QM-C-7.1/CASTING/0001 (Rev 1)
Inspection Plan & Check Sheet for Adapter Class 'E'(6"x11")

Item : Narrow Jaw, Wide Jaw and Modified Adapters (6"x11")
Specn. : AB/RB-39-2002, Rev.3
Amd. : 3 of October' 2016
Drg. No.& Alt.:WD-89067-S-9 Alt.7; SK-78527,Alt.5&WD-85053-S-1,Alt.5

1	NAME OF MANUFACTURER	
2	DATE OF OFFER	
3	RDSO FILE NO.	
4	DESCRIPTION OF MATERIAL	
5	DRAWING & ALT. NO.	
6	SPECIFICATION & GRADE	
7	PURCHASE ORDER NO.	
8	TOTAL QUANTIY ORDERED	
9	QUANTITY EARLIER PASSED	
10	QUANTITY NOW OFFERED	
11	CONSIGNEE	
12	DELIVERY PERIOD	

1	DATE OF INSPECTION	
2	QTY. ACCEPTED	
3	QTY. REJECTED	
4	BALANCE ORDER	

Signature of firm's Representative RDSO Representative

(A)- METALLURGICAL REQUIREMENTS FOR ADAPTERS FOR CLASS 'E'(6"x11")

Specified Values

Specification NO./Grade	Chemical Composition,%	Mechanical Properties					
		UTS, Min. Kgf/mm²	YS, Min Kgf/mm²	EL (Min.) 2In, %	RA% Min.	Base Metal Hardness (BHN)	Micro/Heat treatment
ASTM A 536 Gr.80-55-06 (Ductile Iron)	Not specified in ASTM A-536 however, the chemical composition of iron shall be such as to produce the specified mechanical properties	56.3	38.67	6	-	187-255 BHN, Casting having hardened crown or hardened crown and thrust shoulders 217-255 BHN, Casting not having any hardened surfaces or with hardened thrust shoulders only	Microstructure of ductile cast iron shall consists substantially graphite nodules (minimum 80%)
ASTM A 148 Gr.80-40 (Steel Casting)	S-0.06 max. P-0.05 max.	56.3	28.15	18	30	179-228	Full annealing, normalizing, normalizing & tempering or quenching & tempering.
AAR M-201 Gr.C	C-0.32 max. Mn – 1.85 max Si – 1.5 max S – 0.04 max P – 0.04 max	63.3	42.18	22	45	179-228	Normalised& tempered or quenched & tempered

1. Specification No. of the offered Adapter(6"x11") material :-……..

2(A)SAMPLES REQUIRED FOR DESTRUCTIVE TESTING DURING PURCHASE INSPECTION:

(i) One sample per 1000(lot size) or part required for destructive testing of adapter.
(ii) Integrated test lug or machined test piece from finished product may be tested for mechanical/chemical testing.

Signature of firm's Representative RDSO Representative

2.(B) CHEMICAL COMPOSITION (1 no.per heat)

HEAT NO.	C%	Mn%	Si%	S%	P%	Mg%

2.(C) MECHANICAL PROPERTIES (1 no.per heat)

HEAT NO.	UTS Kgf/mm²	YS Kgf/mm²	EL %	RA %	MICRO	HARDNESS BHN	Heat clearance date
					Nodularity &matrix Microstructure of ductile cast iron shall consist substantially graphite nodules (minimum 80%)		

(B)- I Dimension for Narrow Jaw Adapter Class 'E' (WD-89067-S/9)

S. No.	Sample size	Actual size
1	(a) **Visual Inspection**-10 % of lot, randomly selected, for casting quality (like cracks, inclusions shrinks, porosity, application of rust preventive coating etc.) and marking. (b) Rust-resistance coating as per Specification no. IS: 2074:10% of lots,randomly selected shall be checked visually for uniform coating of the machined surface area of adapter to prevent rusting. (c) **Colour matching of the adapter with the CTRB's outer cup**: 10% of lot shall be checked-The adapter should be placed on the coloured CTRB outer ring & hand pressure applied on the top of adapter. Then the adapter is removed from outer cup and the adapter inner bore touching area with the CTRB outer cup to be inspected. At least 80% of the area must be coloured matched.	
2	**Gauging**: Lot size / Sample size 281-500 / 50 501-1200 / 80 1201-3200 / 125 3201-10000 / 200	
3	**Hardness**- All hardness values to checked on1 % of lot received for inspection.	

S. No.	Parameters Gauged/Checked	Acceptance Std. (mm unless specified otherwise)	Gauge No./gauge Suffix & Name(As per AAR M-924)	Observation									
Machined Surfaces													
1	Centrality	Must be equal within 1.6 mm after bore is machined	AM-45109-4 (Centrality gauge)										
2	Equal Thickness	Within 0.5 mm after bore is machined	AM-45117-4 (Equal thickness gauge)										
3	Bearing Thrust Shoulder Thickness	$13.5^{+0.4/\ -\ 2.0}$	AM-45096-4 (Bearing thrust shoulder thickness gauge)										
4	Bore Diameter	110.5 R $^{+0.015/\ -\ 0.112}$	AM-45092-4 (Bore diameter-Chordal Gauge)										
5	Concentricity & Taper (Use gauge on clear and unpainted surfaces)	The max reading on any of the four indicators must not exceed 0.038 mm (Top center only).	AM-45094 - 4 (Concentricity & taper gauge)										
6	Bearing Thrust Shoulder Depth	$10.11^{+0.0/\ -\ 0.914}$	AM-45095 - 4 (Bearing thrust shoulder depth gauge)										

Signature of firm's Representative RDSO Representative

7	Bearing Thrust Shoulder Spacing and Relief	$166.7^{+1.6 / - 0.0}$	AM-45097 - 4 (Bearing thrust shoulder spacing & relief gauge)										
8	Bearing Thrust Shoulder Chamfer Angle	$35^{\circ}\pm2^{\circ}$	AM-45104 (Bearing thrust shoulder chamfer angle gauge)										
9	Bearing Thrust Shoulder Chamfer Location	$4.76^{+ 0.796/ - 0}$	AM-45105 - 4 (Bearing thrust shoulder chamfer location gauge)										
10	Heat indicator hole diameter and depth (When specified by the customer)	$17.859^{+0.25/-0.0}$ & $81.8^{+1.2/-0.0}$	AM-45093 – 4 (Heat indicator hole diameter and depth gauge)										
11	Snap Ring Groove	$19.13^{+ 0.25/ - 0}$	AM-45101 **(**Snap ring groove gauge)										
12	Machined Surface Finish	6.3 µm (N9)	Comparator or surface roughness measuring instruments										
			UNMACHINED SURFACES										
13	Overall Width	$225.56^{+0.5/ -2.0}$	AM-45084 - 4 (Overallwidthgauge)										
14	Body Width	$181^{+2/ - 0}$	AM-45091 - 4 (Bodywidthgauge)										
15	Side/Outer Thrust Lugs Spacing	$97^{+4 / - 0}$	AM-45085 - 4 (Outerthrustlugspacing gauge)										
16	Side/Outer Thrust Lugs Height	$21.0^{+1.6/-0.7}$	AM-45086-4 (OuterThrustLugHeight Gauge)										
17	Crown/Top Thrust Lugs Spacing	$155.5^{+ 2 / - 0}$											
18	Crown/Top Thrust Lugs Height	24											
19	Combined Crown Radius	$1524R^{+0/ -508 R}$	AM-45110 – 4 (Combined crownradius gauge)										
20	Pedestal Fit		AM – 45102 – 4 (Pedestal fit gauge)										
21	Marking	As perDrg. WD-89067- S/9 latest i.e (Year of Cast, Journal size, Name of manufacturer, Material Code, Heat Number)											

<table>
<tr>
<td>22</td>
<td>Surface Hardnening
<table>
<tr><th>Location</th><th>Hardness</th><th>Observed value</th></tr>
<tr><td>Crown</td><td>350- 450 BHN,
1.5 mm – 5.0 mm in depth</td><td></td></tr>
<tr><td>Thrust Shoulders</td><td>350- 450 BHN,
0.76 – 3.8 mm in depth</td><td></td></tr>
</table></td>
<td></td>
</tr>
</table>

(B)- II Dimension for Wide Jaw Adapter Class 'E' (SK-78527)

S. No.	Sample size	Actual size
1	**(a) Visual Inspection**-10 % of lot, randomly selected, for casting quality (like cracks, inclusions shrinks, porosity, application of rust preventive coating etc.) and marking. **(b)** Rust-resistance coating as per Specification no. IS: 2074: 10% of lots, randomly selected shall be checked visually for uniform coating of the machined surface area of adapter to prevent rusting. **(c) Colour matching of the adapter with the CTRB's outer cup**: 10% of lot shall be checked-The adapter should be placed on the coloured CTRB outer ring & hand pressure applied on the top of adapter. Then the adapter is removed from outer cup and the adapter inner bore touching area with the CTRB outer cup to be inspected. At least 80% of the area must be coloured matched.	
2	**Gauging**: Lot size / Sample size 281-500 / 50 501-1200 / 80 1201-3200 / 125 3201-10000 / 200	
3	**Hardness**- All hardness values to checked on1 % of lot received for inspection.	

S. No.	Parameters Gauged/Checked	Acceptance Std.(mm unless specified otherwise)	Gauge No./gauge Suffix & Name(As per AAR M-924)	Observation									
Machined Surfaces													
1	Centrality	Must be equal within 1.6 mm after bore is machined	AM-45109 – 4 (Centrality gauge)										
2	Equal Thickness	Within 0.4 mm after bore is machined	AM-45117- 4 (Equal thickness Gauge)										
3	Bearing Thrust Shoulder Thickness	$13.5^{+0.0/\ -\ 1.6}$	AM-45096 - 4 (Bearing thrust Shoulder thickness Gauge)										
4	Bore Diameter	110.5 R $^{+0.015/\ -\ 0.112}$	AM-45092 - 4 (Bore diameter-chordal Gauge)										
5	Concentricity & Taper(Use gauge on clear and unpainted surfaces)	The max reading on any of the four indicators must not exceed 0.038 mm (Top center only).	AM-45094 - 4 (Concentricity & taper gauge)										
6	Bearing Thrust Shoulder Depth	$10.1^{+0.009/-0.905}$	AM-45095 - 4 (Bearing thrust shoulder depth gauge)										
7	Bearing Thrust Shoulder Spacing and Relief	162 max.	AM-45097 - 4 (Bearing thrust shoulder spacing										

Signature of firm's Representative RDSO Representative

			&relief gauge)										
8	Bearing Thrust Shoulder Chamfer Angle	35˚±2˚	AM-45104 (Bearing thrust shoulderchamfer angle gauge)										
9	Bearing Thrust Shoulder Chamfer Location	$4.76^{+\ 0.796/\ -\ 0}$	AM-45105 - 4 (Bearing thrust shoulder chamfer location gauge)										
10	Machined Surface Finish	6.3 µm (N9)	Comparator or surface roughness measuring instruments										
			UNMACHINED SURFACES										
11	Overall Width	306	AM-45084 - 4 (OverallWidthGauge)										
12	Body Width	$268^{+0.287/\ -2.888}$	AM-45091 – 4(BodyWidthGauge)										
13	Side/Outer Thrust Lugs Spacing	$130.175^{\ +3.175\ /\ -\ 0.0}$	AM-45085 - 4 (OuterThrustLugSpacing Gauge)										
15	Side/Outer Thrust Lugs Height	$19^{\ +1.5/-\ 0.2}$	AM-45086 – 4 (Outerthrust lugheight gauge)										
16	Crown/Top Thrust Lugs Spacing	$156^{+\ 2.75\ /\ -\ 0.425}$											
17	Crown/Top Thrust Lugs Height	24 min											
18	Combined Crown Radius	$1524R^{+\ 0/\ -\ 508\ R}$	AM – 45110 – 4 (Combined crownradius gauge)										
19	Pedestal Fit		AM – 45102 – 4 (Pedestal fit gauge)										
20	Marking	As per Drg. No. WD-78527 latest i.e(Year of Cast, Journal size,Name of manufacturer, Material Code, Heat Number)											

21	Surface Hardening: **Location** / **Hardness** / **Observed value** Crown — 350- 450 BHN, 1.5 mm – 5.0 mm in depth Thrust Shoulders — 350- 450 BHN, 0.76 – 3.8 mm in depth	

(B)- III Dimension for Modified Adapter(WD-85053/S-1)

S. No.	Sample size	Actual size
1	(d) **Visual Inspection**-10 % of lot, randomly selected, for casting quality (like cracks, inclusions shrinks, porosity, application of rust preventive coating etc.) and marking. (e) Rust-resistance coating as per Specification no. IS: 2074:10% of lots, randomly selected shall be checked visually for uniform coating of the machined surface area of adapter to prevent rusting. (f) **Colour matching of the adapter with the CTRB's outer cup**: 10% of lot shall be checked-The adapter should be placed on the coloured CTRB outer ring & hand pressure applied on the top of adapter. Then the adapter is removed from outer cup and the adapter inner bore touching area with the CTRB outer cup to be inspected. At least 80% of the area must be coloured matched.	
2	**Gauging**: Lot size / Sample size 281-500 / 50 501-1200 / 80 1201-3200 / 125 3201-10000 / 200	
3	**Hardness**- All hardness values to checked on1 % of lot received for inspection.	

S. No.	Parameters Gauged/Checked	Acceptance Std. (mm unless specified otherwise)	Gauge No./gauge Suffix & Name(As per AAR M-924)	Observation									
Machined Surfaces													
1	Centrality	Must be equal within 1.6 mm after bore is machined	AM-45109 - 4 (Centrality gauge)										
2	Equal Thickness	Within 0.4 mm after bore is machined	AM-45117- 4 (EqualthicknessGauge)										
3	Bearing Thrust Shoulder Thickness	$13.5^{+0.0/-1.5}$	AM-45096 - 4 (BearingthrustShoulder thicknessgauge)										
4	Bore Diameter	110.5 R $^{+0.015/-0.112}$	AM-45092 – 4 (ChordalGauge)										
5	Concentricity&Taper(Use gauge on clear and unpainted surfaces)	The max reading on any of the four indicators must not exceed 0.038 mm (Top center only).	AM-45094 – 4 (Concentricity&taper gauge)										
6	Bearing Thrust Shoulder Depth	$10^{+0.0/-1.0}$	AM-45095 – 4 (Bearingthrustshoulder depth gauge)										

Signature of firm's Representative RDSO Representative

7	Bearing Thrust Shoulder Spacing and Relief	162 max	AM-45097 - 4 (Bearingthrustshoulder spacing & relief gauge										
8	Bearing Thrust Shoulder Chamfer Angle	35˚±2˚	AM-45104 (Bearingthrustshoulderchamferangle gauge)										
9	Bearing Thrust Shoulder Chamfer Location	$4.76^{+\ 0.796/-0}$	AM-45105 - 4 (Bearingthrustshoulder chamferlocation gauge)										
10	Machined Surface Finish	6.3 µm (N9)	Comparator or surface roughness measuring instruments										
			UNMACHINED SURFACES										
11	Overall Width	306	AM-45084 - 4 (Overallwidthgauge)										
12	Body Width	$268^{+0/\ -3.0}$	AM-45091 - 4 (Bodywidthgauge)										
13	Side/Outer Thrust Lugs Spacing	$130^{+3.0\ /\ -0}$	AM-45085 - 4 (Outerthrustlugspacing gauge)										
14	Side/Outer Thrust Lugs Height	$19^{\ +1.5/-0.0}$	AM-45086 – 4 (Outerthrust lugheight gauge)										
15	Crown/Top Thrust Lugs Spacing	$156^{+\ 3\ /\ -\ 0}$											
16	Crown/Top Thrust Lugs Height	24 min											
17	Combined Crown Radius	$1524R^{+\ 0/\ -\ 508\ R}$	AM – 45110 – 4 (Combined crownradius gauge)										
18	Pedestal Fit		AM – 45102 – 4 (Pedestal fit gauge)										
19	Marking	As per Drg. No. WD-85053/S-1 latest i.e(Year of Cast, Journal size, Name of manufacturer, Material Code, Heat Number)											

20 **Surface Hardening :**

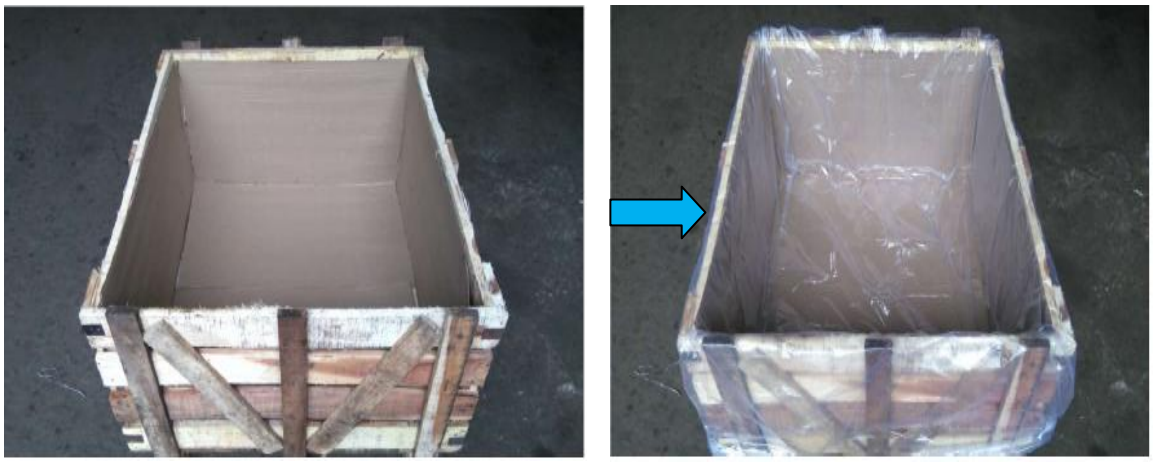
Location	Hardness	Observed value
Crown	350- 450 BHN, 1.5 mm – 5.0 mm in depth	
Thrust Shoulders	350- 450 BHN, 0.76 – 3.8 mm in depth	

(C)- IPacking of Class 'E' (6" X 11") Narrow Jaw Adapter (WD-89067/S/9): procedure

STEP-01

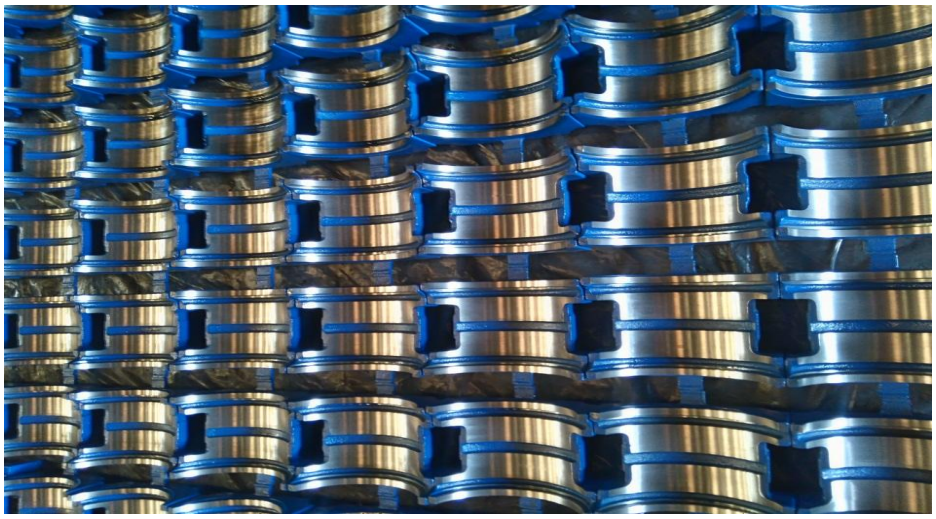
TAKE WOODEN CRATE

STEP-02



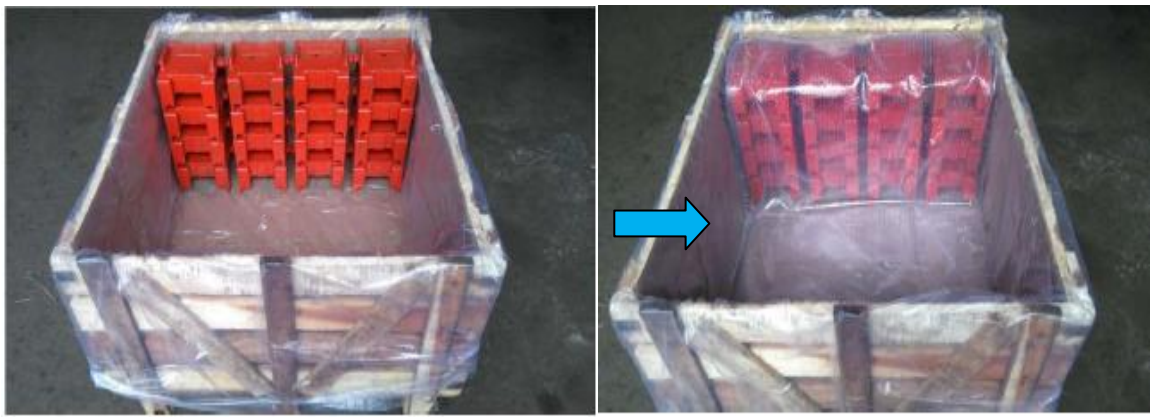
PUT CORRUGATED SHEET & PLASTIC BAG

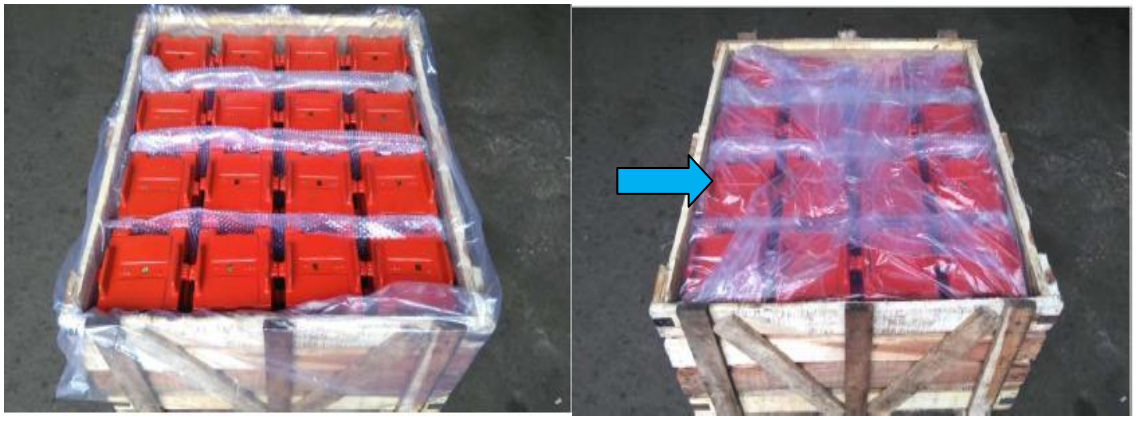
STEP-03



APPLY RUST-RESISTANCE COATING AS PER SPECIFICATION NO IS:2074 FOR COATING THE MACHINED SERFACE AREA OF ADAPTER TO PREVENT RUSTING

STEP-04





PUT 4X4 PARTS AND USE BUBBLE SHEET BETWEEN EACH LAYERAS ABOVE

STEP-05

MAKE TOTAL 16 COLUMN(4X4) WITH 4 LAYERS AS PER ABOVE FIGURE (TOTAL 64 PCS IN EACH CRATE)
&
SEAL THE PLASIC BAG

STEP-06

PUT &NAIL THE TOP COVER

STEP-07

STRAP WITH POLYPROPYLENE /STEEL TAPE & PUT THE LABLE