X'TRAPOLIS MEGA

TEST REPORT

Photo not contractual¶

RELEASED		**X'TRAPOLIS MEGA**	Application: **PRASA**

Technical Modifications	Geometric Tolerances		A4		N

		Replaces :	Replaced by :

A0	Creation	
Index	Revision Notification no.	

		Date	Name	
	Prepared	14/03/2024	L. NGUBANE	
	Checked	14/03/2024	N. NDOVELA	**RTR Train Functional Dynamic Testing TS212 Report**
	Approved	14/03/2024	K. NKOANA	
		Date	Name	
		en		

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Table of Modifications

Rev	Date	Modifications Content	Writer
A0	14 March 2024	Creation	Lindani NGUBANE

Internal validations

	Name	Function	Date	Signature
Writer	Lindani NGUBANE	EPU Manager	14 March 2024	X _[signature]_ Lindani NGUBANE EPU Manager
Checker	Nkululeko NDOVELA	Test Engineering Manager	14 March 2024	X _[signature]_ Nkululeko NDOVELA Test Engineering Manager
Approver	Kgomotso NKOANA	Test Expert	14 March 2024	X _[signature]_ Kgomotso NKOANA Test Expert

Execution Plan

Start Date	12/03/2024
End Date	12/03/2024

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N°	Article TIS with Revision
1	Dynamic Train TS212 D3
1.1	DT Dynamic Test

1. Dynamic   D3 Train

1.1 Object

1.2 Modification Field

Include Eurobalise on the dynamic test track in procedure

1.3 DT Dynamic Test

1.3.1 Tool List

1.3.2 Authorization List

- High Voltage

1.3.3 Objective pass and fail criteria

Acceptance criteria are contained in each section below. The test shall be considered passed if each item is marked as "**OK**"

1.3.4 Instruction List

N°	Type	Instruction	OK/KO
10000	**I**	**Dynamic Test**	
10001	**I**	**Initial conditions**	
10002	I	This test shall be done under dry weather conditions i.e. no rain	OK
10003	I	This test shall be carried out on a straight rail(R>=700m). The track must be well bedded with a maximum gradient =<5% of 3 km length. The track must be dry and clean before commencing the test to prevent degraded adhesion conditions.	OK
10004	I	The catenary nominal voltage should be 3.3 +/- 0.3 kV DC.	OK
10005	I	The test must be done with a complete 6-car configuration Prasa X'Trapolis Train.	OK
10006	I	All routine static tests must be completed before commencing with this test, unless authorization has been given by Management	OK
10007	I	Dynamic Pre-Test has been completed	OK
10008	I	The test shall be performed in M1 load configuration	OK
10009	I	Have a service laptop ready with Train Tracer installed and loaded with the dashboard below	OK
10010	A	DYNAMIC Dashboard.xml	OK
10011	I	Refer to this image for all lamp in alarm module	OK
10012	A	indicator module.jpg	OK
10013	**I**	**Initial Conditions**	
10014	I	Deadman switch 60S1 is in NORMAL position on both TC cars	OK
10015	I	The Traction Isolation switch 22S1 should be in NORMAL position on both TC	OK

		cars	
10016	A	Put the ERTMS switch 62S1 in ISOLATION position in both TC cars	OK
10017	A	Apply the Safety procedure for movements before starting the test below	OK
10018	I	All traction units are in black colour on the DDU maintenance screen	OK
10019	A	Prepare the train in high voltage with active cab on TC1	OK
10020	*R*	*BKT_LineVoltageGl 2700 <(3232.799) ()*	*OK*
10021	**I**	**Movement preparation**	
10022	A	Put the switch 45S1 to 0 position to release the parking brake	OK
10023	A	Select Driving Mode to EFFORT position	OK
10024	A	Put the direction selector switch in FORWARD position in TC1	OK
10025	*R*	*Lamp 31H1 is ON on the alarm module*	*OK*
10026	*R*	*TA appears on DDU screen*	*OK*
10027	A	Write (TBCU1) DSP2_WR_inv_B_inv_on = '0'	OK
10028	A	Write (TBCU2) DSP2_WR_inv_B_inv_on = '0'	OK
10029	A	Write (TBCU3) DSP2_WR_inv_B_inv_on = '0'	OK
10030	A	Write (TBCU4) DSP2_WR_inv_B_inv_on = '0'	OK
10031	A	Slowly move the Master Controller to TRACTION position	OK
10032	*R*	*The train does not move*	*OK*
10033	*R*	*Just read (MPU1) BKT_Tbcu1EffAchPerc = '0'*	*OK*
10034	*R*	*Just read (MPU1) BKT_Tbcu2EffAchPerc = '0'*	*OK*
10035	*R*	*Just read (MPU1) BKT_Tbcu3EffAchPerc = '0'*	*OK*
10036	*R*	*Just read (MPU1) BKT_Tbcu4EffAchPerc = '0'*	*OK*
10037	A	Authorize (TBCU1) DSP2_WR_inv_B_inv_on	OK
10038	A	Authorize (TBCU2) DSP2_WR_inv_B_inv_on	OK
10039	A	Authorize (TBCU3) DSP2_WR_inv_B_inv_on	OK
10040	A	Authorize (TBCU4) DSP2_WR_inv_B_inv_on	OK
10041	A	Put the direction selector switch in NEUTRAL position in TC1	OK
10042	*R*	*Just read (MPU1) bcu1_tlneb = '0'*	*OK*
10043	*R*	*Just read (MPU1) li_drc_tc1dsnozeror1 = '0'*	*OK*
10044	A	Put the direction selector switch to FORWARD and again in NEUTRAL position to reset the emergency brake	OK
10045	**I**	**Traction and Electric Brake - Wheel Turn Test**	
10046	A	Prepare and run Dynamic dashboard	OK
10047	A	Record and SAVE the above dashboard for each car	OK
10048	**I**	**Traction and Brake M4 - Wheel Turn Test**	
10049	A	Write (TBCU1) DSP2_WR_inv_B_inv_on = '0'	OK
10050	A	Write (TBCU2) DSP2_WR_inv_B_inv_on = '0'	OK
10051	A	Write (TBCU3) DSP2_WR_inv_B_inv_on = '0'	OK

10052	R	*Just read (MPU1) BKT_Tbcu1TcuDrinC1 = '1'*	*OK*
10053	R	*Just read (MPU1) BKT_Tbcu2TcuDrinC2 = '1'*	*OK*
10054	R	*Just read (MPU1) BKT_Tbcu3TcuDrinC3 = '1'*	*OK*
10055	R	*Just read (MPU1) BKT_Tbcu4TcuDrinC4 = '1'*	*OK*
10056	A	Put the direction selector switch in FORWARD position	OK
10057	A	Put the Master controller in 100% TRACTION immediately, accelerate to speed 15 km/h	OK
10058	R	*The train is moving forward towards TC1 direction*	*OK*
10059	R	*(MPU1) BKT_Tbcu4EffAchPerc 1 <(100) ()*	*OK*
10060	R	*Just read (MPU1) BKT_Tbcu2EffAchPerc = '0'*	*OK*
10061	R	*Just read (MPU1) BKT_Tbcu3EffAchPerc = '0'*	*OK*
10062	R	*Just read (MPU1) BKT_Tbcu1EffAchPerc = '0'*	*OK*
10063	I	For FOWARD direction: Speed sensor 1 axle 1 (+) Speed sensor 2 axle 1 (direction) (-) Speed sensor axle 2 (+) Speed sensor axle 3 (+) Speed sensor axle 4 (+)	OK
10064	R	*(TBCU4) dsp2_rd_inv_fq_axle0_4 1 <(8.440751) ()*	*OK*
10065	R	*(TBCU4) dsp2_rd_inv_fq_axle1_4 (-8.986366) <0 ()*	*OK*
10066	R	*(TBCU4) dsp2_rd_inv_fq_axle2_4 1 <(9.549905) ()*	*OK*
10067	R	*(TBCU4) dsp2_rd_inv_fq_axle3_4 1 <(9.876692) ()*	*OK*
10068	R	*(TBCU4) dsp2_rd_inv_fq_axle4_4 1 <(10.1863) ()*	*OK*
10069	A	Put the Master controller in BRAKE position until the train comes to a complete stop	OK
10070	A	Put the direction selector switch in REVERSE position	OK
10071	A	Put the Master controller in TRACTION position and slowly accelerate to speed <5 km/h	OK
10072	R	*The train is moving backward towards TC2 direction*	*OK*
10073	R	*(TBCU4) dsp2_rd_inv_fq_axle0_4 (-2.383871) <0 ()*	*OK*
10074	R	*(TBCU4) dsp2_rd_inv_fq_axle1_4 1 <(2.53569) ()*	*OK*
10075	A	Put the Master controller in BRAKE position until the train comes to a complete stop	OK
10076	A	Authorize (TBCU1) DSP2_WR_inv_B_inv_on	OK
10077	**I**	**Traction and Brake M1 - Wheel Turn Test**	
10078	A	Write (TBCU4) DSP2_WR_inv_B_inv_on = '0'	OK
10079	A	Put the direction selector switch in FORWARD position	OK
10080	A	Put the Master controller in 100% TRACTION immediately, accelerate to speed 15 km/h	OK
10081	R	*The train is moving forward towards TC1 direction*	*OK*
10082	R	*(MPU1) BKT_Tbcu1EffAchPerc 1 <(100) ()*	*OK*
10083	R	*Just read (MPU1) BKT_Tbcu2EffAchPerc = '0'*	*OK*
10084	R	*Just read (MPU1) BKT_Tbcu3EffAchPerc = '0'*	*OK*

10085	R	*Just read (MPU1) BKT_Tbcu4EffAchPerc = '0'*	*OK*
10086	R	*(TBCU1) dsp2_rd_inv_fq_axle0_1 1 <(4.405733) ()*	*OK*
10087	R	*(TBCU1) dsp2_rd_inv_fq_axle1_1 (-4.605863) <0 ()*	*OK*
10088	R	*(TBCU1) dsp2_rd_inv_fq_axle2_1 1 <(4.853905) ()*	*OK*
10089	R	*(TBCU1) dsp2_rd_inv_fq_axle3_1 1 <(5.103804) ()*	*OK*
10090	R	*(TBCU1) dsp2_rd_inv_fq_axle4_1 1 <(5.42696) ()*	*OK*
10091	A	Put the Master controller in BRAKE position until the train comes to a complete stop	OK
10092	A	Put the direction selector switch in REVERSE position	OK
10093	A	Put the Master controller in TRACTION position and slowly accelerate to speed <5 km/h	OK
10094	R	*The train is moving backward towards TC2 direction*	*OK*
10095	R	*(TBCU1) dsp2_rd_inv_fq_axle0_1 (-0.43794) <0 ()*	*OK*
10096	R	*(TBCU1) dsp2_rd_inv_fq_axle1_1 1 <(1.433186) ()*	*OK*
10097	A	Put the Master controller in BRAKE position until the train comes to a complete stop	OK
10098	A	Authorize (TBCU2) DSP2_WR_inv_B_inv_on	OK
10099	**I**	**Traction and Brake M2 - Wheel Turn Test**	
10100	A	Write (TBCU1) DSP2_WR_inv_B_inv_on = '0'	OK
10101	A	Put the direction selector switch in FORWARD position	OK
10102	A	Put the Master controller in 100% TRACTION immediately, accelerate to speed 15 km/h	OK
10103	R	*The train moves forward towards TC1 direction*	*OK*
10104	R	*Just read (MPU1) BKT_Tbcu1EffAchPerc = '0'*	*OK*
10105	R	*(MPU1) BKT_Tbcu2EffAchPerc 1 <(100) ()*	*OK*
10106	R	*Just read (MPU1) BKT_Tbcu3EffAchPerc = '0'*	*OK*
10107	R	*Just read (MPU1) BKT_Tbcu4EffAchPerc = '0'*	*OK*
10108	R	*(TBCU2) dsp2_rd_inv_fq_axle0_2 (-1.994247) <0 ()*	*OK*
10109	R	*(TBCU2) dsp2_rd_inv_fq_axle1_2 1 <(2.360904) ()*	*OK*
10110	R	*(TBCU2) dsp2_rd_inv_fq_axle2_2 1 <(2.71968) ()*	*OK*
10111	R	*(TBCU2) dsp2_rd_inv_fq_axle3_2 1 <(3.240905) ()*	*OK*
10112	R	*(TBCU2) dsp2_rd_inv_fq_axle4_2 1 <(3.570296) ()*	*OK*
10113	A	Put the Master controller in BRAKE position until the train comes to a complete stop	OK
10114	A	Put the direction selector switch in REVERSE position	OK
10115	A	Put the Master controller in TRACTION position and slowly accelerate to speed <5 km/h	OK
10116	R	*The train moves backward towards TC2 direction*	*OK*
10117	R	*(TBCU2) dsp2_rd_inv_fq_axle0_2 1 <(2.389394) ()*	*OK*
10118	R	*(TBCU2) dsp2_rd_inv_fq_axle1_2 (-2.535899) <0 ()*	*OK*
10119	A	Put the Master controller in BRAKE position until the train comes to a complete stop	OK

10120	A	Authorize (TBCU3) DSP2_WR_inv_B_inv_on	OK
10121	**I**	**Traction and Brake M3 - Wheel Turn Test**	
10122	A	Write (TBCU2) DSP2_WR_inv_B_inv_on = '0'	OK
10123	A	Put the direction selector switch in FORWARD position	OK
10124	A	Put the Master controller in 100% TRACTION immediately, accelerate to speed 15 km/h	OK
10125	*R*	*The train moves forward towards TC1 direction*	*OK*
10126	*R*	*Just read (MPU1) BKT_Tbcu1EffAchPerc = '0'*	*OK*
10127	*R*	*Just read (MPU1) BKT_Tbcu2EffAchPerc = '0'*	*OK*
10128	*R*	*(MPU1) BKT_Tbcu3EffAchPerc 1 <(100) ()*	*OK*
10129	*R*	*Just read (MPU1) BKT_Tbcu4EffAchPerc = '0'*	*OK*
10130	*R*	*(TBCU3) dsp2_rd_inv_fq_axle0_3 (-5.001571) <0 ()*	*OK*
10131	*R*	*(TBCU3) dsp2_rd_inv_fq_axle1_3 1 <(5.332344) ()*	*OK*
10132	*R*	*(TBCU3) dsp2_rd_inv_fq_axle2_3 1 <(5.609605) ()*	*OK*
10133	*R*	*(TBCU3) dsp2_rd_inv_fq_axle3_3 1 <(5.843353) ()*	*OK*
10134	*R*	*(TBCU3) dsp2_rd_inv_fq_axle4_3 1 <(6.197832) ()*	*OK*
10135	A	Put the Master controller in BRAKE position until the train comes to a complete stop	OK
10136	A	Put the direction selector switch in REVERSE position	OK
10137	A	Put the Master controller in TRACTION position and slowly accelerate to speed <5 km/h	OK
10138	*R*	*The train moves backward towards TC2 direction*	*OK*
10139	*R*	*(TBCU3) dsp2_rd_inv_fq_axle0_3 1 <(1.796352) ()*	*OK*
10140	*R*	*(TBCU3) dsp2_rd_inv_fq_axle1_3 (-1.946663) <0 ()*	*OK*
10141	A	Put the Master controller in BRAKE position until the train comes to a complete stop	OK
10142	**I**	**Wheel Turn Test Results Check**	
10143	A	Analyze the recorded results before continuing with the test. If the results are out of range, the test must be STOPPED immediately and the respective car motor wiring needs to be checked.	OK
10144	*R*	*M4 - Time taken to reach 15km/h = 24 > (19)(s)*	*OK*
10145	*R*	*M1 - Time taken to reach 15km/h = 24 > (20)(s)*	*OK*
10146	*R*	*M2 - Time taken to reach 15km/h = 24 > (20.3)(s)*	*OK*
10147	*R*	*M3 - Time taken to reach 15km/h = 24 > (19.8)(s)*	*OK*
10148	*R*	*All M cars reach 15km/h in less than 24 seconds*	*OK*
10149	**I**	**All Motors Test Run**	
10150	A	Authorize (TBCU1) DSP2_WR_inv_B_inv_on	OK
10151	A	Authorize (TBCU2) DSP2_WR_inv_B_inv_on	OK
10152	A	Authorize (TBCU4) DSP2_WR_inv_B_inv_on	OK
10153	A	Put the direction selector switch in FORWARD position	OK
10154	A	Slowly move the Master Controller to TRACTION position until the train speed reaches 15km/h	OK

10155	R	*Just read (MPU1) bcu1_tlneb = '1'*	OK
10156	R	*Just read (MPU1) li_drc_tc1dsnozeror1 = '1'*	OK
10157	A	Put the Master Controller in OFF position	OK
10158	R	*The train comes to a standstill*	OK
10159	**I**	**Wheel Diameter Calibration**	
10160	I	Following conditions need to be met in order to successfully calibrate the wheel diameter. Ensure that the OTDR reference value of a Wheel Diameter has been entered.	OK
10161	A	1) Train running on a straight track 2) Effort Driving Mode 3) Speed>15km/h 4) No wheel slippage 5) No Emergency Braking 6) Traction Effort = 0% (Coasting) 7) All Traction and Braking Units are working	OK
10162	A	On the DDU screen select "First Acquisition Request"	OK
10163	A	Check if the wheel diameter for each axle is between 838 mm and 842 mm. See the diagram below	OK
10164	A		OK
10165	R	*(MPU1) BKT_Bcu1WhDiamAx1 839 < (840) <841 (*	OK
10166	R	*(MPU1) BKT_Bcu1WhDiamAx2 839 < (840) <841 (*	OK
10167	R	*(MPU1) BKT_Bcu1WhDiamAx3 839 < (840) <841 (*	OK
10168	R	*(MPU1) BKT_Bcu1WhDiamAx4 839 < (840) <841 (*	OK
10169	R	*(MPU1) BKT_Bcu2WhDiamAx1 839 < (840) <841 (*	OK
10170	R	*(MPU1) BKT_Bcu2WhDiamAx2 839 < (840) <841 (*	OK
10171	R	*(MPU1) BKT_Bcu2WhDiamAx3 839 < (840) <841 (*	OK
10172	R	*(MPU1) BKT_Bcu2WhDiamAx4 839 < (840) <841 (*	OK
10173	R	*(MPU1) BKT_Tbcu1WhDiamAx1 839 < (839) <841 (*	OK
10174	R	*(MPU1) BKT_Tbcu1WhDiamAx2 839 < (840) <841 (*	OK
10175	R	*(MPU1) BKT_Tbcu1WhDiamAx3 839 < (840) <841 (*	OK
10176	R	*(MPU1) BKT_Tbcu1WhDiamAx4 839 < (840) <841 (*	OK
10177	R	*(MPU1) BKT_Tbcu2WhDiamAx1 839 < (839) <841 (*	OK
10178	R	*(MPU1) BKT_Tbcu2WhDiamAx2 839 < (840) <841 (*	OK
10179	R	*(MPU1) BKT_Tbcu2WhDiamAx3 839 < (840) <841 (*	OK
10180	R	*(MPU1) BKT_Tbcu2WhDiamAx4 839 < (840) <841 (*	OK
10181	R	*(MPU1) BKT_Tbcu3WhDiamAx1 839 < (840) <841 (*	OK
10182	R	*(MPU1) BKT_Tbcu3WhDiamAx2 839 < (840) <841 (*	OK
10183	R	*(MPU1) BKT_Tbcu3WhDiamAx3 839 < (840) <841 (*	OK
10184	R	*(MPU1) BKT_Tbcu3WhDiamAx4 839 < (840) <841 (*	OK

10185	R	*(MPU1) BKT_Tbcu4WhDiamAx1 839 < (839) <841 (*	*OK*
10186	R	*(MPU1) BKT_Tbcu4WhDiamAx2 839 < (840) <841 (*	*OK*
10187	R	*(MPU1) BKT_Tbcu4WhDiamAx3 839 < (840) <841 (*	*OK*
10188	R	*(MPU1) BKT_Tbcu4WhDiamAx4 839 < (840) <841 (*	*OK*
10189	**I**	**Brake Tests**	
10190	I	For each test run, ensure the following are done: -Prepare the dashboard on train tracer to record train performance -Activate the relevant cab -Login to DDU as Maintainer (70979080) -Save each performance (only for speed of 60Km/h) result as .CVS on local drive of service laptop -Ensure there is enough space remaining for each run, else put the train at the end of the line -From 40km/h tests IT IS FORBIDDEN to do more than one run at a time on the track, each run should start at the beginning/end of the track	OK
10191	I	Initial Conditions for each car: -ERTMS is ISOLATED -Driving mode set to EFFORT mode	OK
10192	I	ALL the brake tests should be done from the extremities of the test track	OK
10193	**I**	**Emergency Brake @ 20km/h TC1**	
10194	A	Write SBK_BrakeDist = '0'	OK
10195	A	Authorize SBK_BrakeDist	OK
10196	A	Put the direction selector switch in FORWARD position	OK
10197	A	Put the Master Controller in MAX TRACTION position until the train speed reaches 20 +/- 2 km/h	OK
10198	A	Push the emergency brake mushroom button 44S1	OK
10199	R	*Brake Distance SBK_BrakeDist (28) <42 (m)*	*OK*
10200	A	Put the direction selector switch in NEUTRAL position	OK
10201	A	Release the emergency brake button 44S1	OK
10202	**I**	**Service Brake @ 30km/h TC1**	
10203	A	Write SBK_BrakeDist = '0'	OK
10204	A	Authorize SBK_BrakeDist	OK
10205	A	Put the direction selector switch in FORWARD position	OK
10206	A	Put the Master Controller in MAX TRACTION position until the train speed reaches 30 +/- 2 km/h	OK
10207	A	Put the Master Controller in 100% BRAKE position	OK
10208	R	*Brake Distance SBK_BrakeDist (46) <87 (m)*	*OK*
10209	A	Put the direction selector switch in NEUTRAL position	OK
10210	**I**	**Emergency Brake @ 40km/h TC1**	
10211	A	Write SBK_BrakeDist = '0'	OK
10212	A	Authorize SBK_BrakeDist	OK
10213	A	Put the direction selector switch in FORWARD position	OK
10214	A	Put the Master Controller in MAX TRACTION position until the train speed reaches 40 +/- 2 km/h	OK

10215	A	Push the emergency brake mushroom button 44S1	OK
10216	R	*Brake Distance SBK_BrakeDist (55) <80 (m)*	*OK*
10217	A	Put the direction selector switch in NEUTRAL position	OK
10218	A	Release the emergency brake button 44S1	OK
10219	**I**	**Service Brake @ 20km/h TC2**	
10220	A	Write SBK_BrakeDist = '0'	OK
10221	A	Authorize SBK_BrakeDist	OK
10222	A	Put the direction selector switch in FORWARD position	OK
10223	A	Put the Master Controller in MAX TRACTION position until the train speed reaches 20 +/- 2 km/h	OK
10224	A	Put the Master Controller in OFF position	OK
10225	R	*Brake Distance SBK_BrakeDist (16) <60 (m)*	*OK*
10226	A	Put the direction selector switch in NEUTRAL position	OK
10227	**I**	**Emergency Brake @ 30km/h TC2**	
10228	A	Write SBK_BrakeDist = '0'	OK
10229	A	Authorize SBK_BrakeDist	OK
10230	A	Put the direction selector switch in FORWARD position	OK
10231	A	Put the Master Controller in MAX TRACTION position until the train speed reaches 30 +/- 2 km/h	OK
10232	A	Put the Master Controller in OFF position	OK
10233	A	Push the emergency brake mushroom button 44S1	OK
10234	R	*Brake Distance SBK_BrakeDist (48) <62 (m)*	*OK*
10235	A	Put the direction selector switch in NEUTRAL position	OK
10236	A	Release the emergency brake button 44S1	OK
10237	**I**	**Service Brake @ 40km/h TC2**	
10238	A	Write SBK_BrakeDist = '0'	OK
10239	A	Authorize SBK_BrakeDist	OK
10240	A	Put the direction selector switch in FORWARD position	OK
10241	A	Put the Master Controller in MAX TRACTION position until the train speed reaches 40 +/- 2 km/h	OK
10242	A	Put the Master Controller in 100% BRAKE position	OK
10243	R	*Brake Distance SBK_BrakeDist (60) <113 (m)*	*OK*
10244	A	Put the direction selector switch in NEUTRAL position	OK
10245	**I**	**ERTMS Dynamic**	
10246	A	Put the ERTMS switch 62S1 in NORMAL position in both TC cars	OK
10247	A	Active cab on TC1	OK
10248	A	Use the procedure attached below for ERTMS dynamic commissioning	OK
10249	A	ERTMS_Dynamic Procedure.pdf	OK
10250	R	*Dynamic ERTMS commissioning has been completed successfully*	*OK*
10251	**I**	**HIGH SPEED TEST**	

10252	I	For each and the following high speed test make sure that the train is positioned at the start of the track,and the driver can see the Eurobalise on the track as shown in the picture below.	OK
10253	A		OK
10254	**I**	**Service Brake @ 50km/h TC1**	
10255	A	Use maintenance code (70979080) to log into DMI screen and do start of mission	OK
10256	A	Write SBK_BrakeDist = '0'	OK
10257	A	Authorize SBK_BrakeDist	OK
10258	A	Put the direction selector switch in FORWARD position	OK
10259	A	Put the Master Controller in MAX TRACTION position until the train speed reaches 50 +/- 2 km/h	OK
10260	A	Put the Master Controller in 100% BRAKE position	OK
10261	*R*	*Brake Distance SBK_BrakeDist (97) <142 (m)*	*OK*
10262	A	Put the direction selector switch in NEUTRAL position	OK
10263	**I**	**Emergency Brake @ 50km/h TC2**	
10264	A	Use maintenance code (70979080) to log into DMI screen and do start of mission	OK
10265	A	Write SBK_BrakeDist = '0'	OK
10266	A	Authorize SBK_BrakeDist	OK
10267	A	Put the direction selector switch in FORWARD position	OK
10268	A	Put the Master Controller in MAX TRACTION position until the train speed reaches 50 +/- 2 km/h	OK
10269	A	Push the emergency brake mushroom button 44S1	OK
10270	*R*	*Brake Distance SBK_BrakeDist (81) <100 (m)*	*OK*
10271	A	Put the direction selector switch in NEUTRAL position	OK
10272	A	Release the emergency brake button 44S1	OK
10273	I	For the following tests, ensure the dashboard is running and record each results and save each file as .CSV	OK
10274	**I**	**Service Brake @ 60km/h TC1**	
10275	A	Use maintenance code (70979080) to log into DMI screen and do start of mission	OK
10276	A	Put the train in starting position on the track	OK
10277	A	Write SBK_BrakeDist = '0'	OK
10278	A	Authorize SBK_BrakeDist	OK
10279	A	Put the direction selector switch in FORWARD position	OK
10280	A	Put the Master Controller in MAX TRACTION position until the train speed reaches 60 +/- 2 km/h	OK
10281	A	Put the Master Controller in 100% BRAKE position	OK
10282	*R*	*Brake Distance SBK_BrakeDist (128) <171 (m)*	*OK*
10283	A	Put the direction selector switch in NEUTRAL position	OK

10284	I	**Service Brake @ 60km/h TC2**	
10285	A	Use maintenance code (70979080) to log into DMI screen and do start of mission	OK
10286	A	Write SBK_BrakeDist = '0'	OK
10287	A	Authorize SBK_BrakeDist	OK
10288	A	Put the direction selector switch in FORWARD position	OK
10289	A	Put the Master Controller in MAX TRACTION position until the train speed reaches 60 +/- 2 km/h	OK
10290	A	Put the Master Controller in 100% BRAKE position	OK
10291	*R*	*Brake Distance SBK_BrakeDist (144) <171 (m)*	*OK*
10292	A	Put the direction selector switch in NEUTRAL position	OK
10293	**I**	**Emergency brake @ 60kh/h TC1**	
10294	A	Use maintenance code (70979080) to log into DMI screen and do start of mission	OK
10295	A	Write SBK_BrakeDist = '0'	OK
10296	A	Authorize SBK_BrakeDist	OK
10297	A	Put the direction selector switch in FORWARD position	OK
10298	A	Put the Master Controller in MAX TRACTION position until the train speed reaches 60 +/- 2 km/h	OK
10299	A	Push the emergency brake mushroom button 44S1	OK
10300	*R*	*Brake Distance SBK_BrakeDist (119) <121 (m)*	*OK*
10301	A	Put the direction selector switch in NEUTRAL position	OK
10302	A	Release the emergency brake button 44S1	OK
10303	A	Put the train at the end of the line	OK
10304	I	Remember to save the .csv result file on the local drive of the PC used	OK
10305	**I**	**Emergency brake @ 60km/h TC2**	
10306	A	Use maintenance code (70979080) to log into DMI screen and do start of mission	OK
10307	A	Write SBK_BrakeDist = '0'	OK
10308	A	Authorize SBK_BrakeDist	OK
10309	A	Put the direction selector switch in FORWARD position	OK
10310	A	Put the Master Controller in MAX TRACTION position until the train speed reaches 60 +/- 2 km/h	OK
10311	A	Push the emergency brake mushroom button 44S1	OK
10312	*R*	*Brake Distance SBK_BrakeDist (117) <121 (m)*	*OK*
10313	A	Release the emergency brake button 44S1	OK
10314	A	Put the direction selector switch in NEUTRAL position	OK
10315	I	Remember to save the .csv result file on the local drive of the PC used	OK
10316	**I**	**Degraded mode @60 km/h TC1**	
10317	A	Use maintenance code (70979080) to log into DMI screen and do start of mission	OK
10318	I	Degraded mode simulation	OK

10319	A	Write (TBCU1) f55_b_br_auth = '0'	OK
10320	A	Write (TBCU2) f55_b_br_auth = '0'	OK
10321	A	Write (TBCU3) f55_b_br_auth = '0'	OK
10322	A	Write (TBCU4) f55_b_br_auth = '0'	OK
10323	A	Put the direction selector switch in FORWARD position	OK
10324	*R*	*Lamp 31H1 is ON on the alarm module*	*OK*
10325	*R*	*TA appears on DDU screen*	*OK*
10326	A	Prepare the dashboard on Train Tracer to record the train performance	OK
10327	A	Write SBK_BrakeDist = '0'	OK
10328	A	Authorize SBK_BrakeDist	OK
10329	A	Put the Master Controller in MAX TRACTION position until the train speed reaches 60 +/- 2 km/h	OK
10330	A	Put the Master Controller in 100% BRAKE position	OK
10331	*R*	*Brake Distance SBK_BrakeDist (154) <171 (m)*	*OK*
10332	A	Put the train at the end of the line	OK
10333	I	Remember to save the .csv result file on the local drive of the PC used	OK
10334	**I**	**Degraded mode @ 60km/h TC2**	
10335	A	Use maintenance code (70979080) to log into DMI screen and do start of mission	OK
10336	A	Put the direction selector switch in FORWARD position	OK
10337	*R*	*Lamp 31H1 is ON on the alarm module*	*OK*
10338	*R*	*TA appears on DDU screen*	*OK*
10339	A	Prepare the dashboard on Train Tracer to record the train performance	OK
10340	A	Write SBK_BrakeDist = '0'	OK
10341	A	Authorize SBK_BrakeDist	OK
10342	A	Put the Master Controller in MAX TRACTION position until the train speed reaches 60 +/- 2 km/h	OK
10343	A	Put the Master Controller in 100% BRAKE position	OK
10344	*R*	*Brake Distance SBK_BrakeDist (159) <171 (m)*	*OK*
10345	A	Authorize (TBCU1) f55_b_br_auth	OK
10346	A	Authorize (TBCU2) f55_b_br_auth	OK
10347	A	Authorize (TBCU3) f55_b_br_auth	OK
10348	A	Authorize (TBCU4) f55_b_br_auth	OK
10349	I	Remember to save the .csv result file on the local drive of the PC used	OK
10350	A	Put the train at the end of the line	OK
10351	**I**	**Normal service brake operation**	
10352	A	Active cab on TC1	OK
10353	A	Put the direction selector switch in FORWARD position	OK
10354	*R*	*Lamp 31H1 is ON on the alarm module*	*OK*
10355	*R*	*TA appears on DDU screen*	*OK*

10356	A	Put the Master controller in TRACTION position until the train speed reaches 10km/h	OK
10357	A	Put the Master controller in LOW BRAKE position until the train reaches a speed less than 3km/h	OK
10358	*R*	*Just read (BCU1) LI_NOT_INHIB = '0'*	*OK*
10359	*R*	*Just read (BCU2) LI_NOT_INHIB = '0'*	*OK*
10360	*R*	*Just read (TBCU1) LI_NOT_INHIB = '0'*	*OK*
10361	*R*	*Just read (TBCU2) LI_NOT_INHIB = '0'*	*OK*
10362	*R*	*Just read (TBCU3) LI_NOT_INHIB = '0'*	*OK*
10363	*R*	*Just read (TBCU4) LI_NOT_INHIB = '0'*	*OK*
10364	A	Put the Master controller in OFF position	OK
10365	*R*	*Observe that the train continues to brake until it comes to a complete stop*	*OK*
10366	*R*	*(BCU1) AO_SERV_BRAKE 1.2 <(38.63683) ()*	*OK*
10367	*R*	*(BCU2) AO_SERV_BRAKE 1.2 <(38.64318) ()*	*OK*
10368	*R*	*(TBCU1) AO_SERV_BRAKE 1.2 <(38.62624) ()*	*OK*
10369	*R*	*(TBCU2) AO_SERV_BRAKE 1.2 <(38.63416) ()*	*OK*
10370	*R*	*(TBCU3) AO_SERV_BRAKE 1.2 <(38.63162) ()*	*OK*
10371	*R*	*(TBCU4) AO_SERV_BRAKE 1.2 <(38.63192) ()*	*OK*
10372	A	Put the ERTMS switch 62S1 in ISOLATION position in both TC cars	OK
10373	**I**	**Brake Distances Results**	
10374	A	Zip All the recorded CSV files of Braking distances into one folder and upload Rename the folder as: TSXXX_BrakingDistances	OK
10375	*R*		*OK*
10376	**I**	**Train Acceleration Results**	
10377	A	Use the following spreadsheet to calculate the acceleration	OK
10378	A	Acceptance and Dynamic Template.xlsx	OK
10379	A	On the recorded dashboard, check how long it takes to reach 55km/h from Rec_speed>0 using Trace CSV software. Delta T (s) Delta V (km/h)	OK
10380	*R*	*TC1 Acceleration = 0.85 < (0.902)(m/s²)*	*OK*
10381	*R*	*TC2 Acceleration = 0.85 < (0.918)(m/s²)*	*OK*
10382	**I**	**25km/h Speed limit in Reverse Direction**	
10383	A	Active Cab in TC1	OK
10384	A	Select Driving Mode to EFFORT position	OK
10385	A	Put the direction selector switch in REVERSE position	OK
10386	A	Put the Master controller in 100% Traction position	OK
10387	*R*	*The maximum train speed reached is 25km/h*	*OK*
10388	A	Put the Master controller in OFF position	OK
10389	*R*	*The train comes to a complete stop*	*OK*
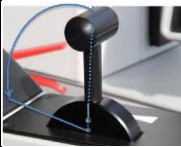
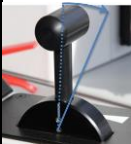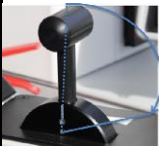| 10390	A	Put the direction selector switch in NEUTRAL position	OK
10391	A	Remove active cab in TC1	OK
10392	**I**	**25km/h Speed limit in Reverse Direction**	
10393	A	Active Cab in TC2	OK
10394	A	Select Driving Mode to EFFORT position	OK
10395	A	Put the direction selector switch in REVERSE position	OK
10396	A	Put the Master controller in 100% Traction position	OK
10397	*R*	*The maximum train speed reached is 25km/h*	*OK*
10398	A	Put the Master controller in OFF position	OK
10399	*R*	*The train comes to a complete stop*	*OK*
10400	A	Put the direction selector switch in NEUTRAL position	OK
10401	**I**	**DEPOT mode speed limit TC1**	
10402	A	Put the driving mode switch in DEPOT position	OK
10403	A	Put the direction selector switch in FORWARD position	OK
10404	A	Put the Master controller in 100% Traction position	OK
10405	*R*	*The maximum train speed reached is 15km/h*	*OK*
10406	A	Put the Master controller in OFF position	OK
10407	*R*	*The train comes to a complete stop*	*OK*
10408	A	Put the direction selector switch in NEUTRAL position	OK
10409	**I**	**DEPOT mode speed limit TC2**	
10410	A	Active cab on TC2	OK
10411	A	Put the driving mode switch in DEPOT position	OK
10412	A	Put the direction selector switch in FORWARD position	OK
10413	A	Put the Master controller in 100% Traction position	OK
10414	*R*	*The maximum train speed reached is 15km/h*	*OK*
10415	A	Put the Master controller in OFF position	OK
10416	*R*	*The train comes to a complete stop*	*OK*
10417	A	Put the direction selector switch in NEUTRAL position	OK
10418	A	Remove active cab on TC2	OK
10419	**I**	**Doors**	
10420	**I**	**Test 04 - PEA activation and override within timeout [PRASA-40-Val-2]**	
10421	A	Put the Master controller in TRACTION position and accelerate the train up to 10km/h	OK
10422	A	Press Left and Right Door Authorization Buttons (50S6 and 50S5)	OK
10423	*R*	*When train is running above 5km/h it is not possible to get Door Authorization.*	*OK*
10424	A	Pull any PEA on the train	OK
10425	A	Before 10s elapses with PEA pulled, press the button 44S5 to override the PEA	OK
10426	*R*	*TA lamp is ON*	*OK*

10427	A	Apply brake until the complete stop of the Train.	OK
10428	A	Reset PEA using the switch 44S6	OK
10429	**I**	**Test 06 - PEA activation with timeout respected [PRASA-40-Val-1]**	
10430	A	Put the Master controller in TRACTION position and accelerate the train up to 10km/h	OK
10431	A	Pull another PEA on the train	OK
10432	*R*	*After 10s with PEA pulled, Emergency Brakes should be applied.*	*OK*
10433	A	Put the Master controller in OFF position	OK
10434	A	Press the button 54S3 twice to acknowledge the PEA	OK
10435	A	Reset PEA using the switch 44S6	OK
10436	A	Release Emergency Brakes	OK
10437	**I**	**Test 05 - PEA activation with Train speed lower than 5 km/h [PRASA-40-Val-4]**	
10438	A	Put the Master controller in TRACTION position, pull any PEA on the train before the train speed reaches 5km/h	OK
10439	*R*	*An alarm appears on DDU screen warning that a PEA was pulled*	*OK*
10440	*R*	*TA lamp turns OFF*	*OK*
10441	*R*	*Emergency Brake is applied*	*OK*
10442	A	Press the button 54S3 twice to acknowledge the PEA	OK
10443	A	Reset the PEA using switch 44S6	OK
10444	A	Open and close the doors on the side where the PEA was pulled	OK
10445	*R*	*All doors are closed on DDU screen*	*OK*
10446	A	Put the Master controller in OFF position	OK
10447	A	Reset Emergency Brakes	OK
10448	**I**	**Test 07 - PEA activation with reset PEA switch permanently active [PRASA-40-Val-3]**	
10449	A	Write (MPU1) lo_ubk_tc1resetpea = '1.0'	OK
10450	A	Accelerate the train up to 10 km/h.	OK
10451	A	Pull any in TC1 car, but not till its final position	OK
10452	I	The lamp 44H1 (Emergency Brake Interlock Open) turns ON.	OK
10453	*R*	*Just read (MPU1) li_ubk_tc1pealoop = '1.0'*	*OK*
10454	*R*	*Just read (MPU1) li_dor_tc1alldoorsclosedr1 = '0'*	*OK*
10455	*R*	*Just read (MPU1) li_dor_tc1alldoorsclosedr2 = '0'*	*OK*
10456	*R*	*An alarm appears on DDU screen warning that a PEA was pulled.*	*OK*
10457	I	The lamp 31H1 (Traction Authorized) turns OFF.	OK
10458	*R*	*Traction effort bar graph is indicating no effort on the line voltage module*	*OK*
10459	*R*	*Just read (MPU1) lo_drc_tc1tractionloopr2 = '0.0'*	*OK*
10460	*R*	*Just read (MPU1) lo_drc_tc1tractionloopr1 = '0.0'*	*OK*
10461	A	After 10 seconds that PEA has been pulled check that:	OK
10462	*R*	*Just read UBK_EmgcyBrkApld = '1'*	*OK*
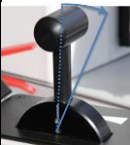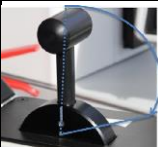
10463	I	The lamp 44H4 (Emergency Brake Loop) turns ON.	OK
10464	*R*	*Just read (MPU1) bcu1_tlneb = '0'*	*OK*
10465	A	Authorize (MPU1) lo_ubk_tc1resetpea	OK
10466	*R*	*The lamp 51H1 turns OFF(door closed and locked).*	*OK*
10467	A	Set Passenger Emergency Alarm Reset Switch (44S6) to "Reset" position.	OK
10468	*R*	*PEA alarm signal is reset.*	*OK*
10469	A	Move Master Controller Handle (30A1) to "OFF" position.	OK
10470	A	Reset the emergency brake setting the direction switch (S2.2) to "NEUTRAL" and then to "FORWARD" position again.	OK
10471	*R*	*Just read UBK_EmgcyBrkApld = '0'*	*OK*
10472	I	The lamp 44H4 (Emergency Brake Loop) turns OFF.	OK
10473	*R*	*Just read (MPU1) bcu1_tlneb = '1'*	*OK*
10474	I	The lamp 31H1 (Traction Authorized) turns ON.	OK
10475	*R*	*Just read (MPU1) lo_drc_tc1tractionloopr1 = '1.0'*	*OK*
10476	*R*	*Just read (MPU1) lo_drc_tc1tractionloopr2 = '1.0'*	*OK*
10477	**I**	**Test 08 - Safety Requirement [PRASA-34A-a]**	
10478	I	On the beginning the Train shall be stationary.	OK
10479	A	Write (MPU1) lo_ets_tc2rstotdrr1 = '1.0'	OK
10480	A	Write (MPU1) lo_ets_tc2rstotdrr2 = '1.0'	OK
10481	*R*	*Check on DDU that the On-board Train Data Recorder is offline*	*OK*
10482	*R*	*Just read (MPU1) li_rec_tc1thresholdfive1 = '0.0'*	*OK*
10483	*R*	*Just read (MPU1) li_rec_tc1thresholdfive2 = '0.0'*	*OK*
10484	*R*	*Just read (MPU1) li_rec_tc2thresholdfive1 = '0.0'*	*OK*
10485	*R*	*Just read (MPU1) li_rec_tc2thresholdfive2 = '0.0'*	*OK*
10486	*R*	*Just read (BCU2) LO_SPEED_THRSLD1 = '1'*	*OK*
10487	A	Accelerate the Train up to 4km/h.	OK
10488	*R*	*Just read (BCU2) LO_SPEED_THRSLD1 = '0'*	*OK*
10489	A	Accelerate the Train up to 10km/h.	OK
10490	*R*	*Just read (MPU1) li_rec_tc1thresholdfive1 = '0.0'*	*OK*
10491	*R*	*Just read (MPU1) li_rec_tc1thresholdfive2 = '0.0'*	*OK*
10492	*R*	*Just read (MPU1) li_rec_tc2thresholdfive1 = '0.0'*	*OK*
10493	*R*	*Just read (MPU1) li_rec_tc2thresholdfive2 = '0.0'*	*OK*
10494	*R*	*Just read (BCU2) LO_SPEED_THRSLD1 = '0'*	*OK*
10495	*R*	*Just read (MPU1) REC_Speed5ThresholdFail = '1'*	*OK*
10496	A	Apply brake until the complete stop of the Train.	OK
10497	*R*	*Just read (BCU2) LO_SPEED_THRSLD1 = '1'*	*OK*
10498	*R*	*The OTDR is maintained OFF.*	*OK*
10499	A	Authorize (MPU1) lo_ets_tc2rstotdrr1	OK
10500	*R*	*The OTDR is turned ON.*	*OK*

10501	I	**Test 09 - Safety Requirement [PRASA-23-Val-2]**	
10502	I	On the beginning the Train shall be stationary.	OK
10503	A	Write (BCU2) LO_SPEED_THRSLD1 = '0'	OK
10504	R	*Read indefinite (MPU1) DCU1_TC1_HwIOStatus (136756)*	*OK*
10505	I	TrainTracer gives a numerical information through the variable "DCU1_TC1_HwIOStatus". In order to check the state of the bits 2 and 8, with the help of a programable calculator (use the computer's one), change the numerical information to a word information and read the state of these bits.	OK
10506	A		OK
10507	R	*DCU1_TC1_HwIOStatus.bit2 = 1*	*OK*
10508	R	*DCU1_TC1_HwIOStatus.bit8 = 0*	*OK*
10509	R	*Just read (MPU1) li_rec_tc1thresholdfive1 = '0.0'*	*OK*
10510	R	*Just read (MPU1) li_rec_tc1thresholdfive2 = '0.0'*	*OK*
10511	R	*Just read (MPU1) li_rec_tc2thresholdfive1 = '0.0'*	*OK*
10512	R	*Just read (MPU1) li_rec_tc2thresholdfive2 = '0.0'*	*OK*
10513	A	Accelerate the Train up to 10km/h and check the variable "DCU1_TC1_HwIOStatus" as soon as the speed overpasses 5km/h (according to DDU's speed value).	OK
10514	R	*Read indefinite (MPU1) DCU1_TC1_HwIOStatus (137008)*	*OK*
10515	R	*DCU1_TC1_HwIOStatus.bit2 = 0*	*OK*
10516	R	*DCU1_TC1_HwIOStatus.bit8 = 1*	*OK*
10517	R	*Just read (MPU1) li_rec_tc1thresholdfive1 = '1.0'*	*OK*
10518	R	*Just read (MPU1) li_rec_tc1thresholdfive2 = '1.0'*	*OK*
10519	R	*Just read (MPU1) li_rec_tc2thresholdfive1 = '1.0'*	*OK*
10520	R	*Just read (MPU1) li_rec_tc2thresholdfive2 = '1.0'*	*OK*
10521	I	**Test 10 - Safety Requirement [PRASA-23-Val-1]**	
10522	A	Apply brake on the Train till its complete stop and check the variable "DCU1_TC1_HwIOStatus" as soon as the speed is lower than 3km/h (according to DDU's speed value).	OK
10523	R	*Read indefinite (MPU1) DCU1_TC1_HwIOStatus (136756)*	*OK*
10524	R	*DCU1_TC1_HwIOStatus.bit2 = 1*	*OK*
10525	R	*DCU1_TC1_HwIOStatus.bit8 = 0*	*OK*
10526	A	Authorize (BCU2) LO_SPEED_THRSLD1	OK
10527	I	**Test 11 - Safety Requirement [PRASA-23-Val-4]**	
10528	I	In case it is not possible to go further at the same direction, change cab and perform the tests with the opposite cab active.	OK
10529	A	Write (BCU1) LO_SPEED_THRSLD1 = '1'	OK
10530	A	Write (BCU2) LO_SPEED_THRSLD1 = '1'	OK
10531	R	*Relay 61k3 permanently supplied in all cars.*	*OK*
10532	R	*Read indefinite (MPU1) DCU1_TC1_HwIOStatus (136756)*	*OK*

10533	R	*DCU1_TC1_HwIOStatus.bit2 = 1*	*OK*
10534	R	*DCU1_TC1_HwIOStatus.bit8 = 0*	*OK*
10535	I	TrainTracer gives a numerical information through the variable "DCU1_TC1_DiagData1". In order to check the state of the bits 22 and 23, with the help of a programable calculator (use the computer's one), change the numerical information to a Dword information and read the state of these bits.	OK
10536	R	*Read indefinite (MPU1) DCU1_TC1_DiagData1 (0)*	*OK*
10537	R	*DCU1_TC1_DiagData1.bit22 = 0*	*OK*
10538	R	*DCU1_TC1_DiagData1.bit23 = 0*	*OK*
10539	A	Accelerate the Train up to 10km/h and check the status of the variables "DCU1_TC1_HwIOStatus" and "DCU1_TC1_DiagData1" when the speed overpasses 5km/h (according to DDU's speed value).	OK
10540	R	*Read indefinite (MPU1) DCU1_TC1_HwIOStatus (136756)*	*OK*
10541	R	*DCU1_TC1_HwIOStatus.bit2 = 1*	*OK*
10542	R	*DCU1_TC1_HwIOStatus.bit8 = 1*	*OK*
10543	R	*Read indefinite (MPU1) DCU1_TC1_DiagData1 (0)*	*OK*
10544	R	*DCU1_TC1_DiagData1.bit22 = 1*	*OK*
10545	R	*DCU1_TC1_DiagData1.bit23 = 0*	*OK*
10546	A	Write (MPU1)OTDR_5kphSpeedFlt = '1'	OK
10547	R	*Check on DDU screen the appearance of an IOS (838) requiring a reparation at the end of the day.*	*OK*
10548	A	Authorize (MPU1)OTDR_5kphSpeedFlt	OK
10549	A	Authorize (BCU1) LO_SPEED_THRSLD1	OK
10550	A	Authorize (BCU2) LO_SPEED_THRSLD1	OK
10551	A	Brake the train until its complete stop.	OK
10552	**I**	**Test 12 - Safety Requirement [PRASA-23-Val-5]**	
10553	A	For the following test use OTDR web portal to force the speed of above 5km/h	OK
10554	A	Dynamic speed threshold test.pdf	OK
10555	R	*Relays 61k1 permanently supplied in all cars plus relays 61k2 in TC1 and TC2 cars.*	*OK*
10556	R	*Read indefinite (MPU1) DCU1_TC1_HwIOStatus (136756)*	*OK*
10557	R	*DCU1_TC1_HwIOStatus.bit2 = 1*	*OK*
10558	R	*DCU1_TC1_HwIOStatus.bit8 = 1*	*OK*
10559	R	*Just read (MPU1) li_rec_tc1thresholdfive1 = '1.0'*	*OK*
10560	R	*Just read (MPU1) li_rec_tc2thresholdfive1 = '1.0'*	*OK*
10561	R	*Check on DDU screen the appearance of an IOS (839) requiring a reparation at the end of the day.*	*OK*
10562	R	*Just read (MPU1) DOR_FDcuSpeedThr = '1'*	*OK*
10563	A	Accelerate the Train up to 10km/h.	OK
10564	R	*Read indefinite (MPU1) DCU1_TC1_HwIOStatus (137008)*	*OK*
10565	R	*DCU1_TC1_HwIOStatus.bit2 = 0*	*OK*
10566	R	*DCU1_TC1_HwIOStatus.bit8 = 1*	*OK*

10567	R	*Read indefinite (MPU1) DCU1_TC1_DiagData1 (0)*	*OK*
10568	R	*DCU1_TC1_DiagData1.bit22 = 0*	*OK*
10569	R	*DCU1_TC1_DiagData1.bit23 = 0*	*OK*
10570	R	*Just read (MPU1) li_rec_tc1thresholdfive1 = '1.0'*	*OK*
10571	R	*Just read (MPU1) li_rec_tc2thresholdfive1 = '1.0'*	*OK*
10572	A	Decelerate the Train untill comes to a complete stop and check the status of the variables "DCU1_TC1_HwIOStatus" and "DCU1_TC1_DiagData1" as soon as the speed is below 5km/h.	OK
10573	R	*Read indefinite (MPU1) DCU1_TC1_HwIOStatus (136752)*	*OK*
10574	R	*DCU1_TC1_HwIOStatus.bit2 = 0, if 5km/h > train speed > 3km/h.*	*OK*
10575	R	*DCU1_TC1_HwIOStatus.bit2 = 1, if train speed < 3km/h.*	*OK*
10576	R	*DCU1_TC1_HwIOStatus.bit8 = 1*	*OK*
10577	R	*Read indefinite (MPU1) DCU1_TC1_DiagData1 (0)*	*OK*
10578	R	*DCU<i>_<car>_DiagData1.bit22 = 0*	*OK*
10579	R	*DCU<i>_<car>_DiagData1.bit23 = 1*	*OK*
10580	R	*Just read (MPU1) li_rec_tc1thresholdfive1 = '0'*	*OK*
10581	R	*Just read (MPU1) li_rec_tc2thresholdfive1 = '0'*	*OK*
10582	R	*Just read (MPU1) DOR_FDcuSpeedThr = '0'*	*OK*
10583	**I**	**Rescue Mode and Emergency Disconnection**	
10584	**I**	**BACKUP MODE**	
10585	A	Active cab in TC1	OK
10586	A	Put the backup mode switch 27S1 in Backup position	OK
10587	A	Put the Driving Direction Switch to FORWARD position	OK
10588	A	Hold pressed the "Master's Deadman Device (30A1.S4)" and move "Master Controller handle (30A1)" to initial "Traction" zone position.	OK
10589	*R*		*OK*
10590	I	Low tractive effort demand is requested.	OK
10591	*R*	*Although the low tractive effort demand has been requested, the Train moves with a standard tractive demand*	*OK*
10592	A	Move "Master Controller (30A1)" handle to extreme "Traction" zone position	OK
10593	*R*		*OK*
10594	*R*	*Verify that there wasn't an impact on train movement and the tractive demand was maintained*	*OK*
10595	A	Release the Master's Deadman Device (30A1.S4) for more than 5 seconds	OK
10596	*R*	*Train applies emergency brake*	*OK*
10597	I	The Deadman device must remain pressed to allow traction in backup mode, otherwise the emergency brake loop is opened when the timer relay expire.	OK

10598	A	Set the master controller to "OFF" position.	OK
10599	A	Set the Driving Direction Switch to NEUTRAL and then to FORWARD position again	OK
10600	*R*	*Emergency brake released on Train.*	*OK*
10601	I	From now on, when operating the master controller don't forget to maintain anyone of the deadman devices pressed.	OK
10602	A	Move "Master Controller (30A1)" handle to "Traction" zone position.	OK
10603	*R*	*Train starts to move.*	*OK*
10604	A	Keeping the Master's handle within traction zone, check that the train is capable to reach 25km/h.	OK
10605	*R*	*Verify that train reaches, but does not exceed the speed of 25km/h.*	*OK*
10606	I	On Backup mode, train speed is limited to 25km/h.	OK
10607	A	Move "Master Controller (30A1)" handle to initial "Brake" zone position.	OK
10608	*R*		*OK*
10609	I	Low brake effort demand is requested.	OK
10610	*R*	*Verify that the train starts to brake with a standard brake effort.*	*OK*
10611	A	Move "Master Controller (30A1)" handle to extreme "Brake" zone position (stop before achieving "Emergency Brake" position).	OK
10612	*R*		*OK*
10613	I	High brake effort demand is requested.	OK
10614	*R*	*Verify that there wasn't an impact on train movement, and the brake demand was maintained.*	*OK*
10615	I	On Backup Mode, brake system considers a single brake demand and disregards master controller handle position within brake zone.	OK
10616	*R*	*Train stops.*	*OK*
10617	**I**	**BACKUP MODE TC2**	
10618	A	Active cab in TC2	OK
10619	A	Press the automatic start button 20S1 to prepare the train in high voltage	OK
10620	*R*	*After few seconds, the train is prepared in high voltage with HSCBs closed*	*OK*
10621	A	Put the backup mode switch 27S1 in Backup position	OK
10622	A	Put the Driving Direction Switch to FORWARD position	OK
10623	A	Hold pressed the "Master's Deadman Device (30A1.S4)" and move "Master Controller handle (30A1)" to initial "Traction" zone position.	OK
10624	*R*		*OK*
10625	I	Low tractive effort demand is requested.	OK

10626	R	*Although the low tractive effort demand has been requested, the Train moves with a standard tractive demand*	*OK*
10627	A	Move "Master Controller (30A1)" handle to extreme "Traction" zone position	OK
10628	R		*OK*
10629	R	*Verify that there wasn't an impact on train movement and the tractive demand was maintained*	*OK*
10630	A	Release the Master's Deadman Device (30A1.S4) for more than 5 seconds	OK
10631	R	*Train applies emergency brake*	*OK*
10632	I	The Deadman device must remain pressed to allow traction in backup mode, otherwise the emergency brake loop is opened when the timer relay expire.	OK
10633	A	Set the master controller to "OFF" position.	OK
10634	A	Set the Driving Direction Switch to NEUTRAL and then to FORWARD position again	OK
10635	R	*Emergency brake released on Train.*	*OK*
10636	I	From now on, when operating the master controller don't forget to maintain anyone of the deadman devices pressed.	OK
10637	A	Move "Master Controller (30A1)" handle to "Traction" zone position.	OK
10638	R	*Train starts to move.*	*OK*
10639	A	Keeping the Master's handle within traction zone, check that the train is capable to reach 25km/h.	OK
10640	R	*Verify that train reaches, but does not exceed the speed of 25km/h.*	*OK*
10641	I	On Backup mode, train speed is limited to 25km/h.	OK
10642	A	Move "Master Controller (30A1)" handle to initial "Brake" zone position.	OK
10643	R		*OK*
10644	I	Low brake effort demand is requested.	OK
10645	R	*Verify that the train starts to brake with a standard brake effort.*	*OK*
10646	A	Move "Master Controller (30A1)" handle to extreme "Brake" zone position (stop before achieving "Emergency Brake" position).	OK
10647	R		*OK*
10648	I	High brake effort demand is requested.	OK
10649	R	*Verify that there wasn't an impact on train movement, and the brake demand was maintained.*	*OK*
10650	I	On Backup Mode, brake system considers a single brake demand and disregards master controller handle position within brake zone.	OK
10651	R	*Train stops.*	*OK*
10652	**I**	**End of Test**	

OBJECTIVE PASS AND FAIL CRITERIA

STP Name   : Train Functional Dynamic Testing

Train Number : Train TS212

Table : Dynamic Test

Chp.	Function	Expected Result	Test Result OK/NOK	Remarks
	DT			
	Dynamic Test	OK	OK	
	Traction and Electric Brake - Wheel Turn Test	OK	OK	
	HIGH SPEED TEST	OK	OK	
	Doors	OK	OK	
	Rescue Mode and Emergency Disconnection	OK	OK	