Govt. of India
Ministry of Railways
Research Designs & Standards Organisation
Manak Nagar, Lucknow-226011

QM-C-7.1/COUPLER/0003
Inspection Plan(Check Sheet)

Item: High Capacity Draft Gear
Specn. : 49-BD-08
Amd.:
Drg. No. & Alt.: WD-81010-S-03

1.Firms Name:

2.Date (Period) of Inspection :

Contract details :

a. Contract No. and Date :
b. Order Placing authority :
c. Specification no :

(as mentioned in contract)

d. Drawing No :

(as mentioned in contract)

3.Quantity on Order :

4.Quantity offered for inspection :

5.Date of offering for inspection:

6.Consignee :

7.Delivery Period;

Signature of firms Representative Signature of Inspecting Official of RDSO

Summary of Results

SN	Items Inspected	Specified values	Observations
1.	Metallurgical & Chemical Properties of Housing	As per check Sheet	
2.	Draft Gear Assembly	Gauging	
3.	DG Housing	Gauging	
4.	Wedge Shoe	Gauging	
5.	Wedge	Gauging	
6.	Top Follower	Gauging	
7.	Rear Wall Plate	Gauging	
8.	Pre – Shortner	Crushing Strength	
9.	Bore Insert	Gauging	
10.	Rubber Pad	Verify DM	
11.	Capacity	Last test done on	
12.	Production Testing	Verify from records	
13.	Status of QAP	Verify from records	
14.	Chemical of bought out components	Verify from TC	

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INSPECTION CHECK SHEET

Lot size – 50 nos. Max.

Sample size – 2 nos.

1. Manufacturing & Inspection of Draft Gear & its components as per manufacturer's approved QAP.
2. Visual Inspection
   Sample size : One assembly

RF – 361 Draft Gear

SN	Components	Remarks of RDSO inspecting official
1.	DG Housing	
2.	Bore Insert	
3.	Pre Shortner	
4.	Wedge Shoe	
5.	Wedge	
6.	Top Follower	
7.	Rear Wall plate	
8.	Rubber Pad	

3. Metallurgical & Chemical Testing of Draft Gear Housing (RF – 361)

Heat No.	
Serial No.	

4. Chemical Testing
   To be checked by Spectro

S.No.	Parameter	Specified value	Observed value
1.	C%	0.30 – 0.35	
2.	Mn%	0.70 - 1.00	
3.	Si%	0.35 – 0.80	
4.	S%	0.040 Max.	
5.	P%	0.040 Max.	
6.	Cr%	0.25 Max.	
7.	Mo%	0.25 Max.	
8.	Ni%	0.25 Max.	
9.	Al%	0.03 – 0.08	
10.	CE%	0.63 Max.	

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5. Mechanical & Metallurgical Properties

S.No.	Parameter	Specified value	Observed value
1.	UTS	95000 PSI	
2.	YS	65000 PSI	
3.	EL %	10	
4.	RA%	25	
5.	Imp.(-20°F or -28.88°C)	15 ft ib or 20.4 J	
6.	Hardness	217 – 285 BHN	
7.	MICRO	Tempered Martensite	
8.	Grain Size	6-8	

6. Dimensions by gauging (Assembly) (RF – 361)

Sample – Two no.

Heat no. & Serial no. 1. 2.

SN	Draft Gear Assembly	Firm's gauge no.	Observations	
			Sample 1	Sample 2
1.	Assembled draft gear			
2.	Draft gear pre shortened length top (Go gauge)			
3.	Draft gear pre shortened length (No go gauge)			

7. Dimensions by gauging (DG housing) to be measured after disassembly

Sample size – one assembly

RF – 361 Draft Gear

SN	DG Housing	Firm's gauge no.	Observations
1.	Heat no. & Serial no.		
2.	Housing box		
3.	Housing bore dia.		
4.	Housing bore dia. (Bottom)		
5.	Wedge to housing lug clearance		
6.	Housing length		
7.	Housing width		
8.	Housing dim. Over hex. Flat		
9.	Inside housing width 7.25"		
10.	Inside housing width 11.5"		
11.	End wall thickness		
12.	Side wall thickness		
13.	Inside housing depth		
14.	Housing depth		
15.	118^0 bore face angle		
16.	122^0 bore face angle		
17.	Housing shoulder height 13.5"		

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8. Dimensions by gauging (Wedge Shoe) to be measured after disassembly

Sample size – one assembly

RF – 361 Draft Gear

SN	Wedge Shoe	Firm's gauge no.	Observations		
			Sample 1	Sample 2	Sample 3
1.	Shoe face I				
2.	Shoe face II				
3.	Shoe back angle & radius				
4.	Outside width of shoe				
5.	Shoe face crown				
6.	Shoe thickness				
7.	Shoe back surface flatness				
8.	Hardness (444 – 495 BHN)				

9. Dimensions by gauging (Wedge) to be measured after disassembly

Sample size – one assembly

RF – 361 Draft Gear

SN	Wedge	Firm's gauge no.	Observations
1.	Wedge lug depth		
2.	Wedge top to top lug depth		
3.	Wedge top to top lug depth		
4.	Wedge lug		
5.	Wedge trim dia.		
6.	30^0 wedge angle		
7.	Wedge body length		
8.	Hardness (555 – 683 BHN)		

10. Dimensions by gauging (Top Follower) to be measured after disassembly

Sample size – one assembly

RF – 361 Draft Gear

SN	Top Follower	Firm's gauge no.	Observations
1.	Dimple		
2.	Top follower bottom flatness		
3.	Top Follower out side contour		
4.	Top follower thickness		
5.	Over all follower thickness		
6.	Follower thickness (Bottom flange)		
7.	Hardness (277 – 331 BHN)		

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11. Dimensions by gauging (Rear Wall Plate) to be measured after disassembly

Sample size – one assembly

RF – 361 Draft Gear

SN	Rear wall plate	Firm's gauge no.	Observations
1.	Rear wall plate thickness		
2.	Rear wall plate width		
3.	Rear wall plate length		

12. Crushing strength (Pre – Shortener) to be measured after disassembly

Sample size – one assembly

RF – 361 Draft Gear

SN	Pre – Shortener	Crushing strength specified	Observations		
			Sample 1	Sample 2	Sample 3
1	Crushing strength				

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13. Dimensions by gauging (Bore Insert) to be measured after disassembly

Sample size – one assembly

RF – 361 Draft Gear

SN	Item	Firm's gauge no.	Observations		
			Sample 1	Sample 2	Sample 3
1.	Bore Insert				

14. Verification of DM (RF – 8 Rubber Pad) to be measured after disassembly

Sample size – one assembly

RF – 361 Draft Gear

SN	RF – 8 Rubber Pad Marking on pad	DM no., Date & Issued by	Observations
1.			
2.			
3.			
4.			
5.			

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15. Capacity & other tests

Sample size – one assembly

The following tests have to be carried out once in six month by inspecting official

SN	Tests	Last test done on	Remarks
1.	Capacity test		
2.	Sturdiness test		
3.	Sticking		
4.	Uniformity of action		

If due, conduct tests and attach results

16. Production Testing

i) Ensure that at least 5 draft gears out of every 500 draft gear or part thereof have been witnessed by inspecting authority for minimum capacity requirements during production of draft gears being offered for final inspection. The test shall consist of minimum numbers of blows required to produce the minimum capacity required. If any unacceptable gear found, this will be necessitate the testing of the next 50 untested gears to 100% capacity. If any defective gears found within that 50 then 100% capacity testing shall be continued until 50 consecutive gears have been tested without failure.

17. Capacity test Results:

SN	Draft Gear Heat no. & SL no.	Capacity obtained in tup hammer test (Min. Capacity 30,000 ft. – lb)
1.		
2.		
3.		
4.		
5.		

ii) Check all the test results of the tests conducted at different stages by manufacturer.

iii) Capacity test shall be done as per para 8.0 of AAR M – 901 E. Start with 9” free fall for testing in buff. Continue with selected increment not to exceed 2”. In order to pass the test the draft gear must develop 30,000 ft – lb capacity in buff.

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