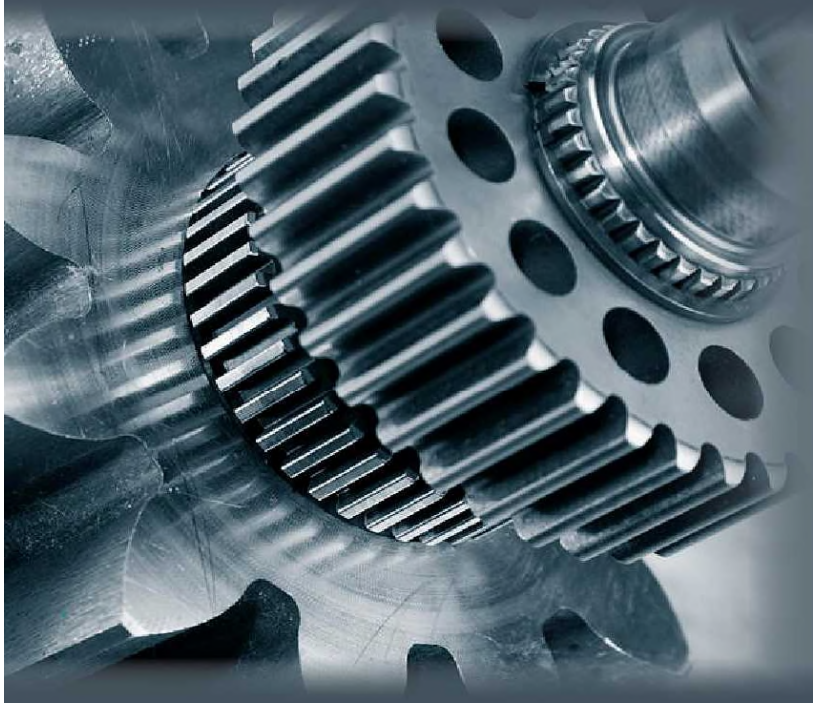
NATIONAL CODE OF PRACTICE



VSB 6

HEAVY VEHICLE MODIFICATIONS

Section R
Vehicle Mounted Lifting Systems - NonSlewing

HEAVY VEHICLE MODIFICATIONS

1. SCOPE

This Section relates to the fitting of non-slewing lifting systems to heavy vehicles.

It outlines the minimum requirements for non-slewing lifting systems to heavy vehicles and includes the fitting of wheelchair loading devices.

2. GENERAL INFORMATION

This Section collates the requirements of a number of different modifications to vehicles. Each modification type is sufficiently different from the others that all data relating to that modification should be grouped together. Accordingly, each modification type is treated as a stand-alone Modification Code & Checklist.

3. ADR's AFFECTED

The fitting of a non-slewing lifting system will not normally affect any ADRs directly; such fitting will reduce the vehicle's payload capacity equivalent to the mass of the lifting system, unless the GVM rating of the vehicle is increased. If the GVM rating is increased, recertification to all GVM related ADRs would be required. Refer to Section S- Vehicle Rating of this National Code of Practice.

The following ADRs may be affected by the installation of a non-slewing lifting system:

ADR 13/..; *Installation of Lighting and Light Signalling Devices*;

ADR 14/..; *Rear Vision Mirrors*;

ADR 17/..; *Fuel Systems*;

ADR 42/..; *General Safety Requirements*;

ADR 43/..; *Vehicle Configuration & Dimensions*;

ADR 58/..; *Requirements for Omnibuses for Hire & Reward*;

ADR 62/..; *Mechanical Connections between Vehicles*.

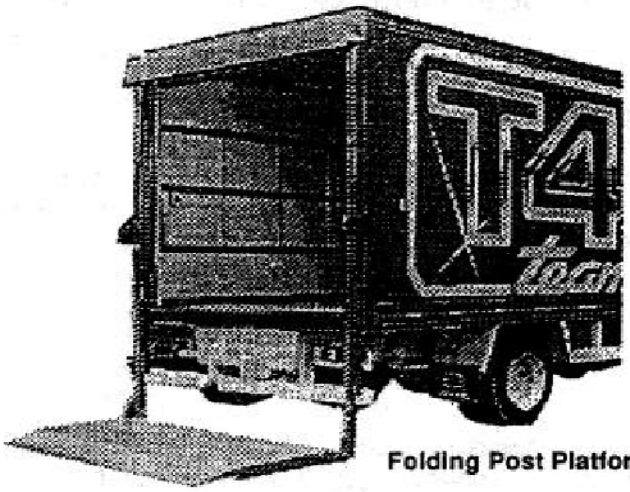
4. AFFECTING MODIFICATIONS

The following modifications are covered by this Section:

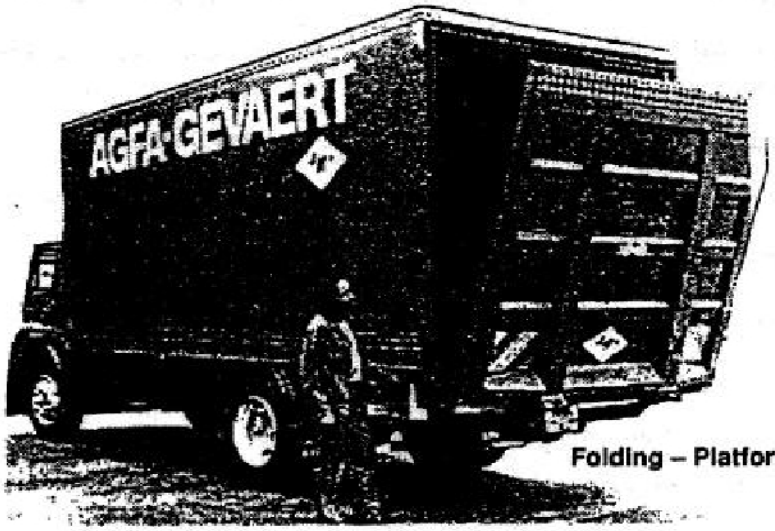
- Fitting of Platform Loader - Side or Rear Operated;
- Change of Platform Loader Type;
- Change of Loader Size or Capacity;
- Fitting of a Wheelchair Loader.

Examples of these devices are shown in Figures 1, 2 and 3.

PLATFORM ILLUSTRATIONS



Folding Post Platform Loader



Folding – Platform Loader

Cantilever Tail-Lift with an Extra-Deep Platform

REAR MOUNTED GOOD LOADING DEVICES

Figure 1

UNDERBODY STOW PLATFORM LOADER

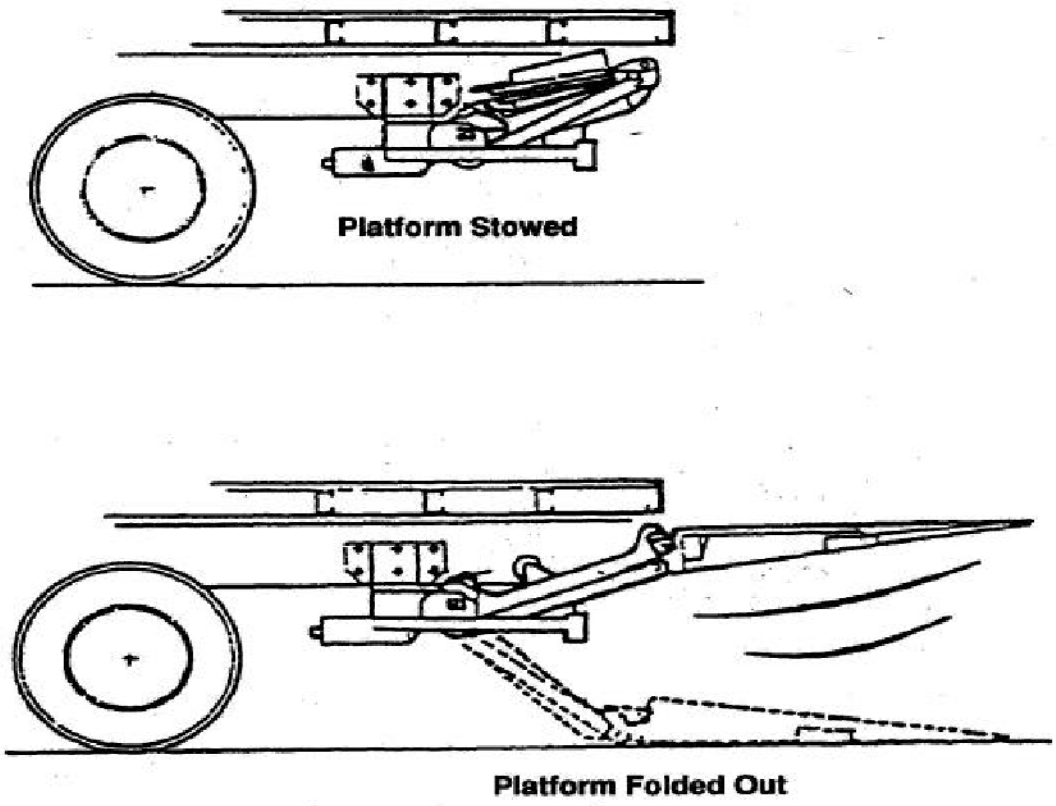


Figure 2

TYPICAL WHEELCHAIR LOADER
(This illustrates only one of several types available)

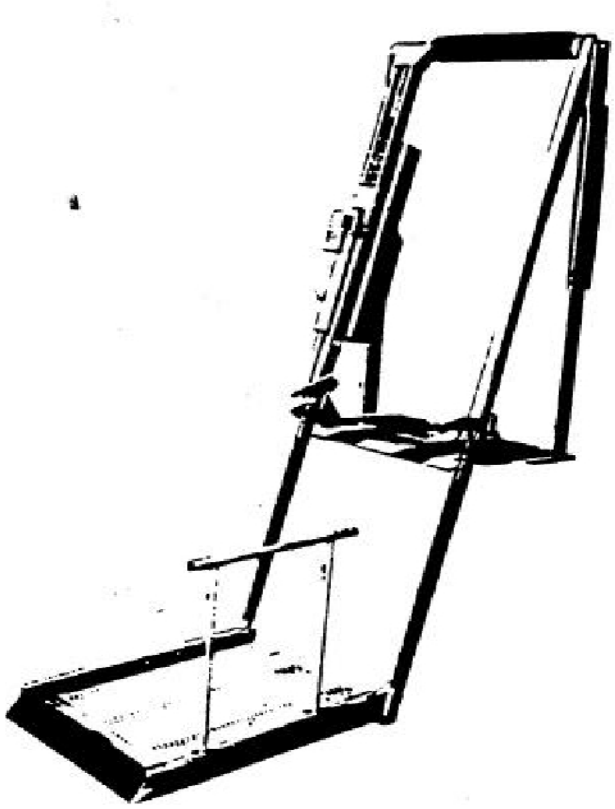


Figure 3

5. GENERAL REQUIREMENTS

The following general requirements, as applicable, are to be met and apply to all modifications involving Vehicle Mounted Lifting Systems - Non-Slewing.

5.1 Manufacturer's Requirements

Vehicle, Body and Platform Loader Manufacturers and/or Supplier(s) should be consulted and their recommendations on special mounting requirements obtained before any accommodating modifications for tailgate loader mounting are commenced. These manufacturers and suppliers should be consulted for suitability of vehicle for platform loader type and capacity or size selected.

5.2 Design Requirements

- All loaders must be installed at either the rear or the left hand side of the vehicle.
- All loader controls installed externally to the vehicle must be fitted with a device to prevent inadvertent operation and be mounted on the left side or rear of the vehicle.
- All equipment, when not deployed, must not protrude from the vehicle so as to minimise the risk of injury to any person.
- The loading device or any associated components must not diminish the visibility of any lamp or rear marker plate.
- Chassis strength must be assured for static loads during loading operations and dynamic loads imposed during travel. This is especially necessary with NB1 category vehicles which have a lighter chassis which generally tapers towards the rear of the vehicle. Assessment calculations must be performed in accordance with procedures and requirements set out in Section H of this Code of Practice.
- Load Distribution - with the vehicle loaded to its maximum G.V.M. rating (centre of mass of payload at centre of load space) and the loader in its stowed travel position, the combined load on each tyre, axle or group of axles must not exceed the lesser of manufacturer's rated capacity, tyre capacity or the regulatory limit for the axle(s).
- The platform loader must be held securely in place on the chassis and/or body against forces resulting from at least 1g lateral and 2g vertical accelerations generated by the motion of the vehicle. A factor of safety of at least 1.5 is to be applied to the stresses calculated for these forces and the factored stresses must not exceed the yield strength of the materials being used.
- Steering Effect - the minimum front axle load, with the vehicle in any load condition and with the loader in its stowed travel position, must not be less than that on the cab-chassis vehicle as supplied by the original vehicle manufacturer. Load distribution calculations are required to ensure that the above requirement is met.
- Departure Angle - must not be less than 11 degrees.
- Wheelchair Loaders must comply with AS/NZS 3856.1:1998"*Hoists and ramps for people with disabilities - Vehicle-mounted- Product requirements*" and AS/NZS 3856.2:1998–*"Hoists and ramps for people with disabilities - Vehicle-mounted- Installation requirements"*.

5.3 Service Considerations

- Mountings should be located so that regular inspection and maintenance can be readily carried out on the mounting and adjacent vehicle parts.
- The loading platform is to be located so that there is adequate clearance from the vehicle's moving parts such as axles, brakes and suspension.
- The loading platform linkages or structure must not be modified without written approval of the platform manufacturer.
- Suitable safety devices incorporated in the design of the loader must be operational.

5.4 Installation Requirements

- Metric standard bolts grade 10.9 or 8.8 (SAE grade 8 or 5) must be used with the appropriate grade nuts for fastening the platform mounting to the chassis frame. Refer Australian Standard AS 1110.1:2000 “ISO Metric Hexagon Bolts “and AS 1110.2:2000 “ISO Metric Hexagon Screws”.
- Drilling of frame longitudinal members for attachment of mounting brackets must be in accordance with the National Code of Practice for Heavy Vehicles Modifications, Section H - Chassis Frames.
- When components of dissimilar metal are bolted together, an insulating compound, or other approved means of preventing corrosion due to electrolysis, must be employed.
- Hydraulic Hoses & fittings - additional, and/or substitute components must be in accordance with the hydraulic standard and flow/pressure ratings of the manufacturers of the existing equipment.
- Location of hydraulic parts and fittings must be away from the rear axle brakes.
- All service lines (electrical and hydraulic) must be protected and adequately secured.

6. RECORDING

Appendix 1 of this document gives a Report Form and Calculation Sheet that should be completed for each installation.

Appendices R1 and R2 apply to the two types of system covered by this Code of Practice:

- R1- Goods Loading Devices; and
- R2- Wheelchair Loading Devices.

These Appendices:

- Summarise the scope of modification work that may be certified under each of these Modification Codes.
- Include lists of Sections of the National Code of Practice covering other areas of the vehicle that may have been affected by the modification that should be assessed to determine if they too require re-certification.
- Include checklists appropriate to the particular Modification Code that should be completed.

It is required that analysis work, sketches and other vehicle data, together with copies of the Calculation Sheet, Report Form and the completed Checklists, be retained by the Certifying Officer for at least the period specified in Part A of the National Code of Practice.

HEAVY VEHICLE MODIFICATIONS

Appendix 1- Sheet 1 of 2
Mass Distribution Worksheet

HEAVY VEHICLE MODIFICATIONS

Appendix 1 - Sheet 2 of 2
Calculation Sheet

HEAVY VEHICLE MODIFICATIONS

Appendix 1

Modification Code R1

GOODS LOADING DEVICE INSTALLATION

Modifications that are covered under this Modification Code are:

1. Reinforcement of chassis for the purpose of fitting a goods loading device.
2. Installation of goods loading device.

Modifications that are **not** covered under this Modification Code are:

1. Extension or reduction of chassis length.
2. Fitting equipment not suitable for automotive use.
3. Body installation.

NOTE: The modified vehicle/modifications must continue to comply with all applicable ADR's, Australian Standards and Regulations/Acts.

Outlined below are areas of the vehicle that may have been affected by the modifications and that may require recertification, testing and/or data to show compliance for the modified vehicle.

DETAIL	**REQUIREMENTS**
Chassis Reinforcement	National Code of Practice - Section H Good Engineering Practice
Fitting Goods Loading Devices	National Code of Practice - Section R Good Engineering Practice

HEAVY VEHICLE MODIFICATIONS

Appendix 1

Modification Code R1

SPECIFIC REQUIREMENTS

In addition to the general requirements given in Part 2 of this Section, the installation of a goods loading device must meet the following specific requirements:

1. The loader must be securely fastened to the vehicle chassis in accordance with the loader manufacturer's recommendations and Section H of this National Code of Practice.

2. If the chassis requires reinforcing in the region of the loader mounts, the reinforcing should be carried out in accordance with the vehicle manufacturer's recommendations and Section H of this National Code of Practice. When operating the loader at its rated capacity, stress level in chassis frame must not exceed the limit specified by the vehicle manufacturer, with a factor of safety not less than 3

3. Brackets may be attached to the chassis by welding in the rear 30% of the rear overhang or with bolts of ISO Grade 8.8 (SAE Grade 5) or stronger and Nyloc or similar self-locking nuts. The tensile stress of all fasteners, as induced by the lifting system load moment, should not exceed 20% of the fastener material yield stress.

4. Brackets attached to the chassis within the wheelbase must be attached by bolting and not by welding.

5. The loader and all associated components must be able to withstand rated capacity without causing permanent deformation or excessive deflection.

6. The loader must be operable from the left side of the vehicle.

HEAVY VEHICLE MODIFICATIONS

Checklist for Code R1

GOOD LOADING DEVICE INSTALLATION

HEAVY VEHICLE MODIFICATIONS

Appendix 2

Modification Code R2

WHEELCHAIR LOADER INSTALLATION

Modifications that are covered under this Modification Code are:

1. Installation of a wheelchair loader designed for automotive use.

2. Manufacturing and fitting of an automotive type door.

Modifications that are **not** covered under this Modification Code are:

1. Fitting wheelchair loaders not designed for automotive use.

2. Fitting of vehicular wheelchair restraints.

NOTE: The modified vehicle/modifications must continue to comply with all applicable ADR's, Australian Standards and Regulations/Acts.

Outlined below are areas of the vehicle that may have been affected by the modifications and that may require recertification, testing and/or data to show compliance of the modified vehicle.

DETAIL	**REQUIREMENTS**
Installation of Wheelchair Loader	National Code of Practice - Section R Good Engineering Practice
Installation of Wheelchair Restraints	National Code of Practice - Section K Good Engineering Practice

Appendix 2
Modification Code R2

SPECIFIC REQUIREMENTS

In addition to the general requirements given in Part 2 of this Section, the installation of a wheelchair loading device must meet the following specific requirements:

1. The loader and its attachments must meet the requirements for design and performance as given in AS 3856 Part 1 and Part 2 - *Hoists and ramps for people with disabilities - Vehicles-mounted*.

2. Anchorage plates must be fitted to support the upper section of the loader and attached to the frame of the vehicle.

3. The brackets must be attached using Nutserts or equivalent expanding insert devices.

4. Where an additional door is manufactured for a loading device, the door must be compliant with the requirements of ADR 29—Side Door Strength, must not have any sharp edges and must be fitted with an automotive type safety catch complying with ADR 2/….—Side Door Latches and Hinges

5. The loader must be operable from the left side of the vehicle. The wheelchair passenger on the loader must not operate the loader. The loader controls must be operable by an attendant.

6. When not in operation, no part of the loader appliance and associated components may extend laterally beyond the maximum width of the vehicle.

HEAVY VEHICLE MODIFICATIONS

Checklist for Modification Code R2

WHEELCHAIR LOADER INSTALLATION