

BCNHL :

Important Info-Body & Doors

Kindly Note: This document is for reference & general information only. Any specific details be kindly cross-checked/ confirmed through relevant drgs & Specifications.

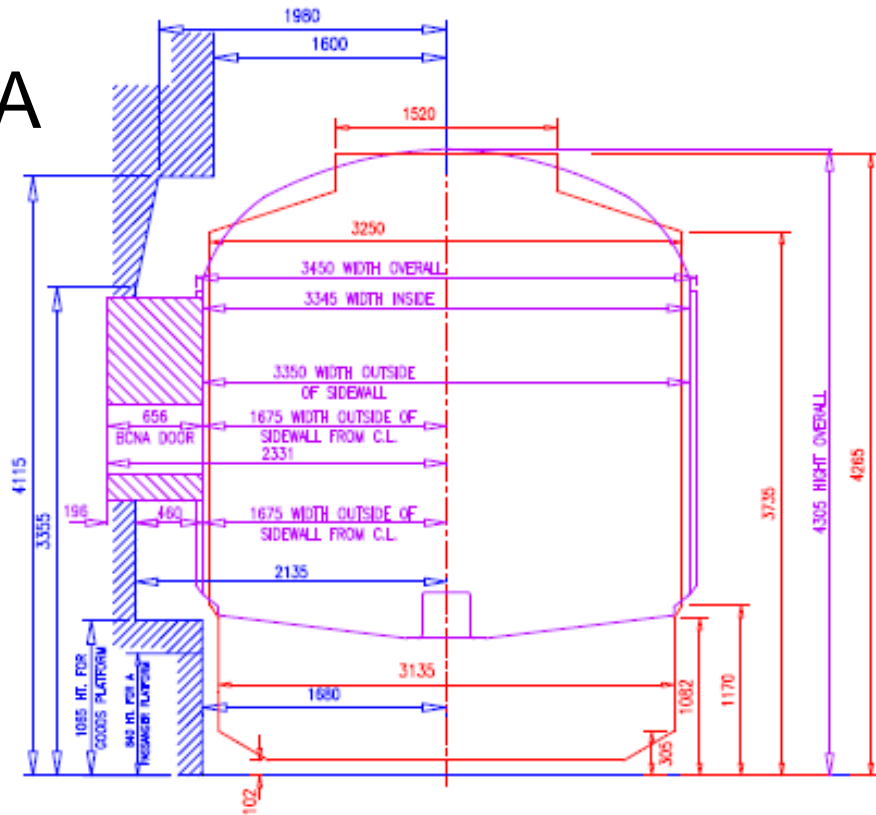
Comparison of Wagon

Design Parameter	BCNA	BCNHL
Length over head stock	13521 mm	10034 mm
Overall width	3200 mm	<u>3450 mm</u>
Inside width	2944 mm	3345 mm
Inside height	2677 mm	<u>3024 mm</u>
Height from rail level	4017 mm	4305 mm
Vol. Capacity/ wagon	103.4 m ³	92.5 m ³
Tare wt/wagon	24.55 T	20.8T
Pay load per wagon	56.73 T	<u>70.8 T</u>
No. of wagon/rake	44	58
Throughput/rake (Cement)	2934.8T	<u>4106.4T</u>

WHY IS BCNHL SUCH A POPULAR
WAGON & WHAT VALUE DOES IT
CARRY FOR IR.

BCHHL WAGON WITH BCNA DOOR SHOWN
WITH M.M.D-1D-2004 & FIXED STRUCTURE

BCNHL
with BCNA
door

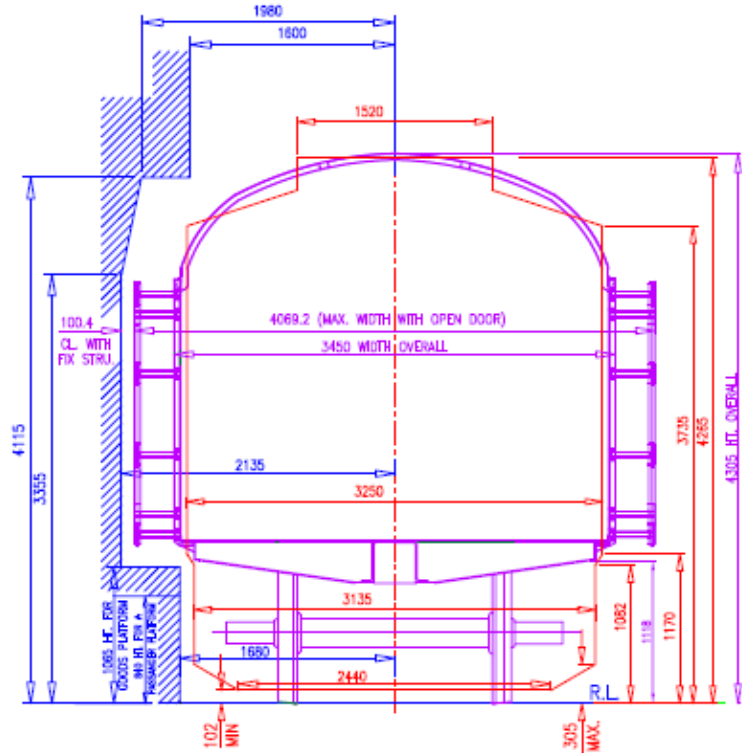


- SHOWS PROFILE OF EXISTING 'BCNHL WAGON' WITH BCNA DOOR
- MMD-1D-2004
- FIXED STRUCTURE

**WHY CANNOT A BCN/BCNA TYPE
DOOR BE USED IN BCNHL**

MMD & BCNHL

OPEN DOOR BCHHL WAGON WITH MMD-1D-2004 & FIXED STRUCTURE



- SHOWS PROFILE OF EXISTING "BCNHL WAGON" IN STATIC CONDITION WITH OPEN DOOR
- MMD-1D-2004
- FIXED STRUCTURE

WHY DO WE FEAR BCNHL HITTING FIXED STRUCTURE IF DOORS ARE OPEN?

DOES BCNHL FOUL IR MMD WHEN DOORS ARE OPEN?

BCNHL Door designs:

Original (First) Design (May'2008)



Design Modification-I (June'2009)

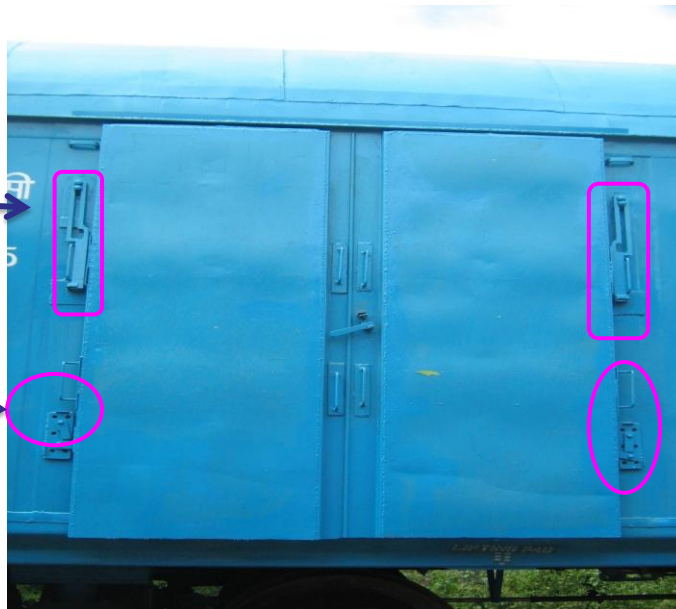
Existing Design modified by improving securing of doors
(Drg. No. WD5-STD-S-1 & S-02)

- *Modification to eliminate gap between side wall and door at hinge, improving door securing & hence eliminating the possibility of door hitting & rain water seepage.*

Chainless
cotter



Door
catch



Design Modification-II (June'2010)

- Provision of small chainless cotter, (2 nos.) on outside, in place of existing long chainless cotters.
- Provision of Tower-Bolt on outside (instead of inside door).



Hinged Door- Modification-II- (Current, latest Design of Hinge Door).



Outer view of door locking arrangement



Inner view of additional door locking arrangement

SOME OTHER DOOR DESIGNS USED IN LIMITED NUMBERS

Design Iteration (Pressed Door design- 4 hinges)-Variant-II
(June'2009)



Sliding door (Fabricated design):
Bottom roller design (Aug'2009)



Sliding door (Pressed design):
Top mounted Roller on Guide Channel (Apr'2010)



BCNHL POPULATION DISPERSION (IN TERMS OF TYPE OF DOORS USED)

[TILL THE RLY BD CONTRACT OF 2012]

BCNHL population dispersion								
S.No.	Door Design	Texmaco	HEI	Titagarh	BESCO	Modern	TOTAL	% of Total
1	ORIGINAL 	254	337	0	362	47	1000	12.6
2	MOD-I 	1688	0	1255	17	104	3064	38.7
3	BESCO DESIGN 	0	0	100	414	0	514	6.5
4	MOD-II 	921	592	302	210	960	2985	37.7
5	SLIDING (TWL) 	0	0	58	0	0	58	0.7
6	SLIDING (Texmaco) 	300	0	0	0	0	300	3.8
TOTAL							7921	100.0

Door Modifications:

- Owing to severe Field issues in earlier versions (Original & Mod-I), ZR have been advised to undertake retro fitment of modified locking arrangement (as per Mod-II) in the earlier versions of door assyl.- (Action of June'10).
- Drawings (WD-10036-S-01/ WD-06076-S-13) & Procedure for above Retro fitment also issued by RDSO-(June'10).

Door Modifications:

- RDSO's request for modifying doors in BCNHL wagons, manufactured prior to June'2010, has been reiterated continuously by RDSO's letters & in CME's conference, CRSE's Conference.
- The modifications have also been reiterated, from time to time to any ZR, reporting any door failures to RDSO.
- As directed by Bd (CRSE conference) RDSO has sought ZR/W'shops suggestions on possible door designs/ improvements on BCNHL

CURRENT STATUS (2011-12)



- NEW BCNHL wagons

(Being manufactured under the Rly Bd Wagon contract of 2011-12):

From amongst the designs, tried in the field, the door design with top mounted rollers (300 wagons), have performed with the least field issues. This door design, with modifications, to address all field issues, has been standardized for new BCNHL wagons.

Modifications in Single Piece Pressed Sliding Door (BCNHL Design-D Wagons)

(a) Roller Support Bracket:

The Roller support bracket, welding has been strengthened.

(b) Roller Design & associated changes in guide channel:

b.1 The roller diameter increased to in order to ensure a roller overlap (with the guide channel) of 12mm in place of the existing 8 mm.

b.2 The roller profile be modified from a flat profile to a convex profile, so that the existing line contact of the roller-guide channel, be modified to a point contact, to ensure smoother sliding motion of the door.

b.3 The number & location of rollers be modified from the existing three rollers, equidistant along the door width to FOUR rollers, with two rollers each in the front & end of the door width.

(c) Rain Protector Strengthening:

The thickness of the rain protector channel be modified from the existing 2.5mm to 4mm. In order to provide support, additional ribs be provided, in the rain protector member.

(d) Provision of additional lateral stop member:

In order to prevent a lateral falling/ movement of door sheet, an additional lateral stop member, needs to be provided.

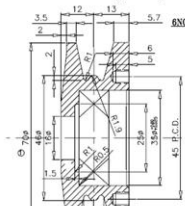
(e) Support in Bottom guide:

To prevent blockage of the bottom guide owing to loose cement, a continuous slot has been provided. In order to provide strength to the bottom support, strengthening of the

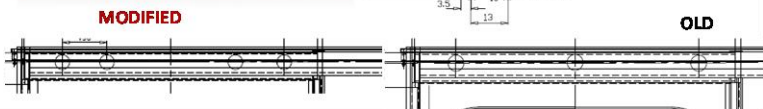
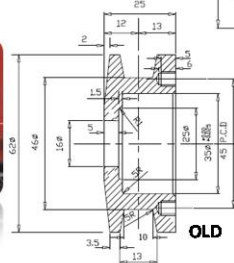
support be done by providing ribs at a pitch of 180mm between the auxiliary sole bar & the vertical face of the inside sole bar channel.

Design Modifications in BCNHL Sliding Door (NEW BCNHL wagon)

Additional Lateral Stopper & strengthened Rain Protector



Strengthened Bottom Guide Brackets



(f) Back Sheet on door:

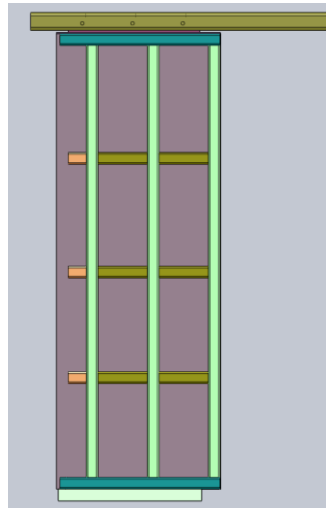
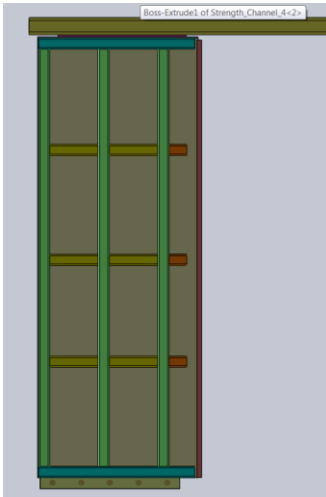
The pressed impression on the door, results in a cavity that could lock/entangle loaded commodity bags, during the sliding motion of the door. To prevent the above, the depressed cavity be covered using off-cuts of the 1.6mm thk sheet. Sections of suitable sizes of this sheet (1.6mm thk) be welded on the inside of the pressed door sheet to cover the portion of the pressing &

ensure a smooth door surface on the inside.

(g) Strengthening the Bottom part of door sheet:

During service in the field, the bottom part of the door, is reported to working-out from the provided slot. To strengthen the bottom portion of the door & to prevent its working out, a 6mm flat be welded at the bottom portion of the door sheet.

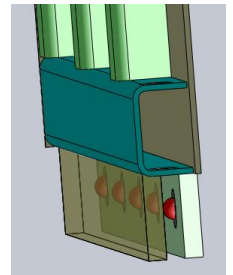
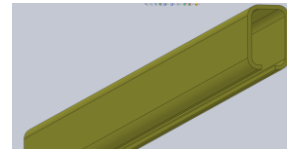
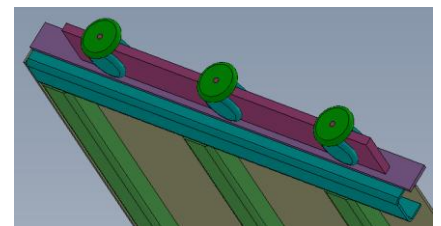
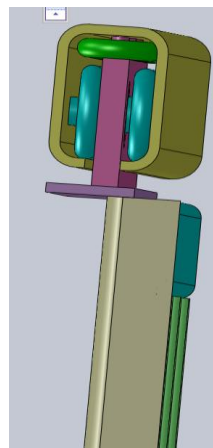
Retrofit-able Sliding Door



FOR OLDER BCNHL Wagons:

For older BCNHL wagons (manufactured prior to June'2010), & NECESSARILY warranting door replacements, a retrofitable two-part door design has been developed.

Retrofit-able Sliding Door



Highlights of the Door Design

- 2 Part Sliding Door.
- Sliding using 3 sets of rollers (on each door) mounted on top portion of door.
- Door Supported at Bottom.
- Top pivoted door with ability to move laterally (on being pushed by loaded bags).
- Retrofitable design. Can be fabricated as a unit & be mounted on existing BCNHL wagons.
- Lower Weight (75 kgs of each door vs 105 kgs of Hinge door).
- No chances of hitting any fixed structure, since lateral projection less than side stanchions.
- Secured locking arrangement, easily operational from non-platform line.
- Ease of Loading/ Unloading owing to Sliding Door design.
- Ease of Maintenance- rollers fitted in guide channel, with end covers which can be replaced/ opened easily.
- Brgs in Rollers provided with dust cover & concealed to prevent ingress of dirt.
- To facilitate lateral movement transfer balls provided at door bottom.

FITMENT OF RETROFITABLE TWO PART SLIDING DOOR & FIELD TRIALS



In-service Wagon No. WCR 33161091877 retrofitted with 2 part sliding door at PRTN W'shop-WR.
2 such wagons under field monitoring by GIM (Gandhidham) Depot-WR



Rake of New BCNHL wagons (TWL) with 2 Part Sliding Door Wagon under operations in SCR (Wadi Division), NR (UMB Divn)

Door Design : Present Status

1. Sliding Door (Top Roller design with modifications) standardized for new BCNHL.



2. Retro fitment of in-field hinge door wagons with modified door securing arrangement.

Action
By
ZR

2. Retrofitable solution for older Wagons (with original door design & Mod-I design)

Fitment
In 2 OLD
RAKES
+
2 NEW
RAKES
Done.

Action by ZR

RDSO Invites & Welcomes:

- Any suggestion/ Design improvements in BCNHL or BCNHL doors.
- Field feedback on the Single Piece Pressed Sliding Door fitted in new BCNHL wagons.
- Field feedback on the Retrofitable Two Part Fabricated Sliding Door fitted in older & new BCNHL wagons
- Any other Query/ Details.

PI Contact:

Rupesh Kohli
Director(Wagon Design-II)
Wagon Directorate, RDSO
Manak Nagar, Lucknow-226011
Ph: 0-9794863029 Email: directorwagon1@gmail.com