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## TECHINCAL SPECIFICATION FOR

**WIND SCREEN WIPER ASSEMBLY COMPLETE WITH AIR MOTOR AND WATER SPRAY ARRANGEMENT**

FOR 3-PHASE ELECTRIC LOCOMOTIVES.

Above ref. specification also used for WAP 4 Conventional Locos

Above ref. specification also used followed for WAG-7 (CF) Locos.

**Specification no.- CLW/MS/3/050 ALT. 6****Issue Date ::03.01.2004****ENCLOSURES:**

- I) Drg. no. 1209-08.032.023  
 II) ANNEXURES (ALL PART DRAWINGS)

**ISSUED BY:**


**DY. CHIEF ELECTRICAL ENGINEER/D-II**  
**CHITTARANJAN LOCOMOTIVE WORKS**  
**P.O. CHITTARANJAN – 713331**  
**DIST. BARDHAMAN (WEST), WEST BENGAL**

Signature Not Verified Digitally signed by ROHIT KUMAR Date: 2023.05.31 16:04:32 +05'30' Reason: IRRPS-CRIS Location: New Delhi	PREPARED BY <b>SANJAY KUMAR DAS</b> 2023.05.23 18:41:49 +05'30' SSE/DESIGN	CHECKED BY <b>CHANDAN KUMAR</b> Digitally signed by CHANDAN KUMAR Date: 2023.05.24 06:49:20 +05'30' AEE/DESIGN	APPROVED BY <b>ANSHU KUMAR VERMA</b> 2023.05.24 14:42:50 +05'30' DY. CEE/D-II

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**ALTERATION RECORD SHEET**


SL. NO.	DATE OF AMENDMENT	PAGE NO.	ALT NO.	DESCRIPTION	INITIAL
1.	05.01.2001	4,8	1	Write up under Cl. 1 (scope) & Cl. 2 (scope of supply) modified. Drg. No. 1209-08.232-019 (For Type-II) included in the specification. ALT. Sheet (Sheet No. 6) and ' & WAP/5 ' added.	S/d-
2.	17.07.2002	1	2	Hand written portions under clauses 1 & 2 in sheet 2, under Sl. No. 1 & 2 of "ENCLOSURES" in sheet 1 deleted. Note 1 in Annexure-I added. Remarks: Since separate spec. has been made for wiper assly. without water spray system.	S/d-
3.	07.09.2002		3	SPECN. REVISED & UPDATED	S/d-
4.	01.01.2004	7	4	Specn. write up revised, updated and typed on tracing paper . Sheet No. of Alt. Sheet was 6. Remarks : Based on RDSO Letter no. EL/3.1.35/5 dtd. 23.06.03	S/d-
5.	02.04.2004		5	This specification also followed for WAP-4 locos from the year 2004-2005 & onwards. Loco No. R-383 & onwards.	S/d-
6.	30.03.2007		6	This specification is also followed for WAG-7 (CF) (crew friendly) loco vide L/No. ELDD/3256/CRH dtd. 09.03.2007.	S/d-

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**SPECIFICATION FOR WIND SCREEN WIPER ASSEMBLY COMPLETE WITH MOTOR FOR 3-PHASE AC ELECTRIC LOCOMOTIVES (WAG-9 & WAP-5) WITH WATER SPRAYING ARRANGEMENTS.**

**1.0 SCOPE**


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

**2.0 SCOPE OF SUPPLY**

2.1 One loco set (4 Nos.) of wiper assembly complete are to be fitted in each loco. One loco set wiper assembly consists of the items conforming to Drg. No. 1209-08-032-023.

**3.0 CLIMATIC & ENVIRONMENTAL CONDITIONS**

Sl. no.	Climate and Environment conditions	Range
a)	Maximum atmospheric temperatures	Under Sun: 70°C In shade : 50°C.
b)	Humidity	100% saturation during rainy season.
c)	Reference Atmospheric Temperature:	
i)	Ambient Temperature	max. 47°C , min 0°C
ii)	Normal Humidity	60%
iii)	Altitude	160 m above mean sea level.
iv)	Rainfall	Very heavy in certain areas. The locomotive will be designed to permit it's running at 10 Km/hr-in flood water level of 102 millimeter above rail level.
d)	Atmosphere during hot weather	Extremely dry and desert terrain in certain areas.
e)	Coastal areas	Locomotive and equipment will be designed to work in coastal areas in humid and salt laden atmosphere.
f)	Vibration	The equipment , subsystem and their mounting arrangement will be designed to withstand vibrations and

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		shocks as specified in corresponding IEC publications for rolling stock application unless otherwise stated.
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#### 4.0 **STANDARD**

Standards used in this specification have been indicated in Drg. No. 1209.08.032.023 against each components. (i) IS:320 Gr. II, (ii) IES-M41, (iii) IS:2062 Gr. C (iv) IS: 3063 & (v) IS:1364.

#### 5.0 **GENERAL AND TECHNICAL DATA**

5.1 The wind screen wiper motor shall be suitable for working at

- I) A minimum air pressure of 3.0 kg/sq.cm and
- II) A maximum air pressure of 11.5 kg/sq.cm

5.2 The operating speed of the wiper motor shall be adjustable between 35 and 55 strokes/minute at a nominal pressure of 7-10 kg/sq.cm.

5.3 Wiping angle of the winds screen wiper shall be 65° with 8°over travel on both sides of the vertical axis.

5.4 Recommended pressure force of the flexible wiper blade on the glass shall be 1 kg. for wiper blade length of 508mm ± 5.

5.5 Wiper assembly will also be provided with water spray wind screen washing systems.

#### 6.0 **DESIGN PRINCIPLE**

6.1 Driving arrangement of spindle of air motor assembly should be rack and pinion type.

6.2 The torque of the air motor working the wiper system should be about 84 Nm at 10 bar air pressure and capable of working at 35 to 55 stroke/min. The motor should be able to give a wiping angle between 50° and 120°.

6.3 Material for Rack should be built in hard-anodized aluminium alloy to IS:734 and material for pinion should be bronze TO IS:28.

6.4 The rack and pinion materials should be high corrosion resistant.

6.5 The tooth profile of rack and pinion should be strong enough to withstand instantaneous/continuous load. Wiper blade will be with mechanism to provide force on its

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length. Mechanism will provide 4 point support for blade. Total length of wiper blade will be  $508 \pm 5\text{mm}$  "Wiper arm will be of  $550 \pm 5\text{mm}$ " of adequate strength to operate wiper continuously and also withstand jerks/shocks in operation.

- 6.6 The pinion should be supported on self-lubricated sintered bronze bushes.
- 6.7 The system should be easy maintainable.
- 6.8 Stopper with rubber pad are to be provided on end cover with the adjustment to set the opening position against piston.
- 6.9 Piston of the pilot valve should be made of Nylon-6/6.
- 6.10 All rubber components should be procured from RDSO/Railway approved sources.
- 6.11 The wiper motor spindle is to be made from standard bar of stainless steel to grade 304.
- 6.12 The mounting arrangement will be as per CLW's drawing.
- 6.13 Wiper motor handles are to be made of Hot dip galvanized steel.
- 6.14 The parking system should be in the wiper motor and wiper control valve assembly.
- 6.15 The supporting arm should be adjustable type.
- 6.16 The tension of spring of wiper arm should be adjustable type to achieve appropriate spring tension during assembly.
- 6.17 Wiper control valve should be suitable for mounting on the driver's desk as indicated in CLW drawing.
- 6.18 Water spray system consists of (i) a polyethylene water tank of 8 litres capacity, (ii) a water pump and (iii) water spraying nozzles, water tube and reduction nipple fitted to the body of wiper assembly.

## 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 plan shall include –

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- 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 5.2.
- iv) Air pressure test of each component.
- v) 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.

### 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 9000.

## 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.

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- 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, wiper control valve.

#### 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.

#### 13.0 **REFERENCE**

CLW's DRAWING No. 1209-08.032-023.

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