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

No. EL/4.6.1/3 phase Date: As signed.

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Sub.: Schedule Maintenance activities for conventional and 3 phase EMU/MEMU rakes.

Ref.: (i) Railway Board letter no. ERB-1/2019/23/27 dated 26.07.2019**.**
(ii) RDSO letter no. EL/4.6.1/3 phase dated 08.01.2024
(iii) Railway Board letter no. 95/Elect(G)/181/2 dated 04.04.2024
(iv) Railway Board letter no. 95/Elect(G)/181/2 dated 16.05.2024
(v) RDSO letter no. EL/4.6.1/3 phase dated 06.07.2024

Railway Board, vide letter under reference (i) constituted a committee comprising DSE(PS&EMU)/RDSO as convener, Sr. DEE/EMU car shed BCT/WR, Sr. DEE/EMU car shed GZB/NR, Sr. DEE/EMU/Howrah/ER and Sr. DEE(RS)/Avadi/SR as members for deciding detailed activities to be under taken during various maintenance schedules.

RDSO vide letter at ref-ii had earlier submitted report no. RDSO/PE/EMU/0038-2021(Rev. 01) dated 06.01.2024 to Railway Board for schedule maintenance activities of conventional as well as three phase EMU and MEMU rakes.

A meeting with Railway Board, committee members and zonal railways was held on 23.04.2024 to discuss the report. Railway Board, vide ref-iv issued MoM and advised the committee to review the report as per MoM. Based on the deliberations of Committee Members and Zonal Railways, final report no- RDSO/PE/EMU/0038-2021(Rev. 02) dated 24.06.2024 has been shared with Railway Board vide this office letter at ref-v.

Based on report no. RDSO/PE/EMU/0038-2021(Rev. 02) dated 24.06.2024, details of following schedule maintenance activities for conventional as well as three phase EMU and MEMU rakes are attached herewith for information and necessary action:

SN	Description	Annexure No.	Applicable to
1.	Equipment wise Revised Maintenance Schedule	1	Conventional EMU/MEMUs
2.	Daily Checking at Night Stabling	2	
3.	Must Change Item in POH	3	
4.	Daily Checking Items at Night Stabling	4	EMU/MEMUs fitted with three phase propulsion equipment
5.	Common Schedule for all Stocks (Mechanical)	5	
6.	Schedule Maintenance Activities of Three Phase EMU (Electrical) including RMPU, Automatic door closer and Vestibule	6A & 6B	
7.	Must Change Items to be replaced during POH Schedule	7	
8.	Scheduled activities during POH	8	
9.	Maintenance Activities to be carried out for Bio-Toilets.	9	Both Conventional and three phase MEMUs

Enclosure: Annexure 1-9

Digitally Signed by
Jitendra Yadav
Date: 08-07-2024 18:03:06
Reason: Approved

(Jitendra Yadav)
Director/MRVC
For Director General /RDSO

Copy to: For your kind information please.

सचिव(विद्युत सामान्य) रेलवे बोर्ड,

[ध्यानाकर्षण: श्री तेज प्रताप नारायण, विशेष कार्य अधिकारी, बिजली इंजिनियरिंग (सा.)]

ANNEXURE-1

EQUIPMENT WISE REVISED MAINTENANCE SCHEDULE FOR CONVENTIONAL EMU/MEMUs

SN	Equipment	Activities		Schedule
1.	**Rectifier**	1	Air blowing of. cubicle	IA / IC
		2	Visual checking for any abnormal sign or loose connection	IA / IC
		3	Visual checking of diode and connections along with Continuity & checking of fuses.	IA / IC
		4	Checking of capacitors DC & AC both side	IC
		5	Tightness checking of power and LT Cables	IA/IC
		6	Healthiness of supervisory circuit by fault simulation	IA/ IC
		7	Ensure proper cleaning of Air duct (HT compartment) & sealing	IA / IC
		8	Check cover sealing gasket condition	IA / IC
		9	Visually check Centre Earth Capacitor for proper condition	IA / IC
		10	Check and ensure intactness of fixation bolts.	IC
		11	Thermography of Power Cable Connection of Incoming Side Power Cable (Bus Bar Joint) of Rectifier (RSI) for checking of loose connections	IA/IC
		12	Thermography of Power Cable Connection of Outgoing Side Power Cable (Bus Bar Joint) of Rectifier (RSI) for checking of loose connections	IA/IC
2.	**Transformer**	1	Oil filtration	POH / (IC in case of low BDV)
		2	BDV checking of oil	IC
		3	PRV operation	IA/IC
		4	DGA of TFP oil	IC
		5	Acidity checking of TF oil	IC
		6	IR / Ratio of transformer	POH
		7	Condition of Silica gel and replacement if required	IA
		8	Tightness checking of power cable & condition of terminal boards their cleaning removal of muck, oil etc.	IC
		9	Cleaning of transformer	IA
		10	Visual, but closely checking of power cables; for its tightness / abrasion etc.	IA
		11	TFP Oil level	TI / IA
		12	TFP earthing checking & Continuity check for earth fault protection system.	IA / IC
		13	Oil leakage	TI / IA / IC
		14	Check mounting bolts and availability of split pin	IA/IC
		15	Thermography of Transformer for hotspot detection.	IA/IC
3.	**Choke Tank**	1	Visual Checking for any oil leakage.	TI / IA / IC
		2	Tightness checking of power cable.	POH
		3	Cleaning of muck etc.	IC
		4	Check SL connection visually for flash over heating marks etc.	IC
		5	Check & ensure intactness & proper tightness of all underslung fixation bolts	IC
		6	Visually check of hitting marks and ensure intactness of fixing bolts.	TI / IA / IC
		7	Thermography of SL (Smoothing Reactor), DL(Dropping Reactor) and TL(Tap Changing Reactor).	IA/IC
4.	**Radiator**	1	Visual checking for any sign of oil leakage.	TI / IA/IC
		2	Radiator blowing	IA
		3	Radiator cleaning in situ position..	IA / IC

SN	Equipment	Activities		Schedule
		4	Ensuring of proper air flow using anemo-meter and recording values	IA/IC
		5	Check and ensure intactness of fixation bolts.	IC
5.	**Buchholz Relay**	1	Effectiveness of working by oil draining	POH
		2	Visual checking for oil leakage, intactness of glass & working of cock and continuity of circuit	TI
		3	Check effectiveness by external air pressure	IA/IC
		4	Check condition of drain plug	IA/IC
		5	Release the gas of transformer from BUD and check the operation	IA / IC
6.	**Gate Valve of TFP Pipeline**	1	Visual checking for any sign of oil leakage or hitting sign.	TI / IA/ IC
		2	Opening of all cocks to be ensured	IA
		3	Ensure sealing of gate valve	IA / IC
		4	Visual checking of Andrew coupler for any breakage	IA
7.	**ASL**	1	Air Blowing & visual checking for its securing.	IA / IC
		2	Power Cable Tightness and proper mounting arrangement & cleaning.	IC
8	**Jumper & Coupler**	1	Meggaring and continuity checking.	POH
		2	Jumper head greasing for free movement.	IC
		3	Check rain protector (canopy) for couplers and receivers.	IA/IC
		4	Check locking handle & plate for each coupler and its fixations.	IA/IC
		5	Changing of Jumper head gasket	POH
		6	Check for proper coupling & securing of MU jumpers.	TI / IA / IC
9.	**MC – TB Checking**	1	Cleaning & tightness checking	
		2	(a) Below driver's desk	IC
		3	(b) LT compartment	IA/IC
		4	(c) HT compartment	IC
		5	Both end TB of each coach (MC & TC)	IC
		6	Proper bunching & Securing of cables to avoid any rubbing with surrounding metallic parts	IA/IC
		7	Check proper fixation / welding of LT panel of stiffeners	IA/IC
		8	Availability of insulation inside the Train line Terminal Board doors and ensure its proper locking	IA/IC
		9	Check the cables for proper layout, overheating symptoms.	IA/IC
		10	Check for cable insulation condition and availability of rubber grommets at entry & exit points of I.V. Jumpers	IA/IC
10	**Transition Resistance Box**	1	Visual checking for any element cutting, over heating melting sign etc.	IA
		2	IR measurement & tightness of power connection	IC
		3	Bus bar connection & value of resistance measurement	POH
		4	Clean TR box by compressed air and remove sticky dust from box/ cover/ insulators	IA/IC
		5	Ensure check nut on TR mounting point	IA/IC
		6	Clean RTL box to remove the accumulated oil & dust.	IA/IC

SN	Equipment	Activities		Schedule
11	**Permanent Field Diverter (PFD)**	1	Visual checking for any element cutting sulphation sign etc.	IA
		2	Tightness of power connection	IC
		3	Continuity of fuse & bus bar element checking	IC
		4	Clean PFD box by compressed air.	IA/IC
		5	Check indication of PFD fuse by fault simulator	IA/IC
		6	Ensure check nut for PFD mounting point	IA/IC
		7	Clean PFD box to remove the accumulated oil & dust.	IA/IC
		8	Check and ensure intactness of fixation bolts	IC
12	**Master Controller**	1	Free operation of MP at different positions & ensure intactness of lock screw	TI / IA / IC
		2	Operational checking and cleaning of interlocks	IA/IC
		3	Operation and checking of Dead man's valve	TI/ IC
		4	Lubrication of gear, bearing and ratchet etc.	IC
		5	Tightness of locking screw and cover latch	IA / IC
		6	Cleaning of contact tips with chamois leather	IA / IC
		7	Measurement of contact pressure by spring balance	IA / IC
		8	Check cams for groove, looseness etc.	IC
		9	Check internal connections and ensure all cables dressed properly.	TI / IA / IC
		10	Ensure interlock gap of 2.54 mm and spring tension of interlocks (240 to 380 gm) and adjust / replace interlocks accordingly if required.	IC
		11	Ensure availability of Grub screw	IA / IC
		12	Ensure availability of Accelerating Handle Holding pin & Stop Pin	IA / IC
13	**EP & motor Contactors**	1	Operational checking of contactor by manual operation	IA/IC
		2	Condition of fixed, mobile contact and examination of pit marking, flashing if any	IA/IC
		3	Operation and spring tension checking of mobile contact	IC
		4	Closing and opening of aux interlocks and interlock crushing	IA/IC
		5	Functioning of return spring at zero pressure.	IA/IC
		6	Effectiveness of knurling spring by pressing bottom contact.	IA/IC
		7	Interlock arms operation and condition checking	IA/IC
		8	Blowing and cleaning of pneumatic pipelines, strainers & filters.	IC
		9	Tightness checking of power cable connected with tap Changer and switch group.	IA/IC
		10	Check condition of arc chutes – remove metal deposition etc. (replace if required)	IA/IC
		11	Check operation of contactors for sluggish operation.	IA/IC
		12	Cleaning of aux. contacts with chamois leather.	IA/IC
		13	Tightness of cable connections with auxiliary contacts.	IA/IC
		14	Check Cam to Roller gap 0.8 mm	IA/IC
14	**Traction motor**	1	Measurement of IR value of armature and stator	IA/IC
		2	Checking of V cone & condition of commutator along with changing of carbon brush if required.	IA / IC
		3	Ensuring tightness of pole shoe bolts & it's locking.	Should be done in

SN	Equipment	Activities		Schedule
				every over hauling
		4	Check for any flash over sign & measure gap between B/holder & commutator.	IA / IC
		5	Check & ensuring of intactness of end shield bolts, fan chamber, end plates, duct & duct bolts.	IA / IC
		6	Check for any damages to TM cables along with its proper securing, rubbing of cable with Magnet frames to be arrested.	TI / IA / IC
		7	Ensuring the intactness of nose plates fitted in magnet frame.	TI/IA/IC
		8	Cleaning of V cone. Also, painting by anti-tracking varnish (Bectal Red or equivalent) if PTFE ring is not provided over "V" Cone.	IA / IC
		9	Measurement of gap between TM nose and sandwich plate by filler gauge. The gap to be maintained as specified	IA/IC
		10	TM blowing.	IA/IC
		11	Securing of junction box & healthiness of incoming & out going cables.	IA/IC
		12	Ensure securing of air bellows with duct along with intactness of all fasteners. Also condition of bellow for any crack etc.	IA/IC
		13	Cleaning TM's suction air filters by air blowing	IA/IC
		14	Intactness of earthing brush and its functioning.	IA / IC
		15	Body earthing	TI/IA/IC
		16	Ensuring intactness & securing of all inspection cover with gasket.	TI/IA/IC
		17	Check the condition of spring washers & ensure replacement for gear case mounting bolts.	IC
		18	Measurement of polarization index of armature and stator	POH
		19	Check & record Temp. of bearings	TI/IA/IC
		20	Proper checking of Junction boxes, panels etc. for rubbing, touching of cables and provision of insulating sleeves at all metallic edges.	TI/IA/IC
		21	Proper checking of TM fan chamber for crack etc. (by tapping/ hammering)	IA/IC
		22	Check for any overheating marks on cables.	IA/IC
		23	Ensure availability of cable cleats	TI/IA/IC
		24	Check for oil traces and clean	IA/IC
		25	Open inspection covers of all traction motors and make a quick inspection for flash marks, broken brushes , damaged pig tails or other damages	IA/IC
		26	Check the commutator for a uniformly coloured, well-polished surface, free from bar marking	IA/IC
		27	Remove copper beads from the commutator surface with fine cloth	IA/IC
		28	Check the carbon brushes for wear, mechanical damages and breakage of flexible leads	IA/IC
		29	Check that flexible leads are firmly secured to the brush holder	IA/IC
		30	Thermography of Traction Motor Junction Box.	IA/IC

SN	Equipment	Activities		Schedule
15	**Auxiliary Motors**	1	Checking for any abnormal sound on run, observance of flashing and changing of carbon brush if required.	IA/IC
		2	Measurement of capacitor value of AC motors and replacement if found defective or low value.	IC
		3	Checking of motor connection tightness at terminals	IC
		4	Measurement of insulation, resistance of auxiliary motors	IC
		5	Air blowing of MCP motors & checking of commutator	IA/IC
		6	Air blowing of RF motor & filter	IA/IC
		7	Checking and ensuring foundation tightness	IA/IC
		8	Checking the condition of MCP and commutator for any flashover or any defect.	IA/IC
		9	Checking the condition of carbon brush and changing if required.	IA/IC
		10	Current measurement of aux. motors.	IC
		11	Air blowing of all AC motors & filters	IA / IC
		12	Ensure intactness of Earth Shunt	IA / IC
		13	Clean interlocks with Contact Cleaning Spray, fine emery paper and cloth.	IA / IC
16	**Battery**	1	Condition of battery tray & repair, if required.	IA / IC
		2	Availability and continuity of battery fuse. Ensuring perfect connection and securing of cable terminal	IA / IC
		3	Checking of specific gravity of each cell	IA / IC
		4	Distil water checking and topping up, if required	TI
		5	Measurement of each cell voltage	IA/IC
		6	Application of petroleum jelly on the bare connections and tightness of terminal connections.	IA / IC
		7	Check for any sign of sulphation and its & removal, if detected.	TI / IC
		8	Cell tap holders cleaning.	IC
		9	Cleaning of vent holes of vent plug.	IA/IC
		10	Check proper fitment of covers and packing to avoid relative movement during run	IA/IC
		11	Ensure compact placement of battery cells to avoid relative movement during run.	IA / IC
		12	Check for any water leakage or crack.	TI / IA / IC
		13	Clean battery box and trays with coir brush and then blow air in battery box especially ventilators. Repair Battery trays if required.	IA / IC
		14	Thermography of Battery Fuse Terminals.	IA/IC
17	**Battery Charger**	1	Checking of foundation and its securing, tightness of terminal condition and cleaning	IA/IC
		2	Air blowing of transformer	IC
		3	Securing of capacitor bank terminal connection and dust cleaning	IA/IC
		4	Measurement of cap. value of capacitor bank and filter capacitor	IC
		5	Dust cleaning and terminal connection tightness checking of choke filter capacitor, diodes, bleeds resistance, and HRC fuse	IA/IC
		6	Ensure proper working of battery charger	TI /IA / IC

SN	Equipment	Activities		Schedule
		7	Ensure working of Indication lamps, Ammeter and replace if required.	IA / IC
18	**Roof Insulators and CHT**	1	Ensure intactness of proper foundation to all Roof insulators & CHT	TI /IA / IC
		2	Ensure tightness of foundation bolts of all Roof insulators & CHT.	IA / IC
		3	Check roof insulators and roof bars for any abnormal sign / cracks / pitting / damages. Replace if required.	TI /IA / IC
		4	Visual checking for any abnormal sign on CHT. Ensure tightness of earth connection & earthing shields	IA / IC
		5	Clean all roof insulators with cloth and then spray Silicon graphite spray / Silicon Jelly.	TI /IA / IC
19	**Head light**	1	Visual and operational checking of lamp holder rotary switch MCB	TI/IA/IC
		2	Tightness checking of holder rotary switch, headlight MCB and spring action checking of holder along with contact of Rotary switch	IC
		3	Headlight glass cleaning with powder.	IA/IC
		4	Brush cleaning of holder for removal of dust and dirt.	IC
		5	Cleaning of reflector	IA/ IC (if twin beam)
		6	Tightness checking of toggle switch connection	IA/IC
		7	Check focusing of Head light in recommended arrangement	IA/IC
		8	Proper sealing of Head Light cover using RTV to avoid moisture ingress	IA/IC
		9	In case of twin beam head light ensure proper working of DC-DC converter with stand by unit.	IA/IC
21	**Flasher Light**	1	Operation checking and lamp changing, if required	TI/IA/IC
		2	Proper sealing of Flasher Light cover using RTV to avoid moisture ingress	IA/IC
		3	Ensure operation & functioning of standby unit on both switches	TI / IA / IC
22	**Bell code and push button**	1	Operational checking of Bell code.	TI/IA/IC
		2	Checking of condition of plunger & copper wires.	IA/IC
		3	Ensuring tightness of bell & its connection.	IA/IC
		4	Ensuring spring action of bell push	IA/IC
		5	Cleaning and checking of plunger and bell push assembly	IA/IC
23	**Alarm Bell & Bell Push**	1	Visual & operation checking	TI/IA/IC
		2	Bell tightness and coil condition checking	IC
		3	Cleaning & Operational checking of Bell code.	IA/IC
24	**Compartment Light & Fan**	1	Changing of defective lamp, fan fitting etc	TI/IA/IC
		2	Check MCBs & fuses in coach terminals.	IA/IC
		3	Check Emergency Lights are glowing.	TI / IA /IC
		4	Cleaning of tube light (inside/ outside) & fans for proper illumination & ventilation.	IA/IC
25	**Wheel**	1	Checking of dull sound, hollow tires, skid marks, cracks flow of metal at surface	TI/IA/IC
		2	Measure TFRW (Two flange root wear) & hollowness & Recording.	IA / IC
		3	Measurement of wheel gauge.	IC
		4	Feeling of temperature of axle box housing & condition of axle box covers, bolts etc. by infrared thermometer.	TI/IA/IC
		5	Check Profile of all wheels	IA/IC

SN	Equipment	Activities		Schedule
26	**Under Gear Items**	1	Bolster : Checking for crack or any other abnormality like oil leakage, fastener deficiency, breakages etc.	TI/ IA / IC
		2	Bogie frame: i) Visual checking of various permissible clearances.	IA /IC
		3	ii)Side Bearer: Visual checking Oil leakage, breakages etc.	TI / IA /IC
		4	Centre Pivot : Visual checking for crack, welding crack, looseness of fasteners etc. or any other abnormality	TI / IA / IC
		5	Safety bracket: Visual checking fastener deficiency or breakages etc.	TI/ IA / IC
		6	Visually inspect mechanical components like Equalizing stay, dampers, Anchor links etc.	TI / IA / IC
27	**Suspension bearing**	1	Checking intactness of rivets of wick pad assembly	IA/IC
		2	Wicks pad opening & checking	IA/IC
		3	Checking the condition of bearing collar	IA/IC
		4	Ensure availability & tightness of axle cap bolt with sealing.	TI / IA / IC
		5	Checking the condition of lube. Oil for any metal contents or symptoms of journal scoring.	IA/ IC
		6	Topping up of cardium compound /oil	TI / IA / IC
		7	Suspension bearing clearances	IA/ IC
		8	Check and record temperature of Suspension bearings with Infra Red Thermometer immediately after receipt of rake in to pit line	TI / IA / IC
28	**Gear Case**	1	Check for any breakages, intactness of bolts & its proper setting.	TI / IA / IC
		2	Topping up of cardium compound	TI / IA / IC
		3	Check the condition of spring washers and ensure replacement for Gear Case mounting bolts	IC
29	**Brake Block & Rigging**	1	Replacement of Brake Blocks on condition basis & tightness of Brake shoe key and gap adjustments.	TI / IA / IC
		2	Ensure proper working of Brake Cylinder	TI / IA / IC
		3	Check condition Brake Cylinder and ensure intactness of fixation bolts.	IA/IC
		4	Ensure intactness of Brake hanger (Inner &Outer) , Brake lever, Pull rod & Brake beam along with nylon bushes. Replace if found bent/crack/worn.	IA/IC
		5	Check Brake rigging for any abnormality. Ensure intactness of all fasteners (split pins, cotter pins, bolts and safety chains)	IA/IC
30	**Swing Link & Hanger Block**	1	Ensuring intactness of spring link & hanger pin & block	TI / IA / IC
		2	Checking for any deformity in pin and crack in BSS Housing	TI / IA / IC
		3	DPT of swing link	POH
		4	Ensure intactness of swing link & saddle block	IA / IC
		5	Check bolster Helical springs / Air Spring visually	TI / IA /IC
31	**Ultrasonic testing of axle, hanger pin**	1	Ultrasonic testing of axle (periodicity : 210+/-30Days)	Separate UST Schedule
		2	Ultrasonic of hanger pin	POH
32	**Shock Absorber**	1	Checking for any sign of oil leakage	TI /IA / IC
		2	Check the condition of mounting flange for any sign of crack & intactness of all fasteners.	TI/ IA / IC
33	**Oil topping in side bearer &**	1	Oil topping in dash pot	IA/ IC
		2	Oil topping in side bearer.	IA/ IC

SN	Equipment	Activities		Schedule
	dash pot	3	Check for excessive oil leakage.	IC
34	**Measurement of safety clearances**	1	Measurement of crown bolt clearance between axle box & bogie frame	IA/IC
		2	Measurement of bogie-body clearance, bogie frame - bolster clearance & crown bolt height	IA/IC
		3	Measurement of buffer height	IA/IC
35	**Cattle Guard**	1	Check intactness of all securing bolts.	TI / IA / IC
		2	Measurement of clearance from rail level & its position	IA/IC
36	**Draw & Buffing Gear**	1	Checking & ensuring sound fixation.	IA / IC
		2	Fixation and intactness of fastener	IA / IC
		3	Greasing.	IC
		4	DPT of fixation base plate in situ of side buffer.	IC
		5	Inspect for cracks, deformation and damage.	IA/IC
37	**Draw Hook & Schaku Coupler**	1	Fixation and intactness of fastener	IA / IC
		2	Greasing of articulation bearing.	IC
		3	Visually inspect schaku couplers, and Centering devices for any abnormality.	TI / IA / IC
		4	Visually inspect Draw & Buff Gear Yoke, Fork eye and Bearing Bolt and ensure there are no symptoms of Grease starvation.	TI / IA / IC
		5	Check the condition of Rubber plates Draw & Buff Gear	TI / IA / IC
38	**Sole Bar & Under Frame Checking**	1	Checking for any sign of crack getting developed	IA/ IC
		2	Check for any hitting mark or camber getting lost.	IA /IC
39	**Parking Brake:**	1	Ensure working & application of parking brake system.	TI /IA/ IC
		2	Ensuring intactness of fixation arrangement of parking brake	IA / IC
40	**Look Out Glass & Head Code Glass**	1	Check for healthy fixation of glasses and any origination of crack & cleaning from both the sides	TI /IA /IC
		2	Check visually look out glass for any abnormality.	TI / IA / IC
		3	Check head code working.	TI / IA / IC
41	**Locking device & Door**	1	Function of all locking device of HT/LT compartment, door & door handle	IA /IC
		2	Check & ensure free movement of coach door	IA /IC
42	**Coach Body flooring, side wall set frame Luggage bunk Window Shutter & comt. door**	1	Check, ensure passenger amenity items, seats, glass / louver shutters, grip handles and rail , seat handle, footstep.	TI / IA / IC
		2	Check for any sign of breakage of hylem sheet, vestibule bellows, doors, trough floor, tread plate of door, notice plates, ACP handle, doorways.	TI / IA / IC
		3	Check for Proper functioning of alarm chain	TI / IA / IC
		4	Lubrication of ACP mechanism.	IC
		5	Check functioning of ladies coach ACP flasher light & Buzzer	IC/IA
43	**Brake Controller**	1	Operational checking of brake controller & ensuring brake application & release of each coach	TI / IA / IC
		2	Ensuring effectiveness of self lapping of EP & auto portion	TI / IA / IC
		3	Measurement of motor coach brake cylinder pressure & corrective action if required	TI / IA / IC
		4	Cleaning & checking the brake controller finger contacts of drum controller and mobile contacts	IC

SN	Equipment	Activities		Schedule
		5	Checking & ensuring the tightness of electrical connections.	IA / IC
		6	Overhauling of reducing valve & changing of rubber parts. Ensure effective operation of brake controller after checking in test bench.	IC
		7	Cleaning all filters & strainers in brake circuit.	IC
		8	Ensuring effective working of brake controller in different position after fitment of reducing valve & all electrical connections checking.	TI / IA / IC
		9	Checking & overhauling of equalizing discharge valve and hand operated isolating valve and replacement of rubber parts.	IC
		10	Overhauling of brake controller	POH
44	**EP Unit & Addl. Limiting Valve**	1	Operational checking of each EP Unit.	TI / IA / IC
		2	For Escort type EP unit greasing of application & holding magnet valve	IA / IC
		3	Overhauling of holding valve, application valve, stabilizing valve, additional limiting valve & replacement of rubber parts in kit.	IC
		4	After overhauling and assembly of EP unit and accelerated testing on test bench to be done.	IC
		5	Connection tightness.	IA / IC
		6	Check for any air leakages at the time of Brake application from Brake unit / BC pipeline / Brake Cylinder and take necessary corrective action.	TI /IA/IC
		7	Ensure effective working of Brake Unit after fitment of overhauled Valves.	IC
45	**Main Compressor**	1	Operational checking of compressor by way of observing running sound, feel test for generation of heat during run, cut in & cut out pressure, availability of back pressure, frame intactness / crackness	TI / IA / IC
		2	Checking up of oil level & topping up, if required.	TI / IA / IC
		3	Operation checking of effectiveness of non-return valve.	IC
		4	Cleaning of main CP suction filter	TI/IA/ IC TI is in passenger compartment, IA if it is in HT compartment
		5	Replacement of oil filter along with complete oil changing	IC
		6	Ensuring intactness of HP & LP safety valves.	IA / IC
		7	Valve cleaning	POH
		8	Checking of motor connection tightness at terminals	IA/IC
		9	Replacement of oil bath strainer along with complete oil changing.	IC
		10	Clean oil traces if any over Main Compressor.	TI / IA / IC
		11	Air blowing of MCP motor & check the condition of commutator.	IC
		12	Check for any abnormal sound from Motor on run, observe commutator for any flashover or defect.	IC
		13	Check the condition of carbon brush and replace if required.	IC

SN	Equipment	Activities		Schedule
		14	Thermography of Power Cable connection of Main Air Compressor Contactor for checking of loose connections	IA/IC
46	**Aux. Compressor**	1	Operational checking of auxiliary compressor by way of observing running sound, feel test to observe excessive generation of heat during run. Fixation checking etc.	TI / IA / IC
		2	Check the cut in cut out pressure	IA / IC
		3	Oil topping up	TI /IA /IC
		4	Checking of motor connection tightness at terminals	IC
		5	Measurement of insulation resistance	IC
		6	Check Safety valve operation	IA/IC
		7	Ensure tightness of foundation bolts and condition of rubber mounting, replace if required.	IC
		8	Thermography of Power Cable Connection of Auxiliary Air Compressor Contactor for checking of loose connections	IA/IC
47	**Under Frame**	1	Ensuring thorough draining of main reservoir, after cooler, inter cooler and supplementary reservoir of trailer coaches.	TI / IA / IC
		2	Check and test healthiness of MR & BP flexible hoses. Observe any sign of air leakage and looseness of end fittings.	TI / IA / IC
		3	Ensure intactness of bogie's pipeline clamping and any sign of air leakage especially from "T" joints & other unions.	IA / IC
		4	Check and ensure proper securing of brake cylinders and intactness of all the fasteners.	IA / IC
		5	Ensure cleaning of MR line dirt collector.	IA /IC
		6	Check and ensure fixation of all under-slung equipments viz Air dryer, all reservoirs, Inter Cooler, After Cooler,	IA / IC
48	**Driving cab Equipments**	1	Ensure effective functioning of horn, wiper, guard's emergency valve & emergency application valve	TI / IA / IC
		2	Ensure quality sound from horn.	TI / IA / IC
		3	Ensure effective securing of horn paddle and its angle from floor to avoid any inconvenience to running staff.	TI / IA / IC
		4	Ensure overhauling of emergency application valve and its effective working.	IC
		5	Ensure lubrication of servomotor of the wiper assembly & testing for smooth operation.	As & when required
		6	Check & ensure lubrication of guard emergency valve and testing for its operation.	IC
		7	Check proper working of BAR and ensure tightness of electrical connections.	IA/IC
49	**Pneumatic Equipment in HT compartment (Governor Control Non Return valve Dirt Collector**	1	Draining of reservoirs in HT compartment	TI / IA / IC
		2	Cut in & cut out checking of MCP	TI / IA / IC
		3	Cut in & cut out of all other governors to be checked along with terminal connection.	IA/ IC
		4	Checking of limiting valve pressure and adjust if necessary	IA / IC
		5	Ensure cleaning of all non- return valve	IA / IC
		6	Operational testing of panto operating valve.	TI / IA / IC
		7	Overhauling of addl. Limiting valve and testing.	IC
50	**Vacuum circuit breaker**	1	Ensure proper closing & opening of VCB through BL Switch	IA / IC
		2	Check & ensure proper crushing of contacts of auxiliary switch. Check for any sign of overheating or melting in auxiliary contacts.	IA / IC

SN	Equipment	Activities		Schedule
		3	Check the condition of silica gel & it should be reactivated in case its colour fades.	IC
		4	Check the condition of air filter and ensure lubrication of relay valve by Molygraph 44	IC
		5	Check and ensure correct setting of pressure switch and pressure regulator	IC
		6	Ensure tightness checking of terminal board connections.	IC
		7	Checking of porcelain insulator for crack etc. Proper sealing of joints of all VCBs for avoiding moisture ingress.	IA/IC
		8	Cleaning of insulators	IA/IC
		9	Check for any air leakage in the VCB.	TI/IA/IC
		10	Ensure intactness of proper foundation of VCB & GLA. Visual checking for any abnormal sign, intactness of earth connection	TI / IA / IC
		11	Clean the VCB & GLA with cloth and provide silicon graphite spray	TI / IA / IC
		12	**Checking of IR Value of Lightening arrestor**	**IC**
		13	Ensure proper tightness of Bus bars.	IA / IC
51	**Pantograph**	1	Ensure lubrication of all joints	IA/ IC
		2	Check the condition of metalized carbon strips for their breakage, chipping, flashing etc. if any.	TI /IA /IC
		3	Measurement of thickness of strip	IA / IC
		4	Ensure counter balance weight testing of pantograph by 7 kg load	IA/IC
		5	Check & ensure any sign of crack development and effectiveness of plunger box.	IA / IC
		6	Check & ensure intactness of all fasteners and its tightness checking.	IA / IC
		7	Ensure greasing of servomotor & proper condition of its bucket.	IC
		8	Ensure greasing of throttle valve & changing of rubber kit.	IC
		9	Check & ensure panto raising & lowering operation from BL switch and within the requisite time and steps for both operation.	TI /IA /IC
		10	Cleaning of roof insulators.	TI /IA /IC
		11	Greasing of bearing	IC
		12	Check copper shunts for damage or loose connection. Replace if necessary	IA/IC
		13	Repainting of Pantograph pan & Horns	IC
		14	Check for any sign of development of crack on plunger housing	IC
		15	Visually check main springs for any crack – replace if necessary.	IA/IC
		16	Check foot & operating rod insulators for any breakage or crack/ flashing or crack.	TI / IA /IC
		17	Check the frame visually for bending or any other damage.	IA/IC
		18	Overhauling of Panto Servomotor and replacement of Piston gasket.	IC
		19	Check Roof Bars for any breakage, loose connections etc.	TI /IA /IC
		20	Check visually the condition of LA & clean it.	TI /IA / IC
		21	Checking of IR Value of LA.	IC

SN	Equipment	Activities		Schedule
		22	Check arc horns for flash marks & remove the flashing	TI/IA/IC
		23	Check & set arc horn gap ET1=200 mm,	TI/IA/IC
		24	Check for any sign of development of crack on plunger housing	IC
		25	Ensure good condition of split pins, shunts.	TI / IA / IC
		26	Ensure proper play of cylinder support washer & anti balancing tube &Check middle articulation play	TI / IA / IC
		27	Check Panto Mounting insulators for flash marks, petticoat breakages	TI / IA / IC
52	**MT Relays**	1	Visual checking, cleaning and crushing adjustment if required for fixed and mobile contacts of interlocks.	IC
		2	Check and ensure proper tightness of terminal connections	IC
		3	Check condition of TQ rods, relay arm	IA/IC
		4	Check operation of relays by switch, by electrical operation	TI / IA / IC
		5	Checking of ABR relay trip coil for smooth movement of armature and armature housing to be replaced if obstructing. Apply Molygraph grease on Armature.	IA/IC
		6	Visually examine each relay and ensure proper condition of Magnet coil, its connections, Armature and return spring.	TI / IA / IC
		7	Ensure free operation of TQ Rod. Ensure proper tightness of TQ fixation bolt (Upper & Lower)	IA / IC
		8	Clean interlocks with Contact Cleaning Spray, fine emery paper and cloth.	TI / IA / IC
		9	Remove the Armatures of ABR & CR and refit after proper cleaning.	IA/IC
53	**Rotary switches**	1	Check and ensure tightness of terminal connections	IC
		2	Check and ensure effective operation along with interlock crushing in different position of switches	IC
		3	Overhauling of battery isolating switch and 100% Changing of shaft sleeve.	IC
54	**BL Box**	1	Check and ensure locking and unlocking of BL after opening	IA / IC
		2	Checking and ensuring proper operation of all BL switches	IA / IC
		3	Check and ensure cleanliness and crushing of limits switches interlocks and rotary switch	IA/ IC
		4	Check and ensure tightness of all connecting cables	IA/ IC
55	**CC1 & CC2 Contactor**	1	Check and ensure tightness of power connections.	IC
		2	Check and ensure proper cleaning, crushing and effective bedding of contact tips, adjustment / replacement of contacts tips as the case may be	IC
		3	Check operation of CC1 & CC2	IA / IC
56	**General Equipments**	1	Check and ensure perfect operation and tightness of terminal connection of MCBs, fuse bases, light latch, fan latch and their respective push buttons.	IA / IC
		2	Cleaning and checking of contact tips of light and fan switch.	IA / IC
		3	Changing of MCBs (Master controller, EP,Guard's supply) on test bench with tested MCBs	Condition basis
		4	Milli volt drop test for critical circuits.	Condition basis
		5	Proper securing of electric cables of air dryer from source to under gear terminal board of air dryer.	IA/IC

SN	Equipment	Activities		Schedule
		6	Availability of stickers on cab equipment for easy identification.	IA/IC
		7	Thermography of Power Cable Connection of Light Contactors for checking of loose connections.	IA/IC
		8	Thermography of Power Cable Connection of Fan Contactor for checking of loose connections.	IA/IC
		9	Thermography of Cable head Termination	IA/IC
		10	Thermography of End Wall Panel of all motor coaches and Trailer coaches	IA/IC
		11	Thermography of MCB and Fuse Panel of all motor coaches and Trailer Coaches	IA/IC
57	**RFR**	1	Ensure proper functioning of RFR Relay	TI/ IA/ IC
		2	Over hauling of RFR relay	IA / IC
58	**LED Box**	1	Check & ensure effective glowing of LEDS.	TI / IA /IC
		2	Check & ensure tightness of terminal connections.	IC
59	**EFRA-II, HOBA & By Pass Switch Operation**	1	Check & ensure effectiveness of EFRA-II by fault simulation.	IA/ IC
		2	Check & ensure terminal connections tightness and cleaning & proper crushing of auxiliary interlocks	IA/IC
		3	Measurement of resistance value of HOBA & EFRP.	POH
		4	Checking of negative bonding.	IA/ IC
		5	Ensure the tightness of HOBA connections.	IA/IC
		6	Ensure proper condition of interlocks & working of resetting of OLP/EFRP and EFRA-II.	IA/IC
60	**NVR Diode Panel**	1	Ensure operational and diode checking along with proper securing terminal connections.	IA/ IC
		2	Overhauling of NVR along with diode.	POH
61	**Relay Calibration**	1	Ensure calibration of relay CLR OL & OVR at their predefined value.	POH
		2	Ensure calibration of OLP & Thermostat relay at their predefined value.	POH
62	**Calibration of gauges & governors**	1	BP, BC etc.	IC
63	**Cable Duct**	1	Check tightness of cables	IC
64	**Magnet Valve**	1	Check condition of valve stem & pin.	IA/IC
		2	Check air bolt bore for cleanliness.	IA/IC
		3	Air bolt bore for MC & NC	IA/IC
		4	Check condition of nylon pipes.	IA/IC
		5	Provision of modified loop in WCO & Reverser.	IA/IC
65	**Under slung Equipment's**	1	Check & ensure proper tightness of fixation of all the under slung equipment's.	IA / IC
66	**Tail Light**	1	Operation checking & functioning of Tail lamp with all LEDs working.	IA/IC
		2	Proper sealing Of Tail Light using RTV to avoid moisture ingress	IA/IC
67	**LED Head Code**	1	Ensure tightness of terminal connections	IA/IC
		2	Ensure proper function and fitment of Head code.	TI / IA/IC
		3	Cleaning of Head code by removing the back cover	IC
		4	Tightness of external cables	IC
68	**Cab Seats**	1	Check the condition of seats, ensure its fitment	TI /IA / IC
	Cab Shutters & Frames	2	Check the condition, ensure its fitment, replace if reqd.	TI / IA / IC
69	**Air Dryer**	1	Open drain cock of final filter to drain off any accumulated water content	TI / IA / IC

SN	Equipment		Activities	Schedule
		2	Check the colour of humidity indicator	TI / IA / IC
		3	Check auto drain of main resorvoir-1	TI / IA / IC
		4	Check electrical connections of air dryer and their tightness.	TI / IA / IC
		5	Clean Air Drier & ensure its proper working.	TI / IA / IC
		6	Ensure proper working of ADVs	TI / IA / IC
		7	Open drain cock of final filter to drain off any accumulated water content.	IA / IC
		8	Check electrical connections of air dryer and their tightness	IA / IC
		9	Check the colour of humidity indicator as per OEM	TI / IA / IC
		10	Check the cyclic operation of the air dryer *(2 Mins dryer and 2 mins regeneration)*	IA / IC
		11	Check memory feature.	IA / IC
		12	Examine the drain valve on the sump of pre-coolers	IC
		13	Charge the system from zero pressure and check the dryer does not cycle immediately. Note the pressure when the dryer starts cycling	IC
70	**Audio System**	1	Ensure proper functioning of Audio system.	TI / IA / IC
		2	Check condition and connection of cables.	TI /IA / IC
		3	Checking of Guard- Driver audio units for functioning. Air blowing of Audio units for better sound (use portable air blower)	IA/IC
71	Deleted			
72	**PA System / GPS System**	1	Ensure proper functioning of PA system / GPS display system (If provided)	TI/IA/IC
		2	Check condition and connection of cables.	IA/IC
73	**Axle & Axle Box & Primary Suspension (As per CMI K001)**	1	Feel all axle boxes by hand / by laser gun immediately after stabling.	TI / IA / IC
		2	Check condition of axle box cover.	TI / IA / IC
		3	Check axle guide for excessive oil leakage.	IA/IC
		4	Check tightness of axle guide oil filling cap.	IA/IC
		5	Check axle guide safety strap.	IA/IC
		6	Check axle boxes for leakage of grease from back dust guard for any crack or damage.	IA/IC
		7	PPM test for grease	IC
		8	Check Intactness and condition of axle box housing, axle box covers , bolts etc	IA/IC
		9	Check rear cover for any signs oozing of grease oozing.	TI / IA / IC
		10	Check Air Spring visually for external damages and infringement of any fittings, etc.	TI / IA / IC
		11	Check Axle guide Helical springs for breakage.	TI / IA / IC
		12	Check dash pot for excessive oil leakages	TI / IA / IC
		13	Check tightness of dash pot oil filling cap	TI / IA / IC
		14	Check axle guide safety strap.	TI / IA / IC
		15	Check condition of Lower Rubber Washer	TI / IA / IC

SN	Equipment	Activities		Schedule
74	**Brake Relay**	1	Visual checking, operation checking & crushing of interlocks.	IA/IC
		2	Cleaning of Brake relay contacts	IA/IC
75	**HT compartment governors**	1	Draining of reservoirs in HT compartment	IA/IC
		2	Cut in & Cut out checking of MCP Governor	IA/IC
		3	Cut in & cut out of all governor to be checked along with terminal connection	IA/IC
		4	Cleaning of all Sintered bronze filter & strainer of all Pneumatic & Tap changer circuit by acid.	IC
76	**Isolating Cocks**	1	Ensure proper smooth movement/ venting of all isolating cocks including PIC & ABB IC	IC
77	**Coach- Coupler Earthing**	1	Check the condition, ensure its fixation.	TI / IA / IC
78	**Tap changer**	1	Checking proper functioning.	TI / IA / IC
		2	Check condition of arc chutes – remove metal deposition etc. (replace if required	IA IC
		3	Check tightness of power cables	IA/IC
		4	Measurement of contacts – Gap of contact tips at arc point (with GO/ NOGO gauge)	IA/IC
		5	Tightness of fixed & mobile contacts & smoothing of pit marking.(Front & rear)	IA/IC
		6	Functioning of return spring at zero pressure.	IA/IC
		7	Replacement of Silver coated contact tips with Tungsten tips in Tap changer (priority to T1 T7 , T8& T9).	IA/IC
		8	Check operation of contactors for sluggish operation.	IA/IC
		9	Aux. contacts (Tap changer)	IA/IC
		10	Closing and opening of auxiliary interlocks & interlock crushing.	IA/IC
		11	Visual checking of Tap changer by opening cover and attend if necessary	IA/IC
		12	Cleaning of aux. contacts with chemoise leather.	IA/IC
		13	Check Contact gap	IA/IC
		14	Spring tension of mobile contact.	IC
		15	Roller and pin condition of mobile contact.	IA/IC
		16	Condition & operation of interlock operating arm.	IA/IC
		17	Tightness of cable connections with auxiliary contacts.	IA/IC
		18	Condition of cam from any groove, decay and looseness.	IA/IC
		19	Visual inspection of Cam to Roller gap	IA/IC
		20	Clean the aux interlocks of T7, T8, T9 with contact cleaning spray, emery paper and cloth and provide Interlock box cover properly.	TI/IA
		21	Remove arc chutes of T7, T8, T9 and clean power contacts with file and emery paper and brush and refit the arc chutes properly and ensure proper working of T7, T8, T9 contactors manually.	TI/IA
		22	Remove arc chutes for all EP contactors and clean with Compressed Air pressure (5 Kg/Cm2)	IA / IC
		23	Blow Tap Changer & Switch Group boxes with Compressed Air pressure (5 Kg/Cm2)	IA / IC
		24	Remove Armature, Stem and Travel Valve. Clean Armature with emery paper and then ensure proper cleaning of Armature, Stem, Travel Valve with lent less cloth. Provide them back in the same magnet valve. Lock the Armature Cap properly.	IA / IC
		25	Ensure proper condition of interlock Cam. Measure the gap of the interlock with GO - NO Go Gauge and adjust / replace interlock accordingly.	IA / IC

SN	Equipment	Activities		Schedule
		26	Clean all aux interlocks with Contact cleaning spray, emery paper and cloth and provide Interlock box cover properly.	IA / IC
		27	Lubricate the Cylinder with SAE30 as per requirement.	IC
		28	Provide the Arcutes properly and ensure proper operation of EP Contactors [No hurdles for movement / sluggish operation]	IA / IC
		29	Visually check Reversor & WCO for proper condition of Bus Bars, Power Cables.	IA / IC
		30	Manually operate and ensure proper working of Reversor & WCO. Clean Power Contacts with emery paper.	IA / IC
		31	Clean Auxiliary interlocks with emery paper and cloth and ensure proper crushing.	IA / IC
		32	Ensure proper fitment of Nylon air hose pipe to Magnet valves of each EP Contactor, and Reversor & WCO. Ensure that there is no air leakage.	IA / IC
		33	Check the proper condition of CLR1&2/AOVR/OVR. Clean interlocks with Contact Cleaner, fine emery paper & brush and ensure the tightness of connections.	IA / IC
		34	Check condition of the covers and replace if found to be torn or damaged with new cover and ensure proper fitment of covers.	TI / IA / IC
		35	Examine visually all flexible shunts and all the fixing bolts for the tightness if over heating or dis-colorization is found. Provide new shunts if badly frayed	IA / IC
		36	Clean the piston insulator thoroughly and ensure no dust is collected on surface.	IA / IC
79	**Speedometer**	1	Visual Checking of junction box for proper sealing and protection of cables.	TI / IA / IC
		2	Check Condition/intactness and connections of Cables.	TI / IA / IC
		3	Record and adjust speedometer/ESMON data if required. e.g. Wheel diameter, Date, Time Energy Reading, Kilo meter, OHE current ,OHE Voltage, Over Speed limit,	IA/IC
		4	Check speedometer/ESMON and ensure proper wheel diameter setting.	IA/IC
		5	Check intactness of couplers.	TI/IA/IC
		6	Check setting of date & time.	TI/IA/IC
		7	Check status of memory card, replace if required.	TI/IA/IC
		8	Clean display glass.	TI/IA/IC
		9	Check intactness of PG at axle.	TI/IA/IC
		10	Download data, in case memory showing full.	TI/IA/IC
		11	Check working of Speedometer.	TI/IA/IC
		12	Download data from speedometer.	IA/IC
		13	Cleaning of all electrical BDs & Connectors including couplers.	IA/IC
		14	Tightness of all electrical BDs & Connectors including couplers.	IA/IC

SN	Equipment	Activities		Schedule
	Speedometer	15	Check all Allen bolts tightness with the help of Allen key.	IA/IC
		16	Open PG junction box cover and check and ensure tightness of connectors after cleaning and re-fit cover.	IA/IC
		17	Check PG & its cables physically for any damage and replace if required.	IA/IC
		18	Open PG for ultrasonic testing of axle. Check the condition of PG and replace if required. Re-fit PG cover after UST of axle.	IC
		19	Strip out RCI & PG from coach.	POH
		20	Dismantle PG.	POH
		21	Check PG sensor disc, replace if required.	POH
		22	Clean all parts of PG with suitable cleaning agent	POH
		23	Replace Oil Seal Gasket (Must Change Item)	POH
		24	Check both sensors physically, replace on condition basis.	POH
		25	Check condition of bearing, replace it on condition basis.	POH
		26	Assemble PG sequentially.	POH
		27	Open RCI cover & remove all PCB cards.	POH
		28	Check healthiness of all PCB cards physically and clean with suitable cleaning agent.	POH
		29	Re-fit all PCB cards and check working of RCI units & PG on Speedometer testing bench.	POH
		30	If working on test bench found satisfactory, then re-fit RCI & PG in motor coach and check working after connecting all BDs, Connectors & Couplers.	POH

PASSENGER AMENITIES ITEMS TO BE CHECKED DURING EACH SCHEDULE

S. No.	ITEMS
1.	Broken seats and seats frame.
2.	Worn out / broken chequered plates in doorways.
3.	Missing glass and louver shutter including complete window frame.
4	Missing doors.
5.	Worn out / tilted foot step in MEMUs
6.	Vestibule plates and shutters in MEMUs.
7.	Vestibule bellows in MEMUs
8.	Missing overhead handles and hand rails.
9.	Breakage of sun mica.
10.	Missing of different types of joints strips i.e. J type and L type.
11.	Missing of seat handle.
12.	Missing of tread plate of door.
13.	Missing of luggage rake.
14.	Missing of notice plates and ACP handles.
15.	Condition of trough floor.
16.	Proper head code working.
17.	Proper working of compartment Light & Fan, changing of defective lamp, fan fitting etc.

JITENDRA YADAV Digitally signed by JITENDRA YADAV Date: 2024.07.05 11:13:25 +05'30'

STUTI NARAYAN Digitally signed by STUTI NARAYAN Date: 2024.07.05 16:48:24 +05'30'

DHARMENDRA KUMAR Digitally signed by DHARMENDRA KUMAR Date: 2024.07.05 17:23:44 +05'30'

KOUSHIK PAN Digitally signed by KOUSHIK PAN Date: 2024.07.05 17:27:44 +05'30'

S.SENTHIL KUMAR Digitally signed by S.SENTHIL KUMAR Date: 2024.07.05 19:55:32 +05'30'

ANNEXURE- 2

DAILY CHECKING AT NIGHT STABLING POINT

(Ref : SMI No- RDSO/ PE / SMI/ EMU/ 0037 –2007(Rev.0))

SN	ITEMS FOR DAILY CHECKING AT NIGHT STABLING POINTS
1.	Visually inspection of all Wheels for defects, cracked tyres, flats and wheel tapping (only for tyred wheel) and checking of axle boxes, its cover and bolts.
2.	Visual Inspection of axle guide springs, bolster spring, swing link, hanger bracket, cattle guard, bogie frame and all brake rigging. Also check Schaku couplers and side buffers.
3.	Check brake blocks for their position and replacements if required.
4.	Drain out All Reservoirs including coolers and others draining points.
5.	Check auxiliary and main compressor for their working and Leakage.
6.	Infrared thermometer to be used for measuring temperature of axle boxes at all stabling points on arrival for night stabling.
7.	Check all compartment lights & fans.
8 .	Check and test horns, wiper, dead man device, guard emergency brake.
9.	Check and clean head code look out glasses.
10.	Check fire extinguishers, locking of HT compartment, cabs.
11.	Ensure all indications lamps functioning.
12.	Formation testing from both the ends and brake testing.
13.	Check for all hoses, air pipes leakage.
14.	Specially check headlights, taillight, flasher lights, Head Code Light & Cab Light.
15.	Check for battery voltage, Battery charging voltage & record values.
16.	Visual check for any oil leakage from transformer, choke, radiator and pipe lines.
17.	Go through the motorman log book and attend the defects booked during the run. Place the rake at suitable location to attend the defects.
18.	Record in the logbook any other abnormalities, which need attention in shed, but ensure safety and reliability.
19.	Proper working of Auxiliary warning switch to be checked
20.	Visual inspection of Inter-unit Air Hose Couplings & Schaku Couplings for any abnormality.
21.	Check the operation of Guard's Emergency brake
22.	Check Master Controller for proper operation and working
23.	Check the raising and lowering of Pantograph
24.	Test Signal Bells & Talk Back System, If provided
25.	Ensure proper Sweeping & Cleaning of Coaches, cleaning of toilets of MEMU coaches.
26.	Visually checking of display item of ESMON

27.	Visual inspection of Traction Motors' Cables & Electrical Jumpers including any other deficiencies
28.	Test all types of Brakes at earmarked positions of Brake Controller & check Brake Pipe pressure & Brake Power
29.	Visual check of all Brake Riggings for any abnormalities.
30.	Visually check the gear case, suspension bearing and axle cap fixing bolt.
31.	Ensure water replenishing of toilets of MEMU coaches & check for any hanging part in underframe of coach.
	For air-suspension system
32.	Drain out of 150 ltr. Reservoir for Air - spring in each coach.
33.	Visually check the condition of leveling valve, protection screen, installation lever, air spring bellow for any damage/ leakage.

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ANNEXURE-3

MUST CHANGE ITEMS IN POH FOR CONVENTIONAL AC EMUs/ MEMUs

SN	DESCRIPTION	Every POH	Every Alternate POH	Every 3rd POH	Every 4th POH
1.0	**AUXILIARY MOTOR**				
1.1	Needle bearing for MCPA	Y			
1.2	Oil sealing ring for Oil pump	Y			
1.3	Bearings for Compressor motor, Aux. comp, .motor. Oil pump, Radiator cooling fan motor and Rectifier fan motor.	Y			
1.4	Capacitors for AC motors,	Y			
2.0	**COUPLER**				
2.1	Polyamide bush for coupler	Y			
2.2	Sliding plate for coupler		Y		
3.0	**BOGIE**				
3.1	Rubber snubber for axle box	Y			
3.2	Rubber packing ring for axle guide	Y			
3.3	Nylon rubbing plate	Y			
3.4	Guide bush for axle guide		Y		
3.5	Hanger for bolster suspension (Swing link) and hanger block		Y		
3.6	Brake beam hanger inner			Y	
3.7	Steel rubbing plate			Y	
3.8	Brake beam		Y		
3.9	Brake hanger bush	Y			
3.10	Brake shoe bush	Y			
4.0	**BOGIE Assembly**				
4.1	Wick pad for axle lubricating assembly	Y			
4.2	Felt for dust guard	Y			
4.3	Felt for dust guard Gear case	Y			
4.4	Sandwich rubber pad for nose suspension unit	Y			
4.5	Lower rubber washer	Y			
4.6	Upper rubber washer for TC	Y			
4.7	Hytrel Washer for TC	Y			
4.8	Shock absorber for MC		Y		
4.9	Sealing cap for center pivot of TC	Y			
4.10	Felt ring for axle box	Y			
4.11	Axle lubricating assembly		Y		
4.12	Dust guard		Y		
4.13	Extreme top and bottom spring plate for nose suspension unit	Y			
4.14	Steel bush for nose suspension unit	Y			
4.15	Suspension bearing		Y		

SN	DESCRIPTION	Every POH	Every Alternate POH	Every 3rd POH	Every 4th POH
4.16	Shock observer for TC	Shock absorber to be overhauled using proper kit	Y		
4.17	Silent block for anchor link		Y		
4.18	Axle shield			Y	
4.19	Helical spring			Y	
4.20	Silent block for center pivot			Y	
4.21	Gear case				Y
4.22	Split ring clamp for center pivot				Y
4.23	Safety Sling	Y			
5.0	**COMPRESSOR**				
5.1.	Valve plates and packing ring for Aux compressor	Y			
5.2	Overhauling kit every POH for compressor as per OEM	Y			
5.3	Overhauling kit alternate POH for compressor as per OEM		Y		
5.4.	Overhauling kit every third POH for Compressor as per OEM			Y	
5.5	Gasket for Non-Return valve for Main compressor	Y			
5.6	Filter element for Centrifugal dirt collector		Y		
6.0	**HEAD LIGHT**				
6.1	Reflector for HL	Y			
6.2	Holder assembly for HL		Y		
6.3	Rotary switch for HL		Y		
7.0	**LT PANEL**				
7.1.	Fixed and moving contact for CC1	Y			
7.2	Spring for CC1		Y		
7.3	Fixed and moving contact for light contactor			Y	
7.4	Arc chute for CC1				Y
8.0	**MASTER CONTROLLER**				
8.1	Springs for master controller	Y			
8.2	Contact screw for master controller		Y		
8.3	Valve stem for master controller			Y	
8.4	Cam for master controller			Y	
8.5	Contact finger assembly for master controller		Y		
9.0	**PANTOGRAPH**				
9.1	Joint perfect (rubber) for Panto	Y			
9.2	Overhauling kit (rubber) for panto as per OEM	Y			
9.3	Overhauling for panto valve as per OEM (Rotex)	Y			
9.4	Long and shorts shunts for panto		Y		
9.5	Latching spring for panto valve (BHEL)		Y		
9.6	Top mounting subassembly part A & B		Y		
9.7	Bearing for yoke assembly		Y		
9.8	Plunger box assembly for panto			Y	

SN	DESCRIPTION	Every POH	Every Alternate POH	Every 3rd POH	Every 4th POH
9.9	Valve for panto operating valve (BHEL)				Y
9.10.	Bearings for Pedestal, push road, lower and middle articulation				Y
10.0	**PNEUMATIC ITEMS**				
10.1	Overhauling kit for EP unit as per OEM.	Y			
10.2	Overhauling kit for Brake controller as per OEM.	Y			
10.3	'O' ring and spring for a foot operated horn valve.	Y			
10.4	Diaphragm for horn.	Y			
10.5	Overhauling kit for emergency valve (Dead man's valve)	Y			
10.6	Piston packing for duplex check valve.	Y			
10.7	Packing rubber for release valve	Y			
10.8	Piston packing ring for brake cylinder	Y			
10.9	Dust excluder for brake cylinder	Y			
10.10	Gasket for centrifugal dirt collector	Y			
10.11	Nylon filter elements	Y			
10.12	Wiper blade	Y			
10.13	All filter elements of Pneumatic circuit.	Y			
10.14	Rubber braided hose of SAE 100 R1	Y			
10.15	Wiper arm		Y		
10.16	Valve guide for holding and application magnet valve			Y	
10.17	Foot operated horn valve			Y	
10.18	Operating and locking pawl for BRAKE CYLINDER		Y		
10.19	Brass bush for dust excluder for BC	Y			
10.20	Seats for Non Return valve	Y			
10.21	Gauges		Y		
10.22.	Magnet valve for EP unit				Y
10.23	Pressure switches				Y
10.24	Safety valves		Y		Y
10.25	Angle cocks				Y
11.00	**RELAY**				
11.1	Spring for MT relays		Y		
11.2	Moving contacts for MT relays	Y			
11.3.	Spring for Overload relays		Y		
11.4.	Spring for CLR relay		Y		
11.5.	Fixed contacts for MT relay		Y		
11.6.	Short and long fingers with pin for Overload relays		Y		
11.7.	Fixed contacts for Overload relays	Y			
11.8.	Finger assembly for CLR relay	Y			
11.9.	Contact carrier for CLR relay		Y		
11.10	Armature for MT relays			Y	
11.11	Bearing sleeve for MT relay			Y	
11.12	TQ rod				Y

SN	DESCRIPTION	Every POH	Every Alternate POH	Every 3rd POH	Every 4th POH
12.0	**SWITCH GROUP**				
12.1	Piston packing ring (B11 Gaeco Washer) for motor contactor and notching Relay.	Y			
12.2	Valve stem for reverser, WCO and contactor	Y			
12.3	Cap for magnet valve with locking pin for motor contactors & Notching Relay				Y
12.4	Finger assembly complete for Notching relay		Y		
12.5	Contact screw for Notching relay auxiliary Interlock		Y		
12.6	Armature for magnet valve for notching relay			Y	
12.7	Bottom valve (Poppet valve) for reverser, WCO and contactor	Y			
12.8	Valve spring for magnet valve for reverser, WCO			Y	
12.9	Finger assembly complete for motor contactor			Y	
12.10	Contact screw for motor contactor aux. Interlock			Y	
12.11	Armature for magnet valve for motor contactor				Y
13.0	**TAP CHANGER**				
13.1.	Cap for magnet valve with locking pin for tap changer contactor		Y		
13.2	Valve stem for tap changer contactor	Y			
13.3	Finger assembly complete for tap changer contactor		Y		
13.4	Contact screw for tap changer aux. interlock		Y		
13.5	Armature for magnet valve for tap changer contactor			Y	
13.6	Bottom valve (Poppet valve) for tap changer contactor	Y			
13.7	Piston packing ring (Gaeco washer) for tap changer	Y			
13.8	Set of Top & bottom arching Contacts (Tungsten tipped)	Y			
14.0	**TRANSFORMER**				
14.1	Flexible expansion piece (Steel coupling)				Y
15.0	**TRAIN LIGHT**				
15.1	Fan bearing		Y		
15.2	Fan capacitor		Y		
15.3	Battery			Y	
15.4	BL Box limit switch	Y			
15.5	BL Box rotary switch			Y	
15.6	MCB				Y
16.0	**TRACTION MOTOR**				
16.1	Leather bellow for traction motor	Y			
16.2	TM filter elements ASSLY COMPLETE	Y			
16.3	TM inspection cover gasket	Y			
16.4	Armature Teflon band		Y		
16.5	TM Bearing				Y
16.6	Brush holders for TM				Y
16.7	TM pinion				Y

SN	DESCRIPTION	Every POH	Every Alternate POH	Every 3rd POH	Every 4th POH
17.0	**CONSUMABLE ITEM**				
17.1	Lubricants	Y			
17.2	Carbon brushes	Y			
17.3	Brake blocks.	Y			
17.4	Panto Strip	Y			
18.0	**HARDWARE ITEMS**				
18.1	Bolts	Y			
18.2	Pins	Y			
18.3	Split Pins	Y			
18.4	Nuts	Y			
18.5	Bushes	Y			
18.6	Cotters	Y			
18.7	Washers / Spring washers	Y			
18.8	Cir clips	Y			
18.9	Shims	Y			
18.10	Cleats	Y			
18.11	Felts	Y			
18.12	Cork sheets	Y			
19.0	**Rubber Item**				
19.1	O' rings	Y			
19.2	Oil seals	Y			
19.3	Grommets	Y			
19.4	Rubber packing	Y			
20.0	**VCB**				
20.1	Overhauling **AOH (Periodicity: 2 years)** kit for VCB	Y			
20.2	Overhauling **IOH (Periodicity:4 years)** kit for VCB		Y		
20.3	Overhauling POH (**Periodicity: 08** years) kit for VCB				Y
20.4	Complete Pressure Regulator		Y		
20.5	Rear and Front Horizontal Sleeve of VCB		Y		
20.6	OH kit of Air-drier VCB	Y			

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ANNEXURE-4

DAILY CHECKING ITEMS AT NIGHT STABLING For 3- PHASE EMU

S.No	Description
	A - Carriage Side
1.	Check Functioning of Brake Controller.
2.	Check Functioning of ICS
3.	Check Functioning of Parking Brakes.
4.	Check Functioning of Guard Emergency Handle.
5.	Check Functioning of Hooter if provided
6.	Check working of wipers
7.	Check Functioning of Pressure Gauges.
8.	Check Intactness Brake Rigging
9.	Check Intactness Air Suspension and for any air leakage
10.	Check Intactness Buffer & Coupler
11	Check temperature of axle box with Infrared thermometer immediately on arrival of rake
12.	Check Air leakage of the following.
	a) Air Suspension.
	b) Pneumatic Piping in under frame.
	c) EP Unit.
13.	Check condition of the following items visually for any abnormality.
	a) Bogie Parts
	b) Axle Box
	c) Brake Blocks
	d) Wheels
	e) Isolation Cock.
	f) Hook Coupler.
	B – Brake Testing by using HMI / MMI / DDU
14	Check Brake cylinder pressure
	a) When DCS key is OFF
	b) When DCS key is ON

	c) Full EP
	d) Full Auto
15.	When CAB 1 ICS ON Check BP in CAB 1 & CAB2
16.	When CAB 2 ICS ON Check BP in CAB 1 & CAB2
17.	Dead man working in Emergency Position.
18	Any Other defects.
	C – AWS Malfunctioning & Isolations, if available.
19.	Functionality Test from CAB 1 & CAB2 and record counter reading.
20.	Check Isolations from CAB 1 & CAB 2.
21	Malfunctioning to be noted with train number.
	D - CHECK PASSENGER AMMENITIES (Visual)
22.	a) Ensure proper Sweeping and cleaning of all coaches.
	b) Door, Windows & shutters
	c) Cleaning of toilet in MEMU coaches.
	d) Condition of center pole
	e) Ensure Water replenishing in Toilet in MEMU coaches.
23.	Provision and removal of wooden wedges as and when required (by pointman)
24.	Any other abnormalities / defects / deficiency in rake / Yard.
	Electrical Side
25.	Check Log Book and control report.
26.	Check operation of Master controller.
27.	Check operation of Signal bell, Emergency Bell, Audio Visual & Talk Back System if provided.
28.	Check operation of Head Light Dim / Full & Auxiliary Head Light.
29.	Check operation Tail Light, Blinker & Spot Light.
30.	Check operation Flasher Light
31.	Check operation of Cab Light and Fan.
32.	Check Working of Passenger compartment Light and fans on DDU/MMI
33.	Check working of PIS Cab to Cab
34	Check working of Public Address system.
35.	Check working of Head code.

36.	Check TMS Cab to Cab
37	Check TMS Cab to Control (On report)
	Check MMI / HMI / FIP
38.	Check on MMI for Functionality (Top level & Unit Level)
39.	Check on MMI for any isolations
40.	Check on MMI for Lights, Fans, AHU Working
41.	Check MCBs status on MMI and E-Cabinet
42.	Any other defects / faults / deficiencies.
43.	Check Battery Voltage in all Motor Coaches.
44.	Check Earth fault in the rake.
	MMI Fault Messenger
45.	Fault Massages to be recorded.
46.	Action taken to be recorded.
	Under Frame Equipment checking.
47.	Checking of Traction Motor cables.
48.	Check Transformer Cables.
49.	Check working of transformer blower.
50.	Check main air compressor cables.
51.	Check air leakage of main air compressor.
52	Check visually intactness of schaku coupler
53.	ETB checking
54.	Check working of Aux Compressor (on HMI/MMI/DDU)
55.	Check and test working of Horns
56.	Visually inspect all Wheels for defects, cracked Tyres, flats.
57.	Drain out All Reservoirs and others draining points.
58.	Check Inter-unit Air Hose Couplings for any air leakage.
59	Visually check the condition of leveling valve, protection plate, installation lever, air spring bellow for any damage/air leakage.
60.	Check Fire Extinguishers, Pad Locks of LT & HT Driving Cab
61.	Visually check display of Speedometer.

62.	Test working of Main Compressor & Auxiliary Compressor (BLUE COLOUR) from display panel in respective BU from MMI/HMI/DDU.
63.	Check TCN FAILURE indication in indication panel (normally OFF)
64.	Check VCB close/Trip for all BU from DDU panel (BLUE COLOUR)
65.	Check EBL is on condition at DT-ECC panel
66.	Check EOL is on condition at DT-ECC panel
67.	Check BAL is on condition at DT-ECC panel
68.	Working of Air conditioning & Door closing & Opening in DDU display
69	Any other abnormality

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ANNEXURE- 5

Common Schedule Activities for all 3 phase EMU / MEMU Rakes (Pneumatic and Under Gear)

SN	Equipment	Activities		Schedules		
1	Driving Cab Items	1	Check availability of wooden wedges (small & big), shorting clips, fire extinguishers and bamboos of ACP.	TI	IA	IC
		2	Ensure the cleaning of Look-out glasses (MM side & Guard Side) in both D/cabs.	TI	IA	IC
		3	Pneumatic Horn- Inspection	TI	IA	IC
		4	Driver Desk Installation-Inspection	TI	IA	IC
		5	Foot operated horn valve – Inspection	TI	IA	IC
		6	Hand operated horn valve – Inspection	TI	IA	IC
		7	Gauge panel Assembly – Inspection		IA	IC
		8	Duplex pressure Gauge - MR / BP - Recalibrate	Condition basis		
		9	Duplex pressure Gauge - BC / PB - Recalibrate			
		10	Single Pressure gauge BP –Recalibrate			
		11	Single Pressure gauge BC – Recalibrate			
		12	Wiper Blade- Visually inspect daily as part of the train preparation & replace as required. (Only in Monsoon seasons)	TI	IA	IC
2	Shunting Cab	1	Shunting Desk - Gauge panel Assembly inspection			IC
		2	Foot operated horn valve – Inspection			IC
		3	Single Pressure gauge BC – Recalibrate	Condition Basis		
3	EP & Auto brake Application and Releasing	1	Check for any leakage in EP/Auto Unit of each coach.	TI	IA	IC
		2	Check for the healthiness of the safety valves of brake units in each coach.	TI	IA	IC
		3	Check the healthiness of EP brake through DBCU and RBCU on HMI.	TI	IA	IC
		4	Check Brake cylinder pressure of all 12 coaches while holding brake, full EP & AUTO BRAKE applied on HMI.	TI	IA	IC
		5	Check EP Application & Release time of all 12 coaches by observing on HMI. (Apply and Release time must be < 6 sec.)	TI	IA	IC
		6	Apply Emergency brake by master controller and ensure application and release timing (< 20 sec).	TI	IA	IC
		7	Check Auto brakes Application & release time (<20 sec) of all 12 coaches by observing on HMI.	TI	IA	IC
		8	Check & ensure the function of Brake controller Emergency position Feedback micro switch on HMI.	TI	IA	IC
		9	Brake Cylinder Pressure Transducer/Pressure sensor (BC) Inspection		IA	IC
		10	Brake Cylinder Pressure Transducer/Pressure sensor (BC) Re-calibration	Condition basis		
		1	Check & Ensure the proper working of auto brake controller on all positions.	TI	IA	IC

SN	Equipment	Activities		Schedules		
4	Brake controller & ICS	2	Check the operation of ICS bypass switch, (Keep ICS OFF) (D- Cab must occupy)	TI	IA	IC
		3	Check the ICS key fixing knob for tightness.		IA	IC
		4	Check intactness of micro switch and its feedback on HMI.	TI	IA	IC
5	Guard Emergency Brake Handle	1	Apply & Release Emergency Brake through Guard emergency handle & verify that message of emergency brake application is appeared/ disappeared on HMI.	TI	IA	IC
		2	Ensure that the handle is in proper ON-OFF position	TI	IA	IC
		3	Check the functionality of Guard emergency Cock and ensure discharge of BP pressure	TI	IA	IC
6	Dead-Man operation	1	Run Down the Rake at the speed of >5 Kmph & release the Dead Man handle & Verify BP pressure is discharging and E-symbol is appeared on HMI brake pictogram.		IA	IC
		2	Check position of Dead man valve isolating cock and ensure the cock position is normal	TI	IA	IC
		3	Apply Emergency Brake through Master Controller check BP pressured is discharging through Deadman Valve and E-symbol is appeared on HMI brake pictogram.	TI	IA	IC
7	BP Charging Time & RDK Setting	1	Check BP charging time from both the cabs and record (up to 4.7 ± 0.2 kg/cm2 (180 second). and record brake pipe pressure showing on HMI in both the cabs.	TI	IA	IC
		2	Ensure that in both the cab RDK setting, difference should not be >0.1 bar. If found calibrate both the cab RDK	TI	IA	IC
8	Brake Cylinder & Bogie Cocks	1	Check brake cylinder for any air leakage from mouth, if found same to be replaced.		IA	IC
		2	Check all Bogie Cocks are Provided with Vent Type		IA	IC
9	Alarm Chain Pulling (ACP)	1	Check working of ACP by pulling handle from each coach and both side (East and West side) and ensure that flags are coming out in sufficient length and getting reset.		IA	IC
		2	Ensure that coach in which ACP operated is correctly displayed on the HMI.		IA	IC
		3	Overhauling, intactness and lubrication of ACP mechanism.			IC
		4	Check and ensure that the flasher indication light provided outside the ladies coach are working when alarm chain is pulled	TI	IA	IC
		5	Wipe the glasses of the flashing indicator with a clean dry cloth.		IA	IC
	Bogie / Under-	1	Check for any Crack, Damages and Excessive Wear. in Bogie Sole Bar, Transom Bar, Bolster, Bolster Pivot, Bogie headstock specially corners and curvatures.	TI	IA	IC
		2	Check visually for hitting of wheels to coach frames	TI	IA	IC

SN	Equipment	Activities		Schedules		
10	Gear/Wheel	3	Check visually for hitting of Axle box to bogie sole Bar and Dashpot springs for any breakages / Permanent set.	TI	IA	IC
		4	Check coach sole bar and under frame for any Cracks/hitting marks.	TI	IA	IC
		5	Check condition of liner between bogie and bolster.	TI	IA	IC
		6	Check for healthiness and foundation intactness of lateral and vertical friction dampers. Check for signs of oil leakage.	TI	IA	IC
		7	Check palm pull rods for any crack/bend.	TI	IA	IC
		8	Check condition of bushes, pins and safety chains.	TI	IA	IC
		9	Check availability pins with bulb cotters & split pins.	TI	IA	IC
		10	Check for side bearer cover jam/loose.		IA	IC
	Bogie / Under-Gear/Wheel	11	Check for intactness of center pivot bolts & for any cracks.	TI	IA	IC
		12	Check for any breakages of dashpot spring & torn and damage of rubber packing.	TI	IA	IC
		13	Check and ensure the intactness of Cattle Guard & Buffer foundation bolts.	TI	IA	IC
		14	Check for Hitting /Rubbing between Bolster and Bogie in lateral direction.	TI	IA	IC
		14.1	Check for condition of liner plate and proper clearance (< 3mm)		IA	IC
		15	Check brake shoe hanger assembly for any excessive play, crack and damages.		IA	IC
		16	Check intactness of rubber snubbers and crown packing on axle box.	TI	IA	IC
		17	Check for any damage or abnormality on Tie bar assembly.		IA	IC
		18	Check the condition of safety brackets and intactness of fixing bolts.		IA	IC
		19	Check height of cattle guard from rail level (150-200 mm).		IA	IC
		20	Ensure availability and intactness of cattle guard mounting bolts.		IA	IC
		21	Check oil leakage from oil well of side bearer on bolster and top up if required		IA	IC
11	Brake Block	1	Adjust by changing holes of palm pull rod. Gap between brake blocks and wheel should be 18 to 24 mm in release condition.		IA	IC
		2	Check brake cylinder piston not infringing with U bracket in brake applied condition	TI	IA	IC
		3	Replace Brake Blocks whenever necessary and record.	TI	IA	IC
12	Brake Rigging	1	Check Pins, Nuts, Bolts, Cotters, Bush, Washers for worn out, Breakages and stopper plate. Tighten them and replace if required	TI	IA	IC
		2	Check Brake Hangers, brake beams, and other brake rigging components. Replace if required.	TI	IA	IC
		3	Lubricate all the moving parts		IA	IC

SN	Equipment	Activities		Schedules		
		4	Check the condition of safety brackets and looseness of fixing bolt.	TI	IA	IC
		5	Ensure availability of stopper plates.	TI	IA	IC
		6	Ensure Proper working of Brake Cylinder	TI	IA	IC
		7	Check condition of Brake Cylinder and ensure intactness of fixation bolts.		IA	IC
13	Dash Pot Oil	1	Check for oil leakage, ensure intactness of oil filling nipples / Cap.	TI	IA	IC
		2	Check the oil level with dip stick and top up if necessary (M/C 97mm, T/C 97mm). Record quantity of oil fill up in Dash pot.		IA	IC
14	Air Suspension	1	Check the Air Spring foundation Allen Bolts intactness.	TI	IA	IC
		2	Check for any Cracks, Dent marks, Leakages, and Hitting marks on Air Spring .	TI	IA	IC
		3	Check the levelling valve assembly for any leakage, replace if required.	TI	IA	IC
		4	Check the installation lever and adjust the clearances if found abnormal.	TI	IA	IC
		5	Adjust the lever rod in horizontal position.	TI	IA	IC
		6	Check all the cocks provided for air springs are open if found closed made open.	TI	IA	IC
		7	Drain the cock provided in air spring tank.		IA	IC
		8	Check all the pipes, couplings for any leakage.	TI	IA	IC
		9	Check for any rubbing/abnormality on the flexible pipes provided in air spring and replace them as required.	TI	IA	IC
		10	Check the function of duplex check valve by manual drain valve of same bolster alternately.		IA	IC
		11	Check the welded joints of air spring base frame for any cracks /breakages.		IA	IC
		12	Check the healthiness of all air spring monitoring sensors and ensure the pressure on HMI if found <1.8 bar for DTC/TC/NDTC and <2.5 bar for MC, adjust levelling valve setting.	TI	IA	IC
15	Wheel & Axle	1	Check Axle Box Cover & fitment.	TI	IA	IC
		2	Check the temperature of Axle boxes with the help of temperature gun and note down readings.	TI	IA	IC
		3	Check wheel with taping hammer for any dull sound, flow of metals at surface.		IA	IC
		4	Check for wheel defect such as grooved / Flat tyre, Sharp flanges, Deep flanges, Thin flanges, Root wear & other defects.		IA	IC
		5	Visually check any abnormality like disk shifting Axles, MSUs.	TI	IA	IC
		6	Check and record the wheel diameter.		IA	IC
		7	Skidding of wheels	TI	IA	IC
		8	Unusual noise from under gear / wheel.	TI	IA	IC

SN	Equipment	Activities		Schedules		
		9	Check axle box cover for any cracks and grease leakage and cover intactness, ensure availability of split pin.	TI	IA	IC
		10	Check tightness of axle guide of oil filling cap		IA	IC
		11	PPM test for grease			IC
		12	Check rear cover for any sign soozing of grease oozing.	TI	IA	IC
		13	Check Axle guide Helical springs for breakage.	TI	IA	IC
		14	Check tightness of dash pot oil filling cap	TI	IA	IC
		15	Check axle guide safety strap.	TI	IA	IC
16	**Parking Brakes**	1	Parking Brake Lever Assembly - Visual inspection, functional check	TI	IA	IC
		2	Check the parking brake cylinders operation, fitted on wheel no.1-3, 5-7 in DTC and middle NDTC coaches. Also verify physically application and release of the brakes.	TI	IA	IC
		3	Check the working of parking brake by applying brake from D/cab push button and ensure push button glows.	TI	IA	IC
		4	Ensure parking brake gauge shows 0 pressure in applied condition and 5 kg/cm^2 in released condition.	TI	IA	IC
		5	Check the parking brake cylinder foundation brake arm, cup sleeve, wire rope release handle etc.	TI	IA	IC
		6	Check for any Air Leakage from Double Check Magnet valve and its Limiting Valve. If found leakage same to be attended.	TI	IA	IC
		7	Solenoid valve visual inspection & function check.		IA	IC
		8	1/2" check valve (soft seated) - visual inspection & function check			IC
		9	Quick release mechanism- visual inspection & function check.		IA	IC
		10	check reservoir 9 litre - visual inspection			IC
		11	Double check valve visual inspection & functional check.			IC
		12	N-1 reducing valve 1/2" BSP thd- Visual inspection, functional check			IC
		13	Hose assembly 3/8" x 4500 mm lg - Visual Inspection			IC
		14	Hose assembly 1/2" x 700 lg- 100187601 - Visual Inspection			IC
		15	Spring Brake Chamber-Visual Inspection			IC
		16	Cut-off cock vent visual inspection and function check	TI	IA	IC
		1	Check the welding joints, split pins, fixing bolts of MR, Aux. and Air spring reservoirs.	TI	IA	IC
		2	Check the intactness of reservoirs MS straps.		IA	IC
		3	Drain all the reservoirs by opening the cock provided.		IA	IC

SN	Equipment	Activities		Schedules		
17	Piping and Reservoirs	4	Check for any leakage / rubbing and ensure availability of clamps.	TI	IA	IC
		5	Check the clamping arrangements and tighten the clamps, if required	TI	IA	IC
		6	Check for leakage of flexible hoses.	TI	IA	IC
		7	Check for any leakage and tighten the clamps	TI	IA	IC
		8	Check the operation of MR, BP, Bogie isolating and drain cocks and replace if any leakage.		IA	IC
		9	Check MR, BP Cock leakage by closing cocks.		IA	IC
		10	Check rubbing of hoses pipe and shifting of end nipples.	TI	IA	IC
		11	Ensure All types of tank proper fitting & Air leakage.	TI	IA	IC
		12	Check for any isolation of EP/Auto /Bogie & coupling cocks and attend if isolated.	TI	IA	IC
		13	Ensure smooth operation of EP/Auto & Bogie cocks.		IA	IC
		14	Ensure that Bogie cocks are vent type, if found without vent same to be replaced.		IA	IC
		15	Check any damage of piping and cocks and replaced defective/Leaking cocks.	TI	IA	IC
18	Auto Drain Valves	1	Check the working of Auto Drain Valve while Main comp is ON/OFF cycle.	TI	IA	IC
		2	Check the leakage of drain valve and replace if required.	TI	IA	IC
19	Buffer & Schaku Coupler	1	Measure and record the buffer height		IA	IC
		2	Ensure the intactness of cup -sleeve bolts.	TI	IA	IC
		3	Check for any air leakage from MR & BP pipe bracket and bushing, V holding and Elbow clamps	TI	IA	IC
		4	Check the condition of centering device & leaf spring	TI	IA	IC
		5	Check greasing of articulation bearing bolt and condition of bush.		IA	IC
		6	Check the leaf spring carrier and dowel pins		IA	IC
		7	Check couplers earthing cables	TI	IA	IC
		8	Check buff gear and its bolts	TI	IA	IC
		9	Check the condition of Rubber plates Draw & Buff Gear	TI	IA	IC
20	Front Screw coupling	1	Check its condition and ensure that it should be secured on J –hook	TI	IA	IC
		2	Clean and lubricate it.		IA	IC
21	Air Dryer	1	Check intactness of mounting bolts.	TI	IA	IC
		2	Check proper working of air dryer in following manner	TI	IA	IC
		3	Check alternate operation of air drier Purging with interval of 2-3 mins.	TI	IA	IC
		4	Check the healthiness of desiccant as per OEM		IA	IC
		5	Check for any leakage from air drier and duplex check piston valve.	TI	IA	IC

SN	Equipment	Activities		Schedules		
		6	Check the color of humidity indicator as per OEM same to be replaced, if required.		IA	IC
		7	Visual inspection for external damages to air dryer and its pipelines.	TI	IA	IC
		8	Check the tightness of electrical supply connector.		IA	IC
		9	Pressure dew point measurement		IA	IC
22	**Furnishing Items**	1	Check operation (open/close/locking) of D/cab area doors & windows.	TI	IA	IC
		1.1	Check operation (open/close/locking) of Passenger area doors & windows.		IA	IC
		2	Check all the grab handles and grab poles		IA	IC
		3	Check all the seats of passenger area and D/cab for any damage.		IA	IC
		4	Check the any abnormality in Handicap compt.		IA	IC
		5	Cleaning of drain holes on the flooring in passenger area during monsoon.		IA	IC
		6	Check the stenciling of each coach.		IA	IC
		7	Ensure availability of safety cover of Articulation Bearing Bolt.		IA	IC
		8	Check the Compartment for Divyangjan passenger amenities.		IA	IC
		9	Check the interior and exterior stenciling of coach.		IA	IC
		10	Ensure intactness of door way side partition foundations.		IA	IC
		11	Ensure intactness coach body end panel partitions.		IA	IC
		12	Ensure intactness partition SS sheet welding & moulding screw.		IA	IC
		13	Ensure intactness of hatch door welding from inside.		IA	IC
		14	Ensure intactness of hatch door nut & bolt from inside/outside.		IA	IC
		15	Ensure intactness of hatch door fixing chain & clamp inside the HT compt.		IA	IC
		16	Driver Seat – Inspection.		IA	IC
		17	Check the Motor man & Guard seat for smooth Up/Down and Forward/Reverse movement operation.	TI	IA	IC
		18	Checking of intactness of Centre Poll located at entrance door	TI	IA	IC
23	**EP & AUTO Brake Testing**	1	Check for following 04 steps for each application/release of EP & Emergency brake by M/controller and Auto brake by Brake controller.		IA	IC
		2	Check for healthy application of particular type of brake by physically verifying application / release of brakes in each wheel of entire rake.		IA	IC
		3	Check for any abnormality/leakage in EP/Auto Unit of each coach.	TI	IA	IC
		4	Check for the healthiness of the safety valves of brake units in each coach.		IA	IC

SN	Equipment	Activities		Schedules		
		5	Check for proper operation of brake cylinder for late release/leakage.	TI	IA	IC
		6	Check the healthiness of DBCU and RBCU	TI	IA	IC

JITENDRA YADAV Digitally signed by JITENDRA YADAV Date: 2024.06.24 17:34:28 +05'30'

DHARMENDRA KUMAR Digitally signed by DHARMENDRA KUMAR Date: 2024.07.04 18:52:12 +05'30'

STUTI NARAYAN Digitally signed by STUTI NARAYAN Date: 2024.07.05 16:40:01 +05'30'

KOUSHIK PAN Digitally signed by KOUSHIK PAN Date: 2024.07.05 17:19:08 +05'30'

S.SENTHIL KUMAR Digitally signed by S.SENTHIL KUMAR Date: 2024.07.05 20:23:48 +05'30'

Schedule Maintenance Activities of Three Phase EMU (Electrical)

Sr No	Equipment /Assembly		Maintenance Activities	Applicable for	Schedule
1	**Master Controller**	1	Check smooth working of Master controller i.e. T-grip handle/FWD/REV/DRIVE/BRAKE/EB position.	All stock	TI, IA, IC
		2	Check intactness of all M/controller fasteners i.e. T- grip handle,both connectors , Direction switch knob & foundation bolts.		TI, IA, IC
		3	Check operation of DMH at v > 5 kmph (in both RDM & Normal mode)		TI, IA, IC
		4	Check emergency brake at EB position of M/controller.		TI, IA, IC
		5	Cleaning of interlocks & lubrication of gears & bearing		IA, IC
2	**Driving Desk, D-Cab equipment (Push Buttons & Rotary switches)**	1	Check operation & function of all switches & push buttons with their indications on Driver Desk and their stenciling.	All stock	TI, IA, IC
		2	Twin beam Main Head Light - Inspection		TI, IA, IC
			Focus setting (If required)		TI, IA, IC
			Working of Dim/Full function		TI, IA, IC
			Working of H/L on both the position of DC-DC convertor		TI, IA, IC
		3	Auxiliary Head Light &Aux cum Blinker Amber		TI, IA, IC
			Aux cum head light Tail light Red - Inspection		TI, IA, IC
			Focus setting (If required)		TI, IA, IC
			Working of Dim/Full function		TI, IA, IC
			Working of H/L on both the position of DC-DC convertor		TI, IA, IC
			Aux cum Blinker Amber - Inspection		TI, IA, IC
			Working of blinker.		TI, IA, IC
		4	Step Light- Inspection		IA,IC
		5	E-cabinet Panel inspection		IA, IC
		6	Check operation & function of all switches on E-Cabinet panel and their stenciling.		IA, IC
		7	Visual inspection of mounting of switch block/MCB and relays for any abnormality.		TI, IA, IC
		8	Visual inspection of cable connection for any heat up sign or flash mark		TI, IA, IC
		9	Ensure proper locking of left and right MCB panel and doors after checks and inspection.		TI, IA, IC
		10	Gasket of door panel to be checked for healthiness		TI, IA, IC
		11	Check for any loose contact block or burn mark at cable connections		TI, IA, IC
		12	Flasher light- Inspection		TI, IA, IC
		13	Normal and Standby		TI, IA, IC
		14	Audio Visual Sign		TI, IA, IC
		15	Speed Recorder cum Indicator- Inspection (Healthy status on HMI).		TI, IA, IC
		16	Signal Bell 1 - Inspection		TI, IA, IC
		17	Trembler Bell (EMR Bell) - Inspection		TI, IA, IC
		18	Emergency Cab Light - Inspection		TI, IA, IC
		19	Check working of Air Condition Switch		TI, IA, IC
		20	Check operation of Door Push Buttons		TI, IA, IC
3	**Gauges**	1	Check proper working of Duplex, Parking Brake, Brake Cylinder and Guards gauge in driving cab.	All stock	TI, IA, IC
		2	Check working & offset value of AUX compressor, Duplex, Brake Cylinder gauge in shunting cab.		TI,IA, IC
4	**PA / PIS , TMS and ETB**	1	Check proper working of PA, PIS and M/man - Guard communication.	All stock	TI, IA, IC
		2	Check Healthiness of all PA/PIS Equipment on PA/PIS screen in HMI at both train level & unit level.		TI, IA, IC
			Check Healthiness of ETB and all PA/PIS Equipment on PA/PIS screen in DDU at both train level & unit level.	ETB on the basis of availability	TI, IA, IC
		3	Ensure healthiness of Microphone and its functioning.	All stock	TI, IA, IC
		4	Check wiring intactness of coach controller & IMS rack.		IA, IC
		5	Front LED Display Left- Inspection		TI, IA, IC

Sr No	Equipment /Assembly		Maintenance Activities	Applicable for	Schedule
		6	Front LED Display Right - Inspection		TI, IA, IC
		7	Interior LED Display -Inspection		IA, IC
		8	Interior Single side LED Display - Inspection		IA, IC
		9	Saloon Loud Speakers - Inspection		IA, IC
		10	Check volume of PA and intercom		IA, IC
5	**Light & Fan(D CAB)**	1	DC Fan -Inspection.	All stock	TI, IA, IC
		2	18 W Interior Light - Inspection.		TI, IA, IC
		3	Emergency cab light- Inspection.		TI, IA, IC
		4	Spot Light- Inspection.		TI, IA, IC
		5	Ensure Fan ON/OFF, light ON/OFF (50% & 100%) & RMVU, ON/OFF (Auto, 50% & 100%) function from both D/cabs & ensure the same on HMI.		TI, IA, IC
6	**APC receiver - Inspection**	1	Ensure APC receiver mounting intactness	All stock	TI,IA, IC
		2	Ensure connector intactness		IA, IC
		3	Ensure healthy operation on test magnet.		IA, IC
		4	Height of APC Receiver from Rail level (160+ 5mm)		IA,IC
7	**E-Cabinet -DTC, MC & CRW & End wall panels & Under driving Desk items (Siemens)**	1	Check operation & function of all switches on CRW panel and their stencilling.	All stock	IA, IC
		2	Visual inspection of mounting of switch block/MCB and relays for any abnormality.		IA, IC
		3	Visual inspection of any loose cable connection.		TI, IA, IC
		4	Ensure proper locking of left and right MCB panel after checks and inspection.		TI, IA, IC
		5	Ensure the proper locking of all panels door of driver desk.		TI, IA, IC
		6	Check working healthiness of 110V AC cooling fans of CRW, EWP & Driver Desk.		IA, IC
		7	Clean the filters of all 110V AC cooling fan		IA, IC
		8	Visually inspect for any abnormality.		TI, IA, IC
		9	Clean with the help of soft brush.		IA, IC
		10	Check intactness of all connector CCU/MCG.		IA, IC
		11	Check intactness of all MVB & IP connector		IA, IC
		12	Check MCB/Contactor for any loose mounting		TI, IA, IC
		13	Check for any loose contact block or burn mark at cable connections.		TI, IA, IC
		14	Ensure the closing of all panels door lock		TI, IA, IC
		15	Check the healthiness of various isolation switches.		TI, IA, IC
		16	Check MCBs and replace defective or burnt MCBs and ensure the healtiness of MCB's and Contactor		TI, IA,IC
		17	Visually inspect for any abnormality of SIBAS KLIP Station & MVB Repeater(Siemens)		IA, IC
		18	Check for tightness of connection in KLIP Station of DTC & Contactor panel.(Siemens)		IC
		19	Check tightness of KLIP station, MCB Panel, Contactor Over load of End wall Panel(Siemens)		IC
		20	Check working healthiness of 110 V AC cooling fans of E- cabinet in HT Compartment & CRW		IC
		21	Capturing of thermal images with the help of thermal Camera to identify any hotspots inside the panel.		IA,IC
		1	Ensure the intactness of USB port, IP connector & power supply connector.		IA, IC
		2	Check the healthiness of touch function and its response time.		TI, IA, IC
		3	Train Overview: Ensure the healthy and working status of all equipment.		TI, IA, IC
		4	Unit Level: Ensure the healthy and working status of all equipment.		TI, IA, IC
		5	Events Screen: Check for any active failure on events screen.		TI, IA, IC
		6	Ensure healthy status of equipment/functions on train level and unit level of various screens of Main System.		TI, IA, IC

Sr No	Equipment /Assembly		Maintenance Activities	Applicable for	Schedule
8	**MMI (Siemens) & H.M.I.(BT) and DDU (Medha) & Air conditioned (BHEL)**	7	Check the healthiness of all EOL on High Voltage screen.		TI, IA, IC
		8	Check the healthiness of all EBL on EMR brake screen.		TI, IA, IC
		9	Check Status of Pressure switches & Sensors on HMI at AAC/PB/MR/BP Pressure = 0 Bar & Max value in Air supply / EMR Brake Screen.		TI, IA, IC
		a	AAC Pressure Switch.		TI, IA, IC
		b	MAC Pressure Switch.		TI, IA, IC
		c	MAC Pressure Sensor.		TI, IA, IC
		d	BP Charged Pressure Switch		TI, IA, IC
		e	EMR Pressure Switch.		IA, IC
		f	Traction Safe Pressure Switch.		TI, IA, IC
		g	Parking Brake		TI, IA, IC
		10	Check Earth Fault of following circuits (if any) on "Aux/Battery" screen.		TI, IA, IC
		a	415V AC 3Ø		TI, IA, IC
		b	110V AC 1Ø		TI, IA, IC
		c	110 V DC		TI, IA, IC
		11	Ensure healthy status of all Auxiliary contactors on Aux/Battery screen with all MC OFF / ON.		TI, IA, IC
		12	Ensure healthy status of Cab occupation on HMI in Regular & High Priority mode.		TI, IA, IC
		13	Check the healthiness of each and every function physically which are displayed on various screens (Top level, Unit Level, Drive/Brake, Energy, Fault logged, V > 0 & V = 0) of MMI.		TI, IA, IC
		14	Check for any error message on the screen.		TI, IA, IC
		15	Ensure the intactness of USB port, Ethernet/MVB & power supply connectors.		IA, IC
		16	Ensure healthiness of Light/Fan in Light/Fan screen of Comfort system.		TI, IA, IC
		17	Ensure healthy status of Cab occupation on DDU in Regular & RDM Mode.		TI,IA,IC
		18	Check healthiness of main and Auxiliary compressor isolation. Normal and Bypass		IA,IC
9	**Fire Extinguisher & Safety Only**	1	Check the availability of fire extinguisher and Check seal is intact.	All Stock	TI, IA, IC
		2	Check for test date. Replace if overdue.		TI, IA, IC
		3	Check for proper vertical mounting.		TI, IA, IC
		4	Ensure availability of Short circuit clip		TI, IA, IC
		5	Ensure availability of emergency ladder in shunting cab.		TI, IA, IC
10	**Passenger Compartment-RMVU/AHU**	1	Ventilation Unit - Inspection on Driver Display	All stocks	IC
		2	Forced Ventilation Unit - General check, like blower alignment, locknuts, keyways, cotter pin.		IC
		3	Forced Ventilation Unit - General inspection: Door sealing, smooth running of motor, motor connector & electrical joints, fasteners, cleaning inside		IC
		4	Forced Ventilation Unit - Clean fresh air filter.		IC
		5	Filter - Replace filter		IC
		6	Ensure healthy working of all RMVU Blower Motors.		TI, IA, IC
		7	Ensure no unusual noise from any Blower Motors.		TI, IA, IC
		8	Ensure provision & intactness of Earthing Shunts Bolts of RMVU.		TI, IA, IC
11	**Passenger Compartment-Light & Fan**	1	AC Fan - Inspection	All stock	TI, IA, IC
		2	Ensure healthy operation of all fan switches.		TI, IA, IC
	HTC & Shunting Cab - Light & Fan	1	Ensure healthiness of all Fan Guards/Blade/Rim & intactness of foundation bolts.		TI, IA, IC
		2	Ensure no unusual noise from Fans.		TI, IA, IC
		3	Interior Light - Inspection		IC
		4	DC Fan -Inspection		IC
		5	Interior Light - Inspection.		IC
		6	Emergency cab light- Inspection.		TI, IA, IC
		1	Ensure easy operation of all HT/LT doors.	All stock	IA, IC

Sr No	Equipment /Assembly		Maintenance Activities	Applicable for	Schedule
12	**Shunting cab with HT & LT doors**	2	Ensure proper locking arrangement.		TI, IA, IC
		3	Ensure proper locking E-Cabinet of D/cab & MC, Various cabinet doors in HTC, various panel doors in coaches of each & every mentioned door.		IA, IC
		4	Check operation & function of all switches & push button with their indications on ECC/Shunting Desk and their stencilling.		IA, IC
		5	Key interlocking- Inspection		TI, IA, IC
		6	Operation of Master Controller from Shunting Cab		IA, IC
13	**Battery**	1	Check the battery voltage with VCB open and close & record it.	All stock	TI,IA, IC
		2	Check for Intactness of battery box mounting bracket and bolts		IA, IC
		3	Check for condition of battery box cover and its proper fitment.		IA, IC
		4	Check each cell for water leakage.		IA, IC
		5	Check the voltage of each cell.		IA, IC
		6	Check the specific gravity of each cell.(**Not to be taken for Dry cell battery)**		IA, IC
		7	Check the level of electrolyte in each cell. Top up if necessary.(Not for Dry cell battery)		IA, IC
		8	Check the condition of battery connecting leads.		IA, IC
		9	Ensure proper connections, tightness of leads.		IA, IC
		10	Apply petroleum jelly on all connections after cleaning.		IA,IC
		11	Cheking of Battery fuse intactness & proper rating		IA,IC
		12	Capturing of thermal images of Battery and Battery Fuse Terminals with the help of thermal Camera to identify the hotspots.		IA, IC
14	**Battery Isolation Switch (AC EMU)**	1	Clean with the help of brush.	All stock	IA, IC
		2	Check battery isolation switch for feedback intactness.		IA, IC
		3	Ensure the proper stenciling of ON/OFF position		IA, IC
		4	Check for smooth operation of Battery isolation switch		IA, IC
15	**Brake Resistor**	1	Air blowing to be done of entire unit.	All stock	IA, IC
		2	Visual check for any damage to grid, flashover.		IA, IC
		3	Check for HT connection intactness.		IA, IC
		4	Check and ensure for any foreign material , stray wire.		TI,IA,IC
		5	Check for any damage to ceramic parts and grid of Grounding Resistor.		IA, IC
		1	Check for any sign of overheating by feeling with hand or non-contact thermometer and record temperature.		TI,IA,IC
		2	Drain old Gear-case oil completely and top-up fresh gear case oil up to max. level. (As per OEM)		IC/One Year
		3	Check for metal particles by blotting paper test		IA,IC
		4	Check any damage or bolt missing of gear case.		TI,IA, IC
		5	Check any damage for Traction Motor cables and proper securing.		IC
		6	Clean the Traction motor body along with gear case.		IC
		7	Ensure intactness of Junction box along with its cover.		IC
		8	Open junction box and check for tightness and any flashing or overheating marks.		IC
		9	Open Terminal box cover and check for any abnormality.		IC
		10	Clean air inlet filters.		IA, IC
		11	Blow the TM by opening the bellow and inspection cover with the help of dry compressed air.		IA, IC
		12	Visual inspection for no external damage.		TI,IA, IC
		13	Check intactness of TM mounting bolts with MSU		IA, IC
		14	Check for damage for Tr. Motor cables and their proper securing through cleats.		TI,IA, IC
		15	Check the level of gear case oil.		TI,IA,IC
		16	Top and bottom bolts of Gear case to be checked for tightness.		IA,IC
		17	Remove and clean TM filters with dry compressed air.		IA, IC

Sr No	Equipment /Assembly		Maintenance Activities	Applicable for	Schedule
16	**Traction motor**	18	Change the TM Filters if damaged.	All stock	IA, IC
		19	Check the joints of air filters after mounting for proper sealing.		IA, IC
		20	Check for proper fitment and tightness of TM Bellow.		IC
		21	Check TM Bellow for any damage. Replace if required.		IC
		22	Check the tightness of foundation bolts of Earth Return Brush assembly.		IC
		23	Check condition of sandwich mounting of Nose suspension and replace if needed.		TI, IA, IC
		24	Check for proper fitment of Nose suspension bolts nuts and keeper pins and split pins.		IA, IC
		25	Ensure mounting intactness of Speed & Temperature sensor along with their connectors & ensure proper routing of sensor cables through cleats.		TI, IA, IC
		26	Visual inspection of sandwich packing for any damage.		TI, IA, IC
		27	Check oil level of gear case (Top-up oil if required)		TI, IA, IC
		28	Ensure intactness of MSU shimring bolts.		IA, IC
		29	Regrease Traction motor DE & NDE as Per OEM		IA, IC
		30	Check visually intactness of earth cable connection and earth return brush in Motor coach & Trailer coach.		TI,IA, IC
		31	Check earth return brush for free movement and condemning size motor coach.		IC
		32	Topping of the grease on the nose suspension bearing (N-End & D-End) as per OEM.		IC
		33	Cannon box,nose suspension bearing-visual check		TI,IA,IC
		34	Gear case-Visual check		TI,IA,IC
		35	Check level & Leakage of Cardium Compound /felt of gear case. (Top-up if required)		TI,IA,IC
		36	Thermography of Traction Motor Junction Box.		IA/IC
17	**Suspension Tube Assly**	1	Check for any sign of overheating of MSU .	All Stock	TI,IA,IC
		2	Ensure intactness of housing bolts.		TI,IA,IC
		3	All coaches under frame all shunts to be checked.		IA, IC
		4	Regrease MSU Bearing on both DE & NDE side as		IA, IC
		5	Regrease MSU labyrinth ring on both DE & NDE side		IA, IC
		6	Ensure intactness of MSU labyrinth ring Allen bolts		IA, IC
18	**Auxiliary Motors**	1	Check the direction and working of all blower motors.	All Stock	IC
		2	Check for any unusual noise from any blower motor.		TI, IA,IC
		3	Check the phase current of Aux. Converter blower motors.		IC
19	**Compressor & Pneumatics**	1	External cleaning	All Stock	IA, IC
		2	Check visually proper fitment of foundation bolts & safety slings.		TI,IA, IC
		3	Ensure intactness of foundation bolts & safety slings.		TI, IA, IC
		4	Ensure healthy working & check for any unusual noise.		TI, IA, IC
		5	Check for any oil & air leakage from joints, suction and delivery pipes.		TI, IA, IC
		6	Ensure no any leakage from safety valve.		TI,IA, IC
		7	Clean the air suction filter and replace if found damaged.		IA, IC
		8	Ensure healthy functioning of Air dryer.		TI,IA, IC
		9	Check proper DOR (Direction of Rotation) of compressor motor.		IA, IC
		10	Record pressure build up time of compressor at unit level.		IA, IC
		11	Ensure proper cut-in & cut-out of MAC/MR pressure switches on HMI.		IA, IC
		12	Main Compressor - Check oil level		IA,IC
		13	Main Compressor - Check vacuum indicator		IA,IC
		14	Main Compressor - Topping up oil		IA,IC
		15	Main Compressor Cleaning cooler		IA,IC

Sr No	Equipment /Assembly		Maintenance Activities	Applicable for	Schedule
		16	Micro mesh filter element - Replacement of air filter elements		IC
		17	Resilient mounting - Visual inspection resilient mountings		IA, IC
20	**AuxiliaryCompresor**	1	Safety Valve - venting & Function test	All Stock	IA, IC
		2	Micromesh Oil filter - Venting, emptying		IA, IC
		3	Oil change (if required)		IA, IC
		4	Check the motor brushes and clean		IA, IC
		5	Check oil level & top up if required.		IA, IC
		6	Check for any abnormal noise		TI, IA, IC
		7	Suction filter cleaning		TI,IA, IC
		8	Drain crank case oil and oil change (if required)		IA, IC
		9	Check for any oil & air leakage.		IA, IC
		10	Ensure intactness of foundation bolts.		IA, IC
		11	Ensure proper cut-in & cut-out of AAC pressure switch.		IA, IC
		12	Safety valve: Replace with calibrated safety valve.		Condition basis
		13	After maintenance carry out an efficiency test. Record pressure build up time from 0 to 5Kg/cm^2		IA, IC
21	**Pantograph**	1	Visual Inspection-Check cracks or flash marks on insulators and cleaning(acid less solution)	All Stock	TI, IA, IC
		2	Check for damage to copper shunts. Replace if 50% shunts are damaged.		TI, IA, IC
		3	Check functionality of ADD by operating manually in all BUs **Not in Siemens**		TI, IA, IC
		4	Check the air leakage from ADD, ODD PU pipes.**Not in Siemens**		TI, IA, IC
		5	Verification of raising time (6 to-10 sec.) and lowering time (below 10 sec.)		TI, IA, IC
		6	Check for abnormal lateral play of pantopan		TI, IA, IC
		7	Measure and write down the thickness of the wearing strips.		TI, IA, IC
		8	Check for breakage, loose connection etc. of roof bars. Special care must be taken with aluminium bars.		TI,IA, IC
		9	Check for any abnormality in 3 steps and make adjustment if required.		IA, IC
		10	Check the sealing of connectors, flexible pipes,regulator, air tank etc.		IC
		11	Check for OHE over riding marks on apex tube, if found rubbing same to be cleaned and apply white paint.		TI,IA, IC
		12	Check and measure OHE over riding marks on horn portion on either side from the center.		IA, IC
		13	MCG Antenna Multiband - Inspection		IA, IC
		14	Line voltage transformer/ Potential transformer 25000V/25V- Inspection.		IA, IC
		15	Current transformer - Inspection		IA, IC
		16	Surge arrestor -Inspection		IA, IC
		17	Transient inductor - Cleaning		IA, IC
		18	Air tank – Draining		IA, IC
		19	Air tank Check for leakage		IA, IC
		20	Pneumatic circuit - Visual inspection		IA, IC
		21	Solenoid Valve (EV Valve) - Visual inspection		IA, IC
		22	Hydraulic damper - Inspection		IA, IC
		23	Carbon sliding strip -Inspection		IA, IC
		24	Rocker Box – Inspection		IA, IC
		25	Leaf spring – Inspection		IA, IC
		26	Piping- Check for tightness		IA,IC
		27	Overreach detection - Inspection		IA,IC
		28	Check the pressure regulater if panto weight found high/low while cheking panto weight		IA,IC
		1	Clean the insulator with dry & clean cloth.		IA, IC
		2	Check for cracks chip and flash marks on insulators.		TI,IA,IC
		3	Check for connection of earthing isolator.		IA, IC
		4	Cleaning and greasing of earthing isolator.		IA, IC
		5	Check for any air leakage in VCB.		IA,IC

Sr No	Equipment /Assembly		Maintenance Activities	Applicable for	Schedule
22	**VCB & AC Earthing Switch**	6	Check the sealing of connectors, flexible pipes, regulator, air dryer tank etc. and pneumatic connection.	All stock	IC
		7	Check the tightness of input,output and earth Connection.		IC
		8	Isolator blades and fixed contact on earthing switch should be cleaned		IA, IC
		9	Connection tightness to be ensured.		IA, IC
		10	Earthing switch moving & fixed contact to be cleaned and lightly greased.		IA, IC
		11	Earthling switch 25KV 400A		IA, IC
		12	Connection for Earthing Isolator-Inspection , Cleaning & intactness		IA, IC
		13	VCB fixing screw/Foundation screw - Check for tightness		IA,IC
		14	Earthing Connection -Check for tightness		IC
		15	VCB LT Box box cover tightness to be checked		IC
		16	Check for any damage,cut & tightness of the cabling & Connector-Visual Inspection.		IC
		17	Toggle Mechanism - Visual inspection & lubrication		IC
		18	Ensure meggering of *Areva make* single bottle VCB between Input/Output & Output/Earth and record keeping for its comparison with last megger value (IR Value Min 200MΩ by 1Kv Megger)		IC
		19	Checking the sealing of VCB		IA,IC
		20	Visual inspection of auxiliary switch & its cam		IC
		21	Operation of magnet coil & relay valve		IC
		22	Check condition of silica gel and it should be reactivated in case its colour fade		IC
		23	Check the condition of air filter & ensure lubrication of relay valve.		IC
		24	Check and ensure correct setting of pressure switch and pressure regulator & record it.		IC
		1	Silica Gel,visual:Check:presence,quantity,color,Regeneratio n or replacement if more than half of the silica gel is saturated.	All stock	IA, IC
		2	Air Filter: Quick visual check: presence, cleanliness. Dry cleaning if necessary.		IC
		3	Protection grid for air inlet/outlet: visual check: presence, cleanliness.		IA, IC
		4	Silent air plug: Check visual check: presence,tightening, cleanliness		IA, IC
		5	Air filter: Dry cleaning if necessary (with vacuum cleaner and soft nylon brush). (condition based maintenance => estimated interval)		IA, IC
		6	Heat exchanger (radiator): Visual check: aspect (absence of damage, cracks), tightness (absence of leakages), cleanliness.		TI, IA, IC
		7	Radiator damage leakage and cleanliness: Dry and wet cleaning (with vacuum cleaner, water jet and compressed air)		IA, IC
		8	Protection louver for air inlet: Visual check: presence, aspect (absence of damage, cracks) cleanliness		IA, IC
		9	Visual inspection of transformer Tank for any damage		TI, IA, IC
		10	HT Bushing: Visual inspection for any damage, deformation and insulation damage		TI, IA, IC
		11	Proper layout of HT cable through its supporting cleat		IC
		12	Oil: Visual check of oil level. Oil top up if necessary (estimate interval valid only if presence of oil level detector)		TI,IA,IC
		13	Check and attend oil leakage if any.		IC

Sr No	Equipment /Assembly		Maintenance Activities	Applicable for	Schedule
23	**Transformer**	14	Pump: Visual check: aspect (absence of damage, cracks), tightness (absence of leakage), cleanliness, absence of abnormal noise.		TI, IA, IC
		15	Electrical connection for pump: Visual check: aspect (absence of damage cracks), cleanliness, proper connection, tightness		IA, IC
		16	Flexible connecting pipe for air dryer: Visual check: presence. Proper connection. Aspect (absence of damage, cracks), tightness (tightening) cleanliness		IA, IC
		17	Fan motor: Visual check: aspect (absence of damage, cracks), cleanliness, absence of abnormal noise and of abnormal vibration		IA, IC
		18	Set of earthing connection for accessories to transformer: Presence, aspect (Absence of damage, cracks), proper connection (tightening)		TI, IA, IC
		19	Set of cable (for accessories): Visual check: aspect (absence of damage, cracks), cleanliness.		TI, IA, IC
		20	Connecting box: Visual check: aspect (absence of damage, cracks), cleanliness.		IC
		21	Visual check of Oil level sensor		IC
		22	Connector on connecting box: Quick visual check: aspect (absence of damage, cracks) cleanliness.		TI, IA, IC
		23	Ball valve for radiator dryer: Visual check: aspect (absence of damage, cracks), cleanliness, status (Open or closed), presence of security sealing.		TI, IA, IC
		24	Filling/draining of ball valve: Visual check: aspect (absence of damage, cracks), tightness (absence of leakage) cleanliness, tightness of safety cap head		IC
		25	Butterfly valve connected to tank: Visual check: aspect (absence of damage, cracks), tightness (absence of leakage) cleanliness, status (Open or closed), presence of security sealing.		TI, IA, IC
		26	Over pressure valve: Visual check-aspect (absence of damage, cracks), tightness (absence of leakage) cleanliness.		TI, IA, IC
		27	Switch for over pressure valve: Visual check-aspect (absence of damage, cracks),cleanliness electrical connection.		TI, IA, IC
		28	Oil flow sensor: Visual check-Aspect (absence of damage, cracks), tightness (absence of leakage) cleanliness. Check by manual operation.		TI, IA, IC
		29	PT100 temperature sensor: Visual check:		TI, IA, IC
		30	Current transformer: Visual check:		TI, IA, IC
		31	Protection cover: Visual check		TI, IA, IC
		32	Closing cover: Visual check		TI, IA, IC
		33	Flexible coupling pipe: Visual check: Presence aspect (absence of damage cracks) tightness (tightening) & cleanliness.		IC
		34	Set of transformer fixing bolts & Safety Sling: Presence, aspect (Absence of damage, cracks), proper connection (check of tightening torque, etc)		IA, IC
		35	Check working of Blower Fans @ Low and High speed and airflow (Check air inlet/outlet protection grid and fan fins)		IA, IC
		36	Oil sample to be taken for DGA & BDV.		IA, IC
		37	Bushing: Visual check: aspect (absence of damage cracks) tightness (absence of leakage), cleanliness,absence of humidity		IA, IC
		38	Oil: Visual check of oil level. Oil top up if necessary (estimate interval valid only if presence of oil level detector)		IA, IC
		39	Transformer Vibration Damper (e.g. Silent block): Visual check: aspect (absence of damage cracks), cleanliness		IC

Sr No	Equipment /Assembly		Maintenance Activities	Applicable for	Schedule
		40	Electrical connection for Fan motor: Visual check: aspect (absence of damage, cracks), cleanliness, proper connection, tightness		IA, IC
		41	Impeller: Visual check: aspect (absence of damage, cracks), cleanliness, absence of abnormal noise and of abnormal vibration		IA, IC
		42	Fan group vibration damper: Visual check: aspect (absence of damage, cracks), cleanliness.		IC
		43	Oil level detector: Visual check: Aspect (absence of damage, cracks), tightness (absence of leakage), cleanliness, electrical connection.		IC
		44	LIF Fuse: Visual check: Aspect (absence of damage, cracks) cleanliness.		IC
		45	Checking of foundation bolt and safety sling		IA/IC
		46	Thermography of Transformer for hotspot identification.		IA,IC
24	**Traction Converter Unit (TCU)**	1	Check that the container is bolted tightly to the vehicle.	Siemens only	IA, IC
		2	Check the container for damage.		IA, IC
		3	Check that the air intake and air outlet opening are unobstructed.		IA, IC
		4	Check electrical connection for corrosion.		IC
		5	Check the grounding connection for corrosion. Check that connection is tight.		IC
		6	Check components cables and connection for damage.		IC
		7	Evidence of excessive temperature and arcing (Voltage flashovers).		IC
		8	Check that all cable ties are tight.		IC
		9	Check that all covers are correctly closed. Adjust if required.		IC
		10	Check that the information/warning labels on the cover are clean. Clean if required.		IC
		11	Check the line contactor K1 & K6.		IC
		12	Visual check of main contacts for damage.		IC
		13	Check magnetic components and insulating parts.		IC
		14	Check the disconnecting switch for smooth action.		IC
		15	Check the pre-charging contactor K4 & K5.		IC
		16	Check that connections are correctly made.		IC
		17	Check that in the 2-pole version. The movable contacts close Simultaneously		IC
		18	Cleaning the ventilated section after removing 2 covers at backside of cabinet.		IC
		19	Clean the equipment sections and mounted section with the vacuum cleaner and then blow them out with compressor air. (Lint free cloth may be used)		IC
		20	Check the seal on the cover, if required clean and apply a thin layer of acid free grease (e.g. Vaseline) or Talcum power.		IC
		21	Remove any damage seals/gaskets.		IC
		22	Cleaning the unventilated section (do not use compress air) after removing all covers.		IC
		23	Vacuum or brush out the equipment sections and components. (Lint free cloth may be used)		IC
		24	Check the seal on the cover, if required clean and apply a thin layer of acid free grease (e.g. Vaseline) or Talcum power.		IC
		25	Capturing of thermal images with the help of thermal Camera to identify any hotspots inside the panel.		IA,IC

Sr No	Equipment /Assembly		Maintenance Activities	Applicable for	Schedule
25	**Auxiliary Converter Unit (ACU)**	1	Isolate the Aux. converter, open the front door and ground it.	Siemens only	IC
		2	Inspect the arc quenching chambers from the contactors.		IC
		3	Inspect the arc quenching chambers and switch elements.		IC
		4	Visual inspect whether the arc quenching chambers exhibit mechanical damage or metal deposits.		IC
		5	Visually inspect whether material deposits have occurred at the power contacts.		IC
		6	In events of faults replace the defective contactor. If the protection is in order re-attach the arc-quenching chamber.		IC
		7	Inspect the components for possible damage (e.g. Discoloration or mech. Damage) and check that they are firmly sealed.		IC
		8	Check the power modules, controls, fans, and current and voltage converters. Replace if components are damage.		IC
		9	Check ACU internal cabling.		IC
		10	Check the line connections (Cable lugs) for tightness.		IC
		11	Inspect the plugs (male & female parts) for corrosion and proper contact. Check the tightness of plug clamping screws. Replace if required.		IC
		12	Remove the hex screws (2xM8) on the pivoting frame A8 and open the pivoting frame. Remove the cover panel in front of the fan.		IC
		13	Open the pivoting frame and check the fan area for dirt. If dirty clean the inside area with vacuum cleaner.		IA, IC
		14	Mount the fan cover panel (8 x M6 torque-6.5Nm). Close the pivoting frame (2xM8 torque – 15Nm) tight.		IA, IC
		15	Remove the 4 bags for corrosion protection and replace them with new one.		IC
		16	Change the filter if torn out or damage. After checking secure the filters properly.		IC
		17	Air blowing of filter unit to be done		IC
		18	Capturing of thermal images with the help of thermal Camera to identify any hotspots inside the panel.		IA,IC
26	**Traction converter Cubucle**	1	Fault Download	BT only	TI,IA,IC
		2	Visual Inspection		IA ,IC
		3	External cleaning		IA ,IC
		4	Checking and cleaning of cooling fans		IA ,IC
		5	Checking of line contactors		IA ,IC
		6	Checking of Precharging contactors		IA ,IC
		7	Cleaning of the internal housing		IA ,IC
		8	Checking of all internal and external cable connection in the TCC		IA ,IC
		9	Checking of control connections and connectors		IA ,IC
		10	Checking of the screws secring the TCC to the supporting beams		IC
		11	Inspection of coolant Pipe lines for any leakage		IA ,IC
		12	Capturing of thermal images with the help of thermal camera to identify any hotspots inside the panel.		IA ,IC
		1	Visual Inspection		IA ,IC
		2	Checking of internal cooling fans		IA ,IC
		3	Cleaning of internal cooling fans		IC

Sr No	Equipment /Assembly		Maintenance Activities	Applicable for	Schedule
27	**Electronic Cubicle**	4	Cleaning of internal housing	BT only	IC
		5	Checking of all internal and external cable connection in the ECC cubicle		IA ,IC
		6	Checking of control connectors		IA ,IC
		7	Checking of relay and contactors		IA ,IC
		8	Checking for clogging and clean outlet mesh		IA ,IC
		9	Checking of the screws securing the ECC to the supporting beams		IC
		10	DC earthling switch		Conditional basis
		11	Checking condition of breaking knives and flexible contacts		IA ,IC
		12	Cleaning Lubrication of Knife contacts		IC
		13	ECC inlet filter cleaning and blowing and intactness		IA ,IC
		14	100 Hz harmonic filter cleaning , intactness and connection		IA ,IC
		15	Capturing of thermal images with the help of thermal camera to identify any hotspots inside the panel.		IA, IC
28	**Electrical distribution compartment(EDC)**	1	Visual Inspection	BT only	IA ,IC
		2	Checking of internal cooling fans and heat exchangers		IA ,IC
		3	Healthiness of Radiator inlet protection jally		IA ,IC
		4	Cleaning g of internal cooling fans and heat exchangers		IA ,IC
		5	Cleaning of internal housing		IC
		6	Checking of all internal and external cable connection in the EDC cubicle		IA ,IC
		7	Checking OF Control connectors		IA ,IC
		8	Checking of relay and contactros		IA ,IC
		9	Checking of the screws securing the EDC to the supporting beams		IC
		10	Checking for clogging and clean outlet mesh		IA ,IC
		11	Replacement of panel locks and rubber gaskets (Condition basis)		IA ,IC
		12	Top up coolant vessel		TI,IA,IC
		13	Visual inspection of sensor		TI,IA,IC
		14	Inspection of coolant pipelines in EDC and HTC for any leakage		TI,IA,IC
		15	Capturing of thermal images with the help of thermal camera to identify any hotspots inside the panel.		IA, IC
29	**Electronic modules**	1	Visual Inspection	BT Only	IA,IC
		2	Cleaning		IC
		1	Fault Download		TI,IA IC
		2	Visual Inspection		TI,IA IC
		3	External cleaning		IC

Sr No	Equipment /Assembly		Maintenance Activities	Applicable for	Schedule
30	**Line & Traction Converter(LTC)**	4	Checking & Cleaning of the Cooling fans	Medha only	IA,IC
		5	Checking of line contactor		IA,IC
		6	Checking of pre-charging contactor		IA,IC
		7	Replacement of Line contactor		Conditional basis
		8	Replacement of Pre-charging contactor		Conditional basis
		9	Cleaning of the internal housing.		IA,IC
		9.1	100 Hz harmonic filter		Conditional basis
		9.2	Cleaning, Intactness of connections		IA,IC
		9.3	Checking of all internal and external cable connections for intactness, any damage and overheating.		IA,IC
		10	Checking of control connections for intactness and visual inspection of overheating.		IA,IC
		11	Checking of control connectors for intactness.		IA,IC
		12	Checking of the screws securing the TCC to the supporting beams.		IA,IC
		13	Checking healthiness of Panel locks, Bolts, Rubber gaskets and stencilling.		IA,IC
		14	Replacement of Panel locks, bolts, stencil & Rubber gaskets		Conditional basis
		15	Checking of all cards of LTC Control unit for intactness and healthiness		IA,IC
		16	Cleaning of Power Modules		Conditional basis
		17	Check for clogging and clean outlet and inlet mesh		TI,IA,IC
		18	Capturing of thermal images with the help of thermal camera to identify any hotspots inside the panel.		IA,IC
31	**Auxiliary Converter Unit (ACU)**	1	Visual Inspection	Medha only	TI,IA,IC
		2	External cleaning		IC
		3	Checking & Cleaning of the Cooling fans		IA,IC
		4	Checking of all internal and external cable connections for intactness, any damage and overheating.		IA,IC
		5	Checking of control connections for intactness and visual inspection of overheating.		IA,IC
		6	Checking of the screws securing the ACU to the supporting beams.		IA,IC
		7	Checking healthiness of Panel locks, Bolts, Rubber gaskets and stencilling.		IA,IC
		8	Replacement of Panel locks, bolts, stencil & Rubber gaskets		Conditional basis
		9	Checking of all cards of ACU/RIO Control unit for intactness and healthiness.		Conditional basis
		10	Cleaning of Aux Inverter Modules.		Conditional basis
		11	Cleaning of the internal housing.		IC
		12	Checking of control connectors for intactness.		IA,IC
		13	Checking of relays and contactors		IA,IC

Sr No	Equipment /Assembly		Maintenance Activities	Applicable for	Schedule
		14	Check for clogging and clean outlet and inlet mesh		IA,IC
		15	Capturing of thermal images with the help of thermal camera to identify any hotspots inside the panel.		IA,IC
32	**MC-Electrical Control Cubicle (ECC)**	1	Visual Inspection	Medha only	TI,IA ,IC
		2	Cleaning of the internal housing		IC
		3	Checking of all internal and external cable connections for intactness, any damage and overheating in ECC.		IA,IC
		4	Checking of control connectors for intactness.		IA,IC
		5	Checking of relays and contactors		IA,IC
		6	Checking of the screws securing the ECC to the supporting beams		IC
		7	DC earthling switch		Conditional basis
		8	Checking condition of breaking knives and flexible contacts		IA,IC
		9	Cleaning and lubrication of knife contacts		IC
		10	Checking healthiness of Panel locks, Bolts, Rubber gaskets and stencilling.		IA,IC
		11	Replacement of Panel locks, bolts, stencil & Rubber gaskets		Conditional basis
		12	Capturing of thermal images with the help of thermal camera to identify any hotspots inside the panel.		IA,IC
33	**DTC-ECC**	1	Cleaning	Medha only	IA,IC
		2	Visual Inspection OF Switches and MCBs.		IA,IC
		3	Checking of control connections and connectors		IA,IC
		4	Checking of relays and contactors		IA,IC
		5	Checking of CCC cards for intactness and healthiness.		IA,IC
		6	Checking of LRMS healthiness.		TI,IA ,IC
		7	Checking of ECN switches healthiness.		TI,IA ,IC
		8	Checking healthiness of Panel locks, Bolts, Rubber gaskets and stencilling.		IA,IC
		9	Replacement of Panel locks, bolts, stencil & Rubber gaskets		Conditional basis
		10	Capturing of thermal images with the help of thermal camera to identify any hotspots inside the panel.		IA,IC
34	**Contactor : (K1 & K6,K4 & K5)**	1	Remove by compressed air dust and other deposits particularly from the magnetic core and insulating parts.	Siemens only	IC
		2	Check the surface of the electromagnet if needed clean it by cloth wet in alcohol.		IC
		3	Check that the connections are correctly made.		IC
		4	Check the closing of magnet without jamming.		IC
		5	Check the loading stroke it should be C=2 $\pm$ 0.2 mm.		IC
		6	lIF Fuse: Visual check: Aspect (absence of damage, cracks) cleanliness.		IC
		7	Check the wear of main and aux. contacts.		IC
		8	Check the condition of arc-chute.		IC
		9	Visually check for any insulation damage or loose connections in LT cut board, Control frame and HT compartment of Motor coaches.		IC
		10	Capturing of thermal images with the help of thermal camera to identify any hotspots inside the panel.		IA,IC
	Pressure Governer &	1	Check for proper operation and settings on test bench. Adjust the setting if needed.		IA,IC
		2	Check for any leakages from piping.		TI,IA,IC

Sr No	Equipment /Assembly		Maintenance Activities	Applicable for	Schedule
35	Pressure Governer & piping	3	Check for Governors are secured properly.	All stock	IA,IC
		4	Ensured intactness of connection on Governor		IA,IC
		5	Pressure Switch Assembly - Inspection, Check setting and Tightness		IA,IC
36	Jumper and Socket	1	Check the proper fitment of all jumpers and their sockets.	All stock	IA,IC
		2	Check for any damage/rubbing of jumpers and their sockets.		IA,IC
37	Train Line Junction Box	1	Clean the terminal with Nylon brush.	All stock	IA, IC
		2	Check the tightness of all connections.		IA, IC
		3	See that all wires are numbered.		IA, IC
38	TCC, ECC & EDC	1	Ensure intactness of foundation bolts of containers.	BT and MEDHA	TI, IA, IC
		2	Check the TCC & EDC cubicle for any damage.		IC
		3	Check that the air outlet openings are un-obstructed.		IA, IC
		4	Ensure healthiness of all the Blowers.		IA, IC
		5	Visually check all HT connections in TCC/EDC/ECC for any flash mark or heating mark.		IA, IC
		6	Ensure intactness of all shunts and provide if found missing.		IC
		7	Check the coolant level and top-up if required.		IC
		8	Check piping and couplings in EDC & TCC for any coolant water leakage.		TI,IA,IC
		9	Check condition of Pre-charging and main contactors arc-chute and their moving and fix contacts. If found flashed same to be cleaned.		IA, IC
		10	Check MIODX & Cable switch DBCU & RBCU connections intactness.		IA, IC
		11	Check IGBT power module for any flash/ overheating mark.		IA, IC
		12	Check for any unusual noise of radiator blowers		IA, IC
		13	Inlet of heat exchanger -Check for clogging and clean		IA, IC
		14	Outlet mesh of EDC & Inlet filter- Check for clogging and clean		IA,IC
		15	Outlet mesh - Check for clogging and clean		IA, IC
		16	Record air flow of EDC and ECC		IA, IC
		17	Capturing of thermal images with the help of thermal camera to identify any hotspots inside the panel.		IA,IC
39	TRC1&2, Aux-1 & Aux-2	1	Ensure intactness of foundation bolts of containers.	Air Conditioned (BHEL)	IA, IC
		2	Check the TRC1 & TRC2 cubicle for any damage.		IA, IC
		3	Check that the air outlet opening are un-obstructed.		IA, IC
		4	Ensure healthiness of all the Blowers.		IC
		5	Visually check all HT connections in TRC1&2/Aux-1/Aux-2 for any flash mark or heating mark.		IC
		6	Ensure intactness of all shunts and provide if found missing.		IC
		7	Check condition of Pre-charging and main contactors arc-chute and their moving and fix contacts. If found flashed same to be cleaned.		IA, IC
		8	Check VIU 1&2, DCU 1&2, ICP 1&2 & Cable connections intactness.		IC
		9	Check IGBT power module for any flash/overheating mark.		IA, IC
		10	Check for any unusual noise of TRC blowers		IA, IC
		11	Inlet of cyclonic filter -Check for clogging and clean		IA, IC
		12	Outlet mesh of TRC 1 & 2, Aux1/Aux-2 -Check for clogging and clean		IA, IC
		13	Inlet filter & Outlet mesh -Check for clogging and clean		IA, IC
		14	Checking of all incoming and outgoing cables termination point for intactness of all HT cubicle.		IA, IC
		15	Capturing of thermal images with the help of thermal camera to identify any hotspots inside the panel.		IA, IC

Sr No	Equipment /Assembly		Maintenance Activities	Applicable for	Schedule
40	**End wall Panel 1, 2, 3, & 4 (AC EMU)**	1	Check 110V AC cooling fans are working	Air Conditioned	TI, IA, IC
		2	Check MCB/Contactor/Busbars and Terminal Blocks for any loose mounting		IA, IC
		3	Clean the filters of 110V AC cooling fan.		IA, IC
		4	Visually inspect for any abnormality.		IA, IC
		5	Clean with the help of soft brush.		IA, IC
		6	Check intactness of all MVB & WTB connector		IA, IC
		7	Check the connection intactness for main and auxiliary contact.		TI, IA, IC
		8	Check for any loose contact block or burn mark at cable connections.		IA, IC
		9	Ensure the closing of all panels door lock		TI, IA, IC
41	**DC Earthing Switch**	1	Clean isolator blades and fixed contact for any flashing marks and apply slight grease on contacts.	All stock	IA,IC
		2	Ensure intactness of HT & LT Connection.		IA,IC
		3	Ensure healthiness of enclosure & smooth operation of switch/handle.		IA, IC
		4	Check the condition of braking knives and flexible contact and the movement of switching mechanism (**Siemens)**		IA, IC
		5	If the braking knives found dirty they will be cleaned up and lubricated (**Siemens)**		IA, IC
42	**Speedometer**	1	Check intactness of couplers.	All stock	TI/IA/IC
		2	Check setting of date & time.		TI/IA/IC
		3	Check status of memory card, replace if required.		TI/IA/IC
		4	Clean display glass.		TI/IA/IC
		5	Check intactness of PG at axle.		TI/IA/IC
		6	Download data, in case memory showing full.		TI/IA/IC
		7	Check working of Speedometer.		TI/IA/IC
		8	Download data from speedometer.		IA/IC
		9	Cleaning of all electrical BDs & Connectors including couplers.		IA/IC
		10	Tightness of all electrical BDs & Connectors including couplers.		IA/IC
		11	Check all Allen bolts tightness with the help of Allen key.		IA/IC
		12	Open PG junction box cover and check and ensure tightness of connectors after cleaning and re-fit cover.		IA/IC
		13	Check PG & its cables physically for any damage and replace if required.		IA/IC
		14	Open PG for ultrasonic testing of axle. Check the condition of PG and replace if required. Re-fit PG cover after UST of axle.		IC

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Annexure-6B

	Maintenance Activities	Schedule
Sr. NO	**Roof mounted package unit (RMPU)**	
1.0	**General Checks/Visual Inspection**	
1	Check the log sheet maintained in each AC EMU coach and attained the defects recorded by crews	TI, IA, IC
2	Remove fresh and Return air filters by opening the access doors of the unit. Clean these filters with vacuum or compressed air after taking out the filters and place them gently in their place or replace with pre-cleaned/ new filters and close the doors properly. NOTE- After this activity, the service doors shall be latched properly in case of return air filters similarly, the fresh air grill shall be positioned and locked.	TI, IA, IC
3	Check the looseness of microprocessors Input/Output connections	IA, IC
4	Check the microprocessor controller is firmly mounted.	IA, IC
5	Checking the control logic of microprocessor controller.	Condition Basis
6	Refrigerant status checking and Refrigerant filling verify to run the unit.	Condition Basis
7	Check the DDU log history and attend the defects recorded in DDU	TI, IA, IC
8	Run the RMPU for half an hour and then check the current drawn by various equipment with clamp tester duly calibrated. 1) package unit in cooling mode-40.1 amp 2) compressor motor - 16.1 amp, 3) condenser motor -2.6amp, 4) Blower motor - 1.6 Amp.	IA, IC
	NOTE - The currents also depends on the ambient temperature. Range to be decided as per the OEM manual.	IA, IC
9	Run the AC unit and check the cut-in and cut-out function of LP/HP	IC
10	Check the visually condenser fan blade and ensure that there is no crack on the blade or hub	IA, IC
11	Check and tight the mountings of Blowers, compressor and Blowers motors	IC
12	Check the capillary tubes provided for HP/LP CUTOUT for proper support/clamping, their nuts should be properly tightened	IA, IC
13	Check the proper tightening of cover provided over evaporator compartment	IA, IC
14	Check the Earthing shunts in RMPU are provided. Earthing shunts should be earthed with coach body	IA, IC
15	Run the RMPU in conjunction with microprocessors controller and observe for any abnormality	TI, IA, IC
16	Check anti-vibration mountings of compressors, condensers motors, Blower motors and overall package unit	IC
17	If less cooling is noticed, check the leakage of refrigerant from the system by using soap solution or leak detector. If leak is detected it should be attended and recharging of refrigerant in the system shall be made as per RDSO SMI No-ELPS/AC/SMI14. Filter drier must be replaced during this activity on condition basis.	TI, IA, IC
18	Check cable for any damage and joints, Replace if needed	IC
19	Check for the physically damaged conduits, Replace them, if needed	IC
20	Check the proper working of servo drive motors for dampers opening	IA, IC
21	Auto/Manual operation of Microprocessor	IA, IC
22	Healthiness of 415V AC earth fault system to be ensured	
2.0	**EMERGENCY BLOWER CHECKS**	
1	Check the function of Emergency Blower to switch off the main supply and monitor the function of Blower motor.	TI, IA, IC
2	Check the Transformer working, and Tightness of Earthing connections.	IA, IC
3	Check the Inverter function of each unit	TI, IA, IC
3.0	**REFRIGERANT PIPE LINE/THERMOSTATIC EXPANSION VALVE**	
1	Check for proper clamping/support	IA, IC
2	Check the Thermostatic expansion valve function and there are no any sharp bend or kinks	IA, IC
4.0	**COMPRESSORS CHECKS**	
1	Mounting fasteners are properly tightened	IA, IC
2	Check electrical terminal box/electrical connection are properly tightened and cables are terminated with lugs	IA, IC

3	Check function if less cooling is noticed, check leakage from joints of compressor, HP/LP CUT-OUTS and filter drier with soap solution. If leak is detected, it should be attended and re-charging of refrigerant (R407C) in the system.	TI, IA, IC
4	Condensing area covers are properly tightened and not touching top of compressor body	IA, IC
5.0	**Condenser Fans Motor/Blades and Blower Motors/Impeller checks**	
1	Mounting fasteners are properly tightened	IA, IC
2	Electrical terminal box of motors is properly tightened and cables are terminated with lugs	IA, IC
3	Double earthing shunts are provided	IA, IC
4	Overhauling of Blower and condenser fan motors shall include the following during POH	
5	Check bearing make and replace with specified make, if found defective	IC
6	Check closely terminal block and connecting lead for any physical damage or any flash mark over it. Replace the same.	IA, IC
7	Ensure that Impellers are properly tightened and Terminal box is properly to tightened	IA, IC
8	Conditions of blade for its fixings/cracking/breakage/damage or touching with its covers. Rectify or Replace if needed	TI, IA, IC
6.0	**Temperature Sensors**	
1	Ensure that sensors provided at Return air path, fresh air and supply air are firmly mounted	IA, IC
2	Ensure sensors wires are properly clamped	IA, IC
3	Remove the dust accumulated over sensor clamped	IA, IC
4	Temperature Sensors, RH sensors healthiness to be ensured (Supply, return, hydrostatic and ambient) and reading of each sensor to be recorded	IA, IC
7.0	**Return/Fresh air filters Cleaning**	
1	Ensure filters are not damaged	TI, IA, IC
2	Ensure that there is a provision to avoid wrong fitment in the filter as well as in RMPU	TI, IA, IC
8.0	**HP/LP/OHP cut-out switch**	
1	Check that the mounting fasteners are properly tightened	IA, IC
2	Ensure proper clamping/support of capillary tube connected to HP/LP cut-out switch	IA, IC
3	Ensure that flare nuts are properly tightened	IA, IC
4	Ensure that controls wires to HP/LP cut-out switches are properly screwed	IA, IC
5	Ensure that covers of these HP/LP cut-out switches are properly screwed	IA, IC
9.0	**Evaporator coil**	
1	Ensure there is no damage to fins	IA, IC
2	Ensure that capillaries of distributors to Evaporator coil are not having any sharp bend or kinks. They should be clamped properly.	IA, IC
3	Ensure that air passes only through evaporator coils and no air is bypassed directly to blower chamber	IA, IC
4	Clean the coil, if found dirty	IA, IC
5	Check the mounting fasteners are properly tightened	IA, IC
10.0	**Filter Drier & Sight glass**	
1	Ensure that drier is installed with flow in the direction of the arrow marked on the filter drier label. (In case of replacement of equipment)	IA, IC
11.0	**Access doors**	
1	Ensure proper Insulation of service door, lower portion and side wall from inside of the Evaporator compartment	TI, IA, IC
2	Ensure that the latches to lock the service doors are not defective/damaged	TI, IA, IC
12.0	**Dip Tray and drain pipe.**	
1	Ensure that there is no leakage of condensate water from drip to electrical box & blower housing area	IC
2	Ensure free flow of condensate water	IA, IC
3	Ensure U trap at the end of drain pipe.	IA, IC
13.0	**Condenser area**	
1	Clean the condenser coil from inside with compressed air/water jet after opening the cover of condenser area	Every 90 Days
2	Ensure that there is no damage of Fins	IA, IC
3	Check the mounting fasteners are properly tightened	IA, IC

4	Ensure that there is no damage/crack in structure frame of RMPU	IA, IC
5	Ensure proper clamping of electrical conduits	IA, IC
14.0	**Electrical Power Control & MCB/MPCB Panel**	
1	Check and clean dust from control panel by compressed air and tighten the cables terminals	IC
2	Compressor motor 1,20amp	IC
3	Compressor motor 2,20Amp	IC
4	Condenser motor 1, 3.25 Amp	IC
5	Condenser motor 2,3,25 Amp	IC
6	Blower motor 1,2,0 Amp	IC
7	Blower motor 1,2.0 Amp	IC
15.0	**Measure the current of RMPU motors**	
1	Compressor motor, Condenser Motor & Blower motor	IA, IC
16.0	**Power/Control Connector**	
1	Inspect and ensure healthiness of Power/Control Connectors X1,X2,X3.	
17.0	**Damper Servo motor**	
1	the proper working of servo drive motors used for dampers opening.	
18.0	**CAB AC**	
1	Healthiness checking of cab AC & checking of its associated switch in panel.	IA, IC
2	Cab AC filter cleaning by water or air blow to remove dust & dirt.	TI, IA, IC
19.0	**Automatic Door**	
1	To open the door pelmet and side cover clean the inner portion and door pocket for any foreign material and dust to be removed.	TI, IA, IC
2	Check the error LED on DCU.	IA, IC
3	Check securing elements of limit switches & drive for intactness.	IA, IC
4	Check intactness of fastening screws of door hanger on the right & left door leaf. If found loose to be tightened with Locktite 243 and marked again with sealing wax.	IA, IC
5	Check that drive torsion springs locking lever and latches are mechanically in order & move smooth & easy.	IA, IC
6	No gap is available between leafs when the door is closed & locked. Check condition of the gasket if found damaged replace	TI, IA, IC
7	Check emergency door knob operation & Functionality from inside & outside for free movement.	IA, IC
8	When door isolation key is operated in door close position, door should not open even when emergency switch is operated.	IA, IC
9	Check visually wiring and all electrical fittings for any damage.	IA, IC
10	**Check the warning buzzer in following conditions**	IA, IC
11	1) It should activate with first obstacle detection.	IA, IC
12	2) It should be activated as long as emergency switch is in operated state 3) Buzzer should work on door close command and door open command	IA, IC
13	1) LED should glow steadystate while door is opened	IA, IC
14	2) LED should get OFF while door is CLOSED	IA, IC
15	3) During opening and closing, LED should blink.	IA, IC
16	Check movement of door for constant speed, any excess play and unusual sound.	IA, IC
17	Open both side doors and run the rake in override condition (all doors must close as soon as rake gain momentum)	TI, IA, IC
18	Drive Unit: Clean relevant Components from old grease and dirt before applying any new lubricant. Procedure: Disconnect electric power supply. Grease Spindle with isoflex LDS 18Spezial/ Equivalent grease A using a brush. open and close the door leaves manually 2 or 3 times. Connect electric power supply.	IC
19	Latches and latch pins: Lubrication of latches and latch pins Procedure: Disconnect electric power supply. Grease sliding surface of latches and latch pins with isoflex topaz NB 52 using a brush. open and close the door leaves manually 2 or 3 times. Connect electric power supply.	IC
20	Door leaf: Clean relevant Components from old grease and dirt before applying any new lubricant.	IC
21	Check for any rubbing marks on door leaf	TI, IA, IC
22	Check for bottom overplay of door leaf on the rail guide.	TI, IA, IC

23	Release lever: Procedure: Disconnect electric power supply. Grease sliding surface of release lever and pins with isoflex topaz NB 52 using a brush open and close the door leaves manually 2 or 3 times. Connect electric power supply.	IC
24	Check intactness of fastening screws of door hanger on the right & left door leaf. If found loose to be tightened with Locktite 243 and marked again with sealing wax. Tightening torque should be used as per metric standard thread and normal dimension.	IA, IC
25	Door Seals: Lubrication of door seals and finger protection rubber Procedure: Disconnect electric power supply. Open the door leaves by hand open the door leaf not completely. Apply kluber Barrierta L 25 DL to door seals. Clean finger protection rubber afterwards with a dry cloth. Connect electric power supply.	IC
26	Spindle: Lubrication of spindle Procedure: Disconnect electric power supply. Grease Spindle with isoflex LDS 18Spezial A using a brush. Open and close the door leaves manually 2 or 3 times. Connect electric power supply	IC
27	Locking Lever: Lubrication of locking lever Procedure: Disconnect electric power supply. Grease sliding surface of locking lever and pins with isoflex topas NB 52 using a brush.open and close the door leaves manually 2 or 3 times. Connect electric power supply.	IC
28	Torsion Spring: Lubrication of all torsion springs on the driving units. Procedure: Grease all torsion springs of the drive units with Isoflex Topaz NB 52 using a brush.	IC
29	Ensure the intactness of Connectors and electrical connection on DCU card.	IC
30	Check obstruction detection system with test object of size 30 X 60 mm in three areas (Upper, Middle & Lower)	IC
31	Check operation & Functionality of following switches:	IC
32	i) isolation switch S4 (Door out of service).	
33	ii) Emergency open S 3	
34	iii) Door lock and closed S7.1, S7.2	
35	iv) DCU power supply S6	
36	Check for any faulty door indication on DDU or event message coming on DDU after pressing 'DOOR OPEN' or 'DOOR CLOSE' push button on driver desk panel.	IA,IC

37	all doors to be check for any scratch mark or any damage or hit mark on door leaf.	IA,IC
38	all door Measurement of gap between footboard patti. Gap to be adjusted at 25 mm.	IA,IC
39	Visually Inspect all door inside and outside Nylon strips and the Foot board plate for any damage or breakage.	IA,IC
40	all door to be Visually check for emergency switch and isolation switch cover and glass cover for any damage.	IA,IC
41	Visually check if all door palmet cover hinges, compression latches, tower bolt are fuctioning properly, .	IA,IC
42	all door to be Check whether the glass is damaged or not, check whether there is water inside the hollow layer. Replace the door glass.	IA,IC
43	Check intactness of foundation bolts of channel. Foundation bolts to be tightened with loktite 243 and provide marking.	IA,IC
44	Check for any damage to rubber stopper	IA,IC
45	Adjustment of stopper to keep the door leaf at least 30mm out in open condition.	IA,IC
46	Physically check for intactnesss of main roller bolts.	IA,IC
47	Physically check for intactnesss of eccentric roller bolts.	IA,IC
48	Physically check no door supporting roller should be dislocated from it's channel or ecentric bolt position should be proper.	IA,IC
49	Clean the contact surface of the guide rail and the roller.	IA,IC
50	Check electrical connectors and earthing of door control unit	IA,IC
51	Check the wire rope unit (Bowden cable) of the inside and outside emergency unlock device is jam or loose	IA,IC
52	check for any damage of wire rope head	IA,IC
53	Check whether the gap between the upper anti-jump wheel and the upper guide rail is (0.2-0.5) mm or not, adjust when not qualified.	IA,IC
54	Visual check whether the surface of the toothed belt is damaged or not.	IA,IC
55	clean toothed belt.	IA,IC
20.0	**Vestibule**	
1	check condition of gangway bellow if torn and damage, replace, repair on condition basis.	TI, IA, IC
2	Visual and physical intactness of spring foundation brackets, spring assembly, tightening rope and limit rope.	IA, IC
3	check gangway locking thread connection of gangway and carbody and its fastners.	IA, IC
4	check proper functionality of gangway locking lever.	IA, IC
4	Vestibule stopper male female intactness to be checked.	IA, IC
5	check gangway sealing rubber and replace on condition basis.	IC
6	check intactness of bridge plate and step plate hinges along with its fastners	TI, IA, IC
7	Coach inside parting lever operation to be checked with key.	IA, IC

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Annexure-7

List of Must Change Items to be replaced during POH Schedule of 3 – Phase EMUs/MEMUs

SN	Main Equipment		Item	Every POH	Every Alternate POH	Every 3rd POH	Every 4th POH
1.	**Brake Equipment**	1.1	Worm drive hose clips for brake cylinder Dust Excluder (Big/Small).	Y			
		1.2	Overhauling kit for EP unit as per OEM	Y			
		1.3	Set of rubber for modified PRV	Y			
		1.4	Set of rubber for triple valve	Y			
		1.5	Kit of rubber components for N1 type pressure reducing valve for parking brake	Y			
		1.6	Maintenance kit of leveling valve	Y			
		1.7	Overhauling kit for emergency valve (Dead man's valve)	Y			
		1.8	Overhauling kit for brake controller as per OEM	Y			
		1.9	Foot operated horn valve			Y	
		1.10	Diaphragm for horn & overhauling kit	Y			
		1.11	Piston packing for duplex piston valve of air drier.	Y			
		1.12	Brake release valve			Y	
		1.13	Rubber kit of solenoid valve of parking brake	Y			
		1.14	Piston packing ring of brake cylinder	Y			
		1.15	Dust excluder	Y			
		1.16	Parking brake cylinder rubber kit	Y			
		1.17	OH KIT for AWS/DMH (Rotex/ KBIL/ Escort)	Y			
		1.18	OH kit for ADV Magnet valve (Rotex)	Y			
		1.19	OH Kit for Hooter magnet valve	Y			
		1.20	Guard's Emergency valve		Y		
		1.21	Diaphragm for Limiting Valve of EP Brake Unit	Y			
		1.22	Set of Rubber Components for Isolating Valve of Brake Controller Type ED 6	Y			
		1.23	Hose Connection	Y			
		1.24	Piston sub assembly for Holding and Application Magnet Valve		Y		

SN	Main Equipment		Item	Every POH	Every Alternate POH	Every 3rd POH	Every 4th POH
		1.25	Maintenance Rubber kit for D1 type Automatic Drain Valve	Y			
		1.26	Valve Head for Stabilizing Valve	Y			
		1.27	Valve Plate Sub. Assly. for Triple Valve	Y			
		1.28	Valve head for Pressure limiting valve	Y			
		1.29	Compression Spring for Application Holding Magnet Valve	Y			
		1.30	COMPRESSION SPRING 1.4 TO 1.8 kg/cm2 PLV	Y			
		1.31	Compression Spring for Triple and stabilizing Valve.	Y			
		1.32	Kit for Seitz Rotex Magnet Valve	Y			
2.	**VCB**	2.1	Overhauling **AOH (Periodicity: 2 years)** kit for VCB	Y			
		2.2	Overhauling **IOH (Periodicity:4 years)** kit for VCB		Y		
		2.3	Overhauling POH (**Periodicity: 08** years) kit for VCB				Y
		2.4	Complete Pressure Regulator		Y		
		2.5	Rear and Front Horizontal Sleeve of VCB		Y		
		2.6	OH kit of Air-drier VCB	Y			
3	**Transformer**	3.1	Silica Gel Orange, Spherical Beads Without Cobalt of Size 3 TO 5 mm. bags of 2.2 KG Pack.	Y			
		3.2	Radiator (heat Exchanger) blower motor foundation dampers.		Y		
4.	**Other**	4.1	Replacement of all connector rubber gasket	Y			
5.	**Pantograph**	5.1	Rubber kit of pressure regulator throttle valve and inlet filter	Y			
		5.2	All flexible shunts		Y		
		5.3	Rocker box assembly leaf spring	Y			
		5.4	Rubber kit and spring in quick exhaust valve	Y			
		5.5	Rubber bellow		Y		
		5.6	Set of Bearings for pantograph type WBL 22.03		Y		
		5.7	Flexible Shunt for AC Panto Type WBL 22.03		Y		
		5.8	Insulating Hoses		Y		

SN	Main Equipment		Item	Every POH	Every Alternate POH	Every 3rd POH	Every 4th POH
		5.9	Air bellow drive Schunk make for Pantograph type WBL 22.03				Y
		5.10	HYDRAULIC DAMPER SCHUNK FOR PANTOGRAPH TYPE WBL 22.03				Y
		5.11	Parallel Guide Bar. Schunk make For pantograph type WBL 22.03				Y
6.	**AHU**	6.1	Replacement of bearing		Y		
7.	**Battery**	7.1	VRLA Battery *		Y		
		7.2	LMLA Battery *		Y		
8.	**Pipes**	8.1	MR hose pipe		Y		
		8.2	BP hose pipe		Y		
		8.3	Bogie hose pipe	Y			
		8.4	Parking brake pipe	Y			
		8.5	Levelling valve hose pipe	Y			
9.	**Schaku Coupler**	9.1	Bush Polymide for Draw Buff Gear to Schaku	Y			
		9.2	Sealing Ring For Air Pipe Coupling To Schaku	Y			
		9.3	Rubber Tube for Air Pipe Coupling. (RDSO)	Y			
		9.4	Grease Nipple A-10 For Bearing Bracket to Schaku	Y			
		9.5	Spring Lock Washer M-16 Conforming to IS- 6735-1994	Y			
		9.6	Rubber Spring Plate	Y			
		9.7	Compression Spring for Air pipe coupling	Y			
		9.8	Hexagonal Head bolt M16*175 with hex nut	Y			
		9.9	Dowel sleeve 10*16 mm and 10*20 mm	Y			
		9.10	Split pin 10*71 mm and Spring lock washer M12	Y			
		9.11	Bush Lowe/Upper for Bearing Bracket Of Schaku	Y			
10.	**Bogie and Brake Rigging**	10.1	Nylon Bush for Motor Coach Brake Head & Block	Y			
		10.2	Nylon Bush for Motor Coach Brake Lever Inner	Y			
		10.3	Nylon Bush For Motor Coach	Y			

SN	Main Equipment		Item	Every POH	Every Alternate POH	Every 3rd POH	Every 4th POH
			Articulation Piece				
		10.4	Coil Spring For Stock Motor Coach	Y			
		10.5	Split Pin 10*75 mm	Y			
		10.6	Bulb Cotter For Brake Hanger	Y			
		10.7	Split Pin- 3.2 X 32mm long	Y			
		10.8	SPLIT PIN DIA - 10 X 100mm Long, to IS: 549- 2005	Y			
		10.9	Acetal Guide Ring for B.G Coaches.	Y			
		10.10	Guide Bush and circlip for Axle Box Guide Arrangement	Y			
		10.11	Rubber Packing Ring for Axle Box Guide Arrangement	Y			
		10.12	Rubber Stopper for Bolster	Y			
		10.13	Lower Rubber Washer for Axle Box Guide Arrangement	Y			
		10.14	Rubber Packing For Crown Clearance (Sets)	Y			
		10.15	Rubber packing for crown clearance of EMU M/C (SET)	Y			
		10.16	K Type Non Asbestos Composite Brake Blocks	Y			
		10.17	Pin Split Cotter 08 X L90 HND)	Y			
		10.18	Countersunk Machine Screw Full Threaded IS 1365:Size 10*75 mm	Y			
		10.19	General Purpose Machinery Oil, Lubrex 100	Y			
		10.20	OH kit for Air Dryer (Faiveley)	Y			
11.	**Traction Motor**	11.1	Roller Bearing Grease for Traction motor	Y			
		11.2	Gear Case Oil	Y			
		11.3	Cylindrical Roller Bearing				Y
		11.4	Deep Groove Ball Bearing Electrically Insulated				Y
		11.5	Set of "O" RING, Gasket & Bush	Y			
		11.6	Grease	Y			
		11.7	Loctite 243 OR it's equivalent adhesive for thread sealing of bolts and screws	Y			
		11.8	Sealant for TM type ITB	Y			
		11.9	Cylindrical Roller Bearing for DE				Y

SN	Main Equipment		Item	Every POH	Every Alternate POH	Every 3rd POH	Every 4th POH
		11.10	NDE Bearing for Siemens TM				Y
		11.11	DE Bearing for Medha TM				Y
		11.12	NDE Bearing for Medha TM				Y
		11.13	Felt for Gear Case	Y			
		11.14	ERB Carbon Brush		Y		
		11.15	Leather Bellow		Y		
		11.16	Gear Case O ring	Y			
		11.17	Rubber Sandwich				Y
		11.18	Pinion				Y
		11.19	Hardware of TM				Y
12.	**Air Suspension**	12.1	O ring for spigot of air spring as per RDSO STR C-K 406 [REV-2] with 3 amendments	Y			
13	**Main Compressor**	13.1	AOH kit for Main compressor (ELGI)	Y			
		13.2	AOH kit for Main compressor (Faiveley)	Y			
		13.3	AOH kit for Air Dryer (Trident)	Y			
		13.4	AOH kit for Air Dryer (Knorr Bremse)	Y			
		13.5	IOH kit for compressor		Y		
		13.6	Overhauling kit for every third POH of compressor			Y	
		13.7	Set of LP-HP cylinder Knorr Bremse Compressor model no. VV-120			Y	
		13.8	Set of LP-HP Piston for Knorr Bremse Compressor Model no.VV 120.			Y	
		13.9	Set of LP-HP Valve for Knorr-Bremse compressor model no. VV-120,			Y	
		13.10	Set of LP-HP Connecting Rod for Compressor Type VV120 of KNORR BREMSE			Y	
		13.11	Set of LP-HP cylinder for ELGI OIL FREE compressor.			Y	
		13.12	Set of LP-HP piston for ELGI OIL FREE compressor.			Y	
		13.13	Set of LP-HP valve for ELGI OIL FREE compressor			Y	
		13.14	Set of LP-HP cylinder for FAIVELEY OIL FREE compressor.			Y	
		13.15	Set of LP-HP piston for FAIVELEY OIL FREE compressor.			Y	

SN	Main Equipment		Item	Every POH	Every Alternate POH	Every 3rd POH	Every 4th POH
		13.16	Set of LP-HP Valve for FAIVELEY OIL FREE compressor.			Y	
		13.17	Micro filter element for final filter assembly of air dryer type LTZ015.1.		Y		
		13.18	Cylinder Valve Plate For ELGI Make Compressor.	Y			
		13.19	Suction filtersVV120 KNORR	Y			
		13.20	Oil breather filter VV120	Y			
		13.21	Compressor oil SIEMENS & BT	Y			
14	**Air Dryer**	14.1	Desiccant kit		Y		
		14.2	Valve plates and packing ring for Aux. Compressor		Y		
		14.3	Compressor Air drier pipe			Y	
		14.4	IOH kit TRIDENT A/D		Y		
		14.5	Bearing		Y		
		14.6	OH Maintenance Kit for Air Dryer		Y		
15	**AUX Equipment**	15.1	Bearing 6204 AHU		Y		
		15.2	Oil Pump O ring		Y		
		15.3	Oil Pump bearing		Y		
		15.4	Radiator Blower Bearing		Y		

* Prior to change, Battery condition to be checked as per RDSO SMI no-RDSO/PE/ SMI/TL/0024-2012(Rev-2) dated 17.08.2012 or latest.

JITENDRA YADAV Digitally signed by JITENDRA YADAV Date: 2024.06.24 17:36:59 +05'30'

DHARMENDRA KUMAR Digitally signed by DHARMENDRA KUMAR Date: 2024.07.04 18:54:13 +05'30'

STUTI NARAYAN Digitally signed by STUTI NARAYAN Date: 2024.07.05 16:38:08 +05'30'

KOUSHIK PAN Digitally signed by KOUSHIK PAN Date: 2024.07.05 17:21:44 +05'30'

S.SENTHIL KUMAR Digitally signed by S.SENTHIL KUMAR Date: 2024.07.05 20:02:31 +05'30'

Annexure-8

Scheduled activities during POH (24 month) for 3 phase EMU / MEMU rake

SN	Description of activities
1.0	**DRIVING-CABS**
1.1	Check condition of lookout glass.
1.2	Check & ensure smooth operation of all push buttons (DVR desk) and replace the critical push buttons, if required.
(i)	Entering neutral section (ENS)
(ii)	Light set / trip.
(iii)	Fan set / trip.
(iv)	SB – 1.
1.3	Check operation of all switches (E-cabinet & DVR desk) & replace the critical switch, if required.
(i)	Pan UP & Down (Condition basis)
(ii)	MC ON & OFF switch replacement, if required.
1.4	Check condition of all MCB's (E-cabinet)
1.5	Replace defective indication LEDs, MCBs, rotary switches & push buttons
1.6	Check for availability of labels on E-cabinet, Provide missing labels.
1.7	Clean and overhaul cab fans, (BLDC Fan)
1.8	Calibrate all pressure gauges (guard gauge, Duplex gauge, PB & BC)
1.9	Clean the drivers desk area and under the desk with vacuum cleaner/blower.
1.10	Clean Cab light Reflectors
1.11	Check head light, Aux head light and cab light replace if required.
1.12	Check the working of spot light
1.13	Check the working flasher light in both normal & stand by mode.
1.14	Check the working of Head light & Marker Light both in normal & stand standby mode.
1.15	Check the working of DC-DC converter
1.1.6	Check the working of Tail Lamp & blinker
1.1.7	Check working of wiper operation
2.0	**MASTER CONTROLLER**
2.1	Check operation of Master Controller and lubricate the cam-switches as per OEM instruction.
2.2	Replace the defective Micro switches / cams if any and ensure proper tightness of fasteners as per specified torque.
2.3	Visual check all electrical connections and their intactness.
2.4	Ensure that dead man valve operates at specified angle.
2.5	Ensure that "T" handle is not loose and there is no excessive play.
2.6	Overhauling & testing of master controller.
3.0	**MMI (Man Machine Interface)**
3.1	Functional test of MMI
3.2	Ensure working of MMI cooling fan. Clean the fan.
4.0	**COACH LIGHTS**
4.1	Ensure working of all tube lights and emergency lights. Replace defective fittings.
4.2	Clean all the reflectors of coach lights.
4.3	Replace the reflector frame air tight gaskets. If required
4.4	Ensure setting and tripping of light from both D/cabs
4.5	Replace tube lights (Condition basis)
5.0	**FANS**
5.1	Clean the fans, replace defective guards and blades.
5.2	Ensure 100% of working fans

SN	Description of activities
5.3	Check availability and tightness of all fixing, cover and guard.
5.4	Replace capacitor of carriage fan. If required
5.5	Remove Overhaul and replace Bearings and capacitor. If required.
6.0	**END PANLES**
6.1	Open and blow out the dust with compressed air.
6.2	Clean the terminals with Nylon brush
6.3	Check the tightness of connection in the train line junction box.
6.4	Check condition of lugs, sleeves & number ferrules.
6.5	Check the operation of all MCB's. Replace MCBs, if required.
6.6	Check & ensure the tightness of 415 v three phase connections and terminals.
6.7	Visually check and ensure the operation of light /fan contactor, change over contactor, MAC contactor. Replace if tips are found flashed.
6.8	Check the operation and function of all motor protection switches (MPS). Replace defective switches.
6.9	Check the intactness if PIS controller and contactors.
7.0	**Pneumatic and Brakes**
7.1	Overhaul and testing of all Brake Equipment.
7.2	Over haul & test Deadman magnet valve, AWS Feed Cut Off Valve, Exhaust Valve and Emergency Valves (all safety Valves)
7.3	Overhaul Non Return Valves.
7.4	Replace damaged / leaking drain cocks
7.5	Overhaul & test Brake Cylinders
7.6	Replacement of bogie pipe, air suspension and other flexible rubber hoses as per list of must change items.
7.7	Calibrate all the pressure governor.
	a) Control Governor (brake pipe)
	b) Equipment Governor
	c) Main Comp Governor
	d) Aux Comp Governor
	e) Parking Brake Governor (apply & release)
	f) Traction Safe Governor
	g) Emergency Governor
7.8	Overhaul all the strainers and filters. Replace filter elements and rubber items.
7.9	Check operation of isolating cocks. Replace defective cocks.
7.10	Overhaul Auto Drain Valves
7.11	Overhaul Panto Set-Trip Magnet Valves
7.12	Overhaul Panto Isolating Cock and Throttle Valve
7.13	Calibration of EP, Air suspension and MR-BP sensors.
7.14	Replacement of brake release wire rope (2nd POH).
8.0	**Piping and Reservoirs**
8.1	Check the welding joints, split pins, fixing bolts of MR, Aux. and Air spring reservoirs for intactness.
8.2	Check the intactness of MS straps of all the reservoirs. If found corroded replace
8.3	Check for hitting marks and attend if any.
8.4	Ensure that the pipes are not rubbing with coach body or bogie frame etc.
8.5	Ensure the availability of Baffle protection plates for drain cocks to arrest damage due to ballast hitting.
8.6	Check the availability of proper pipe line clamps as per the ICF Drg.
8.7	Pressure testing of reservoir at 10kg/cm2
8.8	Check the intactness of ferrule joints
9.0	**Guards Emergency Brakes**
9.1	Overhaul Guard Emergency brake valve and ensure its smooth operation.
9.2	Ensure that the handle “ON-OFF” position is proper.
9.3	Ensure the intactness and functionality of micro switch.

SN	Description of activities
10.0	**Parking Brakes**
10.1	Overhaul of parking brake cylinder, Double check magnet valves & pressure reducing valve.
10.2	Check for proper fitment of parking brake cylinder, brake arm, cup sleeve and release handle etc.
10.3	Check parking brake operation on wheel no.1, 3, 5 & 7 in 'C' coaches. Verify application and release of the brakes.
10.4	Over hauling of parking brake cylinder male/female connector (QRM-Quick release mechanism)
10.5	Checking and calibration of sensors.
11.0	**SHUNTING CAB**
11.1	Check smooth operation of all switches & push button and ensure healthiness of indication lamps.
11.2	Check the working of Battery Selector Switch.
11.3	Check for smooth working of master controller.
11.4	Check the working of Shunting Cabs Gauges & Meters.
11.5	Clean the Shunting Cab area and under the desk with Vacuum Cleaner.
11.6	Check the condition of flexible hoses of pantograph, changeover switch and VCB. Replace if found defective.
11.7	Replace of ICS and flexible pipes of motor coach
11.8	Overhauling of brake controller of Motor Coaches
11.9	OH and calibration of all types of gauges of D'cab
11.10	OH and calibration of all types of gauges in shunting cabs of Motor Coaches and Bogie **(Every 3rd POH)**
12.0	**MAIN COMPRESSOR**
12.1	Clean externally compressor body & the radiator
12.2	Replace air suction filters
12.3	Check the condition of drain plug for sticking up of metal particles.
12.4	Check condition of top and bottom Rubber Gaskets. Replace if found defective.
12.5	Check for any oil or air leakage from joints, suction or delivery pipes and attend
12.6	Overhaul and calibrate safety valve setting.
12.7	Check condition of resilient mounting for intactness.
12.8	Check for any crack/intactness of base frame.
12.9	Check vacuum indicator on silencer (suction filter) i)Color less -ok ii)Red Color-Section filter defective
12.10	Replace lubricating oil in case of oil lubricated compressor.
12.11	Ensures availability of fasteners.
12.12	Ensure proper tightness of delivery pipe
12.13	Ensure the healthiness of mounting wire ropes.
12.14	Check operation of compressor by way of observing running sound, feel temperature by hand
12.15	Check pressure built up time of each Unit (0-8 kg/cm2).
12.16	All compressor motor junction box to be sealed with RTV sealant internally & externally.
12.17	Proper cable gland to be ensured to prevent water entry
12.18	Check and Calibrate pressure sensor
13.0	**AUXILIARY COMPRESSOR**
13.1	Replace lubricating oil
13.2	Clean externally including the surrounding area.
13.3	Replace suction filter.
13.4	Check the tightness of foundation bolts and other fasteners.
13.5	Clean the commutator with compressed air/Charmis leather & replace the carbon brushes.

SN	Description of activities
13.6	After maintenance carry out an efficiency test. Record pressure build up time from 0 to 5Kg/cm2
13.7	Check operation of compressor by way of observing running sound and temperature
13.8	Ensure air blowing of pipe lines connected to Aux. compressor
13.9	Overhaul NRV & ' T' Strainer.
13.10	Overhaul and calibrate safety valve.
13.11	Remove and overhaul as per OEM manual.
14.0	**AIR DRIER**
14.1	Check mounting arrangement of Air Drier for intactness.
14.2	Overhaul the Duplex Piston Valve and Replace all "O" rings.
14.3	Replace final filter element.
14.4	Check for any leakage from Air Drier
14.5	Check proper working of air dryer as under; a) Purging of air dryer with interval of 120 sec. b) Check the alternate operation of cooling towers. c) Check the healthiness of desiccant by observing colour indicator (Blue=OK, Yellow=warning, Red=Not OK)
14.6	Overhaul as per OEM's Manual.
14.7	Check the functionality of sensors and calibrate.
15.0	**BATTERY**
15.1	Clean and Overhaul Battery set as per OEM's manual.
15.2	Clean the battery box & trolly.
15.3	Ensure proper working of trolly and the door hinges.
15.4	Ensure compact placement of battery cells to avoid relative movement during running of coach.
15.5	Testing of Battery rotating switch.
16.0	**AC & DC Earthing switch**
16.1	Check the condition of moving & fixed contact and locking mechanism.
16.2	Check AC & DC Earthing Switch for smooth operation and intactness
16.3	Check Kaba keys.
16.4	Overhaul the switch as per OEM's manual.
16.5	Check for intactness of copper flexible braids & earthing shunts. Replace if found broken / flashed.
17.0	**TRANSFORMER**
17.1	Check the oil level in transformer. Check for any oil leakage.
17.2	Check transformer for hitting or damage to any part.
17.3	Check condition of HV Cable Head Bushing for tightness.
17.4	Check silica gel for any colour change Heat/replace if required.
17.5	Clean radiator with dry compressed air.
17.6	Clean transformer with dry compressed air.
17.7	Check transformer oil pump for any leakage & abnormal sound.
17.8	Check BDV of the transformer oil. Filtration to be done if required.
17.9	Conduct test on oil samples as per OEM manual.
17.10	Ensure the healthiness of sensors and their wiring.
17.11	Check the healthiness of radiator fans and ensure proper direction of rotation
17.12	Check IR of primary and secondary winding.
17.13	Check for proper functioning of oil flow, oil level and temperature sensors.
17.14	Ensure the healthiness of pressure relief valve.
17.15	Ensure the healthiness of oil level indicator (Visual glass type).
17.16	Visual inspection/ checking of the Resilient mounts.
17.17	Bearing replacement date to be marked on each blower & oil pump.
17.18	Transformer butterfly valve must be over hauled & leak test to be done.

SN	Description of activities
17.19	Intactness of bottom protection cover between radiator and filter to be ensured as dust particles enter through bottom in to the radiator.
17.20	Check the condition of transformer radiators, replace if found damaged.
17.21	Water jet cleaning of healthy radiator
17.22	Carry out DGA (dissolved Gas Analysis) of transformer oil.
18.0	**Cable Head Termination (CHT).**
18.1	Check and clean the bushing & ensure its healthiness.
18.2	Check intactness HV bushing clamps in underframe and on roof.
18.3	Replace CHT, if required
19.0	**TRACTION MOTOR**
19.1	Visual inspection for any damage or rubbing
19.2	Ensure intactness of all the Fasteners
19.3	Check ERB assembly.
19.4	Check intactness of body earthing.
19.5	Check the condition of Air bellow / duct for any damage and intactness of all fasteners
19.6	Clean suction air filters by dry compressed air.
19.7	100% replacement of suction filters.
19.8	Open junction box and check for connection tightness, flashing or overheating marks.
19.9	Clean the metal particles from the magnetic oil drain screw on gear case.
19.10	Blow TM with the help of dry compressed air.
19.11	Re-grease the motor bearing (N-End) Shell Retinax LX2 (H3 17) Qty. 26 Gms. As per OEM
19.12	Change the Gear Oil after cleaning the Gear Case internally.
19.13	Ensure proper Cleating and Routing of TM cables.
19.14	Check IR and continuity of stator winding
19.15	Check the winding resistance with DLRO.
19.16	Check pinion teeth for any dent / pitting marks or wear.
19.17	Replace the hardware items, gaskets, felts and sealants of gear case.
19.18	Check the lugs for proper crimping and overheating marks.
19.19	Check for proper intactness of cable screen earthing near cable ground.
19.20	Check the condition of bearing by Shock pulse meter.
19.21	Assemble the motor on bogie and green test in both direction for 2 Hrs.
19.22	Check for any oil leakage or abnormal sound from TM and MSU and record temperature rise of DE & NDE TM & MSU bearings.
19.23	Light run motor at rated speed and ensure bearing testing by SPM/vibration meter.
19.24	Dismantle and Overhaul of Traction motor as per OEM's manual.
19.25	All traction motor nose suspension & lifting lugs dye penetration test to be carried out before assembly as per SMI No. RDSO/2017/EL/SMI/0312 dated 25.08.2017 (Rev -0).
19.26	Traction motor gear case & motor coach axle MSU bolts to be tightened with proper torque to avoid oil & grease leakage.
19.27	All TM greasing points should be provided with proper grease nipple as suggested by OEM to facilitate greasing in sheds
19.28	Avoid mixing of lubrication grease of different makes in traction motor bearing
19.29	Replace bearing of traction motor as per List of must Change Items.
19.30	Check functionality of temperature sensor & speed sensor and calibrate it.
20.0	**Suspension Tube Assembly (MSU)**
20.1	Check housing bolts are intact
20.2	Check for proper fitment of adjustment washer.
20.3	Check for any cracks or damage to MSU
20.4	Topping of bearing grease by Shell Retinax LX2 (H3 17) Qty. 300 grms. As recommendation by OEM.
20.5	Dismantle MSU and overhaul as per OEM's manual.
21.0	**Contactors (K1 & K4, K5 & K6)**

SN	Description of activities
21.1	Clean magnetic core and insulating parts by compressed air.
21.2	Check the surface of electromagnet and clean suitably, if needed.
21.3	Check the condition of Main & Auxiliary Contacts.
21.4	Check the condition of arc-chutes.
22.5	Check for smooth closing of magnet valve without jamming at suitable voltages.
21.6	Check that the two poles of contactor close simultaneously.
21.7	Check the wear of main and aux. contacts.
21.8	Check value of pre charging resistors.
21.9	Dismantle Overhaul and Replace as per OEM's manual.
22.0	**VCB**
22.1	Check for any damage and tightness of connectors and magnet valve coil.
22.2	Check for crack, chip and flash mark on insulators
22.3	Clean the insulator with dry and clean cloth
22.4	Check for damage to connection to earthing isolator cleaning and greasing if required.
22.5	Check HV connection tightness.
22.6	Check torque of VCB fixing screw.
22.7	Check the earth connection tightness
22.8	Check & set value of pressure regulator
22.9	Drain air reservoir tank
22.10	Check for any air leakage in VCB
22.11	Check the cable and lugs for breakage & looseness of auxiliary switch.
22.12	Check the working order of each auxiliary switch
22.13	Check auxiliary switch screw for damage.
22.14	Check auxiliary switch moving contact for its continuity
22.15	Securing of auxiliary switch and support plate
22.16	Check proper fixing/sticking of shock absorber plate in cylinder mounting plate.
22.17	Check setting of pressure switch.
22.18	Check the tightness of pneumatic connection of pressure switch.
22.19	Check the contact spring
22.20	Weight the air dryer, if increase in weight is more than 0.8 kg from new weight, regenerate molecular sieve by heating and replace if required.
22.21	Check the healthiness of EP valve coil resistance.
22.22	Check the air leakage from piston assembly.
22.23	Replacement of filter cartridge with `O' ring of pressure reflector
22.24	Check the closing and opening speed (First after 3years on new breaker & then three year)
22.25	Check the sealing connectors, Flexible Pipe, regulators, air tank etc.
22.26	Lubricate drive plate assembly, shafting head bearing guides, vertical spring, flexible braids piston seal, piston rod & EP valve
22.27	Torque tightening - 1) Rear flange,
	2) Shafting head
	3) Vertical insulator
	4) Bolts of cover for holding cylinder
	5) air tank mounting nuts
22.28	Inspection of main contacts wear in vacuum switch tube
22.29	Overhaul the VCB as per OEM's instruction and RDSO SMI.
23.0	**BRAKING RESISTOR**
23.1	Visual check for any damage to grid, flashover.
23.2	Air Blowing to be done of entire unit
23.3	Check for HT connection intactness.
23.4	Spray cleaning solution on the resistor after removing the cover and terminal box from housing and wash by using water jet and dry it with compressed air.

SN	Description of activities
	Note: cleaning should be done only after cooling of resistors
24.5	Check the ceramic parts if show sign of damage to be replaced
24.6	Dismantle and Overhaul as per OEM's manual
25.0	**L.A., C.T. & P.T.**
25.1	Check for any abnormality & clean the insulators.
25.2	Check IR continuity.
25.3	Check the cable connections and tightness
25.4	Check & replace the PT secondary fuse if required.
26.0	**PANTOGRAPH (ROOF EQUIPMENTS)**
A	**M/s SCHUNK**
26.1	Replacement the rubber/PVC air pipe
26.2	Replacement of air bellow if any air leakage
26.3	Check & adjust the static contact force
26.4	Check the setting of control box Safety Valve
26.5	Replacement of defective lock of pneumatic central Box
26.6	Check the intactness all fasteners and ensure tightness as per specified torque in OEM manual.
26.7	Clean the mounting insulators with detergent.
26.8	Replacement of flexible copper shunts if more than 25% strands are broken
26.9	Overhauling & cleaning of pressure regulator pre filter
26.10	Check and attend if any air leakage from pneumatic control box
26.11	Rocker Assembly: Check rocker suspension, Leaf springs and spring supports if found hit marks, damaged or bent etc. Replace complete rocker assembly if any defect noticed.
26.12	Check the parallelity of Air bellow
26.13	Check the horizontal displacement of pantograph
26.14	Transverse deflection with 300N at a height of 1800 mm, -VE & +VE side
26.15	Visual inspection of hydraulic dampers for any oil leakage & replace if required.
26.16	Check and adjust Pressure Regulating valve and lock the check-nut with torque mark.
26.17	Overhaul complete pantograph & test
26.18	Check operation of ADD & ODD. Replace defective fittings
27.0	**Insulators and pantograph zone**
27.1	Check the insulators for any crack / damages / chipping marks etc. if hair line crack suspected see with magnifying glass and replace the insulator.
27.2	Thoroughly clean all the insulators with detergent and dry cloth.
27.3	Blow the roof equipment by compressed air.
27.4	Check and tighten the panto insulator bolts.
27.5	Replace flashed , dry /painted insulators
27.6	Apply anti tracking paint on the base frames of roof equipment and roof line and panto mounting insulators
28.0	**Roof bars**
28.1	Check roof bar connection and ensure tightness.
28.2	Ensure greasing of all greasing points of pantograph
28.3	Megger the pantograph pan by disconnecting the cable to PT
28.4	Clean the roof bar insulators with detergent.
29.0	**Roof General**
29.1	Replace damaged roof cable cleats, if any.
29.2	Check PCP sheet for any bulging, uprooting. Attend if required.
29.3	Check the catwalk for any damages and proper tapeing of insulation tape over the brackets.
29.4	Cable termination and other junction box to be sealed properly to avoid water entry
29.5	Overhauling lubrication and testing of ACP mechanism.
29.6	Ensure no leakage from roof. Carry out testing by pressure jet and attend the leakage

SN	Description of activities
30.0	**TCU (Traction Converter Unit)**
30.1	Check the air intake and outlet opening are un-obstructed.
30.2	Clean suction filter of TCU by the compressed air
30.4	Check electrical connection for corrosion and tightness.
30.5	Check the grounding connection for corrosion & tightness.
30.6	Check cables and connections for proper tighten
30.7	Check cable ties are not loose.
30.8	Check that warning levels on the cover are clean.
30.9	Cleaning the ventilated section after removing 2 covers at back side of cabinet.
	a) Clean the equipment section with vacuum cleaner and compressed air.
	b) Check the seal on the cover, if required clean and apply vaseline or talcum powder.
30.10	Cleaning the unventilated section after removing all covers (don't use compressed air)
	a) Vacuum or brush out the equipment section in component (use lint free cloth)
	b) Check the seal on the cover, if required clean and apply vaseline or talcum powder.
30.11	Blowers along with motors to be overhauled
30.12	Replace auxiliary working fans
31.0	**Auxiliary Converter Unit (ACU)**
31.1	Isolate the Aux converter, open the front door and ground it.
31.2	Inspect the arc quenching chambers and switch elements.
31.3	Visual check whether arc quenching chambers exhibit mechanical damage or metal deposits.
31.4	Visually inspect whether material deposits have occurred at the power contacts.
31.5	In events of faults, replace the defective component. If the protection is in order re-attach the arc quenching chamber.
31.6	Inspect the components for any damage and check that they are firmly sealed. (discoloration or mechanical damage)
31.7	Check the power modules, controls, fans and current & voltage sensors.
31.8	Check healthiness ACU internal cabling.
31.9	Check the tightness of line connections.
31.10	Inspect the plugs for corrosion and proper contact.
31.11	Check the tightness of plug clamping screws. Replace if needed.
31.12	Open the pivoting frame and clean the fan with vacuum cleaner.
31.13	Mount the fan cover panel (8XM6 torque-6.5Nm) close the pivoting frame (2XM8 torque-15 Nm) tight.
31.14	Remove the 4 bags for corrosion protection and replace them with new one.
31.15	Fan to be removed and fan area to be cleaned
31.16	Anti-corrosion bags to be replaced
31.17	Cleaning of air intake point, air duct and cooling ribs etc.
31.18	Power module fans to be replaced as per OEM.
31.19	Check the cable connection of fuses & ensure the healthiness of fuses
32.0	**CCU (Central Computing Unit/Vehicle Control Unit)**
32.1	Clean the dust with soft brush and vacuum cleaner.
33.0	**BECU (Brake Electronic Control Unit)**
33.1	Check for any abnormality.
33.2	Clean with Vacuum Cleaner.
33.3	Check speed sensor intactness provided in C coach.
34.0	**Train Line Junction Box**
34.1	Open and blow out the dust with compressed air.
34.2	Clean the terminal with nylon brush.
34.3	Check tightness of all the connections.
34.4	See that all wires are numbered.
35.0	**AHU/RMVU**

SN	Description of activities
35.1	Remove the filter from the coach, clean it by immersing the filter in a tank filled with soap/detergent water (mild hot). The jet of high-pressure air should not be used for cleaning
35.2	Replaced the damaged ventilation filters
35.3	Verify the healthiness of stainless-steel earthing block welded to coach end wall. They should be clear and free from paint residues
35.4	Check the intactness of electrical connection after O/H of the AHU.
35.5	Check the blower for any abnormal sound and attend.
35.6	Remove and overhaul the blowers.
35.7	RMVU motor foundation channel strengthening
35.8	Change of bearing as per list of Must change items.
36.0	**Blowers Motors (TCU, ACU, Radiator fan)**
36.1	Check the direction and working of all blower motors.
36.2	Ensure No blower motor working with abnormal sound.
36.3	Measure Phase current of all the Blower Motor by tounge tester.
36.4	Grease the bearing of the pump using grease gun and nipple.
36.5	Remove the auxiliary motors and Overhaul.
36.6	Check the availability of Equipotential Cables & Bogie to Coach sole bar Earthing Shunts.
37.0	**SIBAS KLIP STATION & MVB REPEATER. (for Siemens only)**
37.1	Check visually for any abnormality
37.2	Clean with help of soft brush.
37.3	Check the tightness of connection in KLIP station and contactor panel.
38.0	**BOGIE**
38.1	Lift the coaches, clean the bogies and check for cracks and attend.
38.2	Replace defective/worn out bogie parts sub-assemblies.
38.3	Complete dismantling and overhauling.
38.4	Check the centre pivot pin for any crack / breakages and Replace with single piece forged type C.P pin. If required.
38.5	Replace non stander guide bush of center pivot body bolster.
38.6	Check for any abnormalities of side bearer covers and housing and attend for leak proof by providing oil top up arrangement.
38.7	NDT of side bearer, side bearer rib on bolster and center pivot oil pot
38.8	Provision of nylon nut to shoe head pin.
38.9	NDT of motor coach body bolster.
38.10	Tapered washer to be provided during fitment of draw bar (as per OEM recommendation)
38.11	Fitment of center pivot to be done as per ICF letter No. ICF/QMS/MDM/File/F015 dated 03.10.2020
38.12	Over hauling of buffers as per BG ICF maintenance manual.
38.13	ACP wire rope to be checked (To be checked /drained in every POH, replace with new in 3rd POH)
39.0	**BRAKE CYLINDER**
39.1	Check fixing bolts of brake cylinders for any damages or slackness.
39.2	Check brake rigging parts i.e. pins, nut bolts, cotters, split pins of brake block key shoe head pins for missing, worn out, slackness.
39.3	Overhaul
39.4	Piston stroke of brake cylinder to be adjusted to less than 40mm.
40.0	**Brake Rigging**
40.1	Replace all brake blocks.
40.2	Ensure gap adjustment between brake block and wheel.
40.3	Ensure tightness of brake shoe key.
40.4	Check Pins, nuts, bolts, cotters, bush, washers for w/out, breakages and stopper

SN	Description of activities
	plate. Tighten them and replace if required.
40.5	Check Brake hangers, brake beams, and other brake rigging components. Replace if required.
40.6	Replace the 3 piece palm pull rod by single piece 16mm thickness palm pull rod.
40.7	Replace the brake hanger nylon bush by MS bushes
40.8	Lubricate all the moving parts.
40.9	Check the condition of safety brackets and looseness of fixing bolt.
40.10	Check for any damage or abnormality on brake yoke assembly.
40.11	Replacement of Pins and bushes
40.12	Complete dismantling and overhauling
41.0	**DASHPOT**
41.1	Check for oil leakage.
41.2	Check the oil level with dip stick and top up if necessary (M/C 97mm, T/C 77mm). Record quantity of oil fill up in Dashpot.
41.3	Check for any breakages of dashpot spring and dashpot top covers.
41.4	Cleaning and lubrication of D/pot springs.
41.5	100% replacement of rubber packing
42.0	**AIR SUSPENSION**
42.1	Check the foundation Allen bolts intactness.
42.2	Check for any cracks, dent marks, leakages, and hitting marks on air balloon.
42.3	Check the foundations and fitment of vertical dampers. If damper not working replace it.
42.4	Check the levelling valve assembly for any leakage, replace if required.
42.5	Check the adjusting lever rods and adjust the clearances if found abnormal.
42.6	Adjust the lever rod in horizontal position.
42.1	Check all the cocks provided for air springs are working if not replace them
42.8	Check for all the air spring cocks are in open position.
42.9	Drain all the cocks provided in air spring tank.
42.10	Check all the pipes, couplings for any leakage & attend it.
42.11	Check for any rubbing/abnormality on the flexible pipes provided in air spring and replace them as required.
42.12	100% replacement of flexible hoses.
42.13	Check the function of duplex check valve by operating levelling valve of same bolster alternately.
42.14	Overhaul all control valves, levelling valve, duplex check valve.
42.15	Overhaul air springs, retest & refit.
42.16	Replace the CDC filter element.
43.0	**SHOCK-ABSORBERS**
43.1	Replacement of oil, rubber kit and load testing of vertical and lateral shock absorber
43.2	100% replacement of all the shock absorber.
43.3	Overhauling & testing.
44.0	**WHEELS AND AXLES**
44.1	Re-profiling of wheels
44.2	Overhauling of axle box and attention to roller bearing
44.3	Ultrasonic of Axle
44.4	Perform magnaflux test on each wheel with the help of magnaflux test magnet.
44.5	Measure the wheel distance with the help of wheel distance gauge.
45.0	**DRAW & SHACKU COUPLER**
45.1	Check draw bar and Allen key bolts.
45.2	Check Articulation bearing. Replace if required
45.3	Replace Fiber bush if required
45.4	Greasing of articulation bearing.
45.5	Overhaul as per OEM manual. Replace if required.

SN	Description of activities
45.6	Screw coupling: Check and ensure sound fixation and lubricate oil.
45.7	Ensure intactness of fasteners.
46.0	**Furnishing items**
46.1	Check operation (open/close/locking) of D/cab and passenger area doors and replace door roller if found defective.
46.2	Attend doors for stopper, tower bolts, latches, handles.
46.3	Replacement of defective D/cab and passenger area windows locks, springs, Rubber Gasket, safety mesh.
46.4	Replacement of worn out/broken chequered plates in doorways.
46.5	Provide missing glass and louver shutter including complete window frame.
46.6	Provide missing notice plates.
46.7	Provide ACP handles, ACP ropes, ACP Springs, Rods, cover etc.
46.8	Check the condition of trough floor.
46.9	Check for any abnormality in handicap compartment, luggage compartment.
46.10	Dismantle, attend & change the cover of seat & back rest.
46.11	Ensure functioning of windows & doors.
46.12	Replace missing grab handles and ensure proper welding of grab handles in doorways.
46.13	Ensure functioning of D cab window glass.
46.14	Passenger door and D-cab door and rubber buffing profile, to be replaced on condition basis.
46.15	Replacement of defective lookout glass curtains.
46.16	Check luggage compartment partition for missing of SS sheet patti, if found missing to be attend.
46.17	Motor coach HT compartment defective locks to be replaced.
46.18	Passenger door and D-cab door gaskets to be replaced.
46.19	Proper securing of hatch door to be ensured.
46.20	Check for Roof corrosion, **Paint corroded.**
46.21	Replace 1st class seats cushion and D cab seats
46.22	Special attention in DTC, HT compartment, End wall & AHU to prevent the ingress of water in rainy season.
46.23	Ensure healthiness of Locks provided on coach End wall panel doors.
46.24	Hinge type arrangement for TM filters provided below seat in passenger area
26.25	Ensure proper locking of each & every door viz E-Cabinet of D/cab & MC, Various cabinet door in HTC.
46.26	Replacement of D'cab door polycarbonate glass shutter and its locking arrangement (Alternate POH).
46.27	HT compartment door automatic door locking arrangement (Alternate POH)
46.28	Replacement of end wall cabinet door lock (3rd POH).
46.29	Replacement of all FRP pelmets (Alternate POH)
46.30	Replacement of molding patti side cover of door in luggage compartment.
46.31	Provision of aluminum patti of TM duct filter partition.
46.32	Checking of both D'cab door bearing.
46.33	Exterior PU painting of coaches.
46.34	Instructions provided inside the coach to be screen printing instead of stenciling.
46.35	Painting of tarnished (yellowish) FRP body panels inside the coach.
46.36	D'cab interior painting.
47.0	**FINAL TESTING**
47.1	**Pneumatic Testing**
	Switch on DCS key and observe on MMI.
47.2	Check application of holding brakes in all coaches.
a)	DCS key "ON" position

SN	Description of activities
b)	DCS key "OFF" position
47.3	Check BP pressure charging time from both cab 0 to 4.9 kg/cm^2.
47.4	Check MR and BP drop test in 10 minutes.
47.5	Ensure MR and BP pipe pressure continuity
47.6	**EP Brake Application**
a)	Application Timing
b)	Release Timing
47.7	**Auto Brake Application**
a)	Application Timing
b)	Release Timing
47.8	**Emergency brake By Power Brake Controller**
a)	Application Timing
b)	Release Timing
47.9	**Emergency brake By Brake Controller**
a)	Application Timing
b)	Release Timing
47.10	Check working of Brake Controller at all positions and ensure No leakage in release and auto lap position from Brake Controller.
47.11	Check each coach Brake Cylinders for Leakage.
47.12	Ensure proper working of Duplex Pressure Gauge, BC Gauge, Parking Brake and Guard's Gauge.
47.13	Ensure Parking Brake application & release
47.14	Ensure Parking Brake gauge shows 0 pressure in applied condition and 5 kg/cm^2 in released condition.
47.15	Ensure the working Parking Brake Push button.
47.16	Ensure No EP unit should have air leakage in both release and apply condition.
47.17	Ensure no EP Unit should be Hunting.
47.18	Ensure the provision of safety valve in all brake units.
47.19	Ensure the healthiness of Brake Units Safety Valves by applying Auto Brake.
47.20	Check and ensure Brake Cylinder Pressure of all coaches should not be more than specified limit.
47.21	Ensure functioning of Emergency Valve by keeping PBC on EB position
47.22	Ensure effective functioning of Guards Emergency Brake.
47.23	Check the function of Auto Drain Valve.
47.24	Check and ensure no air leakage in pipe line, couplings & hoses pipes.
47.25	Check rubbing of hose pipes and shifting of end nipples.
47.26	Check & ensure that clamping arrangements of pipes is as per RDSO Drg.
47.27	Check and ensure Smooth Operation of each coach MR& BP Cocks.
47.28	Ensure smooth operation of Horn Foot Valve.
47.29	Check the working of Safety valve by applying of auto brakes.
47.29	Ensure the working of all four Air Dryers and note their Tower Change Over Cycle Time.
47.30	Check working of AWS Feed Cut Off Valve and Exhaust Valve.
47.31	Check and ensure smooth operation of AWS Cocks.
47.32	Check working of both Cab Wipers and ensure wiping action of wiper blade
47.33	Check Cut in & Cut Out Setting of Auxiliary Compressor.
47.34	Check and ensure that there is no Air Leakage from the Panto magnet valve.
47.35	Check the healthiness of all Coaches Air Spring Suspension System & Levelling Valve.

SN	Description of activities
47.36	Check Cut In & Cut Out setting of Main Compressor. (Cut in - 6.0 kg/cm^2 Cut out -7.0 kg/cm^2)
47.37	Ensure availability of Fire Extinguisher in all Motor coaches.
47.38	Ensure availability of Short Circuit Clips, Wooden Wedge, Fire Extinguisher, ACP Bamboo etc. in DTC.
48.0	**ELECTRICAL TESTING**
48.1	Keep MMI in maintenance mode.
48.2	Check on MMI that all coaches are set.
48.3	Check the healthiness of each and every function physically which are displayed on various screens (Top level, Unit Level, Drive/Brake, Energy, Fault logged, V > 0 & V = 0) of MMI.
48.4	Check for any Error Message on the screen.
48.5	Check CB set / trip on MMI.
48.6	Check Panto Raising/Lowering timing on MMI.
48.7	Check working of Fan, Light and Ventilation (both 50% and 100%)
48.8	Check changeover on MMI for 415V AC, 110V AC and 110V DC by operating Basic Unit Isolating Switch.
48.9	Check Healthiness of various Lamp Indication by Pushing Test Push Button.
48.10	Check working of Head Light, Auxiliary Head Light, Flasher Light, Tail Light and Blinker Lights on various positions.
48.11	Check working of Signal bell, Emergency bells and their indication.
48.12	Check for Healthiness of Head-codes.
48.13	Check working of PA & TMS system. (i) Cab to Cab (PA & TMS) (ii) Cab to Passenger (PA)
48.14	Check operation of " BA Reset " switch.
48.15	Check working of " Emergency OFF Loop Push Button "
48.16	Check the function of all Isolating Switches provided on E- Cabinet.
48.17	Ensure No isolation of Rotary Switches & MCBs in trip position.
48.18	Check functionality of Entering Neutral Section Push Button by observing feedback on SKS 12 & 13.
48.19	Ensure no any ground fault in 110V AC & 110 DC circuits.
48.20	Observe all Sensors Feed Back Signals in "Observer" by laptop i. COS Timing, BECU speed sensors, BC pressure, EP Unit pressure transducer, etc.
48.21	Check working of Passenger Alarm by pulling of Alarm Chain from each coach.
48.22	Check and ensure Flasher Indication Provided outside on all ladies compartment while AC pulled.
48.23	Check working of Deadman valve in normal & RDM mode.
48.24	Run down the Rake in Normal and RDM mode from DTC as well as from each Motor Coach.
48.25	Check working of AWS Speedometer and Speed recorder.
48.26	List of Modification being done.
48.27	Check MCBs and Replace defective MCBs.
48.28	Check and ensure the MVB Healthiness.
48.29	Testing of rake to be carried out as per the Testing Protocol.
48.30	Ensure all the Modification as per check list.
48.31	Download the events of all motor coach TCU, BCU, ACU and both CCU and analyze.
48.32	Earthing shunt to be provided at P2 & P3 position from bogie to coach body.
48.33	Equipotential cables to be provided, if found missing.

SN	Description of activities
48.34	Check working of CCTV system and all the cameras installed in EMU/MEMU rakes
48.35	Check working of ETB system installed in EMU/MEMU rakes.
48.36	Check working of RMPU in air-conditioned EMU rakes.
48.37	Check working of AWS/AAWS in all the EMU rakes.
49.0	**MEASUREMENT OF CLEARANCES OF BOGIE PARTS AND WHEEL**
49.1	Between bogie bolster and top of bogie frame
49.2	Between bogie bolster and bottom of bogie frame
49.3	Between axle box crown and bottom of bogie frame
49.4	Buffer height
49.5	Size of wheel
49.6	Distance of wheels on axle.
49.7	Height of cattle guard from rail level.
49.8	Clearance between bolster and transom liner.
49.9	Measure bogie frame height, measure sole bar bottom height.
50.0	**HARDWARE ITEM**
50.1	Bolts, Nuts, Pins, Split Pins, Bushes, Cotters, washers/Spring washers, Shims, Cleats, Felts and Cork sheets etc. to be changed.
51	**SHAUKU COUPLER**
51.1	Polyamide bush for coupler to be changed
51.2	Sliding plate for coupler to be changed.
52	**Speedometer**
52.1	Check all points of speedometer from TI/IA/IC from Annexure-6A
52.2	Strip out RCI & PG from coach.
52.3	Dismantle PG.
52.4	Check PG sensor disc, replace if required.
52.5	Clean all parts of PG with suitable cleaning agent
52.6	Replace Oil Seal Gasket (Must Change Item)
52.7	Check both sensors physically, replace on condition basis.
52.8	Check condition of bearing, replace it on condition basis.
52.9	Assemble PG sequentially.
52.10	Open RCI cover & remove all PCB cards.
52.11	Check healthiness of all PCB cards physically and clean with suitable cleaning agent.
52.12	Re-fit all PCB cards and check working of RCI units & PG on Speedometer testing bench.

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Annexure-9

Maintenance Activities for Bio-Toilets fitted in MEMU

Sr. No.	Action	Schedule
1.	Removal of garbage & complete cleaning of choked Bio- toilet tank & complete cleaning of toilet Pan of Bio- Toilet/ Conventional toilet pan.	Daily/TI/IA/IC/POH
2.	Checking of all the components of Bio-toilet system for any deficiency. Especially in regard to the safety items, all the deficiencies should be replaced and damage should be attended. There will be no tolerance regarding safety items	TI/IA/IC/POH
3.	Attention of P-trap/S-trap and attention to hose connector	IA/IC/POH
4.	Attention to operating mechanism of Ball valve, TPE connector, if any	IA/IC/POH
5.	Examination of chlorinator unit for any leakage, tilting and thread missing. Supply & charging by Chlorine/Kmn04 tablets if required	Daily/TI/IA/IC/POH
6.	Checking and repairing of all bio-toilet retention tank mounting, suspension & safety arrangements	TI/IA/IC/POH
7.	Prescribed Request from Rail Passenger's stickers to be provided on interior panel of each bio toilet and replace in case if defaced or torn.	TI/IA/IC/POH
8.	Supply & charging of Chlorine/Kmno4 tablets and examination of chlorinator unit.	IA/IC/POH
9.	Collection and transportation of samples from retention tanks to effluent testing laboratory as per prescribed latest test scheme by CAMTECH	IA/IC/POH
10.	Ensuring tightening of all fastening system for proper securing of tank, if required, fasteners are to be changed.	TI/IA/IC/POH
11.	Charging of Anaerobic Microbial Inoculums.	IA/IC/POH
12.	Testing of complete Toilet system	IA/IC/POH
13.	Non-biodegradable waste to be removed/cleared from first chamber of Bio-toilet retention tank by applying evacuation machine and waste to be disposed of at the place nominated by railway authority. Evacuation machine is to be arranged by the firm.	POH

*For Maintenance of Bio-Toilets CAMTECH Guideline - IRCAMTECH/GWL/M/Bio-Toilet/AMOC/Revision-2.0 (Or latest) to be followed.

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