I-CAR NEW ZEALAND

# TECHNICAL REPORT


# LET'S LOOK AT THE HONDA

We are always making statements of how fast vehicle technology is moving and the importance of keeping abreast of this.

So for this edition of PanelTalk we will look at a few concepts Honda has developed that are now being used for some models in their current vehicle fleet. Understanding these concepts in new Honda vehicles is important, as most often this will determine if you can or cannot repair a part along with guiding where you should look for secondary damage following a collision.

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Something that is a definite 'do not repair' item in the new Accord is a new type of front subframe (Fig 1). This new technology is for the continuous welding of the dissimilar metals of steel and aluminium and applied this to the subframe of a mass-production vehicle. This will be released in North America and later be adopted in NZ models.

*Fig 1. Subframe*

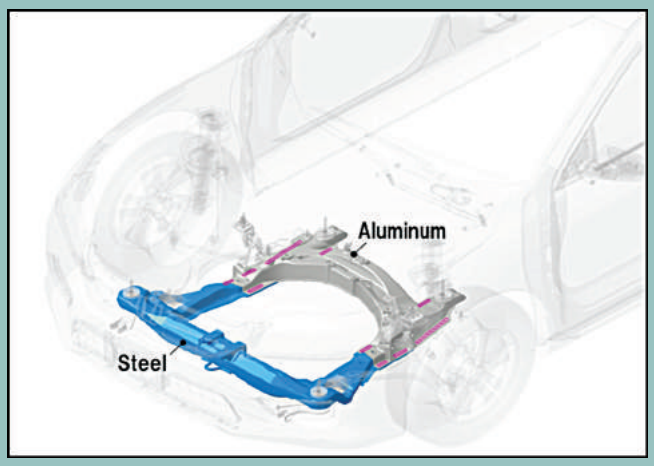
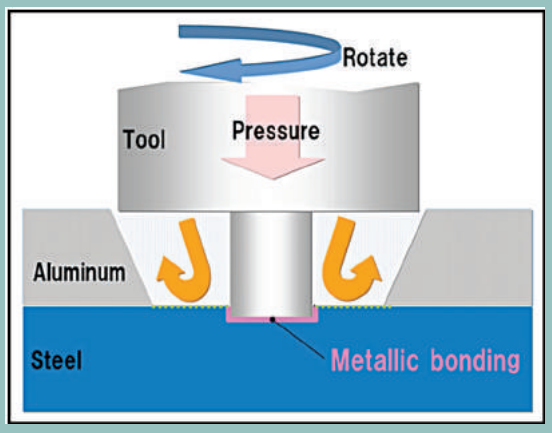



*Fig 2. Conceptual diagram of FSW of ???*



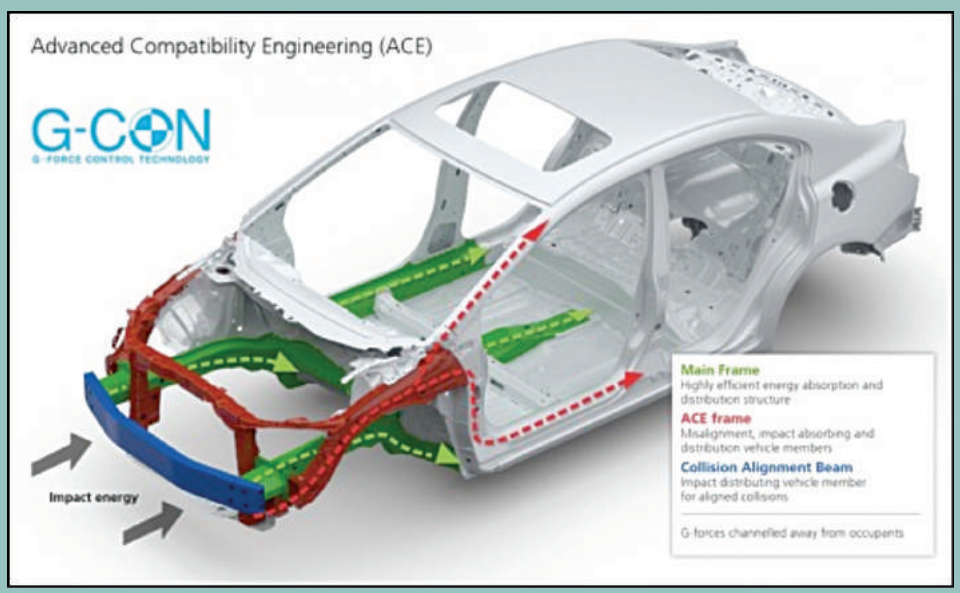

Striving to reduce vehicle weight in order to increase fuel economy, Honda focused on Friction Stir Welding (FSW) and developed a new technology for the continuous welding of steel and aluminium. This technology generates a new and stable metallic bonding between steel and aluminium by moving a rotating tool on the top of the aluminium which is lapped over the steel with high pressure (Fig 2). As a result, the welding strength becomes equal to or beyond conventional Metal Inert Gas (MIG) welding.

This new technology contributes to an improvement in fuel economy by reducing body weight by 25% compared to a conventional steel subframe. It also enabled a change in the structure of the subframe and the mounting point of suspension, which increased the rigidity of the mounting point by 20% and also contributed to the vehicle's dynamic performance. This (FSW) system can also be used for aluminium-to-aluminium.

Another concept is "Honda's Innovative Design". This design disperses collision forces over a larger frontal area and the body structure's front-mounted polygonal main frame is designed to prevent cabin deformation. It uses the engine compartment to efficiently absorb and disperse collision energy during a head-on collision. It features a frame structure composed of a highly efficient energy-absorbing main frame, a bulkhead (upper frame) which absorbs the upper part of the collision energy, and a lower member that helps prevent misalignment. This design disperses collision forces over a larger frontal area, which enhances energy absorption of the engine compartment and reduces the chance of deformation of the passenger compartment by distributing forces through multiple major load bearing pathways.

The overall result is a high level of bending and twisting rigidity for the body combined with enhanced crash-worthiness with no additional weight penalty.

*Fig 3. Load path*



Hot Stamp Material (Fig 4). Boron Steel parts used for the reinforcements in the 2012 Euro Civic requires spot welding and MIG brazing, NEVER use MIG Steel Welding. Honda has strict guide lines for the spot welding equipment that should be used when replacing these panels or panels attached to these reinforcements. Honda states that spot welding current over 12000A, electrode pressure over 450daN with 1500Mpa program is the expected spec:

*Fig 4. Boron Steel*

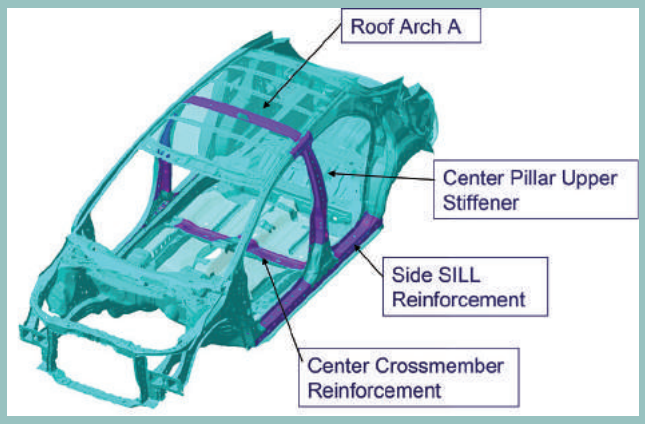
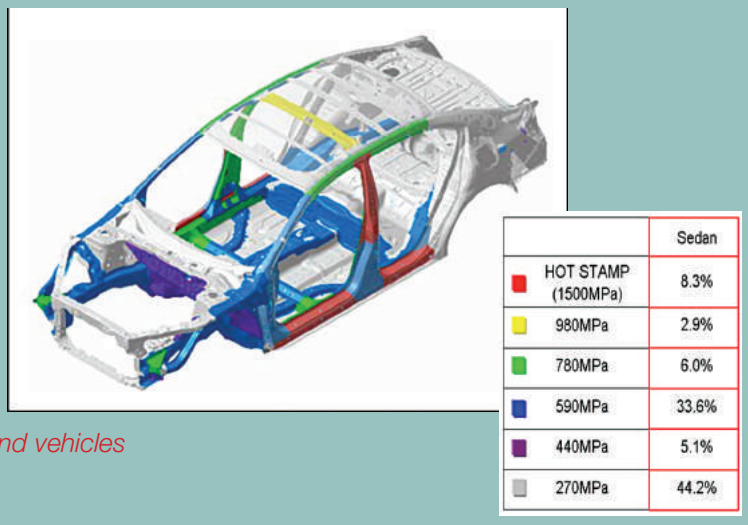



*Fig 5. 2013 Acccord*



| | Sedan |
|---|---|
| HOT STAMP (1500MPa) | 8.3% |
| 980MPa | 2.9% |
| 780MPa | 6.0% |
| 590MPa | 33.6% |
| 440MPa | 5.1% |
| 270MPa | 44.2% |

*Note that this is for Japan 2013 Accord and not Thailand vehicles*

Fig 5 shows the different strength steels used in the 2013 Honda Accord. The placement of these varying strength steels creates the crash management features of the vehicle structure. The B Pillar, floor reinforcements and roof arch now provide greater side impact protection, however this creates greater challenges if repairing these vehicles.

**Conclusion**: These technical advancements reinforce that collision repairers need to keep abreast of any new technology like this used by Honda or any other brand of new age vehicle. New Zealand repairers are perhaps a little spoilt as Honda collision repair information for NZ new vehicles is available free on the Honda NZ website; all you need is your account number and user password. We would like to thank Honda NZ for sharing this information and for the support given to our industry.

Access to Honda Parts website is through the following address; **www.honda.co.nz/parts**