

**INDIAN RAILWAYS**



सत्यमेव जयते

**CHECK SHEETS**

**FOR**

**BOGIE OPEN WAGON (89.28 Tonnes)**

**TYPE – BOSTHSM2 (MBS)-(DESIGN-D)**

**(FIITTED WITH AIR BRAKE SYSTEM)**

**BROAD GAUGE**

**(1676 MM)**

<b>S. No.</b>	<b>Month &amp; Year of issue</b>	<b>Revision / Amendment</b>	<b>Page No.</b>	<b>Reason for Amendment</b>
01	May, 2014	First issue	----	----
02	August,2017	Revision-1	----	Alteration in Drawings( replace Std. 'Z' section Centre Sill to CRF Centre Sill) & RFID Tag added

**ISSUED BY**

**RESEARCH DESIGNS AND STANDARDS ORGANISATION  
(MINISTRY OF RAILWAYS)  
LUCKNOW-226011**

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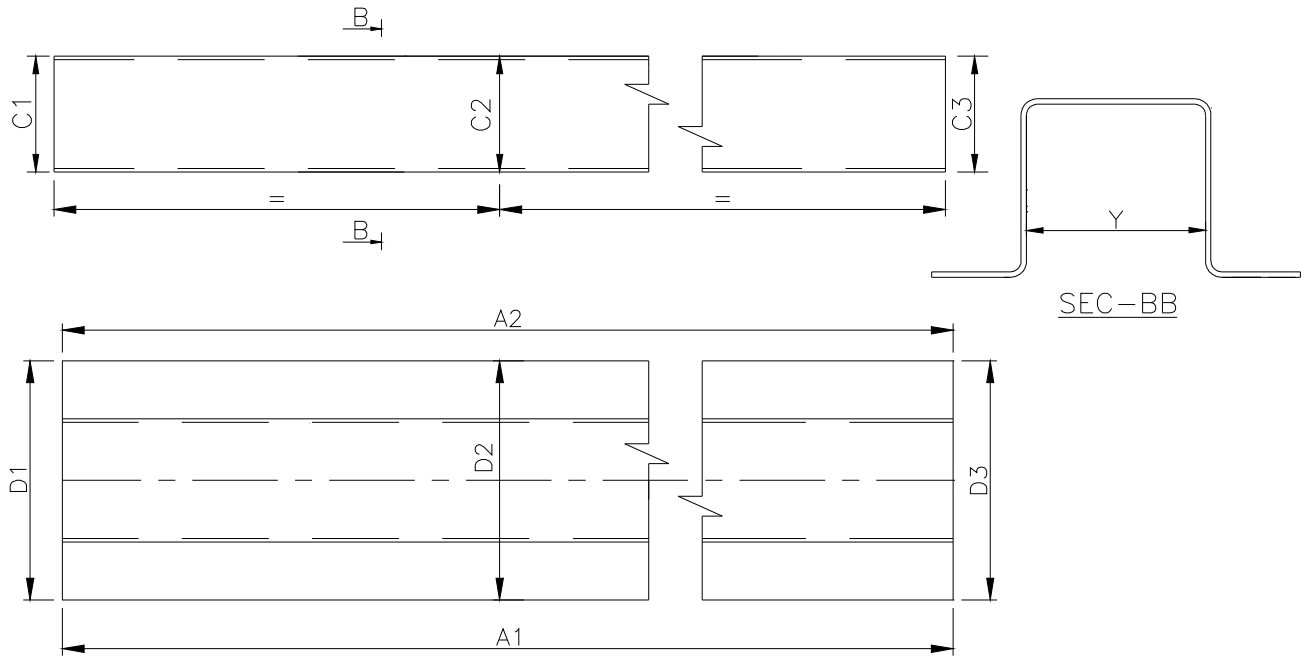
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**Note:**

**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

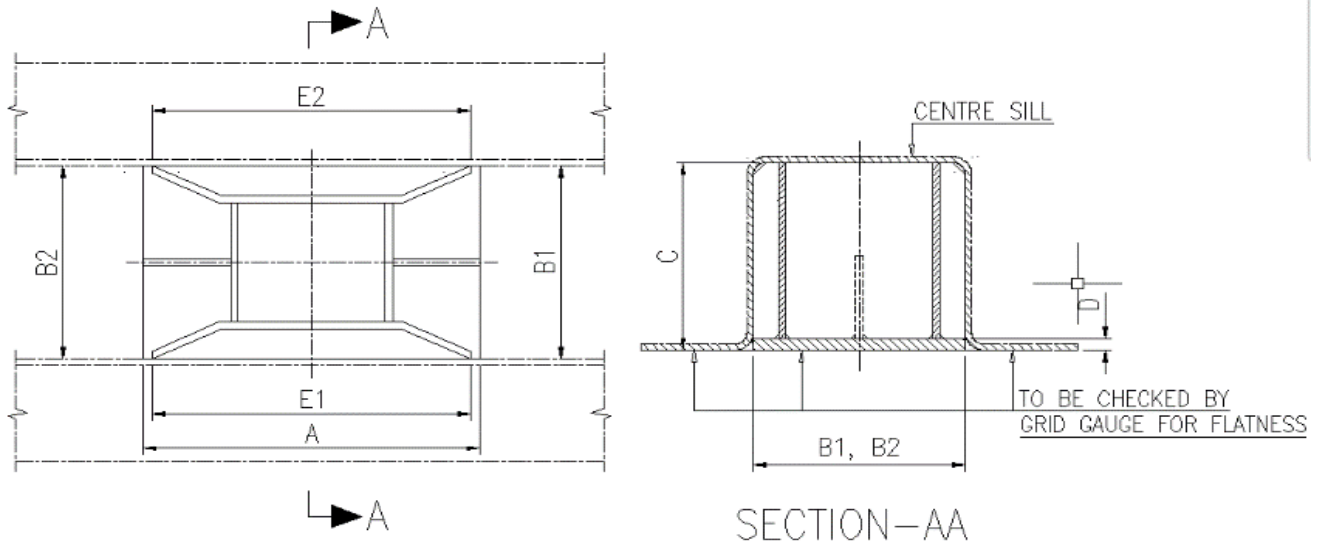


CENTRE SILL NO:				Date:		
SL. NO.	STAGE	Works Inspection	RDSO Inspection	Remarks		
1.	Centre Sill 'Hat' section					
1.1	Fitment of all components					
1.2	Welding					
1.3	Dressing					
1.4	Lock Bolting					
2.	Dimensions		As follows			
	<b>LOCATION</b>		<b>Nominal Dimensions &amp; Allowable Deviation</b>	<b>Actual Dimension</b>		<b>Remarks</b>
				<b>Works Inspection</b>	<b>RDSO Inspection</b>	
i.	Length	A1	12800, +4,-2			
		A2				
ii.	Height	C1	327, ±1.5			
		C2				
		C3				
iii.	Width	D1	674, ±3			
		D2				
		D3				
iv.	Draft Gear Pocket	Y	327, +3,-0			

All dimensions are in mm.

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

**Centre Filler/Pivot Filler**

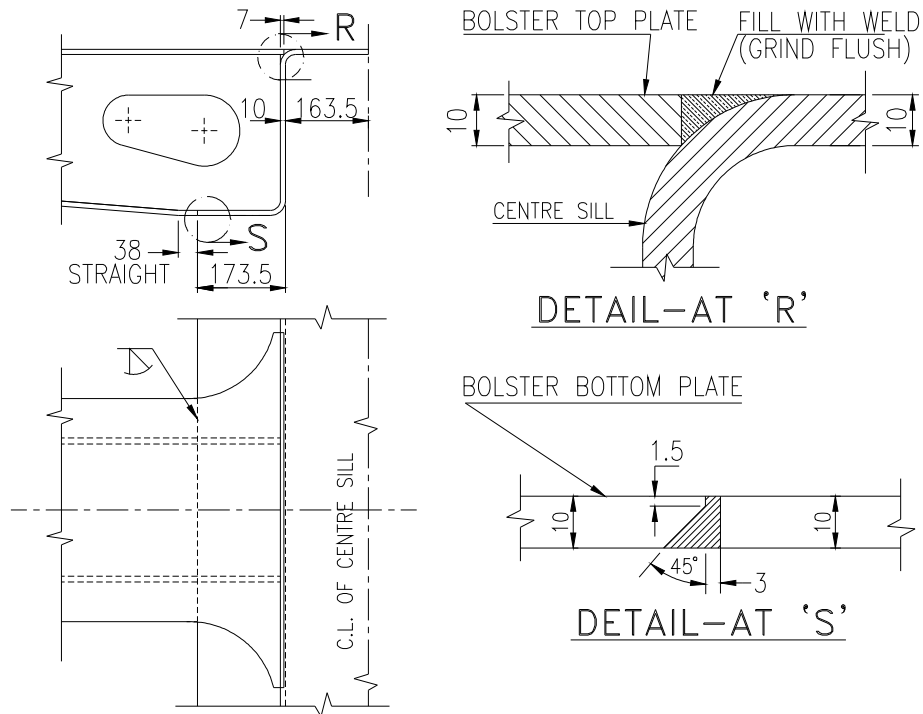


Sl. No.	STAGE	Works Inspector	RDSO Inspector	Remarks		
1	Fitment of all components					
2	Welding					
3	Dressing					
4	Dimensions		As follows			
	LOCATION		Nominal Dimensions & Allowable Deviation	Actual Dimension	Remarks	
				Works Inspection	RDSO Inspection	
I	Length of base plate	A	510 $\pm$ 1			
ii	Overall width at center position	B1 B2	330+3-0			
iii	Assembly height of Pivot filler	C	315 +0, -2			
iv	Thickness of base plate	D	20			
V	Length of Pivot Filler Support web plate at bending condition	E1 E2	400 $\pm$ 1			
Vi	Flatness of Base Plate of Filler Arrangement & Centre Sill after welding	-	Filler Gauge of 0.76 mm. should not pass between the straight edge & mounting surface			

Note: Centre filler base plate edge preparation should be checked properly.  
All dimensions are in mm.

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

**SPECIAL OBSERVATION AT BOLSTER**



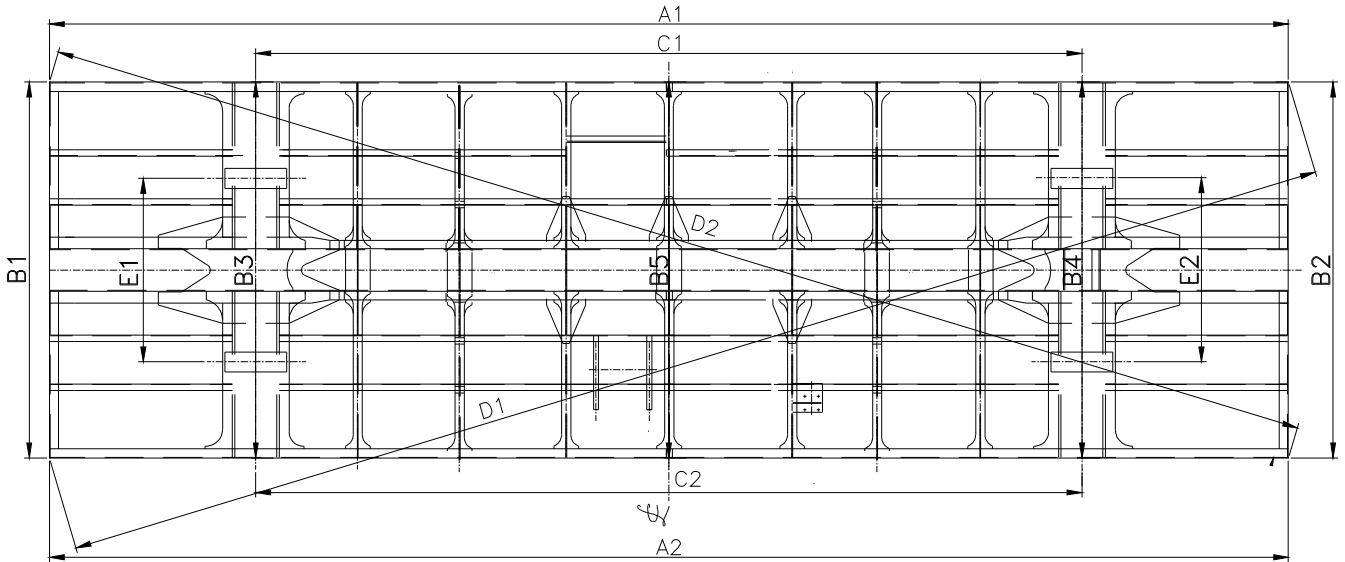
**CORRECT JOINT OF BOLSTER WITH CENTRE SILL**

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 0.76mm			
3.	Gap between centre sill flange and bolster bottom gusset plate	Less than 0.76mm			
4.	Gap between bottom plate of bolster and bolster bottom gusset plate	Less than 0.76mm			

All dimensions are in mm.

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

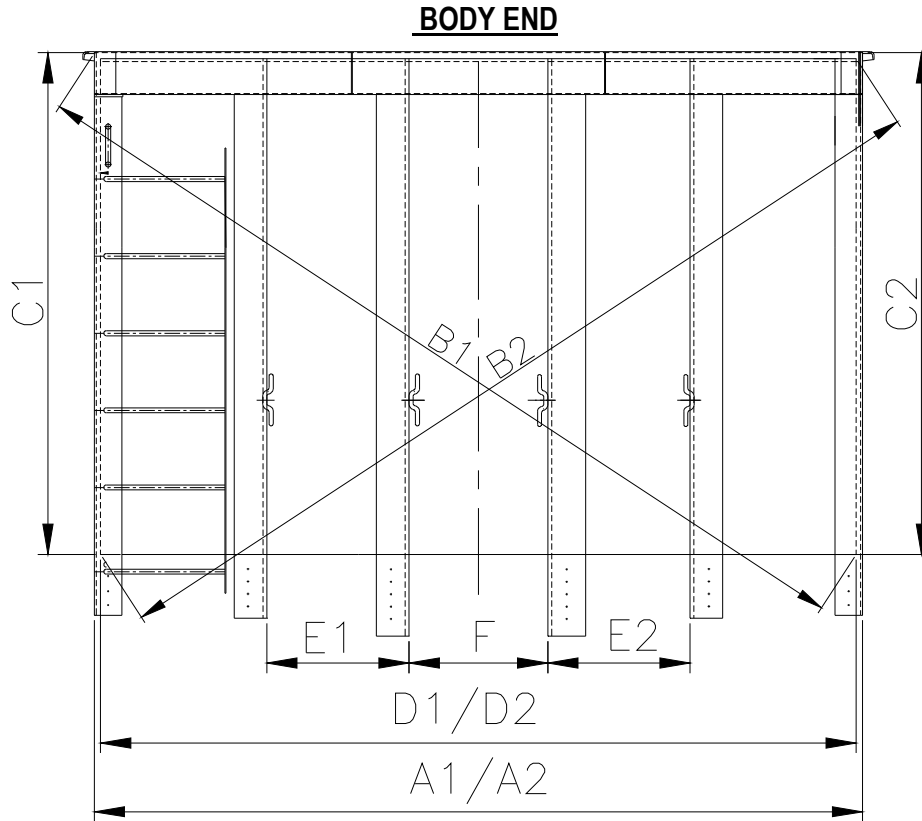
**UNDERFRAME**



UNDERFRAME NO:		Date:				
SL. NO.	STAGE	Works Inspection	RDSO Inspection	Remarks		
1.	Fitment of all components					
2.	Welding					
3.	Lock Bolting					
4.	Dressing					
5.	Dimensions	As follows				
	LOCATION		Nominal Dimensions & Allowable Deviation	Actual Dimension		Remarks
				Works Inspection	RDSO Inspection	
i.	Length over head stock	A1 A2	12800, +4,-2			
ii.	Width over solebar	B1	2860 ±3			
		B2				
		B3				
		B4				
iii.	Distance between bolster bogie centre	C1	8800, +5,-2			
		C2				
iv.	Diagonal difference over headstocks	D1 D2	≤ 5			
v.	Distance between side bearers centre	E1	1474±2			
		E2				
vi.	Camber value ( at Centre)	-	9±3mm			The camber 9±3 mm shall be achieved in final wagon
vii	Difference between side bearer top liner and centre pivot top	-	14, +0,-0.5			

All dimensions are in mm

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

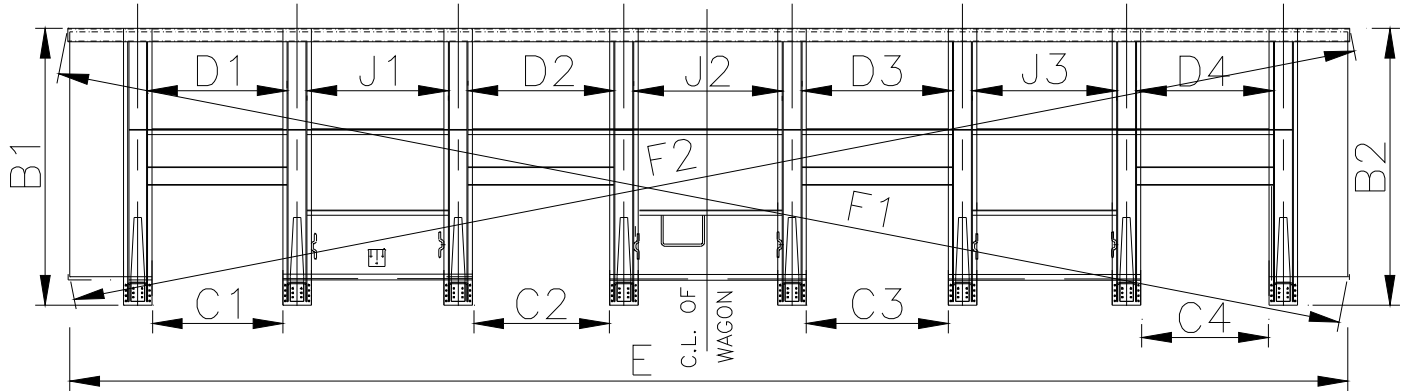


<b>BODY END NO:</b>			<b>Date:</b>			
SL. NO.	STAGE	Works Inspection	RDSO Inspection	Remarks		
1.	Fitment of all components					
2.	Welding					
3.	Dressing					
4.	Dimensions	As follows				
	LOCATION		Nominal Dimensions & Allowable Deviation	Actual Dimension		Remarks
				Works Inspection	RDSO Inspection	
i.	Width over corner stanchion	A1	2880, ± 3			
		A2				
ii.	Overall Height of End plate	C1	1786± 3			
		C2				
iii.	Overall width of End plate	D1	2820± 1.5			
		D2				
iv.	Distance between inner to outer stanchion	E1	550± 1.5			
		E2				
v.	Distance between inner to inner stanchion	F	560± 1.5			
vi.	Diagonal difference over body end	B1	≤ 5			
		B2				

All dimensions are in mm

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

**BODY SIDE**



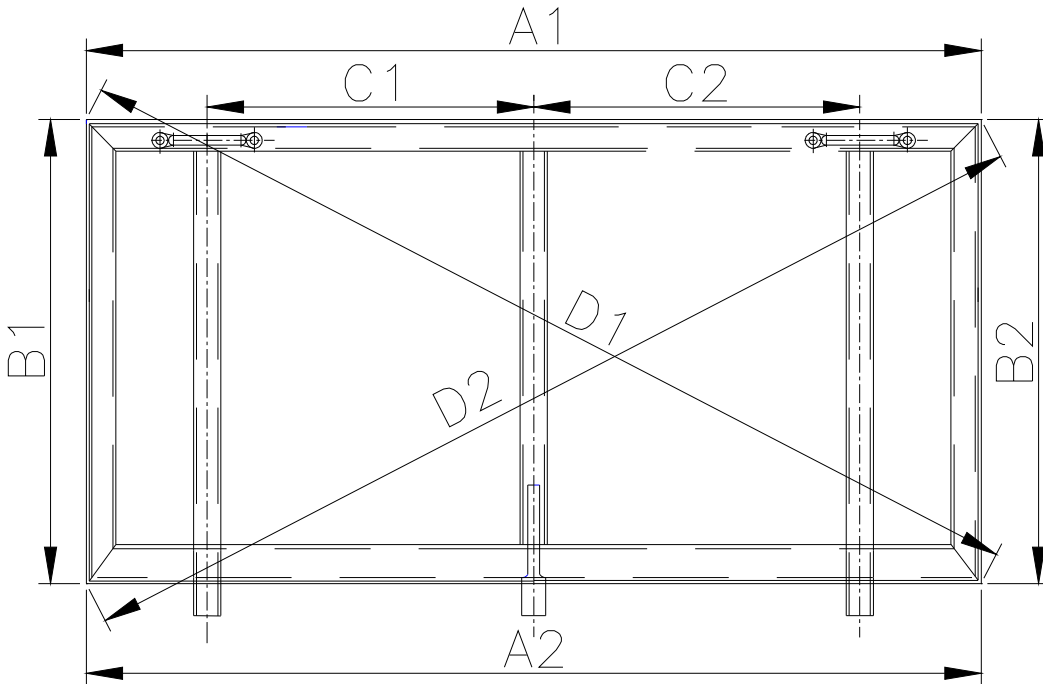
BODY SIDE NO:		Date:				
SL. NO.	STAGE	Works Inspection		RDSO Inspection		Remarks
1.	Fitment of all components					
2.	Welding					
3.	Dressing					
4.	Dimensions			As follows		
	LOCATION		Nominal Dimensions & Allowable Deviation	Actual Dimension		Remarks
				Works Inspection	RDSO Inspection	
i.	Side Wall Overall Height (Stanchion Back plate bottom to top coping)	B1 B2	2051±3			
ii.	Door opening (Horizontal)	C1 C2 C3 C4	1460, +0, -3			
iii.	Distance between side plate end to end	E	12730, +7,-3			
iv.	Diagonal difference over corner	F1 F2	≤ 5			
v.	Distance between body side stanchion pressings at doorway	D1 D2 D3 D4	1530± 3			
vi.	Distance between body side stanchion pressing at dummy quarter	J1 J2 J3	1392± 3			

All dimensions are in mm

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



**FLAP DOOR**

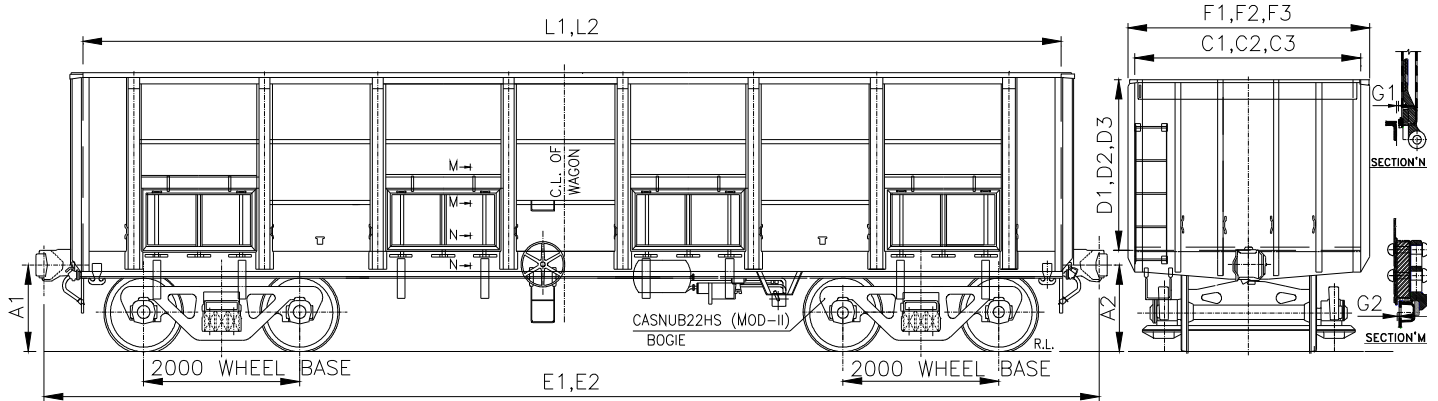


FLAP DOOR NO:			DATE:			
SL. NO.	STAGE	Works Inspection	RDSO Inspection		Remarks	
1.	Fitment of all components					
2.	Welding					
3.	Dressing					
4.	Dimensions	As follows				
	LOCATION		Nominal Dimensions & Allowable Deviation	Actual Dimension		Remarks
				Works Inspection	RDSO Inspection	
i.	Overall Length	A1	1480, +5,-0			
		A2				
ii.	Overall height	B1	777, +5,-0			
		B2				
iii.	Distance between door C.L to C.L of door hinge	C1	540±1.5			
		C2				
iv.	Diagonal difference over corner	D1	≤ 3			
		D2				

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.	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 A2	1105, +0, -5			
ii.	Length Inside	L1 L2	12800, +4, -2			
iii.	Width Inside	C1 C2 C3	2850, ± 3			
iv.	Height Inside (Floor level to top)	D1 D2 D3	1805, ± 3			
v.	Length over coupler face	E1 E2	13729, +7, -3			
vi.	Side bearer clearance	-	Nil			
vii.	Overall Width	F1 F2 F3	3100, ± 3			
viii.	Clearance between floor plate & door pressing	G1	5mm±0.5			
ix	Clearance between doorway crossbar & door plate	G2	5mm±0.5			
x..	Camber (at the both side of centre of wagon)	- -	9, ± 3			

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)	PU Pad make	
f)	Air Brake Make		g)	DV Make & Sr. no.	
h)	Brake Cylinder Make & Sr. Nos.		i)	Aux. Reservoir make	
j)	APM Make & Sr. No.		k)	Date of air brake testing	
l)	Date of SWTR unit calibration		8.	Coupler Make & Sr. Nos.	
9.	Draft Gear Make & Sr. Nos.		10.	Lock Bolt Make	
11.	CBB Make & Sr. Nos		12.	Grit/Shot blasting (As per G-72 latest Rev.)	
13.	Paint make		14.	CRF (Centre Sill) make	
15.	RFID Tag		16.	Tare Weight	
17.	D.M. Issue date		18.	TXR fit memo issue date	

19. RAD availed \_\_\_\_\_

20. Defects Observed \_\_\_\_\_

21. Remarks \_\_\_\_\_

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	Thickness >50 micron (DFT for primary paint) > 70 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 drawing no. WD-09052-S-61 of relevant wagon Mechanical Design Code Index drawing no. WD-00012-S-00		
<b>3.</b>	<b>COUPLER</b>			
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		
<b>4.</b>	<b>HAND BRAKE</b>			
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	
<b>Signature:</b>		<b>Signature:</b>	
<b>Name:</b>		<b>Name:</b>	
<b>Designation:</b>		<b>Designation:</b>	
<b>Date:</b>		<b>Date:</b>	

**PROFORMA 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 ± 0.1kg/cm <sup>2</sup>	
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.	99 +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 20 mm block. placed on bogie frame.	Brake cylinder pressure 3.8 ± 0.1kg/cm <sup>2</sup>	
17	Restrict the movement of lever arm of APM Device with 18 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:	

X-X-X