SPECIFICATION FOR 3D ADJUSTABLE 360 DEGREE ROTATIONAL MODIFIED DRIVER SEAT FOR WAG9/WAG-9HC/WAG-9HC TWIN, WAP-7 & WAP-5 3-PHASE ELECTRIC LOCOMOTIVE OF INDIAN RAILWAYS

SPECIFICATION No. CLW/MS/3/161 ALT.NIL

ISSUE DATE: XX.XX.XXXX

ISSUED BY:
DY. CHIEF ELECTRICAL ENGINEER/D-III
CHITTARANJAN LOCOMOTIVE WORKS
P.O. CHITTARANJAN – 713331
DIST. BARDHAMAN (WEST), WEST BENGAL (INDIA)

PREPARED BY	CHECKED BY	APPROVED BY
SSE/DRG&DGN (M)	SSE/ DRG&DGN (M)	DY. CEE/D-III

ALTERATION RECORD SHEET

ALT. No.	DATE	DESCRIPTION	REASON	SIGNATURE

PREPARED BY	CHECKED BY	APPROVED BY
SSE/DRG&DGN (M)	SSE/ DRG&DGN (M)	DY. CEE/D-III

TABLE OF CONTENTS

TECHNICAL SPECIFICATION OF 3D ADJUSTABLE 360 DEGREE ROTATIONAL MODIFIED DRIVER SEAT FOR WAG9/WAG-9HC/WAG-9HC TWIN, WAP-7 & WAP-5 3-PHASE ELECTRIC LOCOMOTIVES OF INDIAN RAILWAYS.

1. **SCOPE:**

This technical specification defines the minimum requirement of design, manufacture, testing and supply conditions of 3D Adjustable 360 Degree Rotational Modified Driver Seat used in WAG9/WAG-9HC/WAG-9HC TWIN, WAP-7, WAP-5 3-Phase electric locomotives of Indian Railways.

2. **SCOPE OF SUPPLY:**

04(Four) Nos. of assembled 3D Adjustable 360^{o} Rotational Modified Driver Seat per loco to be supplied as per drawing No. 1211-01.131-001 ALT.2 or ALT. Latest.

3. **GENERAL:**

3.1. The driver's Seat consists of cushioned seat, suspension with weight adjuster, tilt and height adjuster, fore and aft adjuster, back rest adjuster, auto lock swivel, adjustable head rest and arm rest.

3.2. Two Nos. of this type of driver's seat are installed in each of the driver's cabin of the loco to enable Driver to take rest and operate the loco comfortably on the line.

3.3. The Driver Seat shall offer 60± 5 mm independent vertical and 360° swivel action with automatic positive lock in driving position. Height can be adjusted to suit the driver's need.

4. **TECHNICAL REQUIREMENT:**

4.1. Seat is designed as per UIC-651/612 standard.

4.2. Modified Driver's Seat Assembly complete including hardware items shall conform to appropriate specifications.

4.3. PU foam cushioning shall conform to RDSO spec no. RDSO/2007/CG-04 Rev.01 or latest and covered with fire barrier conforming to spec EN45545 HL3.

4.4. Vinyl coated upholstery fabric (Artificial Leather) of black colour for cover of Driver's seat shall conform to RDSO. Spec No. RDSO/2008/CG-07 Rev.1 or latest and is to be fire retardant.

4.5. Conditioning Temp. 27 ± 2 ˚C & 65 ± 5% relative humidity to be maintained.

4.6. Material used, shall withstand climatic and environmental conditions as mentioned in Para 5 with fungus coductive.

4.7. **Height adjustment** range shall be 60 ± 5 mm as per drawing.

4.8. **Mechanical Suspension** : Seats should be fitted with a suitable mechanical shock absorbing/ damping suspension. The Suspension Weight adjustment range shall be of 40-130Kg with rotatory dial weight adjuster.

4.9. **Horizontal Sliding Adjustment:** 90mm Forward & 90mm Backward from middle position.

4.10. **Recliner Adjustment**: A robust mechanical dial system for adjusting the reclining angle of back of seat, operable from both the left and right sides while sitting on seat. Seat back should recline according to the dimensions specified in the drawing. Recline mechanism design shall be such that activation of the recline control does not allow a sudden change in back rest position.

4.11. Automatic Swivel Movement: The seat should be easily rotated 360 degree and be fitted with a locking mechanism.

4.12. **Adjustable Armrest**: Armrest shall be adjusted upwards & downwards. Armrests should be horizontal when in the down position. Armrests shall fold up from the horizontal position such that occupant ingress and egress from the seat is completely unimpeded in any seat adjustment configuration. Top of armrests should be padded.

4.13. **Adjustable Head Rest**: Head rest shall be adjusted with 3 stage locking i.e 60mm adjustment in step of 20mm.

4.14. Document pouch to be provided at back side of seat. A catalogue to be provided with detailed functions/mechanism of the seat.

4.15. All fasterners shall be torque tightened as per IS:1367(Part-8):2002.

4.16. The seat must be designed to reduce shocks and vibration.

5. CLIMATIC AND ENVIRONMENTAL CONDITIONS

5.1	Ambient Temperature	-10 ˚C to 60˚C
5.2	Maximum Temperature	75˚C
5.3	Humidity	100% Saturation during rainy season.
5.4	Rainfall	Very heavy in the continent
5.5	Coastal Area	High humidity, salt laden atmosphere.

6. MANUFACTURE:

6.1. Driver's Seat assly. shall be manufactured as per CLW Drawing No.1211-01.131-001 ALT.2 or latest.

6.2. Powder Coating to be done in accordance with colour RAL 9005 MATT BLACK .

6.3. Welding whenever required to be done properly as per IS: 813 with proper grade of electrodes, current etc.

6.4. RDSO Spec. No. RDSO/2007/CG-04 Rev.1 or latest for PU foam cushioning material for Indian railways passengers.

6.5. RDSO Spec No. RDSO/2008/CG-07 Rev.1 or latest for upholstery cover cushioning material.

6.6. Steel used for manufacturing of seat shall conform IS: 1079 Gr.D/Gr.HR2, IRS-M-41 Gr. I, IS: 1239 and must have corrosive treatment.

6.7. Jig and Fixture to be used to maintain the geometry of the assembly.

6.8. Color and stitching of cushion cover, fittings etc to be of quality grade.

6.9. Total weight of seat assly. complete shall be 55 ± 5 kg including pedestal.

6.10. Cushioning material & cover shall be procured from RDSO approved sources only.

6.11. Standard fasteners of M/s TVS, M/s LPS and M/s UNBRAKO & KUNDAN or from CLW/BLW approved sources of its own brand/make shall be used in the assly.

7. INSPECTION AND TESTING:

7.1. Nominated representative of the CLW will carry out the inspection of prototype sample. All the necessary tests conducted during inspection shall be arranged and borne by the supplier.

7.2. The PU Foam material shall conform to RDSO Spec. no. RDSO/2008/CG-07 Rev.1 or latest. Fire Retardant PU foam Cushions to be procure from RDSO approved source only.

7.3. The cover material of Driver' seat shall conform to the parameters of RDSO specn No. RDSO/2008/CG-07 Rev.1 or latest

7.4. Static Load test to be done as per following:

7.4.1. **Bottom cushion static load test**: A vertical downward load of F_1= 2003N shall be applied uniformly over a 305mm × 305mm area located at the front center of the bottom cushion.

7.4.2. **Back rest static load test**: A horizontal load of F_2= 1334 N in the aft direction shall be applied uniformly to the upper part of the seat back at an elevation of 914 mm above the floor, or 76mm below the top of the seat back, whichever is lower. Reclining seats shall be in the full upright position. A fixture may be used to distribute the load across the seat back.

7.4.3. **Armrest vertical load tests:** A vertical downward load of F_3= 1000 N shall be uniformly applied on each armrest with the center of the contact area located 254 mm from the pivot point of the armrest. The contact area shall not exceed 5cm × 5 cm.

7.4.4. **Armrest horizontal load tests:** A horizontal load of F_4= 1000 N shall be applied perpendicular to each armrest with the center of the contact area located 254 mm from the pivot point of the armrest. Test shall be repeated in both directions, i.e., on the inner and outer surface of the armrest. The contact area shall not exceed 5cm × 5cm.

7.4.5. All load F_1 to F_4 shown in the attached diagram shall sustained for 5 minutes.

7.4.6. A maximum of 3mm permanent deflection is allowed for each load case. All adjustment mechanisms shall remain operable subsequent to testing. Measurements for permanent deflection shall be made after testing relative to an undeformed point located at the seat mounting

7.5. The durability of the seat and its adjustment mechanisms shall be demonstrated by testing as shown in Table-1:

Table-1

Life Cycle Test Requirements

Component	Test Cycles	Load Condition
Recline Mechanism	15,000	None
Armrest Folding	20,000	None
Vertical Adjustment	20,000	84Kg
Fore/Aft Adjustment	20,000	84Kg

Loads shall be placed in the seat to simulate the weight as mentioned in the Table-1. A cycle is defined as moving the seat component from one extreme position to the opposite extreme position and then returning to the original position. After testing, the seat shall not exhibit failure of any component or result in wear that would compromise the structural integrity of the seat. Seat controls and adjustments shall not exhibit any substantial change in function or force required to activate.

7.8. All the tests shall be witnessed by authorized representative of the purchaser.

7.9. Prior to prototype inspection CLW's Representative will be deputed to seal the sample piece of the material specified for test in the Govt. approved/ RDSO approved test Lab. The lab test report should be produced at the time of prototype inspection.

8. SUPPLY OF DOCUMENT:

8.1. Material Certificate indicating the specification.

8.2. All the test certificates as mentioned in Para 7 to be submitted.

9. LABELLING/MARKING:

(i) Name of the product.

ii) Month and Year of Manufacture.

iii) Name of the manufacturers with Trade Mark, Code No. and Batch No.

10. WARRANTY/GUARANTEE:

The seat shall be designed for a **5 year life** and shall be such that the strength of the seat structure and attachment to the loco shall not be compromised by environmental factors and in-service use (wear) over the specified life of the seat.

11. PACKAGING & DELIVERY:

11.1. Seat shall be suitably protected, covered or boxed to prevent damage or deterioration during transit, handling and storage at site till the time of erection. The manufacturer shall be responsible for any loss or damage during transportation, handling and storage due to improper packing.

11.2. The seat is to be packed in 02(Two) parts. First part being the entire seat back and the second part being the seat cushion with mechanism and base. The seat should be easily assembled/dismantled by removing the bolts on both sides under the recliner.

12. Any deviation with a view to improve the performance of the driver's seat may be given due consideration, keeping the overall dimension same, full particular with justification should be furnished for approval of CLW thereby. Only the successful tenderers will get detailed drawing.

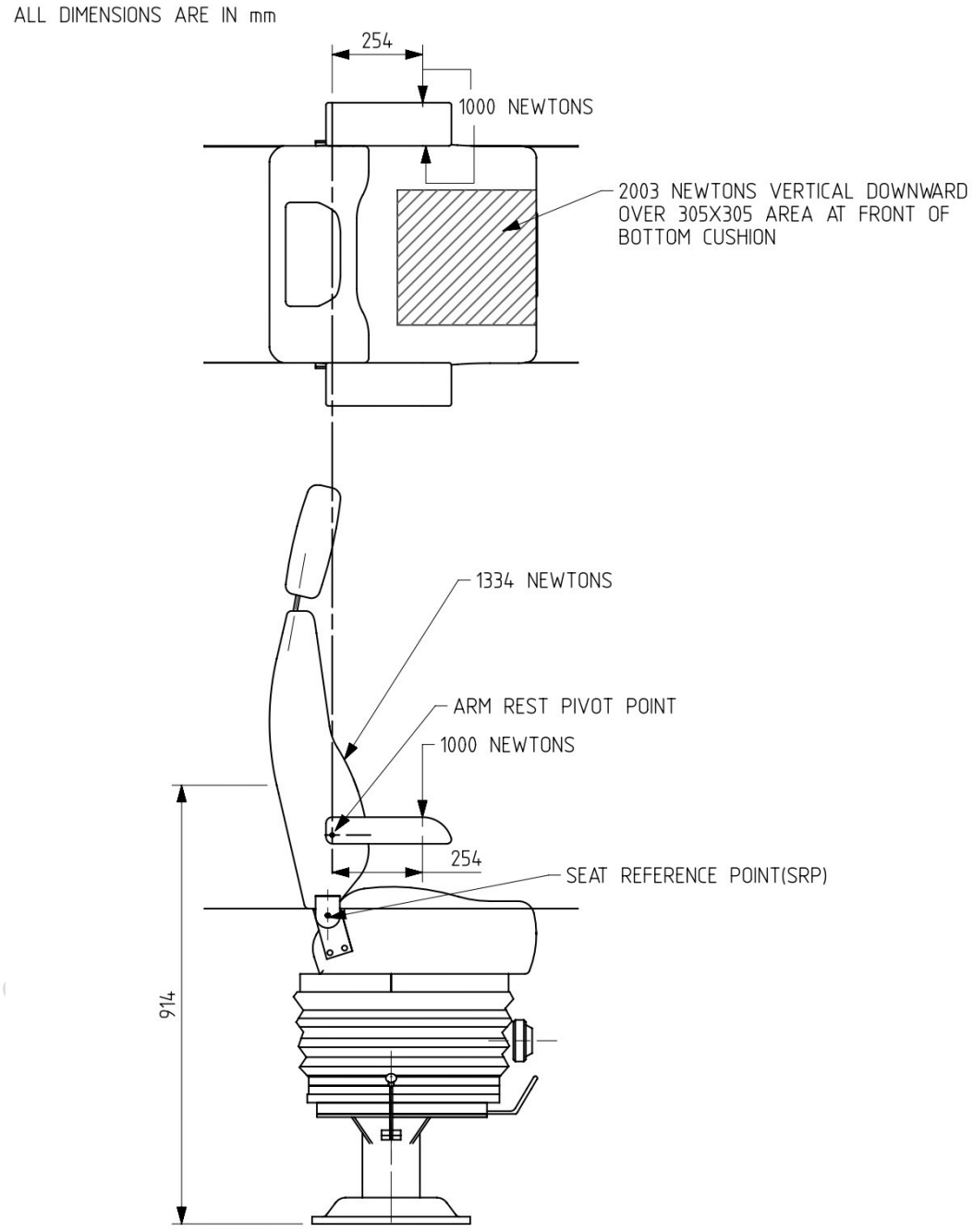

FIG: TEST LOADS

PREPARED BY	CHECKED BY	APPROVED BY
SSE/DRG&DGN (M)	**SSE/ DRG&DGN (M)**	**DY. CEE/D-III**