

## Uniform Procedures For Collision Repair

# PR01–Plastic Repair, Welding

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v.2.3



## 1. Description

This procedure describes methods for making weld repairs to most types of non-reinforced plastic parts. Procedures for reshaping thermoplastic parts are also included.



## 2. Purpose

The purpose of this procedure is to provide industry-accepted requirements for performing high-quality weld repairs to plastic parts. 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**

- HM01 Hazardous Materials
- PR11 Plastic Repairs, Adhesive
- PS01 Personnel Safety
- RF01P Surface Preparation

#### **3.2 Other Information**

- Equipment-specific information
- Product-specific information
- Vehicle-specific repair information



## 4. Equipment And Material Requirements

### 4.1 Plastic Welding Equipment

The use of this equipment is included in this procedure:

- hot-air plastic welder
- airless plastic welder
- fume extractor
- die grinder
- disc grinder
- vacuum sanding system
- heat gun
- hot water tank
- dispensing gun for adhesive cartridge
- mixing nozzles for adhesive cartridge



### 4.2 Filler Rods

**Filler rods** must be compatible with the type of plastic being welded. Rods may differ in diameter and color.

### 4.3 Repair Materials

The use of these materials is included in this procedure:

- adhesion promoter**
- fillers designed for plastic
- aluminum body tape
- plastic cleaner



## 5. Damage Analysis

Does not apply.



## 6. Personnel Safety

### 6.1 General Safety

General safety information is in **PS01**.

### 6.2 Plastic Welding Safety

To prevent injury when welding plastic parts, wear the following protective items:

- chemical respirator, **NIOSH**-approved for organic vapors
- long-sleeved shirt
- safety glasses or face shield
- gloves

Follow the cleaning product maker's recommendations when cleaning and wiping plastics, to avoid the buildup of static electricity and the possibility of fire.



## 7. Environmental Safety

### 7.1 Hazardous Materials

Hazardous material safety information is in **HM01**.



## 8. Vehicle Protection

### 8.1 Adjacent Areas

Protect adjacent areas while making on-vehicle plastic repairs.



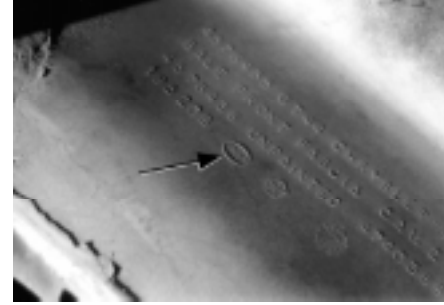
## 9. Repair Procedure

Determine the type of repair to be made. For restoring the shape of plastic parts, see **9.2**. A two-sided repair is required if the damage goes through the part. For one-sided weld repairs, see **9.4**. For two-sided weld repairs, see **9.5**.

### 9.1 Identification Of Plastic

To identify the type of plastic:

- 1. Look for an **ISO** code molded on the part.
- 2. Use information from the vehicle maker.
- 3. Perform a sanding or flexibility test.
- 4. Perform a welding rod adhesion test.



### 9.2 Reshaping Using Heat

To reshape a thermoplastic part using heat:

- 1. Remove the part from the vehicle.
- 2. Clean both sides of the damaged part with a **pH**-neutral soap and water, followed by plastic cleaner.
- 3. Blow or wipe dry.
- 4. Heat the distorted area with a heat gun or heat lamp, or submerge it in hot water, until the opposite side becomes uncomfortable to the touch. Do not exceed 80°C (175°F).
- 5. Bend or twist the part back into shape.
- 6. Cool the area.
- 7. Check the alignment of the part to the adjacent panels.
- 8. If necessary, repeat this process to complete the reshaping.

### 9.3 Rod Adhesion Test

To perform a rod adhesion test:

- 1. **Scuff-sand** and clean an area on the back, or another hidden area of the part.
- 2. Melt the rod into the base material, and cool it with cold water.
- 3. Pull the rod away from the part. Repeat the test in another area with a different rod.

Use the rod with the best adhesion. If little or no adhesion is obtained, try a piece of the same or a similar part. If no adhesion is obtained, try an **adhesive** repair.

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## 9. Repair Procedure (cont'd)

### 9.4 One-Sided Repair

If possible, make one-sided repairs while the part remains on the vehicle.  
To make a one-sided weld repair on a plastic part:

- 1. Clean the repair area with pH-neutral soap and water. Blow or wipe dry.
- 2. Clean the repair area with a plastic cleaner. Blow or wipe dry. Avoid spreading contaminants over the clean area.
- 3. Make a **repair taper** along the length of the damaged area, about 75–80% through the part.
- 4. **Featheredge** the area to remove coatings, **primers**, and paints. Remove all remaining dust and reclean the surface.
- 5. Set the welder temperature. If using a hot-air welder, adjust the air pressure. Allow the welder to preheat to the proper temperature. Follow the welder maker's recommendations.
- 6. Select the welding rod for the type of plastic being welded. If the type of plastic is not known, perform a rod adhesion test. See **9.3**.
- 7. Make the weld. Use the welder to work the rod into the base material, completely filling the groove.
- 8. Smooth the weld with the flat shoe of the welder when using an **airless welder**. The weld should be slightly above the surrounding area.
- 9. Allow the weld to cool. Plastic welds can be quick-cooled with compressed air or cold, clean water, using a sponge or cloth after the weld has solidified. Blow or wipe dry.
- 10. Sand the weld slightly below the surrounding contour. Blow or wipe dry.
- 11. Apply the recommended plastic repair filler for the type of plastic being repaired. Some plastics may require the use of a special primer before the filler is applied. Follow the product maker's recommendations.
- 12. Sand and featheredge to the surrounding contour.
- 13. Refinish the part, following the vehicle maker's recommendations.

### 9.5 Two-Sided Repair

To make a two-sided weld repair on a plastic part:

- 1. Remove the part from the vehicle for access.
- 2. Clean the repair area with pH-neutral soap and water. Blow or wipe dry.
- 3. Clean the repair area with a plastic cleaner. Blow or wipe dry. Avoid spreading contaminants over the clean area.



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## 9. Repair Procedure (cont'd)

- ❑ 4. Hold the pieces in alignment using aluminum body tape on the front side.
- ❑ 5. Make a repair taper on the back side along the length of the damaged area, about 50% through the part.
- ❑ 6. Featheredge the area to remove coatings, primers, and paints. Remove all remaining dust.
- ❑ 7. Set the welder temperature. If using a hot-air welder, adjust the air pressure. Allow the welder to preheat to the proper temperature. Follow the welder maker's recommendations.
- ❑ 8. Select the welding rod for the type of plastic being welded. If the type of plastic is not known, perform a rod adhesion test. See 9.3.
- ❑ 9. Make the weld on the back side of the part. Use the welder to work the rod into the base material, completely filling the groove.
- ❑ 10. Smooth the weld with the flat shoe of the welder when using an airless welder. The weld should be slightly above the surrounding area.
- ❑ 11. Allow the weld to cool. Plastic welds can be quick-cooled with compressed air or cold, clean water, using a sponge or cloth after the weld has solidified. Blow or wipe dry.
- ❑ 12. Remove the aluminum body tape and make a repair taper on the front side of the part. The repair taper must be along the length of the damaged area, through the part into the first weld on the back side.
- ❑ 13. Featheredge the area to remove coatings, primers, and paints. Remove all remaining dust.
- ❑ 14. Make the weld. Use the welder to work the rod into the base material, completely filling the groove.
- ❑ 15. Smooth the weld with the flat shoe of the welder when using an airless welder. The weld should be slightly above the surrounding area.
- ❑ 16. Allow the weld to cool. Plastic welds can be quick-cooled with compressed air or cold, clean water, using a sponge or cloth after the weld has solidified. Blow or wipe dry.
- ❑ 17. Sand the weld to slightly below the surrounding contour. Blow or wipe dry.
- ❑ 18. Apply the recommended plastic repair filler for the type of plastic being repaired. Some plastics may require the use of a special primer or adhesion promoter before the filler is applied.
- ❑ 19. Sand and featheredge to the surrounding contour.
- ❑ 20. Refinish the part, following the vehicle maker's recommendations.





## **10. Use Of Recycled (Salvage) Parts**

Does not apply.



## **11. Inspection And Testing**

Does not apply.