

TECHNICAL REPORT



THE EVOLUTION OF WELDING MATERIALS, METHODS & PRACTICES -

A FOCUS ON HONDA BODY REPAIR MANUAL (BRM) CHANGES.

PART II – WELD-THRU PRIMERS / HEATING / SYMBOLS / SECTIONING & PARTIAL REPLACEMENT INFORMATION

In **Part I**, we looked in particular at Honda's revisions of MAG welding guidelines / requirements for joints, and part attachment – **Part II** examines Honda's other revisions when working with AHSS metals ...

WELD-THROUGH PRIMER GUIDELINES (REVISED) :-

- When doing squeeze-type resistance spot welding (STRSW), apply a zinc-rich weld-through primer, or spot sealer, to bare steel areas being welded and wipe off any excess. Use approved respiratory protection when working around these primers.
- Weld-through primer should not be used when doing MAG plug, MAG butt, or MIG brazing. Further study has shown that weld-through primers can negatively affect weld or joint quality.
- When doing MAG plug and butt welding, or MIG brazing, remove only enough of the factory e-coat to allow bare metal in the weld or joint area. Then, apply corrosion-inhibiting primer over the completed weld or joint.
- Refer to the BRM for complete information.



Resene
Automotive & Light Industrial

Coatings Experts at your door
0800 108 008 www.rali.co.nz

Cromax

STANDOX

TECHNICAL REPORT



USE OF HEAT DURING BODY STRAIGHTENING AND REPAIR :-

When you are doing body straightening and repair procedures, follow these guidelines:

- Do not apply heat to any body part during straightening. This may compromise the internal structure and strength of high-strength steel parts.
- Any part that has heat applied to it during straightening must be replaced with new parts.
- Ignoring these instructions may significantly reduce occupant protection in any subsequent collision.



It may be a good idea to print off the chart on the following page (in colour) - This could then be laminated and distributed to any technicians in the body shop that are, or will be working with new Honda models ...

Resene

Automotive & Light Industrial

Coatings Experts at your door

0800 108 008 www.rali.co.nz



TECHNICAL REPORT



Honda/Acura Steel Usage and Repairability[†] Current as of April, 2018

Steel Strength Strength	Steel Designation	Cold Straighten	Heat During Straightening	MAG Welding		MAG Wire Use **	Possible Sectioning See guidelines	STRSW Spot Weld	Auto-Set For STRSW Acceptable	Mig Brazing to 1500Mpa***	
				Plug	Butt					Pulse Welder Required	
										Single Hole	Double Hole
270	Mild	Yes	No	Yes	Yes	Er70S6	Yes	Yes w/ Zinc Based Weld-through Primer	Yes	Yes	No
340	HSS	Yes	No	Yes	Yes	Er70S6	Possible	Yes w/ Zinc Based Weld-through Primer	Yes	No	Yes
440	HSS	Yes	No	Yes	Yes	Er70S6	Possible	Yes w/ Zinc Based Weld-through Primer	Yes	No	Yes
590	HSS	Yes	No	Yes	Yes	Bohler X96	Possible	Yes w/ Zinc Based Weld-through Primer	Yes	No	Yes
780	HSS	No	No	Yes	Yes	Bohler X96	Possible	Yes w/ Zinc Based Weld-through Primer	Yes	No	Yes
980	UHSS	No	No	Yes	No	Bohler X96	Not Allowed	Yes w/ Zinc Based Weld-through Primer	Yes	No	Yes
1180	UHSS	No	No	Yes*	No	Bohler X96	Not Allowed	Yes w/ Zinc Based Weld-through Primer	NO	No	Yes
1500	UHSS	No	No	Yes*	No	Bohler X96*	Not Allowed	Yes w/ Zinc Based Weld-through Primer	Manual Setting Required	Only to 270	To all HSS/UHSS

NOTES ON *S USED IN THE STEEL MATRIX CHART :-

* Only as specified in the Body Repair Manual.

** Based on strength of weaker panel.

*** MIG Brazing is only performed where indicated in the Model Specific Body Repair Manual.

Plug Hole Diameter			
Panel Thickness	< 1mm	1mm - 1.5mm	> 1.5mm
Hole Diameter mm (in)	6.0 (0.24")	8.0 (0.31")	10 (0.39")

Tearout on test plug welds and spotwelds should be $\geq 4.5 \times$ Square Root of the panel thickness.

Resene
Automotive & Light Industrial

Coatings Experts at your door
0800 108 008 www.rali.co.nz

Cromax

STANDOX

TECHNICAL REPORT

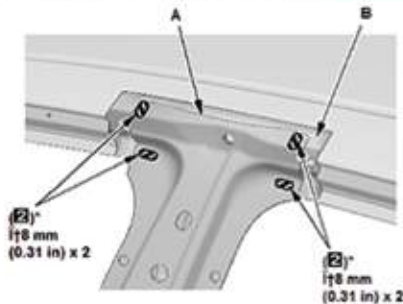


REPLACEMENT INFORMATION :-

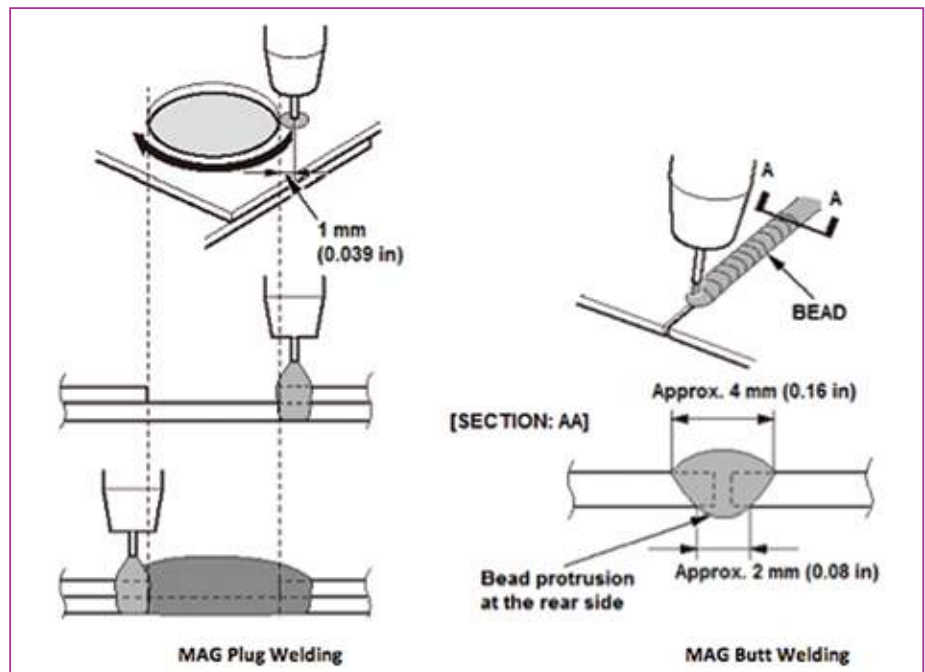
The welding symbols in the removal/installation guides have the following meanings –
(Those symbols with the dashed lines refer to spot-welds that are not visible (concealed)).

- ✕ and ✕ : 2-Plate spot welding
- ⊗ and ⊗ : 3-Plate spot welding
- ⊠ and ⊠ : 4-Plate spot welding
- : MAG plug welding
- : MAG welding
- ⦶ : MIG brazing
- L=Welding length; unit: mm (in)
- () and ()*: The number of welds

NOTE : To maintain the original body strength and collision safety performance, carefully follow published welding methods - **do not substitute**.



(Note the weld starts & finishes
OFF the edge)



Resene
Automotive & Light Industrial

Coatings Experts at your door
0800 108 008 www.rali.co.nz

Cromax

STANDOX

TECHNICAL REPORT



SECTIONING & PARTIAL REPLACEMENT REQUIREMENTS :-

PARTIAL PANEL REPLACEMENT AT FACTORY SEAMS

When you are determining whether to replace a body part as supplied, or do a partial replacement at the factory seams, follow these guidelines:

- Replacement of body service parts as supplied at factory seams is the preferred repair method, except when it may cause unnecessary or excessive intrusion into the body structure.
- In these cases, the service part may be disassembled at factory seams as required to replace only the damaged portion.
- For example, if only the vehicle's rear wheelhouse is damaged, that part may be removed from the rear inner panel service part assembly at the factory seams and installed on the vehicle.
- Note that there is not a BRM replacement procedure for rear inner panels because they are rarely installed as a complete unit.
- All basic welding & sectioning guidelines specified in the service information must be observed during partial panel replacement.

Rear Wheelhouse

Rear Inner Panel Service Part Example



STEEL PARTS SECTIONING GUIDELINES

Replacement of steel parts at factory seams and matching the replacement part configuration remain the preferred repair methods. However, these methods alone are not always practical nor cost effective in all body repair situations.

While some limited sectioning procedures are provided in the body repair manuals, it is not possible to develop published procedures covering every type and angle of impact.

The revised guidelines detailed below are intended as “basic rules” for properly trained collision repair professionals to use when sectioning steel parts on Honda and Acura vehicles.



Resene
Automotive & Light Industrial

Coatings Experts at your door
0800 108 008 www.rali.co.nz



Cromax



STANDOX

TECHNICAL REPORT



Various high-strength and ultra-high-strength steel materials with different sheet thicknesses and strengths are applied in many places that vary with body design in order to increase collision safety performance, body stiffness, and weight reduction. Stiffening members are also applied inside some steel parts (patches, reinforcements, stiffeners, etc.)

Follow these guidelines to avoid an unsafe repair:

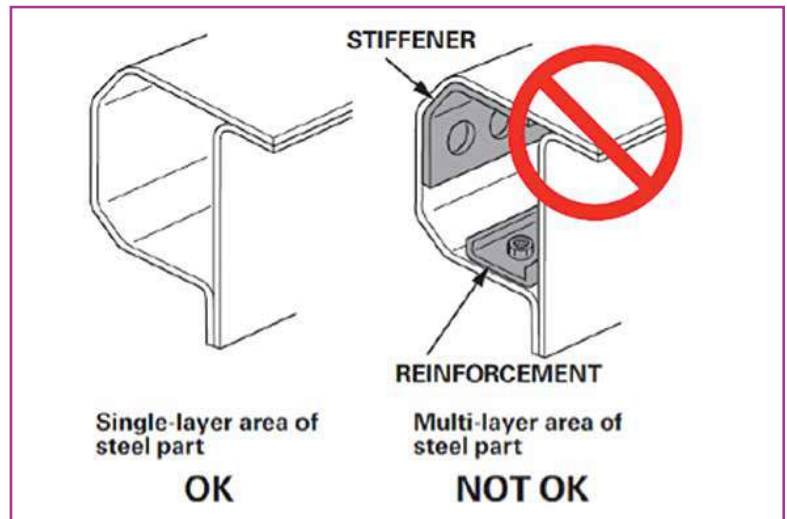
- Outer body and floor panels may be sectioned as necessary. Specific sectioning procedures are not provided in the body repair manual.
- Depending on the type of vehicle damage, steel parts with a tensile strength of 780 MPa or less may be sectioned if all three of the following conditions are met:
 1. Sectioning must be done in a single-layer area of the part.
 2. Multi-layer internal steel reinforcements and stiffeners must not be cut.
 3. Do not section in load bearing areas, such as engine, transmission, or suspension mounting points.
- To determine if a part has a single-layer area that can be sectioned, do the following:
 - Check the body construction pages in the General Information section of the appropriate body repair manual to determine the steel grade(s) and part configurations of the parts being replaced.
 - Inspect the original and replacement parts to confirm if there are internal reinforcements and/or stiffeners.
 - Spot welds not directly on a flange or joint indicate a reinforcement or stiffener inside.
 - The Body Repair Manual Replacement section shows some internal reinforcements as a dotted line.

If any of the above sectioning conditions cannot be met, replace those body structural components (stiffeners, reinforcements, and other multi-layered steel parts) as assemblies that match the replacement parts configuration.

IN SUMMARY :-

Honda have gone to great lengths to identify that their modern vehicle structures contain substantial amounts of High Strength and Ultra High Strength Steels (HSS & UHSS) - and by necessity, the appropriate attachment methods and repairability will vary accordingly.

Those methods must be completed using the correct equipment, tools and materials / consummables, AND techniques...



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

Resene
Automotive & Light Industrial

Coatings Experts at your door
0800 108 008 www.rali.co.nz

Cromax

STANDOX