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**GOVERNMENT OF INDIA - MINISTRY OF RAILWAYS  
RESEARCH, DESIGNS & STANDARDS ORGANISATION**

No.EL/3.1.3

Manak Nagar, Lucknow.

Dated 3-9-1979.

**MODIFICATION SHEET No.RDSO/WAM4/89**

**Provision of Mid-point earthing of power circuit on  
WAM4 locomotives with 2S-3P Traction Motor connection**

**1. Object of modification:**

1.1 There have been a number of cases of failure of insulation to earth on traction motors of WAM4 locomotives. It is considered desirable to reduce the dielectric stress on the motor insulation by earthing the mid-point of the two motors connected in series instead of on one side of the power circuit as at present. In the first instance a modification is to be carried out only on WAM4 locomotives with a permanent 2S3P connection.

1.2 The connection of the mid-points of the motors to the earth will be made through resistors as shown in enclosed sketch No.SK.EL.3176. The resistors are needed to limit the circulating current in the case of a flash-over of any of the motors.

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

2.1 Power circuit of the locomotive with permanent 2S-3P connection of traction motors are to be modified as per RDSO sketch SK.EL.3176.

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

3.1 All WAM4 locos having permanent 2S-3P connection of traction motors.

**4. Material required:** As per CLW's instructions and Drg.No.

CLW.4W.2004.72/A (18 sheets)-issued for

**5. Material rendered** WAM4 locomotives with BHEL TM165 traction motors.

**6. Reference:**

**7. Modification drawings:**

R.D.S.O. SK.EL.3176 and CLW Drg. No. CLW.4W.2004.72/A (18 sheets).

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8. Agency for modifications:

- 1) For existing locomotives by Electric Loco Sheds.
- ii) Locomotives under manufacture by CLW.

9. Distribution:

(As per list appended below)

Encl. As above.

(A.S. Thakur)  
for Director General (Elec.)

DISTRIBUTION 2 copies with 2 copies of Drg./Sketch No. SX.EL.3176 to each addressed below:-

1. Secretary (Electric Traction), Railway Board, Rail Bhavan, New Delhi-110 001.
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