ERTMS/ETCS – Class 1

FFFIS STM test cases of Functional identity 002

APPLICATION START UP

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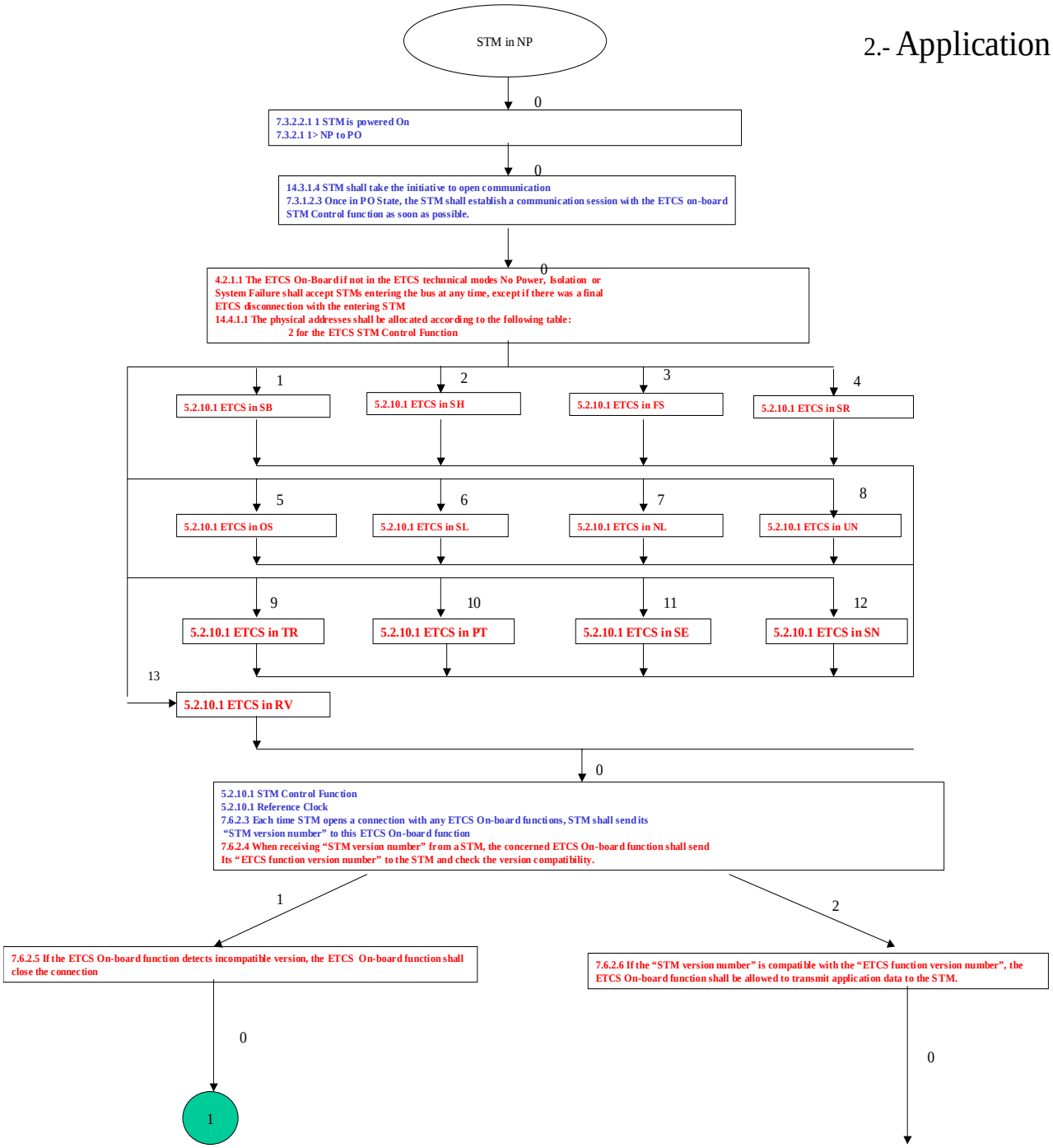
Diagrams



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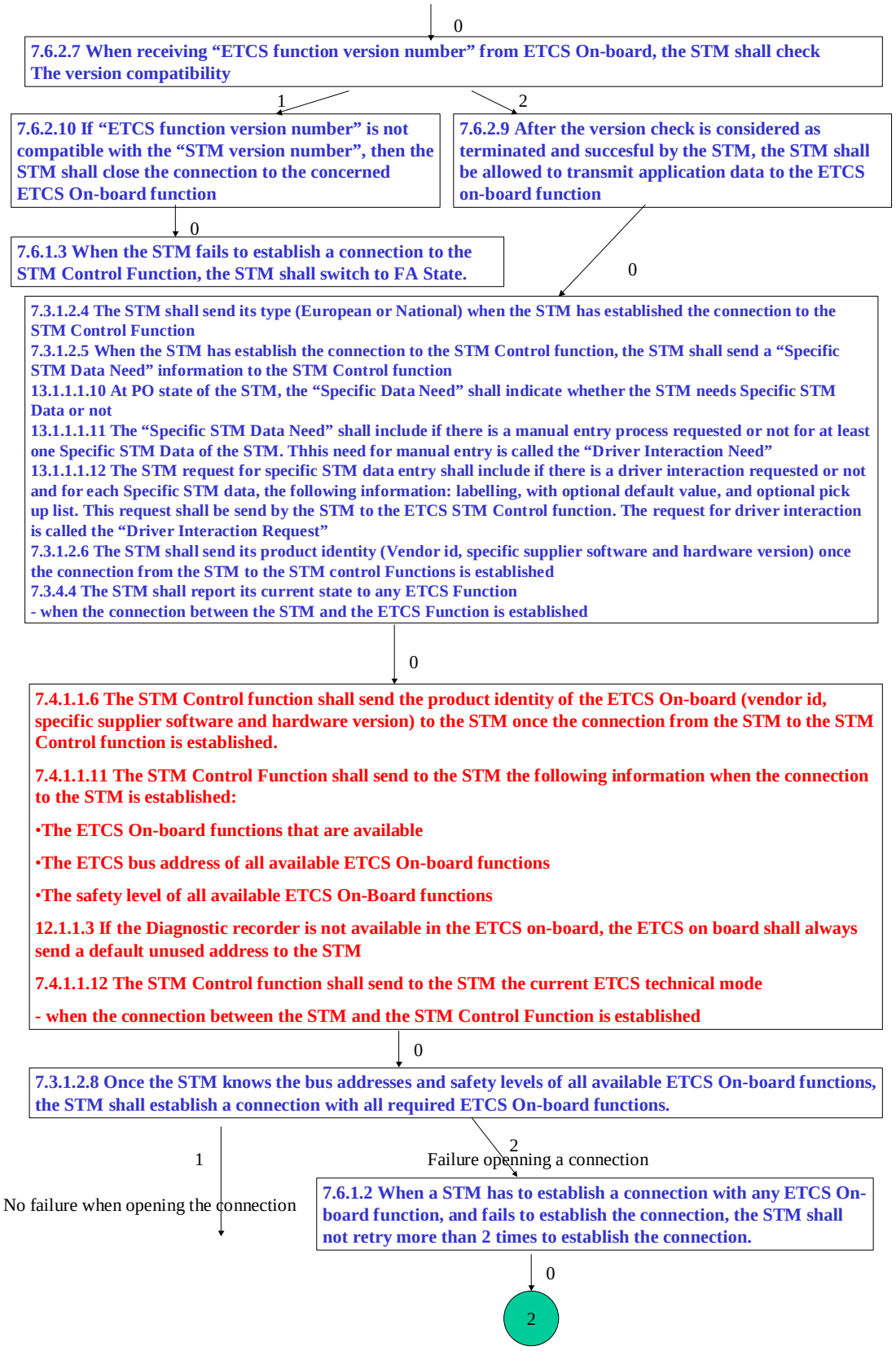

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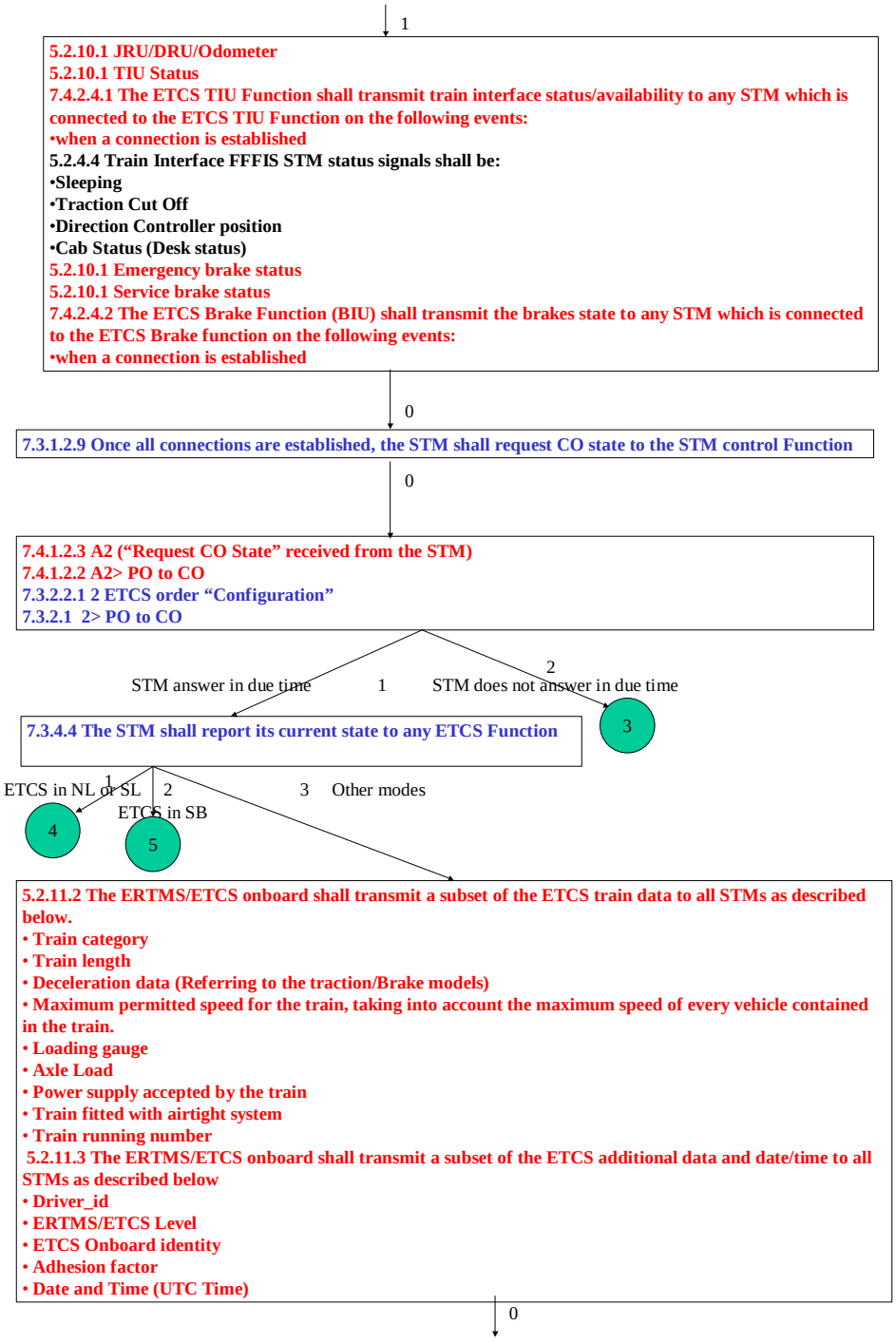

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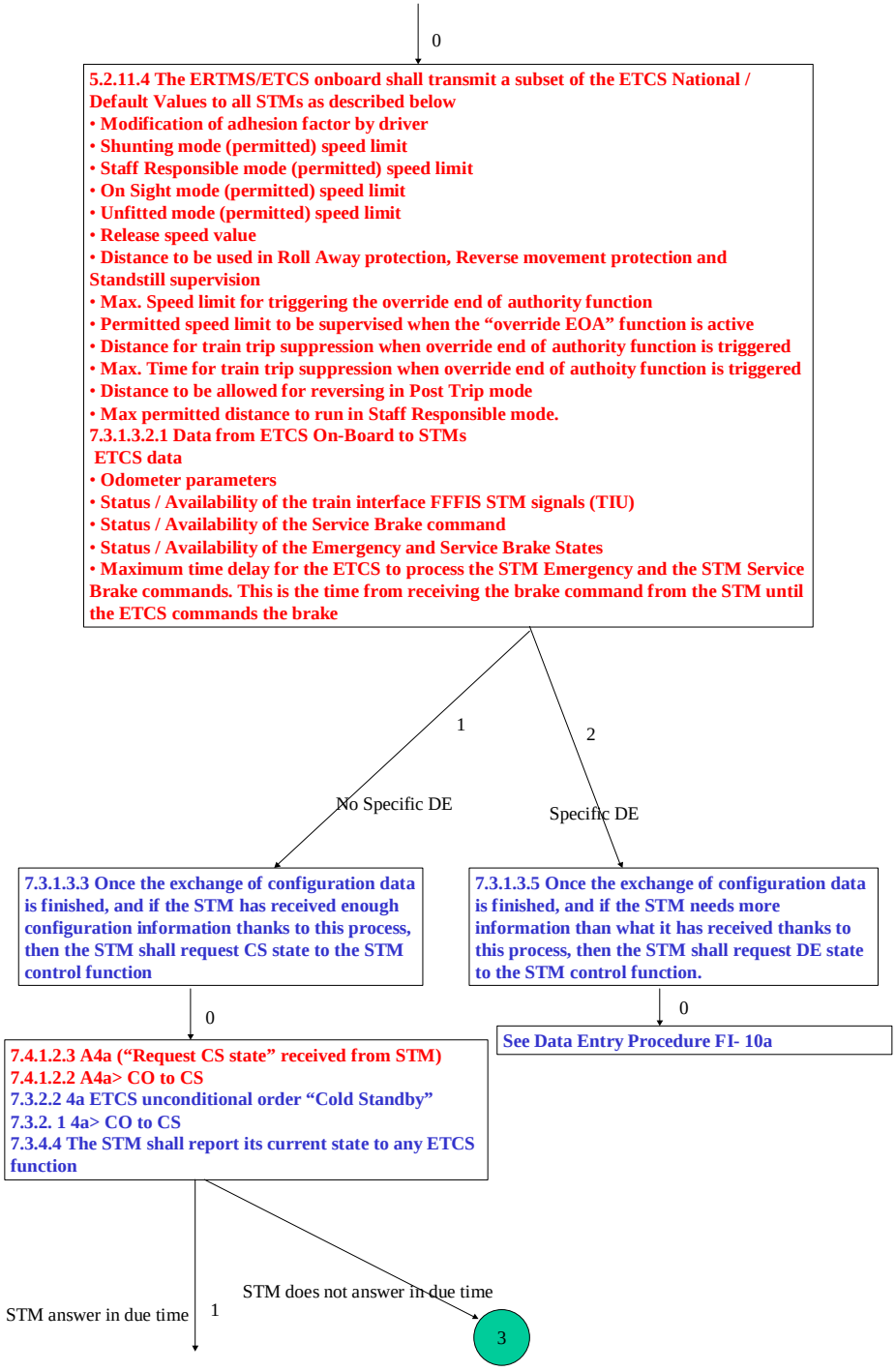

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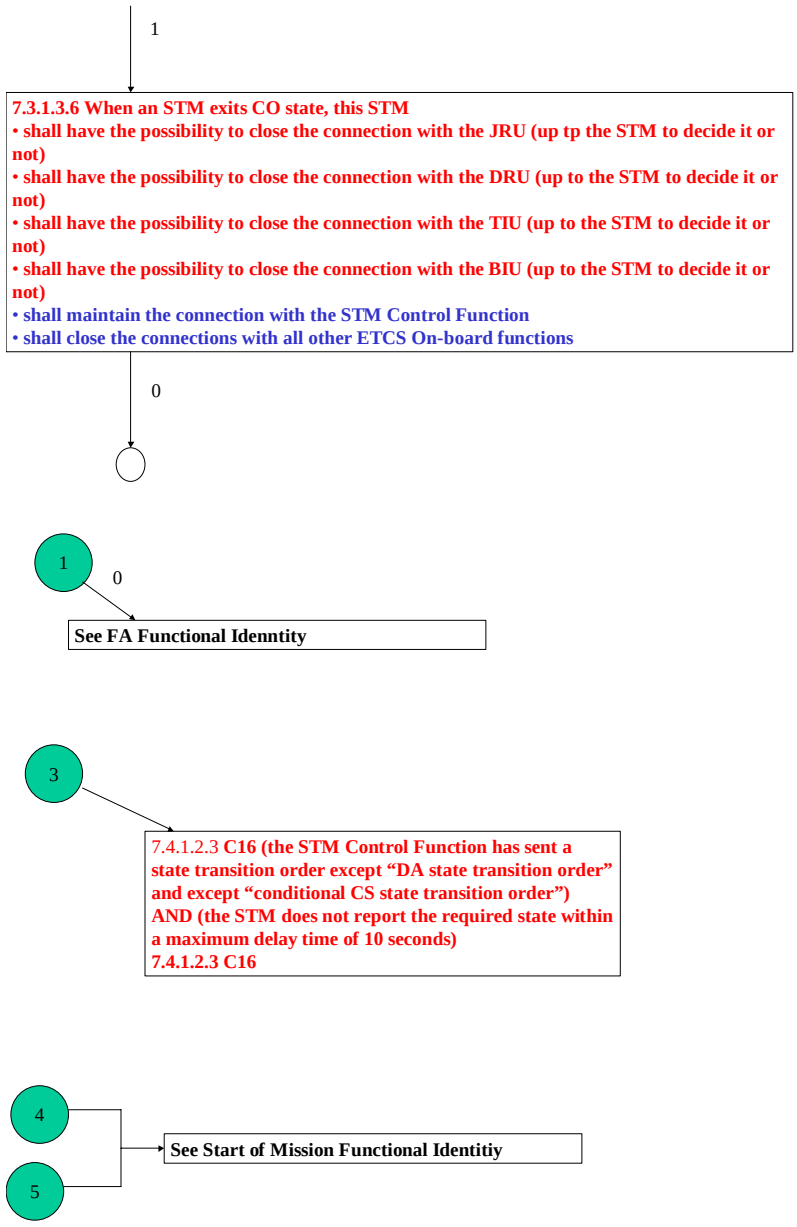

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Test case 2.0.0.0.8.0.1.0

TEST CASE HEADER	
Test case Identification	Application Start Up
	The ETCS mode is UN. The STM Control Function version is not compatible with the STM and closes the connection.
ETCS Requirements Tested	Subset-026 None
	subset-035 4.2.1.1; 5.2.10.1; 7.6.2.4; 7.6.2.5
STM Requirements Tested	Subset-026 None
	Subset-035 None
Packets Transmitted via FFFIS STM	Packet STM-1; STM-15
Comments and constraints	

Starting Conditions	Value	Comments
STM_STATE	NP	
ETCS Mode	UN	
ETCS Level	Not Relevant	
Train State	Standstill	
Train Data	Invalid	
Additional Data	Invalid	
National Values	Valid	
STM Control Function Connection	Not Established	
DMI Connection	Not Established	
Odometry Data	Not Established	
Reference Time Data	Transmitted	
TIU Connection	Not Established	
BIU Connection	Not Established	

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JRU Connection		Not Established	
Other connections		Not Established	
TIU Regenerative Brake Command		Not Relevant	
TIU Magnetic Shoes Command		Not Relevant	
TIU Eddy Current Brake Command		Not Relevant	
TIU Inhibit Passenger Emergency Brake Command		Not Relevant	
TIU Pantograph Command		Not Relevant	
TIU Air Tightness Command		Not Relevant	
TIU Main Switch / Circuit Breaker Command		Not Relevant	
TIU Traction Cut Off Command		Not Relevant	
TIU Sleeping Status		Not Sleeping	
TIU Traction Cut Off Status		Not Relevant	
TIU Direction Controller Position Status		Not Relevant	
TIU Cab Status (Desk Status)		Not Relevant	
BIU 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	
STM Version Number	Subset-026	1.0	SRS 2.2.2 is 1.Y
	Subset-035	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-058	2.0.z	Version 2.1.1 is 3.Y.Z
	Subset-056	3.0.z	Version 2.2.0 is 3.Y.Z
	Subset-057	3.0.z	Version 2.2.0 is 3.Y.Z
ETCS Version Number	Subset-026	1.0	Version 2.2.2 is 1.Y
	Subset-035	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-058	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-056	3.0.z	Version 2.2.0 is 3.Y.Z
	Subset-057	3.0.z	Version 2.2.0 is 3.Y.Z
Track Adhesion		Not Relevant	

ETCS Test Case

Step	Description/Comments	Input I/F	Input Action	DUT	Output I/F	Output action
1	The communication between the	Prof	STM opens the connection with	ETCS	Prof	STM Control Connection: STM Control

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	STM Control Function and the STM is opened		the STM Control Function and send its version number. STM Control Connection: Message 1 sent packet STM- 1			Functions sends its version number and checks the version Message 2 STM-1
2	STM Control function closes the connection because versions are not compatible	-	Version not compatible	ETCS	Prof	Connection between the STM and the STM Control Function is closed

Message 1: STM → ETCS (Packet STM-1; STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	1	STM/ETCS function version number
L_PACKET	13	COMPUTED	Packet length
N_058_VERMAJOR	8	2	Application Layer compatibility number, major number: X
N_058_VERMID	8	0	Application Layer compatibility number, middle number: Y
N_058_VERMINOR	8	2	Application Layer compatibility number, minor number: Z
N_035_VERMAJOR	8	3	FFFIS STM Layer compatibility number, major number: X
N_035_VERMID	8	0	FFFIS STM compatibility number, middle number: Y
N_035_VERMINOR	8	3	FFFIS STM compatibility number, minor number: Z
N_SRS_VERMAJOR	8	1	Major version number of SRS: X
N_SRS_VERMINOR	8	0	Minor version number of SRS: Y
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	Packet length
NID_STMSTATE	4	1	Actual STM State: Power On
Padding bits	COMPUTED	COMPUTED	

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Message 2: ETCS → STM (Packet STM-1)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	1	STM/ETCS function version number
L_PACKET	13	COMPUTED	Packet length
N_058_VERMAJOR	8	3	Application Layer compatibility number, major number: X
N_058_VERMID	8	0	Application Layer compatibility number, middle number: Y
N_058_VERMINOR	8	3	Application Layer compatibility number, minor number: Z
N_035_VERMAJOR	8	3	FFFIS STM Layer compatibility number, major number: X
N_035_VERMID	8	0	FFFIS STM compatibility number, middle number: Y
N_035_VERMINOR	8	3	FFFIS STM compatibility number, minor number: Z
N_SRS_VERMAJOR	8	1	Major version number of SRS: X
N_SRS_VERMINOR	8	0	Minor version number of SRS: Y
Padding bits	COMPUTED	COMPUTED	

End Conditions	Value	Comments
STM_STATE	PO	
ETCS Mode	UN	
ETCS Level	unchanged	
Train State	Standstill	
Train Data	unchanged	
Additional Data	unchanged	
National Values	unchanged	
STM Control Function Connection	unchanged	
DMI Connection	unchanged	

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Odometry data	unchanged	
Reference Time Data	unchanged	
TIU Connection	unchanged	
BIU Connection	unchanged	
JRU Connection	unchanged	
Other connections	unchanged	
TIU Regenerative Brake Command	unchanged	
TIU Magnetic Shoes Command	unchanged	
TIU Eddy Current Brake Command	unchanged	
TIU Inhibit Passenger Emergency Brake Command	unchanged	
TIU Pantograph Command	unchanged	
TIU Air Tightness Command	unchanged	
TIU Main Switch / Circuit Breaker Command	unchanged	
TIU Traction Cut Off Command	unchanged	
TIU Sleeping Status	unchanged	
TIU Traction Cut Off Status	unchanged	
TIU Direction Controller Position Status	unchanged	
TIU Cab Status (Desk Status)	unchanged	
BIU Status	unchanged	
BIU Emergency Brake Command	unchanged	
BIU Service Brake Command	unchanged	
BIU Emergency Brake Status	unchanged	
BIU Service Brake Status	unchanged	
STM Version Number	unchanged	
ETCS Version Number	unchanged	
Track Adhesion	unchanged	

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Test case 2.0.0.0.2.0.2.0.1.0

TEST CASE HEADER	
Test case Identification	Application Start Up
	The ETCS mode is SH. The STM Control Function version is not compatible with the STM and STM closes the connection.
ETCS Requirements Tested	Subset-026 None
	subset-035 4.2.1.1; 5.2.10.1; 7.6.2.4; 7.6.2.6
STM Requirements Tested	Subset-026 None
	Subset-035 7.3.2.2.1 NP to PO; 7.3.2.1 1; 14.3.1.4; 7.3.1.2.3; 7.6.2.3; 7.6.2.7; 7.6.2.10; 14.4.1.1
Packets Transmitted via FFFIS STM	Packet STM-1; STM-15
Comments and constraints	

Starting Conditions	Value	Comments
STM_STATE	PO	
ETCS Mode	SH	
ETCS Level	Not Relevant	
Train State	Not Relevant	
Train Data	Invalid	
Additional Data	Invalid	
National Values	Valid	
STM Control Function Connection	Not Established	
DMI Connection	Not Established	
Odometry Data	Not Established	
Reference Time Data	Transmitted	
TIU Connection	Not Established	

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BIU Connection		Not Established	
JRU Connection		Not Established	
Other connections		Not Established	
TIU Regenerative Brake Command		Not Relevant	
TIU Magnetic Shoes Command		Not Relevant	
TIU Eddy Current Brake Command		Not Relevant	
TIU Inhibit Passenger Emergency Brake Command		Not Relevant	
TIU Pantograph Command		Not Relevant	
TIU Air Tightness Command		Not Relevant	
TIU Main Switch / Circuit Breaker Command		Not Relevant	
TIU Traction Cut Off Command		Not Relevant	
TIU Sleeping Status		Not Sleeping	
TIU Traction Cut Off Status		Not Relevant	
TIU Direction Controller Position Status		Not Relevant	
TIU Cab Status (Desk Status)		Not Relevant	
BIU 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	
STM Version Number	Subset-026	1.0	SRS 2.2.2 is 1.Y
	Subset-035	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-058	2.0.z	Version 2.1.1 is 3.Y.Z
	Subset-056	3.0.z	Version 2.2.0 is 3.Y.Z
	Subset-057	3.0.z	Version 2.2.0 is 3.Y.Z
ETCS Version Number	Subset-026	1.0	Version 2.2.2 is 1.Y
	Subset-035	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-058	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-056	3.0.z	Version 2.2.0 is 3.Y.Z
	Subset-057	3.0.z	Version 2.2.0 is 3.Y.Z
Track Adhesion		Not Relevant	

ETCS Test Case

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Step	Description/Comments	Input I/F	Input Action	DUT	Output I/F	Output action
1	The communication between the STM Control Function and the STM is opened	Prof	STM Control Connection: STM opens the connection with the STM Control Function and send its version number. Message 1 sent packet STM- 1	ETCS	Prof	STM Control Connection: STM Control Functions sends its version number and checks the version Message 2 STM-1
2	Connection is closed	Prof	STM close the connection	ETCS	Prof	Connection is closed

STM Test case

Step	Description/Comments	Input I/F	Input Action	DUT	Output I/F	Output action
1	STM takes the initiative to open the communication with the STM control function	Prof	STM is powered on	STM	Prof	STM Control Connection: STM opens the communication session Message - 1 packet STM-1 STM/ETCS function version number
2	Version not compatible	Prof	STM Control Connection: ETCS sends its version number Message 2	STM		
				STM	Prof	STM Control Connection: STM switches to FA mode (7.6.1.3) Message 3 is sent (if possible) packet STM-15 STM State report
				STM	Prof	STM closes the connection

Message 1: STM → ETCS (Packet STM-1; STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	1	STM/ETCS function version number
L_PACKET	13	COMPUTED	Packet length
N_058_VERMAJOR	8	2	Application Layer compatibility number, major number: X

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N_058_VERMID	8	0	Application Layer compatibility number, middle number: Y
N_058_VERMINOR	8	2	Application Layer compatibility number, minor number: Z
N_035_VERMAJOR	8	3	FFFIS STM Layer compatibility number, major number: X
N_035_VERMID	8	0	FFFIS STM compatibility number, middle number: Y
N_035_VERMINOR	8	3	FFFIS STM compatibility number, minor number: Z
N_SRS_VERMAJOR	8	1	Major version number of SRS: X
N_SRS_VERMINOR	8	0	Minor version number of SRS: Y
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	Packet length
NID_STMSTATE	4	1	Actual STM State: Power On
Padding bits	COMPUTED	COMPUTED	

Message 2: ETCS → STM (Packet STM-1)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	1	STM/ETCS function version number
L_PACKET	13	COMPUTED	Packet length
N_058_VERMAJOR	8	3	Application Layer compatibility number, major number: X
N_058_VERMID	8	0	Application Layer compatibility number, middle number: Y
N_058_VERMINOR	8	3	Application Layer compatibility number, minor number: Z
N_035_VERMAJOR	8	3	FFFIS STM Layer compatibility number, major number: X
N_035_VERMID	8	0	FFFIS STM compatibility number, middle number: Y
N_035_VERMINOR	8	3	FFFIS STM compatibility number, minor number: Z

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N_SRS_VERMAJOR	8	1	Major version number of SRS: X
N_SRS_VERMINOR	8	0	Minor version number of SRS: Y
Padding bits	COMPUTED	COMPUTED	

Message 3: STM → ETCS (Packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	Packet length
NID_STMSTATE	4	8	Failure
Padding bits	COMPUTED	COMPUTED	

End Conditions	Value	Comments
STM_STATE	FA	
ETCS Mode	SH	
ETCS Level	unchanged	
Train State	unchanged	
Train Data	unchanged	
Additional Data	unchanged	
National Values	unchanged	
STM Control Function Connection	unchanged	
DMI Connection	unchanged	
Odometry data	unchanged	

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Reference Time Data	Unchanged	
TIU Connection	unchanged	
BIU Connection	unchanged	
JRU Connection	unchanged	
Other connections	unchanged	
TIU Regenerative Brake Command	unchanged	
TIU Magnetic Shoes Command	unchanged	
TIU Eddy Current Brake Command	unchanged	
TIU Inhibit Passenger Emergency Brake Command	unchanged	
TIU Pantograph Command	unchanged	
TIU Air Tightness Command	unchanged	
TIU Main Switch / Circuit Breaker Command	unchanged	
TIU Traction Cut Off Command	unchanged	
TIU Sleeping Status	Sleeping	
TIU Traction Cut Off Status	unchanged	
TIU Direction Controller Position Status	unchanged	
TIU Cab Status (Desk Status)	unchanged	
BIU Status	unchanged	
BIU Emergency Brake Command	unchanged	
BIU Service Brake Command	unchanged	
BIU Emergency Brake Status	unchanged	
BIU Service Brake Status	unchanged	
STM Version Number	Unchanged	
ETCS Version Number	unchanged	
Track Adhesion	unchanged	

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Test case 2.0.0.0.3.0.2.0.2.0.0.0.2.0

TEST CASE HEADER	
Test case Identification	Application Start Up
	The ETCS mode is FS. The STM Control Function version is compatible with the STM. The establishment of one of the connections fails.
ETCS Requirements Tested	Subset-026 None
	subset-035 None
STM Requirements Tested	Subset-026 None
	subset-035 7.3.2.1 1; 7.3.2.2.1 NP to CO; 7.3.1.2.3; 14.3.1.4; 7.6.2.3; 7.6.2.7; 7.6.2.9; 7.3.1.2.4; 7.3.1.2.5; 13.1.1.1.10; 13.1.1.1.11; 13.1.1.1.12; 7.3.1.2.6; 7.3.4.4; 7.3.1.2.8; 7.6.1.2; 14.4.1.1
Packets Transmitted via FFFIS STM	STM-1; STM-15; STM-2; STM-5; STM-4 ; STM-181
Comments and constraints	

Starting Conditions	Value	Comments
STM_STATE	NP	
ETCS Mode	FS	
ETCS Level	1	
Train State	Not Relevant	
Train Data	valid	
Additional Data	Valid	
National Values	Valid	
STM Control Function Connection	Not Established	
DMI Connection	Not Established	
Odometry Data	Not Established	
Reference Time Data	Transmitted	

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TIU Connection		Not Established	
BIU Connection		Not Established	
JRU Connection		Not Established	
Other connections		Not Established	
TIU Regenerative Brake Command		Not Relevant	
TIU Magnetic Shoes Command		Not Relevant	
TIU Eddy Current Brake Command		Not Relevant	
TIU Inhibit Passenger Emergency Brake Command		Not Relevant	
TIU Pantograph Command		Not Relevant	
TIU Air Tightness Command		Not Relevant	
TIU Main Switch / Circuit Breaker Command		Not Relevant	
TIU Traction Cut Off Command		Not Relevant	
TIU Sleeping Status		Not Sleeping	
TIU Traction Cut Off Status		Not Relevant	
TIU Direction Controller Position Status		Not Relevant	
TIU Cab Status (Desk Status)		Not Relevant	
BIU 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	
STM Version Number	Subset-026	1.0	SRS 2.2.2 is 1.Y
	Subset-035	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-058	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-056	3.0.z	Version 2.2.0 is 3.Y.Z
	Subset-057	3.0.z	Version 2.2.0 is 3.Y.Z
ETCS Version Number	Subset-026	1.0	Version 2.2.2 is 1.Y
	Subset-035	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-058	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-056	3.0.z	Version 2.2.0 is 3.Y.Z
	Subset-057	3.0.z	Version 2.2.0 is 3.Y.Z
Track Adhesion		Not Relevant	

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STM Test case

Step	Description/Comments	Input I/F	Input Action	DUT	Output I/F	Output action
1	STM takes the initiative to open the communication with the STM control function	Prof	STM is powered on	STM	Prof	STM Control Connection: STM opens the communication session Message - 1 packet STM-1 STM/ETCS function version number
2		Prof	STM Control Connection: STM Control Functions sends its version number and checks the version Message 2 STM-1	STM		Version check is successful. STM is allowed to transmit application data
-	STM sends its type and product identity STM sends its current state	-	-	STM	Prof	STM Control Connection: Message - 5 Sent packet STM - 4 STM parameters data and product identity
-	STM sends Specific Data need	-	-	STM	Prof	STM Control Connection: Message - 6 Sent packet STM - 181 Specific data need
3	STM establishes the connection with another ETCS functions	Prof	STM Control Connection: ETCS bus addresses received Message-3	STM	Prof	STM tries to establish the connection first time
4	STM tries a second time	Prof	establishment failed	STM	Prof	STM tries again
5	It is up to the STM to decide what to do now as this connection is not the STM Control Function one. (7.6.1.3, 7.6.1.4)	-	-	-	-	

Message 1: STM → ETCS (Packet STM-1; STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	

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NID_PACKET	8	1	STM/ETCS function version number
L_PACKET	13	COMPUTED	Packet length
N_058_VERMAJOR	8	3	Application Layer compatibility number, major number: X
N_058_VERMID	8	0	Application Layer compatibility number, middle number: Y
N_058_VERMINOR	8	2	Application Layer compatibility number, minor number: Z
N_035_VERMAJOR	8	3	FFFIS STM Layer compatibility number, major number: X
N_035_VERMID	8	0	FFFIS STM compatibility number, middle number: Y
N_035_VERMINOR	8	3	FFFIS STM compatibility number, minor number: Z
N_SRS_VERMAJOR	8	1	Major version number of SRS: X
N_SRS_VERMINOR	8	0	Minor version number of SRS: Y
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	Packet length
NID_STMSTATE	4	1	Actual STM State: Power On
Padding bits	COMPUTED	COMPUTED	

Message 2: ETCS → STM (Packet STM-1)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	1	STM/ETCS function version number
L_PACKET	13	COMPUTED	Packet length
N_058_VERMAJOR	8	3	Application Layer compatibility number, major number: X
N_058_VERMID	8	0	Application Layer compatibility number, middle number: Y

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N_058_VERMINOR	8	3	Application Layer compatibility number, minor number: Z
N_035_VERMAJOR	8	3	FFFIS STM Layer compatibility number, major number: X
N_035_VERMID	8	0	FFFIS STM compatibility number, middle number: Y
N_035_VERMINOR	8	3	FFFIS STM compatibility number, minor number: Z
N_SRS_VERMAJOR	8	1	Major version number of SRS: X
N_SRS_VERMINOR	8	0	Minor version number of SRS: Y
Padding bits	COMPUTED	COMPUTED	

Message 3: ETCS → STM (packet STM-2)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	2	ETCS On-board physical addresses, safety levels and Product identity
N_ADDR_JRU	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_JRU	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CAB_A	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CAB_A	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CAB_B	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CAB_B	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CAB_A_RED	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CAB_A_RED	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CAB_B_RED	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CAB_B_RED	2	FINITE VALUE	Depends on test equipment implementation

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N_ADDR_DRU	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_DRU	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CLOCK	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CLOCK	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_ODO	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_ODO	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_EUROSUP	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_EUROSUP	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_TI	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_TI	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_BI	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_BI	2	FINITE VALUE	Depends on test equipment implementation
L_TEXT	8	24	
X_TEXT (1)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (2)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (3)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (4)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (5)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (6)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (7)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (8)	8	FINITE VALUE	Depends on test equipment implementation

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X_TEXT (9)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (10)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (11)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (12)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (13)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (14)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (15)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (16)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (17)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (18)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (19)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (20)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (21)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (22)	8	FINITE VALUE	Depends on test equipment implementation

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X_TEXT (23)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (24)	8	FINITE VALUE	Depends on test equipment implementation
Padding bits	COMPUTED	COMPUTED	

Message 4 ETCS → STM (packet STM-5)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	5	ETCS Status data
M_LEVEL	3	FINITE VALUE	Value for Levels 1 or 2 or 3
M_MODE	4	0	Full supervision
Padding bits	COMPUTED	COMPUTED	

Message 5: STM → ETCS (packet STM-4)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	4	STM Parameters data and product identity
L_PACKET	13	COMPUTED	
NID_STMTYPE	1	1	STM National
L_TEXT	8	24	

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X_TEXT (1)	8	FINITE VALUE	
X_TEXT (2)	8	FINITE VALUE	
X_TEXT (3)	8	FINITE VALUE	
NID_PACKET	8	15	STM State Report
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 6: STM → ETCS (packet STM-181)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	181	Specific Data need
L_PACKET	13	COMPUTED	
Q_DATAENTRY	1	0	Need for Specific STM Data Entry
Q_DRIVERINT	1	1	Need for driver intervention during Specific STM Data Entry
NID_PACKET	8	15	STM State report
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

End Conditions	Value	Comments
STM_STATE	PO	
ETCS Mode	unchanged	
ETCS Level	unchanged	

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Train State	unchanged	
Train Data	Valid	
Additional Data	Valid	
National Values	unchanged	
STM Control Function Connection	established	
DMI Connection	unchanged	
Odometry data	unchanged	
Reference Time Data	unchanged	
TIU Connection	unchanged	
BIU Connection	unchanged	
JRU Connection	unchanged	
Other connections	unchanged	
TIU Regenerative Brake Command	unchanged	
TIU Magnetic Shoes Command	unchanged	
TIU Eddy Current Brake Command	unchanged	
TIU Inhibit Passenger Emergency Brake Command	unchanged	
TIU Pantograph Command	unchanged	
TIU Air Tightness Command	unchanged	
TIU Main Switch / Circuit Breaker Command	unchanged	
TIU Traction Cut Off Command	unchanged	
TIU Sleeping Status	unchanged	
TIU Traction Cut Off Status	unchanged	
TIU Direction Controller Position Status	unchanged	
TIU Cab Status (Desk Status)	unchanged	
BIU Status	unchanged	
BIU Emergency Brake Command	unchanged	
BIU Service Brake Command	unchanged	
BIU Emergency Brake Status	unchanged	
BIU Service Brake Status	unchanged	
STM Version Number	Unchanged	
ETCS Version Number	unchanged	
Track Adhesion	unchanged	

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Test case 2.0.0.0.4.0.2.0.2.0.0.0.1.0.0.2

TEST CASE HEADER	
Test case Identification	Application Start Up
	The ETCS mode is SR. The STM Control Function version is compatible with the STM. There is no failure in the opening of the communications. ETCS orders CO State but the STM does not answer in due time.
ETCS Requirements Tested	Subset-026 None
	subset-035 4.2.1.1; 5.2.10.1; 7.6.2.4; 7.6.2.6; 7.4.1.1.6; 7.4.1.1.11; 7.4.1.1.12; 7.4.2.4.1; 5.2.4.4; 7.4.2.4.2; 7.4.1.2.3 A2; C16; 7.4.1.2.2 NP to PO; PO to CO; PO to FA ; 12.1.1.3
STM Requirements Tested	Subset-026 None
	Subset-035 None
Packets Transmitted via FFFIS STM	STM-1; STM-15; STM-2; STM-5; STM-139; STM-136; STM-13; STM-14
Comments and constraints	

Starting Conditions	Value	Comments
STM_STATE	NP	
ETCS Mode	SR	
ETCS Level	1	
Train State	Not Relevant	
Train Data	valid	
Additional Data	Valid	
National Values	Valid	
STM Control Function Connection	Not Established	
DMI Connection	Not Established	
Odometry Data	Not Established	
Reference Time Data	Transmitted	

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TIU Connection		Not Established	
BIU Connection		Not Established	
JRU Connection		Not Established	
Other connections		Not Established	
TIU Regenerative Brake Command		Not Relevant	
TIU Magnetic Shoes Command		Not Relevant	
TIU Eddy Current Brake Command		Not Relevant	
TIU Inhibit Passenger Emergency Brake Command		Not Relevant	
TIU Pantograph Command		Not Relevant	
TIU Air Tightness Command		Not Relevant	
TIU Main Switch / Circuit Breaker Command		Not Relevant	
TIU Traction Cut Off Command		Not Relevant	
TIU Sleeping Status		Not Sleeping	
TIU Traction Cut Off Status		Inactive	
TIU Direction Controller Position Status		Forward	
TIU Cab Status (Desk Status)		Desk A opened	
BIU Status		Inactive	
BIU Emergency Brake Command		Not Relevant	
BIU Service Brake Command		Not Relevant	
BIU Emergency Brake Status		Released	
BIU Service Brake Status		Released	
STM Version Number	Subset-026	1.0	SRS 2.2.2 is 1.Y
	Subset-035	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-058	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-056	3.0.z	Version 2.2.0 is 3.Y.Z
	Subset-057	3.0.z	Version 2.2.0 is 3.Y.Z
ETCS Version Number	Subset-026	1.0	Version 2.2.2 is 1.Y
	Subset-035	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-058	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-056	3.0.z	Version 2.2.0 is 3.Y.Z
	Subset-057	3.0.z	Version 2.2.0 is 3.Y.Z
Track Adhesion		Not Relevant	

ETCS Test Case

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Step	Description/Comments	Input I/F	Input Action	DUT	Output I/F	Output action
1	The communication between the STM Control Function and the STM is opened	Prof	STM Control Connection: STM opens the connection with the STM Control Function and send its version number. Message 1 sent packet STM- 1	ETCS	Prof	STM Control Connection: STM Control Functions sends its version number and checks the version Message 2 STM-1
2		-	Version check is successful. ETCs is allowed to transmit application data	ETCS		
-	STM Control function sends the product identity, available functions, bus addresses of ETCS functions	-	-	ETCS	Prof	STM Control Connection: Message - 3 Sent packet STM-2 ETCS On-Board physical addresses, safety levels and Product Identity
-	STM Control Function sends the current ETCS technical mode	-	-	ETCS	Prof	STM Control Connection: Message - 4 Sent packet STM-5 ETCS status data
-	STM sends the specific data need	Prof	STM Control Connection: Message - 14 Sent packet STM - 181 Specific data need	-	-	-
3	JRU/DRU connections are established Odometer is available	Prof	STM establishes the connections to the JRU and DRU	ETCS	Prof	Functions are available
-	STM reports current state to JRU	Prof	JRU Connection: Message-10 packet STM-15 STM State report	-	-	-
-	STM reports current state to DRU –optional-	Prof	DRU Connection: Message-11 packet STM-15 STM State report	-	-	-
4	TIU function availability	Prof	STM establishes successfully the connection with the TIU	ETCS	Prof	TIU Connection: Message 5 is sent packet STM-139 Train interface inputs status/availability to STM
-	STM reports current state to TIU	Prof	TIU Connection: Message-12 packet STM-15 STM State report	-	-	-
5	BIU function availability	Prof	STM establishes successfully the connection with the BIU	ETCS	Prof	BIU Connection: Message 6 is sent packet STM - 136 Brake Interface

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						emergency and service brake status/availability to STM
-	STM reports current state to BIU	Prof	BIU Connection: Message-13 packet STM-15 STM State report	-	-	-
6	STM requests CO State and ETCS orders CO State T=T0	Prof	STM Control Connection: STM Requests CO state. Message 7 received packet STM-13 State request from STM	ETCS	Prof	STM Control Connection: Message -8 sent packet STM - 14 State order to the STM
7	T=T0+10 seconds STM does not answer in due time and ETCS sends the order to go to FA State	Prof	No answer from the STM	ETCS	Prof	STM Control Connection: Message - 9 sent packet STM-14 State order to the STM

Message 1: STM → ETCS (Packet STM-1)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	1	STM/ETCS function version number
L_PACKET	13	COMPUTED	Packet length
N_058_VERMAJOR	8	3	Application Layer compatibility number, major number: X
N_058_VERMID	8	0	Application Layer compatibility number, middle number: Y
N_058_VERMINOR	8	2	Application Layer compatibility number, minor number: Z
N_035_VERMAJOR	8	3	FFFIS STM Layer compatibility number, major number: X
N_035_VERMID	8	0	FFFIS STM compatibility number, middle number: Y
N_035_VERMINOR	8	3	FFFIS STM compatibility number, minor number: Z
N_SRS_VERMAJOR	8	1	Major version number of SRS: X

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N_SRS_VERMINOR	8	0	Minor version number of SRS: Y
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	Packet length
NID_STMSTATE	4	1	Actual STM State: Power On
Padding bits	COMPUTED	COMPUTED	

Message 2: ETCS → STM (Packet STM-1)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	1	STM/ETCS function version number
L_PACKET	13	COMPUTED	Packet length
N_058_VERMAJOR	8	3	Application Layer compatibility number, major number: X
N_058_VERMID	8	0	Application Layer compatibility number, middle number: Y
N_058_VERMINOR	8	3	Application Layer compatibility number, minor number: Z
N_035_VERMAJOR	8	3	FFFIS STM Layer compatibility number, major number: X
N_035_VERMID	8	0	FFFIS STM compatibility number, middle number: Y
N_035_VERMINOR	8	3	FFFIS STM compatibility number, minor number: Z
N_SRS_VERMAJOR	8	1	Major version number of SRS: X
N_SRS_VERMINOR	8	0	Minor version number of SRS: Y
Padding bits	COMPUTED	COMPUTED	

Message 3: ETCS → STM (packet STM-2)

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VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	2	ETCS On-board physical addresses, safety levels and Product identity
N_ADDR_JRU	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_JRU	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CAB_A	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_A	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CAB_B	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_B	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CAB_A_RED	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_A_RED	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CAB_B_RED	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_B_RED	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_DRU	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_DRU	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CLOCK	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CLOCK	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_ODO	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_ODO	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_EUROSUP	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_EUROSUP	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_TI	7	FINITE VALUE	Depends on ETCS implementation

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Q_ADDR_TI	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_BI	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_BI	2	FINITE VALUE	Depends on ETCS implementation
L_TEXT	8	24	
X_TEXT (1)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (2)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (3)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (4)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (4)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (5)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (6)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (7)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (8)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (9)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (10)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (11)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (12)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (13)	8	FINITE VALUE	Depends on ETCS implementation

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X_TEXT (14)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (15)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (16)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (17)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (18)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (19)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (20)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (21)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (22)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (23)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (24)	8	FINITE VALUE	Depends on ETCS implementation
Padding bits	COMPUTED	COMPUTED	

Message 4 ETCS → STM (packet STM-5)			
VARIABLE	Length	VALUE	COMMENTS

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NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	5	ETCS Status data
M_LEVEL	3	FINITE VALUE	Value for Levels 1 or 2 or 3
M_MODE	4	0	Full supervision
Padding bits	COMPUTED	COMPUTED	

Message 5 ETCS → STM (packet STM-139)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	139	Train interface inputs status/availability to STM
M_TITR_C_STATUS	2	10	No traction cut off
M_TIDIR_STATUS	3	001	Forward
M_TICAB_STATUS	3	001	Desk A opened
Padding bits	COMPUTED	COMPUTED	

Message 6 ETCS → STM (packet STM-136)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	136	Brake interface emergency and service brake status/availability to STM
M_BIEB_STATUS	2	10	Released

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M_BISB_STATUS	2	10	Released
Padding bits	COMPUTED	COMPUTED	

Message 7: STM → ETCS (packet STM-13)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	13	STM State request from STM
L_PACKET	13	COMPUTED	
NID_STMTSTATEREQUEST	1	2	Configuration
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 8 ETCS → STM (packet STM-14)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	14	STM State order to STM
NID_STMSTATEORDER	4	2	Configuration
Padding bits	COMPUTED	COMPUTED	

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Message 9 ETCS → STM (packet STM-14)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	14	STM State order to STM
NID_STMSTATEORDER	4	8	Failure
Padding bits	COMPUTED	COMPUTED	

Message 10 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 11 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	

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NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 12 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 13 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 14: STM → ETCS (packet STM-181)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to

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L_MESSAGE	8	COMPUTED	
NID_PACKET	8	181	Specific STM Data Need
L_PACKET	13	COMPUTED	
Q_DATAENTRY	1	1	Need
Q_DRIVERINT	1	0	No driver interaction
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

End Conditions	Value	Comments
STM_STATE	FA	
ETCS Mode	unchanged	
ETCS Level	unchanged	
Train State	unchanged	
Train Data	Valid	
Additional Data	Valid	
National Values	unchanged	
STM Control Function Connection	established	
DMI Connection	unchanged	
Odometry data	unchanged	
Reference Time Data	unchanged	
TIU Connection	Established	
BIU Connection	Established	
JRU Connection	Established	
Other connections	established	
TIU Regenerative Brake Command	unchanged	
TIU Magnetic Shoes Command	unchanged	

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TIU Eddy Current Brake Command	unchanged	
TIU Inhibit Passenger Emergency Brake Command	unchanged	
TIU Pantograph Command	unchanged	
TIU Air Tightness Command	unchanged	
TIU Main Switch / Circuit Breaker Command	unchanged	
TIU Traction Cut Off Command	unchanged	
TIU Sleeping Status	unchanged	
TIU Traction Cut Off Status	unchanged	
TIU Direction Controller Position Status	unchanged	
TIU Cab Status (Desk Status)	unchanged	
BIU Status	unchanged	
BIU Emergency Brake Command	unchanged	
BIU Service Brake Command	unchanged	
BIU Emergency Brake Status	unchanged	
BIU Service Brake Status	unchanged	
STM Version Number	Unchanged	
ETCS Version Number	unchanged	
Track Adhesion	unchanged	

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Test case 2.0.0.0.6.0.2.0.2.0.0.0.1.0.0.1.1

TEST CASE HEADER	
Test case Identification	Application Start Up
	The ETCS mode is NL or SL. The STM Control Function version is compatible with the STM. There is no failure in the opening of the communications. ETCS orders CO State, the STM switches to CO State and then requests to go to the CS State.
ETCS Requirements Tested	Subset-026 None
	subset-035 4.2.1.1; 5.2.10.1; 7.6.2.4; 7.6.2.6; 7.4.1.1.6; 7.4.1.1.11; 7.4.1.1.12; 7.4.2.4.1; 5.2.4.4; 7.4.2.4.2; 7.4.1.2.3 A2; A4a; 7.4.1.2.2 NP to PO; PO to CO; CO to CS; 12.1.1.3
STM Requirements Tested	Subset-026 None
	subset-035 7.3.2.1 NP to PO; PO to CO; CO to CS; 7.3.2.2.1 1; 2; 4a; 7.3.1.2.3; 14.3.1.4; 7.6.2.3; 7.6.2.7; 7.6.2.9; 7.3.1.2.4; 7.3.1.2.5; 13.1.1.1.10; 13.1.1.1.11; 13.1.1.1.12; 7.3.1.2.6; 7.3.4.4; 7.3.1.2.8; 7.3.1.2.9; 14.4.1.1
Packets Transmitted via FFFIS STM	STM-1; STM-15; STM-2; STM-5; ST;-139; STM-136; STM-13; STM-14; STM-4; STM-181
Comments and constraints	

Starting Conditions	Value	Comments
STM_STATE	NP	
ETCS Mode	NL or SL	
ETCS Level	1	
Train State	Not Relevant	
Train Data	valid	
Additional Data	Valid	
National Values	Valid	

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STM Control Function Connection		Not Established	
DMI Connection		Not Established	
Odometry Data		Not Established	
Reference Time Data		Transmitted	
TIU Connection		Not Established	
BIU Connection		Not Established	
JRU Connection		Not Established	
Other connections		Not Established	
TIU Regenerative Brake Command		Not Relevant	
TIU Magnetic Shoes Command		Not Relevant	
TIU Eddy Current Brake Command		Not Relevant	
TIU Inhibit Passenger Emergency Brake Command		Not Relevant	
TIU Pantograph Command		Not Relevant	
TIU Air Tightness Command		Not Relevant	
TIU Main Switch / Circuit Breaker Command		Not Relevant	
TIU Traction Cut Off Command		Not Relevant	
TIU Sleeping Status		Not Sleeping	
TIU Traction Cut Off Status		Inactive	
TIU Direction Controller Position Status		Forward	
TIU Cab Status (Desk Status)		Desk A opened	
BIU Status		Inactive	
BIU Emergency Brake Command		Not Relevant	
BIU Service Brake Command		Not Relevant	
BIU Emergency Brake Status		Released	
BIU Service Brake Status		Released	
STM Version Number	Subset-026	1.0	SRS 2.2.2 is 1.Y
	Subset-035	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-058	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-056	3.0.z	Version 2.2.0 is 3.Y.Z
	Subset-057	3.0.z	Version 2.2.0 is 3.Y.Z
ETCS Version Number	Subset-026	1.0	Version 2.2.2 is 1.Y
	Subset-035	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-058	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-056	3.0.z	Version 2.2.0 is 3.Y.Z

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	Subset-057	3.0.z	Version 2.2.0 is 3.Y.Z
Track Adhesion		Not Relevant	

ETCS Test Case

Step	Description/Comments	Input I/F	Input Action	DUT	Output I/F	Output action
1	The communication between the STM Control Function and the STM is opened	Prof	STM Control Connection: STM opens the connection with the STM Control Function and send its version number. Message 1 received packet STM- 1	ETCS	Prof	STM Control Connection: STM Control Functions sends its version number and checks the version Message 2 STM-1
2		-	Version check is successful. ETCS is allowed to transmit application data	ETCS		
-	STM Control function sends the product identity, available functions, bus addresses of ETCS functions	-	-	ETCS	Prof	STM Control Connection: Message – 3a Sent packet STM-2 ETCS On-Board physical addresses, safety levels and Product Identity
-	STM Control Function sends the current ETCS technical mode	-	-	ETCS	Prof	Message - 4 Sent packet STM-5 ETCS status data
-	STM sends the specific data need	Prof	STM Control Connection: Message - 12 Sent packet STM - 181 Specific data need	-	-	-
3	JRU/DRU/ connections are established Odometer is available	Prof	STM establishes the connections to the JRU and DRU	ETCS	Prof	Functions are available
-	STM reports current state to JRU	Prof	JRU Connection: Message-14 packet STM-15 STM State report	-	-	-
-	STM reports current state to DRU –optional-	Prof	DRU Connection: Message-15 packet STM-15 STM State report	-	-	-
4	TIU function availability	Prof	STM establishes successfully	ETCS	Prof	TIU Connection: Message 5 is sent packet

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			the connection with the TIU			STM-139 Train interface inputs status/availability to STM
-	STM reports current state to TIU	Prof	TIU Connection: Message-16 packet STM-15 STM State report	-	-	-
5	BIU function availability	Prof	STM establishes successfully the connection with the BIU	ETCS	Prof	BIU connectionMessage 6 is sent packet STM - 136 Brake Interface emergency and service brake status/availability to STM
-	STM reports current state to BIU	Prof	BIU Connection: Message-17 packet STM-15 STM State report	-	-	-
6	STM requests CO State and ETCS orders CO State T=T0	Prof	STM Control Connection: STM Requests CO state. Message 7 received packet STM-13 State request from STM	ETCS	Prof	STM Control Connection: Message -8 sent packet STM - 14 State order to the STM
7	T<10s STM confirms the CO State and sends the state request to CS State	Prof	STM Control Connection: STM confirms CO State and requests for CS State Message – 9 received packet STM – 13 State request from STM	ETCS	Prof	STM Control Connection: Message 10 sent packet STM –14 State order to the STM

STM Test case

Step	Description/Comments	Input I/F	Input Action	DUT	Output I/F	Output action
1	STM takes the initiative to open the communication with the STM control function	Prof	STM is powered on	STM	Prof	STM Control Connection: STM opens the communication session Message - 1 packet STM-1 STM/ETCS function version number
2		Prof	STM Control Connection: STM Control Functions sends its version number and checks the version Message 2 STM-1	STM		Version check is successful. STM is allowed to transmit application data
-	STM sends its type and product identity STM sends its current state	-	-	STM	Prof	STM Control Connection: Message - 11 Sent packet STM - 4 STM parameters data and product identity

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-	STM sends Specific Data need	-	-	STM	Prof	STM Control Connection: Message -12 Sent packet STM - 181 Specific data need
-	STM establishes the connection with another ETCS functions	Prof	STM Control Connection: ETCS bus addresses received Message-3b	STM	Prof	STM establishes the connection with all required ETCS functions
-				STM	Prof	TIU Connection if required: Message-16 packet STM-15 STM State report
-				STM	Prof	BIU Connection if required: Message-17 packet STM-15 STM State report
-				STM	Prof	JRU Connection if required: Message-14 packet STM-15 STM State report
-				STM	Prof	DRU Connection if required: Message-15 packet STM-15 STM State report
-		Prof	TIU Connection if opened: Message 5 is sent packet STM-139 Train interface inputs status/availability to STM	STM	-	
-		Prof	BIU Connection if opened: Message 6 is sent packet STM - 136 Brake Interface emergency and service brake status/availability to STM	STM	-	
	STM requests CO state	Prof	All connections are established	STM	Prof	STM Control Connection: Message 7 sent packet STM-13 State request from STM
	STM switches to CO state and requests CS because ETCS is in NL or SL	Prof	STM Control Connection: Message -8 received packet STM - 14 State order to the STM	STM	Prof	STM Control Connection: Message – 9 sent packet STM – 13 State request from STM
	STM switches to CS state	Prof	STM Control Connection: Message 10 received packet STM –14 State order to the STM	STM	Prof	STM Control Connection: Message 13 sent packet STM-15 STM state report

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Message 1: STM → ETCS (Packet STM-1)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	1	STM/ETCS function version number
L_PACKET	13	COMPUTED	Packet length
N_058_VERMAJOR	8	3	Application Layer compatibility number, major number: X
N_058_VERMID	8	0	Application Layer compatibility number, middle number: Y
N_058_VERMINOR	8	2	Application Layer compatibility number, minor number: Z
N_035_VERMAJOR	8	3	FFFIS STM Layer compatibility number, major number: X
N_035_VERMID	8	0	FFFIS STM compatibility number, middle number: Y
N_035_VERMINOR	8	3	FFFIS STM compatibility number, minor number: Z
N_SRS_VERMAJOR	8	1	Major version number of SRS: X
N_SRS_VERMINOR	8	0	Minor version number of SRS: Y
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	Packet length
NID_STMSTATE	4	1	Actual STM State: Power On
Padding bits	COMPUTED	COMPUTED	

Message 2: ETCS → STM (Packet STM-1)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	

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NID_PACKET	8	1	STM/ETCS function version number
L_PACKET	13	COMPUTED	Packet length
N_058_VERMAJOR	8	3	Application Layer compatibility number, major number: X
N_058_VERMID	8	0	Application Layer compatibility number, middle number: Y
N_058_VERMINOR	8	3	Application Layer compatibility number, minor number: Z
N_035_VERMAJOR	8	3	FFFIS STM Layer compatibility number, major number: X
N_035_VERMID	8	0	FFFIS STM compatibility number, middle number: Y
N_035_VERMINOR	8	3	FFFIS STM compatibility number, minor number: Z
N_SRS_VERMAJOR	8	1	Major version number of SRS: X
N_SRS_VERMINOR	8	0	Minor version number of SRS: Y
Padding bits	COMPUTED	COMPUTED	

Message 3a: ETCS → STM (packet STM-2)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	2	ETCS On-board physical addresses, safety levels and Product identity
N_ADDR_JRU	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_JRU	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CAB_A	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_A	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CAB_B	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_B	2	FINITE VALUE	Depends on ETCS implementation

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N_ADDR_CAB_A_RED	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_A_RED	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CAB_B_RED	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_B_RED	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_DRU	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_DRU	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CLOCK	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CLOCK	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_ODO	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_ODO	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_EUROSUP	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_EUROSUP	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_TI	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_TI	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_BI	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_BI	2	FINITE VALUE	Depends on ETCS implementation
L_TEXT	8	24	
X_TEXT (1)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (2)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (3)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (4)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (5)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (6)	8	FINITE VALUE	Depends on ETCS implementation

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X_TEXT (7)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (8)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (9)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (10)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (11)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (12)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (13)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (14)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (15)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (16)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (17)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (18)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (19)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (20)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (21)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (22)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (23)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (24)	8	FINITE VALUE	Depends on ETCS implementation
Padding bits	COMPUTED	COMPUTED	

Message 3b: ETCS → STM (packet STM-2)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to

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L_MESSAGE	8	COMPUTED	
NID_PACKET	8	2	ETCS On-board physical addresses, safety levels and Product identity
N_ADDR_JRU	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_JRU	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CAB_A	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CAB_A	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CAB_B	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CAB_B	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CAB_A_RED	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CAB_A_RED	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CAB_B_RED	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CAB_B_RED	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_DRU	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_DRU	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CLOCK	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CLOCK	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_ODO	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_ODO	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_EUROSUP	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_EUROSUP	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_TI	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_TI	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_BI	7	FINITE VALUE	Depends on test equipment implementation

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Q_ADDR_BI	2	FINITE VALUE	Depends on test equipment implementation
L_TEXT	8	24	
X_TEXT (1)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (2)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (3)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (4)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (5)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (6)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (7)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (8)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (9)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (10)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (11)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (12)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (13)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (14)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (15)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (16)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (17)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (18)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (19)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (20)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (21)	8	FINITE VALUE	Depends on test equipment implementation

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X_TEXT (22)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (23)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (24)	8	FINITE VALUE	Depends on test equipment implementation
Padding bits	COMPUTED	COMPUTED	

Message 4 ETCS → STM (packet STM-5)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	5	ETCS Status data
M_LEVEL	3	FINITE VALUE	Value for Levels 1 or 2 or 3
M_MODE	4	11	Non Leading
Padding bits	COMPUTED	COMPUTED	

Message 5 ETCS → STM (packet STM-139)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	139	Train interface inputs status/availability to STM
M_TITR_C_STATUS	2	10	No traction cut off
M_TIDIR_STATUS	3	001	Forward
M_TICAB_STATUS	3	001	Desk A opened

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Padding bits	COMPUTED	COMPUTED	

Message 6 ETCS → STM (packet STM-136)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	136	Brake interface emergency and service brake status/availability to STM
M_BIEB_STATUS	2	10	Released
M_BISB_STATUS	2	10	Released
Padding bits	COMPUTED	COMPUTED	

Message 7: STM → ETCS (packet STM-13)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	13	STM State request from STM
L_PACKET	13	COMPUTED	
NID_STMTSTATEREQUEST	1	2	Configuration
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

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Message 8 ETCS → STM (packet STM-14)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	14	STM State order to STM
NID_STMSTATEORDER	4	2	Configuration
Padding bits	COMPUTED	COMPUTED	

Message 9 STM → ETCS (packet STM-13)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	13	STM State request from STM
L_PACKET	13	COMPUTED	
NID_STMTSTATEREQUEST	4	4	Cold StandBy
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	2	Configuration
Padding bits	COMPUTED	COMPUTED	

Message 10 ETCS → STM (packet STM-14)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to

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L_MESSAGE	8	COMPUTED	
NID_PACKET	8	14	STM State order to STM
NID_STMSTATEORDER	4	4	Unconditional Cold Standby
Padding bits	COMPUTED	COMPUTED	

Message 11: STM → ETCS (packet STM-4)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	4	STM parameters data and product identity
L_PACKET	13	COMPUTED	
NID_STMTYPE	1	1	SN
L_TEXT	8	24	
X_TEXT(1)	8	FINITE VALUE	
X_TEXT(2)	8	FINITE VALUE	
X_TEXT(3)	8	FINITE VALUE	
X_TEXT(4)	8	FINITE VALUE	
X_TEXT(5)	8	FINITE VALUE	
X_TEXT(6)	8	FINITE VALUE	
X_TEXT(7)	8	FINITE VALUE	
X_TEXT(8)	8	FINITE VALUE	
X_TEXT(9)	8	FINITE VALUE	
X_TEXT(10)	8	FINITE VALUE	
X_TEXT(11)	8	FINITE VALUE	

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X_TEXT(12)	8	FINITE VALUE	
X_TEXT(13)	8	FINITE VALUE	
X_TEXT(14)	8	FINITE VALUE	
X_TEXT(15)	8	FINITE VALUE	
X_TEXT(16)	8	FINITE VALUE	
X_TEXT(17)	8	FINITE VALUE	
X_TEXT(18)	8	FINITE VALUE	
X_TEXT(19)	8	FINITE VALUE	
X_TEXT(20)	8	FINITE VALUE	
X_TEXT(21)	8	FINITE VALUE	
X_TEXT(22)	8	FINITE VALUE	
X_TEXT(23)	8	FINITE VALUE	
X_TEXT(24)	8	FINITE VALUE	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 12: STM → ETCS (packet STM-181)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	181	Specific STM Data Need
L_PACKET	13	COMPUTED	

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Q_DATAENTRY	1	0	No need
Q_DRIVERINT	1	0	No driver interaction
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 13: STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	4	Cold StandBy
Padding bits	COMPUTED	COMPUTED	

Message 14 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

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Message 15 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 16 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 17 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM

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L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

End Conditions	Value	Comments
STM_STATE	CS	
ETCS Mode	unchanged	
ETCS Level	unchanged	
Train State	unchanged	
Train Data	Valid	
Additional Data	Valid	
National Values	unchanged	
STM Control Function Connection	established	
DMI Connection	unchanged	
Odometry data	unchanged	
Reference Time Data	unchanged	
TIU Connection	Established	
BIU Connection	Established	
JRU Connection	Established	
Other connections	established	
TIU Regenerative Brake Command	unchanged	
TIU Magnetic Shoes Command	unchanged	
TIU Eddy Current Brake Command	unchanged	
TIU Inhibit Passenger Emergency Brake Command	unchanged	
TIU Pantograph Command	unchanged	
TIU Air Tightness Command	unchanged	
TIU Main Switch / Circuit Breaker Command	unchanged	
TIU Traction Cut Off Command	unchanged	
TIU Sleeping Status	unchanged	
TIU Traction Cut Off Status	unchanged	

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TIU Direction Controller Position Status	unchanged	
TIU Cab Status (Desk Status)	unchanged	
BIU Status	unchanged	
BIU Emergency Brake Command	unchanged	
BIU Service Brake Command	unchanged	
BIU Emergency Brake Status	unchanged	
BIU Service Brake Status	unchanged	
STM Version Number		
ETCS Version Number		
Track Adhesion	unchanged	

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Test case 2.0.0.0.7.0.2.0.2.0.0.0.1.0.0.1.1

Is the same test case as Test case 2.0.0.0.6.0.2.0.2.0.0.0.1.0.0.1.1

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Test case 2.0.0.0.1.0.2.0.2.0.0.0.1.0.0.1.2

TEST CASE HEADER	
Test case Identification	Application Start Up
	The ETCS mode is SB. The STM Control Function version is compatible with the STM. There is no failure in the opening of the communications. ETCS orders CO State, the STM switches to CO State. The following steps are tested in the Start of mission Functional identity see subset-074 – 2 – 1.
ETCS Requirements Tested	Subset-026 None
	subset-035 4.2.1.1; 5.2.10.1; 7.6.2.4; 7.6.2.6; 7.4.1.1.6; 7.4.1.1.11; 7.4.1.1.12; 7.4.2.4.1; 5.2.4.4; 7.4.2.4.2; 7.4.1.2.3 A2; 7.4.1.2.2 NP to PO; PO to CO; 12.1.1.3
STM Requirements Tested	Subset-026 None
	subset-035 7.3.2.1 NP to PO; PO to CO; 7.3.2.2.1 1; 2; 7.3.1.2.3; 14.3.1.4; 7.6.2.3; 7.6.2.7; 7.6.2.9; 7.3.1.2.4; 7.3.1.2.5; 13.1.1.1.10; 13.1.1.1.11; 13.1.1.1.12; 7.3.1.2.6; 7.3.4.4; 7.3.1.2.8; 7.3.1.2.9; 14.4.1.1
Packets Transmitted via FFFIS STM	STM-1; STM-15: STM-2;STM-5; STM-139; STM-136; STM-13; STM-14; STM-4; STM-181
Comments and constraints	

Starting Conditions	Value	Comments
STM_STATE	NP	
ETCS Mode	SB	
ETCS Level	1	
Train State	Not Relevant	
Train Data	valid	
Additional Data	Valid	
National Values	Valid	
STM Control Function Connection	Not Established	

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DMI Connection		Not Established	
Odometry Data		Not Established	
Reference Time Data		Transmitted	
TIU Connection		Not Established	
BIU Connection		Not Established	
JRU Connection		Not Established	
Other connections		Not Established	
TIU Regenerative Brake Command		Not Relevant	
TIU Magnetic Shoes Command		Not Relevant	
TIU Eddy Current Brake Command		Not Relevant	
TIU Inhibit Passenger Emergency Brake Command		Not Relevant	
TIU Pantograph Command		Not Relevant	
TIU Air Tightness Command		Not Relevant	
TIU Main Switch / Circuit Breaker Command		Not Relevant	
TIU Traction Cut Off Command		Not Relevant	
TIU Sleeping Status		Not Sleeping	
TIU Traction Cut Off Status		Inactive	
TIU Direction Controller Position Status		Forward	
TIU Cab Status (Desk Status)		Desk A opened	
BIU Status		Inactive	
BIU Emergency Brake Command		Not Relevant	
BIU Service Brake Command		Not Relevant	
BIU Emergency Brake Status		Released	
BIU Service Brake Status		Released	
STM Version Number	Subset-026	1.0	SRS 2.2.2 is 1.Y
	Subset-035	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-058	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-056	3.0.z	Version 2.2.0 is 3.Y.Z
	Subset-057	3.0.z	Version 2.2.0 is 3.Y.Z
ETCS Version Number	Subset-026	1.0	Version 2.2.2 is 1.Y
	Subset-035	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-058	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-056	3.0.z	Version 2.2.0 is 3.Y.Z
	Subset-057	3.0.z	Version 2.2.0 is 3.Y.Z

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Track Adhesion	Not Relevant	

ETCS Test Case

Step	Description/Comments	Input I/F	Input Action	DUT	Output I/F	Output action
1	The communication between the STM Control Function and the STM is opened	Prof	STM Control Connection: STM opens the connection with the STM Control Function and send its version number. Message 1 received packet STM- 1	ETCS	Prof	STM Control Connection: STM Control Functions sends its version number and checks the version Message 2 STM-1
2		-	Version check is successful. ETCS is allowed to transmit application data	ETCS		
-	STM Control function sends the product identity, available functions, bus addresses of ETCS functions	-	-	ETCS	Prof	STM Control Connection: Message – 3a Sent packet STM-2 ETCS On-Board physical addresses, safety levels and Product Identity
-	STM Control Function sends the current ETCS technical mode	-	-	ETCS	Prof	STM Control Connection: Message - 4 Sent packet STM-5 ETCS status data
-	STM sends the specific data need	Prof	STM Control Connection: Message - 12 Sent packet STM - 181 Specific data need	-	-	-
3	JRU/DRU/ connections are established Odometer is available	Prof	STM establishes the connections to the JRU and DRU	ETCS	Prof	Functions are available
-	STM reports current state to JRU	Prof	JRU Connection: Message-13 packet STM-15 STM State report	-	-	-
-	STM reports current state to DRU – optional-	Prof	DRU Connection: Message-14 packet STM-15 STM State report	-	-	-
4	TIU function availability	Prof	STM establishes successfully the connection with the TIU	ETCS	Prof	TIU Connection: Message 5 is sent packet STM-139 Train interface inputs status/availability to STM

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-	STM reports current state to TIU	Prof	TIU Connection: Message-15 packet STM-15 STM State report	-	-	-
5	BIU function availability	Prof	STM establishes successfully the connection with the BIU	ETCS	Prof	BIU Connection: Message 6 is sent packet STM - 136 Brake Interface emergency and service brake status/availability to STM
-	STM reports current state to BIU	Prof	BIU Connection: Message-16 packet STM-15 STM State report	-	-	-
6	STM requests CO State and ETCS orders CO State T=T0	Prof	STM Control Connection: STM Requests CO state. Message 7 received packet STM-13 State request from STM	ETCS	Prof	STM Control Connection: Message -8 sent packet STM - 14 State order to the STM
7	T<10s STM confirms the CO State	Prof	STM Control Connection: STM confirms CO State Message – 9 received packet STM – 15 State report from STM	ETCS	Prof	STEPS in SUBSET-074 – 2 – 1

STM Test case

Step	Description/Comments	Input I/F	Input Action	DUT	Output I/F	Output action
1	STM takes the initiative to open the communication with the STM control function	Prof	STM is powered on	STM	Prof	STM Control Connection: STM opens the communication session Message - 1 packet STM-1 STM/ETCS function version number
2		Prof	STM Control Connection: STM Control Functions sends its version number and checks the version Message 2 STM-1	STM		Version check is successful. STM is allowed to transmit application data
-	STM sends its type and product identity STM sends its current state	-	-	STM	Prof	STM Control Connection: Message - 11 Sent packet STM - 4 STM parameters data and product identity
-	STM sends Specific Data need	-	-	STM	Prof	STM Control Connection: Message - 12 Sent packet STM - 181 Specific data need

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-	STM establishes the connection with another ETCS functions	Prof	STM Control Connection: ETCS bus addresses received Message-3b	STM	Prof	STM establishes the connection with all required ETCS functions
-				STM	Prof	TIU Connection if required: Message-15 packet STM-15 STM State report
-				STM	Prof	BIU Connection if required: Message-16 packet STM-15 STM State report
-				STM	Prof	JRU Connection if required: Message-13 packet STM-15 STM State report
-				STM	Prof	DRU Connection if required: Message-14 packet STM-15 STM State report
-		Prof	TIU Connection if opened: Message 5 is sent packet STM-139 Train interface inputs status/availability to STM	STM	-	
-		Prof	BIU Connection if opened: Message 6 is sent packet STM - 136 Brake Interface emergency and service brake status/availability to STM	STM	-	
	STM requests CO state	Prof	All connections are established	STM	Prof	STM Control Connection: Message 7 received packet STM-13 State request from STM
	STM switches to CO state	Prof	STM Control Connection: Message -8 received packet STM - 14 State order to the STM	STM	Prof	STM Control Connection: Message – 9 sent packet STM – 15 State report from STM
-		Prof	TIU Connection if opened: Message 5 is sent packet STM-139 Train interface inputs status/availability to STM	STM	-	
-		Prof	BIU Connection if opened: Message 6 is sent packet STM - 136 Brake Interface emergency and service brake status/availability to STM	STM	-	

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Message 1: STM → ETCS (Packet STM-1)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	1	STM/ETCS function version number
L_PACKET	13	COMPUTED	Packet length
N_058_VERMAJOR	8	3	Application Layer compatibility number, major number: X
N_058_VERMID	8	0	Application Layer compatibility number, middle number: Y
N_058_VERMINOR	8	2	Application Layer compatibility number, minor number: Z
N_035_VERMAJOR	8	3	FFFIS STM Layer compatibility number, major number: X
N_035_VERMID	8	0	FFFIS STM compatibility number, middle number: Y
N_035_VERMINOR	8	3	FFFIS STM compatibility number, minor number: Z
N_SRS_VERMAJOR	8	1	Major version number of SRS: X
N_SRS_VERMINOR	8	0	Minor version number of SRS: Y
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	Packet length
NID_STMSTATE	4	1	Actual STM State: Power On
Padding bits	COMPUTED	COMPUTED	

Message 2: ETCS → STM (Packet STM-1)			
VARIABLE	Length	VALUE	COMMENTS

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NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	1	STM/ETCS function version number
L_PACKET	13	COMPUTED	Packet length
N_058_VERMAJOR	8	3	Application Layer compatibility number, major number: X
N_058_VERMID	8	0	Application Layer compatibility number, middle number: Y
N_058_VERMINOR	8	3	Application Layer compatibility number, minor number: Z
N_035_VERMAJOR	8	3	FFFIS STM Layer compatibility number, major number: X
N_035_VERMID	8	0	FFFIS STM compatibility number, middle number: Y
N_035_VERMINOR	8	3	FFFIS STM compatibility number, minor number: Z
N_SRS_VERMAJOR	8	1	Major version number of SRS: X
N_SRS_VERMINOR	8	0	Minor version number of SRS: Y
Padding bits	COMPUTED	COMPUTED	

Message 3a: ETCS → STM (packet STM-2)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	2	ETCS On-board physical addresses, safety levels and Product identity
N_ADDR_JRU	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_JRU	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CAB_A	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_A	2	FINITE VALUE	Depends on ETCS implementation

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N_ADDR_CAB_B	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_B	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CAB_A_RED	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_A_RED	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CAB_B_RED	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_B_RED	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_DRU	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_DRU	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CLOCK	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CLOCK	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_ODO	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_ODO	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_EUROSUP	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_EUROSUP	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_TI	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_TI	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_BI	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_BI	2	FINITE VALUE	Depends on ETCS implementation
L_TEXT	8	24	
X_TEXT (1)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (2)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (3)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (4)	8	FINITE VALUE	Depends on ETCS implementation

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X_TEXT (5)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (6)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (7)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (8)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (9)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (10)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (11)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (12)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (13)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (14)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (15)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (16)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (17)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (18)	8	FINITE VALUE	Depends on ETCS implementation

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X_TEXT (19)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (20)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (21)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (22)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (23)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (24)	8	FINITE VALUE	Depends on ETCS implementation
Padding bits	COMPUTED	COMPUTED	

Message 3b: ETCS → STM (packet STM-2)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	2	ETCS On-board physical addresses, safety levels and Product identity
N_ADDR_JRU	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_JRU	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CAB_A	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CAB_A	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CAB_B	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CAB_B	2	FINITE VALUE	Depends on test equipment implementation

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N_ADDR_CAB_A_RED	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CAB_A_RED	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CAB_B_RED	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CAB_B_RED	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_DRU	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_DRU	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CLOCK	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CLOCK	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_ODO	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_ODO	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_EUROSUP	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_EUROSUP	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_TI	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_TI	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_BI	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_BI	2	FINITE VALUE	Depends on test equipment implementation
L_TEXT	8	24	
X_TEXT (1)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (2)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (3)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (4)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (5)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (6)	8	FINITE VALUE	Depends on test equipment implementation

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X_TEXT (7)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (8)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (9)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (10)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (11)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (12)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (13)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (14)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (15)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (16)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (17)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (18)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (19)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (20)	8	FINITE VALUE	Depends on test equipment implementation

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X_TEXT (21)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (22)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (23)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (24)	8	FINITE VALUE	Depends on test equipment implementation
Padding bits	COMPUTED	COMPUTED	Depends on test equipment implementation

Message 4 ETCS → STM (packet STM-5)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	5	ETCS Status data
M_LEVEL	3	FINITE VALUE	Value for Levels 1 or 2 or 3
M_MODE	4	6	Stand By
Padding bits	COMPUTED	COMPUTED	

Message 5 ETCS → STM (packet STM-139)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	

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NID_PACKET	8	139	Train interface inputs status/availability to STM
M_TITR_C_STATUS	2	10	No traction cut off
M_TIDIR_STATUS	3	001	Forward
M_TICAB_STATUS	3	001	Desk A opened
Padding bits	COMPUTED	COMPUTED	

Message 6 ETCS → STM (packet STM-136)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	136	Brake interface emergency and service brake status/availability to STM
M_BIEB_STATUS	2	10	Released
M_BISB_STATUS	2	10	Released
Padding bits	COMPUTED	COMPUTED	

Message 7: STM → ETCS (packet STM-13)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	13	STM State request from STM
L_PACKET	13	COMPUTED	
NID_STMTSTATEREQUEST	1	2	Configuration
NID_PACKET	8	15	State report from STM

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L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 8 ETCS → STM (packet STM-14)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	14	STM State order to STM
NID_STMSTATEORDER	4	2	Configuration
Padding bits	COMPUTED	COMPUTED	

Message 9 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	2	Configuration
Padding bits	COMPUTED	COMPUTED	

Message 11: STM → ETCS (packet STM-4)

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VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	4	STM parameters data and product identity
L_PACKET	13	COMPUTED	
NID_STMTYPE	1	1	SN
L_TEXT	8	24	
X_TEXT(1)	8	FINITE VALUE	
X_TEXT(2)	8	FINITE VALUE	
X_TEXT(3)	8	FINITE VALUE	
X_TEXT(4)	8	FINITE VALUE	
X_TEXT(5)	8	FINITE VALUE	
X_TEXT(6)	8	FINITE VALUE	
X_TEXT(7)	8	FINITE VALUE	
X_TEXT(8)	8	FINITE VALUE	
X_TEXT(9)	8	FINITE VALUE	
X_TEXT(10)	8	FINITE VALUE	
X_TEXT(11)	8	FINITE VALUE	
X_TEXT(12)	8	FINITE VALUE	
X_TEXT(13)	8	FINITE VALUE	
X_TEXT(14)	8	FINITE VALUE	
X_TEXT(15)	8	FINITE VALUE	
X_TEXT(16)	8	FINITE VALUE	

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X_TEXT(17)	8	FINITE VALUE	
X_TEXT(18)	8	FINITE VALUE	
X_TEXT(19)	8	FINITE VALUE	
X_TEXT(20)	8	FINITE VALUE	
X_TEXT(21)	8	FINITE VALUE	
X_TEXT(22)	8	FINITE VALUE	
X_TEXT(23)	8	FINITE VALUE	
X_TEXT(24)	8	FINITE VALUE	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 12: STM → ETCS (packet STM-181)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	181	Specific STM Data Need
L_PACKET	13	COMPUTED	
Q_DATAENTRY	1	0	No need
Q_DRIVERINT	1	0	No driver interaction
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On

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Padding bits	COMPUTED	COMPUTED	

Message 13 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 14 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 15 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	

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NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 16 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

End Conditions	Value	Comments
STM_STATE	CS	
ETCS Mode	unchanged	
ETCS Level	unchanged	
Train State	unchanged	
Train Data	Valid	
Additional Data	Valid	
National Values	unchanged	
STM Control Function Connection	established	
DMI Connection	unchanged	
Odometry data	unchanged	
Reference Time Data	unchanged	
TIU Connection	Established	

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BIU Connection	Established	
JRU Connection	Established	
Other connections	Established	
TIU Regenerative Brake Command	unchanged	
TIU Magnetic Shoes Command	unchanged	
TIU Eddy Current Brake Command	unchanged	
TIU Inhibit Passenger Emergency Brake Command	unchanged	
TIU Pantograph Command	unchanged	
TIU Air Tightness Command	unchanged	
TIU Main Switch / Circuit Breaker Command	unchanged	
TIU Traction Cut Off Command	unchanged	
TIU Sleeping Status	unchanged	
TIU Traction Cut Off Status	unchanged	
TIU Direction Controller Position Status	unchanged	
TIU Cab Status (Desk Status)	unchanged	
BIU Status	unchanged	
BIU Emergency Brake Command	unchanged	
BIU Service Brake Command	unchanged	
BIU Emergency Brake Status	unchanged	
BIU Service Brake Status	unchanged	
STM Version Number	unchanged	
ETCS Version Number	unchanged	
Track Adhesion	unchanged	

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Test case 2.0.0.0.9.0.2.0.2.0.0.0.1.0.0.1.3.0.2

TEST CASE HEADER	
Test case Identification	Application Start Up
	The ETCS mode is TR. The STM Control Function version is compatible with the STM. There is no failure in the opening of the communications. ETCS orders CO State, the STM switches to CO State. The STM requires Specific STM DE and is followed by FI 10a
ETCS Requirements Tested	Subset-026 None
	subset-035 4.2.1.1; 5.2.10.1; 7.6.2.4; 7.6.2.6; 7.4.1.1.6; 7.4.1.1.11; 7.4.1.1.12; 7.4.2.4.1; 5.2.4.4; 7.4.2.4.2; 7.4.1.2.3 A2; 7.4.1.2.2 NP to PO; PO to CO; 7.3.1.3.2.1; 5.2.11.4; 5.2.11.3; 5.2.11.2; 12.1.1.3
STM Requirements Tested	Subset-026 None
	subset-035 7.3.2.1 NP to PO; PO to CO; 7.3.2.2.1 1; 2; 7.3.1.2.3; 14.3.1.4; 7.6.2.3; 7.6.2.7; 7.6.2.9; 7.3.1.2.4; 7.3.1.2.5; 13.1.1.1.10; 13.1.1.1.11; 13.1.1.1.12; 7.3.1.2.6; 7.3.4.4; 7.3.1.2.8; 7.3.1.2.9; 7.3.1.3.5; 14.4.1.1
Packets Transmitted via FFFIS STM	STM-1; STM-15;; STM-2; STM-5; STM-139; STM-136; STM_13; SSTM-14; STM-4; STM-181; STM-141; STM-143; STM-9; STM-175; STM-176; STM-177; STM-178
Comments and constraints	The test case ends when the STM requests DE state to the ETCS. Therefore, one of the test cases of the functional identity 10 a will follow this one.

Starting Conditions	Value	Comments
STM_STATE	NP	
ETCS Mode	TR	
ETCS Level	1	
Train State	Not Relevant	
Train Data	valid	
Additional Data	Valid	

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National Values		Valid	
STM Control Function Connection		Not Established	
DMI Connection		Not Established	
Odometry Data		Not Established	
Reference Time Data		Transmitted	
TIU Connection		Not Established	
BIU Connection		Not Established	
JRU Connection		Not Established	
Other connections		Not Established	
TIU Regenerative Brake Command		Not Relevant	
TIU Magnetic Shoes Command		Not Relevant	
TIU Eddy Current Brake Command		Not Relevant	
TIU Inhibit Passenger Emergency Brake Command		Not Relevant	
TIU Pantograph Command		Not Relevant	
TIU Air Tightness Command		Not Relevant	
TIU Main Switch / Circuit Breaker Command		Not Relevant	
TIU Traction Cut Off Command		Not Relevant	
TIU Sleeping Status		Not Sleeping	
TIU Traction Cut Off Status		Inactive	
TIU Direction Controller Position Status		Forward	
TIU Cab Status (Desk Status)		Desk A opened	
BIU Status		Inactive	
BIU Emergency Brake Command		Apply	
BIU Service Brake Command		Apply	
BIU Emergency Brake Status		Apply	
BIU Service Brake Status		Apply	
STM Version Number	Subset-026	1.0	SRS 2.2.2 is 1.Y
	Subset-035	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-058	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-056	3.0.z	Version 2.2.0 is 3.Y.Z
	Subset-057	3.0.z	Version 2.2.0 is 3.Y.Z
ETCS Version Number	Subset-026	1.0	Version 2.2.2 is 1.Y
	Subset-035	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-058	3.0.z	Version 2.1.1 is 3.Y.Z

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	Subset-056	3.0.z	Version 2.2.0 is 3.Y.Z
	Subset-057	3.0.z	Version 2.2.0 is 3.Y.Z
Track Adhesion		Not Relevant	

ETCS Test Case

Step	Description/Comments	Input I/F	Input Action	DUT	Output I/F	Output action
1	The communication between the STM Control Function and the STM is opened	Prof	STM Control Connection: STM opens the connection with the STM Control Function and send its version number. Message 1 received packet STM- 1	ETCS	Prof	STM Control Connection: STM Control Functions sends its version number and checks the version Message 2 STM-1
2		-	Version check is successful. ETCS is allowed to transmit application data	ETCS		
-	STM Control function sends the product identity, available functions, bus addresses of ETCS functions	-	-	ETCS	Prof	STM Control Connection: Message – 3a Sent packet STM-2 ETCS On-Board physical addresses, safety levels and Product Identity
-	STM Control Function sends the current ETCS technical mode	-	-	ETCS	Prof	STM Control Connection: Message - 4 Sent packet STM-5 ETCS status data
-	STM sends the specific data need	Prof	STM Control Connection: Message - 16 Sent packet STM - 181 Specific data need	-	-	-
3	JRU/DRU/ connections are established Odometer is available	Prof	STM establishes the connections to the JRU and DRU	ETCS	Prof	Functions are available
-	STM reports current state to JRU	Prof	JRU Connection: Message-18 packet STM-15 STM State report	-	-	-
-	STM reports current state to DRU – optional-	Prof	DRU Connection: Message-19 packet STM-15 STM State report	-	-	-

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4	TIU function availability	Prof	STM establishes successfully the connection with the TIU	ETCS	Prof	TIU Connection: Message 5 is sent packet STM-139 Train interface inputs status/availability to STM
-	STM reports current state to TIU	Prof	TIU Connection: Message-20 packet STM-15 STM State report	-	-	-
5	BIU function availability	Prof	STM establishes successfully the connection with the BIU	ETCS	Prof	BIU Connection: Message 6 is sent packet STM - 136 Brake Interface emergency and service brake status/availability to STM
-	STM reports current state to BIU	Prof	BIU Connection: Message-21 packet STM-15 STM State report	-	-	-
6	STM requests CO State and ETCS orders CO State T=T0	Prof	STM Control Connection: STM Requests CO state. Message 7 received packet STM-13 State request from STM	ETCS	Prof	STM Control Connection: Message -8 sent packet STM - 14 State order to the STM
7	T<10s STM confirms the CO State	Prof	STM Control Connection: STM confirms CO State Message – 9 received packet STM – 15 State report from STM	ETCS	Prof	
	ETCS transmit ETCS data to STM	-	-	ETCS	Prof	STM Control Connection: Message 10 sent packets STM-175 train data; STM-176 Train data Additional “braking characteristic” to STM; STM-177 Additional data values and date/time to STM; STM-178 National Values to STM
	ETCS transmit; Odometer parameters Status / Availability of the train interface FFFIS STM signals Status / Availability of the Service brake command Status / Availability of the Emergency and Service Brake command	-	-	ETCS	Prof	Odometry Connection: Message 11 sent packets STM-9 Odometer parameters to STM (this packet is multicast); Message 12 TIU Connection STM-141 Train interface command configuration to STM; STM-139 Train interface inputs status/Availability to STM;Message 13 BIU Connection STM-136 Brake

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	Maximum time delay for the ETCS to process the STM Emergency and the STM Service Brake commands					interface emergency and service brake status/Availability to STM;STM-143 Brake Train Interface emergency and Service brake parameters to STM
8	STM requests DE	Prof	STM requests DE. Message 14 received packet STM 13 State Request from STM	ETCS	-	See Subset-074-2-10 Starting conditions A)

STM Test case (This test case is only applicable for STMs which require STM Specific data.)

Step	Description/Comments	Input I/F	Input Action	DUT	Output I/F	Output action
1	STM takes the initiative to open the communication with the STM control function	Prof	STM is powered on	STM	Prof	STM opens the STM control connection STM Control Connection: Message - 1 packet STM-1 STM/ETCS function version number
2		Prof	STM Control Connection: STM Control Functions sends its version number and checks the version Message 2 STM-1	STM		Version check is successful. STM is allowed to transmit application data
-	STM sends its type and product identity STM sends its current state	-	-	STM	Prof	STM Control Connection: Message - 15 Sent packet STM - 4 STM parameters data and product identity
-	STM sends Specific Data need	-	-	STM	Prof	STM Control Connection: Message - 16 Sent packet STM - 181 Specific data need
-	STM establishes the connection with another ETCS functions	Prof	STM Control Connection: ETCS bus addresses received Message-3b	STM	Prof	STM establishes the connection with all required ETCS functions
-				STM	Prof	TIU Connection if required: Message-20 packet STM-15 STM State report
-				STM	Prof	BIU Connection if required: Message-21 packet STM-15 STM State report
-				STM	Prof	JRU Connection if required: Message-18 packet STM-15 STM State report

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-				STM	Prof	DRU Connection if required: Message-19 packet STM-15 STM State report
-		Prof	TIU Connection if opened: Message 5 is sent packet STM-139 Train interface inputs status/availability to STM	STM	-	
-		Prof	BIU Connection if opened: Message 6 is sent packet STM - 136 Brake Interface emergency and service brake status/availability to STM	STM	-	
3	STM requests CO state			STM	Prof	STM Control Connection: Message 7 received packet STM-13 State request from STM
4	STM switches to CO state	Prof	STM Control Connection: Message -8 received packet STM - 14 State order to the STM	STM	Prof	STM Control Connection: Message – 9 sent packet STM – 15 State report from STM
5	When all data is received, it requests DE state	Prof	STM Control Connection: Messages 10 sent packets STM-175 train data; STM-176 Train data Additional “braking characteristic” to STM; STM-177 Additional data values and date/time to STM; STM-178 National Values to STM, 11 sent packets STM-9 Odometer parameters to STM, 12 TIU Connection STM-141 Train interface command configuration to STM; STM-139 Train interface inputs status/Availability to STM and 13 BIU Connection STM-136 Brake interface emergency and service brake status/Availability	STM	Prof	STM Control Connection: Message 17 sent packet STM-13 State request from STM

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			to STM;STM-143 Brake Train Interface emergency and Service brake parameters to STM			

Message 1: STM → ETCS (Packet STM-1)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	1	STM/ETCS function version number
L_PACKET	13	COMPUTED	Packet length
N_058_VERMAJOR	8	3	Application Layer compatibility number, major number: X
N_058_VERMID	8	0	Application Layer compatibility number, middle number: Y
N_058_VERMINOR	8	2	Application Layer compatibility number, minor number: Z
N_035_VERMAJOR	8	3	FFFIS STM Layer compatibility number, major number: X
N_035_VERMID	8	0	FFFIS STM compatibility number, middle number: Y
N_035_VERMINOR	8	3	FFFIS STM compatibility number, minor number: Z
N_SRS_VERMAJOR	8	1	Major version number of SRS: X
N_SRS_VERMINOR	8	0	Minor version number of SRS: Y
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	Packet length
NID_STMSTATE	4	1	Actual STM State: Power On
Padding bits	COMPUTED	COMPUTED	

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Message 2: ETCS → STM (Packet STM-1)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	1	STM/ETCS function version number
L_PACKET	13	COMPUTED	Packet length
N_058_VERMAJOR	8	3	Application Layer compatibility number, major number: X
N_058_VERMID	8	0	Application Layer compatibility number, middle number: Y
N_058_VERMINOR	8	3	Application Layer compatibility number, minor number: Z
N_035_VERMAJOR	8	3	FFFIS STM Layer compatibility number, major number: X
N_035_VERMID	8	0	FFFIS STM compatibility number, middle number: Y
N_035_VERMINOR	8	3	FFFIS STM compatibility number, minor number: Z
N_SRS_VERMAJOR	8	1	Major version number of SRS: X
N_SRS_VERMINOR	8	0	Minor version number of SRS: Y
Padding bits	COMPUTED	COMPUTED	

Message 3a: ETCS → STM (packet STM-2)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	2	ETCS On-board physical addresses, safety levels and Product identity
N_ADDR_JRU	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_JRU	2	FINITE VALUE	Depends on ETCS implementation

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N_ADDR_CAB_A	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_A	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CAB_B	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_B	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CAB_A_RED	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_A_RED	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CAB_B_RED	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_B_RED	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_DRU	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_DRU	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CLOCK	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CLOCK	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_ODO	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_ODO	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_EUROSUP	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_EUROSUP	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_TI	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_TI	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_BI	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_BI	2	FINITE VALUE	Depends on ETCS implementation
L_TEXT	8	24	
X_TEXT (1)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (2)	8	FINITE VALUE	Depends on ETCS implementation

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X_TEXT (3)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (4)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (5)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (6)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (7)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (8)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (9)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (10)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (11)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (12)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (13)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (14)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (15)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (16)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (17)	8	FINITE VALUE	Depends on ETCS implementation

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X_TEXT (18)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (19)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (20)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (21)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (22)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (23)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (24)	8	FINITE VALUE	Depends on ETCS implementation
Padding bits	COMPUTED	COMPUTED	

Message 3b: ETCS → STM (packet STM-2)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	2	ETCS On-board physical addresses, safety levels and Product identity
N_ADDR_JRU	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_JRU	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CAB_A	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CAB_A	2	FINITE VALUE	Depends on test equipment implementation

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N_ADDR_CAB_B	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CAB_B	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CAB_A_RED	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CAB_A_RED	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CAB_B_RED	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CAB_B_RED	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_DRU	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_DRU	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CLOCK	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CLOCK	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_ODO	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_ODO	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_EUROSUP	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_EUROSUP	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_TI	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_TI	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_BI	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_BI	2	FINITE VALUE	Depends on test equipment implementation
L_TEXT	8	24	
X_TEXT (1)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (2)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (3)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (4)	8	FINITE VALUE	Depends on test equipment implementation

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X_TEXT (5)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (6)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (7)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (8)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (9)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (10)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (11)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (12)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (13)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (14)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (15)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (16)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (17)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (18)	8	FINITE VALUE	Depends on test equipment implementation

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X_TEXT (19)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (20)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (21)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (22)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (23)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (24)	8	FINITE VALUE	Depends on test equipment implementation
Padding bits	COMPUTED	COMPUTED	

Message 4 ETCS → STM (packet STM-5)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	5	ETCS Status data
M_LEVEL	3	FINITE VALUE	Value for Levels 1 or 2 or 3
M_MODE	4	7	Trip
Padding bits	COMPUTED	COMPUTED	

Message 5 ETCS → STM (packet STM-139)

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VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	139	Train interface inputs status/availability to STM
M_TITR_C_STATUS	2	10	No traction cut off
M_TIDIR_STATUS	3	001	Forward
M_TICAB_STATUS	3	001	Desk A opened
Padding bits	COMPUTED	COMPUTED	

Message 6 ETCS → STM (packet STM-136)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	136	Brake interface emergency and service brake status/availability to STM
M_BIEB_STATUS	2	10	Apply
M_BISB_STATUS	2	10	Apply
Padding bits	COMPUTED	COMPUTED	

Message 7: STM → ETCS (packet STM-13)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	13	STM State request from STM

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L_PACKET	13	COMPUTED	
NID_STMTSTATEREQUEST	1	2	Configuration
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 8 ETCS → STM (packet STM-14)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	14	STM State order to STM
NID_STMSTATEORDER	4	2	Configuration
Padding bits	COMPUTED	COMPUTED	

Message 9 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	2	Configuration
Padding bits	COMPUTED	COMPUTED	

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Message 10 ETCS → STM (packet STM-175, STM-176, STM-177, STM-178)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	175	Train Data
L_PACKET	13	COMPUTED	
NID_OPERATIONAL	32	FINITE VALUE	Train running number entered by the driver
NC_TRAIN	15	FINITE VALUE	Train category entered by the driver
L_TRAIN	12	FINITE VALUE	Train length (example taken from the subset-076) entered by the driver
V_MAXTRAIN	7	FINITE VALUE	Maximum permitted train speed (example taken from the subset-076) entered by the driver
M_LOADINGGAUGE	8	FINITE VALUE	Load Profile entered by the driver
M_AXLELOAD	7	FINITE VALUE	Axle Load entered by the driver
M_AIRTIGHT	2	FINITE VALUE	Airtight system presence entered by the driver
N_ITER	5	1	1 Iteration
NID_PACKET	8	FINITE VALUE	Traction System type entered by the driver
L_PACKET	13	176	Train data additional "braking characteristic" to STM
T_BEGIN_SB_EF	16	COMPUTED	
T_FULL_SB_EF	16	FINITE VALUE	Brake delay time for starting service brake effort (To be defined)
N_ITER	5	FINITE VALUE	Brake delay time for full service brake effort(To be defined)
V_SB_CHAR(1)	10	2	Number of iterations (this is the example used in the subset-076)
A_SB_CHAR(1)	8	0	Deceleration characteristic for Service brake: Speed value

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V_SB_CHAR(2)	10	92	Deceleration characteristic for Service brake: Deceleration value
A_SB_CHAR(2)	8	160	Deceleration characteristic for Service brake: Speed value
T_BEGIN_EB_EF	16	69	Deceleration characteristic for Service brake: Deceleration value
T_FULL_EB_EF	16	FINITE VALUE	Brake delay time for starting emergency brake effort(To be defined)
N_ITER	5	FINITE VALUE	Brake delay time for full emergency brake effort(To be defined)
V_EB_CHAR(1)	10	2	Number of iterations (this is the example used in the subset-076)
A_EB_CHAR(1)	8	0	Deceleration characteristic for Emergency brake: Speed value
V_EB_CHAR(2)	10	107	Deceleration characteristic for Emergency brake: Deceleration value
A_EB_CHAR(2)	8	160	Deceleration characteristic for Emergency brake: Speed value
T_TRACTION_CUT_OFF	16	80	Deceleration characteristic for Emergency brake: Deceleration value
A_MAX	8	FINITE VALUE	Traction cut off time(To be defined)
NID_PACKET	8	177	Additional data values and date/time to STM
L_PACKET	13	COMPUTED	
NID_DRIVER	32	FINITE VALUE	Driver identity
NID_ENGINE	24	FINITE VALUE	On-board ETCS identity(To be defined)
M_ADHESION	1	FINITE VALUE	Adhesion factor(To be defined)
T_YEAR	7	FINITE VALUE	Official year UTC(To be defined)
T_MONTH	4	FINITE VALUE	Official month UTC(To be defined)
T_DAY	5	FINITE VALUE	Official day UTC(To be defined)
T_HOUR	5	FINITE VALUE	Official hour UTC(To be defined)
T_MINUTES	6	FINITE VALUE	Official minutes UTC(To be defined)
T_SECONDS	6	FINITE VALUE	Official seconds UTC(To be defined)
T_TTS	5	FINITE VALUE	Official hundred of second UTC(To be defined)

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NID_PACKET	8	178	National Values to STM
L_PACKET	13	COMPUTED	
Q_SCALE	2	FINITE VALUE	Distance scale(To be defined)
V_NVSHUNT	7	FINITE VALUE	Shunting mode speed limit(To be defined)
V_NVSTFF	7	FINITE VALUE	Staff Responsible mode speed limit(To be defined)
V_NVONSIGHT	7	FINITE VALUE	On Sight mode speed limit(To be defined)
V_NVUNFIT	7	FINITE VALUE	Unfitted mode speed limit(To be defined)
V_NVREL	7	FINITE VALUE	Release Speed speed limit(To be defined)
D_NVROLL	15	FINITE VALUE	Roll away distance limit(To be defined)
V_NVALLOWOVTRP	7	FINITE VALUE	Maximum speed limit allowing the driver to select the “override EOA” function(To be defined)
V_NVSUPOVTRP	7	FINITE VALUE	Permitted speed limit to be supervised when the “override EOA” function is active(To be defined)
D_NVOVTRP	15	FINITE VALUE	Maximum distance for overriding the train trip(To be defined)
T_NVOVTRP	8	FINITE VALUE	Maximum time for overriding the train trip(To be defined)
D_NVPOTRP	15	FINITE VALUE	Maximum distance for reversing in Post Trip mode(To be defined)
D_NVSTFF	15	FINITE VALUE	Maximum distance for running in Staff Responsible mode(To be defined)
Q_NVDRIVER_ADHES	1	FINITE VALUE	Qualifier for the modification of trackside adhesion factor by driver(To be defined)
Padding bits	COMPUTED	COMPUTED	

Message 11 ETCS → STM (packet STM-9)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	

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NID_PACKET	8	9	Odometers parameters to STM
T_ODOCYCLE	8	FINITE VALUE	
T_ODOMAXPROD	8	FINITE VALUE	
Q_V_ABS	8	FINITE VALUE	
Q_V_REL	8	FINITE VALUE	
Q_D_ABS	8	FINITE VALUE	
Q_D_REL	8	FINITE VALUE	
Padding bits	COMPUTED	COMPUTED	

Message 12 ETCS → STM (packet STM-141, STM-139)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	141	Train Interface command configuration to STM
L_PACKET	13	COMPUTED	
M_TIRB_CMD_AVAIL	1	FINITE VALUE	
M_TIMSH_CMD_AVAIL	1	FINITEVALUE	
M_TIEDCB_CMD_AVAIL	1	FINITEVALUE	

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M_TIPAEB_CMD_AVAIL	1	FINITEVALUE	
M_TIPANTO_CMD_AVAIL	1	FINITEVALUE	
M_TIFLAP_CMD_AVAIL	1	FINITEVALUE	
M_TIMS_CMD_AVAIL	1	FINITEVALUE	
M_TITR_C_CMD_AVAIL	1	FINITEVALUE	
NID_PACKET	8	139	Train interface inputs status/availability to STM
L_PACKET	13	COMPUTED	
M_TITR_C_STATUS	2	10B	No traction cut off
M_TIDIR_STATUS	3	001B	Forward
M_TICAB_STATUS	3	001B	Desk A opened
Padding bits	COMPUTED	COMPUTED	

Message 13 ETCS → STM (packet STM-136, STM-143)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	136	Brake Intereface emergency and service brake status/Availability to STM
M_BIEB_STATUS	2	FINITE VALUE	
M_BISB_STATUS	2	FINITE VALUE	
NID_PACKET	8	143	Brake Train interface emergency and Service brake parameters to STM
L_PACKET	13	COMPUTED	

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M_BIEB_STATUS	2	FINITE VALUE	
T_EB_MAXDELAY	16	FINITE VALUE	
M_BISB_STATUS	2	FINITE VALUE	
T_SB_MAXDELAY	16	FINITE VALUE	
Padding bits	COMPUTED	COMPUTED	

Message 14: STM → ETCS (packet STM-13)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	13	STM State Request from STM
L_PACKET	13	COMPUTED	
NID_STMSTATEREQUEST	4	3	Data Entry
NID_PACKET	8	15	State Report
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	2	Configuration
Padding bits	COMPUTED	COMPUTED	

Message 15: STM → ETCS (packet STM-4)			
VARIABLE	Length	VALUE	COMMENTS

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NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	4	STM parameters data and product identity
L_PACKET	13	COMPUTED	
NID_STMTYPE	1	1	SN
L_TEXT	8	24	
X_TEXT(1)	8	FINITE VALUE	
X_TEXT(2)	8	FINITE VALUE	
X_TEXT(3)	8	FINITE VALUE	
X_TEXT(4)	8	FINITE VALUE	
X_TEXT(5)	8	FINITE VALUE	
X_TEXT(6)	8	FINITE VALUE	
X_TEXT(7)	8	FINITE VALUE	
X_TEXT(8)	8	FINITE VALUE	
X_TEXT(9)	8	FINITE VALUE	
X_TEXT(10)	8	FINITE VALUE	
X_TEXT(11)	8	FINITE VALUE	
X_TEXT(12)	8	FINITE VALUE	
X_TEXT(13)	8	FINITE VALUE	
X_TEXT(14)	8	FINITE VALUE	
X_TEXT(15)	8	FINITE VALUE	
X_TEXT(16)	8	FINITE VALUE	
X_TEXT(17)	8	FINITE VALUE	

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X_TEXT(18)	8	FINITE VALUE	
X_TEXT(19)	8	FINITE VALUE	
X_TEXT(20)	8	FINITE VALUE	
X_TEXT(21)	8	FINITE VALUE	
X_TEXT(22)	8	FINITE VALUE	
X_TEXT(23)	8	FINITE VALUE	
X_TEXT(24)	8	FINITE VALUE	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 16: STM → ETCS (packet STM-181)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	181	Specific STM Data Need
L_PACKET	13	COMPUTED	
Q_DATAENTRY	1	1	Need
Q_DRIVERINT	1	0	No driver interaction
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

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Message 17: STM → ETCS (packet STM-13)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	13	STM State Request from STM
L_PACKET	13	COMPUTED	
NID_STMSTATEREQUEST	4	3	Data Entry
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	2	Configuration
Padding Bits	COMPUTED	COMPUTED	

Message 18 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 19 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS

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NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 20 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 21 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

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End Conditions	Value	Comments
STM_STATE	CO	
ETCS Mode	unchanged	
ETCS Level	unchanged	
Train State	unchanged	
Train Data	Valid	
Additional Data	Valid	
National Values	unchanged	
STM Control Function Connection	established	
DMI Connection	unchanged	
Odometry data	unchanged	
Reference Time Data	unchanged	
TIU Connection	established	
BIU Connection	established	
JRU Connection	established	
Other connections	unchanged	
TIU Regenerative Brake Command	unchanged	
TIU Magnetic Shoes Command	unchanged	
TIU Eddy Current Brake Command	unchanged	
TIU Inhibit Passenger Emergency Brake Command	unchanged	
TIU Pantograph Command	unchanged	
TIU Air Tightness Command	unchanged	
TIU Main Switch / Circuit Breaker Command	unchanged	
TIU Traction Cut Off Command	unchanged	
TIU Sleeping Status	unchanged	
TIU Traction Cut Off Status	unchanged	
TIU Direction Controller Position Status	unchanged	
TIU Cab Status (Desk Status)	unchanged	
BIU Status	unchanged	
BIU Emergency Brake Command	unchanged	
BIU Service Brake Command	unchanged	
BIU Emergency Brake Status	unchanged	

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BIU Service Brake Status	unchanged	
STM Version Number	unchanged	
ETCS Version Number	unchanged	
Track Adhesion	unchanged	

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Test case 2.0.0.0.5.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0

TEST CASE HEADER	
Test case Identification	Application Start Up
	The ETCS mode is OS. The STM Control Function version is compatible with the STM. There is no failure in the opening of the communications. ETCS orders CO State, the STM switches to CO State. The STM does not require Specific STM DE and is ordered to CS State..
ETCS Requirements Tested	Subset-026 None
	subset-035 4.2.1.1; 5.2.10.1; 7.6.2.4; 7.6.2.6; 7.4.1.1.6; 7.4.1.1.11; 7.4.1.1.12; 7.4.2.4.1; 5.2.4.4; 7.4.2.4.2; 7.4.1.2.3 A2; A4a; 7.4.1.2.2 NP to PO; PO to CO; CO to CS; 7.3.1.3.6; 7.3.1.3.2.1; 5.2.11.4; 5.2.11.3; 5.2.11.2; 12.1.1.3
STM Requirements Tested	Subset-026 None
	subset-035 7.3.2.1 NP to PO; PO to CO; CO to CS; 7.3.2.2.1 1; 2; 4a; 7.3.1.2.3; 14.3.1.4; 7.6.2.3; 7.6.2.7; 7.6.2.9; 7.3.1.2.4; 7.3.1.2.5; 13.1.1.1.10; 13.1.1.1.11; 13.1.1.1.12; 7.3.1.2.6; 7.3.4.4; 7.3.1.2.8; 7.3.1.2.9; 7.3.1.3.6; 7.3.1.3.3
Packets Transmitted via FFFIS STM	STM-1; STM-15;; STM-2; STM-5; STM-139; STM-136; STM-13; SSTM-14; STM-4; STM-181; STM-141; STM-143; STM-9; STM-175; STM-176; STM-177; STM-178; STM-179
Comments and constraints	

Starting Conditions	Value	Comments
STM_STATE	NP	
ETCS Mode	OS	
ETCS Level	1	
Train State	Not Relevant	
Train Data	valid	
Additional Data	Valid	
National Values	Valid	
STM Control Function Connection	Not Established	

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DMI Connection		Not Established	
Odometry Data		Not Established	
Reference Time Data		Transmitted	
TIU Connection		Not Established	
BIU Connection		Not Established	
JRU Connection		Not Established	
Other connections		Not Established	
TIU Regenerative Brake Command		Not Relevant	
TIU Magnetic Shoes Command		Not Relevant	
TIU Eddy Current Brake Command		Not Relevant	
TIU Inhibit Passenger Emergency Brake Command		Not Relevant	
TIU Pantograph Command		Not Relevant	
TIU Air Tightness Command		Not Relevant	
TIU Main Switch / Circuit Breaker Command		Not Relevant	
TIU Traction Cut Off Command		Not Relevant	
TIU Sleeping Status		Not Sleeping	
TIU Traction Cut Off Status		Inactive	
TIU Direction Controller Position Status		Forward	
TIU Cab Status (Desk Status)		Desk A opened	
BIU Status		Inactive	
BIU Emergency Brake Command		Not Relevant	
BIU Service Brake Command		Not Relevant	
BIU Emergency Brake Status		Released	
BIU Service Brake Status		Released	
STM Version Number	Subset-026	1.0	SRS 2.2.2 is 1.Y
	Subset-035	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-058	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-056	3.0.z	Version 2.2.0 is 3.Y.Z
	Subset-057	3.0.z	Version 2.2.0 is 3.Y.Z
ETCS Version Number	Subset-026	1.0	Version 2.2.2 is 1.Y
	Subset-035	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-058	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-056	3.0.z	Version 2.2.0 is 3.Y.Z
	Subset-057	3.0.z	Version 2.2.0 is 3.Y.Z

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Track Adhesion	Not Relevant	

ETCS Test Case

Step	Description/Comments	Input I/F	Input Action	DUT	Output I/F	Output action
1	The communication between the STM Control Function and the STM is opened	Prof	STM Control Connection: STM opens the connection with the STM Control Function and send its version number. Message 1 received packet STM- 1	ETCS	Prof	STM Control Connection: STM Control Functions sends its version number and checks the version Message 2 STM-1
2		-	Version check is successful. ETCS is allowed to transmit application data	ETCS		
-	STM Control function sends the product identity, available functions, bus addresses of ETCS functions	-	-	ETCS	Prof	STM Control Connection: Message – 3a Sent packet STM-2 ETCS On-Board physical addresses, safety levels and Product Identity
-	STM Control Function sends the current ETCS technical mode	-	-	ETCS	Prof	STM Control Connection: Message - 4 Sent packet STM-5 ETCS status data
-	STM sends the specific data need	Prof	STM Control Connection: Message - 19 Sent packet STM - 181 Specific data need	-	-	-
3	JRU/DRU/ connections are established Odometer is available	Prof	STM establishes the connections to the JRU and DRU	ETCS	Prof	Functions are available
-	STM reports current state to JRU	Prof	JRU Connection: Message-21 packet STM-15 STM State report	-	-	-
-	STM reports current state to DRU – optional-	Prof	DRU Connection: Message-22 packet STM-15 STM State report	-	-	-
4	TIU function availability	Prof	STM establishes successfully the connection with the TIU	ETCS	Prof	TIU Connection: Message 5 is sent packet STM-139 Train interface inputs status/availability to STM

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-	STM reports current state to TIU	Prof	TIU Connection: Message-23 packet STM-15 STM State report	-	-	-
5	BIU function availability	Prof	STM establishes successfully the connection with the BIU	ETCS	Prof	BIU Connection: Message 6 is sent packet STM - 136 Brake Interface emergency and service brake status/availability to STM
-	STM reports current state to BIU	Prof	BIU Connection: Message-24 packet STM-15 STM State report	-	-	-
6	STM requests CO State and ETCS orders CO State T=T0	Prof	STM Control Connection: STM Requests CO state. Message 7 received packet STM-13 State request from STM	ETCS	Prof	STM Control Connection: Message -8 sent packet STM - 14 State order to the STM
7	T<10s STM confirms the CO State	Prof	STM Control Connection: STM confirms CO State Message – 9 received packet STM – 15 State report from STM	ETCS	Prof	
	ETCS transmit ETCS data to STM	-	-	ETCS	Prof	STM Control Connection: Message 10 sent packets STM-175 train data; STM-176 Train data Additional “braking characteristic” to STM; STM-177 Additional data values and date/time to STM; STM-178 National Values to STM
	ETCS transmit; Odometer parameters Status / Availability of the train interface FFFIS STM signals Status / Availability of the Service brake command Status / Availability of the Emergency and Service Brake command Maximum time delay for the ETCS to process the STM Emergency and the STM Service Brake commands	-	-	ETCS	Prof	Odometry Connection: Message 11 sent packets STM-9 Odometer parameters to STM (this packet is multicast); Message 12 TIU Connection STM-141 Train interface command configuration to STM; STM-139 Train interface inputs status/Availability to STM;Message 13 BIU Connection STM-136 Brake interface emergency and service brake status/Availability to STM;STM-143 Brake Train Interface emergency and

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						Service brake parameters to STM
8		Prof	STM Control Connection Message 14 packet 179 Specific STM Data Entry request	ETCS	-	-
9	STM requests CS	Prof	STM Control Connection: Message 15 received packet STM 13 State Request from STM	ETCS	Prof	STM Control Connection:ETCS orders CS State Message 16 packet STM – 14 State order to STM
10	The STM answer in due time	Prof	STM Control Connection. Message 17 received packet STM Control Connection STM – 15 STM State report	ETCS	-	-
11	The STM request to close the connection with the JRU	Prof	JRU Connection STM closes the connection with the JRU	ETCS	Prof	JRU Connection: Connection closed
12	The STM requests to close the connection with the DRU	Prof	DRU Connection STM closes the connection with the DRU	ETCS	Prof	DRU Connection: Connection closed
13	The STM requests to close the TIU	Prof	TIU Connection: STM requests to close the connection	ETCS	Prof	TIU Connection: Connection closed
14	The STM requests to close the BIU	Prof	BIU Connection: STM requests to close the connection	ETCS	Prof	BIU Connection: Connection closed

STM Test case

Step	Description/Comments	Input I/F	Input Action	DUT	Output I/F	Output action
1	STM takes the initiative to open the communication with the STM control function	Prof	STM is powered on	STM	Prof	STM opens the communication session STM Control Connection: Message - 1 packet STM-1 STM/ETCS function version number
2		Prof	STM Control Connection: STM Control Functions sends its version number and checks the version Message 2 STM-1	STM		Version check is successful. STM is allowed to transmit application data
-	STM sends its type and product identity STM sends its current state	-	-	STM	Prof	STM Control Connection: Message - 18 Sent packet STM - 4 STM

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						parameters data and product identity
-	STM sends Specific Data need	-	-	STM	Prof	STM Control Connection: Message - 19 Sent packet STM - 181 Specific data need
-	STM establishes the connection with another ETCS functions	Prof	STM Control Connection: ETCS bus addresses received Message-3b	STM	Prof	STM establishes the connection with all required ETCS functions
-				STM	Prof	TIU Connection if required: Message-23 packet STM-15 STM State report
-				STM	Prof	BIU Connection if required: Message-24 packet STM-15 STM State report
-				STM	Prof	JRU Connection if required: Message-21 packet STM-15 STM State report
-				STM	Prof	DRU Connection if required: Message-22 packet STM-15 STM State report
-		Prof	TIU Connection: Message 5 is sent packet STM-139 Train interface inputs status/availability to STM	STM	-	
-		Prof	BIU Connection: Message 6 is sent packet STM - 136 Brake Interface emergency and service brake status/availability to STM	STM	-	
3	STM requests CO state	Prof		STM	Prof	STM Control Connection: Message 7 received packet STM-13 State request from STM
4	STM switches to CO state	Prof	STM Control Connection: Message -8 received packet STM - 14 State order to the STM	STM	Prof	STM Control Connection: Message – 9 sent packet STM – 15 State report from STM
5	When all data is received, it requests CS state	Prof	STM Control ConnectionMessages 10 sent packets STM-175 train data; STM-176 Train data Additional “braking characteristic” to STM;	-	-	-

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			STM-177 Additional data values and date/time to STM; STM-178 National Values to STM, 11 sent packets STM-9 Odometer parameters to STM, STM			
-	-	-	-	STM	Prof	STM Control Connection: Message 14 packet 179 Specific STM Data Entry request
-	-	-	-	STM	Prof	STM Control Connection: Message 20 sent packet STM-13 State request from STM
6	STM Switches to CS State		STM Control Connection: State Message 16 packet STM – 14 State order to STM	STM	Prf	STM Control Connection: Message 17 received packet STM Control Connection STM – 15 STM State report
7	the STM shall maintain the connection with the STM control function					
8	If opened the STM shall closed the connection with the DMI and other connections except for TIU, BIU, STM Control, DRU and JRU					

Message 1: STM → ETCS (Packet STM-1)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	1	STM/ETCS function version number
L_PACKET	13	COMPUTED	Packet length
N_058_VERMAJOR	8	3	Application Layer compatibility number, major number: X

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N_058_VERMID	8	0	Application Layer compatibility number, middle number: Y
N_058_VERMINOR	8	2	Application Layer compatibility number, minor number: Z
N_035_VERMAJOR	8	3	FFFIS STM Layer compatibility number, major number: X
N_035_VERMID	8	0	FFFIS STM compatibility number, middle number: Y
N_035_VERMINOR	8	3	FFFIS STM compatibility number, minor number: Z
N_SRS_VERMAJOR	8	1	Major version number of SRS: X
N_SRS_VERMINOR	8	0	Minor version number of SRS: Y
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	Packet length
NID_STMSTATE	4	1	Actual STM State: Power On
Padding bits	COMPUTED	COMPUTED	

Message 2: ETCS → STM (Packet STM-1)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	1	STM/ETCS function version number
L_PACKET	13	COMPUTED	Packet length
N_058_VERMAJOR	8	3	Application Layer compatibility number, major number: X
N_058_VERMID	8	0	Application Layer compatibility number, middle number: Y
N_058_VERMINOR	8	3	Application Layer compatibility number, minor number: Z
N_035_VERMAJOR	8	3	FFFIS STM Layer compatibility number, major number: X
N_035_VERMID	8	0	FFFIS STM compatibility number, middle number: Y

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N_035_VERMINOR	8	3	FFFIS STM compatibility number, minor number: Z
N_SRS_VERMAJOR	8	1	Major version number of SRS: X
N_SRS_VERMINOR	8	0	Minor version number of SRS: Y
Padding bits	COMPUTED	COMPUTED	

Message 3a: ETCS → STM (packet STM-2)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	2	ETCS On-board physical addresses, safety levels and Product identity
N_ADDR_JRU	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_JRU	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CAB_A	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_A	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CAB_B	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_B	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CAB_A_RED	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_A_RED	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CAB_B_RED	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_B_RED	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_DRU	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_DRU	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CLOCK	7	FINITE VALUE	Depends on ETCS implementation

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Q_ADDR_CLOCK	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_ODO	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_ODO	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_EUROSUP	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_EUROSUP	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_TI	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_TI	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_BI	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_BI	2	FINITE VALUE	Depends on ETCS implementation
L_TEXT	8	24	
X_TEXT (1)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (2)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (3)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (4)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (5)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (6)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (7)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (8)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (9)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (10)	8	FINITE VALUE	Depends on ETCS implementation

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X_TEXT (11)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (12)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (13)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (14)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (15)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (16)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (17)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (18)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (19)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (20)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (21)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (22)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (23)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (24)	8	FINITE VALUE	Depends on ETCS implementation

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Padding bits	COMPUTED	COMPUTED	

Message 3b: ETCS → STM (packet STM-2)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	2	ETCS On-board physical addresses, safety levels and Product identity
N_ADDR_JRU	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_JRU	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CAB_A	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CAB_A	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CAB_B	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CAB_B	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CAB_A_RED	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CAB_A_RED	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CAB_B_RED	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CAB_B_RED	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_DRU	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_DRU	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_CLOCK	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_CLOCK	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_ODO	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_ODO	2	FINITE VALUE	Depends on test equipment implementation

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N_ADDR_EUROSUP	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_EUROSUP	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_TI	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_TI	2	FINITE VALUE	Depends on test equipment implementation
N_ADDR_BI	7	FINITE VALUE	Depends on test equipment implementation
Q_ADDR_BI	2	FINITE VALUE	Depends on test equipment implementation
L_TEXT	8	24	
X_TEXT (1)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (2)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (3)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (4)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (5)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (6)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (7)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (8)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (9)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (10)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (11)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (12)	8	FINITE VALUE	Depends on test equipment implementation

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X_TEXT (13)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (14)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (15)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (16)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (17)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (18)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (19)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (20)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (21)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (22)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (23)	8	FINITE VALUE	Depends on test equipment implementation
X_TEXT (24)	8	FINITE VALUE	Depends on test equipment implementation
Padding bits	COMPUTED	COMPUTED	

Message 4 ETCS → STM (packet STM-5)

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VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	5	ETCS Status data
M_LEVEL	3	FINITE VALUE	Value for Levels 1 or 2 or 3
M_MODE	4	1	On sight
Padding bits	COMPUTED	COMPUTED	

Message 5 ETCS → STM (packet STM-139)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	139	Train interface inputs status/availability to STM
M_TITR_C_STATUS	2	10	No traction cut off
M_TIDIR_STATUS	3	001	Forward
M_TICAB_STATUS	3	001	Desk A opened
Padding bits	COMPUTED	COMPUTED	

Message 6 ETCS → STM (packet STM-136)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	136	Brake interface emergency and service brake status/availability to STM

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M_BIEB_STATUS	2	10	Released
M_BISB_STATUS	2	10	Released
Padding bits	COMPUTED	COMPUTED	

Message 7: STM → ETCS (packet STM-13)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	13	STM State request from STM
L_PACKET	13	COMPUTED	
NID_STMTSTATEREQUEST	1	2	Configuration
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 8 ETCS → STM (packet STM-14)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	14	STM State order to STM
NID_STMSTATEORDER	4	2	Configuration
Padding bits	COMPUTED	COMPUTED	

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Message 9 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	2	Configuration
Padding bits	COMPUTED	COMPUTED	

Message 10 ETCS → STM (packet STM-175, STM-176, STM-177, STM-178)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	175	Train Data
L_PACKET	13	COMPUTED	
NID_OPERATIONAL	32	FINITE VALUE	Train running number entered by the driver
NC_TRAIN	15	FINITE VALUE	Train category entered by the driver
L_TRAIN	12	FINITE VALUE	Train length (example taken from the subset-076) entered by the driver
V_MAXTRAIN	7	FINITE VALUE	Maximum permitted train speed (example taken from the subset-076) entered by the driver
M_LOADINGGAUGE	8	FINITE VALUE	Load Profile entered by the driver
M_AXLELOAD	7	FINITE VALUE	Axle Load entered by the driver

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M_AIRTIGHT	2	FINITE VALUE	Airtight system presence entered by the driver
N_ITER	5	1	1 Iteration
NID_PACKET	8	FINITE VALUE	Traction System type entered by the driver
L_PACKET	13	176	Train data additional "braking characteristic" to STM
T_BEGIN_SB_EF	16	COMPUTED	
T_FULL_SB_EF	16	FINITE VALUE	Brake delay time for starting service brake effort (To be defined)
N_ITER	5	FINITE VALUE	Brake delay time for full service brake effort(To be defined)
V_SB_CHAR(1)	10	2	Number of iterations (this is the example used in the subset-076)
A_SB_CHAR(1)	8	0	Deceleration characteristic for Service brake: Speed value
V_SB_CHAR(2)	10	92	Deceleration characteristic for Service brake: Deceleration value
A_SB_CHAR(2)	8	160	Deceleration characteristic for Service brake: Speed value
T_BEGIN_EB_EF	16	69	Deceleration characteristic for Service brake: Deceleration value
T_FULL_EB_EF	16	FINITE VALUE	Brake delay time for starting emergency brake effort(To be defined)
N_ITER	5	FINITE VALUE	Brake delay time for full emergency brake effort(To be defined)
V_EB_CHAR(1)	10	2	Number of iterations (this is the example used in the subset-076)
A_EB_CHAR(1)	8	0	Deceleration characteristic for Emergency brake: Speed value
V_EB_CHAR(2)	10	107	Deceleration characteristic for Emergency brake: Deceleration value
A_EB_CHAR(2)	8	160	Deceleration characteristic for Emergency brake: Speed value
T_TRACTION_CUT_OFF	16	80	Deceleration characteristic for Emergency brake: Deceleration value
A_MAX	8	FINITE VALUE	Traction cut off time(To be defined)
NID_PACKET	8	177	Additional data values and date/time to STM
L_PACKET	13	COMPUTED	
NID_DRIVER	32	FINITE VALUE	Driver identity

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NID_ENGINE	24	FINITE VALUE	On-board ETCS identity(To be defined)
M_ADHESION	1	FINITE VALUE	Adhesion factor(To be defined)
T_YEAR	7	FINITE VALUE	Official year UTC(To be defined)
T_MONTH	4	FINITE VALUE	Official month UTC(To be defined)
T_DAY	5	FINITE VALUE	Official day UTC(To be defined)
T_HOUR	5	FINITE VALUE	Official hour UTC(To be defined)
T_MINUTES	6	FINITE VALUE	Official minutes UTC(To be defined)
T_SECONDS	6	FINITE VALUE	Official seconds UTC(To be defined)
T_TTS	5	FINITE VALUE	Official hundred of second UTC(To be defined)
NID_PACKET	8	178	National Values to STM
L_PACKET	13	COMPUTED	
Q_SCALE	2	FINITE VALUE	Distance scale(To be defined)
V_NVSHUNT	7	FINITE VALUE	Shunting mode speed limit(To be defined)
V_NVSTFF	7	FINITE VALUE	Staff Responsible mode speed limit(To be defined)
V_NVONSIGHT	7	FINITE VALUE	On Sight mode speed limit(To be defined)
V_NVUNFIT	7	FINITE VALUE	Unfitted mode speed limit(To be defined)
V_NVREL	7	FINITE VALUE	Release Speed speed limit(To be defined)
D_NVROLL	15	FINITE VALUE	Roll away distance limit(To be defined)
V_NVALLOWOVTRP	7	FINITE VALUE	Maximum speed limit allowing the driver to select the “override EOA” function(To be defined)
V_NVSUPOVTRP	7	FINITE VALUE	Permitted speed limit to be supervised when the “override EOA” function is active(To be defined)
D_NVOVTRP	15	FINITE VALUE	Maximum distance for overriding the train trip(To be defined)
T_NVOVTRP	8	FINITE VALUE	Maximum time for overriding the train trip(To be defined)

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D_NVPOTRP	15	FINITE VALUE	Maximum distance for reversing in Post Trip mode(To be defined)
D_NVSTFF	15	FINITE VALUE	Maximum distance for running in Staff Responsible mode(To be defined)
Q_NVDRIVER_ADHES	1	FINITE VALUE	Qualifier for the modification of trackside adhesion factor by driver(To be defined)
Padding bits	COMPUTED	COMPUTED	

Message 11 ETCS → STM (packet STM-9)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	9	Odometers parameters to STM
T_ODOCYCLE	8	FINITE VALUE	
T_ODOMAXPROD	8	FINITE VALUE	
Q_V_ABS	8	FINITE VALUE	
Q_V_REL	8	FINITE VALUE	
Q_D_ABS	8	FINITE VALUE	
Q_D_REL	8	FINITE VALUE	
Padding bits	COMPUTED	COMPUTED	

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Message 12 ETCS → STM (packet STM-141, STM-139)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	141	Train Interface command configuration to STM
L_PACKET	13	COMPUTED	
M_TIRB_CMD_AVAIL	1	FINITE VALUE	
M_TIMSH_CMD_AVAIL	1	FINITEVALUE	
M_TIEDCB_CMD_AVAIL	1	FINITEVALUE	
M_TIPAEB_CMD_AVAIL	1	FINITEVALUE	
M_TIPANTO_CMD_AVAIL	1	FINITEVALUE	
M_TIFLAP_CMD_AVAIL	1	FINITEVALUE	
M_TIMS_CMD_AVAIL	1	FINITEVALUE	
M_TITR_C_CMD_AVAIL	1	FINITEVALUE	
NID_PACKET	8	139	Train interface inputs status/availability to STM
L_PACKET	13	COMPUTED	
M_TITR_C_STATUS	2	10B	No traction cut off
M_TIDIR_STATUS	3	001B	Forward
M_TICAB_STATUS	3	001B	Desk A opened
Padding bits	COMPUTED	COMPUTED	

Message 13 ETCS → STM (packet STM-136, STM-143)			
VARIABLE	Length	VALUE	COMMENTS

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NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	136	Brake Intereface emergency and service brake status/Availability to STM
M_BIEB_STATUS	2	FINITE VALUE	
M_BISB_STATUS	2	FINITE VALUE	
NID_PACKET	8	143	Brake Train interface emergency and Service brake parameters to STM
L_PACKET	13	COMPUTED	
M_BIEB_STATUS	2	FINITE VALUE	
T_EB_MAXDELAY	16	FINITE VALUE	
M_BISB_STATUS	2	FINITE VALUE	
T_SB_MAXDELAY	16	FINITE VALUE	
Padding bits	COMPUTED	COMPUTED	

Message 14: STM → ETCS (packet STM-179)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
Q_DRIVERINT	1	FINITE VALUE	

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Q_FOLLOWING	1	0	
N_ITER	5	0	

Message 15: STM → ETCS (packet STM-13)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	13	STM State Request from STM
L_PACKET	13	COMPUTED	
NID_STMSTATEREQUEST	4	4	Cold Standby
NID_PACKET	8	15	State Report
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	2	Configuration
Padding bits	COMPUTED	COMPUTED	

Message 16: ETCS → STM (packet STM-13)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	14	State Order to STM
L_PACKET	13	COMPUTED	

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NID_STMSTATEORDER	4	4	Cold Standby

Message 17: STM → ETCS (packet STM-4)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	STM State report
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	4	Cold Standby

Message 18: STM → ETCS (packet STM-4)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	4	STM parameters data and product identity
L_PACKET	13	COMPUTED	
NID_STMTYPE	1	1	SN
L_TEXT	8	24	
X_TEXT(1)	8	FINITE VALUE	
X_TEXT(2)	8	FINITE VALUE	
X_TEXT(3)	8	FINITE VALUE	
X_TEXT(4)	8	FINITE VALUE	
X_TEXT(5)	8	FINITE VALUE	

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X_TEXT(6)	8	FINITE VALUE	
X_TEXT(7)	8	FINITE VALUE	
X_TEXT(8)	8	FINITE VALUE	
X_TEXT(9)	8	FINITE VALUE	
X_TEXT(10)	8	FINITE VALUE	
X_TEXT(11)	8	FINITE VALUE	
X_TEXT(12)	8	FINITE VALUE	
X_TEXT(13)	8	FINITE VALUE	
X_TEXT(14)	8	FINITE VALUE	
X_TEXT(15)	8	FINITE VALUE	
X_TEXT(16)	8	FINITE VALUE	
X_TEXT(17)	8	FINITE VALUE	
X_TEXT(18)	8	FINITE VALUE	
X_TEXT(19)	8	FINITE VALUE	
X_TEXT(20)	8	FINITE VALUE	
X_TEXT(21)	8	FINITE VALUE	
X_TEXT(22)	8	FINITE VALUE	
X_TEXT(23)	8	FINITE VALUE	
X_TEXT(24)	8	FINITE VALUE	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

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Message 19: STM → ETCS (packet STM-181)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	181	Specific STM Data Need
L_PACKET	13	COMPUTED	
Q_DATAENTRY	1	1	Need
Q_DRIVERINT	1	0	No driver interaction
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 20: STM → ETCS (packet STM-13)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	13	STM State Request from STM
L_PACKET	13	COMPUTED	
NID_STMSTATEREQUEST	4	3	Data Entry
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	2	Configuration
Padding Bits	COMPUTED	COMPUTED	

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Message 21 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 22 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 23 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM

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L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 24 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

End Conditions	Value	Comments
STM_STATE	CS	
ETCS Mode	unchanged	
ETCS Level	unchanged	
Train State	unchanged	
Train Data	Valid	
Additional Data	Valid	
National Values	unchanged	
STM Control Function Connection	established	
DMI Connection	unchanged	
Odometry data	unchanged	
Reference Time Data	unchanged	
TIU Connection	Established	
BIU Connection	Established	

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JRU Connection	Established	
Other connections	unchanged	
TIU Regenerative Brake Command	unchanged	
TIU Magnetic Shoes Command	unchanged	
TIU Eddy Current Brake Command	unchanged	
TIU Inhibit Passenger Emergency Brake Command	unchanged	
TIU Pantograph Command	unchanged	
TIU Air Tightness Command	unchanged	
TIU Main Switch / Circuit Breaker Command	unchanged	
TIU Traction Cut Off Command	unchanged	
TIU Sleeping Status	unchanged	
TIU Traction Cut Off Status	unchanged	
TIU Direction Controller Position Status	unchanged	
TIU Cab Status (Desk Status)	unchanged	
BIU Status	unchanged	
BIU Emergency Brake Command	unchanged	
BIU Service Brake Command	unchanged	
BIU Emergency Brake Status	unchanged	
BIU Service Brake Status	unchanged	
STM Version Number	unchanged	
ETCS Version Number	unchanged	
Track Adhesion	unchanged	

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Test case 2.0.0.0.10.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.2

TEST CASE HEADER	
Test case Identification	Application Start Up
	The ETCS mode is PT. The STM Control Function version is compatible with the STM. There is no failure in the opening of the communications. ETCS orders CO State, the STM switches to CO State. The STM does not require Specific STM DE and is ordered to CS State. The STM does not answer in due time.
ETCS Requirements Tested	Subset-026 None
	subset-035 4.2.1.1; 5.2.10.1; 7.6.2.4; 7.6.2.6; 7.4.1.1.6; 7.4.1.1.11; 7.4.1.1.12; 7.4.2.4.1; 5.2.4.4; 7.4.2.4.2; 7.4.1.2.3 A2; A4a; C16; 7.4.1.2.2 NP to PO; PO to CO; CO to CS; CO to FA; 7.3.1.3..1; 5.2.11.2; 5.2.11.3; 5.2.11.4; 12.1.1.3
STM Requirements Tested	Subset-026 None
Subset-035 None	
Packets Transmitted via FFFIS STM	STM-1; STM-15;; STM-2; STM-5; STM-139; STM-136; STM_13; SSTM-14; STM-4; STM-181; STM-141; STM-143; STM-9; STM-175; STM-176; STM-177; STM-178; STM-179
Comments and constraints	

Starting Conditions	Value	Comments
STM_STATE	NP	
ETCS Mode	PT	
ETCS Level	1	
Train State	Standstill	
Train Data	valid	
Additional Data	Valid	
National Values	Valid	
STM Control Function Connection	Not Established	

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DMI Connection		Not Established	
Odometry Data		Not Established	
Reference Time Data		Transmitted	
TIU Connection		Not Established	
BIU Connection		Not Established	
JRU Connection		Not Established	
Other connections		Not Established	
TIU Regenerative Brake Command		Not Relevant	
TIU Magnetic Shoes Command		Not Relevant	
TIU Eddy Current Brake Command		Not Relevant	
TIU Inhibit Passenger Emergency Brake Command		Not Relevant	
TIU Pantograph Command		Not Relevant	
TIU Air Tightness Command		Not Relevant	
TIU Main Switch / Circuit Breaker Command		Not Relevant	
TIU Traction Cut Off Command		Not Relevant	
TIU Sleeping Status		Not Sleeping	
TIU Traction Cut Off Status		Inactive	
TIU Direction Controller Position Status		Forward	
TIU Cab Status (Desk Status)		Desk A opened	
BIU Status		Inactive	
BIU Emergency Brake Command		Not Relevant	
BIU Service Brake Command		Not Relevant	
BIU Emergency Brake Status		Released	
BIU Service Brake Status		Released	
STM Version Number	Subset-026	1.0	SRS 2.2.2 is 1.Y
	Subset-035	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-058	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-056	3.0.z	Version 2.2.0 is 3.Y.Z
	Subset-057	3.0.z	Version 2.2.0 is 3.Y.Z
ETCS Version Number	Subset-026	1.0	Version 2.2.2 is 1.Y
	Subset-035	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-058	3.0.z	Version 2.1.1 is 3.Y.Z
	Subset-056	3.0.z	Version 2.2.0 is 3.Y.Z
	Subset-057	3.0.z	Version 2.2.0 is 3.Y.Z

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Track Adhesion	Not Relevant	

ETCS Test Case

Step	Description/Comments	Input I/F	Input Action	DUT	Output I/F	Output action
1	The communication between the STM Control Function and the STM is opened	Prof	STM Control Connection: STM opens the connection with the STM Control Function and send its version number. Message 1 received packet STM- 1	ETCS	Prof	STM Control Connection: STM Control Functions sends its version number and checks the version Message 2 STM-1
2		-	Version check is successful. ETCS is allowed to transmit application data	ETCS		
-	STM Control function sends the product identity, available functions, bus addresses of ETCS functions	-	-	ETCS	Prof	STM Control Connection: Message - 3 Sent packet STM-2 ETCS On-Board physical addresses, safety levels and Product Identity
-	STM Control Function sends the current ETCS technical mode	-	-	ETCS	Prof	STM Control Connection: Message - 4 Sent packet STM-5 ETCS status data
-	STM sends the specific data need	Prof	STM Control Connection: Message - 18 Sent packet STM - 181 Specific data need	-	-	-
3	JRU/DRU/ connections are established Odometer is available	Prof	STM establishes the connections to the JRU and DRU	ETCS	Prof	Functions are available
-	STM reports current state to JRU	Prof	JRU Connection: Message-19 packet STM-15 STM State report	-	-	-
-	STM reports current state to DRU –optional-	Prof	DRU Connection: Message-20 packet STM-15 STM State report	-	-	-
4	TIU function availability	Prof	STM establishes successfully the connection with the TIU	ETCS	Prof	TIU Connection: Message 5 is sent packet STM-139 Train interface inputs status/availability to STM

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-	STM reports current state to TIU	Prof	TIU Connection: Message-21 packet STM-15 STM State report	-	-	-
5	BIU function availability	Prof	STM establishes successfully the connection with the BIU	ETCS	Prof	BIU Connection: Message 6 is sent packet STM - 136 Brake Interface emergency and service brake status/availability to STM
-	STM reports current state to BIU	Prof	BIU Connection: Message-22 packet STM-15 STM State report	-	-	-
6	STM requests CO State and ETCS orders CO State T=T0	Prof	STM Control Connection: STM Requests CO state. Message 7 received packet STM-13 State request from STM	ETCS	Prof	STM Control Connection: Message -8 sent packet STM - 14 State order to the STM
7	T<10s STM confirms the CO State	Prof	STM Control Connection: STM confirms CO State Message – 9 received packet STM – 15 State report from STM	ETCS	Prof	
	ETCS transmit ETCS data to STM	-	-	ETCS	Prof	STM Control Connection: Message 10 sent packets STM-175 train data; STM-176 Train data Additional “braking characteristic” to STM; STM-177 Additional data values and date/time to STM; STM-178 National Values to STM
	ETCS transmit; Odometer parameters Status / Availability of the train interface FFFIS STM signals Status / Availability of the Service brake command Status / Availability of the Emergency and Service Brake command Maximum time delay for the ETCS to process the STM Emergency and the STM Service Brake commands	-	-	ETCS	Prof	Odometry Connection: Message 11 sent packets STM-9 Odometer parameters to STM (this packet is multicast); Message 12 TIU Connection STM-141 Train interface command configuration to STM; STM-139 Train interface inputs status/Availability to STM;Message 13 BIU Connection STM-136 Brake interface emergency and service brake status/Availability to STM;STM-143 Brake Train Interface emergency and

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						Service brake parameters to STM
8		Prof	STM Control Connection Message 14 packet 179 Specific STM Data Entry request	ETCS	-	-
9	T=0	Prof	STM Control Connection: STM requests CS. Message 15 received packet STM 13 State Request from STM	ETCS	Prof	STM Control Connection:ETCS orders CS State Message 16 packet STM – 14 State order to STM
10	T=10s The STM does not answer in due time and is ordered to the FA state	Prof		ETCS	Prof	STM Control Connection: Message 17 packet STM 14 State order to STM

Message 1: STM → ETCS (Packet STM-1)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	1	STM/ETCS function version number
L_PACKET	13	COMPUTED	Packet length
N_058_VERMAJOR	8	3	Application Layer compatibility number, major number: X
N_058_VERMID	8	0	Application Layer compatibility number, middle number: Y
N_058_VERMINOR	8	2	Application Layer compatibility number, minor number: Z
N_035_VERMAJOR	8	3	FFFIS STM Layer compatibility number, major number: X
N_035_VERMID	8	0	FFFIS STM compatibility number, middle number: Y
N_035_VERMINOR	8	3	FFFIS STM compatibility number, minor number: Z
N_SRS_VERMAJOR	8	1	Major version number of SRS: X
N_SRS_VERMINOR	8	0	Minor version number of SRS: Y

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NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	Packet length
NID_STMSTATE	4	1	Actual STM State: Power On
Padding bits	COMPUTED	COMPUTED	

Message 2: ETCS → STM (Packet STM-1)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	1	STM/ETCS function version number
L_PACKET	13	COMPUTED	Packet length
N_058_VERMAJOR	8	3	Application Layer compatibility number, major number: X
N_058_VERMID	8	0	Application Layer compatibility number, middle number: Y
N_058_VERMINOR	8	3	Application Layer compatibility number, minor number: Z
N_035_VERMAJOR	8	3	FFFIS STM Layer compatibility number, major number: X
N_035_VERMID	8	0	FFFIS STM compatibility number, middle number: Y
N_035_VERMINOR	8	3	FFFIS STM compatibility number, minor number: Z
N_SRS_VERMAJOR	8	1	Major version number of SRS: X
N_SRS_VERMINOR	8	0	Minor version number of SRS: Y
Padding bits	COMPUTED	COMPUTED	

Message 3: ETCS → STM (packet STM-2)			
VARIABLE	Length	VALUE	COMMENTS

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NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	2	ETCS On-board physical addresses, safety levels and Product identity
N_ADDR_JRU	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_JRU	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CAB_A	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_A	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CAB_B	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_B	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CAB_A_RED	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_A_RED	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CAB_B_RED	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CAB_B_RED	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_DRU	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_DRU	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_CLOCK	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_CLOCK	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_ODO	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_ODO	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_EUROSUP	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_EUROSUP	2	FINITE VALUE	Depends on ETCS implementation
N_ADDR_TI	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_TI	2	FINITE VALUE	Depends on ETCS implementation

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N_ADDR_BI	7	FINITE VALUE	Depends on ETCS implementation
Q_ADDR_BI	2	FINITE VALUE	Depends on ETCS implementation
L_TEXT	8	24	
X_TEXT (1)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (2)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (3)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (4)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (5)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (6)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (7)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (8)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (9)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (10)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (11)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (12)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (13)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (14)	8	FINITE VALUE	Depends on ETCS implementation

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X_TEXT (15)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (16)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (17)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (18)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (19)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (20)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (21)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (22)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (23)	8	FINITE VALUE	Depends on ETCS implementation
X_TEXT (24)	8	FINITE VALUE	Depends on ETCS implementation
Padding bits	COMPUTED	COMPUTED	

Message 4 ETCS → STM (packet STM-5)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	

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NID_PACKET	8	5	ETCS Status data
M_LEVEL	3	FINITE VALUE	Value for Levels 1 or 2 or 3
M_MODE	4	8	Post Trip
Padding bits	COMPUTED	COMPUTED	

Message 5 ETCS → STM (packet STM-139)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	139	Train interface inputs status/availability to STM
M_TITR_C_STATUS	2	10	No traction cut off
M_TIDIR_STATUS	3	001	Forward
M_TICAB_STATUS	3	001	Desk A opened
Padding bits	COMPUTED	COMPUTED	

Message 6 ETCS → STM (packet STM-136)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	136	Brake interface emergency and service brake status/availability to STM
M_BIEB_STATUS	2	10	Released
M_BISB_STATUS	2	10	Released
Padding bits	COMPUTED	COMPUTED	

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Message 7: STM → ETCS (packet STM-13)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	13	STM State request from STM
L_PACKET	13	COMPUTED	
NID_STMTSTATEREQUEST	1	2	Configuration
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 8 ETCS → STM (packet STM-14)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	14	STM State order to STM
NID_STMSTATEORDER	4	2	Configuration
Padding bits	COMPUTED	COMPUTED	

Message 9 STM → ETCS (packet STM-15)

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VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	2	Configuration
Padding bits	COMPUTED	COMPUTED	

Message 10 ETCS → STM (packet STM-175, STM-176, STM-177, STM-178)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	175	Train Data
L_PACKET	13	COMPUTED	
NID_OPERATIONAL	32	FINITE VALUE	Train running number entered by the driver
NC_TRAIN	15	FINITE VALUE	Train category entered by the driver
L_TRAIN	12	FINITE VALUE	Train length (example taken from the subset-076) entered by the driver
V_MAXTRAIN	7	FINITE VALUE	Maximum permitted train speed (example taken from the subset-076) entered by the driver
M_LOADINGGAUGE	8	FINITE VALUE	Load Profile entered by the driver
M_AXLELOAD	7	FINITE VALUE	Axle Load entered by the driver
M_AIRTIGHT	2	FINITE VALUE	Airtight system presence entered by the driver
N_ITER	5	1	1 Iteration

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NID_PACKET	8	FINITE VALUE	Traction System type entered by the driver
L_PACKET	13	176	Train data additional "braking characteristic" to STM
T_BEGIN_SB_EF	16	COMPUTED	
T_FULL_SB_EF	16	FINITE VALUE	Brake delay time for starting service brake effort (To be defined)
N_ITER	5	FINITE VALUE	Brake delay time for full service brake effort(To be defined)
V_SB_CHAR(1)	10	2	Number of iterations (this is the example used in the subset-076)
A_SB_CHAR(1)	8	0	Deceleration characteristic for Service brake: Speed value
V_SB_CHAR(2)	10	92	Deceleration characteristic for Service brake: Deceleration value
A_SB_CHAR(2)	8	160	Deceleration characteristic for Service brake: Speed value
T_BEGIN_EB_EF	16	69	Deceleration characteristic for Service brake: Deceleration value
T_FULL_EB_EF	16	FINITE VALUE	Brake delay time for starting emergency brake effort(To be defined)
N_ITER	5	FINITE VALUE	Brake delay time for full emergency brake effort(To be defined)
V_EB_CHAR(1)	10	2	Number of iterations (this is the example used in the subset-076)
A_EB_CHAR(1)	8	0	Deceleration characteristic for Emergency brake: Speed value
V_EB_CHAR(2)	10	107	Deceleration characteristic for Emergency brake: Deceleration value
A_EB_CHAR(2)	8	160	Deceleration characteristic for Emergency brake: Speed value
T_TRACTION_CUT_OFF	16	80	Deceleration characteristic for Emergency brake: Deceleration value
A_MAX	8	FINITE VALUE	Traction cut off time(To be defined)
NID_PACKET	8	177	Additional data values and date/time to STM
L_PACKET	13	COMPUTED	
NID_DRIVER	32	FINITE VALUE	Driver identity
NID_ENGINE	24	FINITE VALUE	On-board ETCS identity(To be defined)
M_ADHESION	1	FINITE VALUE	Adhesion factor(To be defined)

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T_YEAR	7	FINITE VALUE	Official year UTC(To be defined)
T_MONTH	4	FINITE VALUE	Official month UTC(To be defined)
T_DAY	5	FINITE VALUE	Official day UTC(To be defined)
T_HOUR	5	FINITE VALUE	Official hour UTC(To be defined)
T_MINUTES	6	FINITE VALUE	Official minutes UTC(To be defined)
T_SECONDS	6	FINITE VALUE	Official seconds UTC(To be defined)
T_TTS	5	FINITE VALUE	Official hundred of second UTC(To be defined)
NID_PACKET	8	178	National Values to STM
L_PACKET	13	COMPUTED	
Q_SCALE	2	FINITE VALUE	Distance scale(To be defined)
V_NVSHUNT	7	FINITE VALUE	Shunting mode speed limit(To be defined)
V_NVSTFF	7	FINITE VALUE	Staff Responsible mode speed limit(To be defined)
V_NVONSIGHT	7	FINITE VALUE	On Sight mode speed limit(To be defined)
V_NVUNFIT	7	FINITE VALUE	Unfitted mode speed limit(To be defined)
V_NVREL	7	FINITE VALUE	Release Speed speed limit(To be defined)
D_NVROLL	15	FINITE VALUE	Roll away distance limit(To be defined)
V_NVALLOWOVTRP	7	FINITE VALUE	Maximum speed limit allowing the driver to select the “override EOA” function(To be defined)
V_NVSUPOVTRP	7	FINITE VALUE	Permitted speed limit to be supervised when the “override EOA” function is active(To be defined)
D_NVOVTRP	15	FINITE VALUE	Maximum distance for overriding the train trip(To be defined)
T_NVOVTRP	8	FINITE VALUE	Maximum time for overriding the train trip(To be defined)
D_NVPOTRP	15	FINITE VALUE	Maximum distance for reversing in Post Trip mode(To be defined)
D_NVSTFF	15	FINITE VALUE	Maximum distance for running in Staff Responsible mode(To be defined)

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Q_NVDRIVER_ADHES	1	FINITE VALUE	Qualifier for the modification of trackside adhesion factor by driver(To be defined)
Padding bits	COMPUTED	COMPUTED	

Message 11 ETCS → STM (packet STM-9)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	9	Odometers parameters to STM
T_ODOCYCLE	8	FINITE VALUE	
T_ODOMAXPROD	8	FINITE VALUE	
Q_V_ABS	8	FINITE VALUE	
Q_V_REL	8	FINITE VALUE	
Q_D_ABS	8	FINITE VALUE	
Q_D_REL	8	FINITE VALUE	
Padding bits	COMPUTED	COMPUTED	

Message 12 ETCS → STM (packet STM-141, STM-139)			
VARIABLE	Length	VALUE	COMMENTS

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NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	141	Train Interface command configuration to STM
L_PACKET	13	COMPUTED	
M_TIRB_CMD_AVAIL	1	FINITE VALUE	
M_TIMSH_CMD_AVAIL	1	FINITEVALUE	
M_TIEDCB_CMD_AVAIL	1	FINITEVALUE	
M_TIPAEB_CMD_AVAIL	1	FINITEVALUE	
M_TIPANTO_CMD_AVAIL	1	FINITEVALUE	
M_TIFLAP_CMD_AVAIL	1	FINITEVALUE	
M_TIMS_CMD_AVAIL	1	FINITEVALUE	
M_TITR_C_CMD_AVAIL	1	FINITEVALUE	
NID_PACKET	8	139	Train interface inputs status/availability to STM
L_PACKET	13	COMPUTED	
M_TITR_C_STATUS	2	10B	No traction cut off
M_TIDIR_STATUS	3	001B	Forward
M_TICAB_STATUS	3	001B	Desk A opened
Padding bits	COMPUTED	COMPUTED	

Message 13 ETCS → STM (packet STM-136, STM-143)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	

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NID_PACKET	8	136	Brake Intereface emergency and service brake status/Availability to STM
M_BIEB_STATUS	2	FINITE VALUE	
M_BISB_STATUS	2	FINITE VALUE	
NID_PACKET	8	143	Brake Train interface emergency and Service brake parameters to STM
L_PACKET	13	COMPUTED	
M_BIEB_STATUS	2	FINITE VALUE	
T_EB_MAXDELAY	16	FINITE VALUE	
M_BISB_STATUS	2	FINITE VALUE	
T_SB_MAXDELAY	16	FINITE VALUE	
Padding bits	COMPUTED	COMPUTED	

Message 14: STM → ETCS (packet STM-179)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
Q_DRIVERINT	1	FINITE VALUE	
Q_FOLLOWING	1	0	

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N_ITER	5	0	

Message 15: STM → ETCS (packet STM-13)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	13	STM State Request from STM
L_PACKET	13	COMPUTED	
NID_STMSTATEREQUEST	4	4	Cold Standby
NID_PACKET	8	15	State Report
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	2	Configuration
Padding bits	COMPUTED	COMPUTED	

Message 16: ETCS → STM (packet STM-14)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	14	State Order to STM
L_PACKET	13	COMPUTED	
NID_STMSTATEORDER	4	4	Cold Standby
Padding Bits	COMPUTED	COMPUTED	

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Message 17: ETCS → STM (packet STM-14)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	14	State Order to STM
L_PACKET	13	COMPUTED	
NID_STMSTATEORDER	4	8	Failure
Padding Bits	COMPUTED	COMPUTED	

Message 18: STM → ETCS (packet STM-181)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	181	Specific STM Data Need
L_PACKET	13	COMPUTED	
Q_DATAENTRY	1	1	Need
Q_DRIVERINT	1	0	No driver interaction
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 19STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS

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NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 20 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

Message 21 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

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Message 22 STM → ETCS (packet STM-15)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	The NID_STM which the EVC is connected to
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	1	Power On
Padding bits	COMPUTED	COMPUTED	

End Conditions	Value	Comments
STM_STATE	FA	
ETCS Mode	unchanged	
ETCS Level	unchanged	
Train State	unchanged	
Train Data	Valid	
Additional Data	Valid	
National Values	unchanged	
STM Control Function Connection	established	
DMI Connection	unchanged	
Odometry data	unchanged	
Reference Time Data	unchanged	
TIU Connection	Established	
BIU Connection	Established	
JRU Connection	Established	
Other connections	unchanged	
TIU Regenerative Brake Command	unchanged	
TIU Magnetic Shoes Command	unchanged	
TIU Eddy Current Brake Command	unchanged	
TIU Inhibit Passenger Emergency Brake Command	unchanged	

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TIU Pantograph Command	unchanged	
TIU Air Tightness Command	unchanged	
TIU Main Switch / Circuit Breaker Command	unchanged	
TIU Traction Cut Off Command	unchanged	
TIU Sleeping Status	unchanged	
TIU Traction Cut Off Status	unchanged	
TIU Direction Controller Position Status	unchanged	
TIU Cab Status (Desk Status)	unchanged	
BIU Status	unchanged	
BIU Emergency Brake Command	unchanged	
BIU Service Brake Command	unchanged	
BIU Emergency Brake Status	unchanged	
BIU Service Brake Status	unchanged	
STM Version Number	unchanged	
ETCS Version Number	unchanged	
Track Adhesion	unchanged	

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Test case 2.0.0.0.10.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0

Is the same as Test case 2.0.0.0.5.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0

Test case 2.0.0.0.11.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0

Is the same as Test case 2.0.0.0.5.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0

Test case 2.0.0.0.12.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0

Is the same as Test case 2.0.0.0.5.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0

Test case 2.0.0.0.13.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0

Is the same as Test case 2.0.0.0.5.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0

Test case 2.0.0.0.1.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0

Is the same as Test case 2.0.0.0.5.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0
The purpose of this test case is to completely test the table 5.2.10.1

Test case 2.0.0.0.2.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0

Is the same as Test case 2.0.0.0.5.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0

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The purpose of this test case is to completely test the table 5.2.10.1

Test case 2.0.0.0.3.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0

Is the same as Test case 2.0.0.0.5.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0
The purpose of this test case is to completely test the table 5.2.10.1

Test case 2.0.0.0.4.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0

Is the same as Test case 2.0.0.0.5.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0
The purpose of this test case is to completely test the table 5.2.10.1

Test case 2.0.0.0.6.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0

Is the same as Test case 2.0.0.0.5.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0
The purpose of this test case is to completely test the table 5.2.10.1

Test case 2.0.0.0.7.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0

Is the same as Test case 2.0.0.0.5.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0
The purpose of this test case is to completely test the table 5.2.10.1

Test case 2.0.0.0.8.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0

Is the same as Test case 2.0.0.0.5.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0
The purpose of this test case is to completely test the table 5.2.10.1

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Test case 2.0.0.0.9.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0

Is the same as Test case 2.0.0.0.5.0.2.0.2.0.0.0.1.0.0.1.3.0.1.0.1.0
The purpose of this test case is to completely test the table 5.2.10.1

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