GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

FUNCTIONAL TEST FORMAT

Loco Pilot's Operation-cum-indication Panel
(LP-OCIP (DMI))
For
KAVACH (the Indian Railway ATP System)
Specification No. RDSO/SPN/196/2020 Version 4.0

Issued by

SIGNAL AND TELECOM DIRECTORATE
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MINISTRY OF RAILWAYS
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Revision History

SN.	Issue	Version	Reason of Amendment
1.	1st Issue	1.0	As per RDSO/SPN/196/2020 version 4.0
2.	2nd Issue	1.1	Due to change in Annexure-B
3.	3rd Issue	1.2	New Clause added: Cl. No. 11.2 to 11.13 and 14.17 Modified: Clause No. 11.14, 14.2, 14.3, 14.11, 14.16, 14.22 to 14.24, 14.33, 14.39 to 14.44, 14.47, 14.52,21.12, 21.13,21.14, 21.16, 21.18 and 22.11.
4.	4th Issue	1.3	New clause added: Cl No 9.22 to 9.28 & 21.28 and 21.29. (Use Cases observed during field trial)
5.	5th Issue	1.4	New clause added: Cl No 4.35 (Use Cases observed during field trial) Modified: Clause No. 9.26, 9.27, 9.28

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Test Definitions			
SNo.	**Test Case ID**	**Test Case**	**Description**
1.	KAVACH_DMI_01	DMI Screen – Loading	This Test case is used to verify DMI Screen – Loading.
2.	KAVACH_DMI_02	Loco Id, Date time	This Test case is used to verify Loco ID, Date time information.
3.	KAVACH_DMI_03	Target Distance/ Release Distance	This Test case is used to verify Target Distance /Release Distance data.
4.	KAVACH_DMI_04	Speed and Speed Types information	This Test case is used to verify Speed and Speed Types information of the Loco.
5.	KAVACH_DMI_05	Current mode symbols	This Test case is used to verify Current mode symbols.
6.	KAVACH_DMI_06	Braking Symbol indicating type	This Test case is used to verify Braking Symbol indicating type.
7.	KAVACH_DMI_07	Absolute Location	This Test case is used to verify Absolute Location.
8.	KAVACH_DMI_08	Movement Authority	This Test case is used to verify the Movement Authority.
9.	KAVACH_DMI_09	Signal Aspects	This Test case is used to verify the Signal Aspects information.
10.	KAVACH_DMI_10	Route Indicators directions	This test case is used to verify Route Indicators direction information.
11.	KAVACH_DMI_11	Signal distance information	This test case is used to verify next approaching signal distance information.
12.	KAVACH_DMI_12	RFID Tag Information	This test case is used to verify RFID Tags passed by the locomotives.
13.	KAVACH_DMI_13	Radio packets signal strength	This test case is used to verify Radio packets signal strength.
14.	KAVACH_DMI_14	Context Messages 1	This test case is used to verify Context messages 1 in region H.
15.	KAVACH_DMI_15	Context Messages2	This test case is used to verify Context message 2 at Region I.
16.	KAVACH_DMI_16	Audio Warnings	This test case is used to verify Audio Warnings for corresponding context messages.

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Test Definitions

SNo.	Test Case ID	Test Case	Description
17.	KAVACH_DMI_17	Train Length Value	This test case is used to verify Train Length Value.
18.	KAVACH_DMI_18	Deceleration Constant calculated Value	This test case is used to verify Deceleration Constant calculated Value.
19.	KAVACH_DMI_19	Current Loco KAVACH mode in text	This test case is used to verify current Loco KAVACH mode in text.
20.	KAVACH_DMI_20	Display Keys	The Region K shall be used to display the keys.
21.	KAVACH_DMI_21	Configuration Data	This test case is used to verify Train Configuration Data screen when Unit Info requested.
22.	KAVACH_DMI_22	Unit information screen	This test case is used to verify Unit information screen when Unit Info requested.
23.	KAVACH_DMI_23	DMI Comports Priority	This Test case is used to verify DMI Comports Priority to display data.
24.	KAVACH_DMI_24	DMI LED Indications	This Test Case is used to verify the LED Indications.
25.	KAVACH_DMI_25	DMI Switches	This Test Case is used to verify the operate the DMI switches.

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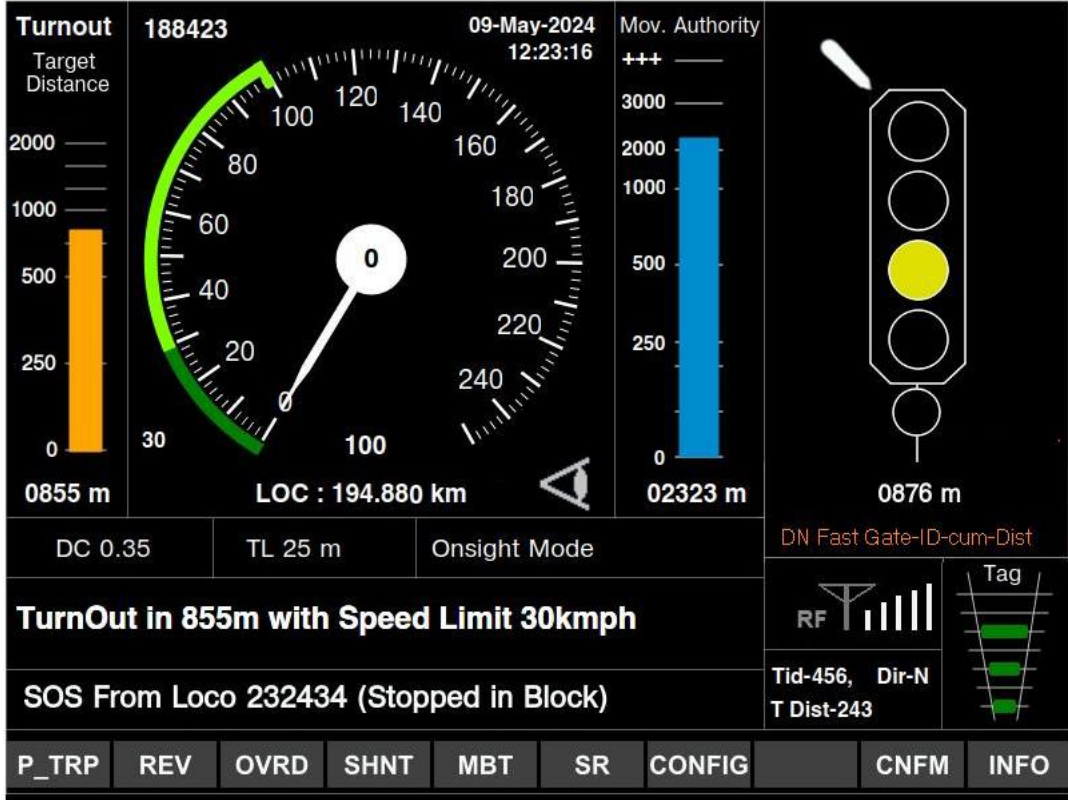
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SNo.	Test Scenario	Input Specification	Expected Output/ Values	Observed Output/ Values
		DMI FUNCTIONAL TEST CASES		
1.0	**Test Case ID/ Title/ Description: KAVACH_DMI_01: DMI Screen – Loading. This Test case is used to verify DMI Screen – Loading.**			
1.1.	Verification of DMI outer view. **(Cl -B4.2.1)**	Check as per figure B1 of Specification of Kavach (The Indian Railway ATP) LP-OCIP Display Requirement - **Annexure-B.**	Outer view shall be as per specification.	
1.2.	Verification of DMI Screen Loading.	Power on the Setup and DMI' s → Check	DMI Screen should load automatically when power on DMI.	
1.3.	Verification of Loading Screen.	Power on the Setup and DMI' s→ Check Loading Screen while loading all the controls.	Loading Screen should display, while loading all the parameters, controls at exact locations/ regions.	
1.4.	Verification of DMI Screen Loading Time.	1. Power on the Setup and DMI's. 2. Loading all the parameters, controls at exact locations/ regions → check loading time.	Loading Time should be less than 120 second.	
1.5.	Verification of Mouse pointer.	Power on the Setup and DMI' s→ Check mouse pointer on DMI Screen.	Should hide the mouse pointer on DMI Screen.	
1.6.	Verification of Task Bar.	Power on the DMI → Check Task Bar on DMI Screen.	Should hide the Task Bar on DMI Screen.	
1.7.	Verification of DMI screen with communication.	Power on the DMI → Screen elements and Screen elements loaded as per exact locations/ regions.	DMI Screen should display the screen elements status as per given in Display Screen-Region's sheet.	

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DMI FUNCTIONAL TEST CASES			
SNo.	**Test Scenario**	**Input Specification**	**Expected Output/ Values**	**Observed Output/ Values**
1.8.	Verification of auto detection of Comports for DMI.	Power on the DMI → Communication OK with system → Check DMI Screen.	DMI Screen should display all screen elements status as per received data.	
1.9.	Verification of default background colour on DMI. **(Cl B4.1.2)**	Power on the DMI → Check Background colour.	DMI Screen background colour Should be Black.	
1.10.	Verification of default Text colours on DMI. **(Cl-B4.1.4)**	Power on the DMI → Check default Text colour.	DMI Screen default Text colour should be white unless a specific colour except for region D3.	
			Region D3: The traffic direction, approaching signal post name and line number information shall be in ORANGE colour.	
1.11.	Verification of Communication Check Message.	Power on the DMI → remove communication port → Check message DMI Screen when communication checking.	Should display the message "Communication link failure"/ "Communication not OK"/ "Blank screen."	
1.12.	Verification of Communication Failure Screen.	Power on the DMI → remove Communication when DMI is fully loaded→ Check.	Should display the message "Communication link failure"/ "Communication not OK"/ "Blank screen."	
1.13.	Verification of DMI grade & size. **(Cl. B.4.1.1)**	Check the display & size (Diagonal).	i. LCD module of industrial grade having minimum 256 colour. ii. Display size of 10.4 inch (Diagonal). **Note:** Para-i shall be verified from data sheet. Data sheet to be attached with report.	
1.14.	Verification of DMI Screen Resolution. **(Cl. B.4.1.1)**	Power on the DMI →Set the Screen resolutions 800 Width x 600 Height→ Check the Screen elements.	Screen resolution should be 800 Width x 600 Height.	

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SNo.	Test Scenario	Input Specification	Expected Output/ Values	Observed Output/ Values
	DMI FUNCTIONAL TEST CASES			
1.15.	Verification of screen elements loaded as per exact locations/regions. **(Cl. B 4.2.2)**	Power on the DMI → Check all Screen elements and Screen elements located as per exact locations/regions.	Should load screen elements as given Figure. • Font size and style ((Bold/Regular) should be same. • Alignment to be verified all the region.	
1.16.	Verification of DMI SW Check sum Data. **(B 4.10.2 (i))**	Power on the DMI → Communication OK with system	Executive Software checksum (CRC) of Onboard Kavach System shall be displayed.	

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	DMI FUNCTIONAL TEST CASES			
SNo.	**Test Scenario**	**Input Specification**	**Expected Output/ Values**	**Observed Output/ Values**
		→ Check sum fields data in DMI Data : Press "info" button along with "cnfm" button.		
1.17.	Verification of Health/link status. **(B 4.10.2 (ii))**	Power on the DMI → Communication OK with system → Press "info" button along with "cnfm" button. Health status of (i) RFID Reader (ii) BIU (iii) GPS/PPS (iv) GSM (v) Pulse Generator (vi) Cab Input Box (if applicable) (vii) Radio Modem (viii) BTM Reader (if applicable)	Health status of following shall be displayed in the DMI (i) RFID Reader (ii) BIU (iii) GPS/PPS (iv) GSM (v) Pulse Generator (vi) Cab Input Box (vii) Radio Modem (viii) BTM reader (if applicable)	
1.18.	Verification of KMS Key Availability. **(B 4.10.2 (iii))**	Power on the DMI → Communication OK with system → Press "info" button along with "cnfm" button.	No. of KMS keys availability shall be displayed in DMI.	

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2.0	Test Case ID/ Title/ Description: KAVACH_DMI_02: Loco Id, Date Time –This Test case is used to verify Loco Id, Date and time information.			
2.1.	Verification of Loco Id **(Cl B4.4.7(a)).**	Check Loco Id at Region B4 position.	Should display loco ID (6 digit) & left aligned at Region B4 position.	
2.2.	Verification of text location in DMI. **(Cl B4.4.7(e))**	It shall start from the X location 100 and Y location 9 of the Display.	Verify the correct display location.	
2.3.	Verification of boundary line. **(Cl B4.4.7(d) & B4.4.8 (d)**	Check that grey boundary line not be displayed in text.	Gray boundary line shall not be displayed.	
2.4.	Verification of Loco ID value through Configuration SW.	Open Configuration Software and Set Loco ID-123456 (Combination of numbers) of Loco Id and send configuration).--> Check Loco Id at Region B4 position.	Should display the Configured Loco Id ""123456"at Region B4 position.	
2.5.	Verification of Right justification of Loco ID through Configuration SW.	Open Configuration Software and Set Loco ID-12345 (Combination of numbers) of Loco Id and send configuration).--> Check Loco Id is justified right at Region B4 position.	Should display the number with right justified.	
2.6.	Verification of Text font for Loco ID. **(Cl B4.4.7(c))**	Check Text Font for Loco Id value at Region B4.	Font: Microsoft Sans serif or Helvetica Font style: Bold, Font Size: 14 point (18.67 pixel)	
2.7.	Verification of current Date. **(Cl B4.4.8(e)**	Check Current Date at Region B5 position.	Should display the Date at Region B5.	
2.8.	Verification of Date Format of the Date displayed. **(Cl B4.4.8(e))**	Check Date format at Region B5 position	The date format shall be DD-Mmm-YYYY. Ex: 24-May-2016	
2.9.	Verification of Text font for Date. **(Cl B4.4.8(c))**	Check text font for date at Region B5.	Font: Microsoft Sans serif or Helvetica. Font style: Bold.	

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			Font Size: 12 point (16 pixel)	
2.10.	Verification of current Time is displayed at Region B6. **(Cl B4.4.8(f))**	Check Time at Region B6.	Should display the Time at Region B6.	
2.11.	Verification of Format of the Time displayed. **(Cl B4.4.8(f))**	Check Time Format at Region B6.	Should Display the Time in "HH:MM:SS" in 24 hour format. Ex: 21:45:14	
2.12.	Verification of Text font for Time. **(Cl B4.4.8(c))**	Check Text font for date at Region B6.	Font: Microsoft Sans serif or Helvetica. Font style: Bold Font Size: 12 point (16 pixel)	

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3.0	Test Case ID/ Title/ Description: KAVACH_DMI_03: Target Distance/ Release Distance -This Test case is used to verify Target Distance/ Release Distance data.			
3.1.	Verification of Region A on DMI Screen. **(Cl B4.3.1), (Cl B4.3.5 (a)), (Cl B4.3.6 (b)), (Cl B4.3.7 (b)) & (Cl B4.3.8 (c))**	Check the Region A position on DMI Screen.	The region A should display the A1, A2, and A3 sub regions. A) Target distance bar value display on the log control at Region A1.	
			B) (i) Text "Target Distance" should be displayed at Region A2. (ii) Font should be Microsoft sans serif or Helvetica with size 14 point (18.67 pixel) and font style Regular in region A2.	
			C) (i) Distance value should be displayed here in number format at Region A3. (ii) Font should be DS-Digital font or Helvetica with size 14 point (18.67 pixel) and font style Bold in region A3.	
			D) (i) Type of Target i.e Turnout/PSR/TSR/EOA/SoS/Coll ision should be displayed in region A4. (ii) Font should be Microsoft sans serif or Helvetica with size 14 point (18.67 pixel) and font style Bold in region A4.	
			Turnout	
			PSR	
			TSR	
			EOA	
			SoS	
			Collision	

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3.2.	Verification of dimension. **(Cl. B4.3.2)**	Check dimension of region A.	Verify dimension 92 X 388 unit.	
3.3.	Verification of target distance bar when no data received from system. **(Cl. B4.3.3)**	Simulate the condition for target distance as zero → Check the target distance bar.	Target distance bar should hidden or disable.	
3.4.	Verification of Target distance, distance bar Scale markings. **(Cl. B4.3.4)**	Simulate the condition for target as greater than zero →check the Target distance, distance bar Scale markings.	Target distance log scale control bar should display with Scale markings steps of 0, 250m, 500 m, 1000 m, 2000 m.	
3.5.	Verification of Target distance when Target distance value received as 250. **(Cl. B4.3.4 & B4.3.5 (e))**	Simulate the condition for target distance as 250→ Check the Target distance.	Target distance bar should fill orange color and indicate scale marking 250.	
3.6.	Verification of Target distance when Target distance value received as 500. **(Cl. B4.3.4 & B4.3.5 (e))**	Simulate the condition for target distance as 500→ Check the Target distance.	Target distance bar should fill orange color and indicate scale marking 500.	
3.7.	Verification of Target distance when Target distance value received as 1000. **(Cl. B4.3.4 & B4.3.5 (e))**	Simulate the condition for target distance as 1000→ Check the Target distance.	Target distance bar should fill orange color and indicate scale marking 1000.	
3.8.	Verification of Target distance when Target distance value received as 2000. **(Cl. B4.3.4 & B4.3.5 (e))**	Simulate the condition for target distance as 2000→ Check the Target distance.	Target distance bar should fill orange color and indicate scale marking 2000.	
3.9.	Verification of Target distance when Target distance value received as 2500. **(Cl. B4.3.4 & B4.3.5 (e))**	Simulate the condition for target distance as 2500→ Check the Target distance.	Target distance bar should fill orange color and indicate scale marking 2000.	

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3.10.	Verification of Number font on Target distance bar log control. **(Cl. B4.3.5(d))**	Check the Number font for Target distance / Release distance bar.	Font: Microsoft Sans serif or Helvetica Font style: Regular Font Size:14 point (18.67 pixel)	
3.11.	Verification of units for Target distance number.	Simulate the condition for Target distance as 1000→ Check the Target distance number.	Target distance units should be in 1000 m (meters).	
3.12.	Verification of Target distance number when Target distance value received as 500.	Simulate the condition for target distance as 500→ Check the Target distance Number.	Target distance Number should display 500 m.	
3.13.	Verification of Distance log bar text for Target distance.	Simulate the condition for Target distance as 1000→ Check the Distance log scale bar text.	should display Distance liner bar text as "Target Distance").	
3.14.	Verification of units for font of type of Target distance in region A4. **(Cl. B4.3.8 (b))**	Check the font for type of Target distance.	Font: Microsoft Sans serif or Helvetica Font style: Bold Font Size: 14 point (18.67 pixel)	

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4.0	Test Case ID/ Title/ Description: KAVACH_DMI_04: Speed and Speed Types information-This Test case is used to verify Speed and Speed Types information of the Loco.			
4.1.	Verification of Speed of the Loco is displayed in the Circular Dial Control/ Speedometer at Centre of the Region B. **(Cl. B4.4.1)**	Check The Regions for B.	The region B should be display the B1, B2, B3, B4, B5, B6, B7, B8, B9, B10, B11 sub regions: • B1 → A Circle of suitable dia size shall display the speed value in Number format. • B2→Regions for Indicating the Speed Divisions. • B3→Regions to show colour the status of the train speed. • B7→Speed Limit Information in number format. • B8→Breaking Symbol indicating type of break applied. • B9→Absolute Location. • B10→Symbol of the KAVACH operating mode • B11 → Section Speed info.	
4.2.	Verification of dimension. **(Cl. B4.4.2)**	Check dimension of region B.	Verify dimension 365 X 388 unit.	
4.3.	Verification of Speed indication on circular dial control when no speed.	Check circular dial control indication when no speed.	Speed indication should display zero on circular dial control when no speed.	
4.4.	Verification of division of circle for speed indication. **(Cl. B4.4.5(c))**	Check that Circle is equally divided into 125 divisions with each division indicating a speed difference of 2 kmph. Check for different speed of i.e 2, 14, 26, 38, 52, 64, 76, 88, 92, 104,	Verify that division are correctly matching and there is no flickering of indicator.	

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		116, 128, 142, 154, 166, 178, 192, 202, 214, 226, 238, 246.		
4.5.	Verification of Speed indication circular dial control when speed is 20.	Simulate Speed 20 kmph → Check circular dial control indication.	Speed indication should display 20Kmph on circular dial control when speed is 20Kmph.	
4.6.	Verification of Speed indication circular dial control when speed is 35kmph.	Simulate Speed35 kmph → Check circular dial control indication.	Speed indication should display 35 Kmph on circular dial control when speed is 35 Kmph.	
4.7.	Verification of Speed indication on circular dial control when speed is 50 kmph.	Simulate Speed 50 kmph → Check circular dial control indication.	Speed indication should display 50Kmph on circular dial control when speed is 50Kmph.	
4.8.	Verification of Speed indication circular dial control when speed is 75 kmph.	Simulate Speed 75 kmph → Check circular dial control indication.	Speed indication should display 75 Kmph on circular dial control when speed is 75Kmph.	
4.9.	Verification of Speed indication on circular dial control when speed is 100 kmph.	Simulate Speed 100 kmph → Check circular dial control indication.	Speed indication should display 100Kmph on circular dial control when speed is 100kmph.	
4.10.	Verification of Speed indication on circular dial control when speed is 125kmph.	Simulate Speed 125kmph → Check circular dial control indication.	Speed indication should display 100Kmph on circular dial control when speed is 125kmph.	
4.11.	Verification of Speed indication on circular dial control when speed is 160kmph.	Simulate Speed 160 kmph → Check circular dial control indication.	Speed indication should display 100Kmph on circular dial control when speed is 160kmph.	
4.12.	Verification of Speed indication on circular dial control when speed is 200.	Simulate Speed 200 kmph → Check circular dial control indication.	Speed indication should display 200Kmph on circular dial control when speed is 200Kmph.	

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4.13.	Verification of Speed indication on circular dial control when speed more than 220.	Simulate Speed more than 220 kmph → Check circular dial control indication.	Speed indication should display 220Kmph on circular dial control when speed is 220Kmph.	
4.14.	Verification of Speed indication on circular dial control when speed is 240mph.	Simulate Speed 240 kmph → Check circular dial control indication.	Speed indication should display 240Kmph on circular dial control.	
4.15.	Verification of Speed indication on circular dial control when speed is 250mph	Simulate Speed 250 kmph → Check circular dial control indication.	Speed indication should display 250Kmph on circular dial control.	
4.16.	Verification of Speed indication on circular dial control when speed more than 250.	Simulate Speed more than 250 kmph → Check circular dial control indication.	Speed indication should display 250Kmph on circular dial control when speed is more than 250Kmph.	
4.17.	Verification of Speed indication digital value on needle of the dial when speed is 0.	Check Speed indication digital value on needle of the dial when no speed.	Speed indication digital value should display "0".	
4.18.	Verification of Speed indication digital value on needle of the dial when speed is 50.	Simulate Speed 50 kmph → Check Speed indication digital value on needle of the dial .	Speed indication digital value should display "50".	
4.19.	Verification of Speed indication digital value on needle of the dial when speed is 100.	Simulate Speed 100 kmph → Check Speed indication digital value on needle of the dial .	Speed indication digital value should display "100".	
4.20.	Verification of Speed indication digital value on needle of the dial when speed is 200.	Simulate Speed 200 kmph → Check Speed indication digital value on needle of the dial .	Speed indication digital value should display "200".	
4.21.	Verification of Speed indication digital value on	Simulate Speed 220 Kmph → Check Speed indication digital value on needle of the dial.	Speed indication digital value should display "220".	

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	needle of the dial when speed is 220.			
4.22.	Verification of Speed indication digital value on needle of the dial when speed is 240.	Simulate Speed 240 kmph → Check Speed indication digital value on needle of the dial .	Speed indication digital value should display "240".	
4.23.	Verification of Permit speed limit 10 Kmph on circular dial control.	Simulate speed of the train is within the permissible speed limit Permit Speed 10 kmph →Check circular dial control indication at target speed position.	Speed should display 10 kmph with light green color indication curve on circular dial control.	
4.24.	Verification of Permit speed limit 50 Kmph on circular dial control.	Simulate speed of the train is within the permissible speed limit Permit Speed 50 kmph →Check circular dial control indication at target speed position.	Speed should display 50 kmph with light green color indication curve on circular dial control in the target speed position.	
4.25.	Verification of Permit speed limit 135 Kmph on circular dial control.	Simulate speed of the train is within the permissible speed limit Permit Speed 135 kmph →Check circular dial control indication at target speed position.	Speed should display 135 kmph with light green color indication on circular dial control in the target speed position.	
4.26.	Verification of Permit speed limit 190 Kmph on circular dial control.	Simulate speed of the train is within the permissible speed limit-permit Speed 190 kmph →Check circular dial control indication at target speed position.	Speed should display 190 kmph with light green color indication curve on circular dial control in the target speed position.	
4.27.	Verification of Permit speed limit 200 Kmph on circular dial control.	Simulate speed of the train is within the permissible speed limit-permit Speed 200 kmph →Check circular dial control indication at target speed position.	Speed should display 200 kmph with light green color indication curve on circular dial control in the target speed position.	
4.28.	Verification of Permit speed limit 220 Kmph on circular dial control.	Simulate speed of the train is within the permissible speed limit-permit Speed 220kmph	Speed should display 220kmph with light green color indication	

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		→Check circular dial control indication at target speed position.	curve on circular dial control in the target speed position.	
4.29.	Verification of Permit speed limit 240 Kmph on circular dial control.	Simulate speed of the train is within the permissible speed limit-permit Speed 240kmph →Check circular dial control indication at target speed position.	Speed should display 240kmph with light green color indication curve on circular dial control in the target speed position.	
4.30.	Verification of Permit speed limit 100kmph for when target speed is greater than zero (high speed and approaching a loop line limit).	Simulate Traveling at a high speed and approaching a loop line limit→ Check circular dial control indication at target speed position.	Speed should display 100 kmph with Dark green color indication on circular dial control in the target speed position.	
4.31.	Verification of SB speed orange colour indication on circular dial control.	Simulate If current speed (108 Kmph) is greater than the Permit speed (100 kmph) and less than the SB speed (108 kmph) →Check circular dial control indication at SB speed position.	Speed curve should display with light orange color and needle should display 100kmph to 108 kmph on circular dial control.	
4.32.	Verification of SB speed red colour indication on circular dial control.	Simulate If current speed (110 Kmph) is greater than the Permit speed (100Kmph) and less than the SB speed (108Kmph) →Check circular dial control indication at SB speed position.	Speed curve should display with red color and needle should display 100kmph to 110 kmph on circular dial control.	
4.33.	Verification of circular dial control when mode is Non-Leading mode.	Simulate mode as Non-Leading mode and simulate speed as 50kmph → Check colour indications on circular dial control	Should not display colour and needle should display 50kmph on circular dial control.	
4.34.	Verification of circular dial control when mode is Isolate mode.	Simulate mode as Isolate mode and simulate speed as 50kmph → Check colour indications on circular dial control.	Should not display colour and needle should display 50kmph on circular dial control.	

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4.35.	Verification of Section Speed in digit & speed indication on circular dial control show in color.	1. Simulate target speed (PSR/TSR) is 60 kmph and section speed is 110 kmph. 2. Check circular dial control indication at target speed position. 3. After completion of target speed 60 kmph, speed shall be relaxed as section speed i.e. 110 kmph.	1. After start of the target, speed shall be indicated 60 kmph in B-11 region and B-3 region (circular dial control) simultaneously 2. After relaxation of target speed, Speed shall be displayed 110 kmph in B-11 region and B-3 region (circular dial control) simultaneously.	
5.0	**Test Case ID/ Title/ Description: KAVACH_DMI_05: Current mode symbols -This Test case is used to verify Current mode symbols.**			
5.1.	Check the area of B10. **(Cl. B4.4.12(a))**	The area of B10 shall be 55 (width) X 35 (height).	Verify the area 55 (width) X 35 (height).	
5.2.	Verification of Stand By mode. **(Cl. B4.4.12(d) (1))**	Simulate the Stand By mode in System → Check.	Should display the Stand By mode symbol.	
5.3.	Verification of Staff Responsible Mode. **(Cl. B4.4.12(d) (2))**	Simulate the Staff Responsible Mode in system → Check.	Should display the Staff Responsible Mode symbol.	
5.4.	Verification of Limited Supervision Mode. **(Cl. B4.4.12(d) (3))**	Simulate the Limited Supervision Mode in system → Check.	Should display the Limited Supervision Mode symbol.	
5.5.	Verification of Full Supervision Mode. **(Cl. B4.4.12(d) (4))**	Simulate the Full Supervision Mode in system → Check.	Should display the Full Supervision Mode symbol.	
5.6.	Verification of On Sight Mode. (Cl. B4.4.12(d) (5))	Simulate the On Sight Mode in system → Check.	Should display the On Sight Mode symbol.	

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5.7.	Verification of Trip Mode. **(Cl. B4.4.12(d) (6))**	Simulate the Trip Mode in system → Check.	Should display the Trip Mode symbol.	
5.8.	Verification of Post Trip Mode. **(Cl. B4.4.12(d) (7))**	Simulate the Post Trip Mode in system → Check.	Should display the Post Trip Mode symbol.	
5.9.	Verification of Reverse Mode. **(Cl. B4.4.12(d) (8))**	Simulate the Reverse Mode in system→ Check.	Should display the Reverse Mode symbol.	
5.10.	Verification of Shunt Mode. **(Cl. B4.4.12(d) (9))**	Simulate the Shunt Mode in system→ Check.	Should display the Shunt Mode symbol.	
5.11.	Verification of Non-Leading Mode. **(Cl. B4.4.12(d) (10))**	Simulate the Non-Leading Mode in System → Check.	Should display the Non-Lading Mode symbol.	
5.12.	Verification of System Failure. **(Cl. B4.4.12(d) (11))**	Simulate the System Failure in system → Check.	Should display the System Failure mode symbol.	
5.13.	Verification of Isolation mode. **(Cl. B4.4.12(d) (12))**	Simulate Isolation mode in system → Check.	Should display the Blank symbol.	

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6.0	Test Case ID/ Title/ Description: KAVACH_DMI_06: Braking Symbol indicating type -This Test case is used to verify Braking Symbol indicating type.			
6.1.	Check the area of B10. **(Cl. B4.4.12)**	The area of B10 shall be 55 (width) X 35 (height).	Verify the area 55 (width) X 35 (height).	
6.2.	Verification of Normal brakes symbol. **(Cl. B4.4.10(f) (1))**	Simulate the Normal brakes in the Loco KAVACH system →Check	Should display the Normal brakes symbol in DMI.	
6.3.	Verification of Full Service Brake symbol. **(Cl. B4.4.10(f) (2))**	Simulate the Full Service Brake in the Loco KAVACH system →Check	Should display the Full Service Brake symbol in DMI	
6.4.	Verification of Emergency Brakes symbol. **(Cl. B4.4.10(f) (3))**	Simulate the Emergency Brakes in the Loco KAVACH system →Check	Should display the Emergency Brakes symbol in DMI	
6.5.	Check brake application involving the action by the Loco pilot **(Cl. B4.4.10(c))**	Loco pilot initiating the brakes →Check	Should not display in DMI	
6.6.	Verification of Loco KAVACH system is not initiating any brake. **(Cl. B4.4.10(d))**	By Default or Loco KAVACH system is not initiating any brake →Check	Should display the No Image/ left blank for Brakes symbol.	

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7.0	**Test Case ID/ Title/ Description: KAVACH_DMI_07: Absolute Location -This Test case is used to verify Absolute Location.**			
7.1.	Verification of Absolute Location value. **(Cl. B4.4.11(b))**	Simulate the absolute value 9.68 km, 52.47 km, 135.09 km → Check the Absolute Location at Region B9.	should be display the absolute location value 9.68 km, 52.47 km , 135.09 km at Region B9.	
7.2.	Verification of font type, style and size at Region B9 **(Cl. B4.4.11(c))**	Check the font type, style and size at Region B9.	i) Font: Microsoft Sans serif or Helvetica ii) Font style: Bold iii) Font Size:-14 point (18.67 Pixel).	
7.3.	Verification of Preceding text with Absolute Location value and Font.	Simulate the absolute value 9.68 km, 52.47 km, 135.09 km → Check the Preceding text and font Absolute Location at Region B9.	1. Should display the "LOC:" Preceding with Absolute Location value 2. Font should be clearly visible. LOC: 9.68 KM, 52.47 km, 135.09 km	
7.4.	Verification of following Text for Absolute Location value and Font. **(Cl. B4.4.11(d))**	Simulate the absolute value 52.47 km → Check the Following text and font Absolute Location at Region B9.	Should display absolute location as followed by ':' followed by space followed by the absolute location 52.47 followed by "km". LOC: 52.47 Km	
7.5.	Verification of Section Speed info in Region B11. **(Cl. B4.4.13(b))**	Simulate Section Speed.	Should display the Section Speed in Region B11 In numerical format with a font Helvetica and font size 14 point (18.67 pixel) and font style Bold.	

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8.0	Test Case ID/ Title/ Description: KAVACH_DMI_08: Movement Authority -This Test case is used to verify the Movement Authority.			
8.1.	Verification of Movement Authority at Region C on DMI Screen. **(Cl. B4.5(a))**	Check Movement Authority at Region C.	The region C should display the C1, C2, and C3 C1 → Movement Authority Bar Diagram. C2 → The Text "Movement Authority "To be displayed. C3 → Movement Authority value in numbers is to be displayed in this location.	
8.2.	Check the dimension of Region C. **(Cl. B4.5(b))**	The Region C shall have the 112 x 388 unit dimension.	Verify the dimension 112 x 388 unit.	
8.3.	Verification of movement authority bar scale. **(Cl. B4.5.1(a))**	Check movement authority on the logarithmic scale	Should display movement authority on the logarithmic scale in Light Blue colour (Coded LBE).	
8.4.	Verification of Movement Authority bar scale control horizontal lines. **(Cl. B4.5.1(b))**	Check Movement Authority log bar control horizontal lines values.	Should display the scale markings Movement Authority with horizontal lines at steps of 0m, 100m, 200m, 250m, 500m, 1000m, 2000m, 3000m and greater than 3000m show as ++ +m.	
8.5.	Verification of Movement Authority numeric value on bar scale. **(Cl. B4.5.1(c))**	Check Movement Authority numeric value on bar scale.	Should display the scale markings Movement Authority for 0m, 250m, 500m, 1000m, 2000m, 3000m and ++ +m.	
8.6.	Verification of font for Movement Authority bar log control. **(Cl. B4.5.1 (d))**	Check the Font for units 0m, 250m, 500 m, 1000m, 2000m, 3000m and +++ on bar log control.	Font: Microsoft Sans serif or Helvetica Font style: Regular Font Size: 14 point (18.67 pixel)	
8.7.	Verification of Movement Authority as Zero.	Simulate the Movement Authority as Zero → Check Movement Authority control bar.	The Movement Authority control bar in blue color shall not be visible.	

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8.8.	Verification of Movement Authority as 50m.	Simulate the Movement Authority as 50m → Check Movement Authority control bar.	Movement Authority value bar should fill Blue color and indicate scale marking 50.	
8.9.	Verification of Movement Authority as 250m.	Simulate the Movement Authority as 250m → Check Movement Authority control bar.	Movement Authority value bar should fill Blue color and indicate scale marking 250.	
8.10.	Verification of Movement Authority as 500m.	Simulate the Movement Authority as 500m → Check Movement Authority control bar.	Movement Authority value bar should fill Blue color and indicate scale marking 500.	
8.11.	Verification of Movement Authority value with color indication control bar.	Simulate the Movement Authority as 1000 → Check Movement Authority control bar.	Movement Authority value bar should fill Blue color and indicate scale marking 1000.	
8.12.	Verification of Movement Authority distance as 3100.	Simulate the Movement Authority as 3100 →Check Movement Authority control bar.	Movement Authority value bar should fill Blue color and indicate scale marking +++ m.	
8.13.	Verification of Text for Movement Authority. **(Cl. B4.5.2(a))**	Simulate the Movement Authority as Greater than Zero → Check	Movement Authority name should be displayed at Region C2	
8.14.	Verification of Text font for Name at Region C2. **(Cl. B4.5.2(b))**	Check The Text Font and heading shall be "Mov. Authority".	Font: Microsoft Sans serif or Helvetica Font style: regular Font Size: 12 point (16 pixel)	
8.15.	Verification of Movement Authority value format at Region C3. **(Cl. B4.5.3(a))**	Check Movement Authority value format.	Movement Authority should display 5-digit number format Eg 00422m.	
8.16.	Verification of value Text font for Movement Authority at Region C3. **(Cl. B4.5.3(b))**	Check Text font for Movement Authority value at Region C3.	Font and size: Helvetica with font sixe 14 point (18.67 pixel). Font style: Bold	

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9.0	Test Case ID/ Title/ Description: KAVACH_DMI_09: Signal Aspects -This Test case is used to verify the Signal Aspects information.			
9.1.	Verification of Signal aspect, signal description and signal distance information at region D Position. **(Cl. B4.6.3)**	Check all parameters data at region D Position.	The region D should display the D1, D2, and D3 D1 →Aspect Direct information. D2 → The value of the approaching signal distance in meters is to be displayed at this location. D3 → The name of the approaching signal direction and line information is to be displayed here in words.	
9.2.	Verification of Signal aspect information at region D. **(Cl. B4.6.4)**	Check Danger, Warning and Caution aspect at region D.	Should be indicated the Danger aspect, Warning aspect and Caution aspect.	
9.3.	Verification of Post Signal aspect information at region D1. **(Cl. B4.6.4.1(a))**	Check Post Signal aspect information.	The Post signal aspects should be shown in 4 circles as Below: a) YELLOW (Coded YLW) at the top. b) Followed by GREEN (Coded GRN). c) then followed by YELLOW (Coded YLW). d) Then by RED (Coded BRD).	
9.4.	Verification of Yellow signal Aspect.	Simulate the condition for Yellow signal → Check.	Signal aspect should display as Yellow signal.	

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9.5.	Verification of GREEN signal Aspect.	Simulate the condition for GREEN signal→ Check.	Signal aspect should display as GREEN signal.	
9.6.	Verification of double Yellow signal Aspect.	Simulate the condition for double Yellow signal→ Check.	Signal aspect should display as double Yellow signal.	
9.7.	Verification of RED signal Aspect.	Simulate the condition for RED signal→ Check.	Signal aspect should display as RED signal.	
9.8.	Verification of Calling On signal aspect. **(Cl. B4.6.4.1(b))**	Simulate the condition for Calling On signal→ Check	Calling On signal aspect should display Letter 'C' in black on White circular.	
9.9.	Verification of IB (Intermediate Block Stop) signal. **(Cl. B4.6.4.1(b))**	Simulate the condition for IB signal→ Check.	IB (Intermediate Block Stop) signal should display Letter 'IB' in black on White circular.	
9.10.	Verification of Gate stop signal. **(Cl. B4.6.4.1(b))**	Simulate the condition for Gate stop signal→ Check.	Gate stop signal should display Letter 'G' in black on White circular.	
9.11.	Verification of Auto signal. **(Cl. B4.6.4.1(b))**	Simulate the condition for Auto signal → Check.	Auto signal should display Letter 'A' in black on White circular.	
9.12.	Verification of Auto Gate signal. **(Cl. B4.6.4.1(b))**	Simulate the condition for Auto Gate signal → Check.	Auto Gate signal should display Letter 'AG' in black on White circular.	
9.13.	Verification of no signal aspects. **(Cl. B4.6.4.1(d))**	Simulate the condition for no signal aspects → Check.	Should no display signal posts with signal & area shall be black blank screen.	
9.14.	Verification of Text font for 'C'/"IB/'G/'A'/'AG''. **(Cl. B4.6.4.1(c))**	Check The Text Font→ Check.	Font: Microsoft Sans serif or Helvetica Font style: Regular Font Size: 14 point (18.67 pixel)	
9.15.	Verification of distance value to next signal value information at Region D2. **(Cl. B4.6.4.2(a))**	Simulate distance value to next signal value as 0933m→ Check.	Approaching signal distance value information should display 0933m at Region D2.	

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9.16.	Verification of distance value to next signal value as minimum. **(Cl. B4.6.4.2(a))**	Simulate distance value to next signal value as 0m → Check.	Approaching signal distance value information should display 0m at Region D2.	
9.17.	Verification of distance value to next signal value as 1008m. **(Cl. B4.6.4.2(a))**	Simulate distance value to next signal value as 1008m → Check.	Approaching signal distance value information should display 1008m at Region D2.	
9.18.	Verification of distance value to next signal value as 0348m. **(Cl. B4.6.4.2(a))**	Simulate distance value to next signal value as 0348m → Check.	Approaching signal distance value information should display 0348 m at Region D2.	
9.19.	Verification of distance value to next signal value as 1442. **(Cl. B4.6.4.2(a))**	Simulate distance value to next signal value as 1442m → Check.	Approaching signal distance value information should display 1442 m at Region D2.	
9.20.	Verification of distance value. **(Cl. B4.6.4.2(b))**	Check distance value shall be 4 digit and in meters.	Display distance value in 4 digit and in meters Eg. 0000 m.	
9.21.	Verification of Text font for signal distance information Value. **(Cl. B4.6.4.2(c))**	Check The Text Font	Font: DS-Digital or Helvetica Font style: Bold Font Size: 14 point (18.67 pixel)	
9.22.	Verification of Gate marker (Gate cum IB distant) signal. **(Cl. B4.6.4.1(b))**	Simulate the condition for Gate cum IB distance → Check.	Gate cum IB distance signal should display Letter „G" in black on White circular.	
9.23.	Verification of Gate marker (Gate cum IB inner distant) signal. **(Cl. B4.6.4.1(b))**	Simulate the condition for Gate cum IB inner distance → Check.	Gate cum IB inner distance signal should display Letter „G" in black on White circular.	
9.24.	Verification of Gate marker (Gate cum distant) signal. **(Cl. B4.6.4.1(b))**	Simulate the condition for Gate cum distance → Check.	Gate cum distance signal should display Letter „G" in black on White circular.	

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9.25.	Verification of Gate marker (Gate cum inner distant) signal. **(Cl. B4.6.4.1(b))**	Simulate the condition for Gate cum inner distance → Check.	Gate cum inner distance signal should display Letter „G" in black on White circular.	
9.26.	Verification of IB marker (IB cum Gate inner distant) signal. **(Cl. B4.6.4.1(b))**	Simulate the condition for IB cum Gate inner distance → Check.	IB cum Gate inner distance signal should display Letter „IB" in black on White circular.	
9.27.	Verification of IB marker (IB cum gate distant) signal. **(Cl. B4.6.4.1(b))**	Simulate the condition for IB cum Gate distance → Check.	IB cum Gate distance signal should display Letter „IB" in black on White circular.	
9.28.	Verification of IB marker (IB cum gate signal). **(Cl. B4.6.4.1(b))** (Annexure-C (a14 to a9) 110001)	Simulate the condition for IB cum gate signal → Check.	IB cum gate should display Letter IB in black on White circular.	

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10	Test Case ID/ Title/ Description: KAVACH_DMI_10: Route Indicators directions -This test case is used to verify Route Indicators direction information.		
10.1.	Verification of Route1 Direction Information. (Cl. B4.6.4.1(e))	Simulate the Direction information for Route1 → Check. **Note**: Check Route Indicators in Display screen regions sheet as per table B.4 of the Specification of Kavach (The Indian Railway ATP)-LP-OCIP Display Requirement -**Annexure-B.**	Should display the route1 Direction.	
10.2.	Verification of Route2 Direction 3Information. (Cl. B4.6.4.1(e))	Simulate the Direction information for Route2→ Check **Note**: Check Route Indicators in Display screen regions sheet as per table B.4 of the Specification of Kavach (The Indian Railway ATP)-LP-OCIP Display Requirement -**Annexure-B.**	Should display the route2 Direction.	
10.3.	Verification of Route3 Direction Information. (Cl. B4.6.4.1(e))	Simulate the Direction information for Route 3→ Check **Note**: Check Route Indicators in Display screen regions sheet as per table B.4 of the Specification of Kavach (The Indian Railway ATP)-LP-OCIP Display Requirement -**Annexure-B.**	Should display the route3 Direction.	
10.4.	Verification of Route4 Direction Information. (Cl. B4.6.4.1(e))	Simulate the Direction information for Route4 → Check **Note**: Check Route Indicators in Display screen regions sheet as per table B.4 of the Specification of Kavach (The Indian Railway ATP)-LP-OCIP Display Requirement -**Annexure-B.**	Should display the route4 Direction.	

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10.5.	Verification of Route5 Direction Information. **(Cl. B4.6.4.1(e))**	Simulate the Direction information for Route5 → Check **Note**: Check Route Indicators in Display screen regions sheet as per table B.4 of the Specification of Kavach (The Indian Railway ATP)-LP-OCIP Display Requirement -**Annexure-B.**	Should display the route5 Direction	
10.6.	Verification of Route6 Direction Information. **(Cl. B4.6.4.1(e))**	Simulate the Direction information for Route6→ Check **Note**: Check Route Indicators in Display screen regions sheet as per table B.4 of the Specification of Kavach (The Indian Railway ATP)-LP-OCIP Display Requirement -**Annexure-B.**	Should display the route6 Direction	
10.7.	Verification of Route Stencil type. **(Cl. B4.6.4.1(e))**	Simulate the Direction information for Route greater than 6, i.e. 7, 8,…..22 upto 30 etc.	Should display the router direction in "Stencil type "	

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11	Test Case ID/ Title/ Description: KAVACH_DMI_11: Signal distance information -This test case is used to verify next approaching signal distance information.			
11.1.	Verification of approaching signal distance information at Region D3. **(Cl. B4.6.4.3(a))**	Check approaching signal distance information.	Traffic direction, approaching signal post name and line number information should display at Region D3.	
11.2.	Verification of Traffic direction. **(Cl. B4.6.4.3(a))**	Simulate the traffic direction for Up signal → Check.	Should display the *UP* with signal post name and line number information.	
11.3.	Verification of Traffic direction. **(Cl. B4.6.4.3(a))**	Simulate the traffic direction for Down signal → Check.	Should display the *DN* with signal post name and line number information.	
11.4.	Verification of Traffic direction. **(Cl. B4.6.4.3(a))**	Simulate the traffic direction for Up Fast Signal → Check.	Should display the *UP FAST* with signal post name and line number information.	
11.5.	Verification of Traffic direction. **(Cl. B4.6.4.3(a))**	Simulate the traffic direction for Down Fast signal → Check.	Should display the *DN FAST* with signal post name and line number information.	
11.6.	Verification of Traffic direction. **(Cl. B4.6.4.3(a))**	Simulate the traffic direction for Up Slow Signal → Check.	Should display the *UP SLOW* with signal post name and line number information.	
11.7.	Verification of Traffic direction. **(Cl. B4.6.4.3(a))**	Simulate the traffic direction for Down Slow signal → Check.	Should display the *DN SLOW* with signal post name and line number information.	
11.8.	Verification of Traffic direction. **(Cl. B4.6.4.3(a))**	Simulate the traffic direction for Up Main Signal → Check.	Should display the *UP MAIN* with signal post name and line number information.	

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11.9.	Verification of Traffic direction. **(Cl. B4.6.4.3(a))**	Simulate the traffic direction for Down Main signal → Check.	Should display the *DN MAIN* with signal post name and line number information.	
11.10.	Verification of Traffic direction. **(Cl. B4.6.4.3(a))**	Simulate the traffic direction for Up Sub Signal → Check.	Should display the *UP SUB* with signal post name and line number information.	
11.11.	Verification of Traffic direction. **(Cl. B4.6.4.3(a))**	Simulate the traffic direction for Down Sub signal → Check.	Should display the *DN SUB* with signal post name and line number information.	
11.12.	Verification of Traffic direction. **(Cl. B4.6.4.3(a))**	Simulate the traffic direction for Up BI-Direction Signal → Check.	Should display the *UP BI-DIR* with signal post name and line number information.	
11.13.	Verification of Traffic direction. **(Cl. B4.6.4.3(a))**	Simulate the traffic direction for Down BI-Direction signal → Check.	Should display the *DN BI-DIR* with signal post name and line number information.	
11.14.	Verification of Type of Signal **(Cl. B4.6.4.3(a))**	Simulate the approaching signal post for Distant → Check	Should display the *Dist* with traffic direction and line number information	
		Simulate the approaching signal post for Inner Distant→ Check	Should display the *Inr-Dist* with traffic direction and line number information	
		Simulate the approaching signal post for Gate Distant→ Check	Should display the *Gate-Dist* with traffic direction and line number information.	
		Simulate the approaching signal post for Gate Inner Distant→ Check	Should display the *Gate-Inr-Dist* with traffic direction and line number information.	

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		Simulate the approaching signal post for IB Distant→ Check	Should display the *IB-Dist* with traffic direction and line number information.	
		Simulate the approaching signal post for IB Inner Distant→ Check	Should display the *IB-Inr-Dist* with traffic direction and line number information	
		Simulate the approaching signal post for Automatic Signal (Excludes Gate Stop Signal in Auto Territory) → Check	Should display the *Auto* with traffic direction and line number information.	
		Simulate the approaching signal post for Semi-Automatic→ Check	Should display the *Semi-Auto* with traffic direction and line number information.	
		Simulate the approaching signal post for Main Home without Junction Route Indicator→ Check	should display the *Home* with traffic direction.	
		Simulate the approaching signal post for Main Home with Junction Route Indicator→ Check	should display the *Home L-X* with traffic direction.	
		Simulate the approaching signal post for Routing Home without Junction Type Route Indicator→ Check	Should display the **R**-*Home* with traffic direction and line number information.	
		Simulate the approaching signal post for Routing Home with Junction Type Route Indicator→ Check	Should display the *R-Home-L-X* with traffic direction and line number information.	
		Simulate the approaching signal post for Mainline Starter → Check	Should display the *M/L-Str L-X* with traffic direction and line number information.	
		Simulate the approaching signal post for Loop line Starter → Check	Should display the *L/L-Str L-X* with traffic direction and line number information.	

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		Simulate the approaching signal post for Intermediate Starter → Check	Should display the ***Int-Str*** with traffic direction and line number information	
		Simulate the approaching signal post for Advance starter Signal→ Check.	Should display the ***Adv-Str*** with traffic direction and line number information.	
		Simulate the approaching signal post for IB Stop Signal → Check.	Should display the ***IB-Stop*** with traffic direction and line number information.	
		Simulate the approaching signal post for Gate Stop Signal → Check	Should display the ***Gate-Stop*** with traffic direction and line number information.	
		Simulate the approaching signal post for Calling ON signal → Check.	Should display the ***Calling-On*** with traffic direction and line number information.	
		Simulate the approaching signal post for Advance starter cum Gate signal → Check.	Should display the ***Adv-Str-cum-Gate*** with traffic direction and line number information.	
		Simulate the approaching signal post for Gate Cum Distant → Check.	Should display the ***Gate-cum-Dist*** with traffic direction and line number information.	
		Simulate the approaching signal post for Advance Starter cum Distant Signal → Check.	Should display the ***Adv-Str-cum-Dist*** with traffic direction and line number information.	
		Simulate the approaching signal post for Gate Stop Signal in Auto Sig territory → Check	Should display the ***Auto-Gate*** with traffic direction and line number information.	
		Simulate the approaching signal post for Advance Starter-cum-Gate Inner Distant in Auto Sig territory → Check	Should display the ***Adv-Str-cum-G-ID*** with traffic direction and line number information.	
		Simulate the approaching signal post for Gate Cum Inner Distant → Check.	Should display the ***Gate-cum-ID*** with traffic direction and line number information.	

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		Simulate the approaching signal post for Gate Inner Distant-cum-Distant Signal→ Check	Should display the *Gate-ID-cum-Dist* with traffic direction and line number information.	
		Simulate the approaching signal post for IB Signal cum Gate Distant Signal → Check	Should display the *IB-cum-Gate-Dist* with traffic direction and line number information.	
		Simulate the approaching signal post for IB cum Gate Inner Distant Signal → Check	Should display the *IB-cum-Gate--ID* with traffic direction and line number information.	
		Simulate the approaching signal post for IB cum Distant Signal → Check	Should display the *IB-cum-Dist* with traffic direction and line number information.	
		Simulate the approaching signal post for Advanced Starter-cum-IB Distant → Check	Should display the *Adv-Str-Cum-IB-D* with traffic direction and line number information.	
		Simulate the approaching signal post for Starter-cum- IB Distant Signal → Check	Should display the *Str-Cum-IB-Dist* with traffic direction and line number information.	
		Simulate the approaching signal post for Stop Board/Buffer Stop → Check	Should display the *Stop Board* with traffic direction and line number information.	
		Simulate the approaching signal post for Gate Cum IB Distant Signal → Check	Should display the *Gate-cum-IB-Dist* with traffic direction and line number information.	
		Simulate the approaching signal post for Gate Cum IB Inner Distant Signal → Check	Should display the *Gate-cum-IB-ID* with traffic direction and line number information.	
		Simulate the approaching signal post for Advance Starter-cum-Gate Distant Signal → Check	Should display the *Adv-Str-cum-GD* with traffic direction and line number information.	
11.15.	Verification of Text fore color for Region D3. **(Cl. B4.6.4.3(b))**	Check Text fore color.	Region D3 text should be shown in ORANGE (Coded ORG) color.	

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11.16.	Verification of Text font for Region D3. **(Cl. B4.6.4.3(b))**	Check The Text Font.	Font: Microsoft Sans serif or Helvetica Font Style: Regular Font Size: 13 point (17.33 pixel)	
12	**Test Case ID/ Title/ Description: KAVACH_DMI_12: RFID Tag Information -This test case is used to verify RFID Tags passed by the locomotives.**			
12.1.	Verification of tags passed by the locomotives at Region M. **(Cl. B4.10.1(a))**	Check at Region M.	Tags passed by the locomotive information should display diagrammatic format as tags laid on a track.	
12.2.	Verification of Tag color by default. **(Cl. B4.10.1(b))**	Check tag color by default.	Tags indication should be displayed the Gray color.	
12.3.	Verification of Tag color when Tag is missed. **(Cl. B4.10.1(a))**	Simulate the Tag missed condition → Check tag color.	Missed Tags indication should be displayed the Red color.	
12.4.	Verification of Tag color when expected tag is received.	Simulate the Expected Tag is received condition → Check tag color.	Tags indication should be displayed the Gray color.	
12.5.	Verification of Tag color when expected tag is crossed. **(Cl. B4.10.1(b))**	Simulate the Expected Tag crossed condition → Check tag color.	Tags indication should be displayed the Dark green color.	
12.6.	Verification of Text font for Region L. **(Cl. B4.10(a))**	Check The Text Font at Region L.	Font: Microsoft Sans serif or Helvetica Font Style: Normal Font Size: 12 point (16 Pixel)	

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13	Test Case ID/ Title/ Description: KAVACH_DMI_13: Radio packets signal strength- This test case is used to verify Radio packets signal strength.			
13.1.	Verification of standing antenna image at region J1. **(Cl. B4.9.1)**	Check Standing antenna image.	Standing antenna image should be displayed at Region J1.	
13.2.	Verification of "RF" Text followed by standing antenna image at Region J2. **(Cl. B4.9.2)**	Check" RF" Text.	Should be displayed the "RF" Text followed by standing antenna image at Region J2.	
13.3.	Verification of signal strength vertical line Bars as per signal strength at Region J3. **(Cl. B4.9.3(a))**	Check at Region J3.	The symbol for receiving antenna and the signal strengths is shown by subsequent lines near it to the count of 5 (Vertical Line Bars).	
13.4.	Verification of Radio packets signal strength as minimum (1). **Cl. B4.9.3(a))**	Previous 1 out of 5 Radio packets signal are received correctly next packet as missing → Check	Signal strength should get displayed as 1 Vertical Line bars.	
13.5.	Verification of Radio packets signal strength as 2. **Cl. B4.9.3(a))**	Previous 2 out of 5 Radio packets signal are received correctly next packet as missing→ Check	Signal strength should get displayed as 2 Vertical Line bars.	
13.6.	Verification of Radio packets signal strength as 3. **Cl. B4.9.3(a))**	Previous 3 out of 5 Radio packets signal are received correctly next packet as missing→ Check	Signal strength should get displayed as 3 Vertical Line bars.	
13.7.	Verification of Radio packets signal strength as 4. **Cl. B4.9.3(a))**	Previous 4 out of 5 Radio packets signal are received correctly next packet as missing→ Check	Signal strength should get displayed as 4 Vertical Line bars.	
13.8.	Verification of Radio packets signal strength as Maximum (5). **Cl. B4.9.3(a))**	Previous 5 Radio packets signal are received correctly→ Check	Signal strength should get displayed as 5 Vertical Line bars.	

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| 13.9. | Verification of Radio Hole region. **Cl. B4.9.3(b))** | i) Radio hole region shall be simulated from simulator or Stationary KAVACH.
 ii) Radio hole shall be displayed when packet is received from stationary Kavach. | Image should be display at Region J1.
 In simulated absolute location

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14	Test Case ID/ Title/ Description: KAVACH_DMI_14: Context Messages 1 - This test case is used to verify Context messages 1 in region H.			
14.1.	Verification of Context message "System Fault, Isolate or Restart KAVACH". **(Cl. B4.7.3 (d) (1))**	Check context message "System Fault, Isolate or Restart KAVACH".	Should display context message "System Fault, Isolate or Restart KAVACH".	
14.2.	Verification of Context message "Ack Loco stop in Block Section, SOS Generates in 15 s". **(Cl. B4.7.3 (d) (2))**	Check context message "Ack Loco stop in Block Section, SOS Generates in 15 s".	Should display context message "Ack Block stop, SOS Generates in 15 s".	
14.3.	Verification of Context message "Emergency Brake Bypassed (EB Cock Closed), No Traction". **(Cl. B4.7.3 (d) (3))**	Check context message "Emergency Brake Bypassed (EB Cock Closed), No Traction".	Should display context message "EB Bypassed (EB Cock Closed), No Traction".	
14.4.	Verification of Context message "Train Tripped, Select P_Trp". **(Cl. B4.7.3 (d) (4))**	Check context message "Train Tripped, Select P_Trp".	Should display context message "Train Tripped, Select P_Trp".	
14.5.	Verification of Context message "Brake Applied, Dead End Detected". **(Cl. B4.7.3 (d) (5))**	Check context message "Brake Applied, Dead End Detected".	Should display context message "Brake Applied, Dead End Detected".	
14.6.	Verification of Context message "Brake Applied, Movement in Stand By Mode". **(Cl. B4.7.3 (d) (6))**	Check context message "Brake Applied, Movement in Standby Mode".	Should display context message "Standstill Protection, Brake Applied".	
14.7.	Verification of Context message "Brake Applied, Rollback Detected". **(Cl. B4.7.3 (d) (7))**	Check context message "Brake Applied, Rollback Detected".	Should display context message "Rollback Protection, Brake Applied,".	

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14.8.	Verification of Context message "Reverse Movement Not Allowed, Use REV mode". **(Cl. B4.7.3 (d) (8))**	Check context message "Reverse Movement Not Allowed, Use REV mode".	Should display context message "REV Movement Not Allowed, Use REV mode".	
14.9.	Verification of Context message "Stand By mode-CAB input is not Active". **(Cl. B4.7.3 (d) (9))**	Check context message "Stand By mode- CAB input is not Active".	Should display context message "Stand By mode- CAB input is not Active".	
14.10.	Verification of Context message "Ack SR mode–KAVACH Territory Exit". **(Cl. B4.7.3 (d) (10))**	Check context message "Ack SR mode– KAVACH Territory Exit".	Should display context message "Ack SR mode– KAVACH Territory Exit".	
14.11.	Verification of Context message "Ack SR mode–Radio Comm Fail with Station". **(Cl. B4.7.3 (d) (11))**	Check context message "Ack SR mode– Radio Comm Fail with Station".	Should display context message "Ack SR mode– Station Radio Comm Fail".	
14.12.	Verification of Context message "Ack SR mode–No Track Profile Info". **(Cl. B4.7.3 (d) (12))**	Check context message "Ack SR mode–No Track Profile Info".	Should display context message "Ack SR mode–No Track Profile Info".	
14.13.	Verification of Context message "Ack SR mode – Tags missing". **(Cl. B4.7.3 (d) (13))**	Check context message "Ack SR mode – Tags missing".	Should display context message "Ack SR mode – Tags missing".	
14.14.	Verification of Context message "Ack SR mode – Direction unknown". **(Cl. B4.7.3 (d) (14))**	Check context message "Ack SR mode – Direction unknown".	Should display context message "Ack SR mode – Direction unknown".	
14.15.	Verification of Context message "Ack SR mode – GPS Fail". **(Cl. B4.7.3 (d) (15))**	Check context message "Ack SR mode – GPS Fail".	Should display context message "Ack SR mode – GPS Fail".	

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14.16.	Verification of Context message "Ack LS mode – Radio Comm Fail with Station". **(Cl. B4.7.3 (d) (16))**	Check context message "Ack LS mode – Radio Comm Fail with Station".	Should display context message "Ack LS mode – Station Radio Comm Fail".	
14.17.	Verification of Context message "Ack SR mode – TSR Link Fail". **(Cl. B4.7.3 (d) (17))**	Check context message "Ack SR mode – TSR Link Fail".	Should display context message "Ack SR mode – TSR Link Fail".	
14.18.	Verification of Context message "Head On Collision with Loco XXXXX in YYYY m". **(Cl. B4.7.3 (d) (18))**	Check context message "Head On Collision with Loco XXXXX in YYYY m".	Should display context message "Head On Collision with Loco XXXXX in YYYY m".	
14.19.	Verification of Context message "Rear End Collision with Loco XXXXX in YYYY m". **(Cl. B4.7.3 (d) (19))**	Check context message "Rear End Collision with Loco XXXXX in YYYY m".	Should display context message "Rear End Collision with Loco XXXXX in YYYY m".	
14.20.	Verification of Context message "Override selected, Pass Signal in XXX s". **(Cl. B4.7.3 (d) (20))**	Check context message "Override selected, Pass Signal in XXX s".	Should display context message "Override selected, Pass Signal in XXX s".	
14.21.	Verification of Context message "Reverse Mode Expires in XXXXm or YYYs". **(Cl. B4.7.3 (d) (21))**	Check context message "Reverse Mode Expires in XXXXm or YYYs".	Should display context message "Reverse Mode Expires in XXXXm or YYYs".	
14.22.	Verification of Context message "Manned LC Gate XXXX approaching in YYYYm". **(Cl. B4.7.3 (d) (22))**	Check context message "Manned LC Gate XXXX approaching in YYYYm".	Should display context message "Manned LC Gate XXXX in YYYYm".	

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14.23.	Verification of Context message "Unmanned LC Gate XXXX approaching in YYYYm. **(Cl. B4.7.3 (d) (23))**	Check context message "Unmanned LC Gate XXXX approaching in YYYYm".	Should display context message "Unmanned LC Gate XXXX in YYYYm".	
14.24.	Verification of Context message "LS mode Waiting for Radio Comm with station". **(Cl. B4.7.3 (d) (24))**	Check context message "LS mode Waiting for Radio Comm with station".	Should display context message "LS mode Waiting for Station Radio Comm".	
14.25.	Verification of Context message "LS mode Waiting for Track Profile info". **(Cl. B4.7.3 (d) (25))**	Check context message "LS mode Waiting for Track Profile info ".	Should display context message "LS mode Waiting for Track Profile info".	
14.26.	Verification of Context message "Both Leading & Non-leading Inputs are Active". **(Cl. B4.7.3 (d) (26))**	Check context message "Both Leading & Non-leading Inputs are Active".	Should display context message "Both Leading & Non-leading Inputs are Active".	
14.27.	Verification of Context message "Train Length Computation in Progress". **(Cl. B4.7.3 (d) (27))**	Check context message "Train Length Computation in Progress".	Should display context message "Train Length Computation in Progress".	
14.28.	Verification of Context message "Train Length Computation Success (XXXXm)". **(Cl. B4.7.3 (d) (28))**	Check context message "Train Length Computation Success (XXXXm)".	Should display context message "Train Length Computation Success (XXXXm)".	
14.29.	Verification of Context message "Train Length Computation Fail (XXXXm)". **(Cl. B4.7.3 (d) (29))**	Check context message "Train Length Computation Fail (XXXXm)".	Should display context message "Train Length Computation Fail (XXXXm)".	

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14.30.	Verification of Context message "Train Length Computation Aborted". **(Cl. B4.7.3 (d) (30))**	Check context message "Train Length Computation Aborted".	Should display context message "Train Length Computation Aborted".	
14.31.	Verification of Context message "TurnOut in XXXXm with speed limit YYYKmph". **(Cl. B4.7.3 (d) (31))**	Check context message "TurnOut in XXXm with speed limit YYYKmph".	Should display context message "TurnOut in XXXm with speed limit YYYKmph".	
14.32.	Verification of Context message "TSR in XXXXm with speed limit YYYKmph". **(Cl. B4.7.3 (d) (32))**	Check context message "TSR in XXXXm with speed limit YYYKmph".	Should display context message "TSR in XXXXm with speed limit YYYKmph".	
14.33.	Verification of Context message "PSR in XXXXm with speed limit YYYKmph". **(Cl. B4.7.3 (d) (33))**	Check context message PSR in XXXXm with speed limit YYYKmph".	Should display context message "PSR in XXXXm with speed limit YYYKmph".	
14.34.	Verification of Context message "End of Authority in XXXXm". **(Cl. B4.7.3 (d) (34))**	Check context message "End of Authority in XXXXm".	Should display context message "End of Authority in XXXXm".	
14.35.	Verification of Context message "KAVACH Territory Entry". **(Cl. B4.7.3 (d) (35))**	Check context message "KAVACH Territory Entry".	Should display context message "KAVACH Territory Entry".	
14.36.	Verification of Context message "System Self-Test in progress". **(Cl. B4.7.3 (d) (36))**	Check context message "System Self-Test in progress".	Should display context message "System Self-Test in progress".	
14.37.	Verification of Context message "System Self-Test Success". **(Cl. B4.7.3 (d) (37))**	Check context message "System Self-Test Success".	Should display context message "System Self-Test Success".	

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14.38.	Verification of Context message "System Self-Test Fail – xxxx". **(Cl. B4.7.3 (d) (38))**	Check context message "System Self-Test Fail – xxxx".	Should display context message "System Self-Test Fail –xxxx".	
14.39.	Verification of Context message "Brakes Testing – Waiting for MR X.YY(X.YY)kg/cm^2". **(Cl. B4.7.3 (d) (39))**	Check context message "Brakes Testing – Waiting for MR X.YY(X.YY)kg/cm^2".	Should display context message "Brakes Test – Waiting for MR X.YY(X.YY)kg/cm^2".	
14.40.	Verification of Context message "Brakes Testing – Waiting for BP X.YY(X.YY)kg/cm^2". **(Cl. B4.7.3 (d) (40))**	Check context message "Brakes Testing – Waiting for BP X.YY(X.YY)kg/cm^2".	Should display context message "Brakes Test – Waiting for BP X.YY(X.YY)kg/cm^2".	
14.41.	Verification of Context message "Brakes Testing – NSB Applied, BP-X.YYkg/cm^2". **(Cl. B4.7.3 (d) (41))**	Check context message "Brakes Testing – NSB Applied, BP-X.YYkg/cm^2".	Should display context message "Brakes Test – NSB Applied, BP-X.YYkg/cm^2".	
14.42.	Verification of Context message "Brakes Testing – FSB Applied, BP-X.YYkg/cm^2". **(Cl. B4.7.3 (d) (42))**	Check context message "Brakes Testing – FSB Applied, BP-X.YYkg/cm^2".	Should display context message "Brakes Test – FSB Applied, BP-X.YYkg/cm^2".	
14.43.	Verification of Context message "Brakes Testing – EB Applied, BP-X.YYkg/cm^2". **(Cl. B4.7.3 (d) (43))**	Check context message "Brakes Testing – EB Applied, BP-X.YYkg/cm^2".	Should display context message "Brakes Test – EB Applied, BP-X.YYkg/cm^2".	
14.44.	Verification of Context message "Brakes Testing – LE Brake applied, BC X.YY Kg/ cm^2. **(Cl. B4.7.3 (d) (44))**	Check context message "Brakes Testing – LE Brake applied, BC X.YY Kg/ cm^2.	Should display context message "Brakes Test – LEB applied, BC X.YY Kg/ cm^2.	

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14.45.	Verification of Context message "Brakes Testing Success". **(Cl. B4.7.3 (d) (45))**	Check context message "Brakes Testing Success".	Should display context message "Brakes Testing Success".	
14.46.	Verification of Context message "Brakes Testing Fail (NSB, FSB, EB)". **(Cl. B4.7.3 (d) (46))**	Check context message "Brakes Testing Fail (NSB)".	Should display context message "Brakes Testing Fail (NSB)".	
		Check context message "Brakes Testing Fail (FSB)".	Should display context message "Brakes Testing Fail (FSB)"	
		Check context message "Brakes Testing Fail (EB)".	Should display context message "Brakes Testing Fail (EB)"	
14.47.	Verification of Context message "Brakes Testing Fail, Press ACK for Retest Brakes". **(Cl. B4.7.3 (d) (47))**	Check context message "Brakes Test Fail, Press ACK for Retest Brakes".	Should display context message "Brakes Test Fail, Press ACK for Retesting".	
14.48.	Verification of Context message "Select Train Configuration, Press 'CONFIG' Button". **(Cl. B4.7.3 (d) (48))**	Check context message "Select Train Configuration, Press 'CONFIG' Button".	Should display context message "Select Train Configuration, Press 'CONFIG' Button".	
14.49.	Verification of Context message "Select Staff Responsible or Shunt Mode". **(Cl. B4.7.3 (d) (49))**	Check context message "Select Staff Responsible or Shunt Mode".	Should display context message "Select Staff Responsible or Shunt Mode".	
14.50.	Verification of Context message "Approaching Radio Hole in XXXXX m". **(Cl. B4.7.3 (d) (50))**	Check context message "Approaching Radio Hole in XXXXX m".	Should display context message "Approaching Radio Hole in XXXXX m".	
14.51.	Verification of Context message "ACK OS Mode". **(Cl. B4.7.3 (d) (51))**	Check context message "ACK OS Mode".	Should display context message "ACK OS Mode".	
14.52.	Verification of Context message "Loco/Train is in	Check context message "Loco/Train is in Fouling Zone, Normalize the reverser".	Should display context message "Train is in FM Zone, Normalize the Reverser".	

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	Fouling Zone, Normalize the reverser". **(Cl. B4.7.3 (d) (52))**			
14.53.	Verification of Context message "SR/SH Mode- ETCS –ETCS Territory Entry". **(Cl. B4.7.3 (d) (53))**	Check context message "SR/SH Mode- ETCS –ETCS Territory Entry".	Should display context message "SR/SH Mode- ETCS–ETCS Territory Entry".	
14.54.	Verification of Context message "FS mode ETCS- ETCS Full Supervision Mode". **(Cl. B4.7.3 (d) (54))**	Check context message "FS mode ETCS- ETCS Full Supervision Mode".	Should display context message "FS mode ETCS- ETCS Full Supervision Mode".	
14.55.	Verification of Context message "ACK SR Mode – ETCS Territory Exit". **(Cl. B4.7.3 (d) (55))**	Check context message "ACK SR Mode – ETCS Territory Exit".	Should display context message "ACK SR Mode – ETCS Territory Exit".	
14.56.	Verification of Context message "Ballise Default telegram received". **(Cl. B4.7.3 (d) (56))**	Check context message "Ballise Default telegram received".	Should display context message "Ballise Default telegram received".	
14.57.	Verification of Context message "Waiting for Traction Command". **(Cl. B4.7.3 (d) (57))**	Check context message "Waiting for Traction Command".	Should display context message "Waiting for Traction Command".	
14.58.	Verification of Context message "Traction cut-off Command fail". **(Cl. B4.7.3 (d) (58))**	Check context message "Traction cut-off Command fail".	Should display context message "Traction cut-off Command fail".	
14.59.	Verification of Context message "Fouling Mark Entry". **(Cl. B4.7.3 (d) (59))**	Check context message "Fouling Mark Entry".	Should display context message "Fouling Mark Entry".	

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14.60.	Verification of Context message "Fouling Mark Clear". **(Cl. B4.7.3 (d) (60))**	Check context message "Fouling Mark Clear".	Should display context message "Fouling Mark Clear".	
14.61.	Verification of Context message "Neutral Section approaching in XXX m". **(Cl. B4.7.3 (d) (61))**	Check context message "Neutral Section approaching in XXX m".	Should display context message "Neutral Section approaching in XXX m".	
14.62.	Verification of Context message "Braking system malfunction". **(Cl. B4.7.3 (d) (62))**	Check context message "Braking system malfunction".	Should display context message "Braking system malfunction".	
14.63.	Verification of Context message "Forward Movement not allowed in REVERSE Mode ". *Cl. B4.7.3 (d) (63))*	Check context message "Forward Movement not allowed in REVERSE Mode ".	Should display context message "No Forward Dir in REV Mode".	
14.64.	Verification of Context message "ACK SR Mode - SR Authorization Received ". *Cl. B4.7.3 (d) (64))*	Check context message "ACK SR Mode- SR Authorization Received ".	Should display context message "ACK SR Mode - SR Authorization Received".	
14.65.	Verification of Context message "ACK SR Mode - Slip/Skid Detected ". *Cl. B4.7.3 (d) (65)*	Check context message "ACK SR Mode - Slip/Skid Detected"	Should display context message "ACK SR Mode - Slip/Skid Detected".	
14.66.	Verification of Context message "ACK SR mode- Foreign Tag Detected ". *Cl. B4.7.3 (d) (66)*	Check context message "ACK SR mode- Foreign Tag Detected"	Should display context message "ACK SR mode- Foreign Tag Detected".	
14.67.	Verification of Context message "Ack for SR mode - Odo Error detected". *Cl. B4.7.3 (d) (67)*	Check context message "Ack for SR mode - Odo Error detected"	Should display context message "Ack for SR mode - Odo Error detected".	

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14.68.	Verification of Context message "Brake Applied- Shunting limits exceeded". *Cl. B4.7.3 (d) (68)*	Check context message "Brake Applied- Shunting limits exceeded"	Should display context message "Brake Applied- Shunting limits exceeded".	
14.69.	Verification of Context message "Brake Applied- Station General SoS". *Cl. B4.7.3 (d) (69)*	Check context message "Brake Applied- Station General SoS"	Should display context message "Brake Applied- Station General SoS".	
14.70.	Verification of Context message "Brake Applied- SPAD detected". *Cl. B4.7.3 (d) (70)*	Check context message "Brake Applied-SPAD detected"	Should display context message "Brake Applied-SPAD detected".	
14.71.	Verification of multiple messages for more than one scenario. **(Cl. B4.7.3 (e))**	Simulate the more than one scenario for different targets Such as Head On/ Rear End Collision, Turnout, PSR, TSR, LC Gate Approach etc.	Both targets shall be displayed alternatively each for 2 seconds (configurable).	
			Head On Collision and PSR	
			Turn out and PSR targets	
			PSR and TSR	
			Gate Approach and PSR	
14.72.	Verification of Text font for Context Messages. **(Cl. B4.7.3 (c))**	Check The Text Font	Font: Microsoft sans serif Style: BOLD Size: 17 Point (24 Pixel) (to accommodate in one line)	

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15	Test Case ID/ Title/ Description: KAVACH_DMI_15: Context Messages 2 - This test case is used to verify Context message 2 at Region I.			
15.1.	Verification of Context message "SOS – Self Loco (Manual). **Cl. B4.8 (d) (1))**	Check context message "SOS – Self Loco (Manual)".	Should display context message "SOS – Self Loco (Manual)".	
15.2.	Verification of Context message "SOS – Self Loco (Stopped in Block Section). **Cl. B4.8 (d) (2))**	Check context message "SOS – Self Loco (Stopped in Block Section)".	Should display context message "SOS – Self Loco (Stopped in Block Section)".	
15.3.	Verification of Context message "SOS - Self Loco (Train Parted)". **(Cl. B4.8 (d) (3))**	Check context message "SOS - Self Loco (Train Parted)".	Should display context message "SOS - Self Loco (Train Parted)".	
15.4.	Verification of Context message "SOS – From Loco XXXXXX (Manual). **(Cl. B4.8 (d) (4))**	Check context message "SOS – From Loco XXXXXX (Manual)".	Should display context message "SOS – From Loco XXXXXX (Manual)".	
15.5.	Verification of Context message "SOS – From Loco XXXXXX (Stopped in Block Section"). **(Cl. B4.8 (d) (5))**	Check context message "SOS – From Loco XXXXXX (Stopped in Block Section)".	Should display context message "SOS – From Loco XXXXXX (Stopped in Block Section)".	
15.6.	Verification of Context message "SOS - From Loco XXXXXX (Train Parted)". **(Cl. B4.8 (d) (6))**	Check context message "SOS - From Loco XXXXXX (Train Parted)".	Should display context message "SOS - From Loco XXXXXX (Train Parted)".	
15.7.	Verification of Context message "SOS – From Station XXXXX (SOS to All Locos)". **(Cl. B4.8 (d) (7))**	Check context message "SOS – From Station XXXXX (SOS to All Locos)".	Should display context message "SOS – From Station XXXXX (SOS to All Locos)".	
15.8.	Verification of Context message "SOS – From	Check context message "SOS – From Station XXXXX (SOS to this Loco)".	Should display context message "SOS – From Station XXXXX (SOS to this Loco)".	

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	Station XXXXX (SOS to this Loco)". **(Cl. B4.8 (d) (8))**			
15.9.	Verification of Context message "Over Speed, Please Reduce Speed" **(Cl. B4.8 (d) (9))**	Simulate Over speed→ Check context message.	Should display context message "Over Speed, Please Reduce Speed".	
15.10.	Verification of Context message "Brake Applied, Speed Limit Exceeded". **(Cl. B4.8 (d) (10))**	Simulate speed of the train more than the permissible speed limit → Check context message.	Should display context message "Brake Applied, Speed Limit Exceeded".	
15.11.	Verification of Context message "FSB will be applied in YYYs". **(Cl. B4.8 (d) (11))**	Check context message "FSB will be applied in YYYs".	Should display context message "FSB will be applied in YYYs".	
15.12.	Verification of Context message "EB will be applied in YYYs". **(Cl. B4.8 (d) (12))**	Check context message "EB will be applied in YYYs".	Should display context message "EB will be applied in YYYs".	
15.13.	Verification of Context message "BIU Isolated". **(Cl. B4.8 (d) (13))**	Check context message "BIU Isolated".	should display context message "BIU Isolated".	
15.14.	Verification of Context message "XXXXXXX Train Type selected". **(Cl. B4.8 (d) (14))**	Check context message "XXXXXXX Train Type selected".	Should display context message "XXXXXXX Train Type selected".	
15.15.	Verification of Text font for Fault Messages. **(Cl. B4.8 (c))**	Check The Text Font	Font: Microsoft Sans serif or Helvetica Font style: BOLD. Font Size: 15 Point (22.67 pixel)	
16	**Test Case ID/ Title/ Description: KAVACH_DMI_16: Audio Warnings -This test case is used to verify Audio Warnings for corresponding context messages.**			
16.1.	Buzzer test	When mode is changed.	Buzzer On	
		When over speed is observed.	Buzzer On	

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| | | When KAVACH initiates brake. | Buzzer On | |
| | | When SOS is received. | Buzzer On | |

17	Test Case ID/ Title/ Description: KAVACH_DMI_17: Train Length Value -This test case is used to verify Train Length Value.			
17.1.	Verification of Train Length Value. **(Cl. B4.7.1 (a))**	Simulate the Different Values for Train Length Value.	Received Train Length Value should be displayed at Region F.	
17.2.	Verification of Train Length value Format. **(Cl. B4.7.1 (c))**	Check Train Length Value Format.	Train Length Value should be shown as TL followed by single space followed by train length calculated by m.	
17.3.	Verification of Train Length value as minimum.	Train Length value as minimum as zero → Check.	Train Length Value should be shown as "Undefined/Invalid".	
17.4.	Verification of Train Length value as 650 m.	Train Length value as average as 650 m → Check.	Train Length Value should be shown as TL 650 m.	
17.5.	Verification of Train Length value as maximum.	Train Length value as Maximum as 2047 m→ Check.	Train Length Value should be shown as TL 2047 m.	
17.6.	Verification of Train Length Units. **(Cl. B4.7.1 (c))**	Check Train Length Units	Train Length units should be shown m.	
17.7.	Verification of Text font for Train Length Value. **(Cl. B4.7.1 (d))**	Check The Text Font.	Font: Microsoft Sans serif or Helvetica Font style: Regular Font Size: 14 point (18.67 Pixel)	
17.8.	Train length shall change only when differs by 25 m.	Train length value shall be changed to less than 25 m from existing train length.	No change to be observed.	
17.9.	Train length shall change only when differs by 26 m.	Train length value shall be changed to 26 m from existing train length.	New train length to be displayed.	

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18	**Test Case ID/ Title/ Description: KAVACH_DMI_18: Deceleration Constant calculated Value -This test case is used to verify Deceleration Constant calculated Value.**		
18.1.	Verification of Deceleration Constant calculated Value. **(Cl. B4.7 (a))**	Simulate the Deceleration Constant Value 0.25 → Check	Should display the Deceleration Constant calculated Value as DC 0.25 at Region E.
18.2.	Verification of Deceleration Constant calculated Value decimal point. **(Cl. B4.7 (c))**	Simulate the Deceleration Constant Value 0.685562 when Speed >50 → Check.	Should display the Deceleration Constant calculated Value as DC 0.68 at Region E.
18.3.	Verification of Deceleration Constant with different speed configuration. **Note**: The parameters in the test are for sample only. The parameters will vary with load. **(Cl. B4.7 (c))**	Configure DC X.XX for below Speeds through Software: 1) Simulate Speed less than 40 KMPH→Check. 2) Simulate Speed more than 40 KMPH but less than 60 KMPH→Check. 3) Simulate Speeds between 61-80 KMPH →Check. 4) Simulate speeds above 80 KMPH→Check.	1) Deceleration Constant calculated Value should display as DC X.XX for speeds up to 40 KMPH. 2) Deceleration Constant calculated Value should display DC X.XX when speeds between 41-60 KMPH. 3) Deceleration Constant calculated Value should display DC X.XX when for speeds between 61- 80 KMPH. 4) Deceleration Constant calculated Value should display DC X.XX when for speeds more than 80 KMPH.
18.4.	Verification of Text font for Deceleration Constant calculated Value. **(Cl. B4.7 (d))**	Check the Text Font.	Font: Microsoft Sans serif or Helvetica Font style: Regular. Font Size: 14 Point (18.67 Pixel).

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19	Test Case ID/ Title/ Description: KAVACH_DMI_19: Current Loco KAVACH mode in text-This test case is used to verify current Loco KAVACH mode in text.		
	• Verification of current Loco KAVACH mode in text at Region G. • Simulate each mode and check the Text at Region G. • Below modes text should be displayed at Region G.		
19.1.	Verification of Stand By mode. **(Cl. B4.7.2 (a))**	Simulate the Stand By mode in System → Check.	Should display the **stand By Mode** Text in DMI.
19.2.	Verification of Staff Responsible Mode. **(Cl. B4.7.2 (a))**	Simulate the Staff Responsible Mode in system → Check.	Should display the **Staff Responsible** mode Text in DMI.
19.3.	Verification of Limited Supervision Mode. **(Cl. B4.7.2 (a))**	Simulate the Limited Supervision Mode in system → Check.	Should display the **Limited Supervision Mode** Text in DMI.
19.4.	Verification of Full Supervision Mode. **(Cl. B4.7.2 (a))**	Simulate the Full Supervision Mode in system → Check.	Should display the **Full Supervision Mode** Text in DMI.
19.5.	Verification of On sight Mode. **(Cl. B4.7.2 (a))**	Simulate the On sight Mode in system → Check.	Should display the **On sight Mode** Text in DMI.
19.6.	Verification of Trip Mode. **(Cl. B4.7.2 (a))**	Simulate the Trip Mode in system → Check.	Should display the **Trip Mode** Text in DMI.
19.7.	Verification of Post Trip Mode. **(Cl. B4.7.2 (a))**	Simulate the Post Trip Mode in system → Check.	Should display the **Post Trip Mode** Text in DMI.
19.8.	Verification of Reverse Mode. **(Cl. B4.7.2 (a))**	Simulate the Reverse Mode in system→ Check.	Should display the **Reverse Mode** Text in DMI.
19.9.	Verification of Shunt Mode. **(Cl. B4.7.2 (a))**	Simulate the Shunt Mode in system→ Check.	Should display the **Shunt Mode** Text in DMI.
19.10.	Verification of Non-Leading Mode. **(Cl. B4.7.2 (a))**	Simulate the Non-Leading Mode in System → Check.	Should display the **Non-Leading Mode** Text in DMI.

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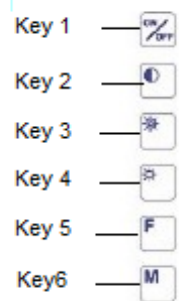
19.11.	Verification of System Failure Mode. **(Cl. B4.7.2 (a))**	Simulate the System Failure in system mode → Check.	Should display the **System Failure Mode** Text in DMI.	
19.12.	Verification of Isolation Mode. **(Cl. B4.7.2 (a))**	Simulate the Isolation Mode in System mode → Check	Should display the **Isolation Mode** Text in DMI.	
19.13.	Verification of Text font for current Onboard KAVACH mode. **(Cl. B4.7.2 (c))**	Check The Text Font	Font: Microsoft Sans serif or Helvetica. Font style: Regular. Font Size: 14 Point (18.67 Pixel).	

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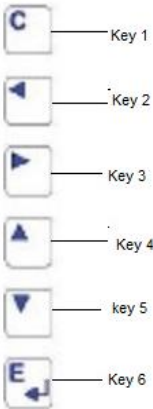| 20	Test Case ID/ Title/ Description: KAVACH_DMI_20: Display Keys -The Region K shall be used to display the keys.			
20.1.	- Verification of display the keys. - Check The Display keys. - Soft keys should display P_TRP, REV, OVRD, SHNT, MBT, SR, CONFIG, Spare (not Used), CNFM, INFO at K Region. 06 soft keys on the left side of screen. 06 soft keys on the right side of screen.			
20.2.	Verification of Key name for Key K1 Region. **(Cl. B5.1.2)**	Check Key Name.	Key name should display P_TRP at Key K1 Region.	
20.3.	Verification of Key K1(P_TRIP) operation. **(Cl. B6.1)**	Press the Key K1 (P_TRIP) option, when CNFM button is not pressed. Check Key K1 (P_TRIP) option.	Key K1 (P_TRP) should be highlighted in white colour for 10 sec.	
20.4.	Verification of Key K1 (P_TRIP) with CNFM option. **(Cl. B6.1)**	Simulate the test scenario Press the Key K1 (P_TRIP) option and press CNFM within 10 seconds.	P_TRIP Mode shall be observed on DMI.	
20.5.	Verification of Key name for Key K2 Region. **(Cl. B5.2.2)**	Check Key Name Key K2 shall be used for the Reverse Operation.	Key name should display REV at Key K2 Region.	
20.6.	Verification of Key K2 (REV) operation. **(Cl. B6.1)**	Press the K2 (REV) option → check K2 (REV) option.	Key K2 (REV) should be highlighted for 10 sec.	
20.7.	Verification of Key K2 (REV) with CNFM option. **(Cl. B6.1)**	Simulate the test scenario Press the Key K2 (REV) option and Press CNFM within 10 seconds.	REV mode shall be observed on DMI.	
20.8.	Verification of Key name for Key K3 Region. **(Cl. B5.3.2)**	Check Key Name. Key K3 shall be used for Override command.	Key name should display OVRD at Key K3 Region.	
20.9.	Verification of Key K3 (OVRD) operation. **(Cl. B6.1)**	Press the Key K3 (OVRD) option → check Key K3 (OVRD) option.	Key K3 (OVRD) should be highlighted for 10 sec.	

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20.10.	Verification of Key K3 (OVRD) with CNFM option. **(Cl. B6.1)**	Simulate the test scenario Press the Key K3 (OVRD) option and Press CNFM within 10 seconds.	OVRD mode shall be observed on DMI.	
20.11.	Verification of Key K3 (OVRD) without CNFM option.	Press the Key K3 (OVRD) option	OVRD mode shall be not be observed on DMI.	
20.12.	Verification of Key name for Key K4 Region. **(Cl. B5.4.2)**	Check Key Name. Key K4 shall be used for entering Shunt Mode.	Key name should display SHNT at Key K4 Region.	
20.13.	Verification of Key K4 (SHNT) operation. **(Cl. B6.1)**	Press the Key K4 (SHNT) option→ check Key K4 (SHNT) option.	Key K4 (SHNT) should be highlighted for 10 sec.	
20.14.	Verification of Key K4 (SHNT) with CNFM option. **(Cl. B6.1)**	Simulate the test scenario Press the Key K4 (SHNT)) option → and Press CNFM within 10 seconds.	SHNT mode shall be observed on DMI.	
20.15.	Verification of Key K4 (SHNT) without CNFM option.	Press only Key K4(SHNT) option.	SHNT mode shall be not be observed on DMI.	
20.16.	Verification of Key name for Key K5 Region. **(Cl. B5.5.2)**	Check Key Name. Key K5 shall be used for performing Manual Brake Test.	Key name should display MBT at Key K5 Region.	
20.17.	Verification of Key K5 (MBT) operation. **(Cl. B6.1)**	Press the Key K5 (MBT) option → check Key K5(MBT) option.	Key K5 (MBT) should be highlighted for 10 sec.	
	Verification of Key K5 (MBT)) with CNFM option. **(Cl. B6.1)**	Simulate the test scenario Press the Key K5 (MBT)) option → and →Press CNFM within 10 seconds.	MBT success message shall be displayed.	
20.18.	Verification of Key K5 (MBT)) without CNFM option.	Press only Key K5(MBT) option	MBT shall not happen.	
20.19.	Verification of Key name for Key K6 Region. (**Cl. B5.6.2**)	Check Key Name. Key K6 shall be used for entering Staff Responsible Mode.	Key name should display SR at Key K6 Region.	

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20.20.	Verification of Key K6 (SR) operation. **(Cl. B6.1)**	Press the Key K6 (SR) option → check Key K6 (SR) option	Key K6(SR) should be highlighted for 10 sec.	
20.21.	Verification of Key K6 (SR) with CNFM option. **(Cl. B6.1)**	Simulate the test scenario Press the Key K6 (SR) option → and →Press CNFM within 10 seconds.	SR mode shall be observed on DMI.	
20.22.	Verification of Key K6 (SR) without CNFM option.	Press the Key K6 (SR) option → without CNFM option. SR mode should not be displayed on DMI.	SR mode shall be not be observed on DMI.	
20.23.	Verification of 06 soft keys on left side of screen.	Verification of 06 nos. of soft keys on left side of screen shall be carried out as per figure below:	All 06 nos. of keys shall be at the predefined sequence and position as per figure.	

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| 20.24. | Verification of 06 soft keys on left side of screen. | Verification of 06 nos. of soft keys on right side of screen shall be carried out as per figure below: | All 06 nos. of keys on right side of screen shall be as shown picture. | |

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21	Test Case ID/ Title/ Description: KAVACH_DMI_21: Configuration Data- This test case is used to verify Train Configuration Data screen when Unit Info requested.			
21.1.	Verification of display keys for Key K7. **(Cl. B5.7.2)**	Check Key K7 name.	Key name should be displayed CONFIG at Key K7 Region.	
21.2.	Verification of Key K7 (CONFIG) operation. **(Cl. B7.2 & B7.3)**	Press the Key K7 (CONFIG) option.	Should display the CONFIG default menu screen with below menu items and menu name should be "Train Type Selection". **1. Light Engine** **2. Goods/Freight Train** **3. Passenger Train (ICF)** **4. Passenger Train (LHB)** **5. EMU** **6. Train Set** **7. Parcel**	
21.3.	Verification of Light Engine Selection.	Press the Key K7 (CONFIG) option → Select 1 in "Train Type Selection" → Check.	Should display the Light Engine.	
21.4.	Verification of Goods/ Freight Train.	Press the Key K7 (CONFIG) option → Select 2 in "Train Type Selection" → Check.	Should display the Goods/Freight Train.	
21.5.	Verification of Passenger Train (ICF).	Press the Key K7 (CONFIG) option → Select 3 in "Train Type Selection" → Check.	Should display the Passenger Train (ICF).	
21.6.	Verification of Passenger Train (LHB).	Press the Key K7 (CONFIG) option → Select 4 in "Train Type Selection" → Check.	Should display the Passenger Train (LHB).	
21.7.	Verification of EMU.	Press the Key K7 (CONFIG) option → Select 5 in "Train Type Selection" → Check.	Should display the EMU.	
21.8.	Verification of Train Set.	Press the Key K7 (CONFIG) option → Select 6 in "Train Type Selection" → Check.	Should display the Train Set.	

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21.9.	Verification of Parcel.	Press the Key K7 (CONFIG) option → Select 6 in "Train Type Selection" → Check.	Should display the Parcel.	
21.10.	Verification of Scroll bars if more no. of records are exits in the configuration data.	Press the Key K7 (CONFIG) option → Select 1 or 2 or 3 or 4 or 5 or 6 or 7 in "Train Type Selection" → Check train types available in the selected train.	Should display available train types in the configuration data.	
21.11.	Verification of key operation for previous screen.	Press the Key K7 (CONFIG) option → Select 1 in "Train Type Selection" and select key K5 for previous key.	The screen shall go to previous screen.	
21.12.	Verification of reconfirm for selected CONFIG data for Confirmation mismatch Clause. **(Cl. B7.5)**	Press the Key K7 (CONFIG) option → Select 1: Light Engine in "Train Type Selection" → Click on continue Key → Select one of the options → Press Enter button → the options would repeat again. → select option other than previously selected option → check. This test for all the other options available.	DMI shall not accept the configuration.	
		Select 2: Goods Train		
		Select 3: Passenger Train (ICF)		
		Select 4: Passenger Train (LHB)		
		Select 5: EMU		
		Select 6: Train Set		
		Select 7: Parcel		

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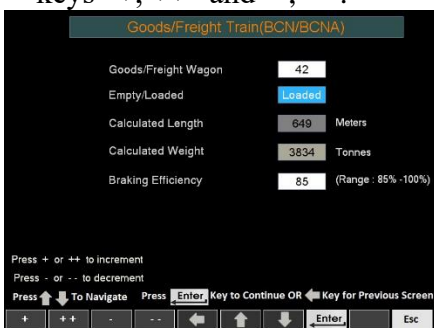
21.13.	Verification of reconfirm for selected CONFIG data for Correct Confirmation data. **(Cl. B7.5)**	Press the Key K7 (CONFIG) option → Select 1: Light Engine in "Train Type Selection" → Click on continue Key → Select one of the options → Press Enter button → the options would repeat again. → select the same option → check. This test for all the other options available.	Selected CONFIG data shall be selected DMI should display the selected train screen and Selected CONFIG data should be display in context message 2.
		Select 2: Goods/Freight Train	
		Select 3: Passenger Train (ICF)	
		Select 4: Passenger Train (LHB)	
		Select 5: EMU	
		Select 6: Train set	
		Select 7: Parcel	
21.14.	Verification of no. of coach selection in passenger type selection (ICF). **(Cl. B7.8.1 & B7.8.2))**	Option → Select 3 in "Train Type Selection" → Click on continue Key → Select one of the options → Press Enter button → the options would repeat again → select the same option. → check.	Coaches selection window shall be opened and number of coach shall with the help of "+" or "-"soft key and "++" & "- -" soft key.
21.15.	Verification of alteration of no. of coaches in Selection 3: Train Type selection and reconfirm the selection (ICF). **(Cl. B7.8.3 & B7.8.2))**	Once train Type: Passenger Train (ICF) selected: 1. Use navigation keys no. 6 and 7 for alteration of no of coaches. 2. Press Key 8 (Enter). 3. Confirm the selected nos. of coaches with selected nos. of coaches. 'YES' OR 'NO'	If 'YES': Passenger train (ICF) with nos. of coaches shall be displayed in DMI and Selected CONFIG data should be display in DMI.
			IF 'NO': Display of DMI shall go to previous screen for selection of coaches.

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21.16.	Verification of no. of coach selection in passenger type selection (LHB).	Option → Select 4 in "Train Type Selection" → Click on continue Key → Select one of the options → Press Enter button → the options would repeat again → select the same option. → check.	Coaches selection window shall be opened.	
21.17.	Verification of alteration of no. of coaches in Selection 4: Train Type selection (LHB).	Once train Type: Passenger Train (LHB) selected: 1. Use navigation keys no. 6 and 7 for alteration of no of coaches 2. Press Key 8 (Enter) for selection of coaches 3. Confirm the selected nos. of coaches with selected nos. of coaches 'YES' OR 'NO'	If 'YES': Passenger train (LHB) with nos of coaches shall be displayed in DMI. And Selected config data should be display in DMI. IF 'NO': Display of DMI shall go to previous screen for selection of coaches.	
21.18.	Verification for selection of Goods/Freight train. **(Cl. B7.9.1)**	Option → Select 2 in "Train Type Selection" → Click on continue Key → Select one of the options → Press Enter button → the options would repeat again. → select the same option. → check.	Train type selection: Goods/Freight shall be selected and been displayed in DMI.	
21.19.	Verification of type of wagon selection/ adding/ deletion in Goods/ Freight Train configuration. **(Cl. B7.9.2)**	1. Once Train type: Goods/freight train selected. 2. Use navigation keys no. 6 and 7 in conjunction with key no.7 for selection of wagon type from master list as shown below:	Goods/ Freight Train configuration shall be displayed at window.	

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21.20.	Verification of nos. of Goods/ Freight wagon selection in selected rake. **(Cl. B7.9.3)**	1. Once test @ 21.19 completed. 2. Select nos. of wagon using keys "+, ++" and "-, --". 	Check that no. of goods/ Freight wagon selection shall be displayed at window.	
21.21.	Verification of wagon type selection i.e empty/ loaded Train configuration. **(Cl. B7.9.3)**	With use of navigation keys no. 6 and 7 in conjunction with key no.8 for selection of wagon type i.e EMPTY or Loaded shall be selected.	Selected Goods/Freight type configuration shall be displayed at window.	
21.22.	Display of Calculated of Train length as per table in clause **B7.10** in DMI.	1. Select different type of wagon with their number. 2. Select BCN wagon. 3. Select 30 wagon 4. Check that calculated train length is correct as per Spec. clause B7.10.	1. Total train length shall be displayed on DMI shall be 463 m. 2. check for other wagon configuration and train length.	

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21.23.	Display of Calculated weight as per table in clause **B7.10** in DMI.	1. Select different type of wagon with their number. 2. Select BCN wagon. 3. Select 30 wagon. 4. Select empty or loaded. 5. Check that calculated train weight is correct as per Spec clause B7.10.	1. Total train weight shall be displayed on DMI shall be i) Empty- 816 ii) Loaded- 2738 2. Check for other Goode/ Freight wagon configuration.	
21.24.	Verification of Up, Down keys on Config screens. **(Cl. B7.6)**	Press the Key K7 (CONFIG) option → Press Up (K5), Down keys (K6) on menu screen.	Should move the Focus to Down side parameters if Down key is pressed, and to Upwards if Up key is pressed.	
21.25.	Verification of right arrow key on Config screen. **(Cl. B7.5)**	Press the Key K7 (CONFIG) option → Press right arrow/ enter key (K7) on Config option.	Nothing should happen.	
21.26.	Verification of Esc keys on Config screens.	Press the Key K7 (CONFIG) option → Press (K10).	Should move to main screen.	
21.27.	No need for selection of train configuration for self-propelled trains. **(Cl. B7.12)**	Onboard KAVACH is to be fed with self-propelled type like EMU or Train Set.	On successful boot up, it shall not ask for train configuration. It shall ask for entering into SR or SH mode.	
21.28.	Display of Calculated of Train length as per table in clause B7.10 in DMI along with length of one loco i.e 23 meter (configurable).	1. Select different type of wagon with their number. 2. Select BCN wagon. 3. Select 30 wagon Check that calculated train length is correct as per Spec. clause B7.10 along with length of one loco i.e 23 meter (configurable).	1. Total train length shall be displayed on DMI shall be 463+23= 486 m. 2. Check for other wagon configuration and train length.	
21.29.	Display of Calculated of Train length as per table in clause B7.10 in DMI along with length of multi loco i.e 50 meter (configurable).	1. Select different type of wagon with their number. 2. Select BCN wagon. 3. Select 30 wagon	1. Total train length shall be displayed on DMI shall be 463+50= 513 m. 2. Check for other wagon configuration and train length.	

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		4. Check that calculated train length is correct as per Spec. clause B7.10 along with length of one loco i.e 23 meter (configurable).		

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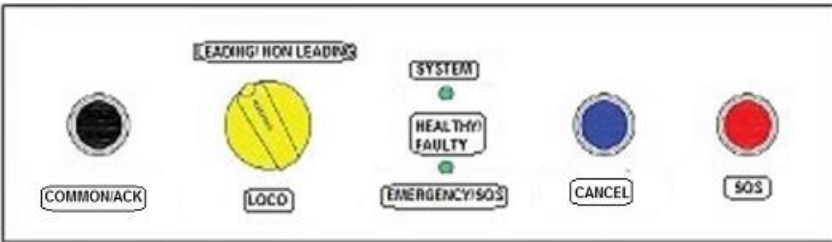| 22	Test Case ID/ Title/ Description: KAVACH_DMI_22: Unit information screen -This test case is used to verify Unit information screen when Unit Info requested.			
22.1.	Verification of Key K10 (INFO) operation. **(Cl. B5.10)**	Press the Key K10 (Info) option → check.	Should display the Unit information screen with module names CPU – A, CPU – B, EVL, CAB 1 Display, CAB 2 Display, Versions, CRC.	
22.2.	Verification of CPU Version Number.	Press the Key K10 (Info) option → check CPU (VCC Card) Version Number.	Should display the CPU Version Number.	
22.3.	Verification of CPU Software CRC.	Press the Key K10 (Info) option → check CPU (VCC Card) Software CRC.	Should display the CPU Software CRC.	
22.4.	Verification of EVL Version Number.	Press the Key K10 (Info) option → check EVL Version Number.	Should display the EVL Version Number.	
22.5.	Verification of EVL CRC.	Press the Key K10 (Info) option → check EVL CRC	Should display the EVL CRC.	
22.6.	Verification of CAB 1 Display Version.	Press the Key K10 (Info) option → check CAB 1 Display Version.	Should display the CAB 1(DMI) Display Version.	
22.7.	Verification of CAB 1 Display CRC.	Press the Key K10 (Info) option → check CAB 1 Display CRC.	Should display the CAB 1(DMI) Display CRC.	
22.8.	Verification of CAB 2 Display Version.	Press the Key K10 (Info) option → check CAB 2 Display Version.	Should display the CAB 2(DMI2) Display Version.	
22.9.	Verification of CAB 2 Display CRC.	Press the Key K10 (Info) option → check CAB 2 Display CRC.	Should display the CAB 2 (DMI2) Display CRC.	
22.10.	Verification of Train configuration CRC.	Press the Key K10 (Info) option → check Train Configuration CRC.	Should display CRC of train configuration.	
22.11.	Verification of communication Link.	Remove the communication cable → Check.	Should display the Communication link Failure screen.	
22.12.	Verification of Unit Info screen only Com 1is available.	Remove com 2-> Press the Key K10 (Info) option (CAB -1) →Unit Info Screen → Check.	Should display the Unit information screen with module names CPU – A, CPU – B, EVL,	

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			CAB 1 Display, CAB 2 Display, Versions and Version CRC.	
22.13.	Verification of Unit Info screen only Com 2 is available.	Remove com 1--> Press the Key K10 (Info) option (CAB-2)) →Unit Info Screen → Check.	should display the Unit information screen with module names CPU – A, CPU – B, EVL, CAB 1 Display, CAB 2 Display, Versions and CRC.	
22.14.	Verification of Back Key operation on Unit info screen.	Remove com 1--> Press the Key K10 (Info) option →Unit Info Screen →Check.	Should display Default screen when Back key is pressed.	
22.15.	Verification of status of RFID reader 1 health.	Check the health of both RFID reader. Then remove communication cable of RFID reader-1. Check the status in DMI.	RFID reader-1 health status shall display "Not OK".	
22.16.	Verification of status of RFID reader 2 health.	Check the health of both RFID reader. Then remove communication cable of RFID reader-2. Check the status in DMI.	RFID reader-2 health status shall display "Not OK".	
22.17.	Verification of GPS 1 status.	Check the health of both GPS Then remove communication cable of GPS-1 antenna. Check the status in DMI.	GPS -1 status shall be displayed "Not Ok".	
22.18.	Verification of GPS 2 status	Check the health of both GPS, Then remove communication cable of GPS-2 antenna. Check the status in DMI.	GPS -2 status shall be displayed "Not Ok".	
22.19.	Verification of PPS 1 & 2 view.	Check the Live view of PPS-1 & 2.	PPS-1 and PPS-2 view should be displayed as OK.	
22.20.	Verification of Radio 1 & 2 diagnosis status.	Check the Radio -1 & 2 diagnostic status.	Radio -1 & 2 diagnostic status shall be displayed as "OK".	
22.21.	Verification of Radio 1 diagnosis status.	Remove the power supply connection of Radio -1 Check the Radio -1 diagnostic status.	Radio -1 diagnostic status shall be displayed as "Not OK".	

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22.22.	Verification of Radio 2 diagnosis status.	Remove the power supply connection of Radio -2 Check the Radio -1 diagnostic status.	Radio -2 diagnostic status shall be displayed as "Not OK".	
22.23.	Verification of Trans /Receive Power of Radio 1.	Check the trans/Receive power of Radio -1.	Write down the power. It shall be approx. 10 watts.	
22.24.	Verification of Trans /Receive Power of Radio 2.	Check the trans/Receive power of Radio -1.	Write down the power. It shall be approx. 10 watts.	
22.25.	Verification of Radio PA temp of Radio 1.	Check the Radio 1 PA temp.	Write down the PA temp, it shall be nominal 40 to 50 degree centigrade.	
22.26.	Verification of Radio PA temp of Radio 1.	Check the Radio 1 PA temp.	Write down the PA temp, it shall be nominal 40 to 50 degree centigrade.	
22.27.	KMS Keys status Expired/Available.	Check the availability of KMS key.	Write the key, in no case all key shall not expires.	
22.28.	Health status of DMI-1.	Verification of health status of DMI. Remove the POWER port of DMI-1.	Check the status, it shall display "NOT OK or Fail".	
22.29.	Health status of DMI-2.	Verification of health status of DMI. Remove the POWER port of DMI-2.	Check the status, it shall display "NOT OK or Fail".	
22.30.	This Test Case verifies DMI response, if no data is receiving from serial port.	Power on the Setup → when no data is receiving from the port → Check.	DMI should display "waiting for communication".	

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23	Test Case ID/ Title/ Description: KAVACH_DMI_23: DMI Comports Priority -This Test case is used to verify DMI Comports Priority to display data.			
23.1	DMI Comport This Test case is used to verify DMI Comport.	Remove Comport connector from the DMI.	Interaction with DMI should not be possible.	
24	Test Case ID/ Title/ Description: KAVACH_DMI_24: DMI LED Indications -This Test Case is used to verify the LED Indications (Subjective to manufacturer).			
24.1	This Test Case is used to verify the LED Indications. (Cl. B4.2.1(i))	System health indication LED	Shall be Bi-Colour	
		(i) Healthy	Green Colour	
		(ii) Faulty	Red Colour	
		Emergency/SOS LED shall be	Shall be Bi-Colour	
		(i) Default colour	Green Colour	
		(ii) SOS	Red Colour	
25	Subjective to manufacturer: KAVACH_DMI_25: DMI Switches -This Test Case is used to verify the operate the DMI switches.			
25.1	This test case to verify the push button/switch at the bottom of DMI. (Cl. B4.2.1)	1. SOS- Push Button of Red Colour. 2. Cancel- Push Button of Blue Colour. 3. Common/Ack- Push Button of Black colour. 4. Rotary Switch knob is Yellow Colour.	• Button/switches shall be as per sequence shown in figure. • The word leading and non-leading shall be placed on the top of the knob. • All other text are placed at the appropriate location.	
25.2	This is to verify the logo location of OEM.	Logo shall be on the top of DMI.	Logo shall be as shown in figure below:	

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	Indian Railway Drivers Machine Interface (IRDMI) Loco KAVACH LP-OCIP	**OEM LOGO**		
25.3	This Test Case is used to verify the operate the switches.	1. Press SOS + Common.	1. SOS shall be generated.	
		2. Press Common/ACK+ Cancel.	2. SOS shall be cancelled.	
		3. Operate Non leading button when Loco at standstill.	3. Onboard shall be entered into non-leading mode.	
25.4	Removability of bottom box consisting of LED and push button for self-propelled vehicle: This test verifies alternative DMI model suitable for self-propelled vehicle. **(Cl. B4.2.1(iv))**	KAVACH system should be able to function by relocation of the LED indications and push buttons on a separate desk.	1. The operation of SOS and its cancellation shall be checked.	
			2. The ACK button shall be checked for LC auto whistle or mode transition etc.	
			3. The KAVACH shall work properly without Leading or Non-Leading knob.	

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