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OPERATION AND MAINTAINANCE MANUAL

FOR

VIGILANCE CONTROL DEVICE

AS PER

RDSO SPECIFICATION

RDSO/2008/EL/SPEC/0025/Rev.'6' Dt: june 2019

FOR

25Kv AC Tap Changer Locomotives

CONTENTS

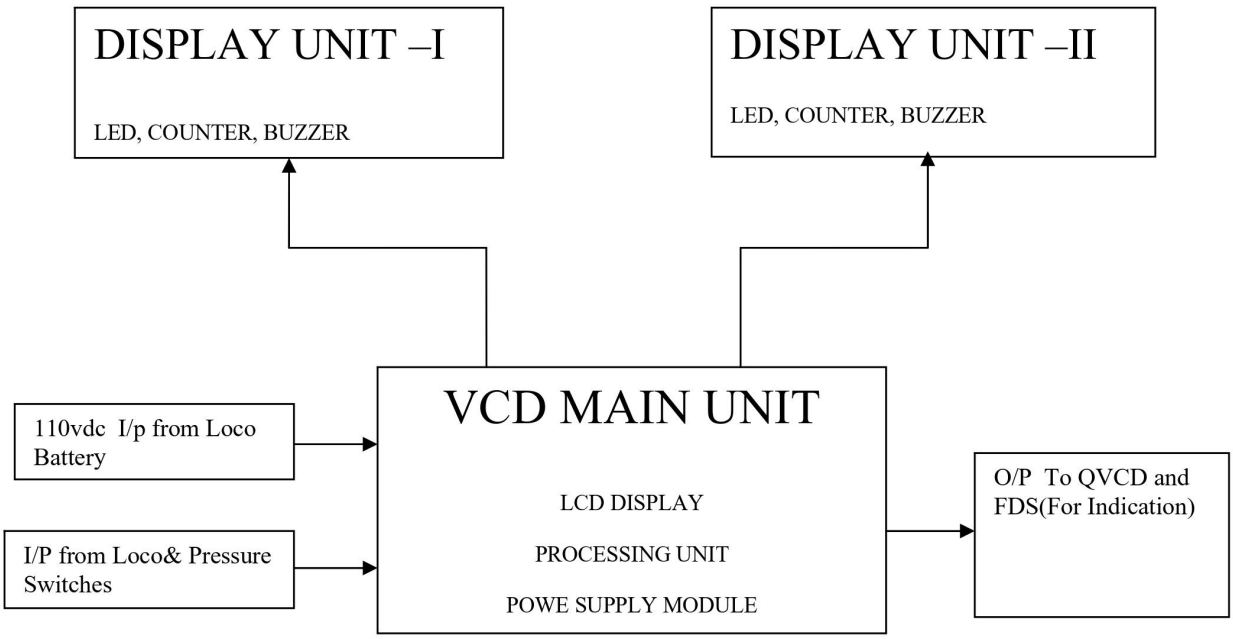
Introduction:

Vigilance Control Device (VCD) monitors alertness of the driver on continuous basis by checking his actions while running a train.VCD monitors various signal inputs from loco through which driver's alertness can be monitored. In the absence of loco signal inputs, the driver has to press Foot switch within the specified time intervals when the train is in movement. VCD system monitors the various signals (Detailed in the later sections of the document) in predefined time. The pre defined time is classified into three types of cycles and these cycles are executed in a specified time frame. By pressing the any input signal within the specified time period, the cycle execution process will get reset. If the driver doesn't activate any input signal, then the VCD considers the loco as an unmanned loco and hence a penalty brake is applied to stop the locomotive for the safety of the passengers and also for the safety of the Locomotive.

Modules Of VCD:

The VCD has three Modules:

1) MAIN UNIT - 1No
2) DISPLAY UNIT -2No.s



Operation Principal

CONCEPT

Vigilance Control Device (VCD) monitors alertness of the driver on continuous basis by checking his actions while running a train. VCD monitors various control signal inputs from loco and foot switch through which driver's alertness can be monitored. In the absence of loco control signal inputs, the driver has to press the foot switch within the specified time intervals when the train is in movement. VCD system executes various cycles with specified own time intervals. By pressing the foot switch or by activating any input signal within the specified time period the cycle execution process can be reset.
If the driver fails to generate input signals or press foot switch with in 60 sec the system assumes that driver is not alert and generates various outputs like visual warning, alarm warning. Even then if driver fails to reset the system, VCD will apply penalty brakes through IP valve by destroying BP pressure. VCD will store all the control functions including faulty events in its permanent memory. The stored events can be downloaded from VCD by commercial USB pen drive or by LAPTOP. The down loaded events can be analyzed by a PC or LAPTOP with an application software package supplied with VCD system. Vigilance control device consisting of:

1. Main unit
2. Display unit for cab-1
3. Display unit for cab-2.

Main unit: The main unit is to be located at machine room on wall behind cab-1. This unit consists of LCD display, data down loading ports & data access key pad.

Display Unit cab-1/cab-2: This cab unit is to be located at both cabs near to assistant driver desk. This unit consists of Green LED, Red LED's (2 no's), Yellow LED, Buzzer and Counter.

FUNCTIONAL DESCRIPTION

Power ON the system: After making proper connections to the VCD system, it is ready to switch ON when ever loco battery switch is put to on position (LT ON).

Power ON Self Test (POST): VCD system performs POST when it is switched ON. In this test, system simulates all the input signals and feeds through the input section to check the proper functionality of input, isolating and buffering sections. If any signal line performs erroneous function then system generates fault indication and communicates to the micro processor based fault diagnostic system (FDS) about VCD activation and its health status by 110vdc potential free signals.
Activation the system: After completing the POST successfully, VCD system will check for the status of the both cabins. As and when loco cab is selected that cab display panel will be energized with LEDs to indicate the status of VCD. If there is any fault in VCD self

check, fault indication will be given by flashing "RED LED" on display panel, and applies penalty brake to draw the attention of driver. After expiry of penalty brake the driver can reset VCD by putting throttle handle to zero position followed by pressing VCD reset bush button located nearer to driver to release brake or if the fault is recurring he can isolate the VCD by 'Bypass switch' located at Cab2 switch board.

If none of the cabs are selected then system will be in suppression mode considering that loco is in slave mode. However, it continuously monitors cab status. The VCD considers two logics to activate the vigilance cycle.

- Check speed of the loco: The VCD continuously monitors speed status form speedometer. (A 110vdc signal shall be made zero by speedometer if the speed is > 2 Kmph for VCD to enter into the vigilance cycle.
- If the speed signal is not provided form speedometer, then VCD will check status of MP, A9 and SA9. If MP is put to neutral, A9 and SA9 are in released condition then the VCD will enter in to Vigilance cycle.

Vigilance/delay cycle: This cycle is predefined with a period of 60 seconds (T0). During this period VCD system can be reset with any input signals like Notch up/Notch down by master controller (MP), sander, A9, SA9, MPS1, vigilance pedal (Foot) switch. After resetting the system vigilance cycle starts again. If none of the reset signal is received by VCD before expiry of this cycle, it enters into flash warning cycle.

Action/Visual warning cycle: This cycle starts with a period of 8 seconds. During this cycle the driver can reset VCD by any one of the input signal as mentioned in vigilance cycle. A LED in yellow color on display panel will be flashing continuously to draw the attention of the driver. If the reset input signal is received, VCD system cancels the action cycle and again starts from vigilance cycle.

Audio warning cycle: If the VCD has not received any acknowledgement within the flash warning cycle, this cycle starts with a period of 8 seconds. During this cycle the driver can reset VCD by any one of the input signal as mentioned in vigilance cycle. If there is no input to VCD the flashing yellow LED will continue to flash and **audio signal starts** with this cycle. If the input signal is received, VCD resets this cycle and again starts from vigilance cycle.

Penalty brake cycle: VCD system enters in this cycle if no acknowledgement is received during the above cycles. Audio alarm and LED flashing will be continued. During this cycle VCD will energize QVCD relay to de-energize IP valve and also activate SMGR down coil to bring auto regression to apply brakes through IP valve for minimum period of 32 sec. This brake cycle is called "**penalty brake."** During this period VCD will not accept any inputs. Only after expire of this period the driver can reset VCD to release brakes by keeping MP in '0' position followed by pressing VCD reset push button Switch.

Penalty brake release: If driver failed to reset VCD after expiry of brake cycle-1, the VCD will enter into penalty brake level-2. The duration of this period is infinite until re-set.

To release brakes driver has to keep MP in '0' position and by pressing reset push button switch brakes can be released.

Vigilance suppression mode: The vigilance suppression can be done by four inputs.

1. Vehicle is stationary/Speed is very low(<2Kmph)
2. Vehicle is used in slave mode (Multiple Unit operation).
3. Upon A9 or SA9 break application.
4. Manual control of GR.

Fault cycle: VCD system runs periodically its own built-in test routines to monitor the healthiness of the system. If it encounters any problem in the system, this cycle is initiated. This cycle is set with 32 sec. In this period 'System fault – RED (Flashing) LED' glows on the display panel in active Cab and brake is applied which cannot be cancelled till expiry of 32 Sec duration. Brakes will be released only after expiry of this cycle by keeping MP in '0' position and pressing the VCD reset push button.

Mismanagement by crew: when loco operator try to keep foot switch continuously 'in pressed' position for more than 60 sec, it is defined as faulty operation. Once this condition is identified such events will be recorded in its permanent memory.

Data storage: An external memory is used to store events. The following events can be stored with a real-time stamp.

1. POWER ON
2. VCD FAULTY
3. PB APPLIED
4. VCD BY PASS BUT HELATHY
5. VCD BY PASS AND FAULTY
6. VCD REACTIVATED
7. QVCD REALY DEFECTIVE
8. IP PROBLEM
9. POWER OFF
10. WARNING CYCLE
11. FOOT SWITCH 1 OPERATED
12. FOOT SWITCH 2 OPERATED
13. FOOT SW1 CNTPRS
14. FOOT SW2 CNTPRS
15. CAB 1 ACTIVE
16. CAB 2 ACTIVE
17. RST P/BSW1 OPTD
18. RST P/BSW2 OPTD
19. SANDER OPERATED
20. VCD SUPRESSED SPEED LOW
21. VCD SUPRESSED A9 APPLIED
22. VCD SUPRESSED SA9 APPLIED
23. VCD SUPRESSED MC-GR OPERATED
24. MP OPERATED
25. USB REMOVED
26. USB CONNECTED

Application s/w package:

An extremely user-friendly application software package is provided with this system to download the stored records from the VCD system to the PC or Laptop. VCD system is provided with two USB ports (Type A for pen drive and Type B for Laptop) for data down loading. The down loaded data can be used for offline analysis by using standard PC/

Laptop and also data can be printed or can be exported to MS word, excel or PDF format by this application software.

CLASSIFICATION OF SIGNALS:

- **I/P Signals**

1) Power on signal from battery supply.
2) Bypass signal from Bypass switch
3) CAB Selection Signals from BL keys
4) Vigilance reset signals:
   a) Cab1/Cab2 Footswitches
   b) MP progression & Regression for throttle handle.
   c) Sander operation
   d) MPS1 operation (Shunting notch operation)
   e) A9 application
   f) SA9 application.
5) VCD Suppression Signals
   a) Speed = 1 (Low Speed signal= 110vdc)
   b) A9 and SA9 operation
   c) Manual Operation Of GR

- **Out Put Signals**
  a) 110vdc to QVCD relay to apply penalty brake and to bring auto regression.
  b) Auxiliary power signals To Counter and LED's on VCD Display Unit
  c) Auxiliary power signals to Buzzer on VCD Display Unit.
  d) 110vdc Signals to FDCS to indicate the status of VCD active & VCD Healthy.

VCD LOCO WIRING: pl. see the Annexure 1

ACCESSORIES SUPPLIED WITH EACH VCD SYSTEM:

1) Vigilance Foot Switch- 2nos
2) VCD Reset Push Button Switch-2Nos
3) Pressure Switches For BP, A9,SA9, -3 nos
4) QVCD Relay- 1No
5) By pass switch- 1nos
6) Inter connecting Cables for VCD main unit & Display units.

LOCATION OF VCD EQUIPMENTS AND SUB ASSEMBLIES:

S.No.		Locomotive		
		WAM-4/WAG-5	WAP1/4	WAG7
1.	VCD main Unit	Machine room on the wall behind Cab-1	Machine room on the wall behind Cab-1	Machine room on the wall behind Cab-1
2.	Cab units	Both cab near assistant Loco Pilot desk	Both cab near assistant Loco Pilot desk	Both cab near assistant Loco Pilot desk
3.	Vigilance foot switch	On right hand side of PVEF below master controller in both cabs	On right hand side of PVEF below master controller in both cabs	On right hand side of PVEF below master controller in both cabs
4.	VCD reset push button switch	Both cab , on Loco Pilot desk	Both cab, on Loco Pilot desk	Both cab, on Loco Pilot desk
5.	QVCD Relay	Cab-1 TPN Panel above baby compressor or Cab-2 Relay panel	Pneumatic Panel near CPs or Cab-2 Relay panel	Cab1 TPN Panel above baby compressor or Cab-2 Relay panel
6.	A-9 & SA-9 pressure switches	Cab-1 TPN Panel	Pneumatic panel near compressors	Pneumatic panel near compressors
7.	Bypass switch(HVCD)	Cab-2 switch board	Cab-2 switch board	Cab-2 switch board

MODIFICATIONS REQUIRED IN THE LOCOMOTIVE:

a) VCD Mounting holes to be drilled on to machine room wall carefully maintaining holes diameter and pitch as per the mounting details given for VCD in RDSO specification.
b) Four holes to be drilled on both driver desks in front of the assistant driver in both cabs as per holes diameter and mounting holes pitch as indicated in RDSO spec for display units. Further cable entry holes (approx Ø 50mm dia)shall be provided to wire display unit
c) Hole to be provided on driver desk nearer to the driver right hand side to fix "reset push button switch" refer CLW drawing for cutout dimensions for reset push button switch.
d) Pressure tapings shall be provided with pressure switch mounting plate on A9, SA9 & BP pipelines to fix the pressure switches.
e) Provision shall be made in the pneumatic panel to provide QVCD relay as near as possible to IP valve.
f) Cut out and mounting arrangements shall be made at cab 2 switch board to fix by pass switch as per mounting dimensions of ZCPA switch as per Drg No. CLW/ES/SK-4/S-1/Alt W of CLW spec NO. CLW/ES/S-1/W.

INSTALLATION OF VCD AND ITS SUBASSEMBLIES:

1) The VCD and its cab units shall be installed as per the Locations specified in the RDSO Specification No: RDSO/2008/EL/SPEC/0025/Rev.'5' dated March 2010
2) The installation of VCD and its sub assemblies shall be properly aligned and fixed tightly on the proper fixtures, with proper hardware specified.
3) The entire Wiring shall be done by the railways as per the VCD hookup drawing being supplied along with the manual,
4) The grounding of the VCD main unit shall be done properly to the loco body, without any loose contact. Care to be taken that no loose contacts are present.
5) The pressure switch shall be mounted properly on respective pressure ports with support plates and ensure that there are no leakages.
6) After installation, open all circular connectors from the VCD and its Sub units and Check the continuity of all the cables from its source to destination point. Voltages levels of all input signals should be checked before the connectors are re-connected to the VCD systems.

CHECK SHEET FOR VERIFICATION OF VCD FUNCTIONS BY LOCO MAINTENANCE ENGINEERS.

Sr. No	Check points	Cab -1	Cab –2
1.	**How to check VCD in service:** VCD will be 'ON" when ever locomotive battery is 'ON. If VCD is OK then 'VCD HEALTHY' Message will be displayed on the VCD Main Unit LCD, and when a Cab is selected then "GREEN LED" indicating "VCD HEALTHY" will glow on the Corresponding selected CAB UNIT. Then VCD is said to be in service.	"GREEN LED" indicating "VCD HEALTHY" Should Glow in selected Cab.	
2	**How to check Vigilance mode: -** VCD will go into the vigilance mode when the following conditions are satisfied 1.Speed signal should be low i.e speed is more than 2 kmph. Or 2.MP signal = N position & A9,SA9 are in released condition. When the vigilance cycle is started then the "VIGILANCE CYCLE" message is displayed on the LCD. The vigilance cycle(T0) is for 60 sec's	During the Vigilance Cycle, on the display unit in the corresponding activated cab a "GREEN LED" indicating "VCD HEALTHY" Should Glow.	
3.	How to Check for Warning Cycle T(1): If No Reset Signal Is received during the vigilance cycle, then a Warning Cycle(T1) which is for 8 sec's is initiated. During the warning cycle "WARNING CYCLE 1" message is displayed on the Main Unit LCD.	During the Warning Cycle(T1), on the display unit in the corresponding activated cab a "GREEN LED" indicating "VCD HEALTHY" and also a "FLASHING YELLOW LED" indicating "VCD WARNING" should glow	

<table>
<tr><td>4</td><td colspan="2">If No Reset Signal Is received during the Warning Cycle (T1), then a Warning Cycle(T2) which is for 8 sec's is initiated. During the warning cycle "WARNING CYCLE 2" message is displayed on the Main Unit LCD.</td><td>During the Warning Cycle(T1), on the display unit in the corresponding activated cab a AUDIO ALARAM is initiated, "GREEN LED" indicating "VCD HEALTHY" and also a "FLASHING YELLOW LED" indicating "VCD WARNING " should glow.</td></tr>
<tr><td>5</td><td colspan="2">THE FOLLOWING ARE THE RESET SIGNALS</td><td></td></tr>
<tr><td rowspan="8"></td><td></td><td>
<table>
<tr><th>Sr. No.</th><th>To be acknowledged by any of the following.</th></tr>
<tr><td>1.</td><td>Vigilance Foot switch</td></tr>
<tr><td>2.</td><td>Sanders operation.</td></tr>
<tr><td>3.</td><td>A-9 brake application.</td></tr>
<tr><td>4.</td><td>SA-9 brake application.</td></tr>
<tr><td>5.</td><td>MP Progression (Notch UP.)</td></tr>
<tr><td>6.</td><td>MP Regression (Notch DN.)</td></tr>
</table>
</td><td></td></tr>
<tr><td colspan="2">Note: -
1) VCD will be Acknowledged by the I/p signals only from working Cab.
2) If any reset signal is received within the time period of any on the above mentioned three cycles(i.e T0,T1,T2), VCD will be re- set and will start again from Vigilance Cycle.
3) Whenever a reset the Signal received a message will be Displayed on VCD Main Unit LCD in the format "Signal Name(eg.Sander,Horn etc.) OPTD" eg. "SANDER OPTD"</td></tr>
<tr><td>6.</td><td>How to check VCD vigilance suppression Mode: - VCD will go in to 'VIGILANCE SUPPRESION mode ' during the following Condition
1. A9,SA9, MC-GR & Speed Signals are high
When any of the following signals are received then on Main unit LCD a message is be displayed in the format "VCD SUPPRESSED"</td><td>During this mode, on the display unit in the corresponding activated cab a "GREEN LED" indicating "VCD HEALTHY" Should Glow.</td></tr>
<tr><td>7.</td><td>Check the penalty brake application: After the expiry of the T0,T1,T2, then Penalty Brake(T3) is applied. Then Main Unit LCD will display a message "PB APPLIED". The PB will be for 32 seconds</td><td>During the Penalty Brake(T3), on the display unit in the corresponding activated cab, a "GREEN LED" indicating "VCD HEALTHY" and also a "FLASHING YELLOW LED" indicating "VCD WARNING" should glow</td></tr>
<tr><td>8.</td><td>Check penalty brake releasing: - After the completion of Penalty Brake (T3), the brakes can be released by keeping the MP =0 and then pressing the VCD Reset Push Button Switch.</td><td>On the display unit in the corresponding activated cab "GREEN LED" indicating "VCD HEALTHY" Should Glow</td></tr>
</table>

9.	**Check the 'VCD fault'** : If an internal fault is generated in the VCD, then, a message "VCD Faulty " is displayed on the main unit	On the display unit in the corresponding activated cab "RED LED" indicating "VCD FAULTY" Should Glow

SUMMARY OF CYCLES

Sr. no.	Operating cycles.	Time periods (Seconds)	Indications on the cab unit	Possibility to reset.
1.	Vigilance cycle	60 ±2	None.	Yes
2.	Warning cycle Level 1	8 ±2	Yellow flashing LED.	Yes.
3.	Warning cycle Level 2	8 ±2	Yellow flashing LED & Intermittent alarm sound.	Yes.
4.	Penalty brake Level 1	32 ±2	Yellow flashing light	No.
5.	Penalty brake Level 2	Unit reset.		Yes

VCD TROUBLE SHOOTING GUIDE

Sr. no.	Trouble	Probable cause	Remedies	Remarks.
1.	No display on VCD main unit LCD even after switching power from loco.	1. VCD fuse (1) might have blown or toggle switch might be in OFF position.	Check the Fuse & tight if found loose. If toggle switch is in OFF position make it ON. **Note:** Fuse holder is mounted adjacent to 22 pin circular connector	If the fuse blown replace it with 1.6 amp 20mm slow blow glass fuse.
		2. Supply not available at Pin No. L of the 22 pin circular Connector(CON-1 22PIN Input)	Check whether 110V supply is available on 12th pin of 32 way terminal block, & L pin of 22pin circular connector. If no voltage available check the connection between SB panel (003/700) & terminal block.	Trace the faulty connection & correct it.
2	VCD shows "VCD FAULTY".	1. There may be an inherent defect in the Power Board.	Replace the SVCD R4 ISO_PWR Card.	Pl. consult factory
		2. There may be a loose contact between the SVCD R4 ISO_PWR board and MC board.	Check for the loose contact between 37 pin D-SUB connector. Connect it properly to remove the loose contact.	Pl. consult factory

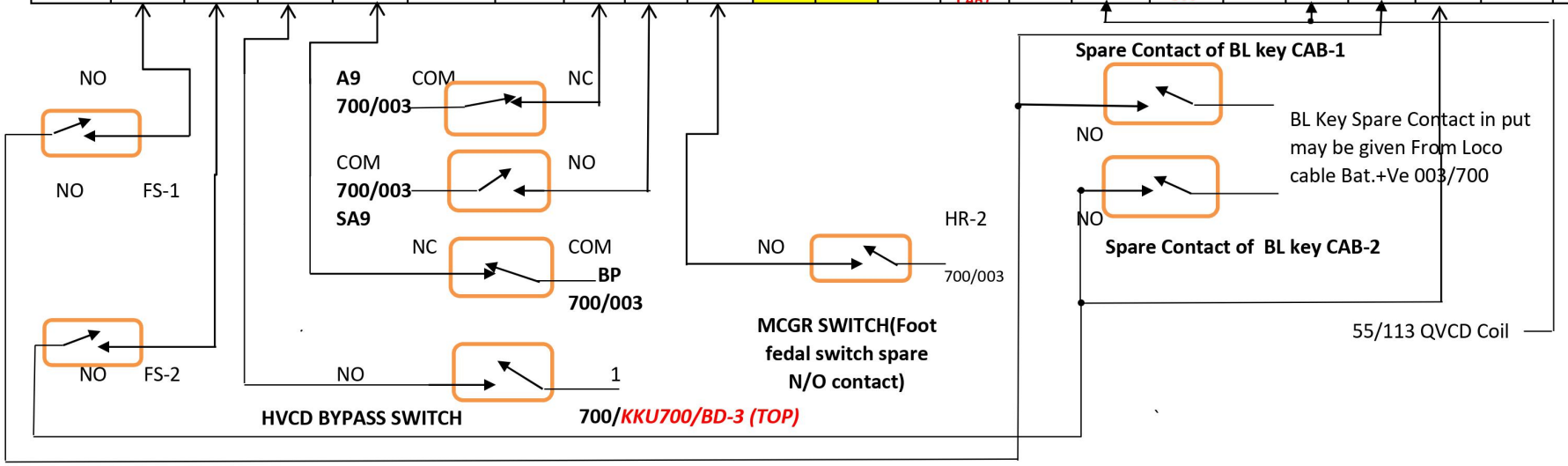
		3) There may be an inherent defect in the Control Board.	Replace the SVCD R4 _MC Card.	
3	No Display in VCD Cab Units after cab selection	The corresponding Cab, Display Unit 9 pin circular connector may have been interchanged at the Main Unit.	The corresponding Cab, Display unit 9 pin female circular connector should be connected exactly to the same corresponding cab 9 pin male connector mounted on the Main Unit.	Inter change the 9pin female circular connector correctly.
4	VCD not applying Penalty Brake	1. IP valve cock may be closed.	Please keep IP valve in service	
		2. By pass switch is in OFF condition	Put Bypass switch in service. If still problem persists check fuse 2 in main unit at 22 pin connector.	Tight the fuse properly. Still if the problem persists replace fuse or bypass switch.
		3. BP pressure might not have reached > 4.5 kg/cm^2.	Wait till BP raises to >4.5kg/cm^2.	
		4. Check VCD BP pressure switch & its settings in loco.	Correct BP PS switch settings as per requirement in loco	
		5. QVCD might be Defective	Check whether the QVCD relay is working or not. If QVCD is ok then Check for the voltage(110Vdc) from the Main unit to QVCD	Replace QVCD
6.	Brake not releasing after penalty brake by VCD	Check whether you have followed instructions to release breaks	Keep MP in 0 and press reset push button to release brakes after 32 sec. of application of Penalty Brake.	
		1. IP valve or E-3 W valve may got stuck up.	Replace the IP valve or E-3 W valve.	
		2. VCD ISO_PWR may be defective	Replace the ISO_PWR card	Contact factory

LIST OF SPARES FOR VCD				
Product Name: Vigilance control Device(25 kv ac locomotive) –Ref: RDSO spec. Rev'6				
Sl.No	**Description**	**Part /series No.**	**Make**	**Qty Per VCD**
1.	ISOLATION & POWER SUPPLY CARD	SVCD R4_ISO PWR Card R.1	SEDPL	1
2.	MICRO CONTROLLER CARD	SVCD R4_MC Card R.1	SEDPL	1
	Mechanical Enclosures			
3.	Main Unit	SVCD R4_Main Unit	SEDPL	1
4.	Cab Unit	SVCD R4_Cab Unit	SEDPL	1
	Circular Connector s			
5.	Main Unit Circular Connectors Sets Consisting Of	SVCD R4_MU_CC		1 set
	9 pin Female St Cable connector with Telescopic bush	MS 3106F-20-16S+TB	ALLIED/Equivalent	2
	9 pin Male box mounting receptacle	MS 3102R-20-16P.	ALLIED	2
	22 pin Female St Cable connector with Telescopic bush	MS 3106F-28-11S+TB	ALLIED	1
	22 pin Male box mounting receptacle	MS 3102R-28-11P.	ALLIED	1
	9 pin Female St Cable connector with Telescopic bush	MS 3106F-20-18S+TB	ALLIED	1
	9 pin Male box mounting receptacle	MS 3102R-20-18P.	ALLIED	1
6.	Cab Unit Circular Connectors Set Consisting Of	SVCD R4_CU_CC		1 set
	9 pin Female St Cable connector with Telescopic bush	MS 3106F-20-16S+TB	ALLIED/Equivalent	2
	9 pin Male box mounting receptacle	MS 3102R-20-16P.	ALLIED	2
	2 pin Female St Cable connector with Telescopic bush	MS 3106F-12S-3S+TB	ALLIED	2
	2 pin Male box mounting receptacle	MS 3102R-12S-3P.	ALLIED	2
7.	Cab Unit Led's Set Consisting Of	SVCD R4_CU_LED		1 set
	LED indication lamp(Green)as per CLW/ES/3/0072	Nil	HOTLINE*	2
	LED indication lamp(Red)as per CLW/ES/3/0072	Nil	HOTLINE*	4
	LED indication lamp(Yellow)as per CLW/ES/3/0072	Nil	HOTLINE*	2
8.	Counter	SVCD R4_CU_COUNTER		2
9	Reset Push Button Switch (YELLOW) as per CLW/ES/3/0072/C	SVCD R4_RPB	Hotline*	2
10.	BUZZER	SVCD R4_BUZ	SEDPL	2
11.	PC 8 AHX 110VDC COIL VOLTAGE QVCD RELAY as per CLW/ES/R/27	SVCD R4_REL	ABB*	1
12.	FOOT SWITCH, as per CLW spec no:CLW/ES/3/0032/A	SVCD R4_FTS	WOAMA*	2
13.	PRESSURE SWITCHES RT-18-SB-X , as per CLW/ES/S-24/I	SVCD R4_PS	INDFOS*	2
14	PRESSURE SWITCHES RT-200-SB-X, as per CLW/ES/S-24/I	"	INDFOS*	1
15.	BYPASS SWITCH (HVCD) As per CLW Spec. No:CLW/ES/S-1/W	SVCD R4_BPS	SIEMENS*	1

SAITRONIX LOCO WIRING DETAILS

DOC NO: SEDPL-VCD-LW50215 Rev-0 02-03-21

22 PIN CIR.CONNECTOR	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	R	S	T	U	V	W	X
WIRE NO/COLOUR																						
TERMINAL BLOCK NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Signal Name	FOOT SWITCH CAB1	FOOT SWITCH CAB2	BYPASS SWITCH	BREAK PIPE	MP ZERO	SANDER	A9	SA9	MC. GR	SPARE	SPARE	110V DC+	110V DC -	NOTCH UP	NOTCH DN	LOW SPEED	QVCD O/P (IP)	QVCD O/P (REG)	BL KEY CAB 1	BL KEY CAB 2	MPS-1	
WIRE NO/COLOUR	5C/1 Black	5C/1 Black	Single Core	Single Core	8C /3 Brown	8C/4 Orange	single Core	Single Core	Single Core	5C/2 Red	5C/2 Red	8C /1 Red	8C/2 Black	8C/5 Yellow	8C /6 Green.	5C/5	Single Core	Single Core	5C/3 Yellow	5C/3 Yellow	8C/ 7	
FROM CONV/ MCP *LOCO*	Foot Sw-C1 NO op Ter/. *A355*	Foot Sw-C2 NO op Ter./ *A356*	BYP SW 2 / *A351*	BP PS OP / *216*	LOCO WIRE NO.144 SB1 / *097*	LOCO WIRE NO.207 SB1 / *151*	A9 PS OP / *218*	SA9 PS OP / *189*	ZSMGR Switch OP / *A359*	SPARE	SPARE	LOCO WIRE NO.003/ 700 SB1	LOCO WIRE NO.B-Ve SB1 /*B-525 SB-3 CAB1*	LOCO WIRE NO.045 SB1 / *093*	LOCO WIRE NO.055 SB1 / *096*	From Speedo meter (SPM)/ *360*	QVCD O/P IP	LOCO WIRE NO.055/ *113*	From spare contact OP / *701/1*	From spare contact OP / *701/2*	LOCO WIRE NO.091 / *123*	SPARE



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Note : 24 core cable Terminal Block to VCD main Unit Length - 1.5 mts

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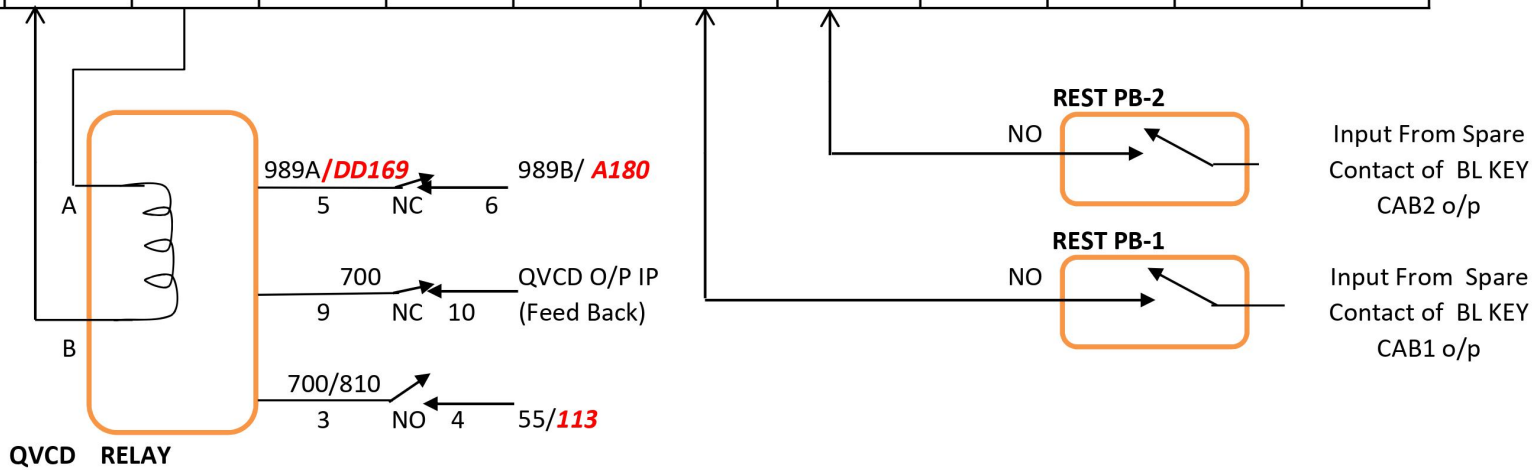
SAITRONIX LOCO WIRING DETAILS

DOC NO: SEDPL-VCD-LW50215 Rev-2 21-04-16

9 PIN CIR.CONNECTOR	A	B	C	D	E	F	G	H	I		
WIRE NO /COLOUR	8C/1 BLACK	8C/2 BROWN	8C/3 RED	8C/4 ORANGE	8C/5 YELLOW	8C/6 GREEN	8C/7 BLUE				
TERMINAL BLOCK NO	23	24	25	26	27	28	29	30	31		
Signal Name	**QVCD COM**	**QVCD NO**	**FDCS COM**	**FDCS NO ACTIVE**	**FDCS NO HEALTHY**	**RESET PB CAB1**	**RESET PB CAB2**				
Wire No/Colour	Single Core	Single Core				5C/4 Green	5C/4 Green				
FROM CONV /*MCP* LOCO	QVCD Relay Coil at B / *A354*	QVCD Relay Coil at A / *A352*				Reset Push Button Switch o/p / *A222/1*	Reset Push Button Switch o/p / *A222/2*				



Note: **8 Core cable Terminal Block to VCD Main Unit Length - 1 mt**

SAITRONIX MAIN UNIT ⇔ CAB UNIT WIRING DETAILS

DOC NO- SEDPL-VCD-LW50215 Rev-0 02-03-21

9 pin Circular threded type Female Part N0-MS3102R-20-16S From Main Unit ⇔ CAB 1&2 Display Units	A	B	C	D	E	F	G	H	I
WIRE NO /COLOUR	10 C/1 Black	10C/2 Brown	10C/3 Red	10C/4 Orange	10C/5 Yellow	10C/6 Green	10C/7 Blue	10C/8 Voilet	10C/9 Gray.
Signal Name From →To	Signal for Buzzer from Main unit	Common for Buzzer from main unit	Counter	Common for Counter	Indication signal from cab unit to main unit for GREEN LED	Indication signal from cab unit to main unit for RED LED	Indication signal from cab unit to main unit for YELLOW LED(Flashing)	Indication signal from cab unit to main unit for RED LED(Flashing)	Common
9 pin Circular threded type Female Part N0-MS3102R-20-16S	A	B	C	D	E	F	G	H	I

Note: 1) 10 core Cable CAB-1 Display Unit to VCD Main unit Length - 9mts
2) 10 core Cable CAB-2 Display Unit to VCD Main unit Length - 24mts