



No. EL/11.5.5/1

Date: 19.06.2009

Chief Electrical Engineer,

- Central Railway, 2nd floor, Parcel Office Building, Mumbai CST-400 001
- Northern Railway, Baroda House, New Delhi-110 001
- East Central Railway, HQs Office, Hajipur-844 101 (Bihar)
- South Central Railway, Rail Nilayam, Secunderabad-500 071
- West Central Railway, Indra Market, Jabalpur-482 001
- South East Central Railway, Bilaspur-495 004
- Chittaranjan Locomotive Works, Chittaranjan-713 331 (WB)

MODIFICATION SHEET NO. RDSO/2009/EL/MS/0378 (REV.0), DATED 29.05.2009

1. **Title**

Modifications in NS/AS Controller Cards (PPA988B02) and Gate Unit of Power Converter of three phase locomotives.

2. **Object**

It has been observed that NS/AS controller card (PPA988B02) is contributing approximately 50% of the card failures of power converter of 3-phase locomotives in the recent years. This card is being imported by M/s. BHEL & M/s. NELCO and indigenised by M/s. BTIL since 2001. After make-wise failure analysis of these cards, it is seen that the failures (FRPCPY) in BTIL make cards is 23.2% as compared to 2.7% of BHEL. Based on failure investigation reports given by M/s. BTIL, it has been observed that majority of the failures are because of failures of IC14C88 and in some cases failures of these ICs are along with zener diodes V637 & V638. The matter was taken-up with M/s. BTIL and it was found that a modification in this IC was cut-in by the OEM in the year 1999, where Pin No. 8 & 11, which were connected to ground earlier, were disconnected from the ground. This was done to avoid failure of this IC and zener diodes. The details have been shown in **Annexure-1**.

It has been verified from the sheds that in BHEL & NELCO make PPA988B02 cards, which are imported, this modification has been implemented by the OEM.

There are approximately 30% failures of Gate Unit which have been observed during last 06 years. M/s BTIL investigated and highlighted the cause of failure of Gate Unit (GVA578A01) due to less clearance between Gate and Cathode terminal. This results in failure of GU of Power converter. In order to avoid this failure it is proposed to insert an insulating sheet between Gate and Cathode plates of gate unit.

3. **Existing Arrangement**

3.1 Pin No. 8 & 11 of IC 14C88 in PPA988B02 card are connected to ground in BTIL make.

3.2 Photograph of Gate Unit given at **Annexure-2**

4. **Modified Arrangement:**

4.1 Pin No. 8 & 11 of IC 14C88 in PPA988B02 card are to be isolated to remove grounding of these pins in M/s. BTIL make cards.

4.2 Insert insulating plate between gate and cathode of Gate Unit as shown in photograph at Annexure-3

5. Application

WAP5, WAP7, WAG9 and WAG9H

6. Material required

6.1 Spare modified NS/AS controller card (PPA988B02) to be supplied by M/s BTIL
6.2 Insulating plate of glass epoxy (FR4 grade material) size- 250x10x1.6 mm.

7. Material rendered surplus

Nil.

8. Reference

8.1 This office letter no. EL/11.5.5/5 dated 06.02.09, issued for measures taken to avoid failure of NS/AS controller cards (PPA988B02).

8.2 This office letter no. EL/115.5/1 dated 05.03.2009, issued for modification in Gate Unit of Power Converter.

9. Modified drawing

Nil.

10. Agency of implementation

M/s BTIL shall supply modified NS/AS controller card (PPA988B02) to loco sheds to replace the unmodified cards with modified cards. The provision of insulating plate shall be done by all loco sheds holding 3-phase electric locomotives as and when replacement of Gate Unit is required. Necessary material (insulating plate) and guidance shall be provided by TOT partners. All TOT partners shall also modified Gate Unit by providing insulation sheet in future supplies.

Adm 19.06.09
(Sandeep Srivastava)

For Director General /Electrical

Copy to: -

1. Secretary (Electrical Traction), Railway board, Rail Bhawan, New Delhi-110001.

2. Sr. DEE (TRS), Electrical Loco Shed

- Central Railway, Ajni (Nagpur)-440 008.
- Northern Railway, Ghaziabad (UP)-201 001.
- East Central Railway, Gomoh-823 401.
- South Central Railway, Lalaguda, Secunderabad-500 071
- West Central Railway, Tughlaquabad-110 044
- South East Central Railway, BMY Complex, Bhilai Durg-490 025

O/C Sme 19.06.09

3. M/s Bombardier Transportation, ERDA ROAD, Maneja, Vadodra-390013

4. M/s Nelco Limited, MIDC, Plot no-6, TTC Industrial Area, Electronics Zone, Mahape, Navi Mumbai-400710

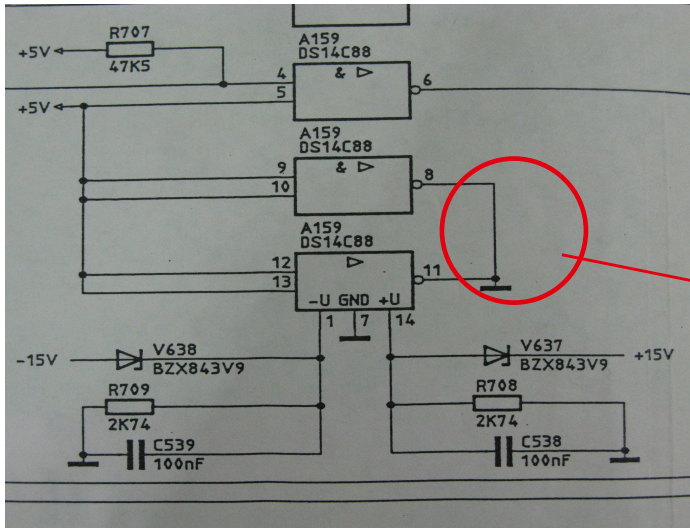
5. M/s. Bharat Heavy Electrical Limited, Electronic Division, Maysore Road, Bangalore-560 026

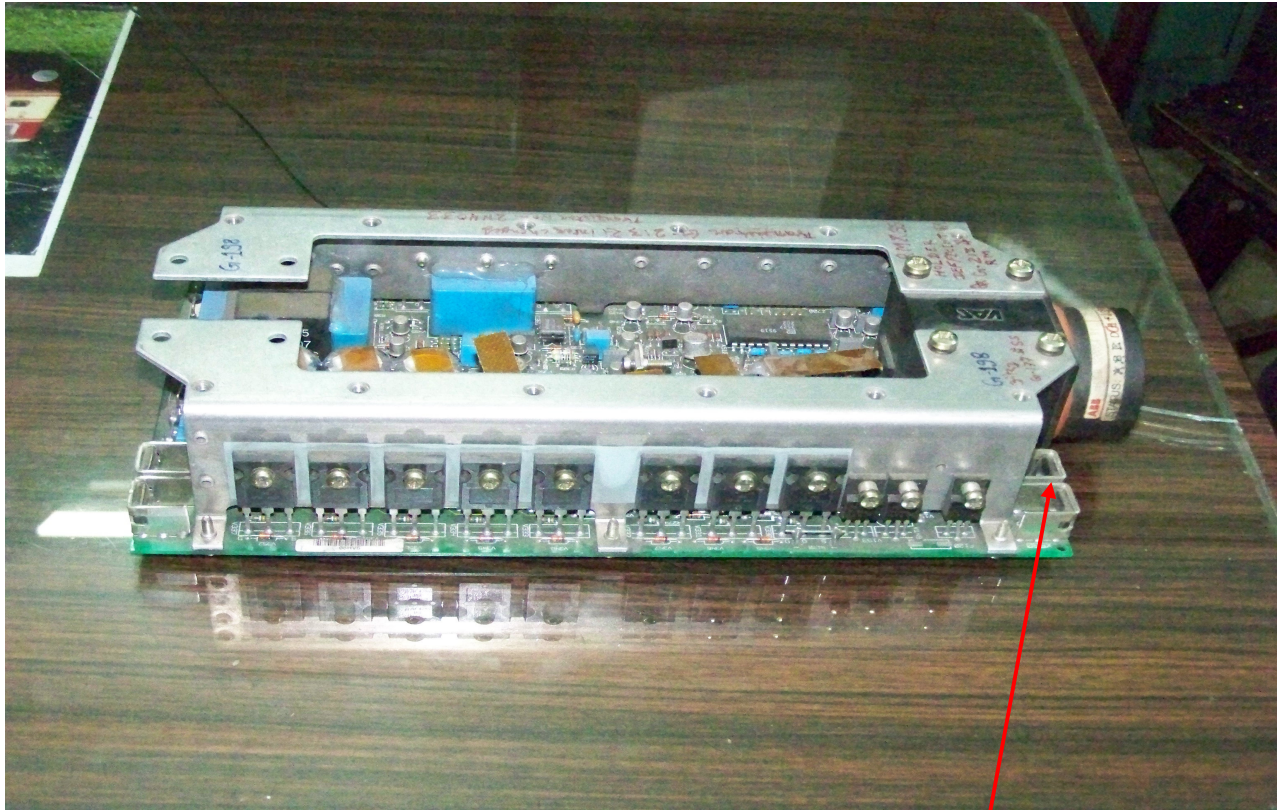
To insure implementation of this modification in all future supply as advised earlier vide letter no. EL/11.5.5/5 dated 06.02.09. Please also advise cut in s.no. of converters.

Adm 19.06.09
(Sandeep Srivastava)

For Director General /Electrical

Annexure-1





No insulating plate

Existing Gate Unit without Insulating Plate

