

Telex : 0535 - 2424 RDSO -IN  
Fax : 91-0522-458500  
Telephone : 454657 & 451200  
Telegram : 'RAILMANAK', LKO  
e-mail : edse@tlwl.vsnl.net.in



Government of India - Ministry of Railways  
Research, Designs & Standards Organization,  
LUCKNOW - 226011

No. EL/3.2.61/Gen.

Dt. 08.05.06

Chief Electrical Engineers,

1. Chittaranjan Locomotive Works, Chittaranjan- 713331
2. Northern Railway, Baroda House, New Delhi-110 001
3. East Central Railway, Hazipur (Bihar)
4. Central Railway, Mumbai CST-400 001

**MODIFICATION SHEET NO. RDSO/2006/EL/MS/0345 (REV. '0'), MAY'06**

**1.0 TITLE:**

Standardisation of earthing switch arrangement on 3-phase locomotives to make interchangeable of various makes of VCBs between single and 3-phase locomotives.

**2.0 OBJECT:**

- 2.1 Presently two designs viz. Secheron and AREVA T&D make VCBs are in use on conventional and 3-phase electric locomotives of Indian Railways. In conventional locomotives, the moving blades of HOM are engaged with contact clips attached with the two insulators mounted on the roof and connected to pantograph and bushing line by flexible connections.
- 2.2 In 3-phase locomotives, the earthing switch is the integral part of Secheron design VCB and moving blades of HOM engaged with contact clips fitted on the horizontal insulator of VCB itself. With this arrangement of earthing switch, other than Secheron design VCBs can not be fitted on 3-phase locomotives.
- 2.3 For standardisation of the earthing switch arrangement on 3-phase locomotives similar to the one already in use on conventional locomotives, the existing HOM has to be shifted by 205 mm (Details available in drg. No.SKEL-4706) with increased mounting collar height by 70 mm from loco roof. With provision of additional 02 nos roof insulators with attached contact clips arrangement to receive moving blades of HOM, the interchangeability is achieved and VCBs of any make can be fitted on 3-phase locomotives to gain advantages of ease in maintenance, inventory control and cost competition.

**3.0 EXISTING ARRANGEMENT:**

Existing arrangement of 3-phase locomotives for Secheron design circuit breaker and earthing switch is shown in enclosed drg, no.SKEL-4704. In this arrangement the moving blades of earthing switch are engaged with contact clips directly attached with the horizontal insulator of VCB.

#### 4.0 MODIFIED ARRANGEMENT:

In the modified arrangement, following actions are required to be taken:

- i) Earthing switch cut out is shifted by 205mm as shown in the drg.No. SKEL - 4706.
- ii) Two additional roof insulators conforming CLW drg. No. CLW/ES/SK-2/AC/I-1,ALT.H are to be erected to receive earth switch contacts. Mounting arrangement of these two insulators shall be same as in conventional locomotives.
- iii) For mounting two additional insulators, surge arrester ( C ) is to be shifted to side by 100mm.
- iv) The height of square base plate for mounting earth switch is to be increased from existing 20 mm to 70 mm from loco roof.
- v) Existing exposed cut out to be sealed properly.
- vi) Two insulators mounted on the roof shall be connected to pantograph and bushing line by flexible connections.

#### 5.0 APPLICATION TO THE CLASS OF LOCOMOTIVES:

All 3-phased electric locomotives ( WAP5, WAG9, WAP7)

#### 6.0 MATERIAL REQUIRED:

- i) 02 nos roof line insulator as per CLW Drg. No CLW/ES/SK-2/AC/I-1,ALT.H
- ii) Mounting arrangement of these two insulators similar as of existing HOM in conventional locomotives.
- iii) Mounting SS plate of thickness 70mm & same width as of existing mounting arrangement.
- iv) Two flexible connections of appropriate length.

#### 7.0 MATERIAL RENDERED SURPLUS:

Nil

#### 8.0 REFERENCE :

Railway Board's letter No.2000/Elect.(TRS)/441/12 dated 27.03.2006.


#### 9.0 MODIFICATION DRAWING:

As per enclosed drawing No. SKEL - 4706.

#### 10.0 AGENCY OF IMPLEMENTATION:


CLW and ELS/GZB,Gomoh & Ajni.

DA: As above.

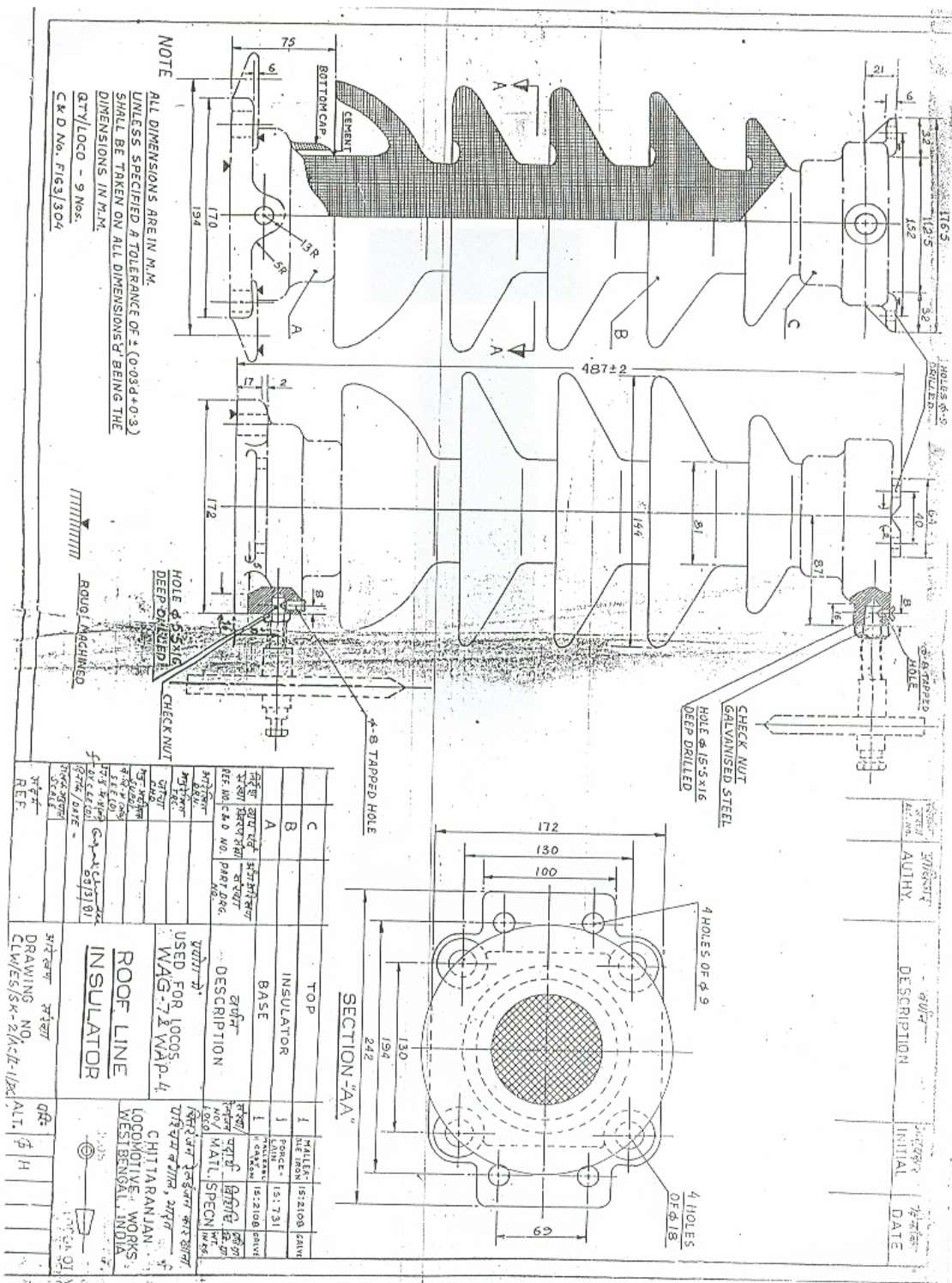
  
(Hari Narayan)  
for Director General (Elec.)

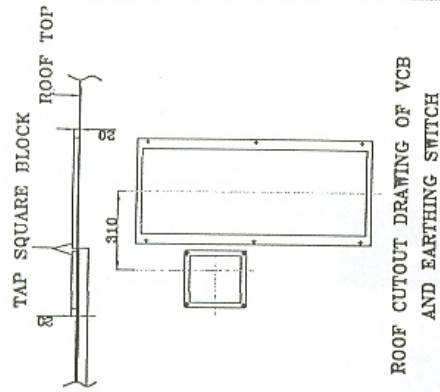
Copy to: The Advisor Elect. Engg. (RS), Railway Board, Rail Bhavan, New Delhi-110 001. This is in reference to Railway Board's letter No.2000/Elect.(TRS)/441/12 dated 27.03.2006.

DA: As above.

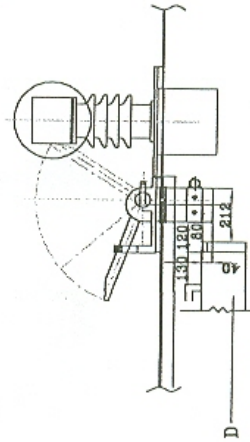
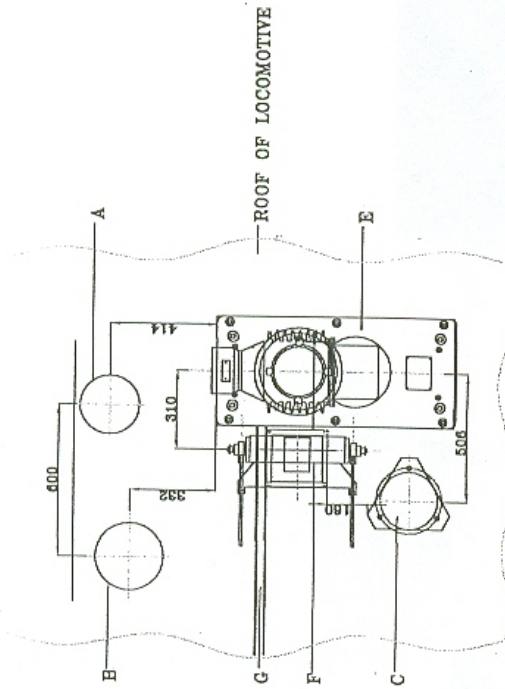
  
(Hari Narayan)  
for Director General (Elec.)







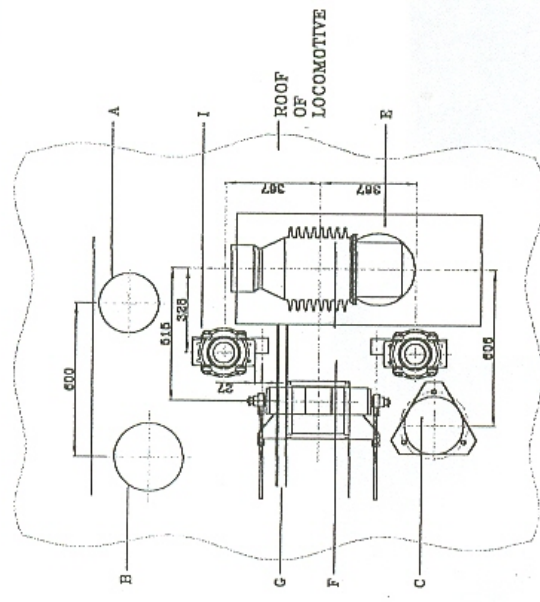
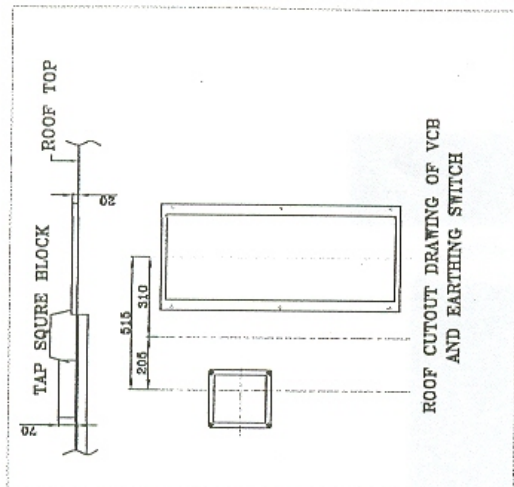
NOTE:  
 A : ROOF INSULATOR FOR EUSEAR  
 B : P.T.  
 C : SURGE ARRESTOR  
 D : OIL TANK FOR COOLING  
 E : CIRCUIT BREAKER (OF SECHERON DESIGN)  
 F : EARTH SWITCH  
 G : CHANNEL WELDED ON BOTTM SIDE OF ROOF  
 I : ROOF LINE INSULATOR



REF.	SCALENTS	APPD BY:-
EXISTING ARRANGEMENT OF 3 PH LOCOMOTIVE FIRST ISSUED		FOR DG
FOR VCB (OF SECHERON DESIGN)		SUPERSEDS
& EARTH SWITCH (OF SECHERON DESIGN)		SUPERSEDED BY
RDSO ELECT. DTE. SKEL-4704		

3.5.06  
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STATUS	ALT. NO.	REF. NO.	DESCRIPTION	APPD. BY DATE

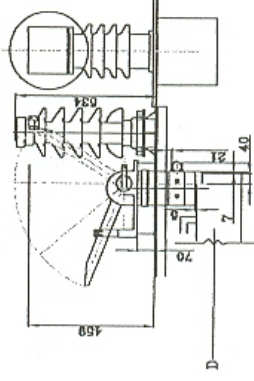


ACTIONS TO BE TAKEN :-

- 1 : EARTH SWITCH CUTOUT IS SHIFED TO SIDE BY 205 mm
- 2 : TWO INSULATORS (CLW/TS/SE-2/AC/1-1-ALT-H) B : P.T. ADDED TO RECEIVED EARTH SWITCH CONTACTS
- 3 : FOR SETTING UP INSULATORS SURGE ARRESTOR 'C' IS SHIFED BY 100 mm TO SIDE.
- 4 : HEIGHT OF SQUARE BASE PLATE FOR MOUNTING EARTH SWITCH TO BE INCREASED FROM 20 mm TO 70 mm FROM ROOF

NOTE:

- A : ROOF INSULATOR FOR HUSBAR
- B : P.T.
- C : SURGE ARRESTOR
- D : OIL TANK FOR COOLING
- E : CIRCUIT BREAKER (OF SECHERON DESIGN)
- F : EARTH SWITCH
- G : CHANNEL WELDED ON BOTTM SIDE OF ROOF
- I : ROOF LINE INSULATOR



REF.	SCALE:NTS	APPR. BY:-
		(Signature) FOR DG
NEW ARRANGEMENT OF 3 PH LOCOMOTIVE FOR FIRST ISSUED		
VCB (OF SECHERON/AREVA/BIECO DESIGN)		
& EARTH SWITCH OF SECHERON DESIGN		
SUPERSEDS		
RDSO ELECT. DTE. SKEL-4706		
SUPERSEDED BY		

2.5.06  
AJAI  
(Signature)

STATUS	ALT. NO.	REF. NO.	DESCRIPTION	APPR. BY/DATE