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Taximeters

Taximètres

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OIML R 21 Edition 1975 (E)



ORGANISATION INTERNATIONALE  
DE MÉTROLOGIE LÉGALE

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INTERNATIONAL ORGANIZATION  
OF LEGAL METROLOGY

## Foreword

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# TAXIMETERS

## 1 General

### 1.1. Scope

This Recommendation concerns time and distance counters known as “taximeters” for fitting on public hire vehicles.

“Taximeters” are measuring instruments which totalize continuously and indicate at any moment of the journey the sum payable by the user of a public vehicle as a function of the distance travelled and – below a certain speed – of the length of time occupied, independently of supplements authorized by the regulations in force.

### 1.2. Regulations

1.2.1. Taximeters must conform to the general and particular specifications of this document. They must be of an approved pattern, when this is laid down by national regulations.

1.2.2. The following units of measurement are approved for taximeters ;

- the metre or kilometre, for distance,
- the second, minute or hour, for time.

The fare for the journey must be expressed in the legal monetary units of the country where the taximeter is used.

1.2.3. National regulations will fix the method and conditions of use of taximeters; they will specify the categories of vehicles which must be equipped with these instruments.

## 2 Standard test conditions for the vehicle

The “standard test conditions” for the vehicle are fixed by national regulations ; in the absence of such regulations, the standard conditions are obtained if :

- a) the load carried by the vehicle corresponds to the weight of two adult persons including the driver,
- b) the tyres are inflated to the pressure prescribed by the vehicle manufacturer and are in good condition (eg conforming to the road safety rules),
- c) the vehicle is moving, under its own power, on level ground, in a straight line, at a speed less than 40 km/h.

## 3 Technical characteristics

### 3.1. Measuring device – calculating device

3.1.1. The taximeter must be made in such a way that it calculates and indicates the charge for the journey solely on the basis of :

- a) the distance travelled (drive by distance) when the vehicle is moving at a speed greater than a given minimum speed (changeover speed),
- b) the period of time (drive by time) when the vehicle is moving at a speed below this minimum speed.

The above changeover speed may vary according to the time and distance tariffs.

- 3.1.2. The drive by distance must be taken from the wheels of the vehicle ; reverse motion must not being about a reduction in the fare or distance shown.

The drive by time must be by means of a mechanical or electrical timekeeping movement which can be started only by operating the taximeter control.

If the mechanical timekeeping movement is hand-wound it must be able to function for at least 8 hours without re-winding, or for two hours if re-winding is necessary at each manual action which precedes the starting of the taximeter.

If the mechanical timekeeping movement is wound electrically, this must be done automatically.

The electrical timekeeping movement must be ready to operate at any time.

- 3.1.3. During drive by distance, the first change of the indication must occur after travelling an initial distance specified according to the national tariff regulations. The subsequent changes of the indication must correspond to successive equal distances.

During drive by time, the first change of the indication must occur after an initial time specified according to the national tariff regulations. The subsequent changes of the indication must correspond to successive equal time intervals.

Without change of drive, the ratio of the initial distance to the subsequent distances, for any tariff, must be the same as the ratio of the initial time and the subsequent time intervals.

- 3.1.4. An adapting device, situated inside or outside the instrument case, must allow the adaptation of the taximeter constant to the characteristic coefficient of the vehicle on which it is mounted, with an accuracy such that the maximum permissible errors laid down in paragraph 5.2 or 5.3 will not be exceeded.

- 3.1.5. The taximeter must be designed in such a way as to permit easy adjustments of the calculator necessary in order to conform to changes in the tariff imposed by the regulations.

If the number of tariffs provided on the instrument is greater than the number of tariffs in force, then in all the superfluous positions the taximeter must calculate and indicate a fare based on one of the tariffs authorized by national regulations.

## 3.2. Control device

- 3.2.1. The mechanism of the taximeter must be capable of being set in motion only after having been engaged by a single control device in one of the following positions :

### 3.2.2. “FREE” (\*) position

In the FREE position :

- a) there must be no indication of the fare to be paid or alternatively this indication must be equal to zero or to the value of the initial charge, but in the latter case national regulations can permit or require that the indication be concealed by a shutter,
- b) the drive by distance and the drive by time must not actuate the device indicating the charge to be paid,
- c) the totalizer showing the total distance covered (3.3.4.a) must remain connected,
- d) the indication of possible supplements (paragraph 3.4.a) must be vacant or bear the indication “zero”.

### 3.2.3. Other positions

The control device must be so designed that, starting from the FREE position, the taximeter can be set successively in the following functioning positions :

- a) in the various operating positions corresponding to the different existing “tariffs” in increasing order or in any other order authorized by national regulations,  
the sequence of different functioning positions can be achieved automatically as a function of a certain distance covered or of a certain occupation time according to the tariff regulations,  
in these positions, the drive by time and the drive by distance and the indication of supplements must be engaged,
- b) in the “TO PAY” (\*\*) position showing the final total of the sum to be paid by the passenger for the journey, separate from any supplement.

In this position the drive by time must be dis-engaged and the drive by distance must be engaged at the authorized tariff.

### 3.2.4. Operation of the control device

The operation of the control device is subject to the following restrictions :

- a) starting from an operating position at any tariff, it must not be possible to return the taximeter to the FREE position without passing through the TO PAY position,
- b) starting from the TO PAY position, it must not be possible to return the taximeter to an operating position at any tariff without passing through the FREE position ; if however, national regulations permit this movement, the design must be such that it is possible to prevent this movement,
- c) the taximeter must be so designed that when a change of tariff is made by passing through the FREE position, then the conditions imposed on the control device for this position (paragraph 3.2.2) must be fully satisfied whilst it passes through this position,
- d) it must be impossible to place the control device such that it remains in any position other than those defined above.

## 3.3. Indicating device

- 3.3.1. The “dial” or “reading face” of the taximeter must be so designed that the indications of interest to the passenger can easily be read by him.

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(\*) *Translator's Note* : In the United Kingdom, the term “FOR HIRE” is normally used.

(\*\*) *Translator's Note* : In the United Kingdom, the term “STOPPED” is normally used.

3.3.2 The sum payable, excluding possible supplements, must be evident by simply reading an indication in aligned figures of minimum height 10 mm.

As soon as the instrument has been started from the FREE position by operation of the control device, the shutter masking the indication of the fare to be paid, if there is one, must be retracted and a fixed sum corresponding to the “initial charge” must appear.

The fare indicator must then change by successive steps of a constant monetary value as soon as the initial charge has been used up.

3.3.3. The taximeter must be provided with a means of indicating at all times on the dial the engaged functioning position in conformity with national regulations.

3.3.4. The taximeter must include totalizers showing in aligned figures of minimum height 4 mm:

- a) the total distance travelled by the vehicle,
- b) the total distance travelled when hired,
- c) the total number of “hirings”,
- d) the number of incremental steps of fare counted in conformity with national regulations :

3.3.5. The taximeter must have a means for illuminating the readings appearing on the dial.

It must be possible to replace the light bulbs without opening the sealed parts of the meter.

#### 3.4. Optional supplementary devices

A taximeter may in addition be provided with supplementary devices such as :

- a) an indicator for any supplements independent of the fare indicator mentioned in 3.3.2 and returning automatically to zero in the FREE position,
- b) totalizers for the use of the vehicle owner,
- c) print-out of the fares to be paid on cards or strips,
- d) repeater for the control device showing outside the vehicle the functioning position or the tariff in use.

#### 3.5. Construction

3.5.1. Taximeters must be robust and well constructed.

Their essential parts must be made of materials guaranteeing adequate robustness and stability.

3.5.2. The casing of the taximeter itself and that of the adapting device as well as the sleeves of the transmission members must be made in such a way that the essential components of the mechanism cannot be reached from the outside and are protected against dust and humidity.

It must be impossible to gain access to the components permitting adjustment without breaking the guarantee seals (paragraph 6).

## **4 Inscriptions**

### 4.1. General inscriptions

Each taximeter must bear the following information :

- a) the name and address of the manufacturer or his identifying mark,
- b) the pattern name and serial number,
- c) the pattern approval sign (paragraph 1.2.1),
- d) the constant “k” in rev/km or imp/km (paragraph T.1).

### 4.2. Identification and inspection

Each taximeter must be provided with space allowing for :

- a) where appropriate, additional information relating to the instrument or to the vehicle in conformity with the requirements of national regulations,
- b) the initial verification and periodic verification marks.

### 4.3. Special inscriptions

4.3.1. In the vicinity of the windows of all indications the meanings of the values shown must be given clearly, legibly and unambiguously.

4.3.2. Beside the indication of the fare for the journey and the indication of the supplements to be paid, the name or symbol of the monetary unit must appear.

## **5 Maximum permissible errors**

### 5.1. Maximum permissible errors in the instruments themselves

5.1.1. During drive by distance the maximum dispersion of the indications must not exceed :

- a) for the initial distance : 2% of the true value ; however, for initial distances less than 1000 metres, the dispersion may be up to 20 metres,
- b) for distances succeeding the initial distance, 2% of the true value.

5.1.2. During drive by time the maximum dispersion of the indications must not exceed :

- a) for the initial time : 3% of the true value ; however, for initial times less than 10 minutes, this error may be up to 20 seconds,
- b) for times succeeding the initial time ; 3% of the true value.

5.1.3. The true value must be included in the range of dispersion of the indications.

National regulations will specify whether the tolerance on dispersion of the indications must be placed symmetrically or asymmetrically in relation to the true value.

### 5.2. Maximum permissible errors in the adaptation of the instruments to the vehicles.

These errors will be fixed by national regulations ; in the absence of such regulations, the adaptation must be carried out under the standard test conditions (paragraph 2) such that the constant “k” of the taximeter differs by less than 1 % from the characteristic number “w” of the vehicle on which it is mounted.

### 5.3. Maximum permissible errors in service

The maximum permissible errors in service, applying to instruments already installed on vehicles, shall be fixed by national regulations.

## 6 Protective and guarantee seals

6.1. The following components of taximeters must be constructed in such a way that they can be sealed by lead seals or by protective and guarantee marks :

- a) the casing enclosing the internal mechanism of the taximeters,
- b) the casing of the adapting device (if this device is outside the taximeter casing),
- c) the terminations of the mechanical or electrical devices connecting the entry point on the taximeter and the corresponding component provided on the vehicle to connect it to the instrument, including the detachable components of the adapting device,
- d) in examples of electrical winding of the timekeeping mechanism and of electrical drive of the control device of the taximeter : the electrical connecting cable,
- e) any compulsory inscription plates, and plates for applying the verification marks.

6.2. These seals must be such that access to the protected components, particularly the adjusting components, is impossible without damaging a guarantee mark.

6.3. National regulations will fix :

- the position of the seals,
- the nature and form of the guarantee mark.

## 7 Liability to metrological controls

7.1. When, in any country, taximeters are subjected to State metrological controls, these must include, according to the internal legislation of that country, all or some of the following :

- a) pattern approval, and approval of modifications to the pattern,
- b) initial verification for all new, repaired or re-adjusted taximeters,
- c) periodic verifications for all taximeters in use.

7.2. National regulations will specify and fix :

- a) the conditions and procedures for administrative examinations and for pattern approval,
- b) the methods and procedures of the verification controls,
- c) the validity and frequency of these controls.

## 8 Confirmation of controls – stamping

The results of the controls are confirmed by applying one or more verification marks on the instruments satisfying the regulation requirements.

These marks and the additional indications (paragraph 4.2.a) will be applied in conformity with national regulations, for example, on a special plate found in the above-mentioned space (paragraph 4.2).



# TERMINOLOGY

## T. SPECIAL TERMS USED IN THE DOCUMENT

The indication of a taximeter depends – disregarding the tariff position – upon the constant ‘k’ of the instrument and a characteristic coefficient ‘w’ of the vehicle on which the instrument is installed. The coefficient ‘w’ is a function of the effective circumference ‘u’ of the wheels of the vehicle and the transmission ratios of the number of revolutions of the wheels to the number of revolutions of the component provided on the vehicle for connecting it to the taximeter.

### T.1 Constant ‘k’ of the taximeter

The constant ‘k’ of a taximeter is a characteristic quantity showing the type and number of signals which the instrument must receive in order to indicate correctly a distance travelled of 1 km.

This constant ‘k’ is expressed:

- a) in “revolutions per indicated kilometre” (rev/km) if the information relating to the distance covered by the vehicle is introduced into the taximeter in the form of a number of revolutions of its main shaft (drive shaft at entry point to the instrument),
- b) in “impulse per indicated kilometre” (imp/km) if this information is introduced in the form of electrical signals.

According to the construction of the instrument, the constant “k” may be fixed or may be adjustable by fixed amounts.

### T.2 Characteristic coefficient ‘w’ of the vehicle

The characteristic coefficient ‘w’ of a vehicle is a quantity indicating the type and number of signals intended to drive the taximeter, which appear at the component provided for this purpose, for a distance travelled of 1 km.

This coefficient ‘w’ is expressed :

- a) in “revolutions per kilometre travelled” (rev/km), or
- b) in “impulses per kilometre travelled” (imp/km), depending on whether the information relating to the distance travelled by the vehicle appears in the form of a number of revolutions of the component driving the taximeter or in the form of electrical signals.

This coefficient varies as a function of several factors, principally : the wear and pressure of the tyres, the load carried by the vehicle, the conditions under which the vehicle makes a journey ; it must be measured under the standard test conditions for the vehicle (paragraph 2).

### T.3 Effective circumference ‘u’ of the wheels

The effective circumference ‘u’ of the wheel of the vehicle which drives the taximeter directly or indirectly is the distance travelled by the vehicle during a complete rotation of this wheel. When two wheels drive the taximeter jointly, the effective circumference is the mean of the effective circumferences of each of the two wheels.

The effective circumference ‘u’ is related to the characteristic coefficient ‘w’ of the vehicle (paragraph T.2) in such a way that these two values are inversely proportional. For this reason, the circumference ‘u’ – if it is necessary to know it – must also be determined under the conditions of Paragraph T.2<sup>(\*)</sup>.

### T.4 Adapting device

Following the definitions given above for ‘k’ (paragraph T.1) and ‘w’ (paragraph T.2) the values for these quantities must be equal if the taximeter is to record correctly the distances travelled.

In a case where the two values differ, a special device allows one of the two values to be adjusted to the other in such a way that their difference satisfies the provisions of paragraph 5.2.

### T.5 Errors

The errors mentioned in paragraph 5.1 are instrument errors, i.e. originating solely in the taximeters detached from the vehicles.

The range of the dispersion of the indications is the greatest difference between the indications of a taximeter corresponding to the same value of the measured quantity.

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(\*) *Translators Note* : This reference should be “paragraph 2”.

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