PAGE 1 OF 26	SPECIFICATION NO. CLW/MS/3/SPEC/ELDO-Bogie/004	ALT. '1' 2

SPECIFICATION FOR HELICAL COMPRESSION SPRINGS FOR WAG-9, WAG-9H, WAP-7 & WAP-5 THREE PHASE ELECTRIC LOCOMOTIVES OF INDIAN RAILWAYS

SPECIFICATION NO.: CLW/MS/3/SPEC/ELDO-Bogie/004 ALT. '1'
ISSUE DATE: 03.02.2017

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

PREPARED BY	CHECKED BY	APPROVED BY
DEBABRATA DHAR Digitally signed by DEBABRATA DHAR Date: 2023.03.31 11:16:56 +05'30' Adobe Reader version: 11.0.10	GURUDAS MANDAL Digitally signed by GURUDAS MANDAL Date: 2023.03.31 13:12:39 +05'30' Adobe Reader version: 11.0.10	RAVI YADAV Digitally signed by RAVI YADAV Date: 2023.03.31 16:36:46 +05'30' Adobe Reader version: 11.0.10
SSE/DRG. (MECH.)	SSE/DRG. (MECH.)	DY. CEE/D-I

DETAILS OF ALTERATION

ALT. No.	DATE	DESCRIPTION	REASON	SIGNATURE
1	15.11.2017	Drg. No.1209-01.015-008 is to be corrected as 1209-01.115-008 & Drg. No. 1209-01.015-009 is to be corrected as 1209-01.115-009 appeared in page no. 22 of 26 (Annexure-I).	Due to over sight	Sd/- 15.11.2017
2		PARA 6.1.1 AT PAGE NO. 15 OF 26 REVISED	STEEL BAND CODING REPLACED BY COLOUR CODING	

Specification has been digitized and all alterations have been incorporated.

PREPARED BY	CHECKED BY	APPROVED BY
DEBABRATA DHAR Digitally signed by DEBABRATA DHAR Date: 2023.03.31 11:17:42 +05'30' Adobe Reader version: 11.0.10	GURUDAS MANDAL Digitally signed by GURUDAS MANDAL Date: 2023.03.31 13:17:24 +05'30' Adobe Reader version: 11.0.10	RAVI YADAV Digitally signed by RAVI YADAV Date: 2023.03.31 17:11:30 +05'30' Adobe Reader version: 11.0.10
SSE/DRG. (MECH.)	SSE/DRG. (MECH.)	DY. CEE/D-I

6.10 **Shot Peening**

All the springs shall be shot peened in a continuous type shot peening machine with self-sieving arrangement in accordance with IS:7001 or suitable international standard to [illegible] of the spring. During shot peening, it shall be ensured that the springs are shot peened uniformly over the entire area of the springs. The intensity and coverage shall be checked with the help of almen strip in accordance with IS:7001. Almen intensity shall be checked minimum two times per shift of production. The minimum coverage (when checked visually) shall be 90% and intensity when checked with Almen strip Type – A in accordance with IS:7001 shall be minimum 0.40 mm (0.016"). The shots as per IS:4606 grade S-S 1180 shall be used. DIC 822 or EN 13298 may also be considered.

6.11 **Grouping and ~~Steel Band~~ Coding** (COLOUR)

100% of the springs shall be compressed with specified Working Load and the loaded height of the individual spring shall be measured on the Spring Testing Machine. The working height of the spring shall be within the tolerance specified in the CLW drawing. Based on the working height observed, the springs shall be grouped and ~~steel band~~ (COLOUR) coded for identification as specified in the relevant drawing. Any spring which is found to defective or which does not confirm to the limits of working height specified in the relevant drawing shall be rejected. ~~One number band~~ (YELLOW COLOUR) preferably ~~copper strip~~ to be used for spring with plus tolerance and ~~two numbers bands~~ (RED COLOUR) to be used to minus tolerance. **Spring to be supplied with same ~~band~~ (COLOUR) per loco set wise.**

7.0 **LOAD TESTING**

7.1 The spring placed on a flat rigid metal support shall be subjected to incremental increasing load upto the value indicated in the drawing on Spring Testing Machine. Each load is to be maintained till the load is stablised. The corresponding height of the spring (under load) is determined. The tolerance in height of the spring under nominal load and at other loads shall be as indicated on the drawing or in absence thereof, it shall not be more than ± 3% of design deflection value at nominal working load and – 4% / + 6% of design deflection value at other loads.

7.2 The spring stiffness shall be within ± 3.4% upto nominal bar diameter upto 18 mm and ± 5% beyond 18 mm nominal bar diameter. It shall be determined by dividing the difference of load between 70% and 30% of the designed solid load by the difference of measured deflection between these two loads or as per chapter 5.2.3.1 to EN 13298.

7.3 **Lateral Deflection**

When prescribed on the relevant drawing, the lateral deflection characteristics shall be checked as per drawing. Tolerance may be considered as guidance ± 25% of specified value for load or displacement. Suitable arrangement for this test to be described in QAP.

PREPARED BY	CHECKED BY	APPROVED BY
DEBABRATA DHAR Digitally signed by DEBABRATA DHAR Date: 2023.03.31 12:39:18 +05'30' Adobe Reader version: 11.0.10	GURUDAS MANDAL Digitally signed by GURUDAS MANDAL Date: 2023.03.31 16:17:36 +05'30' Adobe Reader version: 11.0.10	RAVI YADAV Digitally signed by RAVI YADAV Date: 2023.03.31 17:20:39 +05'30' Adobe Reader version: 11.0.10
SSE/DRG. (MECH.)	SSE/DRG. (MECH.)	DY. CEE/D-I