Collision Industry Conference

Las Vegas, November 2, 2004

Write-It-Right Committee

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A Special Presentation by the Estimating & Technical Committees

Aluminum Rail Replacement on a 2004 and Newer 5 Series BMW

A 2004 BMW 5 Series BMW has been in an accident. The left rail has a golf ball size bend in it about 10 inches from the front end cap & the right rail is swayed out by 15 mm.

Estimator A writes an estimate to pull the front end of the vehicle and repair both rails.

Estimator B writes an estimate to pull the front end and replace the left rail.

Who is right?

- Estimator A is only right
- Estimator B is only right
- Both Estimators are right
- Both Estimators are wrong

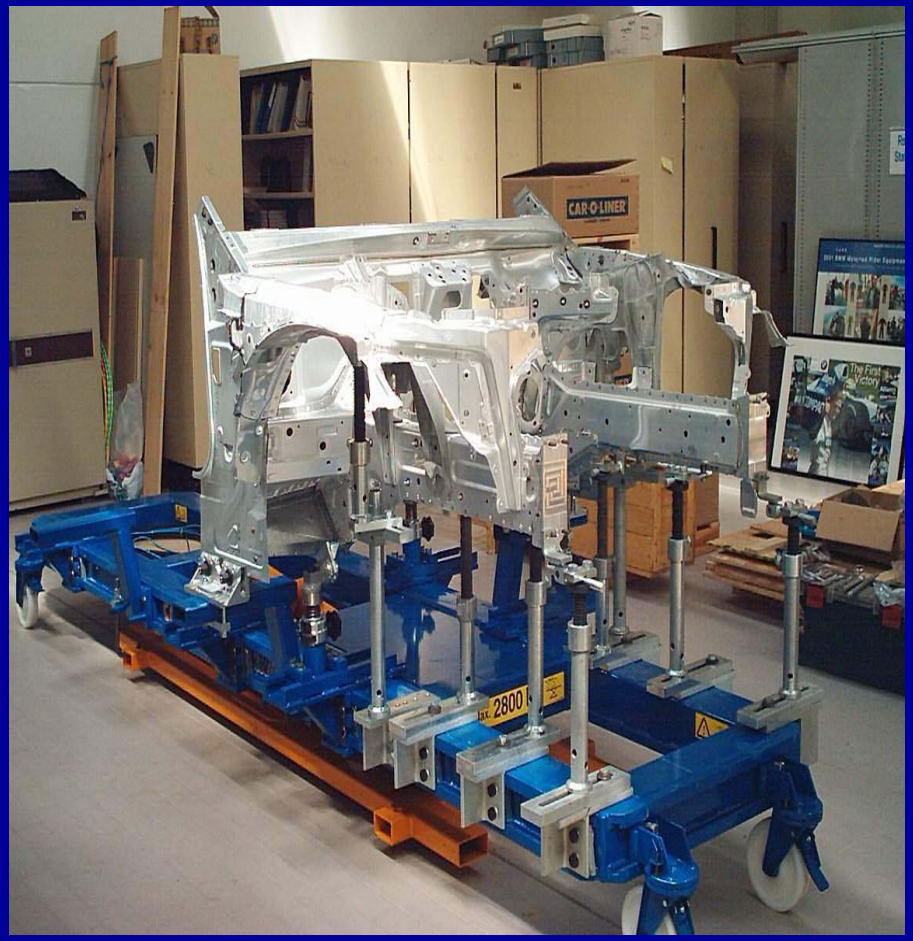
The correct answer is D

Both Estimators are wrong and the following presentation will explain why.

Replacement of the Aluminum Front End Parts on a 2004 and Newer BMW.

The 2004 BMW 5 Series is mixture of aluminum and steel. The front end from the firewall forward is aluminum with the passenger compartment and rear section constructed from steel. BMW has developed and offers a training program on the only recommended procedures for the replacement of the aluminum front end structural parts.

BMW at this time recommends a Cellete Bench or Car-O-Liner bench fitted with a Car-O-Flex with a Car-O-Tronic



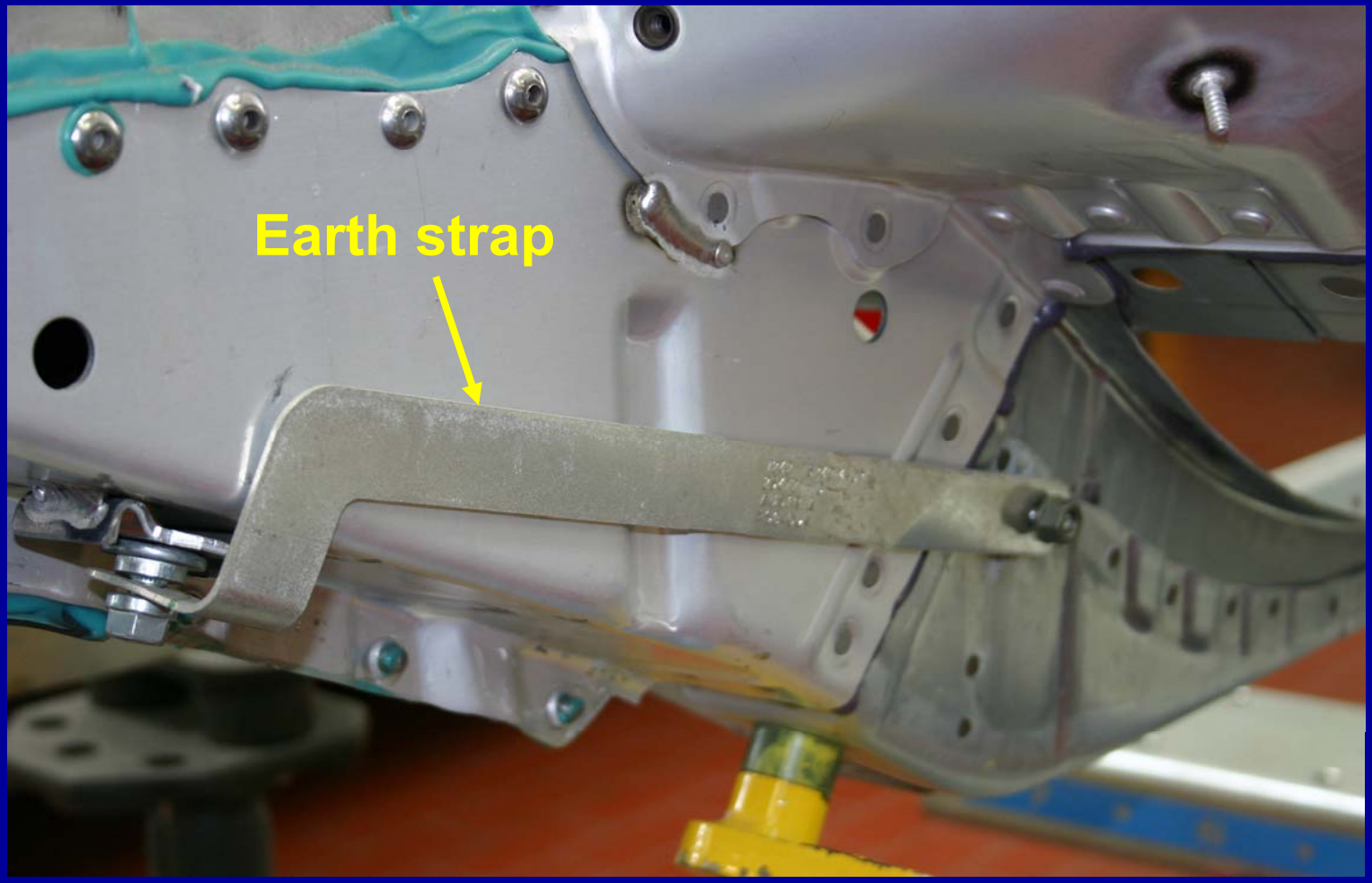
There are 3 rules for repair of the 2004 & later 5 Series BMW and they must be followed to the letter.

1. There is no pulling on the front structure.

2. There is no heat including welding on the front structure.

3. Rules 1 & 2 must be followed to the letter.

Before any repairs on the front section are started, the earth straps need to be disconnected.

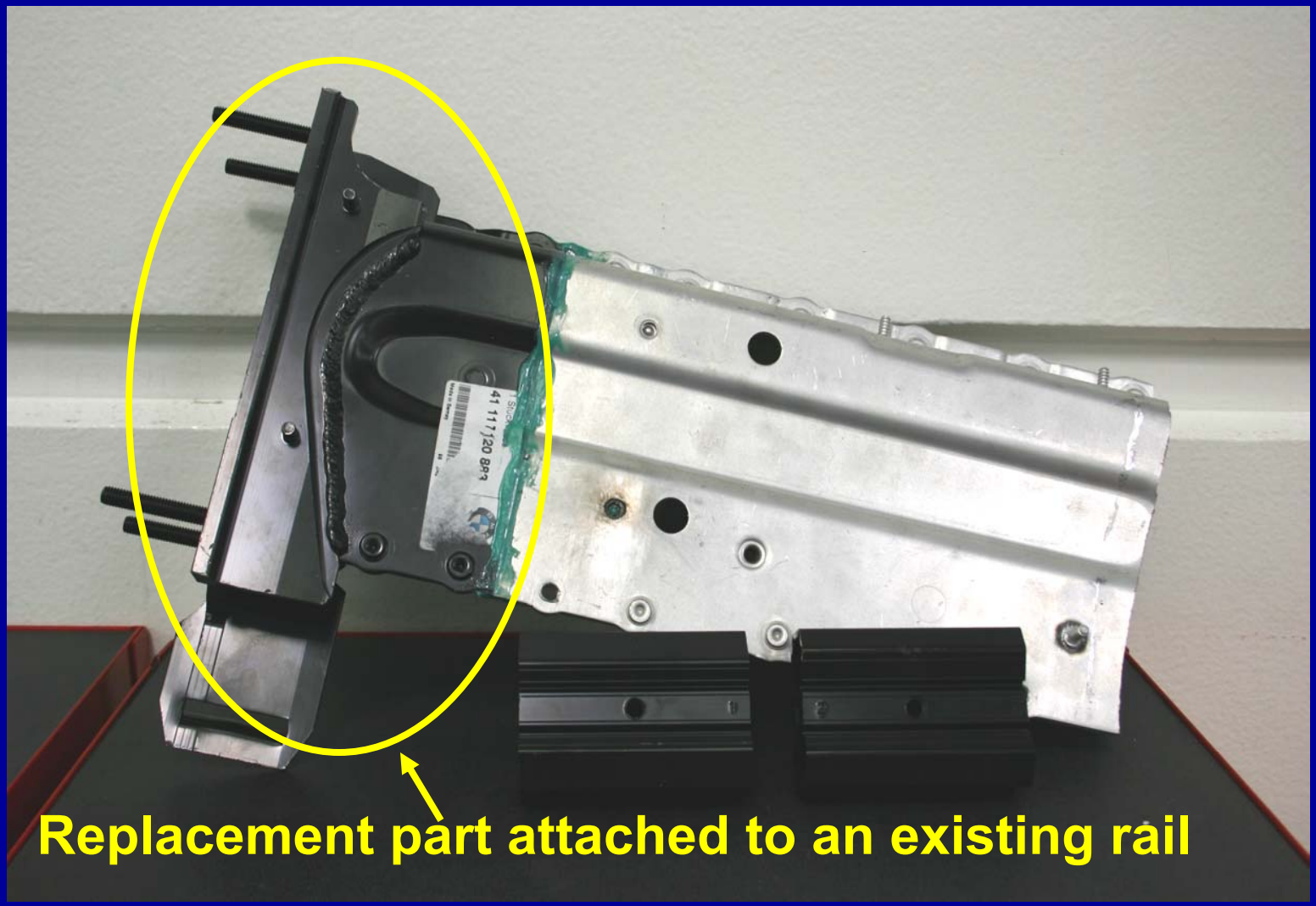


The BMW training class teaches 4 repair procedures:

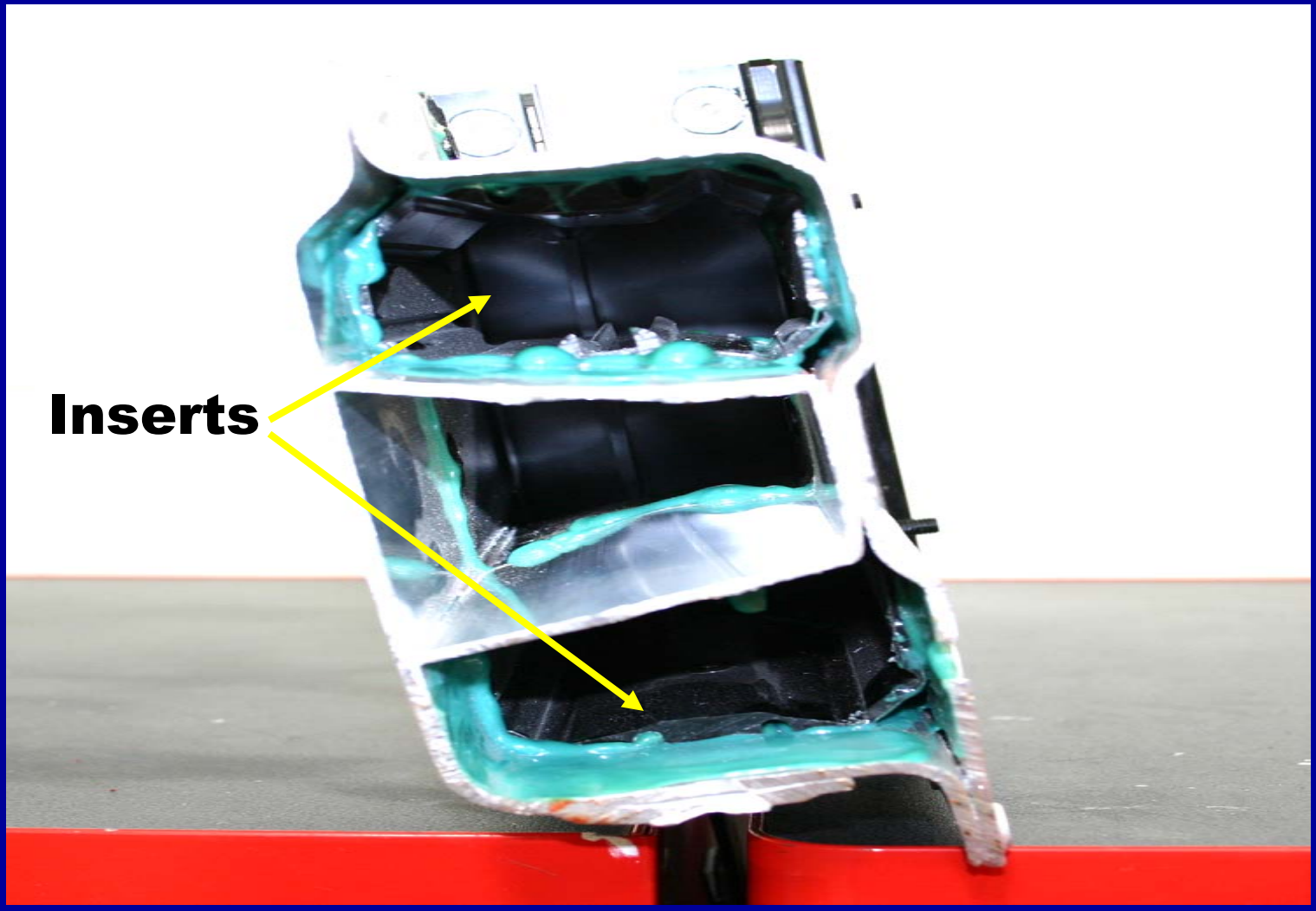
- Rail Front Section
- Upper Rail Front Section
- Full Rail Section
- Full Upper Rail Section

The following presentation will show some of unique aspects of the repair process & need for this specialized training before attempting any repairs.

Replacing the front rail section.

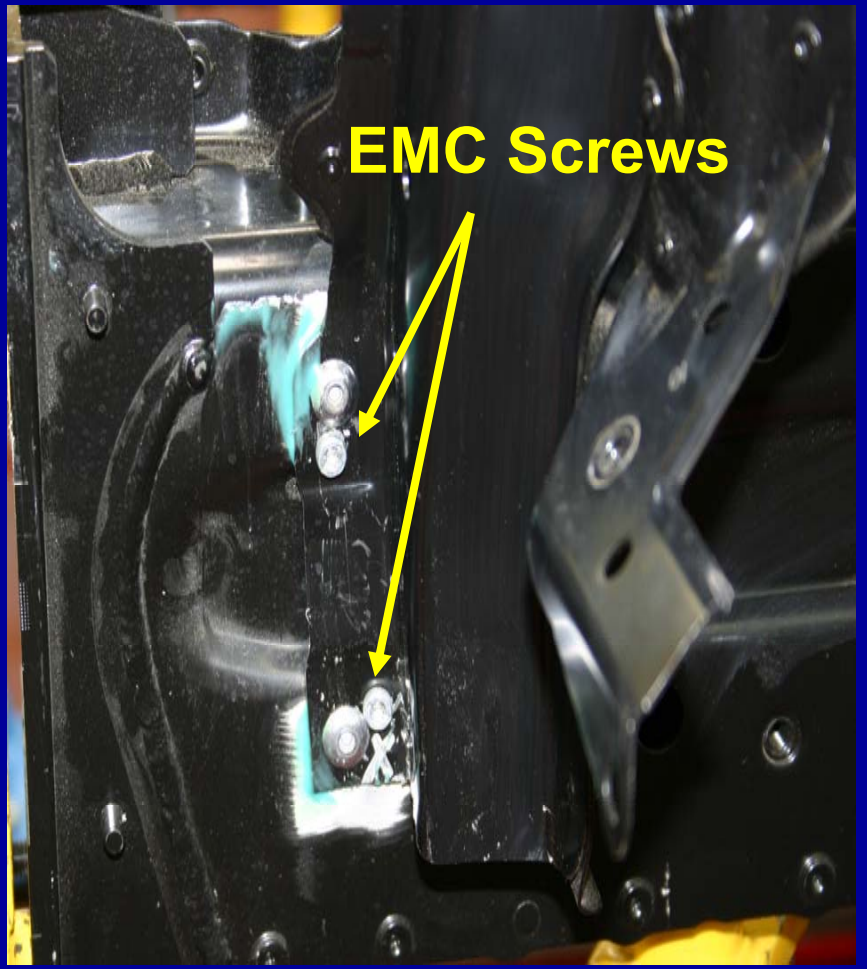


A cross section of the front rail with upper & lower inserts installed.



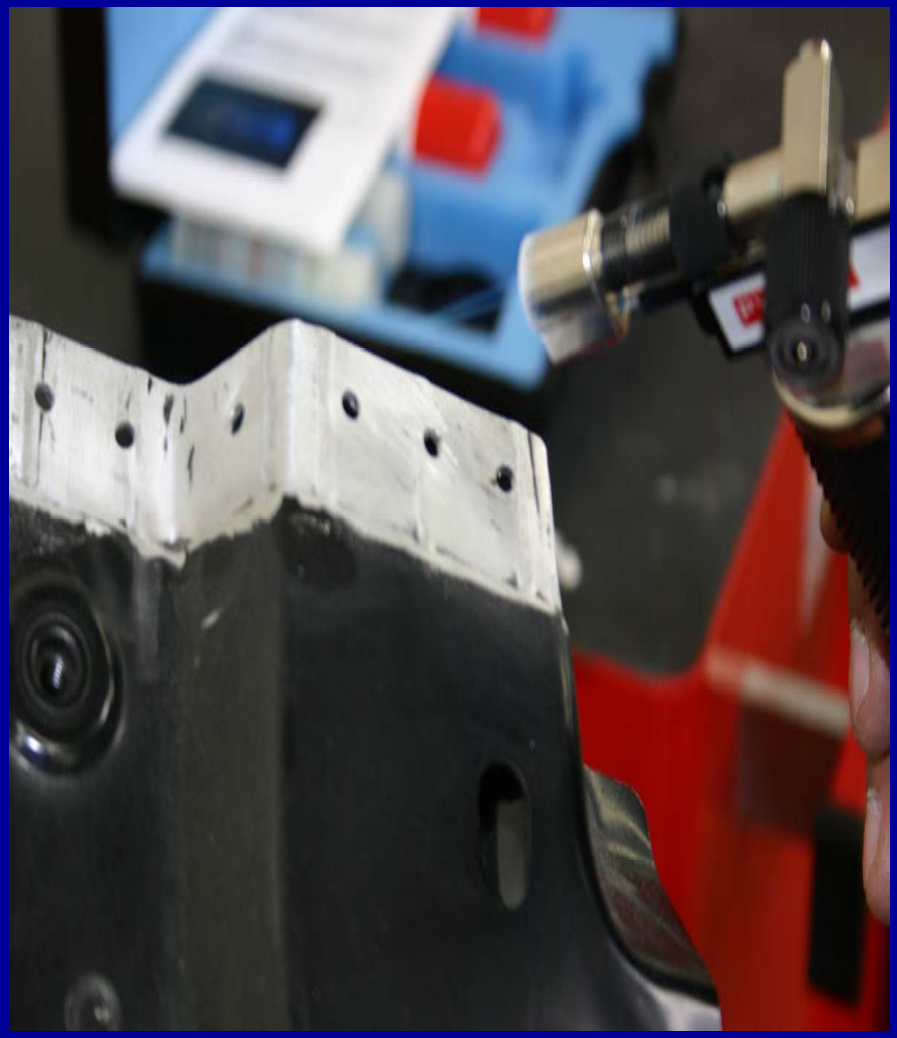
Special Aluminum Insert with special bolt.

Electro Magnetic Conductivity Screws (ECM).

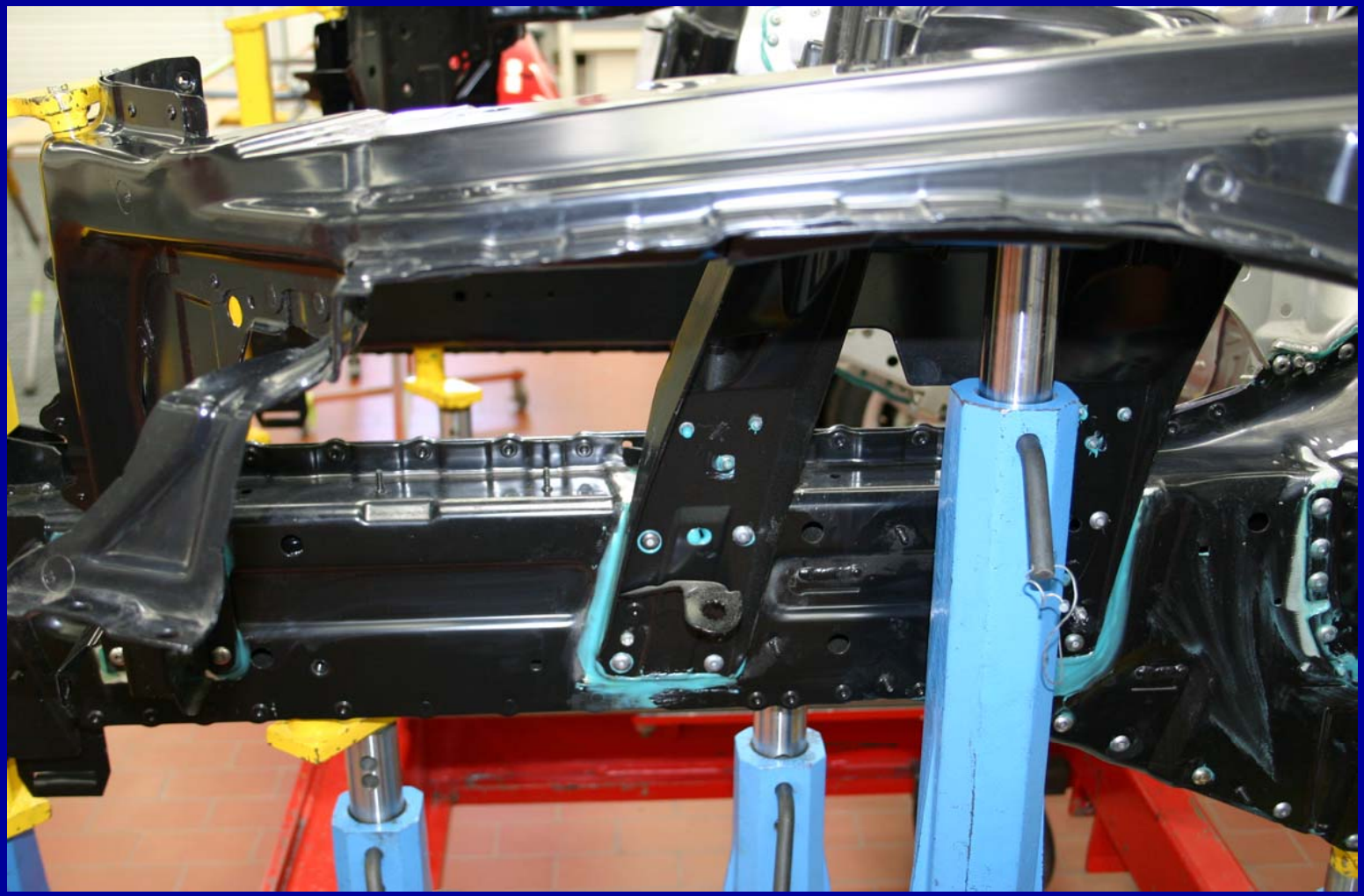


This photo was taken showing the front support carrier prior to installation.

Pyrosil kit and Flame-coating of the replacement part prior to adhesive application.

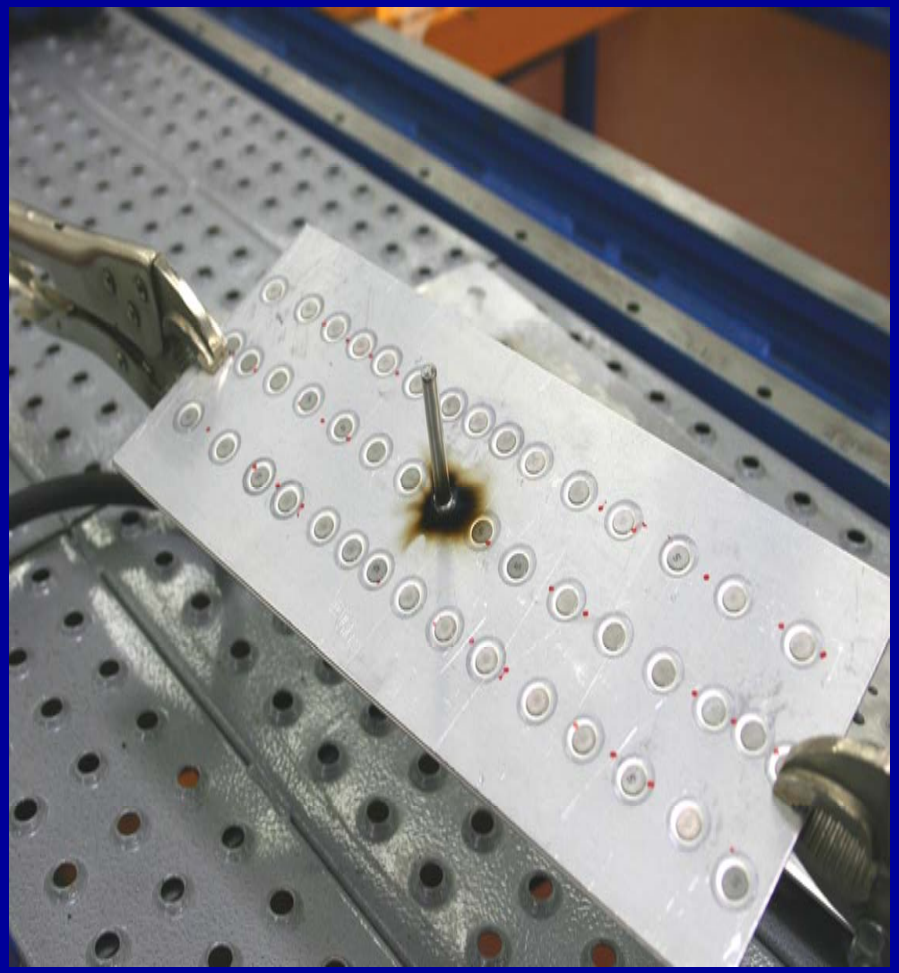


This photo is of a replacement of full rail and upper rail section.

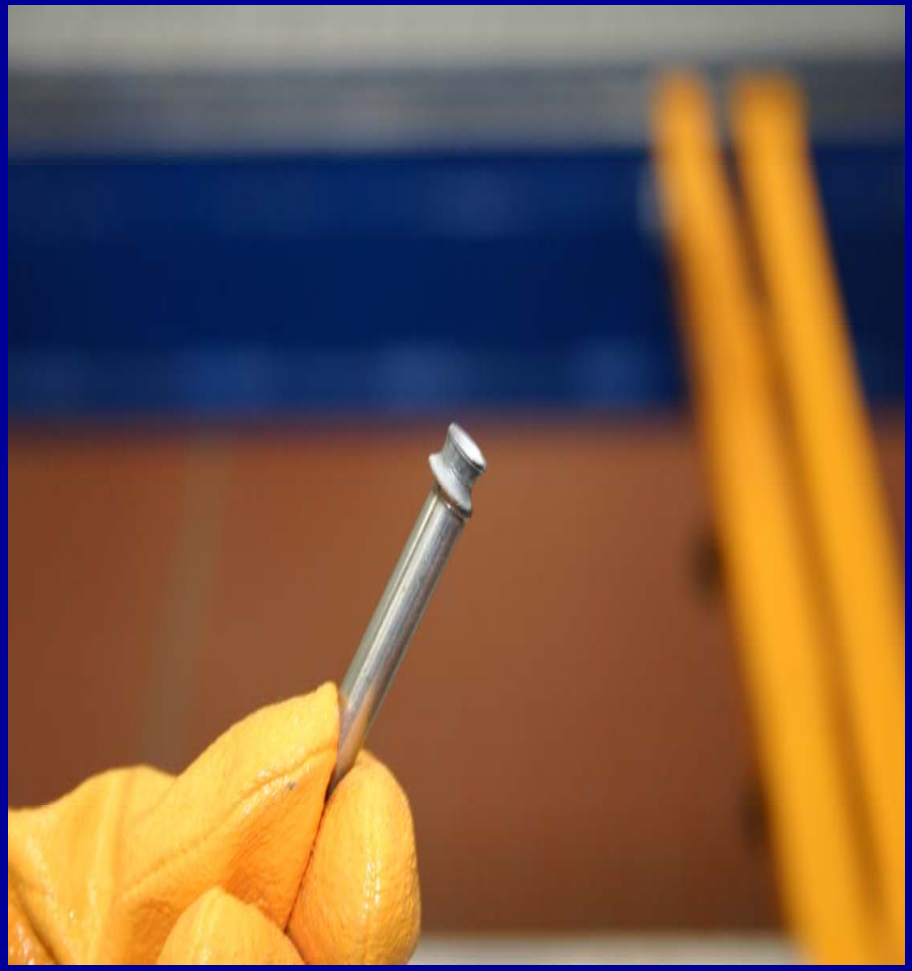


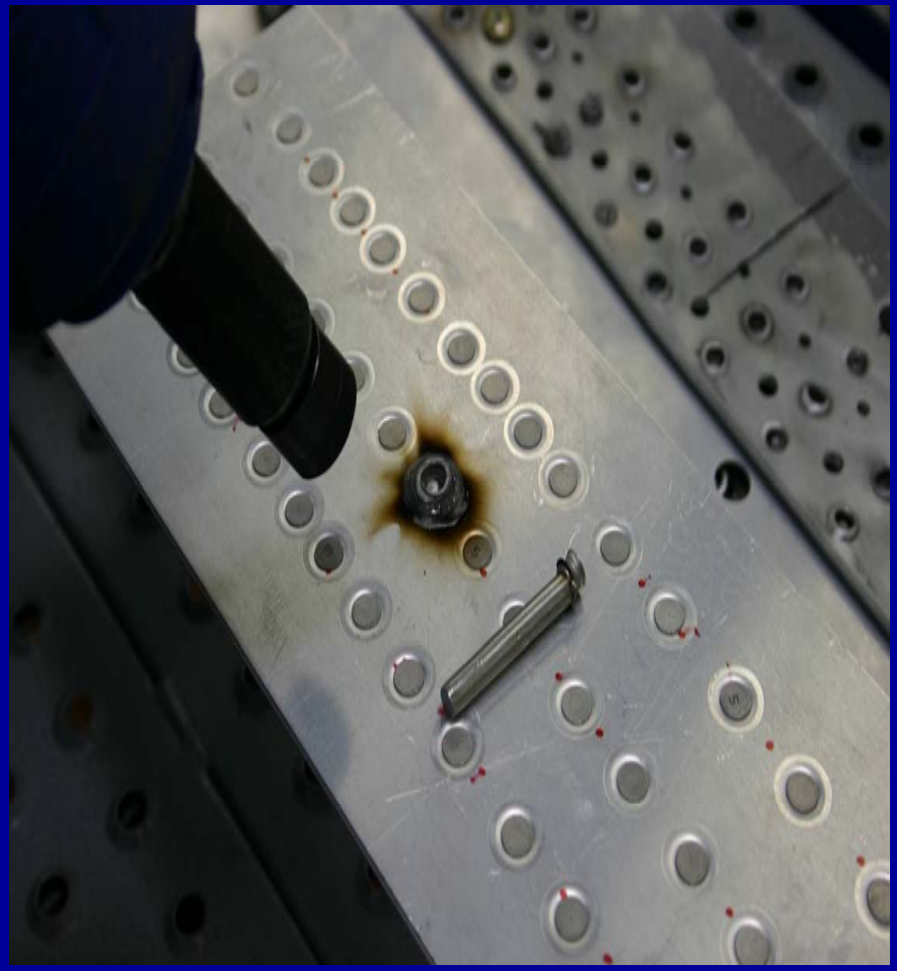
BMW recommended stud welder securing the removal stud to the rivet.

Special removal stud attached to rivet & special rivet extraction / installation tool.



Removal stud with removed rivet.





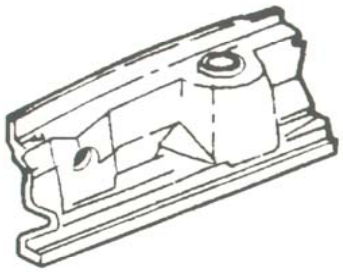
BMW only has one recommended adhesive at this time.

Let's look at the procedures and items that could cause friction costs.

- There is no pulling on the front section.
- The cost of Rivets available only from BMW.
- The cost of adhesive (only one supplier).
- Possible tows to dealer and back.
- The different corrosion protection items.
- Lack of knowledge when writing an estimate.
- Different labor rates.
- Jig rental for the Cellete Bench
- Cost of the Pyrosil and primer

ADP's Procedures for a rail & apron replacement.

Inner Fender Panel
(welded with side rail)



IMPORTANT REMINDER: This is considered a structural part of the vehicle. Replacing structural panels requires:

- ***following specific replacement procedures***
- ***using specified installation materials***
- ***returning the vehicle to OEM structural integrity for occupant safety***

Included Operations:

- Bumper R&I
- Energy absorber R&I (if required)
- Hood panel R&I (if required)
- Hood hinges and hydraulic rod R&I (if required)
- Hood prop rod R&I (if required)
- Fender R&I
- Battery and tray R&I (if required)
- Washer and coolant reservoir tank R&I (if required)
- Sill plate R&I
- Cowl trim R&I
- Carpet/insulation roll back
- Raise and support vehicle
- Front wheel R&I
- Front suspension assembly R&I (rear wheel drive)
- Air inlet system R&I (if required)
- Disconnect and connect engine mounts
- Raise and support engine
- R&I engine & transaxle, suspension & steering assemblies and cradle as a unit (front wheel drive; if required)
- Steering components R&I (rear wheel drive, if required)
- Disconnect/connect battery
- Disconnect/connect wiring harness for access
- Detach and weld at floor pan, radiator support panel, hinge pillar and cowl panel
- Fabrication of inserts (if required)
- Transfer of welded brackets and reinforcements
- Application of weld-through primer
- Seam sealing

Problem: With the ADP estimating system, a few of the items that are included with the operation, could be at different rates than the body rates. Some insurance companies are penalizing the body shops for the manual entries when the rate is changed.

Let's look at ADP's included items for a Inner Fender Panel with side rail that could be at different labor rates.

- R&I front suspension assembly
- Disconnect & connect engine mounts
- R&I engine & transaxle, suspension & steering assemblies

ADP’s response to problem…..

"As you know, ADP's most automated database methodology carries included labor operations to the inner most replacement part labor, and those labor hours are calculated at that part's labor rate. We are aware that on occasions, calculations utilizing multiple wage rates will divert to the original rate when one or more of those included operations are at different rates than the replacement part labor rate. Beyond that, there is the practical issue of the specific technician who does the actual work.

We are in the process of reviewing design alternatives to programmatically breakout or display the damage entries where these variable rate included labor operations occur. A work-around to consider is to identify those included labor operations and enter the variable costs as manual damage entries.

The process of identifying variable rate included operations discussion:

- Review the labor report to identify damage entries which have included labor operations that are known or suspected to be at a different database assigned rate than the replacement part labor rate.
- With the in progress estimate, delete the replacement part damage entry and enter the included labor damage entries believed to be at different rates.
- Note those that have different labor rates with the respective labor amount.
- Restore the deleted replacement part damage entry and then enter manual entries as required to account for the wage rate cost variables

Replacing a Boron Steel Panel

Characteristic of Boron Steel

- Extremely britle
- Can not be drilled with convention drill bits
- Can not be punched
- Can not be straightened when damaged
- Inverter resistance spot welder technology highly recommended
- Plasma cutter highly recommended
- 4 times stronger than steel

A LATE MODEL VOLVO WITH DAMAGE TO THE REAR PORTION OF THE VEHICLE.

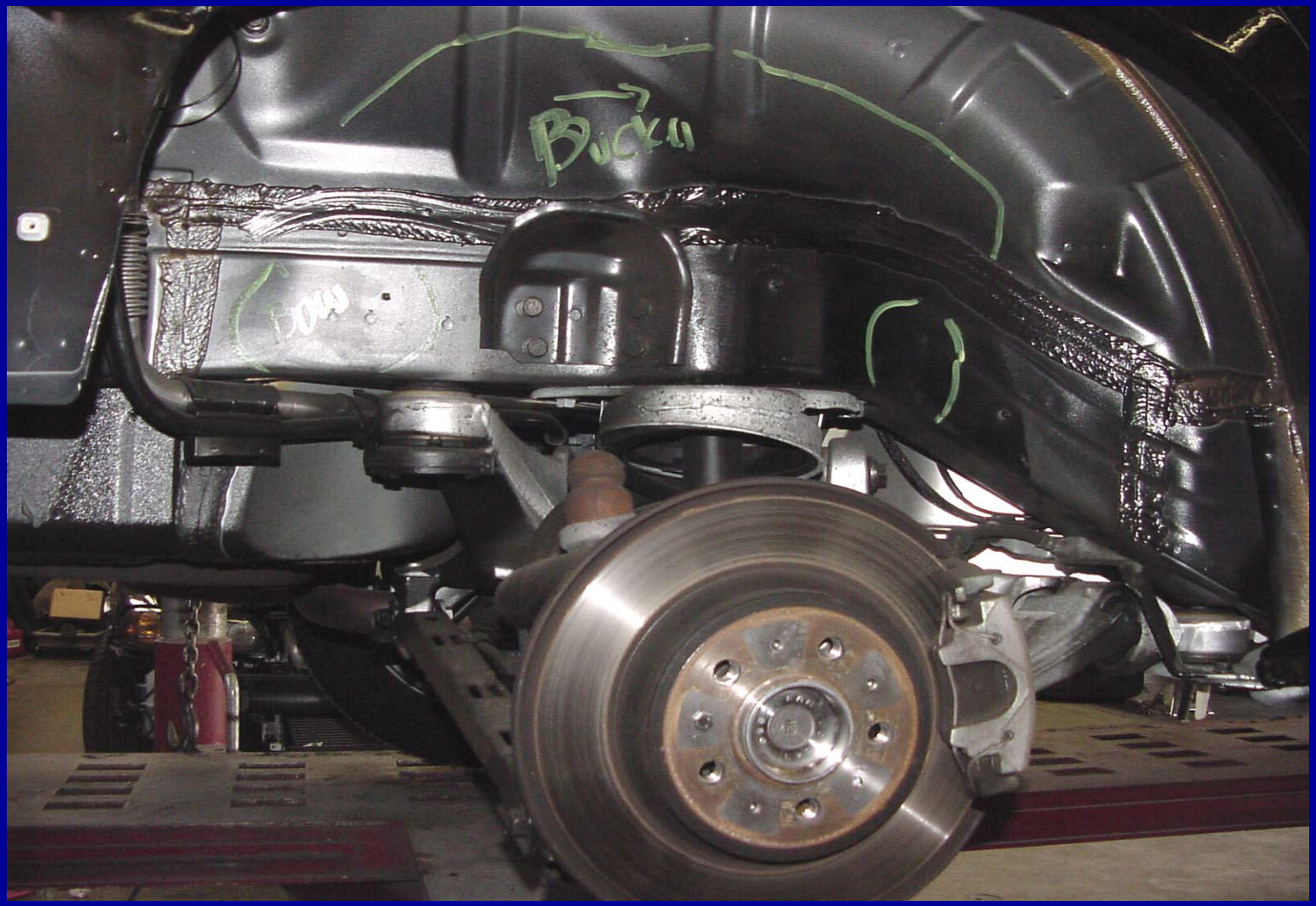
Remove all interior trunk liners.

The technician is removing the external parts for repair access.

Damage to Boron Steel rear bumper reinforcement- lower rear body panel.

Note—The lower rear body panel & bumper reinforcement are welded together. Both panels are made from Boron Steel.

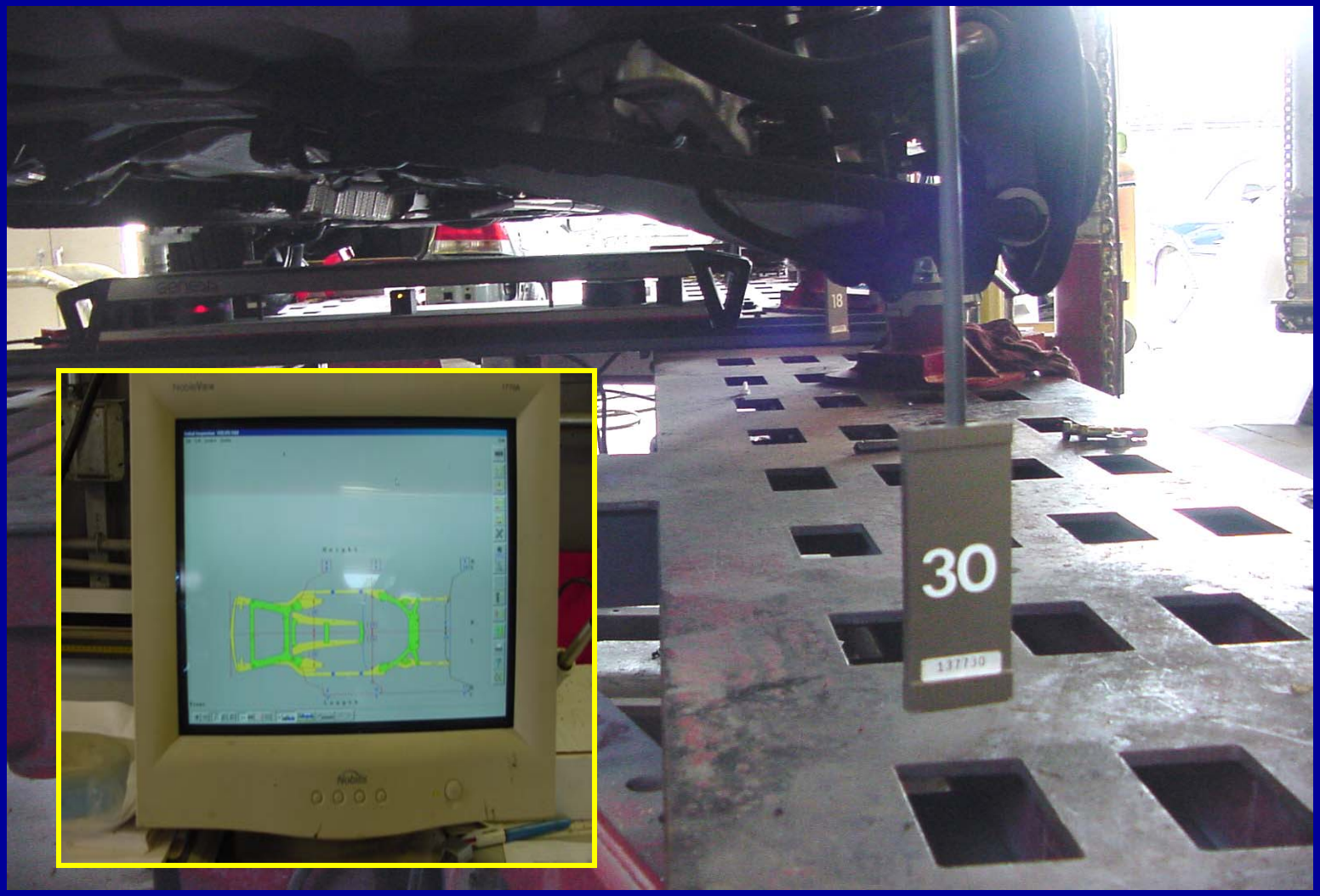
Damage to the inner rear quarter panel.



Disconnect & pull back rear wire looms and fuse block.

Disconnect exhaust system & remove from vehicle.

Set up electronic measuring system to determine extent of damage that needs to be corrected.



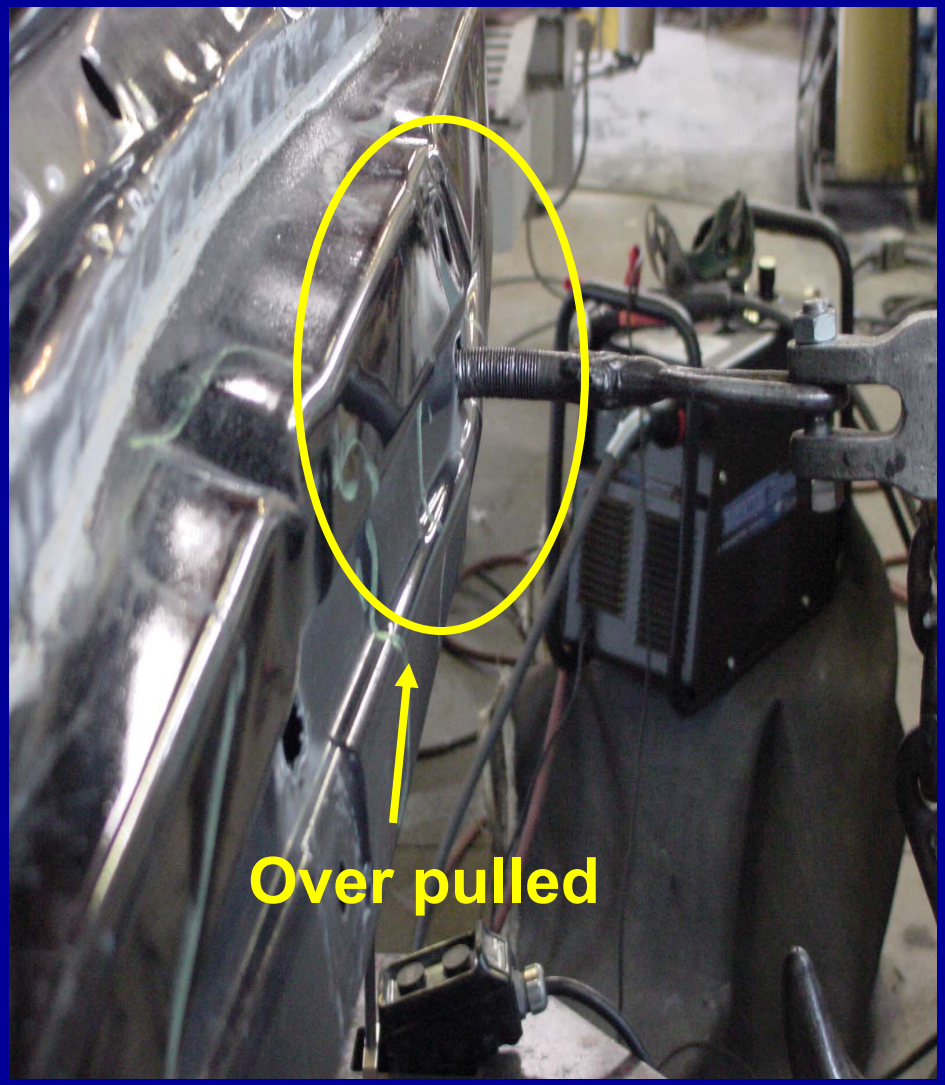
Remove OEM caulking & sealant for access to spot welds.

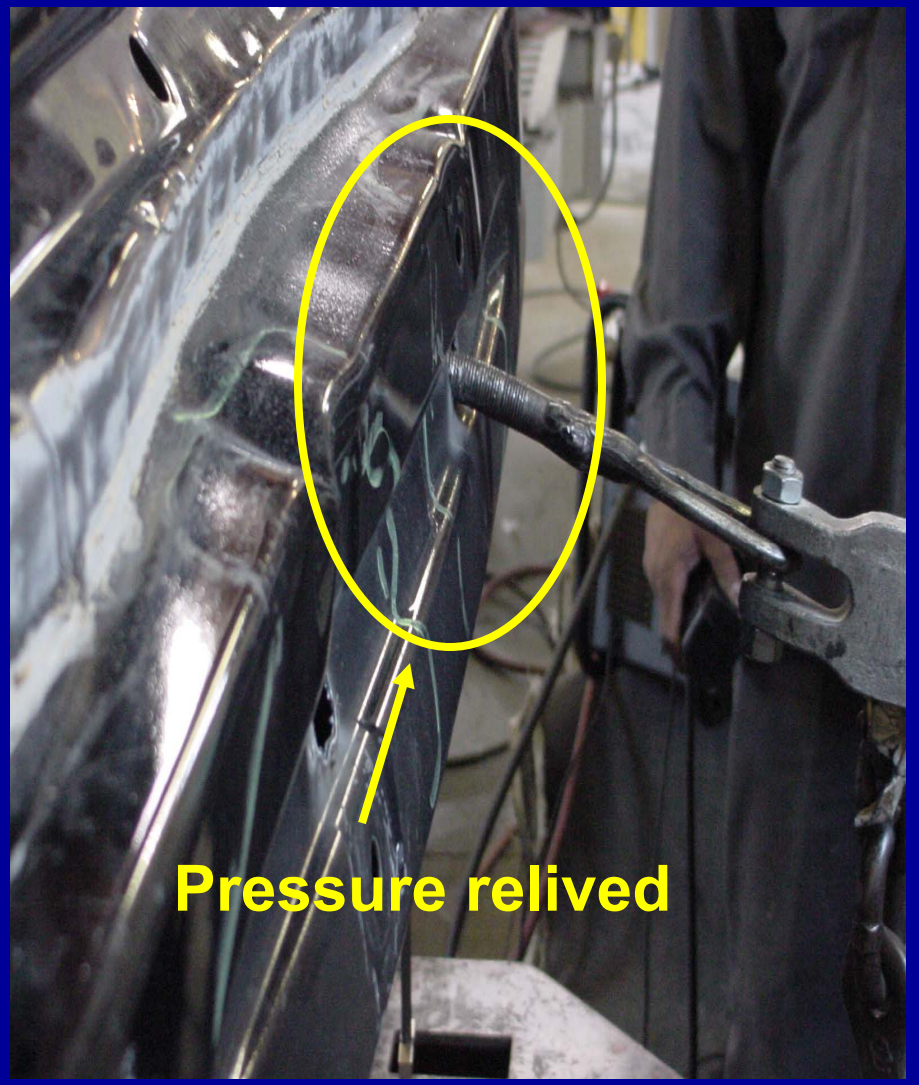
Install Volvo specific tool for pulling rear frame rail.

Pull vehicle to pre-loss dimensions

Pull rear bumper reinforcement in order to relieve tension on non-Boron Steel.

Note how bumper reinforcement is over pulled but returns to its original damaged state after th pressure is relieved.



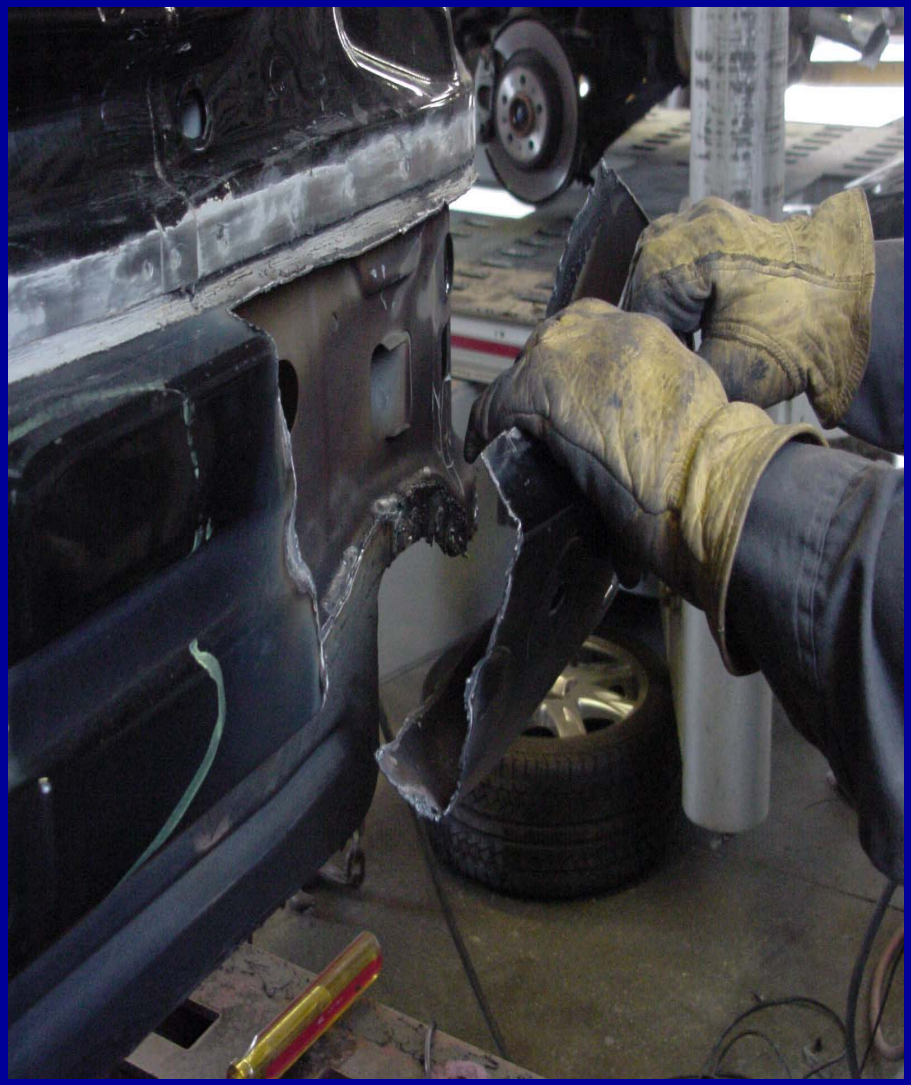


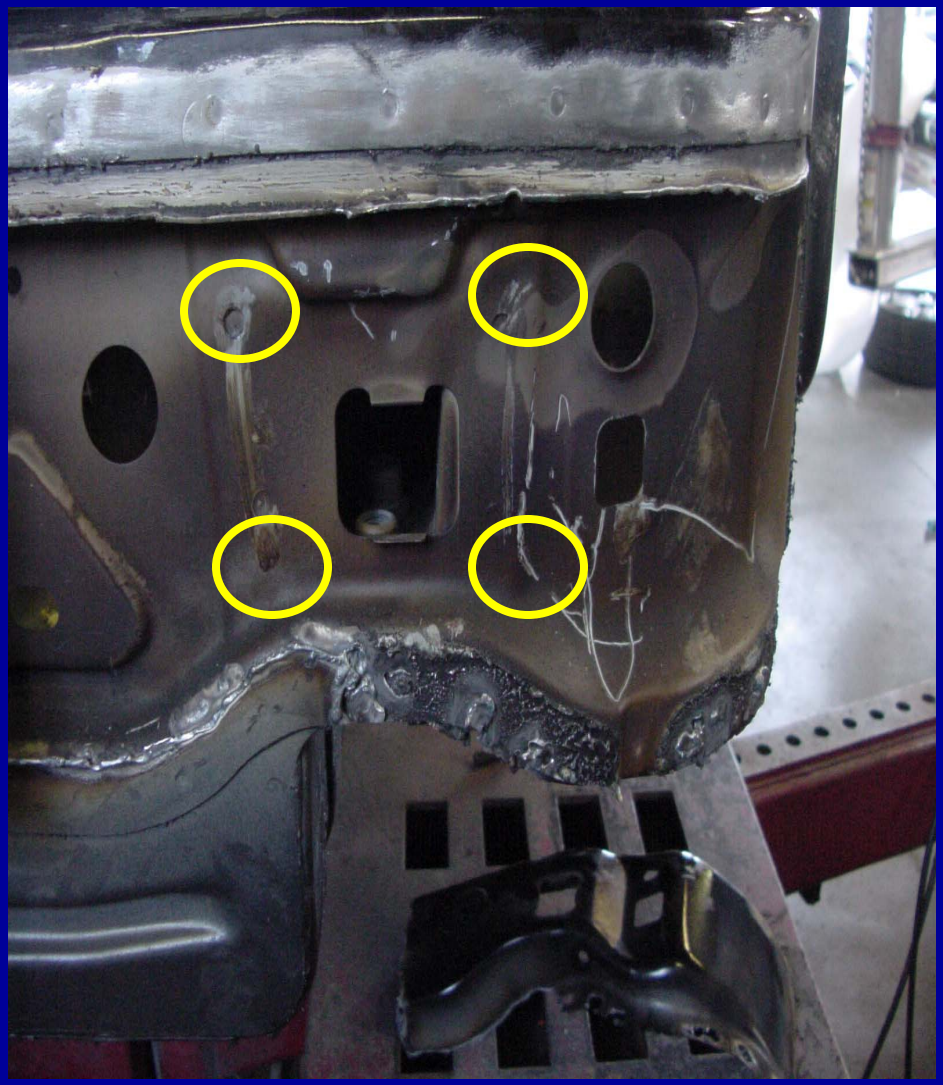
Begin removal of rear bumper reinforcemen
with plasma cutter detailed
in the Volvo repair manual.

More cutting using the plasma cutter.

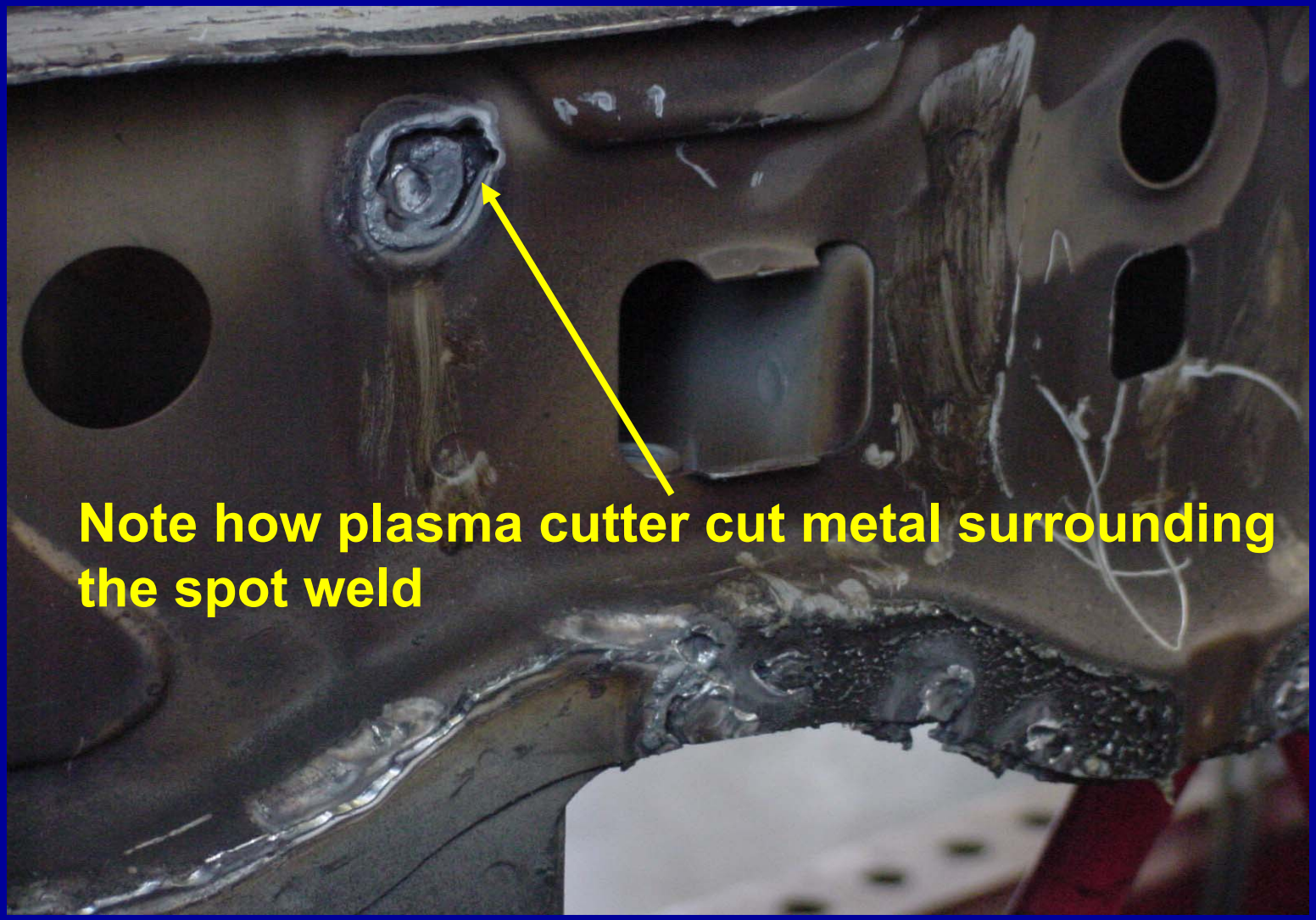
Use plasma cutter to remove factory resistance spot welds.

Remove portion of outer bumper reinforcement to expose sport welds the attach the inner panel to the frame rail.

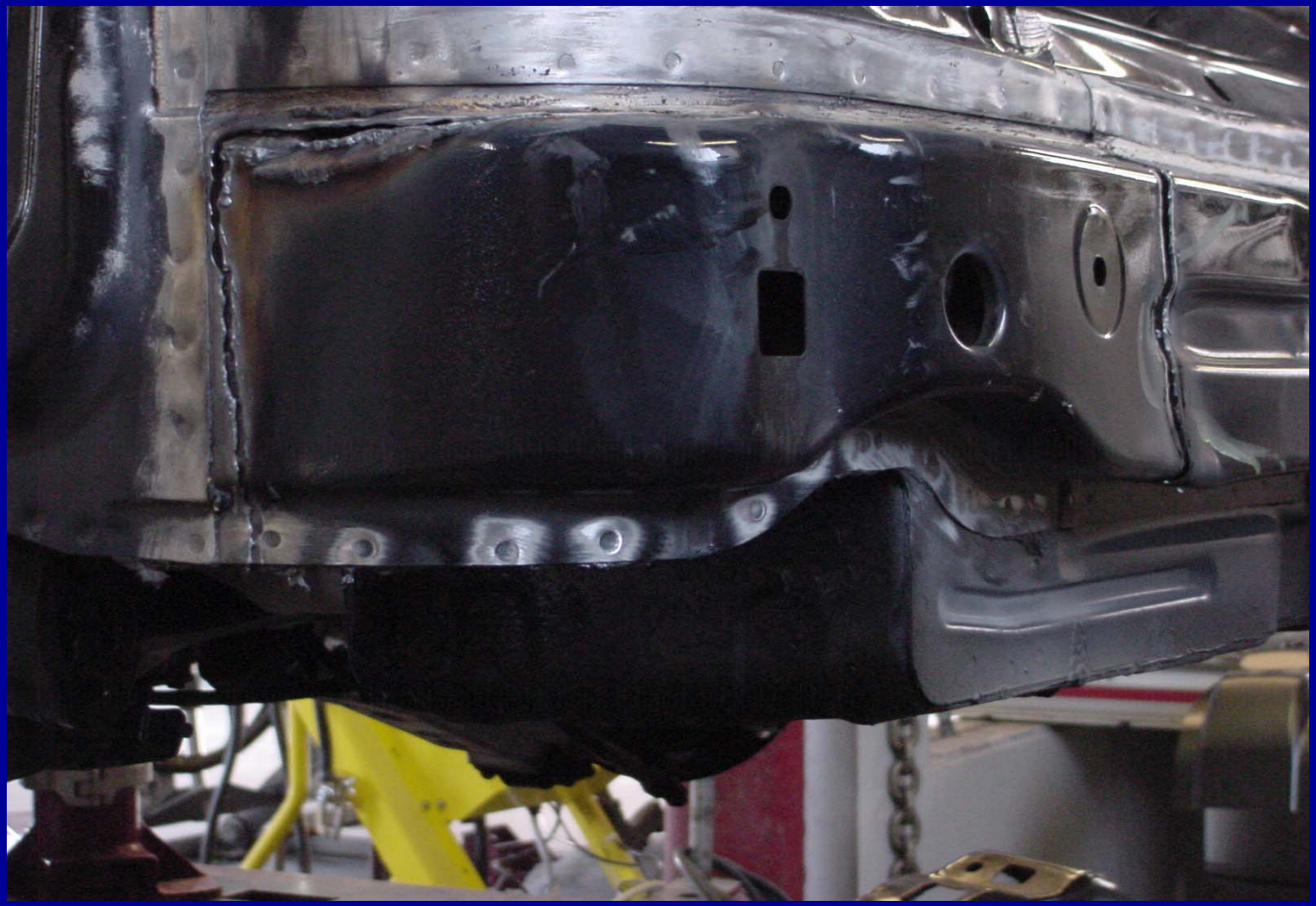




A factory spot weld removed using the plasma cutter.

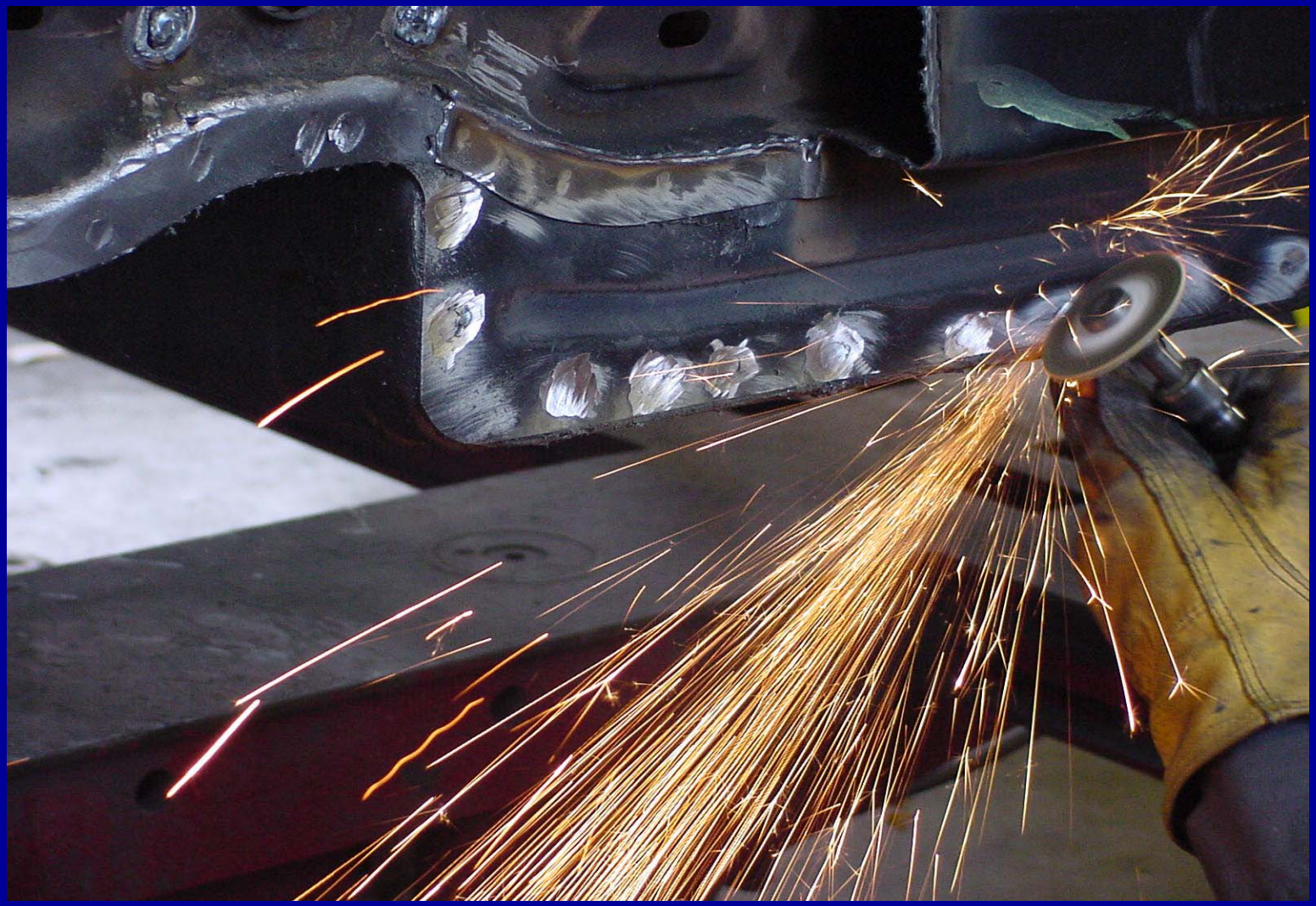


Follow same procedures to other side of the outer bumper reinforcement.

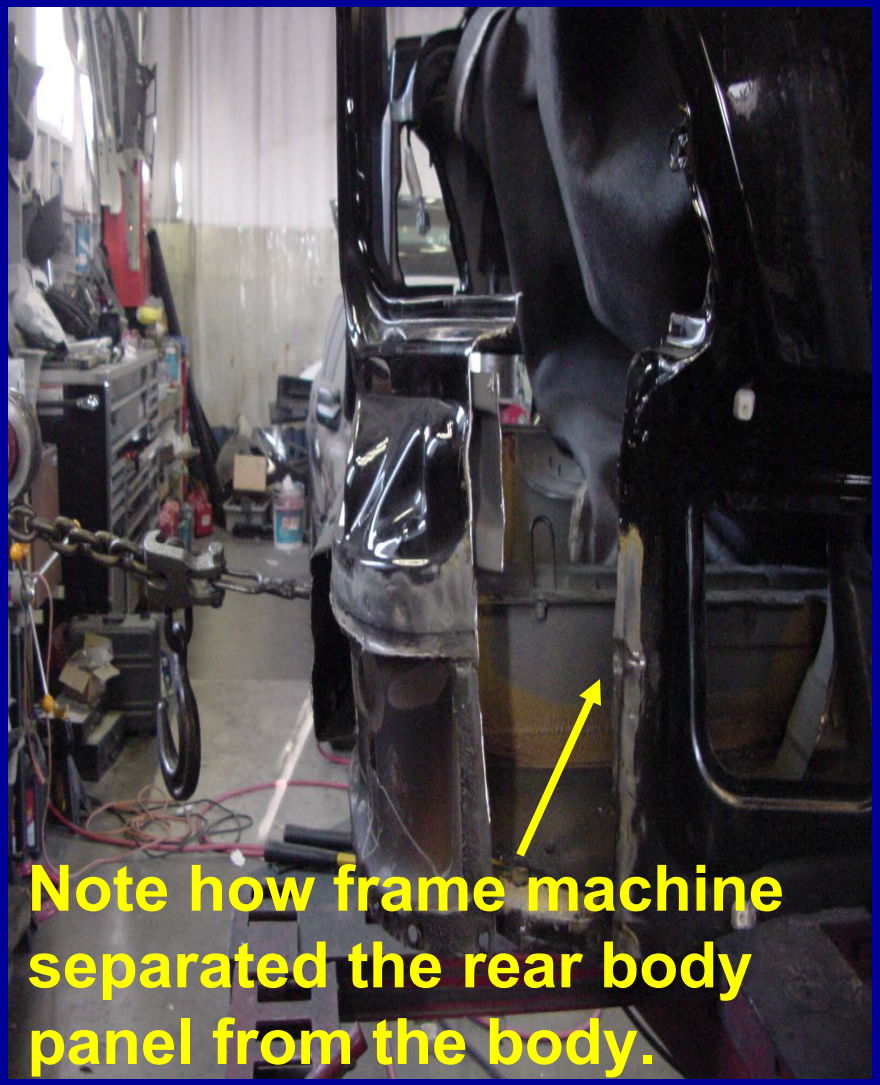


Clean off paint & sealant on inner reinforcement to expose factory spot welds.

Use a disc grinder to remove spot welds that secures the inner panel to the trunk floor.



Use the frame machine to remove the rear panel assembly from the vehicle.



Stress relieve & repair damage to inner quarter panel & frame rail.

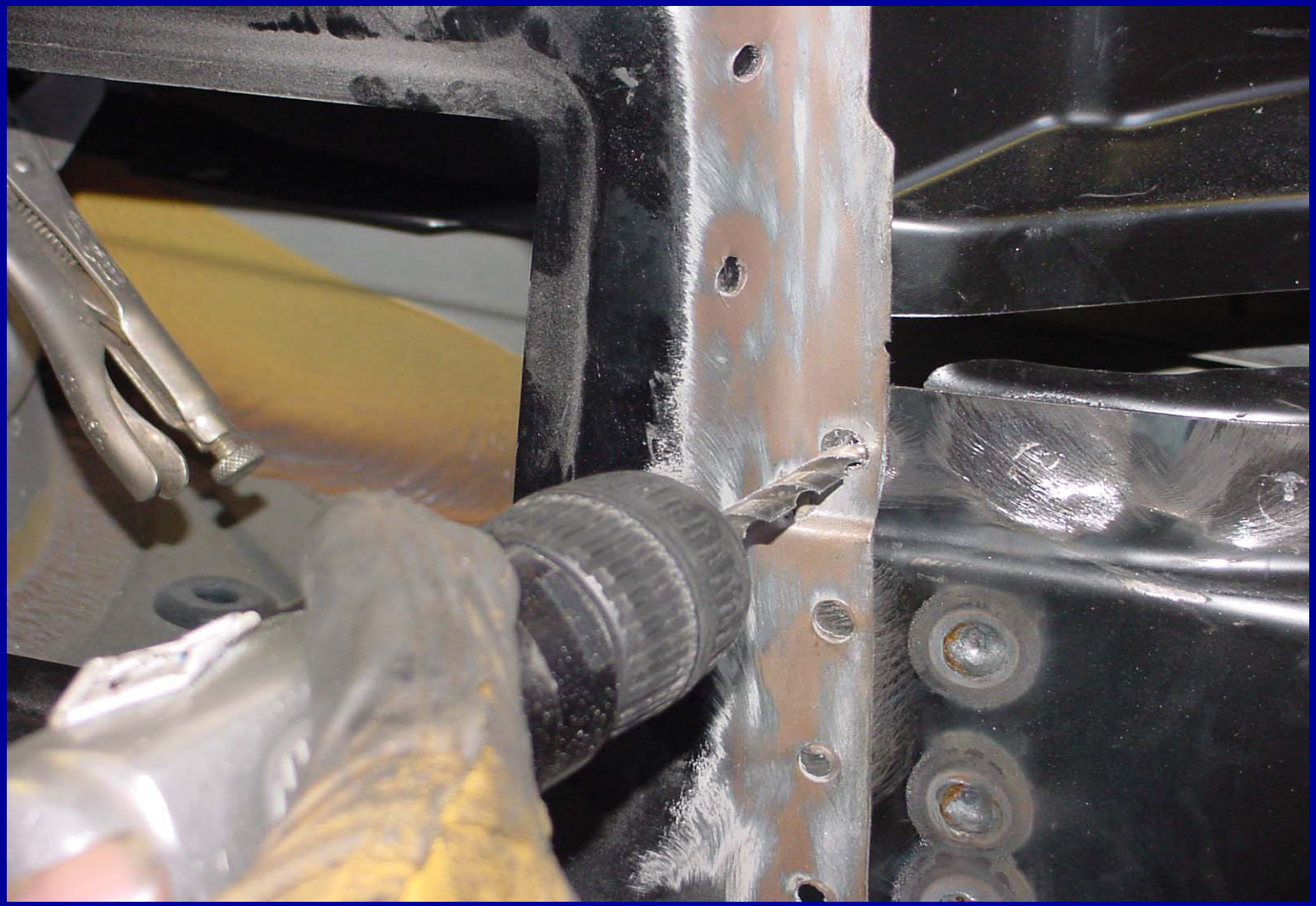
Remove old sealant & caulking from trunk floor.

At this point there are 2 options available for the technician to install the inner Boron Steel rear body panel: First he/she can use a resistance spot welded that will work on Born Steel or

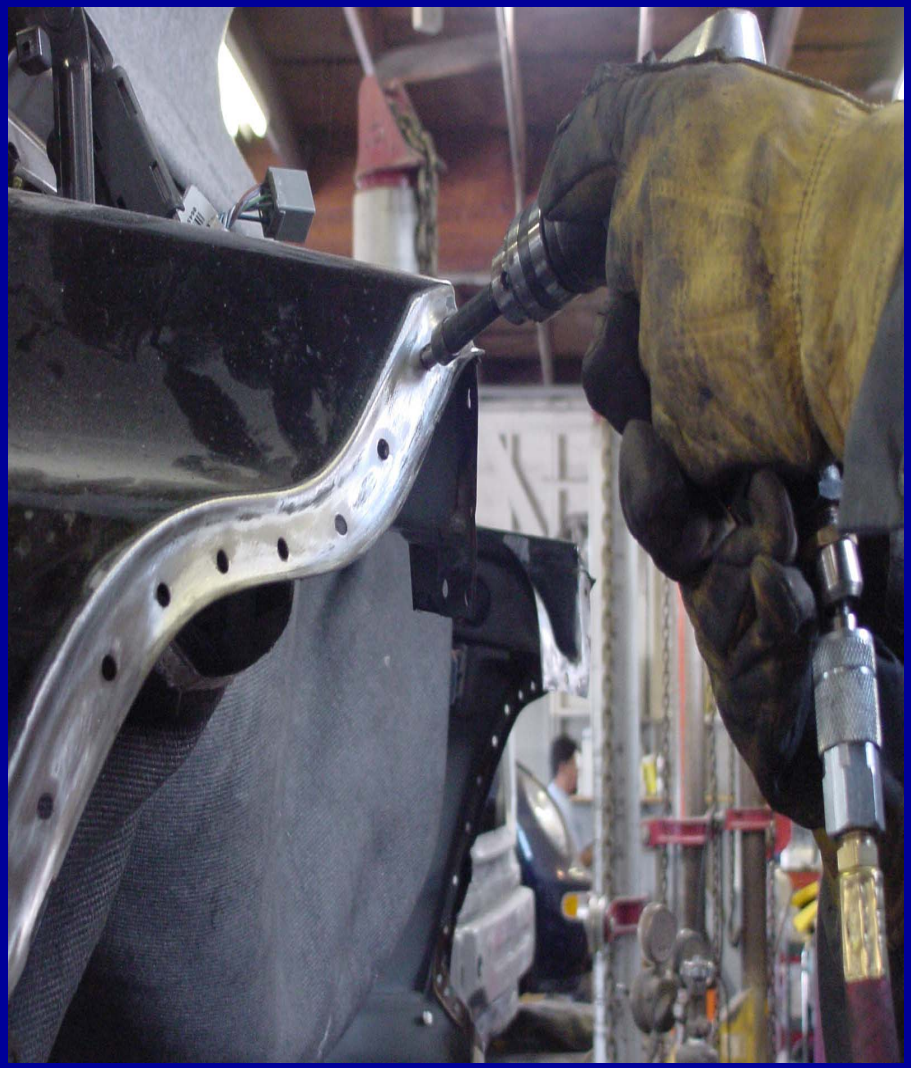
The second option is to use a MIG welder with 8 MM plug welds. Since this inverter resistance spot weld technology is new, the rest of the presentation will concentrate on the plug weld option which is more widely used by the collision repair industry.

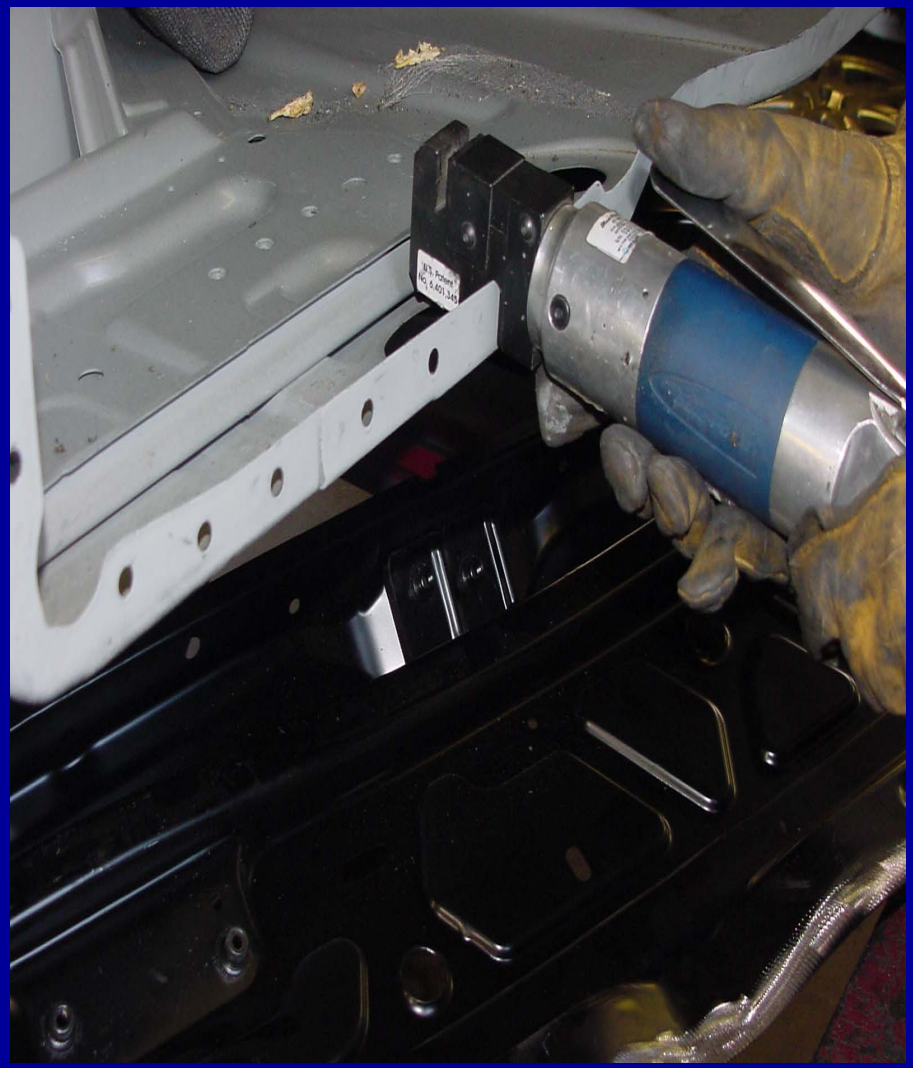
Apply weld thru primer to all mating surfaces that are to be plug welded.

Clean inner panel that is to be plug welded to remove the weld thru primer from the weld site as recommended by I-CAR.



Drill 8 mm holes on quarter panel & punch trunk floor.





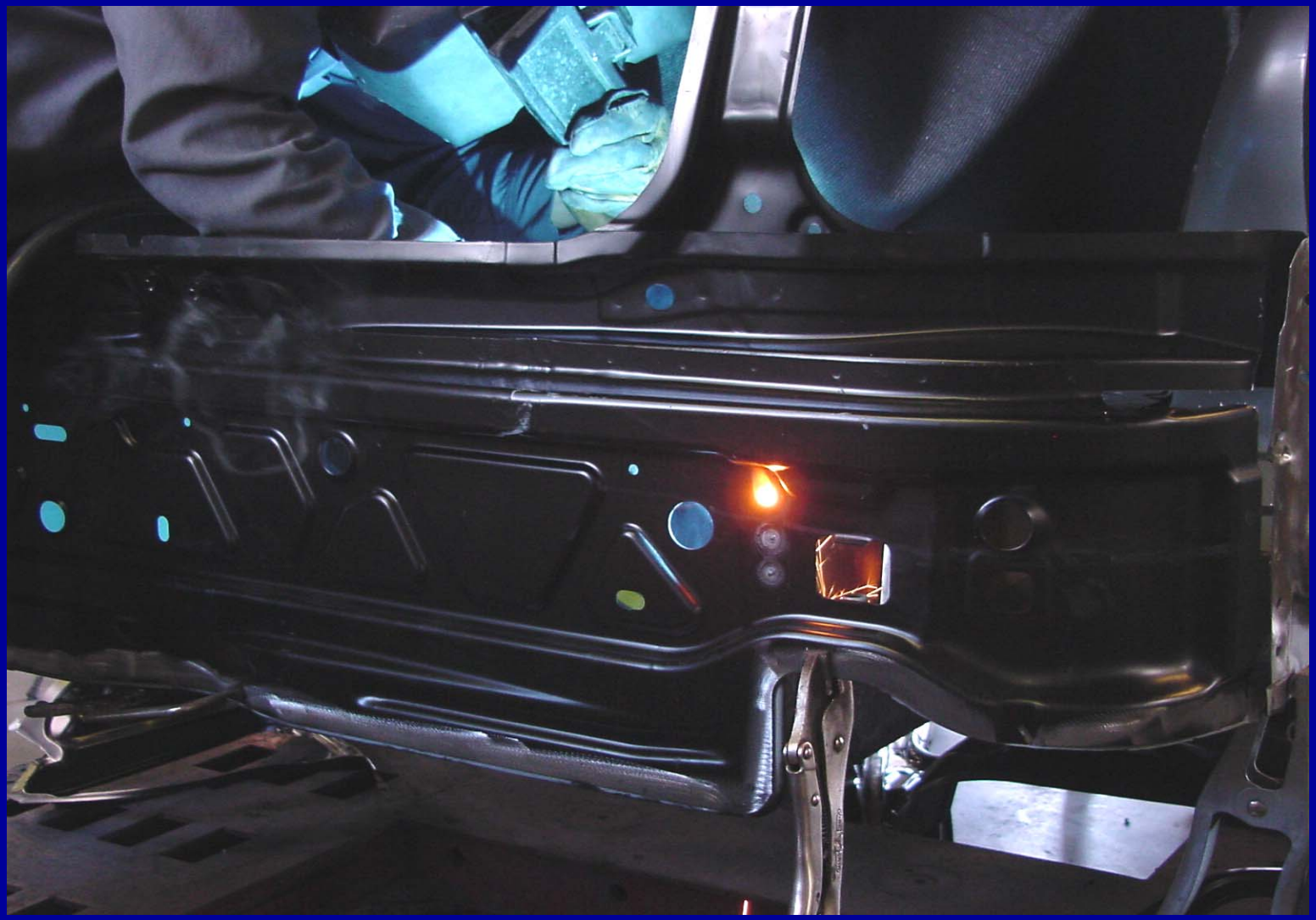
Clamp rear body panel to vehicle to trial fit & mark plug hole locations.

Mark the location of the plug weld holes on the backside of the rear body panel.

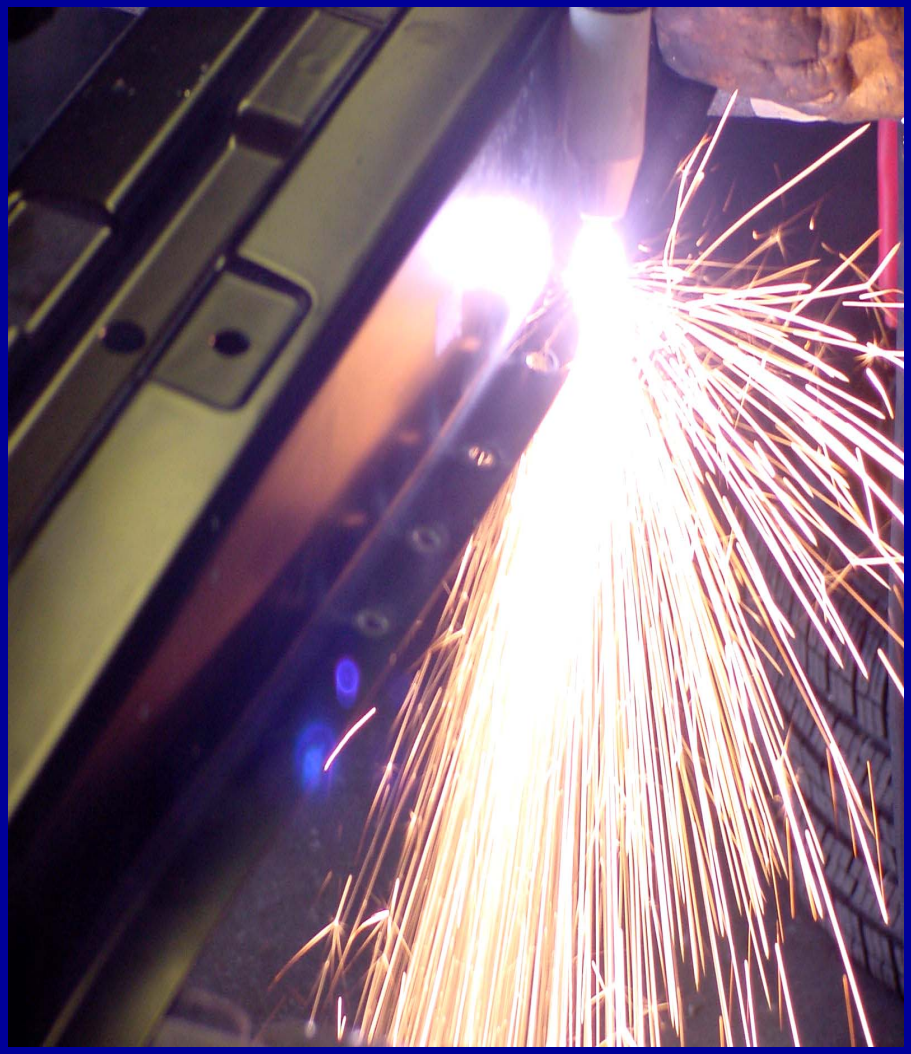
Perform test welds using the old Boron Steel rear body panel as recommended by I-CAR.

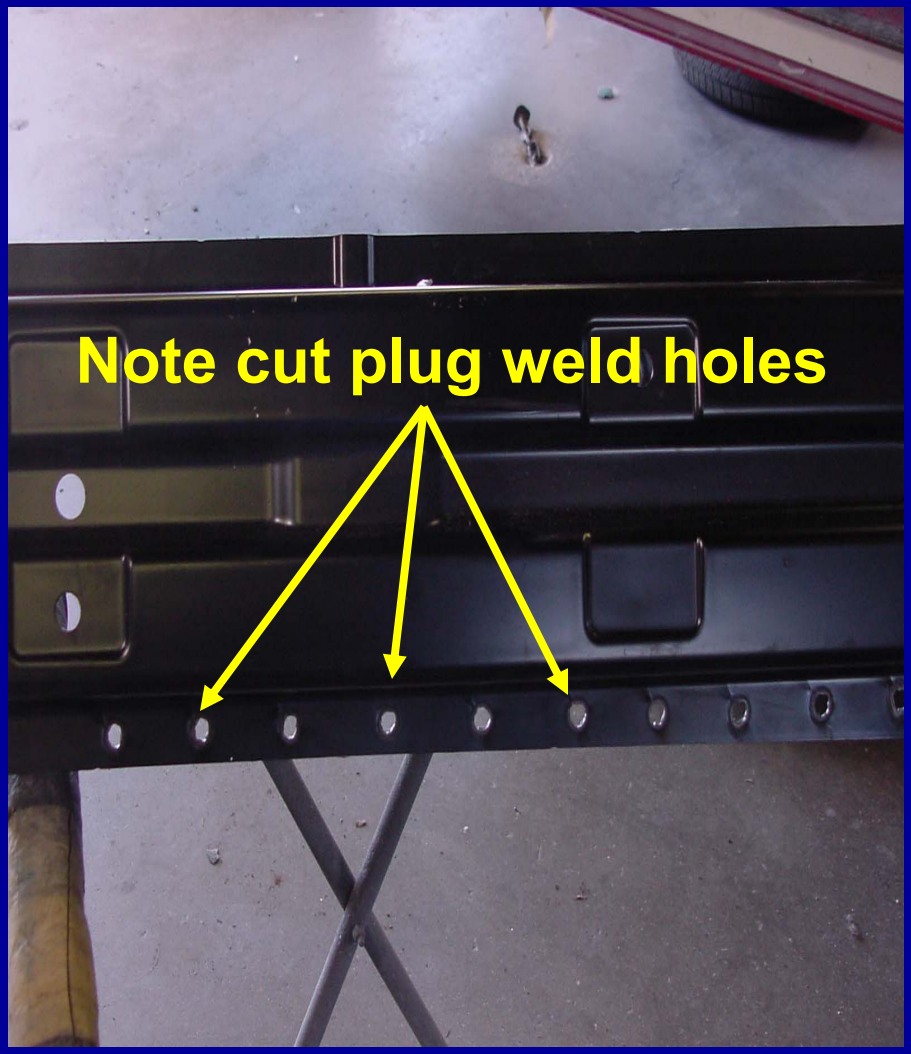
Remove small amount of the factory E-coat at marked locations

Plug weld the frame rail to the rear body panel (it was easier for the tech to drill holes in the frame rail ends instead of rear body panel).

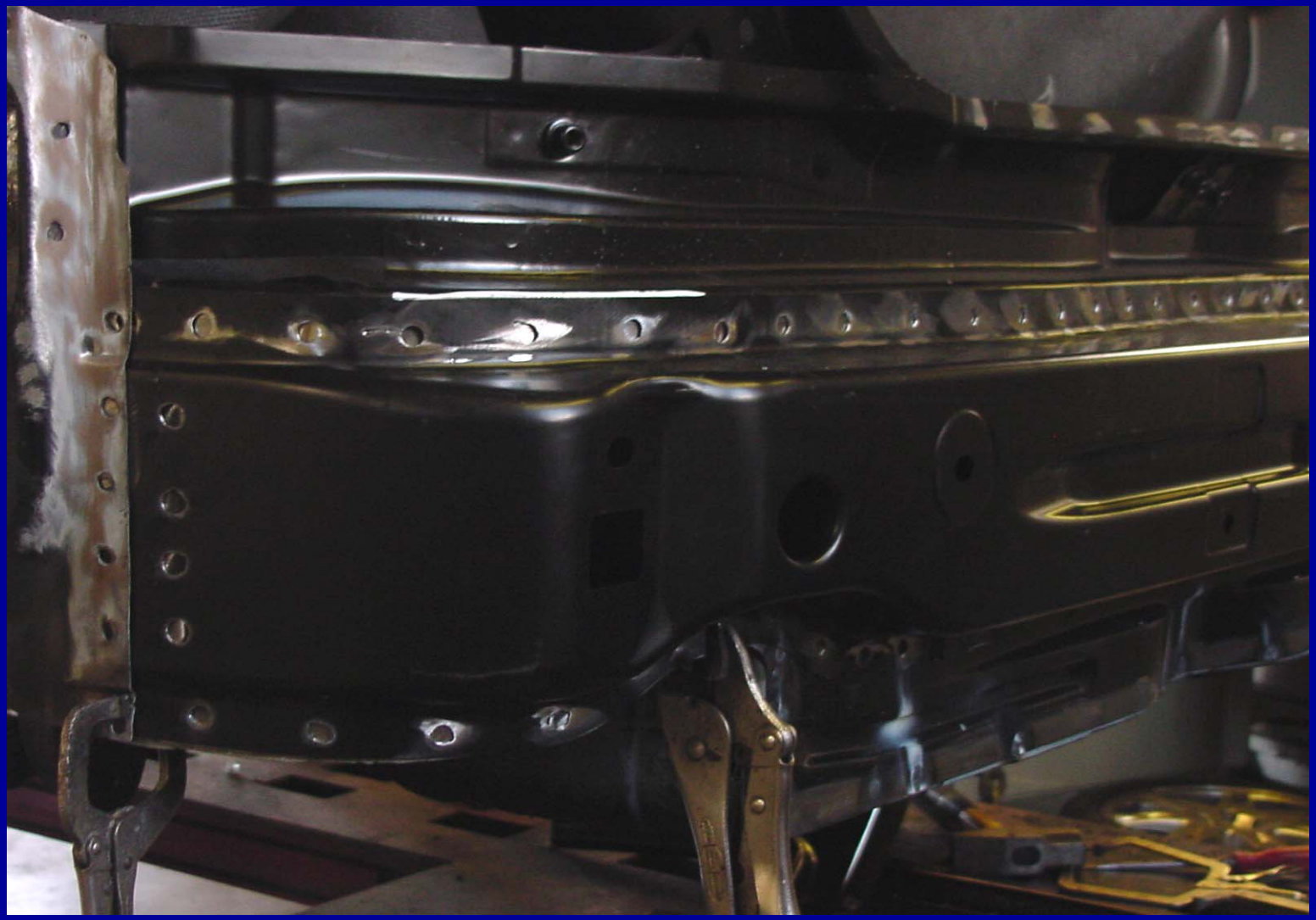


Using the plasma cutter, the tech cut plug weld holes into the Boron Steel outer bumper reinforcement.





Trial fit Born Steel outer rear bumper reinforcement to vehicle.



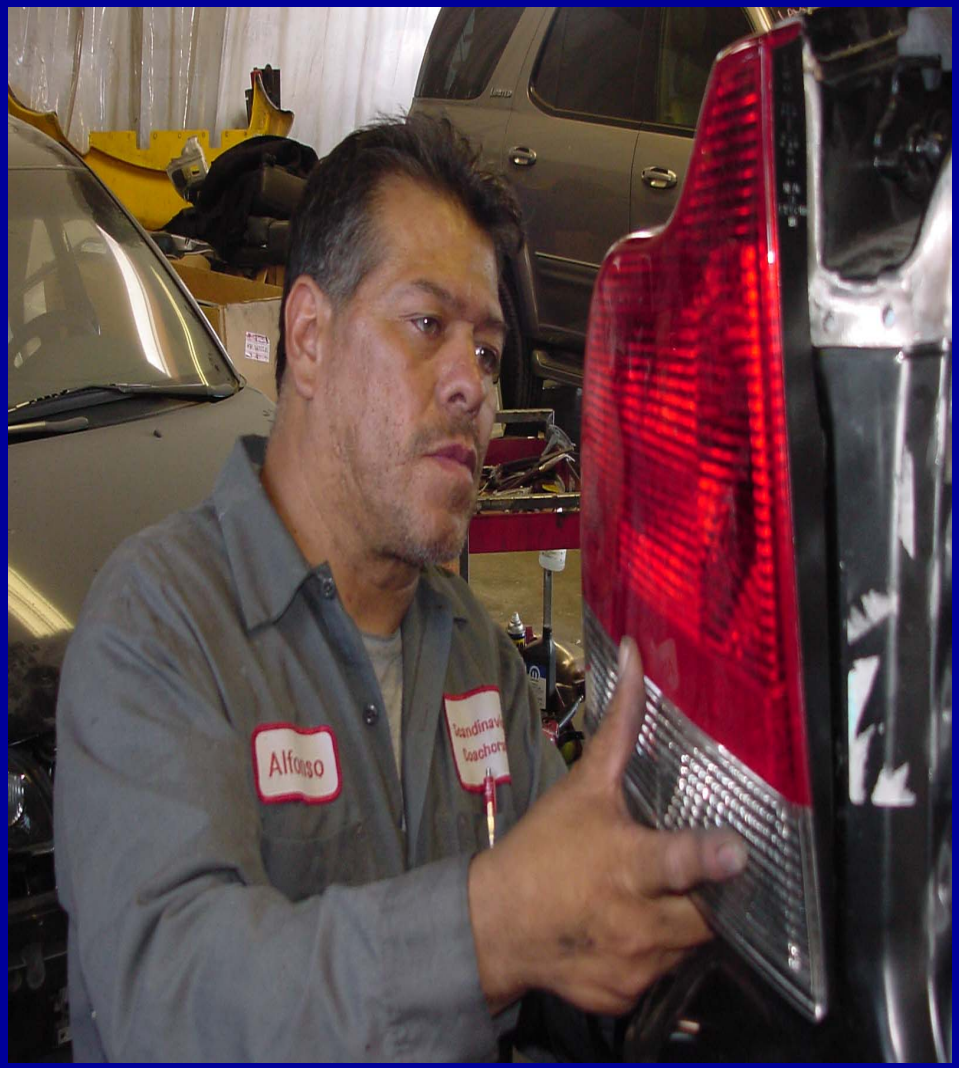
Plug weld the outer Boron Steel rear bumper reinforcement to the vehicle using a MIG welder.

Dress the plug welds on the outer Boron Steel bumper reinforcement.

Apply a self etch primer to the bare metal on the outer Boron Steel rear bumper reinforcement.

Apply undercoating to the rear frame rails.

Install the tail lamp pocket & trial fit the tail lamp assembly



Install used deck lid & check all the gaps for proper dimensions.

Finish welding the remaining panels.

Apply sealant where the new rear body panel joins the quarter panels & trunk floor.

Apply cavity wax to the inner rear frame rails after the painting process.