



**COLLISION INDUSTRY**  
CONFERENCE

# Plastic Repair Using a Nitrogen Welder

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NASHVILLE , TN

APRIL 2019

# Nitrogen Welders

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Nitrogen Bottle Plastic Welders

Nitrogen Generator Plastic Welders

# Nitrogen Generator Plastic Welders



Polyvance  
6080 GC

<https://www.polyvance.com>

A nitrogen hot air welder uses compressed nitrogen gas to eliminate oxygen from the weld area. The nitrogen acts as a shielding gas and allows for a contaminant-free weld with less smoke, which creates a stronger weld.



Dent Fix  
DF-EXnig

<https://www.dentfix.com>

# Considerations for Repairing Plastic Bumpers

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- Repair Cost vs OEM New
- Will repair allow from life time warranty
- Can the repairs be seen
- Will the repairs stand up to stress
- What does the OEM state about repairing their bumpers
- What is the availability of another bumper
- Warpage or memory
- Age of the vehicle
- Damage in area of parking sensor
- Bumper has been repaired before and/or repainted

# How Do Nitrogen Welders work

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Nitrogen is used as a shielding gas to prevent the plastic from burning during the weld process — producing a strong, lasting weld. Compressed air is used to maintain consistent temperature between welds — the nitrogen is only activated when pulling the trigger so that it's not wasted between welds.

# Two Sided Repair Procedures

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Wash the bumper with soap & water prior to the start of repairs

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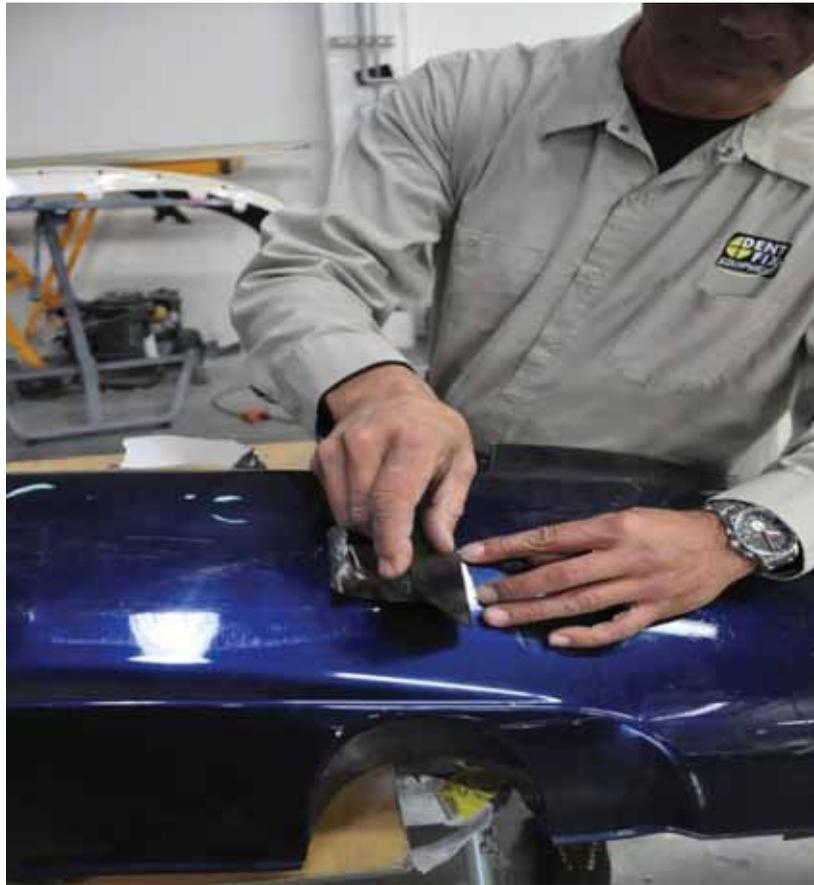
Sand the back side of the bumper with 80 grit DA at low speeds so that the plastic does not burn. Clean with a water based wax & grease remover.

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# Apply aluminum tape to the tear using a squeeze.

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Perform an adhesion test. Even though the rod was black, it did not stick to the bumper.

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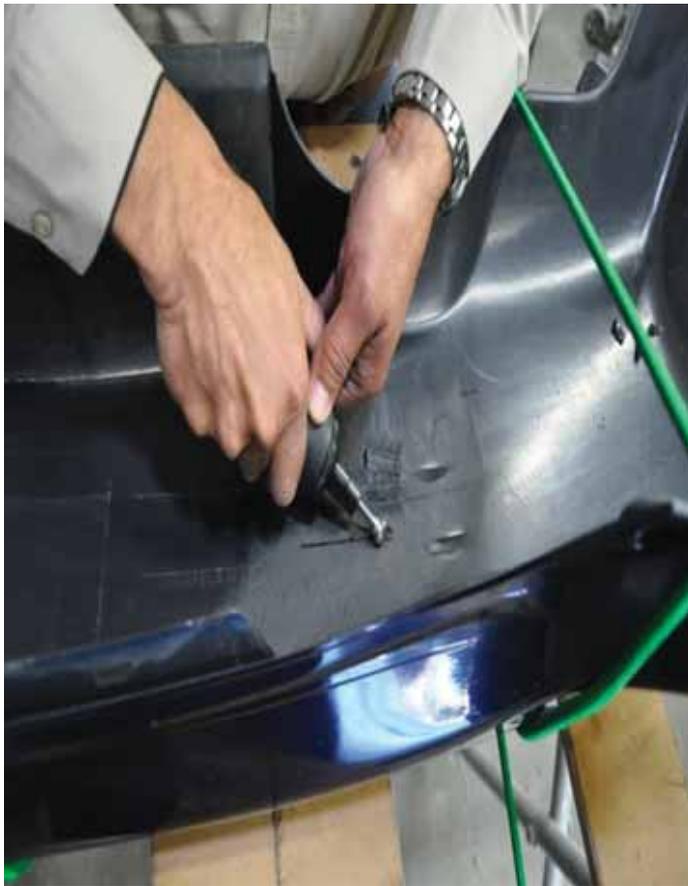
Using a different rod, this one adhered to the plastic. Note the filler rod is white, but it is the correct rod for this bumper.

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Using a ball grinder, remove plastic from the repair area the width of the filler rod

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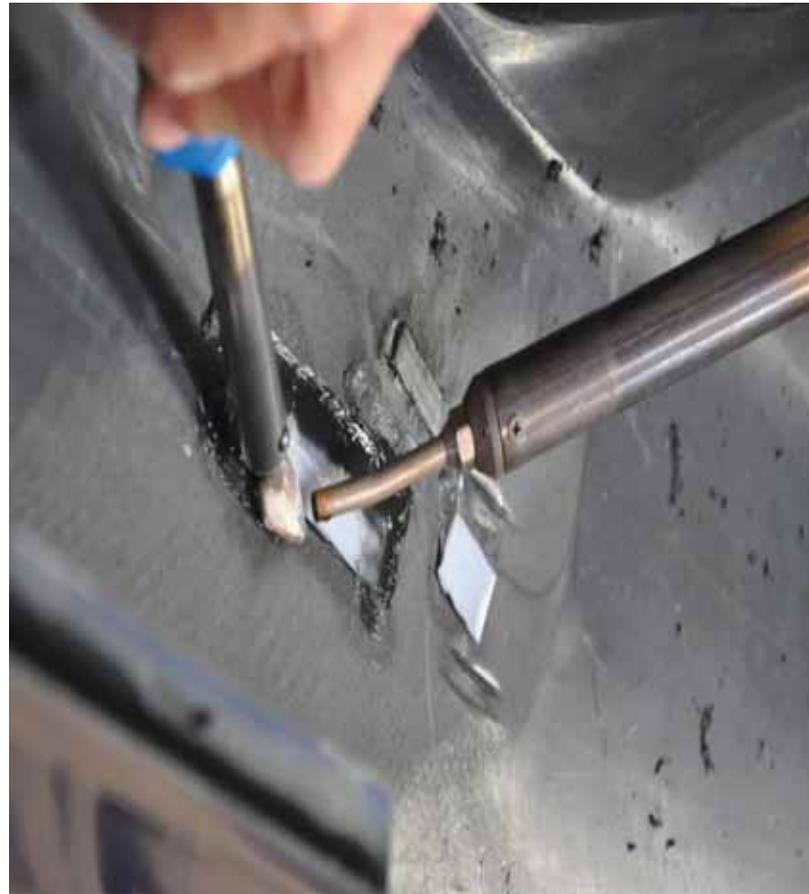
Lay down the filler rod into the tear using nitrogen shielding gas

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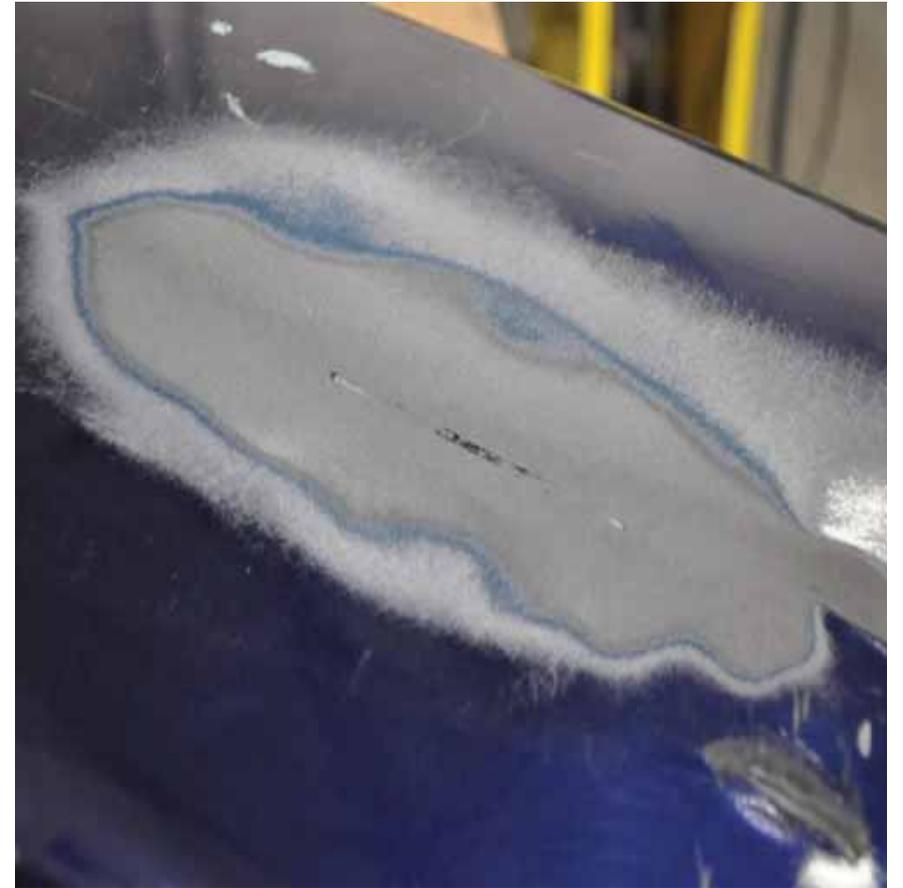
Using a hot iron & nitro welder,  
force the repair into the tear.

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Remove the aluminum tape, sand the front side with 80 grit DA with a 2" to 3" featheredge.

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Clean the front side of the bumper with a water base wax & grease remover, equalize the 2 part plastic material, & run a 3" bead prior to applying material to the bumper.

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Apply 2 part epoxy to the repair area, spread evenly over the repair area, sand with 220 grit DA & apply a high build primer with flex additive.

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# Speed up the drying process with a short wave IR light

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# Repairing & Replacing Broken or Missing Bumper Tabs

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# Broken Side Bumper Tabs

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# Missing Front Bumper Tab vs Non Broken Tab

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After Cleaning with a Water Base Wax & Grease Remover, sand off the paint on the tab

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# Clean Tab area with a burr tool or sander

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# Conduct an adhesion test with various welding rods

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See which welding rod sticks  
(white rod stuck, black did not)

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Apply aluminum tape to the backside & add filler rod to the top of the broken tab.

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# Using a flat iron, shape the top of the tab

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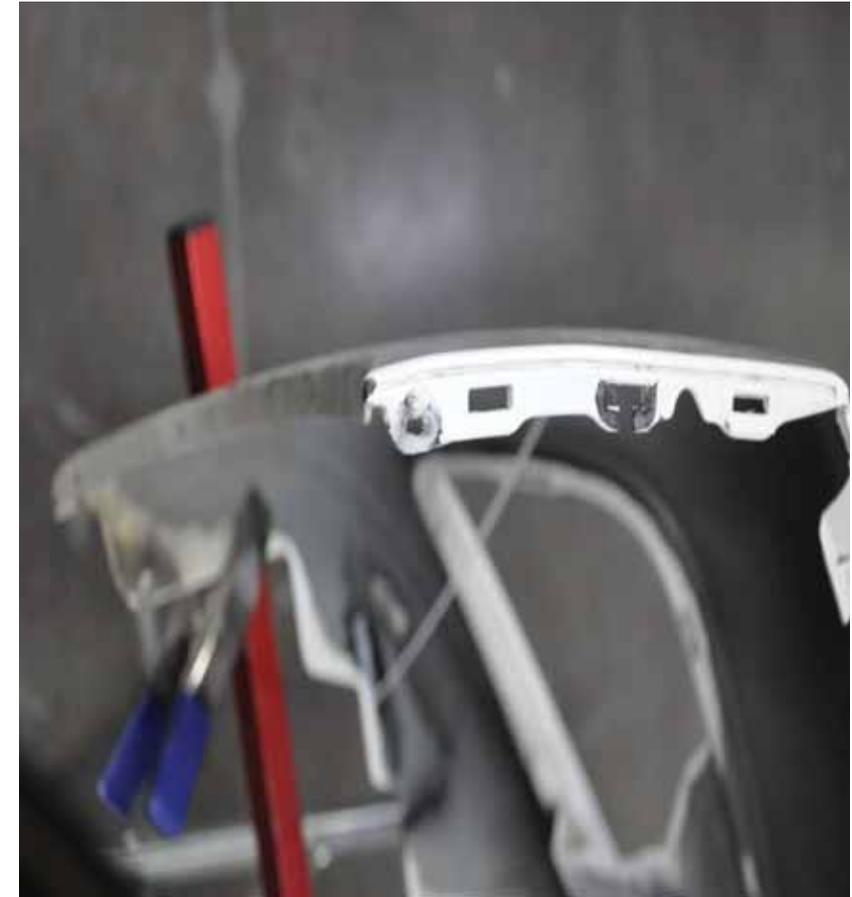
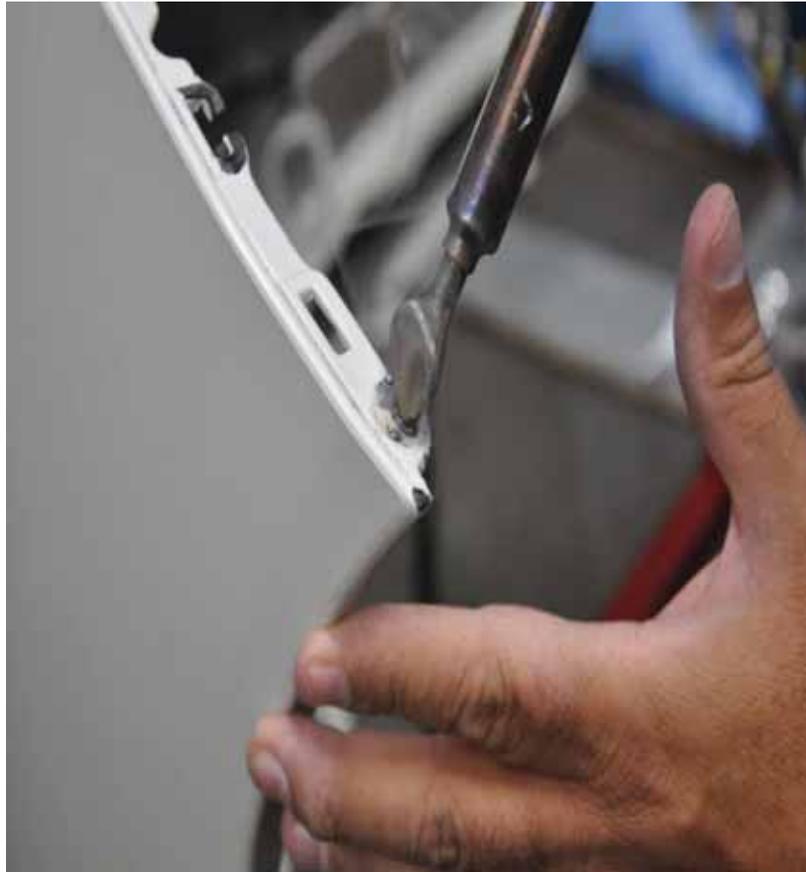
After finishing shaping and while the plastic is still warm, use a hand seamer to obtain the correct thickness.

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Finish the tab with a mini sander and use the flat iron to make the slot in the repaired tab

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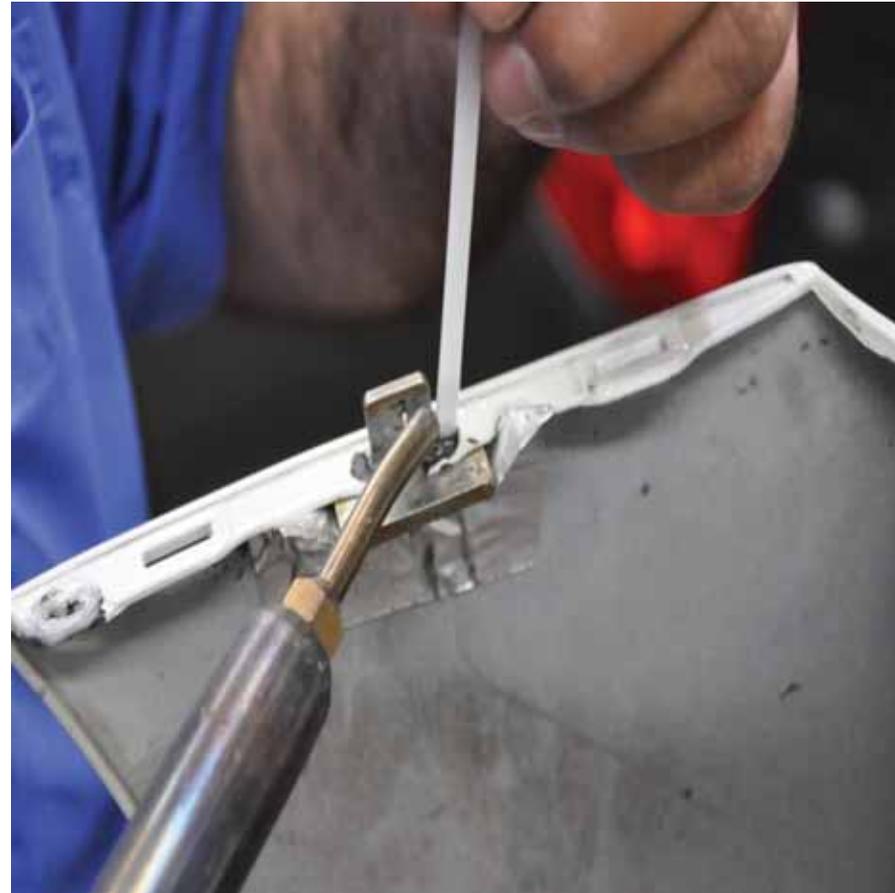
Locate the correct size bumper  
pliers insert (#3) and attach to the  
backside with aluminum tape.

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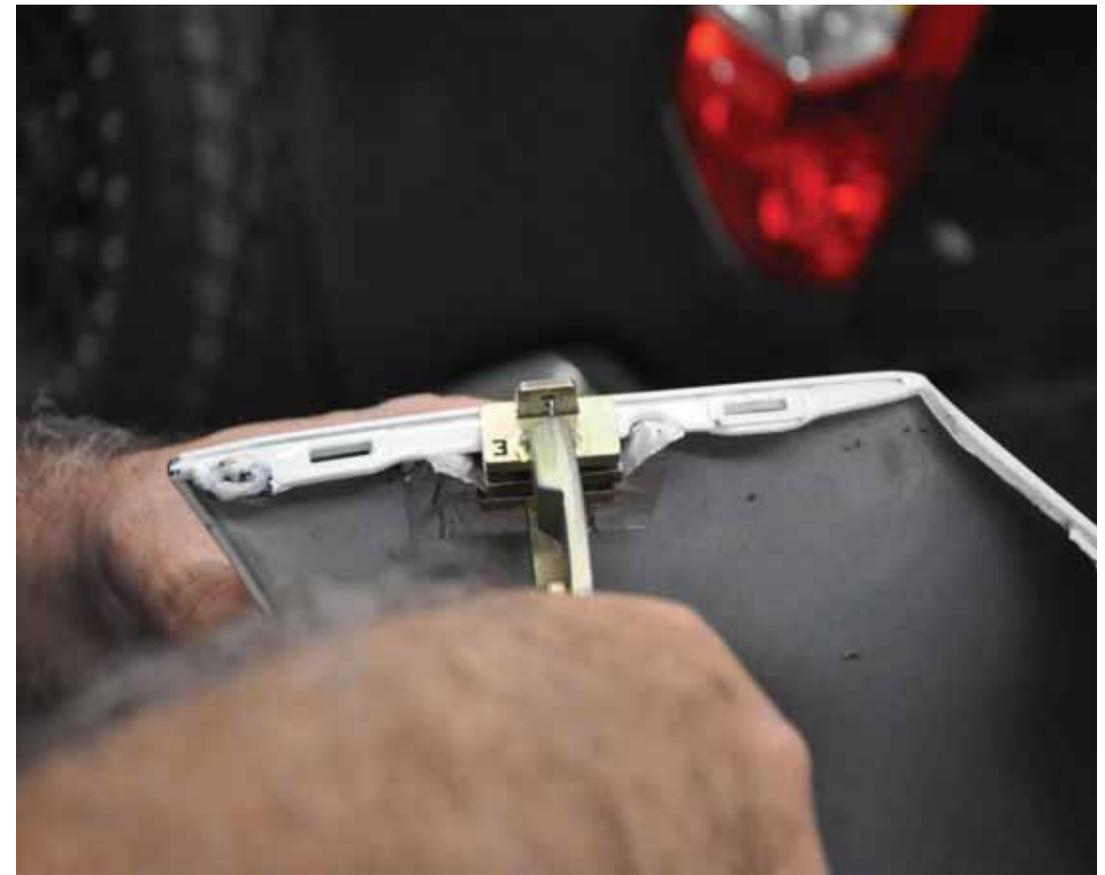
# Apply the filler rod to the broken tab area.

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Using a hot iron to smooth out the repair, use the corresponding pliers to form the correct thickness.

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# Sand the repair at low speeds

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# Make a pattern of tab using the side with undamaged tab

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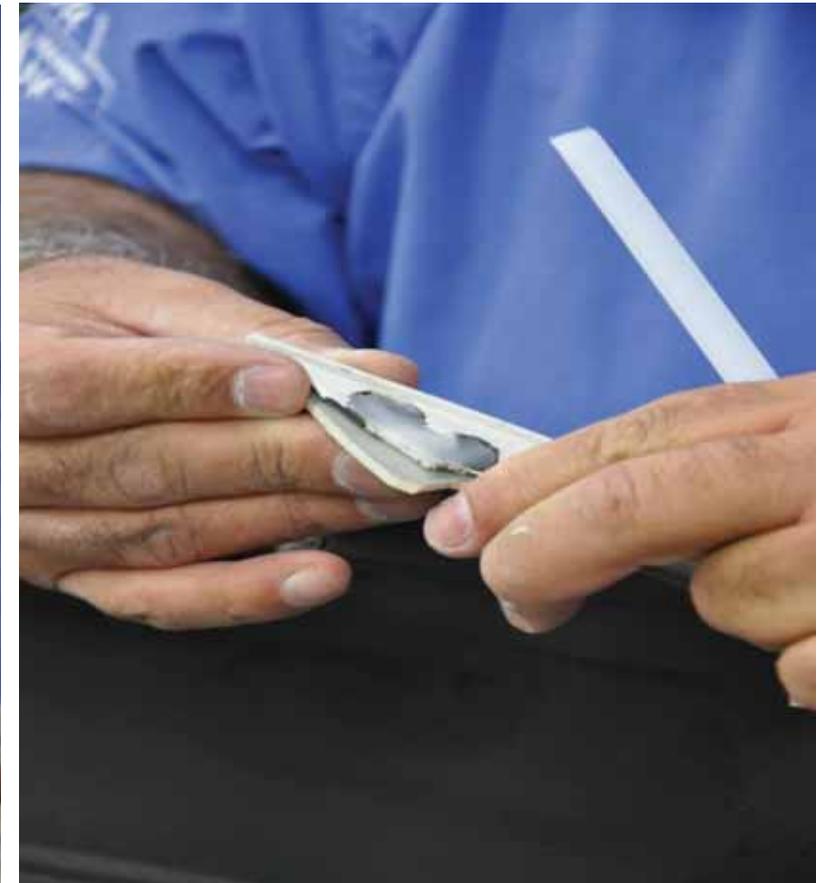
Apply aluminum tape to the backside, add plastic to the repair and smooth out with a hot iron.

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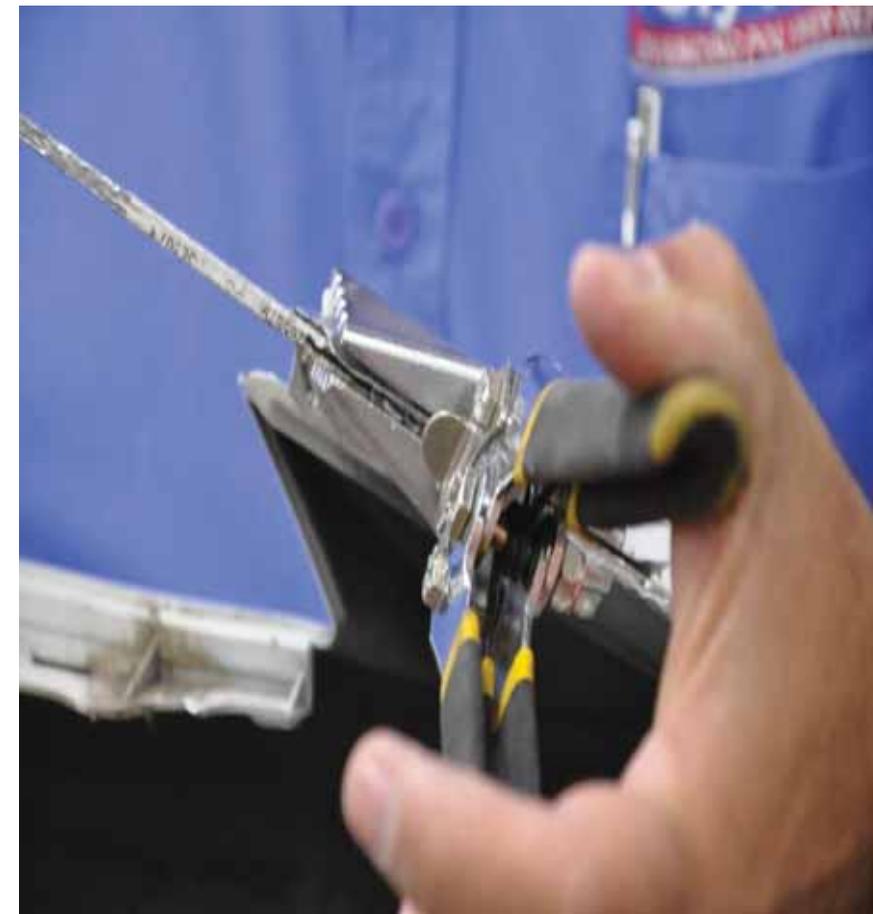
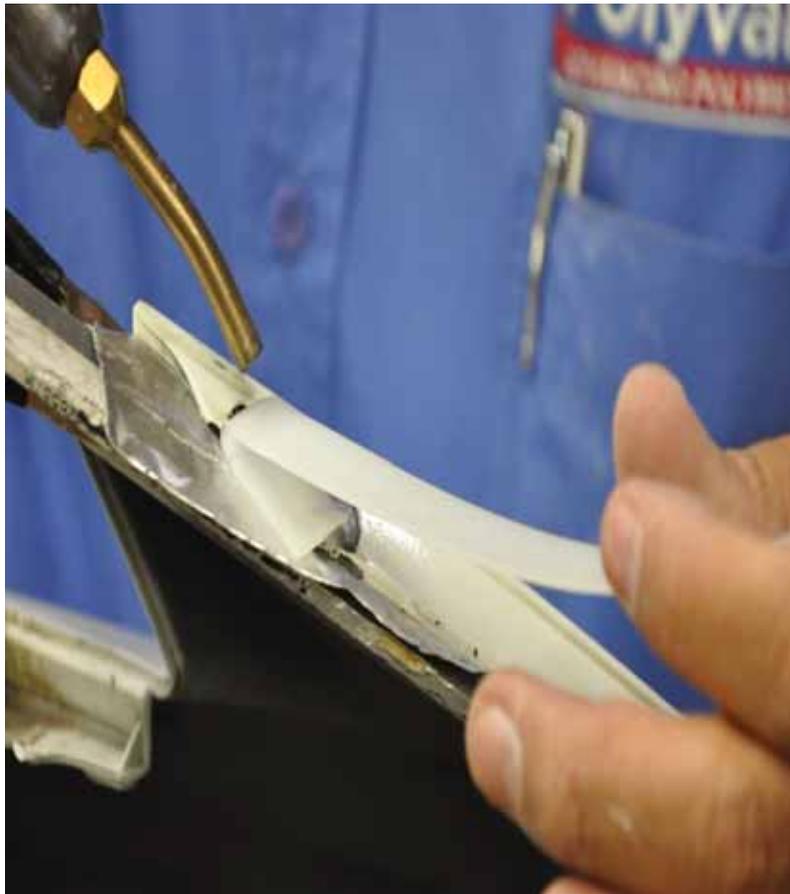
Use the hand seamer to get the tab's proper thickness. Make a comparison of the broken tab with the pattern.

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Add more plastic to finish the tab using the pattern as a guide.

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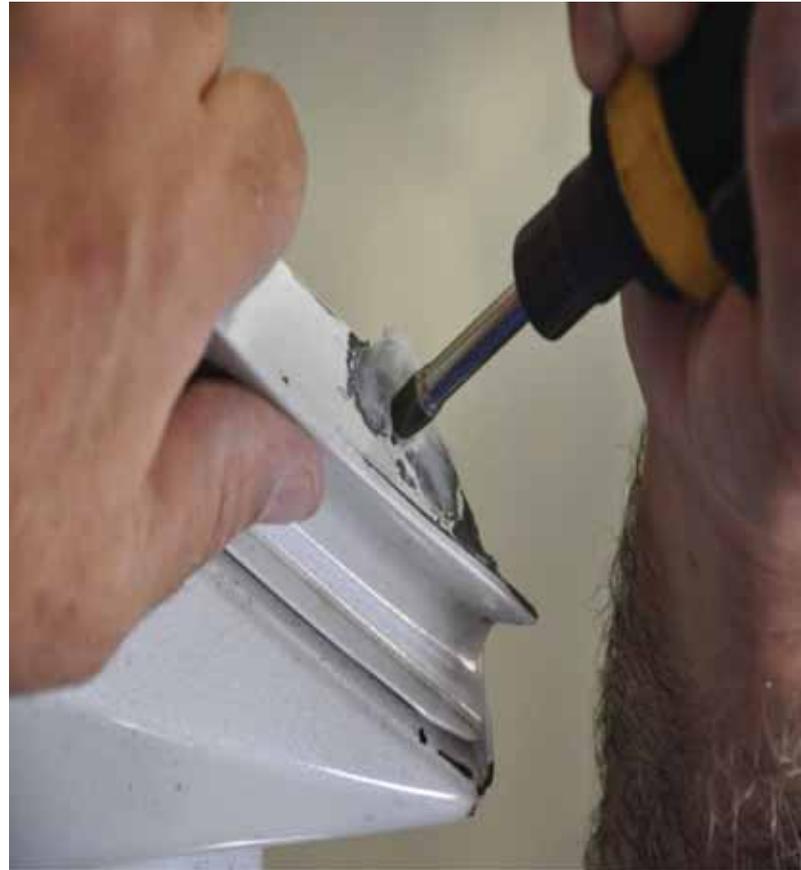
# Sand to the proper shape.

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Finish the repair by adding a hole to the tab.

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# Adhesives VS Nitrogen Welding

- Nitrogen welding has a small footprint on the back side of the bumper compared to adhesive repair
- Nitrogen welding uses similar plastic material into the repair
- Nitrogen welding can repair small side bumper brackets whereas adhesives are not recommended
- Nitrogen welding uses less consumables compared to adhesives
- Nitrogen welding has a much greater ROI compared to adhesives
- Nitrogen welding can only be used by one tech at a time
- Nitrogen welding takes a lot more time to learn the repair process compared to repairs with adhesives
- There are more industry trainers (at this time) to teach adhesive repairs than Nitrogen welding

# Adhesives VS Nitrogen Welding

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- Adhesives requires less touch time compared to Nitrogen welding
- Adhesives are much more affected by mold release agents compared to Nitrogen welding
- Nitrogen welding bottle needs to be continuously filled (Not Nitrogen Generating Units).
- Adhesives are readily available
- Nitrogen welding is not recommended on SMC, whereas adhesives is.
- Nitrogen welding can repair many of the various plastic parts on today's vehicles

# Adhesives VS Nitrogen Welding

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- Plastic Welding Rods & Epoxy adhesives have no expiration date. Urethanes and acrylics have a shelf life.
- Plastic welding rods are fairly inexpensive especially compared to adhesives.
- Plastic Welding uses Nitrogen gas (Nitrogen generators makes their own, but machine is more costly).

# What is a shop's best choice?

TEKTON 3/8-Inch Drive Socket Set, Inch/Metric, 6-Point, 5/16-Inch - 3/4-Inch, 8 mm - 19 mm, 45-Piece



A shop should have  
Adhesives and a Nitrogen Welder

# I-CAR Plastic Repair Classes Offered

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## **PLA 03 Plastic and Composite Repair**

Identify different types of plastics by their characteristics and determine the level of plastic identification that is required to perform a repair

Understand correct preparation procedures for plastics

Identify different types of plastics used on today's vehicles and the correct methods to repair each

Recognize proper adhesives for different repairs and when to use adhesion promoter

Perform one- and two-sided plastic adhesive repairs and mounting tab repairs

Understand the considerations around refinishing plastic parts

Identify the types of plastic welds in automotive applications

Identify welding equipment and its uses

Explain how hot air welds and airless welds are made

Identify differences between a fusion weld and an adhesion weld

## **Plastic Repair Hands-On Skills Development (NS105L01)**

Light-weighting is here to stay and so is the use of plastics in automotive manufacturing. To ensure cars are repaired to pre-collision condition, technicians need to be up-to-date with modern plastic repair techniques. Participation in this hands-on, in-shop class will provide technicians the opportunity to practice their skills including several adhesive repairs as well as airless and hot air welding repairs

# I-CAR Alliance Classes offered

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•Fusor Products	2 Credit Hours
•Kent Automotive	4 Credit Hours
•Polyvance	13 Credit Hours
•SEM Products	2 Credit Hours
•3M	4 Credit Hours