## Fastener Specifications

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Dimensions - Body (Sedan)

Point to Point Measurements

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

Engine Compartment

Rear End
### Structure Identification

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Repair Instructions

Front Bumper Energy Absorber Replacement

Removal Procedure

Warning: Refer to Approved Equipment for Collision Repair Warning.

Warning: Refer to Glass and Sheet Metal Handling Warning.

1. Disable the SIR System. Refer to SIR Disabling and Enabling.

2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).

3. Remove all related panels and components.

4. Remove the 4 front bumper energy absorber fastener (1).

5. Locate and mark all factory welds.

6. Drill all factory welds.

7. Remove the front bumper energy absorber.

Installation Procedure
1. Position the front bumper energy absorber on the vehicle.

**Caution:** Refer to Fastener Caution.

**Note:** Use only the original front bumper energy absorber fastener. Replace fastener if damaged.

2. Install the 4 front bumper energy absorber fasteners (1) and tighten to the front compartment front inner side rail 115 ¥ (85 lb ft).

3. Drill two holes (1) 6 mm (0.24 in) along the edges of the front bumper energy absorber.
4. Drill two holes (1) **6 mm (0.24 in)** along the edges of the front bumper energy absorber.

**Note:** Use only the original front end upper tie bar fastener (M6 bolt and nut). Replace the fastener if damaged.

5. Install the 2 front end upper tie bar fasteners (1) and tighten to the front compartment front inner side rail **22 Y (16 lb ft)**.

**Note:** Use only the original front end upper tie bar fastener (M6 bolt and nut). Replace the fastener if damaged.

6. Install the 2 front end upper tie bar fasteners (1) and tighten to the front compartment front inner side rail **22 Y (16 lb ft)**.

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

8. Install all related panels and components.
9. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).

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

Removal Procedure

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

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

1. Disable the SIR System. Refer to SIR Disabling and Enabling.
2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Without Start/Stop)/Battery Negative Cable Disconnection and Connection (With Start/Stop).
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.

6. Locate and mark all the necessary factory welds of the front wheelhouse front panel (1).
7. Drill all factory welds. Note the number and location of welds for installation of the service assembly.
8. Remove the front wheelhouse front panel.

Installation Procedure

1. Drill 8 mm (5/16 in) for plug welding along the edges of the front wheelhouse front panel as noted from the original panel (1).
2. Clean and prepare the attaching surfaces for welding.
3. Position the front wheelhouse front panel on the vehicle (1).
4. Verify the fit of the front wheelhouse front panel.
5. Clamp the front wheelhouse front panel into position.

6. Plug weld accordingly (1).
7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
8. Paint the repaired area. Refer to Basecoat/Clearcoat Paint Systems.
9. Install all related panels and components.
10. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Without Start/Stop)Battery Negative Cable Disconnection and Connection (With Start/Stop).
11. Enable the SIR system. Refer to SIR Disabling and Enabling.
Front Wheelhouse Panel Replacement

Removal Procedure

1. Disable the SIR system. Refer to SIR Disabling and Enabling.

2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Without Start/Stop/Battery Negative Cable Disconnection and Connection (With Start/Stop).

   **Note:** Sectioning of the front wheelhouse assembly is not recommended. The front wheelhouse service panel is serviced as a complete assembly, which includes the upper front strut mounting surface. The upper strut mounting surface is a dimensionally critical area. Use 3-dimensional measuring equipment to locate the front wheelhouse assembly.

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

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

4. Repair as much of the damage as possible.

   ![Image of front wheelhouse panel]

5. Locate, mark, and drill out all factory welds (1). Note the number and location of welds for installation of the service assembly.

6. Remove the front wheelhouse from the vehicle.

   ![Image of removed front wheelhouse]

Installation Procedure

   **Note:** If the location of the original plug weld holes cannot be determined, or if structural weld-thru adhesive is present, space the plug weld holes every 40 mm (1 ½ in).

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

2. Clean and prepare the mating surfaces for welding, as necessary.

3. Apply GM-approved weld-thru coating or equivalent to all mating surfaces. Refer to Anti-Corrosion Treatment and Repair.
4. Position the service front wheelhouse to the vehicle using 3-dimensional measuring equipment (1). Clamp the front wheelhouse in place.

5. When the service assembly is correctly positioned, plug weld accordingly (1).
6. Measure frequently to ensure proper fit and alignment.
7. Clean and prepare all welded surfaces.
8. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
10. Install all related panels and components.
11. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).
12. Enable the SIR system. Refer to SIR Disabling and Enabling.
Front Compartment Upper Side Rail Replacement

Removal Procedure

Warning: Refer to Approved Equipment for Collision Repair Warning.

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 (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).
3. Remove all related panels and components.
4. Repair as much of the damage as possible to factory specifications. Refer to Dimensions - Body (Sedan).
5. Remove the sealers and anti-corrosion materials from the repair area. Refer to Anti-Corrosion Treatment and Repair.
6. Locate and drill out all factory welds. Note the number and location of the welds for installation of the front upper rail (1).
7. Remove the damaged front upper rail (1).

Installation Procedure
Note: If you cannot determine the location of the original plug weld holes, 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 (1).
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 (1).
5. Plug weld accordingly (1).
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 (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).
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.**

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 (Without Start/Stop)**.
3. Remove the front compartment upper side rail. Refer to **Front Compartment Upper Side Rail Replacement.**
4. Remove the headlamp mount panel.
5. Remove the front wheelhouse. Refer to **Front Wheelhouse Panel Replacement.**
6. Visually inspect the damage. Repair as much of the damage as possible.
7. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to **Anti-Corrosion Treatment and Repair.**

**Note:** Record the number and location of the factory welds for installation of the front compartment front half rail.

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

9. Remove the damaged front compartment front half rail (1).

Installation Procedure
1. Drill out necessary factory welds on the full service assembly (1) where the front compartment front half rail attaches (2), to the full rail service assembly.

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

2. Drill 8 mm (5/16 in) plug weld holes in the service part (1) as necessary in the locations noted from the original panel.
3. Prepare all matting surfaces for welding as necessary.
4. Apply GM-approved Weld-Thru Coating or equivalent to all matting surfaces. Refer to [Anti-Corrosion Treatment and Repair](#).
5. Clean and prepare the attaching surfaces for welding.
6. Position the front compartment front half rail on the vehicle (1).
7. Verify the fit of the front compartment front half rail.
8. Clamp the front compartment front half rail into position.
9. Plug weld accordingly (1).
10. Clean and prepare all of the welded surfaces.
11. Install all of the related panels and components.
12. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
13. Paint the repaired area. Refer to Basecoat/Clearcoat Paint Systems.
14. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).
15. Enable the SIR system. Refer to SIR Disabling and Enabling.
Underbody Outer Front 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 (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).
3. Remove all related panels and components.
4. Repair as much of the damage as possible. Refer to Dimensions - Body (Sedan).
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 outer rail.

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

7. Remove the outer rail from the vehicle (1).

Installation Procedure
**Note:** If the location of the original plug weld holes cannot be determined, space the plug weld holes every 40 mm (1 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 (1).
2. Prepare all mating surfaces as necessary.
3. Apply GM-approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to [Anti-Corrosion Treatment and Repair](#).

4. Position the outer rail to the vehicle using 3-dimensional measuring equipment. Clamp the outer rail in place (1).
5. Plug weld accordingly (1).
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 (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).
11. Enable the SIR system. Refer to SIR Disabling and Enabling.
Front Hinge Pillar Body Sectioning (Upper)

Removal Procedure

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

**Note:** Sectioning should be performed only in the recommended areas. Failure to do so may compromise the structural integrity of the vehicle.

The body side outer panels are available in one-piece side frames. You can perform any one of these replacement procedures separately or in any combination, depending upon the extent of damage to the vehicle. Stay away from the door and window opening radius areas. Perform sectioning 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 (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).
3. Remove all related panels and components.
4. Repair as much of the damaged area as possible. Refer to Dimensions - Body (Sedan).
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 area along the rocker panel.

6. On the "A" Pillar Measure down 300 mm from the roof edge (1). Mark this cut location on the front hinge pillar (2). Mark a cut location in the straight area on the rocker panel (3).

7. Cut the front hinge pillar body where sectioning is to be performed (1).
8. Locate and mark all the necessary factory welds of the front hinge pillar body.
Note: Record the number and location of welds for installation of the service assembly.

9. Drill out all factory welds (1) The Upper Outer Rail will need to be removed to locate 4 hidden welds on Hinge Pillar Reinforcement.

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

Installation Procedure

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

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

6. Plug weld accordingly (1).
7. To create a solid weld with minimum heat distortion, make 25 mm (1 in) stitch welds along the seam with 25 mm (1 in) gaps between them. Then go back and complete the stitch weld (1).

8. Clean and prepare all of the welded surfaces.

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


11. Install all of the related panels and components.

12. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).

13. Enable the SIR system. Refer to SIR Disabling and Enabling.
Front Hinge Pillar Body Sectioning (Lower)

Removal Procedure

Warning: Refer to Approved Equipment for Collision Repair Warning.

Note: Sectioning should be performed only in the recommended areas. Failure to do so may compromise the structural integrity of the vehicle.

The body side outer panels are available in one-piece side frames. You can perform any one of these replacement procedures separately or in any combination, depending upon the extent of damage to the vehicle. Stay away from the door and window opening radius areas. Perform sectioning 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 (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).
3. Remove all related panels and components.
4. Repair as much of the damaged area as possible. Refer to Dimensions - Body (Sedan).
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.

![Diagram of Front Hinge Pillar Body Sectioning (Lower)]

Note: Sectioning can be done anywhere in the straight area along the rocker panel.

6. On the "A" Pillar Measure down 120 mm from the door wiring conduit hole lower edge (1). Mark this cut location on the front hinge pillar (2). Mark a cut location in the straight area on the rocker panel (3).

7. Cut the front hinge pillar body where sectioning is to be performed (1).
8. Locate and mark all the necessary factory welds of the front hinge pillar body.
Note: Record the number and location of welds for installation of the service assembly.

9. Drill out all factory welds (1).

10. Remove the damaged front hinge pillar body.

Installation Procedure

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

3. Prepare all mating surfaces as necessary.

4. Apply 3M Weld-Thru Coating P/N 05916 or equivalent to all mating surfaces. Refer to Anti-Corrosion Treatment and Repair.

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

6. Plug weld accordingly (1).

7. To create a solid weld with minimum heat distortion, make a 25 mm (1 in) stitch welds along the seam with 25 mm (1 in) gaps between them. Then go back and complete the stitch weld (2).

8. Clean and prepare all of the welded surfaces.

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


11. Install all of the related panels and components.

12. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).

13. Enable the SIR system. Refer to SIR Disabling and Enabling.
Body Hinge Pillar Lower Reinforcement Replacement

Removal Procedure

1. Disable the SIR System. Refer to SIR Disabling and Enabling.
2. Remove all related panels and components.
3. Visually inspect the damage. Repair as much of the damage as possible.
4. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
5. Section body side outer-hinge pillar area. Refer to Front Hinge Pillar Body Sectioning (Upper) Front Hinge Pillar Body Sectioning (Lower).

6. Locate and mark all the necessary factory welds of the body hinge pillar lower reinforcement (1).
7. Drill all factory welds. Note the number and location of welds for installation of the service assembly.

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

Installation Procedure

1. Prepare all mating surfaces as necessary.
2. Drill **8 mm (5/16 in)** for plug welding along the edges of the body hinge pillar lower reinforcement (1) as noted from the original panel.
3. Clean and prepare the attaching surfaces for welding.

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

7. Plug weld the body hinge pillar lower reinforcement (1) accordingly.
8. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to [Anti-Corrosion Treatment and Repair](#).
9. Install the bodyside outer hinge pillar section. Refer to [Front Hinge Pillar Body Sectioning (Upper)](#)/[Front Hinge Pillar Body Sectioning (Lower)](#).
11. Install all related panels and components.
12. Enable the SIR system. Refer to SIR Disabling and Enabling.
Roof Outer Panel Replacement (Sedan)

Removal Procedure

Warning: Refer to Approved Equipment for Collision Repair Warning.

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

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 (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
6. Locate and mark all factory welds in the front and rear window openings.

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

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

9. Remove the center portion of the panel.
10. To separate the remaining portion of the panel use a cut off wheel or equivalent to grind out the laser welded seam (1).
11. Remove the remaining portion of the original panel.

Installation Procedure

1. Dry fit the service panel to the vehicle.

2. Clamp the panel into position in the rear window opening (1). Adjust the bow of the roof front to rear. Clamp in place in the windshield opening area (2).
3. With the service panel clamped in position drill a 3.2 mm (1/8 in) hole in each corner of the panel in the front and rear window openings (1).
4. Remove the service panel from the vehicle.

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

8. Apply Fusor super flexible anti-flutter foam fast set (1), or equivalent, to the roof bows in the locations noted from the original panel.
9. Apply a 12 mm (1/2 in) bead of metal panel bonding adhesive Metal Panel Bonding to the left and right roof rails (1).

10. With the help of a second person lower the service panel straight down onto the vehicle.

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

11. Insert an awl or equivalent tool into the four holes drilled in the window openings in step 3 (1).

12. Clamp the roof in place in the front and rear window openings.

13. Clean up the excess urethane from the surface.

14. Install 25 mm (1 in) wide ratchet strap or equivalent across the roof inboard of the bond area (1). Apply light even pressure to the bond area.

15. Allow adhesive to completely cure per manufacturers instructions. Remove the ratchet straps.
16. Plug weld accordingly (1). Weld the four holes used for alignment.

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

18. Use a high quality seam sealer to fill the gap between the outer roof panel and the body side roof rail. Follow the manufacturers instructions.

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

20. Install all related panels and components.

21. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).

22. Enable the SIR system. Refer to SIR Disabling and Enabling
Rocker Inner Panel Reinforcement Replacement

Removal Procedure

1. Disable the SIR system. Refer to SIR Disabling and Enabling.
2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).
3. Remove all related panels and components.

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

**Note:** Failure to replace any damaged reinforcement as described could compromise the structural integrity of the vehicle.

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

5. Drill out factory welds (1).

**Note:** The inner reinforcement is a high strength steel and cannot be sectioned or altered.

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. Prepare the mating surfaces as necessary.
2. Apply GM approved weld-thru coating or equivalent. Refer to Anti-Corrosion Treatment and Repair.
3. Position the rocker reinforcement in place, use 3-dimensional measuring equipment, clamp in place.
4. Plug weld accordingly (1).
5. Clean and prepare all of the welded surfaces.
6. Install all of the related panels and components.
7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
8. Paint the repaired area. Refer to Basecoat/Clearcoat Paint Systems.
9. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).
10. Enable the SIR system. Refer to SIR Disabling and Enabling.
Rocker Outer Panel Sectioning

Note: According to different corrosion warranties, only the regional mandatory joining methods are allowed.

Removal Procedure

Warning: Refer to Approved Equipment for Collision Repair Warning.
Warning: Refer to Collision Sectioning Warning.
Warning: Refer to Glass and Sheet Metal Handling Warning.

1. Disable the SIR system. Refer to SIR Disabling and Enabling.
2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).
3. Remove all related panels and components.
4. Visually inspect the damage. Repair as much of the damage as possible.
5. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.

6. Create cut lines on the rocker outer panel (1). To avoid cutting into hidden reinforcements within the center pillar panel, measure 115 mm down from bottom of electrical conduit hole (2), mark a cut line (3). To avoid a cutting into a sound deadener baffle within the lock pillar panel, measure 350 mm up from the bottom of the rocker panel (4), mark a cut line (5).

7. Perform additional sectioning procedures as needed depending on damage to vehicle. Refer to Quarter Outer Panel Sectioning, Front Hinge Pillar Body Sectioning (Upper) Front Hinge Pillar Body Sectioning (Lower), or Center Pillar Sectioning - Outer.

Note: Do not damage any inner panels or reinforcements.

8. Cut the rocker outer panel (1) where sectioning is to be performed.
9. Locate and mark all the necessary factory welds of the rocker outer panel (1).

10. Drill all factory welds.

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

**Installation Procedure**

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

2. Prepare all mating surfaces as necessary.
3. Drill 8 mm (5/16 in) plug weld holes in the service part (1), as necessary, in the corresponding locations noted on the original panel and along sectioned joint.

4. Clean and prepare the attaching surfaces for welding.

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

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

7. Plug weld the rocker outer panel (1) accordingly.
8. To create a solid weld with minimum heat distortion, make 25 mm (1 in) stitch welds along the seam with 25 mm (1 in) gaps between them. Then go back and complete the stitch weld.

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

10. Paint the repaired area.

11. Install all related panels and components.

12. Enable the SIR system. Refer to SIR Disabling and Enabling.
Body Side Inner Panel Sectioning

Removal Procedure

Warning: Refer to Approved Equipment for Collision Repair Warning.
Warning: Refer to Collision Sectioning Warning.
Warning: Refer to Glass and Sheet Metal Handling Warning.

1. Disable the SIR System. Refer to SIR Disabling and Enabling.

2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).

3. Remove all related panels and components.

4. Visually inspect the damage. Repair as much of the damage as possible.

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

6. Locate and drill out the necessary factory welds of the body lock pillar upper reinforcement (1). Do not drill out the welds above the roof line. With the body lock pillar upper reinforcement still attached above the roof line, pry the lower portion of the reinforcement away from the body side inner panel.

7. From inside of vehicle, cut body side inner panel where sectioning is to be performed (1).
8. Locate and drill out all necessary welds of the body side inner panel (1).

9. Remove the damaged body side inner panel (1).

Installation Procedure

1. From the service part, cut the panel in corresponding locations to overlap the remaining original panel by 25 mm (1 in) at each joint location (1).
2. Drill 8 mm (5/16 in) plug weld holes in the service part (1), as necessary, in the corresponding locations noted on the original panel and along sectioned joint.

3. Prepare all matting surfaces for welding, as necessary.

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

5. Position the body side inner panel (1) to the vehicle using 3-dimensional measuring equipment. Clamp the panel in place.

6. Plug weld accordingly (1).
7. To create a solid weld with minimum heat distortion, make 25 mm (1 in) stitch welds along the seam with 25 mm (1 in) gaps between them. Then go back and complete the stitch weld (1).

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

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

10. Install all related panels and components.

11. Connect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection (Without Start/Stop)** and **Battery Negative Cable Disconnection and Connection (With Start/Stop)**.

12. Enable the SIR system. Refer to **SIR Disabling and Enabling**.
Rear Floor Panel Sectioning

Removal Procedure

Warning: Refer to Approved Equipment for Collision Repair Warning.

1. Disable the SIR system. Refer to SIR Disabling and Enabling.

2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).

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 (Sedan).

6. Measure 70 mm rearward from the rear edge of the #5 bar (1). Mark the cut location (2).

Note: Do not damage any adjacent panels or components when cutting or drilling out spot welds. Record the number and location of welds for installation of the service part.

7. Drill out all factory welds (1).
8. Cut the rear floor panel accordingly (1).

**Installation Procedure**

**Note:** The service part is supplied precut at the proper location for sectioning. The service part will overlap the original floor panel by approximately 50 mm at the cut location. Two rows of evenly staggered plug welds will provide the necessary weld strength for this procedure.

1. Create 2 rows of plug welds in the service part as follows. For the 1st row, measure 13 mm from the front edge of the service part (1). Mark a straight line across the width of the service part (2). For the 2nd row, measure 25 mm from the 1st row. Mark a straight line across the width of the service part (3).
2. Drill 8 mm (5/16 in) plug weld holes, every 40 mm along the 1st marked row. Locating the first hole 20 mm (1) from the left edge of the service part.
3. Drill 8 mm (5/16 in) plug weld holes, every 40 mm along the 2nd marked row (3). Locate first hole 40 mm (2) from the left edge of the service part.
4. Prepare all mating surfaces for welding, as necessary.
5. Apply GM-approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to Anti-Corrosion Treatment and Repair.
6. Position the rear floor pan to the vehicle using 3-dimensional measuring equipment. Clamp the part in place.

7. Plug weld accordingly (1).
8. Clean and prepare all welded surfaces for painting.
10. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
11. Install all related panels and components.
12. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).
13. 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 (Without Start/Stop). Battery Negative Cable Disconnection and Connection (With Start/Stop).

3. Remove all related panels and components.

4. Repair as much of the damaged area as possible. Refer to Dimensions - Body (Sedan).

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 (1).

7. Remove the rear inner wheelhouse (1).

**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 (1).
2. Prepare all mating surfaces for welding as necessary.
3. Apply GM–approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to Anti-Corrosion Treatment and Repair.
4. Position the rear inner wheelhouse to the vehicle. Clamp the part in place (1).
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 (Without Start/Stop)/Battery Negative Cable Disconnection and Connection (With Start/Stop).
11. Enable the SIR system. Refer to SIR Disabling and Enabling.
Quarter Outer Panel Sectioning

Removal Procedure

Warning: Refer to Approved Equipment for Collision Repair Warning.

1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).
2. Disable the SIR system. Refer to SIR Disabling and Enabling.
3. Restore as much of the damage as possible to factory specifications. Refer to Dimensions - Body (Sedan).
4. Remove all related panels and components.
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. Section the sail panel and the rocker panel.
   - At the sail panel, measure from the back glass opening down 85 mm. Scribe a line. This is the cut location (1).
   - Scribe a line on the rocker panel on the flat area between the holes where the molding attaches to the rocker panel. From the third hole rearward, measure 90 mm forward. This is the cut location (2).

7. Locate and drill out all factory welds. Note the number and location of welds for installation of the quarter panel (1).
8. Cut the panel at the marked locations (1).

9. Remove the lower quarter panel (1).

**Installation Procedure**

1. From the service part, cut the panel in corresponding locations to overlap the remaining original panel by 25 mm (1 in) at each joint location (1, 2).
2. Drill 8 mm (5/16 in) plug weld holes as necessary in locations noted from the original quarter panel (1).

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

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

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

5. Position the new service panel and clamp in place (1).

6. Perform the sectioning procedure.
7. Plug weld accordingly (1).

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

9. Clean and prepare all welded surfaces.

10. Pre-flange wheel housing. Using flat faced body hammer, bend over the flanged edge 45 degrees (1), at the same time holding a hard rubber block against it. Use structural adhesive in the area (2).

11. Bend the wheel arch (3).

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


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

16. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Without Start/Stop)/Battery Negative Cable Disconnection and Connection (With Start/Stop).
Body Rear End 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. Disable the SIR system. Refer to **SIR Disabling and Enabling**.
2. Disconnect the negative battery cable. Refer to **Battery Negative Cable Disconnection and Connection (Without Start/Stop)**. Battery Negative Cable Disconnection and Connection (With Start/Stop).
3. Remove all related panels and components.
4. Repair as much of the damage as possible. Refer to **Dimensions - Body (Sedan)**.
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 (1).

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

7. Remove the rear end panel (1).

Installation Procedure
Note: If the location of the original plug weld holes cannot be determined, space the plug weld holes every 40 mm (1 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 (1).
2. Clean and prepare all mating surfaces as necessary (2).
   
   Note: Remove excess weld and sealer

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

4. Position the rear end panel on the vehicle. Use 3-dimensional measuring equipment to inspect the panel (1).
5. Clamp the panel in place.
6. Plug weld accordingly (1).
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 (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).
12. Enable the SIR system. Refer to SIR Disabling and Enabling.
Center Pillar Inner Panel Replacement

Removal Procedure

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

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

1. Disable the SIR system. Refer to SIR Disabling and Enabling.
2. Remove all related panels and components.
3. Visually inspect the damage. Repair as much of the damage as possible.
4. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
5. Locate and mark all factory welds.

6. Drill all factory welds lower of the center pillar inner panel (1). Note the number and location of welds for installation of the service assembly.

7. Drill all factory welds upper of the center pillar inner panel (1). Note the number and location of welds for installation of the service assembly.
8. Remove the damaged center pillar inner panel (1).

Installation Procedure

1. Drill 8 mm (5/16 in) for plug welding along the edges of the center pillar inner panel (1) as noted from the original panel.
2. Clean and prepare the attaching surfaces for welding.
3. Position the center pillar inner panel (1) on the vehicle.
4. Verify the fit of the panel.
5. Clamp the center pillar inner panel into position.
6. Plug weld accordingly center pillar inner panel (1) upper and lower.
7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
8. Paint the repaired area. Refer to Basecoat/Clearcoat Paint Systems.
9. Install all related panels and components.
10. Enable the SIR system. Refer to SIR Disabling and Enabling.
Center Pillar Reinforcement Replacement

**Removal Procedure**

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

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

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

1. Disable the SIR System. Refer to SIR Disabling and Enabling.
2. Remove all related panels and components.
3. Visually inspect the damage. Repair as much of the damage as possible.
4. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
5. Remove body side center pillar section. Refer to Center Pillar Sectioning - Outer.

6. Locate and mark all the necessary factory welds of the center pillar reinforcement (1).
7. Drill all factory welds. Note the number and location of welds for installation of the service assembly.

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

**Installation Procedure**

1. Prepare all matting surfaces as necessary.
2. Align the center pillar reinforcement.
3. Drill 8 mm (5/16 in) for plug welding along the edges of the center pillar reinforcement (1) as noted from the original panel.

4. Clean and prepare the attaching surfaces for welding.

5. Position the center pillar reinforcement (1) on the vehicle using 3-dimensional measuring equipment.

6. Verify the fit of the center pillar reinforcement.

7. Clamp the center pillar reinforcement into position.

8. Plug weld the center pillar reinforcement (1) accordingly.

9. Complete body side center pillar sectioning. Refer to Center Pillar Sectioning - Outer.

10. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
11. Paint the repaired area. Refer to Basecoat/Clearcoat Paint Systems.
12. Install all related panels and components.
13. Enable the SIR system. Refer to SIR Disabling and Enabling.
Center Pillar Sectioning - Outer

Removal Procedure

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

**Note:** Sectioning should be performed only in the recommended areas. Failure to do so may compromise the structural integrity of the vehicle.

**Note:** This procedure was developed to allow full access for the replacement of the center reinforcement pillar replacement since sectioning is not endorsed or recommended to the reinforcement due to the ultra high strength steel Ultra High Strength Steel.

1. Disable the SIR system. Refer to SIR Disabling and Enabling.
2. Remove all related panels and components.
3. Remove the sealers and anti-corrosion materials from the repair area, as necessary, and note their location. Refer to Anti-Corrosion Treatment and Repair.
4. Repair as much of the damaged area as possible. Refer to Dimensions - Body (Sedan).

5. Remove the weatherstrip, observe the flange in the center pillar area. There will be a 3-metal stack-up. The center layer is the center pillar inner reinforcement (1).

6. Measure 13 mm (1/2 in) from the forward and rearward edges of the center pillar inner reinforcement and mark a vertical line (1).
7. Measure down 25 mm (1 in) from the upper edge of the body side outer panel and mark a horizontal line (1). This is the cut line.

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

9. Perform additional sectioning procedures as needed depending on damage to vehicle. Refer to Quarter Outer Panel Sectioning, Rocker Outer Panel Sectioning, or Front Hinge Pillar Body Sectioning (Upper)/Front Hinge Pillar Body Sectioning (Lower).

10. Locate and drill out all factory welds (1). Note the number and location of welds for installation of the service part.
11. Remove the damaged center pillar outer panel section (1).

**Installation Procedure**

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

2. Drill **8 mm (5/16 in)** plug weld holes in the service part (1), as necessary, in the corresponding locations noted on the original panel and along sectioned joint.

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

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

6. Plug weld accordingly (1).

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

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


11. Install all of the related panels and components.

12. Enable the SIR system. Refer to SIR Disabling and Enabling.
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 (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).

2. Disable the SIR system. Refer to SIR Disabling and Enabling.

3. Remove the door from the vehicle. Refer to Front Side Door Replacement.

4. Remove all related panels and components.

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

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

7. Remove the outer door panel (1).

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

9. Straighten the edges of the door shell (1).

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

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

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

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

4. Clean the mating surfaces.
**Note:** Do not allow the adhesive to totally cure off the vehicle, as proper alignment of the door outer panel to the door shell will be difficult.

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

6. Using a small acid brush, spread a coat of adhesive to cover all the bare metal surfaces to ensure corrosion protection.

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

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

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

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 (1).

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. Adjust the alignment as required. Refer to Front Side Door Replacement.

13. Metal-inert gas (MIG) weld the door outer panel to the door frame in the locations noted at the upper door frame (1).

14. Clean and prepare all welded surfaces.
15. Apply Fusor super flexible anti-flutter foam – fast set, Fusor P/N 121/124 or equivalent in 4–5 evenly spaced locations between the door outer panel and the inner safety beam and the upper belt reinforcement (1).

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 (Without Start/Stop) Battery Negative Cable Disconnection and Connection (With Start/Stop).
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 (Without Start/Stop). Battery Negative Cable Disconnection and Connection (With Start/Stop).

Warning: Refer to SIR Warning.

2. Disable the SIR system. Refer to SIR Disabling and Enabling.

3. Remove the door from the vehicle. Refer to Front Side Door Replacement or to Rear Side Door Replacement.

4. Locate and drill out all factory welds. Note the number and location of welds (1).

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

6. Remove the outer door panel (1).

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

8. Straighten the edges of the door shell (1).

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

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

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

   **Note:** If the location of the original plug welds can not be determined, space the 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 to 1/4 in) bead of metal panel bonding adhesive to both of the mating surfaces (1).**

6. Using a small acid brush, spread a coat of adhesive to cover all the bare metal surfaces to ensure corrosion protection.

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

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

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

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

10. **Using a hammer re-hem the hem flanges around the door shell.** Continue to hammer in stages along the hem flanges (1).

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

12. **Install the door to the vehicle check the door outer panel for proper alignment, adjust the alignment as required.**
13. Metal-inert gas (MIG) weld the door outer panel to the door frame in the locations noted at the upper door frame (1).

14. Clean and prepare all welded surfaces.

15. Apply Fusor super flexible anti-flutter foam–fast set, Fusor P/N 121/124 or equivalent in 4–5 evenly spaced locations between the door outer panel and the inner safety beam and the upper belt reinforcement (1).

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. Install the door to the vehicle. Refer to Front Side Door Replacement or to Rear Side Door Replacement.

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

21. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Without Start/Stop) or Battery Negative Cable Disconnection and Connection (With Start/Stop).
Rail Replacement - Rear Section

Removal Procedure

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

1. Disable the supplemental inflatable restraint (SIR) System. Refer to SIR Disabling and Enabling.
2. Remove all related panels and components.
3. Repair as much of the damage as possible to factory specifications. Refer to Dimensions - Body (Sedan).
4. Note the location and remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.

**Note:** To remove the rear rail-rear section, the number five bar extension (1) will have to be removed to gain access to the rail spot welds.

**Note:** Do not damage any inner panels or reinforcements. In areas where structural adhesive is present, heat the area to assist with removing the components.

5. Locate and drill out all factory welds (1). Note the number and location of the welds for installation of the rear rail – rear section.
6. Remove the damaged rear rail – rear section (1).

Installation Procedure

**Note:**

- If the location of the original plug weld holes cannot be determined, space the plug weld holes every 40 mm (1 ½ in) apart.
- Some panels may have structural weld-thru adhesive. It is necessary to replace the weld-thru adhesive with an additional spot weld between each factory spot weld.

1. Prepare all mating surfaces as necessary.
2. Apply GM-approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to Anti-Corrosion Treatment and Repair.

3. Position the rear rail-rear section (1) to the vehicle using 3-dimensional measuring equipment. Clamp the rear rail lower into place.
4. Plug weld accordingly (1).
5. Clean and prepare all welded surfaces.
6. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
7. Paint the repair area. Refer to Basecoat/Clearcoat Paint Systems.
8. Install all related panels and components.
9. Enable the SIR system. Refer to SIR Disabling and Enabling.
Description and Operation

Dual Phase Steel

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

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

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

Recommended Repairs

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

<table>
<thead>
<tr>
<th>Manufacturer and Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pliogrip 5770P</td>
<td>Pliogrip 5770P Structural Impact Durable Adhesive</td>
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<tr>
<td></td>
<td>Available from Ashland 800-PLIOGRIP</td>
</tr>
<tr>
<td></td>
<td><a href="http://www.ashland.com/products/pliogrip-structural-adhesives">www.ashland.com/products/pliogrip-structural-adhesives</a></td>
</tr>
<tr>
<td>Fusor 2098</td>
<td>Fusor 2098 Impact Resistant Adhesive</td>
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<tr>
<td></td>
<td>Available from Lord Fusor 800-234-3876</td>
</tr>
<tr>
<td></td>
<td><a href="http://www.fusor.com">www.fusor.com</a></td>
</tr>
<tr>
<td>3M 07333</td>
<td>3M Impact Resistant Structural Adhesive</td>
</tr>
<tr>
<td></td>
<td>Available from 3M</td>
</tr>
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<td></td>
<td><a href="http://www.3MCollision.com">www.3MCollision.com</a></td>
</tr>
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</table>

### Steel Panel Bonding

<table>
<thead>
<tr>
<th>Manufacturer and Part Number</th>
<th>Description</th>
</tr>
</thead>
<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>
<td>Medium Set Panel Bonding Adhesive</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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<td>Lord Fusor P/N 108B/109B</td>
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<tr>
<td>3M P/N 8116</td>
<td>Panel Bonding Adhesive</td>
</tr>
<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 Dual Phase Steel

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

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

Note:

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