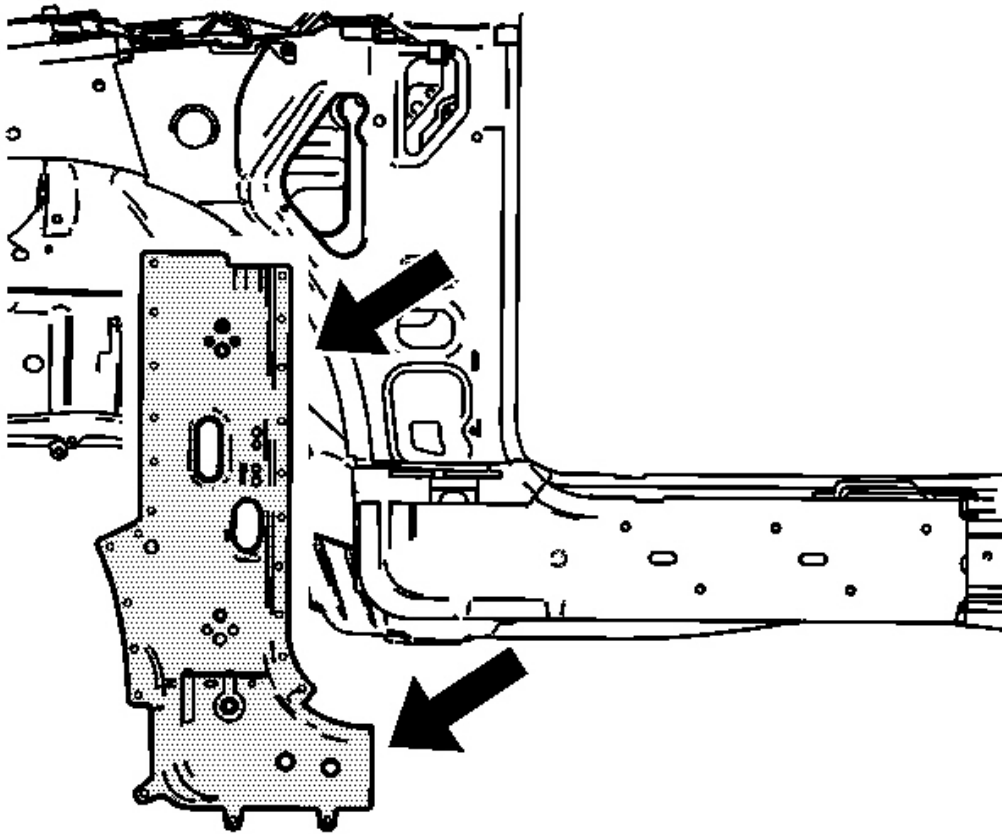


Fig. 43: View Of Hinge Pillar Inner Reinforcement
Courtesy of GENERAL MOTORS CORP.

8. Remove the damaged hinge pillar inner reinforcement.

Installation Procedure

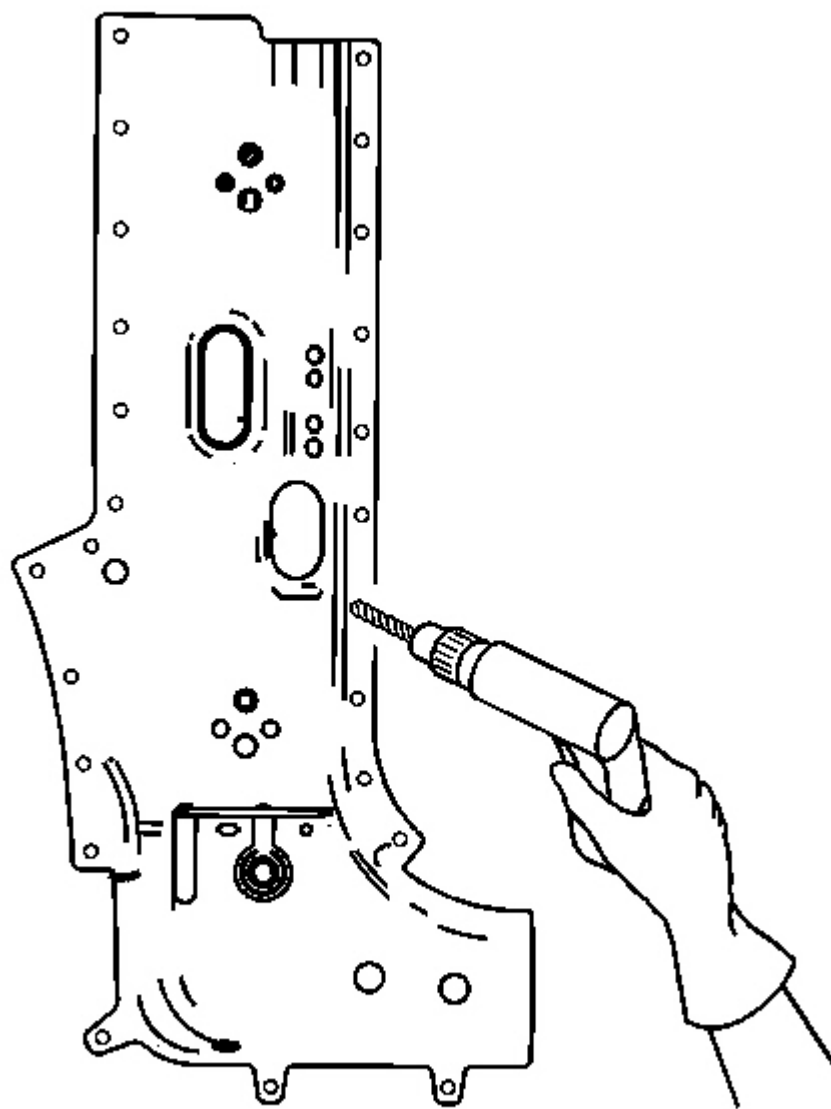


Fig. 44: Drilling Out Plug Weld Holes On Hinge Pillar Inner Reinforcement
Courtesy of GENERAL MOTORS CORP.

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.
Some panels may have structural weld-thru adhesive. It is necessary to replace the weld-thru adhesive with an additional spot weld between each factory spot weld.

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

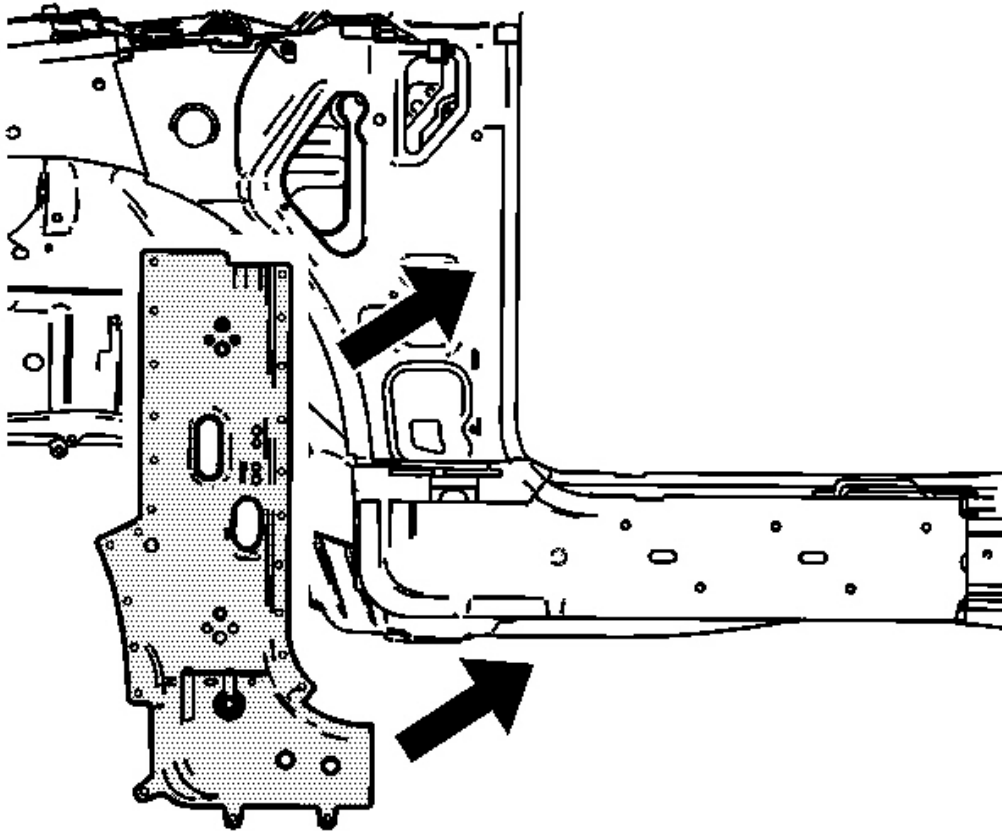


Fig. 45: Positioning Hinge Pillar Inner Reinforcement
Courtesy of GENERAL MOTORS CORP.

4. Position the hinge pillar inner reinforcement to the vehicle using 3-dimensional measuring equipment. Clamp the hinge pillar inner reinforcement into place.

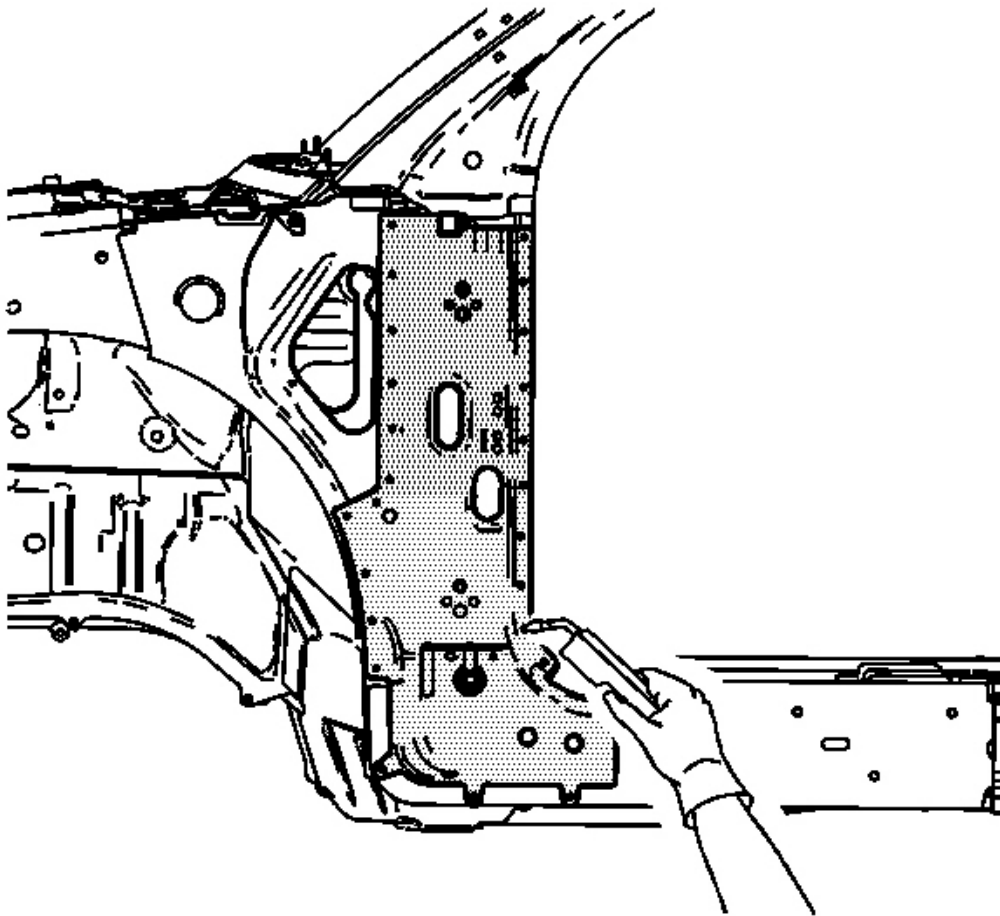


Fig. 46: Plug Welding Hinge Pillar Inner Reinforcement
Courtesy of GENERAL MOTORS CORP.

5. Plug weld accordingly.
6. Clean and prepare all welded surfaces.
7. Install the new body side section.
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** .

FRONT HINGE PILLAR BODY SECTIONING

Removal Procedure

NOTE: Section in specified areas only. Sectioning outside of these areas may compromise the structural integrity of the vehicle. The door frame can be replaced at factory seams, but requires the removal of the windshield and the roof. The sectioning procedures have been developed as a more cost-effective alternative to complete replacement. The specific area to be sectioned is determined by the extent of the damage to the vehicle.

1. Disable the supplemental inflatable restraint (SIR) system. Refer to **SIR Disabling and Enabling** .
2. Disconnect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection** .

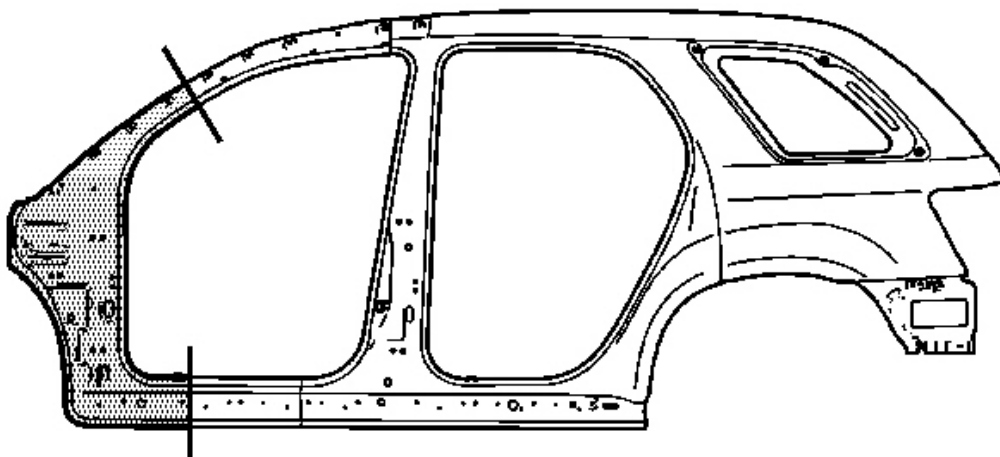


Fig. 47: View Of Front Hinge Pillar Body Sectioning
Courtesy of GENERAL MOTORS CORP.

3. Remove all related panels and components.
4. Repair as much of the damage as possible to factory specifications. Refer to **Dimensions - Body**.

WARNING: Foam sound deadeners must be removed from areas within 152.4 mm (6 in) of where flame is to be used for body repairs. When reinstalling foam sound deadeners, avoid inhaling fumes as bodily injury may result.

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 .

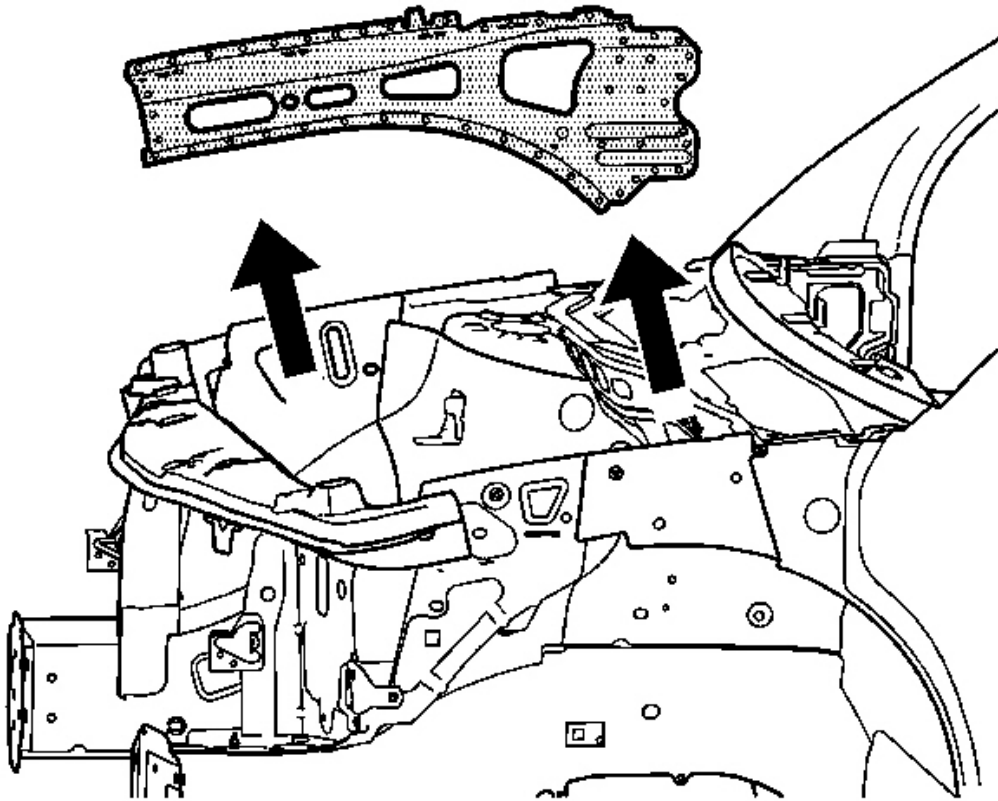


Fig. 48: View Of Front Upper Outer Rail
Courtesy of GENERAL MOTORS CORP.

6. Drill spot welds and remove the front upper outer rail.

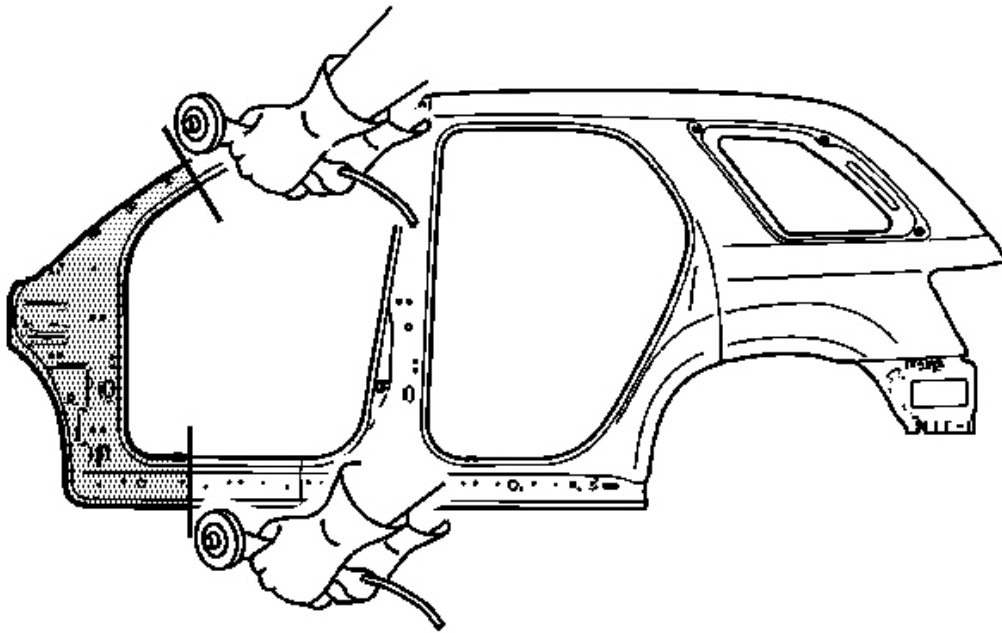


Fig. 49: Cutting Front Hinge Pillar Body Sectioning Panel
Courtesy of GENERAL MOTORS CORP.

NOTE: Do NOT damage any inner panels or reinforcements.

7. Cut the panel where sectioning is to be performed.

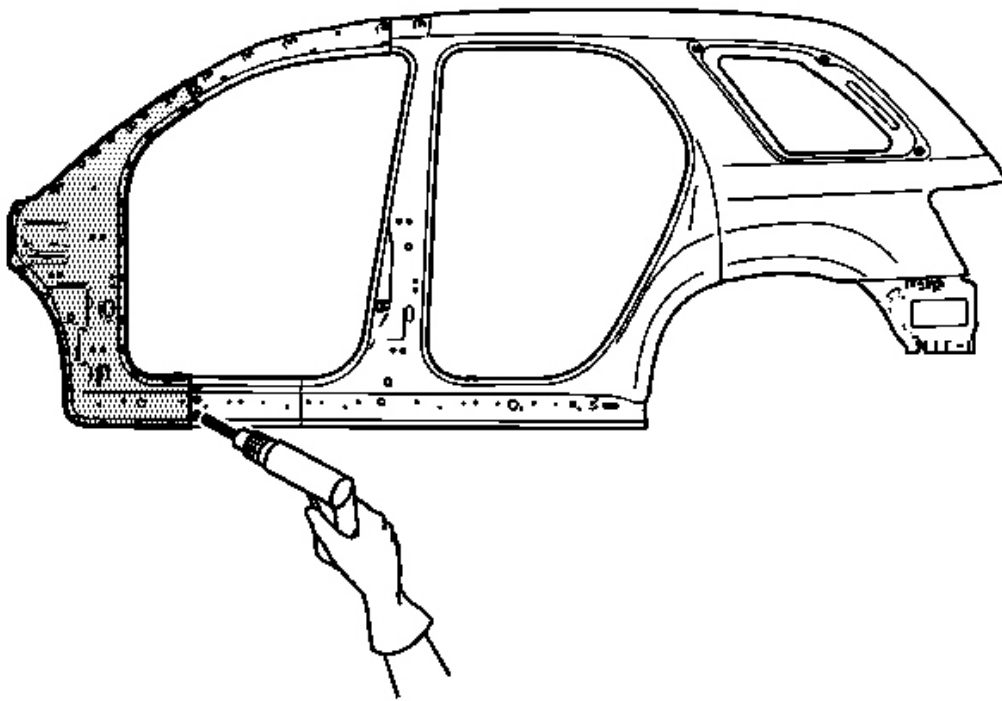


Fig. 50: Drilling Out Factory Welds On Front Hinge Pillar Body
Courtesy of GENERAL MOTORS CORP.

8. Locate and drill out all factory welds. Note the number and location of the welds for installations of the service part.
9. Remove the damaged windshield pillar section.

Installation Procedure

1. Cut the replacement windshield pillar section in corresponding locations to fit the original panel. The sectioning joint should be trimmed to allow $1\frac{1}{2}$ times the metal thickness at the sectioning joint.

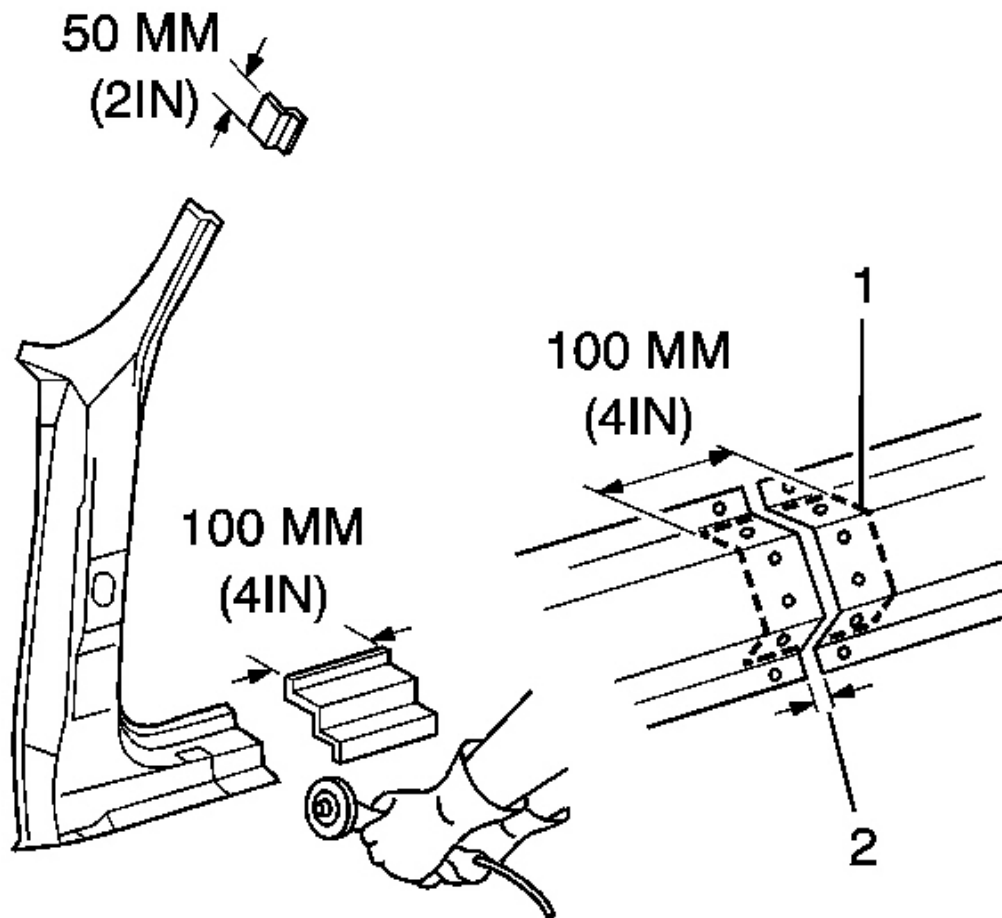


Fig. 51: Creating Backing Plate From Unused Portion Of Windshield Frame Pillar
Courtesy of GENERAL MOTORS CORP.

2. Create a 50 mm (2 in) backing plate (1) from the unused portion of the service part. Trim the backing plate as necessary to fit behind the sectioning joint where there is no reinforcement.
3. Drill 8 mm (5/16 in) plug weld holes along the sectioning cut on the remaining original part. Locate these holes 13 mm (1/2 in) from the edge and spaced 40 mm (1 1/2 in) apart.

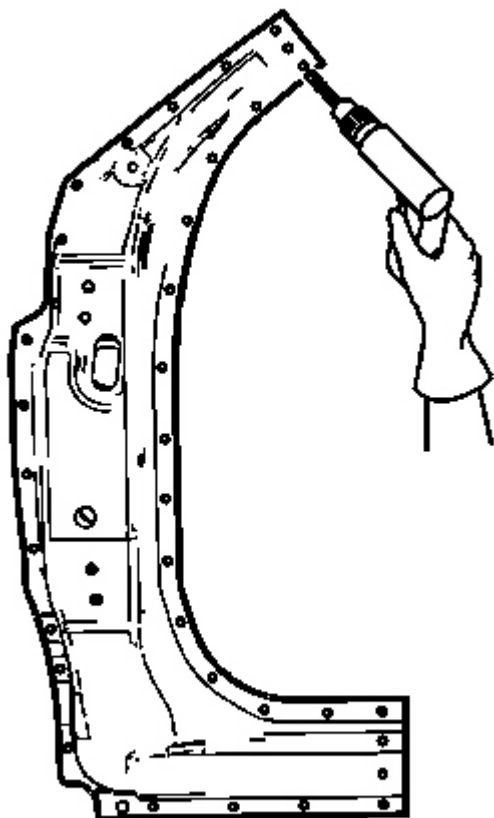


Fig. 52: Drilling Windshield Frame Pillar Plug Weld Holes
Courtesy of GENERAL MOTORS CORP.

NOTE: In any area damaged beyond recognition, or if structural Weld-Thru adhesive is present, space the plug weld holes 40 mm (1 1/2 in) apart.

4. Drill 8 mm (5/16 in) plug weld holes in the service part as necessary in the locations noted from the original panel and along the sectioning cut.
5. Prepare all mating surfaces, as necessary.
6. Apply GM-approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to **Anti-Corrosion Treatment and Repair**.

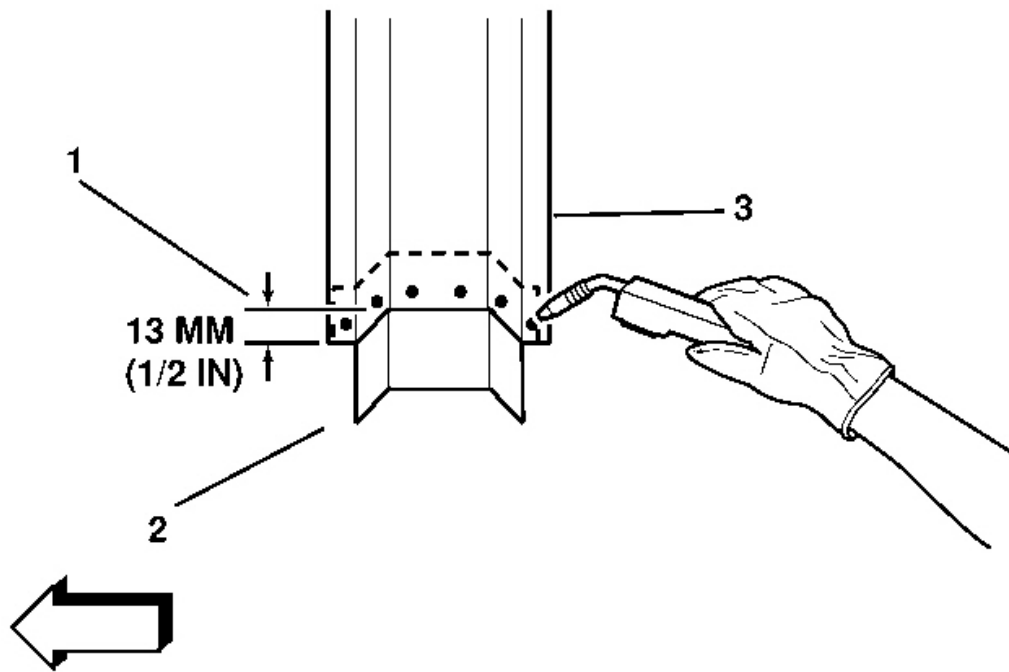


Fig. 53: Plug Welding Backing Plate
Courtesy of GENERAL MOTORS CORP.

7. Fit the backing plate (2) halfway into the sectioning joint, clamp and plug weld to the vehicle.
8. Position the service part.

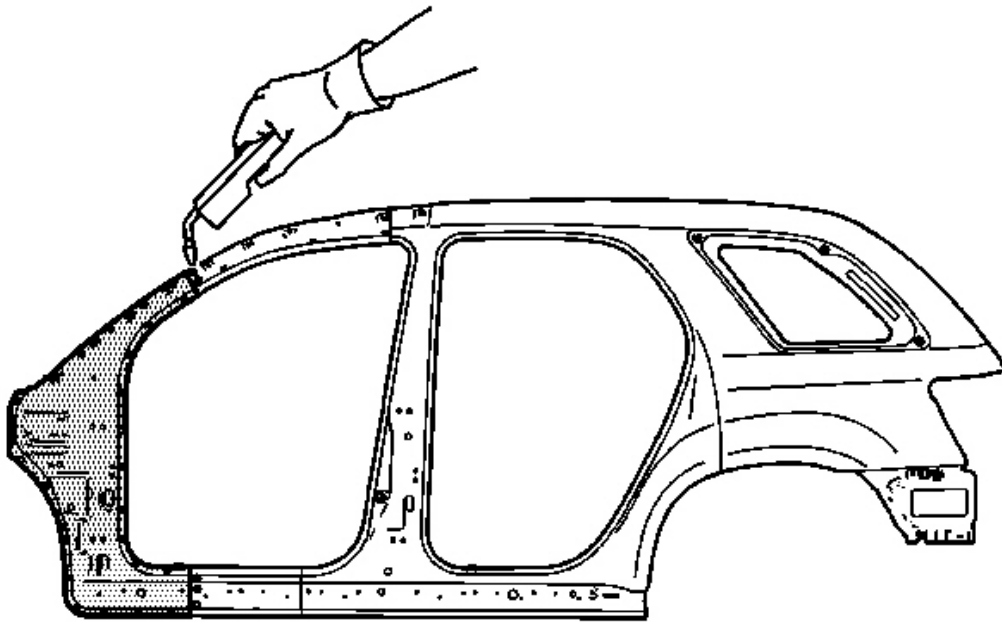


Fig. 54: Plug Welding Front Hinge Pillar Body
Courtesy of GENERAL MOTORS CORP.

9. Plug weld accordingly.

NOTE: 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. Then go back and complete the stitch weld.

10. Stitch weld the sectioning joint.
11. Clean and prepare all welded surfaces.

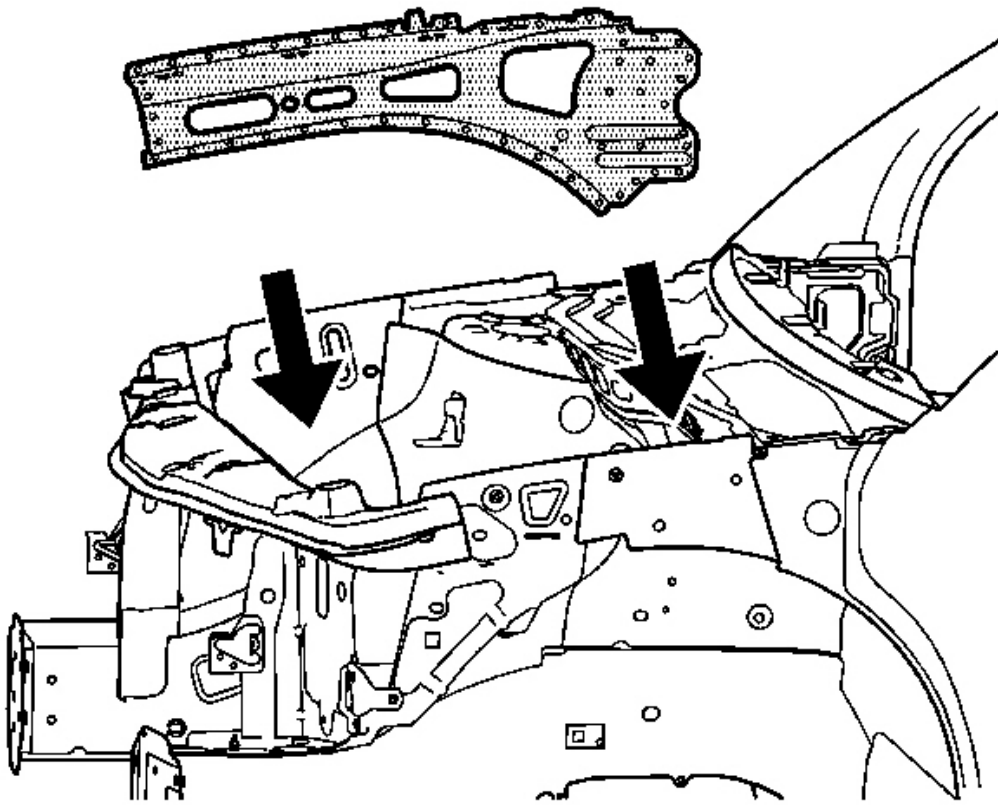


Fig. 55: Identifying Front Upper Outer Rail
Courtesy of GENERAL MOTORS CORP.

12. Install the front upper outer rail.
13. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
14. Paint the repair area. Refer to **Basecoat/Clearcoat Paint Systems** .
15. Install all related panels and components.
16. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection** .
17. Enable the SIR system. Refer to **SIR Disabling and Enabling** .

ROOF OUTER PANEL REPLACEMENT

Removal Procedure

This repair procedure includes an installation procedure for either metal-inert gas welding or adhesive bonding.

WARNING: Refer to Approved Equipment for Collision Repair Warning .

WARNING: Refer to Glass and Sheet Metal Handling Warning .

NOTE: Before beginning the repair, refer to Metal Panel Bonding for proper adhesive applicator preparations and general information.

NOTE: When replacing panels that involve servicing of stationary windows, refer to Adhesive Installation of Windshields before performing any priming or refinishing.

1. Disable the supplemental inflatable restraint (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. Refer to Dimensions - Body.
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 .
6. Remove the windshield. Refer to Windshield Replacement .
7. Remove the liftgate. Refer to Liftgate Replacement .

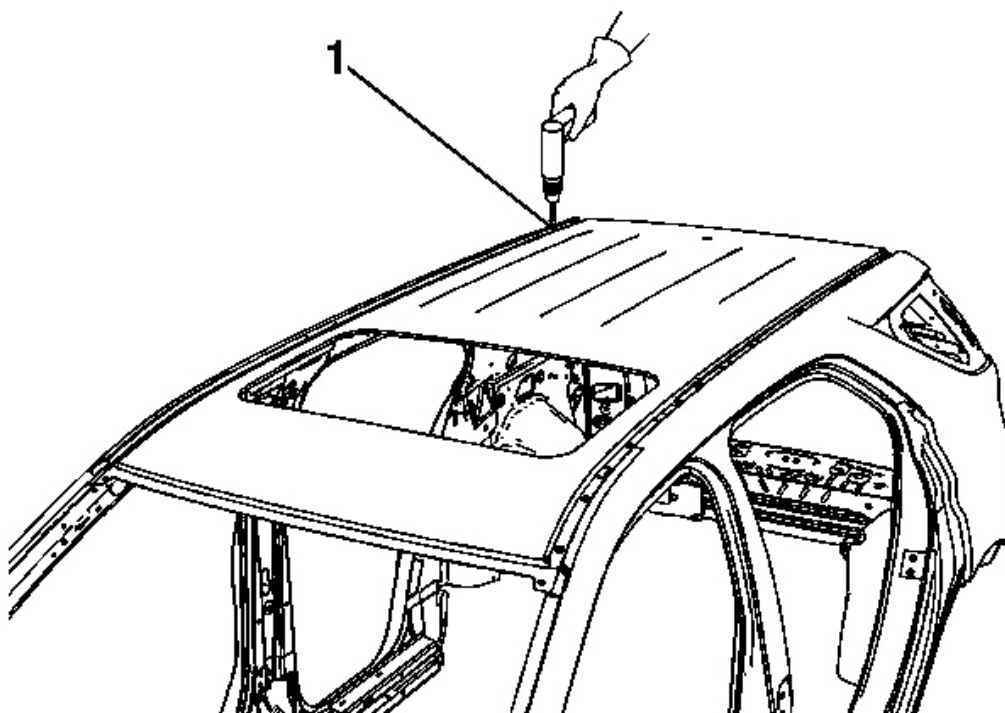


Fig. 56: Drilling Out Roof Factory Welds
Courtesy of GENERAL MOTORS CORP.

NOTE: Do not damage any inner panels or reinforcements. Record the number and location of the original welds for installation of the service part.

8. Locate and drill out all factory welds (1).

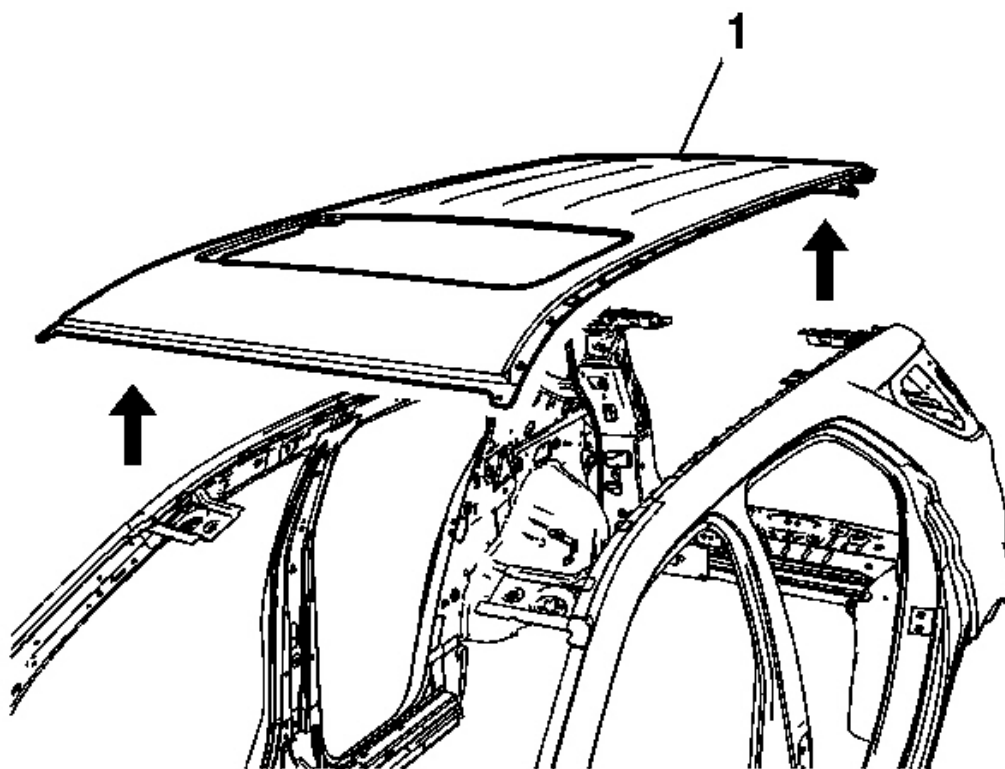


Fig. 57: Identifying Roof Panel

Courtesy of GENERAL MOTORS CORP.

9. With the aid of an assistant, remove the roof panel (1).

Installation Procedure

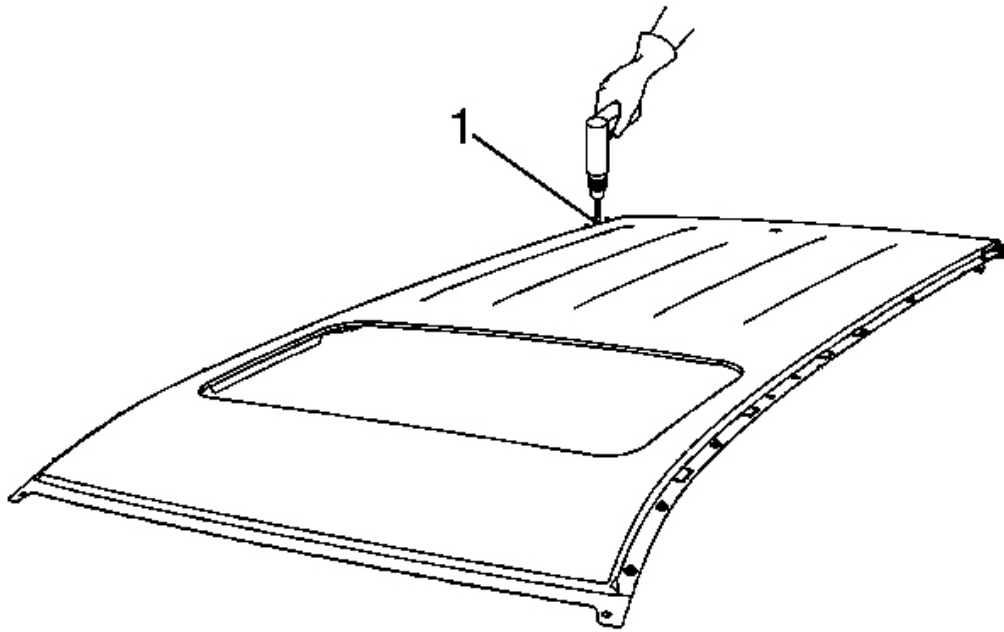


Fig. 58: Drilling Roof Plug Weld Holes
Courtesy of GENERAL MOTORS CORP.

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

IMPORTANT: If the location of the original plug weld holes can not be determined, or if structural weld-thru adhesive is present, space the plug weld holes every 40 mm (1 1/2 in) apart.

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** .

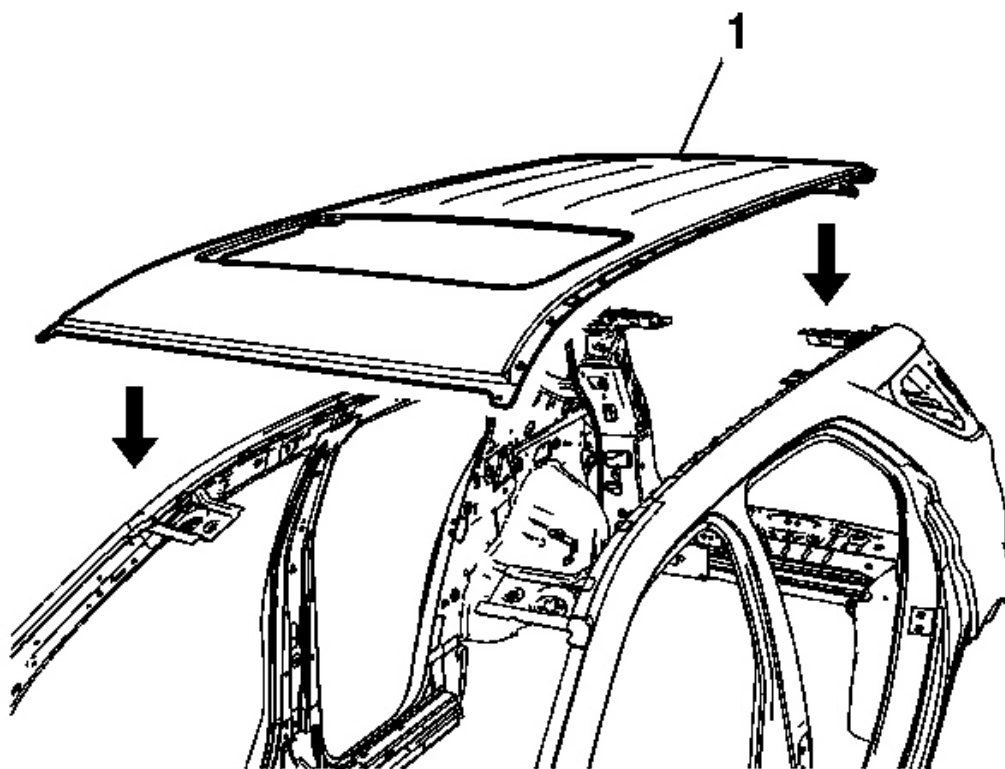


Fig. 59: Positioning Roof Panel To Body
Courtesy of GENERAL MOTORS CORP.

4. With the aid of an assistant, position the roof panel to the body (1).

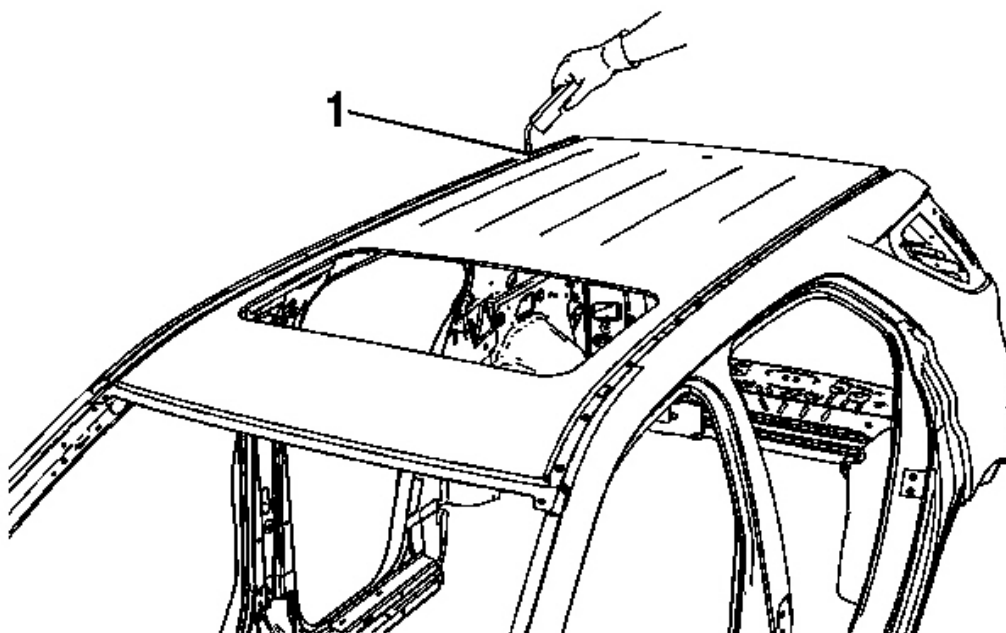


Fig. 60: Plug Welding Roof
Courtesy of GENERAL MOTORS CORP.

5. Plug weld accordingly (1).
6. Clean and prepare all welded surfaces.

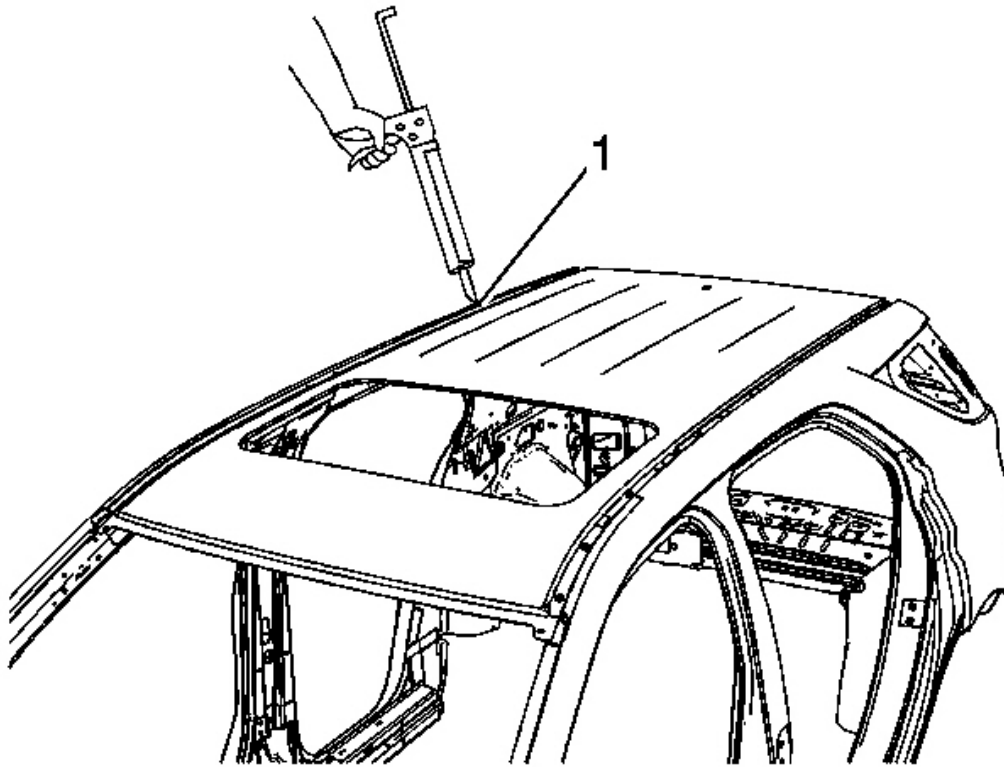


Fig. 61: Applying Sealers

Courtesy of GENERAL MOTORS CORP.

7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
8. Paint the repair area. Refer to **Basecoat/Clearcoat Paint Systems** .
9. Install the windshield. Refer to **Windshield Replacement** .
10. Install the liftgate. Refer to **Liftgate Replacement** .
11. Install all 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** .

ROCKER INNER PANEL REINFORCEMENT REPLACEMENT

Removal Procedure

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

WARNING: Refer to Glass and Sheet Metal Handling 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. Perform additional procedures as necessary. Refer to Front Hinge Pillar Body Sectioning.
5. Restore as much of the damage as possible to factory specifications using 3-dimensional measuring equipment.

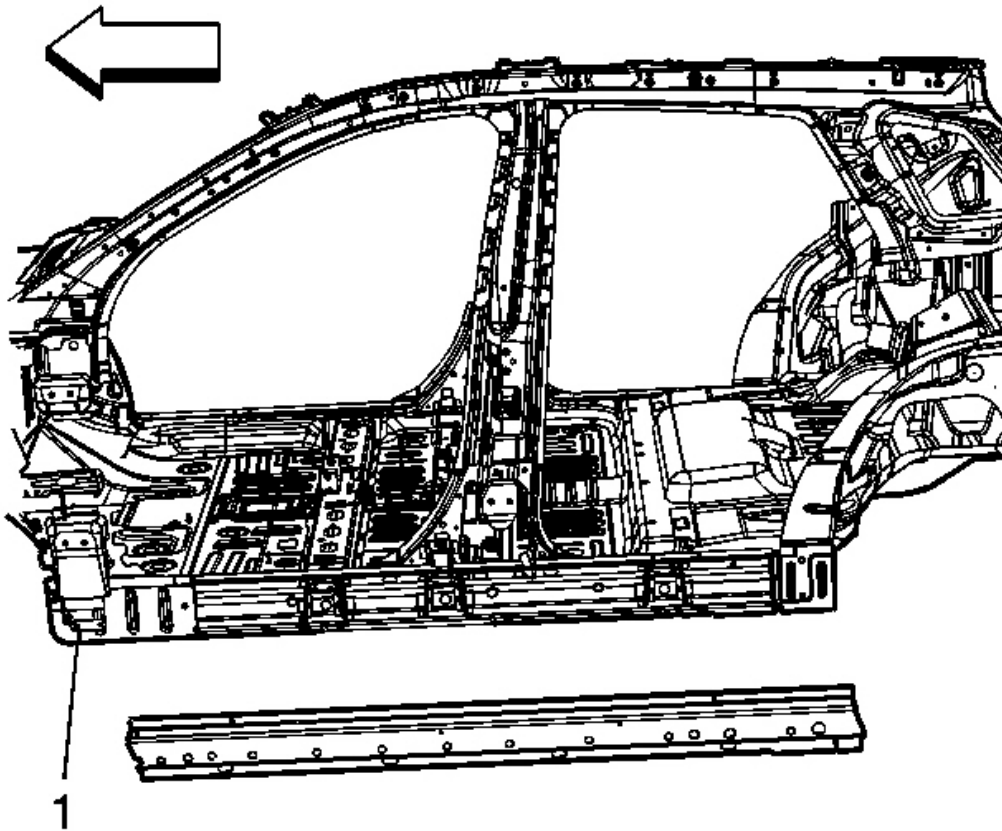


Fig. 62: Locating Sealers & Anti-Corrosion Materials
Courtesy of GENERAL MOTORS CORP.

6. Note the location and remove the sealers and anti-corrosion materials from the repair area, as necessary (1). Refer to Anti-Corrosion Treatment and Repair .

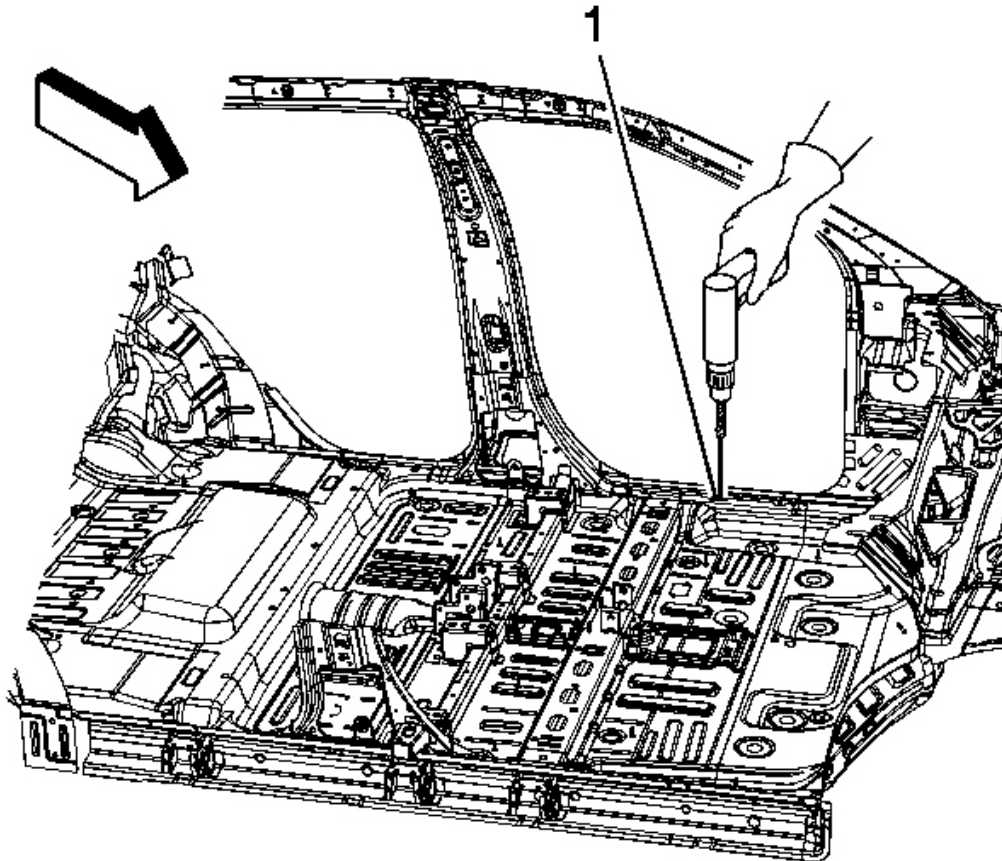


Fig. 63: Drilling Out Factory Welds
Courtesy of GENERAL MOTORS CORP.

NOTE: Do not damage any inner panels or reinforcements.

NOTE: The rocker inner panel is made of ultra high strength steel and should be replaced only at factory joints. Sectioning or straightening are not recommended. Refer to Ultra High Strength Steel.

NOTE: Ultra high steel is very difficult to drill. When possible drill spot welds from the back side of the panel.

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

7. Locate and drill out all factory welds (1).

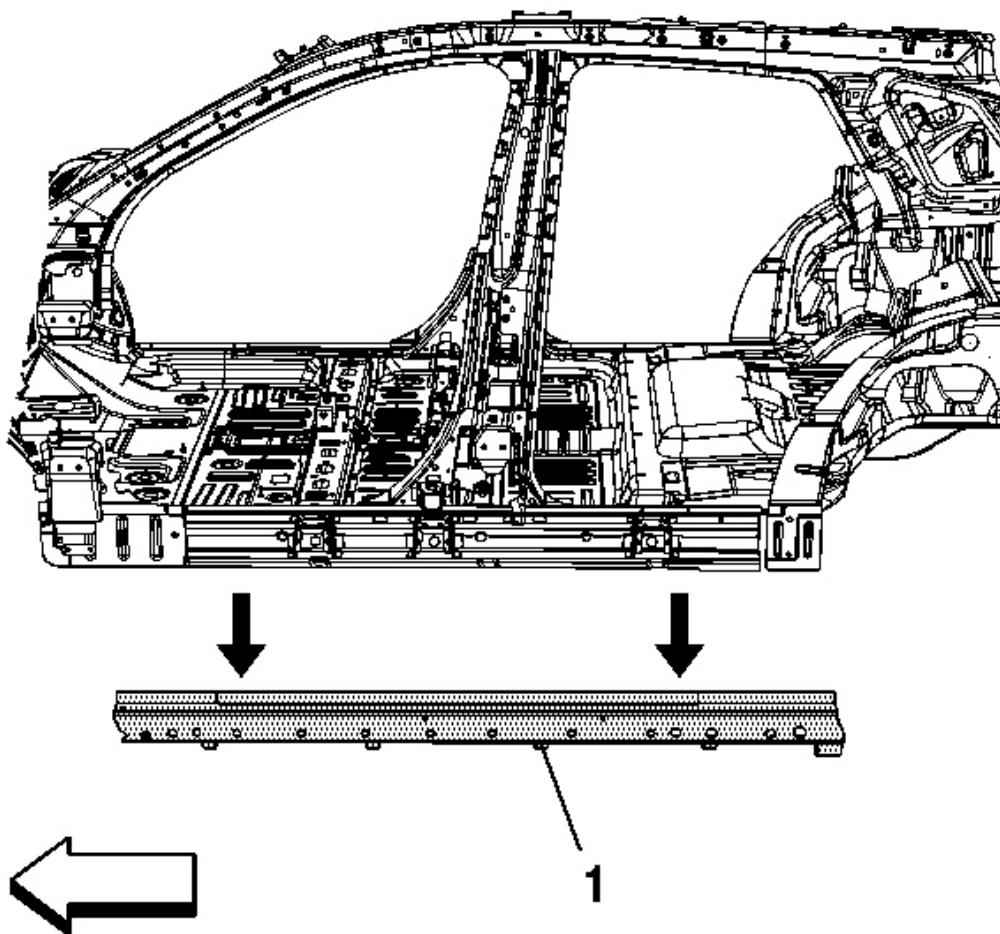


Fig. 64: Removing Damaged Inner Rocker Panel
Courtesy of GENERAL MOTORS CORP.

8. Remove the damaged inner rocker panel (1).

Installation Procedure

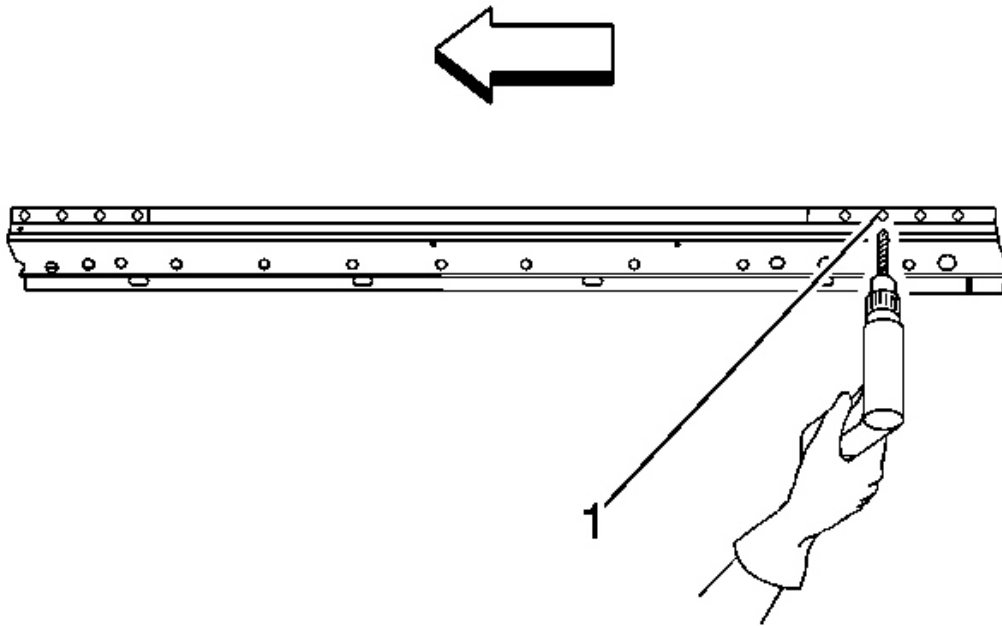


Fig. 65: Drilling Plug Weld Holes
Courtesy of GENERAL MOTORS CORP.

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

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

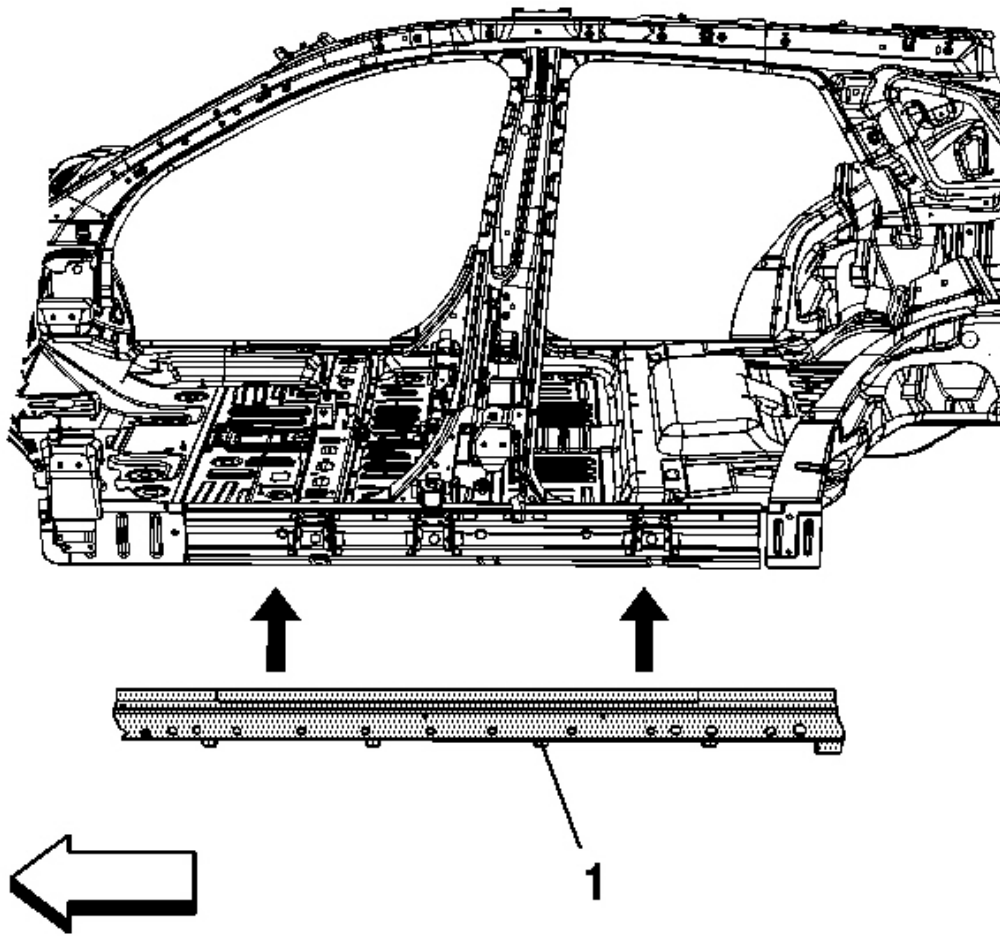


Fig. 66: Positioning Inner Rocker Panel
Courtesy of GENERAL MOTORS CORP.

4. Position the inner rocker panel (1).
5. Clamp service parts in position.
6. Inspect the vehicle for proper dimensions using 3-dimensional equipment.

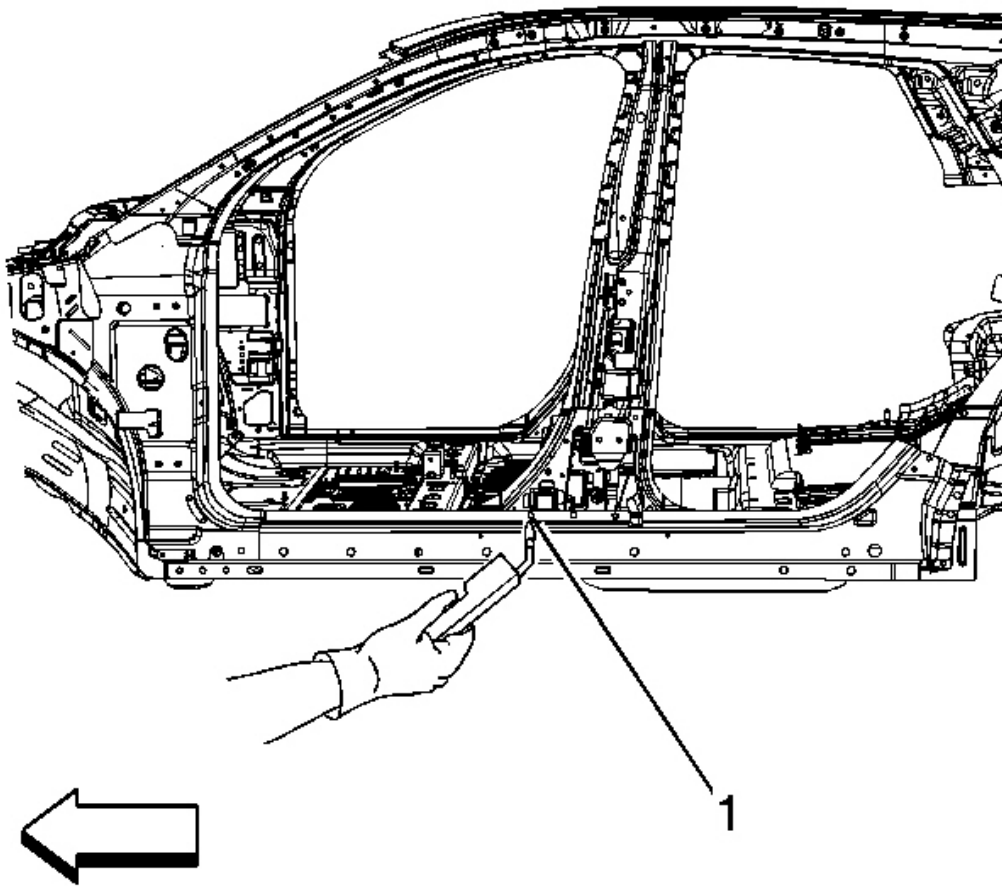


Fig. 67: Plug Welding Inner Rocker Panel
Courtesy of GENERAL MOTORS CORP.

7. Plug weld accordingly (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 repair area. Refer to **Basecoat/Clearcoat Paint Systems** .
11. Install all 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** .

FRONT SIDE DOOR OUTER PANEL REPLACEMENT

Removal Procedure

WARNING: Refer to Approved Equipment for Collision Repair Warning .

WARNING: Refer to Glass and Sheet Metal Handling Warning .

NOTE: Before beginning the repair, refer to Metal Panel Bonding for proper adhesive applicator preparations and general information.

1. Disable the supplemental inflatable restraint (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. Refer to Dimensions - Body.
5. Remove the door assembly. Refer to Front Side Door Replacement .

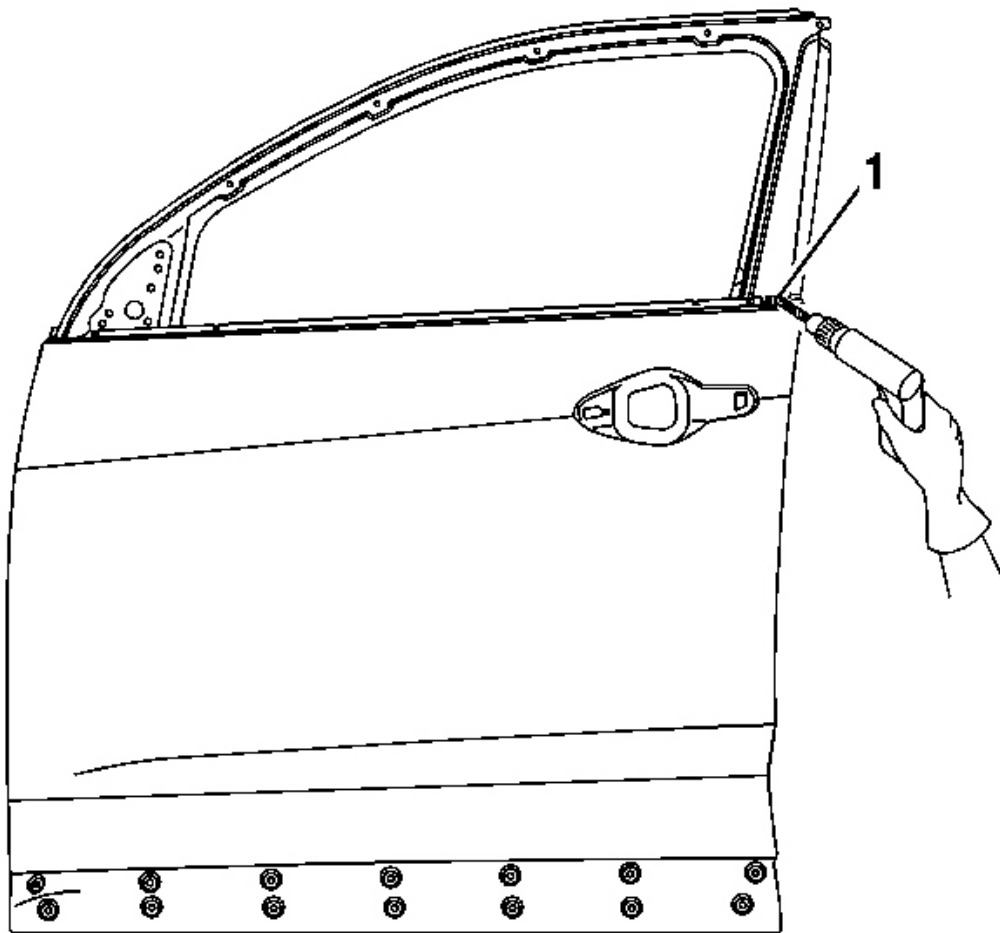


Fig. 68: Drilling Out Factory Welds

Courtesy of GENERAL MOTORS CORP.

6. Locate and drill out all factory welds (1). Note the number and location of welds at the upper window frame and the mirror locations.

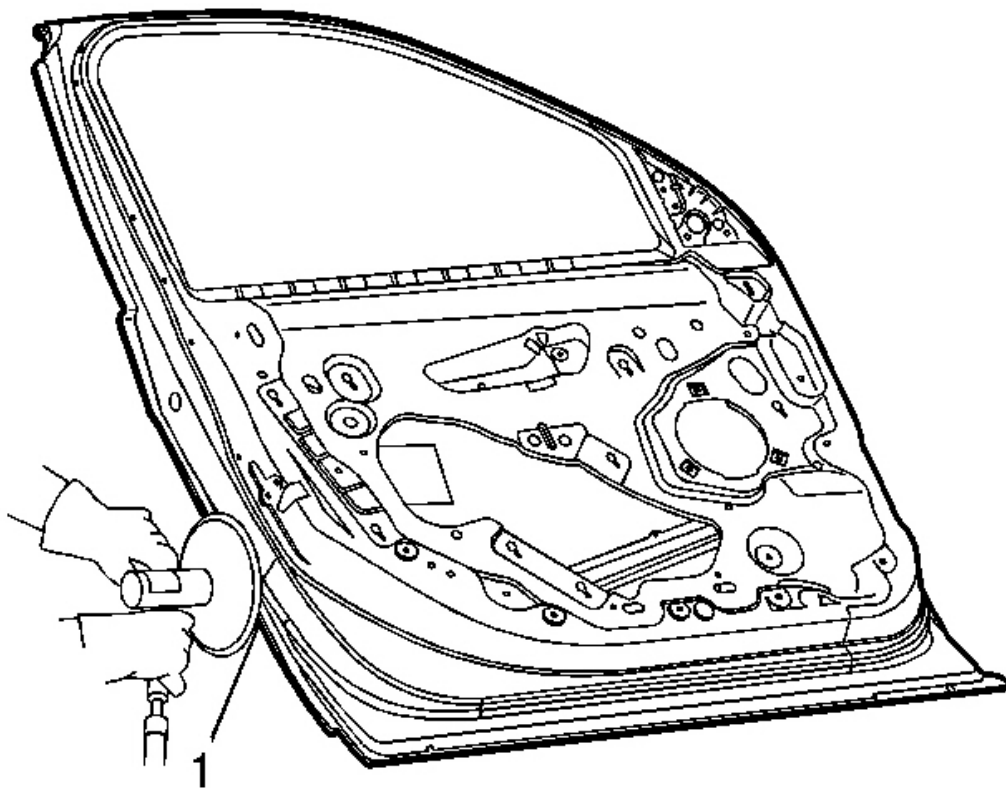


Fig. 69: Grinding Edges Of Door Outer Panel
Courtesy of GENERAL MOTORS CORP.

7. Grind the edges of the door outer panel to separate the outer door panel from the door shell (1).

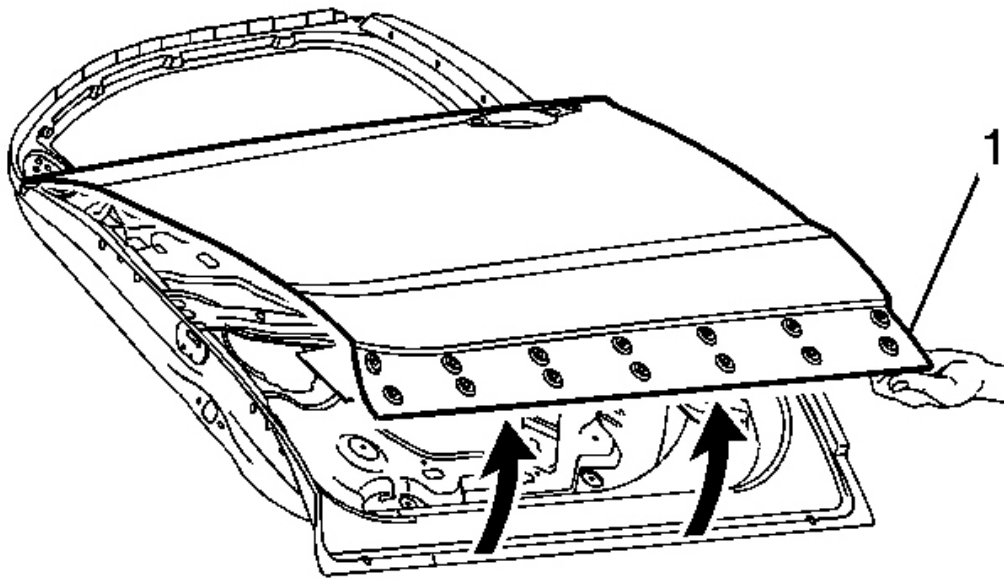


Fig. 70: Removing Outer Door Panel
Courtesy of GENERAL MOTORS CORP.

WARNING: Inspection of the door guard beam for damage must be performed before replacement of the door outer panel. If damage to the door guard beam is found the door must be replaced. Failure to do so may compromise the structural integrity of the vehicle and may cause personal injury if the vehicle is involved in a collision.

8. Remove the outer door panel (1).
9. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .

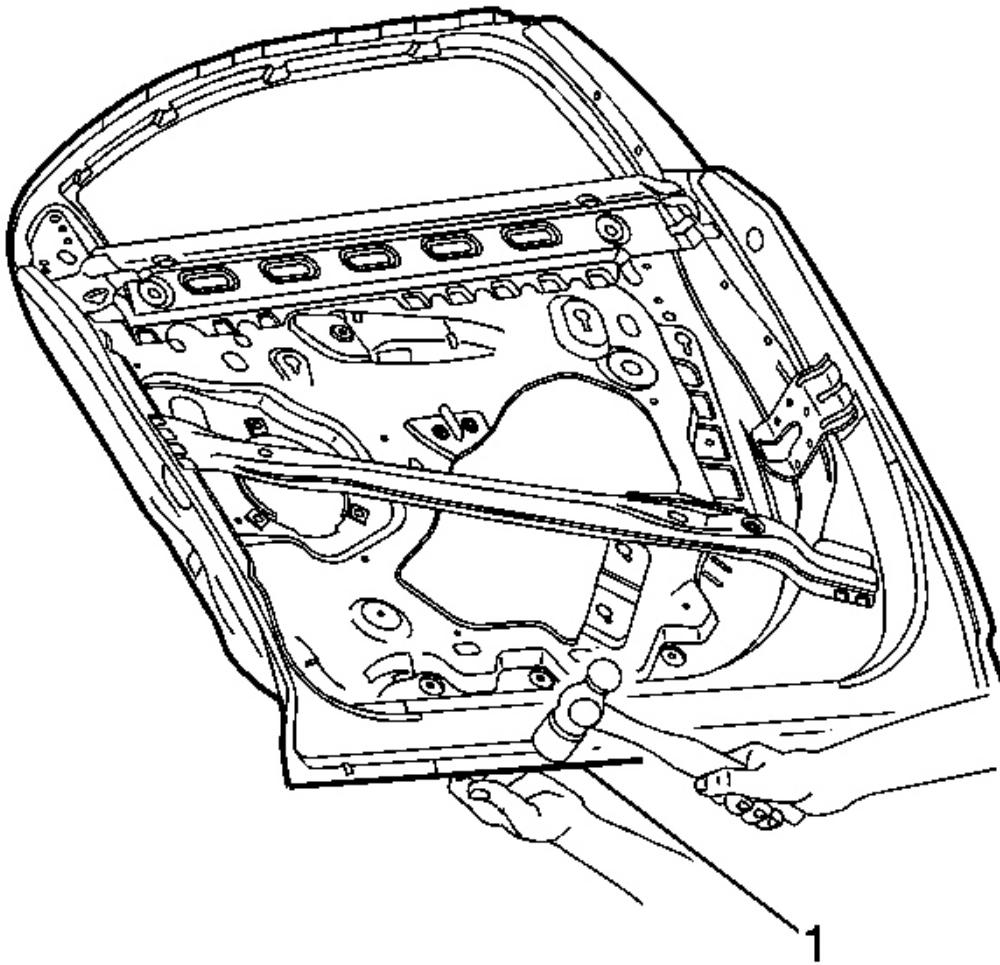


Fig. 71: Straightening Edges Of Door Inner Panel
Courtesy of GENERAL MOTORS CORP.

10. Straighten the edges of the door inner panel (1).

Installation Procedure

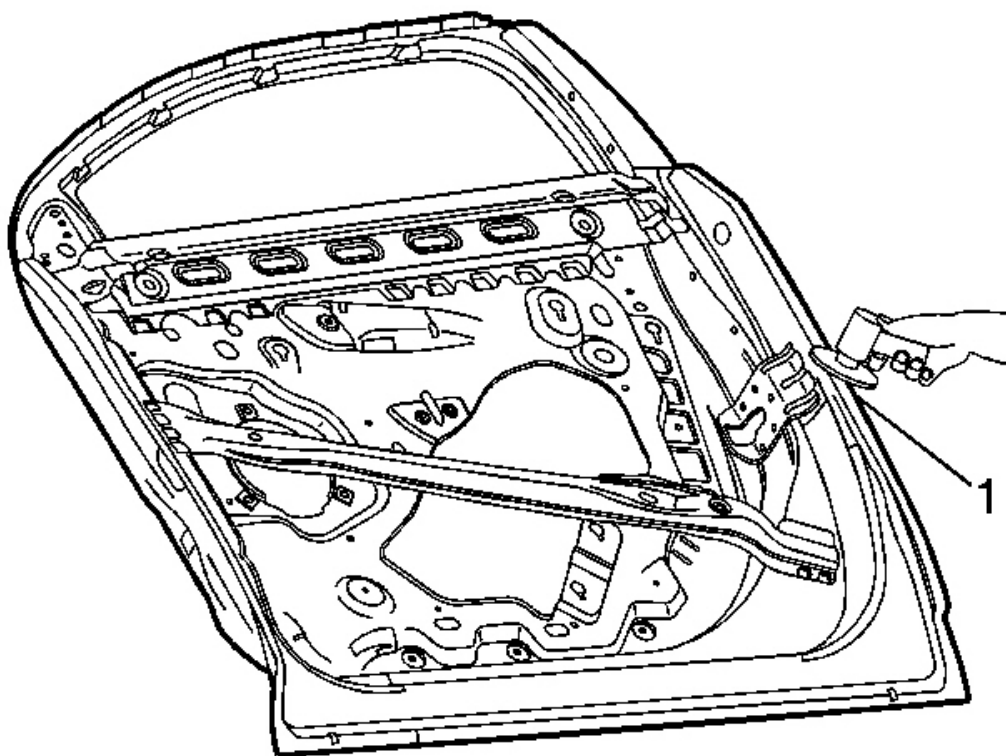


Fig. 72: Grinding Surface Of Door Shell
Courtesy of GENERAL MOTORS CORP.

1. Using a grinding disk, grind the surface of the door shell, removing all adhesive (1). Mate the flanges to the outer panel.

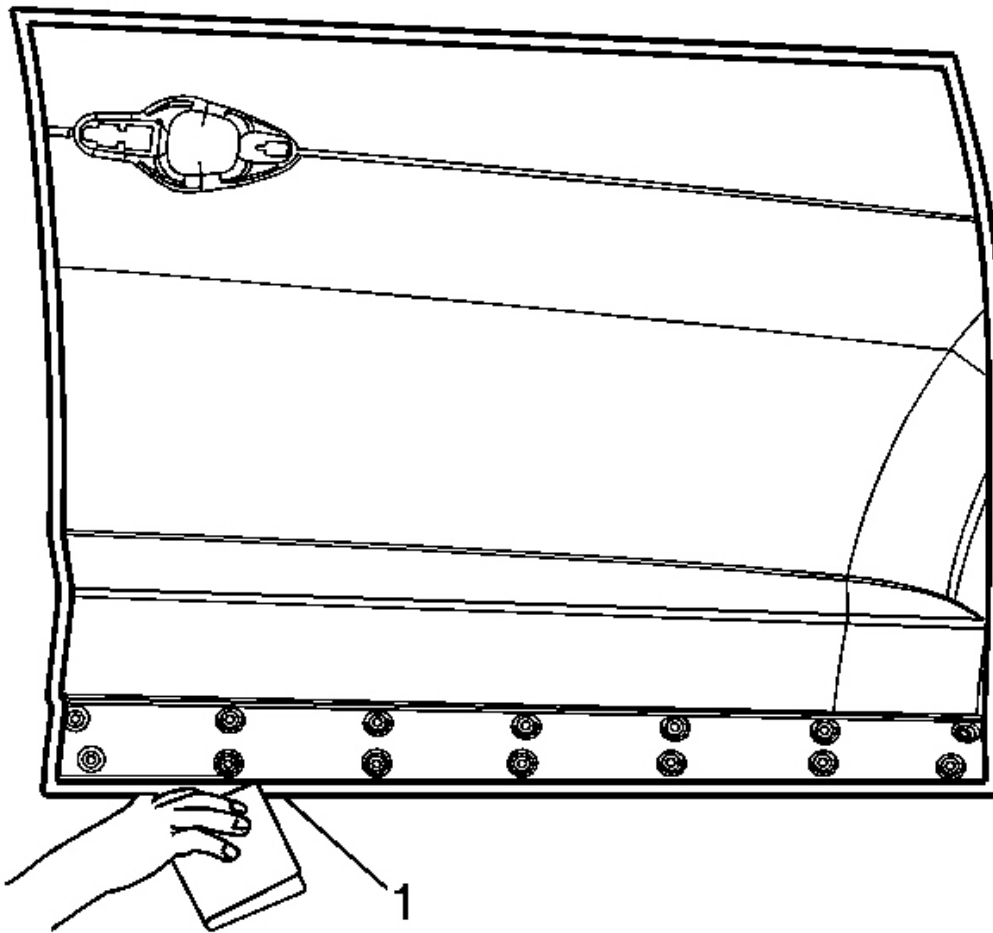


Fig. 73: Scuffing Opposing Mating Surfaces Of Door Outer Panel
Courtesy of GENERAL MOTORS CORP.

2. Scuff the opposing mating surfaces of the door outer panel to remove the gloss of the E-Coat (1).

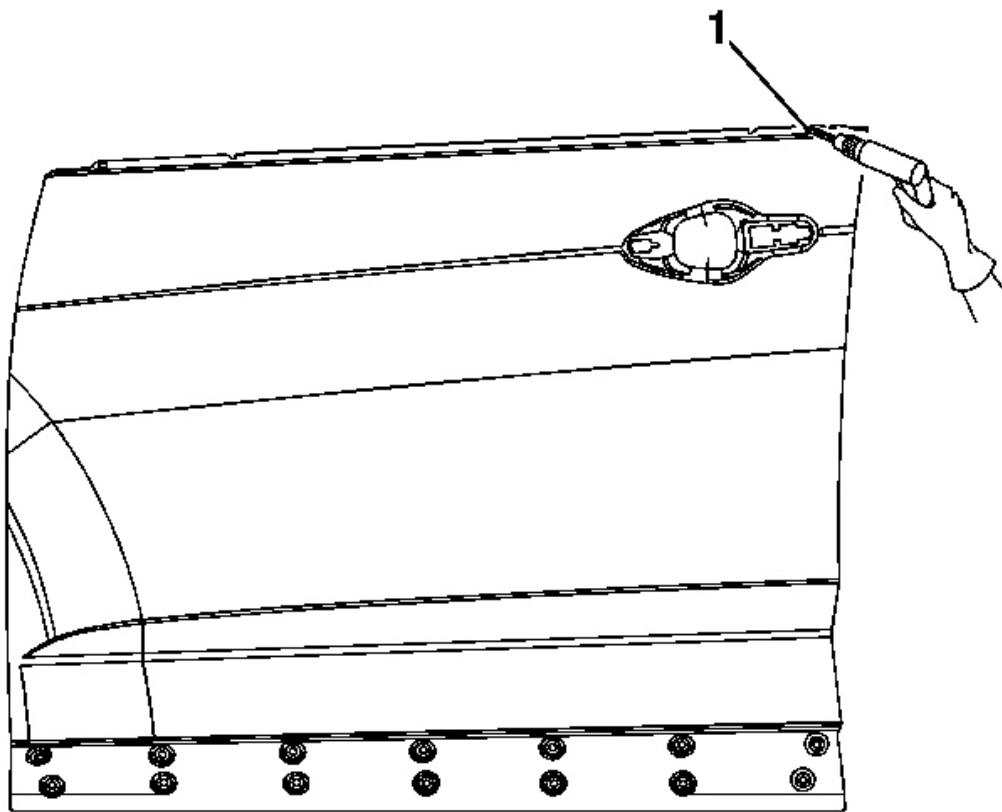


Fig. 74: Drilling Plug Weld Holes
Courtesy of GENERAL MOTORS CORP.

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

3. Drill 8 mm (5/16 in) plug weld holes as necessary in the locations noted from the original panel (1).
4. Clean the mating surfaces.

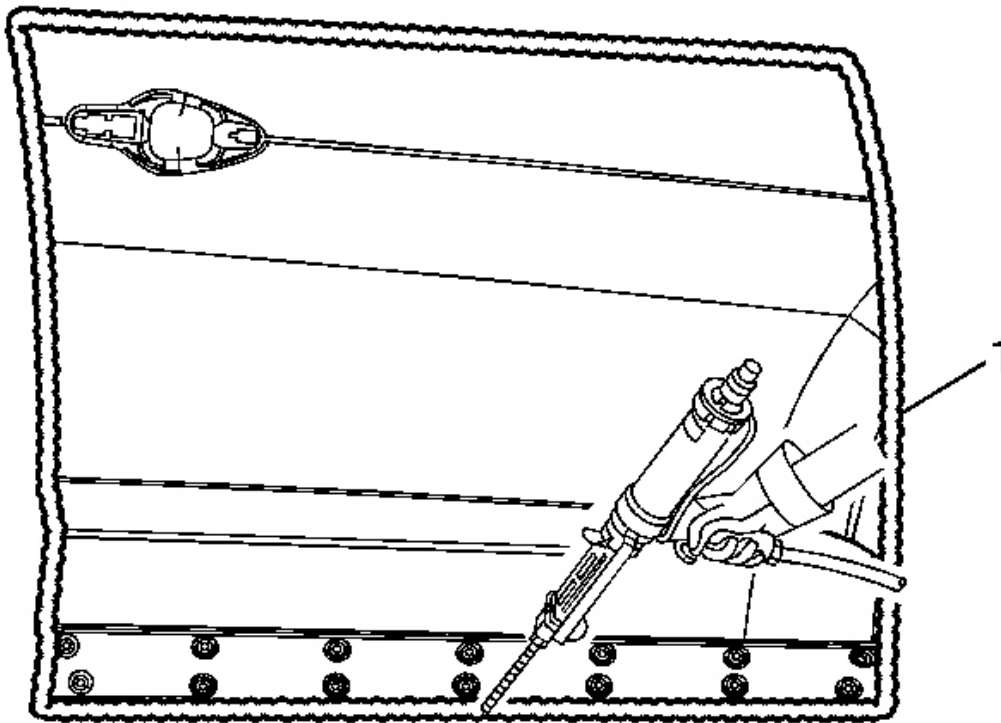


Fig. 75: Applying Adhesive

Courtesy of GENERAL MOTORS CORP.

NOTE: The adhesive has a 40-50 minute working time. Do not allow the door to totally cure off the vehicle, as proper alignment of the door outer panel to the door shell will be difficult.

5. Apply a 3-6 mm (1/8-1/4 in) bead of metal panel bonding adhesive to both of the mating surfaces (1).
6. Using a small acid brush, spread a coat of adhesive to cover all the bare metal surfaces to ensure corrosion protection.

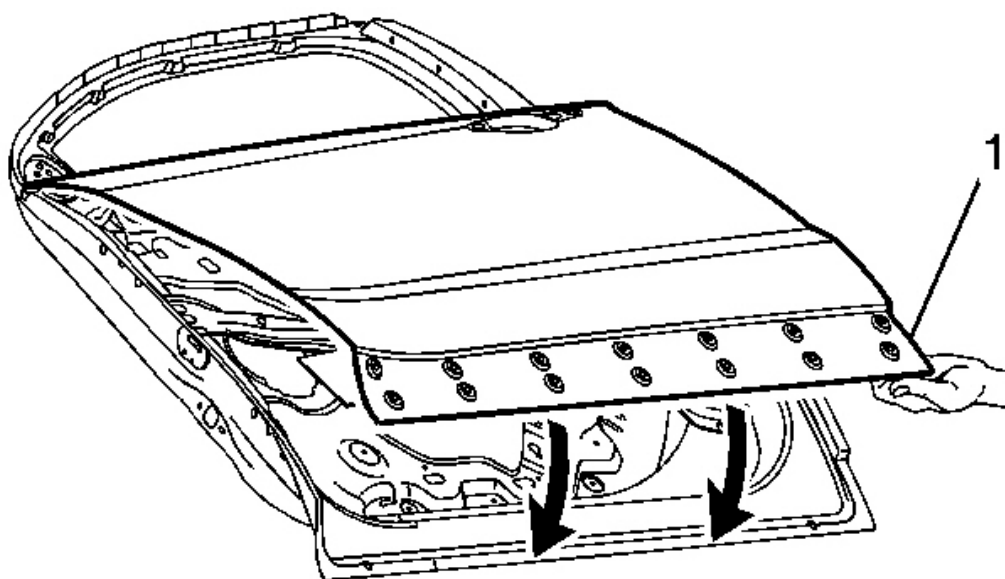


Fig. 76: Installing Door Outer Panel To Door Shell
Courtesy of GENERAL MOTORS CORP.

7. Install the door outer panel to the door shell (1).

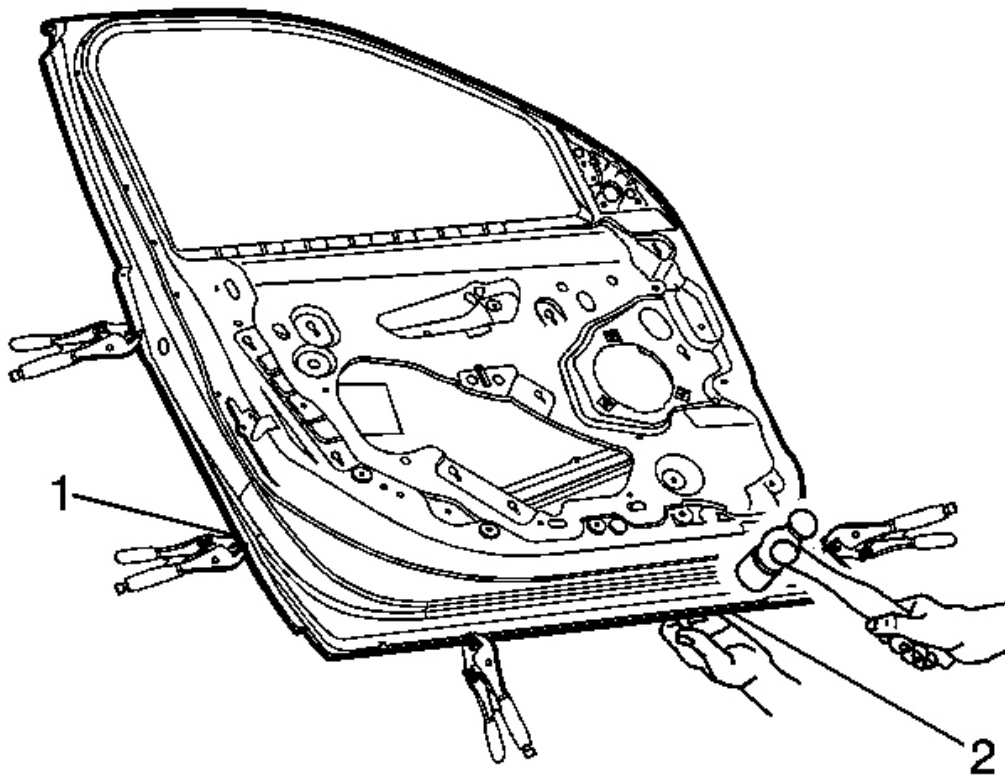


Fig. 77: Re-Hemming Hem Flanges
Courtesy of GENERAL MOTORS CORP.

NOTE: Do NOT pull the panels apart after being joined together. Slide the panels against each other to realign the panels.

8. Clamp the door outer panel into position as required (1).
9. Using a hammer re-hem the hem flanges around the door shell (2).

Continue to hammer in stages along the hem flanges.

10. Using lacquer thinner remove the excess adhesive from the door panel area.
11. Install the door to the vehicle. Inspect the door outer panel for proper alignment, adjust the alignment as required.

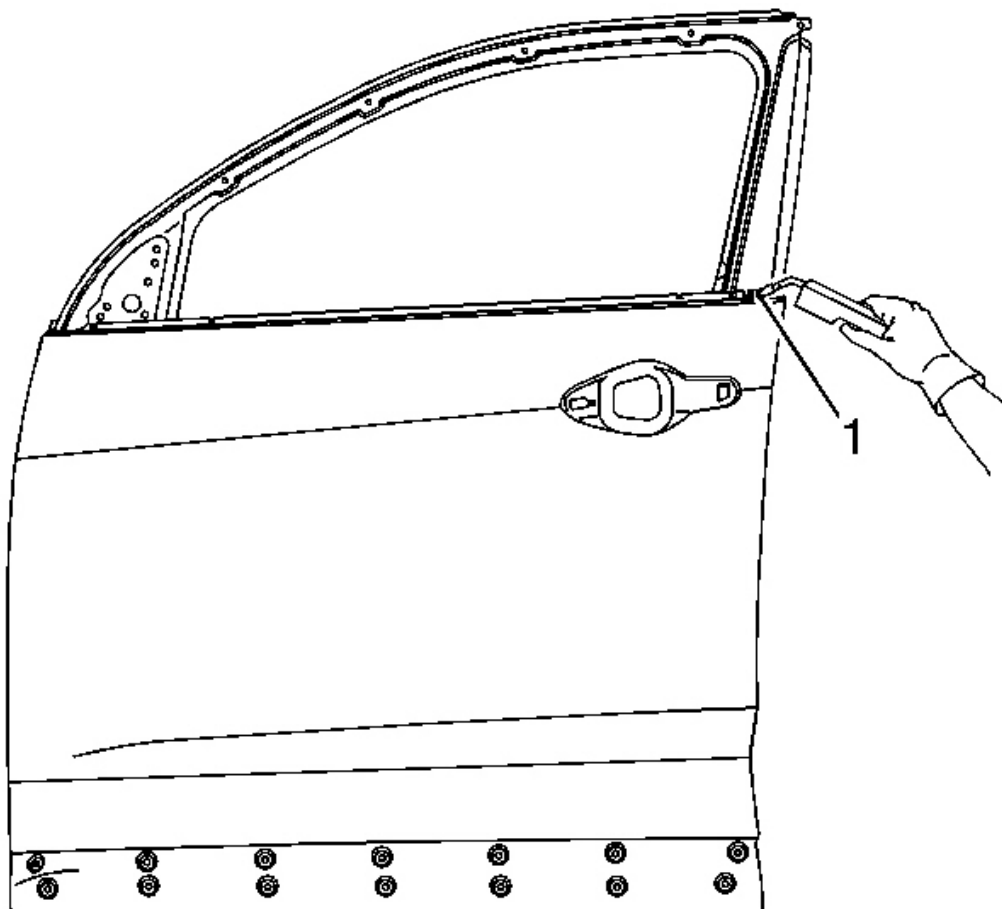


Fig. 78: Welding Door Outer Panel To Door Frame
Courtesy of GENERAL MOTORS CORP.

12. Using metal-inert gas (MIG), weld the door outer panel to the door frame in the locations noted at the upper door frame (1).
13. Clean and prepare all welded surfaces.

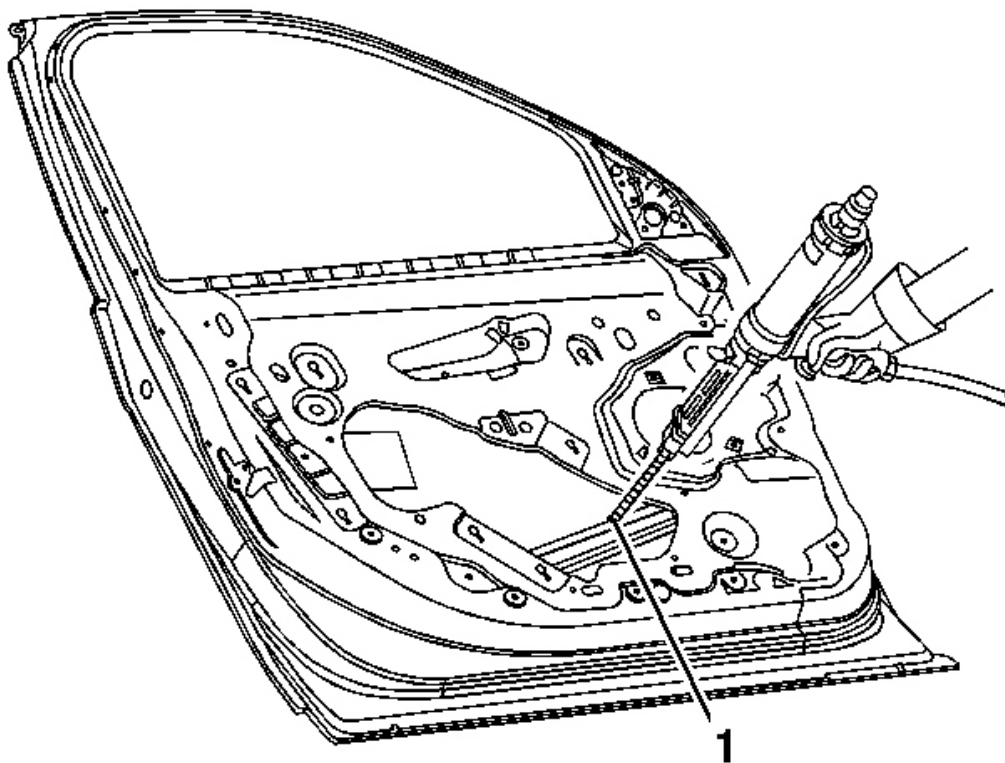


Fig. 79: Applying Fusor
Courtesy of GENERAL MOTORS CORP.

14. Apply Fusor super flexible anti-flutter foam-fast set, Fusor P/N 121/124 or equivalent in 4-5 evenly spaced locations between the door outer panel and the impact beam (1).
15. Apply 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 the door assembly. Refer to **Front Side Door Replacement** .
18. Install all related panels and components.
19. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection** .
20. Enable the SIR system. Refer to **SIR Disabling and Enabling** .

REAR SIDE DOOR OUTER PANEL REPLACEMENT

Removal Procedure

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

WARNING: Refer to Glass and Sheet Metal Handling Warning .

NOTE: Before beginning the repair, refer to Metal Panel Bonding for proper adhesive applicator preparations and general information.

1. Disable the supplemental inflatable restraint (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. Refer to Dimensions - Body.
5. Remove the door assembly. Refer to Rear Side Door Adjustment .

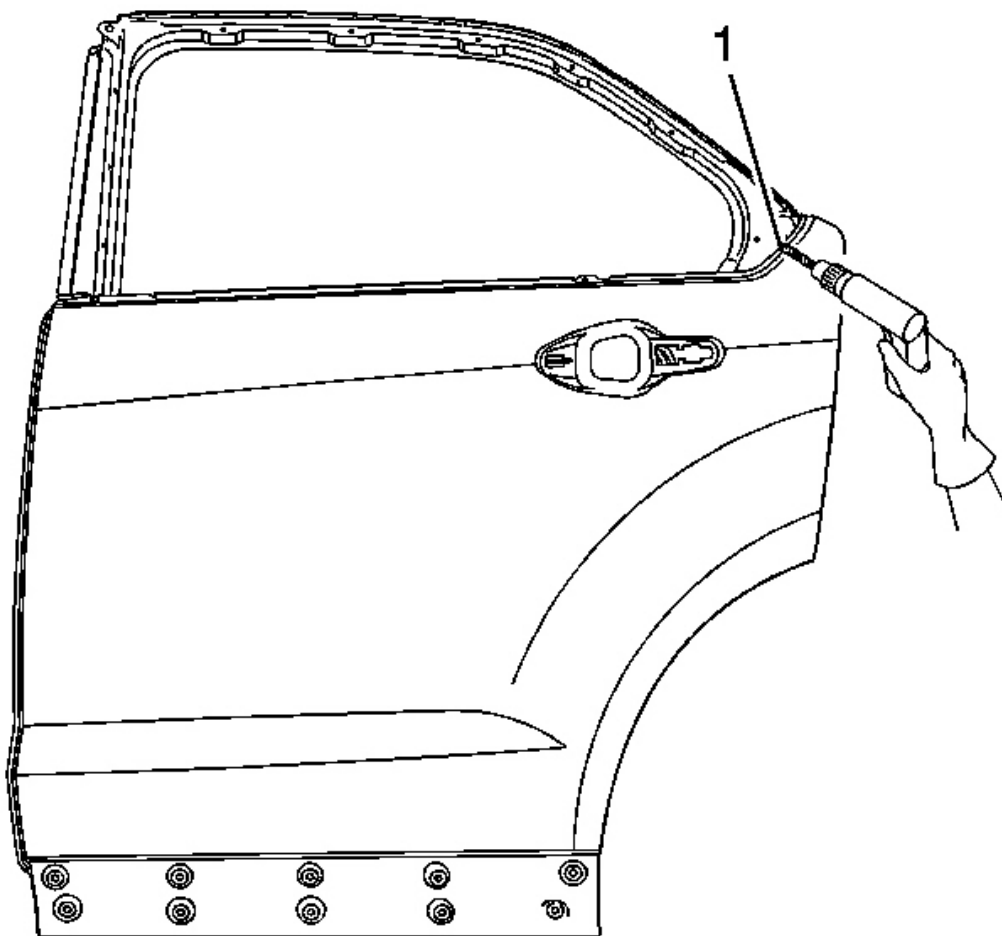


Fig. 80: Drilling Out Factory Welds
Courtesy of GENERAL MOTORS CORP.

6. Locate and drill out all factory welds (1). Note the number and location of welds at the upper window.

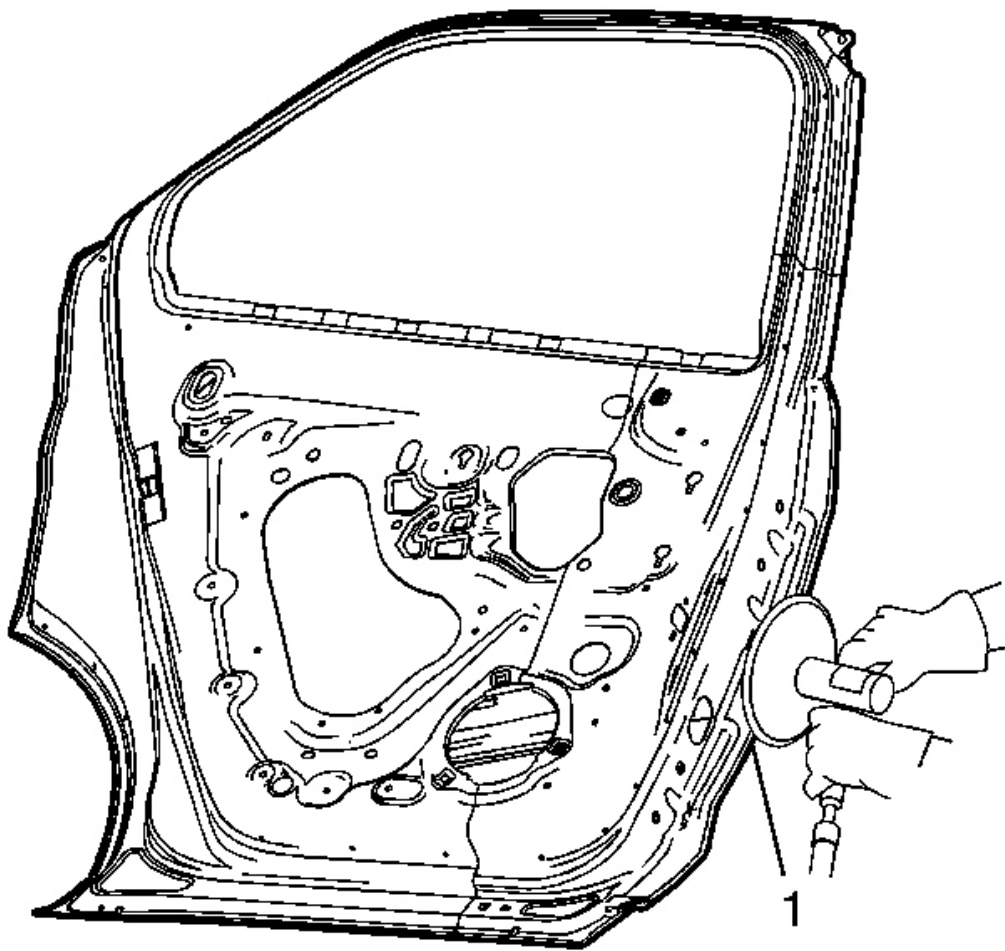


Fig. 81: Grinding Edges Of Door Outer Panel
Courtesy of GENERAL MOTORS CORP.

7. Grind the edges of the door outer panel to separate the outer door panel from the door shell (1).

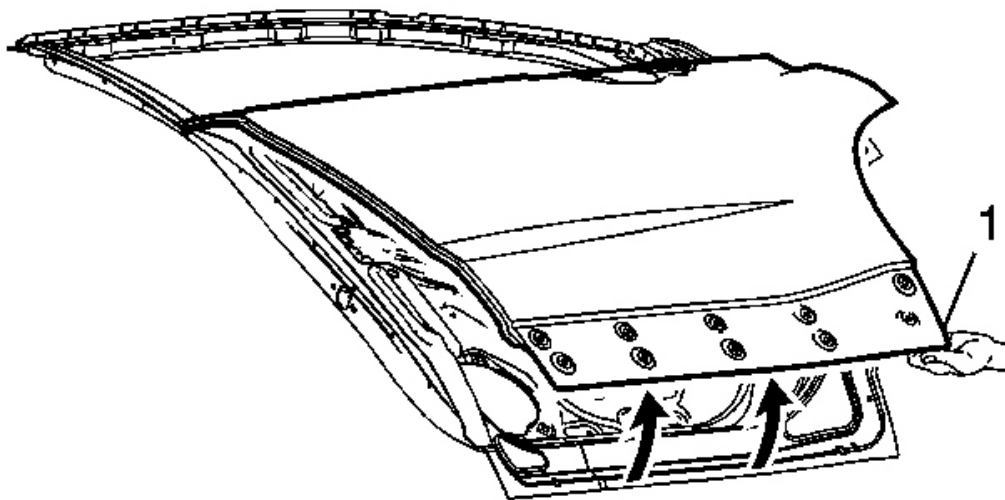


Fig. 82: Removing Outer Door Panel
Courtesy of GENERAL MOTORS CORP.

WARNING: Inspection of the door guard beam for damage must be performed before replacement of the door outer panel. If damage to the door guard beam is found the door must be replaced. Failure to do so may compromise the structural integrity of the vehicle and may cause personal injury if the vehicle is involved in a collision.

8. Remove the outer door panel (1).
9. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .

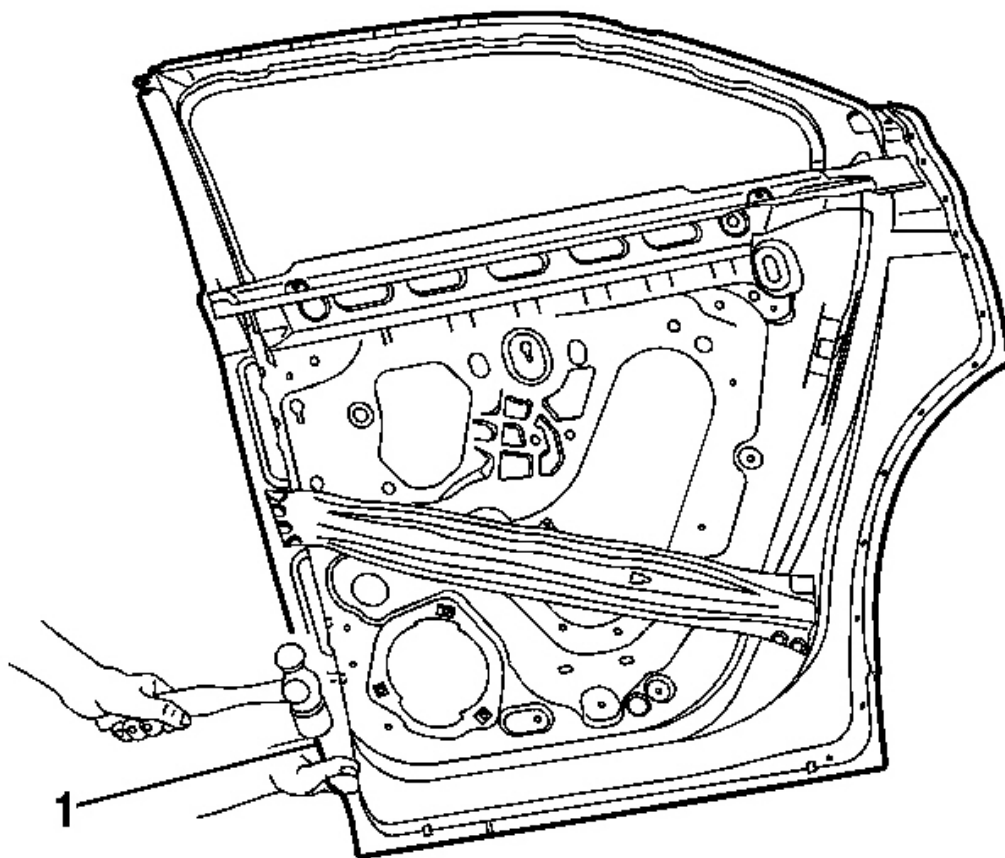


Fig. 83: Straightening Edges Of Door Inner Panel
Courtesy of GENERAL MOTORS CORP.

10. Straighten the edges of the door inner panel (1).

Installation Procedure

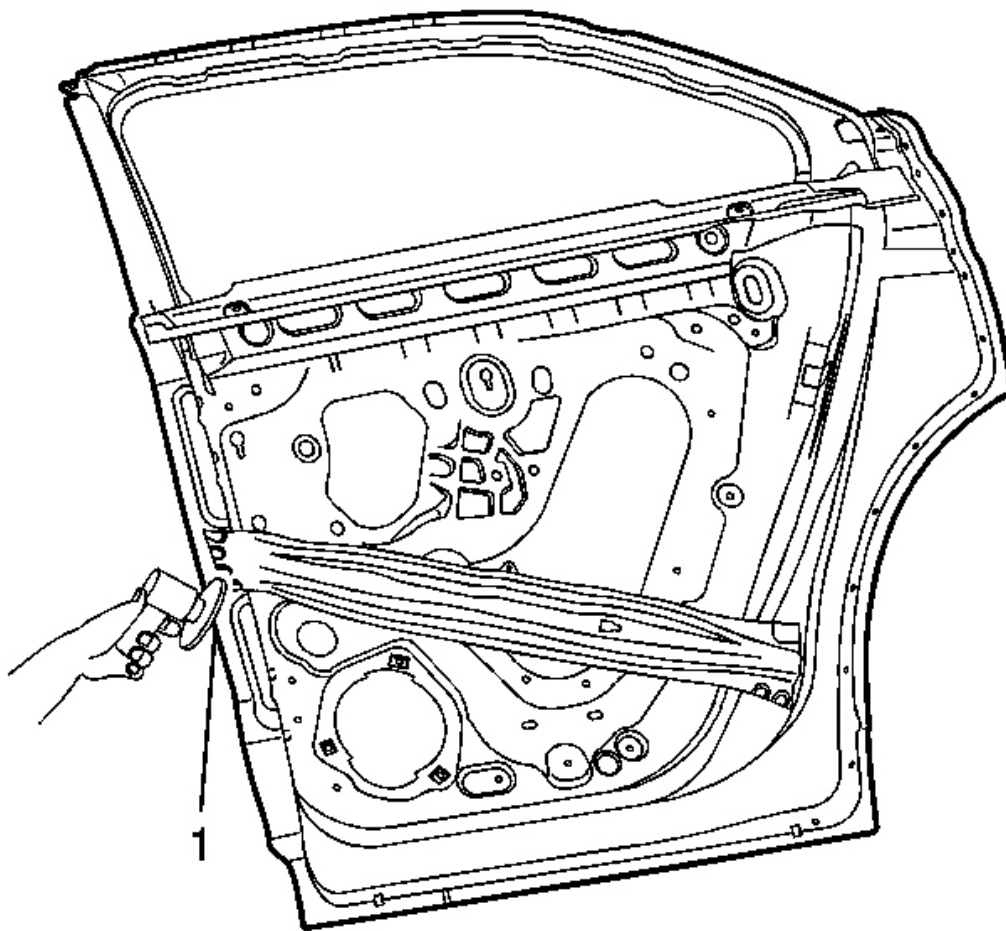


Fig. 84: Grinding Surface Of Door Shell
Courtesy of GENERAL MOTORS CORP.

1. Using a grinding disk, grind the surface of the door shell, removing all adhesive (1). Mate the flanges to the outer panel.

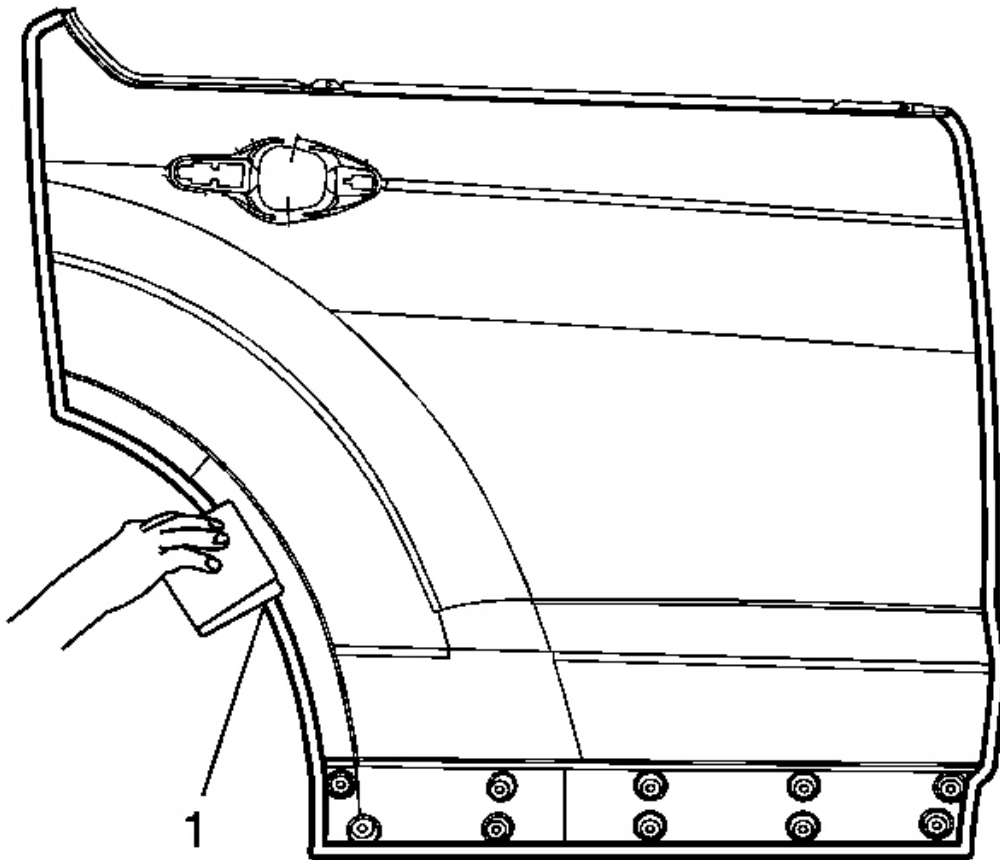


Fig. 85: Scuffing Opposing Mating Surfaces
Courtesy of GENERAL MOTORS CORP.

2. Scuff the opposing mating surfaces of the door outer panel to remove the gloss of the E-Coat (1).

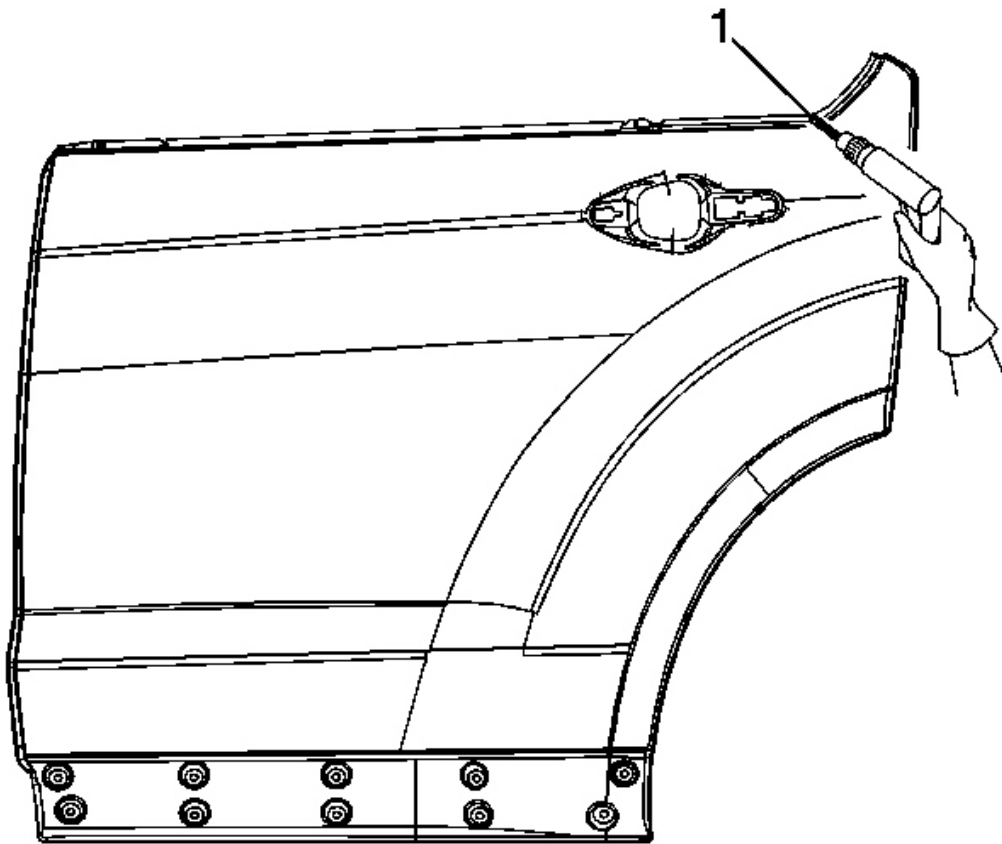


Fig. 86: Drilling Plug Weld Holes

Courtesy of GENERAL MOTORS CORP.

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

3. Drill 8 mm (5/16 in) plug weld holes as necessary in the locations noted from the original panel (1).
4. Clean the mating surfaces.

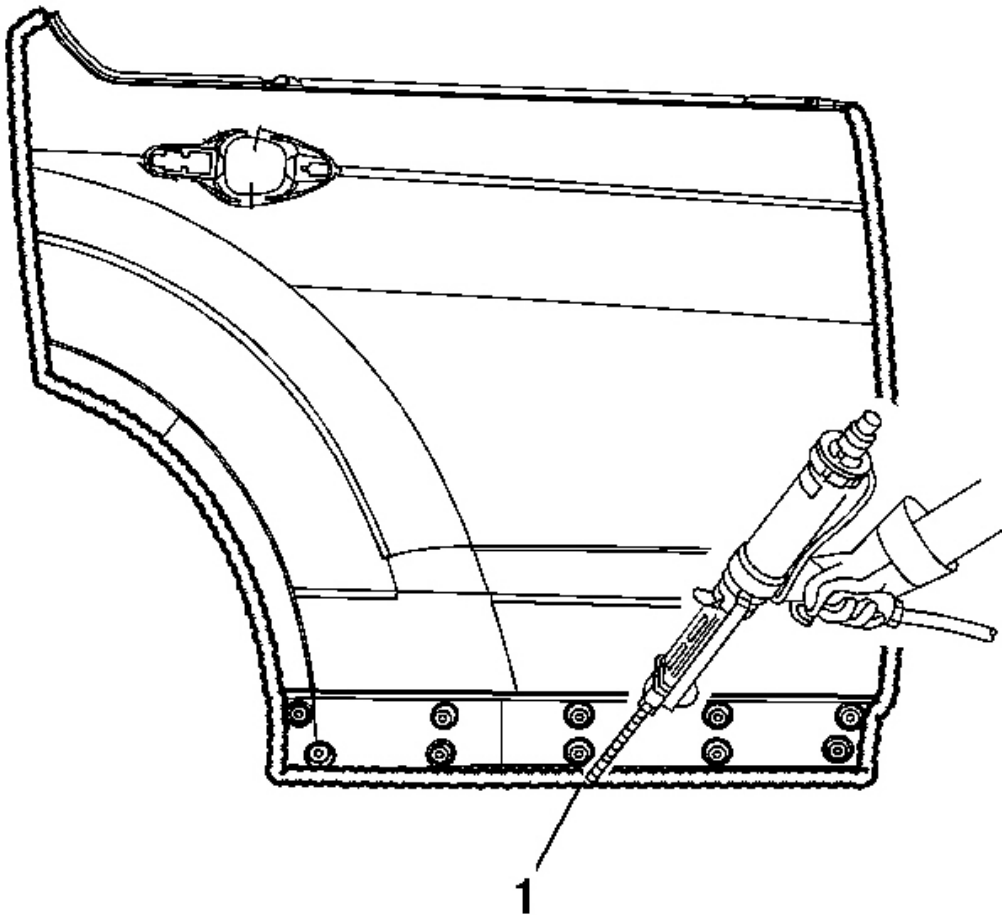


Fig. 87: Applying Metal Panel Bonding Adhesive
Courtesy of GENERAL MOTORS CORP.

NOTE: **The adhesive has a limited working time. Do not allow the door to totally cure off the vehicle, as proper alignment of the door outer panel to the door shell will be difficult.**

5. Apply a 3-6 mm (1/8-1/4 in) bead of metal panel bonding adhesive GM P/N 12378566/7 (Canadian P/N 88901674/5) or equivalent, to both of the mating surfaces (1).
6. Using a small acid brush, spread a coat of adhesive to cover all the bare metal surfaces to ensure corrosion protection.

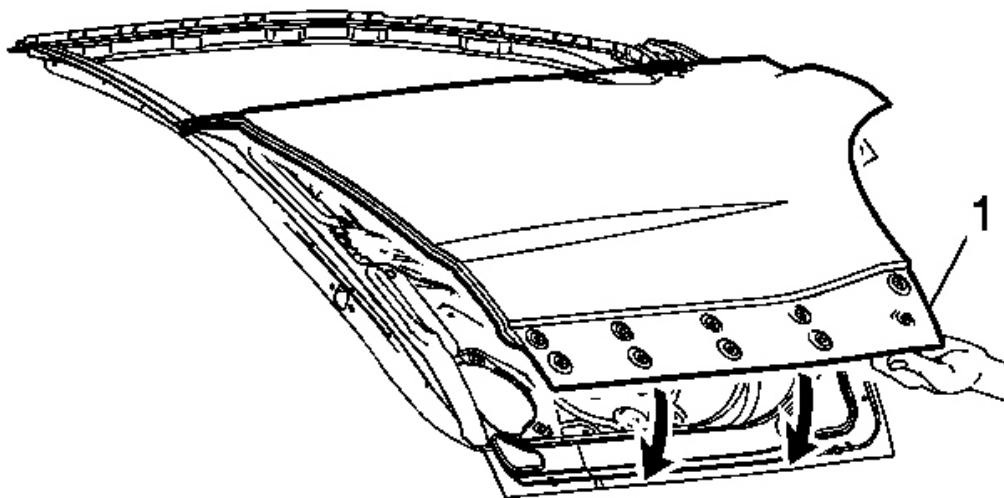


Fig. 88: Installing Door Outer Panel To Door Shell
Courtesy of GENERAL MOTORS CORP.

7. Install the door outer panel to the door shell (1).

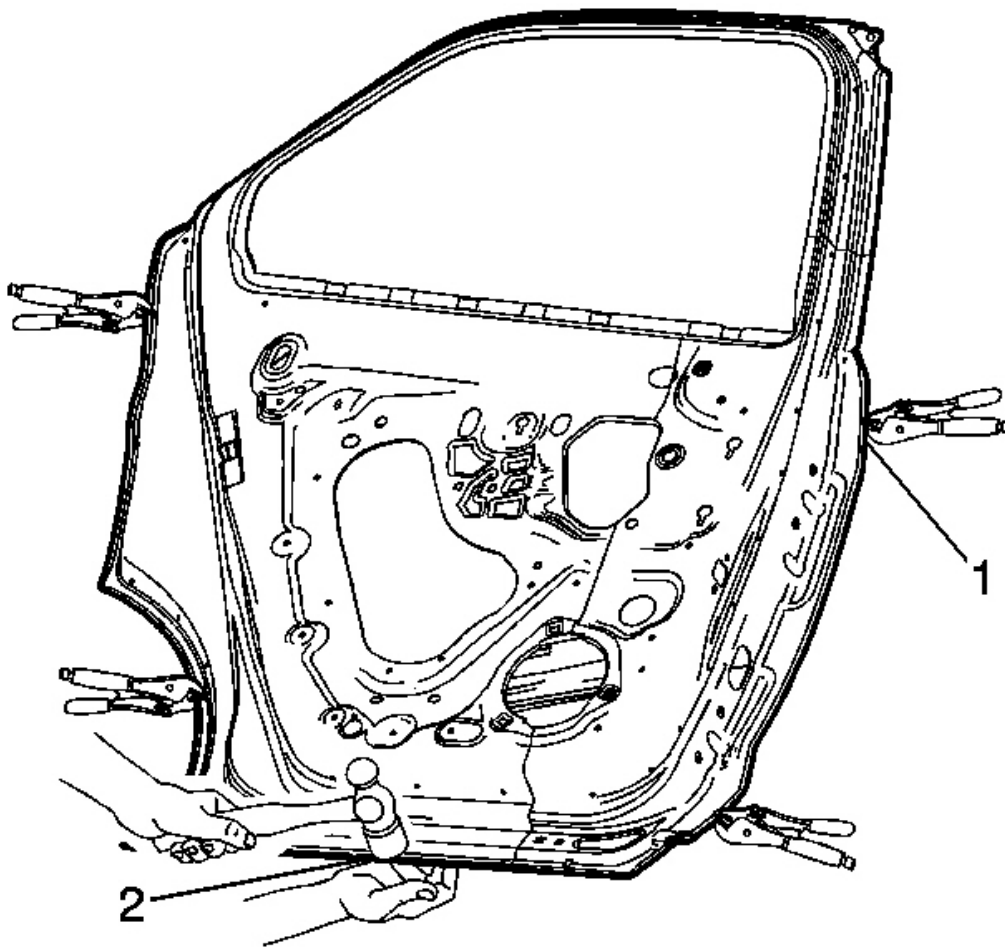


Fig. 89: Re-Hemming Hem Flanges

Courtesy of GENERAL MOTORS CORP.

NOTE: Do NOT pull the panels apart after being joined together. Slide the panels against each other to realign the panels.

8. Clamp the door outer panel into position as required (1).
9. Using a hammer re-hem the hem flanges around the door shell (2).

Continue to hammer in stages along the hem flanges.

10. Using lacquer thinner remove the excess adhesive from the door panel area.
11. Install the door to the vehicle. Inspect the door outer panel for proper alignment, adjust the alignment as

required.

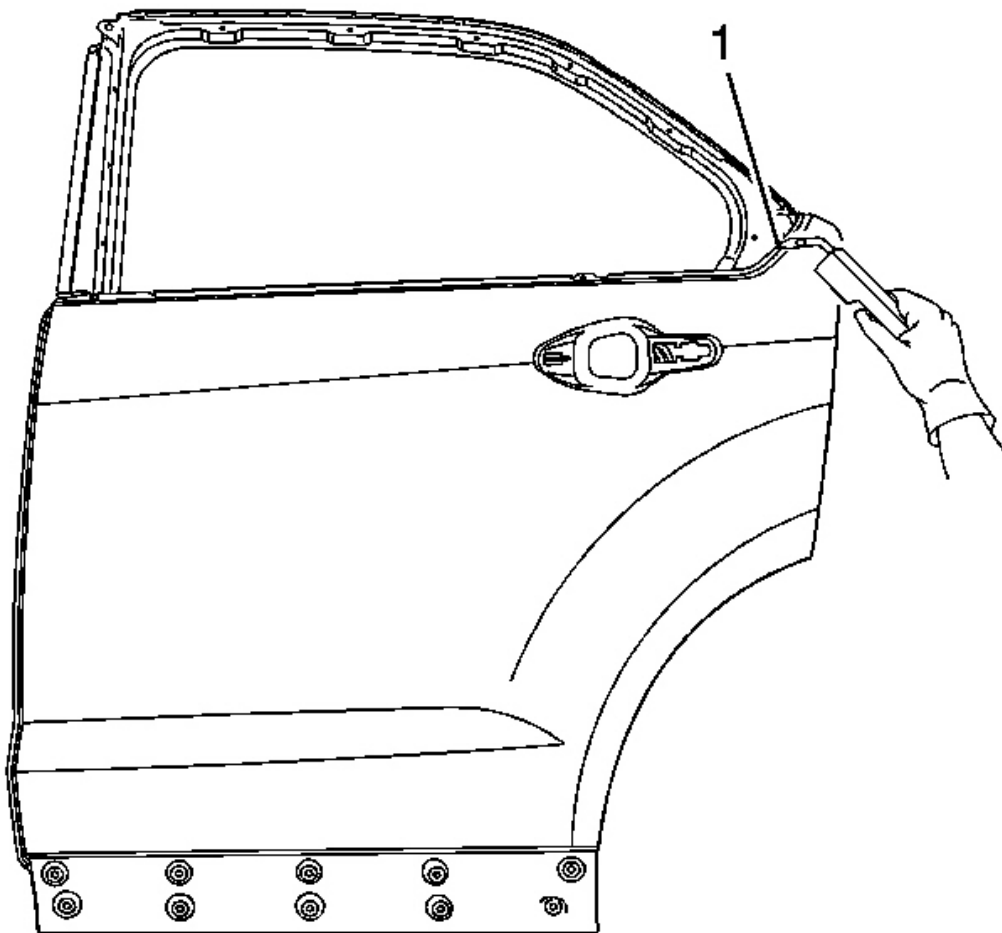


Fig. 90: Welding Door Outer Panel
Courtesy of GENERAL MOTORS CORP.

12. Using metal-inert gas (MIG), weld the door outer panel to the door frame in the locations noted at the upper door frame (1).
13. Clean and prepare all welded surfaces.

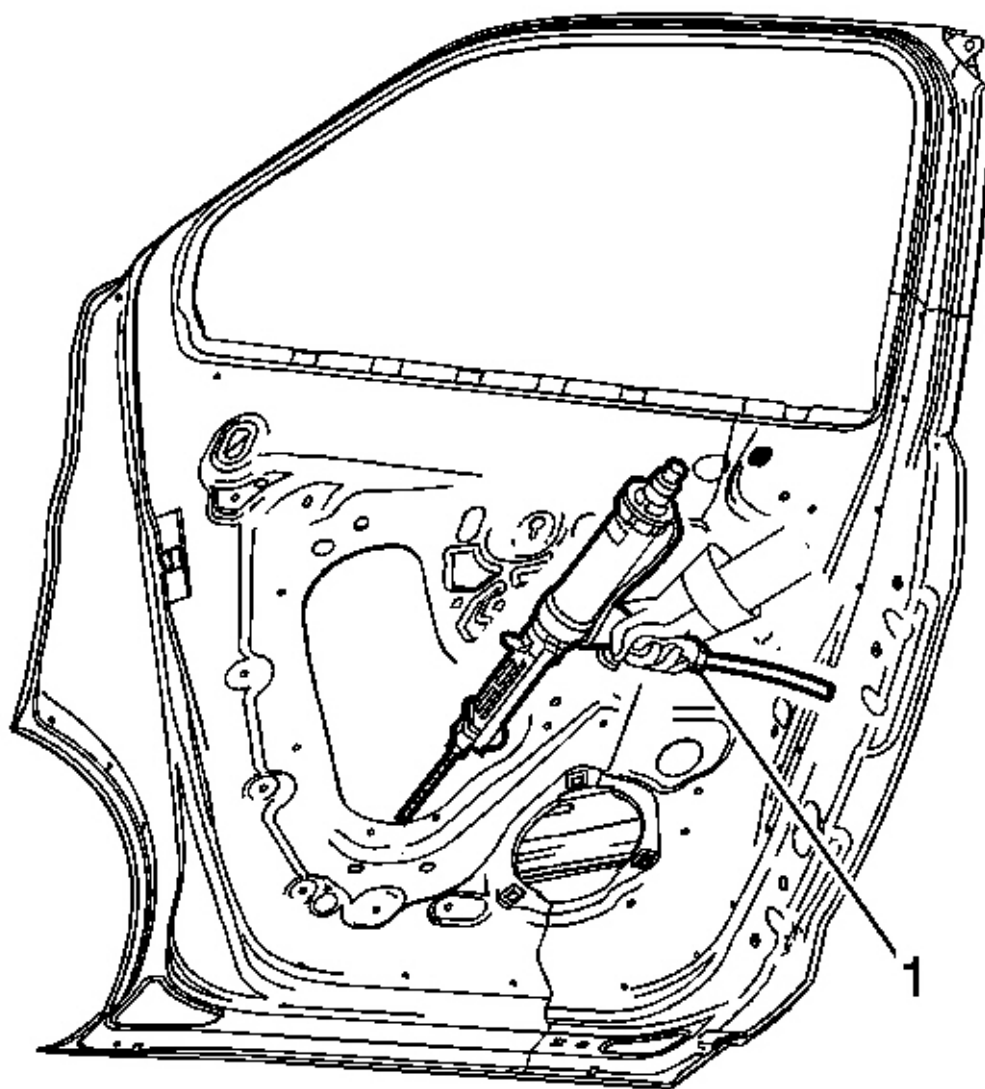


Fig. 91: Applying Fusor
Courtesy of GENERAL MOTORS CORP.

14. Apply Fusor super flexible anti-flutter foam-fast set, Fusor P/N 121/124 or equivalent in 4-5 evenly spaced locations between the door outer panel and the impact beam (1).
15. Apply 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 the door assembly. Refer to **Front Side Door Replacement** .

18. Install all related panels and components.
19. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection** .
20. Enable the SIR system. Refer to **SIR Disabling and Enabling** .

REAR FLOOR PANEL REPLACEMENT

Removal Procedure

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

WARNING: Refer to **Glass and Sheet Metal Handling Warning** .

NOTE: Before beginning the repair, refer to **Metal Panel Bonding** for proper adhesive applicator preparations and general information.

1. Disable the supplemental inflatable restraint (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. Refer to **Dimensions - Body**.
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** .

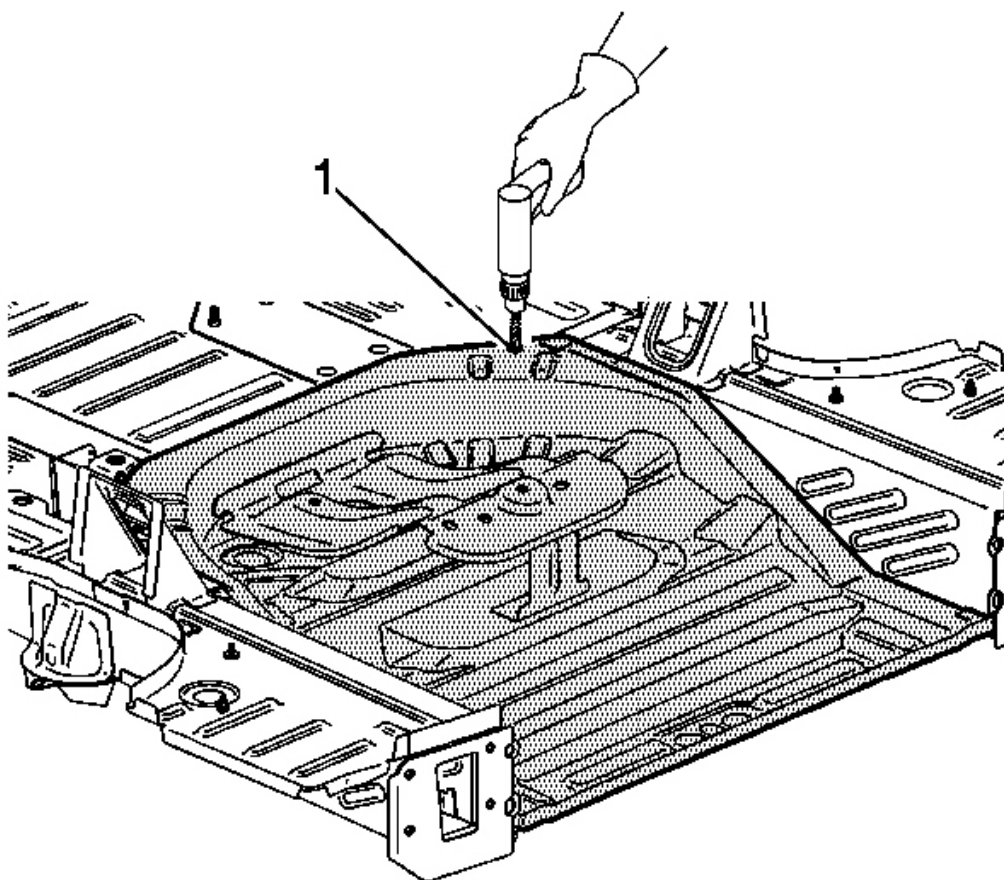


Fig. 92: Drilling Out Factory Welds
Courtesy of GENERAL MOTORS CORP.

NOTE: Do not damage any inner panels or reinforcements. Record the number and location of the original welds for installation of the service part.

6. Locate and drill out all factory welds (1).

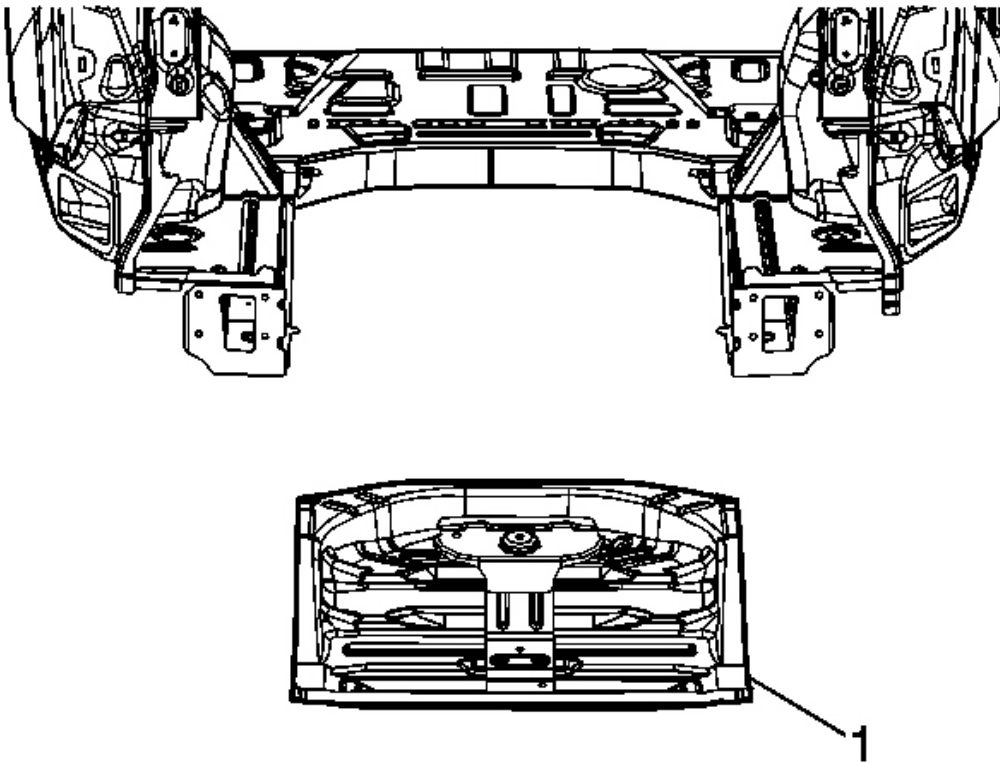


Fig. 93: Identifying Damaged Rear Floor Panel
Courtesy of GENERAL MOTORS CORP.

7. Remove the damaged rear floor panel (1).

Installation Procedure

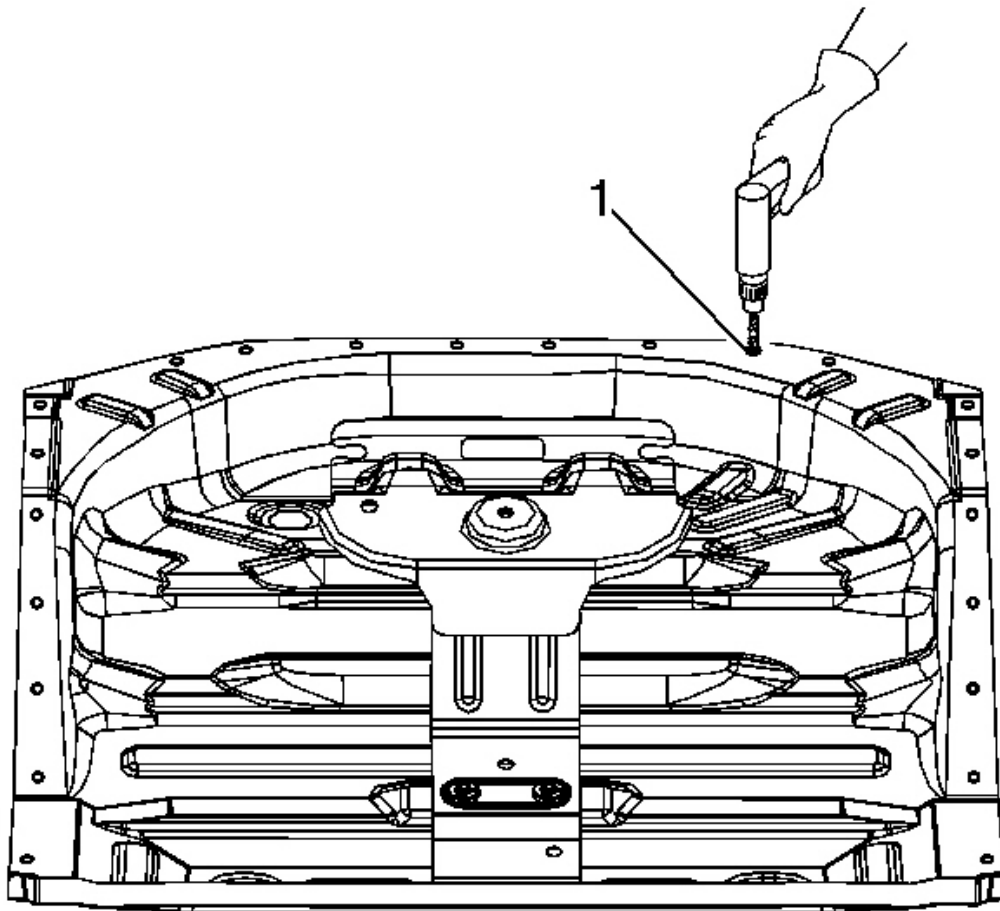


Fig. 94: Drilling Plug Weld Holes
Courtesy of GENERAL MOTORS CORP.

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.

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 mating surfaces as necessary.
3. Apply GM-approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to **Anti-Corrosion Treatment and Repair**.
4. Position the rear floor panel to the vehicle using 3-dimensional measuring equipment. Clamp the rear floor panel into place.

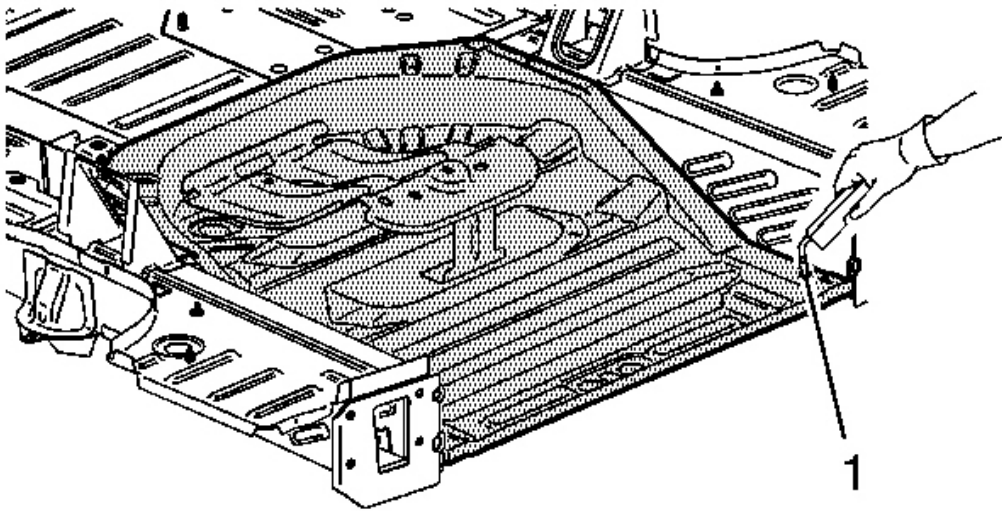


Fig. 95: Plug Welding

Courtesy of GENERAL MOTORS CORP.

5. Plug weld accordingly (1).
6. Clean and prepare all 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 repair 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** .

REAR INNER WHEELHOUSE REPLACEMENT

Removal Procedure

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

WARNING: Refer to **Glass and Sheet Metal Handling Warning** .

NOTE: Before beginning the repair, refer to **Metal Panel Bonding** for proper

adhesive applicator preparations and general information.

1. Disable the supplemental inflatable restraint (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. Refer to **Dimensions - Body**.
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** .

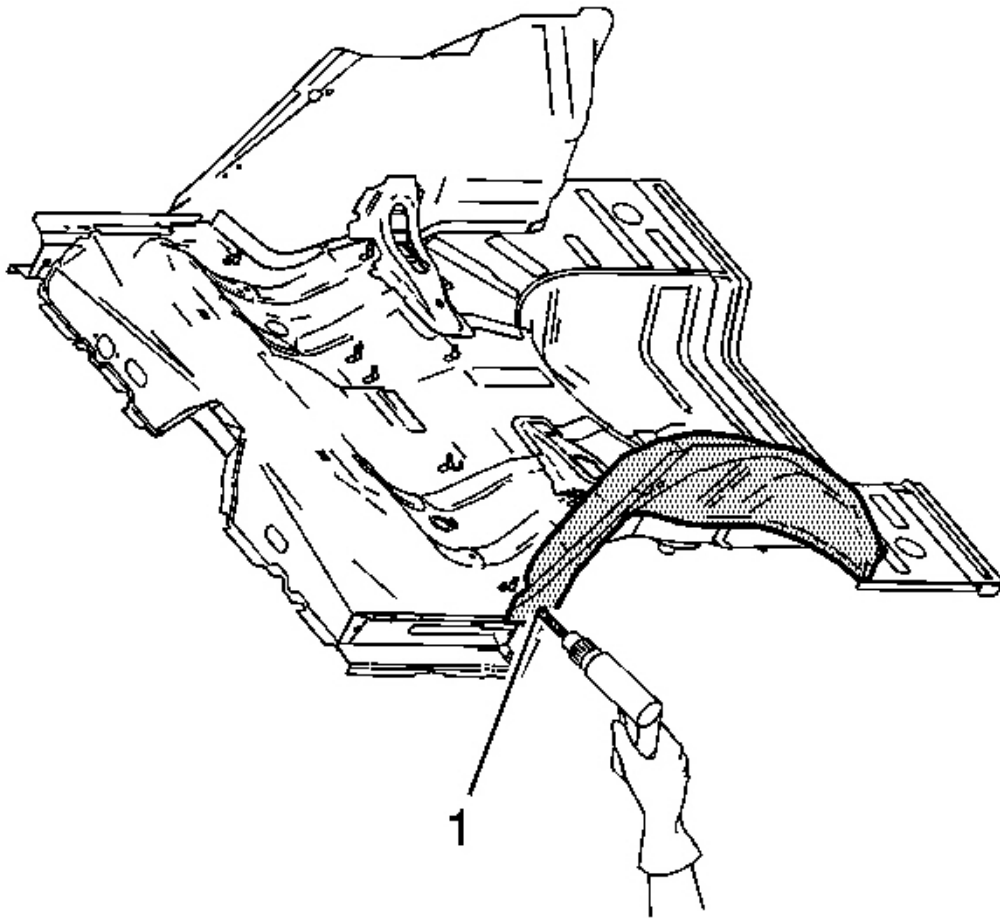


Fig. 96: Drilling Out Factory Welds
Courtesy of GENERAL MOTORS CORP.

NOTE: Do not damage any inner panels or reinforcements. Record the number and location of the original welds for installation of the service part.

6. Locate and drill out all the necessary factory welds (1).

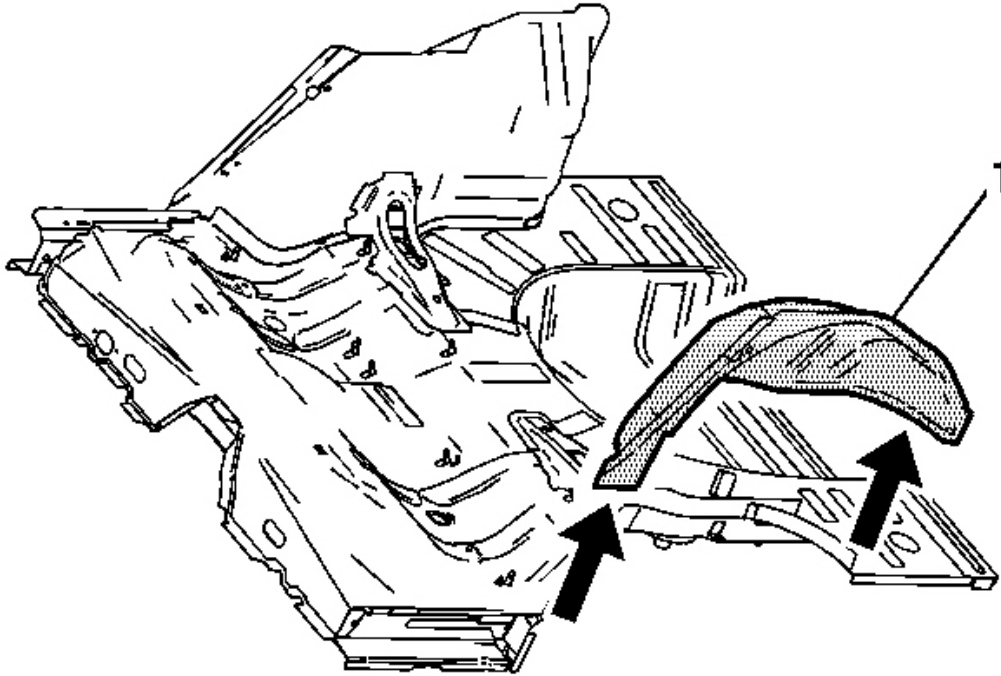


Fig. 97: Removing Rear Inner Wheelhouse
Courtesy of GENERAL MOTORS CORP.

7. Remove the rear inner wheelhouse (1).

Installation Procedure

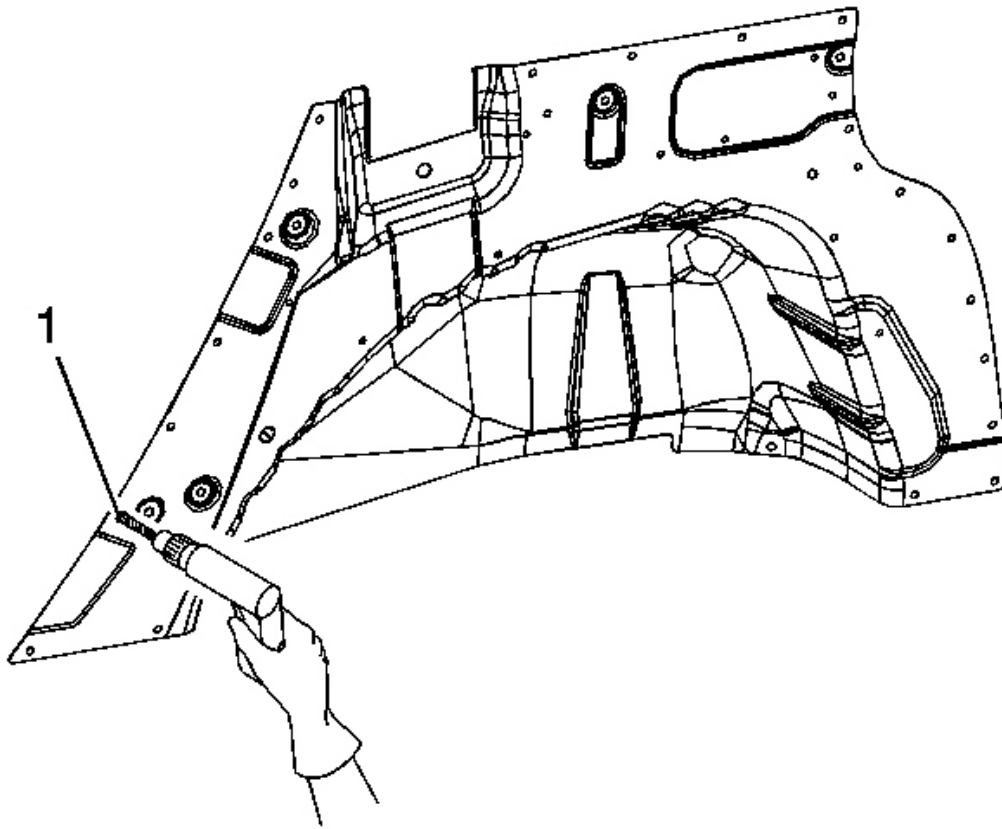


Fig. 98: Drilling Plug Weld Holes
Courtesy of GENERAL MOTORS CORP.

NOTE: If the location of the original plug welds cannot be determined or structural weld- thru adhesive was present, space plug weld holes every 40 mm (1 1/2 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 mating surfaces as necessary.
3. Apply GM-approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to **Anti-Corrosion Treatment and Repair** .

Position the rear inner wheelhouse to the vehicle. Clamp the part in place.

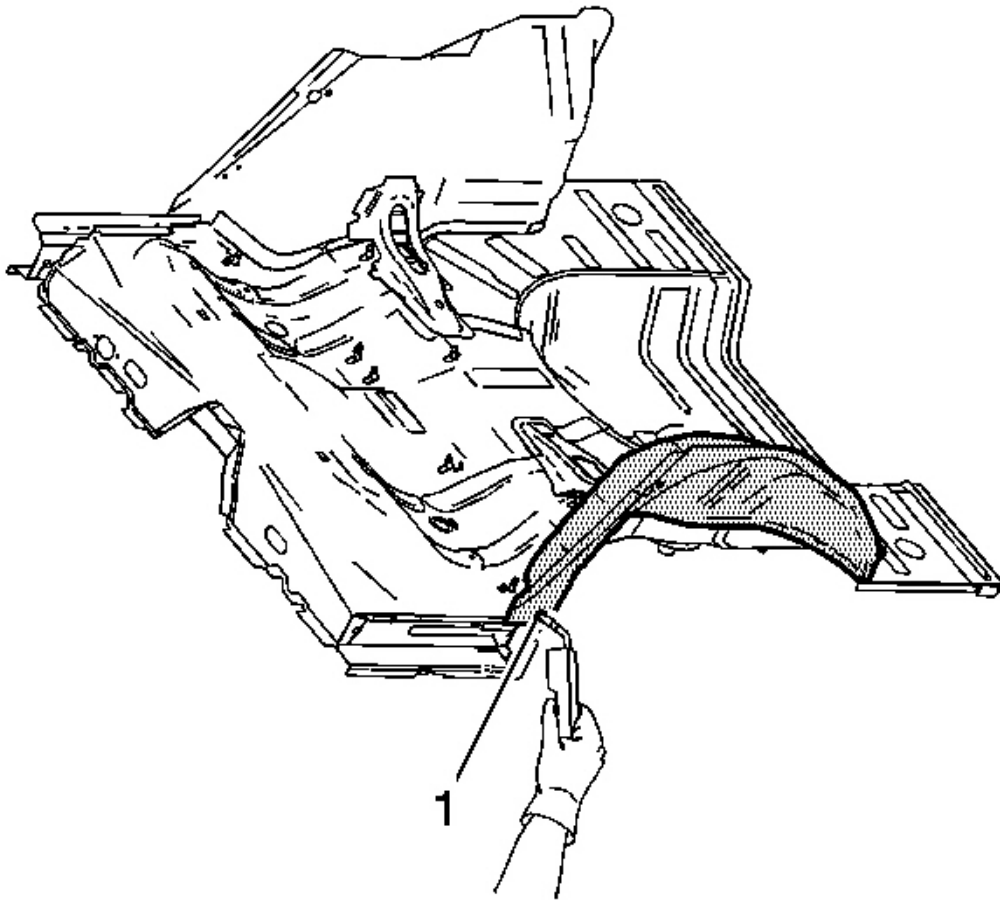


Fig. 99: Plug Welding

Courtesy of GENERAL MOTORS CORP.

4. Plug weld accordingly (1).
5. Clean and prepare all of the welded surfaces.
6. Install all of the related panels and components.
7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair** .
8. Paint the repair area. Refer to **Basecoat/Clearcoat Paint Systems** .
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** .

QUARTER OUTER PANEL SECTIONING

Removal Procedure

NOTE: Section in specified areas only. Sectioning outside of these areas may compromise the structural integrity of the vehicle. The door frame can be replaced at factory seams, but requires the removal of the windshield and the roof. The sectioning procedures have been developed as a more cost-effective alternative to complete replacement. The specific area to be sectioned is determined by the extent of the damage to the vehicle.

NOTE: When replacing panels that involve servicing of stationary glass, refer to Adhesive Installation of Windshields before performing any priming or refinishing.

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

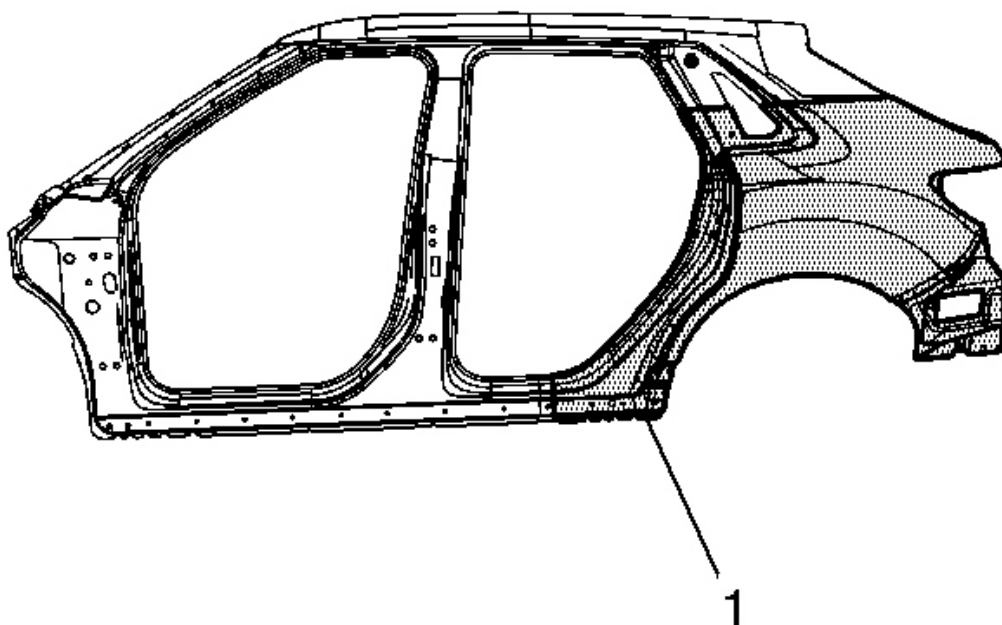


Fig. 100: Identifying Related Panels & Components
Courtesy of GENERAL MOTORS CORP.

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

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**.

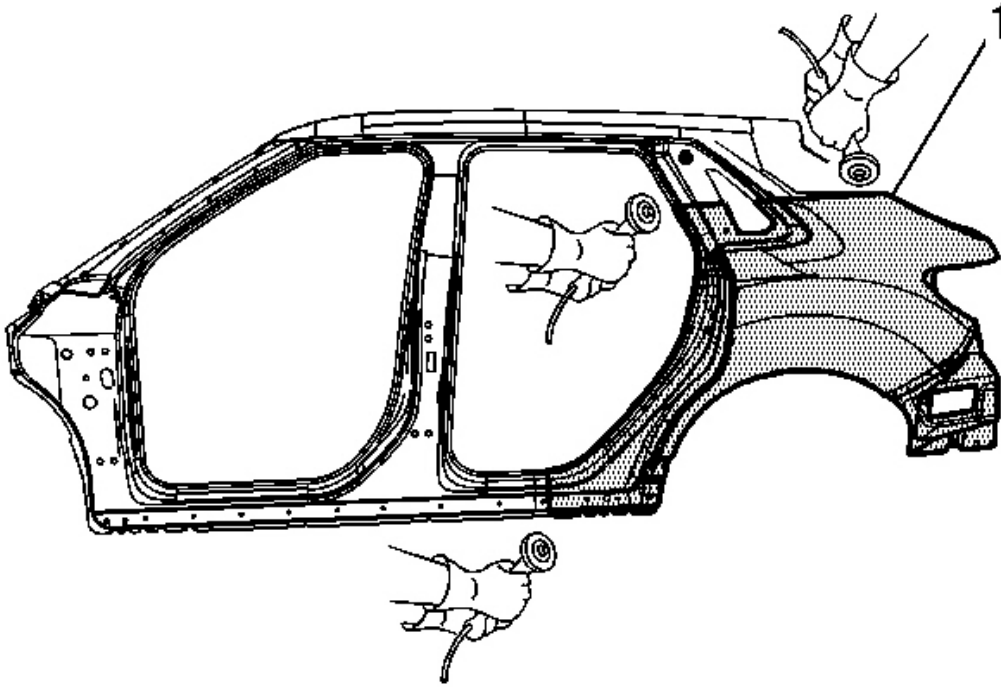


Fig. 101: Cutting Panel

Courtesy of GENERAL MOTORS CORP.

NOTE: Do NOT damage any inner panels or reinforcements.

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

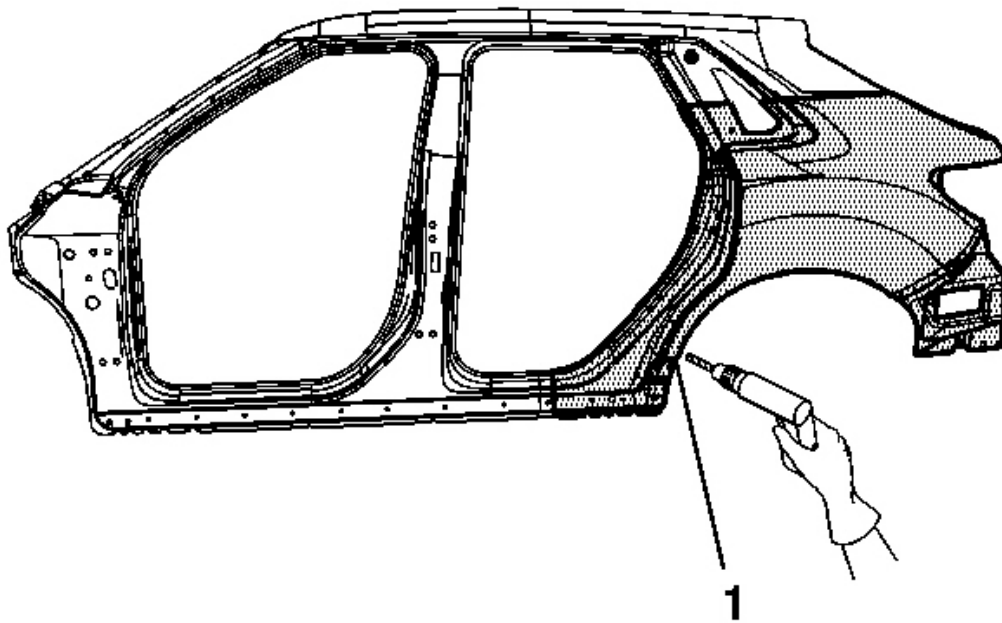


Fig. 102: Drilling Out Factory Welds
Courtesy of GENERAL MOTORS CORP.

7. Locate and drill out all factory welds. Note the number and location of the welds for installations of the service part (1).
8. Remove the damaged quarter panel.

Installation Procedure

1. Cut the replacement quarter panel in corresponding locations to fit the original panel. The sectioning joint should be trimmed to allow $1\frac{1}{2}$ times the metal thickness at the sectioning joint.

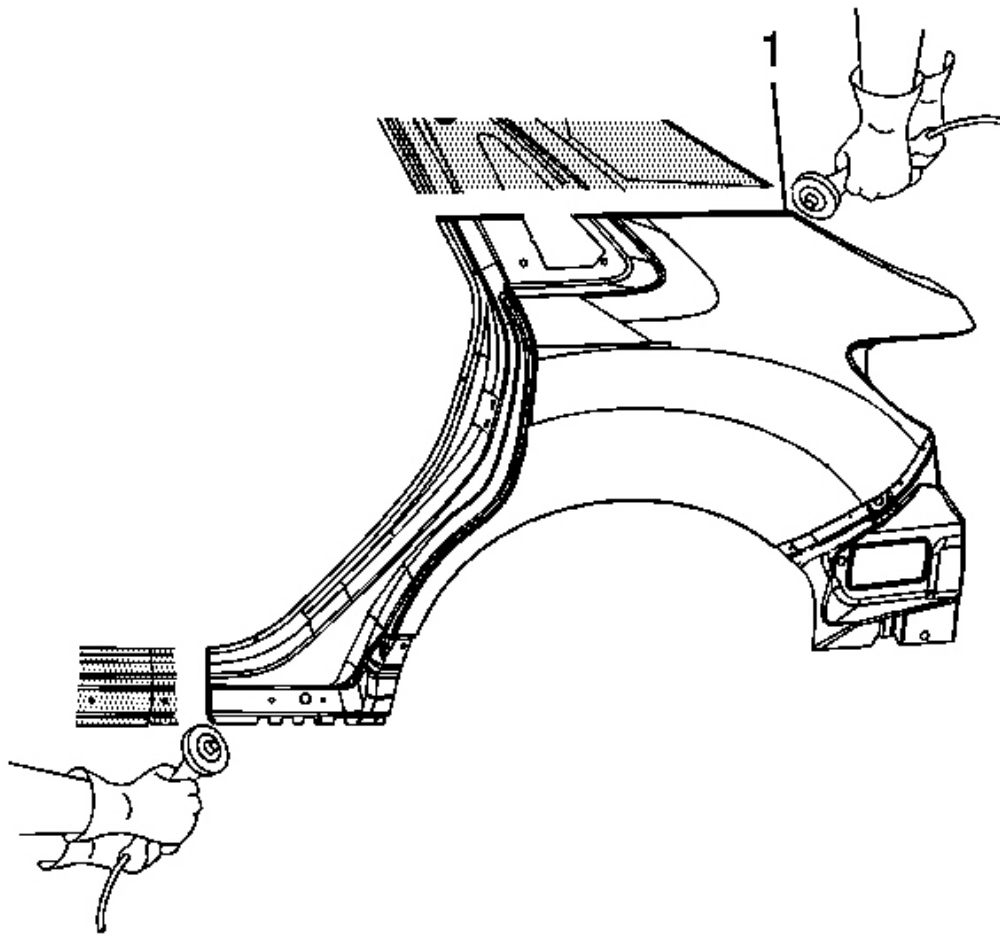


Fig. 103: Creating Backing Plates
Courtesy of GENERAL MOTORS CORP.

2. Create two 50 mm (2 in) backing plates and one 100 mm (4 in) backing plate from the unused portion of the service part. Trim the backing plates as necessary to fit behind the sectioning joints where no reinforcements exist.
3. Drill 8 mm (5/16 in) plug weld holes along the sectioning cut on the remaining original part. Locate these holes 13 mm (1/2 in) from the edge and spaced 40 mm (1 1/2 in) apart.

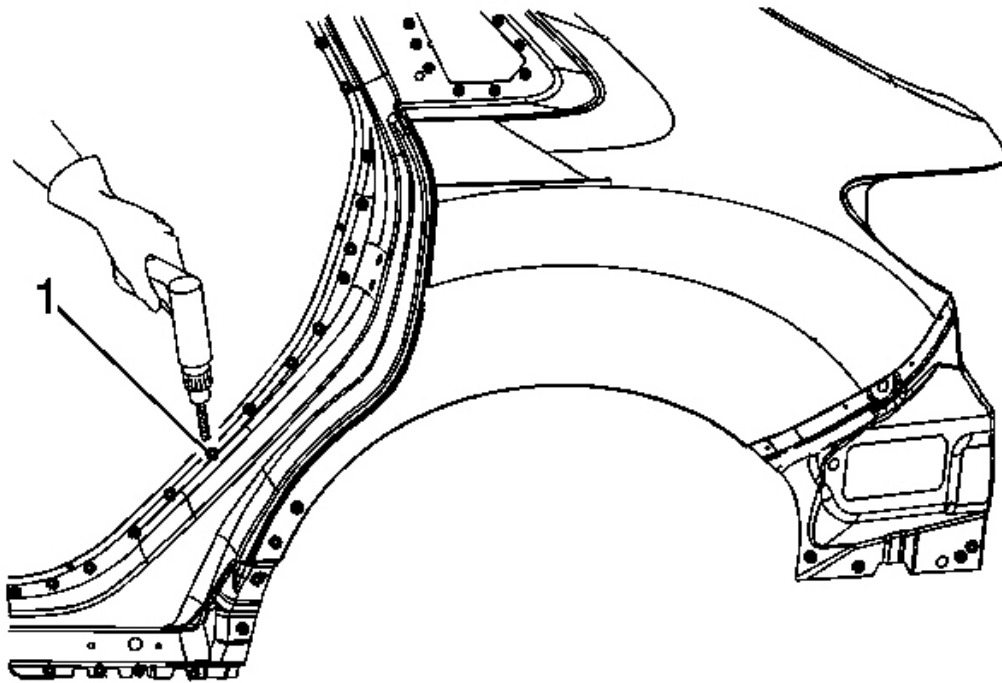


Fig. 104: Drilling Plug Weld Holes

Courtesy of GENERAL MOTORS CORP.

NOTE: In any area damaged beyond recognition, or if structural Weld-Thru adhesive is present, space the plug weld holes 40 mm (1 1/2 in) apart.

4. Drill 8 mm (5/16 in) plug weld holes in the service part as necessary in the locations noted from the original panel and along the sectioning cut (1).
5. Prepare all mating surfaces, as necessary.
6. Apply GM-approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to **Anti-Corrosion Treatment and Repair** .
7. Fit the backing plates halfway into the sectioning joints, clamp and plug weld to the vehicle.
8. Position the quarter panel.

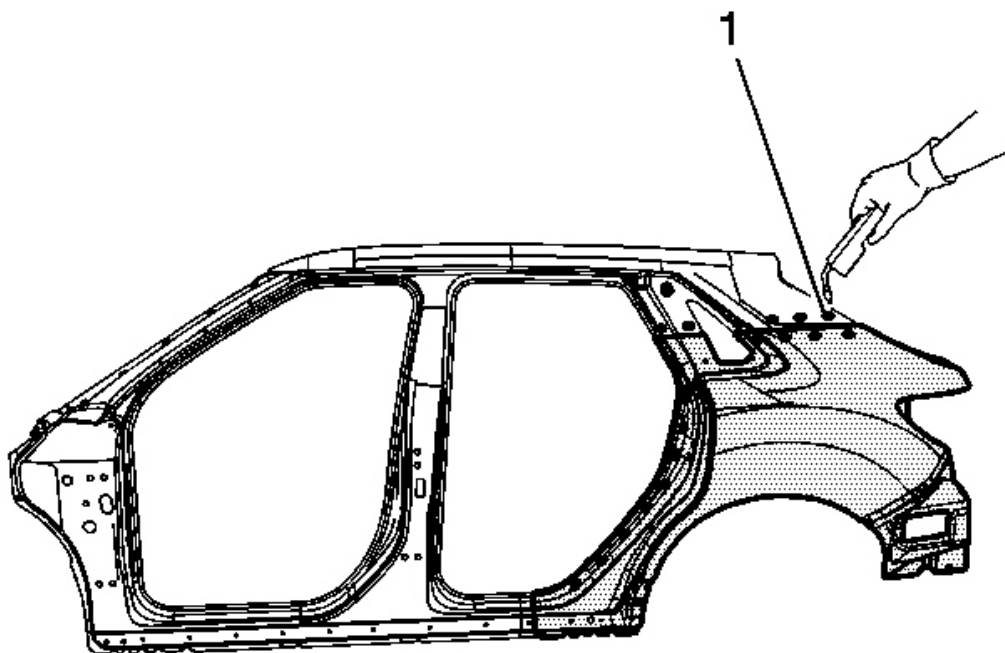


Fig. 105: Plug Welding

Courtesy of GENERAL MOTORS CORP.

9. Plug weld accordingly (1).

NOTE: 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. Then go back and complete the stitch weld.

10. Stitch the weld sectioning joint.
11. Clean and prepare all welded surfaces.
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. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection** .
16. 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 Glass and Sheet Metal Handling Warning .

1. Disable the supplemental inflatable restraint (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. Refer to Dimensions - Body.
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 .

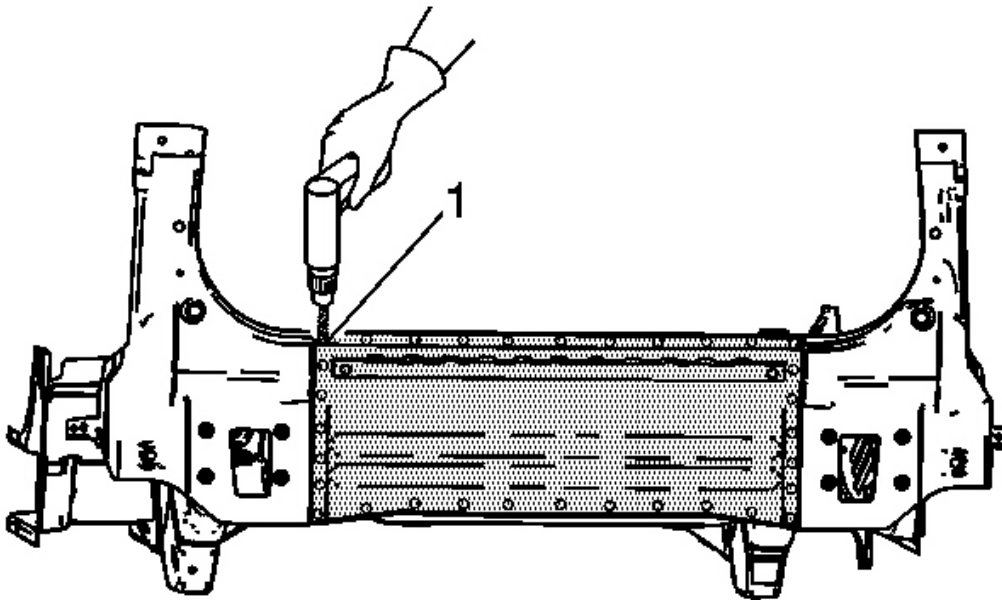


Fig. 106: Drilling Out Factory Welds
Courtesy of GENERAL MOTORS CORP.

NOTE: Do not damage any inner panels or reinforcements. Record the number and location of the original welds for installation of the service part..

6. Locate and drill out all factory welds (1).

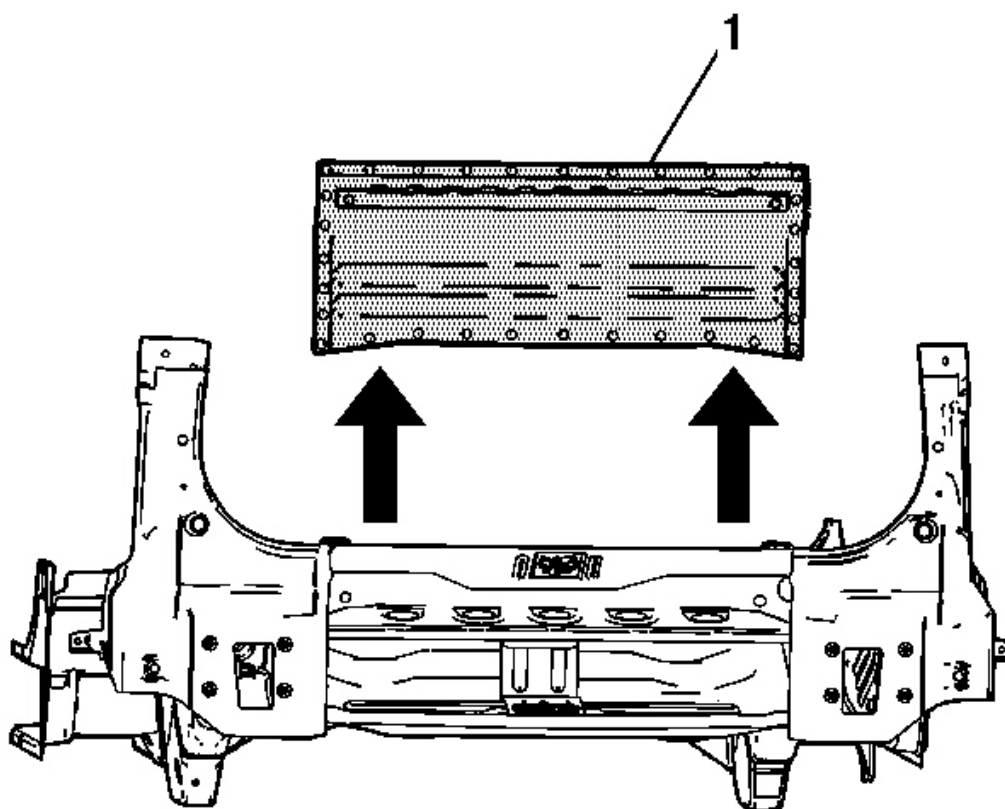


Fig. 107: Removing Damaged Rear End Panel
Courtesy of GENERAL MOTORS CORP.

7. Remove the damaged rear end panel (1).

Installation Procedure

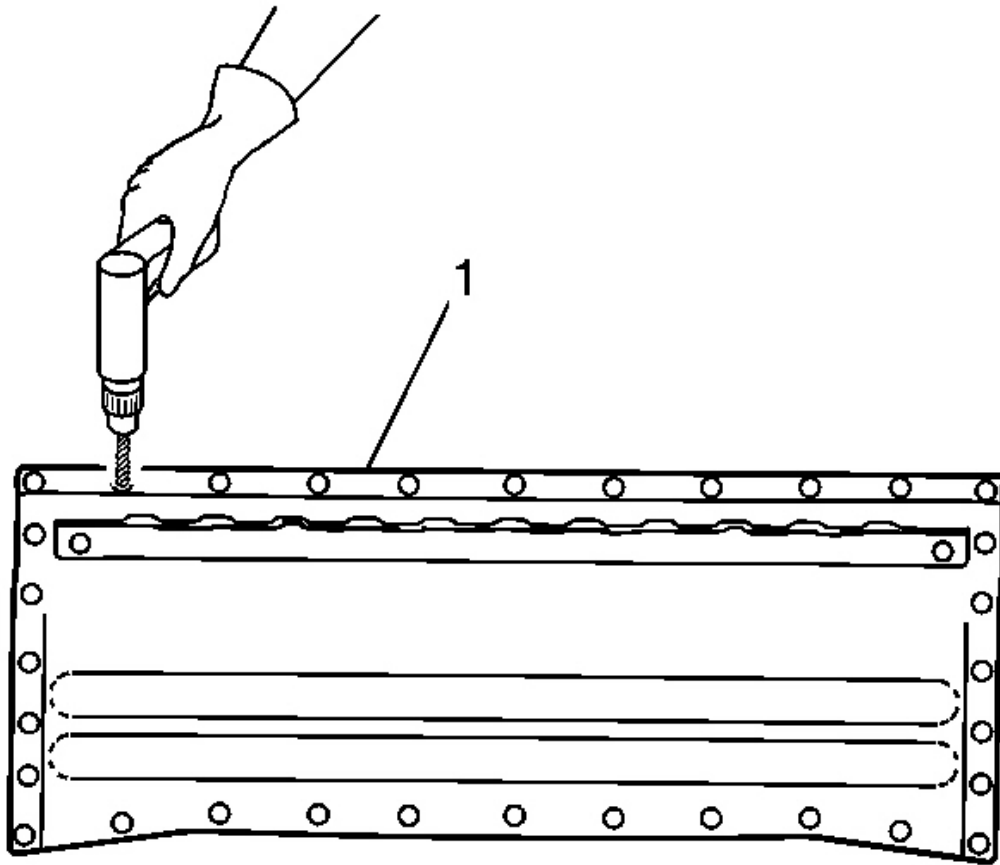


Fig. 108: Drilling Plug Weld Holes

Courtesy of GENERAL MOTORS CORP.

NOTE: If the location of the original plug welds cannot be determined or structural weld- thru adhesive was present, space plug weld holes every 40 mm (1 1/2 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 mating surfaces as necessary.
3. Apply GM-approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to **Anti-Corrosion Treatment and Repair** .

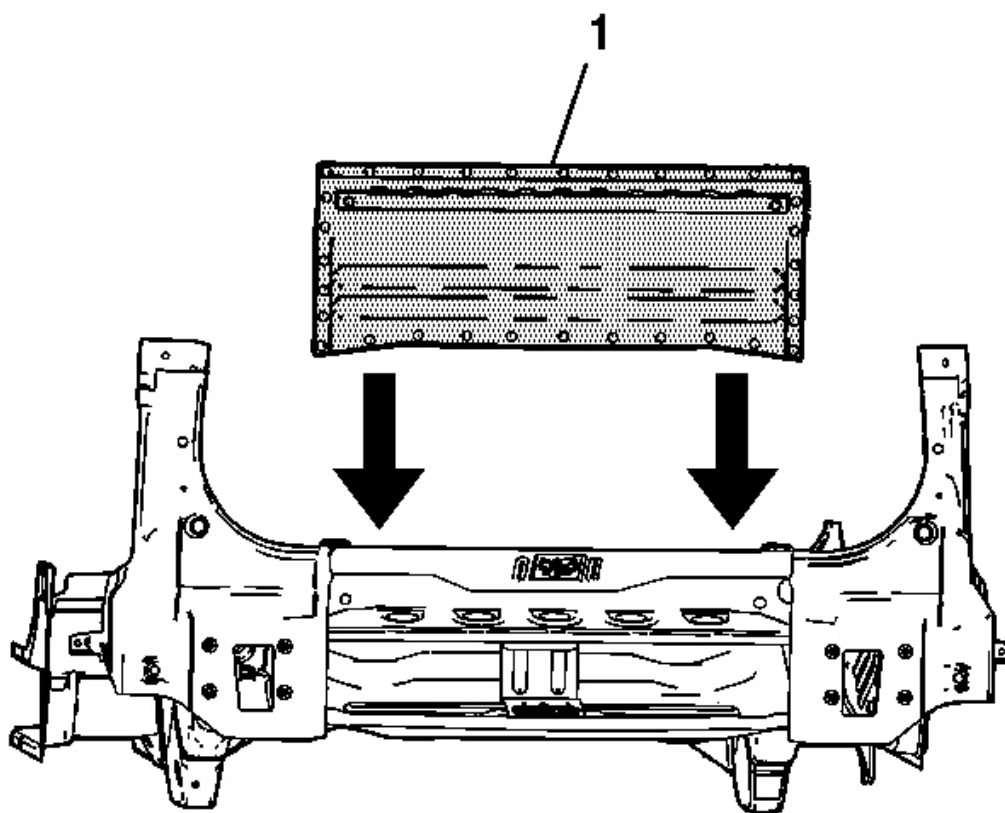


Fig. 109: Positioning Rear End Panel
Courtesy of GENERAL MOTORS CORP.

4. Position the rear end panel to the vehicle using 3-dimensional measuring equipment (1). Clamp the rear end panel into place.

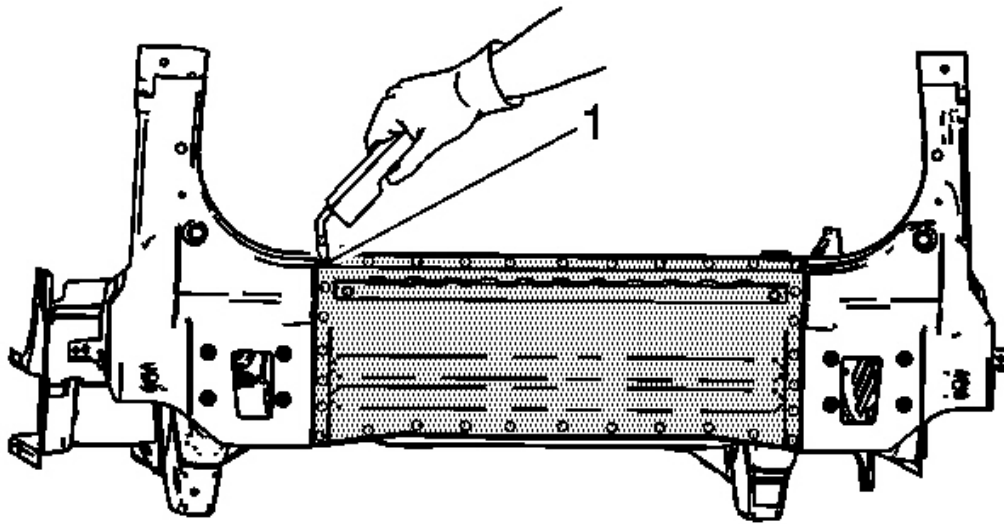


Fig. 110: Plug Welding

Courtesy of GENERAL MOTORS CORP.

5. Plug weld accordingly (1).
6. Clean and prepare all 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 repair 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** .

CENTER PILLAR OUTER PANEL REINFORCEMENT REPLACEMENT

Removal Procedure

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** .

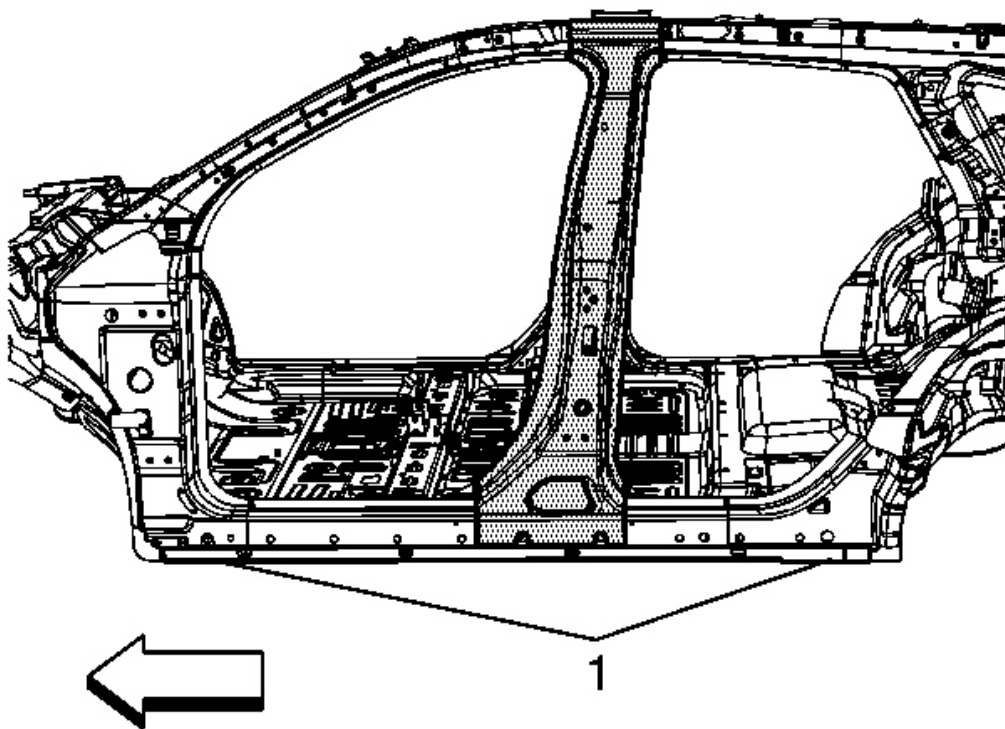


Fig. 111: Center Pillar Outer Panel Reinforcement
Courtesy of GENERAL MOTORS CORP.

WARNING: Refer to Approved Equipment for Collision Repair Warning .

NOTE: The service B-Pillar will come as a complete assembly and the center B-Pillar Reinforcement is constructed of ultra high strength steel (martensitic) and can not be sectioned. It can only be replaced as a one piece unit.

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** .

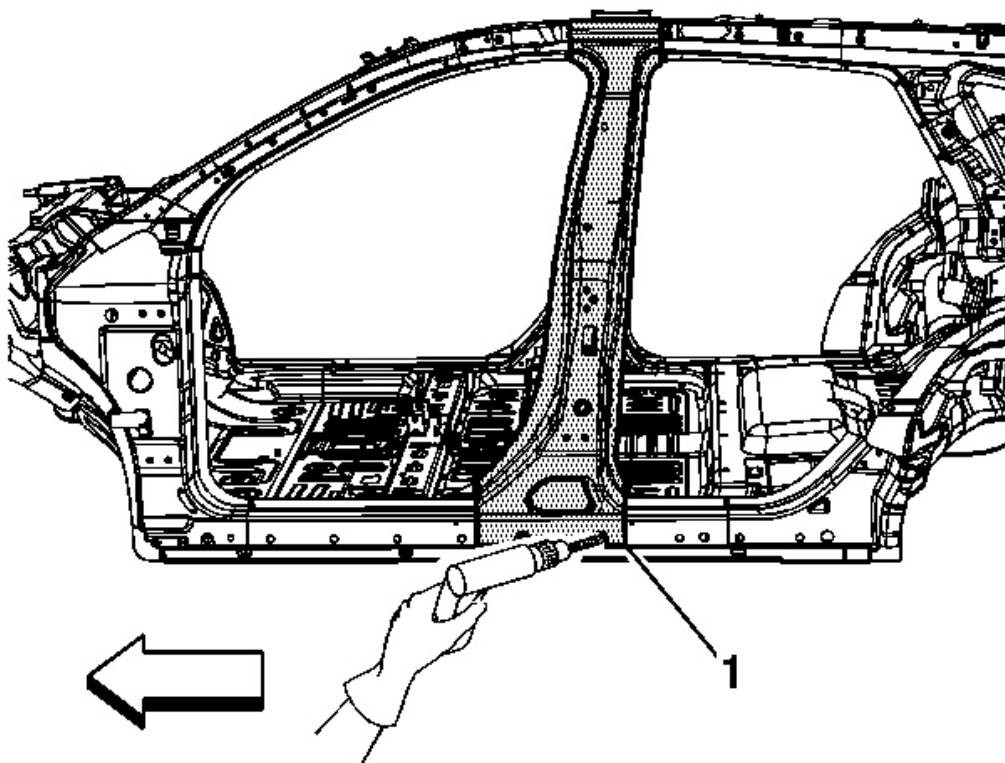


Fig. 112: Drilling Out Factory Welds
Courtesy of GENERAL MOTORS CORP.

NOTE: Note the number and location of the factory welds for installation of the inner pillar lock front door.

6. Locate and drill out all the necessary factory welds (1).

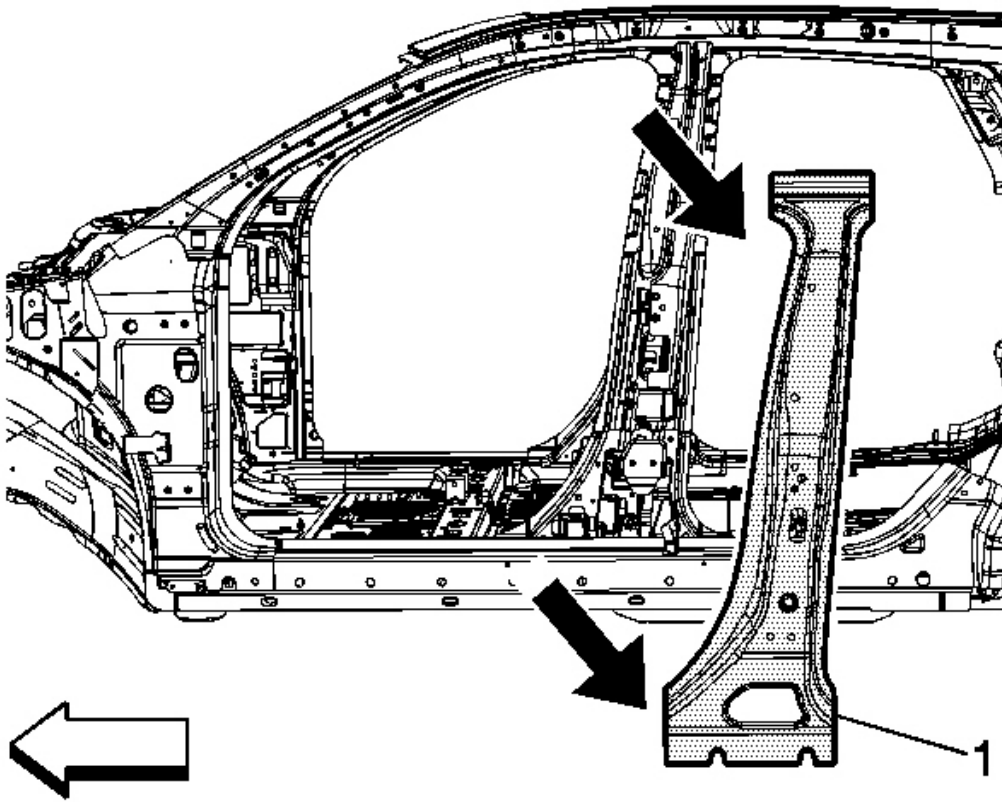


Fig. 113: Removing Center B-Pillar
Courtesy of GENERAL MOTORS CORP.

7. Remove the Center B-Pillar from the factory seams (1).

Installation Procedure

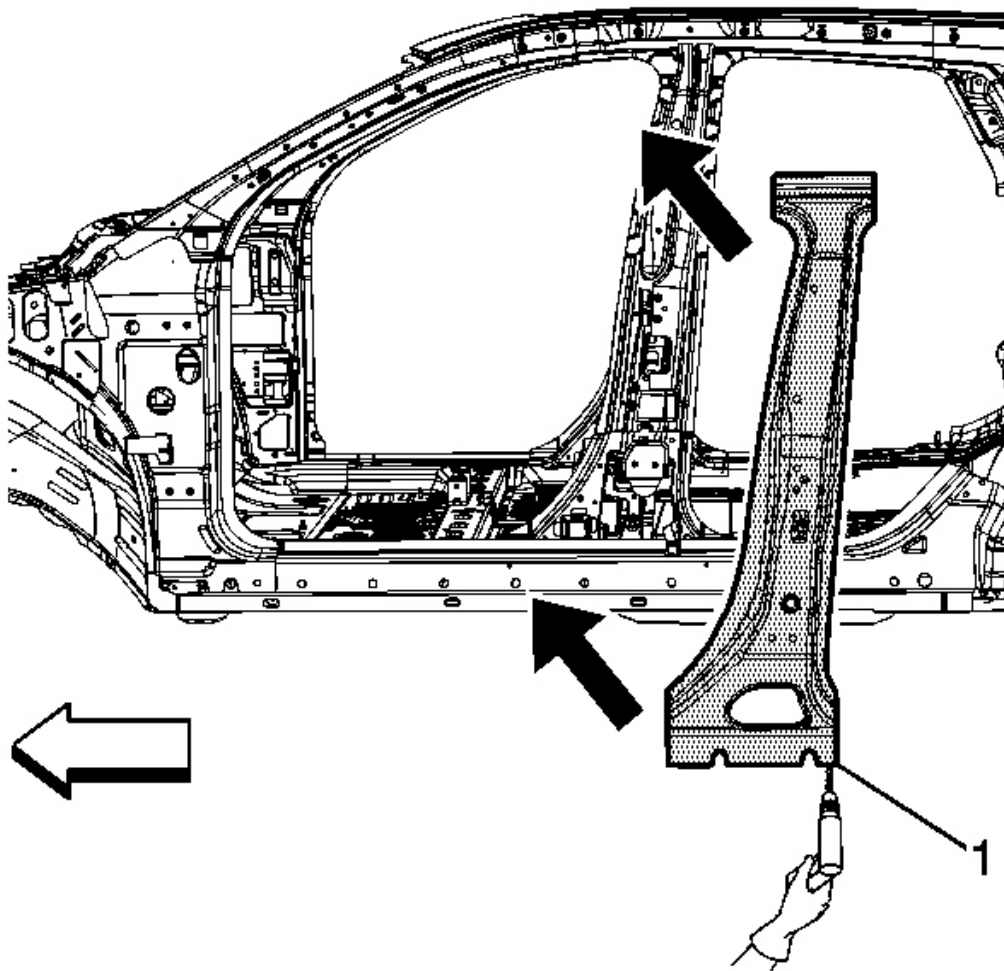


Fig. 114: Drilling Plug Weld Holes
Courtesy of GENERAL MOTORS CORP.

NOTE: If the location of the original plug weld holes can not be determined, space the plug weld holes every 40 mm (1 in) apart.

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

place.

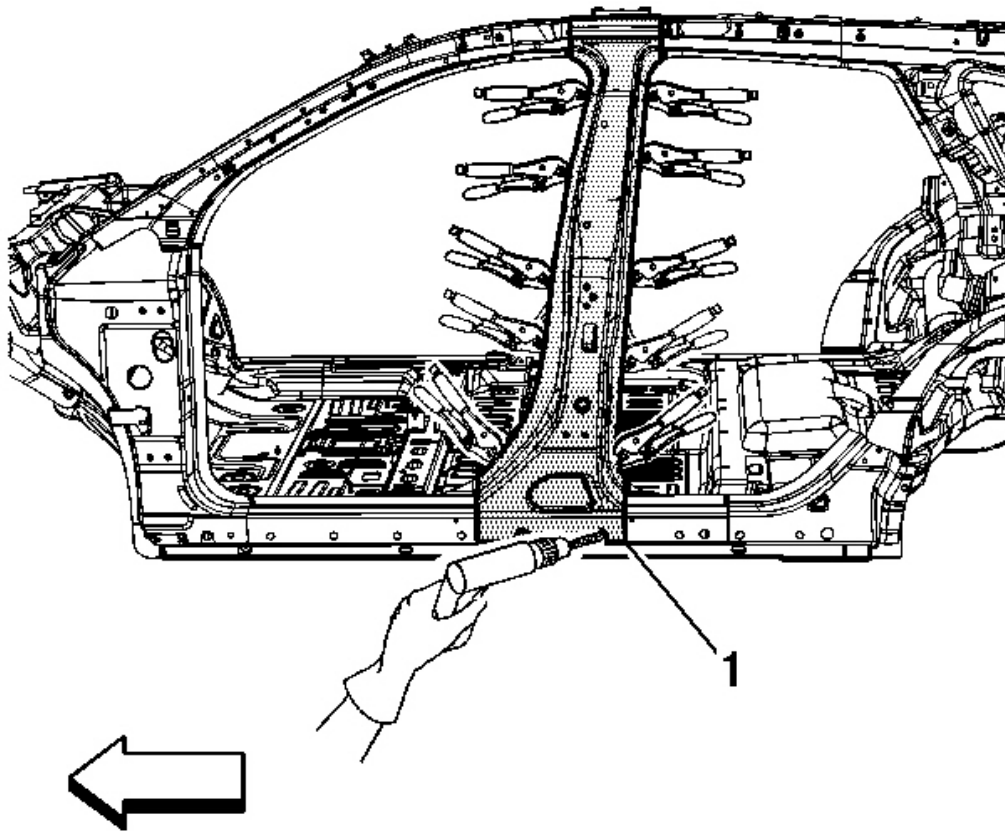


Fig. 115: Plug Welding Center B-Pillar
Courtesy of GENERAL MOTORS CORP.

5. Plug weld accordingly (1).
6. Clean and prepare all 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 repair 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**

REAR RAIL REPLACEMENT

Removal Procedure

WARNING: Refer to Approved Equipment for Collision Repair Warning .

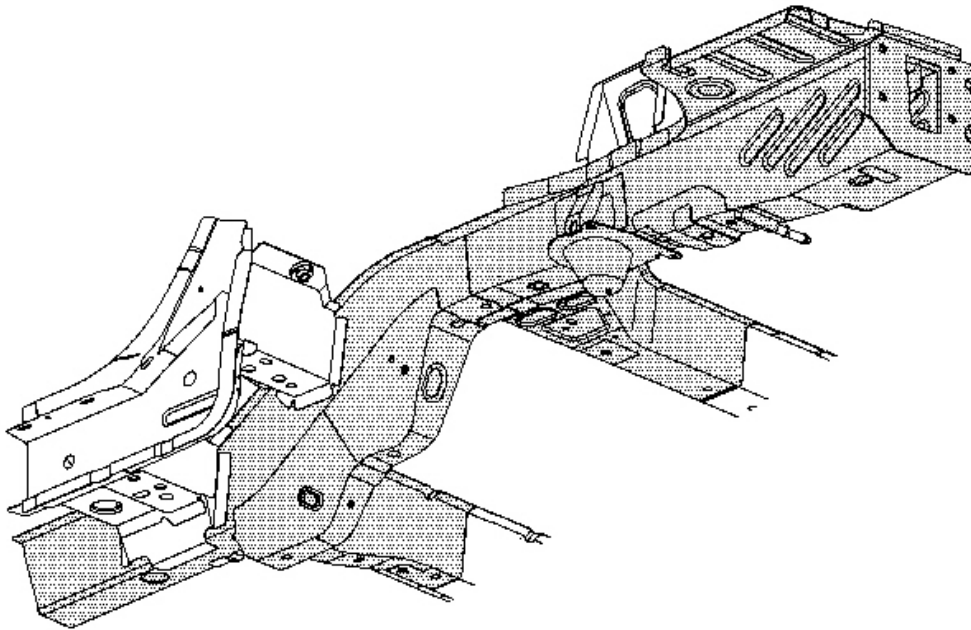


Fig. 116: View Of Rear Rail

Courtesy of GENERAL MOTORS CORP.

1. Disable the supplemental inflatable restraint (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. Refer to **Dimensions - Body**.
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**.

NOTE: **Do not damage any inner panels or reinforcements.**

6. Locate and drill out all factory welds. Note the number and location of the welds for installation of the rear rail lower.
7. Remove the damaged rear rail.

Installation Procedure

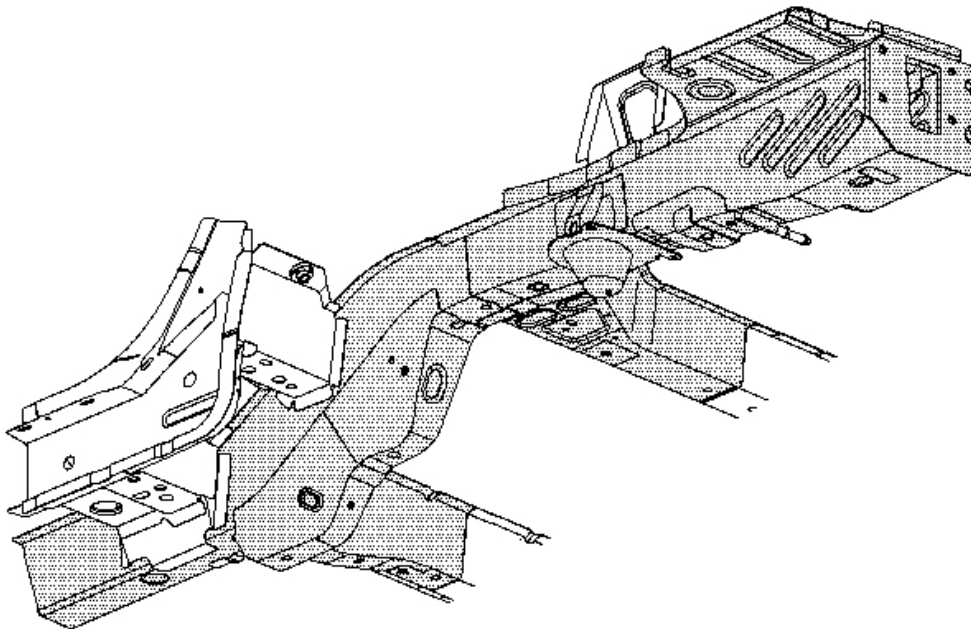


Fig. 117: View Of Rear Rail

Courtesy of GENERAL MOTORS CORP.

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.
Some panels may have structural weld-thru adhesive. It is necessary to replace the weld-thru adhesive with an additional spot weld between each factory spot weld.

1. Drill 8 mm (5/16 in) plug weld holes in the service part as necessary in the locations noted from the original panel.
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** .
4. Position the rear rail lower to the vehicle using 3-dimensional measuring equipment. Clamp the rear rail lower into place.
5. Plug weld accordingly.
6. Clean and prepare all 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 repair 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** .

RAIL REPLACEMENT - REAR SECTION

Removal Procedure

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

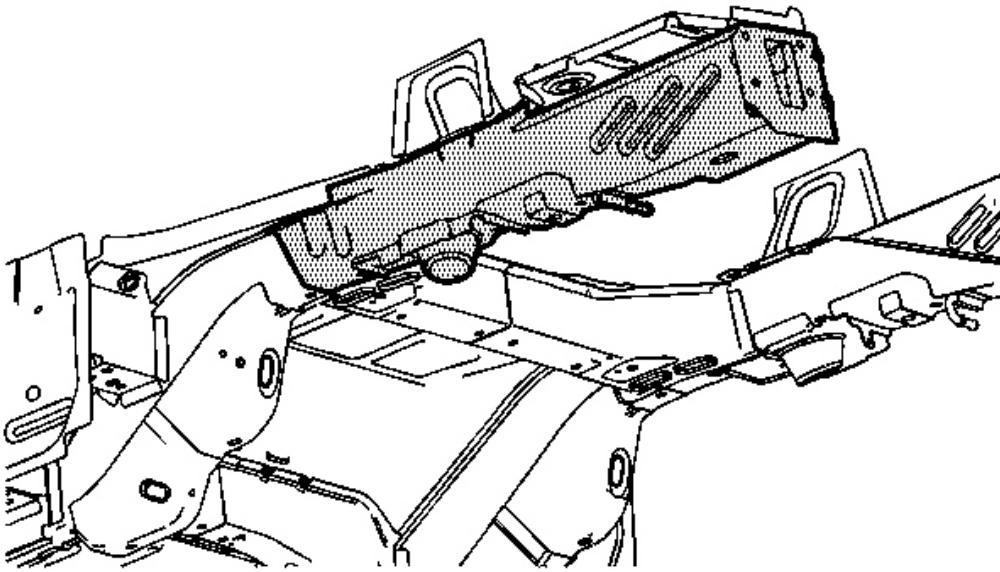


Fig. 118: View Of Rear Rail Lower - Section
Courtesy of GENERAL MOTORS CORP.

1. Disable the supplemental inflatable restraint (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. Refer to **Dimensions - Body**.
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** .

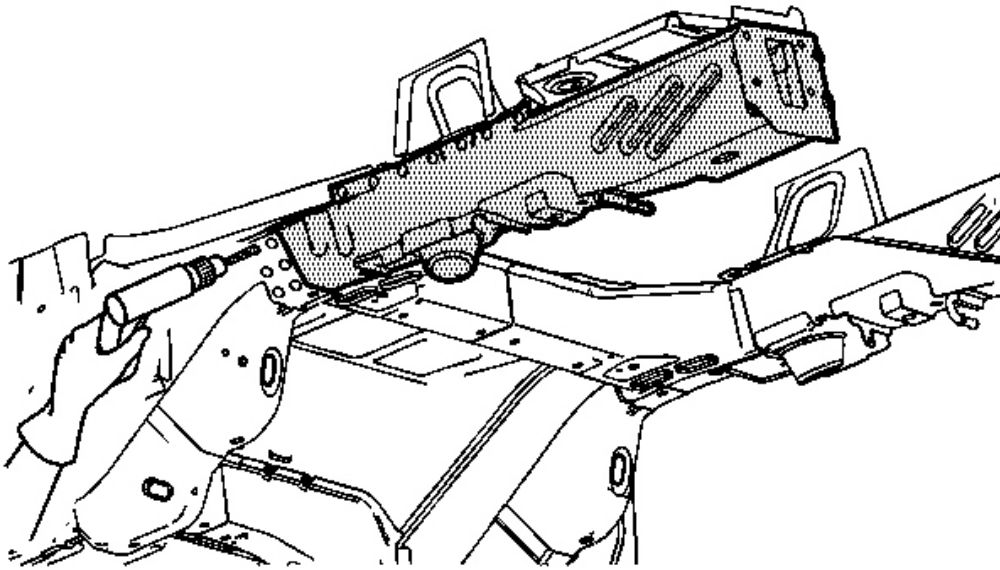


Fig. 119: Drilling Out Factory Welds On Rear Rail Lower - Half
Courtesy of GENERAL MOTORS CORP.

NOTE: Do not damage any inner panels or reinforcements.

6. From inside of the vehicle, locate and drill out all factory welds. Note the number and location of the welds for installation of the rear rail lower - half.
7. Remove the No. 5 crossbar.

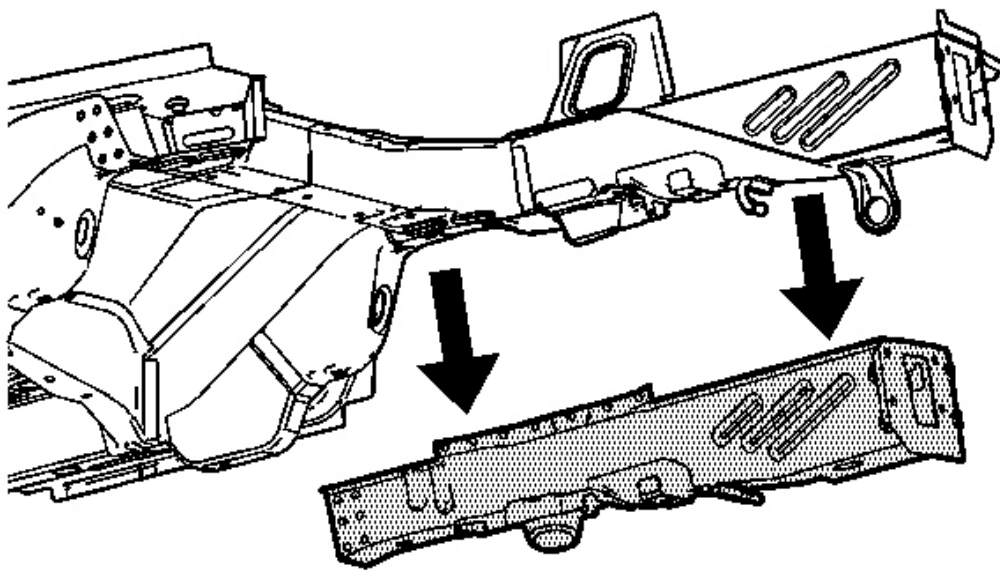


Fig. 120: Identifying Rear Rail Lower - Section
Courtesy of GENERAL MOTORS CORP.

8. Remove the damaged rear rail lower - section

Installation Procedure

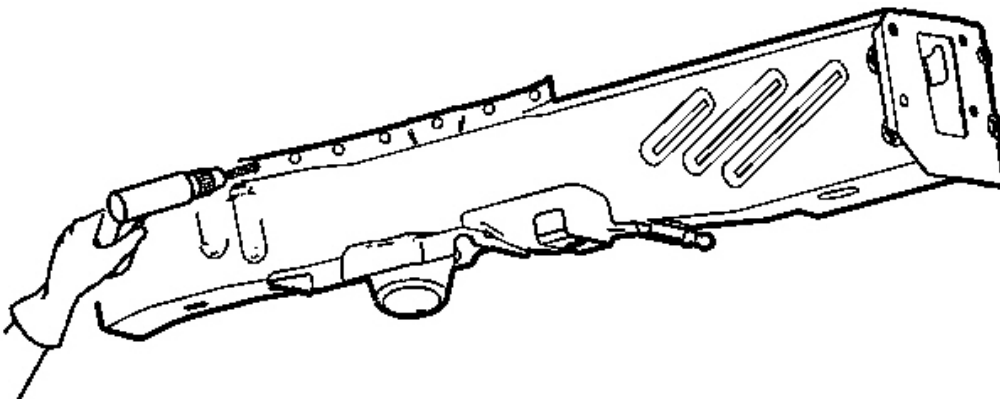


Fig. 121: Drilling Plug Weld Holes On Rear Rail Lower - Section
Courtesy of GENERAL MOTORS CORP.

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.
Some panels may have structural weld-thru adhesive. It is necessary to replace the weld-thru adhesive with an additional spot weld between each factory spot weld.

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

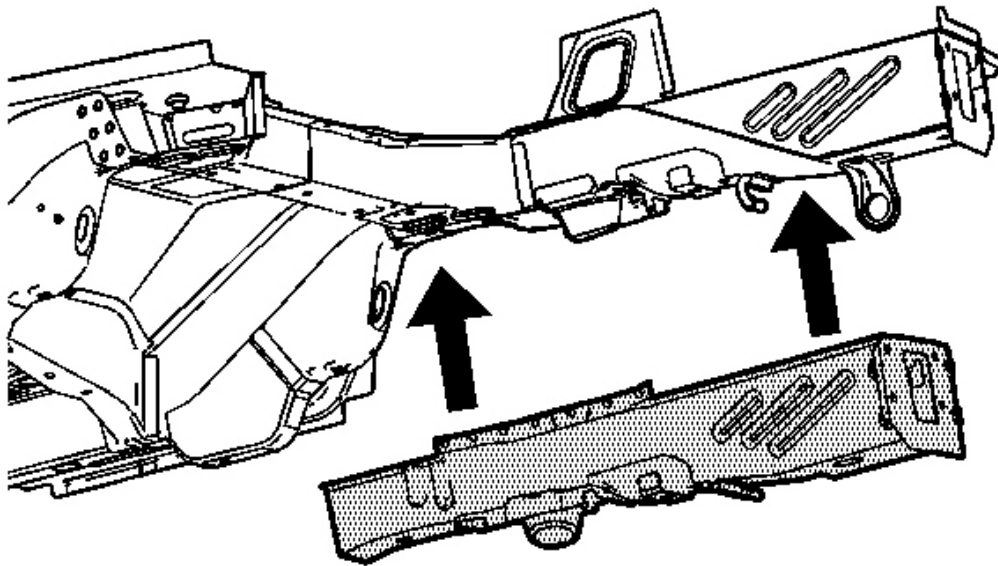


Fig. 122: View Of Rear Rail Lower - Section
Courtesy of GENERAL MOTORS CORP.

4. Position the rear rail lower - rear section, rear rail upper, and No. 5 crossbar to the vehicle using 3-dimensional measuring equipment. Clamp the parts into place.

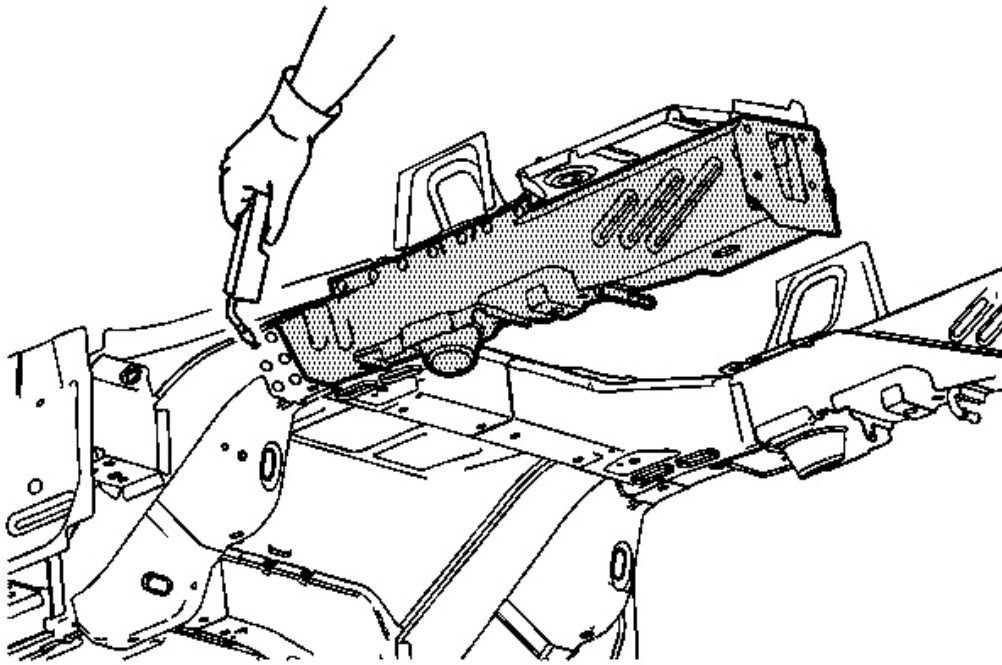


Fig. 123: Plug Welding Rear Rail Lower - Section
Courtesy of GENERAL MOTORS CORP.

5. Plug weld accordingly.
6. Clean and prepare all 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 repair 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** .

DESCRIPTION AND OPERATION

DUAL PHASE STEEL

This information provides repair recommendations and general guidelines for steel classified as Dual Phase Steel (Dual Phase Steel with a tensile strength up to and including 800 MPa), also known as DP.

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

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:

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 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 greater than 700 MPa.

This includes the common steel names of

- Ultra High Strength Steel (UHSS)
- Martensitic Steel (MS)
- Press Hardened Steel (PHS)
- Boron Steel

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.**
- **This type of steel can 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.