

Multi-panel Sub-assembly Replacement

Guidance on Replacing Multiple Inner and Outer Components as Sub-assemblies



Supporting New Zealand's Repair Certification Industry

About RepairCert NZ Technical Bulletins

These Technical Bulletins have been developed to support Specialist Light Vehicle Repair Certifiers (Repair Certifiers) in ensuring autobody repairs are carried out safely and correctly. Repair Certifiers should, in the first instance, be guided by (if available) relevant Vehicle Manufacturer's Information and Repair Industry Information, and in the absence of such information, refer to the Best-practice Guidance provided within RepairCert NZ Technical Bulletins. These bulletins can also be used by the wider autobody repair industry.



Purpose

This Technical Bulletin:

- supports and encourages Specialist Light Vehicle Repair Certifiers (Repair Certifiers) in the use of second-hand multi-panel sub-assemblies as a viable alternative to replacing multiple individual weld-on components on vehicles with significant collision or corrosion damage (see *Note 1* on Page 2); and
- while primarily focusing on the use of second-hand multi-panel sub-assemblies, also supports and encourages the use of vehicle manufacturer-supplied new multi-panel sub-assemblies (such as a front inner guard and chassis rail, an inner rear quarter and wheelhouse, or a body-side aperture) together with any available and relevant Vehicle Manufacturer's Information (see examples in 'Vehicle Manufacturers who Supply New OE Sub-assemblies' sub-section of this Technical Bulletin) (see *Note 2* on Page 2).

The repair methods described in this Technical Bulletin apply to all vehicles of unitary construction (unibody structures), and the bodies of 'body-over frame' vehicles, recognising that both platforms feature the same (or very similar) construction methods, material specifications, and crash management technologies.

<p>Note 1</p>	<p>Typical examples of multi-panel sub-assemblies (or combinations thereof) include the:</p> <ul style="list-style-type: none"> • rear panel and boot floor • boot floor and rear chassis rail member(s) • inner and outer rear quarter panels • inner and outer sill/rocker panels • inner and outer B-pillars • inner and outer A-pillars • complete inner and outer body-side aperture • complete inner and outer side aperture, roof and cross bracing • radiator support and front inner guard apron(s) • front inner guard apron(s) and chassis rail member(s).
<p>Note 2</p>	<p>‘Vehicle Manufacturer’s Information’ (also known as ‘OEM Information’) refers to any documentation from the vehicle manufacturer, including the Body Repair Manual (BRM), and related requirements, recommendations, and guidelines. To learn more about Vehicle Manufacturer’s Information, click here to view <i>RepairCert NZ Information Sheet # 02-2024 Repair Method Options</i> on the RepairCert NZ website.</p>

This Technical Bulletin also differentiates between repairs using replacement multi-panel sub-assemblies, and the ‘cut and shut’ repair method, and must be read in conjunction with *RepairCert NZ Technical Bulletin # 04-2026 Cut and Shut Repair Method* (see Note 3 below).

<p>Note 3</p>	<p>Click here to view <i>RepairCert NZ Technical Bulletin # 04-2026 Cut and Shut Repair Method</i> on the RepairCert NZ website.</p>
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Applicable Requirements

This Technical Bulletin combines non-mandatory Best-practice Guidance, together with the relevant mandatory legislative requirements (referred to as ‘applicable requirements’) to support Repair Certifiers in relation to this subject.

The applicable requirements stem from *Land Transport Rule: Vehicle Standards Compliance 2002 (Compliance Rule)*, and *Land Transport Rule: Vehicle Repair 1998 (Repair Rule)*.

The *Compliance Rule* requires that an unregistered vehicle undergoes repair certification if it has ‘*significant damage or deterioration to its structure, chassis, body-to-chassis attachment, suspension, or occupant protection system*’.

The *Repair Rule* specifies that ‘*a repair to a vehicle, its structure, systems, components or equipment, must restore the damaged or worn vehicle, structure, system, component or equipment so that they are within safe tolerance of the state of the vehicle, structure, system, component or equipment when manufactured.*’

The *Light Vehicle Repair Certification Vehicle Inspection Requirements Manual (Repair VIRM)* sets out the requirements that Repair Certifiers must meet to achieve the objectives of the *Compliance Rule* and the *Repair Rule* (see the ‘Repair VIRM Requirements’ section at the back of this Technical Bulletin).

Background

RepairCert NZ has received several enquiries from Repair Certifiers about major sub-assembly replacements.

One enquiry was detailed in a *From the Help Desk* article in *RepairCert NZ Update # 19* (see Note 4 on Page 3) where a Repair Certifier asked RepairCert NZ about the viability of replacing the complete inner and outer body-side aperture structure on the cab of a Toyota Hilux as a one-piece second-hand ‘sub-assembly’. This was proposed as an alternative to having to cut and weld the various components individually as would be required if new vehicle manufacturer-supplied components (using the appropriate vehicle manufacturer’s replacement procedures) were to be installed.

RepairCert NZ’s response was that in situations where the extent of the damage requires (when using new genuine parts) the replacement of multiple components and their associated procedures (which are typically supplied on an

individual basis), the installation of a second-hand multi-panel sub-assembly (that encompasses all of the damage) may be an entirely viable and appropriate repair option for many different damage scenarios.

Note 4	Click here to view the <i>Info from the Help Desk</i> article 'Side Aperture Replacement' in RepairCert NZ Update # 19 on the RepairCert NZ website .
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After providing guidance to Repair Certifiers on a number of similar situations, it was determined that a Technical Bulletin should be developed to provide more detailed information and guidance on the use of second-hand multi-panel sub-assemblies.

Multi-panel Sub-assembly Replacement vs the Cut and Shut Repair Method

It is vitally important to clearly distinguish between repairing a damaged vehicle via the replacement of a multi-panel sub-assembly, and the 'cut and shut' method. These are very different repair methods.

The 'cut and shut' repair method is explained in detail within *RepairCert NZ Technical Bulletin # 04-2026 Cut and Shut Repair Method*, and must be read in conjunction with this Technical Bulletin (see *Note 3* on Page 2).



It is important to read and understand *Technical Bulletin # 04-2026 Cut and Shut Repair Method*.

Second-hand Multi-panel Sub-assemblies

Benefits of Using Second-hand Multi-panel Sub-assemblies

Depending on the situation, there can be many benefits in using second-hand multi-panel sub-assemblies to effect a repair that might otherwise involve a number of individual welded-on components. These benefits include:

- less time needed to accurately align panels and associated components (see *Image 1* on Page 4), and
- on full body-side aperture replacements in particular, panel gap adjustment and door alignment procedures are simplified or eliminated altogether; and
- outer panel(s) sectioning (cutting and joining at non-factory locations, including 'window cut-outs'), often required to gain access for the fitting and attachment of individual inner reinforcement elements, may not need to be performed at all (see *Image 2* on Page 4); and
- retention of a substantial number of the original factory welds (see *Image 3* on Page 5); and
- a corresponding significant reduction in the number of replacement welds required; and
- that much of the vehicle manufacturer's original corrosion protection is retained; and
- depending on location and proximity to weld points, Noise Vibration Harshness (NVH) elements can often be left undisturbed (see *Image 4* on Page 5); and
- less time spent in preparation and installation (e.g. drilling, cutting, individual component separation operations, coatings removal, surface preparation for welding, alignment, clamping and general clean-up tasks); and
- most original adhesive-bonded flange joints (where installed) can be left undisturbed (depending on location/proximity of any replacement weld points) (see *Note 5* on Page 4); and
- because weld point attachment areas on the vehicle being repaired (where the replacement sub-assembly attaches) are predominately located on flange joints of inner structures which are hidden from view by sealing materials, floor coverings etc., a reduced need to 'dress' welds that would otherwise be required in locations where replacement welds are visible (see *Images 5 and 6* on Page 5); and
- accordingly, as most of the existing (and more visible) weld points are retained, the original overall factory finish/appearance remains intact; and
- GMA-MIG/MAG welding, most often required for attaching multi-panel sub-assembly components to the repaired vehicle's inner structures (e.g. inner sills, floor panels, bulkhead/firewall, or inner wheelhouse areas

where spot-welders can't reach) replicates the replacement welding method recommended by most vehicle manufacturers in these locations (see *Image 7* on Page 6); and

- providing a solution when new genuine replacement parts are no longer available.

Note 5	To learn more about adhesive-bonding and weld-bonding, click here to view <i>RepairCert NZ Technical Bulletin # 03-2024 Understanding Body Repair Manual Procedures (Best-practice Guidance on Adhesive-bonding and Weld-bonding)</i> on the RepairCert NZ website .
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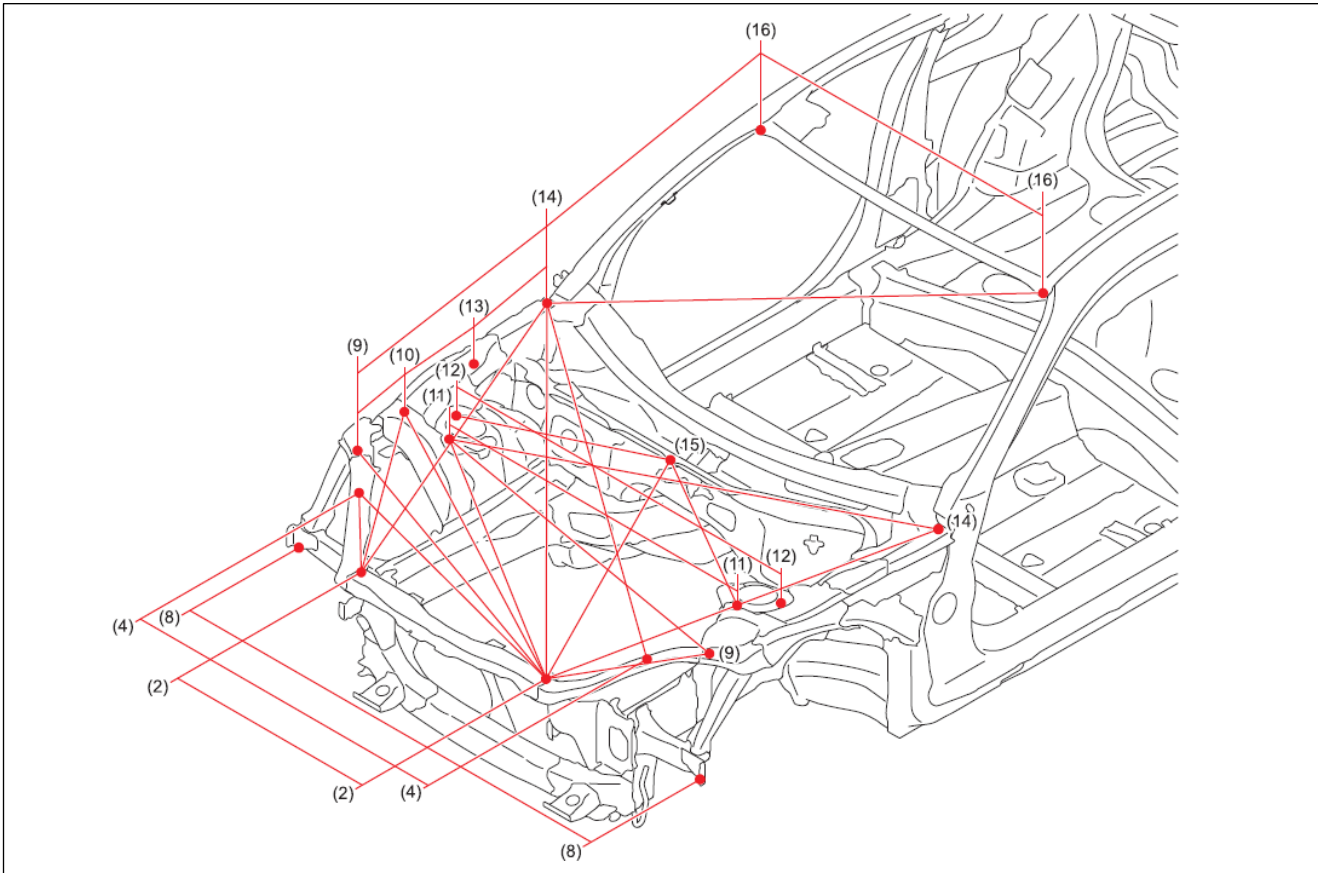


Image 1: Less time is required to align panels and associated components.

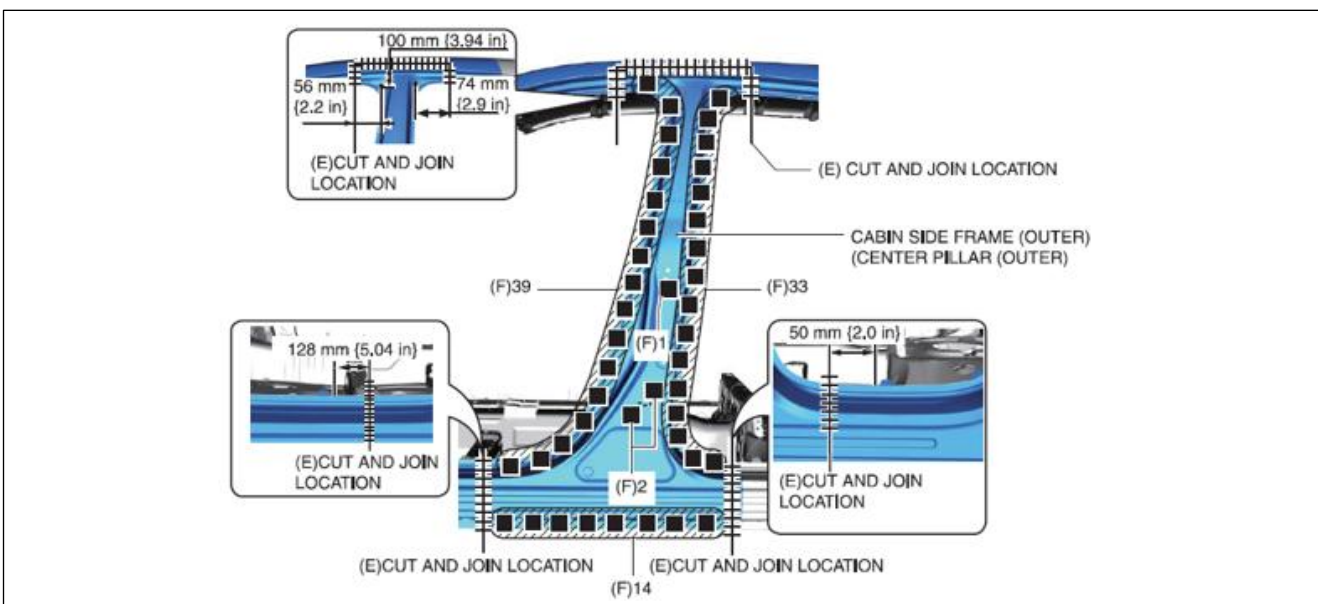


Image 2: The sectioning (cut and join locations) of outer body panels, to access weld points of inner structures (as shown in this Mazda B-pillar procedure), may often not be required.

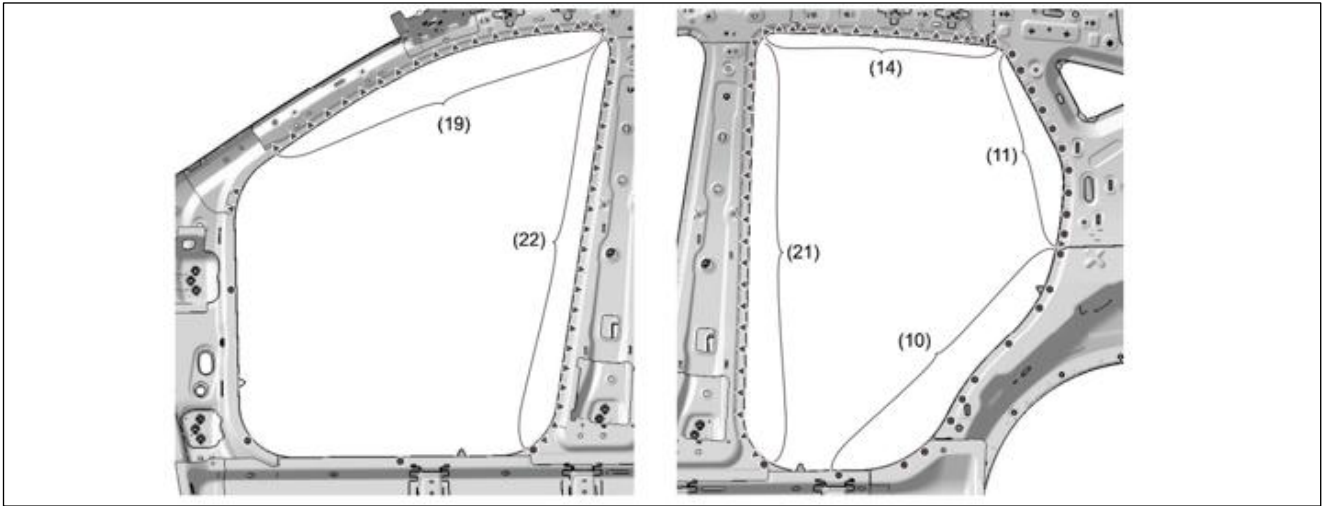


Image 3: A significant number of original spot-welds can be retained in many instances.

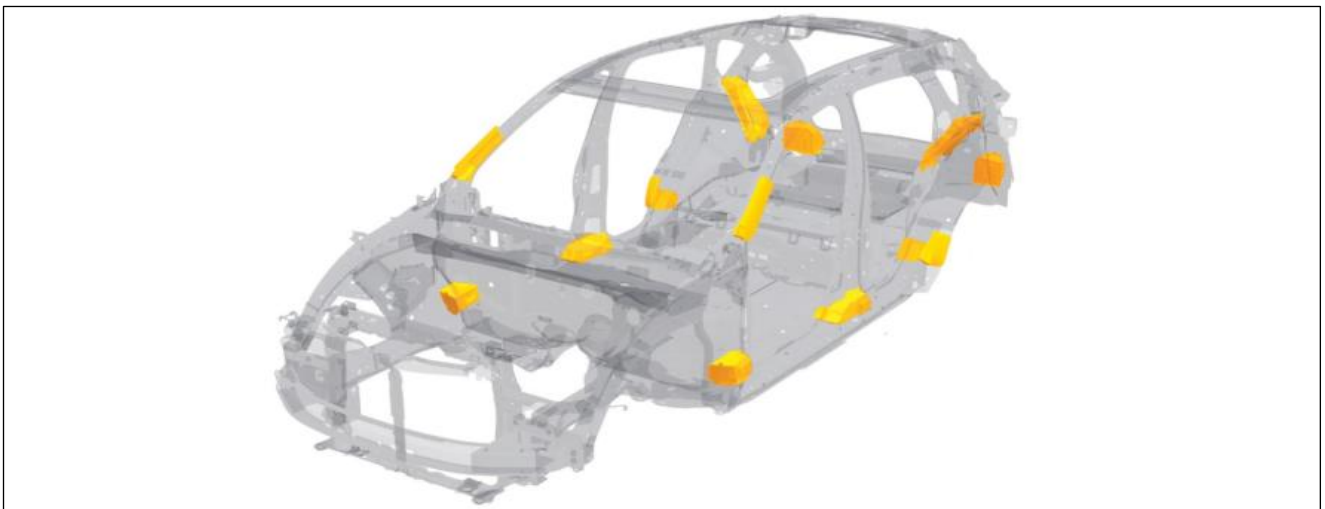
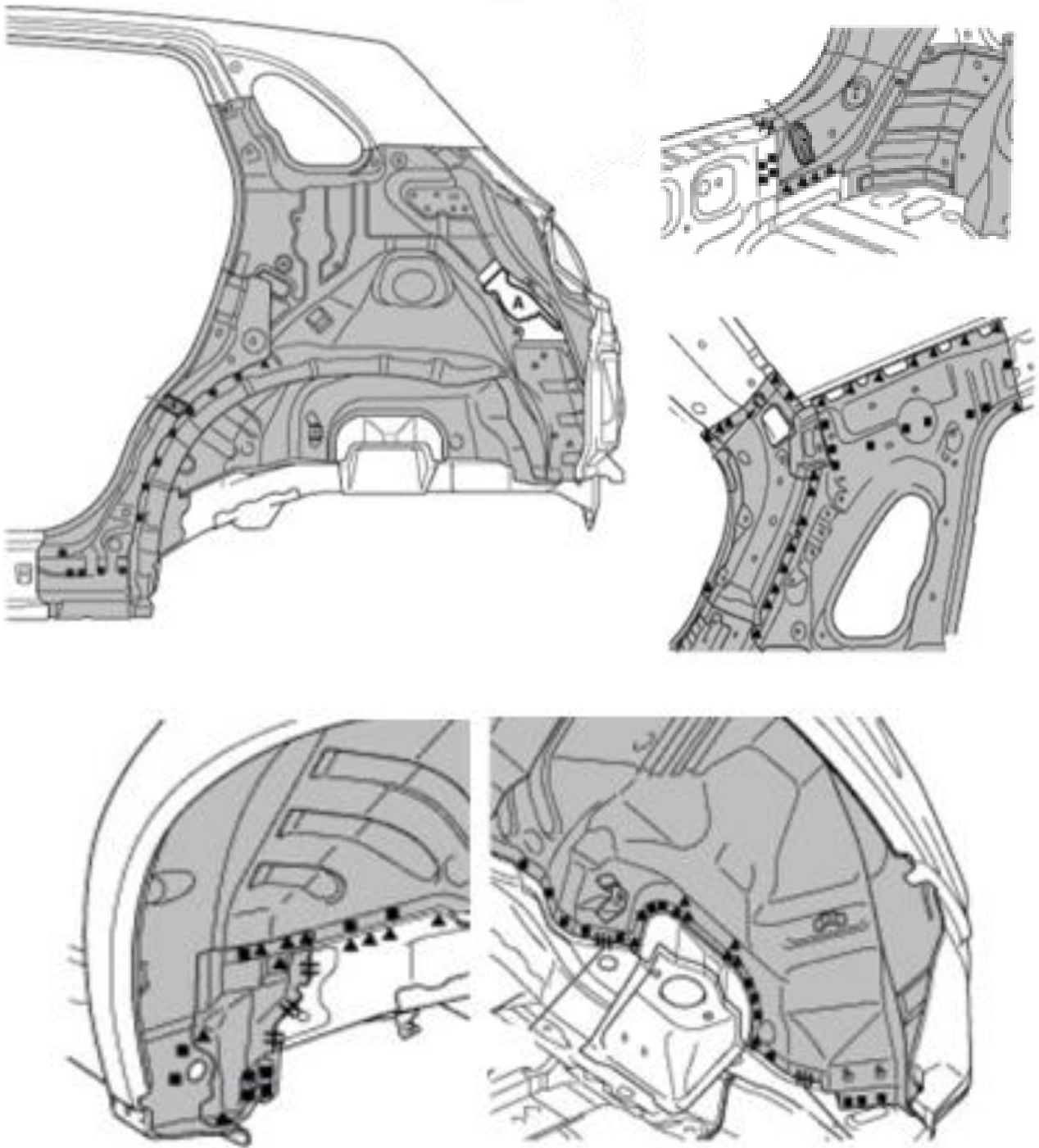


Image 4: NVH elements can often be left undisturbed. Image credit ⁽¹⁾.



Images 5 and 6: Many of the required weld points are in concealed locations (behind trims, floor coverings, and insulation, etc.) and covered by sealing materials, underseal, or texture coats.

REPAIR WELDS



Symbol	Operation description
● ● ● ●	Spot welding
■ ■ ▲ ▲	MIG plug welding (■ : indicates two panels to be welded ▲ : indicates three panels to be welded)

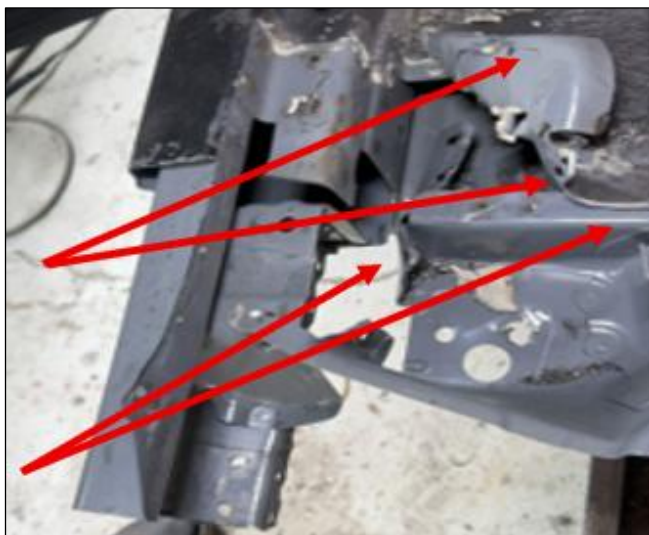
Image 7: In this Mitsubishi inner rear quarter replacement procedure example, the predominant welding method specified is GMA-MIG/MAG welding.

Factors When Considering the Use of Second-hand Multi-panel Sub-assemblies

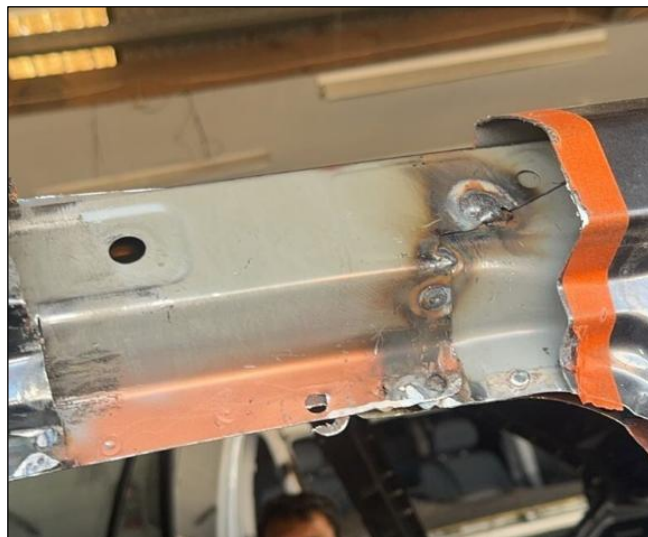
When evaluating the suitability of carrying out a repair using second-hand multi-panel sub-assemblies, a Repair Certifier must ensure that:

- all replacement second-hand sub-assembly components are of the same Like, Kind, and Quality (LKQ) as the vehicle being repaired (see *Note 6* below); and
- because second-hand replacement components will most likely be sourced from vehicles with unknown crash histories, they are carefully inspected for any previous repairs and pre-existing accident damage, as well as deterioration from corrosion (especially in situations where a donor vehicle may have been exposed to the elements for an unknown period); and
- where available, the specific vehicle manufacturer’s BRM information (especially documentation related to welding, cautions, warnings, limitations/prohibitions, model-specific requirements and specifications) has been studied and investigated thoroughly to ensure the multi-panel sub-assembly procedure being completed will return the vehicle to within the vehicle manufacturers’ safe tolerances (see *Note 7* below for examples of some vehicle manufacturer’s BRM welding information and requirements); and
- structural components are not sectioned (cut and joined), unless there is a written specific vehicle manufacturer’s procedure that allows it (see *Note 2* on Page 2), and any outer body panel sectioning to be performed is in accordance with the specific vehicle manufacturer’s BRM information or other supporting documents (where available); and
- all required welds are completed; and
- the weld locations are readily accessible without peeling back or cutting out adjacent welded components (including sectioning of outer body panels) to gain access to welded connections (unless specified in a manufacturer’s procedure) (see *Images 8 to 11* on Page 8).

<p>Note 6</p>	<p>LKQ stands for ‘Like, Kind, and Quality’ in the automotive industry, referring to salvaged, recycled, or second-hand vehicle manufacturer (OEM) components that match the safety and quality of the original components. Key aspects of LKQ components are:</p> <ul style="list-style-type: none"> • Definition: LKQ means the replacement component(s) are of the same model year (or newer, if applicable) and in serviceable condition. • Source: Are generally recycled, salvaged, or second-hand OEM components, <u>not</u> aftermarket components. • Quality and Safety: Being original OEM components, they usually offer better fit and function than aftermarket alternatives. • Cost-effectiveness: Most often are cheaper than new OEM components. • Availability: The best (and often only) option when OEM components are no longer available.
<p>Note 7</p>	<p>Vehicle manufacturer BRM welding information and requirements may include (but are not limited to):</p> <ul style="list-style-type: none"> • STRSW (spot-welding) information, such as: <ul style="list-style-type: none"> – 20-30% increase in weld points; and – inverter welding equipment; and – weld-bonding procedures; and – replacement weld points in different locations than the originals; and – practice welding and destructive testing; and – limitations and requirements for spot-welding Ultra and Advanced High Strength Steels (UHSS and AHSS). • GMA-MIG/MAG welding information, such as: <ul style="list-style-type: none"> – plug-weld hole size variations; and – weld-bonding requirements and limitations; and – weld locations restrictions (where GMA-MIG/MAG welding may not be allowed); and – welding techniques (e.g. stitch and skip methods); and – electrode (welding) wire specifications; and – practice welding and destructive testing.



Images 8 and 9: In these examples of what must not be done, adjacent welded components have been peeled back to access the inner weld points.



Images 10 and 11: In these further examples of what must not be done, adjacent welded components have been either fully removed (Image 10), or sectioned (Image 11), to access the inner weld points.

Examples of Second-hand Multi-panel Sub-assemblies

To follow are two examples of where second-hand multi-panel sub-assemblies have been used to replace significant accident damage on a vehicle. Both examples are considered appropriate and viable alternatives to the normal repair method of using multiple new weld-on components.

Example 1: Holden Colorado – Body-side Aperture and Roof Replacement

In this example, a complete inner and outer body-side aperture (including the roof structure [still attached]) has been installed (see *Image 12* on Page 9).

Attachment (by GMA-MIG/MAG plug welding) is performed at all original factory join locations, which are the:

- A-pillar to firewall/bulkhead and front floor (see *Image 13* on Page 9); and
- sill structure and C-pillar to rear floor and rear cab structure (see *Image 14* on Page 9); and
- roof structure to cant rail structure (see *Images 15 and 16* on Page 10).

While this is obviously a substantial cut and weld repair, the number of replacement welds required to perform this sub-assembly replacement procedure is in fact considerably fewer than what the vehicle manufacturer specifies in

the BRM if each new required replacement component were to be installed individually (i.e. inner and outer A-pillars, inner and outer B-pillars, inner and outer C-pillars, and inner and outer sill panels, roof panel, and associated components).

A key factor that makes this repair method a sound option is that the joining of all elements of the multi-panel sub-assembly to the repaired vehicle's structure occurs at original factory join locations.

It may also be possible for the joining of a multi-panel sub-assembly to occur at other than factory join locations if alternative join locations are allowed by either Vehicle Manufacturers' Information or Repair Industry Information (see Note 2 on Page 2).



Image 12: The complete inner and outer body-side aperture sub-assembly (including the roof) is replaced.



Image 13: Weld point detail - A-pillar and sill.



Image 14: Weld point detail - sill and C-pillar.



Images 15 and 16: Weld point detail – roof structure to existing inner cant rail and body-side structure.

Example 2: Holden Commodore (1997 - 2007) Front Compartment Replacement

In this example, the entire front compartment structure, made up of both chassis rails and inner guards, the front cross-member, and radiator support were replaced (see *Image 17* on Page 11). With the extent of the original damage requiring the replacement or repair of multiple individual components, replacing the entire front compartment in this way was entirely appropriate, with benefits including:

- a dramatic reduction in the number of replacement (GMA-MIG/MAG plug) welds - areas that required re-welding are limited to the rear mating flanges of the:
 - chassis rails to floor-pan rails (see *Image 18* on Page 11); and
 - inner guard aprons to bulkhead/firewall (see *Image 19* on Page 11); and
 - upper inner guard reinforcements to A-pillars (see *Image 20* on Page 11); and
- aside from the weld locations listed above, all original factory sealer materials and corrosion protection remains undisturbed (forward of the front floor and bulkhead/firewall areas); and
- all the factory welds, forward of the bulkhead/firewall area are retained; and
- accurate alignment is much easier to achieve; and
- set-up, and clamping and positioning procedures, are simplified; and
- pre-weld preparation and post-weld clean-up procedures are considerably reduced.

Like the Holden Colorado in the first example, a key factor that makes this repair method a sound option is that the joining of all elements of the multi-panel sub-assembly to the repaired vehicle's structure occurs at original factory join locations.

It may also be possible for the joining of a multi-panel sub-assembly to occur at other than factory join locations if alternative join locations are allowed by either Vehicle Manufacturer's Information or Repair Industry Information (see Note 2 on Page 2).



Image 17: Complete front compartment sub-assembly.



Image 18: Chassis rail to floor-pan rail weld points.



Image 20: Upper inner guard reinforcement to A-pillar weld points.



Image 19: Inner guard apron to bulkhead/firewall weld points.

Limitations of Vehicle Manufacturer-supplied Components

Multiple Individual Replacement Weld-on Components

While there are some exceptions (as shown in the 'Vehicle Manufacturers who Supply New OE Sub-assemblies' section of this Technical Bulletin), most vehicle manufacturers supply weld-on body replacement components (often described as 'service parts' or 'supply parts') only as individual elements that are connected at factory seams or at selected cut and join locations (or both).

These are detailed in the specific replacement (Cut and Weld) procedure(s) of the appropriate vehicle manufacturer's BRM.

Issues With Multiple Individual Replacement Weld-on Components

In contrast to the benefits of using second-hand multi-panel sub-assemblies outlined earlier in this Technical Bulletin, there are several down-sides to performing a significant collision-damage repair by using multiple weld-on components that most vehicle manufacturers supply individually. These down-sides include:

- In situations where multiple components that make up the structural integrity of the body (as per the examples listed in *Note 1* on Page 2) are replaced individually, a substantial amount of time and technical expertise is required to correctly align, position, and attach each individual element.

In many instances, fitting and subsequent welding operations need to be performed in specific sequences or defined order to allow for the installation of additional specialised materials and operations such as adhesive-bonding (see *Note 5* on Page 4), NVH installation, and corrosion protection and coatings application.

- While some vehicle manufacturers provide information on the replacement of multiple individual replacement weld-on components within a single procedure, many others don't - requiring the autobody technician to procure and navigate through multiple replacement procedure documents (see *Image 21* on Page 13).

This increases the risk of critical steps that need to be followed in the replacement of multiple components at the same time being misinterpreted, performed out of sequence, or overlooked altogether.

- Identifying the location or orientation of replacement welds within the 'panel stack' (or multi-panel layers) often means that different welding methods (other than those originally used by the vehicle manufacturer), or the installation of welds at strategic stages of the replacement process (that is, before the next panel layer can be installed), or both, will be required (see *Image 22* on Page 14).
- The large numbers of factory welds on the individual mating flange joints of multiple adjacent or connected components and structures (e.g. brackets, cross-members, and reinforcements) that require removal and subsequent re-welding, can be difficult and time-consuming to replicate in quality and appearance, significantly compromise original corrosion protection, and generate substantial additional heat, increasing the heat-affected zone (HAZ) on existing mating flanges (see *Image 23* on Page 15).
- In particular, new outer body-side (aperture) panels, are often not available as one-piece stampings (as used in production). For example, Toyota/Lexus only supplies the outer body-side panel pre-cut and divided into four or five sections and described as 'supply parts' (see *Image 24* on Page 15 and *Note 8* on Page 16).

Consequently, if the extent of the damage extends beyond that covered by the individual supply part (such as damage to both an A-pillar and B-pillar, or the full length of a sill/rocker), multiple panels may need to be purchased and subsequently welded together to encompass all the damaged area(s).

This creates undesirable multiple cut and join locations that increase the HAZ, additional time to perform welding operations, and alignment and fit-up challenges.

In instances where two or more new service panels need to be joined together in order to encompass all of the damage, the (pre-cut) cut locations of the individual replacement components often don't match up with each other, leaving gaps or spaces between joints that require additional (and often more complex) welding procedures to be performed (see *Image 25* on Page 16).



Apron Side Member Removal and Installation

NOTE

The figure below shows condition where the following parts are removed.

- Front fender (Front Fender Removal and Installation) in Section 9J
- Hood lock member and lamp support brace (Hood Lock Member and Lamp Support Brace Removal and Installation)
- Front fender bracket and front fender lower bracket (Front Fender Bracket and Front Fender Lower Bracket Removal and Installation)
- Cowl side outer member (Cowl Side Outer Member Removal and Installation)
- Dash side front panel, cowl side panel and cowl side reinforcement (Dash Side Front Panel, Cowl Side Panel and Cowl Side Reinforcement Removal and Installation)
- Fender apron panel, fender apron extension (Fender Apron Panel and Fender Apron Extension Removal and Installation)



Hood Lock Member and Lamp Brace



Front Fender Bracket and Front Fender Lower Bracket



Cowl Side Panel Outer Member



Dash Side Front Panel, Cowl Side Panel and Cowl Side Reinforcement



Fender Apron and Fender Apron Extension

Image 21: In this Suzuki example, there are five individual procedures required to replace the front inner guard and chassis rail structure.

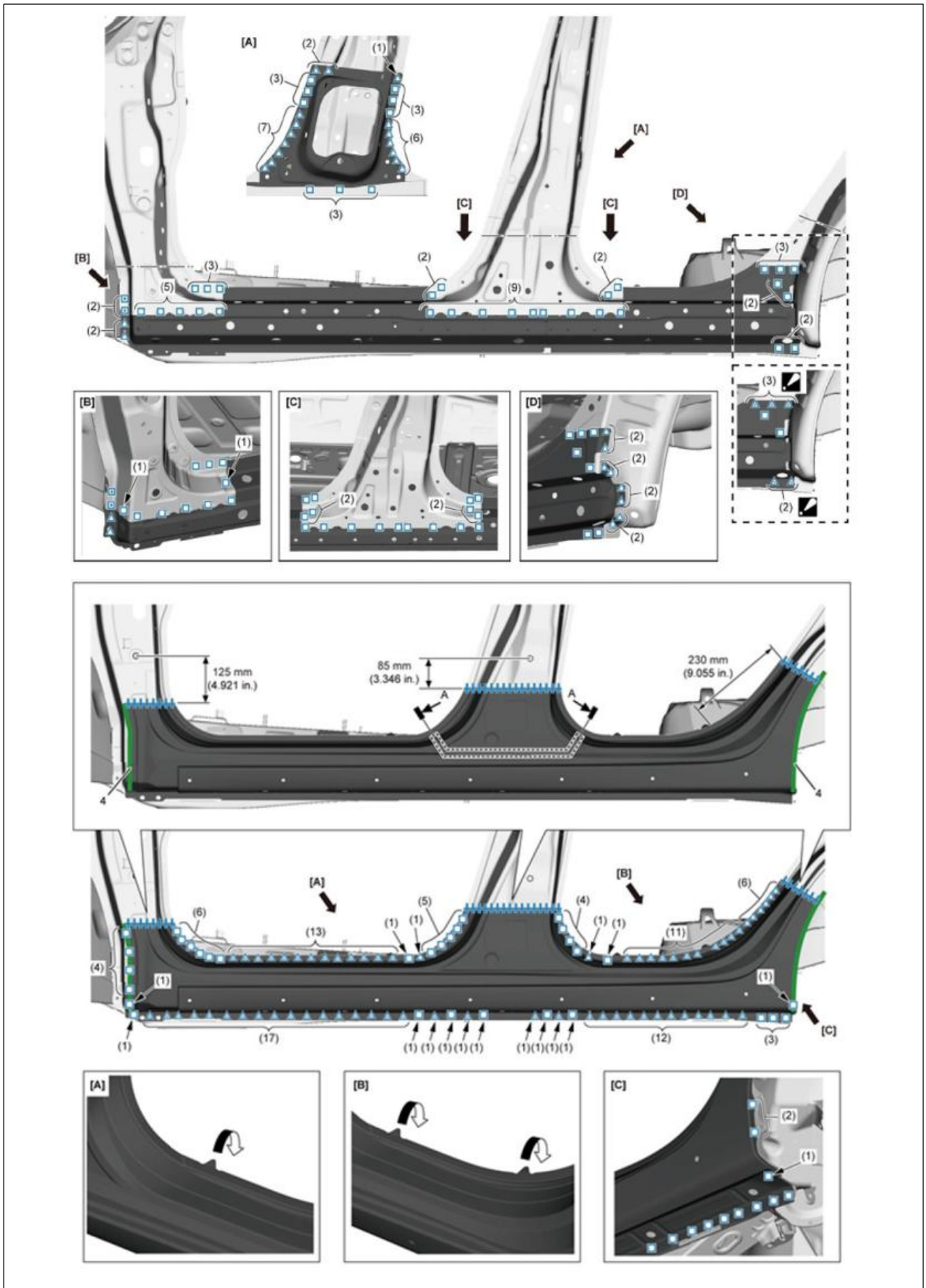


Image 22: Inner and outer sill/rocker replacement procedure excerpts from a Suzuki BRM.

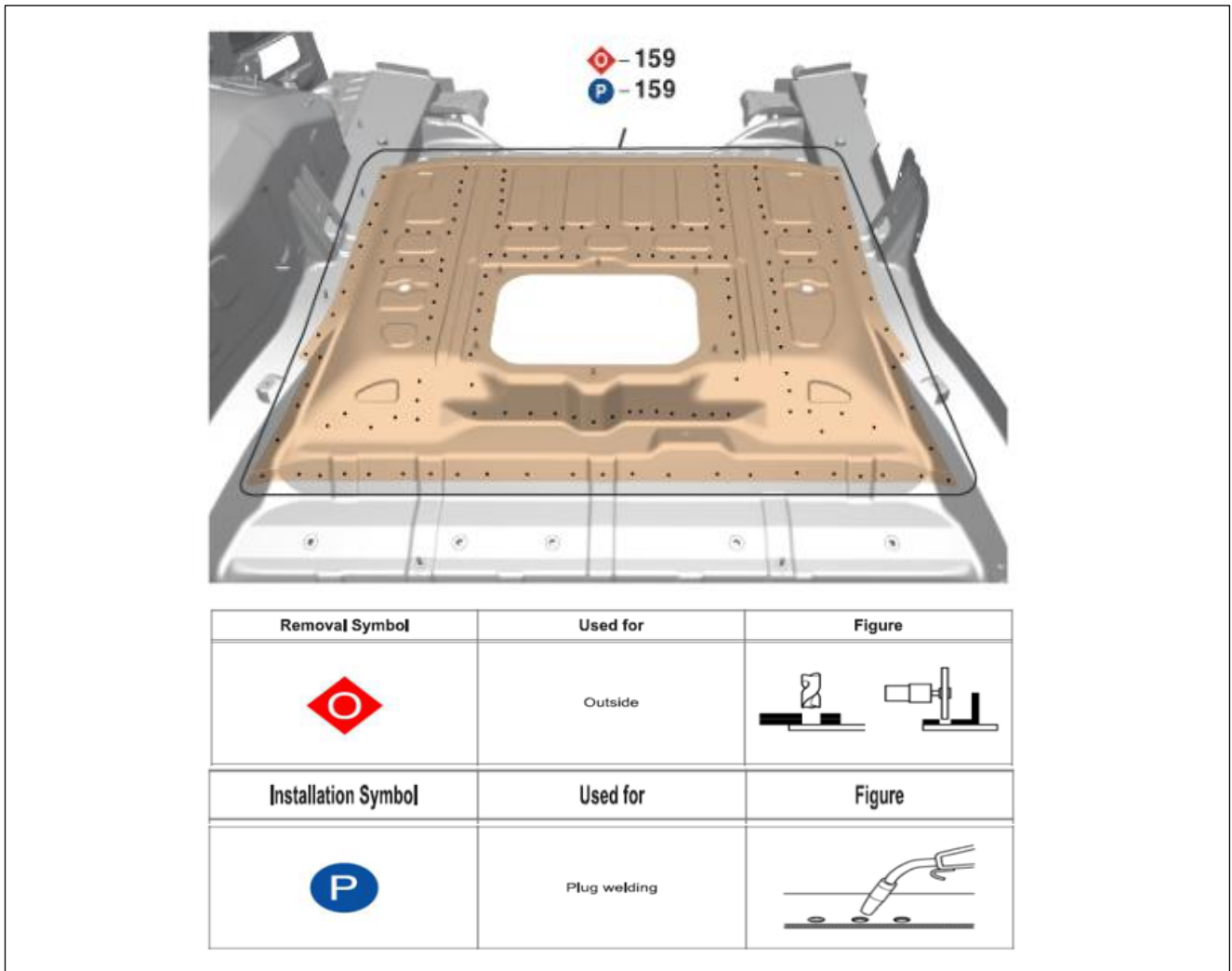


Image 23: A Hyundai Boot Floor Replacement Procedure showing the large number of welds that are required to re-attach all the associated individual components to the new replacement panel.

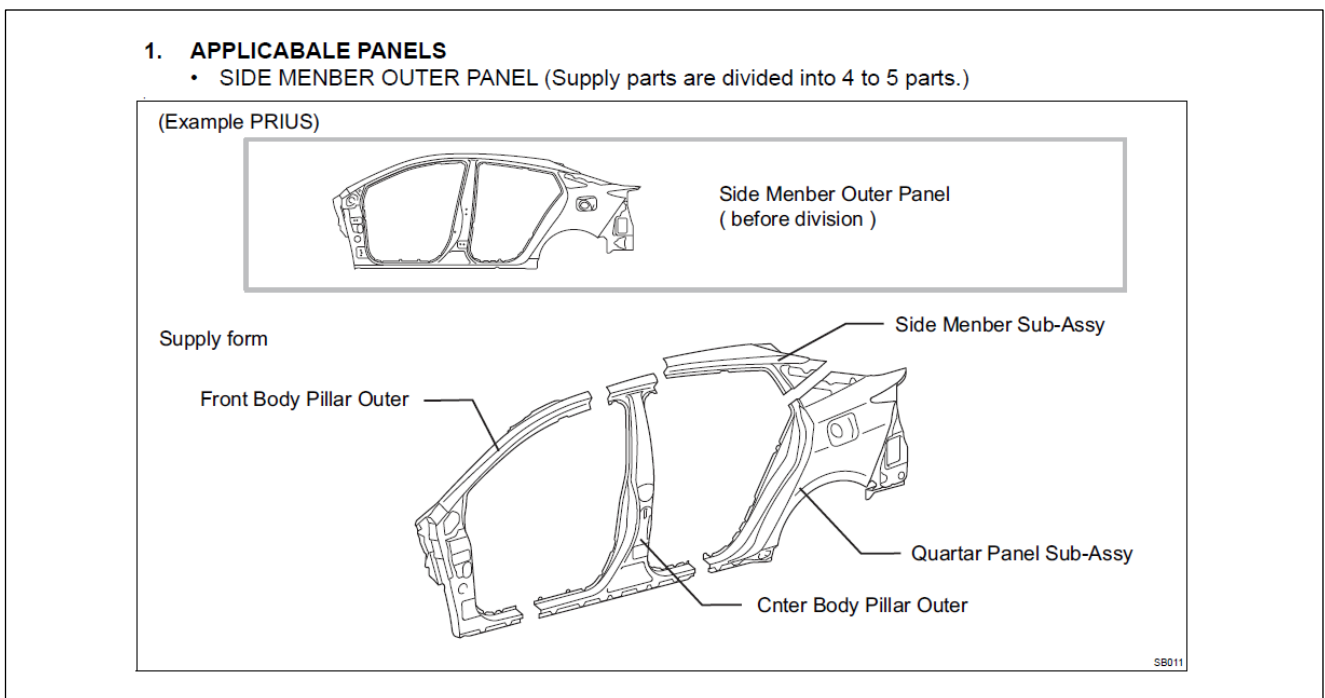


Image 24: Excerpt from the Toyota's 'Partial Repair of the Outer Panels (Cut & Join Repair of Outer Panels)' Technical Bulletin.

Note 8	<p>Examples of other vehicle manufacturers that may not necessarily supply outer body-side panels in one piece include:</p> <ul style="list-style-type: none"> • Hyundai/Kia • Honda • Mitsubishi.
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Image 25: When fitting two or more outer panels, the cut locations of the (pre-cut) supply parts often don't match up with each other.

Vehicle Manufacturers Who Supply New OE Sub-assemblies

If New Is Appropriate, So Is Second-hand

There are several vehicle manufacturers who supply new genuine replacement multi-panel sub-assembly service components to the repair industry. The same engineering logic that led vehicle manufacturers to supply new multi-panel sub-assemblies (together with replacement procedures) forms part of RepairCert NZ's position on supporting and encouraging the use of second-hand multi-panel sub-assemblies in appropriate situations. There is no good reason why second-hand multi-panel sub-assemblies (of the same LKQ) wouldn't be suitable substitutes to genuine new multi-panel sub-assemblies in many instances.

Some examples of new multi-panel sub-assemblies supplied by vehicle manufacturers are provided below.

Example 1: GM Holden VE and VF Commodore Models - Side Door Opening Frames

For VE and VF Commodore models, in addition to GM Holden supplying (or previously supplying) many individual body-side inner and outer components, including the A-pillar, B-pillar, sill/rocker, and inner and outer rear quarter panels (and corresponding BRM replacement procedures), they also supply the inner and outer body-side as a complete, pre-welded, multi-panel sub-assembly (see *Image 26* on Page 17).

The multi-panel sub-assembly includes the entire outer (one-piece) body-side panel, inner rear quarter components, rear wheelhouse, inner cant rail structure, and all reinforcement components. The BRM for both models also includes comprehensive replacement procedures information under the description heading 'Side Door Opening Frame Replacement' (see *Image 27* on Page 17 and *Note 9* on Page 18).

Importantly, replacement of the side door opening frame requires other (commonly undamaged) components to be removed and replaced to complete the procedure in accordance with the BRM, which are the:

- roof panel; and
- upper inner guard to A-pillar reinforcement.



Image 26: The complete (installed) multi-panel body-side sub-assembly on a VF Commodore sedan.

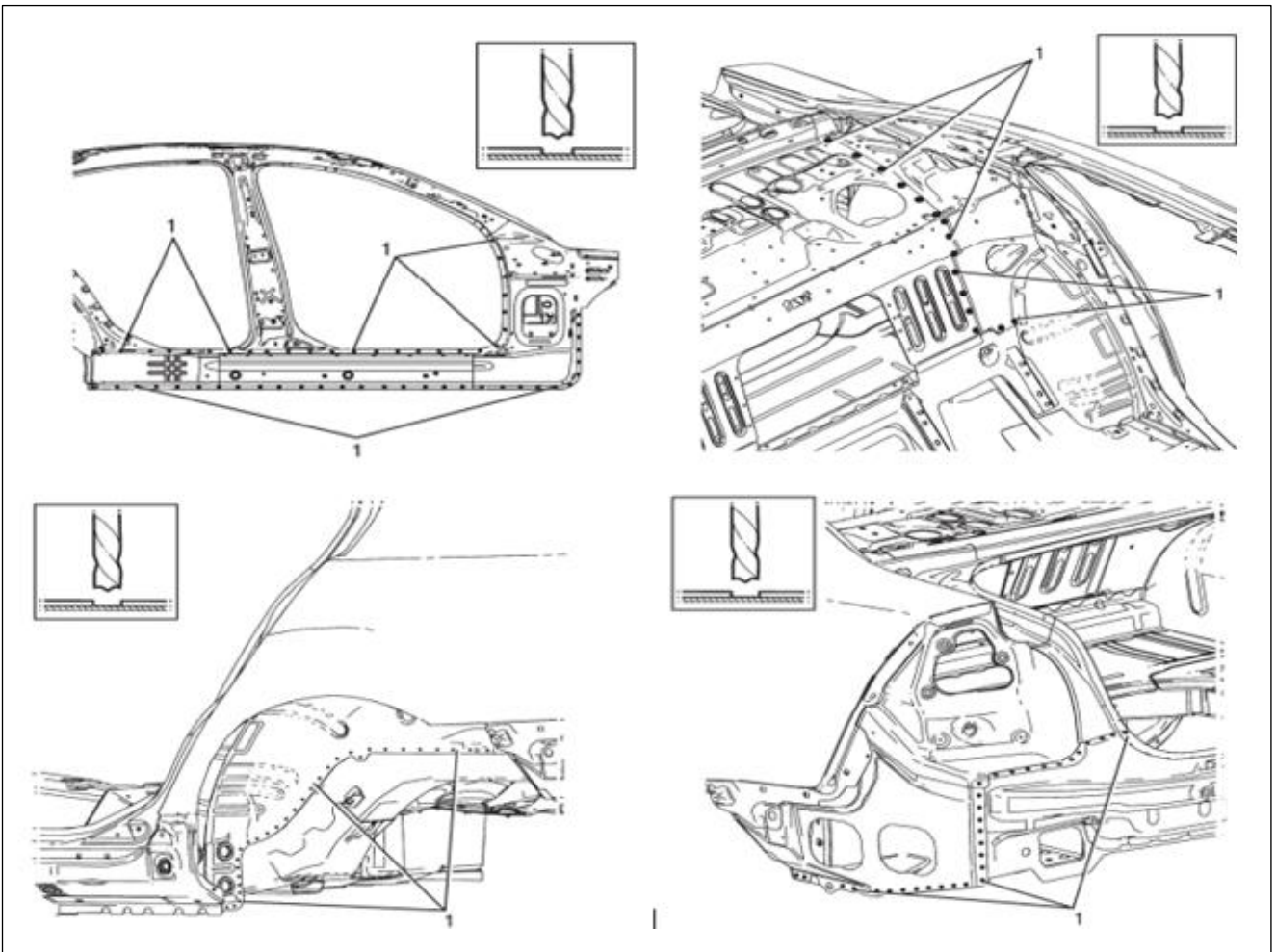


Image 27: Excerpts from the GM Holden BRM procedure 'Side Door Opening Frame Replacement'.

<p>Note 9</p>	<p>Side Door Opening Frame Replacement procedures include two extremely important notes (listed directly under the description heading) that must be read and understood before proceeding. These are:</p> <ul style="list-style-type: none"> • <i>This Procedure refers ONLY to the replacement of the entire body-side service assembly.</i> • <i>This Procedure does NOT allow for the replacement of the body-side outer skin panel.</i>
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Example 2: Hyundai and Kia - Front and Rear Compartments, A-pillar, Door Ring, and B-pillar

Available HMG Multi-panel Sub-assembly Replacement Components

The Hyundai Motor Group (HMG), which includes the Kia Corporation and luxury brand Genesis, is another vehicle manufacturer who supplies multi-panel sub-assembly replacement components (together with corresponding BRM replacement procedures) for many previous and current model platforms.

Depending on the model and year of manufacture, typical multi-panel sub-assembly service components (and related replacement procedures) that are available include the:

- front inner guard and strut tower (see *Image 28* below); and
- rear inner quarter and wheelhouse (see *Image 29* below); and
- A-pillar (primarily for previous generation platforms) (see *Image 30* below); and
- door ring (new generation platforms) (see *Image 31* below); and
- B-pillar (see *Image 32* on Page 19).

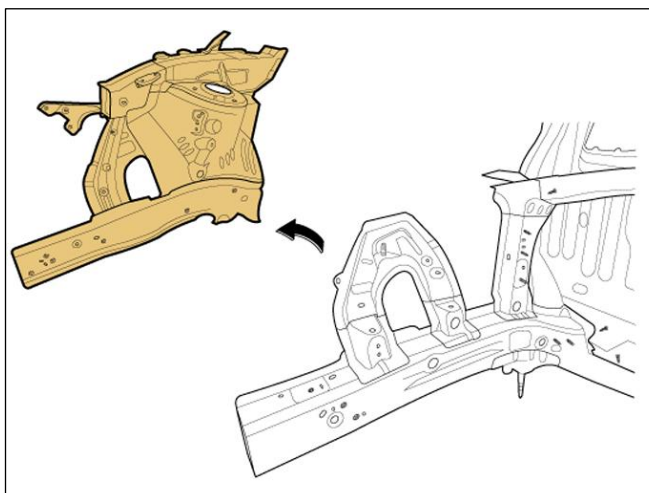


Image 28: Inner guard and strut tower sub-assembly.

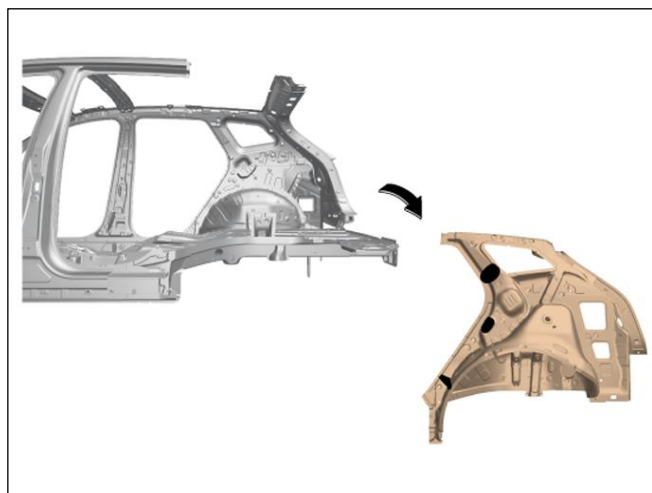


Image 29: Inner rear quarter and wheelhouse sub-assembly.

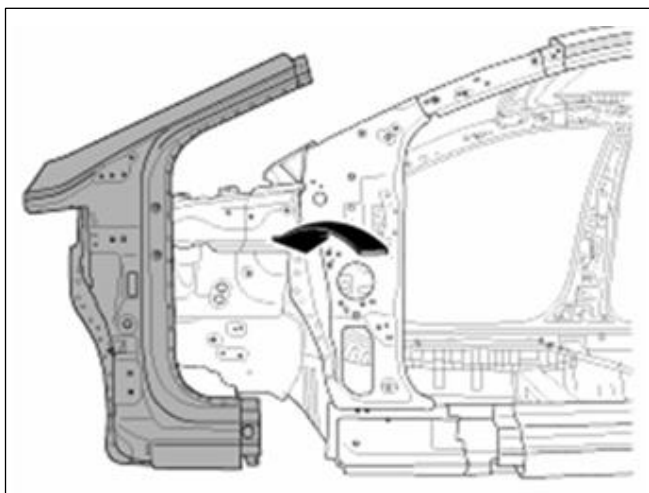


Image 30: A-pillar sub-assembly (previous generation platforms).

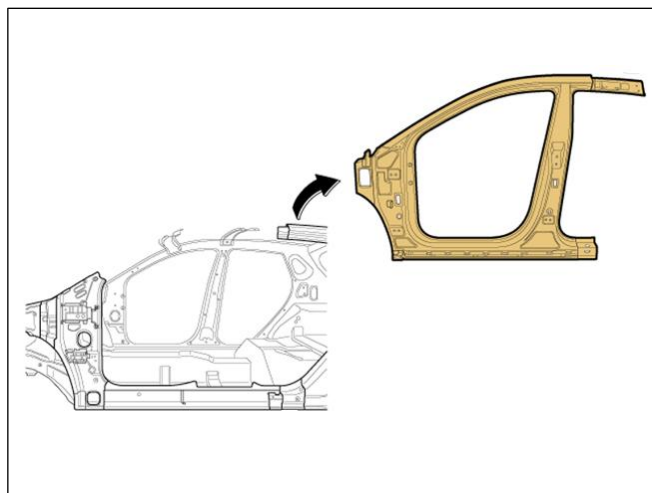


Image 31: Door ring sub-assembly (new generation platforms).

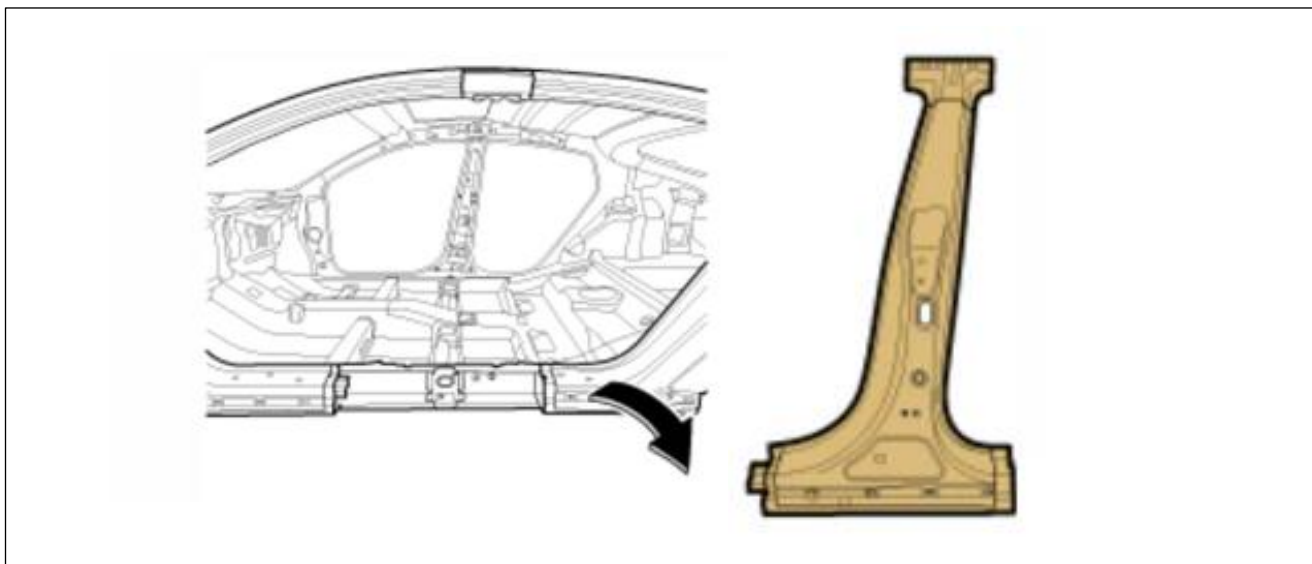


Image 32: B-pillar sub-assembly.

Important Information About HMG Multi-panel Sub-assembly Replacement Components

HMG replacement multi-panel sub-assembly service parts don't necessarily include all the welded components that are associated with (or make up) conventional sub-assembly structures (as would normally be expected).

In these instances, supplementary removal, installation and welding procedures will often need to be performed, as well as the procurement of additional replacement components (see *Image 33* below).



Image 33: In this example, the inner rear quarter multi-panel sub-assembly doesn't include the two components shown in yellow.

In conjunction with the information specified in the applicable BRM replacement procedure, the 'service condition' of many A-pillar, B-pillar (see *Image 34* on Page 20), and door ring (see *Note 10* on Page 20) multi-panel replacement sub-assemblies will most likely dictate that a combination of different joining methods (over and above conventional GMA-MIG/MAG plug welding and STRSW processes) are required (see *Image 35* on Page 20).

Additional welding procedures may include:

- outer panel(s) sectioning and open-butt welds (cut and join locations); and
- inner panel(s) (reinforcements) sectioning and open-butt welds (cut and join locations); and

- STRSW and GMA-MIG/MAG weld-bonding (see Note 5 on Page 4); and
- rivet-bonding.

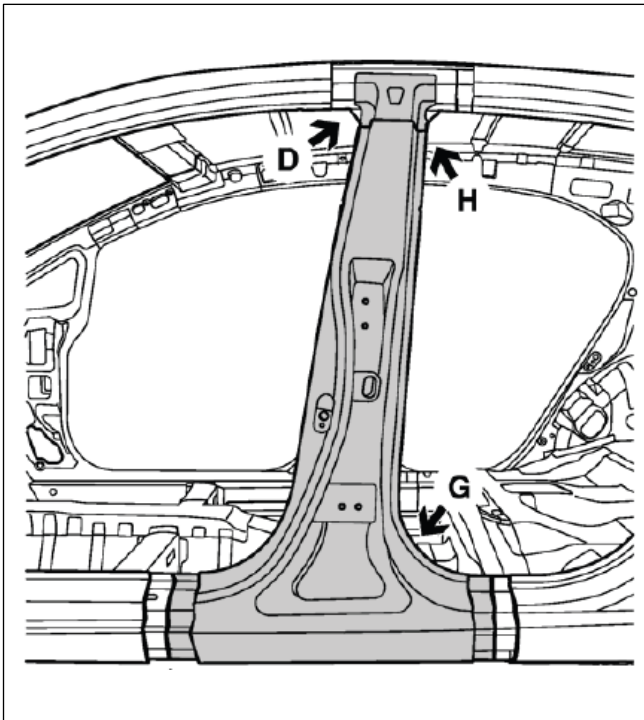


Image 34: Typical 'service condition' of a B-pillar multi-panel sub-assembly.

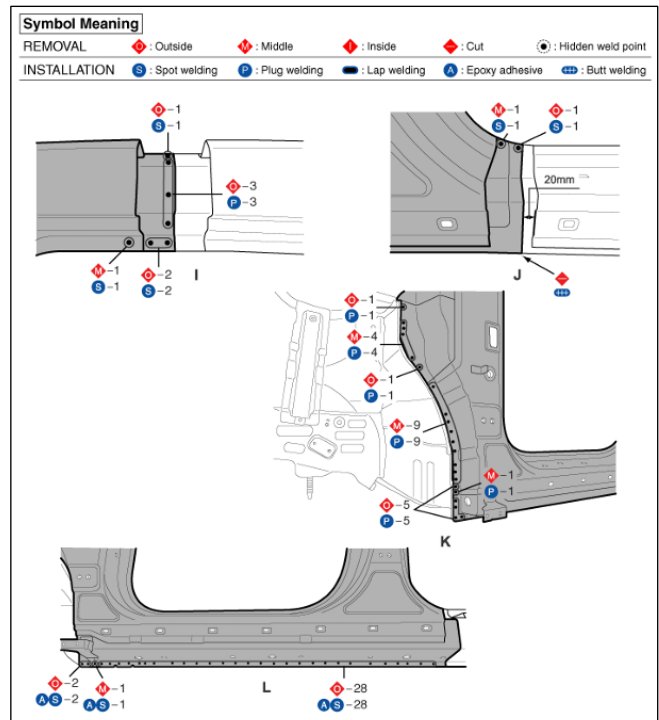


Image 35: Multiple joining methods are typically required.

Note 10	To learn more about door ring replacement procedures, click here to view <i>RepairCert NZ Technical Bulletin # 02-2024 Door Ring Replacement Procedures and Sectioning Guidelines</i> on the RepairCert NZ website .
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Repair VIRM Requirements

Mandatory Content

While the Best-practice Guidance contained in this Technical Bulletin is provided as (non-mandatory) supporting information to help a Repair Certifier achieve the best possible outcomes, the following requirements are copied from the *Repair VIRM* (consolidated for clarification and with links to the appropriate *Repair VIRM* sections) and, together with the requirements from the *Compliance Rule* and *Repair Rule* on Page 2, must in all cases be applied.

Appropriate Repair Methods

Vehicle Manufacturer's Information must be applied in the first instance, and where this is not available or not relevant, then available and relevant Repair Industry Information must be applied (see *Note 2* on Page 2).

It is the responsibility of the Repair Certifier to justify any departure from the relevant Vehicle Manufacturer's Information or Repair Industry Information, and prove that the vehicle is returned to within a safe tolerance of its state when manufactured.

VIN and Chassis Number (click [here](#))

A VIN or chassis number must not be:

- removed, or
- erased, or
- altered, or

- defaced, or
- obscured, or
- destroyed, or
- obliterated, or
- affixed unlawfully or by unauthorised persons.

If the VIN is removed or replaced during repair, the Repair Certifier must provide the TSD agent with all relevant information describing which parts of the vehicle were affected by the repairs and the source of any parts used (including the registration plates, VIN or chassis number of any donor vehicles). The TSD agent will complete the required documentation and reattach the VIN.

Vehicle Structure (click [here](#))

Unibody Chassis Rails (click [here](#))

During the repair of any chassis rails (including the chassis rails of a unibody vehicle):

- the performance of a frontal impact occupant protection system must not be affected by any factor, including corrosion, structural damage, material degradation, inadequate repair, the fitting of additional equipment or the removal of equipment; and
- heat must not be applied to a rail in a manner that does not follow the manufacturer's specifications; and
- the replacement of damaged parts at factory seams should be done whenever practicable and when required by the vehicle manufacturer.

A-pillars (click [here](#))

During the repair of any A-pillars:

- a foam-filled pillar must have any foam (NVH) materials that has been removed in the repair process reinstated with the correct NVH materials; and
- filler must not be applied to the windscreen bonding face of the pillar (click [here](#) for *RepairCert NZ Technical Bulletin # 02-2022 Correct Aperture Preparation for Bonded Glass*); and
- correct etch primer must be applied to the windscreen bonding face of the pillar; and
- damaged parts should be replaced at factory seams whenever practicable and when required by the vehicle manufacturer.

Vehicle Measurement (click [here](#))

A three-dimensional chassis measurement (click [here](#)) must:

- record actual measurements; and
- where no measurement tolerances are available, show that the chassis measurement does not exceed a measurement tolerance of +/- 3mm for a unibody; and
- show the vehicle is within the manufacturer's or measurement sheet's specified measurement tolerances; and
- incorporate a measurement sheet which records the vehicle's details (e.g. make, model, mechanical components); and
- show that adequate measurements have been taken to determine whether the vehicle is within specification.

General Repairs (click [here](#))

Welding (click [here](#))

When performing welding repairs:

- the vehicle manufacturer's welding procedures must be followed; and

- when the vehicle manufacturer provides no information, a recognised repair research organisation's procedures must be followed; and
- all welds must be completed to NZS 1554 or I-CAR compliant standards.

Replacement Components (click [here](#))

When fitting replacement components:

- the replacement components, parts, or systems must comply with approved vehicle standards; and
- any second-hand replacement components, parts, or systems that have been fitted must be accompanied by evidence:
 - of the origin of the component, part, or system; and
 - that the donor vehicle meets the same standards as the vehicle being repaired; and
 - that the replacement component, part, or system meets the same specifications as the replaced component, part, or system; and
 - that the replacement component, part, or system is within the manufacturer's tolerances or specifications.

Component Protection (click [here](#))

To ensure adequate corrosion protection within a repair:

- where required, weld-through primers are to be used during the repair; and
- any seams must be sealed using a suitable sealant; and
- manufacturer's corrosion protection instructions or a recognised repair research organisation's procedures (e.g. RepairCert NZ's four *Corrosion Technical Bulletins*) must be used.

Electrical Safety Systems (click [here](#))

To ensure the correct operation of any electrical safety systems which may be affected during a repair, NZTA's *Technical Bulletin 3/Declaration for SRS, ABS, ESC, and ADAS inspections* should be referred to (click [here](#)).

Summary

When performing multi-panel sub-assembly replacement (irrespective of whether second-hand or new) Repair Certifiers and autobody repairers should always first refer to any relevant and available Vehicle Manufacturer's Information, including for all removal and installation procedures being performed. Where relevant Vehicle Manufacturer's Information is unavailable or incomplete, then Repair Industry Information, or the Best-practice Guidance provided in this Technical Bulletin, should be followed.

The concept of multi-panel sub-assembly replacement:

- is an entirely appropriate repair method to use on body structures with damage to multiple panels that would otherwise require replacements on an individual basis; and
- is a method used by numerous vehicle manufacturers for selected types of collision damage in strategic areas of the body structure; and
- enables the retention of substantially more original corrosion protection; and
- disturbs far fewer factory weld points; and
- reduces (often dramatically) the number of replacement welds required; and
- reduces fit-up and alignment time.

Second-hand multi-panel sub-assembly replacement:

- is, in appropriate circumstances, encouraged and supported by RepairCert NZ for the reasons listed above; and

- must incorporate second-hand components which are of the same Like, Kind, and Quality (LKQ).

By following the Best-practice Guidance in this Technical Bulletin, a Repair Certifier's decisions are likely to be correct, and compliant with the *Compliance Rule*, *Repair Rule*, and the *Repair VIRM*.



FOR FURTHER INFORMATION PLEASE CONTACT REPAIRCERT NZ.

Image Credits

(1) <https://www.nxtbook.com/nxtbooks/sae/19AUTP06/index.php?startid=26#/p/26>

Disclaimer

This document has been developed by subject matter experts for use by industry professionals and is based on the best available information at the time of its development. It is intended to provide general guidance and information to qualified professionals with the knowledge to interpret and apply the content appropriately. Technical standards, specifications, and Land Transport Rules and VIRM requirements are subject to change, and users are responsible for verifying the relevance and accuracy of the information with current standards and best practices.

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