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RECOMMENDATION FOR USE

NB-RAIL COORDINATION GROUP

Administrative Decision according to Interoperability Directive
(EU) 2016/797 art. 30.6



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RFU-RST-304

Issue 02

Date 02/03/2021

TITLE

MECHANICAL STRENGTH OF MANUAL END COUPLING

ORIGINATOR

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SUBJECT RELATED TO

LOC&PAS TSI REG (EU) No.
1302/2014 as amended by Reg.
2019/776 and Reg. (EU) 2020/387

AMENDMENT RECORD:

18.11.2019 First issue

03.12.2020 L&P TSI updated by Reg. (EU) 2020/387

DESCRIPTION AND BACKGROUND EXPLANATION

References

(Quotations are written in *blue colour and in italic type*)

[1] TSI LOC&PAS REG (EU) No. 1302/2014

[2] EN 15566:2016

Background

There is a potential hazard “train separation in normal operation”, if the coupler of units intended for general operation does not withstand the exceptional and normal in-service forces during train operation. There is a risk when IC-certified couplers without fatigue validation are used for passenger coaches. Fatigue strength is an essential safety requirement against train separation with hazards to passengers standing in the gangway between two coaches. Withstanding “in-service-forces” in the meaning of fatigue forces (besides exceptional singular forces) is one of the core functions of a screw coupling system.

TSI LOC&PAS [1], clause 5.3.2 Manual end coupling:

“A manual end coupling shall be designed and assessed for an area of use defined by:

(1) The type of end coupling (mechanical interface).

The ‘UIC type’ shall be composed of buffer, draw gear and screw coupling system complying with the requirements of parts related to passenger coaches of the specification referenced in Appendix J-1, index 67 and the specification referenced in Appendix J-1, index 68; units other than coaches with manual coupling systems shall be fitted with a buffer, draw gear and screw coupling system complying with the relevant parts of the specification referenced in Appendix J-1, index 67 and the specification referenced in Appendix J-1, index 68 respectively.

Note: other types of manual end coupling are not considered as an IC (specification not publicly available).

(2) The tensile and compressive forces it is capable of withstanding.”

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Referenced specifications in **Appendix J-1**:

67	<i>Manual end coupling — UIC type</i>	5.3.2	EN 15551:2017	<i>relevant cl.</i>	<i>applies to buffers, not relevant for this RFU</i>
68	<i>Manual end coupling — UIC type</i>	5.3.2	EN 15566:2016	<i>relevant cl.</i>	<i>applies to draw gear and screw coupling</i>

There are different interpretations of what “*mechanical interface*” means. Surely it covers the geometric interface (shape, dimensions) of the coupler.

If it also covers the mechanical strength, then section 4.4 of EN 15566 [2] falls under the “relevant clauses”, which defines a design fatigue lifetime that any coupler must have as a safety related requirement:

4.4 Life time

Draw gear (excluding the elastic device), draw hooks, and screw coupling shall be designed commensurate with the service life of a vehicle. Unless otherwise specified, the service life shall be 30 years.

Evidence shall be provided by appropriate means such as service experience, a dynamic test or by Finite Element Analysis (FEA). If a dynamic test is required, it shall be carried out according to the test procedure described in Annex A.

NOTE 1 The FEA and the dynamic test do not give indication of the real lifetime of a component in operation.

NOTE 2 Lifetime test qualifies the product and the manufacturer.'

Problem for Conformity Assessment

It seems that some NoBos consider the mechanical strength incl. fatigue strength (section 4.4 of EN 15566 [2]) while others don't. This is an unfavourable situation that should be clarified urgently.

RFU PROPOSAL

1. The use of the word "interface" in the TSI and in EN 15566 [2] suggests that "mechanical interface" not only means the geometrical interface.

The Standard referenced in Appendix J-1, index 68 is the relevant clause(s) of EN 15566:2016 [2]. Appendix J-1 explains in a note which are the relevant clauses: '*Clauses of the standard that are in direct relationship to the requirement expressed in the clause of the TSI*'. The requirement of the TSI is the definition of the mechanical interface.

Therefore, clause 4.4 of EN 15566:2016 [2] is mandatory in TSI LOC&PAS.

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2. In general, TSIs do not require a precise life cycle of a vehicle under assessment; however, clauses 4.2.12.3.1 and 4.2.12.3.2 (Maintenance design justification file and Maintenance description file respectively) require considering the life cycle of the vehicle and its components when defining the maintenance activities.

The maintenance description of the IC 'Manual end coupling' must state for which force levels and lifetime it has been designed. Many EC declarations of conformity of the IC 'Manual end coupling' do not include the maintenance description.

3. The EC certificate of the IC 'Manual end coupling' must state the area of use of the IC 'Manual end coupling', that means:

- the type of end coupling (mechanical interface),
- the exceptional (using categories of EN 15566 [2]) tensile and compressive force levels and the in-service tensile (design) force levels,
- the corresponding lifetime.

THIS RFU WAS AGREED ON

PLENARY MEETING 61

THIS RFU ENTERS INTO FORCE ON

FROM THE DATE OF PUBLICATION ON THIS RFU CAN BE APPLIED INSTEAD OF THE PREVIOUS MANDATORY VERSION.

RFU APPLICATION IS MANDATORY STARTING FROM

02/03/2021 AT THIS DATE ANY PREVIOUS OF THIS RFU WILL BE WITHDRAWN.

RFUS SHALL BE APPLIED BY ALL NOBOS. PLEASE REFER TO RFU-STR-702, CHAPTER 3 OF THE SECTION "DESCRIPTION AND BACKGROUND EXPLANATION", FOR THE LEGAL BASIS SUPPORTING THIS OBLIGATION.

ERA COMMENTS

PLENARY MEETING 61 – 25/02/2021