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EAST AFRICAN STANDARD

Motor vehicle safety specification — Braking — Part 2: Response time of braking devices on vehicles fitted with compressed-air braking devices

EAST AFRICAN COMMUNITY

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Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in East Africa. It is envisaged that through harmonized standardization, trade barriers which are encountered when goods and services are exchanged within the Community will be removed.

In order to meet the above objectives, the EAC Partner States have enacted an East African Standardization, Quality Assurance, Metrology and Test Act, 2006 (EAC SQMT Act, 2006) to make provisions for ensuring standardization, quality assurance, metrology and testing of products produced or originating in a third country and traded in the Community in order to facilitate industrial development and trade as well as helping to protect the health and safety of society and the environment in the Community.

East African Standards are formulated in accordance with the procedures established by the East African Standards Committee. The East African Standards Committee is established under the provisions of Article 4 of the EAC SQMT Act, 2006. The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the private sectors and consumer organizations. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the procedures of the Community.

Article 15(1) of the EAC SQMT Act, 2006 provides that "Within six months of the declaration of an East African Standard, the Partner States shall adopt, without deviation from the approved text of the standard, the East African Standard as a national standard and withdraw any existing national standard with similar scope and purpose".

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

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Motor vehicle safety specification — Braking — Part 2: Response time of braking devices on vehicles fitted with compressed-air braking devices

1 Scope

This part of the specification covers the requirements for the response times of compressed-air braking devices on vehicles of categories M, N, and O (see CD/K/039-1:2008) that have a maximum design speed exceeding 25 km/h.

2 Definitions

For the purposes of this part of the specification, the definitions given in CD/K/039-1:2008 and the following definition shall apply:

response time
duration of the delay between the start of actuation of a brake control or the attainment of a specified pressure, and the production, at a specific point in the braking system, of a specific reaction that is based on a specified percentage of the maximum possible air pressure at that point

3 Requirements

3.1 Response time at brake cylinders of vehicles (categories M and N)

When the braking device of a vehicle of Category M or N is tested in accordance with 4.2 for an actuating time of 0.2 s, the response time, measured at the least favourably placed brake cylinder, for a pressure corresponding to 75 % of maximum possible pressure, shall not exceed 0.6 s.

3.2 Response time at coupling head of vehicles (categories M, N and O)

When the braking device of a drawing vehicle of category M or N or a drawing trailer of category O is tested in accordance with 4.3 for an actuating time of 0.2 s, the response time at the coupling head shall not exceed

a) 0.2 s for *a* pressure corresponding to 10 % of the maximum possible pressure at the coupling head; and

b) 0.4 *s* for a pressure corresponding to 75 % of the maximum possible pressure at the coupling head.

3.3 Response time at brake cylinders of trailers and semi-trailers (category O)

When the braking device of a trailer or a semi-trailer is tested in accordance with 4.4, the response time, between the pressure in the control line reaching 10 % of its maximum possible pressure and the pressure at the least favourably placed brake cylinder reaching 75 % of its maximum possible pressure, shall not exceed 0.4 s.

4 Methods of test

4.1 Test conditions and preliminary procedures

4.1.1 Keep the vehicle stationary during the test(s) and, in the case of *a* combination, separate the vehicles and test them individually.

4.1.2 By making a preliminary inspection and, if necessary, a preliminary test, determine which brake cylinder on the vehicle has the slowest response time, and use that brake cylinder in the actual tests given in 4.2 and 4.4.

4.1.3 Adjust all brakes on the vehicle(s) under test as closely to their brake surfaces as possible.

4.1.4 Note the pressure range in the feed line, as given on the manufacturer's data plate, at which the braking device operates.

4.1.5 In the case of the tests given in 4.2 and 4.3, ensure that, at the beginning of each test, the pressure in the energy reservoir is at the appropriate of the following values:

a) the pressure at which the governor or unloader valve restores the feed to the device;

b) in devices not equipped with a governor, a pressure corresponding to 90 % of the pressure specified by the manufacturer.

4.2 Response time at brake cylinders (categories M and N)

a) Determine the maximum possible value of the pressure in the least favourably placed brake cylinder (see 4.1.2) and note 75 % of this value.

b) Measure, at this brake cylinder, the response time for the pressure noted in (a) above, carrying out a succession of full actuations of the service brake control and ensuring that results are obtained for a series of actuating times ranging from the shortest possible to at least 0.4 s.

c) Plot a graph of response time against actuating time, determine by interpolation the response time that corresponds to an actuating time of 0.2 s, and record this time, rounded off to the nearest one-tenth of a second.

4.3 Response time at coupling head (categories M, N and O)

a) If the power-driven vehicle or the trailer or semi-trailer under test is equipped with a coupling head to connect the brakes to a trailer or semi-trailer, connect to the coupling head a tube of internal diameter 13 mm and length 2.5 m.

b) Determine the maximum possible value of the air pressure at the free end of the tube, and note 10 % and 75 % of this value.

c) In the case of a vehicle of category M or N measure, at the free end of the tube, the response times for the pressures noted in (b) above, carrying out a succession of full actuation of the brake control and ensuring that results are obtained for a series of actuating times ranging from the shortest possible to at least 0.4 s.

d) In the case of a category O vehicle, proceed as in (c) above but use a simulator as specified in 4.4.1 connected to the front couplings of the trailer or semi-trailer.

e) Plot graphs of response times against actuating times, determine by interpolation the response times which correspond to actuating times of 0.2 s, and record these times, rounded off to the nearest one-tenth of a second.

4.4 Response time at brake cylinders (category O)

4.4.1 Equipment

A simulator (see figure 1) that replaces the drawing vehicle and that consists essentially of the following:

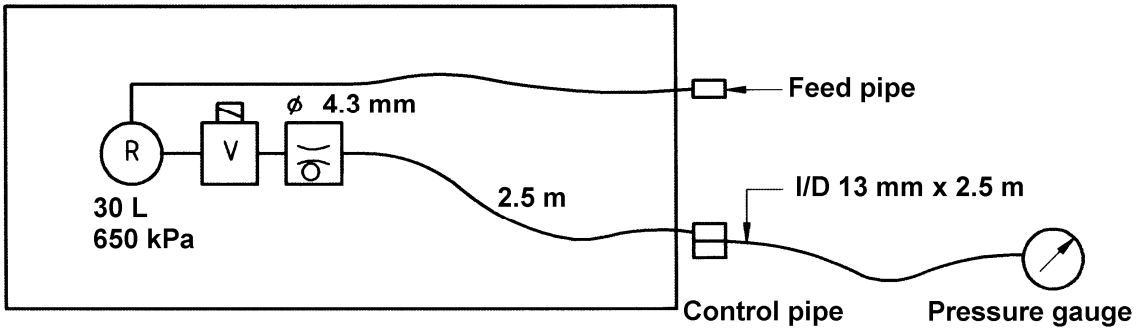
A reservoir of capacity at least 30 L, containing air at a pressure of 650 kPa, and fitted with a throttling device that is connected to the coupling device by a tube of internal diameter 13 mm and length 2.5 m and that is so adjusted that the period required for the simulator to build up pressure at the coupling device from 10 % to 75 % of the full pressure of the air supply, is 0.2 s.

4.4.2 Procedure

a) Connect the brake line and feed line coupling heads of the trailer or semi-trailer, as relevant, to the simulator.

b) Determine the maximum possible pressure in the trailer control line and note 10 % of this value. Then determine the maximum possible pressure in the least favourably placed trailer brake cylinder and note 75 % of this value.

c) Ensuring that the pressure of the simulator (see 4.4.1) at the beginning of each test is still at its appropriate value, operate the control and measure the response time between the attainment of the relevant pressures noted in (b) above.



R = reservoir V = valve

O = calibrated orifice or throttling device that is adjusted to a pressure build-up time of 0.2 s for a pressure rise from 65 kPa to 490 kPa

Figure 1 — Simulator (see 4.4)

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