

INDIAN RAILWAYS



CHECKSHEETS FOR

Body End Arrangement, Body Side Arrangement & Flap Door Arrangement for BOXNR wagon

S. No.	Month & Year of issue	Revision / Amendment	Page No.	Reason for Amendment
1.	June - 2012	-	-	First issue
2.	Jan. - 2017	First Revision	-	End, side & door components are added
3.	August - 2017	Amendment no.-1	Page no.-6	In page no. 6, RFID Tag details added.

ISSUED BY

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

Amendment No. 01 to WD-CS-01-BOXNR-2012(Rev.-1) of August 2017

The following amendment is issued with the approval of the competent authority:

Para /Clause	:	In Amendment at page-6, S. No.7 added-
S. No. 7.	:	- The following S. No. 7 added at page no. 6:- “Wagon should be fitted with RFID Tags at marked location as per drawing no. WD-07001-S-12(with latest amendment/ revision)”.

X-X-X

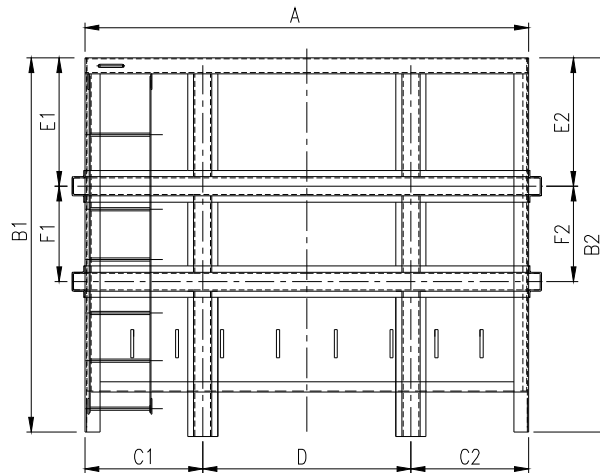
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Note:

1. **These check sheets do not detail all the dimensions or technical requirements of respective wagon sub-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 the purchase order, relevant latest drawings and/or RDSO's Guideline no. WD-16-BOXNR-2010 (Latest) to confirm conformity to the specified dimensions and technical details.**

BODY END ARRANGEMENT (RDSO Drawing No. WD-07001-S-10)



BODY END NO:			Date:			
SL. NO.	STAGE	Works Inspection	Inspecting Authority	Remarks		
1.	Fitment of all components					
2.	Welding	Check quality of welding visually. If required check with welding gauge				
3.	Dressing					
4.	Dimensions	As Under				
	LOCATION		Nominal Dimensions & Allowable Deviation (in mm)	Actual Dimension		Remarks
				Works Inspection	Inspecting Authority	
i.	Width over end top coping	A	2960± 3			
ii.	End Wall overall height	B1	2377± 3			
		B2				
iii.	Distance between corner angle to centre of outer stanchion	C1	968± 1.5			
		C2				
iv.	Distance between centre of inner to inner stanchion	D	1044± 1.5			
v.	Distance between end top coping top to end wall middle coping centre (upper)	E1	756± 1.5			
		E2				
vi.	Distance between two end wall middle coping	F1	661± 1.5			
		F2				
5.	Product Identification	As per clause 6.16 (i) of WD – 16 – BOXNR – 2010 (Latest)				

Works Inspector		Inspecting Authority	
Signature:		Signature:	
Name:		Name:	
Designation:		Designation:	
Date:		Date:	

6. Other "Body End Arrangement" Items:

a. Tarpaulin Cleat (Common for Body End & Body Side): W/ML-2726:

Dia. 16 ±0.2	Length				Value 25 ±0.5	Chemical analysis
	205 ±3	65 ±1	75 ±1	65 ±1		

b. Ladder arrangement:

b.(i). Flat:

Parameter	Value	Measurement					Chemical analysis
Length	2143 ±4						
width	50 ±1						
Thickness	6 ±0.2						

b.(ii). 'L' Pressing:

Parameter	Value	Measurement					Chemical analysis
Leg	155 ±2						
leg	40 ±1						
Thickness	8 ±0.2						

b.(iii). Flat:

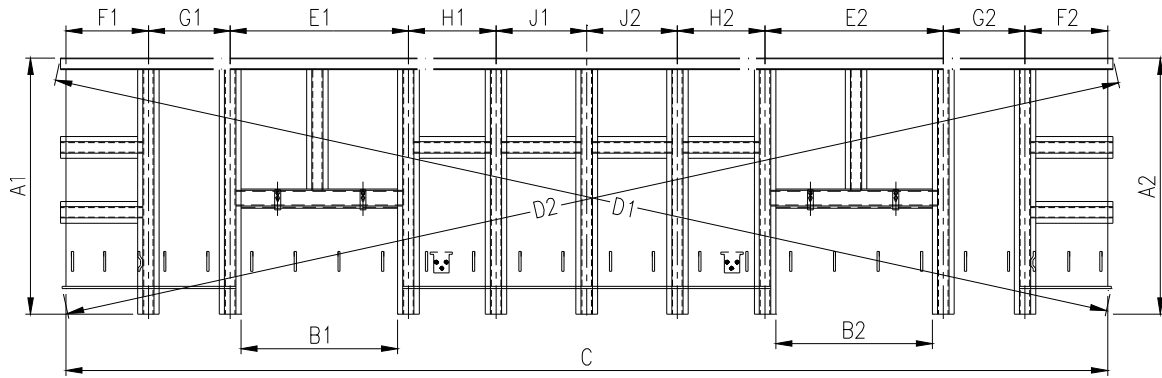
Parameter	Value	Measurement					Chemical analysis
Length	145 ±2						
Width	100 ±2						
Thickness	8 ±0.2						

b.(iv). 20 NB MS Seamless pipe : IS:1239 Part-I (Heavy)

Parameter	Value	Measurement					Chemical analysis
Dia.	20 NB						
Length	400 ±2						

Works Inspector		Inspecting Authority	
Signature:		Signature:	
Name:		Name:	
Designation:		Designation:	
Date:		Date:	

BODY SIDE ARRANGEMENT (RDSO Drawing No. WD-07001-S-08)



BODY SIDE NO:			Date:	
SN	STAGE	Works Inspection	Inspecting Authority	Remarks
1.	Fitment of all components			
2.	Welding	Check quality of welding visually. If required check with welding gauge		
3.	Dressing			
4.	Dimensions	As Under		
	LOCATION	Nominal Dimensions & Allowable Deviation (in mm)	Actual Dimension	
			Works Inspection	Inspecting Authority
i.	Side Wall Overall Height	A1	2371±3	
		A2		
ii.	Door opening	B1	1440, +0, -3	
		B2		
iii.	Distance between side plate end to end	C	9710, +7,-3	
iv.	Diagonal difference over corner	D1	≤ 5	
		D2		
v.	Distance between stanchion centre at doorway	E1	1661± 3	
		E2		
vi.	Distance between door way stanchion centres to dummy quarter stanchion	H1	832,± 3	
		H2		
vii.	Distance between side plate end line to 1 st Stanchion centre	F1	733,± 3	
		F2		
viii.	Distance between 1 st Stanchion centre to 2 nd Stanchion centre	G1	799,± 3	
		G2		
ix.	Distance between centre stanchion to dummy quarter stanchion (centres)	J1	830,± 3	
5.	Product Identification	As per clause 6.16 (i) of WD – 16 – BOXNR – 2010 (Latest)		

Works Inspector		Inspecting Authority	
Signature:		Signature:	
Name:		Name:	
Designation:		Designation:	
Date:		Date:	

6. Other “Body Side Arrangement” Items:

a. Pershad Label Holder : W/ML-11

03 nos. plugs welding	Observation					Chemical analysis
Plug 1						
Plug 2						
Plug 3						

b. Body Side Hand Hold (20 NB MS Seamless pipe to IS:1239 Part-I (Heavy) : WD-07001-S-08:

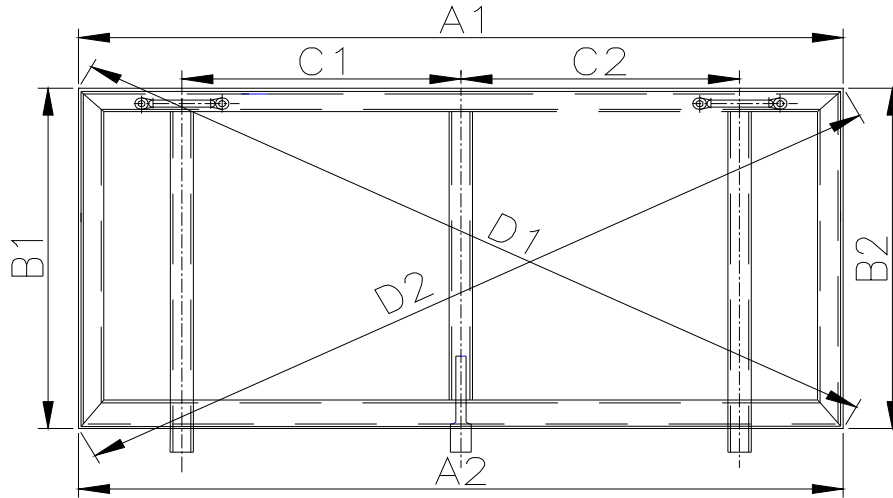
Parameter	Value	Measurement					Chemical analysis
Dia.	20 NB						
Length	691 ±3						
Leg	77 ±1						

c. “Packing Piece” inside the doorway stiffening crossbar at location of door cotter : WD-07001-S-08:

Parameter	Value	Measurement					Chemical analysis
Length	133 ±2						
width	45 ±1						
Thickness	28 ±0.5						

Works Inspector		Inspecting Authority	
Signature:		Signature:	
Name:		Name:	
Designation:		Designation:	
Date:		Date:	

FLAP DOOR ARRANGEMENT (RDSO's Drawing No. WD-09034-S-07) alt.-(latest)



FLAP DOOR NO:			DATE:		
SL. NO.	STAGE	Works Inspection	Inspecting Authority		Remarks
1.	Fitment of all components				
2.	Welding	Check quality of welding visually. If required check with welding gauge			
3.	Dressing				
4.	Dimensions	As Under			
	LOCATION		Actual Dimension		Remarks
		Nominal Dimensions & Allowable Deviation (in mm)	Works Inspection	Inspecting Authority	
i.	Overall Length	A1	1460, +5,-0		
		A2			
ii.	Overall height	B1	775, +3,-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			
5.	Product Identification	As per clause 6.16 (i) of WD - 16 - BOXNR - 2010 (Latest)			

Works Inspector		Inspecting Authority	
Signature:		Signature:	
Name:		Name:	
Designation:		Designation:	
Date:		Date:	

6. Other “Flap Door Arrangement” Items:

a. Locking bolt: WD-09034-S-07:

Parameter	Value	Measurement					Chemical analysis
Length	250 ±2						
Head dia.	16 ±0.2						
Shank dia.	30±0.5						

b. Door hinge straight (long): WD-93067-S-01:

Parameter	Value	Measurement					Chemical analysis
Length	752 ±3						
Hole dia.	21.5 ±0.2						
Dia. (outer)	44±0.8						
offset	36±0.5						
Dim.	20±0.2						
Thickness	12±0.2						
width	45±1						

c. Door hinge straight (Short): WD-93067-S-02:

Parameter	Value	Measurement					Chemical analysis
Length	200 ±2						
Hole dia.	21.5 ±0.2						
Dia. (outer)	44±0.8						
offset	36±0.5						
Dim.	20±0.2						
Thickness	12±0.2						
width	(45±1)/(35±1)						

d. Door hand hold : W/ML-6:

Parameter	Value	Measurement					Chemical analysis
CRS	156 ±1.2						
Dia.	16 ±0.2						
Plug weld	-						

Works Inspector		Inspecting Authority	
Signature:		Signature:	
Name:		Name:	
Designation:		Designation:	
Date:		Date:	

e. Door hinge foot : WD-09034-S-07:

Parameter	Value	Measurement				Chemical analysis
Length (overall)	305 ±2					
Width of base plate	45 ±1					
Thickness of base plate	12 ±0.2					
CRS	254 ±1.2					
CRS	57 ±0.8					
Hole dia.	17.5 ±0.2					
Gap between pin support leg	48 ±1					
Length of pin support leg	51.5 ±1					
Width of pin support leg	45 ±1					
Thickness of pin support leg	22 ±0.5					

f. Pin to support door hinge (short & long): WD-09034-S-07:

Parameter	Value	Measurement				Chemical analysis
Length (overall)	107 ±2					
Shank Dia.	20 ±0.2					
Head Dia.	29 ±0.5					

g. Flap door chainless cotter rivet : WD-04063-S-01:

Parameter	Value	Measurement				Chemical analysis
Length (overall)	135.5 ±2					
Length of 22 Dia.	30 ±0.5					
Length of 16 Dia.	90 ±1					
Head dia.	35 ±1					

Works Inspector		Inspecting Authority	
Signature:		Signature:	
Name:		Name:	
Designation:		Designation:	
Date:		Date:	

h. Flap door chainless cotter : W/DW-297:

Parameter	Value	Measurement					Chemical analysis
Length	172 ±2						
Width	44 ±1						
Thickness	28.5±0.5						

i. Door check spring: W/DW-305D:

Parameter	Value	Measurement					Chemical analysis
Length	495 ±2						
Width	100 ±1						
Thickness	16 ±0.2						
CRS	76 ±0.8						

Works Inspector		Inspecting Authority	
Signature:		Signature:	
Name:		Name:	
Designation:		Designation:	
Date:		Date:	

Sampling Plan & Schedule of Stage Inspection for manufacture of Body Side Arrangement, Body End Arrangement & Flap Door Arrangement for BOXNR (to be ensured by firm & inspecting authority)

SL No.	Component/Operation/ Product/Process	Characteristics / Parameters	Mode of Inspection / Equipment	Sample Size% & Inspection frequency	Reference Document/ Specification	Acceptance Criteria	Documents of Records	Performance			Rejection / Reprocess / Scrap	Remarks	
								SV	MV	IA			
1	2	3	4	5	6	7	8	9	10	11	12	13	
1.0 Raw Material													
1.1	Steel Plates & Structural (own purchase)	a. Receipt particulars	a. Review of Records	a. 100%	Challan	Conform to the respective RDSO drawings and purchase from RDSO vendors.	a. Firm's Internal Records		P	V	Scrap, earmarked 'NOT FOR USE' and return after joint inspection.	1.	First In, First Out to be followed for issuing the material.
		b. Stacking, colour coding & lot no./ heat no./marking	b. Physical verification	b. 100%	Colour coding as given in Col.13, Other as per plan	Stacking to be above ground level, Colour coding to be as given in Col.13, Clear identification of lot, others as per challan/invoice and clearly visible	b. Firm's Internal Records		P	V		2	Raw materials to be stacked as per Grade, Plate Thickness and Size with Colour code. IRS:M44 Colour code: Red+White
		c. Lot to be formed heat wise /cast wise.	c. Physical verification	c. 100%	-	Conform to the requirement	c. Firm's Internal Records		P	V			Colour Codes, Heat , lot no. & date to be stenciled at the corner throughout the length.
		d. Visual Inspection	d. Visual	d. 1 per lot		Free from rust & pitting	d. Firm's Internal Records		P	V			
		e. Dimensions	e. Measuring instruments/ Gauges	e. 5%	As per invoice	To be as per invoice	e. Firm's Internal Records		P	V			Measuring instruments/ gauges shall be calibrated by competent authorities and records shall be available with the contractor.
		f. Chemical composition	f. Spectrometer	f. 1 per heat	Relevant IS/IRS specification	To be as per relevant IS/IRS specification	f. Firm's Internal Records		P	V			
		g. Physical Properties	g. UTM & other machines	g. 1 per heat	Relevant IS/IRS specification	To be as per relevant IS/IRS specification	g. Firm's Internal Records		P	V	Scrap, earmarked 'NOT FOR USE' and return after joint inspection		
		h. Tested material composition	h. Review of Records	h. 100%	Mill Test Certificate	To be as per relevant IS/IRS specification	h. Firm's Internal Records		P	V			Testing of material shall be done by third party or as suggested by RDSO.
		i. Issue of material	i. Review of Records	i. 100%	As per plan	To be as per plan	i. Firm's Internal Records		P	V			
		j. Traceability to be maintained up to final stage & pieces	j. Review of Records	j. 100%	Respective record	Conform to the requirement	j. Firm's Internal Records		P	V			

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SL No.	Component/Operation/ Product/ Process	Characteristics / Parameters		Mode of Inspection / Equipment	Sample Size% & Inspection frequency	Reference Document/ Specification	Acceptanc e Criteria	Documents of Records	Performan ce			Rejection / Reprocess / Scrap	Remarks		
									SV	MV	IA				
1	2	3		4	5	6	7	8	9	10	11	12	13		
1.2	Preparatory Work (Colour coding, Shearing, Sawing, Cutting, Profile, Deburring, Flatness, Bending, Drilling etc)	a.	Material Identification	a. Visual & Review of Records	a. 100%	As Colour Code, relevant Drawings & G-72, Rev- 3	To be as per relevant Drawings & G-72, Rev- 3	a.	Firm's Internal Records	P	P	V	Reject/reprocess	1	Colour code transferred to cut plates & lot no. also to be marked.
b.		Stacking, colour coding & lot no.	b. Review of Records	b. 100%	b.										
c.		Free from crack,lamination,notch marks, burrs	c. Visual	c. 5%	c.										
d.		Dimensional.	d. Tape/Template/Gauge	5%	d.										
2	Bought out items														
2.1	C.R.F Section	a.	General Condition (damages, etc.)	a. Visual	100%	Relevant IS/IRS specification	Conform to respective RDSO drawing	Firm's Internal Records		P	V	-do-		To be procured from RDSO approved vendors with RDSO inspection.	
b.		Verification of facsimile of stamp & correlation with D.M. etc	b. Visual & Review of Records												
2.2	Welding Electrodes	a.	Class/ grade	Visual	5%	G-72, Rev-3 & procured from RDSO approved vendor sources	To be as per G-72 Rev.3 & RDSO approved list, Exp. Date to be sufficient till planned use	Firm's Internal Records		P	V	-do-		To be procured from RDSO approved vendors with RITES inspection.	
b.		Source of supply													
c.		Exp. Date													

Sampling Plan & Schedule of Stage Inspection for manufacture of Body Side Arrangement, Body End Arrangement & Flap Door Arrangement for BOXNR (to be ensured by firm & inspecting authority)

SL No.	Component / Operation / Product / Process	Characteristics / Parameters	Mode of Inspection / Equipment		Sample Size % & Inspection frequency		Reference Document / Specification	Acceptance Criteria	Documents of Records	Performance			Rejection / Reprocess / Scrap	Remarks		
										SV	MV	IA				
1	2	3	4		5		6	7	8	9	10	11	12	13		
3.0 Other Purchase items																
3.1	Other bought out items and shop made components	a.	Finish	a.	Visual	a.	100%	Respective RDSO drawing	Respective RDSO drawing	Firm's Internal Records		P	V	Reprocess/ Scrapped		
		b.	Dimensions	b.	Measuring tape/Gauge	b.	25%									
		c.	Chemical composition	c.	Spectrometer	c.	1%									
		d.	Physical Properties	d.	UTM & other machines	d.	1%									
		e.	Tested material composition	e.	Review of Records	e.	100%									
		f.	Welding (as applicable)	f.	Visual	f.	100%	As per IS: 9595								
		g.	Machining (as applicable)	g.	Visual	g.	100%									
		h.	Forming (as applicable)	h.	Visual	h.	100%									
4.0 Process Inspection																
4.1	Jigs, Fixtures, Templates etc.	a.	Dimensional accuracy	a.	Measuring tape/Gauge	100% at 6 months interval	Manufacturer's drawing	As per Manufacturer's drawing	Firm's Internal Records		P	W	Re-manufacture	Calibration required after six month.		
		b.	General Condition	b.	Visual											
		c.	Identification	c.	Visual Review of Records											
4.2	Welders	a.	Performance	Visual & Non Destructive		100 % at every 6 months	IS-7310 part-1, 1974	As per IS-7310 part-1, 1974	Firm's Internal Records		P	W	Re-trained	Valid welder's certificate of third party shall be available with the contractor		
		b.	Qualification													
		c.	Training													
4.3	Welding Checks	a.	Edge preparation (for butt welds)	a.	Visual	a.	100%	WPS	WPS	Firm's Internal Records		P	W	Reprocess		
		b.	Fitup before welding	b.	Visual & Gauges										b.	100%
		c.	Leg length (for fillet weld)	c.	Gauges										c.	100%
		d.	Blow hole	d.	Visual										d.	100%
		e.	Spatter	e.	Visual										e.	100%

**Sampling Plan & Schedule of Stage Inspection for manufacture of Body Side Arrangement, Body End Arrangement & Flap Door Arrangement
for BOXNR (to be ensured by firm & inspecting authority)**

SL No.	Component/Operation/Product/Process	Characteristics / Parameters		Mode of Inspection / Equipment		Sample Size% & Inspection frequency	Reference Document/ Specification	Acceptance Criteria	Documents of Records	Performance			Rejection / Reprocess / Scrap	Remarks
										SV	MV	IA		
1	2	3		4		5	6	7	8	9	10	11	12	13
5.0	Product Inspection - SUB - ASSEMBLIES													
5.1	Body Side fabrication	a.	Fitment & Edge preparation	a.	Visual & Gauges	100%	RDSO drawing, WPS & WD-16-BOXNR-2010 (latest)	To be as per RDSO drawing & WPS	As per attached check sheet placed at page no. 4		P	W	Reprocess / Scrapped	Lot no. & Sub – Assembly Sl. NO. to be marked, stenciled & records kept.
		b.	Welding	b.										
		c.	Dimensional check up	c.	Measuring Tapes & Gauges									
		d.	Material Identification	d.	Records									
		e.	Product Identification	e.	Visual									
5.2	Body End fabrication	a.	Fitment & Edge preparation	a.	Visual & Gauges	100%	RDSO drawing, WPS & WD-16-BOXNR-2010 (latest)	To be as per RDSO drawing & WPS	As per attached check sheet placed at page no. 3		P	W	Reprocess / Scrapped	Lot no. & Sub – Assembly Sl. NO. to be marked, stenciled & records kept.
		b.	Welding	b.										
		c.	Dimensional check up	c.	Measuring Tapes & Gauges									
		d.	Material Identification	d.	Records									
		e.	Product Identification	e.	Visual									
5.3	Flap Door fabrication	a.	Fitment & Edge preparation	a.	Visual & Gauges	100%	RDSO drawing, WPS & WD-16-BOXNR-2010 (latest)	To be as per RDSO drawing & WPS	As per attached check sheet placed at page no. 5		P	W	Reprocess / Scrapped	Lot no. & Sub – Assembly Sl. NO. to be marked, stenciled & records kept.
		b.	Welding	b.										
		c.	Dimensional check up	c.	Measuring Tapes & Gauges									
		d.	Material Identification	d.	Records									
		e.	Product Identification	e.	Visual									

LEGENDS: W.I - Works Inspector, SV - Sub Vendor, MV - Manufacturer / Vendor, IA - Inspection Authority / Vendor, DM - Dispatch Memo, P- Perform, V- Verify, W-Witness