Test Project

Autobody Repair

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Introduction

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

Description of project and tasks.

- Diagnosis and Correction 13%
- Structural Part Replacement 29%
- Non-Structural Part Replacement 23%
- Panel Repair (Steel and Aluminum) 15%
- Cosmatic Repair on Plastic 10%
- Panel Gap Adjustment 10%

Total: 100%

Instruction to Competitor

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

- The current version of the Technical Description shall apply.
- The current versions of Competition Rules A and B shall apply.
- The current version of the Health and Safety Document shall apply.
- Certain tasks must be marked by Experts **while the task is in progress**. These tasks are clearly indicated in the Instructions with **"STOP."** When "STOP" is shown, the Competitor must proceed with another task while the marking takes place.
- Marks may be forfeited if a Competitor fails to comply with the "in-progress marking" requirements or proceeds with the task before the marking has been completed.
- Assistance with the removal and replacement of heavy parts, such as doors, bonnets, etc., may be provided by any Expert except the Expert from the Competitor's own country. No assistance is permitted for the removal or replacement of side panels.

Safety

Competitors who are identified as working in an unsafe manner or creating an unsafe workplace condition may be subject to a deduction of marks and/or exclusion from the Competition, in accordance with the applicable Competition Rules and Health and Safety requirements.

Any such action shall be determined and applied in accordance with the procedures and provisions established for the Competition.

Examples of Health and Safety non-compliance include, but are not limited to:

- Failure to wear the appropriate Personal Protective Equipment (PPE), including safety glasses, gloves, hearing protection, safety footwear, and other PPE as required.
- Failure to correctly position welding or grinding screens when performing MIG welding or grinding operations.
- Failure to use the designated fume/smoke extraction system when required.
- Performing realignment operations without the safety cable correctly fitted and secured.
- Poor or unsafe housekeeping, including failure to maintain a clean and safe working area.
- Any action or behaviour that may endanger the Competitor or other persons in the workplace. 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 final result that you carefully review and understand each task before starting the work.

The sequence of tasks is predetermined and must be strictly followed. You must begin each task according to the Test Project (TP) and follow all instructions provided at the end of each task.

Unless otherwise specified, you must complete each task fully before proceeding to the next task. Do not start or perform work on a subsequent task until the preceding task has been completed.

The tasks must be completed, as specified in the Test Project.

Time duration according to task

- Diagnosis and Correction 1 hour 30 minutes
- Structural Part Replacement 9 hours 30 minutes
- Non-Structural Part Replacement 4 hours
- Dent Repair (Steel) 1 hour
- Dent Repair (PDR) 1 hour
- Cosmatic Repair on Plastic and Alu.Dent Repair 2 hours
- Panel Gap Adjustment 1 hour

Important!

Task Timing and Workstation Allocation

- Tasks A, E, F, Aluminium Dent Repair are station-specific and time-bound. Competitors must perform these tasks at the designated workstation and within the specified time period.
- If a Competitor completes any of these tasks before the allocated time, the unused time will not be transferred or added to any other task.
- Tasks B, C, Steel Dent Repair, and PDR must be performed at the Competitor's designated bay. The total allocated time for these tasks may be managed by the Competitor according to their own strategy and preference. Competitors may decide how to distribute the available time among these tasks, provided that all tasks are completed within the overall allocated time.
- Competitors are responsible for managing their time effectively and ensuring that all tasks are completed within the specified Competition requirements.

Module A – Diagnosis and correction preparation

This is a time-bound Competition task. Competitors must proceed to the designated workstation at the scheduled time and commence the task as instructed. Each task must be completed within the allocated time. Competitors are responsible for strictly adhering to the published schedule and reporting to the assigned workstation on time.

A1 – Diagnosis of Vehicle

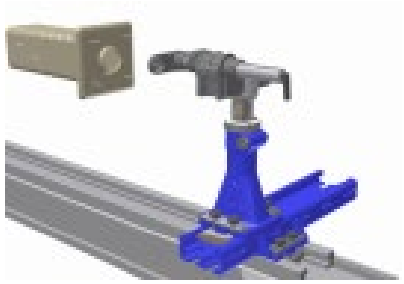
- Observe safe work practices at all times.
- Ensure that all the clamps and bench mountings are correctly fitted and tightened.
- Bench mountings and clamps must be tight, (100 Nm torque).
- Ensure that the measuring bridge/ladder is correctly fitted and locked in place.
- Start up the Car-o-liner Vision X3 System and make a new work order.
- The order must be created and saved with:
- a. Name : **<First Name>**
  b. Work Order No.: **<Your National Country>**
- Select- **MG 7 (China)**, data sheet No. **25:105**
- Measure and report the extent of misalignment at the following locations.
- Set-up and "center" the Car-o-liner measuring system, use measuring point with 5 centering points given.
- Centering Point: Left 20,12,10
  Right 20,12
- Measure and report the extent of misalignment at the following locations.
- Underbody locations: Left 1,2,3,4,8,14,19,21,23,25,28
  Right 4,5,6,8,9,11,13,22,24,29,30
- Upperbody locations: Left 1,9
  Right 2,17
- Save data sheet/damage report on computer.
- Attach the appropriate clamp, chain, or belt securely to the damaged area where the pulling force is required.
- Correctly position and securely attach the pulling tower to the pulling bench.
- Align the pulling tower and clamp/chain/belt with the desired pulling direction to straighten the damaged area as part of the repair process.

Important!

Do not Pull

A2 – Evo Setup

- Perform necessary steps to set up equipment for anchoring **EVO 1-2** using Point No. **Left-21**

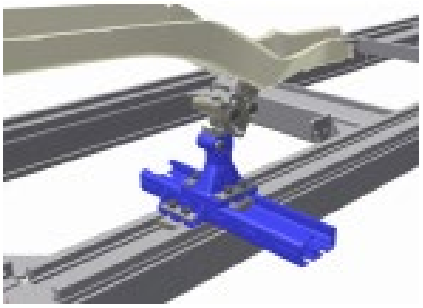


Note: Refer tool list for Evo fixing in the Car-O-Tronic software but you are free to use choose thr tower as require.

- Torque list EVO 1-2:
  Mounting to bench: 100 Nm
  Other bolts: 70 Nm
  Bolt to the car 30 Nm

Now fix EVO 3

- Perform necessary steps to set up equipment for anchoring **EVO 3** using Point No **Right-2**
- Use tool list as in Car-O-Vision to set up equipment for anchoring.
- Torque list EVO 3:
  Mounting to bench: 100 Nm
  Other bolts: No torque require



- When it is fixed, the mesurment should be
  L – 50
  W – 0
  H – 0

Important!

Show the mesurment to Expert team.

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B - Structure Part Replacement

- 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 assembely as per instruction given.



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Parts Details

New Parts

Front Cabin Crossbeam Reinforcement



A-Pillar Inner Panel





Front Wheel Housing

Need to Re-use the Part



A-Pillar

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B1 – Parts Removal

- Cut down the A piller outer panel as per measurement given.
- Mesurment are for efrence, no marks for this measurment

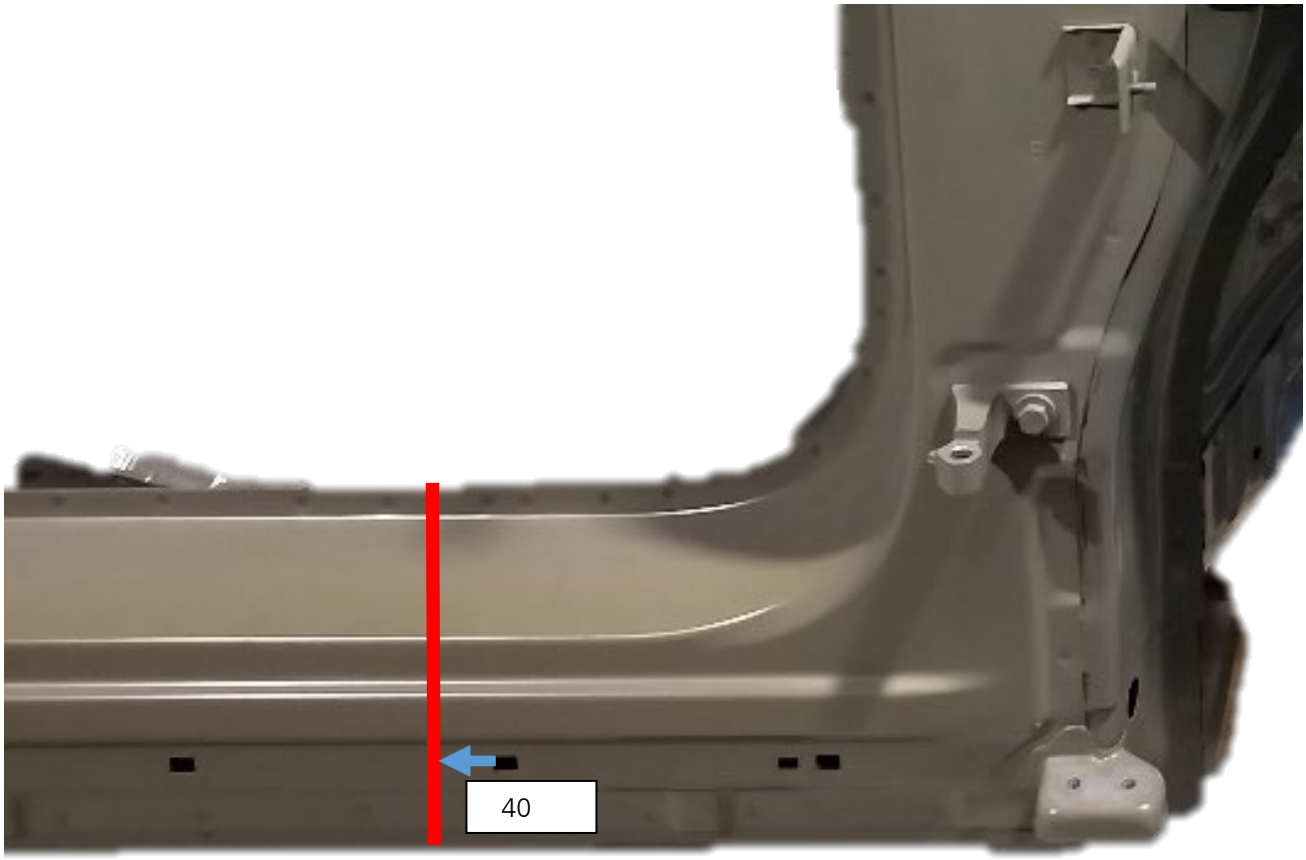


Glass piller cutting line



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A Piller lower cutting line measurement

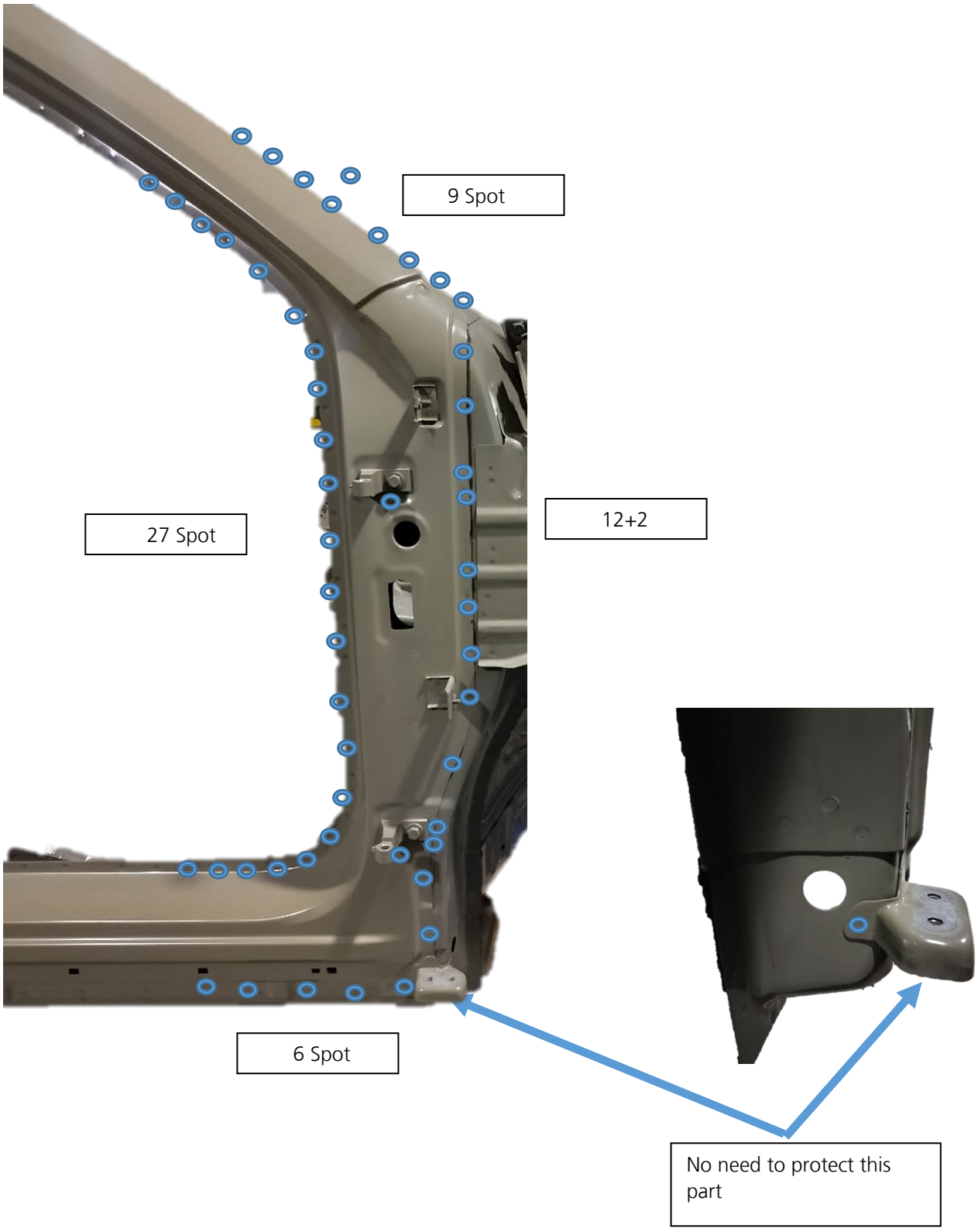


Important!

These measurments are only for refrence, you have to make straight cut line.

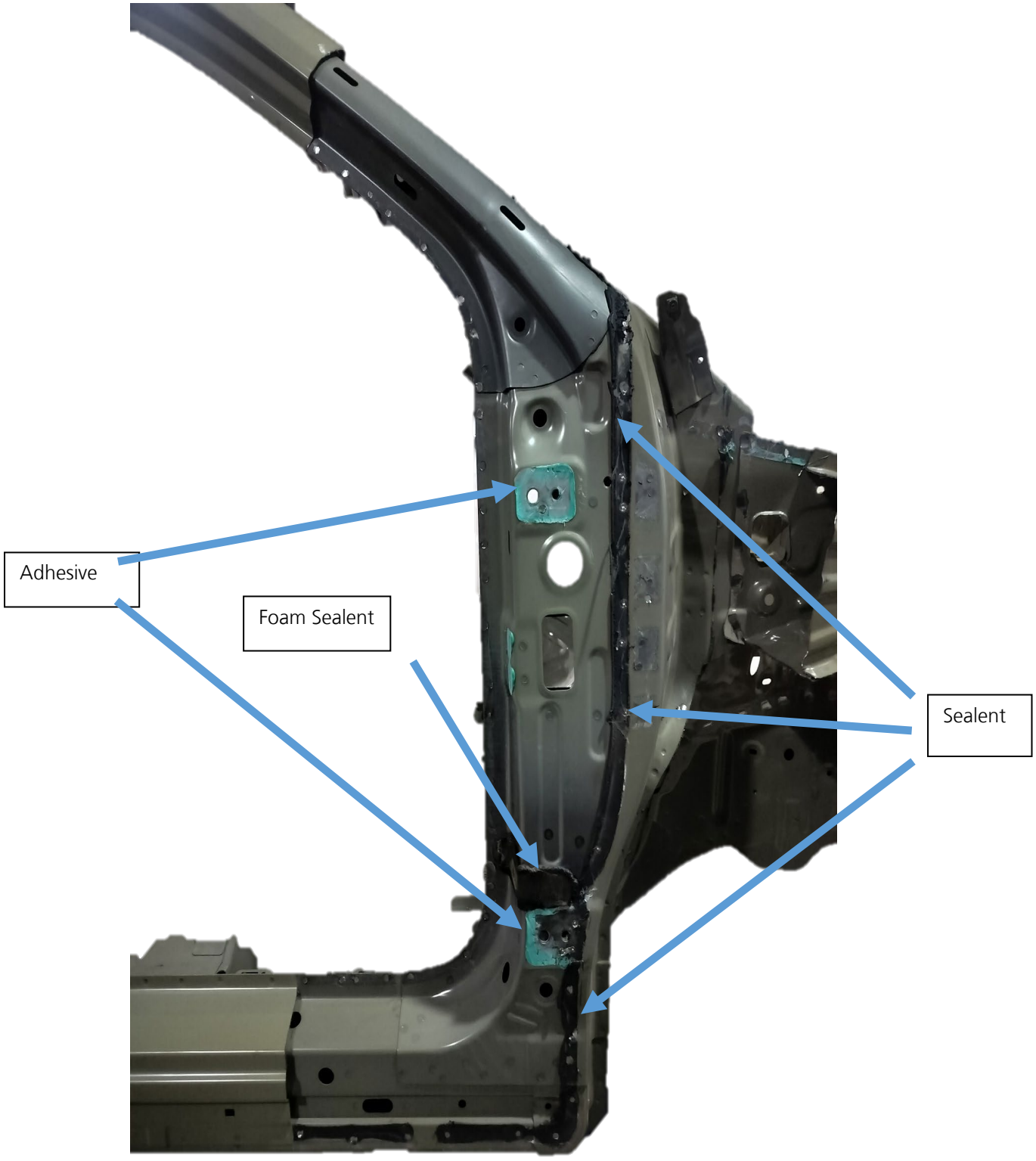
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Spot Cutting Details for A Piller



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Sealant and Adhesive area



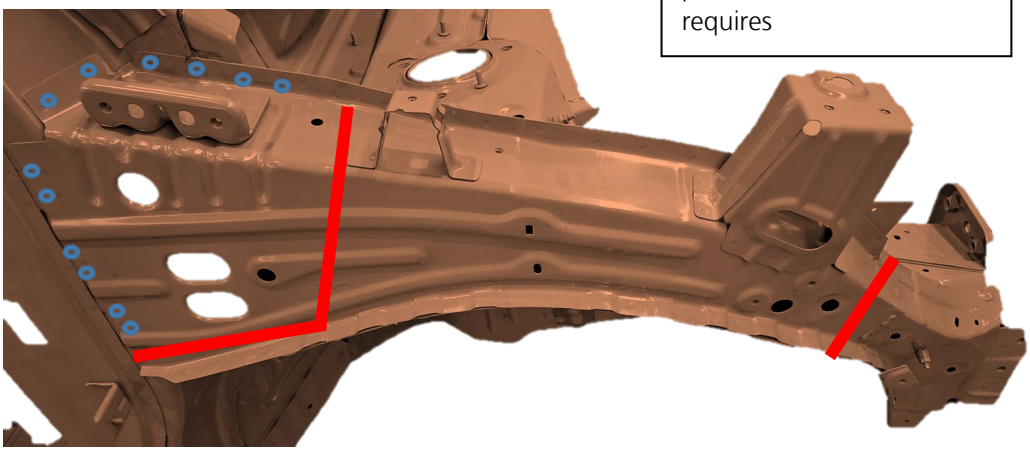
Use Hot air gun to remove the panlel from adhesive area

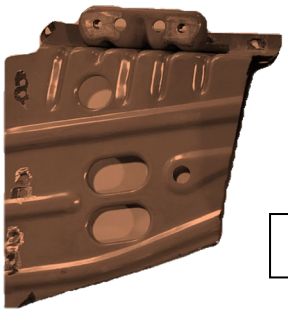
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- Remove Front wheel housing assembly with Front cabin crossbeam reinforcement as per instruction given below.

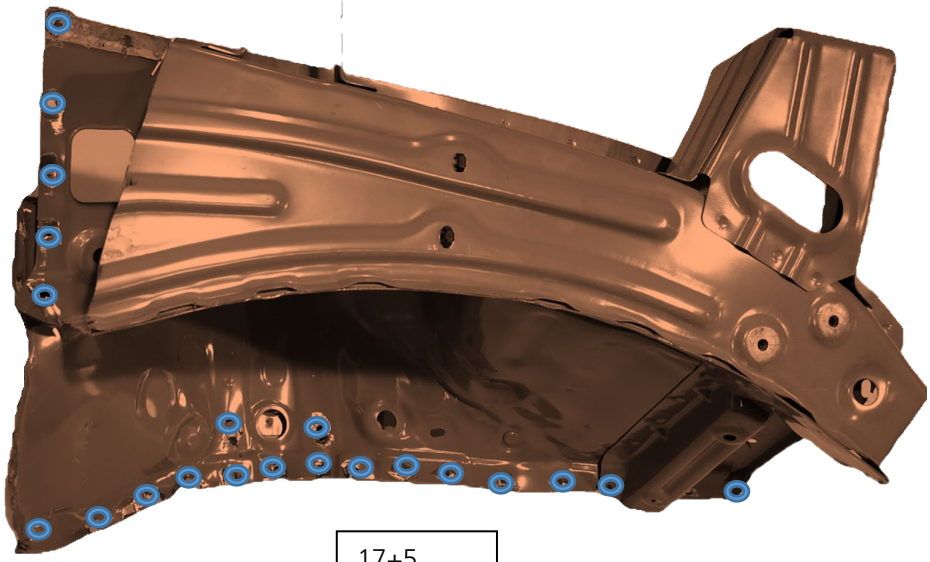
You can cut as shown in picture, no measurement requires

12 Spot





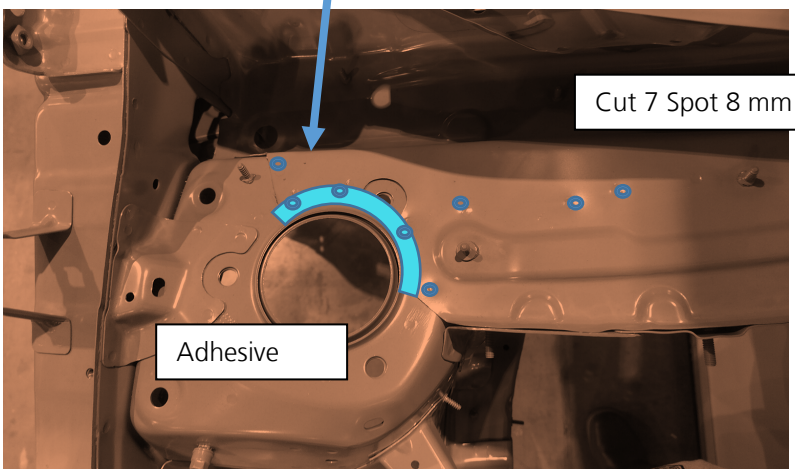
Cut down this piece to access back

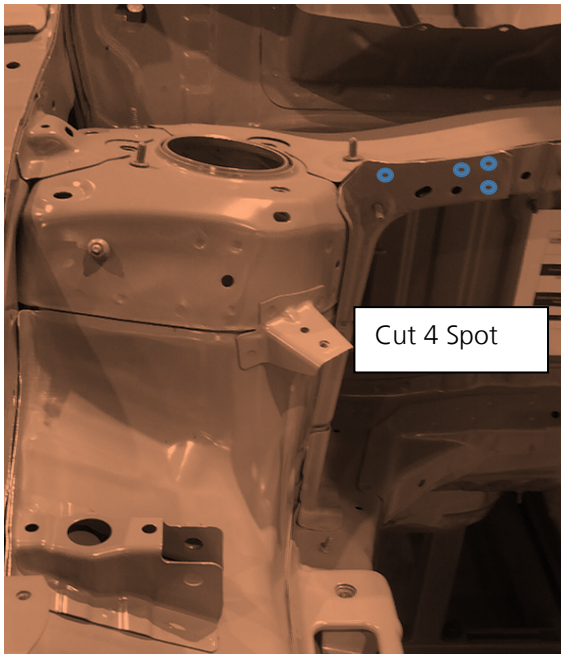


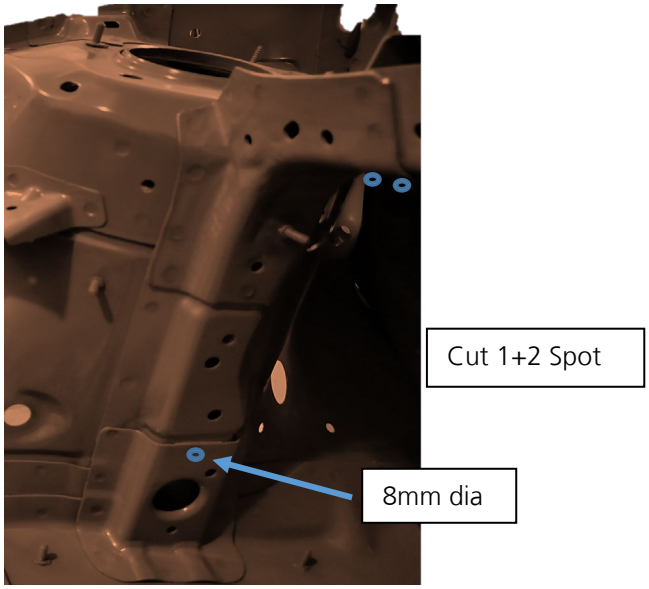
17+5 Spot

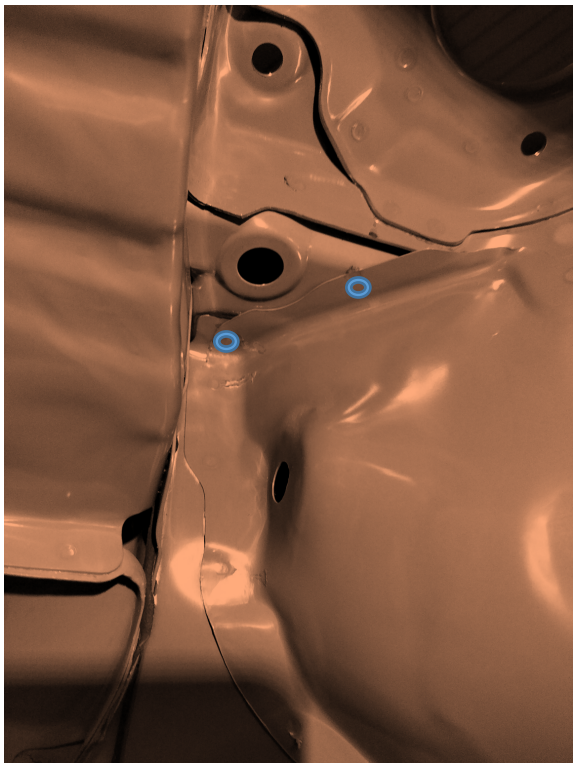
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In this area there are 3 Spot need to cut by belt sander and no marks for these Spot



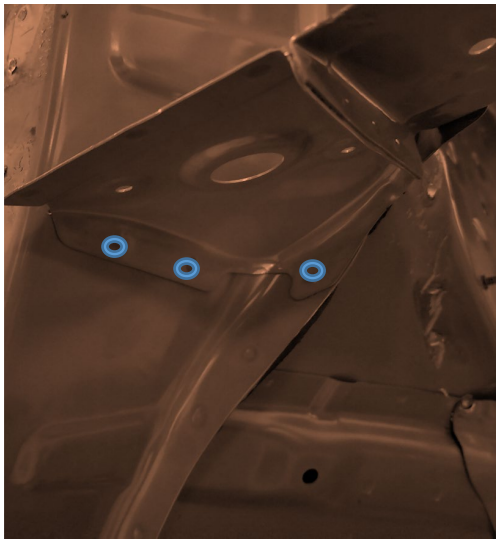




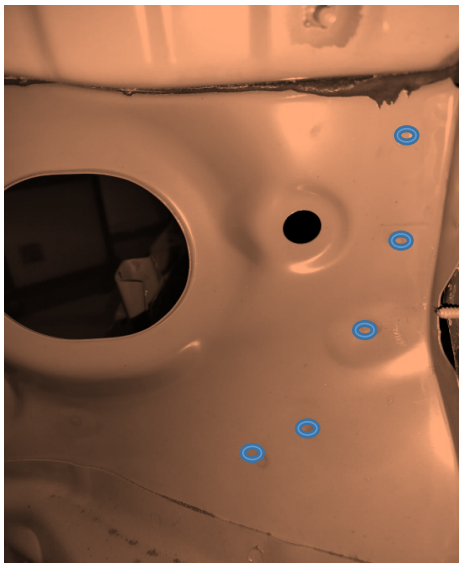


Inside front wheel housing assembly cut 2 Spot

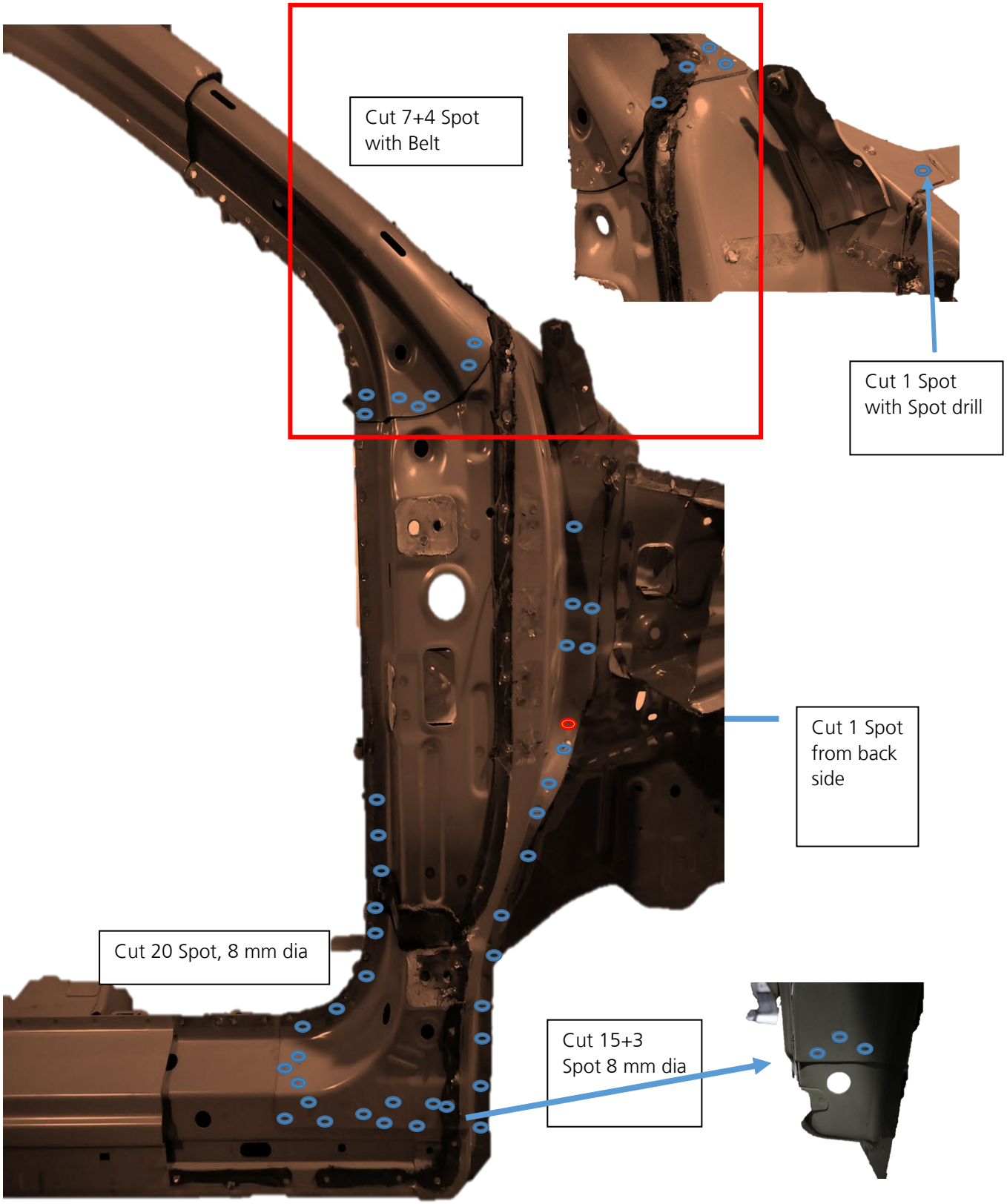
Front Cabin Crossbeam Reinforcement Assembly cut 3 Spot



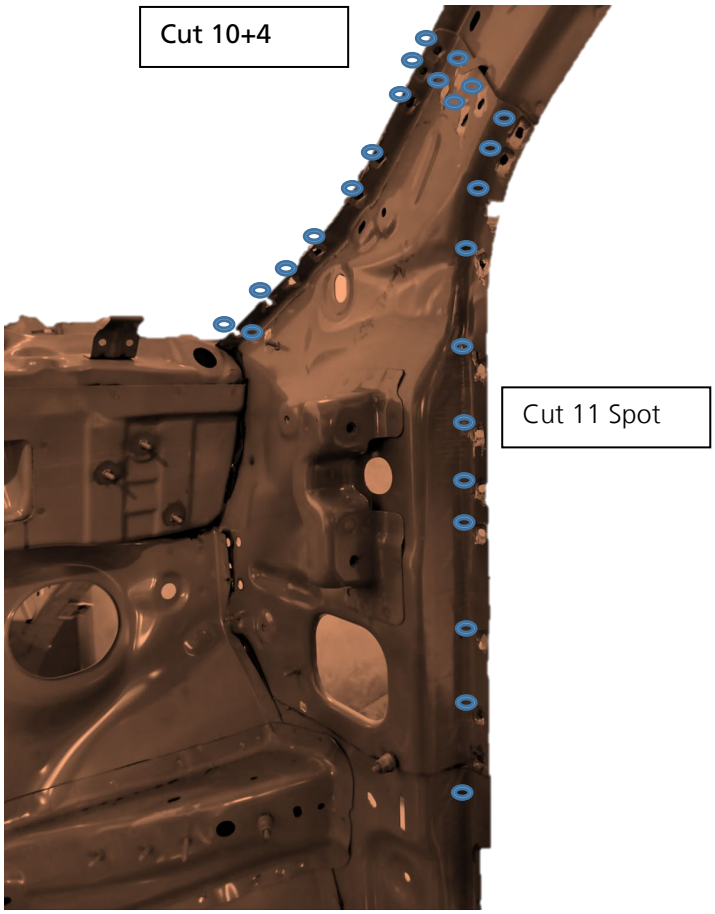
- Remove the A piller middle panel and protact it for re use

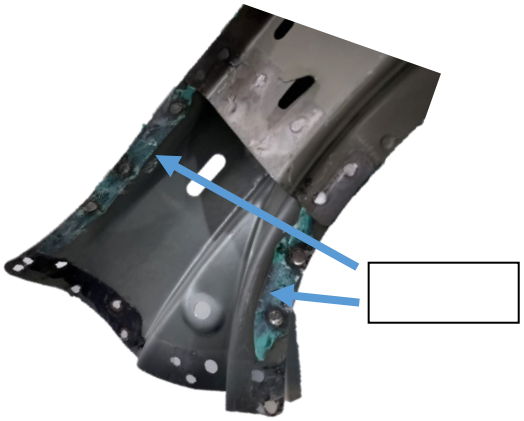


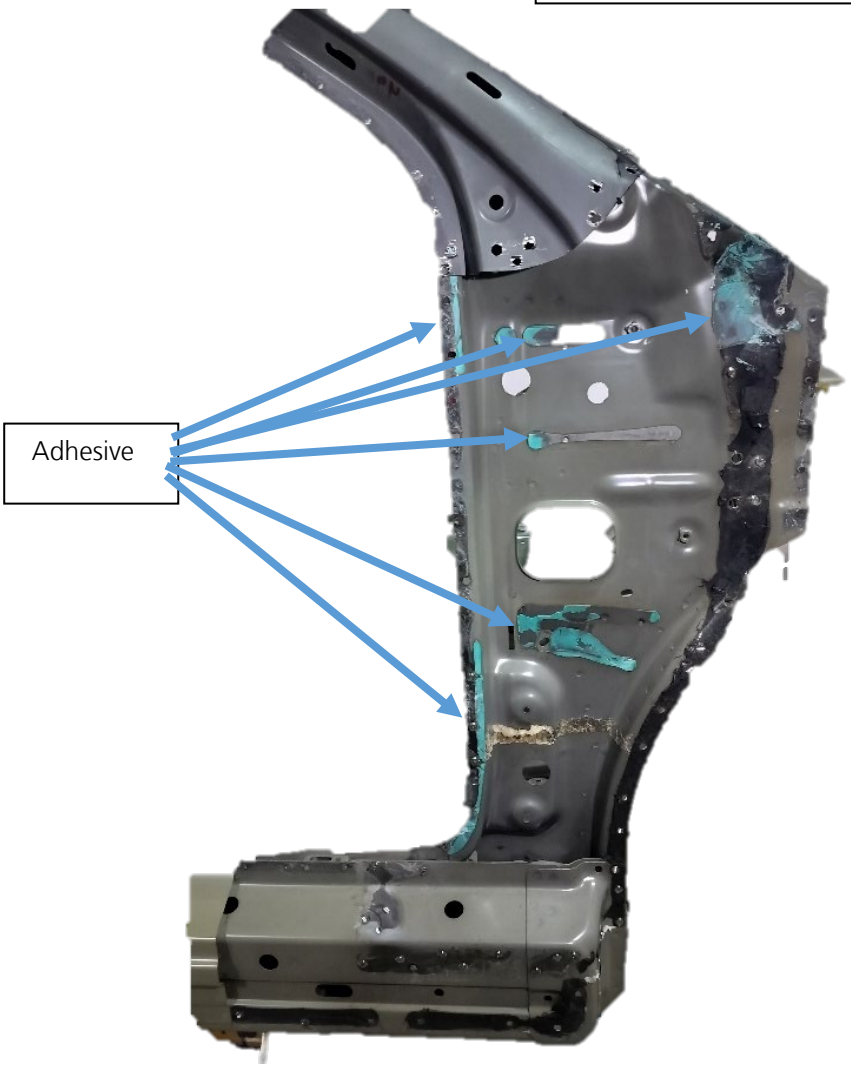
Inside on fire wall cut 5 Spot 8 mm dia

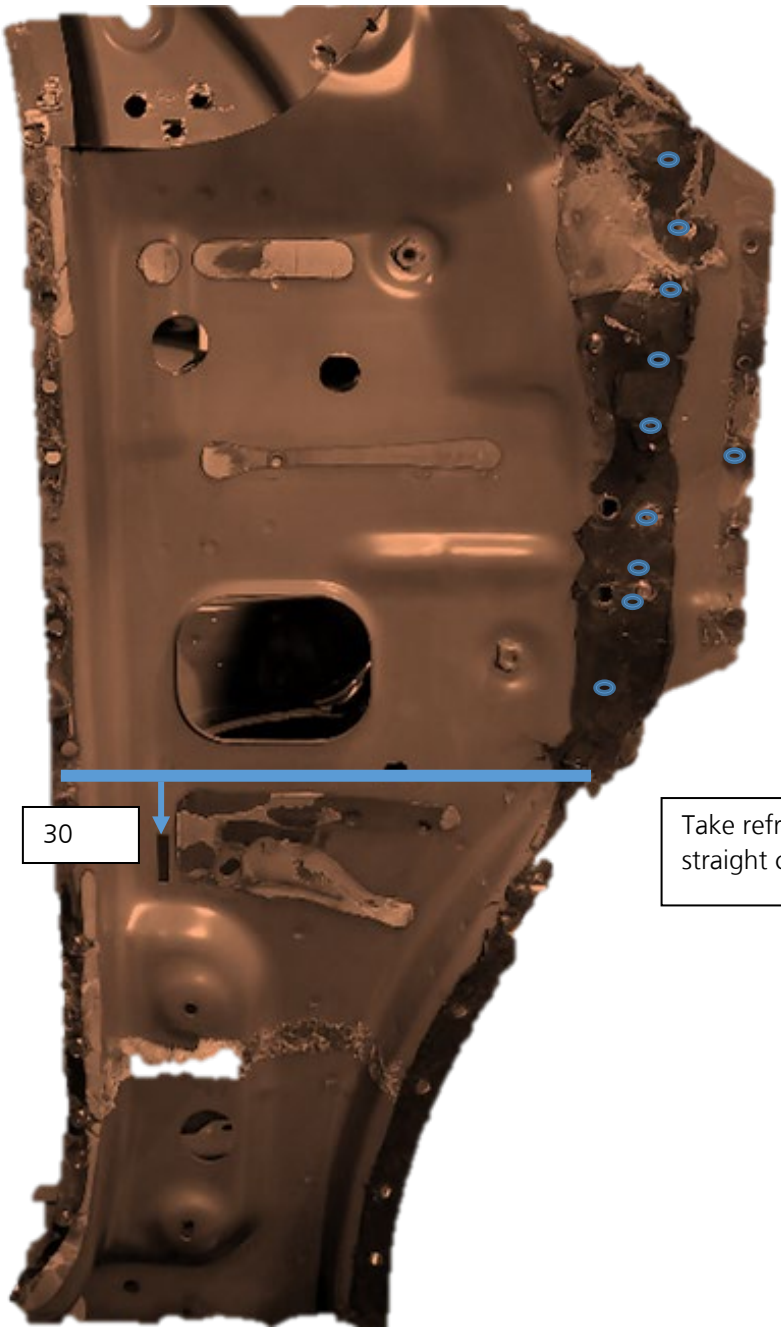


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Cut 10+4
Cut 11 Spot




Sealent and Adhesive
Adhesive

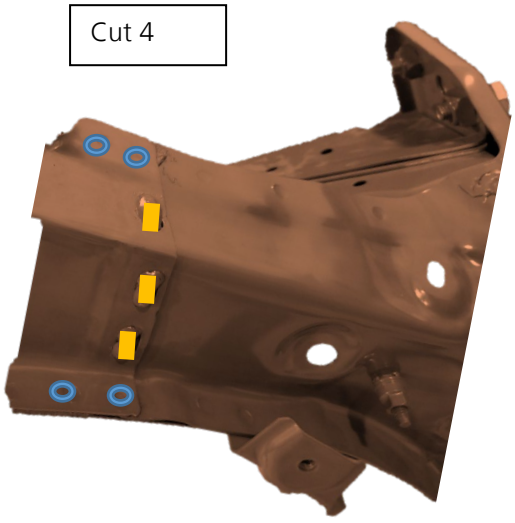

Cut 10
30
Take refrence from the edge and make straight cut line

Sealent and Adhesive

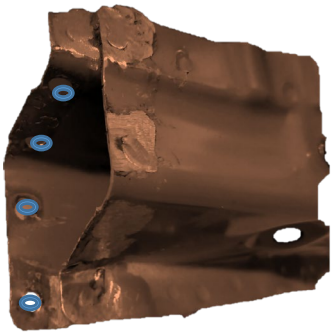


Cabin Crossbeam Reinforcement Assembly front end prepare by grind the weld and cut the spot

Cut 4



Cut 4



Prepare New and Reusable Parts for Joining

- Cut the new replacement parts as required and prepare them for installation.
- Remove all paint, coatings, and other contaminants from the areas to be welded, including the flanges and joints of both the new replacement parts and reusable parts.
- For spot welding, all four (4) sides of the mating area must be completely free of paint/coating and prepared as bare metal.
- For plug welding, all three (3) sides of the welding area must be completely free of paint/coating and prepared as bare metal.
- For plug welding, provide a minimum 10 mm bare-metal area around each plug-weld hole.
- For spot welding, provide a minimum 10 mm bare-metal area around the welding zone.
- For seam welding, where possible, provide a 10-20 mm bare-metal area on both the inside and outside of the joint.
- **Clean all sealant and adhesive application areas thoroughly. Do not remove or disturb the foam sealant area; leave it as it is.**
- **Clean the adhesive areas down to bare metal. There is no need to remove or clean the sealant area on the new parts.**
- Refer to the Plug Weld Details and prepare the holes according to the specified requirements.
- Any accidental holes, cuts, or tears made to parts that are not intended to be replaced must not be repaired or welded until they have been inspected by the Experts.

If you repair or weld these areas before inspection, you will lose all points allocated to this marking area.

B1 STOP

- Sign in on the "Request for Judging" chart mounted on the wall at the time of completion, so that the Experts can mark the work.
- Experts will assess and mark the following activities: part removal, cutting, drilling, dressing, grinding, and preparation of plug-weld holes on the body and/or replacement parts.

Important information!

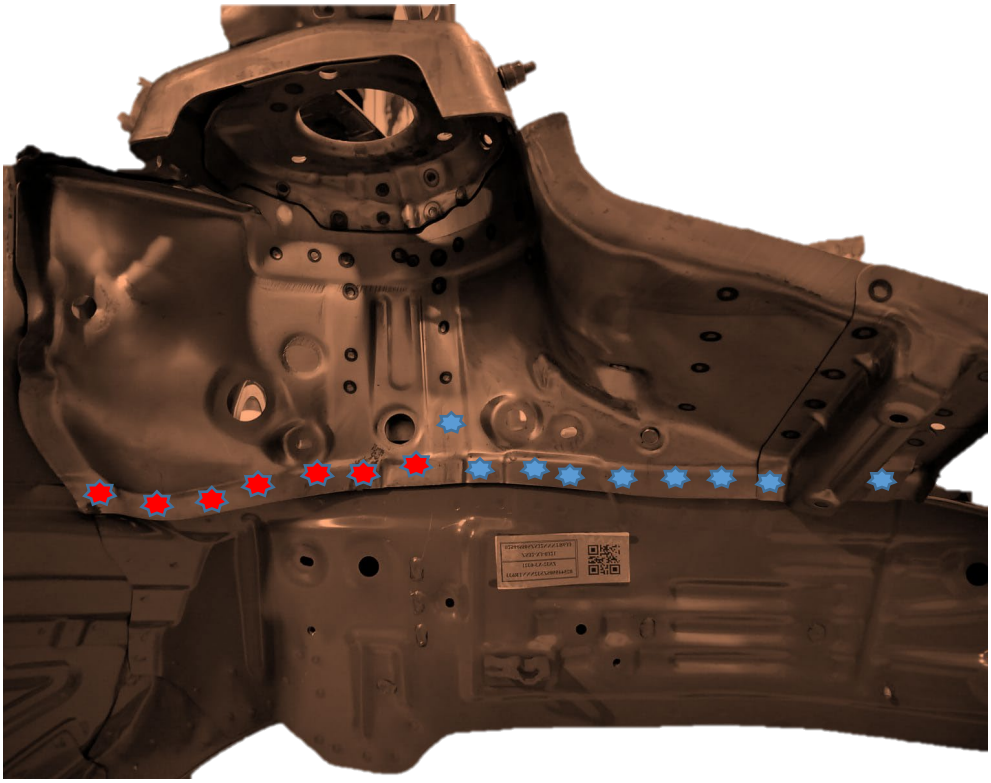
- You will add primer when the Experts are done marking B1
- Apply primer on all surfaces which will be enclosed. (No primer on adheshive and sealent area). This will be marked by a random sample (cut out) at the end of the Competition!
- Marks will be deducted unless Experts assess how the work is performed.

B2 – Primer Application

- You have to apply primer on all parts infront of Expert team.
- After applying primer Expert team may will guide you to continue with other work and after marking your work they will ask you to continue for B3

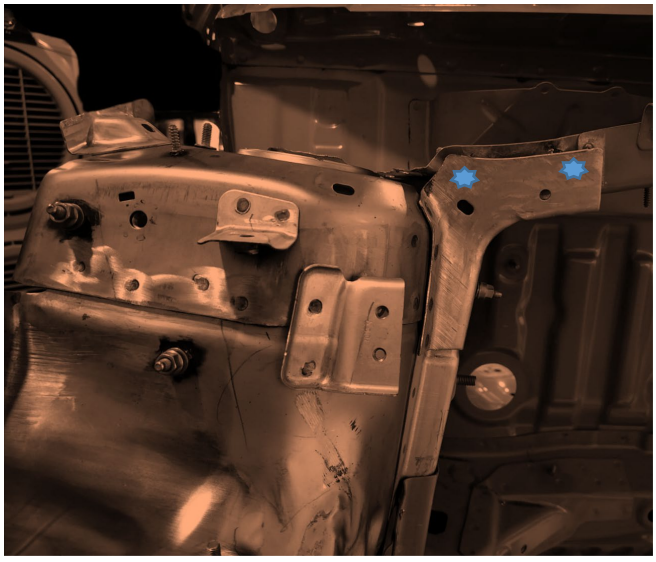
B3 – Re-install parts - Front Wheel Housing Assembly

- Follow the instruction for spot and plug weld

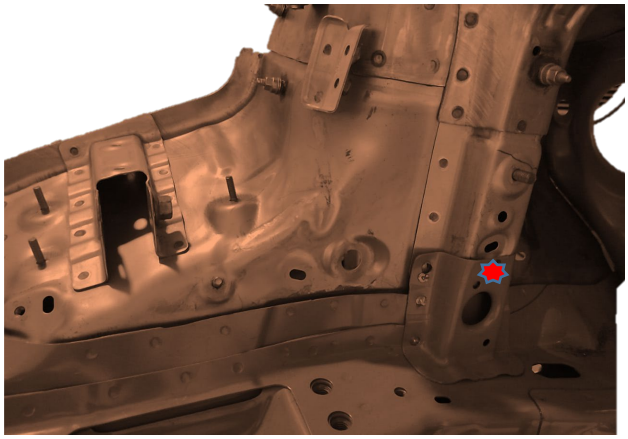


9 Spot

7 Plug (8 mm dia)

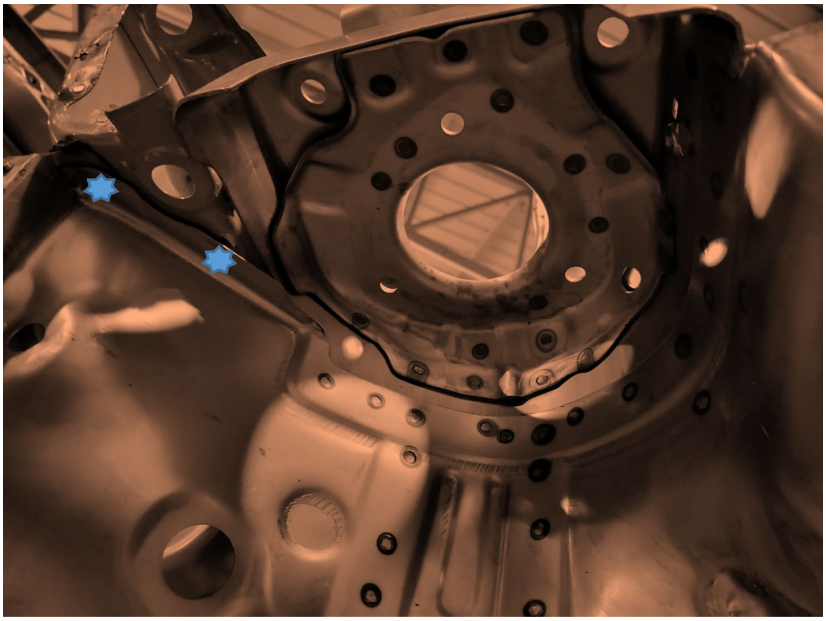


2



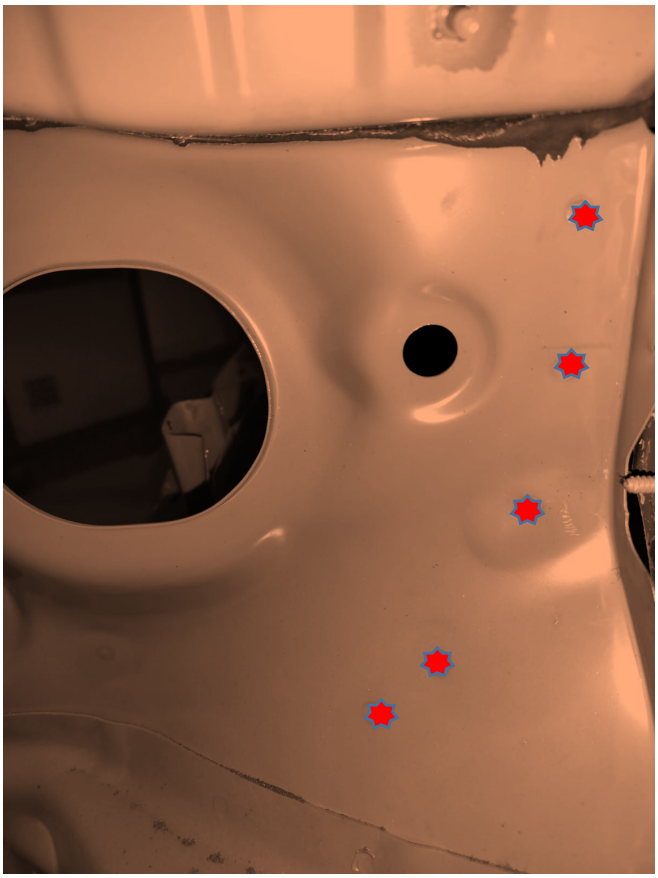
1 Plug

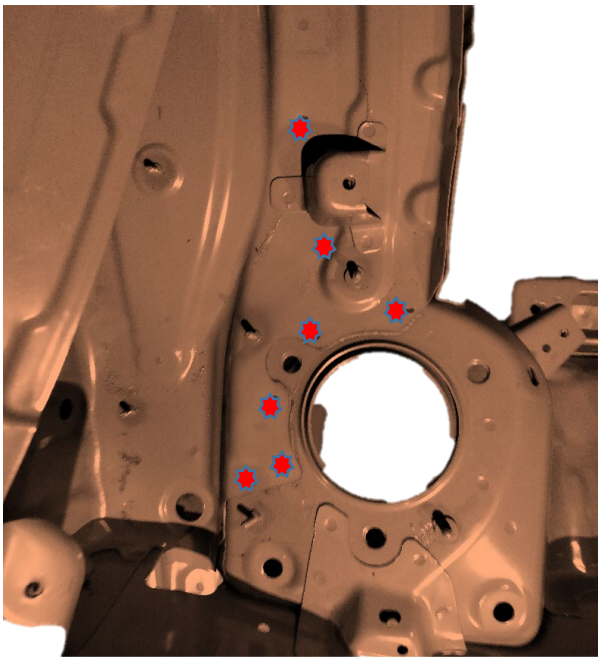
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2

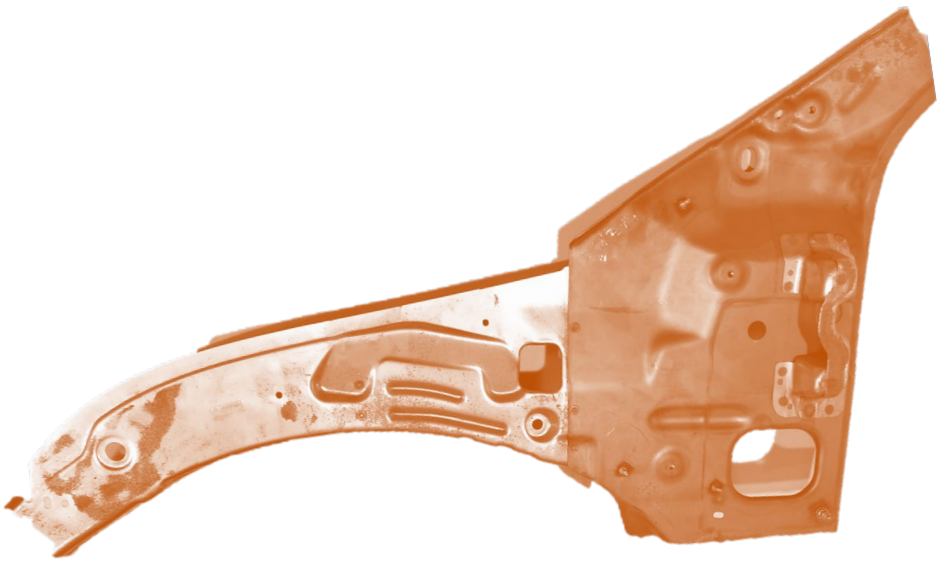
Inside on fire wall 5
Plug (8 mm dia)

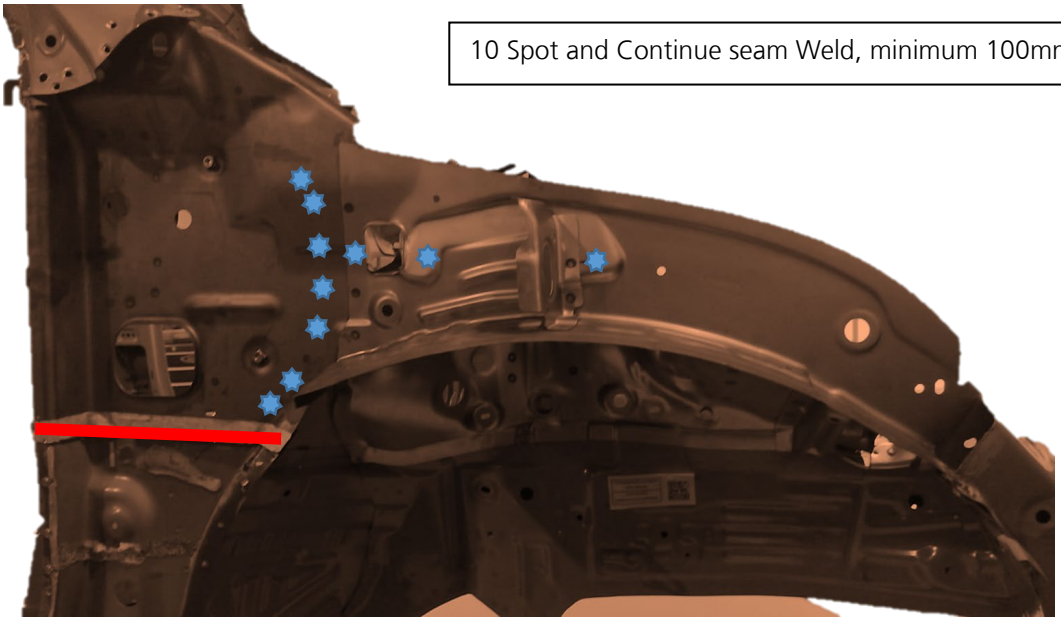




7 Plug

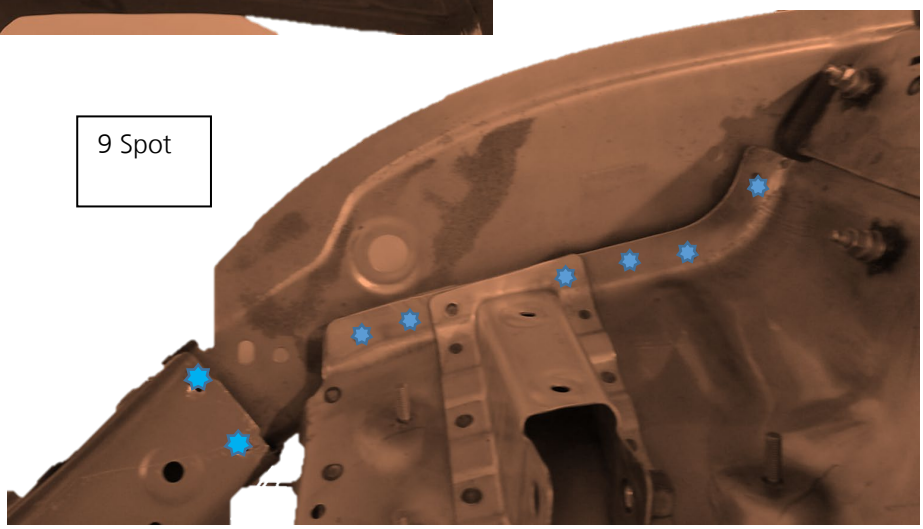
B3 – A-Pillar Inner Panel Assembly





10 Spot and Continue seam Weld, minimum 100mm length

9 Spot





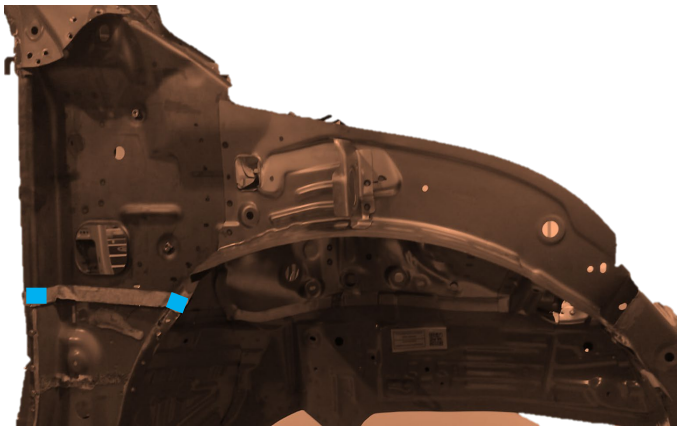
2

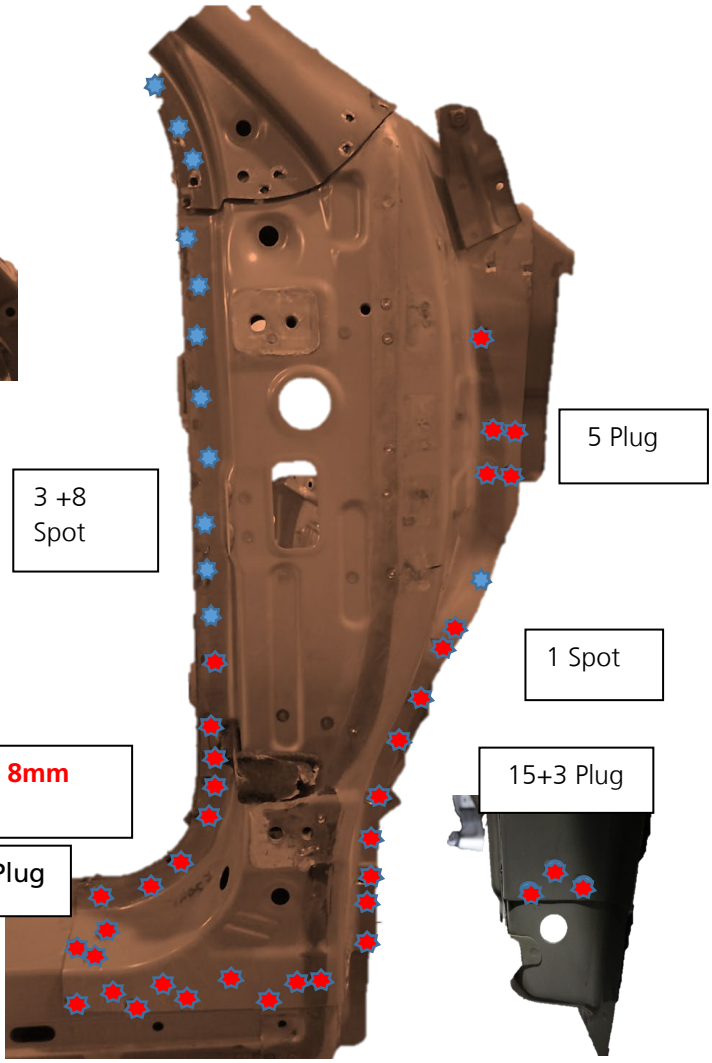
B3 – Stop

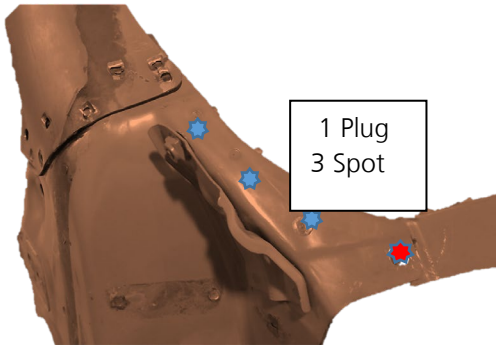
- Sign in on the "request for judging chart" mounted on wall the time of completion and for Experts to mark
- Experts will mark your continuos weld, Spot weld and Plug weld.

B4 – A-Pillar Reinforcement and Front Cabin Crossbeam Reinforcement Assembly Installation

- Grind the weld from the edges of A-Pillar inner assembly

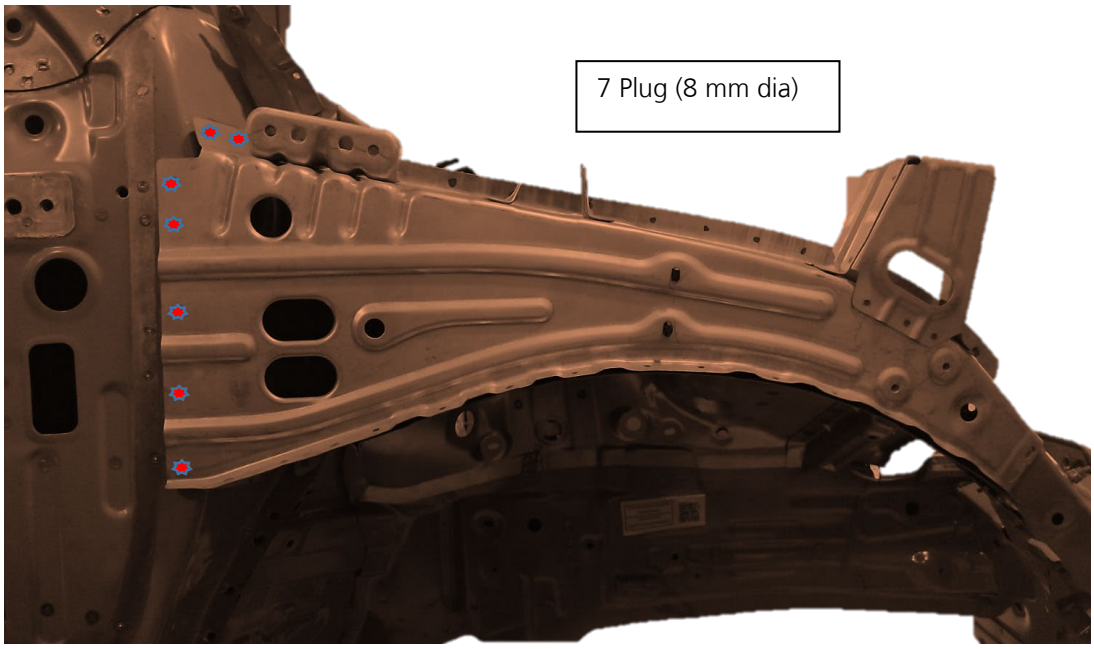


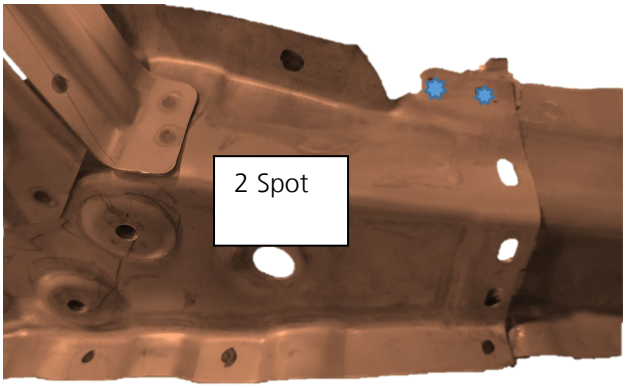


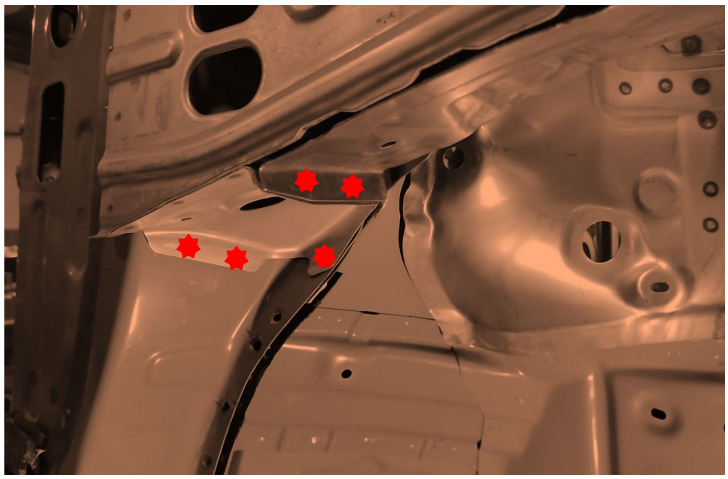


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- Make Plug weld and Spot weld as per Guide line.

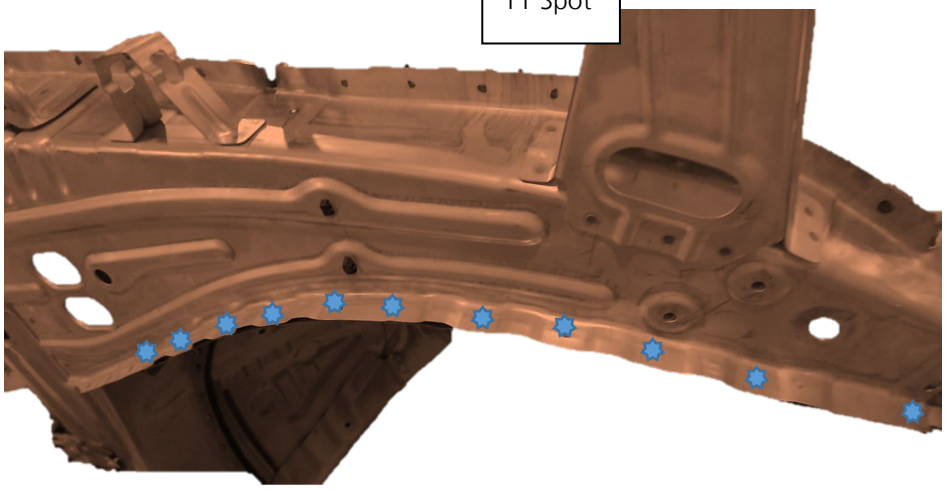




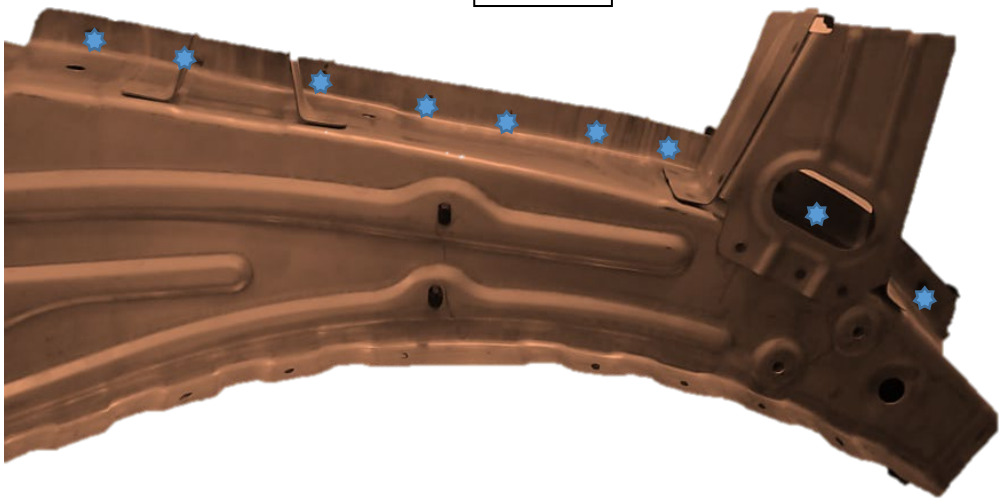


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11 Spot



9 Spot

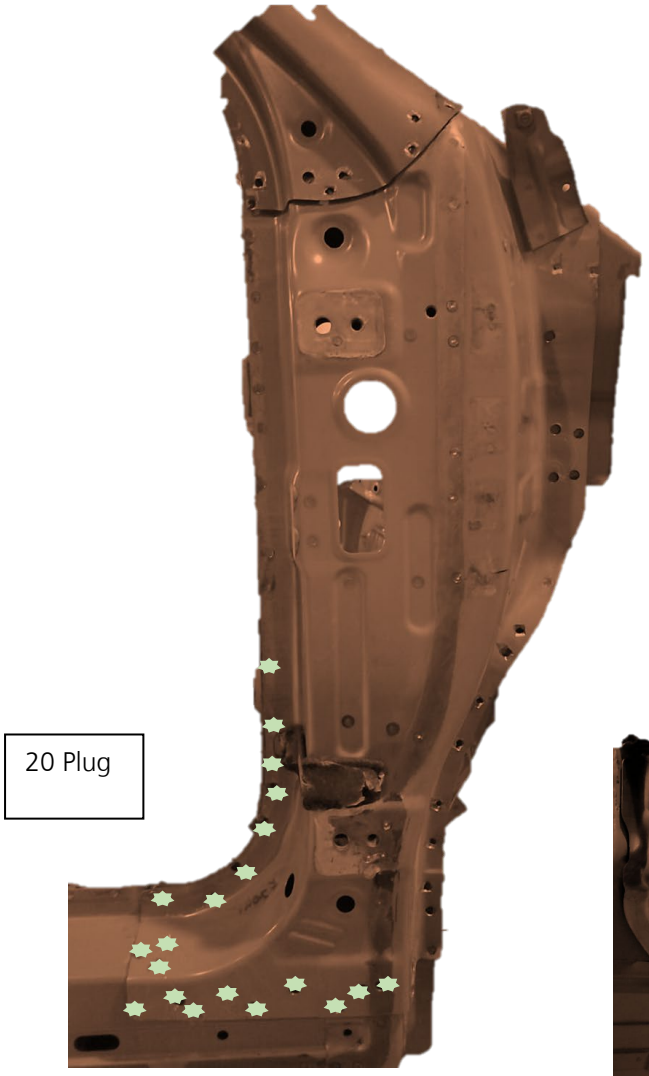


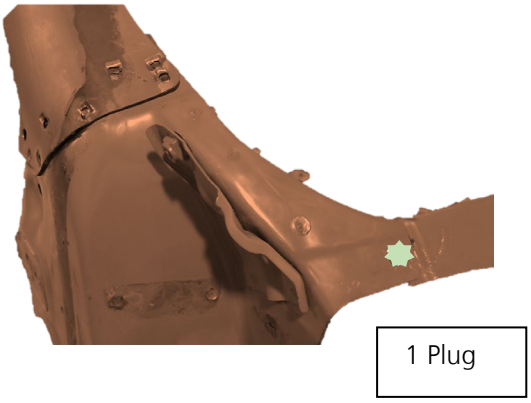
B4 – Stop

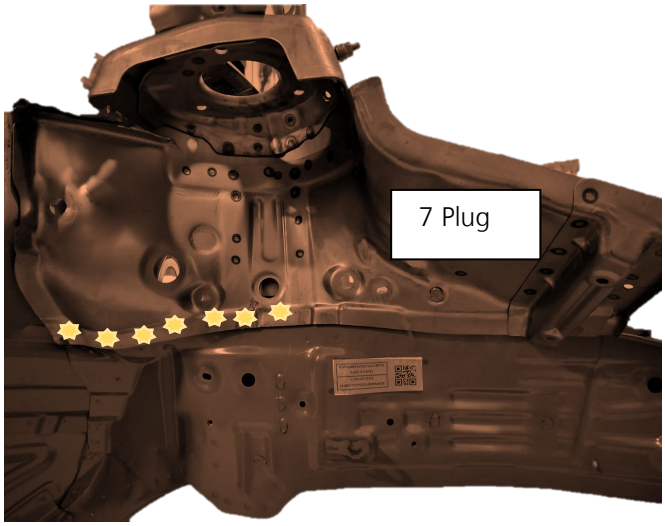
- Sign in on the "request for judging chart" mounted on wall the time of completion and for Experts to mark
- Experts will mark your welding, Spot weld and Plug weld.

B5 – Dress/Grind/Sand Welds

- Grind the below area Plug weld and sand to P120 grit







B5 – Stop

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

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Module C – Non-Structural Part Replacement

Safe work practices must always be adhered to and apply to the Competition Rules.

Replace the quarter panel from the side panel

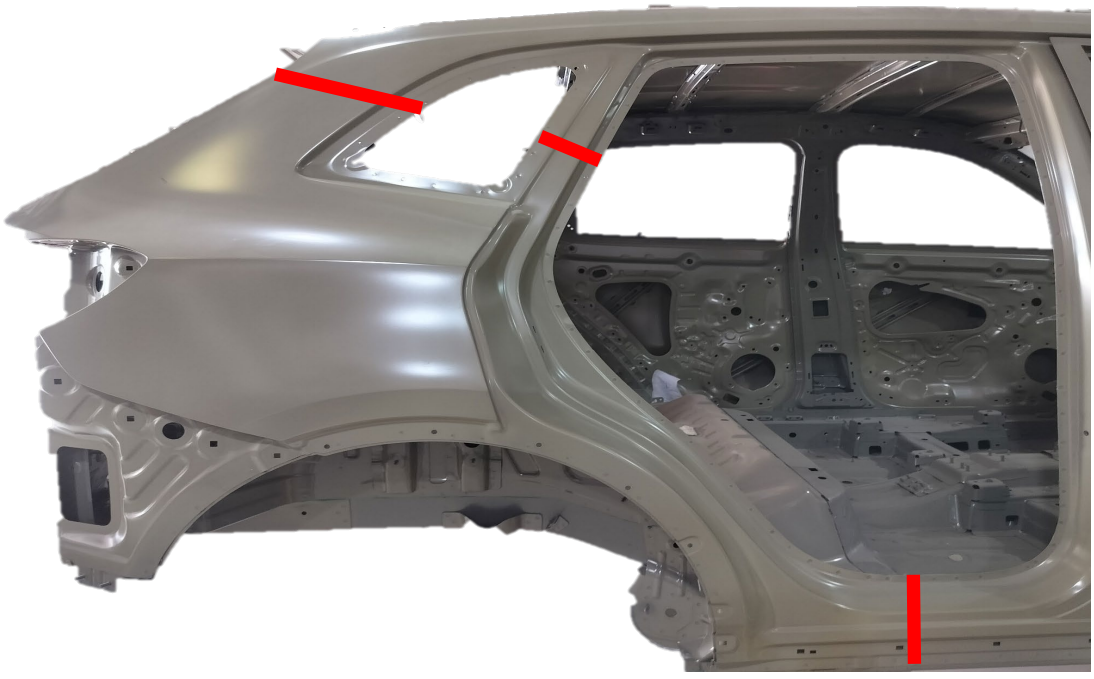
Open welded and seam-adhesive bond connections in all areas. Cut outer panel only.



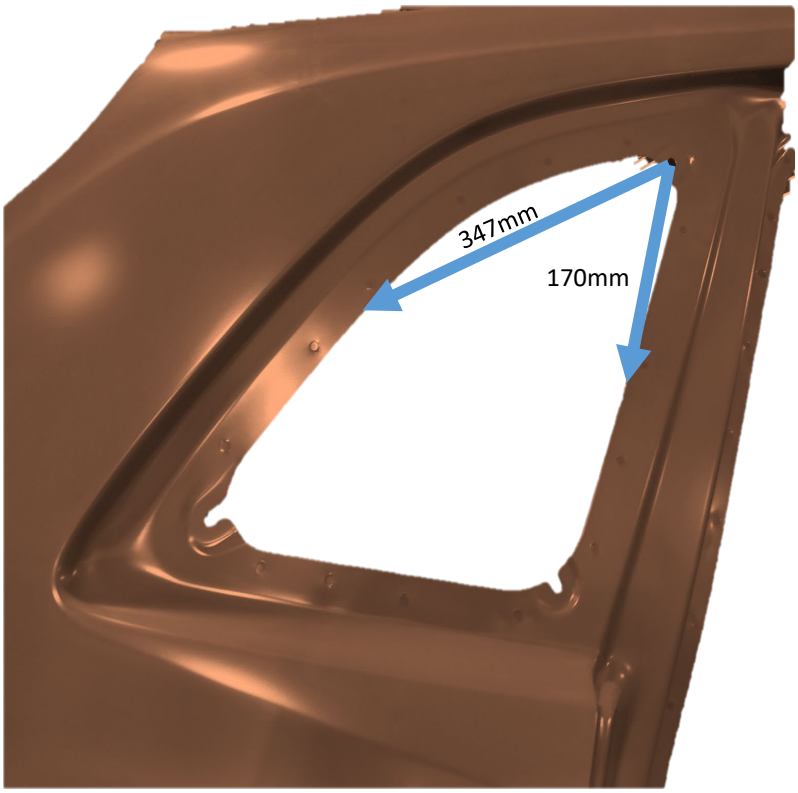
C1 – Cutting, Remove and New Parts Preparation

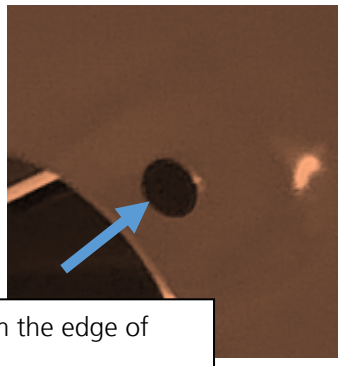
Cut the body and prepare new parts as the dedicated dimension

Cutting Line Dimenssion Details

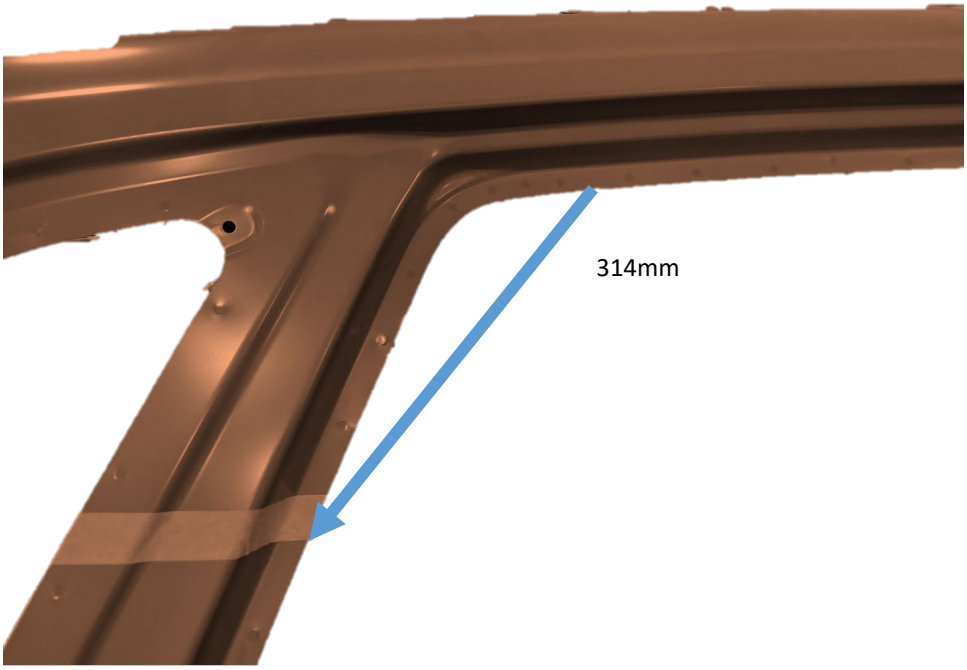


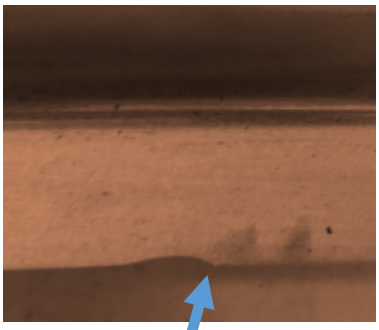
Perform the upper cut lines as specified here and shown in the photos below.





From the edge of hole

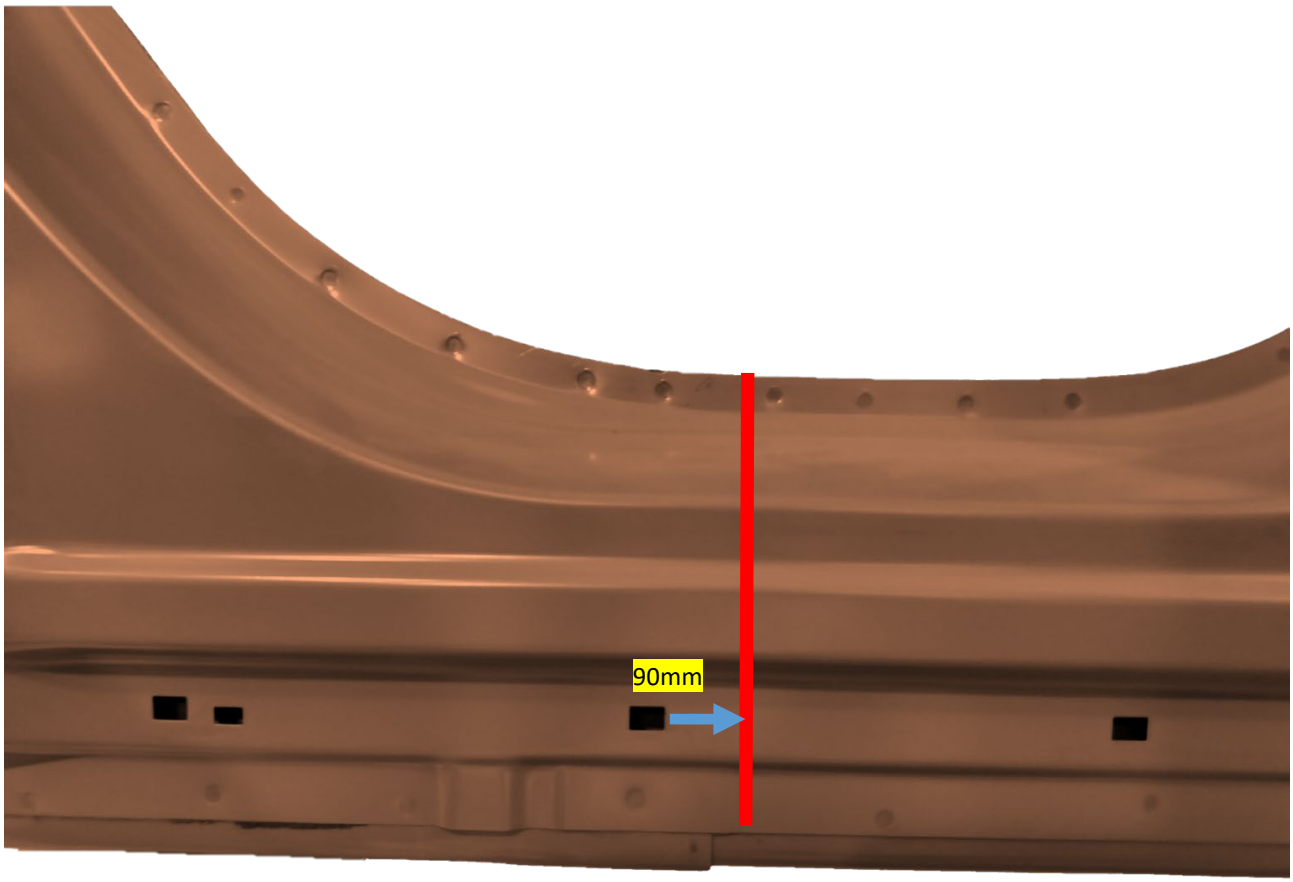




From the corner edge

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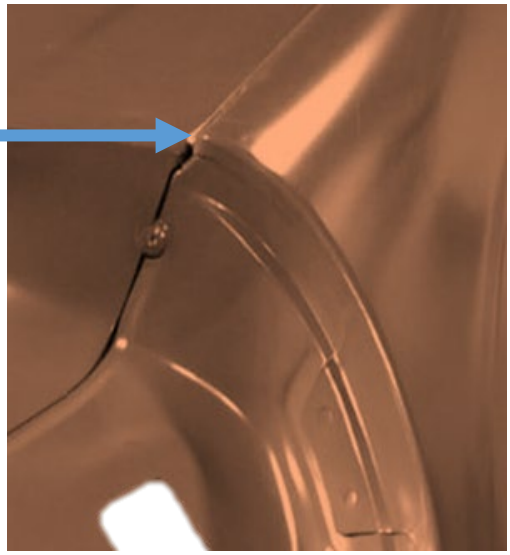
Perform the lower cut line as specified here and shown in the photos below.



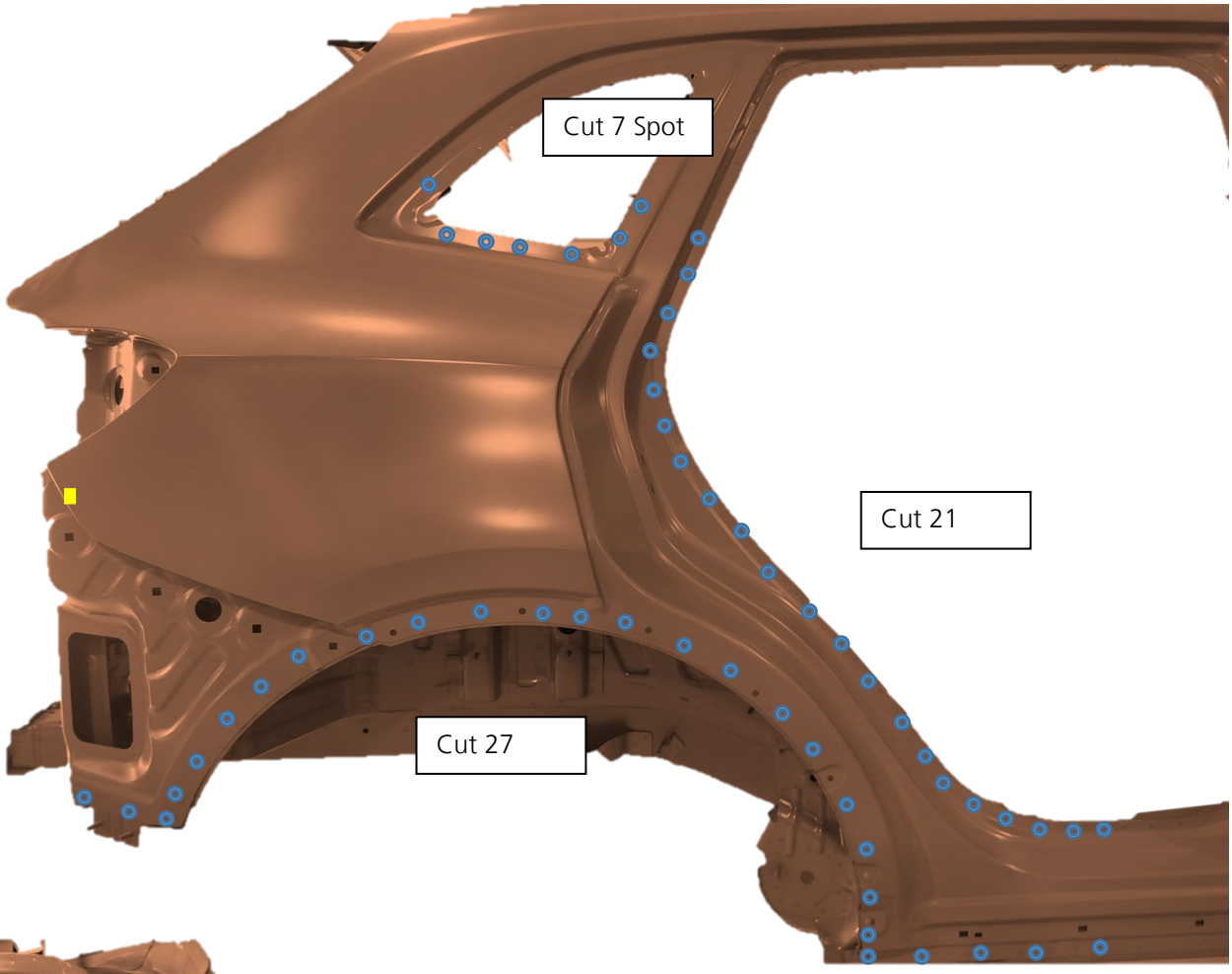
© WorldSkills International

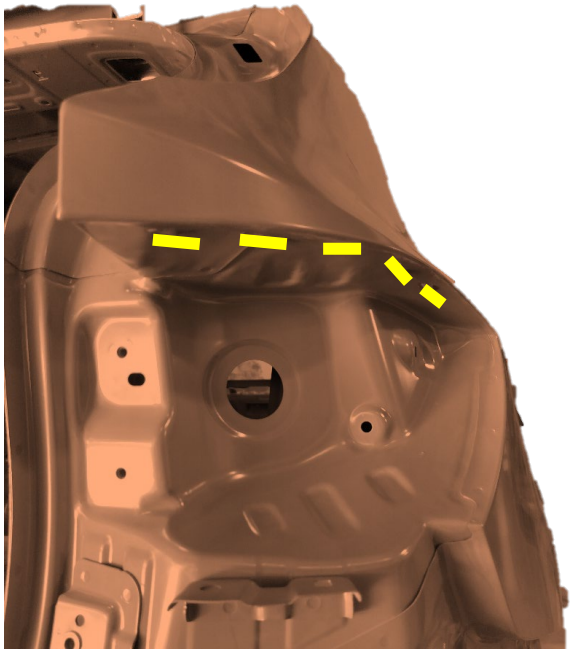


235 mm
from the top
of the corner



Spot Detail on Panel

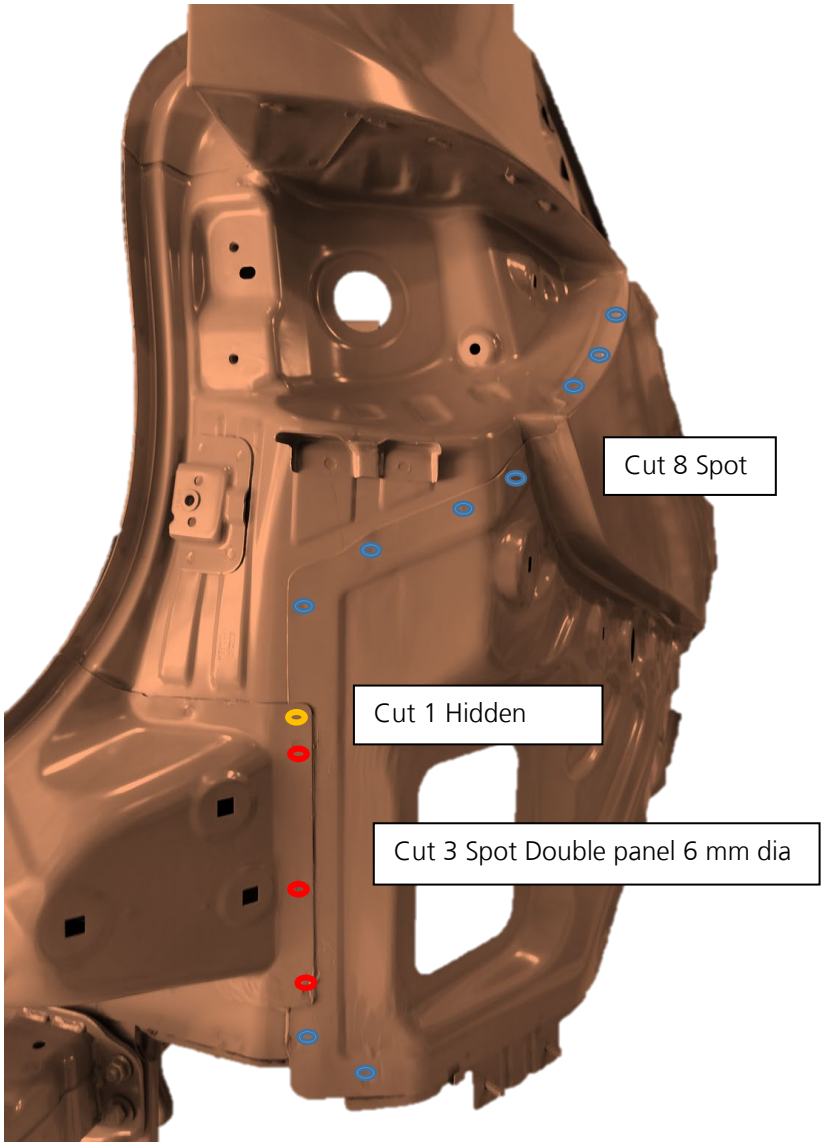




Grind the brazing

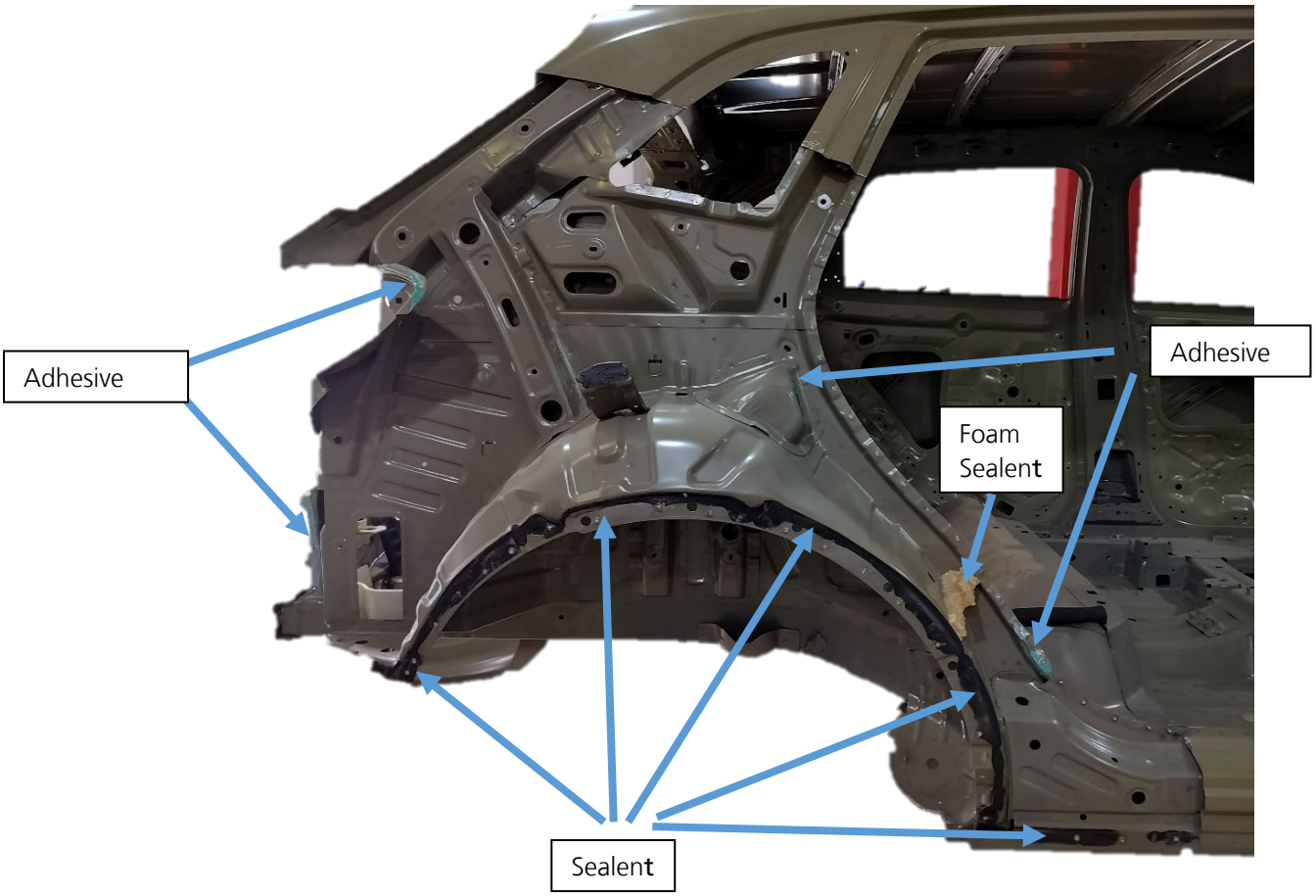
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Sealent and Adhesive area



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

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Important!

- Drill 6mm diameter holes for plug welding on all 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 process.
- Glue gun will be provid 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, including sealent area (No welding Primer on adhesive surfaces). Marks will be deducted unless Experts assess how the work is performed.

C2 – Fitting, Gluing, and Sealing the side panel

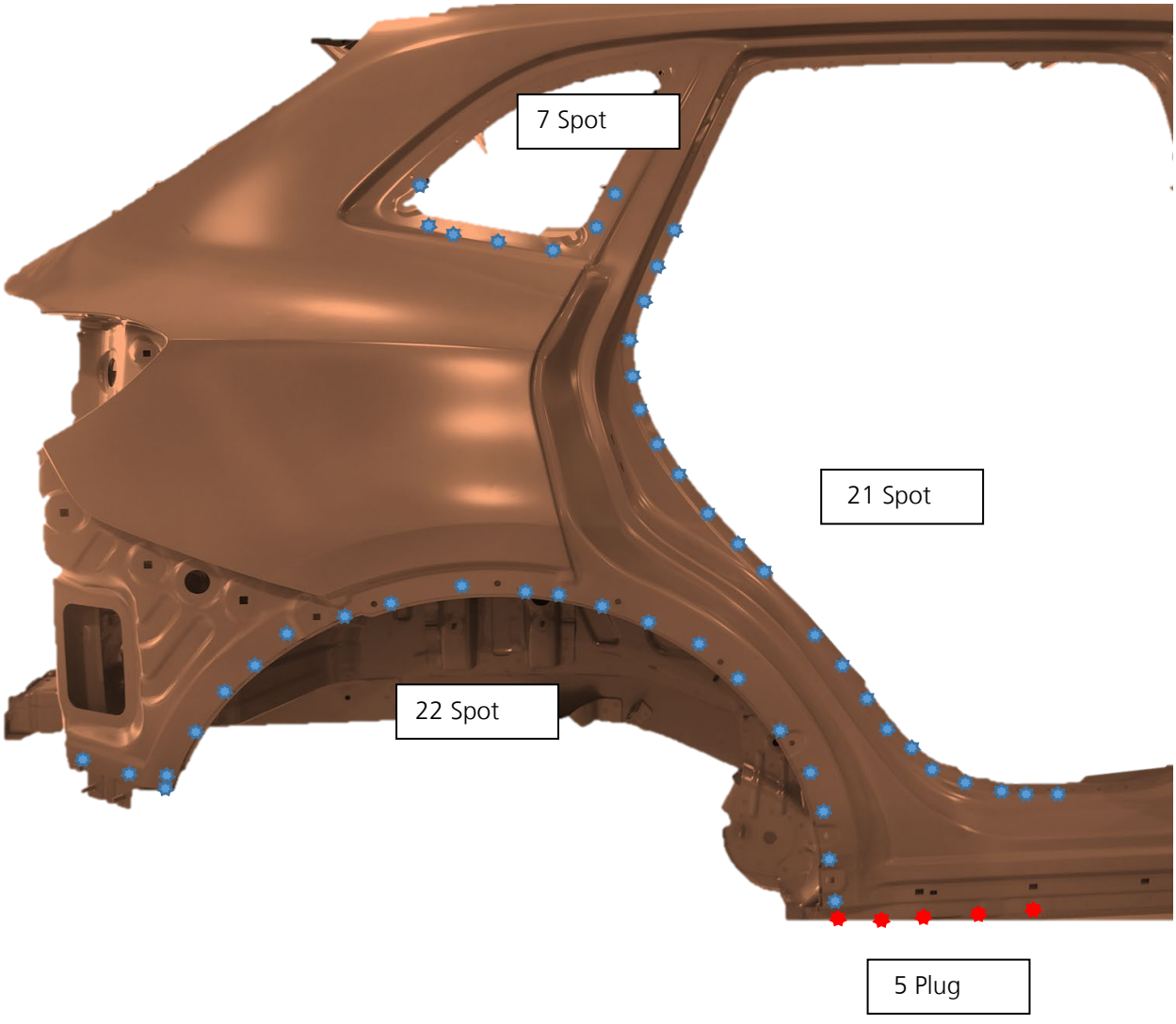
- Safe work practices must always be adhered to and apply to the Competition Rules.
- You have to apply Adhesive infront of Expert team
- Make sure there is sufficient adhesive on bonding surfaces
- Fit, Seal, and Glue Quarter panel.
- Ensure alignment of swage lines at replacement part to existing vehicle part locations
- Prepare for welding (No welding in C2)

Don’t need to remove the Foam Sealing

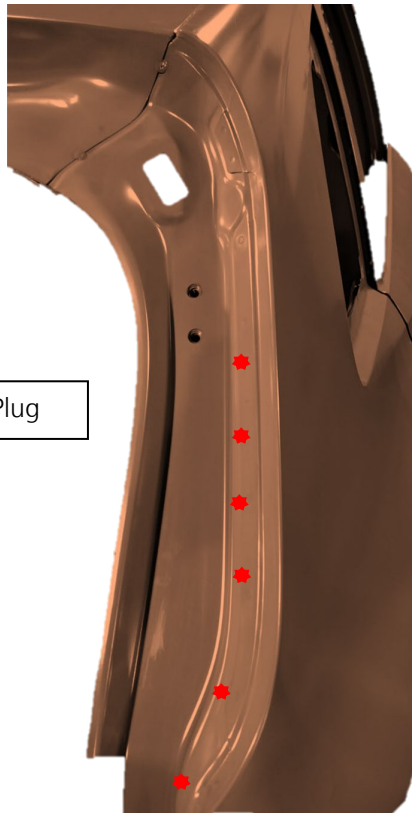
For the glue Use 3M 07333, For the sealent 3M 08362

C3 – Welding Side Panel

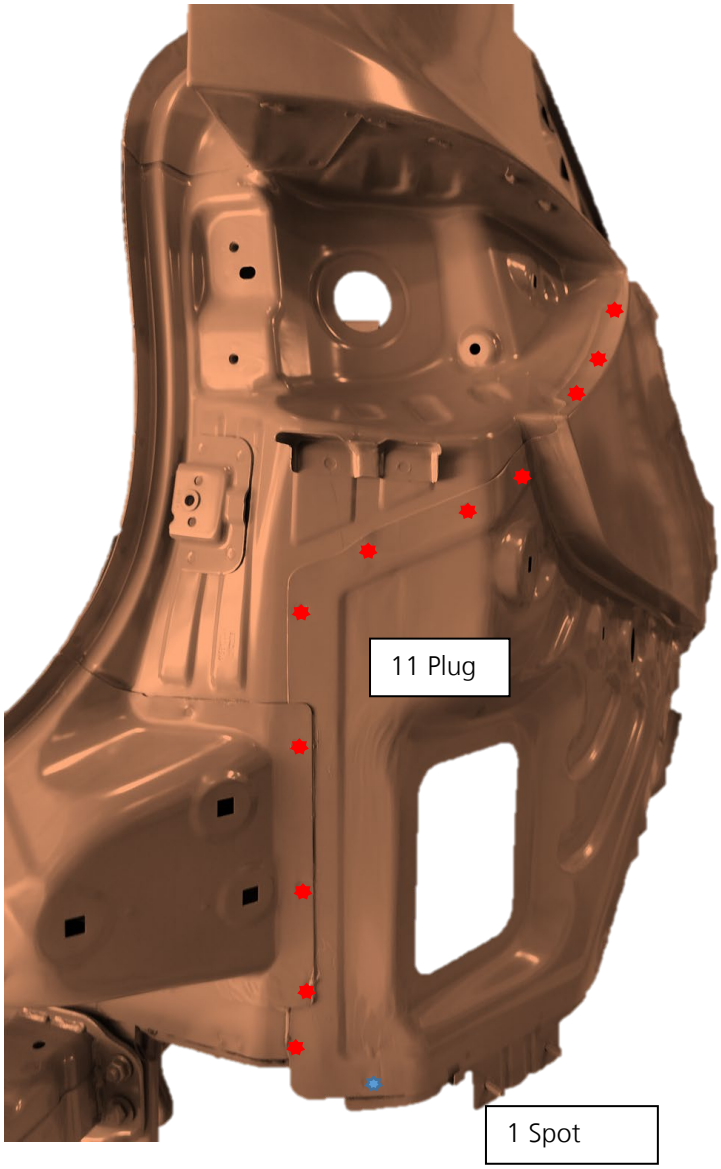
- Safe work practices must always be adhered to and apply to the Competition Rules.
- Fit and weld Quarter panel. The side panel's upside and downside weld must be a continuous weld or a step
- welding, and all welds must have full penetration.
- All welds must be marked before grinding. Completed continuous 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.



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6 Plug



11 Plug

1 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

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D – Panel Repair

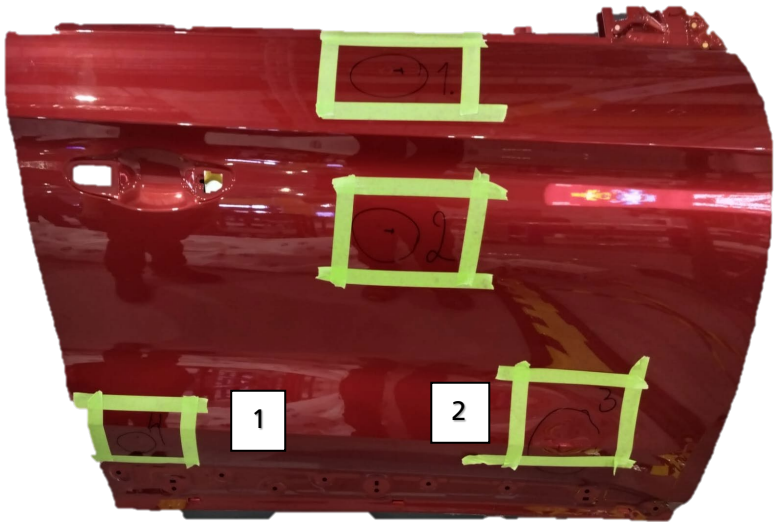
D1 – Door Repair (steel)

Two (2) dents on the door shall be repaired. The location of the dents is shown in the picture below.

Important!

Any additional damage identified on the door shall be reported to the Expert Team before the start of the Competition.
The Competitor may repair the specified dents between other tasks or during any available period when no other activity is specified in the Test Project.

- Safe working practices shall be followed at all times in accordance with the Host Country's health and safety regulations.
- The repaired area shall be restored to its original contour and shape. The Competitor may select the appropriate dent removal technique.
- Panel shrinking shall be carried out using electrical shrinking equipment at the designated workstation or by using a cold shrinking technique.
- The repaired area shall be finished without the use of filler and to a standard suitable for subsequent chemical treatment and primer application.
- Repaired areas shall be free from deep file marks, grinder marks, gouges, or other surface damage.
- The repaired area shall be sanded to a minimum of P120 grit.
- The panel repair area shall not be damaged or excessively thinned due to excessive sanding. Body lines, contours, folds, and edges shall not be filed or ground through.
- Once the repair has been completed, the Competitor shall record the completion on the STOP table.



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D2 – Bonnet Repair (aluminium)

There are three (3) dents on the bonnet to remove, you can see the position on the follow picture.

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 2 hours.
Any additional damage identified on the door shall be reported to the Expert Team before the start of the task.

- Safe working practices shall be followed at all times in accordance with the Host Country's health and safety regulations.
- The repaired area shall be restored to its original contour and shape.
- The repaired area shall be finished without the use of filler and to a standard suitable for subsequent chemical treatment and primer application.
- Repaired areas shall be free from deep file marks, grinder marks, gouges, or other surface damage.
- The repaired area shall be sanded to a minimum of P120 grit.
- The panel repair area shall not be damaged or excessively thinned due to excessive sanding.

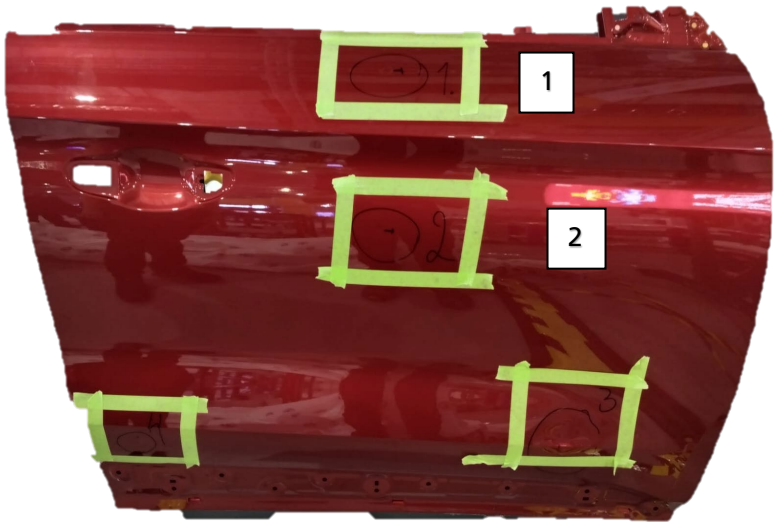
D3 – Door Repair (PDR)

Two (2) dents on the door shall be repaired. The location of the dents is shown in the picture below.

Important!

Any additional damage identified on the door shall be reported to the Expert Team before the start of the Competition. The Competitor may repair the specified dents between other tasks or during any available period when no other activity is specified in the Test Project.

- Safe working practices shall be followed at all times in accordance with the Host Country's health and safety regulations.
- The Competitor shall repair the specified dent using Paintless Dent Repair (PDR) techniques.
- The repaired area shall be restored to its original contour and shape, without damaging the paint finish.
- The use of filler, grinding, sanding, or other conventional dent-repair methods is not permitted for this task.
- Once the repair has been completed, the Competitor shall record the completion on the STOP table.



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E – Cosmatic Repair on Plastic

Important!!

Start both tasks simultaneously and manage your time effectively to complete them within the allocated time.
Use the drying time of the primer and adhesive productively by working on the Dent Repair – Aluminium task.
Ensure that all tasks are completed within the specified Competition time.

E1 – Cosmetic Repair on Plastic (Patch Repair)

Pre-Clean the Area:

- Clean both the inside and outside of the repair area using 3M™ General Purpose Adhesive Cleaner (08984). Ensure all contaminants like paint overspray and grease are removed. Check that both inner and outer surfaces are completely free of grease, dirt, and overspray film.

Prepare the Dish Out Area:

- Use 60 Roloc disc or belt sander to create a gradual "dish out" slope around 10 mm–15 mm from the edge of the hole, leaving 0.5 mm–1.0 mm of material at the inside edge. Then sand the "dish out" area using a DA sander with an 80 abrasive disc. Inspect the slope to ensure a uniform bevel with a 0.5–1.0 mm thickness remaining at the inner edge.

Feather and Sand Surrounding Surface:

- Sand around the "dish out" area using a DA sander with 80–120 abrasive discs. Create a smooth transition into the "dish out" area and a rough, fuzzy surface for maximum adhesion.
- Verify that the transition boundary is smooth to the touch and the surface has an evenly scuffed, fuzzy texture.
- Cut the 3M™ Flexible Reinforcement Repair Patch (05888) 30–40 mm larger than the hole with rounded corners.

Stop

Apply Flexible Repair Patch to the Back Side

- Clean the back side with 3M 08984 cleaner. Wipe adhesion primer (05888) onto the damaged area. Apply the 3M™ Flexible Reinforcement Repair Patch (05888), then firmly press it onto the backside.
- Ensure the patch fully covers the hole with a 20–30 mm overlap and adheres firmly without edge lifting or air bubbles.

Apply Adhesion Promoter and Repair Material:

- Use Polyolefin Adhesion Promoter Sponge (05888) on the sanded front surface and allow it to dry for 5 minutes. Mix and apply 3M™ EZ Sand Multi Purpose Repair Material (05887)—first apply a thin, tight layer, then scrape additional material to cover the area completely. Allow 15 minutes to cure.
- Confirm that the repair material has fully cured and hardened after 15 minutes.

Sand and Shape the Repair Material:

- Rough-sand the cured repair material with a 120 abrasive disc using a sanding block or DA sander, then finish shaping the surface contour using a 180 abrasive disc.
- Run a hand across the area to confirm the patch matches the natural contour of the bumper without high spots.

Final Sanding and Inspection

- Finish-sand the repaired and surrounding area using P 320 abrasive disc. Blow off dust with compressed air and inspect.
- Ensure the surface is completely smooth, flush with surrounding panels, and ready for paint preparation.

E2 – Cosmetic Repair on Plastic (Cut/Creck Repair)

Pre-Cleaning

- Clean the inner and outer repair areas, then wipe down with 3M™ General Purpose Adhesive Cleaner (PN 08984) to remove grease, paint overspray, and other contaminants.

Drill Stop-Holes

- Drill a 3 mm–6 mm hole at each end of the tear to relieve stress and prevent further cracking.

Prepare the "Dish Out" Area

- Use a 2-inch angle grinder or belt sander with a Grade 60 abrasive disc to grind a gradual dish-out area extending 10 mm–15 mm on both sides of the 1 mm–2 mm gap, leaving 0.5 mm–1.0 mm of material at the inner edge. Sand the area using a 3-inch DA sander with Grade 80–120 discs 30 mm both side.

Sand the Back Side

- Sand the inner surface around the damage with Grade 80–120 abrasives, extending at least 80 mm beyond the damaged area (40 mm on each side) to create a bonding surface.

Prepare the Reinforcement Patch

STOP

- Clean the inside surface again using 3M™ Cleaner 08984, spray 3M™ Polyolefin Adhesion Promoter (PN 06396), and allow it to dry for 5 minutes. While drying, cut the 3M™ Reinforcement Patch (PN 04904) to size, extending 15 mm–20 mm beyond the crack edges.

Bond the Back Side

- Apply 3M™ Aluminium Tape (PN 06935) to the outer surface for temporary support. On the inner side, apply a thin, tight layer of 3M™ Semi-Rigid Plastic Repair (PN 04240). Press the reinforcement patch into the adhesive and let it dry for 15 minutes.

Prepare the Front Side

- Remove the outer aluminium tape. Sand around the dish-out area with a 3-inch DA sander (Grade 80–120) to create a smooth transition and a fuzzy surface texture.

Apply Repair Material to Front Side

- Clean the outer area with PN 08984 cleaner, apply PN 06396 adhesion promoter, and let it flash for 5 minutes. Mix and apply 3M™ EZ Sand Multi-Purpose Repair Material (PN 05887)—first applying a thin coat, followed by additional material to cover the area—then let dry for 15 minutes.

Sand the Repair Material

- Rough-sand the repair material with Grade 120 abrasive using a sanding block or DA sander, followed by finish-sanding with Grade 180 abrasive.

Final Sanding and Inspection

- Sand the repair and surrounding areas with Grade P320 abrasive. Blow off dust and inspect the repair.

F – Panel Gap Adjustment

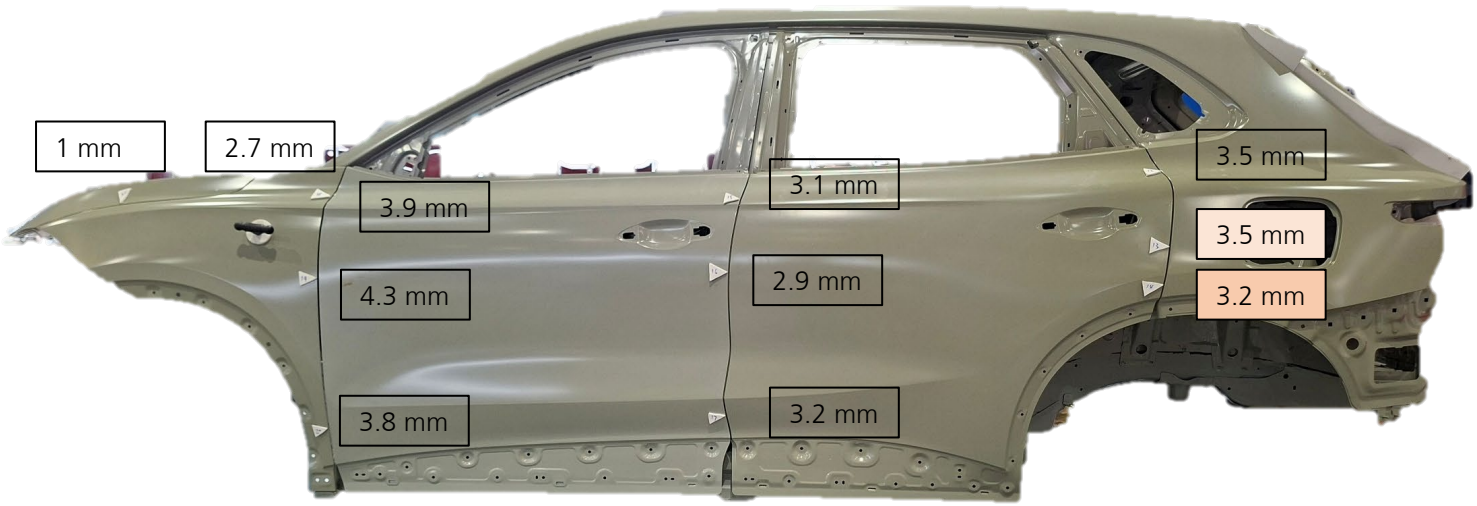
The Competitor shall assemble and align the designated vehicle body panels and adjust the panel gaps to the specified dimensions provided in the Test Project.The Competitor must complete the task within the allocated time while maintaining the required quality, accuracy, and safety standards.

- The panel gaps shall be adjusted according to the specified gap values provided in the Test Project.
- Measurements shall be taken at the designated measurement points shown in the reference image.
- Magnets shall be positioned at the specified locations indicated in the image below.
- The Competitor shall ensure that the required gap value is achieved at each designated measurement point.

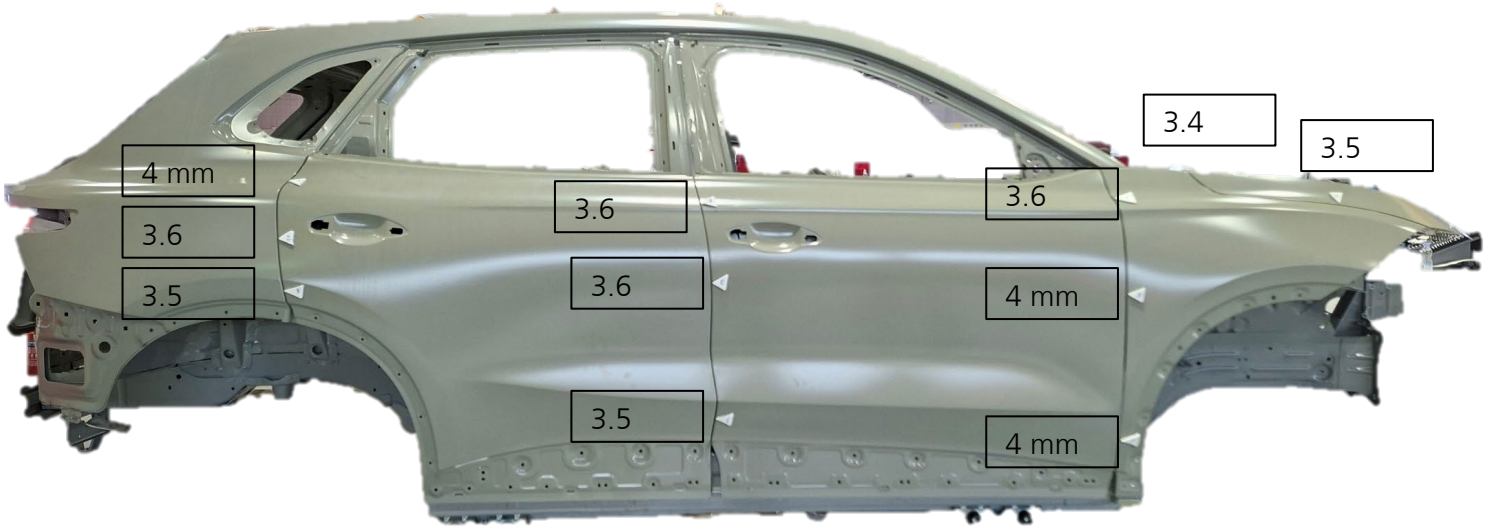
Important!!

- 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.
- Gap line consistency and panel flushness must be considered

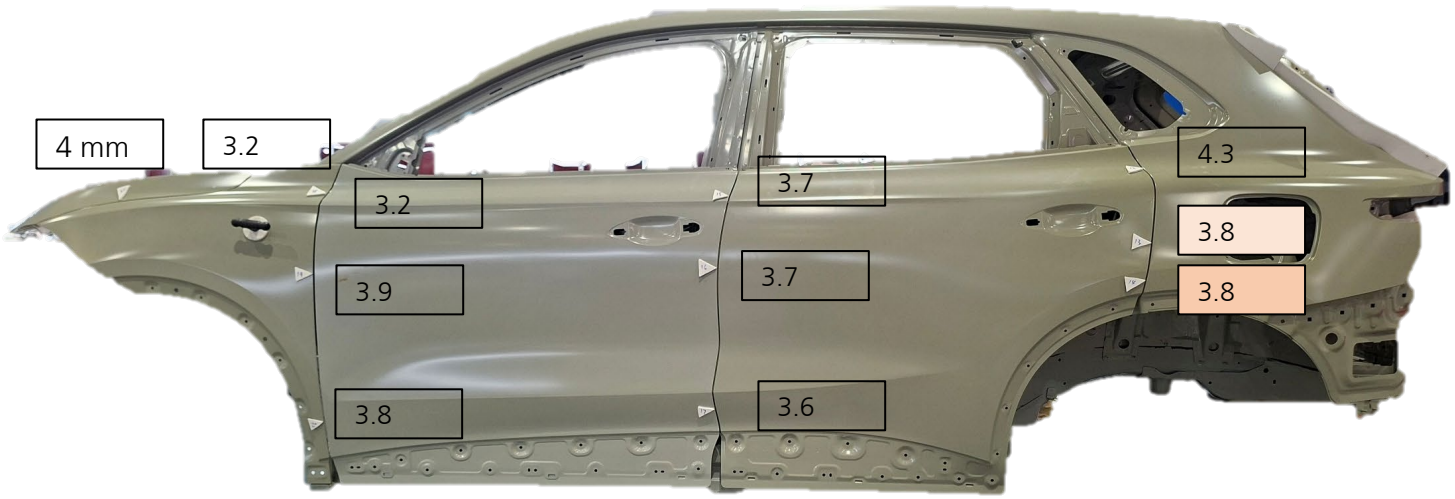
Station - 1



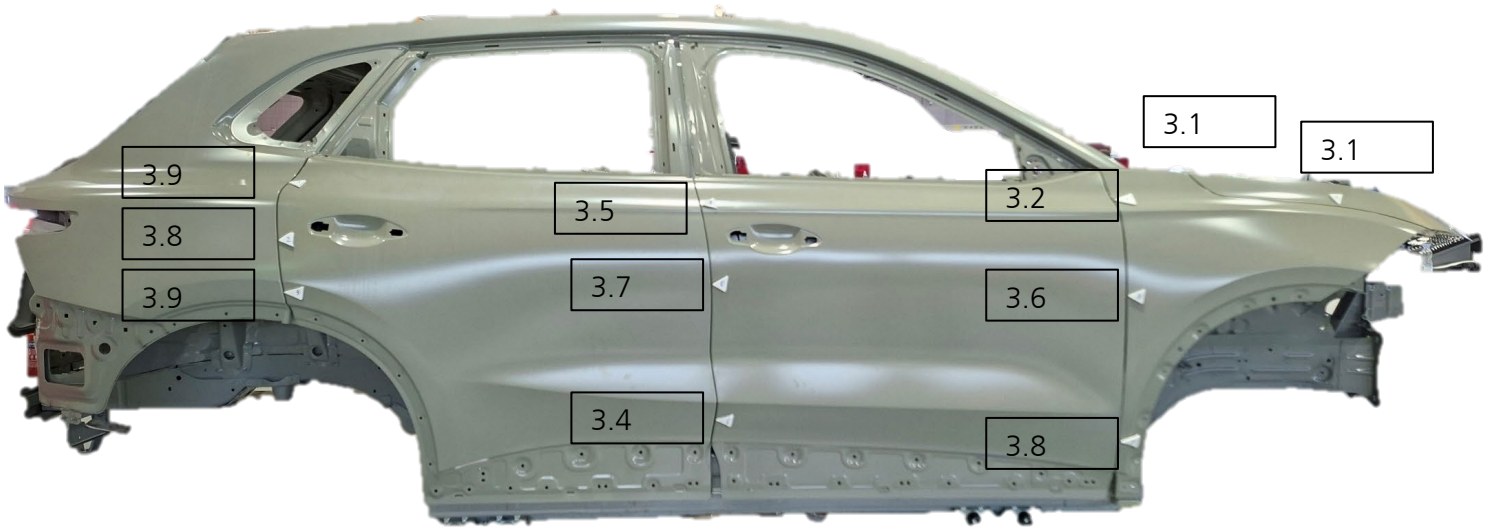
Station - 1



Station - 2



Station - 2



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