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भारत सरकार-रेल मंत्रालय
अनुसंधान अभिकल्प और रमानक संगठन
लखनऊ- 226011

Government of India - Ministry of Railways
Research, Designs & Standards Organization,
Lucknow - 226011

No. EL/1.3.10/3

Date: 18.10.2019

1. M/s Schaeffler India Ltd., Maneja, Vadodara-390 013
2. M/s SKF India Limited, 611-617, 6th Floor, Bestech Chamber, B Block, Sushant Lok, Phase-1, Gurgaon-122 002 (Haryana)
3. M/s National Engineering Industries Ltd., Khatipura Road, Jaipur-302006
4. M/s Timken India Limited, 2nd floor, Ramnath Building, 18 Community Centre, Yusuf Sarai, New Delhi-110 016

Sub: Minutes of Meeting 'modified MSU drive system and MSU bearings of WAG-9/WAP-7 locomotives' held at RDSO on 10.10.2019

Ref: RDSO's letters no. EL/2.2.13 dated 27.09.2019

1. Minutes of Meeting held at RDSO on 10.10.2019 on the issues related to 'Modified MSU drive system and MSU bearings of WAG-9/WAP-7 locomotives' had been issued and uploaded on RDSO website and it may be downloaded using following path:-

www.rdso.indianrailways.gov.in → Directorates → Electric Loco → Reliability Meetings
→ TM/MSU/Bearings.

2. This is for your information and necessary action please

(P.K.Saraswat)

for Director General/ Electrical

Copy to:

1. Secretary (Electric Traction), Railway Board, Rail Bhawan, New Delhi-110 001 :-
(Kind Attn. Shri A. K. Goswami, DEE/RS) - for kind information please.

2. Principal Chief Electrical Engineers,

- i. Chittaranjan Locomotive Works, Chittaranjan: 713 331 (WB)
- ii. South Central Railway, Secunderabad:500 017
- for kind information please

(P.K.Saraswat)

for Director General/ Electrical

Minutes of Meeting on the issues related to 'Modified MSU drive System and MSU bearings of WAG-9/WAP-7 locomotives' was held at RDSO on 10.10.2019

1. **Present:** As per list enclosed as Annexure - I
2. At the outset, PEDSE welcomed all the participants of the meeting and discussed with South Central Railways, CLW and firms on the issues related to 'Modified MSU drive System and MSU bearings of WAG-9/WAP-7 locomotives'.
3. Officers from CLW, SCR and representatives of M/s Schaeffler, M/s SKF, M/s NEI and M/s Timken attended the meeting. M/s G.G. Automotive Gears Ltd., Gajra had not attended the this meeting.
4. During the meeting, SCR had informed large number of arising of MSU in WAG-9/WAP-7 locomotives due to excessive lateral play. Total 80 cases are detected in 2018-19 and 43 cases in 2019-20 (till Aug). SCR had observed that in wheel set with excessive lateral play, rubbing marks are noticed on the rollers of bearing and width of collar of NDE racer and thrust collar worn out during service. As the wear will increase the gap, the lateral play is increasing in the course of service. SCR had recommended use of Taper Roller Bearing (TRB) in MSU as a long term measure and procurement & replacement of thrust collar with different widths of collar and NDE inner race alone to bring the lateral play within limits.
5. To discuss the issues, RDSO had conducted a meeting on 10.10.2019 along with bearing manufacturers, CLW and SCR.
6. SCR is requested to carry out make wise, Wheel shop wise and age wise analysis of excessive lateral play cases.
7. SCR is also requested to handover some released bearing with excessive lateral play to bearing manufacturers for further investigation and analysis.
8. **Deliberation on Long Term Measure Suggested by SCR:**

The existing design of MSU drive system on WAG9/WAP7 class of locos consist of Cylindrical Roller Bearing (CRB). The driving end bearing is mounted on the gear hub itself and lubricated through gear oil. Normally Taper Roller Bearings (TRB) along with grease lubrication are used for MSU bearing applications. Use of taper roller bearing is being made on all Electric and Diesel locomotives on Indian Railways including WDG4/WDP4 class of locomotives.
9. RDSO had also proposed to use TRB on the MSU to get increased life vide RDSO's letter No. EL/1.3.10.3 dated 31.05.2006.
10. RDSO had issued a specification no. RDSO/2006/EL/SPEC/0047 Rev. '1' in February 2007 for Design, Development, Manufacture and supply of modified MSU drive system for WAP7/WAG9 locomotives.

11. Railway Board had placed a Purchase Order no. 2008/Dev. Cell/IML-4/1, dated 28.07.2008 on M/s Timken for 21 loco sets (16 loco sets +5 loco sets).

12. Railway Board had also placed a Purchase Order no. 2008/Dev. Cell/IML-4/2, dated 08.09.2008 on M/s SKF for 18 loco sets (14 loco sets +4 loco sets).

13. Progress of M/s Timken project for Modified MSU:

- 13.1. As per PO, firm has to supply prototype unit (1 loco set) of MSU drive system within 3 months. Field trial of 6 months was prescribed.
- 13.2. Drawings & QAP of modified MSU for WAG9/WAP7 locomotives had been provisionally approved vide RDSO letter no. EL/1.3.10/3 dated 24.07.2009.
- 13.3. M/s Timken had supplied 06 nos. modified MSU. One MSU with gear of M/s KPC had been fitted in one loco 31488/KYN (Axle no. TG-0143) and dispatched for service on 15.03.2014.
- 13.4. 05 nos. out of 06 modified MSU supplied by M/s Timken and gears of M/s KPC are available in CLW/Chittaranjan. M/s Timken had been requested vide CLW's letter no. ELDD/3758/Pt.86 dated 26.06.2015 to co-ordinate for assembling of modified MSU in wheel sets.
- 13.5. M/s Timken had been requested vide CLW's letter number ELDD/3758/Pt.86 dated 19.10.2016, to depute Timken's team for fitment of balance 5 number modified MSU in wheel set at the earliest.
- 13.6. RDSO had also requested M/s Timken to co-ordinate the same vide letter No. EL/1.3.10/3 dated 16.11.2016 & 06.07.2018.
- 13.7. CLW is requested to give the performance of one modified MSU which is in service since 15.03.2014.
- 13.8. CLW had informed that some seals (labyrinths) and gaskets which are supplied as part of Modified MSU may have completed their shelf life. M/s Timken is requested to inspect the seals and gaskets and suggest suitable periodicity of overhaul of Modified MSU considering the life of seals and gaskets.
- 13.9. M/s Timken is advised to complete the fitment of remaining 5 modified MSUs by 31.12.2019. CLW to coordinate and provide necessary assistance to M/s Timken. M/s Timken had agreed to start the work in November first week.

14 Progress of M/s SKF project for Modified MSU:

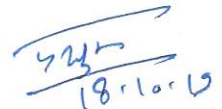
- 14.1 As per PO, firm has to supply prototype unit (1 loco set) of MSU drive system within 3 months. Field trial of 6 months was prescribed.



- 14.2 Drawings for manufacturing & supply of MSU assembly and components of modified suspension Unit drive system for WAG9/WAP7 had been provisionally approved vide RDSO's letter no. EL/1.3.10/3 dated 09.03.2011.
- 14.3 Vide Minutes of Meeting held on 14.03.2013 at CLW, M/s SKF was supposed to supply 01 loco set (06 nos.) of modified MSUs, bearings and all the related components duly inspected by RDSO to CLW.
- 14.4 CLW's letter number ELDD/3758/Pt.86 dated 19.10.2016 had informed that M/s SKF had not supplied any material to CLW till date.
- 14.5 RDSO vide letters No. EL/1.3.10/3 dated 17.11.2016 & 05.07.2018, had also advised M/s SKF to supply the materials to CLW at the earliest.
- 14.6 However, till now, M/s SKF had not supplied the material.
- 14.7 During the meeting, M/s SKF is requested to give time line for supply. However, M/s SKF representative had informed that M/s SKF will give the time lines within one week to RDSO.

15 Deliberation on Short Term Measures Suggested by SCR:

- During the meeting, firms opined that excessive lateral play may not be due to bearing. It may also be due to other components like labyrinths and fitment. Angle ring needs to butt with the inner ring. If fitting is not proper, it may lead to excessive lateral play.
- 16 Joint investigation of MSU with excessive lateral play will be carried out by RDSO along with bearing manufacturers at Wheel shop. SCR is requested to offer a MSU with excessive lateral play for joint investigation at wheel shop.
- 17 Firms had also opinioned that changing of bearing components like inner race or thrust collar separately and using old outer race and rollers is not recommended. Firms had recommended replacing complete NDE bearing in case of excessive lateral play.
- 18 It is suggested that NDE bearings may be replaced during MSU overhauling in case of excessive lateral play.



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

List of Participants:

SN	Name (S/Shri)	Designation	Railway
	RDSO		
1.	O.P. Kesari	PEDSE	RDSO
2.	P.K. Saraswat	DSE (TM)	
3.	L.C. Mahawar	SSE/Elect.	
4.	Mohd. Azeem	SSE/Elect.	
5.	Mohan Kr. Yadav	JE/Elect	
6.	Ritzu Ranjan	JE/Elect	
	CLW/Railways		
7.	Rahul Agarwal	SEE/Design	CLW
8.	T. Nagaraj	Sr. DEE/ELS/LGD	SCR
	Firms		
9.	Shailendra Prasad	Sales Manager	M/s Timken
10.	Debabalta Maity	Sales Manager	M/s Timken
11.	Sumit Gandhi	DM-AE	M/s SKF
12.	Deepak Muraleedharan	Asst. Manager, AE	M/s SKF
13.	Narendra Bhagwanani	GM/Schaeffler	M/s Schaeffler
14.	Santosh Lele	SM/Application Engg.	M/s Schaeffler

