

Motor Vehicle Body Repairs

For further information please write to the Manager, Vehicle Safety Branch
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INTRODUCTION

This information sheet supersedes all previous issues of VSI 25 and provides some general information that should be considered when repairing a motor vehicle.

A motor vehicle is required to comply with the applicable Australian Design Rules (ADRs). There are now over 80 ADRs which apply to the design and construction of a vehicle. A number of these design rules can be affected when a vehicle is repaired after crash damage.

Vehicle manufacturers are continually improving the design and construction of motor vehicles and you will need to be aware of the types of materials used in the construction and any particular repair processes specified by the vehicle manufacturer.

Therefore when repairing a vehicle you must be aware of the effects the repair could have on the overall safety of the vehicle and its compliance with the ADRs and take all the steps necessary to return the vehicle to at least its pre-crash level of safety.

In addition all repairs must be carried out in accordance with the latest applicable industry standards and codes of practice.

DEFINITIONS

Approval Certificate

An Approval Certificate is a technical assessment certificate issued by a participant in the Vehicle Assessment Signatory Scheme (VASS).

A list of VASS signatories is available from any VicRoads Registration and Licensing office, the VicRoads internet site or by contacting VicRoads on 1300 360 745.

Sectionalised Repair

A Sectionalised Repair is a method of repairing a vehicle by replacing a damaged section of the vehicle body with a new or salvaged section.

Vehicle Identity Validation (VIV) Certificate

A *Vehicle Identity Validation (VIV) Certificate* is evidence that the vehicle has been inspected and its identity confirmed by a VIV inspector.

Vehicle Damage and Structural Repair Report

A *Vehicle Damage and Structural Repair Report* is a report issued by a suitably qualified person, who is the owner or manager of a company recognised by an insurance company as a vehicle damage repairer, declaring that the vehicle has been correctly repaired and that all safety related items have been returned to pre-crash condition.

Written Off Vehicle

A *Written Off Vehicle* is a vehicle which because of damage has been assessed as either:

A *Repairable Write Off*, which is a vehicle that has been damaged to the extent that its salvage value plus the cost of repairing the vehicle for use on the road exceeds its market value;

or

A *Statutory Write Off*, which is a vehicle that has been damaged to the extent that it must not be repaired and can only be used for parts.

However, if the vehicle is a Statutory Write Off because of salt water immersion then no structural components or panels, including the side doors, from the Statutory Write Off can be used to repair another vehicle.

A Statutory Write Off cannot be re-registered and the Vehicle Identification Number (VIN) of the Statutory Write Off cannot be reused.

GENERAL REQUIREMENTS

Compliance

A vehicle is designed and assembled so that it complies with the occupant protection ADRs. In order that a repaired vehicle continues to comply, all panels, rails, sub-frames and body components must be in good condition and attached in accordance with the manufacturer's guidelines and any applicable industry code of practice.

All lighting on a vehicle is required to comply with the ADRs. Any replacement lamp or globe must be of the correct type for the particular vehicle and marked as complying with the appropriate standard or ADR. Non-complying lamps must not be used.

Structural Repairs

High strength low alloy steel (HSLA) is often used in panels and components and requires particular attention in the repair process. HSLA steel is heat sensitive and excessive deformation and straightening will be detrimental to the strength of the material. Where any doubt exists damaged panels or components made from HSLA steel should be replaced.

Damaged sub-frames or rails must not be repaired or straightened unless it is a repair recommended by the vehicle manufacturer and carried out in accordance with the vehicle manufacturer's guidelines. In most cases the preferred method is for either new or previously used undamaged salvaged components, to be fitted as a unit in accordance with the vehicle manufacturer's instructions or industry codes of practice.

Structural components or panels, including the side doors, from a vehicle that was assessed as a Statutory Write Off because of salt water immersion must not be used in the repair.

There are a number of areas within the body structure of modern day vehicles where adhesives and expanding type sealers are used. Repairs to these areas must utilise the same manner of fitment and sealing methods as used by the vehicle manufacturer during construction.

Where applicable, the vehicle manufacturers repair instructions must be followed when the damaged body structure is being subjected to either pulling or bending forces in the process of correcting both distortion and alignment. It is important that any bonded or sealed body joint is not subjected to damage during the repair process.

Repairs to side doors must not result in the door not complying with side intrusion requirements. Damaged side intrusion bars must be replaced and attached in the same manner as the original.

All panels must be correctly sealed and treated with the appropriate anti-corrosion protection in accordance with the vehicle manufacturer's guidelines or industry codes of practice.

The windscreen and rear window form part of the vehicle structure. Incorrectly fitted windscreens or rear windows will adversely affect the roof strength and its performance, particularly in a roll over. Therefore it is important that the correct adhesive and application procedures are used when fitting a windscreen or rear window.

Restraint and Occupant Protection Systems

Particular care should be taken when repairing damage to an area which could affect the airbag sensors. This includes all front panels and frame components for vehicles fitted with front airbags and in addition the relevant side panels and components for vehicles fitted with side and or curtain type airbags. These panels must be repaired or replaced in accordance with the vehicle manufacturer's guidelines or industry codes of practice.

Airbags that have deployed must be replaced, the processor reset, and all associated equipment and sensors returned to their original specification.

The entire seat belt assembly including the pretensioners if fitted, must be replaced if the seat belt was worn in a severe impact even if damage to the seat belt assembly is not visible.

Seat belts form an important part of the vehicle's occupant protection package and it is important that any replacement seat belt is the correct one for the particular vehicle.

For example a seat belt that has been designed for a vehicle with an airbag may have different performance characteristics to one designed for a vehicle without an airbag

Certification

Repaired vehicles may require a Certificate of Roadworthiness for registration or other transaction. A Licensed Vehicle Tester may require a Vehicle Damage and Structural Repair Report or an Approval Certificate to assist in determining the structural integrity of the vehicle for the purposes of issuing a Certificate of Roadworthiness.

In addition a repairable write off will need to be issued with a Vehicle Identification Validation (VIV) Certificate before registration can take place.

Reshelled Vehicles

The practice of re-shelling a damaged vehicle by using either a body in white or a salvaged body shell is no longer allowed. Re-shelled vehicles will not be accepted for registration

SECTIONALISED REPAIRS

A sectionalised repair should be carried out in accordance with the following guidelines. However the vehicle manufacturer's recommendations or procedures plus industry codes of practice applying to the repair will also need to be complied with.

Requirements

All repairs should be carried out by qualified tradesmen in such a manner that the safety and structural soundness of the vehicle is not adversely affected as compared with its original standard of manufacture.

The section to be used should be:

- A new section supplied as a service assembly by the vehicle manufacturer or,
- A suitable assembly removed from a new body shell as supplied by the vehicle manufacturer, or
- A suitable undamaged section salvaged from another vehicle of the same make, model and variant as the damaged vehicle.

The section must be of a similar age or younger, and in a sound and generally undamaged condition with no previous major repairs which could affect the strength of the basic structure.

However, no section, structural component or panel, including the side doors, from a vehicle that was assessed as a Statutory Write Off because of salt water immersion can be used in the repair.

Repair Procedures

The method of repair should be based on the original fabrication technique as used in the original construction of the vehicle. Any repair procedures issued by the vehicle manufacturer should be complied with.

All joints across box sections should be staggered to enable:

- Ease of assembly with sliding adjustment for accurate alignment and measurement.
- Each weld to be separated by a non affected zone for maximum strength and safety.
- The correct line and shape to be more easily obtained.

All indirect damage should be re-aligned with the body intact, using the damaged section as leverage. Any damage on the existing body which extends beyond the point where it is to be cut is to be made good, and any misalignment corrected before the section to be replaced is removed.

Common points on the sill panel, pillars and inner and outer rails, from which the cutting points are measured should be selected and marked.

These common points should be identical to both sections and selected from such positions as factory stamped edges, swages, jig holes, etc.

Measurements should be recorded for:

- Windscreen and/or rear window openings.
- Door openings (length of sill and centre pillars).
- Under frame rails.

Cutting and Joining

All cutting lines should be clearly and accurately marked so that the sections to be joined will match accurately.

Filler pieces are not an acceptable method of making good, poorly fitting sections.

All cuts should be made with appropriate cutting tools. Oxy-acetylene cutting is not acceptable as a final cut.

Staggered cuts are required on box sections. The cut on the inner and outer box section must be staggered by a minimum of 50 mm. For each and every adjacent panel or rail, a further 50 mm staggered cut is required. A continuous straight line joint is not acceptable.

Wherever possible, the floor panel should be joined at the original lap joint. Where a non-original joint is transverse in the floor pan the minimum overlap is to be 12.5 mm.

Non-original transverse joints should be located in the centre of an existing cross member.

All edges should be accurately trimmed to the cutting line then, with the vehicle set up on a dedicated jig or a universal system the sections should be temporarily held or clamped together while all measurements are checked. When the alignment is correct, the sections should be locked in position and all joints welded.

Welding

Where the vehicle manufacturer has specified a particular welding process or technique then these requirements must be complied with. In all other cases the welds should be fusion welds carried out in accordance with current industry standards. Bronze welding is not acceptable.

The area to be welded should be brought back to a clean metal surface for no less than 25 mm both sides of the joint, prior to welding.

All internal reinforcement of box members should have a continuous fusion weld at the joint.

Pinch weld flanges should be spot or tack welded at a minimum of 20 mm intervals.

All butt welds should have continuous fusion welds.

Spot welds should be spaced at a minimum of 20 mm intervals over the lap joint area or as originally spaced in manufacture, provided this does not exceed 20 mm. Alternatively a continuous fusion weld may be applied on one side and spot or tack welds at suitable intervals on the other.

Sealing and Finishing

Welds, particularly on structural members, should not be ground back to such an extent that the strength of the joint would be affected.

All subject joints and heat affected areas must be effectively prepared and sealed in accordance with current trade techniques to minimise the onset of corrosion.