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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/4.2.15

Dated 04.06.2012

**Chief Electrical Engineer,**

- Central Railway, Mumbai CST-400 001.
- Northern Railway, Baroda House, New Delhi-110 001.
- North Central Railway, Hastings Road, Allahabad- 211001
- Eastern Railway, Fairlie Place, Kolkata -700 001.
- East Central Railway, Hazipur-844101.
- East Coast Railway, Chandrashekharpur, Bhubaneswar-751016.
- Southern Railway, Park Town, Chennai-600 003.
- South Central Railway, Secunderabad-500 371.
- South Eastern Railway, Garden Reach, Kolkata -700 043.
- South East Central Railway, Bilaspur-495004
- Western Railway, Churchgate, Mumbai-400 020.
- West Central Railway, Jabalpur-482001.
- Chittaranjan Locomotive Works, Chittaranjan-713 331 (WB)

**MODIFICATION SHEET NO. RDSO/2012/EL/MS/ 0410 Rev '0'**  
**Dated: 04.06.2012**

**1. Title:**

Circuit modification of I-68 branch for C145 operation feedback for 25 kv ac electric locomotives fitted with MPCS.

**2. Brief history**

C145 contactor is an Electro Pneumatic type power contactor used to feed the supply to ATFEX excitation transformer at the time of dynamic braking. C145 contactor has 6 auxiliary contacts (3 N/C and 3 N/O) for loco control circuit.

In relay based locomotives one N/C auxiliary contact is used in Q50 branch for traction side & two N/O auxiliary contacts in series are used in same branch for braking side for taking notches in traction and braking mode.

In MPCS locos, power contact of C145 works same way as conventional locos to feed supply to ATFEX excitation transformer at the time of Dynamic Braking. At present, only one N/O auxiliary contact is used as an input (I-68) for feedback of C145 contactor operation. The closing command for C145 is given by O-15.

**3. Object:**

Recently some cases of "C145 contact stuck up and total loss of traction" have resulted failure of locomotive on line. Due to defect in C145 N/O auxiliary contact, input I-68 for MPCS became high while MPCS output O-15 was low.

This problem occurs when loco pilot uses dynamic braking in loco and switch over from braking mode to traction mode and power contact does not open OR due to malfunctioning of auxiliary contact of C145. In these cases LSB does not extinguish in Traction mode resulting notch not progressing.

To avoid failure of locomotive on line due to malfunctioning of auxiliary contact, it is advised that two N/O auxiliary contact of C145 in series should be used (as used in braking side conventional loco) for I-68 input branch. As such closing of C145 will be ascertained by two auxiliary contacts and malfunctioning of one auxiliary contact will not cause TLTE.

**Modified Arrangement:**

To avoid failure of locomotive on line due to above problem following modification is incorporated:-

- Two N/O auxiliary contact of C145 will be connected in series in I-68 branch as shown in enclosed drawing SKEL – 4880. Existing circuit as well as Modified circuit for I-68 input have been shown.

The matter was discussed in 35<sup>th</sup> MSG held at Erode in May 2012. All Railways have opined that two N/O auxiliary contact of C145 should be used in series in I-68 branch. ELS/ GZB, ANGL, CNB have already modified some of the locomotives.

**4. Work to be carried out:**

One spare N/O auxiliary contact of C145 should be connected in series with the existing N/O auxiliary contact by Railways.

**5. Application to class of locomotive:**

WAG-7, WAG5, WAP-4 and WAM-4 class of 25 Kv ac conventional tap changer electric locomotives with microprocessor based control and fault diagnostic system (MPCS). This modification is to be used for MPCS fitted locomotives only.

**6. Material Required:**

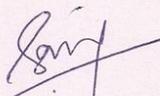
1. One additional N/O auxiliary contact of C145.
2. Control cable of 2.5/3 mm<sup>2</sup> as per requirement.

**7. Material Rendered Surplus: NIL**

**8. Modification Drawings: SKEL-4880**

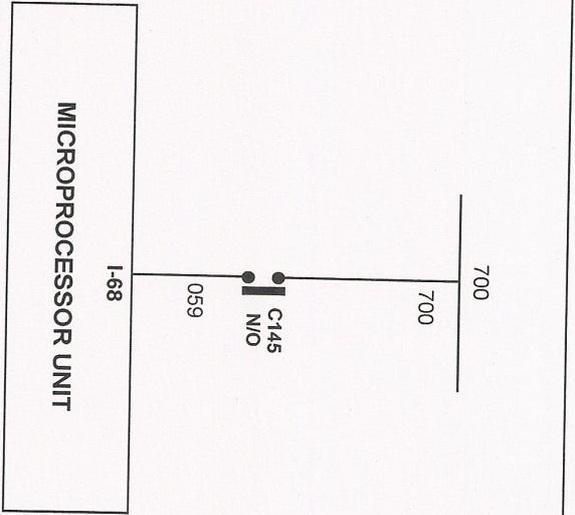
**9. Agency of Implementation:**

Electric loco sheds, MTR/POH workshops and CLW

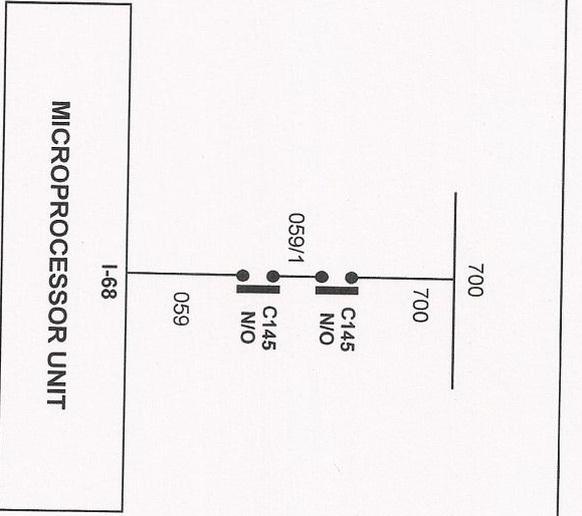
  
(S. K. Gupta)

for Director General/Elect.

Encl: As above



Existing Circuit



Modified Circuit

Two N/O auxiliary contact of C145 of extreme outside will be used.

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| Dt. | 4.6.12 |
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| STATUS | ALT. | REF. NO. | DESCRIPTION | APPD. BY | DATE |
|        |      |          |             |          |      |

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|--|------------------|-------------|-----------------|-----------------------------|---------------|-------|
| REF.   | PART NO.         | DESCRIPTION | DETAIL DRG. NO. | NO./LOCC                    | HAIT.         | SPEC. |
| REF.   | SM110— (Rev '0') |             | SCALE           | APPD. BY <i>[Signature]</i> | (FOR DG)      |       |
| Loco control circuit for C145 N/O interlock.<br>(Ref: DRG no. CLW.3w.15000.004 Sheet no. 12 of 21) |                  |             |                 | FIRST ISSUED                | SUPERSEDES    |       |
| RDSO. ELECT. DTE.  |                  |             |                 | SKEL-4880                   | SUPERSEDED BY |       |