INTERNATIONAL

RECOMMENDATION

OIML R 55

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Speedometers, mechanical odometers and chronotachographs for motor vehicles - Metrological regulations

Compteurs de vitesse, compteurs mécaniques de distance et chronotachygraphes des véhicules automobiles - Réglementation métrologique

OIML R 55 Edition 1981 (E)

ORGANISATION INTERNATIONALE DE MÉTROLOGIE LÉGALE

INTERNATIONAL ORGANIZATION OF LEGAL METROLOGY

Foreword

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SPEEDOMETERS
MECHANICAL ODOMETERS
and CHRONOTACHOGRAPHS
for MOTOR VEHICLES
Metrological regulations

1. Definitions.

1.1. Speedometer

Instrument designed to indicate to the driver, the instantaneous speed of his vehicle.

1.2. Odometer

Instrument designed to indicate the distance covered by the vehicle following a totalisation of vehicle wheel revolutions.

1.3. Chronotachograph

Instrument designed to indicate and record instantaneous vehicle speed, the distance covered by the vehicle, and possibly other parameters of the journey (points 2.4.2. and 2.5.1.).

1.4. Constant *k* of odometer or chronotachograph

Characteristic quantity showing the type (revolutions of the driving shaft or impulses) and number of signals which the odometer or chronotachograph must receive so that the indicated and/or recorded distance increases by 1 km.

The constant *k* may be expressed in revolutions per kilometre, rev/km, or impulses per kilometre, imp/km.

1.5. Coefficient *w* of the vehicle

Characteristic quantity showing the type (revolutions of the driving shaft or impulses) and number of signals emitted by the device provided on the vehicle, for connection to the odometer or chronotachograph, when the vehicle covers a distance of 1 km.

The coefficient *w* must be expressed in the same units as constant *k*.

The coefficient *w* varies according to vehicle load, and the dimensions, pressure and degree of wear of the tyres. It must be determined under standard test conditions (point 4.2.4.).

1.6. Speedometer constant

Characteristic quantity showing the type (revolutions of the driving shaft or impulses) and the frequency of signals at which the speedometer must indicate a speed of 60 km/h.

The speedometer constant may be expressed in revolutions per minute, rev/min, or in impulses per minute, imp/min.

The speedometer constant is numerically equal to odometer constant *k* when the same driving system is used for both instruments.

2. Technical characteristics.

2.1. General

2.1.1. The speedometer, odometer and chronotachograph must be manufactured in materials with adequate stability and strength, and having electrical and magnetic characteristics capable of ensuring the constancy of these instruments, under their normal conditions of use.

2.1.2. The component elements of the speedometer, odometer and chronotachograph must be placed inside a housing, providing protection against the influence of external factors, such as dust and humidity.

2.1.3. The indicating devices of the speedometer, odometer and chronotachograph must be provided with adequate, non-dazzle lighting.

2.1.4. The speedometer, odometer and chronotachograph must be so placed in the vehicle, that the driver can see the indications of these instruments easily from his normal position.

2.1.5. The constant *k* of the odometer or chronotachograph, and the coefficient *w* of the vehicle, must be equal within the limits of maximum permissible errors (point 4). If this is not the case, the vehicle must be provided with a device, designated to make constant *k* and coefficient *w* equal with a degree of accuracy determined by the maximum permissible errors.

2.1.6. The natural frequency and damping of the measuring mechanism of the speedometer or chronotachograph must be such that the speed indicated and/or recorded can follow within the limits of the maximum permissible errors the variation in measured speed, for an acceleration not exceeding 2 m/s^2.

2.2. Speedometer

2.2.1. The scale interval of the speedometer must not exceed 10 km/h.

2.2.2. The scale spacing corresponding to a difference in speed of 10 km/h, must not be less than 5 mm.

2.2.3. The scale of the speedometer must be numbered at least every 20 km/h.

2.3. Odometer

2.3.1. The odometer must comprise at least one totalizer, which cannot be reset to zero, without destroying the protective marks.

2.3.2. The scale interval of the odometer totalizer must be either 1 km or 0.1 km. Where the scale division is 0.1 km, the figures indicating hectometres must be clearly distinguishable from those indicating integral number of kilometres, for example by the use of a comma as a decimal point, or by the use of a comma as a decimal point and a different colour.

2.3.3. The measurement range of the odometer totaliser must be at least 99 999 km.

2.3.4. The figures of the odometer totaliser must be clearly readable, with an apparent height of at least 4 mm.

2.4. Chronotachograph

2.4.1. The chronotachograph must indicate and record instantaneous speed, and the distance covered by the vehicle.

2.4.2. The chronotachograph can also record :

— running time and stopping time,
— working time for the driver or drivers,
— other driving parameters.

2.4.3. Recordings must be made in form of diagrams on a record chart (strip or disc). The chart must be of a quality such that the operation of the instrument is normal, and the recordings are indelible, clearly legible, and identifiable.

2.4.4. The record chart driving device must be controlled by a clock mechanism (mechanical or electrical), continuously and uniformly.

2.4.5. The mechanism driving the record chart, must ensure that the latter is driven with no slip with respect to the control system, and can be correctly inserted and extracted freely.

2.4.6. In any chronotachograph, a marker or any other appropriate device must be provided, ensuring correct positioning of the chart, so as to obtain correspondence between the time indicated by the chronotachograph or actual time where there is no time indicator, and time marking on the chart.

2.4.7. The minimum recording capacity of the charts, irrespective of their form, must be 24 hours. Lower recording capacities can be used on special purpose vehicles.

2.4.8. The speed recorder stylus must have a rectilinear movement, perpendicular to the direction of displacement of the record chart.

2.4.9. The speed scale of the speed diagram must be numbered at least every 20 km/h. This scale can start at 0 km/h.

Maximum values of the measurement ranges, indicated and recorded, must be the same.

2.4.10. Each variation in speed of 10 km/h, must be represented on the speed diagram by a distance of at least :
1.5 mm for measurement range with upper limit not exceeding 125 km/h ;
1.2 mm for measurement range with upper limit exceeding 125 km/h.

2.4.11. Every kilometre of distance travelled must be represented on the distance diagram by a distance of at least 1 mm.

2.4.12. The scale interval of the time scale on the record chart must not exceed 5 minutes, and time values must be indicated at least every hour.

2.4.13. The housing containing the record chart and time reset control device, must be fitted with a lock. Any opening of this housing must be recorded automatically on the sheet.

2.5. Supplementary devices

2.5.1. The following supplementary devices can be used :

— time indicator (clock), on speedometers, odometers and chronotachographs,

— partial distance totalizer with possibility for zero reset, on odometers and chronotachographs,

— alarm device indicating overrange of a preset speed, on speedometers and chronotachographs,

— devices indicating other parameters of the journey.

2.5.2. The measurement range of the partial distance totalizer with possibility for zero reset must be at least equal to 999 km.

3. Inscriptions.

3.1. The unit of measurement of speed, km/h, must be marked on the speedometer dial and on the chronotachograph dial in the vicinity of the speed scale.

The unit of measurement of distance, km, must be marked on the odometer dial and on the chronotachograph dial in the vicinity of the distance totalizer.

Where the speedometer and odometer share a common dial, it is sufficient to indicate one of the preceding units only, of speed or of distance.

3.2. The following indications must appear on the speedometer, odometer or chronotachograph dial, or on their housing or data plate :

— manufacturer's name or mark,
— production serial number,
— pattern mark,
— value of constant *k.*

3.3. The chronotachograph record chart must bear the following indications :

— manufacturer's name or mark,
— pattern mark of chronotachograph in which it can be used,
— upper limit of speed measurement range of chronotachograph, in km/h.

4. Maximum permissible errors.

4.1. The maximum permissible errors for speedometers, odometers and chronotachographs, on verification before installation on a vehicle, for a temperature range of (+ 20 ± 10) °C, are as follows.

4.1.1. The maximum permissible error, positive or negative, for the indication or recording of the distance covered is equal to the larger of the two following values :

1 % of the true distance

10 m.

4.1.2. Every indicated or recorded value of the speed must be within an interval not exceeding the larger of the two following values :

6 % of the true speed

6 km/h.

National regulations will indicate whether the distribution of the maximum permissible errors, with respect to the true value, must be symmetrical or non-symmetrical.

4.1.3. The maximum permissible error, positive or negative, for the indication or recording of time is equal to :

2 minutes in 24 hours or

10 minutes in 7 days, when clock operating time following reset is not less than this period or

0.5 % of the record chart capacity, for a time less than 24 hours.

4.2. The maximum permissible errors for speedometers, odometers and chronotachographs, on verification after installation on a vehicle, for a temperature range of (+ 20 ± 10) °C, are as follows.

4.2.1. The maximum permissible error, positive or negative, for the indication or recording of the distance covered is equal to the larger of the two following values :
2 % of the true distance
20 m.

4.2.2. Every indicated or recorded value of the speed must be within an interval not exceeding the larger of the two following values :
8 % of the true speed
8 km/h.

National regulations will indicate whether the distribution of the maximum permissible errors, with respect to the true value, must be symmetrical or non-symmetrical.

4.2.3. The maximum permissible error for the indication or recording of time is that fixed in point 4.1.3.

4.2.4. The maximum permissible errors defined in point 4.2. above, are determined under the following conditions, which should be considered as standard test conditions :
— vehicle empty, with only one driver,
— tyre pressures in accordance with manufacturer's recommendations,
— tyre wear within limits permitted by current requirements,
— no slip between wheels and road surface,
— vehicle running in a straight line under its own motive power, on a flat surface and at a speed of (50 ± 5) km/h. Verification can also be carried out using appropriate equipment approved by national regulations,
— position of the instruments in accordance with manufacturer's recommendations.

5. Controls.

5.1. If speedometers, odometers and chronotachographs are subject, in a given country, to mandatory national metrological control, this control must include at least the verification indicated in points 5.2 and 5.3.

Supplementary verification can be imposed by national regulations.

5.2. The speedometers, odometers and chronotachographs are subject to pattern approval, initial verification, before and after installation on a vehicle, and verification after each repair under the conditions in point 4.

5.3. In addition to the verification indicated in point 5.2. the chronotachographs are subject to periodic control carried out at least once every two years.

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

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