



ORGANISATION INTERGOUVERNEMENTALE POUR LES
TRANSPORTS INTERNATIONAUX FERROVIAIRES

ZWISCHENSTAATLICHE ORGANISATION FÜR DEN
INTERNATIONALEN EISENBAHNVERKEHR

INTERGOVERNMENTAL ORGANISATION FOR
INTERNATIONAL CARRIAGE BY RAIL

OTIF

Uniform Technical Prescription

Subsystem Rolling Stock

Noise

Applicable from 01.12.2015

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APTU Uniform Rules (Appendix F to COTIF 1999)

**Uniform Technical Prescriptions (UTP) applicable to
the Rolling Stock subsystem:**

NOISE - (UTP NOI)

These regulations have been developed in accordance with the provisions of APTU, in particular Article 8, in the version as amended by the OTIF Revision Committee in 2009, which entered into force on 1 December 2010. For definitions and terms, see also Article 2 of APTU (Appendix F) and Article 2 of ATMF (Appendix G), both Appendices to the 1999 version of the COTIF Convention as applicable since 1 December 2010. Footnotes (which are not part of the regulations) include both explanatory information and references to other regulations.

Explanatory note:

The texts of this UTP which appear across two columns are identical to corresponding texts of the European Union regulations. Texts which appear in two columns differ; the left-hand column contains the UTP regulations, the right-hand column shows the text in the corresponding EU regulations. The text in the right-hand column is for information only and is not part of the OTIF regulations. Texts in the right-hand column which are not quoted from the NOI TSI, but from other EU regulations, are in italics.

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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 APTU¹ and Article 3a of ATMF², in particular to:

- The TSI relating to the subsystem “rolling stock – noise” Commission Regulation (EU) No 1304/2014, hereinafter referred to as NOI TSI: 2014.

The Uniform Technical Prescriptions (UTP) relating to the Subsystem Rolling Stock – NOISE, which entered into force on 1.12.2012 (reference A 94-04/2.2012 version 3) are repealed with effect from the date of entry into force of this UTP. However, the version that entered into force on 1.12.2012 may continue to be applied in accordance with the provisions set out in Chapter 7 of these UTP.

¹ **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 December 2010.

² **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 December 2010.

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1. INTRODUCTION

In general

Uniform Technical Prescriptions (UTP)

Technical Specifications for
Interoperability (TSI)

lay down for each subsystem (or part of it) the optimal level of harmonised specifications in order to ensure the interoperability of the rail system. Therefore

UTPs

TSIs

harmonise only the specifications concerning parameters which are critical to interoperability (basic parameters). The specifications of the

UTPs

TSIs

must meet the essential requirements as set out in

UTP GEN-A 2015³.

Annex III of Directive 2008/57/EC.

In line with the proportionality principle this

UTP

TSI

sets out the optimal level of harmonisation related to specifications on the rolling stock subsystem as defined in section 1.1 intended to limit the noise emission of the rail system within the

OTIF Contracting States.

Union.

1.1. TECHNICAL SCOPE

This

UTP

TSI

applies to all rolling stock within the scope of

UTP LOC&PAS 2015⁴ and UTP WAG 2015⁵.

Regulation (EU) No 1302/2014
(LOC&PAS TSI) and Regulation (EU)
No 321/2013 (WAG TSI).

1.2. GEOGRAPHICAL SCOPE

The geographical scope of this

³ Throughout this regulation, UTP GEN-A 2015 means: Uniform Technical Prescriptions – General Provisions, Essential requirements, in the version that entered into force on 1.1.2015.

⁴ Throughout this regulation, UTP LOC&PAS 2015 means: Uniform Technical Prescriptions relating to the subsystem rolling stock, Locomotives and passenger rolling stock, in the version that entered into force on 1.1.2015.

⁵ Throughout this regulation, UTP WAG 2015 means: Uniform Technical Prescriptions relating to the subsystem rolling stock, Freight Wagons, in the version that entered into force on 1.1.2015.

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TSI

corresponds to the scopes defined in section

1.2 of UTP LOC&PAS 2015 and in section 1.2 of UTP WAG 2015,

1.2 of Regulation (EU) No 1302/2014 and in section 1.2 of Regulation (EU) No 321/2013,

each for their rolling stock (RST) concerned.

2. DEFINITION OF THE SUBSYSTEM

A ‘unit’ means the rolling stock which is subject to the application of this

UTP,

TSI,

and therefore subject to the

UTP verification procedure. Chapter 2 of UTP LOC&PAS 2015 and chapter 2 of UTP WAG 2015

‘EC’ verification procedure. Chapter 2 of Regulation (EU) No 1302/2014 and chapter 2 of Regulation (EU) No 321/2013

describe what a unit can consist of.

The requirements of this

UTP

TSI

apply to the following categories of rolling stock

:

set out in section 1.2 in Annex I of Directive 2008/57/EC:

- a) Self-propelling thermal or electric trains. This category is further defined in chapter 2 of

UTP LOC&PAS 2015

Regulation (EU) No 1302/2014

and shall be referred to in this

UTP

TSI

as multiple units, EMU (electrified) or DMU (diesel).

- b) Thermal or electric traction units. This category is further defined in chapter 2 of

UTP LOC&PAS 2015

Regulation (EU) No 1302/2014

and shall be referred to in this

UTP

TSI

as locomotives. Power units that form part of a “self-propelling thermal or electric train” and railcars are not included in this category and belong to the category under point a).

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- c) Passenger carriages and other related cars. This category is further defined in chapter 2 of UTP LOC&PAS 2015 | Regulation (EU) No 1302/2014
and shall be referred to in this UTP | TSI
as coaches.
- d) Freight wagons, including vehicles designed to carry lorries. This category is further defined in chapter 2 of UTP WAG 2015 | Regulation (EU) No 321/2013
and shall be referred to in this UTP | TSI
as wagons.
- e) Mobile railway infrastructure construction and maintenance equipment. This category is further defined in chapter 2 of UTP LOC&PAS 2015 | Regulation (EU) No 1302/2014
and consists of on-track machines (referred to in this UTP | TSI
as OTMs) and Infrastructure Inspection Vehicles, which belong to the categories in points a), b) or d) depending on their design.

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3. ESSENTIAL REQUIREMENTS

All basic parameters set out in this

UTP

TSI

must be linked with at least one of the essential requirements as set out in

UTP GEN-A 2015.

Annex III of Directive 2008/57/EC.

Table 1 indicates the allocation.

Table 1: Basic parameters and their link to the essential requirements

point	basic parameter	essential requirements				
		safety	reliability availability	health	environm. protection	technical compat.
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

Union

rail system

in accordance with the objectives set out in COTIF.

and to achieve interoperability.

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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. 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 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 APTU and Article 2(aa) of ATMF,

Articles 5(5) and 2(l) of Directive 2008/57/EC,

provision may be made for specific cases. Such provisions are indicated in section 7.3.

The assessment procedures for the requirements in this section 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 top of 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 OTMs with electric traction	70	75	85
Diesel locomotives and OTMs with diesel traction	71	78	

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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 at a distance of 7,5 m from the centre of the track and 1,2 m above top of rail.

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 OTMs 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 OTMs 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

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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 m from the centre of the track and 1,2 m above top of 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 and assessed against the applicable limit values of table 4.

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 OTMs with electric traction	84	99
Diesel locomotives and OTMs 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.

4.2.4. 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.

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

The demonstration of conformity is described in point 6.2.2.4.

4.3. FUNCTIONAL AND TECHNICAL SPECIFICATIONS OF THE INTERFACES

This

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TSI

has the following interfaces with the rolling stock subsystem:

Interface with subsystems of points a), b), c) and e) of chapter 2 (dealt with in

UTP LOC&PAS 2015) 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 of point d) of chapter 2 (dealt with in

UTP WAG 2015) with regard to

Regulation (EU) No 321/2013) with regard to

- pass-by noise,
- stationary noise.

4.4. OPERATING RULES

Requirements concerning the operating rules for the subsystem rolling stock are set out in

section 4.4 and Appendix K of UTP LOC&PAS 2015 and in section 4.4 and Appendix I of UTP WAG 2015.

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

4.5. MAINTENANCE RULES

Requirements concerning the maintenance rules for the subsystem rolling stock are set out in

section 4.5 of UTP LOC&PAS 2015 and in section 4.5 of UTP WAG 2015.

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

4.6. PROFESSIONAL QUALIFICATIONS

Not applicable.

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4.7. HEALTH AND SAFETY CONDITIONS

(6)

See Article 6 of this Regulation⁷.

4.8. DATA TO BE RECORDED

4.8. EUROPEAN REGISTER OF AUTHORISED TYPES OF VEHICLES

In accordance with UTP GEN-C 2015 and the OTIF uniform format of certificates, the following noise related characteristics shall be recorded in the Technical File⁸:

- 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))

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.

5. INTEROPERABILITY CONSTITUENTS

There is no interoperability constituent specified in this UTP.

TSI.

⁶ The EU provisions for section 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.

⁷ Article 6 of the 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.”

⁸ UTP GEN-C 2015 means: Uniform Technical Prescriptions (UTP) General Provisions TECHNICAL FILE, in the version that entered into force on 1.1.2015.

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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.

If an innovative solution is proposed, the manufacturer or his authorised representative shall declare how it deviates from or complements the relevant provisions of this UTP and shall submit the deviations to the Secretary General for analysis. The Secretary General will coordinate its opinion with the EU and the European Railway Agency on the proposed innovative solution and submit its opinion to the CTE.

If the CTE supports the opinion, the appropriate functional and interface specifications and the assessment method, which need to be included in the UTP in order to allow the use of this innovative solution, shall be developed in

(9)

⁹ Article 7 of the 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 6 of Directive 2008/57/EC. 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 2008/57/EC and may therefore be used for the assessment of the subsystem.”

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coordination with the EU and subsequently integrated into the UTP during their respective revision processes.

Pending the revision of the UTP, the positive CTE opinion shall be considered as an acceptable means of compliance with the essential requirements of UTP GEN-A 2015 and may therefore be used for the assessment of the subsystem.

6.1. INTEROPERABILITY CONSTITUENTS

Not applicable.

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.

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-D¹⁰.

Decision 2010/713/EU.

¹⁰ General Provisions, UTP GEN-D Assessment procedures (modules) that entered into force on 1.10.2012

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6.2.2. ASSESSMENT PROCEDURES FOR VERIFICATION | EC VERIFICATION PROCEDURES

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 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.

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. 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 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 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 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 7,5m from the centre of the track and a height of 1,2 m above top of rail. The “averaged level method” and the “maximum level method” in accordance with section 7.6 and 7.5 respectively of EN ISO 3095:2013 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 the starting procedure shall be performed without additional trailer loads.

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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.

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.

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. 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

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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.

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

V_{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 $L_{pAeq,Tp(v_{test})}$ 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 $L_{pAeq,Tp(v_{test})}$ 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.

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

V_{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 $L_{pAeq,Tp(v_{test})}$ shall be normalised to a reference APL of 0,225 m^{-1} $L_{pAeq,Tp(APL_{ref})}$ 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.

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

APL_{wag} = Number of axles divided by the length over the buffers [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 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.

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

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

V_{test} = Actual speed during the measurement

6.2.2.3.2.3. OTMs

For OTMs 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 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

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- 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. 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 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 and for which the pass-by noise results are marked 'comparable',
- Chapter 4 of Decision 2011/229/EU¹¹
or Chapter 4 of UTP NOI¹² which entered into force on 1.12.2012
and for which the pass-by noise results are marked 'comparable',
- Chapter 4 of Decision 2006/66/EC¹³,
- Chapter 4 of Decision 2008/232/EC¹⁴.

¹¹ 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)

¹² General Provisions, Rolling stock - NOISE, UTP, APTU (Ref: A 94-04/2.2012, which entered into force on 01.12.2012)

¹³ 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)

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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. Annex E of EN 13979-1:2011)
Tare weight	Only within the range of + 20% / - 5%
Brake block	Only if variation does not result in higher noise emission.

¹⁴ 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)

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7. IMPLEMENTATION

7.1. APPLICATION OF THIS

UTP

TSI

TO NEW SUBSYSTEMS

The UTP certificate of verification and/or conformity to type of a new vehicle established in accordance with UTP NOI, which entered into force on 1.12.2012, shall be considered valid¹⁵:

See Article 8 of this Regulation.¹⁶

- for wagons until 13 April 2016,
- for other vehicles until 31 May 2017.

7.2. APPLICATION OF THIS

UTP

TSI

TO RENEWED AND UPGRADED SUBSYSTEMS

If a

Contracting State

Member State

considers that in accordance with

Article 10§11 of ATMF

Article 20(1) of Directive 2008/57/EC

a new authorisation for placing in service is necessary, the applicant shall demonstrate that the noise levels of renewed or upgraded units remain below the limits set out in the

¹⁵ 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.

¹⁶ 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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which was applicable when the unit in question was first authorised. If no

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existed at the time of the first authorisation, it shall be demonstrated that the noise levels of renewed or upgraded units

with the exception of high speed vehicles ¹⁷

are either not increased or remain below the limits set out in

UTP NOI which entered into force on
1.12.2012.

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

The demonstration shall be limited to the basic parameters affected by the renewal/upgrade.

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. a replacement after a severe damage) does not require a conformity assessment against this

UTP,

TSI,

as long as the unit or the vehicle(s) are identical to the ones they replace.

If, during renewal or upgrading of a wagon, a wagon is being equipped with composite brake blocks and no noise sources are added to the wagon under assessment, then it shall be assumed that the requirements of point 4.2.3 are met without further testing.

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. General specific case

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

¹⁷ EU Decision 2002/735/EC concerning High Speed Rolling Stock has no equivalent in OTIF regulations and therefore there are no equivalent limits for high speed rolling stock in OTIF. Renewed or upgraded high speed vehicles are subject to admission in accordance with ATMF Article 6 §4.

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the NOI TSI.

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

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Appendix A - Open points

This

UTP

TSI

does not contain any open points.

Appendix B - Standards referred to in this

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

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Appendix C Assessment of the rolling stock subsystem

Characteristics to be assessed, as specified in section 4.2					Particular assessment procedure
		Design review	Type Test	Routine Test	Point
Element of the Rolling Stock sub-system	Point				
Stationary noise	4.2.1	X*	X	n.a.	6.2.2.1
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.