

Test Project

Autobody Repair

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Contents

This Test Project consists of the following documentation/files:

1. WSC2019_TP13_RU_EN_Proposal.doc

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 & aluminum, Plastic repairs.

Description of project and tasks

Module A Diagnosis and Correction	15%
Module B Structural Part Replacement	30%
Module C Non-Structural Part Replacement	25%
Module D Panel Repair (Steel)	10%
Module E Panel Repair (Aluminium)	10%
Module F Plastic Repair	10%
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.

Task F has its own timetable determined by drawing lots. (30 min for each competitor)

Module A – Diagnosis and Correction

Module A1 Diagnose Damage

- Observe safe work practices at all times.
- Remove related parts as necessary.
- Ensure that all the clamps and bench mountings are correctly fitted and tightened.
- Bench mountings and clamps must be tight, 100 Nm minimum torque
- Ensure that the measuring bridge/ladder is correctly fitted and locked in place (5 Nm min. torque).
- Start up the Car-o-liner Vision X3 System and make a New work order.
- The order must be created and saved with your first name, surname and your country.
- Select FORD EcoSport, data sheet NO. 7:316.
- Set-up and “center” the Car-o-liner measuring system, use measuring points L/R 21, L/R 13 and **L10** on the left side. (setup with 5 centering points)
- Measure and report the extent of misalignment at the following locations.
Underbody locations: Left L1, L2, L3, L4, L7, L8, L18
Right R1, R2, R3, R4, R7, R8, R18

Upper body locations: Left HL1, HL3, HL4
Right HR1, HR3, HR4
- Save data sheet/damage report on computer.
- Perform necessary steps to set up equipment for anchoring (EVO2 - Using point R10 and R7 mount EVO to secure the car) and prepare for correction of damage and ready to pull but **NO PULLING** at this point.



A1 STOP

Sign in on the “request for judging chart” mounted on wall the time of completion and for experts to check your completion of the above operations. The experts will then check your set-up. Go directly to Module C (after judges have marked go back and work on A2)

Module A2 Realign Structural Damage

- Safe work practices must always be adhered to and apply to the competition rules.
- **Realign all the rail members and parts to manufacturer's specifications. under body: +/-2mm**
- the must not cause additional Damage or loss of strength to parts that are not being replaced; due to clamp attachment, EVO mounting and incorrect pulling or pushing.
- Repair and stress relieve the rail part/members and adjacent panels that are not being replaced.
- Car-o-liner measuring equipment must be protected from damage that may be caused by incorrect use, welding, grinding sparks or other damage.

A2 STOP

After the realign/correction, the Expert team will ask you to check the measuring points #1L, #2L, #3L, #7L. other points will be checked at the end of competition:

Continue to C1

Module B1 Structural Parts Removal

PANEL REMOVAL AND INSTALLATION:

- Safe work practices must always be adhered to and apply to the competition rules.
- Remove all necessary bolt-on panels at the front end of the body
- Competitor gets following new parts

Cutting line

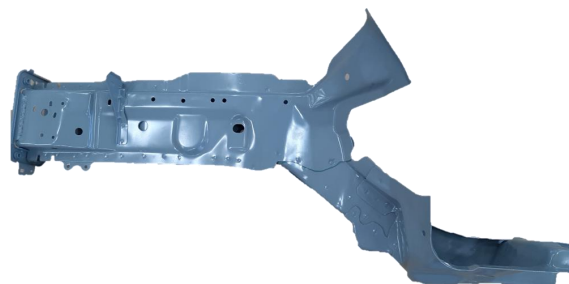


Drilling point



Right hand side longitudinal member

Left hand side Apron and longitudinal member



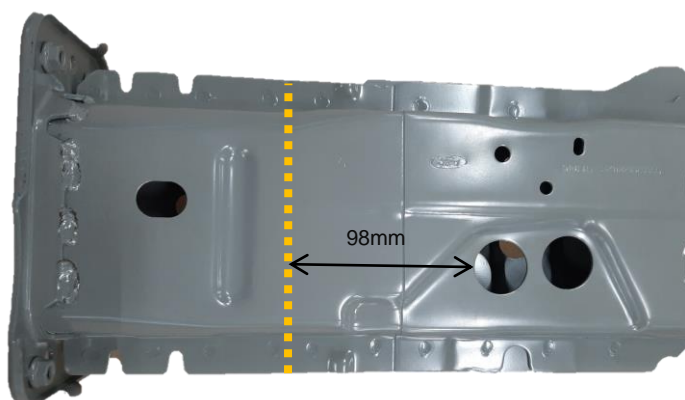
- The following part must be removed and re-fitted.



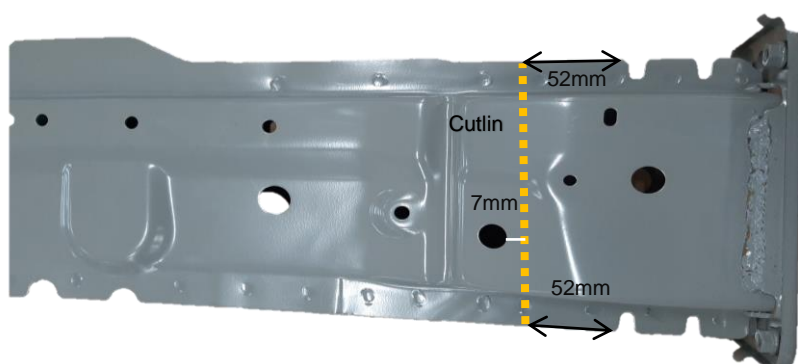
This part must be protected and not removed.

Cutting Instruction Right hand side on member

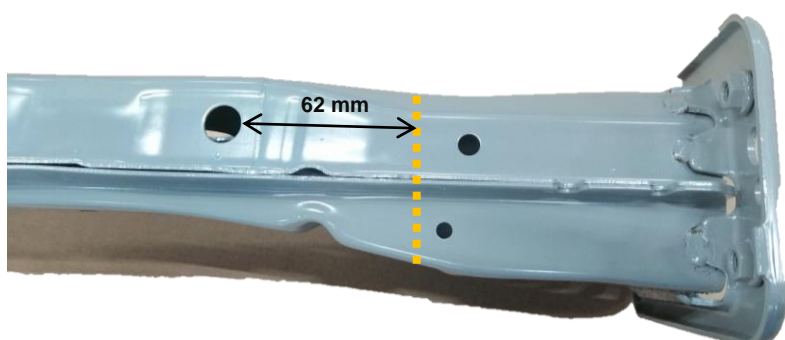
Inside



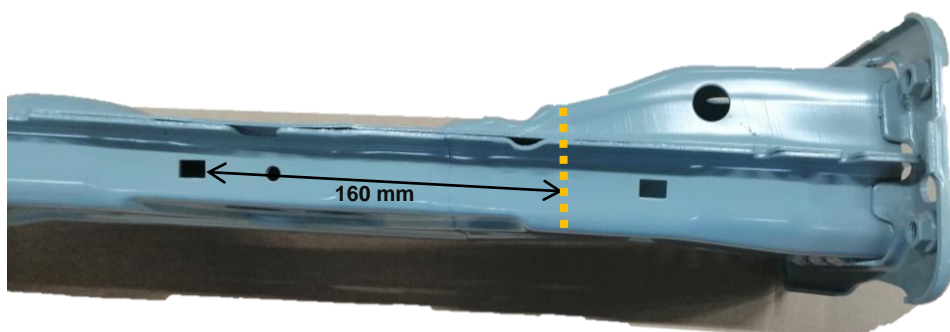
Outside



From the upper side



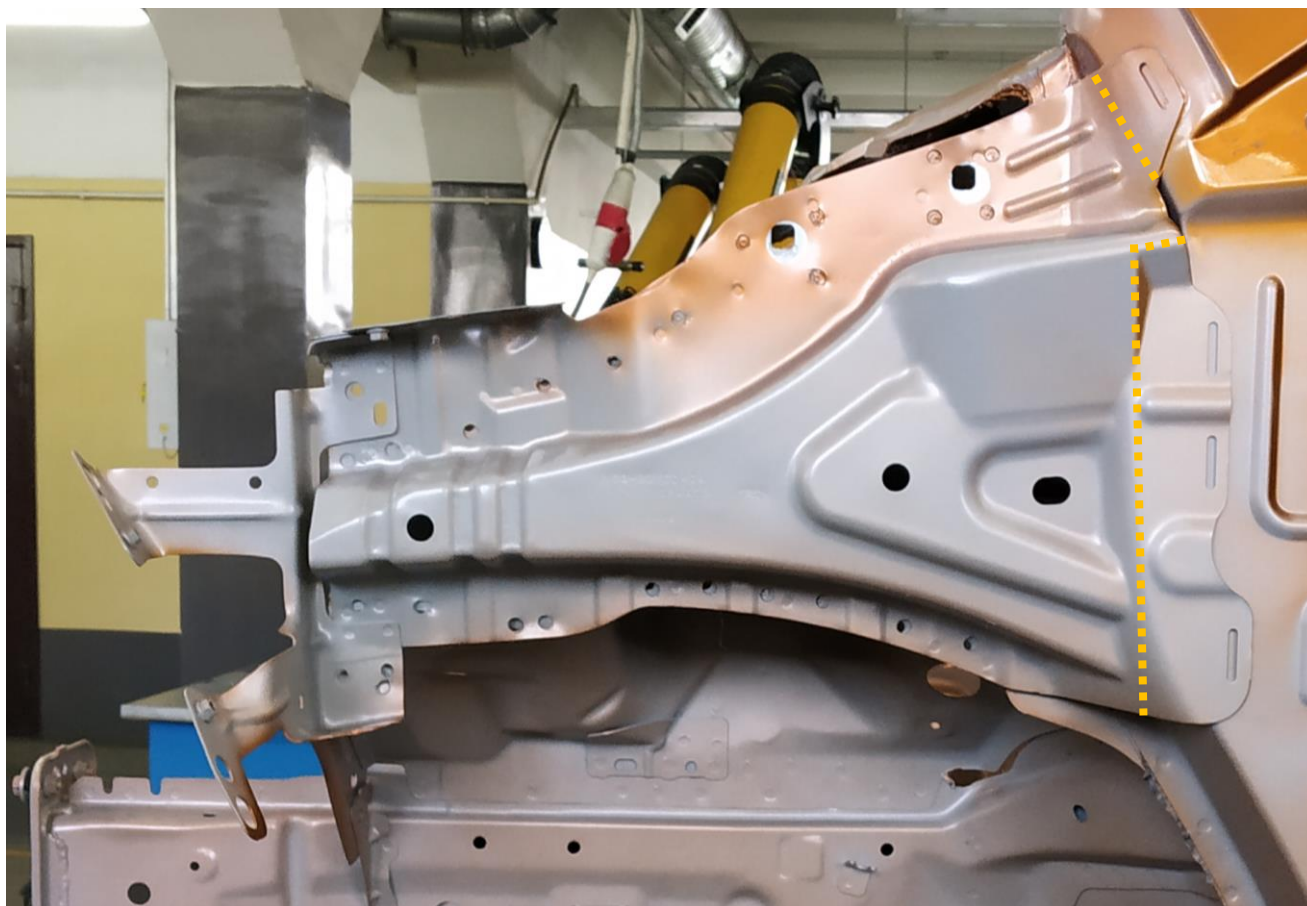
From lower side



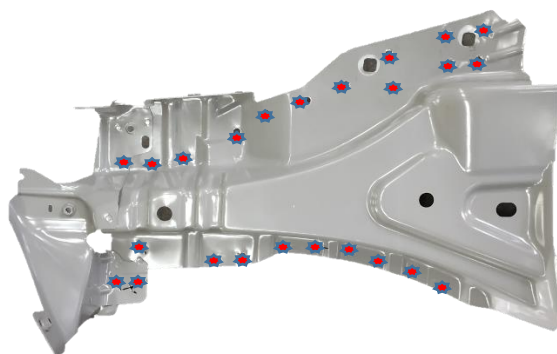
Cutting Instruction Left hand side

Fender Apron Panel Reinforcement removal with bracket

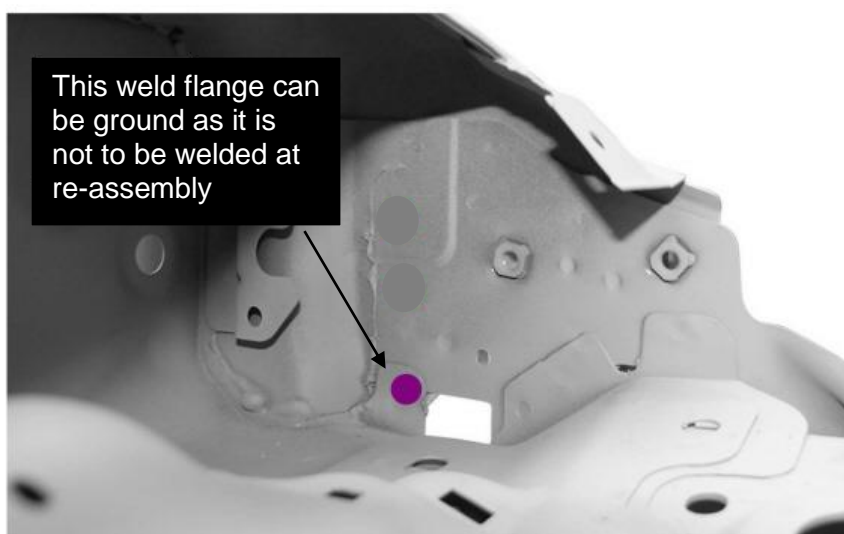
Cut down the panel near Mig welding area by guidenece of the red line (this will NOT be marked for measurements)



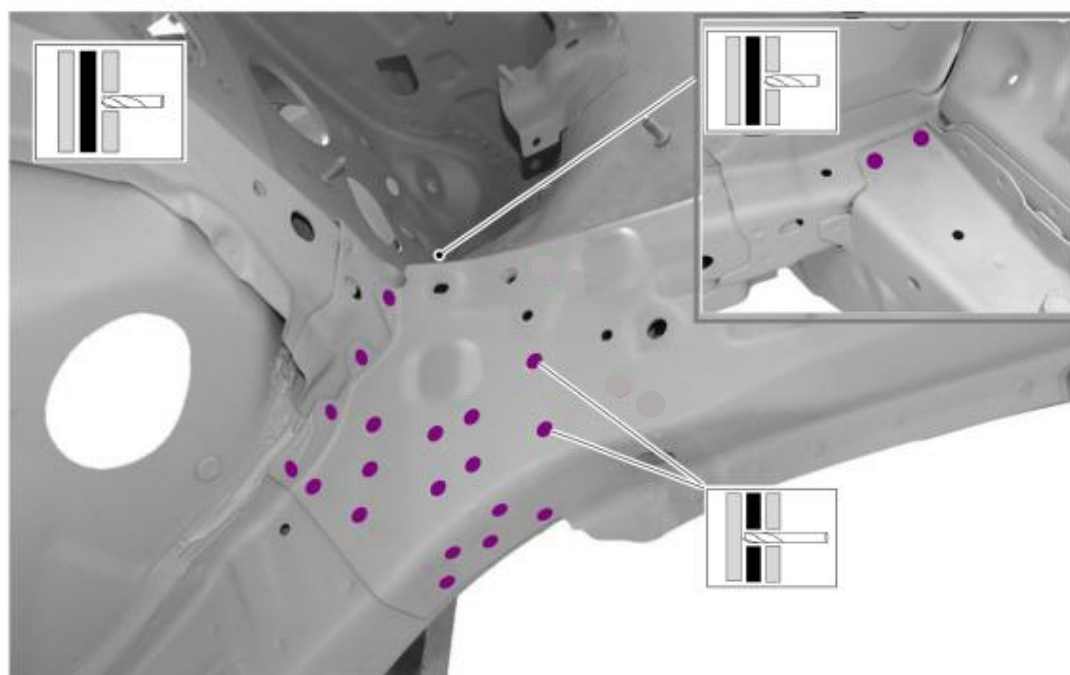
Drill all the necessary spot weld and remove the panel.

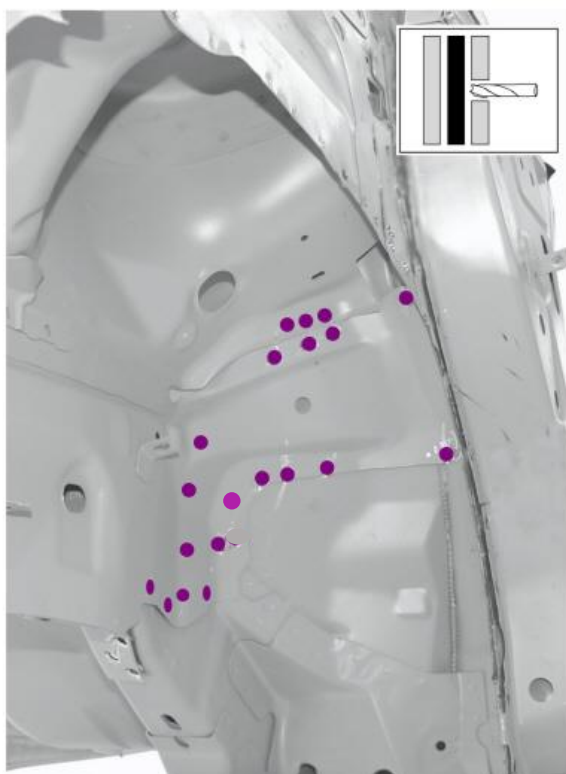


8mm hole (x 24)



Remove the chassis rail from body where shown.



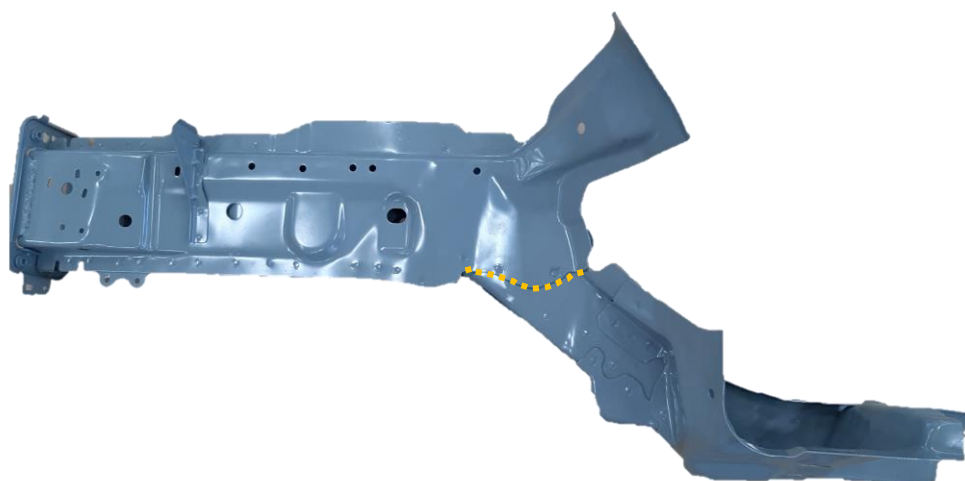


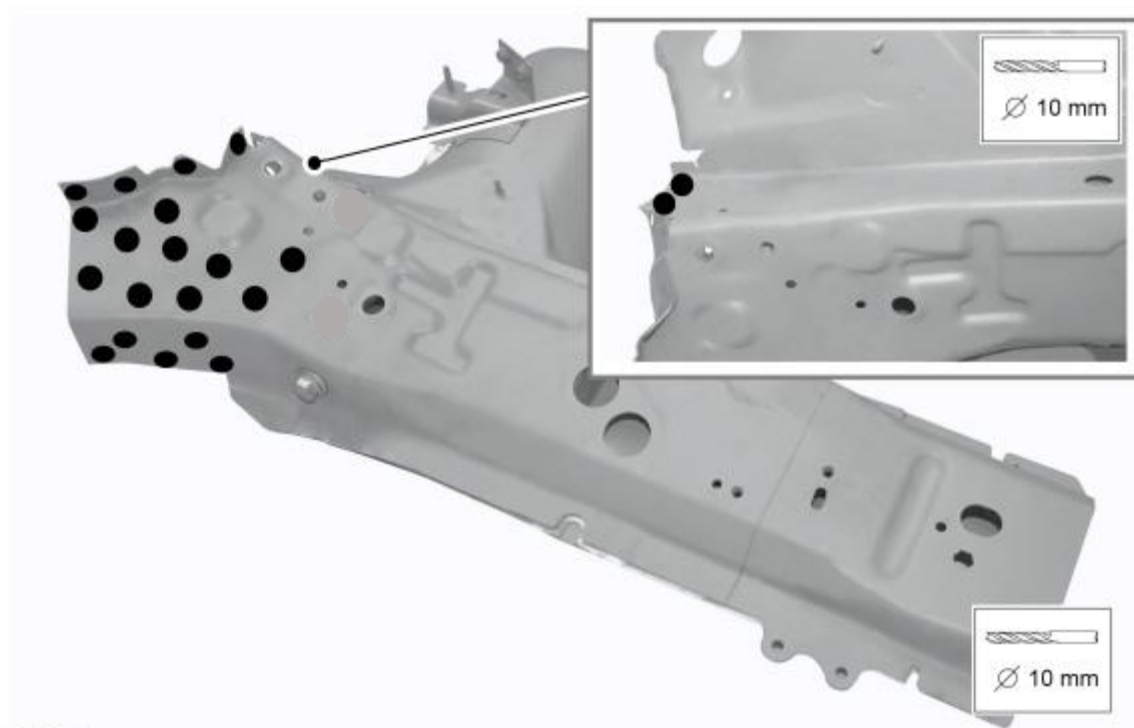
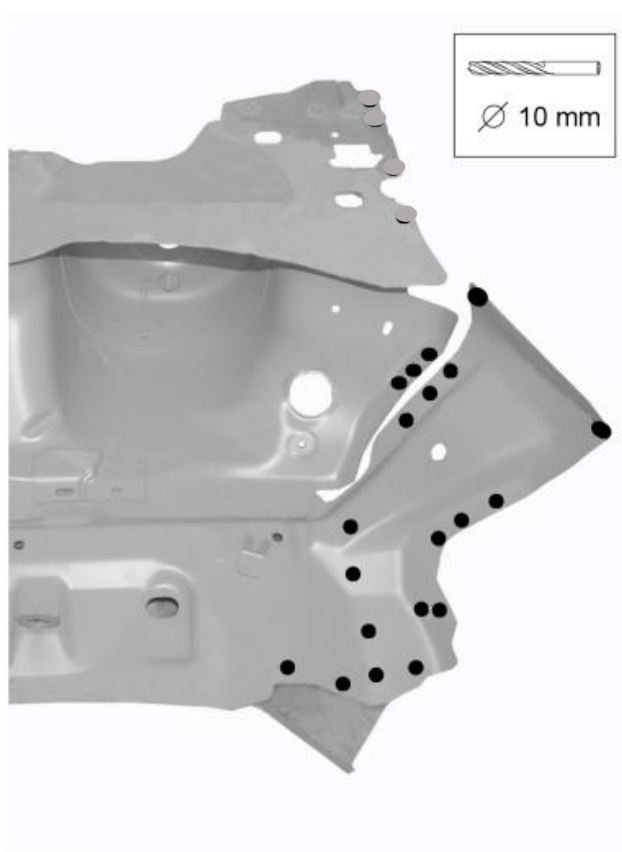
After removing all components, the bodyshell will look like below!



For new parts

Competitors have to separate lower support from the assembly by cut the spot welds with a 10mm drill.





- According to the photos above, remove by cutting and/or drilling: left front side member and fender apron, left shock absorber upper reinforcement and right side longitude member.
- 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 8mm & 10mm 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 4 or 6 sides for spot welding must be bare metal.
- All 3 sides for plug welding must be bare (backside of lower panel. may not be grinded/sanded)
- Minimum 10mm around a hole for plug-welding and minimum 10mm for spot-welding should be bare metal.
- For seam-welding 15mm 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.
- Assemble and fit the left front side member and fender apron to body shell, hold in correct position with clamps and EVO system. No welding or tacking yet. Making extra holes for screws is not allowed. No primer yet. All bolts on the Car-o-liner equipment must be tightened with correct torque.
- Assemble and fit the Right-side longitudinal member with help of EVO or clamps. No welding or tacking yet.
- The butt gap on re-assembly should be min. 1.5 mm and max 2.5 mm.

B1 STOP

Sign in on the "request for judging chart" mounted on wall the time of completion and for experts to mark your righthand side butt joint gap.

Experts will mark your left side parts removal, cutting, drilling, dressing, grinding and, left side butt joint gaps, 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!

MODULE B2 Fit, Weld and all Parts

- Safe work practices must always be adhered to and apply to the competition rules.
- Fit and weld all parts. The right-side longitude member's outside welds must be a continuous weld longer than 10mm each, and all welds must have full penetration.

Mig Welding



Plug weld

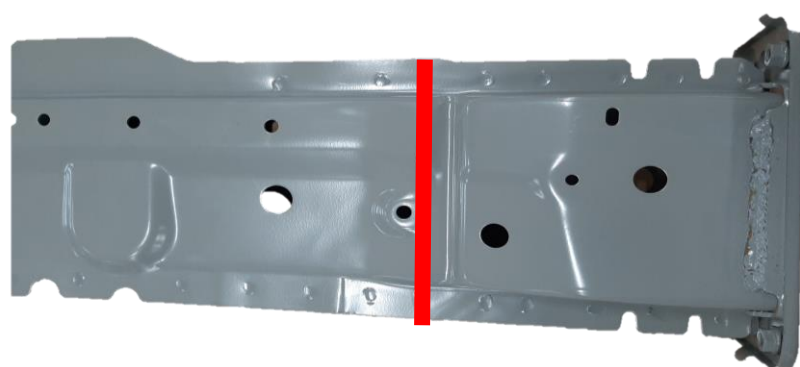
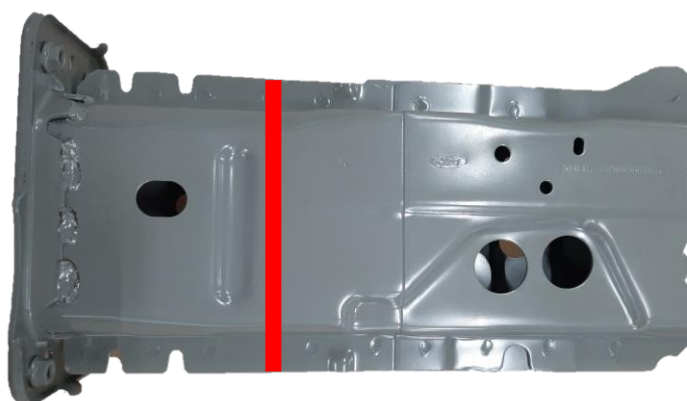


Spot weld

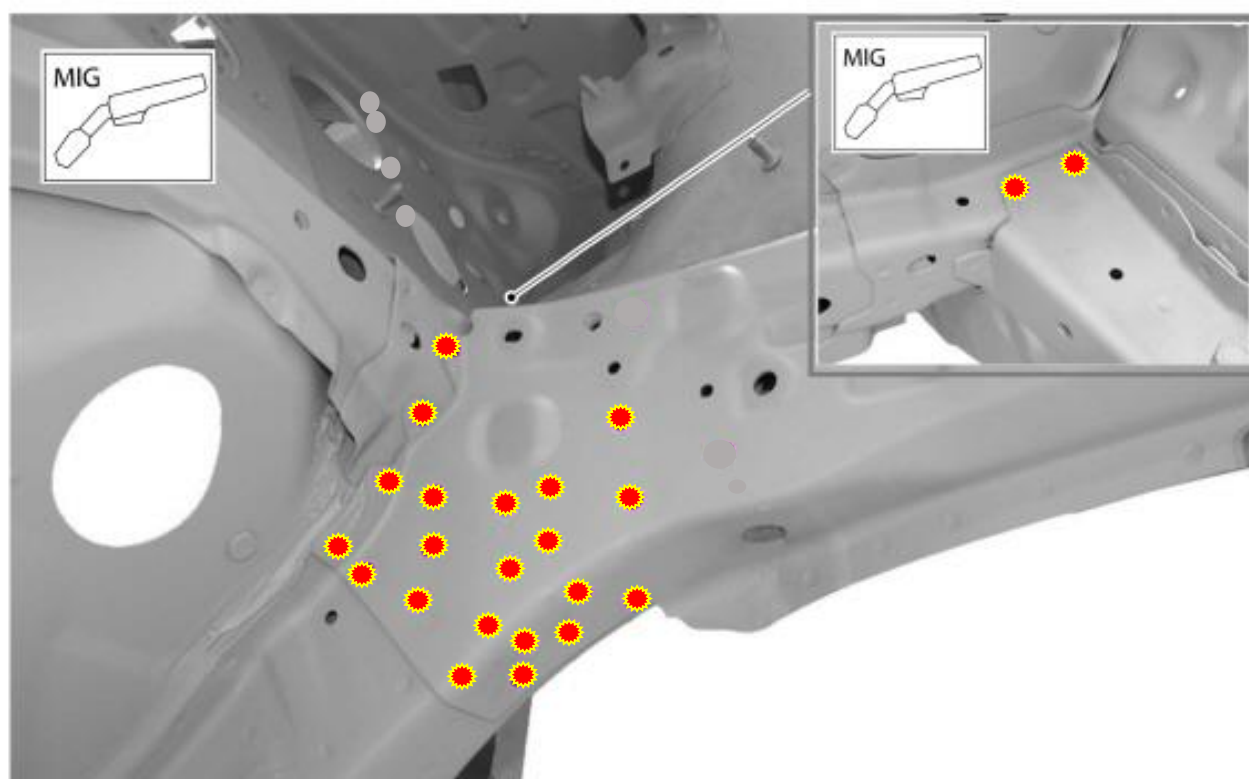


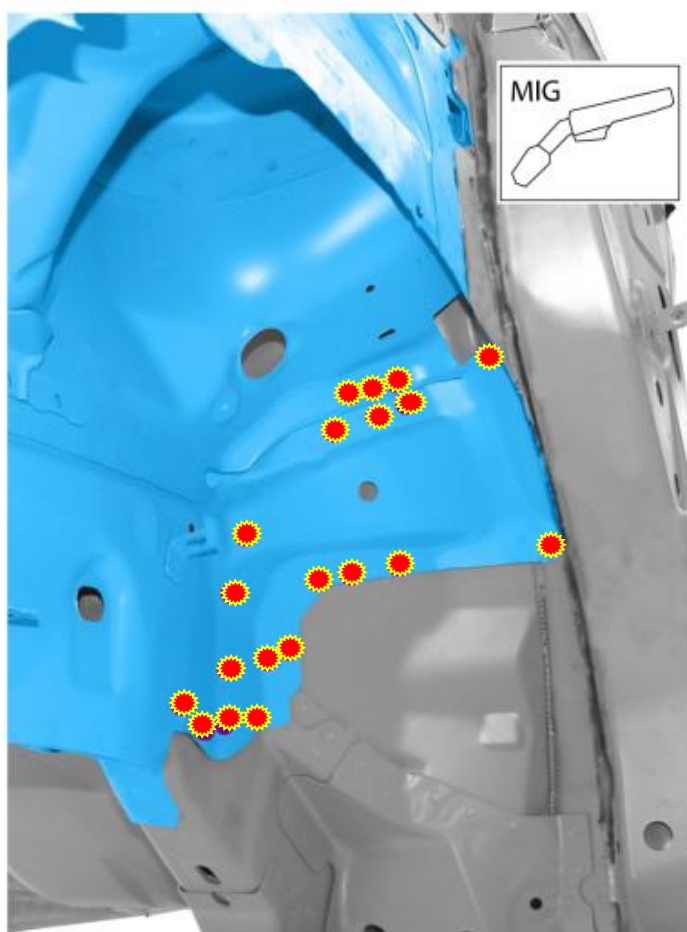
Right side longitude member installation instruction.

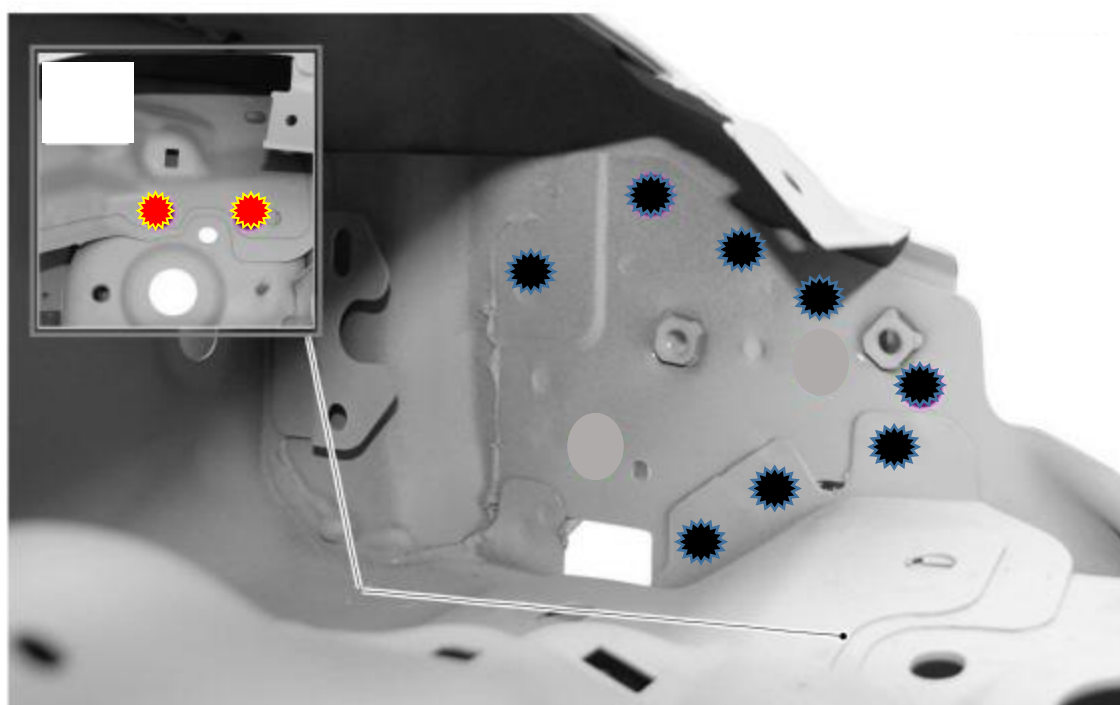
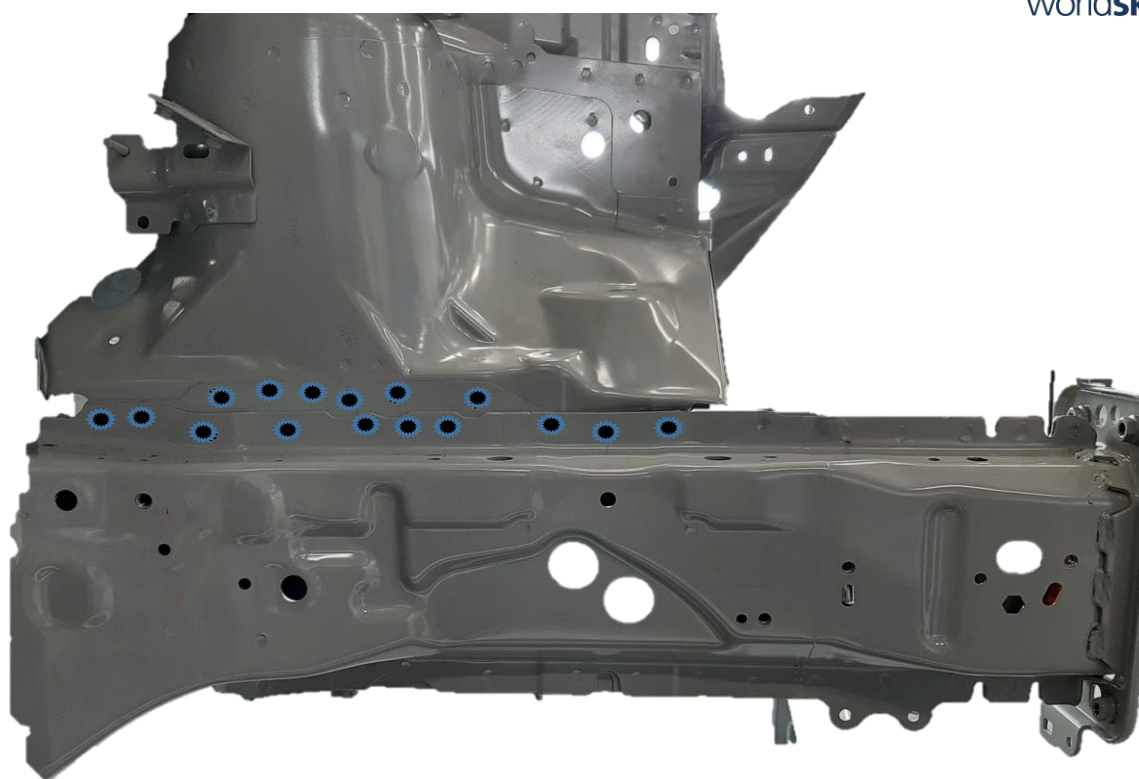
Do the continues weld minimum 10 cm long where it possible.

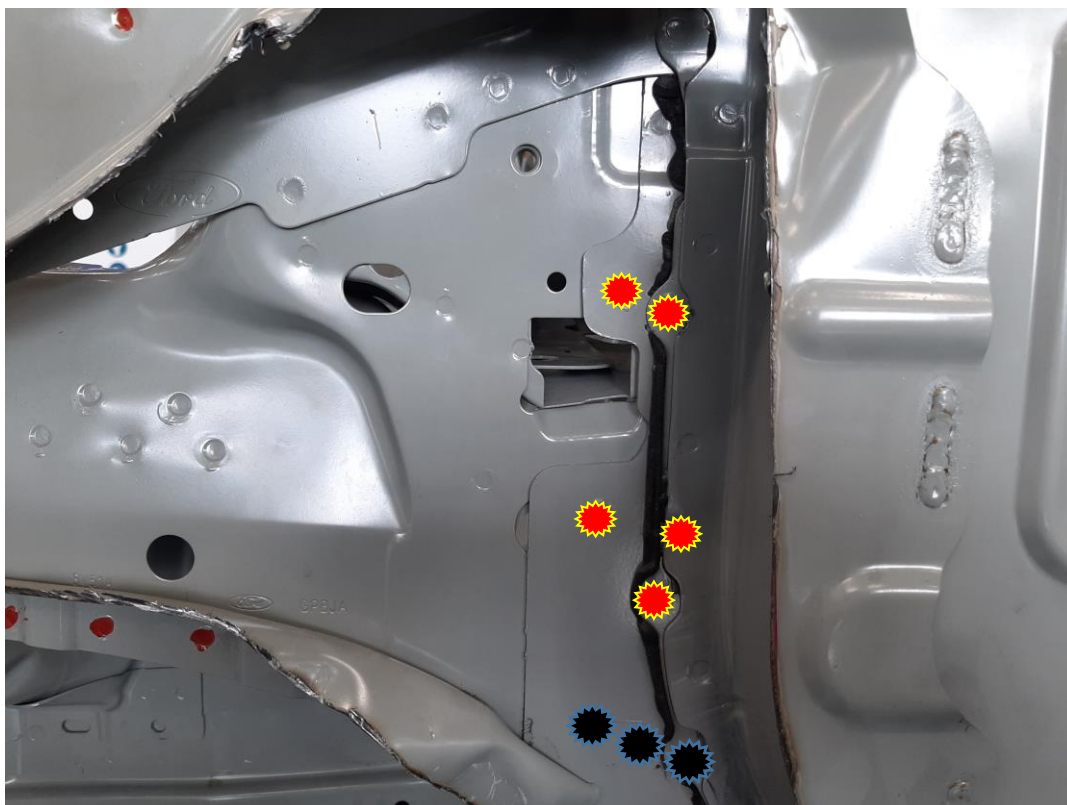


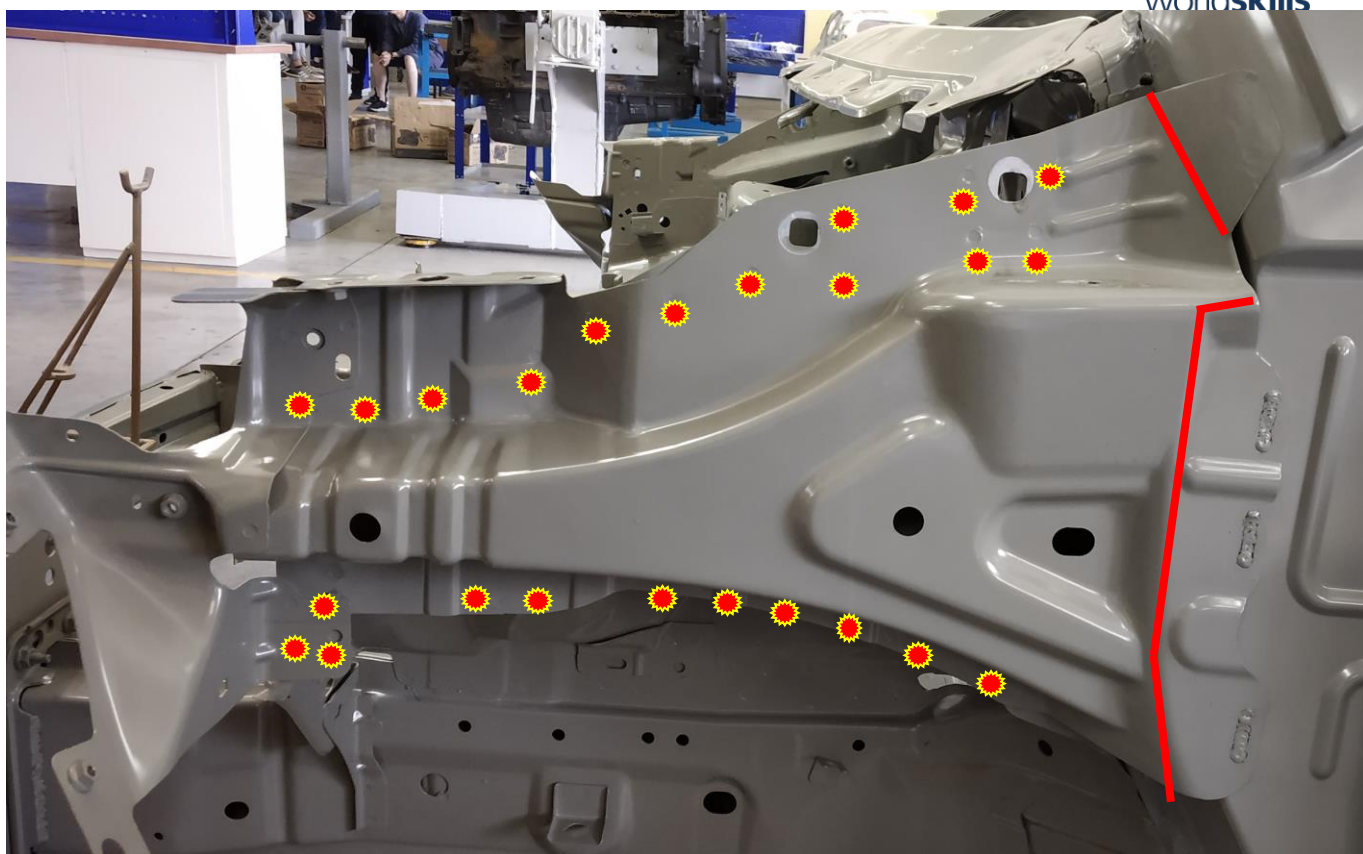
left side member and fender apron installation instruction













- Do the seam welding on the Fender apron reinforcement.
- Completed welds must NOT dressed, ground, sanded or cleaned before marking.
- All the welding must be as shown as pictures above.
- Remove all the jigs (EVO Parts) to allow alignment measurement and print out report.
- Ensure the measuring bridge and measuring slide are correctly fitted.

B2 STOP

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

MODULE B3 Dress/Grind/Sand Welds

- Safe working practices must always be adhered too and apply to the competition rules.
- Grind all you seam welds - and 24 apron plug welds only.
- Paint edges feathered to (p120g-p240g)

B3 STOP

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

MODULE B₄ Parts Installing and Gaps Adjustment

- Install all necessary bolt-on panels at the front end of the body
- adjust hood/bonnet, fender and doors as the specifications

B₄ STOP

Sign in on the “request for judging chart” and the time of completion and for marking your all operations/installed parts above.

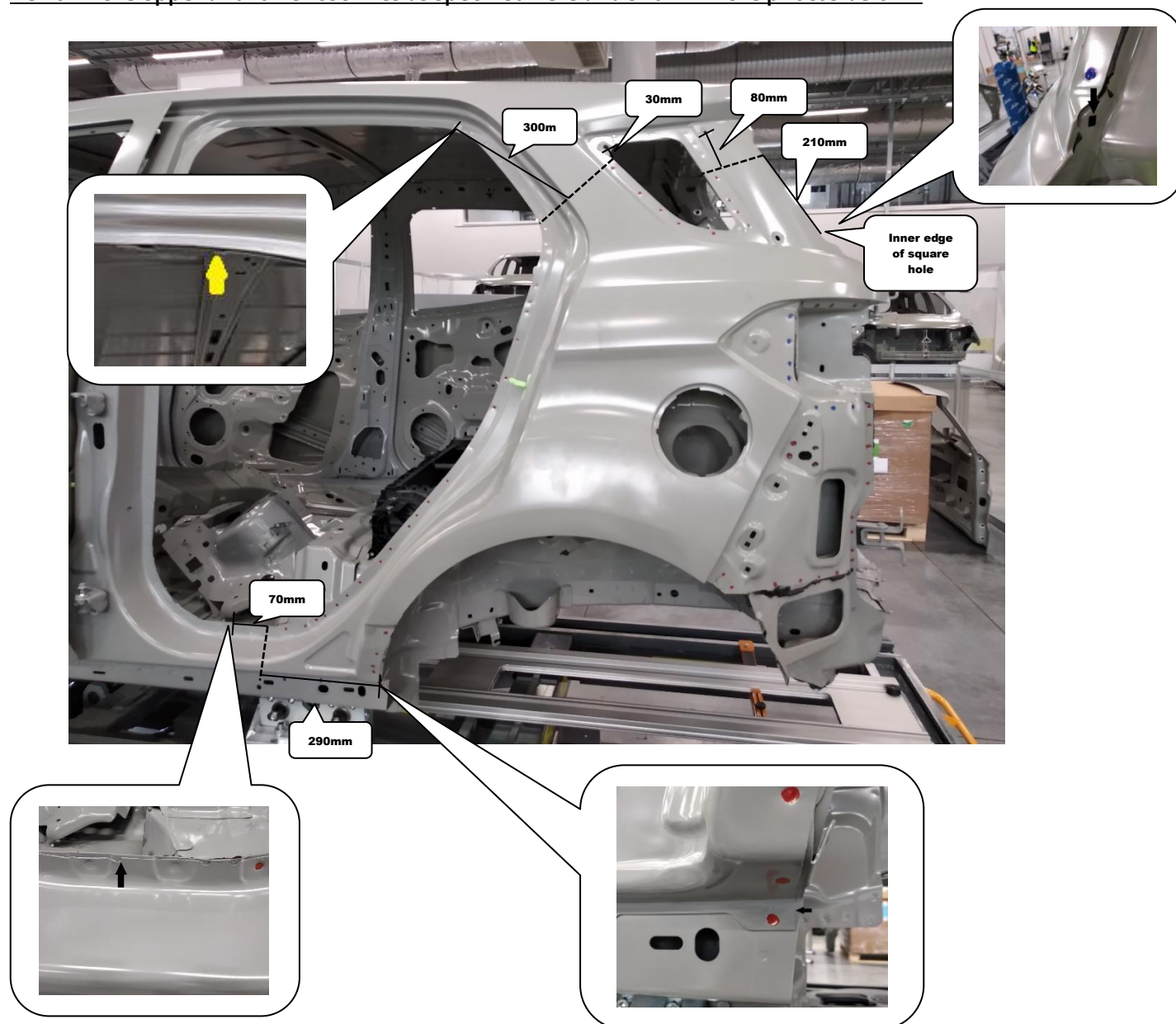
Proceed to any task and complete the task you choose.

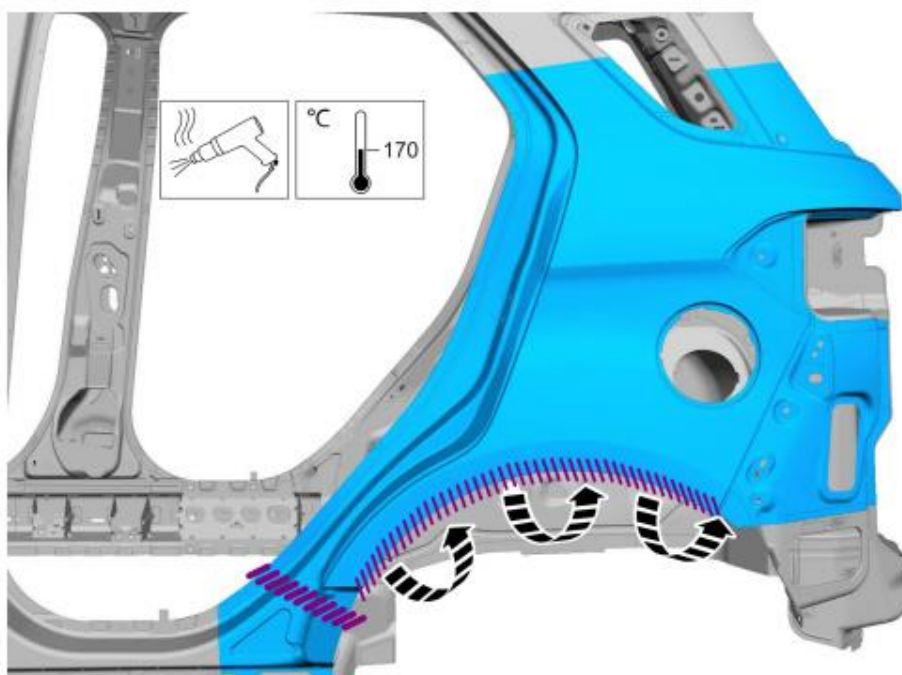
MODULE C – Non-Structural Part(s) Replacement

- Replace left rear side panel
- remove bolt-on parts for access as necessary (bag and tag).
- Open welded and seam-adhesive bond connections in all areas. Cut outer panel only.



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

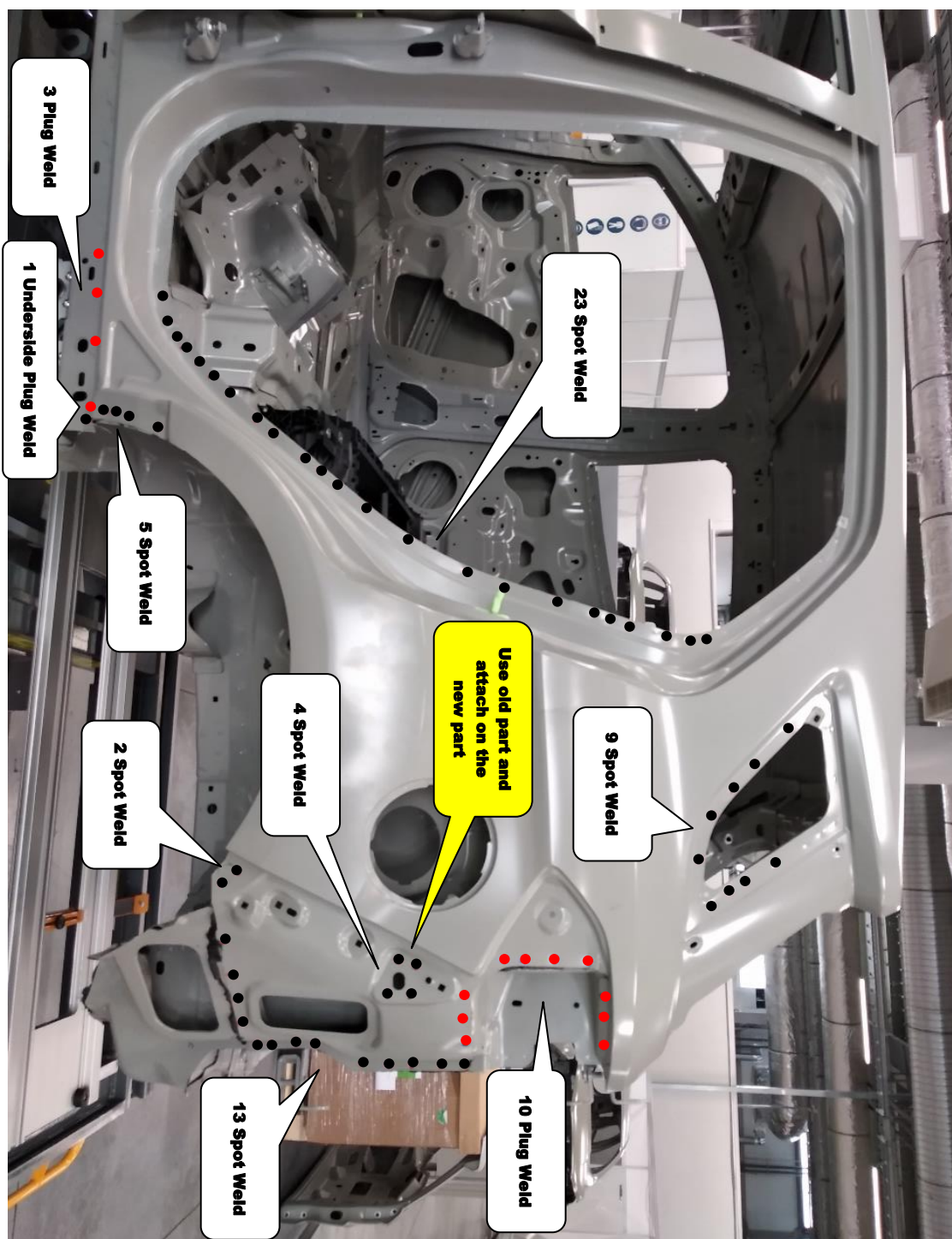


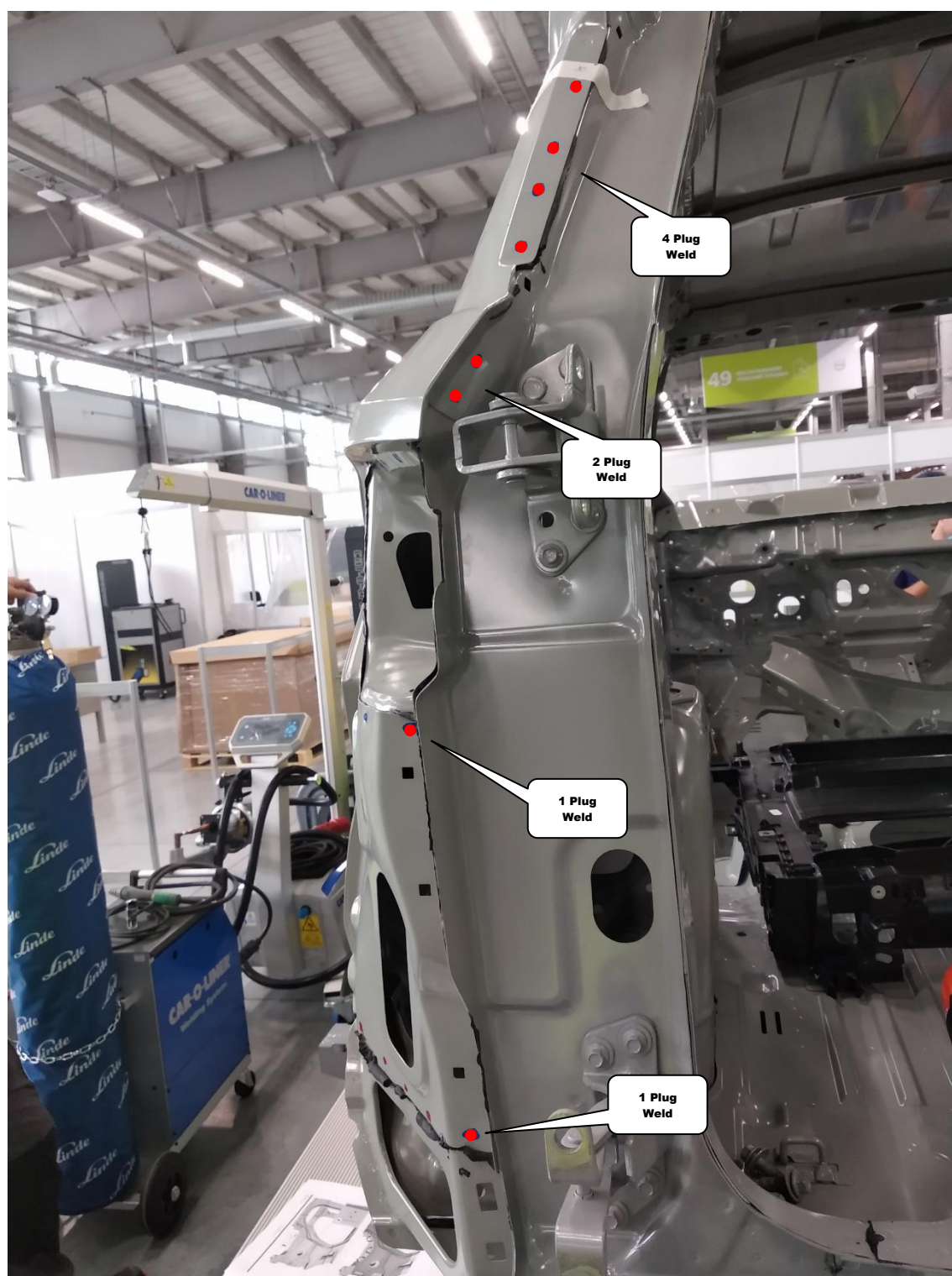


- Cut outer panel only.
- Remove side panel.
- Remove all glue and spot-weld remnants
- Straighten (repair) all deformation.

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

- Drill 6 mm holes for plug welding
- Install side panel, fit up only. At this point, the door gap and the tailgate gap will not be measured.
- Adjust and install new part to fit without excessive tension/stress.
- The C pillar upper and lower sill joint gap must be $0 \pm 1\text{mm}$.
- Adjust new part to fit and secure with clamps
- Prepare all equipment and all the items you need to do the actual bonding, priming and welding process.
- Grind the wheelhouse on the car to bare metal and on the new part too.



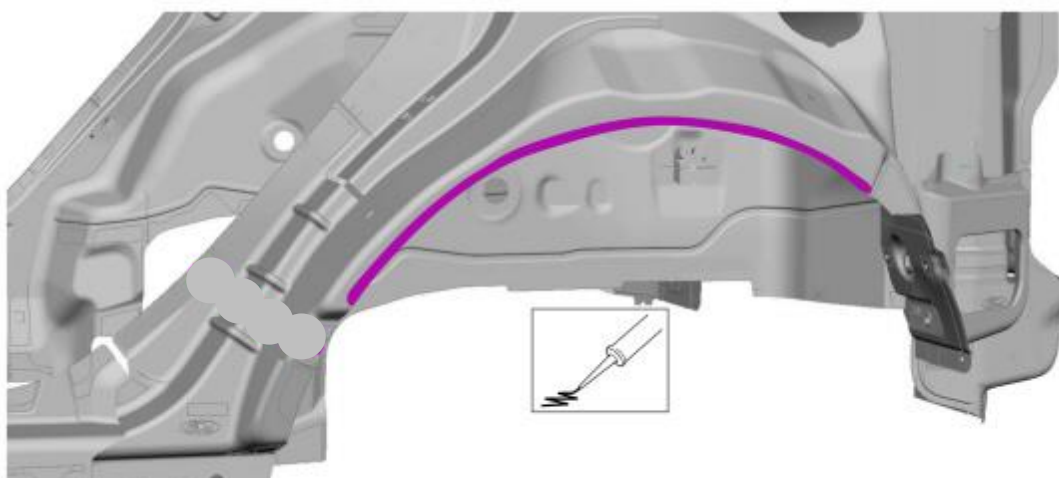


C1 STOP

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, only bonding is done with the experts after C1.
- Apply welding primer on all surfaces which will be enclosed and not on bonding surfaces. Marks will be deducted unless Experts assess how the work is performed.
- For the glue, follow steps procedure for bonding:
 1. Apply the cleaner (3M 08984).
 2. Apply welding primer.
 3. Apply the glue (3M 08115) on the bare metal on the car and the new part to ensure corrosion protection
 4. Apply last coat of glue to ensure the bonding.

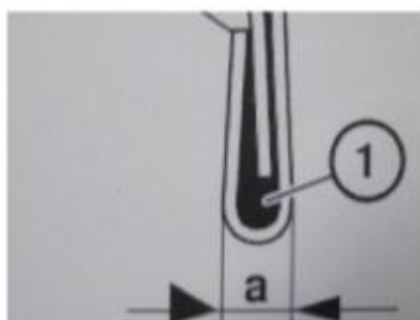


MODULE C2 Fit and Weld Rear Side Panel.

- Safe work practices must always be adhered to and apply to the competition rules.
- Fit and weld rear side panel. The rear side panel's upside and downside weld must be a continuous weld or a series of continuous welds.

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.
- All welds must be marked before grinding takes place. Completed continuous welds must not be ground and re-welded.



C2 STOP

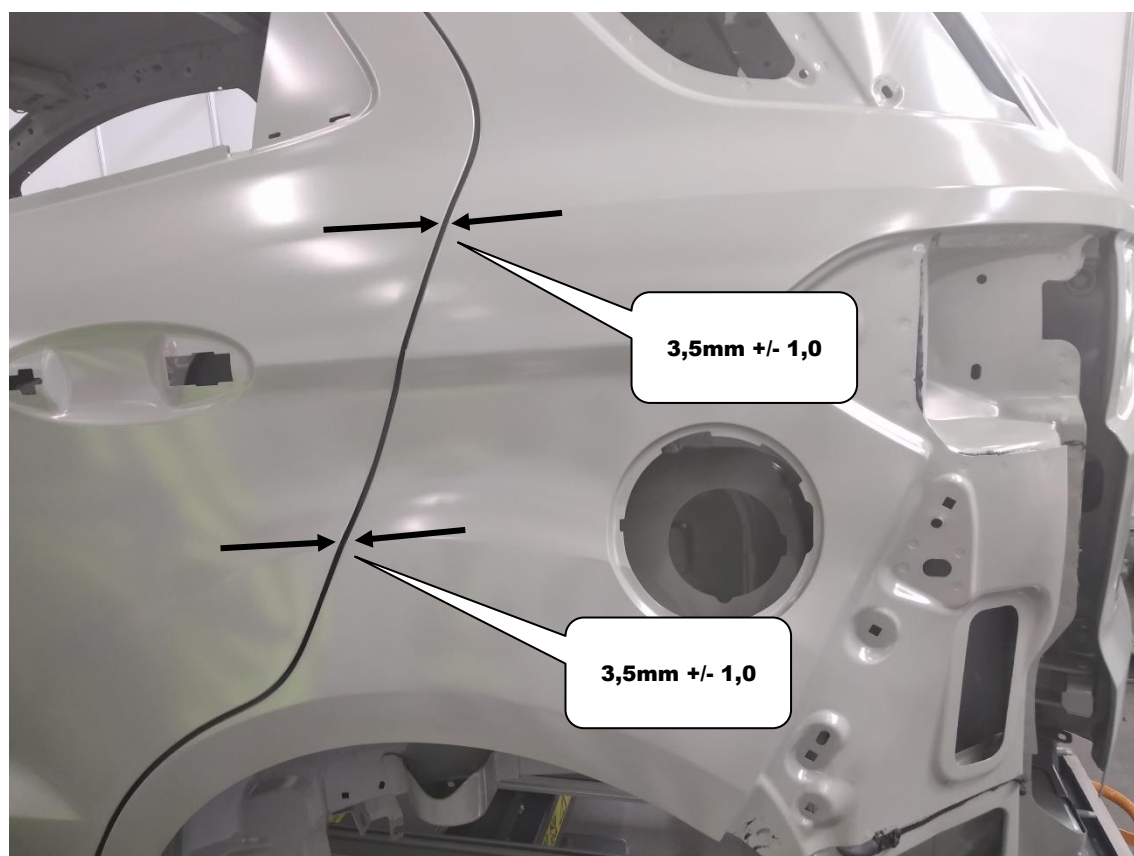
Sign in and write down time of completion. Experts will mark side panel mounting, bonding, welding and hemming.

MODULE C3 Grinding and Panel Gaps Adjustment GRINDINGS

- Grind all you seam - and plug welds.
- Metal finishing areas - sand to P120g or finer, Paint edges feathered to P120g or finer.

PANEL GAPS

- Reinstall all parts removed for repair operations with the specification's pictures below.



C3 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 (Steel)

Dent Quarter panel/rear RH fender

- Repair the damage to the quarter panel
- Safe work practices must always be adhered to and apply to the Host Country's regulations.
- Restore repaired area to original contour and shape.
- Panel shrinking must be done with electrical equipment or cold shrinking as needed and provided by the sponsors only. (same for dent pulling equipment-on IL)
- 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

Module E – Panel Repair (Aluminum)



Dent

- Repair the 3 dents in the hood
- Safe work practices must always be adhered to and apply to the Host Country's regulations.
- Restore repaired area to original contour and shape
- 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 completed repair area to P120g or finer.
- The panel repair area must not be damaged or over thinned by excessive filing or sanding (example, file or grind through body lines and folds).

Module F - Plastic repair



Provided tools and materials:

- 3M manual for Plastic Repair with Patch and Reinforcement cloth;
- 3M™ 08984 – Adhesive Cleaner;
- AtmanAvto (АтманАвто) set RPB1020-3 (3M™ 94520 – cleaning sponge; Self-adhesive Patch);
- 3M™ 05917 – Polyolefin Adhesion Primer;
- 3M™ 08190 - 3M™ Performance Manual Applicator, 50mL;
- 3M™ 05901- Two Part Epoxy Adhesive;
- 3M™ 03020 - Reinforcement cloth;

NOTE: You need to use your own sanding materials and tools to make a hole and “Dish out”.

Crack repair with Patch RPB1020-3: **LEFT SIDE DAMAGE**



- Clean the damaged area
- Drill the hole at the end of the crack to relieve tension 3-6 mm
- Prepare the “Dish out” 10-30 mm on both side from the gap, the gap size is 0.5-1 mm

Crack repair with Reinforcement cloth 3M™ 03020: **RIGHT SIDE DAMAGE**



- Clean the damaged area
- Drill a hole(s) at the end of the crack(s) to relieve tension 3-6 mm
- Prepare the “Dish out” 10-30 mm on both side from the gap, the gap size is 0.5-1 mm

F1 STOP

Sign in and write down the time of completion and for marking all your above completed operations. Experts will mark cleaning, crack stress relieve, crack gap, and the area preparation before applying 05901.

MODULE F2 – Repair material application

Crack repair with Patch: **LEFT SIDE DAMAGE**

- Apply the Patch (3M™ 03020) on the back side of bumper
- Apply 3M™ 05901 on the front side
- Sand repaired area to original contour and shape to P180

Crack repair with Reinforcement cloth: **RIGHT SIDE DAMAGE**

- Apply the Reinforcement cloth on the back side of bumper
- Apply 3M™ 05901 on the back side
- Apply 3M™ 05901 on the front side
- Sand repaired area to original contour and shape to P180

F2 STOP

Sign in and write down the time of completion and for marking all your above completed operations. Experts will mark: Material apply, surface and shape of repaired area.