INTERNATIONAL STANDARD ISO 3854

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Road vehicles — Caravans and light trailers — Vacuum braking — Measurement of reaction time

Véhicules routiers — Caravanes et remorques légères — Freinage à dépression — Mesurage des temps de réponse

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up has the right to be represented on that Committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3854 was drawn up by Technical Committee ISO/TC 22, *Road vehicles,* and was circulated to the Member Bodies in July 1975.

It has been approved by the Member Bodies of the following countries :

Australia	Iran	South Africa, Rep. of
Austria	Ireland	Spain
Belgium	Italy	Switzerland
Brazil	Japan	Turkey
Bulgaria	Mexico	United Kingdom
Finland	New Zealand	Yugoslavia
France	Poland	
Hungary	Romania	

The Member Bodies of the following countries expressed disapproval of the document on technical grounds :

Czechoslovakia
Germany

Printed in Switzerland

Road vehicles — Caravans and light trailers — Vacuum braking — Measurement of reaction time

1 SCOPE

This International Standard specifies a method of measuring the reaction time, applicable, inter alia, to vacuum braking systems in accordance with the specifications of ISO 2890.

2 FIELD OF APPLICATION

This International Standard applies to caravans and light trailers which have a maximum total weight not exceeding 3,5 tonnes.[1] The measurement of the reaction time to the signal in the vacuum braking system from the towing vehicle to the trailer is also considered in this International Standard.

3 REFERENCES

ISO 1176, *Road vehicles — Weights — Vocabulary*.

ISO 2890, *Road vehicles — Vacuum braking for caravans and light trailers.*

4 GENERAL CONDITIONS

4.1 Measurements shall be made with vehicles separated and stationary (engine running at idling speed).

4.2 Brakes shall be closely adjusted.

4.3 At least 50 kPa (0,5 bar)[2] vacuum shall be available.

5 MEASUREMENT OF REACTION TIME TO SIGNAL IN VACUUM BRAKING SYSTEM FROM TOWING VEHICLE TO TRAILER

5.1 Connect a tube 2,5 m long and of 13 mm internal diameter to the coupling head of the control line (X in upper part of figure 1).

5.2 Measure the vacuum at the end of the tube (Y).

5.3 Commence with at least 5 kPa (0,5 bar) vacuum in the tube described in 5.1 and measure the reaction times obtained by a series of activations of the brake control (Z) to the fullest extent, starting from the shortest possible up to a time of about 0,4 s.

The values measured shall be plotted on a diagram. The reaction time corresponding to a brake control activation time of 0,2 s shall be determined for the test. This reaction time may be obtained from the diagram by interpolation.

5.4 The variation in pressure at the end of the tube, as a percentage of its final stabilized value, measured from the start of activating the brake control, shall be

- to 10 % of this value in a time $\leqslant$ 0,2 s;
- to 75 % of this value in a time $\leqslant$ 0,4 s.

6 TOWING VEHICLES SIMULATOR

6.1 The simulator (see figure 2/I) consists of an adjustable orifice and a buffer volume between the throttling device and the coupling device, corresponding to a tube 2,5 m long and of 13 mm internal diameter.

6.2 For its adjustment the simulator is connected to a volume also consisting of a tube 2,5 m long and of 13 mm internal diameter, the vacuum being measured at the end of this tube (A in figure 2/II).

Initially the assembly is under a vacuum of 50 kPa (0,5 bar).

6.3 By successive testing, adjust the orifice so that the variation of pressure at A rises from 10 to 75 % of its final stabilized value in 0,2 s (see diagram, figure 2/II).

7 MEASUREMENT OF REACTION TIME ON TOWED VEHICLES

7.1 Use the simulator defined and adjusted in accordance with clause 6.

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1) This value is chosen to include categories 0_1 and 0_2 of trailers according to the classification of vehicles given in document E/ECE/324/Rev. 1/Add. 12 of the Economic Commission for Europe of the United Nations.

This document is entitled : *"Agreement concerning the adoption of uniform conditions of approval and reciprocal recognition of approval for motor vehicle equipment and parts* — done at GENEVA on 20 March 1958 — Addendum 12 : Regulation No. 13 to be annexed to the Agreement : *Uniform provisions concerning the approval of vehicles with regard to braking"*.

2) 1 bar = 10^5 Pa

7.2 Connect the simulator to the coupling head of the control line of the towed vehicle (X in figure 3).

7.3 Connect the assembly at B to a vacuum source of 50 kPa (0,5 bar).

7.4 Operate the control valve C and measure the time elapsed between the moment when the pressure delivered by the simulator at the coupling device (D) reaches 10 % of its final stabilized value and the moment when the pressure within the brake cylinder (E) reaches 75 % of its final stabilized value.

7.5 This time shall not exceed 0,6 s.

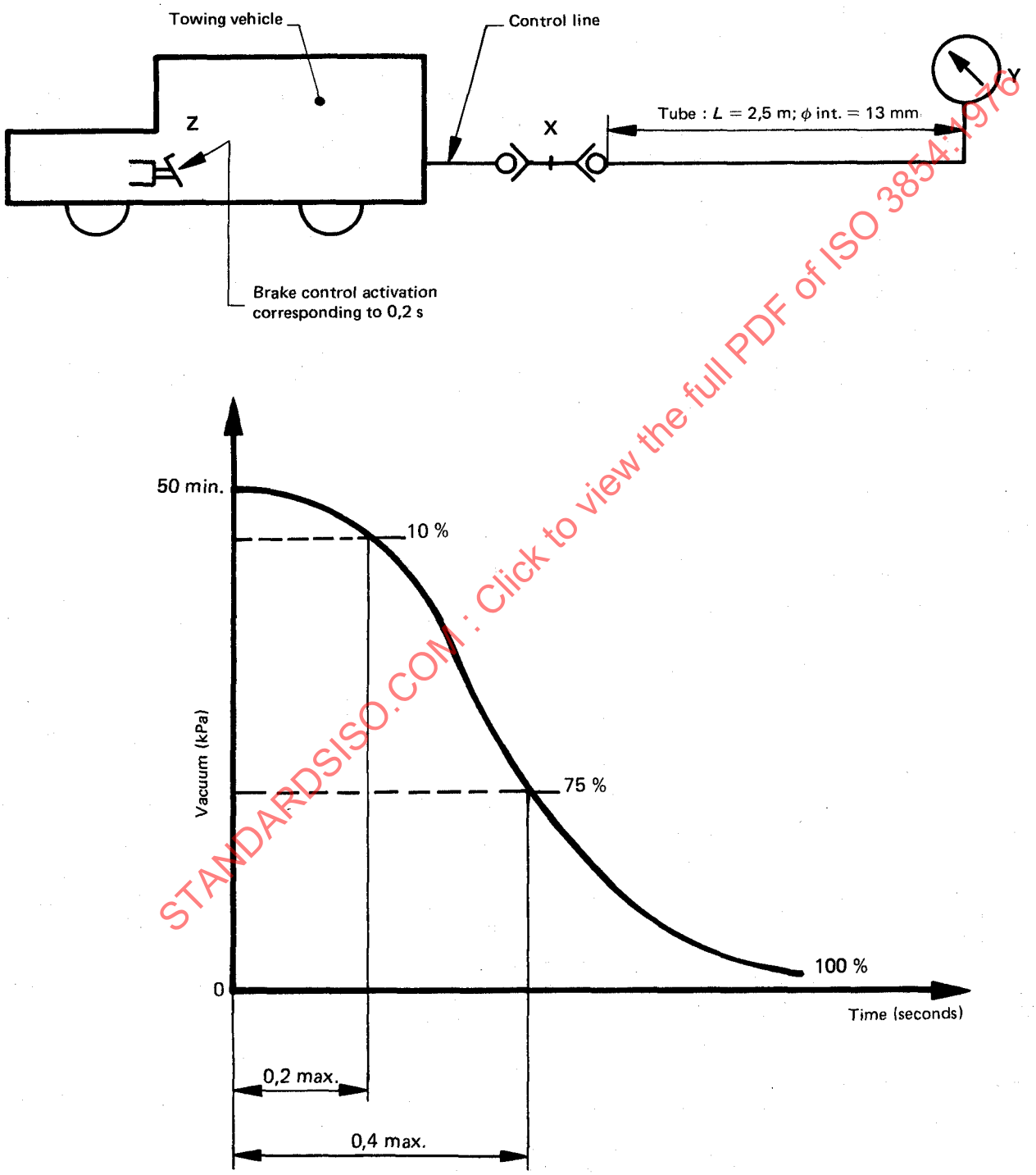
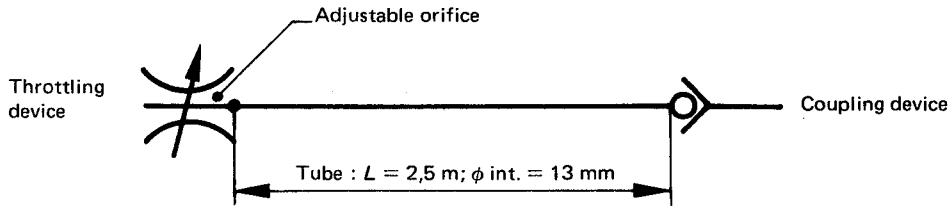


FIGURE 1 — **Measurement of reaction time to the signal in the vacuum braking system from the towing vehicle to the trailer**

I Simulator



II Adjustment (initial position)

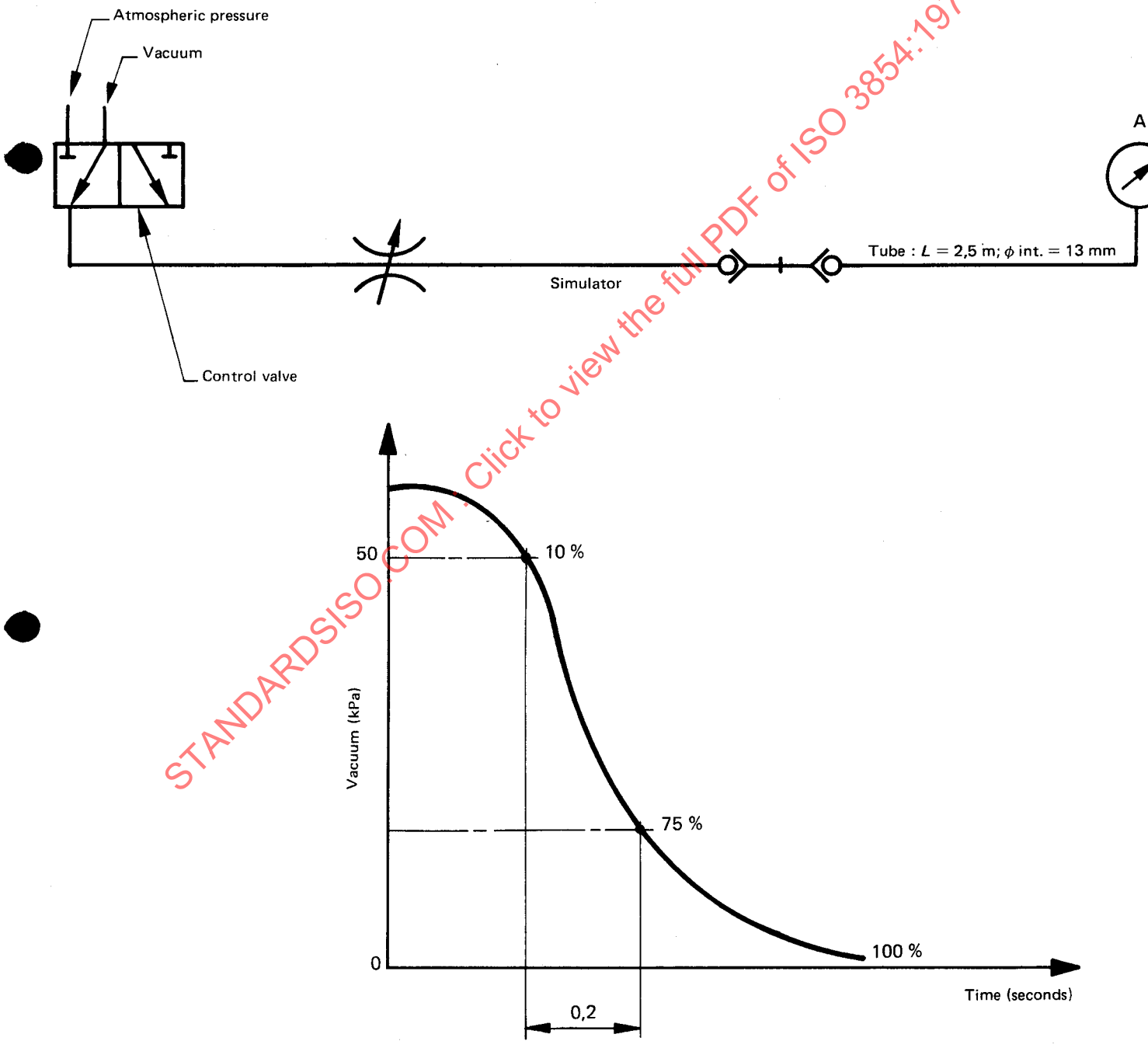


FIGURE 2 — **Towing vehicles simulator**

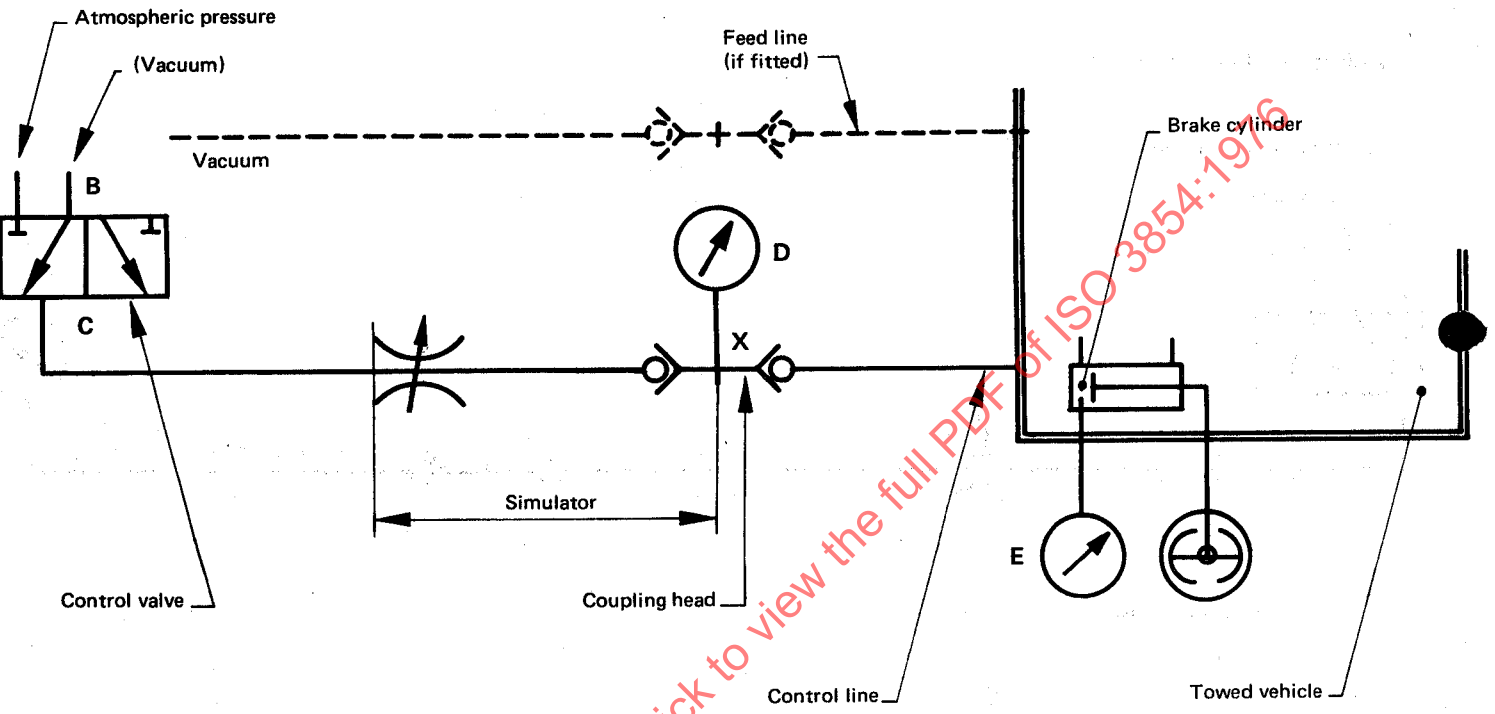


FIGURE 3 — Measurement of reaction time on towed vehicles