

NOTE

This leaflet is part of a series which also includes :

UIC Leaflet 440 : Loudspeaker systems in RIC coaches.

UIC Leaflet 751-3 : Technical regulations relating to ground-train radio systems for international services.

1-GENERAL

1-185

1.1 - The following provisions define the minimum conditions with which loudspeaker and telephone systems must comply in RIC coaches in order to :

- a) guarantee the satisfactory operation of the system in every respect when several coaches from different countries are coupled together to form an international train;
- b) ensure a quality of broadcasting which will satisfy the minimum requirements of all concerned.
These regulations leave each Railway concerned free to install the system in the way best suited to its requirements and to take advantage of rapid technical developments in this field.

The system accepted as standard is that which includes as many amplifiers as there are coaches with loudspeaker systems.

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This system provides for the use of a cable with three quads, two of which are for the loudspeaker system and for a remote link between the driver and the guard, and the third one for other purposes.

A distinction must be drawn between three types of RIC coach :

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- 1 - those which have simply a set of loudspeakers, an amplifier and a microphone for announcements over a public-address system,
- 2 - those which have a set of loudspeakers, an amplifier and a telephone for announcements over the public-address system and telephone link,
- 3 - those which, in addition to one or other of the above-mentioned systems, are also fitted with a point for connecting a portable public address and music broadcasting unit (including, for example, facilities for an official travelling with a cruise train).

* 1.2 - All RIC coaches equipped with a loudspeaker system shall include :

1.2.1 - Loudspeakers situated in the compartments and side corridor;

1.2.2 - A power amplifier;

1.2.3 - Wiring in the coach and connections;

1.2.4 - A supply circuit with protective equipment;

1.2.5 - Remote control accessories.

1-1-85

* 1.3 - All RIC coaches with loudspeaker systems and telephone call stations in accordance with point 1.1 b), 2 and 3 shall be fitted with the equipment listed in § 9.2.

* 1.4 - All RIC coaches with loudspeaker systems and a point for connecting a portable public address and music broadcasting unit must be fitted in addition with :

1.4.1 - a permanently fixed socket for connecting up other items of equipment (pick-up, magnetic tape-reader, etc.) for longer broadcasts.

1.4.2 - a two-way switch for the purpose of supplying modulated current either only to the coach containing the portable public address and music broadcasting unit or to all coaches on the train which are provided with a loudspeaker system.

1.4.3 - if the connection to the portable public address and music broadcasting unit is situated in the immediate vicinity of a loudspeaker, it is recommended that the possibility should exist of cutting out this loudspeaker.

* 1.5 - Plate 1 shows the basic layout with which installations must comply.

N O T E

This leaflet forms part of a set which also includes :

- Leaflet 522 : Technical conditions to be fulfilled by the automatic coupler of the UIC and OSJD member Railways
- Leaflet 561 : Means of intercommunication for coaches
- Leaflet 567-1 : Standard X and Y-type coaches accepted for running on international services
- Leaflet 567-2 : Z-type Standard coaches accepted for running on international services - Characteristics
- Leaflet 567-4 : Standard open bogie van adapted for the conveyance of motor cars - Characteristics
- Leaflet 569 : Regulations to be observed in the construction of coaches and vans suitable for conveyance by train ferry

C O N T E N T S

0 - FOREWORD

1 - GENERAL

1.1 - Conditions to be satisfied

1.2 - Agreement between the UIC and the OSJD in the event of amendments or additions to this leaflet

2 - STRENGTH AND STRUCTURAL CONDITIONS OF BODIES OR UNDERFRAMES

2.1 - Strength of body or underframe with respect to static loads

2.2 - Arrangement of automatic coupler

2.3 - Devices for damping longitudinal play and for protecting the end walls

2.4 - Spaces to be left free

3 - CONDITIONS TO BE SATISFIED WITH RESPECT TO THE WHEELBASE OR THE DISTANCE BETWEEN BOGIE CENTRES AND THE OVERHANG OF COACHES WITH A VIEW TO THE COUPLING OF COACHES FITTED WITH THE AUTOMATIC COUPLER

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5.9 - Cock operating

APPENDIX 1 Distribution of forces in the case of the static loading of coach bodies or underframes

APPENDICES : Space to be reserved on the coach for :
2a, 2b, 2c - suspension - Variant 1 (cross-beam suspension)
 - gathering range of the coupling arm
 - articulation
 - elastic element

Removed from below

Removed from the front

Removed from below and from the front (Solution with traction and compression stops)

APPENDICES : Space to be reserved on the coach for :
3a, 3b, 3c - suspension - Variant 2 (telescopic-leg suspension)
 - gathering range of the coupling arm
 - articulation
 - elastic element

Removed from below

Removed from the front

Removed from the front and from below (Solution with compression and traction stops)

APPENDIX 4: - Space to be reserved on the coach for :
- suspension - Variant 1 (cross-beam suspension)
- gathering range of the coupling arm
- articulation
- elastic element (flanged solution)

APPENDIX 5: Space to be reserved on the coach for :
- suspension - Variant 2 (telescopic-leg suspension)
- gathering range of the coupling arm
- articulation
- elastic element (flanged solution)

APPENDIX 6: Space requirement for two coupler bodies coupled together in the normal position (to be provided)

APPENDICES Basic conditions relating to the space to be reserved in front of the buffer securing plane

APPENDICES Lock control for automatic coupler (to be provided)
8a, 8b :

APPENDICES Cock operating (to be provided)
9a, 9b

APPENDIX 10: Mounting of automatic coupler with traction and compression stops and with cross-beam suspension

APPENDIX 11: Mounting of automatic coupler with traction and compression stops and with telescopic-leg suspension

APPENDIX 12: Mounting of automatic coupler with flange solution and with cross-beam suspension

APPENDIX 13: Mounting of the automatic coupler with flange solution and telescopic-leg suspension

APPENDIX 14 : Principal dimensions for the interchangeability of the elastic element for coaches

APPENDIX 15 : Suspension - Variant 1 (cross-beam suspension)

APPENDIX 16 : Suspension - Variant 2 (telescopic-leg suspension)

FOREWORD

This leaflet is valid for the European member railways of one or both of the railway unions with the exception of the Soviet Railways to which other provisions apply.

All the conditions specified in this leaflet, with the exception of those in chapter 4, are obligatory in the case of coaches (1) built after and intended for fitting with the automatic coupler (2).

The conditions marked by a vertical line in the margin must, in the case of coaches to be fitted with the automatic coupler, be satisfied by the date upon which the automatic coupler is fitted.

0 - PRELIMINARY REMARK

The term "coach" covers :

- coaches with seats, couchette coaches, sleeping cars, restaurant cars, open saloon coaches, mail vans, vans and open vans designed for transporting cars

1 - GENERAL

1.1 - For a coach to be suitable for being fitted and operated with the automatic coupler it must satisfy the following conditions :

- strength and structural conditions of bodies or underframes;
- conditions to be met as regards distance between bogie pivots or wheelbase and overhang, with a view to coupling;
- conditions to be fulfilled in order to guarantee operating safety;
- conditions relating to the mounting of the automatic coupler and accessories.

1.2 - Amendments or additions to this leaflet shall be subject to agreement between the UIC and the OSJD.

2 - STRENGTH AND STRUCTURAL CONDITIONS OF BODIESOR UNDERFRAMES

The body or the underframe of coaches shall be so designed as to enable the subsequent mounting of the automatic coupler without the need for any substantial alterations.

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- (1) Coaches for which the construction documents have not yet been provided
 - (2) Deadline : 6 months after confirmation of the leaflet by the organisations concerned.

2.1 - Strength of body or underframe with respect to static loads2.1.1 - Loads to be withstood by body or underframe

The body or underframe shall be designed to withstand :

- axial loads of 2000 kN in compression and 1500 kN or 1000 kN in tension applied as indicated in figures 1 to 3, 6 and 7 of appendix 1,
- during the transition period until the side buffers are removed, or in the event of the side buffers being retained, (a) loads of 1000 kN applied to each of the side buffers, and (b) a load of 500 kN applied diagonally as indicated in figures 4 and 5 of appendix 1.

In the case of longitudinal loading, allowance shall be made for the superimposition of vertical loads due to certain loading conditions and acting on the body or the underframe, and also for the provisions applicable in connection with the loading of the end wall.

2.1.2 - Strength

In the case of the loads indicated in 2.1.1, the stresses occurring in the underframe or in the body shall be lower than those accepted for the particular form of construction (e.g. welded construction).

The loads shall under no circumstance exceed the yield point (1) of the material used. In the case of the loads according to 2.1.1, no permanent deformation shall be observed in the body or in the underframe.

- (1) σ 0.2 for steels whose stress/strain curve does not exhibit any clearly defined yield point.

For example, for steels with a breaking strength of 370 N/mm² and 520 N/mm², the values shown in the following table shall not be exceeded :

Steel with a tensile strength of			
370 N/mm ²		520 N/mm ²	
Zone a	Zone b	Zone a	Zone b
220 N/mm ²	240 N/mm ²	325 N/mm ²	360 N/mm ²

Zone a = assembly area or change in section

Zone b = other areas

2.2 - Arrangement of automatic coupler

The height of the longitudinal centreline of the automatic coupler or the height of the drawhook of the screw coupling shall meet the following conditions :

- minimum height above rail level in the case of a fully occupied or fully loaded coach, stationary and at the limit of wear : 950 mm (1),
- maximum height above rail level in the case of an empty coach, stationary and in new condition : 1045 mm (1).

2.3 - Devices for damping longitudinal play and for protecting the end walls

The question as to whether to retain the side buffers as an elastic element and/or as a device for affording protection to the end walls (spacer pieces) has not yet been settled.

- (1) See note 11 (appendices 2 and 3)
note 5 (appendix 4)
note 7 (appendix 5)

If the side buffers are used for either or both purposes the height of the buffer centrelines and the dimensions of the buffer heads shall satisfy the conditions in force.

2.4 - Spaces to be left free

The coaches should be designed in such a way as to be capable of taking the control devices for the locking system of the automatic coupler, and the structural form of the underframes should conform to one of the following versions :

- solution with traction and compression stops, with UIC/OSJD suspension - variant 1 (cross-beam suspension),
- solution with traction and compression stops, with UIC/OSJD suspension variant 2 (telescopic-leg suspension),
- flange solution with UIC/OSJD suspension variant 1 (cross-beam suspension),
- flange solution with UIC/OSJD suspension variant 2 (telescopic-leg suspension).

2.4.1 - Mounting and removal of coupler head, elastic element and suspension

To enable the coupler head to be attached to or separated from the elastic element it must be possible to fit or remove the articulation pin from below and/or above. It shall moreover be possible to fit or remove this pin in front of the buffer beam (with the elastic element in the forward position) from below and/or above.

The elastic element may be fitted and removed from below and/or from the front.

The suspension is mounted and removed as follows :

- UIC/OSJD suspension variant 1 (cross-beam suspension) : downwards from below,
- UIC/OSJD suspension variant 2 (telescopic-leg suspension) : forwards from the front.

2.4.2 Arrangement with UIC/OSJD suspension variant 1 (cross-beam suspension)

In order to be able to accommodate the automatic coupler with the UIC/OSJD suspension variant 1, the underframe of the coach shall be prepared in accordance with appendix 2 (solution with stops) or appendix 4 (flange solution).

Appendix 15 provides indications concerning the space requirements and the connecting dimensions of the UIC/OSJD suspension variant 1.

2.4.3 - Arrangement with UIC/OSJD suspension variant 2 (telescopic-leg suspension)

In order to be able to accommodate the automatic coupler with the UIC/OSJD suspension variant 2, the underframe of the coach shall be prepared in accordance with appendix 3 (solution with stops) or appendix 5 (flange solution).

Appendix 16 provides indications concerning the space requirements and the connecting dimensions of the UIC/OSJD suspension variant 2.

2.4.4 - Swivel zone of the automatic coupler and parts thereof

In order to maintain a swivel zone for the automatic coupler and parts thereof, a free space shall be provided in front of the plane of the buffer fastenings.

The data required by the designer for defining this space is assembled in the following appendices :

- Appendix 6 : Space required by two coupling units coupled together in the normal position
- Appendix 7 : Basic conditions relating to the space to be reserved in front of the buffer securing plane.

2.4.5 Mounting space and swivel zone for the control devices

To provide for the mounting and swivelling of the control devices, the following free space shall be reserved :

- Appendix 8 : for the locking mechanism of the automatic coupler
- Appendix 9 : for control of the cocks.

3 - CONDITIONS TO BE SATISFIED WITH RESPECT TO THE WHEELBASE OR THE DISTANCE BETWEEN BOGIE CENTRES AND THE OVERHANG OF COACHES WITH A VIEW TO THE COUPLING OF COACHES FITTED WITH THE AUTOMATIC COUPLER

3.1 - General

The possibility of coupling together vehicles fitted with the automatic coupler, with a high degree of reliability and without any outside help is related to the gathering ranges of the coupling heads and their respective positions during the coupling operation.

It is essential in particular that the reciprocal movements of the heads both vertically and horizontally should not encroach beyond the gathering ranges in the respective directions.

3.2 - Possibility of coupling in the vertical direction

The technical characteristics specified for the coupling heads require that these components couple together with a maximum vertical displacement of their centrelines of 140 mm.

In view of the fact that the centreline of the coupler measured vertically above rail level and in the rest position should be between 1045 and 950 mm regardless of the loading condition of the coach (see point 2.2) it may be assumed that coupling in the vertical direction is always guaranteed.

3.3 - Possibility of coupling in the horizontal direction

The technical characteristics specified for the coupling heads require their gathering range to be 220 mm on each side of the longitudinal centreline of the coach.

It has also been specified that coupling of coaches fitted with the automatic coupler must be possible on straight track and at the point of transition between straight track and 250 m curve without the need for manual intervention.

UIC standard coaches type X or Z and Y fulfill conditions 11a of UIC Leaflet 522 and OSJD Leaflet 522/1; other coaches shall be checked individually to ensure that these conditions are satisfied.

The formula giving the maximum lateral displacement between the coupling heads of two vehicles (see UIC Leaflet 527) is as follows :

$$A = \frac{an + n^2}{2R} + \frac{2n + a}{a} (q_1 + q_2) k + \frac{2n' + a'}{a'} (q_1' + q_2') k'$$

In which :

A = lateral displacement between the two coupling heads,

B = curve radius.

- a = wheelbase or distance between bogie pivots of vehicle in question
- n = maximum overhang in the coupling plane of the vehicle in question
- q_1 = maximum lateral play between the track centreline and the wheelset of the vehicle in question
- q_2 = maximum lateral play between the wheelset and the longitudinal centreline of the vehicle in question
- k = reduction factor
- a' , n' , q_1' , q_2' , k' relate to vehicles on straight track.

The reduction factors k and k' are 0.25 (1) for coaches with bogies having wide lateral play (without horizontal damping) and 0.4 (1) for coaches with bogies having narrow transverse play (with horizontal damping).

4 - CONDITIONS TO BE SATISFIED IN ORDER TO ENSURE OPERATING SAFETY

To be provided

5 - CONDITIONS RELATING TO THE MOUNTING OF THE AUTOMATIC COUPLER AND OF ITS ACCESSORIES

The general provisions governing the mounting of the automatic coupler on coaches are indicated in the following appendices :

(1) provisional value

- Appendix 10 : Mounting of the automatic coupler with traction and compression stops and cross-beam suspension
- Appendix 11 : Mounting of the automatic coupler with traction and compression stops and telescopic-leg suspension
- Appendix 12 : Mounting of the automatic coupler with flange solution and cross-beam suspension
- Appendix 13 : Mounting of the automatic coupler with flange solution and telescopic-leg suspension

5.1 - Installation of elastic element between compression and traction stops (appendices 2 and 3)

5.1.1 - Traction stops

The stops and guide pieces fitted in the underframe shall be so designed as to satisfy the conditions in 2.4.1.

5.1.2 - Compression stops

The mounting recess is restricted at the rear by the compression stop surfaces c_2 or c_1 which may be in one piece or separate.

5.2 - Installation of the flanged elastic element (appendices 4 and 5)

The flange mounted in the underframe shall be so designed as to satisfy the conditions of 2.4.1. In the case of elastic elements with different distances between the support surface of the flange and the articulation pin, shims may be used.