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

No. EL/3.1.35/2 Electrical

Date:25.10.2013

Chief Electrical Engineers,

- East Central Railway, Hazipur – 844 101 (Bihar)
- South East Central Railway, Bilaspur-495 004.
- West Central Railway, Opp. Indira Market, Jabalpur-482001
- Northern Railway, Baroda House, New Delhi-110 001.
- Central Railway, 2nd floor, Parcel Office Bldg., Mumbai CST-400 001
- South Central Railway, Rail Nilyam, Secunderabad – 500 071.
- Eastern Railway, Fairlie Place, Kolkata-700 001.
- Southern Railway, Park Town, Chennai-600 003.
- South Eastern Railway, Garden Reach, Kolkata-700 043.
- Western Railway, Churchgate, Mumbai-400 020.
- Chittaranjan Locomotive Works, Chittaranjan-713 331 (WB).

MODIFICATION SHEET NO. RDSO/2013/EL/MS/0427 (Rev.0), Dated 23.10.13

1.0 Title:

ModificationSheet for MCP control circuit in three phase electric locomotives.

2.0 Introduction:

There are two pressure switches provided in three phase electric locomotives to monitor the MR pressure, one is set at 8.0 kg/cm² and the other at 7.5 kg/cm². The working pattern of compressors is as follows:

- Both compressors work together to build up MR pressure from 0 to 10 kg/cm². On reaching 10 kg/cm² both compressors stop working due to cut off of pressure switch.
- When MR pressure drops from 10 to 8 kg/cm² only one compressor starts alternately to build up the MR pressure up to 10 kg/cm².
- When the MR pressure drops to 7.5 kg/cm² and below, both compressors start till the cut off pressure i.e. 10 kg/cm² is reached.

2.1 Limitations of existing topology:

While working a train with excess leakages in formation, on dropping of MR pressure from 10 to 8 kg/cm², initially one compressor receives start command, but before the compressor starts building up pressure in MR system, the MR pressure further drops below 7.5 kg/cm² due to excess leakages in the train. In such cases, the second compressor also receives start command and BUR-3 output voltage ramps down to facilitate soft start of second compressor and the first compressor which came to working at pressure of 8 kg/cm² also gets switched 'OFF'. After closing the CP contactors, BUR-3 output ramps up and compressors start working. But the actual pressure pumping into MR starts only after completion of unloading of air pressure between CP and NRV. There is nearly 25-30 seconds time delay from start command of compressor to actual building up of pressure in the MR system. In the meantime MR pressure may further drop depending upon the leakages in formation. In

certain cases, MR pressure drops below 5.6 kg/cm² and control electronics initiates reduction of TE/BE with fault message "S/R interlock MR low".

2.2 Object:

In order to avoid the above problem, SCR has proposed to switch 'ON' both compressors on dropping the MR pressure from 10 to 8 kg/cm², instead of existing arrangement of one starting at 8 kg/cm² and another at 7.5 kg/cm². The modification is carried out by SCR in three WAG-9 locos and their performance is reported satisfactory.

3.0 Existing Arrangement with cross-references of respective design document:

As per existing arrangement, both pressure switches i.e. MCP-1 & 2 are connected to 110 VDC. One pressure switch (Sch.Pos. 172.2) is set at < 8 kg/cm² and other pressure switch (Sch.Pos. 172.3) is set at < 7.5 kg/cm². The feedback to pressure switches are received by cable no. 3101 by both the pressure switches and output is through cable no. 3036 and 3038 respectively as shown in the existing circuit (Annexure-I).

4.0 Modified Arrangement to replace existing arrangement as given above in 3.0:

To overcome the problem, the existing arrangement should be modified by setting both pressure switches to 10 to 8 kg/cm² and providing parallel path between two switches. Parallel path shall be provided by giving a loop between cable no. 3036 and 3038 as shown in the modified circuit (Annexure-I).

5.0 Application to class of locomotives:

WAP-5, WAP-7, WAG-9, WAG-9H.

6.0 Material Required:

Nil.

7.0 Material Rendered Surplus:

Nil.

8.0 Reference:

South Central Railway letter no. E.221/SMI/MD/TC/3Phase/V-IV/145 dated 17.04.13.

9.0 Agency of Implementation:

CLW, work shops and loco sheds holding WAP-5, WAP-7, WAG-9 & WAG-9H locomotives.

(Sandeep Srivastava)
for Director General/Elect.

Encl: as above.

Copy to:-

1. **Secretary (Electric Traction)**, Railway Board, Rail Bhavan, New Delhi-110 001
2. **Sr. DEE (TRS), Electric Loco Sheds,**
 - Central Railway, Ajni (Nagpur)-440008.
 - South East Central Railway, BMY Complex, Bhilai, Durg-490 025.

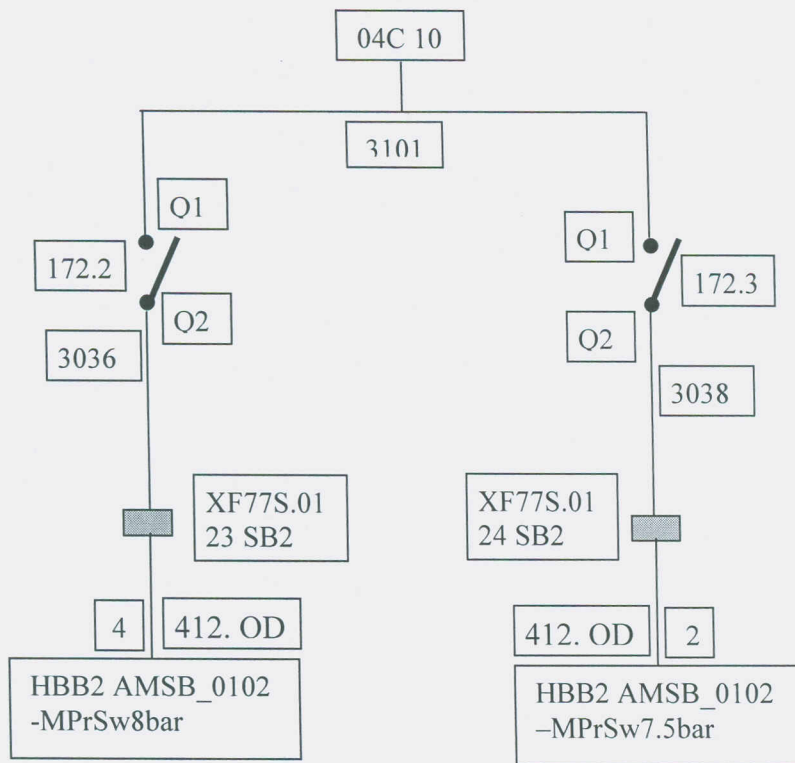
- Wester Central Railway, Tughlakabad, New Delhi-110 044.
- Northern Railway, Ghaziabad (UP)-201 001.
- East Central Railway, Gomoh-828 401
- South Central Railway, Lalaguda, Secunderabad – 500 017.
- Eastern Railway, Howrah.
- South Eastern Railway, Tatanagar-831 002.
- Western Railway, Vadodara-390 002.
- Southern Railway, Royapuram, Chennai-600 013.

Encl: as above

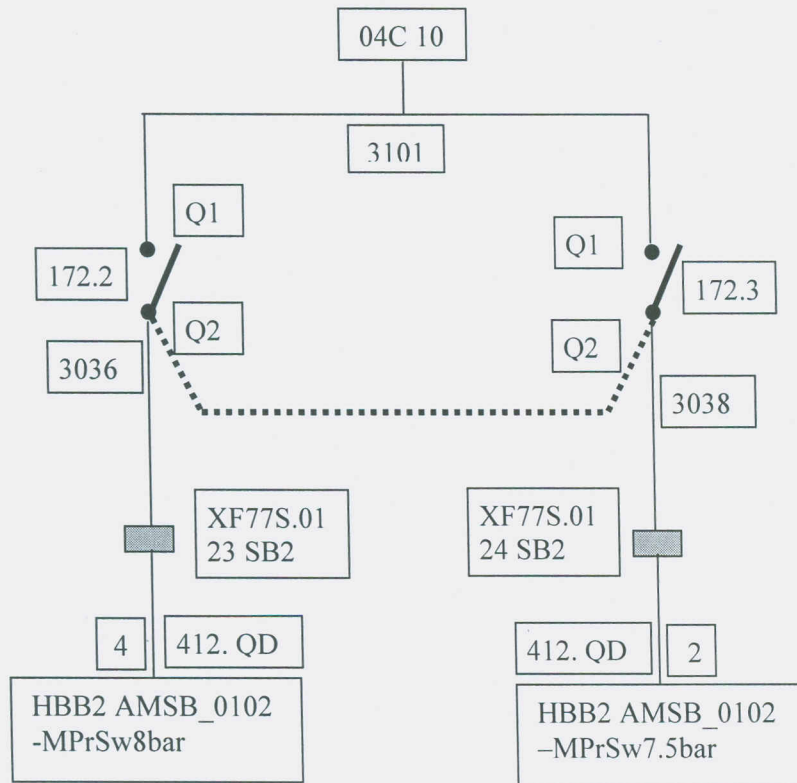
sd/ 25/11/13
(Sandeep Srivastava)
for Director General/Elect.

Existing Circuit

Annexure-I



Modified Circuit



1. Both Pressure switch shall be set at 8-10kg/cm².
2. Loop shall be provided between wire no. 3036 and 3038.