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अनुसंधान अभिकल्प और मानक संगठन
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Government of India - Ministry of Railways
Research, Designs & Standards
Organization, Lucknow - 226011

No. EL/3.2.5

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Modification Sheet No. RDSO/2011/ ELRS/MS/0398 (Rev.'0')

1. Title:

Rewinding of TAO659 armatures having higher core slot mouth than the existing one to prevent pre-mature condemnation of armatures

2. Object:

During rewinding of armatures, the grinding discs are used for core cleaning of armature slots, resulting in increase in dimension of core slot mouth (CSM), which at times goes beyond specified limits and so armatures require condemnation. Secondly, at present slot wedge is in four pieces, which is an old design. Hence, it is required to review the design of slot having higher core slot mouth (CSM) and wedge for longer useful life of armatures.

3. Existing arrangement:

The fleet of traction motors type TAO 659 are getting older and older. The majority of rewinding is being done at TMW Nasik. The practice being followed at TMW Nasik is to allow the Core Slot Mouth (CSM) up to 8.8 mm along with standard slot wedges for last 15 years without any single case of conductor /wedge flying off due to centrifugal forces during service.

4. Modified arrangement:

- 4.1. Due to repetitive rewinding of TAO 659 armatures as the fleet is becoming older and older, CSM are observed to be more than specified value, i.e. 8.35 mm. On an average 7 to 8 armatures are getting condemned at TMW Nasik per month on account of higher CSM. CSM observed are up to 9.1 mm on armatures received at TMW Nasik for rewinding.
- 4.2. To avoid condemnation of TAO armatures on account of higher CSM, a study has been carried out at RDSO. The effect of reduced armature tooth thickness due to higher CSM and its impact on magnetic design of armature has been studied.
- 4.3. From the flux density calculations it is confirmed that even with CSM 9.1 mm, the flux density at armature slot tooth remains well within limit of 1.7 Wb/m² for M-45 grade stampings used in armature and hence CSM up to 9.1 mm can be used. This will enable retention of armatures with higher CSM in

service without compromising the quality of work and reliability of armatures in service. Hence, it is recommended that old TAO armatures having Slot Mouth dimensions up to 9.1 mm can be taken up for rewinding.

- 4.4. At present 4 no of wedges are used in one slot of TAO armature , which is an old design. To ensure better gripping, it has been decided to use 2 number wedges per slot as in case of Hitachi armatures. It has been examined that wedge of similar cross section is adequate with core slot mouth dimension up to 9.1 mm. Only length shall be increased from $194^{+0.0}_{+0.5}$ mm to $197^{+0.0}_{+0.5}$ mm.

5. Application of Class of locomotives:
WAM4, WAG5B, WAP1, WAP3 & WCAM2

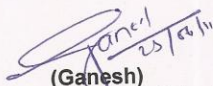
- 6. Material Required:**
2 nos. of slot wedge of same specification and cross section of length 194 mm instead of 4 no wedge of 97 mm. length.

- 7. Material rendered surplus:**
Nil

- 8. Modified drawing:**
Nil

9. Agency of Implementation:

All traction motor workshops doing rewinding of TAO 659 armatures.


(Ganesh)
for Director General (Elect)