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सत्यमेव जयते

भारत सरकार – रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ – 226011
Govt. of India - Ministry of Railways
Research, Designs & Standards Organization,
LUCKNOW - 226011

No. EL/11.5.5/21 Dated: As signed

Principal Chief Electrical Engineers;

- Central Railway, HQs Office, 2nd floor, Parcel Office Bldg., Mumbai – 400 001
- East Central Railway, Hajipur (Bihar) – 844 101
- Eastern Railway, Fairlie Place, Kolkata – 700 001
- East Coast Railway, Railway Complex, Bhuvneshwar – 751 023
- Northern Railway, Baroda House, New Delhi – 110 001
- North Central Railway, Allahabad – 211 001
- North Eastern Railway, Gorakhpur –273 001
- Southern Railway, Park Town, Chennai – 600 003
- South Central Railway, HQs Office, Rail Nilayam, Secunderabad – 500 071
- South Eastern Railway, Garden Reach, Kolkata – 700 043
- South East Central Railway, Bilaspur – 495 004
- South Western Railway, Hubli – 580020
- West Central Railway, HQs Office, Opp. Indira Market, Jabalpur – 482 001
- Western Railway, Churchgate, Mumbai – 400 020
- Banaras Locomotive Works, Varanasi – 221004
- Chittaranjan Locomotive Works, Chittaranjan – 713331 (WB)
- Patiala Locomotive Works, Patiala – 147 003

Sub: Modification Sheet No. RDSO/2022/EL/MS/0488 (Rev. '0') dtd. 22.07.2022 for provision of Blocking Diode in HOG control circuit (in series of MCB 129.2/1) of HOG compliant WAP7 & WAP5 Three Phase Electric Locomotives.

Please find enclosed herewith a copy of Modification Sheet No. RDSO/2022/EL/MS/0488 (Rev. '0') dtd. 22.07.2022 for provision of Blocking Diode in HOG control circuit (in series of MCB 129.2/1) of HOG compliant WAP7 & WAP5 Three Phase Electric Locomotives. This is for information and necessary action.

Himanshu
25/7/2022

(Himanshu Bansal)
For Director General (Elect.)

Encl: As above.

Copy to:

1. **Secretary (Electrical), Railway Board, Rail Bhawan, New Delhi-110 001.** For kind information. (Kind Attn.: Shri Kishore Vaibhav, DEE/RS)
2. **Sr. Divisional Electrical Engineer (TRS), Electric Loco Shed,**
   - Central Railway, Ajni (Nagpur)-440008.

- Central Railway, Kalyan-421304 (Maharashtra)
- East Central Railway, Gomoh – 828 401
- East Central Railway, Barauni – 851112
- Eastern Railway, Howrah-711 106
- Eastern Railway, Sialdah-711 106
- East Coast Railway, Vishakhapatanam – 530 001.
- Northern Railway, Ghaziabad (UP) - 201 001.
- Northern Railway, Tughlakabad (D) – 110 020
- North Central Railway, Fazalganj, Kanpur – 208 003
- North Eastern Railway, Gonda (D)
- Southern Railway, Royapuram, Chennai-600 013.
- Southern Railway, Erode.
- South Central Railway, Lallaguda, Secunderabad – 500 017.
- South Central Railway, Vijayawada
- South Eastern Railway, Tatanagar-831 002.
- South Eastern Railway, Bondamunda
- South Eastern Railway, Santragachi
- South East Central Railway, BMY Complex, Bhilai, Durg-490 025.
- South Western Railway, Krishnarajapuram
- West Central Railway, Tughlakabad, New Delhi-110 044.
- West Central Railway, Itarsi ,
- Western Railway, Vadodara-390 002.

For information & necessary action please.

Himanshu
25/7/2022

(Himanshu Bansal)
For Director General (Elect.)

Encl: as above.

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भारत सरकार – रेल मंत्रलय
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No. EL/11.5.5/21 Dated: As signed

Principal Chief Electrical Engineers;

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- Patiala Locomotive Works, Patiala – 147 003.

MODIFICATION SHEET NO. RDSO/2022/EL/MS/0488 (REV. '0') dated 22/07/2022

1.0 Title:

Provision of Blocking Diode in HOG control circuit (in series of MCB 129.2/1) of HOG compliant WAP7&WAP5 Three Phase Electric Locomotives.

2.0 Brief History:

2.1 ELS/RPM based locomotive working for passenger train with HOG has failed because of wrong feed coming to UIC coupler from power car. In normal working condition the control supply of HOG will be directed from the locomotive to power car. In this case, feed got extended wrongly from power car to UIC coupler (Pin-11) because of which the locomotive (which was in off condition) electronics got switched ON and node went to 612. When LP kept BL key to D position, node went to 504 and worked further. Later when LP tried to turn off the locomotive using BL key, then node went to 613 and got stuck there. Further, locomotive has not responded to BL key and remained at 613 node.

2.2 The above scenario is verified in locomotive 39156/WAP7/MEDHA at ELS/LGD by giving feed externally at UIC coupler pin no. 11 & 12 with locomotive being in off condition. The same result (same as RPM loco failure) was observed in locomotive.The main reason for the failure was, tapping the HOG control supply from the cable 2096 (after 218 interlock) without reverse feed protection because of which wrong feed was getting extended to locomotive electronics through 2096 cable.

2.3 ELS/CNB loco no 37129 failed on 07.03.21, at the time of incident LP tried to switch OFF/ON MCE but MCE supply was not OFF, then Battery MCB 112.1 tripped but again failed to turn off control electronics.Finally UIC coupler had to be disconnected to turn off the Control Electronics. Loco was thoroughly checked at ELS/CNB and no problem was found. ELS/CNB had carried out joint investigation of the incident with TL/AC department. On further investigation of loco and power car jointly with TL/AC, it was found that false feed of 110V appeared from power car due to which control electronics supply was not getting OFF.

2.4 Loco no. 37142 of ELS/ED has failed while working on train no.02845 due to disturbance in converter. While trying to switch OFF/ON CE through MCE, experienced that CE is not getting off. Back feed from power car has caused unable to switch off CE in loco.

2.5 In normal working condition, control supply for HOG will be from loco to power car. In some cases (Especially LSLRD type Brake vans) it has been observed that feed is getting from power car to UIC coupler pin No.11 (cable No.2096). Hence LP was unable to Switch OFF/Reset Main control electronics.

3.0 Objective:

3.1 To avoid above failure, a diode has to be placed in HOG control supply path after MCB (129.2/1), which blocks the reverse feed from UIC coupler at Pin 11. Same modification is implemented in 37538/LGD locomotive and verified that locomotive is working normal even though wrong feed is given in UIC coupler (pin 11) and ELS/ED has also reported that to avoid back feed from power car, a blocking diode (VSHOG) has been provided in all ELS/ED locomotives and working satisfactory.

3.2 As a result, HOG, SR, BUR, VCU electronics can be switched OFF since contactor 218 will remain open and false feedback from power car through UIC coupler pin no. 11 will not go to control electronics after addition of blocking diode.

3.3 The main objective of this modification sheet to suggest a scheme to avoid failure of locomotives due to wrong feed from power car through UIC coupler pin no. 11.

4.0 Limitation in Existing circuit:

4.1 It is to be mentioned that control electronics of locomotive will not be possible to made switched off when wrong feed is coming from power car through UIC coupler

pin no. 11 (wire no UH11, which is connected in output of HOG control MCB 129.2/1) to the locomotive.

4.2 As per the control circuit under normal condition, after closing the Battery MCB 112.1, when BL key is put to ON position, then control supply goes to VCU, BUR, SR as well as to HOG follows the path of MCB112.1 → wire2094 → Contactor126 → wire2095 → contactor 218 → wire 2096 → to control electronics of SR, BUR, HOG etc.

4.3 In the normal situation to drive a loco, LP puts BL key to Drive position then both contactors 126 and 218 closes and if MCE is switched OFF then VCU, BUR, SR and HOG control supply gets switched off, since contactor 126 and 218 gets open and control supply gets off.

4.4 However, in case, false feedback from power car appears then even if battery MCB 112.1 is OFF and contactor no. 126 is open, contactor 218 will remain open. Wire no. 2096 will have supply due to false feedback of 110 V DC from power car through hotel load MCB 129.2/1 due to which HOG, BUR, SR and VCU electronics will not get switch off. They will get supply directly from false feedback via wire no. 2096, since 110 V DC supply is available on pin no 11 of UIC socket which is coming from power car.

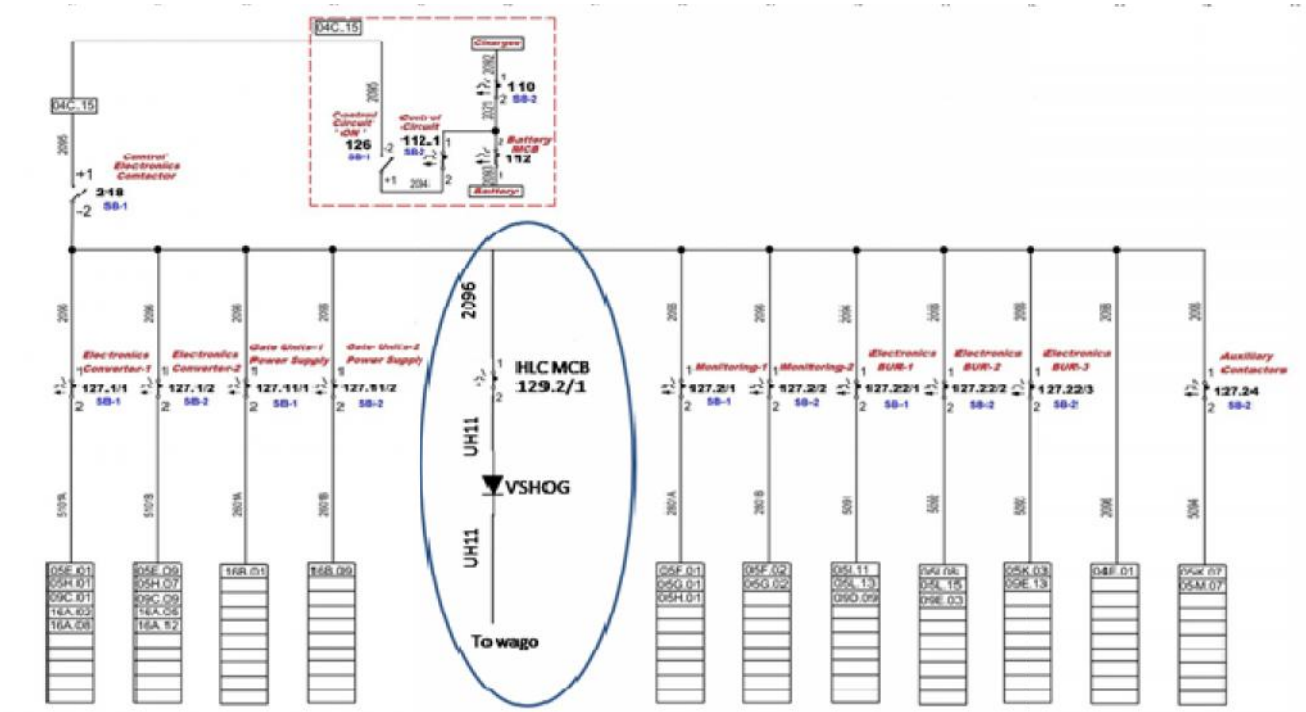
5.0 Instructions:

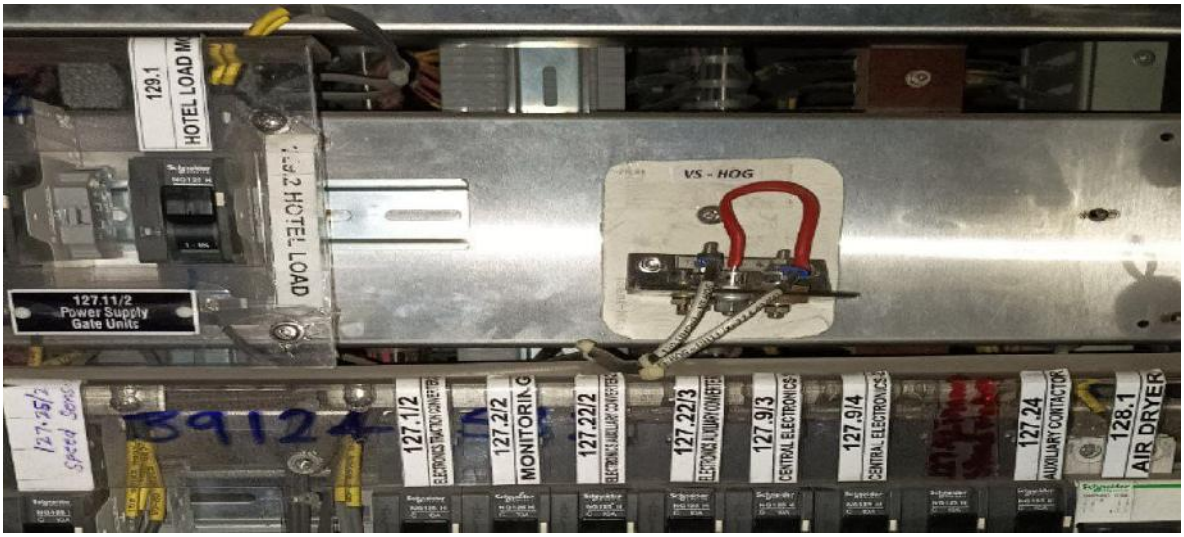
Following instructions may please be followed for this modification:-

SN	Instruction
1	Insert a diode (labelled as 'VSHOG') in series with the cable no. UH11 of 129.2/1 MCB output in SB2. (Remove the cable no. UH11 from wago in SB2 and connect it to diode anode terminal, connect cathode terminal to wago in SB2).
2	Secure the diode to protect it from getting earthed or opened due to vibration.
3	After completion of work, ensure the following two aspects **a.** Ensure correct polarity of diode provided by observing the status of HLC converters display (display should be 'ON') after keeping BL switch in 'D' position. If display is blank, then diode polarity shall be corrected. **b.** After MCE ON, extend 110V feed to UIC coupler pin no. 11 from self-locomotive battery positive cable. Now try to switch 'OFF' MCE and ensure that MCE is getting 'OFF' and again carry out MCE ON and it should be possible to reach 504 node (power ON). If any deviation in the above mentioned behavior, ensure correct wiring of modified circuit.

6.0 Modified Scheme:

MCB 129.2/1 Modified circuit diagram is given below.





7.0 Material required:

i. VS blocking diode 01no. (Used in conventional loco, Rating-12Amps.)

ii. 1.5 sq. mm control cable – 0.5 mts.

8.0 Application to the class of locomotive:

All HOG compliant WAP-7/WAP-5 type 3-Phase electric locomotives.

9.0 Agency of Implementation:

All PUs, POH Shops, Electric Loco Sheds Holding 3-Phase Electric Locomotives.

10.0 Periodicity of Implementation:

Commissioning, POH, all major and minor schedule.

-sd-

Encl: Nil. For Director General (Elect.)

Copy to:

- Secretary (Electrical Engg./RS), Railway Board, Rail Bhawan, New Delhi-110 001.

Digitally Signed by Amit Kumar Saraf
Date: 22-07-2022 11:30:25
Reason: Approved

Encl: Nil . For Director General (Elect.)