

फैक्स/Fax : 91-0522-458500
रेल 'रेलमानक' लखनऊ
Telegram 'RAILMANAK', Lucknow
टेलीफोन/Tele 451200 (PBX)
450567 (DID)



सत्यमेव जयते

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



EL/6 11 1

Dated: 29.5.2003 2/11/03
EL/6 11 1 AND PS-2 EN

Chief Electrical Engineer,

- Central Railway, Mumbai CST- 400 001.
- Eastern Railway, Fairlie Place, Calcutta- 700 001
- East Cost Railway, Chandrashekharapur, Bhubaneswar- 751 016.
- Northern Railway, Baroda House, New Delhi-110 001
- North Central Railway, Hasting Road, Allahabad-211 001.
- Southern Railway, Park Town, Chennai-600 003
- South Central Railway, Rail Nilayam, Secunderabad -500 071
- South Eastern Railway, Garden Reach, Calcutta-700 043
- South Western Railway, Bangalore - 560 046
- Western Railway, Churchgate, Mumbai-400 020
- West Central Railway, Jabalpur
- New Zone Railway, Bilaspur
- Chittaranjan Locomotive Works, Chittaranjan- 713 331

SIGNATURE OF A. K. Agrawal

Sub: Modification of Twin beam head light with DC-DC converter control circuit for trials & feed back

It has been reported by Railways that switches BLPRF, BLPRR & BLPRD in BL box frequently fail in twin beam head light with DC-DC converter. It is proposed to carry out modification in twin beam head light circuit with DC-DC converter in 5 nos. electric locos in each electric loco shed. The performance of modification has to be monitored from the date of commissioning of modification. The feed back with regard to trial modification be communicated to RDSO on monthly basis with your comments if it can be adopted as standard.

The modification circuit details & diagrams are given in annexure for your perusal and further necessary action in this regard.

Encl. : As above

AKHgrawal
(A.K. Agrawal)
for Director General/Elect.

Copy to – Secretary (Electrical) Railway Board –
(Kind Attn- Shri Sudesh Kumar EDEE/RS) – Kind information

W.Med
Shiloo
2.6.03

9/4

Modification for field trials & Feed back

- Title:** Modification of Twin beam head light with DC-DC converter..
- Object:** To prevent frequent cases of flashover/over heating/melting of limit switches used for BLPRF/BLPRR/BLPRD in BL box.
- Analysis:** Switches BLPRF/BLPRR/BLPRD are rated for 10 A (AC) and served well when headlight worked as AC supply from RTPR . But with adoption of twin beam headlight with DC-DC converter these switches carry about 8-9 A (DC) against dc rating of 6 A only. This resulted in failures of switches. Earlier modification No. ELRS/MS/0288 Rev. 0-2000, in reference to modification No. RDSO/WAM4-173 & RDSO/193 for working of headlight while passing neutral section, providing 2 contracts in parallel has not eliminated the problem totally.

GZB Shed of N Rly proposed scheme of indirect switching of headlight using MOSFET by which only MOSFET control current in mA will pass through switches thus eliminating troubles of failure of switches .

However the proposed scheme introduces electronic devices like MOSFET, Zener Diodes etc. and their liability in service need to be evaluated. GZB shed vide letter No. 230-Elect./TRS/GZB/T-51/359 dt: 17.3.03 reports that modification has been implemented on WAP4 loco No. 22021 and it is giving satisfactory performance.

In view of above it is proposed that modification be implemented by all the sheds at least on 5 locos to monitor its performance. Based on feedback from Rlys, the modification will be considered by RDSO for adoption as standard.

Work to be done:

1.

- i. The positive (+ive) terminal of DC-DC converter must be brought through 2.5 mm² copper cable on the back side terminal plate of the headlight box. The terminal is to be marked 'P' on terminal plate. An additional hole for 'P' terminal must be made of similar size on the terminal plate.
- ii. Terminal marked 'B' on the terminal plate of headlight is brought from the cable no. A244 (A245 from rear) this is for bright headlight operation.
- iii. The terminal marked 'D' on the terminal plate of the headlight is brought out from the cable No. 231/1 (231/2 for rear). This is for dim operation of head light.
- iv. The Terminal marked 'C' on terminal plate of head light is brought for negative (-ive) wire no. 258 from B-BD.

- 2 One assembled PCB for each headlight having four set of biasing circuit for driving the 4 MOSFETs of the headlight filament. The PCB may be kept inside the space on the back side of the head light with due precaution with regard to adequate insulation between ground and live parts.
- 3 Each PCB has 3 inputs and 4 outputs as shown in the circuit diagram (A).

a. Inputs :

- i. 'B' for bright terminal connected to point B on the headlight terminal casing.
- ii. 'D' for dimmer terminal connected to D on the headlight terminal casing.
- iii. 'C' for common -ive terminal connected to strip at point C on the enclosure casing.

b. Outputs:

- i. Bf1 for bright 100W filament
- ii. Bf2 for bright 100W filament
- iii. Df1 for dimmer 90W filament
- iv. Df2 for dimmer 90W filament

Application:

The modification, is applicable to all electric locomotives provided with twin beam headlight with DC-DC converter. It be implemented in limited number (5 No.) of locomotives by each shed for field trials with reports to RDSO.

Material required

Sl. no.	description	Specification	Quality
1.	Cable	2.5 Sq. mm	As per requirement
2.	Lugs	2.5 Sq.mm	As per requirement
3.	MOSFET	Type IRF P- 250 or equivalent	8 Nos
4.	Zener Diode	GSZ 6.8 or equivalent	8 Nos
5.	Resistor	4.7 K Ω , ¼W	8 Nos
6.	Resistor	2.2 K Ω , ¼W	8 Nos
7.	PCB	One each for both headlight	2 Nos

Material Rendered Surplus:

1. Nil

Reference:


Suggestion received from N.R. GZB Shed letter no. 230/Elect/TRS/GZB/ T-51/359 dt 17-3-03. As per drawing at annexure-V.

Agency for Implementation:

Electric loco sheds.

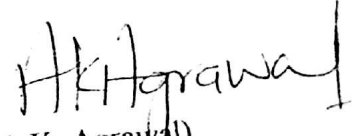
Modification Drawing:

Annexures: A, B & C

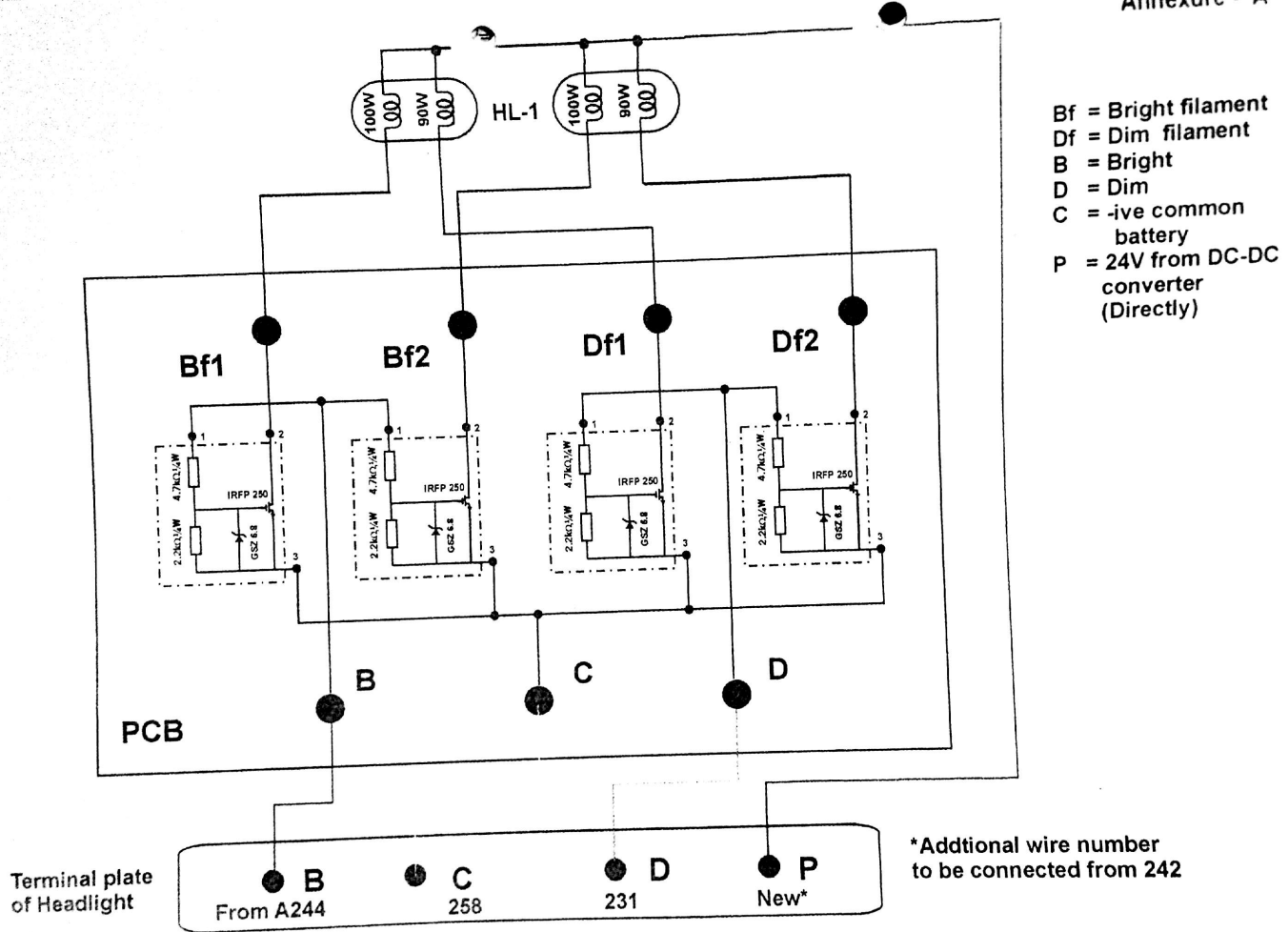

(A.K. Agrawal)
for Director General/Elect.

Copy to: As per Standard Mailing list No. EL/M/0028 Version '1'

PIN:

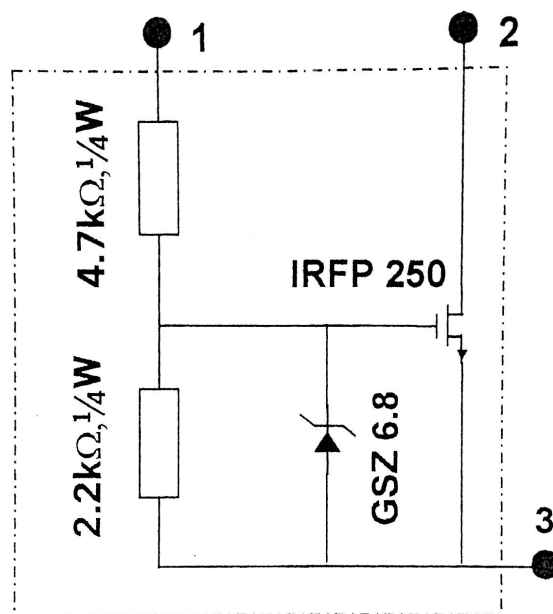

(A.K. Agrawal)
for Director General/Elect.

Annexure - 'A'

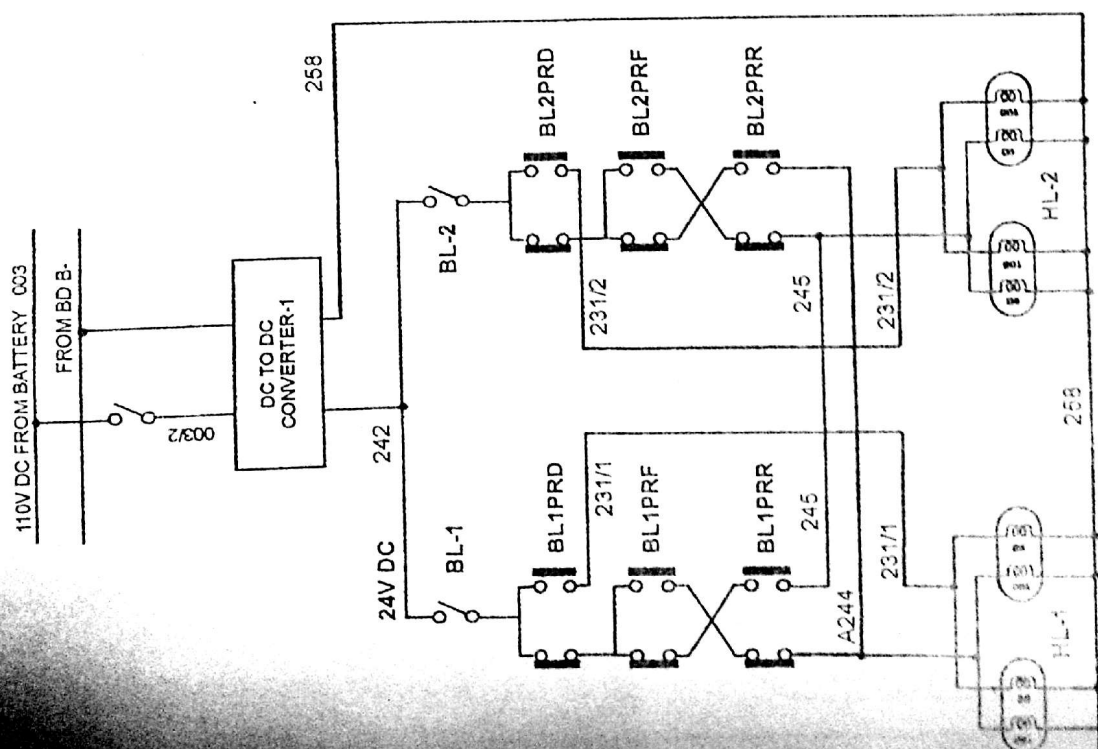
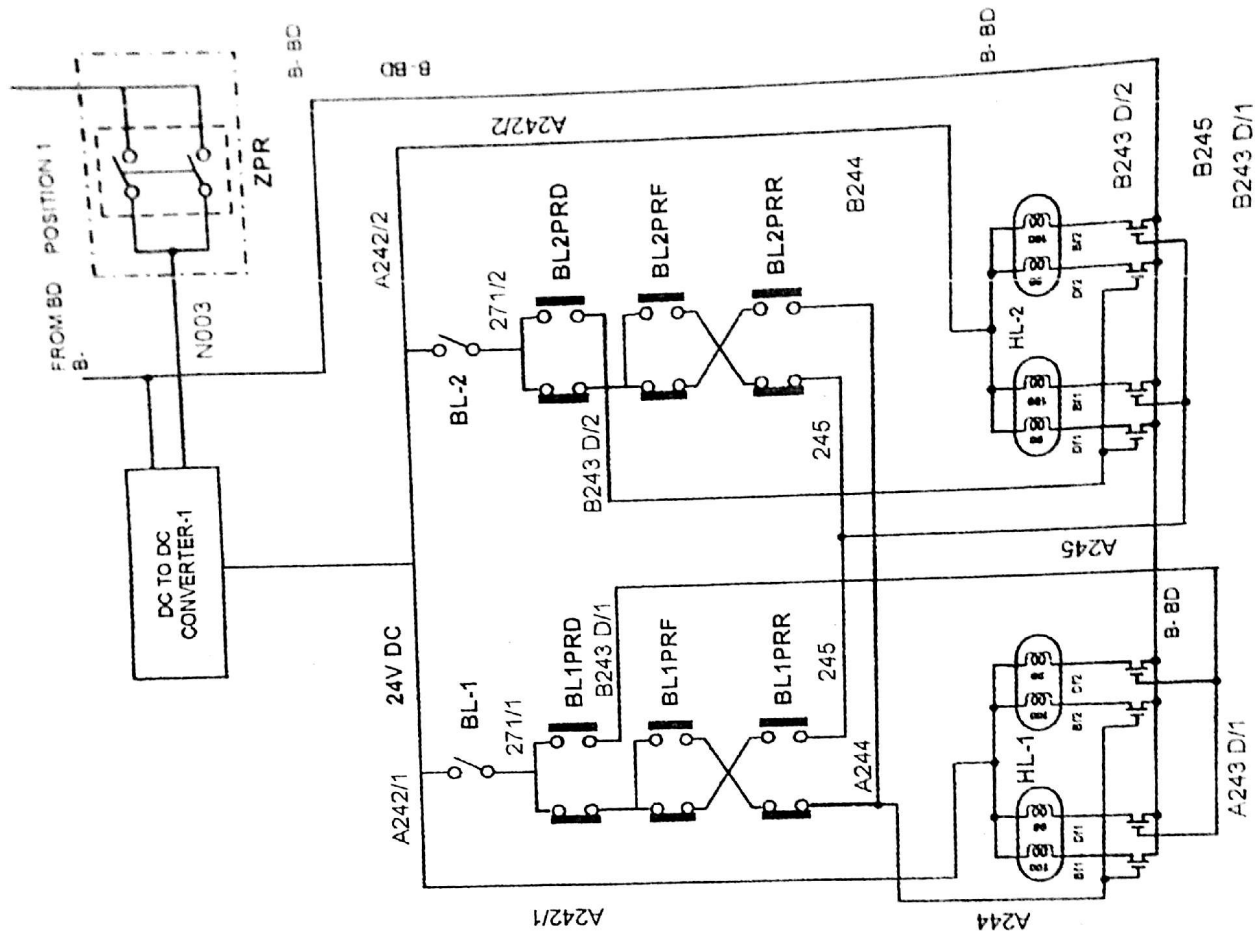


Arrangement of modified wiring connection diagram using MOSFET

Annexure - 'B'



BIASING OF MOSFET



Modified Circuit

Existing Circuit