

AEROSPACE RECOMMENDED PRACTICE

ARP1554™
REV. D

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Superseding ARP1554C

Vehicle Transport Unit Load Device (ULD)

RATIONALE

ARP1554D has been reaffirmed to comply with the SAE five-year review policy.

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1. SCOPE

1.1 Purpose

This document provides functional, dimensional, structural, and environmental requirements for vehicle transport devices used to transport vehicles in wide-body aircraft. These devices are intended for use either in conjunction with NAS 3610 or AS36100 approved air cargo pallets or with specially designed and approved air cargo pallets. The unit load device (ULD) shall facilitate alteration for carriage of general cargo during return haul. Pallet nets used in conjunction with existing pallets in order to restrain general cargo are also described in NAS 3610 and AS36100.

The minimum essential criteria are identified by use of the word "shall". Recommended criteria are identified by use of the key word "should", and while not mandatory, are considered to be of primary importance in providing dependable, economical, and practical vehicle transport devices. Deviation from recommended criteria should occur only after careful consideration, extensive testing, and thorough service evaluations have shown alternate methods to be satisfactory.

It is the intent of this document to specify minimum air and ground handling features and to ensure interchange capability and compatibility with present and future air transport and ground handling systems. It is not the intent of this document to specify equipment designs.

1.2 Type A, B, C

The unit load devices specified herein shall be designed primarily for the transport of vehicles and alternately for the transport of general air cargo in an acceptable and profitable manner.

This SAE Aerospace Recommended Practice (ARP) establishes three types of transport units for carriage of vehicles in cargo compartments of certified civil transport aircraft. The term vehicle is used so as to encompass the possible transport of vehicles such as golf carts, light commercial vehicles, motorbikes etc. in addition to cars / automobiles. Type A (lower deck) and Type B (main deck) will be used for carriage of one vehicle in conjunction with an air cargo pallet secured within an aircraft restraint system designed to be compatible with NAS 3610 or AS36100 approved ULDs, primarily in a random intermix with general cargo pallets. Type C (main deck) will be used, in order to maximize volume utilization, for carriage of two or four vehicles as either a full or part charter operation (see Figure 1).

The equipment covered by this ARP are units that interface with suitably approved / certified ULDs (typically air cargo pallets). It does not seek to bring into being any new type of ULD, although nothing prevents a potential new ULD being developed which uses this ARP as a guide to the design process.

a. Type A:

Will be used for carriage of one vehicle on the lower deck of both freighter and/or passenger wide body aircraft, in conjunction with either a 60.4 in x 125 in (1534 mm x 3175 mm), a 88 in x 125 in (2235 mm x 3175 mm) or 96 in x 125 in (2438 mm x 3175 mm) air cargo pallets.

b. Type B:

Will be used for carriage of one vehicle in slanted configuration on the main deck of freighter wide-body aircraft, in conjunction with either 88 in x 125 in (2235 mm x 3175 mm) or 96 in x 125 in (2438 mm x 3175 mm) air cargo pallets.

NOTE: Max allowed angle for slanted car position is 40 degrees. When the vehicle is loaded lengthwise in an aircraft, the lower end must face forward to cover angle of attack at takeoff.

CAUTION: The angle of the vehicle storage in the transport device is to be checked as some vehicles are not permitted to be transported at a certain angle due to potential spillage or overflow of liquids (hydraulic / battery / lubricants, etc.).

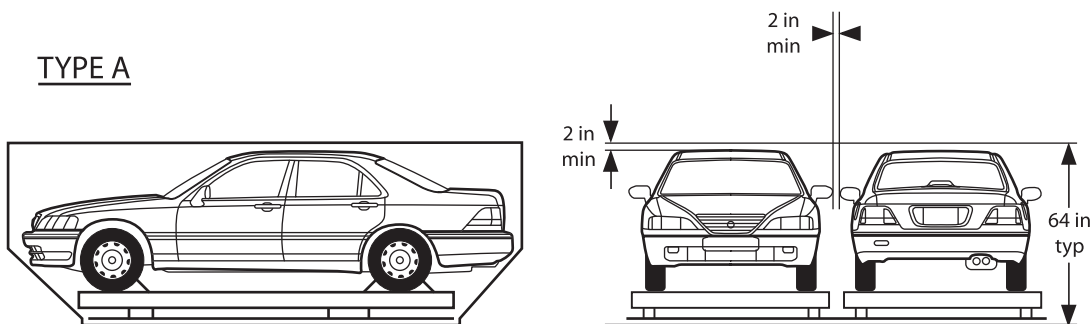
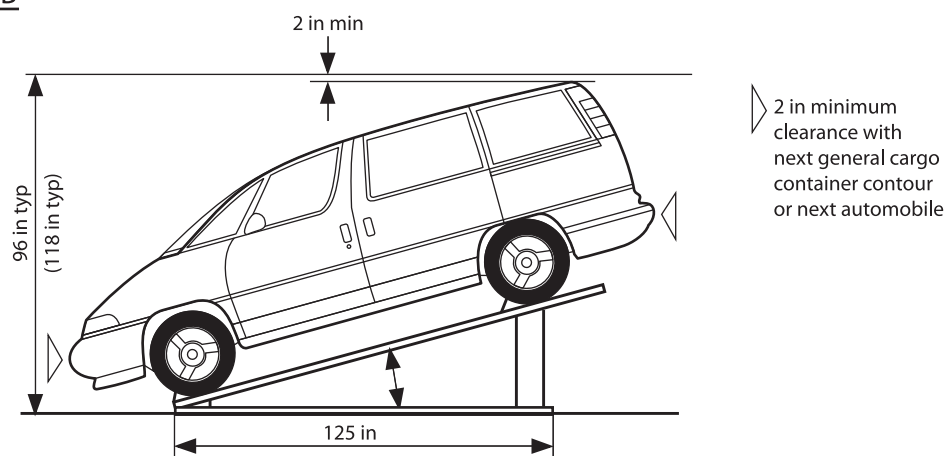
c. Type C:

Will be used for carriage of two or four vehicles in a double level configuration on the main deck of freighter aircraft, in conjunction with:

1. either NAS 3610 or AS36100 approved air cargo pallet(s) ,
2. or specially designed and approved air cargo pallet(s) matching the width of vehicles in order to ensure maximum use of aircraft volume.

1.2.1 Two kinds of Vehicle Transport ULDs are identified:

- a. general purpose vehicle ULDs, useable as a single unit or in a vehicle charter mode but with a variety of models / types fitting the geometry constraints
- b. dedicated vehicle ULDs designed to optimize volume and handling efficiencies with a single defined vehicle model when used on regular charter programs.

TYPE ATYPE BTYPE C

NOTE: Cars may have to be loaded in opposite directions in order to bring the loaded unit CG within limits

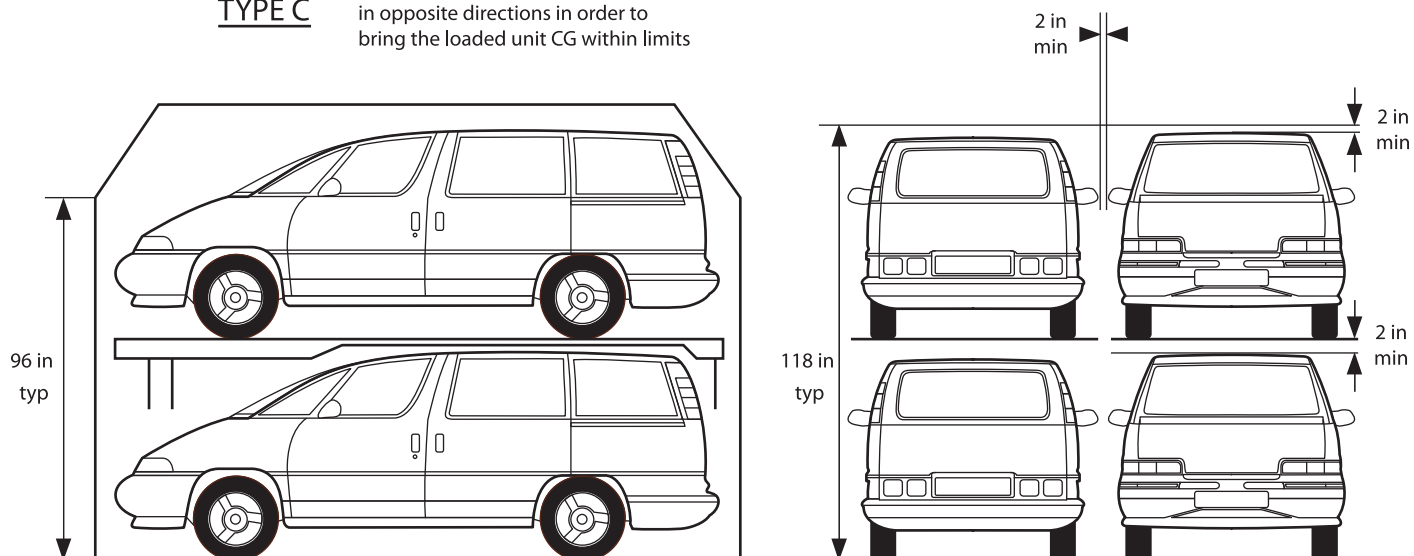


FIGURE 1 - GENERAL ILLUSTRATION OF UNIT TYPES

1.3 Design Objectives

- 1.3.1 Accommodate as many vehicle types and sizes as is feasible within the aircraft envelope with emphasis on those most frequently shipped.
- 1.3.2 Ensure profitable return haul usage with general air cargo.
- 1.3.3 Ensure accessibility and compatibility to meet the minimum dangerous goods requirements for preparation of vehicles for shipment.
- 1.3.4 Protect vehicles from damage.
- 1.3.5 Ensure maintainability using standard high quality aerospace practices.

2. APPLICABLE DOCUMENTS

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org. Note: No revision number is indicated. Check the latest published revision on the SAE website

AS1130	Air and Air/Surface (Platform) Cargo Pallets
AS1491	Interline Air Cargo Pallet
AS36100	Air Cargo Unit Load Devices – Performance Requirements and Test Parameters
AS33601	Track and Stud Fitting for Cargo Transport Aircraft, Standard Dimensions for
AS5385	Cargo Restraint Straps – Design Criteria and Testing Methods
ARP1334	Ground Equipment Requirements for Compatibility with Aircraft Unit Load Devices (IATA AHM 911 is equivalent)
ARP5595	Cargo Restraint Straps - Utilization Guidelines
ARP5486	Air Cargo Pallets – Utilization Guidelines
ARP36103	Air Cargo Unit Load Devices – Center of Gravity Control Methods

2.2 NAS Standards

Available from Aerospace Industries Association, 1000 Wilson Boulevard, Suite 1700, Arlington, VA 22209-3928, Tel: 703-358-1000, www.aia-aerospace.org.

NAS 3610	Minimum Requirements and Test Conditions for Cargo Unit Load Devices U.S. Government Publications
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