भारत सरकार–रेल मंत्रालय
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Government of India - Ministry of Railways
Research, Designs & Standards Organization, LUCKNOW – 226011
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No. EL/2.2.13 Date: As signed

To Principal Chief Electrical Engineers:

1.	Central Railway, Mumbai CST-400001	मध्य रेलवे, मुम्बई ,सीएसटी–400001
2.	East Central Railway, Hazipur-844101	पूर्व मध्य रेलवे, हाजीपुर– 844101
3.	East Coast Railway, Chandra Shekharpur, Bhubaneshwar-751017	पूर्व तटीय रेलवे, चन्द्रशेखरपुर, भुबनेश्वर–751 017
4.	Eastern Railway, Fairlie Place, Kolkata -700 001.	पूर्व रेलवे, फेयर्ली प्लेस, कोलकाता–700 001
5.	North Central Railway, Block-A, Subedarganj, Allahabad- 211 033	उत्तर मध्य रेलवे, ब्लाक ए–2, सुबेदारगंज इलाहाबाद – 211 033
6.	Northern Railway, Baroda House, New Delhi-110001	उत्तर रेलवे, बड़ोदा हाउस, नयी दिल्ली – 110001
7.	North Western Railway, Jaipur- 302 006	उत्तर पश्चिम रेलवे जयपुर– 302006
8.	North Eastern Railway, Gorakhpur-273001	उत्तर पूर्व रेलवे गोरखपुर– 273001
9.	North East Frontier Railway, Maligaon, Guwahati-781011	उत्तर पूर्व फ्रेन्टीयर रेलवे मालीगॉव गुवाहाटी–781011
10.	South Central Railway, Secunderabad -500371	दक्षिण मध्य रेलवे, रेल निलायम, सिकंदराबाद–500 371
11.	South East Central Railway, Bilaspur - 495004	दक्षिण पूर्व मध्य रेलवे, बिलासपुर – 495 004
12.	South Eastern Railway, Garden reach, Kolkata-700043	दक्षिण पूर्व रेलवे, गार्डेनरीच, कोलकाता–700 043
13.	Southern Railway, Park Town, Chennai - 600003	दक्षिण रेलवे, पार्क टाउन, चेन्नई–600003
14.	South Western Railway, Hubli- 580020	दक्षिण पश्चिम रेलवे हुबली–580020
15.	West Central Railway, Jabalpur-482001	पश्चिम मध्य रेलवे, जबलपुर – 482001
16.	Western Railway, Churchgate, Mumbai-400 020	पश्चिम रेलवे, चर्चगेट, मुम्बई– 400 020
17.	Chittaranjan Locomotive Works, Chittaranjan-713331(WB)	चित्तरंजन रेल इंजन कारखाना, चित्तरंजन – 713331
18.	Banaras Locomotive Works, Varanasi -221 004	बनारस रेल इंजन कारखाना, वाराणसी–221004
19.	Patiala Locomotive Works, Patiala (Punjab)-147003	पटियाला रेल इंजन कारखाना, पटियाला ;पंजाबद्ध–147003

Amendment No.-2
Special Maintenance Instruction No. RDSO/2013/EL/SMI/0278 (Rev'0') dated 24.12.2013

Sub.: Amendment no-2 of SMI-0278 Rev '0' dated 24.12.2013 for fitment of Traction Motor Drive End Bearing NU2236 in 3-phase TM type 6FRA6068.

Ref.: Special Maintenance Instruction No. RDSO/2013/EL/SMI/0278 (Rev'0') dated 24.12.2013 and its amendment no.-1 dated 08.03.2021

Amendment no.-2 of Special Maintenance Instruction no. RDSO/2013/EL/SMI/0278 Rev '0' dated 24.12.2013 for fitment of Traction Motor Drive End Bearing NU2236 in 3-phase TM type 6FRA6068 is being issued and enclosed herewith for necessary action.

ANURAG AGARWAL
Digitally signed by ANURAG AGARWAL
Date: 2022.03.29 16:59:04 +05'30'

(Anurag Agarwal)
For Director General/Electrical

Copy to:

Principal Chief Electrical Engineer, Chittaranjan Locomotive Works, Chittaranjan-713331: K**indly inform to all traction motor manufacturers accordingly**

ANURAG AGARWAL
Digitally signed by ANURAG AGARWAL
Date: 2022.03.29 16:59:58 +05'30'

(Anurag Agarwal)
For Director General/Electrical

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No. EL/2.2.13 **Date: As signed**

Amendment No.-2

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1. Recently DE side bearing seizure cases in traction motor type 6FRA6068 is showing increasing trend specially in last two years. In most of the DE side deflector (outer labyrinth) is coming out as reported by Railways.
2. Improper interference between bearing components and rotor shaft is one of the reasons of such type of failures. Interference between bearing components & rotor shaft must be as per MS-0415. During examination it was found that improper taper /dimensions of dummy pinion is one of the reasons for maintaining improper interference.
3. It is mentioned that rotor shaft of the traction motor is hollow from one side. Shaft of the dummy pinion is inserted into the rotor shaft & final machining/grinding of outer surface of shaft is done. Hence the different seating diameters (of inner racer & labyrinths) of rotor shaft OD are maintained with dummy pinion.
4. As per instructions /procedure (as per SMI-0278 & its amendment-1), fitment of inner labyrinths, inner racer & outer labyrinth is done with dummy pinion and after complete assembly of TM, dummy pinion is removed & actual pinion is finally inserted.
5. If there is any discrepancy in dimensions/taper of dummy pinion or in actual pinion then there will be difference of swell on rotor shaft during insertion of actual pinion which will result in improper interference between labyrinths /inner racers & rotor shaft. There is no guarantee that the interference maintained at different locations will remain the same.
6. So, keeping in mind the importance of dimension/taper of dummy pinion, CLW is advised to review the QAP of manufacturing process of rotor assembly for ensuring 100% measurement of dimension/taper of dummy pinion during procurement/assembly.
7. Some Zonal Railways (CR, SCR etc.) have started assembly of traction motor with actual pinion in place of dummy pinion to avoid improper interference due to incorrect dimension/taper of dummy pinion.

8. Keeping in view of above facts, it is advised to assemble the traction motor with actual pinion in place of dummy pinion. Accordingly procedure of assembly of TM as mentioned in SMI-0278 needs to be modified. Existing clauses of SMI-0278 are modified as below :-

SN	Clauses of SMI-0278	Existing	Modified
1.	4.1.3	Ensure dummy pinion is inserted in the shaft before mounting of inner racer. Measure the bore diameter of inner racer and bearing seat diameter and ensure there shall be interference between 50-65 micron. This can be done by selecting right match of inner racer for a given shaft. Record these measurements.	• Remove dummy pinion as per procedure prescribed in SMI-0278 and mount the actual pinion as per procedure given in revised clause 4.5 of SMI-0278 (mentioned below). • Note down the pinion advancement and rotor shaft diameter at inner racer seat, inner & outer labyrinth seats. • Measurement of rotor shaft dia at different location will be useful for ensuring desired interference between rotor shaft & bearing components as per MS-0415.
2.	4.2.1	**Inner racer** After following necessary precautions, heat the inner racer upto 120°C and mount the inner racer and hold it in the position till it cools down. Measure the swell of inner racer and record it.	**Fitment of inner labyrinth &inner racer** **In case of WAG9 TM:** • Actual pinion will remain inserted. After following necessary precautions, mount the inner labyrinth & inner racer. Both must be heated on induction heater & temperature must not exceed 120 degree. During the mounting, racer must be hold till it cools down. **In case of WAP7 TM:** • Remove the actual pinion and mount the inner Labyrinth & racer.
3	4.2.2	**Outer racer** • Clean The end frame and all its tapped holes with compressed air/sand paper. • Fix the expanding dowel on the hole above the greasing nipple hole by driving the ball of expanding dowel with the help of metallic rod and hammer. • Insert the grease with grease gun in the re-greasing bore such that the grease just fills the	**Fitment of outer racer** No change

		entire bore. Remove the first grease which comes out of the bore of the regreasing hole. • Clean the inner labyrinth and apply grease on half of the circumference with grease gun. • Insert the inner labyrinth by matching its slot with the regreasing hole with the help of copper hammer. • Take the cylindrical roller bearing, apply grease with grease gun inside the cylindrical rollers. Make it uniform by hand. • Heat the bearing bracket up to 120°C and insert the outer racer in it . • Clean the bearing cap and apply grease on half of the circumference with grease gun & assemble the sealing ring. • Apply the anti rust compound on the bearing cap and the end frame surface. • Apply the anti-rust compound on all bolts. • Mount the bearing cap by matching its slot with the re-greasing bore hole. • Tighten all bolts by torque wrench.	
4	4.2.3	-	Assemble the TM as per maintenance manual. Finally mount the outer labyrinth. In case of WAP7 TM, finally insert the actual pinion as per revised procedure in clause 4.5 mentioned below
3.	4.5	**a.** Clean the tapered fit by cloth and paper and thinner. Dry it. Clean the pinion with paper and cloth and all its holes by compressed air. Pinion and the shaft bore must be free of any grease/rust/ colour. **b.** Mount the pinion on the shaft as per the procedure given in the maintenance manual. **c.** Measure the distance between	**a.** Clean the tapered fit by cloth and paper and thinner. Dry it. Clean the pinion with paper and cloth and all its holes by compressed air. Pinion and the shaft bore must be free of any grease/rust/ color. **b.** Mount the pinion on the shaft as per the procedure given in the maintenance manual. **c.** Measure the distance between

		gauge face & pinion teeth face. It should be 15±0.3 mm (say a). The pinion shall travel 12 mm inside the shaft and after mounting of pinion, it shall be a-b=12±0.1 mm, There shall be travel of 12±0.1 mm of pinion during application of pressure.	shaft face & pinion teeth face before applying pressure. It should be around 15-17 mm. **d.** Now start applying pressure. Ideally pinion shall travel 12 mm (+/-0.1mm). However, it is advisable to measure racer seating dia during pinion insertion. Make sure racer seating dia must not exceed its maximum limit i.e. 180.068 mm. **e.** During pinion mounting, pressure of pump should be increased up to approximately 1700-1900 bar. Ensure that under no circumstances pressure exceeds 2000 bar.

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for Director General Electrical