I-CAR®

Uniform Procedures For Collision Repair UPCR

QT01A Quarter Panel

 v.4.0

1. Description

This procedure describes the repair and complete or partial replacement of an aluminum quarter 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 quarter 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
PS01 Personnel Safety
QT11A Outer Wheelhouse
RF41 Finish Application
ST01A Stress-Relieving Heat Limitations
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 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 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 quarter panel for these conditions or types of damage:

- ❏ visible damage
- ❏ misalignment with adjacent panels
- ❏ improper previous repairs
- ❏ broken or damaged welds
- ❏ cracked seam sealers
- ❏ related stress damage to adjacent panels

Determine if the quarter panel will be straightened or replaced.

Follow the vehicle maker's sectioning recommendations. Not all vehicle makers recommend a vertical cut line above the wheelhouse or a cut along the beltline. Some vehicle makers recommend against welding tears in aluminum alloys.

Verify the availability of replacement parts.

6. Personnel Safety

6.1 General Safety

General safety information is in **PS01**.

6.2 Welding Safety

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

6.3 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.

Remove any electronic control modules that may be subject to impact during the repair procedure.

8.2 Adjacent Areas

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

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.

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8. Vehicle Protection (cont'd)

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 quarter panel:

- ❏ 1. Remove or reposition the bumper, bumper cover, lamps, interior trim, and other parts required for access or to prevent damage.
- ❏ 2. Remove the backlite and quarter window, if required.
- ❏ 3. Remove the fuel tank, if required for safety.
- ❏ 4. Repair damage using aluminum repair and heat shrinking procedures. If heat is to be used, see **8.5**.
  Note: Some vehicle makers recommend against welding tears in aluminum alloys.
- ❏ 5. Replace trim-mounting studs or drill mounting holes, if required.
- ❏ 6. 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.
- ❏ 7. Apply corrosion-resistant primer to all interior and exterior surfaces, and other areas damaged by the collision or repairs.
- ❏ 8. Apply seam sealers to seal the joints and restore the appearance. Reprime if required by the product maker.
- ❏ 9. Apply anti-corrosion compounds and sound deadening, if required.
- ❏ 10. Refinish areas damaged by the collision, repairs, or anchoring, to restore the appearance.

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❑ 11. Continue vehicle reassembly.
❑ 12. Refinish cosmetic surfaces after all body repairs are complete.
❑ 13. Complete the final reassembly after refinishing is complete. See **9.6**.

9.2 Complete Quarter Panel Removal

To remove a complete aluminum quarter panel:

❑ 1. Loosen or remove the bumper, bumper cover, and tail lamps, as required.
❑ 2. Reposition or remove any attached mechanical parts, wiring, computers, or electronic parts.
❑ 3. Remove the backlite and quarter window, if required. Remove old urethane in the sectioning area.
❑ 4. Remove the fuel tank.
❑ 5. Loosen, remove, or support the deck lid, if required.
❑ 6. Remove moldings and trim, if required.
❑ 7. Make sure the vehicle is properly supported and all adjacent panels are in alignment before removing the quarter panel.
❑ 8. Perform underbody and upperbody measurements and adjacent panel alignment and straightening. See **9.1**.
❑ 9. Locate and mark all spot weld locations.
❑ 10. Determine the location to separate the roof-to-quarter-panel joint, if required. Follow the vehicle maker's recommendations.
❑ 11. Drill out the spot welds. Do not damage parts attached to the quarter panel which are not to be replaced. Use the proper size and type of spot weld cutter.
❑ 12. Remove the damaged quarter panel.
❑ 13. Remove any burrs or spot weld nuggets from the mating surfaces, and repair any damage.
❑ 14. Straighten the mating panel edges, if required to ensure a proper fit-up with the replacement quarter panel.

9.3 Complete Quarter Panel Installation

To install a complete aluminum quarter panel:

❑ 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 ($^3/_8$") holes in the outer or upper panel at the same locations used originally by the vehicle maker.
❑ 4. Test-fit the replacement quarter panel and clamp or securely hold it in place.
❑ 5. Use adjacent panels, tail lamps, and a three-dimensional measuring system to verify that the part is properly aligned.

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- ❑ 6. Remove the replacement quarter panel from the vehicle.
- ❑ 7. Apply weld-bond adhesive when recommended by the vehicle maker.
- ❑ 8. Position the part on the vehicle and clamp it in place.
- ❑ 9. Verify that the assembly is properly aligned.
- ❑ 10. Tack weld or securely clamp the quarter panel in position.
- ❑ 11. Recheck the alignment using the adjacent panels. Ensure that all panel gaps and attached parts are in alignment.
- ❑ 12. 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.
- ❑ 13. Make the required welds.
- ❑ 14. Use the three-dimensional measuring system and adjacent panels to verify that the part is still properly aligned.
- ❑ 15. Dress the welds, if required to restore the appearance.
- ❑ 16. Apply body fillers to the joint areas, if required to restore the appearance. 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.
- ❑ 17. Apply corrosion-resistant primer to all interior and exterior surfaces damaged by the collision or repairs.
- ❑ 18. Apply seam sealers to seal the joints and restore the appearance. Reprime if required by the product maker.
- ❑ 19. Refinish areas damaged by the collision or repairs, if required to restore the appearance.
- ❑ 20. Apply anti-corrosion compounds to all enclosed areas.
- ❑ 21. Replace foam fillers and sound-deadening pads.
- ❑ 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 Quarter Panel Removal

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

- ❑ 1. Make sure all adjacent panels are in alignment before removing the quarter panel.
- ❑ 2. Remove the backlite and quarter window, if required.
- ❑ 3. Loosen or remove the bumper, bumper cover, and tail lamp assemblies, if required.
- ❑ 4. Remove the fuel tank, if required for safety.
- ❑ 5. Loosen, remove, or support the deck lid, if required.
- ❑ 6. Reposition or remove any attached mechanical parts, wiring, computers, or electronic parts.
- ❑ 7. Remove moldings and trim, if required. Plan to transfer or replace any spacers, washers, isolators, etc., required to prevent contact between dissimilar metals.

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9. Repair Procedure (cont'd)

- ❏ 8. Perform underbody and underbody measurements and adjacent panel alignment and straightening. See **9.1**.
- ❏ 9. Select the cut locations based on the repair procedure.
- ❏ 10. Measure and mark the cut locations.
- ❏ 11. Cut the undamaged portion of the quarter panel slightly longer than the final cut locations. Avoid creating a large heat-affected zone.
- ❏ 12. Remove any foam fillers or sound-deadening pads from the weld joint areas.
- ❏ 13. Locate and mark the spot weld locations on the portion to be removed.
- ❏ 14. Drill out the spot welds. Do not damage the parts that are attached to the quarter panel which are not to be replaced. Use the proper size and type of spot weld cutter.
- ❏ 15. Remove the damaged portion of the quarter panel from the vehicle.
- ❏ 16. Trim the remaining edges of the quarter panel back to the exact cut locations.
- ❏ 17. Remove any burrs or spot weld nuggets from the mating surfaces, and repair any damage.
- ❏ 18. Straighten the panel edges, if needed to ensure a proper fit-up with the replacement part.

9.5 Partial Quarter Panel Installation

To install a partial aluminum quarter 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 marks on both parts.
- ❏ 3. Cut the replacement quarter panel to the proper length and shape for the type of joint 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 for each part of the assembly. If no recommendations are available, punch or drill 10 mm ($^{3}/_{8}$") 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 ($^{1}/_{4}$") overlap in the flanged area. Some vehicle makers may recommend the use of a backing strip in the joint location.
- ❏ 6. Test-fit the replacement partial quarter panel and clamp or securely hold it in place.
- ❏ 7. Use adjacent panels, tail lamps, and a three-dimensional measuring system to verify that the part is properly aligned.
- ❏ 8. Remove the replacement partial quarter 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.

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9. Repair Procedure (cont'd)

- ❏ 12. Tack weld, or securely hold, the part in position.
- ❏ 13. Check 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 body fillers to the joint areas, if required to restore the appearance. 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.
- ❏ 19. Apply corrosion-resistant primer to all interior and exterior surfaces damaged by the collision, repairs, or anchoring.
- ❏ 20. Apply seam sealers to seal the joints and restore the appearance. Reprime if required by the product maker.
- ❏ 21. Refinish areas damaged by the collision, repairs, or anchoring, to restore the appearance.
- ❏ 22. Apply anti-corrosion compounds to all enclosed areas.
- ❏ 23. Replace foam fillers and sound-deadening pads.
- ❏ 24. Continue vehicle reassembly.
- ❏ 25. Refinish cosmetic surfaces after all body repairs are complete.
- ❏ 26. Complete the final reassembly after refinishing is complete. See **9.6**.

9.6 Final Reassembly

To complete the final reassembly after refinishing is complete:

- ❏ 1. Reinstall the fuel tank, if required.
- ❏ 2. Reinstall the backlite and quarter window.
- ❏ 3. Reroute any electrical wiring in its original location.
- ❏ 4. Transfer or install replacement parts such as moldings, tail lamps, and bumper assemblies. Transfer or replace spacers, washers, isolators, etc., required to prevent contact between dissimilar metals.
- ❏ 5. Install the bumper, bumper cover, lamps, interior trim and other parts that were removed or repositioned for access or to prevent damage.
- ❏ 6. Test the operation of the tail and license plate lamps and all electrical accessories.
- ❏ 7. Perform water leak tests to ensure proper sealing of the deck lid and tail lamps. See **11.2**.

10. Use Of Recycled (Salvage) Parts

10.1 Condition Of Salvage Parts

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

- ❏ unrepairable damage
- ❏ corrosion that has caused pitting
- ❏ improper previous repairs
- ❏ excessive filler thickness

10.2 Preparation Of Salvage Parts

To prepare a salvage aluminum quarter panel for installation:

- ❏ Remove any trim or moldings that are to be reused or replaced.
- ❏ Clean the part to remove dirt, wax, grease, undercoating, corrosion, excessive paint film thickness, etc.
- ❏ Trim the part to fit.
- ❏ Remove all heat-affected zones.
- ❏ Make sure the part is not deformed along the weld joints.
- ❏ Drill or fill trim-attachment holes, if required.
- ❏ Apply corrosion protection as necessary.

Transfer or replace any required bodyside moldings, stripes, decals, emblems, or other exterior trim. Transfer or replace any undamaged spacers, washers, isolators, etc., required to prevent contact between dissimilar metals.

11. Inspection And Testing

11.1 Inspection Of A Repaired Or Replaced Quarter Panel

After installation or repair, inspect an aluminum quarter panel for these conditions:

- ❏ weld quality
- ❏ proper alignment with attached and adjacent parts
- ❏ proper operation of adjacent hinged parts
- ❏ proper application of corrosion protection and sound deadening materials
- ❏ proper operation of attached electrical and electronic parts
- ❏ proper installation of all fasteners
- ❏ proper installation of all trim
- ❏ proper installation of the fuel tank and filler neck
- ❏ proper finish appearance and film thickness
- ❏ proper seal and absence of leaks
- ❏ 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, 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.