

UIC CODE

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Translation

O R

Brakes - Regulations concerning the design of brake components

Frein - Prescriptions concernant la construction des différents organes de frein
Bremse - Vorschriften für den Bau der verschiedenen Bremsteile



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Leaflet to be classified in volume:

V - Rolling Stock

Application :

With effect from 1.3.2013

All members of the International Union of Railway

DB and ÖBB are nonetheless permitted, as an exceptional measure, to retain 300 mm double brake blocks on vehicles ordered prior to 1 January 1963; such vehicles must be suitable for fitting with standard 250 mm brake blocks.

Record of updates

1st edition, January 1948	Revised version of former Leaflet 185
5th edition, July 1973	and 29 Amendments
6th edition, November 2003	Converted to FrameMaker: - adaptation to the editor's guide M1 - new layout - modification of point 3.10 and of Appendix J - renumbering of points and Appendices.
7th edition, September 2010	Update of the Leaflet
8th edition, March 2013	Addition of point 3.7

The person responsible for this leaflet is indicated in the UIC Code

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Summary

This leaflet outlines the key characteristics with which brake system components must comply in so far as these are not covered in other separate leaflets in the 541-X series.

The brake must comply with all UIC regulations governing the design of the different equipment components and their fitting to the vehicles (for example, layout of the couplings, shape and position of the changeover devices, etc.).

1 - Air brake components

1.1 - Pipes and connections

- **1.1.1** - The internal diameter of the train pipe must be equivalent to:

- 32 mm for wagons,
- 25 mm for coaches.

Sharp elbows must be avoided in train pipes.

The branch pipes connecting the train pipe to the distributor and the emergency brake valve must be as short as possible and their cross section must not exceed that of the train pipe.

- R **1.1.2** - It is recommended that the train pipe be placed under the headstock and that elbows and water pockets be avoided.
- **1.1.3** - The arrangement of air brake pipe connections of vehicles must comply with the provisions of Appendices [A.1 - page 9](#), [A.2 - page 11](#) or [B - page 14](#).

NB: It is recommended that the coupling arrangements laid down in Appendices A.1 and B of this leaflet should be made the same as those in Appendix A.2, in the event of any considerable modification to vehicles built prior to 1.1.1969.

- **1.1.4** - If the vehicle is fitted with a main feed pipe, the coupling connections of this pipe must be placed at a greater distance from the centre-line of the vehicle than those of the automatic brake train pipe.
- **1.1.5** - The shape of the ends of the pipes and their threading must comply with the indications of Appendices [C - page 16](#) and [D - page 18](#).

1.2 - Cut-off cocks

- **1.2.1** - Brake cock design:

The cock handle situated in front of the vehicle headstock may be to the right or left of the pipe except when the cut-off cock is situated near the draw hook (point [A.1 - page 9](#), Fig. [2](#), [3](#) and [4](#) and Appendix [B - page 14](#), Fig. [12](#) and [13](#)), in which case the handle must exclusively be mounted on the side opposite the draw gear. The layout of the handles of cocks mounted on vehicles fitted with automatic couplers is governed by *UIC Leaflet 535-2* (see [Bibliography](#)).

- R **1.2.2** - It is recommended that all new vehicles be equipped with cut-off cocks fitted with a spring locking device in the extreme positions.

1.3 - Quick-release valves

It is obligatory to use quick-release valves on wagons; their use is not recommended on coaches. The quick-release valve functions either via the distributor or separately. Approval is obligatory for all quick-release valves.

The release valve must be designed and assembled so that:

1. before splitting of the train in marshalling yards takes place, with the through pipe empty, it ensures complete release of the brake after operating the chain for a short time, the air capacities being, furthermore, retained to the greatest possible degree (complete emptying of the control reservoir is permissible).

NB: It is however permissible for the auxiliary reservoir to be emptied by the quick-release valve in the case of triple valves or old-type distributors;

2. in the event of a capacity overload, it ensures that the control reservoir is emptied (also the auxiliary reservoir, if necessary) thereby bringing the capacity to the working pressure;
3. when a vehicle brake is taken out of service (following an incident, for example) or is in the workshop, it ensures complete release of the distributor by operating the chain, before any repair work on the brake components takes place.

[R]¹: It is recommended that the release valve should also be able to empty the air in the equipment, in this case, followed, if necessary, by the closing of the isolating cock (involving isolation of the brake);

4. only one chain is necessary, situated on or near the distributor (which can be operated from both sides of the vehicle). In order to be able to distinguish easily the quick-release valve from the conventional release valve, the control handle should comply with Appendix H - page 23 to this leaflet;
5. it then returns to its initial position at the latest when the pressure in the train pipe reaches 3 bars;
6. it must not alter the characteristics of the brakes to which it is fitted;
7. it cannot operate inadvertently as a result of impacts in marshalling yards or circumstances likely to arise during running;

Any Railway wishing to introduce a new quick-release valve for use on international services must, first, submit the latter for examination to the UIC SET7 (braking) which shall be responsible for ensuring that the above technical conditions are fully complied with.

Quick-release valves which are found to comply with the above conditions will be shown in Appendix I - page 24.

1. [R] = optional measure

○ 1.4 - Components for operation of the changeover apparatus

1.4.1 - The components for operation of the changeover apparatus must be very clearly visible and capable of being worked easily from each side of the vehicle. Individual braking systems must be marked according to their functions (see Appendix E - page 20, Fig. 24 or 25).

1.4.2 - They must, furthermore, comply with the following regulations:

1.4.2.1 - "Passenger only" changeover:

- **[R]**: When a vehicle is fitted with several "passenger" brake systems, changeover from one to another of these systems must be made by means of a lever moving perpendicularly to the axles and the working handle of which has the shape of a loop, in conformity with the indications of Appendix E, Fig. 24 - page 20.
- It is recommended to have a device which enables locking at the desired position.

1.4.2.2 - "Goods-Passenger" changeover:

- When a vehicle is fitted with one or several "passenger" brake systems and one "goods" brake system, changeover from one to another of these systems must be made by means of a lever moving perpendicularly to the axles and fitted, at its end, with a ball in conformity with the indications of Appendix E, Fig. 25 - page 20.
- For the "goods" brake system, the lever must be inclined towards the top on the left and occupy its extreme position on the left.
- If there is only one "passenger" brake system, the lever for this system must be in an inclined position towards the top on the right, making with the "goods" position an angle of approximately 90°. If there are several "passenger" brake systems, the position of the lever which gives the "passenger" system complying with the conditions laid down in *UIC Leaflet 540* must be indicated by the special embossed sign in conformity with Appendix E, Fig. 27.

R 1.4.2.3 - "Empty-loaded" changeover:

- When a vehicle is fitted with one "empty" brake system and one or several "loaded" brake systems, changeover from one system to another must be made by means of a cranked lever moving perpendicularly to the axles, and in conformity with the indications of Appendix E, Fig. 26 - page 20.
- When the vehicle is fitted with one "empty-loaded" device only, it has a simple cranked lever only, in conformity with Appendix E, Fig. 26 A.
- If it is fitted with two or more separate "empty-loaded" devices, the levers are cranked and have a double handle in conformity with Appendix E, Fig. 26 B.
- For the "empty" brake system, the lever must be inclined towards the top on the left and occupy its extreme position on the left.
- For the "loaded" brake system corresponding to the changeover maximum weight, the lever must be inclined towards the top on the right and be in its extreme position on the right, making with the "empty" position an angle of at least 90°.

- The positions corresponding to other loaded brake systems must be between these extreme positions and increasing in power as from the left.
- **[R]**: It is recommended to have a device which enables locking at the desired position.

2 - Alarm signals and release mechanisms for emergency braking

- All coaches running as scheduled with passengers inside must have an emergency brake. The emergency brake must include an air release component and an actuating system. When the emergency brake is applied, the air release component immediately opens the train pipe. The actuating system may be mechanical, pneumatic or electrical, and must work directly on the air release component.
- R **2.1** - It is recommended that a whistle be fitted to the air release valve of the train pipe in the event of the alarm signal being operated (passenger alarm signal).
- **2.2** - The smallest cross section through which air can escape in the event of emergency braking triggered from the train must be at least equal to a 19 mm diameter cross section for new vehicles or vehicles equipped with brake pipe emptying accelerators.

[R]: It is recommended that the same cross section be used for existing vehicles.
- **2.3** - The emergency brake (alarm signal) handle, stipulated in *UIC Leaflet 543, point 1.2.4*, must be easily accessible and able to be sealed.
- R **2.4** - It is recommended that the release valve for emergency braking be connected directly to the train pipe and that the handle of this mechanism be fitted with an extension piece which will be in a vertical position when the valve is closed.

If this position is adopted, the valve must be opened from the vehicle by pulling.
- **2.5** - In all coaches built as from 1.1.1969, the alarm signal resetting device must be placed inside the vehicle and easy to operate from there. It must be designed in such a way that passengers are not able to activate it.
- **2.6** - The release of air to atmosphere from the train pipe, when the emergency alarm is operated, must be carried out in complete safety. The release pipe must not, therefore be fitted with either isolating cocks or dust filters.
- **2.7** - On those vehicles fitted with emergency brake override (SAFI / EBO), the release valve must be designed in such a way that, when the alarm signal is triggered, the pressure in the train pipe falls rapidly to 2 bars (+0/-0,5 bar) and remains at that level thereafter.
- R **2.8** - Release valves designed in accordance with the provisions of point **2.7** are also accepted for vehicles not equipped with SAFI.
- **2.9** - A shut-off component between the actuating system and the air release valve is only permitted in case of a SAFI/EBO system.