



QT11A

Outer Wheelhouse

**Uniform
Procedures For
Collision Repair
UPCR**

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v.4.0



1. Description

This procedure describes the repair and complete replacement of an aluminum outer wheelhouse. 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 outer wheelhouses. 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
- QT01A Quarter Panel
- RF41 Finish Application
- ST01A Stress-Relieving Heat Limitations
- ST21A Metal Repair
- 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 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 outer wheelhouse and adjacent parts for these types of damage:

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

Determine if the outer wheelhouse is to be repaired or replaced. Verify the availability of replacement parts.

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 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 the battery if it is near an area to be welded or heated.

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.

8.4 Anti-Theft Label

Protect the anti-theft label during repair and refinishing operations.

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8. Vehicle Protection (cont'd)

8.5 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.

8.6 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 outer wheelhouse:

- 1. Remove or reposition the bumper, bumper cover, lamps, inner splash panels and other parts required for access or to prevent damage.
- 2. Remove the fuel tank, if required for safety.
- 3. Make sure the vehicle is properly anchored to the straightening system.
- 4. Make underbody and upperbody measurements to determine the location of the wheelhouse and adjacent parts.
- 5. Straighten initial damage before removing the quarter panel or other welded parts.
- 6. Use multiple pulls and stress-relieving to return the wheelhouse and adjacent parts 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 to verify that the structure is properly aligned. Check the fit and alignment of attached and adjacent parts, such as inner reinforcements and the quarter panel. If heat is to be used, see **8.6**.

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

- 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.

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9. Repair Procedure (cont'd)

- 8. Apply corrosion-resistant primer to all interior and exterior surfaces and other areas damaged by the collision or repairs.
- 9. Apply seam sealers if required to seal the joints and restore the appearance. Reprime if required by the product maker.
- 10. Apply anti-corrosion compounds.
- 11. Refinish areas damaged by the collision, repairs, or anchoring, if required to restore the appearance. Refinish cosmetic surfaces after all body repairs are complete.
- 12. Continue vehicle reassembly.
- 13. Complete the final reassembly after refinishing is complete. See **9.6**.

9.2 Outer Wheelhouse Removal

Some vehicle makers have procedures for sectioning the outer wheelhouse. Refer to the vehicle maker's recommendations. If recommendations are not available, install the complete replacement wheelhouse.

To remove a complete aluminum outer wheelhouse:

- 1. Remove the fuel tank, if required for safety.
- 2. Make sure all adjacent panels are in alignment before removing the quarter panel and wheelhouse.
- 3. Perform underbody and upperbody measurements and adjacent panel alignment and straightening. See **9.1**.
- 4. Locate and mark all spot weld locations.
- 5. 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.
- 6. Remove the damaged wheelhouse.
- 7. Remove any burrs or spot weld nuggets from the mating flanges, and repair any damage.
- 8. Straighten the mating panel edges, if required to ensure a proper fit-up with the replacement part.

9.3 Outer Wheelhouse Installation

To install a complete replacement aluminum outer wheelhouse:

- 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.

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9. Repair Procedure (cont'd)

- 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 or upper panel at the same locations used originally by the vehicle maker.
- 5. Test-fit the replacement outer wheelhouse, straighten and align the weld surfaces, and clamp or securely hold the outer wheelhouse in place.
- 6. Test-fit the replacement quarter panel to insure proper position of the outer wheelhouse.
- 7. Use adjacent panels and a three-dimensional measuring system to verify that the part is properly aligned.
- 8. Remove the replacement quarter panel. Mark the location of the outer wheelhouse and remove it from the vehicle.
- 9. Apply weld-bond adhesive when recommended by the vehicle maker. Avoid applying the adhesive in the weld areas.
- 10. Position the part on the vehicle, aligning it to the alignment marks 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.
- 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 and other areas 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. Replace sound-deadening pads.
- 21. Apply anti-corrosion compounds to all enclosed areas.
- 22. Continue vehicle reassembly.
- 23. Complete the final reassembly after refinishing is complete. See **9.4**.

9.4 Final Reassembly

To complete the reassembly after refinishing is complete:

- 1. Transfer or install replacement parts such as trim, lamps, etc. Include spacers, washers, isolators, etc. required to prevent contact between dissimilar metals.
- 2. Complete the steps in the final reassembly section of all appropriate procedures.



10. Use Of Recycled (Salvage) Parts

10.1 Condition Of Salvage Parts

Do not install a salvage aluminum outer wheelhouse having any of these defects:

- unrepairable damage
- corrosion that has caused pitting
- improper previous repairs

10.2 Preparation Of Salvage Parts

To prepare a salvage aluminum outer wheelhouse 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 Outer Wheelhouse

After installation or repair, inspect an aluminum outer wheelhouse for these conditions:

- dimensional alignment
- weld quality
- proper application of corrosion protection
- proper application of seam sealers
- proper application sound-deadening materials

Correct any defects.