I-CAR® NEW ZEALAND

TECHNICAL REPORT

0EM PROCEDURES and RECYCLED PARTS:

WHAT SHOULD WE BE DOING TODAY, TOMOROW and INTO THE FUTURE?? (PART 1)

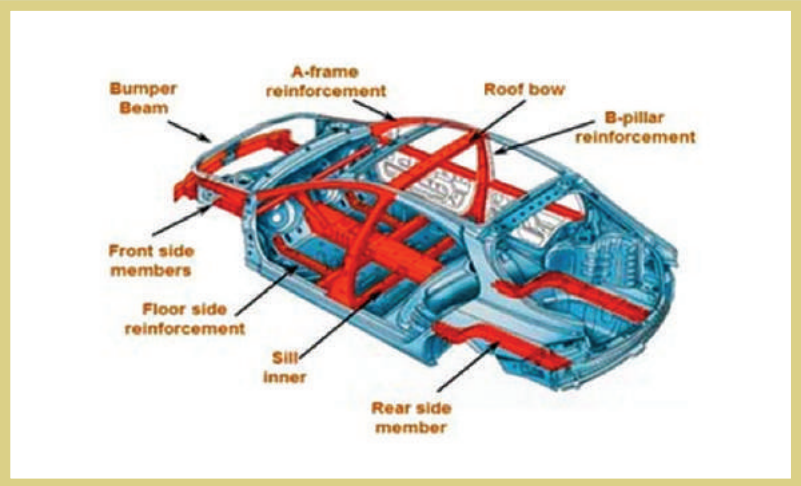
On the back of recent articles and numerous enquiries that have highlighted the issue of using re-cycled weld-on panels and structures when working with later - model vehicles, this 2 part feature will take an in-depth look at what the modern repairer and assessor / work provider are confronted with on a daily basis when determining the "correct" method that will return a damaged vehicle to its "pre-accident condition".

For the sake of argument, and to provide some clarity around what the trade, and all interested parties would deem to be "later model vehicles", let's assume that this is around the middle of the first decade of the new millennia - approximately 2005. It could be argued that this began 4 or 5 years previous to this, dependent on the vehicle maker, and/or who you talk to ....

Recent History :-

"Light weighting" of steel auto bodies became a major focus during the 1990's with the arrival of the Ultra Lightweight Steel Auto Body (ULSAB) - an industry wide consortium that successfully sought to reduce weight with the resultant reduction in environmental impact, far better emissions and economies, provide better crash management systems, and at the same time increasing structural strength and rigidity without compromising safety. 2008 saw the arrival of Arcelor Mittals ABC lightweight project, which then progressed to "S-In Motion" around 2012.

Through all of these progressions, the basic uni-body structure, or "Body In White" utilised more and more High Strength Steels (HSS) - Current global platforms, and next generation vehicles that include hybrids and plug - in electric concepts, will ultimately incorporate more and more " Advanced High Strength Steels" (AHSS) and these materials will continue to challenge traditional and current repair practices....



The Ultra Lightweight Steel Auto Body (ULSAB) concept (completed in 2002)

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Back to the 1990's :-

With the arrival of ULSAB, suddenly everyone involved in the repair industry started to deliberate what this would mean if repairing cars using traditional straightening and welding methods - heating of structural parts became extremely limited or prohibited, oxy-acetylene welding could not be used, and the emphasis on correct repairs began to move towards "OEM procedures" - and that's where we arrive at :-

The Present Day :-

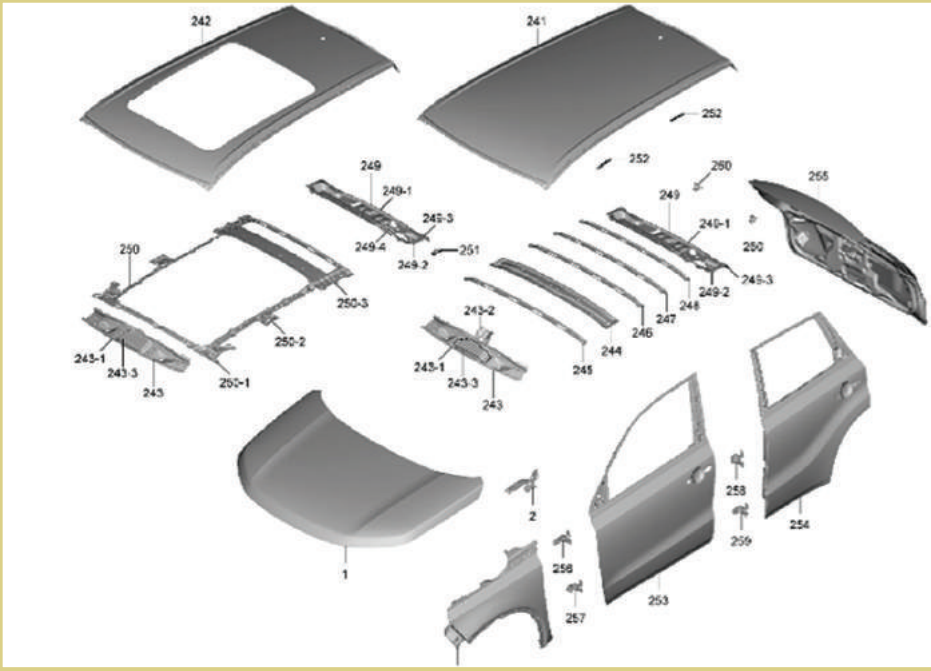
Without exception, all vehicles produced and sold around the world over the last decade have continued to increase the use of AHSS in the "Body In White" - additionally, many vehicle makers are using higher tensile steel materials for non - structural or closure panels, such as door skins, front and rear quarter panels, bonnets and bootlids - these panels can be made in thinner gauges (0.7 and less) that contribute to substantial weight savings, as well as increasing dent resistance and crash predictability parameters .

Ultra High Strength Steels (UHSS) are now used extensively in and around the occupant module of the vehicle structure - that is, inner reinforcements of the sill / rocker, A & B pillars, and floor X members. More recently, additional focus has been placed on using UHSS in front & rear chassis rails, and associated X members.

On the back of all of this advanced materials usage, attachment technologies have been introduced that work alongside these extremely heat sensitive steels - traditional STRSW processes are being used in conjunction with laser welding, adhesives and rivet fasteners that provide time & cost efficiencies on the production line, better durability over the lifetime of the vehicle (corrosion control etc), and far more accurate analysis of deformation, energy transfer and absorption in the event of a collision.

Closure panels in HSS -

Suzuki Vitara example



NO.	PART NAME	QTY	DOUBLE SIDE GALVANISED STEEL	HIGH-STRENGH STEEL (TENSILE STRENGTH (MPA))	THICKNESS (MM (IN.))
1	Hood panel	1	○	340	0.6 (0.024)
253	Front door panel (R,L)	R:1	○	340	0.6 (0.024)
		L:1	○		
254	Rear door panel (R,L)	R:1	○	340	0.6 (0.024)
		L:1	○		

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"The Elephant in the Room " :-

As long as I can remember, it has always been hotly debated that quoting / estimating the additional costs associated with fitting ("un - picking") a S/H or recycled weld - on panel according to "Standard Times" or "The Schedule" does not equate to the actual time taken to complete the operation(s) - this was prevalent even when the auto body technician was working with mild steel materials - let alone HSS and AHSS. Many industry experts now consider that the donor panel removal process damages the spot weld flanges, and in many instances generates drill holes that cannot be filled without producing a large Heat Affected Zone (HAZ) - essentially, time factors aside, successful removal is all but impossible to achieve.

Insurers and their assessors now regularly require repairers to follow OEM procedures wherever possible, and this is to be commended - BUT those OEM methods are developed, tested and supplied by vehicle-makers in the knowledge that NEW, genuine parts will be used - I have yet to see any Body Repair Manuals (BRM), supplied by vehicle makers, that make reference to using a part that has come off another car!!!.

General information that is contained within every vehicle maker's modern BRM's highlights, or identifies, heat limitations / prohibitions, welding recommendations or guidelines, and cautions that cannot be reconciled with using a previously welded - on component.

With all of this knowledge and information understood, and readily available from most automakers, the New Zealand repair industry continues to replace panels and structural parts on late model vehicles using recycled weld-on parts - in addition to this, it is assumed that an OEM replacement method can, and should be followed - really ???.

It would be easy to imagine the horrified looks on the faces of automotive structural engineers and crash research evaluation teams (NCAP), if they were hypothetically in discussions with an insurance assessor and auto body repair technician who had determined a structurally damaged vehicle and / or one that required the replacement of weld - on panels, will be using parts that have been "cut off" another car - This becomes even more problematic when it is highly likely that the donor vehicle has been involved in a major collision and may not be dimensionally accurate. Further issues arise, such as paint coating thickness / previous repairs / specification changes between models that are not identified, and corrosion protection that has been compromised in the salvage processes.

So, what to do ??? -

There are opposing points of view about the validity of using S/H panels - The work provider is likely to suggest that they can be used, whereas the repairer will often have the polar opposite point of view - In the 2nd part of this feature, we will look into many of the factors and variations (both for and against), that come into play when replacing weld-on panels.

These articles have been written by Martyn Lane : I-CAR Instructor, Weld Test Administrator and Technical Specialist to the auto body industry.