INDIAN RAILWAYS

सत्यमेव जयते

CHECK SHEETS

FOR

BOGIE COVERED WAGON
TYPE – BCNAHSM1-(Design-D)

BROAD GAUGE
(1676 MM)

S.No.	Month & Year of issue	Revision / Amendment	Page No.	Reason for Amendment
01	January, 2018	First issue	----	----
02	August, 2018	Revision-1	3,4,6,7,8 & 9	Note added in page no-3,6 to 8. One row added and tolerance revised in page no-3. One row deleted in page no-7 & 8. Dimesion and description changed of s.no.-iv of page no.-9

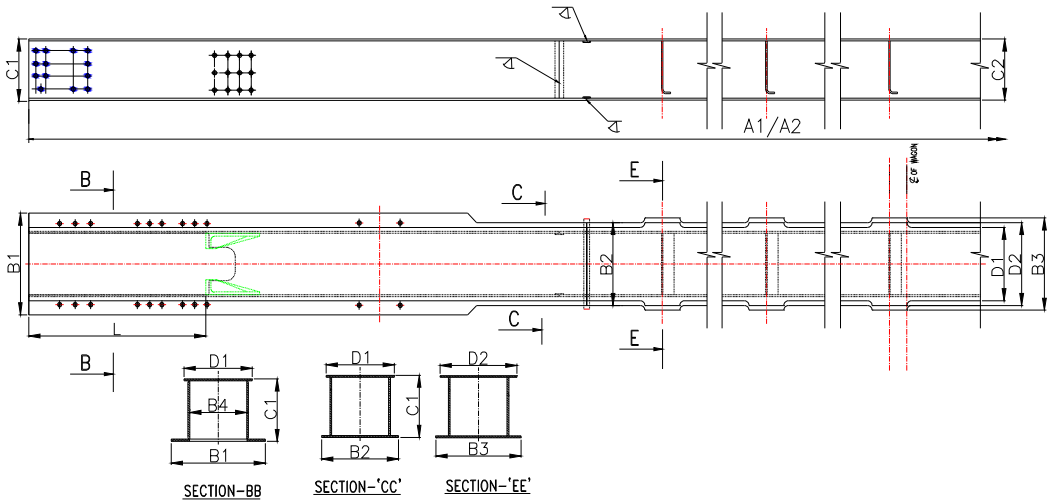
ISSUED BY

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

CONTENTS

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



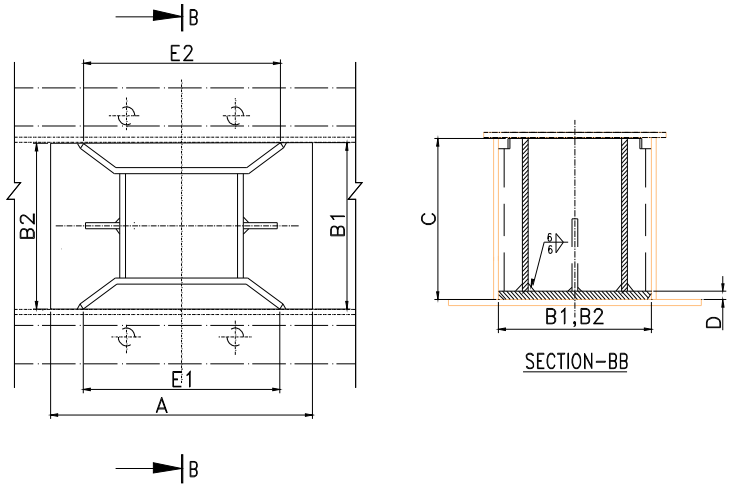
CENTRE SILL NO:				Date:		
SL. NO.	**STAGE**	**Works Inspection**		**RDSO Inspection**		**Remarks**
1.	Fitment of center Sill End with Centre Sill Middle					
1.1	Welding					*
1.2	Dressing					
2.0	Fabrication of Centre Sill					
2.1	Fitment of all components					
2.2	Welding					
2.3	Dressing					
3.	Dimensions			As follows		
	LOCATION		**Nominal Dimensions & Allowable Deviation**	**Actual Dimension**		**Remarks**
				Works Inspection	**RDSO Inspection**	
i.	Length	A1	13521, +7,-3			
		A2				
ii.	Height of Centre Sill	C1/C2	327, ± 1.5			
iii.	Width of bottom plate of center sill at end	B1	540, +1.5,-0			
iv.	Width of top plate of center sill at end	D1	390, ± 1.5			
v	Width of bottom plate of center sill at end towards center of wagon	B2	440, +1.5,-0			
vi	Max. Width of bottom plate of center sill at center	B3	490, ,+1.5,-0			
vii	Max. Width of top plate of center sill at center	D2	440, ± 1.5			
viii	Draft Gear Pocket width	B4	327, ± 1.5			
ix	Centre sill end to back stop face	L	1007, +0,-1.6			

All dimensions are in mm

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

* Both web plate should be welded with centre sill bottom plate from both side as per WD-17029-S-03 & 13 before fitment of centre sill top plate.

Centre filler Arrangement



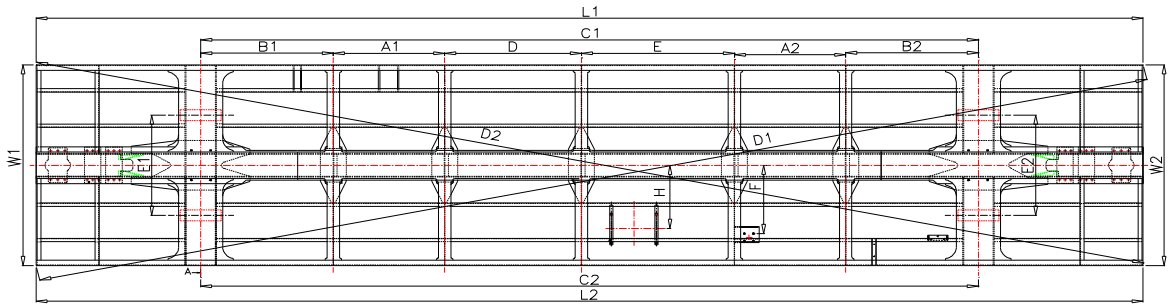
S. No.	STAGE	*Works Inspector*		RDSO Inspector		Remarks
1	Fitment of all components					
2	Welding					
3	Dressing					
4	Dimensions			As follows		
	LOCATION		*Nominal Dimensions & Allowable Deviation*	Actual Dimension		Remarks
				Works Inspector	RDSO Inspector	
i	Length of base plate	*A*	*510 ±1*			
ii	Overall width of base plate at centre position	*B1* *B2*	*326 +1, -0*			
iii	Assembly height of Pivot filler	*C*	*303 +0, -1*			
iv	Thickness of base plate	*D*	*20*			
v	Length of Pivot Filler Support web plate at bending condition	*E1* *E2*	*400 ±1*			
vi	Flatness of Base Plate of Filler arrangement	-	*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:**	

UNDERFRAME

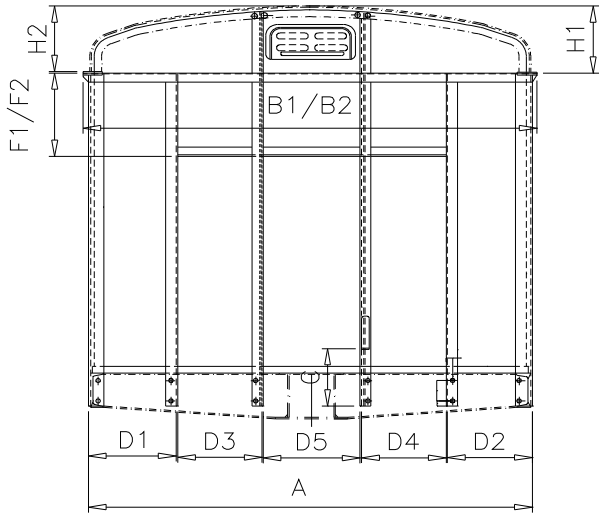


UNDERFRAME NO:					**Date:**	
SL. NO.	**STAGE**	**Works Inspection**			**RDSO Inspection**	**REMARKS**
1.	Fitment of all components					
2.	Welding					
3.	Dressing					
4.	Dimensions	As follows				
	LOCATION		**Nominal Dimensions & Allowable Deviation**	**Actual Dimension**		**Remarks**
				Works Inspection	**RDSO Inspection**	
i.	Length over head stock	L1	13521, +7,-3			
		L2				
ii.	Width over solebar	W1	2950±3			
		W2				
iii.	Distance between bolster bogie centre	C1	9500, +5, -2			
		C2				
iv)	Distance between C.L. of Bolster to centre of Cross bar	B1	1620±2			
		B2				
v)	Distance between C.L. of Cross bar to centre of Cross bar	A1	1360±2			
		A2				
		D	1670±2			
		E	1870±2			
vi)	Distance between side bearers centre	E1	1474±2			
		E2				
vii)	Diagonal difference over headstock	D1	≤ 5			
		D2				
viii)	Camber		10, +0, -3			
ix)	Distance between C.L. of centre sill to centre of first hole of D.V. bracket.	F	1005,+0,-2			
x)	Distance between C.L. of centre sill to centre of Aux. Reservoir centre.	H	930±2			
xi)	Difference between side bearer top liner to center pivot top		13,+0,-0.5			

All dimensions are in mm

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

BODY END



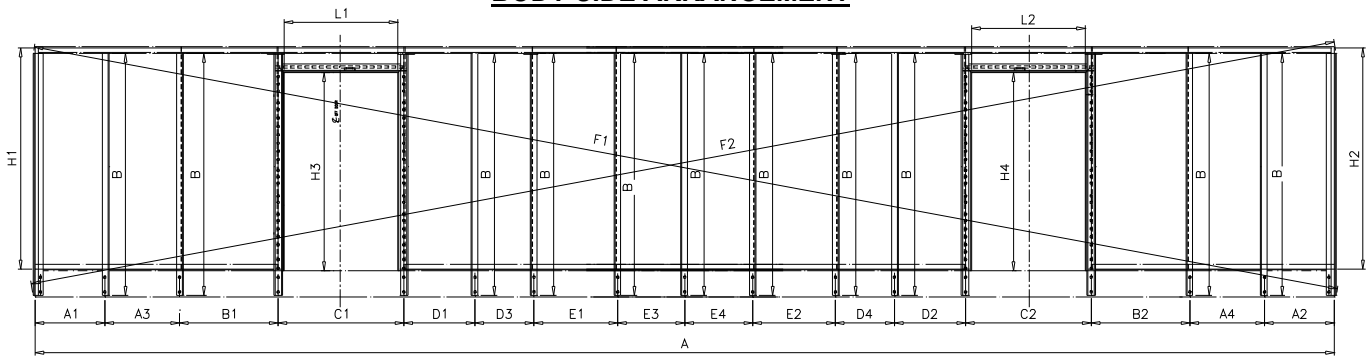
BODY END NO:					**Date:**	
SL. NO.	**STAGE**	**Works Inspection**		**RDSO Inspection**		**Remarks**
1.	Fitment of all components					
2.	Welding					
3.	Dressing					
4.	Dimensions	As follows				
	LOCATION		**Nominal Dimensions & Allowable Deviation**	**Actual Dimension**		**Remarks**
				Works Inspection	**RDSO Inspection**	
i.	Width over corner stanchion	A	2970± 3			
ii.	Distance over end coping channel	B1	3080 ± 1.5			
		B2				
iii.	Distance between Tail lamp bracket to End stanchion(bottom) end	C	438± 1.5			
iv*	Distance between outer edge of corner stanchion to top face of end stanchion	D1*	584 ±1.5			
		D2*				
v.	Distance between outer face of end stanchion to outer face of end stanchion	D3	576 ±1.5			
		D4				
vi.	Distance between outer face of end stanchion to outer face of end stanchion	D5	650 ±1.5			
vii.*	Distance between top surface of corner roof carlines to top surface of end coping channel	H1*	499 ±1.5			
		H2*				
viii	Distance between top face of end coping channel to bottom face of end stiffening angle outer	F1	600 ±1.5			
		F2				

All dimensions are in mm

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

Note:- * These dimensions may be measured either in stage inspection or assembled condition of complete wagon as per manufacturing process.

BODY SIDE ARRANGEMENT



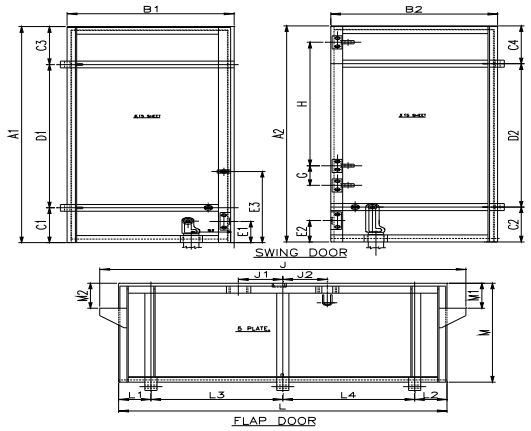
BODY SIDE NO:						**Date:**
SL. NO.	**STAGE**	**Works Inspection**		**RDSO Inspection**		**Remarks**
1.	Fitment of all components					
2.	Welding					
3.	Dressing					
4.	Dimensions			As follows		
	LOCATION		**Nominal Dimensions & Allowable Deviation**	**Actual Dimension**		**Remarks**
				Works Inspection	**RDSO Inspection**	
i. *	Distance between head stock	A	13521 +7, -3			
ii.	Overall stanchion Height	B	2425 ±3			
iii. *	Distance between door striking plate	L1	1204, +0, -3			
		L2				
iv. *	Diagonal difference over corners	F1	≤ 5			
		F2				
v. *	Distance between corner stanchion to side stanchion center	A1	730 ± 3			
		A2				
vi.	Center to centre distance between side stanchions	A3	730 ± 3			
		A4				
vii.	Distance between door-way stanchion to Side stanchion	B1	1054 ± 3			
		B2				
viii. *	Distance between door-way side stanchion to door-way Side stanchion	C1	1296 ± 3			
		C2				
ix.	Distance between side stanchion to Side stanchion	D1	760.5 ± 3			
		D2				
		D3	610 ± 3			
		D4				
		E1	880 ± 3			
		E2				
		E3	700 ± 3			
		E4				
x	Side sheet height	H1	2210 ± 3			
		H2				

All dimension are in mm

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

Note:- * These dimensions may be measured either in stage inspection or assembled condition of complete wagon as per manufacturing process.

SWING & FLAP DOOR



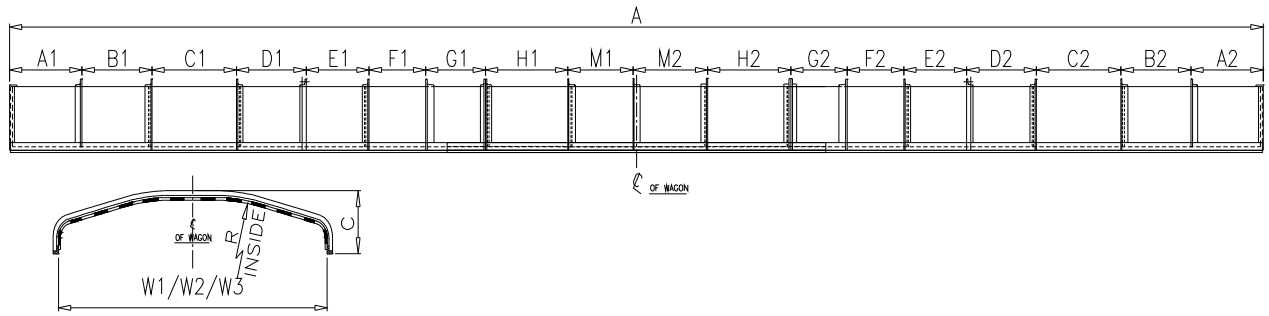
DOOR NO:				**DATE:**		
SL. N0.	**STAGE**	**Works Inspection**		**RDSO Inspection**		**Remarks**
1.	Fitment of all components					
2.	Welding					
3.	Dressing					
4.	Dimensions	As follows				
	LOCATION		**Nominal Dimensions & Allowable Deviation**	**Actual Dimension**		**Remarks**
				Works Inspection	**RDSO Inspection**	
i.	Height of swing door	A1	1390 ±1.5			
		A2	1390 ±1.5			
ii.	Widtht of swing door	B1	615 ±1.5			
		B2	617 ±1.5			
iii.	Distance between lower face of flat to center of flat of swing door	C1	224 ±0.5			
		C2				
iv.	Distance between center of flat to center of flat of swing door	D1	922 ±0.5			
		D2				
v. *	Center distance between door sealing bracket to lower face of bottom flat	E1	137.5 ±0.5			
		E2				
vi. *	Center of swing door bolt eye to lower face of bottom flat	E3	457±1.5			
vii. *	Center distance between center of swing door bolt guide	G	137 ±0.5			
		H	784 ±0.5			
viii.	Overall Width of flap door	L	1224 ±1.5			
ix.	Overall Width of flap door with locking lug	J	1304 ±1.5			
x. *	Distance between center of door chainless cotter bkt. To center of door flat	J1	164 ±0.5			
		J2				
xi.	Distance between outer edge of door panel to center of flap door hinge	L1	152 ±0.5			
		L2				
xii	Distance between flap door hinge	L3	460±0.5			
		L4				
xiii	Height of flap door	M	638 ±0.5			
xiv	Distance between top face of flap door to top face of locking lug	M1	169 ±0.5			
		M2				

All dimensions are in mm

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

Note:- * These dimensions may be measured either in stage inspection or assembled condition of complete wagon as per manufacturing process.

ROOF ASSEMBLY

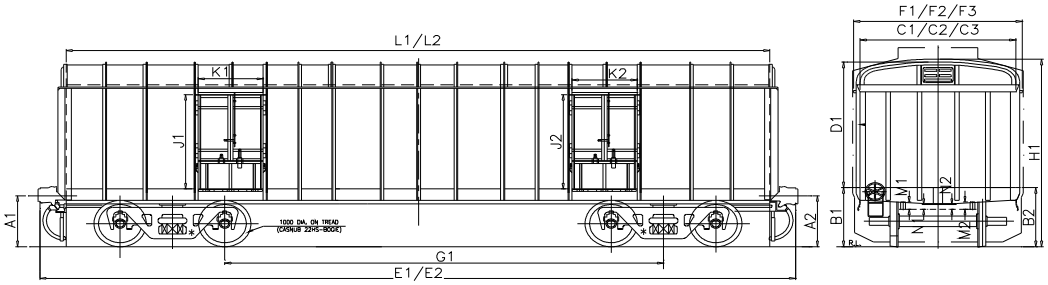


ROOF NO:						**Date:**
SL. NO.	**STAGE**	**Works Inspection**		**RDSO Inspection**		**Remarks**
1.	Fitment of all components					
2.	Welding					
3.	Dressing					
4.	Dimensions			As follows		
	LOCATION		**Nominal Dimensions & Allowable Deviation**	**Actual Dimension**		**Remarks**
				Works Inspection	**RDSO Inspection**	
i.	Distance between corner roof carline	A	13537, +7, -3			
ii.	Distance between side top coping	W1	2950 ± 3			
		W2				
		W3				
iii.	Distance between top of carlines to bottom face of Side top Coping	C	564 ± 1.5			
iv.	Inside radius of roof Carline	R	4751.6 ± 3			
v.	Distance between Carline to Corner roof carline	A1	778 ± 1.5			
		A2				
vi.	Distance between roof Carline to roof carline	B1	730 ± 1.5			
		B2				
		C1	973 ± 1.5			
		C2				
		D1	729 ± 1.5			
		D2				
		E1	649 ± 1.5			
		E2				
		F1	679.5 ± 1.5			
		F2				
		G1	610 ±1.5			
		G2				
		H1	880 ± 1.5			
		H2				
		M1	700 ±1.5			
		M2	780 ±1.5			

All dimension 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 in second coat>80 micron			
10.	Lettering			
11.	RFID(Fitment/Location/Data Entry			
12.	Dimensions	As follows		

	LOCATION		Nominal Dimensions & Allowable Deviation	Actual Dimension		Remarks
				Works Inspection	RDSO Inspection	
i.	Coupler height from R.L	A1	1104, +0, -5			
		A2				
ii.	Floor height from R.L	B1	1273, ± 3			
		B2				
iii.	Length Inside	L1	13515, +7, -3			
		L2				
iv.	Width Inside	C1	2944, ± 3			
		C2				
		C3				
v.	Height Inside (Floor level to top)	D1	2677, ± 3			
vi.	Length over coupler face	E1	14450, +7, -3			
		E2				
vii.	Centre pivot assembled height	N1	120, +2, -0			
		N2				
viii.	Side bearer set up height from bolster seat	M1	123, +0.5, -0			
		M2				
ix	Overall Width	F1	3200, ± 3			
		F2				
		F3				
x.	Distance between bogie centres	G1	9500, ±3			
xi.	Overall height from R.L.	H1	4017, ±3			
xii.	Door opening vertical	J1	1985, +0, -3			
		J2				
xiii	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.	**RFID Tag**		**15.**	**Lock bolt make**	
16.	**Paint Make**		**17.**	**CBB Make & Sr.Nos.**	
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**	**ACCEPTANCELIMIT**	**WORKS INSPN.**	**RDSO INSPN.**
1.	Check paint- for thickness & finish	Thickness >40 micron (DFT for primary paint) > 80 micron (DFT for finish paint). Total DFT after shall be minimum 120 micron. Paint surface to be free from blistering, brush marks & peeling.(As per G-72 Rev.3 or latest Revision)		
2.	Lettering & marking- for legibility, size, location & punch mark.	As per Drg No.WD-17029-S-12(Latest Revision)		
3.	**COUPLER**			
3.1	Height from Rail Level	1104 +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…….. Date…….

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 i) M/s Knorr, Medha, Prag System (Empty) ii) M/s Escorts, GDR, ADEPL system (Empty) (Loaded)	 54± 10 mm 55± 10 mm 70± 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 ± 0.1kg/cm^2	
12.3	APM arm movement from fully retracted position to bogie side frame top.	92 $^{+1/-0}$ mm	
12.4	Brake cylinder pressure with unrestricted movement of lever arm of APM Device.	Brake cylinder pressure 2.2± 0.25 kg/sq.cm.	
12.5	Restrict the movement of lever arm of APM Device with 13 mm block. placed on bogie frame	Brake cylinder pressure 3.8 ± 0.1kg/cm2	
12.6	Restrict the movement of lever arm of APM Device with 11 mm block. placed on bogie frame	Brake cylinder pressure 2.2± 0.25 kg/sq.cm	
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.	AR Charging time (Pressure rise from 0 to 4.8 kg/sq.cm.)	175 ± 30 Sec for C3W D.V	
		60 to 120 Sec for KEO D.V	
15.	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. 14 and 15 to be checked at the time of prototype Wagon only

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