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Road vehicles — Security of the mechanical seals used on tachographs — Requirements and test procedures

bsi.

National foreword

This British Standard is the UK implementation of EN 16882:2016.

The UK participation in its preparation was entrusted to Technical Committee AUE/9, Automobile details and accessories.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Road vehicles - Security of the mechanical seals used on tachographs - Requirements and test procedures

Véhicules routiers - Sécurité des scellés mécaniques utilisés sur des chronotachygraphes - Exigences et procédures d'essais

Straßenfahrzeuge - Sicherheit von mechanischen Siegeln für Tachographen - Anforderungen und Testmethoden

This European Standard was approved by CEN on 18 October 2016.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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European foreword

This document (EN 16882:2016) has been prepared by Technical Committee CEN/TC 301 “Road vehicles” and its working group WG10, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2017, and conflicting national standards shall be withdrawn at the latest by May 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association: M/502 Mandate to CEN, CENELEC and ETSI concerning standardization within the context of Regulation No. 3821/85 on recording equipment in road transport, for purpose of developing seals for digital tachographs.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard is intended to provide technical specifications for mechanical seals to enhance the security of digital tachograph systems. It applies to the category of vehicles as defined in European Regulation n°165/2014.

NOTE 1 This European Standard is primarily intended to digital tachographs but can be applied to analog tachographs.

NOTE 2 Any type of seals which meet the requirements within this European Standard can be used.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

DIN 52348, *Testing of glass and plastics; abrasion test; sand trickling method*

EN 60068-2-6, *Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal) (IEC 60068-2-6)*

EN 60068-2-14, *Environmental testing - Part 2-14: Tests - Test N: Change of temperature (IEC 60068-2-14)*

EN 60068-2-30, *Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle) (IEC 60068-2-30)*

EN 60068-2-38, *Environmental testing - Part 2-38: Tests - Test Z/AD: Composite temperature/humidity cyclic test (IEC 60068-2-38)*

EN ISO 105-X12, *Textiles - Tests for colour fastness - Part X12: Colour fastness to rubbing (ISO 105-X12)*

IEC 60068-2-64:2008, *Environmental testing - Part 2-64: Tests - Test Fh: Vibration, broadband random and guidance*

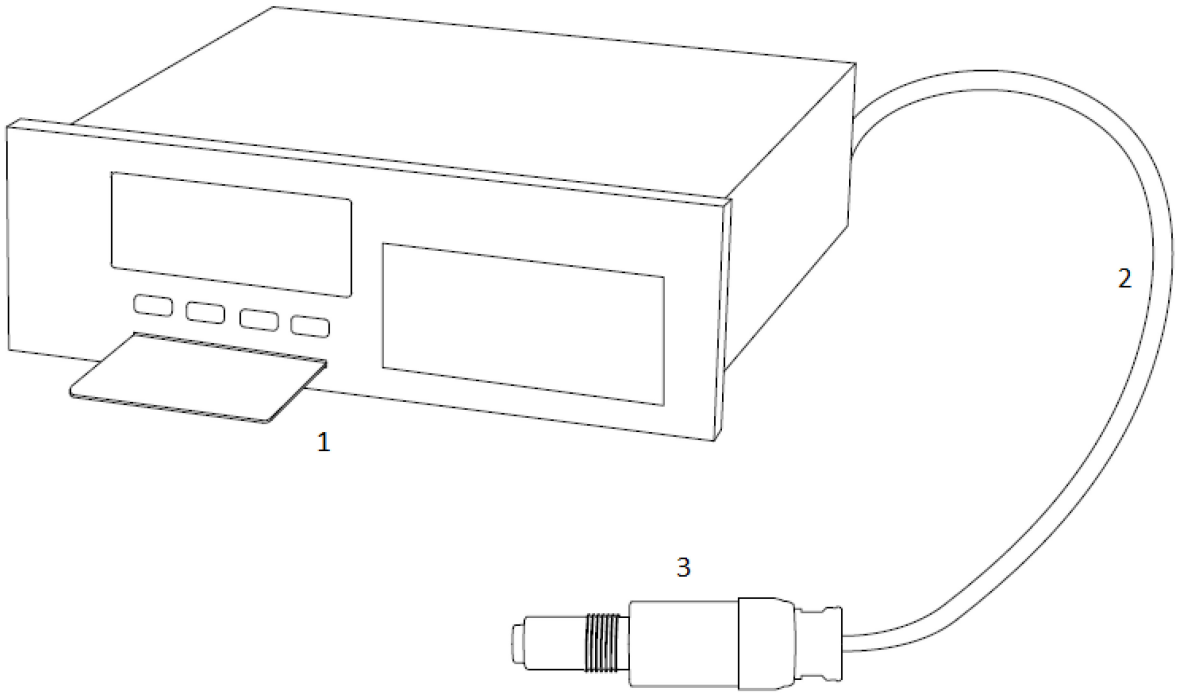
ISO 16750-5:2010, *Road vehicles — Environmental conditions and testing for electrical and electronic equipment — Part 5: Chemical loads*

Regulation EU (No) 165/2014 of the European Parliament and of the Council of 4 February 2014 on tachographs in road transport, repealing Council Regulation (EEC) No 3821/85 on recording equipment in road transport and amending Regulation (EC) No 561/2006 of the European Parliament and of the Council on the harmonization of certain social legislation relating to road transport

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
tachograph system
chain of following components (as defined in Figure 1): vehicle unit, cabling, and motion sensor



Key

1 vehicle unit
2 cabling
3 motion sensor

Figure 1 — Tachograph system

3.2
tachograph or recording equipment
equipment intended for *installation* in road vehicles to display, record, print, store and output automatically or semi-automatically details of the movement, including the speed, of such vehicles, and details of certain periods of activity of their drivers

3.3
motion sensor
part of the tachograph providing a signal representative of vehicle speed and/or distance travelled

3.4
vehicle unit
tachograph excluding the motion sensor and the cables connecting the motion sensor

Note 1 to entry: The vehicle unit may be a single unit or several units distributed in the vehicle, provided that it complies with the security requirements of Regulation 165/2014; the vehicle unit includes, among other things, a processing unit, a data memory, a time measurement function, two smart card interface devices for driver and co-driver, a printer, a display, connectors and facilities for entering the user's inputs.

3.5
seal
mechanical device marked with a unique identifier and designed for a single use, which is externally affixed to the gearbox and the sensor, and other possible sensitive part as defined on the tachograph type approval, and is designed to show visual evidence of tampering or intrusion to the system

Note 1 to entry: In certain configuration, a seal can be composed of different parts to fulfill its aim, as for example, a closing device and a wire.

Note 2 to entry: Seals need to be designed and constructed so that tamper attempts create and leave evidence of that tampering.

Note 3 to entry: All grades and types of seals require inspection to indicate whether tampering has occurred.

3.6
defeated seal
seal which has been opened or removed and replaced or reconstructed without detectable evidence of tampering

3.7
seal tampering
attempt to open, remove, replace or reconstruct a seal

3.8
tamper evidence
irreversible tell-tale indication that an attempt has been made to open, remove, replace or re-construct the seal

Note 1 to entry: It's a mechanical variation obvious and irreversible.

Note 2 to entry: It can't be considered as tamper evidence a modified part of the product, which can recover its initial state by applying an external physical source.

Note 3 to entry: Examples of tamper evidence include a change in the colour of the material, in surface texture, cracks, indentations, abrasions, etc.

Note 4 to entry: Tamper evident indicators are recognizable by normal examination under the usual circumstances prevailing in practice without technical aids (such as a magnifying glass or microscope).

3.9
tampered seal
opened, removed, replaced or reconstructed seal with tamper evidence

3.10
indicativeness
ability to reveal evidence after attempts have been made to tamper with the seal

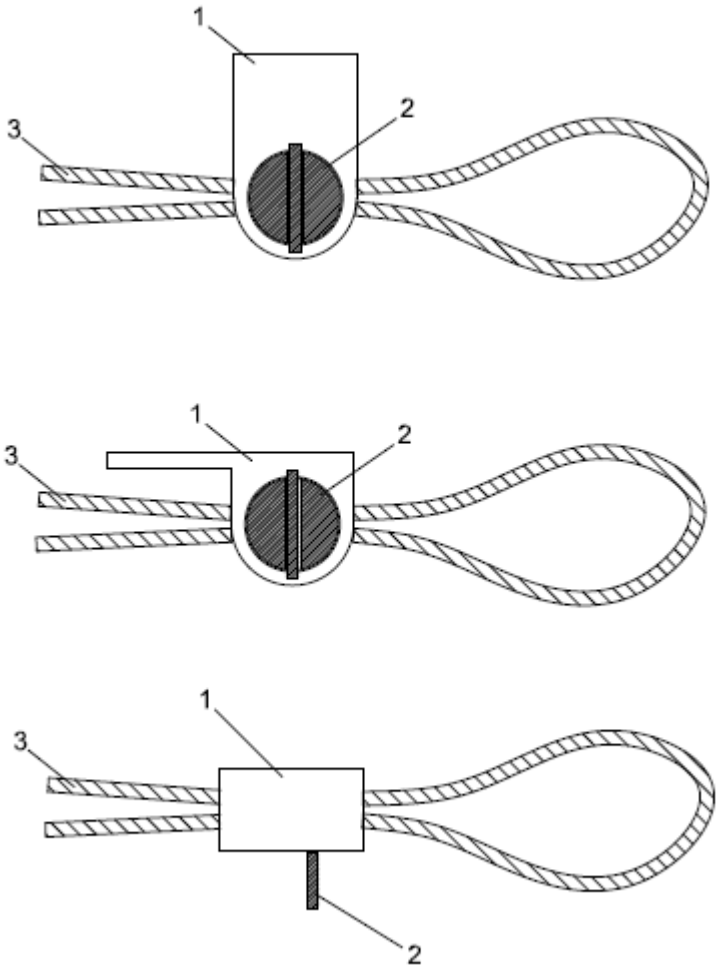
3.11
wire seal
length of wire secured in a loop by some type of seizing device

EXAMPLE Wire seals include: crimp wire, fold wire and cup wire seals.

Note 1 to entry: The seizing device can be plastic or metal and its deformation is one indication of tampering.

3.12
rotating seal
formed by at least two elements: the main body and the rotating element

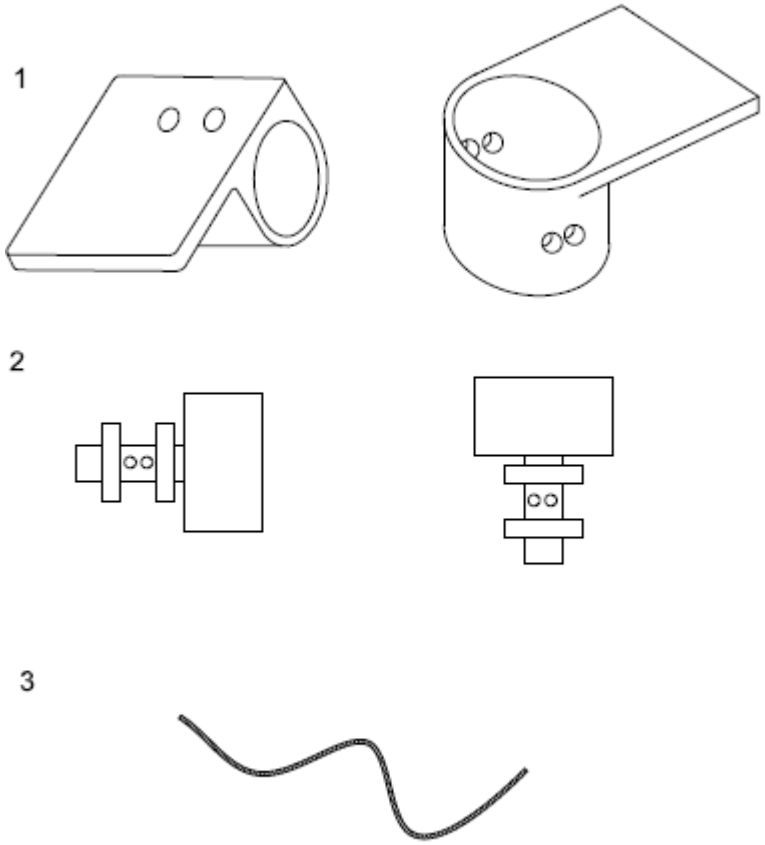
Note 1 to entry: The internal mechanism rotates on its axis without auxiliary tools within the main body in one direction engaging and retaining the two wire ends.



Key

1 main body
2 rotating element
3 wire

Figure 2 — example of rotating seal



Key

1 main body
2 rotating element
3 wire

Figure 3 — example of detailed parts for a rotating seal

3.13
tail seal
metal or plastic strap secured in a loop by inserting one end into or through a protected (covered) locking mechanism on the other end

Note 1 to entry: The seizing device can be plastic or metal and its deformation is one indication of tampering.

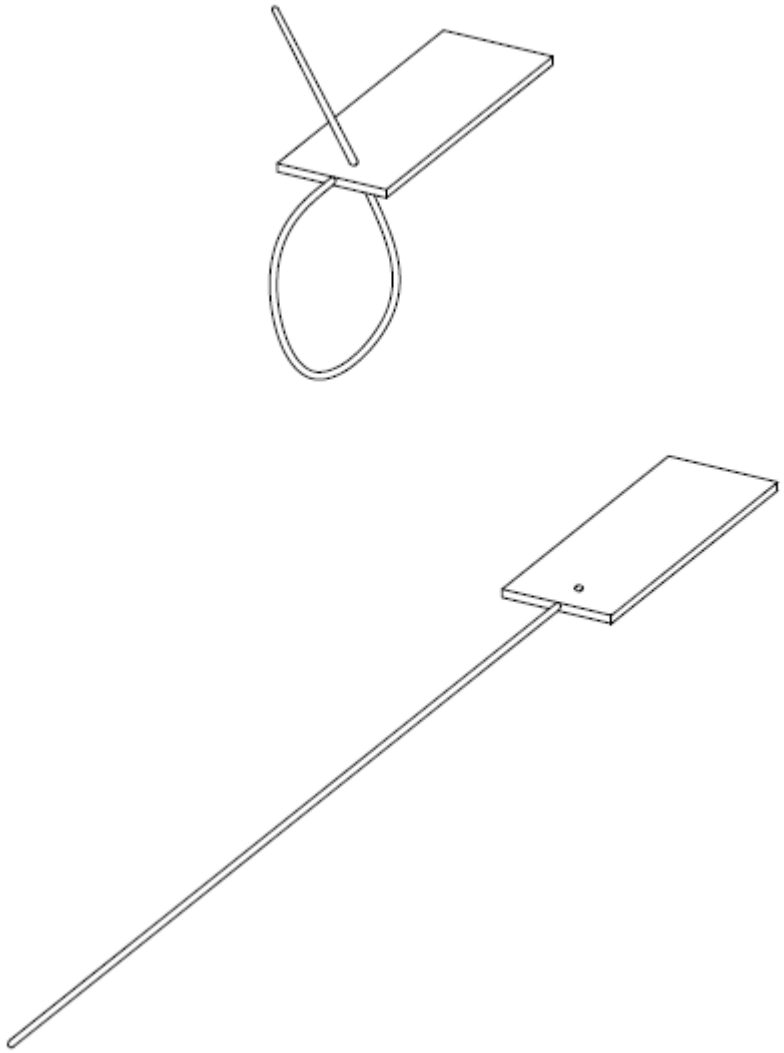


Figure 4 — example of tail seal

3.14
security label seal
paper or plastic backing with adhesive that gives visual evidence of tampering

4 Seal Requirements

4.1 General

These requirements shall be applied to any type of seal.

The marking requirements are given in Clause 7.

All seals should be easy to fit correctly on the item to be sealed and, once *in situ*, be easy to check for correct fitment and integrity. Correct handling and fitting of seals is at least equal if not greater in importance than selection of the correct seal. A poorly chosen but correctly fitted seal may provide security; however, a well-chosen but incorrectly fitted seal will provide no security.

Seals shall be sufficiently durable, strong, and reliable so as to prevent accidental breakage and early deterioration (due to environmental conditions, chemical action, vibration, shock, etc.) in normal use.

All types of seals shall be capable of being affixed quickly.

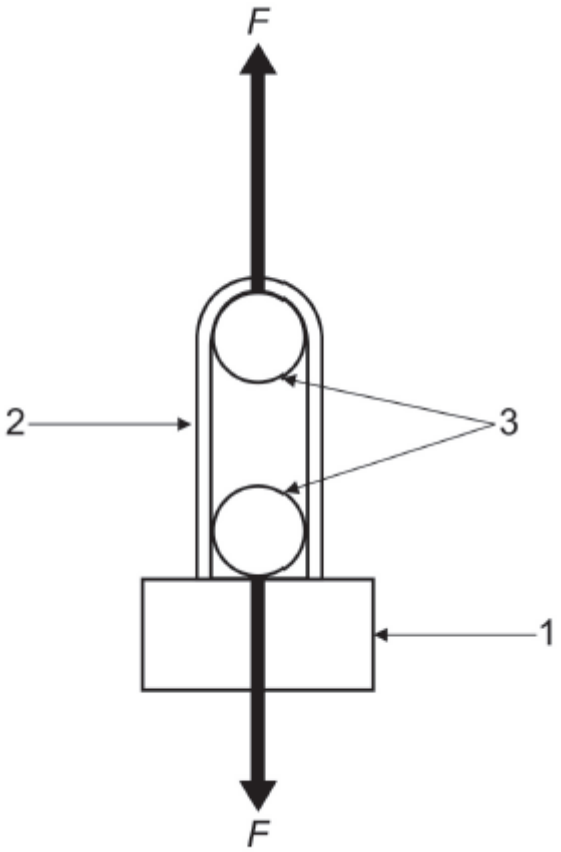
Tachographs seals are typically subjected to the harsh environments of road transport industries. Sand and dust, salt spray, grease, snow, ice and grime can be expected to coat the seal. Physical shock and vibration are commonly encountered as a result of handling and transport operations.

Mechanical seals shall be constructed to be fit for their intended purposes.

4.2 Requirements to traction

4.2.1 First requirement (for the system composed by the wire and the seal)

As shown in Figure 5, a value of 13 kg has to be applied in the longitudinal direction and the seal shall not break.



Key

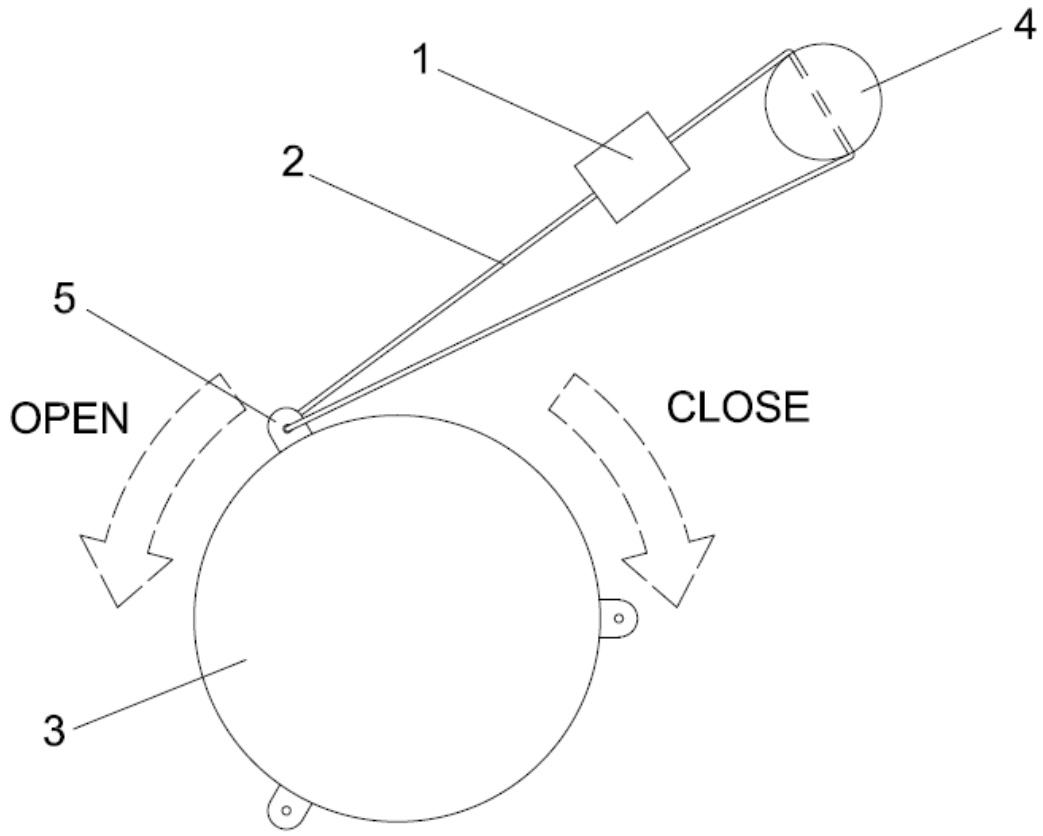
1 locking mechanism of the seal
2 wire
3 pin
F applied pull force

Figure 5 — Traction test for system composed by the the wire and the seal

4.2.2 Second requirement

At a higher power, the seal or the wire shall brake before the opening of the seal in order to show the tampering evidence: the load shall be slowly applied until the seal forcibly opens or is otherwise broken.

On different application points shown in Figure 6, when the parts are assembled, the seal shall not permit the rotation of the sensor more than 90°.



Key

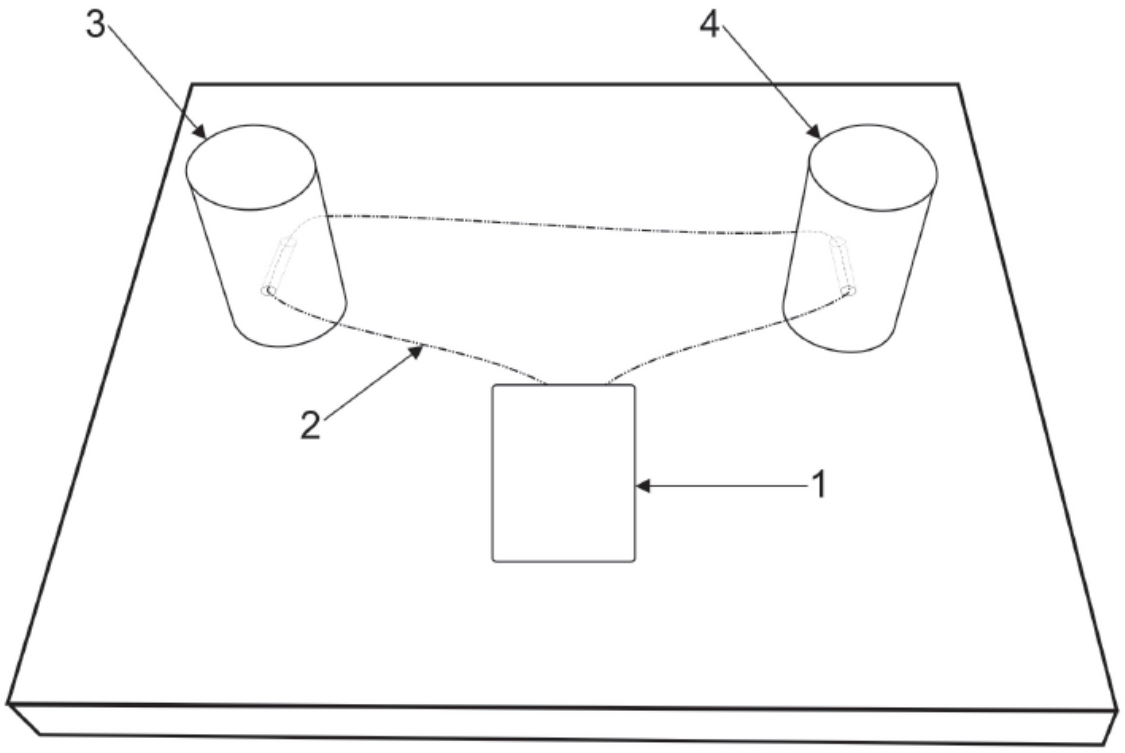
1 locking mechanism of the seal
2 wire
3 motion sensor to be sealed (with the correct fixing point)
4 fixed point (usually bolt on gearbox)
5 correct fixing point

Figure 6 — Rotation test for seal installation

4.3 Requirements for position and tension

System seal shall prevent (with sufficient tension) that sensor can be changed/rotated of position.

An example of an incorrect seal installation is shown in Figure 7.

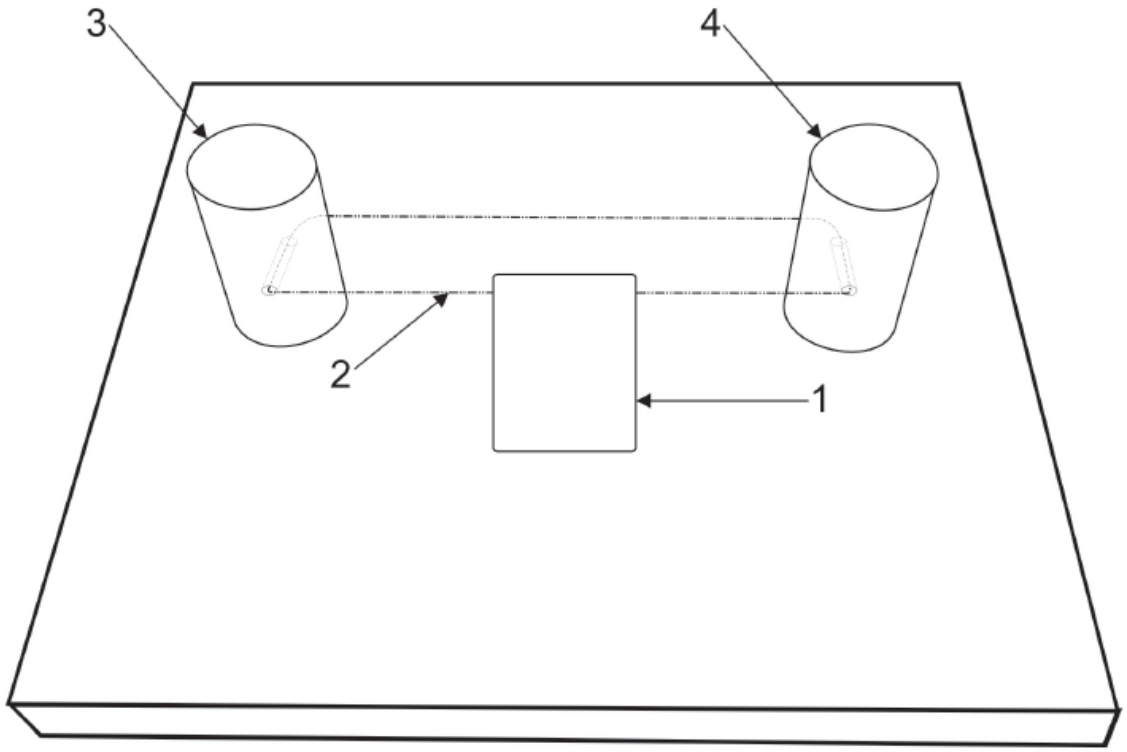


Key

1 locking mechanism of the seal
2 wire
3 fixed element
4 element to be sealed (motion sensor)

Figure 7 — Incorrect seal installation

An example of a correct seal installation is shown in Figure 8.



Key

1 locking mechanism of the seal

2 wire

3 fixed element

4 element to be sealed (motion sensor)

NOTE During the test, the distance between the centre of element 3 and element 4 shall be 200 mm.

Figure 8 — Correct seal installation

The sensor cannot be rotated more than 90° without causing permanent damage to the sealing system.

Requirements for installation:

All seals should be easy to fit correctly on the item to be sealed and once *in situ* be easy to check for positive engagement of the locking mechanism(s).

4.4 Identification marks

4.4.1 General

Regulatory authorities may require identifiers that go beyond the requirements of this European Standard, such as in the following cases.

The normative Annex A shall be applied.

4.4.2 Numbering

A unique number shall be defined by:

— the manufacturer number;

— the serial number for each seal.

5 Test methods

5.1 For sealing elements

Check that the all the parts of the seal are not cut or damaged and that it has not been reconstructed (by welding, gluing or by other means).

Check that all the elements are correctly assembled and you cannot separate them.

If existing, pull the wire (or tail) by hand and be sure that both ends are within the locking mechanism of the seal.

If existing, check that the tamper visual detector is valid.

Check that the seal is correctly marked and printed regarding Clause 7.

5.2 Environmental test specification for the motion sensor seals

5.2.1 Temperature

Operating and storage temperature limits:

The system will function over a temperature range of −40 °C to 135 °C for the gearbox seal.

5.2.2 Resistance against contact with liquids

All the requirements defined in the engine compartment defined in ISO 16750-5:2010, Table 1 shall be fulfilled.

5.2.3 Climatic

5.2.3.1 Humidity

The system will function to specification when exposed to a humid environment conforming to EN 60068-2-30 Db, with an upper air temperature of +55 °C ± 2 °C. The test duration is 6 cycles of a 24 h programme.

Test: 55 °C, 95 %rh

5.2.3.2 Composite temperature and humidity

The system will function to specification when exposed to an humidity - temperature cycle conforming to EN 60068-2-38, with upper and lower air temperatures +65 °C and 10 °C respectively. The test duration is 5 cycles of a 24 h programme.

Test: 10 °C to 65 °C, 95 %rh

5.2.3.3 Temperature cycling (operational)

Testing in accordance with EN 60068-2-14 Nb with the following parameters:

2 h −40 °C, 2 h +135 °C

Rate of temp change: 1 °C/min ± 2 °C

No of cycles: 30

The system will function to specification throughout the test.

5.2.3.4 Thermal shock (non-operational)

Testing in accordance with EN 60068-2-14 Na with the following parameters:

3 h −40 °C, 3 h +135 °C

Transfer time: < 1 min

No of cycles: 20

The system is allowed to stabilize thermally for 1 h at ambient conditions before function testing.

5.2.4 Mechanical

5.2.4.1 Vibration

5.2.4.1.1 Sinusoidal

Testing in accordance with EN 60068-2-6 Fc:

Logarithmic scanning at 1 octave/min

Frequency Levels:

5 Hz to 11 Hz	constant amplitude ± 10 mm
11 Hz to 300 Hz	constant acceleration 50 m/s
300 Hz to 750 Hz	constant acceleration 40 m/s
750 Hz to 1 000 Hz	constant acceleration 30 m/s

The test duration is 15 h in each of the X, Y and Z axes.

5.2.4.1.2 Random

Testing in accordance with IEC 60068-2-64:2008 Fda:

Frequency range: 10 Hz to 500 Hz

RMS Level: 3,2 g

The test duration is 30 h.

5.2.4.2 Dynamic mechanical shock

The seal shall withstand six 50 g half sine shock pulses of duration 10 ms. One in each opposite direction of each perpendicular axis.

5.2.5 Endurance

5.2.5.1 Generalities

Functional testing will confirm performance criteria before, during and after endurance testing.

5.2.5.2 High temperature endurance

The system may operate for 250 h at the temperature of +100 °C.

5.2.5.3 High temperature and high humidity endurance

The system may operate for 250 h at 85 °C and 85 %rh.

5.3 Environmental test specification for the other seals (not in the gearbox area)

5.3.1 Operating and storage temperature limits

The system will function over a temperature range of −40 °C to 85 °C.

5.3.2 Resistance against contact with liquids

The identification labels shall not be removable without damage, and the inscription has to be still readable after getting into contact with the following liquids:

Testing liquids	**Testing temperature (°C)**	**Testing period (h)**
Water (distilled water)	50	1
Soda lye (1 %)	20 ± 2	0,5
Sulphuric acid (5 %)	20 ± 2	0,5
Fuel (super)	20 ± 2	0,25
Toluene	20 ± 2	0,25
Motor oil (High-pressure oil)	20 ± 2	1
Diesel fuel	20 ± 2	0,5

During the tests the specimens have to be fully plunged into the tests liquids. There have to be used separate specimens for each test.

If the intended place of installation for an identification plate is inside the passenger compartment and the testing sample has failed the resistance against toluene, the identification plate nevertheless fulfills the requirement of 5.3.2 of the conditions for testing.

5.3.3 Climatic

5.3.3.1 Humidity

The system will function to specification when exposed to a humid environment conforming to EN 60068-2-30 Db, with an upper air temperature of +55 °C ± 2 °C. The test duration is 6 cycles of a 24 h programme.

Test: 55 °C, 95 %rh

5.3.3.2 Composite temperature and humidity

The system will function to specification when exposed to an humidity - temperature cycle conforming to EN 60068-2-38, with upper and lower air temperatures +65 °C and 10 °C respectively. The test duration is 5 cycles of a 24 h programme.

Test: 10 °C to 65 °C, 95 %rh

5.3.3.3 Temperature cycling (operational)

Testing in accordance with EN 60068-2-14 Nb with the following parameters:

2 h −40 °C, 2 h +85 °C

Rate of temp change: 1 °C/min ± 2 °C

No of cycles: 30

The system will function to specification throughout the test.

5.3.3.4 Thermal shock (non-operational)

Testing in accordance with EN 60068-2-14 Na with the following parameters:

3 h −40 °C, 3 h +85 °C

Transfer time: < 1 min

No of cycles: 20

The system is allowed to stabilize thermally for 1 h at ambient conditions before function testing.

5.3.4 Mechanical

5.3.4.1 Vibration

5.3.4.1.1 Sinusoidal

Testing in accordance with EN 60068-2-6 Fc:

Logarithmic scanning at 1 octave/min.

Frequency Levels:

5 Hz to 11 Hz	constant amplitude ± 10 mm
11 Hz to 300 Hz	constant acceleration 50 m/s
300 Hz to 750 Hz	constant acceleration 40 m/s
750 Hz to 1 000 Hz	constant acceleration 30 m/s

The test duration is 15 h in each of the X, Y and Z axes.

5.3.4.1.2 Random

Testing in accordance with IEC 60068-2-64:2008 Fda:

Frequency range: 10 Hz to 500 Hz

RMS Level: 3,2 g

The test duration is 30 h.

5.3.4.2 Dynamic Mechanical Shock

Using a mass of 200 g and with a diameter of 20 mm, 10 half sine shock pulses must be dropped at 200 mm height and finally no parts of the seal shall crack.

5.3.4.3 Abrasion resistance

Crock meter-test against cotton grating cloth according to EN ISO 105-X12, 100 cycles,

contact pressure 9+ 0,2 N, stroke of 75 % of the printed area of the seal minimum, cylindrical grating pin Ø 16 mm, 1 cycle/3 s, are operated on the identification serial numbers.

The inscription shall also be resistant against the sand trickle-test according to DIN 52348 without damage.

The information on the serial number of the seal shall be legible after the treatment according to all tests defined in 5.3.3 and 5.3.4.

5.3.5 Endurance

5.3.5.1 Generalities

Functional testing will confirm performance criteria before, during and after endurance testing.

5.3.5.2 High temperature endurance

The system may operate for 250 h at the temperature of +75 °C.

5.3.5.3 High temperature and high humidity endurance

The system may operate for 250 h at 85 °C and 85 %rh.

5.4 Test reporting

The test report shall contain:

— all the results obtained after the test methods;

— the manufacturer’s information regarding the material and the manufacturing method, and the handling procedures.

After the test report, a certificate that the seal is fulfilling requirements (of this document) has to be provided to all vehicle unit manufacturer and to the seal's manufacturer database manager as defined in 7.2.

6 Evidence of tampering

6.1 General

Seals shall be designed and constructed so that tamper attempts create and leave evidence of that tampering. More specifically, seals shall be designed and manufactured to prevent removal of or undoing the seal without breaking, or tampering without leaving clear visible evidence, or undetectable re-application of seals designed for single use. Compliant security “T” seals shall demonstrate their ability to resist such tamper attempts. Such documentation shall, upon request, be made available to competent governmental agencies or authorities and to *bona fide* tachograph manufacturers.

Due to different seal types evidence tampering in different ways, it is recommended that users (e.g. law enforcers, workshops technicians) receive training in seal inspection and detection of tampering.

NOTE Table 5 provides useful examples of tampering evidence.

In order to install the seal correctly, it shall be applied according to the seal manufacturer specifications and instructions.

The variation of the shape shall be obvious and irreversible. Thermoplastics, due to their nature, are capable of recovering the application forms with heat for example.

This clause requires that seals be designed and constructed with tamper evidence features that generate tell-tale evidence of tampering. The fundamental function of any seal is “indicativeness”, the ability to reveal evidence after attempts have been made to tamper with the seal. In practical field applications, this calls for evidence available to visual inspection of a seal *in situ* by a control officer, workshop card owner or regulatory person.

6.2 Test methods for evaluation of tampering evidence

6.2.1 This section describes some general types of test methods that may be applied to tested seals. Selection of a specific procedure requires some discretion on the part of the manufacturer because appropriate procedures vary according to the design and construction of the seal under test.

6.2.2 Testers may use single tools or a combination of tools and procedures to attempt to disengage, damage, separate, or manipulate the locking action of the seal. The goal of each procedure will be to allow the seal to be opened and re-closed without leaving evidence of the tampering detectable upon visual inspection.

Similarly, attempts may be made to disassemble the seal and rebuild it to allow re-closure either with original parts, commonly available replica parts or, substitute parts previously disassembled from a practice seal of the same type and design, again without leaving evidence of the action detectable upon visual inspection or any other method.

6.3 Evidence of tampering

After the tamper attempt, a tested seal shall be inspected for evidence of tampering. The tested seal shall be subjected to close visual examination; the initial inspection on all types of seals should be to pull the seal by hand. Additional physical inspection should be conducted as necessary. Tamper-evident features on seals shall be easy to inspect to facilitate regular checks.

Table 5 — Evidence of tampering related to type of seal

Seal type	**Security checks/evidence of tampering**
All types	- Evidence of abrasion or solvent/chemical distortion in and around the area of the seal markings - Post-production marks, scratches, or abrasions, paying particular attention to the surfaces around the locking areas, external shoulders, construction joins, welds, or forms - Deformities, cracks or inconsistencies in the profile of the seal surfaces, particularly at the point of entry on seals that use the male-into-female method of locking and also at the point of exit on pull-through types - Check that there is no free play on designs that do not allow free play - The seal hasn’t proper marks and/or correctly printed according Clause 7

Seal type	**Security checks/evidence of tampering**
Cable seals	- Frayed sections or deformation of the uniform pattern of the cable along the full length - Evidence of abrasion, drilling, or gluing where cable is permanently fixed to the seal body - Cut cable
Rototype seals	For wire 1) Frayed sections or deformation of the uniform pattern of the cable along the full length; cut wire 2) One wire end is not engaged into the rototype seal 3) Wire is not around the rotor for rototype mechanism. For closing mechanism 1) Rotating element is not assembled into the main body or visual evidence that a disassembly occurred. You can separate them, the internal rotating part is out of the main body. 2) (If provided), the tamper visual indicator is invalid 3) Any other traces or evidence that can suggest tampering happened, as example marks between the rotating parts and the main body
Plastic seals and plastic sheathed seals	- Scratches, abrasions, or signs of heat welding/gluing on all surfaces and around external shoulders - Blanching (whitening) of colour on polypropylene materials

6.4 Test results

Seal manufacturers shall provide to tachograph manufacturers and control authorities tamper-testing processes with detailed information based on practical attacks on that seal type.

7 Marking

7.1 Generalities

The traceability of the marking shall be checked:

— Seal manufacturer shall keep and make available to the appropriate authorities internal recorded information with prints and seal serial numbers and associated customers.

— Workshop shall keep and make available to the appropriate authorities internal recorded calibration data with seal serial numbers used and associated customers.

— Seals shall be identified by unique mark (see Figure A.1) and unique numbers that are readily legible; markings intended for unique identification of the seal shall be considered permanent.

NOTE Permanent is the status considered when a part of a seal system is not removable or erasable (example of a laser engraving or moulding embossing).

The approved logo shall be also evident on every category seal by positive moulding (see normative Annex A).

Any modification of markings or numbers shall be visually detectable.

7.2 Gearbox and installation plaque seals

7.2.1 Seal unique number

a) They shall be uniquely numbered and identified (manufacturer unique number). The identity of the seal manufacturer shall be included in the unique identification number as shown below.

b) Unique identification serial number shall be defined as: MM NNNNNNNN by non-removable marking with:

   1) MM unique manufacturer identification (database registration to be managed by EC);

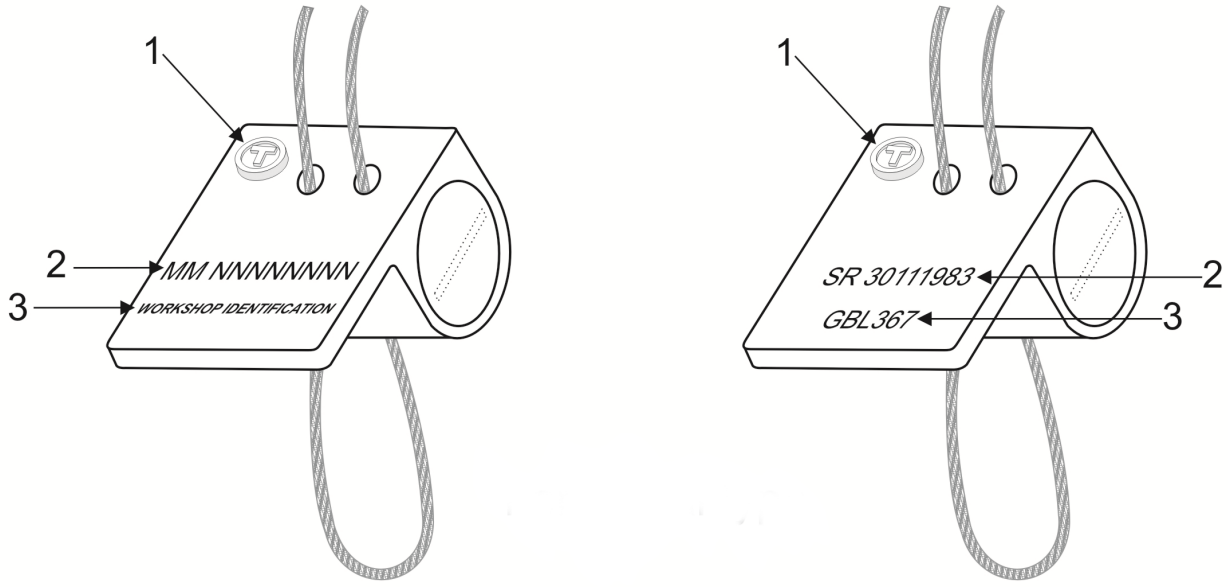
   2) NNNNNNNN unique seal alpha-numeric number in the manufacturer domain.

7.2.2 Workshop special mark

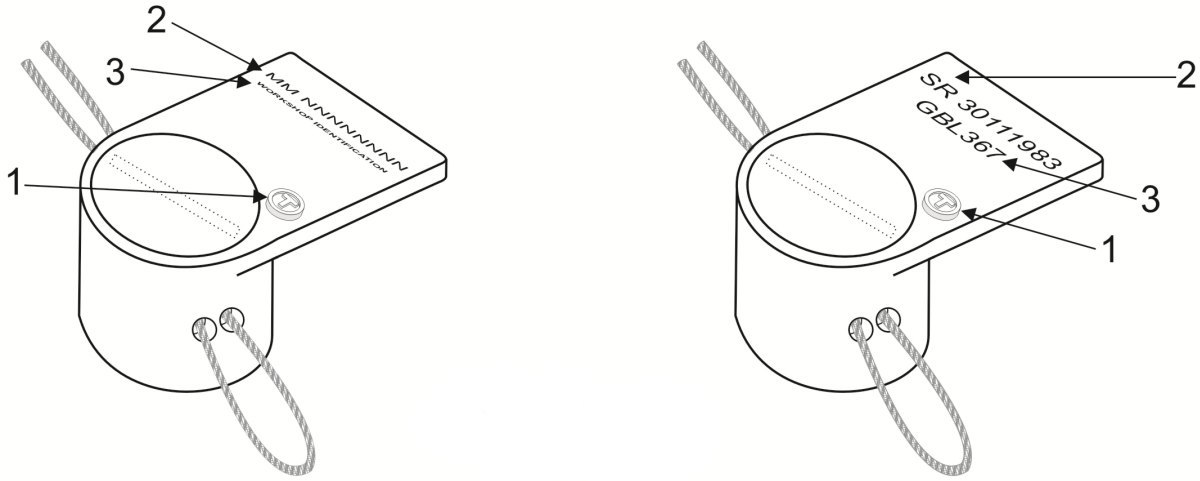
The approved fitter, workshop or vehicle manufacturer shall add a special mark on the seals which it affixes according to the Article 22.3 of Regulation 165/2014.

NOTE This workshop special mark is not part of this European Standard.

7.2.3 Example of marking



a) Horizontal type



b) Vertical type

Key

1 T logo (as defined in Annex A)

2 unique identification alpha-numeric number (as defined in 7.2)

3 workshop mark

Figure 9 — Example of marking

The identity of the workshop (approval number) shall be evident on the installation plaque.

The GEARBOX seal unique identification number shall be present on the installation plaque.

The installation plaque where relevant shall be sealed.

7.3 Restrictions to "T" marking

Seal manufacturers shall not affix the classification mark ("T" logo type as shown in Figure A.1) if the conditions are not met:

a) The seal shall be certified according to this European Standard by a recognized authority.

b) The firm that manufactures the seal complies with the security-related practices described in Annex C, as certified by an accredited process review organization.

7.4 Identification from seal manufacturers

Seals shall be marked and constructed in such a manner that manufacturers shall be able to identify their own products.

8 Seal manufacturer/distributor database

The manufacturer shall be registered in the digital tachograph database and the identification code shall be publicly published on the website (database registration to be managed by EC).

The workshop or the truck manufacturer shall buy seals from a seal manufacturer (or its authorized distributors) which appear as authorized on the website of the European Commission.

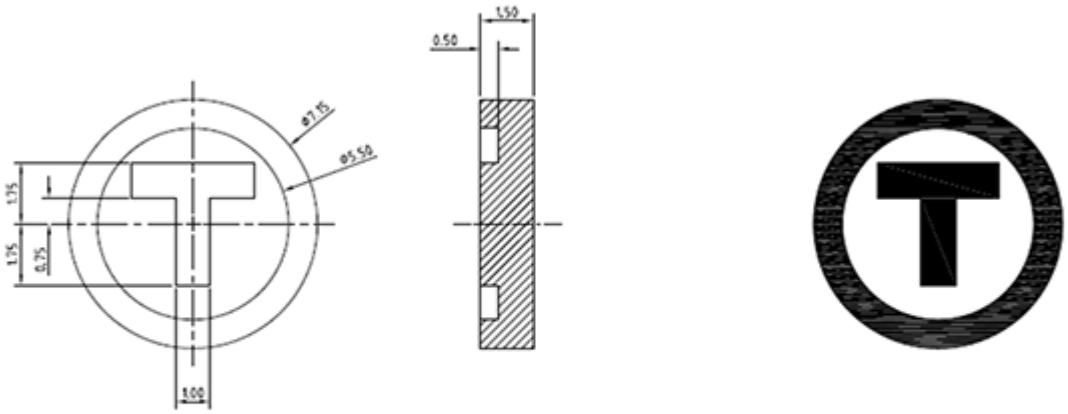
The seal manufacturer may have a list of its officially authorized distributors available.

The seal manufacturers (and its authorized distributors) shall maintain full traceability records of the sales regarding this product and keep it available to authorities' request.

Annex A
(normative)

Logo seal for the marking

The logo seal is defined as following in this figure:



a)

b)

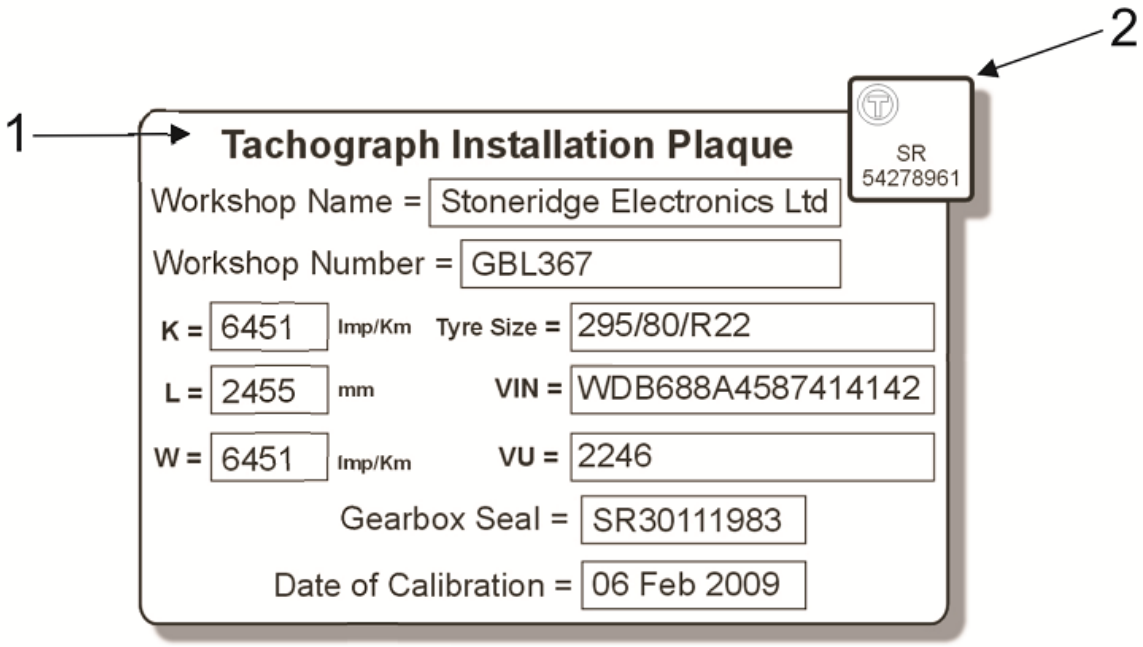
NOTE These dimensions can be proportionally reduced with a minimum of 3 mm global diameter made by moulding process on positive.

Figure A.1 — Seal logo shape and dimensions (2-D and 3-D view)

Annex B
(informative)

Tachograph installation plaque

These two next examples shall be applied:



Tachograph Installation Plaque

This plaque seal shall have unique identifier.

Key

1 tachograph installation plaque

2 plaque security seal

Figure B.1 — First example for tachograph installation plaque

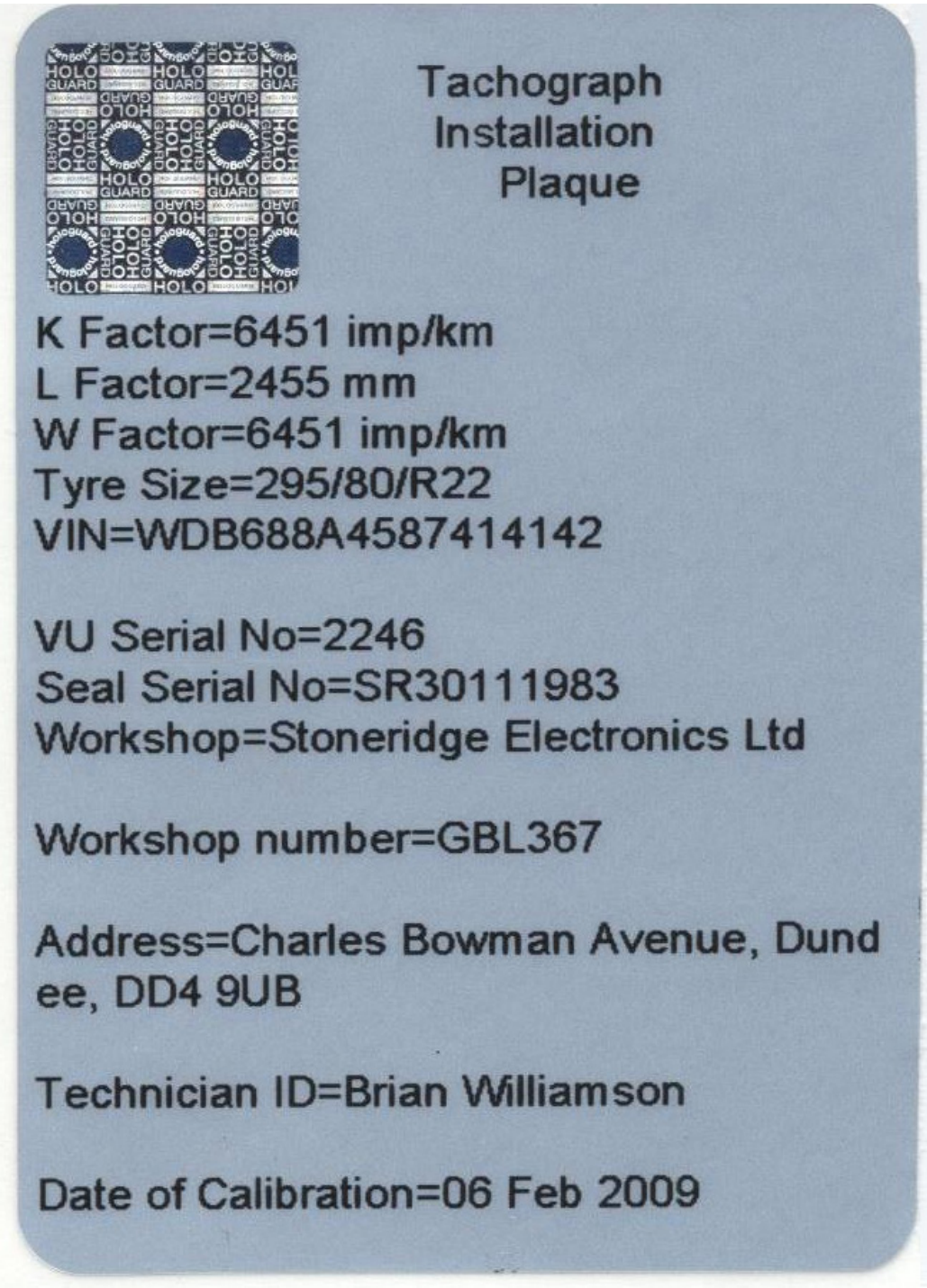


Figure B.2 — Second example for installation plaque

Annex C
(normative)

Seal manufacturer responsibilities

Table C.1 — 6 stages in the life of a tachograph seal

Stage number	Stage name	Role of seal manufacturer
1	Design process	Total responsibility
2	Manufacturing	Total responsibility
3	Distribution	Shall set security-related performance expectations for distributors and resellers Shall regularly help educate distributors and re-sellers
4	User knowledge and discipline	Shall help educate users (workshops) in the care of seals prior to their application Shall help educate users in correct handling of seals
5	In-transit management	May help users and regulators educate supply chain personnel
6	After-life	Shall maintain records for 5 years

a) Seal manufacturers should maintain an EN ISO 9001 quality system (including Table C.1 specifications) at all company-owned manufacturing facilities for all processes connected with seals. Additional confidence can be achieved through certification.

b) When purchasing contract production services for market-ready seal products, manufacturers should purchase from plants that maintain an EN ISO 9001 quality system.

c) If a manufacturer's facility or outside production facility for market-ready seal products fails to maintain an EN ISO 9001 system, notification should be sent to competent regulatory bodies.

Seal manufacturers shall record all aspects of a seal production and shipment, including seal type, seal numbers and identifiers, date of finished production, date of order, date of shipment, description and the name and the address of the individual placing the order and the consignee for the order.

Upon request from an law enforcement body, the manufacturer shall make the necessary records available to assist in the investigation.

Such records shall be kept for at least 5 years from the shipment date.

To ensure the seals traceability, the seal manufacturer shall establish a documented procedure in order to define the necessary control for the identification, the storage, the protection, the recovery, and the sales data availability.

NOTE Guidelines for the maintenance of such records can be found in ISO/IEC 27001:2013 (Information technology — Security techniques — Information security management systems — Requirements).

A restricted access shall be applied in the companies in order to avoid any risks of information losses (on PC, etc.).

d) The security practices referenced herein shall be implemented in accordance with this European Standard.

e) Seal manufacturers shall conduct an initial security risk assessment of facilities and periodic update reviews and implement countermeasures and/or policies to overcome potential vulnerabilities or threats.

f) Seal manufacturers shall assign responsibility for security and product integrity to knowledgeable individual(s), with a principal point of contact.

g) Seal manufacturers shall agree to cooperate with relevant law enforcement officials.

h) Seal manufacturers shall cooperate with regulatory and certification bodies in responding to questions and issues regarding compliance, irregularities, copying, etc.

i) Seal manufacturers shall develop and maintain a crisis management strategy to prepare for and respond to tampering actions; the strategy shall provide guidelines to segregating and securing affected product.

j) Seal manufacturers shall promote seal security awareness among all staff. Security awareness includes identification of whom in management they should alert about potential security problems.

k) Seal manufacturer responsibility toward distributors/resellers:

   1) Seal manufacturers are responsible of the selection for the accreditation of their distributors/resellers. They shall educate them about the importance, mutual advantages and specificity of effective seal security programs.

   2) The manufacturer shall set guidelines and should undertake all necessary actions to ensure that their distributors and resellers comply with their security related guidelines.

   3) Distributors/resellers shall record all aspects of a seal shipment, including source, seal numbers and identifiers, description and the name and the address of the individual placing the order and the consignee for the order.

   4) Upon request from the seal manufacturer or law enforcement body, the distributor/reseller shall make the necessary records available to assist in the investigation.

   5) Such records shall be kept for at least 5 years from the shipment date.

l) Seal manufacturer responsibility toward final users:

   1) Seal manufacturers and/or their distributors/resellers shall help educate users of the importance of proper control and record-keeping about seals prior to their application and use.

   2) Seal manufacturers and/or their distributors/resellers shall help educate users in correct and most effective use of seals, including conformance with applicable standards and regulations.

Bibliography

[1] COMMISSION REGULATION (EC) No 1360/2002 of 13 June 2002 adapting for the seventh time to technical progress Council Regulation (EEC) No 3821/85 on recording equipment in road transport

[2] EN ISO 9001, *Quality management systems - Requirements*

[3] ISO 17712, *Freight containers — Mechanical seals*

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