Body Repair

Collision Repair

Specifications

**Dimensions - Body**

**Description**

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.

**Underhood Opening Dimensions**

![Image of underhood opening dimensions]

Body Side Opening Dimensions
Rear Body Opening Dimensions
### Visual Identification

#### Structure Identification

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Repair Instructions
Front Wheelhouse 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.
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 lower plenum.

Note: Do not damage any inner panels or reinforcements.
7. Locate and drill out all factory welds.
**Note:** Note the number and location of welds for installation of the front wheelhouse.

8. Remove the damaged front wheelhouse.

**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.

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

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

2. Prepare the mating surfaces as necessary.

3. Apply GM-approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to [Anti-Corrosion Treatment and Repair](#).
4. Position the front wheelhouse to the vehicle using 3-dimensional measuring equipment. Clamp the wheelhouse in place.

5. Plug weld accordingly.

6. Install the lower plenum.

7. Clean and prepare all of the welded surfaces.

8. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.


10. Install all related panels and components.

11. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.

12. Enable the SIR system. Refer to SIR Disabling and Enabling.
Front Compartment Inner Side Rail Sectioning

Removal Procedure

Warning: Refer to Approved Equipment for Collision Repair Warning.

1. Disable the SIR system. Refer to SIR Disabling and Enabling.
2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
3. Remove all related panels and components.
4. Repair as much of the damage as possible. 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. Cut the panel along the front edge of the die mark.
7. Locate and drill out all factory welds. Note the number and location of the welds for installation of the front lower inner rail section.

8. Remove the damaged front lower inner rail.

9. If the inner rail reinforcement is damaged beyond repair, replace the reinforcement as needed.

Installation Procedure
1. Install the inner rail reinforcement as needed.

2. Cut the replacement service part along the front edge of the arrow on the die mark.
   
   **Note:** If the location of the original plug weld holes can not be determined, space the plug weld holes every 40 mm (1½ in) apart.

   **Note:** Some panels may have structural weld-thru adhesive. Replace the weld-thru adhesive with an additional spot weld between each factory spot weld.

3. Drill 8 mm (5/16 in) plug weld holes as necessary in the locations noted on the original panel.
4. Drill 8 mm (5/16 in) plug weld holes along the sectioning cut on the service part. Locate these holes 13 mm (½ in) from the edge and spaced 40 mm (1½ in) apart.

5. Prepare all mating surfaces as necessary.

6. Apply GM-approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to Anti-Corrosion Treatment and Repair.

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

8. Plug weld accordingly.

9. To create a solid weld with minimum heat distortion at the sectioning joint, make 25 mm (1 in) gaps between them. Complete the stitch weld.

10. Clean and prepare all of the welded surfaces.

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


13. Install all of the 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.
Front Hinge Pillar Body 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.

**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 Structure Identification.

7. Measure 70 mm (2 3/4 in) down from the lower fender bracket (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.
9. Locate and drill out all factory welds. Note the number and location of the welds for installation of the service part.

10. Remove the damaged hinge pillar.

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

**Installation Procedure**

1. On the service body side, measure 40 mm (1 9/16 in) down from the lower fender bracket. Mark a horizontal line. Cut the hinge pillar along this line.

2. Perform additional sectioning procedures as necessary to remove the unused areas of the service part.
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 ½ in) apart.

3. 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.

4. Prepare all attachment surfaces, as necessary.

5. Apply GM-approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to Anti-Corrosion Treatment and Repair.

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

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](#).
Roof Outer Panel Replacement

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 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.
3. Take note of the gap sizes along the perimeter of the roof panel to the headers, the glass, and the doors.

4. Remove all related panels and components.
5. Repair as much of the damaged area as possible to factory specifications. Refer to Dimensions - Body.
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.
7. Remove the windshield. Refer to Windshield Replacement.
8. Remove the liftgate. Refer to Liftgate Replacement ( Acadia, Enclave, Traverse).

**Note:** Do not damage any inner panels or reinforcements. Drill through the roof panel only.

9. Locate and drill out all factory welds. Note the number and locations of the welds for installation of the roof panel.
Installation Procedure

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 cannot be determined, or if structural weld-thru adhesive is present, space the plug weld holes 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.

4. Apply Fusor super flexible anti-flutter foam fast set, Fusor P/N 121/124, or equivalent, with the bead placed as shown.
5. With the aid of an assistant, position the roof panel on the vehicle.

6. Plug weld accordingly.

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.


10. Install the liftgate. Refer to Liftgate Replacement (Acadia, Enclave, Traverse).

11. Install the windshield. Refer to Windshield Replacement.

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.
Rocker Outer Panel Reinforcement Replacement

Removal Procedure

Warning: Refer to Approved Equipment for Collision Repair Warning.
Warning: Refer to Collision Sectioning Warning.
Warning: Refer to Glass and Sheet Metal Handling Warning.
Warning: Refer to Foam Sound Deadeners 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. 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 the necessary factory welds of the rocker outer panel (1).
7. Drill all factory welds. Note the number and location of welds for installation of the service assembly.
8. Remove the damaged rocker outer panel (1).

Installation Procedure
1. Drill **8 mm (5/16 in)** for plug welding along the edges of the rocker outer panel (1) as noted from the original panel.
2. Clean and prepare the attaching surfaces for welding.
3. Position the rocker outer panel (1) on the vehicle.
4. Verify the fit of the rocker outer panel.
5. Clamp the rocker outer panel into position.
6. Plug weld the rocker outer panel (1) 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.
Rocker Outer Panel Sectioning Removal Procedure

Warning: Refer to Approved Equipment for Collision Repair Warning.
Warning: Refer to Collision Sectioning 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. 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. Perform additional sectioning procedures as needed depending on damage to vehicle.

Note: Do not damage any inner panels or reinforcements.

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

8. Locate and mark all the necessary factory welds of the rocker outer panel (1).
9. Drill all factory welds.
10. Remove the damaged rocker outer panel (1).

**Installation Procedure**

1. From the service part (1), cut the panel in corresponding locations to overlap the remaining original panel by 25 mm (1 inch) at each joint location.
2. Prepare all mating surfaces as necessary.
3. Drill 8 mm (5/16 in) plug weld holes in the service part (1), as necessary, in the corresponding locations noted on the original panel and along sectioned joint.
4. Clean and prepare the attaching surfaces for welding.
5. Apply GM approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to Anti-Corrosion Treatment and Repair.

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

7. Plug weld the rocker outer panel (1) accordingly.

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. 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.

11. Install all related panels and components.
12. 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.

1. Disconnect 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.

6. Locate and drill out all factory welds.

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

1. Use a grinding disk to grind the surface of the door shell mating flanges to bare steel.
2. Scuff the opposing mating surfaces of the door outer panel to remove the gloss of the E-Coat.

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

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

4. Clean the mating surfaces.

   **Note:** Do not allow the adhesive 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 (3/8–½ in) bead of metal bonding adhesive to the mating surfaces of the service panel.

8. Install the door outer panel to the door shell.

9. Clamp the door outer panel into position, as required.

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.
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.

15. Apply Fusor super flexible anti-flutter foam-fast set, Fusor P/N 121/124, or equivalent, in 4–5 evenly spaced locations as noted from the original panel.

16. Apply sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.

17. Paint the repaired area. Refer to Basecoat/Clearcoat Paint Systems.

18. Install the door assembly. Refer to Front Side Door Replacement.

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

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.

1. Disconnect 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 Rear Side Door Replacement.

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

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

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**

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

2. Scuff the opposing mating surfaces of the door outer panel to remove the gloss of the E-Coat.
3. Drill 8 mm (5/16 in) plug weld holes, as necessary, in the locations noted from the original panel.
   
   **Note:** If the original location of the plug weld holes cannot be determined, space plug weld holes every 40 mm (1 in) apart.

4. Clean the mating surfaces.

   **Note:** Do not allow the adhesive 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 (3/8–½ in) bead of metal bonding adhesive to the mating surfaces of the service panel.
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.

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 door to the vehicle. Inspect the door outer panel for proper alignment; then adjust the alignment, as required. Refer to Rear Side Door Replacement.
13. Using metal-inert gas (MIG), weld the door outer panel to the door frame in the locations noted from the original panel.

14. Clean and prepare all welded surfaces.

15. Apply Fusor super flexible anti-flutter foam-fast set, Fusor P/N 121/124, or equivalent, in 4–5 evenly spaced locations between the door outer panel and the inner safety beam.

16. Apply sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.

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

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

**Note:** Do not damage any inner panels or reinforcements.
6. Remove the rear underbody tie plates. Replace if damaged.
7. Locate and drill out all factory welds. Note the number and location of the welds for installation of the rear floor panel.
8. Remove the damaged rear floor panel.

Installation Procedure
Note: If the location of the original plug weld holes cannot be determined, space the plug weld holes every 40 mm (1 ½ in) apart.

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

1. Drill 8-mm (5/16-in) plug weld holes in the service part as necessary in the locations noted from the original panel.
2. Prepare all mating surfaces as necessary.
3. Apply 3M Weld-Thru Coating P/N 05916 or equivalent to all mating surfaces.
4. Position the rear floor panel to the vehicle using 3-dimensional measuring equipment. Clamp the rear floor panel into place.
5. Plug weld accordingly.
6. Install the rear underbody tie plates.
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.
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.
Warning: Refer to Foam Sound Deadeners Warning.

Warning: Refer to Approved Equipment for Collision Repair Warning.

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

Note: Do not damage any inner panels or reinforcements.

6. Locate and drill out all factory welds on the tail lamp filler panel. Note the number and location of the welds for installation of the tail lamp filler panel.
7. Remove the damaged tail lamp filler panel.

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

9. Remove the damaged quarter filler panel.

**Installation Procedure**

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 quarter filler panel to the vehicle using 3-dimensional measuring equipment. Clamp the quarter filler panel into place.

4. Plug weld accordingly.

5. Position the tail lamp filler panel to the vehicle using 3-dimensional measuring equipment. Clamp the tail lamp filler panel into place.
6. Plug weld accordingly.
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.
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.
Body Rear End Panel Replacement (Complete)

Removal Procedure

Warning: Refer to Foam Sound Deadeners Warning.

Warning: Refer to Approved Equipment for Collision Repair Warning.

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

Note: Do not damage any inner panels or reinforcements.

7. Locate and drill out all factory welds. Note the number and location of the welds for installation of the rear end panel.
8. Remove the damaged rear end panel.

**Installation Procedure**

**Note:** If the location of the original plug weld holes can not be determined, space the plug weld holes every 40 mm (1 ½ in) apart.

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

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

5. Plug weld accordingly.

6. Clean and prepare all welded surfaces.

7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.


9. Install all related panels and components.

10. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.

11. Enable the SIR system. Refer to SIR Disabling and Enabling.
Body Rear End Panel Replacement (Sectioning)

Removal Procedure

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

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

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

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

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

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

6. Cut slit in body side frame extension (1).
7. Fold body side frame extension rearward (1).

8. Cut the body side frame extension (1) as shown, and remove rear end panel.

**Installation Procedure**

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

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

5. Weld body side frame extension as shown (1).

6. Fold body side frame extension back in place (1).

7. Weld accordingly at the original weld locations (1).

8. Clean all of the welded surfaces.
9. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.

10. Paint the repaired area. Refer to Basecoat/Clearcoat Paint Systems

11. Install all of the related panels and components.

12. Enable the SIR system and then connect the negative battery cable. Refer to SIR Disabling and Enabling.
Front Rail 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](#).
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. Refer to [Anti-Corrosion Treatment and Repair](#).

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

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

7. Remove the damaged front lower rail.

**Installation Procedure**
**Note:** If the location of the original plug weld holes can not be determined, space the plug weld holes every 40 mm (1½ in) apart.

Some panels may have structural weld-thru adhesive. Replace the weld-thru adhesive with an additional spot weld between each factory spot weld.

1. Drill 8 mm (5/16 in) plug weld holes in the service part as necessary in the locations noted from the original panel.
2. Prepare all mating surfaces as necessary.
3. Apply GM-approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to [Anti-Corrosion Treatment and Repair](#).
4. Position the front lower rail to the vehicle using 3-dimensional measuring equipment. Clamp the rail in place.
5. Plug weld accordingly.
6. Clean and prepare all welded surfaces.
7. Install all related panels and components.
8. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
10. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
11. Enable the SIR system. Refer to SIR Disabling and Enabling.
Center Pillar 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.

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

Note: This procedure is for the body side outer center pillar only. If the center pillar inner reinforcement is damaged beyond repair, refer to Center Pillar Sectioning - Inner for the specific location on sectioning.

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. On the upper door frame opening, measure down 93 mm from top of center pillar and make a horizontal line.

7. Mark additional sectioning locations as needed. Refer to Structure Identification for sectioning locations.
Note: Do not damage any inner panels or reinforcements.

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

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

10. Remove the damaged pillar section.

Installation Procedure
1. Cut the replacement body side in corresponding locations to fit the remaining original panel. The sectioning joint should be trimmed to allow an overlap of 25 mm at the sectioning joint.

   **Note:** If the location of the original plug weld holes cannot be determined, space the plug weld holes every 40 mm (1 ½ in) apart.

2. 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.

3. Prepare all attachment 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 center pillar to the vehicle using 3-dimensional measuring equipment. Clamp in place.

6. 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.

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](#).
Warning: Refer to Approved Equipment for Collision Repair Warning.
Warning: Refer to Glass and Sheet Metal Handling Warning.
Warning: Refer to Foam Sound Deadeners Warning.

Note: Structural adhesive (1) has been added between the body side outer panel and the upper area of the center pillar reinforcement assembly starting January, 2011. Therefore, the complete center pillar reinforcement assembly has to be replaced at factory seams. For vehicles manufactured prior to this, refer to the appropriate center pillar reinforcement sectioning procedure.

Note: Due to replacement of the center pillar reinforcement at factory seams, a special outer body-side sectioning procedure has also been developed. Please refer to Center Pillar Sectioning - Outer for further information.

1. Disable the SIR System. Refer to SIR Disabling and Enabling.
2. Remove all related panels and components.
3. Visually inspect the damage. Repair as much of the damage as possible.
4. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
5. Remove body side center pillar section. Refer to Center Pillar Sectioning - Outer.
6. Remove all structural adhesive (1) at top of pillar.
7. Locate and mark all the necessary factory welds of the center pillar reinforcement (1).

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

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

**Installation Procedure**

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

3. Apply GM-approved Weld-Thru coating or equivalent to all mating surfaces. Refer to Anti-Corrosion Treatment and Repair.

4. Position the center pillar reinforcement (1) on the vehicle using 3-dimensional measuring equipment. Clamp into position.

5. Plug weld the center pillar reinforcement (1) 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. Complete body side center pillar sectioning. Refer to Center Pillar Sectioning - Outer.

9. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.


11. Install all related panels and components.

12. Enable the SIR system. Refer to SIR Disabling and Enabling.
Center Pillar Sectioning - Inner

Removal Procedure

Within the center pillar reinforcement, there are two ultra high strength steel brackets (1). Due to this design, the center reinforcement is to be installed as an assembly. Sectioning or servicing the individual components could compromise the structural integrity of the vehicle.

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

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

5. Note the location and remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#).
6. Remove Body Side Center Pillar Section. Refer to [Center Pillar Sectioning](#).

7. Measure down 20 mm from bottom of reinforcement hole. Mark a horizontal line.
8. Cut the panel where sectioning is to be performed.

9. Drill out the factory welds to separate the B-pillar reinforcement from the body.

10. Remove the B-pillar reinforcement from the vehicle.
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.

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

4. Position the service B-pillar reinforcement assembly to the vehicle using 3-dimensional measuring equipment. Clamp into place.
5. 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. Complete the stitch weld.

6. Stitch weld the sectioning joint.

7. Apply GM-approved Weld-Thru adhesive as needed. Clean the pillar surface. Refer to [Anti-Corrosion Treatment and Repair](#).

8. Complete Body Side Center Pillar Sectioning. Refer to [Center Pillar Sectioning](#).

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

14. Enable the SIR system. Refer to [SIR Disabling and Enabling](#).
Warning: Refer to Approved Equipment for Collision Repair Warning.
Warning: Refer to Glass and Sheet Metal Handling Warning.
Warning: Refer to Foam Sound Deadeners Warning.
Warning: Sectioning should be performed only in the recommended areas. Failure to do so may compromise the structural integrity of the vehicle and cause personal injury if the vehicle is in a collision.

Note:
- Structural adhesive (1) has been added between the body side outer panel and the upper area of the center pillar reinforcement assembly starting January, 2011. Therefore, the complete center pillar reinforcement assembly has to be replaced at factory seams. For vehicles manufactured prior to this, refer to the appropriate center pillar reinforcement sectioning procedure.
- At this time, the ONLY adhesive that meets the General Motors performance requirements is shown below. Contact the manufacturer for ordering and product information:
  - L & L Products – 1-800-452-6359
  - Product – Structural Adhesive – 401773 L00

1. Disable the SIR system. Refer to SIR Disabling and Enabling.
2. Remove all related panels and components.
3. Remove the sealers and anti-corrosion materials from the repair area, as necessary, and note their location. Refer to Anti-Corrosion Treatment and Repair.
4. Repair as much of the damaged area as possible. Refer to Dimensions - Body.
5. Remove the weather-strip, observe the flange in the center pillar area. There will be a 3-metal stack-up. The center layer is the center pillar inner reinforcement (1).

6. Measure 25 mm (1 in) from the forward and rearward edges of the center pillar inner reinforcement and mark a vertical line (1).

7. Measure down 50 mm (2 in) from the body side roof line (1) and mark a horizontal line (2).

8. Cut access window (1) in the center pillar outer.

9. Perform additional sectioning procedures as needed depending on damage to vehicle.
10. Locate and drill out all factory welds (1). Note the number and location of welds for installation of the service part.

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

12. Remove structural adhesive (1) from upper center pillar reinforcement.
1. From the service part (1), cut in corresponding locations to fit the original panel. The sectioning joint should be trimmed to allow a 25 mm overlap.

2. Drill 8 mm (5/16 in) plug weld holes (1) along the sectioning joint at the top of the original panel.

3. Drill 8 mm (5/16 in) plug weld holes in the service part (1) in locations noted from original panel and in the overlap areas of the service panel.
4. Cut a 3 mm x 25 mm slot (1) in the corners to allow top of service part to slide behind (underlap) the original panel.

5. Prepare all mating surfaces for welding, as necessary.

6. Apply GM approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to Anti-Corrosion Treatment and Repair.

**Note:** Do not apply excessive amounts of structure adhesive that will squeeze out onto weld flange areas.

7. Apply structure adhesive in locations to duplicate the footprint of the original adhesive (1). Use approximately 3/8 (170 cc) of the tube (2).
8. Slide service part into slots at top of pillar (1).

9. Position the outer center pillar to the vehicle using 3-dimensional measuring equipment. Clamp the pillar (1) in place. Plug weld accordingly (2).

10. To create a solid weld with minimum heat distortion, make a 25 mm (1 in) stitch weld along the seam with gaps of 25 mm (1 in) gaps between them. Go back and complete the stitch weld.

11. Clean and prepare all of the welded surfaces.

12. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.

13. Paint the repaired area. Refer to Basecoat/Clearcoat Paint Systems.

14. Install all of the related panels and components.

15. Enable the SIR system. Refer to SIR Disabling and Enabling.
Quarter Panel Sectioning

Removal Procedure

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

**Note:** Section in specified areas only. Sectioning outside of these areas may compromise the structural integrity of the vehicle. The quarter panel can be replaced at factory seams, but requires the roof flange spot welds to be removed along the top of the quarter panel. The sectioning procedures have been developed as a more cost-effective alternative to complete replacement.

**Note:** When replacing panels that involve servicing of stationary glass, refer to Full-Cut Method Description 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.
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.

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

6. Cut the panel where sectioning is to be performed.
7. Perform additional sectioning procedures as necessary. Refer to Structure Identification.
8. Locate and drill out all factory welds. Note the number and location of the welds for installations of the service part.

9. Remove the damaged quarter panel.

**Installation Procedure**

1. Cut the replacement quarter panel section in corresponding locations to fit the original panel. The sectioning joint should be trimmed to allow 25 mm overlap at the sectioning joint.
Note: In any area damaged beyond recognition, or if structural weld-thru adhesive is present, space the plug weld holes 40 mm (1½ in) apart.

2. 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.
3. Prepare all attachment surfaces as necessary.
4. Apply GM Approval weld-thru coating or equivalent to all mating surfaces. Refer to Anti-Corrosion Treatment and Repair.

5. Position the quarter panel to the vehicle using 3-dimensional measuring equipment. Clamp in place.

6. 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. Then go back and complete the stitch weld.

7. Stitch the weld sectioning joint.
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.
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.
Rear Rail Replacement

Removal Procedure

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

1. Disable the Supplemental Inflatable Restraint (SIR) System. Refer to SIR Disabling and Enabling.

2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.

3. Remove all related panels and components.

4. Repair as much of the damage as possible to factory specifications. Refer to Dimensions - Body.

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

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

6. To remove the rear rail assembly, the rear spring seats, #4, #5, #6, and #7 cross bars, including the floor extensions will have to be removed to gain access to the rail spot welds.
7. Locate and drill out all factory welds. Note the number and location of the welds for installation of the rear rail.

8. Remove the damaged rear rail.

Installation Procedure

Note:

- If the location of the original plug weld holes cannot be determined, space the plug weld holes every 40 mm (1 ½ in) apart.
- Some panels may have structural weld-thru adhesive. It is necessary to replace the weld-thru adhesive with an additional spot weld between each factory spot weld.
1. Drill 8 mm (5/16 in) plug weld holes in the service part as necessary in the locations noted from the original panel.
2. Prepare all mating surfaces as necessary.
3. Apply GM-approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to Anti-Corrosion Treatment and Repair.
4. Position the rear rail lower to the vehicle using 3-dimensional measuring equipment. Clamp the rear rail lower into place.
5. Plug weld accordingly.
6. Clean and prepare all welded surfaces.
7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
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.
Warning: Refer to Approved Equipment for Collision Repair Warning.

Warning: Sectioning should be performed only in the recommended areas. Failure to do so may compromise the structural integrity of the vehicle and cause personal injury if the vehicle is in a collision.

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

Note: Do not damage floor panel.

6. Cut the panel where sectioning is to be performed.
7. Locate and drill out all factory welds. Note the number and location of welds for installations of service part.

8. Remove the damaged rail from the vehicle.

**Installation Procedure**

1. Cut the replacement rail section in corresponding locations to fit the original panel. The sectioning joint should be trimmed to allow 1½ times the metal thickness at the sectioning joint.
2. Create a 100 mm (4 in) backing plate (A) from the unused portion of the service part. Trim the backing plate, as necessary to fit behind the sectioning joint where there is no reinforcement.

3. Drill 8 mm (5/16 in) plug weld holes along the sectioning cut on the remaining original part. Locate these holes 13 mm (½ in) from the edge and spaced 40 mm (1½ in) apart.

**Note:** In any area damaged beyond recognition, or if structural weld-thru adhesive is present, space the plug weld holes 40 mm (1½ 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.
Note: If the location of the original plug weld holes cannot be determined, or if structural weld-thru adhesive is present, space the plug weld holes every 40 mm (1½ in) apart.

5. Prepare all attachment surfaces as necessary.

6. Apply GM-Approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to Anti-Corrosion Treatment and Repair.

7. Fit the backing plate halfway into the sectioning joint, clamp and plug weld to the vehicle.

8. Position the rail.

   **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. Then go back and complete the stitch weld.

10. Stitch the weld sectioning joint.

11. Clean and prepare all welded surfaces.

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

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


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](#).
Battery Tray Replacement

Removal Procedure

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

**Note:** The battery box upper flange is layered between several panels. To avoid unnecessary repair, separate the lower battery box from the upper flange. The upper flange will be left welded 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 damaged area as possible. Refer to Dimensions - Body.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.

**Note:** Do not damage any inner panels or reinforcement

6. Locate and drill out all the necessary factory welds. Note the number and location of the welds for installation of the battery tray.
7. Remove the battery tray.

**Installation Procedure**

1. Locate and drill out the welds as necessary to separate the upper flange from the lower battery box on the service assembly.

2. Remove the upper flange from the lower battery box.

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

5. Position the battery tray to the vehicle. Clamp the battery tray in place.

6. Plug weld accordingly.

7. Clean and prepare all of the welded surfaces.

8. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.


10. Install all of the related panels and components.

11. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.

12. Enable the SIR system. Refer to SIR Disabling and Enabling.
Resistance Spot Welded Full Panel Replacement

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

**Removal Procedure**

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

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

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

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

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

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

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 (1½ 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.

4. Apply welds accordingly (1).

5. Clean and prepare all welded surfaces.

6. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.

7. Paint the repair area. Refer to Basecoat/Clearcoat Paint Systems.

8. Install all related panels and components.

9. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.

10. Enable the SIR system. Refer to SIR Disabling and Enabling.
MIG Welded Full Panel Replacement

Removal Procedure

Warning: Refer to Approved Equipment for Collision Repair Warning.

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

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

Warning: Refer to Foam Sound Deadeners Warning.

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

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.

Installation Procedure

7. Remove the damaged part (1).
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. 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.

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.
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.

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

**Recommended Repairs**

- Cold repairs can be performed on this type of steel, unless the damage includes kinks. If the damage includes kinks, the part should be replaced.
- Sectioning or partial replacement of this type of steel is recommended only at approved locations, in a specific sectioning procedure.
- 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.

Two types of adhesives are listed here. Impact Resistant Adhesive is used in joints in frame rail assemblies and strut tower assemblies and other body structure joints that have critical strength requirements. The factory applied Impact Resistant Adhesive is purple in color when cured. The 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:

<table>
<thead>
<tr>
<th>Steel Panel Bonding Impact Resistant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manufacturer and Part Number</strong></td>
</tr>
</tbody>
</table>
| 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 |

<table>
<thead>
<tr>
<th>Steel Panel Bonding</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manufacturer and Part Number</strong></td>
</tr>
<tr>
<td>GM P/N 12378566 (US)</td>
</tr>
<tr>
<td>GM P/N 88901674 (Canada)</td>
</tr>
<tr>
<td>Lord Fusor P/N 110B/111B</td>
</tr>
<tr>
<td>GM P/N 12378567 (US)</td>
</tr>
<tr>
<td>GM P/N 88901675 (Canada)</td>
</tr>
<tr>
<td>Lord Fusor P/N 108B/109B</td>
</tr>
<tr>
<td>3M P/N 8116</td>
</tr>
<tr>
<td>Ashland Plio Grip Panel 60</td>
</tr>
</tbody>
</table>

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Mild Steel

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

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

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

**Recommended Repairs:**

- Cold repairs can be performed on this type of steel, unless the damage includes kinks. If the damage includes kinks, the part should be replaced.
- Controlled use of heat can be used to repair damage, if the heat does not exceed 650°C (1200°F). The heat should be applied a maximum of 2 times, for up to 90 seconds.
- Sectioning or partial replacement of this type of steel is recommended only at approved locations, in a specific sectioning procedure.
- 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.
The following products meet GM specifications for sound deadening material. Refer to the manufacturer's recommendation on proper application.

### Sound Deadening Material

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Product</th>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>LizardSkin®</td>
<td>Ceramic Insulation</td>
<td>877–777–5858</td>
</tr>
<tr>
<td>3M®</td>
<td>Ultra-Pro 8374</td>
<td>877–666–2277</td>
</tr>
</tbody>
</table>
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.