

INDIAN RAILWAYS



CHECK SHEETS

FOR

**BOGIE COVERED WAGON (91.6 Tonnes)
TYPE – BCNHL(MBS)-(Design-E)**

**(FITTED WITH AIR BRAKE SYSTEM)
BROAD GAUGE
(1676 MM)**

S.No.	Month & Year of issue	Revision / Amendment	Page No.	Reason for Amendment
01	May, 2014	First issue	----	----
02	April, 2016	Revision-1		Check sheet for centre filler arrangement and special observation (Page-4 & 5) added, page no.-12 revised

ISSUED BY

**RESEARCH DESIGNS AND STANDARDS ORGANISATION
MINISTRY OF RAILWAYS
LUCKNOW-226 011**

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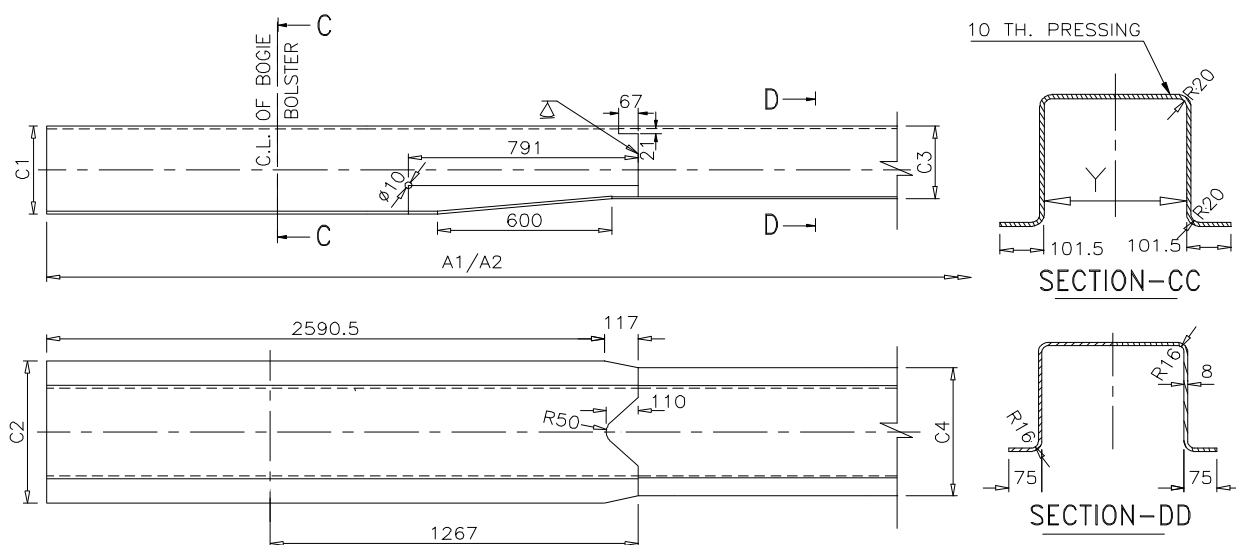
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Note:

These check sheets do not detail all the dimensions or technical requirements of respective wagon assemblies/components.

These check sheets are issued only for General Guidance & assistance of inspecting officials. Notwithstanding the above, the inspecting officials are advised to refer to relevant drawings and/or relevant specifications to confirm conformity to the specified dimensions and technical details.

Centre Sill

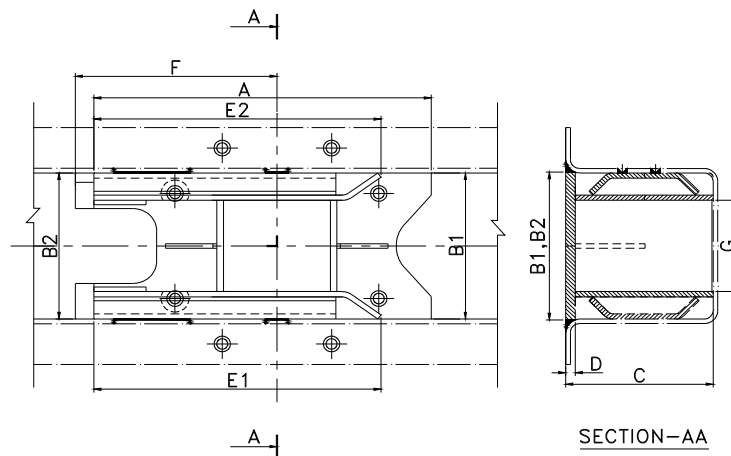


CENTRE SILL NO:			Date:			
SL. NO.	STAGE	Works Inspection	RDSO Inspection		Remarks	
1.	Fitment of center Sill End (CRF 'Z' section) with Centre Sill Middle (CRF section)					
1.1	Welding					
1.2	Dressing					
2.0	Fabrication of Centre Sill					
2.1	Fitment of all components					
2.2	Welding					
2.3	Dressing					
3.	Dimensions		As follows			
	LOCATION		Nominal Dimensions & Allowable Deviation	Actual Dimension		Remarks
				Works Inspection	RDSO Inspection	
i.	Length	A1	10034, +7,-3			
		A2				
ii.	Height and width of end Centre Sill	C1	327 ± 1.5			
		C2	530, +1.5, -0			
iii.	Height and width of center Centre Sill	C3	270 ± 1.5			
		C4	477, +1.5, -0			
iv.	Draft Gear Pocket	Y	327± 1.5			

All dimensions are in mm

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name:		Name:	
Designation:		Designation:	
Date:		Date:	

Centre filler Arrangement



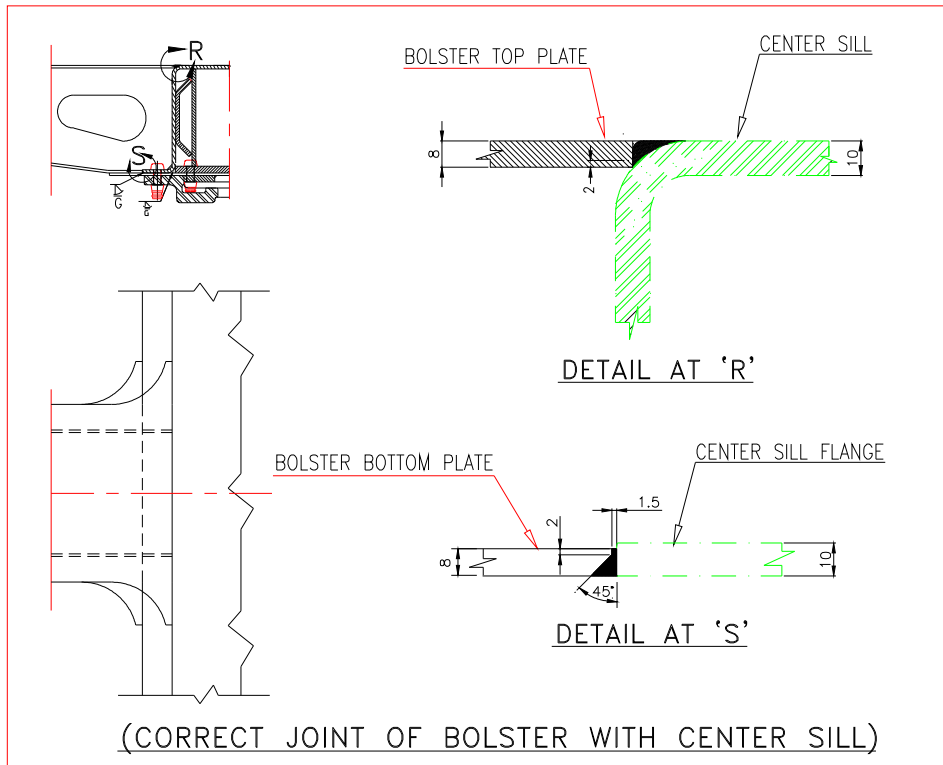
S. No.	STAGE	Works Inspector	RDSO Inspector	Remarks
1	Fitment of all components			
2	Welding			
3	Dressing			
4	Dimensions		As follows	
	LOCATION		Actual Dimension	Remarks
		Nominal Dimensions & Allowable Deviation	Works Inspector RDSO Inspector	
i	Length of base plate	A	725 ±1	
ii	Overall width of base plate at centre position	B1 B2	327 +3, -0	
iii	Assembly height of Pivot filler	C	317 +0, -1	
iv	Thickness of base plate	D	20	
v	Length of Pivot Filler Support web plate at bending condition	E1 E2	617 ±1	
vi	Distance of stopper plate from centre line of bolster	F	433.5	
vii	Flatness of Base Plate of Filler arrangement & Centre Sill after welding	-	Filler Gauge of 0.76 mm. should not pass between the straight edge and mounting surface.	

All dimensions are in mm.

Note : Centre filler base plate edge preparation should be checked properly

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name:		Name:	
Designation:		Designation:	
Date:		Date:	

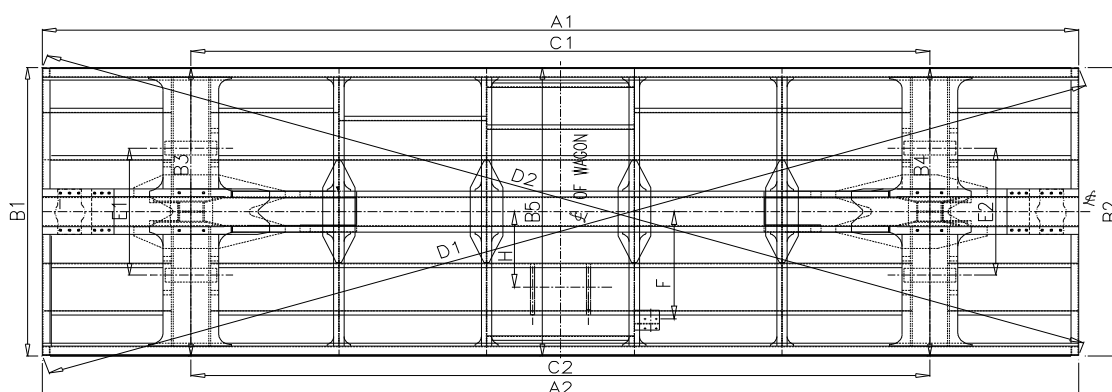
SPECIAL OBSERVATION



UNDERFRAME NO:		Date:			
SL. NO.	LOCATION	Nominal Dimensions & Observation	Actual observation		REMARKS
			Works Inspection	RDSO Inspection	
1.	Joint of bolster bottom plate with centre sill flange	Butt Weld			
2.	Gap between base plate of filler arrangement and bolster bottom gusset plate	Less than 0.76 mm			
3.	Gap between center sill flange and bolster bottom gusset plate	Less than 0.76 mm			
4.	Gap between bottom plate of bolster and bolster bottom gusset plate	Less than 0.76 mm			

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name:		Name:	
Designation:		Designation:	
Date:		Date:	

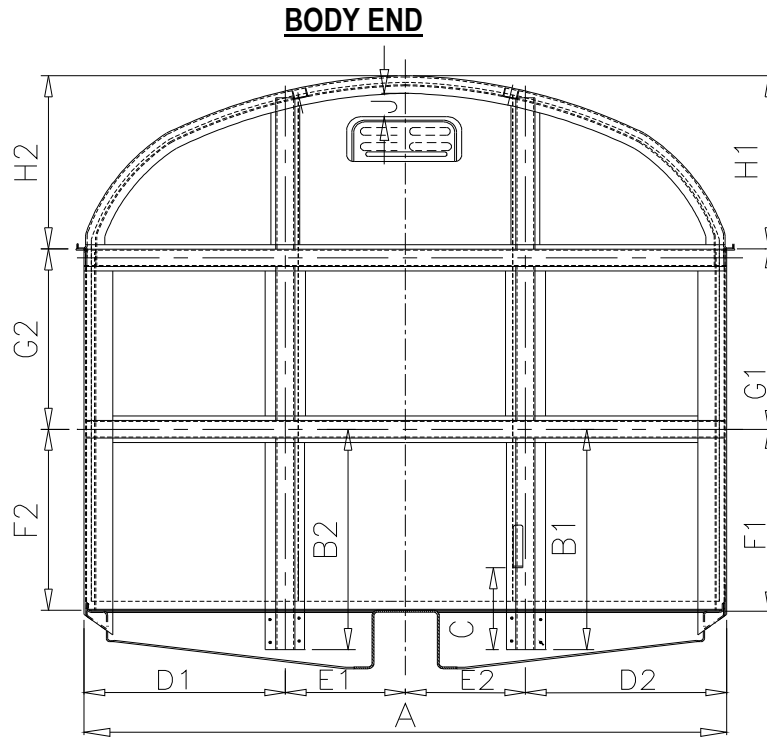
UNDERFRAME



UNDERFRAME NO:		Date:				
SL. NO.	STAGE	Works Inspection		RDSO Inspection	REMARKS	
1.	Fitment of all components					
2.	Welding					
3.	Dressing					
4.	Dimensions	As follows				
	LOCATION		Nominal Dimensions & Allowable Deviation	Actual Dimension		Remarks
				Works Inspection	RDSO Inspection	
i.	Length over head stock	A1	10034, +7,-3			
		A2				
ii.	Width over solebar	B1	3350±3			
		B2				
		B3				
		B4				
		B5				
iii.	Distance between bolster bogie centre	C1	7153, +5, -2			
		C2				
iv)	Distance between side bearers centre	E1	1474±2			
		E2				
v)	Diagonal difference over headstock	D1	≤ 5			
		D2				
vi)	Camber		10, +0, -3			
vii)	Distance between C.L. of centre sill to centre of first hole of D.V. bracket.	F	1097,+0,-2			
viii)	Distance between C.L. of centre sill to centre of Aux. Reservoir centre.	H	728±2			

All dimensions are in mm

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name:		Name:	
Designation:		Designation:	
Date:		Date:	

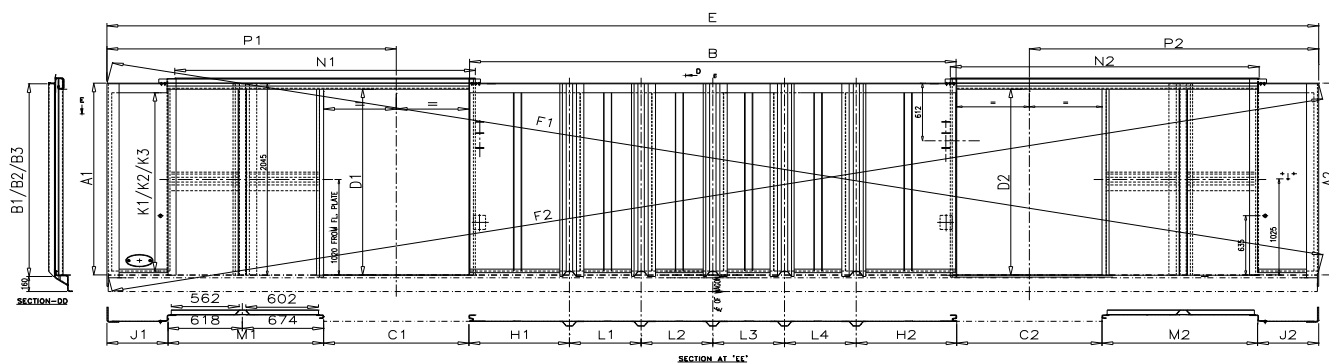


BODY END NO:		Date:				
SL. NO.	STAGE	Works Inspection	RDSO Inspection	Remarks		
1.	Fitment of all components					
2.	Welding					
3.	Dressing					
4.	Dimensions	As follows				
	LOCATION		Nominal Dimensions & Allowable Deviation	Actual Dimension		Remarks
				Works Inspection	RDSO Inspection	
i.	Width over corner stanchion	A	3366± 3			
ii.	Distance between centre line of End stiffening centre to End stanchion (bottom) end	B1	1251± 1.5			
		B2				
iii.	Distance between Tail lamp bracket to End stanchion(bottom) end	C	438± 1.5			
iv.	Distance between corner angle to Vertical stanchion C.L	D1	1054± 1.5			
		D2				
v.	Distance between C.L of body end to Vertical stanchion C.L	E1	629± 1.5			
		E2				
vi.	Distance between floor plate top to center line of end stiffening centre	F1	1023± 1.5			
		F2				
vii.	Distance between end coping to center line of end stiffening centre	G1	1024± 1.5			
		G2				
viii.	Distance between end coping to roof top	H1	985± 1.5			
		H2				
ix.	Distance between corner roof car line edge to ventilator top	J	134± 1.5			

All dimensions are in mm

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name:		Name:	
Designation:		Designation:	
Date:		Date:	

BODY SIDE

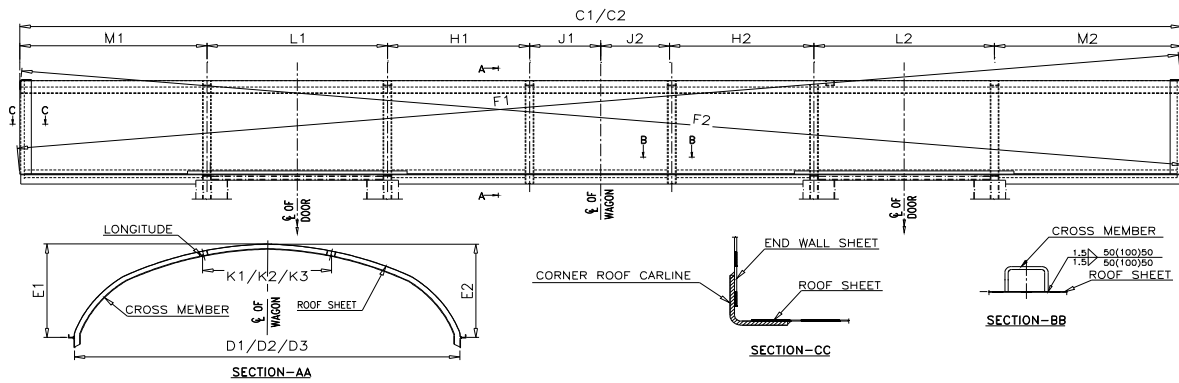


BODY SIDE NO:			Date:		
SL. NO.	STAGE	Works Inspection	RDSO Inspection		Remarks
1.	Fitment of all components				
2.	Welding				
3.	Dressing				
4.	Dimensions		As follows		
	LOCATION	Nominal Dimensions & Allowable Deviation	Actual Dimension		Remarks
			Works Inspection	RDSO Inspection	
i.	Distance between floor sheet top to top of top coping	A1 A2	2047±3		
ii.	Overall stanchion Height	B1 B2 B3	2059±3		
iii.	Door opening horizontal	C1 C2	1204, +0, -3		
iv.	Door opening vertical	D1 D2	1985, +0, -3		
v.	Distance over corner stanchions	E	10050, +7, -3		
vi.	Diagonal difference over corners	F1 F2	≤ 5		
vii.	Distance between corner stanchion to doorway shut pillar	J1 J2	505 ± 3		
viii.	Center to centre distance between side stanchions	L1 L2 L3 L4	595± 3		
ix.	Distance between doorway shut pillar to doorway shut(end) pillar	M1 M2	1292, ± 3		
x.	Distance between doorway stop pillar to Side stanchion center	H1 H2	834± 3		
xi.	Side sheet height	K1 K2 K3	1905± 3		
xii.	Door top track	N1 N2	2563 ± 3		
xiii.	Distance between corner stanchion to door center	P1 P2	2399 ± 1		
xiv.	Length of middle top coping	B	4036 ± 1		

All dimension are in mm

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name:		Name:	
Designation:		Designation:	
Date:		Date:	

ROOF ASSEMBLY

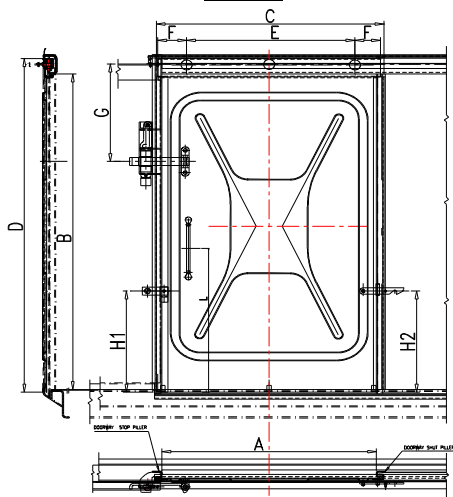


ROOF NO:			Date:			
SL. NO.	STAGE	Works Inspection	RDSO Inspection		Remarks	
1.	Fitment of all components					
2.	Welding					
3.	Dressing					
4.	Dimensions		As follows			
	LOCATION		Nominal Dimensions & Allowable Deviation	Actual Dimension		Remarks
				Works Inspection	RDSO Inspection	
i.	Distance between roof top to top of Side top Coping	E1	985 ± 3			
		E2				
ii.	Distance between corner roof carline	C1	10050, +7, -3			
		C2				
iii.	Distance between side top coping	D1	3338 ± 3			
		D2				
		D3				
iv.	Diagonal difference over corner	F1	≤ 5			
		F2				
v.	Distance between centre line of wagon to centre line of Cross member	J1	615 ± 3			
		J2				
vi.	Distance between centre line of Cross member	L1	1400 ± 3			
		L2				
vii.	Distance between centre line of Cross members	H1	1392 ± 3			
		H2				
viii.	Distance between Cross member centre line to Corner roof carline	M1	1618 ± 3			
		M2				
ix	Center Distance between Longitude members	K1	1116 ± 3			
		K2				
		K3				

All dimension are in mm

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name:		Name:	
Designation:		Designation:	
Date:		Date:	

DOOR

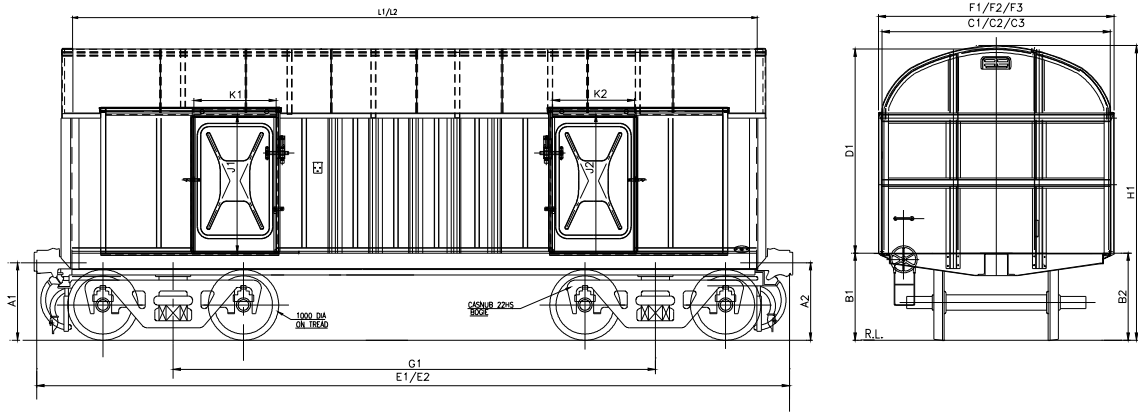


DOOR NO:		DATE:				
SL. NO.	STAGE	Works Inspection	RDSO Inspection		Remarks	
1.	Fitment of all components					
2.	Welding					
3.	Dressing					
4.	Dimensions	As follows				
	LOCATION		Nominal Dimensions & Allowable Deviation	Actual Dimension		Rem arks
				Works Inspection	RDSO Inspection	
i.	Width of Door opening	A	1204, +0, -3			
ii.	Height of Door opening	B	1985, +0, -3			
iii.	Width of Door Flap	C	1278, -0, +5			
iv.	Height of Door	D	2097, -0, +5			
v.	Distance between center of two end Roller	E	1130 ±1.5			
vi.	Distance between door top pressing end to center of end roller	F	55 ±0.5			
vii.	Distance of center line of door fastener from top coping of side wall	G	612 ±1.5			
viii.	Distance of Door sealing bracket from bottom edge of door sheet	H1	635 ±1.5			
		H2				
ix.	Distance of center of handle for sliding door from bottom edge of door sheet	L	803 ±1.5			

All dimensions are in mm

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name:		Name:	
Designation:		Designation:	
Date:		Date:	

FINAL ASSEMBLY



Wagon No.:		U/F No.:		Date:		
SL. NO	STAGE	Works Inspection	RDSO Inspection	Remarks		
1.	Fitment of all components					
2.	Lock Bolting					
3.	Welding					
4.	Operation of Doors					
5.	Operation of Couplers					
6.	Under gear Examination					
7.	Brake test i) Air brake ii) Hand brake					
8.	Shot Blasting					
9.	Painting					
10.	Lettering					
11.	Dimensions	As follows				
	LOCATION		Nominal Dimensions & Allowable Deviation	Actual Dimension		Remarks
				Works Inspection	RDSO Inspection	
i.	Coupler height from R.L.	A1	1105, +0, -5			
		A2				
ii.	Floor height from R.L.	B1	1273, ± 3			
		B2				
iii.	Length Inside	L1	10034, +7, -3			
		L2				
iv.	Width Inside	C1	3345, ± 3			
		C2				
		C3				
v.	Height Inside (Floor level to top)	D1	3024, ± 3			
vi.	Length over coupler face	E1	10963, +8, -3			
		E2				
vii.	Side bearer clearance	-	Nil			
viii.	Overall Width	F1	3450, ± 3			
		F2				
		F3				
ix.	Distance between bogie centres	G1	7153, ±3			
x.	Overall height from R.L.	H1	4305, ±3			
xi.	Door opening vertical	J1	1985, +0, -3			
		J2				
xii.	Door opening horizontal	K1	1204, +0, -3			
		K2				

All dimensions are in mm

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name:		Name:	
Designation:		Designation:	
Date:		Date:	

FINAL WAGON

1.	Wagon No.		2.	Date of offer	
3.	Underframe No.		4.	Name of the Wagon Manufacturer:	
5.	Contract/P.O. placed by		6.	Contract/P.O. No. and date and D.P. (Upto)	
7.	Running Gear				
a)	Bearing Make			Serial Nos.	
b)	Wheel Make			Serial Nos.	
c)	Axle Make			Serial Nos.	
d)	Bogie Make & Sr. Nos.		e)	Air Brake Make	
f)	PU Pad make		g)	Aux. Reservoir make	
h)	DV Make & Sr. no.		i)	Brake Cylinder Make & Sr. Nos.	
j)	Date of air brake testing		k)	Date of *SWTR unit calibration	
8.	Coupler Make & Sr. Nos.		9.	Draft Gear Make & Sr. Nos.	
10.	Tare Weight		11.	Grit/Shot blasting (As per G-72 latest Rev.	
12.	D.M. Issue date		13.	TXR fit memo issue date	
14.	CRF Section Make		15.	Lock bolt make	
16.	Paint Make		17.	CBB Make	
18.	APM Make & Sr. Nos.				

19. RAD availed _____

20. Defects Observed _____

* Single wagon test rake

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name:		Name:	
Designation:		Designation:	
Date:		Date:	

Other Attributes:-

Wagon No.:		U/F No.:	Date:	
SL NO.	ATTRIBUTES	ACCEPTANCE LIMIT	WORKS INSPN.	RDSO INSPN.
1.	Check paint- for thickness & finish	Two coat of primer to minimum DFT 120 microns and two coat of finish paint to minimum DFT 80 microns. Paint surface to be free from blistering & peeling		
2.	Lettering & marking- for legibility, size, location & punch mark.	As per Drg No.WD-11054-S-20(Latest Revision)		
3.	COUPLER			
3.1	Height from Rail Level	1105 +0, - 5		
3.2	Operation of knuckle with operating handle	Full knuckle throw lock to lock		
3.3	Articulation of coupler body	Free movement		
4.	HAND BRAKE			
4.1	Apply hand brake (by one person only and strike all wheels with a Hammer)	There should not be ringing sound		
4.2	Release the hand brake and apply crow bar on one end of brake block to take up all slack	All brake blocks must be released. Gap between the brake block and wheel tread not to be less than 23.6 mm (5.9 x 4)		

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name:		Name:	
Designation:		Designation:	
Date:		Date:	

**Check sheet for BMBS Clearance in assembled CASNUB Bogie
(Brake in released condition)**

Wagon No. :
Bogie No.: (1)

S. No.	Description	Min Value in mm	Measured value.	
1.	Clearance between push rod and spring plank.	10	L	
			R	
2.	Total Clearance between bell crank levers and wheel faces (i.e Total of left & right side)	80 Min. 20 (if measured on any one side.)	L	
			R	
			Total	
3.	Total Clearance (i.e sum of clearances) between 3.1 Spring plank & primary brake beam and 3.2 Spring plank & secondary brake beam.	77	L	
			R	
			Total	
4.	Clearance between brake cylinder & brake beam.	30		

Bogie No.: (2)

S. No.	Description	Min Value in mm	Measured value.	
1.	Clearance between push rod and spring plank.	10	L	
			R	
2.	Total Clearance between bell crank levers and wheel faces (i.e Total of left & right side)	80 Min. 20 (if measured on any one side.)	L	
			R	
			Total	
3.	Total Clearance (i.e sum of clearances) between 3.1 Spring plank & primary brake beam and 3.2 Spring plank & secondary brake beam.	77	L	
			R	
			Total	
4.	Clearance between brake cylinder & brake beam.	30		

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name:		Name:	
Designation:		Designation:	
Date:		Date:	

PERFORMA FOR SINGLE WAGON AIR BRAKE TEST

Wagon No..... Bogie Make.....DV Make.....

S.No.	Check	Specified	Actual
1	Pressure in BP	5 ± 0.1 kg/sq.cm.	
1.a	Pressure in FP	6 ± 0.1 kg/sq.cm. (twin pipe)	
2	Pressure in AR	5 ± 0.1 kg/sq.cm.(for single pipe) 6 ± 0.1 kg/sq.cm. (for twin pipe)	
3	Leakage from the system in one minute.	0.1 kg/sq. cm.(max.)	
4	Full service application after charging		
4.1	Brake cylinder filling time a) Empty (Pressure rise from 0 to 2.1 kg/sq.cm.) b) Loaded (Pressure rise from 0 to 3.6 kg/sq.cm.)	18 to 30 sec 18 to 30 sec.	
4.2	Maximum brake cylinder pressure a) Empty b) Loaded	2.2 ± 0.25 kg/sq.cm. 3.8 ± 0.1 kg/sq.cm.	
4.3	Reduction in BP pressure required for full service application.	1.3 to 1.6 kg/sq.cm.	
5	Release after full service application.		
5.1	Draining time (Brake cylinder pressure to fall from 2.2±0.25 kg/sq.cm. to 0.4kg/sq.cm.in empty condition & 3.8 ± 0.1 kg/sq.cm to 0.4 kg/sq.cm in loaded condition) a) Empty b) Loaded	45 to 60 sec 45 to 60 sec.	
6	Sensitivity of brakes. Isolate brake pipes from mainline. Check the response of brakes when brake pipe pressure is reduced at the most equal to 0.6 kg/sq.cm. in 6 sec.	Brake should apply within 6 sec.	
7	Insensitivity of brakes, isolate brake pipe from mainline. Check the pressure of brakes when brake pipe pressure is reduced at least equal to 0.3 kg/sq.cm. in 60 sec.	Brake should not apply	
8	Emergency application:		
8.1	Brake cylinder filling time a) Empty (Pressure rise from 0 to 2.1 kg/sq.cm.) b) Loaded (Pressure rise from 0 to 3.6 kg/sq.cm.)	18 to 30 sec. 18 to 30 sec.	
8.2	Maximum brake cylinder pressure a) Empty b) Loaded	2.2 ± 0.25 kg/sq.cm. 3.8 ± 0.1 kg/sq.cm.	
9	Piston stroke Empty Condition *	54± 10 mm	
10	Leakage from brake cylinder after emergency application.	0.1 kg/sq.cm. (max.) within 5 minutes	

11	Automatic exhausting of brake cylinder and control chamber.		
11.1	Apply emergency brakes (i.e. BP=0kg/sq.cm). Check the brake cylinder pressure after giving a brief pull to release hook.	Brake cylinder and control reservoirs should exhaust automatically.	
12	Empty load change over by APM Device		
12.1	Unrestricted movement of lever arm APM Device.	Brake cylinder pressure 2.2 ± 0.25 kg/sq.cm.	
12.2	Restrict the movement of lever arm of APM Device by more than 25 mm (by putting a block of 25 mm thickness) from its initial position.	Brake cylinder pressure 3.8 ± 0.1 kg/cm ²	
13	Hand Brake		
13.1	Apply hand brakes (by one person only and strike all wheels with hammer)	There should not be ringing sound	
14.	APM arm movement from fully retracted position to bogie side frame top.	$96^{+1/0}$ mm	
15.	Brake cylinder pressure with unrestricted movement of lever arm of APM Device.	Brake cylinder pressure 2.2 ± 0.25 kg/sq.cm.	
16.	Restrict the movement of lever arm of APM Device with 17 mm block. placed on bogie frame	Brake cylinder pressure 3.8 ± 0.1 kg/cm ²	
17.	Restrict the movement of lever arm of APM Device with 15 mm block. placed on bogie frame	Brake cylinder pressure 2.2 ± 0.25 kg/sq.cm	

18.	AR Charging time (Pressure rise from 0 to 5.0 kg/sq.cm.)	175 ± 30 Sec for C3W D.V	
		60 to 120 Sec for KEO D.V	
19.	CR Charging time (Pressure rise from 0 to 4.8 kg/sq.cm.)	165 ± 20 Sec for C3W D.V	
		160 to 210 Sec for KEO D.V	

* However, if in a few cases, the piston stroke at empty pressure during testing on SWTR exceeds the specified range, the piston stroke is to be tested by locking the wheels with wedges.

S. No. 18 and 19 to be checked at the time of prototype Wagon only

Works Inspector		RDSO Inspector	
Signature:		Signature:	
Name:		Name:	
Designation:		Designation:	
Date:		Date:	