

TSI Package 2023

TSIs LOC&PAS, PRM, NOI, WAG

Q&A Session n°2 – 10 November 2023



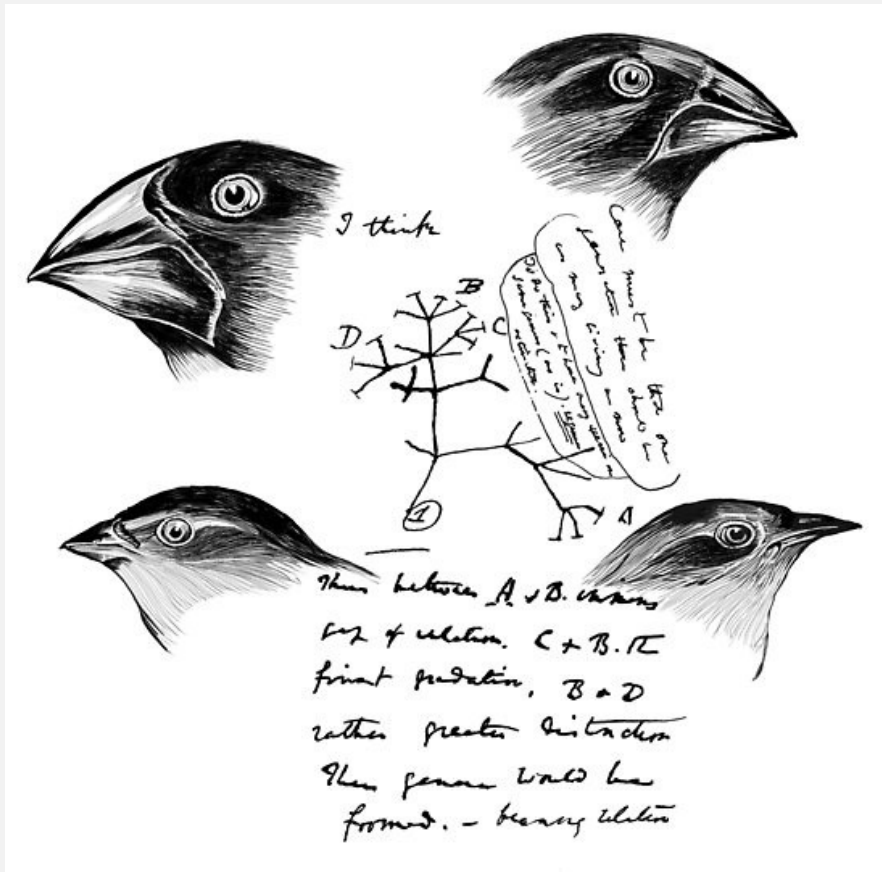
EUROPEAN
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FOR RAILWAYS

Some more questions received at TSI-QA-2023@era.europa.eu



- Transition: application of TSIs to new variants?
- Projects in the list of advanced stage of development
- Case of projects already in “Phase B”

Additional answers after the 1st Q&A



- The TSIs requirements are mandatory for all projects with design phase starting after the date of entry into force, be it for a new type or a variant
- Projects for variants that are in Phase A at the entry into force of the TSI Package 2023 may decide to switch to the new TSIs, but...
- ...a variant ‘inherits’ the limited validity of the type it derives from - LOC&PAS point 7.1.2.2 (11)
- The unlimited validity of certificates doesn’t concern SB/CB/type examination certificates already delivered
- Projects in Phase A that decide not to apply the TSI package 2023 don’t need a derogation, neither those that apply the package 2023 !

Some more questions received at TSI-QA-2023@era.europa.eu



- Can you provide a list of the main changes in the TSIs 2023 compared to the previous versions ?

Changes are listed in the TSIs !

- TSI WAG Appendix A
- TSI LOC&PAS Appendix L
- TSI PRM Appendix P
- TSI NOI Appendix H
- TSI CCS Appendix B

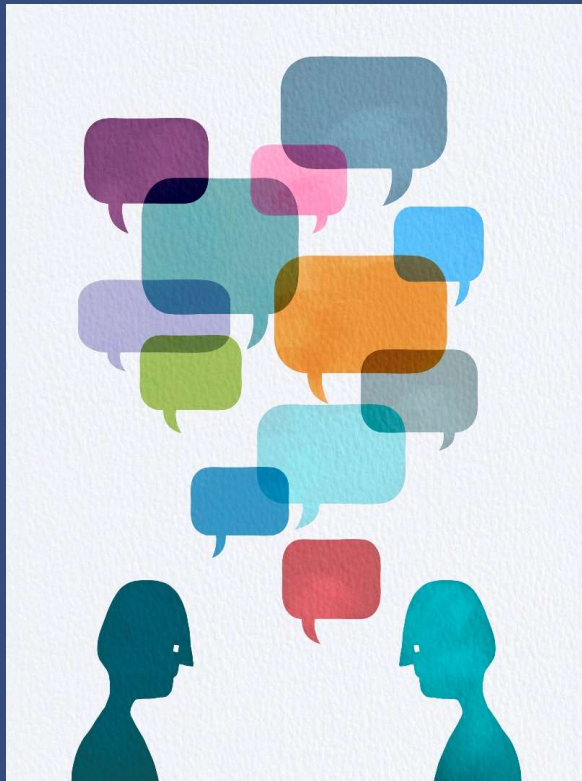
See Q&A Session n°1 for more information:

[TSI Revision Package 2023 Q&A #1: Rolling Stock & On-Board CCS | European Union Agency for Railways \(europa.eu\)](#)



*Authorisation for placing on the market of passenger coaches **not limited to a particular area of use***

Questions received at TSI-QA-2023@era.europa.eu



- What was the objective?
- Which TSIs apply?

Some background

Before TSI LOC&PAS amendment 2023, no provisions and authorisation of coach was requiring :

- Compliance with TSIs and **National rules** of EU Members.
- **Several vehicle authorisation applications** : First authorisation and extension of area of use.
- Involvement of **several authorising entities** : ERA and National Safety Authorities.

To facilitate free circulation of passenger coaches, conditions for having an authorization for placing on the market for an area of use **European Union** were lay down in point 7.1.1.5 of LOC&PAS.

Objectives with amendment 2023

Authorise a



in all EU



with a **single**



One set of harmonised TSIs rules

No National rule

No Designated Body

Authorisation delivered by ERA

No National Safety Authority

LOC&PAS TSI 1302/2014 amended by regulation 2023/1694

- 7.1.1.5. Conditions for having a vehicle type authorisation and/or an authorisation for placing on the market of passenger coaches not limited to a particular area of use.
 - 7.1.1.5.1 Conditions applicable to coaches intended to be used in **predefined formations**
 - 7.1.1.5.2 Additional optional conditions applicable to coaches intended to be used in **general operation**

Questions received at TSI-QA-2023@era.europa.eu



- Is it applicable to existing coaches (e.g RIC)?
- What type of coaches ?

- Unique authorisation conditions applies on top to coaches compliant with **TSI LOC&PAS, TSI PRM and TSI NOI** as amended by regulation 2023/1694:
 - Newly developed vehicle design.
 - Existing type if compliant with TSIs amendment 2023. Such type may need to be modified or not to comply with point 7.1.1.5.

Type of Coaches

LOC&PAS 7.1.1.5(1)

- Coaches without driving cab:



- Coaches carrying passengers incl sleeping, couchette and restaurant cars.



- Coaches that are not carrying passengers (Van, Cars carriers) **integrated in a passenger trains.**

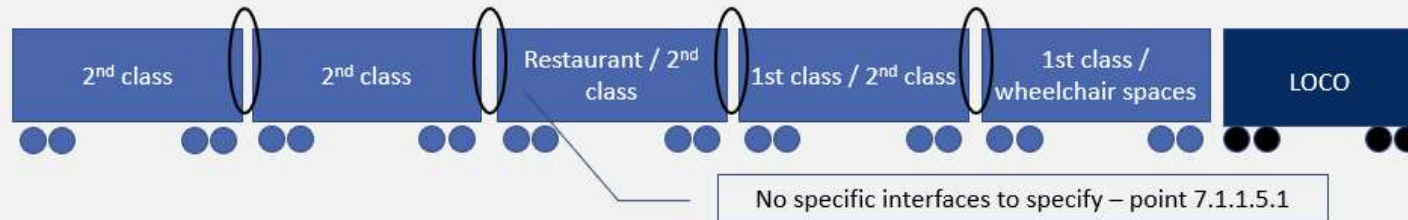


- Fixed Rake of coaches.

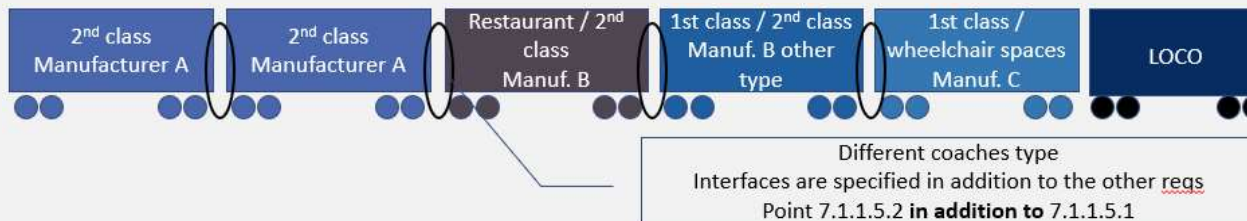
Train formation

LOC&PAS 7.1.1.5(2)

- Coaches intended to be operate in pre-defined formation (point 7.1.1.5.1):
 - Train formation(s) (**defined at design stage**) of coaches coupled together and can be **reconfigured during operation**.



- 7.1.1.5.2 additional optional conditions for coaches intended to be operate in generation operation:
 - Train formation(s) (**not defined at design stage**) of coaches intended to be coupled with other coach(s).
 - Aims to facilitate exchange of units**



Questions received at TSI-QA-2023@era.europa.eu



- What are the conditions applicable to coaches in predefined formation?
- What happens in case of non-compliance with some provisions?

Conditions applicable to coaches in predefined formation?

LOC&PAS 7.1.1.5.1

- Specific coach characteristics such as :

- Not equipped with:



CCS onboard



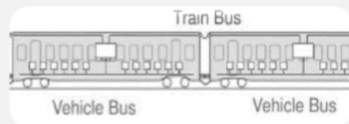
Traction equipment's
(thermal or electric)



- Equipped with:



Forged and rolled
Mini \varnothing above 760 mm



Train Communication
Network (IEC 61375-1)

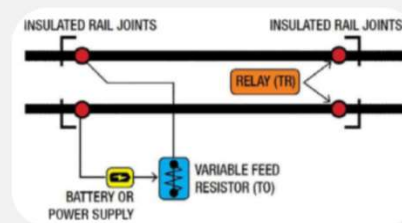
- Speed up to 250km/h



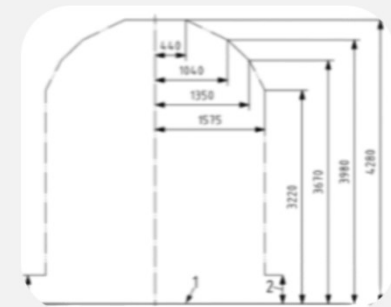
- Compatible with :



Track gage : 1435 **and/or** 1668mm
Rail Inclination : 1/20 **and/or**, 1/30 **and/or**
and/or 1/40



Train detection system
ERA/ERTMS/033281 - V 5.0



One of the reference
profile:
G1, GA, GB, GC or DE3
including for lower part G11,
G12 or G13.

Conditions applicable to coaches in predefined formation?

LOC&PAS 7.1.1.5.1

- **Specific provisions** as:
 - If unit is category B, it shall be equipped with full cross partition section.
 - Possibility to activate/deactivate the use of some equipment as flange lubricators, eddy current track brake, magnetic track brake..
- **Specific environmental conditions defined in 7.4 to be considered**
- **Specific cases** to be considered as :
 - **Austria** : wheel-rail contact geometry
 - **Italy** : aerodynamic effect, fire containment and control systems
 - **Germany** : step position for vehicle access and egress, Cross wind curve, gradient above 40 ‰, emergency exit, wheel-rail contact geometry
 - **France/Sweden** : trackside Hot axle box detection
 - **Spain (1668mm)**: quasi static guiding force, flange thickness

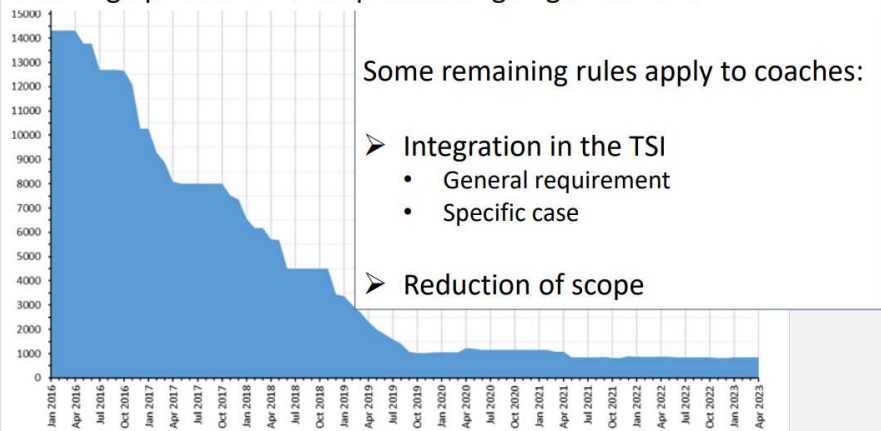
Case of non compliance

LOC&PAS 7.1.1.5.1

- Some non compliance to **mandatory** requirements should trigger **request for non-application of TSIs, as example:**
 - Coach fitted with EN-UIC brake shall be tested following EN17065.
 - Coach of category B shall be equipped with fill cross section partition.
- Some non compliance to requirements can result **into exclusions of some MSs from the area of use or conditions for use and other restrictions, as example :**
 - Non compliance with Trackside HABD (specific case 7.3.2.3) **shall exclude France and/or Sweden** from the area of use.
 - Non compliance of the units with the **German** network characteristics on wheel-rail contact geometry shall result in **restriction of the speed.**

Questions received at TSI-QA-2023@era.europa.eu

Cleaning up national rules: process ongoing since 2016



- What about National rules?

- For following parameters, national rules are still need to be applied :
 - **Fire safety:**
 - **AoU Italy** (7.1.1.5.1(20)(c): FCCS are checked according to NR about fire automatic extinguishing systems and are assessed by **DeBo**.
 - **AoU Channel Tunnel**(7.1.1.5.1(20)(d): Running capability : braking and traction functions impacted by a 'type 2' fire can be assessed in the following conditions:
 - 1. for a duration of 30 minutes at a minimum speed of 100 km/h, or
 - 2. for a duration of 15 minutes at a minimum speed of 80 km/h under the condition specified in the NR and assessed by **DeBo**.
 - **For sleeping coaches of category B** (7.1.1.5.1 (9)) shall be equipped with other Fire Containment and Control Systems(FCCS). The assessment procedure **is an open point: NRs** apply and are assessed by **DeBo**.
 - **Compatibility with train detection system** (7.1.1.5.1 (16)), pending the notification of specific cases, **NRs** apply and are assessed by **DeBo**.

Some more questions received at TSI-QA-2023@era.europa.eu



- Where are the requirements on train detection specified?
- What is the content of that interface document?

Outline

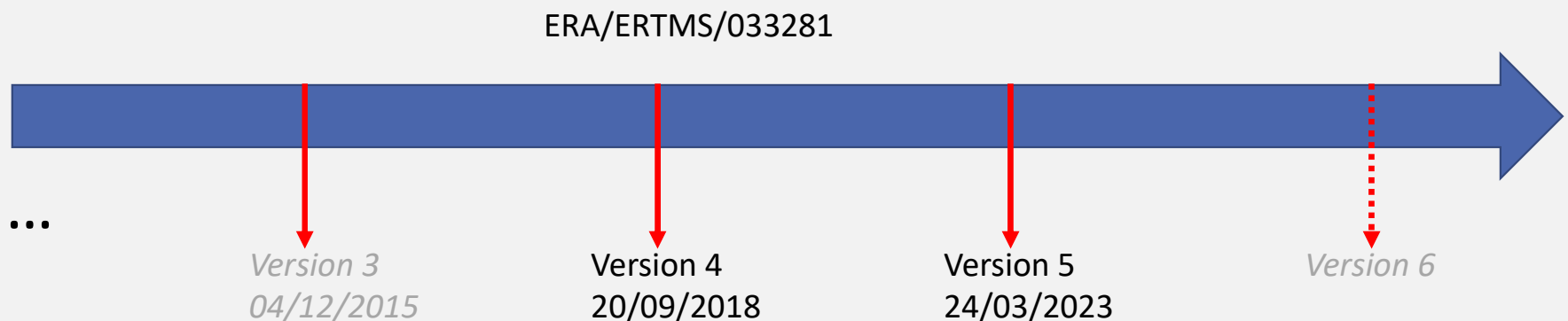
- Introduction
- How the interface document is subdivided?
- Differences between version 4 and version 5 in « Vehicle design and operation part »
- Differences between version 4 and version 5 in « Electromagnetic compatibility part»
- How is the transition regime?
- What is next?

Introduction

- This document defines the interoperability requirements that shall be applicable at the interface between the Control-Command and Signalling Track-side and other subsystems
- ERA website:

Interface between control-command signalling trackside and other subsystems (v.5 24-03-2023)

<https://www.era.europa.eu/system/files/2023-09/index077 - ERA ERTMS 033281 v5.pdf>



How is the document subdivided

ERA/ERTMS/033281
rev 5.0

- 3.1. Vehicle design and operation
- 3.2. Electromagnetic compatibility
- 4. Conformity assessment
- 5. Non TSI compliant TDS

- 3.1.2. Axle distances
- 3.1.3. Wheel geometry
- 3.1.4. Use of sanding equipment
- 3.1.5. On-board flange lubrication
- 3.1.6. Use of composite brake blocks
- 3.1.7. Vehicle axle load and metal construction
- 3.1.8. Shunting behaviour and shunting assisting devices
- 3.1.9. Impedances between wheels
- 3.2.1. Electromagnetic fields
- 3.2.2. Conducted interference
- 3.2.3. Use of magnetic / eddy current brakes
- 4. Conformity assessment and 4.1. IC axle counter
- 5.1. Technical characteristics and 5.2. Compliance

TSI CCS (*)
4.2.10
4.2.11
5.3; 6.3.4;
Art. 13; 7.7

(*) The interface document is also referred in L&P TSI, WAG, TSI, OPE TSI

Difference in “Vehicle design and operation” (version 4)

3.1. Vehicle design and operation

<p>3.1.2. Axle distances</p> <p>3.1.2.1. Maximum axle distance</p> <p>3.1.2.2. Minimum axle distance (I)</p> <p>3.1.2.3. Minimum axle distance (II)</p> <p>3.1.2.4. Distances between end of train and first axle on new High Speed lines</p> <p>3.1.2.5. Distances between end of train and first axle on other lines</p>	<p>3.1.2.</p> <p>Distance “ai”</p> <p>Table Max. speed / Minimum axle distance “ai”</p> <p>Distance “L - (b1 + b2)”</p> <p>Distance “bx”</p> <p>Distance “bx”</p>
<p>3.1.3. Wheel geometry</p> <p>3.1.3.1. Minimum wheel rim width</p> <p>3.1.3.2. Minimum wheel diameter</p> <p>3.1.3.3. Minimum flange thickness</p> <p>3.1.3.4. Flange height</p> <p>3.1.3.5. Metal and inductive components-free space between wheels</p> <p>3.1.3.6. Wheel material</p>	<p>3.1.3.</p> <p>Table Track gauge/Wheel diameter/Wheel rim width</p> <p>Table speed / Massive wheel diameter/Spoked wheel</p> <p>Table Track gauge/Wheel diameter/Flange thickness</p> <p>Table Track gauge/Wheel diameter/Flange height</p> <p>Sensitive area, steel springs and rubber springs</p> <p>Ferromagnetic and are electrically conducting</p>
<p>3.1.4. Use of sanding equipment</p> <p>3.1.4.1. Maximum amount of sand</p> <p>3.1.4.2. Sand characteristics</p>	<p>3.1.4.</p> <p>Amount in function of speed for all track gauges</p> <p>Only for 1520mm. For others [open point]</p>
<p>3.1.5. On-board flange lubrication</p>	<p>3.1.5. Possible to activate/deactivate. Characteristic[open point]</p>
<p>3.1.6. Use of composite brake blocks</p>	<p>3.1.6. Brake blocks: 2006/861/EC amended 2009/107/EC</p>
<p>3.1.7. Vehicle axle load and metal construction</p> <p>3.1.7.1. Vehicle axle load</p> <p>3.1.7.2. Vehicle metal construction</p>	<p>3.1.7.</p> <p>Load in function # of axles for all track gauges</p> <p>Requirements only for 1435mm</p>
<p>3.1.8. Shunting behavior and shunting assisting devices</p>	<p>3.1.8. The use of shunting assisting devices is not required</p>
<p>3.1.9. Impedances between wheels</p>	<p>3.1.9. Resistance 0.05 Ohm</p>

Difference in “Vehicle design and operation” (version 5)

3.1. Vehicle design and operation

<p>3.1.2. Axle distances</p> <p>3.1.2.1. Maximum axle distance</p> <p>3.1.2.2. Minimum distance between following axles</p> <p>3.1.2.3. Minimum distance between first and last axle</p> <p>3.1.2.4. Max. distance between front/ rear end of train and first/last axle for trains running exclusively on High Speed lines</p> <p>3.1.2.5. (..) for trains running on other lines</p>	<p>3.1.2.</p> <p>Distance “ai”</p> <p>Table Max. speed / Minimum axle distance “ai”</p> <p>Distance “L - (b1 + b2)”</p> <p>Distance “bx” (v >= 250km/h)</p> <p>Distance “bx”</p>
<p>3.1.3. Wheel geometry</p> <p>3.1.3.1. Geometric dimension of the rim width</p> <p>3.1.3.2. Minimum wheel diameter</p> <p>3.1.3.3. Geometric dimension of flange thickness</p> <p>3.1.3.4. Geometric dimension of the flange height</p> <p>3.1.3.5. Metal and inductive components-free space between wheels</p> <p>3.1.3.6. Wheel material</p>	<p>3.1.3.</p> <p>Updated table: Track gauge/Wheel diameter/Rim width</p> <p>Table speed / Massive wheel diameter/Spoked wheel</p> <p>Updated table: Gauge/Wheel diameter/Flange thickness</p> <p>Updated table: Gauge/Wheel diameter/Flange height</p> <p>Updated sensitive area, steel springs and rubber springs</p> <p>Ferromagnetic and are electrically conducting</p>
<p>3.1.4. Use of sanding equipment</p> <p>3.1.4.1. Maximum amount of sand</p> <p>3.1.4.2. Sand characteristics</p>	<p>3.1.4.</p> <p>Modified amount of sand for all track gauges</p> <p>Modified sand characteristics for all track gauges</p>
<p>3.1.5. On-board flange lubrication</p>	<p>3.1.5. Possible to activate/deactivate. Characteristic defined.</p>
<p>3.1.6. Use of composite brake blocks</p>	<p>3.1.6. App. G of Regulation 321/2013; ERA/TD/2013-02/INT</p>
<p>3.1.7. Vehicle axle load and metal construction</p> <p>3.1.7.1. Vehicle axle load</p> <p>3.1.7.2. Vehicle metal construction</p>	<p>3.1.7.</p> <p>Load in function # of axles for all track gauges</p> <p>Annex A1 and A2 for 1435mm, for others no requirement</p>
<p>3.1.8. Shunting behavior and shunting assisting devices</p>	<p>3.1.8. The use of shunting assisting devices is not required</p>
<p>3.1.9. Impedances between wheels</p>	<p>3.1.9. Resistance 0.05 Ohm</p>

Difference in “Electromagnetic compatibility and Conformity assessment” (version 4)

3.2. Electromagnetic compatibility	<p>3.2.1. Electromagnetic fields</p> <ul style="list-style-type: none"> 3.2.1.1. Frequency management 3.2.1.2. Vehicle emission limits and evaluation parameters 3.2.1.3. Evaluation of exceedances of limits defined in table 10 3.2.1.4. Measurement specification 	<p>3.2.1.</p> <ul style="list-style-type: none"> → Defined for all track gauges → Updated limits and parameters for evaluation → Table to increase limits in case of exceedance → Updated measurement specification
	<p>3.2.2. Conducted interference</p> <ul style="list-style-type: none"> 3.2.2.1. Vehicle impedance 3.2.2.2. Substation impedance 3.2.2.3. Traction current at fundamental power supply frequency 3.2.2.4. 25kV AC, 50Hz EMI limits for traction current 3.2.2.5. 15kV AC, 16,7Hz EMI limits for traction current 3.2.2.6. 3kV DC & 1.5 kV DC, EMI limits for traction current 3.2.2.7. Measurement, test and evaluation specification 	<p>3.2.2.</p> <ul style="list-style-type: none"> → Impedance pantograph-wheels [open point] → For DC network only [open point] → No requirement → In-bands interference limit. Out-bands [open point] → In-bands interference limit. Out-bands [open point] → In-bands interference limit. Out-bands [open point] → Test and evaluation specification [open point]
	<p>3.2.3. Use of magnetic / eddy current brakes</p>	<p>3.2.3. It shall be possible to activate and deactivate</p>
4. Conformity assessment	<p>4. Conformity assessment</p>	<p>4. Parameter assessed for SS and IC certification</p>
	<p>4.1. Interoperability constituent axle counter</p>	<p>4.1. IC axle counter shall apply table 16</p>

Difference in “Electromagnetic compatibility and Conformity assessment” (version 5)

3.2. Electromagnetic compatibility	3.2.1. Electromagnetic fields 3.2.1.1. Frequency management 3.2.1.2. Vehicle emission limits and evaluation parameters 3.2.1.3. Evaluation of exceedances of limits defined in table 10 3.2.1.4. Measurement specification	<ul style="list-style-type: none"> → Defined for all track gauges → Updated limits and parameters for evaluation → Table to increase limits in case of exceedance → EN50592 presumption of conformity
	3.2.2. Conducted interference 3.2.2.1. Vehicle impedance 3.2.2.2. [DELETED] 3.2.2.3. Traction current at fundamental power supply frequency 3.2.2.4. 25kV AC, 50Hz EMI limits for traction current 3.2.2.5. 15kV AC, 16,7Hz EMI limits for traction current 3.2.2.6. 3kV DC & 1.5 kV DC, EMI limits for traction current 3.2.2.7. Measurement, test and evaluation specification 3.2.2.8. Partial application of the frequency management	<ul style="list-style-type: none"> → AC and DC vehicle impedance → [DELETED] → No requirement → Updated in-bands interference limit → Updated in-bands interference limit → Updated in-bands interference limit → EN50728 presumption of conformity → NoBo provides information in the technical file
	3.2.3. Use of magnetic / eddy current brakes	3.2.3. It shall be possible to activate and deactivate
	3.3.1. Wrong side failures	3.3.1. Informative and out of scope of the document
4. Conformity assessment	4. Conformity assessment	4. Updated table and additional comments
5. Non TSI compliant Train Detection System	4.1. Interoperability constituent axle counter	4.1. IC axle counter shall apply table 16
	5.1. Technical characteristics of non TSI compliant TDS	5.1. Specific cases or Annex B1
	5.2. Compliance with non TSI compliant TDS	5.2. NoBo provides information in the technical file

How is the transition regime for the interface document?

Table B1.2

Transition Regime ⁽⁴⁵⁾ for RST Subsystem

No	TSI point(s)	TSI point(s) in previous version	Explanation on TSI change	Transition regime			
				Design phase started after TSI enters into force	Design phase started before TSI enters into force	Production phase	Vehicle in operation
1	Index 77	V4 – Frequency management not fully defined for the vehicle	V5 – Frequency management fully defined for the vehicle	<p>Directly applicable with the exception of point 3.2.2. This point is applicable 2 years after the entry into force of the TSI on newly developed vehicle designs requiring a first authorisation as defined in Article 14 point 1(a) of Commission Implementing Regulation (EU) 2018/545;</p> <p>Applicable 7 years after the entry into force of the TSI on modified vehicles designs requiring a new authorisation as defined in Article 14 point 1(d) of Commission Implementing Regulation (EU) 2018/545;</p>	Applicable 7 years after the entry into force of the TSI	Not applicable	Not applicable

First authorization:

- The interface document, except point 3.2.2, is directly applicable with the entry in force of CCS TSI
- The complete interface document is applicable 2 years after the entry in force of CCS TSI

<p>3.2.2. Conducted interference</p> <p>3.2.2.1. Vehicle impedance</p> <p>3.2.2.2. [DELETED]</p> <p>3.2.2.3. Traction current at fundamental power supply frequency</p> <p>3.2.2.4. 25kV AC, 50Hz EMI limits for traction current</p> <p>3.2.2.5. 15kV AC, 16,7Hz EMI limits for traction current</p> <p>3.2.2.6. 3kV DC & 1.5 kV DC, EMI limits for traction current</p> <p>3.2.2.7. Measurement, test and evaluation specification</p> <p>3.2.2.8. Partial application of the frequency management</p>

What is next?

- Application guide for the interface document
- Extension of the application not only at « influencing unit » level
- Specific cases for non TSI compliant train detection systems

Derailment Detection Devices



Questions received at TSI-QA-2023@era.europa.eu



- Are the derailment detection devices mandatory in WAG and LOC&PAS TSI?
- What exactly are the functions of these devices?

Where in the TSIs?

LOC&PAS TSI

- 4.2.9.3.7 Derailment detection and prevention signal processing
- 4.2.9.3.7a On-board derailment detection and prevention function

WAG TSI

- 4.2.3.5.3 Derailment detection and prevention function
 - 4.2.3.5.3.1 General requirements
 - 4.2.3.5.3.2 Derailment prevention function (DPF)
 - 4.2.3.5.3.3 Derailment detection function (DDF)
 - 4.2.3.5.3.4 Derailment detection and actuation function (DDAF)

All the clauses above are voluntary? Yes!

However, if derailment detection and protection is fitted, it has to be in accordance with the TSI.

DDF and DPF in locomotive only



The DPF/DDF can be fitted in the locomotive in accordance with clause 4.2.9.3.7a of TSI LOC&PAS

precursor to derailment
detected



Signal processing in accordance
with point 4.2.9.3.7 of TSI
LOC&PAS.

derailment
detected



DPF and DDF both in Locomotive and freight wagon

Derailment Prevention
DPF



precursor to derailment detected



Signal processing in accordance with point 4.2.9.3.7 of TSI LOC&PAS.

Derailment Detection
DDF



derailment detected



The DPF/DDF can be fitted in the freight wagons in accordance with clauses 4.2.3.5.3.2/4.2.3.5.3.3 of TSI WAG.

Additional issues related to DDF/DPF

Derailment
Prevention
DPF



The DPF/DDF fitted in the freight wagons may send the signal to the driver's cab of the locomotive via an electronic tool (e.g, a tablet).

Derailment
Detection
DDF



precursor to derailment
detected



In such case, the requirements of signal processing set out in TSI LOC&PAS do not apply (the tablet is outside the scope of the TSI LOC&PAS)

derailment
detected



Is it possible to couple freight wagons fitted with DDF/DPF with a locomotive not fitted with DDF/DPF?

Yes! – The result will be a freight train without DDF/DPF (which is anyway allowed)

Is it possible to couple freight wagons not fitted with DDF/DPF with a locomotive fitted with DDF/DPF?

Yes! – The result will be a freight train without DDF/DPF (which is anyway allowed)

Derailment
Detection
and
Actuation
DDAF



derailment detected

Application of brakes
No driver override →
The risk of false derailment
detections shall be limited to
an acceptable level.
DDAF can be isolated directly
in the wagon when stopped.

It is allowed to combine functions:

- DPF and DDF
- DPF and DDAF

Application of the TSIs to Special Vehicles



Questions received at TSI-QA-2023@era.europa.eu



- What are the special vehicles concerned?
- How TSIs apply to them?

Special vehicles such as OTMs

LOC&PAS 2.2.2(C)

TSI amendment 2023 introduce definitions of special vehicles:



- **On Track Machines:** designed for construction and maintenance of the track and infrastructure.



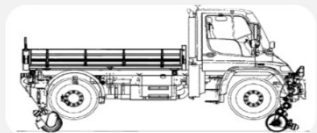
- **Infrastructure Inspection Vehicles:** monitor the condition of the infrastructure.



- **Environment vehicles:** designed for clearance of the track from environmental conditions.



- **Emergency vehicles:** designed for specific emergency use such as evacuation, firefighting, and recovery of trains.



- **Road-Rail vehicles:** self-propelled machines able to move on rails and on the ground.

How TSIs apply?

LOC&PAS 2.3.1

WAG TSI 7.1

- **In the scope of RST TSIs when :**
 - running on its own rail wheels (in running mode self-propelled or hauled), and
 - intended to be detected by a track-based train detection system.
- **For hauled special vehicle:**
 - Applicant can apply either the **WAG TSI** or the **LOC&PAS TSI** depending on the characteristics and the intended use of the vehicle in question in comparison with the technical scope of the respective TSIs.
- **Not in the scope of RST TSIs:**
 - Special vehicles in **working mode, travelling mode.**
 - **Road-Rail** vehicles.



How TSIs apply?

LOC&PAS 7.1.1.3

NOI

- **Area of use of more than one MS(7.1.1.3(1)):**
 - Compliance with **TSI LOC&PAS** and the **TSI NOI** is **mandatory** .
 - Transition regime of 7 Years (table L1)
- **Area of use of one MS (7.1.1.3(2), 7.1.1.3(3)):**
 - Compliance with **TSI LOC&PAS** and **TSI NOI** (except for assessment of the driver's cab interior noise level) is **not mandatory**:
 - Applicant may decide to apply TSIs.
 - Applicant may apply **NRs** as regards the basic parameters of TSIs with following conditions:
 - If NRs “different to TSIs” **do not exist**, compliance with **TSIs is mandatory**.
 - If NRs “cover partially TSIs parameters”, the application of TSIs is **mandatory** for **parameters not covered**. NoBo delivers certificate limited to parameters assessed.
 - If NRs “different to TSIs exist”, special vehicle may be authorised against NRs.



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- How TSI NOISE apply to special vehicle?

- **TSI NOI is mandatory** when AoU is **more than one MS**.
- **TSI NOI is not mandatory** when special vehicle comply **only with NRs** as allowed in 7.1.1.3(2) **except for** assessment of the driver's cab interior noise level as referred in point 4.2.4 of TSI NOI:
 - Table 5 of TSI NOI provides Limit values for driver's cab interior noise.
 - These limit values **are not mandatory** for special vehicles. However, the demonstration of conformity referred to in point 6.2.2.4 shall be **performed** and the **resulting values shall be recorded in the technical file**.



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- How ongoing projects are impacted?
- What about extension of area of use?

How my ongoing projects may be impacted by point 7.1.1.3(1) ?

LOC&PAS 7.1.1.3

Application to ongoing projects :

As defined in table L1, compliance with the previous TSI does not imply compliance with the version of this TSI:

- Projects already in **design phase** shall comply with the requirement of this TSI from the date of entry into force of this **TSI + 7 years**.
- Projects in **production phase and rolling stock in operation** are **not affected** by the TSI requirements listed in Table L.1.

For special vehicle where national rules were applied instead of TSIs, the **design phase** is the period starting once a **DeBo** is contracted by the applicant and ending when the certificate of verification is issued.



What happens in case of extension of AoU?

LOC&PAS 7.1.1.3

- **Case of Extension of area of use :**

- When a special vehicle will have its area of use extended, the applicant can also decide to use NRs instead of the applicable TSI requirements **if for the previous authorisation it also decided to apply NRs.**



Acoustic assessment of composite brake blocks at IC level



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- What are the new acoustic characteristics to be assessed at IC level for composite brake blocks?

Where in the TSIs?

TSI NOI

- 4.2.3.a. Friction elements for wheel tread brakes
- 5. INTEROPERABILITY CONSTITUENTS
 - 5.2.1. Friction element for wheel tread brakes
- 6. CONFORMITY ASSESSMENT AND EC VERIFICATION
 - 6.1.2.1. Friction element for wheel tread brakes of freight wagons
- Appendix F - ASSESSMENT OF ACOUSTIC PERFORMANCE OF A BRAKE BLOCK

A new (and existing) IC

- IC 'friction element for wheel tread brake' (brake blocks) already had requirements in the TSI WAG (for braking performance)
- In the revised TSI Noise, there are additional requirements for the acoustical certification.
- The same component needs to be assessed at IC level against both TSIs
 - The testing process (bench test) is very similar, so the economical cost is kept controlled.
 - Existing exemptions for the TSI WAG are kept for the requirements of the TSI WAG only
 - New exemptions are defined in the TSI Noise for the requirements of the TSI Noise only

If a freight wagon under assessment is fitted with acoustically certified blocks, this means that such wagon fulfils the TSI Noise?

No! The wagons must be assessed at subsystem level against the TSI Noise (pass-by Noise) in any case.

Standards in the TSIs



Questions received at TSI-QA-2023@era.europa.eu



Many can be summarized as:

- Are standard referred to in TSI mandatory?

Standards in European Railway regulation can be :

Mandatory when a direct reference to the standard is made in the TSIs (or in the documents quoted in TSIs).

The application of standards quoted in TSI is mandatory. The version quoted in TSI is the one to be applied even if a new revision of the standard is available.

Voluntary when the standard provides presumption of conformity to a TSI requirement. The standard should then be listed in the European Union Official Journal (OJEU) and should contain an annex ZA/ZZ defining the presumption of conformity.

The application of these standards is not mandatory, the applicant can use other specifications to demonstrate the compliance to the TSI requirement. This demonstration will be assessed by the notified body.

The list can be found here : https://single-market-economy.ec.europa.eu/single-market/european-standards/harmonised-standards/rail-system-interoperability_en

How many Standards

Mandatory Standards :

- In the TSI package 2023 there are 168 Mandatory Standards.
- Some standards are quoted in several TSI. Therefore, there are around 220 references to standards in all TSIs

Voluntary standards :

- Voluntary standards : the official list of voluntary harmonised standard for publication in the OJEU is still under discussion and is composed for the time being of 123 standards.
- 144 standards are quoted in the application guides.

Mandatory harmonised standards

Scope and
definitions

Chapters 1+2

Links with
essential
requirements

Chapter 3

Functional
and technical
specs subsys.

Chapter 4

Inter-
operability
Constituents

Chapter 5

Conformity
assessment +
EC verification

Chapter 6

Implementa-
tion strategy

Chapter 7

TSIs refer to mandatory standards

[Art. 4.8 IOD] :

*“TSIs may make an explicit, clearly identified reference to **European or international standards** or specifications or technical documents published by the Agency where this is strictly necessary in order to achieve the objectives of this Directive [...] “*

- Mandatory clauses of referenced standards are summarised in an Appendix of the TSI (e.g. Appendix J in LOC PAS TSI and Appendix D in WAG TSI)

Mandatory harmonised standards

Example: Loc&Pas TSI

References to standards are detailed in a specific Appendix, except for specific cases.

Functional and technical specs subsys.

Chapter 4

4.2.3.4.1. Safety against derailment running on twisted track

(1) The unit shall be designed to ensure safe running on twisted track and cross level deviations.

(2) The conformity assessment procedure is described in clause 6.2.3.3.

This conformity assessment procedure is applicable for axle loads in the referenced in **Annex J-1, index [9]**.

It is not applicable to vehicle designed for higher axle load, such cases mentioned in article 10 and Chapter 6 of this TSI.

Conformity assessment + EC verification

Chapter 6

6.2.3.3. Safety against derailment running on twisted track

▼ M3

(1) The demonstration of conformity shall be carried out in accordance with one of the methods specified in the specification referenced in **Appendix J-1, index [9]**.

Implementation strategy

Chapter 7

7.3.2.5. Running dynamic behaviour (4.2.3.4.2, 6.2.3.4)

Specific case Spain ("P")

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

J-1 Standards or normative documents

Index	Characteristics to be assessed	TSI point	Mandatory standard point
[9]	EN 14363:2016+ A2:2022 Railway applications - Testing and Simulation for the acceptance of running characteristics of railway vehicles - Running Behaviour and stationary tests		
[9.1]	Axle loads range	4.2.3.4.1, 4.2.3.4.2(4)	1.1, 5.3.2
[9.6]	Safety against derailment running on twisted track	6.2.3.3 (1)	4, 5, 6.1

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Many can be summarized as:

- How to identify a harmonized standard giving presumption of conformity

Voluntary harmonised standards

Scope and
definitions

Chapters 1+2

Links with
essential
requirements

Chapter 3

Functional
and technical
specs subsys.

Chapter 4

Inter-
operability
Constituents

Chapter 5

Conformity
assessment +
EC verification

Chapter 6

Implementa-
tion strategy

Chapter 7

Voluntary standards referring to TSIs

Note

TSI Application guides explain how TSIs may be applied and list voluntary standards giving presumption of conformity to TSI requirements.

- Voluntary harmonised standards may refer to TSI chapters when they give presumption of conformity to them (in addition to the mandatory clauses referred to in the TSIs). In this case their Annex ZA/ZZ shall reflect this.
- All harmonised standards are listed in the OJEU.

EN14813:2006+A1:2010 is referred to in communication [52018XC0810\(06\)](#)
→ List of harmonised standards

Annex ZA of EN 14813-1 refers to clause 4.2.9.1.7 of TSI Loc&Pas, and quote chapter 9.5 of the standard.

Voluntary harmonised standards

Example: EN14813-1/2:2006+A1:2010

ESO (4)	Reference and title of the standard (and reference document)	Reference of superseded standard	Date of cessation of presumption of conformity of superseded standard Note 1
CEN	EN 14813-1:2006+A1:2010 Railway applications — Air conditioning for driving cabs — Part 1: Comfort parameters		

Clause/ sub-clauses of this European Standard	Chapter/§/annexes of the TSI	Corresponding text, articles/§/annexes of the Directive 2008/57/EC
9.5 Air speed	4 Characteristics of the Rolling stock subsystem	Annex III, Essential requirements
9.6 Air quantities	4.2 Functional and technical specification of the sub-system	2 Requirements specific to each subsystem
10.6.3 Emergency ventilation	4.2.9 Driver's cab	2.4 Rolling stock 2.4.1 Safety §8 2.4.3 Technical compatibility §3
	§ 4.2.9.1.7 Climate control and air quality	

Voluntary harmonised standards

Example: EN14813-1/2:2006+A1:2010

Extract from the [Loc&Pas TSI Application guide](#)

2.4.67. *Clause 4.2.9.1.7: Climate control and air quality*

“(2) At the seated driving position (as defined in the clause 4.2.9.1.3) of the driver’s head and shoulders, there shall be no air flows caused by the ventilation system having an air velocity exceeding the limit value recognised to ensure a proper working environment.”

An acceptable limit value for the air velocity is set out in **EN14813-1:2006+A1:2010, clause 9.5**; the measurement procedure of air velocity is specified in EN14813-2:2006+A1:2010, clause 6.2. It is permitted to provide to the driver a means to adjust the air velocity and/or to direct the air flow for his own comfort; in that case, the acceptable limit should be reached for at least one position of the adjustment system.

There is no requirement in the TSI regarding the temperature in the cab, excepted when the applicant covers severe climatic conditions as described in clause 4.2.6.1. In any case, real operating and working conditions should be taken into account by the railway undertaking (user of the vehicle) and are outside of scope of this TSI.

Extract from EN 14813-1:2006+A1:2010

9.5 Air speed

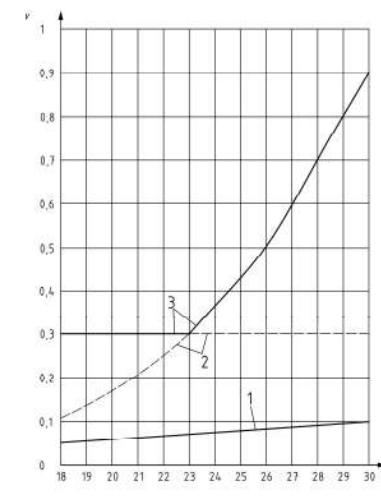
The air speed in the comfort envelope shall be between the maximum and minimum values defined in **Annex A**.

In stabilised operation the fluctuation of the air speed at the supply air outlets shall be in a tolerance range of $\pm 20\%$ of the mean air velocity.

Annex A (normative)

Acceptable air speed

The temperatures indicated on the abscissa correspond to the speed measurement points defined EN 14813-2.



Key

- v air speed, in m/s
- T temperature at the air speed measurement point, in °C
- 1 minimum air speed for category A and category B
- 2 maximum air speed for category A
- 3 maximum air speed for category B

Figure A.1 — Acceptable air speed

Important : The guide can provide further information for the usage of standard but the official list is the one provided in the Official journal

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Many can be summarized as:

- How is ensured the timely update of the references to mandatory standards in TSI.

TSI revision package 2023

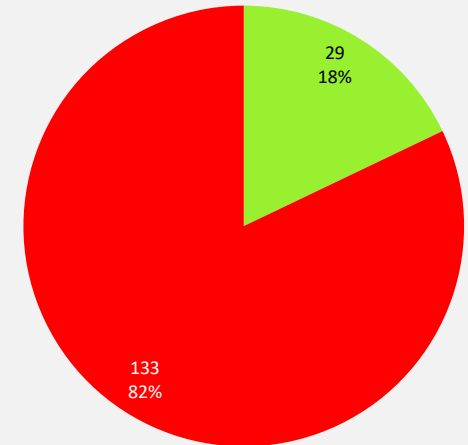
Starting point in May 2020:

- 162 standards quoted in all TSIs.
- 29 standards ok (latest version quoted, precise clauses quoted..).
- 133 Standards with issues (not latest version quoted or unprecise clauses).

Status in TSI Package

168 up to date (as of 03/2023) standards quoted in TSIs.

Note : specific case were updated on request of the Member state.



- **Review the new standards and keep the TSI up to date.**
 - ERA will issue once a year a Technical Opinion on standards, where new version of standards will be assessed and, where appropriate, declared as an alternative acceptable means of compliant toward TSI, waiting for a TSI update
- **Review the number of mandatory standards.**
- **Contribute to the development of the next standardisation request.**



Q&A



THANK YOU

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