



QM-C-7.1/COUPLER/0006
Inspection Plan(Check Sheet)

Item: E-type coupler for EMD locomotives
Specn. : Nil
Amd.:
Drg. No. & Alt.: DLW Part No. 17451103 & 17454505
(EMD Part No. 10632625 & 10661402)

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1. Name of Manufacturer :
 2. Date of Offer :
 3. RDSO File No. :
 4. Description of Material :
 5. Drawing and Alt. No. :
 6. Specification and Grade :
 7. P.O. No. :
 8. Total Quantity Ordered :
 9. Quantity Earlier Passed :
 10. Quantity now offered :
 11. Consignee :
 12. D.P. :

-
- [1. Date of Inspection
 - [2. Quantity Accepted
 - [3. Quantity Rejected
 - [4. Balance Order

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RDSO Representative

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**SUMMARY OF RESULTS OF HIGH TENSILE – E-TYPE COUPLER FOR EMD LOCOMOTIVES & COMPONENTS
(COUPLER BODY, KNUCKLE)
Lot Size - 200 Nos.**

SN	Parameters	Specified Value	Observation	
			Max.	Min.
1.	Visual & Operational Check (Sample size 10%)	No cracks, hot tears, cold shuts & weld cracks and surface condition by SCRATA & Marking as per drg. Components should operate freely in assembled condition		
2.	Dimensional (Sample size 10%)	By go-no go gauges (As per Drawing listed at Sn. 12)		
3.	Physical Properties	Gr. E (Minimum)		
	i) Tensile Strength	84.35 Kg/mm ² / 827.47 N/mm ²		
	ii) YS	70.30 Kg/mm ² / 689.64 N/mm ²		
	iii) Elongation	14%		
	iv) RA	30%		
4.	Proof static Tension Test	Max. Permanent Set in mm For Knuckle at 181.5 T - .76 For Coupler Body at 317.5 T - .76 Min. Ultimate load For Knuckle – 295 T For Coupler body – 408 T		
5.	Chemical composition (Maximum%)	C: 0.28 - 0.33, Mn: 0.80 – 1.10, P: 0.03 Max., S: 0.03 Max., Si: 0.40 - 0.60, Cr: 0.50 - 0.80, Ni: 0.50 - 0.60, Mo: 0.15 - 0.25		
6.	Microstructure of Knuckle	Fine tempered, Martensite.		
7.	Hardness	Except Knuckle 241-311 BHN For Knuckle 261-291 BHN		
8.	Destructive test	No blow holes, slag inclusion, shrinkage etc.		
9.	Heat treatment	Record to be checked.		
10.	Weight variation	+ 5% to -3%		
11.	Radiographic test (Sample size 5%)	ASTM E446 Level II. Location of radiography test should be as per annexure - II of specification 56-BD-07		

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1. Visual, Operation & Marking : Sample size - 5% or min 10 nos.

	Specified	Observed Value											
		1	2	3	4	5	6	7	8	9	10		
Surface defect	No cracks, hot tears, cold shuts & weld cracks and surface condition by SCRATA												
Marking	As per respective drawing												
Operation	Components should operate freely in assembled condition												

2. Dimensions : Sample size - 5% or min 10 nos.

Specified	Observed Value												
	1	2	3	4	5	6	7	8	9	10			
As per respective drawing and with gauges as listed At Sno. 12 of check sheet													

3. Physical Test : Sample size - one from each heat.

Mechanical Properties	Specified (Min.)	Observed Value											
		1	2	3	4	5	6	7	8	9	10		
UTS	827.47 N/mm ² or 84.35 Kg/mm ²												
YS	689.64 N/mm ² or 70.30 Kg/mm ²												
Elongation	14%												
RA	30%												

4. Proof Static test (Permanent set in mm) : Sample size - One per lot.

One in 6 months

	At 181.5 t		At 317.5 t		# Min. Ultimate	
	Specified	Observed	Specified	Observed	Specified	Observed
*Knuckle	0.76				295 T	
Coupler Body			0.76		408 T	

* Based on testing with dummy knuckle fixture

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5. Chemical Composition: Sample size - one from each heat.

Heat No.											
Body Sl. No.											
Qty. Cast											
Qty. Offered											
Qty. Passed											
Qty. Balanced											

Chemical Analysis	Specified Value Grade E	Observed Value (Heat)									
		1	2	3	4	5	6	7	8	9	10
C	0.28 – 0.33										
Mn	0.8 – 1.10										
P	0.03 Max.										
S	0.03 Max.										
Si	0.40 – 0.60										
Cr	0.50 – 0.80										
Ni	0.50 – 0.60										
Mo	0.15 – 0.25										

6. Microstructure of Knuckle : Sample size : One from each heat.

Specified	Observed	1	2	3	4	5	6	7	8	9	10
Fine tempered Martensite	OK/ NOTOK										

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7. **Hardness:** Sample size - 5% or min 5 nos.

Grade	Specified Value (BHN)	Observed Value									
		1	2	3	4	5	6	7	8	9	10
Grade E (Except Knuckle)	241-311										
Grade E (For Knuckle)	261-291										

Testing should be done as per ASTM A 370

8. **Destructive Test:** 2% should be subjected to destructive test as per figure 5 of 56-BD-07

Specified Value	Observation	
	1	2
No Blow Holes, Slag Inclusion and Shrinkage etc. after sectioning		

9. **Heat Treatment:**

Record to be verified	OK / NOT OK	
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10. **Variation of Weight :** One component per P.O.

Specified Value	Observation
Within +5% to -3%	

11. **Radiographic test** (Sample size 5%) - ASTM E446 Level II. Location of radiography test should be as per annexure - II specification 56-BD-97

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12. Gauge Check: As per Drawing (Sample size - 5% or min 10 nos.)

	Parameters	Gauge No. WD-84073-S-	Observation
COUPLER HEAD	10A Contour Gauge	1-RC	
	Bottom anticreep Vertical Location	2-RC	
	Bottom anticreep Horizontal Location	3-RC	
	Top anticreep Vertical Location	4-RC	
	Pivot-Lug	5-RC	
	Pin Protector	6-RC	
	Pulling Lug (Knuckle side)	7-RC	
	Pivot Pin	8-RC	
	Lock chamber	9-RC	
	Lock hole	10-RC	
	Rotary Lug	11-RC	
	Shank end pinhole	12-RC	
COUPLER SHANK			L-Loco, P-passenger
	Shank Height with Wear Plate	BF/1L, BF/1P	
	Shank End inside Profile	BF/5L, BF/5P	
	Butt rear width	BF/3L, BF/3P	
	Shank end pinhole	BF/4L, BF/4P	
COUPLER PARTS	Shank bull height	BF/2L, BF/2P	
	Knuckle Button Pulling Lug	41-RC	
	Knuckle Movable Point	42-RC	
	Knuckle Hub	43-RC	
	Knuckle Tail Height	44-RC	
	Knuckle Top Pulling Lug	45-RC	
	Knuckle Tail Shelf	46-RC	
	Knuckle Pin Hole	47-RC	
	Knuckle Length	48-RC	
	Lock Contour guard arm side	56-RC	
	Lock Contour Knuckle side	57-RC	
	Lock Toggle	58-RC	
	Lock Parallel & thickness	59-RC	
	Lock slot	60-RC	
	Lock Toggle arm width-GO & NO GO	61-RC	
	Knuckle Thrower Contour (Composite)	66-RC	
	Knuckle Thrower Trunion	67-RC	
	Lock lift assembly	76-RC	
Composite Gauge for connector	77-RC		
Composite Gauge for Hook	78-RC		
Composite Gauge for Toggle	79-RC		
Knuckle Pivot Pin Diameter & Length	96-RC		

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