



RB01A

Rear Body 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 rear body panel. 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 rear body panels. This procedure is intended for use by professionals who are qualified through training and experience.



3. Referenced Documents

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

3.1 Procedures

- CP01A Corrosion Protection
- ME01 Three-Dimensional Measuring
- PS01 Personnel Safety
- RF41 Finish Application
- ST01A Stress-Relieving Heat Limitations
- ST11 Structural Straightening
- ST21A Metal Repair
- ST31 Body Fillers
- WE01A GMA (MIG) Plug Weld
- WE11A GMA (MIG) Fillet Weld

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** or **WE11A**.

4.2 Welding Filler Wire

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

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.



5. Damage Analysis

5.1 General Damage

Inspect an aluminum rear body panel for these types of damage:

- visible damage
- corrosion
- improper previous repairs
- dimensional misalignment
- misalignment with adjacent panels
- broken or damaged welds
- cracked seam sealers

Determine whether the rear body panel is to be repaired or 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**.

6.2 Pulling Safety

Pulling safety information is in **ST11**.

6.3 Welding Safety

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

6.4 Safety With Power Tools And Electrical Equipment

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



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.
- 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 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 interior trim and adjacent parts that cannot be protected.

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8. Vehicle Protection (cont'd)

8.3 Aluminum Surfaces

To prevent damaging aluminum surfaces:

- Ensure that all tools are cleaned before, or are dedicated for, use on aluminum.
- Use an orbital or dual-action sander. Do not use a hand-held 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 operate a sander 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 do not have sharp points. 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

To prevent galvanic corrosion when straightening aluminum parts:

- 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.

8.5 Use Of Heat

The application of heat on aluminum alloys can greatly reduce their strength. Determine if the vehicle maker recommends against the use of heat for aluminum parts. If heat is used during aluminum repairs, stay within the recommended temperatures to prevent permanent loss of strength. Use a minimum of 200°C (400°F), and a maximum of 300°C (570°F), unless otherwise directed by the vehicle maker. Use temperature-measuring methods as described in **ST01A**.



9. Repair Procedure

9.1 Straightening

To straighten an aluminum rear body panel:

- 1. Remove or reposition the bumper, bumper cover, lamps, trim panels and other parts required for access or to prevent damage.
- 2. Make sure the vehicle is properly anchored to the straightening system.
- 3. Make underbody and upperbody measurements to determine the location of the rear body panel.
- 4. Use multiple pulls and stress-relieving to return the rear body panel 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 attached and adjacent parts, such as rear lamps, deck lid, and rear bumper.
- 5. If heat is used for relieving stress, follow the vehicle maker's temperature and time recommendations.
Note: Some vehicle makers recommend against the use of heat for stress-relieving. Some vehicle makers recommend against welding tears in aluminum alloys. Refer to the vehicle maker's repair information to locate any internal drain tubes or wiring before applying heat.
- 6. Plan to replace any areas that are kinked, have stress cracks, or develop cracks during straightening. If complete replacement is required, see **9.2** and **9.3**. For sectioning, see **9.4** and **9.5**.
- 7. Apply body fillers, if required. The panel must be within 3 mm ($1/8$ ") 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.
- 8. Apply corrosion-resistant primer to all interior and exterior surfaces damaged by the collision, repairs, or anchoring.
- 9. Apply seam sealers, as required, to seal the joints and restore the appearance. Reprime if required by the product maker.
- 10. Apply anti-corrosion compounds to all enclosed areas.
- 11. Refinish areas damaged by the collision, repairs, or anchoring, as required to restore the appearance.
- 12. Continue vehicle reassembly.
- 13. Refinish cosmetic surfaces after all body repairs are complete.
- 14. Complete the final reassembly after refinishing is complete. See **9.6**.

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9. Repair Procedure (cont'd)

9.2 Complete Panel Removal

To remove a complete rear body panel:

- 1. Make sure all adjacent panels are in alignment before removing the rear body panel.
- 2. Loosen or remove the bumper, bumper cover, and rear lamps, if required.
- 3. Loosen, remove, or support the deck lid, if required.
- 4. Reposition or remove any attached mechanical parts, wiring, computers, or electronic parts.
- 5. Perform underbody and upperbody measurements and adjacent panel alignment and straightening. See 9.1.
- 6. Locate and mark all spot weld locations.
- 7. Drill out the spot welds. Do not damage any panels which are not to be replaced. Use the proper size and type of spot-weld cutter.
- 8. Remove the damaged rear body panel. Do not discard any labels until replacements are obtained.
- 9. Remove any burrs or spot weld nuggets from the mating surfaces, and repair any damage.
- 10. Straighten the mating panel edges, if required to ensure proper fit-up with the replacement part.

9.3 Complete Panel Installation

To install a complete replacement rear body panel:

- 1. Verify that the proper parts are being installed by checking the part number and performing a trial fit.
- 2. Clean the mating surfaces with the proper surface cleaner.
- 3. Use a stainless steel brush, designated for use on aluminum only, to remove aluminum oxide from the weld locations.
- 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 outer panel at the same locations used originally by the vehicle maker. If using a lap joint, allow for a minimum of 6 mm ($\frac{1}{4}$ ") overlap.
- 5. Test-fit the replacement rear body panel and clamp or securely hold it in place.
- 6. Use adjacent panels, rear lamps, and a three-dimensional measuring system to verify that the part is properly aligned.
- 7. Remove the replacement rear body panel from the vehicle.
- 8. Apply weld-bond adhesive when recommended by the vehicle maker.
- 9. Position the part on the vehicle and clamp it in place.
- 10. Verify that the part is properly aligned.
- 11. Tack weld, or securely hold, the part in position.
- 12. Recheck the alignment to the adjacent panels.

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9. Repair Procedure (cont'd)

- 13. 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.
- 14. Make the required welds.
- 15. Use the three-dimensional measuring system and adjacent panels to verify that the part is still properly aligned.
- 16. Dress the welds, if required to restore the appearance.
- 17. Apply corrosion-resistant primer to all interior and exterior surfaces damaged by the collision, repairs, or anchoring.
- 18. Apply seam sealers, if required to seal the joints and restore the appearance. Reprime if required by the product maker.
- 19. Apply anti-corrosion compounds to all enclosed areas.
- 20. Refinish areas damaged by the collision, repairs, or anchoring, if required to restore the appearance.
- 21. Continue vehicle reassembly.
- 22. Refinish cosmetic surfaces after all body repairs are complete.
- 23. Complete the final reassembly after refinishing is complete. See **9.6**.

9.4 Partial Panel Removal

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

- 1. Make sure all adjacent panels are in alignment before removing the rear body panel.
- 2. Loosen or remove the bumper, bumper cover, and rear lamps, if required.
- 3. Loosen, remove, or support the deck lid, if required.
- 4. Reposition or remove any attached mechanical parts, wiring, computers, or electronic parts.
- 5. Perform underbody and upperbody measurements and adjacent panel alignment and straightening. See **9.1**.
- 6. Select the cut location based on the repair procedure.
- 7. Measure and mark the cut location.
- 8. Cut the undamaged portion of the panel slightly longer than the final cut location. Avoid creating a large heat-affected zone.
- 9. Locate and mark the spot weld locations on the portion to be removed.
- 10. Drill out the spot welds. Do not damage any panels which are not to be replaced. Use the proper size and type of spot-weld cutter.
- 11. Remove the damaged portion of the rear body panel from the vehicle. Do not discard any labels until replacements can be obtained.
- 12. Trim the remaining edges of the panel to the exact cut location.
- 13. Remove any burrs or spot weld nuggets from the mating surfaces, and repair any damage.
- 14. Straighten the panel edges, if needed to ensure a proper fit-up with the replacement partial panel.

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9. Repair Procedure (cont'd)

9.5 Partial Panel Installation

To install a replacement rear body panel section:

- 1. Verify that the proper parts are being installed by checking the part number and performing a trial fit.
- 2. Compare the replacement part to the original part by 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 points on both parts.
- 3. Cut the replacement rear body panel to the proper length and shape for the type of joints recommended by the vehicle maker.
- 4. Clean the mating surfaces with the proper surface cleaner.
- 5. 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. If using a lap joint, allow for a minimum of 6 mm ($\frac{1}{4}$ ") overlap.
- 6. Test-fit the replacement partial panel and clamp or securely hold it in place.
- 7. Use adjacent panels, rear lamps, and a three-dimensional measuring system to verify that the part is properly aligned.
- 8. Remove the replacement partial panel from the vehicle.
- 9. Apply weld-bond adhesive when recommended by the vehicle maker.
- 10. Position the part on the vehicle and clamp it in place.
- 11. Verify that the part is properly aligned.
- 12. Tack weld, or securely hold, the part in position.
- 13. Recheck the alignment to the adjacent panels.
- 14. 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.
- 15. Make the required welds.
- 16. Use the three-dimensional measuring system and adjacent panels to verify that the part is still properly aligned.
- 17. Dress the welds, if required to restore the appearance.
- 18. Apply corrosion-resistant primer to all interior and exterior surfaces damaged by the collision, repairs, or anchoring.
- 19. Apply seam sealers, if required to seal the joints and restore the appearance. Reprime if required by the product maker.
- 20. Apply anti-corrosion compounds to all enclosed areas.
- 21. Refinish areas damaged by the collision, repairs, or anchoring, if required to restore the appearance.
- 22. Continue vehicle reassembly.
- 23. Refinish cosmetic surfaces after all body repairs are complete.
- 24. Complete the final reassembly after refinishing is complete. See **9.6**.

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9. Repair Procedure (cont'd)

9.6 Final Reassembly

To complete the reassembly after refinishing is complete:

- 1. Transfer or install replacement parts such as latch assemblies, etc. Include spacers, washers, isolators, etc. required to prevent contact between dissimilar metals.
- 2. Install all exterior trim, labels, weatherstripping, etc.
- 3. Check the deck lid for proper latching. Align the striker and latch assembly.
- 4. Install the rear lamps.
- 5. Reroute any electrical wiring to its original location.
- 6. Reconnect all electrical connectors.
- 7. Lubricate the latch assembly, if applicable, following the vehicle maker's recommendations.
- 8. Verify the proper operation of all rear lamps and electrical accessories.
- 9. Perform a water leak test to ensure proper sealing of the deck lid and rear lamps. Correct any defects.
- 10. Install all removed interior trim.
- 11. 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 rear body panel having any of these defects:

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

10.2 Preparation Of Salvage Parts

To prepare a salvage aluminum rear body 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 Appearance And Performance

Inspect a repaired or replaced rear body panel for these conditions:

- dimensional alignment
- weld quality
- proper finish appearance and film thickness
- proper application of corrosion protection
- proper alignment with attached and adjacent parts
- proper deck lid latching and release
- proper installation of all interior trim, labels, weatherstripping, and fasteners
- proper operation of rear lamps and electrical accessories
- proper lubrication of latch assembly
- correct routing of wiring harnesses and operating cables
- 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 deck lid, the key cylinder, rear lamps, etc. 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.