

TEST PROJECT DOCUMENT AUTOBODY REPAIR

ISC2018_TP13

Submitted by:

Name: Dhaval Rajput



Transforming the skill landscape

DESCRIPTION OF PROJECT AND TASKS

Content and approximate marks distribution:

Module	Weightage	Time
Module A Diagnosis and Correction	20%	360 min
Module B Structural Part Replacement	35%	
Module C Non-Structural Part Replacement	25%	300 min
Module D Panel Repair	15%	90 min
Module E Cosmetic Repair	5%	30 min
TOTAL:	100%	780 min

INSTRUCTIONS TO THE COMPETITOR

Following is a description of the Test Project and the tasks to be performed and to complete.

- 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.
- If a succeeding step is performed that doesn’t allow a previous step to be marked, ALL those stop marks will be forfeited.
- Assistance with the removal and replacement of heavy parts such as doors, bonnet, etc can be given by any expert other than his sponsoring OEM.
- (No help on panels installed with adhesives as the positioning of the panel is critical)

SAFETY

- Competitors could be deducted marks or excluded from the competition 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, 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**

MODULE A – DIAGNOSIS AND CORRECTION

Along with these directions, which guide you through the steps to take and the stop points required, follow the Car-O-Liner equipment guidelines as learned in the information sessions on familiarization day. Safe work practices must always be adhered to and apply to Host Country's regulations.

DIAGNOSIS: SET-UP, MEASURE, AND REPORT DAMAGE

Diagnose damage on a vehicle mounted on a realignment bench.

THIS OPERATION MUST BE DONE FIRST!

1. Set-up.....Mount/attach the body shell to the Car-O-Liner bench.

Ensure that the bench mounting alignment brackets are correctly fitted and tight.

(120Nm) minimum torque

- Remove “bolt-on” parts/panels for access as necessary.
- Ensure that the measuring bridge/ ladder is correctly fitted and locked in place (7 Nm min. torque).

2. Measure.....Start up the Car-o-liner Vision X3 computer and make a new work order.

- The work order must be created and saved with your first name and surname.
- Select and open data sheet number 24:323 Maruti Alto 800
- Set-up and “centre” the measuring the system, use data sheet points – 15R, 15L, 8R, 8L and 9L, and then measure 1R, 1L, 2R, 2L, 3R, 3L, 4R, 4L, 5R, 5L, 6R, 6L, 7R, 7L
- Measure and report the extent of misalignment.

3. Report.....Compile/produce/save data sheet/damage report.

4. Perform necessary steps to set up equipment for anchoring (EVO - Using point 16L and 4R or 4L, mount EVO to secure the car.) and prepare for correction of damage and ready to pull but NO pulling at this point.

If you need to pull the right part, you must mount EVO on 4R

If you need to pull the left part, you must mount EVO on 4L



A1 STOP Sign in on the “request for judging chart” mounted on wall for experts to check your completion of the above operations. Save the report and take print! The experts will then check your set-up and measurements. (After judges have marked go back and work on A2)

MODULE A2 CORRECTION: REPAIR AND REALIGN STRUCTURAL DAMAGE

- Realign the rail members and parts that are not being replaced, to manufacturer's specifications. (+/-2mm)
- Use safety cable when using pulling equipment. Car-o-liners EVO-system must be correctly used at all times on both sides when pulling.
- The realignment must not cause additional damage or loss of strength to parts that are not being replaced; due to clamp attachment, EVO-anchoring, and incorrect pulling/pushing.
- Repair and stress relieve the rail 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 Note: The alignment of the body shell, damage to parts not being replaced, and measuring equipment (damage) will be checked by experts at the end of the competition

MODULE B – STRUCTURAL PARTS REPLACEMENT

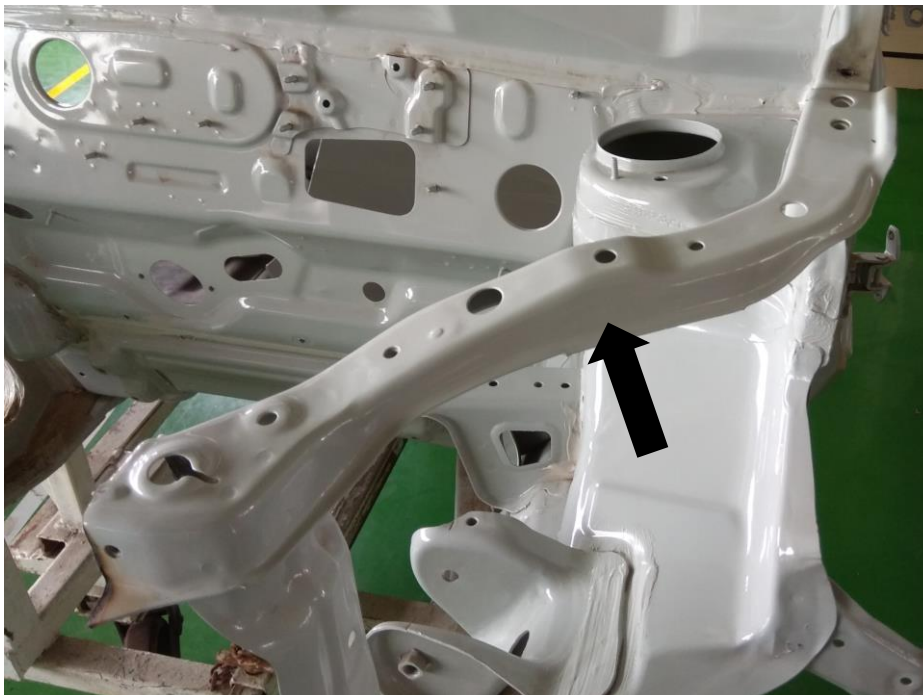
Safe work practices must always be adhered to and apply.

B1- PANEL REMOVAL

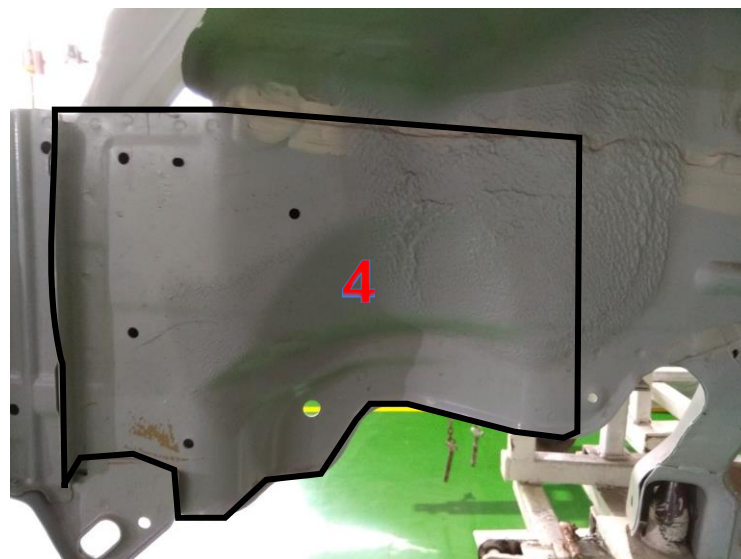
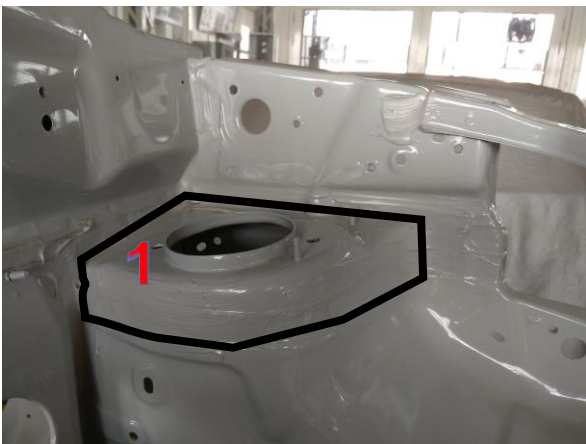
- Remove bolt-on parts for access as necessary (bag and tag).
- Remove the following parts to be replaced (full or partial);

Parts

1. Head light support – (this part will be reinstalled, not replaced with a new part). Remove part by drilling only. You must remove this part to install the longitudinal member. It will be re-installed using Mig plug welds in the holes drilled during removal.



2. Replace the four parts given below



3. Outer panel- Perform the cut line as specified here and shown in the photo



- The butt gap on re-assembly should be 1-2 times metal thickness.
- Make all holes for plug-welding 8mm & 6mm
- Remove corrosion protection materials as necessary in areas where panels or panel flanges will be heated by any welding method during replacement part installation. **(different prep depending on attachment method)**
- 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 plug and spot welding must be bare metal. Minimum 10mm around a hole for plug-welding and minimum 20mm for spot-welding
- For seam-welding 10mm or more inside and outside must be bare metal - where possible.
- Straighten (repair) all distorted flanges and remove all spot weld remnants with grinder or sander.
- Areas around the tear and holes resulting from damage, must also be ground and cleaned, but not repaired by welding.
- Any accidental holes, tears or deep cuts 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!**
- Drill or punch holes for plug welds on flanges as necessary

4. The new parts come in assembly. Necessary parts have to remove from assembly.



B1 **STOP** Sign in when done for experts to mark your completion of the above operations

B2 - PANEL PREPARATION

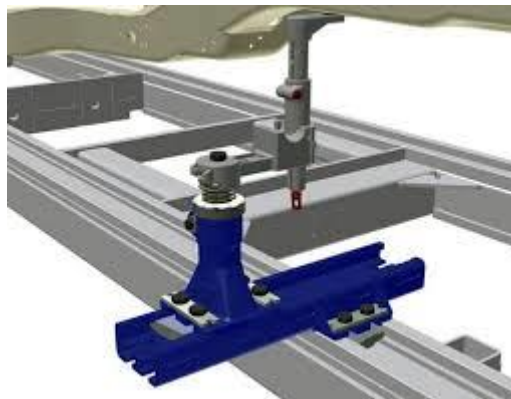
PRIMER

Apply primer on all surfaces which will be enclosed, while experts assess how the work is performed.

B2 **STOP** *Sign in when done for experts to mark your completion of the above operations*

B3 - INSTALL REPLACEMENT PANEL/PARTS (FIT-UP)

- Assemble and fit the shocker mount plate only to body shell, hold in correct position with clamps and EVO. EVO 3 must be used in the measuring-point no L8/R8. 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.
- These measuring-points will be checked before experts start marking
- Tolerance +/- 1mm difference between the measuring points in L/W/H
- The Car-o-Liner X3 must be centred and ready to do the measuring.

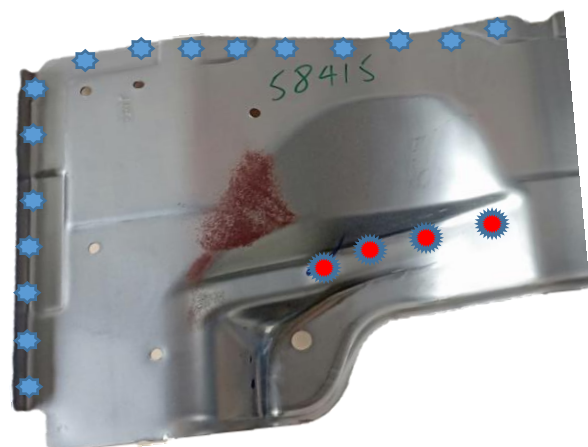
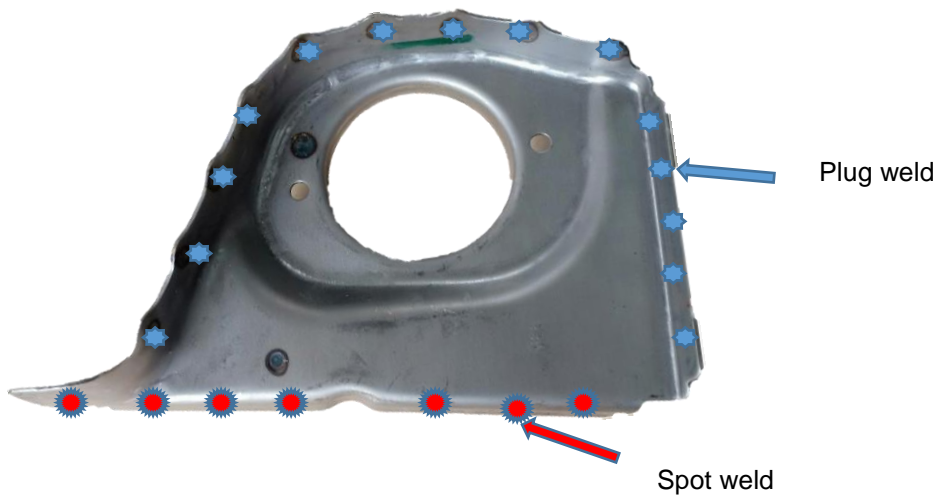


B3 **STOP** *Sign in when done for Experts to mark your completion of the above operations*

B4 - FIT AND WELD ALL PARTS

- Safe work practices must always be adhered.
- Fit and weld all parts. The lower side panel seam-welds must be a continuous weld or a series of continuous welds, longer than 10mm, and all welds must have full penetration.
- The seam-welding can be done with any technique.

Welding instruction.



- Do the seam welding on the chassis leg outside.
- Completed welds must not be dressed, ground, sanded, or cleaned before marking.
- All welding must be as shown in the pictures above.
- Remove all the jigs (EVO parts) to allow alignment measurement.
- Ensure that the measuring bridge and the measuring slide are correctly fitted.

B4 STOP

Sign in to mark your welding.

B5 - GRINDING AND PANEL GAPS

- Grind and sand all plug- and seam - welds. Feather out the paint edges (P120 - P240 grit)
- Fit all front-end bolt-on panels.
- Adjust hood, head lights, fenders and doors to specifications.

B5 STOP

Sign in TO MARK ALL MOUNTING AND GRINDING AS MENTIONED ABOVE.

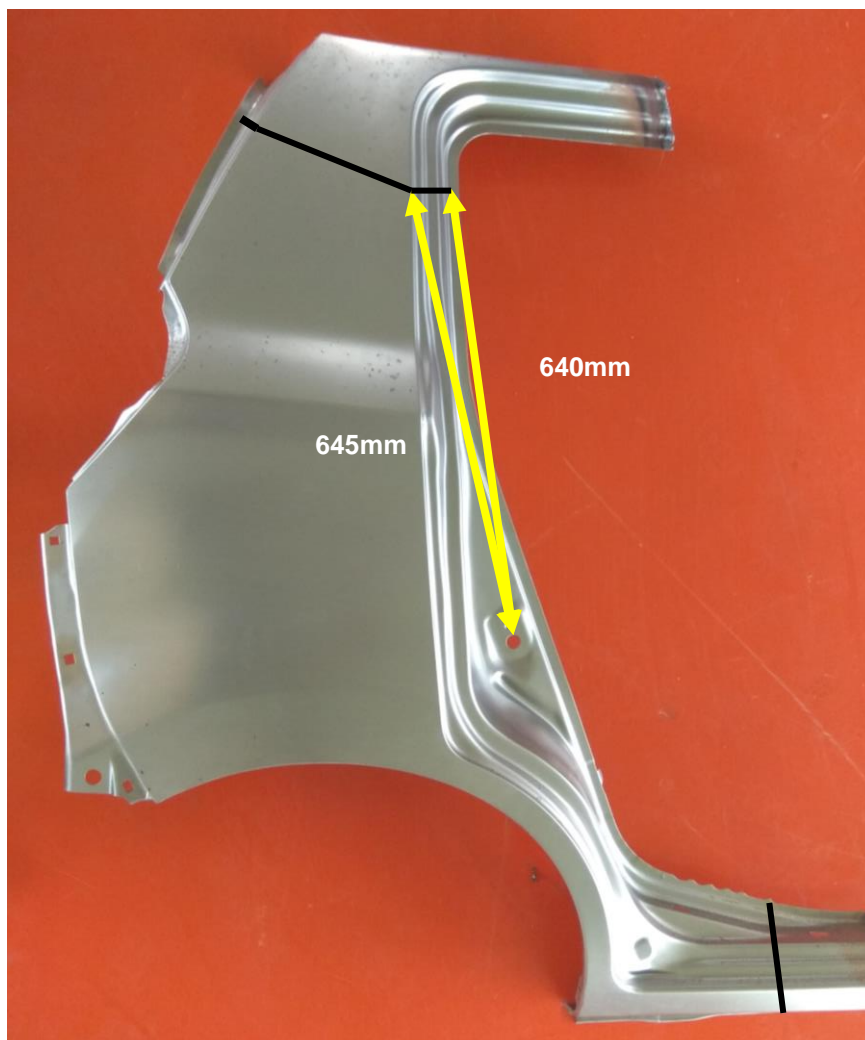
MODULE C – NON-STRUCTURAL PART(S) REPLACEMENT

Along with these directions, which guide you through the steps to take and the stop points required, Safe work practices must always be adhered.

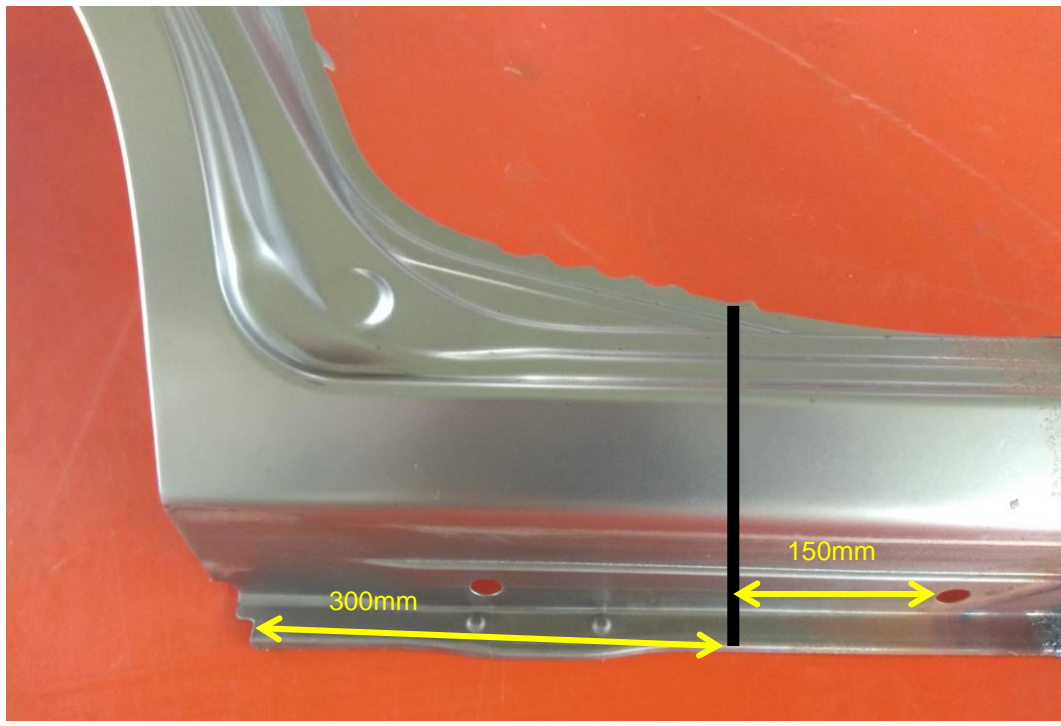
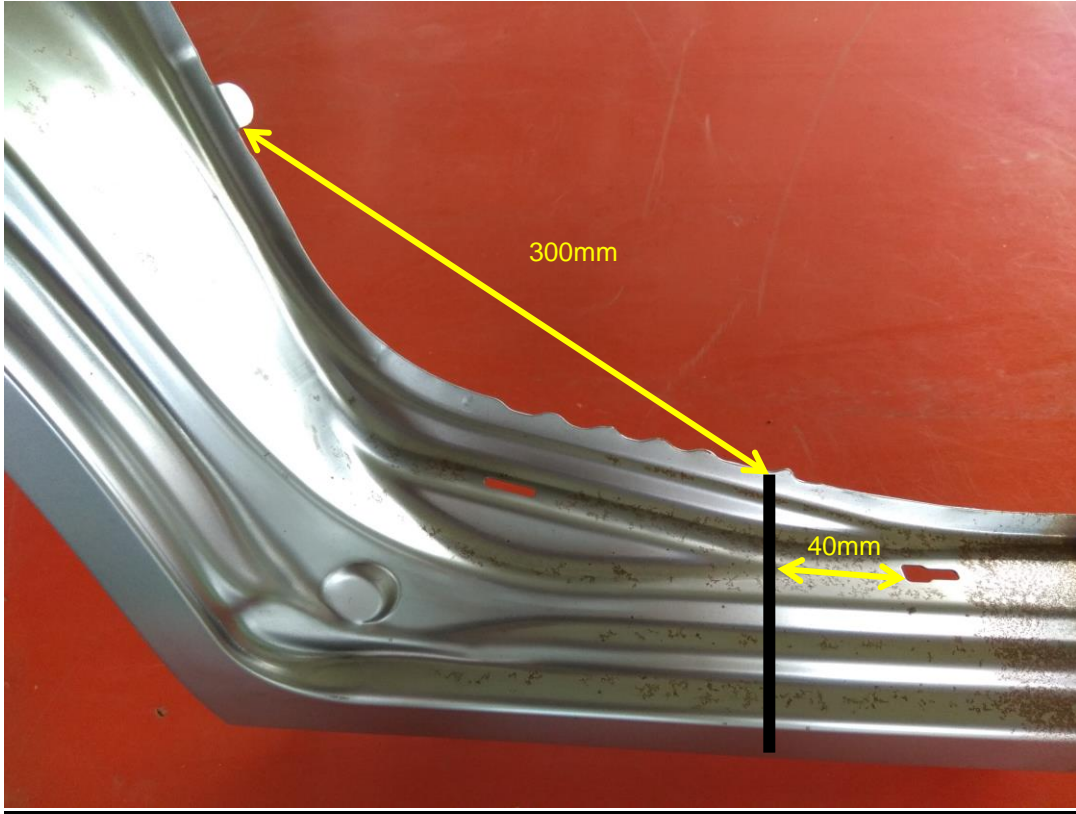
C1 - PANEL REMOVAL AND INSTALLATION (FIT-UP)

- Replace the Right/Left Rear Fender
- Remove bolt-on parts for access as necessary (bag & tag).
- Remove the Right Rear Fender

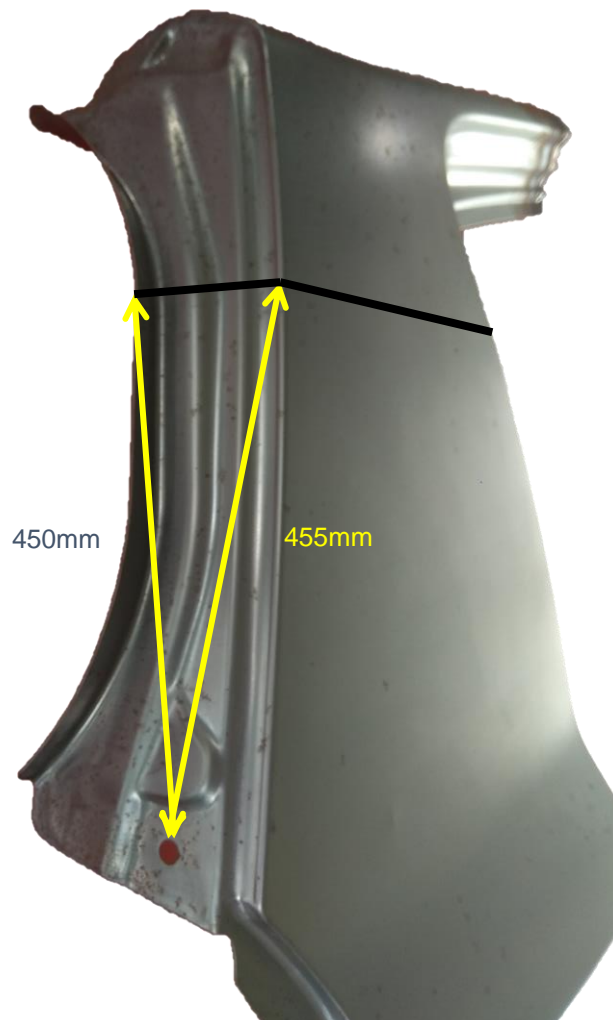
Perform the upper and lower cut lines as specified here



Lower Panel Joint



Upper Panel Joint



- Remove corrosion protection materials as necessary in areas where panels or panel flanges will be heated by any welding method during replacement part installation.
(different prep depending on attachment method)
- Straighten (repair) all deformation and remove spot weld remnants. 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!
- Drill or punch holes for plug welds on flanges as necessary
- Install side panel. Fit up only. At this point, the door gap and the tailgate gap will not be measured.
Important! No adhesives or welds at this point.
- Adjust new part to fit without excessive tension/stress and secure with clamps.
- The C pillar upper and lower sill joint gap must be 0-1mm.
- Ensure the correct alignment of swage/fold lines of the replacement parts to existing vehicle part locations.
- Produce flush mating flange fit-up.
- The panel must be fitted to suit manufacturer's measurements and gaps with adjacent panels.

C1 STOP Sign in when done for experts to mark your completion of the above operations

C2-PANEL PREPARATION

- Remove panel and prepare ALL materials, tools and parts for attaching permanently.
 - Clean the wheel arch sealer surface with Cleaning agent
 - Apply sealer and weld true primer according to standard specification.
 - Install side panel without the help of a partner.
 - Start the welding process. (the marking team will now leave you)
- Weld-Thru primer should be applied to all inside of weld area flanges.

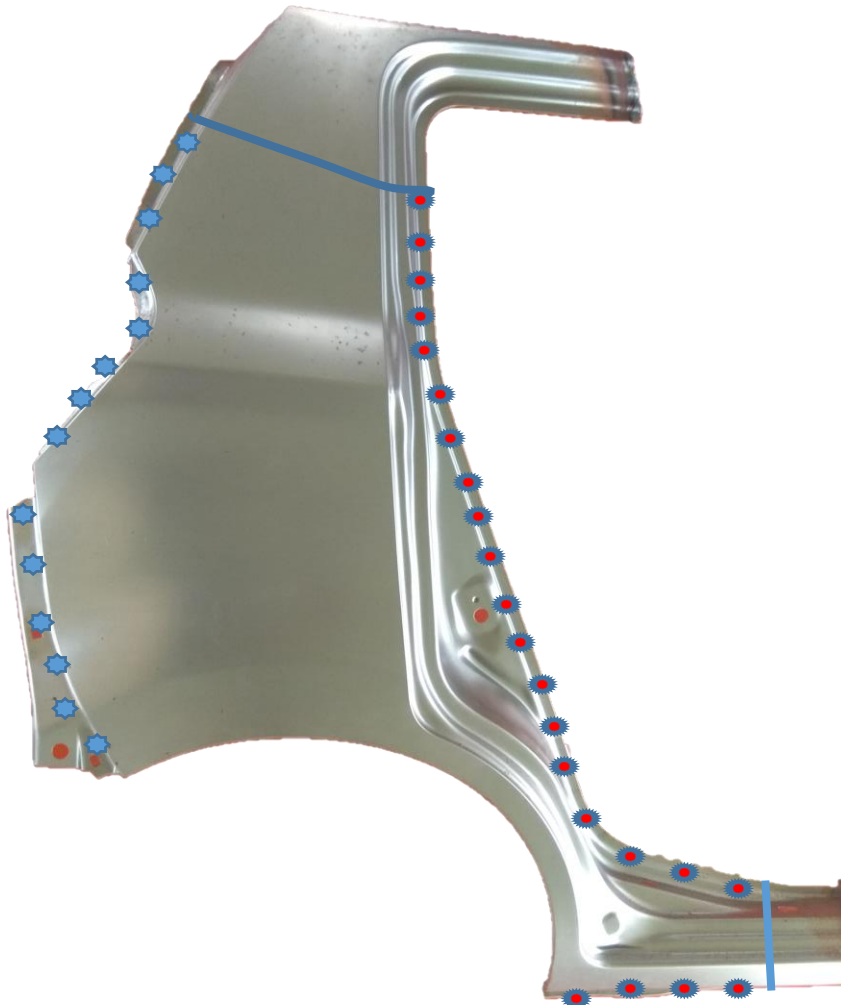
C2 STOP

Sign in when done for experts to mark your weld primer application

C3 - ATTACH REPLACEMENT PANEL/PARTS

Attach part(s) by performing the different types of methods (Mig plug, Mig seam, Spot welding).

Welding instruction



Note: When installing panel, make sure there is sufficient sealer on bonding surfaces

Note: No backing strip/insert to be fitted behind upper and lower butt joints

- Create alignment of swage lines at replacement part to existing vehicle part locations.
- Produce flush mating flange fit-up.
- All welds must be marked before grinding takes place. 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 expert marking team). This will be done by experts at the end of the competition. Butt welding and adhesive application will be marked after competition completion.

C3 STOP Sign in when done for experts to mark your above repair operations

C4 - DRESS/GRIND/SAND WELDS (MARKED WITH JUDGMENT CRITERIA) AND PANEL GAPS

- After MIG welding (plug or continuous welds) metal joining surfaces, the welds must be ground flat and finished. Welded areas must be finished in a state that would enable the areas to be chemically treated and primed (P80 grit or finer) with the exception of the upper and lower butt joints (prepared for filler, but filler will not be applied).
- Metal finishing areas - sand to P80g or finer.
- Paint edges feathered to P120g or finer.
- Reinstall all parts removed for repair operations and adjust using manufacturers' specifications and tolerances.

C4 STOP Sign in when done for experts to mark your completion of the above operations. Marking of these tasks will typically be done at the end of the competition

MODULE D – PANEL REPAIR

Panel Repair 1

- Repair the "big dent" damage in the door using the metal finishing process.
- Safe work practices must always be adhered.
- The repair must have the original contour and shape.
- Panel shrinking must be done with electrical equipment or cold shrinking as needed.
- Repair surface defects, sand to P80g or finer, featheredge broken surrounding surfaces to P120g or finer, but not finer than P240g.
- Repair must not have deep file or grinder marks/gouges).
- The panel repair area must not be over thinned due to excessive filing or sanding.

Panel Repair 2

- Repair the "small dent" damage in the door using the metal finishing process.
- Safe work practices must always be adhered.
- The repair must have the original contour and shape.
- Panel shrinking must be done with electrical equipment or cold shrinking as needed.
- Repair surface defects, sand to P80g or finer, featheredge broken surrounding surfaces to P120g or finer, but not finer than P240g.
- Repair must not have deep file or grinder marks/gouges).
- The panel repair area must not be over thinned due to excessive filing or sanding.

MODULE E – COSMETIC REPAIR

- Repair the cut on bumper with the help of plastic repair kit.
- Safe work practices must always be adhered.
- The repair must have the original contour and shape.
- Repair surface defects, sand to P80g or finer, featheredge broken surrounding surfaces to P120g or finer, but not finer than P240g.
- Repair must not have deep grinder marks.