



QM-C-7.1/BOGIE LWLH25/0001/A
INSPECTION CHECK SHEET FOR LWLH25 BOGIE SIDE FRAME

- 1 Name of Manufacturer :
- 2 Address of works :
- 3 Date of offer :
- 4 RDSO File No :
- 5 Description of material :
- 6 Drawing and Alt. No :
- 7 Specification and grade :
- 8 P.O. No :
- 9 Total quantity Ordered :
- 10 Quantity Earlier passed :
- 11 Quantity now offered :
- 12 Consignee :
- 13 D.P :

- a. Date of inspection
- b. Quantity accepted
- c. Quantity rejected
- d. Balance order

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Note:

These check sheets do not detail all the dimensions or technical requirements of respective Bogie 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.

1. A) Detail of side frame castings offered

S.No. of Side Frame Casting Offered	Heat No.	Date of Cast	Date of heat clearance by RDSO	Date of heat Treatment

B) Detail of weld repair of Side frame castings

S.No. of Side Frame Castings repaired	Heat No.	DPT done yes/no	heat Treatment done
Detail of DPT Agents Used in Crack Detection of Side Frame			
Agent	Make	Expiry Date	
CLEANER			
PENETRANT			
DEVLOPER			

C) Visual/Physical Examination

	Specified	Observations				
Surface defect	Inclusion, sand fusion, blow holes, folds, cracks, misruns, surface imperfections, unfused chaplets, porosity.					
Surface finish	Surface finish check by SCRATA Comparators.					
Marking Details	As per drawing WD - 13012 - S/10					
Weighment Details (5%)	Specified Side frame weight - $400 \pm 5.5\%$					

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1. Chemical, Micro-examination & Mechanical Properties Test

(A) Chemical Composition (As Per M&C Heat Clearance Register)

Element\ Heat No.											
C - 0.32 (Max.)											
Mn- 1.2(Max.) *											
P - 0.04 (Max)											
S - 0.04 (Max)											
Si - 1.50 (Max.)											
CE - 0.72 (Max)											

* Normally Manganese recommended is 0.9% max. with max. carbon as 0.32%, For each reduction of 0.01% carbon below the max. specified, an increase of 0.04% manganese above the max. Specified amount may be permitted to a max. of 1.2%.

B) Micro-examination(As Per M&C Heat Clearance Register)

Grain Size ASTM 4 or finer											
Microstructure Normalized / Normalized & Tempered and should be Non- dendritic											

C) MECHANICAL PROPERTIES (AS PER THE HEAT REGISTER)

Specified Value(N/mm2/Mpa)											
UTS-551(Min)											
YS-344.4(Min)											
El in 2 inch %- 24 (Min)											
RA%-36 (Min)											
IMP-20.3 J at -7° C (Min)											
Hardness- 137-228 BHN											

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2. GAUGE FOR INDIVIDUAL SIDE FRAMECASTING - 5%

S.N O.	DESCRIPTION	GAUGE DRAWING NO.	OBSERVATION			
1	Central opening height gauge (GO & NO GO)					
2	Distance between friction liner & dimension 470 mm					
3	Bolster Anti Rotation control lug gauge (GO & NO GO)					
4	Column side width - cum off set check					
5	Central opening bottom distance gauge (GO & NO GO)					
6	Central opening bottom profile (GO / NO GO)					
7	Spring plank seat profile gauge					
8	Pedestal roof profile & width check					
9	Pedestal jaw lug vertical profile check					
10	Pedestal jaw lug transverse profile check					
11	Pedestal jaw gap check (GO/ NO GO)					
12	Pedestal to key slot distance limit gauge					
13	Brake beam pocket size check					
14	Brake beam pocket Nib hole check					
15	Jaw opening centre marking device					
16	Rivet fit bolt hole position check gauge					
17	Column locater for side frame rivet					
18	Warp check gauge					
19	Pedestal roof level distance check					
20	Wheel base check cum pairing gauge					
21	Central opening off set check					
22	Brake beam location alignment check					

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3. LUG ANALYSIS TEST

Break one lug from any Side Frame

	M&C Heat Register		RDSO Observation	
Specified Value	SF Sl. No.		SF Sl. No.	
	Heat No.		Heat No.	
1. Chemical				
C - 0.32 (Max.)				
Mn- 1.20 (Max.)*				
P - 0.04 (Max)				
S - 0.04 (Max)				
Si - 1.50 (Max.)				
CE - 0.72 (Max.)**				
2. Grain Size ASTM 4 or finer				
3. Microstructure Normalized / Normalized & Tempered (should be Non - dendrites)				

Final Observation:

1. Chemical Composition is as per STR and RDSO observed values are comparable with M & C heat clearance register.
2. Checked H.T. Register & confirmed that all the serial no. offered have been properly heat treated as per H.T. register.
3. * Normally Manganese recommended is 0.9% max. with max. carbon as 0.32%, For each reduction of 0.01% carbon below the max. specified, an increase of 0.04% manganese above the max. Specified amount may be permitted to a max. of 1.2%.

4. **[*Carbon Equivalent (CE)* = $C + \frac{Mn+Si}{6} + \frac{Cr+Mo+V}{5} + \frac{Ni+Cu}{15}$]

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4. MAGNETIC PARTICLE TEST

**NOTE - 100% MPI has to be done for side frame.
5% counter checking is to be done by RDSO.**

Heat No.	Casting Serial No.	OBSERVATION	REMARKS

**5. RADIOGRAPHIC TEST
As per sketch given in specification(1 in 100 Bogies)**

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Casting SL. No.	Location	Accepted level of severity as per ASTM E - 446 -81 or E - 71	Observation
	Location - 2	Gas porosity , sand inclusion & Shrinkage - Level 3 (In CB & CD Cat.)&Shrinkage Level 4 (In CA & CC Cat)	
	Location - 2		
	Location - 3 & 5	Gas porosity& sand inclusion; Shrinkage - Level 4 (In CB & CD Cat. & CA & CC Cat)	
	Location - 3 & 5		
	Location -1 & 4	Gas porosity & sand inclusion; Shrinkage - Level 5 (In CB & CD Cat. & CA & CC Cat)	
	Location -1 & 4		

6. LOAD TESTING REPORT (WD - 40 - LWLH25 - BOGIE)

Static Load Test for Side frame as per sketch given in specification (1 in 100 Bogies):-

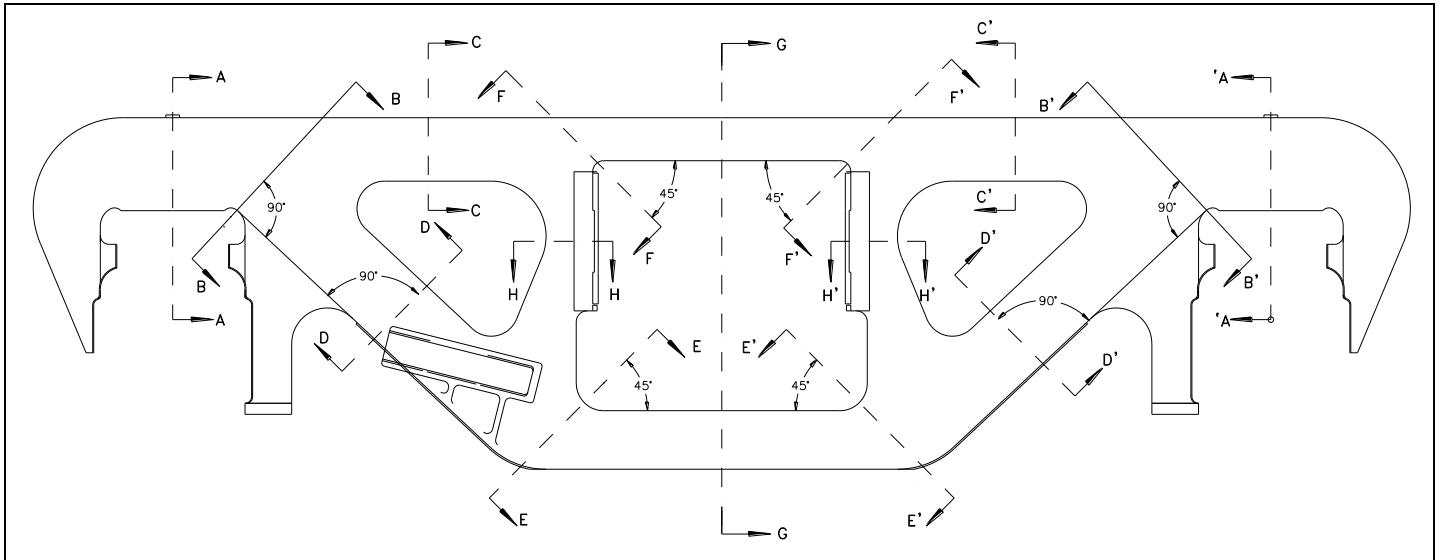
Load S. No.	Type of test load for side frame	Amount of load to be applied (T)	Allowable deflection (mm)	Observed deflection (mm)	Allowable permanent Set (mm)	Observed permanent set (mm)
a)	Transverse loading (F2)	15.90	3.60		---	---
b)	Transverse loading (F2)	27.20	---	---	0.35	
c)	Vertical loading at plank seat (F1)	53.30	1.80		---	---
d)	Vertical loading at plank seat (F1)	102.0	---	---	0.35	
e)	Vertical loading at plank seat(Ultimate Load) (F1)	283.500 (Minimum)	Observation of ultimate load test			

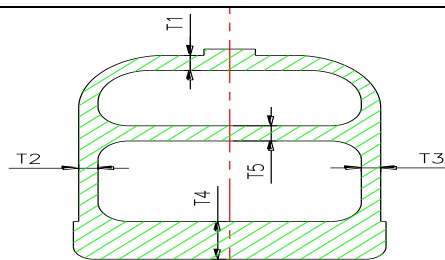
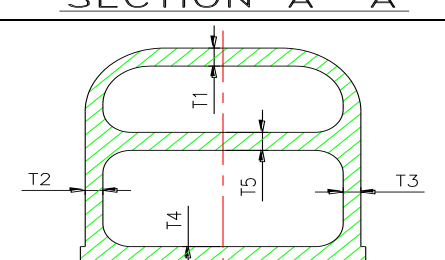
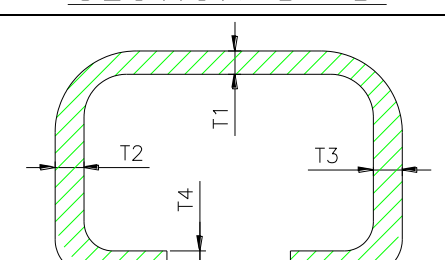
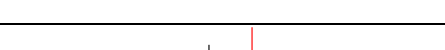
NOTE: - Suitable crack detection test to be carried out before and after static load testing.

7. Sectioning Test- Side frame(1 in 100 Bogies)

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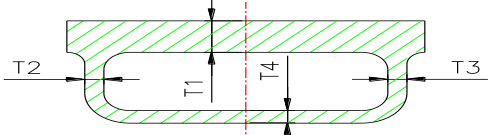
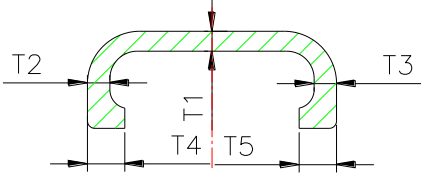
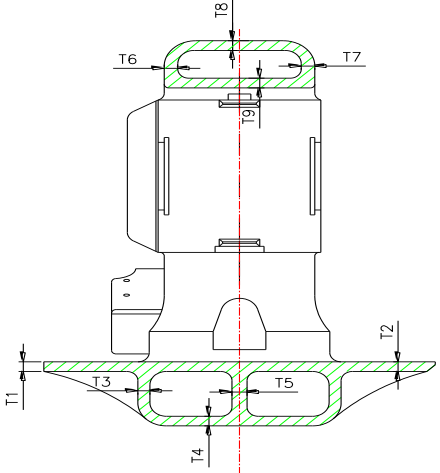
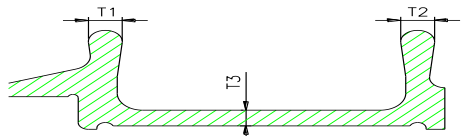


A - A A' - A'	T1	12	A - A	A' - A'	 SECTION A-A SECTION A'-A'
	T2	12			
	T3	12			
	T4	33			
	T5	12			
B - B B' - B'	T1	12	B - B	B' - B'	 SECTION B-B SECTION B'-B'
	T2	12			
	T3	12			
	T4	32			
	T5	12			
C - C C' - C'	T1	12	C - C	C' - C'	 SECTION C-C SECTION C'-C'
	T2	14			
	T3	14			
	T4	12			
			D - D	D' - D'	

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D - D	T1	12				
	T2	14				
	D' - D'	T3	14			
		T4	15			
E - E	T1	40	E - E	E' - E'	 <p style="text-align: center;">SECTION E-E SECTION E'-E'</p>	
	T2	16				
	E' - E'	T3	16			
		T4	16			
F - F	T1	14	F - F	F' - F'	 <p style="text-align: center;">SECTION F-F SECTION F'-F'</p>	
	T2	18				
	F' - F'	T3	18			
		T4	30			
		T5	30			
G - G	T1	16	G - G		 <p style="text-align: center;">SECTION G-G</p>	
	T2	16				
	T3	16				
	T4	16				
	T5	20				
	T6	18				
	T7	18				
	T8	16				
	T9	16				
H - H H' - H'	T1	20	H - H	H' - H'	 <p style="text-align: center;">SECTION H-H SECTION H'-H'</p>	
	T2	20				
	T3	14				

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