HAVING REGARD TO the '*New Highway Code*'adopted by Legislative Decree No 285 of 30 April 1992, and in particular Article 80 thereof;

HAVING REGARD TO the '*Regulation for the execution and implementation of the New Highway Code*'adopted by Presidential Decree No 495 of 16 December 1992, and in particular Articles 238, 239 and 241 thereof;

HAVING REGARD TO Ministerial Decree No 628 of 23 October 1996, '*Regulation laying down rules for the approval and authorisation of technical equipment for roadworthiness tests for motor vehicles and their trailers*';

HAVING REGARD TO the circulars implementing the aforementioned Ministerial Decree No 628 of 23 October 1996, and in particular Circular No 88/95 of 22 May 1995, as supplemented by Circular No 112 of 07 August 1996 and the subsequent Update Circular No 3997/604 of 6 September 1999 (published in the Official Journal No 229 of 29 September 1999, Ordinary Supplement No 178), which provides, *inter alia*, for an initial verification and periodic and occasional verifications of the equipment referred to in points (a), (b), (c), (d), (e), (f), and (g) of Appendix X to Title III of Presidential Decree No 495 of 16 December 1992, in which CHAPTER II states that the above-mentioned initial, periodic and occasional verifications of the technical equipment provided for therein and used by authorised garage repair workshops for the verification of motor vehicles and their trailers may also be carried out by Certification Bodies recognised by the Administration;

HAVING REGARD TO the Ministerial Decree of 16 January 2000 published in the Official Journal No 48 of February 2000 '*Provisions for the periodic roadworthiness tests of motorcycles and mopeds*'

HAVING REGARD TO Circular No 7938/604 of 29 September 2000 laying down '*Approval procedures, initial and periodic inspection of equipment necessary to carry out tests for the roadworthiness tests for mopeds and motorcycles, as referred to in Articles 52 and 53(a) of Legislative Decree No 285 of 30 April 1992*'.

HAVING REGARD TO Circular No 1304/404 of 1 July 2005 laying down the '*Technical characteristics for the approval of chassis dynamometers with a mechanical or electronic connection for speed tests and complementary gas analysis of three-wheel and four-wheel vehicles (International Categories L2, L5e, L6e, L7e, Le)*'.

HAVING REGARD TO Executive Decree No 1699/404 of the Directorate-General for Motor Vehicles of 7 September 2005 on '*Technical specifications for the approval of Plate Brake Tester Benches for vehicles with a maximum gross weight of ≥ 3.5 t*';

HAVING REGARD TO the Executive Decree of the Directorate-General for Motor Vehicles No R.D. 607 of 19 September 2011, on *Technical specifications for the approval of Roller Brake*

Tester Benches for vehicles with a maximum gross weight exceeding 3.5 tonnes';
HAVING REGARD TO Circular No 6710/604 of 27 July 2000 providing for the '*Type approval of steering wheel test benches for heavy duty vehicles*';

HAVING REGARD TO the Executive Decree of the Directorate-General for Motor Vehicles No R.D. 330 of 11 August 2023 defining the '*Type approval standards for testing equipment for vehicles with a maximum gross weight exceeding 3.5 tonnes and approval standards for OBD equipment*';

HAVING REGARD TO the Interministerial Decree of 22 December 2009, published in the Official Journal of the Italian Republic No 20 of 26 January 2010, which designates the Italian national body authorised to carry out accreditation activities pursuant to Article 4 of Law No 99 of 23 July 2009;

HAVING REGARD TO Directive 2014/45/EU of the European Parliament and of the Council of 3 April 2014 on periodic roadworthiness tests for motor vehicles and their trailers;

HAVING REGARD TO Decree No 214 of the Minister for Infrastructure and Transport of 19 May 2017, published in OJ No 139 of 17 June 2017, transposing Directive 2014/45/EU of the European Parliament and of the Council of 03 April 2014 on periodic roadworthiness tests for motor vehicles and their trailers and repealing Directive 2009/40/EC;

HAVING REGARD TO Article 3 of Ministerial Decree 214/2017 entitled '*Definitions*', according to which, in paragraph 1, letter '*o*', '*the competent authority*' is the '*Ministry for Infrastructure and Transport – Department of Transport, Navigation, General Affairs and Personnel – Directorate-General for Motor Vehicles*', which today is the Ministry for Infrastructure and Transport – Department of Transport and Navigation – Directorate-General for Motor Vehicles;

HAVING REGARD TO Article 11 of Ministerial Decree 214/2017 entitled '*Testing facilities and equipment*', paragraph 2 of which provides that '*the equipment used for measurements shall be periodically inspected for metrological compliance, as prescribed by the competent authority in accordance with the minimum intervals specified in point II of Annex III*';

HAVING REGARD TO Article 14 of Ministerial Decree 214/2017 entitled '*Supervision of testing centres*', paragraph 3 of which provides that *'the competent authority shall lay down the relevant procedures concerning the content referred to in letters (a), (b), (c), (d) of point 3 of Annex V'*;

HAVING REGARD TO Annex V to Ministerial Decree No 214/2017, and in particular point 3(c)

thereof, concerning equipment and premises, which provides that the rules and procedures relating to roadworthiness tests must contain, *inter alia*, *'requirements for maintenance and calibration of the inspection equipment'*;

HAVING REGARD TO Decree No 446 of 15.11.2021 of the Minister for Infrastructure and Sustainable Mobility, published in the OJ No 279 of 23 November 2021 *'Update of the framework for roadworthiness tests of heavy-duty vehicles'*;

HAVING REGARD TO the Decree of the Minister for Infrastructure and Transport of 21 September 2023, published in the OJ No 258 of 04 November 2023 *'Amendments to the Decree of 15 November 2021 on the 'Update of the framework for roadworthiness tests of heavy duty vehicles'*;

WHEREAS it is necessary to update the procedures for verifying the metrological conformity of equipment used to carry out vehicle roadworthiness tests in light of changes made to the reference legislation, including in the area of quality management, with the exception of those relating to exhaust gas analysers which are now under the responsibility of the Minister for Economic Development (MIMIT);

HAVING REGARD TO the single text 'MCTCNet 2' on '*Data exchange protocol for roadworthiness test centres authorised pursuant to Article 80 of the highway code*'

HAVING COMPLETED, with notification, the information procedure on technical standards and rules provided for in Legislative Decree No 223 of 15 December 2017 implementing Directive (EU) 2015/1535 of the European Parliament and of the Council;

HEREBY DECREES

Article 1
(Definitions)
The following definitions and their explanations are used in this decree:

a) **'*technical equipment*':** technical equipment for the roadworthiness tests of motor vehicles and their trailers, which the inspection centres must be equipped with, identified in point I of Annex III to Decree No 214 of the Minister for Infrastructure and Transport of 19 May 2017, approved and equipped with a metrological booklet, or, in the case of type approval, a copy of the certified test report;
b) **'*technical inspection or roadworthiness test*':** an inspection in accordance with Annex I to Decree No 214 of the Minister for Infrastructure and Transport of 19 May

2017 to ensure that a vehicle can be safely used on public roads and complies with the required and mandatory environmental characteristics;

c) **'*competent authority*':** the Ministry for Infrastructure and Transport – Department of Transport and Navigation – Directorate-General for Motor Vehicles, Citizen and Business Services in Transport and Navigation;

d) **'*inspection centres*':** the public inspection centres of the Ministry for Infrastructure and Transport, relating to the Department of Transport and Navigation, and the private inspection centres referred to in Article 80 of Legislative Decree No 285 of 30 April 1992;

e) **'*supervisory body*':** the peripheral departments of the Territorial Directorates General of the Department of Transport and Navigation;

f) **'*UMC*':** Provincial offices of the supervisory body;

g) **'*Ministry*':** the Ministry for Infrastructure and Transport;

h) **'*verification of metrological compliance*':** verification of the metrological requirements of the equipment defined in letter (a), for the purposes of the roadworthiness test activities as defined in letter (b), under the responsibility of the Ministry for Infrastructure and Transport;

i) **'*initial verification*':** the verification of initial metrological compliance, to which equipment must be subjected before it is put into service, in order to verify that the metrological performance complies with the requirements laid down in this Decree;

j) **'*periodic verification*':** the periodic verification of metrological compliance, to which the equipment must be subjected, after it has been put into service, in accordance with the intervals laid down in this Decree, or following repairs or alterations, in order to ensure that metrological services as defined in this Decree are maintained over time;

k) **'*random check*':** a check carried out by the supervisory bodies on equipment in operation, other than that referred to in letters (i) and (j), in order to verify its proper functioning;

l) **'*manufacturer*':** the holder of the type approval of the equipment or its type approval certificate;

m) **'*equipment holder*':** the natural or legal person who has ownership of the equipment or who, on another basis, is responsible for the activity verification of metrological compliance~~;~~

n) **'*national accreditation body*':** the only body authorised by a Member State to carry out accreditation activities in accordance with Regulation (EC) No 765/2008 and Regulation (EC) No 1020/2019 of the European Parliament and of the Council, as amended;

o) **'*metrological booklet*':** a booklet, whether on paper or in computerised form, with which each equipment is provided and on which all the information provided for in **Annex V** is recorded;

p) **'*authorisation*':** the legal title adopted by the Administration, lasting four years, under which the bodies referred to in letter (q) shall carry out the initial and periodic verification of the equipment referred to in this Decree;

q) **'*body*':** the body carrying out the initial and periodic verifications of the equipment, following an authorisation issued by the competent authority, after having been accredited by the national accreditation body referred to in letter (n) in accordance with one of the following standards, or subsequent revisions thereof:

1) UNI CEI EN ISO/IEC 17020:2012 – Requirements for the operation of various types of bodies performing type A or type C inspections,

2) UNI CEI EN ISO/IEC 17025:2018 – General requirements for the competence of testing and calibration laboratories – as a calibration laboratory

for the specific purpose of carrying out the checks referred to in Article 2 of this Decree, on all or some of the equipment listed therein;

r) **'*checking instrument*':** means a measuring instrument used for checking equipment.

Article 2
(Objective)-

1. This Decree lays down rules on the way in which the verification of metrological compliance is carried out on the equipment referred to in letter (a) of Article 1.

Article 3
(Verifications)

1. Equipment for testing centres used for the roadworthiness tests of motor vehicles and their trailers shall be subject to the following types of verification of metrological compliance:
(a) initial verification;
(b) periodic verification;
(c) random checks.

Article 4
(Initial and periodic verifications)

1. The verifications referred to in Article 3(a) and (b) shall be carried out by the bodies referred to in Article 1(q) meeting the requirements of **Annex I** of this Decree, following an authorisation issued by the competent authority.
2. The initial verification referred to in Article 3(a) shall be carried out before the equipment is put into service and shall aim at verifying that the metrological performance of the equipment complies with the requirements laid down in this Decree.
3. The purpose of the periodic verification of the equipment referred to in Article 3(b) is to verify maintenance over time, or following repairs or alterations, of the metrological performance defined in this Decree.
The equipment shall be subjected to periodic verifications at intervals provided for in **Annex IV** to this Decree, starting from the date of the initial verification and thereafter from the date of the last verification. The verification must be carried out within one month from the expiry of the validity of the previous one and, if it expires on the first day of the month, it must in any case be carried out no later than the last day of that month.
4. The methods and procedures for carrying out the initial and periodic verifications of equipment are set out in **Annexes II and III.**
5. The results of the verifications referred to in Article 3(a) and (b) shall be recorded, dated and signed in the metrological booklet, which each equipment shall be provided with, the characteristics of which will be defined by a subsequent implementing decree. **Annex V** gives the initial and periodic verification activities for all equipment.
6. In cases where the body also carries out the repair and/or maintenance activities, the verification activity shall be carried out separately and independently.

Article 5
(Random checks)
1. The random checks on the equipment referred to in Article 1(a) in operation at control centres shall be carried out by the Supervision Body at any time, without prior notice, including during the periodic checks referred to in Article 80(10) of Legislative Decree No 285 of 30 April 1992 '*New Highway Code*', while ensuring a fair process. The Supervisory Body shall record in the metrological booklet the results of these checks.
2. The checks referred to in paragraph 1 shall consist, as appropriate, of one or more of the tests provided for periodic verification. Such checks shall be carried out, where appropriate, with the assistance of a body referred to in letter (q) of Article 1.

Article 6
Obligations of the holders of the equipment
Holders of the equipment referred to in Article 1(a) subject to the verification obligation shall:-
1) ensure that the competent UMC stamps the original metrological booklet, which, before the equipment is put into service, is issued by the manufacturer and must always

accompany iteither by registering a certified copy with the same UMC, or by activating the procedure envisaged for the digital metrological booklet.
2) communicate to the relevant UMC the start date of use of the equipment and its corresponding connection diagram;
3) keep the metrological booklet and any additional documentation required;
4) ensure the proper functioning of the equipment and not use it when it is faulty or unreliable from a metrological point of view;
5) inform the relevant UMC of any need for temporary replacement of the equipment in the event of repair, before it is put into service. The equipment may be replaced by a similar approved type, or by a type-approved unit, upon sending to the relevant UMC the appropriate declaration containing the reference to the authorisation or the type approval and the date of the last verification carried out.

Article 7
Bodies - Conditions
1. Verifications of the equipment referred to in Article 2 shall be carried out by bodies meeting the requirements set out in **Annex I**.
2. The competent authority shall draw up the list of bodies authorised to carry out verification activities pursuant to this Decree. This list shall contain at least the following data:
(a) the name, designation or business name of the body;
(b) the name and surname of the person responsible for the verification;
(c) the full address of the head office and any operational branches of the body;
(d) the assigned identification elements;
(e) the equipment for which the body is authorised to carry out initial and periodic verification as defined in this Decree;
(f) the list of operational staff responsible for carrying out separate checks, per type of equipment;
(g) the telephone number, certified e-mail address;
(h) the start dates of any possible measure prohibiting the continuation of activity and of cessation;
(i) the accreditation identifier.
3. The body intending to carry out the initial and periodic verifications of the equipment must be in possession of the accreditation issued by the National Accreditation Body referred to in letter (n) in accordance with one of the following standards, or subsequent revisions:
(a) UNI CEI EN ISO/IEC 17020:2012 – Requirements for the operation of various types of bodies performing type A or type C inspections;
(b) UNI CEI EN ISO/IEC 17025:2018 – General requirements for the competence of testing and calibration laboratories – as a calibration laboratory;

indicating the specific purpose of the accreditation for the purpose of carrying out the verifications referred to in this Decree, on all or some of the equipment provided for in the forms referred to in**Annex III,** in accordance with the general provisions laid down in **Annex II**.

4. The body is required to notify the National Accreditation Body of changes in staff referred to in point 2 of **Annex I**.

Article 8
Authorisation

1. The bodies concerned shall submit an application for authorisation to the competent authority.
2. The application shall contain:
(a) copy of the accreditation certificate and its technical annex;
(b) an indication of the equipment on which they carry out the verification, in line with the purpose of accreditation;
(c) a replacement declaration of certification made pursuant to Presidential Decree No 445 of 2000 by which the legal representative of the undertaking and the members of the board of directors certify compliance with the requirements of Article 240(1)(a), (b), (c), (d) and (e) of the Highway Code;
(d) a statement by which the legal representative and the person responsible for the verification undertake to fulfil the obligations arising from the exercise of the activity;
(e) an indication of the person responsible for the verification and his/her substitute, if any;
(f) the list of operational staff responsible for carrying out separate checks, per type of equipment;
(g) a commitment to keep for at least 5 years a copy of the documentation, including in computerised form, proving the verification operations carried out and the corresponding records of the positive or negative results thereof.
3. The documents referred to in Article 8(2) (a) and (d) explicitly refer to the activities covered by this Decree for which the body applies for authorisation; documentation relating to the general, structural, process resources and management system requirements of the body shall be submitted exclusively to the accreditation body.
4. The competent authority shall, within sixty (60) days of receipt of the application for authorisation, carry out documentary checks on the application submitted pursuant to paragraph 2. If the documentation requested is not available, the applicant shall make the necessary additions within a time limit set by the competent authority and in any event not exceeding thirty (30) days.
5. The competent authority, after verifying that the requirements referred to in paragraph 2 of this Article have been met, shall authorise the applicant as a body within the meaning of Article 1(q), specifying the types of equipment on which it is entitled to operate.

6. When issuing the authorisation, the competent authority shall assign an identifier to the body and the operational staff responsible for carrying out the checks.
7. The authorisation shall be valid for four years and is renewable, on a permanent basis, upon submission of an application for renewal no later than three months from the expiry date.
8. Any costs relating to the assessments and monitoring of bodies pursuant to Article 11 shall be borne by the body that submitted the notice.
9. The bodies may operate throughout the national territory.

Article 9
Order to cease operation and internal review procedures
1. If the conditions laid down in Article 8 have not been met, the competent authority, after consulting the body, shall issue an order to cease the activity.
2. The order to cease the activity shall be adopted by the Competent Authority, after consulting the body, and shall contain the reasons for the decision taken, together with details of the time limit and the body with which any appeal is to be lodged. This order shall also be adopted in cases of suspension or withdrawal of accreditation.
3. The body which is the subject of measures prohibiting the continuation of the activity, or of self-protection by the Competent Authority, shall inform the owners of the equipment, subject to verifications already planned, that it is impossible to carry out the verifications itself. The holders of the equipment are required to reschedule the verifications with another body within 30 working days of receipt of the notification.

Article 10
Registration and reporting obligation
By a subsequent decision of the Competent Authority, detailed rules will be adopted to regulate the registration and reporting procedures for bodies.

Article 11
Supervision of bodies
1. The National Accreditation Body shall supervise bodies accredited in accordance with the rules referred to in Article 1(1)(q).
2. The National Accreditation Body shall promptly notify the Competent Authority of updates to the staff referred to in point 2 of **Annex I**, of the suspension or withdrawal of the accreditation certificate following the surveillance activity referred to in paragraph 1, for the follow-up of competence referred to in Article 9.
3. The UMC responsible for the area shall monitor the equipment by carrying out random checks. The body which carried out the periodic verification of the equipment shall carry out the re-performance of the verification activities in the presence of UMC staff, using control tools and own resources.

4. The provision referred to in the last sentence of paragraph 3 shall not apply where the body communicates electronically to the UMC responsible for the area, the work plan and the holders of the equipment, on which it will carry out the verification operations at least 5 working days in advance.
5. The supervision referred to in this Article shall be carried out in accordance with Article 5(2).
6. The results of the supervisory operations carried out by the UMCs shall be sent to the Competent Authority and, in the event of anomalies found, also to the National Accreditation Body.

Article 12
Repeals and temporary provisions
1. Chapter II of Circular 88/95, as amended, is repealed at the end of the transitional period, as defined in paragraph 2 of this Article. At the end of this transitional period, the metrological compliance verification requirements provided for in the type-approval or authorisation provisions should also be considered to be repealed.
2. Bodies already authorised to carry out verifications in accordance with the provisions of the repealed Chapter II of Circular 88/95 shall continue to carry out these verifications on a temporary basis for a maximum period of **24 months** from the entry into force of this measure in accordance with the procedures laid down in the repealed Chapter II of Circular 88/95, as amended, after verification that the requirements laid down have been complied with;
3. Following the transitional period referred to in paragraph 2 of this Article, the provisions referred to in paragraph 1 of this Article shall cease to apply.
4. For instruments already subject to periodic verifications in accordance with the provisions of the repealed Chapter II of Circular 88/95, as amended, the periodicity of the verifications shall continue to be calculated from the last verification carried out.
5. The provisions of this Decree, together with the annexes thereto, shall take effect from the end of the transitional period as defined above.
6. From the date on which the Decree takes effect, the verifications shall be carried out by the bodies as defined in Article 1(q), in accordance with the procedures laid down in this Decree.

Article 13
Commencement
1. The provisions of this Decree shall enter into force on the fifteenth (15) day following the publication of this Decree in the Official Journal of the Italian Republic;

(ing. Pasquale D'Anzi)

ANNEX I
Requirements for bodies

1. Conditions and requirements

1.1 The bodies which have obtained authorisation from the Competent Authority, in accordance with the conditions and requirements laid down in this Decree, shall carry out the verification activities. In the cases envisaged in point 3, bodies may also carry out the repair of instruments.

1.2 The body shall, at the time of submission of the application for authorisation, submit the accreditation certificate, with the aim of complying with this Decree, issued by the national accreditation body, certifying that it complies with one of the standards referred to in letter (q) of Article 1; in addition, the body shall also declare that the requirements of this Decree are met.

1.3 The bodies shall appoint a person responsible for the verification activities covered by this Decree.

2. Requirements for staff of bodies accredited in accordance with UNI CEI EN ISO/IEC 17020:2018

2.1 The person responsible for carrying out verifications on the equipment and, where applicable, his/her substitute, shall meet the following minimum requirements:

(a) upper secondary school diploma;

(b) at least three years work experience, including two years in industrial or service activities and one year in verification, maintenance, manufacture, installation of the instruments on which it will carry out the checks;

(c) adequate knowledge of the rules on legal metrology and the responsibility of the public service representative.

2.2 The operational staff of the body carrying out checks on equipment shall meet the following minimum requirements:

(a) a lower secondary school diploma;

(b) at least one year work experience in verification, maintenance, manufacture, installation of the instruments on which it will carry out the checks;

(c) adequate knowledge of the rules on legal metrology and the responsibility of the public service representative.

3. Independence of bodies

3.1 The body that meets the minimum independence criteria in Appendix A point A.3 of UNI CEI EN ISO/IEC 17020:2012 may perform verification, repair and maintenance, while in the case where said body meets the minimum independence criteria in Appendix A point A.1, it may only perform verification.

3.2 The body complying with the minimum independence requirements of UNI CEI EN ISO/IEC 17025:2018 may carry out verification, repair and maintenance.

ANNEX II

General provisions for initial and periodic verification

1. METROLOGY CRITERIA

1.1. The terminology used in this Annex is that adopted by Article 1 of this Decree and the International Metrology Vocabulary transposed by UNI CEI 70099.

1.2. Initial and periodic verifications are intended to verify metrological compliance to which the equipment must be subjected in order to ensure that metrological performance complies with the requirements laid down in this Decree and with the maximum permissible errors.-

1.3. For the purpose of carrying out verification activities, any dismantling of components or other operations resulting in a change in the working parameters shall be excluded.

1.4. The purpose of the periodic checks is also to verify the presence of the relevant suitability for use certificate, as attested in the metrological booklet, as well as the authentication criteria of the last verification carried out.

1.5. The control tools must be accompanied by a Calibration Certificate issued by Laboratories Accredited by Accreditation Bodies which are signatories to the international Mutual Recognition Agreements, for the size and measurement range that they are intended to measure. The periodicity of calibration is set out in Annex IV.

1.6. The uncertainty of the control tools used to perform the tests shall not exceed 1/3 of the maximum error allowed for the size being measured.

1.7. Derogations from point 1.5 may be authorised by decision of the Ministry for Infrastructure and Transport for control tools.

1.8. The control tools required for the functions to carry out are materially available to the authorised body carrying out the inspection, including by means of free of charge loan for use or other form ensuring effective availability.

1.9. When carrying out the verifications laid down in this Decree, where access to the periodic verification management software is provided, the authorised body must be in possession of first-level passwords. The same passwords must be available to the competent authority, which shall provide them to the authorised bodies.

1.10. In the event of a negative outcome of the initial and periodic verification, the operator of the authorised body shall record the negative result in the metrological booklet and shall not update the date of verification of the equipment. The equipment may be used following repair and a positive outcome of another periodic verification

2. MAXIMUM PERMISSIBLE ERROR FOR EQUIPMENT AND ACCURACY OF CONTROL TOOLS

Control tool	Range of allowed values										Accuracy of the control tool
Thermohygrometer Measurement of relative humidity temperature barometric pressure	PARAMETERS / EQUIPMENT	BRAKES TESTER car/motorcycle test (rollers and	WEIGHT	WEAR TEST	TEST FUMES	GAS ANALYSIS	REV COUNTERS	HEADLIGHT TEST	PHONOMETER	ROUTE SIMULATOR	Thermometer: ± 1.0 °C Hygrometer (for Relative Humidity): ± 5%. Barometer: ± 5 hPa.
	1. Temperature	0 ÷ 40 °C.	NN	NN	(5 °C - 40 °C)	(5 °C - 40 °C)	NN	NN	15 °C to 31 °C.	(5 °C - 40 °C)	
	2. Relative humidity	10 % and 90 %	NN	NN	10 % - 95 %	10 % and 95 %	NN	NN	25 % - 90 %.	10 % and 90 %	
	3. Atmospheric pressure	85-102.5 kPa	NN	NN	94.5 - 102.5 kPa pressures below 94.5 kPa and up to 85 kPa max read value decreased by 0.25 m-1.	- 85 - 102.5 kPa for automatic compensation; - Otherwise ≤ ± 5 kPa	NN	NN	85 kPa - 102.5 kPa.	85-102.5 k Pa	

Category of Equipment	Control tool	Description	Characteristics of the control tool	Accuracy of the control tool
ANALYSER EXHAUST GAS	**Cylinder No 1**	Sample gas cylinder produced by approved laboratories and complying with the requirements of standard UNI EN ISO 6142.	CO: 0.3 % vol. ±0.2 %vol. CO_2: 6 % vol. ±1 % vol. HC (hexane)*: 100 ppm vol. ±50 ppm vol. 0_2: 0.5 % vol. ±0.4 % vol. (*) Propane C3H8 may be used	≤ 1 % relative

<table>
<tr><th>Category of Equipment</th><th>Control tool</th><th>Description</th><th>Characteristics of the control tool</th><th>Accuracy of the control tool</th></tr>
<tr><td rowspan="2"></td><td>Cylinder No 2

Only foreseen for initial verifications</td><td>Sample gas cylinder produced by approved laboratories and complying with the requirements of standard UNI EN ISO 6142.</td><td><table><tr><td>CO</td><td>1.5 % vol. ±0.5 % vol.</td></tr><tr><td>CO_2</td><td>12 % vol. ±1 % vol.</td></tr><tr><td>HC (hexane)*</td><td>500 ppm vol. ±200 ppm vol.</td></tr><tr><td>0_2</td><td>4 % vol. ±1 % vol.</td></tr></table>(*) Propane C3H8 may be used with double concentration</td><td>≤ 1 % relative</td></tr>
<tr><td>Cylinder No 3</td><td>Sample gas cylinder produced by approved laboratories and complying with the requirements of standard UNI EN ISO 6142.</td><td><table><tr><td>CO</td><td>4.5 % vol. ±1 % vol.</td></tr><tr><td>CO_2</td><td>14.5 % vol. ± 1 % vol.</td></tr><tr><td>HC (hexane)*</td><td>1600 ppm vol. ± 200 ppm vol.</td></tr><tr><td>0_2</td><td>9 % vol. ± 2 % vol.</td></tr></table>(*) Propane C3H8 may be used with double concentration.</td><td>≤ 1 % relative</td></tr>
<tr><td>REV COUNTERS</td><td>Rev simulator</td><td>A device generating electrical and mechanical signals and interfacing with different rev detection systems.</td><td>Working range from 0 to 10.000 rpm.</td><td>≤ 5 rpm absolute or ± 1 % relative.</td></tr>
<tr><td rowspan="2">DECELEROGRAPH</td><td>Calibration template</td><td>Physical device where the various sensors to be calibrated are placed.</td><td>The calibration template is specific to each type of decelerograph approved and is generally produced and supplied by the equipment manufacturer. The characteristics and measurements of the template are defined in the</td><td>Calibration template tolerances are defined in the construction drawings.</td></tr>
<tr><td>Sample mass</td><td>Sample masses to be applied to pedal force measurers.</td><td>Parallelepiped-type sample mass.</td><td>Class M2 or above according to OIML R111 “Weights of classes E1, E2, F1, F2, M1, M1–2, M2, M2–3 and M3”</td></tr>
</table>

Category of Equipment	Control tool	Description	Characteristics of the control tool	Accuracy of the control tool
PHONOMETER	**Multifunction calibrator** **and Acoustic calibrator**	Device capable of carrying out the following phonometer tests: frequency response verification of weighting filter A verification of reduced linearity verification of FAST time constant verification of the crest factor (RMS).	Multifunction calibrators (B&K or Delta Ohm) allow the calibration of free field simulation microphones and can generate acoustic pressure at various frequencies.	Class 1 multifunction calibrator Class 1 acoustic calibrator
OPACIMETER	**Optical filter No 1**	Dedicated optical filter for the equipment type because it is conditioned by chamber and housing characteristics.	Optical filter with known opacity - Opacity between 0,7 and 1,1 k m-1.	±0.025 K m-1.
	Optical filter No 2	Dedicated optical filter for the equipment type because it is conditioned by chamber and housing characteristics.	Optical filter with known opacity - Opacity between 1,5 and 1,9 k m-1.	±0.025 K m-1.
	Optical filter No 3	Dedicated optical filter for the equipment type because it is conditioned by chamber and housing characteristics.	Optical filter with known opacity - Opacity between 2,4 and 3,1 k m-1.	±0.025 K m-1.
HEADLIGHT TESTER	**Headlight simulator**	Headlight simulator (or sample headlight), for the generation of a reference beam, for checking the positioning, brightness and inclination of the equipment.	Headlight simulator (or sample headlight) with a known value of between 4.150 lx/m. and 81.000 lx/m. for the dipped-beam mode, and between 22.000 and 135.000 lx/m. for the driving mode.	≤ 2 % of the minimum and maximum values for the dipped-beam and the driving mode.

Category of Equipment	Control tool	Description	Characteristics of the control tool	Accuracy of the control tool
BRAKE TESTER ROLLERS and SPEED TEST	**Optical rev counters**	Device for measuring the rotational speed of the equipment roller (brake test and speed test).	Suitable device for light slow rotations with a resolution of at least 0.1 rpm	± 0.5 rpm
BRAKE TESTER ROLLERS and PLATES	**Level**	Device to measure the flatness of roller boards (if separated) and the flatness of plates.	Physical or laser device	± 0.5 mm/mt
BRAKE TESTER ROLLERS and PLATES	**Standard masses**	Standard masses to be applied by means of “calibration bars” to check the equipment reading. Standard masses to be applied to pedal and manual pressure measurers to check the equipment reading.	Series of standard masses of the type with a parallelepiped, disc, hexagonal or specific shape. Series of standard masses of the type with a parallelepiped or hexagonal shape.	Class M2 or above according to OIML R111 “Weights of classes E1, E2, F1, F2, M1, M1–2, M2, M2–3 and M3”
BRAKE TESTER ROLLERS and PLATES	**Sample dynamometer**	Sample dynamometer to be combined with suitable anchoring and thrust systems to measure applied force, to be compared with equipment readings.	The range of measurement of the appropriate dynamometer for the equipment categories.	Load cell class C1 or above according to OIML R60 “Metrological regulation for load cells”

Category of Equipment	Control tool	Description	Characteristics of the control tool	Accuracy of the control tool
BRAKE TESTER ROLLERS and PLATES	**“Calibration bars”**	Device designed to anchor the measurement samples to the test equipment and to apply the relevant forces. Carpentry elements of various types and shapes (portals, brackets, linkages,	The calibration bar is specific to each type of approved brake tester and is generally produced and supplied by the manufacturer of the equipment. For each approved type of brake tester, dedicated calibration bars may exist for braking	The tolerances of the various carpentry elements and assembly and fixing systems are defined in the construction drawings.
WEAR TEST	**Flexometer or sliding caliper**	Device for linear measurements	Measuring range of at least 100 mm	Flexometer with an accuracy of at least ± 1 mm. Sliding caliper with an accuracy of at least ± 0.05 mm
SPEED TEST	**Standard masses**	Standard masses to be applied by means of “calibration bars” to check the equipment reading.	Series of standard masses of the type with a parallelepiped, disc, hexagonal or specific shape.	Class M2 or above according to OIML R111 “Weights of classes E1, E2, F1, F2, M1, M1–2, M2, M2–3 and M3”
SPEED TEST	**“Calibration bars”**	Device designed to anchor the measurement samples to the test equipment and to apply the relevant forces. Carpentry elements of various types and shapes (portals, brackets, linkages,	The calibration bar is specific to each type of approved speed test type and is generally produced and supplied by the manufacturer of the equipment. The measurements of the various carpentry	The tolerances of the various carpentry elements and assembly and fixing systems are defined in the construction drawings.

Category of Equipment	Control tool	Description	Characteristics of the control tool	Accuracy of the control tool
ENVIRONMENTAL CONDITIONS	**Barometric station**	Device for measuring temperature, humidity and atmospheric pressure present in the control centre.	Sample of characteristics equivalent to or above those of the barometric station in use at the control centre.	Thermometer: ± 1.0 °C Hygrometer (for Relative Humidity): ± 5%. Barometer: ± 5 hPa.

ANNEX III

Operational arrangements for carrying out the initial and periodic verifications

TECHNICAL DATA SHEET NO 01	EXHAUST GAS ANALYSER
Document type:	**TECHNICAL DATA SHEET**
Document code:	**1-Exhaust gas analyser**
Equipment specifications:	**TYPE APPROVAL in accordance with Circular No 3997 / 604 of 6.9.1999 - New circular 88/95 as amended**.
Date of first issue:	27-06-2024
Roadworthiness test of:	**27-06-2024** | No 1
Written by:	
Verified by:	
Approved by:	

Roadworthiness test sheet			
Rev.	Date	Par.	Description of modifications
1	27-06-2024		Issue of the exhaust gas analyser sheet

Contents

1. DESCRIPTION OF EQUIPMENT

1.1 Description of equipment and parts thereof:

1.1.1 **Exhaust gas analyser**: a partial sampling analysis device, which, by means of a sample of the exhaust gas of the vehicle being tested, is capable of providing information on the concentrations of various types of gases generated by the combustion of positive-ignition engines and thus the quality of the combustion itself.

1.1.2 **CO – Carbon Monoxide**: it is formed by the incomplete reaction between the carbon molecules present in the fuel and oxygen molecules as an oxidising element. The CO value is inversely proportional to the quality of combustion. Its value is expressed as a percentage by volume ($\%_{Vol.}$).

1.1.3 **Corrected CO**: a value obtained by mathematical formulae (correlation between the CO and CO2 value and parameter linked to the type of fuel burnt) allowing the determination of the carbon monoxide value after condensation of water vapour. Its value is expressed as a percentage of volume ($\%_{Vol.}$).

1.1.4 **CO2 – Carbon dioxide**: it is formed by the complete reaction between the carbon molecules present in the fuel and oxygen molecules as an oxidising element. The CO2 value is directly proportional to the quality of combustion. Its value is expressed as a percentage of volume ($\%_{Vol.}$).

1.1.5 **O2 – Oxygen**: the oxidising element. Its presence after combustion (in the absence of infiltration) should be very limited as it is used almost completely in the combustion process. Its value is expressed as a percentage of volume ($\%_{Vol.}$).

1.1.6 **N – Nitrogen**: the predominant element in the atmosphere not affected by combustion; however, at the high temperatures present in the combustion chamber, it can be associated with oxygen molecules, generating nitrogen oxides (NOX) that are very dangerous for the health of animal species and the environment.

1.1.7 **HC – Non-combusted hydrocarbons**: the amount of fuel not affected by combustion. Its unit of measurement is expressed in ppm (parts per million) by volume of hexane (C6H14).

1.1.8 **PEF** -**Hexane/Propane equivalence factor** (C6H14/C3/H8): in order to perform the metrological confirmation and then determine the outcome of the verification, propane samples may have to be used to replace hexane, in which case it is essential to perform the conversion using the Propane/Hexane Correction Factor (PEF) coefficient.

1.1.9 **Lambda factor**: the ratio between the real and theoretical value of the amount of intake air relative to the amount of fuel, the latter measured indirectly through the concentrations of CO, CO2, HC and O2.

1.1.10 **IR – Infrared**: the light spectrum emitted by a metal heated to 800 °C in the non-visible range.

1.1.12 **NDIR – Non-Dispersive Infrared**: optical system based on the concentration of an infrared beam.

1.1.13 **Electrochemical cell (or sensor)**: an electrochemical battery which, when exposed to an air flow containing a defined gas, produces a chemical reaction that creates a potential difference between two electrodes relative to the percentage of that gas.

2 VERIFICATIONS

2.1. Preliminary Activities

2.1.1 Checking compliance with the manufacturer's instructions for use, both for workplace safety requirements and for the operational verification instructions.

2.1.2 Equipment identification check, using the identification plate which shall bear the type approval number and serial number assigned by the manufacturer

2.1.3 Checking the presence of the metrological booklet, which must be complete and legible.

2.1.4 Check the matching of the equipment plate data with data recorded in the metrological booklet.

2.1.5 Monitoring of environmental conditions required for the use of the equipment: 5 °C to 40 °C, ± 2 °C.

2.2. Initial Verification

The initial verification shall include at least the following activities provided for by the metrological booklet; at the operational level, the sequence of activities may change.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment			
2	General and functional checks	2.1 Checking the intactness of the instrument, absence of denting or damage to the operating parts. 2.2 Checking the intactness of the gas intake probe and the connecting tube between the probe and the equipment. 2.3 Checking the condition of filters for collecting solid particles and the condensate separator. 2.4 Checking the functionality and intactness of the supply system. 2.5 Checking the intactness and functionality of measurement indicator displays. 2.6 If required, checking the functionality of the engine temperature probe.			
3	Test ban check during heating.	3.1 Switch on the equipment and carry out an initial heating following the manufacturer's specified times. 3.2 Switch on the equipment and start the test; for the time specified by the manufacturer, check that it is not			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
		possible to start the test and that the equipment shows that it is in the state of heating.			
4	HC residue check.	4.1 Start, following the procedures provided by the manufacturer and using the appropriate control, the HC residue check, taking care to move the gas sampling probe away from any possible source of hydrocarbon emissions (vehicles parked with the engine running, containers of petrol, diluents or other hydrocarbon cleaning products. 4.2 At the end of the manufacturer's procedure, the equipment will provide the result of the verification (positive or negative). 4.3 The reading of the result shall be freely accessible or accessible via the 1st level pw.			
5	Leak test.	5.1 Start, following the procedures provided by the manufacturer and using the appropriate control, the leak test to check the leakage of pipes inside the equipment. 5.2 Repeat the same test by obstructing the inlet of the gas sampling probe with the appropriate cap. 5.3 At the end of the manufacturer's procedure, the equipment will provide the result of the verification (positive or negative). 5.4 The reading of the result shall be freely accessible or accessible via the 1st level pw.			
6	Verification of "Low Flow" indication	6.1 Start an exhaust gas test or a simulation thereof. 6.2 Partially obstruct the sampling probe or probe or tube connected to it and verify that there is a low flow error warning.			
7	Verification of the linearity of the response with sample gases	7.1 Instrument verification. 7.2 For the initial verification, if used, the adjustment of the equipment and the calibration curve shall use the values of the sample gas cylinders (see Annex II), where necessary using the pw supplied by the manufacturer. 7.3 In order to ensure the correct flow of gas, the sample gas cylinders shall be equipped with appropriate pressure reducers and/or devices	Table 1	Sample gas cylinders no 1, no 2 (where required by the manufacturer) and no 3.	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
		that ensure the correct flow of the sample gas mixture, according to the characteristics of the analyser pump. 7.4 Wait until the equipment has completed the heating procedure. 7.5 Disconnect the sampling tube of the equipment and connect sample gas cylinder no 1 in its place. 7.6 Carry out the auto-zero procedure. 7.7 Start the exhaust gas test and at the same time administer the sample gas to the sampling probe at an increased ambient pressure of 750 KPa, or with the polyethylene balloon in equilibrium (excessive flow causes balloon swelling while, on the contrary, insufficient flow causes complete emptying). 7.8 Wait for the gas readings to stabilise and detect the values read by the equipment. 7.9 Close sample gas cylinder no 1 and disconnect it from the equipment at the same time. 7.10 Where required by the manufacturer, repeat the same steps with sample gas cylinder no 2 and detect the values read by the equipment. 7.11 Repeat the same steps with sample gas cylinder no 3 and detect the values read by the equipment. 7.12 Readings of values shall be freely accessible or accessible via the 1st level pw. 7.13 The values detected shall be within the maximum permissible error range.			
8	Verification of the response time of CO, CO_2, HC and O_2 channels	8.1 Perform a reset of the device. 8.2 Using sample gas cylinder number 3 (high concentration), check that the analyser reaches at least 90 % of the nominal gas value within 20 seconds from the start of the measurement. 8.3 Perform a reset of the device. 8.4 Using sample gas cylinder number 1 (low concentration), check that the oxygen value falls below the nominal cylinder value + 0.1%$_{vol.}$ within 60 seconds.			
9	Other checks				

2.3. Periodic verification

The periodic verification shall include at least the following activities provided for by the metrological booklet; at the operational level, the sequence of activities may change.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment			
2	General and functional checks	2.1 Checking the intactness of the instrument, absence of denting or damage to the operating parts. 2.2 Checking the intactness of the gas intake probe and the connecting tube between the probe and the equipment. 2.3 Checking the condition of filters for collecting solid particles and the condensate separator. 2.4 Checking the functionality and intactness of the supply system. 2.5 Checking the intactness and functionality of measurement indicator displays. 2.6 If required, checking the functionality of the engine temperature probe.			
3	Verification of the linearity of the response with sample gases	the operating sequence of subsequent tests is: the HC residue check, the leak test, the low flow test and finally the calibration curve. 3.1 Instrument verification. 3.2 For the initial verification, if used, the adjustment of the equipment and the calibration curve shall use the values of the sample gas cylinders (see Annex II), where necessary using the pw supplied by the manufacturer. 3.3 In order to ensure the correct flow of gas, the sample gas cylinders shall be equipped with appropriate pressure reducers and/or devices that ensure the correct flow of the sample gas mixture, according to the characteristics of the analyser pump. 3.4 Wait until the equipment has completed the heating procedure. 3.5 Disconnect the sampling tube of the equipment and connect sample gas cylinder no 1 in its place. 3.6 Carry out the auto-zero procedure. 3.7 Start the exhaust gas test and at the same time administer the sample gas to the sampling probe at an increased ambient pressure of 750 KPa, or with the polyethylene balloon in equilibrium (excessive flow causes balloon swelling while, on the	Table 2	Sample gas cylinders no 1 and no 3.	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
		contrary, insufficient flow causes complete emptying). 3.8 Wait for the gas readings to stabilise and detect the values read by the equipment. 3.9 Close sample gas cylinder no 1 and disconnect it from the equipment at the same time. 3.10 Where required by the manufacturer, repeat the same steps with sample gas cylinder no 2 and detect the values read by the equipment. 3.11 Repeat the same steps with sample gas cylinder no 3 and detect the values read by the equipment. 3.12 Readings of values shall be freely accessible or accessible via the 1st level pw. 3.13 The values detected shall be within the maximum permissible error range.			
4	Leak test.	4.1 Start, following the procedures provided by the manufacturer and using the appropriate control, the leak test to check the leakage of pipes inside the equipment. 4.2 Repeat the same test by obstructing the inlet of the gas sampling probe with the appropriate cap. 4.3 At the end of the manufacturer's procedure, the equipment will provide the result of the verification (positive or negative). 4.4 The reading of the result shall be freely accessible or accessible via the 1st level pw.			
5	HC residue check.	5.1 Start, following the procedures provided by the manufacturer and using the appropriate control, the HC residue check, taking care to move the gas sampling probe away from any possible source of hydrocarbon emissions (vehicles parked with the engine running, containers of petrol, diluents or other hydrocarbon cleaning products. 5.2 At the end of the manufacturer's procedure, the equipment will provide the result of the verification (positive or negative). 5.3 The reading of the result shall be freely accessible or accessible via the 1st level pw.			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
6	Verification of "Low Flow" indication	6.1 Start an exhaust gas test or a simulation thereof. 6.2 Partially obstruct the sampling probe or probe or tube connected to it and verify that there is a low flow error warning.			
8	Other checks.				

Table 1: Class 1 Analysers – Initial Verification Maximum Permissible Error

gas	absolute error	relative error	Balance between a.e. and r.e.
CO	0.06 (% CO_{vol})	3 %	2 (% CO_{vol})
CO_2	0.4 (% $CO_{2\ vol}$)	4 %	10 (% CO_{vol})
HC	12 (ppm $_{vol}$)	5 %	240 (% CO_{vol})
O_2	0.1 (%$O_{2\ vol}$)	5 %	2 (% CO_{vol})

Table 2: Class 1 Analysers – Periodic Verification Maximum Permissible Error

gas	absolute error	relative error	Balance between a.e. and r.e.
CO	0.06 (% CO_{vol})	5 %	1.2 (% CO_{vol})
CO_2	0.5 (% $CO_{2\ vol}$)	5 %	10 (% CO_{vol})
HC	12 (ppm $_{vol}$)	5 %	240 (% CO_{vol})
O_2	0.1 (%$O_{2\ vol}$)	5 %	2 (% CO_{vol})

3 METROLOGICAL CONFIRMATION

3.1.1. The initial and periodic verification provide for a series of visual and functional checks and a series of instrumental checks by means of a direct comparison of the equipment being tested and the relevant control tools, with the criteria laid down in Annex II.

3.1.2. The outcome of each functional checked or instrumental verification operation shall be attested by ticking the activity in the list ‘initial verification’ or ‘periodic verification’ of the metrological booklets.

3.1.3. After ticking the activities provided for, the final outcome of the verification (positive or negative) must be certified in the metrological booklet, and the authorised CSRPAD portal technician who carried out the operation must be identified, by means of a stamp, signature and registration (or equivalent digital systems).

3.1.4. A positive outcome certifies the metrological confirmation of the equipment, which may be used to start performing vehicle roadworthiness tests (initial verification) or to continue carrying out vehicle roadworthiness tests (periodic verification).

TECHNICAL DATA SHEET NO 02	REV COUNTERS
Document type:	**TECHNICAL DATA SHEET**
Document code:	**2-Rev counters**
Equipment specifications:	**TYPE APPROVED in accordance with Circular No 3997 / 604 of 6.9.1999 - New circular 88/95 as amended**.
Date of first issue:	23-05-2024
Roadworthiness test of:	**23-05-2024** | No 1
Written by:	
Verified by:	
Approved by:	

Roadworthiness test sheet			
Rev.	Date	Par.	Description of modifications
1	23-05-2024		Rev counter sheet approval

Contents

1. DESCRIPTION OF EQUIPMENT

1.1 Description of equipment and parts thereof:

1.1.1 **Rev counters**: a device for detecting engine rotation revs; the measurement may be carried out by one or more of the following methods:

- induction clamp;
- piezoelectric or accelerometric sensor;
- battery ripples;
- antenna detection;
- OBD interface device.

1.1.2 **Rpm**: the number of complete combustion cycles carried out by the engine in one (1) minute. In a 2-stroke engine, each engine rotation represents a complete cycle, while in a 4-stroke engine the full cycle is determined by 2 engine rotations. For this reason, it is of particular importance that the revolution counters be set correctly, failing which the measure will be halved or doubled.

1.1.3 **Induction clamp**: used only for positive-ignition engines (petrol, LPG, CNG), it exploits, thanks to the presence of a small coil, the magnetic fields generated by the high voltage present in the spark plug wires.

1.1.4 **Piezoelectric or accelerometric sensor**: a sensor with the ability to convert the beats caused by combustion within the engine into an electric signal. Generally magnetic, it is positioned by anchoring it to a metal element usually of the engine head, from which it can detect beats and then determine the number of revs.

1.1.5 **Battery ripples**: residual peaks of alternating current produced by the alternator after the adjustment process by the diodes installed on the same alternator. Some rev counters use these peaks to determine the total number of revs of the engine.

1.1.6 **Antenna detection**: engine rev detection system specific to positive-ignition engines. Detection is carried out by sampling the inductive signals produced by electric discharges during the ignition phase in the chamber (burst phase).

1.1.7 **OBD interface detection**: device for connection of the vehicle with the ECU via the OBD communication protocol. This device also detects the engine temperature.

2 VERIFICATIONS

2.1. Preliminary Activities

2.1.1 Checking compliance with the manufacturer's instructions for use, both for workplace safety requirements and for the operational verification instructions.

2.1.2 Equipment identification check, using the identification plate which shall bear the type approval number and serial number assigned by the manufacturer

2.1.3 Checking the presence of the metrological booklet, which must be complete and legible.

2.1.4 Check the matching of the equipment plate data with data recorded in the metrological booklet.

2.2. Initial Verification

The initial verification shall include at least the following activities provided for by the metrological booklet; at the operational level, the sequence of activities may change.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment			
2	General and functional checks	2.1 Checking the intactness of the equipment, absence of denting or damage to the operating parts. 2.2 Checking the presence and intactness of the support equipment (probes, clamps, cables, etc.). 2.3 If required, checking that the indicators are fully functioning. 2.4 If required, checking the intactness of any PC connections. 2.5 For rev counters with multiple engine rev detection systems (e.g. battery, OBD, vibration, antenna, etc.), verify the operation of the various systems in place.			
3	Checking the minimum value	3.1 Instrumental check 3.2 Connect the simulator to the equipment being tested, while keeping the rev simulator. 3.3 Switch on the test equipment and after the necessary start-up period, check that the equipment indicates the minimum value specified in the manufacturer's technical specification. 3.4 Readings of values shall be freely accessible or accessible via the 1st level pw.		Rev simulator.	
4	Verification of linearity in the field of measurement.	4.1 Instrument verification. 4.2 Set the rev simulator to the minimum rotational speed available from the scale (typically 900/1000 rpm).	Controlled ignition rev counters: 0 to 10 000 rpm ± 50 rpm or 3 %	Rev simulator.	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
		4.3 Switch on the test equipment, wait until the indicator is stabilised and then note the indicated value. 4.4 Stop the rev simulator and verify the return of the indicator to the minimum value specified in the technical specification of the manufacturer of the test equipment. 4.5 Repeat the steps before the additional values available from the rev simulator (usually multiples of the lowest value). 4.6 Readings of values shall be freely accessible or accessible via the 1st level pw. 4.7 The values detected shall be within the maximum permissible error range.	relative. Spontaneous ignition rev counters: 0 to 6 000 rpm. ± 50 rpm or 3 % relative.		
5	Other checks				

2.3. Periodic verification

The periodic verification shall include at least the following activities provided for by the metrological booklet; at the operational level, the sequence of activities may change.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment			
2	General and functional checks	2.1 Checking the intactness of the equipment, absence of denting or damage to the operating parts. 2.2 Checking the presence and intactness of the support equipment (probes, clamps, cables, etc.). 2.3 If required, checking that the indicators are fully functioning. 2.4 If required, checking the intactness of any PC connections.			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
		2.5 For rev counters with multiple engine rev detection systems (e.g. battery, OBD, vibration, antenna, etc.), verify the operation of the various systems in place.			
3	Checking the minimum value	3.1 Instrumental check 3.2 Connect the simulator to the equipment being tested, while keeping the rev simulator. 3.3 Switch on the test equipment and after the necessary start-up period, check that the equipment indicates the minimum value specified in the manufacturer's technical specification. 3.4 Readings of values shall be freely accessible or accessible via the 1st level pw.		Rev simulator.	
4	Verification of linearity in the field of measurement.	4.1 Instrument verification. 4.2 Set the rev simulator to the minimum rotational speed available from the scale (typically 900/1000 rpm). 4.3 Switch on the test equipment, wait until the indicator is stabilised and then note the indicated value. 4.4 Stop the rev simulator and verify the return of the indicator to the minimum value specified in the technical specification of the manufacturer of the test equipment. 4.5 Repeat the steps before the additional values available from the rev simulator (usually multiples of the lowest value). 4.6 Readings of values shall be freely accessible or accessible via the 1st level pw. 4.7 The values detected shall be within the maximum permissible error range.	Controlled ignition rev counters: 0 to 10 000 rpm ± 50 rpm or 3 % relative. Spontaneous ignition rev counters: 0 to 6 000 rpm. ± 50 rpm or 3 % relative.	Rev simulator.	
5	Other checks.				

3. METROLOGICAL CONFIRMATION

3.1.1 The initial and periodic verification provide for a series of visual and functional checks and a series of instrumental checks by means of a direct comparison of the equipment being tested and the relevant control tools, with the criteria laid down in Annex II.

3.1.2 The outcome of each functional checked or instrumental verification operation shall be attested by ticking the activity in the list ‘initial verification’ or ‘periodic verification’ of the metrological booklets.

3.1.3 After ticking the activities provided for, the final outcome of the verification (positive or negative) must be certified in the metrological booklet, and the authorised CSRPAD portal technician who carried out the operation must be identified, by means of a stamp, signature and registration (or equivalent digital systems).

3.1.4 A positive outcome certifies the metrological confirmation of the equipment, which may be used to start performing vehicle roadworthiness tests (initial verification) or to continue carrying out vehicle roadworthiness tests (periodic verification).

TECHNICAL DATA SHEET NO 03	DECELEROGRAPH
Document type:	**TECHNICAL DATA SHEET**
Document code:	**03-Decelerograph**
Equipment specifications:	**TYPE APPROVAL in accordance with Circular 1603/404 of 8.10.2001**
Date of first issue:	27-06-2024
Roadworthiness test of:	**27-06-2024** | No 1
Written by:	
Verified by:	
Approved by:	

Roadworthiness test sheet			
Rev.	Date	Par.	Description of modifications
1	27-06-2024		First issue of the Decelerograph sheet

Contents

1. DESCRIPTION OF EQUIPMENT

1.1 Description of equipment and parts thereof:

1.1.1 **Decelerograph**: equipment to be used in checking the mean deceleration of vehicles.

1.1.2 **Sensor unit**: deceleration detection device.

1.1.3 **Pedal or lever force measurers**: a dynamometer for the measurement of the force applied to the device of the vehicle being tested.

2 VERIFICATIONS

2.1. Preliminary Activities

2.3.1 Checking compliance with the manufacturer's instructions for use, both for workplace safety requirements and for the operational verification instructions.

2.3.2 Equipment identification check, using the identification plate which shall bear the type approval number and serial number assigned by the manufacturer

2.3.3 Checking the presence of the metrological booklet, which must be complete and legible.

2.3.4 Check the matching of the equipment plate data with data recorded in the metrological booklet.

2.3.5 Monitoring of environmental conditions required for the use of the equipment: 0 °C to 40 °C.

2.2. Initial Verification

The initial verification shall include at least the following activities provided for by the metrological booklet; at the operational level, the sequence of activities may change.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.1 Checking the intactness of the equipment, absence of denting or damage to the operating parts. 2.2 Checking the presence and intactness of the support equipment (sensor unit, cables, connecting cables, etc.). 2.3 Checking the functioning of the display and the various control			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
		keys.			
3	Zero check.	3.1 Functional check. 3.2 The check may be carried out by means of a specific sw procedure. 3.3 As an alternative to the sw procedure, switch on the equipment being tested and after the necessary start-up period, position the sensors to zero. 3.4 Readings of values shall be freely accessible or accessible via the 1st level pw.		Calibration template.	
4	Verification of the calibration curve	4.1 Instrument verification 4.2 Place the calibration template on a horizontal plane and level it. 4.3 Proceed with verification of the correct reading of angles by the sensor units. 4.4 Readings of values shall be freely accessible or accessible via the 1st level pw. 4.5 The values detected shall be within the maximum permissible error range.	≤ 3 % reading value or 0.03 m/s^2 always taking the largest.	Calibration template.	
5	Verification of maximum permissible error for pedal and lever force measurers.	5.1 Instrument type verification. 5.2 Checking that the devices are intact and functioning correctly. 5.3 Place sample weights directly on the measurer or on the appropriate supports. 5.4 Take measurements at 200 N for both pedal and lever control 5.5 Compare the values reported by the equipment against standard values 5.6 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 5.7 The result must be within the maximum permissible error.	Lever and pedal control: for values $\leq$ 500 N: $\pm$ 10 N.	Sample weights.	
6	Other checks				

2.3. Periodic verification

The periodic verification shall include at least the following activities provided for by the metrological booklet; at the operational level, the sequence of activities may change.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.1 Checking the intactness of the equipment, absence of denting or damage to the operating parts. 2.2 Checking the presence and intactness of the support equipment (sensor unit, cables, connecting cables, etc.). 2.3 Checking the functioning of the display and the various control keys.			
3	Zero check.	3.1 Functional check. 3.2 The check may be carried out by means of a specific sw procedure. 3.3 As an alternative to the sw procedure, switch on the equipment being tested and after the necessary start-up period, position the sensors to zero. 3.4 Readings of values shall be freely accessible or accessible via the 1st level pw.		Calibration template.	
4	Verification of the calibration curve	4.1 Instrument verification 4.2 Place the calibration template on a horizontal plane and level it. 4.3 Proceed with verification of the correct reading of angles by the sensor units. 4.4 Readings of values shall be freely accessible or accessible via the 1st level pw. 4.5 The values detected shall be within the maximum permissible error range.	≤ 3 % reading value or 0.03 m/s^2 always taking the largest.	Calibration template.	
5	Verification of maximum permissible error for pedal	5.1 Instrument type verification. 5.2 Checking that the devices are intact and functioning correctly. 5.3 Place sample weights directly on	Lever and pedal control: for values $\leq$ 500 N: $\pm$ 10 N.	Sample weights.	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
	and lever force measurers.	the measurer or on the appropriate supports. 5.4 Take measurements at 200 N for both pedal and lever control 5.5 Compare the values reported by the equipment against standard values 5.6 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 5.7 The result must be within the maximum permissible error.			
6	Other checks				

3. METROLOGICAL CONFIRMATION

3.1.5 The initial and periodic verification provide for a series of visual and functional checks and a series of instrumental checks by means of a direct comparison of the equipment being tested and the relevant control tools, with the criteria laid down in Annex II.

3.1.6 The outcome of each functional checked or instrumental verification operation shall be attested by ticking the activity in the list ‘initial verification’ or ‘periodic verification’ of the metrological booklets.

3.1.7 After ticking the activities provided for, the final outcome of the verification (positive or negative) must be certified in the metrological booklet, and the authorised CSRPAD portal technician who carried out the operation must be identified, by means of a stamp, signature and registration (or equivalent digital systems).

3.1.8 A positive outcome certifies the metrological confirmation of the equipment, which may be used to start performing vehicle roadworthiness tests (initial verification) or to continue carrying out vehicle roadworthiness tests (periodic verification).

TECHNICAL DATA SHEET NO 04	PHONOMETER
Document type:	**TECHNICAL DATA SHEET**
Document code:	**4-Phonometer**
Equipment specifications:	**TYPE APPROVED class 1 phonometer and TYPE APPROVED in accordance with Circular No 3997 / 604 of 6.9.1999 - New circular 88/95 as amended.**
Date of first issue:	27-06-2024
Roadworthiness test of:	**27-06-2024** | No 1
Written by:	
Verified by:	
Approved by:	

Roadworthiness test sheet			
Rev.	Date	Par.	Description of modifications
1	27-06-2024		Issue of the Phonometer sheet

Contents

1. DESCRIPTION OF EQUIPMENT

1.1 Description of equipment and parts thereof:

1.1.1 Phonometer: an instrument capable of determining pressure levels, spectra and waveforms from a sound source. The phonometer consists of a microphone, which represents the element sensitive to sound sources, a preamplifier, which amplifies the signal coming from the microphone and the display system that processes and integrates the information coming from the microphone/preamplifier group and provides the indication of the detected sound pressure level.

1.1.2 Electro-acoustic calibrator: an apparatus capable of generating a known sound pressure used for checking the phonometer before the noise tests are detected. It is generally capable of generating only one frequency at 1 kHz and 94 dBA sound pressure.

1.1.3 Multifunctional calibrator: an apparatus capable of generating a range of known sound pressures used for the periodic verification of the phonometer. It is generally capable of generating frequencies from 32.5 Hz to 16 kHz and with various sound pressure levels.

1.1.4 Frequency response: a change in the indication of sound pressure as the frequency varies.

1.1.5 Linear response: linearity of response of the constant frequency sound pressure scale.

1.1.6 Time constant: affects the instrument's response speed to changes in the sound pressure level. Fast or Slow constants are available.

1.1.7 Weighting filter: a correction made by the phonometer to adjust the sound pressure detection according to the perception of the human ear. Phonometers may allow the selection of weighting curves A, B and C. The A curve is the most widely used as it is the one that best respects the human perception of the sound pressure. The human ear is more sensitive to central frequencies in the audible frequency range and less sensitive to frequencies close to subsounds and ultrasounds.

2 VERIFICATIONS

2.1. Preliminary Activities

2.1.1 Checking compliance with the manufacturer's instructions for use, both for workplace safety requirements and for the operational verification instructions.

2.1.2 Equipment identification check, using the identification plate which shall bear the type approval number and serial number assigned by the manufacturer

2.1.3 Checking the presence of the metrological booklet, which must be complete and legible.

2.1.4 Check the matching of the equipment plate data with data recorded in the metrological booklet.

2.1.5 Checking the environmental conditions required for verification: temperature: between 15 °C and 31 °C; Relative humidity: between 25 and 90 %; atmospheric pressure: between 85 and 102.5 kPa.

2.2. Initial Verification

The initial verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.1 Creating suitable climate conditions for verification of the phonometer. 2.2 General equipment check: intactness and absence of cracks on the microphone, preamplifier, phonometer body, external connection couplings; intactness and absence of oxides in batteries. 2.3 Functional equipment control: switching in, readability of display, access to verification sw functions.			
3	Adjustment of sound sensitivity.	3.1 The sound sensitivity check shall be carried out in accordance with the manufacturer's requirements. 3.2 Carrying out any adjustment of the equipment. 3.3 Recording the values read by the equipment before and after adjustment.	Not planned	Class 1 multifunction calibrator or equivalent systems.	
4	Auto-generated background noise control.	4.1 Disassembly of the microphone and replacement with a capacitive adaptor of an equal value to that of the microphone. 4.2 The values read on the equipment must be recorded.	Not planned	Capacitive adaptor specific to the equipment under examination.	
5	Verification of a complex	5.1 The verification shall be performed with simulated sound pressures for	Table 1	Class 1 multifunction	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
	microphone frequency response, in weighting curve A.	the free range; checking that the microphone is compensated for the free range, if it is compensated for the pressure range, applying appropriate corrections as specified by the manufacturer. 5.2 In weighting curve A, generate the frequencies shown in Table 1. 5.3 The values read on the equipment shall be within the maximum permissible error range.		calibrator, or equivalent systems.	
6	Verification of measurement ranges.	6.1 According to the instructions for use, apply a reference frequency and sound level to the equipment to check the response of all available measurement ranges. 6.2 The values read on the equipment shall be within the maximum permissible error range.	± 1.1 dB	Class 1 multifunction calibrator, or equivalent systems.	
7	Verification of time weightings (Slow and Fast).	7.1 Apply a reference frequency to the equipment and send wave trains of the expected duration. 7.2 The values read on the equipment shall be within the maximum permissible error range.	± 1 dB	Class 1 multifunction calibrator, or equivalent systems	
8	Verification of acoustic calibrator.	8.1 Detection, at the reference frequency, of the level generated by the acoustic calibrator. 8.2 The values read on the equipment, related to the acoustic calibrator, shall be within the maximum permissible error range.	± 0.5 dB	Class 1 multifunction calibrator, or equivalent systems.	

2.3. Periodic verification

The periodic verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.1 Creating suitable climate conditions for verification of the phonometer. 2.2 General equipment check: intactness and absence of cracks on the microphone, preamplifier, phonometer body, external connection couplings; intactness and absence of oxides in batteries. 2.3 Functional equipment control: switching in, readability of display, access to verification sw functions.			
3	Adjustment of sound sensitivity.	3.1 The sound sensitivity check shall be carried out in accordance with the manufacturer's requirements. 3.2 Carrying out any adjustment of the equipment. 3.3 Recording the values read by the equipment before and after adjustment.	Not planned	Class 1 multifunction calibrator or equivalent systems	
4	Auto-generated background noise control.	4.1 Disassembly of the microphone and replacement with a capacitive adaptor of an equal value to that of the microphone. 4.2 The values read on the equipment must be recorded.	Not planned	Capacitive adaptor specific to the equipment under examination.	
5	Verification of a complex microphone frequency response, in weighting curve A.	5.1 The verification shall be performed with simulated sound pressures for the free range; checking that the microphone is compensated for the free range, if it is compensated for the pressure range, applying	Table 1	Class 1 multifunction calibrator, or equivalent systems.	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
		appropriate corrections as specified by the manufacturer. 5.2 In weighting curve A, generate the frequencies shown in Table 1. 5.3 The values read on the equipment shall be within the maximum permissible error range.			
6	Verification of measurement ranges.	6.1 According to the instructions for use, apply a reference frequency and sound level to the equipment to check the response of all available measurement ranges. 6.2 The values read on the equipment shall be within the maximum permissible error range.	± 1.1 dB	Class 1 multifunction calibrator, or equivalent systems	
7	Verification of time weightings (Slow and Fast).	7.1 Apply a reference frequency to the equipment and send wave trains of the expected duration. 7.2 The values read on the equipment shall be within the maximum permissible error range.	± 1 dB	Class 1 multifunction calibrator, or equivalent systems	
8	Verification of acoustic calibrator.	8.1 Detection, at the reference frequency, of the level generated by the acoustic calibrator. 8.2 The values read on the equipment, related to the acoustic calibrator, shall be within the maximum permissible error range.	± 0.5 dB	Class 1 multifunction calibrator, or equivalent systems.	

Table 1 – Measurement points and maximum permissible error for frequency response verification-

Frequency [Hz]	Tolerance [dB]
125	± 2,0
1000	± 1,5
8000	± 2.5

3. METROLOGICAL CONFIRMATION

3.1.9 The initial and periodic verification provide for a series of visual and functional checks and a series of instrumental checks by means of a direct comparison of the equipment being tested and the relevant control tools, with the criteria laid down in Annex II.

3.1.10 The outcome of each functional checked or instrumental verification operation shall be attested by ticking the activity in the list ‘initial verification’ or ‘periodic verification’ of the metrological booklets.

3.1.11 After ticking the activities provided for, the final outcome of the verification (positive or negative) must be certified in the metrological booklet, and the authorised CSRPAD portal technician who carried out the operation must be identified, by means of a stamp, signature and registration (or equivalent digital systems).

A positive outcome certifies the metrological confirmation of the equipment, which may be used to start performing vehicle roadworthiness tests (initial verification) or to continue carrying out vehicle roadworthiness tests (periodic verification).

TECHNICAL DATA SHEET NO 05	OPACIMETER
Document type:	**TECHNICAL DATA SHEET**
Document code:	**5-Opacimeter**
Equipment specifications:	**TYPE APPROVAL in accordance with Circular No 3997 / 604 of 6.9.1999 - New circular 88/95 as amended**.
Date of first issue:	23-05-2024
Roadworthiness test of:	**23-05-2024** | No 1
Written by:	
Verified by:	
Approved by:	

Roadworthiness test sheet			
Rev.	Date	Par.	Description of modifications
1	23-05-2024		Approval of the Opacimeter sheet

Contents

1. DESCRIPTION OF EQUIPMENT

1.1 Description of equipment and parts thereof:

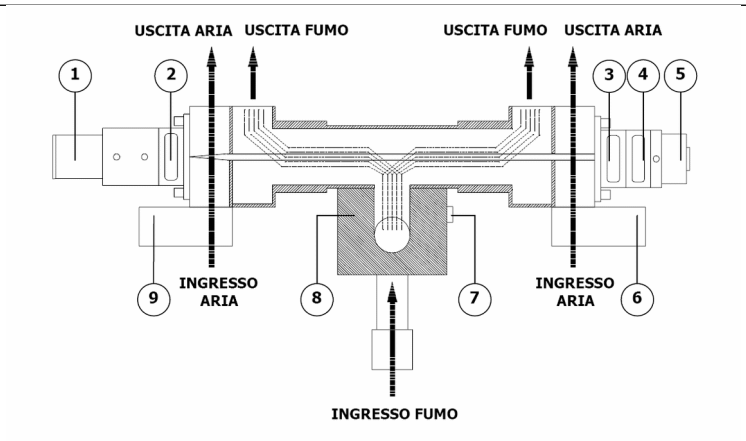
1.1.1 **Opacimeter**: apparatus for measuring exhaust gas smoke from compression-ignition (diesel) engines with soot detection, which makes it possible to make a judgement on combustion efficiency and the resulting degree of pollution produced by the operation of a vehicle with a compression-ignition engine.

1.1.2 **Smoke (opacity)**: engine smoke level, i.e. mitigation of the intensity of a beam caused by optical absorption by solid and gaseous particles present in smoke and the effect of irradiation.

1.1.3 **Emitter**: a light source consisting of a halogen lamp with a colour temperature of 2.800 K and 3.250 K or a green LED diode intended to generate a straight light beam at the wavelength of approximately 560 nm (the typical wavelength detected by the human eye).

1.1.4 **Receiver**: generally a photodiode with the focusing lens aligned at the point of maximum light emission of the emitter.

1.1.5 **Measuring chamber**: usually a metal cell of known length containing the sample of fumes to be analysed.



Key

1 Emitter
2 Slide
3 Slide
4 Sample filter compartment
5 Receiver
6 Ventilator
7 Temperature sensor
8 Auto-zero electric valve
9 Ventilator

USCITA ARIA	AIR OUTLET
USCITA FUMO	SMOKE OUTLET
INGRESSO ARIA	AIR INLET
INDRESSO FUMO	SMOKE INLET

1.1.6 **Absorption coefficient: (K)** expressed in m^{-1} represents the unit of measurement of opacity as defined in MCTC Circular No 88/95, as amended.

It shall be calculated taking into account light absorption according to the length of the measuring chamber expressed in metres according to the following formula (Lambert-Beer):

$$k = \frac{-1}{L_a} \ln\left(1 - \frac{N}{100}\right) = \frac{-1}{L_a} \ln \frac{\tau}{100}$$

Where:

L_α is the length of the chamber
N is the percentage opacity
τ is the transmittance

2 VERIFICATIONS

2.1. Preliminary Activities

2.1.2 Checking compliance with the manufacturer's instructions for use, both for workplace safety requirements and for the operational verification instructions.

2.2.2 Equipment identification check, using the identification plate which shall bear the type approval number and serial number assigned by the manufacturer

2.2.3 Checking the presence of the metrological booklet, which must be complete and legible.

2.2.4 Check the matching of the equipment plate data with data recorded in the metrological booklet.

2.2.5 Monitoring of environmental conditions required for the use of the equipment: 5 °C to 40 °C, ± 2 °C.

2.2. Initial Verification

The initial verification shall include at least the following activities provided for by the metrological booklet; at the operational level, the sequence of activities may change.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment			
2	General and functional checks.	2.1 Checking the intactness of the equipment, absence of denting or damage to the operating parts. 2.1 Checking the presence of the support equipment (exhaust smoke sampling probe, any temperature probe, etc.). 2.3 Checking that reading indicators are fully functioning. 2.4 Checking the intactness and leakproofness of the pipes and smoke sampling probes. 2.5 Checking that the protective slides, emitter and receiver are clean. 2.6 Checking the operation of the circulation fans.			
3	Zero check.	3.1 Checking that during the heating period, access to test programmes is forbidden by indicating 'Pre-heating in progress' or its corresponding code. 3.2 The heating time shall not exceed			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
		30 minutes. 3.3 Checking that, with the sampling probe disconnected from the instrument, and in the total absence of exhaust gas, the value indicated by the instrument is 0.0 ± 0 k [m-1].			
4	Linearity verification.	4.1 Instrument verification. 4.2 Before inserting sample optical filter no 1, the auto-zero procedure of the instrument shall be carried out. 4.3 Enter sample optical filter no 1 in the empty smoke chamber and proceed with readings. 4.4 Remove sample optical filter no 1 and carry out the auto-zero procedure of the instrument. 4.5 Enter sample optical filter no 2 in the empty smoke chamber and proceed with readings. 4.6 Remove sample optical filter no 2 and carry out the auto-zero procedure of the instrument. 4.7 Enter sample optical filter no 3 in the empty smoke chamber and proceed with readings. 4.8 Remove sample optical filter no 3 and carry out the auto-zero procedure of the instrument. 4.9 Check the correct values reported by the equipment in relation to the values applied using the reference samples. 4.10 Readings of values shall be freely accessible or accessible via the 1st level pw. 4.11 The values detected shall be within the maximum permissible error range.	For values of $K^{m-1} \leq 2.5$: ± 0,05 K^{m-1}. For values of $K^{m-1} \geq 2.5$: ± 0,09 K^{m-1}	Optical filter No 1: between 0.7 and 1.1 K^{m-1}. Optical filter No 2: between 1.5 and 1.9 K^{m-1}. Optical filter No 3: between 2.4 and 3.1 K^{m-1}.	
5	Full scale verification.	5.1 Instrument verification 5.2 Inserting the full optical filter (completely obscured) supplied with the equipment in the appropriate slot reserved for the sample optical filters and proceeding with the readings. 5.3 Checking that the equipment reads the maximum opacity value (9.99 K^{m-1}). 5.4 Readings of values shall be freely accessible or accessible via the 1st level pw.		Full optical filter: 9.99 K^{m-1}	
6	Other checks				

2.3. Periodic verification

The periodic verification shall include at least the following activities provided for by the metrological booklet; at the operational level, the sequence of activities may change.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment			
2	General and functional checks.	2.1 Checking the intactness of the instrument, absence of denting or damage to the operating parts. 2.2 Checking the presence of the support equipment (exhaust smoke sampling probe, any temperature probe, etc.). 2.3 Checking that reading indicators are fully functioning. 2.4 Checking the intactness and leakproofness of the pipes and smoke sampling probes. 2.5 Checking that the protective slides, emitter and receiver are clean. 2.6 Checking the operation of the circulation fans.			
3	Zero check.	3.1 Checking that during the heating period, access to test programmes is forbidden by indicating 'Pre-heating in progress' or its corresponding code. 3.2 The heating time shall not exceed 30 minutes. 3.3 Checking that, with the sampling probe disconnected from the instrument, and in the total absence of exhaust gas, the value indicated by the instrument is 0.0 ± 0 k [m-1].			
4	Linearity verification.	4.1 Instrument verification. 4.2 Before inserting sample optical filter no 1, the auto-zero procedure of the instrument shall be carried out. 4.3 Enter sample optical filter no 1 in the empty smoke chamber and proceed with readings. 4.4 Remove sample optical filter no 1 and carry out the auto-zero procedure of the instrument.	For values of $K^{m-1} \leq 2.5$: ± 0,05 K^{m-1}. For values of $K^{m-1} \geq 2.5$: ± 0,09 K^{m-1}	Optical filter No 1: between 0.7 and 1.1 K^{m-1}. Optical filter No 2: between 1.5 and 1.9 K^{m-1}. Optical filter No 3: between 2.4 and 3.1 K^{m-1}.	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
		4.5 Enter sample optical filter no 2 in the empty smoke chamber and proceed with readings. 4.6 Remove sample optical filter no 2 and carry out the auto-zero procedure of the instrument. 4.7 Enter sample optical filter no 3 in the empty smoke chamber and proceed with readings. 4.8 Remove sample optical filter no 3 and carry out the auto-zero procedure of the instrument. 4.9 Check the correct values reported by the equipment in relation to the values applied using the reference samples. 4.10 Readings of values shall be freely accessible or accessible via the 1st level pw. 4.11 The values detected shall be within the maximum permissible error range.			
5	Full scale verification	5.1 Instrument verification. 5.2 Inserting the full optical filter (completely obscured) supplied with the equipment in the appropriate slot reserved for the sample optical filters and proceeding with the readings. 5.3 Checking that the equipment reads the maximum opacity value (9.99 K^{m-1}). 5.4 Readings of values shall be freely accessible or accessible via the 1st level pw.		Full optical filter: 9.99 K^{m-1}	
6	Other checks				

3. METROLOGICAL CONFIRMATION

3.1.1 The initial and periodic verification provide for a series of visual and functional checks and a series of instrumental checks by means of a direct comparison of the equipment being tested and the relevant control tools, with the criteria laid down in Annex II.

3.1.2 The outcome of each functional checked or instrumental verification operation shall be attested by ticking the activity in the list ‘initial verification’ or ‘periodic verification’ of the metrological booklets.

3.1.3 After ticking the activities provided for, the final outcome of the verification (positive or negative) must be certified in the metrological booklet, and the authorised CSRPAD portal technician who carried out the operation must be identified, by means of a stamp, signature and registration (or equivalent digital systems).

A positive outcome certifies the metrological confirmation of the equipment, which may be used to start performing vehicle roadworthiness tests (initial verification) or to continue carrying out vehicle roadworthiness tests (periodic verification).

TECHNICAL DATA SHEET NO 06	HEADLIGHT TESTER
Document type:	**TECHNICAL DATA SHEET**
Document code:	**6-Headlight testers**
Equipment specifications:	**TYPE APPROVAL in accordance with Circular No 3997 / 604 of 6.9.1999 - New circular 88/95 as amended**.
Date of first issue:	22-05-2024
Roadworthiness test of:	**22-05-2024** | No 1
Written by:	
Verified by:	
Approved by:	

Roadworthiness test sheet			
1	22-05-2024		Approval of the Headlight tester sheet

Contents

1. DESCRIPTION OF EQUIPMENT

1.1 Description of equipment and parts thereof:

1.1.1 **Headlight tester**: equipment for checking and determining the orientation and luminous intensity of motor vehicle headlights, which makes it possible to reproduce on a screen, inside the device itself, the orientation of the light beam that would be projected on a screen situated 10 m away from the lamp (88/95 – Chapter I).

1.1.2 **Optical chamber**: the mechanical part within which the beam is pointed. In the inlet part of the beam, there is a focusing lens.

1.1.3 **Screen**: a panel on which the beam is projected, corresponding to the actual beam measurable on a vertical plane situated 10 metres away, on which measurements are made.

1.1.4 **Lens**: a fully-fledged lens used to focus the beam on the measuring panel (where the receiver is located) and which has the characteristic of simulating within the chamber a 10 m light beam path.

1.1.5 **Pole**: a pole on which the optical chamber is inserted, which may be moved vertically by means of a dedicated mechanism.

1.1.6 **Collimator**: a system to position the headlight tester parallel to the vehicle in question; the collimator may be optical or laser-type

1.1.7 **Lens screen**: the headlight tester lens allows the reproduction of the geometrical shapes of the light beam. The focus of the system shall be such that with variations of ± 30 mm between the centre of the lens and the centre of the lamp, there is no change on the screen. The optical system shall reproduce on the screen an image resembling the image that would be obtained on a wall 10 m away from the optical centre.

2 VERIFICATIONS

2.1. Preliminary Activities

2.1.1 Checking compliance with the manufacturer’s instructions for use, both for workplace safety requirements and for the operational verification instructions.

2.1.2 Equipment identification check, using the identification plate which shall bear the type approval number and serial number assigned by the manufacturer

2.1.3 Checking the presence of the metrological booklet, which must be complete and legible.

2.1.4 Check the matching of the equipment plate data with data recorded in the metrological booklet.

2.2. Initial Verification

The initial verification shall include at least the following activities provided for by the metrological booklet; at the operational level, the sequence of activities may change.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.1 Checking that the wheels of the trolley base are efficient and free from abnormal wear. 2.2 Checking the correct attachment of the supporting pole to the trolley base. 2.3 Checking, where present, the regular rotation of the supporting pole on the axis of the trolley base. 2.4 Checking the correct alignment of the collimator according to the manufacturer's instructions. 2.5 Checking the correct attachment of the optical chamber to the supporting pole, the absence of wear and orthogonality in relation to the supporting pole. 2.6 Checking the sliding of the optical chamber on the supporting pole and the absence of wear in guides. 2.7 Checking the intactness of the optical chamber and the cleanliness of the lens. 2.8 Checking the intactness and legibility of the level for horizontal positioning of the tester.			
3	Check the horizontal deviation of the light beam at the zero point.	3.1 Positioning the headlight simulator at the manufacturer's intended distance. 3.2 Headlight simulator positioned on a flat surface; if not perfectly flat, adjust to correct positioning, which can be found by means of a level placed above the headlight simulator. 3.3 Alignment of the headlight simulator with the headlight testers being tested. 3.4 Checking that the light projected by the standard headlight, in dipped-beam operation, falls within the defined range of the headlight tester screen.		Headlight simulator.	
4	Checking the vertical	4.1 Positioning the headlight simulator at the manufacturer's intended		Headlight simulator.	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
	deviation of the light beam.	distance. 4.2 Headlight simulator positioned on a flat surface; if not perfectly flat, adjust to correct positioning, which can be found by means of a level placed above the headlight simulator. 4.3 Alignment of the headlight simulator with the headlight testers being tested. 4.4 Checking that the image projected by the headlight simulator, on the headlight tester panel, is within the range indicated on the headlight tester screen. 4.5 Checking, where provided for, that the interior panel of the chamber moves vertically as a result of turning the adjustment wheel or equivalent devices.			
5	Verification of light intensity in dipped-beam and driving mode.	5.1 Instrument measurement. 5.2 Positioning the headlight simulator at the manufacturer's intended distance. 5.3 Headlight simulator positioned on a flat surface; if not perfectly flat, adjust to correct positioning, which can be found by means of a level placed above the headlight simulator. 5.4 Alignment of the headlight simulator with the headlight testers being tested. 5.5 Measuring the illumination detected by the equipment, in relation to the known values given by the headlight simulator: dipped-beam with a value of between 3 750 lux and 90 000 lux; driving mode with a known value, between 20 000 lux and 150 000 lux. 5.6 Readings of values shall be freely accessible or accessible via the 1st level pw. 5.7 The values detected shall be within the maximum permissible error range.	± 5%.	Headlight simulator.	
6	If present, verification of the rail straightness and the constancy of alignment.	6.1 If there is a rail, checking the intactness, straightness, that there is no deformation and the perfect sliding of the headlight tester trolley.			
7	Other checks				

2.3. Periodic verification

The periodic verification shall include at least the following activities provided for by the metrological booklet; at the operational level, the sequence of activities may change.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.1 Checking that the wheels of the trolley base are efficient and free from abnormal wear. 2.2 Checking the correct attachment of the supporting pole to the trolley base. 2.3 Checking, where present, the regular rotation of the supporting pole on the axis of the trolley base. 2.4 Checking the correct alignment of the collimator according to the manufacturer's instructions. 2.5 Checking the correct attachment of the optical chamber to the supporting pole, the absence of wear and orthogonality in relation to the supporting pole. 2.6 Checking the sliding of the optical chamber on the supporting pole and the absence of wear in guides. 2.7 Checking the intactness of the optical chamber and the cleanliness of the lens. 2.8 Checking the intactness and legibility of the level for horizontal positioning of the tester.			
3	Check the horizontal deviation of the light beam at the zero point.	3.1 Positioning the headlight simulator at the manufacturer's intended distance. 3.2 Headlight simulator positioned on a flat surface; if not perfectly flat, adjust to correct positioning, which can be found by means of a level placed above the headlight simulator. 3.3 Alignment of the headlight simulator with the headlight testers being tested. 3.3 Checking that the light projected by the standard headlight, in dipped-beam operation, falls within the defined range of the headlight tester screen.		Headlight simulator.	
4	Checking the vertical deviation of the light beam.	4.1 Positioning the headlight simulator at the manufacturer's intended distance. 4.2 Headlight simulator positioned on a flat surface; if not perfectly flat, adjust to correct positioning, which		Headlight simulator.	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
		can be found by means of a level placed above the headlight simulator. 4.3 Alignment of the headlight simulator with the headlight testers being tested. 4.4 Checking that the image projected by the headlight simulator, on the headlight tester panel, is within the range indicated on the headlight tester screen. 4.5 Checking, where provided for, that the interior panel of the chamber moves vertically as a result of turning the adjustment wheel or equivalent devices.			
5	Verification of light intensity in dipped-beam and driving mode.	5.1 Instrument measurement. 5.2 Positioning the headlight simulator at the manufacturer's intended distance. 5.3 Headlight simulator positioned on a flat surface; if not perfectly flat, adjust to correct positioning, which can be found by means of a level placed above the headlight simulator. 5.4 Alignment of the headlight simulator with the headlight testers being tested. 5.5 Measuring the illumination detected by the equipment, in relation to the known values given by the headlight simulator: dipped-beam with a value of between 3 750 lux and 90 000 lux; driving mode with a known value, between 20 000 lux and 150 000 lux. 5.6 Readings of values shall be freely accessible or accessible via the 1st level pw. 5.7 The values detected shall be within the maximum permissible error range.	± 5%. *(1)*	Headlight simulator.	
6	If present, checking the rail straightness and the constancy of alignment.	6.1 If there is a rail, checking the intactness, straightness, that there is no deformation and the perfect sliding of the headlight tester trolley.			
7	Other checks				

3. METROLOGICAL CONFIRMATION

3.1.1 The initial and periodic verification provide for a series of visual and functional checks and a series of instrumental checks by means of a direct comparison of the equipment being tested and the relevant control tools, with the criteria laid down in Annex II.

3.1.2 The outcome of each functional checked or instrumental verification operation shall be attested by ticking the activity in the list ‘initial verification’ or ‘periodic verification’ of the metrological booklets.

3.1.3 After ticking the activities provided for, the final outcome of the verification (positive or negative) must be certified in the metrological booklet, and the authorised CSRPAD portal technician who carried out the operation must be identified, by means of a stamp, signature and registration (or equivalent digital systems).

3.1.4 A positive outcome certifies the metrological confirmation of the equipment, which may be used to start performing vehicle roadworthiness tests (initial verification) or to continue carrying out vehicle roadworthiness tests (periodic verification).

TECHNICAL DATA SHEET NO 07	ROLLER BRAKE TESTERS for vehicles up to 3.5 tonnes
Document type:	**TECHNICAL DATA SHEET**
Document code:	**7-ROLLER BRAKE TESTERS_CARS**
Equipment specifications:	**TYPE APPROVAL in accordance with Circular No 3997 / 604 of 6.9.1999 - New circular 88/95 as amended**.
Date of first issue:	31-05-2024
Roadworthiness test of:	**31-05-2024** | No 1
Written by:	
Verified by:	
Approved by:	

Roadworthiness test sheet			
Rev.	Date	Par.	Description of modifications
1	31-05-2024		Approval of the Roller Brake Tester sheet for vehicles up to 3.5 tonnes

Contents

1. DESCRIPTION OF EQUIPMENT

1.1 Description of equipment and parts thereof:

1.1.1 **Brake tester**: equipment for verifying the performance conditions of the braking devices of motor vehicles and trailers by measuring the braking force on each wheel (88/95 – Chapter I).

1.1.2 **Rollers**: drag rollers of the vehicle being tested.

1.1.3 **Gear motor(s)**: roller drive motor

1.1.4 **Load cell**: brake force measurement instrument.

1.1.5 **Auxiliary roller**: a central auxiliary roller for measuring vehicle wheel speed and/or presence of the vehicle on rollers.

1.1.6 **Sensors**: devices for the detection of the wheel of the vehicle being tested on the rollers.

1.1.7 **Containment frame**: a containment frame to which the various parts of the brake tester are anchored (rollers, gear motors, etc.).

1.1.8 **Weight**: instrument(s) for measuring the weight of the vehicle being tested; the instrument may be housed under the containment frame or may be external to the brake tester.

1.1.9 **Control pedal or lever force measurers**: a dynamometer for the measurement of the force applied to the device of the vehicle being tested.

2 VERIFICATIONS

2.1. Preliminary Activities

2.1.6 Checking compliance with the manufacturer's instructions for use, both for workplace safety requirements and for the operational verification instructions.

2.1.7 Equipment identification check, using the identification plate which shall bear the type approval number and serial number assigned by the manufacturer

2.1.8 Checking the presence of the metrological booklet, which must be complete and legible.

2.1.9 Check the matching of the equipment plate data with data recorded in the metrological booklet.

2.1.10 Monitoring of environmental conditions required for the use of the equipment: 0 °C to 40 °C.

2.2. Initial Verification

The initial verification shall include at least the following activities provided for by the metrological booklet; at the operational level, the sequence of activities may change.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
	obvious tampering.				
2	General and functional checks.	2.1 General and functional checks of equipment: e.g. intactness of rollers and mechanical parts, vehicle compliant system operation, minimum roller speed, etc.			
3	Checking the difference in height between roller pair axles (if they have an independent structure).	3.1 In the case of equipment with two roller pairs with an independent structure, checking the difference between the roller axles and flatness between the two planes. 3.2 The values shall be within the manufacturer's specifications set out in the installation and use manual.			
4	Checking the correct detection of the peripheral speed of the vehicle wheel by the central auxiliary roller.	4.1 Checking by the sw function of the equipment that the peripheral speed of the wheel as measured by the auxiliary roller is within the prescribed limits. 4.2 Readings of values shall be freely accessible or accessible via the 1st level pw. 4.3 In the absence of the sw function, checking the peripheral speed of the wheel, as detected by the auxiliary roller, by appropriate measuring instruments.	Peripheral wheel speed with no load on the wheel: ≥ 5.0 km/h.	Digital speedometer or stroboscopic gun	
5	Checking the correctness of the parameters set for the % slip between wheel and roller, which shall lead the rollers to stop.	5.1 Checking by the sw function of the equipment that the parameters for the % slip are correctly set. 5.2 Readings of values shall be freely accessible or accessible via the 1st level pw. 5.3 The reading value must be within the permissible limits.	% slip between wheel and roller until the roller stops between 16 % and 30 %.		
6	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.	6.1 Instrument type verification 6.2 Entering the specific sw function of the equipment, as required by the instructions for use. 6.3 Checking that the zero with no load is within the maximum permissible error. 6.4 Installing the dedicated "calibration	Braking force: zero with no load ≤ 100 N. For braking force with values ≤ 2 500 N: ± 50 N; for values > 2 500 N: ≤ 2 %	"Calibration bar" (anchorage system and levers). Masses or dynamometer	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
		bar" and appropriate measuring instruments. 6.5 Measurements shall be made at the points of 1 000 N, 3 000 N and 5 000 N of the braking forces per wheel. 6.6 Comparing the values reported by the equipment against standard values. 6.7 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 6.8 The values detected shall be within the maximum permissible error range.			
7	Verification of the repeatability per braking force and weight.	7.1 Instrument type verification. 7.2 Performing a consecutive series of tests with appropriate measuring instruments, under the same conditions. 7.3 In the absence of any other indication from the manufacturer, 5 consecutive measurements shall be carried out at the value of 3 000 N per brake force, and at the value of 6 000 N per wheel weight. 7.4 Comparing the values reported by the equipment against standard values. 7.5 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 7.6 The result of the different measurements must be within the maximum permissible error.	Repeatability of braking force and weight force: mean square deviation ≤ 2 %.	"Calibration bar" (anchorage system and levers). Masses or dynamometer	
8	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.	8.1 Instrument type verification. 8.2 Checking that the zero with no load is within the maximum permissible error. 8.3 Installing on the weighing system the appropriate "calibration bar" and appropriate measuring instruments. 8.4 The weighing test methodology must comply with the solutions provided by the manufacturer and/or applicable to the equipment (levers with weights, anchors with a dynamometer, crossbars or portals with a dynamometer). 8.5 If the manufacturer has not put in place suitable solutions for an instrument test, alternative	Weight force: zero with no load ≤ 200 N. For weight force, with values ≤ 2 500 N: ± 50 N; for values > 2 500 N: ≤ 2 %	"Calibration bar" (anchorage system and levers). Masses or dynamometer Wheel weighing platforms (for point 8.5)	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
		solutions shall be adopted (e.g. vehicles with a known axle weight, determined by wheel weighing platforms or similar devices, etc.). 8.6 Make measurements by weight at the points of 2 000 N, 6 000 N, 10 000 N per wheel (double axle). 8.7 Comparing the values reported by the equipment against standard values. 8.8 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 8.9 The values detected shall be within the maximum permissible error range.			
9	Checking the correct expression of braking performance.	9.1 At the end of the checks provided for in activities 6, 7, 8 and 11, carry out the roadworthiness test on a vehicle and check the correct expression of braking performance.			
10	Checking the correctness of the parameters set for alert thresholds.	10.1 Checking the correctness of the parameters set by the manufacturer. 10.2 Checking the set thresholds by reading the values of interest on the sw function of the equipment. 10.3 Readings of values shall be freely accessible or accessible via the 1st level pw.			
11	Verification of the linearity of pedal and manual force measurers.	11.1 Instrument type verification. 11.2 Checking that the devices are intact and functioning correctly. 11.3 Place sample weights directly on the measurer or on the appropriate supports. 11.4 The measurements shall be made at the following points: pedal control at 100 N, 300 N and 500 N; manual control (parking) at 100 N, 300 N and 500 N. 11.5 Comparing the values reported by the equipment against standard values. 11.6 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 11.7 The result must be within the maximum permissible error.	For values $\leq$ 500 N: $\pm$ 10 N; for values > 500 N: $\leq$ 2 %	Masses	
12	Checking the correctness of the	12.1 Checking the correctness of the parameters set by the manufacturer.			-

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
	parameters set for roller speed alert thresholds for tests on 4 WD vehicles.	12.2 Checking the set thresholds by reading the values of interest on the sw function of the equipment. 12.3 Readings of values shall be freely accessible or accessible via the 1st level pw.			
13	Safety check.	13.1 The equipment must be CE marked and provided with instructions for use. 13.2 Checking the impossibility of starting rollers in the absence of both wheels on the rollers. 13.3 Checking the stopping of the rollers, including by the operation of the manual device.			
14	Other checks.				

2.3. Periodic verification

The periodic verification shall include at least the following activities provided for by the metrological booklet; at the operational level, the sequence of activities may change.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.1 General and functional checks of equipment: e.g. intactness of rollers and mechanical parts, vehicle compliant system operation, minimum roller speed, etc.			
3	Checking the difference in height between roller pair axles (if	3.1 In the case of equipment with two roller pairs with an independent structure, checking the difference between the roller axles and			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
	they have an independent structure).	flatness between the two planes. 3.2 The values shall be within the manufacturer's specifications set out in the installation and use manual.			
4	Checking the correct detection of the peripheral speed of the vehicle wheel by the central auxiliary roller.	4.1 Checking by the sw function of the equipment that the peripheral speed of the wheel as measured by the auxiliary roller is within the prescribed limits. 4.2 Readings of values shall be freely accessible or accessible via the 1st level pw. 4.3 In the absence of the sw function, checking the peripheral speed of the wheel, as detected by the auxiliary roller, by appropriate measuring instruments.	Peripheral wheel speed with no load on the wheel: ≥ 5.0 km/h.	Digital speedometer or stroboscopic gun	
5	Checking the correctness of the parameters set for the % slip between wheel and roller, which shall lead the rollers to stop.	5.1 Checking by the sw function of the equipment that the parameters for the % slip are correctly set. 5.2 Readings of values shall be freely accessible or accessible via the 1st level pw. 5.3 The reading value must be within the permissible limits.	% slip between wheel and roller until the roller stops between 16 % and 30 %.		
6	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.	6.1 Instrument type verification 6.2 Entering the specific sw function of the equipment, as required by the instructions for use. 6.3 Checking that the zero with no load is within the maximum permissible error. 6.4 Installing the dedicated "calibration bar" and appropriate measuring instruments. 6.5 Measurements shall be made at the points of 1 000 N, 3 000 N and 5 000 N of the braking forces per wheel. 6.6 Comparing the values reported by the equipment against standard values. 6.7 Readings of values by the	Braking force: zero with no load ≤ 100 N. For braking force with values ≤ 2 500 N: ± 50 N; for values > 2 500 N: ≤ 2 %	"Calibration bar" (anchorage system and levers). Masses or dynamometer	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
		equipment shall be freely accessible or accessible via the 1st level pw. 6.8 The values detected shall be within the maximum permissible error range.			
7	Verification of the repeatability per braking force and weight.	7.1 Instrument type verification. 7.2 Performing a consecutive series of tests with appropriate measuring instruments, under the same conditions. 7.3 In the absence of any other indication from the manufacturer, 5 consecutive measurements shall be carried out at the value of 3 000 N per brake force, and at the value of 6 000 N per wheel weight. 7.4 Comparing the values reported by the equipment against standard values. 7.5 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 7.6 The result of the different measurements must be within the maximum permissible error.	Repeatability of braking force and weight force: mean square deviation ≤ 2 %.	"Calibration bar" (anchorage system and levers). Masses or dynamometer	
8	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.	8.1 Instrument type verification. 8.2 Checking that the zero with no load is within the maximum permissible error. 8.3 Installing on the weighing system the appropriate "calibration bar" and appropriate measuring instruments. 8.4 The weighing test methodology must comply with the solutions provided by the manufacturer and/or applicable to the equipment (levers with weights, anchors with a dynamometer, crossbars or portals with a dynamometer). 8.5 If the manufacturer has not put in place suitable solutions for an instrument test, alternative solutions shall be adopted (e.g. vehicles with a known axle weight, determined by wheel weighing platforms or similar devices, etc.). 8.6 Make measurements by weight at the points of 2 000 N, 6 000 N, 10 000 N per wheel (double axle). 8.7 Comparing the values reported by the equipment against standard values. 8.8 Readings of values by the	Weight force: zero with no load ≤ 200 N. For weight force, with values ≤ 2 500 N: ± 50 N; for values > 2 500 N: ≤ 2 %.	"Calibration bar" (anchorage system and levers). Masses or dynamometer Wheel weighing platforms (for point 8.5)	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
		equipment shall be freely accessible or accessible via the 1st level pw. 8.9 The values detected shall be within the maximum permissible error range.			
9	Checking the correct expression of braking performance.	9.1 At the end of the checks provided for in activities 6, 7, 8 and 11, carry out the roadworthiness test on a vehicle and check the correct expression of braking performance.			
10	Checking the correctness of the parameters set for alert thresholds.	10.1 Checking the correctness of the parameters set by the manufacturer. 10.2 Checking the set thresholds by reading the values of interest on the sw function of the equipment. 10.3 Readings of values shall be freely accessible or accessible via the 1st level pw.			
11	Verification of the linearity of pedal and manual force measurers.	11.1 Instrument type verification. 11.2 Checking that the devices are intact and functioning correctly. 11.3 Place sample weights directly on the measurer or on the appropriate supports. 11.4 The measurements shall be made at the following points: pedal control at 100 N, 300 N and 500 N; manual control (parking) at 100 N, 300 N and 500 N. 11.5 Comparing the values reported by the equipment against standard values. 11.6 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 11.7 The result must be within the maximum permissible error.	For values $\leq$ 500 N: $\pm$ 10 N; for values > 500 N: $\leq$ 2 %	Sample weights.	
12	Checking the correctness of the parameters set for roller speed alert thresholds for tests on 4 WD vehicles.	12.1 Checking the correctness of the parameters set by the manufacturer. 12.2 Checking the set thresholds by reading the values of interest on the sw function of the equipment. 12.3 Readings of values shall be freely accessible or accessible via the 1st level pw.			-
13	Safety check.	13.1 The equipment must be CE			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
		marked and provided with instructions for use. 13.2 Checking the impossibility of starting rollers in the absence of both wheels on the rollers. 13.3 Checking the stopping of the rollers, including by the operation of the manual device.			
14	Check to maintain roller adhesion characteristics.	14.1 Visual check of the coating of each roller to maintain adhesion characteristics. 14.2 Visual check of the absence of significant roller coating detachments. 14.3 Visual check of the absence of excessive central wear of the roller coating in relation to the ends of the roller.			
15	Other checks.				

3. METROLOGICAL CONFIRMATION

3.1.1 The initial and periodic verification provide for a series of visual and functional checks and a series of instrumental checks by means of a direct comparison of the equipment being tested and the relevant control tools, with the criteria laid down in Annex II.

3.1.2 The outcome of each functional checked or instrumental verification operation shall be attested by ticking the activity in the list ‘initial verification’ or ‘periodic verification’ of the metrological booklets.

3.1.3 After ticking the activities provided for, the final outcome of the verification (positive or negative) must be certified in the metrological booklet, and the authorised CSRPAD portal technician who carried out the operation must be identified, by means of a stamp, signature and registration (or equivalent digital systems).

A positive outcome certifies the metrological confirmation of the equipment, which may be used to start performing vehicle roadworthiness tests (initial verification) or to continue carrying out vehicle roadworthiness tests (periodic verification).

TECHNICAL DATA SHEET NO 08	ROLLER BRAKE TESTERS **for mopeds and motorcycles**
Document type:	**TECHNICAL DATA SHEET**
Document code:	**8-ROLLER BRAKE TESTERS_MOTO**
Equipment specifications:	**TYPE APPROVAL in accordance with Circular 7938/604 of 29.9.2000**
Date of first issue:	31-05-2024
Roadworthiness test of:	**31-05-2024** | No 1
Written by:	
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Approved by:	

Roadworthiness test sheet			
Rev.	Date	Par.	Description of modifications
1	31-05-2024		Approval of the Roller Brake Testers – Motorcycles and mopeds sheet

Contents

1. DESCRIPTION OF EQUIPMENT

1.1 Description of equipment and parts thereof:

1.1.1 Brake tester: equipment for verifying the performance conditions of the braking devices of vehicles by measuring the braking force on each wheel.

1.1.2 Rollers: drag rollers of the vehicle being tested.

1.1.3 Gear motor(s): roller drive motor

1.1.4 Load cell: brake force measurement instrument.

1.1.5 Auxiliary roller: a central auxiliary roller for measuring vehicle wheel speed and/or presence of the vehicle on rollers.

1.1.6 Sensors: devices for the detection of the wheel of the vehicle being tested on the rollers.

1.1.7 Containment frame: a containment frame to which the various parts of the brake tester are anchored: rollers, gear motors, etc.

1.1.8 Weight: instrument(s) for measuring the weight of the vehicle being tested; the instrument shall be housed under the containment frame.

1.1.9 Control pedal or lever force measurers: a dynamometer for the measurement of the force applied to the device of the vehicle being tested.

1.1.10 Locking devices: devices for locking and keeping the vehicle stable during the performance of the test on the rollers, avoiding expulsion of the rollers.

2 VERIFICATIONS

2.1. Preliminary Activities

2.1.1 Checking compliance with the manufacturer's instructions for use, both for workplace safety requirements and for the operational verification instructions.

2.1.2 Equipment identification check, using the identification plate which shall bear the type approval number and serial number assigned by the manufacturer

2.1.3 Checking the presence of the metrological booklet, which must be complete and legible.

2.1.4 Check the matching of the equipment plate data with data recorded in the metrological booklet.

2.1.5 Monitoring of environmental conditions required for the use of the equipment: 0 °C to 40 °C.

2.2. Initial Verification

The initial verification shall include at least the following activities provided for by the metrological booklet; at the operational level, the sequence of activities may change.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.1 General and functional checks of equipment: e.g. intactness of rollers and mechanical parts, vehicle compliant system operation, minimum roller speed, etc.			
3	Checking the correct detection of the peripheral speed of the vehicle wheel by the central auxiliary roller.	3.1 Checking by the sw function of the equipment, that the peripheral speed of the wheel as measured by the auxiliary roller is within the prescribed limits. 3.2 Readings of values shall be freely accessible or accessible via the 1st level pw. 3.3 In the absence of the sw function, checking the peripheral speed of the wheel, as detected by the auxiliary roller, by appropriate measuring instruments.	Peripheral wheel speed with no load on the wheel: ≥ 5.0 km/h	Digital speedometer or stroboscopic gun	
4	Checking the correctness of the parameters set for the % slip between wheel and roller, which shall lead the rollers to stop.	4.1 Checking by the sw function of the equipment that the parameters for the % slip are correctly set. 4.2 Readings of values shall be freely accessible or accessible via the 1st level pw set. 4.3 The reading value must be within the permissible limits.	% slip between wheel and roller until the roller stops between 16 % and 30 %.		
5	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.	5.1 Instrument type verification 5.2 Entering the specific sw function of the equipment, as required by the instructions for use. 5.3 Checking that the zero with no load is within the maximum permissible error. 5.4 Installing the dedicated “calibration	Braking force: zero with no load ≤ 100 N. For braking force, with values ≤ 1 000 N: ± 20N; for values > 1 000 N: ≤ 2 %.	“Calibration bar” (anchorage system and levers). Sample masses or sample dynamometer.	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
		bar" and appropriate measuring instruments. 5.5 Measurements shall be made at the points of 500 N, 1 000 N and 2 000 N of the braking forces. 5.6 Comparing the values reported by the equipment against standard values. 5.7 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 5.8 The values detected shall be within the maximum permissible error range.			
6	Verification of the repeatability per braking force and weight.	6.1 Instrument type verification. 6.2 Performing a consecutive series of tests with appropriate measuring instruments, under the same conditions. 6.3 In the absence of any other indication from the manufacturer, make 5 measurements at the value of 1 000 N per brake force and 2 000 N per weight. 6.4 Comparing the values reported by the equipment against standard values. 6.5 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 6.6 The result of the different measurements must be within the maximum permissible error.	Repeatability of braking force and weight force: mean square deviation ≤ 2 %	"Calibration bar" (anchorage system and levers). Masses or dynamometer	
7	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.	7.1 Instrument type verification. 7.2 Checking that the zero with no load is within the maximum permissible error. 7.3 Installing on the weighing system the appropriate "calibration bar" and appropriate measuring instruments. 7.4 The weighing test methodology must comply with the solutions provided by the manufacturer and/or applicable to the equipment (levers with weights, anchors with a dynamometer, crossbars or portals with a dynamometer). 7.5 If the manufacturer has not put in place suitable solutions for an instrument test, alternative	Weight force: zero with no load ≤ 100 N. For weight force with values ≤ 1 000 N: ± 20 N; for values > 1 000 N: ≤ 2 %.	"Calibration bar" (anchorage system and levers). Masses or dynamometer. Wheel weighing platforms (for point 7.5)	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
		solutions shall be adopted (e.g. vehicles with a known axle weight, determined by wheel weighing platforms or similar devices, etc.). 7.6 Checking the weight force at the following points; on the wheel: 1 000 N, 2 000 N and 3 000 N. 7.7 Comparing the values reported by the equipment against standard values. 7.8 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 7.9 The values detected shall be within the maximum permissible error range.			
8	Checking the correct expression of braking performance.	8.1 At the end of the checks provided for in activities 5, 6, 7 and 10, carry out the roadworthiness test on a vehicle and check the correct expression of braking performance.			
9	Checking the correctness of the parameters set for alert thresholds.	9.1 Checking the correctness of the parameters set by the manufacturer. 9.2 Checking the set thresholds by reading the values of interest on the sw function of the equipment. 9.3 Readings of values shall be freely accessible or accessible via the 1st level pw.			
10	Verification of the linearity of pedal and lever force measurers.	10.1 Instrument type verification. 10.2 Checking that the devices are intact and functioning correctly. 10.3 Place sample weights directly on the measurer or on the appropriate supports. 10.4 The measurements shall be made at the following points: pedal control at 100 N, 300 N and 500 N. Lever control: at 100 N, 200 N. 10.5 Comparing the values reported by the equipment against standard values 10.6 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 10.7 The result must be within the maximum permissible error.	Lever and pedal control: for values $\leq$ 500 N: $\pm$ 10 N. for values > 500 N: $\leq$ 2 %.	Masses.	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
11	Checking the correct functioning of the vehicle locking devices.	11.1 In the case of automatic devices, checking the correct operation of the locking devices. 11.2 In the case of manual devices, checking their intactness.			
12	Safety check.	12.1 The equipment must be CE marked and provided with instructions for use. 12.2 Checking the impossibility of starting rollers in the absence of the wheel on the rollers. 12.3 Checking the stopping of the rollers, including by the operation of the manual device.			
13	Other checks.				

2.3. Periodic verification

The periodic verification shall include at least the following activities provided for by the metrological booklet; at the operational level, the sequence of activities may change.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOL	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.1 General and functional checks of equipment: e.g. intactness of rollers and mechanical parts, vehicle compliant system operation, minimum roller speed, etc.			
3	Checking the correct detection of the peripheral speed of the vehicle wheel by the central	3.1 Checking by the sw function of the equipment that the peripheral speed of the wheel as measured by the auxiliary roller is within the prescribed limits. 3.2 Readings of values shall be freely accessible or accessible via the 1st	Peripheral wheel speed with no load on the wheel: ≥ 5.0 km/h	Digital speedometer or stroboscopic gun	

	auxiliary roller.	level pw. 3.3 In the absence of the sw function, checking the peripheral speed of the wheel, as detected by the auxiliary roller, by appropriate measuring instruments.			
4	Checking the correctness of the parameters set for the % slip between wheel and roller, which shall lead the rollers to stop.	4.1 Checking by the sw function of the equipment that the parameters for the % slip are correctly set. 4.2 Readings of values shall be freely accessible or accessible via the 1st level pw set. 4.3 The reading value must be within the permissible limits.	% slip between wheel and roller until the roller stops between 16 % and 30 %.		
5	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.	5.1 Instrument type verification 5.2 Entering the specific sw function of the equipment, as required by the instructions for use. 5.3 Checking that the zero with no load is within the maximum permissible error. 5.4 Installing the dedicated “calibration bar” and appropriate measuring instruments. 5.5 Measurements shall be made at the points of 500 N, 1 000 N and 2 000 N of the braking forces. 5.6 Comparing the values reported by the equipment against standard values. 5.7 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 5.8 The values detected shall be within the maximum permissible error range.	Braking force: zero with no load ≤ 100 N. For braking force, with values ≤ 1 000 N: ± 20N; for values > 1 000 N: ≤ 2 %.	“Calibration bar” (anchorage system and levers). Masses or dynamometer.	
6	Verification of the repeatability per braking force and weight.	6.1 Instrument type verification. 6.2 Performing a consecutive series of tests with appropriate measuring instruments, under the same conditions. 6.3 In the absence of any other indication from the manufacturer, make 5 measurements at the value of 1 000 N per brake force and 2 000 N per weight. 6.4 Comparing the values reported by the equipment against standard	Repeatability of braking force and weight force: mean square deviation ≤ 2 %	“Calibration bar” (anchorage system and levers). Masses or dynamometer.	

		values. 6.5 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 6.6 The result of the different measurements must be within the maximum permissible error.			
7	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.	7.1 Instrument type verification. 7.2 Checking that the zero with no load is within the maximum permissible error. 7.3 Installing on the weighing system the appropriate “calibration bar” and appropriate measuring instruments. 7.4 The weighing test methodology must comply with the solutions provided by the manufacturer and/or applicable to the equipment (levers with weights, anchors with a dynamometer, crossbars or portals with a dynamometer). 7.5 If the manufacturer has not put in place suitable solutions for an instrument test, alternative solutions shall be adopted (e.g. vehicles with a known axle weight, determined by wheel weighing platforms or similar devices, etc.). 7.6 Checking the weight force at the following points; on the wheel: 1 000 N, 2 000 N and 3 000 N. 7.7 Comparing the values reported by the equipment against standard values. 7.8 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 7.9 The values detected shall be within the maximum permissible error range.	Weight force: zero with no load ≤ 100 N. For weight force with values ≤ 1000 N: ± 20 N; for values > 1000 N: ≤ 2 %.	“Calibration bar” (anchorage system and levers). Masses or dynamometer. Wheel weighing platforms (for point 7.5).	
8	Checking the correct expression of braking performance.	8.1 At the end of the checks provided for in activities 5, 6, 7 and 10, carry out the roadworthiness test on a vehicle and check the correct expression of braking performance.			
9	Checking the correctness of the parameters set for alert thresholds.	9.1 Checking the correctness of the parameters set by the manufacturer. 9.2 Checking the set thresholds by reading the values of interest on the sw function of the equipment. 9.3 Readings of values shall be freely accessible or accessible via the 1st level pw.			

10	Verification of the linearity of pedal and lever force measurers.	10.1 Instrument type verification. 10.2 Checking that the devices are intact and functioning correctly. 10.3 Place sample weights directly on the measurer or on the appropriate supports. 10.4 The measurements shall be made at the following points: pedal control at 100 N, 300 N and 500 N. Lever control: at 100 N, 200 N. 10.5 Comparing the values reported by the equipment against standard values 10.6 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 10.7 The result must be within the maximum permissible error.	Lever and pedal control: for values $\leq$ 500 N: $\pm$ 10 N; for values > 500 N: $\leq$ 2 %	Masses	
11	Check to maintain roller adhesion characteristics.	14.1 Visual check of the coating of each roller to maintain adhesion characteristics. 14.2 Visual check of the absence of significant roller coating detachments. 14.3 Visual check of the absence of excessive central wear of the roller coating in relation to the ends of the roller.			
12	Checking the correct functioning of the vehicle locking devices.	12.1 In the case of automatic devices, checking the correct operation of the locking devices. 12.2 In the case of manual devices, checking their intactness.			
13	Safety check.	13.1 The equipment must be CE marked and provided with instructions for use. 13.2 Checking the impossibility of starting rollers in the absence of the wheel on the rollers. 13.3 Checking the stopping of the rollers, including by the operation of the manual device.			
14	Other checks.				

3. METROLOGICAL CONFIRMATION

3.1.1 The initial and periodic verification provide for a series of visual and functional checks and a series of instrumental checks by means of a direct comparison of the equipment being tested and the relevant control tools, with the criteria laid down in Annex II.

3.1.2 The outcome of each functional checked or instrumental verification operation shall be attested by ticking the activity in the list ‘initial verification’ or ‘periodic verification’ of the metrological booklets.

3.1.3 After ticking the activities provided for, the final outcome of the verification (positive or negative) must be certified in the metrological booklet, and the authorised CSRPAD portal technician who carried out the operation must be identified, by means of a stamp, signature and registration (or equivalent digital systems).

3.1.4 A positive outcome certifies the metrological confirmation of the equipment, which may be used to start performing vehicle roadworthiness tests (initial verification) or to continue carrying out vehicle roadworthiness tests (periodic verification).

TECHNICAL DATA SHEET NO 09	ROLLER BRAKE TESTERS for light vehicles < 3.5 tonnes + est 3-4 wheels
Document type:	**TECHNICAL DATA SHEET**
Document code:	**9-ROLLER BRAKE TESTERS_CARS+3-4 WHEELS**
Equipment specifications:	**TYPE APPROVAL in accordance with Circular No 3997 / 604 of 6.9.1999 - New circular 88/95 as amended. + Circular 1603/404 of 8.10.2001**
Date of first issue:	31-05-2024
Roadworthiness test of:	**31-05-2024** | No 1
Written by:	
Verified by:	
Approved by:	

Roadworthiness test sheet			
Rev.	Date	Par.	Description of modifications
1	31-05-2024		Approval of the Brake Tester for light vehicles < 3.5 tonnes + est 3-4 wheels sheet

Contents

1. DESCRIPTION OF EQUIPMENT

1.1 Description of equipment and parts thereof:

1.1.1 Brake tester: per Circ. 1603/404, roller brake testers approved to perform the tests at 2-3-4 cycles are defined as benches which:

- Comply with the type approvals according to Ministerial Decree 628/96 and suitable for motor vehicles with a mass ≤ 3.5 t and supplemented with the characteristics set out in Chapter I of Circular 1603/404

and also

- Comply with type approvals according to Circ. 7938 of 29/9/2000 supplemented with the characteristics set out in Chapter I of Circular 1603/404

1.1.2 Rollers: drag rollers of the vehicle being tested.

1.1.3 Gear motor(s): roller drive motor

1.1.4 Load cell: brake force measurement instrument.

1.1.5 Auxiliary roller: a central auxiliary roller for measuring vehicle wheel speed and/or presence of the vehicle on rollers.

1.1.6 Sensors: devices for the detection of the wheel of the vehicle being tested on the rollers.

1.1.7 Containment frame: a containment frame to which the various parts of the brake tester are anchored (rollers, gear motors, etc.).

1.1.8 Weight: instrument(s) for measuring the weight of the vehicle being tested; the instrument shall be housed under the containment frame.

1.1.9 Pedal or lever force measurers: a dynamometer for the measurement of the force applied to the device of the vehicle being tested.

2 VERIFICATIONS

2.1. Preliminary Activities

2.1.1 Checking compliance with the manufacturer's instructions for use, both for workplace safety requirements and for the operational verification instructions.

2.1.2 Equipment identification check, using the identification plate which shall bear the type approval number and serial number assigned by the manufacturer

2.1.3 Checking the presence of the metrological booklet, which must be complete and legible.

2.1.4 Check the matching of the equipment plate data with data recorded in the metrological booklet.

2.1.5 Monitoring of environmental conditions required for the use of the equipment: 0 °C to 40 °C.

2.2. Initial Verification

The initial verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the	1.1 Checking the compliance of the			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	compliance of the equipment with the metrological booklet and the absence of obvious tampering.	equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.1 General and functional checks of equipment: e.g. intactness of rollers and mechanical parts, vehicle compliant system operation, minimum roller speed, etc.			
3	Checking the difference in height between roller pair axles (if they have an independent structure).	3.1 In the case of equipment with two roller pairs with an independent structure, checking the difference between the roller axles and flatness between the two planes. 3.2 The values shall be within the manufacturer's specifications set out in the installation and use manual.			
4	Checking the correct detection of the peripheral speed of the vehicle wheel by the central auxiliary roller.	4.1 Checking by the sw function of the equipment that the peripheral speed of the wheel as measured by the auxiliary roller is within the prescribed limits. 4.2 Readings of values shall be freely accessible or accessible via the 1st level pw. 4.3 In the absence of the sw function, checking the peripheral speed of the wheel, as detected by the auxiliary roller, by appropriate measuring instruments.	Peripheral wheel speed with no load on the wheel: ≥ 5.0 km/h	Digital speedometer or stroboscopic gun	
5	Checking the correctness of the parameters set for the % slip between wheel and roller, which shall lead the rollers to stop.	5.1 Checking by the sw function of the equipment that the parameters for the % slip are correctly set. 5.2 Readings of values shall be freely accessible or accessible via the 1st level pw. 5.3 The reading value must be within the permissible limits.	% slip between wheel and roller until the roller stops between 16 % and 30 %.		
6	Checking the maximum permissible error at zero (empty) and	6.1 Instrument type verification 6.2 Entering the specific sw function of the equipment, as required by	Braking force: zero with no load ≤ 100 N.	"Calibration bar" (anchorage system and	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	linearity verification per wheel brake force.	the instructions for use. 6.3 Checking that the zero with no load is within the maximum permissible error. 6.4 Installing the dedicated "calibration bar" and appropriate measuring instruments. 6.5 Measurements shall be made at the points of 500 N, 1 000 N, 2 000 N, 3 000 N and 5 000 N of the braking forces per wheel. 6.6 Comparing the values reported by the equipment against standard values. 6.7 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 6.8 The values detected shall be within the maximum permissible error range.	For braking force, with values ≤ 1 000 N: ± 20N; for values > 1 000 N: ≤ 2 %.	levers). Masses or dynamometer	
7	Verification of the repeatability per braking force and weight.	7.1 Instrument type verification. 7.2 Performing a consecutive series of tests with appropriate measuring instruments, under the same conditions. 7.3 In the absence of any other indication from the manufacturer, 5 measurements shall be carried out at the value of 3 000 N per brake force, and at the value of 6 000 N per wheel weight. 7.4 Comparing the values reported by the equipment against standard values. 7.5 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 7.6 The result of the different measurements must be within the maximum permissible error.	Repeatability of braking force and weight force: mean square deviation ≤ 2 %.	"Calibration bar" (anchorage system and levers). Masses or dynamometer	
8	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.	8.1 Instrument type verification. 8.2 Checking that the zero with no load is within the maximum permissible error. 8.3 Installing on the weighing system the appropriate "calibration bar" and appropriate measuring instruments. 8.4 The weighing test methodology	Weight force: zero with no load ≤ 100 N. For weight force with values ≤ 1 000 N: ± 20 N;	"Calibration bar" (anchorage system and levers). Masses or dynamometer	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		must comply with the solutions provided by the manufacturer and/or applicable to the equipment (levers with weights, anchors with a dynamometer, crossbars or portals with a dynamometer). 8.5 If the manufacturer has not put in place suitable solutions for an instrument test, alternative solutions shall be adopted (e.g. vehicles with a known axle weight, determined by wheel weighing platforms or similar devices, etc.). 8.6 Checking the weight force at the following points; 1 000 N, 2 000 N, 3 000 N, 6 000 N and 10 000 N per wheel; the axis shall be considered to be double. 8.7 Comparing the values reported by the equipment against standard values. 8.8 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 8.9 The values detected shall be within the maximum permissible error range.	for values > 1 000 N: ≤ 2 %.	Wheel weighing platforms (for point 8.5)	
9	Checking the correct expression of braking performance.	9.1 At the end of the checks provided for in activities 6, 7, 8 and 11, carry out the roadworthiness test on a vehicle and check the correct expression of braking performance.			
10	Checking the correctness of the parameters set for alert thresholds.	10.1 Checking the correctness of the parameters set by the manufacturer. 10.2 Checking the set thresholds by reading the values of interest on the sw function of the equipment. 10.3 Readings of values shall be freely accessible or accessible via the 1st level pw.			
11	Verification of the linearity of pedal and manual force measurers.	11.1 Instrument type verification. 11.2 Checking that the devices are intact and functioning correctly. 11.3 Place sample weights directly on the measurer or on the appropriate supports. 11.4 The measurements shall be made at the following points: pedal control at 100 N, 300 N and 500 N. lever control at 100 N, 200 N; manual control (parking) at 100	Lever, manual and pedal control: for values ≤ 500 N: ± 10 N. for values > 500 N: ≤ 2 %	Masses	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		N, 300 N and 500 N. 11.5 Comparing the values reported by the equipment against standard values 11.6 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 11.7 The result must be within the maximum permissible error.			
12	Checking the correctness of the parameters set for roller speed alert thresholds for tests on 4 WD vehicles.	12.1 Checking the correctness of the parameters set by the manufacturer. 12.2 Checking the set thresholds by reading the values of interest on the sw function of the equipment. 12.3 Readings of values shall be freely accessible or accessible via the 1st level pw.			
13	Safety check.	13.1 The equipment must be CE marked and provided with instructions for use. 13.2 Checking the impossibility of starting rollers in the absence of both wheels on the rollers. 13.3 Checking the stopping of the rollers, including by the operation of the manual device.			
14	Checking the correct functioning of the vehicle locking devices.	14.1 Checking the correct functioning of the vehicle locking devices. 14.2 In the case of automatic devices, checking the correct operation of the locking devices. in the case of manual devices, checking their intactness.			
15	Other checks				

2.3. Periodic verification

The periodic verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.1 General check of the correct operation of the equipment: e.g. intactness of rollers and mechanical parts; vehicle compliance system operation, minimum roller speed, etc.			
3	Checking the difference in height between roller pair axles (if they have an independent structure).	3.1 In the case of equipment with two roller pairs with an independent structure, checking the difference between the roller axles and flatness between the two planes. 3.2 The values shall be within the manufacturer's specifications set out in the installation and use manual.			
4	Checking the correct detection of the peripheral speed of the vehicle wheel by the central auxiliary roller.	4.1 Checking by the sw function of the equipment that the peripheral speed of the wheel as measured by the auxiliary roller is within the prescribed limits. 4.2 Readings of values shall be freely accessible or accessible via the 1st level pw. 4.3 In the absence of the sw function, checking the peripheral speed of the wheel, as detected by the auxiliary roller, by appropriate measuring instruments.	Peripheral wheel speed with no load on the wheel: ≥ 5.0 km/h.	Digital speedometer or stroboscopic gun	
5	Checking the correctness of the parameters set for the % slip between wheel and roller, which shall lead the	5.1 Checking by the sw function of the equipment that the parameters for the % slip are correctly set. 5.2 Readings of values shall be freely accessible or accessible via the 1st level pw. 5.3 The reading value must be within	% slip between wheel and roller until the roller stops between 16 % and 30 %.		

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	rollers to stop.	the permissible limits.			
6	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.	6.1 Instrument type verification 6.2 Entering the specific sw function of the equipment, as required by the instructions for use. 6.3 Checking that the zero with no load is within the maximum permissible error. 6.4 Installing the dedicated "calibration bar" and appropriate measuring instruments. 6.5 Measurements shall be made at the points of 500 N, 1 000 N, 2 000 N, 3 000 N and 5 000 N of the braking forces per wheel. 6.6 Comparing the values reported by the equipment against standard values. 6.7 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 6.8 The values detected shall be within the maximum permissible error range.	Braking force: zero with no load ≤ 100 N. For braking force, with values ≤ 1 000 N: ± 20N; for values > 1 000 N: ≤ 2 %.	"Calibration bar" (anchorage system and levers). Masses or dynamometer	
7	Verification of the repeatability per braking force and weight.	7.1 Instrument type verification. 7.2 Performing a consecutive series of tests with appropriate measuring instruments, under the same conditions. 7.3 In the absence of any other indication from the manufacturer, 5 measurements shall be carried out at the value of 3 000 N per brake force, and at the value of 6 000 N per wheel weight. 7.4 Comparing the values reported by the equipment against standard values. 7.5 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 7.6 The result of the different measurements must be within the maximum permissible error.	Repeatability of braking force and weight force: mean square deviation ≤ 2 %.	"Calibration bar" (anchorage system and levers). Masses or dynamometer	
8	Checking the maximum permissible	8.1 Instrument type verification. 8.2 Checking that the zero with no load is within the maximum	Weight force: zero with no load ≤ 100 N.	"Calibration bar" (anchorage	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	error at zero (empty) and linearity verification per wheel weight.	permissible error. 8.3 Installing on the weighing system the appropriate “calibration bar” and appropriate measuring instruments. 8.4 The weighing test methodology must comply with the solutions provided by the manufacturer and/or applicable to the equipment (levers with weights, anchors with a dynamometer, crossbars or portals with a dynamometer). 8.5 If the manufacturer has not put in place suitable solutions for an instrument test, alternative solutions shall be adopted (e.g. vehicles with a known axle weight, determined by wheel weighing platforms or similar devices, etc.). 8.6 Checking the weight force at the following points; 1 000 N, 2 000 N, 3 000 N, 6 000 N and 10 000 N per wheel; the axis shall be considered to be double. 8.7 Comparing the values reported by the equipment against standard values. 8.8 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 8.9 The values detected shall be within the maximum permissible error range.	For weight force with values ≤ 1 000 N: ± 20 N; for values > 1 000 N: ≤ 2 %.	system and levers). Masses or dynamometer Wheel weighing platforms (for point 8.5)	
9	Checking the correct expression of braking performance.	9.1 At the end of the checks provided for in activities 6, 7, 8 and 11, carry out the roadworthiness test on a vehicle and check the correct expression of braking performance.			
10	Checking the correctness of the parameters set for alert thresholds.	10.1 Checking the correctness of the parameters set by the manufacturer. 10.2 Checking the set thresholds by reading the values of interest on the sw function of the equipment. 10.3 Readings of values shall be freely accessible or accessible via the 1st level pw.			
11	Verification of the linearity of pedal and manual force	11.1 Instrument type verification. 11.2 Checking that the devices are intact and functioning correctly. 11.3 Place sample weights directly	Lever, manual and pedal control: for values ≤ 500 N:	Masses	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	measurers.	on the measurer or on the appropriate supports. 11.4 The measurements shall be made at the following points: pedal control at 100 N, 300 N and 500 N. lever control at 100 N, 200 N; manual control (parking) at 100 N, 300 N and 500 N. 11.5 Comparing the values reported by the equipment against standard values 11.6 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 11.7 The result must be within the maximum permissible error.	± 10 N. for values > 500 N: ≤ 2 %		
12	Checking the correctness of the parameters set for roller speed alert thresholds for tests on 4 WD vehicles.	12.1 Checking the correctness of the parameters set by the manufacturer. 12.2 Checking the set thresholds by reading the values of interest on the sw function of the equipment. 12.3 Readings of values shall be freely accessible or accessible via the 1st level pw.			
13	Safety check.	13.1 The equipment must be CE marked and provided with instructions for use. 13.2 Checking the impossibility of starting rollers in the absence of both wheels on the rollers. 13.3 Checking the stopping of the rollers, including by the operation of the manual device.			
14	Check to maintain roller adhesion characteristics.	14.1 Visual check of the coating of each roller to maintain adhesion characteristics. 14.2 Visual check of the absence of significant roller coating detachments. 14.3 Visual check of the absence of excessive central wear of the roller coating in relation to the ends of the roller.			
15	Checking the correct functioning of the vehicle	15.1 Checking the correct functioning of the vehicle locking devices. 15.2 In the case of automatic devices, checking the correct			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	locking devices.	operation of the locking devices. in the case of manual devices, checking their intactness.			
16	Other checks				

3. METROLOGICAL CONFIRMATION

2.3.1 The initial and periodic verification provide for a series of visual and functional checks and a series of instrumental checks by means of a direct comparison of the equipment being tested and the relevant control tools, with the criteria laid down in Annex II.

2.3.2 The outcome of each functional checked or instrumental verification operation shall be attested by ticking the activity in the list ‘initial verification’ or ‘periodic verification’ of the metrological booklets.

2.3.3 After ticking the activities provided for, the final outcome of the verification (positive or negative) must be certified in the metrological booklet, and the authorised CSRPAD portal technician who carried out the operation must be identified, by means of a stamp, signature and registration (or equivalent digital systems).

A positive outcome certifies the metrological confirmation of the equipment, which may be used to start performing vehicle roadworthiness tests (initial verification) or to continue carrying out vehicle roadworthiness tests (periodic verification).

TECHNICAL DATA SHEET NO 10	ROLLER BRAKE TESTERS for vehicles exceeding 3.5 tonnes. TYPE-APPROVED
Document type:	**TECHNICAL DATA SHEET**
Document code:	**10-ROLLER BRAKE TESTERS_HEAVY-ROLLERS_OM**
Equipment specifications:	**TYPE APPROVAL in accordance with Circular 26248 of 19.9.2011 and Circular 7937 of 21.6.2012**
Date of first issue:	31-05-2024
Roadworthiness test of:	**31-05-2024** | No 1
Written by:	
Verified by:	
Approved by:	

Roadworthiness test sheet			
Rev.	Date	Par.	Description of modifications
1	31-05-2024		Approval of Roller Brake Tester for vehicles exceeding 3.5 tonnes. TYPE-APPROVED

Contents

1. DESCRIPTION OF EQUIPMENT

1.1 Description of equipment and parts thereof:

1.1.1 Brake tester: equipment for verifying the performance conditions of the braking devices of vehicles with a mass exceeding 3.5 tonnes and their trailers, by measuring the braking force on each wheel.

1.1.2 Rollers: drag rollers of the vehicle being tested.

1.1.3 Gear motor(s): roller drive motor

1.1.4 Load cell: brake force measurement instrument.

1.1.5 Auxiliary roller: a central auxiliary roller for measuring vehicle wheel speed and/or presence of the vehicle on rollers.

1.1.6 Sensors: devices for the detection of the wheel of the vehicle being tested on the rollers.

1.1.7 Containment frame: a containment frame to which the various parts of the brake tester are anchored: rollers, gear motors, etc.

1.1.8 Weight: instrument(s) for measuring the weight of the vehicle being tested; the instrument may be housed under the containment frame or may be external to the brake tester.

1.1.9 Pedal or manual force measurers: a dynamometer for the measurement of the force applied to the device of the vehicle being tested.

2 VERIFICATIONS

2.1. Preliminary Activities

3.1.1 Checking availability of the manufacturer's instructions for use, both for workplace safety requirements and for the operational verification instructions.

2.2.2 Identification of the equipment by means of the identification plate, which shall bear the type and serial number assigned by the manufacturer, as well as the approval number.

3.1.2 Checking the presence of the complete and legible metrological booklet.

3.1.3 Check the matching of the equipment plate data with data recorded in the metrological booklet.

3.1.4 Monitoring of environmental conditions required for the use of the equipment: 0 °C to 40 °C.

2.2. Initial Verification

The initial verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
2	General and functional checks.	2.1 General and functional checks of equipment: e.g. intactness of rollers and mechanical parts, vehicle compliant system operation, etc.			
3	Dimensional checks.	3.1 Checking the flatness and spacing between the benches, in accordance with the manufacturer's installation and use instructions.			
4	Checking compliance of the supply line with the requirements of the accompanying user manual and/or installation manual.	4.1 Obtaining certification of the electrical system in accordance with the requirements of the accompanying user and/or installation manual.			
5	Checking compliance with the minimum rotational speed of the rollers (no load).	5.1 Checking the minimum rotational values for non-loaded rollers by reading the values of interest on the sw function of the equipment. 5.2 Readings of values shall be freely accessible or protected by the 1st level pw. 5.3 The reading value must be within the permissible limits.	Nominal peripheral speed of rollers, no load: ≥ 2 km/h.		
6	Verification of the maximum permissible error at zero (no load) and linearity verification at 20 %, 50 %, 80 % of the CLASS value for measurement of the **braking force** and at 20 %, 50 %, 80 % of the CLASS value for the measurement **of weight force** per wheel.	6.1 Instrument type verification. 6.2 Entering the specific sw function of the equipment, as required by the instructions for use. 6.3 Checking, per braking force and weight force, that the zero with no load is within the maximum permissible error. 6.4 Installing a dedicated "calibration bar" and appropriate measurement instruments and resetting the values to zero. 6.5 Measurements shall be made at the values shown in Table 1 (braking force) and Table 2 (weight force); the values are specific in relation to the type approval of the Class 1 or Class 2 equipment.	Braking force: zero with no load ≤ 400 N. Weight force: zero with no load ≤ 650 N. Braking force; for values < 5 KN: ± 100 N; for values > 5 KN: ≤ 2 %. Weight force; for values < 7.5 KN: ± 150 N; for values >	"Calibration bar" (anchorage system and levers). Masses or dynamometer	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		6.6 Comparing the values reported by the equipment against standard values. 6.7 Readings of values by the equipment shall be freely accessible or protected by the 1st level pw. 6.8 The values detected shall be within the maximum permissible error range.	7.5 KN: ≤ 2 %.		
7	Verification of the linearity for the measurement of **air pressure.**	7.1 Instrument type verification. 7.2 Entering the specific sw function of the equipment, as required by the instructions for use. 7.3 Installing the appropriate standard pressure gauge. 7.4 Reset to zero and proceed with the measurements at 200 kPa, 400 kPa and 800 kPa. 7.5 Comparing the values reported by the equipment against standard values. 7.6 Readings of values by the equipment shall be freely accessible or protected by the 1st level pw. 7.7 The values detected shall be within the maximum permissible error range.	For values ≤ 500 kPa: ± 10 kPa; for values > 500 kPa: ± 2%.	Pressure gauge	
8	Verification of the linearity of pedal and manual force measurers.	8.1 Instrument type verification. 8.2 Checking that the devices are intact and functioning correctly. 8.3 Place sample weights directly on the measurer or on the appropriate supports. 8.4 The measurements shall be made at the following points: pedal control at 100 N, 300 N, 500 N, 800 N; manual control (parking): at 100 N, 300 N, 500 N, 800 N. 8.5 Comparing the values reported by the equipment against standard values. 8.6 Readings of values by the equipment shall be freely accessible or protected by the 1st level pw. 8.7 The values detected shall be within the maximum permissible error range.	For values ≤ 500 N: ± 10 N. for values > 500 N: ≤ 2 %.	Masses	
9	Verification of the repeatability	9.1 Instrument type verification. 9.2 Performing with appropriate	Repeatability of braking	"Calibration bar"	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	of measurements per braking force, weight force and air pressure.	measuring instrumentation a series of consecutive tests, under identical conditions, simulating a braking force, weight force and air pressure value. 9.3 In the absence of any other indication from the manufacturer, carrying out 5 consecutive measurements of the intermediate brake force and weight value described in description 6, and of the intermediate air pressure value given in description 7. 9.4 Comparing the values reported by the equipment against standard values. 9.5 Readings of values by the equipment shall be freely accessible or protected by the 1st level pw. 9.6 The result must be within the maximum permissible error.	force and weight force: mean square deviation ≤ 2 %	(anchorage system and levers). Masses or dynamometer Pressure gauge	
10	Checking the minimum adhesion values also for wet rollers using a dedicated software procedure.	10.1 The equipment management software shall contain a module for the verification of the adhesion coefficient. 10.2 The checking of the minimum adhesion values of the rollers shall be carried out by reading the values of interest on the sw function of the equipment. 10.3 Readings of values shall be freely accessible or protected by the 1st level pw. 10.4 The values shall be within the limits allowed.	Adhesion with dry rollers: ≥ 0.6; with wet rollers: ≥ 0.5.		
11	Checking the correctness of the parameters set and the efficiency of the warning device indicating excessive angular or peripheral velocity difference between the right and the left wheel (if the system and permanent integral traction are used).	11.1 Checking the correctness of the parameters set by the manufacturer. 11.2 The checking of the effectiveness of the warning device shall be carried out by reading the values of interest on the sw function of the equipment. 11.3 Readings of values shall be freely accessible or protected by the 1st level pw.			
12	Checking the	12.1 Checking the correctness of the			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	correctness of the parameters set for program thresholds for efficiency and imbalance calculations.	parameters set by the manufacturer. 12.2 Checking the set thresholds by reading the values of interest on the sw function of the equipment. 12.3 Readings of values shall be freely accessible or protected by the 1st level pw.			
13	Safety check.	13.1 The equipment must be CE marked and provided with instructions for use. 13.2 Rollers shall not start up in the absence of a vehicle inside them. 13.3 The protectors shall be properly secured.			
14	Other checks				

2.3. Periodic verification

The periodic verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.2 General and functional check of the equipment: e.g. intactness of rollers and mechanical parts; vehicle compliance system operation; etc.			
3	Dimensional checks.	3.1 Checking the flatness and spacing between the benches, in accordance with the manufacturer’s installation and use instructions.			
4	Checking compliance of the supply line with the requirements of the accompanying	4.1 Obtaining certification of the electrical system in accordance with the requirements of the accompanying user and/or installation manual.			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	user manual and/or installation manual.				
5	Checking compliance with the minimum rotational speed of the rollers (no load).	5.1 Checking the minimum rotational values for non-loaded rollers by reading the values of interest on the sw function of the equipment. 5.2 Readings of values by the equipment shall be freely accessible or protected by the 1st level pw. 5.3 The reading value must be within the permissible limits.	Nominal peripheral speed of rollers, no load: ≥ 2 km/h.		
6	Verification of the maximum permissible error at zero (no load) and linearity verification at 20 %, 50 %, 80 % of the CLASS value for measurement of the **braking force** and at 20 %, 50 %, 80 % of the CLASS value for the measurement **of weight force** per wheel.	6.1 Instrument type verification. 6.2 Entering the specific sw function of the equipment, as required by the instructions for use. 6.3 Per braking force and weight force, verify that the zero with no load is within the maximum permissible error. 6.4 Installing a dedicated “calibration bar” and appropriate measurement instruments and resetting the values to zero. 6.5 Measurements shall be made at the values shown in Table 1 (braking force) and Table 2 (weight force); the values are specific in relation to the type approval of the Class 1 or Class 2 equipment. 6.6 Comparing the values reported by the equipment against standard values. 6.7 Readings of values by the equipment shall be freely accessible or protected by the 1st level pw. 6.8 The values detected shall be within the maximum permissible error range.	Braking force: zero with no load ≤ 400 N. Weight force: zero with no load ≤ 650 N. Braking force; for values < 5 KN: ± 100 N; for values > 5 KN: ≤ 2 %. Weight force; for values < 7.5 KN: ± 150 N; for values > 7.5 KN: ≤ 2 %.	“Calibration bar” (anchorage system and levers). Masses or dynamometer	
7	Verification of the linearity for the measurement of **air pressure.**	7.1 Instrument type verification. 7.2 Entering the specific sw function of the equipment, as required by the instructions for use. 7.3 Installing the appropriate standard	For values ≤ 500 kPa: ± 10 kPa; for values > 500 kPa: ± 2%.	Pressure gauge	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		pressure gauge. 7.4 Reset to zero and proceed with the measurements at 200 kPa, 400 kPa and 800 kPa. 7.5 Comparing the values reported by the equipment against standard values. 7.6 Readings of values by the equipment shall be freely accessible or protected by the 1st level pw. 7.7 The values detected shall be within the maximum permissible error range.			
8	Verification of the linearity of pedal and manual force measurers.	8.1 Instrument type verification. 8.2 Checking that the devices are intact and functioning correctly. 8.3 Place sample weights directly on the measurer or on the appropriate supports. 8.4 The measurements shall be made at the following points: pedal control at 100 N, 300 N, 500 N, 800 N; manual control (parking) at 100 N, 300 N, 500 N, 800 N. 8.5 Comparing the values reported by the equipment against standard values. 8.6 Readings of values by the equipment shall be freely accessible or protected by the 1st level pw. 8.7 The values detected shall be within the maximum permissible error range.	For values $\leq$ 500 N: $\pm$ 10 N; for values > 500 N: $\leq$ 2 %.	Masses	
9	Verification of the repeatability of measurements per braking force, weight force and air pressure.	9.1 Instrument type verification 9.2 Performing with appropriate measuring instrumentation a series of consecutive tests, under identical conditions, simulating a braking force, weight force and air pressure value. 9.3 In the absence of any other indication from the manufacturer, carrying out 5 consecutive measurements of the intermediate brake force and weight value described in description 6, and of the intermediate air pressure value given in description 7. 9.4 Comparing the values reported by the equipment against standard values. 9.5 Readings of values by the equipment shall be freely accessible	Repeatability of braking force and weight force: mean square deviation $\leq$ 2 %	"Calibration bar" (anchorage system and levers). Masses or dynamometer Pressure gauge	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		or protected by the 1st level pw. 9.6 The result must be within the maximum permissible error.			
10	Checking the minimum adhesion values also for wet rollers using a dedicated software procedure.	10.1 The equipment management software shall contain a module for the verification of the adhesion coefficient. 10.2 The checking of the minimum adhesion values of the rollers shall be carried out by reading the values of interest on the sw function of the equipment. 10.3 Readings of values shall be freely accessible or protected by the 1st level pw. 10.4 The values shall be within the limits allowed.	Adhesion with dry rollers: ≥ 0.6; with wet rollers: ≥ 0.5.		
11	Checking the correctness of the parameters set and the efficiency of the warning device indicating excessive angular or peripheral velocity difference between the right and the left wheel (if the system and permanent integral traction are used).	11.1 Checking the correctness of the parameters set by the manufacturer. 11.2 The checking of the effectiveness of the warning device shall be carried out by reading the values of interest on the sw function of the equipment. 11.3 Readings of values shall be freely accessible or protected by the 1st level pw.			
12	Checking the correctness of the parameters set for program thresholds for efficiency and imbalance calculations.	12.1 Checking the correctness of the parameters set by the manufacturer. 12.2 Checking the thresholds used by the programme by reading the values of interest on the sw function of the equipment. 12.3 Readings of values shall be freely accessible or protected by the 1st level pw.			
13	Verification of the maximum permissible error of the friction values and transcription	13.1 Starting up the equipment without a load (without a vehicle on the rollers) and checking that friction due to parasitic forces affecting the equipment is within the permissible limits. 13.2 In order to carry out this	No load friction values ≤ 500N		

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	thereof.	verification, a specific sw procedure prepared by the manufacturer shall be used. 13.3 Access to the start up procedure without a load, and the reading of the resulting values, shall be free or protected by the 1st level pw. 13.4 Indicating on the metrological booklet the values of interest read on the equipment.			
14	Safety check.	14.1 The equipment must be CE marked and provided with instructions for use; in the case of approved and subsequently adapted brake testers, prior to the entry into force of the CE marking, the equipment must be adapted to the essential safety requirements. 14.2 Rollers shall not start up in the absence of a vehicle inside them. 14.3 The protectors shall be properly secured.			
15	Other checks				

Table 1	**Bottom Scale Minimum BRAKE Force**	**20 %**	**50 %**	**80 %**
CLASS 1	*35 000 N*	*7 000 N*	*17 500 N*	*28 000 N*
CLASS 2	*45 500 N*	*9 100 N*	*22 750 N*	*36 400 N*

Table 2	**Bottom Scale Minimum WEIGHT Force**	**20 %**	**50 %**	**80 %**
CLASS 1	*50 000 N*	*10 000 N*	*25 000 N*	*40 000 N*
CLASS 2	*65 000 N*	*13 000 N*	*32 500 N*	*52 000 N*

3. METROLOGICAL CONFIRMATION

2.3.1 The initial and periodic verification provide for a series of visual and functional checks and a series of instrumental checks by means of a direct comparison of the equipment being tested and the relevant control tools, with the criteria laid down in Annex II.

2.3.2 The outcome of each functional checked or instrumental verification operation shall be attested by ticking the activity in the list ‘initial verification’ or ‘periodic verification’ of the metrological booklets.

2.3.3 After ticking the activities provided for, the final outcome of the verification (positive or negative) must be certified in the metrological booklet, and the authorised CSRPAD portal technician who carried out the operation must be identified, by means of a stamp, signature and registration (or equivalent digital systems).

2.3.4 A positive outcome certifies the metrological confirmation of the equipment, which may be used to start performing vehicle roadworthiness tests (initial verification) or to continue carrying out vehicle roadworthiness tests (periodic verification).

TECHNICAL DATA SHEET NO 11	ROLLER BRAKE TESTERS for vehicles exceeding 3.5 tonnes. APPROVED
Document type:	**TECHNICAL DATA SHEET**
Document code:	**11-ROLLER BRAKE TESTERS_HEAVY_ROLLERS_AP**
Equipment specifications:	**APPROVAL in accordance with Circular 7690/699 of 16.12.1999 and ADJUSTMENT in accordance with Circular No 26638 of 21.9.2011**
Date of first issue:	31-05-2024
Roadworthiness test of:	**31-05-2024** | No 1
Written by:	
Verified by:	
Approved by:	

Roadworthiness test sheet			
Rev.	Date	Par.	Description of modifications
1	31/05/2024		Approval of Roller Brake Tester for vehicles exceeding 3.5 tonnes. APPROVED

Contents

1. DESCRIPTION OF EQUIPMENT

1.1 Description of equipment and parts thereof:

1.1.1 Brake tester: equipment for verifying the performance conditions of the braking devices of vehicles with a mass exceeding 3.5 tonnes and their trailers, by measuring the braking force on each wheel.

1.1.2 Rollers: drag rollers of the vehicle being tested.

1.1.3 Gear motor(s): roller drive motor

1.1.4 Load cell: brake force measurement instrument.

1.1.5 Auxiliary roller: a central auxiliary roller for measuring vehicle wheel speed and/or presence of the vehicle on rollers.

1.1.6 Sensors: devices for the detection of the wheel of the vehicle being tested on the rollers.

1.1.7 Containment frame: a containment frame to which the various parts of the brake tester are anchored: rollers, gear motors, etc.

1.1.8 Weight: instrument(s) for measuring the weight of the vehicle being tested; the instrument may be housed under the containment frame or may be external to the brake tester.

1.1.9 Pedal or manual force measurers: a dynamometer for the measurement of the force applied to the device of the vehicle being tested.

2 VERIFICATIONS

2.1. Preliminary Activities

2.1.1 Checking availability of the manufacturer's instructions for use, both for workplace safety requirements and for the operational verification instructions.

2.1.2 Identification of the equipment by means of the identification plate, which shall bear the type and serial number assigned by the manufacturer, as well as the approval number.

2.1.3 Checking the presence of the complete and legible metrological booklet.

2.1.4 Check the matching of the equipment plate data with data recorded in the metrological booklet.

2.1.5 Monitoring of environmental conditions required for the use of the equipment: 0 °C to 40 °C.

2.2. Periodic verification

The periodic verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
2	General and functional checks.	2.2 General and functional check of the equipment: e.g. intactness of rollers and mechanical parts; vehicle compliance system operation; etc.			
3	Dimensional checks.	3.1 Checking the flatness and spacing between the benches, in accordance with the manufacturer's installation and use instructions.			
4	Checking compliance with the minimum rotational speed of the rollers (no load).	4.1 Checking the minimum rotational values for non-loaded rollers by reading the values of interest on the sw function of the equipment. 4.2 Readings of values by the equipment shall be freely accessible or protected by the 1st level pw. 4.3 The reading value must be within the permissible limits.	Nominal peripheral speed of rollers, no load: ≥ 2 km/h.		
5	Verification of the maximum permissible error at zero (no load) and linearity verification at 20 %, 50 %, 80 % of the CLASS value for measurement of the **braking force** and at 20 %, 50 %, 80 % of the CLASS value for the measurement **of weight force** per wheel.	5.1 Instrument type verification. 5.2 Entering the specific sw function of the equipment, as required by the instructions for use. 5.3 Per braking force and weight force, verify that the zero with no load is within the maximum permissible error. 5.4 Installing a dedicated "calibration bar" and appropriate measurement instruments and resetting the values to zero. 5.5 Measurements shall be made at the values shown in Table 1 (braking force) and Table 2 (weight force); the values are specific to the approved and adjusted type. 5.6 Comparing the values reported by the equipment against standard values. 5.7 Readings of values by the equipment shall be freely accessible or protected by the 1st level pw. 5.8 The values detected shall be within the maximum permissible error range.	Braking force: zero with no load ≤ 400 N. Weight force: zero with no load ≤ 650 N. Braking force; for values < 5 KN: ± 100 N; for values > 5 KN: ≤ 2 %. Weight force; for values < 7.5 KN: ± 150 N; for values > 7.5 KN: ≤ 2 %.	"Calibration bar" (anchorage system and levers). Masses or dynamometer	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
6	Verification of the linearity for the measurement of **air pressure.**	6.1 Instrument type verification. 6.2 Entering the specific sw function of the equipment, as required by the instructions for use. 6.3 Installing the appropriate standard pressure gauge. 6.4 Reset to zero and proceed with the measurements at 200 kPa, 400 kPa and 800 kPa. 6.5 Comparing the values reported by the equipment against standard values. 6.6 Readings of values by the equipment shall be freely accessible or protected by the 1st level pw. 6.7 The values detected shall be within the maximum permissible error range.	For values ≤ 500 kPa: ± 10 kPa; for values > 500 kPa: ± 2%.	Pressure gauge	
7	Verification of the linearity of pedal and manual force measurers.	7.1 Instrument type verification. 7.2 Checking that the devices are intact and functioning correctly. 7.3 Place sample weights directly on the measurer or on the appropriate supports. 7.4 The measurements shall be made at the following points: pedal control at 100 N, 300 N, 500 N, 800 N; manual control (parking) at 100 N, 300 N, 500 N, 800 N. 7.5 Comparing the values reported by the equipment against standard values. 7.6 Readings of values by the equipment shall be freely accessible or protected by the 1st level pw. 7.7 The values detected shall be within the maximum permissible error range.	For values ≤ 500 N: ± 10 N; for values > 500 N: ≤ 2 %.	Masses	
8	Verification of the repeatability of measurements per braking force, weight force and air pressure.	8.1 Instrument type verification 8.2 Performing with appropriate measuring instrumentation a series of consecutive tests, under identical conditions, simulating a braking force, weight force and air pressure value. 8.3 In the absence of any other indication from the manufacturer, carrying out 5 consecutive measurements of the intermediate brake force and weight value	Repeatability of braking force and weight force: mean square deviation ≤ 2 %	"Calibration bar" (anchorage system and levers). Masses or dynamometer Pressure gauge	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		described in description 5, and of the intermediate air pressure value given in description 6. 8.4 Comparing the values reported by the equipment against standard values. 8.5 Readings of values by the equipment shall be freely accessible or protected by the 1st level pw. 8.6 The result must be within the maximum permissible error.			
9	Checking the minimum adhesion values also for wet rollers using a dedicated software procedure.	9.1 The equipment management software shall contain a module for the verification of the adhesion coefficient. 9.2 The checking of the minimum adhesion values of the rollers shall be carried out by reading the values of interest on the sw function of the equipment. 9.3 Readings of values shall be freely accessible or protected by the 1st level pw. 9.4 The values shall be within the limits allowed.	Adhesion with dry rollers: ≥ 0.6; with wet rollers: ≥ 0.5.		
10	Checking the correctness of the parameters set and the efficiency of the warning device indicating excessive angular or peripheral velocity difference between the right and the left wheel (if the system and permanent integral traction are used).	10.1 Checking the correctness of the parameters set by the manufacturer. 10.2 The checking of the effectiveness of the warning device shall be carried out by reading the values of interest on the sw function of the equipment. 10.3 Readings of values shall be freely accessible or protected by the 1st level pw.			
11	Checking the correctness of the parameters set for program thresholds for efficiency and imbalance calculations.	11.1 Checking the correctness of the parameters set by the manufacturer. 11.2 Checking the thresholds used by the programme by reading the values of interest on the sw function of the equipment. 11.3 Readings of values shall be freely accessible or protected by the 1st level pw.			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
12	Verification of the maximum permissible error of the friction values and transcription thereof.	12.1 Starting up the equipment without a load (without a vehicle on the rollers) and checking that friction due to parasitic forces affecting the equipment is within the permissible limits. 12.2 In order to carry out this verification, a specific sw procedure prepared by the manufacturer shall be used. 12.3 Access to the start up procedure without a load, and the reading of the resulting values, shall be free or protected by the 1st level pw. 12.4 Indicating on the metrological booklet the values of interest read on the equipment.	No load friction values ≤ 500N		
13	Safety check.	13.1 The equipment must be CE marked and provided with instructions for use; in the case of approved and subsequently adapted brake testers, prior to the entry into force of the CE marking, the equipment must be adapted to the essential safety requirements. 13.2 Rollers shall not start up in the absence of a vehicle inside them. 13.3 The protectors shall be properly secured.			
14	Other checks				

Table 1	**Bottom Scale Minimum BRAKE Force**	**20 %**	**50 %**	**80 %**
APP + ADEG.	*40 000 N*	*8 000 N*	*20 000 N*	*32 000 N*

Table 2	**Bottom Scale Minimum WEIGHT Force**	**20 %**	**50 %**	**80 %**
APP + ADEG.	*57 100 N*	*11 420 N*	*28 550 N*	*45 680 N*

3. METROLOGICAL CONFIRMATION

2.4.1 The periodic verification provide for a series of visual and functional checks and a series of instrumental checks by means of a direct comparison of the equipment being tested and the relevant control tools, with the criteria laid down in Annex II.

2.4.2 The outcome of each functional checked or instrumental verification operation shall be attested by ticking the activity in the list ‘periodic verification’ of the metrological booklets.

2.4.3 After ticking the activities provided for, the final outcome of the verification (positive or negative) must be certified in the metrological booklet, and the authorised CSRPAD portal technician who carried out the operation must be identified, by means of a stamp, signature and registration (or equivalent digital systems).

2.4.4 A positive outcome certifies the metrological confirmation of the equipment, which may be used to continue carrying out vehicle roadworthiness tests (periodic verification).

TECHNICAL DATA SHEET NO 12	PLATE BRAKE TESTERS for vehicles up to 3.5 tonnes
Document type:	**TECHNICAL DATA SHEET**
Document code:	**12-PLATE_BRAKE TESTERS_CARS**
Equipment specifications:	**TYPE APPROVAL in accordance with Circular No 3997 / 604 of 6.9.1999 - New circular 88/95 as amended**.
Date of first issue:	31-05-2024
Roadworthiness test of:	**31-05-2024** | No 1
Written by:	
Verified by:	
Approved by:	

Roadworthiness test sheet			
Rev.	Date	Par.	Description of modifications
1	31-05-2024		Approval of the Plate brake tester sheet for vehicles up to 3.5 tonnes

Contents

1. DESCRIPTION OF EQUIPMENT

1.1 Description of equipment and parts thereof:

1.1.1 Brake tester: equipment for verifying the performance conditions of the braking devices of motor vehicles and trailers by measuring the braking force on each wheel (88/95 – Chapter I).

1.1.2 Plate: resistant friction surface that is not damaging for the tyres, connected to the load cells to carry out the measurements.

1.1.3 Load cell: a load cell connected to the plate for the measurement of the braking force and weight force.

1.1.4 Plate support: a frame on which plates are supported and the electronic devices of the equipment are housed.

1.1.5 Input speed detection system of the vehicle being tested: a system based on the detection of the time that elapses from the detection of the vehicle from the first to the second pair of plates.

1.1.6 Control pedal or lever force measurers: a dynamometer for the measurement of the force applied to the device of the vehicle being tested.

2 VERIFICATIONS

2.1. Preliminary Activities

2.1.1 Checking compliance with the manufacturer's instructions for use, both for workplace safety requirements and for the operational verification instructions.

2.1.2 Equipment identification check, using the identification plate which shall bear the type approval number and serial number assigned by the manufacturer

2.1.3 Checking the presence of the metrological booklet, which must be complete and legible.

2.1.4 Check the matching of the equipment plate data with data recorded in the metrological booklet.

2.1.5 Monitoring of environmental conditions required for the use of the equipment: 0 °C to 40 °C.

2.2. Initial Verification

The initial verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
2	General and functional checks.	2.1 General check and proper functioning of the equipment: e.g. plate intactness check, absence of deformations, absence of obstacles to perform the test, access ramps (if any) correctly positioned.			
3	Checking the coplanarity of the plates.	3.1 Checking that the instrumented plates are perfectly coplanar with each other. 3.2 Measurements shall be made between the external points of the two instrumented plate pairs (length, width and diagonal). 3.3 The result shall be within the manufacturer's specifications set out in the installation and use manual. 3.4 In the absence of manufacturer's indication, the result shall be within the maximum permissible error.	± 10 mm on linear mt.	Level	
4	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.	4.1 Instrument type verification. 4.2 Entering the specific sw function of the equipment, as required by the instructions for use. 4.3 Checking that the zero with no load is within the maximum permissible error. 4.4 Installing the dedicated "calibration bar" and appropriate measuring instruments. 4.5 Measurements shall be made at the points of 1 000 N, 3 000 N and 5 000 N of the braking forces per wheel. 4.6 Comparing the values reported by the equipment against standard values. 4.7 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 4.8 The values detected shall be within the maximum permissible error range.	Braking force: zero with no load ≤ 100 N. For braking force with values ≤ 2 500 N: ± 50 N; for values > 2 500 N: ≤ 2 %.	"Calibration bar" (anchorage system and levers). Masses or dynamometer	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
5	Verification of the repeatability per braking force and weight.	5.1 Instrument type verification. 5.2 Performing a consecutive series of tests with appropriate measuring instruments, under the same conditions, simulating a braking force. 5.3 In the absence of any other indication from the manufacturer, 5 measurements shall be carried out at the value of 3 000 N per brake force, and at the value of 6 000 N per wheel weight. 5.4 Comparing the values reported by the equipment against standard values. 5.5 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 5.6 The result of the different measurements must be within the maximum permissible error.	Repeatability of braking force: mean square deviation ≤ 2 %.	"Calibration bar" (anchorage system and levers). Masses or dynamometer	
6	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.	6.1 Instrument type verification. 6.2 Checking that the zero with no load is within the maximum permissible error. 6.3 Installing the dedicated "calibration bar" and appropriate measuring instruments on the plate. 6.4 The weighing test methodology must comply with the solutions provided by the manufacturer and/or applicable to the equipment (levers with weights, anchors with a dynamometer, crossbars or portals with a dynamometer). 6.5 Make measurements by weight at the points of 2 000 N, 6 000 N, 10 000 N per wheel (double axle). 6.6 Comparing the values reported by the equipment against standard values. 6.7 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 6.8 The values detected shall be within the maximum permissible error range.	Weight force: zero with no load ≤ 200 N. For weight force, with values ≤ 2 500 N: ± 50 N; for values > 2 500 N: ≤ 2 %.	"Calibration bar" (anchorage system and levers). Masses or dynamometer	
7	Checking the correctness of the initial vehicle speed	7.1 Checking the correct adjustment of sensors using a vehicle. 7.2 Carrying out a low speed test and ascertaining that the equipment signals insufficient speed.	≥ 10 km/h.		

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	measurement				
8	Checking the correct expression of braking performance.	8.1 At the end of the checks provided for in activities 4, 5, 6 and 10, carry out the roadworthiness test on a vehicle and check the correct expression of braking performance.			
9	Checking the correctness of the parameters set for alert thresholds.	9.1 Checking the correctness of the parameters set by the manufacturer. 9.2 Checking the set thresholds by reading the values of interest on the sw function of the equipment. 9.3 Readings of values shall be freely accessible or accessible via the 1st level pw.			
10	Verification of the linearity of pedal and manual force measurers	10.1 Instrument type verification. 10.2 Checking that the devices are intact and functioning correctly. 10.3 Place sample weights directly on the measurer or on the appropriate supports. 10.4 The measurements shall be made at the following points: pedal control at 100 N, 300 N and 500 N. manual control (parking) at 100 N, 300 N and 500 N. 10.5 Comparing the values reported by the equipment against standard values. 10.6 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 10.7 The result must be within the maximum permissible error.	For values $\leq$ 500 N: $\pm$ 10 N. for values > 500 N: $\leq$ 2 %	Masses	
11	Safety check.	11.1 The equipment must be CE marked and provided with instructions for use.			
12	Other checks.				

2.3. Periodic verification

The periodic verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.1 General check and proper functioning of the equipment: e.g. plate intactness check, absence of deformations, absence of obstacles to perform the test, access ramps (if any) correctly positioned			
3	Checking the coplanarity of the plates.	3.1 Checking that the instrumented plates are perfectly coplanar with each other. 3.2 Measurements shall be made between the external points of the two instrumented plate pairs (length, width and diagonal). 3.3 The result shall be within the manufacturer's specifications set out in the installation and use manual. 3.4 In the absence of manufacturer's indication, the result shall be within the maximum permissible error.	± 10 mm on linear mt.	Level	
4	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.	4.1 Instrument type verification. 4.2 Entering the specific sw function of the equipment, as required by the instructions for use. 4.3 Checking that the zero with no load is within the maximum permissible error. 4.4 Installing the dedicated "calibration bar" and appropriate measuring instruments.	Braking force: zero with no load ≤ 100 N. For braking force with values ≤ 2 500 N: ± 50 N; for values > 2 500 N: ≤ 2 %.	"Calibration bar" (anchorage system and levers). Masses or dynamometer	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		4.5 Measurements shall be made at the points of 1 000 N, 3 000 N and 5 000 N of the braking forces per wheel. 4.6 Comparing the values reported by the equipment against standard values. 4.7 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 4.8 The values detected shall be within the maximum permissible error range.			
5	Verification of the repeatability per braking force and weight.	5.1 Instrument type verification 5.2 Performing a consecutive series of tests with appropriate measuring instruments, under the same conditions, simulating a braking force. 5.3 In the absence of any other indication from the manufacturer, 5 measurements shall be carried out at the value of 3 000 N per brake force, and at the value of 6 000 N per wheel weight. 5.4 Comparing the values reported by the equipment against standard values. 5.5 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 5.6 The result of the different measurements must be within the maximum permissible error.	Repeatability of braking force: mean square deviation ≤ 2 %.	“Calibration bar” (anchorage system and levers). Masses or dynamometer .	
6	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.	6.1 Instrument type verification. 6.2 Checking that the zero with no load is within the maximum permissible error. 6.3 Installing the dedicated “calibration bar” and appropriate measuring instruments on the plate. 6.4 The weighing test methodology must comply with the solutions provided by the manufacturer and/or applicable to the equipment (levers with weights, anchors with a dynamometer, crossbars or portals with a dynamometer). 6.5 Make measurements by weight at the points of 2 000 N, 6 000 N, 10 000 N per wheel (double axle). 6.6 Comparing the values reported by the equipment against standard	Weight force: zero with no load ≤ 200 N. For weight force, with values ≤ 2 500 N: ± 50 N; for values > 2 500 N: ≤ 2 %.	“Calibration bar” (anchorage system and levers). Masses or dynamometer	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		values. 6.7 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 6.8 The values detected shall be within the maximum permissible error range.			
7	Checking the correctness of the initial vehicle speed measurement	7.1 Checking the correct adjustment of sensors using a vehicle. 7.2 Carrying out a low speed test and ascertaining that the equipment signals insufficient speed.	≥ 10 km/h.		
8	Checking the correct expression of braking performance.	8.1 At the end of the checks provided for in activities 4, 5, 6 and 10, carry out the roadworthiness test on a vehicle and check the correct expression of braking performance.			
9	Checking the correctness of the parameters set for alert thresholds.	9.1 Checking the correctness of the parameters set by the manufacturer. 9.2 Checking the set thresholds by reading the values of interest on the sw function of the equipment. 9.3 Readings of values shall be freely accessible or accessible via the 1st level pw.			
10	Verification of the linearity of pedal and manual force measurers	10.1 Instrument type verification. 10.2 Checking that the devices are intact and functioning correctly. 10.3 Place sample weights directly on the measurer or on the appropriate supports. 10.4 The measurements shall be made at the following points: pedal control at 100 N, 300 N and 500 N. manual control (parking) at 100 N, 300 N and 500 N. 10.5 Comparing the values reported by the equipment against standard values. 10.6 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 10.7 The result must be within the maximum permissible error.	For values ≤ 500 N: ± 10 N. for values > 500 N: ≤ 2 %	Masses	
11	Verification of the minimum grip also for	11.1 Instrument type verification. 11.2 Visually checking the plate	Wet plate grip: ≥ 0.6.	Mass Dynamometer	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	wet plates.	surface condition (no oil stains) and intactness of the coating surface. 11.3 Wetting the plate and positioning the sample instrument at the most worn point. 11.4 Identifying the values of the adhesion coefficient between the wheel and the plate. 11.5 The measurement shall be carried out on all plates instrumented by braking force.			
12	Safety check.	12.1 The equipment must be CE marked and provided with instructions for use.			
13	Other checks.				

3. METROLOGICAL CONFIRMATION

3.1.1 The initial and periodic verification provide for a series of visual and functional checks and a series of instrumental checks by means of a direct comparison of the equipment being tested and the relevant control tools, with the criteria laid down in Annex II.

3.1.2 The outcome of each functional checked or instrumental verification operation shall be attested by ticking the activity in the list ‘initial verification’ or ‘periodic verification’ of the metrological booklets.

3.1.3 After ticking the activities provided for, the final outcome of the verification (positive or negative) must be certified in the metrological booklet, and the authorised CSRPAD portal technician who carried out the operation must be identified, by means of a stamp, signature and registration (or equivalent digital systems).

A positive outcome certifies the metrological confirmation of the equipment, which may be used to start performing vehicle roadworthiness tests (initial verification) or to continue carrying out vehicle roadworthiness tests (periodic verification).

TECHNICAL DATA SHEET NO 13	PLATE BRAKE TESTERS for Mopeds and Motorcycles
Document type:	**TECHNICAL DATA SHEET**
Document code:	**13-PLATE_BRAKE TESTERS_MOTO**
Equipment specifications:	**TYPE APPROVAL in accordance with Circular 7938/604 of 29.9.2000**
Date of first issue:	31-05-2024
Roadworthiness test of:	**31-05-2024** | No 1
Written by:	
Verified by:	
Approved by:	

Roadworthiness test sheet			
Rev.	Date	Par.	Description of modifications
1	31-05-2024		Approval of the Plate brake testers for mopeds and motorcycles

Contents

1. DESCRIPTION OF EQUIPMENT

1.1 Description of equipment and parts thereof:

1.1.1 Brake tester: equipment for verifying the performance conditions of the braking devices of vehicles by measuring the braking force on each wheel.

1.1.2 Plate: resistant friction surface that is not damaging for the tyres, connected to the load cells to carry out the measurements.

1.1.3 Load cell: a load cell connected to the plate for the measurement of the braking force and weight force.

1.1.4 Plate support: a frame on which plates are supported and the electronic devices of the equipment are housed.

1.1.5 Input speed detection system of the vehicle being tested: a system based on the detection of the time that elapses from the detection of the vehicle from the first to the second plate.

1.1.6 Control pedal or lever force measurers: a dynamometer for the measurement of the force applied to the device of the vehicle being tested.

2 VERIFICATIONS

2.1. Preliminary Activities

2.1.1 Checking compliance with the manufacturer's instructions for use, both for workplace safety requirements and for the operational verification instructions.

2.1.2 Equipment identification check, using the identification plate which shall bear the type approval number and serial number assigned by the manufacturer

2.1.3 Checking the presence of the metrological booklet, which must be complete and legible.

2.1.4 Check the matching of the equipment plate data with data recorded in the metrological booklet.

2.1.5 Monitoring of environmental conditions required for the use of the equipment: 0 °C to 40 °C.

2.2. Initial Verification

The initial verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional	2.1 General check and proper functioning of the equipment: e.g.			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	checks.	plate intactness check, absence of deformations, absence of obstacles to perform the test, access ramps (if any) correctly positioned.			
3	Checking the coplanarity of the plates.	3.1 Checking that the instrumented plates are perfectly coplanar with each other. 3.2 Measurements shall be made between the external points of the two instrumented plates (length, width and diagonal). 3.3 The result shall be within the manufacturer's specifications set out in the installation and use manual. 3.4 In the absence of manufacturer's indication, the result shall be within the maximum permissible error.	± 10 mm on linear mt.	Level.	
4	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.	4.1 Instrument type verification. 4.2 Entering the specific sw function of the equipment, as required by the instructions for use. 4.3 Checking that the zero with no load is within the maximum permissible error. 4.4 Installing the dedicated "calibration bar" and appropriate measuring instruments. 4.5 Measurements shall be made at the points of 500 N, 1 000 N and 2 000 N of the braking forces per wheel. 4.6 Comparing the values reported by the equipment against standard values. 4.7 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 4.8 The values detected shall be within the maximum permissible error range.	Braking force: zero with no load ≤ 100 N. For braking force with values ≤ 1 000 N: ± 20 N; for values > 1 000 N: ≤ 2 %.	"Calibration bar" (anchorage system and levers). Masses or dynamometer	
5	Verification of the repeatability per braking	5.1 Instrument type verification 5.2 Performing a consecutive series of tests with appropriate measuring instruments, under the same conditions, simulating a braking	Repeatability of braking force and weight force: mean square deviation	"Calibration bar" (anchorage system and levers).	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	force and weight.	force. 5.3 In the absence of any other indication from the manufacturer, 5 measurements shall be carried out at the value of 1 000 N per brake force and at the value of 2 000 N per weight force. 5.4 Comparing the values reported by the equipment against standard values. 5.5 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 5.6 The result of the different measurements must be within the maximum permissible error.	≤ 2 %	Masses or dynamometer .	
6	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.	6.1 Instrument type verification. 6.2 Checking that the zero with no load is within the maximum permissible error. 6.3 Installing the dedicated “calibration bar” and appropriate measuring instruments on the plate. 6.4 The weighing test methodology must comply with the solutions provided by the manufacturer and/or applicable to the equipment (levers with weights, anchors with a dynamometer, crossbars or portals with a dynamometer). 6.5 Make measurements by weight at the points of 1 000 N, 2 000 N, 3 000 N per wheel (double axle). 6.6 Comparing the values reported by the equipment against standard values. 6.7 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 6.8 The values detected shall be within the maximum permissible error range.	Weight force: zero with no load ≤ 100 N. For weight force with values ≤ 1 000 N: ± 20 N; for values > 1 000 N: ≤ 2 %.	“Calibration bar” (anchorage system and levers). Masses or dynamometer	
7	Checking the correctness of the initial vehicle speed measurement	7.1 Checking the correct adjustment of sensors using a vehicle. 7.2 Carrying out a low speed test and ascertaining that the equipment signals insufficient speed.	≥ 7 km/h.		
8	Checking the correct expression of braking performance.	8.1 At the end of the checks provided for in activities 4, 5, 6 and 10, carry out the roadworthiness test on a vehicle and check the correct expression of braking performance.			
9	Checking the	9.1 Checking the correctness of the			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	correctness of the parameters set for alert thresholds.	parameters set by the manufacturer. 9.2 Checking the set thresholds by reading the values of interest on the sw function of the equipment. 9.3 Readings of values shall be freely accessible or accessible via the 1st level pw.			
10	Verification of the linearity of pedal and lever force measurers.	10.1 Instrument type verification. 10.2 Checking that the devices are intact and functioning correctly. 10.3 Place sample weights directly on the measurer or on the appropriate supports. 10.4 The measurements shall be made at the following points: pedal control at 100 N, 300 N and 500 N. lever control: at 100 N, 200 N. 10.5 Comparing the values reported by the equipment against standard values 10.6 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 10.7 The result must be within the maximum permissible error.	Lever and pedal control: for values $\leq$ 500 N: $\pm$ 10 N; for values > 500 N: $\leq$ 2 %	Masses	
11	Safety check.	11.1 The equipment must be CE marked and provided with instructions for use.			
12	Other checks.				

2.3. Periodic verification

The periodic verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.2 General check and proper functioning of the equipment: e.g. plate intactness check, absence of deformations, absence of obstacles to perform the test, access ramps (if any) correctly positioned.			
3	Checking the coplanarity of the plates.	3.1 Checking that the instrumented plates are perfectly coplanar with each other. 3.2 Measurements shall be made between the external points of the two instrumented plates (length, width and diagonal). 3.3 The result shall be within the manufacturer's specifications set out in the installation and use manual. 3.4 In the absence of manufacturer's indication, the result shall be within the maximum permissible error.	± 10 mm on linear mt.	Level.	
4	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.	4.1 Instrument type verification. 4.2 Entering the specific sw function of the equipment, as required by the instructions for use. 4.3 Checking that the zero with no load is within the maximum permissible error. 4.4 Installing the dedicated "calibration bar" and appropriate measuring instruments. 4.5 Measurements shall be made at	Braking force: zero with no load ≤ 100 N. For braking force with values ≤ 1 000 N: ± 20 N; for values > 1000 N: ≤ 2 %.	"Calibration bar" (anchorage system and levers). Masses or dynamometer	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		the points of 500 N, 1 000 N and 2 000 N of the braking forces per wheel. 4.6 Comparing the values reported by the equipment against standard values. 4.7 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 4.8 The values detected shall be within the maximum permissible error range.			
5	Verification of the repeatability per braking force and weight.	5.1 Instrument type verification 5.2 Performing a consecutive series of tests with appropriate measuring instruments, under the same conditions, simulating a braking force. 5.3 In the absence of any other indication from the manufacturer, 5 measurements shall be carried out at the value of 1 000 N per brake force and at the value of 2 000 N per weight force. 5.4 Comparing the values reported by the equipment against standard values. 5.5 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 5.6 The result of the different measurements must be within the maximum permissible error.	Repeatability of braking force and weight force: mean square deviation ≤ 2 %	"Calibration bar" (anchorage system and levers). Masses or dynamometer	
6	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.	6.1 Instrument type verification. 6.2 Checking that the zero with no load is within the maximum permissible error. 6.3 Installing the dedicated "calibration bar" and appropriate measuring instruments on the plate. 6.4 The weighing test methodology must comply with the solutions provided by the manufacturer and/or applicable to the equipment (levers with weights, anchors with a dynamometer, crossbars or portals with a dynamometer). 6.5 Make measurements by weight at the points of 1 000 N, 2 000 N, 3 000 N per wheel (double axle). 6.6 Comparing the values reported by the equipment against standard	Weight force: zero with no load ≤ 100 N. For weight force with values ≤ 1000 N: ± 20 N; for values > 1000 N: ≤ 2 %.	"Calibration bar" (anchorage system and levers). Masses or dynamometer.	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		values. 6.7 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 6.8 The values detected shall be within the maximum permissible error range.			
7	Checking the correctness of the initial vehicle speed measurement	7.1 Checking the correct adjustment of sensors using a vehicle. 7.2 Carrying out a low speed test and ascertaining that the equipment signals insufficient speed.	≥ 7 km/h.		
8	Checking the correct expression of braking performance.	8.1 At the end of the checks provided for in activities 4, 5, 6 and 10, carry out the roadworthiness test on a vehicle and check the correct expression of braking performance.			
9	Checking the correctness of the parameters set for alert thresholds.	9.1 Checking the correctness of the parameters set by the manufacturer. 9.2 Checking the set thresholds by reading the values of interest on the sw function of the equipment. 9.3 Readings of values shall be freely accessible or accessible via the 1st level pw.			
10	Verification of the linearity of pedal and lever force measurers.	10.1 Instrument type verification. 10.2 Checking that the devices are intact and functioning correctly. 10.3 Place sample weights directly on the measurer or on the appropriate supports. 10.4 The measurements shall be made at the following points: pedal control at 100 N, 300 N and 500 N. lever control: at 100 N, 200 N. 10.5 Comparing the values reported by the equipment against standard values 10.6 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 10.7 The result must be within the maximum permissible error.	Lever and pedal control: for values ≤ 500 N: ± 10 N; for values > 500 N: ≤ 2 %	Masses.	
11	Verification of the minimum grip also for	11.1 Instrument type verification. 11.2 Visually checking the plate surface condition (no oil stains)	Wet plate grip: ≥ 0.6.	Masses or dynamomete	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	wet plates.	and intactness of the coating surface. 11.3 Wetting the plate and positioning the sample instrument at the most worn point. 11.4 Identifying the values of the adhesion coefficient between the wheel and the plate. 11.5 The measurement shall be carried out on all plates instrumented by braking force.		r	
12	Safety check.	12.1 The equipment must be CE marked and provided with instructions for use.			
13	Other checks.				

3. METROLOGICAL CONFIRMATION

3.1.1 The initial and periodic verification provide for a series of visual and functional checks and a series of instrumental checks by means of a direct comparison of the equipment being tested and the relevant control tools, with the criteria laid down in Annex II.

3.1.2 The outcome of each functional checked or instrumental verification operation shall be attested by ticking the activity in the list ‘initial verification’ or ‘periodic verification’ of the metrological booklets.

3.1.3 After ticking the activities provided for, the final outcome of the verification (positive or negative) must be certified in the metrological booklet, and the authorised CSRPAD portal technician who carried out the operation must be identified, by means of a stamp, signature and registration (or equivalent digital systems).

A positive outcome certifies the metrological confirmation of the equipment, which may be used to start performing vehicle roadworthiness tests (initial verification) or to continue carrying out vehicle roadworthiness tests (periodic verification).

TECHNICAL DATA SHEET NO 14	PLATE BRAKE TESTERS for light vehicles < 3.5 tonnes + est. 3-4 wheels
Document type:	**TECHNICAL DATA SHEET**
Document code:	**14-PLATE_BRAKE TESTERS_CARS+3-4 WHEELS**
Equipment specifications:	**TYPE APPROVAL in accordance with Circular No 3997 / 604 of 6.9.1999 - New circular 88/95 as amended. + Circular 1603/404 of 8.10.2001**
Date of first issue:	31-05-2024
Roadworthiness test of:	**31-05-2024** | No 1
Written by:	
Verified by:	
Approved by:	

Roadworthiness test sheet			
Rev.	Date	Par.	Description of modifications
1	31-05-2024		Approval of Plate brake testers for light vehicles < 3.5 tonnes + est. 3-4 wheels

Contents

1. DESCRIPTION OF EQUIPMENT

1.1 Description of equipment and parts thereof:

1.1.1 Brake tester: equipment for verifying the performance conditions of the braking devices of motor vehicles and trailers by measuring the braking force on each wheel.

1.1.2 Plate: resistant friction surface that is not damaging for the tyres, connected to the load cells to carry out the measurements.

1.1.3 Load cell: a load cell connected to the plate for the measurement of the braking force and weight force.

1.1.4 Plate support: a frame on which plates are supported and the electronic devices of the equipment are housed.

1.1.5 Input speed detection system of the vehicle being tested: a system based on the measurement of the time that elapses from the detection of the vehicle between the first and the second plate.

1.1.6 Control pedal or lever force measurers: a dynamometer for the measurement of the force applied to the device of the vehicle being tested.

2 VERIFICATIONS

2.1. Preliminary Activities

2.1.1 Checking compliance with the manufacturer's instructions for use, both for workplace safety requirements and for the operational verification instructions.

2.1.2 Equipment identification check, using the identification plate which shall bear the type approval number and serial number assigned by the manufacturer

2.1.3 Checking the presence of the metrological booklet, which must be complete and legible.

2.1.4 Check the matching of the equipment plate data with data recorded in the metrological booklet.

2.1.5 Monitoring of environmental conditions required for the use of the equipment: 0 °C to 40 °C.

2.2. Initial Verification

The initial verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	tampering.	equipment.			
2	General and functional checks.	2.1 General check and proper functioning of the equipment: e.g. plate intactness check, absence of deformations, absence of obstacles to perform the test, access ramps (if any) correctly positioned.			
3	Checking the coplanarity of the plates.	3.1 Checking that the instrumented plates are perfectly coplanar with each other. 3.2 Measurements shall be made between the external points of the two instrumented plate pairs (length, width and diagonal). 3.3 The result shall be within the manufacturer's specifications set out in the installation and use manual. 3.4 In the absence of manufacturer's indication, the result shall be within the maximum permissible error.	± 10 mm on linear mt.	Level	
4	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.	4.1 Instrument type verification. 4.2 Entering the specific sw function of the equipment, as required by the instructions for use. 4.3 Checking that the zero with no load is within the maximum permissible error. 4.4 Installing the dedicated "calibration bar" and appropriate measuring instruments. 4.5 Measurements shall be made at the points of 500 N, 1 000 N, 2 000 N, 3 000 N and 5 000 N of the braking forces per wheel. 4.6 Comparing the values reported by the equipment against standard values. 4.7 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 4.8 The values detected shall be within the maximum permissible error range.	Braking force: zero with no load ≤ 100 N. For braking force with values ≤ 1 000 N: ± 20 N; for values > 1 000 N: ≤ 2 %.	"Calibration bar" (anchorage system and levers). Masses or Dynamometer.	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
5	Verification of the repeatability per braking force and weight.	5.1 Instrument type verification. 5.2 Performing a consecutive series of tests with appropriate measuring instruments, under the same conditions, simulating a braking force. 5.3 In the absence of any other indication from the manufacturer, 5 measurements shall be carried out at the value of 3 000 N per brake force and at the value of 6 000 N per weight force. 5.4 Comparing the values reported by the equipment against standard values. 5.5 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 5.6 The result of the different measurements must be within the maximum permissible error.	Repeatability of braking force and weight force: mean square deviation ≤ 2 %	"Calibration bar" (anchorage system and levers). Masses or Dynamometer	
6	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.	6.1 Instrument type verification. 6.2 Checking that the zero with no load is within the maximum permissible error. 6.3 Installing the dedicated "calibration bar" and appropriate measuring instruments on the plate. 6.4 The weighing test methodology must comply with the solutions provided by the manufacturer and/or applicable to the equipment (levers with weights, anchors with a dynamometer, crossbars or portals with a dynamometer). 6.5 Make measurements by weight at the points of 1 000 N, 2 000 N, 3 000 N, 6 000 N, 10 000 N per wheel (twice per axle). 6.6 Comparing the values reported by the equipment against standard values. 6.7 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 6.8 The values detected shall be within the maximum permissible error range.	Weight force: zero with no load ≤ 100 N. For weight force with values ≤ 1 000 N: ± 20 N; for values > 1 000 N: ≤ 2 %.	"Calibration bar" (anchorage system and levers). Masses or Dynamometer	
7	Checking the correctness of the initial vehicle speed measurement	7.1 Checking the correct adjustment of sensors using a vehicle. 7.2 Carrying out a low speed test and ascertaining that the equipment signals insufficient speed.	≥ 7 km/h for motorcycles; ≥ 10 km/h for motor vehicles.		

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
8	Checking the correct expression of braking performance.	8.1 At the end of the checks provided for in activities 4, 5, 6 and 10, carry out the roadworthiness test on a vehicle and check the correct expression of braking performance.			
9	Checking the correctness of the parameters set for alert thresholds.	9.1 Checking the correctness of the parameters set by the manufacturer. 9.2 Checking the set thresholds by reading the values of interest on the sw function of the equipment. 9.3 Readings of values shall be freely accessible or accessible via the 1st level pw.			
10	Verification of the linearity of pedal, manual and lever force measurers.	10.1 Instrument type verification. 10.2 Checking that the devices are intact and functioning correctly. 10.3 Place sample weights directly on the measurer or on the appropriate supports. 10.4 The measurements shall be made at the following points: pedal control at 100 N, 300 N and 500 N. lever control at 100 N, 200 N; manual control (parking) at 100 N, 300 N and 500 N. 10.5 Comparing the values reported by the equipment against standard values 10.6 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 10.7 The result must be within the maximum permissible error.	Lever, manual and pedal control: for values $\leq$ 500 N: $\pm$ 10 N; for values > 500 N: $\leq$ 2 %	Masses	
11	Safety check.	11.1 The equipment must be CE marked and provided with instructions for use.			
12	Other checks.				

2.3. Periodic verification

The periodic verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.1 General check and proper functioning of the equipment: e.g. plate intactness check, absence of deformations, absence of obstacles to perform the test, access ramps (if any) correctly positioned.			
3	Checking the coplanarity of the plates.	3.1 Checking that the instrumented plates are perfectly coplanar with each other. 3.2 Measurements shall be made between the external points of the two instrumented plate pairs (length, width and diagonal). 3.3 The result shall be within the manufacturer's specifications set out in the installation and use manual. 3.4 In the absence of manufacturer's indication, the result shall be within the maximum permissible error.	± 10 mm on linear mt.	Level	
4	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.	4.1 Instrument type verification. 4.2 Entering the specific sw function of the equipment, as required by the instructions for use. 4.3 Checking that the zero with no load is within the maximum permissible error. 4.4 Installing the dedicated "calibration bar" and appropriate measuring instruments. 4.5 Measurements shall be made at the	Braking force: zero with no load ≤ 100 N. For braking force with values ≤ 1 000 N: ± 20 N; for values > 1 000 N: ≤ 2 %.	"Calibration bar" (anchorage system and levers). Masses or Dynamometer	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		points of 500 N, 1 000 N, 2 000 N, 3 000 N and 5 000 N of the braking forces per wheel. 4.6 Comparing the values reported by the equipment against standard values. 4.7 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 4.8 The values detected shall be within the maximum permissible error range.			
5	Verification of the repeatability per braking force and weight.	5.1 Instrument type verification. 5.2 Performing a consecutive series of tests with appropriate measuring instruments, under the same conditions, simulating a braking force. 5.3 In the absence of any other indication from the manufacturer, 5 measurements shall be carried out at the value of 3 000 N per brake force and at the value of 6 000 N per weight force. 5.4 Comparing the values reported by the equipment against standard values. 5.5 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 5.6 The result of the different measurements must be within the maximum permissible error.	Repeatability of braking force and weight force: mean square deviation ≤ 2 %	"Calibration bar" (anchorage system and levers). Masses or Dynamometer	
6	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.	6.1 Instrument type verification. 6.2 Checking that the zero with no load is within the maximum permissible error. 6.3 Installing the dedicated "calibration bar" and appropriate measuring instruments on the plate. 6.4 The weighing test methodology must comply with the solutions provided by the manufacturer and/or applicable to the equipment (levers with weights, anchors with a dynamometer, crossbars or portals with a dynamometer). 6.5 Make measurements by weight at the points of 1 000 N, 2 000 N, 3 000 N, 6 000 N, 10 000 N per wheel (twice per axle). 6.6 Comparing the values reported by the equipment against standard values.	Weight force: zero with no load ≤ 100 N. For weight force with values ≤ 1000 N: ± 20 N; for values > 1000 N: ≤ 2 %.	"Calibration bar" (anchorage system and levers). Masses or Dynamometer	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		6.7 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 6.8 The values detected shall be within the maximum permissible error range.			
7	Checking the correctness of the initial vehicle speed measurement	7.1 Checking the correct adjustment of sensors using a vehicle. 7.2 Carrying out a low speed test and ascertaining that the equipment signals insufficient speed.	≥ 7 km/h for motorcycles; ≥ 10 km/h for motor vehicles.		
8	Checking the correct expression of braking performance.	8.1 At the end of the checks provided for in activities 4, 5, 6 and 10, carry out the roadworthiness test on a vehicle and check the correct expression of braking performance.			
9	Checking the correctness of the parameters set for alert thresholds.	9.1 Checking the correctness of the parameters set by the manufacturer. 9.2 Checking the set thresholds by reading the values of interest on the sw function of the equipment. 9.3 Readings of values shall be freely accessible or accessible via the 1st level pw.			
10	Verification of the linearity of pedal, manual and lever force measurers.	10.1 Instrument type verification. 10.2 Checking that the devices are intact and functioning correctly. 10.3 Place sample weights directly on the measurer or on the appropriate supports. 10.4 The measurements shall be made at the following points: pedal control at 100 N, 300 N and 500 N. lever control at 100 N, 200 N; manual control (parking) at 100 N, 300 N and 500 N. 10.5 Comparing the values reported by the equipment against standard values 10.6 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 10.7 The result must be within the maximum permissible error.	Lever, manual and pedal control: for values $\leq$ 500 N: $\pm$ 10 N; for values > 500 N: $\leq$ 2 %	Masses	
11	Verification of the minimum grip also for wet plates.	11.1 Instrument type verification. 11.2 Visually checking the plate surface condition (no oil stains) and intactness of the coating surface. 11.3 Wetting the plate and positioning	Wet plate grip: ≥ 0.6.	Masses or Dynamometer	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		the sample instrument at the most worn point. 11.4 Identifying the values of the adhesion coefficient between the wheel and the plate. 11.5 The measurement shall be carried out on all plates instrumented by braking force.			
12	Safety check.	12.1 The equipment must be CE marked and provided with instructions for use.			
13	Other checks.				

3. METROLOGICAL CONFIRMATION

3.1.1 The initial and periodic verification provide for a series of visual and functional checks and a series of instrumental checks by means of a direct comparison of the equipment being tested and the relevant control tools, with the criteria laid down in Annex II.

3.1.2 The outcome of each functional checked or instrumental verification operation shall be attested by ticking the activity in the list ‘initial verification’ or ‘periodic verification’ of the metrological booklets.

3.1.3 After ticking the activities provided for, the final outcome of the verification (positive or negative) must be certified in the metrological booklet, and the authorised CSRPAD portal technician who carried out the operation must be identified, by means of a stamp, signature and registration (or equivalent digital systems).

3.1.4 A positive outcome certifies the metrological confirmation of the equipment, which may be used to start performing vehicle roadworthiness tests (initial verification) or to continue carrying out vehicle roadworthiness tests (periodic verification).

TECHNICAL DATA SHEET NO 15	PLATE BRAKE TESTERS Vehicles with a maximum overall mass ≥ 3.5 t.
Document type:	**TECHNICAL DATA SHEET**
Document code:	**15-PLATE_BRAKE TESTERS_HEAVY_PLATES**
Equipment specifications:	**TYPE APPROVAL in accordance with Circular 1699/404 of 7.9.2005**
Date of first issue:	31-05-2024
Roadworthiness test of:	**31-05-2024** | No 1
Written by:	
Verified by:	
Approved by:	

Roadworthiness test sheet			
Rev.	Date	Par.	Description of modifications
1	31-05-2024		Approval of Plate brake testers for vehicles with a maximum overall mass ≥ 3.5 t

Contents

1. DESCRIPTION OF EQUIPMENT

1.1 Description of equipment and parts thereof:

1.1.1 Brake tester: equipment for verifying the performance conditions of the braking devices of vehicles with a mass exceeding 3.5 tonnes and their trailers, by measuring the braking force on each wheel.

1.1.2 Plate: resistant friction surface that is not damaging for the tyres, connected to the load cells to carry out the measurements.

1.1.3 Load cell: a load cell connected to the plate for the measurement of the braking force and weight force.

1.1.4 Plate support: a frame on which plates are supported and the electronic devices of the equipment are housed.

1.1.5 Input vehicle speed detection system for the vehicle being tested: a system based on special speed detection instrumentation (specific for small plates).

1.1.6 Control pedal or lever force measurers: a dynamometer for the measurement of the force applied to the device of the vehicle being tested.

2 VERIFICATIONS

2.1. Preliminary Activities

2.1.1 Checking compliance with the manufacturer's instructions for use, both for workplace safety requirements and for the operational verification instructions.

2.2.2 Equipment identification check, using the identification plate which shall bear the type approval number and serial number assigned by the manufacturer

2.2.3 Checking the presence of the metrological booklet, which must be complete and legible.

2.2.4 Check the matching of the equipment plate data with data recorded in the metrological booklet.

2.2.5 Monitoring of environmental conditions required for the use of the equipment: 0 °C to 40 °C.

2.2. Initial Verification

The initial verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
2	General and functional checks.	2.1 General check and proper functioning of the equipment: e.g. plate intactness check, absence of deformations, absence of obstacles to perform the test, access ramps (if any) correctly positioned.			
3	Checking the coplanarity of the plates-	3.1 Checking that the instrumented plates are perfectly coplanar with each other. 3.2 Measurements shall be made between the external points of the furthest instrumented plate pairs (length, width and diagonal). 3.3 The result shall be within the manufacturer's specifications set out in the installation and use manual. 3.4 In the absence of manufacturer's indication, the result shall be within the maximum permissible error.	± 50 mm on the total test track and instrumented plates.	Level	
4	Checking the dimensions of the plates and the dimensional constraints of the vehicles declared compatible with the configuration being tested.	4.1 Checking the dimensions of plates and items on the metrological booklet, for the correct identification of the dimensional constraints of vehicles declared compatible with the configuration of the equipment: - number of axles; - dimensions of the vehicles, for which the equipment itself is to be regarded as suitable: diameter of wheels being tested, distances between the axles (wheelbase), carriageways (minimum and maximum). instructions for use and in the metrological booklet.			
5	Checking the maximum permissible error at zero (empty) and linearity verification per plate brake force.	5.1 Instrument type verification. 5.2 Entering the specific sw function of the equipment, as required by the instructions for use. 5.3 Per braking force, verify that the zero with no load is within the maximum permissible error. 5.4 Installing a dedicated "calibration bar" and appropriate measurement	Braking force: zero with no load ≤ 400 N. Braking force: ± 100 N for values ≤ 5.0 kN; ≤ 2 % for values > 5 kN	"Calibration bar" (anchoring system, levers or thrust systems). Masses or Dynamometer.	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		instruments and resetting the values to zero. 5.5 Measurements shall be made at the prescribed braking force values, SEE TABLE 1. 5.6 Comparing the values reported by the equipment against standard values. 5.7 Readings of values by the equipment shall be freely accessible or protected by the 1st level pw. 5.8 The values detected shall be within the maximum permissible error range 5.9 Operations to be repeated on each instrumented plate to detect braking force.			
6	Verification of the repeatability per braking force and weight.	6.1 Instrument type verification 6.2 Performing a consecutive series of tests with appropriate measuring instruments, under the same conditions, simulating a braking force. 6.3 In the absence of any other indication from the manufacturer, make 5 measurements at the intermediate braking force value in description 5. 6.4 Comparing the values reported by the equipment against standard values. 6.5 Readings of values by the equipment shall be freely accessible or protected by the 1st level pw. 6.6 The result must be within the maximum permissible error.	Repeatability of braking force: mean square deviation ≤ 2 %	“Calibration bar” (anchoring system, levers or thrust systems). Masses or Dynamometer	
7	Checking the maximum permissible error at zero (empty) and linearity verification per plate weight force.	7.1 Instrument type verification. 7.2 Entering the specific sw function of the equipment, as required by the instructions for use. 7.3 Per weight force, verify that the zero with no load is within the maximum permissible error. 7.4 Installing a dedicated “calibration bar” and appropriate measurement instruments and resetting the values to zero. 7.5 Measurements shall be made at the prescribed weight force values, SEE	Weight force: zero with no load ≤ 650 N. Weight force; for values < 7.5 KN: ± 150 N; for values > 7.5 KN: ≤ 2 %.	“Calibration bar” (anchoring system, levers or thrust systems). Masses or Dynamometer	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		TABLE 2. 7.6 Comparing the values reported by the equipment against standard values. 7.7 Readings of values by the equipment shall be freely accessible or protected by the 1st level pw. 7.8 The values detected shall be within the maximum permissible error range 7.9 Operations to be repeated on each instrumented plate to detect weight force.			
8	Checking acceptability thresholds.	8.1 Checking the correctness of thresholds used by the equipment's sw program (efficiency, imbalance, etc.). 8.2 Checking the thresholds by reading the values of interest on the sw function of the equipment. 8.3 Readings of values shall be freely accessible or accessible via the 1st level pw.			
9	Checking the correctness of the initial vehicle speed measurement.	9.1 Checking the correct adjustment of sensors using a vehicle. 9.2 Carrying out a low speed test and ascertaining that the equipment signals insufficient speed.	≥ 10 km/h for vehicles > 3.5 tonnes.		
10	Checking the correctness of the parameters set for alert thresholds.	10.1 Checking the correctness of the parameters set by the manufacturer. 10.2 Checking the set thresholds by reading the values of interest on the sw function of the equipment. 10.3 Readings of values shall be freely accessible or accessible via the 1st level pw.			
11	Safety check.	11.1 The equipment must be CE marked and provided with instructions for use.			
12	Checking the correct expression of braking performance.	12.1 At the end of the checks provided for in activities 5, 6, 7 and 13, carry out the roadworthiness test on a vehicle and check the correct expression of braking performance.			
13	Verification of the linearity of	13.1 Instrument type verification. 13.2 Checking that the devices are intact and functioning correctly.	For values ≤ 500 N: ± 10 N; for values >	Masses	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	pedal and manual force measurers.	13.3 Place sample weights directly on the measurer or on the appropriate supports. 13.4 The measurements shall be made at the following points: pedal control at 100 N, 300 N, 500 N and 800 N; manual control (parking) at 100 N, 300 N, 500 N, 800 N. 13.5 Comparing the values reported by the equipment against standard values. 13.6 Readings of values by the equipment shall be freely accessible or protected by the 1st level pw. 13.7 The values detected shall be within the maximum permissible error range.	500 N: ≤ 2 %.		
14	Other checks.				

2.3. Periodic verification

The periodic verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.2 General check and proper functioning of the equipment: e.g. plate intactness check, absence of deformations, absence of obstacles to perform the test, access ramps (if any) correctly positioned.			
3	Checking the coplanarity of the plates-	3.1 Checking that the instrumented plates are perfectly coplanar with each other. 3.2 Measurements shall be made between the external points of the furthest instrumented plate pairs	± 50 mm on the total test track and instrumented plates.	Level.	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		(length, width and diagonal). 3.3 The result shall be within the manufacturer's specifications set out in the installation and use manual. 3.4 In the absence of manufacturer's indication, the result shall be within the maximum permissible error.			
4	Checking the dimensions of the plates and the dimensional constraints of the vehicles declared compatible with the configuration being tested.	4.1 Checking the dimensions of plates and items on the metrological booklet, for the correct identification of the dimensional constraints of vehicles declared compatible with the configuration of the equipment: - number of axles; - dimensions of the vehicles, for which the equipment itself is to be regarded as suitable: diameter of wheels being tested, distances between the axles (wheelbase), carriageways (minimum and maximum). instructions for use and in the metrological booklet.			
5	Checking the maximum permissible error at zero (empty) and linearity verification per plate brake force.	5.1 Instrument type verification. 5.2 Entering the specific sw function of the equipment, as required by the instructions for use. 5.3 Per braking force, verify that the zero with no load is within the maximum permissible error. 5.4 Installing a dedicated "calibration bar" and appropriate measurement instruments and resetting the values to zero. 5.5 Measurements shall be made at the prescribed braking force values, SEE TABLE 1. 5.6 Comparing the values reported by the equipment against standard values. 5.7 Readings of values by the equipment shall be freely accessible	Braking force: zero with no load ≤ 400 N. Braking force: ± 100 N for values ≤ 5.0 kN; ≤ 2 % for values > 5 kN	"Calibration bar" (anchoring system, levers or thrust systems). Masses or Dynamometer .	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		or protected by the 1st level pw. 5.8 The values detected shall be within the maximum permissible error range 5.9 Operations to be repeated on each instrumented plate to detect braking force.			
6	Verification of the repeatability per braking force and weight.	6.1 Instrument type verification 6.2 Performing a consecutive series of tests with appropriate measuring instruments, under the same conditions, simulating a braking force. 6.3 In the absence of any other indication from the manufacturer, make 5 measurements at the intermediate braking force value in description 5. 6.4 Comparing the values reported by the equipment against standard values. 6.5 Readings of values by the equipment shall be freely accessible or protected by the 1st level pw. 6.6 The result must be within the maximum permissible error.	Repeatability of braking force: mean square deviation ≤ 2 %	"Calibration bar" (anchoring system, levers or thrust systems). Masses or Dynamometer	
7	Checking the maximum permissible error at zero (empty) and linearity verification per plate weight force.	7.1 Instrument type verification. 7.2 Entering the specific sw function of the equipment, as required by the instructions for use. 7.3 Per weight force, verify that the zero with no load is within the maximum permissible error. 7.4 Installing a dedicated "calibration bar" and appropriate measurement instruments and resetting the values to zero. 7.5 Measurements shall be made at the prescribed weight force values, SEE TABLE 2. 7.6 Comparing the values reported by the equipment against standard values. 7.7 Readings of values by the equipment shall be freely accessible or protected by the 1st level pw. 7.8 The values detected shall be within the maximum permissible error range 7.9 Operations to be repeated on each instrumented plate to detect weight force.	Weight force: zero with no load ≤ 650 N. Weight force; for values < 7.5 KN: ± 150 N; for values > 7.5 KN: ≤ 2 %.	"Calibration bar" (anchoring system, levers or thrust systems). Masses or Dynamometer	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
8	Verification of the minimum grip also for wet plates.	8.1 Instrument type verification. 8.2 Visually checking the plate surface condition (no oil stains) and intactness of the coating surface. 8.3 Wetting the plate and positioning the sample instrument at the most worn point. 8.4 Identifying the values of the adhesion coefficient between the wheel and the plate. 8.5 The measurement shall be carried out on all plates instrumented by braking force. 8.6 The results of the measurement shall be within the maximum permissible error.	Wet plate grip: ≥ 0.6.	Masses or Dynamometer	
9	Checking acceptability thresholds.	9.1 Checking the correctness of thresholds used by the equipment's sw program (efficiency, imbalance, etc.). 9.2 Checking the thresholds by reading the values of interest on the sw function of the equipment. 9.3 Readings of values shall be freely accessible or accessible via the 1st level pw.			
10	Checking the correctness of the initial vehicle speed measurement.	10.1 Checking the correct adjustment of sensors using a vehicle. 10.2 Carrying out a low speed test and ascertaining that the equipment signals insufficient speed.	≥ 10 km/h for vehicles > 3.5 tonnes;		
11	Checking the correctness of the parameters set for alert thresholds.	11.1 Checking the correctness of the parameters set by the manufacturer. 11.2 Checking the set thresholds by reading the values of interest on the sw function of the equipment. 11.3 Readings of values shall be freely accessible or accessible via the 1st level pw.			
12	Safety check.	12.1 The equipment must be CE marked and provided with instructions for use.			
13	Checking the correct expression of braking	13.1 At the end of the checks provided for in activities 5, 6, 7 and 14, carry out the roadworthiness test on a vehicle and check the correct expression of braking performance.			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	performance.				
14	Verification of the linearity of pedal and manual force measurers.	14.1 Instrument type verification. 14.2 Checking that the devices are intact and functioning correctly. 14.3 Place sample weights directly on the measurer or on the appropriate supports. 14.4 The measurements shall be made at the following points: pedal control at 100 N, 300 N, 500 N and 800 N; manual control (parking) at 100 N, 300 N, 500 N, 800 N. 14.5 Comparing the values reported by the equipment against standard values. 14.6 Readings of values by the equipment shall be freely accessible or protected by the 1st level pw. 14.7 The values detected shall be within the maximum permissible error range.	For values $\leq$ 500 N: $\pm$ 10 N; for values > 500 N: $\leq$ 2 %.	Masses	
15	Other checks.				

Table 1	Bottom Scale Minimum BRAKE Force	20 %	50 %	80 %
	45 500 N	*9 100 N*	*22 750 N*	*36 400 N*

Table 2	Bottom Scale Minimum WEIGHT Force	20 %	50 %	80 %
	65 000 N	*13 000 N*	*32 500 N*	*52 000 N*

3. METROLOGICAL CONFIRMATION

3.1.1 The initial and periodic verification provide for a series of visual and functional checks and a series of instrumental checks by means of a direct comparison of the equipment being tested and the relevant control tools, with the criteria laid down in Annex II.

3.1.2 The outcome of each functional checked or instrumental verification operation shall be attested by ticking the activity in the list ‘initial verification’ or ‘periodic verification’ of the metrological booklets.

3.1.3 After ticking the activities provided for, the final outcome of the verification (positive or negative) must be certified in the metrological booklet, and the authorised CSRPAD portal technician who carried out the operation must be identified, by means of a stamp, signature and registration (or equivalent digital systems).

3.1.4 A positive outcome certifies the metrological confirmation of the equipment, which may be used to start performing vehicle roadworthiness tests (initial verification) or to continue carrying out vehicle roadworthiness tests (periodic verification).

TECHNICAL DATA SHEET NO 16	WEAR TESTERS
Document type:	**TECHNICAL DATA SHEET**
Document code:	**16-Wear Testers_CARS**
Equipment specifications:	**TYPE APPROVAL in accordance with Circular No 3997 / 604 of 6.9.1999 - New circular 88/95 as amended**.
Date of first issue:	04-05-2024
Roadworthiness test of:	**04-05-2024** | No 1
Written by:	
Verified by:	
Approved by:	

Roadworthiness test sheet			
Rev.	Date	Par.	Description of modifications
1	04-06-2024		Approval of the Wear testers for motor vehicles sheet

Contents

1. DESCRIPTION OF EQUIPMENT

1.1 Description of equipment and parts thereof (if present in the approved type):

1.1.1 Wear tester: hydraulic or pneumatic equipment for visually detecting wear of the steering and suspension systems (New 88/95 – Chapter I, point 9.4).

The equipment must enable steering and suspension devices to be picked up (lengthwise and transversally) in such a way as to visually check defects (wear of spherical joints, silent-block suspension, guide box couplings, shock absorbers, etc.) by means of a spot lamp (New 88/95 – Chapter I, point 9.4).

The equipment is usually made up of the frame, thrust pistons, floor pads, transfer plates, steering units, spot lamps.

1.1.2 Frame: a structure firmly attached (on the ground or on a dedicated lifting device) on which the pistons are mounted.

1.1.3 Piston: bodies exerting thrust on the plate to exert movement of the plate in the intended direction.

1.1.4 Floor pads: components of plastic material with a low friction coefficient on which the plates rest and which enable them to move.

1.1.5 Plate: component in contact with the wheel of the vehicle, which, following the thrust of the piston, makes the intended movement.

1.1.6 Steering unit: a hydraulic or pneumatic control unit with an electric motor and pump to ensure the necessary pressure on the operating components.

1.1.7 Spot lamp: an inspection lamp, with low voltage, with controls for the movement of the wear tester.

2 VERIFICATIONS

2.1. Preliminary Activities

2.1.1 Checking compliance with the manufacturer's instructions for use, both for workplace safety requirements and for the operational verification instructions.

2.1.2 Equipment identification check, using the identification plate which shall bear the type approval number and serial number assigned by the manufacturer

2.1.3 Checking the presence of the metrological booklet, which must be complete and legible.

2.1.4 Check the matching of the equipment plate data with data recorded in the metrological booklet.

2.2. Initial Verification

The initial verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the compliance of the equipment	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	with the metrological booklet and the absence of obvious tampering.	the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.1 General check of the correct operation of the equipment: e.g. no deformations of plates, free movement of plates, movement of plates in the various directions available.			
3	Spot lamp control.	3.1 Checking the operation and correct switching on of the spot lamp. 3.2 Checking the correct operation of movement control of the wear tester plates.			
4	Verification of unladen movements.	4.1 Instrument verification. 4.2 Make the measurement without a load. 4.3 Measure the plate movement, from the initial position, in the intended directions: transverse, longitudinal or combinations of these (≥ 40 mm). 4.4 Check that each plate, at the beginning of the cycle, is in its initial position. 4.5 Measurements shall be made on both plates. 4.6 The results of the measurements shall be within the maximum permissible error.	-1 mm with respect to the minimum measurement specified in point 4.3.	Flexometer, sliding caliper.	
5	Verification of the coefficient of adhesion.	5.1 Visually checking the plate surface condition (no oil stains) and intactness of the coating surface. 5.2 Make measurements at the most worn point with wet plates. 5.3 Identifying the values of the friction coefficient between the wheel and plate. 5.4 Measurements shall be made on both plates. 5.5 The results of the measurements shall be consistent with the indicated value.	≥ 0.6 even with wet plates.	Masses and Dynamometer.	
6	Safety check.	6.1 The equipment must be CE marked and provided with instructions for			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		use.			
7	Other checks.				

2.3. Periodic verification

The periodic verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.1 General check of the correct operation of the equipment: e.g. no deformations of plates, free movement of plates, movement of plates in the various directions available.			
3	Spot lamp control.	3.1 Checking the operation and correct switching on of the spot lamp. 3.2 Checking the correct operation of movement control of the wear tester plates.			
4	Verification of unladen movements.	4.1 Instrument verification. 4.2 Make the measurement without a load. 4.3 Measure the plate movement, from the initial position, in the intended directions: transverse, longitudinal or combinations of these (≥ 40 mm). 4.4 Check that each plate, at the beginning of the cycle, is in its initial position. 4.5 Measurements shall be made on	-1 mm with respect to the minimum measurement specified in point 4.3.	Flexometer, sliding caliper.	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		both plates. 4.6 The results of the measurements shall be within the maximum permissible error.			
5	Verification of the coefficient of adhesion.	5.1 Visually checking the plate surface condition (no oil stains) and intactness of the coating surface. 5.2 Make measurements at the most worn point with wet plates. 5.3 Identifying the values of the friction coefficient between the wheel and plate. 5.4 Measurements shall be made on both plates. 5.5 The results of the measurements shall be consistent with the indicated value.	≥ 0.6 even with wet plates.	Masses and Dynamometer.	
6	Safety check.	6.1 The equipment must be CE marked and provided with instructions for use.			
7	Other checks.				

3. METROLOGICAL CONFIRMATION

3.1.1 The initial and periodic verification provide for a series of visual and functional checks and a series of instrumental checks by means of a direct comparison of the equipment being tested and the relevant control tools, with the criteria laid down in Annex II.

3.1.2 The outcome of each functional checked or instrumental verification operation shall be attested by ticking the activity in the list ‘initial verification’ or ‘periodic verification’ of the metrological booklets.

3.1.3 After ticking the activities provided for, the final outcome of the verification (positive or negative) must be certified in the metrological booklet, and the authorised CSRPAD portal technician who carried out the operation must be identified, by means of a stamp, signature and registration (or equivalent digital systems).

A positive outcome certifies the metrological confirmation of the equipment, which may be used to start performing vehicle roadworthiness tests (initial verification) or to continue carrying out vehicle roadworthiness tests (periodic verification).

TECHNICAL DATA SHEET NO 17	TYPE APPROVED WEAR TESTERS (>3,5 Tonnes)
Document type:	**TECHNICAL DATA SHEET**
Document code:	**17-Wear Testers_HEAVY-DUTY_OM**
Equipment specifications:	**TYPE APPROVED – Circular 330 of 11.8.2023 (wear testers for vehicles with a mass > 3.5 tonnes)**
Date of first issue:	04-05-2024
Roadworthiness test of:	**04-05-2024** | No 1
Written by:	
Verified by:	
Approved by:	

Roadworthiness test sheet			
Rev.	Date	Par.	Description of modifications
1	04-06-2024		Approval of the Wear Testers for Heavy-Duty Vehicles sheet – TYPE APPROVED

Contents

1. DESCRIPTION OF EQUIPMENT

1.1 Description of equipment and parts thereof (if present in the approved type):

1.1.1 Wear tester: equipment for the visual inspection of steering gear wear and vehicle axle and suspension wear.

The equipment shall be suitable for exerting force on the wheels of the axle under test in such a way as to stress the steering components, axles, and suspensions to highlight play at the fixing and coupling points of the same.

The equipment is usually made up of the frame, thrust pistons, floor pads, transfer plates, steering units, spot lamps.

1.1.2 Frame: a structure firmly attached (on the ground or on a dedicated lifting device) on which the pistons are mounted.

1.1.3 Piston: bodies exerting thrust on the plate to exert movement of the plate in the intended direction.

1.1.4 Floor pads: components of plastic material with a low friction coefficient on which the plates rest and which enable them to move.

1.1.5 Plate: component in contact with the wheel of the vehicle, which, following the thrust of the piston, makes the intended movement.

1.1.6 Steering unit: a hydraulic or pneumatic control unit with an electric motor and pump to ensure the necessary pressure on the operating components.

1.1.7 Spot lamp: an inspection lamp, with low voltage, with controls for the movement of the wear tester.

2. VERIFICATIONS

2.1. Preliminary Activities

2.1.1 Checking compliance with the manufacturer's instructions for use, both for workplace safety requirements and for the operational verification instructions.

2.1.2 Equipment identification check, using the identification plate which shall bear the type approval number and serial number assigned by the manufacturer

2.1.3 Checking the presence of the metrological booklet, which must be complete and legible.

2.1.4 Check the matching of the equipment plate data with data recorded in the metrological booklet.

2.2. Initial Verification

The initial verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
2	General and functional checks.	2.1 General check of the correct operation of the equipment: e.g. no deformations of plates, free movement of plates, movement of plates in the various directions available.			
3	Spot lamp control.	3.1 Checking the operation and correct switching on of the spot lamp. 3.2 Checking the correct operation of movement control of the wear tester plates.			
4	Verification of unladen movements:	4.1 Instrument verification. 4.2 Make the measurement without a load. 4.3 Measure the plate movement, from the initial position (central), in the intended directions: transverse, longitudinal or combinations of these (diagonal) for ≥ 47.5 mm. 4.4 Check that each plate, at the beginning of the cycle, is in its initial position (central). 4.5 Measurements shall be made on both plates. 4.6 The results of the measurement shall be within the maximum permissible error.	-1 mm with respect to the minimum measurement specified in point 4.3.	Flexometer, sliding caliper.	
5	Verification of the coefficient of adhesion.	5.1 Visually checking the plate surface condition (no oil stains) and intactness of the coating surface. 5.2 Make the measurements at the most worn point, first with dry plates and then with wet plates. 5.3 Identifying the values of the friction coefficient between the wheel and plate. 5.4 Measurements shall be made on both plates. 5.5 The results of the measurements shall be consistent with the indicated value.	Wet surface: ≥ 0.6. Dry surface: ≤ 0.8	Masses and Dynamometer.	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
6	Safety check.	6.1 The equipment must be CE marked and provided with instructions for use.			
7	Checking the movements of laden plates.	7.1 Checking the laden operation of each plate. 7.2 Positioning a vehicle weighing ≥ 1 000 kg per wheel on the plate. 7.3 Operating the equipment and checking that the laden plate carries out all the intended movements, with motion speeds in line with the manufacturer's specifications.			
8	Other checks.				

2.3. Periodic verification

The periodic verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.1 General check of the correct operation of the equipment: e.g. no deformations of plates, free movement of plates, movement of plates in the various directions available.			
3	Spot lamp control.	3.1 Checking the operation and correct switching on of the spot lamp. 3.2 Checking the correct operation of movement control of the wear tester plates.			
4	Verification of unladen	4.1 Instrument verification.	-1 mm with respect to the	Flexometer, sliding	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	movements:	4.2 Make the measurement without a load. 4.3 Measure the plate movement, from the initial position (central), in the intended directions: transverse, longitudinal or combinations of these (diagonal) for ≥ 47.5 mm. 4.4 Check that each plate, at the beginning of the cycle, is in its initial position (central). 4.5 Measurements shall be made on both plates. 4.6 The results of the measurement shall be within the maximum permissible error.	minimum measurement specified in point 4.3.	caliper.	
5	Verification of the coefficient of adhesion.	5.1 Visually checking the plate surface condition (no oil stains) and intactness of the coating surface. 5.2 Make the measurements at the most worn point, first with dry plates and then with wet plates. 5.3 Identifying the values of the friction coefficient between the wheel and plate. 5.4 Measurements shall be made on both plates. 5.5 The results of the measurements shall be consistent with the indicated value.	Wet surface: ≥ 0.6. Dry surface: ≤ 0.8	Masses and Dynamometer.	
6	Safety check.	6.1 The equipment must be CE marked and provided with instructions for use.			
7	Checking the movements of laden plates.	7.1 Checking the laden operation of each plate. 7.2 Positioning a vehicle weighing ≥ 1 000 kg per wheel on the plate. 7.3 Operating the equipment and checking that the laden plate carries out all the intended movements, with motion speeds in line with the manufacturer’s specifications.			
8	Other checks.				

3. METROLOGICAL CONFIRMATION

3.1.1 The initial and periodic verification provide for a series of visual and functional checks and a series of instrumental checks by means of a direct comparison of the equipment being tested and the relevant control tools, with the criteria laid down in Annex II.

3.1.2 The outcome of each functional checked or instrumental verification operation shall be attested by ticking the activity in the list ‘initial verification’ or ‘periodic verification’ of the metrological booklets.

3.1.3 After ticking the activities provided for, the final outcome of the verification (positive or negative) must be certified in the metrological booklet, and the authorised CSRPAD portal technician who carried out the operation must be identified, by means of a stamp, signature and registration (or equivalent digital systems).

3.1.4 A positive outcome certifies the metrological confirmation of the equipment, which may be used to start performing vehicle roadworthiness tests (initial verification) or to continue carrying out vehicle roadworthiness tests (periodic verification).

TECHNICAL DATA SHEET NO 18	APPROVED WEAR TESTERS (>3,5 Tonnes)
Document type:	**TECHNICAL DATA SHEET**
Document code:	**18-Wear Testers_HEAVY-DUTY_AP**
Equipment specifications:	**APPROVED – Circular No 6710/604 of 27/7/2000 (wear testers for vehicles with a mass > 3.5 tonnes)**
Date of first issue:	04-05-2024
Roadworthiness test of:	**04-05-2024** | No 1
Written by:	
Verified by:	
Approved by:	

Roadworthiness test sheet			
Rev.	Date	Par.	Description of modifications
1	04-06-2024		Approval of the Wear Testers for Heavy-Duty Vehicles sheet – APPROVED

Contents

1. DESCRIPTION OF EQUIPMENT

1.1 Description of equipment and parts thereof (if present in the approved type):

1.1.1 Wear tester: equipment for the visual inspection of steering gear wear and vehicle axle and suspension wear.

The equipment shall be suitable for exerting force on the wheels of the axle under test in such a way as to stress the steering components, axles, and suspensions to highlight play at the fixing and coupling points of the same.

The equipment is usually made up of the frame, thrust pistons, floor pads, transfer plates, steering units, spot lamps.

1.1.2 Frame: a structure firmly attached (on the ground or on a dedicated lifting device) on which the pistons are mounted.

1.1.3 Piston: bodies exerting thrust on the plate to exert movement of the plate in the intended direction.

1.1.4 Floor pads: components of plastic material with a low friction coefficient on which the plates rest and which enable them to move.

1.1.5 Plate: component in contact with the wheel of the vehicle, which, following the thrust of the piston, makes the intended movement.

1.1.6 Steering unit: a hydraulic or pneumatic control unit with an electric motor and pump to ensure the necessary pressure on the operating components.

1.1.7 Spot lamp: an inspection lamp, with low voltage, with controls for the movement of the wear tester.

2 VERIFICATIONS

2.1. Preliminary Activities

2.1.1. Checking compliance with the manufacturer's instructions for use, both for workplace safety requirements and for the operational verification instructions.

2.1.2. Equipment identification check, using the identification plate which shall bear the type approval number and serial number assigned by the manufacturer

2.1.3. Checking the presence of the metrological booklet, which must be complete and legible.

2.1.4. Check the matching of the equipment plate data with data recorded in the metrological booklet.

2.2. Initial verification

The initial verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	tampering.				
2	General and functional checks.	2.1 General check of the correct operation of the equipment: e.g. no deformations of plates, free movement of plates, movement of plates in the various directions available.			
3	Spot lamp control.	3.1 Checking the operation and correct switching on of the spot lamp. 3.2 Checking the correct operation of movement control of the wear tester plates.			
4	Verification of unladen movements.	4.1 Instrument verification. 4.2 Make the measurement without a load. 4.3 Measure the plate movement, from the initial position, in the intended directions: transverse, longitudinal or combinations of these (diagonal) for ≥ 40 mm. 4.4 Check that each plate, at the beginning of the cycle, is in its initial position. 4.5 Measurements shall be made on both plates. 4.6 The results of the measurements shall be within the maximum permissible error.	-1 mm with respect to the minimum measurement specified in point 4.3.	Flexometer, sliding caliper.	
5	Verification of the coefficient of adhesion.	5.1 Visually checking the plate surface condition (no oil stains) and intactness of the coating surface. 5.2 Make the measurements at the most worn point, first with dry plates and then with wet plates. 5.3 Identifying the values of the friction coefficient between the wheel and plate. 5.4 Measurements shall be made on both plates. 5.5 The results of the measurements shall be consistent with the indicated	Wet surface: ≥ 0.6.	Masses and Dynamometer.	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		value.			
6	Safety check.	6.1 The equipment must be CE marked and provided with instructions for use.			
7	Other checks.				

2.2. Periodic verification

The periodic verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.1 General check of the correct operation of the equipment: e.g. no deformations of plates, free movement of plates, movement of plates in the various directions available.			
3	Spot lamp control.	3.1 Checking the operation and correct switching on of the spot lamp. 3.2 Checking the correct operation of movement control of the wear tester plates.			
4	Verification of unladen movements.	4.1 Instrument verification. 4.2 Make the measurement without a load. 4.3 Measure the plate movement, from the initial position, in the intended directions: transverse, longitudinal or combinations of these (diagonal) for ≥ 40 mm. 4.4 Check that each plate, at the beginning of the cycle, is in its initial	-1 mm with respect to the minimum measurement specified in point 4.3.	Flexometer, sliding caliper.	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		position. 4.5 Measurements shall be made on both plates. 4.6 The results of the measurements shall be within the maximum permissible error.			
5	Verification of the coefficient of adhesion.	5.1 Visually checking the plate surface condition (no oil stains) and intactness of the coating surface. 5.2 Make the measurements at the most worn point, first with dry plates and then with wet plates. 5.3 Identifying the values of the friction coefficient between the wheel and plate. 5.4 Measurements shall be made on both plates. 5.5 The results of the measurements shall be consistent with the indicated value.	Wet surface: ≥ 0.6.	Masses and Dynamometer.	
6	Safety check.	6.1 The equipment must be CE marked and provided with instructions for use.			
7	Other checks.				

3. METROLOGICAL CONFIRMATION

3.1.1 The initial and periodic verification provide for a series of visual and functional checks and a series of instrumental checks by means of a direct comparison of the equipment being tested and the relevant control tools, with the criteria laid down in Annex II.

3.1.2 The outcome of each functional checked or instrumental verification operation shall be attested by ticking the activity in the list ‘initial verification’ or ‘periodic verification’ of the metrological booklets.

3.1.3 After ticking the activities provided for, the final outcome of the verification (positive or negative) must be certified in the metrological booklet, and the authorised CSRPAD portal technician who carried out the operation must be identified, by means of a stamp, signature and registration (or equivalent digital systems).

3.1.4 A positive outcome certifies the metrological confirmation of the equipment, which may be used to start performing vehicle roadworthiness tests (initial verification) or to continue carrying out vehicle roadworthiness tests (periodic verification).

TECHNICAL DATA SHEET NO 19	SPEED TEST for motorcycles and 2-wheel mopeds
Document type:	**SPEED TEST TECHNICAL DATA SHEET**
Document code:	**19-SPEED TEST_MOTO**
Equipment specifications:	**TYPE APPROVAL in accordance with Circular 211/404 of 18.1.2002 for 2 wheels.**
Date of first issue:	29-05-2024
Roadworthiness test of:	**29-05-2024** | No 1
Written by:	
Verified by:	
Approved by:	

Roadworthiness test sheet			
Rev.	Date	Par.	Description of modifications
1	29-05-2024		Approval of the 2-wheel moped and motorcycle speed test sheet

Contents

1. DESCRIPTION OF EQUIPMENT

1.1 Description of equipment and parts thereof:

1.1.1 Speed test: equipment to be used in the emission and speed test of motorcycles, mopeds with 2 and 3 wheels and quadricycles (1304/404 of 1.7.2005).

1.1.2 Roller bench with one or more frames and devices for testing the maximum speed
on various types of vehicles.

1.1.3 Roller brake by power-absorbing device(s) on the same rolling axle.

1.1.4 Idle roller.

1.1.5 Vehicle safety, anchorage and/or locking devices.

1.1.6 Vehicle engine coolers.

1.1.7 Covering parts of rollers not used during testing.

2 VERIFICATIONS

2.1. Preliminary Activities

2.1.1 Checking compliance with the manufacturer's instructions for use, both for workplace safety requirements and for the operational verification instructions.

2.1.2 Equipment identification check, using the identification plate which shall bear the type approval number and serial number assigned by the manufacturer

2.1.3 Checking the presence of the metrological booklet, which must be complete and legible.

2.1.4 Check the matching of the equipment plate data with data recorded in the metrological booklet.

2.1.5 Monitoring of environmental conditions required for the use of the equipment: 5 °C to 40 °C, ± 2 °C.

2.2. Initial Verification

The initial verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.1 General check of the correct operation of the equipment: e.g. clamp opening and closing controls,			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		etc.			
3	Checking the dimensions and distances of the operator's foot area.	3.1 Checking the size characteristics of the equipment in relation to the instructions for use and the image on page 2 of the metrological booklet.			
4	Checking the size of the roller bench.	4.1 Checking the size characteristics of the equipment in relation to the instructions for use and the image on page 2 of the metrological booklet.			
5	Checking the correct functioning of the vehicle locking devices.	5.1 Checking the conformity of the vehicle locking/anchorage devices against the requirements of the instructions for use and/or on page 2 of the metrological booklet. 5.2 Checking the correct operation of the vehicle locking/anchorage devices.			
6	Checking the efficiency of the cooling device	6.1 Checking the presence of the cooling devices provided for by type approval (see page 2 of the metrological booklet). 6.2 Checking the operation, intactness of devices, absence of blockages or damage that diminishes their effectiveness and/or reach, without detecting the extent.			
7	Checking the detection of the brake roller speed.	7.1 The brake roller speed detection system has been verified at type approval. 7.2 Perform a functionality test using a vehicle. 7.3 With the vehicle correctly fixed to the equipment, and a brake roller, gradually accelerate to reach the speed of 45 km/h. 7.4 Check the functionality of the display system by reading the values from the equipment. 7.5 Readings of values by the equipment shall be freely accessible. 7.6 If the equipment fails to display the values, detect the rotational speeds of the brake roller at the prescribed values, by means of appropriate measuring instruments.	± 5km/h	Digital speedometer or stroboscopic gun.	
8	Checking the	8.1 Checking the correct operation of the			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	alert threshold when the limit speed is exceeded.	automatically activated alert, optical or acoustic system when the prescribed threshold of 75 km/h is exceeded for 2 wheels. 8.2 The check may be carried out by means of appropriate sw activation, via access with the 1st level pw. 8.3 In the absence of sw activation systems, a vehicle with speed characteristics suitable to exceed the alert threshold shall be placed on the equipment.			
9	Verification of the correct operation of the braking device using the method set out in the use and maintenance manual and verified at type approval.	9.1 Verification of the correct operation of the absorption device using the method given in the instructions for use and verified at type approval. 9.2 In the case of dynamometer sinks or equivalent, verification shall be carried out on the load cell: a) install appropriate lever systems and apply sample weights in relation to the measurement points specified by the manufacturer in the instructions for use; b) compare the values reported by the equipment against standard values; c) readings of values by the equipment shall be freely accessible or accessible via the 1st level pw; d) the values detected shall be within the maximum permissible error range. 9.3 In the case of aerodynamic sinks or equivalent, the verification shall be carried out using the coast-down method: a) to activate the coast-down, follow the manufacturer's instructions for use; b) detect the unladen coast-down time between 50 km/h and 20 km/h; c) integrate the detected time values with the correction factors derived from the ambient temperature. d) compare the values recorded	± 2 % ± 10 % compared to the type approval values.	"Calibration bar" (anchorage system and levers). Masses	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		during the inspection with those recorded at type approval; e) readings of values by the equipment shall be freely accessible or accessible via the 1st level pw; e) the values detected shall be within the maximum permissible error range.			
10	Safety check.	10.1 The equipment must be CE marked and provided with instructions for use. 10.2 The equipment shall be equipped with vehicle locking/anchorage systems as required by the manufacturer.			
11	Other checks.				

2.3. Periodic verification

The periodic verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.1 General check of the correct operation of the equipment: e.g. clamp opening and closing controls, etc.			
3	Checking the dimensions and distances of the operator's foot area.	3.1 Checking the size characteristics of the equipment in relation to the instructions for use and the image on page 2 of the metrological booklet.			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
4	Checking the size of the roller bench.	4.1 Checking the size characteristics of the equipment in relation to the instructions for use and the image on page 2 of the metrological booklet.			
5	Checking the correct functioning of the vehicle locking devices.	5.1 Checking the conformity of the vehicle locking/anchorage devices against the requirements of the instructions for use and/or on page 2 of the metrological booklet. 5.2 Checking the correct operation of the vehicle locking/anchorage devices.			
6	Checking the efficiency of the cooling device	6.1 Checking the presence of the cooling devices provided for by type approval (see page 2 of the metrological booklet). 6.2 Checking the operation, intactness of devices, absence of blockages or damage that diminishes their effectiveness and/or reach, without detecting the extent.			
7	Checking the detection of the brake roller speed.	7.1 The brake roller speed detection system has been verified at type approval. 7.2 Perform a functionality test using a vehicle. 7.3 With the vehicle correctly fixed to the equipment, and a brake roller, gradually accelerate to reach the speed of 45 km/h. 7.4 Check the functionality of the display system by reading the values from the equipment. 7.5 Readings of values by the equipment shall be freely accessible. 7.6 If the equipment fails to display the values, detect the rotational speeds of the brake roller at the prescribed values, by means of appropriate measuring instruments.	± 5km/h	Digital speedometer or stroboscopic gun.	
8	Checking the alert threshold when the limit speed is exceeded.	8.1 Checking the correct operation of the automatically activated alert, optical or acoustic system when the prescribed threshold of 75 km/h is exceeded for 2 wheels. 8.2 The check may be carried out by means of appropriate sw activation, via access with the 1st level pw. 8.3 In the absence of sw activation systems, a vehicle with speed characteristics suitable to exceed the			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		alert threshold shall be placed on the equipment.			
9	Verification of the correct operation of the braking device using the method set out in the use and maintenance manual and verified at type approval.	9.1 Verification of the correct operation of the absorption device using the method given in the instructions for use and verified at type approval. 9.2 In the case of dynamometer sinks or equivalent, verification shall be carried out on the load cell: a) install appropriate lever systems and apply sample weights in relation to the measurement points specified by the manufacturer in the instructions for use; b) compare the values reported by the equipment against standard values; c) readings of values by the equipment shall be freely accessible or accessible via the 1st level pw; d) the values detected shall be within the maximum permissible error range. 9.3 In the case of aerodynamic sinks or equivalent, the verification shall be carried out using the coast-down method: a) to activate the coast-down, follow the manufacturer's instructions for use; b) detect the unladen coast-down time between 50 km/h and 20 km/h; c) integrate the detected time values with the correction factors derived from the ambient temperature. d) compare the values recorded during the inspection with those recorded at type approval; e) readings of values by the equipment shall be freely accessible or accessible via the 1st level pw; e) the values detected shall be within	± 2 % ± 10 % compared to the type approval values.	"Calibration bar" (anchorage system and levers). Masses	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		the maximum permissible error range.			
10	Safety check.	10.1 The equipment must be CE marked and provided with instructions for use. 10.2 The equipment shall be equipped with vehicle locking/anchorage systems as required by the manufacturer.			
11	Other checks.				

3. METROLOGICAL CONFIRMATION

3.1.1 The initial and periodic verification provide for a series of visual and functional checks and a series of instrumental checks by means of a direct comparison of the equipment being tested and the relevant control tools, with the criteria laid down in Annex II.

3.1.2 The outcome of each functional checked or instrumental verification operation shall be attested by ticking the activity in the list ‘initial verification’ or ‘periodic verification’ of the metrological booklets.

3.1.3 After ticking the activities provided for, the final outcome of the verification (positive or negative) must be certified in the metrological booklet, and the authorised CSRPAD portal technician who carried out the operation must be identified, by means of a stamp, signature and registration (or equivalent digital systems).

A positive outcome certifies the metrological confirmation of the equipment, which may be used to start performing vehicle roadworthiness tests (initial verification) or to continue carrying out vehicle roadworthiness tests (periodic verification).

TECHNICAL DATA SHEET NO 20	SPEED TEST for motorcycles and mopeds with 2, 3 and 4 wheels
Document type:	**TECHNICAL DATA SHEET**
Document code:	**20-SPEED TEST _MOTO+3-4 WHEELS**
Equipment specifications:	**TYPE APPROVAL in accordance with Circular 1304/404 of 1.7.2005 for 2 wheels, 3 wheels and quadricycles.**
Date of first issue:	29-05-2024
Roadworthiness test of:	**29-05-2024** | No 1
Written by:	
Verified by:	
Approved by:	

Roadworthiness test sheet			
Rev.	Date	Par.	Description of modifications
1	30-05-2024		Approval of the 2-, 3- and 4-wheel moped and motorcycle speed test sheet

Contents

1. DESCRIPTION OF EQUIPMENT

1.1 Description of equipment and parts thereof:

1.1.1 Speed test: equipment to be used in the emission and speed test of motorcycles, mopeds with 2 and 3 wheels and quadricycles (1304/404 of 1.7.2005).

1.1.2 Roller bench with one or more frames and devices for testing the maximum speed
on various types of vehicles.

1.1.3 Roller brake by power-absorbing device(s) on the same rolling axle.

1.1.4 Idle roller.

1.1.5 Vehicle safety, anchorage and/or locking devices.

1.1.6 Vehicle engine coolers.

1.1.7 Covering parts of rollers not used during testing.

2 VERIFICATIONS

2.1. Preliminary Activities

2.1.1 Checking compliance with the manufacturer's instructions for use, both for workplace safety requirements and for the operational verification instructions.

2.1.2 Equipment identification check, using the identification plate which shall bear the type approval number and serial number assigned by the manufacturer

2.1.3 Checking the presence of the metrological booklet, which must be complete and legible.

2.1.4 Check the matching of the equipment plate data with data recorded in the metrological booklet.

2.1.5 Monitoring of environmental conditions required for the use of the equipment: 5 °C to 40 °C, ± 2 °C.

2.2. Initial Verification

The initial verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence.

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.1 General check of the correct functioning of the equipment: e.g.			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		clamp opening and closing controls, selector to move from 2 to 3-4 wheels.			
3	Size check: roller diameter, roller wheelbase, minimum and maximum distance of the roller edges, any additional roller connections, any transfer device functionality.	3.1 Checking the size characteristics of the equipment in relation to the instructions for use and the image on page 2 of the metrological booklet. 3.2 In the case of equipment with two separate benches, check the correct operation of the connecting joint between the two benches in relation to 2, 3-4 wheels selector.			
4	Checking the correct functioning of the vehicle anchorage and/or locking devices.	4.1 Checking the conformity of the vehicle locking/anchorage devices against the requirements of the instructions for use and/or on page 2 of the metrological booklet. 4.2 Checking the correct operation of the vehicle locking/anchorage devices.			
5	Checking the efficiency of the cooling device.	5.1 Checking the presence of the cooling devices provided for by type approval (see page 2 of the metrological booklet). 5.1 Checking the operation, intactness of devices, absence of blockages or damage that diminishes their effectiveness and/or reach, without detecting the extent.			
6	Checking the correct detection of the rotational speed of the brake roller.-	6.1 The brake roller speed detection system has been verified at type approval. 6.2 Perform a functionality test using a vehicle. 6.3 With the vehicle correctly fixed to the equipment, and a brake roller, gradually accelerate to reach the speed of 45 km/h. 6.4 Check the functionality of the display system by reading the values from the equipment. 6.5 Readings of values by the equipment shall be freely accessible. 6.6 If the equipment fails to display the values, detect the rotational speeds of the brake roller at the prescribed values, by means of appropriate measuring instruments.	± 5km/h	Digital speedometer or stroboscopic gun.	
7	Checking the alert threshold	7.1 Checking the correct operation of the automatically activated alert, optical			

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
	when the limit speed is exceeded.	or acoustic system when the prescribed threshold of 60 km/h is exceeded for 3 and 4 wheels. 7.2 The check may be carried out by means of appropriate sw activation, via access with the 1st level pw. 7.3 In the absence of sw activation systems, a vehicle with speed characteristics suitable to exceed the alert threshold shall be placed on the equipment. 7.4 In the case of two roller assemblies without a mechanical connection, check the alert threshold when the difference limit between the two brake rollers is exceeded (2 km/h from the speed of 20 km/h); the check may be carried out by means of a vehicle test or by means of appropriate sw activation, via access with the 1st level pw.			
8	Verification of the correct operation of the braking device using the method set out in the use and maintenance manual and verified at type approval.	8.1 Verification of the correct operation of the absorption device using the method given in the instructions for use and verified at type approval. 8.2 In the case of dynamometer sinks or equivalent, verification shall be carried out on the load cell: a) install appropriate lever systems and apply sample weights in relation to the measurement points specified by the manufacturer in the instructions for use; b) compare the values reported by the equipment against standard values; c) readings of values by the equipment shall be freely accessible or accessible via the 1st level pw; d) if there are two benches, check the load cell of each bench; e) the values detected shall be within the maximum permissible error range. 8.3 In the case of aerodynamic sinks or equivalent, the verification shall be carried out using the coast-down method: a) to activate the coast-down, follow the manufacturer's instructions for	± 2 %. ± 10 % compared to the type approval values.	"Calibration bar" (anchorage system and levers). Masses.	

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
		use; b) detect the unladen coast-down time between 50 km/h and 20 km/h; c) integrate the detected time values with the correction factors derived from the ambient temperature. d) compare the values recorded during the inspection with those recorded at type approval; e) readings of values by the equipment shall be freely accessible or accessible via the 1st level pw; e) the values detected shall be within the maximum permissible error range.			
9	Safety check.	9.1 The equipment must be CE marked and provided with instructions for use. 9.2 The equipment shall be fitted with roller covers for those not used during testing. 9.3 The equipment shall be equipped with vehicle locking/anchorage systems as required by the manufacturer.			
10	Verification of the barometric station (if used).	10.1 Instrument type verification. 10.2 Verification of correct readings from the barometric station of the control centre by comparison with the sample barometric station, with the same or higher characteristics as the instrument being tested. 10.3 The results must be within the maximum permissible error range.	Temperature: ± 1.0 from 0 to 50 °C Moisture: ± 3.0 from 30 to 80 % RH Atmospheric pressure: ± 20 hPa from 850 to 1 025 hPa.		
11	Other checks.				

2.3. Periodic and occasional verification

The periodic and occasional verification shall include at least the following activities provided for by the metrological booklet; at operational level, activities could be carried out in a different sequence

No	ACTIVITY	DESCRIPTION	MAXIMUM PERMISSIBLE ERROR	CONTROL TOOLS	NOTES
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.	1.1 Checking the compliance of the equipment with the relevant metrological booklet (page 2) and/or the instructions for use. 1.2 Checking that there are no obvious signs of tampering with the equipment.			
2	General and functional checks.	2.1 General check of the correct functioning of the equipment: e.g. clamp opening and closing controls, selector to move from 2 to 3-4 wheels.			
3	Size check: roller diameter, roller wheelbase, minimum and maximum distance of the roller edges, any additional roller connections, any transfer device functionality.	3.1 Checking the size characteristics of the equipment in relation to the instructions for use and the image on page 2 of the metrological booklet. 3.2 In the case of equipment with two separate benches, check the correct operation of the connecting joint between the two benches in relation to 2, 3-4 wheels selector.			
4	Checking the intactness and correct functioning of the vehicle anchorage and locking devices.	4.1 Checking the conformity of the vehicle locking/anchorage devices against the requirements of the instructions for use and/or on page 2 of the metrological booklet. 4.2 Checking the intactness and correct operation of the vehicle locking/anchorage devices.			
5	Checking the efficiency of the cooling device.	5.1 Checking the presence of the cooling devices provided for by type approval (see page 2 of the metrological booklet). 5.2 Checking the operation, intactness of devices, absence of blockages or damage that diminishes their effectiveness and/or reach, without detecting the extent.			
6	Checking the correct detection	6.1 The brake roller speed detection system has been verified at type	± 5km/h	Digital	

	of the rotational speed of the brake roller.-	approval. 6.2 Perform a functionality test using a vehicle. 6.3 With the vehicle correctly fixed to the equipment, and a brake roller, gradually accelerate to reach the speed of 45 km/h. 6.4 Check the functionality of the display system by reading the values from the equipment. 6.5 Readings of values by the equipment shall be freely accessible or accessible via the 1st level pw. 6.6 If the equipment fails to display the values, detect the rotational speeds of the brake roller at the prescribed values, by means of appropriate measuring instruments.		speedometer or stroboscopic gun.	
7	Checking the alert threshold when the limit speed is exceeded.	7.1 Checking the correct operation of the automatically activated alert, optical or acoustic system when the prescribed threshold of 60 km/h is exceeded for 3 and 4 wheels. 7.2 The check may be carried out by means of appropriate sw activation, via access with the 1st level pw. 7.3 In the absence of sw activation systems, a vehicle with speed characteristics suitable to exceed the alert threshold shall be placed on the equipment. 7.4 In the case of two roller assemblies without a mechanical connection, check the alert threshold when the difference limit between the two brake rollers is exceeded (2 km/h from the speed of 20 km/h); the check may be carried out by means of a vehicle test or by means of appropriate sw activation, via access with the 1st level pw.			
8	Verification of the correct operation of the braking device using the method set out in the use and maintenance manual and verified at type approval.	8.1 Verification of the correct operation of the absorption device using the method given in the instructions for use and verified at type approval. 8.2 In the case of dynamometer sinks or equivalent, verification shall be carried out on the load cell: a) install appropriate lever systems and apply sample weights in relation to the measurement points specified by the manufacturer in the instructions for use; b) compare the values reported by the equipment against standard values; c) readings of values by the	± 2 %.	“Calibration bar” (anchorage system and levers). Masses.	

		equipment shall be freely accessible or accessible via the 1st level pw; d) if there are two benches, check the load cell of each bench; e) the values detected shall be within the maximum permissible error range. 8.3 In the case of aerodynamic sinks or equivalent, the verification shall be carried out using the coast-down method: a) to activate the coast-down, follow the manufacturer's instructions for use; b) detect the unladen coast-down time between 50 km/h and 20 km/h; c) integrate the detected time values with the correction factors derived from the ambient temperature. d) compare the values recorded during the inspection with those recorded at type approval; e) readings of values by the equipment shall be freely accessible or accessible via the 1st level pw; e) the values detected shall be within the maximum permissible error range.	± 10 % compared to the type approval values.		
9	Safety check.	9.1 The equipment must be CE marked and provided with instructions for use. 9.2 The equipment shall be fitted with roller covers for those not used during testing. 9.3 The equipment shall be equipped with vehicle locking/anchorage systems as required by the manufacturer.			
10	Verification of the barometric station (if used).	10.1 Instrument type verification. 10.2 Verification of correct readings from the barometric station of the control centre by comparison with the sample barometric station, with the same or higher characteristics as the instrument being tested.	Temperature: ± 1.0 from 0 to 50 °C Moisture: ± 3.0 from 30 to 80 % RH Atmospheric pressure: ± 20 hPa from 850 to 1 025 hPa		

		10.3 The results must be within the maximum permissible error range.			
11	Other checks.				

3. METROLOGICAL CONFIRMATION

3.1.1 The initial and periodic verification provide for a series of visual and functional checks and a series of instrumental checks by means of a direct comparison of the equipment being tested and the relevant control tools, with the criteria laid down in Annex II.

3.1.2 The outcome of each functional checked or instrumental verification operation shall be attested by ticking the activity in the list ‘initial verification’ or ‘periodic verification’ of the metrological booklets.

3.1.3 After ticking the activities provided for, the final outcome of the verification (positive or negative) must be certified in the metrological booklet, and the authorised CSRPAD portal technician who carried out the operation must be identified, by means of a stamp, signature and registration (or equivalent digital systems).

3.1.4 A positive outcome certifies the metrological confirmation of the equipment, which may be used to start performing vehicle roadworthiness tests (initial verification) or to continue carrying out vehicle roadworthiness tests (periodic verification).

ANNEX IV

1. Periodicity of periodic verifications

Category of equipment	Frequency of periodic verification
Exhaust gas analyser	1 year
Rev counter	1 year
Decelerometer	1 year
Phonometer	1 year (1)
Opacimeter	1 year
Headlight tester	1 year
Brake tester (rollers and plates)	1 year
Wear tester	1 year
Speed tester	1 year

Note (1): The equipment must be calibrated at least every four years at an Accredited Laboratory as defined in Article 1(n) for the purpose of accreditation with metrological capabilities in the context of acoustic measurements.

2. Calibration frequency for control tools

Control tool	Calibration interval
Masses	5 years
Parallel plane blocks	3 years
Luxmeter	1 year
Multimeter	1 year
Frequency meter	1 year
Calibration bar	5 years
Multifunction calibrator	1 year
Load cell/Dynamometer/Wheel weighing platforms	1 year
Sample template for decelerograph	5 years
Sample headlight	1 year
Optical filters	5 years if in paste form 1 year if surface coating
Level	2 years
Rev simulator	1 year
Dimensional/mechanical instruments	2 years
Electronic instruments	1 year
Optical rev counters	2 years
Thermo-hygrometer	2 years

ANNEX V
LIST OF ACTIVITIES OF THE INITIAL AND PERIODIC VERIFICATION

1 - Exhaust gas analyser	
TYPE APPROVED – Circular No 3997/604 of 6.9.1999 – New Circular 88/95 as amended	
Initial verification	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.
3	Test ban check during heating.
4	HC residue test.
5	Leak test.
6	“Low flow” indication check.
7	Verification of the linearity of the response with sample gases.
8	Verification of the response time of CO, CO_2, HC and O_2.
9	Other checks.

1 - Exhaust gas analyser	
TYPE APPROVED – Circular No 3997/604 of 6.9.1999 – New Circular 88/95 as amended	
Periodic verification	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.
3	HC residue test.
4	Leak test.
5	“Low flow” indication check.
6	Verification of the linearity of the response with sample gases.
7	Other checks.

2 - Rev counter	
TYPE APPROVED – Circular No 3997/604 of 6.9.1999 – New Circular 88/95 as amended	
Initial verification	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.
3	Checking the minimum value.
4	Verification of linearity in the field of measurement.
5	Other checks.

2 - Rev counter	
TYPE APPROVED – Circular No 3997/604 of 6.9.1999 – New Circular 88/95 as amended	
Periodic verification	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.
3	Checking the minimum value.
4	Verification of linearity in the field of measurement.
5	Other checks.

3 - Decelerograph	
TYPE APPROVED – Circular 1603/404 8.10.2001	
Initial verification	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.
3	Zero check.
4	Verification of the calibration curve.
5	Verification of maximum permissible error for pedal and lever force measurers.

3 - Decelerograph	
TYPE APPROVED – Circular 1603/404 8.10.2001	
Periodic verification	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.
3	Zero verification.
4	Verification of the calibration curve.
5	Verification of maximum permissible error for pedal and lever force measurers.

4 - Phonometer and acoustic calibrator			4 - Phonometer and acoustic calibrator	
TYPE APPROVED class 1 phonometer and TYPE APPROVED in accordance with Circular No 3997 / 604 of 6.9.1999 - New circular 88/95 as amended.			TYPE APPROVED class 1 phonometer and TYPE APPROVED in accordance with Circular No 3997 / 604 of 6.9.1999 - New circular 88/95 as amended.	
Initial verification			***Periodic verification***	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.		1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.		2	General and functional checks.
3	Adjustment of sound sensitivity.		3	Adjustment of sound sensitivity.
4	Auto-generated electric noise control.		4	Auto-generated electric noise control.
5	Verification of a complex microphone frequency response, in weighting curve A.		5	Verification of a complex microphone frequency response, in weighting curve A.
6	Verification of measurement ranges.		6	Verification of measurement ranges.
7	Verification of time weightings (Slow and Fast).		7	Verification of time weightings (Slow and Fast).
8	Verification of acoustic calibrator.		8	Verification of acoustic calibrator.

5 - Opacimeter			5 - Opacimeter	
TYPE APPROVED – Circular No 3997/604 of 6.9.1999 – New Circular 88/95 as amended			TYPE APPROVED – Circular No 3997/604 of 6.9.1999 – New Circular 88/95 as amended	
Initial verification			***Periodic verification***	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.		1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.		2	General and functional checks.
3	Zero check.		3	Zero check.
4	Linearity verification.		4	Linearity verification.
5	Full scale verification.		5	Full scale verification.
6	Other checks.		6	Other checks.

6 - Headlight tester			6 - Headlight tester	
TYPE APPROVED – Circular No 3997/604 of 6.9.1999 – New Circular 88/95 as amended			TYPE APPROVED – Circular No 3997/604 of 6.9.1999 – New Circular 88/95 as amended	
Initial verification			***Periodic verification***	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.		1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.		2	General and functional checks.
3	Check the horizontal deviation of the light beam at the zero point.		3	Check the horizontal deviation of the light beam at the zero point.
4	Checking the vertical deviation of the light beam.		4	Checking the vertical deviation of the light beam.
5	Verification of light intensity in dipped-beam and driving mode.		5	Verification of light intensity in dipped-beam and driving mode.
6	If present, checking the rail straightness and the constancy of alignment.		6	If present, checking the rail straightness and the constancy of alignment.

7	Other checks.

7	Other checks.

7 – CAR Roller Brake Tester (< 3.5 Tones)			7 – CAR Roller Brake Tester (< 3.5 Tones)	
TYPE APPROVED – Circular No 3997/604 of 6.9.1999 – New Circular 88/95 as amended			TYPE APPROVED – Circular No 3997/604 of 6.9.1999 – New Circular 88/95 as amended	
Initial verification			***Periodic verification***	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.		1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.		2	General and functional checks.
3	Checking the difference in height between roller pair axles (if they have an independent structure).		3	Checking the difference in height between roller pair axles (if they have an independent structure).
4	Checking the correct detection of the peripheral speed of the vehicle wheel by the central auxiliary roller.		4	Checking the correct detection of the peripheral speed of the vehicle wheel by the central auxiliary roller.
5	Checking the correctness of the parameters set for the % slip between wheel and roller, which shall lead the rollers to stop.		5	Checking the correctness of the parameters set for the % slip between wheel and roller, which shall lead the rollers to stop.
6	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.		6	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.
7	Verification of the repeatability per braking force and weight.		7	Verification of the repeatability per braking force and weight.
8	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.		8	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.
9	Checking the correct expression of braking performance.		9	Checking the correct expression of braking performance.
10	Checking the correctness of the parameters set for alert thresholds.		10	Checking the correctness of the parameters set for alert thresholds.
11	Verification of the linearity of pedal and manual force measurers.		11	Verification of the linearity of pedal and manual force measurers.
12	Checking the correctness of the parameters set for roller speed alert thresholds for tests on 4 WD vehicles.		12	Checking the correctness of the parameters set for roller speed alert thresholds for tests on 4 WD vehicles.
13	Safety check.		13	Safety check.
14	Other checks		14	Check to maintain roller adhesion characteristics.
			15	Other checks.

8 – MOTORCYCLE Roller Brake Tester			8 – MOTORCYCLE Roller Brake Tester	
TYPE APPROVED – Circular 7938/604 of 29.9.2000			TYPE APPROVED – Circular 7938/604 of 29.9.2000	
Initial verification			***Periodic verification***	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.		1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.		2	General and functional checks.
3	Checking the correct detection of the peripheral speed of the vehicle wheel by the central auxiliary roller.		3	Checking the correct detection of the peripheral speed of the vehicle wheel by the central auxiliary roller.
4	Checking the correctness of the parameters set for the % slip between wheel and roller, which		4	Checking the correctness of the parameters set for the % slip between wheel and roller, which

	shall lead the rollers to stop.
5	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.
6	Verification of the repeatability per braking force and weight.
7	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.
8	Checking the correct expression of braking performance.
9	Checking the correctness of the parameters set for alert thresholds.
10	Verification of the linearity of pedal and lever force measurers.
11	Checking the correct functioning of the vehicle locking devices.
12	Safety check.
13	Other checks.

	shall lead the rollers to stop.
5	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.
6	Verification of the repeatability per braking force and weight.
7	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.
8	Checking the correct expression of braking performance.
9	Checking the correctness of the parameters set for alert thresholds.
10	Verification of the linearity of pedal and lever force measurers.
11	Check to maintain roller adhesion characteristics.
12	Checking the correct functioning of the vehicle locking devices.
13	Safety check.
14	Other checks.

9 – CAR Roller Brake Tester + 3-4 WHEELS	
TYPE APPROVED – Circular No 3997/604 of 6.9.1999 – New Circular 88/95 as amended + Circular 1603/404 of 8.10.2001	
Initial verification	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.
3	Checking the difference in height between roller pair axles (if they have an independent structure).
4	Checking the correct detection of the peripheral speed of the vehicle wheel by the central auxiliary roller.
5	Checking the correctness of the parameters set for the % slip between wheel and roller, which shall lead the rollers to stop.
6	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.
7	Verification of the repeatability per braking force and weight.
8	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.
9	Checking the correct expression of braking performance
10	Checking the correctness of the parameters set for alert thresholds.

9 – CAR Roller Brake Tester + 3-4 WHEELS	
TYPE APPROVED – Circular No 3997/604 of 6.9.1999 – New Circular 88/95 as amended + Circular 1603/404 of 8.10.2001	
Periodic verification	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.
3	Checking the difference in height between roller pair axles (if they have an independent structure).
4	Checking the correct detection of the peripheral speed of the vehicle wheel by the central auxiliary roller.
5	Checking the correctness of the parameters set for the % slip between wheel and roller, which shall lead the rollers to stop.
6	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.
7	Verification of the repeatability per braking force and weight.
8	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.
9	Checking the correct expression of braking performance
10	Checking the correctness of the parameters set for alert thresholds.

11	Verification of the linearity of pedal and manual force measurers.
12	Checking the correctness of the parameters set for roller speed alert thresholds for tests on 4 WD vehicles.
13	Safety check.
14	Checking the correct functioning of the vehicle locking devices.
15	Other checks.

11	Verification of the linearity of pedal and manual force measurers.
12	Checking the correctness of the parameters set for roller speed alert thresholds for tests on 4 WD vehicles.
13	Safety check.
14	Check to maintain roller adhesion characteristics. .
15	Checking the correct functioning of the vehicle locking devices.
16	Other checks.

10 – HEAVY-DUTY Roller Brake Tester – OM (> 3.5 Tonnes)	
TYPE APPROVED – Circular 26248 of 19.9.2011 and Circular 7937 of 21.6.2012	
Initial verification	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.
3	Dimensional checks.
4	Checking compliance of the supply line with the requirements of the accompanying user manual and/or installation manual.
5	Checking compliance with the minimum rotational speed of the rollers (no load).
6	Verification of maximum permissible error at zero (no load) and linearity verification at 20 %, 50 % 80 % of the CLASS value for measurement of the **braking force,** and at 20 %, 50 % 80 % of the CLASS value for measurement of the **weight force** per wheel.
7	Verification of linearity for the measurement of **air pressure.**
8	Verification of the linearity of pedal and manual force measurers.
9	Verification of the repeatability of measurements per braking force, weight force and air pressure.
10	Checking the minimum adhesion values also for wet rollers using a dedicated software procedure.
11	Checking the correctness of the parameters set and the efficiency-of the warning device indicating excessive angular or peripheral velocity difference between the right and the left wheel (if the system and permanent integral traction are used).
12	Checking the correctness of the parameters set for program thresholds for efficiency and imbalance calculations.
13	Safety check.

10 – HEAVY-DUTY Roller Brake Tester – OM (> 3.5 Tonnes)	
TYPE APPROVED – Circular 26248 of 19.9.2011 and Circular 7937 of 21.6.2012	
Periodic verification	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.
3	Dimensional checks.
4	Checking compliance of the supply line with the requirements of the accompanying user manual and/or installation manual.
5	Checking compliance with the minimum rotational speed of the rollers (no load).
6	Verification of maximum permissible error at zero (no load) and linearity verification at 20 %, 50 % 80 % of the CLASS value for measurement of the **braking force,** and at 20 %, 50 % 80 % of the CLASS value for measurement of the **weight force** per wheel.
7	Verification of linearity for the measurement of **air pressure.**
8	Verification of the linearity of pedal and manual force measurers.
9	Verification of the repeatability of measurements per braking force, weight force and air pressure.
10	Checking the minimum adhesion values also for wet rollers using a dedicated software procedure.
11	Checking the correctness of the parameters set and the efficiency-of the warning device indicating excessive angular or peripheral velocity difference between the right and the left wheel (if the system and permanent integral traction are used).
12	Checking the correctness of the parameters set for program thresholds for efficiency and imbalance calculations.
13	Verification of the maximum permissible error of the friction values and transcription thereof.

14	Other checks		14	Safety check.
			15	Other checks.
11 – HEAVY-DUTY Roller Brake Tester – AP (> 3.5 Tonnes)			**11 – HEAVY-DUTY Roller Brake Tester – AP (> 3.5 Tonnes)**	
APPROVED – 7690/699 of 16.12.1999 and ADJUSTED with Circular No 26638 of 21.9.2011			APPROVED – 7690/699 of 16.12.1999 and ADJUSTED with Circular No 26638 of 21.9.2011	
Initial verification			***Periodic verification***	
			1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
			2	General and functional checks.
			3	Dimensional checks.
			4	Checking compliance with the minimum rotational speed of the rollers (no load).
			5	Verification of maximum permissible error at zero (no load) and linearity verification at 20 %, 50 % 80 % of the CLASS value for measurement of the **braking force,** and at 20 %, 50 % 80 % of the CLASS value for measurement of the **weight force** per wheel.
			6	Verification of linearity for the measurement of **air pressure.**
			7	Verification of the linearity of pedal and manual force measurers.
			8	Verification of the repeatability of measurements per braking force, weight force and air pressure.
			9	Checking the minimum adhesion values also for wet rollers using a dedicated software procedure.
			10	Checking the correctness of the parameters set and the efficiency of the warning device indicating excessive angular or peripheral velocity difference between the right and the left wheel (if the system and permanent integral traction are used).
			11	Checking the correctness of the parameters set for program thresholds for efficiency and imbalance calculations.
			12	Verification of the maximum permissible error of the friction values and transcription thereof.
			13	Safety check.
			14	Other checks.
12 – CAR Plate Brake Tester (< 3.5 Tonnes)			**12 – CAR Plate Brake Tester (< 3.5 Tonnes)**	
TYPE APPROVED – Circular No 3997/604 of 6.9.1999 – New Circular 88/95 as amended			TYPE APPROVED – Circular No 3997/604 of 6.9.1999 – New Circular 88/95 as amended	
Initial verification			***Periodic verification***	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.		1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.		2	General and functional checks

3	Checking the coplanarity of the plates.
4	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.
5	Verification of the repeatability per braking force and weight.
6	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.
7	Checking the correct regulation of the initial vehicle speed sensors.
8	Checking the correct expression of braking performance.
9	Checking the correctness of the parameters set for alert thresholds.
10	Verification of the linearity of pedal and manual force measurers.
11	Safety check.
12	Other checks.

3	Checking the coplanarity of the plates.
4	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.
5	Verification of the repeatability per braking force and weight.
6	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.
7	Checking the correct regulation of the initial vehicle speed sensors.
8	Checking the correct expression of braking performance.
9	Checking the correctness of the parameters set for alert thresholds.
10	Verification of the linearity of pedal and manual force measurers.
11	Verification of the minimum grip also for wet plates.
12	Safety check.
13	Other checks.

13 – MOTORCYCLE Plate Brake Tester	
TYPE APPROVED – Circular 7938/604 of 29.9.2000	
Initial verification	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.
3	Checking the coplanarity of the plates.
4	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.
5	Verification of the repeatability per braking force and weight.
6	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.
7	Checking the correct regulation of the initial vehicle speed sensors.
8	Checking the correct expression of braking performance.
9	Checking the correctness of the parameters set for alert thresholds.
10	Verification of the linearity of pedal and lever force measurers.

13 – MOTORCYCLE Plate Brake Tester	
TYPE APPROVED – Circular 7938/604 of 29.9.2000	
Periodic verification	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.
3	Checking the coplanarity of the plates.
4	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.
5	Verification of the repeatability per braking force and weight.
6	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.
7	Checking the correct regulation of the initial vehicle speed sensors.
8	Checking the correct expression of braking performance.
9	Checking the correctness of the parameters set for alert thresholds.
10	Verification of the linearity of pedal and lever force measurers.

11	Safety check.
12	Other checks.

11	Verification of the minimum grip also for wet plates.
12	Safety check.
13	Other checks.

14 – CAR Plate Brake Tester + 3-4 WHEELS	
TYPE APPROVED – Circular No 3997/604 of 6.9.1999 – New Circular 88/95 as amended + Circular 1603/404 of 8.10.2001	
Initial verification	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.
3	Checking the coplanarity of the plates.
4	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.
5	Verification of the repeatability per braking force and weight.
6	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.
7	Checking the correct regulation of the initial vehicle speed sensors.
8	Checking the correct expression of braking performance.
9	Checking the correctness of the parameters set for alert thresholds.
10	Verification of the linearity of pedal, manual and lever force measurers.
11	Safety check.
12	Other checks.

14 – CAR Plate Brake Tester + 3-4 WHEELS	
TYPE APPROVED – Circular No 3997/604 of 6.9.1999 – New Circular 88/95 as amended + Circular 1603/404 of 8.10.2001	
Periodic verification	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.
3	Checking the coplanarity of the plates.
4	Checking the maximum permissible error at zero (empty) and linearity verification per wheel brake force.
5	Verification of the repeatability per braking force and weight.
6	Checking the maximum permissible error at zero (empty) and linearity verification per wheel weight.
7	Checking the correct regulation of the initial vehicle speed sensors.
8	Checking the correct expression of braking performance.
9	Checking the correctness of the parameters set for alert thresholds.
10	Verification of the linearity of pedal, manual and lever force measurers.
11	Verification of the minimum grip also for wet plates.
12	Safety check.
13	Other checks.

15 – HEAVY-DUTY Plate Brake Tester (>3.5 Tonnes)	
TYPE APPROVED – Circular 1699/404 of 7.9.2005	
Initial verification	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.

15 – HEAVY-DUTY Plate Brake Tester (>3.5 Tonnes)	
TYPE APPROVED – Circular 1699/404 of 7.9.2005	
Periodic verification	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.

3	Checking the coplanarity of the plates.
4	Checking the dimensions of the plates and the dimensional constraints of the vehicles declared compatible with the configuration being tested.
5	Checking the maximum permissible error at zero (empty) and linearity verification per plate brake force.
6	Verification of the repeatability per braking force and weight.
7	Checking the maximum permissible error at zero (empty) and linearity verification per plate weight force.
~~8~~	Checking acceptability thresholds.
9	Checking the correct regulation of the initial vehicle speed sensors.
10	Checking the correctness of the parameters set for alert thresholds.
11	Safety check.
12	Checking the correct expression of braking performance.
13	Verification of the linearity of pedal and manual force measurers.
14	Other checks.

3	Checking the coplanarity of the plates.
4	Checking the dimensions of the plates and the dimensional constraints of the vehicles declared compatible with the configuration being tested.
5	Checking the maximum permissible error at zero (empty) and linearity verification per plate brake force.
6	Verification of the repeatability per braking force and weight.
7	Checking the maximum permissible error at zero (empty) and linearity verification per plate weight force.
8	Verification of the minimum grip also for wet plates.
9	Checking acceptability thresholds.
10	Checking the correct regulation of the initial vehicle speed sensors.
11	Checking the correctness of the parameters set for alert thresholds.
12	Safety check.
13	Checking the correct expression of braking performance.
14	Verification of the linearity of pedal and manual force measurers.
15	Other checks.

16 – CAR Wear Tester	
TYPE APPROVED – Circular No 3997/604 of 6.9.1999 – New Circular 88/95 as amended	
Initial verification	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.
3	Spot lamp control.
4	Verification of unladen movements
5	Verification of the coefficient of adhesion.
6	Safety check.
7	Other checks.

16 – CAR Wear Tester	
TYPE APPROVED – Circular No 3997/604 of 6.9.1999 – New Circular 88/95 as amended	
Periodic verification	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.
3	Spot lamp control.
4	Verification of unladen movements
5	Verification of the coefficient of adhesion.
6	Safety check.
7	Other checks.

17 – HEAVY-DUTY Wear Tester – OM
TYPE APPROVED – Circular 330 of 11.8.2023 (wear testers for vehicles with a mass > 3.5 tonnes)

17 – HEAVY-DUTY Wear Tester – OM
TYPE APPROVED – Circular 330 of 11.8.2023 (wear testers for vehicles with a mass > 3.5 tonnes)

	Initial verification			***Periodic verification***
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.		1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.		2	General and functional checks.
3	Spot lamp control.		3	Spot lamp control.
4	Verification of unladen movements.		4	Verification of unladen movements.
5	Verification of the coefficient of adhesion.		5	Verification of the coefficient of adhesion.
6	Safety check.		6	Safety check.
7	Checking the movements of laden plates.		7	Checking the movements of laden plates.
8	Other checks.		8	Other checks.

18 – HEAVY-DUTY Wear Tester – AP			**18 – HEAVY-DUTY Wear Tester – AP**	
TYPE APPROVED – Circular 6710/604 of 27/7/2000 (wear testers for vehicles with a mass > 3.5 tonnes)			TYPE APPROVED – Circular 6710/604 of 27/7/2000 (wear testers for vehicles with a mass > 3.5 tonnes)	
Initial verification			***Periodic verification***	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.		1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.		2	General and functional checks.
3	Spot lamp control.		3	Spot lamp control.
4	Verification of unladen movements.		4	Verification of unladen movements.
5	Verification of the coefficient of adhesion.		5	Verification of the coefficient of adhesion.
6	Safety check.		6	Safety check.
7	Other checks.		7	Other checks.
19 – Velocity test 2 WHEELS			**19 – Velocity test 2 WHEELS**	
TYPE APPROVED – Circular 211/404 of 18.1.2002 for 2 wheels.			TYPE APPROVED – Circular 211/404 of 18.1.2002 for 2 wheels.	
Initial verification			***Periodic verification***	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.		1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.		2	General and functional checks.
3	Checking the dimensions and distances of the operator’s foot area.		3	Checking the dimensions and distances of the operator’s foot area.
4	Checking the size of the roller bench.		4	Checking the size of the roller bench.
5	Checking the correct functioning of the vehicle locking devices.		5	Checking the correct functioning of the vehicle locking devices.
6	Checking the efficiency of the cooling device.		6	Checking the efficiency of the cooling device.
7	Checking the detection of the brake roller speed.		7	Checking the detection of the brake roller speed.
8	Checking the alert threshold when the limit speed is exceeded.		8	Checking the alert threshold when the limit speed is exceeded.

9	Verification of the correct operation of the braking device using the method set out in the use and maintenance manual and verified at type approval.		9	Verification of the correct operation of the braking device using the method set out in the use and maintenance manual and verified at type approval.
10	Safety check.		10	Safety check.
11	Other checks.		11	Other checks.

20 – Velocity test 2+3+4 WHEELS			20 – Velocity test 2+3+4 WHEELS	
TYPE APPROVED – Circular 1304/404 of 1.7.2005 for 2 wheels, 3 wheels and quadricycles			TYPE APPROVED – Circular 1304/404 of 1.7.2005 for 2 wheels, 3 wheels and quadricycles	
Initial verification			***Periodic verification***	
1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.		1	Checking the compliance of the equipment with the metrological booklet and the absence of obvious tampering.
2	General and functional checks.		2	General and functional checks.
3	Size check: roller diameter, roller wheelbase, minimum and maximum distance of the roller edges, any additional roller connections, any transfer device functionality.		3	Size check: roller diameter, roller wheelbase, minimum and maximum distance of the roller edges, any additional roller connections, any transfer device functionality.
4	Checking the correct functioning of the vehicle anchorage and/or locking devices.		4	Checking the intactness and correct functioning of the vehicle anchorage and locking devices.
5	Checking the efficiency of the cooling device.		5	Checking the efficiency of the cooling device.
6	Checking the correct detection of the rotational speed of the brake roller.		6	Checking the correct detection of the rotational speed of the brake roller.
7	Checking the alert threshold when the limit speed is exceeded.		7	Checking the alert threshold when the limit speed is exceeded.
8	Verification of the correct operation of the braking device using the method set out in the use and maintenance manual and verified at type approval.		8	Verification of the correct operation of the braking device using the method set out in the use and maintenance manual and verified at type approval.
9	Safety check.		9	Safety check.
10	Verification of the barometric station (if used).		10	Verification of the barometric station (if used).
11	Other checks.		11	Other checks.