



# SP91A

## Trunk Floor

**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 trunk floor. 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 trunk floors. 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
- WE01A GMA (MIG) Plug Weld
- WE11A GMA (MIG) Fillet Weld

### 3.2 Other Information

- Equipment-specific information
- Product-specific repair information
- Vehicle-specific dimension 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**.

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## 4. Equipment And Material Requirements (cont'd)

### 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 trunk floor for these types of damage:

- visible damage
- corrosion
- dimensional misalignment
- improper previous repairs
- missing drain plugs
- cracked seam sealers

Determine how much of the trunk floor 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**.

Remove the fuel tank from the vehicle if it is located beneath the trunk floor. Properly handle and store the fuel tank to reduce the possibility of a fire or explosion.

### 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 key 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 contamination such as dirt, heat, static electricity, and moisture.

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## 8. Vehicle Protection (cont'd)

- Loosen or remove any wiring harnesses or electrical parts that could be damaged during the repair process.
- Remove any electronic modules that may be subject to impact during the repair procedure.

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

### 8.2 Adjacent Areas

Protect glass, upholstery, and other cosmetic surfaces from welding and cutting sparks. Remove interior trim, accessories, and trunk contents that cannot be protected.

### 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 trunk floor:

- 1. Reposition or remove the fuel tank and lines, wiring harnesses, deck lid, or 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 trunk floor and surrounding structure.
- 5. Use multiple pulls and heat, if needed, to return the trunk floor 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  $\pm 3$  mm ( $1/8$ ""). Use a three-dimensional measuring system and adjacent panels to verify that the trunk floor is properly aligned.

Note: If heat is used, follow the vehicle maker's temperature and time recommendations. Some vehicle makers recommend against the use of heat on certain parts.

- 6. Replace any areas that are kinked, have stress cracks, or develop cracks during straightening. Some vehicle makers recommend against welding tears in aluminum alloys. Use a dye penetrant to check the damaged area for cracks. If complete replacement is required, see **9.2** and **9.3**. For sectioning, see **9.4** and **9.5**.
- 7. Apply corrosion-resistant primer to interior and exterior surfaces damaged by the collision, repairs, or anchoring.
- 8. Apply seam sealers, if required to seal the joints and restore the appearance. Reprime if required by the product maker.

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## 9. Repair Procedure (cont'd)

- 9. Apply undercoating and sound deadeners to underbody and trunk floor areas, if required to restore the appearance.
- 10. Apply anti-corrosion compounds to enclosed areas, if required.
- 11. Refinish areas damaged by the collision, repairs, or anchoring, if required to restore the appearance.
- 12. Transfer or install replacement parts such as the fuel tank and lines, wiring harnesses, trim, deck lid, etc. Include spacers, washers, isolators, etc. required to prevent contact between dissimilar metals.
- 13. Install any labels previously removed.
- 14. Continue vehicle reassembly.

### 9.2 Complete Removal

To remove a complete aluminum trunk floor:

- 1. Reposition or remove the fuel tank and lines, deck lid and any attached mechanical or electrical 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. Locate and mark all spot weld and rivet locations.
- 5. 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. It may be necessary to remove undamaged adjacent parts.
- 6. Remove the damaged trunk floor. Heat may be required to help separate adhesively bonded joints. Do not discard any labels until replacements are obtained.
- 7. Remove any burrs or spot weld nuggets from the mating surfaces, and repair any damage.
- 8. Straighten the mating panel edges, if required to ensure a proper fit-up with the replacement floor.

### 9.3 Complete Installation

To install a complete replacement aluminum trunk floor:

- 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. If using a lap joint, allow for a minimum of 6 mm ( $\frac{1}{4}$ " ) overlap.
- 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.

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## 9. Repair Procedure (cont'd)

- 5. Test-fit the replacement trunk floor and clamp or securely hold it in place.
- 6. Use adjacent panels and a three-dimensional measuring system to verify that the trunk floor is properly aligned.
- 7. Mark the location of the trunk floor and remove it from the vehicle.
- 8. Apply adhesive when recommended by the vehicle maker. Avoid applying the adhesive in the weld areas.
- 9. Position the floor on the vehicle and clamp or securely hold it in place.
- 10. Verify that the trunk floor is properly aligned.
- 11. Tack weld, or securely hold, the floor in position. Ensure that the proper electrode wire is being used for the type of alloy being welded.
- 12. Recheck the alignment.
- 13. Install any rivets, following the vehicle maker's recommendations.
- 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. 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.
- 16. Use the three-dimensional measuring system and adjacent panels to verify that the trunk floor is still properly aligned.
- 17. Dress the welds, if required to restore appearance.
- 18. Apply corrosion-resistant primer to 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 undercoating and sound deadeners to underbody areas.
- 21. Apply anti-corrosion compounds to all enclosed areas, if required.
- 22. Refinish areas damaged by the collision, repairs, or anchoring, if required to restore the appearance.
- 23. Transfer or install replacement parts such as the fuel tank and lines, wiring harnesses, trim, deck lid, etc. Include spacers, washers, isolators, etc. required to prevent contact between dissimilar metals.
- 24. Install any labels previously removed.
- 25. Continue vehicle reassembly.

### 9.4 Partial Removal

To remove the damaged portion of an aluminum trunk floor for partial replacement:

- 1. Reposition or remove the fuel tank and lines, deck lid and any attached mechanical or electrical 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.

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## 9. Repair Procedure (cont'd)

- 3. Perform measurements and adjacent panel alignment and straightening. See 9.1.
- 4. Select the cut location based on the repair procedure.
- 5. Measure and mark the cut location.
- 6. Cut the undamaged portion of the trunk floor slightly longer than the final cut location, using a saw.
- 7. Locate and mark the spot weld and rivet locations of the portion to be removed.
- 8. Drill out the spot welds and rivets where the damaged floor joins the parts to be saved. Do not damage the parts that are attached to the floor if they are not to be replaced. Use the proper size and type of spot weld cutter.
- 9. Remove the damaged portion of the trunk floor from the vehicle. Heat may be required to help separate adhesively bonded joints. Do not discard any labels until replacements can be obtained.
- 10. Trim the remaining edges of the trunk floor to the exact cut locations.
- 11. Remove all burrs or spot weld nuggets from the mating surfaces, and repair all damage.
- 12. Straighten the panel edges, if needed to ensure a proper fit-up with the replacement portion.

### 9.5 Partial Installation

To install a partial aluminum trunk floor 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 trunk floor to the proper size and shape for the type of joint recommended by the vehicle maker.
- 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. If using a lap joint, allow for a minimum of 6 mm ( $\frac{1}{4}$ " ) overlap.
- 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 trunk floor and clamp or securely hold it in place.
- 7. Use adjacent panels and a three-dimensional measuring system to verify that the partial floor is properly aligned.
- 8. Mark the location of the trunk floor 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 trunk floor on the vehicle and clamp or securely hold it in place.
- 11. Verify that the partial trunk floor is properly aligned.
- 12. Tack weld, or securely hold, the partial trunk floor in position. Ensure that the proper electrode wire is being used for the type of alloy being welded.

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## 9. Repair Procedure (cont'd)

- 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 from the top of the partial floor.
- 17. Make continuous fillet welds on the bottom of any lap joints. Follow the vehicle maker's recommendations. 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.
- 18. Use the three-dimensional measuring system and adjacent panels to verify that the trunk floor is still properly aligned.
- 19. Dress the welds, if required to restore the appearance.
- 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 undercoating and sound deadeners to the underbody and trunk floor areas.
- 23. Apply anti-corrosion compounds to all enclosed areas, if required.
- 24. Refinish areas damaged by the collision, repairs, or anchoring, if required to restore the appearance.
- 25. Transfer or install replacement parts such as the fuel tank and lines, wiring harnesses, trim, deck lid, etc. Include spacers, washers, isolators, etc. required to prevent contact between dissimilar metals.
- 26. Install any labels previously removed.
- 27. Continue vehicle reassembly.



## 10. Use Of Recycled (Salvage) Parts

### 10.1 Inspection Of Salvage Parts

Do not install a salvage aluminum trunk floor 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 trunk floor 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 Trunk Floor

Inspect a repaired or replaced aluminum trunk floor area for these conditions:

- dimensional alignment
- weld quality
- proper application of corrosion protection
- proper finish appearance and film thickness
- proper alignment with adjacent parts
- proper installation of seam sealers
- proper installation of sound-deadening materials
- proper installation of all interior trim, labels, weatherstripping, and fasteners
- proper installation of all drain plugs
- proper operation of all rear lamps and electrical accessories
- proper lubrication of hinge and latch assemblies
- correct routing of wiring harnesses and operating cables
- proper installation and operation of the fuel system and all attached mechanical and electrical parts
- proper alignment, sealing, and operation of the deck lid
- proper installation of any spacers, washers, isolators, etc., required to prevent contact between dissimilar metals

Correct any defects.

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## 11. Inspection And Testing (cont'd)

### 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 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.