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सत्यमेव जयते

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

(7)

No.MC/EMU/SPD/BG

Dated :30.10.2002

General Manager (Engg.)
Western Railway,
Churchgate,
Mumbai – 400 020.

Sub: Final maximum permissible speed certificate for BG ac/dc EMU stock fitted with Alstom electrics and air suspension, up to a maximum speed of 100kmph.

1.0 The traction power system of Mumbai suburban area is being converted from 1500V DC to 25KV AC system for meeting the growing and urgent demands of suburban passengers. This inter-alia requires EMUs capable of having both AC and DC systems during the transition phase of conversion. Western Railway entered into contract with M/s Alstom for design, supply, installation, testing and commissioning of 3-phase propulsion equipment for retrofitment on existing DC EMUs. Hence, the existing DC electrics in the motor coach have been replaced with ac/dc 3-phase electrics. As a result, there has been an increase in the tare weight of the existing motor coach from 50.95t to 53.6t. To cater for the extra tare weight of the motor coach, and also super dense crush loading situations of Mumbai area, the suspension arrangement of motor and trailer coaches has been modified to steel spring in primary and air suspension in secondary stage. The coaches are fitted with Schaku coupler and Electro-pneumatic air brake system with regenerative brake blending features. Motor coach, Trailer coach 'C' type, Trailer coach 'D' type and Driving trailer coaches are respectively to layout drawing nos.DC/EMU/M2-9-0-501, DC/EMU-2/C-9-0-503, DC/EMU2/D-9-0-506 & DC/EMU-2/D-9-0-501.

1.1 With a view to assess the speed potential of motor coach and trailer coach fitted with Alstom electrics, detailed oscillation trials were conducted up to a maximum test speed of 110km/h on Churchgate-Virar-Dahanu Road suburban section of Western Railway, Mumbai Division. The results as contained in RDSO Report No.MT-325 of December 2001 indicated satisfactory riding upto the maximum speed of 110kmph.

2.0 Based on the above, it is certified that operation of BG ac/dc EMU retrofitted with Alstom electrics in 3,4 or 5 unit configuration, each unit

consisting of three coaches viz. one motor coach and two trailer coaches or one motor coach with one trailer coach and one driving trailer coach to ICF layout drg. nos.DC/EMU/M2-9-0-501, DC/EMU-2/C-9-0-503, DC/EMU-2/D-9-0-506 & DC/EMU-2/D-9-0-501 respectively, may be permitted to operate up to a maximum speed of 100 km/h on Churchgate-Virar-Dahanu Road section of Mumbai Division, Western Railway, subject to the following conditions.

2.1 TRACK

2.1.1 The track shall be to a minimum standard of 52 kg.(90 UTS) rails on sleeper to M+7 density and depth of ballast cushion of 250mm which may consist of at least 100mm clean and the rest in caked-up condition on compacted and stable formation.

2.1.2 For track of lower standard that that mentioned above, the Chief Engineer concerned shall decide the lower maximum permissible speed. In this connection, Railway Board's letter No.65/WDO/SR/26 dated 19/20-10-1996 may be seen. When the Chief Engineer considers that the road bed is not compacted or there is improper drainage, he may suitably restrict the maximum permissible speed depending on the local conditions.

2.1.3 The maximum permissible speed on curves shall be decided on the basis of the existing provisions of the Indian Railways Permanent Way Manual, 1986.

2.2 BRIDGES

2.2.1 The clearance in regard to bridges refers to standard design of girders, slabs, pipe, culverts, pier and abutments etc. issued by RDSO for BGML, RBG and MBG- 1987 standard loadings.

2.2.2 All other designs of superstructures and sub-structures are to be examined under the direction of the Chief Engineer concerned and certified safe by him in terms of current IRS Bridge Rules, Steel Bridge Code, Concrete Bridge Code, Arch Bridge Code, Bridge Sub-Structure and Foundation Code etc. read with up-to-date correction slips.

2.2 3 This clearance is subject to the following parameters.

(i)	Maximum axle load (MC)	:	20.32t
(ii)	Maximum axle load (TC/DTC)	:	17.36t / 17t
(iii)	Maximum tractive effort (MC)	:	14t
(iv)	Maximum braking force (MC)	:	5.116t

(v) Maximum braking force (TC/DTC) : 3.82t
(vi) CG height above rail level (MC/TC/DTC): not exceeding 1830mm
(vii) Maximum braking force of 3-car unit : 12.756t

2.3 SIGNALLING

2.3.1 Provision of GR, SR, SEM and all extant instructions issued from time to time shall be complied with.

2.3.2 In the event of failure, when only one motor coach remains in operation, the rake shall be put out of service not later than completing its scheduled run. The restriction of single motor coach operation shall not be applicable to the operation of EMUs/Units under tare/empty conditions.

2.4 TRACTION INSTALLATION

2.4.1 For AC OHE

.1 The OHE shall have swiveling type of cantilever having the tension in the conductors regulated automatically with pre-sag of 50/100mm. The presag is on contact wire for a span of 72 meter, proportionately less for smaller spans.

.2 The Chief Electrical Engineer may impose any temporary speed restrictions on the basis of his personal knowledge and experience of the OHE and the conditions prevailing on the particular section.

2.4.2 At locations where porcelain section insulators are installed on main line and lie within $1/10^{th}$ and $1/3^{rd}$ of the span immediately after the OHE structure and runners in the trailing direction the maximum speed shall be 100kmph. At all other locations where porcelain section insulators are installed, the speed shall be limited to 80kmph.

2.4.3 For the DC OHE, the conditions for operation shall be specified by the CEE/Western Railway.

2.5 GENERAL

2.5.1 All the permanent and temporary speed restrictions in force and those that may be imposed from time to time due to track, bridges, curves, signaling and interlocking etc. shall be observed.

2.5.2 Any special restriction imposed by CEE due to the conditions of overhead equipment or any other reasons shall be observed.

2.5.3 3660mm(12'0") wide ac/dc EMU stock fitted with Alstom Electrics (retrofitment) infringes Clauses 10, 14(b), 26(b), 27(b), 28(b), 31 & 32(b) of Chapter IV(A) of BG Schedule of Dimensions, 1929 (Reprint 1973). Railway Board vide their letter No.99/CEDO/SR/15 dated 08-10-99 have condoned the infringements.

(P.Srivastava)
Executive Director Standards (Motive Power)

Encl: (1) Drg. nos.DC/EMU/M2-9-0-501, DC/EMU-2/C-9-0-503 and DC/EMU2/D-9-0-506 & DC/EMU-2/D-9-0-501.
(2) Railway Board's letter No.99/CEDO/SR/15 dt.8.10.99.

Copy to:

1. General Manager (Mech./Elec./Optg.), Western Railway, Churchgate, Mumbai – 400 020.
2. Secretary (Mech./Elec.), Railway Board, Rail Bhawan, New Delhi – 110 001.
3. CWM, Mahalaxmi Workshop, Western Railway, Mumbai.

c/c

Encl: nil

(P.Srivastava)
Executive Director Standards (Motive Power)