



Technical Presentations

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Tech-Cor

Collision Industry Conference



Las Vegas- November 1, 2005

New technologies in panel attachments.



MIG Welding Aluminum

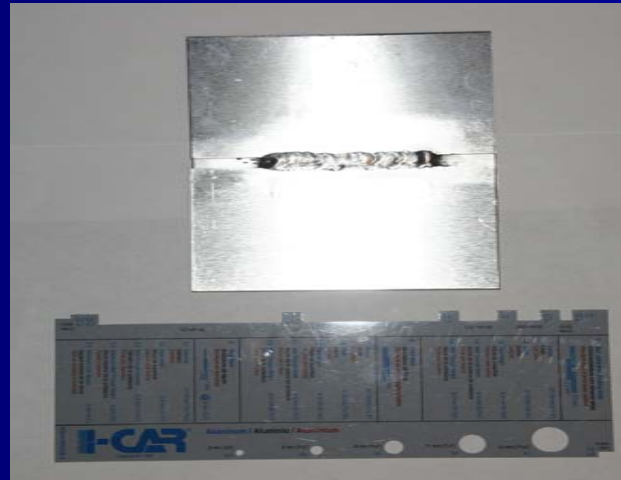
Aluminum Welding

Three most used welds when replacing damaged aluminum panels.

Fillet Weld



Plug Weld with backer



Plug Weld





Aluminum Monocoque Construction

The body of the XJ is an aluminum monocoque (French for "one shell"), an industry first in a volume build production car. The aluminum panels are formed into a monocoque using a rivet bonding technique common in aerospace construction, but never applied to a production sedan until the XJ. The result is a body both extraordinarily strong and incredibly weight efficient.

Panel Attachment with Rivets and Adhesive

Self-Piercing Rivets

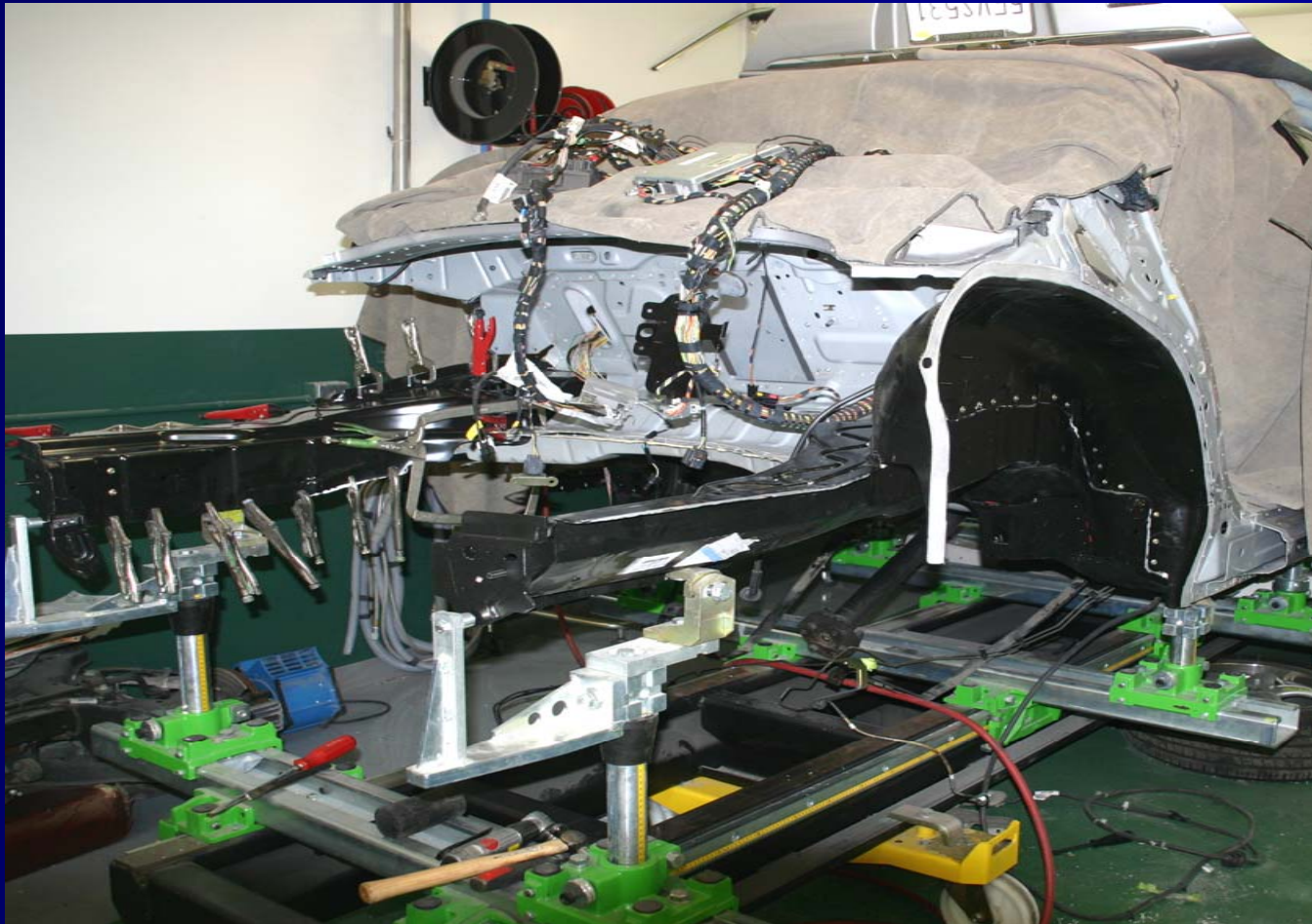
Front & Back View



Cross Sectional View



The vehicle showing 2 new rear frame rails installed with adhesive & rivets



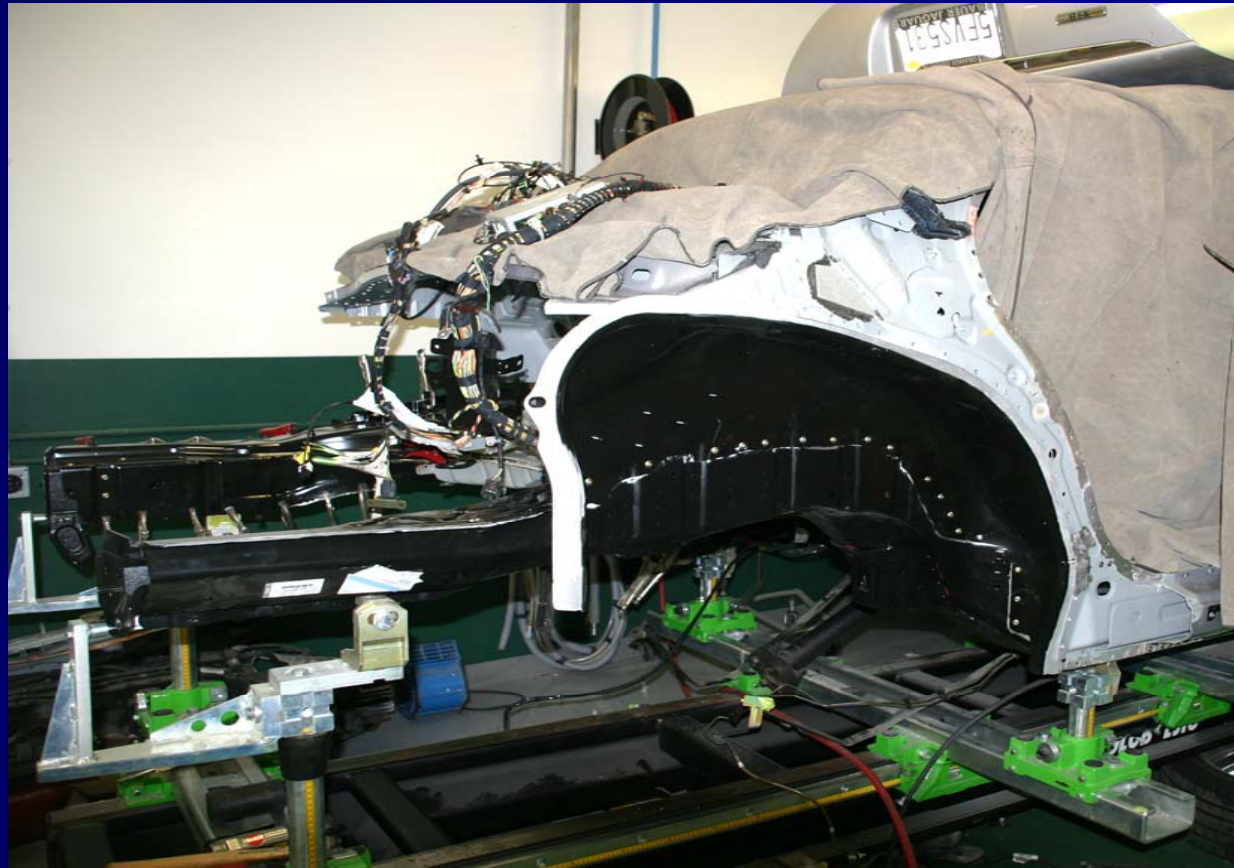
The driver's side rear frame rail
glued and riveted in place.



The final rivet being applied to the new inner wheelhouse.



The vehicle is now ready for the installation on the new outer wheelhouse.



The outer wheel is secured to the vehicle and the panel is scribed.



The OEM E-Coat is removed from the inner & outer flanges of the panel.



A Pryosil adhesion promoter is applied to the panel that is to rivet-bonded.



Adhesive is applied the inner flange of the new outer wheelhouse panel.



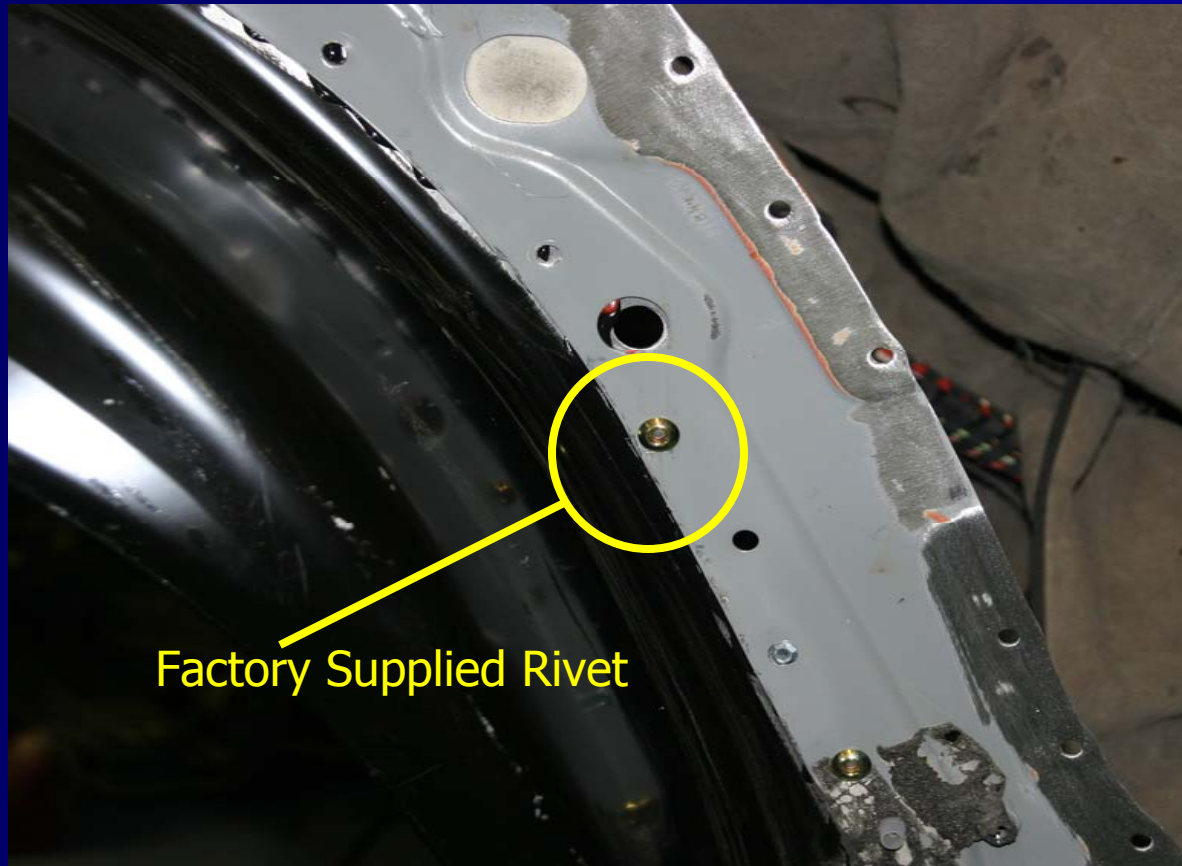
The new outer wheelhouse is secured to the vehicle with two sheet metal screws.



A 6.5 MM hole is drilled followed by the proper length rivet.



The new outer wheelhouse panel attached with adhesive and rivets



The upper-outer reinforcement removed for access is rivet-bonded to the vehicle.



Re-install with rivets, adhesive and welding inner quarter panel reinforcement, which was removed for replacement access.



The pulsed welded is set according to OEM specification and the panel is welded into place.



Panel Attachment with Adhesive

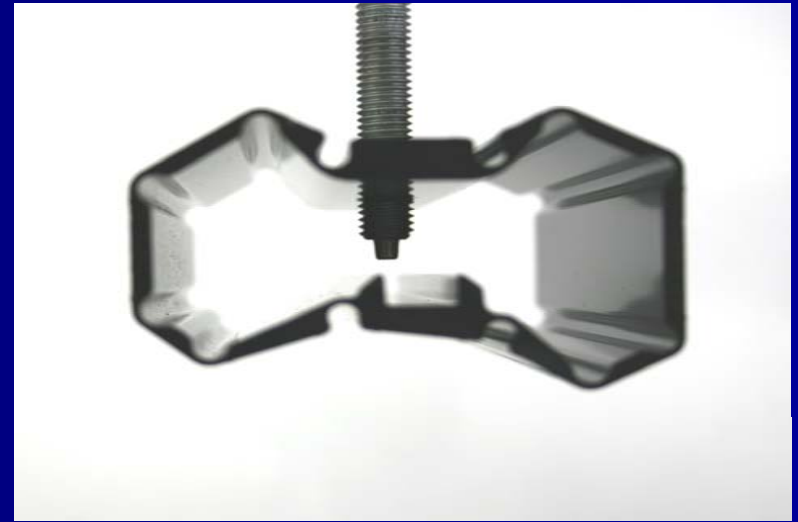
A replacement front rail section bonded to a frame rail with adhesive.



A cross section of a frame rail with adhesive, sleeves and new front section.

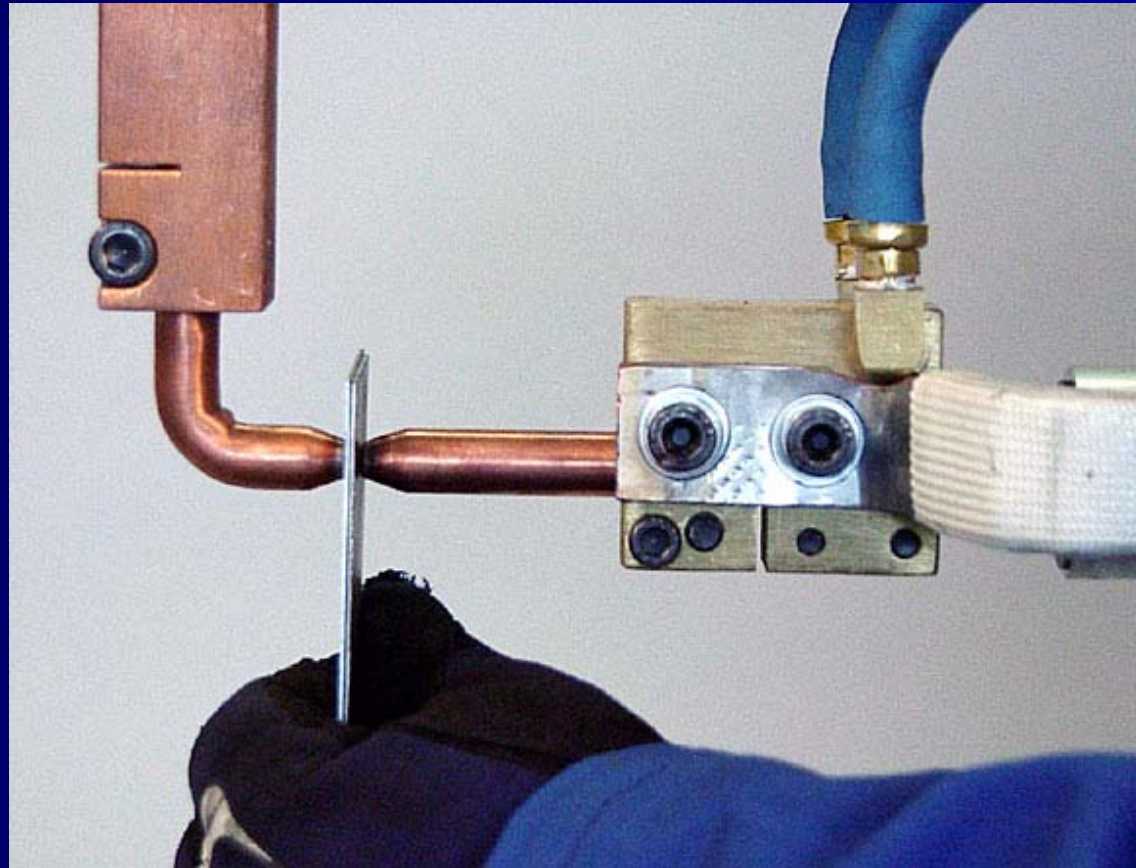


The inner replacement front rail sleeves.

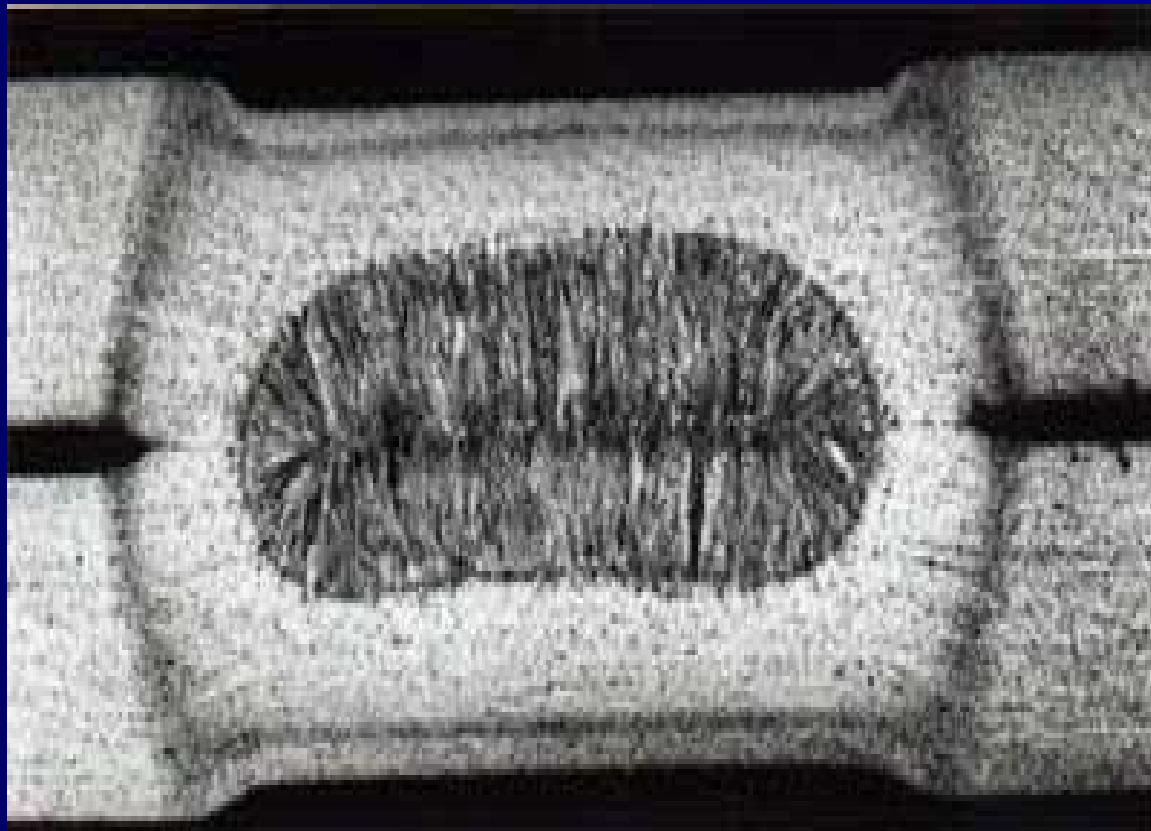


Panel Attachment with Resistance Spot Welding and Adhesive

Squeeze Type Resistance Spot Welding.



A cross section of a resistance spot weld.



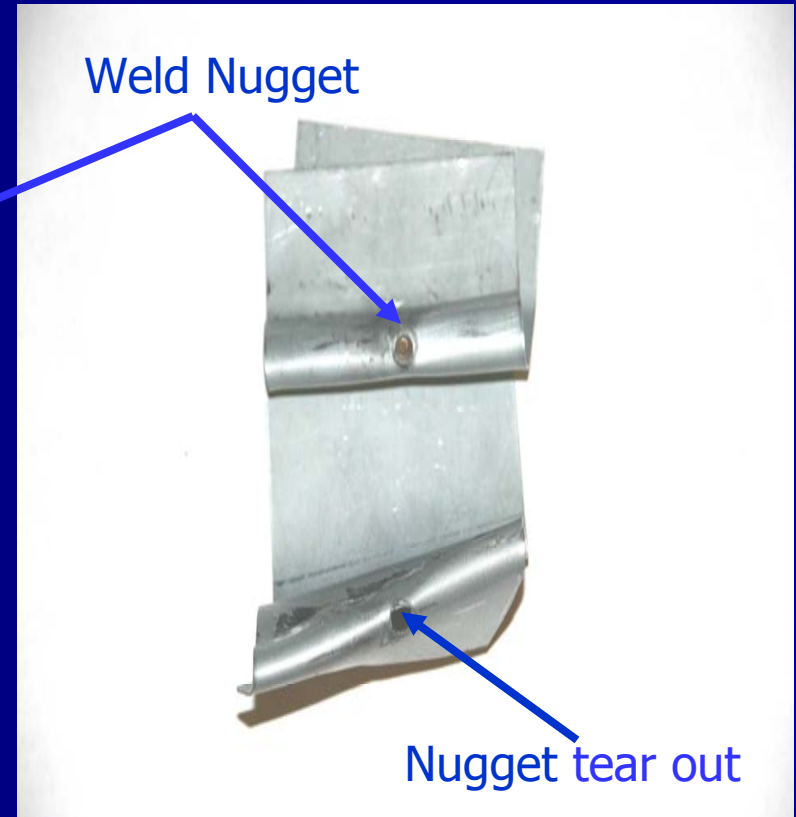
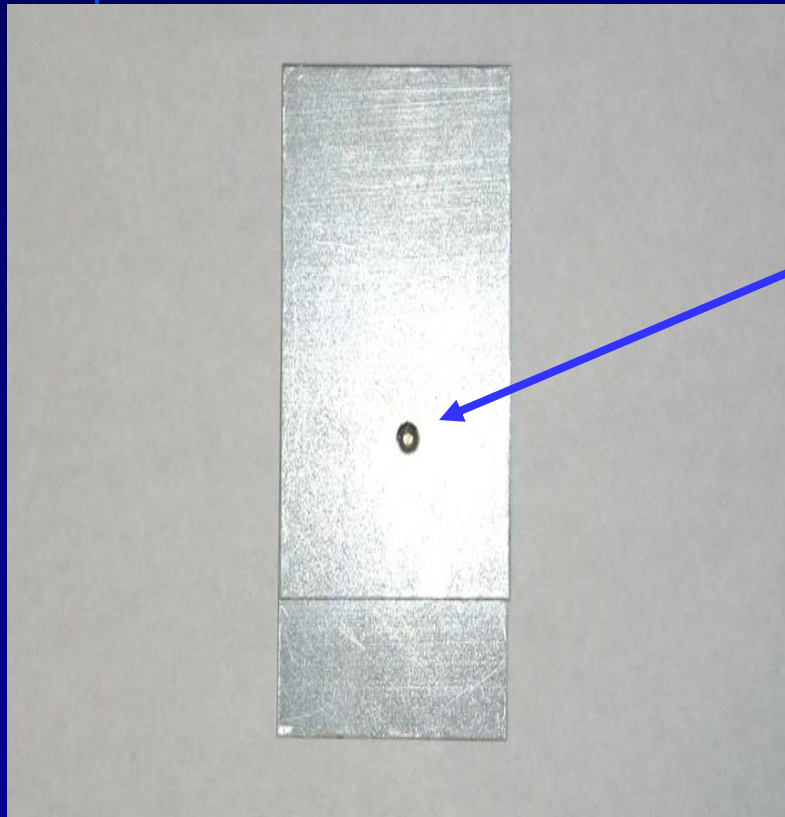
Set the welder for the correct metal thickness and metal type.



Perform a test weld prior to welding on the vehicle.



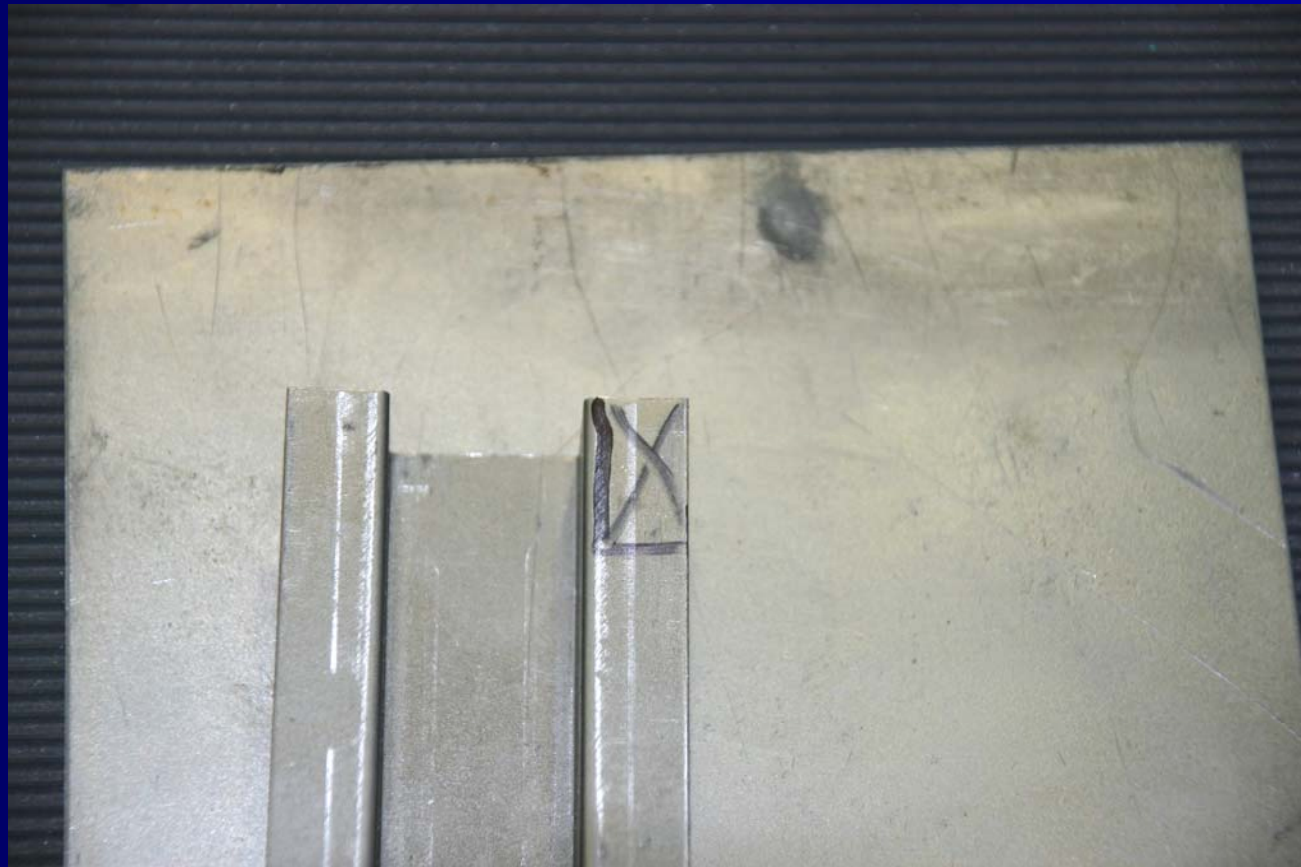
Resistance Spot Welds should always be destructively tested prior to welding on the vehicle.



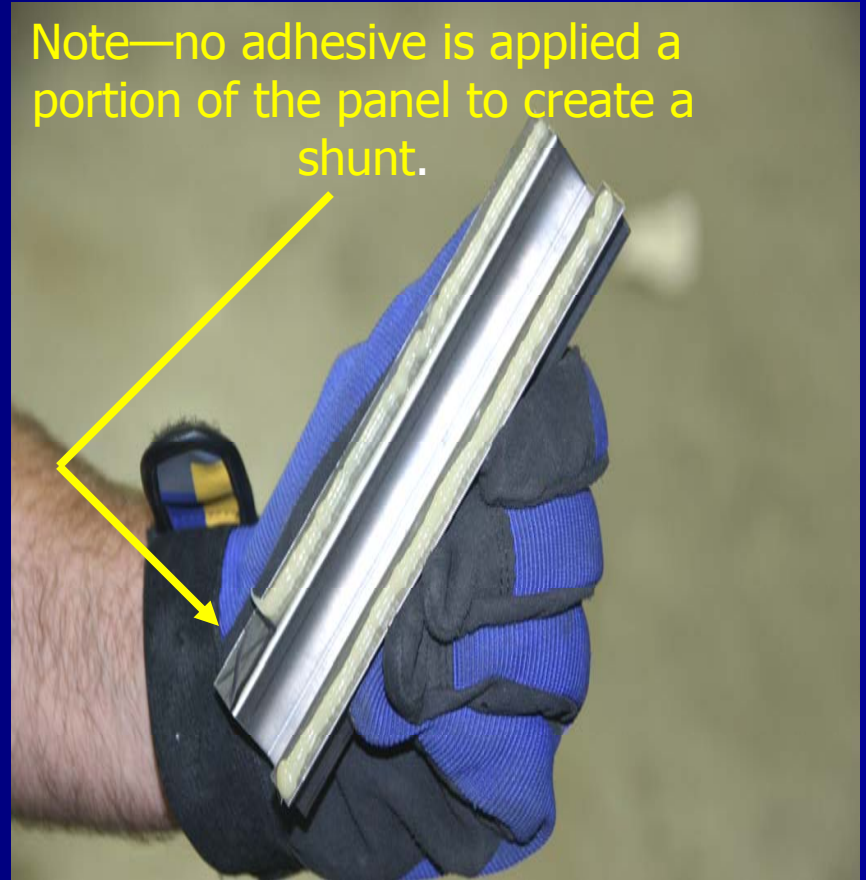
Weld Bonding



Mark an area where no adhesive is applied to create a shunt.



Adhesive is applied to the panel that will weld-bonded.



The panels are attached and held in place with clamps before the welding process is started.



The finished panel.



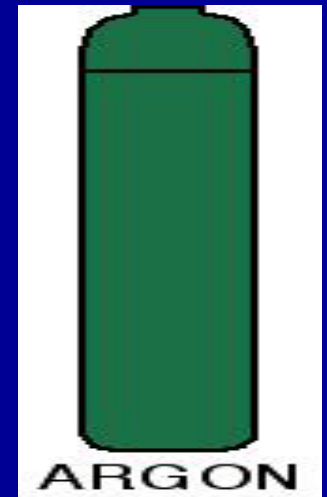
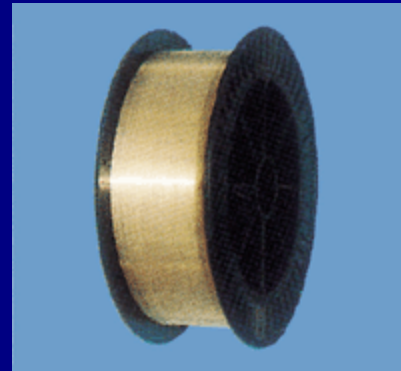
MIG Weld Brazing

Items necessary to perform MIG Weld Brazing

Copper-Silicon Wire



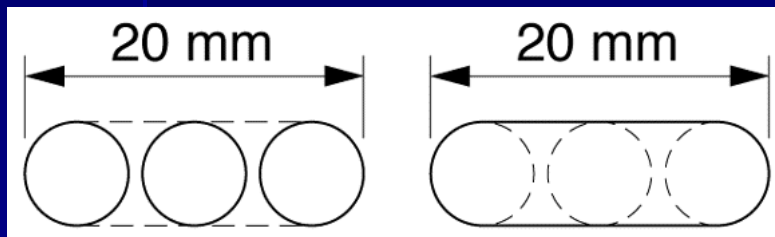
MIG Spool Gun



Argon Shielding Gas

Weld Types used with MIG Weld Brazing

Fillet



Plug Welds

Butt Weld with Backer

Features of MIG Weld Brazing:

- Less welding spatter
- Less heat used for process
- Less panel warpage
- Does not remove Zinc coating
- Seals joint with welding material
- Duplicates OEM welding
- Uses same equipment used in pulsed Aluminum welding