



Organisation intergouvernementale pour les transports internationaux ferroviaires

Zwischenstaatliche Organisation für den internationalen Eisenbahnverkehr

Intergovernmental Organisation for International Carriage by Rail

# Uniform Technical Prescription

Subsystem: Rolling stock

NOISE


UTP Noise

Applicable from [Click here to enter a date.](#)



Amendments record

<u>Reference</u>	<u>Date</u>	<u>Description and comments</u>
<u>Version 1</u>	<u>17.5.2023</u>	<p><u>First draft for review by WG TECH 49.</u></p> <p><u>Changes are indicated in track changes compared to the version of UTP NOI in force.</u></p> <p><u>The following EU document has been used as input:</u></p> <ul style="list-style-type: none"> <li><u>Draft amendments to Commission Regulation (EU) No 1304/2014 of 26 November 2014 as last amended by [add new reference] on the technical specification for interoperability relating to the subsystem ‘rolling stock - noise’, as voted on by the EU’s Railway Interoperability and Safety Committee.</u></li> </ul> <p><u>Main amendments:</u></p> <ul style="list-style-type: none"> <li><u>Addition of further requirements for friction elements for wheel tread brakes that require an assessment of conformity</u></li> <li><u>Introduction of the Interoperability Constituent (IC) specifications and their conformity assessment</u></li> <li><u>Appendices to UTP NOI:</u> <ul style="list-style-type: none"> <li><u>Deletion of the list of open points (Appendix A)</u></li> <li><u>Update of the list of referenced standards (Appendix B)</u></li> <li><u>Detailed description of the assessment of acoustic performance of a brake block (Appendix F)</u></li> <li><u>The list of exempted brake blocks from an EC declaration of conformity (new Appendix G)</u></li> <li><u>Transition regimes (new Appendix H)</u></li> </ul> </li> <li><u>Editorial corrections, improvements and substantial modifications throughout the text</u></li> </ul>
<u>Version 2</u>	<u>9.8.2023</u>	<p><u>Draft for review by WG TECH 50.</u></p> <p><u>Changes compared to version 1 are marked green.</u></p> <p><u>Changes include:</u></p> <ul style="list-style-type: none"> <li><u>Specific cases for Norway in point 7.3.2</u></li> </ul>

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## APTU Uniform Rules (Appendix F to COTIF 1999)

### Uniform Technical Prescription applicable to the subsystem: “Rolling stock – NOISE” (UTP Noise)

This UTP has been developed in accordance with COTIF [in the version of](#), ~~as amended by OTIF’s Revision Committee in February 2018 and which entered into force on~~ 1 March 2019 ~~and~~ [\(in particular in accordance with](#) Articles [3, 4, 6, 7, 7a](#) and [8](#) of [the APTU Uniform Rules](#) (Appendix F to COTIF).

For definitions, see also Article 2 of [the APTU Uniform Rules](#) and Article 2 of [the ATMF Uniform Rules](#) (Appendix G to COTIF).

[Footnotes are not legal provisions. They include both explanatory information and references to other regulations.](#)

#### 0. EQUIVALENCE AND TRANSITIONAL PROVISIONS

Following their adoption by the Committee of Technical Experts, the OTIF regulations included in this document are declared equivalent to the corresponding EU regulations within the meaning of Article 13§4 of [the APTU UR](#)<sup>1</sup> and Article 3a of [the ATMF UR](#)<sup>2</sup>, in particular to:

- ~~The TSI relating to the subsystem “rolling stock – noise”~~ Commission Regulation (EU) No 1304/2014 [of 26 November 2014](#) as last amended by ~~Commission Implementing Regulation (EU) 2019/774 of 16 May 2019~~, [\[add new reference\]](#) [on the technical specification for interoperability relating to the subsystem ‘rolling stock – noise’](#), hereinafter referred to as NOI TSI.

<sup>1</sup> ~~APTU means the Uniform Rules concerning the Validation of Technical Standards and the Adoption of Uniform Technical Prescriptions applicable to Railway Material intended to be used in International Traffic—Appendix F to COTIF 1999 in the revised version that entered into force on 1 March 2019.~~

<sup>2</sup> ~~ATMF means the Uniform Rules concerning Technical Admission of Railway Material used in International Traffic—Appendix G to COTIF 1999 in the revised version that entered into force on 1 March 2019.~~



The Uniform Technical Prescription (UTP) relating to the Subsystem Rolling Stock – NOISE, which entered into force on ~~1.12.2015~~[01.04.2021](#) (reference UTP NOI 2021~~15~~) ~~are-is~~ repealed with effect from the date of entry into force of this UTP. However, previous versions may continue to be applied in accordance with the provisions set out in Chapter 7 of ~~these~~[this](#) UTP.


The objectives and scope of COTIF and the EU law concerning railways are not identical and it has therefore been necessary to use different terminology for concepts that have a similar, but not identical meaning. The following table lists the terms used in this UTP and the corresponding terms used in the NOI TSI:

This UTP	NOI TSI
Uniform Technical Prescription (UTP)	Technical Specification for Interoperability (TSI)
Admission to operation <sup>3</sup>	Authorisation
UTP verification	EC verification
UTP declaration of verification	EC declaration of verification
Contracting State	Member State
Assessing Entity	Notified Body

Where provisions in this UTP and the NOI TSI differ in substance, the respective texts are in a 2-column format. The left-hand column and the full width texts show the UTP provisions (OTIF regulations) and the right-hand column shows the European Union TSI texts. Texts in the right-hand column are strictly for information only. For EU law consult the Official Journal of the European Union.

Where differences between texts of this UTP and the European Union NOI TSI are either editorial, or not substantive, or concern the list of terms quoted above, the NOI TSI texts are not generally reproduced. The TSI texts may however be reproduced to improve clarity and readability.

<sup>3</sup> The concepts of admission (COTIF) and authorisation (EU) are not equivalent. However, both confirm [each within their own scope and meaning](#), that a vehicle may be operated in its area of use.

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## 1. INTRODUCTION

### In general

Uniform Technical Prescriptions (UTPs) | Technical Specifications for Interoperability (TSI)

lay down ~~for each subsystem (or part of it)~~ the optimal level of harmonised specifications for each subsystem (or part of it), in order to ensure the safety and the interoperability of the rail system,

in accordance with the provisions of the APTU and ATMF UR.

to facilitate improve and develop rail transport services within the Union and with third countries, and to contribute to the completion of the single European railway area and the progressive achievement of the internal market.

Therefore, UTPs harmonise only the specifications concerning parameters which are critical to interoperability (basic parameters). The specifications of the UTPs must meet the essential requirements as set out in

UTP GEN-A.

| Annex III of Directive (EU) 2016/797.

In accordance with ~~line with~~ the proportionality principle this UTP sets out the optimal level of harmonisation related to specifications on the rolling stock subsystem as defined in ~~section~~ point 1.1 intended to limit the noise emission

of vehicles in international traffic.

| of the rail system within the Union.

### 1.1 Technical scope

#### 1.1.1 Scope related to rolling stock

This UTP applies to all rolling stock within the scope of

UTP LOC&PAS and UTP WAG.

| The Annex to Regulation (EU) No 1302/2014<sup>4</sup> (LOC&PAS TSI) and the Annex to Regulation (EU) No 321/2013<sup>5</sup> (WAG TSI).

#### 1.1.2 Scope related to operational aspects

Alongside national provisions, where these exist, this UTP

| Alongside with the Annex to Commission Implementing Regulation (EU) 2019/773<sup>6</sup> ~~Decision 2012/757/EU~~<sup>7</sup> (OPE TSI) this TSI

<sup>4</sup> Commission Regulation (EU) No 1302/2014 of 18 November 2014 as last amended by [add new reference] concerning a technical specification for interoperability relating to the 'rolling stock – locomotives and passenger rolling stock' subsystem

<sup>5</sup> Commission Regulation (EU) No 321/2013 of 13 March 2013 as last amended by [add new reference] concerning the technical specification for interoperability relating to the subsystem 'rolling stock – freight wagons'

<sup>6</sup> Commission Implementing Regulation (EU) 2019/773 of 16 May 2019 as last amended by [add new reference] on the technical specification for interoperability relating to the operation and traffic management subsystem

<sup>7</sup> ~~Commission Decision 2012/757/EU of 14 November 2012 concerning the technical specification for interoperability relating to the operation and traffic management subsystem of the rail system in the European Union and amending Decision 2007/756/EC (OJ L 345, 15.12.2012, p. 1).~~



applies to the operation of freight wagons which are used on railway infrastructure designated as “quieter routes”.

### 1.2 Geographical scope

The geographical scope of this UTP corresponds to the scopes defined in [section point 1.2 of UTP LOC&PAS](#) and in [point 1.2 of UTP WAG](#), each for their rolling stock (RST) concerned.

~~1.2 of UTP LOC&PAS and in section point 1.2 of UTP WAG, each for their rolling stock (RST) concerned.~~ | ~~1.2 of Regulation (EU) No 1302/2014 and in section 1.2 of Regulation (EU) No 321/2013,~~

## 2. DEFINITION OF THE SUBSYSTEM

A ‘unit’ means the rolling stock which is subject to the application of this UTP, and therefore subject to the [UTP verification procedure. Chapter 2 of UTP LOC&PAS and chapter 2 of UTP WAG describe what a unit can consist of.](#)


~~UTP verification procedure. Chapter 2 of UTP LOC&PAS and chapter 2 of UTP WAG~~ | ~~‘EC’ verification procedure. Chapter 2 in the annex to Regulation (EU) No 1302/2014 and chapter 2 in the annex to Regulation (EU) No 321/2013~~

~~describe what a unit can consist of.~~

The requirements of this UTP apply to the following categories of rolling stock:

set out in ~~s~~Section 2 in Annex I of Directive (EU) 2016/797:

- a) Locomotives and passenger rolling stock, including thermal or electric traction units, self-propelling thermal or electric trains, and passenger coaches. This category is further defined in [chapter 2 of UTP LOC&PAS and shall be referred to in this UTP as locomotives, electric multiple units \(EMU\), diesel multiple units \(DMU\) and coaches;](#)  
~~of UTP LOC&PAS~~ | ~~in the annex to Regulation (EU) No 1302/2014 and shall be referred to in this UTP as locomotives, electric multiple units (EMU), diesel multiple units (DMU) and coaches;~~
- b) Freight wagons, including low-deck vehicles designed for the entire network and vehicles designed to carry lorries. This category is further defined in [chapter 2 of UTP WAG and shall be referred to in this UTP as wagons;](#)  
~~of UTP WAG~~ | ~~in the annex to Regulation (EU) No 321/2013 and shall be referred to in this UTP as wagons;~~
- c) Special vehicles, such as on-track machines. This category is further defined in [Chapter 2 of UTP LOC&PAS.](#)  
~~of UTP LOC&PAS~~ | ~~in the annex to Regulation (EU) No 1302/2014 and consists of on-track machines (referred to in this UTP as OTMs) and infrastructure inspection vehicles, which belong to the categories in points a) or b), depending on their design.~~

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### 3. ESSENTIAL REQUIREMENTS

All basic parameters set out in this UTP shall be linked to at least one of the essential requirements as set out in

UTP GEN-A 2017.

| Annex III of Directive (EU) 2016/797.

Table 1 indicates the allocation.

*Table 1. Basic parameters and their link to the essential requirements*

Point	Basic parameter	Essential requirements					
		Safety	Reliability and availability	Health	Environmental protection	Technical compatibility	Accessibility
4.2.1	Limits for stationary noise				1.4.4		
4.2.2	Limits for starting noise				1.4.4		
4.2.3	Limits for pass-by noise				1.4.4		
4.2.4	Limits for driver's cab interior noise				1.4.4		

### 4. CHARACTERISATION OF THE SUBSYSTEM

#### 4.1 Introduction

This Chapter sets out the optimal level of harmonisation related to specifications on the rolling stock subsystem intended to limit the noise emission of ~~the~~

vehicles used in international traffic in the scope of | the Union rail system and to achieve interoperability.

~~rail system~~


~~in accordance with the objectives set out in COTIF.~~ | ~~and to achieve interoperability.~~

#### 4.2 Functional and technical specifications of the subsystems

The following parameters have been identified as critical for the interoperability (basic parameters)

- “stationary noise”,
- “starting noise”,
- “pass-by noise”,
- “driver's cab interior noise”.

The corresponding functional and technical specifications allocated to the different categories of rolling stock are set out in this ~~section~~ point. In case of units equipped with both thermal and electric power the relevant limit values under all normal operation modes shall be respected. If one of these operation modes

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foresees the use of both thermal and electric power at the same time the less restrictive limit value applies. In accordance with

Article 8§6 of [the APTU UR](#) and Article 2(aa) of [the](#) | Articles 4(5) and 2(13) of Directive (EU) ATMF [UR](#), | 2016/797,

provision may be made for specific cases. Such provisions are indicated in [section-point](#) 7.3.

The assessment procedures for the requirements in this [section-point](#) are defined in the indicated points and sub points of [Chapter](#) 6.

#### 4.2.1 Limits for stationary noise

The limit values for the following sound pressure levels under normal vehicle conditions concerning the stationary noise allocated to the categories of the rolling stock subsystem are set out in table 2:

- the A-weighted equivalent continuous sound pressure level of the unit ( $L_{pAeq,T[unit]}$ ),
- the A-weighted equivalent continuous sound pressure level at the nearest measuring position i considering the main air compressor ( $L_{pAeq,T}^i$ ) and
- the AF-weighted sound pressure level at the nearest measuring position i considering impulsive noise of the exhaust valve of the air dryer ( $L_{pAFmax}^i$ ).

The limit values are defined at a distance of 7.5 m from the centre of the track and 1.2 m above the top of the rail.

*Table 2. Limit values for stationary noise*

Category of the rolling stock subsystem	$L_{pAeq,T [unit]}$ [dB]	$L_{pAeq,T}^i$ [dB]	$L_{pAFmax}^i$ [dB]
Electric locomotives and <a href="#">special vehicles</a> <del>OTMs</del> with electric traction	70	75	85
Diesel locomotives and <a href="#">special vehicles</a> <del>OTMs</del> with diesel traction	71	78	
EMUs	65	68	
DMUs	72	76	
Coaches	64	68	
Wagons	65	n.a.	n.a.

The demonstration of conformity is described in point 6.2.2.1.

#### 4.2.2 Limits for starting noise

The limit values for the AF-weighted maximum sound pressure level ( $L_{pAF,max}$ ) concerning the starting noise allocated to the categories of the rolling stock subsystem are set out in [Table](#) 3. The limit values are [defined-set](#) at a distance of 7.5 m from the centre of the track and 1.2 m above the top of the rail.




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Table 3: Limit values for starting noise

Category of the rolling stock subsystem	$L_{pAF,max}$ [dB]
Electric locomotives with total tractive power $P < 4500$ kW	81
Electric locomotives with total tractive power $P \geq 4500$ kW <del>OTMs</del> <a href="#">special vehicles</a> with electric traction	84
Diesel locomotives $P < 2000$ kW at the engine output shaft	85
Diesel locomotives $P \geq 2000$ kW at the engine output shaft <del>OTMs</del> <a href="#">special vehicles</a> with diesel traction	87
EMUs with a maximum speed $v_{max} < 250$ km/h	80
EMUs with a maximum speed $v_{max} \geq 250$ km/h	83
DMUs $P < 560$ kW/engine at the engine output shaft	82
DMUs $P \geq 560$ kW/engine at the engine output shaft	83

The demonstration of conformity is described in point 6.2.2.2.

#### 4.2.3 Limits for pass-by noise

The limit values for the A-weighted equivalent continuous sound pressure level at a speed of 80 km/h ( $L_{pAeq,Tp,(80\text{ km/h})}$ ) and, if applicable, at 250 km/h ( $L_{pAeq,Tp,(250\text{ km/h})}$ ) concerning the pass-by noise allocated to the categories of the rolling stock subsystem are set out in [Table 4](#). The limit values are defined at a distance of ~~7.5~~ 5 m from the centre of the track and ~~1.2~~ 2 m above the top of the rail.

Measurements at speeds higher than or equal to 250 km/h shall also be made at the ‘additional measurement position’ with a height of 3.5 m above top of rail in accordance with ~~chapter 6 of EN ISO 3095:2013~~ [the specification referenced in Appendix B, Index \[1\]](#) and assessed against the applicable limit values of [Table 4](#).


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Table 4: Limit values for pass-by noise

Category of the rolling stock subsystem	$L_{pAeq,Tp}$ (80 km/h) [dB]	$L_{pAeq,Tp}$ (250 km/h) [dB]
Electric locomotives and <del>OTMs</del> <a href="#">special vehicles</a> with electric traction	84	99
Diesel locomotives and <del>OTMs</del> <a href="#">special vehicles</a> with diesel traction	85	n.a.
EMUs	80	95
DMUs	81	96
Coaches	79	n.a.
Wagons (normalised to APL=0,225)*	83	n.a.

\*APL: the number of axles divided by the length over the buffers [ $m^{-1}$ ]

The demonstration of conformity is described in point 6.2.2.3.

#### 4.2.3.a Friction elements for wheel tread brakes

[The friction element for wheel tread brakes \(i.e. brake block\) has an influence on the pass-by noise by creating roughness on the wheel tread when braking.](#)

[The demonstration of conformity of brake blocks for freight wagons is described in point 6.1.2.1 of this UTP. Conformity of its brake blocks to that point does not exempt the unit under assessment from the requirements set out in point 4.2.3 and the demonstration of conformity set out in point 6.2.2.3.](#)


#### 4.2.4 Limits for the driver's cab interior noise

The limit values for the A-weighted equivalent continuous sound pressure level ( $L_{pAeq,T}$ ) concerning the noise within the driver's cab of electric and diesel locomotives, OTMs, EMUs, DMUs and coaches fitted with a cab are set out in table 5. The limit values are defined in the vicinity of the driver's ear.

[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.](#)

Table 5: Limit values for driver's cab interior noise

Noise within the driver's cab	$L_{pAeq,T}$ [dB]
At standstill with horns sounding	95
At maximum speed $v_{max}$ if $v_{max} < 250$ km/h	78
At maximum speed $v_{max}$ if $250$ km/h $\leq v_{max} < 350$ km/h	80

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The demonstration of conformity is described in point 6.2.2.4.

### 4.3 Functional and technical specifications of the interfaces

This UTP has the following interfaces with the rolling stock subsystem:

Interface with subsystems [referred to in Chapter 2, of points a\), b\), and c\) and e\) of chapter 2](#) (dealt with in [UTP LOC&PAS](#)) with regard to:

~~UTP LOC&PAS) with regard to~~ | ~~Regulation (EU) No 1302/2014) with regard to~~

- stationary noise,
- starting noise (not applicable to coaches),
- pass-by noise,
- interior noise within the driver's cab, where applicable.

Interface with subsystems [referred to in Chapter 2, of point b\) of chapter 2 of this UTP](#) (dealt with in [UTP WAG](#)) with regard to:

~~UTP WAG) with regard to~~ | ~~Regulation (EU) No 321/2013) with regard to~~

- pass-by noise,
- stationary noise.

This TSI has the following interface with the operation and traffic management subsystem (~~dealt with in Decision 2012/757/EU~~ [OPE TSI](#)) with regard to:

- pass-by noise.

### 4.4 Operating rules

Requirements concerning the operating rules for the subsystem rolling stock are set out in [point 4.4 of UTP LOC&PAS and in point 4.4 of UTP WAG](#).


~~section 4.4 and Appendix K of UTP LOC&PAS and in section 4.4 and Appendix I of UTP WAG.~~

[In addition, the requirements concerning the train composition and route compatibility checks are set out in UTP TCRC.](#)

~~section 4.4 of the Annex of Regulation (EU) No 1302/2014 and in section 4.4 of the Annex of Regulation (EU) No 321/2013.~~

For the purpose of this UTP a 'quieter route' means a part of the railway infrastructure that for noise environmental reasons is only suitable for the operation of wagons which are compliant with point 7.2.2.2 of this UTP.

Contracting States may define quieter routes on their territory in accordance with Appendix D.

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On quieter routes, States may restrict or forbid the use of wagons not compliant with point 7.2.2.2 of this UTP.

In compliance with Article 15a § 4 of [the ATMF UR and the UTP TCRC](#), the infrastructure manager shall make available to any rail transport undertaking operating on its network information concerning the location of quieter routes, if any. This information shall be made available without delay.

#### 4.4.1 Specific rules for the operation of wagons on quieter routes in case of degraded operation

States may define contingency arrangements for the operation on quieter routes of wagons not compliant with point 7.2.2.2.

The contingency arrangements as ~~defined~~ [set out](#) in point 4.2.3.6.3 of ~~the Annex of Decision 2012/757/EU~~ [OPE TSI](#) include the operation of wagons not compliant with point 7.2.2.2 on quieter routes.

This measure can be applied to address capacity restrictions or operational constraints caused by rolling stock failures, extreme weather conditions, accidents or incidents and infrastructure failures.

#### 4.4.2 Specific rules for the operation of wagons on quieter routes in case of infrastructure works and wagon maintenance

The operation of wagons not compliant with point 7.2.2.2 on quieter routes shall be possible in case of wagon maintenance activities where only a quieter route is available in order to access the maintenance workshop.

Contingency arrangements

shall be defined to ensure that wagons not compliant with point 7.2.2.2 can continue to be operated when, due to infrastructure works, the use of

set out in point 4.4.1 are applicable in case of infrastructure works where

a quieter route is the only suitable alternative.

#### 4.5 Maintenance rules


Requirements concerning the maintenance rules for the subsystem rolling stock are set out in [point 4.5 of UTP LOC&PAS and in point 4.5 of UTP WAG](#).

~~section 4.5 of UTP LOC&PAS and in section 4.5 of UTP WAG.~~

~~section 4.5 of the Annex of Regulation (EU) No 1302/2014 and in section 4.5 of the Annex of Regulation (EU) No 321/2013.~~

#### 4.6 Professional qualifications

Not applicable.

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#### 4.7 Health and safety conditions

[\[reserved\]](#) <sup>(8)</sup>

See Article ~~6 of this Regulation~~ <sup>9</sup>.

#### 4.8 Data to be recorded<sup>10</sup>

#### ~~4.8 Data to be recorded~~

#### ~~European register of authorised types of vehicles~~

In accordance with UTP GEN-C ~~2017~~ and the OTIF uniform format of certificates, the following noise related characteristics shall be recorded in the Technical File<sup>11</sup>:

The data of the rolling stock that must be recorded in the “European register of authorised types of vehicles (ERATV)” are set out in Decision ~~2011/665/EU~~ <sup>12</sup>.

- Pass-by noise level (dB(A)) [Number] (dB(A))
- Pass-by noise level was measured under reference conditions [Boolean] Y/N (see point 6.2.2.3.1)
- Stationary noise level (dB(A)) [Number] (dB(A))
- Starting noise level (dB(A)) [Number] (dB(A))

### 5. INTEROPERABILITY CONSTITUENTS

#### 5.1 General

#### Interoperability constituents (ICs).

<sup>8</sup> The EU provisions for ~~section-point~~ [4.7](#) on health and safety conditions must take into account the way the rolling stock is operated. This is outside the scope of this UTP NOI and is not therefore repeated on the left-hand side. Notwithstanding this, Contracting States may have provisions in force, either through national or regional (e.g. EU) law, which regulate the use of a vehicle which fulfils the UTP NOI in order to ensure compliance with lower exposure action values for cabin interior noise.

<sup>9</sup> Article 6 of ~~the Commission Regulation (EU) No 1304/2014 as last amended by~~ [\[add new reference\]](#) ~~on the technical specification for interoperability relating to the subsystem ‘rolling stock – noise’;~~ ~~EU Decision enacting the NOI TSI:~~

*“Compliance with the lower exposure action values set out in Article 3 of Directive 2003/10/EC of the European Parliament and of the Council (OJ L 42, 15.2.2003, p. 38), shall be ensured by compliance with the driver’s cabin interior noise level, as set out in point 4.2.4 of the Annex to this Regulation as well as by appropriate operational conditions to be defined by the railway undertaking.”*

<sup>10</sup> [The title in the TSI reads: “European register of authorised types of vehicles”.](#)

<sup>11</sup> ~~UTP GEN-C 2017 means: Uniform Technical Prescription (UTP) General Provisions TECHNICAL FILE, in the version that entered into force on 1.12.2017.~~

<sup>12</sup> [Commission Implementing Decision No 2011/665/EU of 4 October 2011 as last amended by](#) [\[add new reference\]](#) [on the European register of authorised types of railway vehicles.](#)



[as defined in Article 2\(7\) of Directive \(EU\) 2016/797,](#)

[are listed in point 5.2 of this UTP together with the reference to corresponding requirements set out in point 4.2 of this UTP.](#)

## 5.2 Interoperability constituent specifications

### 5.2.1 Friction element for wheel tread brakes

[This interoperability constituent is only applicable to the ‘rolling stock - freight wagons’ subsystem.](#)

[A friction element for wheel tread brakes shall comply with the requirements set out in point 4.2.3.a. These requirements shall be assessed at IC level.](#)

## 6. CONFORMITY ASSESSMENT AND

### UTP VERIFICATION

### EC VERIFICATION

#### Innovative solutions

In order to adapt to technological progress, innovative solutions may be required, which do not comply with the specifications set out in this UTP and/or to which the assessment methods set out in this UTP cannot be applied. In that case, new specifications and/or new assessment methods associated with those innovative solutions shall be developed.

Innovative solutions may be related to the rolling stock subsystem, its parts and its ICs.

(13)

<sup>13</sup> Article 7 of ~~the Commission Regulation (EU) No 1304/2014 of 26 November 2014 as last amended by~~ [\[add new reference\] on the technical specification for interoperability relating to the subsystem ‘rolling stock — noise’](#) ~~EU Regulation enacting the NOI-TSI:~~

- “1. In order to adapt to technological progress, innovative solutions may be proposed by the manufacturer or its authorised representative which do not comply with the specifications set out in the Annex and/or for which the assessment methods set out in the Annex cannot be applied.
2. Innovative solutions may be related to the rolling stock subsystem, its parts and its interoperability constituents.
3. Where an innovative solution is proposed, the manufacturer or his authorised representative established within the Union shall state in what way it deviates from or how it complements the relevant provisions of this TSI and shall submit the deviations to the Commission for analysis. The Commission may request the opinion of the Agency on the proposed innovative solution.
4. The Commission shall deliver an opinion on the proposed innovative solution. If this opinion is positive, the appropriate functional and interface specifications and the assessment method, which need to be included in the TSI in order to allow the use of this innovative solution, shall be developed by the Agency and subsequently integrated into the TSI during the revision process pursuant to Article 5 of Directive (EU) 2016/797. If the opinion is negative, the proposed innovative solution shall not be used.
5. Pending the review of the TSI, a positive opinion delivered by the Commission shall be considered as an acceptable means of compliance with the essential requirements of Directive (EU) 2016/797 and may therefore be used for the assessment of the subsystem.”



If an innovative solution is proposed, the manufacturer or his authorised representative shall declare how it intends to deviate from or complement the relevant provisions of this UTP. On the basis of this declaration, one of the entities listed in Article 6 § 2 of [the APTU UR](#), or the Secretary General may submit the new specifications and/or new assessment methods to the Committee of Technical Experts for analysis and approval.

If the CTE supports the new specifications and/or new assessment methods, the appropriate functional and interface specifications, which need to be included in the UTP in order to allow the use of this innovative solution, shall be developed and subsequently integrated into the UTP during its revision processes.

Pending the revision of the UTP, the Committee of Technical Experts may already consider the new specifications and/or new assessment methods as an acceptable means of compliance with the essential requirements of UTP GEN-A. In such case the Committee of Technical Experts shall instruct the Secretary General as to how the new specifications and/or new assessment methods shall be communicated to the Contacting States and be made public.

## 6.1 Interoperability constituents

### 6.1.1 [Modules](#)

~~Not applicable.~~

The interoperability constituent (IC) shall be assessed for its conformity with the applicable provisions. The conformity shall either be assessed on the IC in isolation from the subsystem, or, if permitted by the law applicable in the state concerned, assessed as part of the rolling stock subsystem in which it is integrated. The assessment shall be performed in accordance with the [module\(s\) described in Table 5a.](#)

The conformity assessment of an interoperability constituent shall be performed in accordance with the [the](#)



Table 5a

Modules for conformity assessment of interoperability constituents

Module CB	Type examination <sup>14</sup>
Module CD	Conformity to type based on quality management system of the production process
Module CF	Conformity to type based on product verification
Module CH1	Conformity based on full quality management system plus design examination

Those modules are specified in detail in

UTP GEN-D.

Decision 2010/713/EU.

6.1.2 Conformity assessment procedures

The manufacturer

or the applicant for admission of the subsystem

or his authorised representative established within the Union

shall choose one of the modules or module combinations indicated below for the constituent 'Friction element for wheel tread brakes':

- CB+CD,
- CB+CF,
- CH1.

Within the application of the chosen module or combination of modules, the interoperability constituent shall be assessed against the requirements set out in point 4.2. If necessary, additional requirements concerning the assessment of particular interoperability constituents are defined in the following points.

6.1.2.1 Friction element for wheel tread brakes of freight wagons

A friction element for wheel tread brakes of freight wagons shall comply with the requirements set out in Appendix F.

Until the end of the transition period set out in Appendix G, the types of friction elements for wheel tread brakes listed in Appendix G are deemed to comply with the requirements set out in Appendix F without testing.

6.2 Subsystem rolling stock regarding noise emitted by rolling stock

6.2.1 Modules

The

UTP verification

EC verification

shall be performed in accordance with the module(s) described in table 6.

<sup>14</sup> "EC-Type examination" in the TSI




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Table 6:

Assessment procedures for the verification of subsystems

Modules for EC verification of subsystems

SB	Type examination	EC-Type Examination
SD	Quality management system of the production process	EC verification based on quality management system of the production process
SF	Verification based on product verification	EC verification based on product verification
SH1	Verification based on full quality management system plus design examination	EC verification based on full quality management system plus design examination

These modules are specified in detail in

UTP GEN-D<sup>15</sup>.

Decision 2010/713/EU.

## 6.2.2 Assessment procedures for verification

The applicant shall choose one of the following assessment procedures consisting of one or more modules for the

UTP verification

EC verification

of the subsystem:

- (SB+SD),
- (SB+SF),
- (SH1).


Within the application of the chosen module or module combination the subsystem shall be assessed against the requirements defined in [section point 4.2](#). If necessary, additional requirements concerning the assessment are given in the following points.

### 6.2.2.1 Stationary noise

The demonstration of conformity with the limit values on stationary noise as set out in point 4.2.1 shall be carried out in accordance with [sections 5.1, 5.2, 5.3, 5.4, 5.5 \(without clause 5.5.2\), 5.7 and clause 5.8.1 of EN ISO 3095:2013, the specification referred to in Appendix B, Index \[1\]](#).

For the assessment of the main air compressor noise at the nearest measuring position  $i$ , the  $L_{pAeq,T}^i$  indicator shall be used with  $T$  representative of one operating cycle as defined in [section 5.7 of EN ISO 3095:2013, the specification referred to in Appendix B, Index \[1\]](#). Only the train systems that are required for the air compressor to run under normal operating conditions shall be used for this. The train systems which are not needed for the operation of the compressor may be switched off to prevent contribution to

<sup>15</sup>—General Provisions, UTP GEN-D Assessment procedures (modules) that entered into force on 1.10.2012

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the noise measurement. The demonstration of conformity with the limit values shall be carried out under the conditions solely necessary for operation of the main air compressor at the lowest rpm.

For the assessment of the impulsive noise sources at the nearest measuring position  $i$ , the  $L_{pAFmax}^i$  indicator shall be used. The relevant noise source is the exhaust from the valves of the air dryer.

#### 6.2.2.2 Starting noise

The demonstration of conformity with the limit values on starting noise as set out in point 4.2.2 shall be carried out in accordance with ~~chapter 7 (without clause 7.5.1.2) of EN ISO 3095:2013~~ [the specification referred to in Appendix B, Index \[1\]](#). The maximum level method ~~referring to section 7.5 of EN ISO 3095:2013~~ shall apply. Deviating from ~~clause 7.5.3 of EN ISO 3095:2013~~ [the test procedure of the specification](#), the train shall accelerate from standstill up to 30 km/h and then maintain the speed.

In addition the noise shall be measured at a distance ~~of 7.5 m~~ from the centre of the track and ~~a height of 1.2 m at the same height~~ above top of rail [as set out in point 4.2.2](#). The “averaged level method” and the “maximum level method” in accordance with ~~section 7.6 and 7.5 respectively of EN ISO 3095:2013~~ [the specification referred to in Appendix B, Index \[1\]](#) shall apply and the train shall accelerate from standstill up to 40 km/h and then maintain the speed. The measured values are not assessed against any limit value and shall be recorded in the technical file

~~and communicated to OTIF Secretary General.~~ | and communicated to the Agency.

For ~~OTMs~~ [special vehicles](#), the starting procedure shall be performed without additional trailer loads.

#### 6.2.2.3 Pass-by noise

The demonstration of conformity with the limit values on pass-by noise as set out in point 4.2.3 shall be carried out in accordance with points 6.2.2.3.1 and 6.2.2.3.2.

##### 6.2.2.3.1 Test track conditions

The tests shall be performed on a reference track as defined in ~~section 6.2 of EN ISO 3095:2013~~ [Appendix B, Index \[1\]](#).


However, it is permitted to carry out the test on a track that does not comply with the reference track conditions in terms of acoustic rail roughness level and track decay rates as long as the noise levels measured in accordance with point 6.2.2.3.2 do not exceed the limit values set out in point 4.2.3.

The acoustic rail roughness and the decay rates of the test track shall be determined in any case. If the track on which the tests are performed does meet the reference track conditions, the measured noise levels shall be marked ‘comparable’, otherwise they shall be marked ‘non-comparable’. It shall be recorded in the technical file whether the measured noise levels are ‘comparable’ or ‘non-comparable’.

The measured acoustic rail roughness values of the test track remain valid during a period starting 3 months before and ending 3 months after this measurement, provided that during this period no track maintenance has been performed which influences the rail acoustic roughness.

The measured track decay rate values of the test track shall remain valid during a period starting 1 year before and ending 1 year after this measurement, provided that during this period no track maintenance has been performed which influences the track decay rates.

Confirmation shall be provided in the technical file that the track data related to the type’s pass-by noise measurement were valid during the day(s) of testing, e.g. by providing the date of last maintenance having an impact on noise.

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Furthermore, it is permitted to carry out tests at speeds equal to or higher than 250 km/h on slab tracks. In this case the limit values shall be 2 dB higher than those set out in point 4.2.3.

### 6.2.2.3.2 Procedure

The tests shall be carried out in accordance with ~~the provision in sections 6.1, 6.3, 6.4, 6.5, 6.6 and 6.7 (without 6.7.2) of EN ISO 3095:2013.~~ [the specification referred to in Appendix B, Index \[1\]](#). Any comparison against limit values shall be carried out with results rounded to the nearest integer decibel. Any normalisation shall be performed before rounding. The detailed assessment procedure is set out in points 6.2.2.3.2.1, 6.2.2.3.2.2 and 6.2.2.3.2.3.

#### 6.2.2.3.2.1 EMU, DMUs, locomotives and coaches

For EMU, DMUs, locomotives and coaches three classes of maximum operational speed are distinguished:

1. If the maximum operational speed of the unit is lower than or equal to 80 km/h, the pass-by noise shall be measured at its maximum speed  $v_{\max}$ . This value shall not exceed the limit value  $L_{pAeq, Tp(80 \text{ km/h})}$  as set out in point 4.2.3.
2. If the maximum operational speed  $v_{\max}$  of the unit is higher than 80 km/h and lower than 250 km/h, the pass-by noise shall be measured at 80 km/h and at its maximum speed. Both measured pass-by noise values  $L_{pAeq, Tp(v_{\text{test}})}$  shall be normalised to the reference speed of 80 km/h  $L_{pAeq, Tp(80 \text{ km/h})}$  using formula (1). The normalised value shall not exceed the limit value  $L_{pAeq, Tp(80 \text{ km/h})}$  as set out in point 4.2.3.

#### Formula (1):

$$L_{pAeq, Tp(80 \text{ km/h})} = L_{pAeq, Tp(v_{\text{test}})} - 30 \cdot \log(v_{\text{test}}/80 \text{ km/h}) \quad (1)$$

$v_{\text{test}}$  = Actual speed during the measurement

3. If the maximum operational speed  $v_{\max}$  of the unit is equal to or higher than 250 km/h, the pass-by noise shall be measured at 80 km/h and at its maximum speed with an upper test speed limit of 320 km/h. The measured pass-by noise value  $L_{pAeq, Tp(v_{\text{test}})}$  at 80 km/h shall be normalised to the reference speed of 80 km/h  $L_{pAeq, Tp(80 \text{ km/h})}$  using formula (1). The normalised value shall not exceed the limit value  $L_{pAeq, Tp(80 \text{ km/h})}$  as set out in point 4.2.3. The measured pass-by noise value at maximum speed  $L_{pAeq, Tp(v_{\text{test}})}$  shall be normalised to the reference speed of 250 km/h  $L_{pAeq, Tp(250 \text{ km/h})}$  using formula (2). The normalised value shall not exceed the limit value  $L_{pAeq, Tp(250 \text{ km/h})}$  as set out in point 4.2.3.

#### Formula (2):

$$L_{pAeq, Tp(250 \text{ km/h})} = L_{pAeq, Tp(v_{\text{test}})} - 50 \cdot \log(v_{\text{test}}/250 \text{ km/h}) \quad (2)$$

$v_{\text{test}}$  = Actual speed during the measurement

#### 6.2.2.3.2.2 Wagons

For wagons two classes of maximum operational speed are distinguished:

1. If the maximum operational speed  $v_{\max}$  of the unit is lower than or equal to 80 km/h, the pass-by noise shall be measured at its maximum speed. The measured pass-by noise value  $L_{pAeq, Tp(v_{\text{test}})}$  shall be normalised to a reference APL of  $0,225 \text{ m}^{-1}$   $L_{pAeq, Tp( APL_{\text{ref}})}$  using formula (3). This value shall not exceed the limit value  $L_{pAeq, Tp(80 \text{ km/h})}$  as set out in point 4.2.3.

Formula (3):

$$L_{pAeq,Tp} (APL_{ref}) = L_{pAeq,Tp}(v_{test}) - 10 \cdot \log(APL_{wag}/0,225 \text{ m}^{-1}) \quad (3)$$

$APL_{wag}$  = Number of axles divided by the length over the buffers [ $\text{m}^{-1}$ ]

$v_{test}$  = Actual speed during the measurement

2. If the maximum operational speed  $v_{max}$  of the unit is higher than 80 km/h, the pass-by noise shall be measured at 80 km/h and at its maximum speed. Both measured pass-by noise values  $L_{pAeq,Tp}(v_{test})$  shall be normalised to the reference speed of 80 km/h and to a reference APL of  $0,225 \text{ m}^{-1}$   $L_{pAeq,Tp}(APL_{ref}, 80 \text{ km/h})$  using formula (4). The normalised value shall not exceed the limit value  $L_{pAeq,Tp}(80 \text{ km/h})$  as set out in point 4.2.3.

Formula (4):

$$L_{pAeq,Tp} (APL_{ref}, 80 \text{ km/h}) = L_{pAeq,Tp}(v_{test}) - 10 \cdot \log(APL_{wag}/0,225 \text{ m}^{-1}) - 30 \cdot \log(v_{test}/80 \text{ km/h}) \quad (4)$$

$APL_{wag}$  = Number of axles divided by the length over the buffers [ $\text{m}^{-1}$ ]

$v_{test}$  = Actual speed during the measurement

6.2.2.3.2.3 ~~OTMs~~ Special vehicles

For ~~OTMs~~ special vehicles, the same assessment procedure as set out in 6.2.2.3.2.1 applies. The measuring procedure shall be performed without additional trailer loads.

~~OTMs~~ Special vehicles are deemed to comply with the pass-by noise level requirements in point 4.2.3 without measuring when they are:

- solely braked by either composite brake blocks or disc brakes, and
- equipped with composite scrubbers, if scrubber blocks are fitted.

## 6.2.2.4 Driver's cab interior noise

The demonstration of conformity with the limit values on the driver's cab interior noise as set out in point 4.2.4 shall be carried out in accordance with ~~EN 15892:2011~~ [the specification referenced in Appendix B, Index \[2\]](#). For OTMs the measuring procedure shall be performed without additional trailer loads.

## 6.2.3 Simplified evaluation

Instead of the test procedures as set out in point 6.2.2, it is permitted to substitute some or all of the tests by a simplified evaluation. The simplified evaluation consists of acoustically comparing the unit under assessment to an existing type (further referred to as the reference type) with documented noise characteristics.

The simplified evaluation may be used for each of the applicable basic parameters "stationary noise", "starting noise", "pass-by noise" and "driver's cab interior noise" autonomously and shall consist of providing evidence that the effects of the differences of the unit under assessment do not result in exceeding the limit values set out in ~~section~~ [point 4.2](#).

For the units under simplified evaluation, the proof of conformity shall include a detailed description of the noise relevant changes compared to the reference type. From this description, a simplified evaluation shall be performed. The estimated noise values shall include the uncertainties of the applied evaluation method. The simplified evaluation can either be a calculation and/or simplified measurement.



A unit certified on the basis of the simplified evaluation method shall not be used as a reference unit for a further evaluation.

If the simplified evaluation is applied for pass-by noise, the reference-type shall comply with at least one of the following:

- ~~— Chapter 4 of this UTP~~ and for which the pass-by noise results are marked ‘comparable’,
- ~~— Chapter 4 of Decision 2011/229/EU<sup>16</sup>~~
- ~~— or Chapter 4 of UTP NOI<sup>17</sup> which entered into force on 1.12.2012~~ Chapter 4 of any previous UTP Noise or equivalent TSI, whilst this UTP or TSI was in force.
- ~~— Chapter 4 of Decision 2011/229/EU<sup>18</sup> and for which the pass-by noise results are marked ‘comparable’,~~
- ~~— Chapter 4 of Decision 2006/66/EC<sup>19</sup>,~~
- ~~— Chapter 4 of Decision 2008/232/EC<sup>20</sup>.~~

~~and for which the pass-by noise results are marked ‘comparable’,~~

- ~~— Chapter 4 and for which the pass-by noise results are marked ‘comparable’,~~
- ~~— Chapter 4 of Decision 2006/66/EC<sup>21</sup>,~~
- ~~— Chapter 4 of Decision 2008/232/EC<sup>22</sup>.~~

In case of a wagon which parameters remain, compared to the reference type, within the permitted range of table 7 it is deemed without further verification that the unit complies with the limit values on pass-by noise as set out in point 4.2.3.

Table 7: Permitted variation of wagons for the exemption from verification

Parameter	permitted variation (compared to the reference unit)
Max. unit Speed	Any speed up to 160 km/h
Type of wheel	Only if equally or less noisy (acoustic characterisation i. a. w. <a href="#">the specification referred to in Appendix B, Index [3] Annex E of EN 13979 1:2011</a> )

<sup>16</sup> ~~Commission Decision of 4 April 2011 concerning the technical specifications of interoperability relating to the subsystem rolling stock – noise of the trans-European conventional rail system (OJ L 99, 13.4.2011, p.1-39)~~

<sup>17</sup> ~~General Provisions, Rolling stock – NOISE, UTP, APTU (Ref: A 94-04/2.2012, which entered into force on 01.12.2012)~~

<sup>18</sup> [Commission Decision of 4 April 2011 concerning the technical specifications of interoperability relating to the subsystem rolling stock - noise of the trans-European conventional rail system](#)

<sup>19</sup> [Commission Decision of 23 December 2005 concerning the technical specification for interoperability relating to the subsystem rolling stock — noise of the trans-European conventional rail system](#)

<sup>20</sup> [Commission Decision of 21 February 2008 concerning a technical specification for interoperability relating to the rolling stock sub-system of the trans-European high-speed rail system](#)

<sup>21</sup> ~~Commission Decision of 23 December 2005 concerning the technical specification for interoperability relating to the subsystem rolling stock — noise of the trans-European conventional rail system (OJ L 37, 8.2.2006, p.1-49)~~

<sup>22</sup> ~~Commission Decision of 21 February 2008 concerning a technical specification for interoperability relating to the rolling stock sub-system of the trans-European high-speed rail system (OJ L 84, 26.3.2008, p.132-392)~~



Parameter	permitted variation (compared to the reference unit)
Tare weight	Only within the range of + 20% / - 5%
Brake block	<u>Only if the reference unit is fitted with brake blocks and the brake block of the unit under assessment complies with the provisions related to the IC brake block in accordance with this UTP, or with brake blocks listed in Appendix G to this UTP.</u> <del>Only if variation does not result in higher noise emission.</del>

## 7. IMPLEMENTATION

### 7.1 Application of this UTP to new subsystems

In accordance with Article 7 § 1 of [the ATMF UR](#), compliance with this UTP is one of the conditions for a new vehicle to be admitted to circulation in international traffic.

The UTP certificate of verification and/or conformity to type of a new vehicle established in accordance with [a previous version of the UTP NOI](#), ~~whilst it was in which entered into force on 1.12.2015~~, shall be considered valid until the type or design certificate expires<sup>23</sup>.

~~See Article 8 of this Regulation.~~<sup>24</sup>

(1) This TSI is applicable to all units of rolling stock in its scope which are placed on the market after [Publications Office: please insert the date of entry into force of this amending act], except where point 7.1.1.2 ‘Application to ongoing projects’ or point 7.1.1.3 ‘Application to special vehicles’ of LOC&PAS TSI or point 7.1.1 ‘Application to ongoing projects’ of WAG TSI applies.

(2) Compliance with this Annex in its version applicable before [Publications Office: please insert the date of entry into force of this amending act] is deemed equivalent to compliance with this TSI, except for the TSI changes listed in Appendix H.

~~(+)(3) \_\_\_\_\_ For the rolling stock subsystem and the associated interoperability constituents, the rules related to the EC type~~


<sup>23</sup> EU Decision 2008/232/EC concerning High Speed Rolling Stock and EU Decision 2011/229/EU concerning conventional locomotives and passenger rolling stock, have no equivalent in OTIF regulations. As a result, a declaration of verification and/or conformity to type /of a new vehicle established in accordance with Decision 2008/232/EC or Decision 2011/229/EU is not recognised in OTIF and such vehicles are therefore subject to admission in accordance with ~~ATMF~~ Article 6 § 4 [of the ATMF UR](#).

<sup>24</sup> ~~Article 8 of the EU Decision enacting the NOI TSI:~~

~~“The declaration of verification and/or conformity to type of a new vehicle established in accordance with Decision 2011/229/EU shall be considered valid:~~

~~— for locomotives, EMUs, DMUs and coaches until the type or design certificate needs to be renewed as stated in Decision 2011/291/EU for cases where the latter decision was applied, or until 31 May 2017 for other cases;  
— for wagons until 13 April 2016.~~

~~The declaration of verification and/or conformity to type of a new vehicle established in accordance with Decision 2008/232/EC shall be considered valid until the type or design certificate needs to be renewed as stated in this Decision.”~~

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[or design examination certificates shall be as specified in point 7.1.3 of LOC&PAS TSI; and point 7.2.3 of WAG TSI.](#)

## 7.2 Application of this UTP to existing subsystems

The principles to be applied by the applicants and authorising entities in case of change(s) to an existing rolling stock or rolling stock type are defined in [point 7.1.2 of UTP LOC&PAS and in point 7.2 of UTP WAG.](#)

~~section 7.1.2 of UTP LOC&PAS and in section 7.2 of UTP WAG.~~

~~point 7.1.2 of the Annex to Regulation (EU) No 1302/2014 and section 7.2 of the Annex to Regulation (EU) No 321/2013.~~

### 7.2.1 Provisions in case of changes to existing rolling stock or rolling stock type

The applicant shall ensure that the noise levels of rolling stock subject to change(s) remain below the limits set out in the UTP which was applicable when the rolling stock in question was first admitted to operation. If no UTP existed at the time of the first admission to operation, the applicant shall ensure that the noise levels of the rolling stock subject to change(s) are either not increased or remain below the limits set out in

the UTP NOI which entered into force on 1.12.2012 or UTP NOI 2015 which entered into force on 1.12.2015.

Decision 2006/66/EC or Decision 2002/735/EC.

If an assessment is required, it shall be limited to the basic parameters affected by the change(s).

If the simplified evaluation is applied, the original unit may represent the reference unit in accordance with the provisions of point 6.2.3.

The replacement of a whole unit or (a) vehicle(s) within a unit (e.g. replacement after [a](#) severe damage) does not require a conformity assessment against this UTP, as long as the unit or the vehicle(s) are identical to the ones they replace.

### 7.2.2 Additional provisions for the application of this UTP to existing wagons

Unless indicated otherwise in a particular implementing rule in ~~section~~ [point](#) 7.4, from 8 December 2024, wagons within the scope of UTP WAG which are not covered by point 7.2.2.2 of this UTP shall not be operated on the quieter routes. However, this

The restriction of the operation set out in Article 5a ~~of this Regulation~~<sup>25</sup>

shall not apply to wagons mostly operated on lines with a gradient of more than 40 ‰, wagons with a maximum operating speed higher than 120 km/h, wagons with a maximum axle load higher than 22.5 t, wagons exclusively operated for infrastructure works and wagons used in rescue trains.

<sup>25</sup> Article 5a [of Commission Regulation \(EU\) No 1304/2014 of 26 November 2014 as last amended by \[add new reference\]\(#\) on the technical specification for interoperability relating to the subsystem 'rolling stock — noise': "From 8 December 2024, wagons within the scope of Regulation \(EU\) No 321/2013 which are not covered by point 7.2.2.2 \[...\] shall not be operated on the quieter routes."](#)



If a wagon is being equipped with either friction elements for wheel tread brakes ~~quieter brake blocks~~ as defined in point 7.2.2.1 and no noise sources are added to the wagon, then it shall be assumed that the requirements of point 4.2.3 are met without further testing.

that comply with the provisions of Appendix F of this UTP, covered by an EC Declaration of Conformity in accordance with this TSI,

or with friction elements for wheel tread brakes listed in Appendix G and no noise sources are added to the wagon, then it shall be assumed that the requirements of point 4.2.3 are met without further testing.

7.2.2.1 ~~[not used]~~ Quieter brake blocks

~~A quieter brake block is a brake block belonging to one of the following categories:~~

- ~~— Brake block listed in Appendix G of~~

~~UTP WAG;~~

~~Regulation (EU) No 321/2013;~~

- ~~— Brake block assessed in accordance with the procedure set out in Appendix F of this UTP.~~

7.2.2.2 Wagons operated on quieter routes

Wagons belonging to one of the categories below can be operated on the quieter routes within their area of use:

- ~~Wagons: compliant with either;~~
  - ~~- Complying with this UTP NOI;~~
  - ~~- Complying with a previous version of the UTP NOI, whilst it was in force;~~
  - ~~— which entered into force on 1.12.2012, or~~
  - ~~— the UTP NOI 2015 which entered into force on 1.12.2015, or~~
  - ~~— with this UTP, or~~
- ~~wagons holding an EC declaration of verification in accordance with the relevant TSIs, provided that the EC declaration is valid in accordance with EU law against a Technical Specification for Interoperability of the European Union which is equivalent to one of the UTPs listed above~~

- ~~Wagons holding an EC declaration of verification against Commission Decision 2006/66/EC concerning the technical specification for interoperability relating to the subsystem ‘rolling stock — noise’ of the trans-European conventional rail system;~~
- ~~Wagons holding an EC declaration of verification against Commission Decision 2011/229/EU concerning the technical specifications of interoperability relating to the subsystem ‘rolling stock — noise’ of the trans-European conventional rail system;~~
- ~~Wagons holding an EC declaration of verification against this TSI;~~
- ~~Wagons fitted with either of the following:~~
  - ~~- friction elements for wheel tread brakes covered by an EC Declaration of Conformity in accordance with this TSI,~~
  - ~~- friction elements for wheel tread brakes listed in Appendix G,~~
  - ~~- brake discs for the service brake function,~~





~~— Wagons fitted with quieter brake blocks as defined in point 7.2.2.1 or brake discs for the service brake function;~~

– Wagons fitted with composite brake blocks listed in Appendix E for the service brake function. The operation of these wagons on the quieter routes shall be limited in accordance with the conditions described in this appendix.

### 7.3 Specific cases

#### 7.3.1 Introduction

The specific cases, as listed in point 7.3.2, are classified as:

- (a) “P” cases: “permanent” cases.
- (b) “T” cases: “temporary” cases, ~~where it is recommended that the target system is reached by 2020 (an objective set in Decision 2010/661/EU).~~

#### 7.3.2 List of specific cases

##### 7.3.2.1 Specific cases

The Specific Cases for Member States of the European Union are those which are specified in the NOI TSI.

[\[See 7.3.2.1 of NOI TSI\]](#)

In addition to the above, the following specific cases apply:

##### 7.3.2.1.1 Limits for starting noise (point 4.2.2)

###### (a) Specific case Norway

(‘T’) For locomotives with total tractive power of more than 6000 kW and a maximum axle load of more than 25 t the limit values for starting noise  $L_{pAF,max}$  in Table 3 may be raised up to 89 dB.

##### 7.3.2.1.2 Limits for pass-by noise (point 4.2.3)

###### (a) Specific case Channel Tunnel

(‘P’) For the Channel Tunnel, the limits for pass-by noise shall not apply to wagons dedicated to the transport of heavy goods vehicles between Coquelles (France) and Folkestone (United Kingdom).

###### (b) Specific case Norway

(‘T’) For locomotives with total tractive power of more than 6000 kW and a maximum axle load of more than 25 t the limit values for pass-by noise  $L_{pAVe,70}(80\text{ km/h})$  in Table 4 may be raised up to 85 dB.



### 7.4 Particular implementation rules

#### 7.4.1 Particular implementation rules for the application of this UTP to existing wagons (point 7.2.2)

The particular implementation rules for Member States of the European Union are those which are specified in ~~the NOI TSI~~ [Regulation No 1304/2014, as last amended by \[\\[add new reference\\]\]\(#\)](#).

[\[See 7.4.1 of the NOI TSI\]](#).

In addition to the above, the following particular implementation rules apply:

##### **Particular implementation rules for Switzerland:**

(‘P’) **Quieter** routes shall cover the entire Swiss railway network.

##### Particular implementation rules for the use of existing wagons in the Channel Tunnel

(‘P’) For the calculation of the annual average daily operated freight trains during night-time, freight trains composed of wagons dedicated to the transport of heavy goods vehicles confined to the Coquelles (France) - Folkestone (United Kingdom) line shall not be taken into account.

##### Particular implementation rules for the application of this UTP to existing wagons in Norway

(‘P’) The concept of quieter routes shall not apply on the Norwegian networks due to uncertainties related to the operation in severe winter conditions with composite brake blocks until 31 December 2032. That shall not prevent freight wagons from other Contracting States to operate on the Norwegian network.

#### 7.4.2 Particular implementation rules for wagons operated on quieter routes (point 7.2.2.2)

The particular implementation rules for Member States of the European Union are those which are specified in the NOI TSI [\(Commission Implementing Regulation amending Commission Regulation No 1304/2014, as amended\)](#).

[\[See 7.4.2 of NOI TSI\]](#).

##### Particular implementation rules for wagons operated on quieter routes of the Channel Tunnel

(‘P’) In addition to the wagons listed in point 7.2.2.2, the following existing wagons may be operated on quieter routes in the Channel Tunnel concession:



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[Wagons dedicated to the transport of heavy goods vehicles between Coquelles \(France\) and Folkestone \(United Kingdom\).](#)

**Appendix A --[not used] Open points**

Element of the rolling stock subsystem	Clause of this UTP	Technical aspect not covered by this UTP	Comments
Quieter brake block	7.2.2.1 and Appendix F	Assessment of the acoustic properties of the brake blocks	Alternative technical solutions available (see point 7.2.2)

**Appendix B - Standards referred to in this UTP****UTP** | **TSI**

UTP/TSI		Standard	
Characteristics to be assessed		References to mandatory standards	Chapter
Stationary noise	4.2.1	-	-
	6.2.2.1	EN-ISO-3095:2013	5
Starting noise	4.2.2	-	-
	6.2.2.2	EN-ISO-3095:2013	7
Pass-by noise	4.2.3	EN-ISO-3095:2013	6
	6.2.2.3	EN-ISO-3095:2013	6
Driver's cab interior noise	4.2.4	-	-
	6.2.2.4	EN-15892:2011	all
Simplified evaluation	6.2.3	EN-13979-1:2011	Annex E

*Table B.1**List of referenced standards*

<i>Index</i>	<i>Parameter</i>	<i>UTP Point</i>	<i>Standard Point</i>
<b>[1]</b>	<b>EN ISO 3095 :2013 Acoustics — Railway applications — Measurement of noise emitted by railbound vehicles</b>		




[1.1]	<a href="#">Pass-by noise - measurements at speeds higher than or equal to 250 km/h</a>	<a href="#">4.2.3</a>	<a href="#">6</a>
[1.2]	<a href="#">Stationary noise – demonstration of conformity</a>	<a href="#">6.2.2.1</a>	<a href="#">5.1, 5.2, 5.3, 5.4, 5.5 (without 5.5.2), 5.7 and clause 5.8.1</a>
[1.3]	<a href="#">Stationary noise – operating cycle of the main air compressor</a>	<a href="#">6.2.2.1</a>	<a href="#">5.7</a>
[1.4]	<a href="#">Starting noise</a>	<a href="#">6.2.2.2</a>	<a href="#">7 (without 7.5.1.2) Deviation to 7.5.3</a>
[1.5]	<a href="#">Pass-by noise – test track conditions</a>	<a href="#">6.2.2.3.1</a>	<a href="#">6.2</a>
[1.6]	<a href="#">Pass-by noise - procedure</a>	<a href="#">6.2.2.3.2</a>	<a href="#">6.1, 6.3, 6.4, 6.5, 6.6 and 6.7 (without 6.7.2)</a>
[2]	<a href="#">EN ISO 3381:2021 Railway applications - Acoustics - Noise measurement inside railbound vehicles</a>		
[2.1]	<a href="#">Driver's cab interior noise</a>	<a href="#">6.2.2.4</a>	<a href="#">7, 8 except 8.4.5 and 8.7.2</a>
[3]	<a href="#">EN 13979-1:2020 Railway applications - Wheelsets and bogies - Monobloc wheels - Technical approval procedure - Part 1: Forged and rolled wheels</a> Note: EN 13979-1:2003+A2:2011 is also acceptable		
[3.1]	<a href="#">Simplified evaluation</a>	<a href="#">6.2.3 – table 7</a>	<a href="#">Annex E</a>
[3.2]	<a href="#">Particular implementation rules for wagons operated on quieter routes</a>	<a href="#">7.4.2</a>	<a href="#">All</a>
[4]	<a href="#">UIC 541-4 :2020 Composite brake blocks - General conditions for certification and use</a>		
[4.1]	<a href="#">Brake performance test programme</a>	<a href="#">Appendix F</a>	<a href="#">Test programs A1_a and A2_a</a>
[5]	<a href="#">EN 16452:2015+A1:2019 Railway applications - Braking - Brake blocks</a>		
[5.1]	<a href="#">Brake performance test programme – LL-blocks and K-blocks</a>	<a href="#">Appendix F</a>	<a href="#">Test programmes D.1 and C.1</a>
[5.2]	<a href="#">Brake performance test programme – other blocks</a>	<a href="#">Appendix F</a>	<a href="#">Test programme J.2</a>
[6]	<a href="#">EN 15610:2019 Railway applications - Acoustics - Rail and wheel roughness measurement related to noise generation</a>		
[6.1]	<a href="#">Wheel acoustic roughness measurement procedure</a>	<a href="#">Appendix F</a>	<a href="#">All except clause 6.2.2.2</a>



**Appendix C Assessment of the rolling stock subsystem**

Characteristics to be assessed, as specified in <del>section</del> <a href="#">point 4.2</a>					Particular assessment procedure
Element of the Rolling Stock sub-system	Point	Design review	Type Test	Routine Test	Point
					Stationary noise
Starting noise	4.2.2	X*	X	n.a.	6.2.2.2
Pass-by noise	4.2.3	X*	X	n.a.	6.2.2.3
Driver's cab interior noise	4.2.4	X*	X	n.a.	6.2.2.4

\* Only if the simplified evaluation in accordance with point 6.2.3 is applied.

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## Appendix D Quieter routes

### D.1 Identification of quieter routes

Contracting States may designate some or all lines open to international traffic as quieter routes in the meaning of this UTP in accordance with the rules applicable in the state concerned.

In case all lines open to international traffic are designated as quieter routes this shall be indicated as a particular implementing rule in chapter 7.4 of this UTP, which shall indicate whether the rule is permanent or temporary and from which date it will apply. For any temporary rule it shall be indicated when it will cease to apply.

If only a part of the network open to international traffic is designated as quieter routes, the Contracting State shall ensure that a precise list of quieter routes open for international traffic is publicly available.

The list shall contain at least the start and end points of the quieter routes and their corresponding sections. If one of these points is at the border, it shall be reflected.

In accordance with Article 5c (1)<sup>26</sup> ~~of this Regulation~~ the Member States shall provide ~~the European Union Agency for Railways~~ (‘the Agency’) with a list of quieter routes ~~in a format allowing further processing by the users with IT tools.~~ through the Commission Implementing Decision (EU) 2019/777<sup>27</sup> (RINF). The list shall contain at least the following information:

- Start and end points of the quieter routes and their corresponding sections, using geographical code location ~~as defined in the register set out in Commission Implementing Decision 2014/880/EU<sup>28</sup> in the register set out in~~ (RINF). If one of these points is at the border of the Member State, it shall be reflected.
- Identification of the sections making up the quieter route

The list shall be provided using the template below:

Quieter route	Sections in the route	Line identification	Quieter route starts/finishes at the border of the Contracting State
Point A - Point E	Point A - Point B		Yes POINT E (Country Y)
	Point B - Point C		
	Point C - Point D		
	Point D - Point E		

<sup>26</sup> [Article 5c \(1\) of Commission Regulation \(EU\) No 1304/2014 as last amended by \[add new reference\] on the technical specification for interoperability relating to the subsystem ‘rolling stock — noise’: “Member States shall designate quieter routes in accordance with Article 5b and the procedure set out in Appendix D.1 of the Annex. They shall provide the European Union Agency for Railways \(‘the Agency’\) with a list of quieter routes six months after the date of publication of this Regulation at the latest. The Agency shall publish those lists on its website.”](#)

<sup>27</sup> [Commission Implementing Decision \(EU\) 2019/777 of 16 May 2019 on the common specifications for the register of railway infrastructure and repealing Implementing Decision 2014/880/EU](#)

<sup>28</sup> ~~Commission Implementing Decision 2014/880/EU of 26 November 2014 on the common specifications of the register of railway infrastructure and repealing Implementing Decision 2011/633/EU (OJ L 356 12.12.2014, p. 489).~~



Quieter route	Sections in the route	Line identification	Quieter route starts/finishes at the border of the Contracting State
Point F - Point I	Point F - Point G		No
	Point G - Point H		
	Point H - Point I		

Contracting States may provide maps illustrating the quieter routes on a voluntary basis.

The Secretary General shall publish on the website of OTIF the lists of quieter routes and maps provided by Contracting States.

If there are no quieter routes in a Contracting State or if all lines open to international traffic in a Contracting State are quieter routes, this shall be published on the website of OTIF as well.

In addition, the Member States may provide maps illustrating the quieter routes on a voluntary basis. All lists and maps shall be published on the Agency website (<http://www.era.europa.eu>) no later than 9 months after 27.5.2019.

By the same date the Agency shall inform the Commission of the lists and maps of quieter routes. The Commission shall inform the Member States accordingly through the committee referred to in Article 51 of Directive (EU) 2016/797.

## D.2 Update of quieter routes

Without prejudice to point D.1, Contracting States may update the list of quieter routes at any time, taking into account reasonable transitional periods allowing actors sufficient time to adjust.

The freight traffic data used for the update of quieter routes in accordance with Article 5c(2)<sup>29</sup> ~~of this Regulation~~ shall refer to the last three years preceding the update for which the data is available. ~~In case the freight traffic~~ Where, due to exceptional circumstances, the freight traffic diverges in a given year from that average number by more than 25%, the Member State concerned can calculate the average number on the basis of the remaining two years. ~~Member States shall provide the Agency with the updated quieter routes.~~ Member States shall ensure that the infrastructure managers update quieter routes in RINF as soon as these updates become available. Updates shall apply from the next timetable change following their publication.

The routes designated as quieter routes shall remain as such following the update unless during the period concerned the volume of traffic has decreased by more than 50% and the average

<sup>29</sup> Article 5c (2) of Commission Regulation (EU) No 1304/2014 as last amended by [\[add new reference\]](#) on the technical specification for interoperability relating to the subsystem 'rolling stock — noise': *"Member States shall update the list of quieter routes at least every five years after 8 December 2024, following the procedure set out in Appendix D.2 of the Annex."*





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number of daily operated freight trains during the night-time is lower than 12.

In case of new and upgraded lines, the expected volume of traffic shall be used for the designation of those lines as quieter routes.

~~The Agency shall publish the updated quieter routes on its website (<http://www.era.europa.eu>) no later than 3 months after their reception and they shall apply from the next December timetable change following one year after their publication.~~

~~The Agency shall inform the Commission of any changes to the quieter routes. The Commission shall inform the Member States of these changes through the committee referred to in Article 51 of Directive (EU) 2016/797.~~

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## Appendix E Historic composite brake blocks

### **E.1 Historic composite brake blocks for international use.**

Existing wagons equipped with the brake blocks listed below are allowed to be used on the quieter routes within their area of use, until the relevant date set out in Appendix N of UIC Leaflet 541-4.

Manufacturer/name of product	Designation/type of block	Type of friction coefficient
Valeo/Hersot Wabco/Cobra	693 W554	K
Ferodo	I/B 436	K
Abex	229	K (Fe - sintered)
Jurid	738	K (Fe - sintered)

Wagons equipped with historic composite brake blocks not listed in the table above but already authorised for international traffic

in conformity with the provisions of Decision 2004/446/EC or Decision 2006/861/EC

~~can~~ may still be used without any deadline within the area of use covered by their authorisation.

### **E.2 Historic composite brake blocks for national use**

Existing wagons equipped with the brake blocks listed below are only allowed to be used on the railway networks, including quieter routes, of the corresponding Member States within their area of use.

Manufacturer/name of the product	Designation/type of block	Member State	Remarks
Cobra/Wabco	V133	Italy	
Cofren	S153	Sweden	
Cofren	128	Sweden	
Cofren	229	Italy	
ICER	904	Spain, Portugal	
ICER	905	Spain, Portugal	
Jurid	838	Spain, Portugal	



## **Appendix F Assessment of acoustic performance of a brake block**

The purpose of this procedure is to demonstrate the acoustic performance of a composite brake block at interoperability constituent level.

~~This procedure is an open point.~~

~~This procedure shall be an open point in accordance with Article 4(6) of Directive (EU) 2016/797.~~

The procedure consists of the following steps:

1. Measure the acoustic roughness of a wheel representative of the brake block under assessment.

### *Wheel acoustic roughness development on bench test*

New brake blocks shall be used. Only new or reprofiled wheels shall be used. The wheels shall be free of any damage (cracks, flats, etc.).

One of the following brake performance test programs shall be applied to at least one wheel of 920 mm nominal diameter:

- A2\_a for LL-Blocks and A1\_a for K-blocks of the specification referenced in Appendix B, Index [4];
- D.1 for LL-Blocks and C.1 for K-blocks of the specification referenced in Appendix B, Index [5];
- J.2 of the specification referenced in Appendix B, Index [5] for other blocks.

The selected programme shall be completed and the results of the measurement series after completion shall be used to determine the wheel roughness index.

It is optional to continue with a second run of the selected program. If that option is chosen, the results of the measurement series after completion of the second run shall be used to determine the wheel roughness index. The results from both runs shall be documented.

The second run shall be performed with the same wheel, but the brake block may be renewed and replaced with another block of the same type. In that option, the bedding-in of the new brake block shall be completely executed at the beginning of the second run.

### *Wheel acoustic roughness measurement procedure*

The measurement will be performed as set out in the specification referenced in Appendix B, Index [6]. In order to ensure the representativeness of the acoustic roughness of the rolling surface of the wheel, 8 measurement lines spaced 5 mm are deemed sufficient instead of the positions set out in the specification referenced in Appendix B, Index [6].

The measurement shall be performed during the wheel acoustic roughness development on bench test specified in the previous section in accordance with one of the tables below:



If the selected programme is A2\_a of the specification referenced in Appendix B, Index [4]:

<u>Acoustic roughness measurement series / Label</u>		<u>Programme section</u>	<u>Brake application No.</u>
<u>1<sup>st</sup> run</u>	<u>2<sup>nd</sup> run</u>		
<u>A</u>		<u>At start</u>	<u>Initial condition</u>
<u>B</u>	<u>I</u>	<u>After bedding-in</u>	<u>after Br 6</u>
<u>C</u>	<u>J</u>	<u>After conditioning the block for empty load</u>	<u>after Br. 26</u>
<u>D</u>	<u>K</u>	<u>Dry and empty conditions</u>	<u>after Br. 51</u>
<u>E</u>	<u>L</u>	<u>Wet and empty conditions</u>	<u>after Br. 87</u>
<u>F</u>	<u>M</u>	<u>Laden conditions</u>	<u>after Br. 128</u>
<u>G</u>	<u>N</u>	<u>Drag braking (steep gradient downhill simulation)</u>	<u>after Br. 130</u>
<u>H</u>	<u>O</u>	<u>End of programme</u>	<u>after Br. 164</u>

If the selected programme is A1\_a of the specification referenced in Appendix B, Index [4]:

<u>Acoustic roughness measurement series / Label</u>		<u>Programme section</u>	<u>Brake application No.</u>
<u>1<sup>st</sup> run</u>	<u>2<sup>nd</sup> run</u>		
<u>A</u>		<u>At start</u>	<u>Initial condition</u>
<u>B</u>	<u>I</u>	<u>After bedding-in</u>	<u>after Br 6</u>
<u>C</u>	<u>J</u>	<u>After conditioning the block for empty load</u>	<u>after Br. 26</u>
<u>D</u>	<u>K</u>	<u>Dry and empty conditions</u>	<u>after Br. 51</u>
<u>E</u>	<u>L</u>	<u>Wet and empty conditions</u>	<u>after Br. 87</u>
<u>F</u>	<u>M</u>	<u>Laden conditions</u>	<u>after Br. 128</u>
<u>G</u>	<u>N</u>	<u>Drag braking (steep gradient downhill simulation)</u>	<u>after Br. 130</u>
<u>H</u>	<u>O</u>	<u>End of programme</u>	<u>after Br. 164</u>



If the selected programme is D.1 of the specification referenced in Appendix B, Index [5]

<u>Acoustic roughness measurement series / Label</u>		<u>Programme section</u>	<u>Brake application No.</u>
<u>1<sup>st</sup> run</u>	<u>2<sup>nd</sup> run</u>		
<u>A</u>		<u>At start</u>	<u>Initial condition</u>
<u>B</u>	<u>I</u>	<u>After bedding-in</u>	<u>after Br. 6</u>
<u>C</u>	<u>J</u>	<u>After conditioning the block for empty load</u>	<u>after Br. 26</u>
<u>D</u>	<u>K</u>	<u>Dry and empty conditions</u>	<u>after Br. 51</u>
<u>E</u>	<u>L</u>	<u>Wet and empty conditions</u>	<u>after Br. 87</u>
<u>F</u>	<u>M</u>	<u>Laden conditions</u>	<u>after Br. 128</u>
<u>G</u>	<u>N</u>	<u>Drag braking (steep gradient downhill simulation)</u>	<u>after Br. 130</u>
<u>H</u>	<u>O</u>	<u>End of programme</u>	<u>after Br. 149</u>

If the selected programme is C.1 of the specification referenced in Appendix B, Index [5]

<u>Acoustic roughness measurement series / Label</u>		<u>Programme section</u>	<u>Brake application No.</u>
<u>1<sup>st</sup> run</u>	<u>2<sup>nd</sup> run</u>		
<u>A</u>		<u>At start</u>	<u>Initial condition</u>
<u>B</u>	<u>I</u>	<u>After bedding-in</u>	<u>after Br. 6</u>
<u>C</u>	<u>J</u>	<u>After conditioning the block for empty load</u>	<u>after Br. 26</u>
<u>D</u>	<u>K</u>	<u>Dry and empty conditions</u>	<u>after Br. 51</u>
<u>E</u>	<u>L</u>	<u>Wet and empty conditions</u>	<u>after Br. 87</u>
<u>F</u>	<u>M</u>	<u>Laden conditions</u>	<u>after Br. 128</u>
<u>G</u>	<u>N</u>	<u>Drag braking (steep gradient downhill simulation)</u>	<u>after Br. 130</u>
<u>H</u>	<u>O</u>	<u>End of programme</u>	<u>after Br. 149</u>



If the selected programme is J.2 of the specification referenced in Appendix B, Index [5]

Acoustic roughness measurement series / Label		Programme section	Brake application No.
1 <sup>st</sup> run	2 <sup>nd</sup> run		
<u>A</u>		<u>At start</u>	<u>Initial condition</u>
<u>B</u>	<u>I</u>	<u>After bedding-in</u>	<u>after Br 6</u>
<u>C</u>	<u>J</u>	<u>After conditioning the block for empty load</u>	<u>after Br. 26</u>
<u>D</u>	<u>K</u>	<u>Dry and empty conditions</u>	<u>after Br. 51</u>
<u>E</u>	<u>L</u>	<u>Wet and empty conditions</u>	<u>after Br. 87</u>
<u>F</u>	<u>M</u>	<u>Laden conditions</u>	<u>after Br. 128</u>
<u>G</u>	<u>N</u>	<u>Drag braking (steep gradient downhill simulation)</u>	<u>after Br. 130</u>
<u>H</u>	<u>O</u>	<u>End of programme</u>	<u>after Br. 149</u>

- Sampling: The acoustic roughness of 1 wheel shall be measured.
- Averaging: the RMS average of the acoustic roughness shall be used.

The result is a representative one-third octave wavelength wheel roughness spectrum in the wavelength domain  $L_r$

2. Derive a scalar indicator from the measured wheel roughness  $L_r$  in step 1

$$C(i) = B(i) + 10 \log_{10}[10^{0,1L_R(i)} + 10^{0,1A(i)}]$$

$$Indicator = 10 \log_{10}(\sum_{i=1}^{19} 10^{0,1 C(i)})$$

Where A(i) and B(i) are tabulated as follows<sup>30</sup>:

i	Wavelength $\lambda$ [m]	A dB re 1 micrometre	B dB re 1/(10 <sup>-6</sup> m)	$L_r$ dB re 1 micrometre
<u>1</u>	<u>0,00315</u>	<u>-17,9</u>	<u>-16,6</u>	
<u>2</u>	<u>0,004</u>	<u>-16,2</u>	<u>-13,9</u>	
<u>3</u>	<u>0,005</u>	<u>-15,5</u>	<u>-10,0</u>	
<u>4</u>	<u>0,0063</u>	<u>-14,4</u>	<u>-6,9</u>	
<u>5</u>	<u>0,008</u>	<u>-13,3</u>	<u>-6,2</u>	

<sup>30</sup> Coefficients A(i) and B(i) are tailored to the current limit values for pass-by noise and reference track conditions



i	Wavelength $\lambda$ [m]	A dB re 1 micrometre	B dB re 1/(10 <sup>-6</sup> m)	L <sub>r</sub> dB re 1 micrometre
<u>6</u>	<u>0.501</u>	<u>-13.51</u>	<u>-5.4</u>	<u>Obtained from</u> <u>wheel roughness</u> <u>measurements</u>
<u>7</u>	<u>0.50125</u>	<u>-12.58</u>	<u>-3.53</u>	
<u>8</u>	<u>0.5016</u>	<u>-12.4</u>	<u>-2.52</u>	
<u>9</u>	<u>0.502</u>	<u>-10.59</u>	<u>-4.2</u>	
<u>10</u>	<u>0.5025</u>	<u>-11.51</u>	<u>-8.5</u>	
<u>11</u>	<u>0.50315</u>	<u>-10.5</u>	<u>-11.52</u>	
<u>12</u>	<u>0.504</u>	<u>-9.58</u>	<u>-14.3</u>	
<u>13</u>	<u>0.505</u>	<u>-4.58</u>	<u>-15.6</u>	
<u>14</u>	<u>0.5063</u>	<u>-5.59</u>	<u>-17.3</u>	
<u>15</u>	<u>0.508</u>	<u>-5.56</u>	<u>-23.7</u>	
<u>16</u>	<u>0.51</u>	<u>-0.55</u>	<u>-29.0</u>	
<u>17</u>	<u>0.5125</u>	<u>2.4</u>	<u>-30.7</u>	
<u>18</u>	<u>0.516</u>	<u>4.58</u>	<u>-31.7</u>	
<u>19</u>	<u>0.52</u>	<u>2.4</u>	<u>-30.7</u>	

3. Pass-fail criterion

The indicator measured in step 2 shall be lower than or equal to 1.

The indicator measured in step 2 as well as the representative one-third octave wavelength wheel roughness spectrum in the wavelength domain L<sub>r</sub> shall be recorded in the IC certificate.

**Appendix G Exempted brake blocks**

The blocks listed below are exempted from an EC Declaration of conformity until **add date that is 10 years after entry into force of TSI**. Until that date, the manufacturer or its representative may notify to the Commission the need to revise the pass-fail criterion set out in point 3 of Appendix F or the methodology set out in that Appendix.

<u>Manufacturer</u>	<u>Type description and abbreviated designation (if different)</u>
<u>Becorit</u>	<u>K40</u>
<u>CoFren</u>	<u>C333</u>
<u>CoFren</u>	<u>C810</u>
<u>Knorr-Bremse</u>	<u>Cosid 704</u>
<u>Knorr-Bremse</u>	<u>PROBLOCK J816M</u>
<u>Frenoplast</u>	<u>FR513</u>
<u>Federal Mogul</u>	<u>Jurid 816 M</u> <u>abbreviated: J816M</u>
<u>Federal Mogul</u>	<u>Jurid 822</u>
<u>Knorr-Bremse</u>	<u>PROBLOCK J822</u>
<u>CoFren</u>	<u>C952-1</u>
<u>Federal Mogul</u>	<u>J847</u>
<u>Knorr-Bremse</u>	<u>PROBLOCK J847</u>
<u>Icer Rail / Becorit</u>	<u>IB 116*</u>
<u>Alstom/Flertex</u>	<u>W30-1</u>





**Appendix H Changes of requirements and transition regimes**

During a period that ends on 1 January 2034, new rolling stock may be assessed and certified for compliance with the UTP Noise of 1 April 2021 instead of this UTP. During this time, compliance with the preceding UTP is considered as compliance with this UTP

Projects that are already in the design phase before 1 January 2034, may apply the UTP Noise of 1 April 2021 instead of this UTP until 1 April 2041. In such cases compliance with the preceding UTP is considered as compliance with this UTP

Projects that are already in the production phase before 1 January 2034, may apply the UTP Noise of 1 April 2021 instead of this UTP until the end of the project. In such cases compliance with the preceding UTP is considered as compliance with this UTP

For other TSI points than those listed in Table H.1 and Table H.2, compliance with the ‘previous TSI’ (i.e. this Regulation as amended by Commission Implementing Regulation (EU) 2019/774<sup>31</sup>) imply compliance with this TSI applicable from **[add date that is 10 years after entry into force of TSI]**.

**Changes with a generic transition regime of 7 years:**

For TSI points listed in Table H.1, compliance with the previous TSI does not imply compliance with the version of this TSI applicable from **[add date that is 10 years after entry into force of TSI]**.

Projects already in the design phase on **[add date that is 10 years after entry into force of TSI]** shall comply with the requirement of this TSI from **[add date that is 10 years after entry into force of TSI + 7 years]**.

Projects in the production phase and rolling stock in operation are not affected by the TSI requirements listed in Table H.1.

Table H.1 – transition regime of 7 years

<u>UTP point(s)</u>	<u>UTP point(s) in the previous UTP</u>	<u>Explanation of the UTP change</u>
<u>Not applicable</u>		

[reserved]

**Changes with a specific transition regime:**

For TSI points listed in Table H.2, compliance with the previous TSI does not imply compliance with this TSI applicable from **[add date that is 10 years after entry into force of TSI]**.

Projects already in the design phase on **[add date that is 10 years after entry into force of TSI]**, projects in the production phase, and rolling stock in operation shall comply with the requirement of this TSI in accordance with the respective transition regime set out in Table H.2 starting

<sup>31</sup> Commission Implementing Regulation (EU) 2019/774 of 16 May 2019 amending Regulation (EU) No 1304/2014 as regards application of the technical specification for interoperability relating to the subsystem ‘rolling stock – noise’ to the existing freight wagons (OJ L 139I, 27.5.2019, p. 89).



from [add date that is 10 years after entry into force of TSI].

Table H.2 – Specific transition regime

<u>UTP point(s)</u>	<u>UTP points(s) in the previous UTPs</u>	<u>Explanation of UTP change</u>	<u>Transition regime</u>			
			<u>Design phase not started</u>	<u>Design phase started</u>	<u>Production phase</u>	<u>Rolling stock in operation</u>
<u>Not applicable</u>						