



**PRODUCT STANDARD**  
**TME DIVISION, BHOPAL**

**TM 10896**

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TME 2011

**SPECIFICATION FOR ROCKER ASSEMBLY (COMPLETE) FOR HS15250A**

**1.0 Scope**

1.1 This specification covers the manufacturing, testing, Inspection, packing of Rocker Assembly (Complete) for HS15250A TM.

**2.0 Reference drawing and specification for Rocker Assly. (Complete) are as follows:**

Sl. No.	Drg./Specn. No.	Equivalent CLW drawing/ specification	Description
1	04392060051	10Q750-249	Rocker Assembly
2	14392060058	10Q750-317	Rocker ring
3	24392060058	10R823-314	Cleat arrangement for rocker Ring
4	44392060058	4TWD 095-088	Cleat for rocker
5	44392060056	10T835-014	Handle
6	24392060060	2TWD-095-007	Insulating Rod
7	44392060067	4TWD095086	Hex head screw M24x30
8	44392060068	4TWD095087	Hex head screw M20x45
9	14392060056	2TWD095-090	Brush Holder Assembly
10	14392060057	3TWD095-091	Brush Holder Case
11	24392060057	10S773-713	Brush Spring
12	44392060051	10T806-970	Adjusting pin
13	44392060052	4TWD-095-252	Spacer
14	44392060053	10T806-972	Spring Support
15	34392060061	4TWD-095-085	Serrated Washer
16	44392060055	10T806-977	Special washer
17	44392060054	10T806-973	Spring Support
18	34392060060	3TWD-095-092	Arching stud fixing bracket and arching stud
19	24392060059	2TWD-095-052	Insulating Rod
20	14392060059	10Q750-320	Connector Assembly
21	34392060053	3TWD095-075	Lead Wire
22	34392060054	3TWD095-076	Lead Wire
23	34392060055	3TWD095-077	Lead Wire
24	34392060056	3TWD095-057	Lead Wire
25	34392060057	3TWD095-058	Lead Wire
26	34392060059	3TWD095-078	Lead Wire
27	44393060053	4TWD095-082	Solderless terminal
28	44393060051	4TWD095-080	Copper Tube Connector
29	TM88076	A0108	Varnish HEW 502 N
30	TM88089	A0178	Polyamide non-woven mat
31	TM10444	A0248	Polyamide woven tape
32	TM10420	4TMS.095.016	Glass tape
33	TM88110	A0251	Heat shrinkable silicon rubber tube

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**2.0 Source of Raw material:**

Suppliers will have to purchase the following components from approved source of CLW/RDSO or seek prior permission from CLW/RDSO if they want to use raw material of other sources. Suppliers should clearly indicate all the source of raw material proposed by them in their offer and provide documental evidence of purchase to BHEL during execution of PO.

S.No.	Item Description	Item reference in Assembly drawing No. 04392060051 (latest revision)	BHEL drawing no./spec no. for item (latest revision to be followed)	CLW controlled item	RDSO controlled item
1	Rocker	001	14392060058	√	x
2	Insulation rod	010	24392060060	√	x
3	Brush Holder Assembly	014	14392060056	√	x
4	Insulation Rod	015	24392060059	√	x
5	Connector Assly (Cable Leads (80 sq. mm))	016	14392060059	√	x
6.	Silicon rubber tube	Item no. 008 of BHEL drawing 14392060059	14392060059, Specification TM88110	x	√
7.	Varnish HEW 502 N	14392060059	TM88076	x	√
8.	Polyamide non-woven mat	Item no. 007 of BHEL drawing 14392060059	TM88089	x	√
9.	Polyamide woven tape	Item no. 006 of BHEL drawing 14392060059	TM10444	x	√
10.	Glass tape	Item no. 009 of BHEL drawing 14392060059	TM10420	√	x

**4.0 Important M & P requirements for assembly of Rocker:**

- (1) Baking oven – Having Auto cut in & cut off facility Max temperature up to 300°C.
- (2) Rocker Assembly and Brush Holder alignment fixture.
- (3) Brush Holder spring pressure measurement.
- (4) Brush holder pocket GO-NO GO gauge.
- (5) 500V and 1000 V Megger for IR measurement.
- (6) HV testing facility up to 35 KV.
- (7) Torque wrench more than 3500 Kg-m range.
- (8) Hot blower for heat shrinking of silicon rubber tube.

**5.0 Procedure for Rocker Assembly:**

5.1 Check the dimensions, shapes, physical condition of following parts before start of assembly.

1	Rocker ring
2	Lead wires
3	Brush Holder Assemblies
4	Insulation rods
5	Cleat arrangement

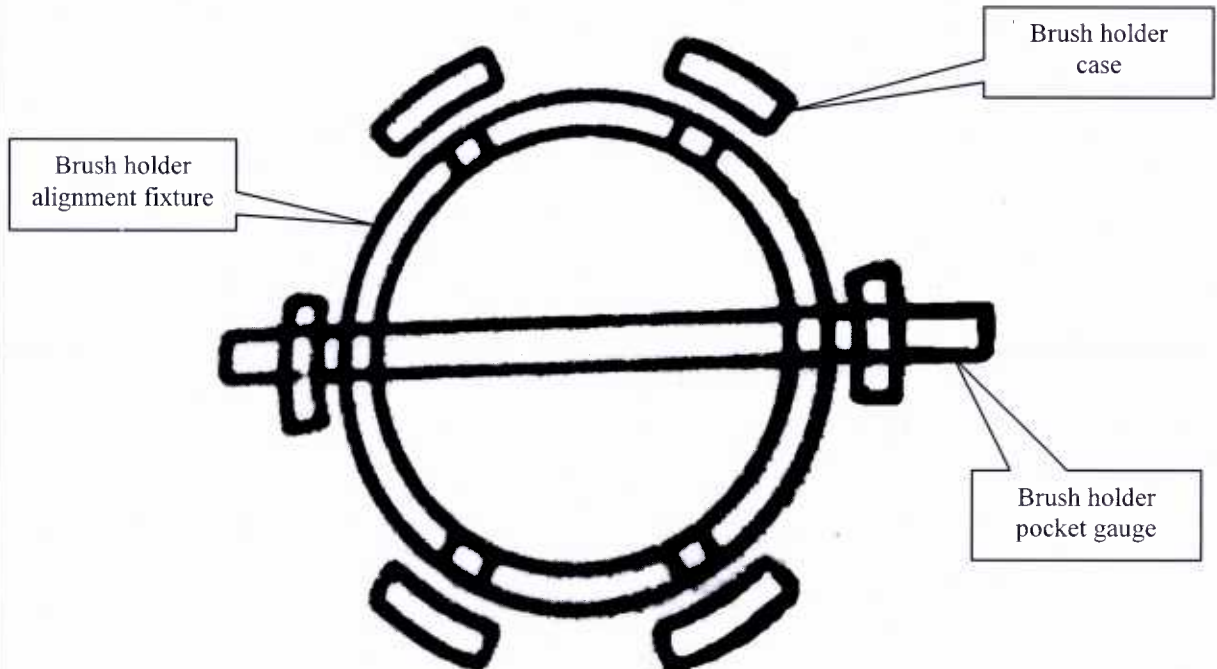


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- 5.2 Confirm the parts are free from rust, flaws etc.
- 5.3 Place the rocker on alignment fixture with the carbon brush holder side down.
- 5.4 Install insulation rods for brush holders with M24x30 screws with help of torque wrench at 3500 Kg-m.
- 5.5 Install insulation rods -ve & +ve with lock tight.
- 5.6 Install insulation brush holders with M20x45 screws temporarily.
- 5.7 Align face to face brush holder with suitable alignment jig.
- 5.8 Tight all the six M20x45 screws with help of torque wrench at 2000 Kg-m.
- 5.9 Brush holders to be perfectly align. Pitch error of the six brush holders must not be more than 0.3 mm. Watching error of each brush holder must be within 0.3 mm max. Watching error of six brush holders must be within 0.5 mm max.



- 5.10 Install the handle to the rocker at torque value 1020 Kg-m and secure it by tack welding.
- 5.11 Cover the exposed core of each lead wire connected to a terminal with heat shrinkable tube with the help of hot blower and heat it to until tube shrinks.
- 5.12 Install the lead wires as shown in connector assembly drawing 14392060059.
- 5.13 Tie and insulate the cable with cleat and handles as shown in connector assembly drawing 14392060059.
- 5.14 Apply varnish HEW502 N while tying the glass tape.
- 5.15 Remove the rocker assembly from alignment jig and weld the M24 screws and brush holder screw M20.
- 5.16 Clean the weld parts and apply rust preventive paint followed by arc resistance paint to them.
- 5.17 Dry the rocker assembly at 120°C for 5 hours in baking oven.

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**6 Testing of Assembled Rocker :**

- 6.1 Each rocker assembly to pass High voltage testing at 15 KV for 1 min.
- 6.2 IR of each rocker assembly to be more than 500MΩ.
- 6.3 Brush spring pressure for each brush holder with new carbon brush to be  $3.44 \pm 10\%$  and with worn out carbon brush to be  $2.82 \pm 10\%$ . Length of fresh carbon brush is 57 mm and worn out is 25 mm.
- 6.4 One no insulator pin of both the type (brush holder pin & +ve,-ve insulator pin) ) in each lot of supplied Rocker Assembly to BHEL shall be subjected to following test:
  - a) Ultimate tensile strength for -ve & +Ve insulator should not be less than 3250 Kg and for brush holder insulator should not be less than 6000 Kg
  - b) Insulator should withstand High Voltage testing for 1 min in oil at 32 KV, 50Hz.
  - c) IR of each insulator pin should be more than 1000MΩ.

**7.0 INSPECTION CLAUSE :**

- 7.1 Dimensional measurement and testing should be as per drawing & specification TM10896.
- 7.2 The final inspection is to be carried by the BHEL's Quality control at BHEL.
- 7.3 Certificate from NABL accredited lab for metallurgical testing of Brush holder material.
- 7.4 Supplier to submit dimensional reports and test report of the entire tests as mentioned in clause 6.

**8.0 PACKING :**

Supplier shall ensure that components do not get damaged in transit and transport by suitable packing. Each Rocker Assembly should be wrapped in water proof packing followed by suitable packing in which rocker assembly to be duly fixed and tightened to avoid damage and deformation during transit. Supplier's identification mark and serial number to be punched on the rocker assembly for proper identification.

**Note:**

1. Latest Alteration of all Drawings / Specifications is to be used.
2. In case of any discrepancy in BHEL drawing viz-a viz CLW drawing, equivalent CLW Drawings / Specifications to be referred.

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