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Translation

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Conditions for the acceptance of draw-only automatic couplers

Conditions d'homologation pour l'attelage automatique de simple traction
Zulassungsbedingungen für die automatische Zugkupplung



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

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Summary

The UIC developed an automatic buffing and draw coupler (UIC 69E/Intermat automatic coupler) for the European railways jointly with the OSJD in the 1960s. The migration to the automatic coupler which was to take place in a single brief period given the type of system concerned, has been suspended to date for financial reasons.

When more simple financial solutions were sought for an automatic coupler, an automatic draw-only coupler was proposed which:

- transmits only traction forces and with which side buffers are retained,
- couples the main brake pipe automatically,
- includes an integrated mixed coupler so that it can be coupled manually with vehicles equipped with screw couplers in order to allow for gradual migration.

The following acceptance conditions have been drawn up for use of automatic draw-only couplers in international traffic. Point 2 specifies the acceptance tests required to ascertain compliance with acceptance conditions.

1 - Technical and operational conditions for the draw-only automatic coupler (DAC)

o 1.1 - General

1.1.1 - The DAC (see [List of abbreviations - page 24](#)) may transfer only the traction forces. The compressive forces will be absorbed by the side buffers.

1.1.2 - The DAC should be so designed that it can be installed on vehicles prepared in accordance with *UIC Leaflet 530-1 and 567-3* respectively for automatic buffing and draw coupling, while retaining the non-continuous draw-gear as defined in *UIC Leaflet 520* and the side buffers of *UIC Leaflet 526-1, 526-2, 526-3 and 528* respectively.

1.1.3 - The DAC should be directly compatible with current screw coupling systems (mechanical and pneumatic), without requiring physical modifications to vehicles equipped with screw couplings. In the case of vehicles not constructed in accordance with UIC regulations, modifications may be necessary. The conditions covering the design of combined couplers are set out in points [1.7 - page 7](#) and [1.8 - page 8](#).

1.1.4 - The DAC should be so designed as to permit coupling to an automatic buffing and draw coupling, which in turn may be directly coupled to an SA3 coupler. If this condition is not satisfied, the reasons for this should be stated and possible solutions, together with their costs and implementation times, should be indicated.

1.1.5 - All variants of the DAC must be directly compatible with one another from the mechanical, pneumatic and, where applicable, electrical standpoint. Variants of the DAC shall not affect operating conditions. The principles of interaction are set out in Appendix [A - page 12](#), Coupling and Uncoupling.

1.1.6 - The DAC shall be so constructed and installed on vehicles that:

- the side buffers do not impede coupling or uncoupling on curves or the negotiation of curves, in accordance with the conditions of point [1.3 - page 4](#);
- in train running, no jerks or surges may be initiated which could create greater risks than those currently accepted for existing couplers used for each of the various train classes and speeds concerned.

1.1.7 - It should be possible to discharge individual open freight wagons equipped with DAC on wagon tipping installations.

1.1.8 - It should be possible for all operations necessary to actuate the DAC to be carried out by one person alone without moving from one side of the track to the other. Exceptions to this may be granted if both couplers need to be in the "long position" to negotiate curves of radius ≤ 135 m.

1.1.9 - The space currently provided for coupling/uncoupling screw couplings (Berne rectangle) shall, so far as possible, be maintained. Limited use of this space may be authorised by the UIC after examination. This examination shall cover in particular:

- the assessment of risks,
- the drafting of operating instructions,

- the development of any special equipment,
- the defining of an operating procedure for the CDC (see List of abbreviations - page 24).

1.1.10 - Temperature and environmental factors shall not affect the functioning and operation of the DAC (see List of abbreviations - page 24) more adversely than when screw couplings are used.

1.1.11 - The weight of the DAC shall not exceed 200 kg per coupler.

1.1.12 - Vehicles and loads may not be damaged by the buffing impacts occurring during the splitting-up of a train, nor should these impacts exceed the maximum values for conventional couplers.

1.2 - Actuation of the DAC

- **1.2.1** - The risks of errors, omissions or faulty operation of the DAC by operating staff shall not be greater than those arising from corresponding operations with conventional couplers.

1.2.2 - Appendix B - page 13 gives a comparison of the activities and functions involved in the various operations.

- **1.2.3** - Each DAC shall be provided with a device to permit the safe and easy release, from each side of the track, of DACs coupled together, by operation of only one device.

- **1.2.4** - When vehicles are at a standstill or moving at a speed of up to 1,8 m/s with a tensile force of zero N, it must be possible to release the DAC. It must also be possible to release the DAC when vehicles at a standstill are under a moderate tensile force.

1.2.5 - The locking control mechanism should as far as possible be standard for all vehicles.

1.2.6 - Actuation operations

- **1.2.6.1** - The operations necessary for actuation should be identical for all freight vehicles.

1.2.6.2 - Variations in the mode of operation may be authorised for passenger vehicles and traction units.

1.2.7 - Positioning of handles

- **1.2.7.1** - The handles of the locking mechanism should be placed as far as possible to the vehicle side and as close as possible to the vehicle end.

1.2.7.2 - For passenger coaches it is recommended that the locking mechanism be designed so as to make unauthorised uncoupling difficult.

- **1.2.8** - The actuating mechanism for the locking system shall permit the deflections of the coupler which occur in operation including the associated spring travel.

- **1.2.9** - The actuating mechanism shall be so designed that the shunter's platform may be used safely, both when the vehicle is moving and also when at a stand.

- **1.2.10** - The locking mechanism shall be so dimensioned that forces of 1000 N may be transferred at the handle without plastic deformation.

- **1.2.11** - The "coupling impossible" position shall not be cancelled unintentionally, even under buffing impacts.
- **1.2.12** - The construction and layout of the actuating mechanism shall allow for enlargement of the left-hand end step of freight wagons (*UIC Leaflet 535-2*).
- **1.2.13** - It shall be possible to adjust the locking mechanism of the DAC ([see List of abbreviations - page 24](#)) so that, after release, the following conditions are satisfied:
 - the coupler heads shall remain released until the vehicles are separated;
 - the coupler heads shall, as desired, either be ready for coupling or incapable of coupling again after the vehicles are separated.
- **1.2.14** - Adjustment of the "coupling impossible" position with 2 hands is permissible. It shall be possible to cancel the "coupling impossible" position using one hand, up to a vehicle speed of 3 m/s.
- 1.2.15** - The design and layout of the locking mechanism should allow for automation of the setting and cancelling of the "coupling impossible" position and the release of the DAC.
- **1.2.16** - It shall be possible to recognise the position of the locking mechanism from either side of the vehicle by means of a simple indicator, so that in the event of faults or of any incidents in the train, the position of the locking mechanism may be clearly established.
- **1.2.17** - The normal position of the actuating mechanism shall be clearly recognisable.
- **1.2.18** - It must be possible to override the horizontal force of the resetting mechanism of the DAC in the centre position by a force exerted directly by hand. It shall be possible to fix the DAC in the deflected position, in order to facilitate coupling on tight curves. This fixing shall automatically release after coupling, at the latest during coupler deflections against the deflected position, e.g. when running on straight line. Safe vehicle running shall not be impaired by this facility.
- **1.2.19** - Any risks threatened by incorrect operation shall be investigated.
- **1.3 - Coupling on and negotiation of curves, humps in marshalling yards and ferry ship ramps**

1.3.1 - The complete coupling of two vehicles with DAC shall take place automatically, apart from the exceptions allowed for under points [1.3.3 - page 4](#) and [1.3.9 - page 5](#), without assistance or supervision, at the moment of coming together.

1.3.2 - Correct coupling shall be ensured:

- on straight and curved track, in accordance with condition 1.3.3, at buffing speeds of 2 km/h up to at least 7 km/h;
- on curves, in accordance with point [1.3.5 - page 5](#), at walking pace (roughly 5 km/h).

The DAC shall however withstand buffing speeds of up to 15 km/h without damage.

1.3.3 - With provision for the handling area specified under point [1.4.2 - page 5](#), it shall be possible for vehicles with DAC to be coupled as follows:

- without manual assistance:
 - on straight track,
 - on curves and at the transition between straight line and curves,
 - of 150 m radius for freight wagons, locomotives and service vehicles,
 - of 250 m for passenger coaches and service vehicles of coach design;
- with manual assistance:
 - on curves and reverse curves of at least 190 m radius without an intermediate straight section,
 - on curves and reverse curves of at least 150 m radius with a minimum 6 m intermediate straight section.

1.3.4 - It shall be possible, with vehicles previously coupled in the close coupled position, to negotiate:

- curves and reverse curves of at least 190 m radius without an intermediate straight section,
- curves and reverse curves of at least 150 m radius with a 6 m intermediate straight section.

1.3.5 - Coupling on tight curves and also negotiation of such curves shall be possible under the same conditions as for screw couplings (maximum length of the screw coupling, less one turn of the screw), using aids where necessary.

1.3.6 - The DAC (see [List of abbreviations - page 24](#)) shall not release unintentionally. On negotiation of tight curves, a DAC not in the long position shall not release unintentionally; nor may it be so damaged, or so damage the vehicle, that a dangerous situation could arise.

1.3.7 - It shall be possible for coupled vehicles to pass over marshalling humps with the profile specified in [Appendix C - page 15](#), without risk of uncoupling.

1.3.8 - It shall be possible to uncouple vehicles on all sides of the marshalling hump, taking condition [1.2.4 - page 3](#) into account; passenger coaches may be in the "long-coupled" position if necessary.

1.3.9 - It shall be possible to push vehicles with unlocked DAC over all points of the marshalling hump without risk of damage to the DAC.

1.3.10 - The DAC shall be so designed and installed that coupled vehicles may negotiate ferry ship ramps with a maximum ramp incline of 3°30', with a maximum twist of 5° over 24 m length, without risk of uncoupling.

1.4 - Coupler heads (characteristics, design)

- **1.4.1** - The coupler head shall be designed on the basis of the Willison (see [Glossary - page 25](#)) principle.
- **1.4.2** - The side handling area of the DAC measured from the centre line of the vehicle, shall be 190 mm to both sides.
- **1.4.3** - DACs shall still couple reliably with a vertical difference of 120 mm at the coupler centre lines.
- **1.4.4** - The height of the coupler head, measured from the centre line to the top edge of the coupler, shall however not exceed 200 mm.