



SP71A

Rocker Panel

**Uniform
Procedures For
Collision Repair
UPCR**

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v.4.0



1. Description

This procedure describes the repair and complete or partial replacement of an aluminum rocker panel assembly. Inspection and evaluation requirements are also included.



2. Purpose

The purpose of this procedure is to provide industry-accepted requirements for performing high-quality repair of aluminum rocker panel assemblies. This procedure is intended for use by professionals who are qualified through training and experience.



3. Referenced Documents

The following documents are considered to be part of this procedure by reference.

3.1 Procedures

- CP01A Corrosion Protection
- DO21 Door
- ME01 Three-Dimensional Measuring
- PS01 Personnel Safety
- RE01 Seat Belt
- RE21 Airbag Systems
- RE22 Airbag Systems, Side
- RE31 Tensioners, Seat Belt
- RF41 Finish Application
- ST01A Stress-Relieving Heat Limitations
- ST11 Structural Straightening
- ST21A Metal Repairs
- ST31 Body Fillers
- WE01A GMA (MIG) Plug Weld
- WE11A GMA (MIG) Fillet Weld
- WE21A GMA (MIG) Butt Joint With Backing

3.2 Other Information

- Equipment-specific information
- Product-specific information
- Vehicle-specific dimension specifications
- Vehicle-specific repair information



4. Equipment And Material Requirements

4.1 Welding Equipment

Use GMA (MIG) welding equipment as described in **WE01A**, **WE11A** or **WE21A**.

4.2 Welding Filler Wire

Welding filler wire must be compatible with the base metal alloy being joined. See **WE01A**, **WE11A** or **WE21A**.

4.3 Straightening And Measuring Equipment

Use straightening equipment as described in **ST11**.

Use measuring equipment as described in **ME01**.

4.4 Special Equipment

Use tools and materials, such as abrasives, that are designated for use only on aluminum, to avoid surface contamination.

A stainless steel wire brush, dedicated for use on aluminum, is recommended for cleaning aluminum before making a weld.

A power saw is recommended for cutting aluminum parts for partial replacement.



5. Damage Analysis

5.1 General Damage

Inspect an aluminum rocker panel assembly for these types of damage:

- visible damage
- corrosion
- dimensional misalignment
- misalignment with adjacent panels
- improper previous repairs
- cracked seam sealers

Determine how much of the rocker panel can be straightened, and the portion that must be replaced. Verify the availability of replacement parts. Follow the vehicle maker's recommendations for joint locations.

Note: Some vehicle makers recommend against welding tears in aluminum alloys.



6. Personnel Safety

6.1 General Safety

General safety information is in **PS01**.

Inspect for fuel or brake lines that may be routed along or through the rocker panel before starting repairs.

Inspect the repair area for seat belt tensioners.

6.2 Pulling Safety

Pulling safety information is in **ST11**.

6.3 Welding Safety

Welding safety information is in **WE01A**, **WE11A** or **WE21A**.

6.4 Safety With Power Tools And Electrical Equipment

Power tool and electrical equipment safety information is in **ST21A**.

6.5 Safety With Restraint Systems

Restraint system safety information is in **RE21**, **RE22** and **RE31**.



7. Environmental Safety

Does not apply.



8. Vehicle Protection

8.1 Electronic Parts

To protect computers and other sensitive parts from damage:

- Follow the vehicle maker's recommendations for recording and resetting electronic memories.
- Ensure that the ignition switch is in the LOCK position, and the key is removed.
- Disconnect and isolate the negative battery cable, and disarm the passive restraint system. Follow the vehicle maker's recommendations.

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8. Vehicle Protection (cont'd)

- Carefully remove computer modules when welding or heating within 300 mm (12"), or a greater distance when recommended by the vehicle maker.
- Protect computer modules, connectors, and wiring from contamination such as dirt, heat, static electricity, and moisture.
- Loosen or remove any wiring harnesses or electrical parts that could be damaged during the repair process.

8.2 Adjacent Areas

Protect glass, upholstery, and other cosmetic surfaces from welding, grinding, or cutting sparks. Remove glass, interior trim, and adjacent parts that cannot be protected.

Remove or relocate any wiring, brake lines, or fuel lines that may be attached to, or routed through, the rocker panel.

8.3 Aluminum Surfaces

To prevent damaging aluminum surfaces:

- Use an orbital or dual-action sander. Do not use a disc grinder.
- Use 80-grit or finer, open-coat sanding discs.
- Use foam backing pads instead of stiff backing pads.
- Apply less pressure than when sanding steel.
- Do not sand continuously in the same area.
- Keep sanding discs and other abrasives separate from those used for steel repairs.
- Make sure the faces and edges of metal hammers and dollies are smooth and polished and have rounded edges.
- Make sure the points of picks are not sharp. File or grind the tips until they are rounded or flat. An option is to use a tip made of rubber or plastic, or cover the tip with tape.
- Use a dull file.
- Do not use shrinking hammers.

8.4 Galvanic Corrosion

Avoid galvanic corrosion of aluminum parts by following the procedures in **CP01A**.

To prevent galvanic corrosion when straightening aluminum parts:

- Ensure that all tools are cleaned before, or are dedicated for, use on aluminum.
- Thoroughly remove steel particles from power tools before use.
- Keep hand tools separate from those used for steel repairs.
- Keep sanding discs and other abrasives separate from those used for steel repairs.

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8. Vehicle Protection (cont'd)

8.5 Use Of Heat

The improper application of heat on aluminum alloys can greatly affect their strength. To prevent permanent softening, or increasing brittleness, of certain alloys, the temperature and heating time must be strictly controlled. Follow the vehicle maker's recommendations for applying heat to aluminum parts.

If vehicle maker recommendations are not available, keep the repair temperature between 200°C (400°F) and 300°C (570°F), while limiting the total heating time to no more than 15 minutes. Use temperature-measuring methods as described in **ST01A**.

Note: Some vehicle makers recommend against the use of heat on certain parts.



9. Repair Procedure

9.1 Straightening

To straighten an aluminum rocker panel assembly:

- 1. Reposition or remove the doors, pillars, floor pan, trim panels, and other parts required for access or to prevent damage.
- 2. Thoroughly clean the repair area to remove dirt, grease, sealers, sound deadeners, anti-corrosion materials, etc.
- 3. Make sure the vehicle is properly anchored to the straightening system.
- 4. Make underbody and upperbody measurements using a three-dimensional measuring system to determine the location of the rocker panel and surrounding structure.
- 5. Make door-opening diagonal measurements to determine the location of the rocker panel.
- 6. Use multiple pulls and heat, if needed, to return the rocker panel and surrounding structure to proper dimensions. Follow the repair and tolerance recommendations of the vehicle maker. If no recommendations are given, use a tolerance of ± 3 mm ($1/8$ "). Use a three-dimensional measuring system and adjacent panels to verify that the part is properly aligned. Check the fit and alignment of adjacent parts, such as the doors, pillars, and floor pan.

Note: If heat is used, follow the vehicle maker's temperature and time recommendations. Some vehicle makers recommend against the use of heat on some parts or product forms. Refer to the vehicle maker's repair information to locate any foam-fillers, fuel or brake lines, or wiring before applying heat.

- 7. Replace any areas that are kinked, have stress cracks, or develop cracks during straightening. Some vehicle makers recommend against welding tears in aluminum alloys. If complete replacement is required, see **9.2** and **9.3**. For sectioning, see **9.4** and **9.5**.

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9. Repair Procedure (cont'd)

- 8. Apply body fillers, if required. The panel must be within 3 mm ($\frac{1}{8}$ ") of its original contour for most body filler applications. Follow the filler maker's recommendations. Ensure that the body filler used is compatible with aluminum. Some vehicle and product makers recommend the application of a two-part epoxy primer before applying body fillers to aluminum.
- 9. Apply corrosion-resistant primer to all interior and exterior surfaces damaged by the collision, repairs, or anchoring.
- 10. Apply seam sealers, as required to seal the joints and restore the appearance. Reprime if required by the product maker.
- 11. Replace foam fillers, if required. Follow the vehicle maker's recommendations.
- 12. Apply anti-corrosion compounds to enclosed areas, if required.
- 13. Refinish areas damaged by the collision, repairs, or anchoring, if required to restore the appearance.
- 14. Continue vehicle reassembly.
- 15. Refinish cosmetic surfaces after all body repairs are complete.
- 16. Complete the final reassembly after refinishing is complete. See 9.6.

9.2 Complete Removal

To remove a complete aluminum rocker panel assembly:

- 1. Reposition or remove the doors, pillars, floor pan, trim panels, and other parts required for access or to prevent damage.
- 2. Thoroughly clean the repair area to remove dirt, grease, sealers, sound deadeners, anti-corrosion materials, etc.
- 3. Perform measurements and adjacent panel alignment and straightening. See 9.1.
- 4. Identify areas of overlapped panels to ensure that the replacement panel will be in the same relative position.
Note: It may be necessary to remove undamaged parts or reinforcements to remove the B-pillar.
- 5. Locate and mark all spot weld and rivet locations.
- 6. Drill out the spot welds and rivets. Do not damage the parts which are not to be replaced. Use the proper size and type of spot-weld cutter. It may be necessary to remove undamaged adjacent parts.
- 7. Remove the damaged rocker panel. Heat may be required to help separate adhesively bonded joints. Do not discard any labels until replacements are obtained.
- 8. Remove any burrs or spot weld nuggets from the mating surfaces, and repair any damage.
- 9. Remove any foam fillers from the weld joint areas, if required. Follow the vehicle maker's recommendations.
- 10. Straighten the mating panel edges, if required to ensure a proper fit-up with the replacement rocker panel.

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9. Repair Procedure (cont'd)

9.3 Complete Installation

To install a complete replacement aluminum rocker panel assembly:

- 1. Verify that the proper parts are being installed by checking the part number and performing a trial fit. Ensure that all mating surfaces are properly aligned.
- 2. Clean the mating surfaces with the proper surface cleaner.
- 3. Refer to the vehicle maker's recommendation for the location, number, and size of plug weld holes. If no recommendations are available, punch or drill 10 mm ($\frac{3}{8}$ ") holes in the outer panel at the same locations used originally by the vehicle maker.
- 4. Use a stainless steel brush, designated for use on aluminum only, to remove aluminum oxide from the weld locations. Do not touch cleaned areas.
- 5. Test-fit the replacement rocker panel, and clamp or securely hold it in place. Ensure that all drain tubes and other parts are properly routed.
- 6. Test-fit the front and rear doors.
- 7. Use adjacent panels, the front and rear doors, and a three-dimensional measuring system to verify that the rocker panel is properly aligned.
- 8. Mark the location of the rocker panel and remove it from the vehicle.
- 9. Apply adhesive when recommended by the vehicle maker. Avoid applying the adhesive in the weld areas.
- 10. Position the rocker panel on the vehicle and clamp or securely hold it in place.
- 11. Verify that the rocker panel is properly aligned.
- 12. Tack weld, or securely hold, the rocker panel in position. Ensure that the proper electrode wire is being used for the type of alloy being welded
- 13. Recheck the alignment.
- 14. Install any rivets, following the vehicle maker's recommendations.
- 15. Make test welds, before welding on the vehicle, using the same type and thickness metal that will be welded on the vehicle. Make the test welds in the same position as the welds on the vehicle. Visually inspect and destructively test the welds before welding on the vehicle.
- 16. Make the required welds. Make all welds as long as possible, without causing heat distortion, to avoid start and stop defects. Use a dye penetrant to check the repair area for cracks. Correct any defects.
- 17. Use the three-dimensional measuring system and adjacent panels to verify that the rocker panel assembly is still properly aligned.
- 18. Dress the welds, if required to restore the appearance.
- 19. Apply body fillers to the joint areas, if required to restore the appearance. The panel must be within 3 mm ($\frac{1}{8}$ ") of its original contour for most body filler applications. Follow the filler maker's recommendations. Ensure that the body filler used is compatible with aluminum. Some vehicle and product makers recommend the application of a two-part epoxy primer before applying body fillers to aluminum.
- 20. Apply corrosion-resistant primer to interior and exterior surfaces damaged by the collision, repairs, or anchoring.

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9. Repair Procedure (cont'd)

- 21. Apply seam sealers, if required to seal the joints and restore the appearance. Reprime if required by the product maker.
- 22. Apply anti-corrosion compounds to enclosed areas, if required.
- 23. Reinstall the brake and fuel lines, doors, trim panels, and other parts, if required.
- 24. Replace foam-fillers, as required. Follow the vehicle maker's recommendations.
- 25. Refinish areas damaged by the collision, repairs, or anchoring, if required to restore the appearance.
- 26. Continue vehicle reassembly.
- 27. Refinish cosmetic surfaces after all body repairs are complete.
- 28. Complete the final reassembly after refinishing is complete. See **9.6**.

9.4 Partial Removal

To remove the damaged portion of an aluminum rocker panel for partial replacement:

- 1. Reposition or remove the doors, pillars, floor pan, trim panels, and other parts required for access or to prevent damage.
- 2. Thoroughly clean the repair area to remove dirt, grease, sealers, sound deadeners, anti-corrosion materials, etc.
- 3. Perform measurements and adjacent panel alignment and straightening. See **9.1**.
- 4. Select the cut locations based on the repair procedure.
- 5. Measure and mark the cut locations.
- 6. Cut the undamaged portion of the rocker panel slightly longer than the final cut locations, using a saw.
- 7. Locate and mark the spot weld and rivet locations on the portion to be removed.
- 8. Drill out the spot welds and rivets. Do not damage any parts which are not to be replaced. Use the proper size and type of spot weld cutter.
- 9. Remove the damaged portion of the rocker panel from the vehicle. Heat may be required to help separate adhesive bonded joints. Do not discard any labels until replacements are obtained.
- 10. Remove any foam fillers from the weld joint areas, if required. Follow the vehicle maker's recommendations.
- 11. Trim the remaining edges of the rocker panel to the exact cut locations.
- 12. Remove all burrs or spot weld nuggets from the mating surfaces, and repair all damage.
- 13. Straighten the mating panel edges, if needed to ensure a proper fit-up with the replacement portion.

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9. Repair Procedure (cont'd)

9.5 Partial Installation

To install a replacement aluminum rocker panel section:

- ❑ 1. Compare the replacement part to the original part by part number, visual inspection and measuring. Measure across the area to be sectioned using three or more reference points, such as holes, notches, weld seams, or feature lines. If no reference points exist on the replacement part, make reference marks on both parts.
- ❑ 2. Cut the replacement rocker panel to the proper length and shape for the type of joint recommended by the vehicle maker, or included in another verified procedure. The type of joint selected may require the use of an insert.
- ❑ 3. Clean the mating surfaces with the proper surface cleaner.
- ❑ 4. Refer to the vehicle maker's recommendation for the location, number, and size of plug weld holes. If no recommendations are available, punch or drill 10 mm ($\frac{3}{8}$ ") holes in the replacement panel at the same locations used originally by the vehicle maker.
- ❑ 5. Use a stainless steel brush, designated for use on aluminum only, to remove aluminum oxide from the weld locations. Do not touch cleaned areas.
- ❑ 6. Test-fit the partial rocker panel, and clamp or securely hold it in place.
- ❑ 7. Use adjacent panels and a three-dimensional measuring system to verify that the rocker panel is properly aligned.
- ❑ 8. Mark the location of the rocker panel and remove it from the vehicle.
- ❑ 9. Apply adhesive when recommended by the vehicle maker. Avoid applying the adhesive in the weld areas.
- ❑ 10. Position the partial rocker panel on the vehicle and clamp or securely hold it in place.
- ❑ 11. Verify that the rocker panel is properly aligned.
- ❑ 12. Tack weld, or securely hold, the partial rocker panel in position. Ensure that the proper electrode wire is being used for the type of alloy being welded.
- ❑ 13. Recheck the alignment.
- ❑ 14. Install any rivets, following the vehicle maker's recommendations.
- ❑ 15. Make test welds, before welding on the vehicle, using the same type and thickness metal that will be welded on the vehicle. Make the test welds in the same position that will be used on the vehicle. Visually inspect and destructively test the welds before welding on the vehicle.
- ❑ 16. Make the required welds. Make all welds as long as possible, without causing heat distortion, to avoid start and stop defects. Use a dye penetrant to check the repair area for cracks, only if recommended by the vehicle maker. Correct any defects.
- ❑ 17. Use the three-dimensional measuring system and adjacent panels to verify that the rocker panel is still properly aligned.
- ❑ 18. Dress the welds, if required to restore the appearance.
- ❑ 19. Apply body fillers to the joint areas, if required to restore the appearance. The panel must be within 3 mm ($\frac{1}{8}$ ") of its original contour for most body filler applications. Follow the filler maker's recommendations. Ensure that the body filler used is compatible with aluminum. Some vehicle and product makers recommend the application of a two-part epoxy primer before applying body fillers to aluminum.

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9. Repair Procedure (cont'd)

- 20. Apply corrosion-resistant primer to interior and exterior surfaces damaged by the collision, repairs, or anchoring.
- 21. Apply seam sealers, if required to seal the joints and restore the appearance. Reprime if required by the product maker.
- 22. Apply anti-corrosion compounds to enclosed areas, if required.
- 23. Reinstall the brake lines, fuel lines,, wiring, and other required parts.
- 24. Replace foam fillers, as required. Follow the vehicle maker's recommendations.
- 25. Refinish areas damaged by the collision, repairs, or anchoring, as required to restore the appearance.
- 26. Continue vehicle reassembly.
- 27. Refinish cosmetic surfaces after all body repairs are complete.
- 28. Complete the final reassembly after refinishing is complete. See **9.6**.

9.6 Final Reassembly

To complete the reassembly after refinishing is complete:

- 1. Install, labels, weatherstripping, etc.
- 2. Transfer or install replacement parts such as exterior trim, etc. Include spacers, washers, isolators, etc., required to prevent contact between dissimilar metals.
- 3. Check the doors for proper latching. Align the strikers and latch assemblies, if required.
- 4. Lubricate the latch assemblies, if applicable, following the vehicle maker's recommendations.
- 5. Reroute any electrical wiring, drain tubes, brake and fuel lines, to their original locations.
- 6. Reconnect all electrical connectors.
- 7. Verify the proper operation of all door- and pillar-mounted lamps and electrical accessories.
- 8. Verify the proper operation of the restraint system.
- 9. Bleed the brakes, following the vehicle maker's recommendations, if required.
- 10. Perform a water leak test to ensure proper sealing of the doors. See **11.2**.
- 11. Install all removed interior trim.
- 12. Complete the steps in the final reassembly section of all appropriate procedures.



10. Use Of Recycled (Salvage) Parts

10.1 Inspection Of Salvage Parts

Do not install a salvage aluminum rocker panel having any of these defects:

- unrepairable damage
- corrosion that has caused pitting
- improper previous repairs
- missing or damaged mounting locations

10.2 Preparation Of Salvage Parts

To prepare a salvage aluminum rocker panel for installation:

- Make any required repairs.
- Trim the part to fit.
- Remove all heat-affected zones.
- Make sure the part is not deformed along the weld joints.
- Remove any corrosion.



11. Inspection And Testing

11.1 Inspection Of A Repaired Or Replaced Aluminum Rocker Panel

Inspect a repaired or replaced aluminum rocker panel for these conditions:

- dimensional alignment
- weld quality
- proper finish appearance and film thickness
- proper application of corrosion protection
- proper installation of seam sealers
- proper installation of sound-deadening materials
- proper alignment with adjacent parts
- proper installation of all interior trim, labels, weatherstripping, and fasteners
- proper operation of all door-mounted lamps and electrical accessories
- proper lubrication of the latch assemblies
- correct routing of wiring harnesses, operating cables, and brake and fuel lines
- proper operation of the brake and fuel systems
- proper operation of the restraint system
- proper alignment, sealing, and operation of door mechanisms, hinges, latches, and locks
- proper installation of any spacers, washers, isolators, etc., required to prevent contact between dissimilar metals

Correct any defects.

11.2 Water-Leak Test

To test for water leaks:

1. Protect the vehicle interior.
2. Apply water at low pressure around the perimeter of the doors from the outside of the vehicle, starting at the bottom and working up.
3. Look for water leaks on the inside.

Correct any water leaks, and repeat the test.