



**ERTMS/ETCS**

## **FFFIS STM test cases of Functional identity 011**

### **PROCEDURE STM OPERATIONAL TESTS**

**Total: 1 Test case**

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<b>Company</b>	<b>Technical Approval</b>	<b>Management approval</b>
ALSTOM		
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CAF		
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## Modification History

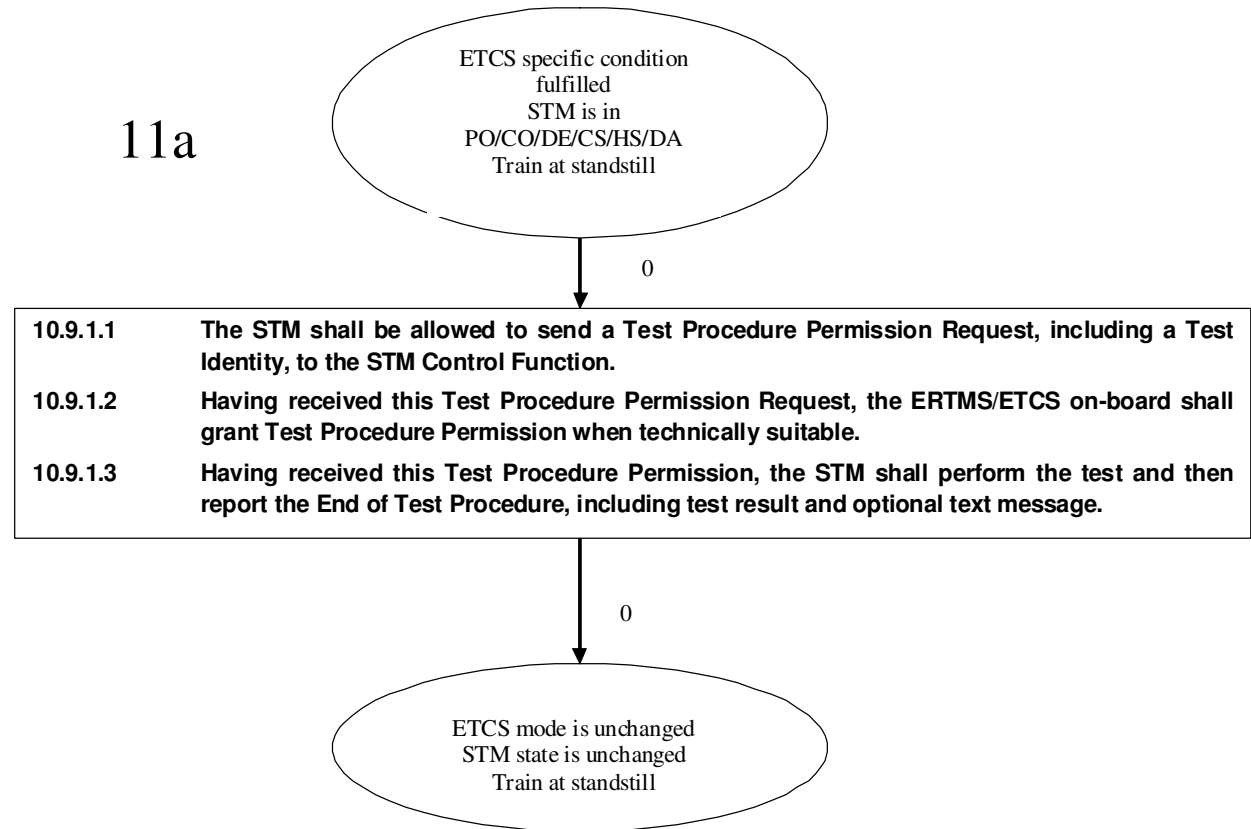
Issue Number Date	Section Number	Modification / Description	Author
0.0.1 07/12/2004	All	First version	Alstom AS
0.0.2 15/12/2004	All	Reviewed in Madrid on 15-12-2004	Alstom AS
0.0.3 26/01/2005	All	Reviewed in Paris on 26-01-2005	Alstom AS
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1.0.1 01.06.2007	Diagrams Test case 11.a.0.1.0.0. Test case 11a.0.2.0.	Modification of Subset 35 version 2.1.6 : Modification of the diagrams and added test case 11a 0.2.0	Alstom Axel Schoevaerts
2.0.0 15.05.2011	All	Updated to be in line with Subset 35 issue 2.2.0 date 2010-12-17	Alstom Thomas Mandry
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2.9.2 30.08.2013	All	Updated according to comments from 2nd internal review	Alstom Thomas Mandry
2.9.3 31.10.2013	No change to this part	Updated according to CR 1158 (considering impact from CR 1173)	Alstom Thomas Mandry
2.9.4 28.02.2014	No change	No change to this part of the Subset	Alstom Thomas Mandry
2.9.5 2014-04-24	Front page	Baseline 3 1 <sup>st</sup> Maintenance pre-release version	Thomas Mandry (Alstom)
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## Diagram





## Supplier-specific delays table

#	Supplier of	Start time	End time
Ts1	ETCS	Time-stamp of message including STM-21	Reference time at which the ERTMS/ETCS on-board could be put in a condition to permit STM specific Test Procedure (with train already at standstill & with no other STM installed on-board)
Ts2	ETCS	Reference time at which the ERTMS/ETCS on-board is put in a condition to permit STM specific Test Procedure (could involve several interfaces, e.g. DMI & Train Interface)	Time-stamp of message including STM-22
Ts3	ETCS	Time-stamp of message including STM-23	Reference time at which the result of the STM specific Test Procedure is displayed
Ts4	STM	Reference time at which the STM is put in a condition to request STM specific Test Procedure (could involve several interfaces, e.g. DMI & Train Interface)	Time-stamp of message including STM-21
Ts5	STM	Time-stamp of message including STM-22	Time-stamp of message including STM-23



## TEST CASE 11a.1

TEST CASE HEADER	
Test Case identification	Procedure STM Operational Tests
	11a.0.0
	Two consecutive Test Procedures requested by STM (in all relevant STM states)
ERTMS/ETCS on-board requirements tested	Subset-035: 10.9.1.1; 10.9.1.2
STM requirements tested	Subset-035: 10.9.1.3
Packets transmitted via FFFIS STM	STM-15, STM-21, STM-22, STM-23.
ERTMS/ETCS on-board configuration	
Comments and constraints	Test case for STM: Only applicable for STMs that use Test Procedure in PO, CO, DE, CS, HS and/or DA state



Starting Conditions	Value	Comments
STM State	PO/CO/DE/CS/HS/DA	Test case for ETCS: All of these STM states (several test executions) Test case for STM: All of these STM states in which the tested STM could request a Test Procedure (zero, one or several test executions)
ETCS Mode	Not relevant	Test case for ETCS: Shall be selected according to specific condition needed for ETCS.
ETCS Level	Not relevant	
Train State	Standstill	
Train Data	Not relevant	
Active DMI channel Connection	Not relevant	
Other DMI channels Connections	Not relevant	
TIU Connection	Not relevant	
BIU Connection	Not relevant	
JD Connection	Not relevant	
TIU Regenerative Brake Command	Not relevant	
TIU Magnetic Shoes Brake Command	Not relevant	
TIU Eddy Current Brake Command for Emergency Brake	Not relevant	
TIU Eddy Current Brake Command for Service Brake	Not relevant	
TIU Pantograph Command	Not relevant	
TIU Air Tightness Command	Not relevant	
TIU Main Switch / Circuit Breaker Command	Not relevant	
TIU Traction Cut Off Command	Not relevant	
TIU Traction Status	Not relevant	
TIU Direction Controller Position Status	Not relevant	
TIU Cab Status	Cab A active	
BIU Emergency Brake Command	Not relevant	
BIU Service Brake Command	Not relevant	
BIU Emergency Brake Status	Not relevant	
BIU Service Brake Status	Not relevant	

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NTC isolation status	Not relevant	
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# **Test case for ETCS On-board:**

Step	Description/Comments	Input I/F	Input time	Input Action	Output I/F	Output time limit	Output action
1.	ETCS receives Test Procedure Permission Request from STM.	PROF	T0	STM Control connection: Message 1: Packet STM-21 Test Procedure Permission Request Packet STM-15 State report from STM	PROF	Ts1	<b>No</b> message 6: Packet STM-14 State order to STM (FA)
2.	Test Procedure can be launched.	-	T1=T0+Ts1	ETCS is put in the needed specific conditions to accept STM request. This could involve several interfaces (DMI, Train Interface...).	PROF	Ts2	STM Control connection: Message 2: Packet STM-22 Test Procedure Permission <b>No</b> message 6: Packet STM-14 State order to STM (FA)
3.	Test Procedure ends	PROF	T2=T1+Ts2+5s	STM Control connection: Message 3: Packet STM-23 End of Test Procedure Packet STM-15 State report from STM	DMI	Ts3	ETCS displays the STM test result (specific layout)
					PROF	Ts3	<b>No</b> message 6: Packet STM-14 State order to STM (FA)
4.	ETCS receives another Test Procedure Permission Request from STM.	PROF	T3=T2+Ts3	STM Control connection: Message 7: Packet STM-21 Test Procedure Permission Request Packet STM-15 State report from STM	PROF	Ts1	<b>No</b> message 6: Packet STM-14 State order to STM (FA)
5.	The second Test Procedure can be launched.	-	T4=T3+Ts1	ETCS is put in the needed specific conditions to accept STM request. This could involve several interfaces (DMI, Train Interface...).	PROF	Ts2	STM Control connection: Message 2: Packet STM-22 Test Procedure Permission <b>No</b> message 6: Packet STM-14 State order to STM (FA)

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Step	Description/Comments	Input I/F	Input time	Input Action	Output I/F	Output time limit	Output action
6.	Test Procedure ends	PROF	T4+Ts2+5s	STM Control connection: Message 3: Packet STM-23 End of Test Procedure Packet STM-15 State report from STM	DMI	Ts3	ETCS displays the STM test result (specific layout)

#### **Test case for STM:**

Step	Description/Comments	Input I/F	Input time	Input Action	Output I/F	Output time limit	Output action
1.	STM wants to perform a test.	-	T0	A condition to trigger the need of STM test is fulfilled. This could involve several interfaces (DMI, Train Interface...).	PROF	Ts4	STM Control connection: Message 4: Packet STM-21 Test Procedure Permission Request Packet STM-15 State report from STM
2.	ETCS permits the STM test, STM performs it and reports the result of this test.	PROF	T0+Ts4+5s	STM Control connection: Message 2: Packet STM-22 Test Procedure Permission	PROF	Ts5	STM Control connection: Message 5: Packet STM-23 End of Test Procedure Packet STM-15 State report from STM

Note: the STM may request another Test Procedure Permission with another Test ID after the last step; this is out of scope of the Test Case.



Message 1: (STM => ETCS STM control function) Packet STM-21 Test Procedure Permission Request			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	When testing ETCS On-board a valid value should be used (same value for all messages used in the test).
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	FINITE VALUE	Value set according to the STM state used for the test execution
NID_PACKET	8	21	Test Procedure Permission Request
L_PACKET	13	COMPUTED	
NID_TEST	8	1	
PADDING_BITS	COMPUTED	NOT RELEVANT	Value not to be checked

Message 2: (ETCS STM control function => STM) Packet STM-22 Test Procedure Permission			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	Should be replaced by STM-1 ID when testing STM. When testing ETCS On-board a valid value should be used (same value for all messages used in the test).
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	22	Test Procedure Permission
L_PACKET	13	COMPUTED	
PADDING_BITS	COMPUTED	NOT RELEVANT	Value not to be checked

Message 3: (STM => ETCS STM control function) Packet STM-23 End of Test Procedure			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	When testing ETCS On-board a valid value should be used (same value for all messages used in the test).
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	FINITE VALUE	Value set according to the STM state used for the test execution
NID_PACKET	8	23	End of Test Procedure

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L_PACKET	13	COMPUTED	
M_TESTOK	1	1	Test(s) successful
L_TEXT	8	7	
X_TEXT(1)	8	'T'	
X_TEXT(2)	8	'e'	
X_TEXT(3)	8	's'	
X_TEXT(4)	8	't'	
X_TEXT(5)	8	' '	
X_TEXT(6)	8	'O'	
X_TEXT(7)	8	'K'	
PADDING_BITS	COMPUTED	NOT RELEVANT	Value not to be checked

Message 4: (STM => ETCS STM control function) Packet STM-21 Test Procedure Permission Request (generic)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	Should be replaced by STM-1 ID when testing STM.
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM This packet could be sent after packet 13.
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	FINITE VALUE	Value set according to the STM state used for the test execution
NID_PACKET	8	21	Test Procedure Permission Request
L_PACKET	13	COMPUTED	
NID_TEST	8	FINITE VALUE	
PADDING_BITS	COMPUTED	NOT RELEVANT	Value not to be checked

Message 5: (STM => ETCS STM control function) Packet STM-23 End of Test Procedure (generic)			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	Should be replaced by STM-1 ID when testing STM
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM This packet could be sent after packet 13.
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	FINITE VALUE	Value set according to the STM state used for the test execution

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NID_PACKET	8	23	End of Test Procedure
L_PACKET	13	COMPUTED	
M_TESTOK	1	FINITE VALUE	The test result is supplier-specific.
L_TEXT	8	FINITE VALUE	
X_TEXT(k)	8	FINITE VALUE	
PADDING_BITS	COMPUTED	NOT RELEVANT	Value not to be checked

Message 6: (ETCS STM control function => STM) Packet STM-14 State order to STM.			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	When testing ETCS On-board a valid value should be used (same value for all messages used in the test).
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	14	State order to STM
L_PACKET	13	COMPUTED	
NID_STMSTATEORDER	4	8	FA
PADDING_BITS	COMPUTED	NOT RELEVANT	Value not to be checked

Message 7: (STM => ETCS STM control function) Packet STM-21 Test Procedure Permission Request			
VARIABLE	Length	VALUE	COMMENTS
NID_STM	8	FINITE VALUE	When testing ETCS On-board a valid value should be used (same value for all messages used in the test).
L_MESSAGE	8	COMPUTED	
NID_PACKET	8	15	State report from STM
L_PACKET	13	COMPUTED	
NID_STMSTATE	4	FINITE VALUE	Value set according to the STM state used for the test execution
NID_PACKET	8	21	Test Procedure Permission Request
L_PACKET	13	COMPUTED	
NID_TEST	8	2	
PADDING_BITS	COMPUTED	NOT RELEVANT	Value not to be checked



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