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भारत सरकार - रेल मंत्रालय
अनुसंधान, अभिकल्प और मानक संगठन
लखनऊ - 226 011
Government of India - Ministry of Railways
Research Design & Standards Organization
Lucknow - 226 011

No. MC/EMU/Mainline

Dated 31.07.2008

The General Manager (Engg.)

1. Eastern Railway, Fairlie Place, Kolkata - 700 001.
2. Northern Railway, Baroda House, New Delhi - 110 001.
3. Central Railway, Mumbai CST - 400 001.
4. Western Railway, Churchgate, Mumbai - 400 020.
5. Southern Railway, Park Town, Chennai - 600 003.
6. East Central Railway, Hazipur, Dighi Distt., Vaishali Bihar- 844 101.
7. East Coast Railway, B-2, Rail Vihar, Chandrashekherpur, Bhubaneswar, Orissa- 751 023.
8. North Central Railway, Headquarter, Block -A, Subedarganj, Allahabad- 211 033.
9. North Eastern Railway, Gorakhpur - 273 001.
10. North Western Railway, Jaipur - 302 006.
11. Northeast Frontier Railway, Maligaon, Guwahati - 781 011.
12. West Central Railway, Jabalpur - 482 001.
13. South Eastern Railway, Garden Reach, Kolkata - 700 043.
14. South Central Railway, 7th Floor, Rail Nilayam, Secunderabad - 500 071.
15. South Western Railway, 4th Floor, Shri Laxmi Narayana Complex, Station Road, Hubli 580 020
16. South East Central Railway, Bilaspur - 495 004
17. Konkan Railway, Raigad Bhavan, 8th Floor, Sector-11, P. O. Box No.45, C.B.D. Belapur, Navi Mumbai 400 614

Sub: Speed certificate for operation of BG 3250 mm (10' 8") wide, 20-car MEMU rake fitted with all coil ICF bogies upto a maximum speed of 100 kmph.

1. The BG 3250 mm (10' 8") wide AC EMU stock designed by RDSO as per directive of Railway Board has been manufactured by ICF. This EMU stock is intended to replace the slow moving loco hauled passenger trains on saturated sections of main line routes so as to improve the overall line capacity. These coaches are very similar to the existing 12 feet wide AC EMU Coaches. The unit consists of one driving motor coach as per ICF drawing No. MEMU/DMC-9-0-001 and 3 trailer coaches as per as per ICF drawing No. MEMU/TC-9-0-001. The motor and trailer coaches are fitted with all coil bogies similar to the bogies fitted on existing 12" wide EMU stock. However, the suspensions have been designed to cater for dense crush loading thus providing a maximum passenger capacity of 324 and 243 for trailer and motor coaches respectively. The maximum axle load of motor and trailer coaches are 18.4 t and 13.6 t respectively. The coaches are

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provided with Schaku couplers and Electro Pneumatic brake system as in the case of existing 12" wide EMU stock. The coaches have been provided with footsteps for boarding by passengers and also vestibule arrangement to enable inter-coach movement.

1.1 In order to assess the speed potential of this stock detailed oscillation trials have been conducted on Khana-Waria section of Northern Railway up to a maximum test speed of 110 kmph and the results are contained in RDSO's Report No. MT-6 and speed certificate issued vide letter No.MC/EMU/Mainline dated 24-06-94.

1.2 Further, in order to run 20-car MEMU rake, Emergency Braking Distance (EBD) and Coupler force trials have been conducted on Sabzimandi – Ambala section of Northern Railway and result are contained in RDSO's Report No. RDSO/2008/TG/MT-877/F dated 23-06-08 and RDSO/2008/TG/MT-876/F dated 23-06-08 respectively.

2. Based on the results of these trials, it is certified that BG 3250 mm (10" 8") wide, 20-car rake MEMU stock fitted with ICF all coil bogie may be permitted to run at a maximum speed of 100 kmph on track maintained to other than C&M-I Vol-I standard routes subject to the following conditions.

2.1 Track

2.1.1 The track shall be to a maximum standard of 90 R rails on sleepers to M+4 density and depth of ballast cushion below sleepers of 200 mm which may consist of atleast 75 mm clean and the rest in caked up condition, on compacted and stable formation.

2.1.2 For track maintained to lower standard than that mentioned above, the Chief Engineer shall decide the lower maximum permissible speed on the basis of maintenance condition. In this connection, Railway Board's letter No. 65/WDO/SR/26 dtd. 19/20.10.1966 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 upon the local conditions.

2.1.3 The maximum permissible speed on curve shall be decided on the basis of existing provisions of the Indian Railway Permanent Way Manual second reprint 2004.

2.2 Bridges

2.2.1 The clearance refers to bridges with standard design of girders, slabs, pipe culverts, piers and abutments etc. issued by RDSO for BGML, RBG and MBG-1987 standard loadings. However, the bearings of span 78.8m (effective) designed for BGML standard loading as per RDSO's drawing no.BA-11154 should be strengthened by providing two additional anchor bolts.

MEMU Mainline: Letters 2008 Carriage Directorate, RDSO/Lucknow.

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- 2.2.2** Superstructures and bearings of non-standard spans including Arches and sub-structures of all bridges are to be examined under the directions of the Chief Bridge Engineer concern and certified safe by him in terms of current IRS Bridge Rules, Steel Bridge Code, Concrete Bridge Code, Arch Bridge Code, Bridge Sub-structures and foundations Code etc. read with upto-date correction slips.
- 2.2.3 Zonal Railways to certify adequacy of existing bridges for permitting rolling stock based on physical condition of bridges by keeping them under observations considered necessary by the Chief Bridge Engineer of Railway.
- 2.2.4 Location of bridges of which speed restrictions are imposed shall be notified by the Railways and incorporated in the working timetable.
- 2.2.5 Specific restrictions are applicable as mentioned in relevant speed certificates of hauling single/multiple locomotives/attached wagons issued by RDSO.
- 2.2.6 The clearance is subject to the following parameters of MEMU:-
- | | | |
|------|-------------------------------------|--------------------|
| i) | Maximum axle load (MC) | =18.4t |
| ii) | Maximum axle load (TC) | =13.6t |
| iii) | Maximum Tractive force (MC) | =9.6t |
| iv) | Maximum braking force (TC) | =3.82t |
| v) | Maximum braking force (MC) | =5.116t |
| vi) | Maximum C.G. height from rail level | = less than 1830mm |

2.3 Traction Installation

2.3.1 For 25 kV ac OHE

2.3.1.1 The OHE shall have swivelling type of cantilever having the tension in the conductors regulated automatically with a presag of 50/100mm. The presag is on contact wire on span of 72m, proportionately less for smaller spans.

2.3.1.2 In case of locations where porcelain section insulators are installed on track maintained to other than C&M-I Vol-I standard and lie within first 1/10th and 1/3rd of the span immediately after the OHE structure and the runners are in trailing direction, the maximum speed shall be 120kmph. At all other locations where porcelain section insulators are installed, the speed shall be limited to 80kmph.

2.3.1.3 In 25kV ac traction area, the CEE of the concerned Railway shall have to ensure that the minimum height of contact wire and electrical clearances as stipulated in provision of Chapter -V and V-A, Electric Traction "Schedule of Dimension of 1676 gauge (BG) revised 2004" is not violated and strictly followed to ensure its safe running.

2.3.1.4 In addition to above, the Chief Electrical Engineer may impose any temporary speed restriction on the basis of his personal knowledge and experience of the OHE and the conditions prevailing on the particular section.

2.4 Signalling

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

2.4.2 On the sections where EBD of more than 1Km is to be catered for, second distant signal or automatic signalling should be available failing which suitable speed restriction is to be imposed.

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, signalling and interlocking etc. shall be observed.

2.5.2 The trailer coaches have been constructed within EDO 590 profile which is approved for standard BG coaching stock.

However, the profile of motor coach as shown in RDSO sketch-94014 with the pantographs in locked down conditions though generally within EDO-590, infringes the following clauses of the schedule of dimensions - 1973 reprint.

- i) Clause 31 of Chapter - IV (A) in respect of central height and width of projection (900 + 5mm)
 - ii) Clause 19 (b) of Chapter - IV (A) in respect of length of coach
- These infringements have been condoned by Railway Board vide their letter No. 94/CEDO/SR/10 dtd. 24.05.1994.

DA: (i) Drawing No. MEMU/DMC-9-0-001
(ii) MEMU/TC-9-0-001 & SK 94014



(S. Mani)

Executive Director Standards (Motive Power)

Copy to:-

1. Secretary (Mech./Traction/Elect.), Railway Board, New Delhi.
2. General Manager(Elec./Optg./S&T)
All Zonal Railways.



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Executive Director Standards (Motive Power)