

Commission Decision of 28 July 2006 concerning the technical specification of interoperability relating to the subsystem 'rolling stock — freight wagons' of the trans-European conventional rail system (notified under document number C(2006) 3345) (Text with EEA relevance) (2006/861/EC) (repealed)

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## ANNEX D

### VEHICLE TRACK INTERACTION AND GAUGING

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### COMMUNICATION

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### ENVIRONMENTAL CONDITIONS

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### INFRASTRUCTURE AND ROLLING STOCK REGISTER

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### VEHICLE TRACK INTERACTION AND GAUGING

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## Static Tests With Normal In-Service Loads– Three Axle Bogies

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- Torsional Loads
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- Load on Pivot Bearing
- Loads on Friction Pads
- Transverse Load Acting on the Pivot Bearing

### J.4. NOTATION

### J.5. OVERVIEW/GUIDELINES

- Common Conditions For Rig Tests

## ANNEX K

### VEHICLE TRACK INTERACTION AND GAUGING

#### K.1 ASSEMBLY OF COMPONENTS.

- K.1.1 General.
- K.1.2 Interference between axle wheelseat and wheel bore hub.
- K.1.3 Press fitting diagram.

#### K.2 WHEELSET CHARACTERISTICS.

- K.2.1 Mechanical resistance of the assemblies.

#### K.3 DIMENSIONS AND TOLERANCES.

- K.3.1 General.
- K.3.2 Characteristics of mounted wheels.  
Fig. K6
- K.3.3 Overhang of the wheel.

#### K.4 PROTECTION AGAINST CORROSION.

## ANNEX L

### VEHICLE TRACK INTERACTION AND GAUGING

#### L.1 DESIGN ASSESSMENT

- L.1.1 General
- L.1.2 Design parameters to be assessed.
  - L.1.2.1 Parameters for geometrical compatibility

**Changes to legislation:** There are currently no known outstanding effects for the Commission Decision of 28 July 2006 concerning the technical specification of interoperability relating to the subsystem 'rolling stock — freight wagons' of the trans-European conventional rail system (notified under document number C(2006) 3345) (Text with EEA relevance) (2006/861/EC) (repealed). (See end of Document for details)

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- L.1.2.2 Parameters for thermo mechanical Compatibility
- L.1.2.3 Parameters for mechanical assessment
- L.1.3 Assessment of geometrical Compatibility
- L.1.4 Assessment of thermo mechanical compatibility
  - L.1.4.1 General procedure
  - L.1.4.2 First step: Braking bench test.
    - L.1.4.2.1 Test procedure.
    - L.1.4.2.2 Decision criteria.
  - L.1.4.3 Second step: Wheel fracture bench test.
    - L.1.4.3.1 General.
    - L.1.4.3.2 Wheel fracture bench test procedure
    - L.1.4.3.3 Decision criteria.
  - L.1.4.4 Third step: Field braking test.
    - L.1.4.4.1 General.
    - L.1.4.4.2 Test procedure.
    - L.1.4.4.3 Decision criteria.
- L.1.5 Assessment of mechanical compatibility
  - L.1.5.1 General procedure.
  - L.1.5.2 First step: calculation.
    - L.1.5.2.1 Applied forces.
      - Figure. L1
    - L.1.5.2.2 Calculation procedure.
    - L.1.5.2.3 Decision criteria.
  - L.1.5.3 Second step: Bench test.
    - L.1.5.3.1 General.
    - L.1.5.3.2 Definitions of the bench loading and test procedure.
    - L.1.5.3.3 Decision criteria.
- L.2 PRODUCT ASSESSMENT
  - L.2.1 Mechanical characteristics linked to wear:
    - L.2.1.1 Tensile test characteristics
    - L.2.1.2 Hardness characteristics in the rim
    - L.2.1.3 Heat treatment homogeneity
  - L.2.2 Mechanical characteristics linked to safety:
    - L.2.2.1 Impact test characteristics
    - L.2.2.2 Toughness characteristic of the rim
  - L.2.3 Material cleanliness
    - L.2.3.1 Micrographic cleanliness
    - L.2.3.2 Internal integrity
  - L.2.4 Surface condition
    - L.2.4.1 Characteristics to be achieved.
  - L.2.5 Surface integrity
  - L.2.6 Geometrical tolerances
  - L.2.7 Static imbalance
  - L.2.8 Protection against corrosion

## ANNEX M

### VEHICLE TRACK INTERACTION AND GAUGING

- M.1. DESIGN ASSESSMENT
  - M.1.1. General

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- M.1.2. Identification of forces and calculation of moments.
  - M.1.3. Geometrical and dimensional tolerances
    - M.1.3.1. Selection of the diameters for journals and axle body.
    - M.1.3.2. Selection of the diameters of the various seats from the...
      - M.1.3.2.1. Collar bearing surface.
      - M.1.3.2.2. Transition between the collar bearing surface and wheelseat.
      - M.1.3.2.3. Wheelseat.
  - M.1.4. Maximum permissible stresses.
    - M.1.4.1. Steel grade EA1N
    - M.1.4.2. Steel grades other than EA1N.
- M.2. PRODUCT ASSESSMENT
- M.2.1. Mechanical characteristics:
    - M.2.1.1. Characteristics from tensile test
    - M.2.1.2. Impact test characteristics
  - M.2.2. Microstructure characteristics
  - M.2.3. Material micrographic cleanliness
  - M.2.4. Internal integrity
  - M.2.5. Permeability to ultrasound
  - M.2.6. Surface characteristics
    - M.2.6.1. Surface finish
    - M.2.6.2. Surface integrity
    - M.2.6.3. Geometrical and dimensional tolerances
  - M.2.7. Final protection against corrosion
    - M.2.7.1. General
    - M.2.7.2. Resistance to specific corrosive products

## ANNEX N

### STRUCTURE AND MECHANICAL PARTS

- N.1. STATIC TEST METHODS
  - N.1.1. Limits values for static tests to verify fatigue strength

## ANNEX O

### ENVIRONMENTAL CONDITIONS

Design level for temperature class TRIV

## ANNEX P

### BRAKING PERFORMANCE

- P.1. DESIGN ASSESSMENT
  - P.1.1. Distributor
  - P.1.2. Relay valve for variable load and automatic empty-load change-over
    - P.1.2.1. Relay valve for variable load
    - P.1.2.2. Relay valve for automatic empty-load
  - P.1.3. Wheel slide protection device
  - P.1.4. Slack adjuster



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- P.1.5. Brake cylinder/actuator
- P.1.6. Pneumatic half coupling
- P.1.7. End Cocks
- P.1.8. Isolating device for distributor
- P.1.9. Brake pads
- P.1.10. Brake blocks
- P.1.11. Accelerator valve
- P.1.12. Automatic variable load sensing and empty/load changeover device
  - P.1.12.1 Automatic variable load sensing device
  - P.1.12.2 Empty/load changeover device

P. PRODUCT ASSESSMENT

- P.2.1. Distributor
- P.2.2. Relay valve for variable load and empty/load
- P.2.3. Wheel slide protection device
- P.2.4. Slack adjuster
- P.2.5. Brake cylinder/actuator
- P.2.6. Pneumatic half coupling
- P.2.7. End Cocks
- P.2.8. Isolating device for distributor
- P.2.9. Brake pads
- P.2.10. Brake blocks
- P.2.11. Accelerator valve
- P.2.12. Automatic variable load sensing and empty/load changeover device
  - P.2.12.1 Automatic variable load sensing device
  - P.2.12.2 Empty/load changeover device

P.3. TEST PROCEDURE CHARACTERISTIC

ANNEX Q

ASSESSMENT PROCEDURES

Modules for Interoperability Constituents:

Characteristics

MODULES FOR INTEROPERABILITY CONSTITUENTS

1. ....
2. ....
3. The technical documentation must enable the conformity of the interoperability...
4. ....
5. The manufacturer or his authorised representative established within the Community...
6. ....
7. ....

MODULES FOR INTEROPERABILITY CONSTITUENTS Verification

1. ....
2. ....

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- 3. The technical documentation must enable the conformity of the interoperability...
- 4. ....
- 5. ....
- 5.1. ....
- 5.1.1. ....
- 5.1.2. ....
- 5.2. ....
- 5.2.1. ....
- 5.2.2. ....
- 5.2.3. ....
- 5.2.4. ....
- 5.2.5. ....
- 6. The manufacturer or his authorised representative established within the Community...
- 7. ....
- 8. ....

MODULES FOR INTEROPERABILITY CONSTITUENTS

- 1. ....
- 2. The application for the EC type-examination must be lodged by...
- 3. The technical documentation must enable the conformity of the interoperability...
- 4. ....
- 4.1. ....
- 4.2. ....
- 4.3. ....
- 4.4. ....
- 4.5. ....
- 4.6. ....
- 4.7. ....
- 4.8. ....
- 5. Where the type meets the provisions of the TSI, the...
- 6. ....
- 7. ....
- 8. ....
- 9. ....
- 10. ....

MODULES FOR INTEROPERABILITY CONSTITUENTS

- 1. ....
- 2. ....
- 3. The manufacturer or his authorised representative established within the Community...
- 4. The manufacturer or his authorised representative established within the Community...
- 5. ....

MODULES FOR INTEROPERABILITY CONSTITUENTS

- 1. ....
- 2. ....
- 3. ....
- 3.1. The manufacturer must lodge an application for assessment of his...

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- 3.2. The quality management system must ensure compliance of the interoperability...
- 3.3. The notified body assesses the quality management system to determine...
- 3.4. The manufacturer must undertake to fulfil the obligations arising out...
4. ....
- 4.1. ....
- 4.2. The manufacturer must allow the notified body entrance for inspection...
- 4.3. The notified body must periodically carry out audits to make...
- 4.4. ....
5. Each notified body must communicate to the other notified bodies...
6. The manufacturer must, for a period of 10 years after...
7. The manufacturer or his authorised representative established within the Community...
8. The manufacturer or his authorised representative established within the Community...
9. ....

#### 4 MODULES FOR INTEROPERABILITY CONSTITUENTS

1. ....
2. ....
3. ....
4. ....
- 4.1. ....
- 4.2. ....
- 4.3. ....
5. ....
- 5.1. ....
- 5.2. ....
- 5.3. ....
- 5.4. In the case of accepted lots, the notified body shall...
- 5.5. ....
6. The manufacturer or his authorised representative established within the Community...
7. The manufacturer or his authorised representative established within the Community...
8. ....

#### MODULES FOR INTEROPERABILITY CONSTITUENTS

1. ....
2. ....
3. ....
- 3.1. The manufacturer must lodge an application for assessment of his...
- 3.2. The quality management system must ensure compliance of the interoperability...
- 3.3. The notified body must assess the quality management system to...
- 3.4. The manufacturer must undertake to fulfil the obligations arising out...
4. ....
- 4.1. ....
- 4.2. The manufacturer must allow the notified body entrance for inspection...
- 4.3. ....
- 4.4. ....
5. The manufacturer must, for a period of 10 years after...
6. Each notified body must communicate to the other notified bodies...

**Changes to legislation:** There are currently no known outstanding effects for the Commission Decision of 28 July 2006 concerning the technical specification of interoperability relating to the subsystem 'rolling stock — freight wagons' of the trans-European conventional rail system (notified under document number C(2006) 3345) (Text with EEA relevance) (2006/861/EC) (repealed). (See end of Document for details)

7. The manufacturer or its authorised representative established within the Community...
8. The manufacturer or his authorised representative established within the Community...
9. ....

#### MODULE 5 FOR INTEROPERABILITY MANAGEMENT SYSTEMS (TSI) Design Examination

1. ....
2. ....
3. ....
- 3.1. The manufacturer must lodge an application for assessment of his...
- 3.2. The quality management system must ensure compliance of the interoperability...
- 3.3. The notified body must assess the quality management system to...
- 3.4. The manufacturer must undertake to fulfil the obligations arising out...
4. ....
- 4.1. ....
- 4.2. The manufacturer must allow the notified body entrance for inspection...
- 4.3. The notified body must periodically carry out audits to make...
- 4.4. ....
5. The manufacturer must, for a period of 10 years after...
6. ....
- 6.1. ....
- 6.2. The application must enable the design, manufacture, maintenance and operation...
- 6.3. ....
- 6.4. The notified body must examine the application and assess the...
- 6.5. ....
- 6.6. ....
7. Each notified body must communicate to the other notified bodies...
8. The manufacturer or his authorised representative established within the Community...
9. The manufacturer or his authorised representative established within the Community...
10. ....

#### MODULE 6 FOR INTEROPERABILITY CONSEQUENCE (Suitability For Use)...

1. ....
2. The manufacturer, or his authorised representative established within the Community,...
3. The technical documentation must enable the assessment of the product...
4. The programme for the validation by in service experience must...
5. ....
- 5.1. ....
- 5.2. ....
- 5.3. ....
- 5.4. ....
- 5.5. ....
- 5.6. ....
- 5.7. ....
6. Where the type meets the provisions of the TSI, the...
7. ....
8. ....

**Changes to legislation:** There are currently no known outstanding effects for the Commission Decision of 28 July 2006 concerning the technical specification of interoperability relating to the subsystem 'rolling stock — freight wagons' of the trans-European conventional rail system (notified under document number C(2006) 3345) (Text with EEA relevance) (2006/861/EC) (repealed). (See end of Document for details)

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- 9. ....
- 10. ....
- 11. The manufacturer or his authorised representative established within the Community...
- 12. ....

## ANNEX R

### VEHICLE TRACK INTERACTION AND GAUGING

- R.1. TESTS CONDITIONS
  - R.1.1. Track
    - Fig. R1
  - R.1.2. Test train
    - Fig. R2
  - R.1.3. Buffer type
  - R.1.4. Carrying out the tests
- R.2. SCOPE OF MEASUREMENTS
  - R.2.1. Measurements during the tests
    - Fig. R3
  - R.2.2. Measurements/Calculations to be made
- R.3. EVALUATION CRITERIA USED TO CALCULATE THE PERMISSIBLE LONGITUDINAL COMPRESSIVE FORCE....
- R.4. ANALYSIS
  - Fig. R4
- R.5. CONDITIONS FOR TEST EXEMPTION
  - Fig. R5
  - Fig. R 6
  - Fig. R 7

## ANNEX S

### BRAKING

- S.1. DETERMINING THE BRAKING POWER OF VEHICLES FITTED WITH UIC AIR...
  - S.1.1. General
  - S.1.2. Determining the braking power by calculation
    - S.1.2.1. Determining the braking power using the factor k
    - S.1.2.2. Wagons for which the required condition for calculating the braking...
      - Fig.S1 Assessment graph
  - S.1.3. Determining the braked mass in tests
    - S.1.3.1. Wagons with a maximum speed of  $\leq 120$  km/h
      - S.1.3.1.1 Tests on a single vehicle (slip brake tests)
      - S.1.3.1.2 Vehicle composition in the slip brake test
    - S.1.3.2. Wagons with a maximum speed greater than 120 km/h but...
- S.2. DETERMINING THE BRAKING POWER OF WAGONS FITTED WITH A UIC...

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- S.3. EXECUTION OF TESTS
  - S.3.1. Method of execution for the tests
    - S.3.1.1. Atmospheric conditions
    - S.3.1.2. Number of tests
    - S.3.1.3. Condition of friction components and discs/wheels
  - S.3.2. Method of evaluating the test results
    - S.3.2.1. Correcting the braking distances from each test
    - S.3.2.2. Correcting the mean braking distance s –
- S.4. EVALUATION OF BRAKE PERFORMANCE BY A CALCULATION
  - S.4.1. Step by step calculation
  - S.4.2. Calculation by stages of deceleration

## ANNEX T

### SPECIFIC CASES

- T.1. WAGONS INTENDED TO RUN ON THE BRITISH NETWORK
  - T.1.1. Introduction
  - T.1.2. Section A — Gauge applicable to wagons in Great Britain...
    - Area above 1 000 mm Above Rail Level (ARL)
      - General
      - 1 000 mm Dimension ARL
      - Determination of Maximum Vehicle Width.
      - Formulae to be applied for determination of the reduction above...
    - Area below 1 000 mm ARL
      - General
      - Determination of Maximum Vehicle Width
      - Diagram Figure With Reduction Formulae
      - Formulae to be applied for determination of the reduction below...
  - T.1.3. Section B — Sample Calculation for a W6-A Gauge Vehicle...
    - 1. ....
    - 1.1. Two-axle covered wagon, to the following dimensions:
    - 1.2. ....
    - 1.2.1. At centre of the vehicle
    - 1.3. ....
    - 1.3.1. ....
    - 1.4. ....
    - 1.4.1. ....
    - 1.4.1.1. ....
    - 1.5. ....
    - 1.5.1.  $E_o/E_i = \text{zero}$
    - 1.6. ....
    - 1.6.1. ....
    - 1.7. ....
    - 1.7.1. ....
    - 3. ....
    - 3.1. ....
    - 3.1.1. ....
    - 3.2. ....

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3.2.1.	
3.2.2.	.....
3.3.	.....
3.3.1.	
3.4.	.....
3.4.1.	
3.4.2.	
T.1.4.	Section C — W7 and W8 Gauges
	W7 Gauge Fig. T4
	W8 Gauge Fig. T5
T.1.5.	Section D — Special load gauge W9
1.1.	The W9 gauge has two distinct parts that shall both...
	Reference profile of the gauge W9 (i) inner
2.	.....
2.1.	.....
2.1.1.	.....
2.1.1.1.	.....
2.1.1.2.	.....
	Area comprised between 1 000 mm and 780 mm ARL
1.1.3.	Reduction $E_i$ (metres) to be made on each side of...
	Area between 1 000 mm and 780 mm ARL
2.1.	.....
2.1.1.	This part of the W9 (i) gauge is simplified kinematic...
2.1.3.	.....
2.1.3.1.	
2.1.4.	.....
	Fig. T7
2.1.5.	At any point of the vehicle, the combination of its:...
2.1.5.1.	Reduction $E_i$ (metres) to be made on each side of...
2.1.6.2.	.....
3.	.....
3.1.	.....
3.1.1.	Bogie wagon, to the following dimensions:
3.2.	.....
3.2.1.	At the centre of the wagon
3.2.2.	Overall gauge reduction
3.3.	.....
3.3.1.	
3.3.2.	
4.	.....
4.1.	.....
4.1.1.	.....
4.1.1.1.	General
4.1.2.1.	.....
	Fig. T7
4.1.3.	.....
4.1.3.1.	
4.1.3.2.	Note
4.2.2.	.....
4.2.2.1.	
4.2.2.2.	Determination of gauge widths
4.2.2.3.	
	Fig. T8

*Changes to legislation:* There are currently no known outstanding effects for the Commission Decision of 28 July 2006 concerning the technical specification of interoperability relating to the subsystem 'rolling stock — freight wagons' of the trans-European conventional rail system (notified under document number C(2006) 3345) (Text with EEA relevance) (2006/861/EC) (repealed). (See end of Document for details)

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## ANNEX U

### SPECIFIC CASES

.....

- U.1. WAGONS FOR BOTH 1 520 MM AND 1 435 MM...
  - Fig. U1
  - Fig.U2
  - Fig.U3
- U.2. WAGONS FOR ONLY 1 520 MM TRACKS
  - Fig. U4 Kinematic gauge WM-2
  - Fig.U5 Kinematic gauge WM-1
  - Fig. U6 Lower parts for kinematic gauge WM-02, 1, 0
- U.3. PASSING OVER TRANSITION CURVES
- U.4. PASSING OVER VERTICAL TRANSITION CURVES (INCLUDING MARSHALLING YARD HUMPS) AND...
  - Fig. U7 First track retarder before first turnout
  - Fig. U8 First track retarder after first turnout
- U.5. ABILITY TO COUPLE

## ANNEX V

### SPECIFIC CASE

- V.1. PARKING BRAKE FOR FREIGHT WAGONS INTENDED FOR USE ON THE...
- V.2. EQUIVALENT BRAKE FORCE & BRAKE FORCE FACTORS FOR FREIGHT WAGONS...
  - Brake Force
  - Equivalent Brake Force
  - Brake Force Factors
  - Calculation of Brake Force Data
    - i) Vehicles with either a single value of brake force, or...
    - ii) Vehicles with a value of brake force that varies in...
    - iii) Factors to be considered in the derivation of brake force...

## ANNEX W

### SPECIFIC CASES

- W.1. GENERAL RULES
  - 1.1. ....
  - 1.2. To define the lowest position of the various parts of...
  - 1.3. ....
- W.2. LOWER PART OF THE VEHICLE





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FIN1/Appendix B2

Increase of the minimum height of the lower part of the vehicle unable to pass over marshalling humps and rail brakes

.....  
.....  
.....  
.....  
.....  
.....  
.....

FIN1/Appendix B3

LOCATION OF THE RAIL BRAKES AND OTHER SHUNTING DEVICES OF MARSHALLING HUMPS

PASSING TRACKS:

FIN1/Appendix C

Reduction of the half-width according to the vehicle gauge FIN1, (reduction formulae)

- 1. General rules
- 2. Reduction formulae (in metres)
  - 2.1 Sections between bogie pivots or between end axles
  - 2.2 Sections beyond bogie pivots or beyond end axles (vehicles with...
- 3. Reduction values
  - 3.1 For sections between bogie pivots;
  - 3.2 For sections beyond bogie pivots;

FIN1/Appendix D1

GAUGE OF THE VEHICLE LOWER STEP

- 1. This norm concerns the step used either for high (550/1...
- 2. ....
- 3. ....
- 3.1 ....
- 3.2 Step located beyond bogie pivots:
- 4. Notations (values in metres):
- 5. ....

**Changes to legislation:** There are currently no known outstanding effects for the Commission Decision of 28 July 2006 concerning the technical specification of interoperability relating to the subsystem 'rolling stock — freight wagons' of the trans-European conventional rail system (notified under document number C(2006) 3345) (Text with EEA relevance) (2006/861/EC) (repealed). (See end of Document for details)

- 5.1 .....
- 5.2 .....
- 6. Gauge check
- 7. Display of the outputs

FIN1/Appendix D2

Gauge of outwards opening doors and of opened steps for coaches and multiple units

- 1. To avoid a uselessly wide gap between the step and...
- 2. The distance between the track centreline and the fixed equipment...
- 3. ....
- 3.1. ....
- 3.2. ....
- 4. Notations (values in metres):
- 5. Rules related to the transverse distance between the door and...
- 6. Gauge check
- 7. Display of the outputs

FIN1/Appendix E

Pantograph and non-insulated live parts

- .....
- 1) .....

ANNEX X  
SPECIFIC CASES

MEMBER STATE: SPAIN AND PORTUGAL

ANNEX Y  
CONSTITUENTS

.....  
.....  
.....

**Changes to legislation:** There are currently no known outstanding effects for the Commission Decision of 28 July 2006 concerning the technical specification of interoperability relating to the subsystem 'rolling stock — freight wagons' of the trans-European conventional rail system (notified under document number C(2006) 3345) (Text with EEA relevance) (2006/861/EC) (repealed). (See end of Document for details)

## Special remark

- Y.1 TWO AXLE BOGIES  
Y.2 SUSPENSION

## ANNEX Z

## STRUCTURE AND MECHANICAL PARTS

## Z.1. BUFFING TESTS

- Z.1.1. Requirement  
Z.1.2. Buffing tests with empty wagons  
Z.1.3. Buffing test with laden wagons  
Z.1.4. Wagons with side buffers  
Z.1.5. Wagons equipped with an automatic coupler  
Z.1.6. Results

## ANNEX AA

## ASSESSMENT PROCEDURES

Structure of modules for the EC verification procedure of Subsystems...

## MODULES FOR THE EC VERIFICATION OF SUBSYSTEMS

1. This module describes the EC verification procedure whereby a notified...
2. The contracting entity must lodge an application for EC verification...
3. The applicant must place at the disposal of the notified...
4. ....
- 4.1. ....
- 4.2. ....
- 4.3. ....
- 4.4. ....
- 4.5. ....
- 4.6. ....
- 4.7. ....
5. Where the type meets the provisions of the TSI, the...
6. ....
7. ....
8. ....
9. ....

## MODULES FOR THE EC VERIFICATION OF SUBSYSTEMS

1. This module describes the EC verification procedure whereby a notified...
2. The notified body carries out the procedure, under the condition,...
3. For the subsystem that is subject of the EC verification...
4. ....
- 4.1. ....
- 4.2. The application must enable the design, manufacture, assembly, installation, maintenance...
- 4.3. The notified body shall first examine the application concerning the...
5. ....
- 5.1. The contracting entity, if involved, and the main contractors, when...
- 5.2. For the contracting entity or the main contractor responsible for...

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- 5.3. The notified body chosen by the contracting entity must examine,...
- 5.4. The notified body referenced to in point 5.1. must assess...
- 5.5. The contracting entity, if involved, and the main contractors shall...
6. ....
- 6.1. ....
- 6.2. The contracting entity, if involved, and the main contractors must...
- 6.3. The notified body must periodically carry out audits to make...
- 6.4. ....
- 6.5. The notified body chosen by the contracting entity and responsible...
7. ....
8. The contracting entity, if involved, and the main contractors must,...
9. Where the subsystem meets the requirements of the TSI, the...
10. The notified body chosen by the contracting entity shall be...
11. Each notified body must communicate to the other notified bodies...
12. The records accompanying the certificate of conformity must be lodged...

#### MODULES FOR THE EC VERIFICATION OF SUBSYSTEMS

1. This module describes the EC verification procedure whereby a notified...
2. The contracting entity must lodge an application for EC verification...
3. Within that part of the procedure the contracting entity checks...
4. ....
5. The application must enable the design, manufacture, installation, maintenance and...
6. The notified body shall first examine the application concerning the...
7. ....
- 7.1. ....
- 7.2. ....
8. The notified body may agree with the contracting entity (and...
9. Where the subsystem meets the requirements of the TSI, the...
10. The notified body shall be responsible for compiling the technical...
11. The records accompanying the certificate of conformity must be lodged...

#### MODULES FOR THE EC VERIFICATION OF SUBSYSTEMS

1. This module describes the EC verification procedure whereby a notified...
2. The notified body shall carry out the procedure, including a...
3. For the subsystem that is subject of the EC verification...
4. ....
- 4.1. ....
- 4.2. The application must enable the design, manufacture, assembly, installation, maintenance...
- 4.3. ....
- 4.4. The notified body must examine the application concerning the design...
5. ....
- 5.1. The contracting entity, if involved, and the main contractors, when...
- 5.2. For the contracting entity or the main contractor responsible for...
- 5.3. The notified body chosen by the contracting entity must examine,...
- 5.4. The notified body referenced in point 5.1. must assess the...
- 5.5. The contracting entity, if involved, and the main contractors shall...
6. ....
- 6.1. ....
- 6.2. The contracting entity, if involved, and the main contractors must...
- 6.3. The notified body must periodically carry out audits to make...
- 6.4. ....

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- 6.5. The notified body chosen by the contracting entity and responsible...
- 7. ....
- 8. The contracting entity, if involved, and the main contractors must,...
- 9. Where the subsystem meets the requirements of the TSI, the...
- 10. The notified body chosen by the contracting entity shall be...
- 11. Each notified body must communicate to the other notified bodies...
- 12. The records accompanying the certificate of conformity must be lodged...

## ANNEX BB

### STRUCTURES AND MECHANICAL PARTS

- BB.1 TAIL SIGNAL LAMP BRACKETS  
Fig. BB1 Signal lamp bracket
- BB.2 TAIL SIGNAL LAMPS: SPACE REQUIRED — ENVELOPE  
Fig. BB2 Space required envelope

## ANNEX CC

### STRUCTURE AND MECHANICAL PARTS

- CC.1 PAYLOAD SPECTRUM
  - CC.1.1 General
  - CC.1.2 Track induced loading
  - CC.1.3 Traction and braking
  - CC.1.4 Aerodynamic loading
  - CC.1.5 Fatigue loads at interfaces

## ANNEX DD

### ASSESSMENT OF MAINTENANCE ARRANGEMENTS

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## ANNEX EE

### STRUCTURES AND MECHANICAL PARTS

- EE.1 GENERAL
- EE.2 MINIMUM REQUIREMENTS
  - EE.2.1 Handrails
  - EE.2.2 Dimension of footsteps  
Fig. EE1 Disposition des Marchepieds et des mains courantes aux extrémités des...  
Fig. EE2 Espace libre, Clearance, Freiraum  
Fig. EE3 Hand rails for shunters

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## ANNEX FF

### BRAKING

- FF1. WHEEL SLIDE PROTECTION DEVICES
  - FF1.1. Wheel slide protection devices for new, existing, upgraded and renewed...
  - FF1.2. Wheel slide protection devices for use on existing vehicles
- FF 2. COMPRESSED-AIR BRAKES FOR 'FREIGHT TRAINS' AND 'PASSENGER TRAINS'
  - FF 2.1. Distributor Valves for new vehicles, upgraded and renewed vehicles
  - FF 2.2. Valves for vehicles existing before 2005 which are upgraded or...
- FF 3. SELF-ADJUSTING LOAD-PROPORTIONAL BRAKING DEVICES APPROVED FOR INTERNATIONAL TRAFFIC
- FF 4. BRAKE PIPE EMPTYING ACCELERATORS ACCEPTED IN INTERNATIONAL SERVICES
- FF 5. QUICK-RELEASE VALVES ACCEPTED IN INTERNATIONAL SERVICES
- FF 6. BRAKE PADS FOR VEHICLES EQUIPPED WITH DISC BRAKES, ACCEPTED FOR...
- FF 7. AUTOMATIC 'EMPTY-LOADED' CONTROL MECHANISMS ACCEPTED IN INTERNATIONAL TRAFFIC
- FF 8. TEST BENCHES ASSESSED UP TO JUNE 2004 AS CAPABLE OF...

## ANNEX GG

### SPECIFIC CASES

## ANNEX HH

### SPECIFIC CASES

## ANNEX II

### VEHICLE TRACK INTERACTION AND GAUGING

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## ANNEX JJ

- JJ.1. LIST OF OPEN POINTS
- JJ.2. CLOSURE OF OPEN POINTS AND ADDITIONAL SPECIFICATIONS IN THE CASE...

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1. Closure of open points
  - 1.1. Hot Axle Box detection
  - 1.2. Cross winds
  - 1.3. Assessment of welding joints
  - 1.4. Assessment of maintenance
  - 1.5. Wheel treads
  - 1.6. Cast wheels
  - 1.7. Design and Assessment of composite brake blocks
2. Additional specifications
  - 2.1. Buffers and draw gears
  - 2.2. Strength of main vehicle structure
  - 2.3. Jacking
    - Figure Relevage sur la voie / Rerailing
  - 2.4. Axle
  - 2.5. Dynamic behaviour of the vehicle
  - 2.6. Longitudinal compressive force
  - 2.7. Braking
    - 2.7.1. Energy storage
  - 2.8. Two-axle wagons
  - 2.9. Electric or electromagnetic interference
  - 2.10. Special types of wagons
  - 2.11. Wagons coming to UK

## ANNEX KK

### INFRASTRUCTURE AND ROLLING STOCK REGISTER

## ANNEX LL

### HOT AXLE BOX DETECTION REFERENCE DOCUMENT

1. TERMS AND DEFINITIONS
  - Hot axle box detector (HABD):
2. SYMBOLS AND ABBREVIATIONS
3. ROLLING STOCK REQUIREMENTS
  - 3.1. Target Zone
  - 3.2. Target area
  - 3.3. Dimensions of the Target Area
  - 3.4. Position of the Target Area in the XY plane
  - 3.5. Visibility requirements for the Target Area
4. OTHER MECHANICAL DESIGN REQUIREMENTS
  - 4.1. Prohibitive Zone
5. CROSS REFERENCE TABLE



## ANNEX YY

### STRUCTURES AND MECHANICAL PARTS

- YY.1. INTRODUCTION
- YY.2. STRENGTH OF WAGON BODY STRUCTURES
  - YY.2.1. Stresses due to the vertical load
  - YY.2.2. Combined stresses
  - YY.2.3. Strength of the wagon floor to support industrial trucks and...
- YY.3. COVERED WAGONS WITH FIXED ROOF AND FIXED OR MOVING SIDE-WALLS...
  - YY.3.1. Strength of fixed side and end-walls
  - YY.3.2. Strength of side doors
  - YY.3.3. Strength of sliding walls
  - YY.3.4. Forces resulting from the passing of trains
  - YY.3.5. Strength of lockable partitions of sliding-wall wagons
  - YY.3.6. Strength of roof
- YY.4. WAGONS WITH FULL OPENING ROOF (ROLLER ROOF AND HINGED ROOF)...
  - YY.4.1. Wagons for the transport of heavy part-load goods
  - YY.4.2. Wagons for the transport of heavy bulk goods
- YY.5. HIGH-SIDED OPEN WAGONS
  - YY.5.1. Resistance of side-walls to transverse forces and of the edges...
  - YY.5.2. Strength of the side doors
- YY.6. FLAT WAGONS AND COMPOSITE FLAT/HIGH-SIDED WAGONS
  - YY.6.1. Strength of the side and end flaps
  - YY.6.2. Strength of the fixed side-wall flaps
  - YY.6.3. Strength of the side stanchions
  - YY.6.4. Strength of end stanchions
- YY.7. GRAVITY DISCHARGE WAGONS
  - YY.7.1. Strength of walls
- YY.8. WAGONS FOR THE CONVEYANCE OF ISO CONTAINERS AND/OR SWAP-BODIES
  - YY.8.1. Attachment of containers and swap-bodies
  - YY.8.2. Strength requirements for the container/swap-body retention devices
  - YY.8.3. Positioning of the container/swap-body retention devices
- YY.9. REQUIREMENTS FOR OTHER PAYLOAD SECURING EQUIPMENT
- YY.10. DEPOT TOW HOOKS
  - 1. ....
  - 2. ....
  - 3. ....

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## ANNEX ZZ

### STRUCTURES AND MECHANICAL PARTS

ZZ.1. STRUCTURAL STEELS

ZZ.2. OTHER STRUCTURAL MATERIALS

**Changes to legislation:**

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