

2759608/2024/O/o PED/TRACTION/RDSO

अनुसंधान अभिकल्प और मानक संगठन
लखनऊ- 226011
Tele/Fax : 0522-2452581
E-mail: dirpnloco@gmail.com



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



No. EL/3.2.19/3-Phase

Date: 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, Chandrashekharapur, Bhubaneswar-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 (Karnataka)-580 020
14. Northeast Frontier Railway, Maligaon, Guwahati-781 011
15. Western Railway, Churchgate, Mumbai-400 020.
16. West Central Railway, Jabalpur-482001.
17. Chittaranjan Locomotive Works, Chittaranjan-713331 (WB)
18. Banaras Locomotive Works, Varanasi-221004
19. DMW, Patiala- 147003

Sub: Minutes of meeting on reliability related issues of E-70 Brake System provided in 3-Phase Electric Locomotives.

Ref: This office letter of even no dated 02-02-2024

A meeting was conducted at RDSO on 15.03.24 between RDSO & technical representatives of M/s FTRTPL to discuss the various reliability related issues of "E-70" Brake System reported by Zonal Railways. Based on discussions the MOM has been issued and enclosed herewith for kind information and necessary actions.

This issues with approval of competent authority.

Encl: As above

(Rajesh Kumar)
For Director General Std./ Electrical

Copy to:

- Secretary (Electrical), Railway Board, Rail Bhawan, New Delhi-110001
(Kind attn.: Shri Kishore Vaibhav, EDEE/RS/RB) -for kind information please.
- M/s. Faiveley Transport Rail Technologies India Private Limited, P.B. No. 39, Harita, HOSUR- 635 109
- for necessary actions please.

Encl: As above

(Rajesh Kumar)
For Director General Std./ Electrical

2759608/2024/Q/c PED/TRACTION/RDSO Minutes of the meeting held at RDSO on 15-03-2024 on Reliability issues of E-70 Brake System of 3-Phase Locos.

Members Present:

RDSO	M/s FTRTIPL
Sh. R. K. Gupta, PED/PS&EMU " Rajesh Kumar, JDSE " Mahendra Pal, JE/D	Sh. Prashant Choudhary, Sr General manager - services " Mahentesh - Sr Manager - Engineering " Ravindra Kumar - Manager Field service " Sundresh - Dy manager quality

Meeting chaired by PED/PS&EMU and focused on review the reliability related issues of E-70 brake systems reported by Zonal Railways. PED/PS&EMU stressed on the implementation of the action plans to improve reliability of the brake system. The problems existing presently should be tackled immediately. Reliability improvements steps should also be taken in new supplies. The decisions and action taken there are furnished below:

#	Issues/ Equipments	Findings/observations	Discussion	Action to be taken
1	Pressure gauge failures	Air Leakage, Zero error	Gauges procured from approved sources - Midland and Topgrip. M/s Midland submitted RCA and action plan, improvement actions implemented in supplies from Mar-2022.	1. The reported issues of pressure gauges have been informed to M/s Topgrip & M/s Midland vide RDSO letter dated 27-12-2023. A separate meeting with gauge suppliers is to be conducted in May, 2024.
2	AFI gauge failures	Air Leakage	Calibration of gauges shall be done annually as per CLW and OEM recommendation to be followed to address zero errors.	2. Improvements to arrest air leakage & breakage of gauge glass are as follows: a) Polycarbonate glass thickness is changed to 12mm from 8mm. b) Pointer material is changed from plastic to aluminium. c) Improved electrical connection for leak proof by applying Loctite 638 on screws and Anabond 666 sealant on nylon grommet. d) Chamber height is reduced to 20mm from 40mm. 3. M/s Faiveley shall ensure supply gauges with improved gauges only. 4. ZRs are advised to ensure Calibration of gauges annually as per CLW letter no EL/3606 dated 08-07-2021 5. Performance of improved gauges are to be furnished by ZRs.
3	BP/FP Angle cock leakage	Air Leakage	In the 2-part design, the Problem of air leakage and misalignment of steel ball due to single-point support. 3-part design, new supplies shall be cut in from April 2024.	1. In terms of RDSO letter no. EL/3.2.19/3-Phase dated 24-05-2023 ZRs and M/s FTRTIPL were advised to switch over to 3-part design of 1-1/4" Cut off Angle cock with vent (end cock) for BP/FP as per as per CLW drawing No. 0/2/65/386 Alt-6. 2. M/s Faiveley has not cut-in supply of 3-part design of 1-1/4" Cut off Angle cock with vent (end cock) for BP/FP. It is a serious concern over reliability improvement. 6 month time has been considered adequate to cut-in the improvement in new supply. 3. M/s Faiveley shall cut-in supply of 3-part design of BP/FP angle cock

2759603/2024/O/o PED/TRACTION/RDSO

				with immediate effect and with no further delay.
4	E70 Valve assembly	1. Air Leakage due to circlip breakage. 2. Air Leakage due to seal hardening.	Water ingress observed in all cases where failures are noticed. 1. Circlip material changed from Stainless steel to spring steel with Geomet coating for rust prevention & implemented from April' 2021. Circlip spares provided to sheds. 2. Seal hardened & Circlip broken due to contamination of water ingress, Degradation of rubber properties, Grease dryness. 3. Proposed replacement of seal in TOH and recommended improving air quality.	1. M/s FTRTIPL is advised to introduce Criclip (spring steel with Geomet coating) of E-70 valve assembly in TOH kit. 2. ZRs are requested that replacement of E70 valve Circlips during TOH schedule. 3. TOH/IOH/POH scheduled kits are to be submitted so that comments on same may be obtained from ZRs. 4. ZRs are also advised to ensure proper functioning of Air Dryer to avoid water ingress into brake system.
5	Air Horn	Abnormal sound (flat tone)	Air Horn procured from approved sources –RECON, ELBI and previously ELGI. Process reviewed at supplier end for ELBI and RECON. Improved performance from ELBI, No major failures reported Since Feb 2020. As per suggestions from shed, Hylum diaphragm has been introduced.	1. M/s Faiveley is supplying horn with Hylum sheet. 2. ZRs are requested to ensure use of diaphragm with Hylum sheet instead of brass/Phosphor bronze.
6	Two-way horn valve leakage	Leakage Handle Jammed	Valve stem Material changed from Steel to Brass for easing of manufacturing to maintaining the groove dimension. Implemented since 2016 supplies Replacement provided to sheds.	M/s FTRTIPL is advised to provide modified valve stem (Brass) to GZB, CNB, TKD etc. where failures of old horn valves are reported.
7	SA9	Continuous Leakage from relay valve, Valve stem rubber insert de-bonded, Poor adhesive strength.	Process improved by increasing the area of holding glue application. Implemented from Nov 2021. 3500 Nos Replacements provided to loco sheds so far, NR-1700 Nos, WCR -1000 Nos, SCR – 200 Nos, NCR – 160 Nos, SER-130 Nos, WR-110 Nos, ER -73 Nos, other railways – 200 Nos	1. Mostly cases are reported from CNB, GZB, LGD & TKD sheds. Railways are requested to ensure replacement of exiting valve stem of SA9 & D2 relay valve with improved one. 2. M/s Faiveley will supply additional quantity, if required by sheds.
8	DBC (A9)	Air Leakage at release position	Under investigation. RCA will be provided in April 2024	Issue to be resolved by M/s FTRTIPL by April'2024
9	VCD	Vigilance PSU NORMAL LED Not glowing •BP not maintained or drops •VCD penalty comes in standstill position	Investigated & found 5V regulator(LM140) failure in PCB of VCD. Field modification carried out in all loco shed for batch of Jan 2018 to Jan 2021. Retro fitment completed in suspected batch.	M/s FTRTIPL representative shall visit AQ, CNB & ET sheds who has reported failure of VCD. Field modification shall be carried out if required for VCD. ZRs are requested to ensure that refurbishment/ rehabilitation of printed circuit boards of E-70 Brake System shall be carried out in service of 9 years as per Guidelines under TC-148.
10	C3W Valve	1. Leakage 2. Valve finish /Rubber to metal bond failed.	Replacement provided. Process corrected and replacement sent to Zonal railways. Pull test conducted after process improvement and found OK. No issues reported in Improved valve stem since Feb 2022.	M/s FTRTIPL has to ensure entire replacement of improved valve stem in ELS: TKD, GZB, AQ, CNB and provide required quantity of improved valve stem.
11	Unloader exhaust valve	Leakage	Out of 14 reported cases - Failure details of 6 cases are not available with shed (ELS GZB, ED & LGD). 5 cases are due to foreign particle	M/s FTRTIPL is advice to introduce TOH kit of ULV. ZRs are requested to clean the ULV

2759603/2024/O/o PED/TRACTION/RDSO

			seating on valve stem face - AQ & GZB (washer of Compressor check valve getting removed from Valve stem and getting struck in Unloader exhaust valve. Tooth lock washer implemented on Valve stem of Compressor check valve to eliminate this issue). As advised by RDSO we will propose TOH kit	during every IC schedule ('O' ring and spring shall be changed on condition basis) as per TC/142, Rev.1
12	Emergency exhaust valve	Leakage	O-ring squeeze calculation reviewed, O-ring with higher thickness implemented Batch identified ID 42.86 x C/S Dia3.53 ; Material NBR. Corrected :ID 42.86 x C/S Dia3.8; Material NBR. Spares provided to affected sheds and PUs.	M/s FTRTIPL is advised to ensure replacement of entire quantity of 'O' ring found undersized of the identified batch.
13	Control card	1. LED not glowing 2. Malfunction.	•R62 resistor burnt. •Component found burnt and open circuited due to excess current flow.	1. M/s FTRTIPL has switched over the procurement of Electronic cards of E-70 from M/s Tri-face to M/s Avlon from 2019 onwards.
14	LPO Card	Not working	•RL5, C12 and PCBA surface got damaged subsequently. •10A MCB used instead of 6A MCB for Pneumatic Panel MCB of 6 AMP to be used in place of 10 AMPs	2. ZRs are requested to furnish the performance of M/s Avlon make cards with failure data in Google sheet. 3. ZRs are also requested to ensure refurbishment/ rehabilitation of PCBs of E-70 Brake System to be carried out in service of 9 years as per Guidelines under TC-148.
15	Tri-Plate Assembly	Air Leakage between the panel plates.	Water ingress (O-ring squeezes due to chemical reaction of water ingress with grease and which is affecting the rubber properties. Air dryer maintenance to be ensured to avoid water entry and provide clean/ dry air for Brake system	The cases of air leakage between the panel plates within service period of 8-9 years lies the responsibility of manufacturer, M/s FTRTIPL has to attend such panels. ZRs are requested to ensure proper functioning of Air Dryer to avoid water ingress into brake system. ZRs are also requested to ensure OH of panels within stipulated service period of 8-9 years. During premature failures of Tri-Plate Assembly, check sheet (attached as annexure) shall be furnished along with joint note for analysis to be carried out by M/s Faiveley.

Other Issues

#	Topic	Faiveley Remarks	Action to be taken
1	Transmission of actual BP signal for recording in VCU	In the E70 brake panel, there is no provision for adding a BP pressure monitoring signal system. Actual BP pressure signal from the loco brake pipeline. The signal of the brake pipe (4-20ma) can be monitored by VCU. For the Same purpose, FTRTIPL submitted a letter to RDSO on 27-09-2022. Technical and commercial proposal will be submitted by 15 April	The proposal in details has been sought from M/s FTRTIPL on 23.01.2024. Technical proposal in details has been submitted.
2	Reliability Concern of SOAEB	In the 5 SOAEB units under trials, no issues have been reported so far. SOAEB will be monitored for performance. Awaiting RDSO	ZRs are requested to furnish the performance of SOAEB Ver.2 for sustainable period in ref of RDSO letter no.

(Rajesh Kumar)
For Director General Std./Electrical.

[illegible]