



**Transport for London**

# **PUBLIC CARRIAGE OFFICE TAXIMETER SPECIFICATION**

Specification for a Taximeter to be approved for the use in a  
London Taxi (2006)

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## Foreword

This specification supersedes the Public Carriage Office Taximeter Regulations 1997 known as 'Notice to owners and manufacturers of motor cabs and taximeters regarding taximeters to be used in the Metropolitan Police District and the City of London - July 1997' which are hereby withdrawn.

## Introduction

This specification describes a series of requirements to demonstrate that taximeters used in the London area meet the Measuring Instruments Directive and BS EN 50148, together with specific attributes defined by Transport for London and the Public Carriage Office. The latter include audit and tariff change tests. It also details the approval mechanism for taximeters under the control of the Public Carriage Office.

The Measuring Instruments Directive applies to the devices and systems with a measuring function defined in the instrument-specific annexes concerning:

- a) water meters (MI-001);
- b) gas meters and volume conversion devices (MI-002);
- c) active electrical energy meters (MI-003), heat meters (MI-004);
- d) measuring systems for continuous and dynamic measurement of quantities of liquids other than water (MI-005);
- e) automatic weighing instruments (MI-006);
- f) taximeters (MI-007);
- g) material measures (MI-008);
- h) dimensional measuring instruments (MI-009);
- i) exhaust gas analysers (MI-010).

The Annex for taximeters includes requirements for construction and performance which are detailed in BS EN 50148.

## 1 Scope

To provide a specification for ensuring taximeters used in taxis in the Greater London Area meet the requirements of the Measuring Instruments Directive and BS EN 50148 and are fit for purpose for approval by the Public Carriage Office, on behalf of Transport for London.

## 2 References

The following referenced documents are indispensable for the application of this document and for any taximeter manufacturer who requires having their products approved for fitting in London taxis. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS EN 50148:1996, Electronic Taximeters (ISBN 0 580 25249 3 available from BSI at <http://www.bsonline.bsi-global.com/server/index.jsp>).

BS EN ISO 17025, General requirements for the competence of testing and calibration laboratories.

Commission Directive 2004/104/EC of 14 October 2004 adapting to technical progress Council Directive 72/245/EEC relating to the radio interference (electromagnetic compatibility) of vehicles and amending Directive 70/156/EEC on the approximation of the laws of the Member States relating to the type-approval of motor vehicles and their trailers (available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31995L0054:EN:HTML>).

Directive 2004/22/EC of the European Parliament and of the Council of 31 March 2004 on Measuring Instruments - Annex MI-007; Official Journal of the European Union L135 (available at <http://www.nwml.gov.uk/Docs/Legislation/MID/Measuring%20Instruments%20Directive%20text%20from%20OJ.pdf>) hereafter referred to as the Measuring Instruments Directive.

This is implemented into UK Law by Statutory Instrument 2006 No 2304; Weights and Measures; The Measuring Instruments (Taximeters) Regulations 2006.

Transport for London Public Carriage Office Taximeters and Taximeter Receipt Printers – Specification for the Provision of an Installation Service.

London Cab Order 1934, Regulations as to Taximeters and Fares for Motor Cabs, Part VI, 38 Lighting of taximeters and taxi signs and 40 Fares for motor cabs.

## 3 Terms and definitions

For the purposes of this specification, the terms and definitions given in the Measuring Instruments Directive and BS EN 50148:1996 apply together with those below:

### **3.1 Audit test**

Series of tests or checks performed at regular intervals on each taximeter to demonstrate continued conformance with this specification and programmed tariff structure

### **3.2 Tariff change test**

Series of tests performed on representative taximeters to verify that they have programmed to display the correct fares on receipt of specified numbers of pulses or elapsed time in accordance with tariff structure agreed by Transport for London

### **3.3 Type test**

Series of tests performed on a taximeter to confirm that it meets the requirements of the Measuring Instruments Directive, BS EN 50148 and this specification

## **4 Requirements**

### **4.1 General**

#### **4.1.1 General requirements**

For the purposes of this specification taximeters shall meet the performance requirements of the Measuring Instruments Directive and BS EN 50148 in addition to those indicated below.

#### **4.1.2 Device constant**

The taximeter device constant  $k$  shall be in pulses per mile or kilometre appropriate to the vehicle type.

#### **4.1.3 Fare units**

The units of fare shall be in pounds sterling (£) and pence (p).

#### **4.1.4 Operating positions**

The operating positions shall be 'FOR HIRE', 'HIRED' and 'STOPPED'. The fare calculation based on distance shall continue to operate when the meter is in 'STOPPED' mode.

#### **4.1.5 Tariff structure**

The tariff structure is presently of normal calculation mode S (single application of tariff) - see Measuring Instruments Directive Annex MI-007 and BS EN 50148:1996 **4.1.1a**).

Cross-over speed is specified in the London Cab Order 1934, 40 Fares for Motor Cabs.

The tariff structure and rates, including cross-over speed and increments for the "Extras" key, will be determined by Transport for London and issued by the PCO from time to time and may include differing rates according to time of day, date or value of fare.

**4.1.6 Language**

The taximeter display, markings and instructions shall be in the English language.

**4.2 Physical requirements**

**4.2.1 Sealing points**

Each taximeter shall be fitted with recesses or other approved sealing devices, as approved by the Public Carriage Office:

- a) to receive a seal to cover the fitting screw attaching the taximeter to the body of the vehicle. Typical recess dimensions shall be 9.00 – 9.125 mm diameter and 8.00 – 8.25 mm deep (see Figure 1 for dimensions);
- b) to receive a seal to indicate the year and month of audit testing. Typical recess dimensions shall be tapering from 9.3 – 9.5 mm at the mouth to 10.5 – 11.0 mm at the root which shall be 2.4 - 2.6 mm deep;
- c) if applicable, to seal the cover to the tariff injection port.

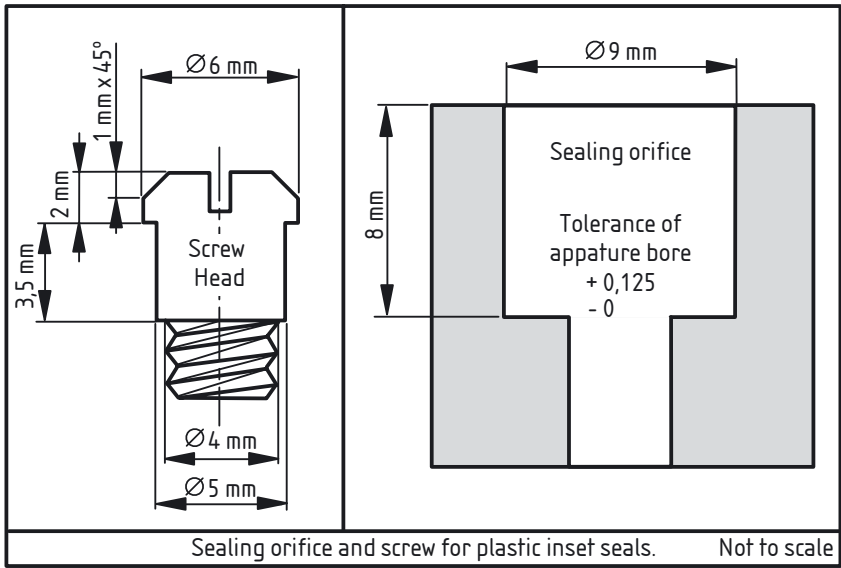


Figure 1 Design of sealing socket for screw securing the taximeter to the body of the vehicle

**4.2.2 Tariff identification**

The tariff programme contained within the taximeter must be clearly identified by a colour code as directed by Transport for London. This identification may be in the form of a spot having a visible area of not less than 5mm diameter or as a homogeneous coloured tariff programme cover. It must not be accessible nor shall it be possible to gain access to the components permitting the tariff or, with the exception of an approved disabling device, the functional adjustments to the meter without breaking the Nominated Body seals.

### **4.2.3 Electronic tariff injection methods**

In the event that identification is electronic, the colour code must be constantly illuminated at a suitable intensity to facilitate identification whilst the taximeter is in use. When the taximeter is not in use the colour code may be either constantly illuminated or flashing. Access to the electronic tariff update portals will be permitted providing that the interface link is encrypted and contains security measures that prevent any form of programme tampering. (Declaration of this must be supplied by the taximeter manufacturer as part of the approval process)

## **4.3 Tolerances**

### **4.3.1 Pulses**

The tolerance on numbers of pulses to effect a change in fare displayed by a taximeter shall be  $\pm 0.1\%$  or  $\pm 2$  pulses whichever is the larger (see Measuring Instruments Directive Annex MI-007 clause 7 and BS EN 50148:1996 clause 7).

### **4.3.2 Time**

The tolerance on the time taken to effect a change in fare for the taximeter fitted to a taxi shall be  $\pm 0.1\%$  (see Measuring Instruments Directive Annex MI-007 clause 7 and BS EN 50148:1996 clause 7).

### **4.3.3 Electromagnetic compatibility**

Reference shall be made to the Automotive Directive 2004/104/EC in regard to e-marking of electronic products installed in taxis.

## **4.4 Peripheral devices**

### **4.4.1 Printers**

The use of printers shall comply with "Transport for London Public Carriage Office Taximeters and Taximeter Receipt Printers – Specification for the Provision of an Installation Service".

### **4.4.2 'For Hire' lamp**

The taximeter shall be constructed to operate light boxes in accordance with the London Cab Order 1934, Regulations as to Taximeters and Fares for Motor Cabs, Part VI, 38 Lighting of taximeters and taxi signs.

## **5 Testing**

### **5.1 General**

Taximeters for use in London shall be subject to performance tests by a Notified Body under the Measuring Instruments Directive, as in the case of **5.2.1**, or by a laboratory operating a quality system in accordance with BS EN ISO 17025. Flow charts for this process are given in Annex A.

## **5.2 Type test**

### **5.2.1 Laboratory tests**

Two samples of each type of taximeter shall be submitted to a suitable test laboratory together with full written operating instructions and all the necessary equipment to alter the time and date of each taximeter. The taximeters shall be type tested in accordance with the requirements defined in the Measuring Instruments Directive, BS EN 50148:1996 and this specification.

One of the taximeters shall be retained by the laboratory or notified body as a pattern meter.

### **5.2.2 Road tests**

A road test shall be undertaken on the second taximeter consisting of a minimum of 250 hirings and 500 paid miles. These shall be verified by an approved installer. Road tests shall be performed on a London licensed taxicab.

## **5.3 Tariff change test**

From time to time the Public Carriage Office will notify the approved taximeter manufacturers and taximeter installers of the tariff for taxis in the London area. The proposed tariff will be circulated by the Public Carriage Office and its implementation shall be verified using the method described in Annex B.

The testing shall be performed on each meter type and on each device constant k value in pulses per mile.

## **5.4 Audit or routine test**

Audit or routine testing of taximeters shall be performed at a minimum frequency of once per year on each type of taximeter by performing the testing in accordance with Annex C. Taximeters should be fitted to at least one licensed London taxi within a 12 month period.

The taximeter shall then be sealed with a seal as described in **4.2.1 (b)** to indicate the month and year of testing.

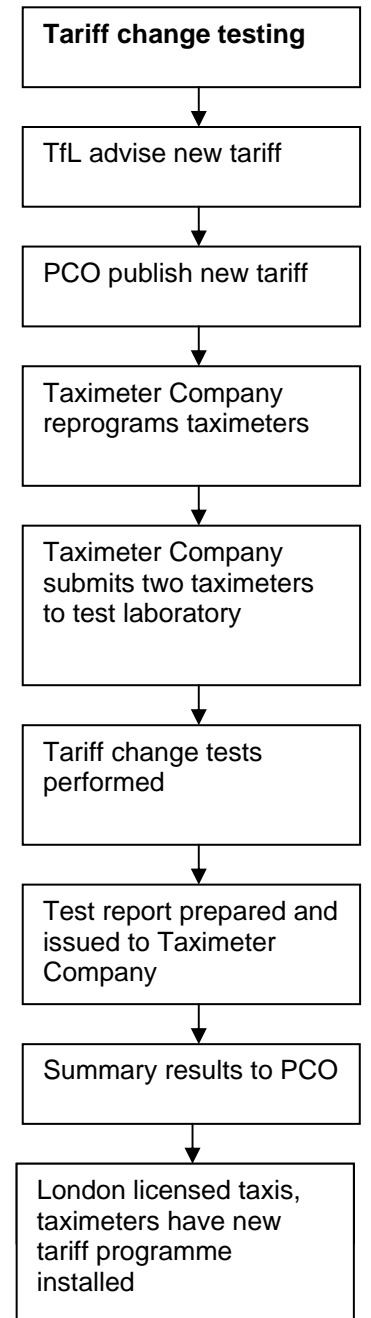
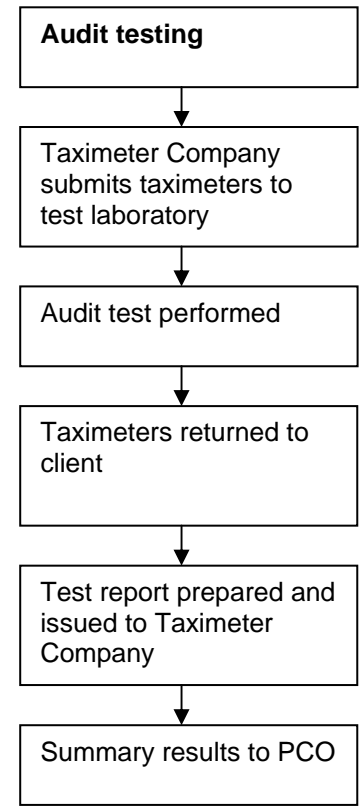
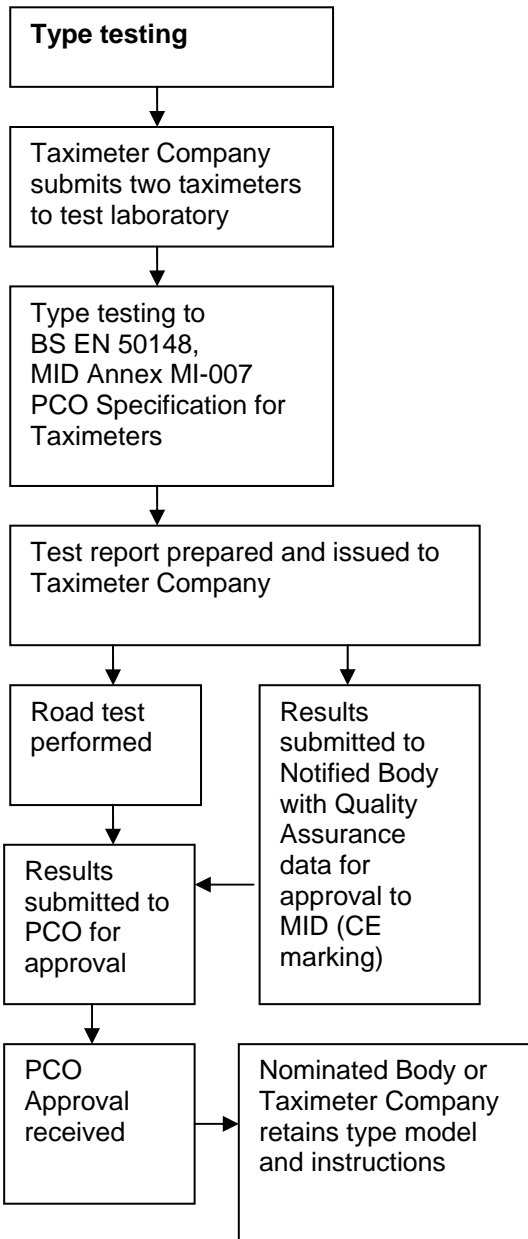
If a taximeter type has not been submitted for testing for a period of 12 calendar months then the Public Carriage Office may remove its approval and type testing shall be repeated before re-approval.

## **6 Marking**

All taximeters shall be clearly and permanently marked with the information required in BS EN 50148:1996 clause **9** including the device constant k in pulses per mile.

Reference should also be made to the marking requirements of the Measuring Instruments Directive and the Statutory Instrument 2006 SI 2304.





PCO Taximeter Specification  
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 Version 1/TLP/100/02F

**Annex A Flow charts for taximeter testing**

## **Annex B**

### **Tariff change test**

#### **B.1 General**

When the tariff in the London area is changed the following tests shall be performed to demonstrate the correct calculation and display of fares. These tests shall be performed with the time and date of the taximeters set to activate the different tariff rates. For any changes in tariff rate that depends on a Bank or Public Holiday the dates shall be confirmed by Transport for London.

#### **B.2 Samples**

Each manufacturer or taximeter agent shall submit two taximeters of each type and of each device constant k value in pulses per mile with the proposed tariff programmed for testing by a suitable laboratory. These shall be accompanied by full written instructions and all the necessary equipment to alter the time and date of each taximeter.

#### **B.3 Test procedure**

**B.3.1** Suitable dates and times shall be set on each taximeter to perform a series of tests to verify the following inputs in the proposed tariff:

**B.3.2** With each taximeter in 'STOPPED' mode supply the agreed number of pulses to effect the first change in fare and a change in fare at any change in rate. The number of pulses taken to effect these changes shall be within the tolerances laid down by the Public Carriage Office (see **4.3.1**).

**B.3.3** With each taximeter in 'HIRED' mode verify the time taken for the fare to display the first or other agreed change in fare and the time taken for the fare change to the equivalent of the fare at any change in rate in 'STOPPED' mode. The time taken shall be within the tolerances laid down by the Public Carriage Office (see **4.3.2**).

**B.3.4** With the taximeter set to a suitable alternative date or time to affect a different tariff rate the tests given in **B.3.2** and **B.3.3** shall be repeated.

**B.3.5** Repeat the tests given in **B.3.2** and **B.3.3** to verify any additional tariff rates or fare structures.

#### **B.4 Test report**

The test report shall include the following information:

- a) The model and serial number of the taximeter;
- b) The submitter;
- c) Details of the testing performed;
- d) References to the equipment used to perform the tests;
- e) Dates and times set on the taximeters;
- f) Date of the tests.

The information should be provided to the Public Carriage Office within 30 days of notification from Transport for London

## **Annex C**

### **Audit or routine testing of taximeters**

#### **C.1 General**

**C.1.1** Taximeters shall be tested at a minimum frequency of once per year in accordance with the method described below to demonstrate continuing conformity.

**C.1.2** All meters shall be inspected to ensure that the appropriate London tariff colour identifier, applicable to the tariff in use, is in position.

**C.1.3** The meters shall not differ in construction from their relevant pattern meter.

#### **C.2 Functional assessment of taximeter**

**C.2.1** Each meter shall be operated following the manufacturer's instructions to ensure that all features of the meter are operating correctly. Such tests shall include the correct operation of the following:

- a) Lights indicating 'FOR HIRE', 'HIRED' and 'STOPPED' operating positions;
- b) 'EXTRAS' button and display;
- c) Totalisers;
- d) Fare display;
- e) Modes;
- f) Date and time.

#### **C.3 Performance tests**

**C.3.1** Each meter shall be tested for accuracy and distance using a suitable test rig.

**C.3.2** Pulses shall be injected to the taximeter to simulate the distance covered to the first, or other agreed change in fare. The number of pulses taken to effect this change shall be within the tolerances laid down by the Public Carriage Office (see **4.3.1**).

**C.3.3** If a time test is to be conducted, the duration will take the meter to a suitable change in fare. The time taken shall be within the tolerances laid down by the Public Carriage Office (see **4.3.2**).

**C.3.4** In accordance with Public Carriage Office requirements the taximeter clock shall be correct to within 3 minutes. This shall be verified by reference to a suitable time source.

#### **C.4 Sealing**

Meters that have met with the above requirements shall have the tariff access, or other agreed point, sealed by means of coloured plastic seals indicating the month and year of the test.

#### **C.5 Test report**

The test report shall include the following information:

- a) The model, serial number and device constant k value of the taximeter;
- b) The submitter;
- c) Details of the testing performed;
- d) References to the equipment used to perform the tests;
- e) Date of the tests.

Taximeter manufacturers shall supply the Public Carriage Office with a summary of the testing including make, model number, serial number and a laboratory reference