INTERNATIONAL RECOMMENDATION

OIML R 91-3

Edition 202x (E)

TC7_SC4_P3_N062 3.1CD revision of R 91-3 - Marked

Traffic speed meters

Part 3: Test report format

Cinémomètres pour la mesure de la vitesse des véhicules

Partie 3: Format du rapport d'essais

DRAFT

ORGANISATION INTERNATIONALE DE MÉTROLOGIE LÉGALE

INTERNATIONAL ORGANIZATION OF LEGAL METROLOGY

Contents

Contents ... 3
Foreword ... 5
Introduction ... 6
Test report ... 7
Explanatory notes (continued) ... 8
Identification of the instrument ... 9
Identification of the instrument (continued) ... 10
Identification of the instrument (continued) ... 11
General information concerning the type ... 12
General information concerning the type (continued) ... 13
Information concerning the test equipment used for type evaluation ... 14
Configuration for test ... 15
Adjustments or modifications ... 16
Summary of type evaluation tests ... 17
Summary of Environmental conditions (OIML R 91-2, 6.1 detailed) ... 18
Metrological field test (R 91-2, 4) ... 19
Traffic condition during measurement (R 91-2, 4.6) ... 19
Statistical analysis of errors (optional) (R 91-2, 4.7) ... 21
Assignment to image evidence (R 91-2, 4.8) ... 22
Metrological laboratory tests by traffic simulation (OIML R 91-2, 5) ... 23
Dynamic performance test (OIML R 91-2, 5.3) ... 23
Speed linearity test (OIML R 91-2, 5.4) ... 24
Distance linearity test (OIML R 91-2, 5.5) ... 25
Angle linearity test (OIML R 91-2, 5.6) ... 26
Influence factor and disturbance tests (OIML R 91-2, 6) ... 27
Dry heat (operating) ... 27
Dry heat (storage) ... 28
Cold (operating) ... 29
Cold (storage) ... 30
Damp heat, cyclic (condensing) ... 31
Water (optional) ... 32
Sand and dust (optional) ... 33
Salt mist (optional) ... 34
Vibration (random) ... 35
Mechanical shock ... 36
DC mains voltage variation ... 37
Ripple on DC mains power ... 39
AC mains voltage variation ... 40

DRAFT

AC mains frequency variation ... 42
DC mains voltage dips, short interruptions and (short term) voltage variations ... 43
AC mains voltage dips, short interruptions and reductions ... 44
AC mains frequency harmonics ... 45
VLF and LF disturbances on AC and DC mains ... 46
Bursts (transients) on AC and DC mains ... 48
Surges on AC and DC mains power lines ... 49
Bursts (transients) on signal, data and control lines ... 50
Surges on signal, data and control lines ... 51
AC mains power frequency magnetic field ... 52
Conducted (common mode) currents generated by RF electromagnetic fields ... 53
RF electromagnetic fields ... 54
Electrostatic discharges ... 56
Low voltage of internal battery ... 57
Voltage variations of a road vehicle battery ... 58
Electrical transient conduction along supply lines of external 12 V and 24 V batteries ... 59
Electrical transient conduction via lines other than supply lines for external 12 V and 24 V batteries ... 60
Battery voltage variations during cranking ... 61
Load dump test ... 62
Acceleration test (OIML R 91-2, 6.5) ... 63
Further influence quantity tests (OIML R 91-2, 6.6) ... 65
Installation and alignment of sensor and camera (OIML R 91-2, 6.7) ... 66
Tests specific to certain categories of speed meters (OIML R 91-2, 7) ... 67
Doppler-radar based speed meters (OIML R 91-2, 7.1) ... 67
Range-finding based speed meters (OIML R 91-2, 7.2) ... 69
Average speed meters (OIML R 91-2, 7.3) ... 71
Fixed-distance speed meters (OIML R 91-2, 7.4) ... 73
Image based speed meters (OIML R 91-2, 7.5) ... 74
Across-the-road speed meters (OIML R 91-2, 7.6) ... 75
Moving speed meters (OIML R 91-2, 7.7) ... 76
Moving metrological field test (OIML R 91-2, 7.7.1) ... 76
Metrological field test of the ego speed meter (OIML R 91-2, 7.7.2) ... 77
Traffic simulation for moving speed meters (OIML R 91-2, 7.7.3) ... 78
Software examination (OIML R 91-2, 8) ... 79
General requirements [mandatory] (OIML R 91-2, 8.3.1) ... 79
Software protection [mandatory] (OIML R 91-2, 8.3.2) ... 80
Support of hardware features [mandatory] (OIML R 91-2, 8.3.3) ... 81
Specification and separation of legally relevant parts and specification of interfaces [optional] (OIML R 91-2, 8.3.1) ... 82
Maintenance and re-configuration [optional] (OIML R 91-2, 8.3.1) ... 84
General remarks ... 85

DRAFT

Foreword

The International Organization of Legal Metrology (OIML) is a worldwide, intergovernmental organization whose primary aim is to harmonize the regulations and metrological controls applied by the national metrological services, or related organizations, of its Member States. The main categories of OIML publications are:

- **International Recommendations (OIML R),** which are model regulations that establish the metrological characteristics required of certain measuring instruments and which specify methods and equipment for checking their conformity. OIML Member States shall implement these Recommendations to the greatest possible extent;
- **International Documents (OIML D),** which are informative in nature and which are intended to harmonize and improve work in the field of legal metrology;
- **International Guides (OIML G),** which are also informative in nature and which are intended to give guidelines for the application of certain requirements to legal metrology; and
- **International Basic Publications (OIML B),** which define the operating rules of the various OIML structures and systems.

OIML Draft Recommendations, Documents and Guides are developed by Project Groups linked to Technical Committees or Subcommittees which comprise representatives from the Member States. Certain international and regional institutions also participate on a consultation basis. Cooperative agreements have been established between the OIML and certain institutions, such as ISO and the IEC, with the objective of avoiding contradictory requirements. Consequently, manufacturers and users of measuring instruments, test laboratories, etc. may simultaneously apply OIML publications and those of other institutions.

International Recommendations, Documents, Guides and Basic Publications are published in English (E) and translated into French (F) and are subject to periodic revision.

Additionally, the OIML publishes or participates in the publication of **Vocabularies (OIML V)** and periodically commissions legal metrology experts to write **Expert Reports (OIML E)**. Expert Reports are intended to provide information and advice, and are written solely from the viewpoint of their author, without the involvement of a Technical Committee or Subcommittee, nor that of the CIML. Thus, they do not necessarily represent the views of the OIML.

This publication – reference OIML R 91-3, Edition 202x – was developed by Project Group 3 of OIML Technical Subcommittee TC 7/SC 4 – *Traffic s~~S~~peed meters*. It was approved for final publication by the International Committee of Legal Metrology at its xxth meeting in October 202x. It supersedes the previous edition of R 91 dated 1990.

OIML Publications may be downloaded from the OIML web site in the form of PDF files. Additional information on OIML Publications may be obtained from the Organization's headquarters:

Bureau International de Métrologie Légale
11, rue Turgot - 75009 Paris - France
Telephone: 33 (0)1 48 78 12 82
Fax: 33 (0)1 42 82 17 27
E-mail: biml@oiml.orgmailto:biml@oiml.org
Internet: http://www.oiml.org/www.oiml.org

Introduction

The “Test report format”, the subject of OIML R 91-3, aims at presenting, in a standardized format, the results of the various tests and examinations to which a type of speed meters shall be submitted with a view to its approval.

The “Test report” is a record of the results of the tests carried out on the instrument. The “test report” forms have been produced based on the tests detailed in the performance test procedures (OIML R 91-2).

The “information concerning the test equipment used for type evaluation” shall cover all test equipment which has been used in determining the test results given in a report. The information may be a short list containing essential data (name, type, reference number for purpose of traceability). For example:

- Verification standards (accuracy or accuracy class, and no.);
- Simulator for testing of modules (name, type, traceability and no.);
- Climatic test and static temperature chamber (name, type and no.);
- Electrical tests, bursts (name of the instrument, type and no.);
- Description of the procedure of field calibration for the electromagnetic susceptibility test.

All metrology services or laboratories evaluating types of speed meters according to OIML R 91-1 and -2 or to national or regional regulations based on OIML R 91-1 and -2 are strongly advised to use this “Test report format”, directly or after translation into a language other than English or French. Its direct use in English or in French, or in both languages, is even more strongly recommended whenever test results may be transmitted by the country performing these tests to the approving authorities of another country, under bi- or multi-lateral cooperation agreements. In the framework of the OIML Certification System (OIML-CS), use of the “Test report format” is mandatory.

DRAFT

Test report

Explanatory notes

Symbols	Meaning
v [km/h]	Indicated speed of measured vehicle
v_{EGO} [km/h]	EGO speed of speed meter, when the speed meter is installed in a vehicle
v_{ref} [km/h]	Reference measured speed by reference speed meter or simulator
Δv [km/h]	Absolute difference between v in v_{ref}
MPE [km/h]	Maximum permissible error
N	Constant number of performed measurements, typical value 500, 50 or 5
a_{ref} [m/s^2]	Acceleration for dynamic performance test
d [m]	Distance to vehicle for linearity test
α [°]	Angle to vehicle for linearity test

DRAFT

Explanatory notes (continued)

The name(s) or symbol(s) of the unit(s) used to express test results shall be specified on each form.

The boxes under the headings of the report should always be filled in according to the following example:

	At start	At end	
Temp.:	20.5	21.1	°C
Rel. h.:			%
Date:	2014-10-15	2014-10-15	yyyy-mm-dd
Time:	16:00:05	16:30:05	hh:mm:ss

where: Temp. = temperature
Rel. h. = relative humidity

“Date” in the test report refers to the date on which the test was performed.

DRAFT

Identification of the instrument

Application no.:	.....	Type designation:	.....
Identification no.:	.....	Manufacturer:	.....
Software version:	.....		
Report date:	.....		

Documentation from the manufacturer

(Record as necessary to identify the equipment under test)

System or module name	Drawing number or software reference	Version	Serial no.

Manufacturer provided simulator documentation (if applicable)

System or module name	Drawing number or software reference	Version	Serial no.

DRAFT

Identification of the instrument (continued)

Application no.:	.....	Type designation:	.....
Identification no.:	.....	Manufacturer:	.....
Software version:	.....		
Report date:	.....		

Description or other information pertaining to identification of the instrument (components, interfaces, configuration). Attach photograph, diagrams or drawings if available:

Describe, using point form, the measurement technology used:

DRAFT

Identification of the instrument (continued)

Application no.:	.....	Type designation:	.....
Identification no.:	.....	Manufacturer:	.....
Software version:	.....		
Report date:	.....		

Description or other information pertaining to identification of the instrument:
(attach photograph here if available)

DRAFT

General information concerning the type

Application no.: ..... Manufacturer: .....

Type designation: ..... Applicant: .....

Instrument category: .....

Testing on: ☐ Complete instrument ☐ Module*

Categorisation of speed meter	
Mode of use	
Principle of installation	
Working principle	
Triggering and camera	
Compensation for cosine error	

Rated operating conditions		
	Minimum	**Maximum**
Speed measurement		
- Speed measurement [km/h]		
- EGO speed measurement [km/h], if applicable		
Vehicle identification		
- Distance to vehicle [m], if applicable		
- Angle to vehicle [°], if applicable		
- Number of vehicles, if applicable		
Temperature		
- Operating temperature [°C]		
- Storage temperature [°C]		
Power supply		
- Voltage [V]		

Evaluation period: ……

Date of report: ……

Observer: ……

* The test equipment (simulator or part of a complete instrument) connected to the module shall be defined in the test form(s) used

DRAFT

General information concerning the type (continued)

Application no.:	.....	Manufacturer:	.....
Type designation:	.....	Applicant:	.....
Instrument category:	.....		

Testing on: ☐ Complete instrument ☐ Module*

Use this space to indicate additional remarks and/or information: connecting equipment, interfaces and sensors, choice of the manufacturer regarding protection and specific speed meter requirements etc.

Indications and controls

Describe, using point form, all indications and controls of the instrument (such as wired or wireless communication with the instrument, installation, ready indication, error codes).:

Evidence file

Describe, using point form, evidence file for measurement (type of file, encryption, content, storage, retrieval, authentication):

Checking facility

Describe, using point form, checking facility (automatic and/or manual triggering, outcomes):

Alignment and aiming device

Describe, using point form, alignment procedure and use of aiming device, if applicable:

Test interface

Describe, using point form, test interface (access, parameters

Software

Describe, using point form, the means used to protect legally relevant software in the instrument and indicate the version of the software present at the time of testing and how to verify this version number:

Sealing

Describe, using point form, the physical and electronic seals (e.g. audit trails) used to protect the metrological characteristics of the instrument, and how to access them. Also describe any remote access abilities available and how these are sealed:

* The test equipment (simulator or part of a complete instrument) connected to the module shall be defined in the test form(s) used

DRAFT

Information concerning the test equipment used for type evaluation

Application no.: ..... Type designation: .....

Report date: ..... Manufacturer: .....

List all test equipment used in this report (including descriptions of the equipment used for testing)

Equipment name	Manufacturer	Type	Serial no.	Used for (test references)

DRAFT

Configuration for test

Application no.:	.....	Type designation:	.....
Report date:	.....	Manufacturer:	.....

Use this space for additional information relating to equipment configuration, interfaces, data rates, protection options, additional devices and additional software for the instrument and/or simulator to support type evaluation.

DRAFT

Adjustments or modifications

Application no.:	.....	Type designation:	.....
Report date:	.....	Manufacturer:	.....

Use this space for additional information relating to the identification of any authorized and agreed upon adjustments or modifications made to the sample or samples during the evaluation.

DRAFT

Summary of type evaluation tests

Application no.: ..... Type designation: .....

Report date: ..... Manufacturer: .....

Requirement (R 91-2)		Report page	Passed	Failed	Remarks
4	**Metrological field test**				
4.6	Maximum permissible error	19			
4.7	Statistical analysis of errors (optional)	21			
4.8	Assignment to image evidence	22			
5	**Metrological laboratory tests by traffic simulation**				
5.3	Dynamic performance test	23			
5.4	Speed linearity test	24			
5.5	Distance linearity test	25			
5.6	Angle linearity test	26			
6	**Influence factor and disturbance tests**				
6.1	Evaluation method (detailed checklist)	18			
6.5	Acceleration test	63			
6.6	Further influence quantity tests	65			
6.7	Installation and alignment of sensor and camera	66			
7	**Tests specific to certain categories of speed meters**				
7.1	Doppler-radar based speed meters	67			
7.2	Range-finding based speed meters	69			
7.3	Average speed meters	71			
7.4	Fixed-distance speed meters	73			
7.5	Image based speed meters	74			
7.6	Across-the-road speed meters	75			
7.7	Moving speed meters				
7.7.1	Moving metrological field test	76			
7.7.2	Metrological field test of ego speed meter	77			
7.7.3	Traffic simulation for moving speed meters	78			
8	**Software examination**				
8.3.1	General requirements (mandatory)	79			
8.3.2	Software protection (mandatory)	80			
8.3.3	Support of hardware features (mandatory)	81			
8.3.4	Specification and separation of legally relevant parts and specification of interfaces (optional)	82			
8.3.5	Maintenance and re-configuration (optional)	84			

***BIML Note*: The page numbers in the table above will be updated prior to conversion of the CD to a Draft revision.**

DRAFT

Summary of Environmental conditions (OIML R 91-2, 6.1 detailed)

Requirement (R 91-2, 6.1)		Report page	Passed	Failed	Remarks
1	Dry heat (operating)	27			
2	Dry heat (storage)	28			
3	Cold (operating)	29			
4	Cold (storage)	30			
5	Damp heat, cyclic (condensing)	31			
6	Water (optional)	32			
7	Atmospheric pressure	n/a			
8	Sand and dust (optional)	33			
9	Salt mist (optional)	34			
10	Vibration (random)	34			
11	Mechanical shock	35			
12	DC mains voltage variation	36			
13	Ripple on DC mains power	37			
14	AC mains voltage variation	39			
15	AC mains frequency variation	42			
16	DC mains voltage dips, short interruptions and (short term) voltage variations	43			
17	AC mains voltage dips, short interruptions and reductions	43			
18	AC mains frequency harmonics	45			
19	VLF and LF disturbances on AC and DC mains	45			
20	Bursts (transients) on AC and DC mains	48			
21	Surges on AC and DC mains power lines	48			
22	Bursts (transients) on signal, data and control lines	49			
23	Surges on signal, data and control lines	50			
24	AC mains power frequency magnetic field	52			
25	Conducted (common mode) currents generated by RF electromagnetic fields	52			
26	RF electromagnetic fields	53			
27	Electrostatic discharges	54			
28	Low voltage of internal battery	56			
29	Voltage variations of a road vehicle battery	58			
30	Electrical transient conduction along supply lines of external 12 V and 24 V batteries	59			
31	Electrical transient conduction via lines other than supply lines for external 12 V and 24 V batteries	60			
32	Battery voltage variations during cranking	60			
33	Load dump test	62			

***BIML Note*: The page numbers in the table above will be updated prior to conversion of the CD to a Draft revision.**

DRAFT

1 Metrological field test (R 91-2, 4)

1.1 Traffic condition during measurement (R 91-2, 4.6)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Location:
Describe, using point form, the location (location, map, photos, …):

Test site:
Describe, using point form, the test site (road category, speed limits, …):

Traffic conditions:
Describe, using point form, the traffic conditions (traffic density, distance between vehicles, …):

Number of measurements:
Describe, using point form, the decision for number of executed measurements:

Reference speed meter:
Describe, using point form, the used reference speed meter (manufacturer, type, serial, technology, traceability, …):

DRAFT

1.1 Traffic condition during measurement (R 91-2, 4.6) (Continued)

Checklist for traffic conditions:

OIML R 91-2 requirements		Yes	No	Remarks
4.1	General conditions			
4.2	Choice of test sites			
4.3	Traffic condition during measurement			
4.4	Number of measurements			
4.5	Reference speed meter			
4.9	Testing at speeds above the legal limit up to the maximum specified speed			

Acceptance criterion:

The integer speed values from the EUT shall fulfil the MPE for stationary measurements (clause 6.4 of R 91-1).

Results:

Measurement No.	v [km/h]	v_{ref} [km/h]	Δv[km/h]	MPE [km/h]	Pass	Fail
1						
2						
3						
…						
N						

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

1.2 Statistical analysis of errors (optional) (R 91-2, 4.7)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Acceptance criterion:

For the subdivision the measurements from the metrological field test given above shall be used. The interval [$m - z\,\sigma$, $m + z\,\sigma$] shall be fully within the MPE for stationary measurements (clause 6.4 of R91-1).

The following factor z is chosen as a measure of confidence: .....

Results:

Interval	Mean deviation m [km/h]	Standard deviation σ [km/h]	$m - z\,\sigma$ [km/h]	$m + z\,\sigma$ [km/h]	MPE [km/h]	Pass	Fail
0 km/h .. 50 km/h							
50 km/h .. 100 km/h							
100 km/h .. 150 km/h							
150 km/h .. 200 km/h							
200 km/h .. 250 km/h							
250 km/h .. 300 km/h							
300 km/h .. 350 km/h							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

1.3 Assignment to image evidence (R 91-2, 4.8)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Examples of evidence photos:

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

2 Metrological laboratory tests by traffic simulation (OIML R 91-2, 5)

2.1 Dynamic performance test (OIML R 91-2, 5.3)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Checklist for conditions:

OIML R 91-2 requirements		**Yes**	**No**	**Remark**
5.1	General conditions			
5.2	Characteristics of the traffic simulator			

Acceptance criterion:
The integer speed values from the EUT shall fulfil the MPE for stationary measurements (clause 6.4 of R91-1).

Results:

Measurement No.	v **[km/h]**	v_{ref} **[km/h]**	a_{ref} **[m/s²]**	Δv**[km/h]**	**MPE [km/h]**	**Pass**	**Fail**
1							
2							
3							
…							
N							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

2.2 Speed linearity test (OIML R 91-2, 5.4)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Acceptance criterion:

The high-resolution speed values from the EUT shall fulfil the linearity error limit (clause 6.5 of R91-1).

Results:

Measurement No.	v [km/h]	v_{ref} [km/h]	Δv[km/h]	MPE [km/h]	PASS	FAIL
1						
2						
3						
…						
N						

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

2.3 Distance linearity test (OIML R 91-2, 5.5)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Acceptance criterion:

The distance values from the EUT shall fulfil the error limit specified by the manufacturer.

Results:

Measurement No.	***d* [m]**	***d_{ref}* [m]**	**Δ*d*[m]**	**MPE [m]**	**PASS**	**FAIL**
1						
2						
3						
…						
N						

The reference speed for this kind of test should be 0 km/h.

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

2.4 Angle linearity test (OIML R 91-2, 5.6)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Acceptance criterion:

The angle values from the EUT shall fulfil the error limit specified by the manufacturer.

Results:

Measurement No.	α [°]	α_{ref} [°]	$\Delta\alpha$ [°]	MPE [°]	PASS	FAIL
1		0				
2		0				
3		0				
…		…				
N		0				

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3 Influence factor and disturbance tests (OIML R 91-2, 6)

3.1 Dry heat (operating)

			At start	At end	
Application no.:	.....				
Type designation:	.....	Temp.:			°C
Observer:	.....	Rel. h.:			%
		Date:			yyyy-mm-dd
	.....	Time:			hh:mm:ss

Acceptance criterion:

MPE Linearity error limit defined in OIML R91-1, 6.5 is respected during the presence of the influence factor. The evidence files produced for every measurement must not be corrupt and the photographic documentation must be of the same quality as without the influence factor (if camera is part of EUT).

Results:

Reference to OIML D 11:2013, clause 6

Measurement No.	***v* [km/h]**	**v_{ref} [km/h]**	**Δv[km/h]**	**MPE [km/h]**	**Pass**	**Fail**
1						
2						
3						
…						
N						

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.2 Dry heat (storage)

			At start	At end	
Application no.:	.....				
Type designation:	.....	Temp.:			°C
Observer:	.....	Rel. h.:			%
		Date:			yyyy-mm-dd
	.....	Time:			hh:mm:ss

Acceptance criterion:

NSFa No significant fault occurred after the disturbance. The EUT shall continue to operate as intended after the test (manual intervention allowed).

Results:

Reference to OIML D 11:2013, clause 6

Measurement No.	***v* [km/h]**	**v_{ref} [km/h]**	**Δv[km/h]**	**MPE [km/h]**	**Pass**	**Fail**
1						
2						
3						
…						
N						

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.3 Cold (operating)

			At start	At end	
Application no.:	.....				
Type designation:	.....	Temp.:			°C
Observer:	.....	Rel. h.:			%
		Date:			yyyy-mm-dd
	.....	Time:			hh:mm:ss

Acceptance criterion:

MPE Linearity error limit defined in OIML R 91-1, 6.5 is respected during the presence of the influence factor. The evidence files produced for every measurement must not be corrupt and the photographic documentation must be of the same quality as without the influence factor (if camera is part of EUT).

Results:

Reference to OIML D 11:2013, clause 7

Measurement No.	***v* [km/h]**	**v_{ref} [km/h]**	**Δv[km/h]**	**MPE [km/h]**	**Pass**	**Fail**
1						
2						
3						
…						
N						

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.4 Cold (storage)

			At start	At end	
Application no.:	.....				
Type designation:	.....	Temp.:			°C
Observer:	.....	Rel. h.:			%
		Date:			yyyy-mm-dd
	.....	Time:			hh:mm:ss

Acceptance criterion:

NSFa No significant fault occurred after the disturbance. The EUT shall continue to operate as intended after the test (manual intervention allowed).

Results:

Reference to OIML D 11:2013, clause 7

Measurement No.	***v* [km/h]**	**v_{ref} [km/h]**	**Δv[km/h]**	**MPE [km/h]**	**Pass**	**Fail**
1						
2						
3						
…						
N						

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.5 Damp heat, cyclic (condensing)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Acceptance criterion:

MPE Linearity error limit defined in OIML R 91-1, 6.5 is respected during the presence of the influence factor. The evidence files produced for every measurement must not be corrupt and the photographic documentation must be of the same quality as without the influence factor (if camera is part of EUT).

Results:

Reference to OIML D 11:2013, clause 9

Measurement No.	***v* [km/h]**	**v_{ref} [km/h]**	**Δv[km/h]**	**MPE [km/h]**	**Pass**	**Fail**
1						
2						
3						
…						
N						

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.6 Water (optional)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Acceptance criterion:

NSFd No significant fault occurred during the disturbance. The EUT shall continue to operate as intended after the test without manual intervention.

Results:

Reference to OIML D 11:2013, clause 10

Measurement No.	***v* [km/h]**	**v_{ref} [km/h]** ~~**v_{ref} [km/h]**~~	**Δ*v*[km/h]**	**MPE [km/h]**	**Pass**	**Fail**
1						
2						
3						
…						
N						

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.7 Sand and dust (optional)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Acceptance criterion:

NSFd No significant fault occurred during the disturbance. The EUT shall continue to operate as intended after the test without manual intervention.

Results:

Reference to OIML D 11:2013, clause 13

Measurement No.	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1						
2						
3						
…						
N						

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.8 Salt mist (optional)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Acceptance criterion:

NSFd No significant fault occurred during the disturbance. The EUT shall continue to operate as intended after the test without manual intervention.

Results:

Reference to OIML D 11:2013, clause 14

Measurement No.	***v* [km/h]**	**v_{ref} [km/h]** ~~**v_{ref} [km/h]**~~	**Δ*v*[km/h]**	**MPE [km/h]**	**Pass**	**Fail**
1						
2						
3						
…						
N						

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.9 Vibration (random)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Acceptance criterion:

MPE Linearity error limit defined in OIML R91-1, 6.5 is respected during the presence of the influence factor. The evidence files produced for every measurement must not be corrupt and the photographic documentation must be of the same quality as without the influence factor (if camera is part of EUT).

Results:

Reference to OIML D 11:2013, clause 15

Measurement No.	***v* [km/h]**	**v_{ref} [km/h]** ~~v_{ref} [km/h]~~	**Δ*v*[km/h]**	**MPE [km/h]**	**Pass**	**Fail**
1						
2						
3						
…						
N						

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.10 Mechanical shock

			At start	At end	
Application no.:	.....				
Type designation:	.....	Temp.:			°C
Observer:	.....	Rel. h.:			%
		Date:			yyyy-mm-dd
	.....	Time:			hh:mm:ss

Acceptance criterion:

NSFa No significant fault occurred after the disturbance. The EUT shall continue to operate as intended after the test (manual intervention allowed).

Results:

Reference to OIML D 11:2013, clause 17

Measurement No.	***v* [km/h]**	**v_{ref} [km/h]** ~~**v_{ref} [km/h]**~~	**Δ*v*[km/h]**	**MPE [km/h]**	**Pass**	**Fail**
1						
2						
3						
…						
N						

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.11 DC mains voltage variation

			At start	At end	
Application no.:	.....				
Type designation:	.....	Temp.:			°C
Observer:	.....	Rel. h.:			%
		Date:			yyyy-mm-dd
	.....	Time:			hh:mm:ss

Acceptance criterion:

MPE Linearity error limit defined in OIML R91-1, 6.5 is respected during the presence of the influence factor. The evidence files produced for every measurement must not be corrupt and the photographic documentation must be of the same quality as without the influence factor (if camera is part of EUT).

Results:

Reference to OIML D 11:2013, clause 18

No.	Conditions	v [km/h]	v_{ref} [km/h]~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
...							
N							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

DRAFT

3.12 Ripple on DC mains power

			At start	At end	
Application no.:	.....				
Type designation:	.....	Temp.:			°C
Observer:	.....	Rel. h.:			%
		Date:			yyyy-mm-dd
	.....	Time:			hh:mm:ss

Acceptance criterion:

NSFd No significant fault occurred during the disturbance. The EUT shall continue to operate as intended after the test without manual intervention.

Results:

Reference to OIML D 11:2013, clause 19

No.	Conditions	v [km/h]	v_{ref} [km/h]	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Remarks:

DRAFT

Result:

Pass ☐ **Fail** ☐

3.13 AC mains voltage variation

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Acceptance criterion:

MPE Linearity error limit defined in OIML R91-1, 6.5 is respected during the presence of the influence factor. The evidence files produced for every measurement must not be corrupt and the photographic documentation must be of the same quality as without the influence factor (if camera is part of EUT).

Results:

Reference to OIML D 11:2013, clause 20

No.	Conditions	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

DRAFT

3.14 AC mains frequency variation

			At start	At end	
Application no.:	.....				
Type designation:	.....	Temp.:			°C
Observer:	.....	Rel. h.:			%
		Date:			yyyy-mm-dd
	.....	Time:			hh:mm:ss

Acceptance criterion:

MPE Linearity error limit defined in OIML R91-1, 6.5 is respected during the presence of the influence factor. The evidence files produced for every measurement must not be corrupt and the photographic documentation must be of the same quality as without the influence factor (if camera is part of EUT).

Results:

Reference to OIML D 11:2013, clause 21

No.	Conditions	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.15 DC mains voltage dips, short interruptions and (short term) voltage variations

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Acceptance criterion:

NSFd No significant fault occurred during the disturbance. The EUT shall continue to operate as intended after the test without manual intervention.

Results:

Reference to OIML D 11:2013, clause 22

No.	Conditions	v [km/h]	v_{ref} [km/h]	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.16 AC mains voltage dips, short interruptions and reductions

			At start	At end	
Application no.:	.....				
Type designation:	.....	Temp.:			°C
Observer:	.....	Rel. h.:			%
		Date:			yyyy-mm-dd
	.....	Time:			hh:mm:ss

Acceptance criterion:

NSFd No significant fault occurred during the disturbance. The EUT shall continue to operate as intended after the test without manual intervention.

Results:

Reference to OIML D 11:2013, clause 23

No.	Conditions	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.17 AC mains frequency harmonics

			At start	At end	
Application no.:	.....				
Type designation:	.....	Temp.:			°C
Observer:	.....	Rel. h.:			%
		Date:			yyyy-mm-dd
	.....	Time:			hh:mm:ss

Acceptance criterion:

NSFd No significant fault occurred during the disturbance. The EUT shall continue to operate as intended after the test without manual intervention.

Results:

Reference to OIML D 11:2013, clause 24

No.	Conditions	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.18 VLF and LF disturbances on AC and DC mains

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Acceptance criterion:

NSFd No significant fault occurred during the disturbance. The EUT shall continue to operate as intended after the test without manual intervention.

Results:

Reference to OIML D 11:2013, clause 25

No.	Conditions	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

DRAFT

3.19 Bursts (transients) on AC and DC mains

			At start	At end	
Application no.:	.....				
Type designation:	.....	Temp.:			°C
Observer:	.....	Rel. h.:			%
		Date:			yyyy-mm-dd
	.....	Time:			hh:mm:ss

Acceptance criterion:

NSFd No significant fault occurred during the disturbance. The EUT shall continue to operate as intended after the test without manual intervention.

Results:

Reference to OIML D 11:2013, clause 26

No.	Conditions	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.20 Surges on AC and DC mains power lines

			At start	At end	
Application no.:	.....				
Type designation:	.....	Temp.:			°C
Observer:	.....	Rel. h.:			%
		Date:			yyyy-mm-dd
	.....	Time:			hh:mm:ss

Acceptance criterion:

NSFd No significant fault occurred during the disturbance. The EUT shall continue to operate as intended after the test without manual intervention.

Results:

Reference to OIML D 11:2013, clause 27

No.	Conditions	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.21 Bursts (transients) on signal, data and control lines

			At start	At end	
Application no.:	.....				
Type designation:	.....	Temp.:			°C
Observer:	.....	Rel. h.:			%
		Date:			yyyy-mm-dd
	.....	Time:			hh:mm:ss

Acceptance criterion:

NSFd No significant fault occurred during the disturbance. The EUT shall continue to operate as intended after the test without manual intervention.

Results:

Reference to OIML D 11:2013, clause 28

No.	Conditions	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.22 Surges on signal, data and control lines

			At start	At end	
Application no.:	.....				
Type designation:	.....	Temp.:			°C
Observer:	.....	Rel. h.:			%
		Date:			yyyy-mm-dd
	.....	Time:			hh:mm:ss

Acceptance criterion:

NSFd No significant fault occurred during the disturbance. The EUT shall continue to operate as intended after the test without manual intervention.

Results:

Reference to OIML D 11:2013, clause 29

No.	Conditions	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.23 AC mains power frequency magnetic field

			At start	At end	
Application no.:	.....				
Type designation:	.....	Temp.:			°C
Observer:	.....	Rel. h.:			%
		Date:			yyyy-mm-dd
	.....	Time:			hh:mm:ss

Acceptance criterion:

NSFd No significant fault occurred during the disturbance. The EUT shall continue to operate as intended after the test without manual intervention.

Results:

Reference to OIML D 11:2013, clause 30

No.	Conditions	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.24 Conducted (common mode) currents generated by RF electromagnetic fields

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Acceptance criterion:

NSFd No significant fault occurred during the disturbance. The EUT shall continue to operate as intended after the test without manual intervention.

Results:

Reference to OIML D 11:2013, clause 31

No.	Conditions	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.25 RF electromagnetic fields

			At start	At end	
Application no.:	.....				
Type designation:	.....	Temp.:			°C
Observer:	.....	Rel. h.:			%
		Date:			yyyy-mm-dd
	.....	Time:			hh:mm:ss

Acceptance criterion:

NSFd No significant fault occurred during the disturbance. The EUT shall continue to operate as intended after the test without manual intervention.

Results:

Reference to OIML D 11:2013, clause 32

No.	Conditions	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Reference to OIML D 11:2013, clause 33

No.	Conditions	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Reference to OIML D 11:2013, clause 34

No.	Conditions	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Remarks:

Result:

DRAFT

Pass ☐ **Fail** ☐

DRAFT

3.26 Electrostatic discharges

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Acceptance criterion:

NSFd No significant fault occurred during the disturbance. The EUT shall continue to operate as intended after the test without manual intervention.

Results:

Reference to OIML D 11:2013, clause 35

No.	Conditions	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.27 Low voltage of internal battery

			At start	At end	
Application no.:	.....				
Type designation:	.....	Temp.:			°C
Observer:	.....	Rel. h.:			%
		Date:			yyyy-mm-dd
	.....	Time:			hh:mm:ss

Acceptance criterion:

MPE Linearity error limit defined in OIML R91-1, 6.5 is respected during the presence of the influence factor. The evidence files produced for every measurement must not be corrupt and the photographic documentation must be of the same quality as without the influence factor (if camera is part of EUT).

Results:

Reference to OIML D 11:2013, clause 36

No.	**Conditions**	***v* [km/h]**	v_{ref} [km/h] ~~v_{ref} [km/h]~~	**Δ*v*[km/h]**	**MPE [km/h]**	**Pass**	**Fail**
1							
2							
3							
…							
N							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.28 Voltage variations of a road vehicle battery

			At start	At end	
Application no.:	.....				
Type designation:	.....	Temp.:			°C
Observer:	.....	Rel. h.:			%
		Date:			yyyy-mm-dd
	.....	Time:			hh:mm:ss

Acceptance criterion:

MPE Linearity error limit defined in OIML R91-1, 6.5 is respected during the presence of the influence factor. The evidence files produced for every measurement must not be corrupt and the photographic documentation must be of the same quality as without the influence factor (if camera is part of EUT).

Results:

Reference to OIML D 11:2013, clause 37

No.	Conditions	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.29 Electrical transient conduction along supply lines of external 12 V and 24 V batteries

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Acceptance criterion:

NSFd No significant fault occurred during the disturbance. The EUT shall continue to operate as intended after the test without manual intervention.

Results:

Reference to OIML D 11:2013, clause 38

No.	Conditions	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.30 Electrical transient conduction via lines other than supply lines for external 12 V and 24 V batteries

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Acceptance criterion:

NSFd No significant fault occurred during the disturbance. The EUT shall continue to operate as intended after the test without manual intervention.

Results:

Reference to OIML D 11:2013, clause 39

No.	Conditions	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.31 Battery voltage variations during cranking

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Acceptance criterion:

NSFd No significant fault occurred during the disturbance. The EUT shall continue to operate as intended after the test without manual intervention.

Results:

Reference to OIML D 11:2013, clause 40

No.	Conditions	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.32 Load dump test

			At start	At end	
Application no.:	.....				
Type designation:	.....	Temp.:			°C
Observer:	.....	Rel. h.:			%
		Date:			yyyy-mm-dd
	.....	Time:			hh:mm:ss

Acceptance criterion:

NSFd No significant fault occurred during the disturbance. The EUT shall continue to operate as intended after the test without manual intervention.

Results:

Reference to OIML D 11:2013, clause 41

No.	Conditions	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.33 Acceleration test (OIML R 91-2, 6.5)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Acceptance criterion

The integer speed values from the EUT shall fulfil the MPE for stationary measurements (clause 6.4 of R91-1).

Results:

Reference acceleration should be between [−5 m/s^2, −1.5 m/s^2] and [1.5 m/s^2, 5 m/s^2].

No.	Conditions	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	a_{ref} [m/s^2]	Δv[km/h]	MPE [km/h]	Pass	Fail
1								
2								
3								
…								
N								

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

DRAFT

3.34 Further influence quantity tests (OIML R 91-2, 6.6)

			At start	At end	
Application no.:	.....				
Type designation:	.....	Temp.:			°C
Observer:	.....	Rel. h.:			%
		Date:			yyyy-mm-dd
	.....	Time:			hh:mm:ss

Acceptance criterion:

The high-resolution speed values from the EUT shall fulfil the linearity error limit (clause 6.5 of R91-1).

Results:

No.	Conditions	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1							
2							
3							
…							
N							

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

3.35 Installation and alignment of sensor and camera (OIML R 91-2, 6.7)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Results:

Mark observations as bullet points:

Remarks:

DRAFT

Result:

Pass ☐ **Fail** ☐

4 Tests specific to certain categories of speed meters (OIML R 91-2, 7)

4.1 Doppler-radar based speed meters (OIML R 91-2, 7.1)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Specific tests:

a. Carrier frequency or interval of modulated frequencies

Results:

Remarks:

b. Antenna pattern test to determine beam width and secondary beams and angles of the measurement beam

Results:

Remarks:

c. Equivalent isotropic radiated power [EIRP] (optional)

Results:

Remarks:

DRAFT

Doppler-radar based speed meters (OIML R 91-2, 7.1) (Continued)

d. Minimum and maximum of distance measurement (if applicable)

Results:

Remarks:

e. Accuracy of angle measurement, if applicable, and

Results:

Remarks:

f. Accuracy of the aiming device, if applicable.

Results:

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

4.2 Range-finding based speed meters (OIML R 91-2, 7.2)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Specific tests:

a. Vehicle shape does not significantly affect the speed measurement

Results:

Remarks:

b. Pulse repetition rate or another characteristic of the time intervals between the pulses

Results:

Remarks:

c. Beam width, secondary beams and relevant characteristics of the field of view (divergence etc.)

Results:

Remarks:

DRAFT

Range-finding based speed meters (OIML R 91-2, 7.2) (Continued)

d. The exit angle of measurement beam, if applicable,

Results:

Remarks:

e. Influence of curve radius

Results:

Remarks:

DRAFT

Result:

Pass ☐ **Fail** ☐

4.3 Average speed meters (OIML R 91-2, 7.3)

			At start	At end	
Application no.:	.....				
Type designation:	.....	Temp.:			°C
Observer:	.....	Rel. h.:			%
		Date:			yyyy-mm-dd
	.....	Time:			hh:mm:ss

Specific tests:

a. the robustness of time synchronisation mechanism,

Results:

Remarks:

b. that MPE for time measurement is fulfilled when vehicle detection and image recording are included,

Results:

Remarks:

~~b.~~c. ~~minimum and~~ maximum- size of detection field, even at varying speeds~~area of trigger point/determination~~, and

Results:

Remarks:

~~c.~~d. minimum distance between entry and exit point.

Results:

Remarks:

DRAFT

Result:

Pass ☐ **Fail** ☐

DRAFT

4.4 Fixed-distance speed meters (OIML R 91-2, 7.4)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Specific tests:

a. accuracy of trigger point, and

Results:

Remarks:

b. minimum and maximum distance between trigger points.

Results:

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

4.5 Image based speed meters (OIML R 91-2, 7.5)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Specific tests:

a. accuracy of trigger point, and

Results:

Remarks:

b. minimum and maximum distance between trigger points.

Results:

Remarks:

c. minimum illumination and fog

Results:

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

4.6 Across-the-road speed meters (OIML R 91-2, 7.6)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Specific test:

a. accuracy of aiming device, if applicable

Results:

Remarks:

b. influence of curve radius

Results:

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

5 Moving speed meters (OIML R 91-2, 7.7)

5.1 Moving metrological field test (OIML R 91-2, 7.7.1)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Results:

(on road conditions)

Measurement No.	v [km/h]	v_{ref} [km/h] ~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1						
2						
3						
…						
N						

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

5.2 Metrological field test of the ego speed meter (OIML R 91-2, 7.7.2)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Results:

Measurement No.	v_{EGO} [km/h]	v_{ref} [km/h]~~v_{ref} [km/h]~~	Δv[km/h]	MPE [km/h]	Pass	Fail
1						
2						
3						
…						
N						

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

5.3 Traffic simulation for moving speed meters (OIML R 91-2, 7.7.3)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Results:

Stationary mode

Measurement No.	v_{EGO} **[km/h]**	v **[km/h]**	v_{ref} **[km/h]** ~~v_{ref} [km/h]~~	Δv**[km/h]**	**MPE [km/h]**	**Pass**	**Fail**
1	0						
2	0						
3	0						
…							
N	0						

Ego speed meter

Measurement No.	v_{EGO} **[km/h]**	v_{ref} **[km/h]** ~~v_{ref} [km/h]~~	Δv**[km/h]**	**MPE [km/h]**	**Pass**	**Fail**
1						
2						
3						
…						
N						

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

6 Software examination (OIML R 91-2, 8)

6.1 General requirements [mandatory] (OIML R 91-2, 8.3.1)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Results:

#	Requirement	OIML D 31 [2]	Pass	Fail	Remark
1	Software identification	6.2.1			
2	Correctness of algorithms and functions	6.2.2			

Remarks:

Result:

Pass ☐ **Fail** ☐

DRAFT

6.2 Software protection [mandatory] (OIML R 91-2, 8.3.2)

			At start	At end	
Application no.:	.....				
Type designation:	.....	Temp.:			°C
Observer:	.....	Rel. h.:			%
		Date:			yyyy-mm-dd
	.....	Time:			hh:mm:ss

Results:

#	Requirement	OIML D 31 [2]	Pass	Fail	Remark
3	Evidence and prevention of intervention	6.2.3			
4	Prevention of misuse	6.2.4			
5	Demands on the user	6.2.5			

Remarks:

DRAFT

Result:

Pass ☐ **Fail** ☐

6.3 Support of hardware features [mandatory] (OIML R 91-2, 8.3.3)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Results:

#	Requirement	OIML D 31 [2]	Pass	Fail	Remark
6	Detection of significant defects	6.2.6.1			
7	Durability protection	6.2.6.2			
8	Time stamps	6.2.7			

Remarks:

DRAFT

Result:

Pass ☐ **Fail** ☐

6.4 Specification and separation of legally relevant parts and specification of interfaces [optional] (OIML R 91-2, 8.3.1)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

#	Requirement	OIML D 31 [2]	Pass	Fail	Remark
9	Separation of components	6.3.2.1			
10	Specification and separation of software parts	6.3.2.2			
11	Shared indication	6.3.3			
12	Storage of data	6.3.4			
13	The measurement data stored shall be accompanied by all relevant information necessary for future legally relevant use	6.3.4.2			
14	The stored measurement data shall be protected by software means to guarantee the authenticity, integrity and correctness of the information concerning the speed measurement	6.3.4.3			
15	Automatic storing	6.3.4.4			
16	~~Transmission via communication lines~~Data transmission	6.3.5			
17	The measurement data transmitted shall be accompanied by all relevant information necessary for future legally relevant use.	6.3.5.2			
18	The transmitted data shall be protected by software means to guarantee the authenticity, integrity and, if necessary correctness of the information concerning the speed of measurement.	6.3.5.3			
19	Transmission delay or interruption	6.3.5.4			
20	Compatibility of operating systems and hardware	6.3.6.2			
21	Hardware interfaces not equipped with a protective software interface shall not be able to inadmissibly influence the legally relevant software part.	6.3.6.2			
22	If a secure boot process is needed to ensure protection of the legally relevant software part, the following requirements apply.	6.3.6.3.1			
23	The combination of the legally relevant software part and the operating system shall ensure that there are enough resources for the operation of the legally relevant application.	6.3.6.4			

DRAFT

#	Requirement	OIML D 31 [2]	Pass	Fail	Remark
24	Protection during use	6.3.6.5			
25	Communication with the legally relevant software part shall be made via protective interfaces.	6.3.6.6			
26	Identification and traceability	6.3.6.7			
27	The manufacturer shall identify the hardware and software environment that is suitable. Minimum resources and a suitable configuration necessary for correct functioning shall be declared by the manufacturer.	6.3.6.8			
28	Technical means shall be provided in the legally relevant software to prevent operation, if the minimum resources or a suitable configuration are not met.	6.3.6.9			

Remarks:

DRAFT

Result:

Pass ☐ **Fail** ☐

6.5 Maintenance and re-configuration [optional] (OIML R 91-2, 8.3.1)

Application no.: .....

Type designation: .....

Observer: .....

.....

	At start	At end	
Temp.:			°C
Rel. h.:			%
Date:			yyyy-mm-dd
Time:			hh:mm:ss

Results:

#	Requirement	OIML D 31 [2]	Pass	Fail	Remark
29	Verified update	6.3.8.3			
30	Traced update	6.3.8.4			

Remarks:

DRAFT

Result:

Passed ☐ **Failed** ☐

General remarks

Additional remarks:

DRAFT