

ACCESSORIES & EQUIPMENT
Collision Repair - Canyon, Colorado

SPECIFICATIONS

FASTENER SPECIFICATIONS

Application	Specification	
	Metric	English
Front End Upper Tie Bar Fasteners	6.5 N.m	4.8 lb ft
I/P Bracket	22.5 N.m	16.6 lb ft
Cowl Panel	9 N.m	6.6 lb ft
Pickup Box Fasteners	13 N.m	9.6 lb ft

DIMENSIONS - BODY

Engine Compartment Point to Point Measurements

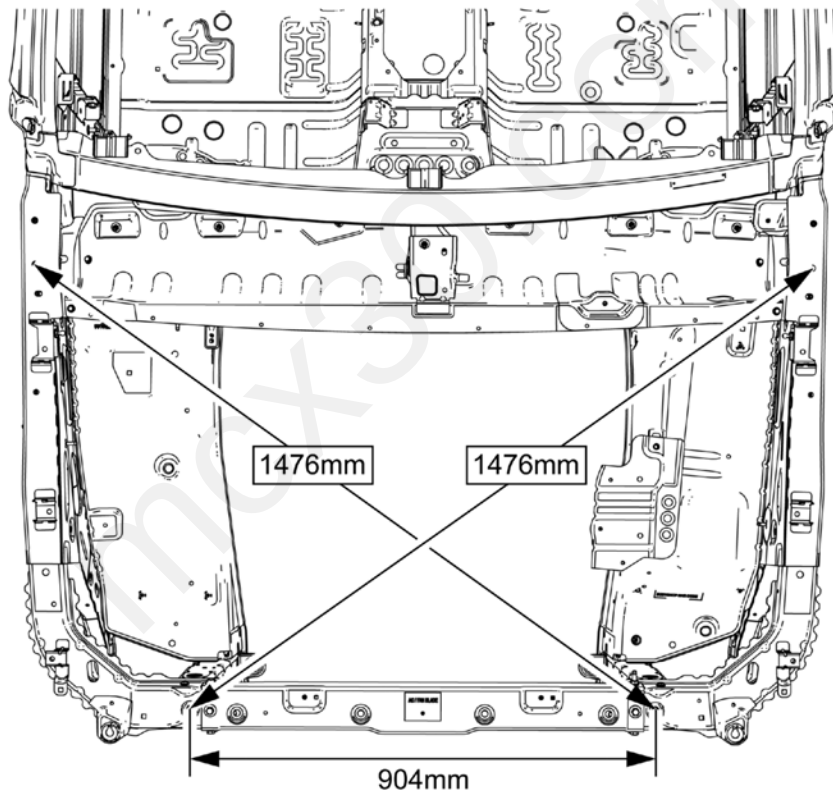


Fig. 1: Engine Compartment Point to Point Measurements

Courtesy of GENERAL MOTORS COMPANY

Location	Length
1	1498 mm
2	1472 mm
3	1093 mm

All dimensions are measured from a zero line, a center line, and a common datum. All dimensions are symmetrical unless otherwise specified.

ensions (Crew Cab)

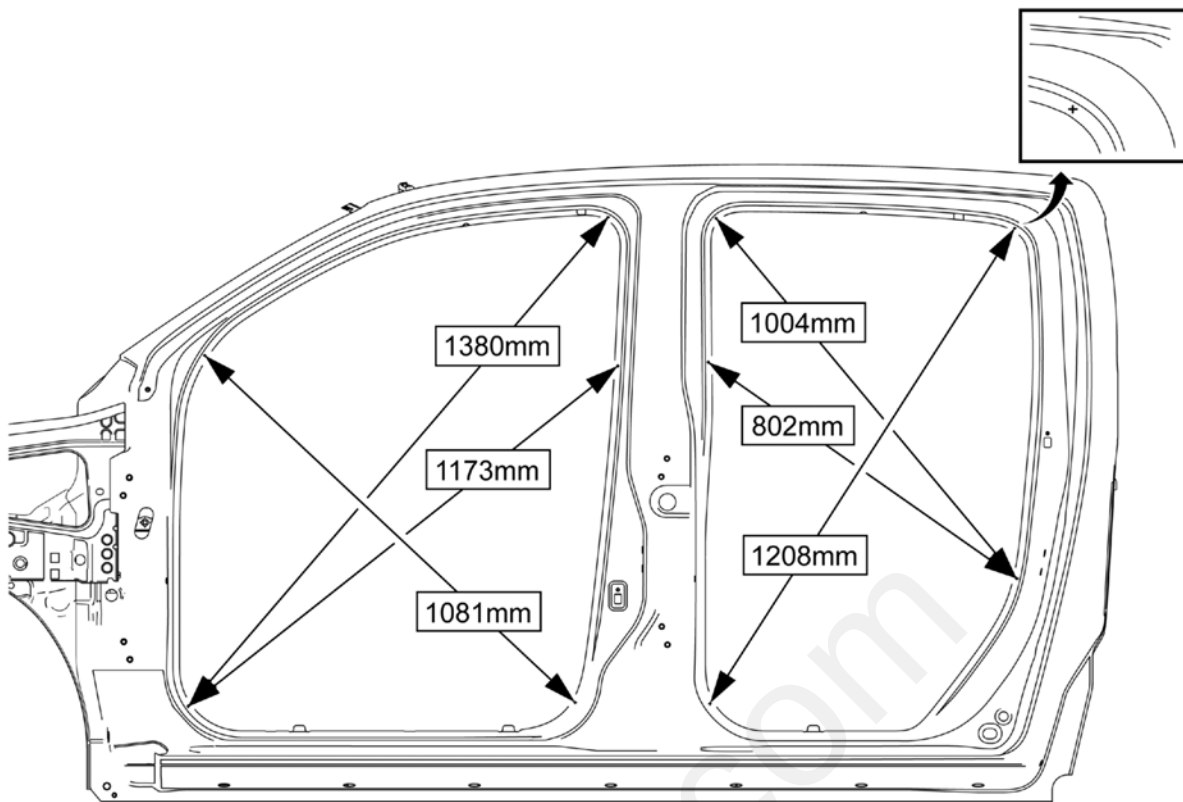
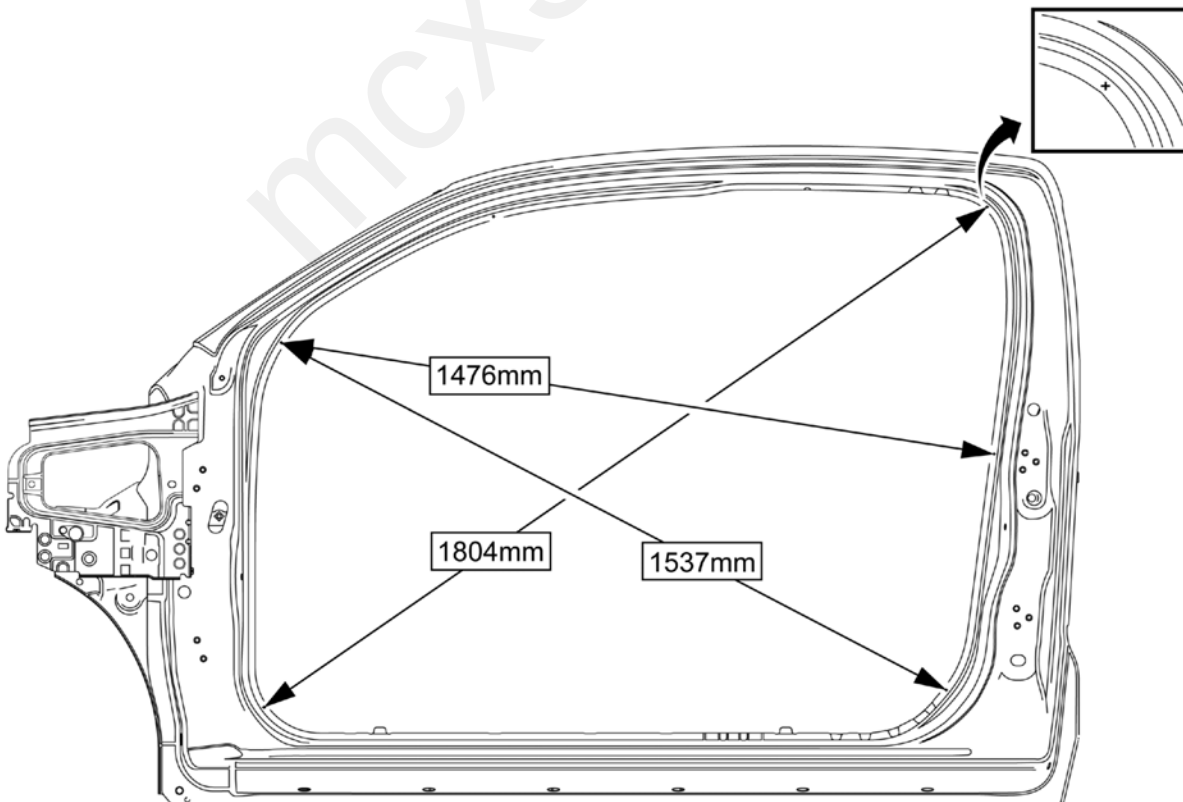


Fig. 2: Body Side Dimensions (Crew Cab)
Courtesy of GENERAL MOTORS COMPANY

Body Side Dimensions (Extended Cab)



Side Dimensions (Extended Cab)	Description	Material	Procedure
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Courtesy of GENERAL MOTORS COMPANY

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 die marks, holes, slots, and fasteners are measured to the center. All dimensions are symmetrical unless otherwise specified.

VISUAL IDENTIFICATION

STRUCTURE IDENTIFICATION (EXTENDED CAB)

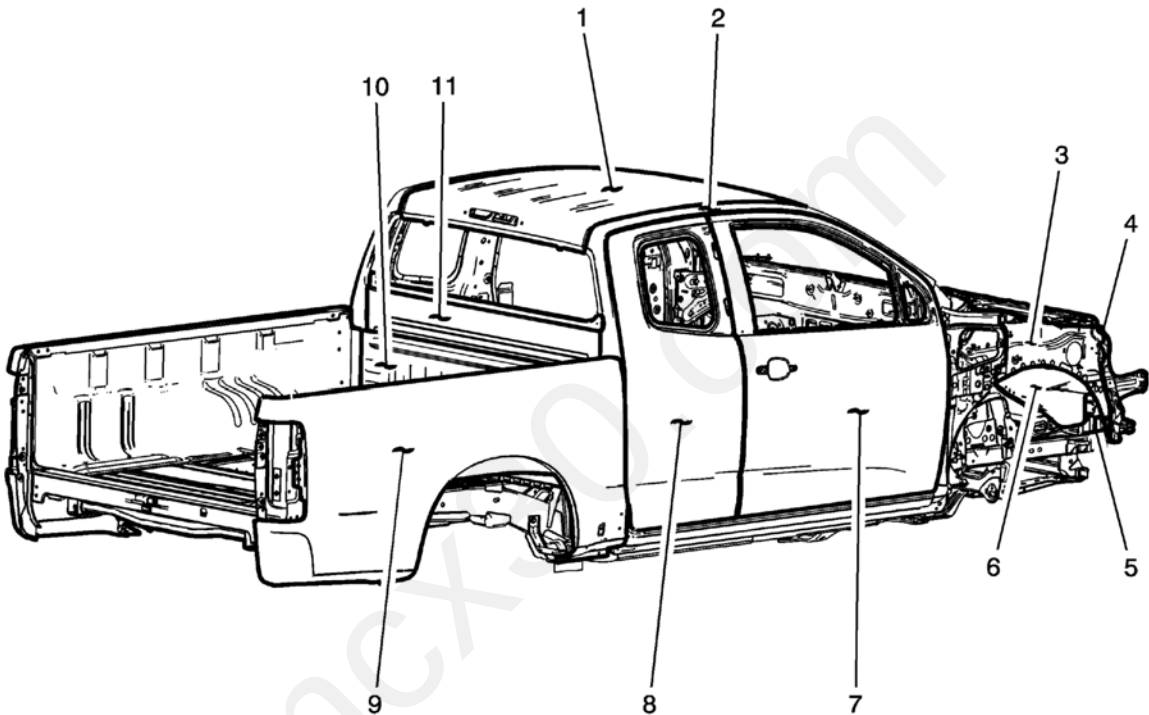


Fig. 4: Structure Identification (Extended Cab)
 Courtesy of GENERAL MOTORS COMPANY

Number	Description	Material	Procedure
1	Roof Panel	Mild Steel	Roof Outer Panel Replacement (Adhesive Bonding Procedure)Roof Outer Panel Replacement (Weld On Procedure)

	Description	Material	Procedure
2	Outer Door Frame Sectioning	<u>Mild Steel</u>	• <u>Outer Windshield Frame Pillar Sectioning</u> • <u>Rocker Outer Panel Sectioning</u> • <u>Front Hinge Pillar Sectioning</u> • <u>Center Pillar Sectioning</u> • <u>Rear Pillar Sectioning (Lower)</u><u>Rear Pillar Sectioning (Complete)</u>
3	Front Compartment Upper Side Rail	<u>Mild Steel</u>	<u>Front Compartment Upper Side Rail Replacement (Outer)</u>
4	Radiator Support	<u>Mild Steel</u>	<u>Radiator Support Replacement</u>
5	Front Rail Extension	<u>Mild Steel</u>	Front Rail Extension
6	Front Wheelhouse Panel	<u>Mild Steel</u>	<u>Front Wheelhouse Panel Replacement</u>
7	Front Side Door Outer Panel	<u>Mild Steel</u>	<u>Front Side Door Outer Panel Replacement</u>
8	Rear Side Door Outer Panel	<u>Mild Steel</u>	<u>Rear Side Door Outer Panel Replacement (Extended Cab)</u>
9	Pick Up Box Outer Side Panel	<u>Mild Steel</u>	<u>Pickup Box Outer Side Panel Replacement (Welding Procedure)</u> <u>Pickup Box Outer Side Panel Replacement (Adhesive Bonding Procedure)</u>
10	Pick Up Box Front End Panel	<u>Mild Steel</u>	<u>Pickup Box Front End Panel Replacement</u>
11	Rear End Panel	<u>Mild Steel</u>	<u>Rear End Panel Replacement</u>

STRUCTURE IDENTIFICATION (CREW CAB)

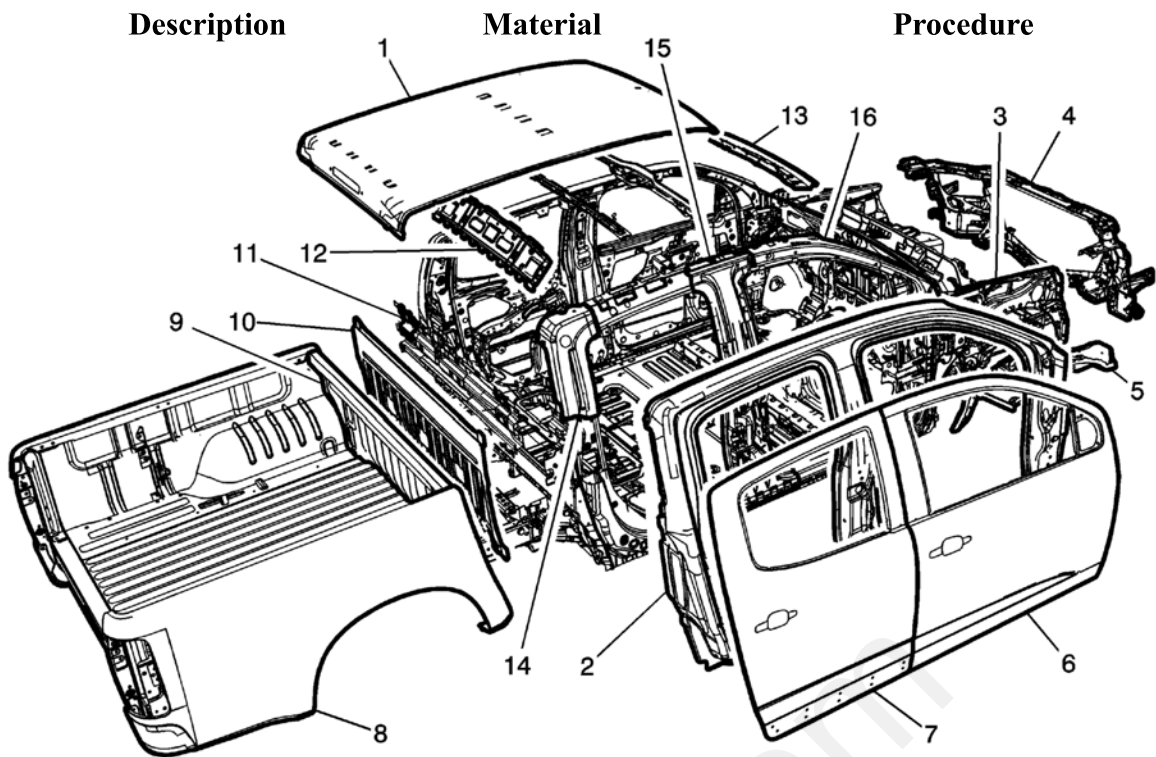


Fig. 5: Structure Identification (Crew Cab)
 Courtesy of GENERAL MOTORS COMPANY

Number	Description	Material	Procedure
1	Roof Panel	<u>Mild Steel</u>	<u>Roof Outer Panel Replacement (Adhesive Bonding Procedure)</u> <u>Roof Outer Panel Replacement (Weld On Procedure)</u>
2	Outer Door Frame Sectioning	<u>Mild Steel</u>	• <u>Outer Windshield Frame Pillar Sectioning</u> • <u>Rocker Outer Panel Sectioning</u> • <u>Front Hinge Pillar Sectioning</u> • <u>Center Pillar Sectioning</u> • <u>Rear Pillar Sectioning (Lower)</u> <u>Rear Pillar Sectioning (Complete)</u>
3	Front Compartment Upper Side Rail	<u>Mild Steel</u>	<u>Front Compartment Upper Side Rail Replacement (Outer)</u>
4	Radiator Support	<u>Mild Steel</u>	<u>Radiator Support Replacement</u>
5	Front Wheelhouse Panel	<u>Mild Steel</u>	<u>Front Wheelhouse Panel Replacement</u>
6	Front Side Door Outer Panel	<u>Mild Steel</u>	<u>Front Side Door Outer Panel Replacement</u>
7	Rear Side Door Outer Panel	<u>Mild Steel</u>	<u>Rear Side Door Outer Panel Replacement (Crew Cab)</u>

	Description	Material	Procedure
8	Pick Up Box Outer Side Panel	<u>Mild Steel</u>	<u>Pickup Box Outer Side Panel Replacement (Welding Procedure)</u> <u>Pickup Box Outer Side Panel Replacement (Adhesive Bonding Procedure)</u>
9	Pick Up Box Front End Panel	<u>Mild Steel</u>	<u>Pickup Box Front End Panel Replacement</u>
10	Rear End Panel	<u>Mild Steel</u>	<u>Rear End Panel Replacement</u>
11	Rear End Panel Reinforcement	<u>High Strength Low Alloy Steel</u>	<u>Rear End Panel Replacement</u>
12	Roof Rear Header Panel	<u>High Strength Low Alloy Steel</u>	<u>Roof Rear Header Panel Replacement</u>
13	Windshield Frame Header Front Panel	<u>High Strength Low Alloy Steel</u>	<u>Windshield Frame Header Front Panel Replacement</u>
14	Back Body Pillar Inner Panel Reinforcement	<u>Mild Steel</u>	<u>Back Body Pillar Inner Panel Reinforcement Replacement</u>
15	Center Pillar Sectioning	<u>High Strength Low Alloy Steel</u>	<u>Center Pillar Sectioning</u>
16	Outer Windshield Frame Pillar sectioning	<u>Mild Steel</u>	<u>Outer Windshield Frame Pillar Sectioning</u>

REPAIR INSTRUCTIONS

FRONT END LOWER CENTER TIE BAR 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 Glass and Sheet Metal Handling Warning .

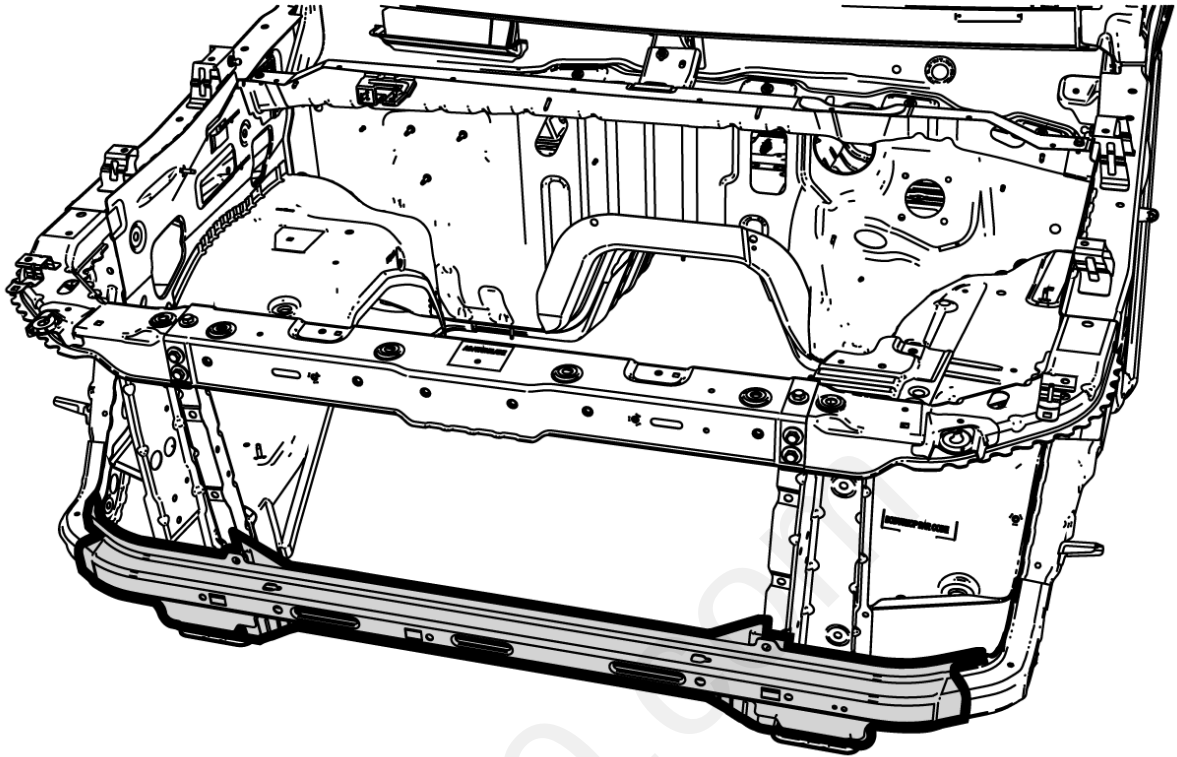


Fig. 6: Applying Sealers And Anti-Corrosion Materials To Repair Area
Courtesy of GENERAL MOTORS COMPANY

2. Remove all related panels and components (1).
3. Restore as much of the damage as possible to factory specifications. Refer to [**Dimensions - Body**](#).
4. Note the location and remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [**Anti-Corrosion Treatment and Repair**](#).

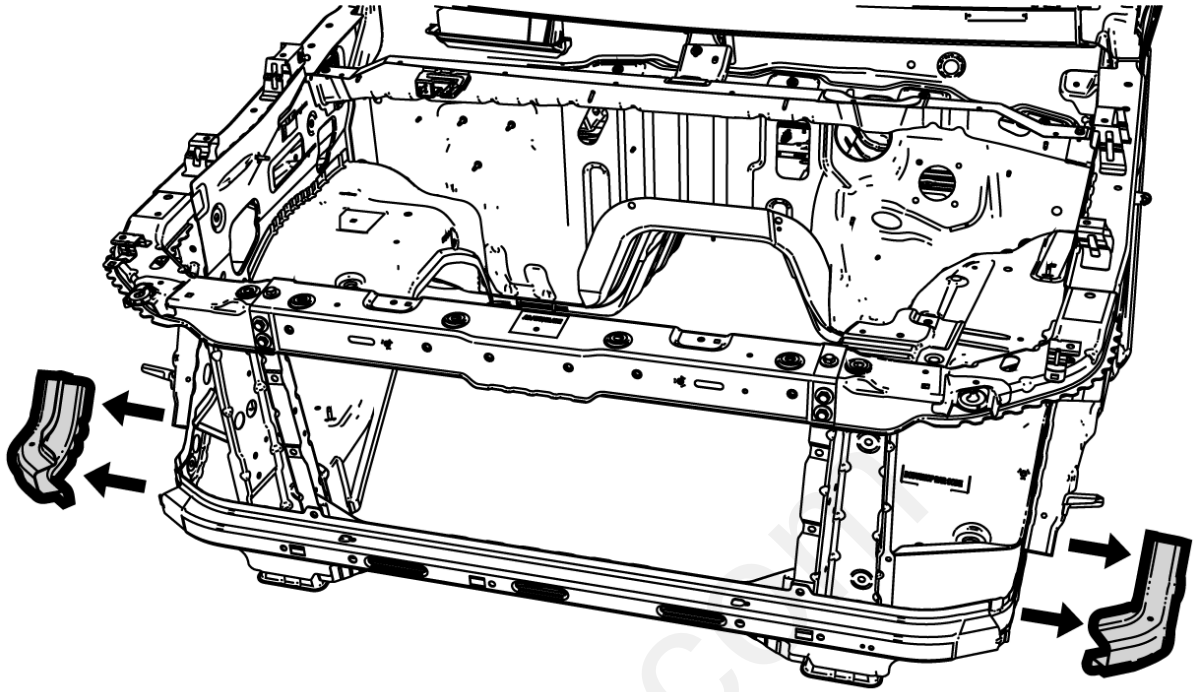


Fig. 7: Front End Lower Tie Bar End Panels

Courtesy of GENERAL MOTORS COMPANY

NOTE: Record the number and location of the original welds for installation of the service assembly. Do not damage any inner panels, reinforcements, or adjacent panels during the removal process.

5. Remove factory welds as required, to remove the front end lower tie bar end panels (1).
6. Remove the front end lower tie bar end panels.

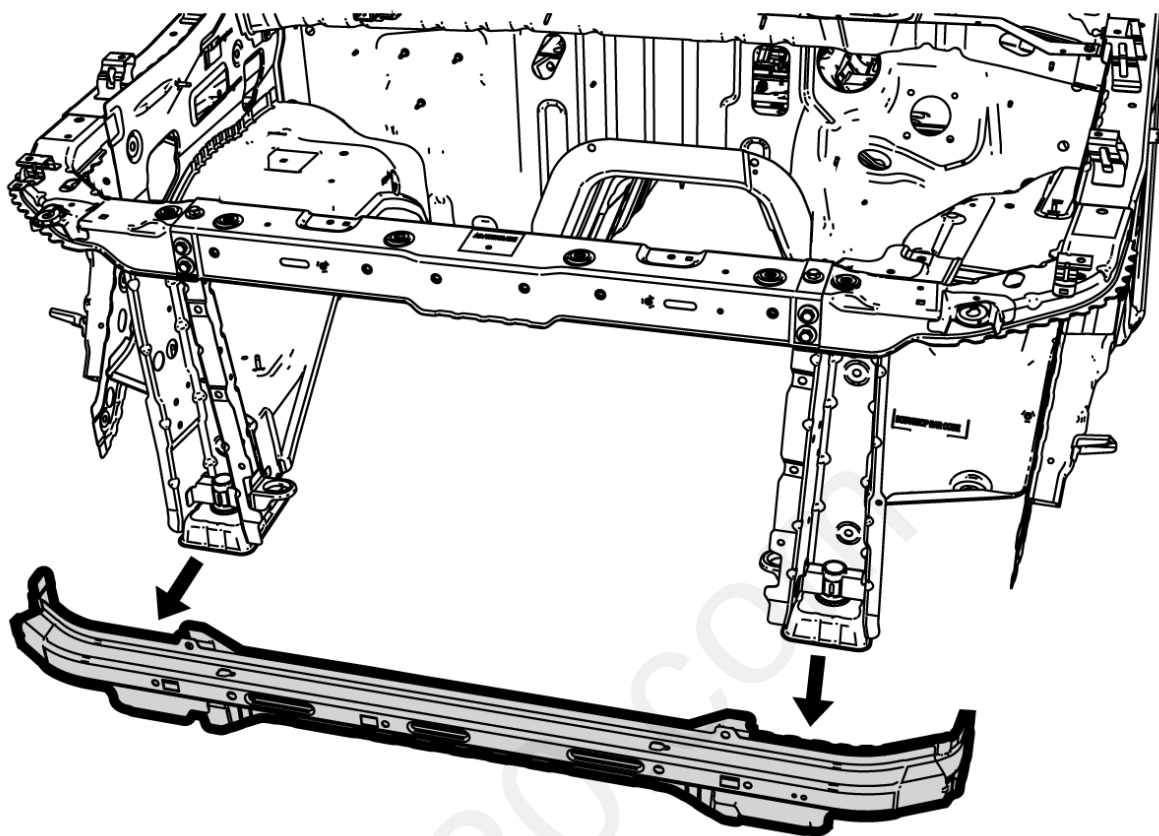


Fig. 8: Front End Lower Center Tie Bar

Courtesy of GENERAL MOTORS COMPANY

NOTE: Record the number and location of the original welds for installation of the service assembly. Do not damage any inner panels, reinforcements, or adjacent panels during the removal process.

7. Remove factory welds as required, to remove the front end lower center tie bar (1).
8. Remove the front end lower center tie bar.

Installation Procedure

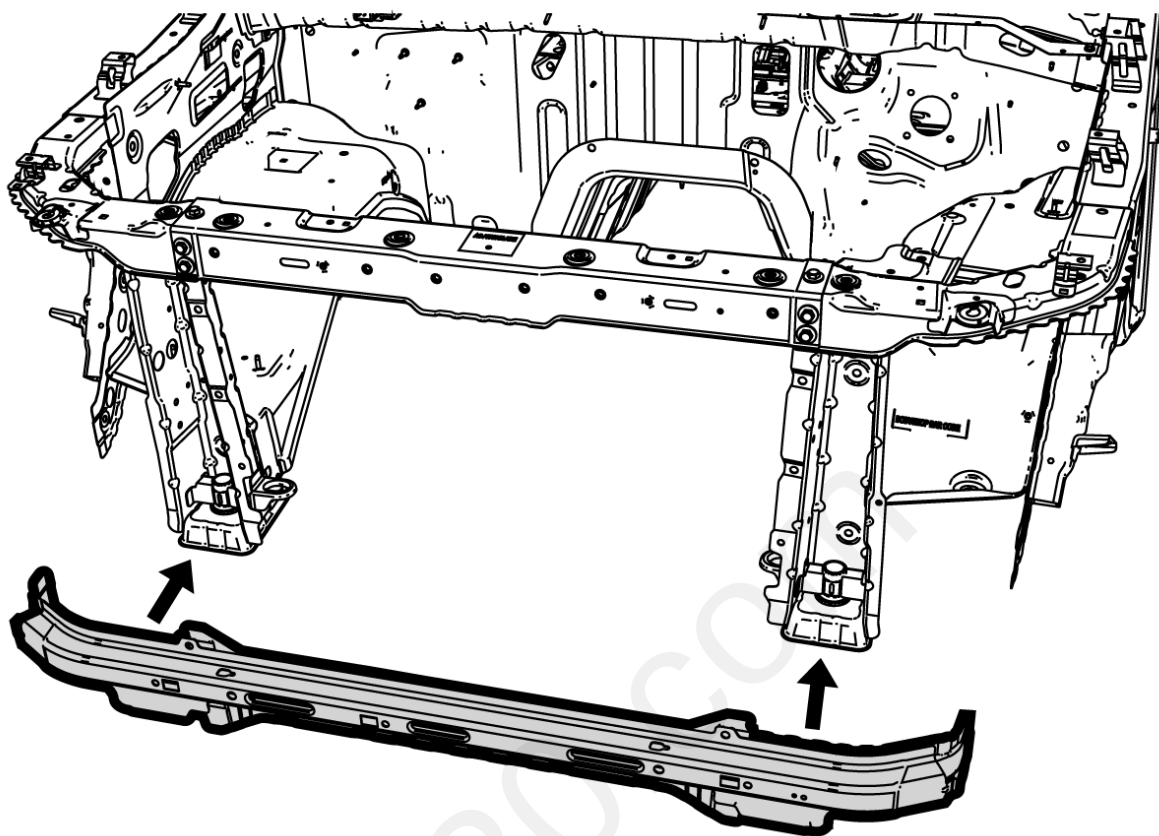


Fig. 9: Front End Lower Center Tie Bar

Courtesy of GENERAL MOTORS COMPANY

NOTE:

If the location of the original welds can not be determined, space the weld every 40 mm (1 1/2 in) apart. If MIG plug welding is used, proper sized plug weld holes will be required in one of the joining surfaces, based on the thickness of the panels being welded.

1. Prepare all mating surfaces as necessary.
2. Apply Weld-Thru coating or equivalent to all mating surfaces. Refer to [Anti-Corrosion Treatment and Repair](#).

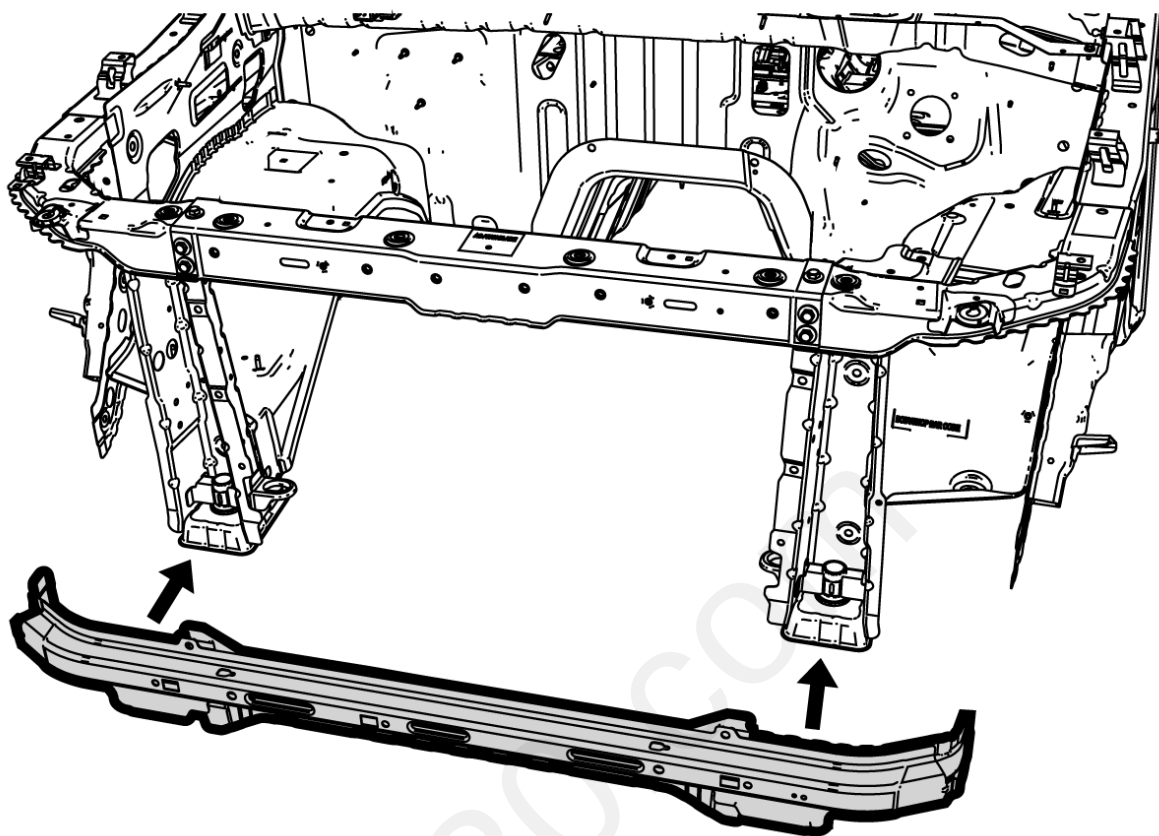


Fig. 10: Front End Lower Center Tie Bar

Courtesy of GENERAL MOTORS COMPANY

3. Position the front end lower center tie bar on the vehicle using 3-dimensional measuring equipment. Clamp the front end lower center tie bar in place (1).
4. Weld as required.

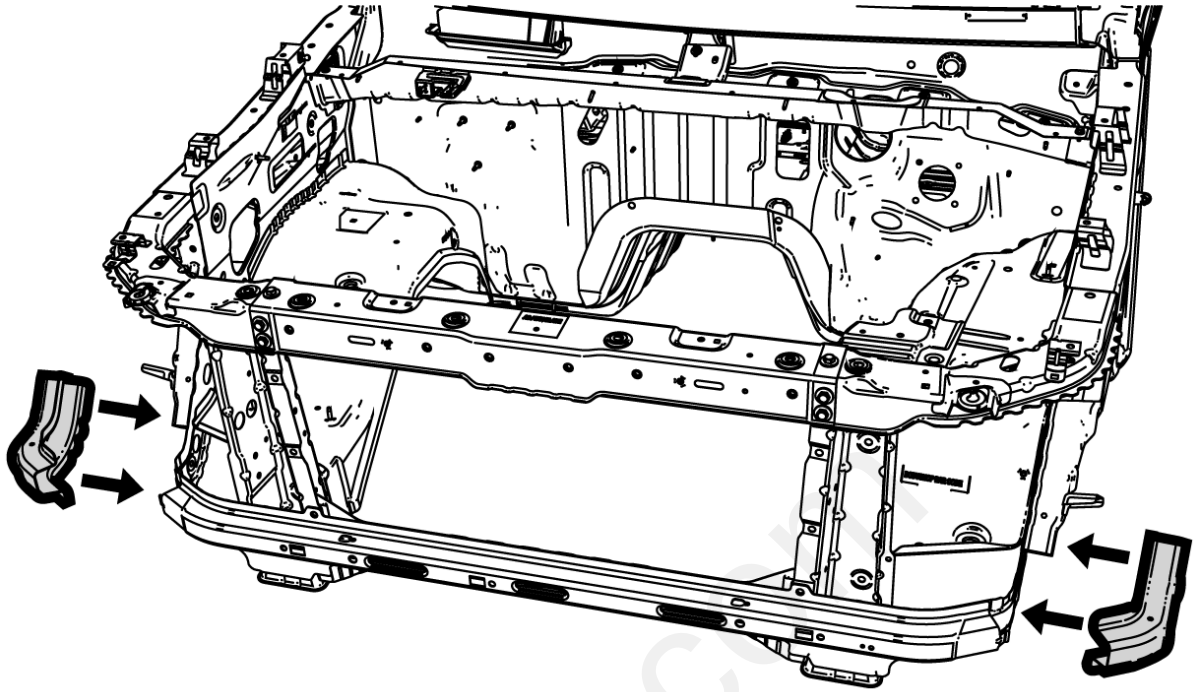


Fig. 11: Front End Lower Tie Bar End Panels
Courtesy of GENERAL MOTORS COMPANY

5. Install the front end lower tie bar end panels in the proper location (1).
6. Weld as required.
7. Clean and prepare all welded surfaces.

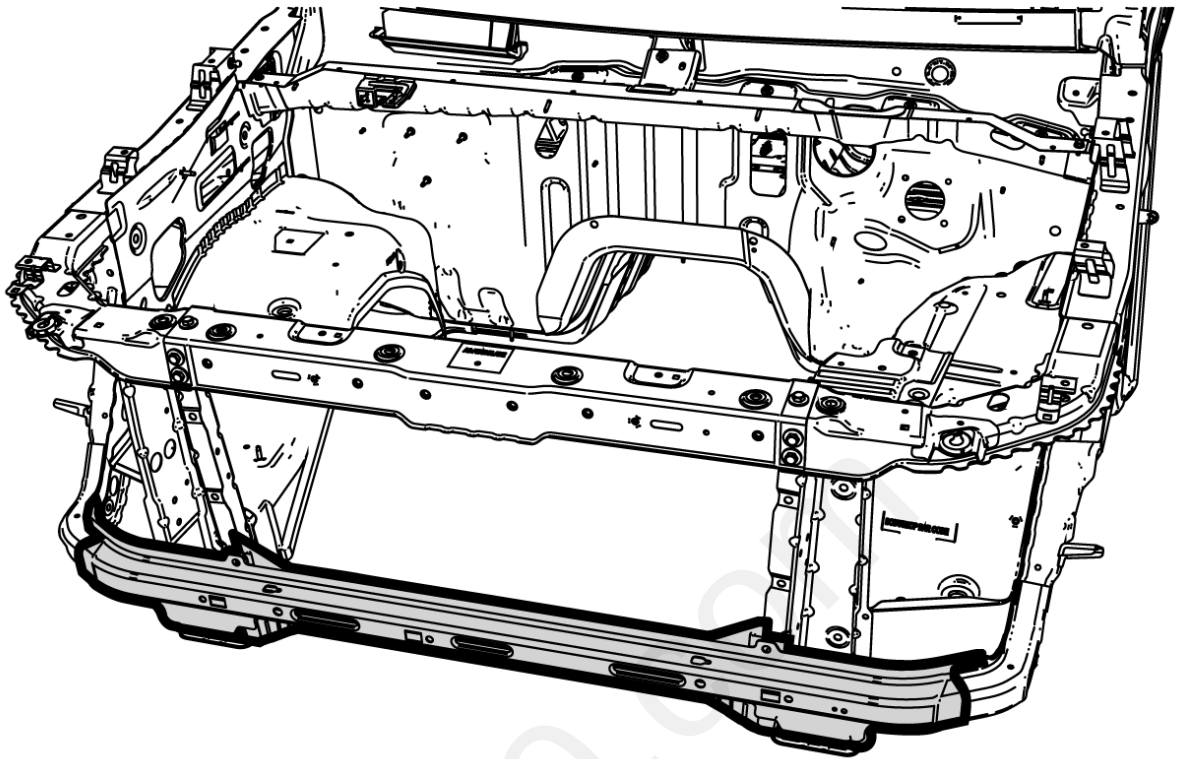


Fig. 12: Applying Sealers And Anti-Corrosion Materials To Repair Area
Courtesy of GENERAL MOTORS COMPANY

8. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
9. Paint and repair the 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](#) .

FRONT WHEELHOUSE 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](#) .

WARNING: Refer to [Glass and Sheet Metal Handling Warning](#) .

the SIR system and then disconnect the negative battery cable. Refer to [SIR Disabling and Enabling](#) .

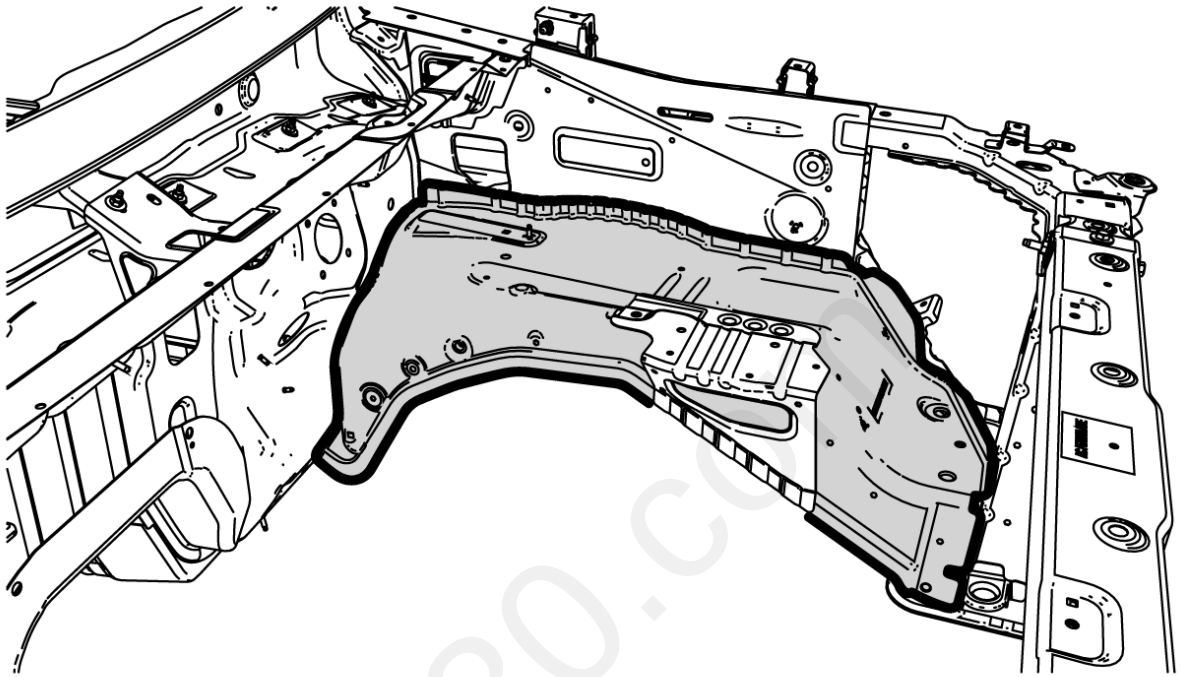


Fig. 13: Panels And Components

Courtesy of GENERAL MOTORS COMPANY

2. Remove all related panels and components.
3. Repair as much of the damage as possible to factory specifications. Refer to [Dimensions - Body](#).
4. Note the location and remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .

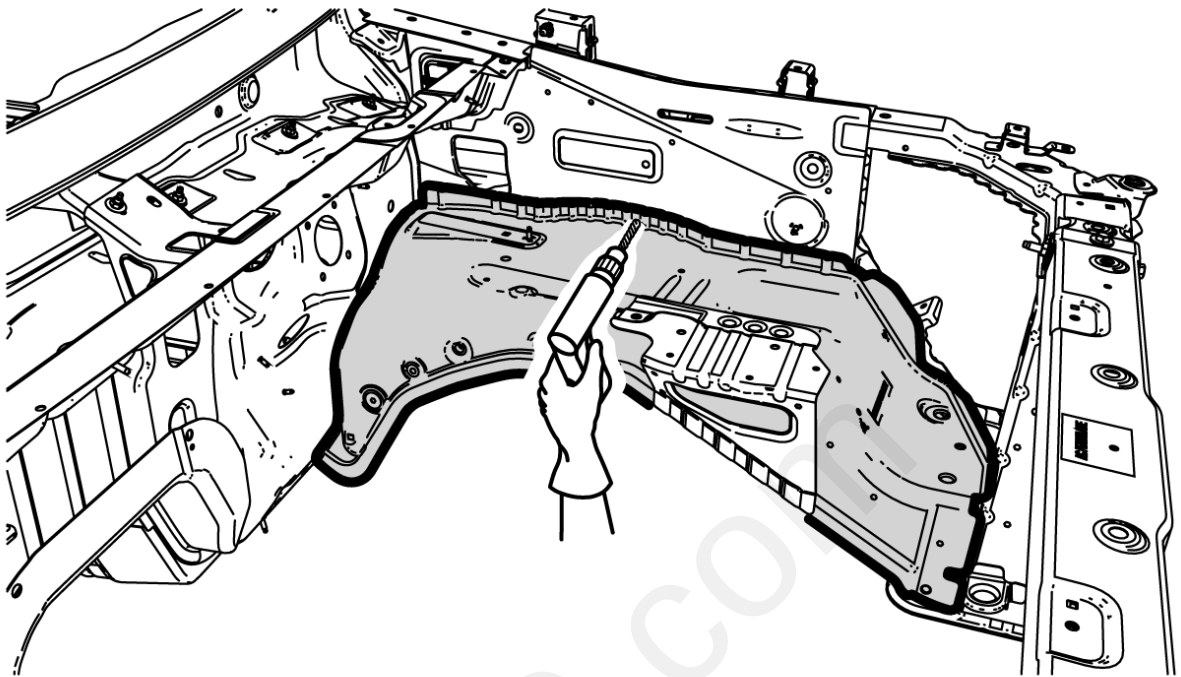


Fig. 14: Sealers And Anti-Corrosion Materials
Courtesy of GENERAL MOTORS COMPANY

NOTE: Do not damage any inner panels, reinforcements, or adjacent panels during the removal process.

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

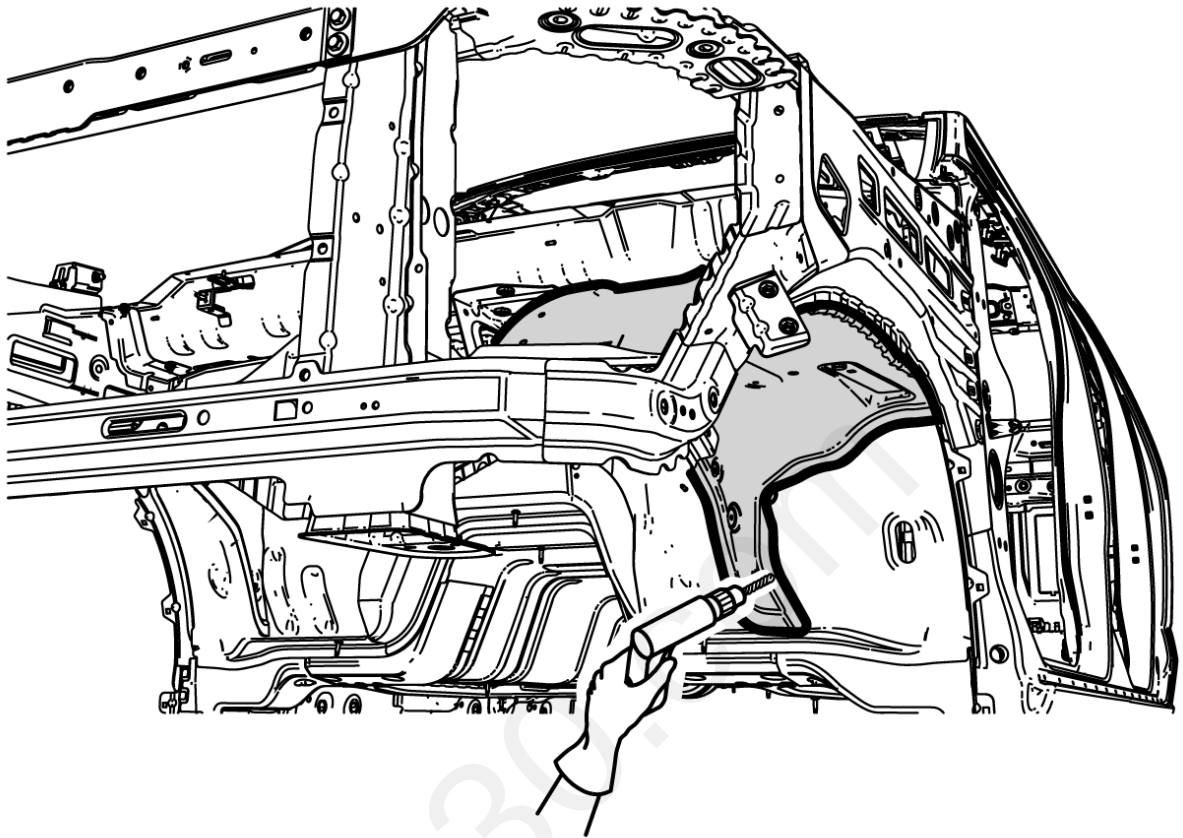


Fig. 15: Front Wheelhouse Panel

Courtesy of GENERAL MOTORS COMPANY

6. Remove factory welds as required, to remove the front wheelhouse panel (1).

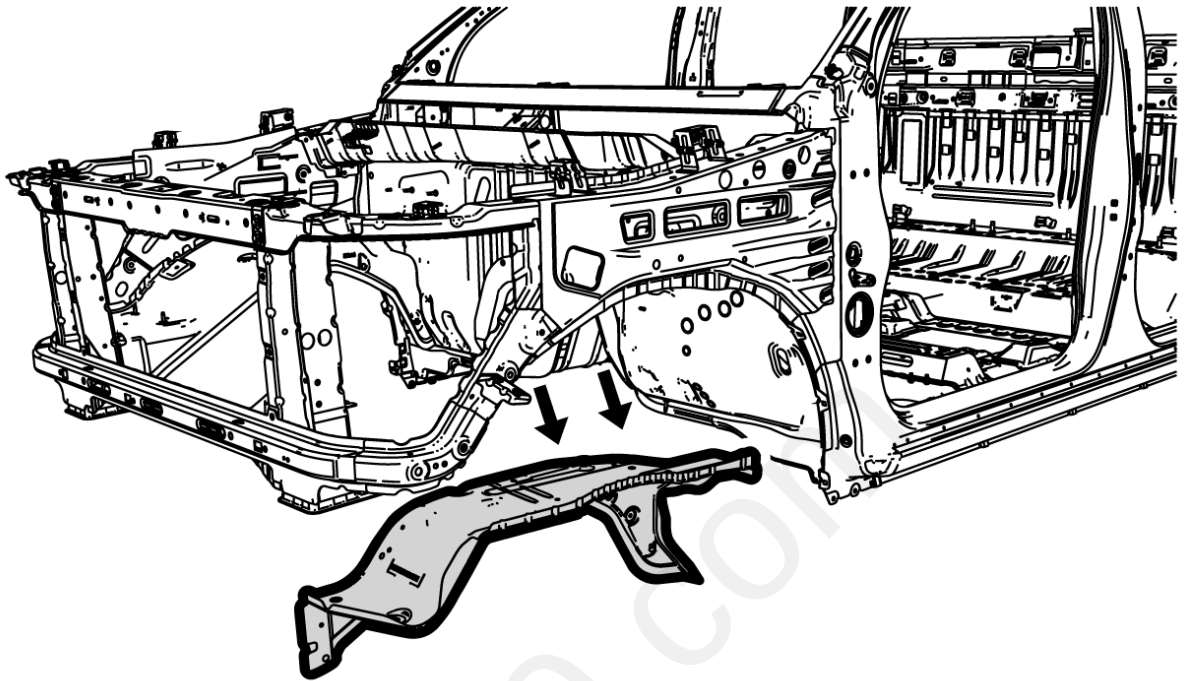


Fig. 16: Front Wheelhouse Panel

Courtesy of GENERAL MOTORS COMPANY

7. Remove the front wheelhouse panel.

Installation Procedure

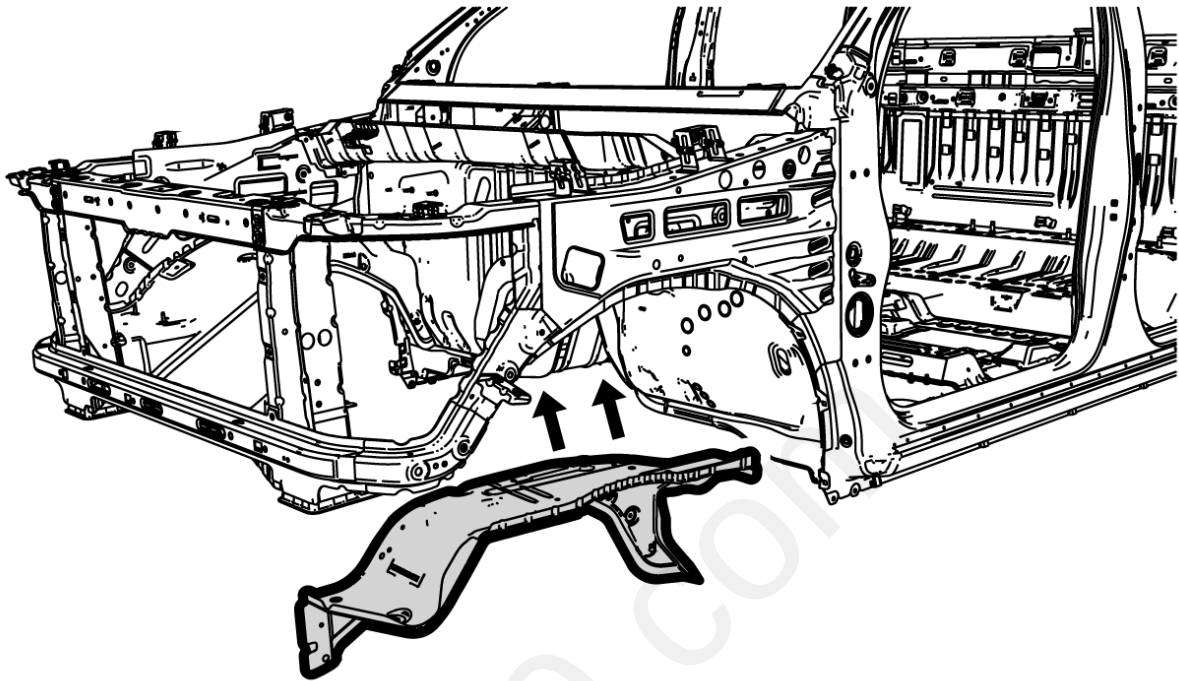


Fig. 17: Space Welds Every 40 mm (1 1/2 in) Apart

Courtesy of GENERAL MOTORS COMPANY

NOTE:

If the location of the original welds can not be determined, space the welds every 40 mm (1 1/2 in) apart. If MIG plug welding is used, proper sized plug weld holes will be required in one of the joining surfaces, based on the thickness of the panels being welded.

1. Prepare all mating surfaces as necessary.
2. Apply Weld-Thru coating or equivalent to all mating surfaces. Refer to [Anti-Corrosion Treatment and Repair](#) .

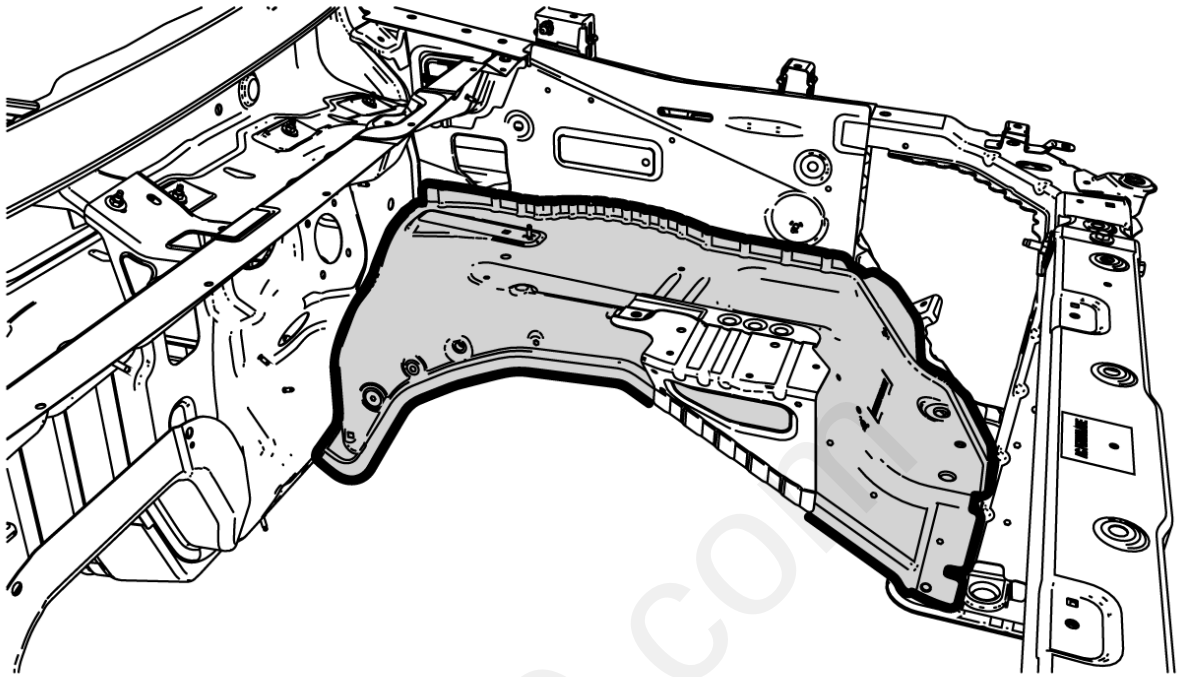


Fig. 18: Panels And Components

Courtesy of GENERAL MOTORS COMPANY

3. Position the front wheelhouse.

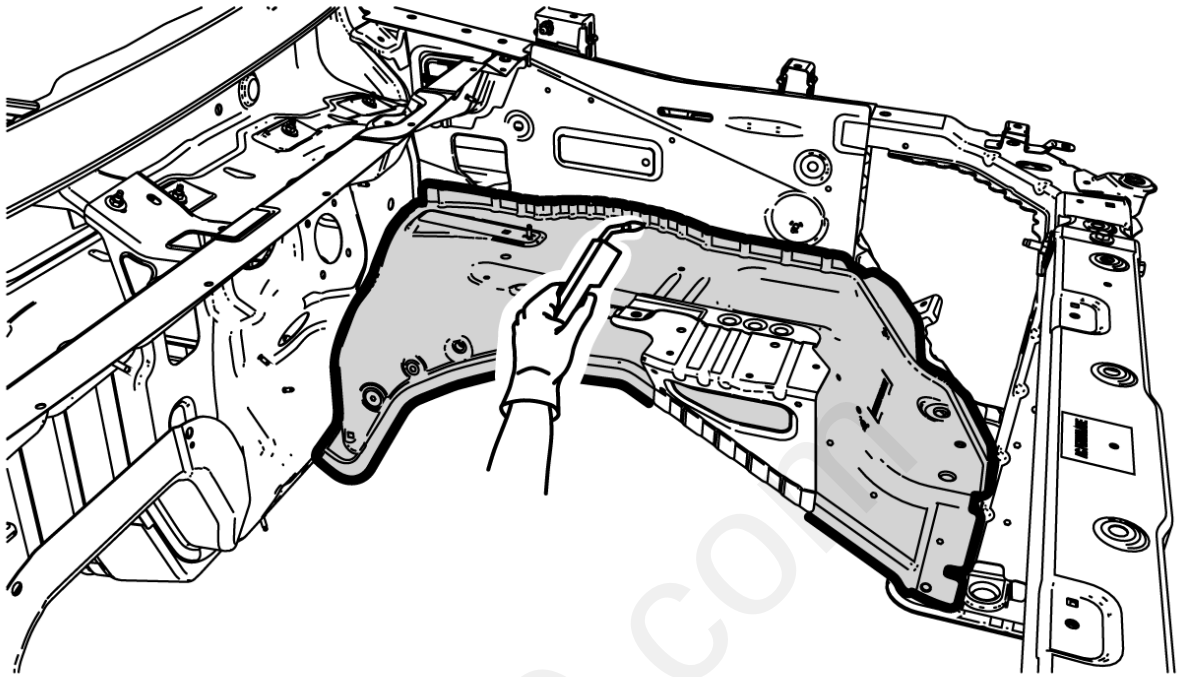


Fig. 19: Welding

Courtesy of GENERAL MOTORS COMPANY

4. Weld as required.

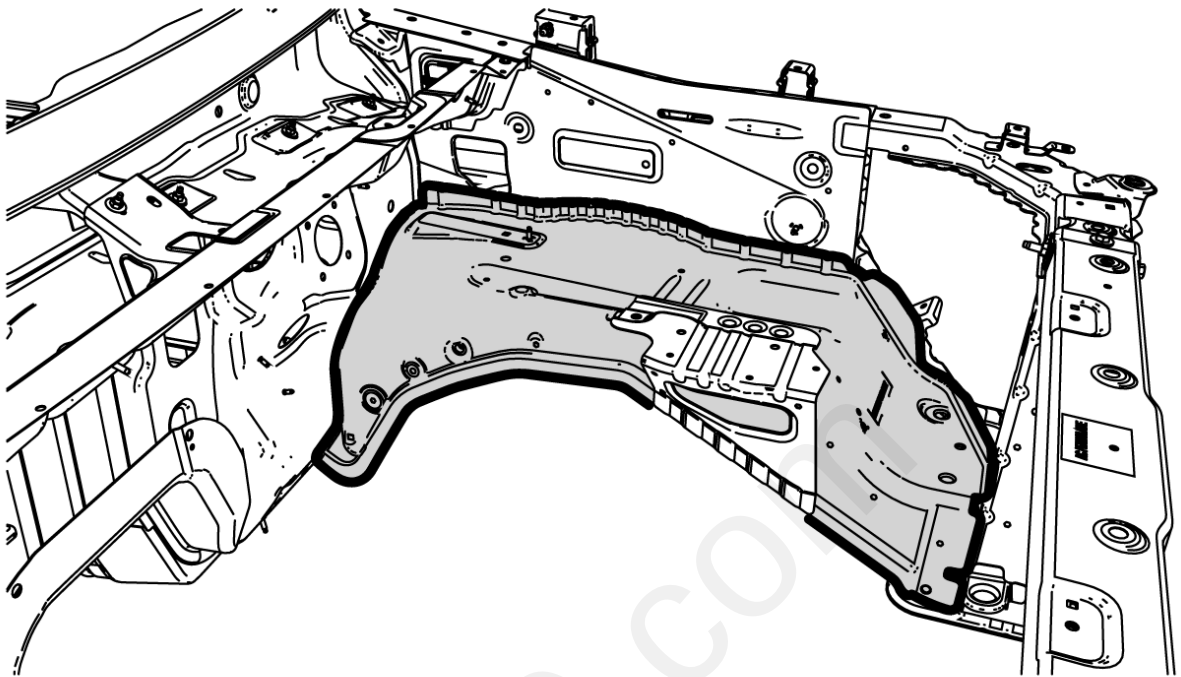


Fig. 20: Panels And Components

Courtesy of GENERAL MOTORS COMPANY

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 and repair the area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
8. Install all related panels and components.
9. Enable the SIR system and then connect the negative battery cable. Refer to [SIR Disabling and Enabling](#) .

FRONT COMPARTMENT UPPER SIDE RAIL REPLACEMENT (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](#) .

Refer to [Glass and Sheet Metal Handling Warning](#) .

ING: Refer to [Glass and Sheet Metal Handling Warning](#) .

1. Disable the SIR system and then disconnect the negative battery cable. Refer to [Glass and Sheet Metal Handling Warning](#) .
2. Remove all related panels and components.
3. Repair as much of the damage as possible to factory specifications. Refer to [Dimensions - Body](#).
4. Note the location and remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .

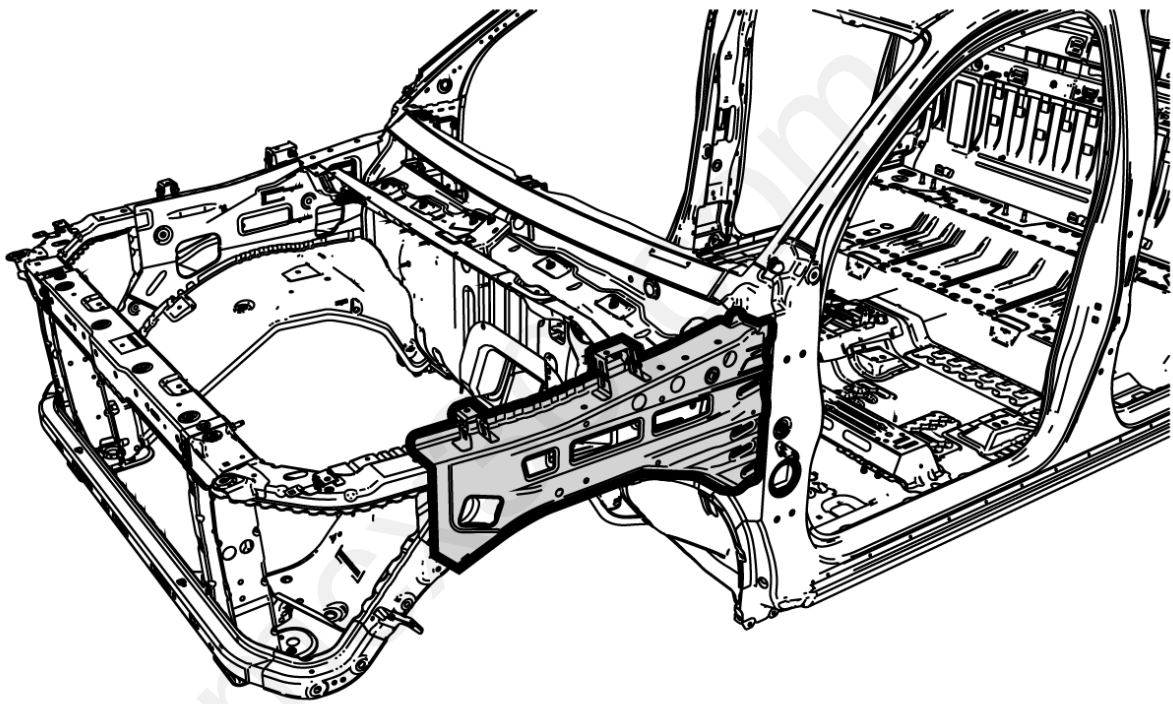


Fig. 21: Service Assembly

Courtesy of GENERAL MOTORS COMPANY

NOTE: Do not damage any inner panels or reinforcements.

NOTE: Record the number and location of the original welds for installation of the service assembly. Do not damage any inner panels, reinforcements, or adjacent panels during the removal process.

5. Note the MIG Slot Braze joints where the rail attaches to the hinge pillar. These braze joints must be replaced with MIG braze rather than MIG Weld. Grind the MIG braze enough to release the part without

ing the hinge pillar.

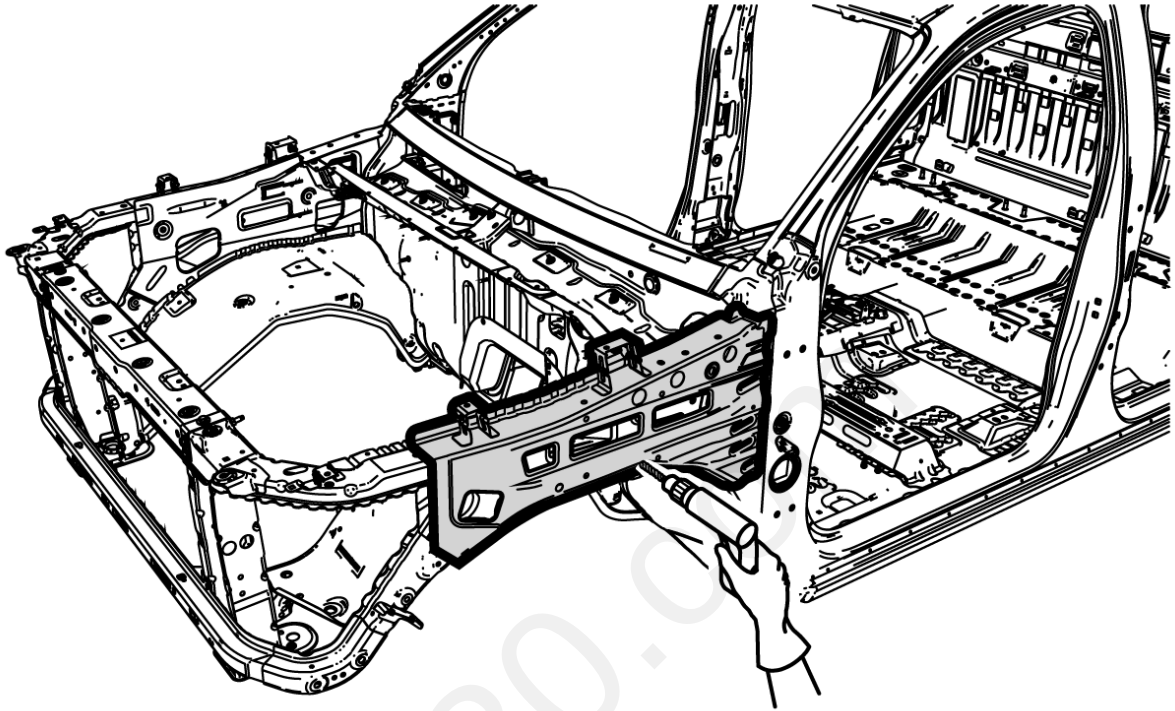


Fig. 22: Front Compartment Upper Side Rail
Courtesy of GENERAL MOTORS COMPANY

6. Remove all factory welds as required, to remove the front compartment upper side rail (1).

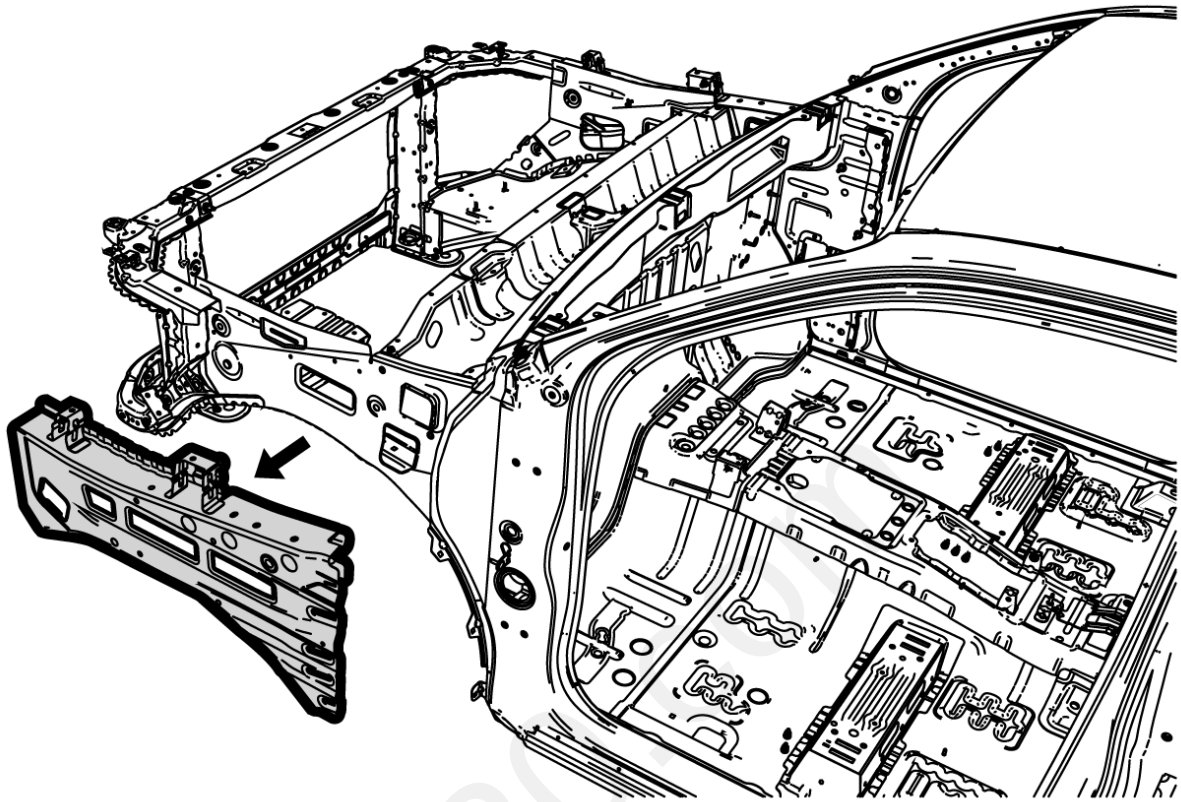


Fig. 23: Front Compartment Upper Side Rail
Courtesy of GENERAL MOTORS COMPANY

7. Remove the front compartment upper side rail.

Installation Procedure

NOTE: If the location of the original welds cannot be determined, space the welds every 40 mm (1 1/2 in) apart. If MIG plug welding is used, proper sized plug weld holes will be required in one of the joining surfaces, based on the thickness of the panels being welded.

NOTE: Every MIG Brazed seam / slot must be MIG Brazed in repair.

1. Prepare all mating surfaces as necessary.
2. Apply Weld-Thru coating or equivalent to all mating surfaces. Refer to [Anti-Corrosion Treatment and Repair](#) .

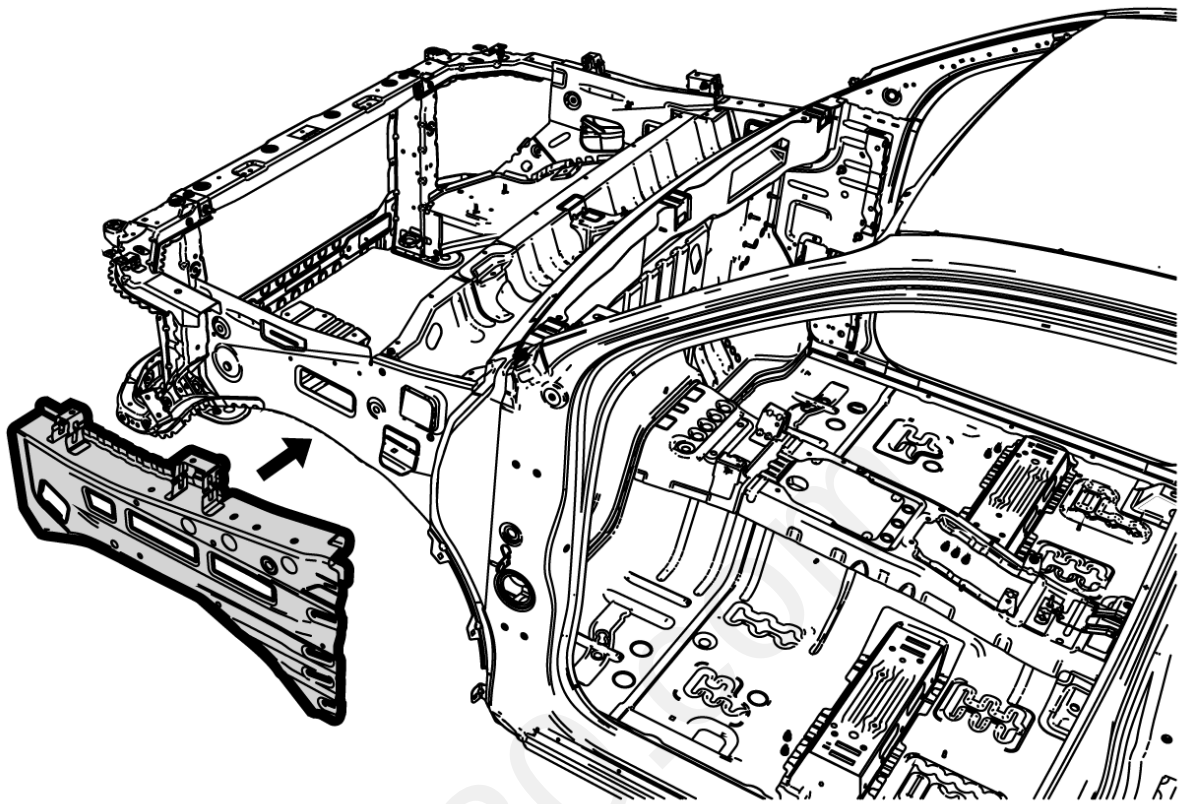


Fig. 24: Front Compartment Upper Side Rail
Courtesy of GENERAL MOTORS COMPANY

3. Install the front compartment upper side rail in the proper location (1).

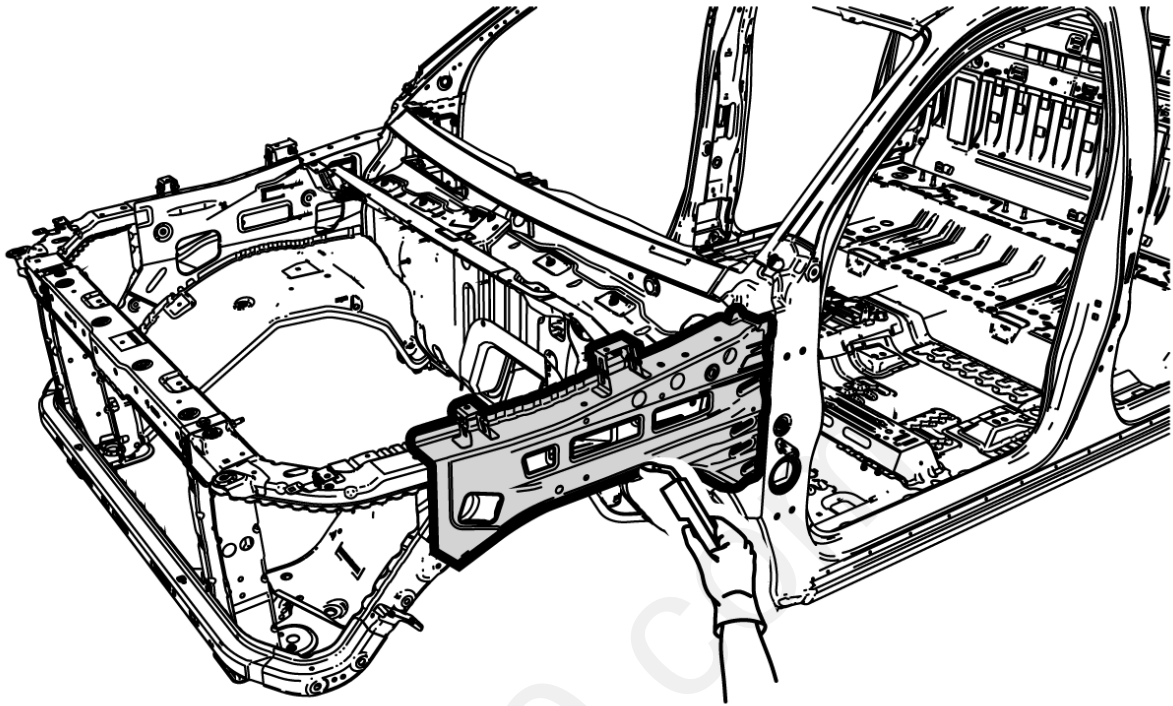


Fig. 25: Weld/Braze

Courtesy of GENERAL MOTORS COMPANY

4. Weld/Braze as required.
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. Enable the SIR system and then connect the negative battery cable. Refer to [SIR Disabling and Enabling](#) .

OUTER WINDSHIELD FRAME PILLAR SECTIONING

Removal Procedure

WARNING: Refer to [Approved Equipment for Collision Repair Warning](#) .

WARNING: Refer to [Glass and Sheet Metal Handling Warning](#) .

WARNING: Refer to [Collision Sectioning Warning](#) .

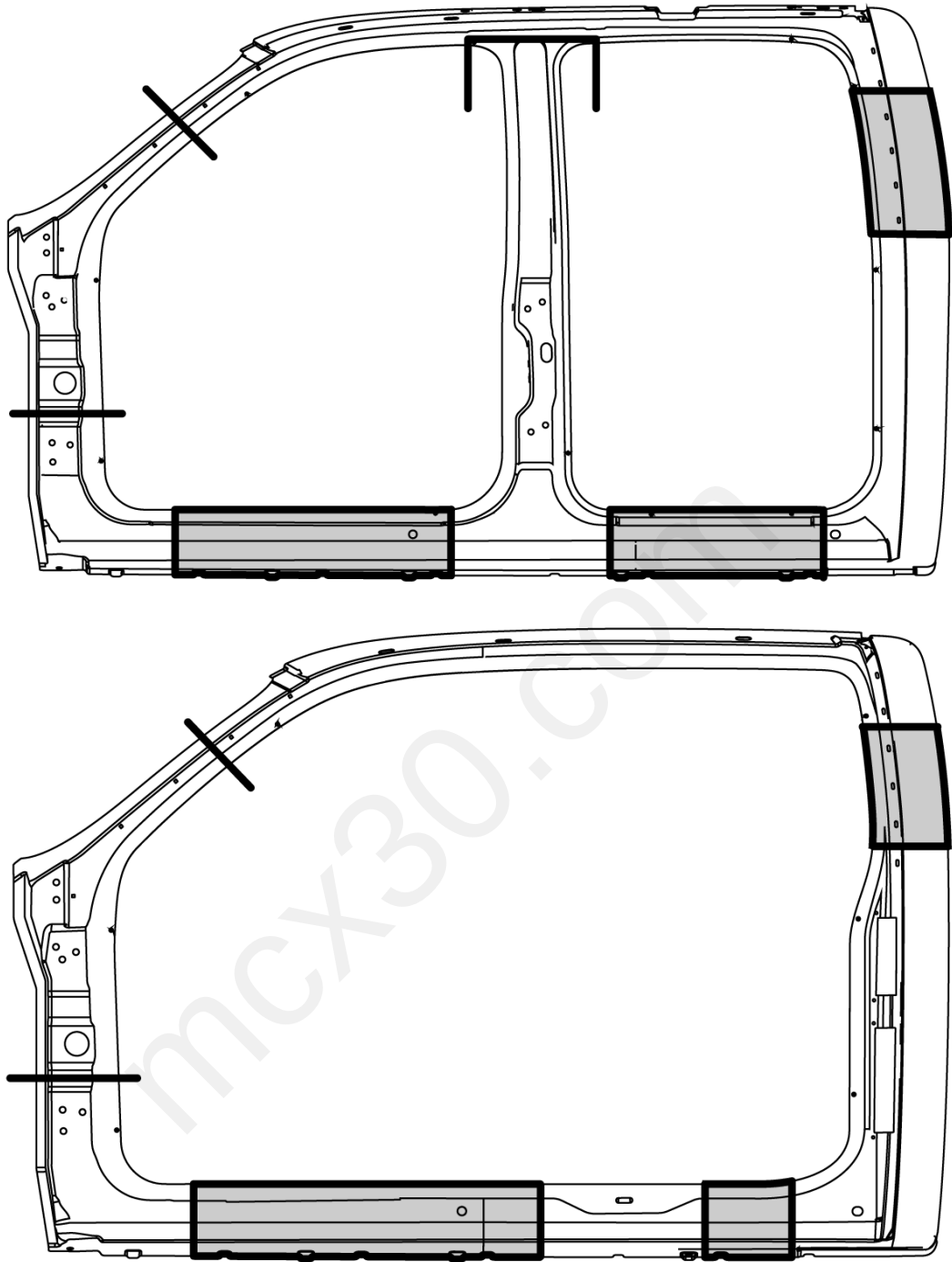


Fig. 26: Door Frame

Courtesy of GENERAL MOTORS COMPANY

NOTE:

The door frame can be replaced at the factory seams, but requires the removal of the windshield and 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.

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. Refer to [Dimensions - Body](#).

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](#) .
6. Perform additional sectioning procedures as necessary. Refer to the following procedures:
 - [Rocker Outer Panel Sectioning](#)
 - [Front Hinge Pillar Sectioning](#)
 - [Center Pillar Sectioning](#)
 - [Rear Pillar Sectioning \(Lower\)](#)[Rear Pillar Sectioning \(Complete\)](#)

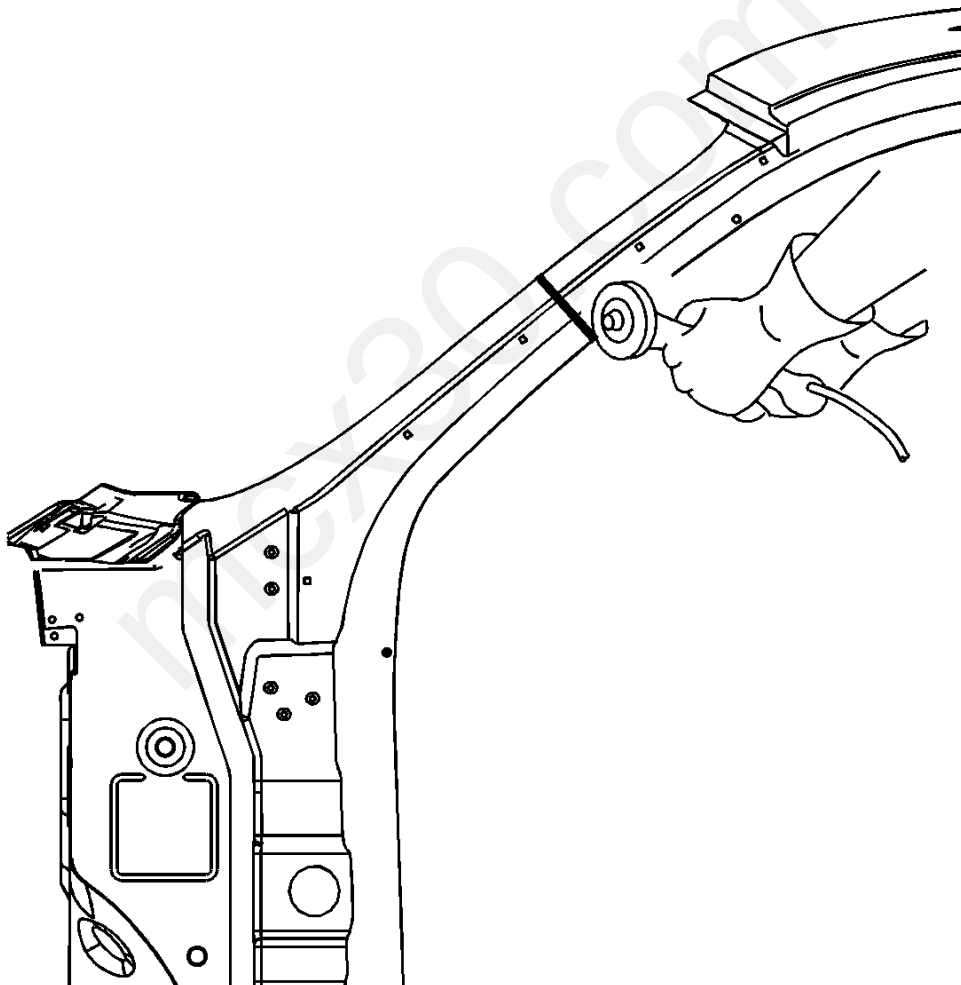


Fig. 27: Perform Lower Sectioning At 30 mm (1.18 in) From Inner Reinforcement
Courtesy of GENERAL MOTORS COMPANY

NOTE:

- Perform the sectioning in the flat area.
- Do not damage any inner panels or reinforcements.

the lower sectioning at 30 mm (1.18 in) from the inner reinforcement or choose the procedure that fits better according to the collision.

8. Cut the panel in the locations where sectioning is to be performed.

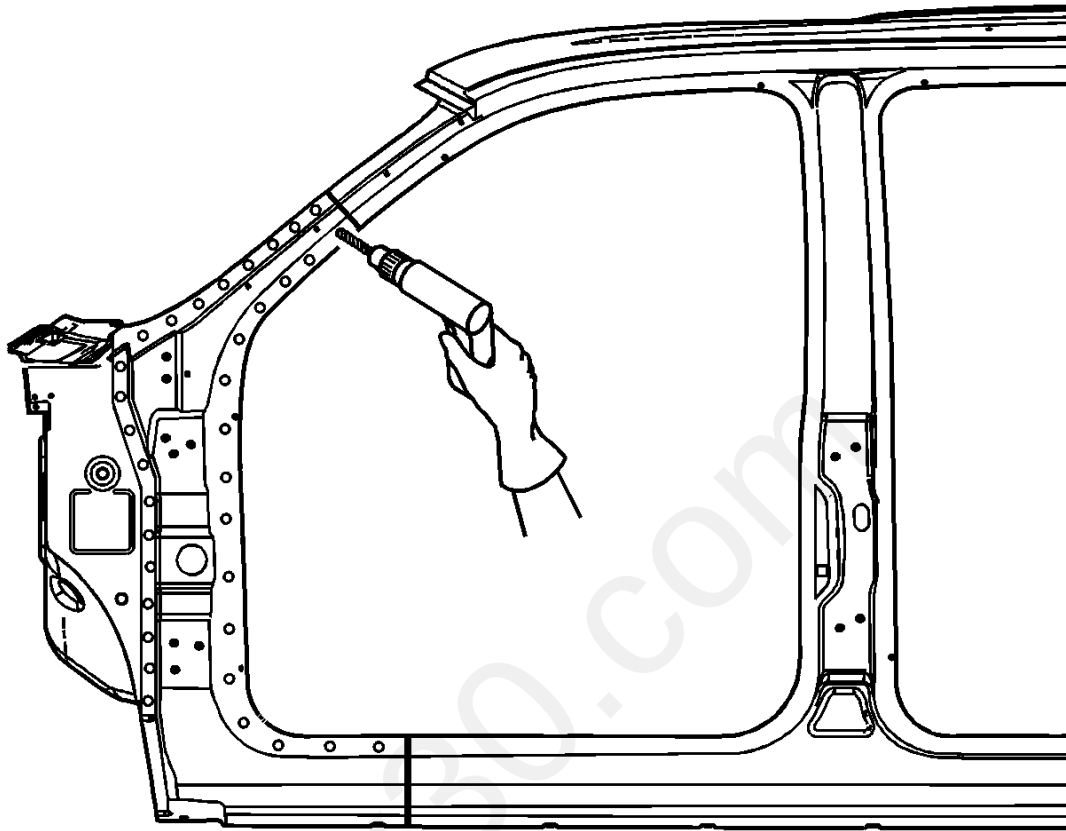


Fig. 28: Drilling Out Factory Welds

Courtesy of GENERAL MOTORS COMPANY

9. Locate and drill out all factory welds. Note the number and location of the welds for installation of the service part.

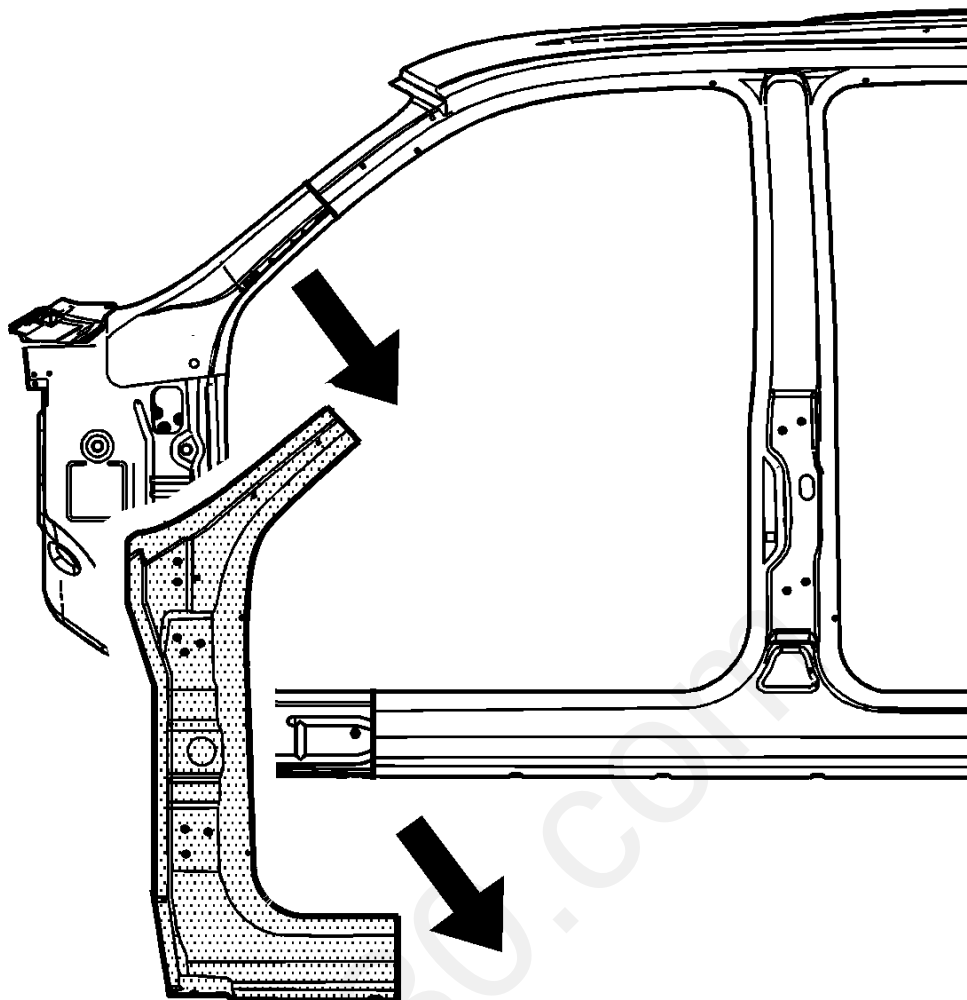


Fig. 29: View Of Damaged Section

Courtesy of GENERAL MOTORS COMPANY

10. Remove the damaged body side.

Installation Procedure

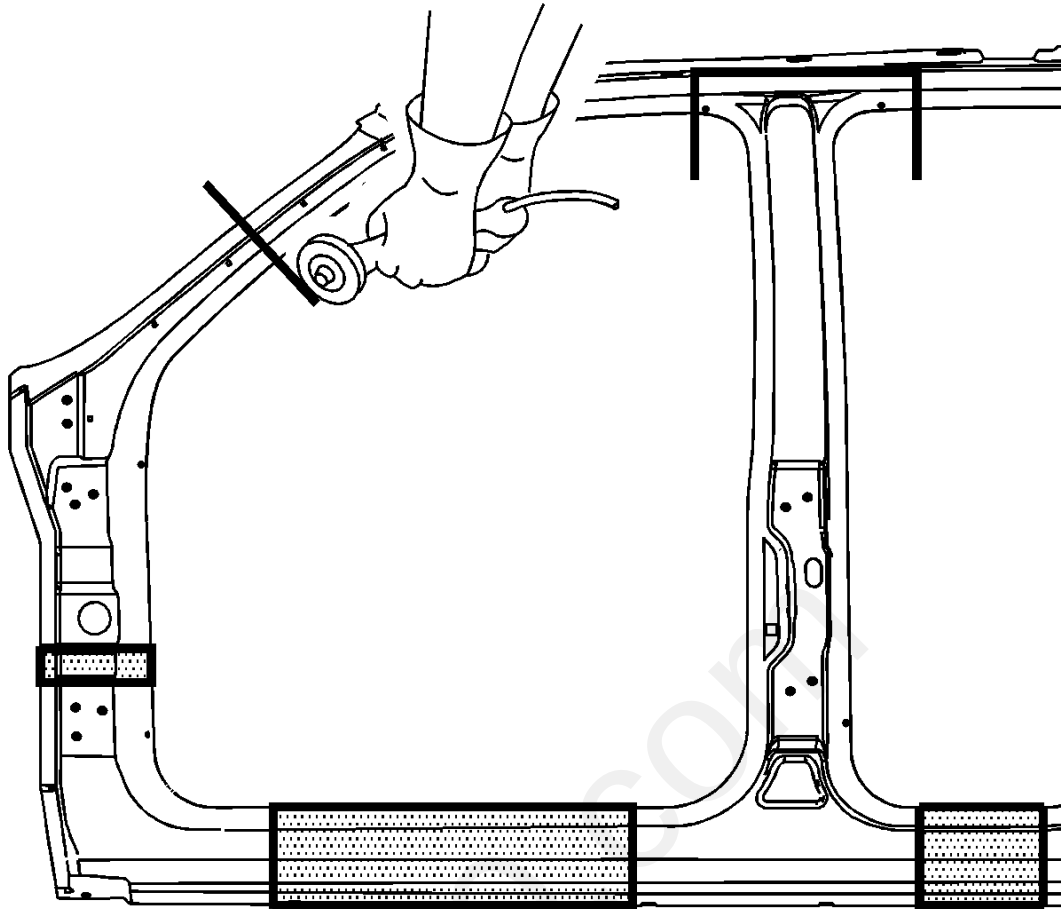


Fig. 30: Cutting Panel In Corresponding Locations

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.

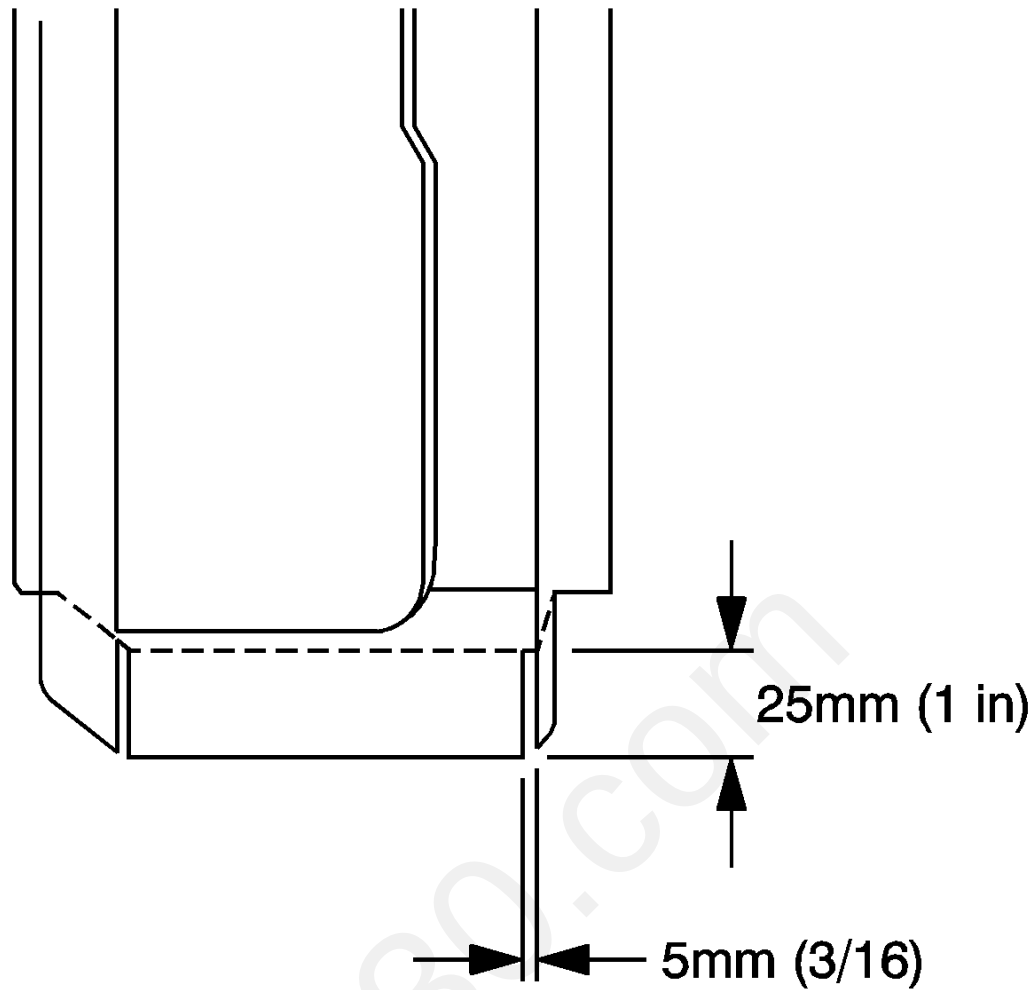


Fig. 31: Cutting 5 mm (3/16 in) Wide Gaps In Bottom Corners

Courtesy of GENERAL MOTORS COMPANY

2. Cut and remove 25 mm (1 in) from the flanges on either side of the remaining section of the original pillar.
Cut 5 mm (3/16 in) wide gaps in the bottom corners.

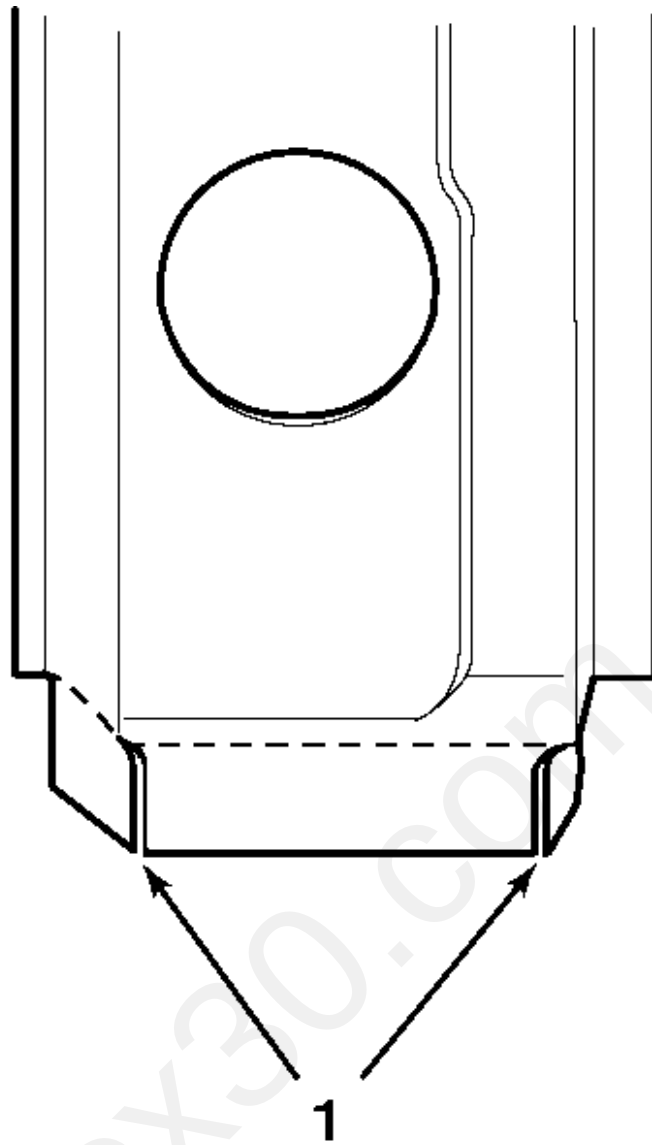


Fig. 32: Stepping Tabs

Courtesy of GENERAL MOTORS COMPANY

3. Step the tabs (1) inward to allow the door frame opening service section to fit over the original hinge pillar.

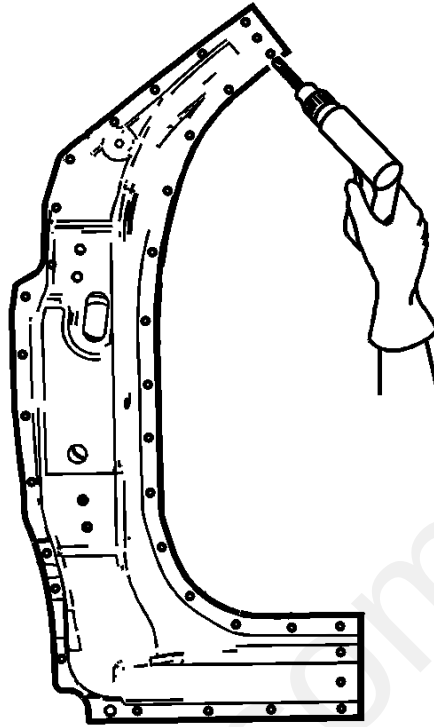


Fig. 33: Drilling Windshield Frame Pillar Plug Weld Holes

Courtesy of GENERAL MOTORS COMPANY

NOTE: If the location of the original plug weld holes can not be determined, or if structural weld-thru adhesive was present, space the plug weld holes every 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 attachment surfaces as necessary.
6. Apply Weld-Thru Coating or equivalent to all mating surfaces. Refer to [Anti-Corrosion Treatment and Repair](#).

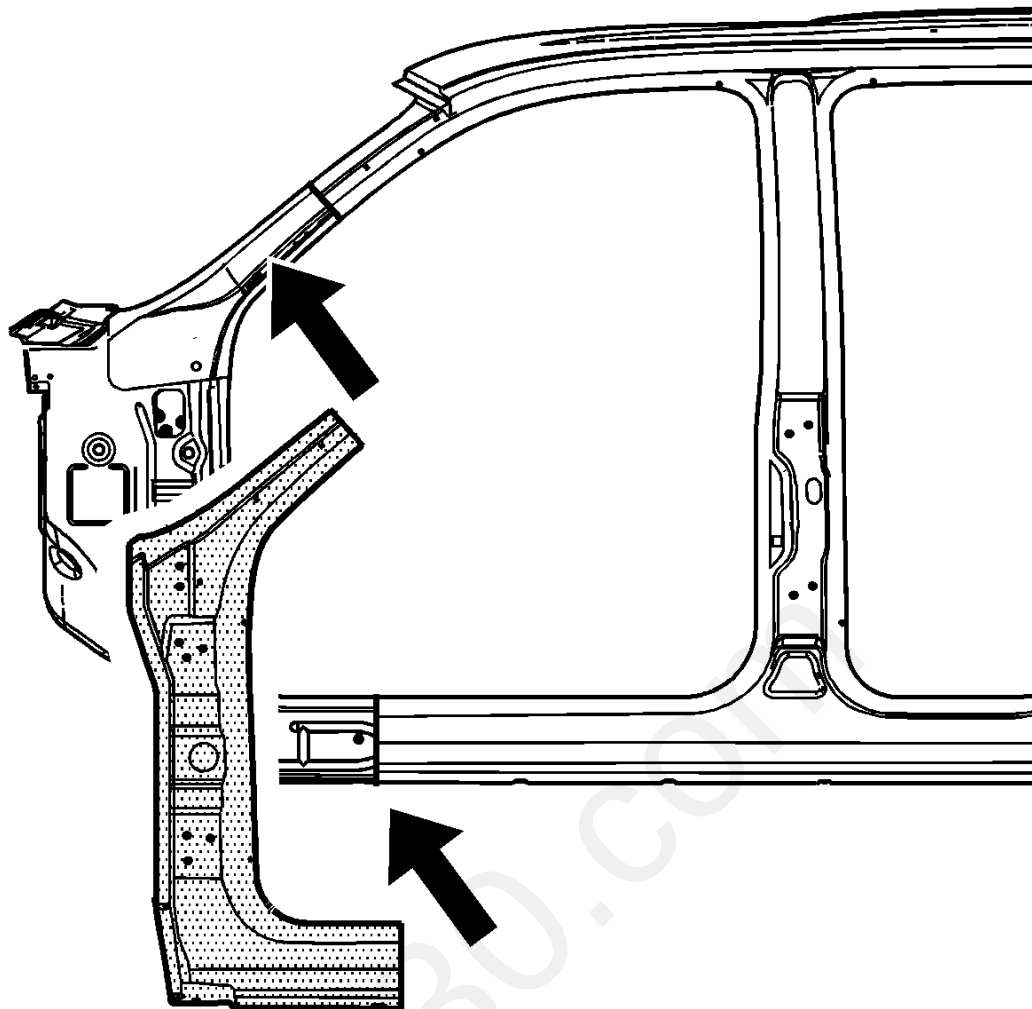


Fig. 34: View Of New Section

Courtesy of GENERAL MOTORS COMPANY

7. Position the body side to the vehicle using 3-dimensional measuring equipment. Clamp in place.

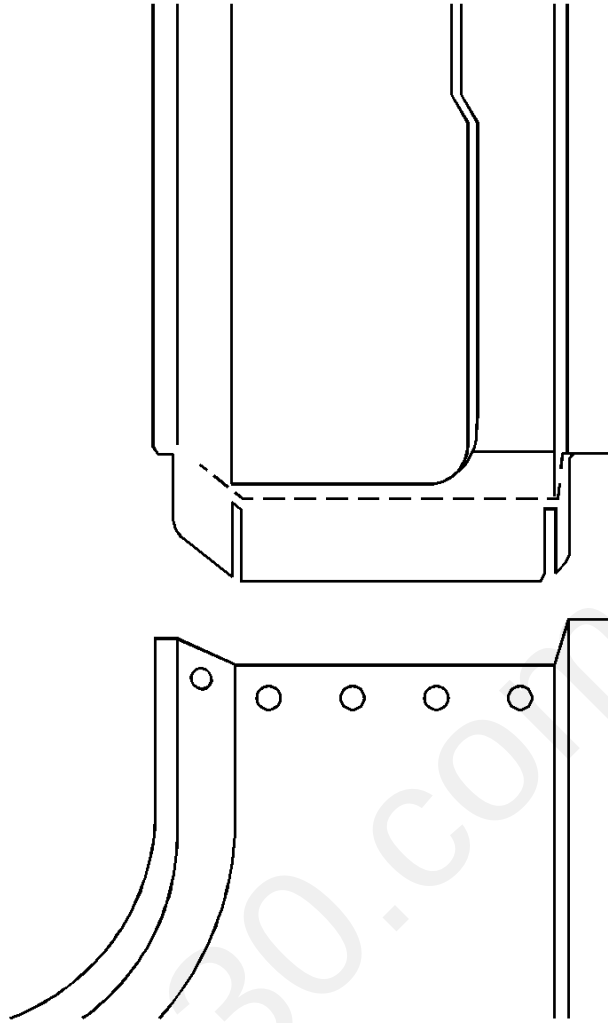


Fig. 35: Fitting New Part On Original Panel
Courtesy of GENERAL MOTORS COMPANY

8. Fit the new part on the original panel.

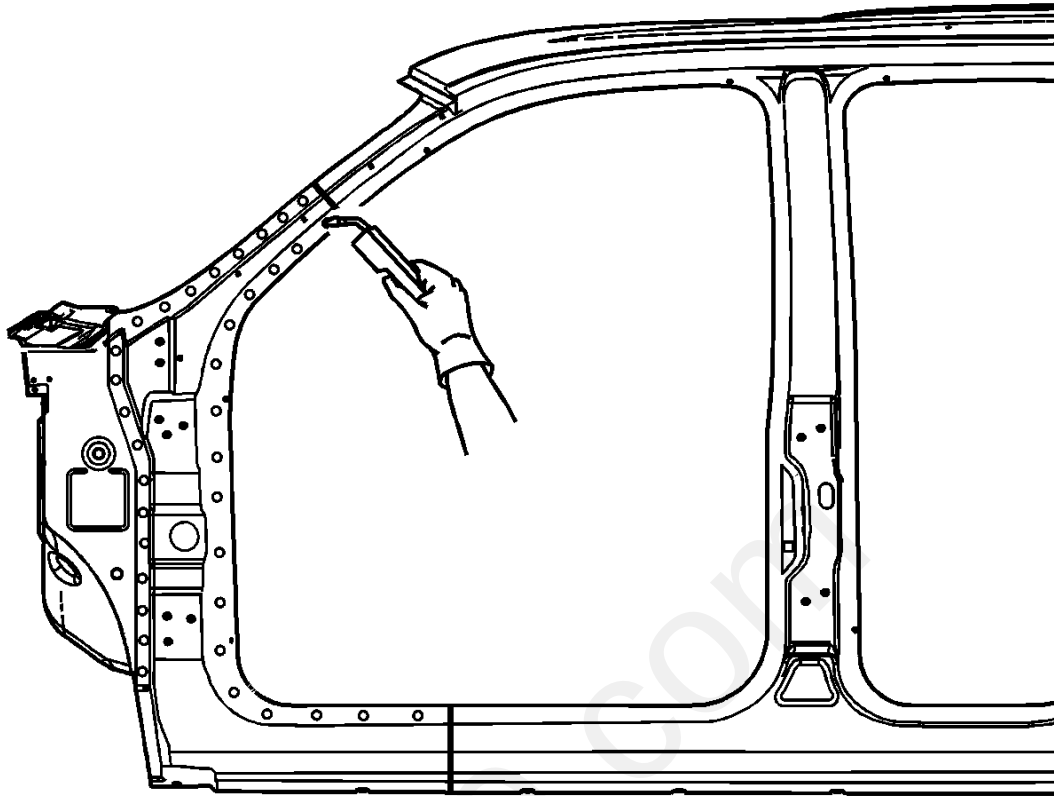


Fig. 36: Plug Welding Frame

Courtesy of GENERAL MOTORS COMPANY

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 them. Complete the stitch weld.

10. Clean and prepare all welded surfaces.

11. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .

12. Paint the repair area. Refer to [Basecoat/Clearcoat Paint Systems](#) .

13. Install all related panels and components.

14. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .

15. 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](#) .

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. Refer to [Anti-Corrosion Treatment and Repair](#) .

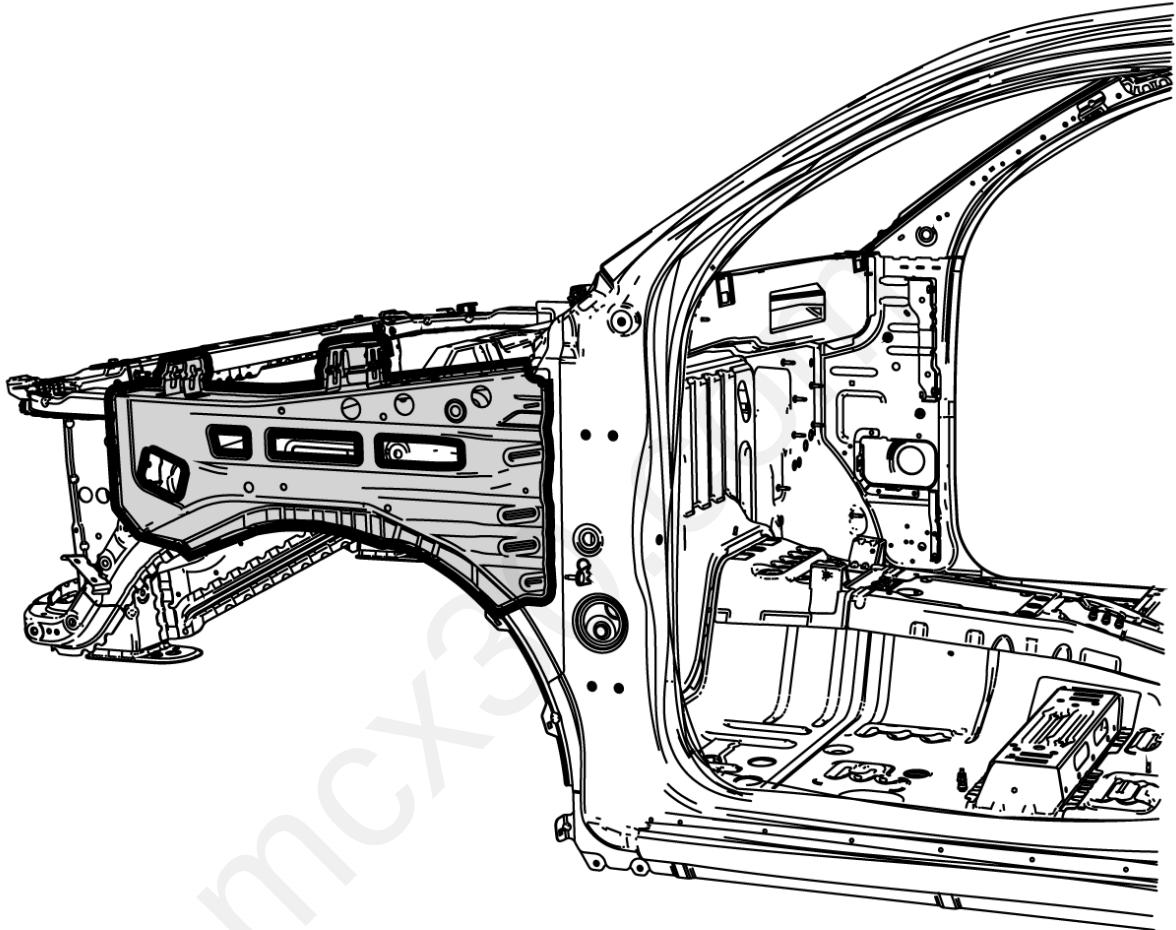


Fig. 37: Front Compartment Upper Side Rail (Outer)

Courtesy of GENERAL MOTORS COMPANY

6. Remove the Front Compartment Upper Side Rail (Outer). Refer to [Front Compartment Upper Side Rail Replacement \(Outer\)](#).

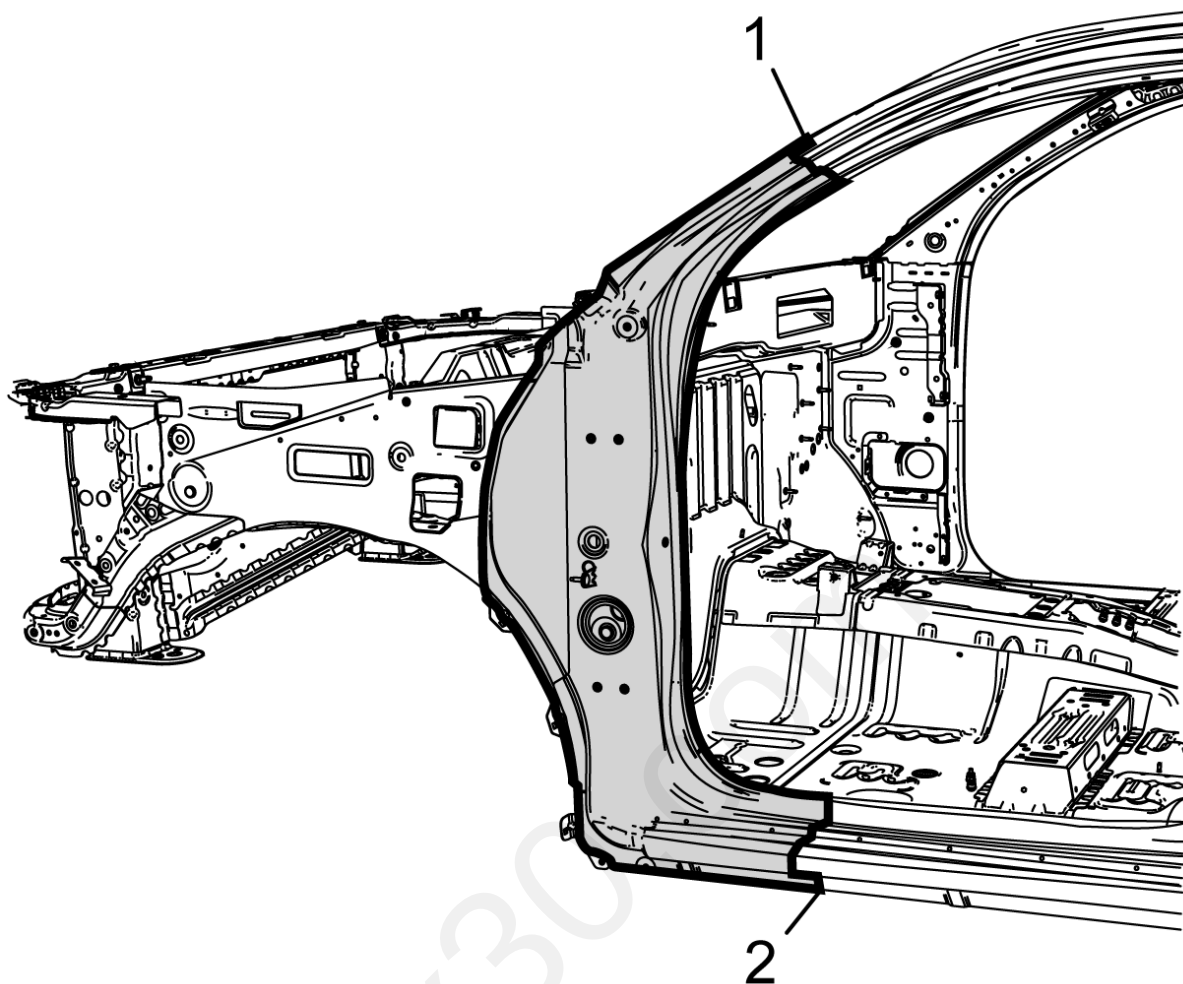


Fig. 38: Cutting Outer Body Side Panel At Locations
Courtesy of GENERAL MOTORS COMPANY

NOTE:

- Perform the sectioning in the flat area.
- Do not damage any inner panels or reinforcements.

7. Cut the outer body side panel at locations (1) and (2).

8. Locate and drill all the necessary factory welds between locations 1 and 2 and remove sectioned outer body side panel.

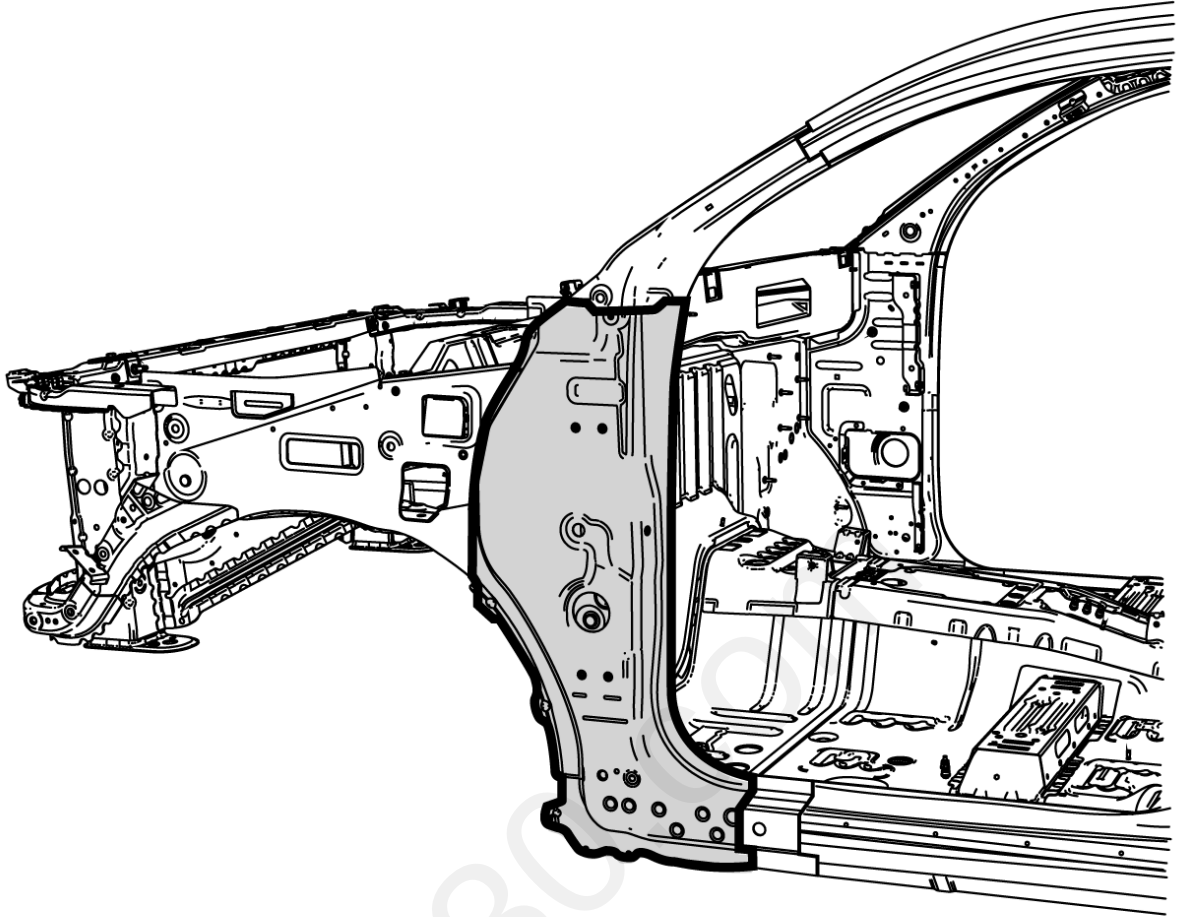


Fig. 39: Marking Factory Welds

Courtesy of GENERAL MOTORS COMPANY

9. Locate and mark all the necessary factory welds of the front hinge pillar body.

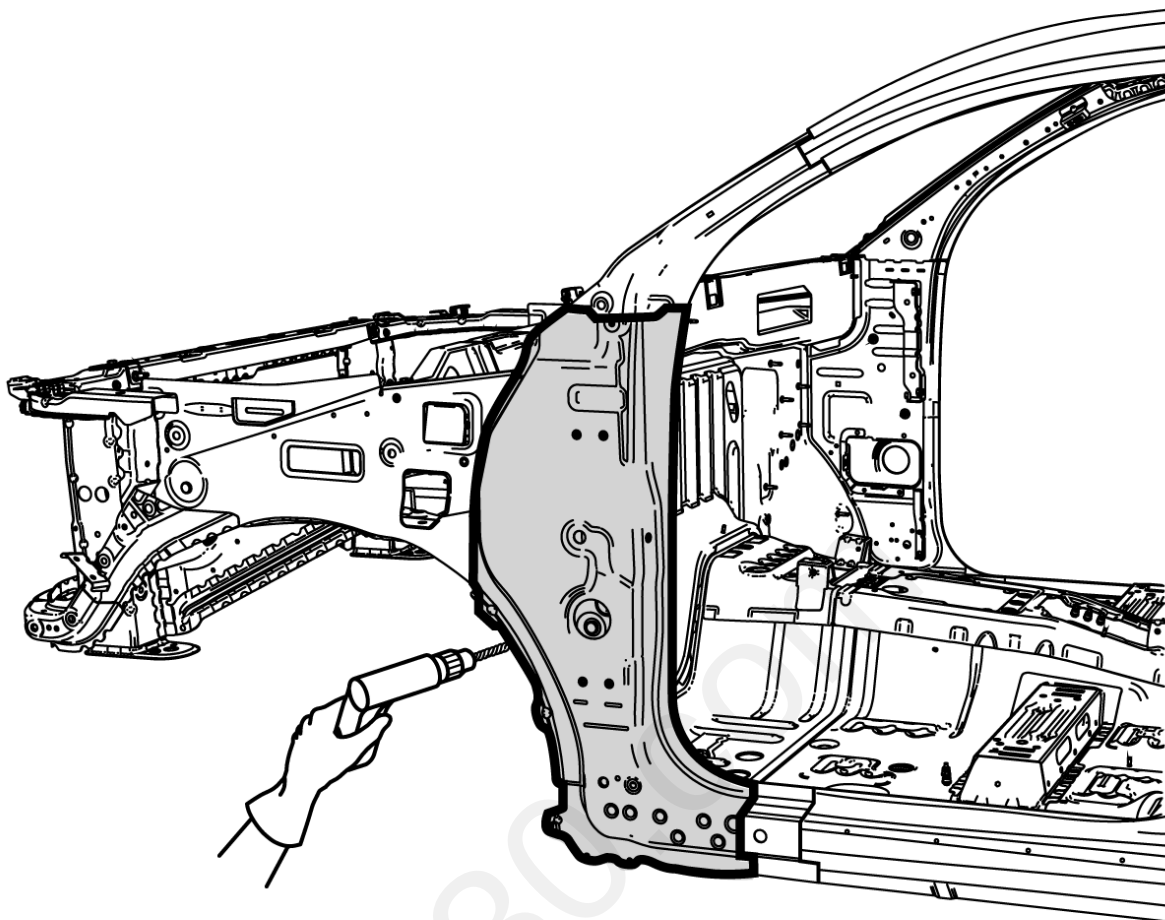


Fig. 40: Drilling All Factory Welds

Courtesy of GENERAL MOTORS COMPANY

10. Drill all factory welds. Note the number and location of welds for installation of the body hinge pillar lower reinforcement.

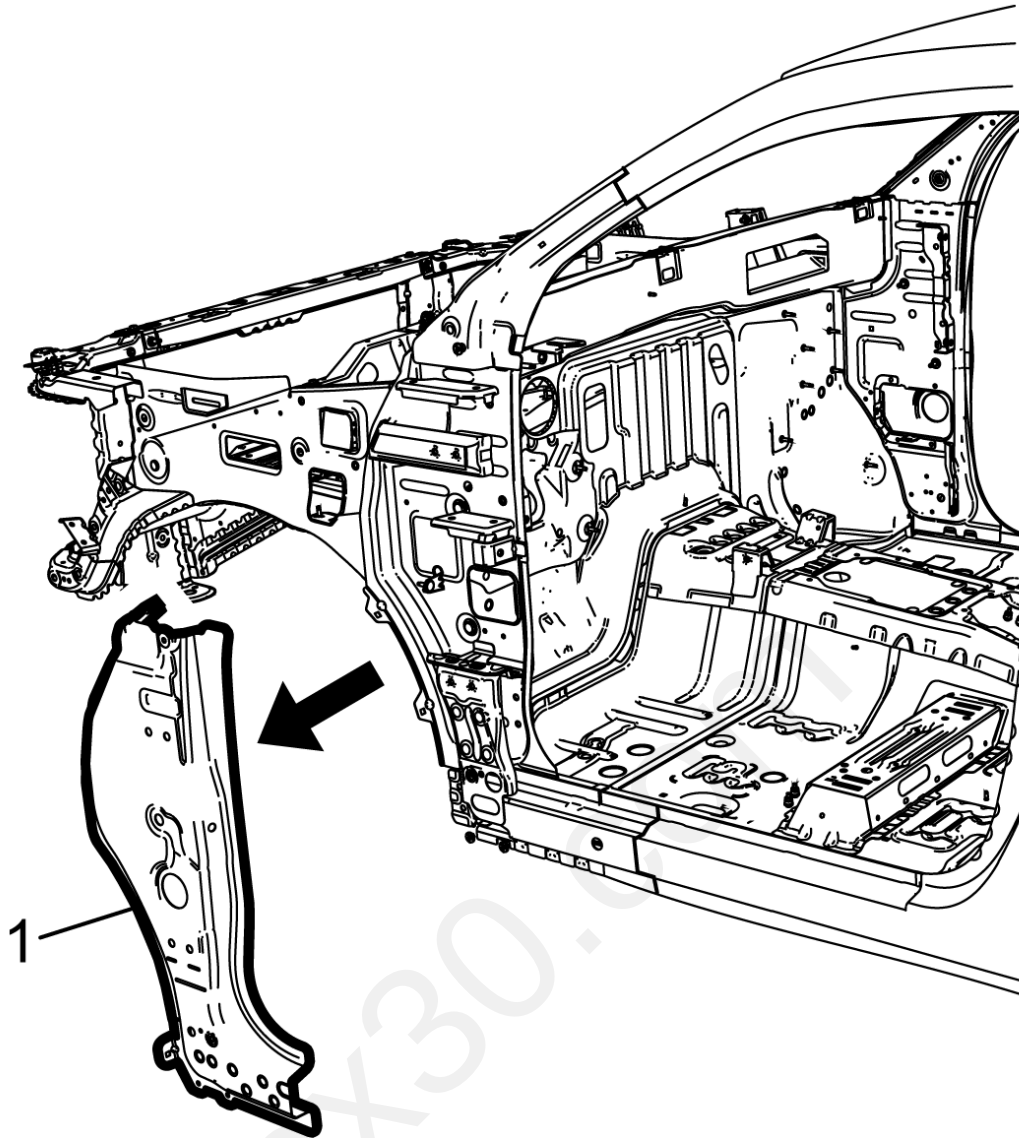


Fig. 41: Damaged Body Hinge Pillar Lower Reinforcement
Courtesy of GENERAL MOTORS COMPANY

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

Installation Procedure

1. Prepare all mating surfaces as necessary.
2. Align the body hinge pillar lower reinforcement.

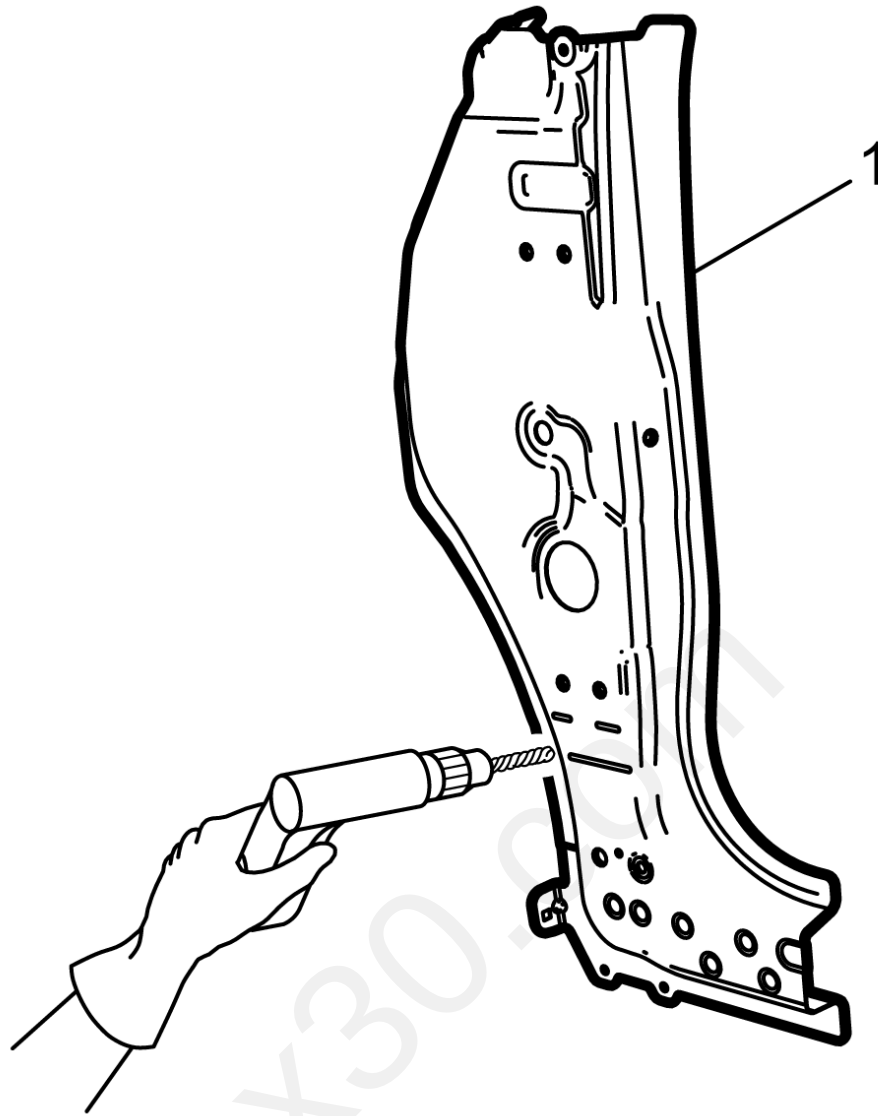


Fig. 42: Drilling 8 mm (5/16 in) Holes For Plug Welding Along Edges Of Front Hinge Pillar Body
Courtesy of GENERAL MOTORS COMPANY

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

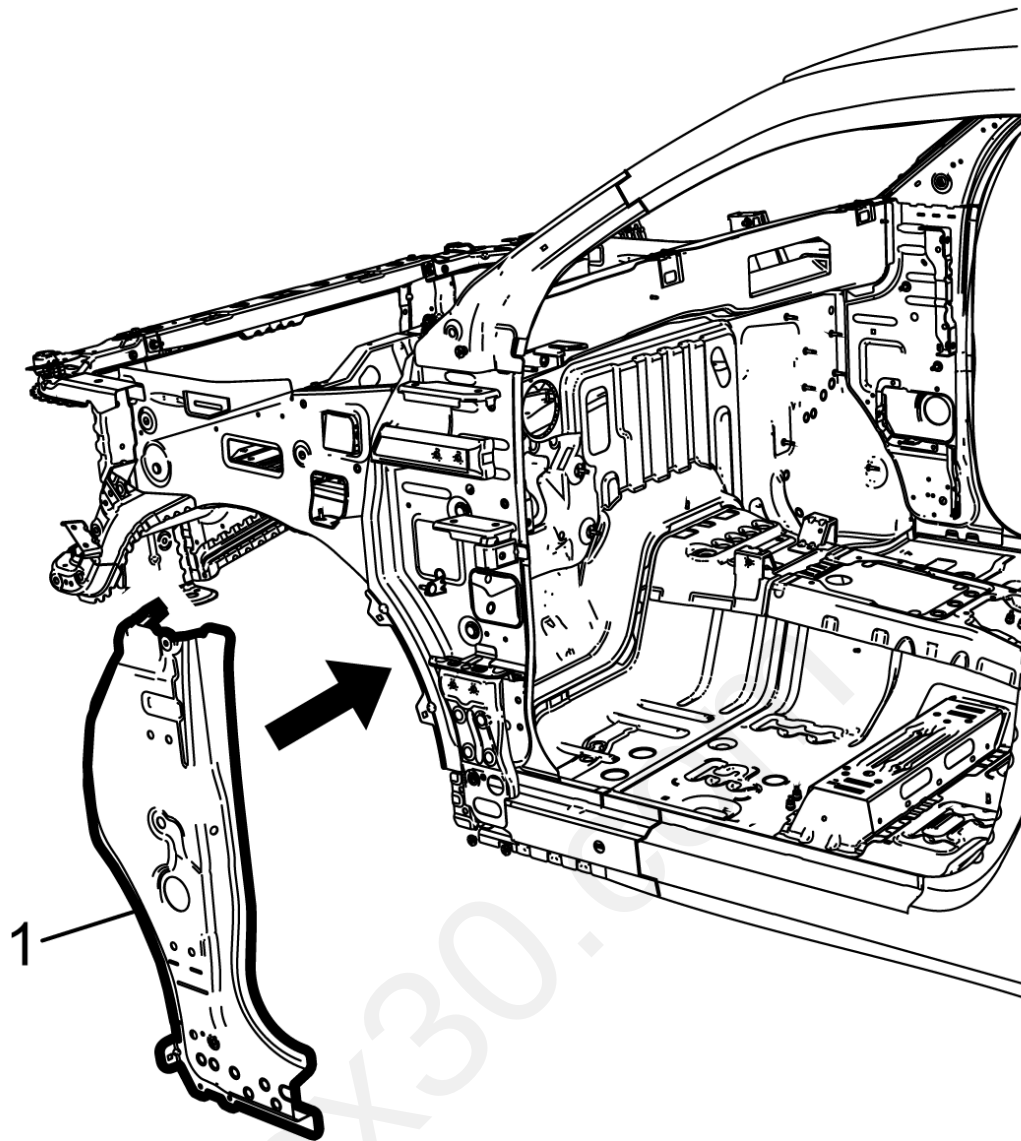


Fig. 43: Body Hinge Pillar Lower Reinforcement On Vehicle
Courtesy of GENERAL MOTORS COMPANY

5. Position the body hinge pillar lower reinforcement on the vehicle (1).
6. Verify the fit of the front hinge pillar body reinforcement.
7. Clamp the front hinge pillar body reinforcement into position.

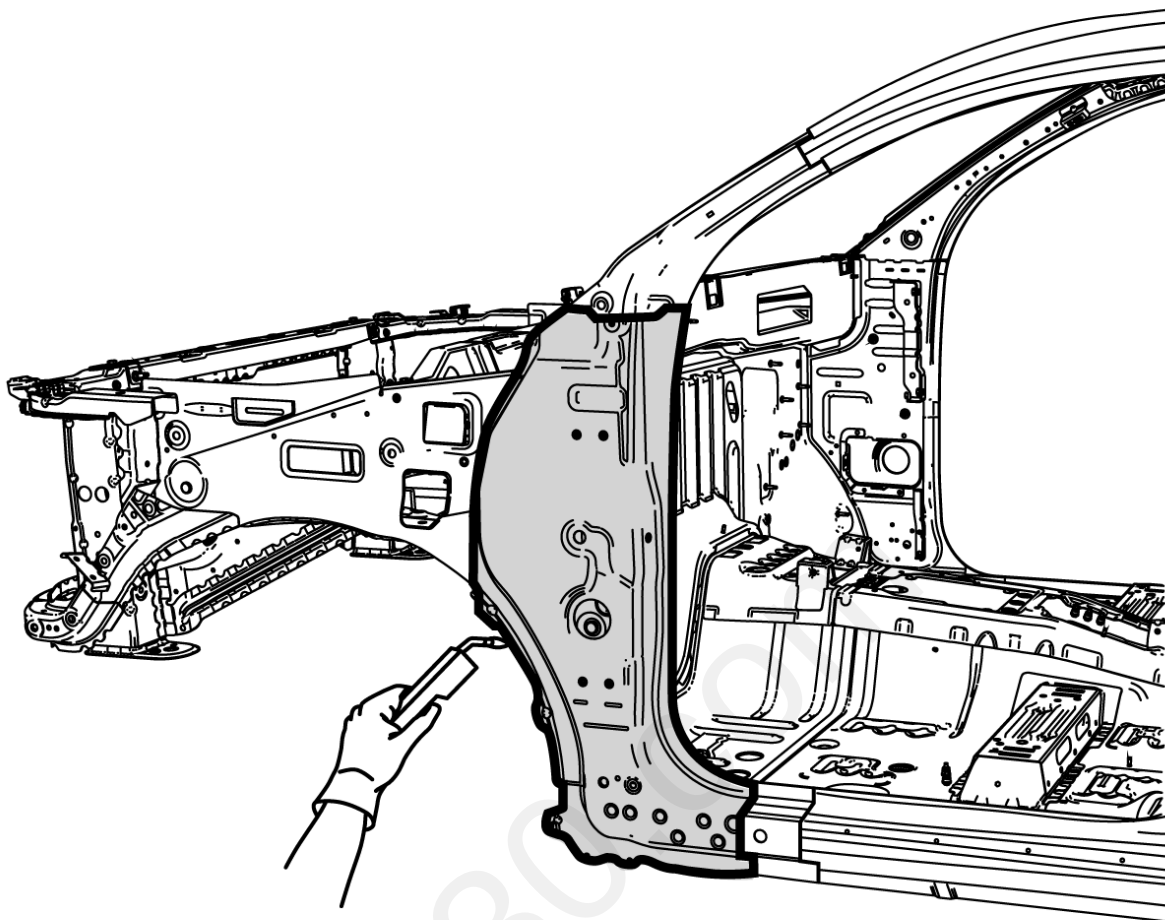


Fig. 44: Plug Welding

Courtesy of GENERAL MOTORS COMPANY

8. Plug weld accordingly.
9. 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.
10. Replace the sectioned hinge pillar portion of the outer bodyside. Refer to [Outer Windshield Frame Pillar Sectioning](#).
11. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#).
12. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#).
13. Install all related panels and components. Refer to [Outer Windshield Frame Pillar Sectioning](#).
14. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#).
15. Enable the SIR system. Refer to [SIR Disabling and Enabling](#).

ROOF OUTER PANEL REPLACEMENT (ADHESIVE BONDING PROCEDURE)

Removal Procedure

WARNING: Refer to [Approved Equipment for Collision Repair Warning](#).

When replacing panels that involve servicing of stationary windows, refer to [Adhesive Installation of Windshields](#) , and [Adhesive Installation of Rear Windows](#) , before performing any priming or refinishing.

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](#) .

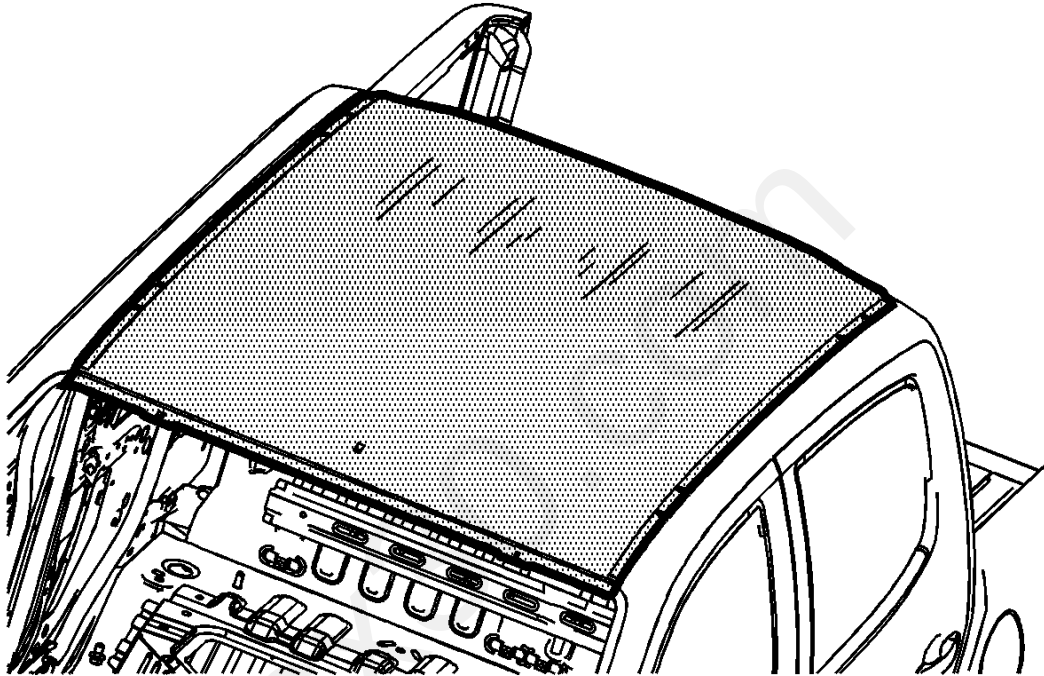


Fig. 45: Panels And Components

Courtesy of GENERAL MOTORS COMPANY

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 rear window. Refer to [Rear Window Replacement](#) .

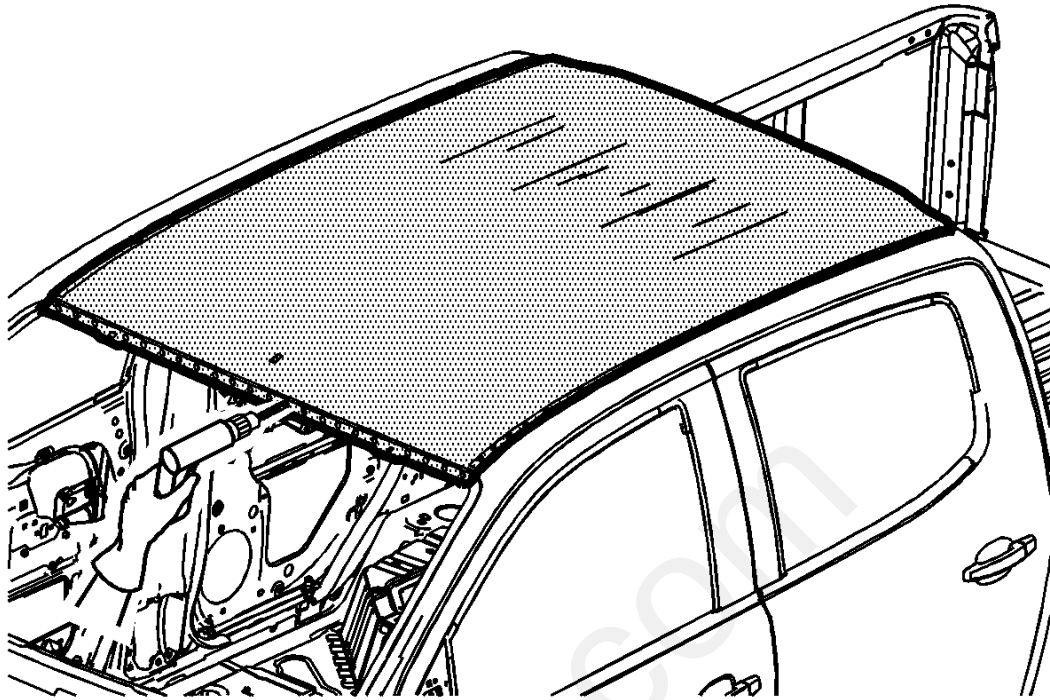


Fig. 46: Drill Out All Factory Welds

Courtesy of GENERAL MOTORS COMPANY

8. Locate and drill out all factory welds. Note the number and location of welds for installation of the roof panel.

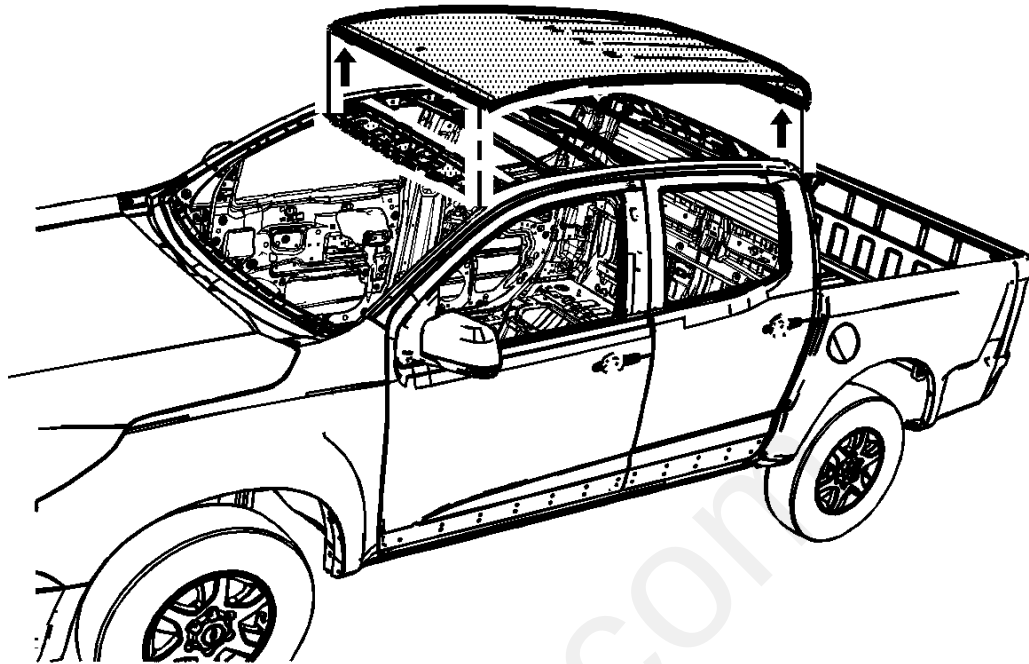


Fig. 47: Roof Panel

Courtesy of GENERAL MOTORS COMPANY

9. With an assistant remove the roof panel.

Installation Procedure

NOTE: Before you begin the repair, refer to [Metal Panel Bonding](#) for proper adhesive preparations and general information.

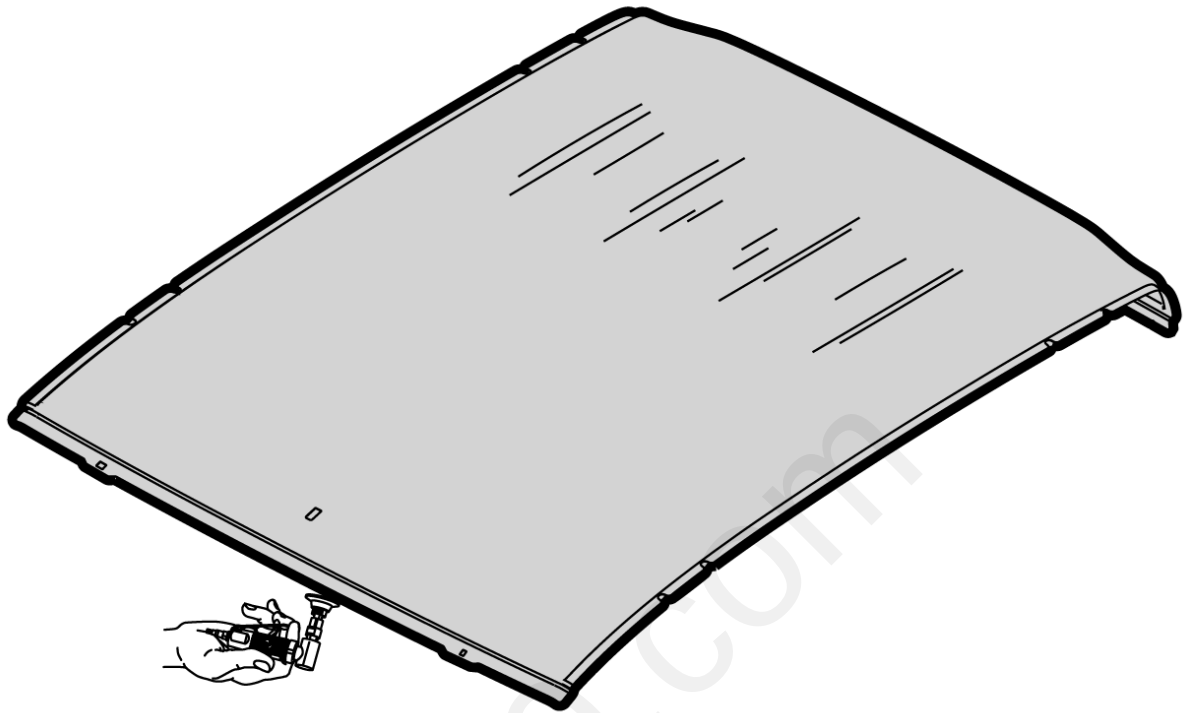


Fig. 48: Grind Surface Of Roof Panel Mating Flanges To Bare Steel
Courtesy of GENERAL MOTORS COMPANY

1. Grind the surface of the roof panel mating flanges to bare steel. Do not damage the corners or thin the metal during the grinding process.
2. Grind the mating flanges of the service roof panel to remove the E-coating. Do not damage the corners or thin the metal during the grinding operation.
3. Clean all mating surfaces, as necessary.

NOTE: Do not allow the adhesive to cure prior to installing the service side panel.

4. Apply a 3-6 mm (1/8-1/4 in) bead of metal panel bonding adhesive to both of the mating surfaces.
5. Using a small acid brush, spread a coat of adhesive to both of the mating surfaces. Cover all of the bare metal to ensure corrosion protection.
6. Apply a 9-13 mm (3/8-1/2 in) bead of metal panel bonding adhesive to the mating surface of the service roof panel.

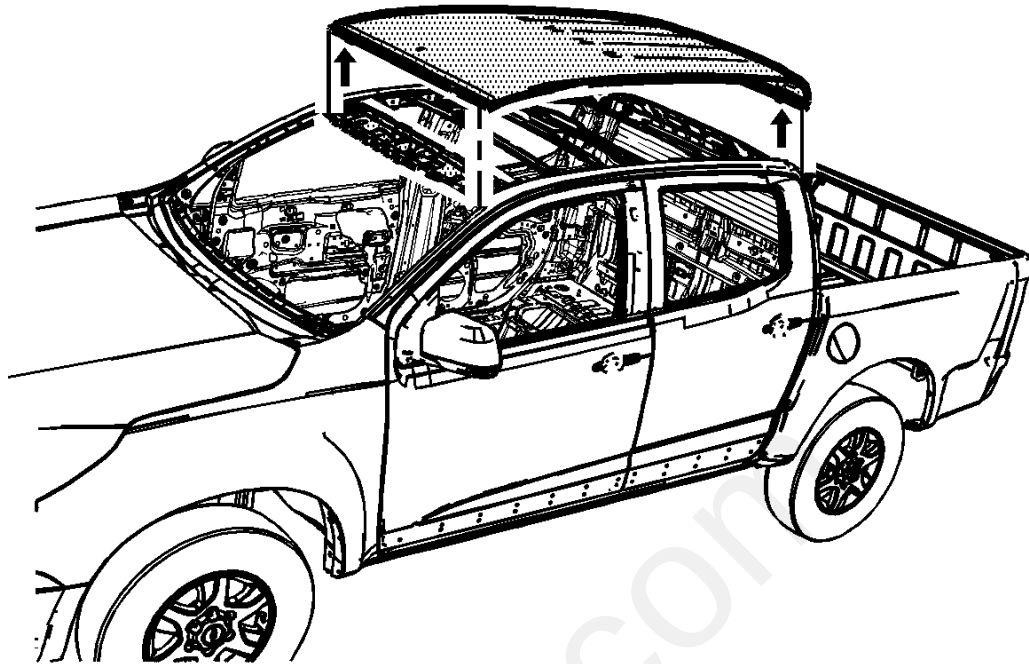


Fig. 49: Roof Panel

Courtesy of GENERAL MOTORS COMPANY

7. With the aid of an assistant, position the roof panel to the body.

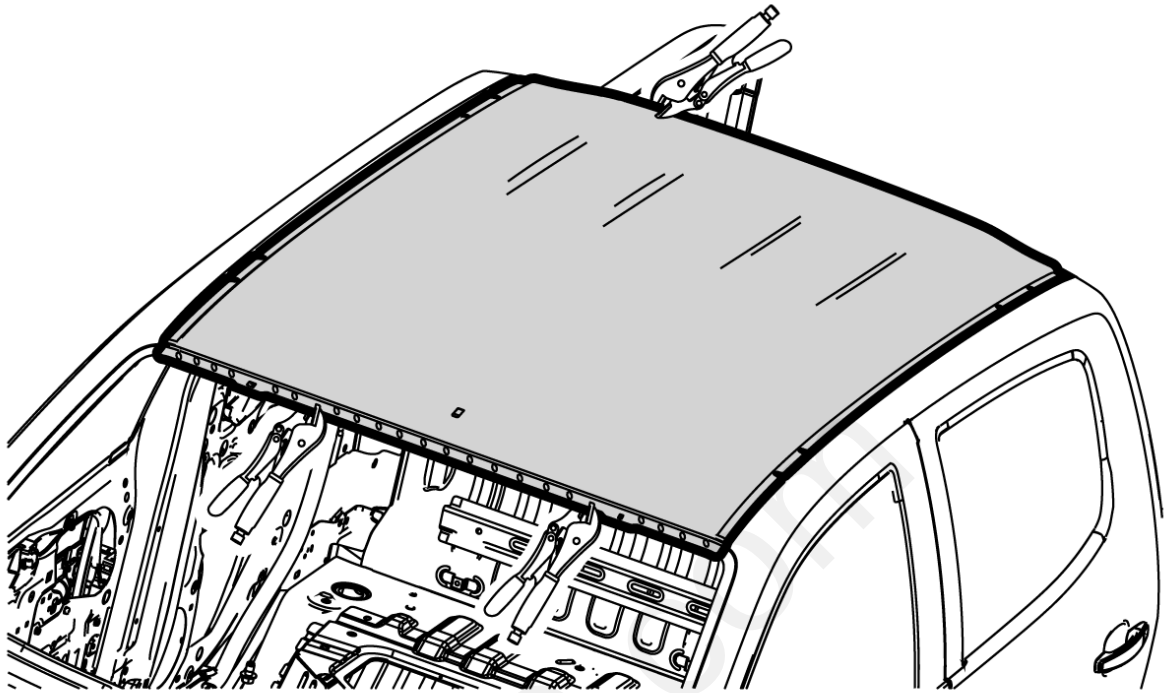


Fig. 50: Roof Panel

Courtesy of GENERAL MOTORS COMPANY

8. Clamp the service roof panel into position.
9. Using lacquer thinner remove the excess adhesive from the bed side panel area.

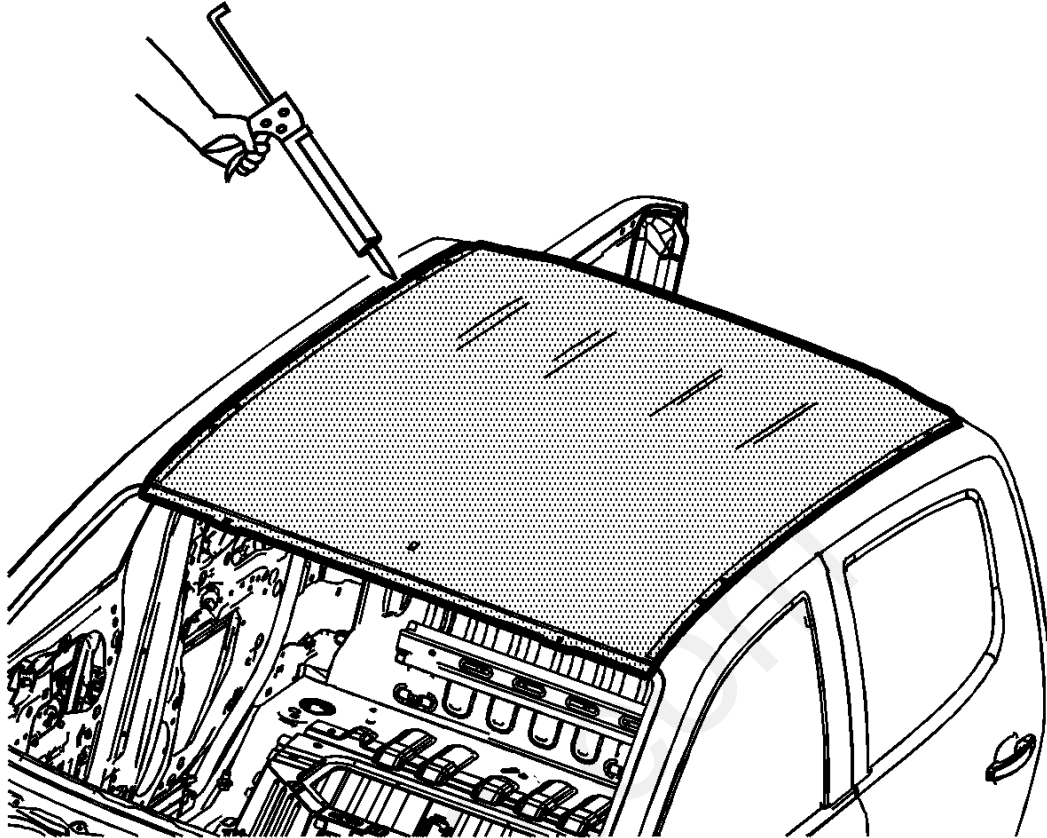


Fig. 51: Applying Sealers And Anti-Corrosion Materials To Repair Area
Courtesy of GENERAL MOTORS COMPANY

10. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
11. Paint the repair area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
12. Install the windshield. Refer to [Windshield Replacement](#) .
13. Install the rear window. Refer to [Rear Window Replacement](#) .
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](#) .

ROOF OUTER PANEL REPLACEMENT (WELD ON PROCEDURE)

Removal Procedure

WARNING: Refer to [Approved Equipment for Collision Repair Warning](#) .

NOTE: When replacing panels that involve servicing of stationary windows, refer to [Adhesive Installation of Windshields](#) , and [Adhesive Installation of Rear Windows](#) , before performing any priming or refinishing.

the SIR system. Refer to [SIR Disabling and Enabling](#) .

2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .

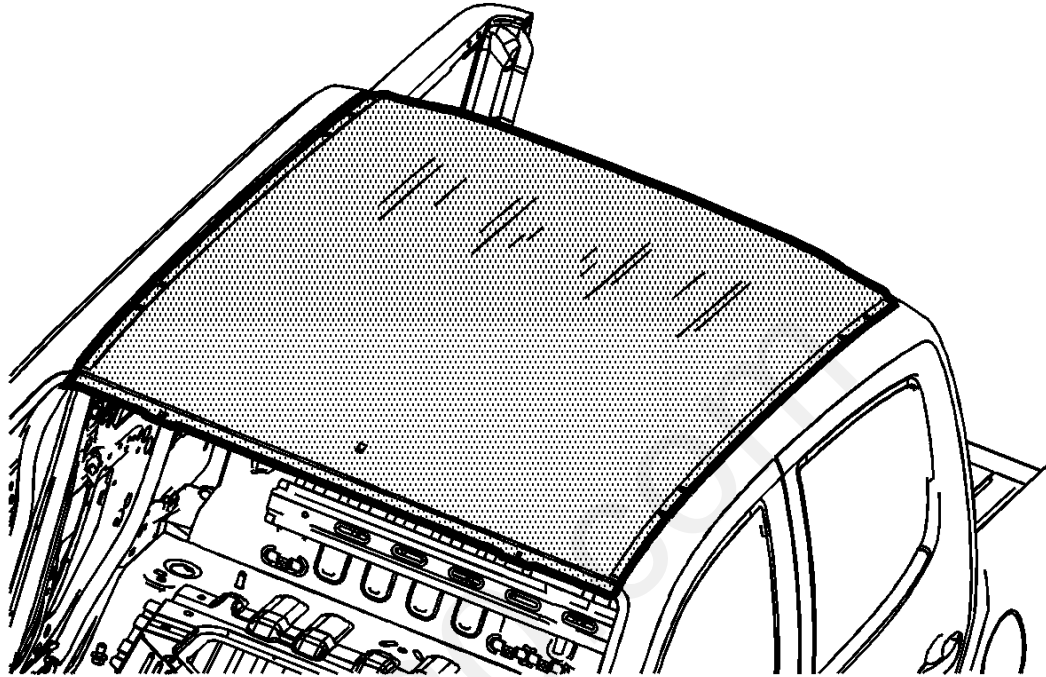


Fig. 52: Panels And Components

Courtesy of GENERAL MOTORS COMPANY

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 rear window. Refer to [Rear Window Replacement](#) .

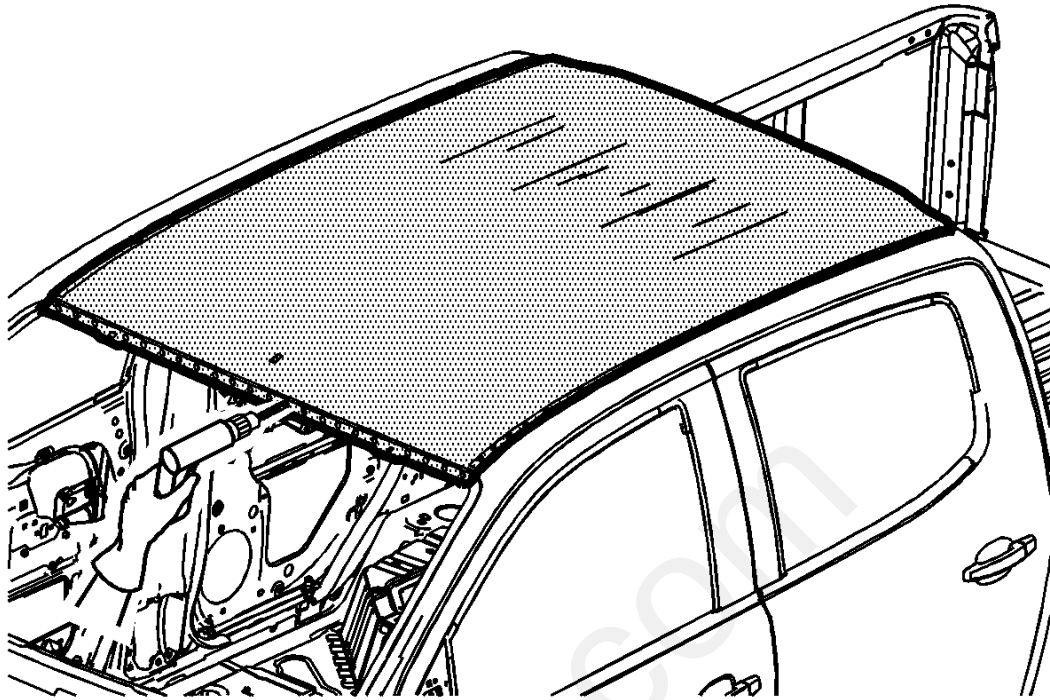


Fig. 53: Drill Out All Factory Welds

Courtesy of GENERAL MOTORS COMPANY

8. Locate and drill out all factory welds. Note the number and location of welds for installation of the roof panel.

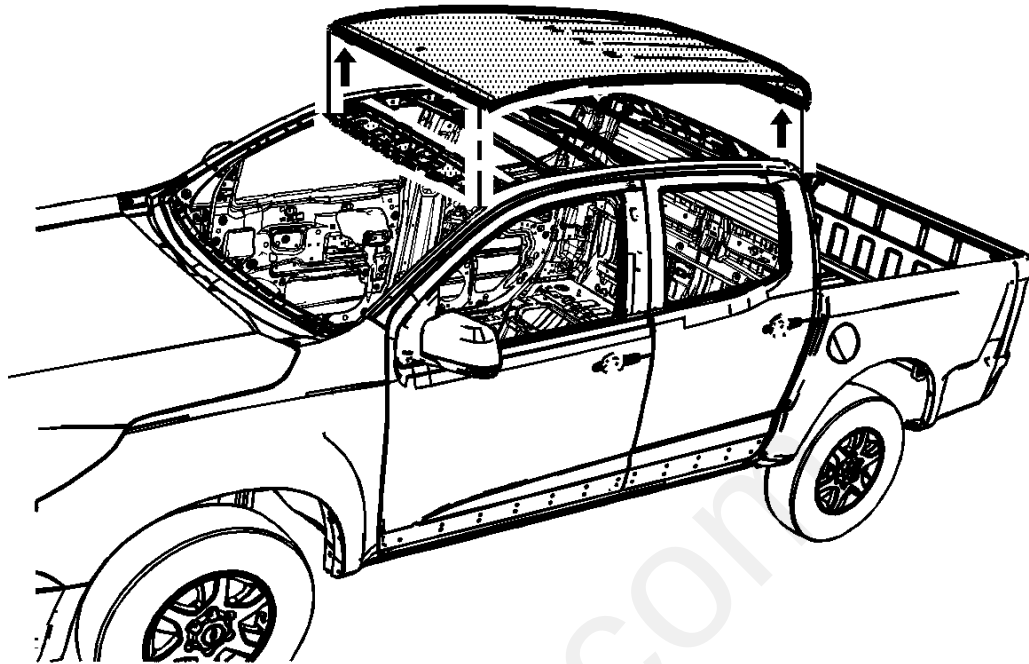


Fig. 54: Roof Panel

Courtesy of GENERAL MOTORS COMPANY

9. With an assistant remove the roof panel.

Installation Procedure

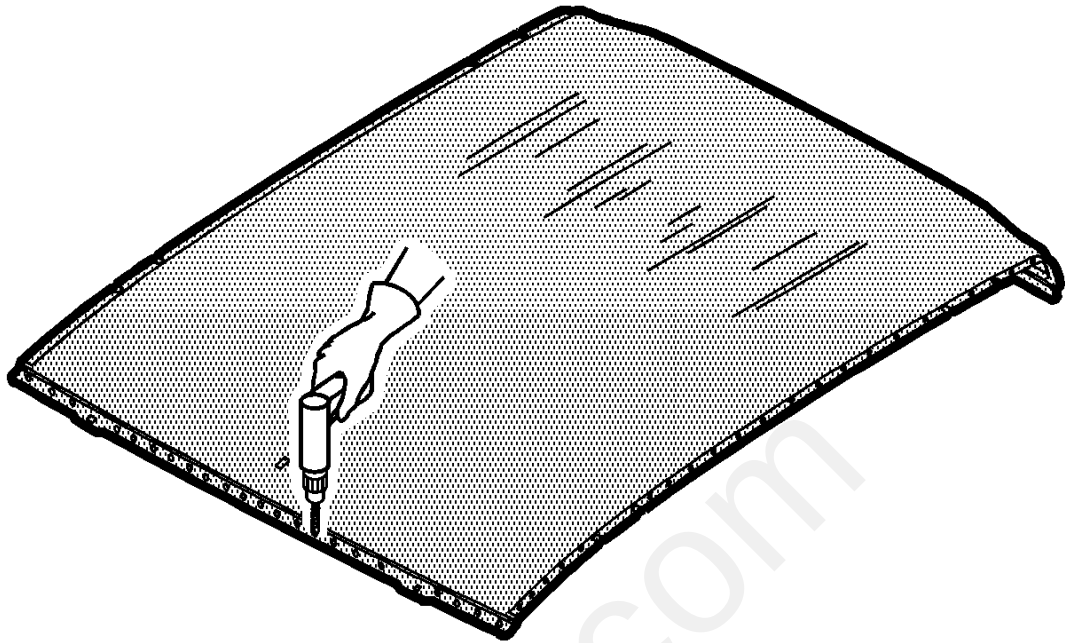


Fig. 55: Drilling 8 mm (5/16 in) Plug Weld Holes

Courtesy of GENERAL MOTORS COMPANY

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

NOTE: 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](#) .

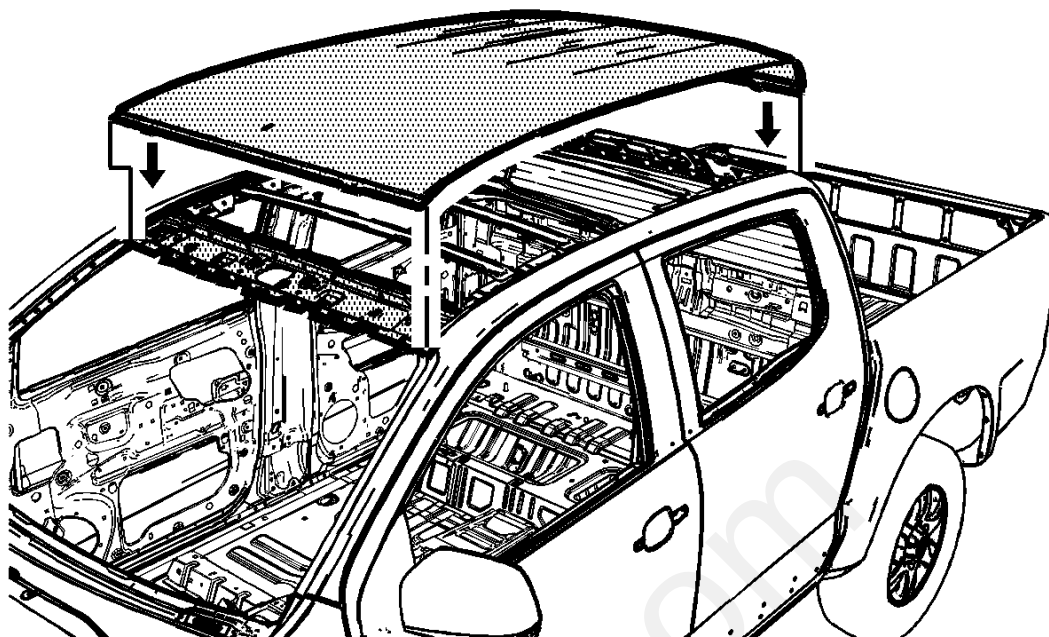


Fig. 56: Roof Panel

Courtesy of GENERAL MOTORS COMPANY

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

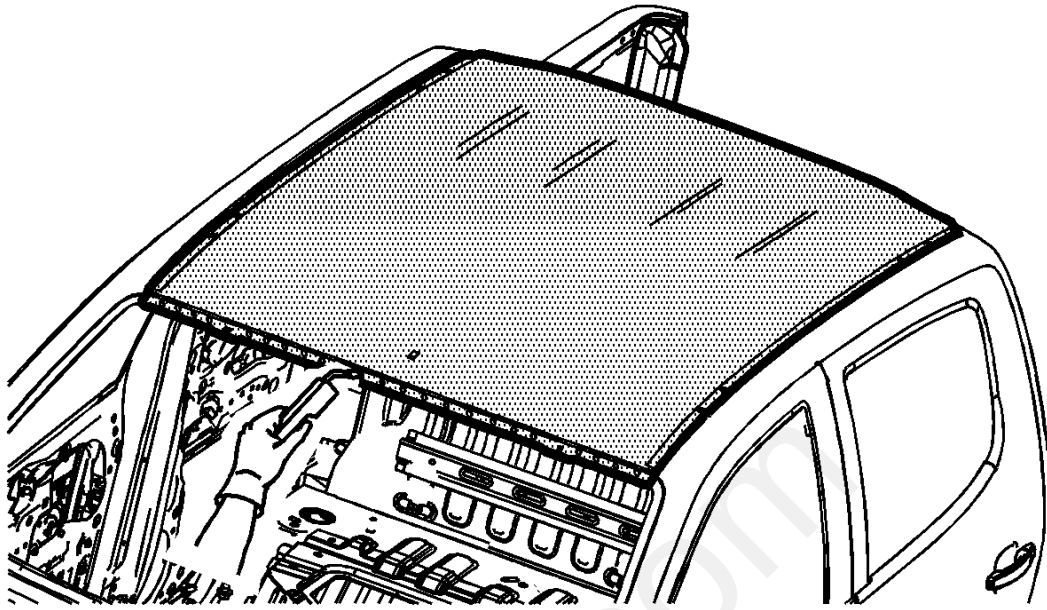


Fig. 57: Plug Welding

Courtesy of GENERAL MOTORS COMPANY

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

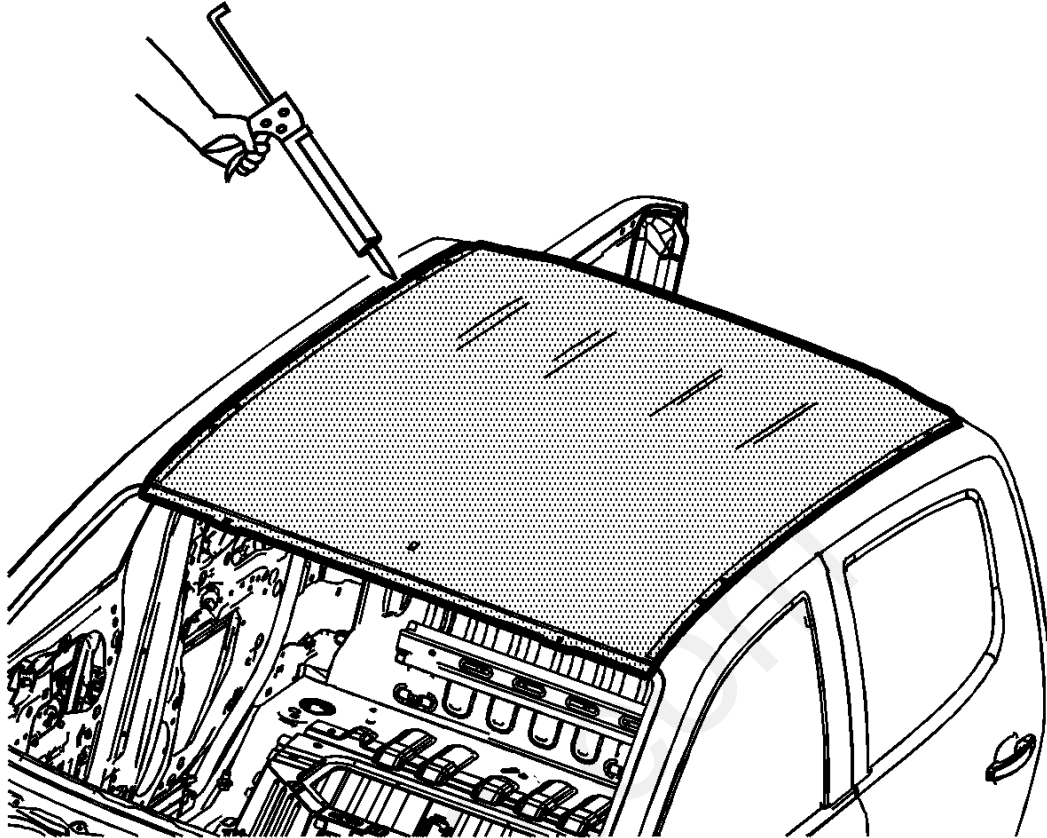


Fig. 58: Applying Sealers And Anti-Corrosion Materials To Repair Area
 Courtesy of GENERAL MOTORS COMPANY

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 rear window. Refer to [Rear Window 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](#) .

WINDSHIELD FRAME HEADER FRONT PANEL REPLACEMENT

NOTE: This procedure is similar to all cabs.

Removal Procedure

WARNING: Refer to [Approved Equipment for Collision Repair Warning](#) .

1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .

ect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .

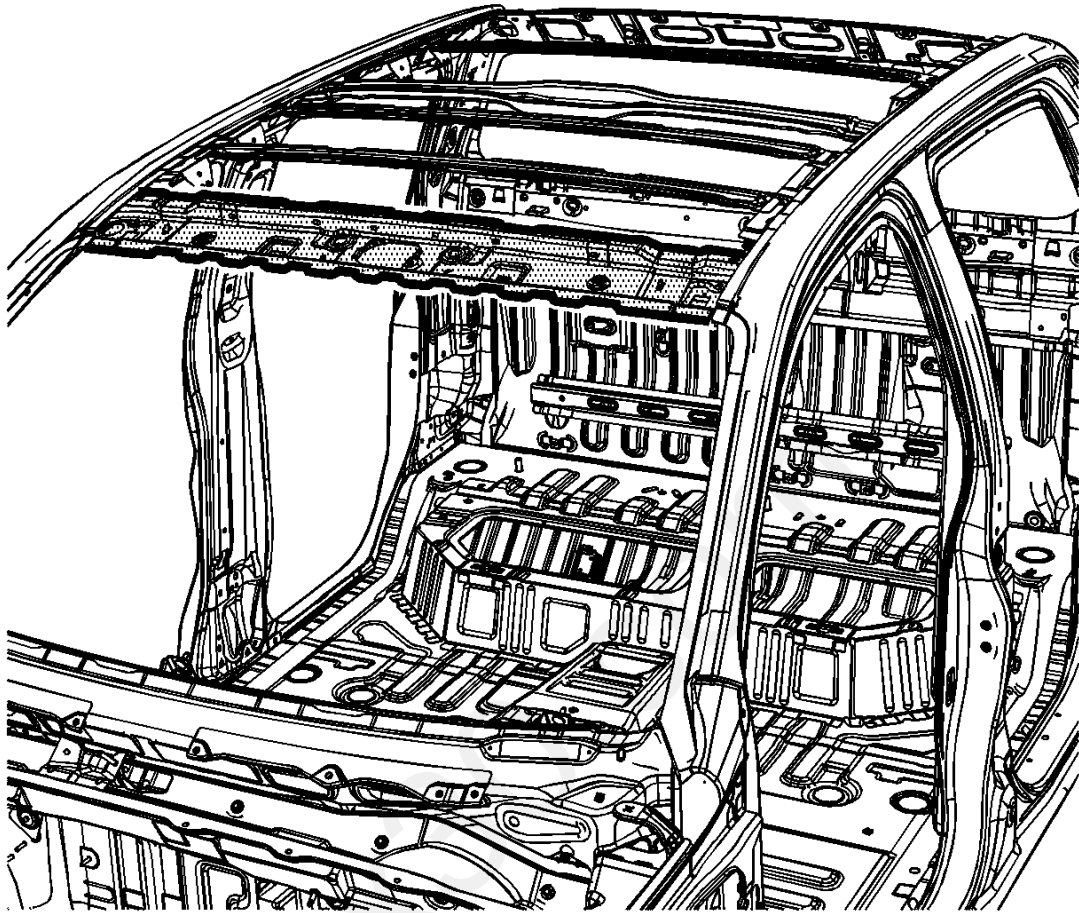


Fig. 59: Panels And Components

Courtesy of GENERAL MOTORS COMPANY

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 anticorrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .

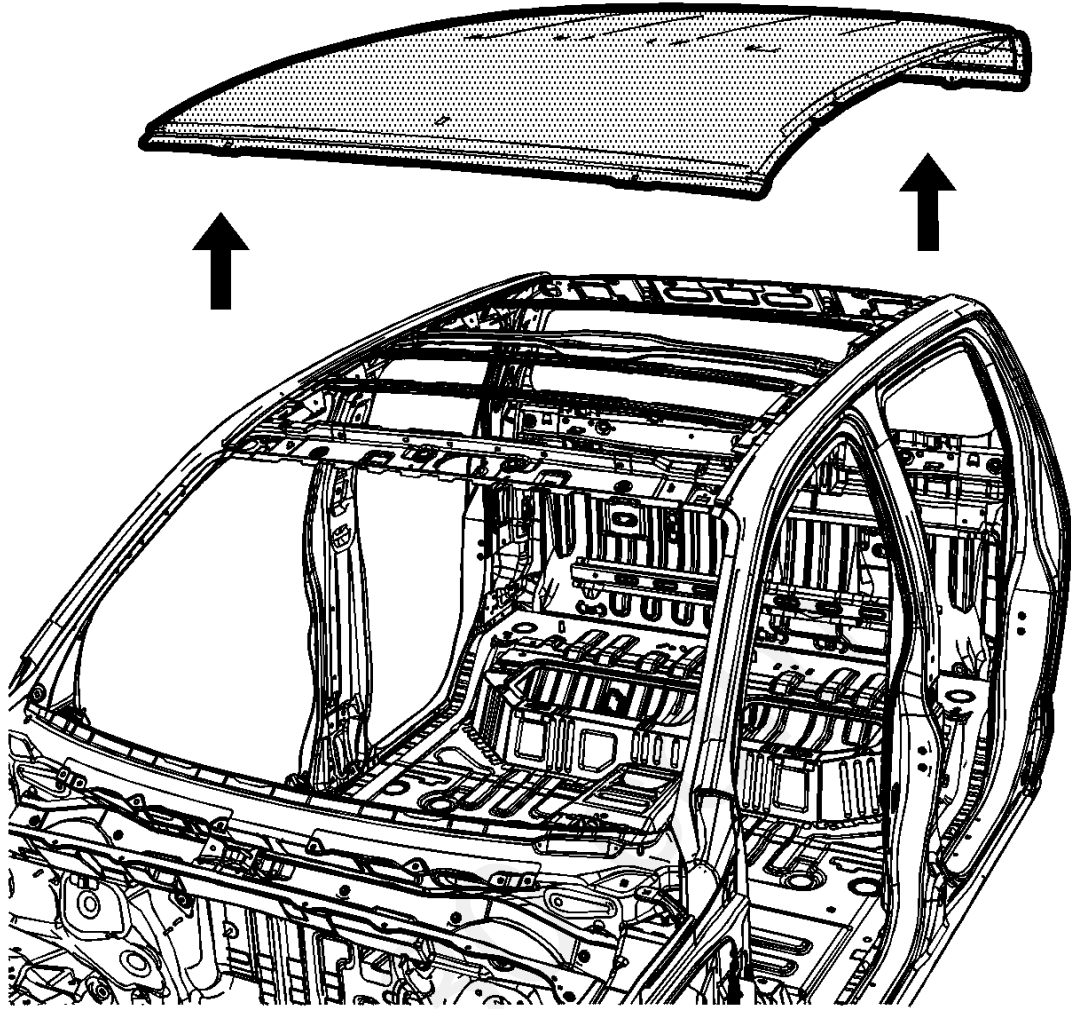


Fig. 60: Roof Panel

Courtesy of GENERAL MOTORS COMPANY

6. Remove the roof panel. Refer to [Roof Outer Panel Replacement \(Adhesive Bonding Procedure\)](#)[Roof Outer Panel Replacement \(Weld On Procedure\)](#).
7. Note the location and remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .

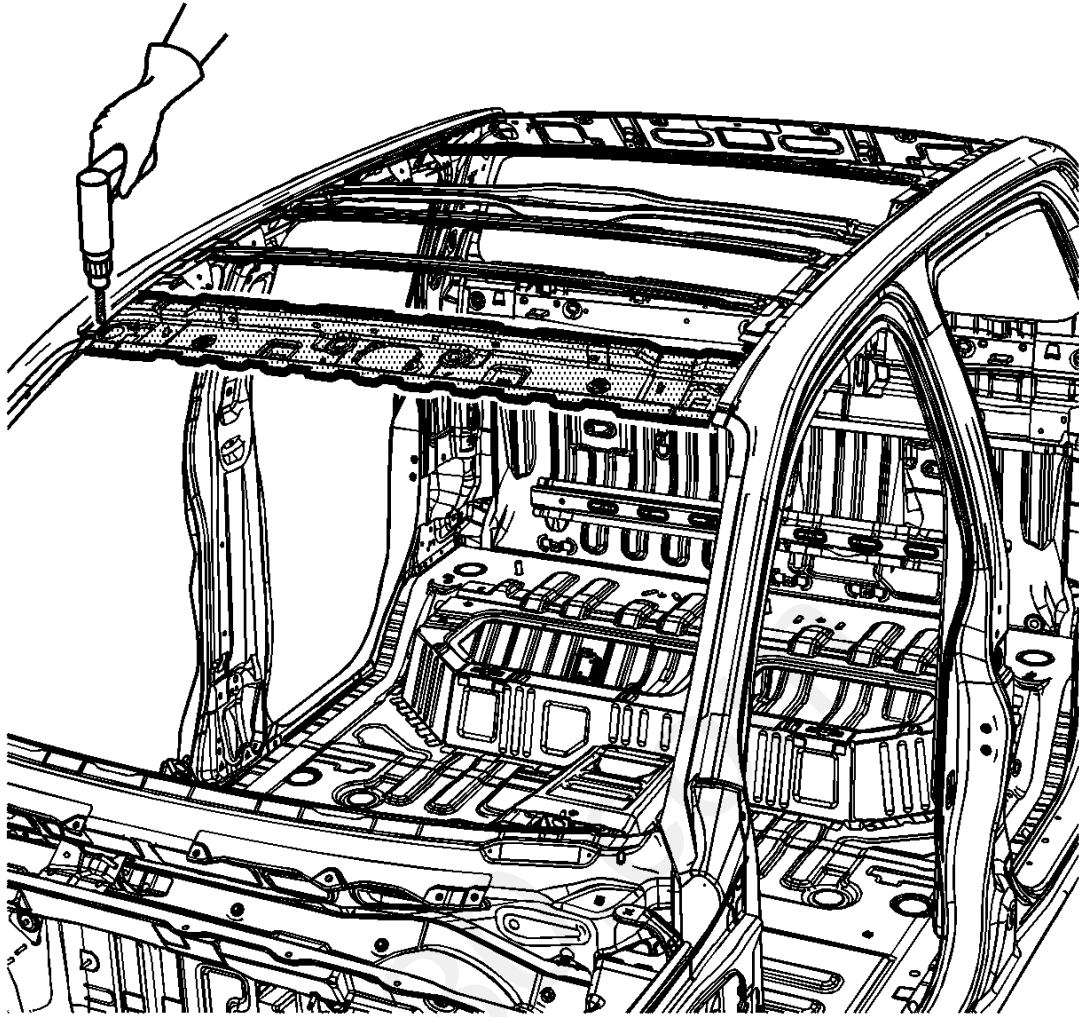


Fig. 61: Drill Out All Factory Welds

Courtesy of GENERAL MOTORS COMPANY

NOTE: Do not damage any inner panels or reinforcements.

8. Locate and drill out all factory welds. Note the number and location of welds for installation of the service part.

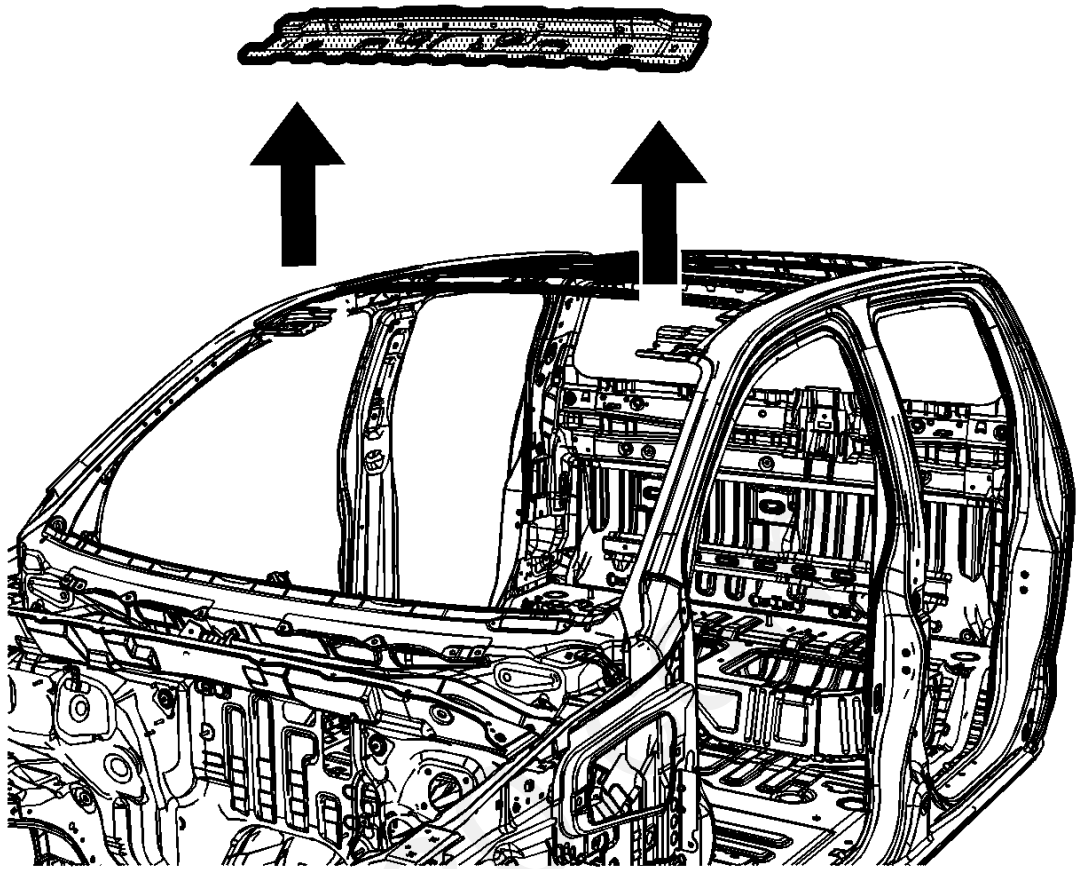


Fig. 62: Damaged Windshield Header Panel
Courtesy of GENERAL MOTORS COMPANY

9. Remove the damaged windshield header panel.

Installation Procedure

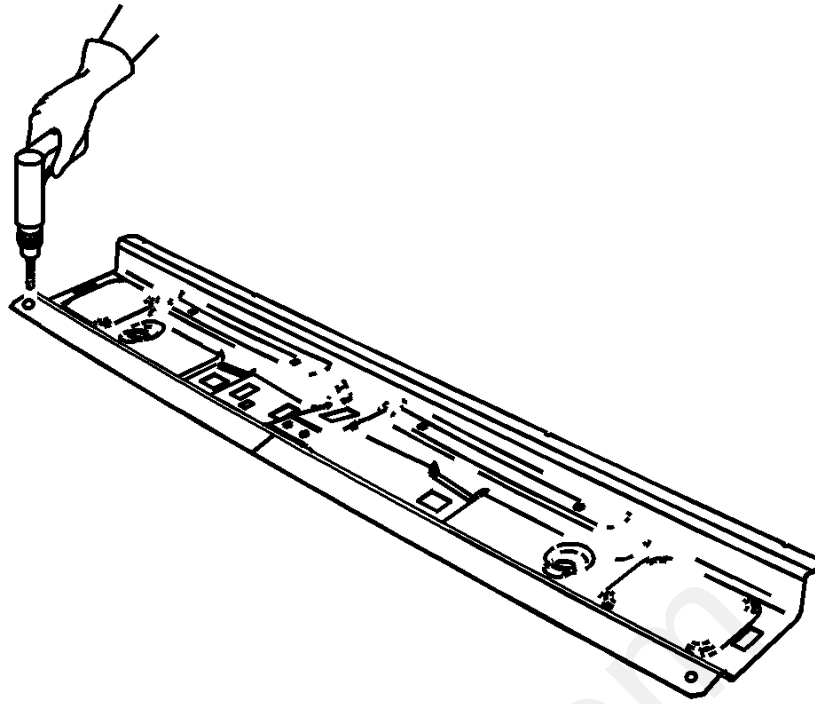


Fig. 63: Drilling Windshield Frame Header Panel Plug Weld Holes

Courtesy of GENERAL MOTORS COMPANY

NOTE: 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.

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 Weld-Thru coating or equivalent to all mating surfaces. Refer to [Anti-Corrosion Treatment and Repair](#).

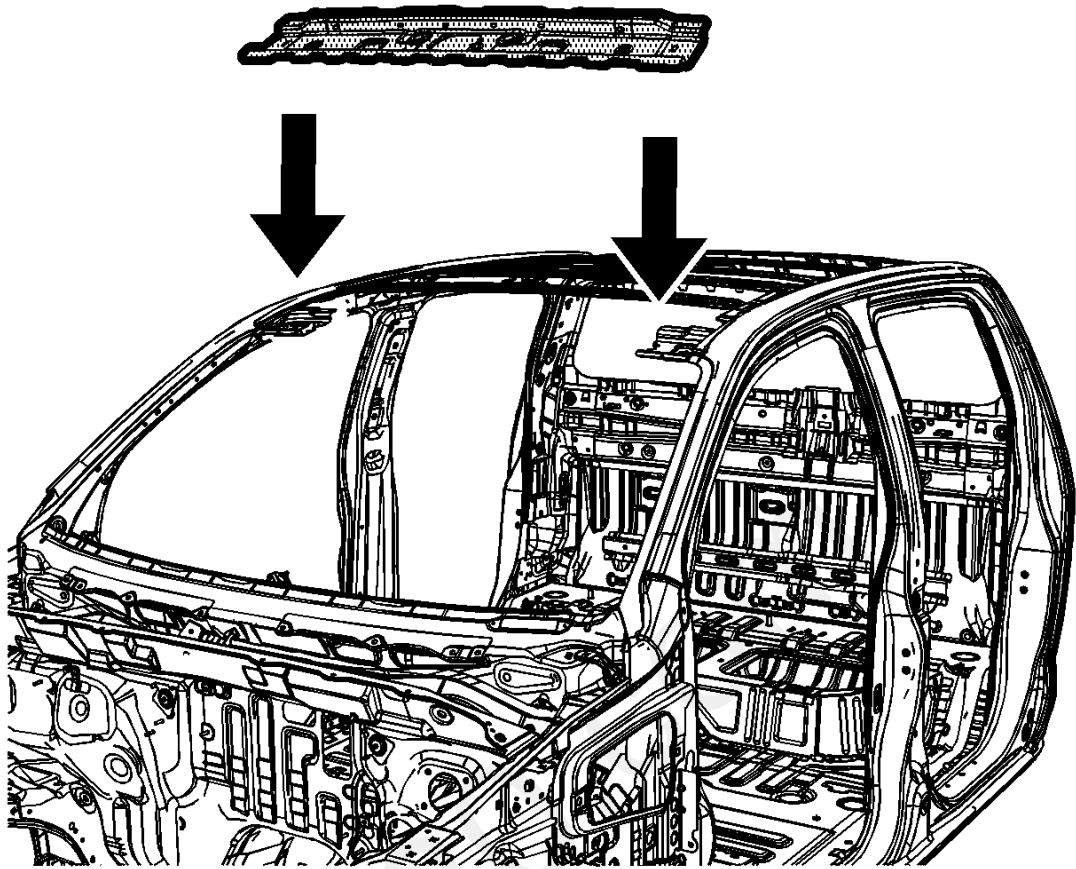


Fig. 64: Windshield Header Panel

Courtesy of GENERAL MOTORS COMPANY

4. Position the windshield header panel.

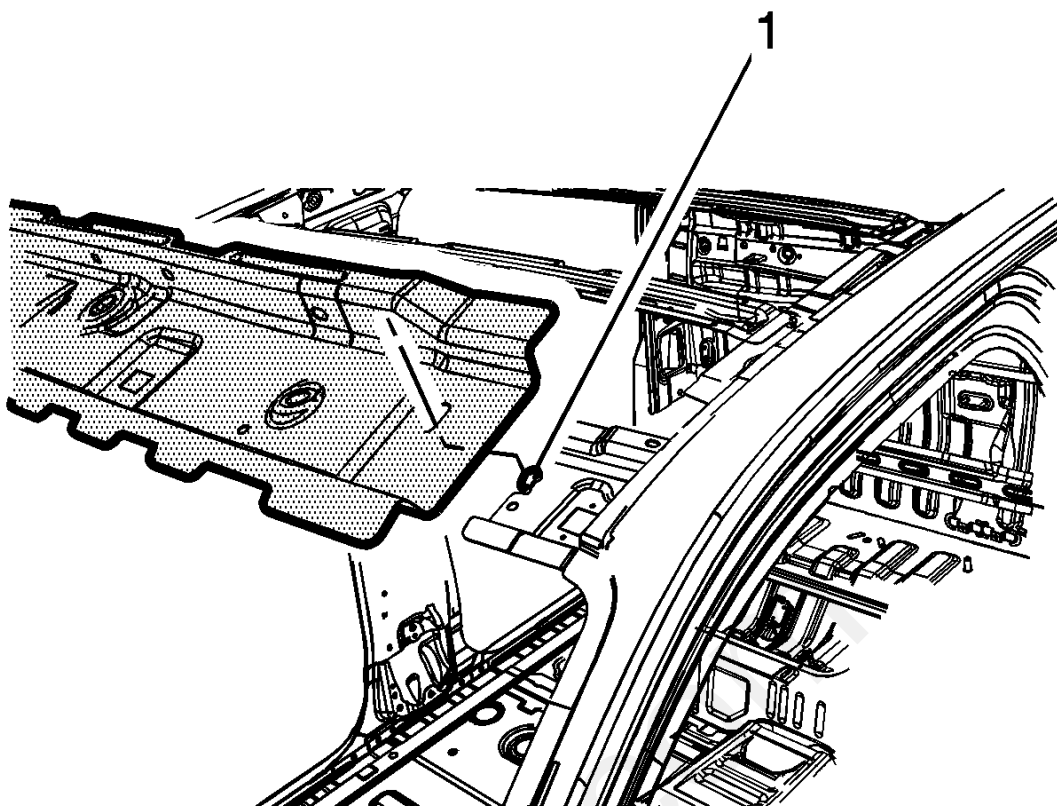


Fig. 65: Roof Header Panel Over Locator Tabs

Courtesy of GENERAL MOTORS COMPANY

5. Align the roof header panel over the locator tabs (1).

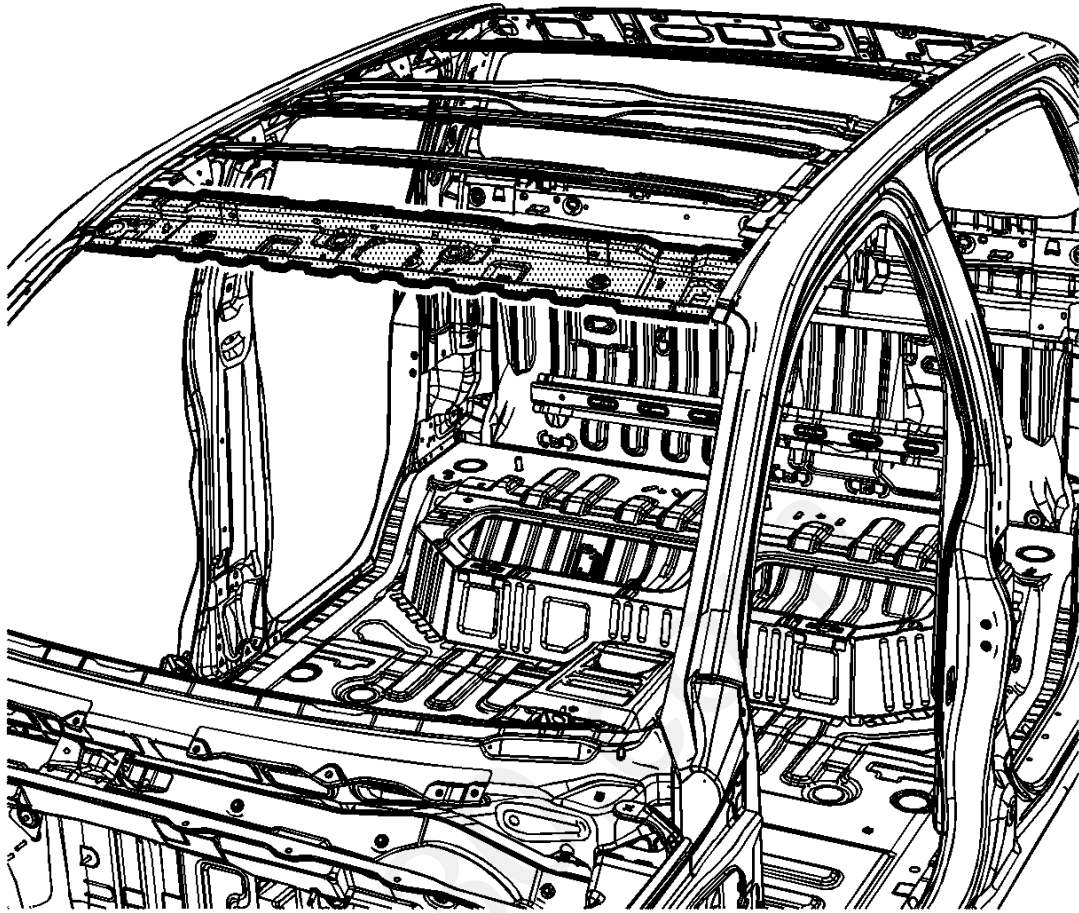


Fig. 66: Plug Welding

Courtesy of GENERAL MOTORS COMPANY

6. Plug weld accordingly.

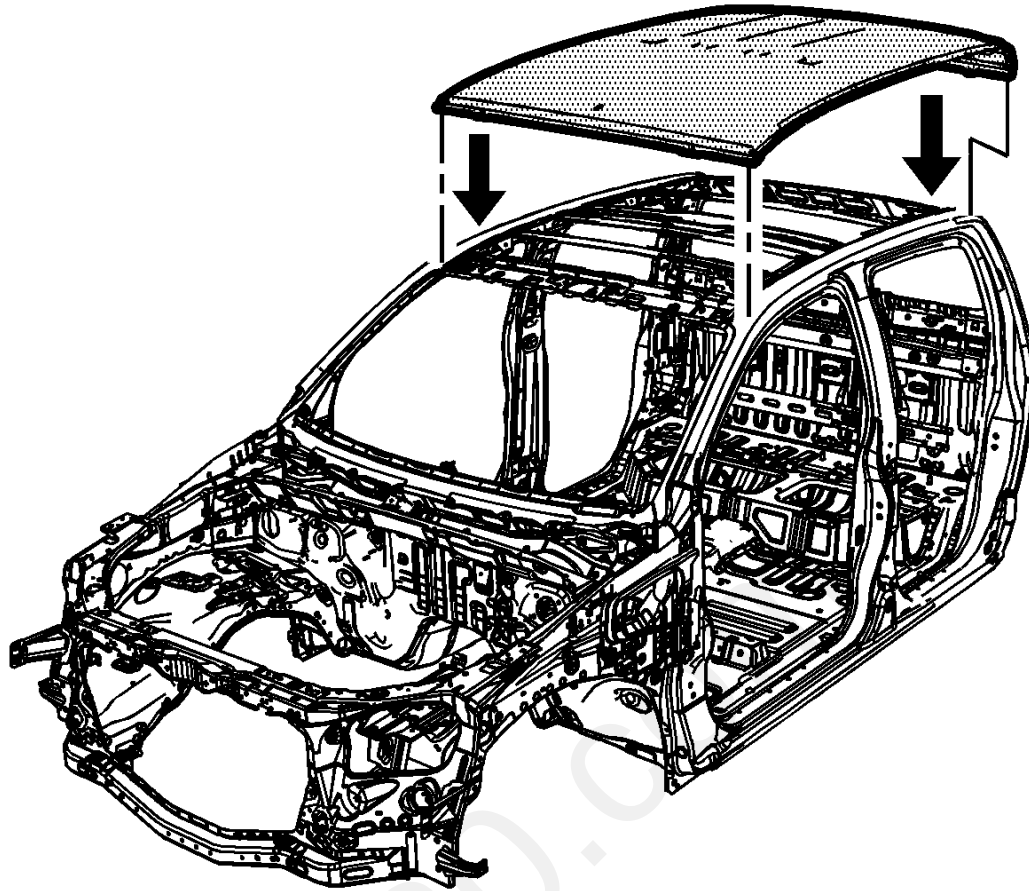


Fig. 67: Roof Panel

Courtesy of GENERAL MOTORS COMPANY

7. Install the roof panel. Refer to [Roof Outer Panel Replacement \(Adhesive Bonding Procedure\)](#)[Roof Outer Panel Replacement \(Weld On Procedure\)](#).
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 and repair the 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](#) .

ROOF REAR HEADER PANEL REPLACEMENT

NOTE: This procedure is similar to all cabs.

Removal Procedure

WARNING: Refer to [Approved Equipment for Collision Repair Warning](#) .

the SIR system. Refer to [SIR Disabling and Enabling](#) .

2. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .

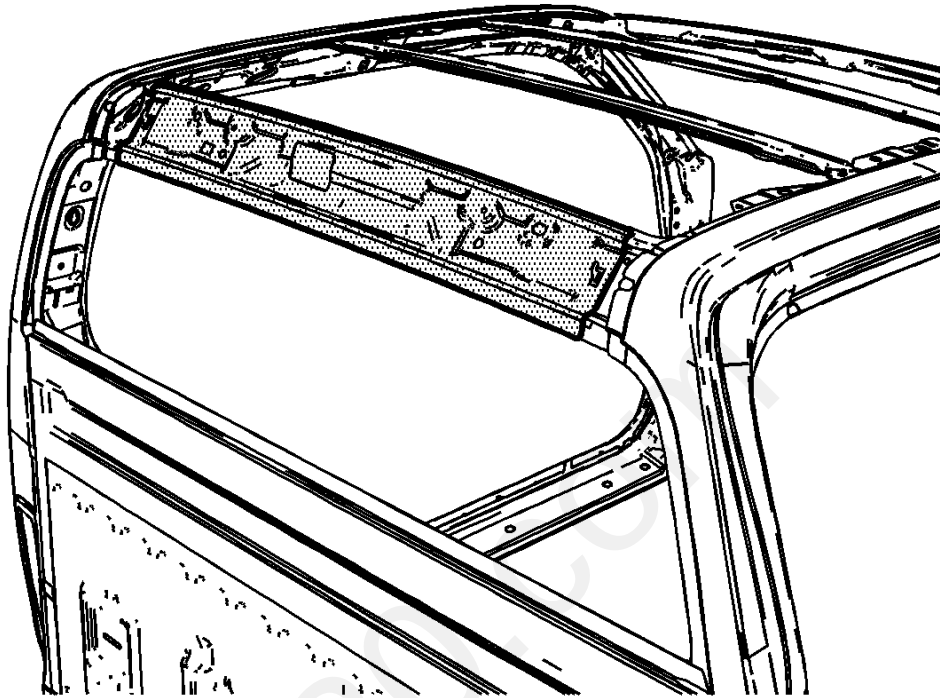


Fig. 68: View Of Rear Roof Header Panel

Courtesy of GENERAL MOTORS COMPANY

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](#) .

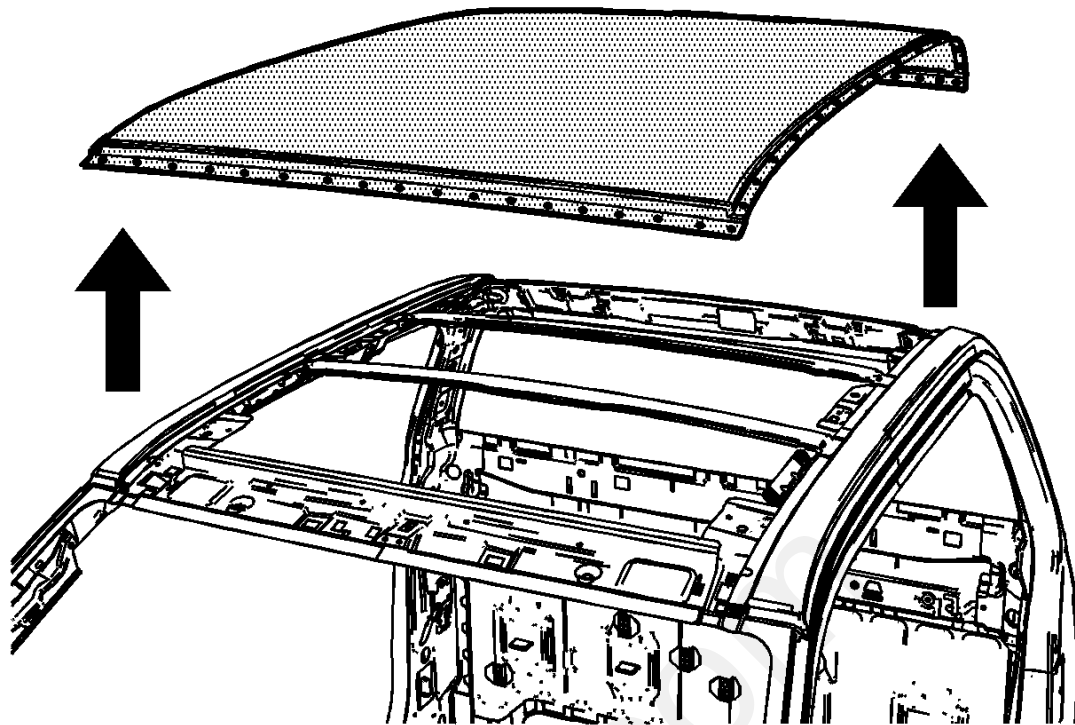


Fig. 69: Removing Roof Panel

Courtesy of GENERAL MOTORS COMPANY

6. Remove the roof panel. Refer to [Roof Outer Panel Replacement \(Adhesive Bonding Procedure\)](#)[Roof Outer Panel Replacement \(Weld On Procedure\)](#).

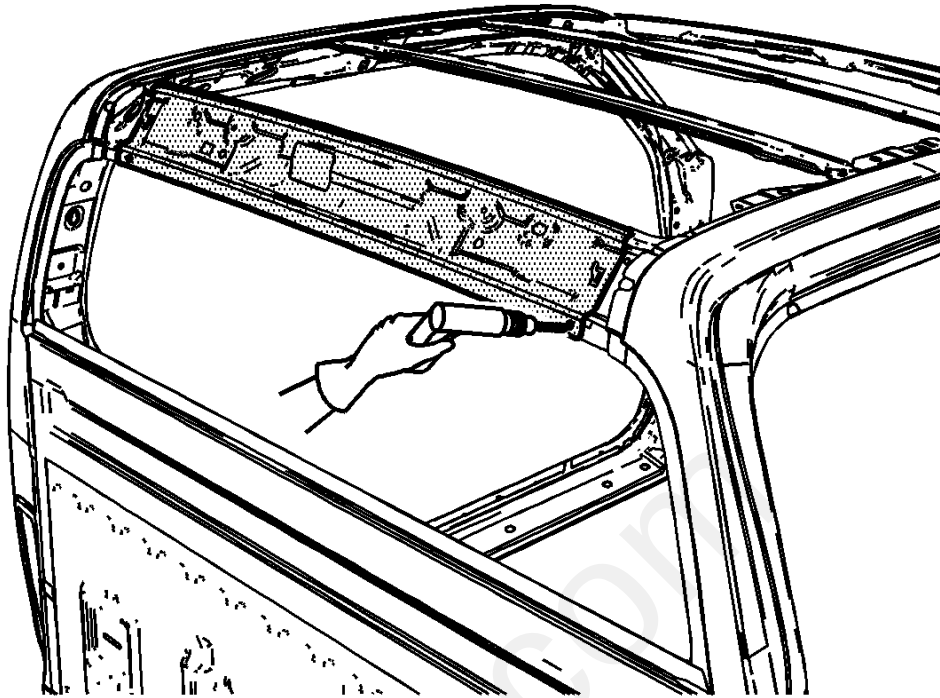


Fig. 70: Drilling Out Rear Roof Header Panel Factory Welds

Courtesy of GENERAL MOTORS COMPANY

NOTE: Do not damage any inner panels or reinforcements.

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

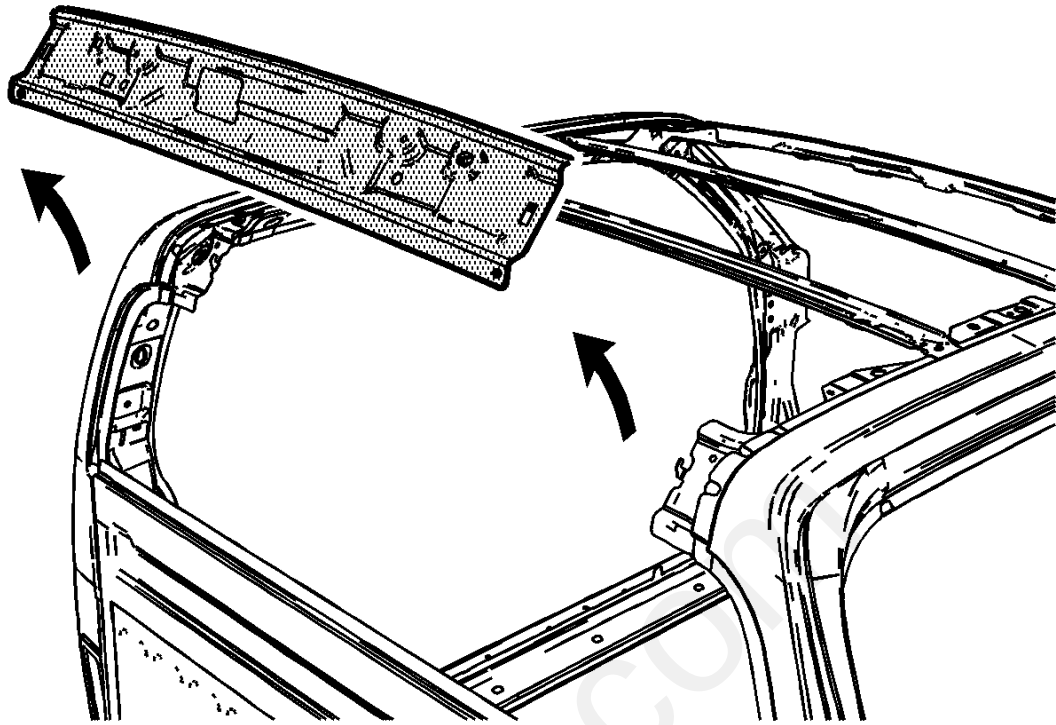


Fig. 71: Roof Header Panel

Courtesy of GENERAL MOTORS COMPANY

8. Remove the damaged roof header panel.

Installation Procedure

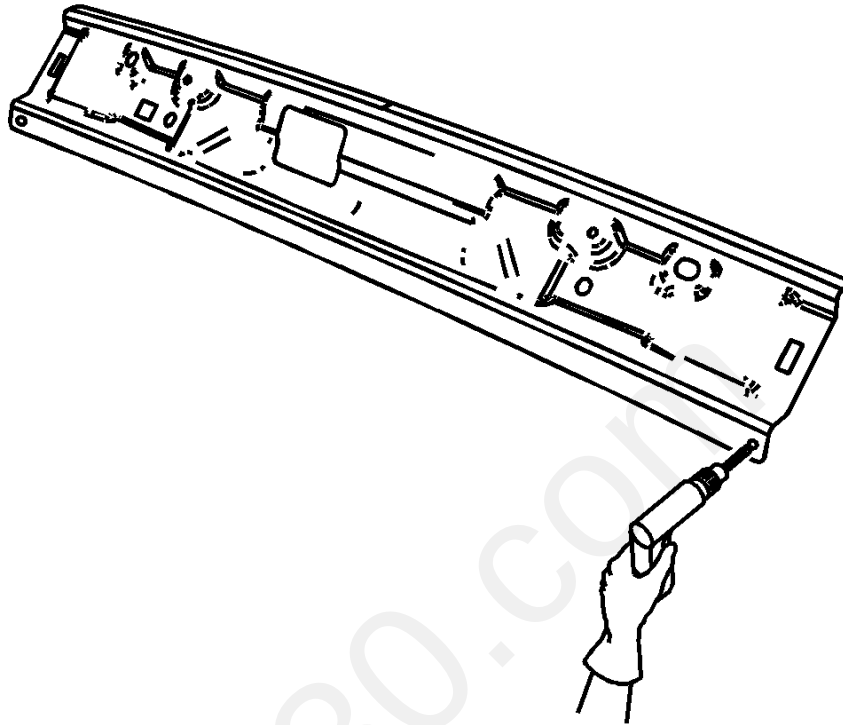


Fig. 72: Drilling Rear Roof Header Panel Plug Weld Holes

Courtesy of GENERAL MOTORS COMPANY

NOTE: 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.

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 Weld-Thru coating or equivalent to all mating surfaces. Refer to [Anti-Corrosion Treatment and Repair](#).

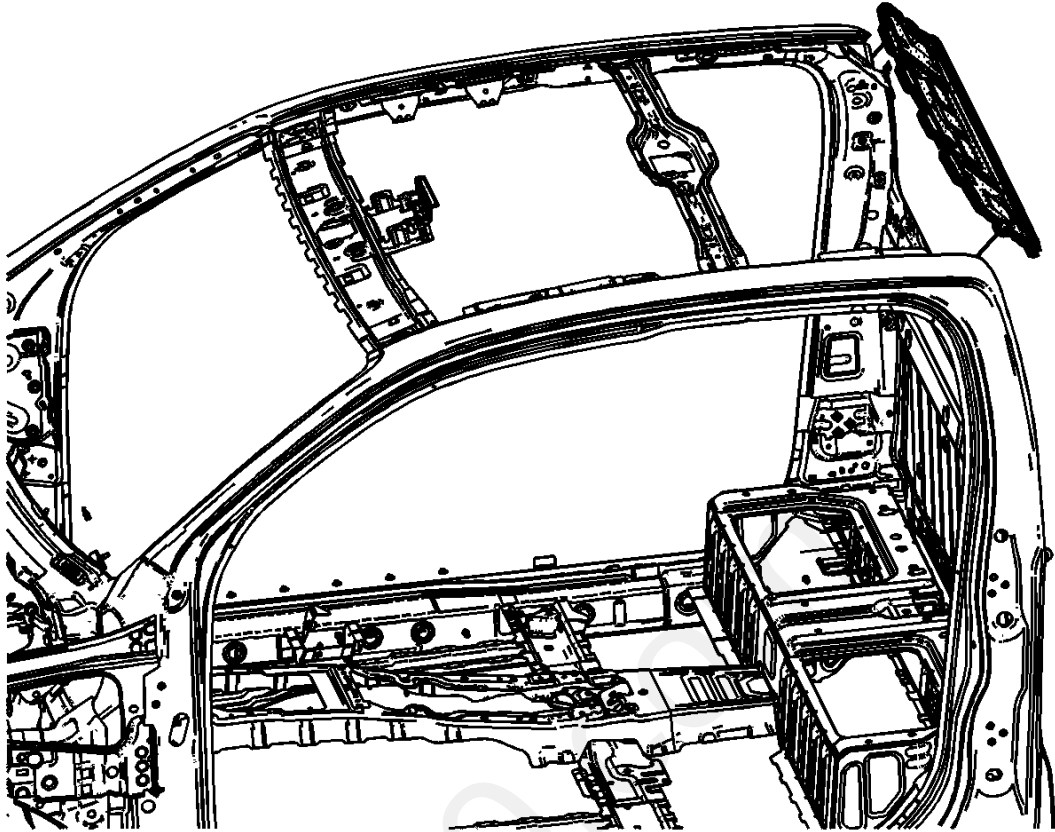


Fig. 73: Roof Header Panel

Courtesy of GENERAL MOTORS COMPANY

4. Position the roof header panel.

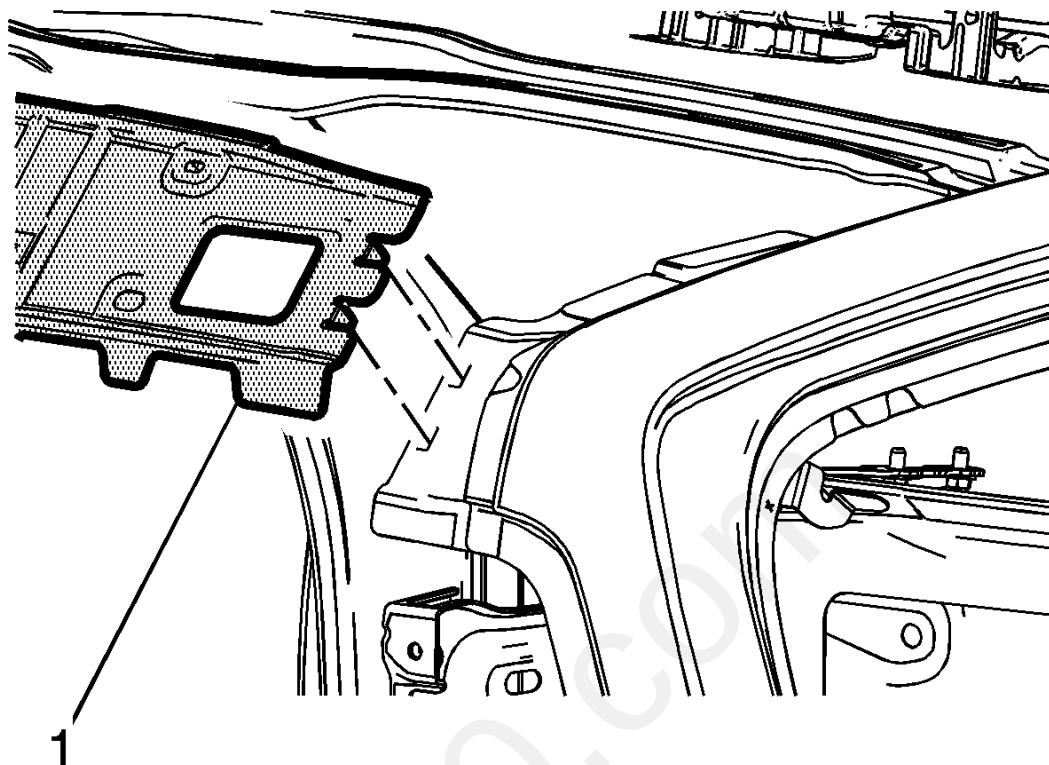


Fig. 74: Roof Header Panel Over Locator Tabs

Courtesy of GENERAL MOTORS COMPANY

5. Align the roof header panel over the locator tabs (1).

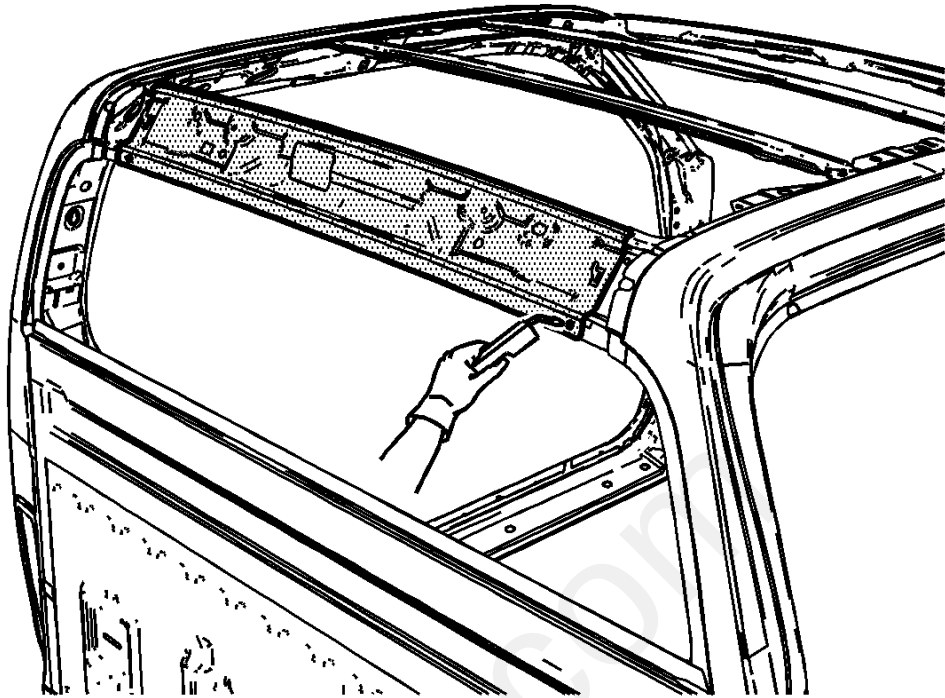


Fig. 75: Plug Welding Rear Roof Header Panel

Courtesy of GENERAL MOTORS COMPANY

6. Plug weld accordingly.

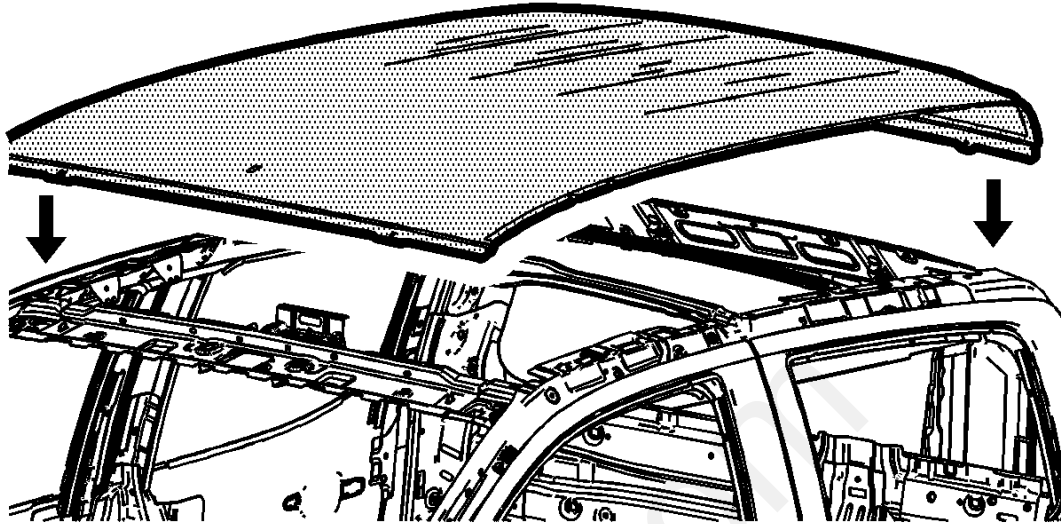


Fig. 76: Roof Panel

Courtesy of GENERAL MOTORS COMPANY

7. Install the roof panel. Refer to [Roof Outer Panel Replacement \(Adhesive Bonding Procedure\)](#)[Roof Outer Panel Replacement \(Weld On Procedure\)](#).
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 and repair the 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](#) .

ROCKER INNER PANEL REPLACEMENT

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](#) .

all related panels and components. Refer to the following procedures:

- [Rocker Outer Panel Sectioning](#)
- [Rocker Inner Panel Reinforcement Replacement](#)
- [Body Hinge Pillar Lower Reinforcement Replacement](#)
- [Back Body Pillar Inner Panel Reinforcement Replacement](#)

4. Repair as much of the damage as possible to factory specifications. Refer to [Dimensions - Body](#).

5. Remove the sealers and anti-corrosion materials from the repair area. Refer to [Anti-Corrosion Treatment and Repair](#).

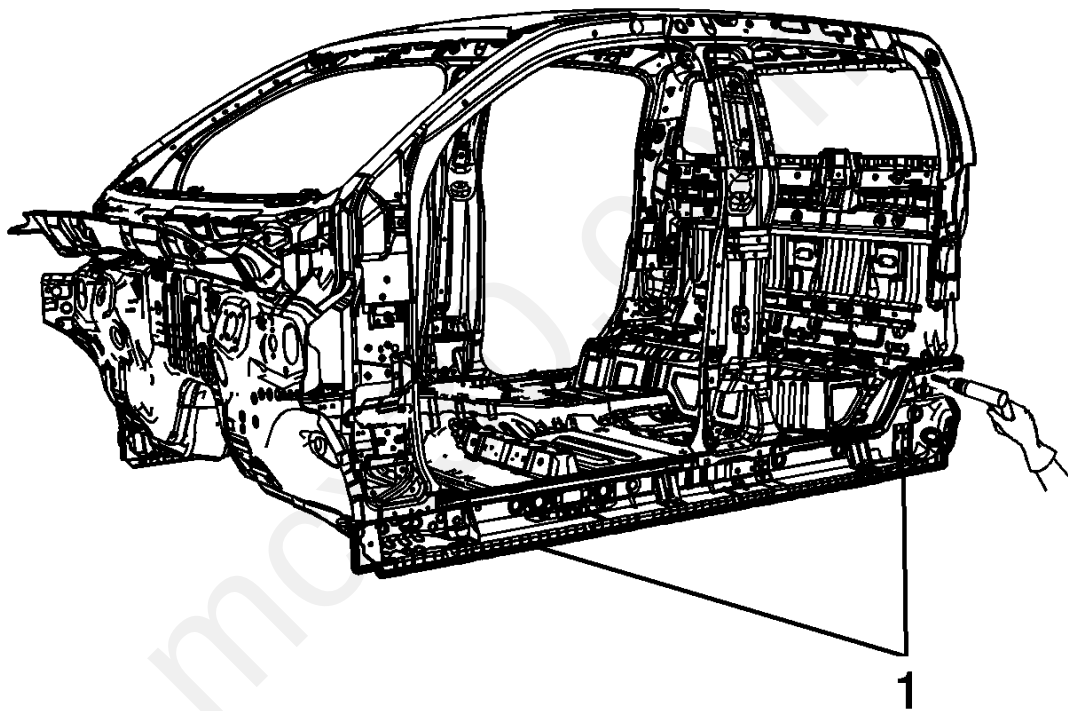


Fig. 77: Drill All Factory Welds

Courtesy of GENERAL MOTORS COMPANY

6. Carefully move the center pillar inner panel as needed to drill the rocker inner pane.

7. Locate and mark all the necessary factory welds of the rocker inner panel.

8. Drill all factory welds (1). Note the number and location of welds for installation of the service assembly.

9. Remove the damaged rocker inner panel.

Installation Procedure

1. Drill 8 mm (5/16 in) holes for plug welding along the edges of the quarter outer panel (1) as noted from the original panel.

id prepare the attaching surfaces for welding.

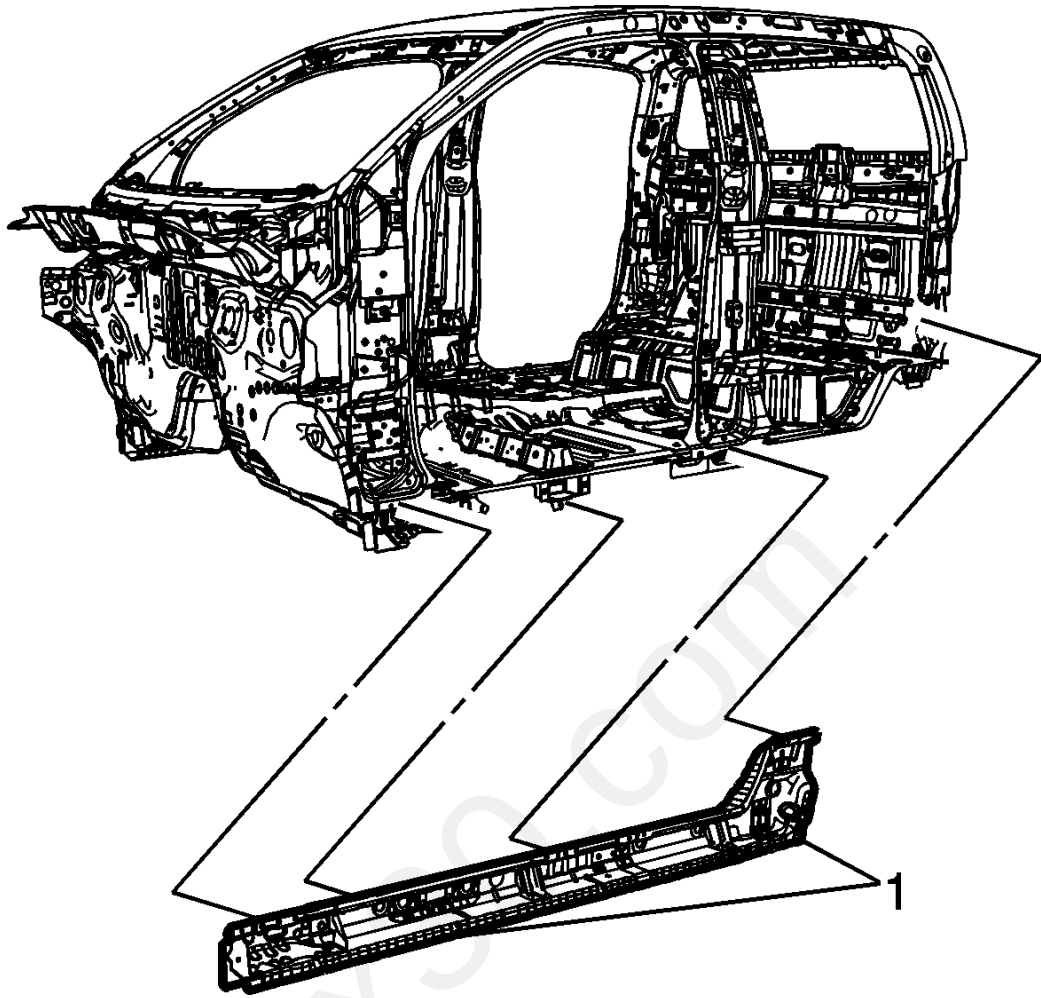


Fig. 78: Rocker Inner Panel

Courtesy of GENERAL MOTORS COMPANY

3. Position the rocker inner panel on the vehicle.
4. Verify the fit of the panel.
5. Clamp the rocker inner panel into position.

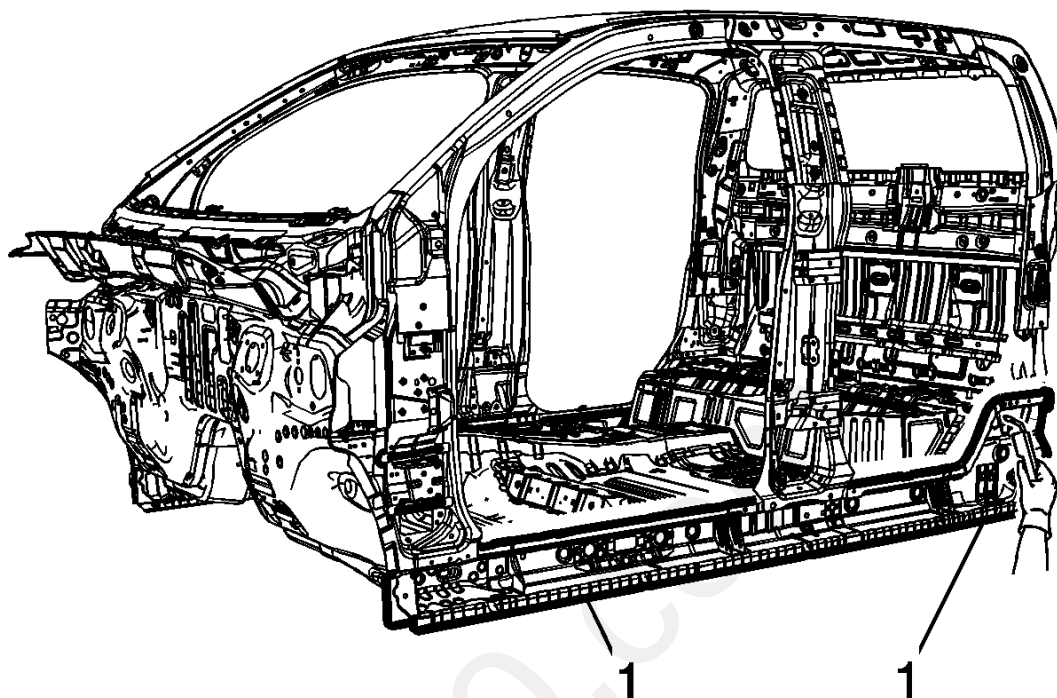


Fig. 79: Center Pillar Inner Panel

Courtesy of GENERAL MOTORS COMPANY

6. Carefully move the center pillar inner panel as needed to weld the rocker inner pane.
7. Plug the weld accordingly.
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. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
12. 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](#) .

- ect 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 the following procedures:
 - [Rocker Outer Panel Sectioning](#)
 - [Body Hinge Pillar Lower Reinforcement Replacement](#)
 - [Back Body Pillar Inner Panel Reinforcement Replacement](#)
 5. Restore as much of the damage as possible to factory specifications using 3-dimensional measuring equipment.

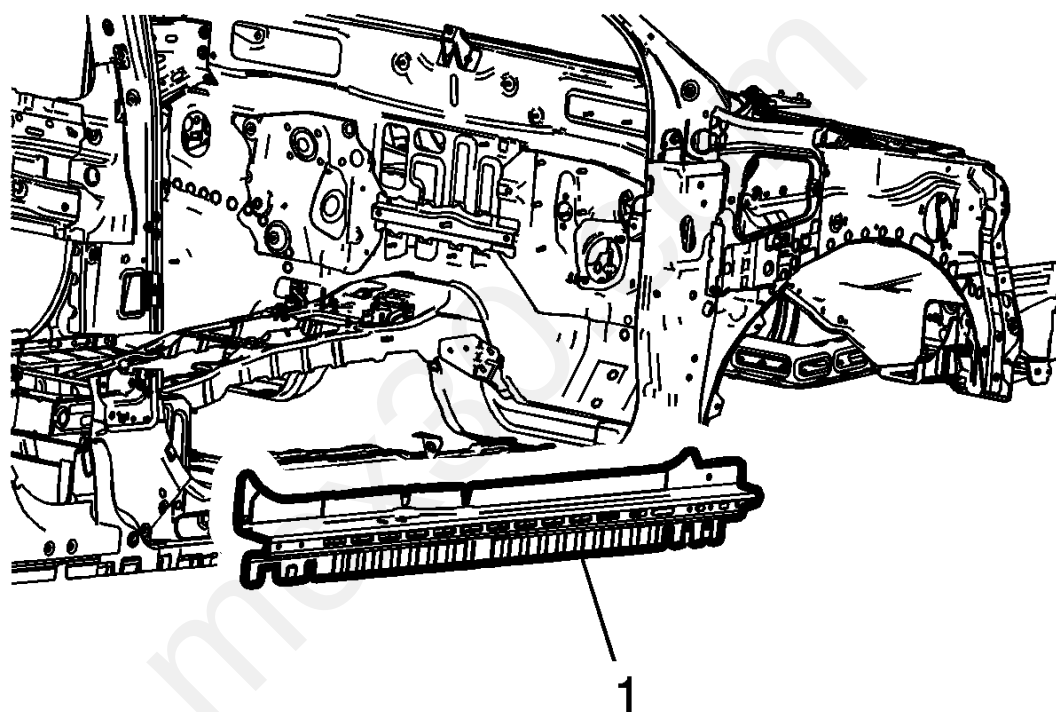


Fig. 80: Sealers And Anti-Corrosion Materials
Courtesy of GENERAL MOTORS COMPANY

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](#) .

NOTE:

- Removing only the body hinge pillar lower reinforcement and releasing only the welds that attach the back body pillar inner panel reinforcement, if possible, removes the rocker inner panel reinforcement by sliding it out. Choose the procedure that fits better according to the collision
- Do not damage any inner panels or reinforcements.

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

7. Locate and drill out all factory welds (1).
8. Remove the damaged inner rocker panel.

Installation Procedure

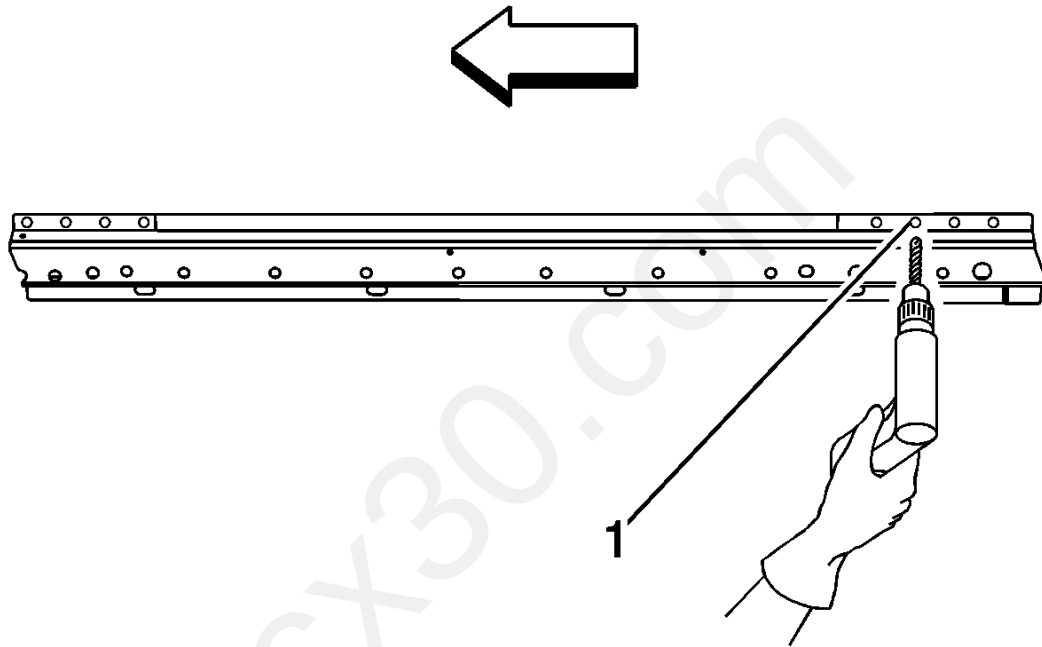


Fig. 81: Drilling Plug Weld Holes

Courtesy of GENERAL MOTORS COMPANY

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 Weld-Thru Coating or equivalent to all mating surfaces. Refer to [Anti-Corrosion Treatment and Repair](#) .

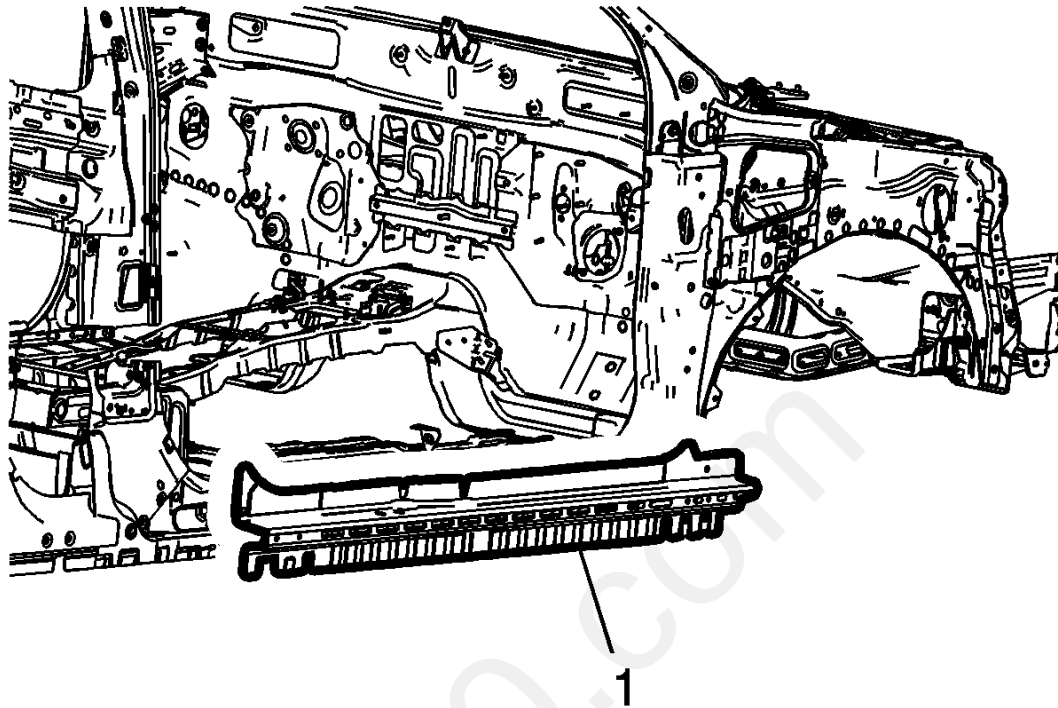


Fig. 82: Sealers And Anti-Corrosion Materials
Courtesy of GENERAL MOTORS COMPANY

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

ROCKER OUTER PANEL SECTIONING

Removal Procedure

WARNING: Refer to [Approved Equipment for Collision Repair Warning](#) .

Refer to [Glass and Sheet Metal Handling Warning](#) .

WARNING: Refer to [Collision Sectioning Warning](#) .

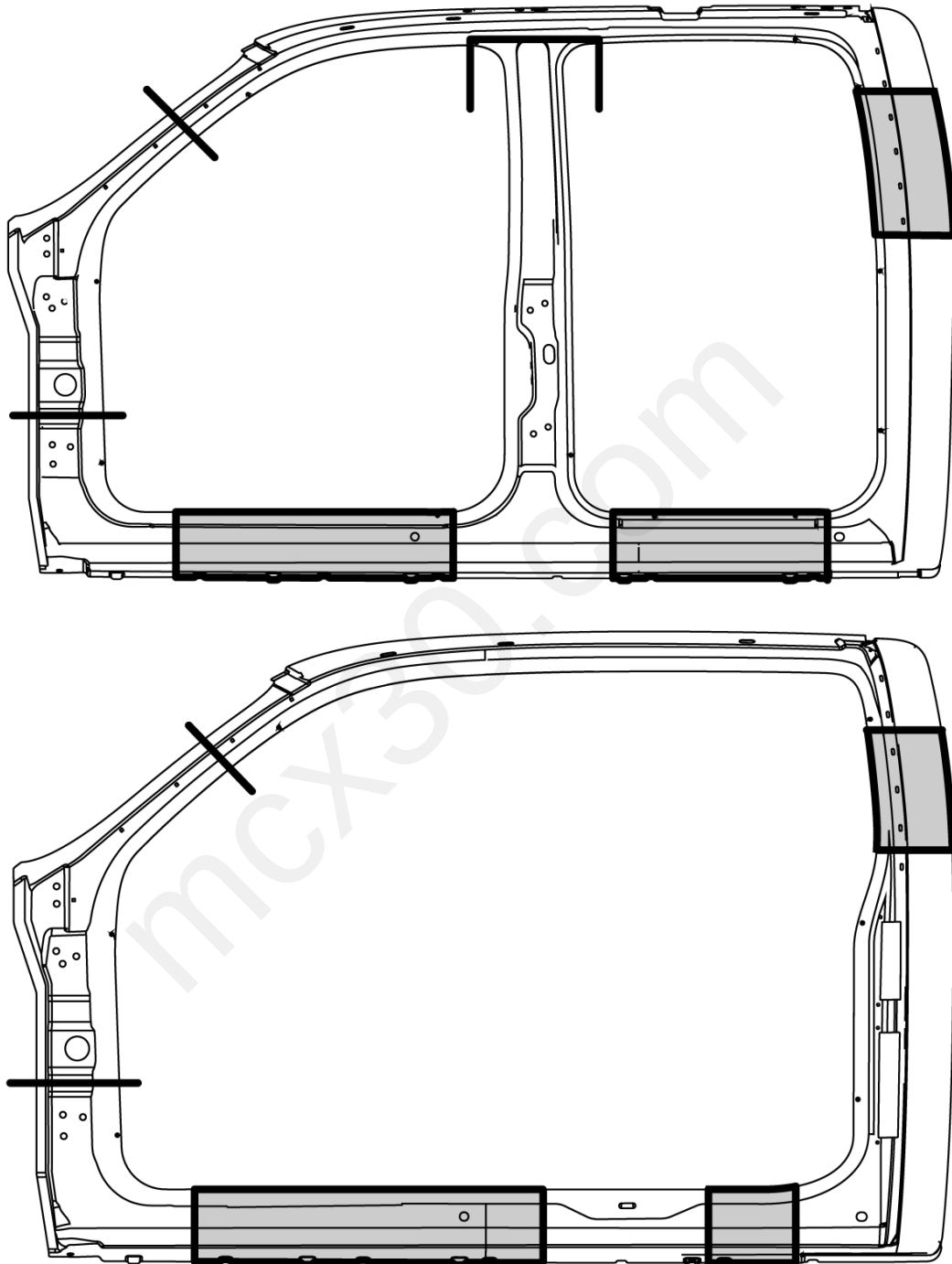


Fig. 83: Door Frame

Courtesy of GENERAL MOTORS COMPANY

NOTE:

The door frame can be replaced at the factory seams, but requires the removal of the windshield, roof, and quarter panel. 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 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](#).

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](#) .
6. Perform additional sectioning procedures as necessary. Refer to the following procedures:
 - [Outer Windshield Frame Pillar Sectioning](#)
 - [Front Hinge Pillar Sectioning](#)
 - [Center Pillar Sectioning](#)
 - [Rear Pillar Sectioning \(Lower\)Rear Pillar Sectioning \(Complete\)](#)

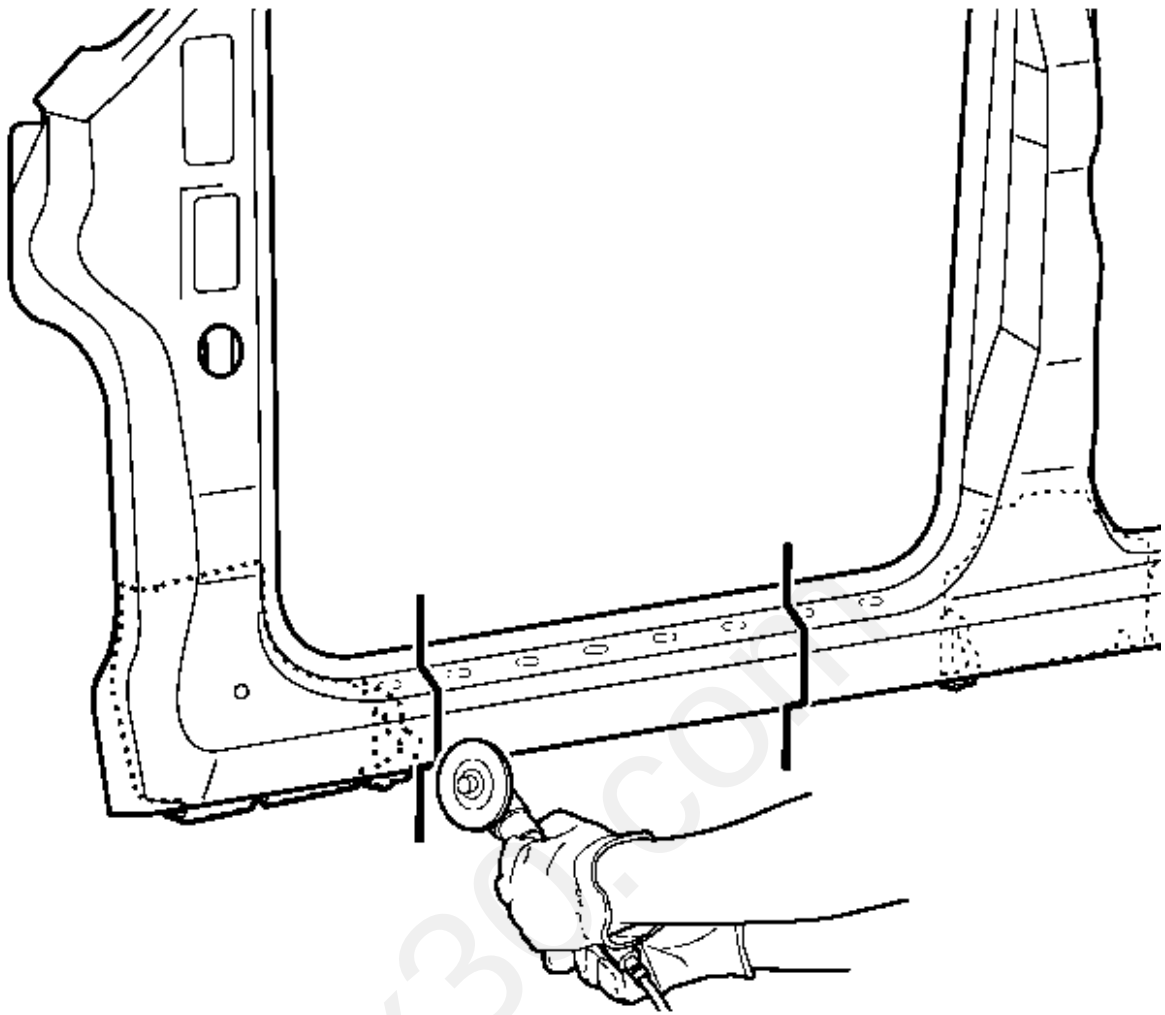


Fig. 84: Cutting Rocker Panel Section

Courtesy of GENERAL MOTORS COMPANY

NOTE: Do not damage any inner panels or reinforcements.

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

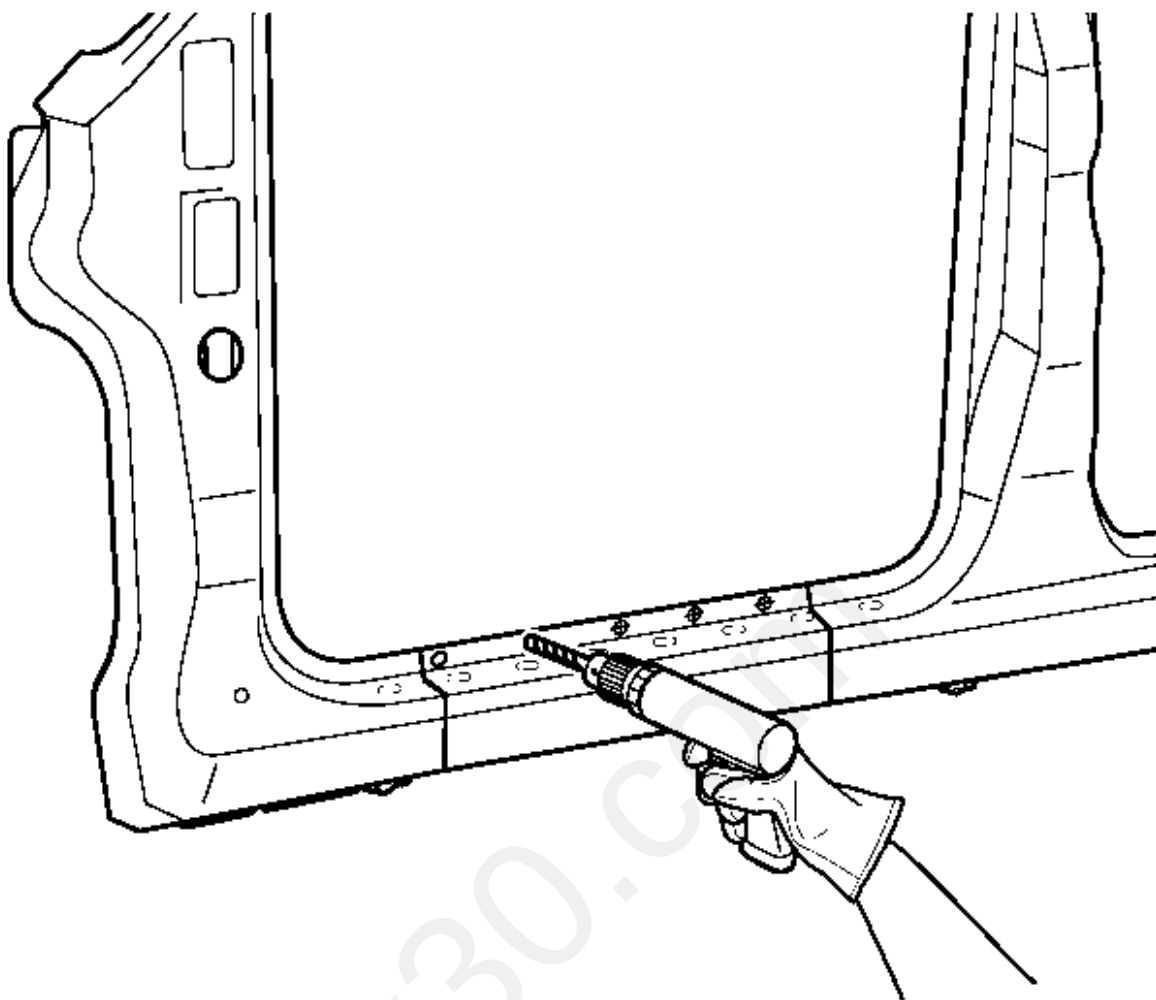


Fig. 85: Locating & Drilling Out Factory Welds On Rocker Panel Section
Courtesy of GENERAL MOTORS COMPANY

8. Locate and drill out all factory welds. Note the number and location of the welds for installation of the service part.

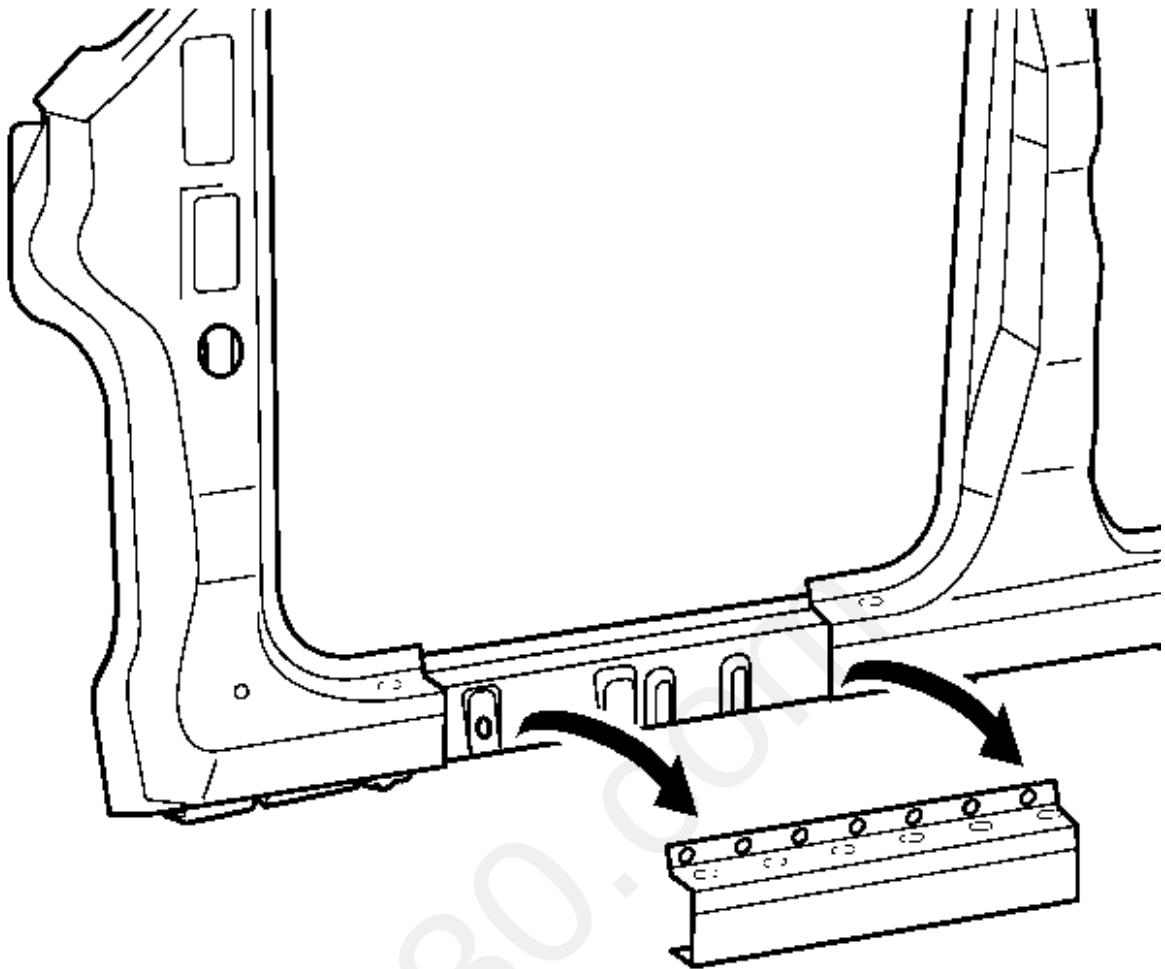


Fig. 86: Damaged Rocker Panel Section
Courtesy of GENERAL MOTORS COMPANY

9. Remove the damaged body side.

Installation Procedure

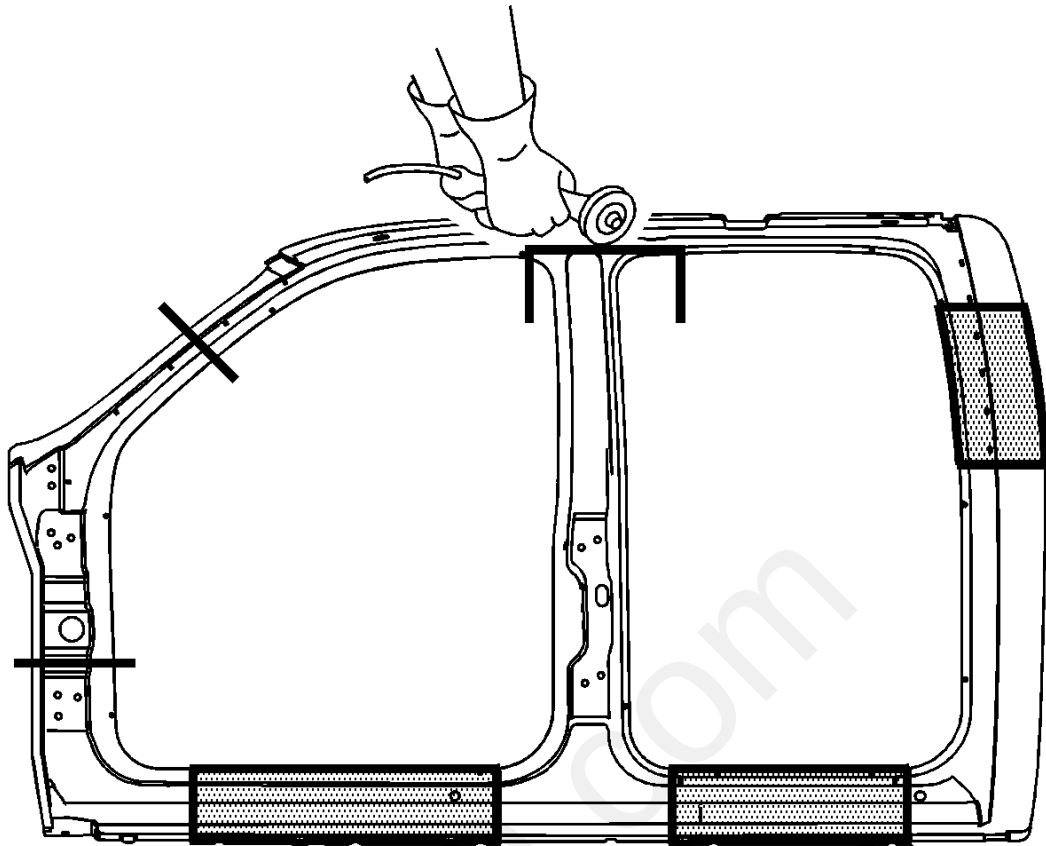


Fig. 87: Cutting Panel In Corresponding Locations

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.

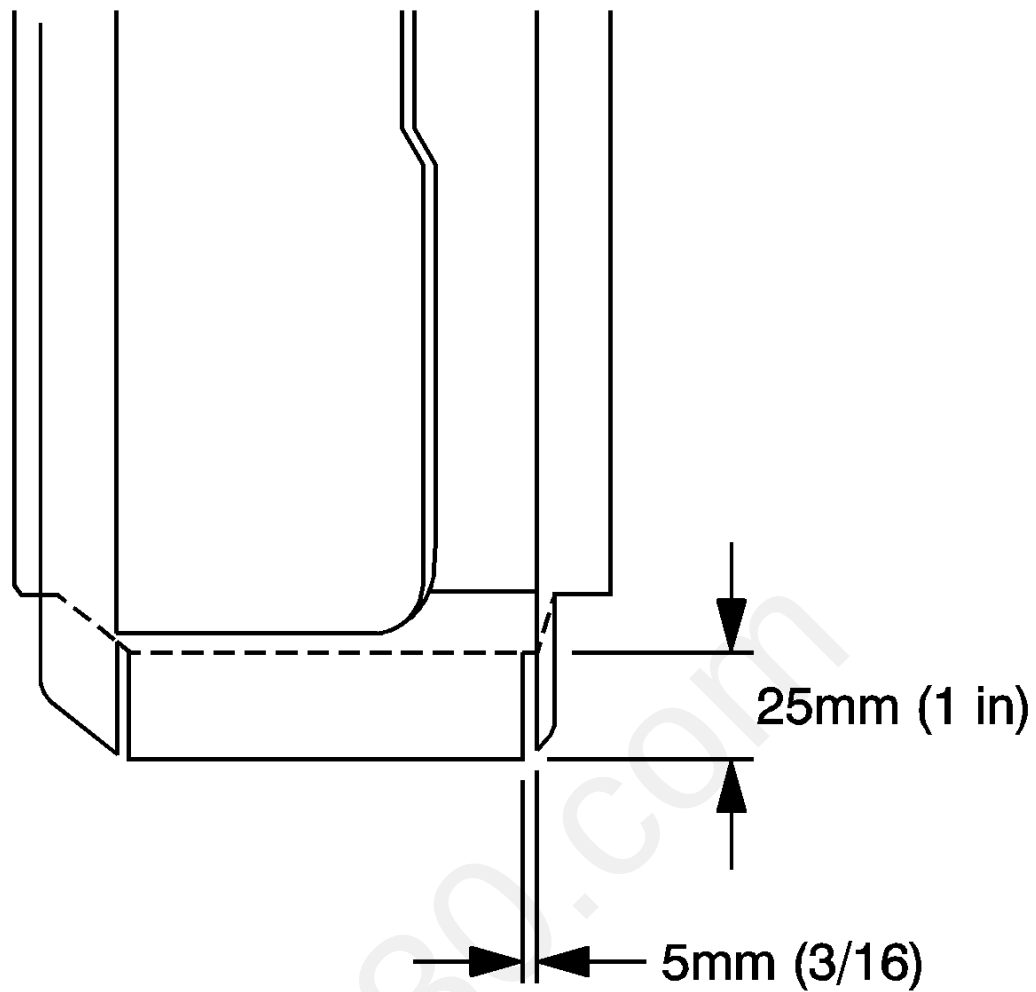


Fig. 88: Cutting 5 mm (3/16 in) Wide Gaps In Bottom Corners

Courtesy of GENERAL MOTORS COMPANY

2. Cut and remove 25 mm (1 in) from the flanges on either side of the remaining section of the original pillar.
Cut 5 mm (3/16 in) wide gaps in the bottom corner.

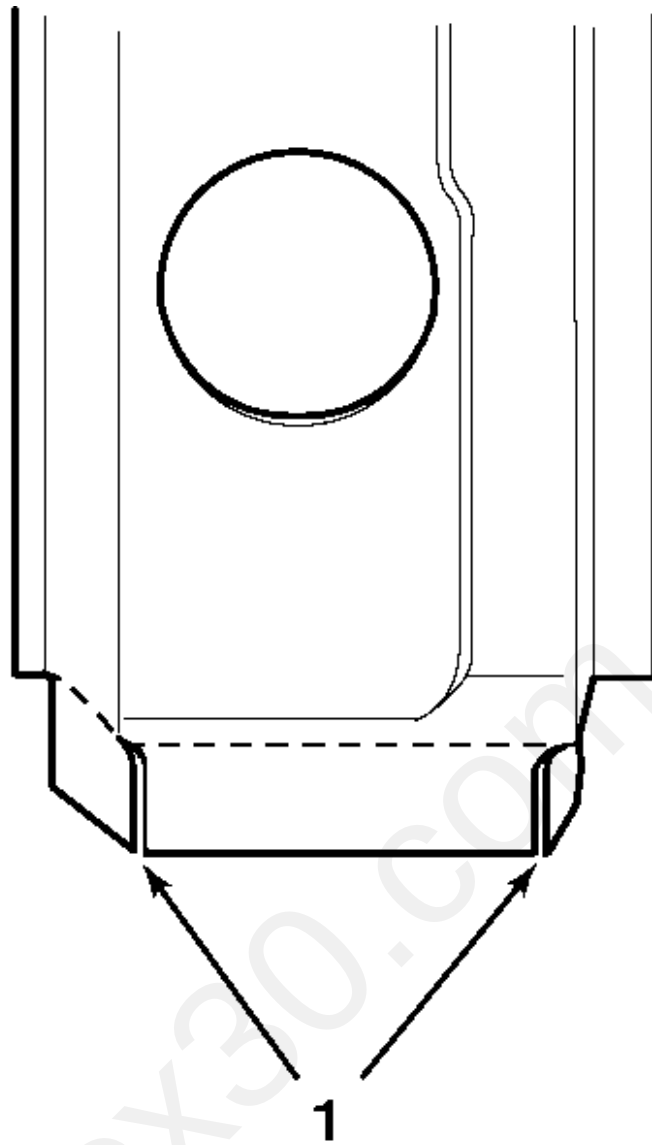


Fig. 89: Stepping Tabs

Courtesy of GENERAL MOTORS COMPANY

3. Step the tabs (1) inward to allow the door frame opening service section to fit over the original hinge pillar.

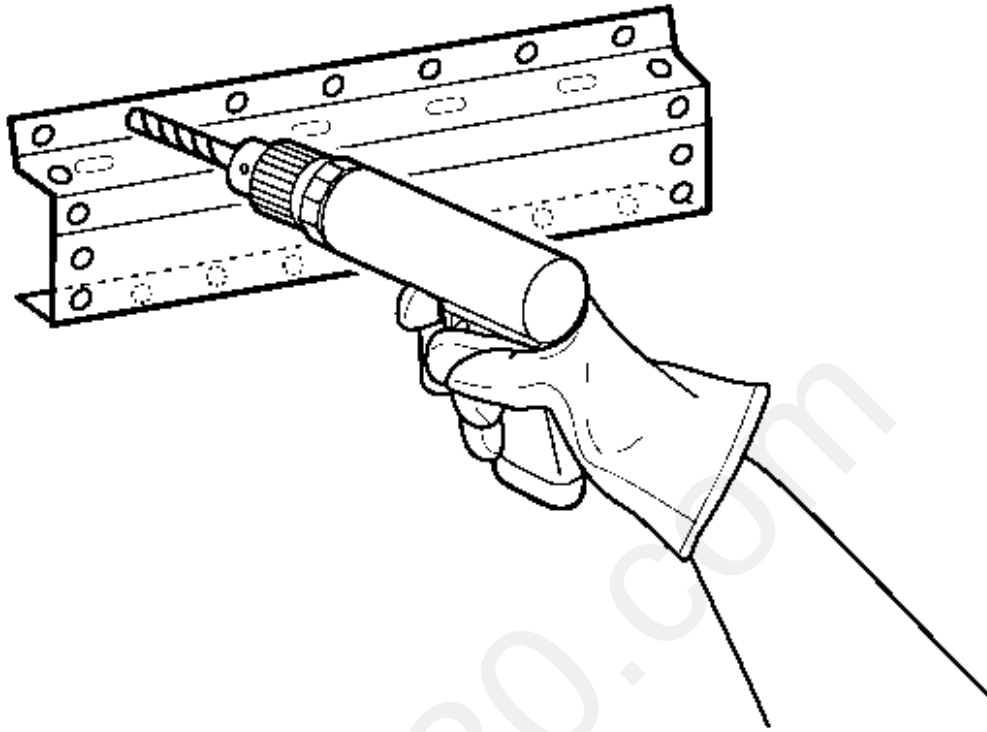


Fig. 90: Drilling Plug Weld Holes In Rocker Panel Section

Courtesy of GENERAL MOTORS COMPANY

NOTE: If the location of the original plug weld holes can not be determined, or if structural weld-thru adhesive was present, space the plug weld holes every 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 attachment surfaces as necessary.
6. Apply Weld-Thru Coating or equivalent to all mating surfaces. Refer to [Anti-Corrosion Treatment and Repair](#).

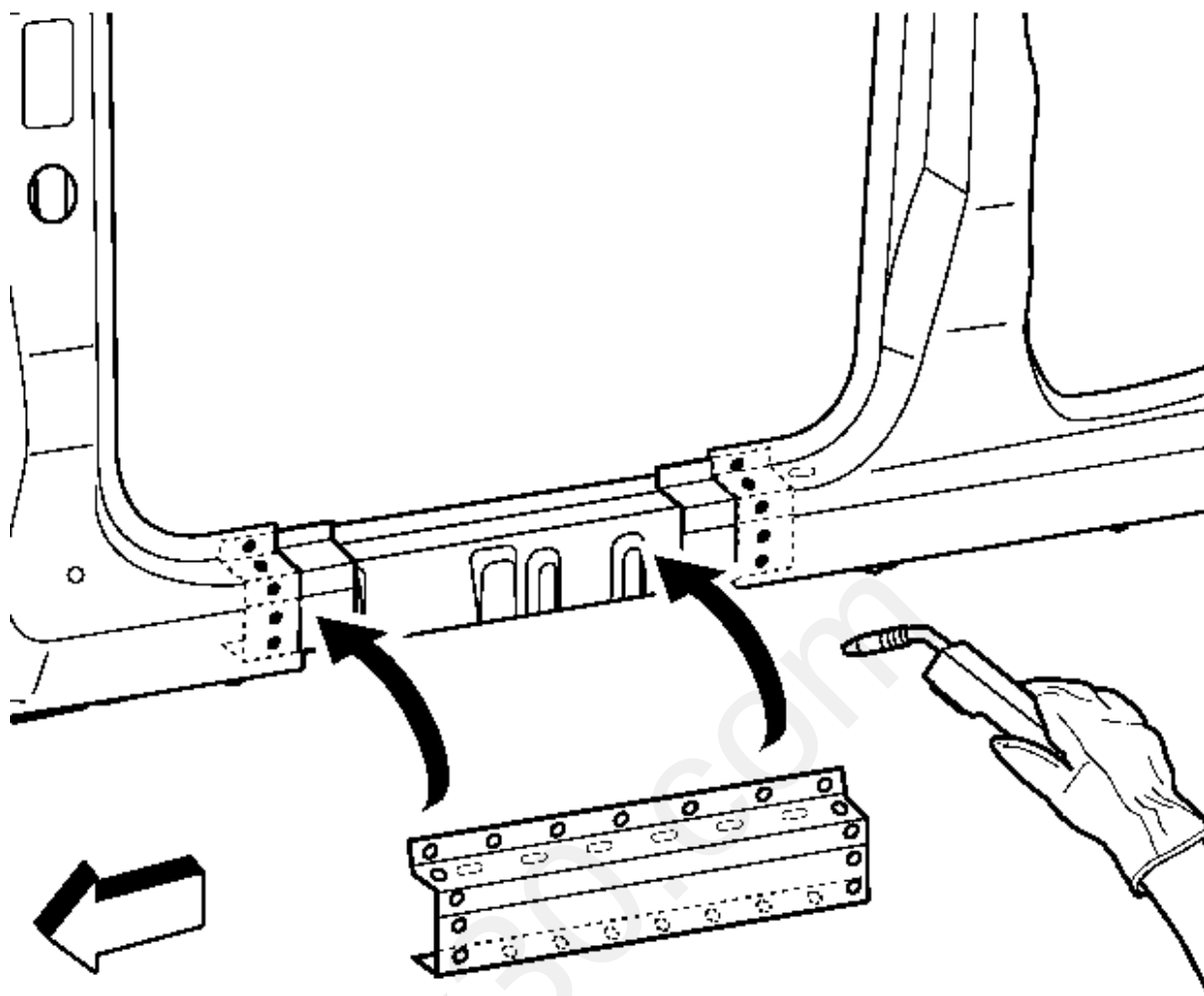


Fig. 91: Plugging Weld Rocker Panel Section
 Courtesy of GENERAL MOTORS COMPANY

7. Position the body side to the vehicle using 3-dimensional measuring equipment. Clamp in place.
8. Fit the new part on the original panel.

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 them. Complete the stitch weld.

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

PILLAR 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 [Rear End Panel Replacement](#), [Rocker Outer Panel Sectioning](#), [Roof Outer Panel Replacement \(Adhesive Bonding Procedure\)](#), [Roof Outer Panel Replacement \(Weld On Procedure\)](#), and [Outer Door Frame Sectioning](#).
5. Restore as much of the damage as possible to factory specifications using 3-dimensional measuring equipment.
6. Note the location and remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .

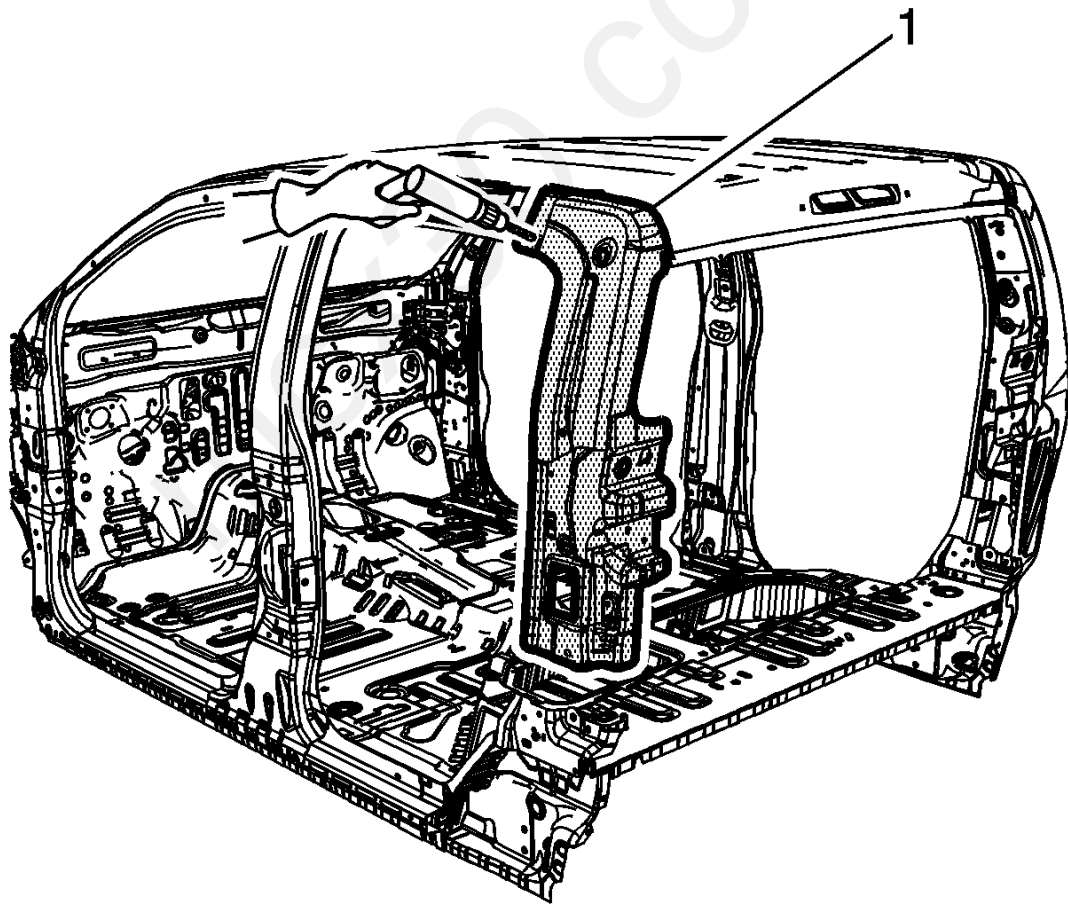


Fig. 92: Drill Out All Factory Welds
Courtesy of GENERAL MOTORS COMPANY

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

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

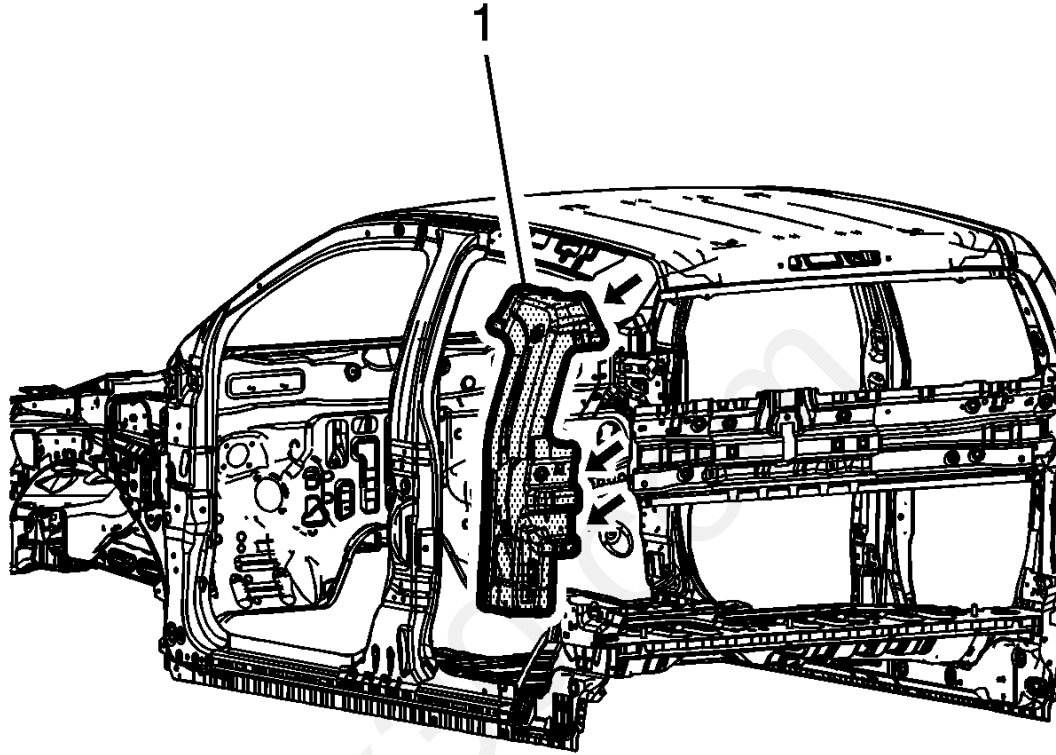


Fig. 93: Damaged Back Body Pillar Inner Panel Reinforcement
Courtesy of GENERAL MOTORS COMPANY

8. Remove the damaged back body pillar inner panel reinforcement (1).

Installation Procedure

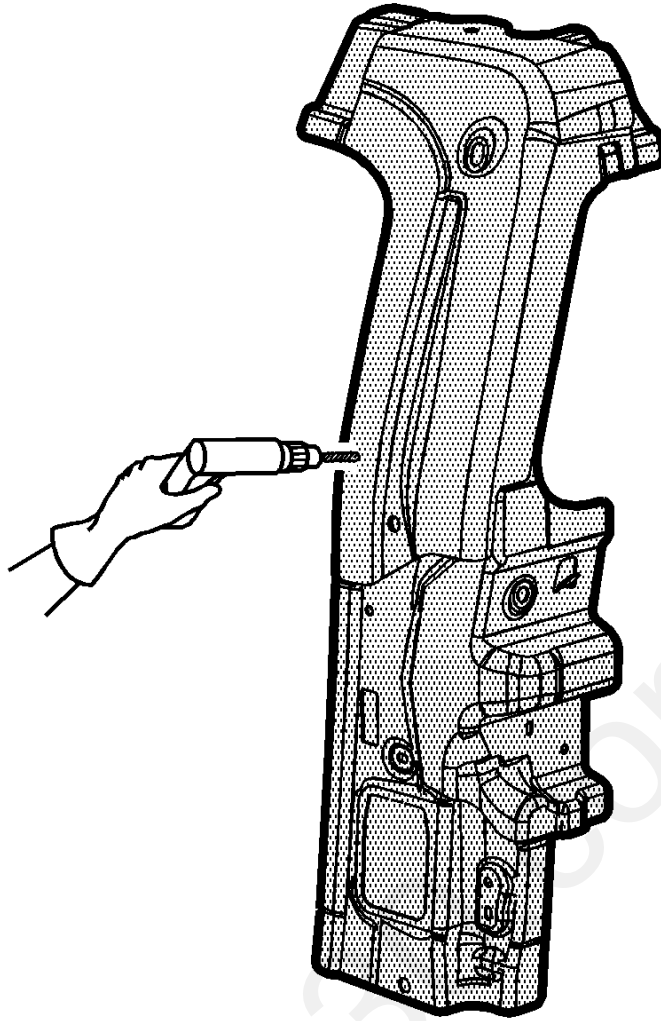


Fig. 94: Drilling 8 mm (5/16 in) Plug Weld Holes In Service Part
Courtesy of GENERAL MOTORS COMPANY

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 Weld-Thru Coating or equivalent to all mating surfaces. Refer to [Anti-Corrosion Treatment and Repair](#).

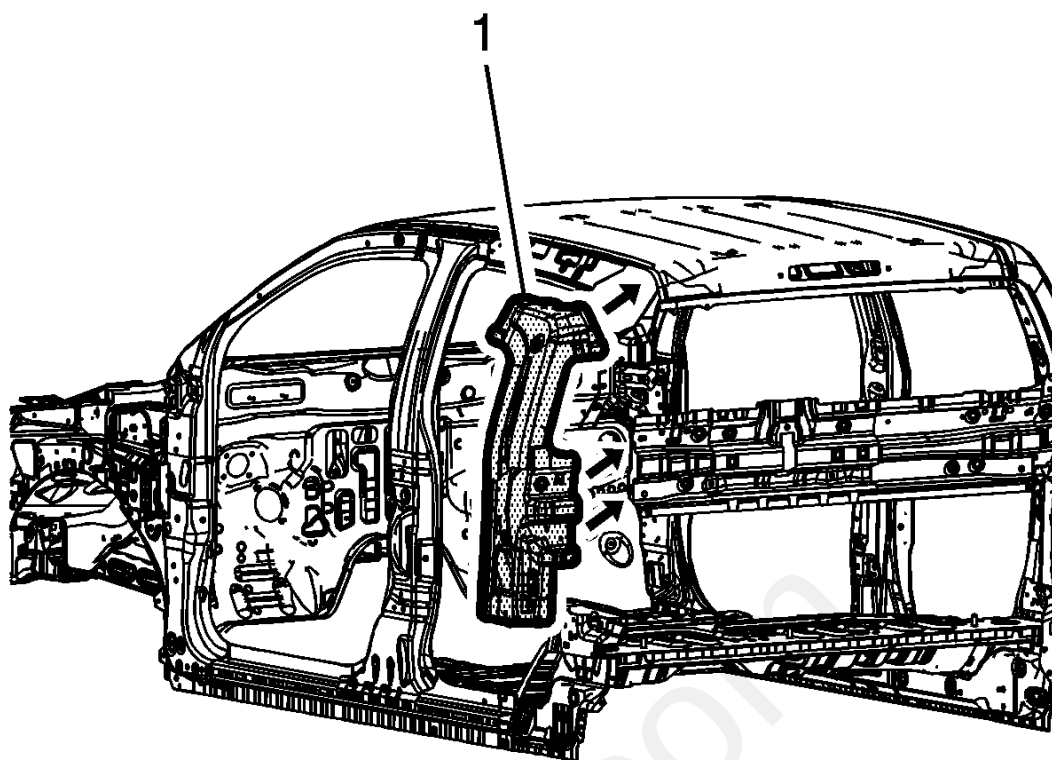


Fig. 95: Back Body Pillar Inner Panel

Courtesy of GENERAL MOTORS COMPANY

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

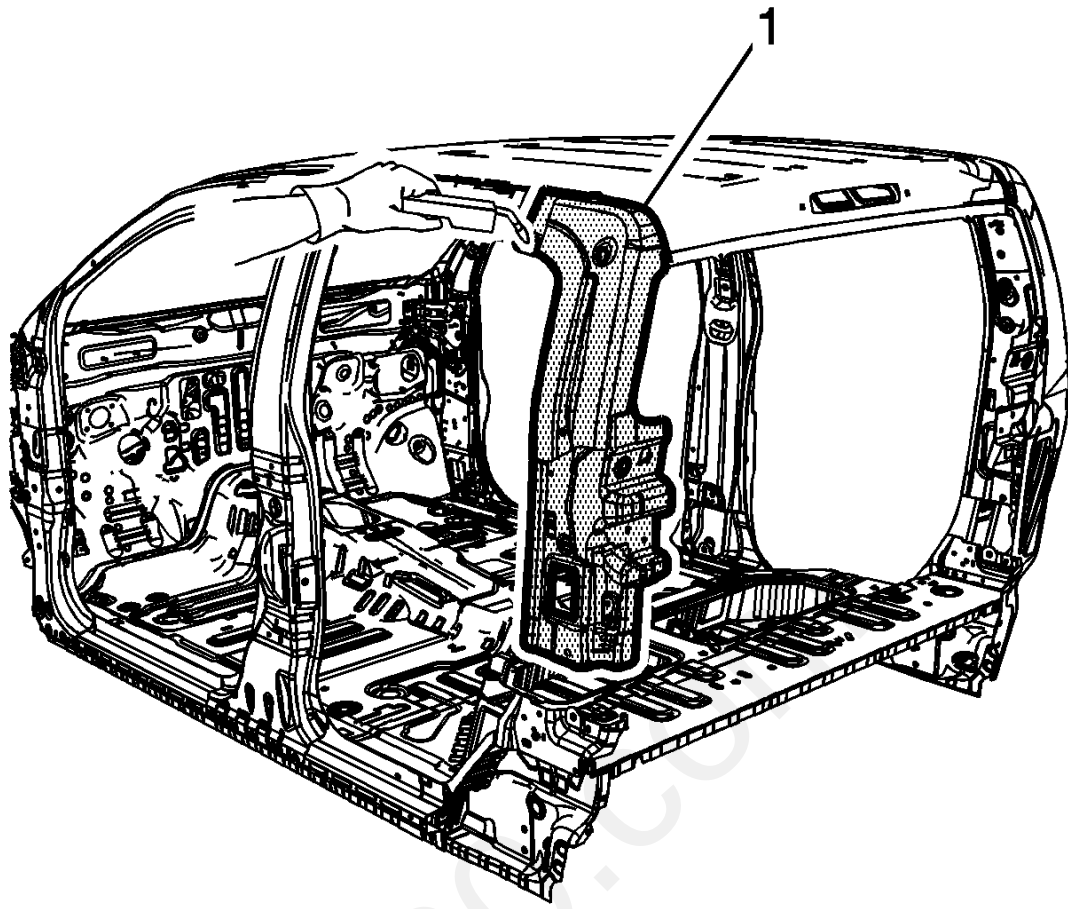


Fig. 96: Plug Welding

Courtesy of GENERAL MOTORS COMPANY

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](#) .

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

- ect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
2. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
 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](#) .

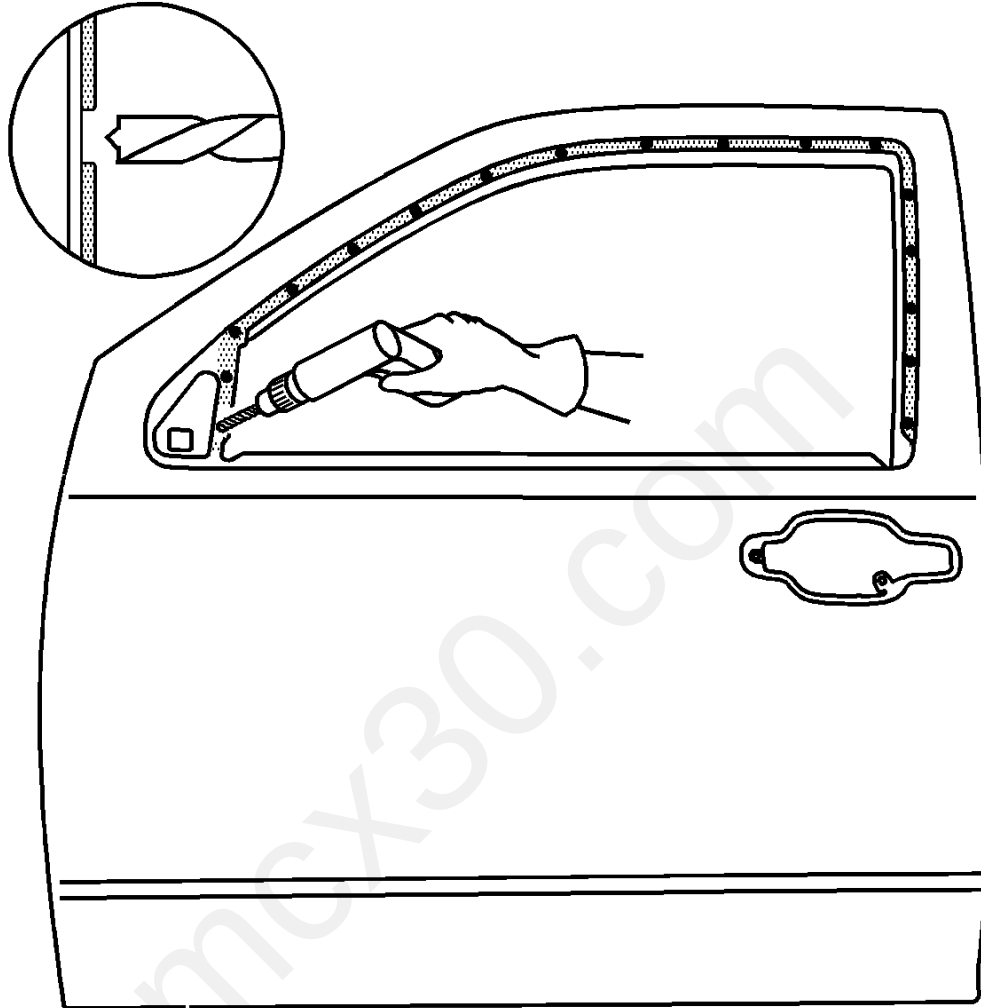


Fig. 97: Drilling Out Outer Front Door Panel Factory Welds
Courtesy of GENERAL MOTORS COMPANY

6. Locate and drill out all factory welds. Note the number and location of welds for installation of the service panel.

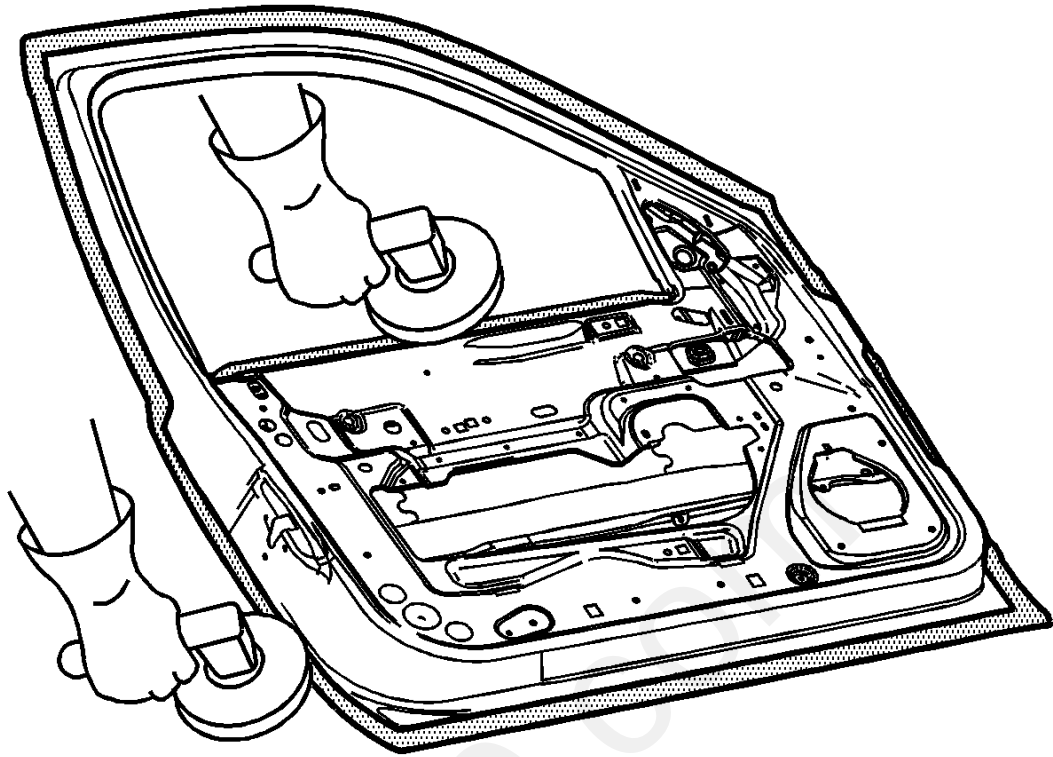


Fig. 98: Grinding Outer Door Panel Edges

Courtesy of GENERAL MOTORS COMPANY

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

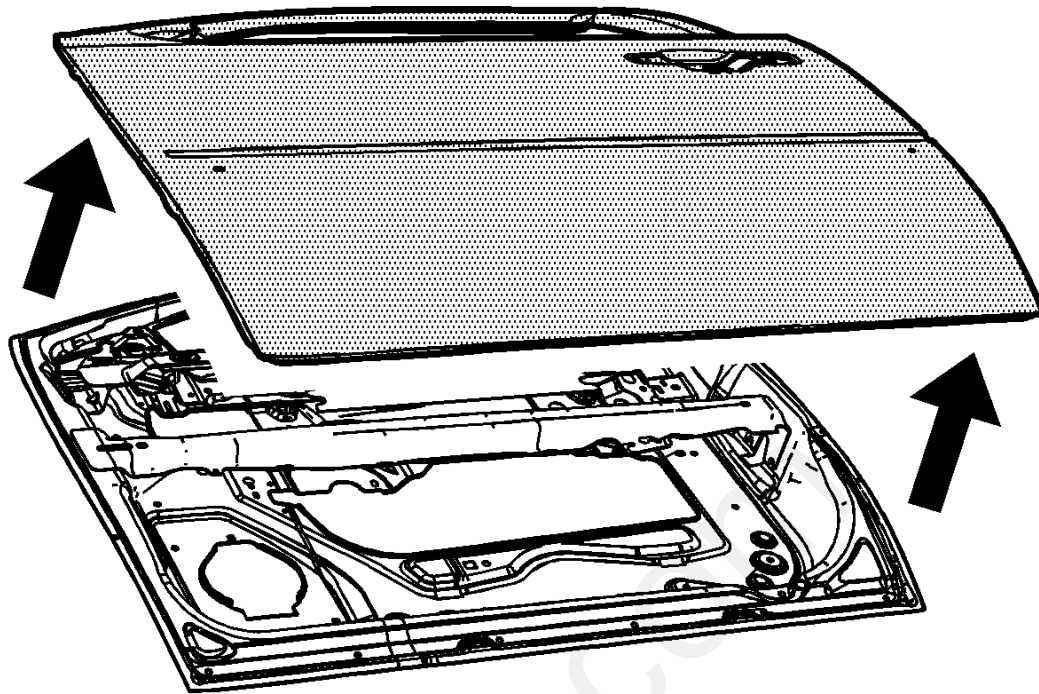


Fig. 99: View Of Outer Door Panel

Courtesy of GENERAL MOTORS COMPANY

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.
9. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#).
10. Straighten the edges of the door shell.

Installation Procedure

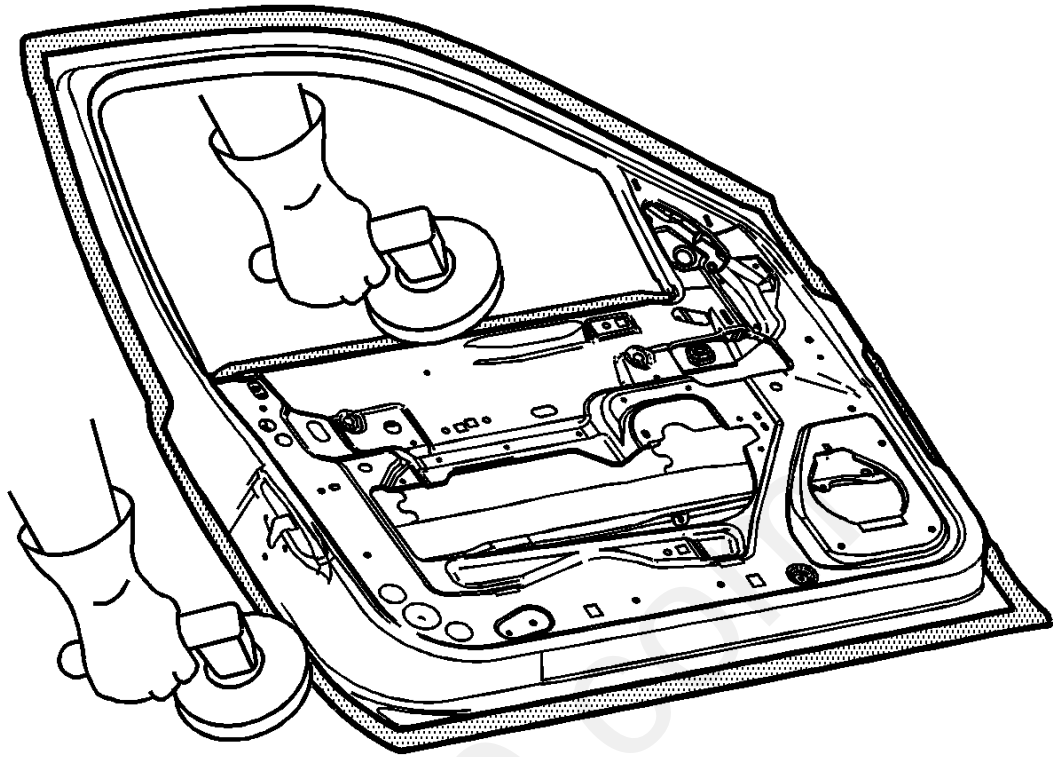


Fig. 100: Grinding Outer Door Panel Edges
Courtesy of GENERAL MOTORS COMPANY

1. Using a grinding disk grind the surface of the door shell mating flanges to bare steel.

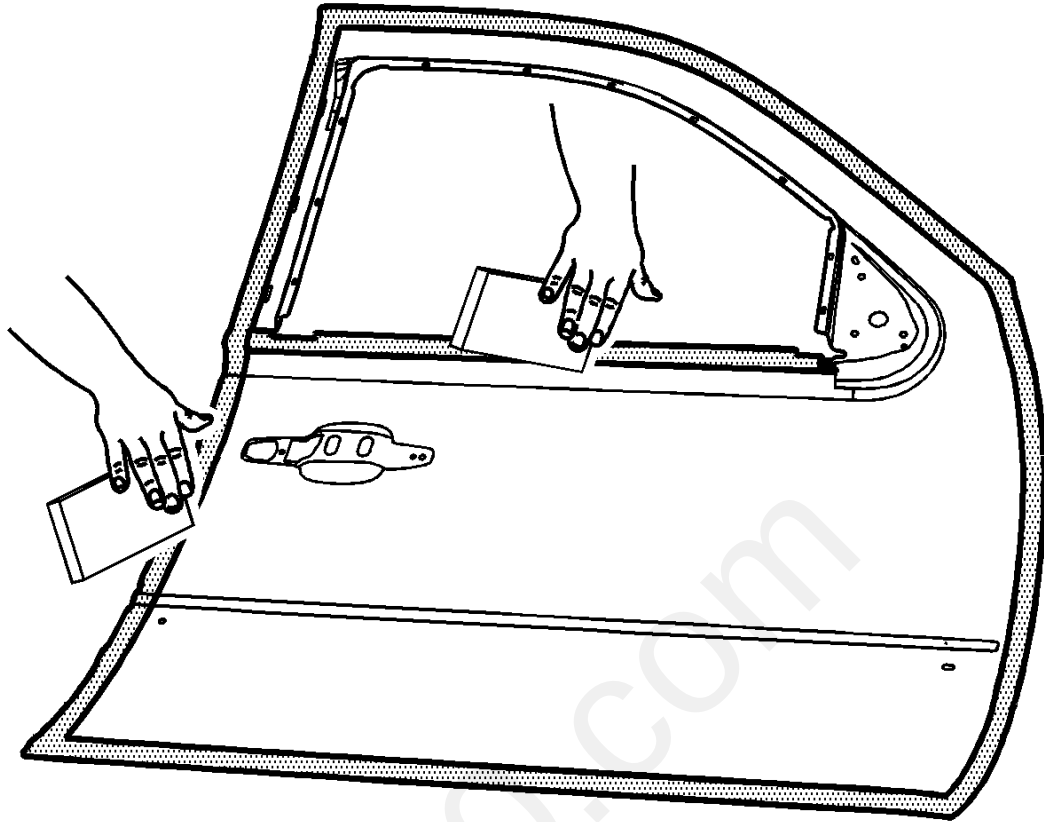


Fig. 101: Scuffing Mating Surfaces

Courtesy of GENERAL MOTORS COMPANY

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

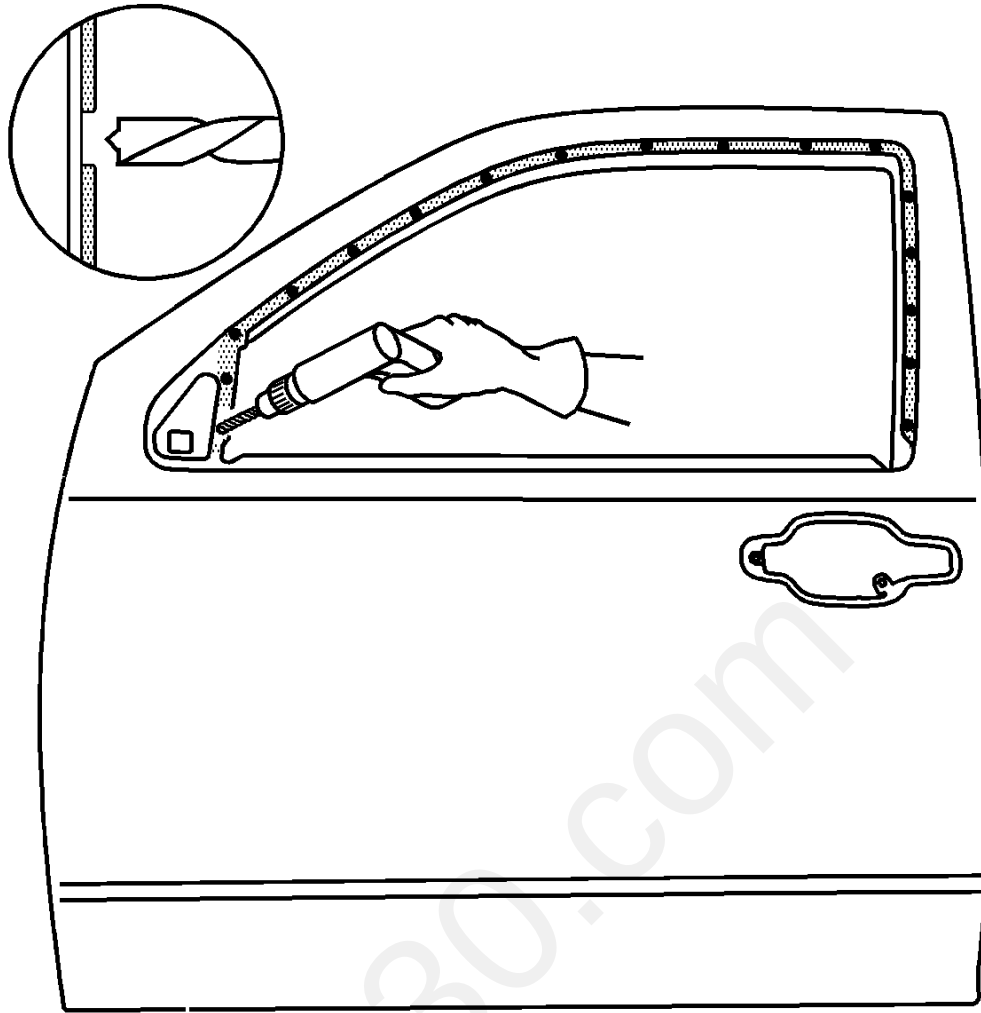


Fig. 102: Drilling Out Outer Front Door Panel Factory Welds

Courtesy of GENERAL MOTORS COMPANY

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

NOTE: In any area damaged beyond recognition, space plug weld holes every 40 mm (1 in) apart.

4. Clean the mating surfaces.

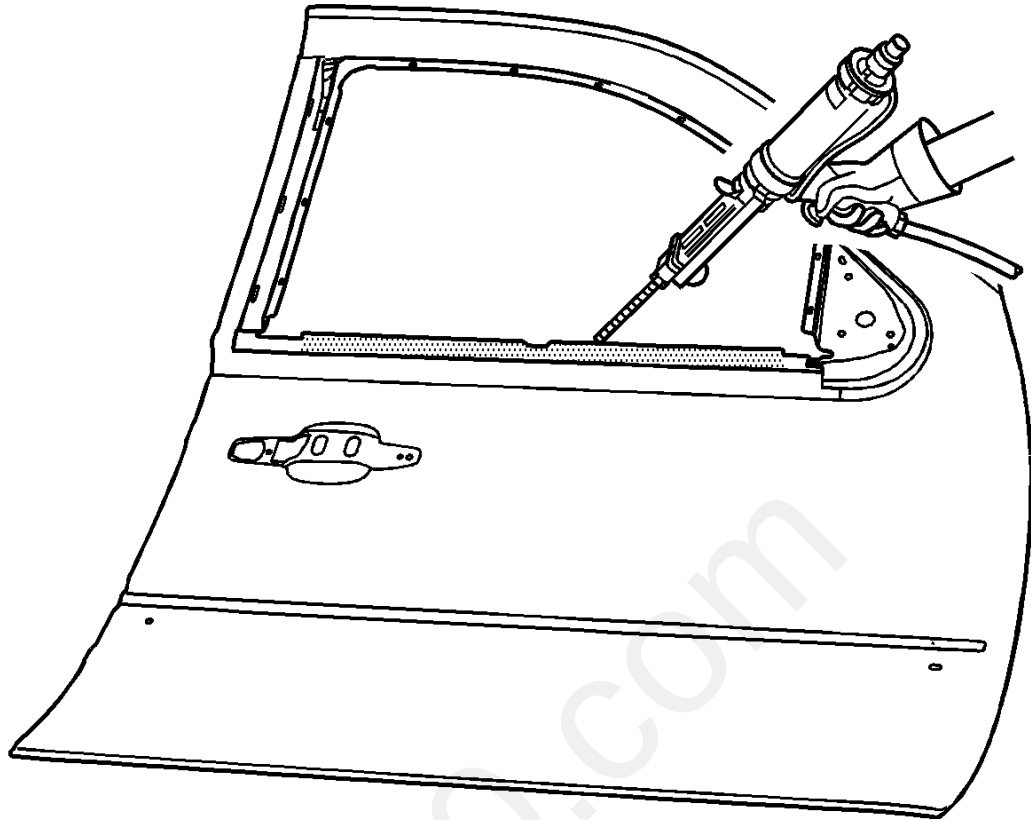


Fig. 103: Applying Panel Bonding Adhesive

Courtesy of GENERAL MOTORS COMPANY

NOTE: 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.
6. Using a small acid brush, spread a coat of adhesive to cover all the bare metal surfaces to ensure corrosion protection.
7. Apply a 9-13 mm (3/8-1/2 in) bead of metal bonding adhesive to the mating surfaces of the service panel.

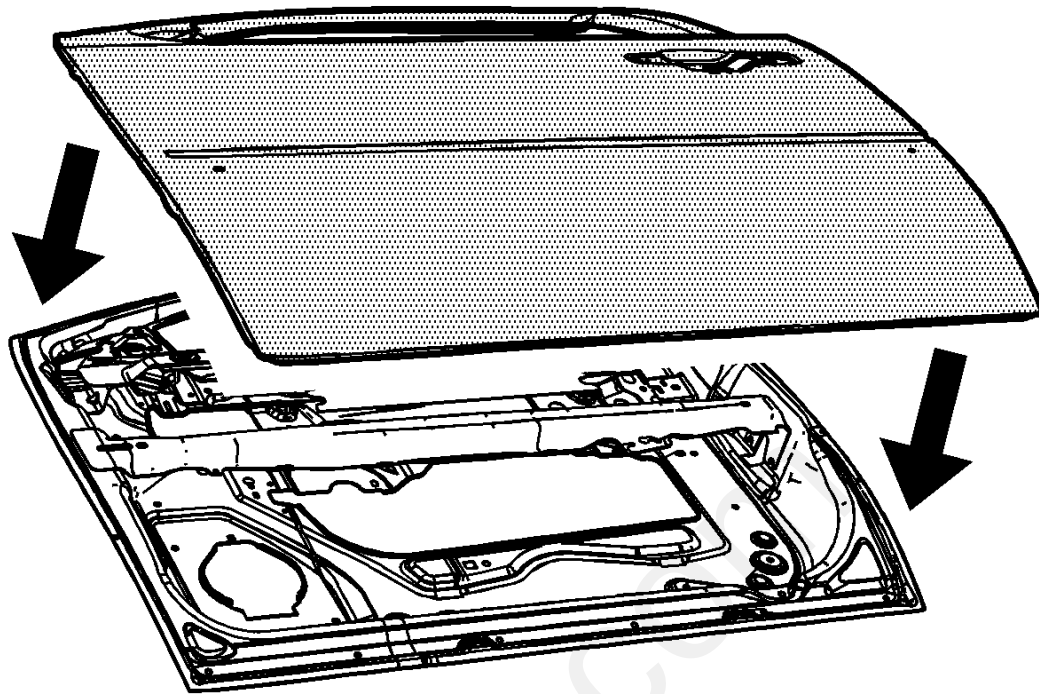


Fig. 104: View Of Outer Dood Panel

Courtesy of GENERAL MOTORS COMPANY

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

8. Install the door outer panel to the door shell.
9. Clamp the door outer panel into position, as required.

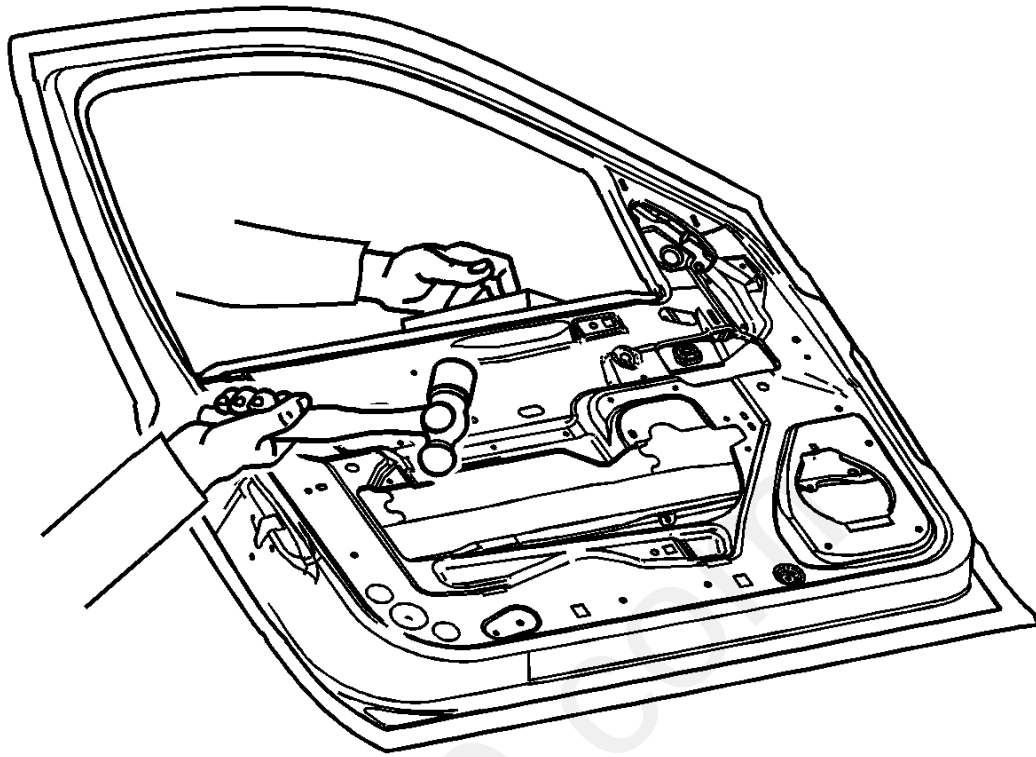


Fig. 105: Re-Hemming Hem Flanges

Courtesy of GENERAL MOTORS COMPANY

10. Using a hammer re-hem the hem flanges around the door shell.

Continue to hammer in stages along the hem flanges.

11. Using lacquer thinner remove the excess adhesive from the door panel area.

12. Install the door to the vehicle. Inspect the door outer panel for proper alignment; then adjust the alignment, as required. Refer to [**Front Side Door Replacement**](#) .

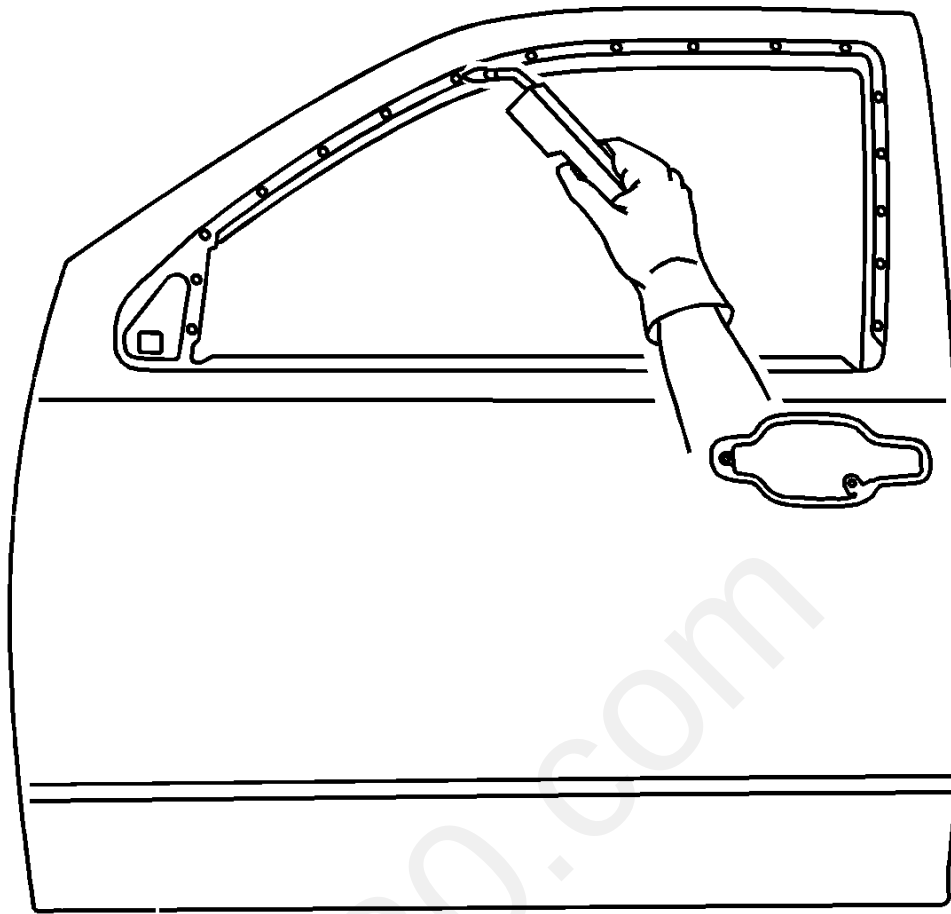


Fig. 106: Welding Outer Front Door Panel

Courtesy of GENERAL MOTORS COMPANY

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

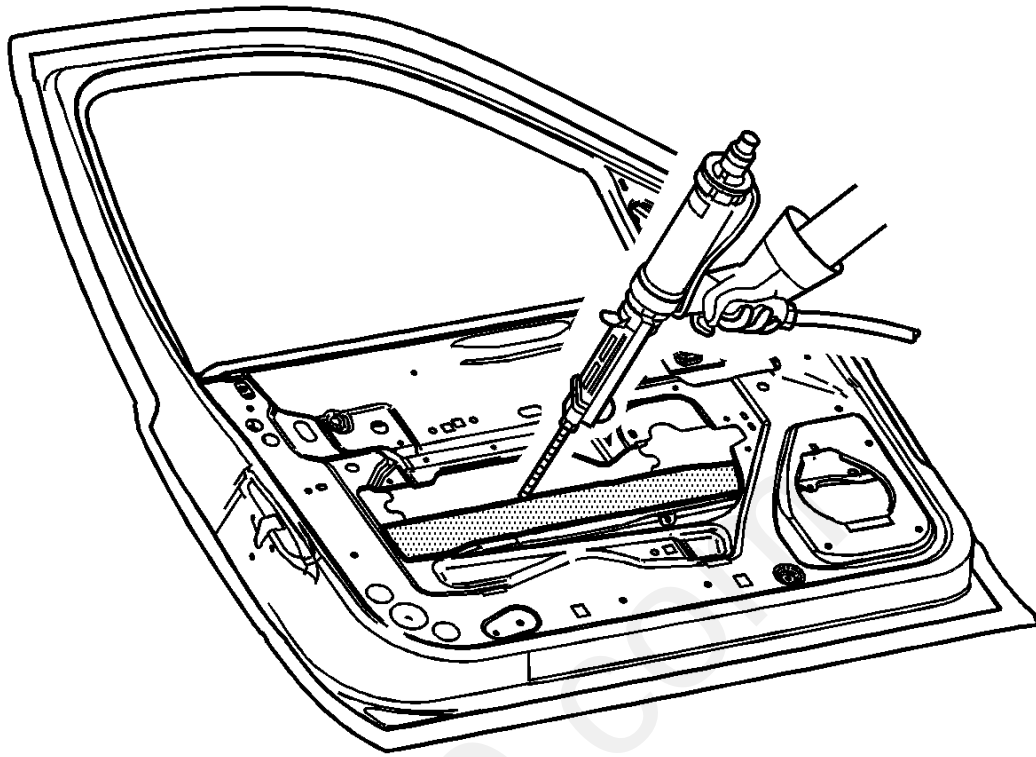


Fig. 107: Applying Anti-Flutter Foam

Courtesy of GENERAL MOTORS COMPANY

15. Apply Fusor super flexible anti-flutter foam-fast set, Fusor P/N 121/124, or equivalent, in a continuous bead the entire length between the beltline reinforcement and the door outer panel.
16. Apply Fusor super flexible anti-flutter foam-fast set, Fusor P/N 121/124, or equivalent, in a continuous bead the entire length between the door outer panel and the inner safety beam making multiple passes behind the side impact sensor portion of the beam as required to fill in any gaps.
17. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
18. Install all related panels and components.
19. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .
20. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .

REAR SIDE DOOR OUTER PANEL REPLACEMENT (EXTENDED CAB)

Removal Procedure

WARNING: Refer to [Approved Equipment for Collision Repair Warning](#) .

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

- ect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
2. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
 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 side door assembly. Refer to [Rear Side Door Replacement \(Extended Cab\)](#) .

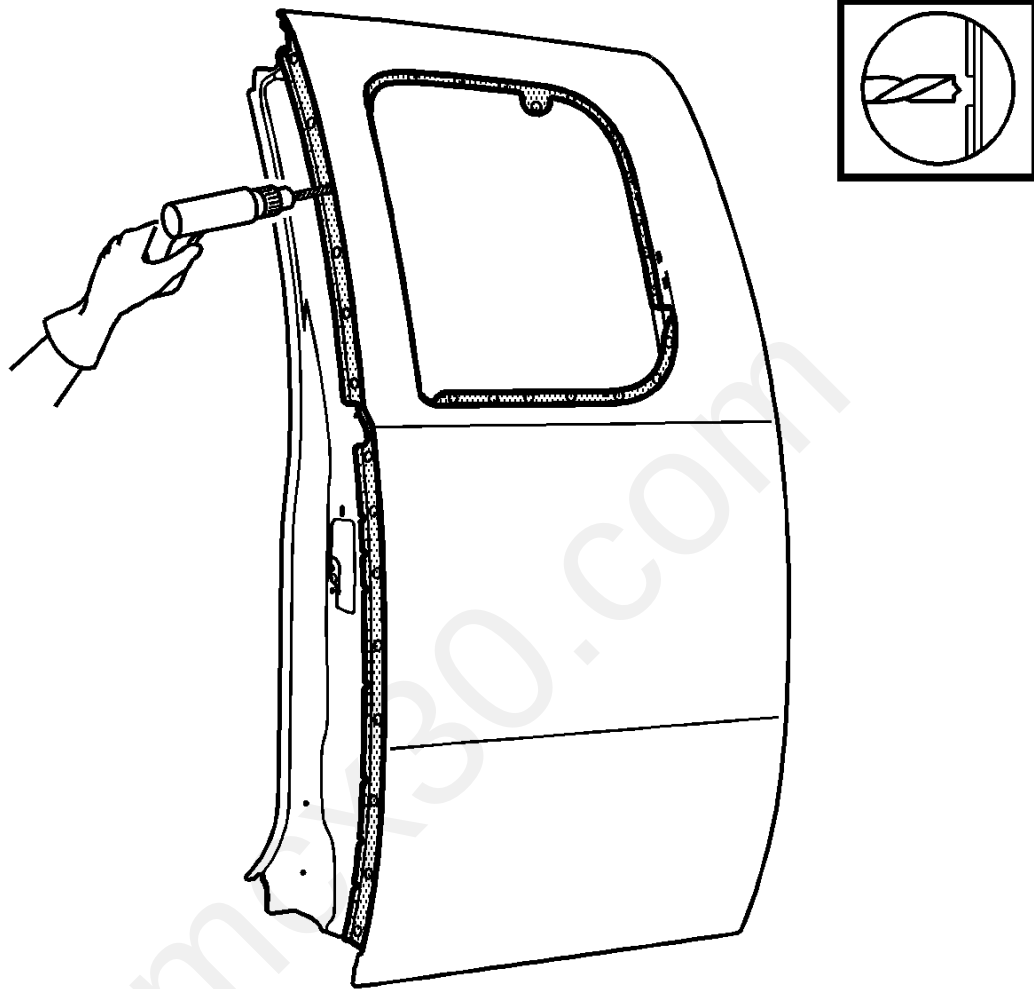


Fig. 108: Drilling Out Factory Welds

Courtesy of GENERAL MOTORS COMPANY

6. Locate and drill out all factory welds. Note the number and location of welds for the installation of the service panel.

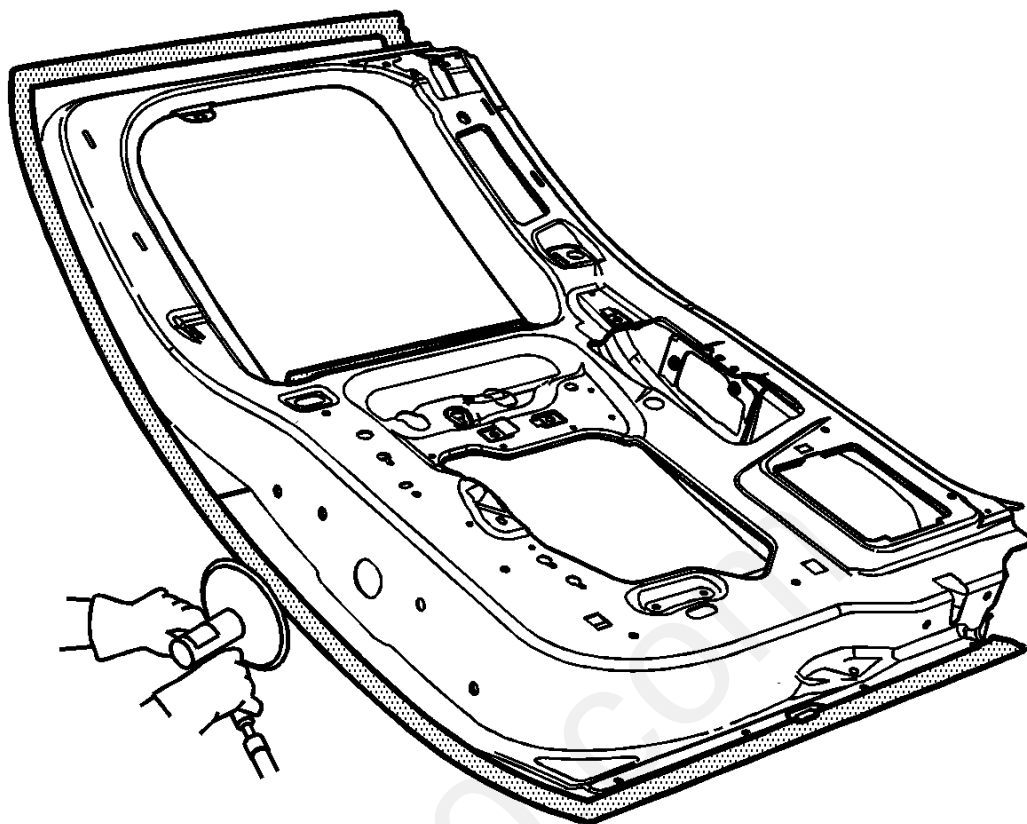


Fig. 109: Grinding Edges Of Outer Door Panel

Courtesy of GENERAL MOTORS COMPANY

NOTE: Remove the hem flange at the upper belt reinforcement.

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

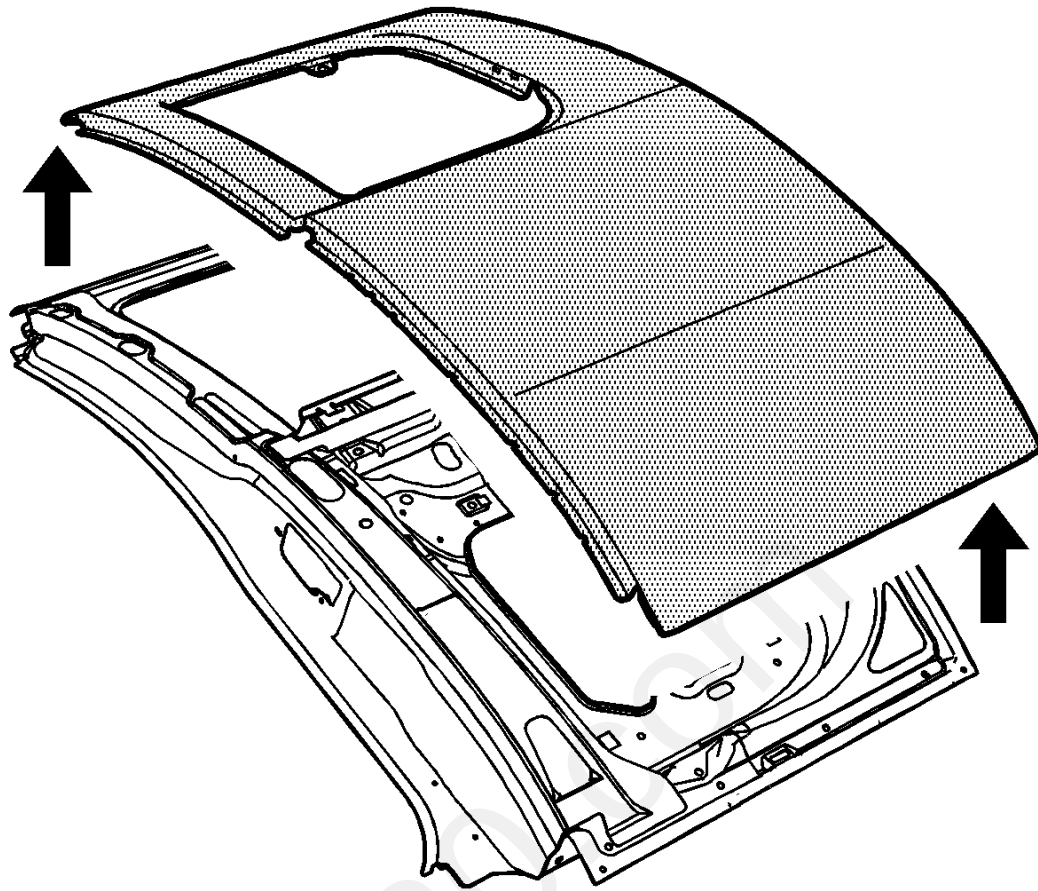


Fig. 110: View Of Outer Door Panel
Courtesy of GENERAL MOTORS COMPANY

8. Remove the outer door panel.
9. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
10. Straighten the edges of the door shell.

Installation Procedure

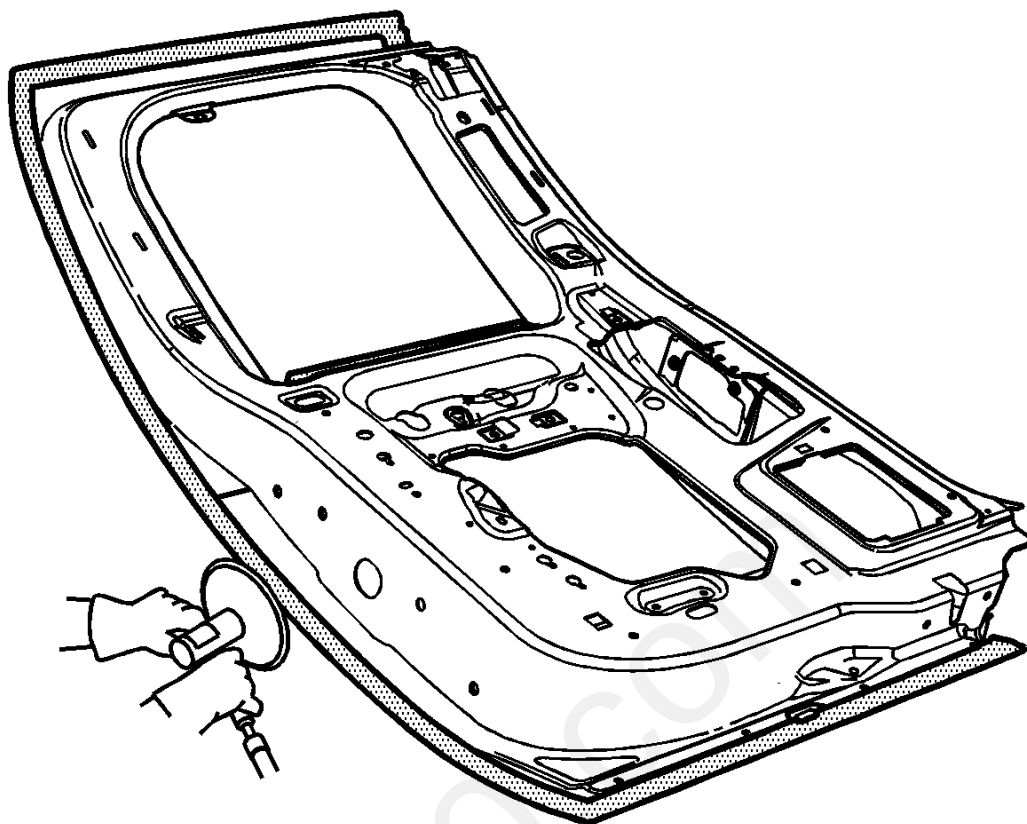


Fig. 111: Grinding Edges Of Outer Door Panel
Courtesy of GENERAL MOTORS COMPANY

1. Using a grinding disk grind the surface of the door shell mating flanges to bare steel.

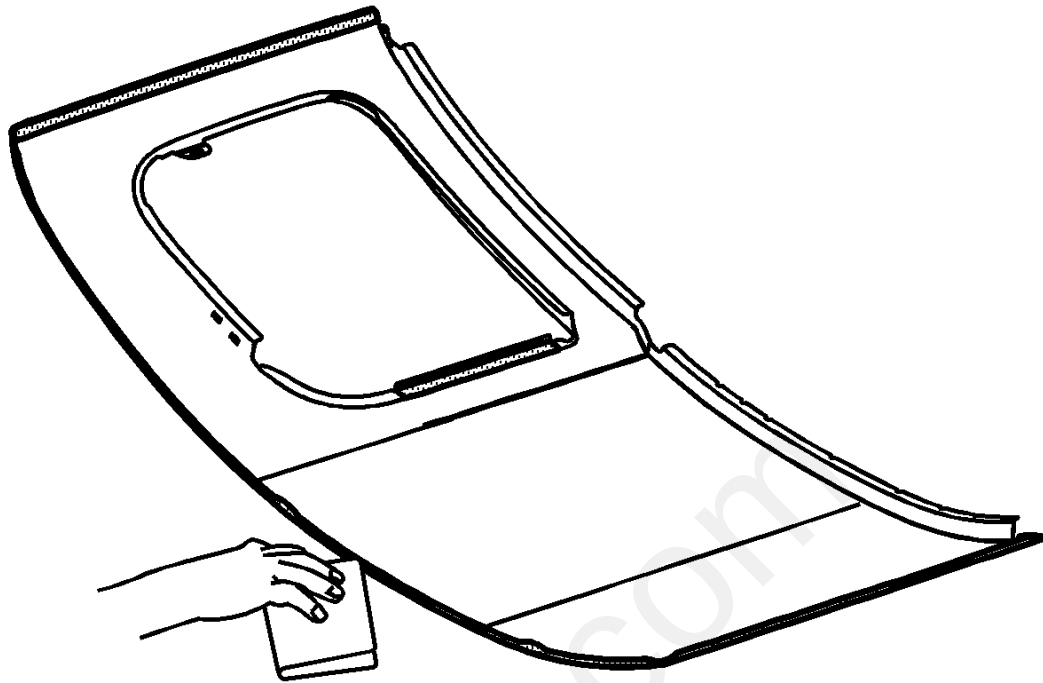


Fig. 112: Scuffing Outer Door Panel Mating Surfaces

Courtesy of GENERAL MOTORS COMPANY

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

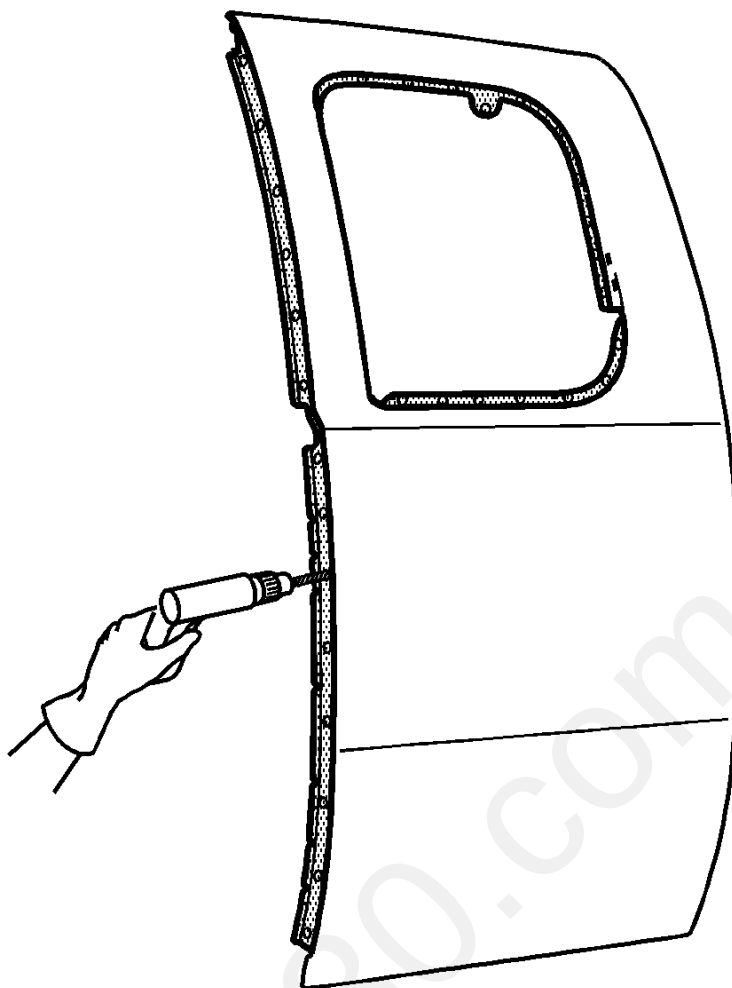


Fig. 113: Drilling Plug Weld Holes

Courtesy of GENERAL MOTORS COMPANY

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

NOTE: In any area damaged beyond recognition, space plug weld holes every 40 mm (1 in) apart.

4. Clean the mating surfaces.

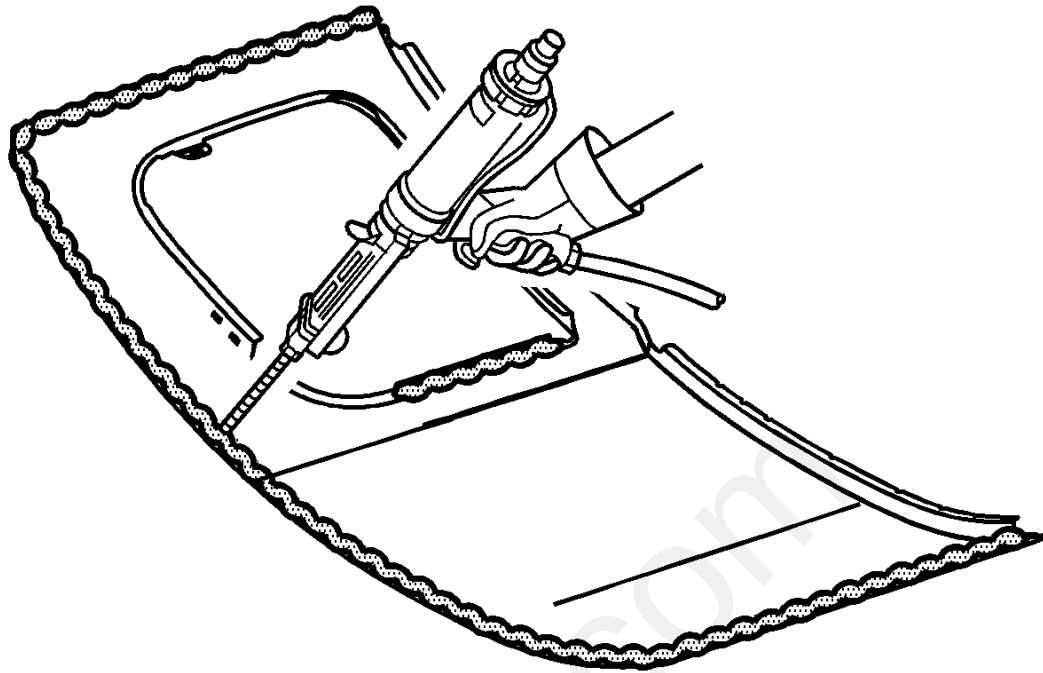


Fig. 114: Applying Metal Panel Bonding Adhesive

Courtesy of GENERAL MOTORS COMPANY

NOTE: 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.
6. Using a small acid brush, spread a coat of adhesive to cover all the bare metal surfaces to ensure corrosion protection.
7. Apply a 9-13 mm (3/8-1/2 in) bead of metal bonding adhesive to the mating surfaces of the service panel.

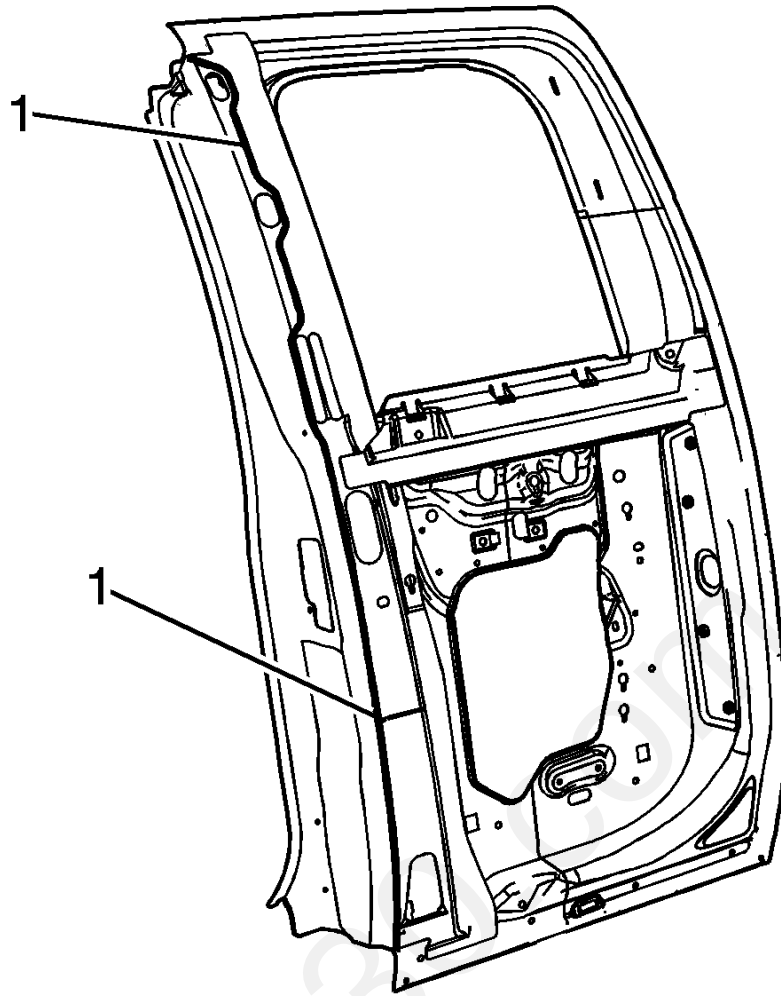


Fig. 115: Applying Metal Bonding Adhesive
Courtesy of GENERAL MOTORS COMPANY

8. Apply a 3-6 mm (1/8-1/4 in) bead of metal bonding adhesive along the front portion of the door shell (1).

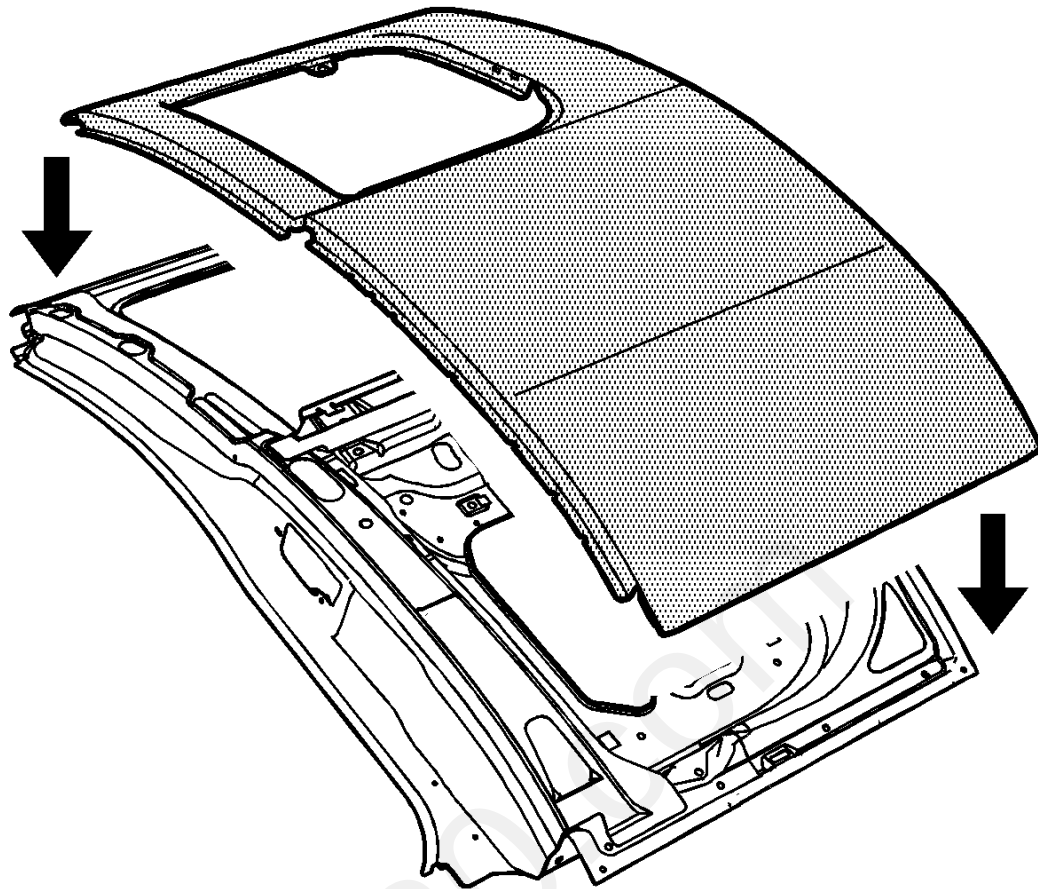


Fig. 116: View Of Outer Door Panel
Courtesy of GENERAL MOTORS COMPANY

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

9. Install the door outer panel to the door shell.
10. Clamp the door outer panel into position, as required.

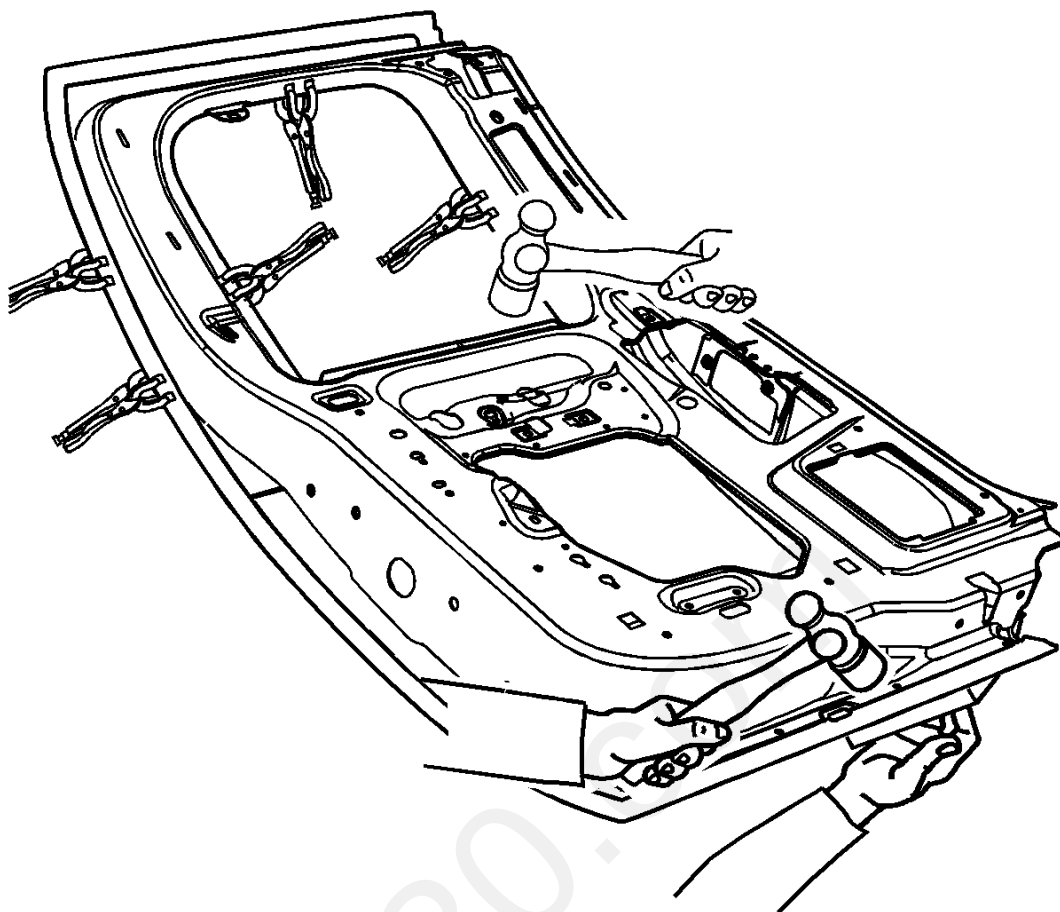


Fig. 117: Re-Hemming Hem Flanges

Courtesy of GENERAL MOTORS COMPANY

11. Using a hammer re-hem the hem flanges around the door shell.

Continue to hammer in stages along the hem flanges.

12. Remove the excess adhesive from the door panel area.
13. Install the side door to the vehicle. Inspect the door outer panel for proper alignment; then adjust the alignment, as required. Refer to [Rear Side Door Replacement \(Extended Cab\)](#).

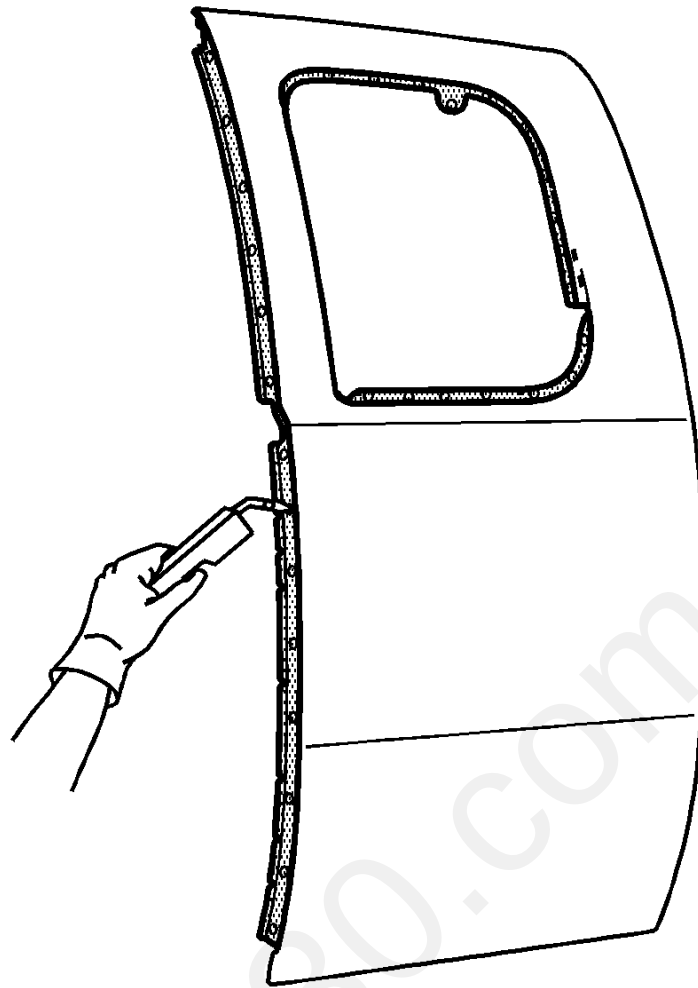


Fig. 118: MIG Welding Outer Door Panel
Courtesy of GENERAL MOTORS COMPANY

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

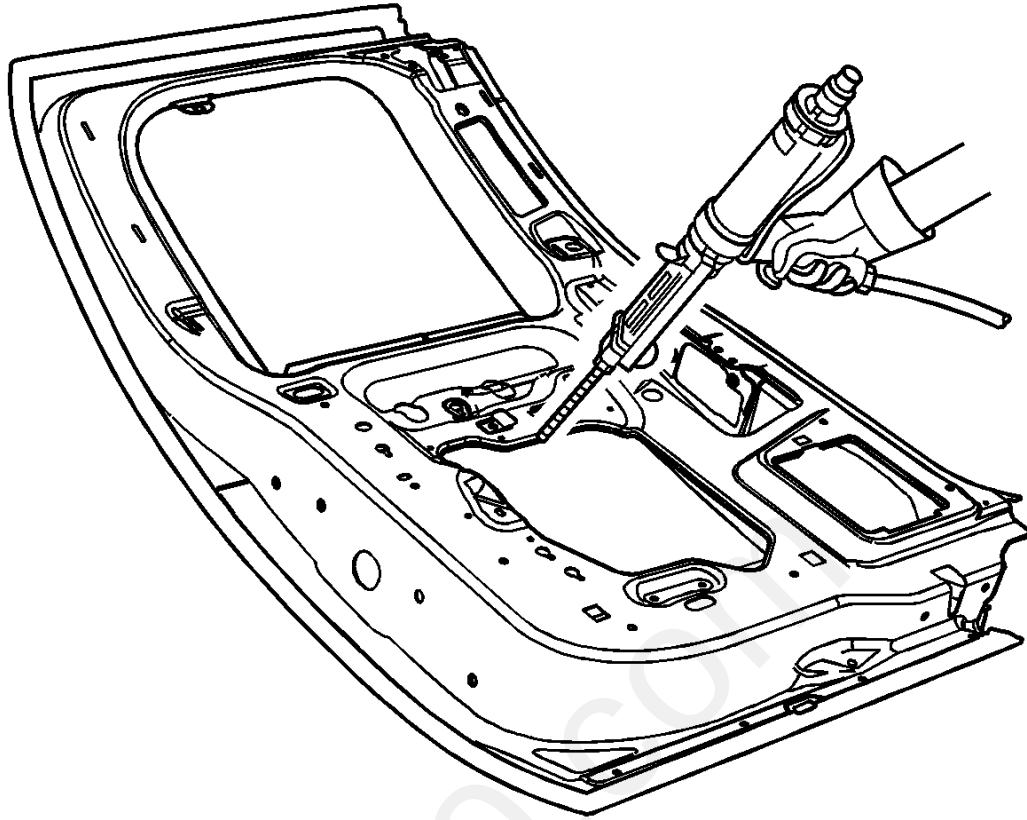


Fig. 119: Applying Anti-Flutter Foam

Courtesy of GENERAL MOTORS COMPANY

16. Apply Fusor super flexible anti-flutter foam-fast set, Fusor P/N 121/124, or equivalent, in a continuous bead the entire length between the beltline reinforcement and the door outer panel.
17. Apply Fusor super flexible anti-flutter foam-fast set, Fusor P/N 121/124, or equivalent, in a continuous bead the entire length between the door outer panel and the inner safety beam making multiple passes behind the side impact sensor portion of the beam as required to fill in any gaps.
18. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
19. Install all related panels and components.
20. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .
21. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .

REAR SIDE DOOR OUTER PANEL REPLACEMENT (CREW CAB)

Removal Procedure

WARNING: Refer to [Approved Equipment for Collision Repair Warning](#) .

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

- ect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
2. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .
 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 side door assembly. Refer to [Rear Side Door Replacement \(Crew Cab\)](#) .

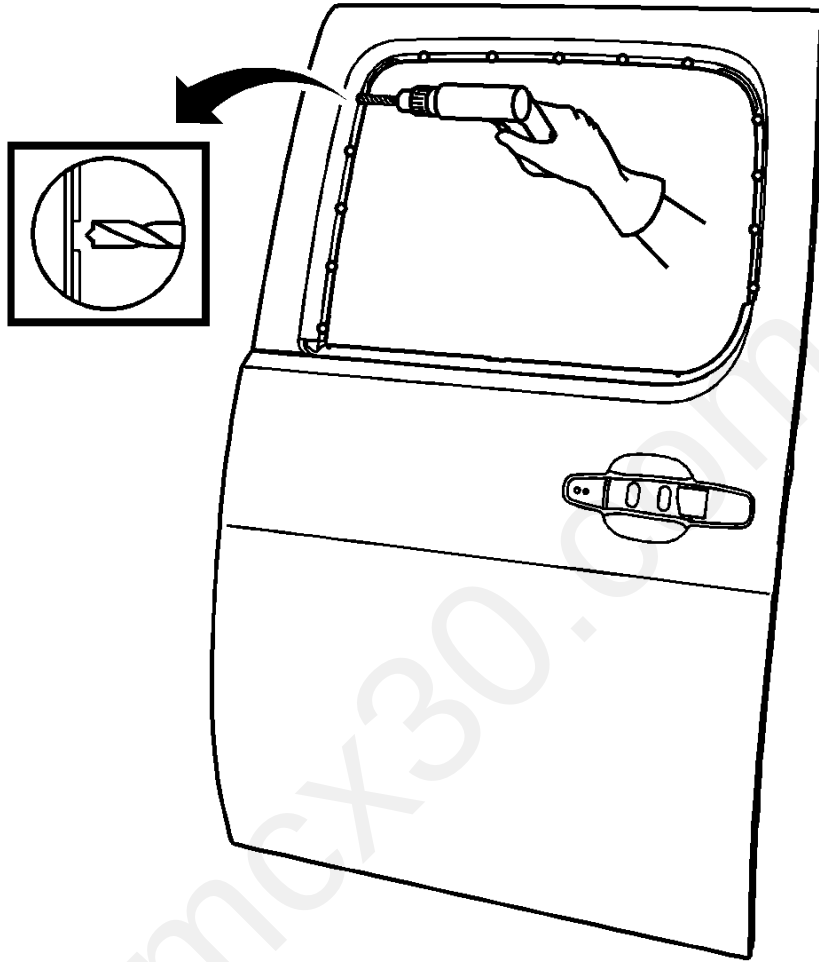


Fig. 120: Drilling Out Factory Welds

Courtesy of GENERAL MOTORS COMPANY

6. Locate and drill out all factory welds. Note the number and location of welds for the installation of the service panel.

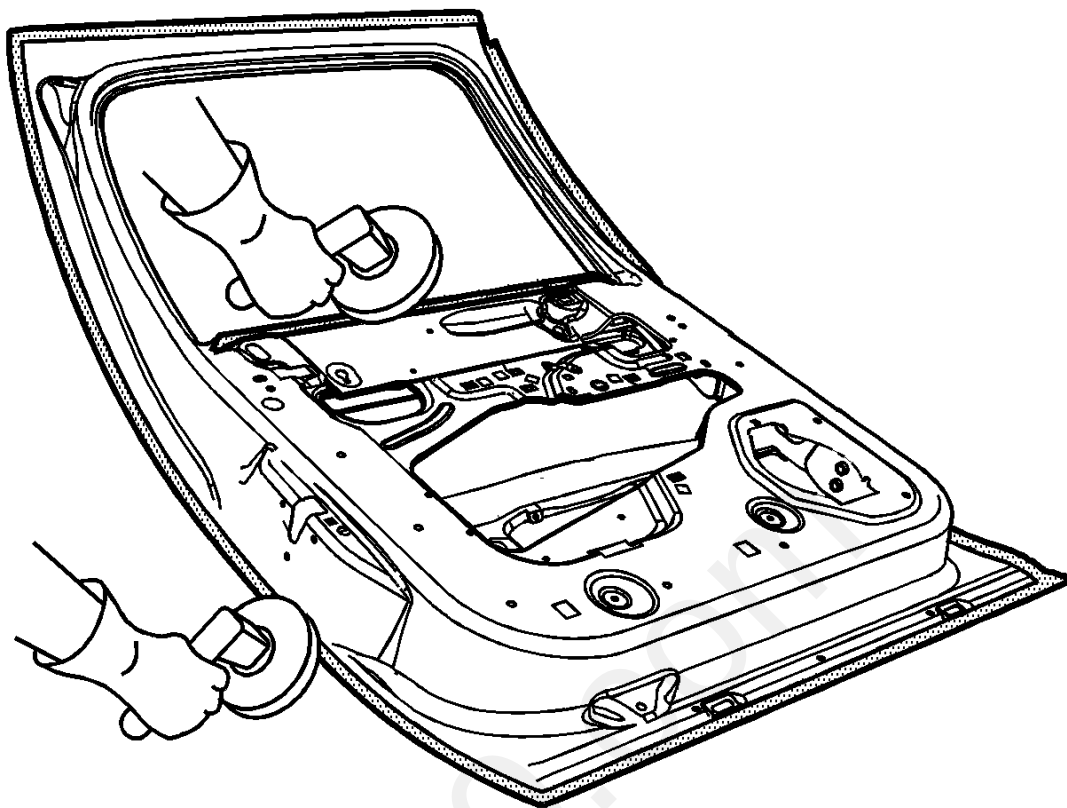


Fig. 121: Grinding Outer Door Panel Edges
Courtesy of GENERAL MOTORS COMPANY

NOTE: Remove the hem flange at the upper belt reinforcement.

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

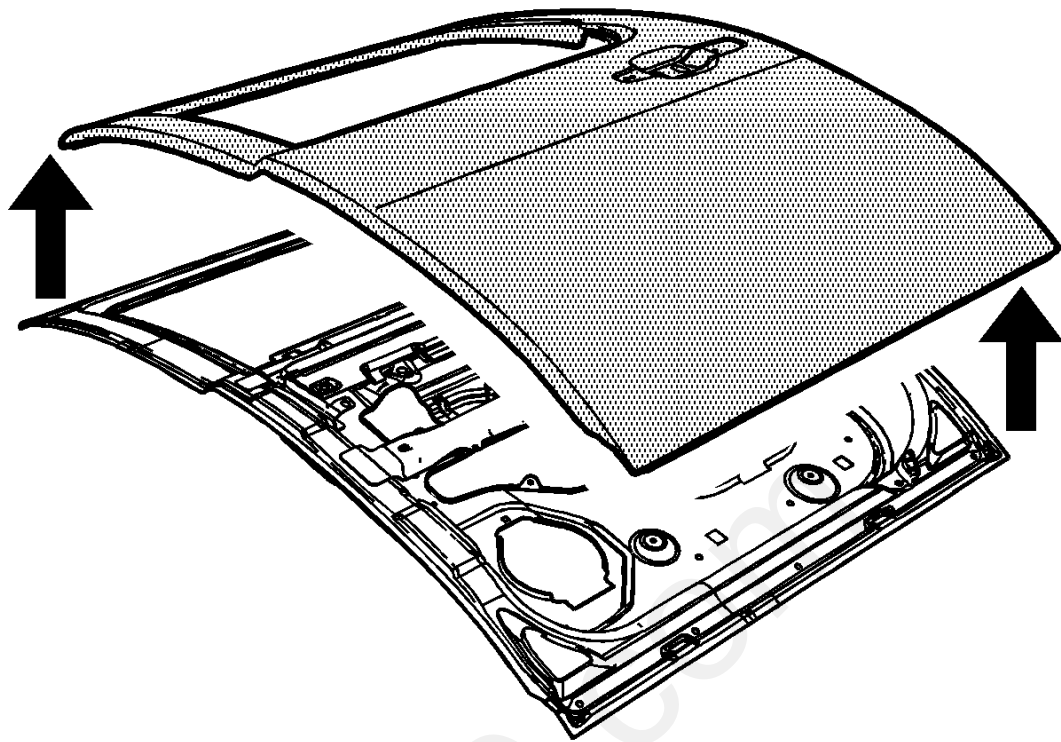


Fig. 122: View Of Outer Door Panel
Courtesy of GENERAL MOTORS COMPANY

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.
9. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
10. Straighten the edges of the door shell.

Installation Procedure

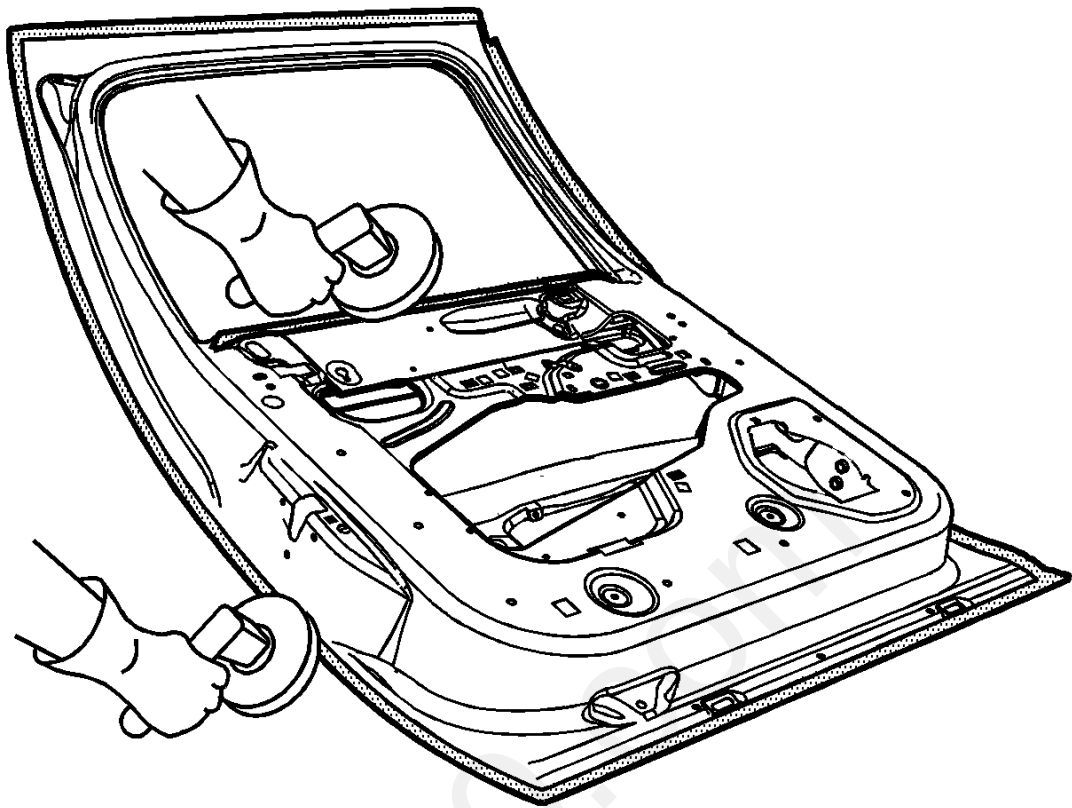


Fig. 123: Grinding Outer Door Panel Edges
Courtesy of GENERAL MOTORS COMPANY

1. Using a grinding disk grind the surface of the door shell mating flanges to bare steel.

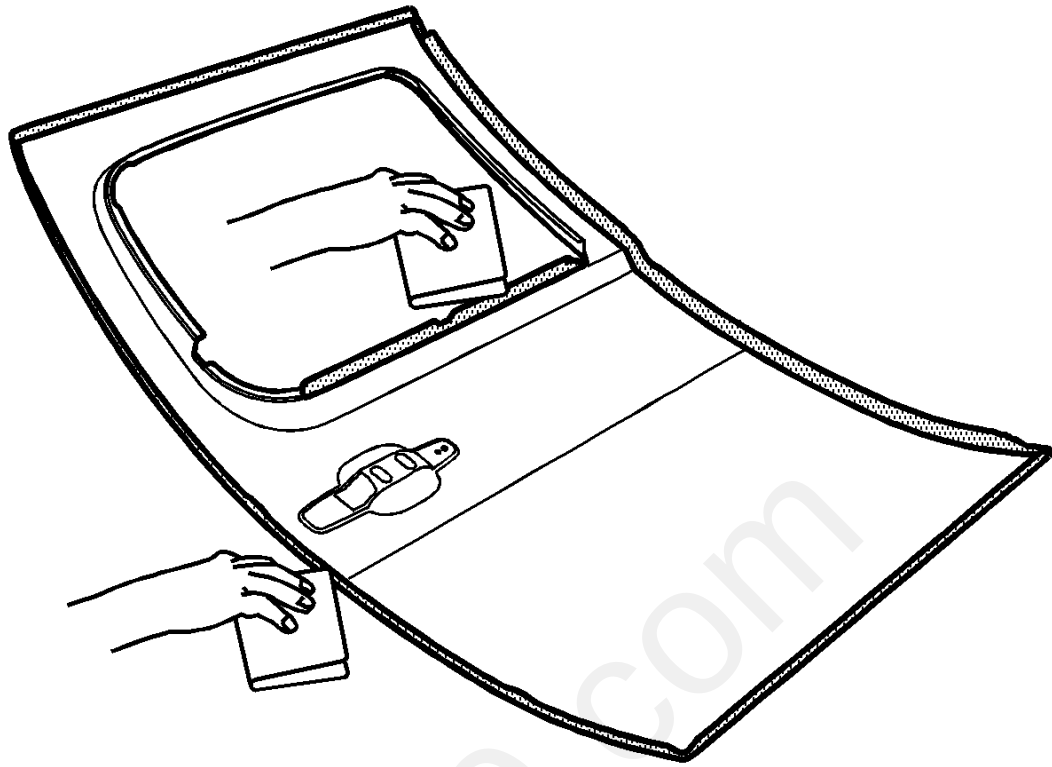


Fig. 124: Scuffing Mating Surfaces

Courtesy of GENERAL MOTORS COMPANY

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

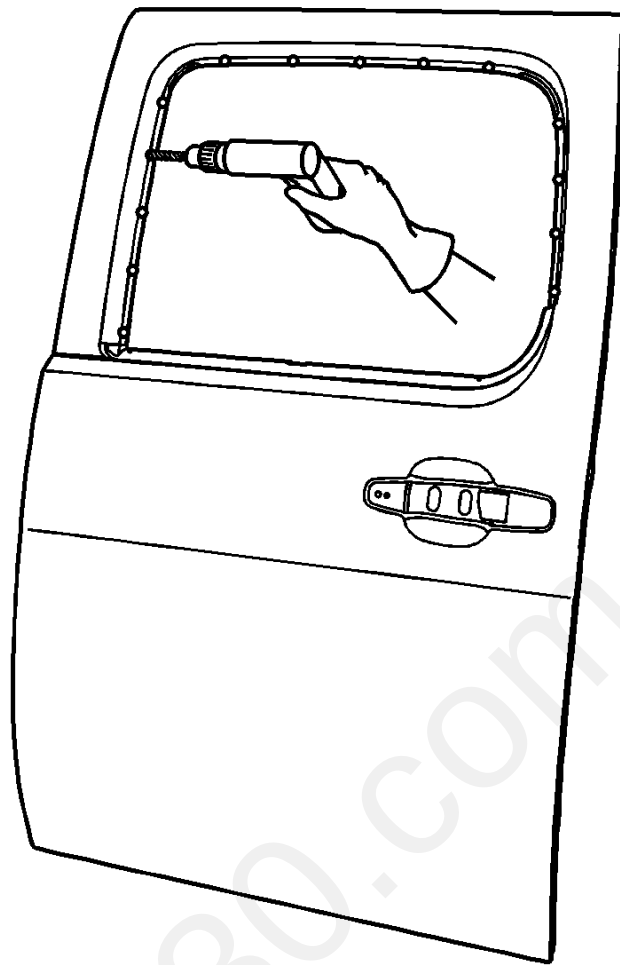


Fig. 125: Drilling Plug Weld Holes
Courtesy of GENERAL MOTORS COMPANY

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

NOTE: In any area damaged beyond recognition, space plug weld holes every 40 mm (1 in) apart.

4. Clean the mating surfaces.

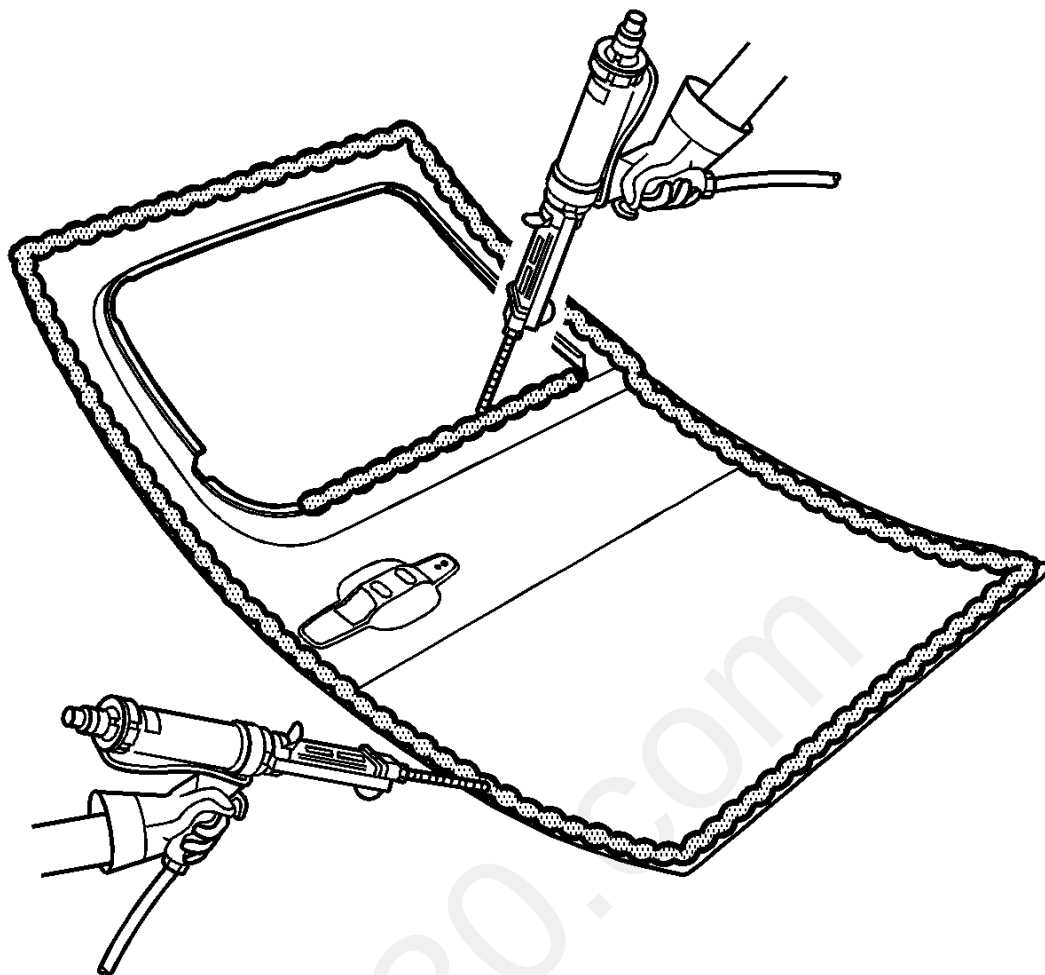


Fig. 126: Applying Metal Panel Bonding

Courtesy of GENERAL MOTORS COMPANY

NOTE: 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.
6. Using a small acid brush, spread a coat of adhesive to cover all the bare metal surfaces to ensure corrosion protection.
7. Apply a 9-13 mm (3/8-1/2 in) bead of metal bonding adhesive to the mating surfaces of the service panel.

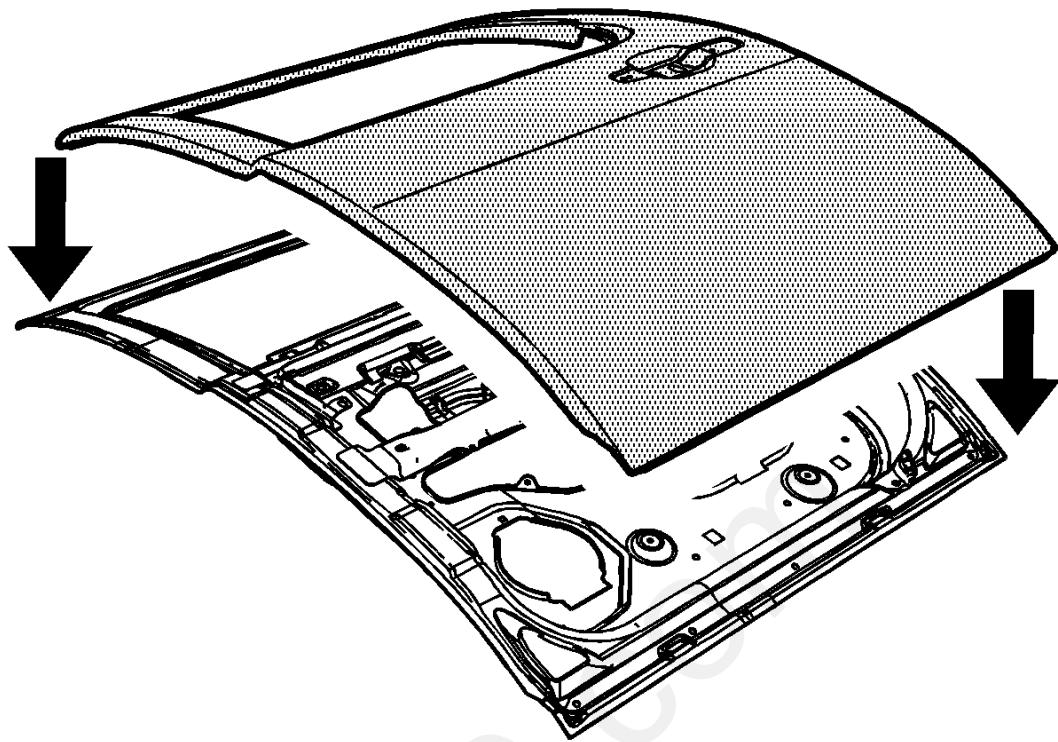


Fig. 127: View Of Outer Door Panel

Courtesy of GENERAL MOTORS COMPANY

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

8. Install the door outer panel to the door shell.
9. Clamp the door outer panel into position, as required.

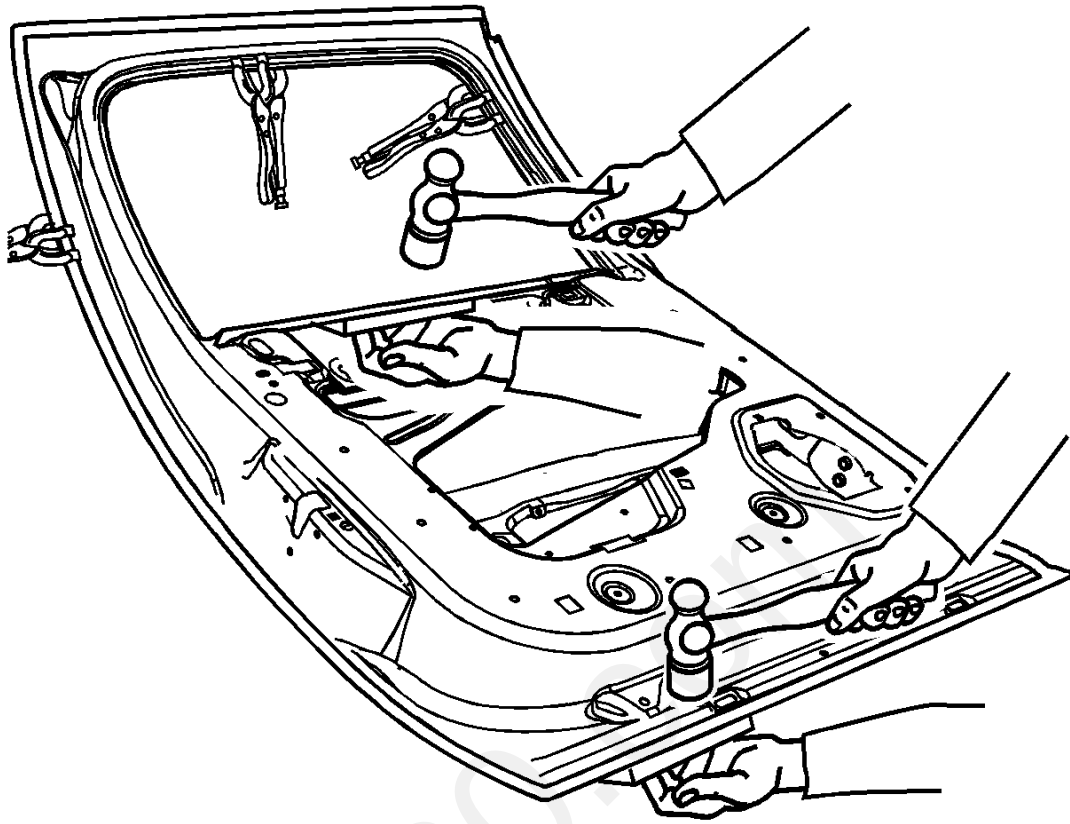


Fig. 128: Re-Hemming Hem Flanges

Courtesy of GENERAL MOTORS COMPANY

10. Using a hammer re-hem the hem flanges around the door shell.

Continue to hammer in stages along the hem flanges.

11. Remove the excess adhesive from the door panel area.

12. Install the rear side door to the vehicle. Inspect the door outer panel for proper alignment; then adjust the alignment, as required. Refer to **Rear Side Door Replacement (Crew Cab)** .

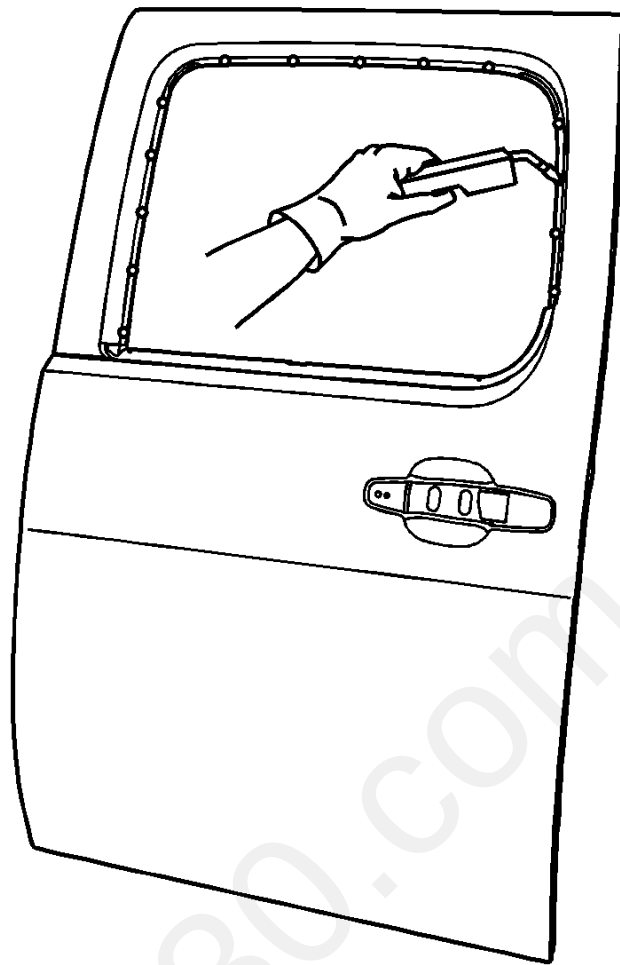


Fig. 129: MIG Welding Outer Door Panel
Courtesy of GENERAL MOTORS COMPANY

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

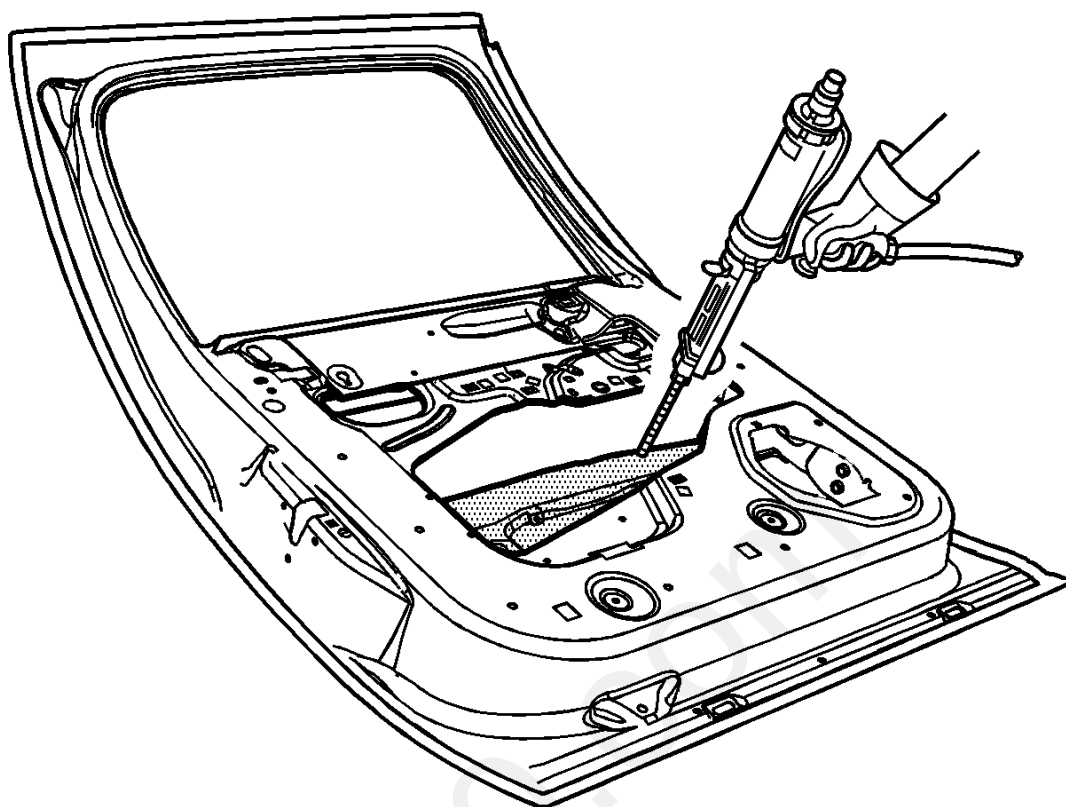


Fig. 130: Applying Anti-Flutter Foam
Courtesy of GENERAL MOTORS COMPANY

15. Apply Fusor super flexible anti-flutter foam-fast set, Fusor P/N 121/124, or equivalent, in a continuous bead the entire length between the beltline reinforcement and the door outer panel.
16. Apply Fusor super flexible anti-flutter foam-fast set, Fusor P/N 121/124, or equivalent, in a continuous bead the entire length between the door outer panel and the inner safety beam making multiple passes behind the side impact sensor portion of the beam as required to fill in any gaps.
17. Paint the repaired area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
18. Install all related panels and components.
19. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .
20. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .

RADIATOR SUPPORT REPLACEMENT

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](#) .

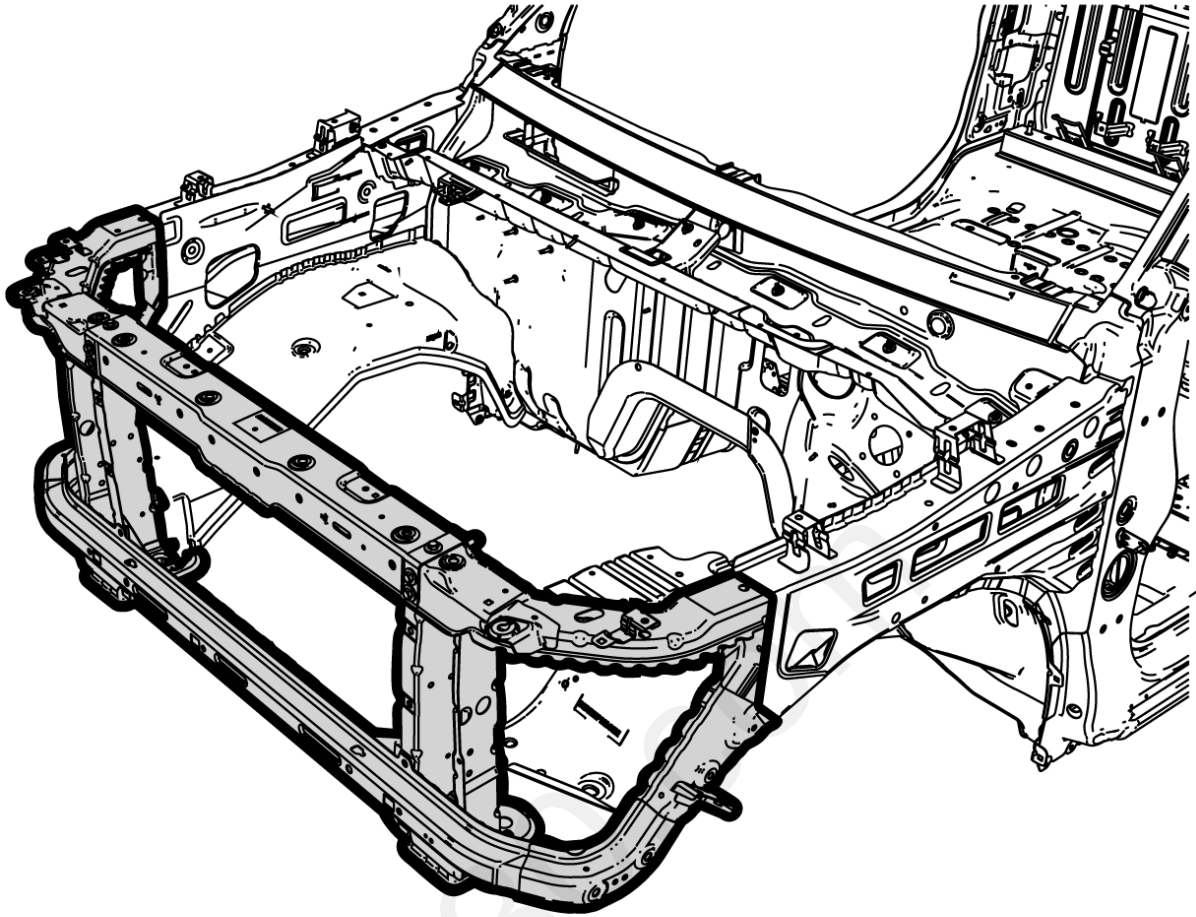


Fig. 131: Panels And Components

Courtesy of GENERAL MOTORS COMPANY

3. Remove all related panels and components.
4. Restore 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 welds for installation of the radiator support.

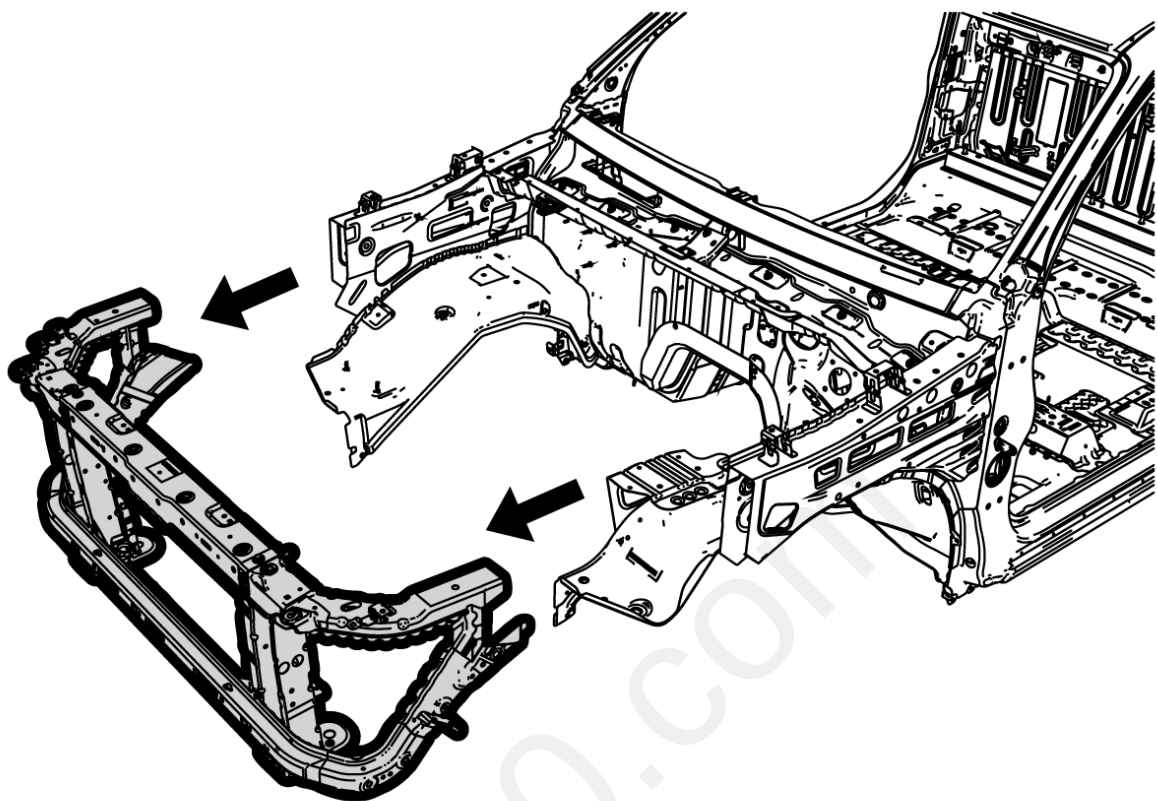


Fig. 132: Damaged Radiator Support

Courtesy of GENERAL MOTORS COMPANY

7. Remove the damaged radiator support.

Installation Procedure

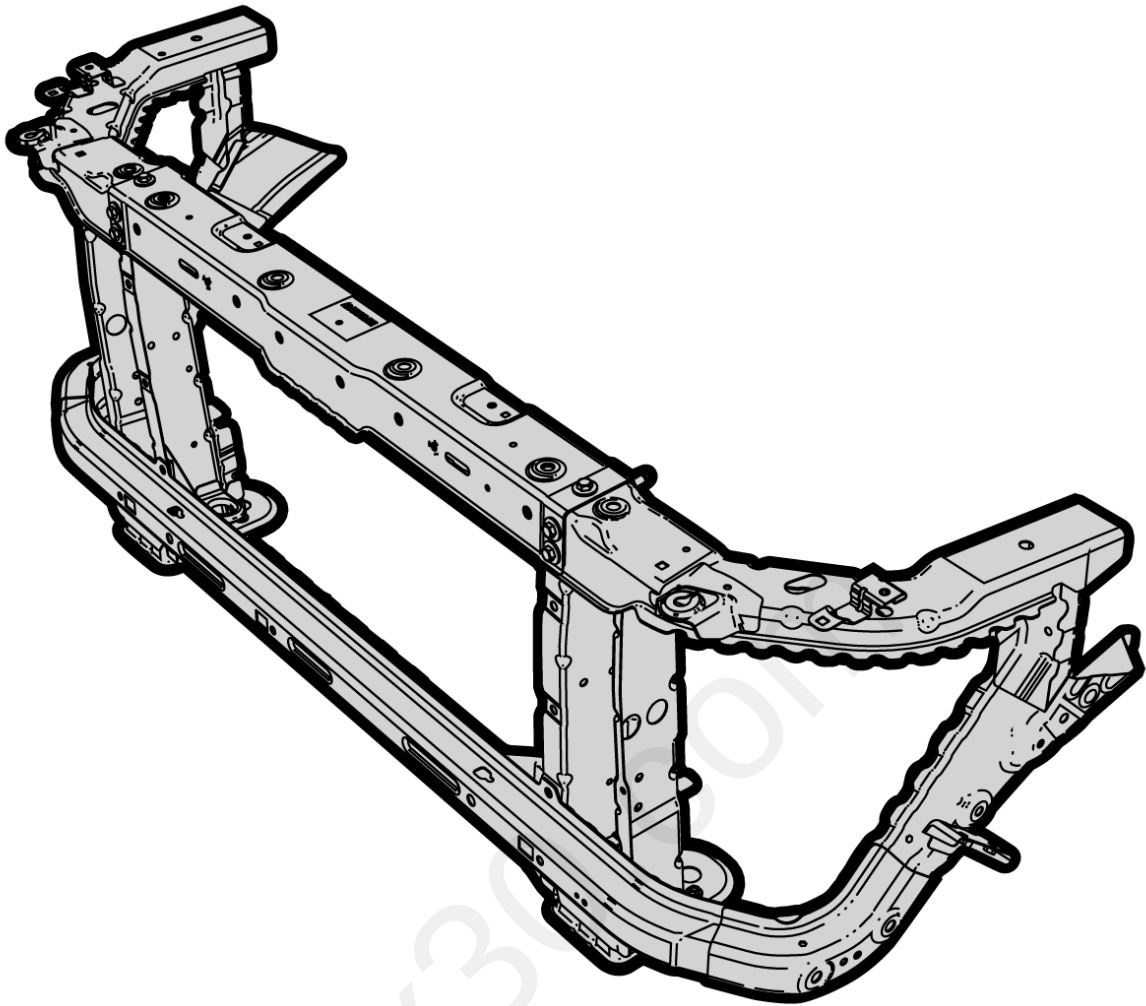


Fig. 133: Drilling 8 mm (5/16 in) Plug Weld Holes

Courtesy of GENERAL MOTORS COMPANY

NOTE: 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.

1. Drill 8 mm (5/16 in) plug weld holes as necessary in locations noted from the original panel.
2. Prepare all mating surfaces as necessary.
3. Apply Weld-Thru coating or equivalent to all mating surfaces. Refer to [Anti-Corrosion Treatment and Repair](#) .

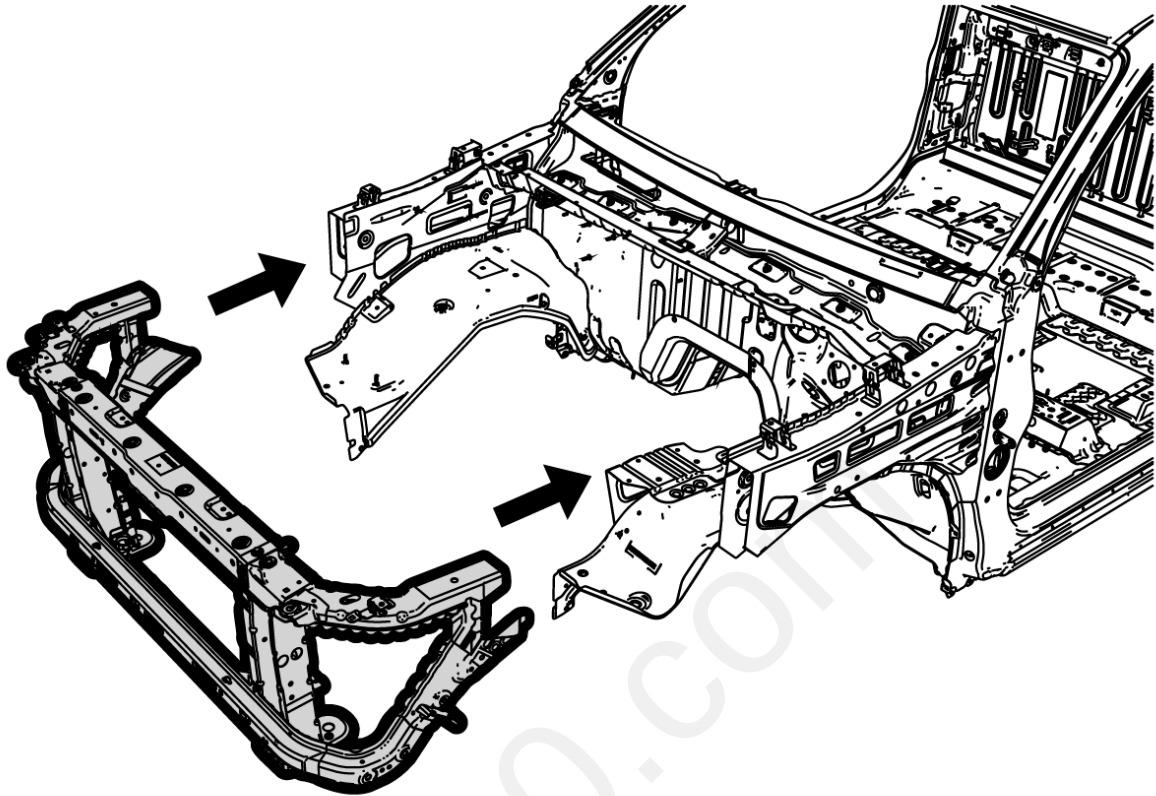


Fig. 134: Radiator Support

Courtesy of GENERAL MOTORS COMPANY

NOTE: You may need to lift the body to install the radiator support.

4. Position the radiator support.

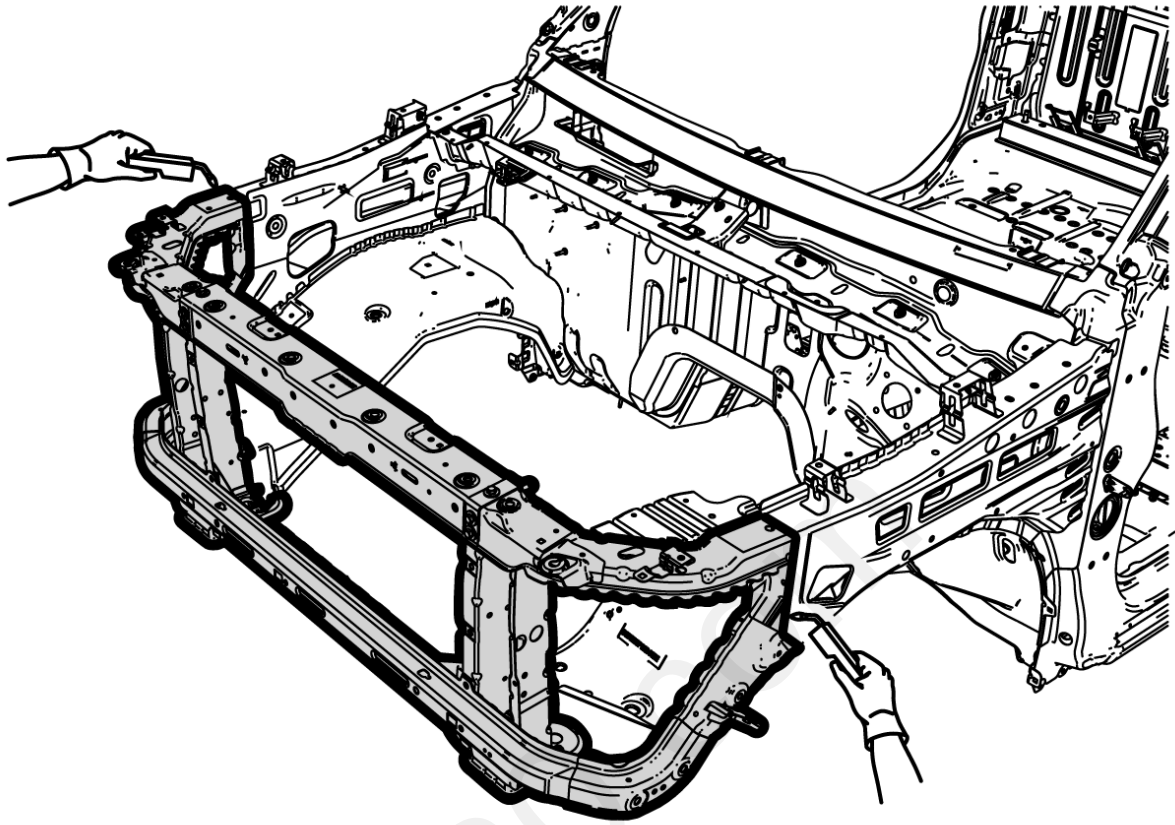


Fig. 135: Plug welding

Courtesy of GENERAL MOTORS COMPANY

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 and repair the 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 HINGE PILLAR SECTIONING

Removal Procedure

WARNING: Refer to [Approved Equipment for Collision Repair Warning](#) .

WARNING: Refer to [Glass and Sheet Metal Handling Warning](#) .

Refer to [Collision Sectioning Warning](#) .

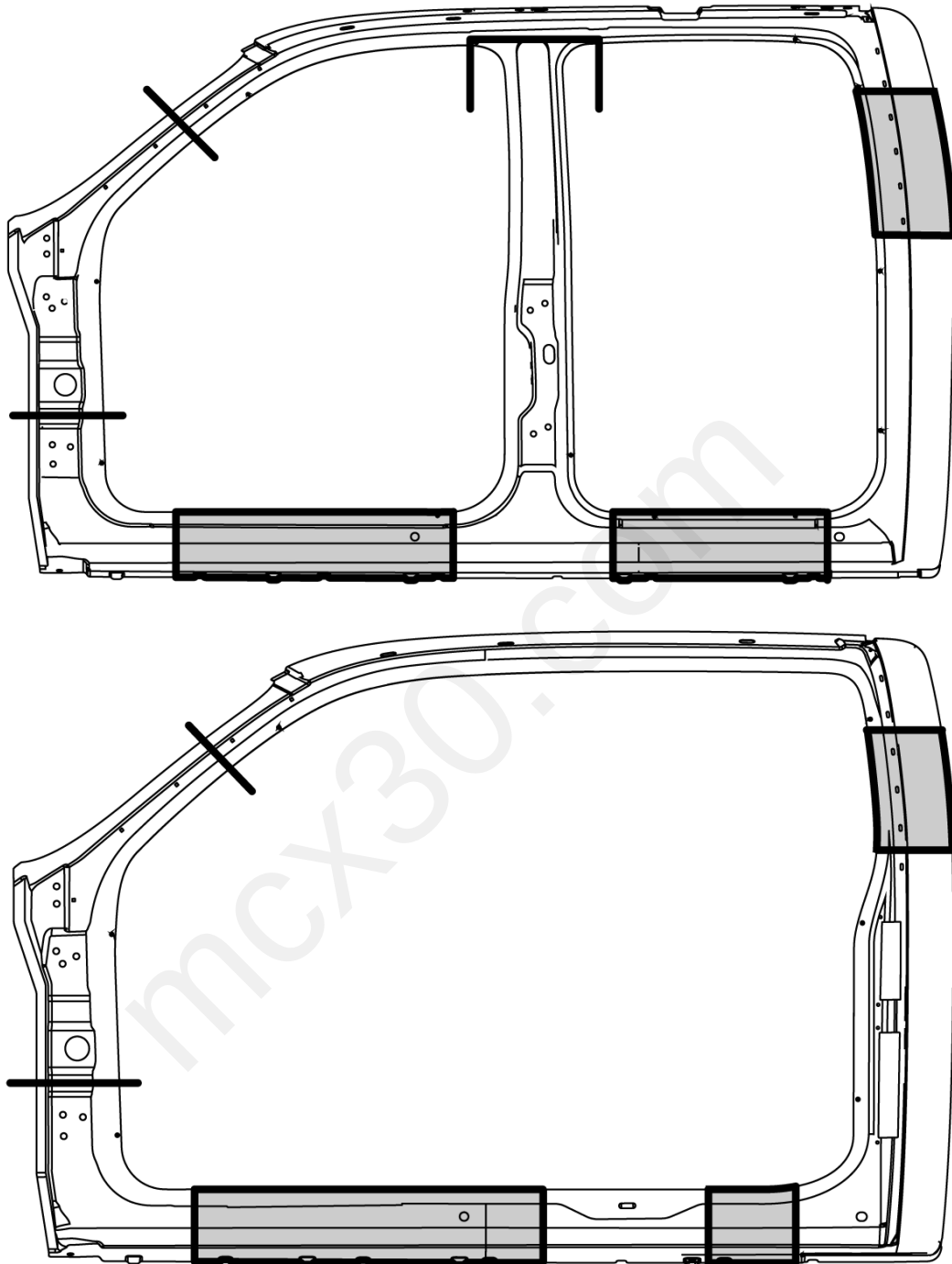


Fig. 136: Door Frame

Courtesy of GENERAL MOTORS COMPANY

NOTE: The door frame can be replaced at the factory seams, but requires the removal of the windshield, roof, and quarter panel. 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 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](#).

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](#) .
6. Perform additional sectioning procedures as necessary. Refer to the following procedures:
 - [Outer Windshield Frame Pillar Sectioning](#)
 - [Rocker Outer Panel Sectioning](#)
 - [Center Pillar Sectioning](#)
 - [Rear Pillar Sectioning \(Lower\)](#)[Rear Pillar Sectioning \(Complete\)](#)

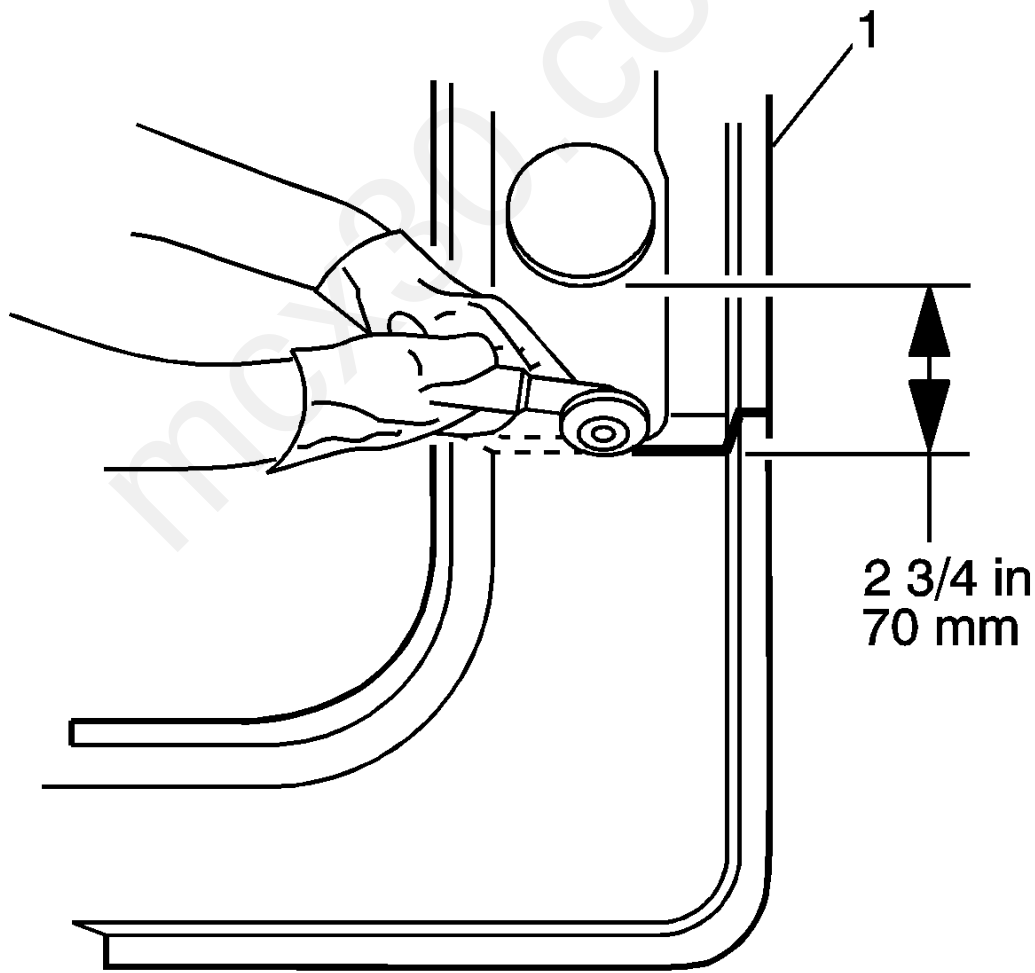


Fig. 137: Cutting Sectioning Panels
Courtesy of GENERAL MOTORS COMPANY

70 mm (2 3/4 in) down from the large wiring harness hole in the hinge pillar (1). Mark a horizontal line.

NOTE: Do not damage any inner panels or reinforcements.

8. Cut the panel in the locations where sectioning is to be performed.

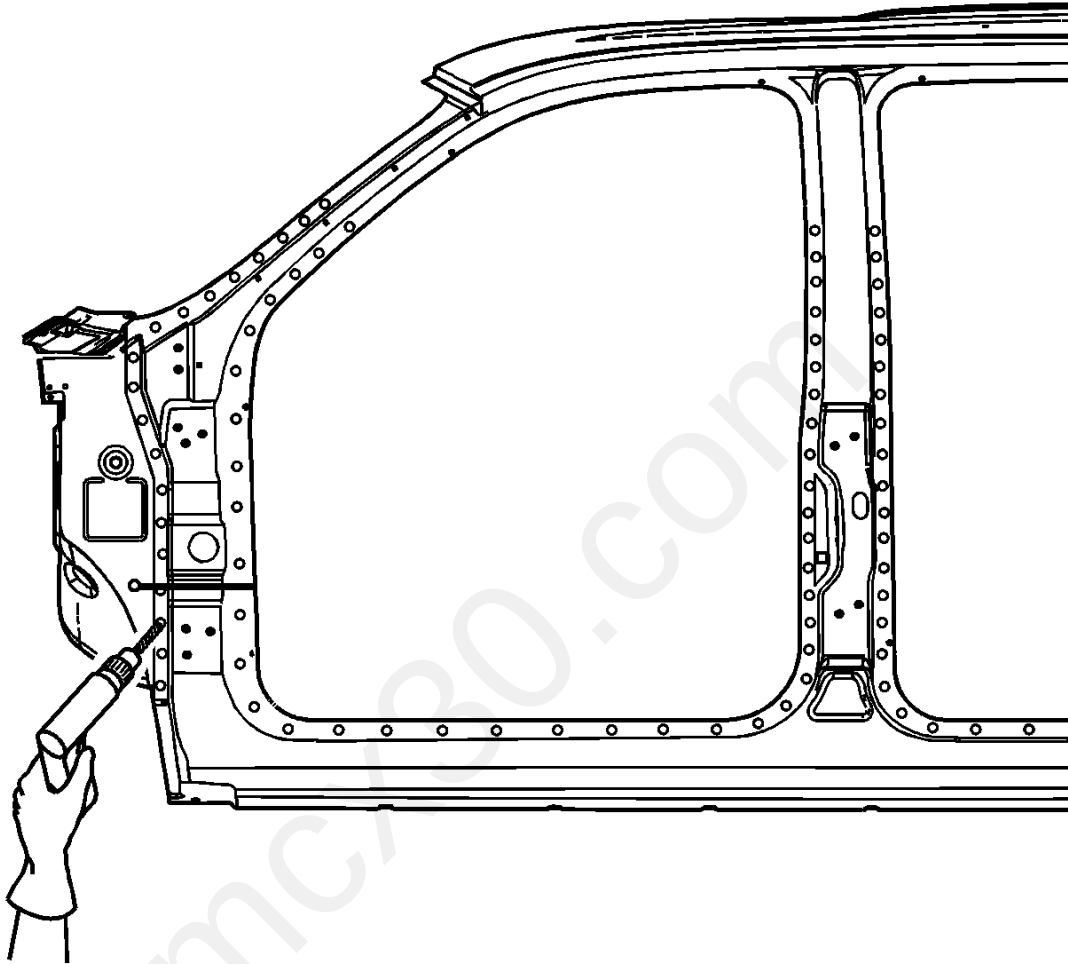


Fig. 138: Drilling Out Factory Welds

Courtesy of GENERAL MOTORS COMPANY

9. Locate and drill out all factory welds. Note the number and location of the welds for installation of the service part.

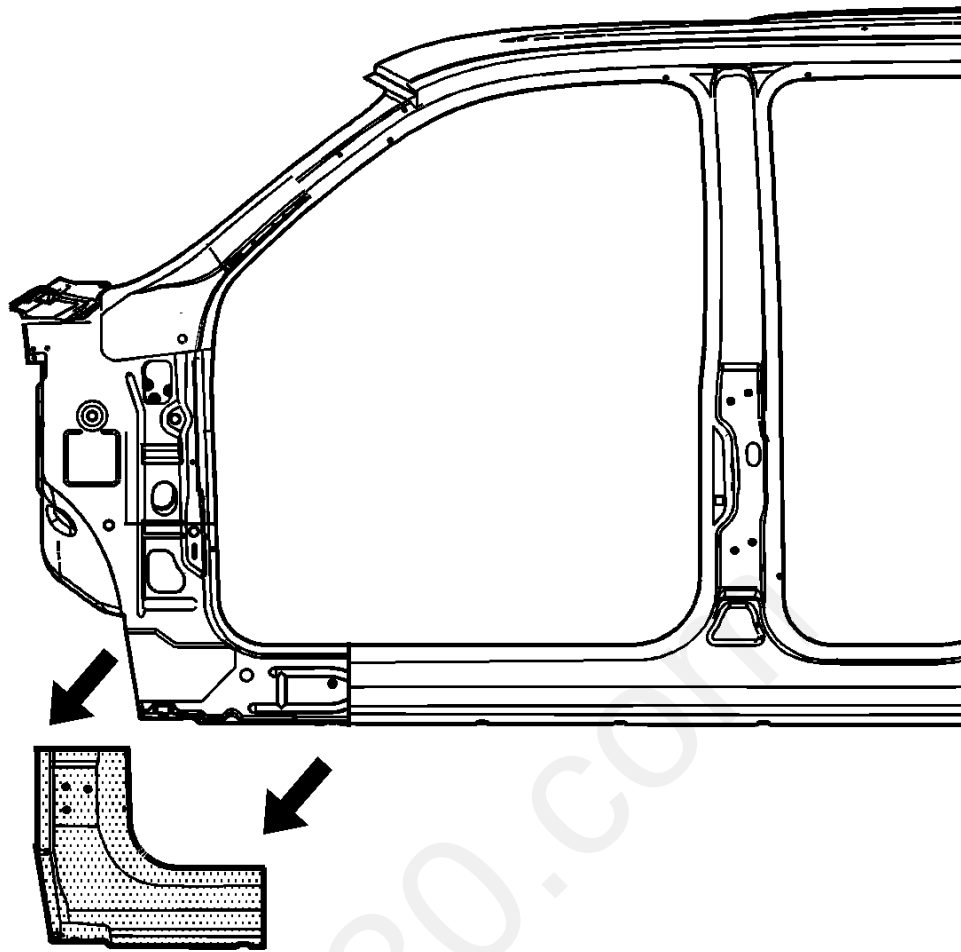


Fig. 139: View Of Damaged Hinge Pillar
Courtesy of GENERAL MOTORS COMPANY

10. Remove the damaged hinge pillar.

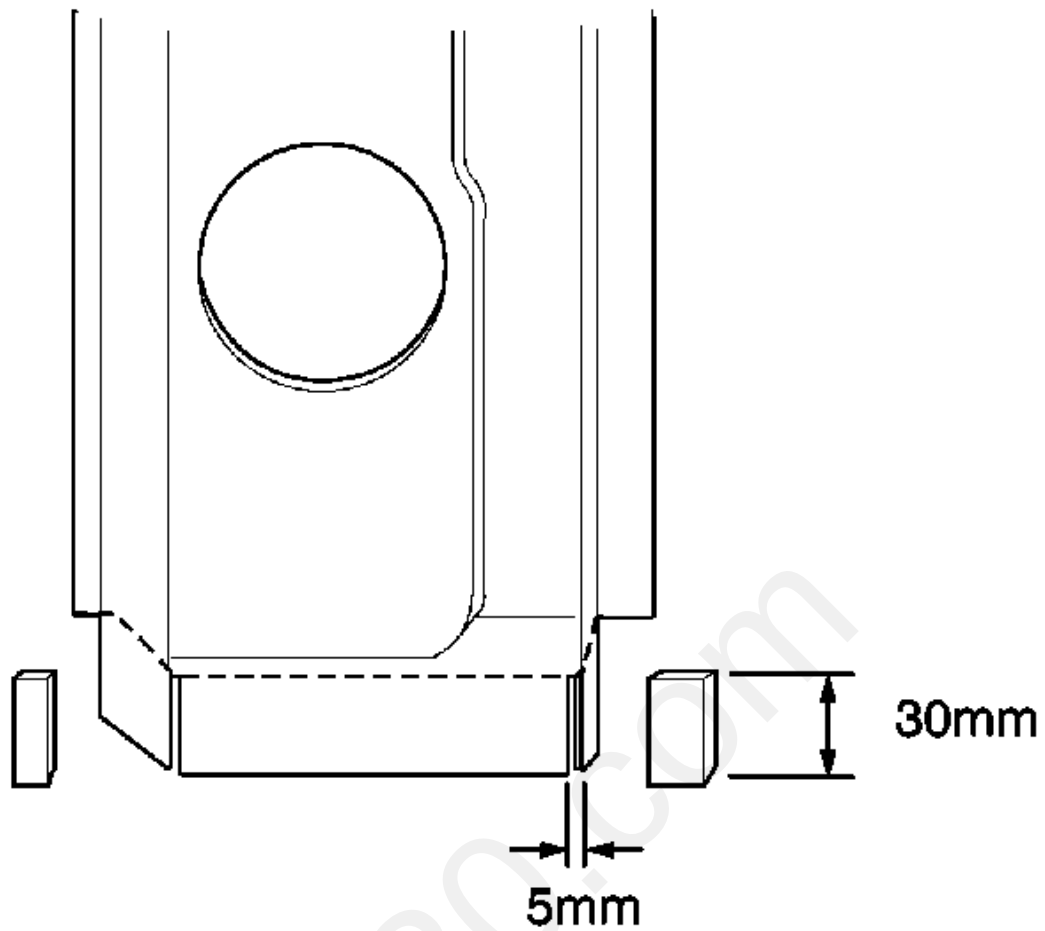


Fig. 140: Cutting 30 mm Tabs

Courtesy of GENERAL MOTORS COMPANY

11. Cut and remove 30 mm (1 3/16 in) from the flanges on either side of the remaining section of the original pillar. Cut 5 mm (3/16 in) wide gaps in the bottom corners.

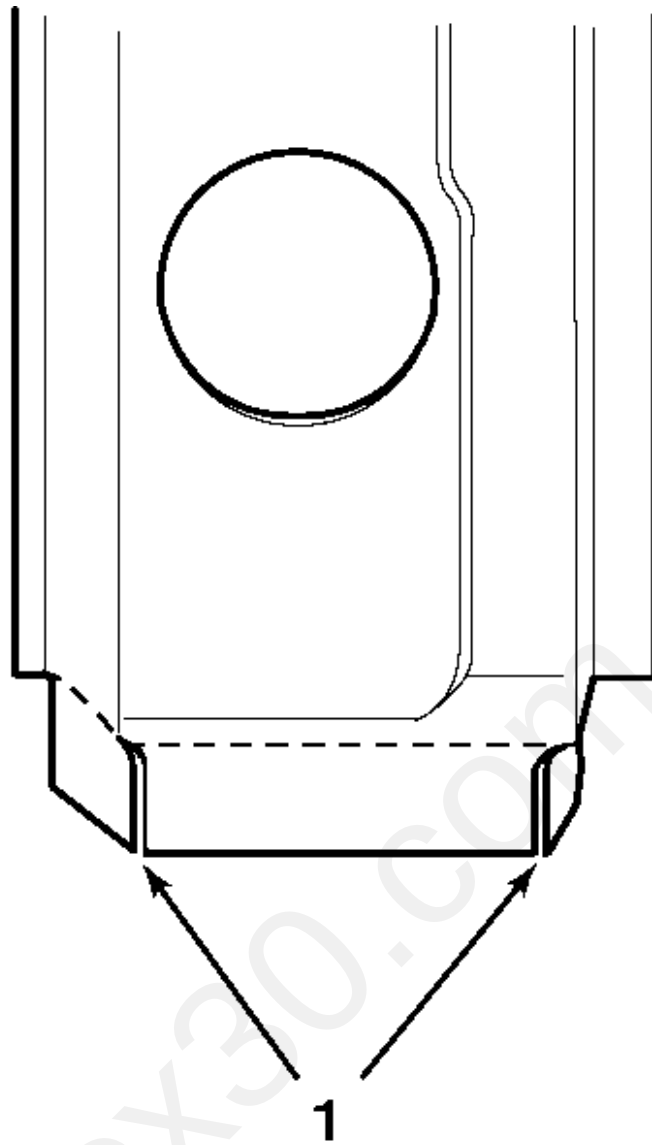


Fig. 141: Stepping Tabs

Courtesy of GENERAL MOTORS COMPANY

12. Step the tabs (1) inward to allow the door frame opening service section to fit over the original hinge pillar.

Installation Procedure

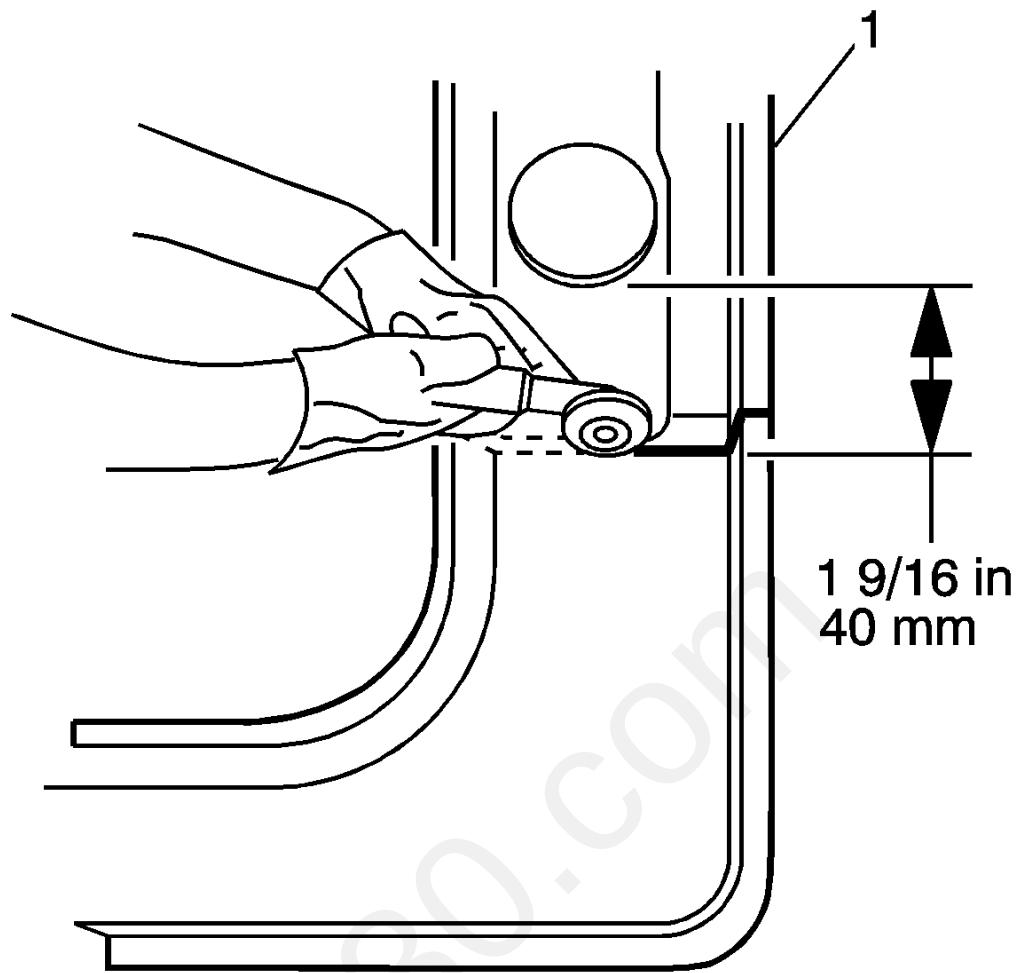


Fig. 142: Cutting Hinge Pillar

Courtesy of GENERAL MOTORS COMPANY

1. On the service body side, measure 40 mm (1 9/16 in) down from the large wiring harness hole in the hinge pillar. Mark a horizontal line. Cut the hinge pillar (1) along this line.
2. Perform additional sectioning procedures as necessary to remove the unused areas of the service part.

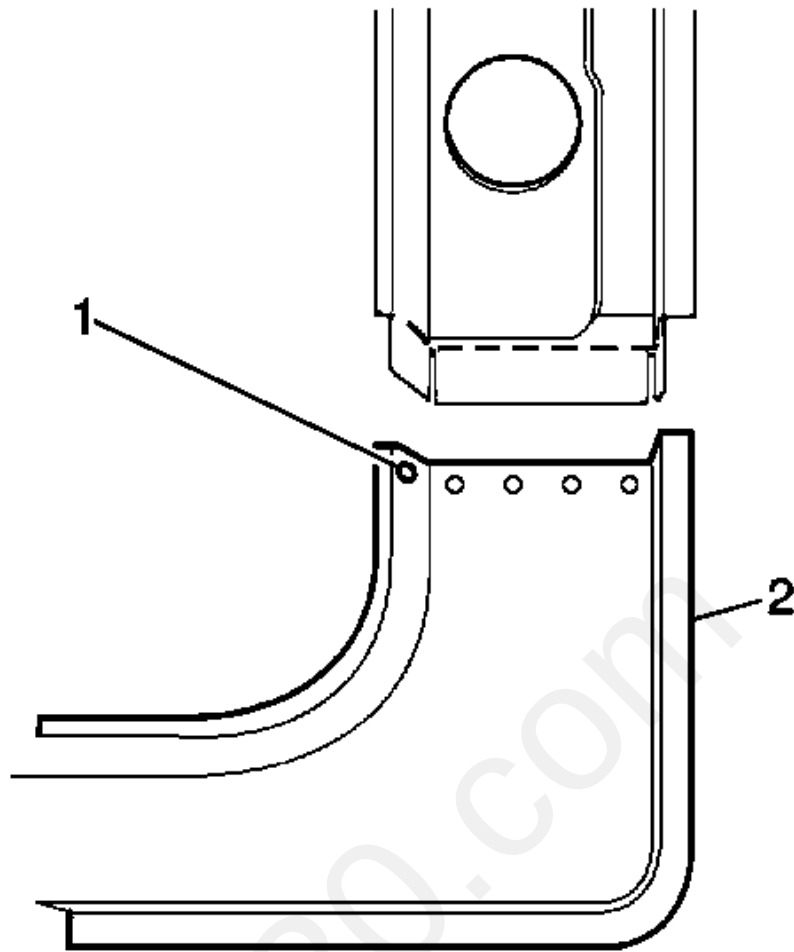


Fig. 143: Plug Weld Holes & Service Part

Courtesy of GENERAL MOTORS COMPANY

3. Drill 8 mm (5/16 in) plug weld holes along the sectioning cut on the remaining original part (2). Locate these holes approximately 25 mm (1 in) (a) from the edge and spaced 40 mm (1 1/2 in) apart.

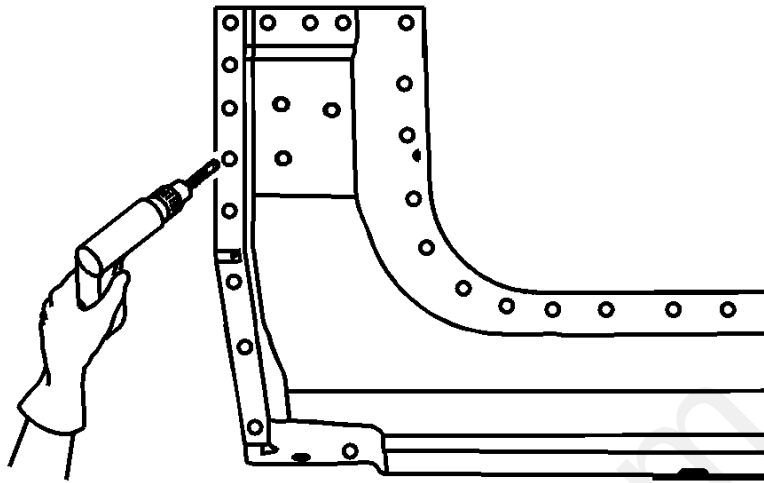


Fig. 144: Drilling Plug Weld Holes

Courtesy of GENERAL MOTORS COMPANY

NOTE: If the location of the original plug weld holes cannot be determined, or if structural weld-thru adhesive was present, space the plug weld holes every 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 attachment surfaces, as necessary.
6. Apply Weld-Thru Coating or equivalent to all mating surfaces. Refer to [Anti-Corrosion Treatment and Repair](#).

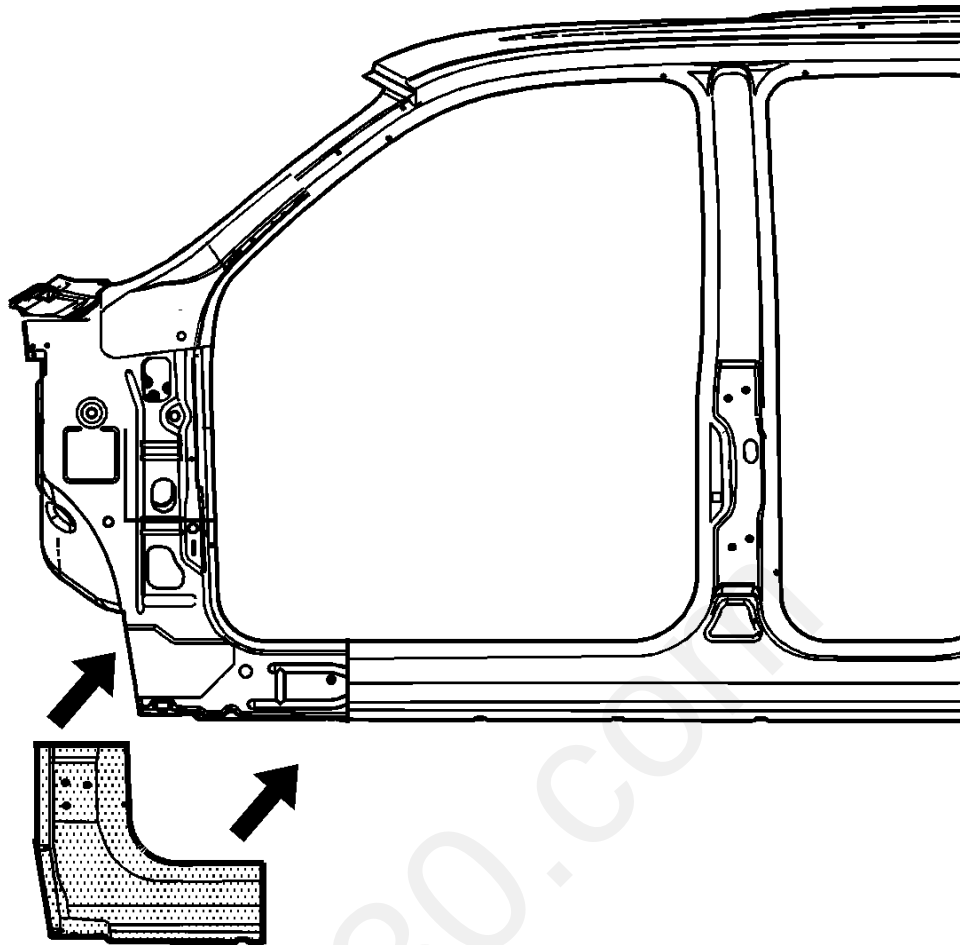


Fig. 145: View Of Hinge Pillar

Courtesy of GENERAL MOTORS COMPANY

7. Position the hinge pillar to the vehicle using 3-dimensional measuring equipment. Clamp in place.

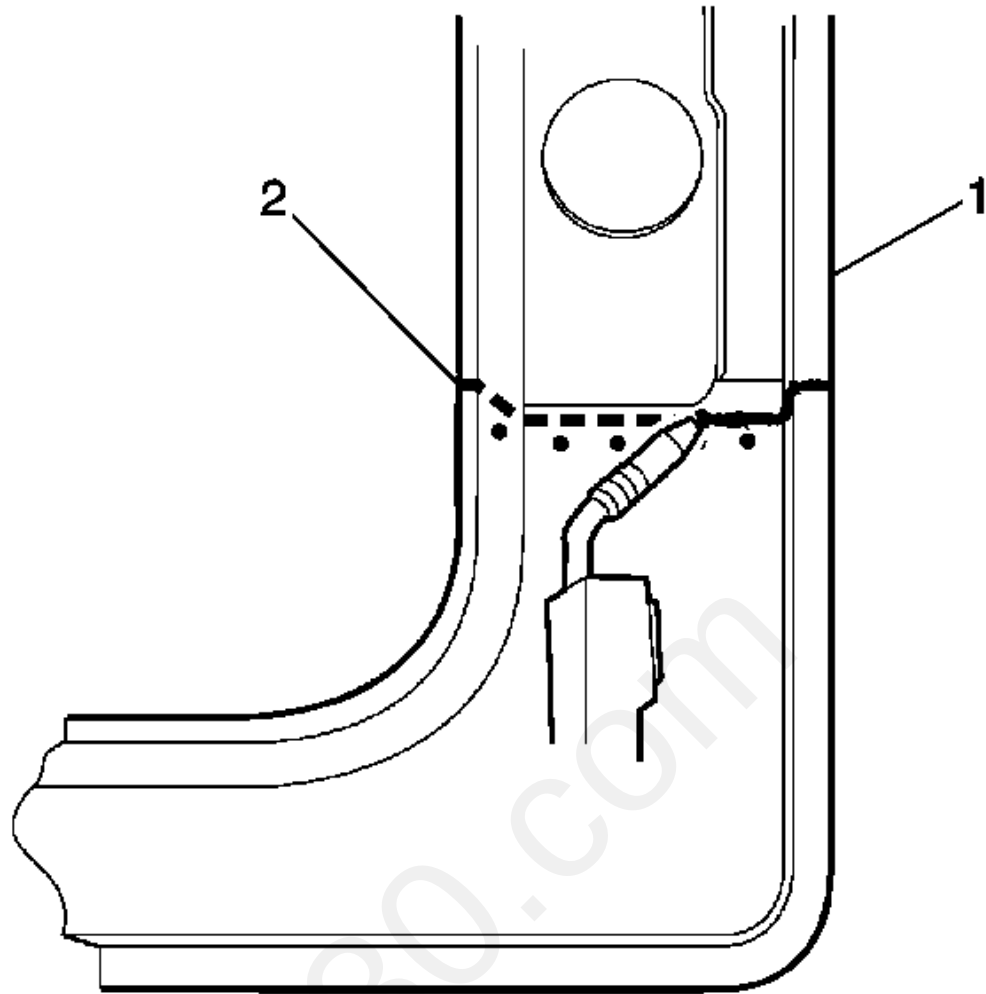


Fig. 146: Welding Service Part
Courtesy of GENERAL MOTORS COMPANY

8. Plug weld accordingly.

NOTE: To create a solid weld with minimum heat distortion, make 25 mm (1 in) stitch welds along the seam (2) with 25 mm (1 in) gaps between them. Complete the stitch weld.

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

BODY HINGE PILLAR OUTER PANEL REINFORCEMENT REPLACEMENT

Removal Procedure

ING: 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. Refer to [Dimensions - Body](#).
5. Remove the sealers and anti-corrosion materials from the repair area. Refer to [Anti-Corrosion Treatment and Repair](#) .
6. Locate and mark all the necessary factory welds of the body hinge pillar outer panel reinforcement.

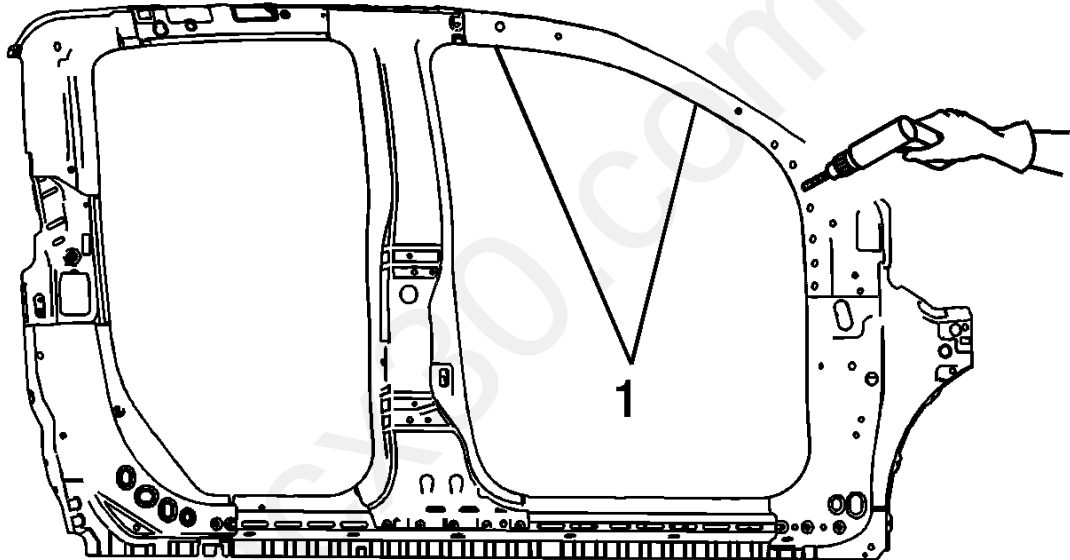


Fig. 147: Factory Welds

Courtesy of GENERAL MOTORS COMPANY

7. Drill all factory welds (1). Note the number and location of welds for installation of the service assembly.

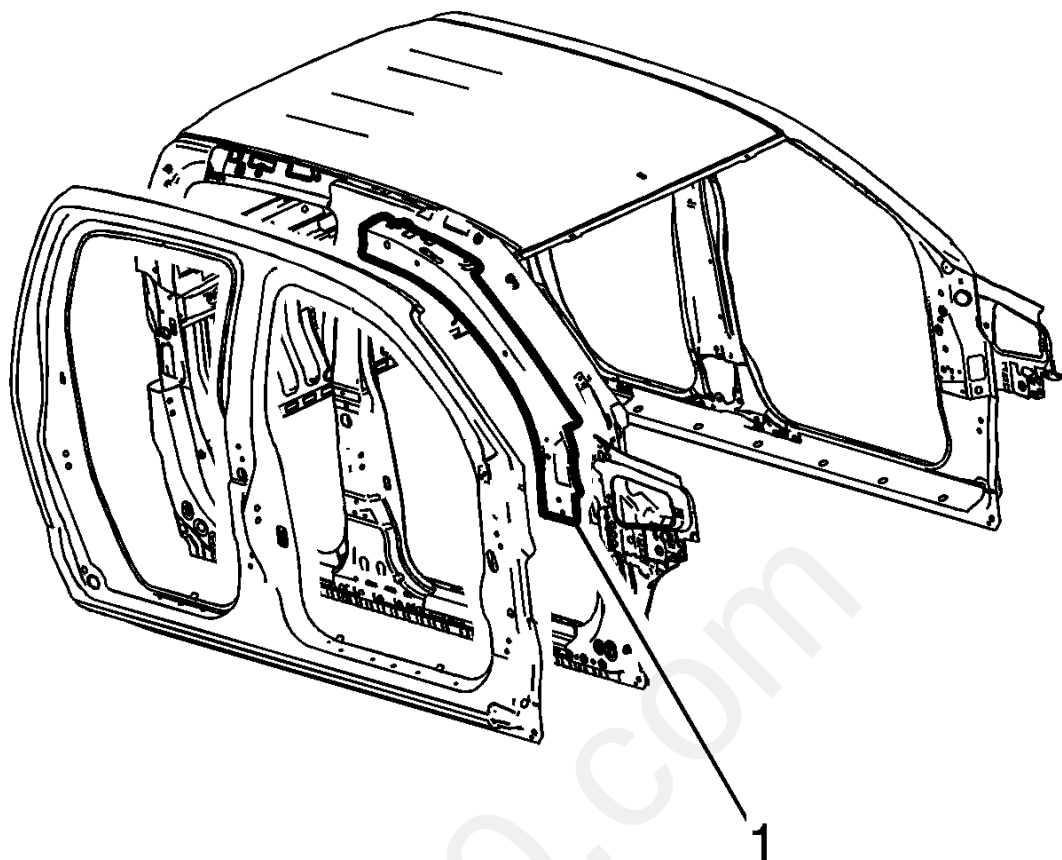


Fig. 148: Damaged Body Hinge Pillar Outer Panel Reinforcement
Courtesy of GENERAL MOTORS COMPANY

8. Remove the damaged body hinge pillar outer panel reinforcement (1).

Installation Procedure

1. Prepare all mating surfaces as necessary.
2. Align the body hinge pillar outer panel reinforcement.

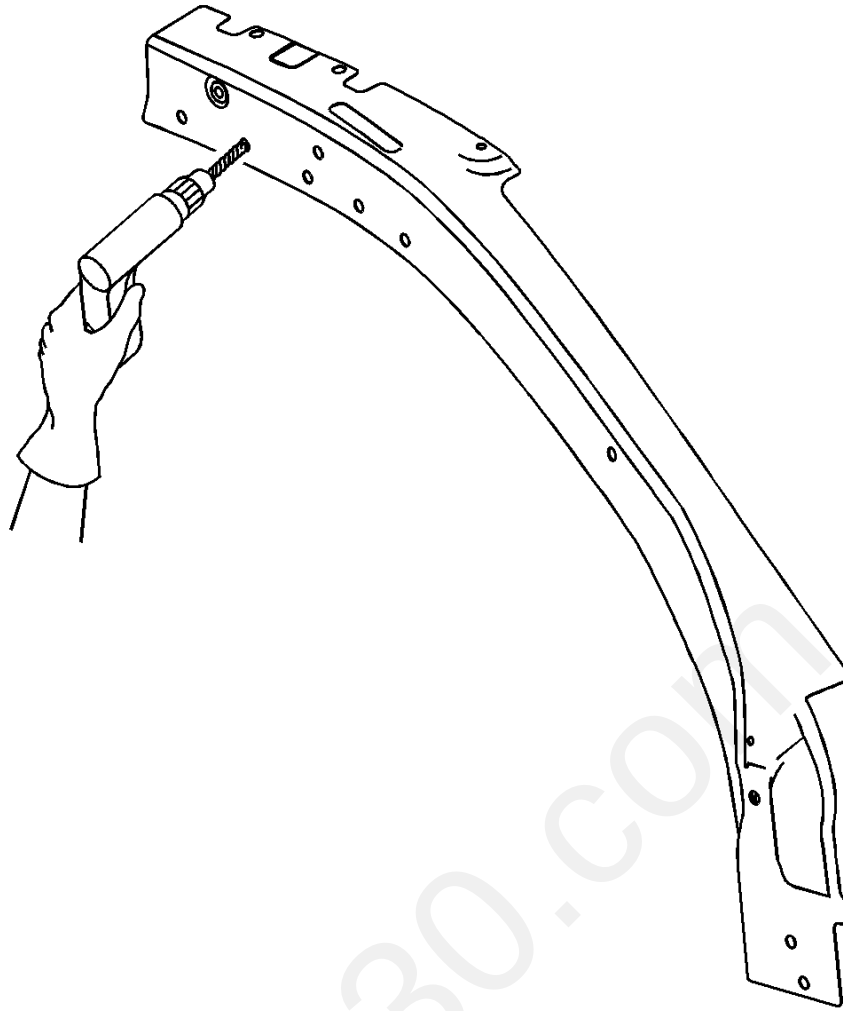


Fig. 149: Drill 8 mm (5/16 in) Holes For Plug Welding Along Edges Of Body Hinge Pillar Outer Panel Reinforcement

Courtesy of GENERAL MOTORS COMPANY

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

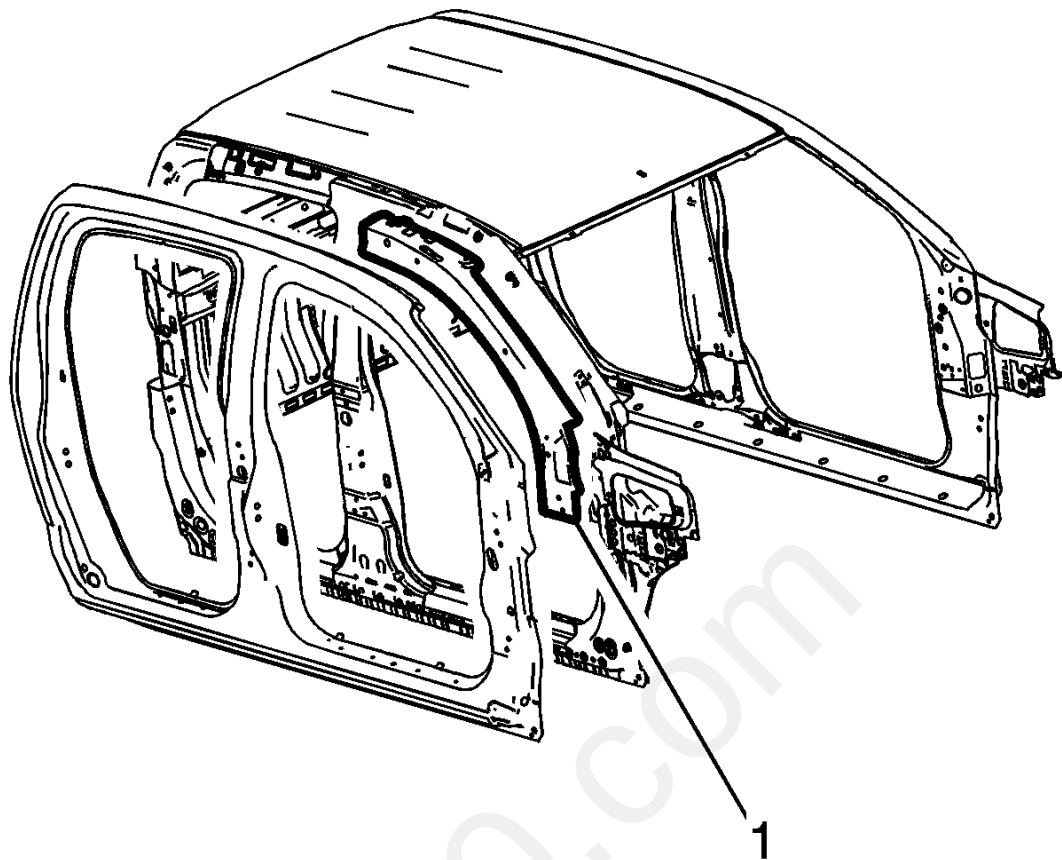


Fig. 150: Body Hinge Pillar Outer Panel Reinforcement

Courtesy of GENERAL MOTORS COMPANY

5. Position the body hinge pillar outer panel reinforcement on the vehicle (1).
6. Verify the fit of the hinge pillar outer panel reinforcement.
7. Clamp the hinge pillar outer panel reinforcement into position.

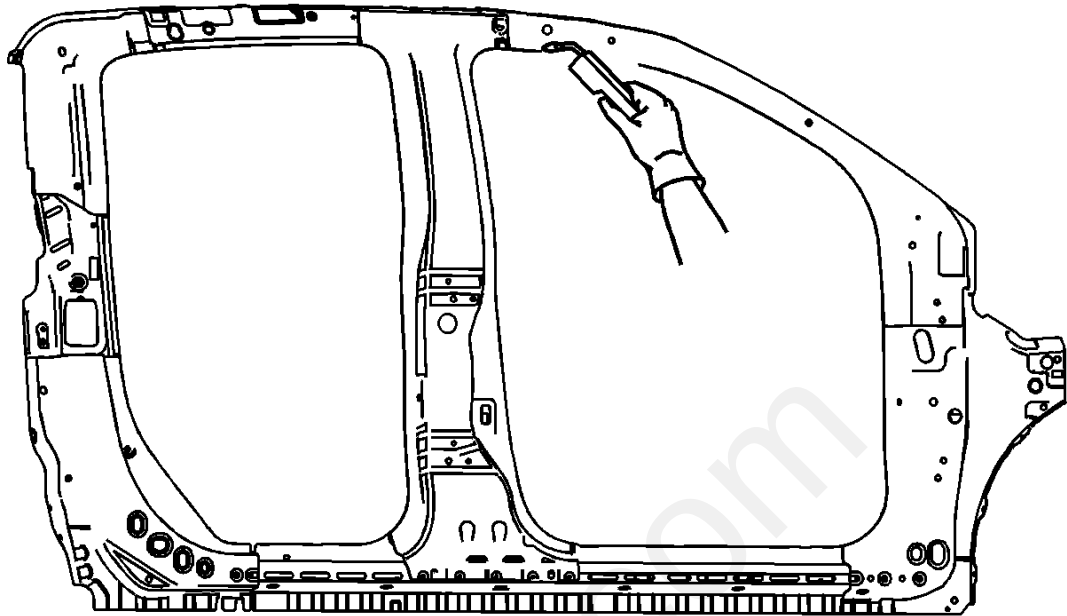


Fig. 151: Plug Welding

Courtesy of GENERAL MOTORS COMPANY

8. Plug weld accordingly.
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. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .
13. Enable the SIR system. 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 [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](#) .

all related panels and components.

4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#).
6. Locate and mark all factory welds.
7. Remove the center pillar. Refer to [Center Pillar Sectioning](#).

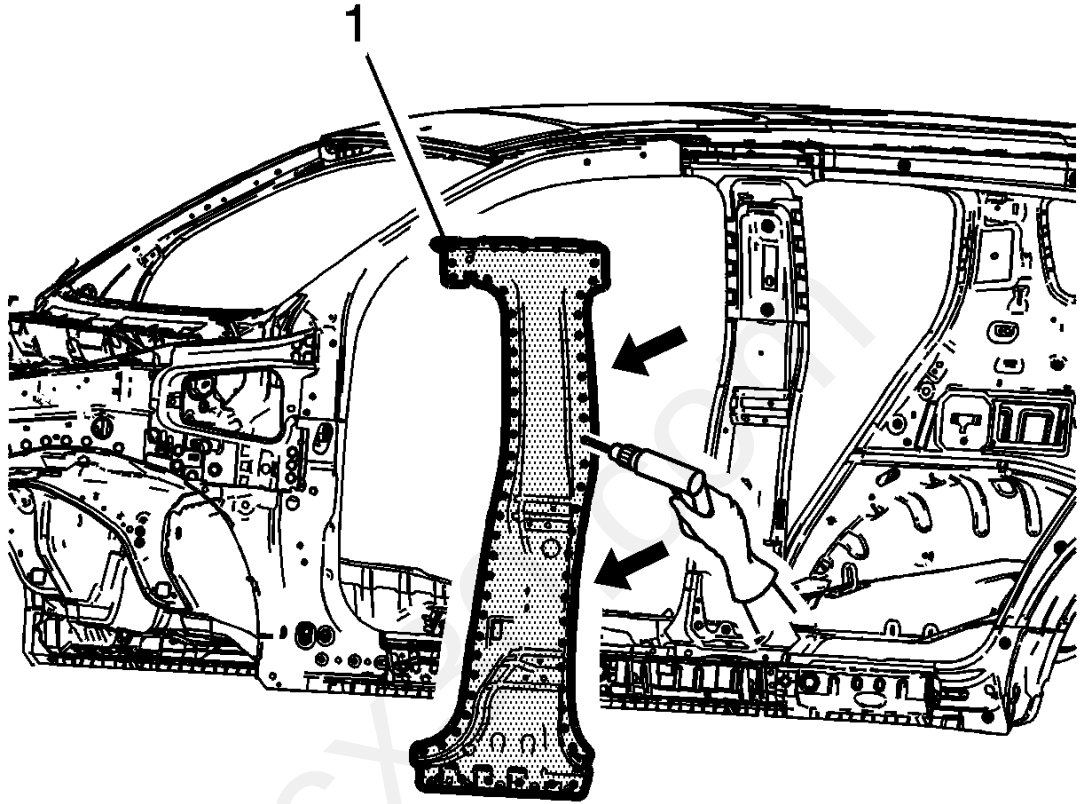


Fig. 152: Damaged Center Pillar Inner Panel
Courtesy of GENERAL MOTORS COMPANY

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

Installation Procedure

1. Prepare all mating surfaces as necessary.
2. Align the center pillar inner panel (1).

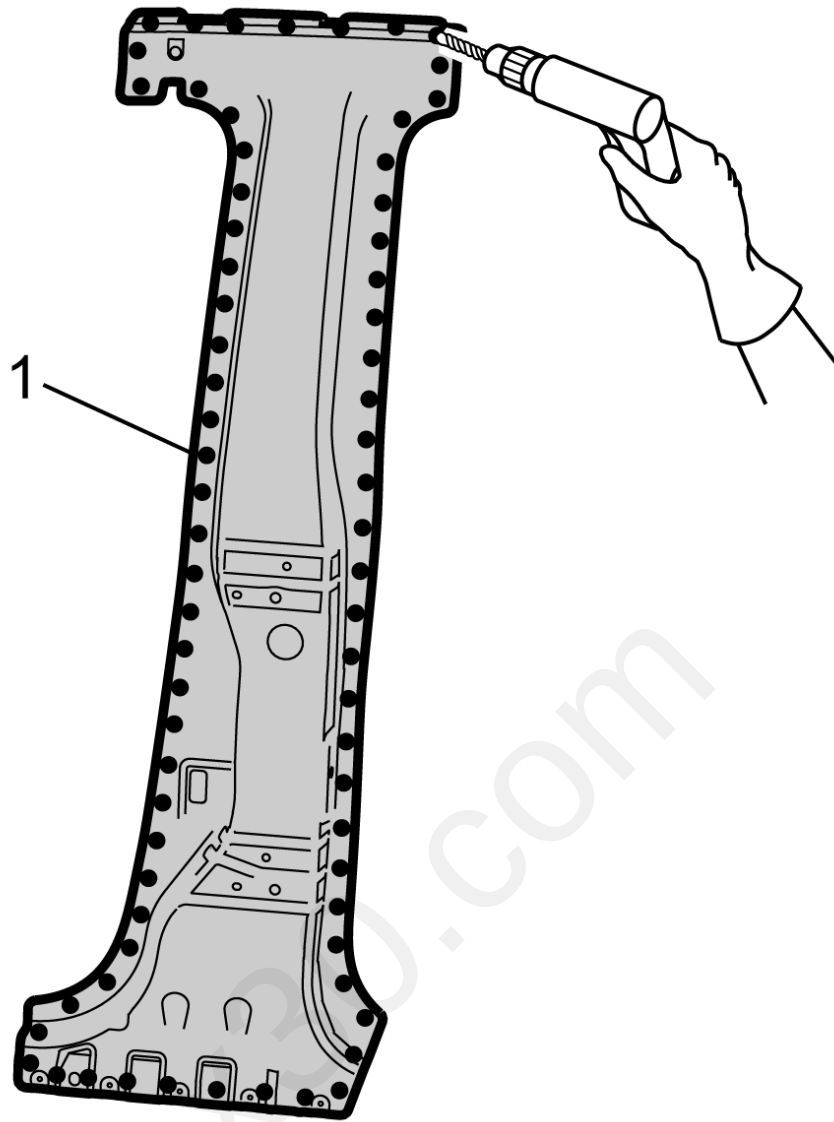


Fig. 153: Drill 8 mm (5/16 in) Holes For Plug Welding Along Edges Of Center Pillar Inner Panel
Courtesy of GENERAL MOTORS COMPANY

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

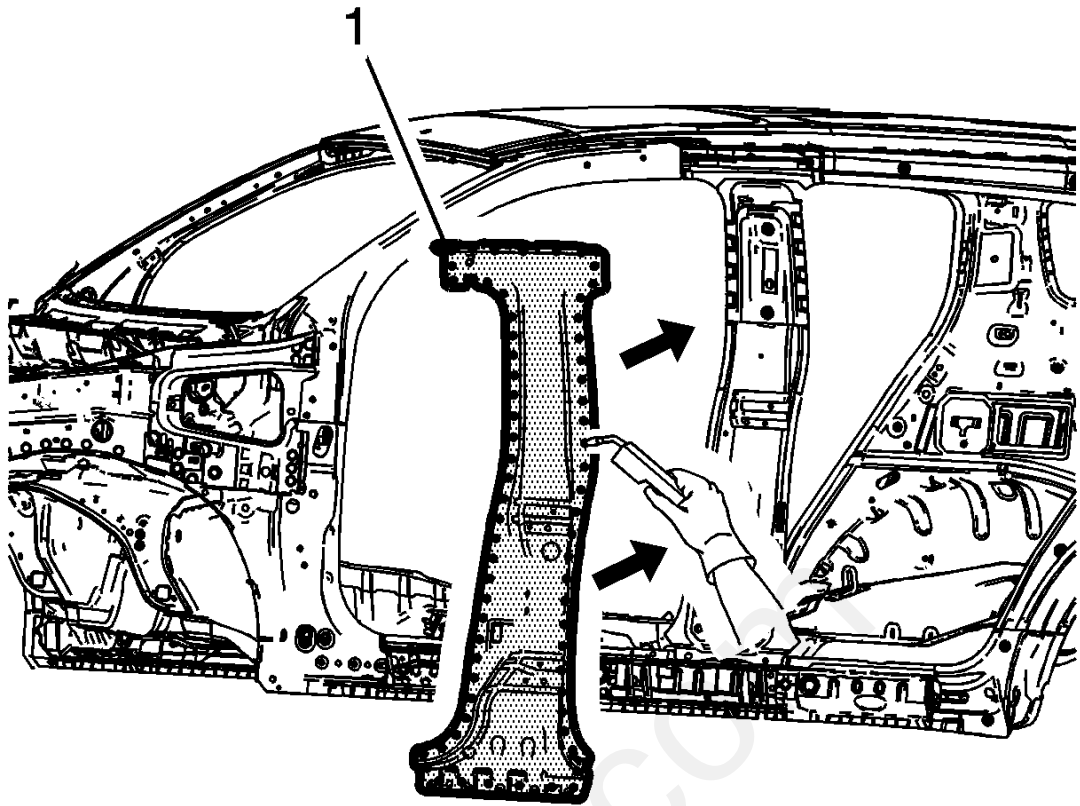


Fig. 154: Center Pillar Inner Panel

Courtesy of GENERAL MOTORS COMPANY

5. Position the center pillar inner panel (1) on the vehicle.
6. Verify the fit of the center pillar inner panel (1).
7. Clamp the center pillar inner panel (1) into position.
8. Install the center pillar. Refer to [Center Pillar Sectioning](#).
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](#).

CENTER PILLAR SECTIONING

Removal Procedure

WARNING: Refer to [Approved Equipment for Collision Repair Warning](#).

WARNING: Refer to [Glass and Sheet Metal Handling Warning](#).

WARNING: Refer to [Collision Sectioning Warning](#).

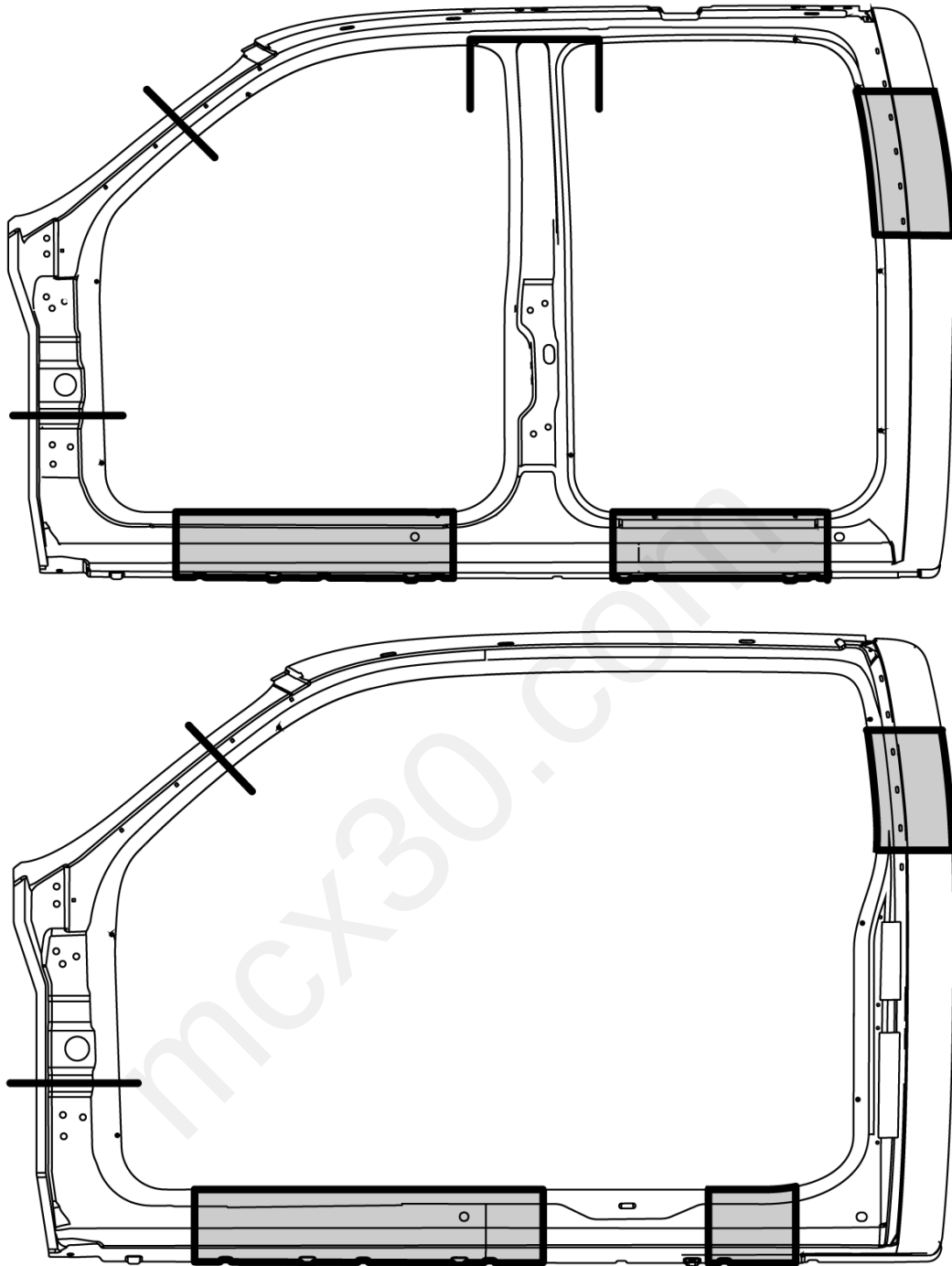


Fig. 155: Door Frame

Courtesy of GENERAL MOTORS COMPANY

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. Refer to [Dimensions - Body](#).

ING: 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 .
6. Perform additional sectioning procedures as necessary. Refer to the following procedures:
 - Outer Windshield Frame Pillar Sectioning
 - Front Hinge Pillar Sectioning
 - Rocker Outer Panel Sectioning
 - Rear Pillar Sectioning (Lower)Rear Pillar Sectioning (Complete)

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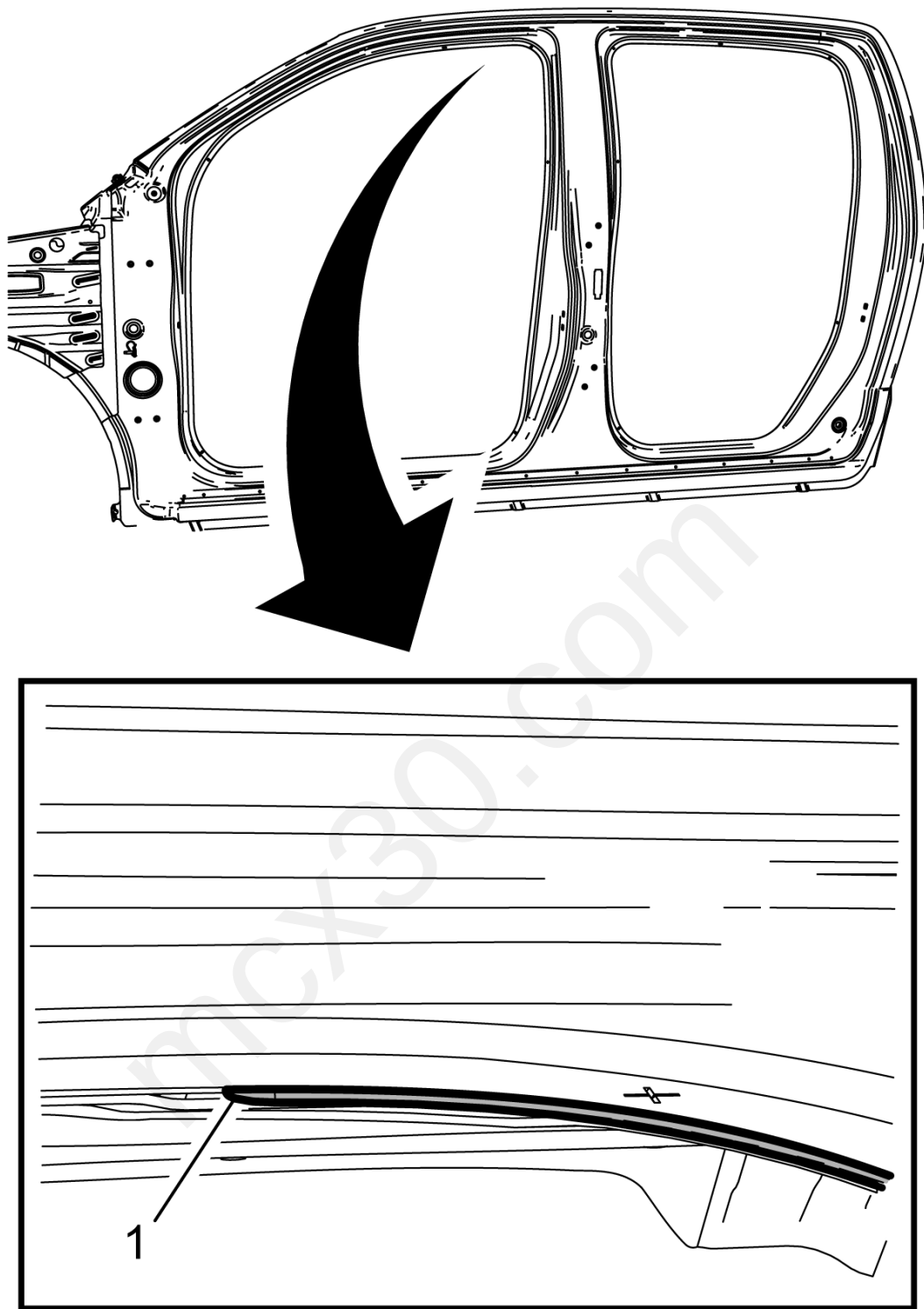


Fig. 156: Center Pillar Inner Reinforcement
Courtesy of GENERAL MOTORS COMPANY

7. Remove the weatherstrip, observe the flange in the center pillar area. There will be a 4-metal stack-up. The layer below the bodyside outer is the center pillar inner reinforcement (1).

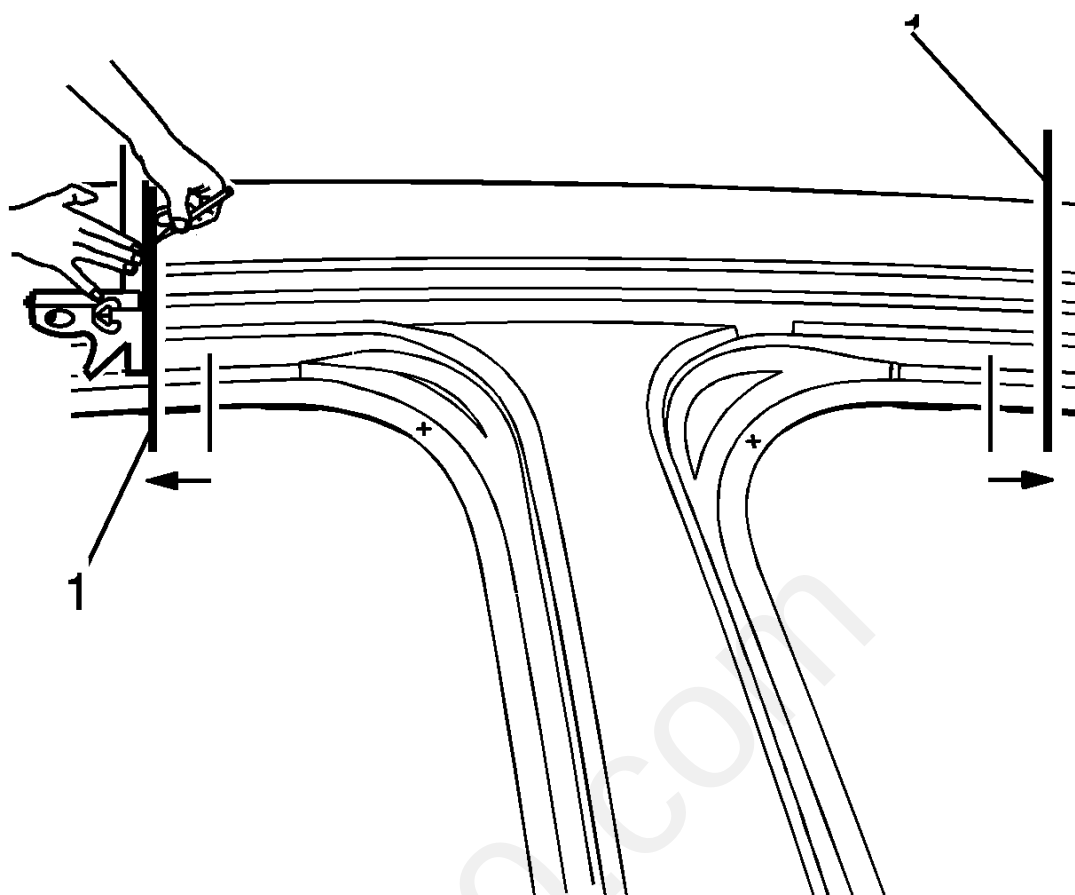


Fig. 157: Vertical Line Marks

Courtesy of GENERAL MOTORS COMPANY

8. Measure 30 mm (1.18 in) from the forward and rearward edges of the center pillar inner reinforcement and mark a vertical line (1).

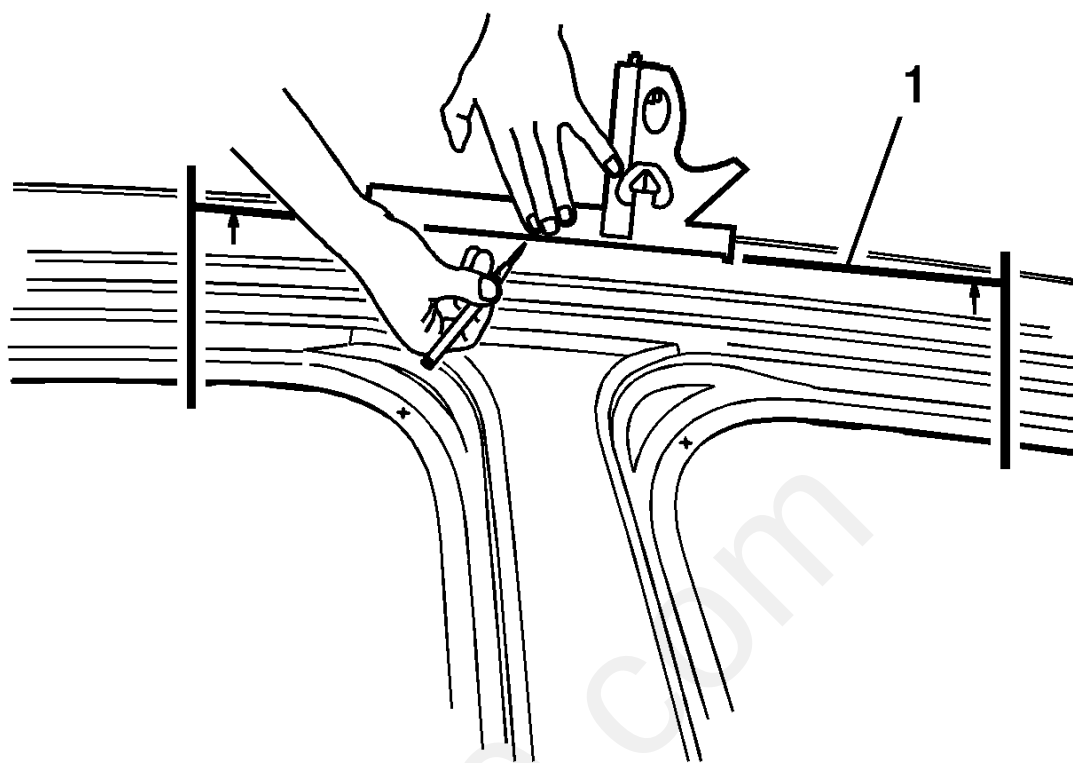


Fig. 158: Measuring Up 1 Inch From Door Opening Feature Line And Mark A Horizontal Line.
Courtesy of GENERAL MOTORS COMPANY

9. Measure up 30 mm (1.18 in) from the door opening feature line (1) and mark a horizontal line.

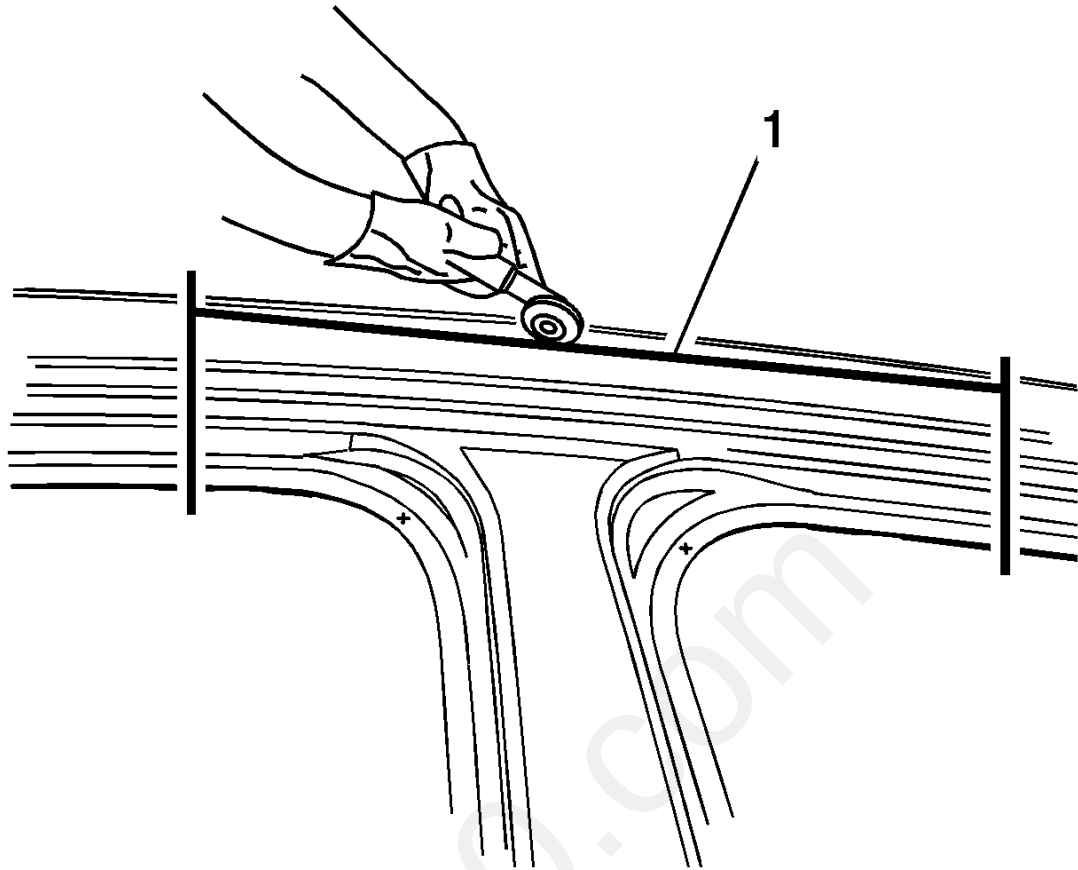


Fig. 159: Cutting Access Window In Center Pillar

Courtesy of GENERAL MOTORS COMPANY

NOTE: Do not damage any inner panels or reinforcements.

10. Cut the panel in the locations where sectioning is to be performed.

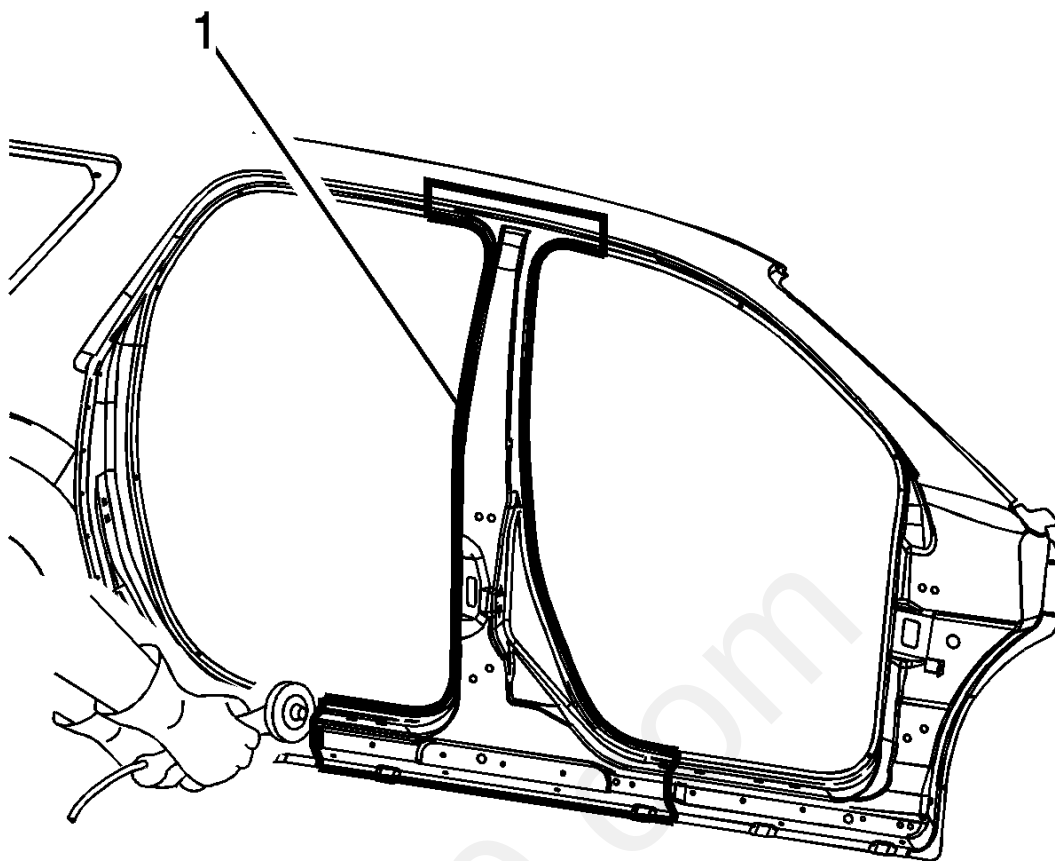


Fig. 160: Service Part

Courtesy of GENERAL MOTORS COMPANY

11. Measure 30 mm (1.18 in) from the forward and rearward edges of the center pillar inner reinforcement and mark a vertical line (1).

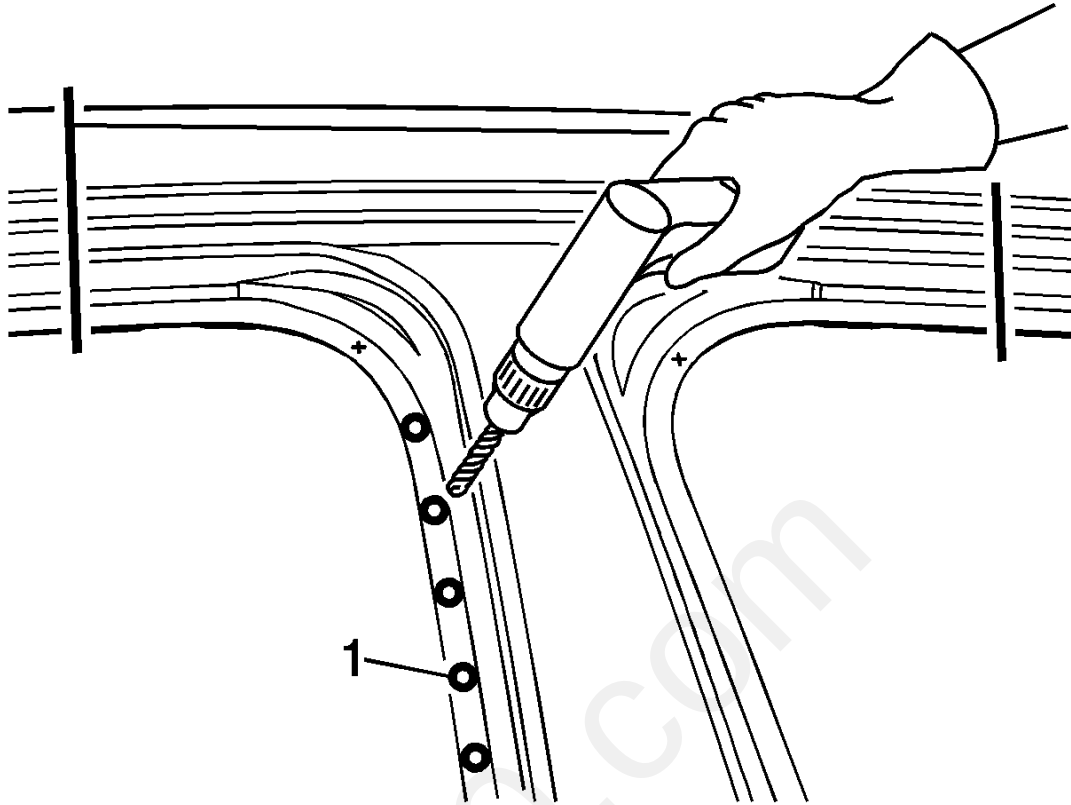


Fig. 161: Locating And Drill Out All Factory Welds

Courtesy of GENERAL MOTORS COMPANY

12. Locate and drill out all factory welds (1). Note the number and location of the welds for installation of the service part.
13. Remove the damaged pillar section.

Installation Procedure

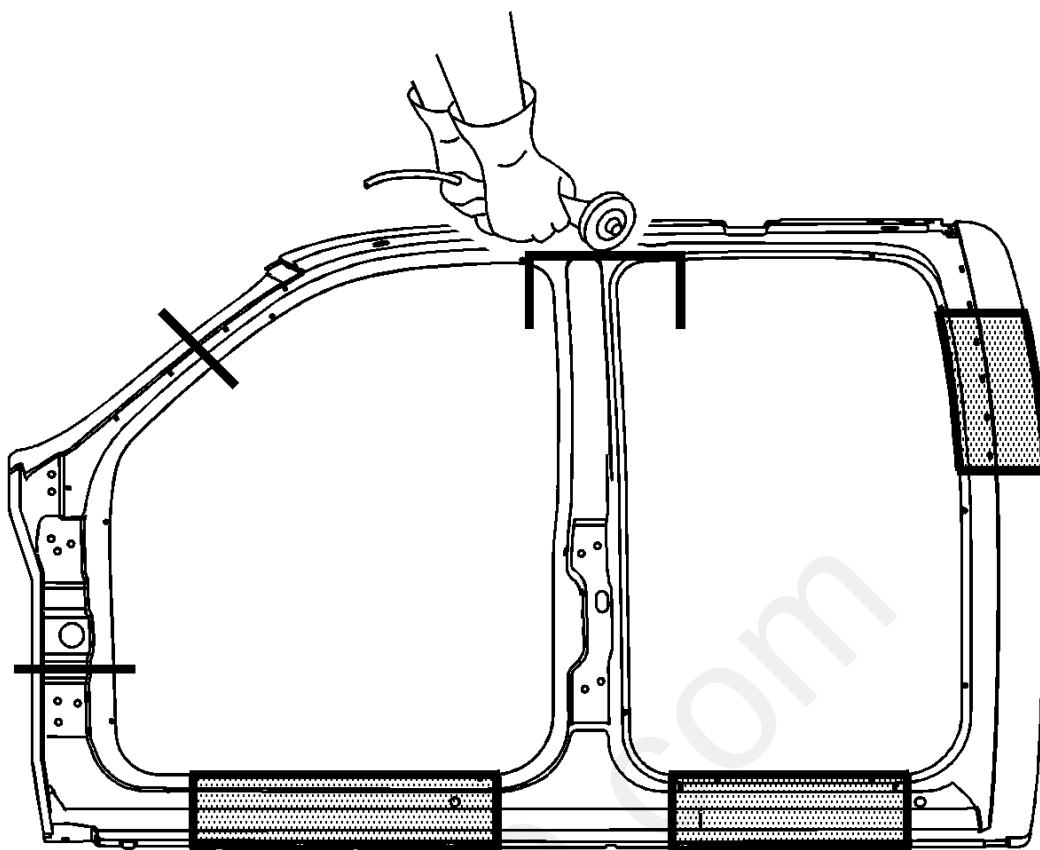


Fig. 162: Cutting Panel In Corresponding Locations

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.

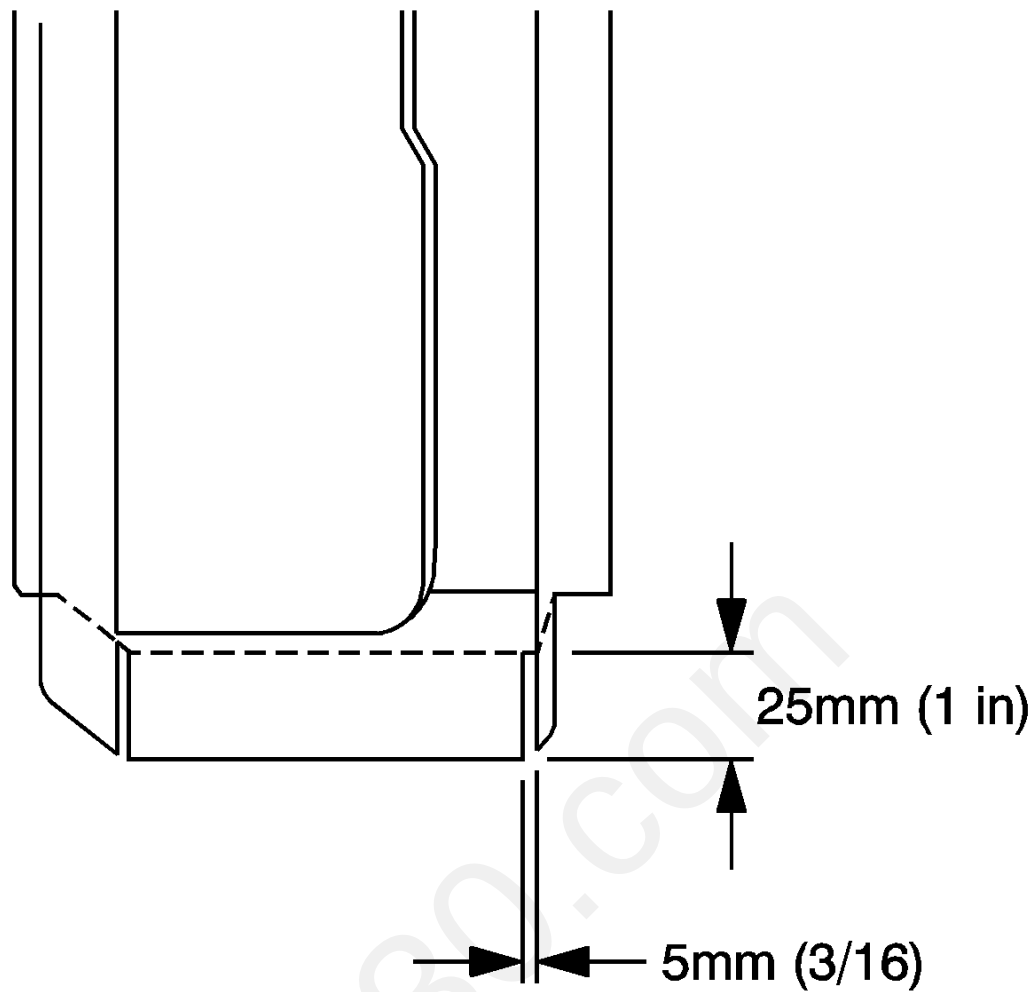


Fig. 163: Cutting 5 mm (3/16 in) Wide Gaps In Bottom Corners

Courtesy of GENERAL MOTORS COMPANY

2. Cut and remove 25 mm (1 in) from the flanges on either side of the remaining section of the original pillar.
Cut 5 mm (3/16 in) wide gaps in the bottom corners.

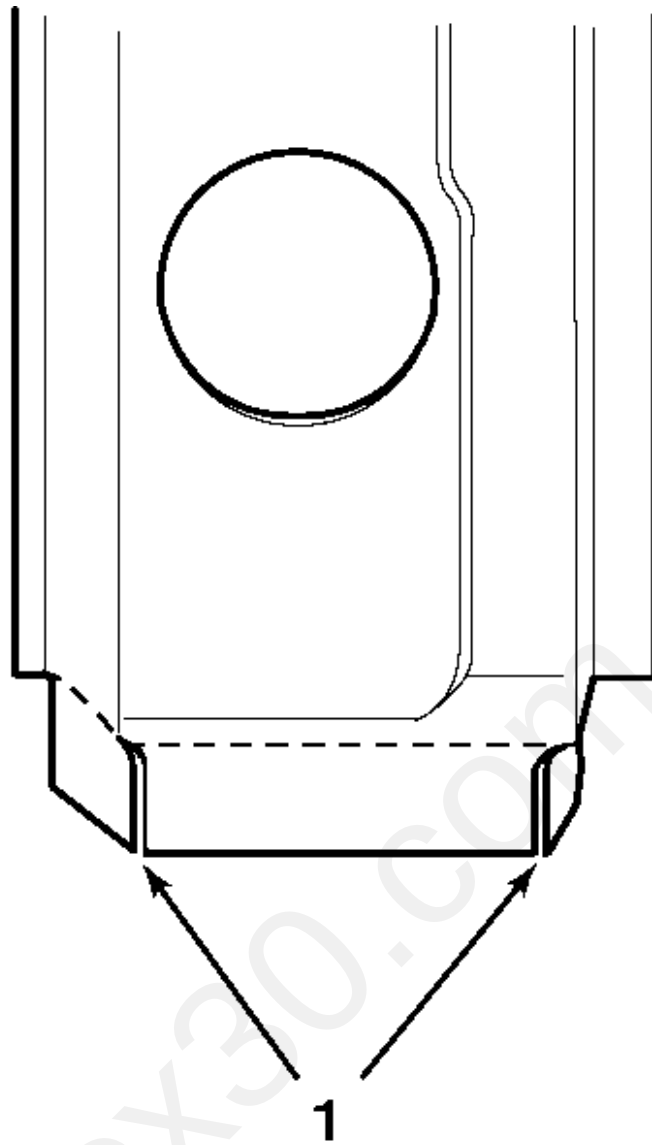


Fig. 164: Stepping Tabs

Courtesy of GENERAL MOTORS COMPANY

3. Step the tabs (1) inward to allow the door frame opening service section to fit over the original hinge pillar.

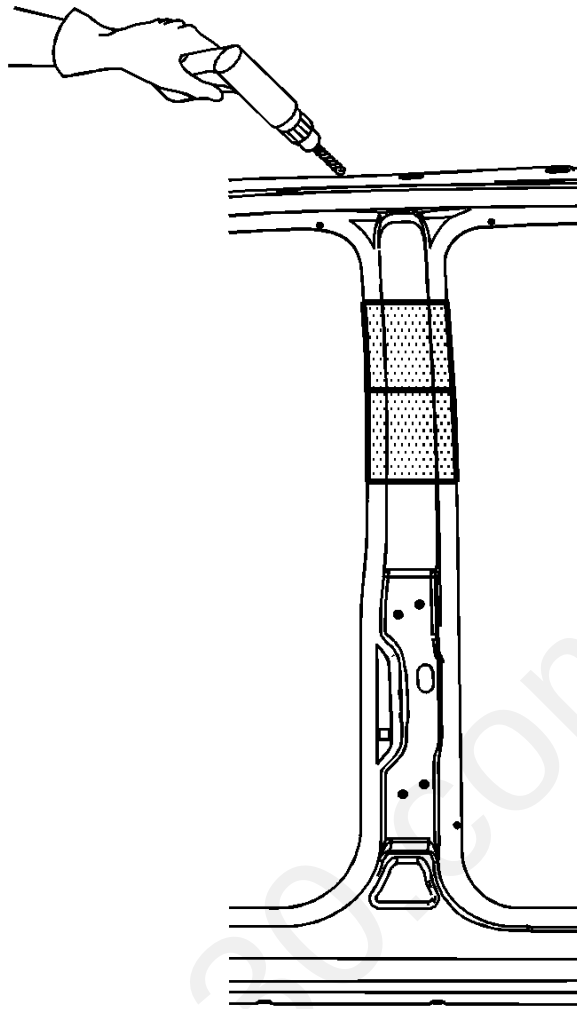


Fig. 165: Drill 8 mm (5/16 in) Plug Weld Holes
Courtesy of GENERAL MOTORS COMPANY

NOTE: If the location of the original plug weld holes cannot be determined, or if structural weld-thru adhesive was present, space the plug weld holes every 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 attachment surfaces, as necessary.
6. Apply Weld-Thru Coating or equivalent to all mating surfaces. Refer to [Anti-Corrosion Treatment and Repair](#).

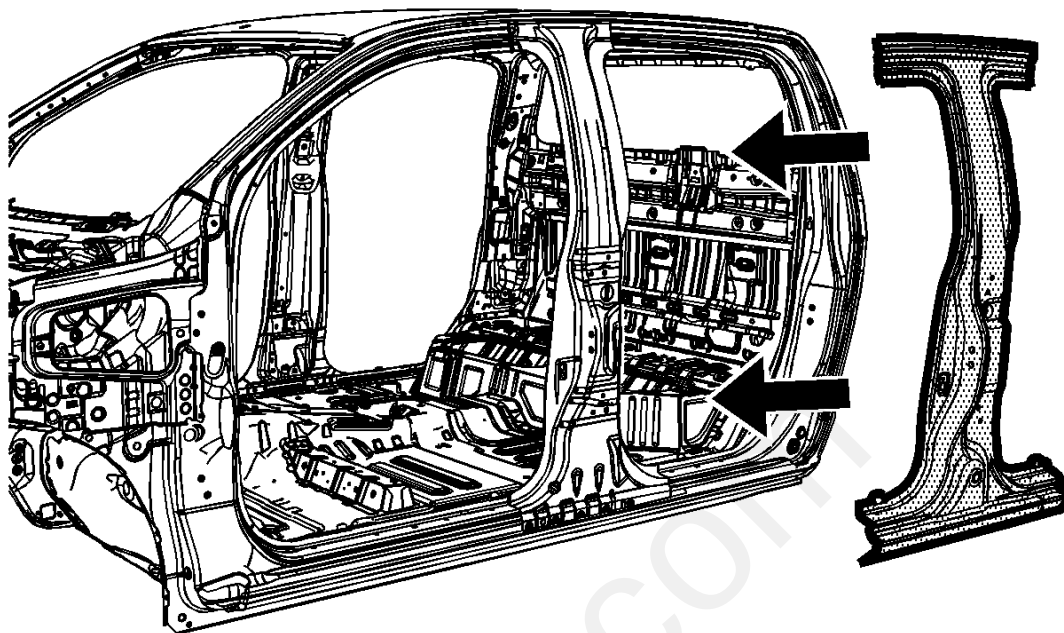


Fig. 166: Center Pillar

Courtesy of GENERAL MOTORS COMPANY

7. Position the center pillar to the vehicle using 3-dimensional measuring equipment. Clamp in place.

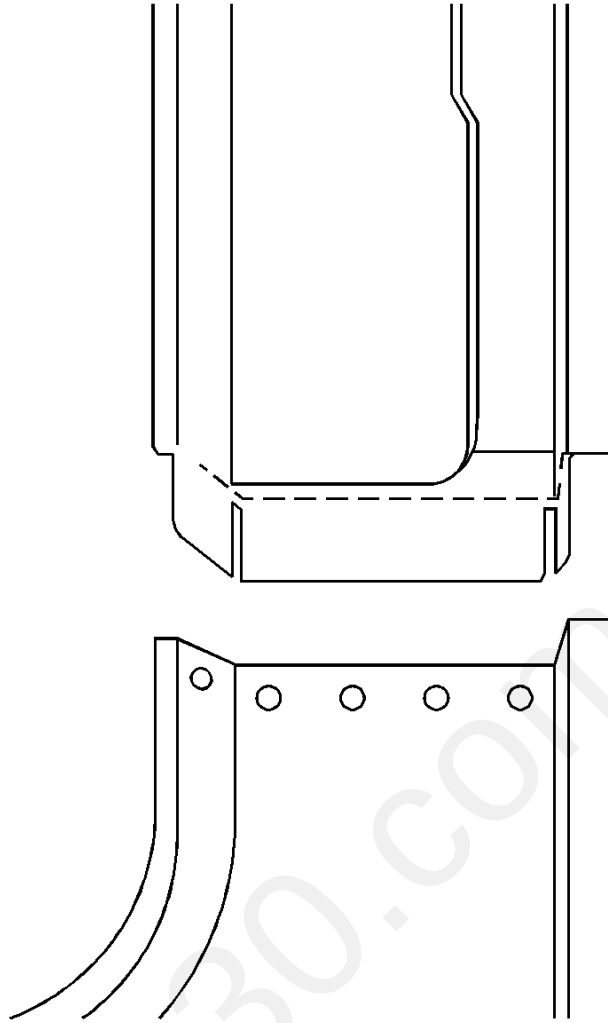


Fig. 167: Fitting New Part On Original Panel
Courtesy of GENERAL MOTORS COMPANY

8. Fit the new part on the original panel.

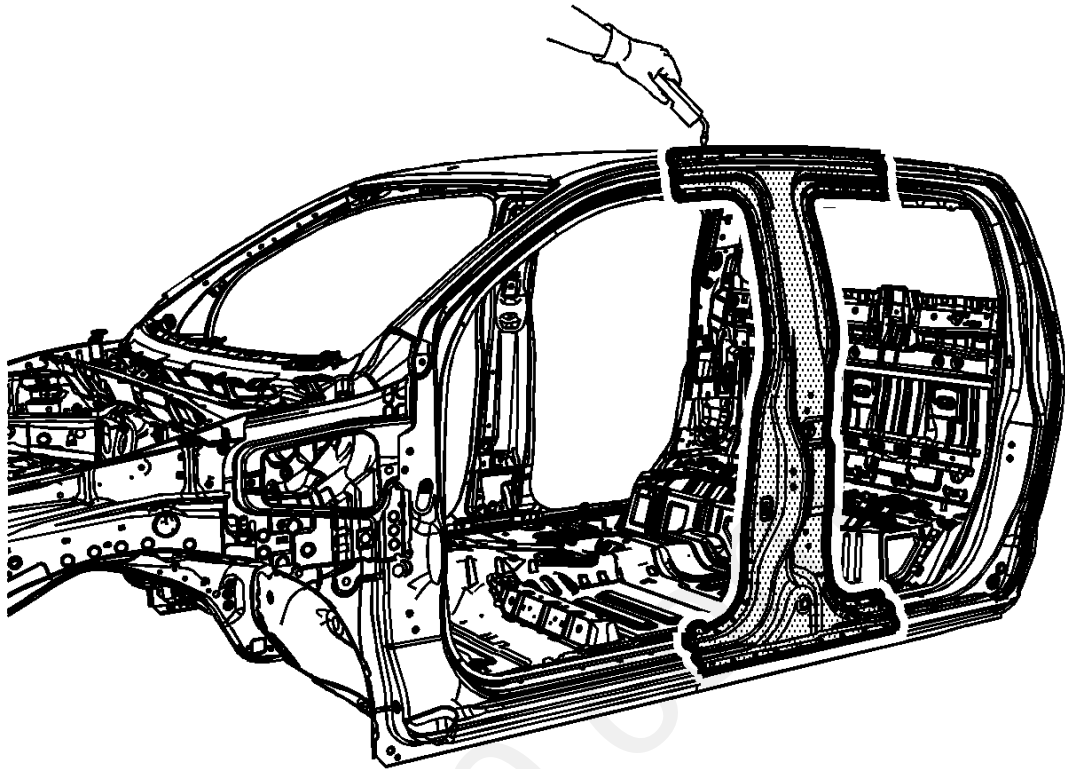


Fig. 168: Plug Welding

Courtesy of GENERAL MOTORS COMPANY

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 them. Complete the stitch weld.

10. Clean and prepare all welded surfaces.

11. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .

12. Paint the repair area. Refer to [Basecoat/Clearcoat Paint Systems](#) .

13. Install all related panels and components.

14. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .

15. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

REAR PILLAR SECTIONING (LOWER)

Removal Procedure

WARNING: Refer to [Approved Equipment for Collision Repair Warning](#) .

----- Refer to [Glass and Sheet Metal Handling Warning](#) .

WARNING: Refer to [Collision Sectioning Warning](#) .

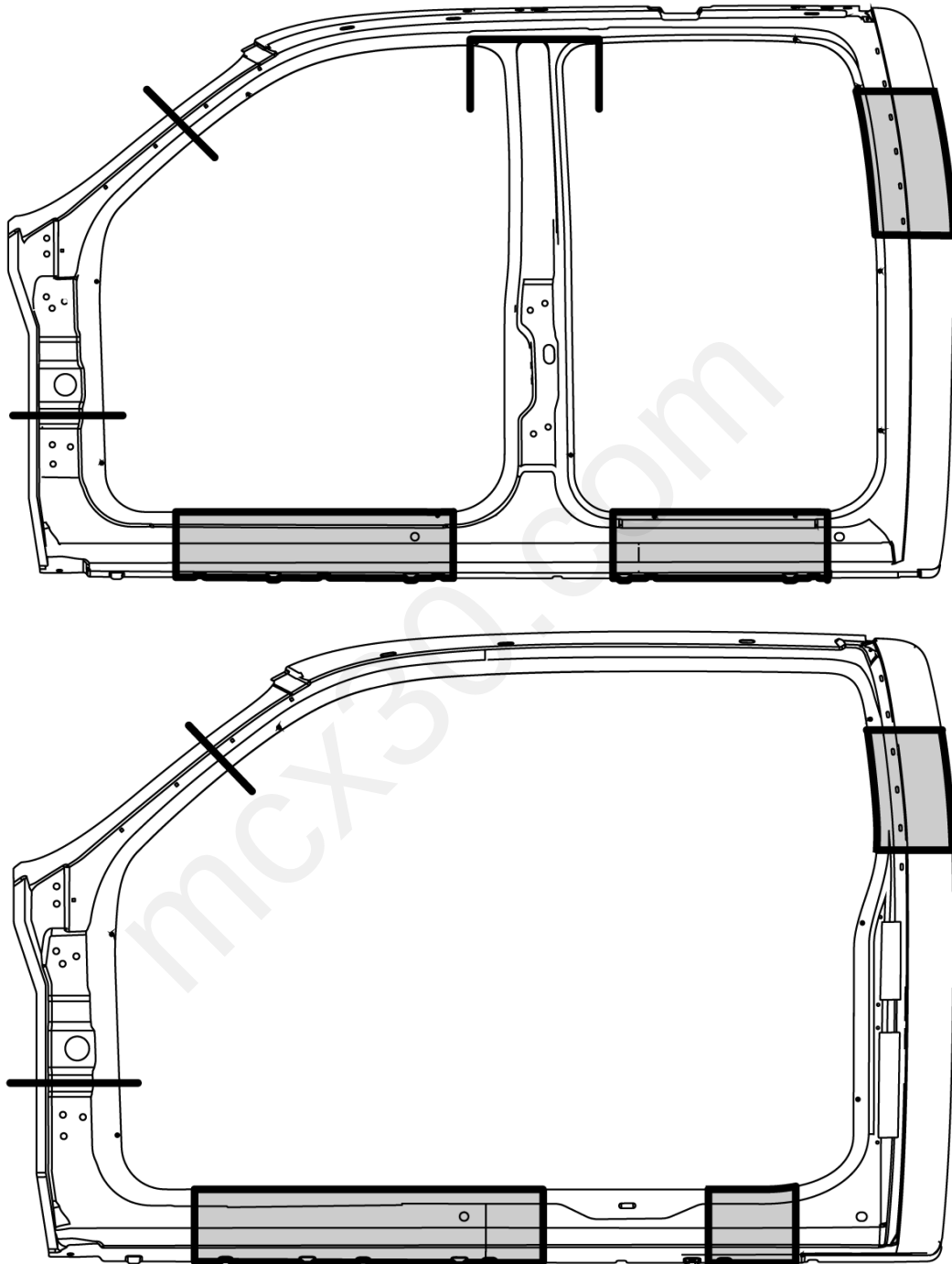


Fig. 169: Door Frame

Courtesy of GENERAL MOTORS COMPANY

1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .

- ect 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](#).

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](#) .
6. Perform additional sectioning procedures, as necessary. Refer to the following procedures:
 - [Outer Windshield Frame Pillar Sectioning](#)
 - [Front Hinge Pillar Sectioning](#)
 - [Rocker Outer Panel Sectioning](#)
 - [Center Pillar Sectioning](#)

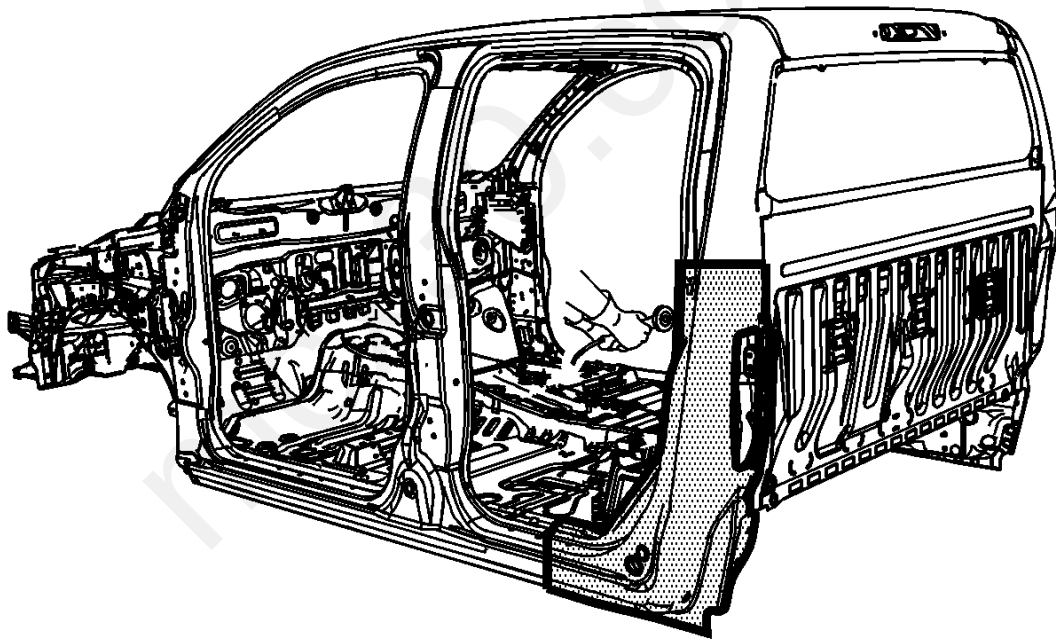


Fig. 170: Perform Sectioning at 170 mm (6.7 in) From Point Indicated

Courtesy of GENERAL MOTORS COMPANY

7. Perform the sectioning at 170 mm (6.7 in) from the point indicated and 30 mm (1.18 in) from the inner reinforcement or choose the procedure that fits better according to the collision.

NOTE: Do not damage any inner panels or reinforcements.

panel in the locations where sectioning is to be performed.

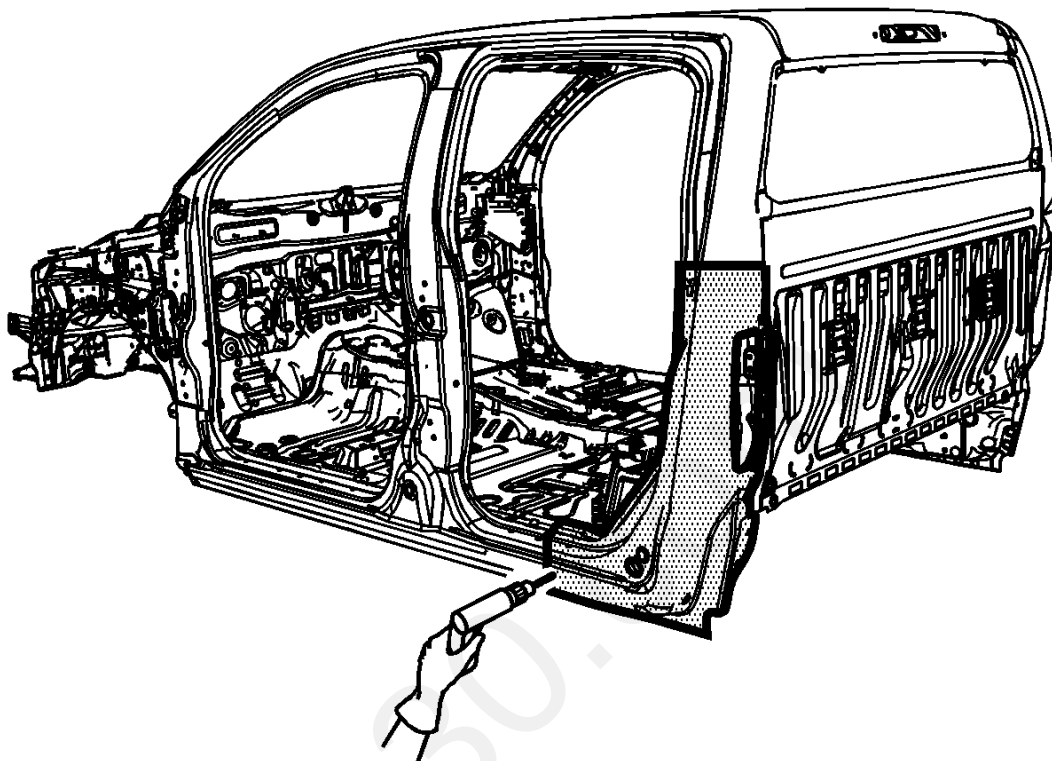


Fig. 171: Drilling Out All Factory Welds

Courtesy of GENERAL MOTORS COMPANY

9. Locate and drill out all factory welds. Note the number and location of the welds for installation of the service part.

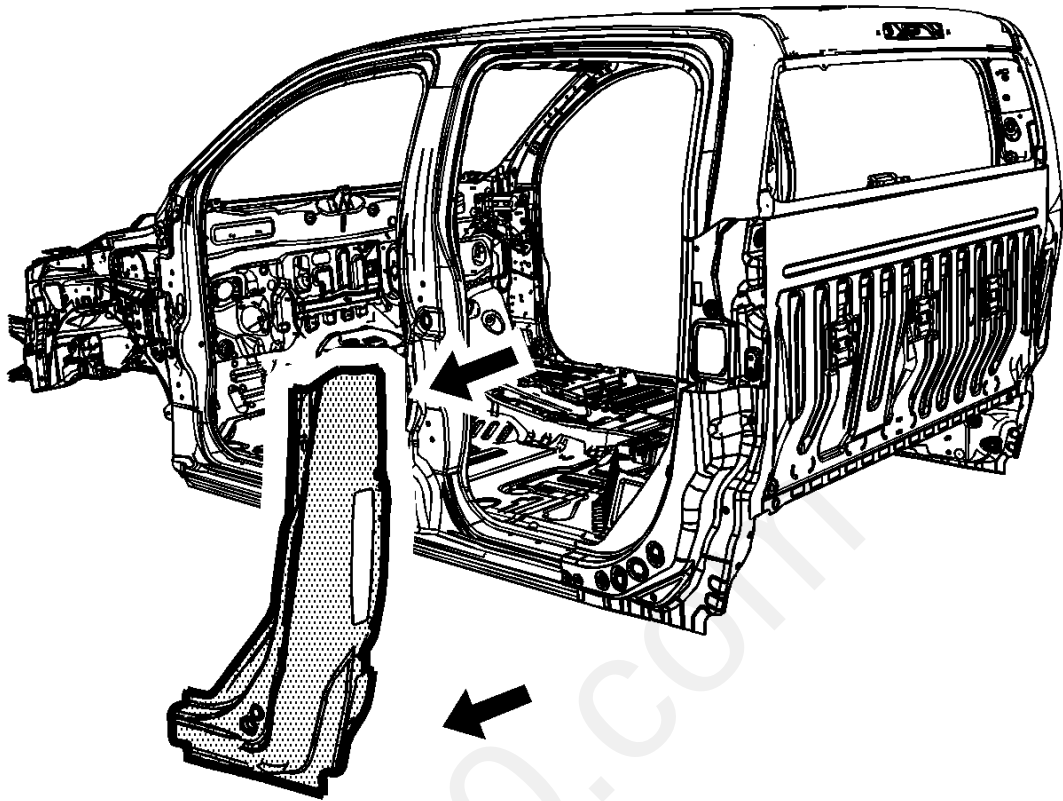


Fig. 172: Positioning Rear Pillar To Vehicle Using 3-Dimensional Measuring Equipment
Courtesy of GENERAL MOTORS COMPANY

10. Remove the damaged pillar section.

Installation Procedure

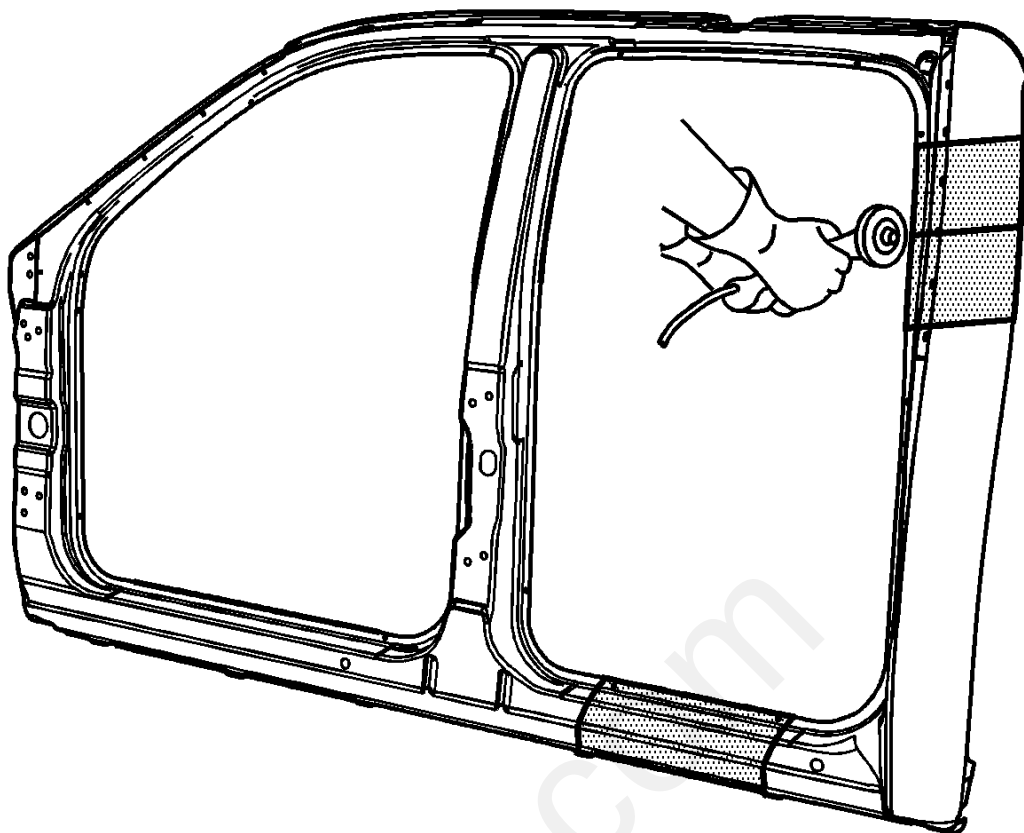


Fig. 173: Cutting Panel For Sectioning

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).

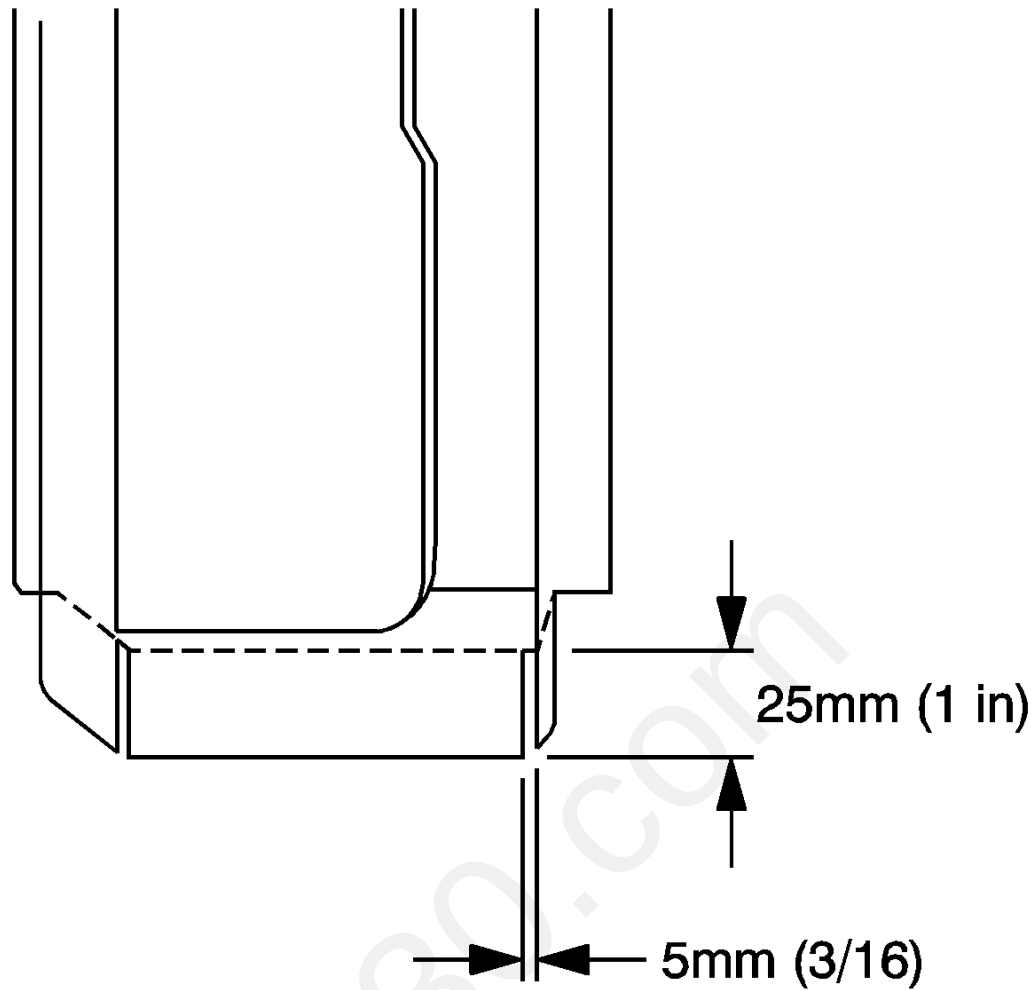


Fig. 174: Cutting 5 mm (3/16 in) Wide Gaps In Bottom Corners

Courtesy of GENERAL MOTORS COMPANY

2. Cut and remove 25 mm (1 in) from the flanges on either side of the remaining section of the original pillar.
Cut 5 mm (3/16 in) wide gaps in the bottom corners.

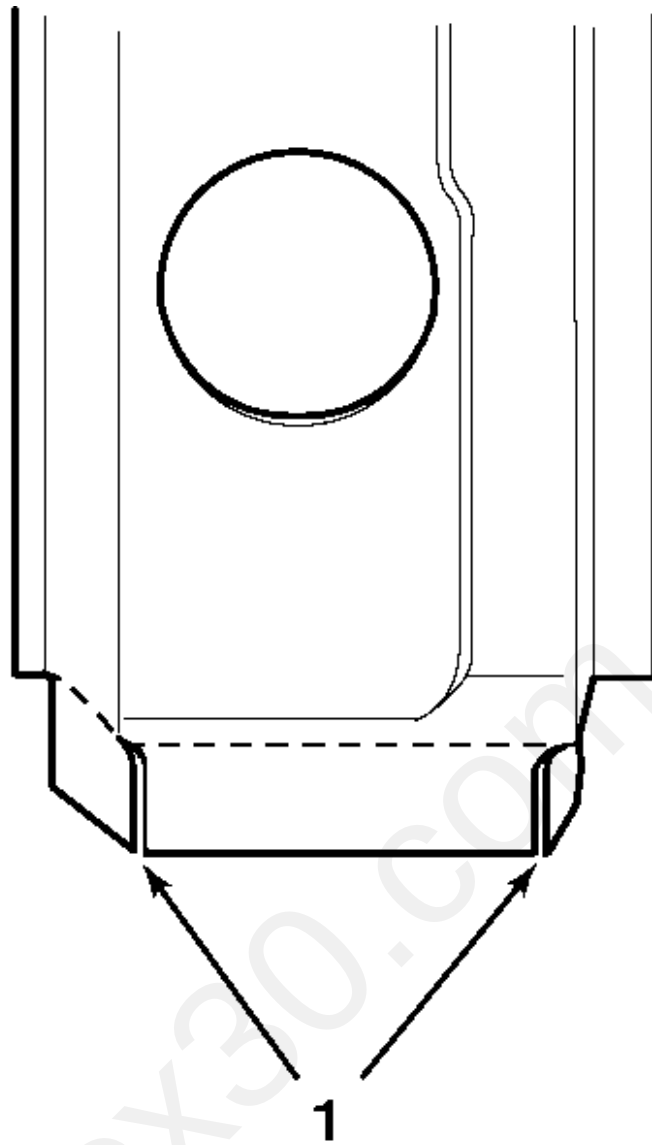


Fig. 175: Stepping Tabs

Courtesy of GENERAL MOTORS COMPANY

3. Step the tabs (1) inward to allow the door frame opening service section to fit over the original hinge pillar.

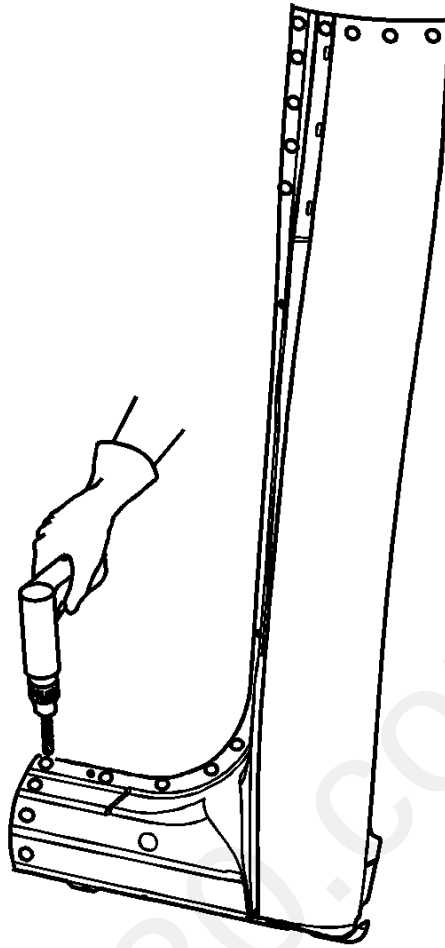


Fig. 176: Drilling Plug Weld Holes

Courtesy of GENERAL MOTORS COMPANY

NOTE: If the location of the original plug weld holes cannot be determined, or if structural weld-thru adhesive was present, space the plug weld holes every 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.

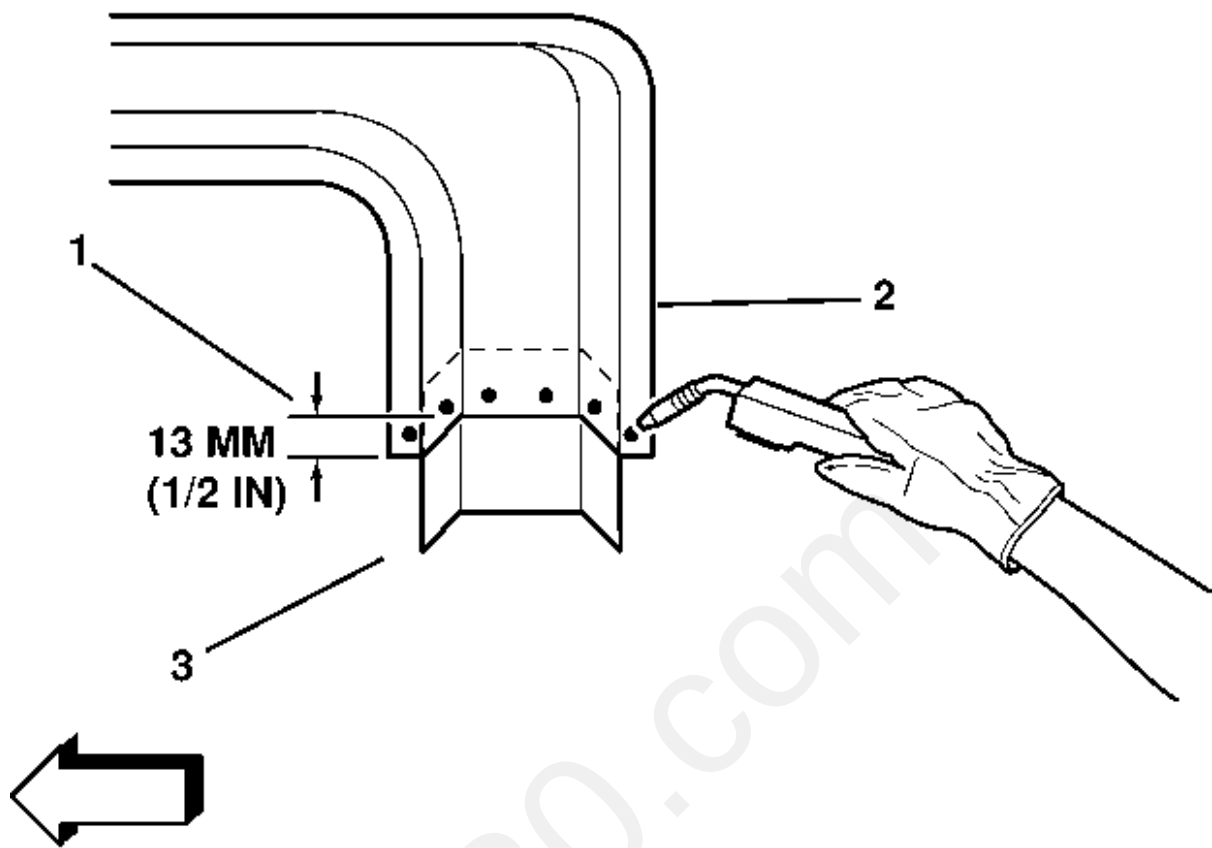


Fig. 177: Plug Welding Backing Plate

Courtesy of GENERAL MOTORS COMPANY

5. Prepare all attachment surfaces, as necessary.
6. Apply Weld-Thru Coating or equivalent to all mating surfaces. Refer to [Anti-Corrosion Treatment and Repair](#) .

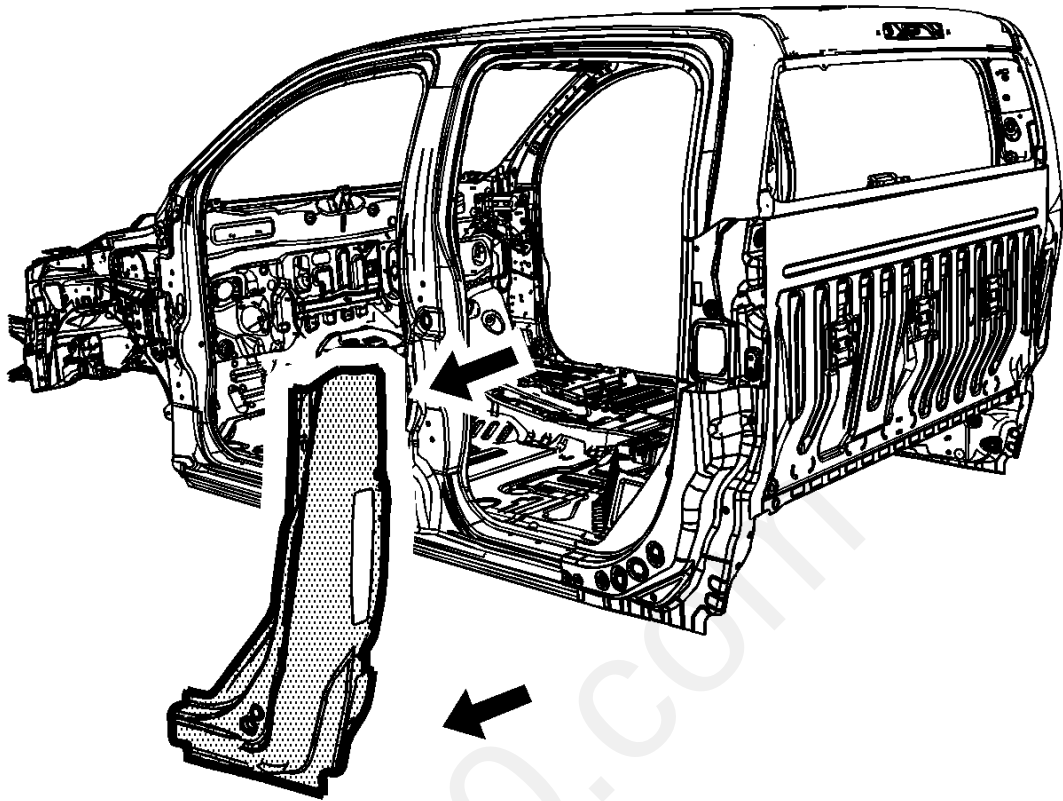


Fig. 178: Positioning Rear Pillar To Vehicle Using 3-Dimensional Measuring Equipment
Courtesy of GENERAL MOTORS COMPANY

7. Position the rear pillar to the vehicle using 3-dimensional measuring equipment. Clamp in place.

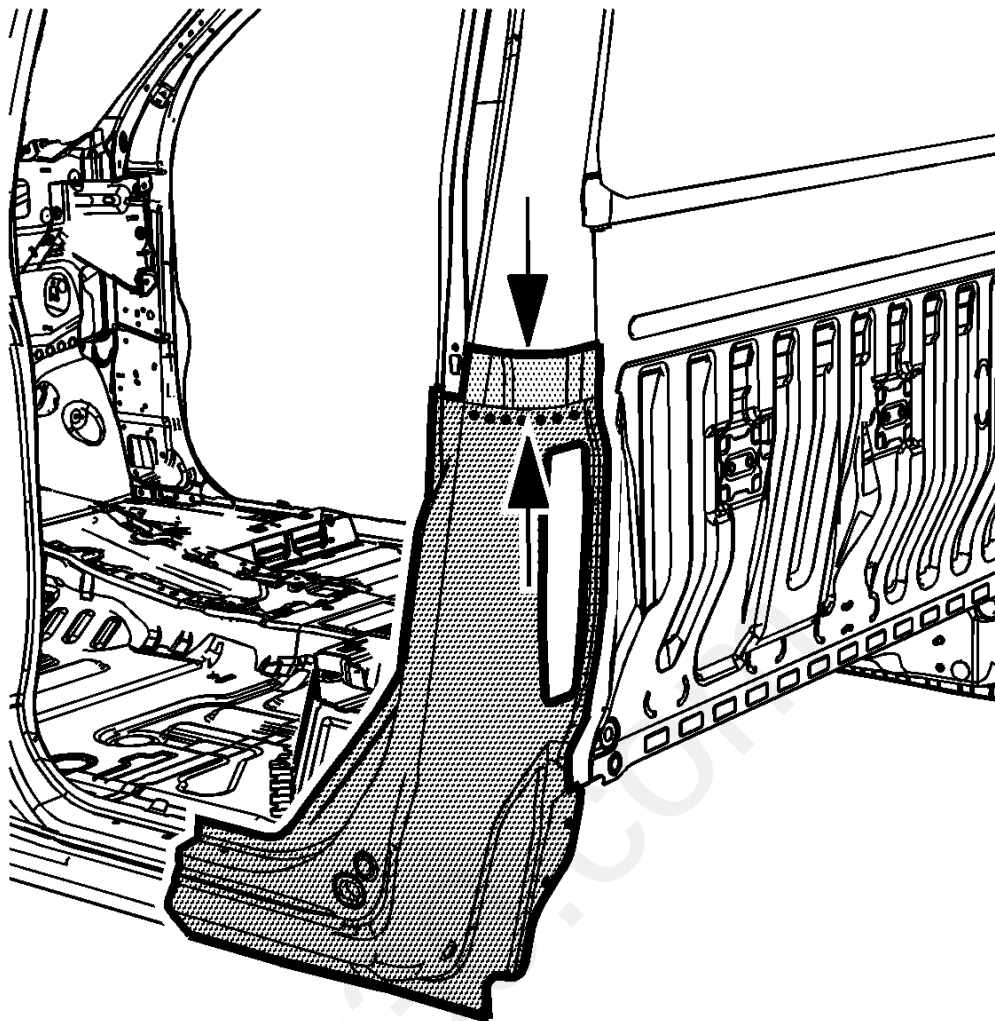


Fig. 179: Fitting New Part On Original Panel
Courtesy of GENERAL MOTORS COMPANY

8. Fit the new part on the original panel.

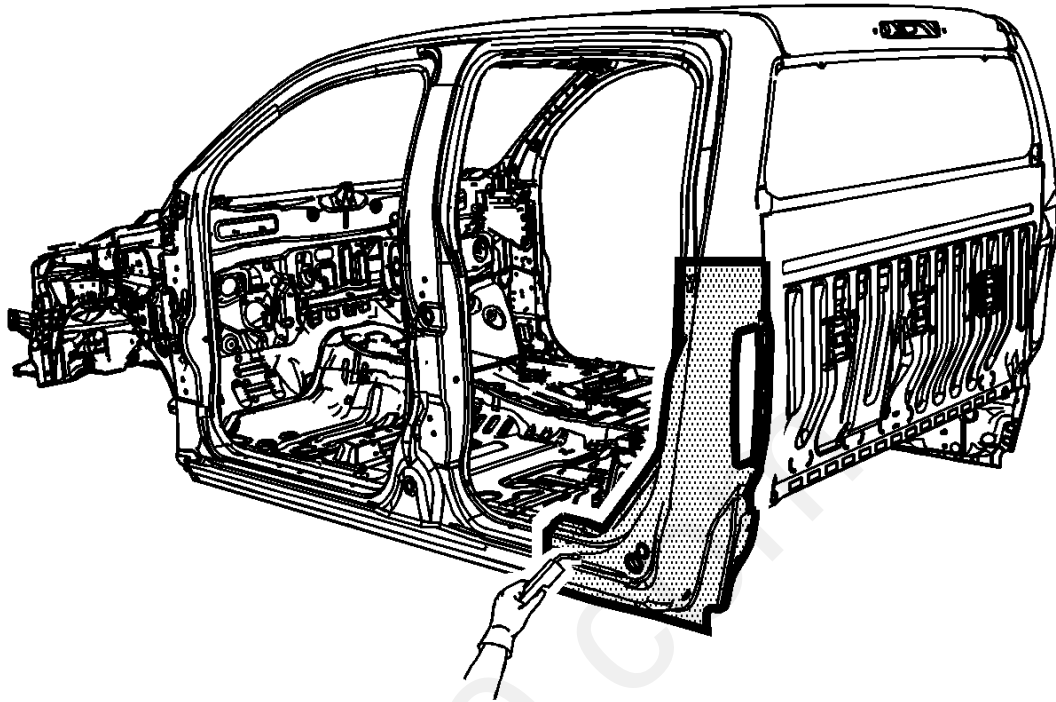


Fig. 180: Plug Welding

Courtesy of GENERAL MOTORS COMPANY

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 them. Complete the stitch weld.

10. Clean and prepare all welded surfaces.

11. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .

12. Paint the repair area. Refer to [Basecoat/Clearcoat Paint Systems](#) .

13. Install all related panels and components.

14. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .

15. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

REAR PILLAR SECTIONING (COMPLETE)

Removal Procedure

WARNING: Refer to [Approved Equipment for Collision Repair Warning](#) .

----- Refer to [Glass and Sheet Metal Handling Warning](#) .

WARNING: Refer to [Collision Sectioning Warning](#) .

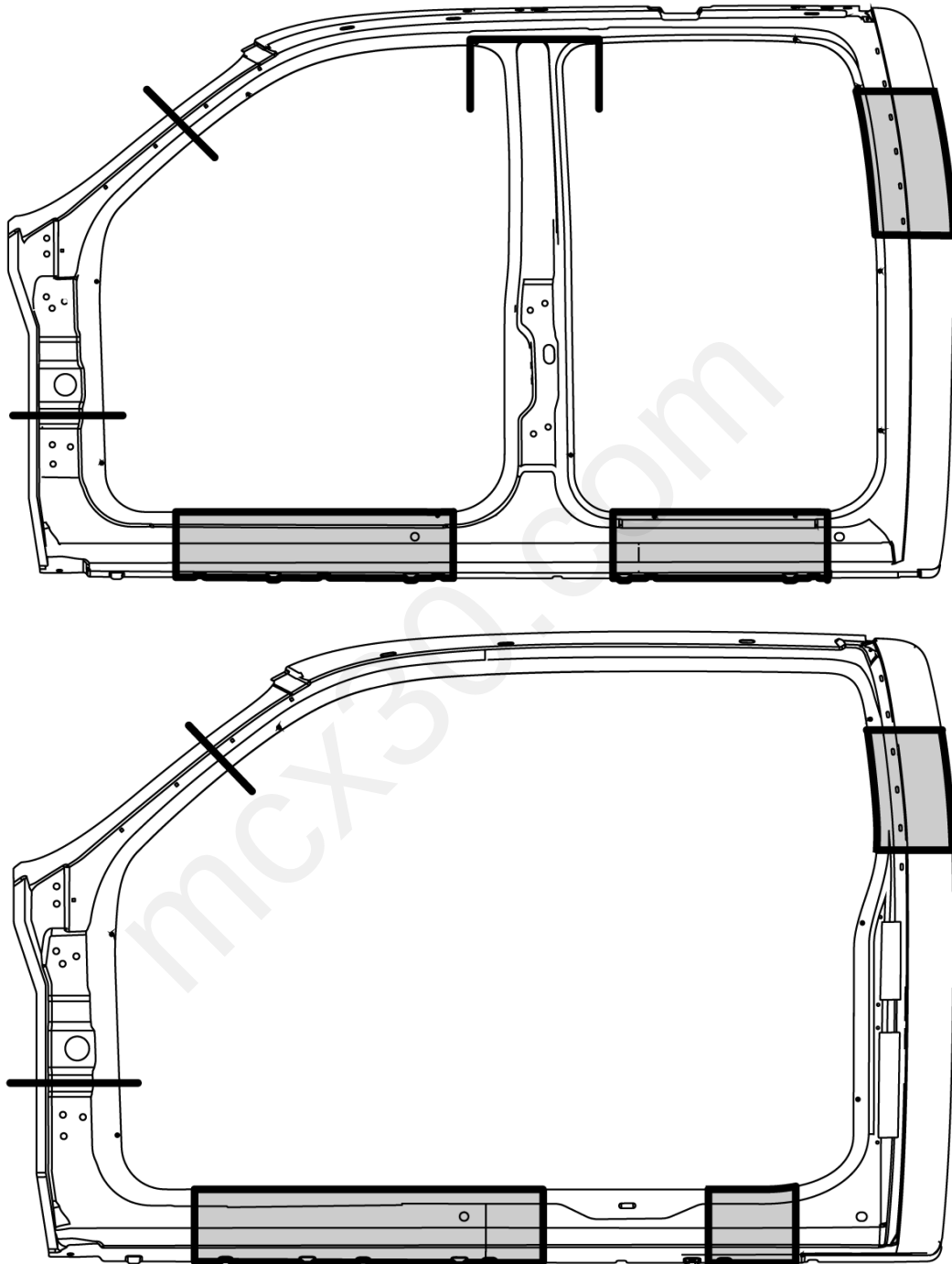


Fig. 181: Door Frame

Courtesy of GENERAL MOTORS COMPANY

1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .

- ect 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](#).

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](#) .
6. Perform additional sectioning procedures, as necessary. Refer to the following procedures:
 - [Outer Windshield Frame Pillar Sectioning](#)
 - [Front Hinge Pillar Sectioning](#)
 - [Rocker Outer Panel Sectioning](#)
 - [Center Pillar Sectioning](#)

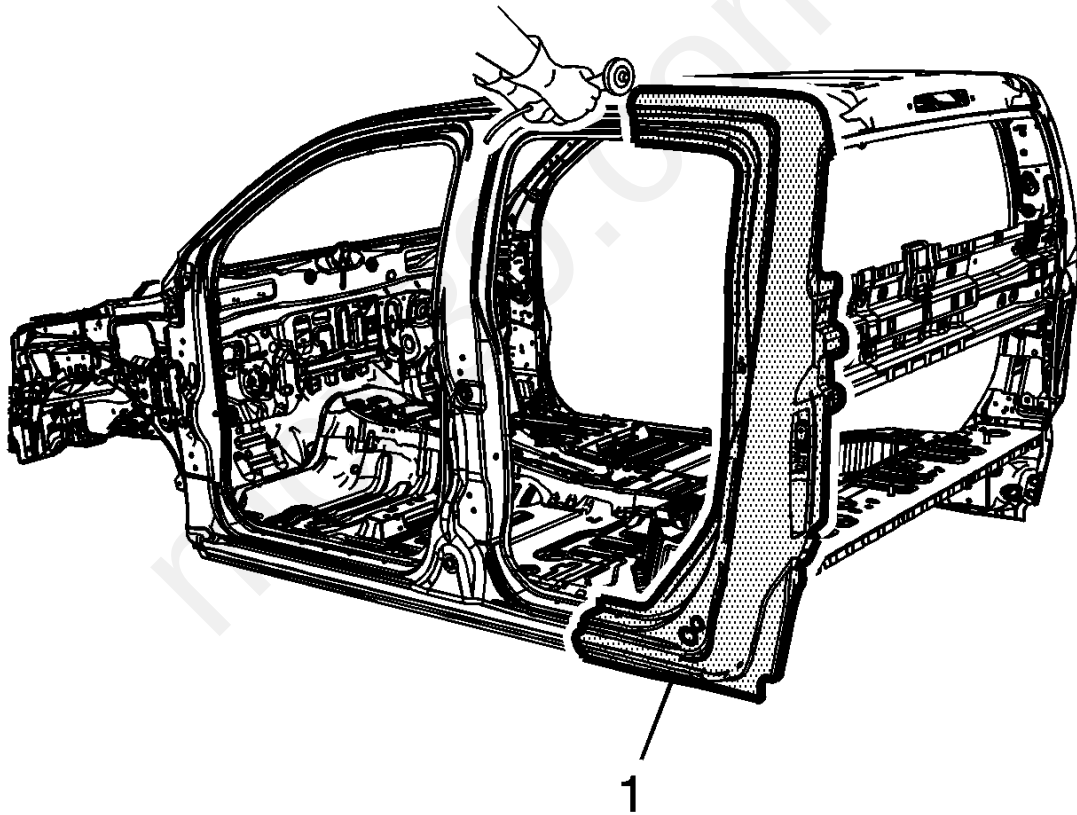


Fig. 182: Perform Sectioning (1) at 170 mm (6.7 in) From Point Indicated
Courtesy of GENERAL MOTORS COMPANY

7. Perform the sectioning (1) at 170 mm (6.7 in) from the point indicated and 30 mm (1.18 in) from the inner reinforcement or choose the procedure that fits better according to the collision.

NOTE: Do not damage any inner panels or reinforcements.

panel in the locations where sectioning is to be performed.

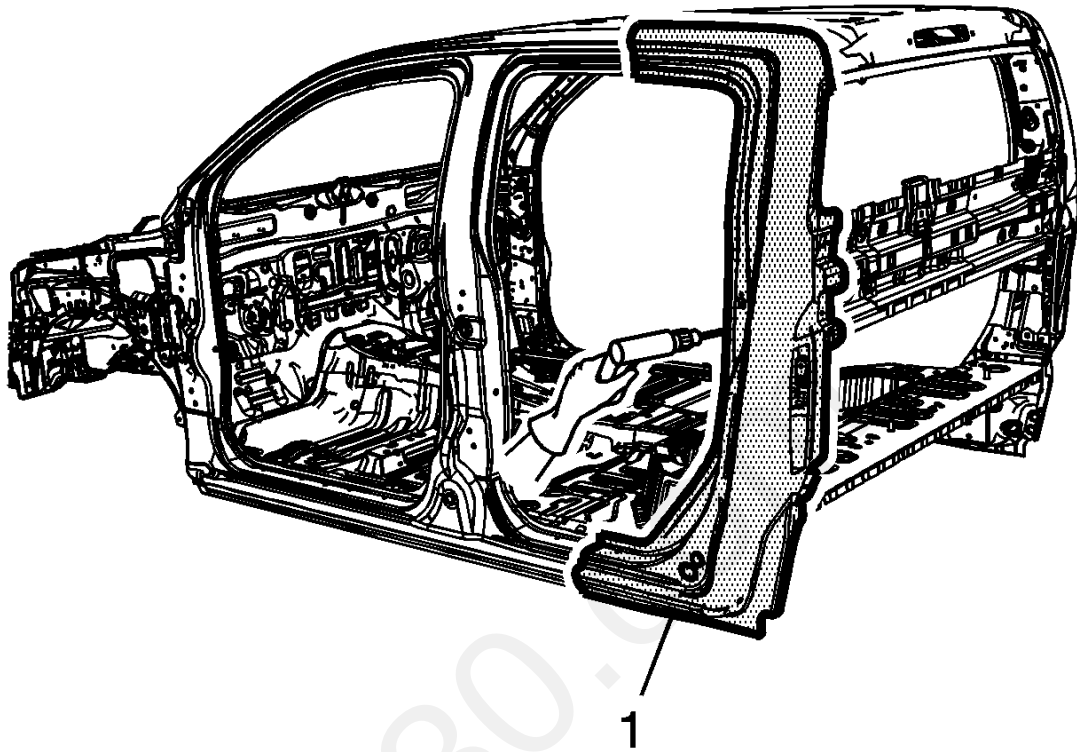


Fig. 183: Drilling Out All Factory Welds

Courtesy of GENERAL MOTORS COMPANY

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

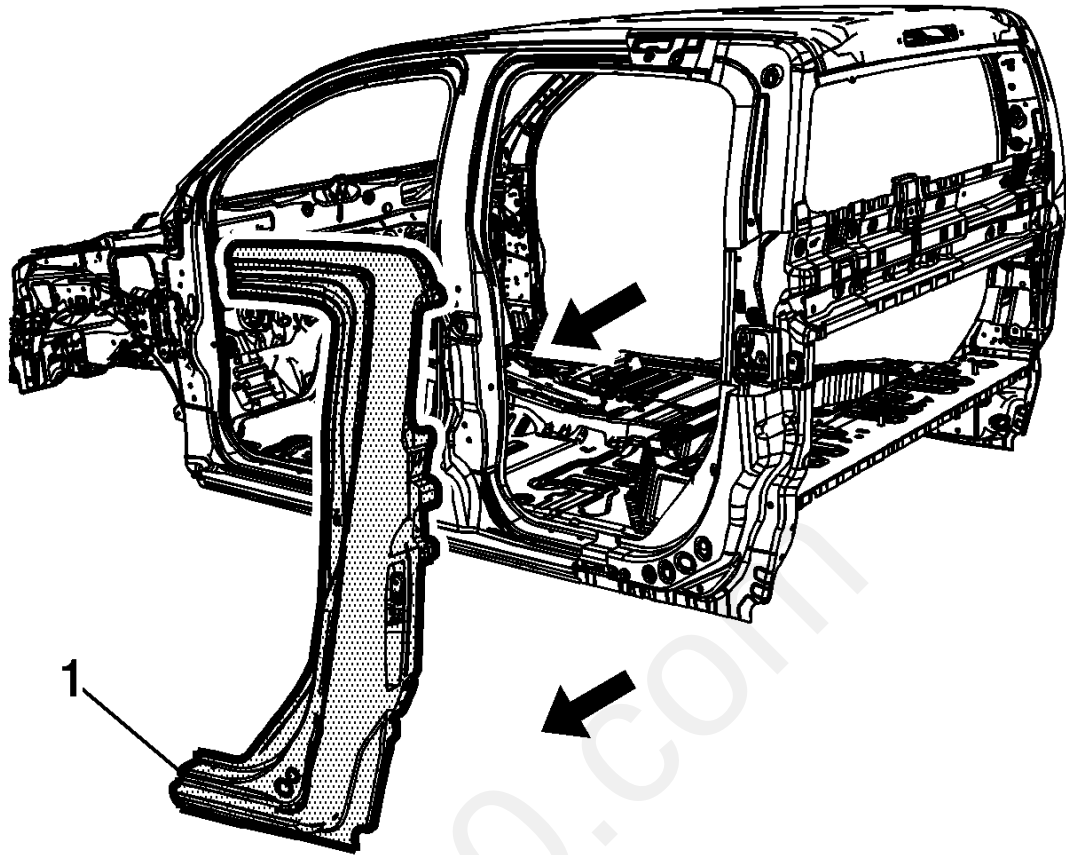


Fig. 184: Damaged Pillar Section

Courtesy of GENERAL MOTORS COMPANY

10. Remove the damaged pillar section (1).

Installation Procedure

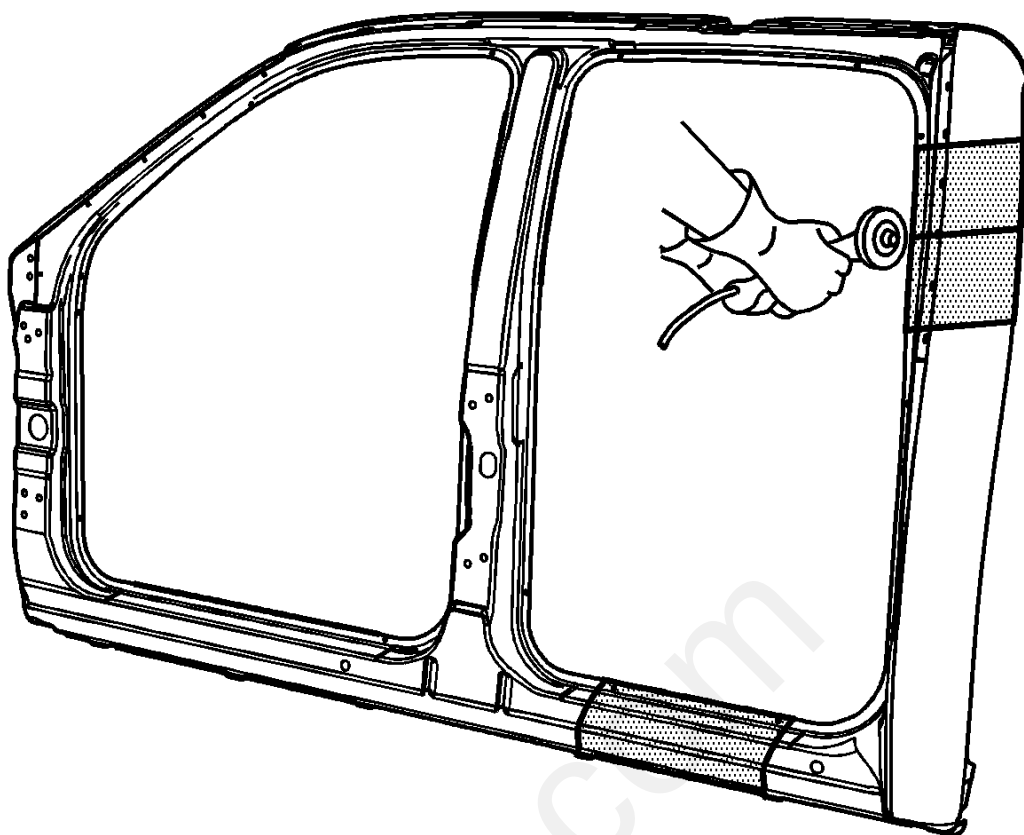


Fig. 185: Cutting Panel For Sectioning

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).

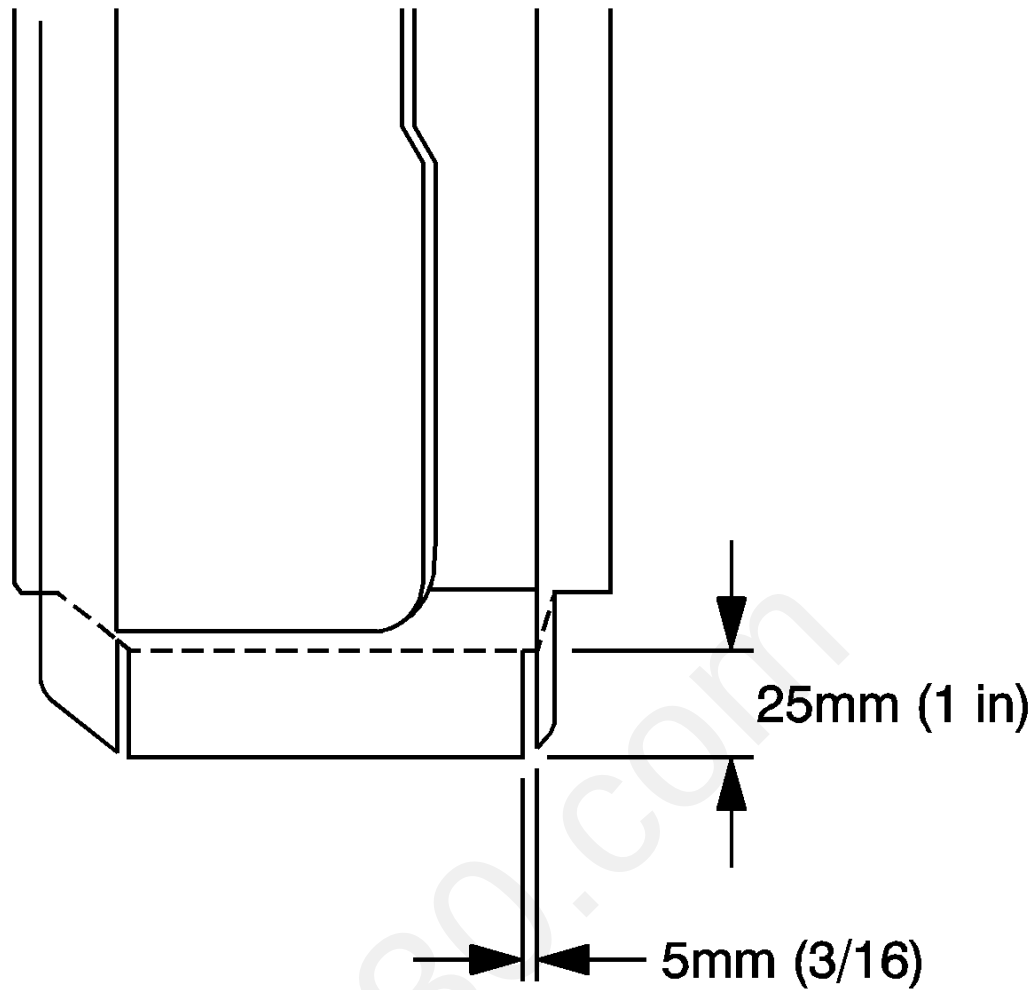


Fig. 186: Cutting 5 mm (3/16 in) Wide Gaps In Bottom Corners

Courtesy of GENERAL MOTORS COMPANY

2. Cut and remove 25 mm (1 in) from the flanges on either side of the remaining section of the original pillar.
Cut 5 mm (3/16 in) wide gaps in the bottom corners.

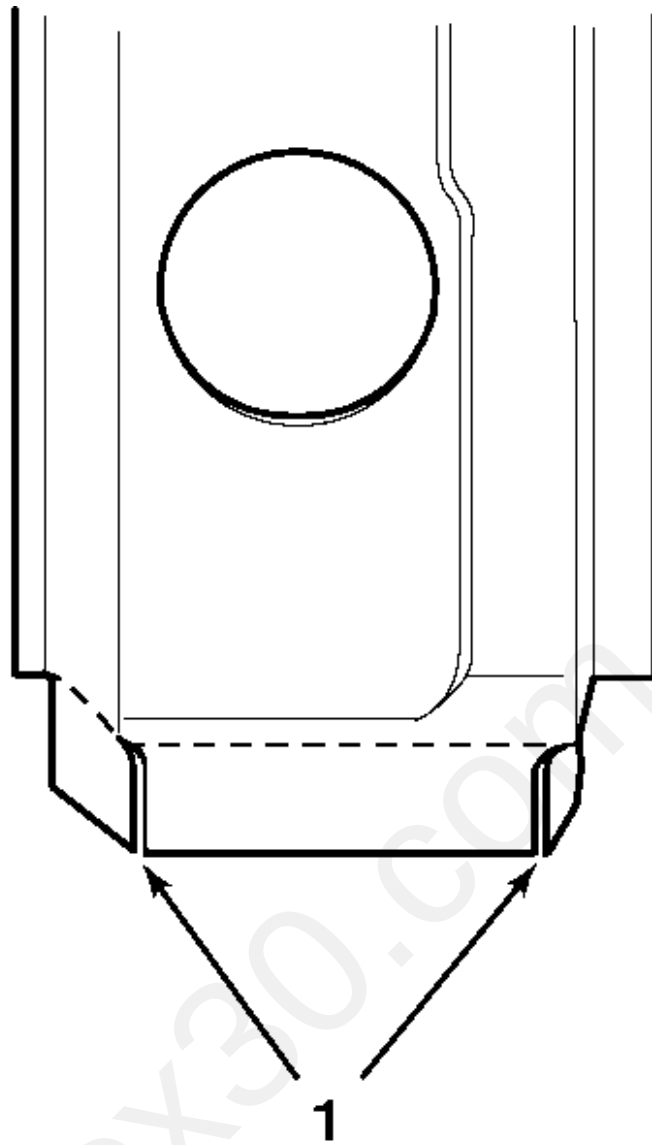


Fig. 187: Stepping Tabs

Courtesy of GENERAL MOTORS COMPANY

3. Step the tabs (1) inward to allow the door frame opening service section to fit over the original hinge pillar.

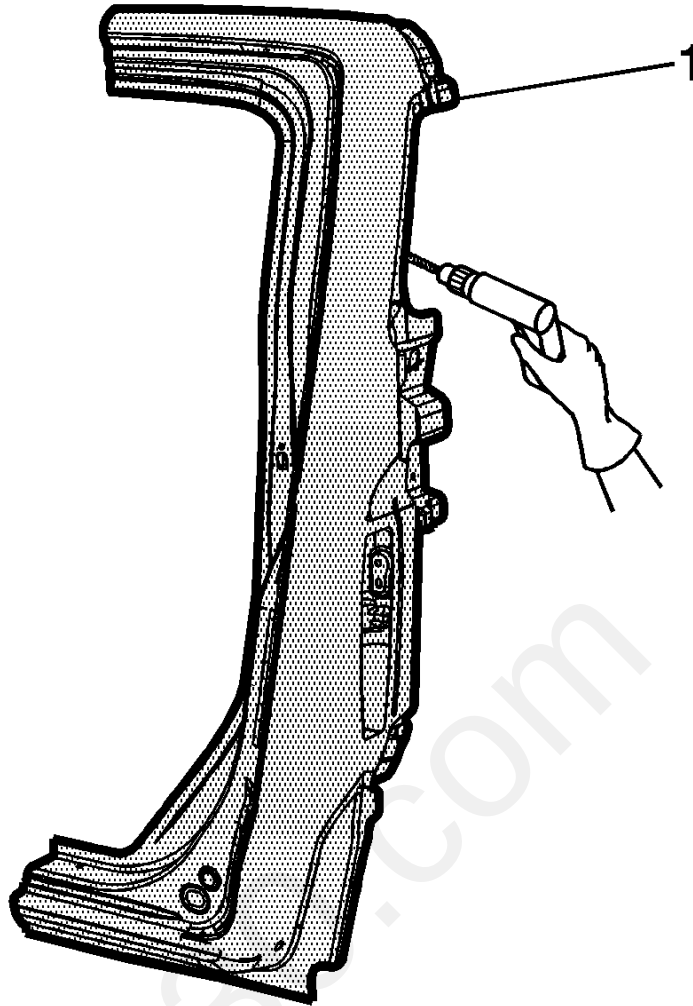


Fig. 188: Drill 8 mm (5/16 in) Plug Weld Holes In Service Part

Courtesy of GENERAL MOTORS COMPANY

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

4. Drill 8 mm (5/16 in) plug weld holes in the service part (1) as necessary in the locations noted from the original panel and along the sectioning cut.
5. Prepare all attachment surfaces, as necessary.
6. Apply Weld-Thru Coating or equivalent to all mating surfaces. Refer to [Anti-Corrosion Treatment and Repair](#).

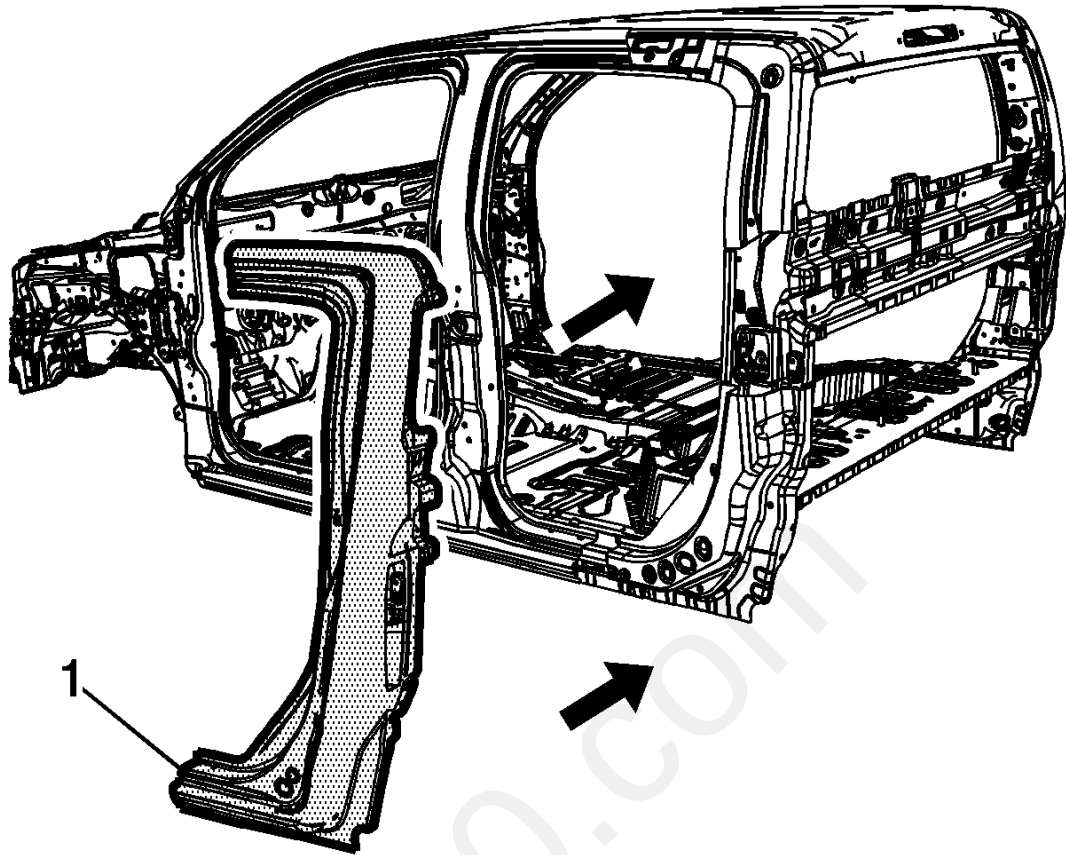


Fig. 189: Rear Pillar

Courtesy of GENERAL MOTORS COMPANY

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

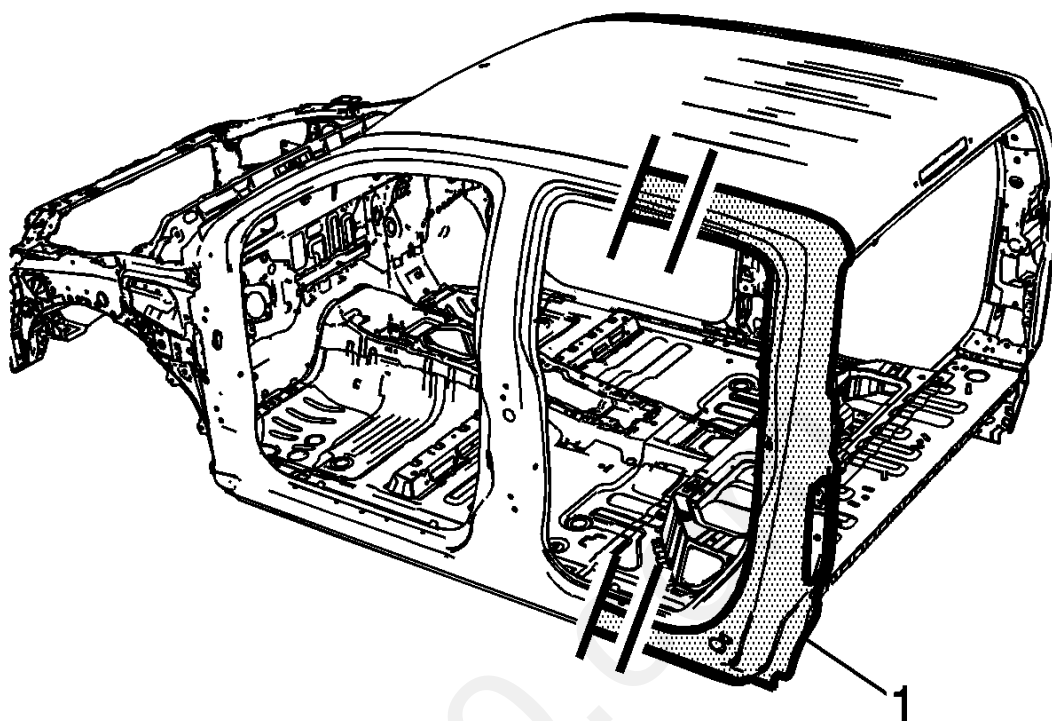


Fig. 190: Fitting New Part On Original Panel
Courtesy of GENERAL MOTORS COMPANY

8. Fit the new part (1) on the original panel.

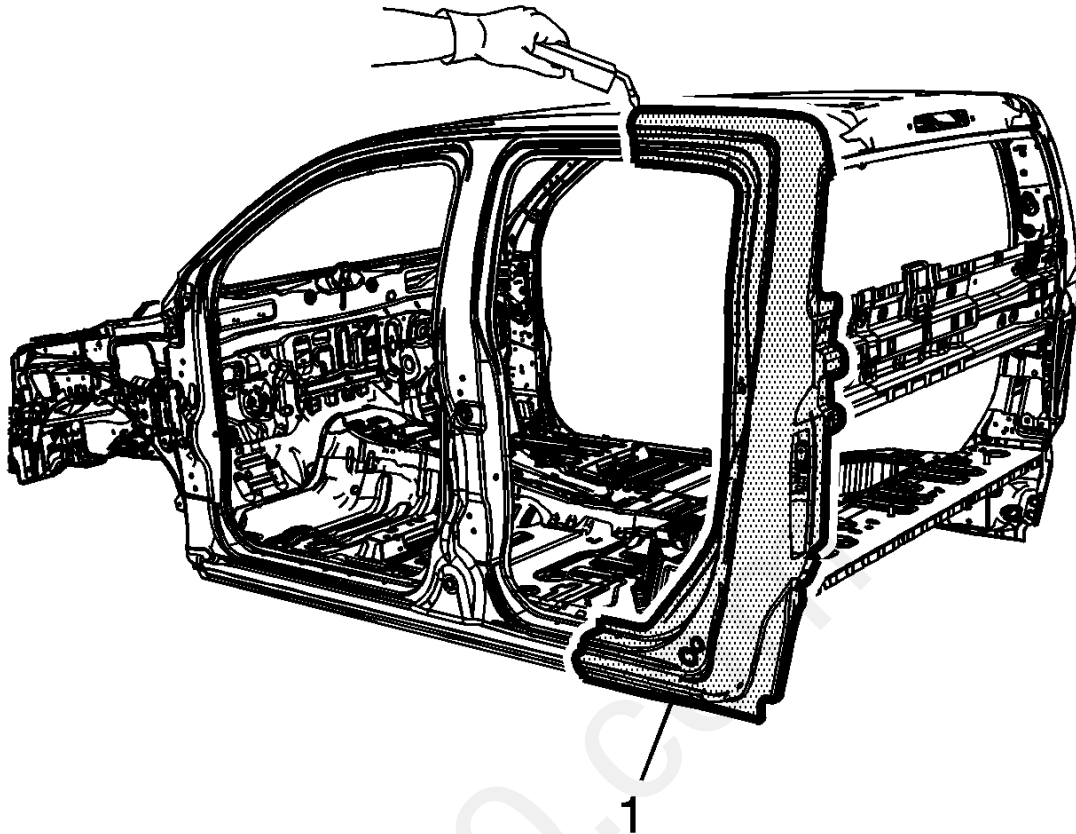


Fig. 191: Plug Welding

Courtesy of GENERAL MOTORS COMPANY

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 them. Complete the stitch weld.

10. Clean and prepare all welded surfaces.

11. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .

12. Paint the repair area. Refer to [Basecoat/Clearcoat Paint Systems](#) .

13. Install all related panels and components.

14. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#) .

15. Enable the SIR system. Refer to [SIR Disabling and Enabling](#) .

OUTER DOOR FRAME SECTIONING

Sectioning Locations

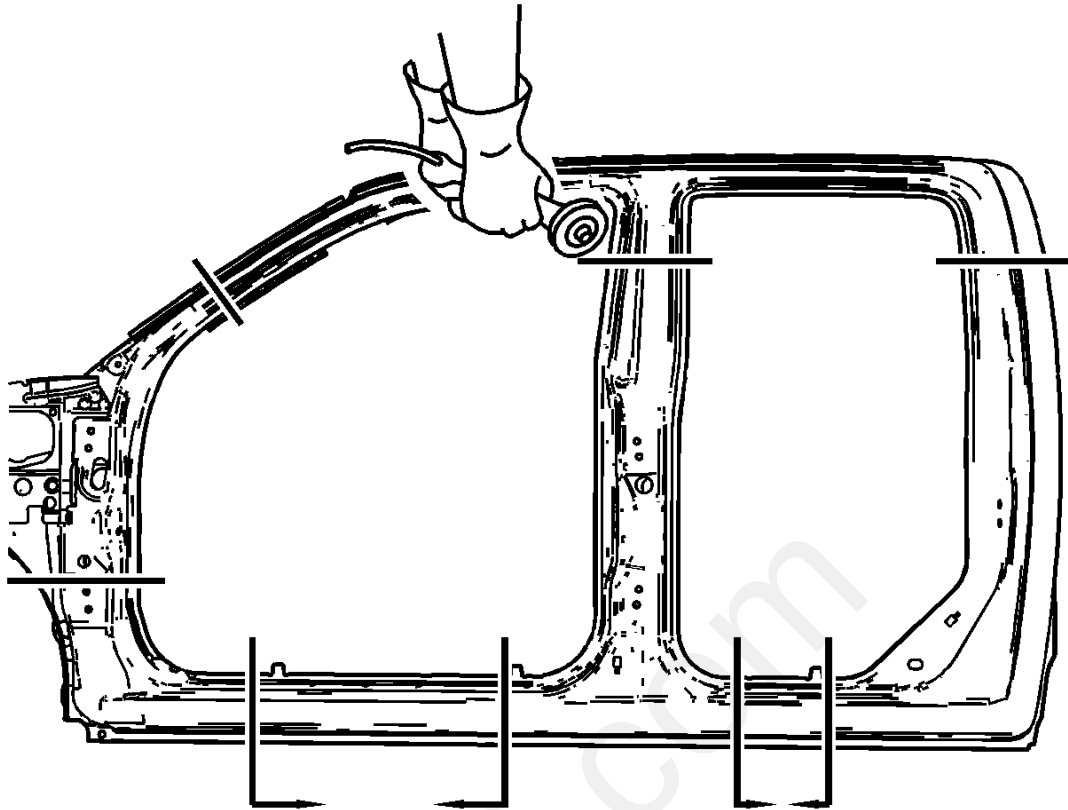


Fig. 192: Cutting Rocket Panel

Courtesy of GENERAL MOTORS COMPANY

IMPORTANT: Section in specified areas only. Sectioning outside of these areas may compromise the structural integrity of the vehicle.

- The crew cab pick-up has identical passenger and driver side door frames. Refer to the following procedures for specific instructions:
 - **Rocker Outer Panel Sectioning**
 - **Front Hinge Pillar Sectioning**
 - **Center Pillar Sectioning**
 - **Rear Pillar Sectioning (Lower)Rear Pillar Sectioning (Complete)**
 - **Outer Windshield Frame Pillar Sectioning**

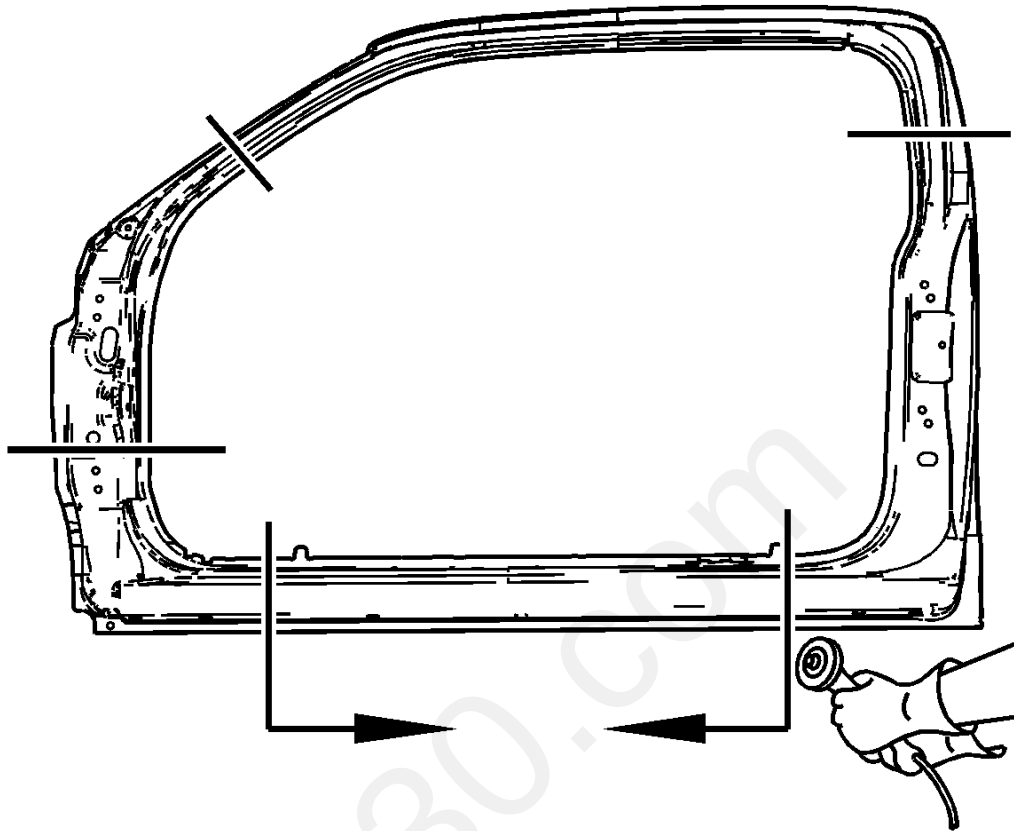


Fig. 193: Cutting Outer Door Frame - Extended Cab

Courtesy of GENERAL MOTORS COMPANY

- The extended cab pick-up has identical passenger and driver side door frames. Refer to the following procedures for specific instructions:
 - [Rocker Outer Panel Sectioning](#)
 - [Front Hinge Pillar Sectioning](#)
 - [Rear Pillar Sectioning \(Lower\)](#)[Rear Pillar Sectioning \(Complete\)](#)
 - [Outer Windshield Frame Pillar Sectioning](#)

REAR END PANEL REPLACEMENT

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](#) .

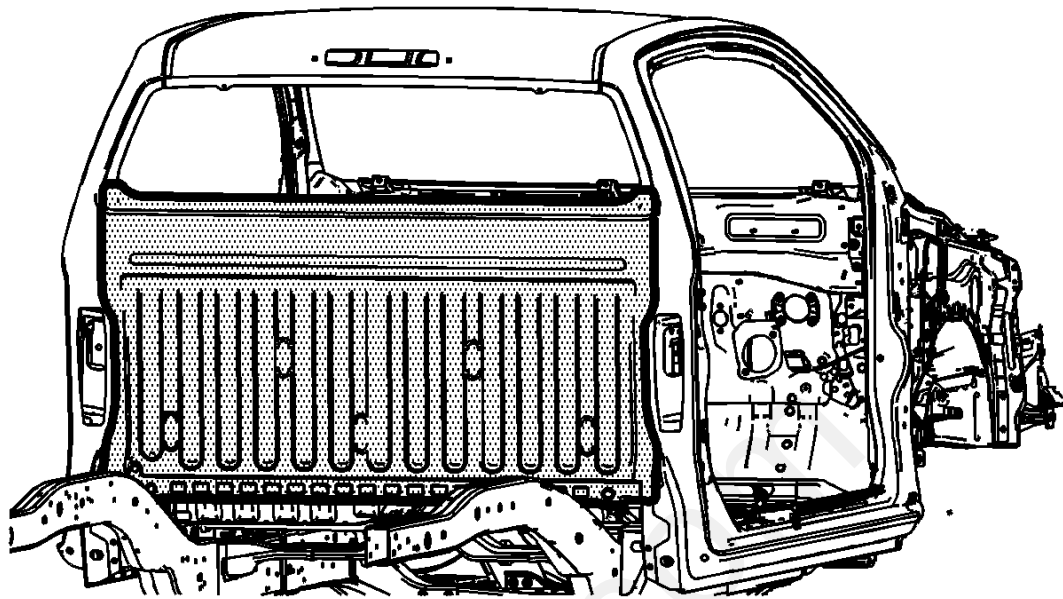


Fig. 194: Panels And Components

Courtesy of GENERAL MOTORS COMPANY

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** .

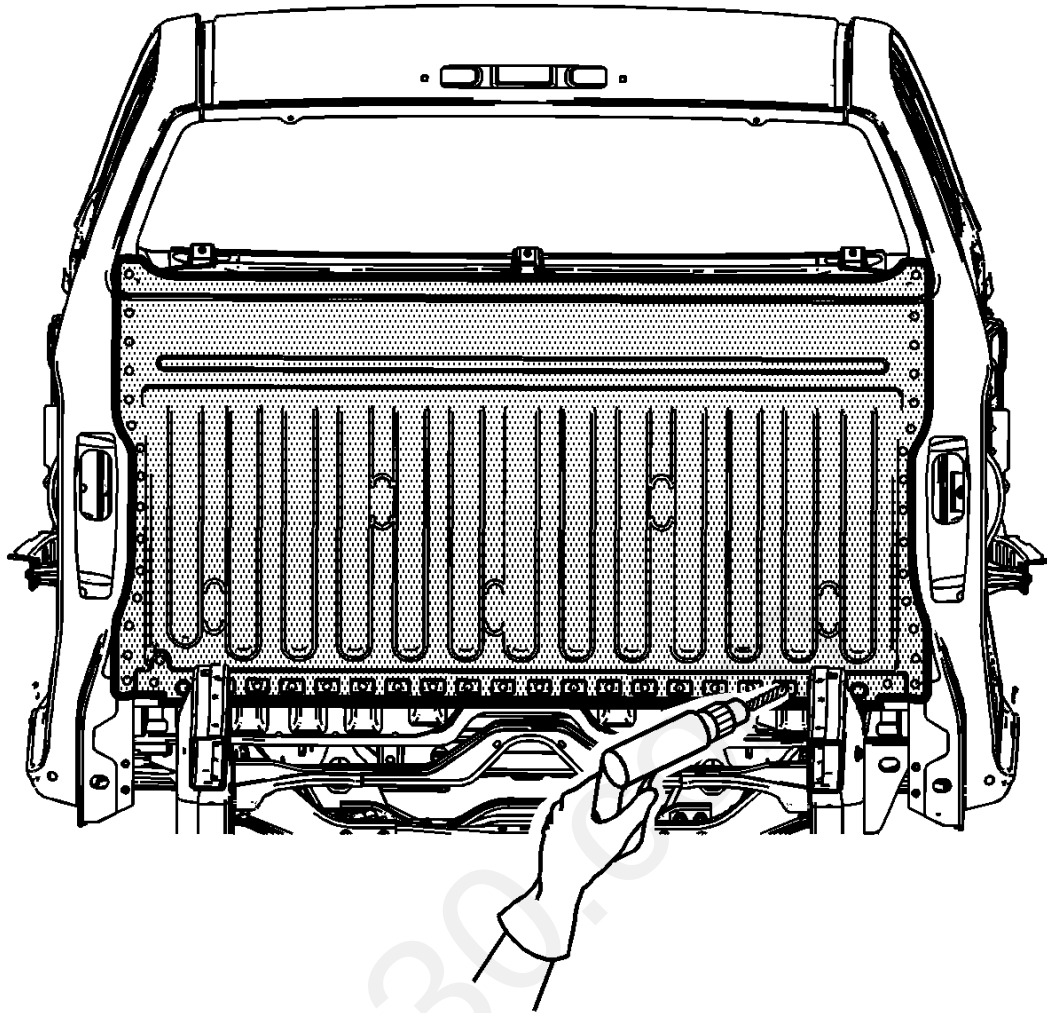


Fig. 195: Drill Out All Factory Welds

Courtesy of GENERAL MOTORS COMPANY

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

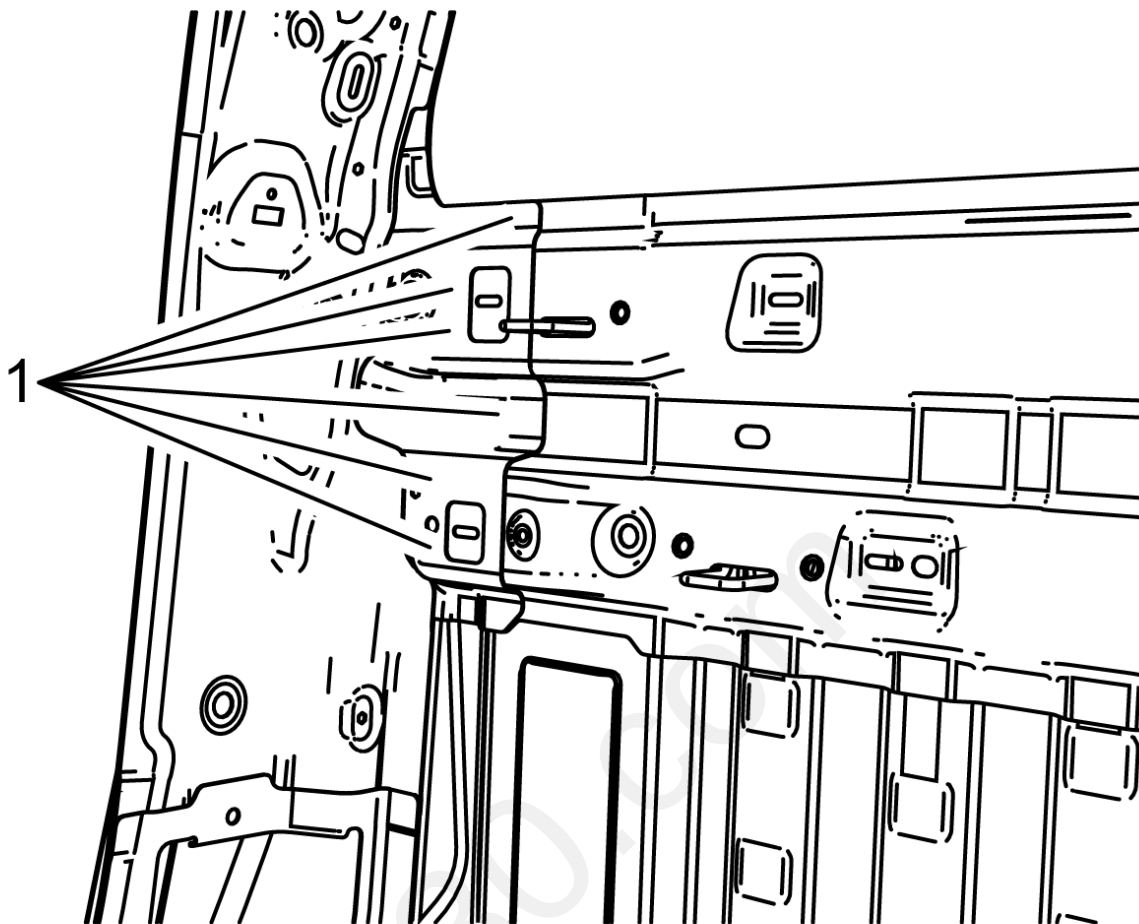


Fig. 196: Drill Factory Welds

Courtesy of GENERAL MOTORS COMPANY

7. Locate and drill factory welds (1) in rear end panel reinforcement.

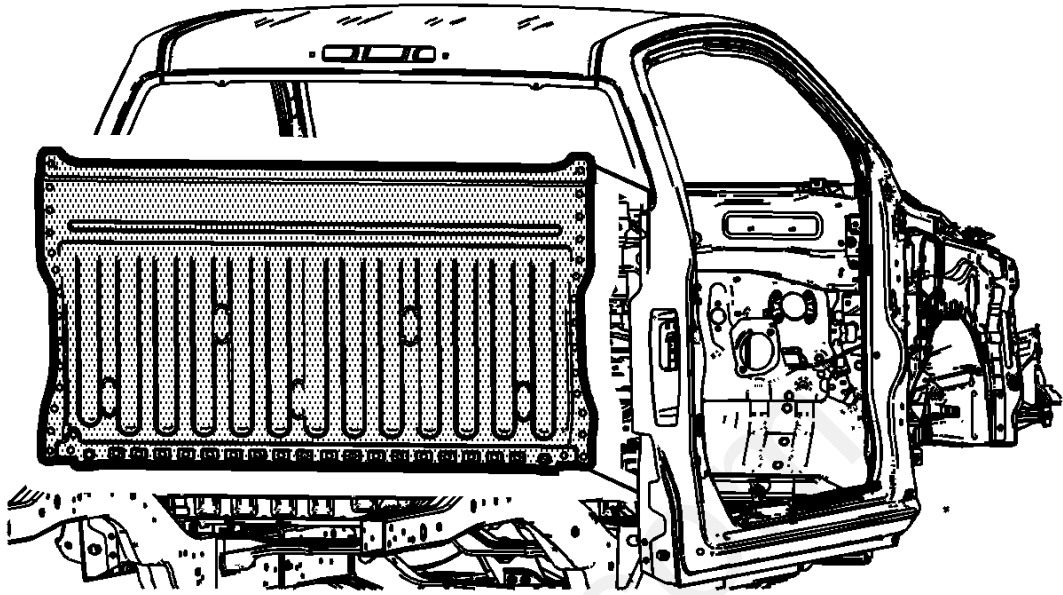


Fig. 197: Damaged Rear End Panel
Courtesy of GENERAL MOTORS COMPANY

8. Remove the damaged rear end panel.

Installation Procedure

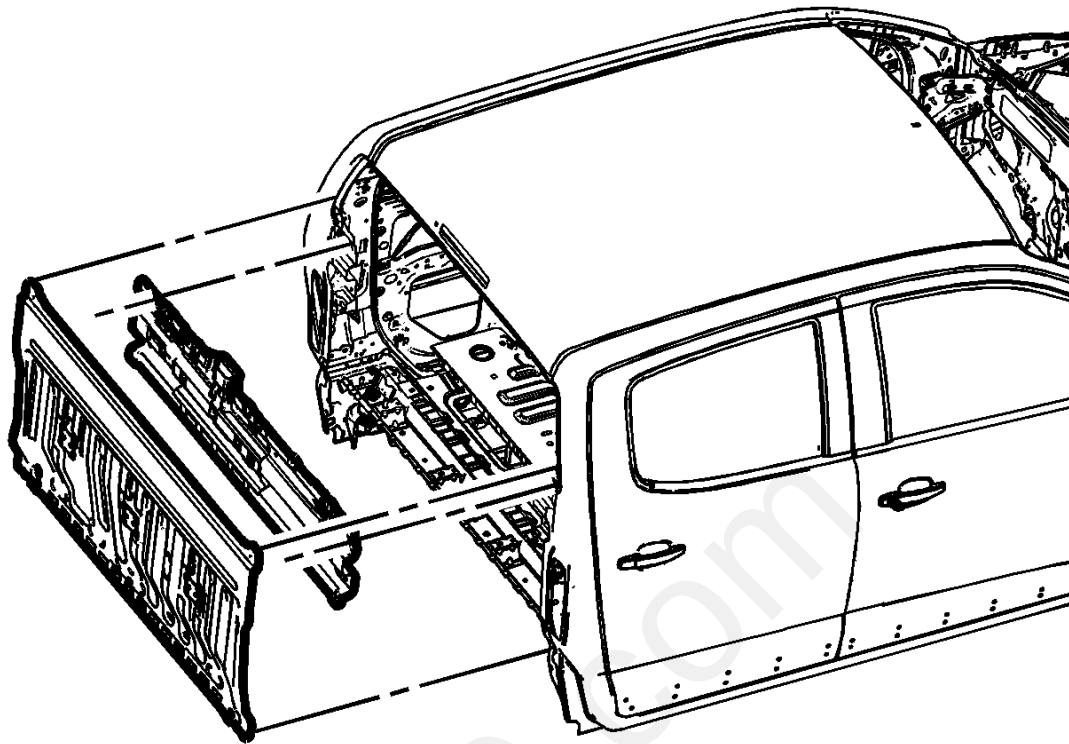


Fig. 198: Prepare Mating Surfaces

Courtesy of GENERAL MOTORS COMPANY

1. Prepare the mating surfaces as necessary. Inspect for proper fit of the service panel.

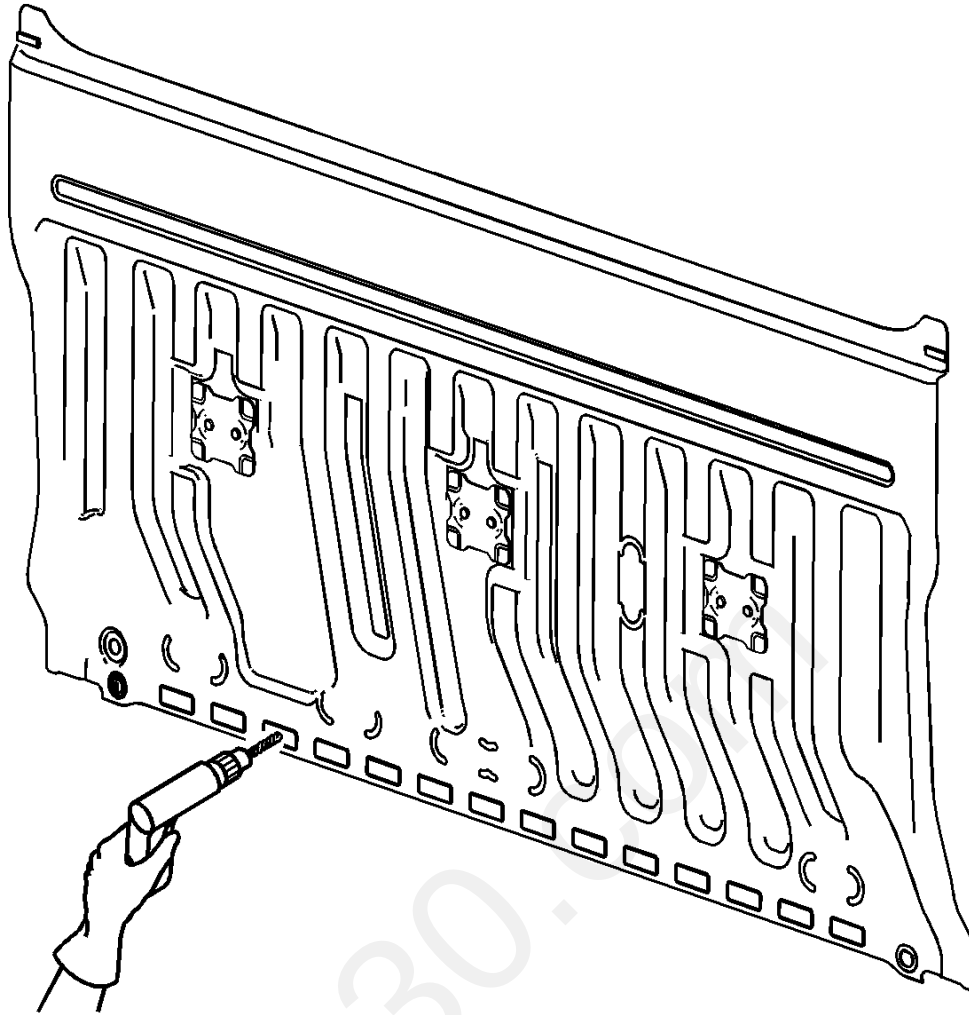


Fig. 199: Drill 8 mm (5/16 in) Plug Weld Holes
Courtesy of GENERAL MOTORS COMPANY

2. Drill 8 mm (5/16 in) plug weld holes as necessary in the locations noted from the original panel.
3. Position the service panel. Inspect with 3-dimensional measuring equipment.
4. Apply Weld-Thru coating or equivalent to all mating surfaces. Refer to [Anti-Corrosion Treatment and Repair](#) .

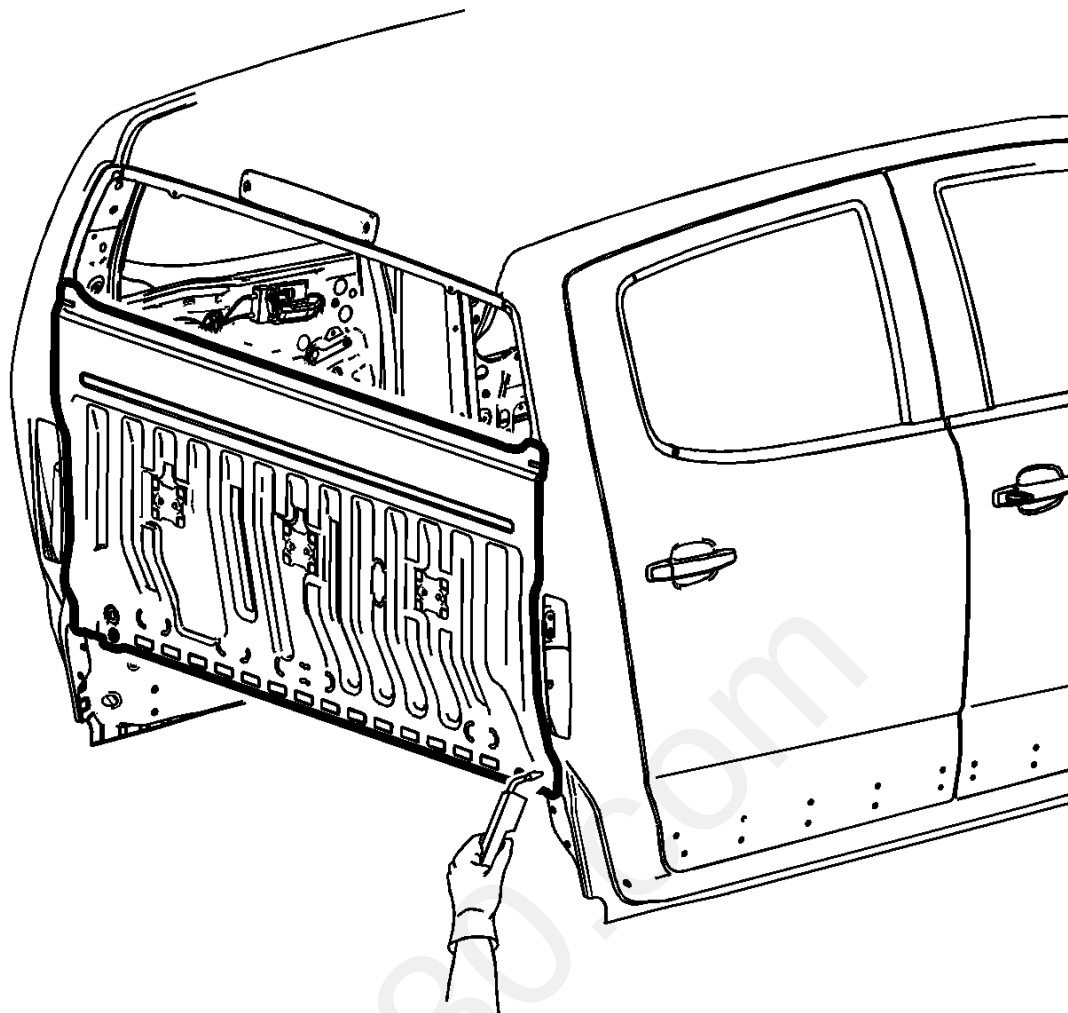


Fig. 200: Plug Welding

Courtesy of GENERAL MOTORS COMPANY

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

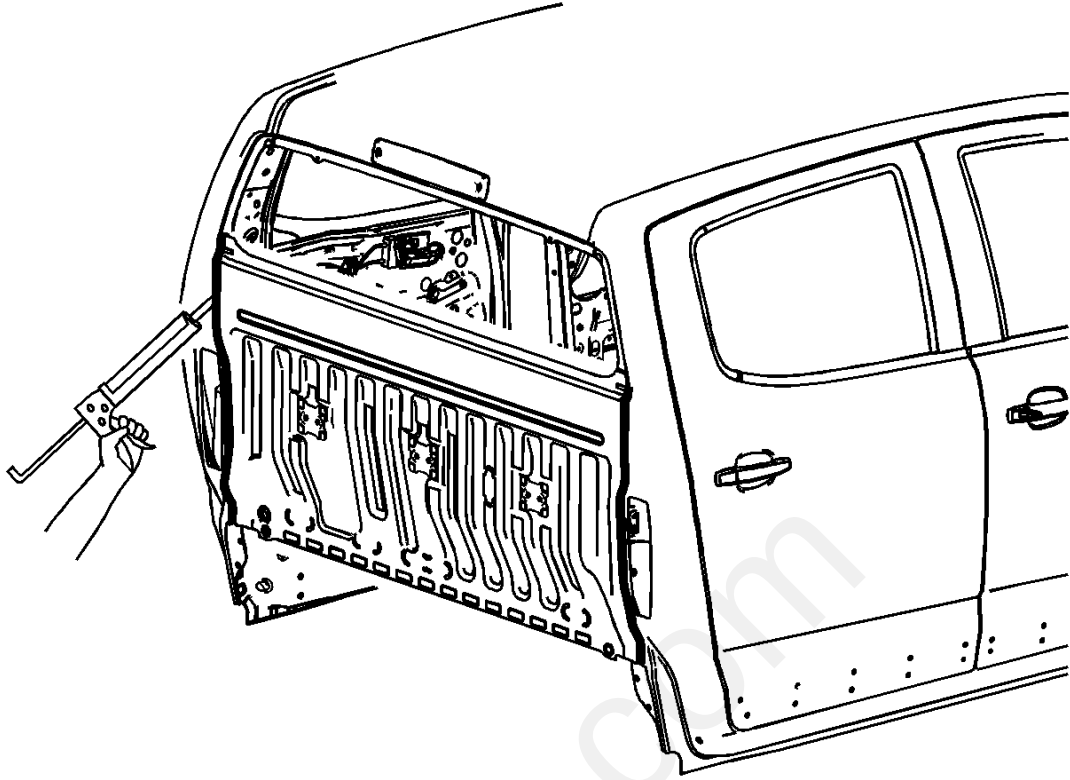


Fig. 201: Apply Sealers And Anti-Corrosion Materials

Courtesy of GENERAL MOTORS COMPANY

7. Apply the sealers and the 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](#) .

BATTERY TRAY REPLACEMENT

Removal Procedure

WARNING: Refer to [Approved Equipment for Collision Repair Warning](#) .

1. Disable the SIR system. Refer to [SIR Disabling and Enabling](#) .

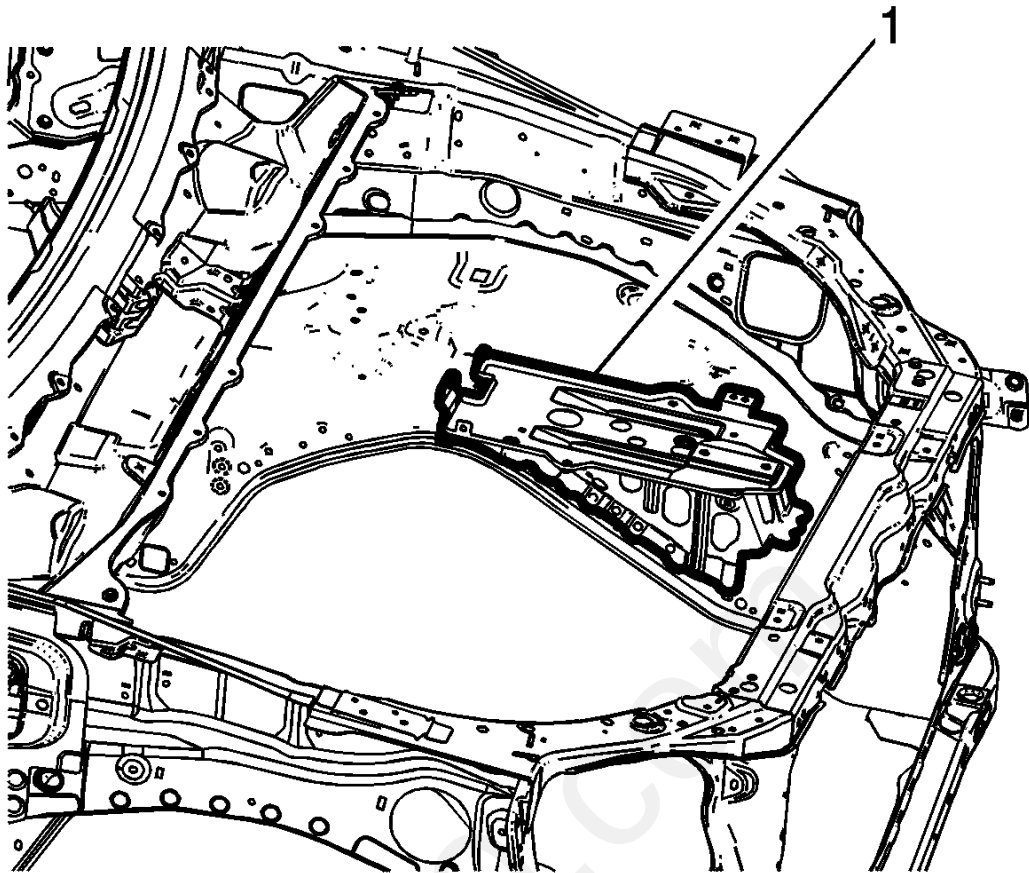


Fig. 202: Related Panels And Components

Courtesy of GENERAL MOTORS COMPANY

2. Remove all related panels (1) and components.
3. Repair as much of the damage as possible to factory specifications. Refer to [Dimensions - Body](#).
4. Note the location and remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#).

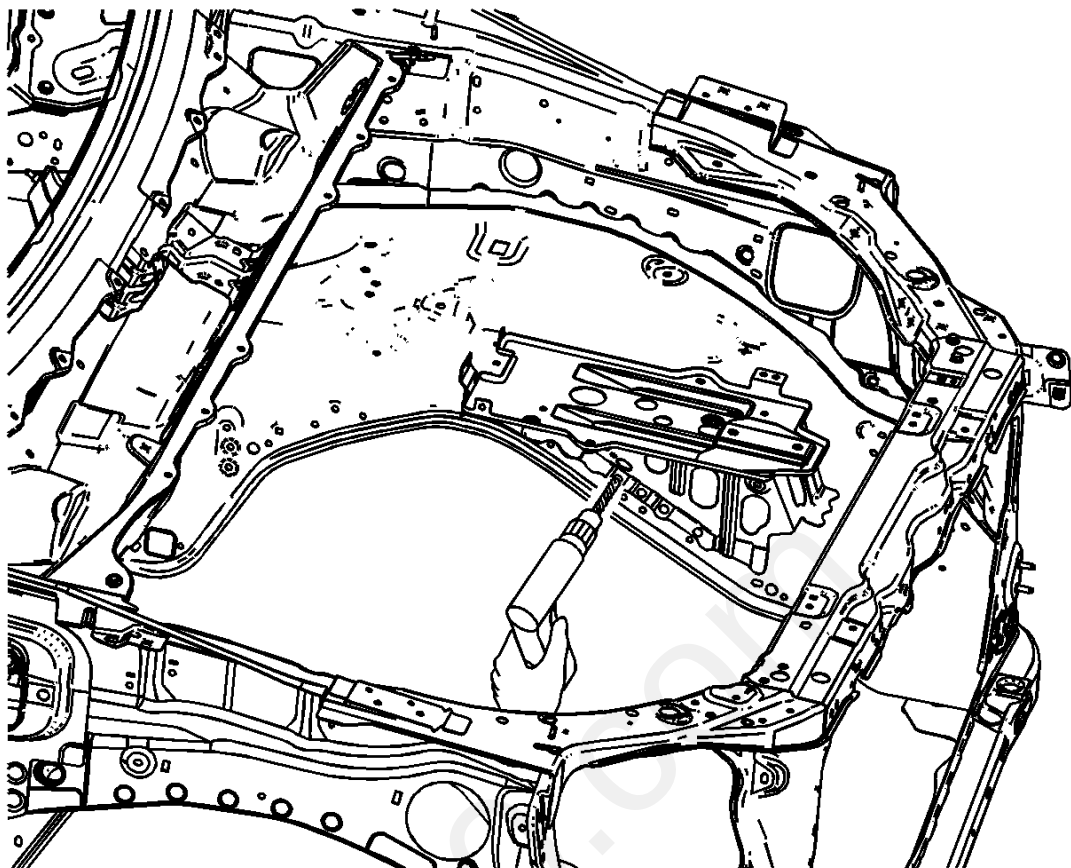


Fig. 203: Locate And Drill Out All Factory Welds

Courtesy of GENERAL MOTORS COMPANY

NOTE: Do not damage any inner panels or reinforcements.

5. Locate and drill out all factory welds. Note the number and location of welds for installation of the battery tray.

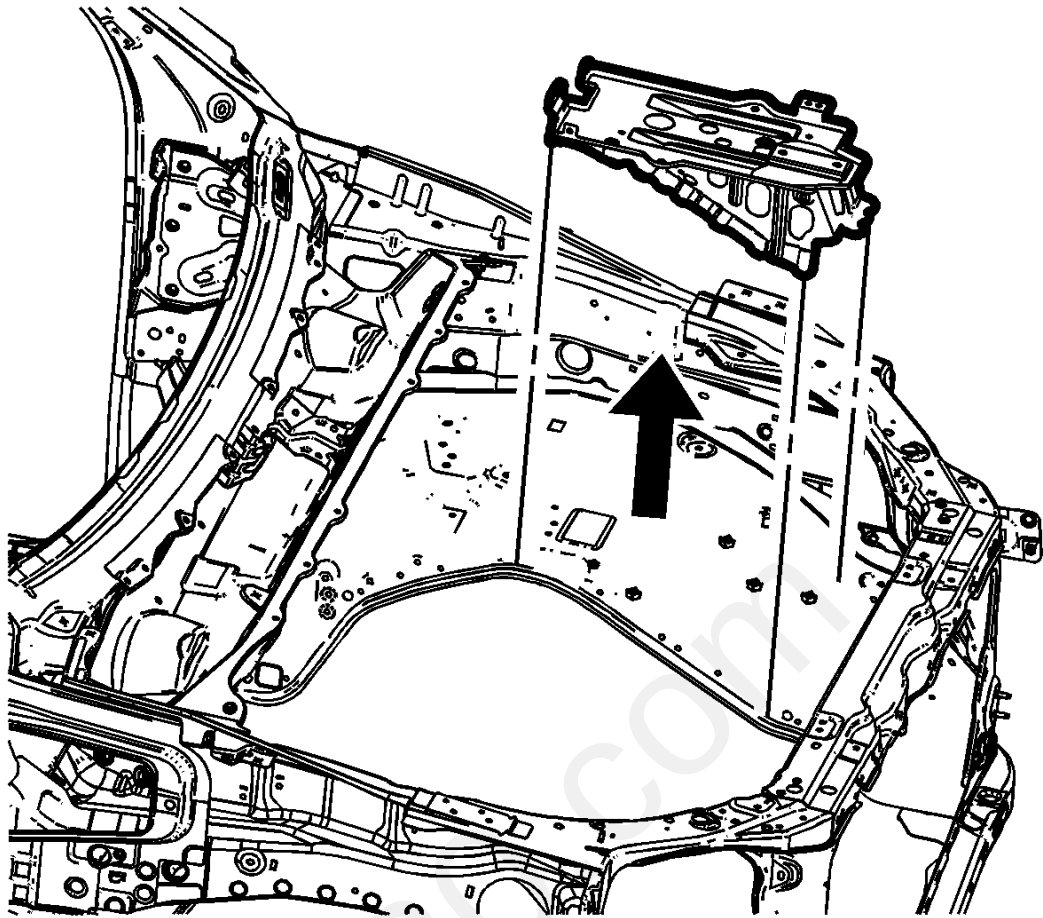


Fig. 204: Damaged Battery Tray

Courtesy of GENERAL MOTORS COMPANY

6. Remove the damaged battery tray.

Installation Procedure

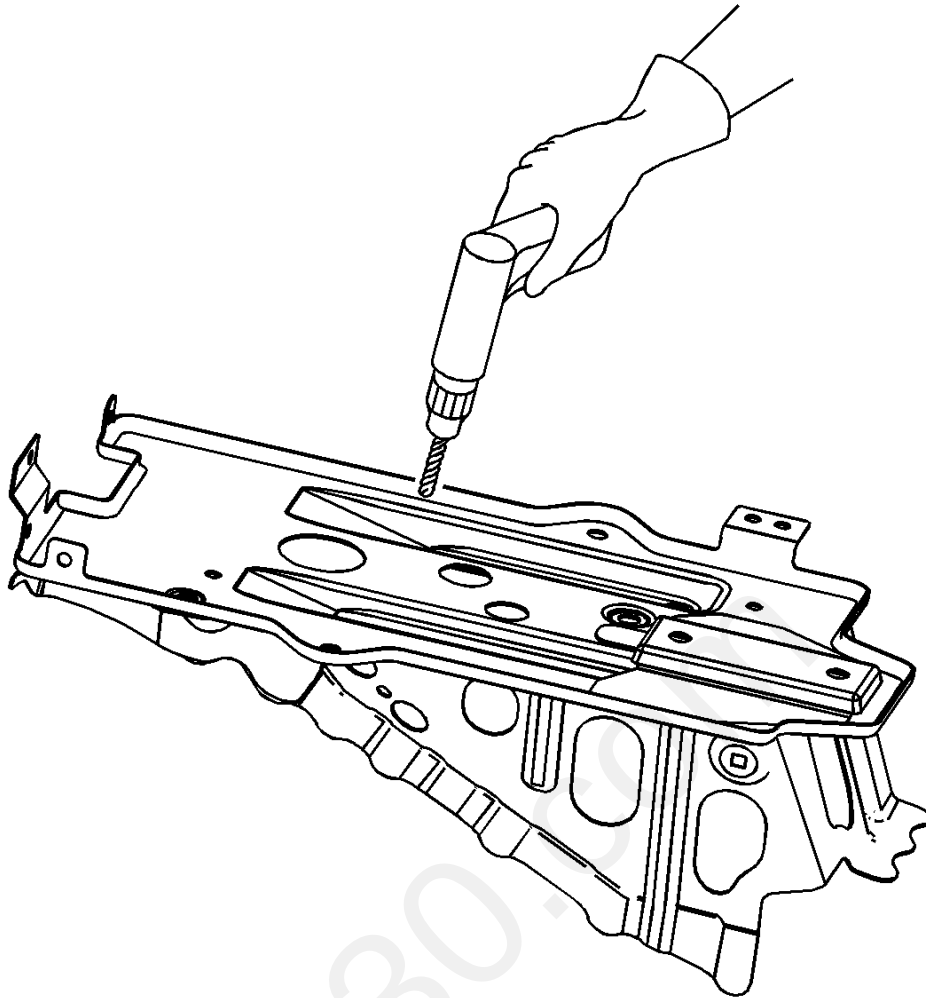


Fig. 205: Drill 8 mm (5/16 in) Plug Weld Holes
Courtesy of GENERAL MOTORS COMPANY

NOTE: 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.

1. Drill 8 mm (5/16 in) plug weld holes as necessary in locations noted from the original battery tray.
2. Prepare all mating surfaces as necessary.
3. Apply Weld-Thru coating or equivalent to all mating surfaces. Refer to [Anti-Corrosion Treatment and Repair](#) .

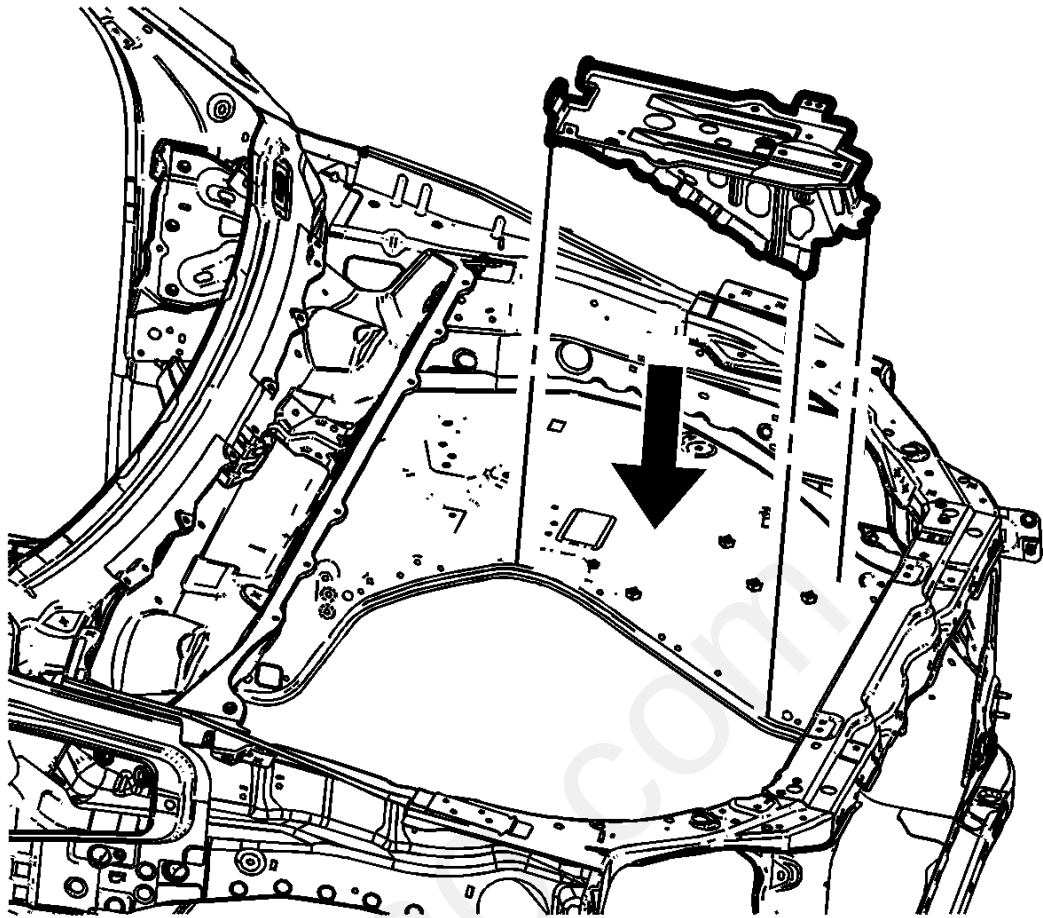


Fig. 206: Battery Tray

Courtesy of GENERAL MOTORS COMPANY

4. Position the battery tray.

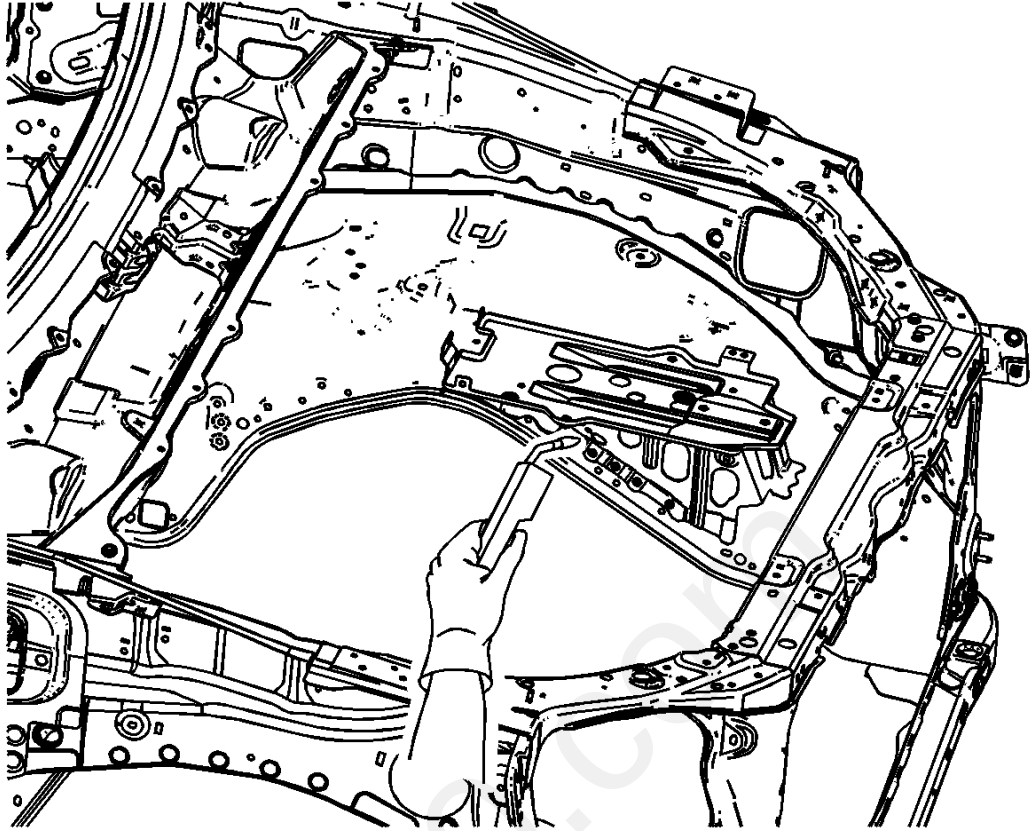


Fig. 207: Plug welding

Courtesy of GENERAL MOTORS COMPANY

5. Plug the weld accordingly.

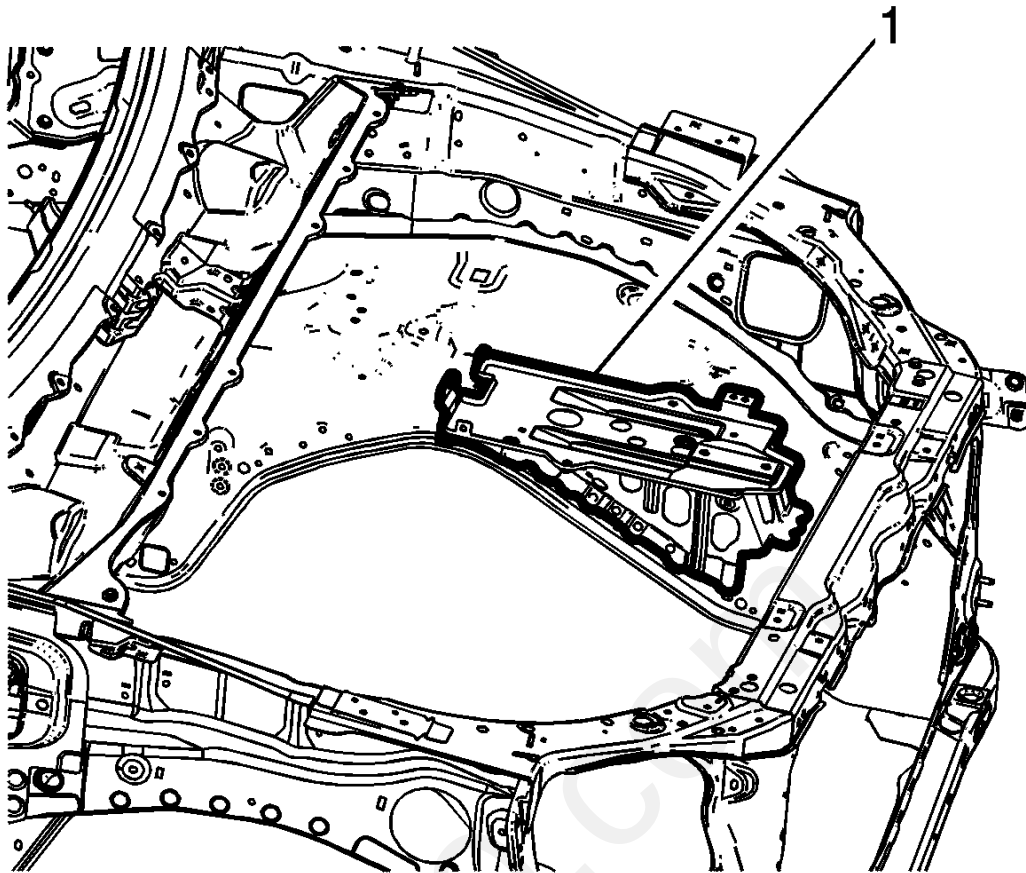


Fig. 208: Related Panels And Components

Courtesy of GENERAL MOTORS COMPANY

6. Clean and prepare all welded surfaces (1).
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. Enable the SIR system. Refer to [SIR Disabling and Enabling](#).

PICKUP BOX FRONT END PANEL REPLACEMENT

Removal Procedure

WARNING: Refer to [Approved Equipment for Collision Repair Warning](#).

1. Remove the pickup box assembly. Refer to [Pickup Box Replacement](#).
2. Restore as much damage as possible.
3. Note the location and remove the sealers and anti-corrosion materials from the repair area as necessary. Refer to [Anti-Corrosion Treatment and Repair](#).

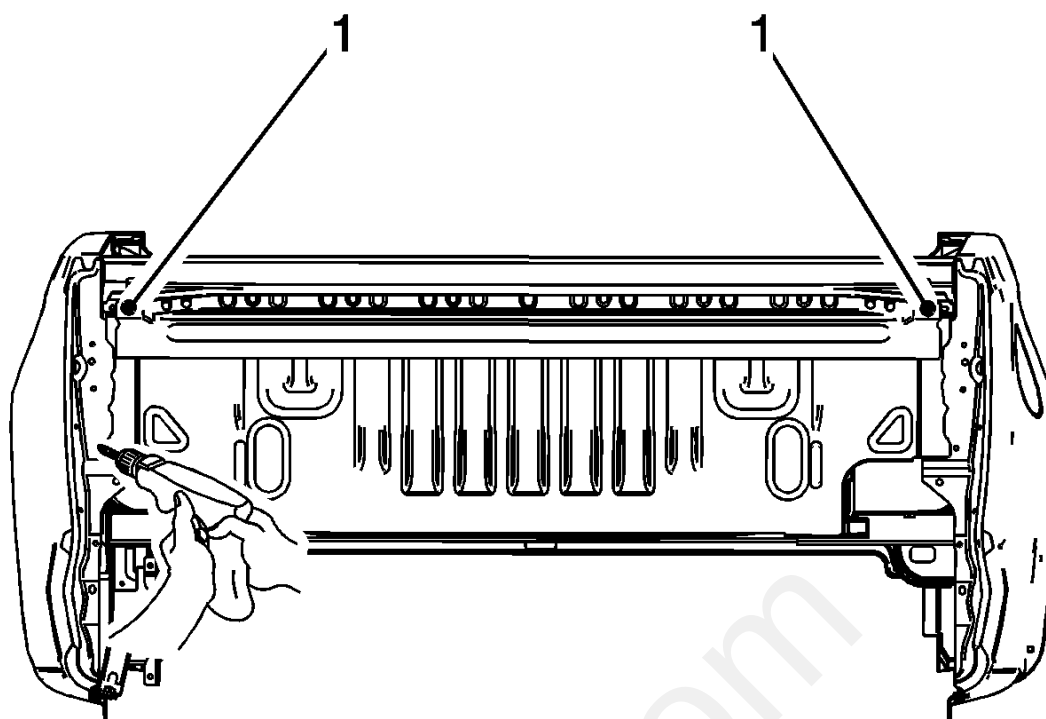


Fig. 209: Bolts

Courtesy of GENERAL MOTORS COMPANY

4. Remove the bolts (1).
5. Locate and drill out all factory welds. Note the location of the welds for installation of the service part.
6. Remove the front panel.

Installation Procedure

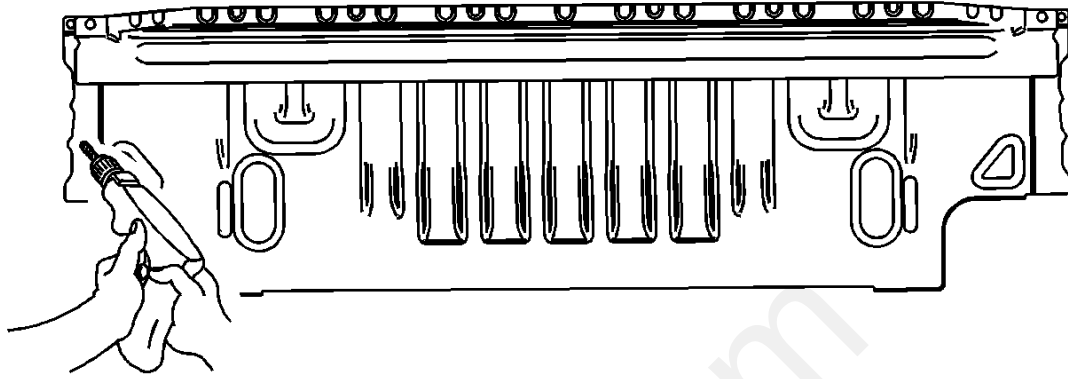


Fig. 210: Drill 8 mm (5/16 in) Plug Weld Holes
Courtesy of GENERAL MOTORS COMPANY

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

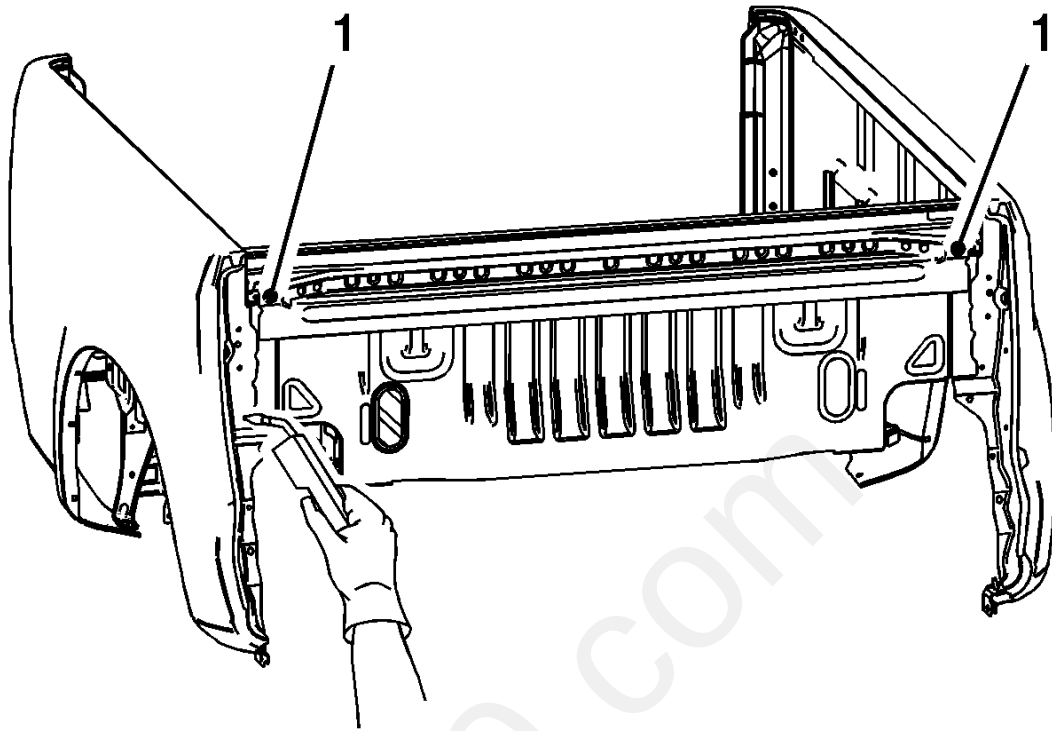


Fig. 211: Bolts

Courtesy of GENERAL MOTORS COMPANY

4. Install the bolts (1) and tighten to 13 N.m (9.6 lb ft).
5. Plug weld into position.
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 and repair the area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
9. Install the pickup box assembly. Refer to [Pickup Box Replacement](#) .

PICKUP BOX LAMP POCKET 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](#) .

all related panels and components.

4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .

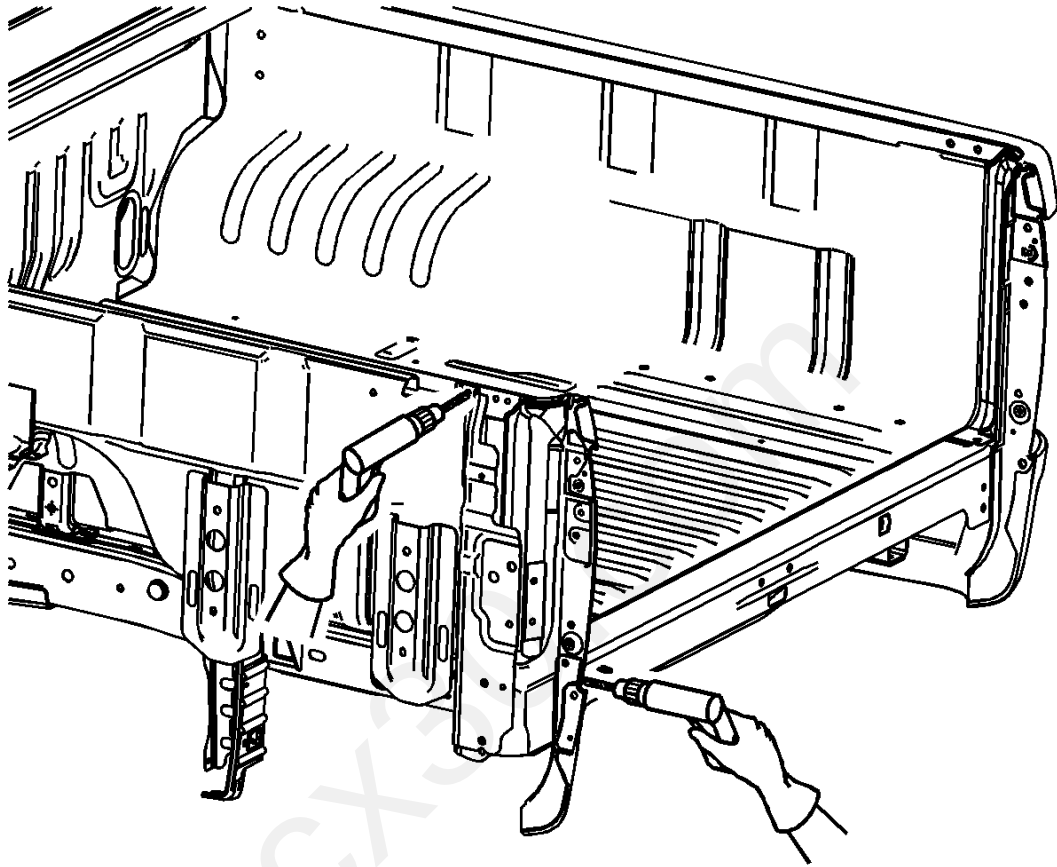


Fig. 212: Marking Factory Welds Of Body Rear End Panel

Courtesy of GENERAL MOTORS COMPANY

6. Locate and mark all the necessary factory welds of the body rear end panel.

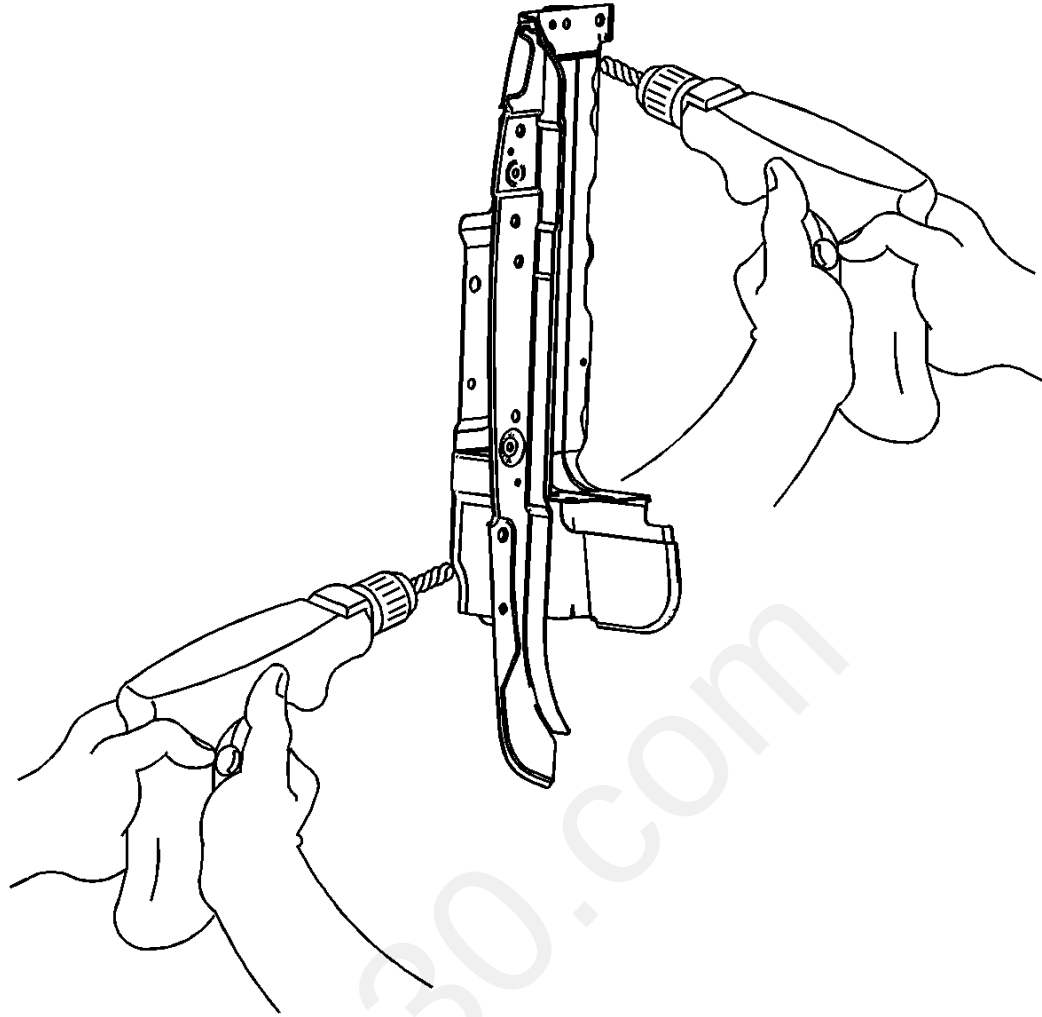


Fig. 213: Drilling All Factory Welds

Courtesy of GENERAL MOTORS COMPANY

7. Drill all factory welds. Note the number and location of welds for installation of the service assembly.

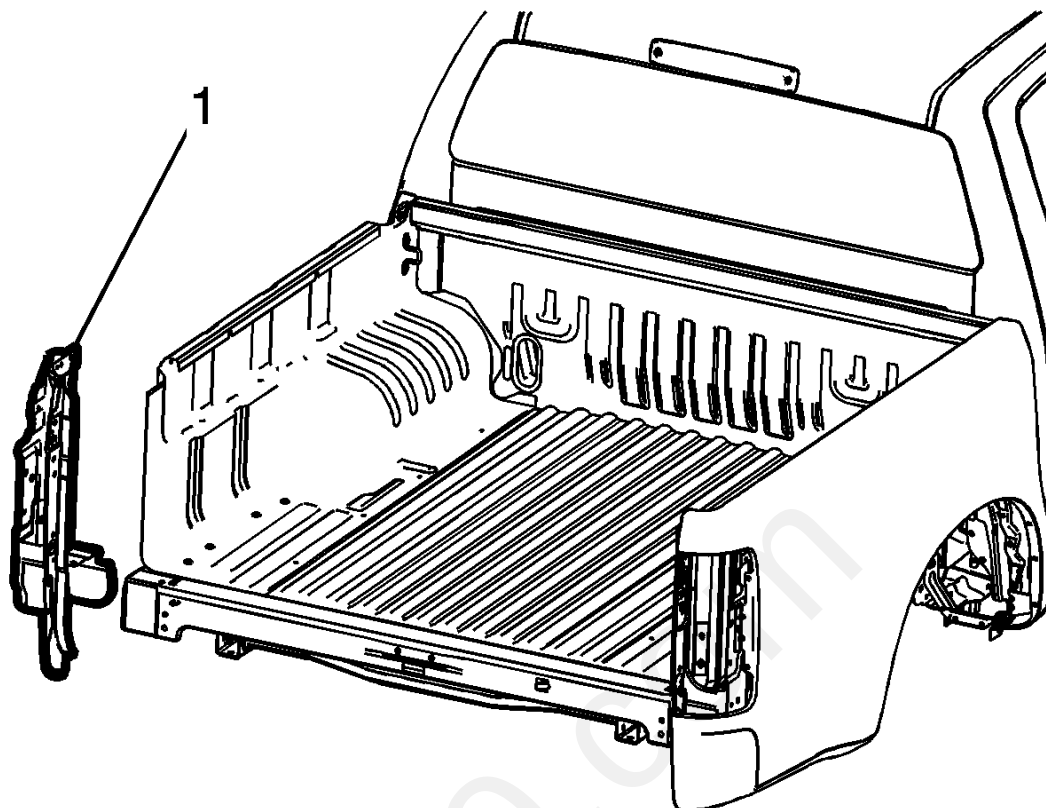


Fig. 214: Tail Lamp Pocket

Courtesy of GENERAL MOTORS COMPANY

8. Remove the tail lamp pocket (1).

Installation Procedure

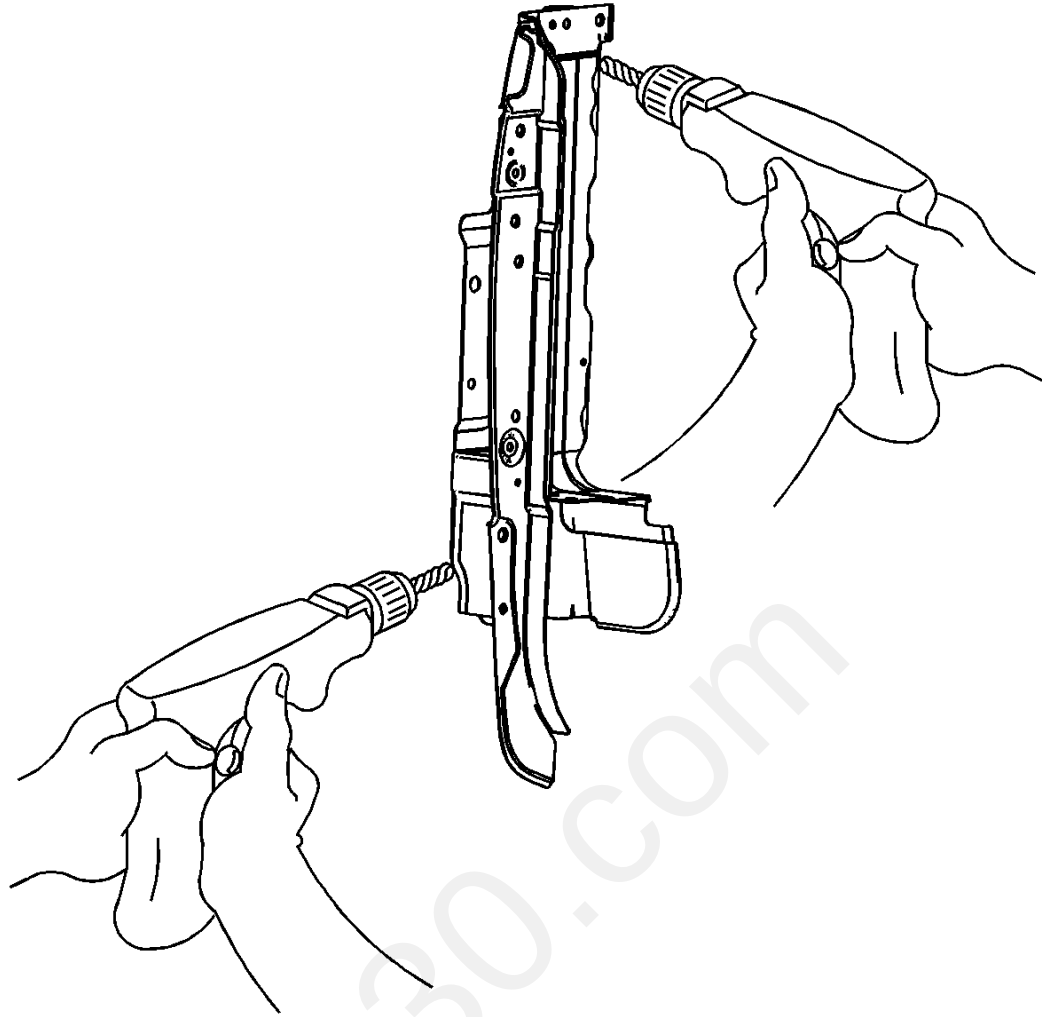


Fig. 215: Drilling All Factory Welds

Courtesy of GENERAL MOTORS COMPANY

1. Drill 8 mm (5/16 in)holes for plug welding along the edges of the tail lamp pocket as noted from the original panel.
2. Clean and prepare the attaching surfaces for welding.

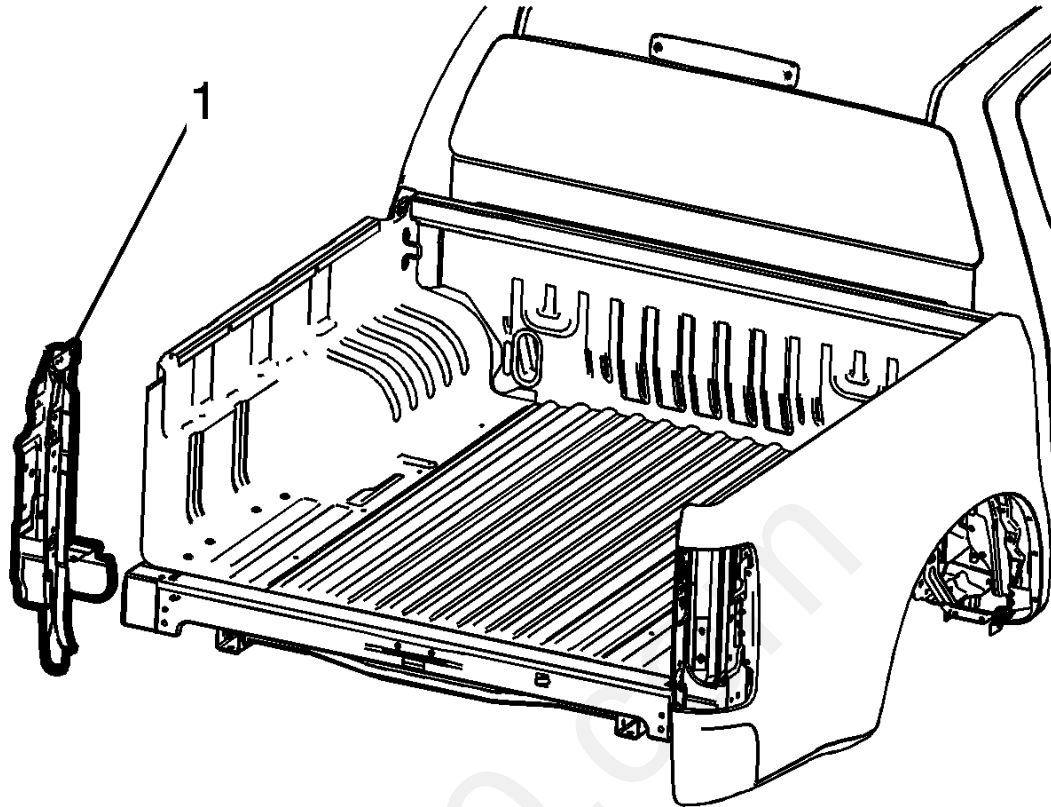


Fig. 216: Tail Lamp Pocket

Courtesy of GENERAL MOTORS COMPANY

3. Position the tail lamp pocket on the vehicle (1).
4. Verify the fit of the tail lamp pocket.
5. Clamp the tail lamp pocket into position.

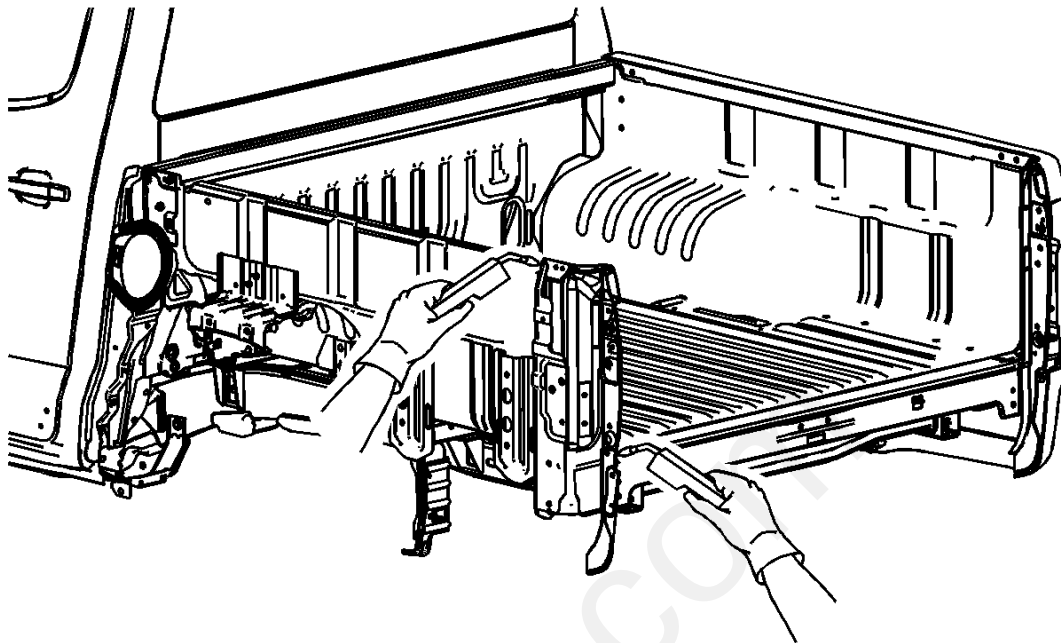


Fig. 217: Plug Welding

Courtesy of GENERAL MOTORS COMPANY

6. Plug the weld accordingly.
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](#) .

PICKUP BOX REPLACEMENT - SIDE

Removal Procedure

NOTE: This procedure shows illustrations for the crew cab pickup box. All pickup box sizes have similar procedures.

WARNING: Refer to [Approved Equipment for Collision Repair Warning](#) .

1. Remove the box assembly. Refer to [Pickup Box Replacement](#) .

all related panels and components.

3. Repair as much of the damage as possible, according to factory specifications.
4. Note the location and remove the sealers and anti-corrosion materials from the repair area, as necessary.
Refer to [Anti-Corrosion Treatment and Repair](#) .

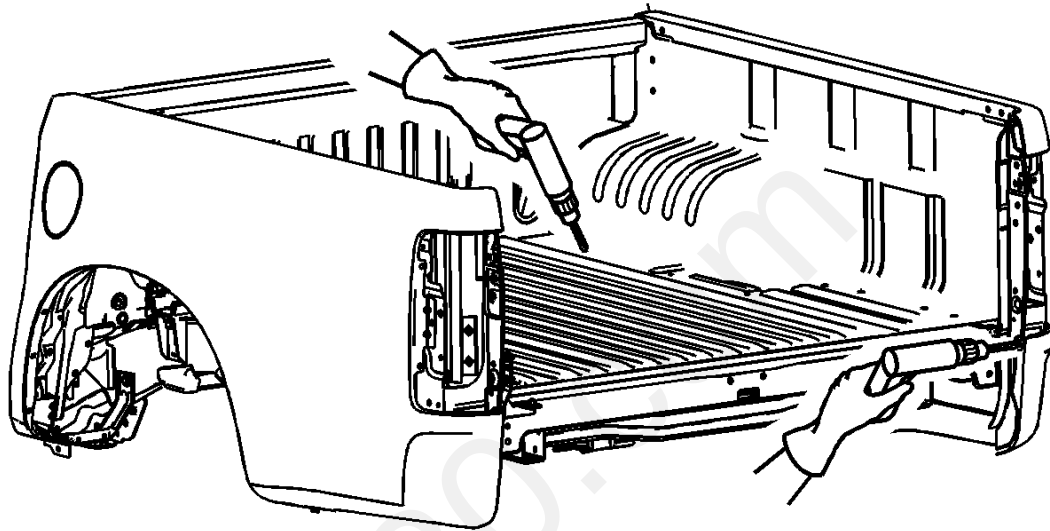


Fig. 218: Drill Out Spot Welds inside of Panel
Courtesy of GENERAL MOTORS COMPANY

5. Locate and drill out spot welds on the inside of the panel.

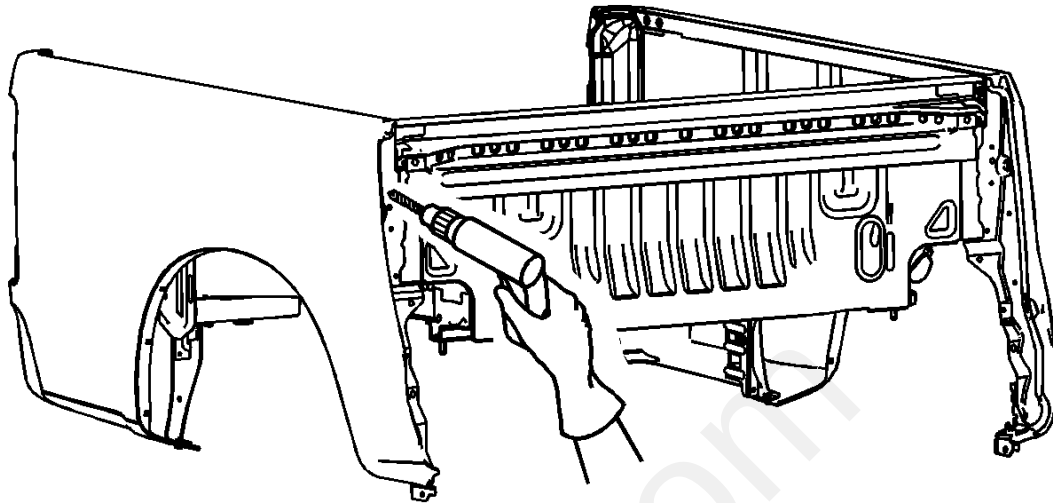


Fig. 219: Drill Out Spot Welds Along Front Bed Panel

Courtesy of GENERAL MOTORS COMPANY

6. Locate and drill out the spot welds along the front bed panel.

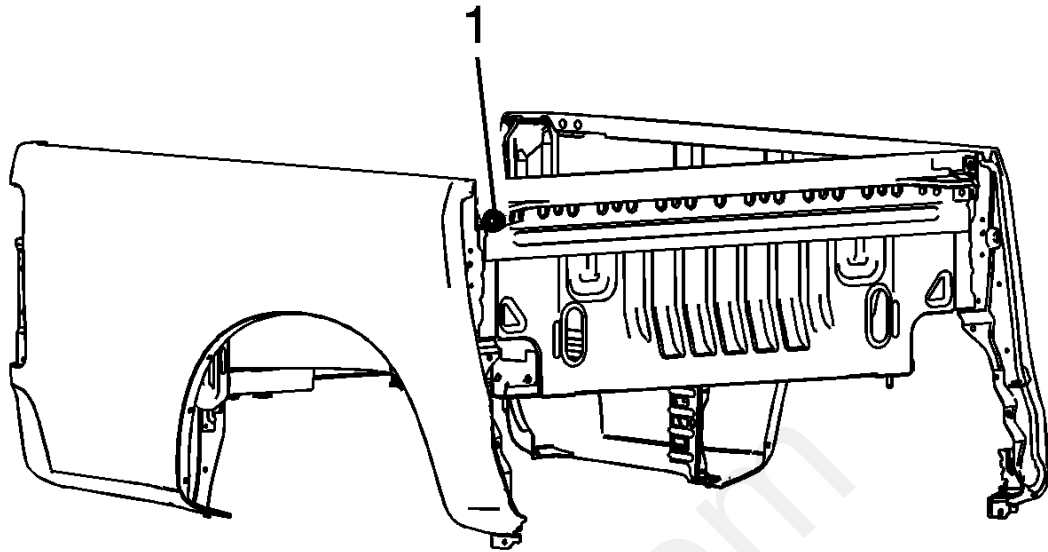


Fig. 220: Remove Bolt

Courtesy of GENERAL MOTORS COMPANY

7. Remove the bolt (1).

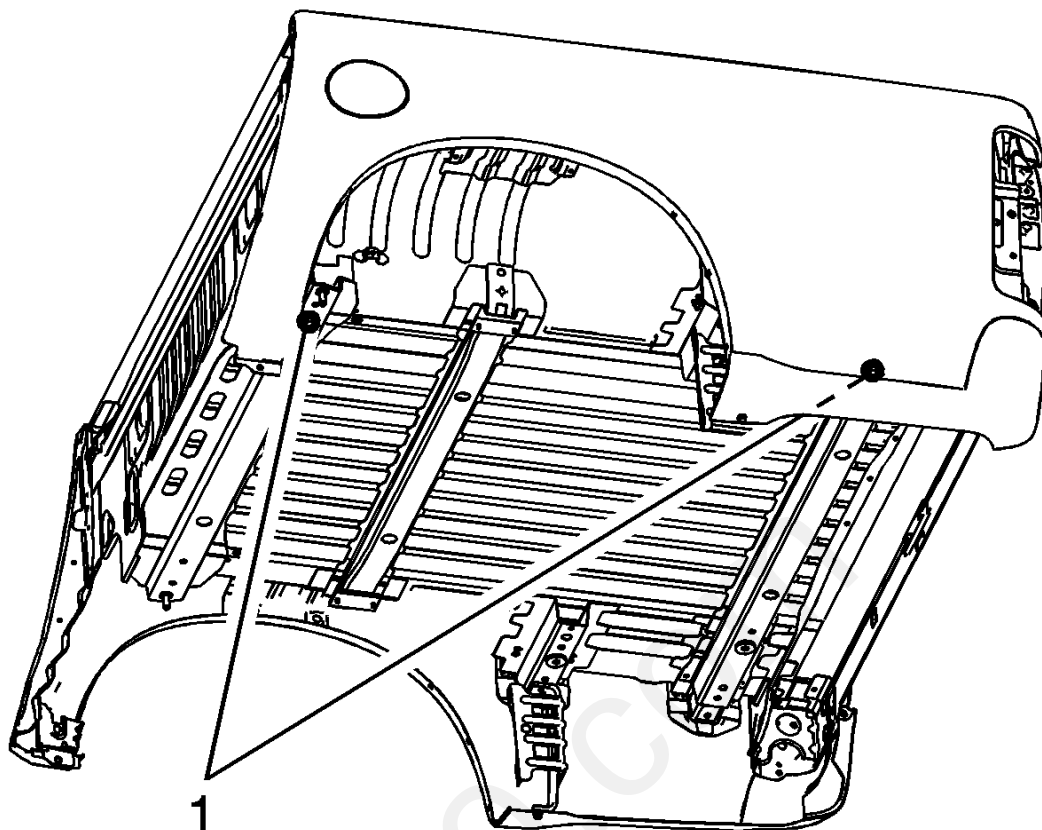


Fig. 221: Remove Bolts

Courtesy of GENERAL MOTORS COMPANY

8. Remove the bolts (1).

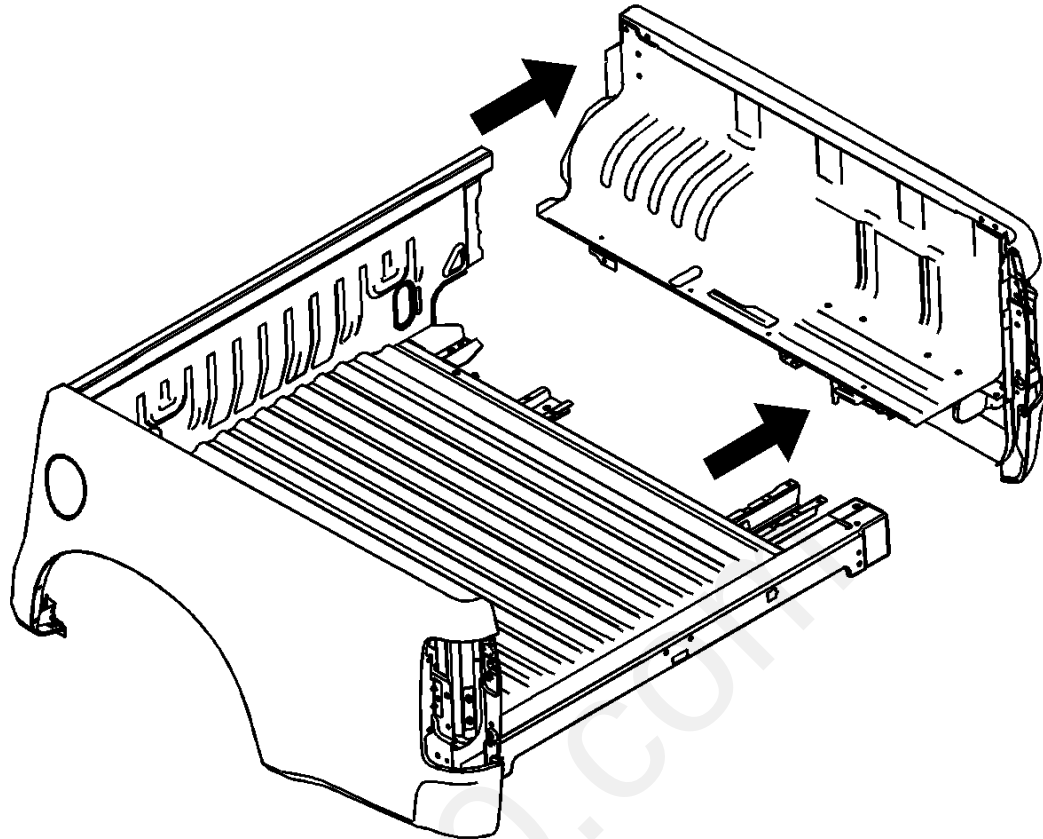


Fig. 222: Side Panel

Courtesy of GENERAL MOTORS COMPANY

9. Remove the side panel.

Installation Procedure

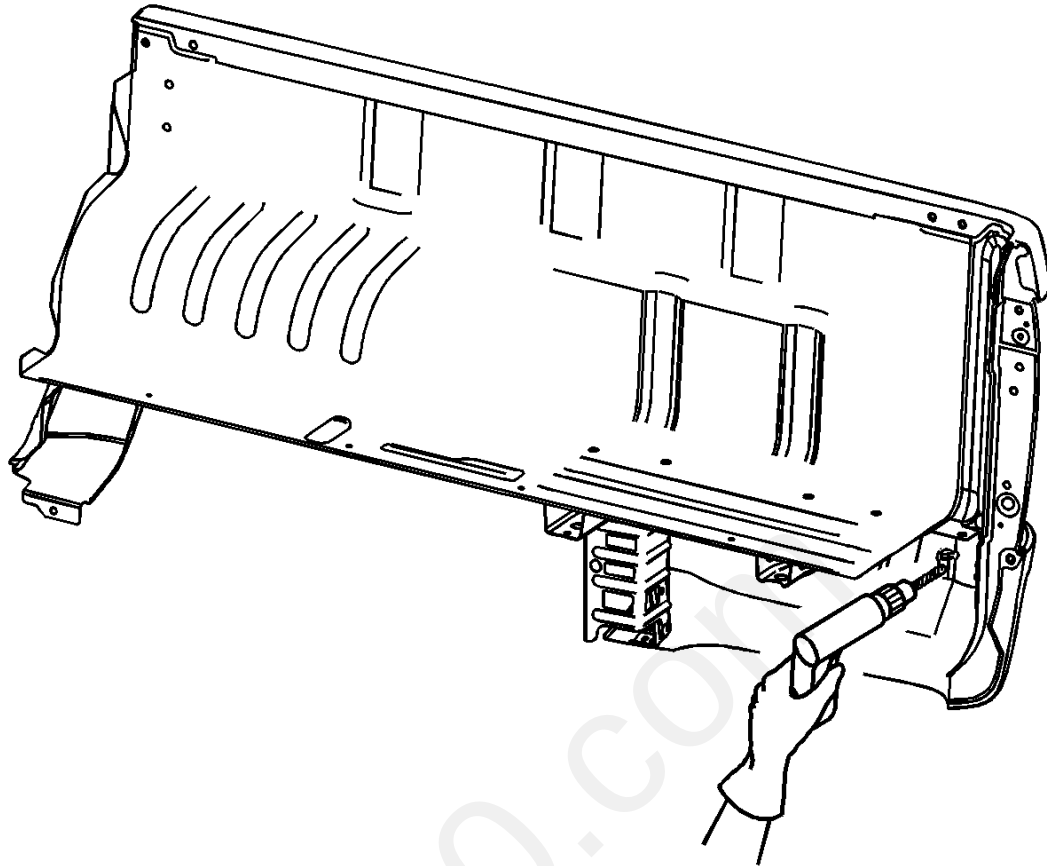


Fig. 223: Drill 8 mm (5/16 in) Plug Weld Holes
Courtesy of GENERAL MOTORS COMPANY

NOTE: If the location of the original plug weld holes can not be determined, or if the structural weld-thru adhesive was present, 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 noted.
2. Prepare all mating surfaces as necessary.
3. Apply Weld-Thru Coating or equivalent to all mating surfaces. Refer to [Anti-Corrosion Treatment and Repair](#) .

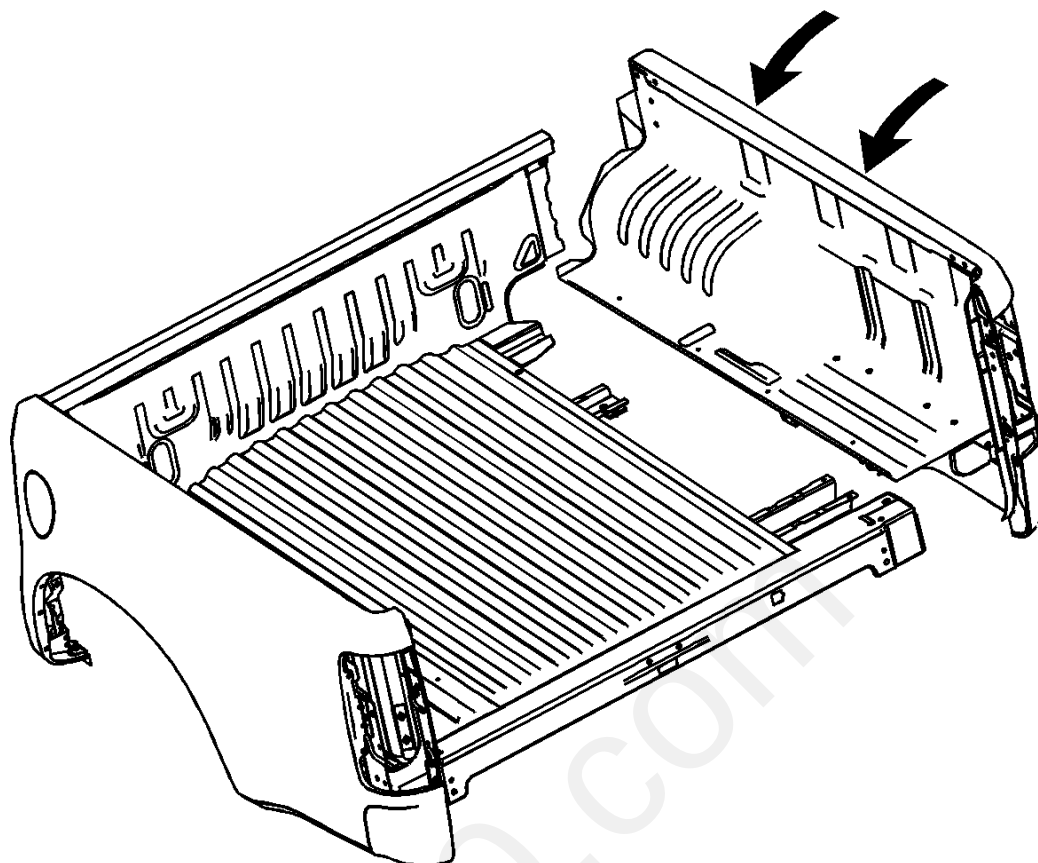


Fig. 224: Position Service Side Panel To Bed Assembly
Courtesy of GENERAL MOTORS COMPANY

4. Position the service side panel to the bed assembly.

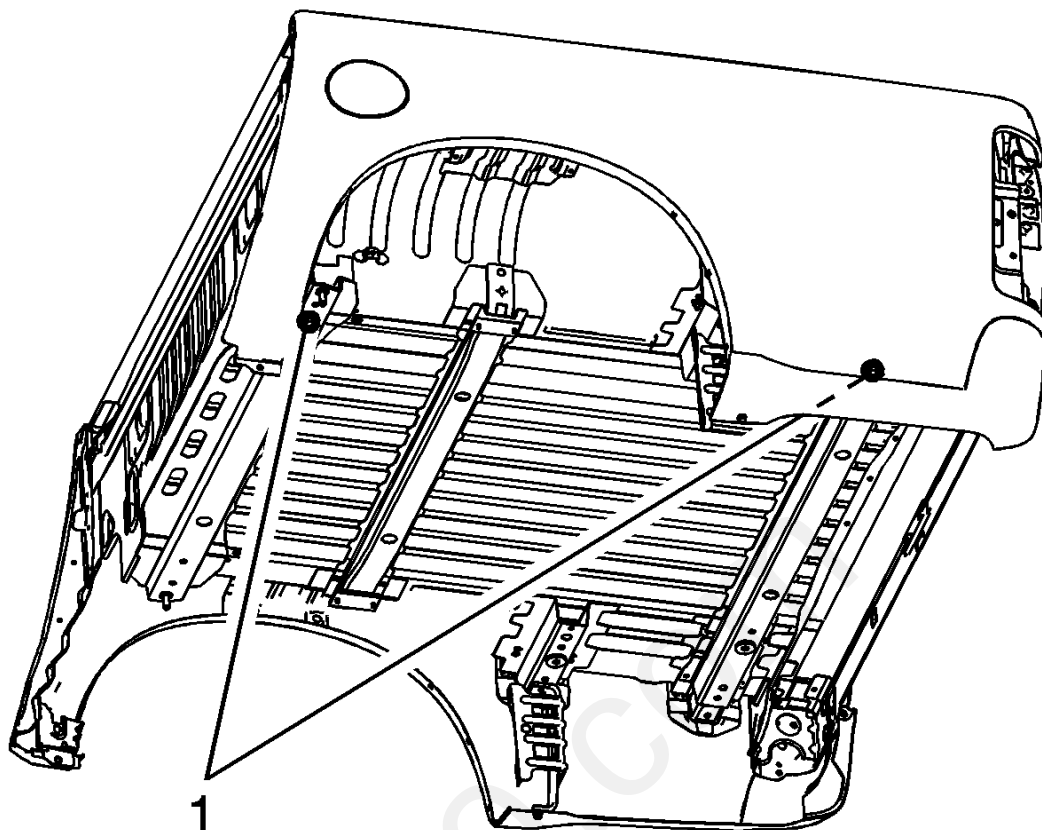


Fig. 225: Remove Bolts

Courtesy of GENERAL MOTORS COMPANY

5. Install the bolts (1) and tighten 13 N.m (9.6 lb ft).

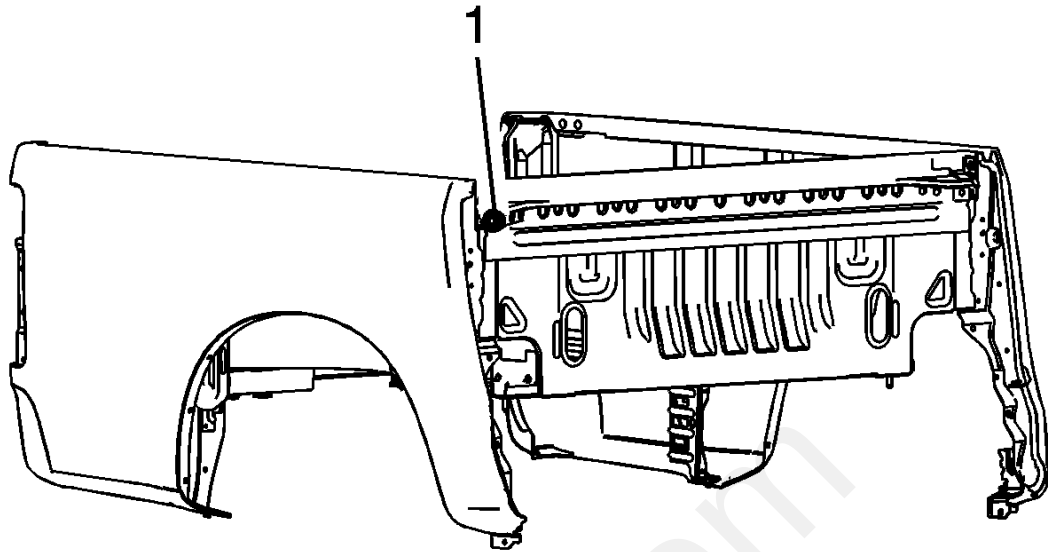


Fig. 226: Remove Bolt

Courtesy of GENERAL MOTORS COMPANY

6. Install the bolt and tighten to 13 N.m (9.6 lb ft)..

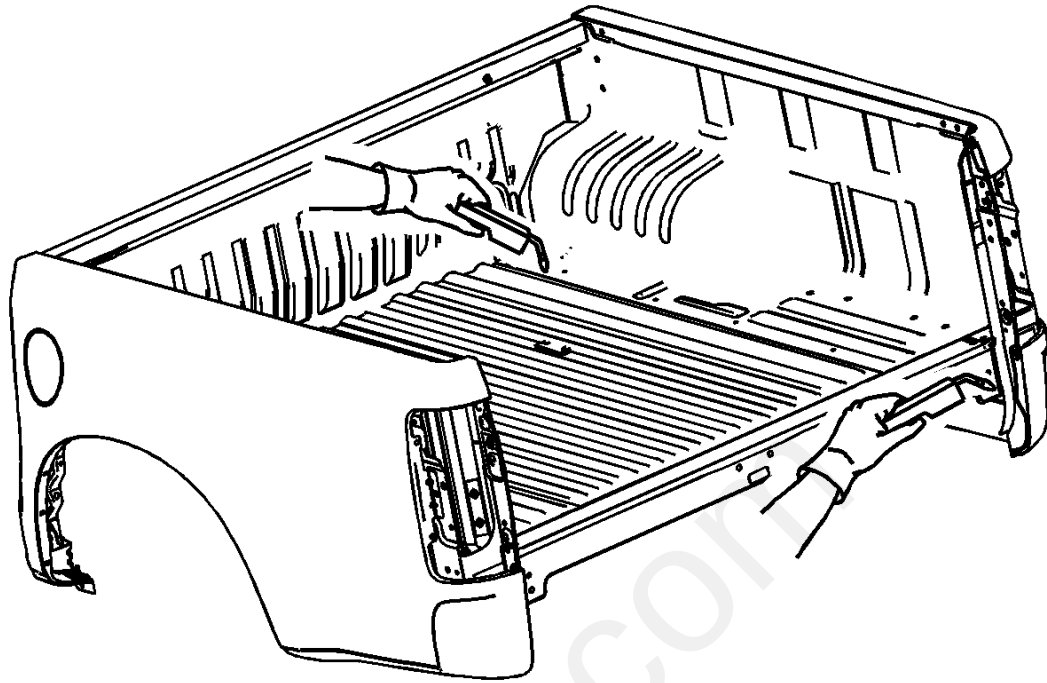


Fig. 227: Plug Welding

Courtesy of GENERAL MOTORS COMPANY

7. Plug weld as necessary
8. 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.
9. Clean and prepare all welded surfaces.
10. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
11. Paint and repair the area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
12. Install all related panels and components.
13. Install the box assembly. Refer to [Pickup Box Replacement](#) .

PICKUP BOX OUTER SIDE PANEL REPLACEMENT (WELDING PROCEDURE)

Removal Procedure

WARNING: Refer to [Approved Equipment for Collision Repair Warning](#) .

NOTE: Before you begin the repair, refer to [Metal Panel Bonding](#) for proper adhesive preparations and general information.

the box assembly. Refer to [Pickup Box Replacement](#) .

2. Remove all related panels and components.
3. Repair as much of the damage as possible, according to factory specifications.
4. Note the location and remove the sealers and anti-corrosion materials from the repair area, as necessary.
Refer to [Anti-Corrosion Treatment and Repair](#) .
5. Note the number and location of all spot welds to be drilled out for installation of the service part.

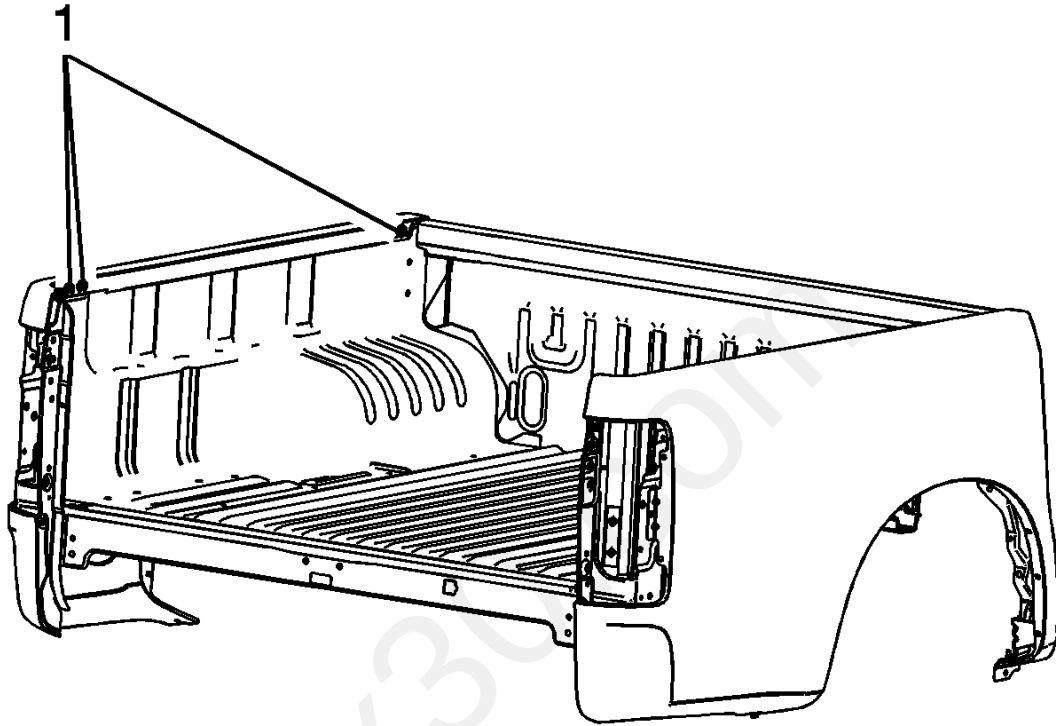


Fig. 228: Bolts

Courtesy of GENERAL MOTORS COMPANY

6. Remove the bolts (1).

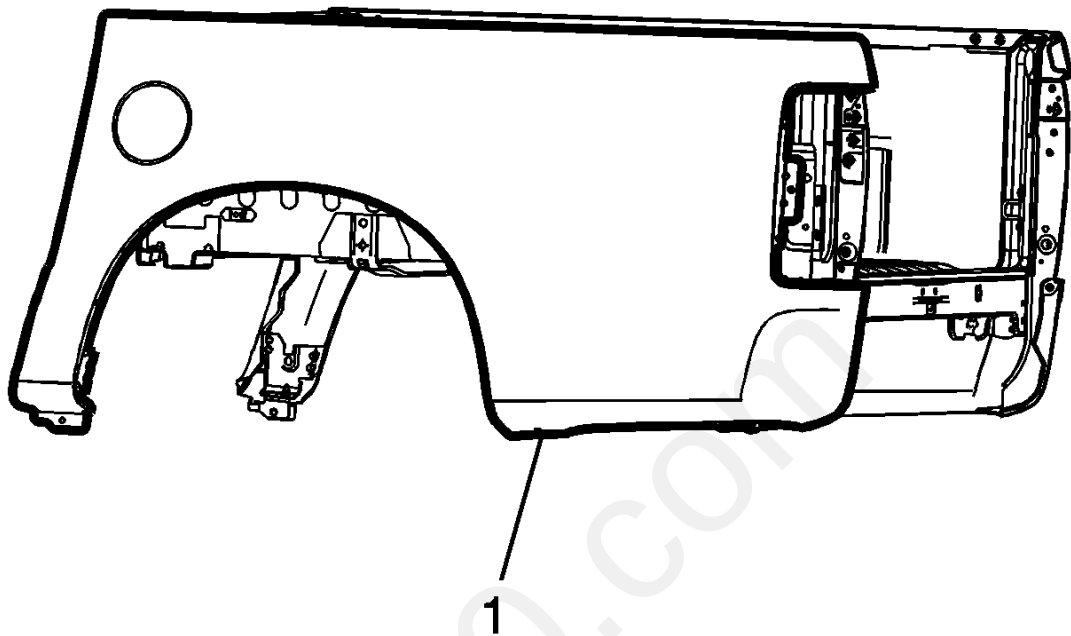


Fig. 229: Bolt

Courtesy of GENERAL MOTORS COMPANY

7. Remove the bolt (1).

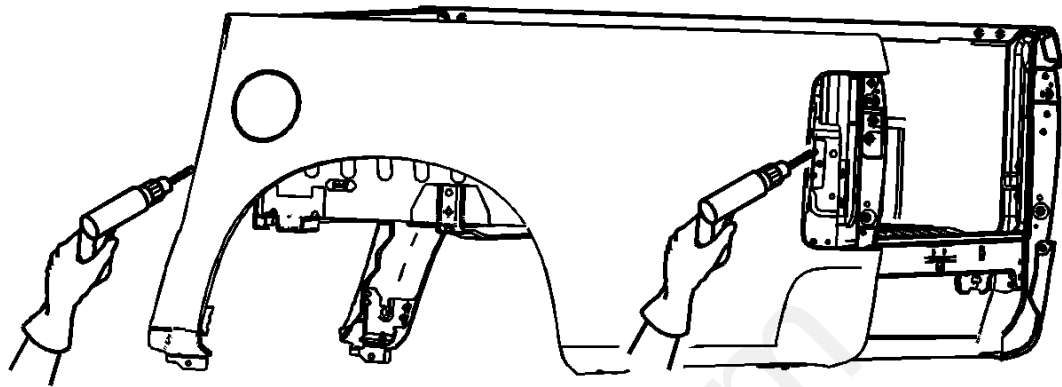


Fig. 230: Drill Out Spot Welds

Courtesy of GENERAL MOTORS COMPANY

8. Locate and drill out the spot welds attaching the rear panel wheelhouse and the tail lamp pocket area.
9. Locate and drill out the spot welds attaching the front panel, the wheelhouse and the tail lamp pocket area.

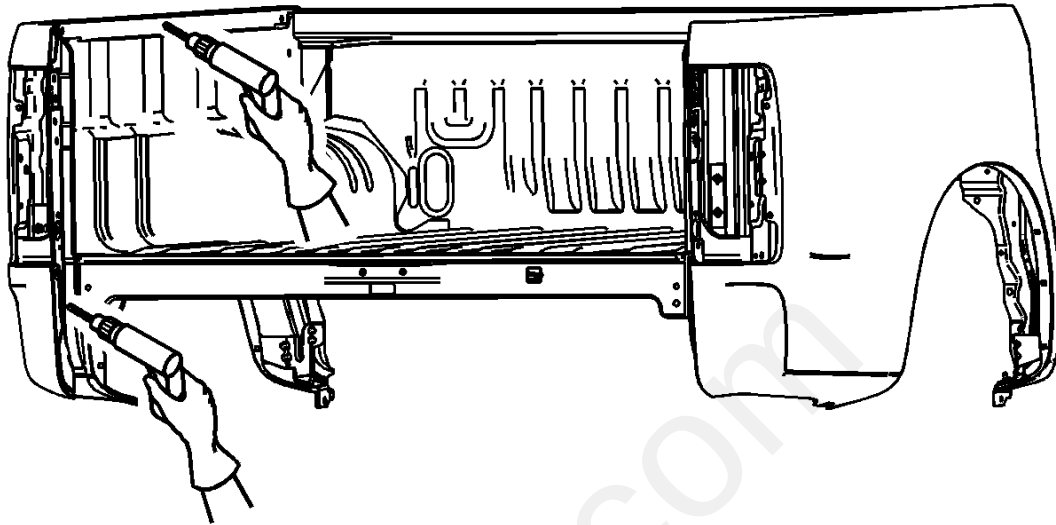


Fig. 231: Drill Out Spot Welds Along Upper Rail

Courtesy of GENERAL MOTORS COMPANY

10. Locate and drill out the spot welds along the upper rail and the rear sill area.

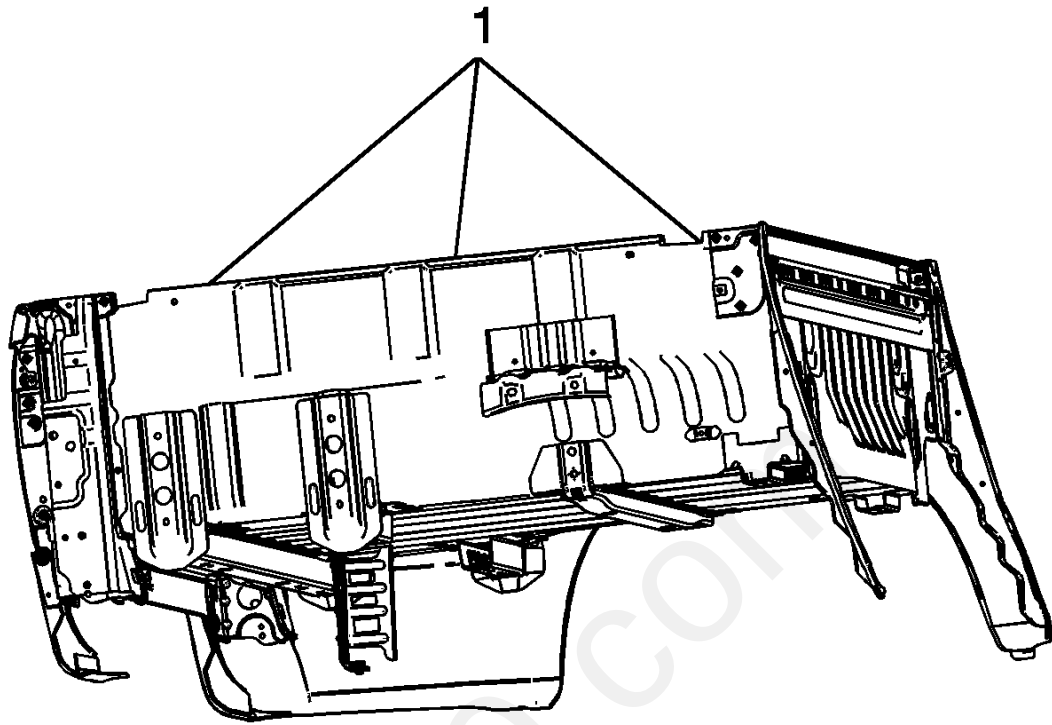


Fig. 232: Upper Inner Panel

Courtesy of GENERAL MOTORS COMPANY

11. Structural adhesive may be present between the upper inner panel (1) and the outer panel, according to the pickup box model. If necessary, use a chisel to separate the outer panel from the inner panel.

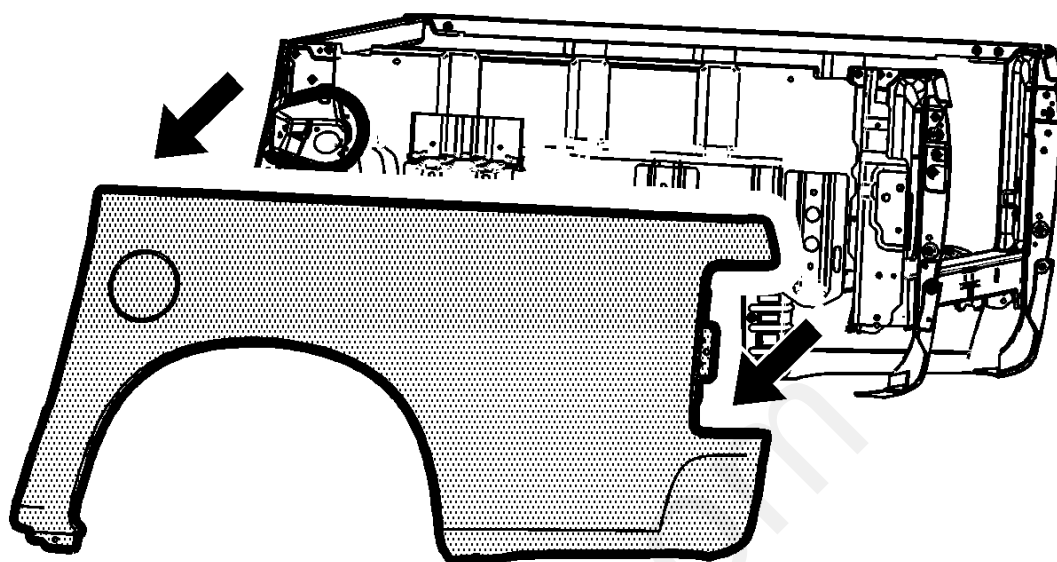


Fig. 233: Side Panel

Courtesy of GENERAL MOTORS COMPANY

12. Remove the side panel.

Installation Procedure

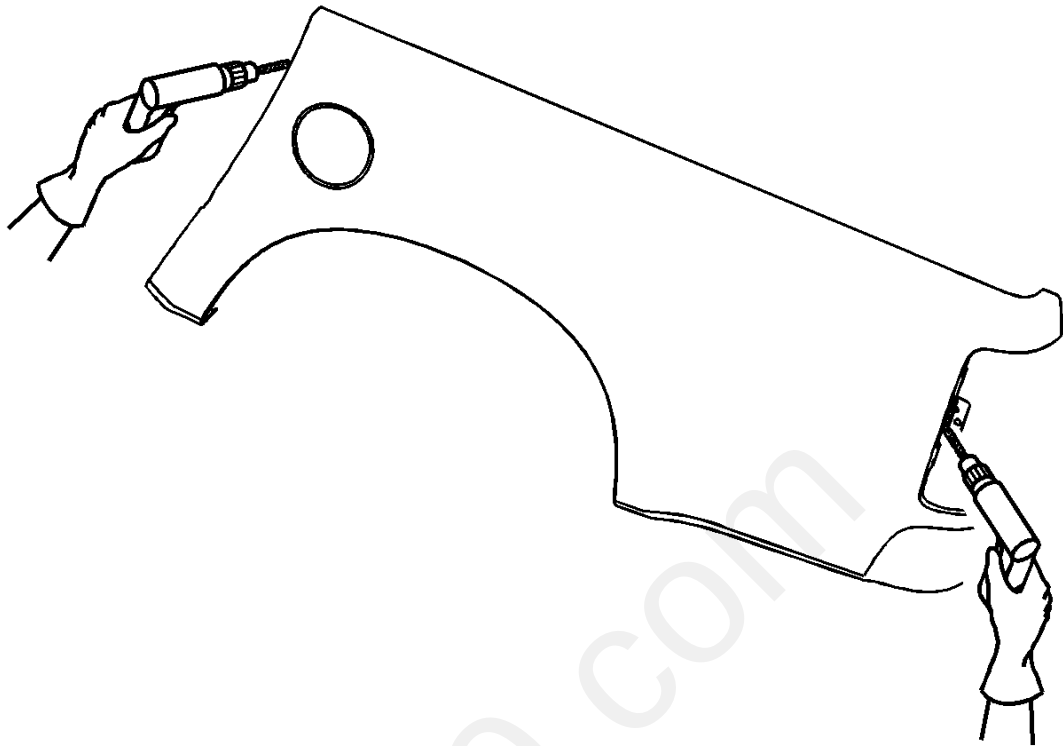


Fig. 234: Drill 8 mm (5/16 in) Plug Weld Holes
Courtesy of GENERAL MOTORS COMPANY

1. Drill 8 mm (5/16 in) plug weld holes in the service part as noted.
2. Prepare all mating surfaces as necessary.
3. Apply Weld-Thru Coating to all mating surfaces.
4. Apply a 9-13 mm (3/8-1/2 in) bead of metal panel bonding adhesive to the mating surface of the box inner panel.

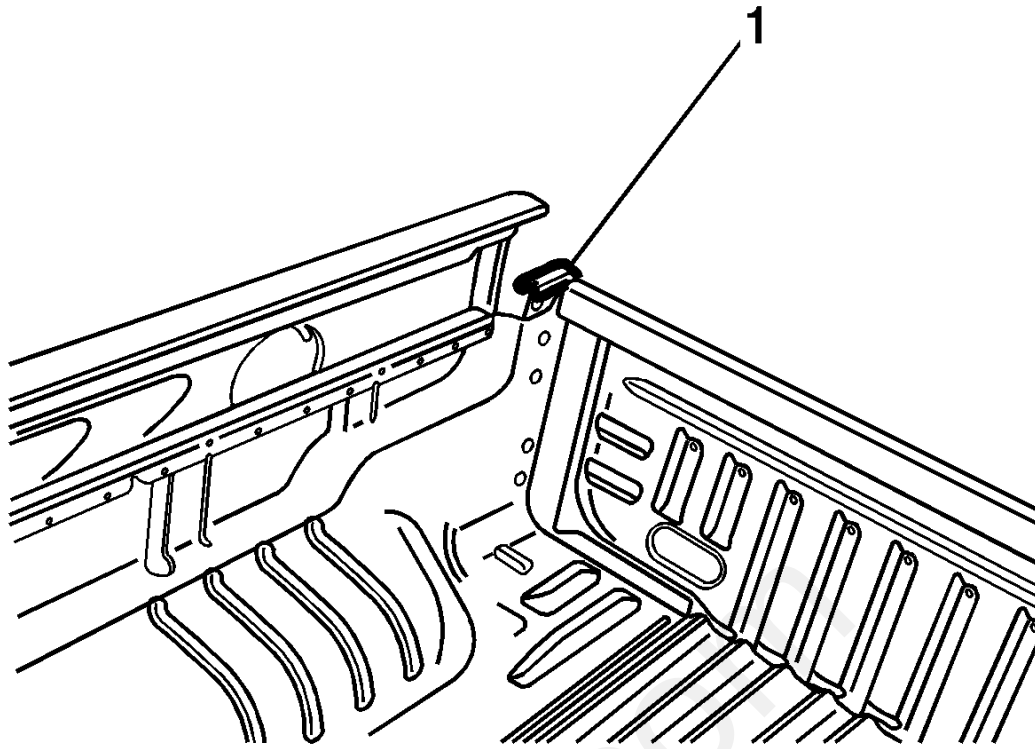


Fig. 235: Filler Reinforcement

Courtesy of GENERAL MOTORS COMPANY

NOTE: Do not pull the panels apart after the panels have been joined together. Slide the panels against each other to align the panels.

5. If equipped with filler reinforcement (1), use Structural Metal Bonding Adhesive (Medium Set Panel Bonding Adhesive) or equivalent, if needed. Refer to [Metal Panel Bonding](#).
6. Position the service part onto the bed assembly

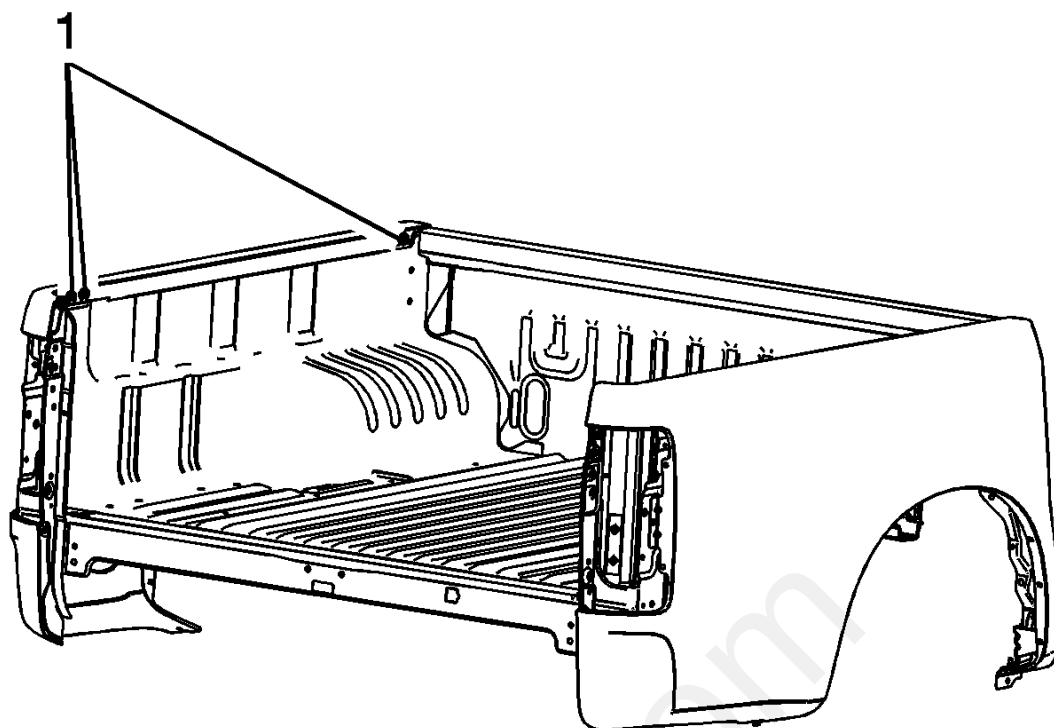


Fig. 236: Bolts

Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to **Fastener Caution** .

7. Install the bolts (1) and tighten to 13 N.m (9.6 lb ft).

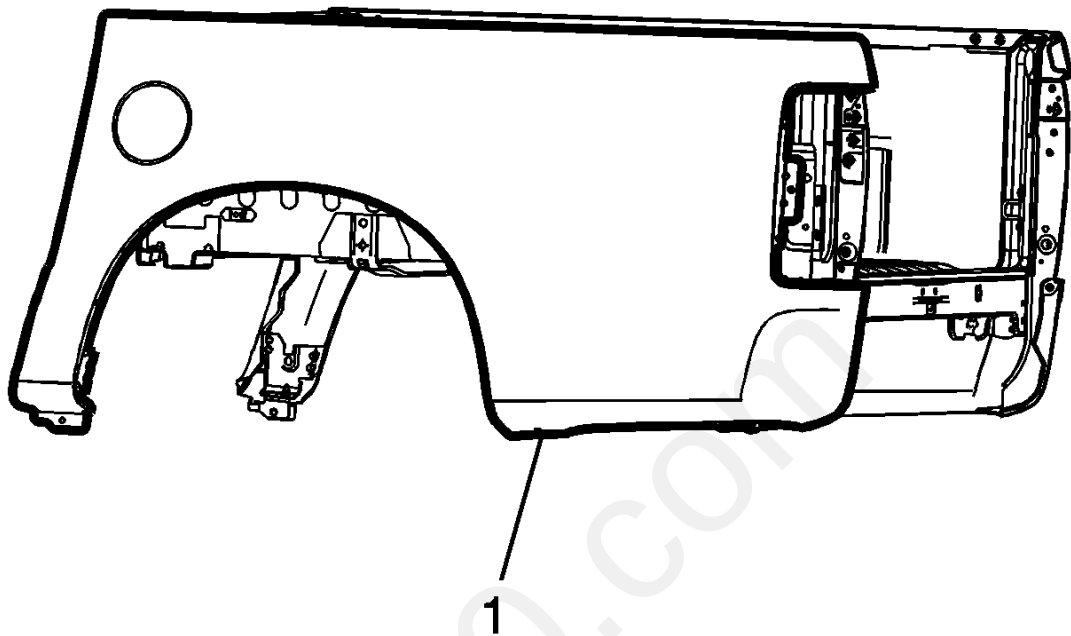


Fig. 237: Bolt

Courtesy of GENERAL MOTORS COMPANY

8. Install the bolt (1) and tighten to 13 N.m (9.6 lb ft).

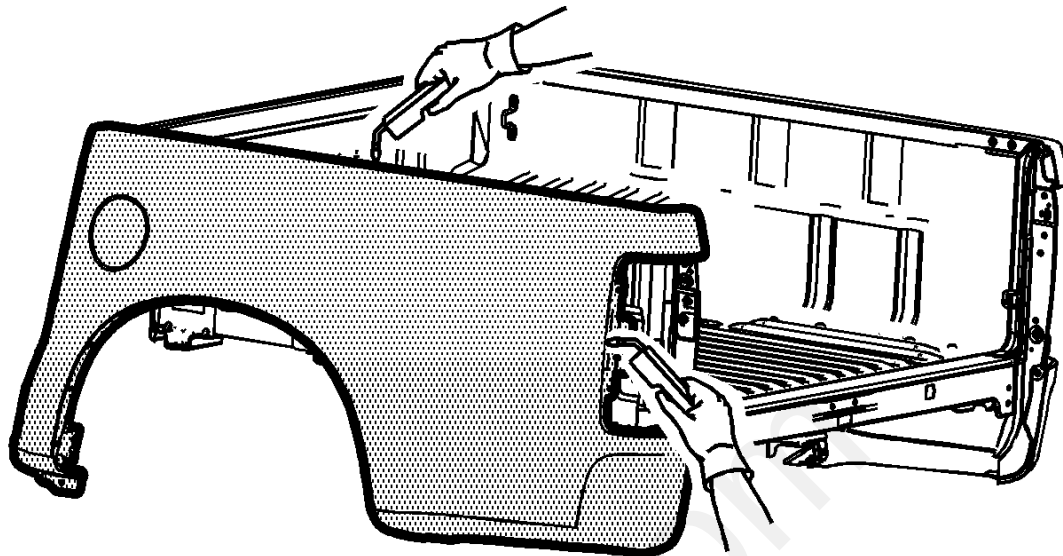


Fig. 238: Plug Welding

Courtesy of GENERAL MOTORS COMPANY

9. Plug weld as necessary
10. Clean and prepare all welded surfaces.
11. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
12. Paint and repair the area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
13. Install all related panels and components.
14. Install the box assembly. Refer to [Pickup Box Replacement](#) .

PICKUP BOX OUTER SIDE PANEL REPLACEMENT (ADHESIVE BONDING PROCEDURE)

Removal Procedure

WARNING: Refer to [Approved Equipment for Collision Repair Warning](#) .

NOTE: This adhesive bonding procedure represents one manufacturer's installation application. Other manufacturers' procedures may vary, including MIG welding in some areas of the repair. Always follow the system manufacturer's instructions for application, handling, and curing.

Before you begin the repair, refer to [Metal Panel Bonding](#) for proper adhesive preparations and general information.

1. Remove the box assembly. Refer to [Pickup Box Replacement](#) .
2. Remove all related panels and components.
3. Repair as much or the damage as possible, according to factory specifications.
4. Note the location and remove the sealers and anti-corrosion materials from the repair area, as necessary.
Refer to [Anti-Corrosion Treatment and Repair](#) .

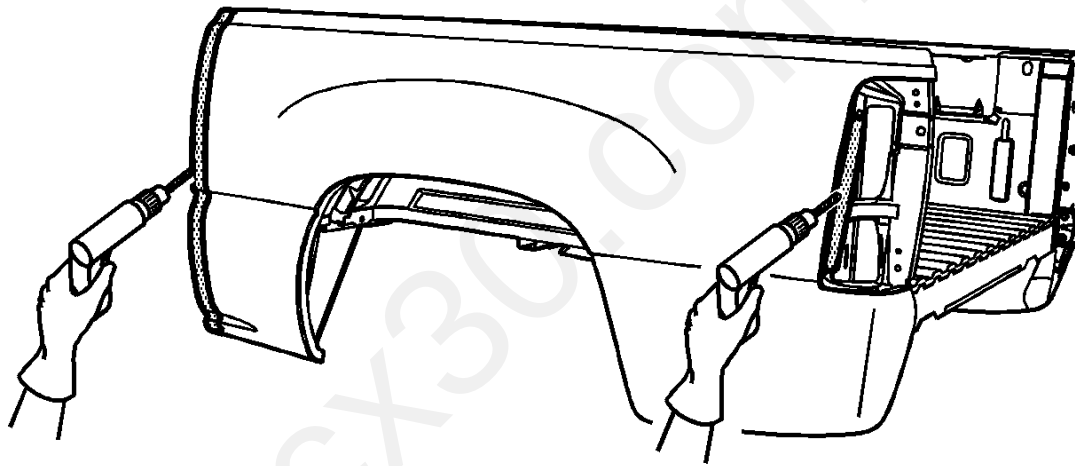
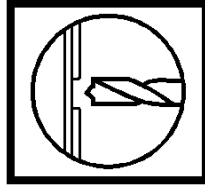


Fig. 239: Spot Welds

Courtesy of GENERAL MOTORS COMPANY

5. Locate and drill out the spot welds attaching the front panel, the wheelhouse, and the tail lamp pocket area.

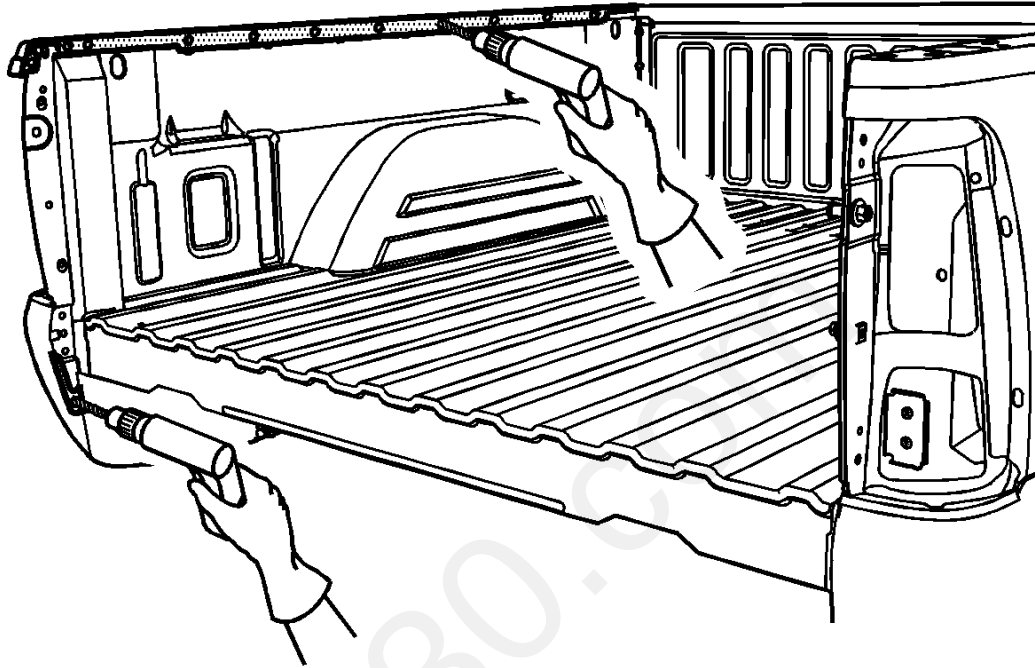
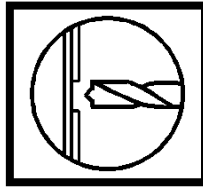


Fig. 240: Upper Rail Spot Welds

Courtesy of GENERAL MOTORS COMPANY

6. Locate and drill out spot welds on the upper rail and the rear sill area.

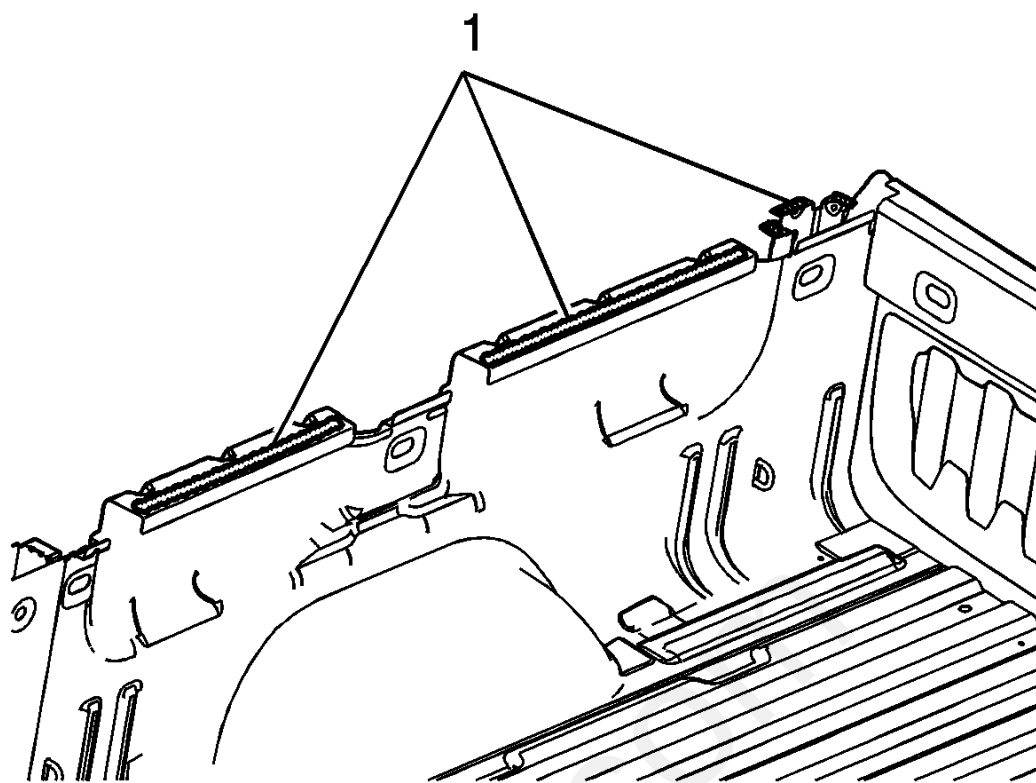


Fig. 241: Inner Panel

Courtesy of GENERAL MOTORS COMPANY

7. Structural adhesive is present between the upper inner panel (1) and the outer panel. If necessary, use a chisel to separate the outer panel from the inner panel.

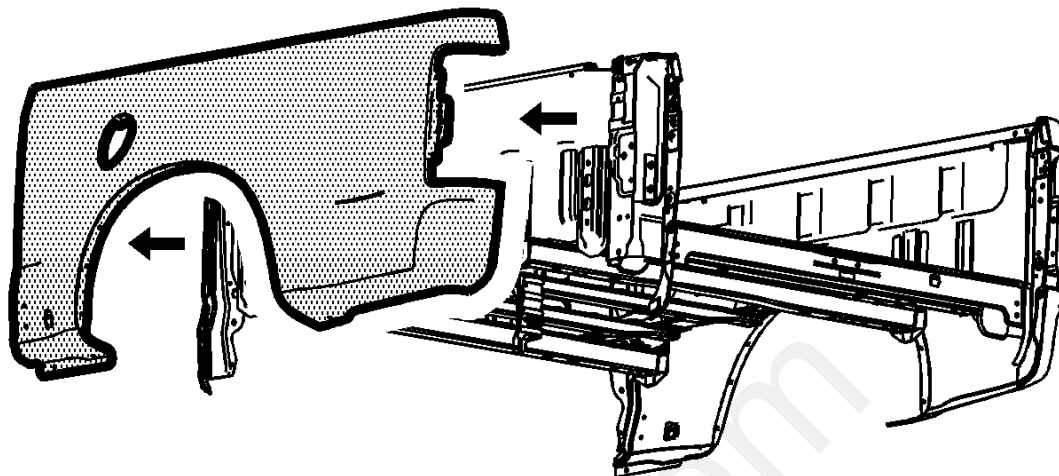


Fig. 242: Side Panel

Courtesy of GENERAL MOTORS COMPANY

8. Remove the side panel.

Installation Procedure

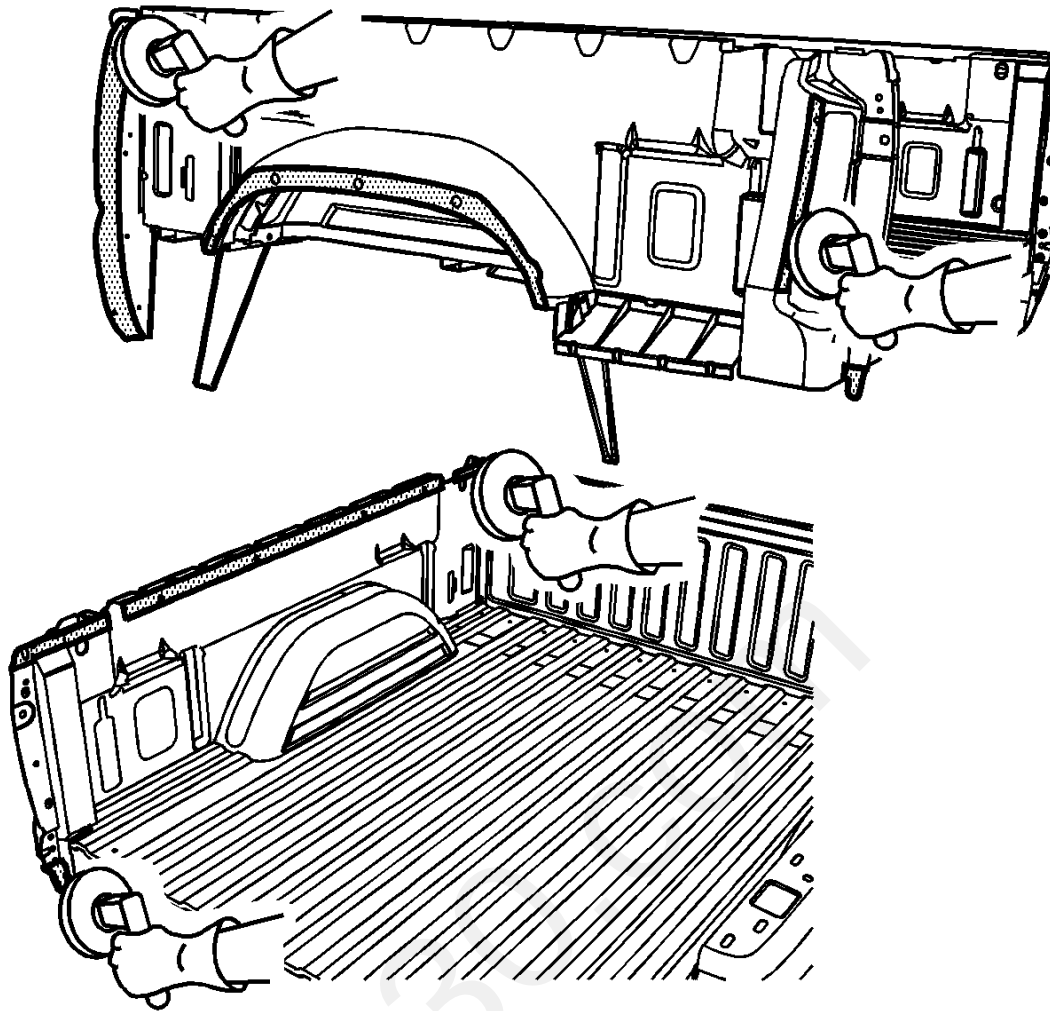


Fig. 243: Grinding Assembly Mating Flanges To Bare Steel

Courtesy of GENERAL MOTORS COMPANY

1. Grind the surface of the bed assembly mating flanges to bare steel. Do not damage the corners or thin the metal during the grinding process.

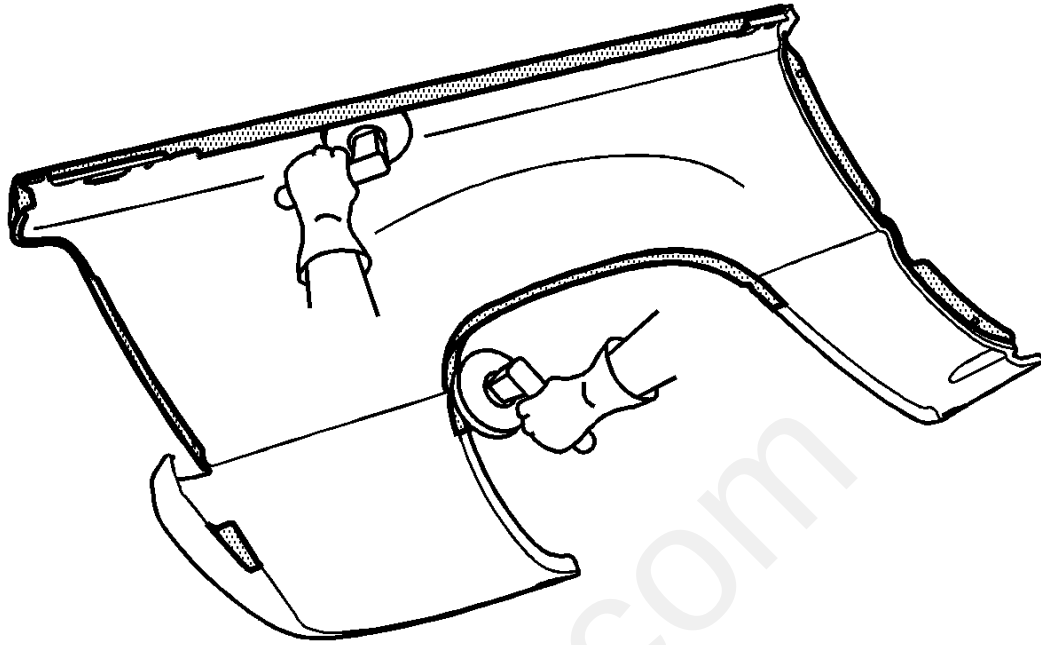


Fig. 244: Mating Flanges Of Service Side Panel

Courtesy of GENERAL MOTORS COMPANY

2. Grind the mating flanges of the service side panel to remove the E-coating. Do not damage the corners or thin the metal during the grinding operation.
3. Clean the mating surfaces.

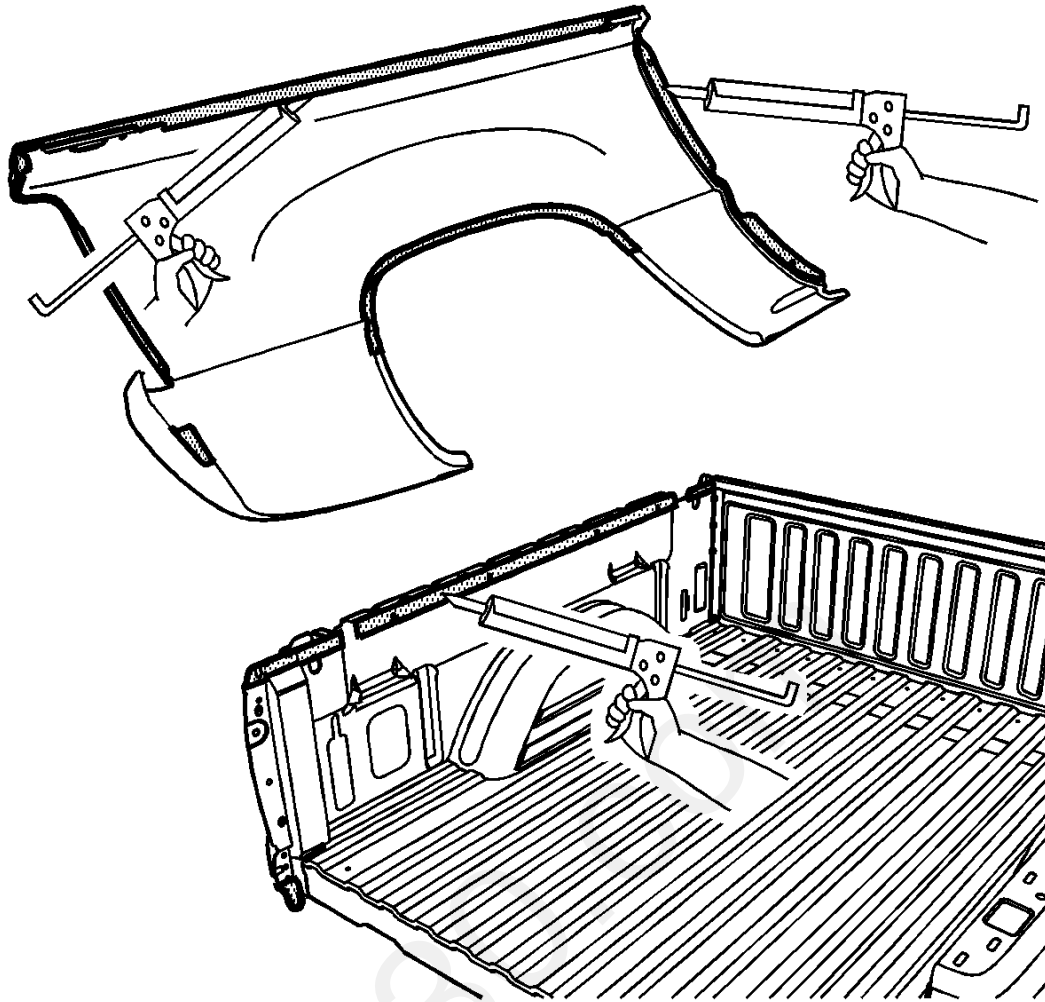


Fig. 245: Applying Metal Panel Bonding Adhesive To Mating Surfaces

Courtesy of GENERAL MOTORS COMPANY

NOTE: Do not allow the adhesive to cure prior to installing the service side panel.

4. Apply a 3-6 mm (1/8-1/4 in) bead of metal panel bonding adhesive to both of the mating surfaces.

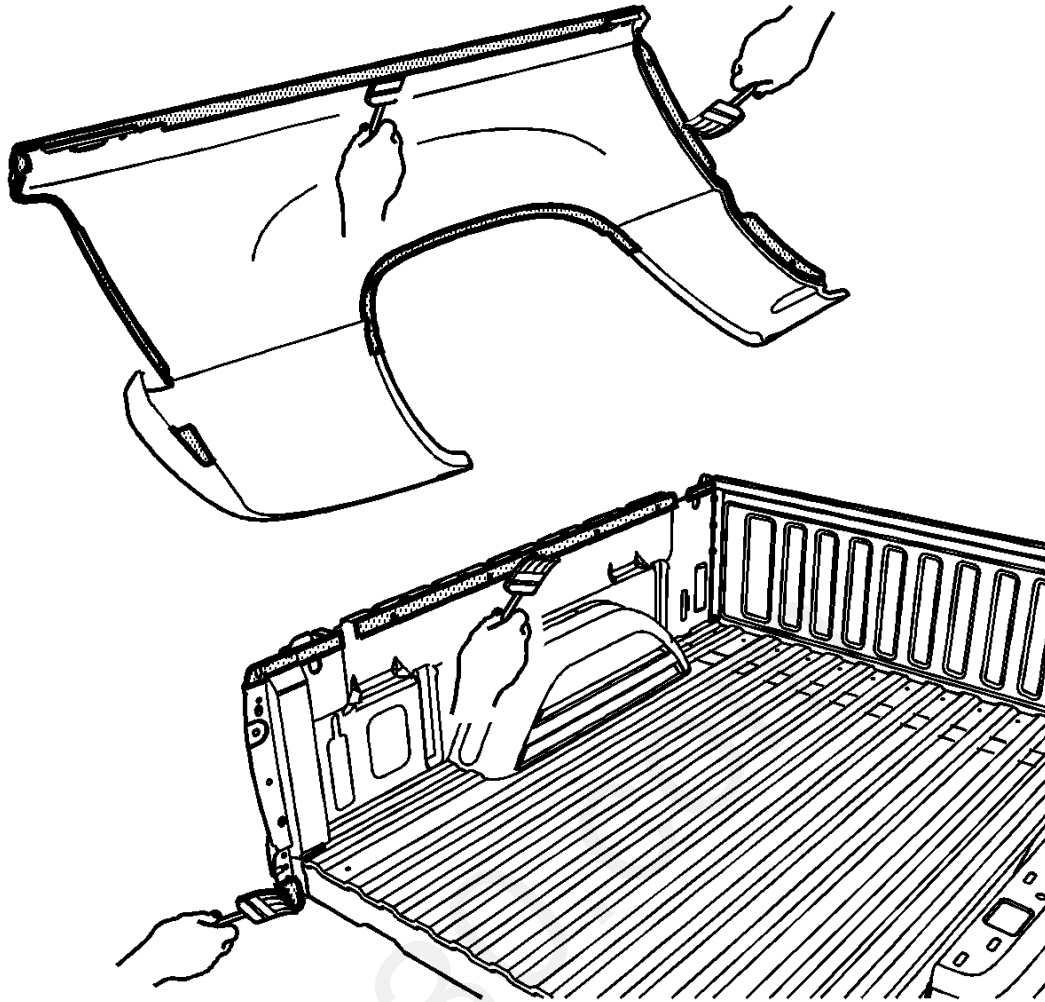


Fig. 246: Applying Adhesive To Mating Surfaces With Brush

Courtesy of GENERAL MOTORS COMPANY

5. Using a small acid brush, spread a coat of adhesive to both of the mating surfaces. Cover all of the bare metal to ensure corrosion protection.

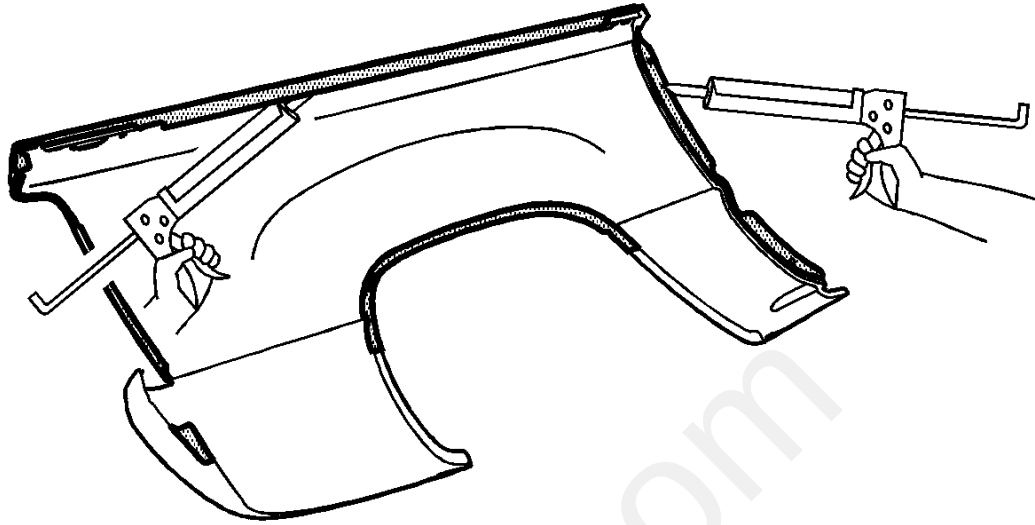


Fig. 247: Applying Metal Panel Bonding Adhesive To Mating Surfaces

Courtesy of GENERAL MOTORS COMPANY

6. Apply a 9-13 mm (3/8-1/2 in) bead of metal panel bonding adhesive to the mating surface of the service side panel.

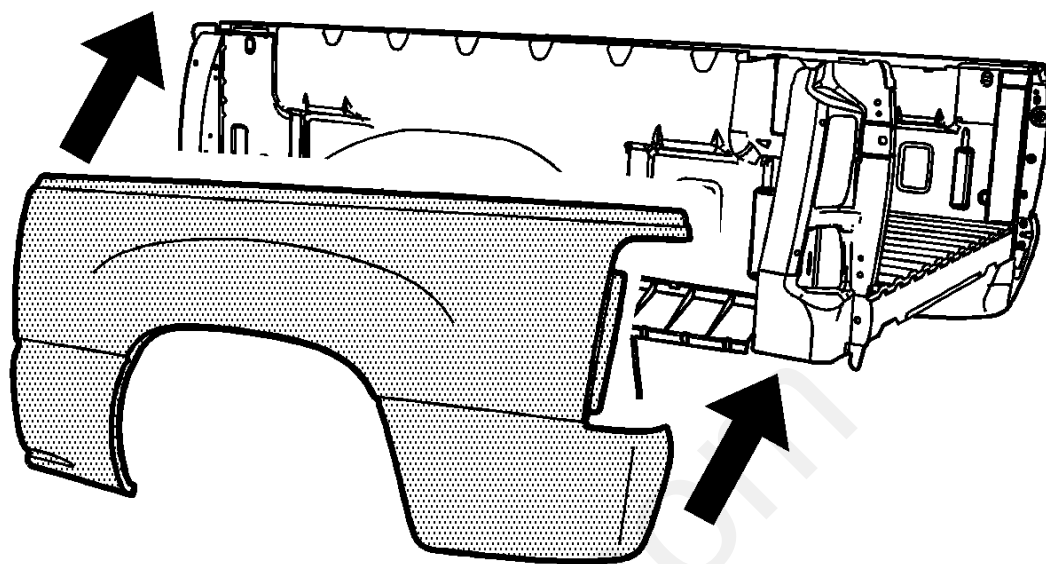


Fig. 248: Service Side Panel

Courtesy of GENERAL MOTORS COMPANY

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

7. Position the service side panel to the bed assembly.

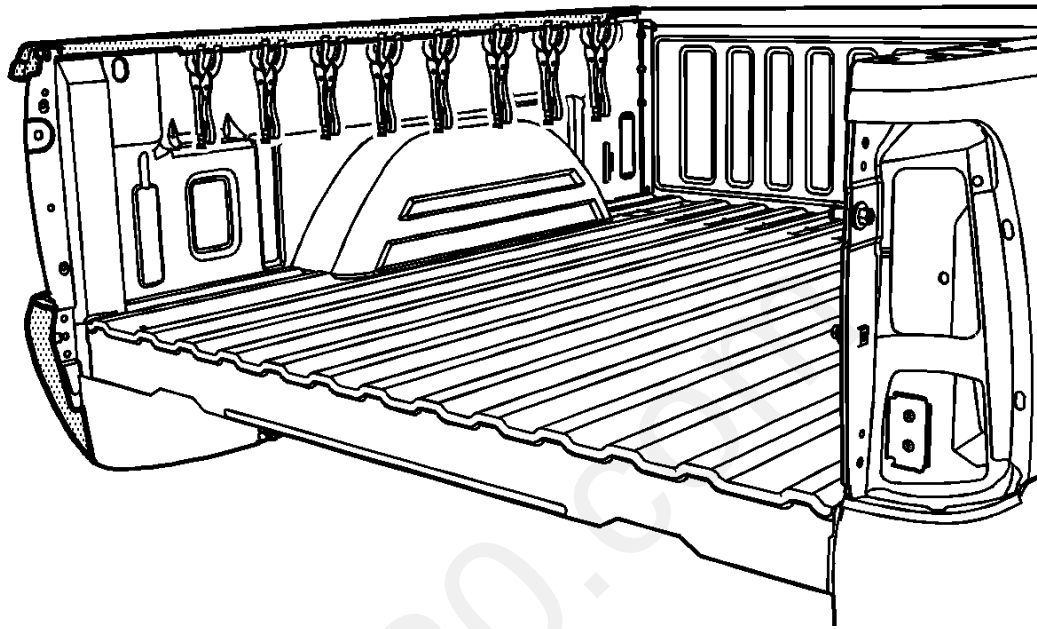


Fig. 249: Service Side Panel

Courtesy of GENERAL MOTORS COMPANY

8. Clamp the service side panel into position.
9. Using lacquer thinner remove the excess adhesive from the bed side panel area.
10. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#) .
11. Paint the repair area. Refer to [Basecoat/Clearcoat Paint Systems](#) .
12. Install all related panels and components.
13. Install the box assembly. Refer to [Pickup Box Replacement](#) .

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](#) .

ect 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](#) .

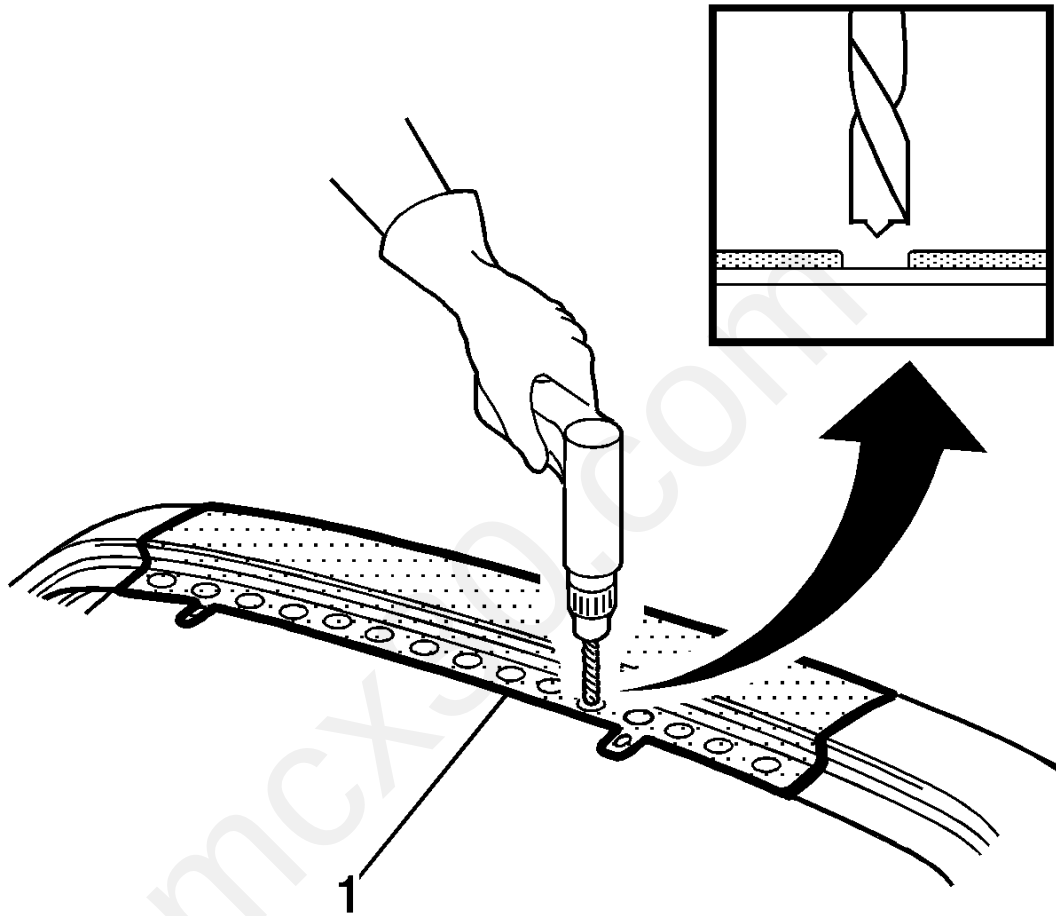


Fig. 250: Drilling Out Factory Welds (Full Panel)

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.

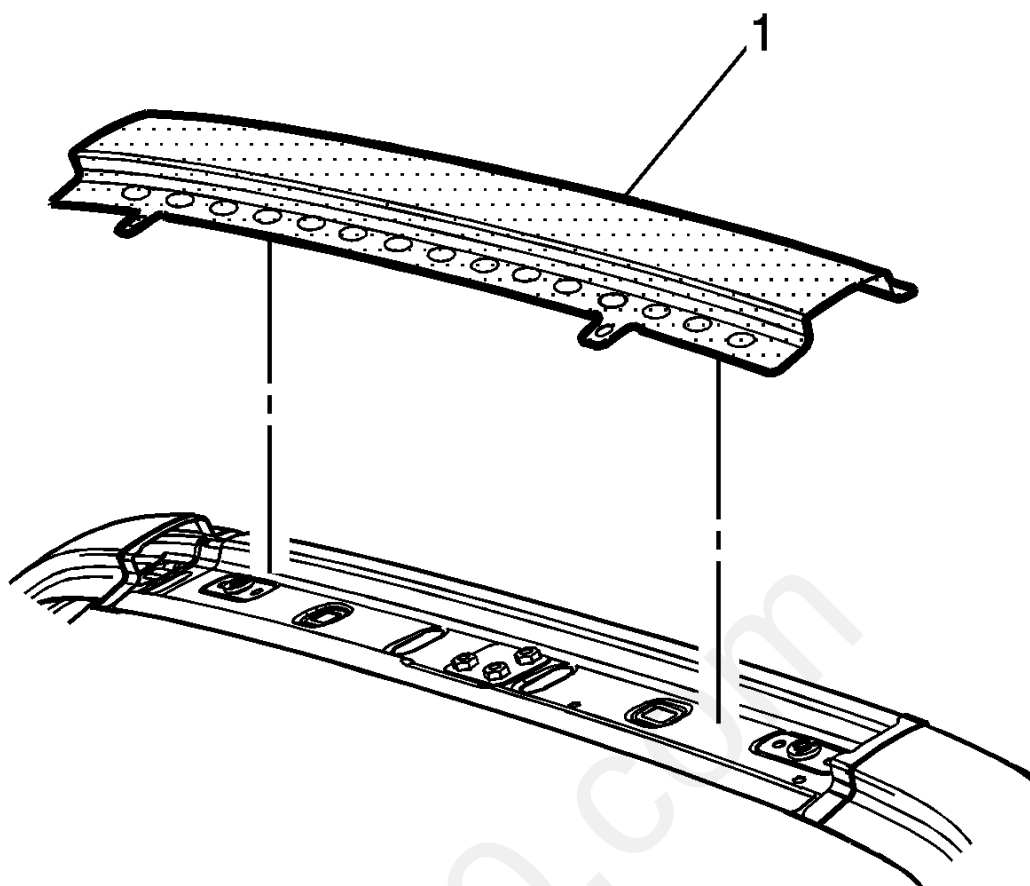


Fig. 251: Damaged Part (Full Panel)

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.

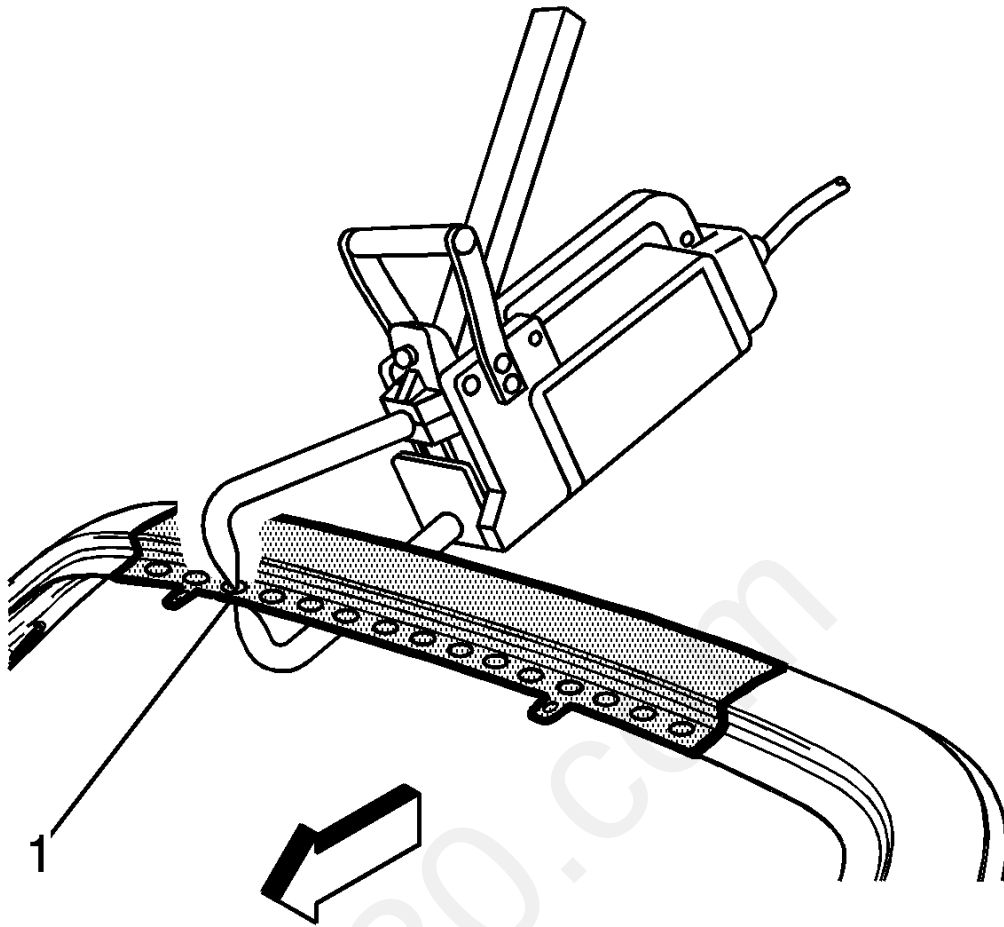


Fig. 252: Welding New Part (Full Panel)

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.

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](#) .

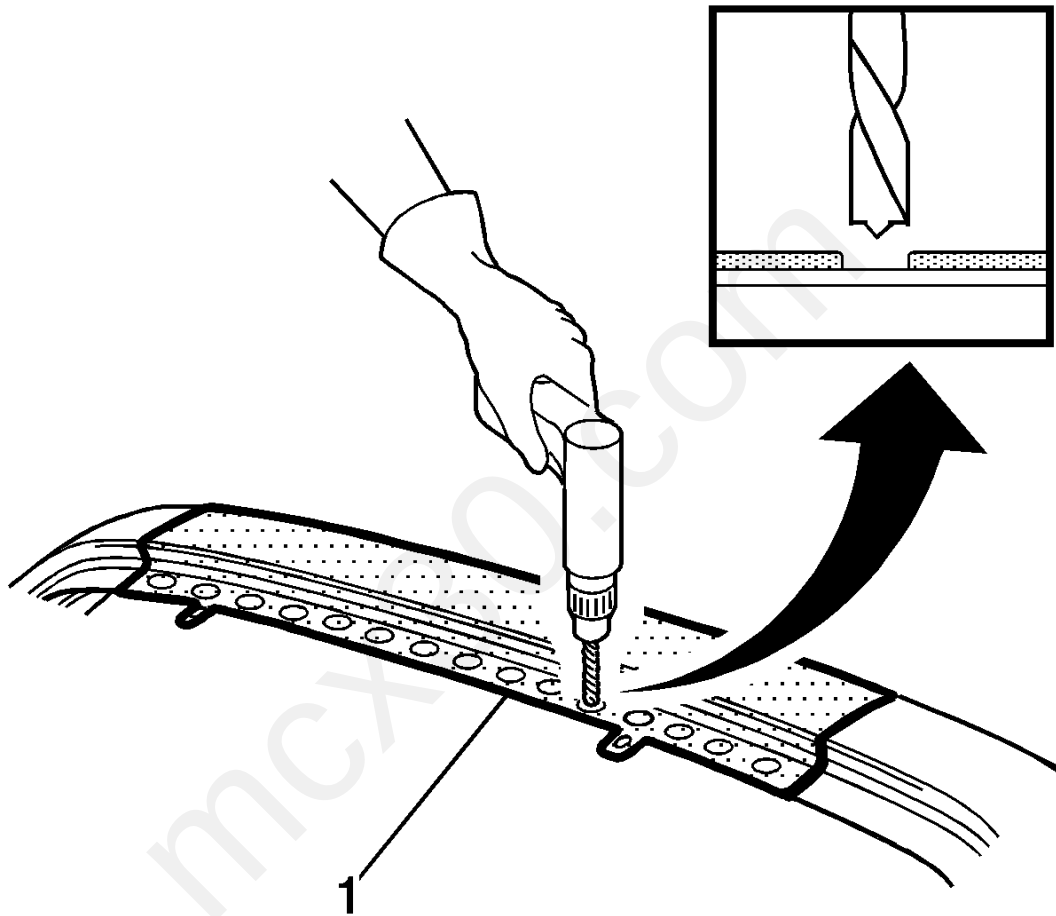


Fig. 253: Drilling Out Factory Welds (Full Panel)

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.

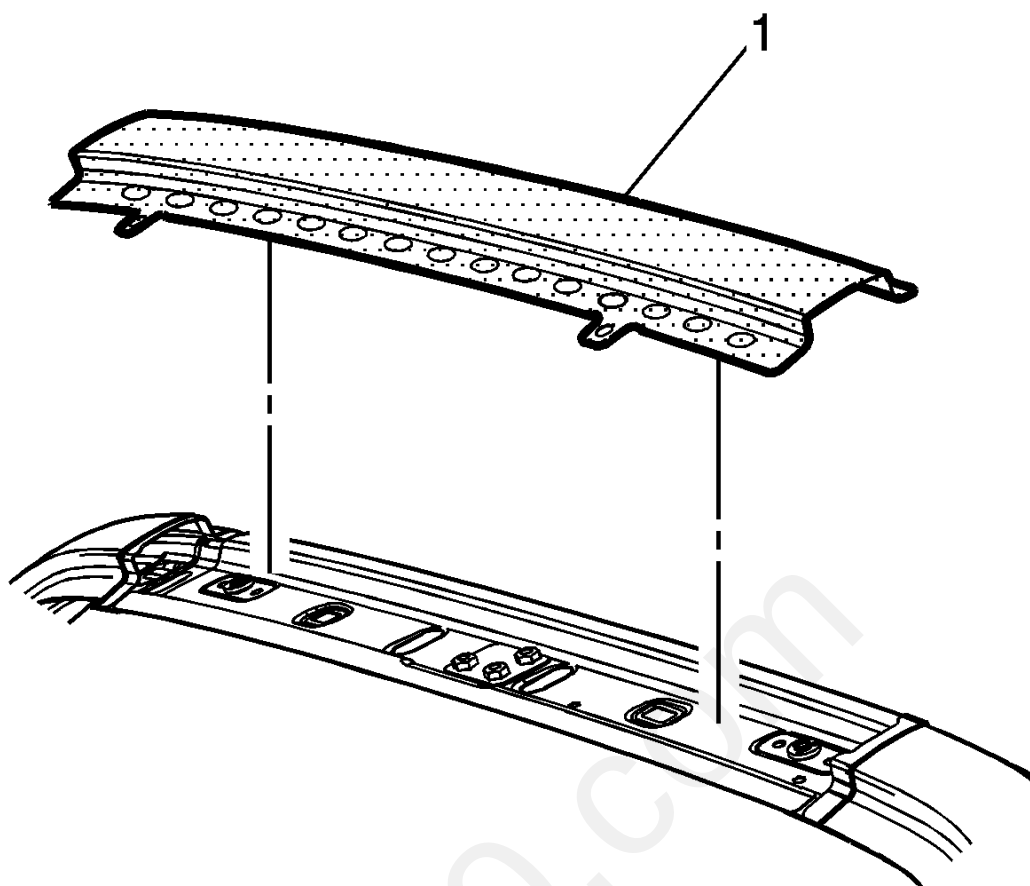


Fig. 254: Damaged Part (Full Panel)

Courtesy of GENERAL MOTORS COMPANY

7. Remove the damaged part (1).

Installation Procedure

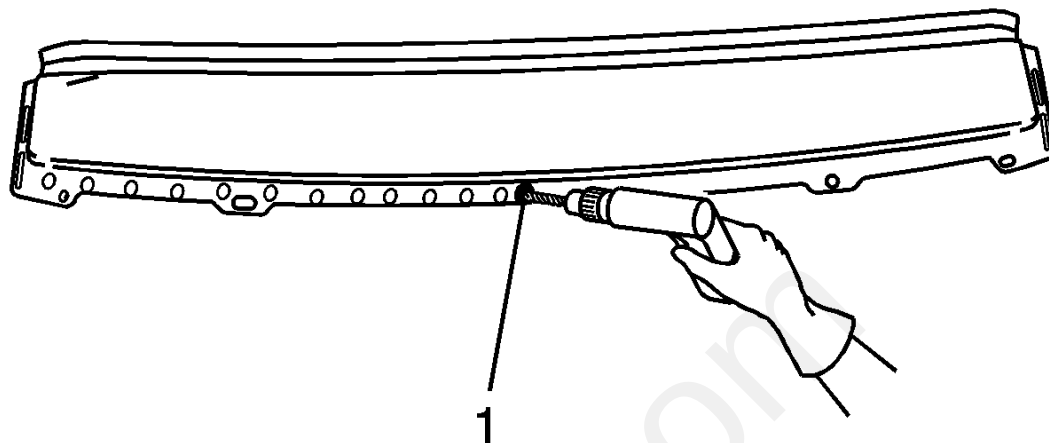


Fig. 255: Drilling Plug Weld Holes (Full Panel)
Courtesy of GENERAL MOTORS COMPANY

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.

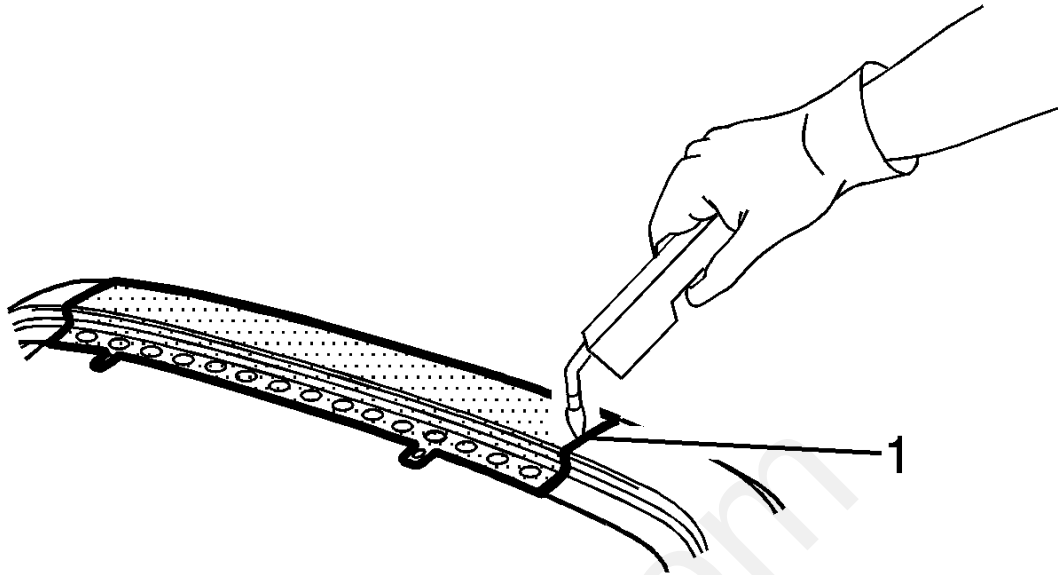


Fig. 256: Plug Welding Service Part (Full Panel)
Courtesy of GENERAL MOTORS COMPANY

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

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.

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.
- When recommended in a specific sectioning procedure, this type of steel can be used as a weld plate for reinforcing the sectioning location.
- 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.
- When recommended in a specific sectioning procedure, this type of steel can be used as a weld plate for reinforcing the sectioning location.
- 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 information is intended to provide general guidelines for adhesive bonding of steel panels. Panel bonding of steel 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 steel body panels.

Bonding procedures in general are applicable only at factory joints.

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

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

Adhesives are listed below. 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 Impact Resistant adhesives available for servicing these joints are considerably stronger once cured than panel bonding adhesives. 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:

Steel Panel Bonding Impact Resistant

Manufacturer and Part Number	Description
Pliogrip 5770P	Pliogrip 5770P Structural Impact Durable Adhesive Available from Ashland 800-PLIOGRIP www.ashland.com/products/pliogrip-structural-adhesives
Fusor 2098	Fusor 2098 Impact Resistant Adhesive Available from Lord Fusor 800-234-3876 www.fusor.com
3M 07333	3M Impact Resistant Structural Adhesive Available from 3M www.3MCollision.com

Steel Panel Bonding

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 ©2015 General Motors. All rights reserved.	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.

ed 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.
- When recommended in a specific sectioning procedure, this type of steel can be used as a weld plate for reinforcing the sectioning location.
- 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 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 weld plate for reinforcing the sectioning location.**

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.
-