

# Test Project

## *Autobody Repair*

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## Introduction

All Competitors will be tasked to demonstrate a range of skills in Autobody Repair. There should be at least six (6) different project modules to include but not limited to the following: Diagnosis and Correction, Structural Part Replacement, Non-Structural Part Replacement, Panel Repairs steel and aluminum, Plastic repairs.

## Description of project and tasks

Module A Diagnosis and Correction	13%
Module B Structural Part Replacement	27%
Module C Non-Structural Part Replacement	23%
Module D Panel Repair (Steel & Aluminum)	13%
Module E Cosmetic Repair on Plastic	12%
Module F Panel Gap Adjustment	12%
TOTAL:	100%

## Instruction to Competitor

These Competitor instructions must be read in conjunction with the following documents:

1. Current version of Technical Description.
  2. Current version of Competition Rules A and B.
  3. Current version of Health and Safety Document
- Certain tasks need to be marked by Experts “while in progress”, these are indicated in your Instructions where STOP is shown proceed with another task while marking takes place.
  - Marks will be forfeited if the Competitor overlooks the “in progress marking” by Experts.
  - Assistance with the removal and replacement of heavy parts such as doors, bonnet, etc can be given by any Expert other than the one from your country. (No help on side panel)

## Safety

Competitors could be deducted marks or excluded from the competition (as per competition rules & Health and Safety document) if they are identified working in an unsafe manner or create an unsafe workplace condition.

Examples of unsafe practices include:

- Not wearing the appropriate personal safety equipment, safety glasses, gloves, hearing protection, safety shoes etc.
- Not correctly positioning screens when MIG welding or grinding.
- Not using fume/smoke extractor.
- Realigning without safety cable correctly fitted.
- Poor/unsafe housekeeping.
- Endangering yourself or others.

Reckless or accidental damage caused to equipment or vehicle while performing repairs could result in loss of marks in any or all categories.

## **Important!**

It is crucial to the end result that you carefully review the task before you start work. The order of the tasks is determined. You begin on the task A, and follow the instructions given at the end of each task. The order will then be A1, A2, C1, B1, and so on. You must always complete each task before moving on to the next task, if not otherwise specified.

# Module A Diagnosis and correction Preparation

## A1 – Diagnosis of Vehicle

- Observe safe work practices at all times.
- Remove related parts if necessary.
- Ensure that all the clamps and bench mountings are correctly fitted and tightened. No measurement from required
- Bench mountings and clamps must be tight, (100 Nm torque).
- Ensure that the measuring bridge/ladder is correctly fitted and locked in place.
- Start up the Car-O-Liner Vision X3 System and make a new work order.
- The order must be created and saved with:
  - Name: <First Name>
  - Work Order No.: <Your country/region>
- Select Peugeot 308 Stationwagon – Dataheet: 16:148
- Set-up and “center” the Car-O-Liner measuring system, use measuring point with 5 centering points given. You might get a warning that the point is not recommended for centering. You can close this message and continue.
- Centering Point:
 

Left	L10, L19
Right	R10, R19, R16
- Measure and report the extent of misalignment at the following locations.
- Underbody locations:
 

Left	L1, L2, L3, L4, L5 L6, L7, L9, L11, L25, L26
Right	R1, R2, R3, R4, R5, R6, R7, R9, R11, R25, R26
- Measure and report the extent of misalignment at the following locations.
- Upperbody locations:
 

Left	HL7, HL8, HL9, HL10
------	---------------------
- Perform necessary steps to set up equipment for anchoring point R9 According to the item list in the Car-o-Vision. The bolt that should attach the Evo to the car is in the black box on the EVO-wall.
- Torquelist EVO 1-2:
 

➤ Mounting to bench:	100 Nm
➤ Other bolts:	70 Nm
➤ Bolt to the car	30 Nm



*Figure 1 These parts are already fixed together*

**Important!!** DO NOT PULL THE CHASSIS MEMBER

- Attach the pulling tower correctly on the pulling bench.
- Attach the correct clamp or chain on to the area you would like to pull on the righthand side
- Align the puller tower and chain to the direction you desire to pull the chassis member as a remedial action.
- Mount up EVO 3 on point L6. Perform necessary steps and use tool list as in Car-O-Vision to set up equipment for anchoring. When it is fixed, make a new measurement trough the EVO3.
- Torquelist EVO3:
  - Bolts to the bench: 100 Nm
  - Other bolts: 30 Nm

**A1 STOP** – Call the Expert to check measurement and puller

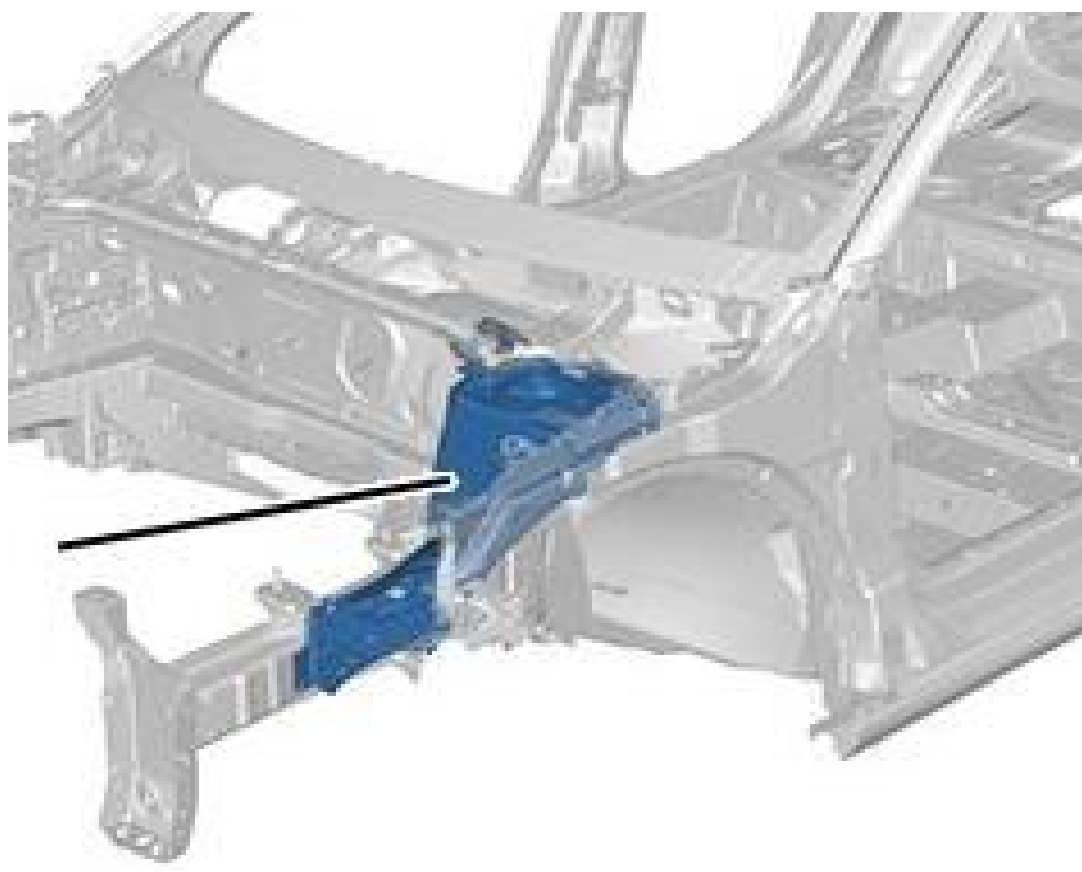
Do not Closing the Car-O-Vision software (Measuring software).

Module A is finished.

# Module B Structure Part Replacement

## B1 – Parts Removal

- Safe work practices must always be adhered to and apply to host country's regulations.
- Remove all necessary bolt-on panels at the front end of the side body assembly.
- Remove the following parts from the side body assembly as per instruction given.



### New Replacement Parts



Front  
Wing  
Upper  
Support



Engine Support Outer



Photos from difrent angles given for understanding the parts



## Parts Removal Instruction

- Signs for parts removal work

Spot Single panel cut



Spot Double panel cut



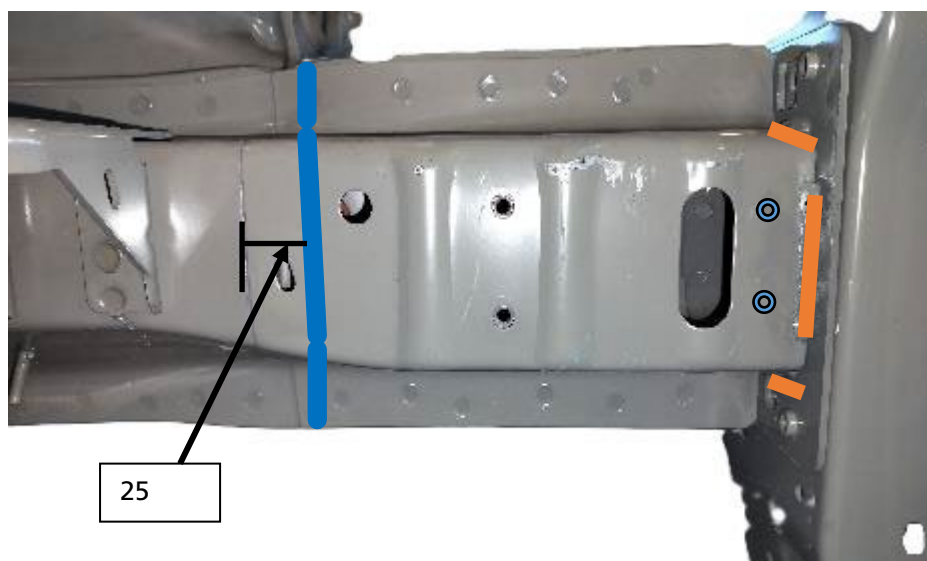
Welding cutting



Cut line



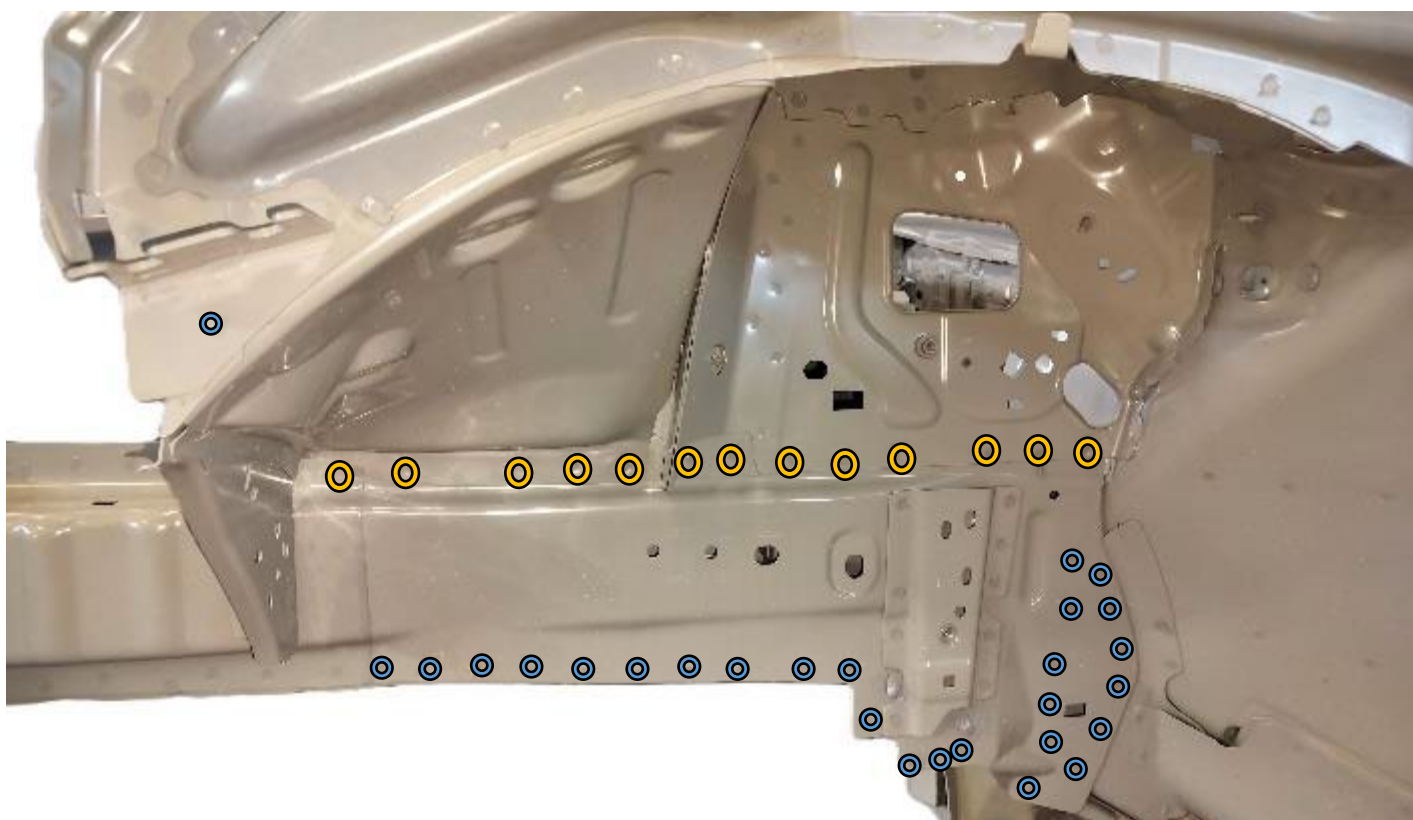
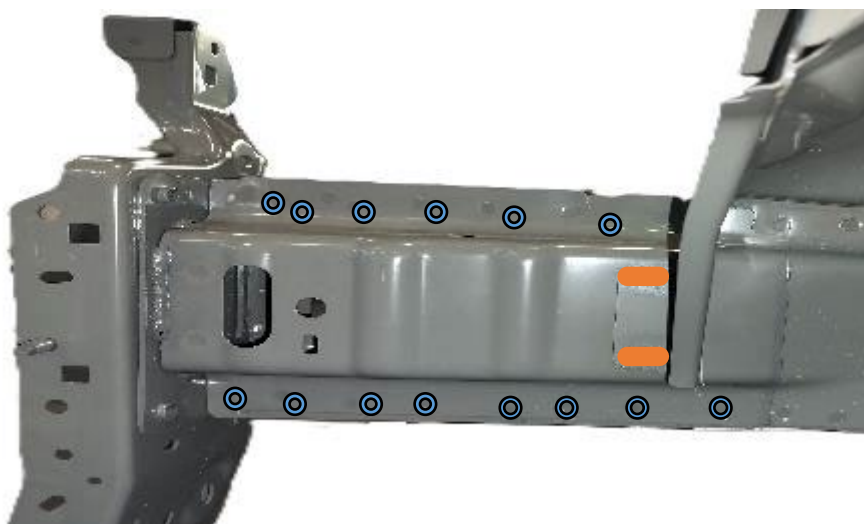
Cut the spot and weld as per instruction given below



Engine Support

Take the reference of laser weld line and make cut at 25 mm on engine support inner

You have to protect this part and have to reuse.



Engine Support



## Important!!

Two spot need to cut from engine support inner side.  
Fourth from the end and third from laser weld cut.







Cut six spots from inside of socker mount.



Four more spot from inside of shocker mount.





Cut spots from fire wall from cabin side

- According to the photos above, remove by cutting and/or drilling: left engine support outer and fender apron, left shock absorber upper reinforcement and partial engine support inner.
- Straighten (repair) all distorted flanges and remove all spot weld remnants with grinder or sander. Any accidental cuts and holes resulting from damage on removal, must also be ground and cleaned, but not repaired by welding.
- Make all holes for plug-welding 8 mm as per instruction.
- Remove all paint from areas for welding on flanges and joints, from the new replacement parts and the body shell in preparation for welding.
- All four or six sides for spot welding must be bare metal.
- All three sides for plug welding must be bare (backside of lower panel. may not be grinded/sanded)
- Minimum 10 mm around a hole for plug-welding and minimum 10 mm for spot-welding should be bare metal.
- For seam-welding 15 mm or more inside and outside must be bare metal - where possible.
- Any accidental holes or tears to parts not to be replaced must not be welded until after inspection by Experts. If you do - you will lose all the points in this marking area.

## **B1 STOP**

Sign in on the "request for judging chart" mounted on wall the time of completion and for Experts to mark

Experts will mark your left side parts removal, cutting, drilling, dressing, grinding and, making of plug weld holes to the body and/or spare parts.

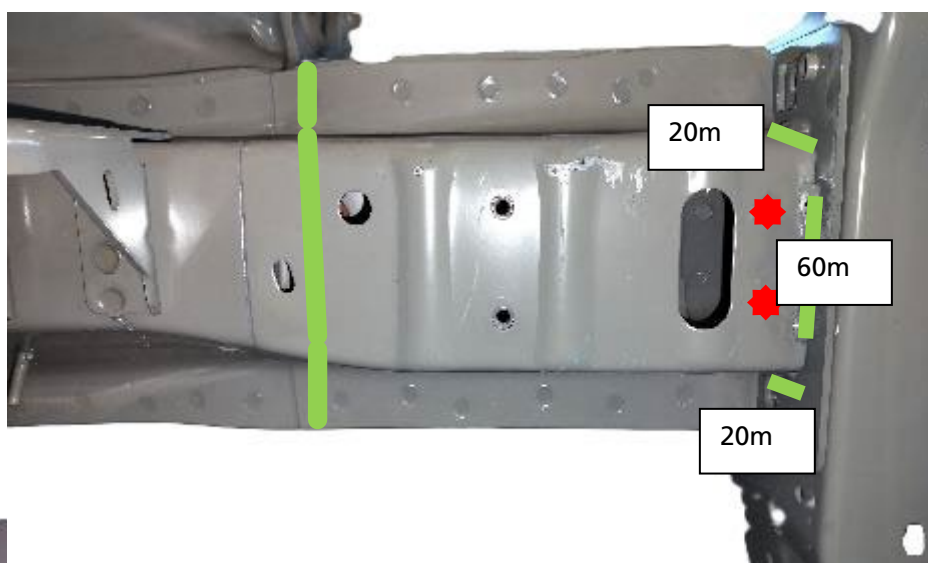
### **Important information!**

You will add primer when the Experts are done marking B1

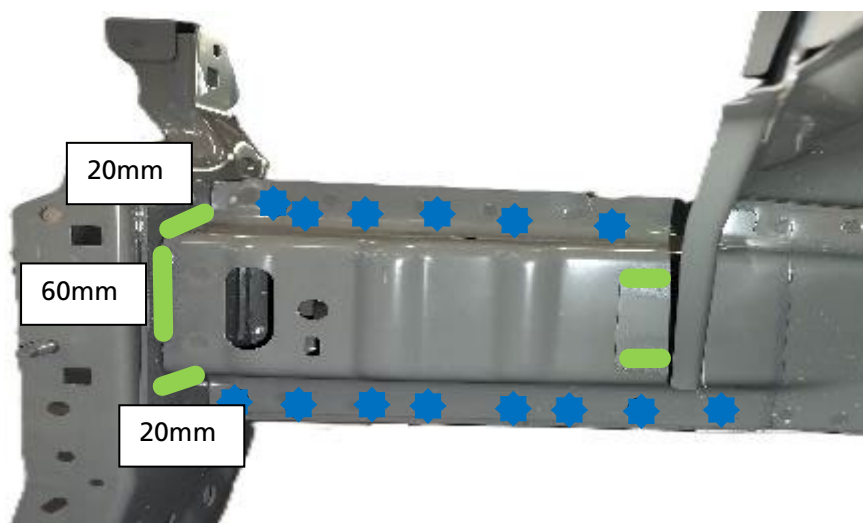
Apply primer on all surfaces which will be enclosed. This will be marked by a random sample (cut out) at the end of the competition!

## B2 – Fit and Weld all Parts

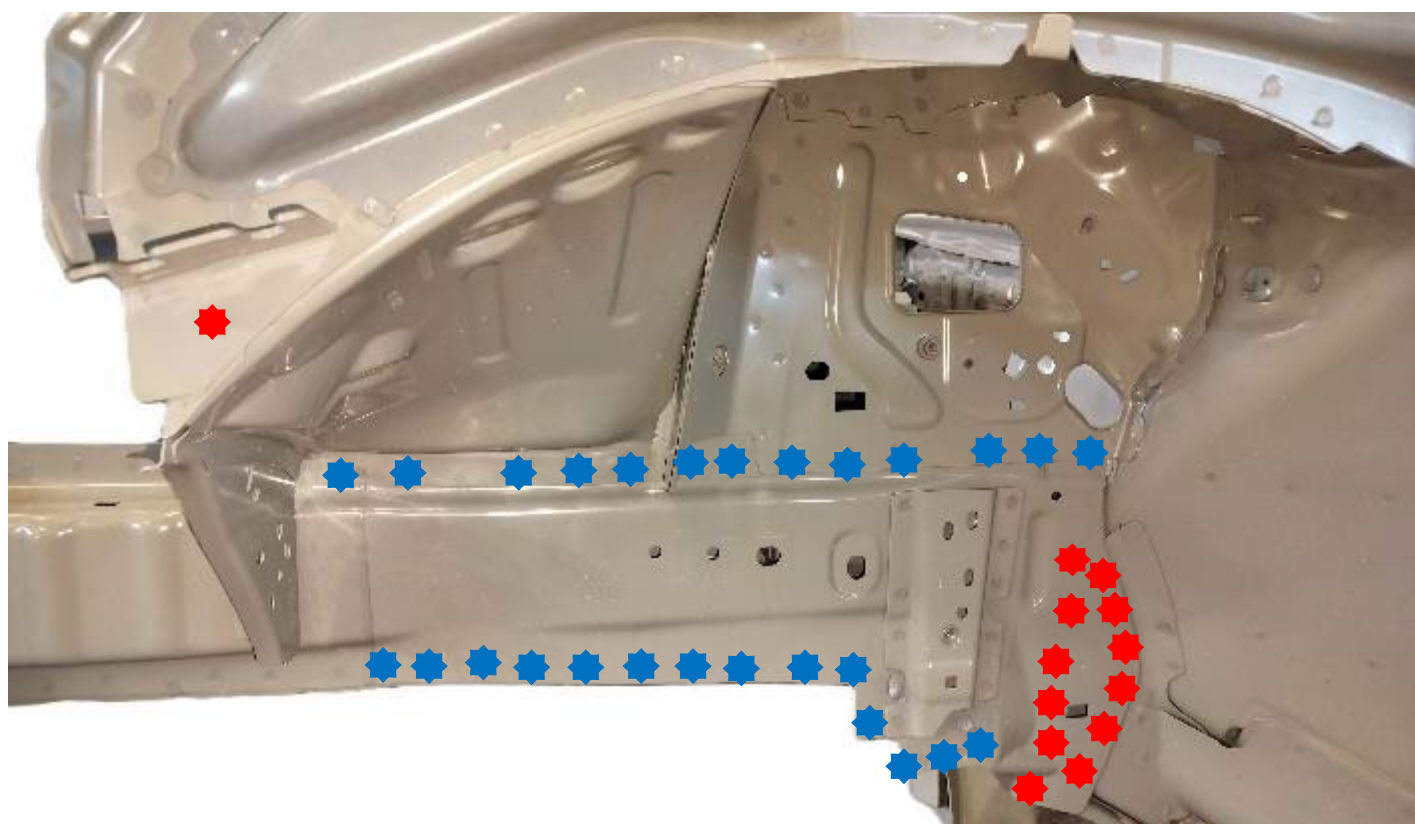
- Spot weld 
- Plug weld 
- Seam Weld 



Engine Support





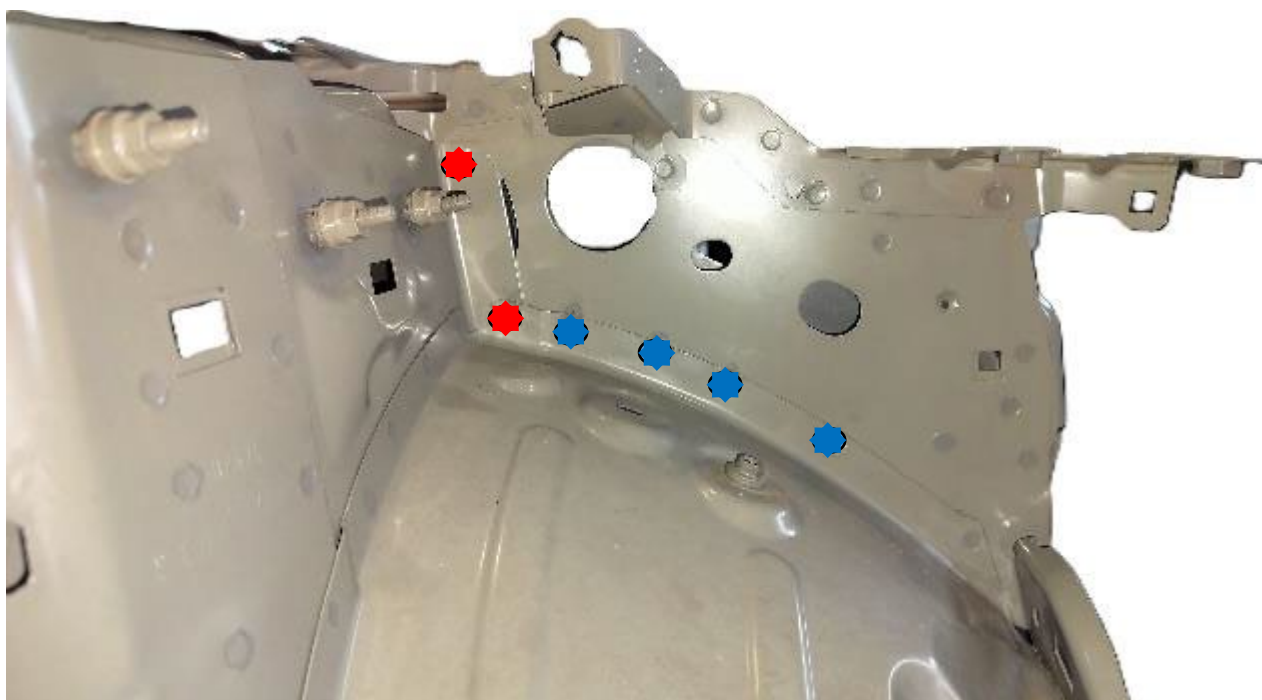


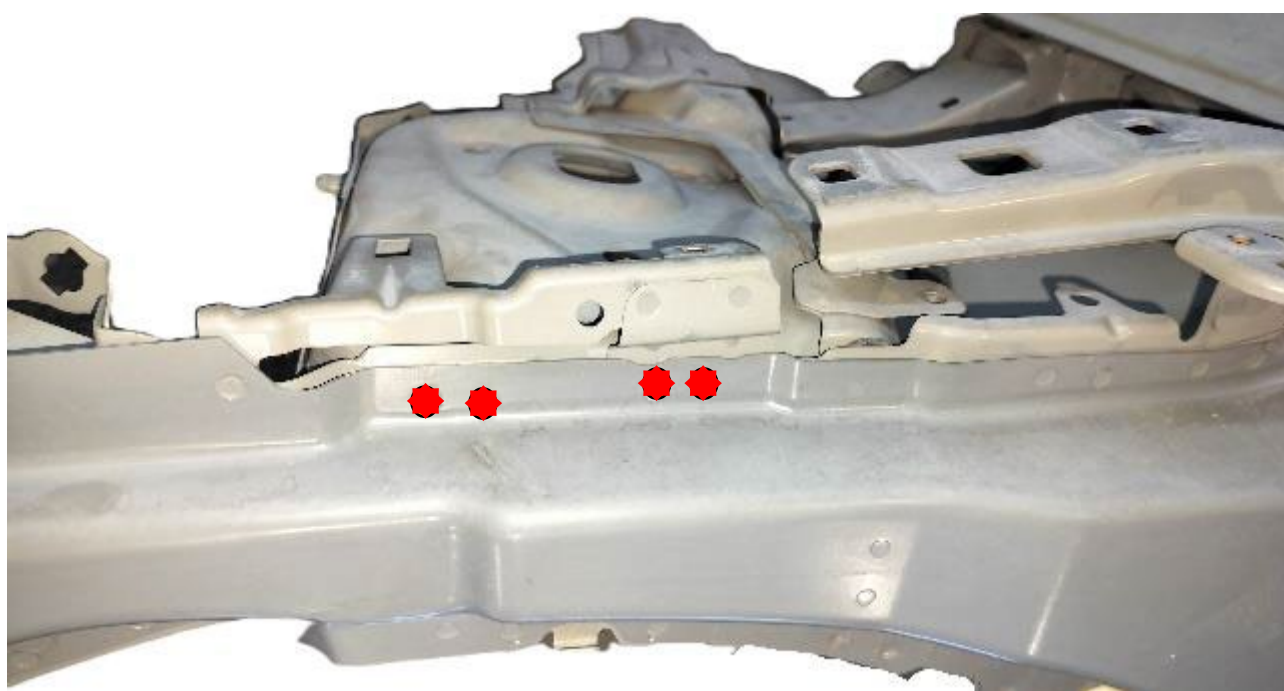
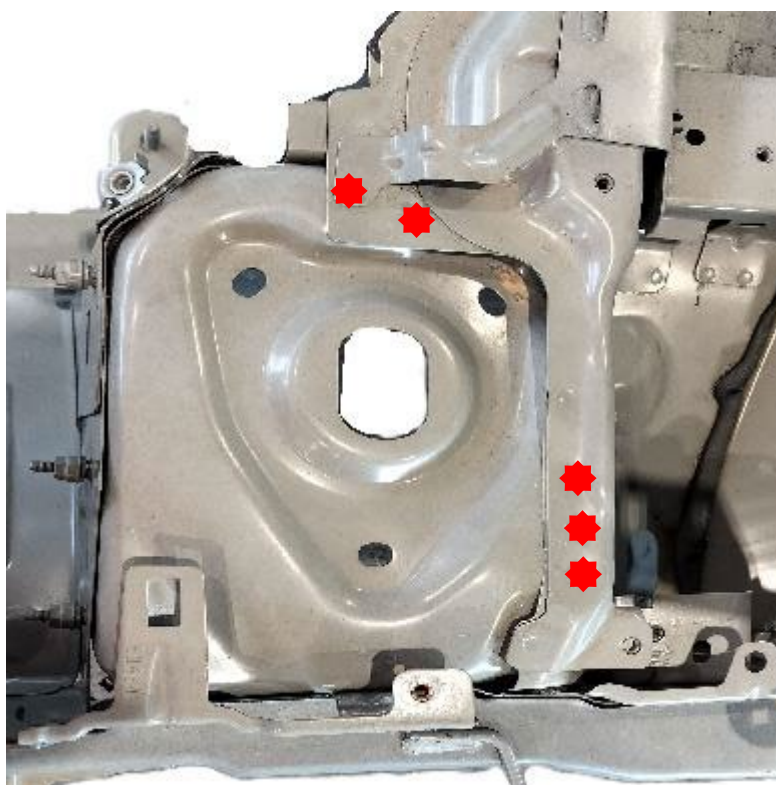
Engine Support



## Important!!

Fourth from the end and third from laser weld cut.





Cut six spots from inside of socker mount.







- Completed welds must NOT dressed, ground, sanded, or cleaned before marking.
- All the welding must be as shown as pictures above.

## **B2 STOP**

Sign in and write down the time of completion and for marking your welding.

## **B3 - Dress/Grind/Sand Welds**

- Safe working practices must always be adhered too and apply to the Competition Rules.
- Grind all the seam welds and plug welds.
- Paint edges feathered on seam weld area.(p120g-p240g)

## **B3 STOP**

Sign in and write down the time of completion and for marking all your above dress/grind/welds.

## Module C Non-Structural Part Replacement

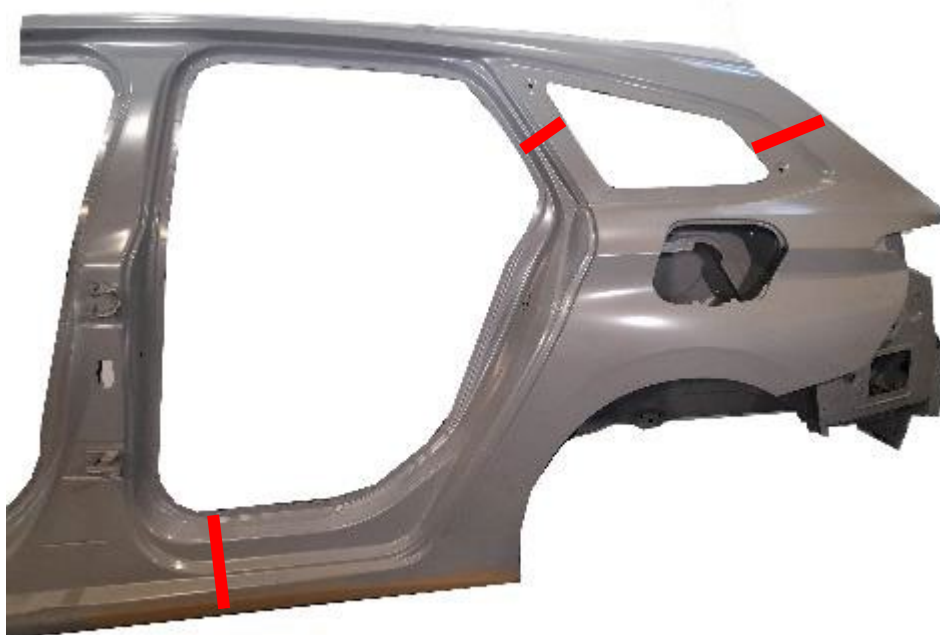
Replace the quarter panel from the side panel

Open welded and seam-adhesive bond connections in all areas. Cut outer panel only.

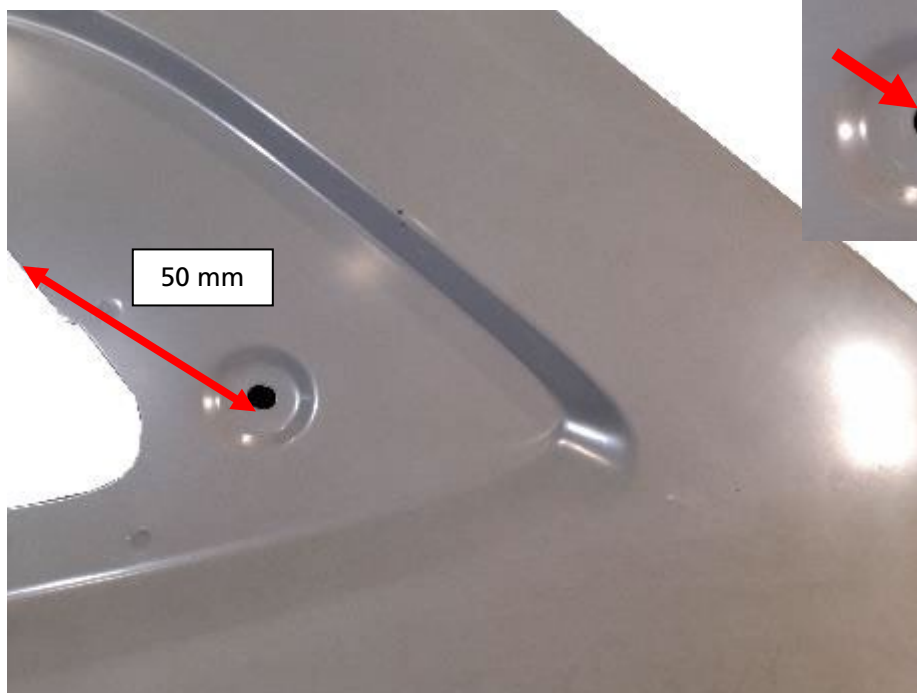


### C1 – Cutting, Remove and New Parts Preparation

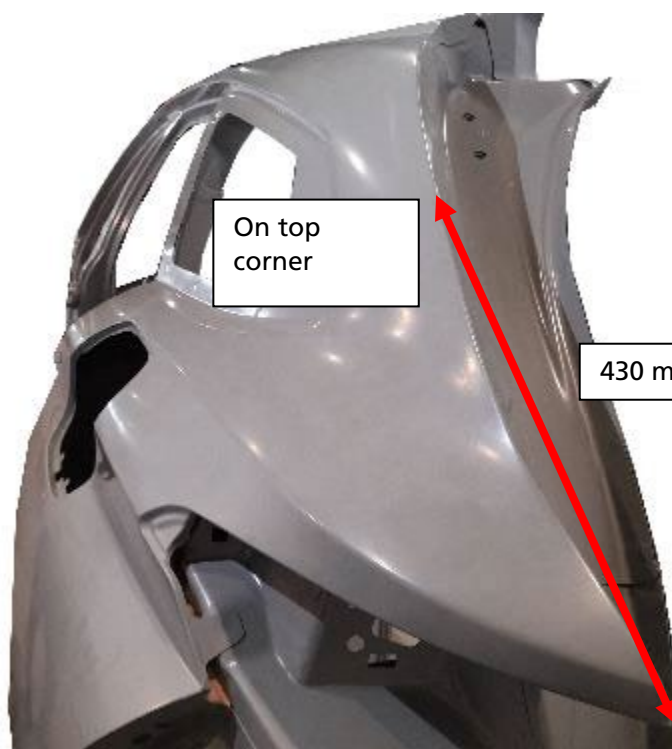
- Safe work practices must always be adhered to and apply to the Competition Rules.
- Cutting the body and prepare new parts as the dedicated dimension



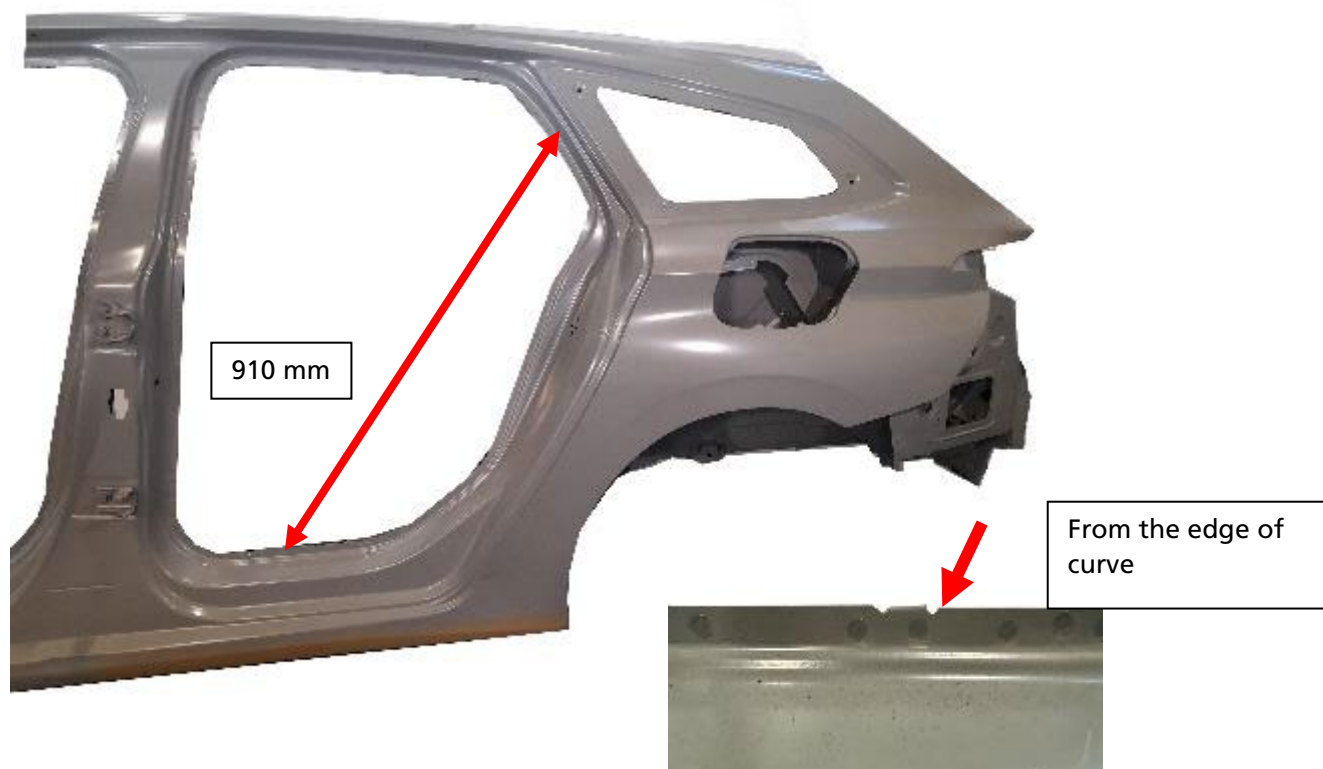
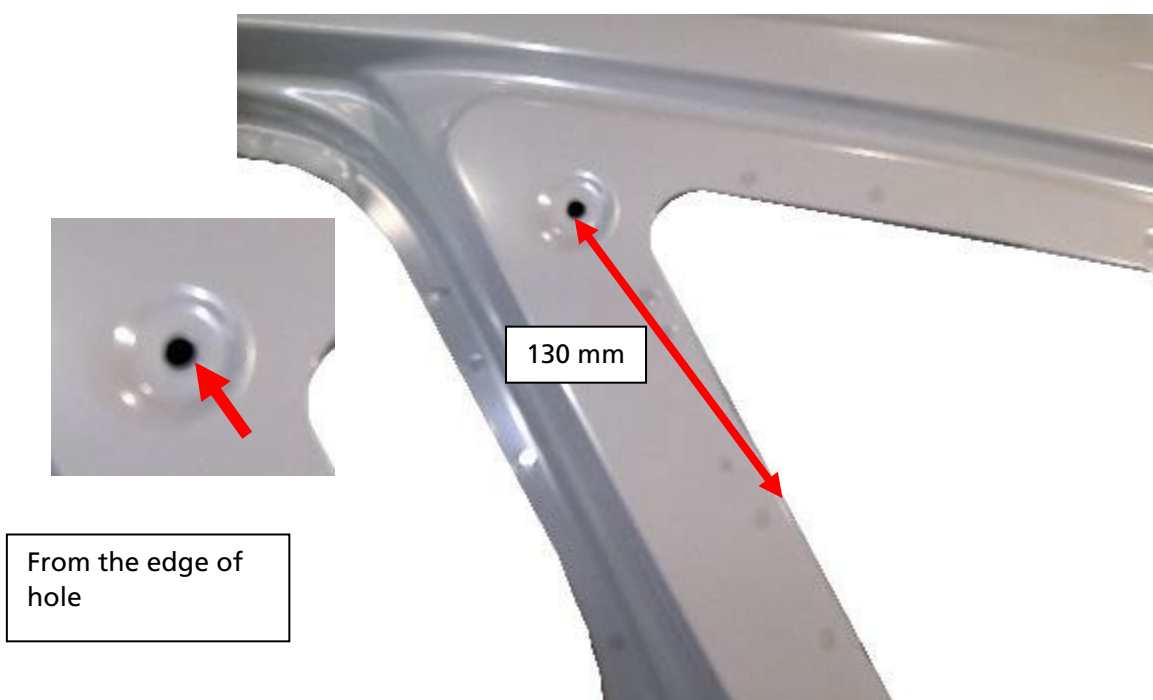
Perform the upper and lower cut lines as specified here and shown in the photos on next page!!

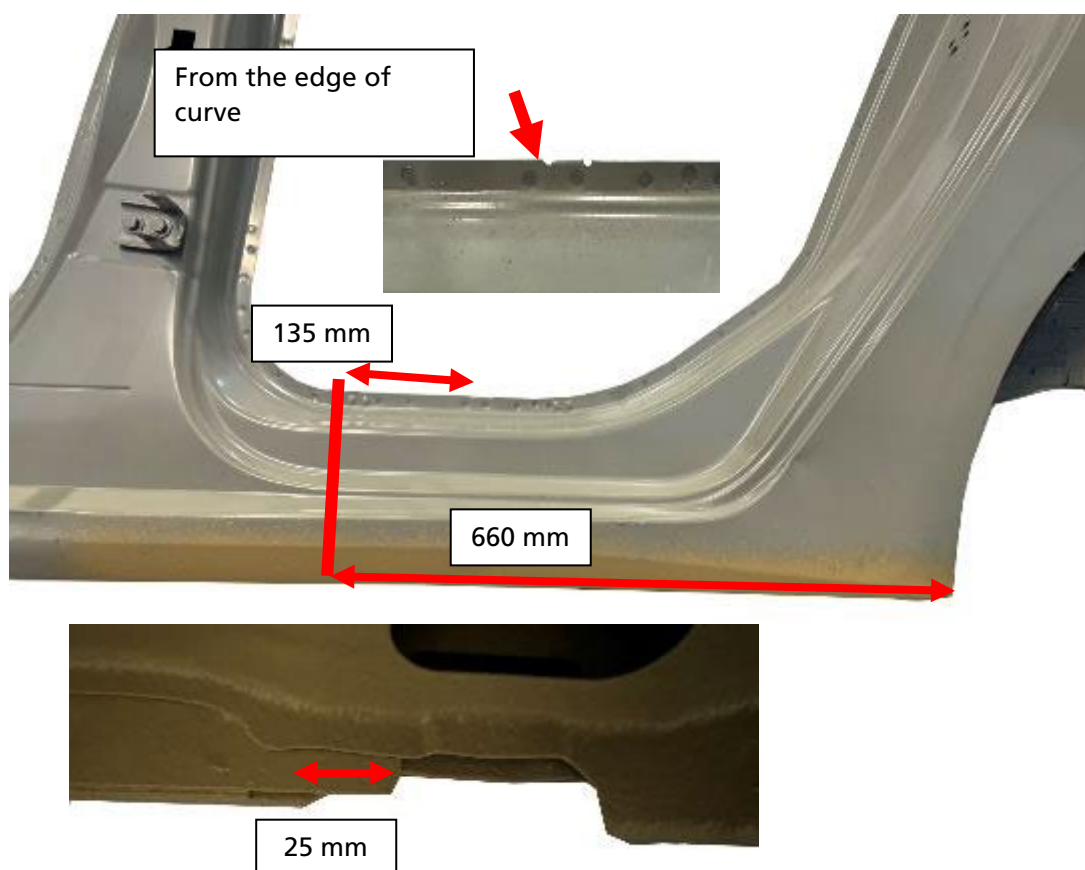


From the edge of  
hole













### Cut outer panel only.

- Remove side panel.
- Remove all glue and spot-weld remnants
- Straighten (repair) all deformation.

NOTE: Any accidental holes or tears to parts not to be replaced must not be welded and repaired

### Important!

- Drill 6mm diameter holes for plug welding on new parts
- Install side panel, fit up only. No Glue, No Weld in C1
- Adjust and install new part to fit without excessive tension/stress.
- All the sill joint gap must be 0 mm – 1 mm
- Adjust new part to fit and secure with clamps
- Prepare all equipment and all the items you need to do the actual gluing and sealing process.
- Glue gun will provided by Experts

### C1 STOP

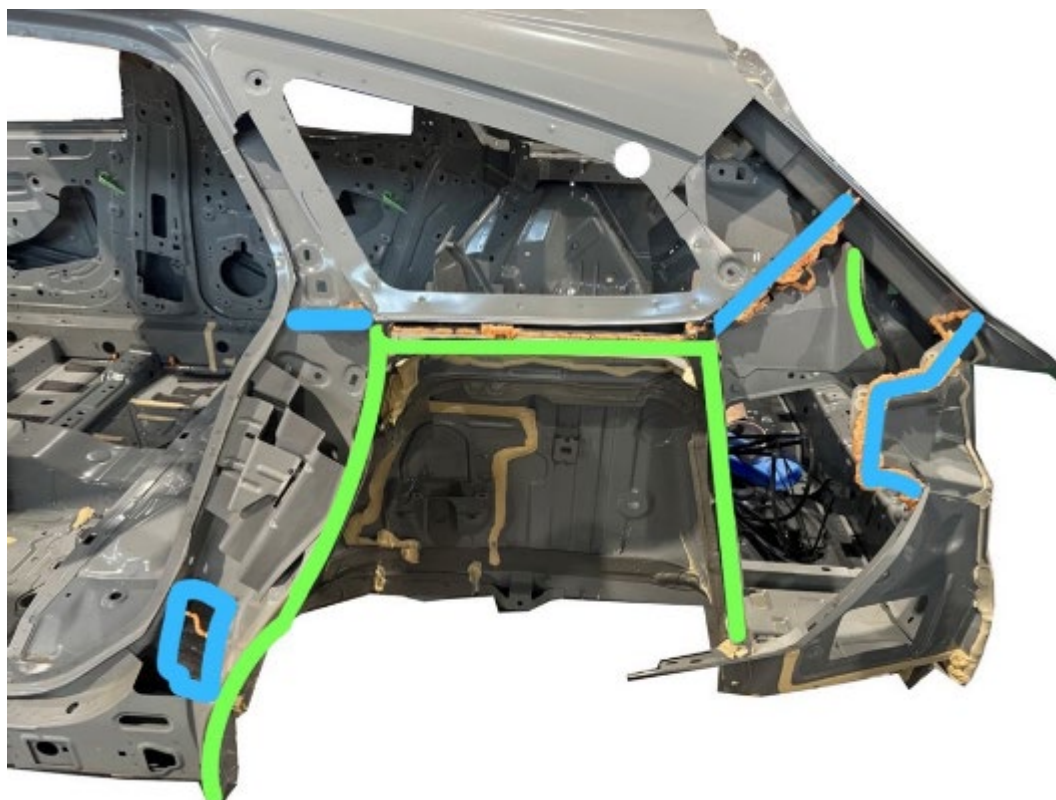
Sign in and write down the time of completion and for marking all your above operations: side panel removal, cutting, drilling, grinding, gap and new parts preparation.

### Important!

- You will be called for to add primer and glue when the Experts are done C1
- Apply primer on all surfaces which will be enclosed (on adhesive surfaces, no welding Primer). Marks will be deducted unless Experts assess how the work is performed.

## C2 – Fitting, Gluing and Sealing the side panel

- Safe work practices must always be adhered to and apply to the Competition Rules.
- Fit, Seal and Glue Quarter panel.
- Prepare for welding (No welding in C2)



- Remove the needed parts then glue, seal

Sealing ●

Glue ●

Don't need to remove the Foam Sealing

For the glue Use 3M 08115, For the Sealing 3M 08684

### C2 STOP



Sign in and write down time of completion Experts will mark cleaning, side panel mounting, bonding with glue and sealing.

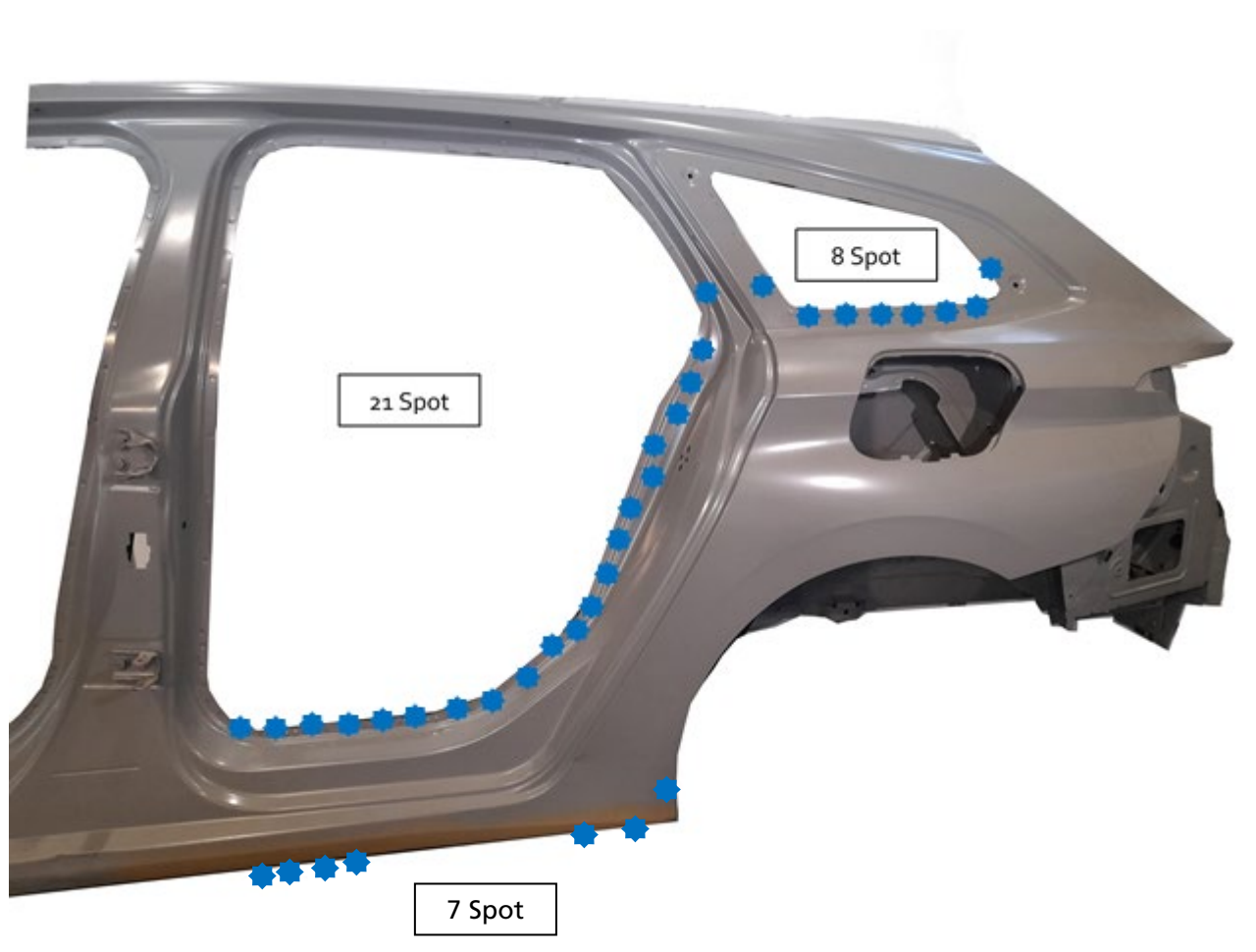
**NOTE:** When installing panel, make sure there is sufficient adhesive on bonding surfaces

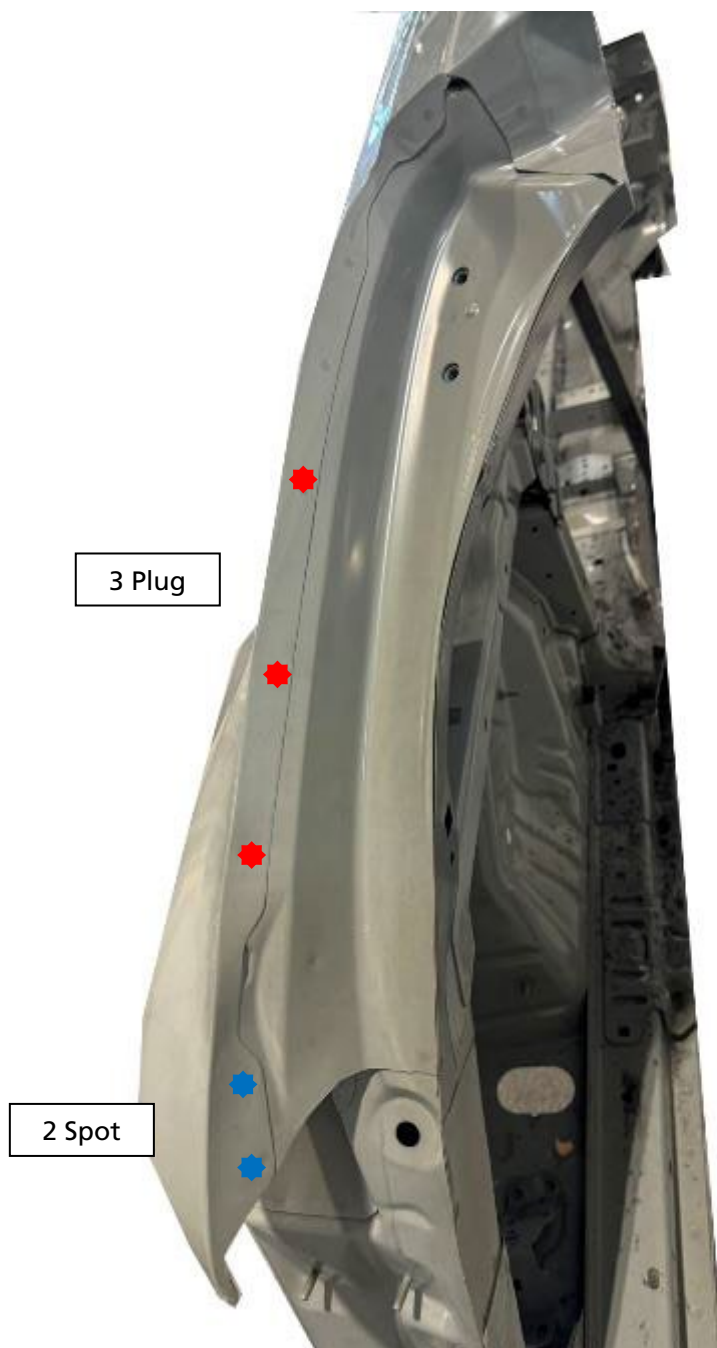
- Ensure alignment of swage lines at replacement part to existing vehicle part locations.



## C3 – Welding Side Panel

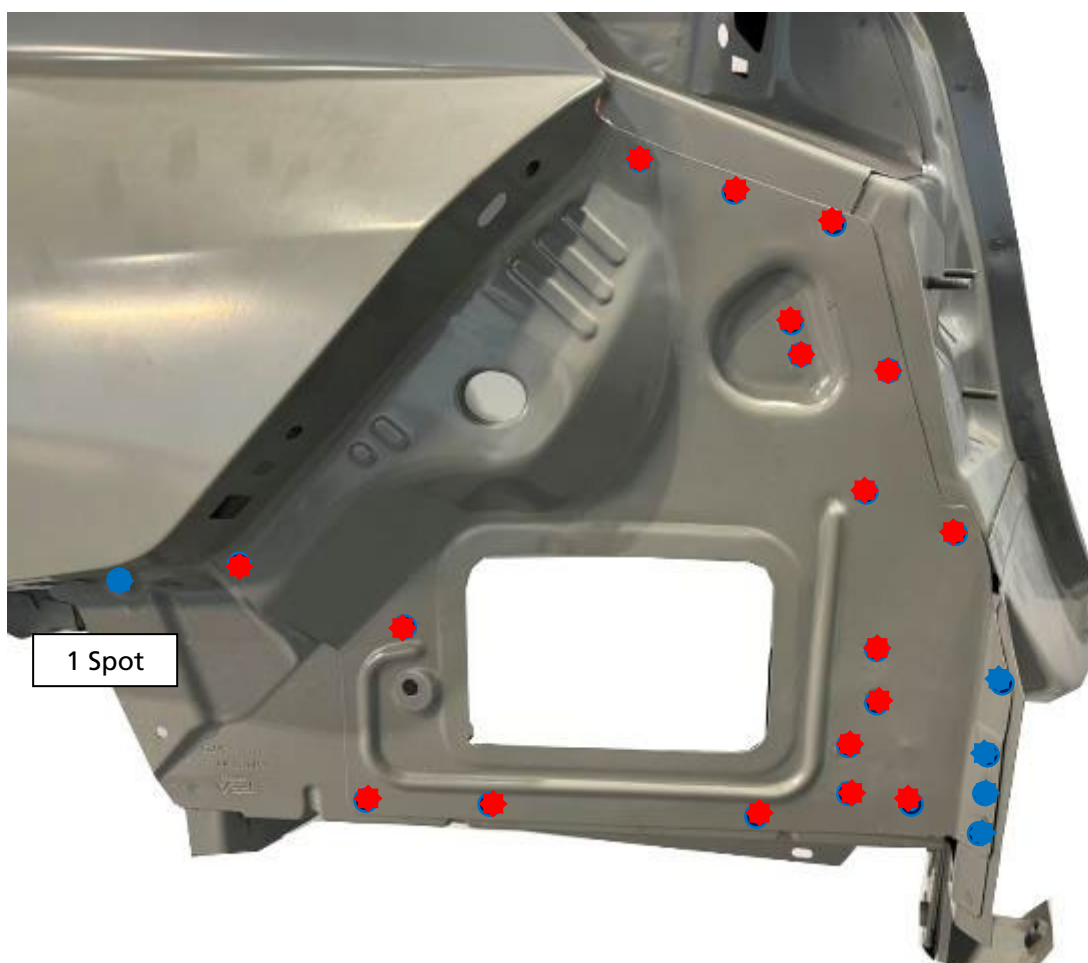
- Safe work practices must always be adhered to and apply to the competition rules.
- Fit and weld Quarter panel. The side panel's upside and downside weld must be a continuous weld or a step welding, and all welds must have full penetration.
- **All welds must be marked before grinding.** Completed continuous welds must not be ground and re-welded.
- Welds will be tested for strength (random selection but the same weld for each Competitor-to be determined by Experts marking team). This will After be done by Experts at the end of the competition. Butt welding and adhesive application will be marked after competition completion.
- Spot weld 
- Plug weld 







2 Plug



18 Plug

1 Spot

4 Spot

### **C3 STOP**

Sign in and write down the time of completion and for marking all your above completed operations

## **C4 – Grinding and Dressing**

- Grind all the seam - and plug welds.
- Clean and finish all weld aras - sand to P120 or finer
- Paint edges feathered on seam weld area. (p120g-p240g)

### **C4 STOP**

Sign in and write down the time of completion and for marking all your above completed operations. Marking of these tasks will typically after done at the end of the competition

## Module D – Panel Repair

### D1 – Door Repair (steel)

There are two dents on the door to remove, you can see the position on the follow picture. All the other dents are already noted from the Expert group, documented and do not have to be observed.

You can repair the dents on the door at any time between the other tasks or if there are no other steps written in the manual.

#### Important!!

The door is positioned outside of your work area, as soon that you start to work on **it the door has to stay** in of your working place until it is completed. Once it is completed you can record it on the STOP table.

- Safe work practices must always be adhered to and apply to the Host Country's regulations.
- Restore repaired area to original contour and shape. The dent removal technique is up to you.
- Panel shrinking must be done with electrical equipment on your working place or cold shrinking.
- Repaired area is to be carried out without filler to a standard ready for chemical treatment and primer.
- Repaired areas must not have deep file or grinder marks/gouges.
- Sand your repair area to minimum P120 g.
- The panel repair area must not be damaged or over thinned by excessive filing or sanding (example, file or grind through body lines and fold).



## D2 – Bonnet Repair (aluminium)

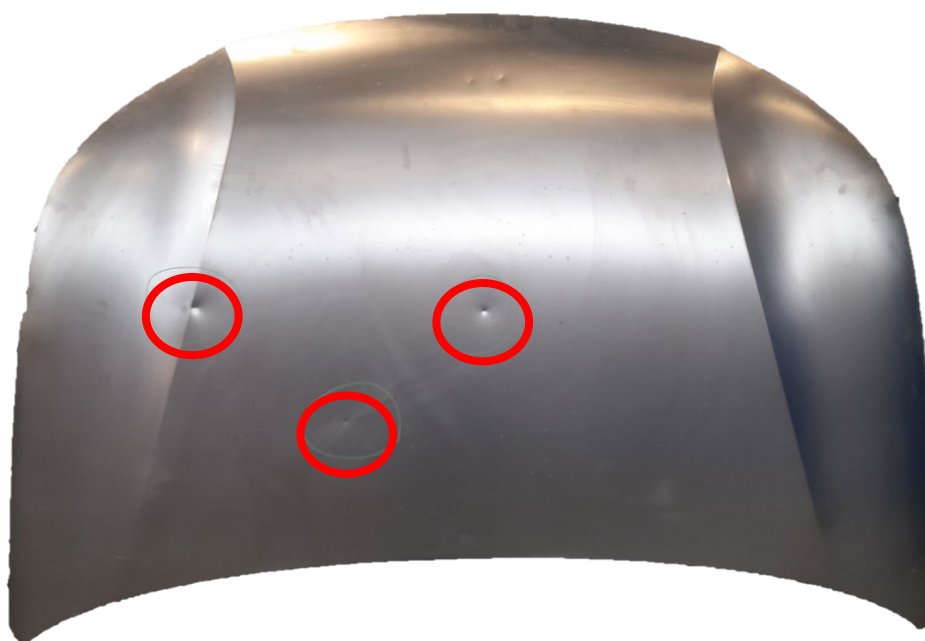
There are three dents on the bonnet to remove, you can see the position on the follow picture. All the other dents are already noted from the Expert group, documented and do not have to be observed.

### Important!!

The repair will be in a separate workstation, together with the Module E. The time limit in the shared area are for both **module D2 and module E1 and E2 is two hours**.

It is allowed to bring tools box and materials for the dent repair:

- Safe work practices must always be adhered to and apply to the Host Country's regulations.
- Restore repaired area to original contour and shape. The dent removal technique is up to you.
- Panel shrinking must be done with electrical equipment on your working place or cold shrinking.
- The repaired area is to be carried out without filler to a standard ready for chemical treatment and primer.
- The repaired areas must not have deep file or grinder marks/gouges.
- Sand your repair area to minimum P120. Grind your repair area to at least P120. If there is no damage to the surface after the repair (PDR), the repair area may also be un sanded.
- The panel repair area must not be damaged or over thinned by excessive filing or sanding (example, file or ground through body lines).



# Module E Cosmetic Repair on Plastic

## E1 – Cosmetic Repair on Plastic (Two-sided Bumper Repair)

## E2 – Cosmetic Repair on Plastic (Flexible Patch Non- Structural Bumper Repair)

### Important!!

You have to start with both of task at same time and have to manage complete the task in given time.  
You also have to work on module D during the drying time of primer and glue.

**The total time for module D2 and modules E1 and E2 is two hours.**

### Provided tools and materials for Module E1

1. 3M manual for "Two-sided Bumper Repair";
2. 3M surface cleaner VOC(08984);
3. Reinforcement Patch 04904;
4. 3M™ 05917TF – Polyolefin Adhesion Primer;
5. 3M™ 05901- Two Part Epoxy Adhesive;
6. 3M™ 08190 - 3M™ Performance Manual Applicator, 50ml
7. Aluminum Tape

### Provided tools and materials for Module E2

1. 3M surface cleaner VOC (08984);
2. 3M EZ Fix Flexible Patch Kit (05888);
3. 3M Automotive Adhesion Promoter (05888);
4. 3M™ 05917TF – Polyolefin Adhesion Primer;
5. 3M™ 05901- Two Part Epoxy Adhesive

E1



E2



### For E1

- Drill the hole at the end of the crack to relieve tension 3 mm - 5 mm
- Clean the damaged area with 08984
- Prepare the "Dish out" 15 mm - 20 mm on both side from the gap, the gap size is 1 mm -2 mm

### For E2

- Bevel the front side of the repair area 20 mm from the edge leaving 1 mm of material at the inside edge
- Prepare the "Dish out" 15 mm - 20 mm on both

## E1 and E2 STOP

You have to inform the Expert group about your stop and **have to start the work on module D2**

### For E2

- Sand from out side of bumper with 80 to 180 grit disc.
- Clean the damaged area

### For E1

- Apply aluminum tape to the front side of the repair (06935)
- Apply adhesion promoter 05917 TF to back side of bumper and allow to dry (10 minutes)
- While waiting for the adhesion promoter to dry, cut the fiberglass reinforcing cloth to 15 mm - 20 mm larger than the repair area.

### For E2

- Apply bumper patch adhesion promoter (wipe pad) to the back side of the repair)
- While adhesion promoter dries, cut the bumper patch 20 mm larger on all sides then the hole and round the corners.

E1



E2



### For E1

- Apply a coat of adhesive to the back side of the repair area, embed the fiberglass cloth into the adhesive on the back side of the bumper.

## E1 and E2 STOP

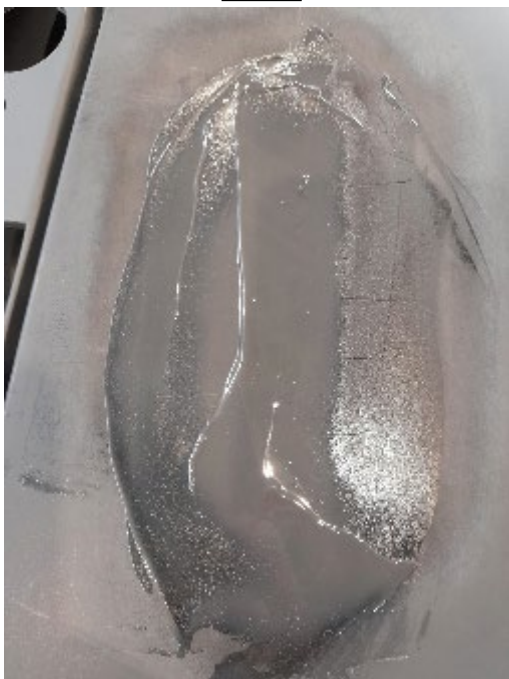
You have to inform the Expert group about your stop and **have to start the work on module D2**



### For E1 and E2

- Apply adhesive to front side's both repair areas.
- Once cured, sand to shape using 80-180 grit.

E1



E2



## Important!!

During the drying time you are allowed to work on module D2

### For E1 and E2

- Once cured, sand to shape using 80-180 grit both area.
- Apply second coat if required. REPEAT ADHESION PROMOTER STEP IF NECESSARY
- Finish sand entire area to be primer ready.



## Module F Panel Gap Adjustment

Competitors are requested to assemble and re-align the following vehicle body panels to the gap specifications also relayed below.

The designated parts to be assembled are as follows

- Front Fender R
- Front Fender L
- Assemble all the designate parts.
- Ensure that all the parts are correct position, correctly fitted and all bolts tightened.
- All the Gap must be adjusted as the standard value given.

See the relayed gap alignment values and continue to assemble the:

- Left and Right Front Doors
- Left and Right Rear Doors
- Front Hood
- The Gaps will be checked with the magnets placed in the positions relayed in the picture below.



### Important!!

- The gap value is shown in the picture below and the tolerance will be +/- 1 mm.
- The gap will be measured at the point of the arrow.
- All bolts must be tightened
- Gap line consistency and panel flushness must be considered

