

SPECIFICATION NO. CLW/ES/3/0674
ELECTRICALLY OPERATED WIND SCREEN WIPER ASSEMBLY COMPLETE
WITH WATER SPRAY ARRANGEMENT

TECHINICAL SPECIFICATION FOR
ELECTRICALLY OPERATED WIND SCREEN WIPER ASSEMBLY COMPLETE WITH WATER SPRAY
ARRANGEMENT

FOR 3-PHASE ELECTRIC LOCOMOTIVES.

Specification no.- CLW/ES/3/0674

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SPECIFICATION FOR ELECTRICALLY OPERATED WIND SCREEN WIPER ASSEMBLY COMPLETE WITH WATER SPRAYING ARRANGEMENT FOR 3-PHASE AC ELECTRIC LOCOMOTIVES (WAG-9 HC/WAP-7/WAP-5).

1.0 SCOPE

This specification prescribes the requirements for Design and supply of the wind screen wiper assembly complete with wiper motor, wiper arm with blade & pipe connections & water spray wind screen washing system complete for WAG-9HC/WAG-9/WAP-7/WAP-5 class of 3-phase electric locomotives.

2.0 SCOPE OF SUPPLY

2.1 One loco set (4 Nos.) of wiper assembly complete (2 LH + 2 RH Wiper Assembly) are to be fitted in each loco.

3.0 CLIMATIC & ENVIRONMENTAL CONDITIONS

- 3.1 Maximum atmospheric Temp : Under sun 70°C
In shade 50 °C
- Humidity : 100% saturation during rainy season
- 3.2 Reference site conditions : i) Ambient Temp : Max. 47 °C
Min. 0 °C
ii) Humidity : 60%
iii) Altitude : 160 mts. Above sea level.
- 3.3 Rain fall : Very heavy in certain areas. The locomotive will be designed to permit its running of 10 km/hr in flood water level of 102 mm above rail level.
- 3.4 Atmosphere during hot weather : Extremely dusty & desert terrain in certain areas.
- 3.5 Coastal Area : Locomotive & equipment will be designed to work in coastal areas in humid And salt laden atmosphere.
- 3.6 Vibration : The equipment, sub-system & their mounting arrangement will be designed to withstand vibration & shock encountered in service as specified in corresponding IEC publications for rolling stock application, unless otherwise stated.

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4.0 STANDARD

Manufacturer should follow all relevant standard for manufacturing of wiper assembly complete as follows:-

STANDARD	SPECIFICATION
AISI 304	Stainless Steel 304
IS: 7827 – Part I	For wiper system
IS: 7827 – Part II	For wiper motors
IS: 7827 – Part III	For wiper arms & blades
IS: 14141	For electrical windshield washing system

5.0 GENERAL AND TECHNICAL DATA

- 5.1 The operating speed of the wiper motor shall be adjustable between 35 and 75 strokes/minute.
- 5.2 Wiping angle of the winds screen wiper shall be in the range of 50° to 75°.
- 5.3 Recommended pressure force of the flexible wiper blade on the glass shall be 1.25 kg. maximum for wiper blade length of 508 mm \pm 5.
- 5.4 Wiper assembly will also be provided with water spray wind screen washing systems.

6.0 DESIGN PRINCIPLE

- 6.1 The torque of the wiper motor working the wiper system should be approx. in the range of 80 Nm to 84 Nm and will be supplied in the required 110 V \pm 30% DC and capable of working at minimum 35 to 75 stroke/min (Slow speed function: 35-40 stroke/min. whereas High speed function: 55 -75 stroke/min). The rated wattage of wiper motor to be approx. 100 watts. The motor should be able to give a wiping angle between 50° and 75°. The motor will be fully EMC complaint to EN 50121-3-2:2016 and rated to IP 67.
- 6.2 The wiper motor will be mounted on MS bracket with powder coated to prevent corrosion. The motor is connected electrically by means of a multi-pin connector to be provided by the supplier.
- 6.3 A drive mechanism is provided which transfers the rotary output from the motor to the oscillation movement of the spindles.

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- 6.4 Drive spindles (EN8 with Electroless nickel plating) that drive the wiper arms (MS with powder coat), pass through the bulkhead, connecting the drive mechanism to the wiper arm are manufactured from stainless steel, to prevent corrosion.
- 6.5 The wiper blade (SS with powder coated) is secured to the arm assembly using the blade clip arrangement on the arm with a blade retaining Pin with Hex Dome Nut.
- 6.6 All rubber components should be procured from RDSO/Railway approved sources.
- 6.7 The wiper motor spindle is to be made from Carbon steel shaft (wiper motor is internally mounted).
- 6.8 The Motor is fitted with a parking mechanism so that when the wiper is disengaged it will automatically returned to the park position.
- 6.9 The wiper arm assembly is manufactured from carbon steel with powder coated to prevent corrosion and to be of good appearance.
- 6.10 The tension of spring of wiper arm should be adjustable type to achieve appropriate spring tension during assembly.
- 6.11 One control box, control switch/knob for wiper motor to be supplied with proper mounting arrangement (Existing cut out dimension for control switch/knob is 76 mm x 60 mm). The control box is fabricated from stainless steel and polyester powder coated black to be of good appearance. The control switch provides simple wiper functionality. The Control switch type is of Toggle Switch with 4 positions :-
- Off – Park – this will always stop the wiper in the agreed park position
 - Slow wipe
 - Fast wipe
 - Push to Wash option.
- 6.12 The design of control unit should be in such a way that in case of failure of one wiper motor does not affect the operation/function of another wiper motor. There must be provision of Isolating switches in driver's cab for isolation of defective wiper motor. In addition, Protective Switchgear of suitable rating to be provided for each cab by the supplier which shall be mounted in Auxiliary cubicles of respective cabs.
- 6.13 Water spray system consists of a washer tank of 10 litres capacity with suitable pumping arrangement and water spraying nozzles, water tube and reduction nipple fitted to the body of wiper assembly.

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6.14 The washer tank can be filled by removing the cap located on the externally mounted filler spout. The mounting arrangement of wash tank to be provided by the supplier. Submersible wash pump is mounted inside the tank or Externally mounted washer pump may be provided. However, the details of functionality of wash pump with proper mounting position to be furnished by the supplier. Water pump may be operated by 24V DC in case of submersible wash pump or 110V±30% DC for externally mounted washer pump. The suitable power supply to the wash pump from the control unit to be provided by the manufacturer. The pump supplies washer fluid to the wash jet mounted on the wiper arm, through suitable tubing.

6.15 The drawings of Cab Structure (Drg. No. 1209-08.130-511), Wind Screen Assembly (Drg. No. 1209-08.130-263), Front Sheet (Drg. No. 1209-08.130-019) of existing WAG-9 HC locomotives are attached for guidance only.

7.0 INSPECTION AND ACCEPTANCE

7.1 Type Test:

The manufacturer shall indicate along with their offer the following type tests to be carried out at the time of inspection at firm's premises. They shall have complete test equipments (including test racks) at their work premises to conduct such tests. Type test to be carried out as per IS: 7827 – Part I, IS: 7827 – Part II, IS: 7827 – Part III & IS: 14141. Type test plan shall include –

- i) Endurance test for continuous 1 MILLION CYCLE with water pump for 10 cycles operation at 30 minutes intervals.
- ii) Test of wiper blade pressure on the glass.
- iii) Operating speed of the wiper motor according to Clause 5.1.
- iv) Material test certificate.

7.2 Routine Test

Routine inspection with various tests will be carried out by an authorized representative of the purchaser as per approved routine test programme approved by the purchaser.

7.3 Inspection Plan

The tenderer shall indicate the sample size including minimum size for routine inspection of each lot.

8.0 SUPPLY OF DOCUMENTS

8.1 Along with tender offer :-

- a) The tenderer shall submit details dimension drawings of assembly and sub-assemblies.
- b) Any deviation from the specified value shall be spelled out by the tenderer clearly.
- c) Test facilities for the type and routine tests as indicated in clause 7.1 available with the tenderer.

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8.2 Along with supplies :-

The successful tenderer shall submit along with supply the required copies of maintenance/overhaul manuals and instruction and material tests certificate from RDSO/Rly./Govt. approved test laboratory.

9.0 **QUALITY ASSURANCE**

As per ISO 9001.

10.0 **MARKING**

10.1 Each assembly, sub-assembly/component shall have clear readable marking on its body. The marking shall be as follows :-

- A. Manufacturer's Name/Trade Mark clearly engraved/embossed.
- B. part No./Drawing No./Type No.
- C. Year & Month of the manufacturer.
- D. Batch No.
- E. Minimum & Maximum working pressure.
- F. Proper identification (either punched/embossed) of parts for wiper motor.

11.0 **GUARANTEE**

11.1 The equipment and its accessories shall be guaranteed for satisfactory performance for a period of 36 months from the date of delivery or 30 months from the date of commissioning of the locomotive whichever is earlier. All aspects of workmanship and material will be covered by the guarantee.

11.2 The components/material, which fails during the guarantee period, must be replaced by the manufacturer/contractor free of cost.

12.0 **PACKING**

The wind screen wiper assembly will be properly packed to avoid damages during transit and storage.

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