

1. -----IND- 2018 0304 CZ- EN- ----- 20180712 --- --- PROJET

Executive summary for the EC (not part of this legislation)

Measuring devices for determining the load per axle for road vehicles are placed on the market and put into use in the Czech Republic in accordance with Directive 2014/31/EU (Non Automatic Weighing Instruments – NAWI). Once they have been put into use, they become subject to national metrology regulation – verification at specified intervals.

This notified legislation only applies to the verification of measuring instruments that have already been put into use. It does not concern placing them on the market or putting them into use.

(End of executive summary.)

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PUBLIC DECREE

As the authority with substantive and territorial jurisdiction in the matter of laying down metrological and technical requirements for legally controlled measuring instruments and stipulating the testing methods for type approval and verification of legally controlled measuring instruments pursuant to § 14(1) of Act No 505/1990 on metrology, as amended (hereinafter referred to as the ‘Metrology Act’), and in accordance with the provisions of § 172 et seq. of Act No 500/2004, the Administrative Procedure Code (hereinafter referred to as the ‘APC’), the Czech Metrology Institute (hereinafter referred to as the ‘CMI’) commenced ex officio proceedings on 4 April 2017 pursuant to § 46 APC, and, on the basis of supporting documents, issues the following:

I.

DRAFT GENERAL MEASURE

number: 0111-OOP-C086-16

laying down the metrological and technical requirements for legally controlled measuring instruments, including testing methods for type approval and verification of the following legally controlled measuring instruments:

'Measuring devices for determining the load per axle of road vehicles'

1 Basic definitions

For the purposes of this general measure, terms and definitions pursuant to VIM and VIML¹ as well as the terms and definitions stated below shall apply:

1.1 Basic definitions

1.1.1

measuring devices for determining the load per axle or wheel of road vehicles (hereinafter referred to as 'devices')

a measuring device used to determine the wheel load of a road vehicle using the effect of gravity on this vehicle; the device has non-automatic operation with automatic balancing

1.1.2

wheel load

the apparent mass of the road vehicle wheel when it is stationary and its contact surface is resting on the active surface of the load carrier

1.1.3

wheel contact surface

the area of the tyre in direct contact with the surface of the load carrier; the size of this area depends on the technical dimension of the tyre (width and diameter) and its current air pressure

1.1.4

approach section

the part of the surrounding terrain adjacent to the location of the device; for a device that is installed flush to the road (the upper surface of the load carrier is at the level of the surrounding terrain), the approach section is part of the device

1.1.5

vehicle chassis

for the purposes of this legislation, a chassis is defined as the mechanical connection of two or three vehicle axles with a rigid frame or a dependent - flexible connection (for example leaf springs) in order to reduce the load on individual wheels or axles of the vehicle - see Figure 1.

1.1.6

dual wheel (dual formation)

a dual wheel is used on a road vehicle to reduce load on the road surface by doubling its contact surface; instead of one wheel, two wheels are mounted next to each other (dual formation) and the axle has a total of four wheels

1.2 Main parts

1.2.1

load receptor

the part of the device intended to receive the load; it can be either portable - transportable (it is several cm in height), is intended to be placed on the road surface, or is adapted in order to be embedded in a pre-prepared foundation with a frame adapted to the road surface (built-in)

¹ TNI 01 0115 International Vocabulary of Metrology – Basic and General Concepts and Associated Terms (VIM) and International Vocabulary of Legal Metrology (VIML) are part of the technical harmonisation compendium ‘Terminology in the field of metrology’, which is publicly available at www.unmz.cz.

1.2.2 active carrier surface

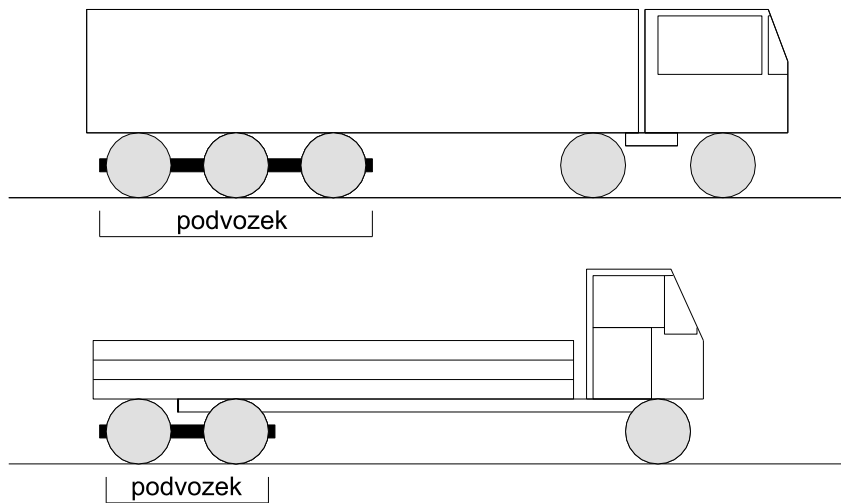
the surface of the carrier intended to bear the vehicle wheel in order to determine the vehicle's wheel load; in the case of transportable devices, it is usually permanently marked with a groove on the upper surface of the carrier

1.2.3 evaluation and indication device (EID)

a part of the non-automatic device that processes information on the magnitude of the load

NOTE

In some device versions the EID is integrated into the load carrier.



podvozek	chassis
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Figure 1 - vehicle chassis

1.3 Auxiliary elements

1.3.1 levelling plate

a plate of a rigid and tough material (wood, metal), usually with an area the size of the transportable load carrier; the height of the plate must be the same as this carrier (Figure 3)

The total number of plates (Q) used to measure a vehicle's wheel load is determined using the equation

$$Q = N - A \tag{1}$$

where *N*.... the total number of the road vehicle's wheels (in this case a dual wheel is considered a wheel),

A..... the number of wheels for which the load is being measured using the device (at one time).

Levelling plates are used during measurement to keep the vehicle's wheels level.

1.4 Metrological characteristics

1.4.1

interval size for testing

the device must be capable of setting and displaying intervals with a minimum resolution of $1/5 e$

1.4.2

simulation test

a test performed using a special loading device (SLD); this is because the test cannot be performed using standard load weights (the size of the carrier's active surface is limited)

1.4.3

capacity of the device (Lim)

the maximum permissible load to which the device can be subjected without damaging it or permanently impairing its metrological properties; the capacity of the device (Lim) is higher than its maximum capacity limit (Max)

2 Metrological requirements

2.1 Accuracy class

Accuracy classes III or IIII are specified for this device.

2.2 Maximum permissible errors (MPE)

The maximum permissible error used for a load greater than or equal to the minimum capacity (Min) and less than or equal to the maximum capacity (Max) are specified for a given accuracy class in Table 1.

Table 1 – Maximum permissible errors (MPE)

Maximum permissible errors (MPE)	For load m , expressed by the number of verification intervals e	
	Class III	Class IIII
$\pm 0.5e$	$0 \geq m \geq 500$	$0 \geq m \geq 50$
$\pm 1.0e$	$500 < m \geq 2\ 000$	$50 < m \geq 200$
$\pm 1.5e$	$2\ 000 < m \geq 10\ 000$	$200 < m \geq 1\ 000$

2.3 Eccentricity load

The difference between the results of several weighings of the same load when the load is placed at various locations on the active surface of the load carrier must not be greater than the absolute value of the maximum permissible errors (MPE) under Table 1 for a given load.

2.4 Repeatability

The difference between the results of a repeated weighing of the same load placed on the load carrier under the same conditions must not be greater than the absolute value of the maximum permissible errors (MPE) under Table 1 for a given load.

3 Technical requirements

3.1 Indicator

3.1.1 Reading quality

Reading of measurement results must be reliable, easy and unambiguous under conditions of normal use. The indication must be provided with the appropriate unit of weight, either in text or as a symbol.

All printing must be legible and indelible for the intended use. Printed numerals must be at least 2 mm high.

If being printed, the text or symbol of the unit of measurement must be either to the right of the measured value or above the values column^{*)}.

^{*)} A column is defined as an arrangement where at least three results of the same measured value are one above another.

3.1.2 Indication limits

The device must not display weight information that exceeds the maximum capacity (*Max*) by more than $9e$.

3.2 Installation conditions

3.2.1 Installation conditions for a built-in carrier

The term *built-in load carrier* is also used for a transportable (portable) device if it is placed in the terrain on a bed built for measurement purposes.

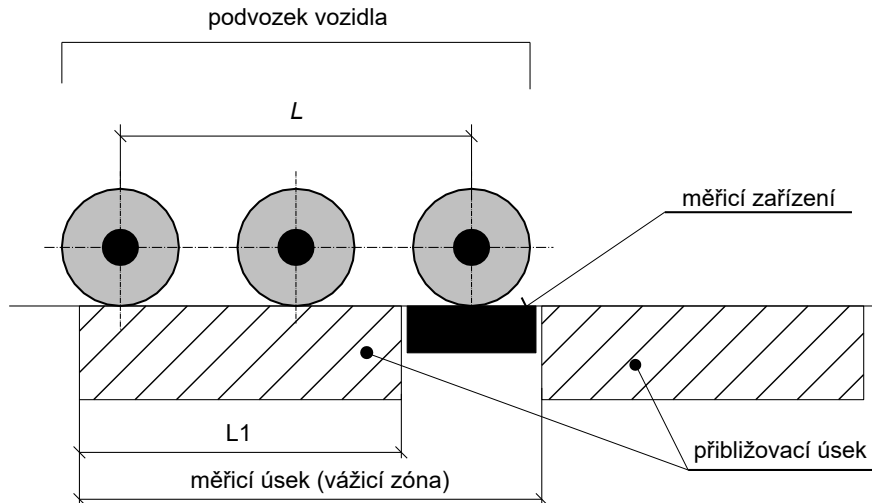
The load carrier is installed flush to the terrain so that the upper surface of the carrier is at the level of the surrounding terrain (see Figure 2).

The surrounding terrain (the approach section) in front of and behind the load carrier surface, over the length of the longest wheelbase (L) of the measured vehicle's chassis and the width of the load carrier - in the direction of the vehicle's movement - must be adapted so that it is installed at a non-freezing depth and the absolute value of deviation from the level of the entire measurement section does not exceed 2 mm.

The measurement section must be sufficiently rigid so that no mechanical changes occur that may have a negative impact on measurement results for the period during which the device's verification is valid.

The load carrier must be waterproof or have a drained base so that elements with a significant effect on the measurement signal are functional for the entire period during which the device's verification is valid.

The load carrier must be suitably protected from overloading, i.e. from a load greater than the measuring instrument's maximum capacity *Max*.



podvozek vozidla	vehicle chassis
měřicí zařízení	measuring device
měřicí úsek (vážicí zóna)	measuring section (weighing zone)
přibližovací úsek	approach section

Figure 2 - Measuring section of the device

3.2.2 Conditions for transportable device installation

The load carrier (or the device, if the carrier is part thereof) is situated on the road (terrain) so that its upper surface is above the surrounding terrain.

The load carrier must be equipped with a spirit level or must be designed so that in the case of a 5 % incline the load indication error does not exceed the value of the maximum permissible error (*MPE*) for the given accuracy class and given load.

The carrier must be designed so that when the vehicle drives over its constituent parts it does not tilt or shift and thus cause possible errors greater than the values of the maximum permitted errors (*MPE*).

All wheels (dual wheels) of the measured road vehicle must be at the same level during measurement (see Figure 3). The measured wheel (dual wheel) rests on the active surface of the load carrier and other wheels (dual wheels) are supported by the levelling plates. If levelling plates are not used during measurement, the measurement results are subject to excessive errors depending, among other things, on the length of the chassis, vehicle weight, and vehicle height (change of the vehicle's centre of gravity).

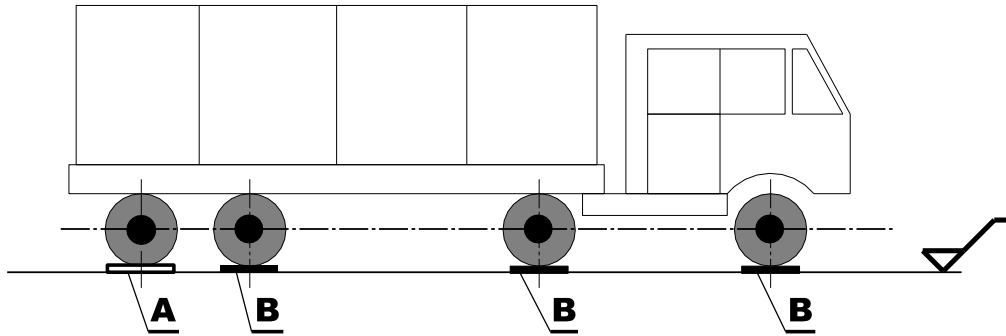


Figure 3 - Use of the device and levelling plates

where **A**..... active support (load carrier, device)

B..... levelling plate

4 Markings

4.1 Descriptive markings

Scales must be marked in a visible, legible and indelible manner with the following information:

- a) the number of the EU type-examination certificate, if available;
- b) the manufacturer's name, registered trade name or registered trade mark;
- c) the accuracy class, enclosed in an oval or in two horizontal lines joined by two half circles;
- d) maximum capacity, in the form 'Max ...';
- e) minimum capacity, in the form 'Min ...';
- f) verification scale interval, in the form 'e = ...';
- g) type, batch or serial number;

and where applicable:

- h) for instruments consisting of separate but associated units, an identification mark on each unit;
- i) the scale interval, if different from e , in the form 'd = ...';
- j) the maximum additive tare effect, in the form 'T = + ...';
- k) the maximum subtractive tare effect if it is different from the upper capacity (Max), in the form 'T = - ...';
- l) the tare interval if it is different from d, in the form 'dT = ...';
- m) maximum safe load if it is different from the maximum capacity (Max), in the form 'Lim ...';
- n) special temperature limits, in the form '°C/...°C';
- o) the ratio between load carrier and load.

5 Type approval of the measuring instrument

These measuring instruments are placed on the market and into service with a conformity assessment in accordance with the Government Regulation on non-automatic weighing instruments², meaning that they are not subject to type approval.

6 Initial verification

These measuring instruments are placed on the market with a conformity assessment pursuant to the Government Regulation on non-automatic weighing instruments², meaning that they are not subject to type approval.

7 Subsequent verification

Tests are performed in non-automatic mode with a static load.

7.1 General conditions

Devices are tested in the laboratory using a standard loading device (SLD).

7.1.1 Temperature

Tests must be performed at a stable ambient temperature. The temperature is considered stable when the difference between temperature extremes recorded during the test does not exceed one fifth of the temperature range of the given device or 5 °C, whichever is less, and the rate of change does not exceed 5 °C per hour.

7.1.2 Power

Tests must be performed with power supplied as stipulated by the device manufacturer.

7.2 Standard references

7.2.1 Standard loading device (SLD)

The standard loading device must make gradual loading possible.

7.2.1.1 SLD work surface

The SLD must be adapted to accommodate the tested transportable device so that a load can be exerted at various locations on the active carrier surface.

7.2.1.2 Contact surface

The load transferred from the SLD to the tested load carrier must be distributed over an area equivalent to the contact surface of a truck tyre with the road surface when the tyre is pressurised to a nominal pressure under the relevant regulations.

There must be a flexible part between the metal part of the SLD and the tested load carrier that simulates the physical characteristics of the tyre.

² Government Regulation No 121/2016 on conformity assessment of non-automatic weighing instruments when being made available on the market.

7.3 Loading rate

Delays between individual load levels must be sufficient to allow the operator to accurately read the indication for individual loads.

7.4 Weighing test

One set of measurements is performed for loading and unloading with at least five load values, including zero, *Min*, *Max*, and points where the value of the maximum permissible error (*MPE*) changes.

Errors in the device must not be greater than the maximum permissible error (*MPE*) for the weight given in Table 1.

7.5 Repeatability test

One set of weight measurements must be performed with a load close to 0.8 times the maximum capacity (*Max*). The maximum difference between measurement results for the same load must not be greater than the absolute value of the maximum permissible error (*MPE*) for the given load.

7.6 Error evaluation

If the interval value can be reduced to at least $e/5$, the device error is calculated using the following formula:

$$E = I_z - L \quad (2)$$

where I_z is the measuring instrument indication under load

L the nominal load value indicated by the SLD.

None of the determined device errors (E) may exceed the value of the maximum permitted error (*MPE*) as per Table 1.

8 Measuring instrument re-test at the request of the persons concerned

When examining measuring instruments pursuant to § 11a of the Metrology Act at the request of a person who may be affected by an incorrect measuring instrument, please proceed according to Chapter 7. The maximum permissible error used will be double the maximum permissible errors (*MPE*) specified in Table 1.

9 Notified standards

For the purposes of specifying the metrological and technical requirements for measuring instruments and specifying the testing methods for their verification stemming from this general measure, the CMI shall notify Czech technical standards, other technical standards or technical documents of international or foreign organisations, or other technical documents containing more detailed technical requirements (hereinafter referred to as ‘notified standards’). The CMI shall publish a list of these notified standards attached to the relevant measures, together with the general measure, in a manner accessible to the public (on www.cmi.cz).

Compliance with notified standards or parts thereof is considered, to the extent and under the conditions stipulated by a general measure, to be compliance with the requirements stipulated by this measure to which these standards or parts thereof apply.

For the purposes of specifying the metrological and technical requirements for measuring instruments and specifying the testing methods for their type approval and verification stemming from this general

measure, the CMI shall notify Czech technical standards, other technical standards or technical documents of international or foreign organisations, or other technical documents containing more detailed technical requirements (hereinafter referred to as 'notified standards'). The CMI shall publish a list of these notified standards attached to the relevant measures, together with the general measure, in a manner accessible to the public (on www.cmi.cz).

Compliance with notified standards or parts thereof is considered, to the extent and under the conditions stipulated by a general measure, to be compliance with the requirements stipulated by this measure to which these standards or parts thereof apply.

Compliance with notified standards is one way of demonstrating compliance with the requirements. These requirements may also be met by using another technical solution guaranteeing an equivalent or higher level of protection of legitimate interests.

II. G R O U N D S

The CMI issues, pursuant to § 14(1)(j) of the Metrology Act, for the implementation of § 6(2), § 9(1) and (9) as well as § 11a(3) of the Metrology Act, this general measure laying down the metrological and technical requirements for the specified measuring instruments and for the verification of specified measuring instruments - 'Measuring devices for determining the load per axle of road vehicles'.

Implementing Decree No 345/2002 specifying measuring instruments for mandatory verification and measuring instruments subject to type approval, as amended, classifies the measuring instruments under item 2.1.5 b) in the annex entitled 'List of legally controlled measuring instruments' as measuring instruments subject to type approval and mandatory verification.

This legislation (general measure) will be notified in accordance with Directive (EU) 2015/1535 of the European Parliament and of the Council of 9 September 2015 laying down a procedure for the provision of information in the field of technical regulations and of rules on Information Society services.

III. I N S T R U C T I O N S

In accordance with § 172(1), in conjunction with § 39(1) APC, the CMI has stipulated a time limit for comments of 30 days as of the date of posting on the official notice board. Comments submitted after this time limit will not be considered.

The persons concerned are hereby invited to comment on this draft general measure. With a view to the provisions of § 172(4) APC, the comments shall be submitted in writing and meet the requirements for submissions in accordance with § 37 APC.

The comments shall include the particulars referred to in § 37(2) APC and clearly state the following: who is making the comments; which general measure they concern; to what extent the comments challenge the measure; how the general measure runs contrary to legislation or how the general measure or the procedure that preceded it is inaccurate; which matters the comments concern and what is being proposed. Said comments must also identify the administrative authority to which they are addressed and be signed by the person making them.

The supporting documents for this draft general measure may be consulted at the Czech Metrology Institute, Legal Metrology Department, Okružní 31, 638 00 Brno, after making arrangements by telephone.

This general measure shall be posted for 15 days.

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RNDr. Pavel Klenovský

Director-General

Person responsible for accuracy: Mgr. Tomáš Hendrych

Posted on: 12 April 2018

Signature of the authorised person confirming posting:.....

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Signature of the authorised person confirming removal:.....