

Annex I: Amendments to Technical specification for interoperability relating to the subsystem 'Rolling stock – Locomotive and passenger rolling stock' (Annex to Regulation 1302/2014)

1. In chapter 3 'Essential requirements', the row 4.2.3.5.2.3 in Table 1 is replaced by the following:

4.2.3.5.2.3	Automatic variable gauge systems	1.1.1, 1.1.2				
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2. In chapter 4 'Characteristics of the rolling stock subsystem', points (6) and (7) of clause 4.2.2.5 are replaced by the following:

'(6) Within the scope of the present TSI, the 'collision speed' and 'collision partner' when scenarios 1 and 2 are applied to locomotives fitted with automatic end centre buffer couplers and capable of a traction effort at coupling higher than 300 kN described in Table 2 of the specification referenced in appendix J-1, index 8 shall be

- 20 km/h instead of 36 km/h for scenarios 1 and 2 and
- the reference wagon described in Appendix K instead of reference wagon described in annex C.1 of the specification referenced in appendix J-1, index 8 for scenario 2.

Note: such high traction effort is required for heavy haul freight locomotives.

(7) Until 31/12/2019, it is permitted for locomotives with single 'central cab' as an alternative method to demonstrate compliance against the requirement of scenario 3 by demonstrating compliance with following criteria:

- the frame of the locomotive is designed according to the specification referenced in Appendix J-1, index 7 cat L (as already specified in clause 4.2.2.4 of this TSI),
- the distance between buffers and windscreen cab is at least 2,5 m'

3. In chapter 4 'Characteristics of the rolling stock subsystem', the text 'clause 2.1' in point (1) of clause 4.2.2.10 'Load conditions and weighed mass' shall be replaced by 'clause 4.5'
4. In chapter 4 'Characteristics of the rolling stock subsystem', the text 'technical document referenced in Appendix J-2, index 2' in point (3) of clause 4.2.3.4.2 'Running dynamic behaviour' is replaced by 'specification referenced in Appendix J-1, index 16'
5. In chapter 4 'Characteristics of the rolling stock subsystem', the word 'reference' in point (3) of clause 4.2.3.4.2 'Running dynamic behaviour' is deleted
6. In chapter 4 'Characteristics of the rolling stock subsystem', the text in point (5) of clause 4.2.3.4.2 'with the modifications as set out in the technical document referenced in Appendix J-2, index 2' is deleted
7. In chapter 4 'Characteristics of the rolling stock subsystem', the text in point (1) of clause 4.2.3.4.2.1 'and additionally for trains intended to be operated with a cant deficiencies > 165 mm in the specification referenced in Appendix J-1, index 18, with the modifications as set out in the technical document referenced in Appendix J-2, index 2.' is deleted

8. In chapter 4 'Characteristics of the rolling stock subsystem', the text in point (1) of clause 4.2.3.4.2.2 'with the modifications as set out in the technical document referenced in Appendix J-2, index 2' is deleted.
9. In chapter 4 'Characteristics of the rolling stock subsystem', the clause 4.2.3.5.2.3 'Variable gauge wheelsets' is replaced by the clause 4.2.3.5.2.3 'Automatic variable gauge systems' as follows:
 - (1) This requirement is applicable to units equipped with an automatic variable gauge system with changeover mechanism of the axial position of the wheels allowing the unit to be compatible with 1435 mm track gauge and other track gauge(s) within the scope of this TSI by means of passage through a gauge changeover facility.
This system is part of the wheelset as defined in point (1) of clause 4.2.3.5.2.
 - (2) The changeover mechanism shall ensure the locking in the correct intended axial position of the wheel.
 - (3) After passage through the changeover facility, the verification of the state of the locking system (locked or unlocked) and of the position of the wheels shall be performed by one or more of the following means: visual control, on-board control system or infrastructure/facility control system. In case of on-board control system, a continuous monitoring shall be possible.
 - (4) If a wheelset is equipped with brake equipment subject to a change in position during the gauge change operation, the automatic variable gauge system shall ensure the position and safe locking in the correct position of this equipment simultaneously to those of the wheels.
 - (5) The failure of the locking of the position of the wheels and braking equipment (if relevant) during operation has typical credible potential to lead directly to a catastrophic accident (resulting in multiple fatalities); considering this severity of the failure consequence, it shall be demonstrated that the risk is controlled to an acceptable level.
 - (6) The automatic variable gauge system is defined as an interoperable constituent (clause 5.3.4b). The conformity assessment procedure is specified in clause 6.1.3.1b (IC level), in clause 6.2.3.5 (safety requirement) and in clause 6.2.3.7 (subsystem level) of this TSI.
 - (7) The track gauges the unit is compatible with shall be recorded in the technical documentation. A description of the changeover operation in normal mode, including the type(s) of gauge changeover facility(ies) the unit is compatible with, shall be part of the technical documentation (see also clause 4.2.12.4 of this TSI)
 - (8) The requirements and conformity assessments required in other sections of this TSI apply independently for each wheel position corresponding to one track gauge, and have to be documented accordingly."
10. In chapter 4 'Characteristics of the rolling stock subsystem', the point (1) of clause 4.2.6.2 'Aerodynamic effects' is replaced by the following text:
 - (1) The requirements of this clause apply to all rolling stock. For rolling stock operated on the 1520 mm and 1600 mm track gauge system, in case of maximum speed higher than the limits specified in the clauses 4.2.6.2.1 to 4.2.6.2.5 the procedure for innovative solution shall apply.'

11. In chapter 4 'Characteristics of the rolling stock subsystem', the clause 4.2.6.2.1 'Slipstream effects on passengers on platform and on workers trackside' is replaced by the following text:

4.2.6.2.1 Slipstream effects on passengers on platform and on workers trackside

- (1) Units of maximum design speed $v_{tr,max} > 160$ km/h, running in the open air at a reference speed $v_{tr,ref}$ shall not cause the air speed to exceed at each measurement point defined in clause 4.2.2.1 and Table 5 of the specification referenced in Appendix J-1, index 108 the value $u_{95\%,max}$ as indicated in Table 5 of the specification referenced in Appendix J-1, index 108.
- (2) For units intended to be operated on the networks with track gauges of 1524 mm and 1668 mm, the corresponding values in Table 4 referring to the parameters of the specification referenced in Appendix J-1, index 108 shall be applied:

Table 4

Limit criteria

Track gauge (mm)	Maximum design speed $v_{tr,max}$ (km/h)	Measurement point		Trackside maximum permissible air speed, (limit values for $u_{95\%,max}$ (m/s))	Reference speed $v_{tr,ref}$ (km/h)
		Measurement performed at height above the top of rail	Measurement performed at a distance from the track centre		
1524	$160 < v_{tr,max} < 250$	0.2 m	3.0 m	22,5	Maximum design speed
		1.4 m	3.0 m	18	200 km/h or the maximum design speed, whichever is lower
1668	$160 < v_{tr,max} < 250$	0.2 m	3.1 m	20	Maximum design speed
		1.4 m	3.1 m	15.5	200 km/h or the maximum design speed, whichever is lower
	$250 \leq v_{tr,max}$	0.2 m	3.1 m	22	300 km/h or the maximum design speed, whichever is lower
		1.4 m	3.1 m	15.5	200 km/h

- (3) The formation to be tested is specified for fixed/predefined formations and units assessed for use in general operation respectively in clauses 4.2.2.2 and 4.2.2.4 of the specification referenced in Appendix J-1, index 108. Single units fitted with a drivers cab shall be tested within a formation complying with the requirements set out in clause 4.2.2.3 of specification referenced in Appendix J-1, index 108.

(4) The conformity assessment procedure is described in clause 6.2.3.13 of this TSI.'

12. In chapter 4 'Characteristics of the rolling stock subsystem', the clause 4.2.6.2.2 'Head pressure pulse' is replaced by the following text:

4.2.6.2.2 Head pressure pulse

- (1) The passing of two trains generates an aerodynamic load on each of the two trains. The requirement on head pressure pulse in open air allows defining a limit aerodynamic load induced by the rolling stock in open air assuming a distance between track centres for the track where the train is intended to be operated.
The distance between track centres depends on the speed and the gauge of the line; minimum values of distance between track centres depending on speed and gauge are defined as per the INF TSI.
- (2) Units with a maximum design speed higher than 160 km/h running in the open air at their reference speed $v_{tr,ref}$ on 1435 mm track gauge shall not cause the maximum peak-to-peak pressure to exceed the maximum permissible pressure change defined in Table 2 of the specification referenced in Appendix J-1, index 108 assessed over the measurement positions defined in point 4.1.2 of the specification referenced in Appendix J-1, index 108.
- (3) For units intended to be operated on the networks with track gauges of 1524 mm and 1668 mm, the corresponding values in Table 4b referring to the parameters of the specification referenced in Appendix J-1, index 108 shall be applied:

Table 4b

Limit criteria

Track gauge	Maximum design speed $v_{tr,max}$ (km/h)	Measurement point		Permissible pressure change, $(\Delta p_{95\%,max})$	Reference speed $v_{tr,ref}$ (km/h)
		Measurement performed at height above the top of rail	Measurement performed at a distance from the track centre		
1524 mm	$160 < v_{tr,max} < 250$	between 1,5 m and 3,0 m	2.5 m	900 Pa	Maximum design speed
1668 mm	$160 < v_{tr,max} < 250$	between 1,5 m and 3,0 m	2.6 m	800 Pa	Maximum design speed
	$250 \leq v_{tr,max}$	between 1,5 m and 3,0 m	2.6 m	800 Pa	250 km/h

(4) The formation to be verified by a test is specified below for different types of rolling stock:

- Unit assessed in fixed or predefined formation:

5.3.4b	Automatic variable gauge systems		X(*)		X	X	X(*)	X
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18. In chapter 6 'Assessment of conformity or suitability for use and 'EC' verification', a new clause is added below clause 6.1.3.1 'Wheels':

'6.1.3.1b Automatic variable gauge system (clause 5.3.4b)

- (1) The assessment procedure shall be based on a validation plan covering all aspects mentioned in clauses 4.2.3.5.2.3 and 5.3.4b.
- (2) The validation plan shall consider assessment on all the following different phases:
 - Design review.
 - Static tests (bench tests and integration-in-the-wheelset/unit tests).
 - Test on gauge changeover facility(ies).
 - On-track tests
- (3) Regarding the demonstration of compliance to points (5) of clause 4.2.3.5.2.3, the assumptions considered for the safety analysis related to the vehicle the system is intended to be integrated in, and related to the mission profile of that vehicle, shall be clearly documented.
- (4) In case the manufacturer has no sufficient return of experience, the automatic variable gauge system should be subject to an assessment of suitability for use (module CV; see also clause 6.1.6)
- (5) The certificate delivered by the Notified Body in charge of the conformity assessment shall include the type(s) and operating conditions of the gauge changeover facility(ies) the automatic variable gauge system has been assessed for.'

19. In chapter 6 'Assessment of conformity or suitability for use and 'EC' verification', a new bullet point is added below the bullet point 'Wheels (see clause 6.1.3.1)' in point (1) of clause 6.1.6 'Assessment of suitability for use' as follows:

'— Automatic variable gauge system (see clause 6.1.3.1b).'

20. In chapter 6 'Assessment of conformity or suitability for use and 'EC' verification', the text 'as amended by the technical document referenced in Appendix J-2, index 2' of point (1) in clause 6.2.3.3 'Safety against derailment running on twisted track (Clause 4.2.3.4.1)' is deleted.

21. In chapter 6 'Assessment of conformity or suitability for use and 'EC' verification', the text 'clause 5' of point (1) in clause 6.2.3.4 'Running dynamic behaviour — technical requirements (Clause 4.2.3.4.2 a)' is replaced by 'clause 7'.

22. In chapter 6 'Assessment of conformity or suitability for use and 'EC' verification', the text 'The conditions for the assessment in accordance with the specification referenced in Appendix J-1, index 84 shall be amended as per technical document referenced in Appendix J-2, index 2' of clause 6.2.3.4 'Running dynamic behaviour — technical requirements (Clause 4.2.3.4.2 a)' is deleted.

- A single unit of the fixed formation or any configuration of the pre-defined formation.
 - Unit assessed for use in general operation (train formation not defined at design stage):
 - Unit fitted with a drivers cab shall be assessed alone.
 - Other units: Requirement not applicable.
- (5) The conformity assessment procedure is described in clause 6.2.3.14 of this TSI.
13. In chapter 4 'Characteristics of the rolling stock subsystem', the text 'of intensity' in point (2) of clause 4.2.7.1 'External lights' is replaced by 'which luminous intensity'
14. In chapter 4 'Characteristics of the rolling stock subsystem', the text '100 cd/m²' in point (2) of clause 4.2.7.1 'External lights' is replaced by '100 cd'
15. In chapter 5 'Interoperability constituents', a new clause is added below clause 5.3.4 'Wheels':
- '5.3.4b Automatic variable gauge systems
- (1) An IC "automatic variable gauge system" shall be designed and assessed for an area of use defined by:
- The track gauges the system is designed for.
 - The range of maximum static axle loads (corresponding to design mass under normal payload as defined in clause 4.2.2.10 of this TSI).
 - The range of nominal wheel tread diameters.
 - The maximum design speed of the unit.
 - The type(s) of gauge changeover facility(ies) the system is designed for, including the nominal speed through the changeover facility(ies) and the maximum axial forces during the automatic gauge changeover process.
- (2) An automatic variable gauge system shall comply with the requirements set out in clause 4.2.3.5.2.3; these requirements shall be assessed at IC level as set out in clause 6.1.3.1b.'
16. In chapter 6 'Assessment of conformity or suitability for use and 'EC' verification', a new point is added below point (2) of clause 6.1.1 'Conformity assessment':
- (3) In case of a specific case applicable to a component defined as interoperability constituent in section 5.3 of this TSI, the corresponding requirement can be part of the verification at interoperability constituent level only in the case where the component remains compliant to the chapters 4 and 5 of this TSI, and where the specific case does not refer to a national rule (i.e. additional requirement compatible with the core TSI and fully specified in the TSI). In other cases, the verification shall be made at subsystem level; when a national rule applies to a component, the concerned Member State may define relevant applicable conformity assessment procedures.
17. In chapter 6 'Assessment of conformity or suitability for use and 'EC' verification', a new row is added below the row '5.3.4 wheel' in the second table of clause 6.1.2 'Application of modules':

23. In chapter 6 'Assessment of conformity or suitability for use and 'EC' verification', the text 'clauses 4.2.3.4.2, 4.2.4.2.2, 4.2.5.3.5, 4.2.5.5.8 and 4.2.5.5.9' of point (3) in clause 6.2.3.5 'Conformity assessment for safety requirements' is replaced by 'clauses 4.2.3.4.2, 4.2.3.5.2.3, 4.2.4.2.2, 4.2.5.3.5, 4.2.5.5.8 and 4.2.5.5.9'.
24. In chapter 6 'Assessment of conformity or suitability for use and 'EC' verification', the text 'Commission Regulation (EC) No 352/2009' of point (1) in clause 6.2.3.5 'Conformity assessment for safety requirements' is replaced by 'Commission Implementing Regulation (EU) No 402/2013'
25. In chapter 6 'Assessment of conformity or suitability for use and 'EC' verification', the footnote in clause 6.2.3.5 'Conformity assessment for safety requirements' is replaced by '(¹) Commission implementing regulation (EU) No 402/2013 of 30 April 2013 on the common safety method for risk evaluation and assessment and repealing Regulation (EC) No 352/2009 as referred to in Article 6(3)(a) of Directive 2004/49/EC of the European Parliament and of the Council (OJ L 121, 3.5.2013, p. 8)'
26. In chapter 6 'Assessment of conformity or suitability for use and 'EC' verification', the text 'in the technical document referenced in Appendix J-2, index 2' of point (1) in clause 6.2.3.6 'Design values for new wheel profiles (Clause 4.2.3.4.3.1)' is replaced by 'in the specification referenced in Appendix J-1, index 107
27. In chapter 6, 'Assessment of conformity or suitability for use and 'EC' verification', the point (2) of clause 6.2.3.7 'Mechanical and geometric characteristics of wheelsets (clause 4.2.3.5.2.1)' is replaced by the following text:
 - (2) The demonstration of compliance for mechanical resistance and fatigue characteristics of the axle shall be in accordance with the specification referenced in Appendix J-1, index 88, clauses 5, 6 and 7.
The decision criteria for the permissible stress is specified in the specification referenced in Appendix J-1, index 88, clause 8.'
28. In chapter 6, 'Assessment of conformity or suitability for use and 'EC' verification', the following points are added below point (8) of clause 6.2.3.7 'Mechanical and geometric characteristics of wheelsets (clause 4.2.3.5.2.1)'
 - (9) The safety analysis required in clause 4.2.3.5.2.3 point (5), and performed at IC level, shall be consolidated at the level of the unit (vehicle); in particular, the assumptions made according to clause 6.1.3.1b point (3) may need to be reviewed to take into account the vehicle and its mission profile."
 - (10) The assessment of the integration of the IC within the wheelset/unit and the technical compatibility with the changeover facility shall consist of:
 - The compliance with the area of use defined in clause 5.3.4.b (1) shall be verified.
 - Verification of the correct integration of the IC within the wheelset/unit, including the correct performance of its on-board control / monitoring system (when applicable), and
 - Tests on gauge changeover facility(ies).'
29. In chapter 6, 'Assessment of conformity or suitability for use and 'EC' verification', clause 6.2.3.13 'Slipstream effects on passengers on platform and on workers trackside (clause 4.2.6.2.1)' is replaced by the following text:

‘6.2.3.13 Slipstream effects on passengers on platform and on workers trackside (clause 4.2.6.2.1)

- (1) Demonstration of conformity with the limit value of trackside maximum permissible air speed defined set out in clause 4.2.6.2.1 of this TSI shall be demonstrated on the basis of full-scale tests on straight track performed in accordance with clause 6.2.2.1 of specification referenced in Appendix J-1, index 94.
- (2) Instead of the full assessment described above, it is permitted to carry out a simplified assessment for rolling stock of a similar design to rolling stock for which the full assessment defined in this TSI has been carried out. In such case, the simplified conformity assessment defined in clause 4.2.4 of the specification referenced in Appendix J-1, index 94 can be applied as far as the design differences remain in the limits of table 7 of the specification referenced in Appendix J-1, index 94.’

30. In chapter 6, ‘Assessment of conformity or suitability for use and ‘EC’ verification’, the text ‘clause 5.5.2’ of point (1) of clause 6.2.3.14 ‘Head pressure pulse (clause 4.2.6.2.2)’ is replaced by ‘clause 6.1.2.1’.

31. In chapter 6, ‘Assessment of conformity or suitability for use and ‘EC’ verification’, the text ‘clause 5.3’ of point (1) of clause 6.2.3.14 ‘Head pressure pulse (clause 4.2.6.2.2)’ is replaced by ‘clause 6.1.2.4’.

32. In chapter 6, ‘Assessment of conformity or suitability for use and ‘EC’ verification’, the text ‘clause 5.4.3’ of point (1) of clause 6.2.3.14 ‘Head pressure pulse (clause 4.2.6.2.2)’ is replaced by ‘clause 6.1.2.2’.

33. In chapter 6, ‘Assessment of conformity or suitability for use and ‘EC’ verification’, the following text is added below point (1) of clause 6.2.3.14 ‘Head pressure pulse (clause 4.2.6.2.2)’:

- (2) Instead of the full assessment described above, it is permitted to carry out a simplified assessment for rolling stock of a similar design to rolling stock for which the full assessment defined in this TSI has been carried out. In such case, the simplified conformity assessment defined in clause 4.1.4 of specification referenced in Appendix J-1, index 94 can be applied as far as the design differences remain in the limits of table 4 of specification referenced in Appendix J-1, index 94.

34. In chapter 7, ‘Implementation’, the clause 7.1.2 is replaced by the following clause:

‘7.1.2 Modifications to an existing rolling stock

7.1.2.1 Introduction

- (1) This clause applies in case of modification, including renewal or upgrade, to an existing rolling stock. It does not apply in case of substitution in the framework of maintenance.
- (2) This clause defines the principles to be applied by the applicants and Member States in line with the EC verification procedure described in Annexes V and VI of Directive 2008/57/EC, and in Decision 2010/713/EC, and considering Article 20 of Directive 2008/57/EC.
- (3) These principles depend on the status against TSIs of the existing rolling stock and are specified in clauses 7.1.2.2 and 7.1.2.3.

7.1.2.2 Modifications to an existing Rolling stock not covered by an EC certificate of verification against TSIs

- (1) This clause applies in case of modification of an existing rolling stock that was not assessed against TSIs; therefore it is not covered by an EC certificate of verification against TSIs (existing non-TSI compliant rolling stock).
- (2) Parts and basic parameters of the rolling stock that are not affected by the modification works are exempt from conformity assessment against the provisions in this TSI.
A new assessment against the requirements of this TSI may be only needed for the basic parameters in this TSI which may be affected by the modification(s).
- (3) When it is not economically feasible to fulfil the TSI requirement, the modification could be accepted if it is evident that a basic parameter is improved in the direction of the TSI defined performance.
For requirements specified in TSI Noise (Commission regulation N° 1304/2014) see also clause 7.2 of that TSI.
For requirements specified in TSI PRM (Commission regulation N° 1300/2014) see also clause 7.2.3 of that TSI.
National migration strategies related to the implementation of other TSIs (e.g. TSIs covering fixed installations) may have an impact to what extent the TSIs covering rolling stock needs to be applied.
- (4) The applicant shall identify and document the requirements of this TSI that are proposed to be applied.
- (5) The EC certificate to be issued by the NoBo is limited to the parts corresponding to point (4) above.
- (6) The replacement of a whole unit or (a) vehicle(s) within a unit (e.g. a replacement after a severe damage; see also clause 6.2.9) does not require a conformity assessment against this TSI, as long as the unit or the vehicle(s) are identical to the ones they replace. Such units must be traceable and certified in accordance with any national or international rule, or any code of practice widely acknowledged in the railway domain.
- (7) Guidance to the Member State for those modifications requiring a new authorization for placing into service is given in the Application Guide.

7.1.2.3 Modifications to an existing rolling stock covered by an EC certificate of verification against TSIs

- (1) This clause applies in case of modification of an existing rolling stock that was assessed against TSIs therefore is covered by an EC certificate of verification against TSIs.
- (2) Any modification to such existing vehicle shall be addressed as a modification to a type or design already bearing an EC type or examination certificate as specified in clause 7.1.3.1 point (8).
- (3) For requirements specified in TSI Noise (Commission regulation N° 1304/2014) see also section 7.2 of that TSI.'

35. In chapter 7, 'Implementation', the text 'Rules related to the type or design examination certificates' is replaced by 'Rules related to the EC type or design examination certificates' in clause 7.1.3

36. In chapter 7, 'Implementation', the following text is added at the end of point (1) of clause 7.1.3.1:

'It also applies to the EC type or design verification procedure in accordance with the TSI Noise (Commission regulation N° 1304/2014), and with the TSI PRM (Commission regulation N° 1300/2014) which refers to this TSI for its scope of application to Locomotives and Passengers rolling Stock.'

37. In chapter 7, 'Implementation', the text 'type or design examination' is replaced by 'EC type or design examination' in point (2) of clause 7.1.3.1.

38. In chapter 7, 'Implementation', the text 'EC type examination' is replaced by 'EC type or design examination' in point (3) of clause 7.1.3.1.
39. In chapter 7, 'Implementation', the text 'either totally or for particular sections,' in point (5) of clause 7.1.3.1 is replaced by 'either totally or for particular sections, unless explicitly otherwise specified in the revision of these TSIs;'
40. In chapter 7, 'Implementation', the text 'type examination' is replaced by 'EC type or design examination' in point (6) of clause 7.1.3.1.
41. In chapter 7, 'Implementation', the text 'type examination certificate' in point (7) of clause 7.1.3.1 is replaced by 'type or design examination certificate'
42. In chapter 7, 'Implementation', the point (8) of clause 7.1.3.1 is replaced by the following:

'(8) For modifications to a rolling stock type already bearing a type or design examination certificate of verification, the following rules apply:

- In accordance with Decision 2010/713/EU and by application of modules SB or SH1 for the EC verification, the applicant shall inform the notified body of all modifications to the approved type or design that may affect the conformity of the subsystem with the requirements of the relevant TSI(s) or the conditions for validity of the certificate. This information shall be provided by the applicant with corresponding references to the technical documentation relating to the existing EC type or design examination certificate. The modifications may require additional approval in the form of an addition to the original EC type or design examination certificate.
- The changes are permitted to be dealt with by only re-assessing those modifications that affect the conformity of the subsystem with the latest revision of the TSIs in force at that time. The applicant has to justify and document that applicable requirements remain consistent at subsystem level, and this has to be approved by the notified body.
- In case of modification that do not affect the provisions of the relevant TSI(s), the applicant may define a new version to the type fully covered by the original type or design examination certificate (version to a type)
- In order to establish the EC type or design examination certificate, the notified body is permitted to refer to:
 - The original EC type or design examination certificate for parts of the design that are unchanged or those that are changed but do not affect the conformity of the subsystem, as far as it is still valid (during 7 years phase B period).
 - Additional EC type or design examination certificate (amending the original certificate) for modified parts of the design that affect the conformity of the subsystem with the latest revision of this TSI in force at that time.
- In any case, the applicant shall ensure that the technical documentation which is relating to the EC type or design examination certificate is updated accordingly.'

43. In chapter 7, 'Implementation', the following point is added below point (8) of clause 7.1.3.1:

'(9) The updated technical documentation, related to the EC type or design examination certificate is referred to in the technical file accompanying the EC declaration of verification issued by the applicant for rolling stock declared as conformant to the modified type.'

44. In chapter 7, 'Implementation', the following point is added below point (5) of clause 7.3.1:

'(6) In case of a specific case applicable to a component defined as interoperability constituent in section 5.3 of this TSI, the conformity assessment has to be made according to the clause 6.1.1 point (3).'

45. In chapter 7, 'Implementation', the text 'EN14363:2005 clause 4.1.3.4.1' in clause 7.3.2.4 Specific case United Kingdom (Great Britain) ("P") is replaced by 'EN14363:2016 clause 6.1.5.3.1'.

46. In chapter 7, 'Implementation', the text 'Running dynamic behaviour (4.2.3.4.2, 6.2.3.4, ERA/TD/2012-17/INT)' of clause 7.3.2.5 should be replaced by 'Running dynamic behaviour (4.2.3.4.2, 6.2.3.4)'.

47. In chapter 7, 'Implementation', the text below:

'The limit value shall be evaluated in accordance with ERA/TD/2012-17/INT except for the formula in clause 4.3.11.2 which shall be taken to be $(11\ 550\ \text{m}/R_m - 33)$ instead.

In addition the cant deficiency threshold to be considered for applying the EN 15686:2010 shall be 190 mm.'

of clause 7.3.2.5 Specific case Spain ("P") is replaced by the following text:

'For the normalization of the estimated value to the radius $R_m = 350\ \text{m}$ according to clause 7.6.3.2.6 (2) of EN 14363:2016, the formula ' $Y_{a,nf,qst} = Y_{a,f,qst} - (10\ 500\ \text{m} / R_m - 30)\ \text{kN}$ ' shall be replaced by ' $Y_{a,nf,qst} = Y_{a,f,qst} - (11\ 550\ \text{m} / R_m - 33)\ \text{kN}$ '.

Values of cant deficiency can be adapted to 1668 mm track gauge by multiplying the corresponding 1435 mm parameter values by the following conversion factor: 1733/1500.'

48. In chapter 7, 'Implementation', the text 'amending EN 14363 and the ERA/TD/2012-17/INT requirements' of clause 7.3.2.5 Specific case United Kingdom (Great Britain) ("P") is replaced by 'amending EN 14363 requirements'

49. In chapter 7, 'Implementation', the text 'Specific case Spain ("P")' of clause 7.3.2.6 is replaced by 'Specific case Spain for 1668 mm track gauge ("P")'.

50. In chapter 7, 'Implementation', the text 'clause 7.4.2.8.1' of clause 7.3.2.10 Specific case United Kingdom (Great Britain) ("P") is replaced by 'clause 7.4.2.9.1'.

51. In chapter 7, 'Implementation', the text 'clause 7.4.2.3.1' of clause 7.3.2.11 Specific case Latvia ("T") is replaced by 'clause 7.4.2.4.1'.

52. In appendix C.3, 'Running dynamic behaviour', the text 'clause 5.4.3.2' is replaced by 'clause 5.3.1'.

53. In appendix C.3, 'Running dynamic behaviour', the text 'when test zone 3 (as described in Table 9 of to the specification referenced in Annex J-1, index 16) is used it is sufficient to have a minimum of 25 conformant track sections.' is deleted.

54. In the table of appendix H, 'Assessment of the rolling stock subsystem', the row:

Variable gauge wheelsets	4.2.3.5.2.3	open	open	open	open
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Is replaced by the following:

Automatic variable gauge systems	4.2.3.5.2.3	X	X	X	6.2.3.7
Automatic variable gauge systems (IC)	5.3.4b	X	X	X	6.1.3.1b

55. In the first table of appendix I 'Aspects for which the technical specification is not available (open points)', the following row is deleted:

Aerodynamic effects for 1520 mm, 1524 mm and 1668 mm track gauge systems	4.2.6.2	Limit values and conformity assessment	Normative documents referred to in the TSI are based on experience gained on the 1435 mm system.
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56. In the second table of appendix I 'Aspects for which the technical specification is not available (open points)', the following two rows are deleted:

Passive safety	4.2.2.5	Application of scenarios 1 and 2 to locomotives with centre couplers and traction effort higher than 300 kN	If no technical option is available, possible restrictions at the level of operation.
Automatic variable gauge system	4.2.3.5.2.3	Conformity assessment	Design option.

57. In appendix J-1 'Standards or normative documents', the following replacements are performed:

- EN 12663-1:2010 is replaced by EN 12663-1:2010+A1:2014
- EN 15807:2012 is replaced by EN 15807:2011
- EN 15227:2008+A1:2011 is replaced by EN 15227:2008+A1:2010
- EN 14531-1:2005 is replaced by EN 14531-1:2015
- FprEN 14752:2014 is replaced by EN 14752:2015
- EN 50388:2012 is replaced by EN 50388:2012 and EN 50388:2012/AC:2013
- EN 50367:2012 is replaced by EN 50367:2012 and EN 50367:2012/AC:2013
- EN 50119:2009 is replaced by EN 50119:2009/A1:2013
- EN 50153:2002 is replaced by EN 50153:2014
- EN 45545-2:2013 is replaced by EN 45545-2:2014+A1:2015
- EN 50553:2012 is replaced by EN 50553:2012 and EN 50553:2012/AC:2013
- EN 15551:2009 is replaced by EN 15551:2009+A1:2010
- EN 15566:2009 is replaced by EN 15566:2009+A1:2010
- EN 50317:2012 is replaced by EN 50317:2012 and EN 50317:2012/AC:2012
- EN 13715:2006 is replaced by EN 13715:2006+A1:2010
- EN 12082:2007 is replaced by EN 12082:2007+A1:2010

58. In appendix J-1, 'Standards or normative documents', the indexes 16, 17, 18, 19, 31, 65, 82, 83, 84, 88, 89, 94 and 95 are replaced by the indexes below:

16	Running dynamic behaviour	4.2.3.4.2 Appendix C	EN 14363:2016	relevant cl. ⁶
17	Running dynamic behaviour – limit values for running safety	4.2.3.4.2.1	EN 14363:2016	7.5
18	NOT USED			
19	Running dynamic behaviour – track loading limit values	4.2.3.4.2.2	EN 14363:2016	7.5
31	Magnetic track brake	4.2.4.8.2	EN 16207:2014	Annex C
65	Special requirements for stabling of trains – local external auxiliary power supply	4.2.11.6	EN/IEC 60309-2:1999 and amendments EN 60309-2:1999/A11:2004, A1:2007 and A2:2012	relevant cl. ⁶
82	Contact strips – verification method	6.1.3.8	EN 50405:2016	7.2, 7.3 7.4, 7.6 7.7
83	Safety against derailment running on twisted track	6.2.3.3	EN 14363:2016	4, 5, 6.1
84	Running dynamic behaviour – method of verification assessment of criteria conditions of assessment	6.2.3.4	EN 14363:2016	4, 5, 7
88	Wheelset – Powered and non-powered axles, method of verification, decision criteria	6.2.3.7	EN 13103-1:2016	5,6,7
89	NOT USED			
94	Slipstream effect - full scale tests – simplified assessment	6.2.3.13	EN 14067-4:2013	6.2.2.1 4.2.4 and table 7
95	Head pressure pulse – method of verification CFD Moving model – simplified assessment method	6.2.3.14	EN 14067-4:2013	6.1.2.1 6.1.2.4 6.1.2.2 4.1.4 and table 4

59. In appendix J-1, 'Standards or normative documents', the indexes below are added:

106	NOT USED			
107	Design values for new wheel profiles – evaluation of the equivalent conicity	6.2.3.6	EN 14363:2016	Annexes O and P
108	Slipstream effects – Requirements	4.2.6.2.1	EN 14067-4:2013	4.2.2.1, 4.2.2.2, 4.2.2.3 and 4.2.2.4
109	Head pressure pulse – Requirements	4.2.6.2.2	EN 14067-4:2013	4.1.2

60. In appendix J-2 'Technical documents (available on ERA website)', the following is deleted:

2	Rolling stock dynamic behaviour	4.2.3.4	ERA/TD/2012-17/INT rev 3.0	All
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61. The appendix K below is added:

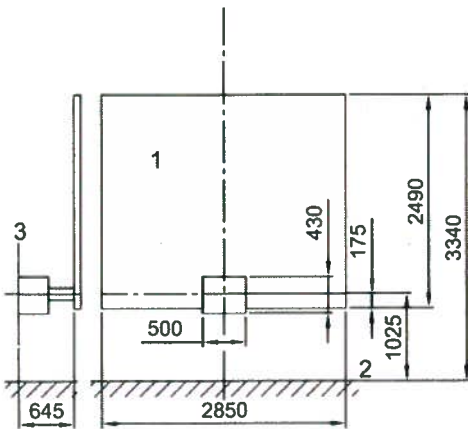
Appendix K

Reference wagon for locomotives fitted with automatic end centre buffer couplers and capable of a traction effort at coupling higher than 300 kN

For collisions between a train unit and a wagon fitted both with heavy duty couplers, the wagon shall be represented by a mass of 80 t which has only one degree of freedom in the translational x direction. The wagon interface geometry is shown in Figure K.1. The end wall and coupler head geometry shall be assumed to be rigid. It shall be equipped with a centre coupler with a stroke of 110 mm and the force-displacement characteristic indicated in Figure K.2. The total energy absorption capacity of the wagon coupler is 77 kJ.

The coupler head geometry and height above top of rail shall be the same as that of the impacting train unit. The longitudinal distance of the coupler plane to the end wall of the wagon shall be 645 mm. For simplification it is allowed to model the coupler heads using the geometry and height given in Figure K.1.

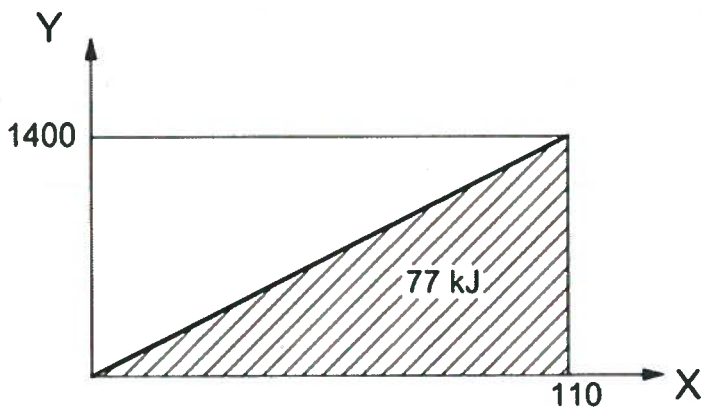
Dimensions in millimetres



Key

- 1 wagon end
- 2 top of rail
- 3 coupler plane

Figure K.1 — Wagon interface with centre coupler



Key

- Y coupler force - coupler, in kN
- X displacement, in mm

Figure K.2 — Wagon coupler characteristic

