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सत्यमेव जयते

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

No. EL/3.2.70 Dated 25.9.2000

MODIFICATION SHEET No. ELRS/MS-0295-2000 (Rev-'0')

1. **TITLE** : Rewinding of stator winding of MVMT and MVRH of CGL/Siemens make with dual coated enamelled winding wires conforming to IS:13730 Part 13.

2. **OBJECT** :

2.1 At present MVMT and MVRH motors of Electric Locomotives are wound with Double Glass Enamelled copper conductor (DGCC). This DGCC conductor has been used on these machines since 1992-93 onwards. However, some of the Railways have complained about the non-availability of DGCC wires at their end and the rewinding staff are also not very conversant with the use of these glass covered conductors and therefore Railways are using enamelled winding wires only during rewinding of these machines.

2.2 During the performance review meeting on Auxiliary Motors at Electric Loco Shed, Kanpur, N.Rly. on 13/14-10.99, the minutes of which were issued vide RDSO's letter of even number dated 17.11.99, it was decided that Railways may continue to rewind these two machines, i.e., MVMT and MVRH using dual coated winding wires.

2.3 In view of the above, RDSO have now prepared Rewinding Data for MVMT and MVRH motors of CGL and Siemens makes, using dual coated winding wires to IS:13730 Part-13, which may be followed by Re-winding Shops/Electric Loco Sheds.

2.4 So far, only M/s CGL have started manufacture of MVMT and MVRH using dual coated winding wires. M/s Siemens and M/s ABB have not yet started manufacturing of these motors using dual coated winding wires, but they are expected to do so shortly. M/s BBL have also cut in the manufacture of these motors using dual coated winding wires. The winding data for M/s ABB and M/s BBLmake of motors using dual coated winding wires shall be issued in due course.

3 **WORKS TO BE CARRIED OUT** :

3.1 Remove the existing stator winding material and DGCC from the stator slot and clean it.

3.2 Follow the rewinding procedure as per SMI No. RDSO/ELRS/SMI/3 of Nov., 1978.

3.3 Adopt the following rewinding scheme for stator winding of MVMT's and MVRH :

Sr. No.	Rewinding Parameters	CROMPTON GREAVES		SIEMENS LTD.	
		MVMT	MVRH	MVMT	MVRH
	Type of motor			1RA2 164-2	1RA2 164-4
1.	Type of winding	Double layer concentric	Double layer concentric	Double layer concentric	Double layer concentric
2.	Method of connection	Star	Star	Star	Star
3.	No. of coils/No. of slots	48	48	48	48
4.	No. of turns/coil	8&9	10&11	8	9/10
5.	No. of turns/phase in series	64	84	68	76
6.	Cold pitch	1-22,2-21, 3-20,4-19	1-14, 2-13, 3-12, 4-11	16/24	10/12
7.	Conductor size bare/Area. ..... Insulated diameter/Area	1.25/6.14mm^2 1.35/7.17mm^2	1.12+1.18 (5.142 mm^2) 3.49+2.57 (6.06mm^2)	1.12/0.985 mm^2 1.217/1.163 mm^2	1.06/0.885 mm^2 1.155/1.048 mm^2
8.	No. of conductor/Slot	17/85	21/105	2x8	9+10
9.	No. of wires in parallel	5x1.35	3 of 3.49 + 2 of 2.57 (6.06 mm2)	6x1.217	6x1.155
10.	Slot area	229 mm2	237mm2	226mm2	245mm2
11.	Copper weight	24 Kg	17 Kg	23 Kg	19 Kg
12.	Resistance/phase at 20°C.	0.100 Ohm	0.110 Ohm	0.097 Ohm	0.1053 Ohm.

3.4 Following Class H material shall be used during rewinding :

(i) Winding wires : Dual coated as per IS: 13730 - Part 13.
(ii) Slot Liner : Nomex-Kapton-Nomex (NKN)
(iii) Slot Separator : NKN
(iv) Slot Closure: NKN
(v) Slot Wedge : Glass reinforced epoxy laminate
(vi) Phase insulation : NKN
(vii) Connecting Lead Wire: 10mm^2 to BS 6195 type 8`b' Category `D'.
(viii) Sleeves : Silicon Elastomer to BS:2848 to grade 1/180 Tb.
(ix) Impregnating varnish : Dobeckon- FT 2005/500EK or Elmotherm H71A of M/s Schenectady Beck India Ltd.
(x) Anti-tracking varnish on overhang etc.: Becktol Red of M/s Schenectady Beck India Ltd.

Follow RDSO SMI No.ELRS/SMI/185-2000 (Rev.-1) for Insulating materials in detail.

4 **REFERENCE** :

(i) SMI/3
(ii) ELRS/SMI/185-2000 (Rev.-1)
(iii) Rewinding Scheme of motor manufacturers –

a) Siemens – MTR 2.6.034 dated 14.3.00
b) Crompton Greaves Ltd., Ahmednagar – Appendix- D2 dated 24.1.2000.

5 **APPLICATION** :

MVMT's and MVRH wound with DGCC fitted on 25 KV – BG class of Electric Locomotives.

6. **PERIODICITY** : During rewinding.

7. AGENCY : Sheds/Shops and authorised rewinders of Railways and motor manufacturers.

8. **DRAWING :** Nil

9. **DISTRIBUTION** : As per enclosed list.

Rajiv Kumar

(R K Kulshrestha)
for Director General (Elec.)