



**SPECIFICATION No.: CLW/MS/03/xxxx**

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**Total Number of Sheets: 8**

**SPECIFICATION**

*for*

**DRIVER SEAT ASSEMBLY WITH MECHANICAL SUSPENSION  
FOR 3-PHASE ELECTRIC LOCOMOTIVE**

**ISSUED BY:**

**ELECTRIC LOCO DESIGN OFFICE  
CHITTARANJAN LOCOMOTIVE WORKS  
P.O. CHITTARANJAN – 713331, DIST. BURDWAN,  
WEST BENGAL (INDIA)**

SPECIFICATION FOR DRIVER SEAT ASSEMBLY WITH MECHANICAL SUSPENSION FOR 3-PHASE ELECTRIC LOCOMOTIVE	Prepared By	Reviewed By	ELECTRIC LOCO DESIGN OFFICE CHITTARANJAN LOCOMOTIVE WORKS, CHITTARANJAN (W.B.)				
	SSE/D	SEE/D/CON	Specn No. CLW/MS/03/XXXX				
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**1. FOREWORD**

A constantly alert and vigilant crew is crucial for safe running of trains. Optimum seat ergonomics crucially improves working conditions and helps to preserve crew health, thereby, ensuring alertness and cognizance of the crew.

To achieve optimum seat ergonomics for anthropometric variation across India must be considered. Reach, visibility, comfortable sitting position and sitting posture of crew varies with the variation in anthropometric dimension which in turn varies with the racial and geographical changes over the country. Hence, a single fixed dimension for driver seat and its sub-assemblies cannot be suitable for all crews. Necessary adjustments are required for each crew. The specification considers this aspect in detail.

Optimum seat ergonomics ensures reach of all the locomotive controls and driver interface to crew without any stress. Each user has different requirements for comfortable sitting. Various adjustments in driver seat provide user specific optimization in terms of reach, visibility and sitting posture, thus, providing a comfortable working condition to crew. It contributes to enhancement in crew alertness level, reduction in drowsiness and ensuring visibility of signals to crew, thereby, improving overall safety in operation of locomotive.

**2. SCOPE OF SUPPLY**

Four numbers of assembled driver seats per locomotive are to be supplied.

**3. CLIMATIC AND ENVIRONMENTAL CONDITIONS**

a) Maximum Atmospheric Temperature:

Under Sun : 75<sup>0</sup> C  
 In Shed : 55<sup>0</sup> C

b) Humidity:

100% saturation during rainy season.

c) Reference site condition:

Ambient Temp : 47<sup>0</sup>C (Max) & -5<sup>0</sup>C (Min)  
 Humidity : 60%  
 Altitude : 160 m above sea level

d) Rainfall:

Very heavy in certain areas. The locomotive will be designed to permit its running at 10 Km/Hr. in flood water level of 102 mm above rail level.

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- e) Atmosphere during hot weather:  
Extremely dusty and desert terrain in certain areas.
- f) Coastal areas:  
Locomotives and equipment shall be designed to work in coastal areas in humid and salt laden atmosphere.
- g) Vibration:  
The equipment, sub system and their mounting arrangement will be designed to withstand vibration and shocks encountered in service as specified in corresponding IEC publication unless otherwise prescribed.

**4. STANDARDS:**

- 4.1. Latest version of specification shall be applicable unless otherwise specified.
- 4.2. Certification/Performance Standards referenced

<b>1.</b>	<b>ISO 9001:2015 (or latest version)</b>	Quality management systems
<b>2.</b>	<b>UIC 651</b>	Layout of Driver's Cabs in Locomotives, Railcars, Multiple-Unit Trains and Driving Trailers
<b>3.</b>	<b>UIC 612</b>	Driver Machines Interfaces for EMU/DMU, Locomotives and Driving Coaches - Functional and System Requirements Associated with Harmonised Driver Machine Interfaces
<b>4.</b>	<b>EN 45545-2</b>	Railway applications - Fire protection on railway vehicles - Part 2: Requirements for fire behavior of materials and components
<b>5.</b>	<b>DIN 5566</b>	Railway vehicles - Driver cabs
<b>6.</b>	<b>IEC 61373</b>	Railway applications – Rolling stock equipment – Shock and vibration tests

**5. GENERAL & TECHNICAL REQUIREMENTS:**

- 5.1. Two nos. of driver seat are installed in each cab. Pedestal for mounting driver seat and associated accessories are to be supplied along with the assembly.

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5.2. The driver seat shall be mechanically/pneumatically suspended and shall have following features:

SN	Features	
1.	Height adjustment (mm)	80 (in 4 steps)
2.	Suspension travel (mm)	100
3.	Fore/aft adjustment (mm)	210
4.	Adjustable backrest	10° to 70°
5.	Tilt adjustment	-3° to +5°
6.	Seat rotation with roller catch release	-120° to +120°
7.	Mechanical weight adjustment	50 to 130 kg
8.	Adjustable seat cushion depth (mm)	60
9.	High-comfort folding armrests	60x320mm
10.	Combined tilt and height adjustment	--
11.	Attachable headrest	--
12.	Mechanical lumbar support	--
13.	Adjustable shock absorber	--

5.3. Control for each adjustment should be different to prevent confusion when adjusting the seat. They should also be placed where one intuitively expect to find them.

5.4. It shall be possible for driver seat to be secured in working posture, but not locked.

5.5. Seat and back of driver seat shall be covered with porous material allowing for normal body perspiration.

5.6. The driver seat assembly shall conform to ergonomic requirement as per TSI Loc & Pas, UIC 651 and UIC 612.

5.7. Driver seat shall conform to safety requirement as per UIC 651, UIC 612, DIN 5566 and EN 45545-2.

5.8. Seat cushion, fabric and non-metallic part of the driver seat assembly should be made of fire resistant materials as per relevant international standard.

## 6. INSPECTION AND ACCEPTANCE:

6.1. The manufacturer shall offer one loco-set (4 nos.) of driver seat assembly for prototype inspection.

6.2. One no. of offered driver seat assembly shall undergo type testing and other 3 unit shall undergo routine testing at their works premises.

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6.3. All tests shall be witnessed by an authorized representative of the CLW and the cost of the testing shall be borne by manufacturer/bidder.

6.4. The manufacturer shall submit the test protocol to CLW for approval before offering prototype unit for inspection. The prototype test, routine test and acceptance test shall be carried out as per approved test protocol.

**6.5. PROTOTYPE TEST:**

6.5.1. **Visual/Dimensional checks:** The driver seat assembly shall be checked for overall finish, workmanship and dimensions; Dimensional checking will be carried out by properly calibrated measuring/checking instruments.

6.5.2. Conformity with the standard as specified in this specification shall be verified during the prototype testing. All tests shall be performed as per relevant standard and approved test protocol.

6.5.3. Type test shall be carried in following cases:  
 (i) First time supply to IR  
 (ii) Failure or variations established during type or routine test  
 (iii) Consistency type test within 5 years of the last type test to reestablish performance parameters

6.6. **FIELD TRIAL:** Prototype set shall undergo field trial for 6 months.

6.7. **ROUTINE TEST:** Routine test shall be performed by manufacturer on each assembly as per approved test protocol. Record of the same is to be maintained and furnished as per demand of the purchaser.

6.8. **ACCEPTANCE TEST:** 10% of the quantity of each batch shall undergo acceptance test as per approved test protocol. The acceptance test shall be witnessed by authorized representative of the purchaser.

6.9. Railway reserves the right to perform any tests at any time to establish specific performance parameter.

**7. DOCUMENTATION:**

7.1. Along with tender offer, tender shall submit:

- Clause wise comments on the specification.
- Detailed Dimensional Drawings
- Material Specification

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- Technical Data sheet
- Operational manual
- Maintenance manual
- Past experience with supporting papers (if any).
- Quality Assurance program.
- Machinery and plant for such job.
- Testing facilities available

7.2. Successful tenderers shall submit list of items supplied, certified copies of material and test certificates, technical datasheet and guarantee certificate along with the supply.

**8. QUALITY ASSURANCE:**

8.1. **System Certification:** Firm to have obtained system certification against ISO 9001:2015 (or latest version).

8.2. Any other certification obtained by the firm may also be submitted during the tender.

**9. MARKING:**

9.1. Each assembly shall have clear readable marking as follows:

- a. Name and model number of product
- b. Manufacturer’s name/trade mark
- c. Date of manufacturing
- d. CLW PO number and date
- e. Batch number/code for traceability of raw material

9.2. Various adjustment controls shall also be marked accordingly for user. A brief sheet shall be attached at the back side of the backrest explaining various adjustments.

**10. PACKING:**

All pipe fittings shall be properly packed to avoid damage during transit and storage.

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