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No. EL/1.3.10/3 **Date: 09.01.2017**

Chief Electrical Engineers,

1. CentralRailway,MumbaiCST-400001
2. Eastern Railway, Fairlie Place, Kolkata- 700 001
3. East Coast Railway, Chandrashekharpur, Bhubaneshwar-751 016
4. Northern Railway, Baroda House, New Delhi-110 001
5. North Central Railway, Hasting Road, Allahabad-211 001
6. Southern Railway, Park Town, Chennai-600 003
7. South Central Railway, Rail Nilayam, Secunderabad-500 071
8. South Eastern Railway, Garden Reach,Kolkata-700 043
9. South East Central Railway, Bilaspur-495004
10. Western Railway, Churchgate, Mumbai-400 020
11. West CentralRailway,Jabalpur-482001
12. East Central Railway, Hazipur-844101 (Bihar)
13. Chittaranjan Locomotive Works, Chittaranjan- 713 331

Modification Sheet NO. RDSO/2017/EL/MS/ 0456 (Rev '0') Dated 09.01.2017

1. **Title:**
Modification in drawing of supporting ring to achieve adequate 'C' Clearance in MSU assembly of 6FRA-6068 TM in WAG9/ WAP7 class of locomotives**.**

2. **Object:**
To modify drawing of supporting ring to achieve adequate 'C' Clearance in MSU assembly of 6FRA-6068 TM in WAG9/ WAP7 class of locomotives**.**

3. **Existing arrangement with cross references of respective design document :**
3.1. Background:

3.1.1. During the Technical Audits carried out for maintenance practices of 3-phase MSU assembly at CLW, ELW/BSL and KPA workshop, it had been observed that 'C' clearance (Distance between Suspension tube and Supporting ring) is not coming within limits. Range of 'C' Clearance is specified as 0.1 to 0.7 mm in ABB 'Maintenance and Repair Manual' document No. 3EHW 411416, Chapter 2.06, page no. 27/36 and 'Wheelset Assembly Manual of WAG9 locomotive', page no. 20 of 54.

3.1.2. ABB document number AEB 452511 'Drive 15 AN 21 R1 Instructions for Assembly and Disassembly' clause 2.8 page no. 6/16, species the range of C clearance from -0.2 to +0.7 mm. Observed value of 'C' clearance during technical audits is found zero in most of the cases.

3.1.3. 'C' clearance is effected by depth of DE bearing seating portion in MSU, width of DE bearing (Outer race) and step in supporting ring.

3.1.4. From drawings of Suspension tube, Suspension tube bearing and Supporting ring, range of 'C' clearance is calculated as -0.15 to +0.65 mm as detailed below:

Dimension	**Description**	**Range Specified**	**Range Actual**
L	Depth of DE bearing seating portion in MSU (Drg. No. 1209-01.011-018 Alt. 8)	(97 ± 0.1 mm) - (49 ± 0.1 mm)	48.2 to 47.8 mm
M	The width of DE bearing (Outer racer) (Drg. No. 1209-01.411-020 Alt 1)	(56-0.1) to (56-0.4) mm	55.9 to 55.6 mm
N	The depth of step available in Supporting ring (Drawing No. 1209-01.211-036 Alt. 0)	7.55-0.1 mm	7.45 to 7.55
M - (L+N)	C clearance is defined as M - (L+N) The possible range of 'C' clearance based on the various tolerance given above are as given below:		
Calculation of 'C' clearance (in mm)	Max to max 55.9-(48.2+7.55)	0.15	
	Min to min. 55.6-(47.8+7.45)	0.35	
	Max to min 55.9-(47.8+7.45)	**0.65**	
	Min to max 55.6-(48.2+7.55)	**-0.15**	

3.1.5. If C clearance is zero or negative, it indicates that supporting ring is not touching/pressing the outer racer of drive end (DE) bearing which is not desirable.

3.1.6. Supporting ring drawing No. 1209-01.211-036 Alt '0' specifies the depth of step available in supporting ring as $7.55_{-0.1}$ mm. It is observed that if depth of step is changed from existing $7.55_{-0.1}$ mm to $7.30_{-0.1}$ mm, the calculated range of C clearance will be from 0.1 to 0.9 mm.

3.1.7. As the observed value of C clearance in most of the cases was zero during technical audits, CLW, BSL & KPA workshops were requested vide letter no. EL/1.3.10/3 dated 26.10.2016 to actually measure and record the value of C clearance during assembly. Based on the feedback received from CLW, BSL & KPA workshops, CLW was advised vide letter no. EL/1.3.10/3 dated 23.12.2016 to amend the Supporting ring drawing No. 1209-01.211-036.

3.1.8. Accordingly, CLW had changed dimension $7.55_{-0.1}$ to $7.30_{-0.1}$ and issued drawing No. 1209-01.211-036 Alt.1 vide letter no. ELDD/3751/Pt. 62 dated 28.12.2016.

3.2. Existing drawing:
Supporting ring as per drawing No. 1209-01.211-036 Alt '0'.

4. **Modified Instructions :-**

4.1. Description of kit of Suspension tube and its assembly components shall be modified to include modified drawing of supporting ring i.e. Drawing No. 1209-01.211-036 Alt '1' for future procurements.

4.2. During the new assembly of Suspension tube, Supporting ring as per Drawing No. 1209-01.211-036 Alt '1' to be used.

4.3. During the overhauling of Suspension tube assembly, if C clearance is less than 0.1 mm, existing supporting ring as per drawing No. 1209-01.211-036 Alt '0' to be replaced with Supporting ring as per Drawing No. 1209-01.211-036 Alt '1'.

4.4. After implementation of this modification sheet, range of C clearance will be from 0.1 to 0.9 mm.

5. **Application to class of Locomotives:**
WAP7/WAG9/WAG9H class of locomotives.

6. **Material Required:**
Supporting ring as per drawing No. 1209-01.211-036 Alt '1'.

7. **Material Rendered Surplus:**
Old supporting ring as per drawing No. 1209-01.211-036 Alt '0'.

8. **References:**

8.1 RDSO's letter no. EL/1.3.10/3 dated 26.10.2016
8.2 Dy.CME-DHD/WR letter no. M572/W/5/RB Box dated 09.12.2016
8.3 CWM/ELW/BSL letter no. BSL/ELW/Tech/F-4 dated 10.12.2016.
8.4 Dy.CEE/KPA letter no. ERS/LT-3/621 dated 10.12.2016.
8.5 Dy.CEE/Con/D-II/CLW/CRJ letter no. ELDD/3751/Pt./62 dated 16.12.2016
8.6 RDSO's letter no. EL/1.3.10/3 dated 23.12.2016.
8.7 Dy.CEE/D-II/CLW/CRJ letter no. ELDD/3751/Pt.62 dated 28.12.2016
8.8 M/s Kay Pee Equipment letter no. KPE/RDSO/C Clearance/2016 dated 16.11.2016
8.9 M/s Kalyani letter no. KEW/RDSO/0346/2016-17 dated 28.11.2016
8.10 M/s KMRI email dated 20.12.2016.

9. **Modification Drawing:**
CLW Drawing No. 1209-01.211-036 Alt '1'.

10. **Agency of Implementation:-**
CLW and Workshops carrying out assembly of MSU and wheel set.

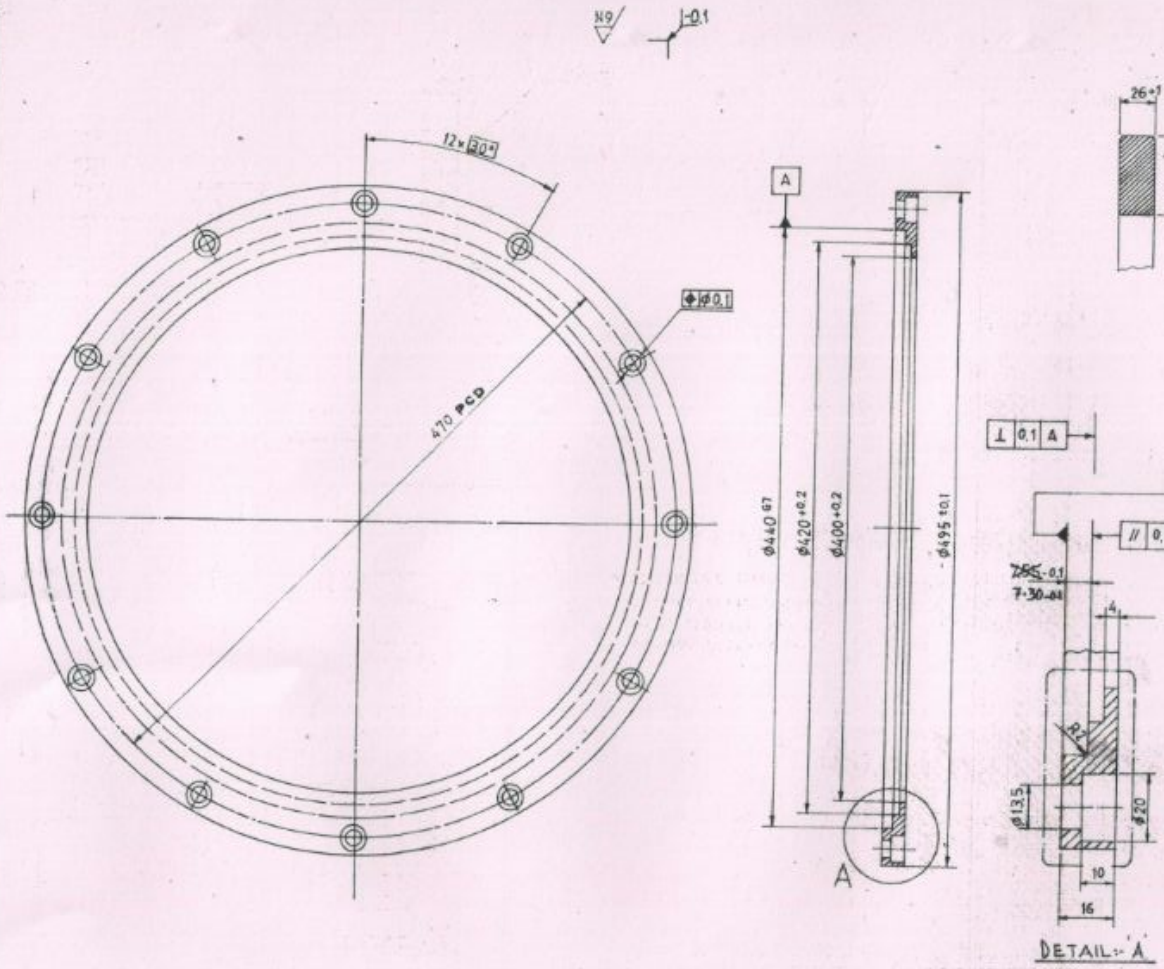
Encl: Above modified drawing

Encl: nil

9.1.17

(P. K. Saraswat)
for Director General/Electrical

Distribution: As per standard mailing list



* ALTERNATIVE SPECN.
(a) ISO 1083 : 1987 : 400-12
(b) BS 2789 : 1985 GRADE 400/18
(c) ASTM A 536-84, GRADE 60-40-18

	—	—	SUPPORTING RING	6	SGCI	DIN 1693 GGG 40
			DESCRIPTION		MATL	SPECN

REF. ASSLY DRG NO.
ABB DRG. NO. 18016-00431
1209-01-111-004, REF NO. 2

CHITTARANJAN LOCOMOTIVE WORKS
D & D CENTRE

SUPPORTING RING
(NOSE SUSPEND RING)

1ST ANGLE PROJECTION

USED FOR WAG 9 LOCOS

DRAWING NO.
1209-01-211-036

ALT (1)