Body Repair

Collision Repair

Specifications

Dimensions - Body

Point to Point Measurements

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

Engine Compartment

Body Side
Rear End
Visual Identification
Structure Identification

Passenger Compartment

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Repair Instructions

Front Bumper Impact Bar Bracket 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. 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:** Note the number and location of the factory welds for installation of the impact bar bracket - front bumper.

6. Locate and drill out all the factory welds from the outside surface of the rail.
7. Remove the front bumper impact bar bracket.

**Installation Procedure**

1. Prepare all mating surfaces as necessary.

2. Apply 3M Weld-Thru Coating P/N 05916 or equivalent to all mating surfaces.

*Note:* Verify the location of the front rail using 3-dimensional measuring equipment.
3. Position the impact bar bracket on the rail and clamp in place.

4. Plug weld accordingly.

5. Clean and prepare all of the welded surfaces.

6. Install all of the related panels and components.

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

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

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

10. Enable the SIR system. Refer to SIR Disabling and Enabling.
Front End Upper Tie Bar 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.

   **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 tie bar.

7. Using a grinder or an equivalent tool, remove the silicon bronze welds (1) completely on each end of the upper fender rails.
8. Remove the damaged tie bar.

**Installation Procedure**

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.

**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.
3. Measure 50 mm (2 in) rearward from the front edge of the upper fender rail.

4. Mark the top of the upper fender rail at the location.

5. At the mark, align a sliding square or similar tool, square to surface to the top of the upper fender rail.

6. Scribe a line (1) to the top of the upper fender rail.

7. Cut the top of the upper fender rail at the scribe line (1).

8. Reposition the shaded area of the upper fender rail in order to install the new tie bar.
9. Apply GM-approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to Anti-Corrosion Treatment and Repair.

10. Position the tie bar to the vehicle using 3-dimensional measuring equipment. Clamp the tie bar into place.

11. Position the shaded area of the upper fender rail back into place.

12. Using a metal inert gas (MIG) welder, weld (1) the top of the upper fender rail and the tie bar completely.

13. Clean and prepare all welded surfaces.

14. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
15. Paint the repair area. Refer to Basecoat/Clearcoat Paint Systems.

16. Install all related panels and components.

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

18. Enable the SIR system. Refer to SIR Disabling and Enabling.
Front Wheelhouse Panel Replacement

Removal Procedure

The plenum lower is formed from laminated steel. This steel is constructed by bonding 2 pieces of cold rolled steel (1) with a viscoelastic layer of adhesive (2). MIG welding laminated steel does not meet GM Corporate standards for structural integrity. As an alternative, all factory welds may be replaced by using the rivet and adhesive bond method described in the installation portion of this procedure. The rivet and adhesive bond method must only be used in the areas described in this procedure.

**Note:** Failure to follow this procedure will compromise the structural integrity of the vehicle.

**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.

   **Note:** The upper strut mounting surface is a dimensionally critical area, and 3-dimensional measuring equipment should be used to locate the front wheelhouse assembly. The front wheelhouse can be serviced as a complete assembly for both the left and right wheelhouses. A wheelhouse front panel is also available to service separately on the left or the right sides.

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

   **Note:** Be sure to inspect the front of the cowl and dash panel for damage. If the metal surface is damaged, the cowl panel must be repaired to restore the structural integrity of the vehicle.

4. Visually inspect the damaged area. Repair as much of the damage as possible. Refer to Dimensions - Body.

   **Note:** Drill through the wheelhouse flange only. Do not drill into the dash panel.

5. Using an 8 mm (5/16 in) spot weld remover, locate and drill out the factory welds on the weld flange connecting the wheelhouse to the dash panel.
6. Using an 8 mm (5/16 in) spot weld remover, locate and drill out the factory welds on the weld area that connects the top of the wheelhouse strut cap to the lower plenum.

7. Locate and drill out all remaining factory welds.

   **Note:** Note the number and location of welds for installation of the front wheelhouse.

8. Remove the front wheelhouse from the vehicle.
Installation Procedure

1. Position the service front wheelhouse in the vehicle using 3-dimensional measuring equipment. Clamp the wheelhouse in place.

2. Using a 7 mm (17/64 in) bit, drill the rivet attachment holes through the service wheelhouse strut cap and the lower plenum in the locations as noted from the factory wheelhouse.

3. Remove the service front wheelhouse.

   **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.

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

5. Prepare the MIG weld mating surfaces as necessary.

6. Apply 3M Weld-Thru Coating P/N 05916 or equivalent to all MIG weld mating surfaces. This includes all welds not attached to the lower plenum.
7. Prepare the bonding mating areas by grinding to bare steel the surface of the body mating and at the service wheelhouse flanges.

8. Apply a 3–6 mm (1/8–1/4 in) bead of metal panel bonding adhesive GM P/N 12378567 (Canadian P/N 88901675) or equivalent to the mating surfaces of the dash and lower plenum, and the wheelhouse service panel.

9. Using a small acid brush, spread a coating of adhesive on the mating surfaces. Cover all of the bare metal to ensure corrosion protection.

**Note:** Do not pull the front wheelhouse off of the dash on the plenum after adhesion. To align the parts, slide the front wheelhouse against the front of the
10. Position the service front wheelhouse to the vehicle using 3-dimensional measuring equipment. Clamp the front wheelhouse in place.

**Note:** Verify the proper positioning of the service front wheelhouse prior to riveting and welding.

11. Install the 9 mm (11/32 in) long rivets so that the rivet head contacts the wheelhouse cap bottom side.

12. Remove the excess adhesive from the front wheelhouse bond rivet area.

13. Plug weld accordingly.

14. Clean and prepare all of the welded surfaces.

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


17. Install all related panels and components.

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

19. Enable the SIR system. Refer to SIR Disabling and Enabling.
Front Compartment Upper Side Rail Replacement

Removal Procedure

Warning: Refer to Approved Equipment for Collision Repair Warning.

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

Note: Do not damage any inner panels or reinforcements.

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

7. Locate and grind away the MIG welds at the front and rear attachment areas on the front compartment side upper rail.
8. Remove the damaged front upper 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 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 3M Weld-Thru Coating P/N 05916 or equivalent to all mating surfaces.
4. Position the front upper rail on 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.
Front Compartment 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 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:** Note the number and location of the factory welds for installation of the inner hinge pillar.

6. Locate and drill out all the necessary factory welds.

7. Remove the inner hinge pillar.

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.

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 hinge pillar body to the vehicle using 3-dimensional measuring equipment and clamp the panel in place.
5. Plug weld accordingly.
6. Clean and prepare all of the welded surfaces.
7. Install all of the 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.
Front Compartment Front Half Rail Replacement

Removal Procedure

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

**Note:** The service part is developed from a complete assembly and will require the spot weld removal at the rail mid joint. The lower rail service part comes as a complete front rail assembly, including all the brackets and the reinforcements.

Note: Loosen and protect the fuel and brake lines during rail replacement.

1. Support the engine and the transmission with suitable equipment. Refer to Engine Support Fixture for the 2.2L engine.
2. Remove the fasteners to the engine and the transmission.
3. Remove all the other related panels and components as necessary, including the suspension and the crossmember.
4. Visually inspect the damaged area. 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, as necessary. Refer to Anti-Corrosion Treatment and Repair.

6. Locate the area where the front compartment will be separated from the rail.
7. Locate and drill the factory welds along the flanges of the rail, only up to and including the rail mid joint just forward of the dash panel.

8. Drill out the factory welds.

9. Pry open the outer layer of the rail at the front rail mid joint to allow the front portion of the rail to be removed from the vehicle.

10. Remove the damaged front lower rail.
11. Drill out the factory welds at the service rail assembly mid joint.

12. Remove the forward portion of the front rail assembly at the mid joint.

13. Prepare the mating surfaces as necessary.

14. Apply 3M Weld-Thru Coating P/N 05916 or equivalent to all mating surfaces.

**Installation Procedure**
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 rail to the vehicle.

5. Plug weld accordingly.

6. Clean and prepare all of the welded surfaces.

7. Install all related panels and components.

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

Caution: Refer to Fastener Caution.

9. Install the suspension crossmember. Refer to Frame Replacement and tighten to 100 Y (74 lb ft) plus 180 degrees.
Front Compartment Side Rail Sectioning

Removal Procedure

**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 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 of the related panels and the components.
4. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
5. Repair as much of the damage as possible to factory specifications. Refer to Dimensions - Body.

6. Locate the die marks on the inner and outer halves of the front rail.
Note: Do not section the rail except where indicated.

7. Measure forward of the straight line shown on the die marks 7 mm (¼ in). Mark the rail at both die mark locations.

8. At the marks made forward of the die marks, align a sliding square or similar tool to the bottom side of the front rail. Scribe a line 360 degrees around the frame rail, 7 mm (¼ in) forward of the die marks (1).

9. Cut the rail at the marked location.
10. Remove the damaged component from the vehicle.

**Installation Procedure**

1. Cut the upper and lower inner and outer corners of the frame rail. Cut at the beginning and the end of the radius at each corner rearward 7 mm (¼ in) to the scribe line.

2. Bend each side of the rail inward by aligning a vice grip flanging tool or similar tool to the scribe line. Bend a 7 mm (¼ in) flange inward slightly. This flange is the welding backer.
3. Prepare the sectioning weld area as necessary for welding.

4. Locate the die marks on the service part front rail.

5. Scribe a line completely around the service rail at the line in the die mark by aligning a sliding square or similar tool to the bottom edge of the front rail service part.

6. Cut at the marked location. Remove the front portion of the rail.

7. Prepare the cut edge of the front rail section for welding.

8. Apply 3M Weld-Thru Coating P/N 05916 or equivalent to all mating surfaces.
9. Position the front rail section using 3-dimensional measuring equipment. Clamp the service part in place.

10. Tack weld the part into position.

11. Inspect the service rail for proper dimensions using 3-dimensional measuring equipment.

12. Stitch weld along the entire sectioning joint. Make 25 mm (1 in) welds along the seam with 25 mm (1 in) gaps between.

13. Complete the stitch weld.

14. Clean and prepare the welded surfaces.

15. Install all of the related panels and components.

16. Apply the 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 Anti-Corrosion Treatment and Repair.

18. Enable the SIR system. Refer to SIR Disabling and Enabling.

19. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
Front Compartment Side Rail Rear Extension 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. 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:** Note the number and location of the factory welds for installation of the rear extension of the front compartment side rail.

6. Locate and drill out all the necessary factory welds.

7. Remove the rear extension.

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.

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 extension to the vehicle using 3-dimensional measuring equipment. Clamp the support into place.
5. Plug weld accordingly.
6. Clean and prepare all of the welded surfaces.
7. Install all of the 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.
Front Inner Hinge Pillar Body 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 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: Note the number and location of the factory welds for installation of the inner hinge pillar.

6. Locate and drill out all the necessary factory welds.

7. Remove the inner hinge pillar.

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.

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 hinge pillar body to the vehicle using 3-dimensional measuring equipment and clamp the panel in place.
5. Plug weld accordingly.
6. Clean and prepare all of the welded surfaces.
7. Install all of the 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.
Front Hinge Pillar Body Sectioning

Removal Procedure

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.

The body side outer panel is available as a one-piece assembly. You can perform any of the outer body side panel replacement procedures separately or in any combination, depending upon the extent of damage to the vehicle. Sectioning must take place in specified areas only. Stay away from the door and window opening radius areas. Section only in straight areas of the openings.

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: Sectioning can be done anywhere in the straight areas of the windshield pillar and along the rocker panel.

6. Locate the area on the panel where sectioning will be performed.
7. Locate the windshield pillar moulding retainer on the vehicle.
8. Locate the spot welds that attach the moulding retainer to the vehicle.
9. Drill out all but one top spot weld along the retainer.
10. Separate the retainer. Position the retainer aside to allow cutting of the pillar.
11. Measure from any key feature within the recommended sectioning areas. Mark the location at the windshield pillar and rocker panel locations.
Note: Note the number and location of the factory welds for installation of the hinge pillar.

12. Locate and drill out all factory welds.

Note: Do NOT damage any other panels or reinforcements when cutting at the marked locations.

13. Cut the panel at the windshield pillar location laid out in the previous steps.

14. Cut the panel at the rocker panel location laid out in the previous steps.
15. Remove the damaged hinge pillar.

**Installation Procedure**

1. Locate the area on the service panel where you will perform sectioning.
2. Measure and mark the cut line location on the service part at the same location as on the vehicle layout.

3. Cut the outer front hinge pillar in corresponding locations to fit the remaining original panel. The sectioning joint should be trimmed to allow a gap of 1½ times the metal thickness at the sectioning joint.

4. Create a 50 mm (2 in) backing plate from the unused portion of the service part for the windshield area.
5. Create a 100 mm (4 in) backing plate from the unused portion of the service part for the rocker area.
6. Trim the backing plates as necessary to fit behind the panel 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 1/2 in) apart.

7. Drill 8 mm (5/16 in) plug weld holes along the sectioning area in the service part, and at the locations noted from the original panel.
8. Prepare all mating surfaces, as necessary.

9. Apply 3M Weld-Thru Coating P/N 05916 or equivalent to all mating surfaces.

10. Fit the backing plates halfway into the sectioning joints, 25 mm (1 in) at the windshield pillar and 50 mm (2 in) at the rocker panel areas. Clamp the plates in place, and plug weld to the section joint.

11. Position the outer front pillar to the vehicle using 3-dimensional measuring equipment. Clamp the pillar in place.

12. Plug weld accordingly.

13. Stitch weld the butt weld locations.

14. 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). Go back and complete the stitch weld.

15. Install the windshield pillar retainer in the proper position on the vehicle.

16. Plug weld the retainer accordingly.

17. Clean and prepare all of the welded surfaces.

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

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

20. Install all of the related panels and components.

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

22. 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**.

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.

**Note:** Save the original panel. Measure and note the antenna hole locations.

4. Remove all related panels and components.
5. Repair as much of the damaged area as possible. 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 nuts retaining the roof side reinforcements to the vehicle.
8. Locate and drill out all the necessary factory welds along the front and rear headers.

9. Drill through the roof panel along the perimeter of the roof reinforcements.

10. Cut along the holes created in the previous step.
11. Remove the center section of the roof panel.

12. Bend back the remaining portion of the roof panel (a) to expose the top side of the roof reinforcement (b).

13. Use a small flame from an oxy-acetylene torch to aid in releasing the roof reinforcement bond to the vehicle.

14. Separate the adhesive holding the roof panel to the vehicle. Note the location of the adhesive for installation of the service roof panel.
15. Remove the damaged roof panel.

**Installation Procedure**

**Note**: Do not drill holes in the panel along the body side of the roof rail. Use adhesive bond only.

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

1. Drill 8 mm (5/16 in) plug weld holes along the front and rear edge of the service part as necessary in the corresponding locations noted on the original panel.
2. To locate the center line (1) on the roof panel, measure across the front and rear portion of the panel a short distance in from the front and rear edges of the panel. Mark the center line with a pencil or other non-permanent marking tool.

3. On the original panel, measure forward along the center line of the panel to the center of the holes. Note the measurements.

4. Measure forward along the center line of the service panel the distance noted on the original panel. Mark the location with a pencil or other non-permanent marking tool.

5. Verify the measurements and the hole configuration.
6. Drill out the holes from the following steps.
   - $a = 5.0 \text{ mm (7/32 in)}$ hole
   - $b = 19.5 \text{ mm (3/4 in)}$ hole

7. Grind the surface of the body mating flanges at the same location as the original structural adhesive to bare steel.

8. Grind the service panel mating flanges to remove the e-coating. Do not damage the corners or thin the metal during the grinding process.
9. Clean the mating surfaces.

10. Prepare all mating surfaces for welding as necessary.

11. Apply 3M Weld-Thru Coating P/N 05916 or equivalent to all welded mating surfaces only.

**Note:** The adhesive has a working time of 40–50 minutes. Do not allow the adhesive to totally cure off the vehicle, as proper alignment of the panel to the body will be difficult.

12. Apply a bead of metal bonding adhesive to all areas noted earlier as having structural adhesive. Use GM P/N 12378566/7 (Canadian P/N 88901674/5) or equivalent to a thickness of 3–6 mm (1/8–1/4 in) to both mating surfaces.

13. Use a small acid brush to spread a coat of adhesive to cover all of the bare metal surfaces to ensure corrosion protection.

**Note:** Do not pull the panels apart after the panels have been joined together. Slide the panels against each other to realign the panels.

14. Install the service panel to the vehicle.

15. Verify the fit of the roof panel to the front edge of the front header panel and to the rear edge of the rear header panel.

16. Verify the fit of the roof panel at the gap along the top of the door frame to the roof panel. Adjust the panel if necessary. Clamp the panel into place.

17. Use lacquer thinner to remove the excess adhesive from the panel area.

18. Allow the adhesive adequate cure time.
19. Plug weld accordingly along the front and rear weld flange.
20. Remove the clamps.
21. Clean and prepare all of the welded surfaces.
22. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
23. Paint the repair area. Refer to Basecoat/Clearcoat Paint Systems.
24. Install all related panels and components.
25. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
26. 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.
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:** Note the number and location of the factory welds for installation of the inner rocker panel.

6. Locate and drill out all the necessary factory welds.

7. Locate and drill out the spot welds on the lower dog leg of the body side inner panel to allow relocating the lower portion to gain access to the rocker inner.
8. Remove the inner rocker panel.

**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.

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 inner rocker panel and clamp the panel in place.

5. Plug weld accordingly.

6. Place the relocated portion of the body side inner panel into position.

7. Plug weld accordingly.

8. Clean and prepare all of the welded surfaces.

9. Install all of the related panels and components.
10. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.

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

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

13. Enable the SIR system. Refer to SIR Disabling and Enabling.
Body Lock Pillar Outer Panel Sectioning

Removal Procedure

**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. The body side outer panel is a one-piece assembly. You can perform any one of these replacement procedures separately or in any combination, depending upon the extent of the damage to the vehicle. Sectioning must take place in specified areas only.
2. Remove all related panels and components.
3. Disable the SIR system. Refer to SIR Disabling and Enabling.
4. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary and note their location. Refer to Anti-Corrosion Treatment and Repair.
6. Repair as much of the damaged area as possible. Refer to Dimensions - Body.

**Note:** The next 2 steps will create a sectioning zone of 45 mm (1.75 in) for the top portion of the pillar.

7. Measure straight up from the top of the square hole in the center pillar 495 mm (19 in) and mark the location of the measurement.
8. Measure up 45 mm (1.75 in) from the mark created in the previous step. Mark location of measurement.

9. Within the zone at the top of the pillar, measure and mark your required cut line. Make note of this measurement and use for service part cut line location.

10. Cut the top area of the center pillar where the lay out line was previously formed.

**Note:** Sectioning procedures can only take place in the straight areas of the body side panel.

11. Measure from any key feature in the panel. Lay out the cut line location on the body side panel within the approved section locations along rocker within the front and rear door openings as needed. Make note of this measurement and use for service part cut line location.
12. Mark measured location within sectioning zones in both front and rear door opening locations.

13. Cut the panel at the front door opening of the rocker panel area where sectioning is to be performed, within the straight sections only.

14. Cut the panel at the rear door opening of the rocker panel area where sectioning is to be performed within the straight sections only.

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

16. Remove the damaged center pillar.

**Installation Procedure**
1. Cut the outer center pillar service panel in corresponding locations to fit the remaining original panel. The sectioning joint should be trimmed to allow a gap of $1\frac{1}{2}$ times the metal thickness at the sectioning joint.

2. In all the rocker panel areas, create a 100 mm (4 in) backing plate from the unused portion of the service part. Trim the backing plates as necessary to fit behind the sectioning joint.

Note: The reinforcement in top of pillar sectioning area fits tight to outer panel. Reinforcement in center area of sectioning joint will be utilized as a welding backer. See illustration for service part joint preparation.
3. In the upper center pillar area, the joint will be a 25 mm (1 in) overlap. Special attention to joint fit up and cutting is necessary with this area of the repair.

   **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.

4. Drill 8 mm (5/16 in) holes along the sectioning area on the service and original part. Locate these holes 13 mm (1/2 in) from the edge.

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

6. Prepare all mating surfaces for welding as necessary.

7. Apply 3M Weld-Thru Coating P/N 05916 or equivalent to all mating surfaces.

8. Clamp the backing plates in place. Plug weld the backing plates to the vehicle.

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


11. 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). Go back and complete the stitch weld.

12. Clean and prepare all of the welded surfaces.

13. Apply sound deadening materials as necessary.

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

15. Paint the repaired area. Refer to *Basecoat/Clearcoat Paint Systems*.

16. Install all of the related panels and components.

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

18. Enable the SIR system. Refer to *SIR Disabling and Enabling*. 
Body Lock Pillar Outer Panel Reinforcement Sectioning

Removal Procedure

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 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.

6. Measure up from the top of the square hole 395 mm (15.75 in) and mark location.
7. At the marked location, transfer a line across the reinforcement.

Note: Do not damage any inner reinforcements.

8. Cut the panel at the mark made previously.
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 center pillar.

**Installation Procedure**

1. On the service part, measure up from the top of the square hole 420 mm (16.75 in) and mark the location.
2. At the marked location, transfer a line across the reinforcement.

3. Cut the replacement service part at the marked line 420 mm (19.75 in) (a).
4. At the cut area of the service part (a), notch the weld flange areas down 25 mm (1 in).
5. Step flange all 3 sides that will extend up inside the original panel by 25 mm (1 in).
6. Drill 8-mm (5/16-in) plug weld holes along the sectioning cut on the original reinforcement. Locate these holes 10 mm (1/2 in) from the edge.
7. Drill 8-mm (5/16-in) plug weld holes in the service part as necessary in the corresponding locations noted on the original panel.
8. Prepare all mating surfaces for welding as necessary.
9. Apply 3M Weld-Thru Coating P/N 05916 or equivalent to all mating surfaces.
10. Slide the top sectioning joint together by sliding the service part under the original part at the sectioning area.
11. Position the service part on the vehicle using 3-dimensional measuring equipment. Clamp the part in place.
12. Plug weld accordingly.
13. To create a solid weld with minimum heat distortion, make 25 mm (1 in) stitch welds along the sectioning joint seam with gaps of 25 mm (1 in). Go back and complete the stitch weld.
14. Clean and prepare all of the welded surfaces.
15. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
17. Install all of the related panels and components.
18. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
19. Enable the SIR system. Refer to SIR Disabling and Enabling.
Rear Door Inner Lock Pillar 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 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:** Note the number and location of the factory welds for installation of the inner pillar lock rear door.

6. Locate and drill out all the necessary factory welds.

7. Remove the inner pillar lock rear door.

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.

1. Drill 8-mm (5/16-in) plug weld holes in the service part as necessary in the corresponding locations noted on the original panel.
2. Prepare all mating surfaces for welding, as necessary.
3. Apply 3M Weld-Thru Coating P/N 05916 or equivalent to all mating surfaces.
4. Position the inner pillar lock rear door. Clamp the part in place.
5. Plug weld accordingly.
6. Clean and prepare all of the welded surfaces.
7. Install all of the 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.
Back Body Opening Upper Frame Replacement

Removal Procedure

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

6. Locate the notch in the window opening pinchweld flange.
7. Align a sliding square or similar tool to the top portion of the notch and scribe a line across the reinforcement.

8. Use the same tool to transfer this scribed line onto the back side of the reinforcement.

9. Cut at the marked location.

**Note:** Do not section the rail in any area other than location given.
10. Remove the damaged component from the vehicle.

11. Drill 2 8 mm (5/16 in) plug weld holes on each of the 2 sides of the reinforcement. Position the center of the holes 10 mm (3/8 in) from the cut edge.

**Installation Procedure**

1. Locate the notch on the service part.

2. Align a sliding square or similar tool to the top of the notch in the window opening pinchweld flange. Scribe a line across the service part.

3. Use the same tool to transfer this scribed line onto the back side of the service part.
4. Place a mark 25 mm (1 in) above the scribed line on all 2 sides of the service part.
5. Use the tool to scribe a line on all sides of the service part.
6. Cut at the top scribed line created on the service part.

7. Remove the service part portion of the reinforcement.

8. Cut the upper outer flanges of the reinforcement at the section joint on the service part. Cut the flanges (a) down 25 mm (1 in) and remove the tabs.
9. Cut the radius corner (b) of the service part down 25 mm (1 in) also and remove the small corner piece.
10. Bend the bottom side of the service part at the sectioning location inward slightly by aligning a vice grip flanging tool or similar tool at the lower scribed line at the top of the notch.

11. Prepare the service part for welding.

12. Apply 3M® Weld-Thru coating P/N 05916 or equivalent to all mating surfaces.

**Note:** The service part sectioning joint is to go inside the original reinforcement with a 25 mm (1 in) overlap.

13. Position the rear rail section using 3-dimensional measuring equipment. Clamp the service part in place.

14. Tack weld the part into position.

15. Inspect the service part for proper dimensions, using 3-dimensional measuring equipment.

16. Plug weld at each 8 mm plug weld hole location.

17. Stitch weld along the entire sectioning joint. Make welds along the seam with 25 mm (1 in) gaps between. Weld the gaps.

18. Clean and prepare the welded surfaces.

19. Install all of the related panels and components.

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

21. Paint the repaired area. Refer to Anti-Corrosion Treatment and Repair.

22. Enable the SIR system. Refer to SIR Disabling and Enabling.

23. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
Back Body Pillar Inner Panel Reinforcement 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. 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: Note the number and location of the factory welds for installation of the impact bar bracket - front bumper
6. Locate and drill out all the factory spot welds.
7. Remove the rear pillar inner reinforcement.

Installation Procedure
1. Prepare all mating surfaces as necessary.

2. Apply 3M Weld-Thru Coating P/N 05916 or equivalent to all mating surfaces.

Note: Verify the location of the rear pillar inner reinforcement using 3-dimensional measuring equipment.

3. Position the rear pillar inner reinforcement on the vehicle and clamp in place.

4. Plug weld accordingly.
5. Clean and prepare all of the welded surfaces.
6. Install all of the related panels and components.
7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
8. Paint the repaired area. Refer to Basecoat/Clearcoat Paint Systems.
9. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
10. Enable the SIR system. Refer to SIR Disabling and Enabling.
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. Note the number and location of welds at the upper window frame and the mirror locations.

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 (3/8–1/2 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. 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](#).
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 between the door outer panel and the upper belt reinforcement 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.
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.
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: The adhesive has a 40–50 minute working time. 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 (3/8–1/2 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. 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 Rear Side Door Replacement.
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 between the door outer panel and the upper belt reinforcement 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.
Floor Panel Number 6 Cross Bar Extension 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. 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: Note the number and location of the factory spot welds for the installation of the six bar extension.

6. Locate and drill out all the factory spot welds.

7. Remove the six bar extension.

Installation Procedure
1. Prepare all mating surfaces as necessary.

2. Apply 3M Weld-Thru Coating P/N 05916 or equivalent to all mating surfaces.

3. Position the six bar extension on the vehicle and clamp in place.

   **Note:** Verify the location of the six bar extension using 3-dimensional measuring equipment.

4. Plug weld accordingly.
5. Clean and prepare all of the welded surfaces.

6. Install all of the related panels and components.

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

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

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

10. Enable the SIR system. Refer to SIR Disabling and Enabling.
Rear Compartment Floor Panel Sectioning

Removal Procedure

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

Note: The rear seat bracket will be bent slightly out of position to allow access to the weld flanges on the #5 upper cross bar. Leave the front welds attached to aid in positioning during the Installation Procedure.

6. Locate and drill out the factory weld spots on the top and rear portion of the bracket. Leave the front welds intact.
7. Bend the bracket upward to gain access to the spot welds on the #5 bar upper cross bar.

8. Locate the #5 bar inner upper cross bar.

9. Drill out all related spot welds on the #5 bar inner upper cross bar.

10. Remove the #5 bar inner upper cross bar.
11. Locate the rear edge of cross bar #5 from under the vehicle.

12. Drill several 1/8 in holes in the floor pan only along the rear edge of the rear weld flange of cross bar #5. This will aid in identifying the location from the top side of the floor pan.

13. Apply a piece of masking tape to the top surface of the rear compartment panel along the holes drilled in the floor pan.

Note: Do not damage any adjacent panels or components when cutting or drilling out spot welds.

Note: Do not damage any inner panels or reinforcements.
14. Cut slightly rearward of the tape along the holes drilled in the floor pan. Later, the floor panel will be ground flush to the rear edge of the weld flange.

15. Drill out all the spot welds along rails and the wheelhouses rearward of the cutline. Remove the rear compartment floor panel. Note the number and location of welds for installation of the service assembly.

16. Cut and grind flush the original panel of the rear compartment panel at the rear edge of the #5 crossbar.

Installation Procedure

1. On the rear compartment floor panel service part, locate the transition area from the floor pan to the drop-down area which supports the rear seat bottom half.
2. Place a piece of masking tape along the top radius within this transition area across the panel.

3. Cut along the forward edge of the tape, the edge that would be closest to the rear seat, and remove the rear portion of the panel.

4. Drill 8-mm (5/16-in) plug weld holes in the service part as necessary in the corresponding locations noted on the original panel.

5. Lay out and drill 2 additional rows of 8-mm (5/16-in) plug weld holes on top of the #5 bar weld flanges.

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

7. Apply 3M Weld-Thru Coating P/N 05916 or equivalent to all mating surfaces.
8. Position the rear floor pan to the vehicle using 3-dimensional measuring equipment. Clamp the part in place.
10. Weld the seam along the front cut edge of the floor panel service part. To create a solid weld along the front of the service part with a minimum of heat distortion, make a stitch weld along the seam with 25 mm (1 in) gaps between each weld.
11. Clean and prepare all welded surfaces.

12. Use 3-dimensional measuring equipment to position the #5 bar inner upper cross bar to the vehicle.

13. Plug-weld the #5 bar inner upper cross bar accordingly.
14. Position the rear seat brackets in place.

15. Plug weld accordingly.

16. Apply sound deadening materials, as necessary.

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

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

19. Install all related panels and components.

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

21. Enable the SIR system. Refer to SIR Disabling and Enabling.
Rear Wheelhouse 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.
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: Note the number and location of the factory welds for installation of the rear inner wheelhouse.

6. Locate and drill out all the necessary factory welds.

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.

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 for welding as necessary.
3. Apply 3M Weld-Thru Coating P/N 05916 or equivalent to all mating surfaces.

4. Position the rear inner wheelhouse to the vehicle. Clamp the part in place.
5. Plug weld accordingly.
6. Clean and prepare all of the welded surfaces.
7. Install all of the 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.
Rear Wheelhouse Outer Panel Replacement

Service Part Preparation Procedure

Important: When damage to the rest of the panel is minimal, repair the outer rear wheelhouse by sectioning.

Before you remove the damaged section of the panel from the vehicle, prepare the service assembly in order to become familiar with the procedure, to know exactly where to cut the damaged panel for a better fit of the new section.

1. On the service part, apply a strip of 50 mm (2 in) masking tape along the vertical surface of the wheelhouse radius to form a welding flange. Center the tape midway between the upper and the lower tangents of the bend radius.
2. On the service part, cut along the inner edge of the tape location (b).

3. Remove the excess portion of the wheelhouse on the service part.

**Removal Procedure**

1. Remove all the related panels and the components.
2. Visually inspect the damage.
3. Remove the following components as necessary:
   - The sealers
   - The sound deadeners
   - The anti-corrosion materials
4. On the damaged part, apply a strip of 50 mm (2 in) masking tape along the horizontal surface of the wheelhouse radius to form a welding flange. Center the tape midway between the upper and the lower tangents of the bend radius.

5. On the vehicle, cut along the outboard side of the masking tape in order to create a tab for the weld flange on the new wheelhouse section.

6. Remove the damaged section of the wheelhouse.

Installation Procedure

1. Mark the plug weld holes every 40 mm (1½ in) along the weld flange on the service part.
2. Position the service part.
3. Temporarily align the sheet metal with sheet metal screws
4. Install the quarter panel outer. Position the panel to the vehicle, using 3-dimensional measuring equipment. Clamp the panel in place.
5. Verify the fit of the panels. Adjust the panels as necessary. Temporarily sheet metal screw the panel in place.
6. Remove the quarter outer panel.
7. Remove the service part.
8. Drill 8 mm (5/16 in) along the weld flange on the service part at the locations marked in the earlier step.
9. Prepare the mating surfaces for welding, as necessary.
10. Apply 3M® Weld-Thru coating P/N 05916 or equivalent to all mating surfaces.
11. Install the service wheelhouse outer panel in the proper position, as verified in the previous steps.
12. Plug weld accordingly the wheelhouse outer to the vehicle.
13. Stitch weld along the top side of the service panel to the inner quarter panel. Place a 12 mm (1/2 in) stitch weld between the plug welds.
14. Apply sound deadening materials as necessary.
15. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
17. Install all related panels and components.
18. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
19. Enable the SIR system. Refer to SIR Disabling and Enabling.
Quarter Outer Panel Sectioning (Panel Van)

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 quarter panel can be serviced as a complete panel or sectioned. When the complete panel replacement is performed, the roof panel must be removed.

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. Apply 25 mm (1 in) wide tape (1) along the upper edge of the quarter panel at the roof line.
Note: Do not damage any inner panels or reinforcements.

7. Cut along the upper edge of the quarter panel (1) at the roof line.

8. Trim as necessary leaving a 25 mm (1 in) vertical flange (1) to be used as a bonding surface for installation of the new quarter panel.

9. Locate and drill out all factory welds. Note the number and location of welds for installation of the new quarter panel.
10. Remove the damaged quarter panel.

**Installation Procedure**

1. Trim the shaded area (1) from the new quarter panel as necessary to mate with the 25 mm (1 in) vertical flange left from the original panel.

**Note:** In any area damaged beyond recognition, space plug weld holes every 40 mm (1 1/2 in) apart.

2. Drill 8 mm (5/16 in) plug weld holes in the new quarter panel as necessary in the locations noted from the original panel.
3. Using a 50-grit grinding disk to grind to bare steel the 25 mm (1 in) flange (1) left from the original panel to be used as a bonding surface with the new quarter panel.

4. Scuff the bonding surface of the new quarter panel and remove the gloss of the E-Coat.

5. Prepare all attachment surfaces as necessary for welding and bonding.

6. Before applying adhesive dry fit the quarter panel for proper fit and alignment.

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

8. Apply internal sealers in the locations noted from the removal procedure.

9. Apply a 3–6 mm (1/8–1/4 in) bead of metal panel bonding adhesive to the 25 mm (1 in) flange left from the original panel. Refer to Metal Panel Bonding.

10. Apply a 3–6 mm (1/8–1/4 in) bead of metal panel bonding adhesive (1) to the mating surface of the new quarter panel. Refer to Metal Panel Bonding.

11. Using a small acid brush spread the adhesive to cover all bonding surfaces and bare metal surfaces to ensure corrosion protection.

12. Apply a 9–13 mm (3/8–1/2 in) bead of metal bonding adhesive to the mating surfaces of the new quarter panel. Refer to Metal Panel Bonding.
Note: Do NOT pull the panels apart after being joined together. Slide the panels against each other to realign the panels.

13. Position the quarter panel to the vehicle.
14. Clamp or mechanically fasten the quarter panel into place as necessary.
15. Remove any excess adhesive.

16. Using a Mig welder, plug weld accordingly.
17. Clean and prepare all welded surfaces.
18. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
20. Install all related panels and components.
21. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
22. Enable the SIR system. Refer to SIR Disabling and Enabling.
Quarter Outer Panel Sectioning (Quarter Window)

Removal Procedure

**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.

The body side outer panel is available in one piece. You can perform any one of these replacement procedures separately or in any combination, depending upon the extent of damage to the vehicle. Sectioning must take place in specified areas only. Stay away from the door and window opening radius areas. Section only in straight areas of the openings.

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 sound deadeners as necessary. Note their location.
6. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.

Note:

- Perform sectioning only in the recommended areas of the rocker panel and pillars.
- Avoid areas in the radius corners for the rear header attachment locations.
- Avoid areas in the radius corners, at the bottom of the quarter window and at the bottom of the dogleg in the door opening.

7. Sectioning can be performed at any of the following locations:

   - Any straight area along the bottom of the rear door opening forward of the rear corner radius and rearward of the center pillar radius. Use a 100 mm (4 in) welding backer.
   - Any straight area along the front quarter window opening. Use a 50 mm (2 in) weld backer.
   - Any straight area along the rear quarter window opening. Use a 50 mm (2 in) weld backer.

8. Within the recommended sectioning areas, mark the location of the sectioning cut lines on the vehicle.

   **Note:** Note the number and location of the factory welds for installation of the quarter panel.

9. Locate and drill out all factory welds.
Note: Do NOT damage any other panels or reinforcements when cutting at the marked locations.

10. Cut the panel at the locations laid out in the previous steps.

11. Remove the damaged quarter panel.

**Installation Procedure**

Note: To allow proper layout and cutting of the service port, review the appropriate sectioning area information in the removal procedure.

1. Locate the area on the service panel where you will perform sectioning.

2. Measure and mark the cut line location on the service part.
3. Cut the service panel in corresponding locations to fit the remaining original panel. Trim the sectioning butt joint to allow a gap of 1½ times the metal thickness at the sectioning joint.

4. Create backing plates of the specified length from the unused portion of the service part.

5. Trim the backing plates as necessary to fit behind the panel at the sectioning joints.

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

6. Drill 8 mm (5/16 in) plug weld holes along the sectioning areas in the service part. Drill the plug weld holes 15 mm (5/8 in) from the edges.

7. Drill 8 mm (5/16 in) plug weld holes at the locations noted from the original panel.

8. Prepare all mating surfaces as necessary.

9. Apply 3M Weld-Thru Coating P/N 05916 or equivalent to all mating surfaces.

10. Fit the backing plates halfway into the sectioning joints on the vehicle. Clamp the plates in place, and plug weld to the section joint.

11. Weld the plug weld holes on the vehicle half of the backing plates.

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

13. Plug weld accordingly.

14. 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). Go back and complete the stitch weld.

15. Clean and prepare all of the welded surfaces.

16. Apply the 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 of the related panels and components.

19. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection**.
Enable the SIR system. Refer to SIR Disabling and Enabling.
Floor Panel Number 1 Cross Bar 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. 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: Note the number and location of the factory welds for installation of the cross bar #1 to the floor panel.

6. Locate and drill out all the necessary factory welds.

7. Remove the cross bar.

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.

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 cross bar. Clamp the cross bar in place.
5. Plug weld accordingly.
6. Clean and prepare all of the welded surfaces.
7. Install all of the 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.
Floor Panel Number 4 Cross Bar 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 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: Note the number and location of the factory welds for installation of the #4 cross bar.

6. Locate and drill out all the necessary factory welds.

7. Remove the #4 cross bar.

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.

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 for welding as necessary.

3. Position the #4 cross bar.
4. Apply 3M Weld-Thru Coating P/N 05916 or equivalent to all mating surfaces.
5. Plug weld accordingly.
6. Clean and prepare all of the welded surfaces.
7. Install all of the 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.
Floor Panel Number 5 Cross Bar 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. 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: Note the number and location of the factory welds for installation of the #5 cross bar.

6. Locate and drill out all the necessary factory welds.

Installation Procedure

7. Remove the #5 cross bar.
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 the locations noted from the original panel.
2. Prepare all mating surfaces for welding as necessary.
3. Apply 3M Weld-Thru Coating P/N 05916 or equivalent to all mating surfaces.

4. Position the #5 cross bar.
5. Plug weld accordingly.
6. Clean and prepare all of the welded surfaces.
7. Install all of the 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.
Floor Panel Number 5 Cross Bar Extension 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. 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:** Note the number and location of the factory welds for installation of the #5 bar extension.

6. Locate and drill out all the necessary factory welds.

7. Remove the #5 bar extension.

Installation Procedure
Note: If the location of the original plug weld holes can not be determined, space the plug weld holes every 40 mm (1 1/2 in) apart.

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 #5 bar extension.
5. Plug weld accordingly.
6. Clean and prepare all of the welded surfaces.
7. Install all of the 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.
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. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.

Note: Note the number and location of the factory welds for installation of the six bar.

6. Locate and drill out all the factory spot welds.

7. Remove the six bar.

Installation Procedure
1. Prepare all mating surfaces, as necessary.

2. Apply 3M Weld-Thru Coating P/N 05916 or equivalent to all mating surfaces.

**Note:** Use 3-dimensional measuring equipment to verify the location of the six bar.

3. Position the six bar. Clamp the six bar in place.

4. Plug weld accordingly.
5. Clean and prepare all of the welded surfaces.
6. Install all of the related panels and components.
7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
8. Paint the repaired area. Refer to Basecoat/Clearcoat Paint Systems.
9. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
10. Enable the SIR system. Refer to SIR Disabling and Enabling.
Underbody Rear Side 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 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:** Note the number and location of the factory welds for installation of the wheelhouse – rear inner.

6. Locate and drill out all the necessary factory welds.

7. Locate the rail that has adhesive (1) bonding the rail to the underside of the floor pan.
8. Use heat from a small flame on a torch to release the bond.
9. Remove the 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 (1½ 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 for welding, as necessary.
3. Apply 3M Weld-Thru Coating P/N 05916 or equivalent to all mating surfaces.

**Note:** The service part includes an inner rocker rear extension. The rear rail can be installed with or without the extension.

4. If an extension panel is not required, drill out the spot welds.
5. Remove the extension panel if necessary.

6. Drill 8-mm (5/16-in) holes in the floor pan at the bulkhead location.

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

8. Plug weld accordingly.

9. Clean and prepare all of the welded surfaces.

**Note:** Plug weld the bulkhead location instead of the adhesive attachment found in the Removal Procedure.
10. Install all of the related panels and components.

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


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

6. Locate the die mark on the outer lower surface of the rear rail, rearward of the #5 bar.
Note: Do not section the rail in any area other than the die mark location given.

7. Align a sliding square or similar tool to the line at the tip of the arrow in the die mark. Scribe a line across the rail.

8. Use the same tool to transfer this scribed line onto the sides and the weld flanges of the rail.

9. Cut at the marked location.
10. Remove the damaged component from the vehicle.

11. Drill 2 8 mm (5/16 in) plug weld holes on each of the 3 sides of the rear rail. Position the center of the holes 10 mm (3/8 in) from the cut edge.

**Installation Procedure**

1. Locate the die marks on the service part rear rail.
2. Align a sliding square or similar tool to the line at the tip of the arrow in the die mark and scribe a line across the rail.
3. Use the same tool to transfer this scribed line onto the sides and the weld flanges of the rail.
4. Place a mark forward, towards the rear of the arrow, 25 mm (1 in) from the scribed line on all 3 sides of the service rail.
5. Use the tool to scribe a line on all 3 sides and weld flanges of the rail.
6. Cut at the scribe line at the rear of the arrow.

7. Remove the rear portion of the rail.
8. Cut the upper outer flanges of the rear portion of the rear rail service part. Cut the flanges back to the first scribe line and remove the tabs.

9. Cut the lower radius corners of the service part back to the first scribe line and remove the small corners.

10. Bend the bottom side of the service part at the sectioning location inward slightly by aligning a vice grip flanging tool or similar tool at the first scribed line.

11. Prepare the sectioning area of the rear rail for welding.

12. Apply 3M® Weld-Thru coating P/N 05916 or equivalent to all mating surfaces.

13. Position the rear rail section using 3-dimensional measuring equipment. Clamp the rail section in place.

14. Tack weld the part into position.

15. Inspect the service rear rail for proper dimensions, using 3-dimensional measuring equipment.

16. Plug weld at each 8 mm plug weld hole location.

17. Stitch weld along the entire sectioning joint. Make welds along the seam with 25 mm (1 in) gaps between. Weld the gaps.

18. Clean and prepare the welded surfaces.

19. Install all of the related panels and components.

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

21. Paint the repaired area. Refer to Anti-Corrosion Treatment and Repair.

22. Enable the SIR system. Refer to SIR Disabling and Enabling.

23. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
Underbody Rear Side Rail Gusset 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. 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:** Note the number and location of the factory welds for installation of the underbody gusset to the rear rail.

6. Locate and drill out all the necessary factory welds.
7. Remove the underbody gusset from the 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 (1½ in) apart.

1. Drill 8-mm (5/16-in) plug weld holes in the service part as necessary in the corresponding locations noted on the original panel.
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 underbody gusset to the rear rail.

5. Plug weld accordingly.

6. Clean and prepare all of the welded surfaces.

7. Install all of the 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.
Underbody Side Rail Rear Extension 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. 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:** Note the number and location of the factory welds for installation of the underbody reinforcement of the rear rail.

6. Locate and drill out all the necessary factory welds.

---

7. Remove the underbody reinforcement of the 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 (1½ in) apart.

1. Drill 8-mm (5/16-in) plug weld holes in the service part as necessary in the corresponding locations noted on the original panel.
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 underbody reinforcement to the rear rail and clamp in place.
5. Plug weld accordingly.
6. Clean and prepare all of the welded surfaces.
7. Install all of the 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.
Rear Bumper Impact Bar Anchor Plate 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. 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: Note the number and location of the factory welds for installation of the anchor plate.

6. Locate and drill out all the necessary factory welds.
7. Remove the anchor plate.

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.

1. Drill 8-mm (5/16-in) plug weld holes in the service part as necessary in the corresponding locations noted on the original panel.
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 anchor plate to the rear rail.

5. Plug weld accordingly.

6. Clean and prepare all of the welded surfaces.

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

Note: Note the number and location of the factory welds for installation of the rear end panel.

6. Use a 10 mm to 12 mm spot weld remover when drilling out welds to the outer side areas of the rear end panel.

7. Drill out spot welds in lower end of the gutter.
8. Pry the lower edge to expose hidden welds under the gutter.

9. Drill out hidden spot welds under the gutter.

10. Locate and drill out all remaining factory welds using an 8 mm (5/16 in) spot weld cutter.

11. Remove the rear end panel.

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.

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 end panel on the vehicle. Use 3-dimensional measuring equipment to inspect the panel.
5. Clamp the panel in place.

6. Plug weld accordingly.
7. Clean and prepare all of the welded surfaces.
8. Install all of the related panels and components.
9. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
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.
Quarter Inner Panel Upper Reinforcement 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. 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**: Note the number and location of the factory welds. Drill out the factory spot welds from the interior side surface of the vehicle if necessary.

6. Locate and drill out all the factory welds.
7. Remove the reinforcement from the vehicle. If necessary, slide the reinforcement down and out from under any overlapping outer body side panel that may be present.

**Installation Procedure**

1. Prepare all mating surfaces as necessary.
2. Apply 3M Weld-Thru Coating P/N 05916 or equivalent to all mating surfaces.
3. Position the reinforcement bracket on the vehicle, and clamp in place.

**Note:** Use 3-dimensional measuring equipment to verify the location of the reinforcement.

4. Plug weld accordingly.

5. Clean and prepare all of the welded surfaces.

6. Install all of the related panels and components.

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

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

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

10. Enable the SIR system. Refer to SIR Disabling and Enabling.
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.

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

   Note: This panel is replaced at factory seams.

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.

6. Locate and drill out all the necessary factory welds.

7. Structural adhesive is present at the joint between the battery tray and the rear floor pan. Heat the battery tray at the locations shown with a small flame from an oxy-acetylene torch to release the bond to the rear floor panel.
Installation Procedure

8. Remove the battery tray.

Note: The original battery tray has spot welds and bonding adhesive, but the service panel replacement will be MIG plug welded back together. Double the amount of factory welds in place of using the adhesive.

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 for welding as necessary.
3. Apply 3M Weld-Thru Coating P/N 05916 or equivalent to all mating surfaces.
4. Position the battery tray to the vehicle. Clamp the battery tray in place.
5. Plug weld accordingly.
6. Clean and prepare all of the welded surfaces.
7. Install all of the 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.
Description and Operation

General Body Construction (Unibody) Description

This information pertains to unitized body construction. The engine and transaxle, front suspension control arms, and rack and pinion steering are supported by the engine frame which is bolted to the vehicle at six locations. Each mounting location is cushioned by a thick rubber insulator. These insulators are specifically designed for each location to give the proper amount of structural strength while providing maximum road noise isolation. Different insulators are used at the various frame-to-body attaching points to change ride and handling characteristics of the vehicle.

Mounting provisions for the front suspension system are also shared by the body components through the suspension strut towers. The towers must be dimensionally correct in relation to the underbody to maintain proper suspension geometry.

With unitized body construction, underbody components must be properly aligned to assure correct suspension location. In case of collision damage, it is important that the body dimensions be checked thoroughly, and if necessary, realigned in order to accurately establish proper dimensions.

Since the individual underbody components also contribute directly to the overall strength of the body, it is essential that the proper welding techniques be observed during service repair operations. The underbody components should be properly sealed and rustproofed whenever body repair operations destroy or damage the original sealing and rustproofing. When rustproofing critical underbody components, it is essential to use a quality air dry primer such as corrosion-resistant chromate or equivalent material. Combination type primer-surfacers are not recommended.
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.

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:

### Steel Panel Bonding Impact Resistant

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<thead>
<tr>
<th>Manufacturer and Part Number</th>
<th>Description</th>
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<tbody>
<tr>
<td>Fusor 2098</td>
<td>Fusor 2098 Impact Resistant Adhesive Available from Lord Fusor 800-234-3876 <a href="http://www.fusor.com">www.fusor.com</a></td>
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<tr>
<td>3M 07333</td>
<td>3M Impact Resistant Structural Adhesive Available from 3M <a href="http://www.3MCollision.com">www.3MCollision.com</a></td>
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### Steel Panel Bonding

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<tr>
<th>Manufacturer and Part Number</th>
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<tbody>
<tr>
<td>GM P/N 12378566 (US)</td>
<td>Fast Set Panel Bonding Adhesive</td>
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<tr>
<td>GM P/N 88901674 (Canada)</td>
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<tr>
<td>Lord Fusor P/N 110B/111B</td>
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<td>GM P/N 12378567 (US)</td>
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<td>GM P/N 88901675 (Canada)</td>
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<tr>
<td>3M P/N 8116</td>
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<tr>
<td>Ashland Plio Grip Panel 60</td>
<td>Panel Bonding Adhesive</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.
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.