



## ERTMS/ETCS

### FFFIS STM test cases of Functional Identity 012

#### Procedures Override & Shunting

**Total: 7 Test cases**

REF : SUBSET-074-2-12

ISSUE : 3.0.0

DATE : 2014-05-09

Company	Technical Approval	Management approval
ALSTOM		
ANSALDO		
AZD		
BOMBARDIER		
CAF		
SIEMENS		
THALES		



## Modification History

Issue Number Date	Section Number	Modification / Description	Author
0.0.1 2004-08-26	All	Document created, including the Test Case Diagram and frames for the Test Cases.	P. Lührs (Siemens AG)
0.0.2 2004-09-17	"Test Case Diagram" "Test Cases"	Test Case Diagram updated according to review comments. Test Case names updated and additional frames for the Test Cases added according to the new Test Case Diagram.	P. Lührs (Siemens AG)
0.0.3 2004-10-19	"Test Cases"	Test case 12a.0.1.0, Test case 12b.0.1.0, Test case 12c.0.1.0 specified. Balise information added for Test case 12b.0.2.0.0.0 and Test case 12c.0.2.0.0.0.	P. Lührs (Siemens AG)
0.0.4 2004-11-02	"Test Case Diagram" "Test Cases"	Test Case Diagram updated according to review comments (no distinction between red and green signal, new branches for transition to STM introduced). Test Case numbers updated due to new Test Case Diagram. Starting condition „TIU Sleeping Status“ changed to “not Sleeping” for all Test Cases. Connection information for all transmitted PROFIBUS messages added in the Test Cases. Test case 12a.0.2.0.0.0, Test case 12b.0.2.0.0.0, Test case 12b.0.3.0.0.0.0.0, Test case 12c.0.2.0.0.0 and Test case 12c.0.3.0.0.0.0.0 specified (all Test Cases created).	P. Lührs (Siemens AG)
0.0.5 2004-11-10	"Test Case Diagram" "Test Cases"	Test Case Diagram updated according to review comments (no STM state transition DA to CS in Test case 12a.0.2.0.0.0, number of STMs in Test Case). Test Cases updated according to review comments (number of STMs in Test Case, Transition Acknowledgement has to be displayed and removed from the DMI, Order of the test steps at the transition border changed (message “state order to STM” shall be in the same step as the reception of the border balises), Test case 12b.0.2.0.0.0 and Test case 12c.0.2.0.0.0 also check that ETCS does not apply the brakes due to a Trip situation at the transition border (test case header changed), in the Test Cases 12b.xxx the override procedure is activated via the STM and not the ETCS (test case header changed)). Message E3 in Test case 12b.0.3.0.0.0.0.0 and Test case 12c.0.3.0.0.0.0.0 does not include packet STM-5 (ETCS status data).	P. Lührs (Siemens AG)
0.0.6 2004-11-24	"Test Cases"	Test Cases updated according to review comments (T_NVOVTRP, not transmitted values are not included in telegram specifications, ...).	P. Lührs (Siemens AG)

© This document has been developed and released by UNISIG



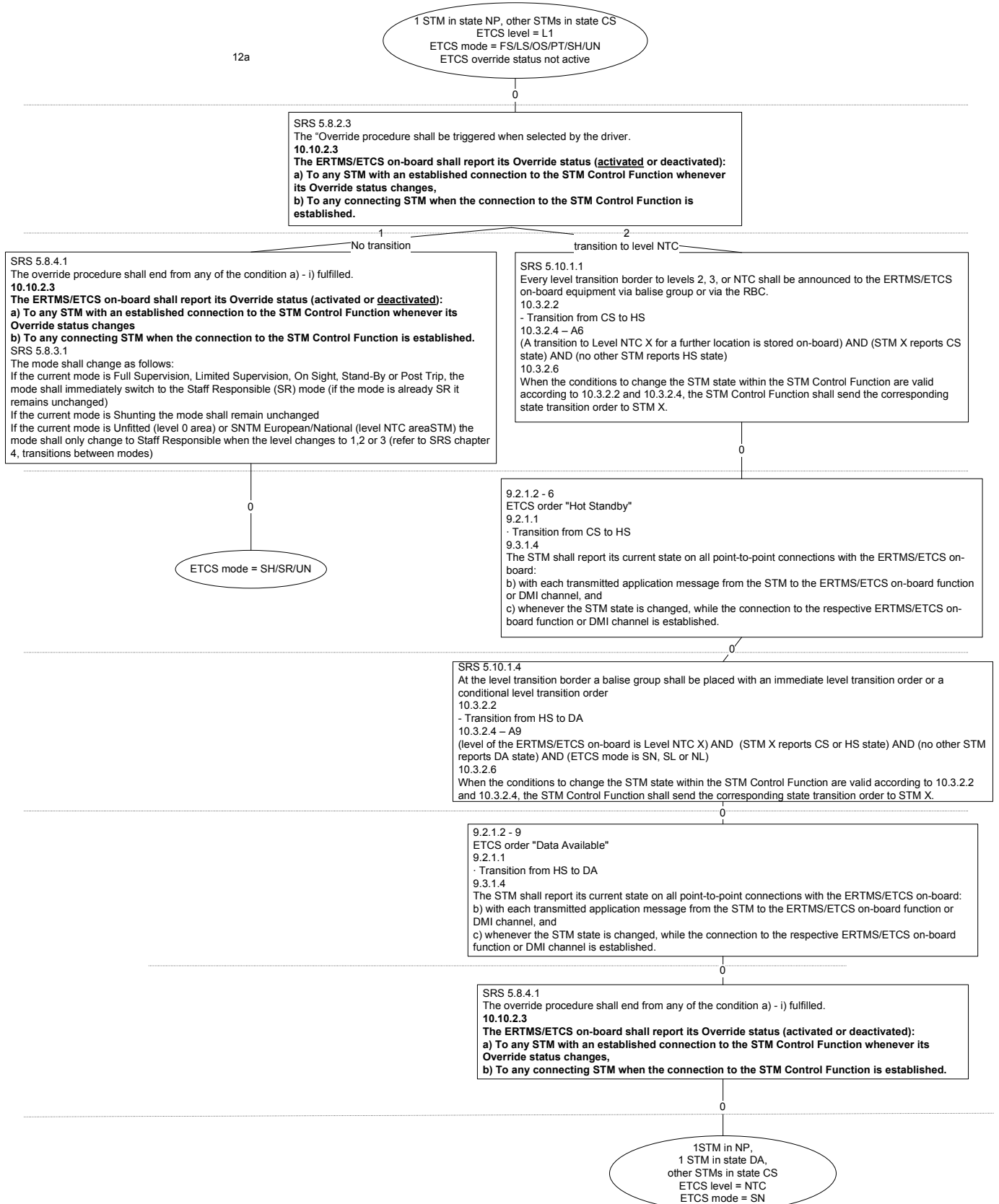
		"Reference Time Data" added to the end conditions.	
0.1.0 2004-12-15		Editorial changes for preliminary delivery.	P. Lührs (Siemens AG)
0.1.1 2005-01-26		Title updated	P. Lührs (Siemens AG)
0.2.0 2005-01-27		Editorial changes for delivery.	P. Lührs (Siemens AG)
1.0.0 13.10.2005		Editorial changes for delivery	Invensys Rail
1.0.1 2011-07-07		Diagrams updated according to Subset 035 release 220 Editorial changes of header and name of companies Override EOA -> Override NID_STM -> NID_NTC STM National -> National system Q_OVREOA_STATUS -> Q_OVR_STATUS level STM -> level NTC update of packets according to new B3 SRS (national values)	J. Sukup (AZD)
2.9.1 2013-01-30	All	Updated to be in line with Subset 35 issue 3.0.0 date 2010-02-29, SRS issue 3.3.0 date 2012-03-07 and ETCS DMI specification issue 3.3.0 date 2012-03-01	AZD J. Sukup
2.9.2 2013-08-30	All	Updated according to 2 <sup>nd</sup> review process, see revision marks	AZD J. Sukup
2.9.3 2013-10-31	Diagrams, 12b.2, 12c.2	Updated according to CR 1158 (considering impact from CR 1173 and STMWG comments)	AZD J. Sukup
2.9.4 2014-02-28	No change	No change to this part of the Subset	Alstom Thomas Mandry
2.9.5 2014-04-24	Front page	Baseline 3 1 <sup>st</sup> Maintenance pre-release version	Thomas Mandry (Alstom)
3.0.0 2014-05-09	—	Baseline 3 1 <sup>st</sup> Maintenance release version	Philippe Prieels

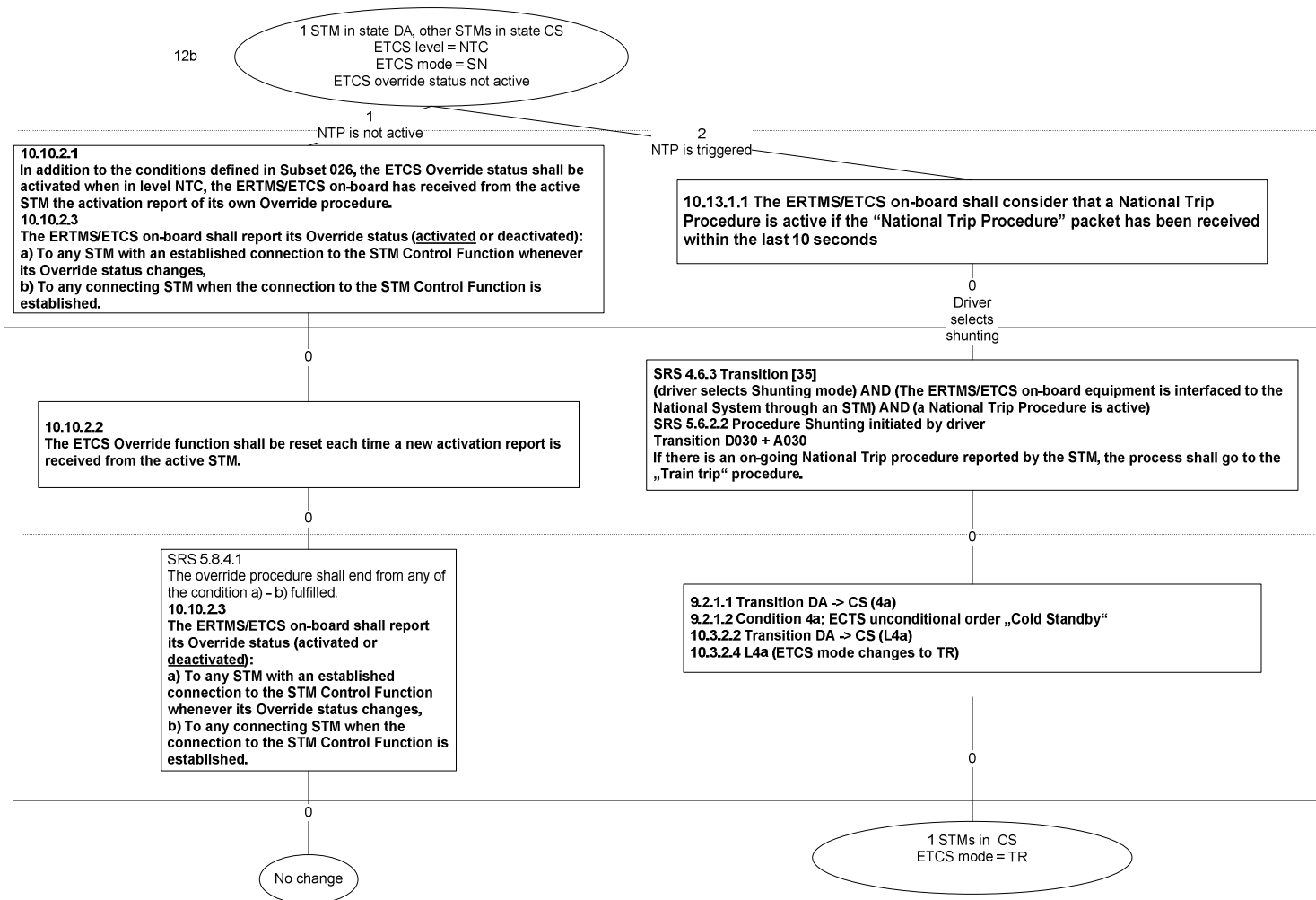


## Table of Contents

Diagrams .....	5
Supplier-specific delays table .....	8
Test Cases .....	9
Test case 12a.1 .....	9
Test case 12a.2 .....	15
Test case 12b.1 .....	26
Test case 12b.2 .....	31
Test case 12c.1 .....	36
Test case 12c.2 .....	42
Test case 12c.3 .....	49

## DIAGRAMS





12c

All STMs in state CS  
ETCS level = L1  
ETCS mode = OS/SR/FS/LS/PT

0

SRS 5.10.1.1  
Every level transition border to levels 2, 3, or NTC shall be announced to the ERTMS/ETCS on-board equipment via balise group or via the RBC.  
10.3.2.2 – A6  
(A transition to Level NTC X for a further location is stored on-board) AND (STM X reports CS state) AND (no other STM reports HS state)  
10.3.2.2  
- Transition from CS to HS  
10.3.2.6  
When the conditions to change the STM state within the STM Control Function are valid according to 10.3.2.2 and 10.3.2.4, the STM Control Function shall send the corresponding state transition order to STM X.  
9.2.1.2 – 6  
ETCS order "Hot Standby"  
9.2.1.1  
- Transition from CS to HS  
9.3.1.4  
The STM shall report its current state on all point-to-point connections with the ERTMS/ETCS on-board:  
b) with each transmitted application message from the STM to the ERTMS/ETCS on-board function or DMI channel, and  
c) whenever the STM state is changed, while the connection to the respective ERTMS/ETCS on-board function or DMI channel is established.

1 Driver stops the train and selects shunting

2 Driver continue drive to NTC area

3 Driver selects override

SRS 4.4.8.1.6  
Shunting mode can be selected by the driver, only accepted when the train is at standstill, or ordered by the trackside.  
10.3.2.2 Transition from HS to CS (I4a)  
10.3.2.4 I4a (ETCS mode changes to SH)  
10.3.2.7 When the state transition order is going to CS state, the STM Control Function shall send an "unconditional order CS state" for the transitions A4a, B4a, C4a, E4a, G4a, H4a, I4a, J4a and K4a, and a "conditional order CS state" for the transitions A4b and B4b.  
9.2.1.2 – 4a  
ETCS unconditional order "Cold Standby"  
9.2.1.1  
- Transition from HS to CS  
9.3.1.4  
The STM shall report its current state on all point-to-point connections with the ERTMS/ETCS on-board:  
b) with each transmitted application message from the STM to the ERTMS/ETCS on-board function or DMI channel, and  
c) whenever the STM state is changed, while the connection to the respective ERTMS/ETCS on-board function or DMI channel is established.

SRS 5.10.1.4  
At the level transition border a balise group shall be placed with an immediate level transition order or a conditional level transition order  
10.3.2.2 – A9  
(level of the ERTMS/ETCS on-board is Level NTC X) AND (STM X reports CS or HS state) AND (no other STM reports DA state) AND (ETCS mode is SN, SL or NL)  
10.3.2.2  
- Transition from HS to DA  
10.3.2.6  
When the conditions to change the STM state within the STM Control Function are valid according to 10.3.2.2 and 10.3.2.4, the STM Control Function shall send the corresponding state transition order to STM X.  
9.2.1.2 – 9  
ETCS order "Data Available"  
9.2.1.1  
- Transition from HS to DA  
9.3.1.4  
The STM shall report its current state on all point-to-point connections with the ERTMS/ETCS on-board:  
b) with each transmitted application message from the STM to the ERTMS/ETCS on-board function or DMI channel, and  
c) whenever the STM state is changed, while the connection to the respective ERTMS/ETCS on-board function or DMI channel is established.

SRS 5.8.2.3  
The "Override procedure shall be triggered when selected by the driver.  
10.10.2.3  
The ERTMS/ETCS on-board shall report its Override status (activated or deactivated):  
a) To any STM with an established connection to the STM Control Function whenever its Override status changes,  
b) To any connecting STM when the connection to the STM Control Function is established.  
SRS 4.6.3 transition [37] to SR  
SRS 4.10.1.3 level transition order shall be deleted when entered mode SR

0

ETCS mode = SH

SRS 4.4.8.1.6  
Shunting mode can be selected by the driver, only accepted when the train is at standstill, or ordered by the trackside.  
SRS 5.6.2 Shunting initiated by driver procedure  
10.3.2.2 Transition from DA to CS (I4a)  
10.3.2.4 I4a (ETCS mode changes to SH)  
10.3.2.7 When the state transition order is going to CS state, the STM Control Function shall send an "unconditional order CS state" for the transitions A4a, B4a, C4a, E4a, G4a, H4a, I4a, J4a and K4a, and a "conditional order CS state" for the transitions A4b and B4b.  
9.2.1.2 – 4a  
ETCS unconditional order "Cold Standby"  
9.2.1.1  
- Transition from DA to CS  
9.3.1.4  
The STM shall report its current state on all point-to-point connections with the ERTMS/ETCS on-board:  
b) with each transmitted application message from the STM to the ERTMS/ETCS on-board function or DMI channel, and  
c) whenever the STM state is changed, while the connection to the respective ERTMS/ETCS on-board function or DMI channel is established.

ETCS mode = SH

SRS 5.8.4.1  
The Override procedure shall end when at least one of the following conditions is fulfilled:  
e.g.:  
a) The „max. time for train trip suppression when Override function is triggered (national value) elapses after Override has been selected  
10.10.2.3  
The ERTMS/ETCS on-board shall report its Override status (activated or deactivated):  
a) To any STM with an established connection to the STM Control Function whenever its Override status changes,  
b) To any connecting STM when the connection to the STM Control Function is established.  
10.3.2.2 Transition from HS to CS (G4a)  
10.3.2.4 G4a (STM X reports "HS state") AND (no transition to any level associated to STM X for further location is stored on-board) AND (Override function is not active) AND (ETCS level is different from any level associated to STM X)  
10.3.2.7 When the state transition order is going to CS state, the STM Control Function shall send an "unconditional order CS state" for the transitions A4a, B4a, C4a, E4a, G4a, H4a, I4a, J4a and K4a, and a "conditional order CS state" for the transitions A4b and B4b.  
9.2.1.2 – 4a  
ETCS unconditional order "Cold Standby"  
9.2.1.1  
- Transition from HS to CS  
9.3.1.4  
The STM shall report its current state on all point-to-point connections with the ERTMS/ETCS on-board:  
b) with each transmitted application message from the STM to the ERTMS/ETCS on-board function or DMI channel, and  
c) whenever the STM state is changed, while the connection to the respective ERTMS/ETCS on-board function or DMI channel is established.

ETCS mode = SR

## SUPPLIER-SPECIFIC DELAYS TABLE

#	Supplier of	Start time	End time
Ts1	ETCS	Override status activated on DMI or connection with STM is established or conditions for deactivation of override according to ETCS rules get valid or STM-6 is sent by STM.	Packet STM-7 informing about override status change is sent.
Ts2	ETCS	Conditions to change mode or request to change state of STM are fulfilled	Packet STM-5 and/or STM-14 informing about mode change / STM state order is sent
Ts3	ETCS	Packet STM-1 is received from STM	Packet STM-1 is sent to STM
Ts4	ETCS	Position for level transition is passed (requesting driver acknowledgement) or mode change (requesting driver acknowledgement)	ETCS display on DMI "Request for driver acknowledgement" / "Request for driver acknowledgement to Train Trip"
Ts5	STM	Conditions for national trip procedure are fulfilled (National Track Simulator sends "National Trip Procedure start" to National Adaptor).	Packet STM-18 is sent on Profibus





## TEST CASES

### Test case 12a.1

TEST CASE HEADER	
Test case identification	Procedures Override & Shunting
	12a.0.1.0
	Check the transmission of the Override Status to the STMs while the ETCS on-board is in an ETCS level and the ETCS Override Status is activated by the ETCS on-board according to the ERTMS / ETCS rules. No transition shall occur in this test.
ERTMS/ETCS requirements tested	Subset-035 : 10.10.2.3 a), 10.10.2.3 b) Subset-026 :
STM requirements tested	Subset-035 : Subset-026 :
Packets transmitted via FFFIS STM	Packet STM-1, STM-5, STM-7, STM-15
ERTMS/ETCS on-board configuration	- To perform this test case it is necessary to connect at least 2 STMs to the ETCS on-board.
Comments and constraints	The objective of this test is to check that the ETCS on-board (STM Control Function) in an ETCS level reports the ETCS Override Status to all connected or connecting STMs whenever the ETCS Override Status changes according to the ERTMS / ETCS rules.

Starting Conditions	Value	Comments
STM State	NP, CS	1 STM X in NP, all other STMs in CS
ETCS Mode	FS/LS/OS/PT/SH	All values shall be tested
ETCS Level	1	
Train State	Standstill	
ETCS Train Data	Valid	

© This document has been developed and released by UNISIG



Starting Conditions	Value	Comments
Active DMI channel Connection	Not Relevant	
Other DMI channels Connections	Not Relevant	
TIU Connection	Not Relevant	
BIU Connection	Not Relevant	
JD Connection	Not Relevant	
TIU Regenerative Brake Command	Not Relevant	
TIU Magnetic Shoes Brake Command	Not Relevant	
TIU Eddy Current Brake Command for Emergency Brake	Not Relevant	
TIU Eddy Current Brake Command for Service Brake	Not Relevant	
TIU Pantograph Command	Not Relevant	
TIU Air Tightness Command	Not Relevant	
TIU Main Switch / Circuit Breaker Command	Closed	
TIU Traction Cut Off Command	Not Relevant	
TIU Traction Status	Not Relevant	
TIU Direction Controller Position Status	Not Relevant	
TIU Cab Status	Not Relevant	
BIU Emergency Brake Command	Not Relevant	
BIU Service Brake Command	Not Relevant	
BIU Emergency Brake Status	Not Relevant	
BIU Service Brake Status	Not Relevant	
NTC isolation status	Not isolated	Valid for all STMs used within this Test Case



## ERTMS/ETCS on-board Test Case

Step	Description/Comments	Input I/F	Input time	Input Action	Output I/F	Output time limit	Output action
1	"Override Request" by the driver at standstill so that the "Override" procedure is activated by the ETCS on-board.	DMI	T0	Override button activated by the driver	Prof	Ts1	STM Control Connection: Message-1 (STM-7 – override status, status active) with the NID_STM of the corresponding STMs– transmitted to all connected STMs used within this Test Case (T0 + Ts1) < (T0 + T_NVOVTRP*)
	If mode is different from SR, SH or UN, ETCS sends packet STM-5 with mode changed to SR to all connected STMs	-	-	-	Prof	Ts2	STM Control Connection: Message-5 (STM-5) – transmitted to all connected STMs used within this Test Case (T0 + Ts2) < (T0 + T_NVOVTRP*)
2	STM X that started in NP establishes the communication with the STM Control Function and sends packets STM-1 + STM-15	SMS	T1 >= (T0 + Ts1)	The STM establishes the safety layers connection and sends Message-2	Prof	Ts3	Communication established between STM and STM control function and Message-2 (STM-1, STM-15) accepted and Message-4 (STM-1) send as response (T1 + Ts3) < (T0 + T_NVOVTRP*)
	ETCS sends packet STM-5 with actual mode to STM X	-	-	-	Prof	Ts2	STM Control Connection: Message-6 (STM-5) – transmitted to STM X (T1 + Ts2) < (T0 + T_NVOVTRP*)
	STM X receives STM-7 – override status activated				Prof	Ts1	STM Control Connection: Message-1 (STM-7 – override status, status active) with NID_STM of STM X (T1 + Ts1) < (T0 + T_NVOVTRP*)
3	Time: (national value) The "Override" procedure is deactivated when the "max. time for train trip suppression when Override function is triggered" (national value) is passed.		T2 = T0 + T_NVOVTRP*	The 'max. time for train trip suppression when Override function' is triggered	Prof	Ts1	STM Control Connection: Message-3 (STM-7 – override status, status not active) with the NID_STM of the corresponding STM– transmitted to all STMs used within this Test Case



\* T\_NVOVTRP is given by national values, see Telegram B1 in TC 12a.2

## STM Test Case

Not applicable

Message-1 (STM-7 – override status, status active): ETCS STM Control Function → STM			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM of the STM addressed
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	7	Override status (STM-7)
L_PACKET	13	COMPUTED	packet length
Q_OVR_STATUS	1	1	ERTMS/ETCS Override status active
PADDING_BITS	COMPUTED	NOT RELEVANT	

Message-2 (STM-1, STM-15): STM X → ETCS STM Control Function			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM of STM X
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	1	STM/ETCS function version number (STM-1)
L_PACKET	13	COMPUTED	packet length
N_VERMAJOR	8	4	FFFIS STM version number: X
N_VERMINOR	8	0	FFFIS STM version number: Y
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	packet length
NID_STMSTATE	4	1	Current STM state = PO
PADDING_BITS	COMPUTED	FINITE_VALUE	

Message-3 (STM-7 – override status, status not active): ETCS STM Control Function → STM			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM of the STM addressed
L_MESSAGE	8	COMPUTED	message length

© This document has been developed and released by UNISIG



Message-3 (STM-7 – override status, status not active): ETCS STM Control Function → STM

VARIABLE	Length	VALUE	COMMENTS
NID_PACKET	8	7	Override status (STM-7)
L_PACKET	13	COMPUTED	packet length
Q_OVR_STATUS	1	0	ERTMS/ETCS Override status not active
PADDING_BITS	COMPUTED	NOT RELEVANT	

Message-4 (STM-1): ETCS STM Control Function → STM

VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM of the STM X
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	1	STM/ETCS function version number (STM-1)
L_PACKET	13	COMPUTED	packet length
N_VERMAJOR	8	4	FFFIS STM version number: X
N_VERMINOR	8	0	FFFIS STM version number: Y
PADDING_BITS	COMPUTED	NOT RELEVANT	

Message-5 (STM-5): ETCS STM Control Function → STM

VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM of the STM addressed
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	5	ETCS status data STM-5
L_PACKET	13	COMPUTED	packet length
M_LEVEL	3	2	Level 1
M_MODESTM	4	2	Mode SR
PADDING_BITS	COMPUTED	NOT RELEVANT	

Message-6 (STM-5): ETCS STM Control Function → STM

VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM of the STM addressed
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	5	ETCS status data STM-5
L_PACKET	13	COMPUTED	packet length

© This document has been developed and released by UNISIG



M_LEVEL	3	2	Level 1
M_MODESTM	4	2/3/4	Mode SR/SH/UN (depending on previous state)
PADDING_BITS	COMPUTED	NOT RELEVANT	

End Conditions	Value	Comments
STM_STATE	PO, CS	STM in NP at start in PO, all other STMs unchanged in CS
ETCS Mode	SR/SH/UN	if mode was SH or UN it remains unchanged, otherwise SR
ETCS Level	Unchanged	
Train State	Unchanged	
ETCS Train Data	Unchanged	
Active DMI channel Connection	Not Relevant	
Other DMI channels Connections	Not Relevant	
TIU Connection	Not Relevant	
BIU Connection	Not Relevant	
JD Connection	Not Relevant	
TIU Regenerative Brake Command	Not Relevant	
TIU Magnetic Shoes Brake Command	Not Relevant	
TIU Eddy Current Brake Command for Emergency Brake	Not Relevant	
TIU Eddy Current Brake Command for Service Brake	Not Relevant	
TIU Pantograph Command	Not Relevant	
TIU Air Tightness Command	Not Relevant	
TIU Main Switch / Circuit Breaker Command	Unchanged	
TIU Traction Cut Off Command	Not Relevant	
TIU Traction Status	Not Relevant	
TIU Direction Controller Position Status	Not Relevant	
TIU Cab Status	Not Relevant	
BIU Emergency Brake Command	Not Relevant	
BIU Service Brake Command	Not Relevant	
BIU Emergency Brake Status	Not Relevant	
BIU Service Brake Status	Not Relevant	
NTC isolation status	Unchanged	

© This document has been developed and released by UNISIG



## Test case 12a.2

TEST CASE HEADER	
Test case identification	Procedures Override & Shunting
	12a.0.2.0.0.0.0
	<p>Check the transmission of the Override Status to the STMs while the ETCS on-board is in an ETCS level and the ETCS Override Status is activated by the ETCS on-board according to the ERTMS / ETCS rules. A transition to an ETCS level NTC shall be passed while the ETCS Override Status is active.</p> <p>Note: In this test case, the override procedure is activated at the ETCS according to the ERTMS/ETCS rules.</p>
ERTMS/ETCS requirements tested	Subset-035 : 10.10.2.3 a) Subset-026 :
STM requirements tested	Subset-035 : Subset-026 :
Packets transmitted via FFFIS STM	Packet STM-5, STM-7, STM-14, STM-15
ERTMS/ETCS on-board configuration	
Comments and constraints	

Starting Conditions	Value	Comments
STM State	CS	
ETCS Mode	FS/LS/OS/PT/SH	select suitable value
ETCS Level	1	
Train State	Moving	Train speed is 144km/h
ETCS Train Data	Valid	
Active DMI channel Connection	Not Relevant	
Other DMI channels Connections	Not Relevant	

© This document has been developed and released by UNISIG



Starting Conditions	Value	Comments
TIU Connection	Not Relevant	
BIU Connection	Not Relevant	
JD Connection	Not Relevant	
TIU Regenerative Brake Command	Not Relevant	
TIU Magnetic Shoes Brake Command	Not Relevant	
TIU Eddy Current Brake Command for Emergency Brake	Not Relevant	
TIU Eddy Current Brake Command for Service Brake	Not Relevant	
TIU Pantograph Command	Not Relevant	
TIU Air Tightness Command	Not Relevant	
TIU Main Switch / Circuit Breaker Command	Closed	
TIU Traction Cut Off Command	Not Relevant	
TIU Traction Status	Not Relevant	
TIU Direction Controller Position Status	Not Relevant	
TIU Cab Status	Not Relevant	
BIU Emergency Brake Command	Not Relevant	
BIU Service Brake Command	Not Relevant	
BIU Emergency Brake Status	Not Relevant	
BIU Service Brake Status	Not Relevant	
NTC isolation status	Not isolated	

## ERTMS/ETCS on-board Test Case

Step	Description/Comments	Input I/F	Input time	Input Action	Output I/F	Output time limit	Output action
-	Initial Condition: Set the National Values for the "Override" procedure to defined values suitable for this Test Case.	BTM		Telegram-B1 (3 – National Values) Telegram-B2	-		-





Step	Description/Comments	Input I/F	Input time	Input Action	Output I/F	Output time limit	Output action
1	"Override Request" by the driver so that the "Override" procedure is activated by the ETCS on-board.	DMI	T0	Override button activated by the driver	Prof	Ts1	STM Control Connection: Message-1 (STM-7 – override status, status active) with the NID_STM of the addressed STM
	If mode != SR, SH or UN, ETCS sends packet STM-5 with mode changed to SR to all connected STMs	-	-	-	Prof	Ts2	STM Control Connection: Message-7 (STM-5) – transmitted to all connected STMs used within this Test Case
2	Level Transition announcement for an ETCS -> STM transition: order announced STM to HS state	BTM	T0 + Ts1 + 5s	Telegram-B3 (12 - Level 1 Movement Authority, 21 - Gradient Profile, 27 - International Static Speed Profile, 41 - Level Transition Order) Telegram-B2	Prof		STM Control Connection: Message-2 (STM-14 – state order to STM) Time T1
3	STM reports HS	Prof	T2 = T1 + 3s	Message-3 (STM-15 – state report from STM)	-		-
4	A transition border for a transition to ETCS level NTC is passed.	BTM	T3 = T2 + 47s	Telegram-B4(41 - Level Transition Order) Telegram-B2	DMI		Transition acknowledgement request displayed
	ETCS orders the announced STM to the state DA.	-		-	Prof		STM Control Connection: Message-4 (STM-14 – state order to STM, STM-5 - ETCS status data) with the NID_NTC of the STM announced in Telegram-B3  Time T4
5	Driver acknowledges the transition	DMI	T3 + 3s	Driver acknowledges Transition	DMI		Transition acknowledgement request removed
6	STM reports state DA in due time.	Prof	T4+3s	STM Control Connection: Message-5 (STM-15 – state report from STM)	-		-
7	The "Override" procedure is deactivated when the "max. time for train trip suppression when Override function is triggered" (national value) is passed.	-	T0 + T_NVO VTRP	The 'max. time for train trip suppression when Override function' is triggered	Prof	Ts1	STM Control Connection: Message-6 (STM-7 – override status, status not active) with the NID_STM of the addressed STM used transmitted to all STMs used within this Test Case



## STM Test Case

Not applicable

Telegram-B1: Balise-Information (National Values)			
VARIABLE	Length	VALUE	COMMENTS
Q_UPDOWN	1	1	Uplink
M_VERSION	7	FINITE VALUE	SRS version
Q_MEDIA	1	0	Balise
N_PIG	3	0	1 <sup>st</sup> Balise
N_TOTAL	3	1	2 Balise in group
M_DUP	2	0	no duplicates
M_MCOUNT	8	255	identical Value for all balises of the group
NID_C	10	FINITE VALUE	ID of country / region
NID_BG	14	FINITE VALUE	ID of Balise Group
Q_LINK	1	1	<b>linked</b>
NID_PACKET	8	3	Packet 3 – National Values
Q_DIR	2	1	nominal direction
L_PACKET	13	COMPUTED	
Q_SCALE	2	1	1 m
D_VALIDNV	15	0	the national values shall be valid direct after reception
NID_C	10	FINITE VALUE	Identification of national areas to which the set applies
N_ITER	5	0	no national area(s)
V_NVSHUNT	7	6	30 km/h (default value)
V_NVSTFF	7	8	40 km/h (default value)
V_NVONSIGHT	7	6	30 km/h (default value)
V_NVLIMSUPERV	7	20	100 km/h (default value)
V_NVUNFIT	7	20	100 km/h (default value)
V_NVREL	7	8	40 km/h (default value)
D_NVROLL	15	2	2 m (default value)
Q_NVSBTSMPerm	1	1	yes (default value)
Q_NVEMRRLS	1	0	release only at standstill possible (default value)
Q_NVGUIPERM	1	0	No (default value)
Q_NVSBFBPerm	1	0	No (default value)
Q_NVINHSMICPerm	1	0	No (default value)
V_NVALLOWOVTRP	7	20	100 km/h

© This document has been developed and released by UNISIG



Telegram-B1: Balise-Information (National Values)			
VARIABLE	Length	VALUE	COMMENTS
V_NVSUPOVTRP	7	20	100 km/h
D_NVOVTRP	15	2000	2000 m
T_NVOVTRP	8	60	60 s
D_NVPOTRP	15	200	200 m (default value)
M_NVCONTACT	2	10B	no reaction (default value)
T_NVCONTACT	8	255	∞ (default value)
M_NVDERUN	1	1	yes (default value)
D_NVSTFF	15	32767	∞ (default value)
Q_NVDRIVER_ADHES	1	0	not allowed (default value)
A_NVMAXREDADH1	6	20	1.0 m/s <sup>2</sup> (default value)
A_NVMAXREDADH2	6	14	0.7 m/s <sup>2</sup> (default value)
A_NVMAXREDADH3	6	14	0.7 m/s <sup>2</sup> (default value)
Q_NVLOCACC	6	12	12 m (default value)
M_NVAVADH	5	0	0 (default value)
M_NVEBCL	4	9	99.9999999 % (default value)
Q_NVKINT	1	0	No integrated correction factors follow
NID_PACKET	8	11111111	Packet 255 – End of information

Telegram-B2: Balise-Information			
VARIABLE	Length	VALUE	COMMENTS
Q_UPDOWN	1	1	uplink
M_VERSION	7	FINITE VALUE	SRS version
Q_MEDIA	1	0	Balise
N_PIG	3	1	2 <sup>nd</sup> Balise
N_TOTAL	3	1	2 Balise in group
M_DUP	2	0	no duplicates
M_MCOUNT	8	255	identical Value for all balises of the group
NID_C	10	FINITE VALUE	ID of country / region
NID_BG	14	FINITE VALUE	ID of Balise Group
Q_LINK	1	1	<b>linked</b>
NID_PACKET	8	11111111	Packet 255 – End of information



Telegram-B3: Balise-Information (L1 MA, Gradient Profile, International Speed Profile. Level Transition Order)			
VARIABLE	Length	VALUE	COMMENTS
Q_UPDOWN	1	1	Uplink
M_VERSION	7	FINITE VALUE	SRS version
Q_MEDIA	1	0	Balise
N_PIG	3	0	1 <sup>st</sup> Balise
N_TOTAL	3	1	2 Balise in group
M_DUP	2	0	no duplicates
M_MCOUNT	8	255	identical Value for all balises of the group
NID_C	10	FINITE VALUE	ID of country / region
NID_BG	14	FINITE VALUE	ID of Balise Group
Q_LINK	1	1	<b>linked</b>
NID_PACKET	8	12	Packet 12 - Level 1 Movement Authority
Q_DIR	2	1	nominal direction
L_PACKET	13	COMPUTED	
Q_SCALE	2	2	10 m
V_MAIN	7	40	200 km/h
V_LOA	7	40	200 km/h
T_LOA	10	1023	no time out
N_ITER	5	0	only one section
L_ENDSECTION	15	32767	327.670 km
Q_SECTIONTIMER	1	0	
Q_ENDTIMER	1	0	
Q_DANGERPOINT	1	0	
Q_OVERLAP	1	0	
NID_PACKET	8	21	Packet 21 – Gradient Profile
Q_DIR	2	1	nominal direction
L_PACKET	13	COMPUTED	
Q_SCALE	2	2	10 m
D_GRADIENT	15	0	0 m
Q_GDIR	1	0	downhill
G_A	8	0	0‰
N_ITER	5	0	only one gradient
NID_PACKET	8	27	Packet 27 – International Static Speed Profile
Q_DIR	2	1	nominal direction
L_PACKET	13	COMPUTED	

© This document has been developed and released by UNISIG



Telegram-B3: Balise-Information (L1 MA, Gradient Profile, International Speed Profile. Level Transition Order)			
VARIABLE	Length	VALUE	COMMENTS
Q_SCALE	2	2	10 m
D_STATIC	15	0	0 m
V_STATIC	7	40	200 km/h
Q_FRONT	1	1	no train length delay
N_ITER	5	0	
N_ITER	5	0	
NID_PACKET	8	41	Packet 41 – Level Transition Order
Q_DIR	2	1	nominal direction
L_PACKET	13	COMPUTED	
Q_SCALE	2	1	1 m
D_LEVELTR	15	2000	2000 m
M_LEVELTR	3	1	Level STM, specified by NID_NTC
NID_NTC	8	FINITE VALUE	NID_NTC for the STM in CS
L_ACKLEVELTR	15	0	acknowledgement area starts at the level transition border
N_ITER	5	0	no mixed level area
NID_PACKET	8	11111111	Packet 255 – End of information

Message-1 (STM-7 – override status, status active): ETCS STM Control Function → STM			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM of the addressed STM
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	7	Override status (STM-7)
L_PACKET	13	COMPUTED	packet length
Q_OVR_STATUS	1	1	ERTMS/ETCS Override status active
PADDING_BITS	COMPUTED	NOT RELEVANT	

Telegram-B4: Balise-Information (Level Transition Order)			
VARIABLE	Length	VALUE	COMMENTS
Q_UPDOWN	1	1	Uplink
M_VERSION	7	FINITE VALUE	SRS version
Q_MEDIA	1	0	Balise
N_PIG	3	0	1 <sup>st</sup> Balise

© This document has been developed and released by UNISIG



Telegram-B4: Balise-Information (Level Transition Order)			
VARIABLE	Length	VALUE	COMMENTS
N_TOTAL	3	1	2 Balise in group
M_DUP	2	0	no duplicates
M_MCOUNT	8	255	identical Value for all balises of the group
NID_C	10	FINITE VALUE	ID of country / region
NID_BG	14	FINITE VALUE	ID of Balise Group
Q_LINK	1	1	<b>linked</b>
NID_PACKET	8	41	Packet 41 – Level Transition Order
Q_DIR	2	1	nominal direction
L_PACKET	13	COMPUTED	
Q_SCALE	2	1	1 m
D_LEVELTR	15	32767	now (the level transition is performed upon receipt of the order)
M_LEVELTR	3	1	Level NTC
NID_NTC	8	FINITE VALUE	NID_NTC as announced in Telegram-B3
L_ACKLEVELTR	15	0	acknowledgement area starts at the level transition border
N_ITER	5	0	no mixed level area
NID_PACKET	8	11111111	Packet 255 – End of information

Message-2 (STM-14 – state order to STM): ETCS STM Control Function → STM			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM (according to the NTC announced in Telegram-B3)
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	14	State order to STM (STM-14)
L_PACKET	13	COMPUTED	packet length
NID_STMSTATEORDER	4	6	state HS
PADDING_BITS	COMPUTED	NOT RELEVANT	

Message-3 (STM-15 – state report from STM): STM → ETCS STM Control Function			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM according to the NTC announced in Telegram-B3
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	15	State report from STM (STM-15)
L_PACKET	13	COMPUTED	packet length
NID_STMSTATE	4	6	state HS

© This document has been developed and released by UNISIG



Message-3 (STM-15 – state report from STM): STM → ETCS STM Control Function

VARIABLE	Length	VALUE	COMMENTS
PADDING_BITS	COMPUTED	FINITE VALUE	

Message-4 (STM-14 – state order to STM, STM-5 - ETCS status data): ETCS STM Control Function → STM

VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM according to the NTC announced in Telegram-B3
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	14	State order to STM (STM-14)
L_PACKET	13	COMPUTED	packet length
NID_STMSTATEORDER	4	7	state DA
NID_PACKET	8	5	ETCS status data (STM-5)
L_PACKET	13	COMPUTED	packet length
M_LEVEL	3	1	Level NTC
NID_NTC	8	FINITE VALUE	NID_NTC (according to the NTC announced in Telegram-B3)
M_MODE	4	13	SN (National system)
PADDING_BITS	COMPUTED	NOT RELEVANT	

Message-5 (STM-15 – state report from STM): STM → ETCS STM Control Function

VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM according to the NTC announced in Telegram-B3
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	15	State report from STM (STM-15)
L_PACKET	13	COMPUTED	packet length
NID_STMSTATE	4	7	state DA
PADDING_BITS	COMPUTED	FINITE VALUE	

Message-6 (STM-7 – override status, status not active): ETCS STM Control Function → STM

VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM of the addressed STM
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	7	Override status (STM-7)
L_PACKET	13	COMPUTED	packet length
Q_OVR_STATUS	1	0	ERTMS/ETCS Override status not active

© This document has been developed and released by UNISIG



Message-6 (STM-7 – override status, status not active): ETCS STM Control Function → STM

VARIABLE	Length	VALUE	COMMENTS
PADDING_BITS	COMPUTED	NOT RELEVANT	

Message-7 (STM-5): ETCS STM Control Function → STM

VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM of the addressed STM
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	5	ETCS status data STM-5
L_PACKET	13	COMPUTED	packet length
M_LEVEL	3	2	Level 1
M_MODESTM	4	2	Mode SR
PADDING_BITS	COMPUTED	NOT RELEVANT	

End Conditions	Value	Comments
STM_STATE	DA	
ETCS Mode	SN	
ETCS Level	NTC	
Train State	Unchanged	
ETCS Train Data	Unchanged	
Active DMI channel Connection	Not Relevant	
Other DMI channels Connections	Not Relevant	
TIU Connection	Not Relevant	
BIU Connection	Not Relevant	
JD Connection	Not Relevant	
TIU Regenerative Brake Command	Not Relevant	
TIU Magnetic Shoes Brake Command	Not Relevant	
TIU Eddy Current Brake Command for Emergency Brake	Not Relevant	
TIU Eddy Current Brake Command for Service Brake	Not Relevant	
TIU Pantograph Command	Not Relevant	
TIU Air Tightness Command	Not Relevant	

© This document has been developed and released by UNISIG





TIU Main Switch / Circuit Breaker Command	Unchanged	
TIU Traction Cut Off Command	Not Relevant	
TIU Traction Status	Not Relevant	
TIU Direction Controller Position Status	Not Relevant	
TIU Cab Status	Not Relevant	
BIU Emergency Brake Command	Not Relevant	
BIU Service Brake Command	Not Relevant	
BIU Emergency Brake Status	Not Relevant	
BIU Service Brake Status	Not Relevant	
NTC isolation status	Unchanged	



## Test case 12b.1

TEST CASE HEADER	
Test case identification	Procedures Override & Shunting
	12b.1.0.0.0
	Check the transmission of the Override Status to the STMs while the ETCS level is Level NTC and the ETCS Override Status is activated by the STM in the state DA according to the national requirements. No transition shall occur in this test.
ERTMS/ETCS requirements tested	Subset-035: 10.10.2.1, 10.10.2.2, 10.10.2.3 a) Subset-026 :
STM requirements tested	Subset-035 : Subset-026 :
Packets transmitted via FFFIS STM	Packet STM-6, STM-7, STM-15
ERTMS/ETCS on-board configuration	- To perform this test case it is necessary to connect at least 2 STMs to the ETCS on-board.
Comments and constraints	<p>The objective of this test is to check</p> <ul style="list-style-type: none"> <li>that the ERTMS/ETCS on-board (STM Control Function) while in Level NTC reports the ETCS Override Status to all connected STMs, after the STM in the state DA has reported the activation of its override function according to the national requirements to the ETCS on-board (STM Control Function), and</li> <li>that the ERTMS/ETCS on-board (STM Control Function) reports the deactivation of the ETCS Override Status to all connected STMs whenever the ETCS Override Status is deactivated according to the ERTMS/ETCS rules.</li> <li>That the ERTMS/ETCS on-board resets the override procedure when new activation report from STM is received</li> </ul>

Starting Conditions	Value	Comments
STM State	DA	all other STMs used within this Test Case shall be in the state CS



Starting Conditions	Value	Comments
ETCS Mode	SN	
ETCS Level	NTC	
Train State	Not Relevant	
ETCS Train Data	Valid	
Active DMI channel Connection	Established	for STM in DA
Other DMI channels Connections	Not Relevant	
TIU Connection	Not Relevant	
BIU Connection	Not Relevant	
JD Connection	Not Relevant	
TIU Regenerative Brake Command	Not Relevant	
TIU Magnetic Shoes Brake Command	Not Relevant	
TIU Eddy Current Brake Command for Emergency Brake	Not Relevant	
TIU Eddy Current Brake Command for Service Brake	Not Relevant	
TIU Pantograph Command	Not Relevant	
TIU Air Tightness Command	Not Relevant	
TIU Main Switch / Circuit Breaker Command	Closed	
TIU Traction Cut Off Command	Not Relevant	
TIU Traction Status	Not Relevant	
TIU Direction Controller Position Status	Not Relevant	
TIU Cab Status	Not Relevant	
BIU Emergency Brake Command	Not Relevant	
BIU Service Brake Command	Not Relevant	
BIU Emergency Brake Status	Release	
BIU Service Brake Status	Release	
NTC isolation status	Not isolated	



## ERTMS/ETCS on-board Test Case

Step	Description/Comments	Input I/F	Input time	Input Action	Output I/F	Output time limit	Output action
-	Initial Condition: Set the National Values for the "Override" procedure to defined values suitable for this Test Case.	BTM		See Telegram-B1&B2 in test case 12a.2	-		-
1	"Override Request" by the STM in state DA so that the "Override" procedure is activated by the ETCS on-board.	Prof	T0	STM Control Connection: Message-1 (STM-15 - state report from STM, STM-6 – Override activation)	Prof	Ts1	STM Control Connection: Message-2 (STM-7 – override status, status active) with the NID_STM of the addressed STMs transmitted to all STMs used within this Test Case
2	Repeated "Override Request" by the STM in state DA so that the "Override" procedure is reset by the ETCS on-board. STM Control Connection shall not send STM-7 (no change of override status)	Prof	T1 = (T0 + T_NVOV TRP – 5s)	STM Control Connection: Message-1 (STM-15 - state report from STM, STM-6 – Override activation)	Prof		STM Control Connection shall not send Message-2 (STM-7 – override status, status active).
4	The "Override" procedure is deactivated when the "max. time for train trip suppression when Override function is triggered" (national value) is passed.		T1 + T_NVOV TRP	The 'max. time for train trip suppression when Override function' is triggered	Prof	Ts1	STM Control Connection: Message-3 (STM-7 – override status, status not active) with the NID_STM of the addressed STM transmitted to all STMs used within this Test Case

## STM Test Case

Not applicable

Message-1 (STM-15 - state report from STM, STM-6 – Override activation): STM → ETCS STM Control Function			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM of STM in DA
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	15	State report from STM (STM-15)
L_PACKET	13	COMPUTED	packet length
NID_STMSTATE	4	7	state DA

© This document has been developed and released by UNISIG



Message-1 (STM-15 - state report from STM, STM-6 – Override activation): STM → ETCS STM Control Function			
VARIABLE	Length	VALUE	COMMENTS
NID_PACKET	8	6	Override activation (STM-6)
L_PACKET	13	COMPUTED	packet length
PADDING_BITS	COMPUTED	FINITE VALUE	

Message-2 (STM-7 – override status, status active): ETCS STM Control Function → STM			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	any valid value for NID_STM (according to the STMs used within this Test Case)
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	7	Override status (STM-7)
L_PACKET	13	COMPUTED	packet length
Q_OVR_STATUS	1	1	ERTMS/ETCS Override status active
PADDING_BITS	COMPUTED	NOT RELEVANT	

Message-3 (STM-7 – override status, status not active): ETCS STM Control Function → STM			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	any valid value for NID_STM (according to the STMs used within this Test Case)
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	7	Override status (STM-7)
L_PACKET	13	COMPUTED	packet length
Q_OVR_STATUS	1	0	ERTMS/ETCS Override status not active
PADDING_BITS	COMPUTED	NOT RELEVANT	

End Conditions	Value	Comments
STM_STATE	Unchanged	
ETCS Mode	Unchanged	
ETCS Level	Unchanged	
Train State	Unchanged	
ETCS Train Data	Unchanged	

© This document has been developed and released by UNISIG



Active DMI channel Connection	Unchanged	
Other DMI channels Connections	Not Relevant	
TIU Connection	Not Relevant	
BIU Connection	Not Relevant	
JD Connection	Not Relevant	
TIU Regenerative Brake Command	Not Relevant	
TIU Magnetic Shoes Brake Command	Not Relevant	
TIU Eddy Current Brake Command for Emergency Brake	Not Relevant	
TIU Eddy Current Brake Command for Service Brake	Not Relevant	
TIU Pantograph Command	Not Relevant	
TIU Air Tightness Command	Not Relevant	
TIU Main Switch / Circuit Breaker Command	Unchanged	
TIU Traction Cut Off Command	Not Relevant	
TIU Traction Status	Not Relevant	
TIU Direction Controller Position Status	Not Relevant	
TIU Cab Status	Not Relevant	
BIU Emergency Brake Command	Not Relevant	
BIU Service Brake Command	Not Relevant	
BIU Emergency Brake Status	Unchanged	
BIU Service Brake Status	Unchanged	
NTC isolation status	Unchanged	



## Test case 12b.2

TEST CASE HEADER	
Test case identification	Procedures Override & Shunting
	12b.2.0.0.0
	Check correct handling transition to TR mode, when driver select manually shunting during national trip procedure in level NTC. STM is sent to CS state and ETCS mode changes to TR.
ERTMS/ETCS requirements tested	Subset-035 : 10.3.2.2 (DA->CS), 10.3.2.4 (L4a), 10.13.1.1 Subset-026 : 4.6.3 (transition [35]), 5.6.2.2 (D030, A030)
STM requirements tested	Subset-035 : 9.2.1.1 (Transition DA to CS); 9.2.1.2 (4a) Subset-026 :
Packets transmitted via FFFIS STM	Packet STM-5, STM-14, STM-15, STM-18
ERTMS/ETCS on-board configuration	
Comments and constraints	STM test case is applicable only for STMs using National Trip Procedure.

Starting Conditions	Value	Comments
STM State	DA	all other STMs used within this Test Case shall be in the state CS
ETCS Mode	SN	
ETCS Level	NTC	
Train State	Standstill	
ETCS Train Data	Valid	
Active DMI channel Connection	Established	
Other DMI channels Connections	Not Relevant	
TIU Connection	Not relevant	



Starting Conditions	Value	Comments
BIU Connection	Not relevant	
JD Connection	Not relevant	
TIU Regenerative Brake Command	Not Relevant	
TIU Magnetic Shoes Brake Command	Not Relevant	
TIU Eddy Current Brake Command for Emergency Brake	Not Relevant	
TIU Eddy Current Brake Command for Service Brake	Not Relevant	
TIU Pantograph Command	Not Relevant	
TIU Air Tightness Command	Not Relevant	
TIU Main Switch / Circuit Breaker Command	Closed	
TIU Traction Cut Off Command	Not Relevant	
TIU Traction Status	Not Relevant	
TIU Direction Controller Position Status	Not Relevant	
TIU Cab Status	Not Relevant	
BIU Emergency Brake Command	Not Relevant	
BIU Service Brake Command	Not Relevant	
BIU Emergency Brake Status	Release	
BIU Service Brake Status	Release	
NTC isolation status	Not isolated	

## ERTMS/ETCS on-board Test Case

Step	Description/Comments	Input I/F	Input time	Input Action	Output I/F	Output time limit	Output action
1	National trip procedure is triggered and STM-18 is sent	Prof	T0	STM Control Connection: Message-1 (STM-18, STM-15)	-	-	-
2	Driver selects shunting on DMI, ETCS shall report new technical mode TRIP and order active STM to go in CS state	DMI	T0 + 5s	Driver selects shunting on DMI	Prof	Ts2	STM Control Connection sends Message-2 (STM-5, STM-14) containing change of mode to TR and State order to STM (unconditional CS order) Time: T1 > T0

© This document has been developed and released by UNISIG





Step	Description/Comments	Input I/F	Input time	Input Action	Output I/F	Output time limit	Output action
	ETCS displays "Request for driver acknowledgement to Train Trip" to the driver	-	-	-	DMI	Ts4	ETCS displays "Request for driver acknowledgement to Train Trip"
3	The STM reports its new state CS to the STM Control function in due time (within 10s)	PROF	T2=T1+5s	STM Control Connection: Message-3(STM-15)	Prof		No Message-4 (STM-14) is sent to the STM Control Function (State order to FA)

### STM Test Case

Step	Description/Comments	Input I/F	Input time	Input Action	Output I/F	Output time limit	Output action
1)	NTP is triggered (STM starts cyclic transmission of STM-18)	NTS	T0	National Trip Procedure start from track adapter	PROF.	Ts5	STM Control Connection: Message-1 (STM-18, STM-15)  Time: T1>T0
2)	Driver manually selects shunting, EMS sends Message-2 (STM-5, STM-14) containing change of mode to TR and unconditional CS state order to STM. STM shall accept state order.	PROF	T2=T1+8s	STM Control Connection: Message 2 (STM-5, STM-14) containing change of mode to TR and State order to STM (unconditional CS order)	PROF	10s	STM Control Connection: Message 3: Packet STM-15 State Report

Message-1 (Packet STM-18 National Trip Procedure, Packet STM-15 State Report) : STM → ETCS STM Control Function			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	any valid value for NID_STM (according to the STMs used within this Test Case)
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State Report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	7	Data Available (DA)
NID_PACKET	8	18	National Trip Procedure
L_PACKET	13	COMPUTED	
PADDING_BITS	COMPUTED	FINITE VALUE	



Message-2 (Packet STM-5 ETCS Status data, Packet STM-14: State order to STM) : ETCS STM Control Function → STM			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	any valid value for NID_STM (according to the STMs used within this Test Case)
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	5	ETCS Status data
L_PACKET	13	COMPUTED	
M_LEVEL	3	1	Level NTC
NID_NTC	8	FINITE VALUE	Valid value corresponding with NID_STM
M_MODESTM	4	7	Trip
NID_PACKET	8	14	State order to STM
L_PACKET	13	COMPUTED	
NID_STMSTATEORDER	4	4	Unconditional order CS
PADDING_BITS	COMPUTED	NOT RELEVANT	

Message-3 (Packet STM-15: State report from STM) : STM → ETCS STM control function			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	any valid value for NID_STM (according to the STMs used within this Test Case)
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State Report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	4	CS
PADDING_BITS	COMPUTED	FINITE VALUE	

Message-4 (STM-14 – state order to STM): ETCS STM Control Function → STM			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM according to the NTC announced
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	14	State order to STM (STM-14)
L_PACKET	13	COMPUTED	packet length
NID_STMSTATEORDER	4	8	state FA
PADDING_BITS	COMPUTED	NOT RELEVANT	



End Conditions	Value	Comments
STM_STATE	CS	
ETCS Mode	TR	
ETCS Level	Unchanged	
Train State	Unchanged	
ETCS Train Data	Unchanged	
Active DMI channel Connection	Unchanged	
Other DMI channels Connections	Not Relevant	
TIU Connection	Not relevant	
BIU Connection	Not relevant	
JD Connection	Not relevant	
TIU Regenerative Brake Command	Not Relevant	
TIU Magnetic Shoes Brake Command	Not Relevant	
TIU Eddy Current Brake Command for Emergency Brake	Not Relevant	
TIU Eddy Current Brake Command for Service Brake	Not Relevant	
TIU Pantograph Command	Not Relevant	
TIU Air Tightness Command	Not Relevant	
TIU Main Switch / Circuit Breaker Command	Unchanged	
TIU Traction Cut Off Command	Not Relevant	
TIU Traction Status	Not Relevant	
TIU Direction Controller Position Status	Not Relevant	
TIU Cab Status	Not Relevant	
BIU Emergency Brake Command	Not Relevant	
BIU Service Brake Command	Not Relevant	
BIU Emergency Brake Status	Unchanged	
BIU Service Brake Status	Unchanged	
NTC isolation status	Unchanged	



## Test case 12c.1

TEST CASE HEADER	
Test case identification	Procedures Override & Shunting
	12c.0.1.0
	Purpose is to check the correct handling of state transition related to STM due to manual change of mode to shunting when STM is in HS.
ERTMS/ETCS requirements tested	Subset-035 : 10.3.2.2 (HS -> CS), 10.3.2.4 (I4a), 10.3.2.7 Subset-026 :
STM requirements tested	Subset-035 : 9.2.1.1 (Transition HS to CS); 9.2.1.2 (4a) Subset-026 :
Packets transmitted via FFFIS STM	Packet STM-5, STM-14, STM-15
ERTMS/ETCS on-board configuration	
Comments and constraints	

Starting Conditions	Value	Comments
STM State	CS	
ETCS Mode	OS/SR/FS/LS/PT	Select a suitable value.
ETCS Level	1	
Train State	Moving	Speed is 18km/h
ETCS Train Data	Valid	
Active DMI channel Connection	Not Relevant	
Other DMI channels Connections	Not Relevant	
TIU Connection	Not relevant	
BIU Connection	Not relevant	

© This document has been developed and released by UNISIG



Starting Conditions	Value	Comments
JD Connection	Not relevant	
TIU Regenerative Brake Command	Not Relevant	
TIU Magnetic Shoes Brake Command	Not Relevant	
TIU Eddy Current Brake Command for Emergency Brake	Not Relevant	
TIU Eddy Current Brake Command for Service Brake	Not Relevant	
TIU Pantograph Command	Not Relevant	
TIU Air Tightness Command	Not Relevant	
TIU Main Switch / Circuit Breaker Command	Closed	
TIU Traction Cut Off Command	Not Relevant	
TIU Traction Status	Not Relevant	
TIU Direction Controller Position Status	Not Relevant	
TIU Cab Status	Not Relevant	
BIU Emergency Brake Command	Not Relevant	
BIU Service Brake Command	Not Relevant	
BIU Emergency Brake Status	Release	
BIU Service Brake Status	Release	
NTC isolation status	Not isolated	

## ERTMS/ETCS on-board Test Case

Step	Description/Comments	Input I/F	Input time	Input Action	Output I/F	Output time limit	Output action
1	Level Transition announcement for an ETCS -> STM transition: order announced STM to HS state	BTM	T0	Telegram-B3 (12 - Level 1 Movement Authority, 21 - Gradient Profile, 27 - International Static Speed Profile, 41 - Level Transition Order) Telegram-B2 – <i>Telegrams B2, B3 are equivalent to telegrams from test case 12a.2</i>	Prof		STM Control Connection: Message-1 (STM-14 – state order to STM) Time T1

© This document has been developed and released by UNISIG



Step	Description/Comments	Input I/F	Input time	Input Action	Output I/F	Output time limit	Output action
2	STM reports HS	Prof	$T2 = T1 + 3s$	Message-2 (STM-15 – state report from STM)	-		-
3	Driver applies brakes to stop the train	ODO	$T3 = T2 + 5s$	Driver applies brakes	-		-
4	Deceleration until standstill	ODO	$T3$	Train decelerates (deceleration of $1m/s^2$ up to standstill)			
5	Driver selects shunting, ETCS changes mode to shunting and sends STM to CS state	DMI	$T4 > T3 + 5s$	Driver selects shunting	Prof	$Ts2$	Message-3 (STM-5, STM-14) Time $T5$
6	STM reports state	Prof	$T6 = T5 + 3s$	Message-4 (STM-15), state report CS	Prof	10s	No Message-5 (STM-14) is sent to the STM Control Function (State order to FA)

## STM Test Case

Step	Description/Comments	Input I/F	Input time	Input Action	Output I/F	Output time limit	Output action
1	EMS order announced STM to HS state, STM reports HS.	Prof	$T0$	STM Control Connection: Message-1 (STM-14 – state order to STM)	Prof.	10s	STM Control Connection: Message-2 (STM-15 – state report from STM) Time: $T1 > T0$
2	Driver applies brakes to stop the train.	ODO	$T2 = T1 + 5s$	ETCS applies brake			
3	Train motion simulator starts decelerate speed until standstill	ODO	$T2$	Train decelerates (deceleration of $1m/s^2$ up to standstill)			
4	Driver selects shunting, sends STM to CS state and report SH mode. STM accepts state transition.	Prof	$T3 > T2 + 5s$	STM Control Connection: Message-3 (STM-5, STM-14)	Prof	10s	STM Control Connection: Message-4 (STM-15), state report CS

Message-1 (STM-14 – state order to STM): ETCS STM Control Function → STM			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM (according to the NTC announced in Telegram-B3)
L_MESSAGE	8	COMPUTED	message length

© This document has been developed and released by UNISIG



Message-1 (STM-14 – state order to STM): ETCS STM Control Function → STM			
VARIABLE	Length	VALUE	COMMENTS
NID_PACKET	8	14	State order to STM (STM-14)
L_PACKET	13	COMPUTED	packet length
NID_STMSTATEORDER	4	6	state HS
PADDING_BITS	COMPUTED	NOT RELEVANT	

Message-2 (STM-15 – state report from STM): STM → ETCS STM Control Function			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM according to the NTC announced in Telegram-B3
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	15	State report from STM (STM-15)
L_PACKET	13	COMPUTED	packet length
NID_STMSTATE	4	6	state HS
PADDING_BITS	COMPUTED	FINITE VALUE	

Message-3 (STM-14 – state order to STM, STM-5 - ETCS status data): ETCS STM Control Function → STM			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM according to the NTC announced in Telegram-B3
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	14	State order to STM (STM-14)
L_PACKET	13	COMPUTED	packet length
NID_STMSTATEORDER	4	4	state U-CS
NID_PACKET	8	5	ETCS status data (STM-5)
L_PACKET	13	COMPUTED	packet length
M_LEVEL	3	2	Level 1
M_MODE	4	3	SH
PADDING_BITS	COMPUTED	NOT RELEVANT	



Message-4 (Packet STM-15: State report from STM) : STM → ETCS STM control function			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	any valid value for NID_STM (according to the STMs used within this Test Case)
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State Report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	4	CS
PADDING_BITS	COMPUTED	FINITE VALUE	

Message-5 (STM-14 – state order to STM): ETCS STM Control Function → STM			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM according to the NTC announced in Telegram-B3
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	14	State order to STM (STM-14)
L_PACKET	13	COMPUTED	packet length
NID_STMSTATEORDER	4	8	state FA
PADDING_BITS	COMPUTED	NOT RELEVANT	

End Conditions	Value	Comments
STM_STATE	CS	
ETCS Mode	SH	
ETCS Level	1	
Train State	Standstill	
ETCS Train Data	Unchanged	
Active DMI channel Connection	Not Relevant	
Other DMI channels Connections	Not Relevant	
TIU Connection	Not relevant	
BIU Connection	Not relevant	
JD Connection	Not relevant	
TIU Regenerative Brake Command	Not Relevant	
TIU Magnetic Shoes Brake Command	Not Relevant	
TIU Eddy Current Brake Command for Emergency Brake	Not Relevant	
TIU Eddy Current Brake Command for	Not Relevant	

© This document has been developed and released by UNISIG





Service Brake		
TIU Pantograph Command	Not Relevant	
TIU Air Tightness Command	Not Relevant	
TIU Main Switch / Circuit Breaker Command	Unchanged	
TIU Traction Cut Off Command	Not Relevant	
TIU Traction Status	Not Relevant	
TIU Direction Controller Position Status	Not Relevant	
TIU Cab Status	Not Relevant	
BIU Emergency Brake Command	Not Relevant	
BIU Service Brake Command	Not Relevant	
BIU Emergency Brake Status	Unchanged	
BIU Service Brake Status	Unchanged	
NTC isolation status	Unchanged	



## Test case 12c.2

TEST CASE HEADER	
Test case identification	Procedures Override & Shunting
	12c.0.2.0.0
	Purpose is to check the correct handling of state transition related to STM due to manual change of mode to shunting when STM is in DA.
ERTMS/ETCS requirements tested	Subset-035 : 10.3.2.2 (DA -> CS), 10.3.2.4 (I4a), 10.3.2.7 Subset-026 :
STM requirements tested	Subset-035 : 9.2.1.1 (Transition DA to CS); 9.2.1.2 (4a) Subset-026 :
Packets transmitted via FFFIS STM	Packet STM-5, STM-14, STM-15
ERTMS/ETCS on-board configuration	
Comments and constraints	

Starting Conditions	Value	Comments
STM State	CS	
ETCS Mode	OS/SR/FS/LS/PT	
ETCS Level	1	
Train State	Moving	Speed is 144 km/h
ETCS Train Data	Valid	
Active DMI channel Connection	Not Relevant	
Other DMI channels Connections	Not Relevant	
TIU Connection	Not relevant	
BIU Connection	Not relevant	

© This document has been developed and released by UNISIG



Starting Conditions	Value	Comments
JD Connection	Not relevant	
TIU Regenerative Brake Command	Not Relevant	
TIU Magnetic Shoes Brake Command	Not Relevant	
TIU Eddy Current Brake Command for Emergency Brake	Not Relevant	
TIU Eddy Current Brake Command for Service Brake	Not Relevant	
TIU Pantograph Command	Not Relevant	
TIU Air Tightness Command	Not Relevant	
TIU Main Switch / Circuit Breaker Command	Closed	
TIU Traction Cut Off Command	Not Relevant	
TIU Traction Status	Not Relevant	
TIU Direction Controller Position Status	Not Relevant	
TIU Cab Status	Not Relevant	
BIU Emergency Brake Command	Not Relevant	
BIU Service Brake Command	Not Relevant	
BIU Emergency Brake Status	Release	
BIU Service Brake Status	Release	
NTC isolation status	Not isolated	

## ERTMS/ETCS on-board Test Case

Step	Description/Comments	Input I/F	Input time	Input Action	Output I/F	Output time limit	Output action
1	Level Transition announcement for an ETCS -> STM transition: order announced STM to HS state	BTM	T0	Telegram-B3 (12 - Level 1 Movement Authority, 21 - Gradient Profile, 27 - International Static Speed Profile, 41 - Level Transition Order) Telegram-B2 – <i>Telegrams B2, B3 are equivalent to telegrams from test case 12a.2</i>	Prof		STM Control Connection: Message-1 (STM-14 – state order to STM) Time T1



Step	Description/Comments	Input I/F	Input time	Input Action	Output I/F	Output time limit	Output action
2	STM reports HS	Prof	T2 = T1 + 3s	Message-2 (STM-15 – state report from STM)	Prof		No Message-7 (STM-14) is sent to the STM Control Function (State order to FA)
3	A transition border for a transition to ETCS level NTC is passed.	BTM	T3 = T2 + 47s	Telegram-B4(41 - Level Transition Order) Telegram-B2 <i>Telegrams B2, B4 are equivalent to telegrams from test case 12a.2</i>	DMI	Ts4	Transition acknowledgement request displayed
	ETCS orders the announced STM to the state DA.	-		-	Prof		STM Control Connection: Message-3 (STM-14 – state order to STM, STM-5 – ETCS status data) with the NID_NTC of the STM announced in Telegram-B3  Time T4
4	Driver acknowledges the transition	DMI	T5 = T3 + 3s	Driver acknowledges Transition	DMI		Transition acknowledgement request removed
5	STM reports state DA in due time.	Prof	T6 = T4+3s	STM Control Connection: Message-4 (STM-15 – state report from STM)	Prof		No Message-7 (STM-14) is sent to the STM Control Function (State order to FA)
6	Driver applies brakes to stop the train	ODO	T7 = T6+5s	Driver applies brakes	-		-
7	Deceleration up to standstill	ODO	T7	Train decelerates (deceleration of 1m/s <sup>2</sup> up to standstill)			
8	Driver selects shunting, ETCS changes mode to shunting and sends STM to CS state	DMI	T8 = T7 + 40s	Driver selects shunting	Prof	Ts2	Message-5 (STM-5, STM-14) Time T9
9	STM reports state	Prof	T10 = T9 + 3s	Message-6 (STM-15 – state report from STM, CS state)	Prof	10s	No Message-7 (STM-14) is sent to the STM Control Function (State order to FA)

## STM Test Case

Step	Description/Comments	Input I/F	Input time	Input Action	Output I/F	Output time limit	Output action
------	----------------------	-----------	------------	--------------	------------	-------------------	---------------

© This document has been developed and released by UNISIG



Step	Description/Comments	Input I/F	Input time	Input Action	Output I/F	Output time limit	Output action
1	EMS order announced STM to HS state, STM reports HS.	Prof	T0	STM Control Connection: Message-1 (STM-14 – state order to STM)	Prof.	10s	STM Control Connection: Message-2 (STM-15 – state report from STM)  Time: T1>T0
	EMS order DA state to STM, STM confirms DA state.	Prof	T2=T1 + 50s	STM Control Connection: Message-3 (STM-14 – state order to STM, STM-5 – ETCS status data)	Prof		STM Control Connection: Message-4 (STM-15 – state report from STM) Time T3
2	Driver applies brakes to stop the train.	ODO	T4=T3+5s	ETCS applies brake through train interface simulator			
3	Train motion simulator starts decelerate speed until standstill	ODO	T4	Train decelerates (deceleration of 1m/s <sup>2</sup> up to standstill)			
4	Driver selects shunting, sends STM to CS state and report SH mode. STM accepts state transition.	Prof	T5 = T4 + 50s	STM Control Connection: Message-5 (STM-5, STM-14)	Prof	10s	STM Control Connection: Message-6 (STM-15), state report CS

Message-1 (STM-14 – state order to STM): ETCS STM Control Function → STM			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM (according to the NTC announced in Telegram-B3)
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	14	State order to STM (STM-14)
L_PACKET	13	COMPUTED	packet length
NID_STMSTATEORDER	4	6	state HS
PADDING_BITS	COMPUTED	NOT RELEVANT	

Message-2 (STM-15 – state report from STM): STM → ETCS STM Control Function			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM according to the NTC announced in Telegram-B3
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	15	State report from STM (STM-15)
L_PACKET	13	COMPUTED	packet length
NID_STMSTATE	4	6	state HS

© This document has been developed and released by UNISIG



Message-2 (STM-15 – state report from STM): STM → ETCS STM Control Function

VARIABLE	Length	VALUE	COMMENTS
PADDING_BITS	COMPUTED	FINITE VALUE	

Message-3 (STM-14 – state order to STM, STM-5 - ETCS status data): ETCS STM Control Function → STM

VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM according to the NTC announced in Telegram-B3
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	14	State order to STM (STM-14)
L_PACKET	13	COMPUTED	packet length
NID_STMSTATEORDER	4	7	state DA
NID_PACKET	8	5	ETCS status data (STM-5)
L_PACKET	13	COMPUTED	packet length
M_LEVEL	3	1	Level NTC
NID_NTC	8	FINITE VALUE	NID_NTC (according to the NTC announced in Telegram-B3)
M_MODE	4	13	SN (National system)
PADDING_BITS	COMPUTED	NOT RELEVANT	

Message-4 (STM-15 – state report from STM): STM → ETCS STM Control Function

VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM according to the NTC announced in Telegram-B3
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	15	State report from STM (STM-15)
L_PACKET	13	COMPUTED	packet length
NID_STMSTATE	4	7	state DA
PADDING_BITS	COMPUTED	FINITE VALUE	

Message-5 (STM-14 – state order to STM, STM-5 - ETCS status data): ETCS STM Control Function → STM

VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM according to the NTC announced in Telegram-B3
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	14	State order to STM (STM-14)
L_PACKET	13	COMPUTED	packet length
NID_STMSTATEORDER	4	4	state U-CS
NID_PACKET	8	5	ETCS status data (STM-5)

© This document has been developed and released by UNISIG



Message-5 (STM-14 – state order to STM, STM-5 - ETCS status data): ETCS STM Control Function → STM			
VARIABLE	Length	VALUE	COMMENTS
L_PACKET	13	COMPUTED	packet length
M_LEVEL	3	1	Level NTC
NID_NTC	8	FINITE VALUE	NID_NTC (according to the NTC announced in Telegram-B3)
M_MODE	4	4	SH
PADDING_BITS	COMPUTED	NOT RELEVANT	

Message-6 (STM-15 – state report from STM): STM → ETCS STM Control Function			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM according to the NTC announced in Telegram-B3
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	15	State report from STM (STM-15)
L_PACKET	13	COMPUTED	packet length
NID_STMSTATE	4	4	state CS
PADDING_BITS	COMPUTED	FINITE VALUE	

Message-7 (STM-14 – state order to STM): ETCS STM Control Function → STM			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM according to the NTC announced in Telegram-B3
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	14	State order to STM (STM-14)
L_PACKET	13	COMPUTED	packet length
NID_STMSTATEORDER	4	8	state FA
PADDING_BITS	COMPUTED	NOT RELEVANT	

End Conditions	Value	Comments
STM_STATE	CS	
ETCS Mode	SH	
ETCS Level	NTC	
Train State	Standstill	
ETCS Train Data	Unchanged	
Active DMI channel Connection	Not Relevant	

© This document has been developed and released by UNISIG



Other DMI channels Connections	Not Relevant	
TIU Connection	Not relevant	
BIU Connection	Not relevant	
JD Connection	Not relevant	
TIU Regenerative Brake Command	Not Relevant	
TIU Magnetic Shoes Brake Command	Not Relevant	
TIU Eddy Current Brake Command for Emergency Brake	Not Relevant	
TIU Eddy Current Brake Command for Service Brake	Not Relevant	
TIU Pantograph Command	Not Relevant	
TIU Air Tightness Command	Not Relevant	
TIU Main Switch / Circuit Breaker Command	Unchanged	
TIU Traction Cut Off Command	Not Relevant	
TIU Traction Status	Not Relevant	
TIU Direction Controller Position Status	Not Relevant	
TIU Cab Status	Not Relevant	
BIU Emergency Brake Command	Not Relevant	
BIU Service Brake Command	Not Relevant	
BIU Emergency Brake Status	Unchanged	
BIU Service Brake Status	Unchanged	
NTC isolation status	Unchanged	





## Test case 12c.3

TEST CASE HEADER	
Test case identification	Procedures Override & Shunting
	12c.0.3.0.0
	Purpose is to check the correct handling of state transition related to STM – transition G4a.
ERTMS/ETCS requirements tested	Subset-035 : 10.3.2.2 (HS -> CS), 10.3.2.4 (G4a), 10.3.2.7 Subset-026 :
STM requirements tested	Subset-035 : Subset-026 :
Packets transmitted via FFFIS STM	Packet STM-5, STM-7, STM-14, STM-15
ERTMS/ETCS on-board configuration	
Comments and constraints	

Starting Conditions	Value	Comments
STM State	CS	
ETCS Mode	OS/SR/FS/LS/PT	
ETCS Level	1	
Train State	Moving	Speed is 18 km/h
ETCS Train Data	Valid	
Active DMI channel Connection	Not Relevant	
Other DMI channels Connections	Not Relevant	
TIU Connection	Not relevant	
BIU Connection	Not relevant	
JD Connection	Not relevant	

© This document has been developed and released by UNISIG



Starting Conditions	Value	Comments
TIU Regenerative Brake Command	Not Relevant	
TIU Magnetic Shoes Brake Command	Not Relevant	
TIU Eddy Current Brake Command for Emergency Brake	Not Relevant	
TIU Eddy Current Brake Command for Service Brake	Not Relevant	
TIU Pantograph Command	Not Relevant	
TIU Air Tightness Command	Not Relevant	
TIU Main Switch / Circuit Breaker Command	Closed	
TIU Traction Cut Off Command	Not Relevant	
TIU Traction Status	Not Relevant	
TIU Direction Controller Position Status	Not Relevant	
TIU Cab Status	Not Relevant	
BIU Emergency Brake Command	Not Relevant	
BIU Service Brake Command	Not Relevant	
BIU Emergency Brake Status	Release	
BIU Service Brake Status	Release	
NTC isolation status	Not isolated	

## ERTMS/ETCS on-board Test Case

Step	Description/Comments	Input I/F	Input time	Input Action	Output I/F	Output time limit	Output action
1	Level Transition announcement for an ETCS -> STM transition: order announced STM to HS state	BTM	T0	Telegram-B3 (12 - Level 1 Movement Authority, 21 - Gradient Profile, 27 - International Static Speed Profile, 41 - Level Transition Order) Telegram-B2 – <i>Telegrams B2, B3 are equivalent to telegrams from test case 12a.2</i>	Prof		STM Control Connection: Message-1 (STM-14 – state order to STM) Time T1



Step	Description/Comments	Input I/F	Input time	Input Action	Output I/F	Output time limit	Output action
2	STM reports HS	Prof	T2 = T1 + 3s	Message-2 (STM-15 – state report from STM)	Prof		No Message-8 (STM-14) is sent to the STM Control Function (State order to FA)
3	“Override Request” by the driver at standstill so that the “Override” procedure is activated by the ETCS on-board.	DMI	T3 = T2 + 5s	Override button activated by the driver	Prof	Ts1	STM Control Connection: Message-3 (STM-7 – override status, status active) with the NID_STM of the corresponding STMs– transmitted to all STMs used within this Test Case
	ETCS changes mode to SR if not SR, SH or UN	-	-	-	Prof	Ts2	Message-7 (STM-5) Time T5
	The “Override” procedure is deactivated when the “max. time for train trip suppression when Override function is triggered” (national value) is passed, STMs are informed about deactivation.	-	-	-	Prof	T_NVOTR P + Ts1	STM Control Connection: Message-4 (STM-7 – override status, status not active) with an NID_STM of one STM used within this Test Case – transmitted to all STMs used within this Test Case
	ETCS sends STM to CS state, since conditions for transition G4a are matched.	-	-	-	Prof	T_NVOTR P + Ts2	Message-5 (STM-14)
4	STM reports state	Prof	T5+3s	Message-6 (STM-15 – state report from STM, CS state)	Prof	10s	No Message-8 (STM-14) is sent to the STM Control Function (State order to FA)

Message-1 (STM-14 – state order to STM): ETCS STM Control Function → STM			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM (according to the NTC announced in Telegram-B3)
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	14	State order to STM (STM-14)
L_PACKET	13	COMPUTED	packet length
NID_STMSTATEORDER	4	6	state HS
PADDING_BITS	COMPUTED	NOT RELEVANT	

© This document has been developed and released by UNISIG



Message-2 (STM-15 – state report from STM): STM → ETCS STM Control Function

VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM according to the NTC announced in Telegram-B3
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	15	State report from STM (STM-15)
L_PACKET	13	COMPUTED	packet length
NID_STMSTATE	4	6	state HS
PADDING_BITS	COMPUTED	FINITE VALUE	

Message-3 (STM-7 – override status): ETCS STM Control Function → STM

VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	any valid value for NID_STM (according to the STMs used within this Test Case)
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	7	Override status (STM-7)
L_PACKET	13	COMPUTED	packet length
Q_OVR_STATUS	1	1	ERTMS/ETCS Override status active
PADDING_BITS	COMPUTED	NOT RELEVANT	

Message-4 (STM-7 – override status): ETCS STM Control Function → STM

VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	any valid value for NID_STM (according to the STMs used within this Test Case)
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	7	Override status (STM-7)
L_PACKET	13	COMPUTED	packet length
Q_OVR_STATUS	1	0	ERTMS/ETCS Override status not active
PADDING_BITS	COMPUTED	NOT RELEVANT	

Message-5 (STM-14 – state order to STM): ETCS STM Control Function → STM

VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM (according to the NTC announced in Telegram-B3)
L_MESSAGE	8	COMPUTED	message length



Message-5 (STM-14 – state order to STM): ETCS STM Control Function → STM			
VARIABLE	Length	VALUE	COMMENTS
NID_PACKET	8	14	State order to STM (STM-14)
L_PACKET	13	COMPUTED	packet length
NID_STMSTATEORDER	4	4	state U-CS
PADDING_BITS	COMPUTED	NOT RELEVANT	

Message-6 (STM-15 – state report from STM): STM → ETCS STM Control Function			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM according to the NTC announced in Telegram-B3
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	15	State report from STM (STM-15)
L_PACKET	13	COMPUTED	packet length
NID_STMSTATE	4	4	state CS
PADDING_BITS	COMPUTED	FINITE VALUE	

Message-7 (STM-5): ETCS STM Control Function → STM			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM of the addressed STM
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	5	ETCS status data STM-5
L_PACKET	13	COMPUTED	packet length
M_LEVEL	3	2	Level 1
M_MODESTM	4	2	Mode SR
PADDING_BITS	COMPUTED	NOT RELEVANT	

Message-8 (STM-14 – state order to STM): ETCS STM Control Function → STM			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	NID_STM according to the NTC announced in Telegram-B3
L_MESSAGE	8	COMPUTED	message length
NID_PACKET	8	14	State order to STM (STM-14)
L_PACKET	13	COMPUTED	packet length
NID_STMSTATEORDER	4	8	state FA



Message-8 (STM-14 – state order to STM): ETCS STM Control Function → STM

VARIABLE	Length	VALUE	COMMENTS
PADDING_BITS	COMPUTED	NOT RELEVANT	

End Conditions	Value	Comments
STM_STATE	Unchanged	
ETCS Mode	SR/SH/UN	
ETCS Level	Unchanged	
Train State	Unchanged	
ETCS Train Data	Unchanged	
Active DMI channel Connection	Not Relevant	
Other DMI channels Connections	Not Relevant	
TIU Connection	Not relevant	
BIU Connection	Not relevant	
JD Connection	Not relevant	
TIU Regenerative Brake Command	Not Relevant	
TIU Magnetic Shoes Brake Command	Not Relevant	
TIU Eddy Current Brake Command for Emergency Brake	Not Relevant	
TIU Eddy Current Brake Command for Service Brake	Not Relevant	
TIU Pantograph Command	Not Relevant	
TIU Air Tightness Command	Not Relevant	
TIU Main Switch / Circuit Breaker Command	Unchanged	
TIU Traction Cut Off Command	Not Relevant	
TIU Traction Status	Not Relevant	
TIU Direction Controller Position Status	Not Relevant	
TIU Cab Status	Not Relevant	
BIU Emergency Brake Command	Not Relevant	
BIU Service Brake Command	Not Relevant	
BIU Emergency Brake Status	Unchanged	
BIU Service Brake Status	Unchanged	
NTC isolation status	Unchanged	

© This document has been developed and released by UNISIG