फैक्स/Fax : 91-0522-458500
तार : '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 Design & Standards Organisation
Lucknow - 226011

No.EL/3.2.92 Dated 21.9.2000

MODIFICATION SHEET NO. ELRS/MS/0294-2000 (Rev.-0)

1. **TITLE** :

Rewinding scheme for the existing 14HP Compressor driving motor (MCP) of M/s ABB, CGL and BBL makes suitable for high starting torque..

2. **APPLICATION** :

Compressor driving motors of 14 HP MCP of M/s ABB. CGL and BBLmakes for 25 KV –BG-AC Electric Locomotives.

3. **OBJECT** :

3.1 Railways have reported number of failures of compressor driving motors of 14 HP/10.5 KW of M/s CGL and M/s ABB makes since motors are not able to start the compressor against the presence of back pressure in the delivery pipeline.

3.2 In order to start the motor against back pressure, starting torque of the motor has been increased to 17 Kgm at 290Volts with the revised winding scheme to be followed for ABB and CGL makes of motors. All 'BBL' makes motors are suitable for high starting torque.

3.3 However, for Siemens make MCPs, revised rewinding scheme has already been issued vide Modification Sheet No. MS No. RDSO/WAM4/177 Revision 1 issued vide RDSO letter of even number dated 3.5.2000.

4. REFERENCE:

Rewinding data submitted by motor manufacturers.

5. **DETAILS OF SPECIAL INSTRUCTIONS** ;

Following instructions shall be followed while rewinding the 14 HP/10.5 Kw MCP to obtain high starting torque.

5.1 **For ABB Motors** :

5.1.1 Motors having machine No. 821427 onwards of type TQU180L6 ci are having

winding scheme suitable for high starting torque. Winding scheme is placed at para '6' below which may be followed during rewinding of these motors.

5.1.2 The same winding scheme as mentioned under 5.1.1 above will also be adopted for motors having machine number less than 821427 of motor type TQU 180L 6 ci which were originally provided with winding scheme suitable for lower starting torque.

5.1.3 However, to have more starting torque, i.e. 17 Kgm. the rotor shall also be changed for the motor having machine numbers less than 821427 as mentioned under Para 5.1.2 above. Rotor may be procured from M/s ABB/Faridabad mentioning high torque rotor for 14 HP compressor motor. Even if the modified rotors are not available, modified stator as above may be adopted to give better starting torque.

5.2 **For CGL Motors** :

5.2.1 Complete winding scheme furnished by M/s CGL is placed at para 6 to convert the existing 14 HP MCP to high starting torque motor.

5.2.2 There is no need to change rotors in the case of M/s CGL motors.

5.3 **For BBL Motors** :

5.3.1 Rewinding scheme is placed under para 6 to be followed for 14 HP motor of M/s BBL make.

5.3.2 All the motors of M/s BBL make of 14 HP are of high starting torque. Therefore, there is no need to change rotors.

6. **REWINDING DATA FOR ABB, CGL AND BBL MOTORS** :

Parameters	Make/Type		
	M/s ABB/TQU180L6CI	M/s BBL	M/s CGL/ND 180L
(1) Type of winding	Double layer concentric	Single layer concentric	Double layer concentric
(2) Winding connection.	Star	Star	Star
(3) No. of coils used	54	27	54
(4) No. of slots	54	54	54
(5) No. of turns/ Coil	16,17,16 3 coils per group	10,11,10	11

(6) No. of parallel path.	2	1	2
(7) No. of coil Group phase	3	3	18 of 3 coils per group.
(8) Wire size dual coated enamelled wire conforming to IS:13730-Part 13	2x1.217	4x17SWG	See winding details as per Annex. I
(9) Coil pitch	1-6 (Inner pitch)	1-10, 2-9 11-18	1-10, 2-9, 3-8
(10) Resistance/phase at 20 deg. C	0.25 Ohm	0.22 Ohm	See winding details as per Annex. I
(11) Gross copper Weight.	14.5 Kg	12.5 Kg	16 Kg/17.5 Kg.
(12) Core pack length	275 mm	-	240 mm/255 mm
(13) No load current	12.6 A	14.0 Amp	10 to 13 A
(14) Working voltage	290-500	290-500	290-500
(15) Starting torque	17.1 Kgm	17.0 Kgm	17.0 Kg.m

Note – All the insulating materials shall be used as per RDSO Special Maintenance Instruction No. ELRS/SMI/185-2000 (Rev.-1)

7. **APPLICATION** :

14 HP/ 10.5 Kw MCPs fitted on Electric Locomotives.

7. **AGENCY FOR IMPLEMENTATION :**

Sheds/Shops of Electric Locomotives.

8. **PERIODICITY OF IMPLEMENTATION** : During any rewinding.

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

Rajiv Kumar

(R K Kulshrestha)
for Director General (Elec)

Encl: One (Winding data of CGL-MCP)

ANNEXURE-I

Winding details for 14 hp 6 pole motor MCP for 1000 LPM Compressor of Crompton Greaves make.

Sr. No.	Winding details/ parameter	Design – 1	Design – 2	Design -3
		Data of motors supplied before Feb.'98	Data of motors supplied from Feb.'98 up to June, 99	New approved data for high torque motor, effective from July, 99.
1.	Rewinding to be done as per	Design – 3	Design – 3	Design -3
2.	Type of winding	Double layer concentric.		
3.	Winding connection	Star connected		
4.	Number of slot in stator	54		
5.	Number of coils used	54 (Fifty four)		
6.	Number of turns per coil	6 (six)		
7.	Number of parallel paths	1 (One)		
8.	Number of coil groups	18 (Eighteen) of 3 coils per group.		
9.	Wire size (Dual coated as per IS:13730-13)	5/1.25(Original) To follow design-3	5/1.25 (Original) To follow design-3	4/0.90 + 1/0.95
10.	Coil pitch	1-10, 2-9, 3-8		
11.	Class of insulation	Class H (NKN)		
12.	Slot wedge	Epoxy slot wedge		
13.	Type of impregnation	Vacuum pressure impregnation (Class H resin)		
14.	Resistance per phase @ 20°C	0.265Ohm (original) 0.230 Ohms (As per design-3 data)	0.255 Ohm(Original) 0.215 Ohm (As per design-3 data)	0.215 (0.230 for design 1 – rewound motors)
15.	Gross copper weight	17.5 Kg	16 Kg (17.5 Kg for rewound design – 1 motor)	
16.	Core pack length	255 mm	240 mm (255 mm for rewound design – 1 motor)	
17.	No load current at 415V balanced	9.5/11A	9/10.5 A	11.5/13A 10/12.5 for Design-1