

[<sup>F1</sup>ANNEX IV

## Energy reservoirs and sources of energy

**Textual Amendments**

- F1** Substituted by [Commission Directive 98/12/EC of 27 January 1998](#) adapting to technical progress [Council Directive 71/320/EEC on the approximation of the laws of the Member States relating to the braking devices of certain categories of motor vehicles and their trailers](#) (Text with EEA relevance).

## A. Compressed-air braking systems

1. CAPACITY OF RESERVOIRS
  - 1.1. *General requirements*
    - 1.1.1. Vehicles on which the operation of the braking system depends on the use of compressed-air shall be fitted with reservoirs of a capacity meeting the requirements of points 1.2 and 1.3.
    - 1.1.2. However, the reservoirs shall not be required to be of a prescribed capacity if the braking system is such that in the absence of any energy reserve it is possible to achieve a braking performance at least equal to that prescribed for the secondary braking system.
    - 1.1.3. When verifying compliance with the requirements of points 1.2 and 1.3 the brakes shall be adjusted as closely as possible.
  - 1.2. *Motor vehicles*
    - 1.2.1. The air brake reservoirs of motor vehicles shall be so designed that after eight full-stroke actuations of the service braking system control, the pressure remaining in the air brake reservoir shall be not less than the pressure required to obtain the specified secondary braking performance.
    - 1.2.2. During the test, the following requirements shall be satisfied:
      - 1.2.2.1. The initial pressure in the reservoirs shall be that indicated by the manufacturer<sup>(1)</sup>. This pressure shall be such as to enable the prescribed performance for the service braking system to be achieved.
      - 1.2.2.2. The reservoir or reservoirs shall not be replenished; in addition, the reservoir or reservoirs of auxiliary equipment shall be isolated.
      - 1.2.2.3. In the case of motor vehicles authorised to tow a trailer, the supply line shall be blocked off and a reservoir of 0,5 litre capacity shall be connected to the control line. The pressure in this reservoir shall be exhausted before each actuation of the brakes. After the test referred to in point 1.2.1 the pressure in the control line shall not be less than one half of the pressure obtained at the first brake application.
  - 1.3. *Trailers (including semi-trailers)*
    - 1.3.1. Reservoirs fitted to trailers shall be such that after eight full-stroke actuations of the towing vehicle's service braking system, the pressure supplied to the operating parts using it does not fall below a level equivalent to one-half of the figure obtained at the first brake application and without actuating either the automatic or the parking braking system of the trailer.

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1.3.2. During the test, the following requirements shall be satisfied:

1.3.2.1. The pressure in the reservoirs at the beginning of the test shall be 8,5 bar.

1.3.2.2. The supply line shall be blocked off; in addition, the auxiliary equipment reservoirs shall be isolated.

1.3.2.3. The reservoir shall not be replenished during the test.

1.3.2.4. For each brake application, the pressure in the control line shall be 7,5 bar.

## 2. CAPACITY OF ENERGY SOURCES

### 2.1. *General provisions*

Compressors shall satisfy the requirements laid down in the following points:

### 2.2. *Definitions*

2.2.1.  $p_1$  the pressure corresponding to 65 % of the pressure  $p_2$  defined in point 2.2.2.

2.2.2.  $p_2$  is the value specified by the manufacturer and referred to in point 1.2.2.1.

2.2.3.  $T_1$  is the time required for the relative pressure to rise from 0 to  $p_1$ ;  $T_2$  is the time required for the relative pressure to rise from 0 to  $p_2$ .

### 2.3. *Conditions of measurement*

2.3.1. In all cases the speed of the compressor shall be that obtained when the engine is running at the speed corresponding to its maximum power or at the speed allowed by the governor.

2.3.2. The auxiliary equipment reservoirs shall be isolated during the tests for determining the periods  $T_1$  and  $T_2$ .

2.3.3. On motor vehicles constructed to tow trailers, the trailer shall be represented by a reservoir whose maximum relative pressure  $p$  (expressed in bars) is that which can be supplied through the feed circuit of the towing vehicle and whose volume  $V$  (expressed in litres) is given by the formula  $p \times V = 20 R$  ( $R$  being the permissible maximum load, expressed in metric tonnes, on the axles of the trailer or semi-trailer).

### 2.4 *Interpretation of results*

2.4.1. The time  $T_1$  for the least efficient reservoir shall not exceed:

— three minutes in the case of vehicles to which the coupling of a trailer or semi-trailer is not authorised

— six minutes in the case of vehicles to which the coupling of a trailer or semi-trailer is authorised.

2.4.2. The time  $T_2$  for the least efficient reservoir shall not exceed:

— six minutes in the case of vehicles to which the coupling of a trailer or semi-trailer is not authorised

— nine minutes in the case of vehicles to which the coupling of a trailer or semi-trailer is authorised.

### 2.5. *Additional test*

- 2.5.1. When the vehicle is equipped with an auxiliary equipment reservoir or reservoirs with a total capacity exceeding 20 % of the total capacity of the brake reservoirs, an additional test shall be carried out during the course of which there shall be no interference with the functioning of the valves controlling the filling of the auxiliary equipment reservoir(s). A check shall be made during the course of this test that the period  $T_3$  required to bring about a rise in the pressure in the brake reservoirs from 0 to  $p_2$  is less than:
- eight minutes in the case of vehicles to which the coupling of a trailer or semi-trailer is not authorised
  - eleven minutes in the case of vehicles to which the coupling of a trailer or semi-trailer is authorised.
- 2.5.2. The test shall be performed in the conditions prescribed in points 2.3.1 and 2.3.3.
- 2.6 *Towing vehicles*
- 2.6.1. Vehicles to which the coupling of a category O vehicle is authorised shall also comply with the above requirements for vehicles not so authorised. In that case, the tests in points 2.4.1, 2.4.2 (and 2.5.1) will be conducted without the reservoir mentioned in item 2.3.3 of this Annex.
3. PRESSURE TEST CONNECTIONS
- 3.1. A pressure test connection shall be fitted at the closest readily accessible position to the least-favourably placed reservoir within the meaning of point 2.4 of this Annex.
- 3.2. The pressure test connections shall comply with clause 4 of ISO standard 3583-1984.]

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(1) [<sup>F1</sup>The initial energy level shall be stated in the information document.]

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