

SCHEDULE 1

Regulation 2(1)

ESSENTIAL REQUIREMENTS

1. The essential requirements are the relevant requirements relating to taximeters contained in Annex I and Annex MI-007 set out in this Schedule.

Definitions

2. In these Regulations—

“appropriate licensing authority” means—

- (a) in relation to the area to which the Metropolitan Public Carriage Act 1869(1) applies, Transport for London;
- (b) in relation to any other area in England and Wales, the authority responsible for licensing taxis in that area; and
- (c) in relation to Scotland, the district or islands council responsible for licensing taxis in that area;

“climatic environments” means the conditions in which taximeters may be used;

“critical change value” means the value at which the change in the measurement result is considered undesirable;

“cross-over speed” means the speed value found by division of a time tariff value by a distance tariff value;

“direct sales” means a trading transaction where—

- (a) the measurement result serves as the basis for the price to pay;
- (b) at least one of the parties involved in the transaction related to the measurement is a consumer or any other party requiring a similar level of protection; and
- (c) all the parties in the transaction accept the measurement result at that time and place;

“disturbance” means an influence quantity having a value within the limits specified in the appropriate requirement but outside the specified rated operating conditions of the taximeter. An influence quantity is a disturbance if for that influence quantity the rated operating conditions are not specified;

“fare” means the total amount of money due for a trip based on a fixed initial hire fee or the length or the duration of the trip (or a combination of any of these), and does not include a supplement charged for extra services;

“influence quantity” means a quantity that is not the measurand but that affects the result of measurement;

“measurand” means the particular quantity subject to measurement;

“normal calculation mode D (double application of tariff)” means a fare calculation based on simultaneous application of time tariff and distance tariff over the whole trip;

“normal calculation mode S (single application of tariff)” means a fare calculation based on application of the time tariff below the cross-over speed and application of the distance tariff above the cross-over speed;

“operating position” means the different modes in which a taximeter fulfils the different parts of its functioning, and which are distinguished by the following indications—

- (a) ‘For Hire’, which is the operating position in which the fare calculation is disabled;

(1) 1869 c .115; section 2 sets out the areas covered by the Act.

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- (b) ‘Hired’, which is the operating position in which the fare calculation takes place on the basis of a possible initial charge and a tariff for distance travelled or time of the trip, or both; and
- (c) ‘Stopped’, which is the operating position in which the fare due for the trip is indicated and at least the fare calculation based on the time is disabled;

“rated operating conditions” means the values for the measurand and influence quantities making up the normal working conditions of a taximeter; and

“resolution” means the decision making process by which an appropriate licensing authority sets its tariff of fares for its area.

Allowable Errors

3.—(1) Under rated operating conditions and in the absence of a disturbance, the error of measurement shall not exceed the maximum permissible error (MPE) value as set out in paragraph 17.

(2) Unless stated otherwise, MPE is expressed as a bilateral value of the deviation from the true measurement value.

(3) Under rated operating conditions and in the presence of a disturbance, the performance requirement shall be as set out in paragraph 18.

(4) The manufacturer shall specify the climatic, mechanical and electromagnetic environments in which the taximeter is intended to be used, power supply and other influence quantities likely to affect its accuracy, taking account of the requirements in this Schedule.

(a) Climatic environments—

The manufacturer shall specify the temperature range. The minimum temperature range is 80°C and shall be within the upper temperature limit of 70°C and the lower temperature limit of -40°C. The manufacturer shall indicate whether the taximeter is designed for condensing or non-condensing humidity as well as the intended location for the instrument, that is open or closed.

(b) Mechanical environments—

(i) M3: This class applies to taximeters used in locations where the level of vibration and shock is high and very high, such as instruments mounted directly on machines or conveyor belts.

(ii) The following influence quantities shall be considered in relation with mechanical environments, namely—

(aa) vibration;

(bb) mechanical shock.

(c) Electromagnetic environments—

(i) E3: This class applies to taximeters supplied by the battery of a vehicle. Such instruments shall comply with the requirements of instruments used in locations with electromagnetic disturbances corresponding to those likely to be found in industrial buildings and the following additional requirements—

(aa) voltage reductions caused by energising the starter-motor circuits of internal combustion engines;

(bb) load dump transients occurring in the event of a discharged battery being disconnected while the engine is running.

(ii) The following influence quantities shall be considered in relation with electromagnetic environments—

- (aa) voltage interruptions;
 - (bb) short voltage reductions;
 - (cc) voltage transients on supply lines or signal lines, or both;
 - (dd) electrostatic discharges;
 - (ee) radio frequency electromagnetic fields;
 - (ff) conducted radio frequency electromagnetic fields on supply lines or signal lines, or both;
 - (gg) surges on supply lines or signal lines, or both.
- (5) Other influence quantities to be considered, where appropriate, are—
- (a) voltage variation;
 - (b) any other quantity likely to influence in a significant way the accuracy of the taximeter.
- (6) When carrying out the tests as envisaged in these Regulations, the following paragraphs apply—
- (a) The basic rules for testing and the determination of errors are—
 - (i) the essential requirements specified in sub-paragraphs (1) to (4) shall be verified for each relevant influence quantity. These essential requirements apply when each influence quantity is applied and its effect evaluated separately, all other influence quantities being kept relatively constant at their reference value; and
 - (ii) the metrological tests shall be carried out during or after the application of the influence quantity, whichever condition corresponds to the normal operational status of the taximeter when that influence quantity is likely to occur.
 - (b) In relation to ambient humidity—
 - (i) according to the climatic operating environment in which the taximeter is intended to be used either the damp heat-steady state (non-condensing) or damp heat cyclic (condensing) test may be appropriate; and
 - (ii) the damp heat cyclic test is appropriate where condensation is important or when penetration of vapour will be accelerated by the effect of breathing. In conditions where non-condensing humidity is a factor the damp-heat steady test is appropriate.

Reproducibility

4. The application of the same measurand in a different location or by a different user, all other conditions being the same, shall result in the close agreement of successive measurements. The difference between the measurement results shall be small when compared with the MPE.

Repeatability

5. The application of the same measurand under the same conditions of measurement shall result in the close agreement of successive measurements. The difference between the measurement results shall be small when compared with the MPE.

Discrimination and Sensitivity

6. A taximeter shall be sufficiently sensitive and the discrimination threshold shall be sufficiently low for the intended measurement task.

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Durability

7. A taximeter shall be designed to maintain an adequate stability of its metrological characteristics over a period of time estimated by the manufacturer, provided that it is properly installed, maintained and used according to the manufacturer's instruction when in the environmental conditions for which it is intended.

Reliability

8. A taximeter shall be designed to reduce as far as possible the effect of a defect that would lead to an inaccurate measurement result, unless the presence of such a defect is obvious.

Suitability

9.—(1) A taximeter shall have no feature likely to facilitate fraudulent use, whereas possibilities for unintentional misuse shall be minimal.

(2) A taximeter shall be suitable for its intended use taking account of the practical working conditions and shall not require unreasonable demands of the user in order to obtain a correct measurement result.

(3) Where a taximeter is designed for the measurement of values of the measurand that are constant over time, the instrument shall be insensitive to small fluctuations of the value of the measurand, or shall take appropriate action.

(4) A taximeter shall be robust and its materials of construction shall be suitable for the conditions in which it is intended to be used.

(5) A taximeter shall be designed so as to allow the control of the measuring tasks after the instrument has been placed on the market and put into use. If necessary, special equipment or software for this control shall be part of the instrument. The test procedure shall be described in the operation manual.

(6) When a taximeter has associated software which provides other functions besides the measuring function, the software that is critical for the metrological characteristics shall be identifiable and shall not be inadmissibly influenced by the associated software.

Protection against corruption

10.—(1) The metrological characteristics of a taximeter shall not be influenced in any inadmissible way by the connection to it of another device, by any feature of the connected device itself or by any remote device that communicates with the instrument.

(2) A hardware component that is critical for metrological characteristics shall be designed so that it can be secured. Security measures foreseen shall provide for evidence of an intervention.

(3) Software that is critical for metrological characteristics shall be identified as such and shall be secured.

(4) Software identification shall be easily provided by the taximeter.

(5) Evidence of a software intervention shall be available for a reasonable period of time.

(6) Measurement data, software that is critical for measurement characteristics and metrologically important parameters stored or transmitted shall be adequately protected against accidental or intentional corruption.

Information to be borne by and to accompany the taximeter

11.—(1) A taximeter shall bear the following inscriptions—

- (a) manufacturer's mark or name;
 - (b) information in respect of its accuracy,
- plus, when applicable—
- (c) information in respect of the conditions of use;
 - (d) measuring capacity;
 - (e) measuring range;
 - (f) identity marking;
 - (g) number of the EC-type examination certificate or the EC design examination certificate;
 - (h) information whether or not additional devices providing metrological results comply with these Regulations.
- (2) The taximeter shall be accompanied by information on its operation, unless the simplicity of the instrument makes this unnecessary. Information shall be easily understandable and shall include where relevant—
- (a) rated operating conditions;
 - (b) mechanical and electromagnetic environment classes;
 - (c) the upper and lower temperature limit, whether condensation is possible or not, open or closed location;
 - (d) instructions for installation, maintenance, repairs, permissible adjustments;
 - (e) instructions for correct operation and any special conditions of use;
 - (f) conditions for compatibility with interfaces or other measuring instruments.
- (3) Groups of identical taximeters used in the same location do not necessarily require individual instruction manuals.
- (4) The scale interval for a measured value shall be in the form 1×10^n , 2×10^n or 5×10^n , where n is any integer or zero. The unit of measurement or its symbol shall be shown close to the numerical value.
- (5) The units of measurement used and their symbols shall be in accordance with the provisions of Community legislation on units of measurement and their symbols.
- (6) All marks and inscriptions required under any requirement shall be clear, non-erasable, unambiguous and non-transferable.

Indication of result

- 12.**—(1) Indication of the result shall be by means of a display or hard copy.
- (2) The indication of any result shall be clear and unambiguous and accompanied by such marks and inscriptions necessary to inform the user of the significance of the result. Easy reading of the presented result shall be permitted under normal conditions of use. Additional indications may be shown provided they cannot be confused with the metrologically controlled indications.
- (3) In the case of hard copy the print or record shall also be easily legible and non-erasable.
- (4) A measuring instrument for direct sales trading transactions shall be designed to present the measurement result to both parties in the transaction when installed as intended. When critical in case of direct sales, any ticket provided to the consumer by an ancillary device not complying with the appropriate requirements of these Regulations shall bear an appropriate restrictive information.

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Further processing of data to conclude the trading transaction

13.—(1) A taximeter shall record by a durable means the measurement result accompanied by information to identify the particular transaction, when—

- (a) the measurement is non-repeatable; and
- (b) the taximeter is normally intended for use in the absence of one of the trading parties.

(2) Additionally, a durable proof of the measurement result and the information to identify the transaction shall be available on request at the time the measurement is concluded.

Conformity evaluation

14. A taximeter shall be designed so as to allow ready evaluation of its conformity with the appropriate requirements of these Regulations.

Design requirements

15.—(1) The taximeter shall be designed to calculate the distance and to measure the duration of a trip.

(2) The taximeter shall be designed to calculate and display the fare, incrementing in steps equal to the resolution fixed by the appropriate licensing authority in the operating position ‘Hired’. The taximeter shall also be designed to display the final value for the trip in the operating position ‘Stopped’.

(3) A taximeter shall be able to apply the normal calculation modes S and D. It shall be possible to choose between these calculation modes by a secured setting.

(4) A taximeter shall be able to supply the following data through an appropriate secured interface or interfaces, namely—

- (a) the operating position—
 - (i) ‘For Hire’;
 - (ii) ‘Hired’; or
 - (iii) ‘Stopped’;
- (b) the totaliser data according to paragraph 25(1);
- (c) the general information—
 - (i) constant of the distance signal generator;
 - (ii) date of securing;
 - (iii) taxi identifier;
 - (iv) real time; and
 - (v) identification of the tariff;
- (d) the fare information for a trip—
 - (i) total charged;
 - (ii) fare;
 - (iii) calculation of the fare;
 - (iv) supplement charge;
 - (v) date;
 - (vi) start time;
 - (vii) finish time; and

(viii) distance travelled; and

(e) the tariff or tariffs information, namely the parameters of the tariff or tariffs.

(5) Where a device is required to be connected to the interface of a taximeter, it shall be possible, by way of a secured setting, to inhibit automatically the operation of the taximeter for reasons of the non-presence or improper functioning of the required device.

(6) If relevant, it shall be possible to adjust a taximeter for the constant of the distance signal generator to which it is to be connected and to secure the adjustment.

Rated operating conditions

16. The manufacturer shall specify the rated operating conditions for the instrument, and in particular the limits of the DC power supply for which the instrument has been designed.

Maximum permissible errors (MPEs)

17. The MPEs, excluding any errors due to the application of a taximeter in a taxi, are—

(a) For the time elapsed: $\pm 0.1 \%$

minimum value of MPE: 0.2s;

(b) For the distance travelled: $\pm 0.2 \%$

minimum value of MPE: 4 m;

(c) For the calculation of the fare: $\pm 0.1 \%$

minimum, including rounding: corresponding to the least significant digit of the fare indication.

Permissible effect of disturbance

18. The MPE laid down in paragraph 17 shall also be respected in the presence of an electromagnetic disturbance.

Power supply failure

19. In case of a reduction of the voltage supply to a value below the lower operating limit as specified by the manufacturer, the taximeter shall—

(a) continue to work correctly or resume its correct functioning without loss of data available before the voltage drop if the voltage drop is temporary, that is, due to restarting the engine; and

(b) abort an existing measurement and return to the position 'For Hire' if the voltage drop is for a longer period.

Other requirements

20. The conditions for the compatibility between the taximeter and the distance signal generator shall be specified by the manufacturer of the taximeter.

21. If there is a supplement charge for an extra service, entered by the driver on manual command, this shall be excluded from the fare displayed. However, in that case a taximeter may display temporarily the value of the fare including the supplementary charge.

22. If the fare is calculated according to calculation mode D a taximeter may have an additional display mode in which only the total distance and duration of the trip are displayed in real time.

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23. All values displayed for the passenger shall be suitably identified, so that these values as well as their identification shall be clearly readable under daylight and night conditions.

24.—(1) If the fare to be paid or the measures to be taken against fraudulent use can be affected by the choice of functionality from a pre-programmed setting or by free data setting, it shall be possible to secure the instrument settings and data entered.

(2) The securing possibilities available in a taximeter shall be such that separate securing of the settings is possible.

(3) The provisions in paragraph 10(3), (4) and (5) apply also to the tariffs.

25.—(1) A taximeter shall be fitted with non-resettable totalisers for all of the following values—

- (a) the total distance travelled by the taxi;
- (b) the total distance travelled when hired;
- (c) the total number of hirings;
- (d) the total amount of money charged as supplements; and
- (e) the total amount of money charged as fare; and

the totalised values shall include the values saved according to paragraph 19 under conditions of loss of power supply.

(2) If disconnected from power, a taximeter shall allow the totalised values to be stored for one year for the purpose of reading out the values from the taximeter to another medium.

(3) Adequate measures shall be taken to prevent the display of totalised values from being used to deceive passengers.

26. Automatic change of tariffs is allowed due to the—

- (a) distance of the trip;
- (b) duration of the trip;
- (c) time of the day;
- (d) date;
- (e) day of the week.

27. If properties of the taxi are important for the correctness of the taximeter, the taximeter shall provide means to secure the connection of the taximeter to the taxi in which it is installed.

28. For the purpose of testing after installation, the taximeter shall be equipped with the possibility to test separately the accuracy of time and distance measurement and the accuracy of the calculation.

29. A taximeter and its installation instructions specified by the manufacturer shall be such that, if installed according to the manufacturer's instructions, fraudulent alterations of the measurement signal representing the distance travelled are sufficiently excluded.

30. The general essential requirement dealing with fraudulent use shall be fulfilled in such a way that the interests of the customer, the driver, the driver's employer and the fiscal authorities are protected.

31. A taximeter shall be designed so that it can respect the MPEs without adjustment during a period of one year of normal use.

32. The taximeter shall be equipped with a real-time clock by means of which the time of the day and the date are kept, one or both can be used for automatic change of tariffs. The requirements for the real-time clock are—

- (a) the timekeeping shall have an accuracy of 0.02 %;
- (b) the correction possibility of the clock shall be not more than 2 minutes per week. Correction for summer and wintertime shall be performed automatically; and
- (c) correction, automatic or manually, during a trip shall be prevented.

33. The values of distance travelled and time elapsed, when displayed or printed in accordance with these Regulations shall be for—

- (a) the distance travelled, the units of kilometres or miles, until the date is fixed according to Article 1(b) of Council Directive [80/181/EEC](#)(**2**), as amended by Council Directive [89/617/EEC](#)(**3**); and
- (b) the time elapsed, the units of seconds, minutes or hours, as may be suitable, but keeping in mind the necessary resolution and the need to prevent misunderstandings.

(2) OJNo. L39, 15.2.1980, p.40.

(3) OJ No. L357, 7.12.1989, p.28.