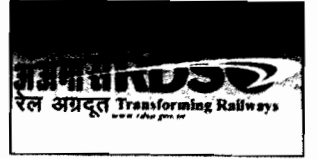




भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ - 226 011
EPBX (0522) 2451200
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Government of India-Ministry of Railways
Research Designs & Standards Organisation
Lucknow - 226 011
DID (0522) 2450115
DID (0522) 2465310

S.No 2281



No. MC/LHB/Coach

Date- 27-10-2011

महाप्रबन्धक (इंजीनियरिंग),
उत्तर रेलवे, बडौदा हाउस,
नई दिल्ली.110001

Sub: Final speed Certificate for operation of Shatabdi Express and other similar trains comprising maximum 18 numbers of LHB AC EOG coaches on NDLS-LDH section of Northern Railway at a maximum speed of 130 kmph on track maintained to C&M-I, Vol.-I standard.

1. Shatabdi Express and other similar train services between New Delhi - Ambala section and Ambala-Ludhiana section of Northern Railway at 110 kmph are already in operation. Northern Railway vide their letter no. 519-W/916 Pt. I/UMB-LDH dated 19.5.2011 has proposed to increase the speed potential of Shatabdi Express and other similar trains on this section up to 130 kmph.
 - 1.1. RCF has built LHB AC EOG broad gauge coaches fitted with FIAT bogies under Transfer of Technology from M/s. ALSTOM-LHB. The AC coaches, generally to RDSO's drawing no. Sk. 96077 have a speed potential for operation at a maximum speed of 160 km/h, on track maintained to standards contained in RDSO's Report No. C&M-I Vol.-I standard. These coaches have been built to the-state-of-art technology, fitted with disc brakes and centre buffer couplers and have a unique feature of wheel slide protection device (WSP), to prevent formation of wheel flats.
 - 1.2. Detailed oscillation trials of LHB AC EOG Chair car have been conducted up to maximum speed of 180 km/h and results are contained in RDSO's Report no. MT-240. On the basis of satisfactory results of oscillation trials, this chair car has been cleared for operation up to maximum speed of 160 km/h on track maintained to C&M-I, Vol.-I standard vide this office letter of even no. dated 19.03.2003. The detailed oscillation trials of LHB AC Generator Van have also been conducted up to maximum speed of 180 km/h and results are contained in RDSO's Report no. MT-274 and MT-282. On the basis of satisfactory results of oscillation trials, the LHB AC Generator Van has also been cleared for operation up to maximum speed of 160 km/h on track maintained to C&M-I, Vol.-I standard vide this office letter of even no. dated 20.03.2003.
 - 1.3. Coupler force and EBD trials of 18 numbers of LHB AC EOG coaches with single WAP5 Locomotive have been conducted on NDLS-CNB-NDLS section of Northern Railway and North Central Railway. The test results of these trials in RDSO Report no. MT-283 (March 2001) are found satisfactory.
 - 1.4. The Confirmatory Oscillograph Car Runs of LHB AC EOG coaches have been conducted on NDLS-LDH-NDLS section of Northern Railway in both up and down. The test results as contained in RDSO's Report no. RDSO/2010/TG/MT-1026/F Rev.0 Amendment-Nil, dated 07.04.2010, exhibit satisfactory riding and stability behavior upto maximum speed of 130 kmph.

- 1.5. WDP3A (previously WDP2) class of locomotive has undergone detailed oscillation trials up to a maximum test speed of 160 kmph on Palwal-Mathura section of North Central Railway and results are contained in RDSO report no. MT-208 (Dec,1999). Based on the satisfactory results of trials, WDP2/WDP3A class of locomotive has been cleared for regular operation upto a maximum speed of 140 kmph on track maintained to standards laid down in RDSO report no. C&M-I, Vol.-I vide RDSO's letter no. SD.WDP2.11 dated 26.07.2000.
- 1.6. WDP4 (4000hp) class of locomotive originally imported from M/s General Motors, USA, and being now manufactured by DLW Varansi. The locomotives are fitted with two nos. three axle bogies each having A-A-1 axle arrangement. General arrangement of locomotive is as per GM's drawing no. L.020792 "WDP4 locomotive the maximum axle load of the locomotive is 19.3. The locomotive has been designed for a speed of 180 kmph and intended for hauling passenger train at a speed upto 160 kmph on Rajdhani standard track and upto 105 kmph on main line standard track. Locomotive has been cleared for operation at 160 kmph and 105 kmph vide this office letter no. SD.WDP4.11 dated 29.12.2008 and 30.10.2002 on track maintained to C&M-I, Vol. -I and other than C&M-I, Vol. -I standards respectively
- 1.7. The WAP4 locomotive, previously as WAP1 (5,000 hp) locomotive as shown in RDSO's sketch no. SK.DL-3031A Alt.1 has undergone detailed oscillation trials at a maximum speed of 160 kmph and the results are contained in RDSO report no. M-529 (Feb. 1994). Based on the results, WAP4 class of locomotive has been cleared up to a max. speed of 140 kmph for operation on track maintained to C&M-I, Vol.I standard vide this office letter no. SD.WAP1.11 dt. 27.9.1994.

This class of locomotive has been classified as WAP4 and accordingly, the Zonal Railways have been advised vide this office letter no. SD.WAP1.11 dated 18.4.1996.

- 1.8 WAP5 class of locomotive with Bo-Bo bogies is imported from M/s ABB, Switzerland. Outline of locomotive is as per drawing No. Sk.EL.4353. The axle load of locomotive is 19 + 2% t. Detailed oscillation trials of WAP5 have been done at a maximum test speed of 180 kmph and results are contained in RDSO's Report No.-MT-88 (June-88), are satisfactory. Based on results of trials of WAP5 class of locomotive has been cleared for the operation at a maximum speed of 160 kmph on track maintained to standards laid down in Report No. C&M-1 Volume-1' vide RDSO's letter No. SD.WAP5.11, dated 19.6.97. The Confirmatory Oscillograph Car run at a maximum speed of 130 kmph of WAP5 class of locomotive has been done and the results are contained in RDSO's Report No.-MT-59 (Oct.-96) and MT-66(Dec.-96), are satisfactory. On the basis of detailed oscillation trials and Confirmatory Oscillograph Car run conducted, WAP5 class of locomotive has been cleared for operation of trains on NDLS-HWH section upto a maximum speed of 130kmph on track maintained to standards laid down in Report No. C&M-1 (Volume-1), vide RDSO's letter No. SD.POL.12.2 dated 31.12.1996.
- 1.9 WAP7 class of locomotives manufactured by Chitranjan Locomotive Works have undergone detailed oscillation trials at maximum speed of 145 kmph and the results are contained in RDSO report no. MT-290 (March, 2001). Based on the results, WAP7 class of locomotives have been cleared for operation up to a maximum speed of 130 kmph on track maintained to C&M-I Vol. I standard vide RDSO's letter no. EL/3.1.35/4 dated 1.05.2001.
2. Based on the above, it is certified that Shatabdi Express and other similar trains hauled by single WDP3A/ WDP4/ WPA5/WAP4/WAP7 class of locomotive having maximum

18 Nos. of LHB AC EOG chair car coaches including two AC Generator Van may be permitted to operate up to the maximum speed of 130 kmph between New Delhi-Ludhiana section of Northern Railway on track maintained to C&M-I, Vol.-I standard, subject to the following conditions.

2.1. Track

- 2.1.1. The track shall be to a minimum standard of 52 kg rails on sleepers to M+7 density and minimum depth of ballast cushion below the sleepers to 250 mm which may consist of at least 100 mm clean and the rest in caked up condition on compacted and stable formation.
- 2.1.2. The track maintenance shall be in accordance with the recommendations contained in RDSO Report No. C&M-I Vol.-I. In this connection, the instructions for the maintenance of track on high-speed routes circulated to the Railways under RDSO's DO letter no. CRA/509 dated 07.7.1971 and approved by Railway Board vide their letters no. 71/W6/HS/8 dated 27.8.1971 and 71/W6/HS/1 dated 21.10.1971 should also be followed.
- 2.1.3. 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 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 permission speed depending upon the local conditions.
- 2.1.4. The maximum permissible speed on curves to be decided on the basis of the existing provisions of the Indian Railways 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 78.8 m (effective) designed for BGML standard loading as per RDSO's drawing no. BA-11154 should be strengthened by providing two additional anchor bolts.
- 2.2.2. Superstructures and bearings of non-standard spans including Arches and sub-structures of all bridges shall 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 shall certify the adequacy of existing bridges for permitted rolling 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 on which speed restrictions have been imposed shall be notified by the Railways and incorporated in the working timetable.
- 2.2.5. This clearance is subject to the following parameters of locomotives and LHB AC EOG coaches:

(A) For Locomotives:

S. No.	Description	WAP4	WAP7	WDP3A	WDP4	WAP ₅
1.	Max. axle load	18.8+2%t	20.5+2%t	19.5t	19.5t	19.5 ± 2% t
2.	Max. tractive effort	30.8t	32.9t	29.1t	27.52t	26.3 t
3.	Max. braking force at rail level	12.8t	18.6t	13.4t	16.3t	16.3 t
4.	Max. CG height above rail level	Not exceed 1830 mm	Not exceed 1830 mm	Not exceed 1830 mm	Not exceed 1830 mm	Not exceed 1830 mm

(B) For LHB AC EOG Coaches

i) AC Chair Car

Maximum Gross Load : 50.3t
Maximum Braking Force at Rail Level : 4.65t
(at 3kg/cm² BC pressure)
CG height above rail level : Not exceeding 1830 mm

ii) Generator van

Maximum Gross Load : 56.8t
Maximum Braking Force at Rail Level : 5.32t
(at 3kg/cm² BC pressure)
CG height above rail level : Not exceeding 1830 mm

2.2.6. Specific restrictions are applicable as mentioned in relevant speed certificates of hauling single/multiple locomotives issued by RDSO.

2.3. Signaling

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

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

2.4. Traction Installation

For AC OHE

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

2.4.2 In case of locations where porcelain section insulators are installed on main line and lie within first 1/10th and 1/3rd of the span immediately after the OHE structure and the runners are in the trailing direction the maximum speed shall be limited to 120 km/h. At

all other locations where porcelain section insulators are installed, the speed shall be limited to 80 km/h.

- 2.4.3 It is recommended that the cantilevers in the section shall have BFB steady arm (RI No.2390) with 25 mm drop bracket assembly (RI No.2360) instead of tubular steady arm (RI No.2520), however bent steady arm at overlap locations shall continue.
- 2.4.4 The current collection shall be made through 1 number pantograph fit for high-speed operation.
- 2.4.5 In 25 KV a.c. traction area, the CEE of 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 mm gauge (BG) revised 2004" is not violated and strictly followed to ensure its safe running.
- 2.4.6 In addition to the above, the Chief Electrical Engineer may impose any temporary speed restriction is based on the conditions prevailing on any particular section.

2.5 Rolling Stock

- 2.5.1 Before starting the operation, CME/CEE of the concerned Railway shall certify the track worthiness and safety of the rolling stocks. They shall also ensure proper maintenance of the stocks.
- 2.5.2 The Wheel Slide Protection (WSP) device of all the coaches in the rake shall be functional at the starting station. If the WSP of any coach becomes defective enroute, the brake system of that particular coach shall be isolated.
- 2.5.3 The earthing arrangement on the coaches shall be maintained as per design.
- 2.5.4 The LHB AC EOG coaches shall be maintained as per "Preventive Maintenance system for LHB Coaching Stock" issued by Railway Board and the instructions issued by RDSO & Railway Board time to time.
- 2.5.5 Two Generating vans one at each end shall be provided in 18 coach formation.

2.6 General

- 2.6.1 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.
- 2.6.2 Attention is also invited to the note on "Preparation of Electrical Equipment of Diesel and Electric Locomotives for high speed operation" circulated with this office letter No. EL/3.3.15/WAM2/Gr.CON dated 24.12.1970 and the locomotive should be attended accordingly.
- 2.6.3 LHB AC EOG coaches with 23540 mm length over body and 12340 mm maximum distance apart between any two adjacent axles infringes clauses 13(b) 16, 17, 19(b), 20(b), 21(b), 22 & 32(b) of Chapter IV(A) of BG Schedule of Dimensions, 1973 Reprint. These infringements of LHB AC EOG coaches have been condoned by Railway Board vide their letter No. 97/CEDO/SR/3 dated 07.02.1997.
- 2.6.4 The design of WDP3 A (previously WDP2) locomotive infringes clauses 12 and 13 of Chapter IV(C) of the BG Metric Schedule of Dimensions, 1973 Reprint. Railway Board

have condoned these infringements vide their letter No. 98/CEDO/SR/13 dated 12.10.1998.

- 2.6.5 The design of WDP4 locomotive infringes clauses 11(ii), 12, 13 and 17 of Chapter IV(C) of the BG Metric Schedule of Dimensions, 1973 Reprint. Railway Board have condoned these infringements vide their letter No. 2001/CEDO/SR/18 dated 23.8.2001.
- 2.6.6 The design of WAP4 (previously WAP1 5000 hp) locomotive infringes clauses 9 (b), 12 and 13 of Chapter IV(C) of the BG Metric Schedule of Dimensions, 1973 Reprint. Railway Board have condoned these infringements vide their letter No. 96/CEDO/SR/10 dated 10.5.1996.
- 2.6.7 The pantograph of the WAP7 locomotives locked down condition and surge arresters infringe the maximum moving dimensions of 1929 over non-electrified sections. After removing pantograph pan assembly and two surge arresters, the profile will infringe the maximum moving dimensions of 1929 but will be within 'X' class loco profile. For moving the loco in non-electrified territory, pantograph pan assembly and two surge arresters shall be removed and the movement of the loco shall be cleared by the Railway concerned as per the extant rules applicable. In non electrified sections where maximum moving dimensions of existing 'X' class locos are not permissible, the movement shall be in accordance with the instructions issued by the Railway Board and other additional instructions issued by Zonal railways for the movement of ODCs. Railway Board have condoned the infringements of WAP7 locomotive vide letter no. 2000/CEDO/SR/2 dt. 17.02.2000.
- 2.6.8 The pantograph of WAP5 Locomotive in locked down condition and the surge arrestors infringe the Maximum Moving Dimensions of 1929 over non-electrified sections. After removing the pantograph pan assembly and two surge arrestors, the profile will infringe the Maximum Moving Dimensions of 1929 but will be within 'X' class loco profile. For movement of loco in non-electrified sections, pantograph pan assembly and two surge arrestors shall be removed and the movement of the loco shall be cleared by the Railway concerned as per the extant rules applicable. In non electrified section where Maximum Moving Dimensions of existing 'X' class loco are not permissible, the movement shall be in accordance with the instructions issued by Railway Board and other additional instructions issued by the Zonal Railways for the movement of ODCs. Railway Board have condoned these infringements vide their letter no. 95/CEDO/SR/18 dated 14-7-1995.
- 2.6.9 The adequacy of the brake power available on the locomotives in conjunction with the coaching stock shall be used in the proposed train, vis-a-vis the signalling system available on the route, shall have to be established.
- 2.6.10 Attention should be given to sections where acceleration has been exceeded 0.35g or where the number of peaks exceeding 0.3g recorded per km is greater than 1 which is already explained in para no. 7.2 of report no. MT-1026/F.

संलग्नक:

1. Rly. Bd.'s letter No.97/CEDO/SR/3 dated 07.02.1997
2. RDSO Sk.96077



(राजीव विश्‍नोई)

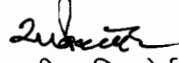
वरिष्ठ कार्यकारी निदेशक मानक / चालन शक्ति

प्रतिलिपि:

1. सचिव (यांत्रिक / विद्युत / इंजीनियरिंग-जी), रेलवे बोर्ड, रेल भवन, नई दिल्ली-110 001.
2. मुख्य रेल संरक्षा आयुक्त, मण्डल रेल प्रबन्धक कार्यालय, पूर्वोत्तर रेलवे परिसर, अशोक मार्ग लखनऊ-226 001.
3. महाप्रबन्धक (यांत्रिक / विद्युत / ओपरेटिंग / एस एण्ड टी)
उत्तर रेलवे, बडौदा हाउस, नई दिल्ली.110 001

संलग्नक:

1. Rly. Bd.'s letter No.97/CEDO/SR/3 dated 07.02.1997
2. RDSO SK.96077


(राजीव विश्‍नोई)

वरिष्ठ कार्यकारी निदेशक मानक / चालन शक्ति

भारत सरकार GOVERNMENT OF INDIA
रेल मंत्रालय MINISTRY OF RAILWAYS

(रेलवे बोर्ड RAILWAY BOARD)

No. 97/CEDO/SR/3.

23/2

रेल नंबर. नं लिपि-110001, तिथि

Rail No. 110001, dated

07.02.97

To,

The Director General (Track),
R.D.S.C.,
Manak Nagar,
LUCKNOW - 226 001.

4/7/97
R.S. No. []
Dy. No. []

Subj. LHB Coach - Condonation of the infringements to Schedule of dimensions 1973.

With reference to your application No. CT/LC/ES. dt. 17/20.1.97, sent through the Chief Commissioner of Railway Safety, Lucknow, the sanction of Ministry of Railways is hereby communicated for condonation of infringement to item 13(b), 16, 17, 19(b), 20(b), 21(b), 22 & 32(b) of Chapter-IV(A) of B.G. Schedule of dimensions (1973) involved in 23540 mm long LHB coach with 2350 mm width.

The sanction is based on Form- and Sketch No. 96077 accompanying your application referred to above.

(V.K. BAHUANI)
Exec. Dir. Civil Engg. (G)
Railway Board.

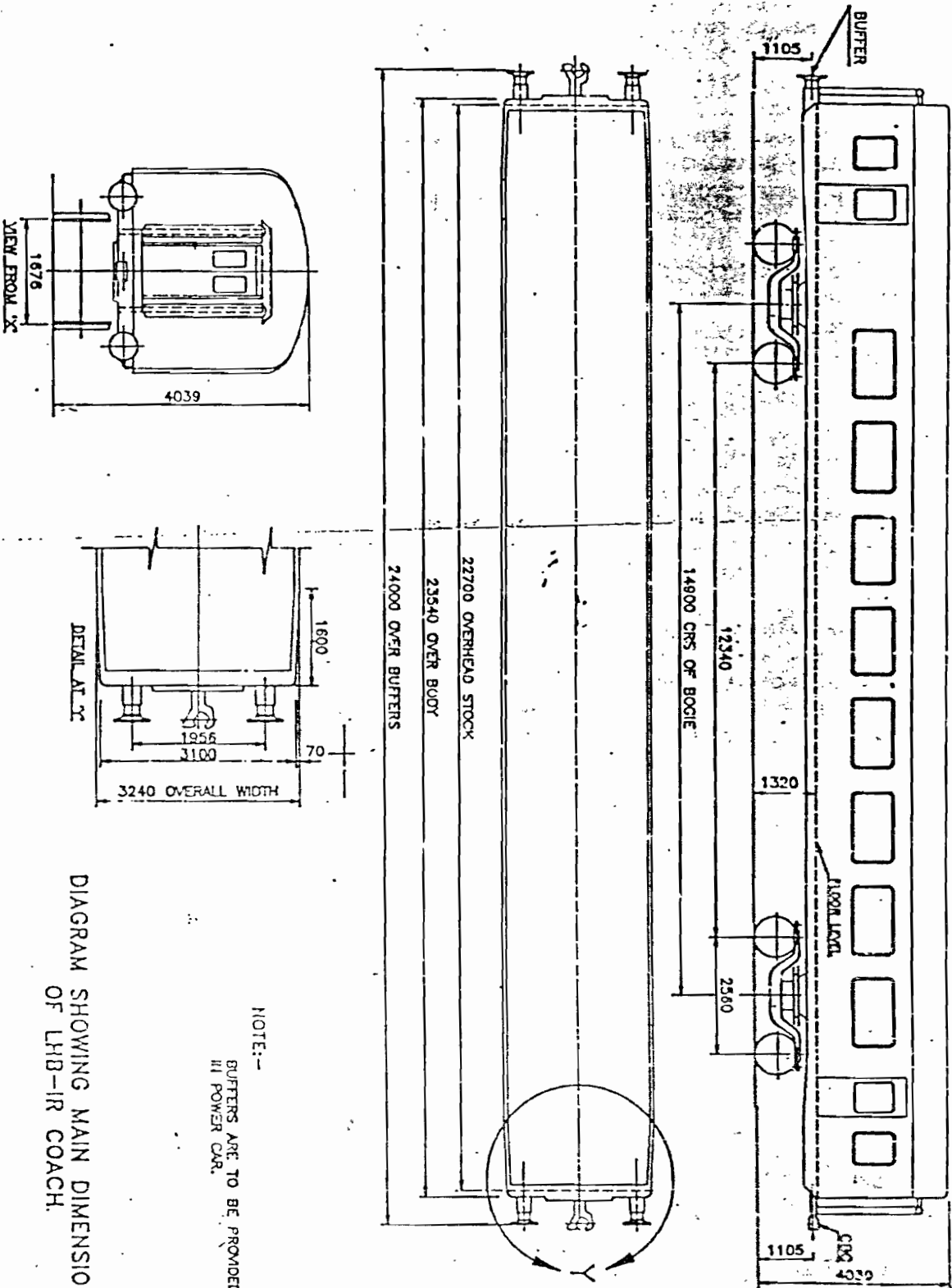
No. 97/CEDO/SR/3.

New Delhi, Dt. 07.02.97.

Copy forwarded for information to the Chief Commissioner of Railway Safety, 16-A, Ashok Marg, Lucknow - 226 001 with reference to his endorsement No. Q.17111/1/97/ES dated Nil.

(V.K. BAHUANI)
for Secretary Railway Board.

DS-10-T



NOTE:--
BUFFERS ARE TO BE PROVIDED ONLY
IN POWER CAR.

DIAGRAM SHOWING MAIN DIMENSIONS
OF LHB-IR COACH.

SKETCH-96077