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सत्यमेवजयते

भारत सरकार—रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ— 226 011

Government of India – Ministry of Railways
Research, Designs & Standards
Organization,
Lucknow – 226 011

No. EL/3.2.182

Dated. 23.11.2016

Chief Electrical Engineers

1. Central Railway, CST Mumbai-400001.
2. Northern Railway, Baroda House, New Delhi-110001.
3. Eastern Railway, Fairlie Place, Kolkata-700 001.
4. Southern Railway, Park Town, Chennai-600 003.
5. South Central Railway, Secunderabad-500 071.
6. Western Railway, Churchgate, Mumbai-400 020.
7. South Eastern Railway, Garden Reach, Kolkata-700 043
8. East Coast Railway, Chandrashekharapur, Bhubaneswar-751016.
9. North Central Railway, Subedarganj, Allahabad-211033
10. East Central Railway, Hazipur-844101, Bihar
11. West Central Railway, Jabalpur-482001.
12. South East Central Railway, Bilaspur-495004.
13. South Western Railway, Station road, Hubli-580020.
14. Chittaranjan Locomotive Works, Chittaranjan-713331 (WB)

Modification Sheet No. RDSO/2016/EL/MS/0439 (Rev.'0')

1.0 Title :

Modification in drawing of Outer Bearing Cap (DE) to drain out ingressed gear case oil from TM type 6FRA6068.

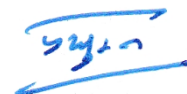
2.0 Object :

To modify drawing of Outer Bearing Cap (DE) to drain out ingressed gear case oil from TM type 6FRA6068.

3.0 Existing arrangement:

3.1 Background of the problem:

- 3.1.1 Three phase TM type 6FRA6068 are used on WAG9/WAP7 class of locomotives. During past, cases of bearing seizure were reported by Railways. During investigation of failed traction motors by CLW, it was noticed that Outer Labyrinth (DE) got locked with Outer Bearing Cap (DE).
- 3.1.2 After investigation of failed traction motors by CLW, these failures were attributed to very little clearance in the range of 0.5mm (Min.) to 0.87mm (Max.) between rotating and static labyrinths. Radial clearances between rotating and non-rotating ribs of labyrinths were in the range of 0.25mm-0.435mm. Any non-concentricity of 0.2mm-0.3mm between labyrinth/End Frame/Stator may cause rubbing of labyrinth which may finally result in seizure of bearing. To avoid the cases of bearing seizure due to rubbing (radially), clearance between fixed and moving parts of matching labyrinths had been increased by 0.5mm in diameter and axial clearance had been increased by 0.2mm in the relevant drawings by CLW.
- 3.1.3 Subsequent to implementation of above modification in manufacturing of TMs at CLW, cases of ingress of gear case oil in 3 phase traction motors had been observed at different loco sheds due to increase in Labyrinth clearances.
- 3.1.4 To drain out ingressed gear case oil, CLW had proposed a modification in the drawing of Outer Bearing Cap (DE) by providing three channels of 10 mm width and 12.2 mm depth to drain out ingressed gear case oil.
- 3.1.5 The proposal of CLW has been examined by RDSO and CLW was advised to modify the drawing No. 1TWD.096.006 Alt-3 of Outer Bearing Cap (DE) by providing three channels of 10 mm width X12.2 mm depth to drain out ingressed gear case oil.
- 3.1.6 Accordingly CLW had modified the drawing of Outer Bearing Cap (DE) and issued drawing No.1TWD.096.006 Alt-4 for Outer Bearing Cap (DE) by providing three channels of 10 mm width X12.2 mm depth to drain out ingressed gear case oil from traction motor.
- 3.1.7 RDSO had prepared draft modification sheet No. RDSO/2015/EL/MS/0439 (Rev.'0') and circulated for comments vide letter No. EL/3.2.182 dated 07.07.2015.



- 3.1.8 Draft modification sheet had been implemented on few traction motors by SER, ECR, CR and WCR and it is observed that problem of oil ingress in traction motor had reduced /eliminated after implementation of the draft modification sheet.
- 3.1.9 Hence it is now decided to implement this modification in all the traction motors of type 6FRA6068.

3.2 Existing Drawing:

Outer Bearing Cap (DE) is as per CLW's drawing .No.1TWD.096.006 Alt-3.

4.0 Modified arrangement :

- 4.1 Outer Bearing Cap (DE) to be modified as per CLW's drawing No. 1TWD.096.006 Alt '4' by way of providing three channels of 10mm width and 12.2 mm depth.
- 4.2 There is no change in any other component or processes for manufacturing/maintenance instructions for traction motor type 6FRA6068.

5.0 Application to class of locomotive:

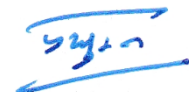
Three phase locomotives type WAP7 & WAG9/9H.

6.0 Material required: Nil

7.0 Material rendered surplus: Nil

8.0 Reference:

- i) CLW's letter No. CLW/TM/18009 dated 01.01.2015.
- ii) RDSO's draft Modification Sheet No. RDSO/2015/EL/MS/0439 (Rev.'0') dated 7.07.2015.
- iii) East Central Railway's letter No. ECR/ELE/RS/023/MS/1777 dated 10.09.2015.
- iv) South Eastern Railway's letter No. CEE/RS/220-B dated 03.12.2015.
- v) ELS/KYN's letter No. ELS/Kyn.Tech.151 dated 16.01.2016
- vi) West Central Railway's letter No. WCR/L/05/2221/2051 dated 21.06.2016.
- vii) ELS/AQ's letter No. ELS/AQ/T-91 dated 15.11.2016.

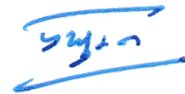


9.0 Modification drawing:

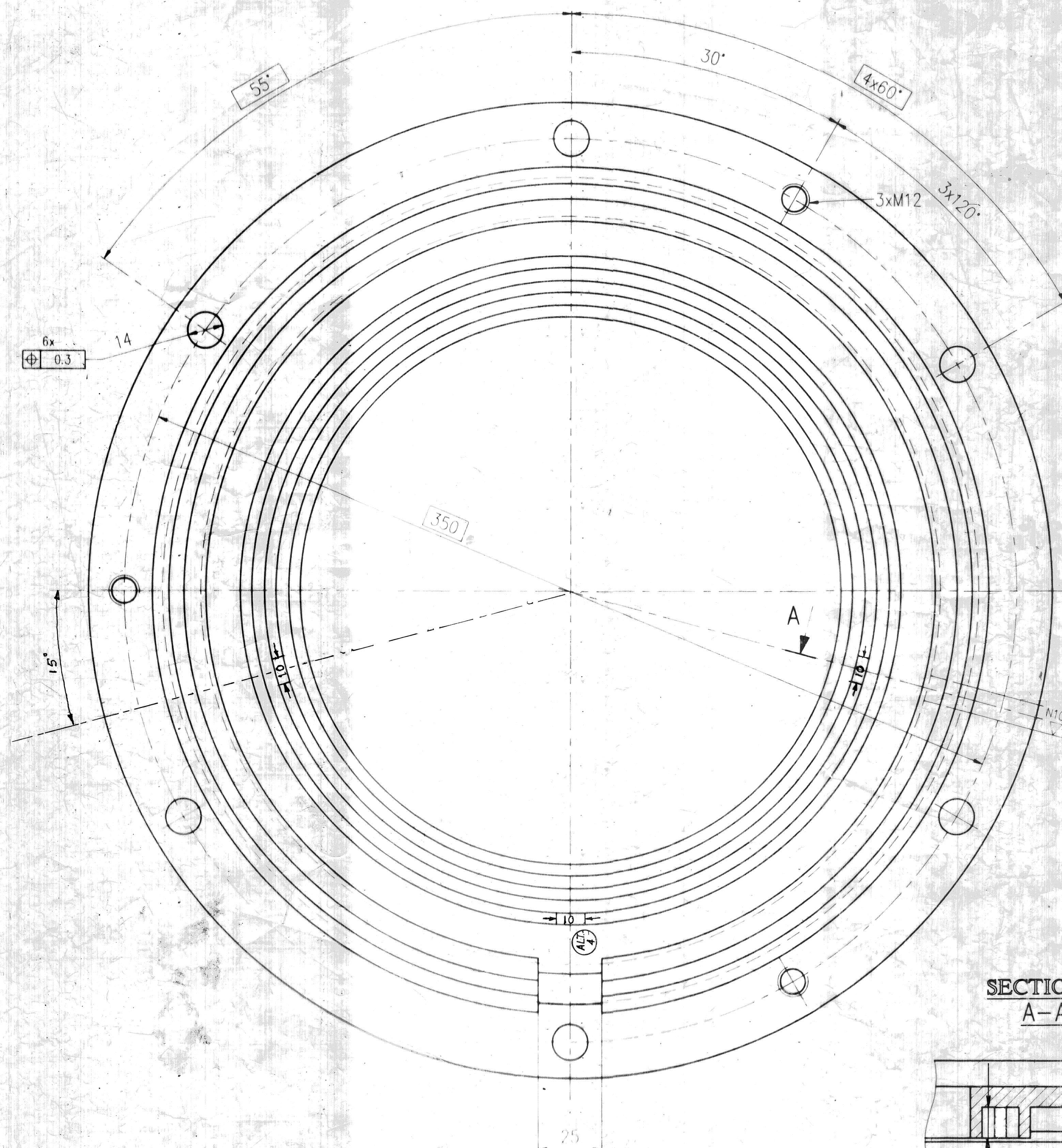
CLW's drawing No. 1TWD.096.006 Alt 4.

10.0 Agency of implementation:

- All traction motor manufacturers of traction motor type 6FRA6068 TM.
- All approved sources for repair & rehabilitation of traction motor type 6FRA6068.
- All Railway Workshops and Electric Loco Sheds.



(P.K. Saraswat)
For Director General/Elect



NOTE :-

1. REMOVE ALL SHARP EDGES.
2. MATERIAL :- SPHERULITE GRAPHITE CAST IRON (SGCI) TO DIN-1693 PART-1, GR- GGG/40 GR. 40/6 OF IS:1865-1391 (LATEST VERSION) TO SPECN. NO. 4TMS-096-068.

GENERAL TOLERANCE FOR LINEAR AND ANGULAR MEASUREMENTS FOR MACHINING ACCORDING TO ISO 2768					
RATED MEASUREMENTS RANGE	>0.5 TO 3.0	>3.0 TO 6	>6 TO 30	>30 TO 120	>120 TO 400
DEVIATION GRADE	±0.1	±0.1	±0.2	±0.3	±0.5

SURFACE ROUGHNESS VALUE - TO IS: 3073

GRADE NUMBER	N1	N2	N3	N4	N5	N6	N7	N8	N9	N10	N11	N12
Ra μm	0.025	0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50
SYMBOL	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	▽	~

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DGN.	N. R. Das		11.10.96				
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TRD.							
CKD.	D. C. B.		15.10.96				
SEE/TAG/III	S.S. 14	Scaph	24.6.97				
SCALE: 1:1							
REF. - 3EHM 112045							

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