SŽ PPD-2/2018

Infrastructure Manager Guideline to ensure smooth and safe rail transport – Compatibility Tests of on-board and trackside components of the ERTMS/ETCS Level 2 system

as amended by Change No. 1

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director general

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(The person in charge of issuing a correct copy)

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OVERVIEW OF CORRECTIONS AND CHANGES

The holder of the paper version of this document is responsible for the timely and correct incorporation of effective corrections and changes and for making the appropriate records.

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SCOPE OF KNOWLEDGE

The table below sets out the scope of knowledge of this document for a particular job classification (function) or activity, where:

- informative knowledge means, that the employee concerned is aware of the document, knows the subject matter, and upon consulting the relevant provision, is able to independently abide by or act in accordance with that provision;
- full knowledge means that the employee concerned is aware of the document, knows the subject matter, and is able to independently abide by or act in accordance with a relevant provision without consulting the provision;
- literal knowledge means that the employee concerned knows the text of a relevant provision that is written in italics in quotation marks word for word and is able to reproduce it independently without consulting the relevant provision.

If the extent of the knowledge for a job (function) or activity is not determined, the scope of knowledge, if required, is determined by the relevant senior staff member.

Work activity or classification (position)	**Knowledge of provisions**
SŽ – Employees involved in the construction of ETCS	informative – the whole Guideline full – Article 1.4
SŽ – Employees maintaining the signalling system and ETCS	informative – the whole Guideline
SŽ – CTD – Employees involved in ETCS testing	full – the whole Guideline
Carrier – Responsible representative of the carrier and the employees appointed by him	full – the whole Guideline
Compatibility Assessment Body – Employees involved in ETCS testing	full – the whole Guideline

ABBREVIATIONS AND LABELS

The list below contains the abbreviations and labels used in this document. The list does not include the legislative abbreviations, abbreviations and labels generally known, introduced by law, shown in the figures, examples or tables.

AC	Alternating Current
ATAF	Automatic TAF (Automatic Track Ahead Free)
BG	Balise Group
BL2	Baseline 2 pursuant to the European Union legal regulation on the Technical Specification for Interoperability relating to the control command and signalling subsystems
BL3	Baseline 3 pursuant to the European Union legal regulation on the Technical Specification for Interoperability relating to the control command and signalling subsystems
CCS	Control Command and Signalling
CEM	Conditional Emergency Message
CTD	Telematics and Diagnostics Center
DC	Direct Current
DMI	Driver Machine Interface
DMU	Diesel Multiple Unit
DP	Danger Point
EOA	End of Authority
EOM	End of Mission
EMU	Electric Multiple Unit
ERTMS	European Rail Traffic Management System
ETCS	European Train Control System
FS	Full Supervision
GSM-R	Global System for Mobile communication – Railway
HMI	Human Machine Interface
HO	Train handover from a RBC to the adjacent RBC
JRU	Juridical Recorder Unit
KÚ	Track section
L0	Level 0
L2	Level 2
LNTC	Level of National Train Control
LRBG	Last Relevant Balise Group
LS	Continuos transmision system (national train control system of the Czech Republic)
LSTM	Level of Specific Transmission Module
MA	Movement Authority
NL	Non Leading
NTC	National Train Control
O14	Signalling and Telecommunication Department
OBU	On-Board Unit
OS	On Sight

ÖBB	Austrian Federal Railways
pk	Packet
PR	Position Report
PT	Post Trip
RBC	Radio Block Centre
RBC ACC	Accepting RBC
RBC HOV	Handing Over RBC
RV	Reversing
SB	Stand By
SF	System Failure
SN	National System
SH	Shunting
SHP	Samoczynne hamowanie pociagu (Automatic Train Braking), national train control system of the Republic of Poland
SL	Sleeping
SOM	Start of Mission
SPK	Compatibility Assessment Body
SR	Staff Responsible
STM	Specific Transmission Module
SÚ	Signal room
SW	Software
SZZ	Station interlocking system
SŽ	Správa železnic, státní organizace (the Czech railway infrastructure manager)
SŽDC	Správa železniční dopravní cesty, státní organizace (former name of Správa železnic, státní organizace)
TAF	Track Ahead Free
TIU	Train Interface Unit
TR	Trip
TSI	Technical Specifications for Interoperability
TZZ	Line block signalling system
UEM	Unconditional Emergency Message
UN	Unfitted
UTZ	Specified Technical Equipment
VCRP	On Sight Train Route
VUZ	Výzkumný ústav železniční, a. s., Prague
VC	Train Route

1 INTRODUCTORY PROVISIONS

1.1 Správa železnic, státní organizace (hereinafter referred to as "SŽ"), issues this Infrastructure Manager Guideline to ensure smooth and safe rail transport (hereinafter referred to as the "Guideline"), in accordance with the provisions of Section 22(3)(a) of Act No. 266/1994 Coll., on Railways, as amended.

1.2 This Guideline is intended for the performance of on-board and trackside components the ERTMS/ETCS and ERTMS/GSM-R system compatibility tests (i.e. rail system "on-board control-command and signalling" subsystems and "trackside control-command and signalling" subsystems as defined in the European Union´s regulation on rail system interoperability[1]) for the purposes of checking the technical compatibility between the vehicle and the network regarding the usage on tracks equipped with ERTMS/ETCS Level 2 system under the SŽ administration.

1.3 SŽ requires compatibility tests in accordance with the European Union legal regulation on the technical specification for interoperability relating to the control command and signalling subsystems[2] and in accordance with the legislation of the Czech Republic[3] in order to prove the compatibility and prevent operational complications and disruptions in the fluency of rail transport due to the possible operation of incompatible subsystems.

1.4 Employees who process contracts concerning the trackside part of the ERTMS/ETCS system are required to include in the contract with the contractor:

a) knowledge and compliance with this guideline;
b) that the contractor is simultaneously an applicant for EC verification of the CCS trackside subsystem;
c) Supply of the following items for the section that is the content of the trackside part of the ERTMS/ETCS system construction:
   - the list of required tests in accordance with Annex A to this Guideline,
   - a description of other necessary tests not described in Annex A to this Guideline,
   - the recommended test order,

   all of which must be structured in the same way as in Annex A of this Guideline and delivered to the SŽ in written form and in both the closed and open data form;
d) performance of compatibility tests with ERTMS/ETCS on-board units approved into service up to the date of the ERTMS/ETCS trackside part commissioning.

2 BASIC NAMES AND TERMS USED IN THE GUIDELINE

2.1 **Running track** means a station track designed for the arrival, departure or passage of trains, in this document, it is a track also equipped with the trackside part of ETCS

2.2 **Unlimited SR Authorisation** means the authorisation of transition to SR mode, in which D_SR = 32767 (infinity)

2.3 **Zero SR Authorisation** means the authorisation of transition to SR mode, in which D_SR = 0.

2.4 **Limited SR Authorisation** means the authorisation of transition to SR mode, in which D_SR ≠ 0 and D_SR ≠ 32767 (infinity).

2.5 **TAF window** means the area in rear of the main signal, in rear of the ETCS stop marker (ETCS trackside signal board) or in rear of the ETCS location marker, in which the TAF

[1] E.g. in points 2.3 and 2.4 of Annex II to Directive (EU) 2016/797 of the European Parliament and of the Council on the interoperability of the rail system within the European Union, in point 1(a) of Annex II to Directive 2008/57/EC of the European Parliament and of the Council on the interoperability of the rail network within the Community, as amended by Commission Directive 2014/106/EU and the preceding.

[2] E.g. with the point 6.5 of Commission Regulation (EU) No. 2016/919 on the technical specification for interoperability relating to the “control command and signalling” subsystems of the rail system in the European Union.

[3] E.g. with the point 5 of Part II of Annex 3 to Decree No. 173/1995 Coll., which sets out the railway traffic rules, as amended by Decree No. 78/2017 Coll., and the preceding.

request is shown. It is defined by the project according to local conditions. Window length is not greater than:

- the area of real visibility of the main signal, the ETCS stop marker or the ETCS location marker (when the adjacent tracks are free),
- the value of CZ_D_TAFREQDISP.

2.6 **OS window** means the area in rear of the EOA defined by the speed and distance. For the train to be located in the OS window, its speed must be lower than CZ_V_OSPERMISR and its front end must be in the distance shorter than CZ_D_OSPERMISR from the nearest relevant main signal, ETCS stop marker (ETCS trackside signal board) or ETCS location marker.

2.7 **Position unknown or invalid** means the state when the on-board unit cannot determine its position in the coordinate system of the balise groups.

2.8 **Type of ERTMS/ETCS on-board unit** means a set of specific types (specific HW type and SW version) of the products which constitute of the ETCS on-board control-command and signalling subsystem and participate in its function, including Data Only Radio equipment for the purposes of ETCS, with a specific design of the interface ERTMS/ETCS on-board unit – vehicle (hereinafter referred to as TIU).

2.9 **Compatibility Assessment Body** means the body described in the Article 3.3, which is authorised to perform and evaluate compatibility tests.

3 COMPATIBILITY TESTS EXECUTION

3.1 SŽ requires testing according to this Guideline for each type of ERTMS/ETCS on-board unit of the vehicle regardless of the vehicle series or specific form of installation[4]. In the case of a change of the type of ETCS on-board unit that has already been tested, the compatibility tests must be performed again. Based on the assessment of the extent of the changes in the type ETCS on-board unit, the notified body may limit the range of compatibility tests that need to be performed. Testing under this Guideline is not a test of the STM LS module itself, but only a check of the transitions between the LNTC and L2 levels.

3.2 All the tests performed must be executed on the real trackside part of the ERTMS/ETCS L2 system used on the relevant section (see table in point 3.18) and/or on the railway test ring of the Test Centre VUZ Velim, owned by Výzkumný ústav železniční, a. s. (the Railway Research Institute). On the railway test ring of the Test Centre VUZ can only be realized tests for the sections equipped with the same type of RBC and with the same RBC system SW version as is used in RBC on the railway test ring. Some tests on the real trackside part can only be performed in the certain areas or sections. In such cases, these areas (sections) are specified in the initial test conditions or in the test comments. For some tests, the recommended areas (sections) are specifically listed in the chapter "List of recommended test sections" in the relevant appendix.

3.3 The performance and evaluation of the compatibility tests may be carried out by the notified bodies or legal entities authorised to carry out technical inspections and tests of specified technical equipment (hereinafter referred to as UTZ) pursuant to Section 47(4) of Act No. 266/1994 Coll., on Railways, as amended (hereinafter referred to as the Compatibility Assessment Body (SPK)). For these purposes, the SPK must have an authorisation for the on-board and trackside components of the ETCS, or the SPK with an authorisation for the on-board component of the ETCS must cooperate on the execution and evaluation of the tests with a SPK with an authorisation for the trackside component of the ETCS.

3.4 The SPK, which evaluates the tests, shall compose the Protocol on the execution of the tests of the compatibility between the on-board and trackside components of the ERTMS/ETCS subsystem (hereinafter referred to as the Protocol), which shall incorporate at least:

- vehicle identification (type, manufacturer, number)
- version of the vehicle control system

[4] This does not affect the more stringent requirements for compatibility tests (e.g. for each vehicle series, for each form of installation implementation) of other eligible subjects (e.g. from the perspective of the electromagnetic compatibility).

- identification of the on-board unit (type, manufacturer, version of the HW and SW of the used products which constitute the ETCS on-board control-command and signalling subsystem and which participates on its functions, including Data Only Radio for ETCS and STM LS purposes, if applicable)
- OBU identification (NID_ENGINE)
- identification of the set of specifications that the ETCS on-board unit meets, pursuant to the European Union legal regulation on the Technical Specification for Interoperability relating to the control-command and signalling subsystems[5]
- the number of the EC declaration of verification of on-board control-command and signalling subsystem
- identification of the RBC that were used for the tests performing (specific RBC, SW version)
- identification of the eurobalises that were used for the tests performing (type of the eurobalises)
- the number of the EC declaration of verification of trackside control-command and signalling subsystem
- identification of the set of specifications that the ETCS trackside part meets, pursuant to the European Union legal regulation on the Technical Specification for Interoperability relating to the control-command and signalling subsystems[5]
- indentification of the areas of application (ESC Identifier by the "ESC/RSC technical document", No. TD/011REC1028, European Union Agency for Railways)
- the maximum value of the cant deficiency for which the vehicle is approved; for the vehicles with the active tilting, also the maximum value of the cant deficiency for which the vehicle is allowed to operate with inactive tilting device
- the list of train categories which can be selected on the OBU; for each of these categories it is necessary to specify the speed profile applied by the OBU (see test T_131, point 3)
- test results.

3.5 The applicant requesting execution of the compatibility tests must provide a valid EC declaration of verification of CSS subsystem to the Compatibility Assessment Body. This is usually documented before or, in exceptional cases, after the tests. The Protocol cannot be issued without these documents.

3.6 The applicant requesting execution of the compatibility tests must provide to the Compatibility Assessment Body the maximum value of the cant deficiency for which the vehicle is approved, additionally, for the vehicles with the active tilting, the applicant must also provide the maximum value of the cant deficiency for which the vehicle is allowed to operate with inactive tilting device. If the cant deficiency value relevant for the selected category is not obvious from the train category selection on the DMI, the applicant shall, before performing the compatibility tests, submit to the Compatibility Assessment Body a list of train categories that can be selected on the OBU with assigning the corresponding cant deficiency for each train category.

3.7 If any test fail, its course shall be recorded in the Protocol with the maximum level of detail. If it is not obvious that the fault has been caused by the on-board unit , an expert group consisting of the representatives of the trackside and the on-board (mobile) unit manufacturers, the compatibility test applier, SPK and SŽ O14 shall meet to decide on the next steps. If it is obvious that the fault is on the on-board unit, the encryption keys for other vehicles with the same ERTMS/ETCS on-board unit type will not be activated or will be deactivated or will not be released for other vehicles until the fault is resolved.

3.8 The Protocol issued for a section according to the table in point 3.18 does not prove compatibility with other sections. However, if the assessment made by the supplier of the

[5] According to the list of mandatory specifications listed in Annex A to Commission Regulation (EU) No. 2016/919 on the technical specification for interoperability relating to the "control command and signalling" subsystems of the rail system in the European Union.

ETCS trackside part confirms that the difference between the respective sections is insignificant, SŽ O14 decision can extend the validity of these tests to other sections as well. The decision may further specify the additional tests to be carried out.

3.9 If a change to the ERTMS/ETCS L2 trackside components (RBC, balises), which requires assessment by the notified body, is made on a section specified by the table in the point 3.18, the assessment must also include a statement whether it is necessary to perform compatibility tests with those types of ETCS on-board units that have been, based on the performed compatibility test, considered compatible with the trackside (before the change) in that section. This assessment shall include a definition of the types of ETCS on-board units which require the compatibility tests, the range of tests to be performed and, where appropriate, the need to restrict operation or additional technical or administrative measures when operating the vehicles with the relevant types of ETCS on-board unit in that section until compatibility tests are performed.

3.10 The test description does not include the time parameters of each operation on the DMI OBU, of the RBC operator and of the response of the OBU, RBC, or other devices. Specific time parameters are not known at this time and will be added after obtaining the limit values of these time parameters if this appears necessary or appropriate.

3.11 If the "message XXX" is indicated in the test descriptions, it refers to the message XXX according to SUBSET-026-8 of the appropriate set of specifications according to point 3.18. If "pk YY" is indicated in the test descriptions, it refers to the packet number YY according to SUBSET-026-7 of the appropriate set of specifications according to point 3.18.

3.12 Required OBU and RBC responses, which is needed to be checked during the test, are highlighted in bold font in the test descriptions. This does not limit the ability of the examiner to check the equipment functionality in the OBU and/or RBC records by analysing the recorded data and to check for other OBU and/or RBC responses.

3.13 If something needs to be checked that is not directly visible on the OBU DMI or on the RBC HMI, this means to check by analysing the OBU archive (for example JRU) and/or the RBC archive.

3.14 Person participating in the performance of tests must be permanently present at HMI RBC during the tests. This is not stated in the test descriptions. However, this is emphasised for tests which need an RBC operator. Furthermore, the test descriptions indicate the need for non-standard operation of the interlocking or other specific actions concerning the interlocking (e.g. simulation of the occupancy of the KÚ).

3.15 In the test description, the indications on the OBU DMI are based on what is required for the OBU according to the Baseline 2 (hereinafter referred to as BL2) and Baseline 3 (hereinafter referred to as BL3). Since the requirements vary in the amount of information displayed and in the way they are displayed, the test specifications are written in such a general manner that there is no need to distinguish between the two baseline versions in the test specifications.

3.16 Before the commencement of the tests, the SŽ CTD shall issue the encryption keys for the respective OBU to be tested and the carrier / vehicle operator shall ensure their uploading into the OBU. Concerning the RBC, the encryption keys will only be uploaded for the duration of the tests. As long as the encryption key is valid, the vehicle may not be operated on a given line outside the scope of the tests if the ETCS on-board unit is in operation or it cannot be effectively prevented from the transition to L2 by the trackside section order. If the test is carried out on the railway test ring of the Test Centre VUZ Velim, the release and upload of the encryption keys into the RBC must be ensured timely with the VUZ.

3.17 The LNTC abbreviation has the same meaning for vehicles with the BL2 on-board unit as LSTM.

3.18 The Guideline describes the compatibility tests on the sections listed in the table. The set of tests listed in the last column of the table shall be used for the relevant section.

Section	RBC type (RBC manufacturer)	The RBC corresponds to the set of specifications[5] no.	GSM-R corresponds to the set of specifications no.	Test set, identification of the areas of application
Kolín (inclusive) – Česká Třebová – Adamov (inclusive), Modřice (exclusive) – Břeclav – state border with Austria/Slovakia	REA 10 (AŽD Praha, s. r. o.)	1 (BL2)	1	T_101 to T_132[6] ESC-CZ-01
Petrovice u Karviné – Břeclav, Česká Třebová (exclusive) – Přerov, Český Brod – Praha-Malešice – Praha-Uhříněves	REA 11 (AŽD Praha, s. r. o.)	3 (BL3R2) System version 1	1	T_103, T_105, T_107 to T_115, T_117 to T_121, T_123, T_124, T_128 to T_132[6] T_106, T_201 to T_210 ESC-CZ-02

[6] Tests No. T_103, T_105, T_107 to T_115, T_117 to T_121, T_123, T_124, T_128 to T_132 will be executed only if they have not already been done for the other section.

4 EMPOWERING AND FINAL PROVISIONS

4.1 Director of the administrative department is authorized to approve amendments of this Guideline's attachments and all the related changes in the main part of this Guideline.

4.2 Please acquaint demonstrably all employees specified in the Scope of knowledge the contents with this Instruction.

4.3 Please include the contents of this Guideline to the soonest mandatory training of the employees specified in the Scope of knowledge.

4.4 The Guideline is issued in electronic form only.

4.5 The Guideline enters into validity on the date of signature.

4.6 The Guideline enters into force on 01 September 2018.

Annex A (normative)

Compatibility tests for the section Kolín (incl.) – Česká Třebová – Adamov (incl.), Modřice (excl.) – Břeclav – state border with Austria/Slovakia

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A.1 List of compatibility tests

T_101 Establishing the communication session and SOM with unknown or invalid position

T_102 Establishing the communication session and SOM with a valid position

T_103 SR authorisation and its changes

T_104 Transition from SR mode to FS mode using ATAF

T_105 Transition from SR mode to OS mode followed by transition to FS mode using TAF procedure

T_106 Train run in FS mode

T_107 Transition from FS mode to OS mode on the running track (transition in the actual location)

T_108 Transition from FS mode to OS mode in rear of the automatic block signal (transition in a future location)

T_109 MA OS extension and consequent regeneration MA OS to MA FS

T_110 Zero TAF

T_111 CEM – acceptance and revocation

T_112 Sending the UEM and its revocation

T_113 End of the train mission

T_114 Shunting in SH mode, passing BG with the Danger for SH information

T_115 Transition to the ETCS trackside exclusion

T_116 Return from the ETCS trackside exclusion without stopping

T_117 Entry into the ETCS L2 area in FS mode with sending the MA FS in rear of the entry border

T_118 Exit from the ETCS L2 area

T_119 Entry into the ETCS L2 area in FS mode with sending the MA FS at the entry border

T_120 Cancelling of the exit from the ETCS L2 area

T_121 Entry into the ETCS L2 area in OS mode

T_122 Passage of a train through a place with the change of traction system

T_123 Handover (HO) – handover of a train that is capable of conducting two communication sessions

T_124 Handover (HO) – handover of a train that is capable of conducting one communication session

T_125 Special Handover (HO) – train run from Břeclav to Bernhardsthal

T_126 Special Handover (HO) – train run from Bernhardsthal to Břeclav

T_127 Departure from Břeclav in LNTC different from the LS

T_128 Loss of connection

T_129 Position report from single BG

T_130 No establishing communication session in SL mode

T_131 Static speed profile assignment

T_132 Receiving of the MA with endtimer equals to zero

A.2 Recommended test order

T_101 – T_104 – T_106 – T_108 – T_109 – T_115 – T_116

T_102 – T_103 – T_105 – T_107 – T_110 – T_111 – T_112 – T_113 – T_114

T_117 – T_118 (for LS STM equipped vehicle with LS STM enabled) – T_119 – T_120 – T_121 – T_118 (for LS STM equipped vehicle with LS STM disabled)

T_123 – T_124

T_125 – T_126 – T_127

T_122

T_128

T_129

T_130

T_131

T_132

A.3 Description of individual tests

Test designation	T_101
Test name	**Establishing the communication session and SOM with unknown or invalid position**
Recommended previous test	Empty.
Initial conditions	The vehicle with OBU is within the ETCS L2 area with not powered OBU. *Note: To allow for the execution of the recommended follow-up test, the vehicle should stand on a running track at a location where there is no BG other than BG at the main signal between train front end and the nearest relevant main signal.* *Note: If the OBU does not send a PR with an unknown or invalid position when the OBU is turned on and the self-tests are completed, the unknown or invalid position is simulated by the procedure defined by the OBU manufacturer.*
Necessary co-operation with the infrastructure staff	Empty.
Test description	1. The OBU power is turned on. 2. The OBU self-tests are performed properly when the power is turned on. 3. If necessary, level (L2) and RBC contact information (NID_MN, NID_RADIO, NID_C, NID_RBC) are entered or validated on the OBU DMI. 4. OBU establishes a connection with RBC at a safe Euroradio level. 5. OBU establishes a communication session with RBC (exchange of messages 155, 32 and 159). 6. **It must be indicated on the OBU DMI that communication session has been established.** 7. **A new train with unknown train data and unknown direction has to be indicated on the RBC HMI in the RBC stack.** 8. OBU sends a SOM PR message in SB mode with an unknown position (message 157 with Q_STATUS = 2) or an invalid position (message 157 with Q_STATUS = 0). 9. **The reception of such a PR must be checked in the RBC JRU.** 10. RBC accepts the train (sends message 41) and, if the position is invalid, sets the LRBG to unknown (NID_LRBG = 16777215). The LRBG of all subsequent PR (pk 0) from the OBU must be unknown until the new BG is read. 11. The train data is entered on the OBU DMI, and the OBU sends it to the RBC (message 129 with pk 11). 12. The RBC confirms the train data (message 8) and sends to OBU national values and parameters for PR and for MA request (message 24 with pk 3, 57 and 58). 13. If the confirmation of message 24 with pk 3, 57 and 58 is not received by RBC and PR with error reporting (pk 4 with M_ERROR = 3) is received, RBC sends parameters for PR and MA (message 24 with pk 57, 58, i.e. without pk 3) to OBU again. 14. **On the RBC HMI, unknown train data must be changed to specific data.** **Presented train data must meet the train and vehicle parameters entered into the DMI OBU (train number is checked as well as train length, train category and maximum train speed if entered) as well as the parameters given into the OBU while OBU was implemented into EMU or DMU (train length, train category, maximum train speed and type of traction is checked according to the technical documentation or according to the reality).** 15. **The possibility to select Start must be available on the OBU DMI.** 16. Start is selected on the OBU DMI. 17. OBU sends a MA request (message 132). 18. The RBC sends the unlimited SR authorisation to OBU (message 2 with D_SR = 32767).

	19. Displaying of the speed limits in SR/OS mode is toggled on the OBU DMI. 20. **SR mode and the maximum speed V_NVSTFF must be indicated on the OBU DMI, the permitted distance must not be limited.** 21. **If the vehicle is standing more than approximately 50 m in rear of the main signal, the unlimited SR authorisation** (message 2 with D_SR = 32767) **must be checked in the OBU JRU or it must be checked on OBU DMI during the run according to the recommended follow-up test, that the permitted distance is not limited during the entire time of driving in SR mode.** 22. **The train in SR mode with the unknown direction must be indicated in the RBC stack on the RBC HMI.** 23. Train in SR mode reads some BG and sends PR to the RBC (pk 0 or pk 1). 24. If RBC did not receive confirmation of message with the national values from the OBU (message 24 with pk 3) – see step 13, RBC sends the national values, parameters for PR and for MA request to OBU again (message 24 with pk 3, 57 and 58).
Comments	The contact details for each RBC are listed in the Route Book.
Recommended follow-up test	T_104

Test designation	T_102
Test name	**Establishing the communication session and SOM with a valid position**
Recommended previous test	Empty.
Initial conditions	The OBU is in SB mode, has no established communication with the RBC and considers its position to be valid. No desk is activated. The vehicle is located in the L2 area. No route is set from the running track. Neither VC, nor shunting route is set to the main signal for the opposite direction (if the running track is split for the opposite direction). *Note: In order to enable continuation with the recommended follow-up test, the vehicle should stand on a split running track at a location where the main signal for the opposite direction of travel is between the vehicle front end and the nearest main signal relevant for the tested vehicle.* *Note: Due to one of the recommended follow-up tests, it is recommended that the front end of the train should be in the place where there is a BG between the train front end and the BG at the main signal that is relevant for the train and this BG is located in the TAF window.* *Note: Valid position can be achieved, for example, by entering the running track (and by reading BG at the beginning of this track) in SH, NL, FS, OS or SR mode and performing EOM.*
Necessary co-operation with the infrastructure staff	Empty.
Test description	1. The desk is enabled in the vehicle. 2. OBU establishes a connection with RBC at a safe Euroradio level. 3. OBU establishes a communication session with RBC (exchange of messages 155, 32 and 159). 4. **It must be indicated on the OBU DMI that communication session has been established.** 5. **A new train with unknown train data and unknown direction has to be indicated on the RBC HMI in the RBC stack.** 6. OBU sends a SOM PR message in SB mode with a valid position (message 157 with Q_STATUS = 1). 7. **SB mode and the train direction must be indicated on the RBC HMI.** 8. The train data is entered on the OBU DMI, and the OBU sends it to the RBC (message 129 with pk 11). 9. The RBC confirms the train data (message 8). RBC sends national values and parameters for PR and for MA request to OBU (message 24 with pk 3, 57 and 58). 10. **On the RBC HMI, unknown train data must be changed to specific data.** **Presented train data must meet the train and vehicle parameters entered into DMI OBU (train number is checked as well as train length, train category and maximum train speed if entered) as well as the parameters given into the OBU while OBU was implemented into EMU or DMU (train length, train category, maximum train speed and type of traction is checked according to the technical documentation or according to the reality).** 11. **The possibility to select Start must be available on the OBU DMI.** 12. Start is selected on the OBU DMI. 13. OBU sends a MA request (message 132). 14. The RBC sends a limited SR authorisation to the train (message 2) with the D_SR corresponding to the distance between the front end of the vehicle and the nearest main signal relevant to the direction of the vehicle. 15. Displaying of the speed limits in SR/OS mode is toggled on the OBU DMI. 16. **SR mode, maximum speed V_NVSTFF or lower depending on the length of SR authorisation, the target speed 0 km/h and the permitted distance which correspond to the distance of the front end of the vehicle to the nearest main signal relevant for the train must**

	be indicated on the OBU DMI. 17. **The train in SR mode with the indicated direction of the actual direction of the train must be indicated in the RBC stack on the RBC HMI.**
Comments	The contact details for each RBC are listed in the Route Book.
Recommended follow-up test	T_103

Test designation	T_103
Test name	**SR authorisation and its changes**
Recommended previous test	T_102
Initial conditions	The train stands on a split running track, in the ETCS L2 area, at a location where the main signal for the opposite direction of travel is between the front end of the vehicle and the nearest main signal relevant for the tested vehicle. The OBU is in SR mode, has a known position and a limited SR authorisation. No VC is set for the train from the running track. *Note: Due to one of the recommended follow-up tests, it is recommended that the front end of the train should be in the place where there is a BG between the train front end and the BG at the main signal that is relevant for the train and this BG is located in the TAF window.*
Necessary co-operation with the infrastructure staff	Operator at the SZZ control in the event of setting and cancelling a non-used VC.
Test description	1. The VC is set towards the opposite main signal dividing the running track on which the train stands. 2. The RBC sends a zero SR authorisation (message 2 with D_SR = 0) and a text message (message 24 with pk 72) with the information about the zero length of SR authorisation. 3. **The zero permitted speed, zero permitted distance and the text message that requires confirmation must be indicated on the OBU DMI.** 4. The text message is confirmed on the OBU DMI. 5. The VC in the opposite direction is cancelled and the RBC sends a limited SR authorisation (message 2 with D_SR = distance from the front end of the train to the nearest point, which can be the EOA, i.e. to the the main signal relevant to the train direction) and a text message (message 24 with pk 72) with the information about the possibility of a run in SR mode. 6. **The maximum speed V_NVSTFF or lower depending on the length of the SR authorisation, the target speed 0 km/h, the permitted distance which correspond to the distance to the nearest main signal relevant to the train direction and the text message must be indicated on the OBU DMI.** 7. A VC is set for the tested train. 8. The RBC sends the unlimited SR authorisation (message 2 with D_SR = 32767). 9. **SR mode, the maximum speed V_NVSTFF and permitted distance without limitation must be indicated on the OBU DMI.**
Comments	Empty.
Recommended follow-up test	T_105

Test designation	T_104
Test name	**Transition from SR mode to FS mode using ATAF**
Recommended previous test	T_101
Initial conditions	The train stands in SR mode on a running track, in the ETCS L2 area, at a location where there is no BG between the front end of the train and the BG at the nearest main signal relevant for its direction of travel (i.e. the nearest BG is at the main signal). The train position is known or unknown. A train route is set for the train from the running track, where it stands (from the route signal or exit signal).
Necessary co-operation with the infrastructure staff	Empty.
Test description	1. The train moves in the direction of the set VC. 2. The OBU reads BG at the exit or route signal. 3. The OBU sends PR, in which BG at the exit or route signal is used as LRBG, to the RBC. 4. The train occupies the track section in advance of the exit or route signal (this can occur even before or simultaneously with the event according to point 3). 5. The RBC sends the MA FS to OBU (message 3 with pk 15, 5, 21, 27 and 68). 6. **The OBU must switch to FS mode** (FS mode is indicated on the OBU DMI) **and the permitted speed and distance must be limited according to the conditions of the VC**.
Comments	Empty.
Recommended follow-up test	T_106

Test designation	T_105
Test name	**Transition from SR mode to OS mode followed by transition to FS mode using TAF procedure**
Recommended previous test	T_103
Initial conditions	The train is in SR mode on a running track or a line track, with the front end in the ETCS L2 area, at the location where a BG is located between the train front end and the nearest main signal relevant for its direction of travel (this is not the BG located directly at this signal). The position of the train may be known or unknown. If the train is on the running track, a train route is set for it (from the route or exit signal). If the train is in the block section of the automatic block, at least the following block section is clear.
Necessary co-operation with the infrastructure staff	Empty.
Test description	1. The train moves in the direction of the set route or in the direction of line consent. 2. The OBU reads the BG and sends PR to the RBC. 3. If there is less than 400 m between the BG and the main signal, the driver stops the train. 4. The RBC sends the MA OS to the train (message 3 with pk 15, 80, 5, 21, 27 and 68). 5. **The OBU must switch to OS mode** (OS mode is indicated on the OBU DMI)**.** 6. **The active button or icon for OS confirmation must be indicated on the OBU DMI.** 7. The RBC sends a TAF request to the train (message 34). **Option A** - The OBU displays the confirmation request for OS mode and TAF at the same time: 8. The TAF is confirmed on the OBU DMI and the OBU sends the TAF Granted information (message 149). 9. The RBC sends the MA FS (message 3 with pk 15, 5, 21, 27 and 68). 10. **The OBU must switch to FS mode** (FS mode is indicated on the OBU DMI)**.** **Option B** - The OBU does not display the confirmation request for OS mode and TAF at the same time: 8. OS mode is confirmed on the OBU DMI. 9. **The TAF request must be displayed after the OS mode confirmation on the OBU DMI.** 10. The TAF is confirmed on the OBU DMI and the OBU sends the TAF Granted information (message 149). 11. The RBC sends the MA FS (message 3 with pk 15, 5, 21, 27 and 68). 12. **The OBU must switch to FS mode** (FS mode is indicated on the OBU DMI)**.**
Comments	Empty.
Recommended follow-up test	T_107

Test designation	T_106
Test name	**Train run in FS mode**
Recommended previous test	T_104
Initial conditions	The train runs in FS mode. The test shall be performed on a section, where it is possible to achieve the speed corresponding to the design speed of the tested vehicle. If this speed exceeds 160 km/h, the test can be performed on a section with the line speed of 160 km/h.
Necessary co-operation with the infrastructure staff	Operator at the SZZ control in the event of setting and cancelling a non-used VC.
Test description	1. The RBC cyclically sends the MA FS to the OBU so that the T_SECTIONTIMER timer does not expire. 2. A straight VC is set on the SZZ in the stations so that the conditions for MA is met for minimal length of 7.5 km. 3. **FS mode must be indicated on the OBU DMI and it must be possible to display the MA length up to 7.5 km in the planning area.** 4. **If the vehicle is equipped with an eddy current brake, the OBU DMI must still display an icon indicating the Switch off eddy current brake information.** 5. The OBU sends PR cyclically with the period as requested RBC in pk 58. 6. **The train speed shall be increased to the highest permitted speed (for tested vehicles with a design speed of 160 km/h or more to the speed of 160 km/h).** 7. **When passing every BG, the OBU must send a PR, in which passed BG is used as LRBG** (this is checked in the JRU records [preferentially RBC JRU], especially for the balise groups that are close to each other, e.g. the BG at the home signal and the BG at the Limit of shunting signal)**.** 8. With each change of LRBG in PR from OBU, the RBC sends MA FS with this new LRBG. 9. The RBC sends a CEM (message 15) that OBU rejects (message 147 with Q_EMERGENCYSTOP = 1). 10. Train speed can be reduced. 11. On the SZZ, the non-used route is cancelled at a sufficient distance before the train (so that its cancelling does not cause the train speed to exceed the braking curve, the cancelled route must begin with a signal where the non-zero value of release speed is configured). 12. **MA shortening must be visible in the planning area on the DMI OBU, the correct value of release speed must be indicated on the OBU DMI.** 13. The train stops near the end of the Movement Authority (if possible, the train speed exceeds the braking curve when reaching the end of the Movement Authority but does not exceed the release speed), the OBU sends PR with zero speed to the RBC. 14. The RBC starts to sending the MA FS without DP (pk 15 with Q_DANGERPOINT = 0) to the OBU. 15. **The non-zero release speed must change to the zero release speed on the OBU DMI.** 16. The previously cancelled route is set for the tested train. 17. **MA extension is checked on the OBU DMI.**
Comments	At least one section between two stations (at the track with an automatic block divided into at least two block sections) and one station must be passed through at the highest permitted speed. The test includes the transmission of track conditions (Switch off eddy current brake). The release speed values assigned to the individual signals are indicated in the release speed table.
Recommended follow-up test	T_108

Test designation	T_107
Test name	**Transition from FS mode to OS mode on the running track (transition in the actual location)**
Recommended previous test	T_105
Initial conditions	The train in FS mode is on the running track, while the EOA is at the end of the track on which the train is located. The track section in advance of the EOA is free and it is not locked by any train route.
Necessary co-operation with the infrastructure staff	The maintenance employee in the SÚ for simulation of the occupancy of the track section.
Test description	1. The occupancy of the immediate track section in advance of the EOA is simulated. 2. The RBC receives information about the danger in advance of the EOA from the SZZ. 3. The RBC will start sending the MA OS with the same EOA as in the previously sent MA FS. If MA FS included a DP, the MA OS is without any DP (Q_DANGERPOINT = 0). 4. **The OBU must switch to OS mode** (OS mode is indicated on the OBU DMI)**.** 5. The transition to OS mode is confirmed on the OBU DMI.
Comments	Empty.
Recommended follow-up test	T_110

Test designation	T_108
Test name	**Transition from FS mode to OS mode in rear of the automatic block signal (transition in a future location)**
Recommended previous test	T_106
Initial conditions	The occupancy of the track section is simulated in one of the block sections. The train in FS runs to the signal at the beginning of the block section with the occupied track section. The EOA is at the signal at the beginning of the occupied block section. The other conditions of the TZZ and RBC for the run in OS mode in advance the block signal are met. The train front end is not yet in the OS window. *Note: The track section occupancy must be simulated before the train enters the track section preceding the block section with the occupied track section.*
Necessary co-operation with the infrastructure staff	The maintenance employee in the SÚ for simulation of the occupancy of the track section.
Test description	1. The train front end enters the OS window in rear of the block signal at danger. 2. OBU sends a PR with the information, that the front end of the train is located in the OS window. 3. The RBC starts sending the MA FS with the OS mode profile in the part of the MA and with the EOA at the next main signal to the train (i.e. with the EOA at signal at the end of the block section with the occupied KÚ). 4. **The request to confirm the transition to OS mode must be displayed on the OBU DMI.** 5. The transition to OS mode is confirmed on the OBU DMI. 6. **The OBU must switch to OS mode** (OS mode is indicated on the OBU DMI)**.** 7. **The MA extension must be displayed on the OBU DMI.** 8. RBC starts sending the MA OS. 9. The train continues the run in OS mode in advance the block signal.
Comments	The KÚ occupancy simulation can be cancelled as soon as the train passes the block signal.
Recommended follow-up test	T_109

Test designation	T_109
Test name	**MA OS extension and consequent regeneration MA OS to MA FS**
Recommended previous test	T_108
Initial conditions	The occupancy of the track section is simulated on one of the block sections. The train in the OS runs to the signal at the beginning of the block section with the occupied KÚ. The EOA is at the signal at the beginning of the occupied block section. The other conditions of the TZZ and RBC for the run in OS mode in advance of the block signal are met. The train front end is not yet in the OS window. *Note: The KÚ occupancy must be simulated before the train enters the track section preceding the block section with the occupied KÚ.*
Necessary co-operation with the infrastructure staff	The maintenance employee in the SÚ for simulation of the occupancy of the track section. Operator at the SZZ control in the event of cancelling a block condition fault. Operator at the SZZ control in the event of setting the entrance route for the simulation of the release of the last block section.
Test description	1. The train enters the OS window in rear of the block signal at danger. 2. OBU sends a PR with the information, that the front end of the train is located in the OS window. 3. The RBC, after receiving the PR, extends the MA OS to the next block section. 4. Before the train enters the next block section, release of this block section is simulated (simulation of the previous train run to the following block section or to the station). 5. The RBC sends a TAF request to OBU (message 34). 6. **A TAF request is displayed on the OBU DMI.** 7. The TAF is confirmed on the OBU DMI and the OBU sends the TAF Granted information (message 149). 8. The RBC starts sending the MA FS. 9. **The OBU must switch to FS mode** (FS mode is indicated on the OBU DMI)**.**
Comments	Empty.
Recommended follow-up test	T_115

Test designation	T_110
Test name	**Zero TAF**
Recommended previous test	T_107
Initial conditions	The train is in OS mode in rear of exit, route or home signal in the TAF window.
Necessary co-operation with the infrastructure staff	Operator at the SZZ control in the event of setting and cancelling a non-used VC.
Test description	1. The train route is set for the train. 2. The RBC sends a TAF request to OBU (message 34). 3. **The TAF request must be displayed on the OBU DMI.** 4. The train route is cancelled. 5. The RBC sends a request to cancel the TAF request displaying to OBU (message 34 with D_TAFDISPLAY = L_TAFDISPLAY = 0). 6. **The TAF request must be deleted from the OBU DMI**. 7. The train route is set for the train again. 8. The RBC sends a new TAF request to OBU (message 34). 9. **The TAF request must be displayed on the OBU DMI.** 10. The TAF is confirmed on the OBU DMI. 11. The OBU sends the TAF Granted information to the RBC (message 149). 12. The RBC sends the MA FS to OBU (message 3 with pk 15, 5, 21, 27 and 68). 13. **The OBU must switch to FS mode** (FS mode is indicated on the OBU DMI)**.**
Comments	Empty.
Recommended follow-up test	T_111

Test designation	T_111
Test name	**CEM – acceptance and revocation**
Recommended previous test	T_110
Initial conditions	The train is on the running track (preferably split) or in the block section in the ETCS L2 area at least 50 m in rear of the end of the KÚ. The OBU is in FS mode. The EOA is at least at the end of the immediately following KÚ in rear of the train. This KÚ is free.
Necessary co-operation with the infrastructure staff	The maintenance employee in the SÚ for simulation of the occupancy of the KÚ. Operator at the SZZ control in the event of cancelling a block condition fault.
Test description	1. The occupancy of the next KÚ (i.e. KÚ immediate in advance of the KÚ in with the train is) due to a failure is simulated. 2. The RBC sends the CEM to the train (message 15). 3. The OBU sends the CEM acceptance (message 147 with Q_EMERGENCYSTOP = 0). 4. The RBC sends the UEM to the train (message 16). 5. **The OBU must switch to TR mode** (braking is activated, TR mode is indicated on the OBU DMI)**.** 6. **The emergency stop order must be indicated on the OBU DMI.** 7. **After confirming the transition to TR mode on the OBU DMI, the OBU must switch to PT mode** (PT mode is indicated on the OBU DMI)**.** 8. The RBC sends the Recognition of exit from TR mode to the train (message 6). 9. The RBC sends the CEM revocation (message 18) and the UEM revocation (message 18) to the train. 10. **The possibility to select Start must be available on the OBU DMI.** 11. Start is selected on the OBU DMI and the OBU sends a MA request (message 132). 12. The RBC sends the OS MA to the train (message 3 with pk 15, 27, 21, 5 and 80). 13. **The OBU must switch into OS mode** (OS mode is indicated on the OBU DMI)**.**
Comments	Empty.
Recommended follow-up test	T_112

Test designation	T_112
Test name	**Sending the UEM and its revocation**
Recommended previous test	T_111
Initial conditions	The train is on a running track or on a block section in the ETCS L2 area. The OBU is in either FS or OS mode.
Necessary co-operation with the infrastructure staff	RBC HMI operator when setting and revoking the Stop order.
Test description	1. Addressed (individual) Stop order for the tested train is set on the HMI RBC. 2. The RBC sends the UEM to the train (message 16). 3. **The OBU must switch to TR mode** (braking is activated, TR mode is indicated on the OBU DMI)**.** 4. **The emergency stop order must be indicated on the OBU DMI.** 5. **After confirming the transition to TR mode on the OBU DMI, the OBU must switch to PT mode** (PT mode is indicated on the OBU DMI)**.** 6. The RBC sends the Recognition of exit from TR mode to the train (message 6). 7. The addressed Stop order is revoked on the RBC HMI. 8. The RBC sends the UEM revocation to train (message 18). 9. **The possibility to select Start must be available on the OBU DMI.** 10. Start is selected on the OBU DMI and the OBU sends a MA request (message 132). 11. The RBC sends the OS MA to the train (message 3 with pk 15, 27, 21, 5 and 80). 12. **The OBU must switch to OS mode** (OS mode is indicated on the OBU DMI)**.**
Comments	Empty.
Recommended follow-up test	T_113

Test designation	T_113
Test name	**End of the train mission**
Recommended previous test	T_112
Initial conditions	The train is in FS, OS or SR mode in the ETCS L2 area.
Necessary co-operation with the infrastructure staff	Empty.
Test description	1. The vehicle desk is closed. 2. The OBU sends the EOM to the RBC (message 150). 3. **The OBU switches to the SB mode** (SB mode is indicated on the OBU DMI or DMI becomes blank)**.** 4. **There must be a mode change to SB visible on the RBC HMI or the transition to the SB mode is checked in the OBU JRU.** 5. The RBC orders the OBU to terminate the communication session (message 24 with pk 42). 6. The OBU sends the RBC the information about the termination of communication session (message 156). 7. The RBC confirms the termination of communication session (message 39). 8. The connection is terminated at a safe Euroradio level. 9. **All information about the train must be deleted on the RBC HMI.**
Comments	SB mode is indicated only for a short time on the RBC HMI, so it is necessary to notify the person at the RBC HMI about the desk closing in advance.
Recommended follow-up test	T_114

Test designation	T_114
Test name	**Shunting in SH mode, passing BG with the Danger for SH information**
Recommended previous test	T_113
Initial conditions	The tested vehicle is in the SB mode in the ETCS L2 area and its desk is closed.
Necessary co-operation with the infrastructure staff	Empty.
Test description	1. The vehicle desk is enabled. 2. The OBU establishes a communication session with the RBC. 3. Shunting is selected on the OBU DMI. 4. The OBU sends a Request for shunting (message 130) to the RBC. 5. The RBC sends Shunting Authorised (message 28) to the OBU 6. **The request to confirm the transition to SH mode must be displayed on the OBU DMI.** 7. The transition to SH mode is confirmed on the OBU DMI. 8. **The OBU must switch to SH mode** (SH mode is indicated on the OBU DMI)**.** 9. The OBU sends PR in SH mode to the RBC. 10. The RBC orders the OBU to terminate the communication session (message 24 with pk 42). 11. The OBU sends the RBC the information about the termination of communication session (message 156). 12. The RBC confirms the termination of communication session (message 39). 13. **The established communication session with the RBC must not be indicated any more on the OBU DMI.** 14. **All information about the OBU must be deleted on the RBC HMI.** 15. The vehicle, moving at a low speed, reads the BG containing the Danger for SH information (pk 132) which is valid for the train direction of travel. 16. **OBU must switch to TR mode** (braking is activated, TR mode is indicated on the OBU DMI) and begins to establish a communication session with the RBC**.** 17. **After stopping and confirming the transition to TR mode on the OBU DMI, the OBU must switch to PT mode** (PT mode is indicated on the OBU DMI)**.** 18. The OBU establishes a communication session with the RBC while still in TR mode or, after stopping, in PT mode (messages exchange 155, 32 and 159). 19. **The established communication session with the RBC must be indicated on the OBU DMI.** 20. **The train in TR or PT mode must be indicated on the RBC HMI.** 21. The RBC sends the Recognition of exit from TR mode to the OBU (message 6). 22. The RBC orders the OBU to terminate the communication session (message 24 with pk 42). 23. The OBU sends the RBC the information about the termination of communication session (message 156). 24. The RBC confirms the termination of communication session (message 39). 25. **The established communication session with the RBC must not be indicated any more on the OBU DMI.** 26. **All information about the train must be deleted on the RBC HMI.** **For the baseline 3 OBU:** 27. The vehicle desk is closed. 28. **The OBU must switch to SB mode (SB mode is indicated on the OBU DMI or DMI becomes blank).** **For the baseline 2 OBU:** **Scenario A:** OBU allows to enter the train data in the PT mode. 27. **It must be able to enter the train data on the OBU.**

	28. Train data is entered on the OBU DMI. 29. **The OBU must allow to trigger Override EOA option.** 30. Override EOA is selected on the OBU DMI. 31. **The OBU must switch to SR mode** (SR mode is indicated on the OBU DMI). **Scenario B:** OBU does not allow to enter the train data in the PT mode. 27. **The OBU must allow switch to SR mode in the suitable way** (e.g. a choice to restart the EVC is allowed)
Comments	The information Danger for SH is in the BG located at the Limit of shunting signal (the validity direction for departure from the station) or in the BG located at the home signal (the validity direction for entering the station).
Recommended follow-up test	Empty.

Test designation	T_115
Test name	**Transition to the ETCS trackside exclusion**
Recommended previous test	T_109
Initial conditions	The train is in FS mode on the running track in rear of the exit signal. A definitive ETCS exclusion is activated for the line track where a train departure route can be set.
Necessary co-operation with the infrastructure staff	RBC HMI operator when ETCS exclusion is activated and cancelled.
Test description	1. The VC is set to a line track with an ETCS exclusion activated. 2. The RBC sends a text message informing about the approach of ETCS excluded area (message 24 with pk 72) to the OBU. 3. **The text message with the information about the ETCS exclusion area must display on the OBU DMI.** 4. Train speed is lower than V_NVALLOWOVTRP. 5. Override EOA is selected on the DMI OBU. 6. **The OBU must switch to SR mode** (SR mode is indicated on the DMI OBU)**.** 7. The RBC sends the LNTC / L0 level transition order (message 24 with pk 41 with LNTC/LS – L0 – L2 priority order and D_LEVELTR = 32767) to the train. 8. **If the OBU is equipped with STM LS, it must switch to the SN mode** (SN mode and LS national train control system are indicated on the OBU DMI), otherwise it must switch **to the UN mode** (UN mode is indicated on the OBU DMI)**.**
Comments	Empty.
Recommended follow-up test	T_116

Test designation	T_116
Test name	**Return from the ETCS trackside exclusion without stopping**
Recommended previous test	T_115
Initial conditions	The train moves in the SN or UN mode on the line track in the definitive ETCS exclusion area and has a communication session with the RBC established. An entry route and at least one follow-up route are set for the train in the next station where the ETCS exclusion is not activated.
Necessary co-operation with the infrastructure staff	RBC HMI operator when ETCS exclusion is activated and cancelled.
Test description	1. The train runs on the running track at the station and read the BG at its beginning. 2. The RBC sends the MA FS and the level transition order at the signal at the end of the running track (message 24 with pk 41 with D_LEVELTR corresponding to the distance between the LRBG and the signal, with L2 – LNTC/LS – L0 priority order) to the train. 3. **The information about the approaching L2 transition must be displayed on the OBU DMI.** 4. **If the train is in the SN mode, a confirmation of the ETCS L2 transition must be required.** 5. If the train is in the SN mode, the entry into the ETCS L2 area is confirmed on the OBU DMI. 6. The train front end passes the signal at the end of the running track. 7. **The OBU must switch to FS mode** (FS mode is indicated on the DMI OBU)**.**
Comments	Empty.
Recommended follow-up test	Empty.

Test designation	T_117
Test name	**Entry into the ETCS L2 area in FS mode with sending the MA FS in rear of the entry border**
Recommended previous test	Empty.
Initial conditions	The train with the OBU in the UN or SN mode runs towards the entry border of ETCS L2 area, where the automatic switchover takes place. If possible, the train runs at the maximum permitted speed (the minimum value is chosen out of the maximum line speed, maximum train speed and maximum speed considering the presence of the NTC on-board unit in the vehicle and the information received from the NTC trackside). The conditions for the MA FS issue are met in advance of the entry border. *Note: If the vehicle is equipped with an LS STM, this test must be performed in the level LNTC/LS.*
Necessary co-operation with the infrastructure staff	Empty.
Test description	1. The OBU receives the radio network registration order to the GSM-R CZ network from the BG at the registration area (pk 45). 2. The OBU, if not already registered, registers to the GSM-R CZ network. 3. The OBU receives the order to establish a communication session from the BG in the registration area (pk 42). 4. OBU establishes a connection with RBC at a safe Euroradio level. 5. OBU establishes a communication session with RBC (exchange of messages 155, 32 and 159). 6. **It must be indicated on the OBU DMI that communication session has been established.** 7. The OBU sends the train data to the RBC (message 129 with pk 11). 8. The RBC confirms the train data (message 8). 9. The RBC sends parameters for PR and for MA request (message 24 with pk 57 and 58). 10. **The train in SN or UN mode must be indicated in the RBC stack on the RBC HMI, and its train data must be displayed.** 11. The OBU reads the BG located on the track with the automatic block at the beginning of the block section, which ends at the entry border of the ETCS L2 area (in case of track without the automatic block at the beginning of the KÚ at a defined distance in rear of the ETCS L2 area entry border), sends the PR, in which this BG is listed as LRBG, to the RBC and the train occupies the KÚ. The events order (occupying the KÚ x sending the PR) is not decisive. 12. The RBC sends the MA FS and the L2 level transition order (message 3 with pk 15, 5, 21, 27, 68 and 41, with the priority order in pk 41 L2 – LNTC/LS – L0) to the train. 13. **The information about the approaching ETCS L2 area must be displayed on the OBU DMI.** 14. **If the train is in the SN mode, a confirmation of the ETCS L2 transition must be required.** 15. If the train is in the SN mode, the entry into the ETCS L2 area is confirmed on the OBU DMI. 16. The train front end passes the entry border of the ETCS L2 area. 17. **The OBU must switch to FS mode** (FS mode is indicated on the OBU DMI).
Comments	In frontier areas, other types of NTC may also be present in pk 41.
Recommended follow-up test	T_118

Test designation	T_118
Test name	**Exit from ETCS L2**
Recommended previous test	T_117
Initial conditions	The train in FS mode is approaching at the highest permissible speed to the ETCS L2 exit border. The conditions for FS mode are met up to the ETCS L2 border and in advance it. *Note: If the vehicle is equipped with an LS STM module, this test must be performed for the exit to the LNTC/LS level and repeated with the disabled LS STM. It is recommended to switch off the LS STM when the OBU is switched off.*
Necessary co-operation with the infrastructure staff	Empty.
Test description	1. The RBC extends the MA FS beyond the ETCS L2 exit border and sends the LNTC/L0 level transition order (pk 41 with the LNTC/LS – L0 priority order and with the confirmation window L_ACKLEVELTR = 200 m) with the MA FS to the train. 2. The MA FS is issued for a distance according to the line speed and the signal aspect of the border signal, in case of the train with the OBU without LS STM with the maximum speed V_NVUNFIT from the ETCS L2 exit border. 3. **The information about the approaching LNTC or L0 (vehicle without LS STM or vehicle with LS STM deactivated) area must be displayed on the OBU DMI.** 4. **In the window 200 m in rear of the exit border, the OBU must require confirmation of the transition to LNTC or L0 (vehicle without LS STM or vehicle with LS STM deactivated).** 5. The transition to the LNTC or L0 is confirmed on the OBU DMI. 6. The train front end passes the ETCS L2 exit border. 7. **The OBU with LS STM enabled must switch to level LNTC/SN mode of the LS NTC** (SN mode and LS NTC are indicated on the OBU DMI)**.** 8. **The OBU without LS STM must switch to level L0/UN mode** (level L0 and UN mode are indicated on the OBU DMI)**.** 9. **The OBU with LS STM deactivated must either switch to level L0/UN mode** (level L0 and UN mode are indicated on the OBU DMI) **or to level LNTC/SF mode** (level L0 and SF mode are indicated on the OBU DMI)**.** 10. The OBU sends PR with a level change to the LNTC or L0 to the RBC. 11. The RBC stops sending the MA to the train. 12. After the PR confirms that the whole train has left the ETCS L2 area, the RBC sends the order to terminate the communication session (message 24 with pk 42) to the OBU. 13. The OBU sends the information about the communication session termination (message 156) to the RBC. 14. The RBC confirms the communication session termination (message 39). 15. The connection is terminated at a safe Euroradio level. **The established communication session with the RBC must not be indicated any more on the OBU DMI.** 16. **All information about the train must be deleted on the RBC HMI.**
Comments	In frontier areas, other types of NTC may also be present in pk 41.
Recommended follow-up test	T_119

Test designation	T_119
Test name	**Entry into the ETCS L2 area in FS mode with sending the MA FS at the entry border**
Recommended previous test	T_118
Initial conditions	The train with the OBU in the LNTC/SN or L0/UN level/mode runs towards the entry border of the ETCS L2 area, where the automatic switchover takes place. The conditions for the MA FS issue are met in advance of the entry border. The occupancy of the last KÚ in rear of the ETCS L2 entry border is simulated. *Note: In order to ensure that the RBC does not send the MA for entry to the ETCS L2 area when the train is in rear of the entry border, the last KÚ in rear of the ETCS L2 entry border is simulated as occupied in such advance that the driver cannot register the signal aspect change (e.g. on the track with automatic block during the run of the previous train).* *Note: If the vehicle is equipped with an LS STM, this test must be performed in the LNTC/LS level.*
Necessary co-operation with the infrastructure staff	The maintenance employee in the SÚ for simulation of the occupancy of the KÚ. Operator at the SZZ control in the event of cancelling a block condition fault.
Test description	1. The OBU receives the radio network registration order to the GSM-R CZ network from the BG at the registration area (pk 45). 2. The OBU, if not already registered, registers to the GSM-R CZ network. 3. The OBU receives the order to establish a communication session from the BG in the registration area (pk 42). 4. OBU establishes a connection with RBC at a safe Euroradio level. 5. OBU establishes a communication session with RBC (exchange of messages 155, 32 and 159). 6. **It must be indicated on the OBU DMI that communication session has been established.** 7. The OBU sends the train data to the RBC (message 129 with pk 11). 8. The RBC confirms the train data (message 8). 9. The RBC sends parameters for PR and for MA request (message 24 with pk 57 and 58). 10. **The train in SN or UN mode must be indicated in the RBC stack on the RBC HMI, and its train data must be displayed.** 11. The OBU reads the BG located on the track with the automatic block at the beginning of the block section, which ends at the entry border of the ETCS L2 area (in case of track without the automatic block at the beginning of the KÚ at a defined distance in rear of the ETCS L2 area entry border), sends PR, in which this BG is listed as LRBG, to the RBC. The RBC does not send neither the MA FS nor the L2 level transition order (pk 41). 12. **The information about the approaching ETCS L2 area must not be displayed on the OBU DMI.** 13. The OBU reads the BG located at the ETCS L2 entry border, sends PR, where this BG is listed as LRBG, to the RBC and occupies the first KÚ in advance of the ETCS L2 entry border. The events order (occupying the KÚ x sending the PR) is not decisive. 14. The RBC sends the MA FS and the L2 level transition order (message 3 with pk 15, 5, 21, 27, 68 and 41, with the priority order in pk 41 L2 – LNTC/LS – L0) to the train. 15. **The OBU must immediately switch to FS mode** (FS mode is indicated on the OBU DMI)**.** 16. **If the train was in the SN mode, a confirmation of the ETCS L2 transition shall be required.** 17. If the train was in the SN mode, the entry into the ETCS L2 area is confirmed on the OBU DMI.
Comments	The simulation of the occupied KÚ can be cancelled as soon as the train enters this KÚ. In frontier areas, other types of NTC may also be present in pk 41.

Recommended follow-up test	T_120

Test designation	T_120
Test name	**Cancelling of the exit from the ETCS L2 area**
Recommended previous test	T_119
Initial conditions	The train in FS mode is approaching to the ETCS L2 exit border. The conditions for FS mode are met up to the ETCS L2 border and in advance it. A train route is set between the front end of the train and the exit border.
Necessary co-operation with the infrastructure staff	Operator at the SZZ control in the event of setting and cancelling a non-used VC.
Test description	1. The RBC extends the MA FS beyond the ETCS L2 exit border and sends the LNTC/L0 level transition order (pk 41 with the LNTC/LS – L0 priority order and with the confirmation window L_ACKLEVELTR = 200 m) with the MA to the train. 2. **The information about the approaching LNTC (vehicle with LS STM enabled or LS STM deactivated) or L0 (vehicle without LS STM or with LS STM deactivated) area must be displayed on the OBU DMI.** 3. The train route to the exit border is cancelled. 4. The RBC shortens the MA FS to the signal at the beginning of the cancelled train route. This MA contains an order to cancel the transition to LNTC/L0 (pk 41 with the L2 – LNTC/LS – L0 priority order and D_LEVELTR = L_ACKLEVELTR = 0). 5. **The information about the approaching LNTC or L0 area must be not be displayed any more on the OBU DMI.**
Comments	In the case of LS STM disabled, two options are allowed in the point 2 because the CCS TSI requirements do not clearly indicate how the OBU should proceed. If the test is followed by the recommended test, it is necessary to make an exit from L2 area.
Recommended follow-up test	T_121

Test designation	T_121
Test name	**Entry into the ETCS L2 area in OS mode**
Recommended previous test	T_120
Initial conditions	The train with the OBU in the LNTC/SN or L0/UN level/mode runs towards the entry border of the ETCS L2 area, where the automatic switchover takes place. The conditions for the MA OS issue are met in advance of the entry border (the occupancy of the first KÚ in advance of the ETCS L2 entry border is simulated). *Note: The first KÚ in advance of the ETCS L2 area entry border is simulated as occupied in such advance that the driver cannot register the signal aspect change (e.g. on the track with automatic block during the run of the previous train).* *Note: If the vehicle is equipped with an LS STM, this test must be performed in the LNTC/LS level.*
Necessary co-operation with the infrastructure staff	The maintenance employee in the SÚ for simulation of the occupancy of the KÚ. Operator at the SZZ control in the event of cancelling a block condition fault.
Test description	1. The OBU receives the radio network registration order to the GSM-R CZ network from the BG at the registration area (pk 45). 2. The OBU, if not already registered, registers to the GSM-R CZ network. 3. The OBU receives the order to establish a communication session from the BG in the registration area (pk 42). 4. OBU establishes a connection with RBC at a safe Euroradio level. 5. OBU establishes a communication session with RBC (exchange of messages 155, 32 and 159). 6. **It must be indicated on the OBU DMI that communication session has been established.** 7. The OBU sends the train data to the RBC (message 129 with pk 11). 8. The RBC confirms the train data (message 8). 9. The RBC sends parameters for PR and for MA request (message 24 with pk 57 and 58). 10. **The train in SN or UN mode must be indicated in the RBC stack on the RBC HMI, and its train data must be displayed.** 11. The OBU reads the BG located on the track with the automatic block at the beginning of the block section, which ends at the entry border of the ETCS L2 area (in case of track without the automatic block at the beginning of the KÚ at a defined distance in rear of the ETCS L2 area entry border), sends the PR, in which this BG is listed as LRBG, to the RBC and the train occupies the KÚ. The events order (occupying the KÚ x sending the PR) is not decisive. 12. The RBC sends the level transition order to switch to L2 at the entry border (message 24 with pk 41 with the L2 – LNTC/LS – L0 priority order) to the train. 13. **The information about the approaching ETCS L2 area must be displayed on the OBU DMI (this information must not require confirmation).** 14. The train reaches the OS window. 15. The RBC sends the MA OS and the L2 level transition order (message 3 with pk 15, 5, 21, 27, 80, 68 and 41, with the priority order in pk 41 L2 – LNTC/LS – L0). 16. **If the train is in the SN mode, a confirmation of the ETCS L2 transition must be required.** 17. If the train is in the SN mode, the entry into the ETCS L2 area is confirmed on the OBU DMI. 18. The train front end passes the entry border of the ETCS L2 area. 19. **The OBU must switch to OS mode** (OS mode is indicated on the OBU DMI)**.** 20. The OBU DMI must require the confirmation of the transition to OS.

	21. The transition to OS mode is confirmed on the OBU DMI.
Comments	The simulation of the occupied KÚ can be cancelled as soon as the train enters this KÚ. In frontier areas, other types of NTC may also be present in pk 41.
Recommended follow-up test	T_118 (for LS STM equipped vehicle with LS STM disabled)

Test designation	T_122
Test name	**Passage of the train through a place with the change of traction system**
Recommended previous test	Empty.
Initial conditions	The train in FS mode moves to a location where the type of electric traction changes, but the MA for the passage through this location has not been issued yet.
Necessary co-operation with the infrastructure staff	Empty.
Test description	1. The RBC extends the MA FS for the train so that it includes the traction change location. 2. The RBC starts sending the track condition "Powerless section – lower pantograph" (pk 68 with M_TRACKCOND = 3) or "Powerless section – switch off the main power switch" (pk 68 with M_TRACKCOND = 9) in the MA FS to the train and sends the information about the new traction system to the train (message 24 with pk 39, where M_TRACTION = 129 (25 kV AC) or 130 (3 kV DC), or 51 (15 kV AC)). **For the baseline 2 OBU:** 3. **The information about the approaching change of traction system to 25 kV or 3 kV or 15 kV and about the necessity of pantograph lowering or switching off the main power switch must be displayed in the planning area on the OBU DMI**. 4. The vehicle approaches to the distance necessary for lower the pantograph or switch off the main power switch. 5. **The information about the necessity of pantograph lowering or switching off the main power switch must appear in the area B (under the speed indicator) of the OBU DMI.** The way and punctual place of the indication depends on the OBU implementation and the time required to perform given task. 6. The vehicle approaches the place where it is necessary to change the traction system. 7. **The information about the necessity of traction system change must appear in the area B (under the speed indicator) of the OBU DMI.** The way and punctual place of the indication depends on the OBU implementation and the time required to perform given task. The new traction system information may be displayed in area E (text information) in the case of vehicles with the OBU according to BL2. 8. Either the vehicle automatically or the driver manually lowers the pantograph (or switches the main power switch off) and changes the traction system. 9. The vehicle passes the signal board with "raise the pantograph" (or "switch the main power switch on") signal. 10. **The information about the necessity of pantograph lowering or switching off the main power switch must not be displayed any more on the OBU DMI.** **For the baseline 3 OBU:** 11. **Either the test must be passed through the steps 3 – 10 or the vehicle passes through the traction change point without any warning on the DMI OBU regarding traction change, pantograph lowering or switching the main switch off, and without automatic performing of any act connected with the change of the traction system (switching the main switch off, pantograph lowering or traction system changing) by vehicle.**

Comments	The location of the traction system change is the point of contact of the 3 kV DC and 25 kV AC systems at the km 228.087 or km 228.113 between the stations Svitavy and Březová nad Svitavou (with the obligation to lower the pantograph) and the point of contact of the 25 kV AC and 15 kV AC systems at the km 77.950 or km 78.100 between Břeclav and Bernhardsthal (with the obligation to switch off the main power switch). This test must therefore be planned in these sections. The test is performed only with two- and multi-system vehicles. The test is performed for both directions of travel. On the cross-border section of Břeclav - Bernhardsthal, is to be performed only with the vehicles that can travel to Austria. Baseline 3 vehicles shouldn't send the information about the traction system in the baseline 2 format (N_ITER for M_TRACTION should be equal to zero). Alternative implementation is allowed when the OBU sends the traction information and/or informs driver on the DMI OBU about the change of the traction system, pantograph lowering or main switch switching off (with a possibility of automatic execution of some of these operations). In the case when DMI OBU does not indicate the necessity of lowering the pantograph or switching off the main power switch (see point 11) in any way, this behaviour have to be stated in the protocol on the execution of the tests of the compatibility with the warning that the vehicle operator must state this fact in the vehicle (or OBU) operating instructions.
Recommended follow-up test	Empty.

Test designation	T_123
Test name	**Handover (HO) – handover of a train that is capable of conducting two communication sessions**
Recommended previous test	Empty.
Initial conditions	The train in FS mode approaches the border of two RBCs (the HO border). The OBU is equipped with two data radio terminals. The conditions for issuing the MA FS are met in the RBC ACC area in advance the HO border.
Necessary co-operation with the infrastructure staff	Empty.
Test description	1. The RBC HOV extends the MA FS for the train so that it ends at the HO border. 2. The RBC HOV sends the RBC transition order to the OBU (message 131 with RBC ACC contact details and with D_RBC = distance from LRBG to the HO border). 3. The OBU establishes a connection with RBC ACC at a safe Euroradio level. 4. OBU establishes a communication session with RBC ACC (exchange of messages 155, 32 and 159). 5. The OBU sends the train data to the RBC ACC (message 129 with pk 11). 6. The RBC ACC confirms the train data (message 8). 7. **The train in FS mode must be indicated in the RBC stack on the RBC ACC HMI.** 8. **The train data of the new train must be displayed on the RBC ACC HMI.** 9. The OBU sends PR to the RBC HOV as well as RBC ACC. 10. The train will approach at the distance shorter than 5 km from the HO border, if it is not there yet. 11. The RBC HOV extends the MA FS for the train over the HO border. 12. **The MA extended to the RBC ACC area must be displayed on the RBC HMI.** 13. **The MA extended to the RBC ACC area must be displayed in the planning area on the OBU DMI.** 14. The OBU reads the last BG in rear of the HO border and sends PR, in which this BG is listed as LRBG, to RBC ACC. 15. The RBC ACC starts sending the MA FS to the OBU (the MA is stored in the OBU buffer). 16. The train front end passes the HO border, the train starts using the MA FS from the RBC ACC, and the OBU sends PR, in which the BG at the HO border is listed as LRBG, to the RBC HOV and to the RBC ACC. 17. RBC ACC sends parameters for PR and for MA request (message 24 with pk 57 and 58) to the OBU. 18. The RBC HOV orders the OBU to terminate the communication session (message 24 with pk 42). 19. The OBU sends the information about the communication session termination (message 156) to the RBC HOV. 20. The RBC HOV confirms the communication session termination (message 39). 21. The connection between the OBU and the RBC HOV is terminated at a safe Euroradio level. 22. **All information about the train must be deleted on the RBC HOV HMI.** 23. **The train must continue running according to the MA FS sent.**
Comments	Events 3 to 9 can occur in parallel with events 10 to 12.
Recommended follow-up test	T_124

Test designation	T_124
Test name	**Handover (HO) – handover of a train that is capable of conducting one communication session**
Recommended previous test	T_123
Initial conditions	The train in FS mode approaches the border of two RBCs (the HO border). The OBU is equipped with one data radio terminal or two data terminals, while one is faulty (simulated by turning it off). The conditions for issuing the MA FS are met in the RBC ACC area in advance of the HO border.
Necessary co-operation with the infrastructure staff	Empty.
Test description	1. The RBC HOV extends the MA FS for the train so that it ends at the HO border. 2. The RBC HOV sends the RBC transition order to the OBU (message 131 with the RBC ACC contact details and with D_RBC = distance from LRBG to the HO border). 3. The train will approach at the distance shorter than 5 km from the HO border, if it is not there yet. 4. The RBC HOV extends the MA FS for the train over the HO border, with EOA being at the first main signal in advance of the HO border. 5. **The MA extended to the RBC ACC area must be displayed on the RBC HMI.** 6. **The MA extended to the RBC ACC area must be displayed in the planning area on the OBU DMI.** 7. The train front end passes the HO border and the OBU sends PR, in which the BG at the HO border is listed as LRBG, to the RBC HOV. 8. The RBC HOV orders the OBU to terminate the communication session (message 24 with pk 42). 9. The OBU sends the information about the communication session termination (message 156) to the RBC HOV. 10. The RBC HOV confirms the communication session termination (message 39). 11. The connection between the OBU and the RBC HOV is terminated at a safe Euroradio level. 12. **The established communication session with the RBC must not be indicated any more on the OBU DMI.** 13. **All information about the train must be deleted on the RBC HOV HMI.** 14. The OBU establishes a connection with RBC ACC at a safe Euroradio level. 15. OBU establishes a communication session with RBC ACC (exchange of messages 155, 32 and 159). 16. **The established communication session with RBC must be indicated on the OBU DMI.** 17. The OBU sends the train data (message 129 with pk 11) to the RBC ACC. 18. The RBC ACC confirms the train data (message 8). 19. RBC ACC sends parameters for PR and for MA request (message 24 with pk 57 and 58) to the OBU. 20. **The train in FS mode must be indicated in the RBC stack on the RBC ACC HMI.** 21. **The train data of the new train must be displayed on the RBC ACC HMI.** 22. The RBC ACC starts sending the MA FS to the OBU. 23. **The train must continue running in FS mode.**
Comments	Empty.
Recommended follow-up test	Empty.

Test designation	T_125
Test name	**Special Handover (HO) – train run from Břeclav to Bernhardsthal**
Recommended previous test	Empty.
Initial conditions	The train in FS mode is on the running track in the station Břeclav in rear of the exit signal in the direction of Bernhardsthal. Departure train route for train in Břeclav is not set. It is recommended that an entrance route into Bernhardsthal station is set (when the train passes the HO border at the latest). *Note: The test is performed only with a vehicle that is capable of conducting two communication sessions.*
Necessary co-operation with the infrastructure staff	Empty.
Test description	1. A departure train route is set for the train to the line track to Bernhardsthal. 2. The RBC SŽ extends the MA FS so that it reaches the home signal of the Bernhardsthal station. 3. The train passes the exit signal. 4. The RBC SŽ sends a GSM-R A (ÖBB) radio network registration order to the OBU (message 24 with pk 46 with NID_MN = 23291). 5. The OBU registers into the GSM-R A (ÖBB) network with a free data radio terminal. 6. The RBC SŽ sends the RBC transition order to the OBU (message 131 with RBC ÖBB contact details and with D_RBC = distance from the LRBG to the HO border). 7. The OBU establishes a connection with RBC ÖBB at a safe Euroradio level. 8. The OBU establishes a communication session with RBC ÖBB (exchange of messages 155, 32 and 159). 9. The OBU sends the train data (message 129 with pk 11) to the RBC ÖBB. 10. The RBC ÖBB confirms the train data (message 8). 11. The OBU reads the BG at the home signal of Břeclav station (valid for the opposite direction) and reads pk 46, which adjusts the permitted NTC systems for the direction to Austria. 12. **The train must continue running in FS mode.** 13. The OBU reads the last BG in rear of the HO border and sends PR, in which this BG is listed as LRBG, to the RBC ÖBB. 14. The RBC ÖBB starts sending the MA FS to the OBU (the MA is stored in the OBU buffer). The EOA is located at the home signal of Bernhardsthal station or further (according to the set train routes). 15. The train front end passes the HO border, the train starts using the MA FS from the RBC ÖBB, and the OBU sends PR, in which the BG at the HO border is listed as LRBG, to the RBC SŽ and to the RBC ÖBB. 16. The OBU reads the BG, which contains the order to terminate the connection with the RBC SŽ (pk 42). 17. The OBU sends the information about the connection termination to the RBC SŽ (message 156). 18. The RBC SŽ confirms the connection termination (message 39). 19. The OBU registers to the GSM-R A (ÖBB) network with a released mobile terminal. 20. **All information about the train must be deleted on the RBC SŽ HMI.** 21. **The MA extended to the RBC ÖBB area must be displayed in the planning area on the OBU DMI** (if the entrance train route is set into the Bernhardsthal station). 22. **The train must continue running in FS mode at least until it reaches the Bernhardsthal station home signal.**
Comments	The test is to be performed only with the vehicles that travel to Austria via the Břeclav – Bernhardsthal track section. RBC SŽ means RBC Břeclav.

Recommended follow-up test	T_126

Test designation	T_126
Test name	**Special Handover (HO) – train run from Bernhardsthal to Břeclav**
Recommended previous test	T_125
Initial conditions	The train in FS mode is on the running track in the station Bernhardsthal in rear of the exit (route) signal in the direction of Břeclav. Departure train route for train in Bernhardsthal is not set. An entrance route into Břeclav station is set. *Note: The test is performed only with a vehicle that is capable of conducting two communication sessions.*
Necessary co-operation with the infrastructure staff	Empty.
Test description	1. A departure train route is set for the train to the line track to Břeclav. 2. The RBC ÖBB extends the MA FS so that it reaches the home signal of the Břeclav station. 3. The train passes the exit signal. 4. The OBU reads the BG which contains radio network registration order to register to the GSM-R CZ network (pk 46 with NID_MN = 23098). 5. The OBU registers into the GSM-R CZ network with a free data radio terminal. 6. The OBU reads the BG which contains the RBC transition order (message 131 with the RBC SŽ contact details and with D_RBC = distance from LRBG to the HO border). 7. The OBU establishes a connection with RBC SŽ at a safe Euroradio level. 8. The OBU establishes a communication session with RBC SŽ (exchange of messages 155, 32 and 159). 9. The OBU sends the train data (message 129 with pk 11) to the RBC SŽ. 10. The RBC SŽ confirms the train data (message 8). 11. **The train in FS mode must be indicated in the line track stack on the RBC SŽ HMI.** 12. **The train data of the new train must be displayed on the RBC SŽ HMI.** 13. The OBU reads the following BG in the direction of the HO border and sends PR, in which this BG is listed as a LRBG, to the RBC SŽ. 14. The RBC SŽ starts sending the MA FS (the EOA is at one of Břeclav station route signals according to the set entrance route) to the OBU (MA is stored in the OBU buffer). 15. The train front end passes the HO border, the train starts using the MA FS from the RBC SŽ, and the OBU sends PR, in which the BG at the HO border is listed as LRBG, to the RBC SŽ and to the RBC ÖBB. 16. **The MA extended to the RBC SŽ area must be displayed in the planning area on the OBU DMI**. 17. **The train must continue running in FS mode.** 18. The OBU reads the BG, which contains the order to terminate the connection with the RBC ÖBB (pk 42). 19. The OBU sends the information about the connection termination to the RBC ÖBB (message 156). 20. The RBC ÖBB confirms the connection termination (message 39). 21. The OBU registers to the GSM-R CZ network with a released mobile terminal. 22. **The train must continue running in FS mode.** 23. The OBU reads the BG at the home signal of Břeclav station and reads pk 46, which adjusts the permitted NTC for the direction to Břeclav. 24. The OBU continues running in FS mode until it reaches the running track.
Comments	The test is to be performed only with the vehicles that travel to Austria via the Břeclav – Bernhardsthal track section. RBC SŽ means RBC Břeclav.
Recommended follow-up test	T_127

Test designation	T_127
Test name	**Departure from Břeclav in LNTC different from the LS**
Recommended previous test	T_126
Initial conditions	The train is located in the LNTC level in Břeclav station with the STM different from the STM LS (NID_STM = 33), i.e. for example STM LZB (NID_STM = 9), INDUSI (NID_STM = 6), INDUSI I 60 (NID_STM = 27), or INDUSI I 60 (NID_STM = 36). Before starting the test, it is necessary to prevent the RBC from switching the OBU to L2 by the principle of returning from the ETCS exclusion (after OBU passes a BG and establishes the connection with RBC) e.g. by activating an ETCS exclusion for the line track or by switching off the data radio terminal.
Necessary co-operation with the infrastructure staff	The RBC HMI operator when ETCS exclusion is activated and cancelled if the ETCS exclusion is used (see Comments).
Test description	1. The train runs at a low speed from Břeclav in the direction of Lanžhot, Podivín or Hrušky. 2. The train passes the home signal valid for the opposite direction and the OBU reads the BG at the home signal which contains the level priority list not allowing the Austrian STM (pk 46 with LNTC/LS - L2 - L0 priority order). 3. **The OBU with LS STM must switch to level LNTC/SN mode of the LS NTC** (SN mode and LS NTC are indicated on the OBU DMI)**.** 4. **The request to confirm the transition to LNTC must be displayed on the OBU (with LS STM) DMI.** 5. The transition to the LNTC is confirmed on the OBU (with LS STM) DMI. 6. **The OBU without LS STM (or with LS STM deactivated) must switch to level 2, TR mode** (braking is activated, TR mode is indicated on the OBU DMI)**.** 7. **After stopping and confirming the transition to TR mode on the OBU DMI, the OBU must switch to PT mode** (PT mode is indicated on the OBU DMI)**.**
Comments	The test is to be performed only with the vehicles that travel to Austria via the Břeclav – Bernhardsthal track section and are equipped with a different STM than STM LS.
Recommended follow-up test	Empty.

Test designation	T_128
Test name	**Loss of connection**
Recommended previous test	Empty.
Initial conditions	The train is in FS or OS mode on the running track.
Necessary co-operation with the infrastructure staff	Empty.
Test description	1. The loss of a safe connection is simulated. 2. **The connection loss/failure must be indicated on the OBU DMI.** 3. **No later than after T_SECTIONTIMER period, the OBU must switch to TR mode** (braking is activated, TR mode is indicated on the OBU DMI)**.** 4. **After confirming TR mode on the OBU DMI, the OBU must switch to PT mode** (PT mode is indicated on the OBU DMI)**.** 5. A safe connection is restored. 6. The RBC sends the Recognition of exit from TR mode to the OBU (message 6). 7. Start is selected on the OBU DMI. 8. OBU sends a MA request to the RBC (message 132). 9. The RBC sends the OS MA to the OBU. 10. **The OBU must switch to OS mode** (OS mode is indicated on the OBU DMI)**.** 11. The loss of a safe connection is simulated again. 12. **No later than after T_SECTIONTIMER period, the OBU must switch to TR mode** (braking is activated, TR mode is indicated on the OBU DMI)**.** 13. **After confirming TR mode on the OBU DMI, the OBU must switch to PT mode** (PT mode is indicated on the OBU DMI)**.** 14. **No later than 5 minutes after connection loss, the train must be erased from the RBC HMI and the indication of established communication must be terminated on the OBU DMI** (not even the connection loss/failure is indicated)**.** 15. Override EOA is selected on the OBU DMI. 16. **The OBU must switch to SR mode** (SR mode is indicated on the OBU DMI)**.** 17. A safe connection is restored. 18. In SR mode, the train reads a BG. 19. **The OBU must establish a connection with the RBC.**
Comments	The loss and restoration of a safe connection is simulated, for example, by turning the data radio terminals off and on.
Recommended follow-up test	Empty.

Test designation	T_129
Test name	**Position report from single BG**
Recommended previous test	Empty.
Initial conditions	The train is on the running track in rear of the BG at the exit signal in a station with single BGs in advance of the last switch. The OBU at the running track has the train data entered and has established a connection with the RBC. No departure route is set. The switches are set to a line track with automatic block and locked. The train run is permitted using the call-on signal.
Necessary co-operation with the infrastructure staff	Operator at the SZZ control for fulfilling the conditions for the train run and for allowing the train run by call-on signal.
Test description	1. Override EOA is selected on the OBU DMI. 2. The train starts to move. 3. The OBU reads the BG at the exit signal and sends PR (pk 0) to the RBC. 4. The OBU reads the single BG in advance of the last switch and sends PR based on two balise groups (pk 1, where NID_PRVLRBG is the BG at the exit signal and NID_BG is the BG in advance of the last switch) to the RBC. 5. The RBC sends the information about nominal or reverse direction of passing the LRBG (message 45) to the OBU. 6. The OBU sends a new PR with the same LRBG, but as pk 0. 7. The RBC sends the OS MA (message 3 with pk 15, 80, 5, 21, 27 and 68) with the EOA at the first block signal to the OBU. 8. **The OBU must switch to OS mode** (OS mode is indicated on the OBU DMI)**.** 9. The OBU sends PR with OS mode to the RBC. 10. The transition to OS mode is confirmed on the OBU DMI. 11. The RBC sends a TAF request to OBU (message 34). 12. The train enters the TAF window (if it is not already there). 13. **The TAF request must be displayed on the OBU DMI.** 14. The TAF is confirmed on the OBU DMI. 15. The OBU sends the TAF Granted information to the RBC (message 149). 16. The RBC sends the MA FS to OBU (message 3 with pk 15, 5, 21, 27 and 68). 17. **The OBU must switch to FS mode** (FS mode is indicated on the OBU DMI)**.**
Comments	
Recommended follow-up test	Empty.

Test designation	T_130
Test name	**No establishing communication session in SL mode**
Recommended previous test	Any test after which the train stops on a running track at the station.
Initial conditions	The tested vehicle is in the ETCS L2 area, preferably in a station on a running track, where it arrived in FS or SR mode. The tested vehicle is connected with another vehicle using a system for remote control from another vehicle.
Necessary co-operation with the infrastructure staff	Empty.
Test description	1. The vehicle desk is closed. 2. The desk is enabled in the second vehicle with the connected remote control system. 3. **The OBU of the tested vehicle must switch to SL mode** (checked in OBU JRU records, OBU DMI should be off)**.** 4. The OBU of the tested vehicle sends PR, which indicates SL mode, to the RBC. 5. The RBC orders the OBU to terminate the connection, which is then terminated. 6. **This OBU must not be indicated in the RBC stack on the RBC HMI.** 7. Any test contains the train run takes place, preferably with HO. 8. **The OBU in SL mode must not attempt to establish a connection with the RBC** (checked on the RBC HMI or in the RBC JRU records)**.**
Comments	The test is to be performed on train units with two OBUs, driving trailers and locomotives that can be controlled from another vehicle and in the operation it is assumed usage of the remote control. If the test with the vehicle is not done, in the compatibility tests protocol must be stated that the vehicle has not been tested in the term of the compatibility for the SL mode with the reason why the test has not been performed.
Recommended follow-up test	Empty.

Test designation	T_131
Test name	**Static speed profile assignment**
Recommended previous test	Empty
Initial conditions	The tested vehicle stands in the ETCS L2 area in FS mode on the open track in such a place that its permitted speed is limited only by the line speed limit applicable at the given location (i.e. it must not be located in the area of the braking curve to further speed reduction and there must not be activated temporary speed restriction on the RBC HMI for this location). Also, a different speed must be determined at this location for each of the four cant deficiency categories listed below, or the test may be performed at a location where a different speed is determined for only some of the cant deficiency categories listed below and then the test is repeated at another location (locations) so that each of the cant deficiency categories listed below has determined a different speed than the others at least in one test (at least at one location). The speed determined for all train categories tested at this location must not exceed the vehicle design speed and the maximum train speed entered during the SOM. If the vehicle design speed is lower than the lowest of the speeds specified for the particular speed profile in Annex A.5, the test shall not be performed for this profile. Note: *The RBC sends the static speed profiles for different cant deficiency, depending on the speed boards. For the cant deficiency train categories:* • *up to 130 mm (excl.) sends the speed profile given by the N speed boards* • *from 130 mm (incl.) to 150 mm (excl.) sends the speed profile given by the upper N speed boards* • *from 150 mm (incl.) to 275 mm (excl.) sends the speed profile given by a speed profile for 150 mm, which is not signalled by line speed boards* • *over 275 mm (incl.) sends the speed profile given by the NS speed boards.* *If there is no speed board related speed restriction apply to one of the above-mentioned cant deficiencies in a given location or the Route Book does not define the speed for the 150 mm profile for a given location, the speed profile for the nearest lower cant deficiency category valid in the given location is used.*
Necessary co-operation with the infrastructure staff	Empty.
Test description	1. A change of train data is selected on the OBU DMI. The tested train category is entered and the OBU shortens the MA to the front end of the train. 2. After the RBC has confirmed the new train data and sends the new FS MA, the non-zero length MA must again be indicated on the DMI. 3. **The permitted speed displayed on the OBU DMI must correspond to the entered train category or must be lower** – it is compared with the permitted speed value for the relevant cant deficiency given in the Route Book for the place where the test is performed. 4. Points 1 to 3 are repeated for all train categories that can be entered on the OBU DMI. 5. During the tests in accordance with points 1 to 4 must be verified that it is possible to enter the train category for which the OBU uses the speed profile for cant deficiency up to 130 mm (excl.) – **the permitted speed displayed on the OBU DMI must correspond to the speed profile for the cant deficiency up to 130 mm (excl.)** – it is compared with the permitted speed value for cant deficiency up to 130 mm (excl.) given in the Route Book for the place where the test is performed. 6. In the case of an active tilting vehicle, the tilting system is switched off or its failure is simulated. 7. **The permitted speed displayed on the OBU DMI must be changed to the speed corresponding to the speed profile for the cant deficiency**

	with idle tilting, or to the lower speed (see point 3) – it is compared with the permitted speed value for the relevant cant deficiency given in the Route Book for the place where the test is performed.
Comments	Each train category that can be selected on the OBU DMI must have corresponding cant deficiency clearly assigned – see Section 3.6. If, in normal operation, it is not assumed that the run of the train set with the vehicles authorised for a run with the cant deficiency only up to 130 mm (excl.) will be controlled from the tested vehicle (for example, it is a train unit or it is given by the Railway Vehicle Approval Decision), the vehicle is considered as compatible despite it not meets the requirement in point 5, however, the vehicle operator must take administrative measures for situations, when the tested vehicle controls the run of trainset which exceptionally contains vehicles authorised to run with the cant deficiency only up to 130 mm (excl.) (e.g. when pulling a broken vehicle off the open track). If the requirement in point 5 is not met, it must be verified that it is possible on the DMI to select such a train category that the permitted speed displayed on the DMI at point 3 does not exceed the speed limit of the cant deficiency train category for which the vehicle is approved (according to the Railway Vehicle Approval Decision). If the vehicle with the active tilting does not perform an automatic change of the train category in the event of a failure or disabling the tilting system, points 6 and 7 are not tested. It is necessary to check the choice of the relevant train category in case of idle tilting (points 1 – 3) according to the OBU possibilities – for example, to simulate the tilting failure in order to access the selection of the train category with idle tilting. Details must be specified in the vehicle documentation.
Recommended follow-up test	Empty.

Test designation	T_132
Test name	**Receiving of the MA with endtimer equals to zero**
Recommended previous test	Empty
Initial conditions	The tested vehicle stands in FS mode on a running track, on which a VCRP in the opposite direction can be set. The RBC is sending MA FS with EOA at the end of the running track to the train.
Necessary co-operation with the infrastructure staff	Operator at the SZZ control in the event of setting and cancelling a non-used VCRP.
Test description	1. The VCRP in the opposite direction is set on the running track with the train standing on it. 2. RBC starts sending MA FS with endtimer equals to zero (pk 15 with Q_ENDTIMER = 1 and T_ENDTIMER = 0). 3. **The zero permitted speed, zero permitted distance must be indicated on the OBU DMI** 4. The VCRP in the opposite direction is cancelled and RBC starts sending MA FS without endtimer (Q_ENDTIMER = 0). 5. **The non-zero permitted speed and the permitted distance which correspond to the distance to the nearest main signal relevant to the train direction.**
Comments	The test must be performed at the station equipped with VCRP (e. g. Hrušovany u Brna station).
Recommended follow-up test	Empty.

A.4 List of chosen national values, SŽDC data and other parameters

V_NVALLOWOVTRP	40 km/h	Maximum speed limit for triggering the Override EOA function
V_NVSTFF	40 km/h	The SR mode speed limit
V_NVUNFIT	100 km/h	The UN mode speed limit
CZ_D_OSPERMISR	300 m	Distance used for OS in rear of the signal with the permissive Stop signal
CZ_D_TAFREQDISP	500 m	Maximum distance for displaying the TAF request
CZ_V_OSPERMISR	40 km/h	Speed limit for transition to OS mode in rear of the signal with the permissive Stop signal
T_SECTIONTIMER	18 s	MA validity time

A.5 List of recommended test sections

For T_131:

Section	The lowest permitted speed [km/h] in the section for cant deficiency			
	< 130 mm	130 mm (incl.) – 150 mm (excl.)	150 mm (incl.) – 275 mm (excl.)	≥ 275 mm
Adamov – Blansko track 1	70	75	75*	90
Březová n. S. – Svitavy	110	120	125	140
Ústí n. O. – Brandýs n. O.	80	85	85*	80

* - the speed profile is the same as the speed profile for the cant deficiency of 130 mm (incl.) – 150 mm (excl.) in this section; it is only possible to check that the OBU does not misuse the speed profile for the cant deficiency ≥ 275 mm

Annex B (normative)

Compatibility tests for the sections Petrovice u Karviné – Břeclav, Česká Třebová – Přerov, Český Brod – Praha-Malešice – Praha-Uhříněves

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B.1 List of compatibility tests

T_201 Establishing the communication session and SOM with unknown or invalid position

T_202 Establishing the communication session and SOM with valid position

T_203 Transition from SR mode to FS mode using ATAF after SOM with unknown or invalid position

T_204 Return from the ETCS trackside exclusion without stopping and with sending of the national values

T_205 Passage of the train through a place with the change of traction system with packet 239

T_206 Transition from FS mode to SH mode by the RBC order

T_207 Transition from FS mode to RV mode

T_208 Exit from the ETCS area in the direction of Poland

T_209 Departure from Petrovice u Karviné or Bohumín in LNTC different from the LS

B.2 Recommended test order

T_201 – T_203

T_202

T_204

T_205

T_206

T_207

T_208

T_209

B.3 Description of individual tests

Test designation	T_201
Test name	**Establishing the communication session and SOM with unknown or invalid position**
Recommended previous test	Empty.
Initial conditions	The vehicle with OBU is within the ETCS L2 area with not powered OBU. *Note: To allow for the execution of the recommended follow-up test, the vehicle should stand on a running track at a location where there is no BG other than BG at the main signal between train front end and the nearest relevant main signal.* *Note: If the OBU does not send a PR with an unknown or invalid position when the OBU is turned on and the self-tests are completed, the unknown or invalid position is simulated by the procedure defined by the OBU manufacturer.*
Necessary co-operation with the infrastructure staff	Empty.
Test description	1. The OBU power is turned on. 2. The OBU self-tests are performed properly when the power is turned on. 3. If necessary, level (L2) and RBC contact information (NID_MN, NID_RADIO, NID_C, NID_RBC) are entered or validated on the OBU DMI. 4. OBU establishes a connection with RBC at a safe Euroradio level. 5. OBU establishes a communication session with RBC (exchange of messages 155, 32 and 159). 6. **It must be indicated on the OBU DMI that communication session has been established.** 7. **A new train with unknown train data and unknown direction has to be indicated on the RBC HMI in the RBC stack.** 8. OBU sends a SOM PR message in SB mode with an unknown position (message 157 with Q_STATUS = 2) or an invalid position (message 157 with Q_STATUS = 0). 9. **The reception of such a PR must be checked in the RBC JRU.** 10. RBC accepts the train (sends message 41) and, if the position is invalid, sets the LRBG to unknown (NID_LRBG = 16777215). The LRBG of all subsequent PR (pk 0) from the OBU must be unknown until the new BG is read. 11. The train data is entered on the OBU DMI, and the OBU sends it to the RBC (message 129 with pk 11). 12. The RBC confirms the train data (message 8) and sends to OBU parameters for PR and for MA request (message 24 with pk 57 and 58). 13. **On the RBC HMI, unknown train data must be changed to specific data.** **Presented train data must meet the train and vehicle parameters entered into the DMI OBU (train number is checked as well as train length, train category and maximum train speed if entered) as well as the parameters given into the OBU while OBU was implemented into EMU or DMU (train length, train category, maximum train speed and type of traction is checked according to the technical documentation or according to the reality).** 14. **The possibility to select Start must be available on the OBU DMI.** 15. Start is selected on the OBU DMI. 16. OBU sends a MA request (message 132). 17. The RBC sends the unlimited SR authorisation to OBU (message 2 with D_SR = 32767). 18. Displaying of the speed limits in SR/OS mode is toggled on the OBU DMI. 19. **SR mode and the maximum speed V_NVSTFF must be indicated on the OBU DMI, the permitted distance must not be limited.**

	20. **If the vehicle is standing more than approximately 50 m in rear of the main signal, the unlimited SR authorisation** (message 2 with D_SR = 32767) **must be checked in the OBU JRU or it must be checked on OBU DMI during the run according to the recommended follow-up test, that the permitted distance is not limited during the entire time of driving in SR mode.** 21. **The train in SR mode with the unknown direction must be indicated in the RBC stack on the RBC HMI.**
Comments	The contact details for each RBC are listed in the Route Book.
Recommended follow-up test	T_203

Test designation	T_202
Test name	**Establishing the communication session and SOM with a valid position**
Recommended previous test	Empty.
Initial conditions	The OBU is in SB mode, has no established communication with the RBC and considers its position to be valid. No desk is activated. The vehicle is located in the L2 area. No route is set from the running track. Neither VC, nor shunting route is set to the main signal for the opposite direction (if the running track is split for the opposite direction). *Note: Valid position can be achieved, for example, by entering the running track (and by reading BG at the beginning of this track) in SH, NL, FS, OS or SR mode and performing EOM.*
Necessary co-operation with the infrastructure staff	Empty
Test description	1. The desk is enabled in the vehicle. 2. OBU establishes a connection with RBC at a safe Euroradio level. 3. OBU establishes a communication session with RBC (exchange of messages 155, 32 and 159). 4. **It must be indicated on the OBU DMI that communication session has been established.** 5. **A new train with unknown train data and unknown direction has to be indicated on the RBC HMI in the RBC stack.** 6. OBU sends a SOM PR message in SB mode with a valid position (message 157 with Q_STATUS = 1). 7. **SB mode and the train direction must be indicated on the RBC HMI.** 8. The train data is entered on the OBU DMI, and the OBU sends it to the RBC (message 129 with pk 11). 9. The RBC confirms the train data (message 8). RBC sends national values together with national values for braking curves and parameters for PR and for MA request to OBU (message 24 with pk 3, 203, 57 and 58). 10. **On the RBC HMI, unknown train data must be changed to specific data.** **Presented train data must meet the train and vehicle parameters entered into DMI OBU (train number is checked as well as train length, train category and maximum train speed if entered) as well as the parameters given into the OBU while OBU was implemented into EMU or DMU (train length, train category, maximum train speed and type of traction is checked according to the technical documentation or according to the reality).** 11. **The possibility to select Start must be available on the OBU DMI.** 12. Start is selected on the OBU DMI. 13. OBU sends a MA request (message 132). 14. The RBC sends a limited SR authorisation to the train (message 2) with the D_SR corresponding to the distance between the front end of the vehicle and the nearest main signal relevant to the direction of the vehicle. 15. Displaying of the speed limits in SR/OS mode is toggled on the OBU DMI. 16. **SR mode, maximum speed V_NVSTFF or lower depending on the length of SR authorisation, the target speed 0 km/h and the permitted distance which correspond to the distance of the front end of the vehicle to the nearest main signal relevant for the train must be indicated on the OBU DMI.** 17. **The train in SR mode with the indicated direction of the actual direction of the train must be indicated in the RBC stack on the RBC HMI.**
Comments	The contact details for each RBC are listed in the Route Book.
Recommended follow-up test	Empty.

Test designation	T_203
Test name	**Transition from SR mode to FS mode using ATAF after SOM with unknown or invalid position**
Recommended previous test	T_201
Initial conditions	The train stands in SR mode on a running track, in the ETCS L2 area, at a location where there is no BG between the front end of the train and the BG at the nearest main signal relevant for its direction of travel (i.e. the nearest BG is at the main signal). The train position is known or unknown. A train route is set for the train from the running track, where it stands (from the route signal or exit signal).
Necessary co-operation with the infrastructure staff	Empty.
Test description	1. The train moves in the direction of the set VC. 2. The OBU reads BG at the exit or route signal. 3. The OBU sends PR, in which BG at the exit or route signal is used as LRBG, to the RBC. 4. RBC sends national values and national values for braking curves (message 24 with pk 3 and 203) to OBU. 5. The train occupies the track section in advance of the exit or route signal (this can occur even before or simultaneously with the event according to point 3). 6. The RBC sends the MA FS to OBU (message 3 with pk 15, 5, 21, 27 and 68). 7. **The OBU must switch to FS mode** (FS mode is indicated on the OBU DMI) **and the permitted speed and distance must be limited according to the conditions of the VC**.
Comments	Empty.
Recommended follow-up test	Empty.

Test designation	T_204
Test name	**Return from the ETCS trackside exclusion without stopping stopping and with sending of the national values**
Recommended previous test	Empty.
Initial conditions	The train moves in the SN or UN mode on the line track in the definitive ETCS exclusion area and has a communication session with the RBC established. The communication session with the RBC was established in SN or UN mode in the ETCS trackside exclusion area. An entry route and at least one follow-up route are set for the train in the next station where the ETCS exclusion is not activated.
Necessary co-operation with the infrastructure staff	RBC HMI operator when ETCS exclusion is activated and cancelled.
Test description	1. The train runs on the running track at the station and read the BG at its beginning. 2. The RBC sends the MA FS and the level transition order at the signal at the end of the running track (message 24 with pk 41 with D_LEVELTR corresponding to the distance between the LRBG and the signal, with L2 – LNTC/LS – L0 priority order) to the train. 3. **The information about the approaching L2 transition must be displayed on the OBU DMI.** 4. **If the train is in the SN mode, a confirmation of the ETCS L2 transition must be required.** 5. If the train is in the SN mode, the entry into the ETCS L2 area is confirmed on the OBU DMI. 6. The train front end passes the signal at the end of the running track. 7. **The OBU must switch to FS mode** (FS mode is indicated on the DMI OBU)**.** 8. RBC sends national values and national values for braking curves to the train (message 24 with pk 3 and 203).
Comments	Empty.
Recommended follow-up test	Empty.

Test designation	T_205
Test name	**Passage of the train through a place with the change of traction system with packet 239**
Recommended previous test	Empty.
Initial conditions	The train in FS mode moves to a location where the type of electric traction changes, but the MA for the passage through this location has not been issued yet.
Necessary co-operation with the infrastructure staff	Empty.
Test description	1. The RBC extends the MA FS for the train so that it includes the traction change location. 2. The RBC starts sending the track condition "Powerless section – lower pantograph" (pk 68 with M_TRACKCOND = 3) in the MA FS to the train and sends the information about the new traction system to the train (message 24 with pk 39, where M_TRACTION = 129 (25 kV AC) or 130 (3 kV DC) and pk 239, where M_VOLTAGE = 1 and NID_CTRACTION = 36 (25 kV AC) or M_VOLTAGE = 3 and NID_CTRACTION = 37 (3 kV DC)). 3. **The information about the approaching change of traction system to 25 kV or 3 kV and about the necessity of pantograph lowering must be displayed in the planning area on the OBU DMI**. 4. The vehicle approaches to the distance necessary for lower the pantograph. 5. **The information about the necessity of pantograph lowering must appear in the area B (under the speed indicator) of the OBU DMI.** The way and punctual place of the indication depends on the OBU implementation and the time required to perform given task. 6. The vehicle approaches the place where it is necessary to change the traction system 7. **The information about the necessity of traction system change must appear in the area B (under the speed indicator) of the OBU DMI.** The way and punctual place of the indication depends on the OBU implementation and the time required to perform given task. The new traction system information may be displayed in area E (text information) in the case of vehicles with the OBU according to BL2. 8. Either the vehicle automatically or the driver manually lowers the pantograph and changes the traction system. 9. The vehicle passes the signal board with "raise the pantograph" signal. 10. **The information about the necessity of pantograph lowering must not be displayed any more on the OBU DMI.**
Comments	The location of the traction system change is the point of contact of the 3 kV DC and 25 kV AC systems at the km 132.089 or km 132.120 at Nedakonice station. The test is performed only with two- and multi-system vehicles. The test is performed for both directions of travel.
Recommended follow-up test	Empty.

Test designation	T_206
Test name	**Transition from FS mode to SH mode by the RBC order**
Recommended previous test	Empty.
Initial conditions	The train in FS mode is on the running track with the signal at the end of the track which transfers "shunting allowed" signal into the RBC. Stop signal is presented on that signal. Train is max in the distance of D_SH ahead of the signal at the end of the running track.
Necessary co-operation with the infrastructure staff	Operator at the SZZ control in the event of setting SH (PC)
Test description	1. The shunting route from the main signal at the end of the running track on which the train stands is set. 2. RBC starts sending MA SH (message 3 with pk 80 with M_MAMODE = 1). 3. **OBU must switch to SH mode** (SH mode is indicated on the OBU DMI). 4. The transition to SH mode is confirmed on the DMI OBU. 5. OBU sends the EOM to the RBC (message 150). 6. The RBC orders the OBU to terminate the communication session (message 24 with pk 42). 7. The OBU sends the RBC the information about the termination of communication session (message 156). 8. The RBC confirms the termination of communication session (message 39). 9. The connection is terminated at a safe Euroradio level. 10. **All information about the train must be deleted on the RBC HMI.**
Comments	In the section Petrovice u Karviné – Břeclav (exclusive) the test can be performed at the signal S101b at Ostrava hl.n. – Hrušov station. In the sections Česká Třebová (exclusive) – Přerov (exclusive) and Český Brod – Praha-Malešice – Praha-Uhříněves the test can be performed at all of the route signals and exit signals except Praha–Malešice station.
Recommended follow-up test	Empty.

Test designation	T_207
Test name	**Transition from FS mode to RV mode**
Recommended previous test	Empty.
Initial conditions	Train in the FS mode moves in the area where the RV mode selection is allowed.
Necessary co-operation with the infrastructure staff	Empty.
Test description	1. Train stops at the place where the RV mode selection is allowed 2. **The information about the possibility of selecting RV mode must be displayed on the OBU DMI.** 3. Driver selects the reverse direction or takes another action according to the manufacturer's instructions to indicate an intention to switch to RV mode. 4. **The request to confirm the transition to RV mode must be displayed on the OBU DMI.** 5. The transition to RV mode is confirmed on the OBU DMI. 6. **The OBU must switch to RV mode** (RV mode is indicated on the OBU DMI). **Maximal permitted speed V_RV must be indicated.** 7. **HMI RBC must display announcement „Mód Reverz (RV) XXXXX" where XXXXX is the train number.** 8. The vehicle desk is closed. 9. OBU sends the EOM to the RBC (message 150). 10. The OBU switches to the SB mode (SB mode is indicated on the OBU DMI or DMI becomes blank). 11. The RBC orders the OBU to terminate the communication session (message 24 with pk 42). 12. The OBU sends the RBC the information about the termination of communication session (message 156). 13. The RBC confirms the termination of communication session (message 39). 14. The connection is terminated at a safe Euroradio level. 15. **All information about the train must be deleted on the RBC HMI.**
Comments	Test can be performed in the some of the tunnels in the sections Česká Třebová (exclusive) – Přerov (exclusive) and Český Brod – Praha-Malešice – Praha-Uhříněves. Specific mileage values can be found in the Annex B.5.
Comments	Empty.

Test designation	T_208
Test name	**Exit from the ETCS area in the direction of Poland**
Recommended previous test	Empty.
Initial conditions	The train in FS mode is approaching the L2 exit border which is situated in the section Petrovice u Karviné – Zebrzydowice. MA FS has not been issued beyond the ETCS L2 exit border yet.
Necessary co-operation with the infrastructure staff	Empty.
Test description	1. The RBC extends the MA FS beyond the ETCS L2 exit border. For train with the OBU without STM SHP is permitted speed from the exit border equal to at most V_NVUNFIT. 2. If this has not already happened, the train passes the penultimate signal in rear of the ETCS L2 exit border. RBC sends the LNTC/L0 level transition order (pk 41 with the LNTC/SHP – L0 priority order and with the confirmation window L_ACKLEVELTR = 200 m) with the MA FS to the train. 3. **The information about the approaching LNTC or L0 (vehicle without SHP STM or vehicle with SHP STM deactivated) area must be displayed on the OBU DMI.** 4. Train passes SHP system magnet located in the km 291.772. 5. **Text message „Tarcza ostrzegawcza przejazdowa / Sledujte prejezdnik"**, is displayed on the OBU DMI with a confirmation required. 6. The text message is confirmed on the OBU DMI. 7. **In the window 200 m in rear of the exit border, the OBU must require confirmation of the transition to LNTC or L0 (vehicle without SHP STM or vehicle with SHP STM deactivated)**. 8. The transition to the LNTC or L0 is confirmed on the OBU DMI. 9. Train passes SHP system magnet located in the km 292.138. 10. **Text message „Tarcza ostrzegawcza przejazdowa / Sledujte prejezdnik"**, is displayed on the OBU DMI with a confirmation required. 11. The text message is confirmed on the OBU DMI. 12. The train front end passes the ETCS L2 exit border. 13. **The OBU with SHP STM enabled must switch to level LNTC/SN mode of the SHP NTC** (SN mode and SHP NTC are indicated on the OBU DMI). 14. **The OBU without SHP STM must switch to level L0/UN mode** (level L0 and UN mode are indicated on the OBU DMI). 15. **The OBU with SHP STM deactivated must either switch to level L0/UN mode** (level L0 and UN mode are indicated on the OBU DMI) **or to level LNTC/SF mode** (level L0 and SF mode are indicated on the OBU DMI). 16. The OBU sends PR with a level change to the LNTC or L0 to the RBC. 17. The RBC stops sending the MA to the train. 18. After the PR confirms that the whole train has left the ETCS L2 area, the RBC sends the order to terminate the communication session (message 24 with pk 42) to the OBU. 19. The OBU sends the information about the communication session termination (message 156) to the RBC. 20. The RBC confirms the communication session termination (message 39). 21. The connection is terminated at a safe Euroradio level. **The established communication session with the RBC must not be indicated any more on the OBU DMI.** 22. **All information about the train must be deleted on the RBC HMI**.
Comment	Test is performed only with the vehicles with allowed transition to Poland.
Recommended follow-up test	Empty.

Test designation	T_209
Test name	**Departure from Petrovice u Karviné or Bohumín in LNTC different from the LS**
Recommended previous test	Empty.
Initial conditions	The train is located in the LNTC level with the SHP STM (NID_STM = 26) in Petrovice u Karviné or Bohumín station (including Bohumín-Vrbice station part). Before starting the test, it is necessary to prevent the RBC from switching the OBU to L2 by the principle of returning from the ETCS exclusion (after OBU passes a BG and establishes the connection with RBC) e.g. by activating an ETCS exclusion for the line track or by switching off the data radio terminal.
Necessary co-operation with the infrastructure staff	The RBC HMI operator when ETCS exclusion is activated and cancelled if the ETCS exclusion is used (see Comments).
Test description	1. The train runs at a low speed from Petrovice u Karviné in the direction of Dětmarovice or from Bohumín in the direction of Dětmarovice or Ostrava hl. n. 2. The train passes the home signal valid for the opposite direction and the OBU reads the BG at the home signal which contains the level priority list not allowing other STM than LS STM (pk 46 with LNTC/LS – L0 – L2 priority order). 3. **The OBU with LS STM must switch to level LNTC/SN mode of the LS NTC** (SN mode and LS NTC are indicated on the OBU DMI). 4. **The request to confirm the transition to LNTC must be displayed on the OBU (with LS STM) DMI.** 5. The transition to the LNTC is confirmed on the OBU (with STM LS) DMI. 6. **The OBU without LS STM (or with LS STM deactivated) must switch to level L0/UN mode** (level L0 and UN mode are indicated on the OBU DMI). 7. The transition to the L0 is confirmed on the OBU DMI.
Comments	The test is to be performed only with the vehicles that travel to Poland via Petrovice u Karviné – Zebrzydowice or Bohumín – Chałupki track section and are equipped with other STM than LS STM.
Recommended follow-up test	Empty.

B.4 List of chosen national values, SŽDC data and other parameters

V_NVALLOWOVTRP	40 km/h	Maximum speed limit for triggering the Override EOA function
V_NVSTFF	40 km/h	The SR mode speed limit
V_NVUNFIT	100 km/h	The UN mode speed limit
CZ_D_OSPERMISR	300 m	Distance used for OS in rear of the signal with the permissive Stop signal
CZ_D_TAFREQDISP	500 m	Maximum distance for displaying the TAF request
CZ_V_OSPERMISR	40 km/h	Speed limit for transition to OS mode in rear of the signal with the permissive Stop signal
T_SECTIONTIMER	18 s	MA validity time
D_SH	500 m	Distance for transition into SH mode
V_RV	30 km/h	Maximum permitted speed in the RV mode

B.5 List of recommended test sections

For T_207:

Tunnel name	Beginning	Ending
Section Česká Třebová (exclusive) – Přerov (exclusive)		
Krasíkovský	24.693	25.792
Tatenický	25.997	26.120
Malá Huba	27.370	27.694
Hněvkovský I	33.815	33.995
Hněvkovský II	34.755	35.218
Section Český Brod – Praha-Malešice – Praha-Uhříněves		
Malešický	3.047	3.405

Area with the allowed transition into RV mode always starts 100 m in rear of the tunnel beginning and ends 100 m in advance of the end of the tunnel.