

## Plastic Repair Considerations

Plastic repair techniques, such as plastic welding and the use of two-part adhesives are crucial for restoring the appearance and strength of damaged plastic components.

Plastic welding uses specialized tools that allow for precise temperature control and minimize the risk of damage to the plastic material. This technique ensures a seamless repair while preserving the components' original form and durability. On the other hand, two-part adhesives provide strong adhesion and fill gaps or cracks in the damaged area. Proper surface preparation, right compound selection, and correct mixing and application techniques are essential for achieving optimal results. Ultimately, both techniques contribute to the longevity and safety of the repaired plastic components.

Plastic bumpers are the most common components that may be repaired to their original appearance and structural integrity.

Other components that may involve repairing cracks or mounting points include:

- Grilles
- Trim and moldings
- Interior panels
- Side mirrors
- Headlights
- Taillights
- Splash shields
- Composite radiator supports
- Fuel tanks

These are just a few examples, but plastic automotive components may be generally repaired to address various issues, restoring their functionality and appearance.

Cost-effectiveness repairs, part availability, and cycle times should all be considered when deciding whether to repair or replace.

## Bumper Repair Considerations

- Single-sided repairs include scratches, dents, and spider cracking that do not penetrate the plastic part. This should be considered repairable based on the extent of damage compared to the cost of a replacement part. Damage location and part shape are considerations when determining repair time. Two-sided repairs should be considered for any damage that has penetrated the plastic, including cracks,

holes, and large gouges. Damage location should be considered, especially if the damage travels to an edge or is confined to the center of the bumper. An inspection should be completed to determine if all pieces are still intact or if parts are missing. It should also be determined if the part can be returned to the original strength and function based on the amount and location of damage.

- Broken tabs may be repairable and do not necessarily require part replacement. The tab location and type should be considered during the decision-making process to determine if the tab can be restored to the same strength and function. There are two common tab styles:
  - A tab with a hole where a bolt or clip is utilized to fasten the part to the vehicle. This style of tab can be repaired with different methods, including adhesives, using the pinning method, and welding.
  - A tab that clips into another part precisely, such as a grille opening or bumper-side retainer. This is a more difficult repair, and some of these areas can be very thin with an interference fit. Finishing to get proper alignment and a satisfactory cosmetic appearance is also more difficult. Restoring the strength and function should be carefully considered for these repairs. This would be a repair where welding is required most of the time.
- The degree of distortion is an important factor to consider when assessing the feasibility and approach to repairing a plastic bumper. The degree of distortion can vary from minor to severe, depending on the impact force and the type of plastic used in the bumper. In many cases of distortion, the bumper can still be repaired effectively using techniques like heat reshaping or plastic welding. These methods can help restore the bumper to its original form with minimal visible signs of damage.

## ADAS

Repairs in the ADAS sensor location need to take OEM recommendations into account. Various recommendations are made depending on the vehicle manufacturer. Some allow repair in the ADAS sensor locations and recommend a material thickness, while others do not.

## Calibration

If the plastic component requires calibration, such as a headlight, the calibration process must be completed successfully after repair (when applicable).

## Repair Guidelines

- A cosmetic, single-sided repair is repairable damage. The size of the damaged area, part location, and part contours should be accounted for when determining repair time.
- A gouge, crack, or hole penetrating the part, that does not travel to an edge, is repairable damage. The size of the damaged area, part location, and part contours should be accounted for when determining repair time. This will often require a two-sided repair.
- A gouge, crack, or hole penetrating the plastic and travelling to an edge will require a two-sided repair. The size of the damaged area, part location, and part contours should be accounted for when determining a repair time. It should also be determined if the part can be returned to its original strength and function based on the amount and location of damage.
- A damaged tab attached to a part with a bolt or clip can typically be repaired with adhesive or welding. Most tabs can be duplicated by copying an undamaged tab. Adhesive (pinning) or welding can be used for this repair. It should be determined whether the part can be returned to its original strength and function, depending on the damage amount and location.

## Replacement Guidelines

- Damaged tabs that are an interference fit and fit precisely into other components, such as a grille or bumper side retainer, are a more complex repair and should be carefully considered. Considerations include the damage area, the thickness of the damaged area, and how it attaches to the part, as well as the feasibility of restoring the original strength and function. These types of tabs are most likely a welded repair only if repairable.
- If pieces of the part are missing, this would be a more complicated repair. Careful consideration should be given to the amount of time required to complete the repair, and whether the original strength, function, and appearance can be restored. This should not be considered often, unless dictated by the part cost or availability.
- A heavy deformation area with a tear into an edge or component mounting area can be a difficult repair and careful consideration should be given based on the amount of time required to restore the original shape, strength, function, and appearance for the component to fit correctly.
- The type of plastic will play a role in the repairs that can be completed. Knowing if the plastic is a thermoset or thermoplastic dictates the limitations to some repairs. Thermoset parts can't be welded and are typically an adhesive repair only, so careful consideration should be given to the damage area.