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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/11.5.5/5

Dated 24.04.2014

**Chief Electrical Engineers,**

- Central Railway, 2<sup>nd</sup> floor, Parcel Office Bldg., Mumbai CST-400 001
- Chittaranjan Locomotive Works, Chittaranjan-713 331 (WB)
- East Central Railway, Hazipur – 844 101 (Bihar)
- Eastern Railway, Fairlie Place, Kolkata -700 001
- East Coast Railway, Railway Complex, Bhuvneshwar – 751 023
- North Central Railway, Allahabad – 211 001
- Northern Railway, Baroda House, New Delhi-110 001.
- North Eastern Railway, Gorakhpur – 273 001
- South Central Railway, Rail Nilyam, Secunderabad – 500 071.
- South East Central Railway, Bilaspur-495 004.
- South Eastern Railway, Garden Reach, Kolkata-700 043
- Southern Railway, Park Town, Chennai-600 003
- West Central Railway, Jabalpur 482 001.
- Western Railway, Churchgate, Mumbai –400 020

**MODIFICATION SHEET NO. RDSO/2014/EL/MS/0434(Rev.0), Dated 28.03.14.**

**1.0 Title:**

Modification sheet to create low pressure zone above hood ventilator in order to make machine room pressurized and free from dust to avoid failure of Electronic cards in 3 phase locomotives.

**2.0 Object:**

In order to avoid ingress of dust in three phase locomotives, machine room of these locomotives are pressurised using machine room blowers. The air delivery of machine room blowers first passes through heat sink of electronic cubical of power converter, auxiliary converter, vehicle control unit and thereafter it goes to machine room compartment and finally escapes out through ventilators. It is noted that although WAP5 locomotives is shorter in length by almost 2 meters but it has only four ventilators for escaping out the air, whereas WAG9/WAP7 has six ventilators even though its machine room size is larger in volume.

After implementation of MODIFICATION SHEET NO. RDSO/2009/EL/MS/0380 (Rev.0), Dated 06.07.09, the two ventilators provided in the centre one above OCB and other above E-70 brake panels were closed through a dummy MS sheet of proper size. But it has been observed that at high speed (i.e. more than 80 kmph) the direction of air get reversed at non driving end and atmospheric air enters inside the machine room with lot of dust.

During high speed at driving end, since both ventilators are covered by cab roof projections, this causes atmospheric air flow from top of ventilators and create

low pressure at out let of ventilators resulting machine room air to flow from inside of loco to the atmosphere. At the same time, on non driving end, atmospheric air directly enters into the machine room from ventilators due to increased velocity of air because of high speed.

Further more trials were conducted by ELS/Ajni sheds to evaluate the direction of air flow from the ventilators in WAG9/WAP7 locomotives at different speed with four (blocking the two centrally located ventilators) ventilators.

It has been noted by ELS/Ajni that air starts flowing into the locomotive through the rear ventilators after 80 kmph onwards in WAG9/WAP7 locomotives. In order to prevent air coming from outside at high speed ( $\geq 80$  km/h), ELS/Ajni shed has carried out a modification by providing M.S. Plate of size 880 x 150 x 2.5 mm making half round of dia 600 mm near all ventilators on roof at a distance of 100 mm from ventilator in three locomotives and observed that machine room air always flow from machine room to outside atmosphere through all 04 ventilators at any speed and machine room is protected from outside dusty air.

With this arrangement air flows from top of the ventilator to outside atmosphere and low pressure zone is maintained at out let of ventilators at all the locations. This issue was discussed in 36<sup>th</sup> MSG meeting as item no.-04(new item) and vide Rly. Board letter no.2013/Elect(TRS)/138/6 dated 17.01.2014(decision on MSG item), it was decided to issue a Modification Sheet in this regard by RDSO. Thus, this Modification Sheet is being issued.

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

In existing arrangement in WAP-7 & WAG-9 locomotives Six ventilators are provided two near back side of CAB-1, two near back side of CAB-2 and but two ventilators are provided in centre one above OCB and other above E-70 brake panel however closed through a dummy MS sheet of proper size (refer attached Annexure-1).

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

The four ventilators provided two near back side of CAB-1, two near back side of CAB-2 are covered by M.S. Plate of size 880 x 150 x 2.5 mm making half round of dia 600 mm near all ventilators on roof at a distance of 100 mm from ventilator apposite to cab (refer attached Annexure-1 , Annexure-2 and Annexure-3).

### **5.0 Application to class of locomotives:**

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

### **6.0 Material Required:**

04 number of M.S. Plate of size 880 x 150 x 2.5 mm and 12 number of L angle of size 25 x 25 x 5 (refer attached Annexure-3).

### **7.0 Material Rendered Surplus:**

Nil.

### **8.0 Reference:**

Rly. Board letter no.2013/Elect(TRS)/138/6 dated 17.01.2014.



**9.0 Modification Drawing:**

Enclosed as Annexure-3.

**10.0 Agency of Implementation:**

CLW and Loco Sheds holding, WAP-7, WAG-9 & WAG-9H locomotives.



(A.K. Goswami)

for Director General/Elect.

Encl: As Above .

**Copy to:-**

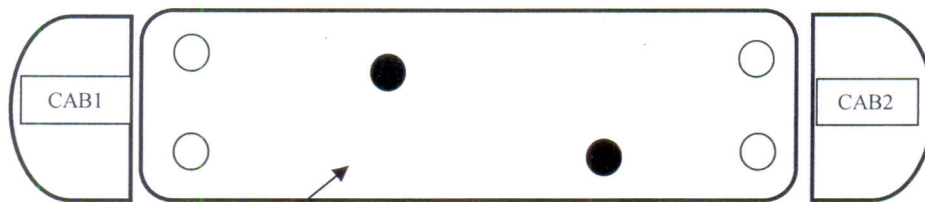
Secretary (Electric Traction), Railway Board, Rail Bhavan, New Delhi-110 001.	For kind information please.
<ol style="list-style-type: none"><li>1. Chief Works Manager, Electric Loco Workshop, Central Railway, Bhusawal-425 201.</li><li>2. Chief Works Manager, Electric Loco Workshop, Eastern Railway, Kancharapara, 24 Pargana (N) – 743145 (W.B.)</li><li>3. Chief Works Manager, Loco, Carriage &amp; Wagon Works, Western Railway, Dahod, P.O. Freeland Gank – 389160 (Gujrat)</li><li>4. <b>Sr. DEE (TRS), Electric Loco Sheds,</b><ul style="list-style-type: none"><li>▪ Central Railway, Ajni (Nagpur)-440008.</li><li>▪ Central Railway, Kalyan-421304 (Maharashtra)</li><li>▪ East Central Railway, Gomoh-828 401</li><li>▪ Eastern Railway, Howrah-711 106</li><li>▪ Northern Railway, Ghaziabad (UP)-201 001.</li><li>▪ South East Central Railway, BMY Complex, Bhilai, Durg-490 025.</li><li>▪ North Central Railway, Fazalganj, Kanpur – 208 003</li><li>▪ South Central Railway, Lallaguda, Secunderabad – 500 017.</li><li>▪ South Eastern Railway, Tatanagar-831 002.</li><li>▪ Southern Railway, Royapuram, Chennai-600 013.</li><li>▪ West Central Railway, Tughlakabad, New Delhi-110 044.</li><li>▪ Western Railway, Vadodara-390 002.</li></ul></li></ol>	For information and necessary action please.



(A.K. Goswami)

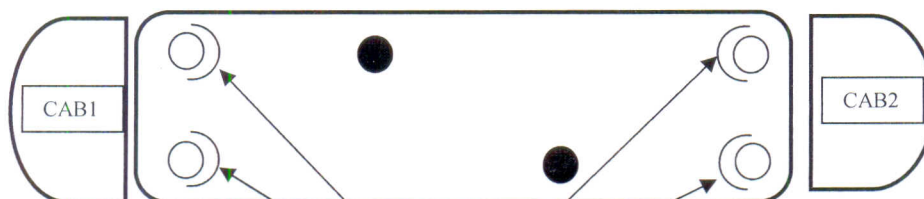
for Director General/Elect.

Encl: As above



Roof layout with four ventilators open and two closed

### EXITING ARRANGEMENT



Roof layout with four ventilators covered with MS plate of size 880 x 150 x 2.5 mm.

### MODIFIED ARRANGEMENT

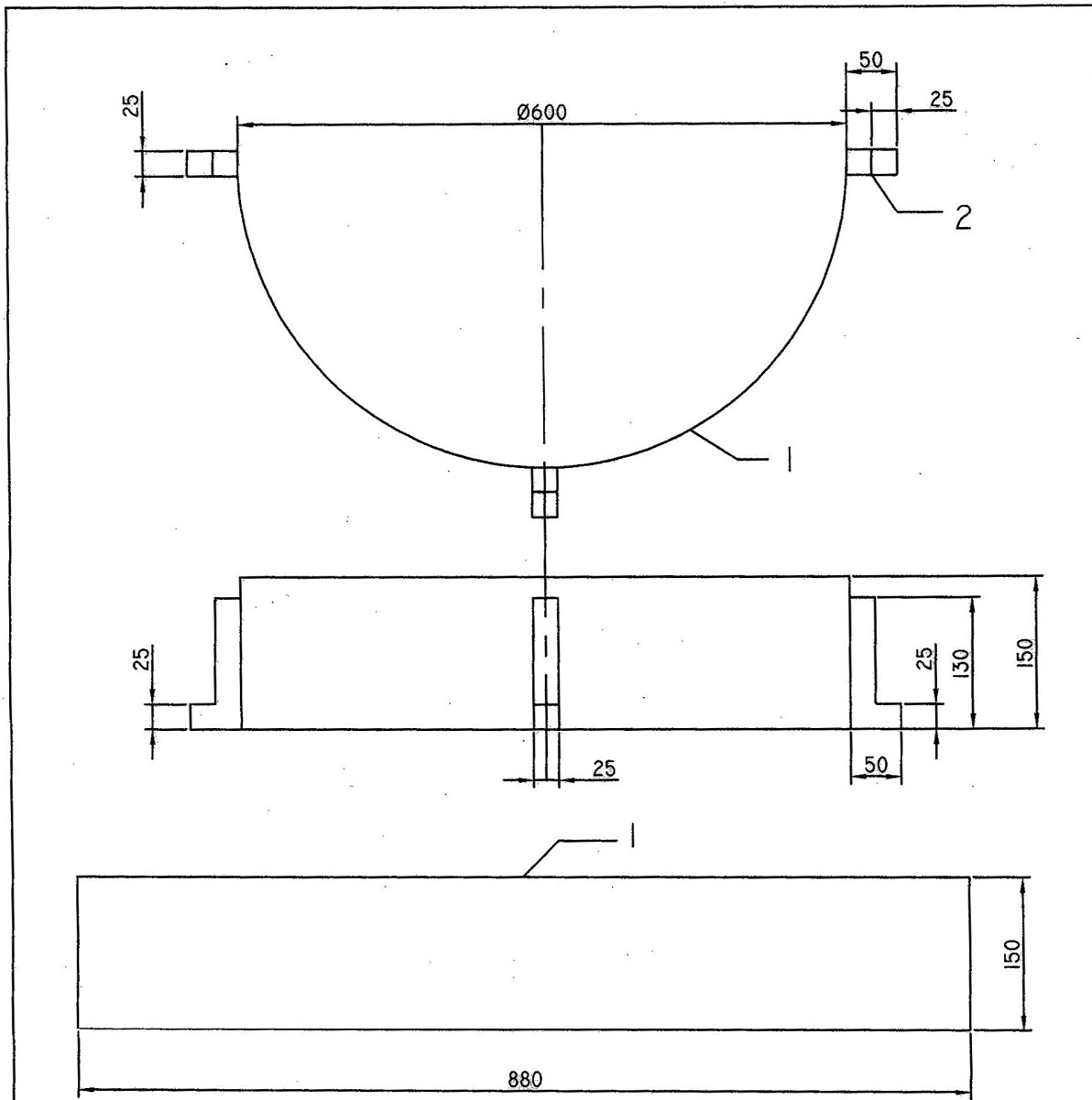




Additional M.S plate provided

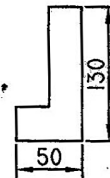


Additional M.S plate provided



NOTE - 1. MATERIAL:-M.S.PLATE SIZE 880X150X2.5MM.  
2. ALL DIMENSIONS ARE IN M.M.

DETAILS OF 2



3 NOS 'L' OF ANGLE 25X25X5



	DATE	NAME	SEMICIRCULAR SURROUNDING PLATE FOR HOOD VENTILATOR	ELS.AQ.
DRN	10.02.14	M.S. THAKUR		
CHD	10.02.14	A.Z. KHADE		
SSE / MPWL	11.02.14	GAJBHIYE		
SCALE :- 1:6			DRAWING NO:-NGP/TRS/4/25.188	ALT:0