

[^{F1}ANNEX X

Test requirements for vehicles with anti-lock braking systems

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).

4. GENERAL REQUIREMENTS
- 4.1. Any electrical failure or sensor anomaly that affects the system with respect to the functional and performance requirements in this Annex, including those in the supply of electricity, the external wiring to the controller(s), the controller(s)⁽¹⁾ and the modulator(s) shall be signalled to the driver by a specific optical warning signal.
- 4.1.1. The warning signal shall light up when the anti-lock braking system is energised and, with the vehicle stationary, it shall be verified that none of the above-mentioned defects are present before extinguishing the signal.
- 4.1.2. The static sensor check may verify that a sensor was not functioning the last time that the vehicle was at a speed greater than 10 km/h⁽²⁾. Also during this verification phase, the electrically controlled pneumatic modulator valve(s) shall cycle at least once.
- 4.2. Motor vehicles equipped with an anti-lock braking system and authorised to tow a trailer equipped with such a system, with the exception of vehicles of categories M₁ and N₁, shall be fitted with a separate optical warning signal for the anti-lock braking system of the trailer, meeting the requirements of point 4.1 of this Annex.
- 4.2.1. This warning signal shall not light up when a trailer without an anti-lock braking system is coupled or when no trailer is coupled. This function shall be automatic.
- 4.3. The abovementioned optical warning signal(s) shall be visible even in daylight and it shall be easy for the driver to check that they are in working order.
- 4.4. Except for vehicles of categories M₁ and N₁, O₁ and O₂, the electrical connections used for the anti-lock braking systems of towing vehicles and trailers shall be effected by a special connector conforming to ISO Standard 7638-1985 or ISO/DIS Standard 7638-1996⁽³⁾.
- 4.5. In the event of a failure of the anti-lock braking system, the residual braking performance shall be that prescribed for the vehicle in question in the event of a failure of a part of the transmission of the service braking system (see point 2.2.1.4 of Annex I). This requirement shall not be construed as a departure from the requirements concerning secondary braking. In the case of trailers, the residual braking performance in the event of a defect in the anti-lock braking system according to point 4.1 of this Annex shall be at least 80 % of the laden prescribed performance for the service braking system of the relevant trailer.
- 4.6. The operation of the system shall not be adversely affected by magnetic or electrical fields⁽⁴⁾.

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- 4.7. A manual device may not be provided to disconnect or change the control mode⁽⁵⁾ of the anti-lock braking system, except on off-road motor vehicles of categories N₂ or N₃. Where a device is fitted to N₂ or N₃ off-road motor vehicles, the following conditions shall be met:
- 4.7.1. the motor vehicle with the anti-lock braking system disconnected or the control mode changed by the device referred to in point 4.7 above shall satisfy all the relevant requirements in the Appendix to point 1.1.4.2 of Annex II;
 - 4.7.2. an optical warning signal shall inform the driver that the anti-lock braking system has been disconnected or the control mode changed; the anti-lock failure warning signal may be used for this purpose;
 - 4.7.3. the anti-lock braking system shall automatically be reconnected/returned to on-road mode when the ignition (start) device is again set to the 'on' (run) position;
 - 4.7.4. the vehicle user's handbook provided by the manufacturer should warn the driver of the consequences of manual disconnection or mode change of the anti-lock braking system;
 - 4.7.5. the device referred to in point 4.7 above may, in conjunction with the towing vehicle, disconnect/change the control mode of the anti-lock braking system of the trailer; a separate device for the trailer alone is not permitted.]

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- (1) [^{F1}Until uniform test procedures have been agreed, the manufacturer shall provide the technical service with an analysis of potential failures within the controller(s) and their effects. This information shall be subject to discussion and agreement between the technical service and the vehicle manufacturer.
- (2) The warning signal may light up again while the vehicle is stationary, provided that it is extinguished before the vehicle speed reaches 10 km/h when no defect is present.
- (3) The wiring specification of point 6.2 of ISO 7638-1985 or point 5.4 of ISO/DIS standard 7638-1996 for the trailer may only be reduced if the trailer is equipped with its own independent fuse. The rating of the fuse shall be such that the current rating of the conductors is not exceeded. With the exception of vehicles of categories N₃ and O₄, and until a uniform international standard has been agreed, the electrical connection between towing vehicles and trailers equipped with a 12 volt electrical system shall conform with DIN standard 72570, Part 4.
- (4) This shall be demonstrated by compliance with the technical requirements laid down in Council Directive 72/245/EEC (OJ L 152, 6.7.1972, p. 15), as last amended by Directive 95/54/EC (OJ L 266, 3.11.1995, p. 1).
- (5) It is understood that devices changing the control mode of the anti-lock braking system are not subject to point 4.7 if in the changed control mode condition all requirements for the category of anti-lock braking system, with which the vehicle is equipped, are fulfilled. However, in this case points 4.7.2, 4.7.3 and 4.7.4 shall be met.]

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