

Study on alternative for Normative Vehicles EN1493

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After having investigated the different approaches of the ANSI-ALI and EN1493 standard, the conclusion is that the differences are too big to reach a workable compromise.

An investigation was done into the European legislation, and it shows that there is a rather clear definition of vehicles in the European union (including Russia and Switzerland).

It seems that the current normative vehicle description in EN1493 already partly follows this definition.

Therefore it may be an idea to just update the list in EN1493 conform these vehicle definitions.

The main structure is as follows:

General Vehicle Categories in the European Union	
Category	Vehicle type
Category L	Mopeds, Motorcycles, Motor Tricycles and Quadricycles
Category M	Motor vehicles having at least four wheels and for the carriage of passengers
Category N	Power-driven vehicles having at least four wheels and for the carriage of goods
Category O	Trailers (including semitrailers)

Category M - Motor vehicles having at least four wheels and for the carriage of passengers	
Category	Vehicle Description
M1	Vehicles designed and constructed for the carriage of passengers and comprising no more than eight seats in addition to the driver's seat, and having a maximum mass ("technically permissible maximum laden mass") not exceeding 3.5 tons
M2	Vehicles designed and constructed for the carriage of passengers, comprising more than eight seats in addition to the driver's seat, and having a maximum mass ("technically permissible maximum laden mass") not exceeding 5 tons
M3	Vehicles designed and constructed for the carriage of passengers, comprising more than eight seats in addition to the driver's seat, and having a maximum mass exceeding 5 tons

Category N - Power-driven vehicles having at least four wheels and for the carriage of goods	
Category	Vehicle Description
N1	Vehicles for the carriage of goods and having a maximum mass not exceeding 3.5 tonnes
N2	Vehicles for the carriage of goods and having a maximum mass exceeding 3.5 tonnes but not exceeding 12 tonnes
N3	Vehicles for the carriage of goods and having a maximum mass exceeding 12 tonnes

Category O - Trailers (including semitrailers)	
Category	Vehicle Description
O1	Trailers with a maximum mass not exceeding 0.75 tonnes
O2	Trailers with a maximum mass exceeding 0.75 tonnes, but not exceeding 3.5 tonnes
O3	Trailers with a maximum mass exceeding 3.5 tonnes, but not exceeding 10 tonnes
O4	Trailers with a maximum mass exceeding 10 tonnes

Looking at the structure, it seems that the normative vehicle categories a and b can be merged to 1 category a, representing EU vehicles categories M1 and N1.

Then, normative vehicle category b should represent the EU vehicle category N2: maximum mass exceeding 3.5 tons but not exceeding 12 tons.

The last normative vehicle category c could represent EU vehicle category N3 and O3, O4: maximum mass exceeding 12 tons.

With heavy duty vehicles, the load is distributed on multiple axles.

There is a point above 12 ton capacity where it's no longer the load on the axle that varies, but the number of axles with the maximum permitted load. So we might investigate if category c should be subdivided .

Based on this we can provide ways to put up the calculation / load distribution on the lift.
Chapter 4 of 1996/53EC shown below, gives possible means to define wheelbases.

When it comes to special vehicles (off-road, agricultural, utility vehicles etc.) paragraph 5.7.4.4 applies.

1996/53/EC

4. Related characteristics of the vehicles referred to in Article 1 (1) (b)

4.1 All vehicles

The weight borne by the driving axle or driving axles of a vehicle or vehicle combination must not be less than 25 % of the total laden weight of the vehicle or vehicle combination, when used in international traffic

4.2 Road trains

The distance between the rear axle of a motor vehicle and the front axle of a trailer must not be less than 3,00 m.

4.3 Maximum authorized weight depending on the wheelbase

The maximum authorized weight in tonnes of a four-axle motor vehicle may not exceed five times the distance in metres between the axles of the foremost and rearmost axles of the vehicle

4.4 Semi-trailers

The distance measured horizontally between the axis of the fifth-wheel king pin and any point at the front of the semi-trailer must not exceed 2,04 m

For information, a table showing permissible weights and load distribution in Europe is added hereafter.

Axle weights and load distribution

Table 1: Permissible maximum weights of 5 and 6 axle articulated trucks in Europe (in tonnes)

Country	Weight per non-drive axles	Weight per drive axle	Tractor 2 axle unit GVW	Tractor 3 axle unit GVW	Trailer tri-axle bogie	Gross train weight 5 axles	Gross train weight 6 axles	Container transport 5 / 6 axles
Albania (AL)	10	10 / 11.5 (1)	18	25 / 26 (1,2)	22	38 / 44 (1)	38 / 44 (1)	
Austria (A)	10	11.5	18	26 (2)	24	40	40	44
Belgium (B)	10	12	19	26	30	43 / 44 (3)	43 / 44 (3)	
Bosnia-Herzegovina (BIH)	10	11.5	20	26	26	40	40	
Bulgaria (BG)	10	11.5	18	26 (2)	24	40	40	44
Croatia (HR)	10	11.5	18	26 (2)	24	40	40	
Czech Republic (CZ)	10	11.5	18	26 (2)	24	42	48	48
Denmark (DK)	10	10 / 11.5 (1)	18	24 / 26 (1,2)	24	42	48	
Finland (FIN)	10	11.5	18	26 (2)	30	42	48	
France (F)	13/12 (2,4)	13/ 12 (2,4)	19	26	24	40 / 44 (5)	40 / 44 (5)	44
Germany (D)	10	11.5	18	26 (2)	24	40	40	44
Greece (GR)	7 / 10	11.5 / 13	18	26	24	40	40	44
Hungary (H)	10	11.5	18	26 (2)	24	40	40	44
Ireland (IRL)	10	10.5/11.5 (6)	17 / 18	26 (2)	24	40 / 42(7)	44 / 46 (8)	44
Italy (I)	12	12	18	26 (2)	26	44	44	44
Netherlands (NL)	10	11.5	21.5	33	30	50	50	
Norway (N)	10	11.5	19.5	26 / 29.5 (9)	30	47	47	
Poland (PL)	10	11.5	18	26 (2)	24	40	40	44
Portugal (P)	10	12	19	26	24	40	40	44
Romania (RO)	10	11.5	18	26	24	40	40	44
Russia (RUS)	10	10	18	25 (2)		38	38	
Serbia (SRB)	10	11.5	18	24	22	40	40	44
Slovakia (SK)	10	11.5	18	26 (2)	24	40	40	
Slovenia (SLO)	10	11.5	18	25	24	40	40	44
Spain (E)	10	11.5	18	26	24	40	40	42 / 44
Sweden (S)	10	11.5	18	26 (2)		48 / 60 (10)	48 / 60 (10)	
Switzerland (CH)	10	11.5 (11)	18	26 (2)	24	40	40	
Turkey (TR)	10	11.5	18	25 / 26 (9)		40	40	44
Ukraine (UA)	10	11	16 / 18	22 / 24		38	38	44/46 (12)
United Kingdom (GB)	10	11.5/10.5(2,4)	18	26 (13)	24	40	44	44

Notes

- (1) Lower figure is for national traffic; higher figure is for international traffic.
- (2) With road friendly (air) suspension or similar.
- (3) 43 t with mechanical suspension, 44 t with air suspension.
- (4) Drive axle must not exceed the lower figure for a 3 axle tractor unit operating above 40 t GTW.
- (5) 44 t limit for vehicles registered after 1 Oct 2009. As of 30 Sept 2014, also vehicles registered after 1 Oct 2001 (Euro III vehicles).
- (6) Mechanical suspension national traffic 10.5 t; air suspension national traffic 11.5 t; international traffic 11.5 t.
- (7) 42 t limit only until 31 Dec 2014 - then reverts to 40 t limit.
- (8) 46 t limit requires vehicle to have Electronic Braking System and Electronic Stability Control.
- (9) Certain national conditions apply.
- (10) For vehicles engaged in combined road/rail transport. In Sweden the higher value relates to 'B-doubles'.
- (11) Switzerland enforce a *minimum* drive axle load limit of 25% of the Gross Train Weight to ensure traction.
- (12) Licensed by state Motor Road service of Ukraine 5 axle + limit is 46 t.
- (13) 6 x Tractor Wheel Base (in m) capped at 26 tonnes. Must have road friendly suspension.

Sources: International Transport Forum 12 Oct 2011

IRU Maximum weights and dimensions 12 Mar 2012

Road Safety Authority Ireland Weights and Dimensions leaflet Feb 2013