

Uniform Procedures For Collision Repair

FR11A—Fender, Welded-On

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v.3.1



1. Description

This procedure describes the repair and complete replacement of a welded-on aluminum fender. 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 welded-on aluminum fenders. 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
HO01 Hinge, Bolted-On
PS01 Personnel Safety
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 a welded-on aluminum fender for these types of damage:

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

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

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8. Vehicle Protection (cont'd)

8.2 Adjacent Areas

Protect glass, upholstery, and other **cosmetic surfaces** from welding, grinding, and sanding operations.

8.3 Anti-Theft Label

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

8.4 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.

8.5 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.

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8. Vehicle Protection (cont'd)

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 Fender Repairs

To straighten a welded-on aluminum fender:

- 1. Remove or reposition the bumper, bumper cover, lamps, inner splash panels and other parts required for access or to prevent damage.
- 2. Repair damage using aluminum repair and heat shrinking procedures. If heat is to be used, see **8.6**.
Note: Some vehicle makers recommend against welding tears in aluminum alloys.
- 3. Replace trim-mounting studs or drill holes, if required.
- 4. 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.
- 5. Apply corrosion-resistant **primer** to all interior and exterior surfaces and other areas damaged by the collision or repairs.
- 6. Apply **seam sealers** as required to seal the joints and restore the appearance. Reprime if required by the product maker.
- 7. Apply **anti-corrosion compounds**.
- 8. Refinish areas damaged by the collision, repairs, or anchoring, as required to restore the appearance.
- 9. Continue vehicle reassembly.
- 10. Refinish cosmetic surfaces after all body repairs are complete.
- 11. Complete the final reassembly after refinishing is complete. See **9.4**.

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9. Repair Procedure (cont'd)

9.2 Fender Removal

To remove a welded-on aluminum fender:

- 1. Make sure all adjacent panels are in alignment before removing the fender.
- 2. Loosen or remove the bumper, bumper cover, header panel, or headlamp, if required.
- 3. Loosen, remove, or support the hood, if required.
- 4. Reposition or remove any attached mechanical parts, wiring, computers, or electronic parts.
- 5. Remove moldings and trim, if required.
- 6. Some vehicle makers require removing adjacent parts, such as the door or windshield, to allow access to the welded areas. Follow the vehicle maker's recommendations.
- 7. Remove fasteners attaching the inner skirt or splash panels to the fender and inner structure, if required.
- 8. Locate and mark all **spot weld** locations.
- 9. 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.
- 10. Remove the damaged fender. Do not discard any labels attached to the original panel until replacements are obtained.
- 11. Remove any burrs or spot weld **nuggets** from the remaining mating flanges, and repair any damage.
- 12. Straighten the panel edges, if required to ensure a proper fit-up with the replacement part.

9.3 Fender Installation

To install a replacement welded-on aluminum fender:

- 1. Verify that the proper parts are being installed by checking the part number and performing a trial fit.
- 2. Prepare the fender for vehicle options such as antenna, trim, etc.
- 3. Install trim mounting studs or drill holes, if required.
- 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.
- 6. Test-fit the replacement fender, straighten and align the **flanges** and inner panels, and clamp the fender in place.
- 7. Use adjacent panels to verify that the fender is properly aligned.
- 8. Remove the replacement fender from the vehicle.

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9. Repair Procedure (cont'd)

- 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. Check the alignment to the adjacent panels. Temporarily install the door and windshield if they were removed for access.
- 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. Verify that the part is 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 or repairs.
- 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 **9.4**.

9.4 Final Reassembly

To complete the reassembly after refinishing is complete:

- 1. Install the bumper, bumper cover, lamps, inner splash panels, moldings and other parts that were removed or repositioned.
- 2. Ensure that final reassembly steps are completed in all appropriate procedures.



10. Use Of Recycled (Salvage) Parts

10.1 Condition Of **Salvage Parts**

Do not install salvage, welded-on, aluminum fenders 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, welded-on, aluminum fender for installation:

- Remove any trim or moldings that are to be reused or replaced.
- 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.
- Drill or fill trim-attachment holes, if required.
- Remove any corrosion.
- Apply corrosion protection as required.



11. Inspection And Testing

11.1 Inspection Of A Repaired Or Replaced Fender

After installation, inspect a welded-on aluminum fender for these conditions:

- proper alignment with attached and adjacent parts
- proper operation of adjacent hinged parts
- weld quality
- proper application of corrosion protection
- proper finish appearance and film thickness
- proper operation of attached electrical and electronic parts
- proper installation of any spacers, washers, isolators, etc., required to prevent contact between dissimilar metals

Correct any defects.