Mr. Paul Carter
Design Assurance and Authorisation Manager
Bombardier Transportation UK Ltd.
Registered Office: Litchurch Lane,
Derby,
DE24 8AD

Your Ref

Case Ref PRM-IOP-0334
EIN UK/51/2020/0027

6th May 2020

Contact: Paul Frary
HM Inspector of Railways
25 Cabot Square
London
E14 4QZ

Dear Paul

THE RAILWAYS (INTEROPERABILITY) REGULATIONS 2011, AS AMENDED AUTHORISATION OF CLASS 345 AGAINST CCS TSI FOR THE ONBOARD USE OF ETCS NTC, ETCS LEVEL 0, 1 AND 2.

VEHICLE NUMBERS (INCLUSIVE): 3450001 TO 345070

I refer to your application for authorisation, received on the 26th March 2020.

This letter of authorisation is only valid when accompanied by Appendix 1 and Appendix 2.

Following review of your application, I can confirm that ORR grants authorisation under regulation 4 (1) (a) of the Railways (Interoperability) Regulations 2011, as amended. This authorisation is for the placing into service of an on board ETCS NTC and ETCS Level 0, 1 and 2 sub-system for Class 345 vehicles as per Appendix 1.

The ETCS configuration is PVI 6.4.3. Incorporating product version 2.4.1 and TCMS v7.3.1.8. According to functional baseline as described above and according to documents 3EER400028-7392_A and 3EER400024-2788_G.

Configuration is valid for all vehicles as per Appendix 1.

I also refer to your EC Declaration of Verification, reference 3EER400031-2590_Ben dated 26th April 2020 and Article 16 Declaration dated 27th February 2020.

The restrictions or limitations of use on the structural subsystem are those contained in your Declaration of Verification dated 26th April 2020 and contained in your Technical File, reference 3EER400031-2104.
The conditions are summarised below and reproduced in Appendix 2, along with timescales and implementation methodology.

Limitations

There are 33 limitations of use. 31 limitations of use are based on the out of scope functionality (3EER400032-0008 Rev A) and 2 limitations of use are as identified in the Safety Justification Report conclusions (3EER400030-4631 rev A) and echoed in the Assessment Body Report conclusions (AES/556/L18)

Restrictions

1. Compatibility between the vehicle and the infrastructure.

   Network Rail Summary of Compatibility (NRSC) shall be issued in accordance with RIS-8270-RST issue 1 prior to trains being put into use.

2. There are 3 restrictions based on NNTR non-conformity at the time of the authorisation.
   GE/RT8075 issue 2 AWS/TPWS:
   - Subject to permanent Deviation 16-021-DEV Isolation Switch Design

   GE/RT8402 issue 2 ETCS DMI:
   - Subject to 19-046-DEV - Speed display in MPH only, expires 6th September 2022
   - Subject to 19-047-DEV - Ability to enter invalid Train Running Number on the ETCS DMI, expires 30th June 2020

   To remove the two conditions relating to GE/RT8402 issue 2, evidence of either a new Deviation from RSSB or compliance with the standard must be submitted to and agreed by a relevant assessing body.

3. There are 84 restrictions based on TSI non-conformity at the time of authorisation (3EER400032-0011 Rev A).

   The applicant and NoBo has made specific reference to the following conditions:

   Valid only for ETCS routes:

   - Not requiring geographical position reporting (numbering 1)
   - With one RBC (numbering 2)

- Not requiring limited supervision mode (numbering 3)
- With a single GSM-R data network (numbering 1)
- Not requiring VBC to be set by the driver (numbering 1)

To remove the five conditions above, evidence of compliance must be submitted to and agreed by a relevant assessing body. They must also be completed in the time scales set out in this authorisation.

In addition, the applicant and NoBo has made reference to the following conditions:

- Non-compliant behaviour (numbering 65)
- Non-standard DMI (numbering 11)

These must also be completed in the time scales set out in this authorisation.

NOTE: One condition regarding the driver not being required to set Virtual Balise Covers (VBC), was identified in the Safety Justification Report conclusions (3EER400030-4631 rev A) and echoed in the Assessment Body Report conclusions (AES/556/L18) but has already been identified by the NoBo.

Non-compliances subject to ETCS Maintenance Release 5 and TCMS Release 7.3.2.3 shall be completed prior to trains being put into use.

Non-compliances subject to ETCS Maintenance Release 6 to 10 inclusive and TCMS 7.6 to 8.0 inclusive shall be completed in a timely manner as set out in the ETCS Non-compliance Resolution Plan (3EER400031-1120) to achieve the overarching end completion date of 31st March 2024.

The NSA may request progress on the ETCS Non-compliance Resolution Plan from time to time to demonstrate progression and ensure timely completion of the scheme.

The Technical File should be kept up to date.

The closure plan is based upon document 3EER400031-1120 and referenced to 3EER400032-0011 demonstrating non-compliant behaviour in line with the Safety Justification Report 3EER400030-4631. Any changes in these documents over the course of the maintenance releases shall be reflected in the closure plan.

It is noted that a safety justification report has been produced by the applicant (3EER400030-4631) and has been reviewed by an Assessment Body.

The rolling stock subsystem(s) authorised by this letter must be operated and maintained in accordance with Regulation 20.

You should be aware that any future modifications to the authorised subsystem may constitute a ‘renewal’ or an ‘upgrade’ as defined in Regulation 2. If a project entity, in relation to the project, considers that the modification meets either of these definitions they may apply, in accordance with the provisions of Regulation 13, to the Department for Transport (DfT) for a decision on whether a new authorisation will be required. Should DfT decide that an authorisation is not required they must consult with ORR whether authorisation is required on safety grounds.

As the project entity you are responsible for retaining the technical file, keeping it up to date and making it available to the ORR in accordance with Regulations 18 and 19.

If you are not the owner of the authorised subsystem you shall within 60 days, in accordance with Regulation 19(3), transfer the technical file, certificate of verification and verification declaration to the owner of the subsystem and the owner shall then be regarded as the project entity. If the owner, in accordance with Regulation 19(4), disposes of his interest in the authorised subsystem, he shall within 60 days of the disposal transfer the technical file, certificate of verification and verification declaration to the person acquiring that interest and that person shall be regarded as the project entity.

Please note that under Regulation 36, the person who applied for the authorisation shall send particulars to the Registration Entity to enable the registration entity to enter the information on the National Vehicle Register. This will include such further information as the registration entity may reasonably require set out in the relevant standard.

The person who applied for the authorisation to place in service will be issued with a determination of type in accordance with Commission Implementing Decision 2011/665/EC. The person who applied for the authorisation to place in service will receive the type authorisation after providing the data to the Registration Entity in accordance with Annex II of Commission Implementing Decision 2011/665/EC.

If you are the operator, may I remind you of the need to have adequate arrangements within your Safety Management System to control the risks associated with this rolling stock subsystem(s).

This decision letter will be published on ORR website.

Yours sincerely

Steve Fletcher
Deputy Director, Engineering & Asset Management

Cc

Ian Prosser	Director, Railway Safety Directorate, ORR
Ian Jones	Head of Interoperability, DfT
National Vehicle Register	nvr@networkrail.co.uk
Phil Clarke	Director of Rolling Stock, RFL
Kam Sandhu	HM Inspector of Railways, ORR
Pete Gracey	Head of Interoperability, ORR
Dave Galloway	Professional Head of System Compatibility, NR

APPENDIX 1

	Veh 1		Veh 2		Veh 3		Veh 4		Veh 5		Veh 6		Veh 7		Veh 8		Veh 9	
Designation	DMS		PMS		MS1		MS3		TS(W)		MS3		MS2		PMS		DMS	
RSL Designation	DMS1		PMS1		MS1		MS3		TS		MS3		MS2		PMS2		DMS2	
DIS	C6063		C6064		C6065		C6066		C6067		C6068		C6069		C6070		C6071	
Design code	EM2300A		EK2900A		ER2010A		ER2020A		EK2910A		ER2030A		ER2040A		EK2920A		EM2310A	
Unit Numbers	Domestic	EVN	Domestic	EVN	Domestic	EVN	Domestic	EVN	Domestic	EVN	Domestic	EVN	Domestic	EVN	Domestic	EVN	Domestic	EVN
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345059	340159	94700340159 5	340259	94700340259 3	340359	94700340359 1	340459	94700340459 9	340559	94700340559 6	340659	94700340659 4	340759	94700340759 2	340859	94700340859 0	340959	94700340959 8
345060	340160	94700340160 3	340260	94700340260 1	340360	94700340360 9	340460	94700340460 7	340560	94700340560 4	340660	94700340660 2	340760	94700340760 0	340860	94700340860 8	340960	94700340960 6
345061	340161	94700340161 1	340261	94700340261 9	340361	94700340361 7	340461	94700340461 5	340561	94700340561 2	340661	94700340661 0	340761	94700340761 8	340861	94700340861 6	340961	94700340961 4
345062	340162	94700340162 9	340262	94700340262 7	340362	94700340362 5	340462	94700340462 3	340562	94700340562 0	340662	94700340662 8	340762	94700340762 6	340862	94700340862 4	340962	94700340962 2
345063	340163	94700340163 7	340263	94700340263 5	340363	94700340363 3	340463	94700340463 1	340563	94700340563 8	340663	94700340663 6	340763	94700340763 4	340863	94700340863 2	340963	94700340963 0
345064	340164	94700340164 5	340264	94700340264 3	340364	94700340364 1	340464	94700340464 9	340564	94700340564 6	340664	94700340664 4	340764	94700340764 2	340864	94700340864 0	340964	94700340964 8
345065	340165	94700340165 2	340265	94700340265 0	340365	94700340365 8	340465	94700340465 6	340565	94700340565 3	340665	94700340665 1	340765	94700340765 9	340865	94700340865 7	340965	94700340965 5
345066	340166	94700340166 0	340266	94700340266 8	340366	94700340366 6	340466	94700340466 4	340566	94700340566 1	340666	94700340666 9	340766	94700340766 7	340866	94700340866 5	340966	94700340966 3
345067	340167	94700340167 8	340267	94700340267 6	340367	94700340367 4	340467	94700340467 2	340567	94700340567 9	340667	94700340667 7	340767	94700340767 5	340867	94700340867 3	340967	94700340967 1
345068	340168	94700340168 6	340268	94700340268 4	340368	94700340368 2	340468	94700340468 0	340568	94700340568 7	340668	94700340668 5	340768	94700340768 3	340868	94700340868 1	340968	94700340968 9
345069	340169	94700340169 4	340269	94700340269 2	340369	94700340369 0	340469	94700340469 8	340569	94700340569 5	340669	94700340669 3	340769	94700340769 1	340869	94700340869 9	340969	94700340969 7
345070	340170	94700340170 2	340270	94700340270 0	340370	94700340370 8	340470	94700340470 6	340570	94700340570 3	340670	94700340670 1	340770	94700340770 9	340870	94700340870 7	340970	94700340970 5

APPENDIX 2

Appendix 2.1 Out Of Scope – Reference to Technical File, document 3EER400032-0008 rev A and 3EER400030-4631 rev A.

The following items (33) have been identified by the applicant as being out of scope and hence present limitations in use of the sub-system. These need to be brought to any relevant duty holder's attention.

Reference		
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 1	4.2.3	CCS Trackside sub-system Not part of CL345 onboard application.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 2	4.2.4.2	GSM-R Voice Radio Separate equipment. Certification has been established to 2012 CCS TSI and does not import any requirements on other onboard functions
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 3	4.2.4.1	GSM-R SIM cards SIM card is provided under free issue by Rail for London and is to be certified separately.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 4	4.2.4	GSM-R packet switched radio. No current plans for CL345 to implement ETCS over packet switched GSM-R. Any future use of packet switched ETCS in GB will require a strategic level decision on the appropriate bearer technology along with upgrades to both trackside and train-borne equipment.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 5	4.2.2	ETCS Level 3 CL345 is only required to support Levels 0, 1, 2, NTC TPWS/AWS and NTC CBTC.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 6	4.2.7	Interfacing to ETCS trackside equipment that sends messages / packets or uses Euroradio protocols other than those defined in ETCS Baseline Three Maintenance Release One CL345 is designed and tested to this version of the ETCS specifications. It cannot be relied on to handle erroneous messages or messages introduced in later versions of the ETCS specifications.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 7	4.2.7	Radio sessions initiated by the RBC. No anticipated need for CL345 to implement this function, which is rarely if ever used.

Reference	TSI Clause	Applicant Explanation
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 8	4.2.7	RBC on-board short numbers. No current plans for the CL345 to support this function.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 9	4.2.7	RBC phone numbers longer than 16 digits RBC phone numbers are expected never to be longer than 16 digits
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 10	4.2.5.3, 4.2.7.5	Euroloop functionality Optional interface and no requirement for CL345 identified as Euroloops are not used on the GB rail network, nor ever expected to be.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 11	4.2.5.1, 4.2.7.3, 4.2.8	Radio infill functionality Optional interface and no requirement for CL345 identified as radio infill is not used on the GB rail network, nor ever expected to be
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 12	6.2.4.2	STM interface Optional interface and CL345 Level NTC (TPWS/AWS and CBTC) will use specific interfaces.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 13	4.2.6.1	Interfaces ‘G’ and ‘K.’ KER balises, for which interfaces ‘G’ and ‘K’ are required, are not used on the GB rail network on which the CL345 operates, nor ever expected to be.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 14	4.2.2	Unfitted mode speed supervision when STM is operating in stand alone mode CBTC stand alone mode is a specific requirement for the CL345 trains to enable them to operate under CBTC supervision without ETCS intervention, e.g. in cases of ETCS on-board equipment failure.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 15	4.1	Cold movement detection. Optional function, not supported by CL345. CL345 will normally be powered via overhead line equipment hence loss of valid position, when unpowered, will be an exceptional occurrence even without cold movement detection.

Reference	TSI Clause	Applicant Explanation
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 16	4.1	ETCS protection when direction controller reverse. Design requirement of CL345 to enable trains to reverse without ETCS supervision.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 17	4.1	Roll away protection when direction controller is neutral and the train still moving to allow coasting CL345 does not have a neutral position on the direction controller.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 18	7.5	Level crossing information, using packet 88 No current plans for the CL345 to support this function.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 19	Open Point, Annex G	'Special' brakes (inc. magnetic shoe, eddy current etc.) Not implemented on CL345. Braking is via friction pads and traction motors only.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 20	N/A	Air tightness controls Not implemented on CL345. CL345 operating speed means interface is below levels of concern.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 21	N/A	Passenger door control by ETCS. Passenger door controls implemented independently of ETCS on CL345.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 22	4.1	Brake pressure monitoring by ETCS. Optional interface and no requirement for service brake feedback on CL345 identified.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 23	4.1	Train length integrated correction factor. Conversion model not applicable to CL345 as it operates as a fixed formation.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 24	4.2.2	Train integrity proving CL345 is not required to operate in ETCS Level 3, hence there is no need for train integrity proving.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 25	6.1.1.2	Level NTC operation other than TPWS/AWS CL 345 is only required to support Levels 0, 1, 2, NTC TPWS/AWS and NTC CBTC.

Reference	TSI Clause	Applicant Explanation
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 26	4.1	Non-leading mode CL345 will only operate as in fixed formations, hence Non Leading mode is not required.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 27	4.2.3	Route suitability based on traction type No current plans for the CL345 to support this function.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 28	4.1	Track Ahead Free Function not used in GB applications of ETCS in preference for automated means of determining track is clear ahead of a train.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 29	4.2.8	Key Management Centre Euroradio keys to be managed and distributed by Network Rail.
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 30	4.1	Interfacing to an RBC that doesn't order termination of communication session when train reports a transition from SL to SB mode (in accordance with SRS 5.12.3.3.3). SUBSET-026 of the CCS TSI strongly implies this RBC behaviour as the start of mission procedure, which is the logical next step after a train transitions from SL to SB mode, assumes no communication session between train and RBC. However, the CCS TSI does not explicitly state that RBCs should behave in this way
3EER400032-0008 revision A Sec 4.3 - Table 2 Item 31	4.1	Interfacing ETCS Trackside equipment with NID_C=0 ETCS on-board product constraint; see GoIC Application Conditions and Constraints document [8], entry W20 in section 2.3.4.
AsBo Report AES/556/L18 Section 4 – Conclusions 3EER400030-4631 Rev B Section 7 – Conclusions		The RBC will order the termination of a communication session.
AsBo Report AES/556/L18 Section 4 – Conclusions 3EER400030-4631 Rev B Section 7 – Conclusions		Cl345 operation is permitted only on infrastructure where the balises do not use short numbers.

Appendix 2.2 NNTR Non-Compliances – Reference to DeBo Certificate 6186/1/SB/2020/CCO/EN/0068 and Technical File

1. There are 3 restrictions based on NNTR non-conformity at the time of the authorisation.
   GE/RT8075 issue 2 AWS/TPWS:
   - Subject to permanent Deviation 16-021-DEV Isolation Switch Design

   GE/RT8402 issue 2 ETCS DMI:
   - Subject to 19-046-DEV - Speed display in MPH only, expires 6th September 2022
   - Subject to 19-047-DEV - Ability to enter invalid Train Running Number on the ETCS DMI, expires 30th June 2020

   To remove the two conditions relating to GE/RT8402 issue 2, evidence of either a new Deviation from RSSB or compliance with the standard must be submitted to and agreed by a relevant assessing body.

Appendix 2.3 TSI Non-Compliances – Reference to NoBo Certificate 2642/1/SB/2020/CCO/EN/0067, Technical File and document 3EER400032-0011 revision A

The following items (84) have been identified by the applicant as being TSI non-compliant and hence present restrictions in use of the sub-system.

The applicant and NoBo has made specific reference to the following conditions:

Valid only for ETCS routes:

- Not requiring geographical position reporting (1)
- With one RBC (2)
- Not requiring limited supervision mode (3)
- With a single GSM-R data network (1)
- Not requiring VBC to be set by the driver (1)

To remove the five conditions above, evidence of compliance must be submitted to and agreed by a relevant assessing body. They must also be completed in the time scales set out in this authorisation.

In addition, the applicant and NoBo has made reference to the following conditions:

- Non-compliant behaviour (65)
- Non-standard DMI (11)

These must also be completed in the time scales set out in this authorisation.

NOTE: One condition regarding the driver not being required to set Virtual Baliese Covers, was identified in the Safety Justification Report conclusions (3EER400030-4631 rev A) and echoed in the Assessment Body Report conclusions (AES/556/L18).

Non-compliances subject to ETCS Maintenance Release 5 and TCMS Release 7.3.2.3 shall be completed prior to trains being put into use.

Non-compliances subject to ETCS Maintenance Release 6 to 10 inclusive and TCMS 7.6 to 8.0 inclusive shall be completed in a timely manner as set out in the ETCS Non-compliance Resolution Plan (3EER400031-1120) to achieve the overarching end completion date of 31st March 2024.

The NSA may request progress on the ETCS Non-compliance Resolution Plan from time to time to demonstrate progression and ensure timely completion of the scheme.

The Technical File should be kept up to date.

The closure plan is based upon document 3EER400031-1120 and referenced to 3EER400032-0011 demonstrating non-compliant behaviour in line with the Safety Justification Report 3EER400030-4631. Any changes in these documents over the course of the maintenance releases shall be reflected in the closure plan.

Compliance	Item Reference and Condition	TSI Clause	Applicant Explanation
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 4 - Table 1 - ID CL345-N-C-TSI-GoIC-094 Condition: CL345 is technically compatible with routes that do not require geographical position reporting	4.1 Index 04 - SS026 3.6.6.4.2 4.1 Index 04 - SS026 3.6.6.9 b)	The onboard ETCS should stop calculating geographical position from a track kilometre reference if it is ordered to do so from the trackside. However the onboard ETCS continues to calculate geographical position reporting even when ordered to stop doing so.
ETCS fix Plan MR6	3EER400032-0011 revision A Sec 4 - Table 1 - ID CL345-N-TSI-EVC-RR1 Non-compliant behaviour	4.1 Index 04 SS026 3.14.1.7	The onboard ETCS supervises the safe radio connection. If a defined time (T_NVCONTACT) since the last received message is exceeded then the service brakes are commanded. If the service brakes are commanded due to supervision of the safe radio connection (T_NVCONTACT exceeded) then the onboard ETCS should release the brakes at standstill or if a new consistent message has been received from the RBC. However, if the CL345 onboard ETCS has commanded the service brakes due to supervision of the safe radio connection, and whilst the brakes are applied receives a Level 2 transition order from a balise, then the brakes are immediately released without requiring standstill or a new consistent message from the RBC. The T_NVCONTACT timer restarts.
ETCS fix Plan MR8	3EER400032-0011 revision A Sec 4 - Table 1 - ID CL345-N-C-TSI-GoIC-047 Condition: CL345 is technically compatible with routes with only one RBC	4.1 Index 04 - SS026 4.8.3.1 Index 04 - SS026 5.4.4.1	The onboard ETCS should reject a Movement Authority from the RBC if train data acknowledgement has not yet been received from the RBC. However, if during start of mission the driver changes the radio connection to a different RBC having received acknowledgement of train data from the original RBC, the CL345 onboard ETCS does not send train data automatically to the new RBC. The CL345 onboard ETCS is unable to establish a session with the new RBC.

Compliance	Item Reference and Condition	TSI Clause	Applicant Explanation
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 4 - Table 1 - ID CL345-N-C-TSI-GoIC-044 Condition: CL345 is technically compatible with routes with only one RBC	4.1 Index 04 - SS026 4.8.4.2:26 [8]	Whilst in Shunting mode the onboard ETCS should accept RBC transition orders, but only with zero distance to execution (i.e. RBC transition announcement should be rejected). However, the onboard ETCS in Shunting mode accepts RBC transition orders with non-zero distance to execution.
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 4 - Table 1 - ID CL345-N-C-TSI-GoIC-064 Condition: CL345 is technically compatible with routes that do not require Limited Supervision mode	4.1 Index 04 - SS026 4.8.4.2:61	In level 1 Limited Supervision mode the onboard ETCS should display the Lowest Supervised Speed within the Movement Authority (LSSMA) on the DMI. However, when in L1 Limited Supervision mode the CL345 onboard ETCS does not display the LSSMA on the DMI.
ETCS fix Plan MR8 TCMS fix Plan 7.3.1.6	3EER400032-0011 revision A Sec 4 - Table 1 - ID CL345-N-C-TSI_DMI-JRU-& Other-077 Condition: CL345 is technically compatible with routes with only one GSM-R network	4.2.2 Index 6 ERA 015560 11.3.4.1 Index 6 ERA 015560 11.7.1.5	For a DMI window covering the half grid array, the value stored by the onboard ETCS should be replaced by the data value of the input field when the driver accepts this data value. However in the radio network ID window, the CL345 onboard ETCS does not store, or subsequently display, the driver's selection of radio network ID.
ETCS fix Plan MR6 TCMS fix Plan 7.3.2.2	3EER400032-0011 revision A Sec 4 - Table 1 - ID CL345-N-C-TSI_DMI-JRU-& Other-108 Condition: CL345 is technically compatible with routes that do not require VBCs to be set by the driver	4.2.2 Index 6 ERA 015560 11.7.7.3	Within the Settings window the driver should be to select Set VBC (Virtual Balise Cover), which should then open the Set VBC window and allow the driver to enter a VBC code. However the CL345 DMI Set VBC window does not open when selected. The driver cannot access the Set VBC functionality.

Compliance	Item Reference and Condition	TSI Clause	Applicant Explanation
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 4 - Table 1 - ID CL345-N-C-TSI_DMI-JRU-& Other-038z Condition: CL345 is technically compatible with routes that do not require Limited Supervision mode	4.2.14 Index 05 SS027 4.3.1.1:25	Whenever the Lowest Supervised Speed within the Movement Authority (LSSMA) appears, changes or disappears on the DMI, the LSSMA should be recorded. However, the CL345 onboard ETCS records the wrong value for LSSMA.
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 4 - Table 1 - ID CL345-N-C-TSI_DMI-JRU-& Other-038p Condition: CL345 is technically compatible with routes that do not require Limited Supervision mode	4.2.14 Index 05 SS027 4.3.1.1:44	Whenever the Lowest Supervised Speed within the Movement Authority (LSSMA) appears, changes or disappears on the DMI, the LSSMA should be recorded. However, when the CL345 onboard ETCS transitions to Limited Supervision mode and the LSSMA is not currently displayed, the LSSMA is still recorded.
ETCS fix Plan MR9	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-040 Non-compliant behaviour	4.1 Index 04 - SS026 3.5.3.4 f)	The onboard ETCS should establish a communication session when the previous communication session is considered as terminated due to loss of safe radio connection. However the CL345 onboard ETCS does not attempt to establish a communication when the previous communication session is considered as terminated due to loss of safe radio connection.
ETCS fix Plan MR9	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-108 Non-compliant behaviour	4.1 Index 04 - SS026 3.5.3.7:2.4	When the onboard ETCS requests the set-up of a safe radio connection with the trackside as part of Start of Mission, it should be repeated until successful or for a defined number of times. If it is not part of Start of Mission, it should be repeated until at least one of a number of specified conditions is met, one of which is that the train front end passes a level transition border (from level 2 to level 0, NTC or 1). However, if the CL345 onboard ETCS is requesting to set up a safe radio connection with the trackside and there is no response whilst the train switches to level 1, train continues to call the trackside (for the defined number of times) rather than stopping.

Compliance	Item Reference and Condition	TSI Clause	Applicant Explanation
ETCS fix Plan MR9	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-043 Non-compliant behaviour	4.1 Index 04 - SS026 3.5.3.7_a	The onboard ETCS should repeat requests to set up a safe radio connection with the trackside, unless part of an ongoing Start of Mission procedure, upon specified conditions including End of Mission being performed or an order to terminate the communications is received from trackside. However the CL345 onboard ETCS continues to request the set-up of a safe radio connection for 5 minutes after End of Mission or after an order to terminate communication session is received from trackside.
ETCS fix Plan MR9	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-052 Non-compliant behaviour	4.1 Index 04 - SS026 3.5.6.6	If the onboard ETCS connected mobile terminal is not currently registered to the Radio Network ordered by trackside and if other specified conditions are fulfilled, the onboard ETCS should initiate Radio Network registration. However, upon losing registration to the Radio Network, and with the other required criteria being fulfilled, the CL345 onboard ETCS does not initiate Radio Network registration.
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-022 Non-compliant behaviour	4.1 Index 04 - SS026 3.5.6.7	If no mobile terminal is registered to a radio network, any order to contact an RBC received from trackside should be rejected by the onboard ETCS. However, if no mobile terminal is registered to a radio network and an order to contact an RBC is received, the CL345 onboard ETCS continues to try registering and to establish a communication with an RBC.
ETCS fix Plan MR5	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-097 Non-compliant behaviour	4.1 Index 04 - SS026 3.5.7.1	The onboard ETCS should indicate the status of the safe radio connection to the driver as either “No Connection”, “Connection Lost/Set-Up failed” or “Connection Up”. However, the CL345 DMI removes the Connection Up symbol when transitioning from Level NTC into Level 1 or from Level 2 into Level NTC, even if the connection is still maintained.

Compliance	Item Reference and Condition	TSI Clause	Applicant Explanation
ETCS fix Plan MR9	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-046 Non-compliant behaviour	4.1 Index 04 - SS026 3.5.7.5, (Table 2, [5]) Index 04 - SS026 3.5.7.5: 7	The onboard ETCS should inform the driver about the status of the safe radio connection. In the scenario where T_NVCONTACT expires (maximum time since last received RBC message) and the subsequent additional delay time (60s) also expires, the onboard ETCS should release the safe radio connection and remove the “Connection Up” symbol. However in this scenario, the CL345 onboard ETCS releases the connection but does not remove the “Connection Up” symbol.
ETCS fix Plan MR9	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-053 Non-compliant behaviour	4.1 Index 04 - SS026 3.6.2.2.2 4.1 Index 04 - SS026 3.6.5.1.4 j)	When passing a linked balise group contained in previously received linking information, the onboard ETCS should send a position report to the RBC (unless position report parameters from the RBC are stored onboard). Passing a linked balise group not contained in previously received linking information should not be a trigger for the onboard ETCS to send a position report to the RBC. However, when the train passes over a linked balise group not contained in the linking information, the CL345 onboard ETCS sends a position report to the RBC even if it should not.
ETCS fix Plan MR5	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-095 Non-compliant behaviour	4.1 Index 04 - SS026 3.14.1.5	If an emergency brake command was triggered due to roll away protection, reverse movement protection or standstill supervision the emergency brake command should be released at standstill and after driver acknowledgement. However, in the case where service brakes have failed and roll away protection triggers an emergency brake command, the CL345 onboard ETCS does not enable to driver to acknowledge the brake application, so the emergency brakes remain applied.
ETCS fix Plan MR9	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-072 Non-compliant behaviour	4.1 Index 04 - SS026 3.14.1.7.5	If the onboard ETCS triggers a brake command due to the driver not having acknowledged a text message, the brake command should be released once the driver has acknowledged the text message. However if the CL345 onboard ETCS triggers a brake command due to the driver not having acknowledged a text message, the brake is not released once the driver has acknowledged the text message until or unless the train is also at standstill.

Compliance	Item Reference and Condition	TSI Clause	Applicant Explanation
ETCS fix Plan MR6	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-110 Non-compliant behaviour	4.1 Index 04 - SS026 3.14.4.1 Index 04 - SS026 3.14.4.2 Index 04 - SS026 4.4.7.1.5 Index 04 - SS026 4.4.7.3.1	Whilst supervising standstill, the onboard ETCS should prevent the train from moving. However, the CL345 onboard ETCS does not perform standstill supervision for speed lower than 4cm/s or 0.0895mph because the odometer cannot detect speed below 4cm/s or 0.0895mph.
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-038 Non-compliant behaviour	4.1 Index 04 - SS026 3.16.1.1 Index 04 - SS026 3.16.3.1.1.1 Index 04 - SS026 3.16.3.1.1.2 4.2.2 Index 13 SS040 4.3.2.1.1 e)	The onboard ETCS should be able to store up to 30 Temporary Speed Restrictions (TSRs). If a message is received that exceeds that amount, the onboard ETCS should not consider the message, it should reject the message and inform the RBC. However the CL345 onboard ETCS is only able to store up to 20 TSRs. Once this is exceeded the onboard ETCS enters System Failure mode.
TCMS fix Plan 7.3.2.2	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-071 Non-compliant behaviour	4.1 Index 04 - SS026 3.18.4.3.5	The onboard ETCS should allow a range for the RBC ID from 0 to 16777214 inclusive. However the CL345 onboard ETCS does not accept an RBC ID of 0.
ETCS fix Plan MR9	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-049 Non-compliant behaviour	4.1 Index 04 - SS026 3.18.6.1 4.2.2 Index 6 ERA 015560 8.5.1.5	Outside the context of data entry, the driver should be able to view driver ID, train running number, RBC contact information, Virtual Balise Cover(s) and Train Data either modifiable by the driver or modifiable by other ERTMS/ETCS external sources. However, in Shunting mode the CL345 onboard ETCS does not open the data view window when selected by the driver.
ETCS fix Plan MR6	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-076 Non-compliant behaviour	4.1 Index 04 - SS026 4.4.5.1.1 Index 04 - SS026 4.4.5.1.2 Index 04 - SS026 4.6.2 Index 04 - SS026 4.6.3_13	The onboard ETCS should switch to System Failure mode in the case of a fault which affects safety and command the emergency brakes. However, in the event of a safety related failure of the odometry system the CL345 onboard ETCS commands the service brake until standstill, in accordance with operating within the target speed profile. However, if a target speed exceedance occurs after an odometry failure there is a delay of 120 seconds before the CL345 onboard ETCS commands the emergency brakes.

Compliance	Item Reference and Condition	TSI Clause	Applicant Explanation
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-055 Non-compliant behaviour	4.1 Index 04 - SS026 4.4.8.1.7	When the driver selects Shunting mode in Level 2, the onboard ETCS should send the request to the trackside for authorisation. The onboard ETCS then switches to Shunting mode only once that authorisation is received. However the CL345 onboard ETCS does not send the Shunting request to the trackside.
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-086 Non-compliant behaviour	4.1 Index 04 - SS026 4.4.11.1.3.1 b)	The onboard ETCS in Staff Responsible mode supervises train movements against a given distance. If that distance is determined by the value transmitted by the RBC or entered by the driver, the start location of the distance should refer to the estimated position of the train front when the distance information is received or entered. However the CL345 onboard ETCS supervises the distance to run in Staff Responsible mode, received from the RBC or entered by the driver, from a position referring to a location 25m in advance of the train front.
ETCS fix Plan MR8	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-093 Non-compliant behaviour	4.1 Index 04 - SS026 4.4.11.1.5.1	If train movement is detected while the Driver is entering Staff Responsible mode speed/distance limits on the DMI, the onboard ETCS should trigger the brakes. The CL345 onboard ETCS is compliant up until the brakes are triggered. However, if the Driver tries to move the train forward again (after the train has stopped and the brakes are released) the brakes are triggered again. The driver must open the Staff Responsible mode speed/distance window again and acknowledge the Staff Responsible mode speed/distance limits to avoid this repeat brake intervention. This repeat brake intervention and need to open the Staff Responsible mode speed and distance window again is the noncompliance.

Compliance	Item Reference and Condition	TSI Clause	Applicant Explanation
ETCS fix Plan MR8	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-TSI-TRANSITIONS-RR1 Non-Compliant behaviour	4.1 Index 04 - SS026 4.6.2 [31] and [32]	The onboard ETCS should transition from On Sight mode to Full Supervision mode if defined criteria are fulfilled, including that no specific mode is required by a mode profile. However, when in On Sight mode between two On Sight mode profiles without overlapping acknowledgement areas, the CL345 onboard ETCS remains in On Sight mode instead of transitioning to Full Supervision.
ETCS fix Plan MR9	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-090 Non-Compliant behaviour	4.1 Index 04 - SS026 4.7.2 Index 04 - SS026 4.7.2.1.4:41	The onboard ETCS should provide an indication (fixed text message) to the driver when an emergency brake feedback failure is detected. However the CL345 onboard ETCS does not provide this indication after emergency brake feedback failure.
ETCS fix Plan MR8	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-074 Non-Compliant behaviour	4.1 Index 04 - SS026 4.7.2 Index 04 - SS026 4.7.2.1.4:60	The driver should be able to acknowledge an indication on that the onboard ETCS roll away protection has applied the brakes. However, if the CL345 onboard ETCS is in Shunting mode or Limited Supervision mode, the driver is not able to acknowledge brakes applied by roll away protection.
ETCS fix Plan MR6	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-038f Non-Compliant behaviour	4.1 Index 04 - SS026 4.7.2.1.4:26 4.2.14 Index 05 - SS027 4.3.1.1:4	Upon changing mode the onboard ETCS JRU should record the change of mode. However upon entering System Failure mode the CL345 onboard ETCS JRU does not record the mode change.
ETCS fix Plan MR9	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-048 Non-Compliant behaviour	4.1 Index 04 - SS026 4.10.1.3:42b Index 04 - SS026 4.10.1.3:33	When transitioning to level 0 Unfitted mode, the onboard ETCS should not change the stored Radio Network ID but should delete the RBC ID and phone number. However, when transitioning to level 0 Unfitted mode, the onboard ETCS deletes the Radio Network ID, does not delete the RBC ID and the RBC phone number is as 0.
ETCS fix Plan MR8	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-054 Non-Compliant behaviour	4.1 Index 04 - SS026 5.4.3.2:13 Index 04 - SS026 A.3.1:2 Index 04 - SS026 A.3.1: 3	In the absence of reply from the RBC, the onboard ETCS should wait 15 seconds before repeating its message to the RBC. However the onboard ETCS waits 30 seconds before repeating its message.

Compliance	Item Reference and Condition	TSI Clause	Applicant Explanation
ETCS fix Plan MR6	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-TSI-TRACKTRAIN-RR1 Non-Compliant behaviour	4.1 Index 04 - SS026 5.4.3.2:S3	During Start of Mission, if the driver selects to re-enter the Radio Network ID, the onboard ETCS should acquire a list of available and allowed networks based on a request to the mobile terminals. However, the CL345 onboard ETCS presents no available networks if the identified network has an ID but no network name.
ETCS fix Plan MR5, MR6, MR7 (reset reduction); MR8 L1 issues	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-091 Non-Compliant behaviour	4.1 Index 04 - SS026 5.4.3.3: 5 4.2.2 Index 6 ERA 015560 8.2.3.2.3	If the stored train position is 'unknown' during Start of Mission then the onboard ETCS should set the status of the ETCS Level variable to 'invalid' and send 'unknown' status to the DMI. However, when the stored train position is 'unknown' the CL345 onboard ETCS incorrectly sends "L1' to the DMI, and this results in the DMI indicating Level 1 as the current level.
ETCS fix Plan MR6	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-051 Non-Compliant behaviour	4.1 Index 04 - SS026 5.4.4.1: E11	The driver should be able to enter or validate train data when the ETCS Level 2 is selected, regardless of whether radio communication has been established with the RBC. However, on the CL345 onboard ETCS it is not possible to perform train data entry in Level 2 if the communication session is not established. If a communication session is not available the CL345 onboard ETCS does not respond to a driver request to enter train data.
ETCS fix Plan MR9	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-085 Non-Compliant behaviour	4.1 Index 04 - SS026 5.5.3.1.3	Entering Shunting mode from Full Supervision, Limited Supervision, On Sight, Staff Responsible, National System or Unfitted mode (or from Post Trip if there was on on-going mission) is considered an end of mission. At end of mission the onboard ETCS should report the end of mission to the RBC. However, at end of mission initiated by entering Shunting mode, the CL345 onboard ETCS delays reporting end of mission to the RBC by 8 seconds.
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-008 Non-Compliant behaviour	4.1 Index 04 - SS026 5.8.2.1	The onboard ETCS should allow the driver to select Override only when specified criteria are fulfilled relating to train speed, onboard ETCS mode and availability of valid train data and train running number. However the CL345 includes an additional criterion not specified in the standard - that the Driver ID is entered in Stand By mode before Override is selected.

Compliance	Item Reference and Condition	TSI Clause	Applicant Explanation
ETCS fix Plan MR9	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-99 Non-Compliant behaviour	4.1 Index 04 - SS026 5.8.3.1.1 4.1 Index 04 - SS026 5.8.4.1 c)	When activating Override in Post Trip mode, the current position of the train front end should be considered as the former End of Authority (EOA). However, the CL345 onboard ETCS considers the former EOA as the min safe antenna position + 5m, rather than as the current position of the train front end. The safe antenna position is calculated by subtracting the distance between active EUROBALISE antenna and the front end of the train from the min safe front end position. This puts the former EOA 2.6m ahead of the current train front, rather than at the current position of the train front. The Override procedure should end when at least one of a number of specified conditions are met, one of which is that the former EOA has been passed with the min safe antenna position. However, given the way the CL345 onboard ETCS considers the former EOA in this scenario, this is always 5m, which is 2.6m later than specified.
TCMS fix Plan 7.3.2.2	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-060 Non-standard DMI	4.2.2 Index 6 ERA 015560 5.1.3.2	Aligned text within an area of the DMI should be indented by three cells from the limit of the area. However the title of the Train Running Number entry field is not indented.
ETCS fix Plan MR6	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-040d Non-Compliant behaviour	4.2.2 Index 6 ERA 015560 5.3.1.1.6	Windows on the DMI should include a ‘close’ button which closes the window and returns to the parent window. However, the CL345 DMI close button for the Set VBC window does not work. The Set VBC window does not close.
TCMS fix Plan 7.6	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-073 Non-standard DMI	4.2.2 Index 6 ERA 015560 5.3.2.5.3	An “enabled” button should be shown slightly lifted from the background by displaying a border. A “pressed” button should not display this border. The “Yes” button in the RBC data window and train data window always shows a border independently of state, so always appears not to be “pressed”.

Compliance	Item Reference and Condition	TSI Clause	Applicant Explanation
TCMS fix Plan 7.6	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-079 Non-standard DMI	4.2.2 Index 6 ERA 015560 5.4.1.9	If more than one object or text message require a driver's acknowledgement, the DMI should display the next object or text message one second after the current object or text message has been acknowledged. However, when an object or text message is acknowledged the CL345 DMI displays the next one immediately, without the one second delay.
TCMS fix Plan 7.3.2.2	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-085 Non-standard DMI	4.2.2 Index 6 ERA 015560 8.1.1.4	The layout of objects and functions are allocated to particular layers and areas of the DMI. The CL345 DMI area C2+C3+C4 contains an erroneous vertical black line.
TCMS fix Plan 7.6	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-110 Non-standard DMI	4.2.2 Index 6 ERA 015560 8.1.1.4, 10.2.3.1, 10.3.7.1, 10.5.3.1	The layout of objects and functions are allocated to particular layers and areas of the DMI. The areas for each layer in the DMI default window should be as follows: • Layer 0: E10, E11, G1, G2, G3, G4, G5, G6, G7, G8, G9, G10, Z, Y • Layer 1: A1, (A2+A3)*, A4, B*, D*, C1, (C2+C3+C4)*, C5, C6, C7, C8, C9, E1, E2, E3, E4, (E5-E9)*, G11, G12, G13 • Layer 2: B3, B4, B5, B6, B7 Where * indicates those drawn as a whole area. However the CL345 DMI's layers and areas are as follows • Layer 0: E10, E11, G1, G2, G3, G4, G5, G6, G7, G8, G9, G10, Z, Y, A4, C1, C5, C6, C7, C8, C9, E1, E5, E6, E7, E8, E9, G11, G12, G13 • Layer 1: A1, B*, D*, (C2+C3+C4)*, E2, E3, E4, B3, B4, B5 • Layer 2: B6, B7

Compliance	Item Reference and Condition	TSI Clause	Applicant Explanation
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-001 Non-Compliant behaviour	4.2.2 Index 6 ERA 015560 8.2.1.2.3 Index 6 ERA 015560 8.2.1.3.1 4.1 Index-004 SS026 3.13.10.2.1	The onboard ETCS should indicate the estimated train speed to the driver. The estimated speed is referred to as the nominal speed (Vnom) for the CL345 onboard ETCS. However, when in National System or Unfitted mode, the CL345 onboard ETCS includes an additional feature that is not specified in the standard. In these modes, if the difference between the nominal speed (Vnom) and the maximum speed (Vmax) exceeds certain thresholds, the needle on the speedometer will alternate between Vnom and Vmax rather than indicating the estimated speed. Those thresholds for the difference between Vnom and Vmax are as follows: • greater than 5km/h for more than 2s, or • greater than 4km/h for more than 20s, or • greater than 2km/h for more than 180s. The alternating frequency is 1Hz.
TCMS fix Plan 8.0	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-080 Non-Compliant behaviour	4.2.2 Index 6 ERA 015560 8.2.2.2.7	In Staff Responsible and On Sight modes the driver should be able to toggle the DMI display of distance to target on and off . Upon transition to Staff Responsible or On Sight modes the distance to target should be automatically toggled off. However, the CL345 DMI does not show the distance to target in Staff Responsible or On Sight modes when it is toggled on.
TCMS fix Plan 7.6	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-091 Non-Compliant behaviour	4.2.2 Index 6 ERA 015560 8.2.2.4.2 Index 6 ERA 015560 8.2.2.4.5	In On Sight, Staff Responsible and Shunting modes the driver should be able to toggle the display of Basic Speed Hooks on and off. Upon transition to On Sight, Staff Responsible and Shunting modes the Basic Speed Hooks should be automatically toggled off. However on the CL345 DMI, upon transition to On Sight, Staff Responsible and Shunting modes the Basic Speed Hooks are automatically toggled on. In On Sight mode, the driver should be able to toggle the display of Release Speed Digital on and off. Upon transition to On Sight, the Release Speed Digital should be automatically toggled off. However on the CL345 DMI, upon transition to On Sight mode the Release Speed Digital is automatically toggled on.

Compliance	Item Reference and Condition	TSI Clause	Applicant Explanation
ETCS fix Plan MR8	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-065 Non-Compliant behaviour	4.2.2 Index 6 ERA 015560 8.2.3.2.3	If the current ETCS level is unknown or invalid during start of mission, the DMI area where ETCS level is usually displayed should be blank. However, in the case where unknown position should result in ETCS level being invalid, the CL345 displays the current ETCS level. This relates to CL345-N-C-TSI-GoIC-091.
TCMS fix Plan 7.3.2.2	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-086 Non-Compliant behaviour	4.2.2 Index 6 ERA 015560 8.2.3.2.9 14.2.2 Index 6 ERA 015560 13.2.1.1	The DMI should use a distinct abbreviation of the corresponding national system rather than 'NTC' when displaying level announcements for level NTC. For the CL345 the distinct abbreviation for the CBTC national system is 'CBTC'. However for Level NTC CBTC level announcements not requiring acknowledgement, the CL345 DMI displays 'STM' rather than 'CBTC'. For Level NTC CBTC level announcements requiring acknowledgement the CL345 DMI displays 'NTC' rather than 'CBTC'.
ETCS fix Plan MR7	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-056 Non-Compliant behaviour	4.2.2 Index 6 ERA 015560 8.2.3.6.8	The DMI should enable the driver to toggle on and off the display of the tunnel stopping area. Whilst tunnel stopping areas are toggled on, 'tunnel stopping area' and 'tunnel stopping area announcement' symbols should be shown. Whilst the 'tunnel stopping area announcement' symbol is displayed, the DMI should show the remaining distance to the tunnel stopping area. However, on the CL345 DMI, with the tunnel stopping area display toggled on and the 'tunnel stopping area announcement' symbol displayed, the remaining distance to the tunnel stopping area is only displayed if data for a single tunnel stopping area is received from the RBC. If data for more than one tunnel stopping area is received by the CL345 onboard ETCS, the distance to the tunnel stopping area display is blank.
TCMS fix Plan 8.0	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-066 Non-standard DMI	4.2.2 Index 6 ERA 015560 8.2.3.6.9	The DMI display of the remaining distance to a tunnel stopping area should be right aligned with a ten cell indent. However, the CL345 DMI display of remaining distance to a tunnel stopping area is horizontally centred.

Compliance	Item Reference and Condition	TSI Clause	Applicant Explanation
TCMS fix Plan 7.3.2.2	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-082 Non-standard DMI	4.2.2 Index 6 ERA 015560 8.5.1.7 Index 6 ERA 015560 I0.2.1.3	The Main window on the DMI should be an up-type button. Once selected by the driver an up-type button should change to the 'pressed' state, remaining in that state as long as the driver presses the button. Once the driver stops pressing the button, the button exits the 'pressed' state and the button's function should be activated. If the driver selection continues, but outside the up-type button (the finger slides out of the sensitive area of the button) the button should exit the 'pressed' state and the button's function should not be activated. However, when the driver's finger presses the Main button and slides out of that button's area whilst continuing to press, the button press's function is activated, resulting in the Main window being wrongly displayed. The Main window is therefore not behaving like an up-type button.
TCMS fix Plan 7.3.2.2	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-078 Non-Compliant behaviour	4.2.2 Index 6 ERA 015560 10.3.1	The DMI should display the RBC ID data value when its entry is accepted by the driver pressing the input field. However, on the CL345 DMI, when a new value is entered into the RBC ID field and accepted a blank input field is displayed. The accepted data value is displayed only when the RBC ID field is pressed again.
TCMS fix Plan 7.3.2.2	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-084 Non-Compliant behaviour	4.2.2 Index 06 ERA_DMI 10.3.1.19	When entering data on the DMI, after the first press of the associated keyboard, the value corresponding to the pressed data key should replace any existing value in the data area of the selected input field. However, values corresponding to the pressed data keys do not always replace existing values for Staff Responsible speed and distance on the CL345 DMI. The driver sometimes needs to press the Delete key prior to overwriting the previous data value.

Compliance	Item Reference and Condition	TSI Clause	Applicant Explanation
TCMS fix Plan 7.6	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-088 Non-Compliant behaviour	4.2.2 Index 06 ERA_DMI 10.3.1.24 Index 06 ERA_DMI 10.3.1.25 Index 06 ERA_DMI10.3.1.26	When pressing the Enter button associated to an input field on the DMI, that input field should go to the 'accepted' state and the next input field in the same topic should be selected automatically. When the driver presses an input field area on the DMI, that input field should be selected. However in the Staff Responsible Speed / Distance window on the CL345 DMI, having entered and accepted values into either the speed or distance fields, but not pressed 'Yes', if the driver repeatedly presses the input fields then the input field is cleared of the previously entered values.
TCMS fix Plan 7.6	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-076 Non-standard DMI	4.2.2 Index 6 ERA 015560 10.3.1.26	The driver should be able to select a specific input field by activating the input field area (the label or data part) on the DMI, which should behave like an up-type button. A one cell wide, medium grey border should be shown around an input field on the DMI. In addition, in line with behaving like an up-type button as it should, three dimensional border effects should be shown on the DMI, distinguishing between the input field's 'enabled' and 'pressed' states. However, whilst the thin, grey border is shown on the CL3453 DMI, the three dimensional borders have not been implemented.
TCMS fix Plan 7.3.2.2	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-075a Non-standard DMI	4.2.2 Index 6 ERA 015560 10.3.2.1 Index 6 ERA 015560 10.3.2.2 Index 6 ERA 015560 10.3.2.3 Index 6 ERA 015560 10.3.2.4	A cursor (flashing horizontal line below the position of the next character to be entered) is required to indicate to the driver where the next selected character will be inserted in an input field on the DMI. However, the CL345 DMI does not show a cursor for RBC ID and RBC phone number entry.
TCMS fix Plan 7.3.2.2	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-074 Non-Compliant behaviour	4.2.2 Index 6 ERA 015560 10.3.5.9	The Yes button of a data entry window on the DMI should only be enabled when all input fields display a data value, that is the input field contains data that has been accepted. However on the CL345 DMI the Yes button on the RBC Data and Train Data windows is enabled before all input fields display a data value.

Compliance	Item Reference and Condition	TSI Clause	Applicant Explanation
TCMS fix Plan 7.6	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-070 Non-standard DMI	4.2.2 Index 6 ERA 015560 11.2.1.6	When the hour glass symbol is shown on the DMI (due to an exchange of messages with the RBC), it should be vertically centred in the Main window title area. However, after RBC contact data are validated the hourglass is shown on the CL345 DMI moving vertically centred underneath (rather than within) the Main window title area.
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-040a Non-Compliant behaviour	4.2.2 Index 6 ERA 015560 11.3.3 Index 6 ERA 015560 11.7.2 Index 6 ERA 015560 11.7.3	The DMI should follow the specified sequencing of windows, sub-level windows and menus, as well as the transitions for input fields. However the CL345 DMI does not follow the window, sub-window and menu sequencing specified by ERA ERTMS 015560 during Start of Mission. For example, upon pressing the Close (X) button in the RBC Contact window, the Main window should be displayed. However, the CL345 DMI displays the Level window instead.
ETCS fix Plan MR8	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-039a Non-Compliant behaviour	4.2.2 Index 6 ERA 015560 11.7.1.8 Index 6 ERA 015560 11.7.1.9	During the start up dialogue sequence, if a driver's acknowledgement is required, the DMI should display it 1 second after the end of the start up dialogue sequence. However the CL345 DMI displays any required driver acknowledgement immediately after completion of the start up dialogue sequence. After the start up dialogue sequence, if a data entry or validation window is currently displayed when a driver's acknowledgement is required, the DMI should stop the data entry / validation process, display the parent window instead and the driver's acknowledgement should appear 1 second afterwards. However on the Class345 DMI, the acknowledge message will only be presented when the driver closes the data entry or validation window.

Compliance	Item Reference and Condition	TSI Clause	Applicant Explanation
ETCS fix Plan MR9	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-040k Non-Compliant behaviour	4.2.2 Index 6 ERA 015560 11.7.3.3	With the onboard ETCS in Post Trip mode, after sending a Movement Authority request, the DMI should display the hourglass symbol until the Movement Authority is received from the RBC. Once that Movement Authority is received, the DMI should switch from the Main window to the Default window and stop displaying the hourglass. However, with the CL345 onboard ETCS in Post Trip mode, the CL345 DMI switches from the Main window to the Default window upon sending the Movement Authority request, rather than waiting until the Movement Authority is received from the RBC. The hourglass symbol is not displayed between requesting and receiving the Movement Authority.
ETCS fix Plan MR9	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-044 Non-Compliant behaviour	4.2.2 Index 6 ERA 015560 11.7.3.3	If the driver selects 'Close' (X) in the Train Data Validation window, the DMI should display the parent window, in this case the Main window. If the driver selects 'No' in the Train Data Validation window, then the DMI should display the Train Data window. However, if the driver selects 'No' in the Train Data Validation window on the CL345 DMI, the Main window is displayed instead of the Train Data window.
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-040e Non-Compliant behaviour	4.2.2 Index 6 ERA 015560 11.7.6.3 S1	When the driver presses the Train Integrity button on the DMI Special window, the Special window should be closed and the default window should be displayed. However, pressing the Train Integrity button on the CL345 DMI does not result in the Special window being closed and the default window being displayed.
TCMS fix Plan 8.0	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-106 Non-standard DMI	4.2.2 Index 6 ERA 015560 14.2.1.2	An audible click sound is given as feedback while pressing the finger on a DMI button. It should only be played once. However, the click sound is played repeatedly whilst a CL345 DMI button is pressed and held.

Compliance	Item Reference and Condition	TSI Clause	Applicant Explanation
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-046 Non-Compliant behaviour	4.2.2 Index 6 ERA 015560 15.1.1.4 Index 6 ERA 015560 15.1.1.4.1	The DMI should display system status messages as text messages not to be acknowledged by the driver, with one exception ("[name of NTC] failed"). However the CL345 DMI displays all system status messages as text messages requiring acknowledgement by the driver.
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-003 Non-Compliant behaviour	4.2.5 Index 10 SS037-7.2.4.2.6 Index 10 SS037-7.2.5.2.2 (Table 11) Index 10 SS037-7.2.5.2.3 (Table 12) Index 39 SS092-1 5.6	The standard allows for the implementation of Safety Feature negotiation, whereby the initiating entity can request a certain Safety Feature. The responding entity should then offer the requested Safety Feature, unless it is not available in which case it offers the default value. However, the CL345 onboard ETCS does not support this Safety Feature negotiation. The standard defines only one Safety Feature (single Data Encryption Standard with modified Message Authentication Code algorithm 3), and this one is implemented.
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-004 Non-Compliant behaviour	4.2.5 Index 39 - SS092-1 A3.1	It should be possible to reset the radio to Bombardier's default configuration. This should be implemented by command MC21. This is an internal command triggered by system conditions, not by the user. However command MC21 is not implemented in the CL345 onboard ETCS and reset to default configuration is managed by different commands, but achieving the same objectives as MC21. Therefore the required functionality is achieved but with different commands than the specified MC21.
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-057 Non-Compliant behaviour	4.2.6 Index 34 MORANE FFFIS 4.4.5.4.1	The onboard ETCS should include a command to enable or disable the presentation of the connected line identity at the Terminal Equipment. However, the CL345 onboard ETCS does not include this command (AT+COLP: Attention command set, Connected Line Identification Presentation), so the Connected Line Identity is not presented to the trackside.

Compliance	Item Reference and Condition	TSI Clause	Applicant Explanation
ETCS fix Plan MR9	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-061 Non-Compliant behaviour	4.2.8 Index 079 - SS114 4.3.4.2 Index 079 - SS114 4.3.4.3 Index 079 - SS114 4.5.1.7	The onboard ETCS should refer to only one Home Key Management Centre and receive all keys from that Home Key Management Centre. However the CL345 ETCS does not know the identity of the Key Management Centre from which it is authorised to receive keys.
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-060 Non-Compliant behaviour	4.2.8 Index 079 - SS114 4.3.4.9	The onboard ETCS should be able to store 2000 key relations which consist of a relationship between a trackside unit, an authentication key and a validity period. However the CL345 onboard ETCS can store a maximum of 1000 key relations.
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-038b Non-Compliant behaviour	4.2.14 Index 05 - SS027 4.1.1.2(b) Index 05 - SS027 4.2.3.5	The onboard ETCS JRU should record the train position in metres. However the CL345 onboard ETCS rounds up distances sent to the JRU.
ETCS fix Plan MR5	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-038r Non-Compliant behaviour	4.2.14 Index 05 SS027 4.2.4.6	Upon receiving a message from a balise, the onboard ETCS should send the contents of that balise message to the JRU for recording. Its maximum length is 143 bytes. However the CL345 onboard ETCS always sends the contents of the balise message to the JRU as a 'full length' message of 143 bytes, where the remaining bytes after the contents of the balise message are filled with FF bytes.
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-038s Non-Compliant behaviour	4.2.14 Index 05 SS027 4.2.4.21	The onboard ETCS JRU should record the status of the set of symbols that can be displayed on the DMI. However the CL345 ETCS JRU records that the Connection Lost / Set-Up Failed symbol and Connection Up symbol are displayed at the same time on the DMI which is not the case.

Compliance	Item Reference and Condition	TSI Clause	Applicant Explanation
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-038a Non-Compliant behaviour	4.2.14 Index 05 SS027 4.2.4.23	The onboard ETCS JRU should record a message when any system status message appears or disappears. However the CL345 onboard ETCS does not send the 'SH Request failed' status in the correct message to the JRU. Instead the ETCS Onboard sends 'SH Request failed' as part of a plain text message to the JRU.
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-038u Non-Compliant behaviour	4.2.14 Index 05 SS027 4.2.4.42	The onboard ETCS JRU should record the isolation status of each National System. However the CL345 onboard ETCS JRU does not record the isolation status of each National System (CBTC and TPWS)
ETCS fix Plan MR9	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI-GoIC-039 Non-Compliant behaviour	4.2.14 Index 05 SS027 4.3.1.1	The onboard ETCS JRU should record a change of system version. However the CL345 onboard ETCS JRU does not record a change of system version when transitioning from Level 1 to Level 2.
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-038x Non-Compliant behaviour	4.2.14 Index 05 SS027 4.3.1.1:13	Upon receiving a message from the RBC, the onboard ETCS should send the contents of that RBC message to the JRU for recording. That message should include the Train Running Number. However the CL345 onboard ETCS does not send the Train Running Number with RBC messages to the JRU for recording. The Train Running Number in this case is not recorded.
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-038h Non-Compliant behaviour	4.2.14 Index 05 SS027 4.3.1.1:20 Index 05 SS027 4.2.4.20	The onboard ETCS should record speed and distance monitoring data as displayed to the driver, including the target distance. However, when the target distance is "0 m" the CL345 onboard ETCS records "None" rather than "0 m".

Compliance	Item Reference and Condition	TSI Clause	Applicant Explanation
ETCS fix Plan MR8	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-038l Non-Compliant behaviour	4.2.14 Index 05 SS027 4.3.1.1:21	The onboard ETCS JRU should record a message when any DMI symbol appears or disappears. However the CL345 onboard ETCS JRU records the yellow tunnel stopping announcement symbol whilst the tunnel stopping area display is toggled off, instead of the toggling function symbol which is displayed.
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-038m Non-Compliant behaviour	4.2.14 Index 05 SS027 4.3.1.1:21	The onboard ETCS JRU should record a message when any DMI symbol appears or disappears. When a L0 announcement does not need acknowledgement the grey L0 announcement symbol is displayed. When a L0 announcement does need acknowledgement the yellow L0 announcement symbol is displayed. However, when the CL3454 DMI displays either the yellow or the grey level 0 announcement symbol, both symbols are recorded at the same time.
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-038n Non-Compliant behaviour	4.2.14 Index 05 SS027 4.3.1.1:21	The onboard ETCS JRU should record a message when any DMI symbol appears or disappears. However the Acknowledgement for Trip symbol is recorded when the onboard ETCS enters Trip mode even though the symbol is not displayed until the driver confirms the text message “Apply Brakes!”.
ETCS fix Plan MR10	3EER400032-0011 revision A Sec 5 - Table 2 - ID CL345-N-C-TSI_DMI-JRU-& Other-038ad Non-Compliant behaviour	4.2.14 Index 05 SS027 4.3.1.1:47	The onboard ETCS JRU should record a message when the traction cut off command state changes. However the CL345 onboard ETCS JRU does not record the change in traction cut off state when traction cut off is requested by the ETCS.