3396895/2024/O/o PED/TRACTION/RDSO

भारतसरकार–रेलमंत्रालय
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सत्यमेव जयते

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

No. EL/3.2.19/3-Phase/Pt-1 **Dated**: As signed

Principal Chief Electrical Engineer,

1. Central Railway, Mumbai CST-400 001.
2. Northern Railway, Baroda House, New Delhi-110001.
3. North Central Railway, Subedarganj, Allahabad- 211001
4. North Eastern Railway, Gorakhpur-273 001
5. Eastern Railway, Fairlie Place, Kolkata -700 001.
6. East Central Railway, Hazipur-844101.
7. North Western Railway, Opp. Railway Hospital,Jaipur-302 006
8. East Coast Railway, Chandrashekharpur, Bhubaneshwar-751 016.
9. Southern Railway, Park Town, Chennai-600 003.
10. South Central Railway, Secunderabad-500 371.
11. South Eastern Railway, Garden Reach, Kolkata -700 043.
12. South East Central Railway, Bilaspur-495004
13. South Western Railway, Hubli (Karnatka)-580 020
14. Northeast Frontier Railway, Maligaon, Guwahati-781 011
15. Western Railway, Churchgate, Mumbai-400 020.
16. West Central Railway, Jabalpur-482001.

Sub: SPECIAL MAINTENANCE INSTRUCTION NO. RDSO/2024/EL/SMI/0333, Rev. '0', Dated 11-12-2024

Ref: Railway Board letter no. 2012/Elect (TRS)/ 440/21 dated 19-09-2024

The subject Special Maintenance Instruction (SMI) containing comprehensive maintenance activities of Pneumatic Wiper Assembly in electric locomotives is being issued for implementation after getting comments/suggestions from Zonal Railways and uploaded on RDSO's website (Copy enclosed). The SMI-333 can also be downloaded under following path:

http://rdso.indianrailways.gov.in → Specifications/Drawings → Loco, EMU & Power Supply→ Other Important links for loco → SMI/MS/TC→ Serial number wise→ Master list of Special Maintenance Instructions.

This issues with approval of competent authority.

Rajesh Kumar
for Director General Std./Electrical

Encl: As above

Copy to: Secretary (Electrical), Railway Board, Rail Bhawan, New Delhi-110 001
(Kind attention: Shri Avinash Singh Kushwah, ED/RS/RB) -for kind information please

(Rajesh Kumar)
for Director General Std./Elect.

Encl: As above

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No. EL/3.2.19/3-Phase/Part-1 Dated: As Signed

All Principal Chief Electrical Engineers,

SPECIAL MAINTENANCE INSTRUCTION No. RDSO/2024/EL/SMI/0333, Rev. '0', Dated 11-12-2024

1.0 **Title**: Comprehensive Maintenance Instructions for the maintenance of Wiper Assembly in work shops, loco-sheds, trip-sheds / pooling points and on-line to improve their effectiveness.

2.0 **Brief History with existing instructions (along with cross reference of respective design document):**

2.1 Pneumatic wipers are being procured as per CLW specification No. CLW/MS/3/050, Alt-6 or latest. Technical particulars of wiper assembly are described under Annexure-I.

2.2 Breakage of wiper blade, wiper servomotor spindle jam, breakage of wiper balancing rod & wiper assembly arm, wiper switch defective & rotating shaft jam due to rusting are the major causes reported by Railways for wiper not working.

2.3 Water sprayer nipple choke, wiper PU pipe breakage, wiper servomotor water seal damage, water pneumatic pump valve defective are the main reasons for water/air leakage as reported by Railways.

2.4 Revised maintenance schedule activities (TI, Minor & Major) along with list of must change items for 3-Ph locos had been issued by RDSO vide letter no. EL/3.1.35/16 dated 07-02-2012. Wiper assembly was also part of the revised maintenance schedule activities.

3.0 **Object**: To improve the reliability and effectiveness of working of Pneumatic Wipers of electric locomotives.

4.0 **Modified instructions**:

4.1 Revised maintenance activities as well as must change item list for pneumatic wipers have been further reviewed based on the feedback from Railways. Modified Maintenance schedule activities & must change item list is described in Annexure-II.

4.2 While taking up overhauling of pneumatic wiper, overhauling procedure mentioned in the OEM maintenance manual shall be followed.

4.3 Recommended tool list required for overhauling of Pneumatic Wiper is attached as Annexure-III which shall be ensured by maintenance sheds/workshops.

4.4 For reliable & effective working, precautions as mentioned in the Annexure-I shall be taken and accordingly counselling of crew shall be ensured.

5.0 **Application to**: 3- Phase Electric Locomotives equipped with Pneumatic wipers as per CLW specification no. CLW/MS/3/050 ALT-6 or latest.

6.0 **Agency of Implementation**: All workshops, loco-sheds, trip-sheds / pooling points.

7.0 **Periodicity of Implementation**: As per periodicity of various minor & major maintenance schedules.

8.0 **References**:

i. Railway Board letter no. 2012/Elect (TRS)/ 440/21 dated 19-09-2024
ii. Major reasons of wiper & washer not working with action plan received from ELS/CNB/NCR (PPT dated 30-09-2024).
iii. Major reasons for wiper not working (Wiper defective) and water leakage or water not coming including air leakage & wiper switch defective etc issue received from ELS/LGD/SCR (PPT dated 16-09-2024)

(Rajesh Kumar)
for Director General Std./Elect.

Encl: As above

Copy to :

As per Standard Mailing List No. EL-M-7.5.3-19 Latest Revision.

Annexure-I

1. Technical Particulars of Pneumatic Wiper Assembly:

a) The mounting arrangement will be as per CLW's drawing no. 1209-08.032.023.

b) The wind screen wiper motor shall be suitable for working at
   i. A minimum air pressure of 3.0 kg/sq.cm and
   ii. A maximum air pressure of 11.5 kg/sq.cm

c) The operating speed of the wiper motor shall be adjustable between 35 and 55 strokes/minute at a nominal pressure of 7-10 kg/sq.cm.

d) Wiping angle of the winds screen wiper shall be 65° with 8°over travel on both sides of the vertical axis.

e) Recommended pressure force of the flexible wiper blade on the glass shall be 1 kg. for wiper blade length of 508mm ± 5.

f) Wiper blade will be with mechanism to provide force on its length. Mechanism will provide 4 point support for blade. Total length of wiper blade will be 508±5mm "Wiper arm will be of 550±5mm" of adequate strength to operate wiper continuously and also withstand jerks/shocks in operation.

g) The wiper motor spindle is to be made from standard bar of stainless steel to grade 304.

2. Precautions for Reliable & Effective working of Wiper:

a) Crew shall be counselled to avoid dry run of wipers.

b) Crew shall also be counselled to operate few cycles of wiper after crew changing at crew changing points.

c) As per OEM, Crew should run the wiper motor everyday for few cycles.

d) Replace wiper blades during monsoon preparedness drive if required.

Annexure-II

MINOR MAINTENANCE SCHEDULE FOR WAP5, WAP7, WAG9 LOCOMOTIVES

SN	Description/ Activities	IT	IA/IB	IC
1	Check the operation of wind screen wipers using the wiper switch & manual handles & ensure proper contact between blade and lookout glass & no leakage of air. Rectify if fault found.	√	√	√
2	Check the water level in the reservoir at cab 1 and cab 2 end. Top up if required. Check wipers for proper operation.	√	√	√
3	Clean & Examine all components for wear, looseness, scoring and cracks, renew if any defective components.	√	√	√
4	Proper tightness and free movement of wiper assembly be ensured to prevent breakage of wiper assembly & blades.	√	√	√
5	Check working of washer nozzle jet for chocking, clean if required.	x	√	√
6	Check condition of air and water pipes through its operation, rectify if fault found.	x	√	√
7	Check seat-mounting points for integrity and ensure fixing or fully tightened.	x	√	√
8	Check wiper arm & blade for any sign of damage due to external hitting. Rectify, if fault found.	x	√	√
9	Check the wiper and parallel arm assembly for wear and damage. Replace the arm or any part if there is excessive wear or damage.	x	x	√
10	Greasing of Wiper servomotor rotating shaft with Lithium based Grease as recommended by OEM.	x	x	√ (2nd IC)
11	Replace the windscreen wiper blade on condition basis, In case of replacement measure the contact force between blade & glass using spring balance. Adjust spring tension to 1.0 Kg contact force.	x	x	√

MAJOR OVERHAUL SCHEDULE FOR WAP5, WAP7, WAG9 & WAG9H LOCOMOTIVES

SN	Description/ Activities	TOH	IOH	POH
1	Overhaul the wind screen wiper/washer system including overhauling of wiper motor, water pump & wiper switch & control valve assembly. Lubrication of servomotor spindle with Lithium base grease to prevent shaft jam & breakage of balancing rod.	√	√	√
2	Check the water level in the reservoir at cab1 and cab 2 end of locomotive and top up.	√	√	√
3	Clean the washer tank and washer jet nozzle.	√	√	√
4	Check for proper functioning of wiper/washer system. Rectify if fault founds.	√	√	√
5	Check Wiper motor driver shaft seal, wiper arm, pneumatic and water hoses and wiper blade and other components for wear, looseness, scoring and cracks, renew if any defects.	√	x	x
6	Adjust the position of wiper arm.	√	√	√
7	Replace wiper motor driver shaft seal, wiper arm, pneumatic and water hoses, wiper blade and idler shaft assembly.	x	√	√
8	Check seat mounting points for integrity and ensure fixing or fully tightened.	√	x	x
9	Measure the Contact force between blade & glass using spring balance. Adjust spring tension to 1.0 Kg contact force if required.	√	√	√
MUST CHANGE ITEMS OF WAP5, WAP7 AND WAG9 LOCOMOTIVES		**TOH**	**IOH**	**POH**
Wiper motor driver shaft seal, wiper arm, pneumatic and water hoses, wiper blade and idler shaft assembly.		x	√	√

Note:- Lithium based Grease shall be used instead of Silicon grease as recommended by OEM.

Annexure-III

Recommended Tool list required for overhauling of Pneumatic Wiper

SN	Description of Tool
1.	BOX SPANNERS 8/16 mm
2.	DOUBLE ENDED SPANNERS 8/10/12/13/16/17/32/1 inch
3.	RING SPANNER 8/10 mm
4.	ALLEN KEY 2/3/4/5/6 mm
5.	Slotted Screw Driver
6.	Bullet tool for O-Ring
7.	Oil seal pressing tools
8.	Spring Balance

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