Body Repair

Collision Repair

Specifications

Dimensions - Body

Body Side Dimensions (Crew Cab)

![Diagram of Body Side Dimensions (Crew Cab)](image)

1150 mm

1144 mm

1502 mm

830 mm

1292 mm

1366 mm

Body Side Dimensions (Extended Cab)
Body Side Dimensions (Regular Cab)
### Structure Identification

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Repair Instructions

Front Full Frame Sectioning (Light Duty)

Removal Procedure

If damage permits a pre-sleeved replacement front frame service section has been developed as a cost-effective alternative to complete frame replacement. This procedure is for the light duty pick-up front frame section, the utility front frame section is similar.

Warning: Refer to Approved Equipment for Collision Repair Warning.

Warning: Refer to Collision Sectioning Warning.

Note: Perform all of the steps on both of the rails for complete module replacement.

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 (Single Battery) Battery Negative Cable Disconnection and Connection (Dual Battery).
3. Remove all of the related panels and components.

4. Locate and mark the sectioning location by using at least 2 of the measurements below for each frame rail:
   - Top of the frame rail edge rearward 420 mm (16 1/2 in) (with bumper bracket removed)
   - Bottom of the frame rail edge rearward 387 mm (15 3/16 in) (with bumper bracket removed)
   - Front edge of the gauge hole forward 22 mm (7/8 in)
   - Center of the gauge hole forward 33 mm (1 1/4 in)
   - Rear edge of the gauge hole forward 47 mm (1 7/8 in)
5. **Note:** Line up the masking tape with the tape edge facing the front of the vehicle on the sectioning location.

   **Apply masking tape completely around the frame rail next to the sectioning location as shown.**

6. **Note:** The tape edge facing the front of the vehicle is the proper cut location.

   **Cut each frame rail at the front edge of the tape line using a reciprocating saw or equivalent, as shown.**

7. **Remove the damaged frame section.**
1. Grind the existing frame rail seam to taper seam at a 45 degree angle.
2. Prepare all of the attaching surfaces as necessary.
3. Apply the weld-thru primer to all of the welded surfaces.

4. Position the service frame section to the existing frame and clamp in place.
Note: Verify the frame measurements 3-dimensionally to ensure proper position of the service frame.

5. Continuous-weld the upper and lower horizontal joints through each corner.

6. Continuous-weld the inner and outer vertical joints from corner to corner.

7. Clean and prepare all of the welded surfaces.

8. Install all of the related panels and components.

9. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Single Battery)/Battery Negative Cable Disconnection and Connection (Dual Battery).

10. Enable the SIR system. Refer to SIR Disabling and Enabling.
Front Full Frame Sectioning (Heavy Duty)

Removal Procedure

If damage permits a pre-sleeved replacement front frame service section has been developed as a cost-effective alternative to complete frame replacement. This procedure is for the heavy duty pick-up front frame service section.

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

**Warning:** Refer to Collision Sectioning Warning.

**Note:** Perform all of the steps on both of the rails for complete module replacement.

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 (Single Battery) Battery Negative Cable Disconnection and Connection (Dual Battery).

3. Remove all of the related panels and components.

**Note:** Perform the following steps on both of the rails for complete module replacement.

4. Locate and mark the sectioning location by using at least 2 of the measurements below for each frame rail:

   - Top of the frame rail edge rearward approximately 550 mm (with bumper bracket removed)
   - Front edge of the gauge hole rearward approximately 5 mm
   - Back edge of the lower control arm crossmember, rearward approximately 20 mm
   - Approximately 50 mm rearward of shock tower bracket
   - Approximately 55 mm rearward of shock tower bracket (inboard side rail)
**Note:** Line up the masking tape with the tape edge facing the front of the vehicle on the sectioning location.

5. Apply masking tape completely around the frame rail next to the sectioning location as shown.

**Note:** The tape edge facing the front of the vehicle is the proper cut location.

6. Using a reciprocating saw or equivalent cut each frame rail approximately 5 mm forward of the front edge of the tape line. This will allow for final trimming of each rail rearward to the proper sectioning location.

7. Remove the damaged frame section.

*Installation Procedure*
1. Grind the existing frame rail (at the proper sectioning location) at a 45 degree angle (a) as shown.
2. Prepare all of the attaching surfaces as necessary.
3. Apply the weld-thru primer to all of the welded surfaces.

4. Position the service frame section to the existing frame and clamp in place.

**Note:** Verify the frame measurements 3-dimensionally to ensure proper position of the service frame.

5. Continuous-weld the upper and lower horizontal joints through each corner.
6. Continuous-weld the inner and outer vertical joints from corner to corner.
7. Clean and prepare all of the welded surfaces.
8. Apply sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
10. Install all of the related panels and components.
11. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Single Battery) Battery Negative Cable Disconnection and Connection (Dual Battery).
12. 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.
Warning: Refer to Glass and Sheet Metal Handling Warning.

Note: This procedure shows the crew cab pickup; the extended cab and the regular cab are similar.

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 (Single Battery)Battery Negative Cable Disconnection and Connection (Dual Battery).

3. Remove all related panels and components.
4. Repair as much of the damage as possible to factory specifications.

Warning: Refer to Foam Sound Deadeners Warning.

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

Note: Do not damage any inner panels or reinforcements.

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

**Installation Procedure**

1. Prepare all attachment surfaces as necessary for welding. Apply GM-approved Weld-Thru Coating or equivalent to all mating surfaces. Refer to [Anti-Corrosion Treatment and Repair](#).

2. Position the roof panel.

3. Weld accordingly.
4. Clean and prepare all welded surfaces.

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


7. Install all related panels and components.

8. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Single Battery) Battery Negative Cable Disconnection and Connection (Dual Battery).

9. 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.

Warning: Refer to Glass and Sheet Metal Handling Warning.

Warning: Refer to Collision Sectioning Warning.

Note: The rocker inner panel reinforcement assembly is made of Ultra High Strength Steel. Sectioning or repair of Ultra High Strength Steel is not recommended. It should be replaced as a complete assembly at factory location.

Note: For access to the rocker inner panel reinforcement assembly, the outer door frame can be replaced at the factory seams, but requires the removal of the windshield, roof, and back panel. 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. This procedure shows the outer door frame completely removed on a crew cab, the extended cab is similar.

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 (Single Battery) Battery Negative Cable Disconnection and Connection (Dual Battery).
3. Remove all related panels and components.
4. Repair as much of the damage as possible to factory specifications. Refer to Dimensions - Body.

Warning: Refer to Foam Sound Deadeners Warning.

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

6. Remove outer door frame as necessary. Refer to the following procedures:
   - Front Hinge Pillar Sectioning
   - Center Pillar Sectioning
   - Rear Pillar Sectioning
7. Locate and drill out all factory welds. Note the number and location of the welds for installation of the service part.

8. From inside of the vehicle locate and drill out the factory welds along the inner center pillar.

9. Remove the damaged rocker inner panel reinforcement assembly.

Installation Procedure
1. Clean and prepare all attachment surfaces for welding.

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

3. Position the inner rocker reinforcement assembly to the vehicle using 3-dimensional measuring equipment. Clamp in place.

4. Prior to installing outer body side, replace all necessary welds, that are covered by the outer body side, weld accordingly at those original weld locations.

5. Weld accordingly all factory welds along the inner center pillar.

6. Complete body side outer sectioning as necessary.

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


9. Install all related panels and components.

10. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Single Battery)Battery Negative Cable Disconnection and Connection (Dual Battery).

11. Enable the SIR system. Refer to SIR Disabling and Enabling.
Rocker Outer Panel Sectioning

Removal Procedure

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

Note: The door frame can be replaced at the factory seams, but requires the removal of the windshield, roof, and back panel. Sectioning procedures have been developed as a more cost-effective alternative to complete replacement. The specific area to be sectioned is determined by the extent of the damage to the vehicle.

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

Warning: Refer to Foam Sound Deadeners Warning.

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

6. Perform additional sectioning procedures as necessary. Refer to the following procedures:
   - Front Hinge Pillar Sectioning
   - Center Pillar Sectioning
   - Rear Pillar Sectioning
Note: This procedure shows sectioning the outer rocker at the front hinge pillar, center pillar, and rear pillar, the specific area to be sectioned is determined by the extent of the damage to the vehicle.

Note: Do not damage any inner panels or reinforcements.

7. Mark and cut the panel in the locations where sectioning is to be performed.

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

9. Remove the damaged outer rocker.

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

2. Prepare all attachment 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 outer rocker to the vehicle using 3-dimensional measuring equipment. Clamp in place.

5. Weld accordingly.

6. Clean and prepare all welded surfaces.

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


9. Install all related panels and components.

10. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Single Battery)/Battery Negative Cable Disconnection and Connection (Dual Battery).

11. Enable the SIR system. Refer to SIR Disabling and Enabling.
Front Side Door Outer Panel Replacement (Belt Cut)

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.

**Note:** Complete Outer Door Panel replacement is not recommended, this procedure is for Belt Cut Only.

1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Single Battery) Battery Negative Cable Disconnection and Connection (Dual Battery).

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 (Crew Cab, Extended Cab) Front Side Door Replacement (Regular Cab).

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

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. From the service part, cut the replacement panel in corresponding locations to overlap the remaining original panel by approximately 25 mm (1 inch) at each joint.
2. Using a grinding disk grind the surface of the door shell mating flanges to bare steel.

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

4. Clean the mating surfaces.

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

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

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

7. Apply a 9–13 mm (3/8–1/2 in) bead of metal bonding adhesive to the mating surfaces of the service panel.
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 (Crew Cab, Extended Cab)/Front Side Door Replacement (Regular Cab).
13. Weld as necessary the door outer panel.

14. Clean and prepare all welded surfaces.

15. Apply Fusor super flexible anti-flutter foam-fast set, Fusor P/N 121/124, or equivalent, in a continuous bead the entire length between the beltline reinforcement and the door outer panel.

16. Apply Fusor super flexible anti-flutter foam-fast set, Fusor P/N 121/124, or equivalent, in a continuous bead the entire length between the door outer panel and the inner safety beam making multiple passes behind the side impact sensor portion of the beam as required to fill in any gaps.

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

18. Install all related panels and components.

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

20. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Single Battery) Battery Negative Cable Disconnection and Connection (Dual Battery).
Rear Side Door Outer Panel Replacement (Belt Cut)

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.

Note: Complete Outer Door Panel replacement is not recommended, this procedure is for Belt Cut Only.

Note: This procedure shows the Pick-Up Crew Cab Rear Door, all full size pick up and utilities rear doors are similar.

1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Single Battery) Battery Negative Cable Disconnection and Connection (Dual Battery).

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 (Crew Cab) Rear Side Door Replacement (Extended Cab).

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

Note: Do not damage any window run channels or reinforcements.

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. From the service part, cut the replacement panel in corresponding locations to overlap the remaining original panel by approximately 25 mm (1 inch) at each joint.
2. Using a grinding disk grind the surface of the door shell mating flanges to bare steel.

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

4. Clean the mating surfaces.

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

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

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

7. Apply a 9–13 mm (3/8–1/2 in) bead of metal bonding adhesive to the mating surfaces of the service panel.
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 (Crew Cab) Rear Side Door Replacement (Extended Cab).
13. Weld as necessary the door outer panel.
14. Clean and prepare all welded surfaces.

15. Apply Fusor super flexible anti-flutter foam-fast set, Fusor P/N 121/124, or equivalent, in a continuous bead the entire length between the beltline reinforcement and the door outer panel.

16. Apply Fusor super flexible anti-flutter foam-fast set, Fusor P/N 121/124, or equivalent, in a continuous bead the entire length between the door outer panel and the inner safety beam making multiple passes behind the side impact sensor portion of the beam as required to fill in any gaps.

17. Paint the repaired area. Refer to Basecoat/Clearcoat Paint Systems.
18. Install all related panels and components.
19. Enable the SIR system. Refer to SIR Disabling and Enabling.

20. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Single Battery) Battery Negative Cable Disconnection and Connection (Dual Battery).
Front Hinge Pillar Sectioning

Removal Procedure

Warning: Refer to Approved Equipment for Collision Repair Warning.

Warning: Refer to Glass and Sheet Metal Handling Warning.

Warning: Refer to Collision Sectioning Warning.

Note: The outer door frame can be replaced at the factory seams, but requires the removal of the windshield, roof, and back panel. Sectioning procedures have been developed as a more cost-effective alternative to complete replacement. The specific area to be sectioned is determined by the extent of the damage to the vehicle.

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

2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Single Battery), Battery Negative Cable Disconnection and Connection (Dual Battery).

3. Remove all related panels and components.

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

Warning: Refer to Foam Sound Deadeners Warning.

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

6. Perform additional sectioning procedures as necessary. Refer to the following procedures:

   - Rocker Outer Panel Sectioning
   - Center Pillar Sectioning
   - Rear Pillar Sectioning
Note: This procedure shows sectioning the outer hinge pillar at the upper A pillar, and the rocker, the specific area to be sectioned is determined by the extent of the damage to the vehicle.

Note: Do not damage any inner panels or reinforcements.

7. Mark and cut the panel in the locations where sectioning is to be performed.

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

9. Remove the damaged hinge pillar.
1. From the service part, cut the replacement panel in corresponding locations to overlap the remaining original panel by 25 mm (1 inch) at each joint.

2. Prepare all attachment 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 hinge pillar to the vehicle using 3-dimensional measuring equipment. Clamp in place.
5. Weld accordingly.
6. Clean and prepare all welded surfaces.
7. Apply the sealers and anti-corrosion materials to the repair area (1), as necessary. Refer to Anti-Corrosion Treatment and Repair.
9. Install all related panels and components.
10. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Single Battery) Battery Negative Cable Disconnection and Connection (Dual Battery).
11. Enable the SIR system. Refer to SIR Disabling and Enabling.
Center Pillar Sectioning

Removal Procedure

Warning: Refer to Approved Equipment for Collision Repair Warning.

Warning: Refer to Glass and Sheet Metal Handling Warning.

Warning: Refer to Collision Sectioning Warning.

Note: The door frame can be replaced at the factory seams, but requires the removal of the windshield, roof, and back panel. Sectioning procedures have been developed as a more cost-effective alternative to complete replacement. The specific area to be sectioned is determined by the extent of the damage to the vehicle.

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

2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Single Battery)/Battery Negative Cable Disconnection and Connection (Dual Battery).

3. Remove all related panels and components.

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

Warning: Refer to Foam Sound Deadeners Warning.

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

6. Perform additional sectioning procedures as necessary. Refer to the following procedures:

   - Front Hinge Pillar Sectioning
   - Rear Pillar Sectioning
   - Rocker Outer Panel Sectioning
**Note:** This procedure shows sectioning the outer center pillar at the front and rear outer rocker areas, the specific area to be sectioned is determined by the extent of the damage to the vehicle.

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

7. Mark and cut the panel in the locations where sectioning is to be performed.

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

9. Remove the damaged outer center pillar.

**Installation Procedure**
1. From the service part, cut the replacement panel in corresponding locations to overlap the remaining original panel by 25 mm (1 inch) at each joint.
2. Prepare all attachment 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 outer center pillar to the vehicle using 3-dimensional measuring equipment. Clamp in place.
5. Weld accordingly at the original weld locations.
6. Clean and prepare all welded surfaces.
7. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
9. Install all related panels and components.
10. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Single Battery)/Battery Negative Cable Disconnection and Connection (Dual Battery).
11. Enable the SIR system. Refer to SIR Disabling and Enabling.
Center Pillar Outer Panel Reinforcement Replacement

Removal Procedure

Warning: Refer to Approved Equipment for Collision Repair Warning.
Warning: Refer to Foam Sound Deadeners Warning.
Warning: Refer to Battery Disconnect Warning.

Note: The center pillar outer panel reinforcement is made of Ultra High Strength Steel. Sectioning, or repair of Ultra High Strength Steel is not recommended. It should be replaced as a complete assembly at factory locations. Refer to Ultra High Strength Steel.

Note: This procedure was developed to allow access for the complete replacement of the center pillar outer panel reinforcement without removing the roof panel. There are sectioning procedures available for various locations of the body side outer panel. The location should be chosen based on the extent of the damage to the vehicle and other inner reinforcements that need to be replaced. Sectioning should be performed only in the recommended areas. Failure to do so may compromise the structural integrity of the vehicle. Refer to other service procedures for additional sectioning locations. This procedure shows a crew cab, the extended cab is similar.

1. Disable the SIR System and then disconnect the negative battery cable. Refer to SIR Disabling and Enabling.
2. Remove all related panels and components.
3. Repair as much of the damaged area as possible. Refer to Dimensions - Body.
4. Remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
5. Remove body side outer as necessary for access to the Center Pillar Outer Panel Reinforcement.

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

6. Remove all necessary factory welds (1).
7. Remove the damaged center pillar reinforcement (1).

Installation Procedure
1. Clean and prepare all mating surfaces, as necessary for welding.
2. Align the center pillar reinforcement.
3. Drill 8 mm (5/16 in) for plug welding along the top and bottom of the center pillar reinforcement (1) as noted from the original panel.
4. Position the center pillar reinforcement (1) on the vehicle using 3-dimensional measuring equipment.
5. Verify the fit of the center pillar reinforcement.
6. Clamp the center pillar reinforcement into position.

7. Weld accordingly at the original weld locations (1).
8. Complete body side outer sectioning as necessary.
9. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
11. Install all related panels and components.
12. Enable the SIR system and then connect the negative battery cable. Refer to SIR Disabling and Enabling.
Rear Pillar Sectioning

Removal Procedure

Warning: Refer to Approved Equipment for Collision Repair Warning.

Warning: Refer to Glass and Sheet Metal Handling Warning.

Warning: Refer to Collision Sectioning Warning.

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 (Single Battery)/Battery Negative Cable Disconnection and Connection (Dual Battery).

3. Remove all related panels and components.

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

Warning: Refer to Foam Sound Deadeners Warning.

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

6. Perform additional sectioning procedures, as necessary. Refer to the following procedures:
   - Front Hinge Pillar Sectioning
   - Rocker Outer Panel Sectioning
   - Center Pillar Sectioning
**Note:** This procedure shows sectioning the rear pillar at the rocker, the specific area to be sectioned is determined by the extent of the damage to the vehicle.

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

7. Mark and cut the panel in the locations where sectioning is to be performed.

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

9. Remove the damaged pillar section.
1. From the service part, cut the replacement panel in corresponding locations to overlap the remaining original panel by 25 mm (1 inch) at each joint.

2. Prepare all attachment 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 pillar to the vehicle using 3-dimensional measuring equipment. Clamp in place.
5. Weld accordingly.

6. Clean and prepare all welded surfaces.

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


9. Install all related panels and components.

10. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Single Battery) Battery Negative Cable Disconnection and Connection (Dual Battery).

11. Enable the SIR system. Refer to SIR Disabling and Enabling.
Removal Procedure

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

1. Remove the pickup box assembly. Refer to Pickup Box Replacement (Long Box) Pickup Box Replacement (Standard Box).
2. Restore as much damage as possible.
3. Note the location and remove the sealers and anti-corrosion materials from the repair area as necessary. Refer to Anti-Corrosion Treatment and Repair.
4. Locate and drill out all factory welds. Note the location of the welds for installation of the service part.
5. Remove the front panel.

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 part. 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. Align the service part to the pickup box.
4. Plug weld into position.
5. Clean and prepare all welded surfaces.
6. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
7. Paint and repair the area. Refer to Basecoat/Clearcoat Paint Systems.
8. Install the pickup box assembly. Refer to Pickup Box Replacement (Long Box) Pickup Box Replacement (Standard Box).
Pickup Box Replacement - Side

Description
This procedure shows illustrations for the 6.6L box. The 5.8, 8.0, and dually pickup boxes are similar. This procedure may be used for all pickup box sizes.

Removal Procedure

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

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

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

6. Locate and drill out the spot welds along the front bed panel.
**Note:** Structural adhesive is used to bond the front stake pocket reinforcement to the mating cross sill.

7. Use a heat gun or a chisel to separate the stake pocket reinforcement from the cross sill (1).

8. Remove the side panel.

**Installation Procedure**

1. Drill 8 mm (5/16 in) plug weld holes in the service part as noted.

2. Prepare all mating surfaces as necessary.

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

**Note:** Before you begin the repair, refer to Metal Panel Bonding for proper adhesive preparation and general information.

4. Grind the surface of the pickup box cross sill and the front stake pocket reinforcement mating flanges to bare steel.
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 both of the mating surfaces. Cover all of the bare metal to ensure corrosion protection.

7. Apply three 9–13 mm (3/8–1/2 in) beads of metal panel bonding adhesive as shown.

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

8. Position the service side panel to the bed assembly.
9. Plug weld as necessary

10. Clean and prepare all welded surfaces.

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


13. Install all related panels and components.

14. Install the box assembly. Refer to Pickup Box Replacement (Long Box) Pickup Box Replacement (Standard Box).
Pickup Box Outer Side Panel Replacement (Bond-On)

Removal Procedure

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

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

**Note:** Before you begin the repair, refer to Metal Panel Bonding for proper adhesive preparations and general information.

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

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

6. Locate and drill out spot welds on the upper rail and the rear sill area.
7. Structural adhesive is present between the upper inner panel (1) and the outer panel. If necessary, use a chisel to separate the outer panel from the inner panel.

8. Remove the side panel.

Installation Procedure

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

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

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

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

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

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

8. Clamp the service side panel into position.

9. Using lacquer thinner remove the excess adhesive from the bed side panel area.

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

12. Install all related panels and components.

13. Install the box assembly. Refer to Pickup Box Replacement (Long Box) Pickup Box Replacement (Standard Box).
Pickup Box Outer Side Panel Replacement (Weld-On)

Removal Procedure

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

**Important:** Before you begin the repair, refer to Metal Panel Bonding for proper adhesive preparations and general information.

1. Remove the box assembly. Refer to Pickup Box Replacement (Long Box) Pickup Box Replacement (Standard Box).
2. Remove all related panels and components.
3. Repair as much of the damage as possible, according to factory specifications.
4. Note the location and remove the sealers and anti-corrosion materials from the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
5. Note the number and location of all spot welds to be drilled out for installation of the service part.
6. Locate and drill out the spot welds attaching the front panel wheelhouse and the tail lamp pocket area.
7. Locate and drill out the spot welds attaching the front panel, the wheelhouse and the tail lamp pocket area.
8. Locate and drill out the spot welds along the upper rail and the rear sill area.
9. Structural adhesive is present between the upper inner panel (1) and the outer panel. If necessary, use a chisel to separate the outer panel from the inner panel.

10. Remove the side panel.

Installation Procedure

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

**Important:** Do not pull the panels apart after the panels have been joined together. Slide the panels against each other to align the panels.
5. Position the service part onto the bed assembly.

6. Plug weld as necessary
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. Install the box assembly. Refer to Pickup Box Replacement (Long Box)Pickup Box Replacement (Standard Box).
Warning: Refer to Approved Equipment for Collision Repair Warning.

1. Locate and drill out the spot welds.
2. Remove the tie down loop.

Installation Procedure

1. Prepare all mating surfaces as necessary.
2. Apply GM–approved Weld-Thru coating or equivalent to all mating surfaces. Refer to Anti-Corrosion Treatment and Repair.
3. Position the tie down loop.
4. Plug weld accordingly.
5. Clean and prepare all welded surfaces.
6. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
7. Paint and repair the area. Refer to Basecoat/Clearcoat Paint Systems.
Resistance Spot Welded Full Panel Replacement

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

Removal Procedure

Warning: Refer to Approved Equipment for Collision Repair Warning.

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

Warning: Refer to Foam Sound Deadeners Warning.

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

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

7. Remove the damaged part (1).

Installation Procedure

Note: If the location of the original plug weld holes cannot be determined, space the plug weld holes every 40 mm (1½ in) apart. Where structural adhesive was present, space the plug weld holes every 20 mm (3/4 in) apart.

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

3. Position the service part. Clamp in place.

4. Apply welds accordingly (1).

5. Clean and prepare all welded surfaces.

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

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

8. Install all related panels and components.

9. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Single Battery)/Battery Negative Cable Disconnection and Connection (Dual Battery).

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

Removal Procedure

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

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

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

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

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

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

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

7. Remove the damaged part (1).

Installation Procedure
Note: If the location of the original plug weld holes can not be determined, space the plug weld holes every 40 mm (1 1/2 in) apart. Where structural adhesive was present, space the plug weld holes every 20 mm (3/4 in) apart.

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

6. Plug weld accordingly (1).
7. Clean and prepare all welded surfaces.
8. Apply the sealers and anti-corrosion materials to the repair area, as necessary. Refer to Anti-Corrosion Treatment and Repair.
10. Install all related panels and components.
11. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection (Single Battery) Battery Negative Cable Disconnection and Connection (Dual Battery).
12. Enable the SIR system. Refer to SIR Disabling and Enabling.
Description and Operation

Dual Phase Steel

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

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

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

**Recommended Repairs**

- Cold repairs can be performed on this type of steel, unless the damage includes kinks. If the damage includes kinks, the part should be replaced.

- Sectioning or partial replacement of this type of steel is recommended only at approved locations, in a specific sectioning procedure.

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

- Squeeze Resistance Spot Welding can be used to replace factory spot welds, where applicable.

- MIG plug welding and MIG stitch welding can be used on this type of steel.

- MIG Brazing can be used on this type of steel.
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.

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>
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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>
</tr>
<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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</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>
</tr>
<tr>
<td>GM P/N 88901674 (Canada)</td>
<td>Medium Set Panel Bonding Adhesive</td>
</tr>
<tr>
<td>Lord Fusor P/N 110B/111B</td>
<td>Panel Bonding Adhesive</td>
</tr>
<tr>
<td>GM P/N 12378567 (US)</td>
<td>Panel Bonding Adhesive</td>
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<td>GM P/N 88901675 (Canada)</td>
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<tr>
<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.