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8 Section 2.5: Maintenance Checklists for "B8" Service Check

8.1 Sub-Section 2.5.1: "B8" Service Checklist


Title : B8 Service Check list		Checklist No: 3B-02-05-01	
Note: This Checklist for 'B8' Service Checks should be applied to the running distance or service time period elapsed, since the last Car Overhaul.		Running Distance	Service Time
Maintenance Interval:		Approx. 150K km	360 days
Maintenance Tolerance:		± 4.0 kkm	Approx. ± 15 days
Downtime	Man Power	Skill Requirements	
24 hours	16 persons per train	Mechanical & Electrical	
Train No.		Date and Time	
Checked by		Approved by	
Work Preparation			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
1	Low Tension Junction Box	1. Visually check if the component is damaged or deteriorated. 2. Inspect that bolts of Terminal Block and Receptacle have not loosened. 3. Inspect that the component labelling are existing. 4. Check the cable connection state.	3C-80131-01	X	X	X		
2	High Tension Junction Box	1. Visually check if the component is damaged or deteriorated. 2. Inspect that bolts of Terminal Block and Receptacle have not loosened. 3. Inspect that the component labelling are existing. 4. Check the cable connection state.	3C-80132-01	X	X	X		
3	Traction Motor Junction Box	1. Visually check if the component is damaged or deteriorated. 2. Inspect the connection bolts torque(22.6NM) of inside TM terminal box. 3. Check if Receptacle is	3C-80133-01	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		fastened. 4. Inspect that the component labelling are existing.						
4	Pressure Governor	Check to see if pressure governor reacts when the upper and lower pressure threshold are reached. If necessary, adjust or replace.	3C-KM611-20	X	X	X		
5	BC Hose Pipes (Flexible hose to brake cylinder)	1. Inspect the hose pipe connection for outward damage and cracking.	3C-KM611-25	X	X	X		
6	Collector Shoe Junction Box	1. Check if the component is damaged or deteriorated. 2. Inspect that bolts of bus bar have not loosened. Re-tighten the bolts if necessary. 3. Inspect that the component labelling are existing.	3C-80512-01	X		X		
7	Bogie	1 Visually check the following for damage and safety a. All earth cables (body/bogie and journal box/frame). b. Axle end earth cables.	3C-KM310-01	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		2 Visually check the Journal box for sign of overheating (eg. discoloration, paint blisters, any grease leakage from the rear of the journal box) 3 Visually Check Journal box for mechanical damage or cracks 4 Visually Check the safety of front covers and the integrity of the cover seal, fixations with torque mark 5 All bogie mounted equipment's fixation with torque mark to be checked						
8	Brake Calliper Unit	1. Visual Inspection of brake calliper unit for damage, safety, fixations with torque marks 2. Poke out the breather hole with a rod-like tool. 3. Inspect the brake calliper unit, especially the bellows, for damage.	3C-KM316-01	X	X	X		
9	Centre pivot	1. Visually Check fixations with its torque marks 2. Casting defects and		X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		cracks						
10	Mono link	1. Visually check for cracks,bent and spherical bush for damage. 2.Visually Check fixation and its torque mark	3C-KM313-02	X	X	X		
11	Anti-roll bar system	<ul style="list-style-type: none"> Visually check for any damage Check all fixings are present and secure with torque mark 	3C-KM335-01	X	X	X		
12	Lateral Buffer Stop	1. Visually check each rubber buffer stop for crack or any de-bonding of the rubber. 2. Check fixation and torque mark	3C-KM313-04	X	X	X		
13	Lateral and Vertical Damper	1. Visual check for any damage & oil leakage and cleaning to be done 2. Check rubber bushes for de-bonding 3. Check fixation and its torque mark	3C-KM313-06, KM333-01,02	X	X	X		
14	Driving Gear	Visual Inspection 1. The axle gear box oil leakage. 2. Change the axle gearbox oil with filtered oil via the filler opening up to the top mark. 3. The axle gearbox for	3C-KM315-01,02	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>visible damage.</p> <p>4. The spherical bearings of the torque arm for cracks</p> <p>5. Check Flexible coupling</p> <p>6. Cleaning the Gear Box</p>						
15	Brake Pad	<p>1. Inspect pads worn irregularly.</p> <p>2. Check that no pad may be thinner than 5mm at any point.</p>	3C-KM316-03	X	X	X		
16	Remote Control (Parking Brake hand release lever)	Check the parking brake release function by emergency release gear of the brake cylinder when MR pressure <4 bar.	3C-KM316-05	X	X	X		
17	BC Hose Pipes (Flexible hose to brake cylinder)	Inspect visually the hose pipes for outward damage and cracking.	3C-KM316-07	X	X	X		
18	Journal Box Assy (WSP) Gap check	Check the gap between pole wheel & speed sensor, within 0.9 ± 0.5 mm.	3C-KM317-02	X	X	X		
19	Flange Lubricator System	<p>1. Check the position of wheel flange lubricator.</p> <p>2. Check the free movement of sticks in the applicator case.</p> <p>3. Inspect the wheel</p>	3C-KM336-01	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		flange lubricator system for wear and crack. 4. Measure the amount of the stick and provide new one if required						
20	Flange Lubricator System	3. The angle that is made between the applicator and the flat on the back of the wheel should be: $\Theta = 55^\circ$ 4. The distance between the dispensing end of the applicator and the wheel flange should be as per dimension "F" and "T" shown in Fig. MM-03-03-06-02, where: F = 13.5 mm -0+2 T = 6.5 mm -0+2	3C-KM336-02	X	X	X		
21	Gangway half	Check the following. 1. Gap free fit of adjacent couple frames 2. Gap free fit of screw-on frame 3. Outer seal (transparent Elastosil Eplus) between couple frame and screw-on profile of outer corrugated bellows is existing 4. Free movement of floor flaps of bridge plates	3C-80410-01	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		5. Velcro correctly and accurately attached 6. Car floor level levelled with gangway floor level						
22	Wheel set	[Axle] Visual Inspection 1. The axles for any signs of corrosion, surface damage, poor paint adherence, blistered paint. 2. There is no debris lodged between the traction motors and motor axles. 3. Rust on axles [Wheel] Inspect 4. Measure Wheel diameter and Deviation from true running (New diameter 860mm (+0.5 / -0) condemn 780mm) 5. Measure wheel profile i. Flange Thickness, new – 32.5mm condemn 22mm ii. Flange Height – min 28 mm, max – 36 mm iii. Gradient not less than 6.5 mm 6. Visual check wheel profile for crack,	3C-KM320-01	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		grooves, skid, metal out on tread 7. Measure wheel back to back distance – 1358 (+2 / -0)mm						
23	Conical Spring (Primary Spring)	1. Visual Inspection for bonding failure & any mechanical damage 2. Visual Inspection of fixations and torque mark 3. Check the crown height(H) 45 ± 5 mm. Check if the height difference(A) in a bogie is within 3mm 4. Check to see if it has cracks of size more than about 10% of adhesion area 5. Check to see if a crack have grown deeper than 3 mm throughout	3C-KM331-01	X	X	X		
24	Air Spring	Inspect 1. The external rubber surface for damage and cracks. 2. Clean dirt or oil deposits from the air spring using clean water. 3. Check for any audible sound	3C-KM332-02	X	X	X		
25	Levelling Valve and	1. Ensure that MR pressure is normal (8	3C-KM334-01	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
	Installation rod	<p>to 10 bar).</p> <p>2. Close the concerned cock L05.1 and L05.2 (marked as ASCO) at both bogies.</p> <p>3. Discharge both air springs by operating the drain cocks (L09.1) mounted at the bottom of surge reservoirs (L09) at both bogies.</p> <p>4. Close the drain cocks (L09.1) and open the concerned cock L05.1 and L05.2</p> <p>5. Check if the lever of levelling valve is moving upward and stops when the lever is parallel to axis "x"</p> <p>6. Measure Installation rod Height (300±3mm)</p>						
26	Front Automatic Coupler	<p>1. Rough cleaning</p> <p>2. Visual check for damage</p> <p>3. Check the coupler head for damages, rust or sign of wear.</p> <p>4. Visual check of tension spring,</p> <p>5. Grease coupler head according to greasing plan</p> <p>6. Visual and audible</p>	3C-80421-01	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		check for Air pipe connection: Clean mouth pieces (socket and gasket) 7. Inspect supporting device for any defect 8. Visually check draft gear housing for any damages						
27	Front Automatic Coupler	1. Check coupler height (790mm) and inclination of coupler($\pm 0.5^\circ$) according to the Fig. MM-04-02-01-02 2. Inclination of coupler head is checked by placing spirit level on coupler head. 3. For adjustment of the couplers vertical position, turn the screw-nuts (Figure MM-04-02-01-02/ 1) of the spring supporting devices, till to the adjustment of $\pm 0.5^\circ$.	3C-80421-02	X				
28	Front Automatic Coupler	Check horizontal and vertical alignment of coupler by means of a level indicator and adjust by turning the screw nuts	3C-80421-03	X				
28	Current Collector Device	1 Visual inspection of all components for damage and dirt 2 Check the right height	3C-KM511-01	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		of the Current Collector H1=120mm (+0/-2) H2=201mm (±2) H3=221.5mm (±2) 3 Wear inspection of the collector shoe						
29	Current Collector Device	1. Cleaning and inspection the Current Collector, Fuse box and Connection box. 2. Inspect all components for proper seating. 3. Check the function of the latching mechanism.	3C-KM511-02	X		X		
30	Current Collector Device	1. Measurement of insulation value on insulator Setting of the Insulation tester: 3.9 kVDC Measurement time: 1 minute Value to reach (target): $R \geq 100 \text{ M}\Omega$ 2 Check of the contact force $130\text{N} \pm 10 \text{ N}$.	3C-KM511-03	X		X		
31	HSCB	1. Check the High Speed Circuit Breaker box for damage to the box, the covers, the fasteners and the FRP cover(Bolting torque value: $15\text{N}\cdot\text{m}$, M10 which is the torque	3C-152100-02	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		value of FRP cover fixation bolt). 2. Check the connector is securely fitted. 3. Check the earth strap mounting point for signs of damage. 4. Check the earth strap for signs of damage. 5. If any damage is found, repair or replace the damaged part. 6. Checking of the mounting brackets (M12x 30L) and check the Torque (73.58 Nm)						
32	HSCB	1. Check condition of box cover, mounting brackets and fasteners as per 3C-152100-02 2. Check damage or deterioration of electrical cables 3. Check main car body cable appearance within HSCB enclosure	3C-152100-03,05	X		X		
33	HSCB	1. Measure of the main contact wear 2. Inspection of the arc chute 3. Cleaning and horns	3C-152100-04	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		inspection a. Remove the arc chute b. Operations c. Assemble the arc chute						

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
34	Intermediate Automatic Coupler (MC-MC)	1. Rough cleaning with rag for visual check 2. Visual check for damage, without uncoupling 3. Visual check of tension spring, 4. Greasing of intermediate automatic coupler shall carried out during uncoupling of train for other schedule/ unscheduled maintenance as per MWI. 5. Visual and audible check for Air pipe connection: if leakage found then Clean mouth pieces (socket and gasket) 6. Inspect supporting device for any defect 7. Visually check draft gear housing for damages	3C-80422-01			X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
35	Intermediate Automatic Coupler (MC-MC)	1. Check coupler height (790mm) and inclination of coupler($\pm 0.5^\circ$) according to the Fig. MM-04-02-02-02 2. Inclination of coupler head is checked by placing spirit level on coupler head. 3. For adjustment of the couplers vertical position, turn the screw-nuts (Figure MM-04-02-02-02/ 1) of the spring supporting devices, till to the adjustment of $\pm 0.5^\circ$.	3C-80422-02			X		
36	Intermediate Automatic Coupler (MC-MC)	Check horizontal and vertical alignment of coupler by means of a level indicator and adjust by turning the screw nuts	3C-80422-03			X		
37	Semi-permanent Coupler	1. Visual check for damage without uncoupling. 2. Visual and audible check for the air connections. 3. Check the supporting device for its position and any damage, if any. 4. Visually check draft gear for any defect/damage	3C-80423-01	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		5. Muff coupling: Check visually, if bores of muffs are filled with grease						
38	Hose Pipe – Visual Inspection	1. Inspect the hose pipes for outward damage and cracking. 2. Exchange any hose pipe found to be damaged. 3. Test the hose pipes for leakage at their points of connection.	3C-KM615-04	X	X			
39	MS Box	1. Check each part visually. 2. Loose bolts and screws. 3. Check that cover opens and closes normally. 4. There must not be loose or damage, the stain, and the installation screw in the box. 5. Wipe off with the moist cloth when the dirt of the cover is awful. 6. Retighten bolts and screws with proper Torque.	3C-152300A-02	X		X		
40	MS Box 2	1. Check each part visually. 2. Check that cover	3C152300B-02	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		opens and closes normally. 3. Loose bolts and screws. 4. Measure the switch operating force. If measurement is not within values grease it with indicated following procedure in order to arrange the operating force.						
41	DC arrestor	1. Check for any sign of damage or looseness of the DC Arrestor Box. 2. Remove the bolts of the covers of DC Arrestor 3. Clean the porcelain surface with a damp cloth to remove any dirt. 4. Check visually the porcelain surface for any cracks. Replace if found. 5. Check by hand all high tension connections (Terminal lugs) for looseness. Torque if necessary. 6. Check by hand earth Connections (Terminal lugs) for looseness. Torque if necessary.	3C-152200-02	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		7. Measure the Insulation Resistance between the line terminal and earth terminal using a 500 Volt Megger .Confirm that the measured value is more than 100 mega ohms 8. Earth wire continuity and Resistance checking						
42	Filter Inductor	1. Check the mounting bolts and torque (343.35 Nm) 2. Check the mounting points for cracks or deformation. If there is any crack or deformation, repair it. 3. Check the main circuit cables HV512(L1), HV514(LL1), HV522(L2) and HV524(LL2) having any sign of insulation damage ,deformation or bend. 4. Check the safety earth cables having any sign of insulation damage. 5. Check the terminal covers for cracks or deformation. If there is any crack or deformation, repair it.	3C-152400-02	X		X		

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				DM	T	M		
		6. Check the side covers for cracks or deformation. If there is any crack or deformation, repair it. 7. Check the frame covers for cracks or deformation. If there is any crack or deformation, repair it. 8. Check the side covers for blockages or clogging of foreign materials. If there is any blockage or clogging of foreign materials, remove it.						
43	VVVF Inverter	1. Visually check condition of C/I box exterior covers ,rubber gasket of covers and locks for signs of damage, cracks or deformation 2. Ensure that covers are correctly fitted and secured by the key locks 3. Check mounting and safety brackets for signs of damage or cracks 4. Check that the Interior condition of VVVF box is free from dirt and dust.	3C-152500-03	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		5. Check that cooling fins with guide rods of VVVF power units are free from dust and dirt. Clean if required by a stiff brush. 6. Check earth cables/straps for damage and ensure these are connected properly. 7. Check connectors and pins for any sign of damage and ensure that no cable/wire is touching the body. 8. Check bus bars, terminal and cable, insulating material for any damage, discolouring, peeling, crack, etc						
44	Brake Resistor	a. Check that no bolts are evidently (visually) loose and no mechanical parts are damaged. If damages are noted, replace damaged parts on Work Instruction and tighten the bolts. b. Check that ceramic spacers and insulators are not visibly cracked. If a suspect crack exists, check the insulation resistance	3C-152600-03	X		X		

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				DM	T	M		
		<p>and replace always damaged insulating materials according to Work Instruction and Work Instruction.</p> <p>c. Check that no foreign bodies are present between resistor elements and inside resistor frame. If noted, remove them immediately.</p>						
45	Traction Motor	<p>1. Clean wire net filter of air Inlet box by stiff Nylon brush or blowing compressed air (4 bar) over it.</p> <p>2. Check lead wire for damage, Inspection cover and motor exterior.</p> <p>3. Visually Check grease leakage from bearing surface.</p>	3C-80523-01	X		X		
46	Traction Motor	<p>1. Check all fixing bolts are loose or missing</p> <p>2. Tighten Traction Motor lead cable to 22.6 N/m. (Junction box)</p> <p>3. Check Bearing Box and Bearing Cap for signs of oil leakage</p> <p>4. Recoup the lost quantity of grease (COSMO LIMAX HS No. 2) in Roller and</p>	3C-80523-02		X			

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				DM	T	M		
		Ball Bearings by using High pressure Grease Gun. 5. Dust Blowing						
47	Piping	1. Check the damaged part of the piping. 2. Repair or replace with a new item. 3. Repair finishing	3C-KM112-01	X	X	X		
48	Isolation Cock (1/2") with electric switch	Replacement of Isolation Cock (1/2") with electric switch	3C-KM611-16	X	X	X		
49	Isolation Cock (1/2") with electric switch B01.1-SR B01.2A-EPIC B01.2B-EPIC B01.3A-BIC B01.3B-BIC	1. Turn the cock handle to open position. Compressed air freely passes through the isolating cock. 2. Turn the cock handle to closed position. The supply of compressed air will be cut off and the venting noise can be heard. 3. The cock handle must be easy to turn without jerking. 4. Inspect the isolating cock, and its cable connections and insulation for outward damage and wear. 5. The electric switch must be heard to operate when the	3C-KM611-17	X	X	X		

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				DM	T	M		
		isolating cock is changed over from open to close.						
50	Air Filter	1. Take out the screw plugs at the sides of the air filter, and remove the filter element and the screening pipe 2. Clean the filter element (TLF2) and the screening pipe in light-grade petrol 3. Assembly 4. Leakage test by soapy water	3C-KM611-27	X	X	X		
51	Double Pressure Gauge	1. Check the unions A and B for leakage 2. Check the dial lighting and the surrounding illumination	3C-KM612-02	X				
52	Ballcock (1/2") with electric switch D05-BPIC	1. Turn the cock handle to open position. Compressed air freely passes through the isolating cock. 2. Turn the cock handle to closed position. The supply of compressed air will be cut off and the venting noise can be heard. 3. The cock handle must be easy to turn without	3C-KM612-12	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>jerking.</p> <p>4. Inspect the isolating cock, and its cable connections and insulation for outward damage and wear.</p> <p>5. The electric switch must be heard to operator when the isolating cock is changed over from open to close.</p>						
53	Air Reservoir – Visual Inspection	<p>1. Inspect the air reservoir for outward damage.</p> <p>2. Exchange the air reservoir immediately if the inspection of the circumferential and longitudinal welds reveal any cracking.</p> <p>3. Check the reservoir connections. The fittings screwed into the reservoir connections must be either stainless steel or galvanised steel. No other kind of fitting is allowed.</p> <p>4. Check any air leakage from the fittings connected to the reservoir by using soap water. Tighten the fittings immediately if there is</p>	3C-KM613-06	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		air leak. 5. The fasteners holding the air reservoir on board the vehicle must fit tightly. The strap holding the air reservoir must fit tightly. 6. The water collected must be drained from the air reservoir by its water drain after specified time periods.						
54	Isolation Cock (1/2") with electric switch(L05.1, L05.2)	1. Turn the cock handle to open position. Compressed air freely passes through the isolating cock. 2. Turn the cock handle to closed position. The supply of compressed air will be cut off and the venting noise can be heard. 3. The cock handle must be easy to turn without jerking. 4. Inspect the isolating cock, and its cable connections and insulation for outward damage and wear. 5. The electric switch must be heard to operate when the isolating cock is changed over from	3C-KM613-10	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		open to close						
55	Pipeline filter (MR line)(L01)	<ol style="list-style-type: none"> 1. Use a soft wire brush to remove heavy dirt deposits. 2. clean the filter element with light grade petrol if necessary. 	3C-KM613-01	X	X	X		
56	Isolation Cock (drain cock-L04.1,L09.1)	<ol style="list-style-type: none"> 1. Turn the cock handle to open position. Compressed air freely passes through the isolating cock. 2. Turn the cock handle to closed position. The supply of compressed air will be cut off and the venting noise can be heard. 3. The cock handle must be easy to turn without jerking. 	3C-KM613-08	X	X	X		
57	Auxiliary Inverter box(APS)	<ol style="list-style-type: none"> 1. Visually check condition of APS box exterior, covers, rubber gasket of covers and locks for signs of damage, cracks or deformation. 2. Ensure that covers are correctly fitted and secured by the key locks. 3. Check mounting and safety brackets for signs of damage or cracks. 	3C-171100-03, 04		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		4. Check that the Interior condition of APS box is free from dirt and dust 5. Blow off dust by industrial vacuum cleaner 6. Check earth cables/straps for damage and ensure these are connected properly. 7. Check connectors and pins for any sign of damage and ensure that no cable/wire is touching the body. 8. Visually check following parts of Auxiliary static Inverter for damage or deterioration an Input contactor (IVK) b. Transformer(TR1) c. Reactor d. Resistance e. Control Unit. f. Con / Inv Unit g. APS K Contactors						
58	Auxiliary Inverter box(APS)	1. Check of box covers and fasteners, for damage, dirt, etc. 2. Check visually that the	3C-171100-04		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>exterior of APS box does not have any signs of corrosion, deformation, or other damage</p> <p>3. Check visually that the box-mounting brackets do not have any cracks or damage. Repair the box-mounting bracket(s) if necessary.</p> <p>4. Check visually that the box welds do not have any signs of cracks. Repair the box weld(s) if necessary</p> <p>5. Confirm that the earth strap does not have any signs of damage</p> <p>6. Check visually that the surface of the bus bars does not have any signs of damage such as discolouring, cracking, peeling, etc. Replace the bus bar(s) if necessary</p> <p>7. Check visually that the cable insulation and the terminals do not have any signs of damage such as discolouring, cracking, peeling, etc. Replace the cable(s) and/or the terminal(s) if</p>						

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>necessary.</p> <p>8. Check by hand that the terminations are tight. Tighten the termination(s) if necessary.</p> <p>9. Check visually that the insulated mounting panels, the terminals, and the posts do not have any signs of damage such as discoloring, cracking, peeling, delaminating, etc. Replace damaged part(s) if necessary.</p> <p>10. Check visually that the air filter does not have any signs of damage, dust, dirt, etc. Replace the air filter if necessary.</p> <p>11. Clean the air filter with compressed air or water.</p>						
59	Battery Control Box (BIS, Relay, contactor, Diode)	<p>1. Check to see if any of the components are damaged or have deteriorated.</p> <p>2. Inspect the component mounting bolts to see if any have become loosened.</p> <p>3. Check if any label lettering is damaged</p>	3C-80721-01		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		or missing. 4. Check that all cable connections are secure. 5. Check that the component does not make any abnormal noises.						
60	Battery Control Box	Low tension – Visual Inspection / Replace terminal block, Diode block, contactor, Battery switch, current sensor, power supply and Interface PCB, Relay MCB.	3C-80721-02		X			
61	Battery box	Visual check of Cells: 1. Check if fuses are damaged or have deteriorated. 2. Check to see if the fuse holder bolts have loosened. 3. Check if any label lettering is damaged or missing. 4. Check that all cable connections are secure. 5. Check that the component does not make any abnormal noises. 6. Ensure assembled cells are clean and	3C-172200-01		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		dust free. 7. Ensure no signs of leakage of electrolyte, cracks / damage. If minor traces of leakage of electrolyte is found, wipe it with soft cloth. If major leakage is observed, replace the cell with new one. 8. If any white crystals found on the cell around the vent cap, clean with wet cloth first, later with dry cloth. 9. Visual check of condition of CWS vent plugs: 10. Ensure for no cracks or no blockage of flow of water. If found, replace with new one. 11. Ensure no abnormality in the gasket used for CWS vent cap fixing to the cell. If found, replace with new one. 12. Visual check of condition of water pipes, water inlet & outlet connector and connector covers: 13. Check all the water pipes, L-bends, U-bends, Water inlet & outlet connectors for						

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>free from fraying or cracks. If found, replace with new one.</p> <p>14.Ensure all the cable ties are firmly tightened.</p> <p>15.Ensure connector covers free from any damages or melting or heat affected marks. If found, replace with new one.</p> <p>16.Visual check of condition of cable& Lug:</p> <p>17.Ensure cables are free from damages, fraying of strands at lug crimping area and overheating.</p> <p>18.Ensure lug is free from defects like peeling of electroplating, over heating</p> <p>If found any defects in cable & lug, replace with new one.</p> <p>Individual cell voltage</p> <p>19.Keep HSCB Off position.</p> <p>20.Keep BCB in OFF position.</p> <p>21.Pull the battery tray out and remove connector covers to access</p>						

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>polarity terminals</p> <p>22. Check individual cell voltage with the help of Digital Multi-meter. Open circuit voltage of fully charged cells should be 1.30±0.03 volts.</p> <p>23. If any cell is found below 1 volt, it should be removed and follow O&M manual for the corrective maintenance.</p> <p>Charger Output:</p> <p>24. Keep BCB in ON position.</p> <p>25. Keep train in auxiliary ON position.</p> <p>26. Check output voltage of charger in float mode. it should be 110.4 min- 114.4 max volts.</p> <p>27. Aux OFF train for a while and discharge the battery for 5~10 minutes.</p> <p>Aux ON and check the boost voltage. it should be 117.6 max to 112.8 min volts.</p> <p>Check drawing current with the help of clamp meter.</p>						

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		28. Charging current should not be more than 18 amps (float mode).						
62	Battery	1. Topping up can be performed by gravity or by using a water filling station provided by SAFT with a flow rate of 0.7 L/min at a relative pressure of 0.3 bar maximum. 2. Check that all hydraulic connectors are clean to prevent contaminating the electrolyte. Check the tightness of all hoses connections of the central filling system. 3. If topping up is not performed using the automatic water filling station: connect a distilled water tank to the hydraulic connector and place the tank 1.5 meter above the filling circuit inlet. Then connect a container to the coupling without shutoff of the filling circuit. 4. If topping up is performed using the automatic water filling station: connect the	3C-172200-03		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>filling station hose to the hydraulic connector and the hose for return water to the coupling without shutoff of the filling circuit.</p> <p>5. Topping up is completed when an excess of 1 litre is measured at the outlet of the water filling circuit. The filling operation stops automatically when using the automatic water filling station.</p> <p>6. Record the total quantity of water introduced in the battery in order to adjust the topping up frequency.</p> <p>7. Disconnect the water tank or the filling station hose from the hydraulic connector and the container or the hose for return water from the filling circuit outlet.</p> <p>8. Perform this operation on all water filling systems of the battery.</p> <p>9. Reconnect the cables to the positive and negative terminals.</p>						

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
63	Refrigeration Equipment	1. The A/C unit covers are sealed via a rubber seal. Inspect the seal for any damage 2. Inspect the covers for for any dust trails, which may indicate an air leak due to a poor seal. any dust trails.	3C-191110-05 3C-192110-03	X X	X 	X 		
64	Condenser Coil (Saloon & Cab)	Inspection and Cleaning 1. Inspect the condenser compartment for any damage. 2. Inspect the condenser coil for any damage to the fins or copper tube 3. Clean the evaporator coil by using industrial cleaner BEML recommends (3M - Evaporator cleaner & Disinfectant) / shiny coil cleaner	3C-191112-01,02 3C-192112-01	X X	X 	X 		
65	Evaporator Coil (Saloon & Cab)	Inspection and Cleaning 4. Inspect the evaporator compartment for any damage. 5. Inspect the evaporator coil for any damage to the fins or copper tube 6. Clean the evaporator coil by using industrial cleaner BEML recommends (3M - Evaporator cleaner &	3C-191113-01 3C-192113-01	X X	X 	X 		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		Disinfectant) / shiny coil cleaner						
66	Main Air Compressor VV-120	Check vacuum indicator to see if the air filter is dirty; Once a negative pressure of about 50 mbar is reached, the indicator plunger latches and still remains fully visible when the compressor is turned off. The air filter element must be exchanged in this case	3C-KM1011-01-02		X			
67	Hose pipe	Visually check for any damages, Replace if found defective	3C-KM10114-02		X			
68	Main Air Compressor VV120	1. Check the air filter and replace if required 2. Cleaning cooler with compressed air or steam jet 3. Check safety valve for re-usability as directed by railway administration in charge	3C-KM1011-01-04		X			
69	Main Air Compressor VV120	1. Changing oil and exchanging the oil filter cartridge 2. Servicing the oil scavenge pipe filter	3C-KM1011-01-05		X			
70	Oil Separator	Visually check for any abnormalities and drain the oil manually	3C-KM1012-01,02		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
71	Micromesh Oil filter	1. Drain the accumulating oil off the filter 2. Record and compare the amount with the average 3. Check the oil filter for good external condition, especially for leakage around its body and connections. 4. If not found ok, replace the micromesh oil filter	3C-KM1013-01,02		X			
72	Safety Valve SV10, 12 bar	Entirely vent the compressed air pipes and unscrew the safety valve before removal. 1 Remove the safety valve 2 Install new safety valve by Sight-check the marking (component test) for the relevant service conditions and response pressure. 3 Sight-check the unit for external damage. Do not install damaged safety valves. 4 Remove any protective caps that are fitted to the safety valve inlet unions. 5 Prior to installation,	3C-KM1014-01		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>thoroughly clean the supply pipe and pipe work, and remove all traces of dust and dirt.</p> <p>6 Seal the fitting with suitable sealing rings. Apply the tightening torque from the installation drawing.</p> <p>7 Perform Leakage and Function testing after installation of new safety valve</p>						
73	Safety Valve SV10, 12 bar Main comp.	<p>Universal test bench (UTB) is required to test.</p> <p>1 Check the valve for freedom of movement,</p> <p>2 Unscrew the hand discharge screw to remove any dirt lodged in the valve seat with the air.</p> <p>3 Detach and mount the safety valve on a special test bench</p> <p>Check follows;</p> <p>a) Opening pressure difference above pressure setting,</p> <p>b) Closing pressure difference below pressure setting,</p> <p>c) Difference between response pressure and pressure setting,</p>	3C-KM1014-02		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		d) Discharge capacity						
74	Pressure Governor	Check to see if pressure governor reacts when the upper and lower pressure threshold are reached. If necessary, adjust or replace.	3C-KM1017-01, 02		X			
75	Pressure sensor with current outputs	<ul style="list-style-type: none"> The unit can be removed with standard tools. Turn off the supply of compressed air and vent all the reservoirs and air pipes connected to the unit. Do not allow any more compressed air to reach the unit. Switch off the power supply and prevent it from being restored. Do not allow electric power to reach the unit any longer. Release the union nut holding the onboard connecting cable, or unlock the bayonet fastener and remove the connecting cable. Unscrew the unit from the onboard port. Cover up the pneumatic and electric connections on the 	3C-KM1018-01		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>unit.</p> <ul style="list-style-type: none">• Cover up the onboard port and secure the connecting cable unless a replacement unit is going to be fitted immediately after removal. <p>For installation</p> <ul style="list-style-type: none">• Take the covers off the unit's port and off the on-board port.• Thoroughly clean the ports.• Only for units with enhanced resistance to low temperatures (letter "K" at the end of the type designation):• Lubricate sealing ring (b) with a thin film of RENOLIT KBS 1 grease.• For all other units:• Lubricate sealing ring (b) with a thin film of RENOLIT HLT2-KB grease.• Place the greased sealing ring (b) on the unit.• Screw the unit into the onboard port. Tightening torque: See installation drawing						

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<ul style="list-style-type: none"> Plug in the onboard connecting cable, and screw the union nut tight or plug in and secure the bayonet connector. Connect the supply of compressed air. Connect the power supply. Perform Leakage and Function testing after installation 						
76	Ball cock with or without exhaust valve – Function test	1. Turn the cock handle to open position. Compressed air freely passes through the isolating cock. 2. Turn the cock handle to closed position. The supply of compressed air will be cut off and the venting noise can be heard. 3. The cock handle must be easy to turn without jerking.	3C-KM1019-02		X			
77	Drain Valve	1. Start compressor. 2. The Drain Valve must automatically be vented through the drain port	3C-KM10110-02		X			
78	Silencer	Check the silencer for obstructions at the annular gap	3C-KM10111-02		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
79	Three way cock – Function test	Check if a) Three-way cock stiff to operate. b) Air discharging constantly from housing. c) When the path is open from A1 to A2 and from A1 to A3, air flows to A3 and to A2, respectively.	3C-KM10113-02		X			

Task 2. Cab


80	DC-DC Converter Panel (Driving cab inside)	1. Visually check to see if the component is damaged or deteriorated. 2. Inspect the bolts of the DC-DC converter to see if any have loosened. 3. Inspect Visually that the component labelling are existing. 4. Check Visually the cable connection state. 5. Check to see if the dc-dc converter makes a noise.	3C-117000-01	X				
81	Relay Panel	1. Visually Check to see if the component is damaged or deteriorated. 2. Inspect the bolts of the relay and contactor to	3C-114000-01	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		see if any have loosened. 3. Inspect Visually that the component labelling are existing. 4. Visually Check the cable connection state. 5. Check to see if the relay and contactor make a noise.						
82	Footrest Ass'y	Inspect 1. The safety of the footrest fixings. 2. The footrest functions normally.	3C-80242-03	X				
83	Miniature Circuit Breaker Panel	Inspect visually 1. The component is damaged or deteriorated 2. The MCB is secured in the DIN rail 3. The letters of any label are missing 4. The condition of the cable connection	3C-80243-01	X				
84	Driver's Seat	Inspect the safety of the seat frame fastenings and the seat mounted equipment fastenings Test 1. Unfolding/folding 2. Fore/aft sliding	3C-80244-01	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		3. Vertical height adjustment 4. Armrest rotation						
85	Auxiliary Seat	Inspect the safety of the seat frame fastenings and the brackets fastenings Test unfolding/folding	3C-80245-01	X				
86	Cab-Accessories Inspection	The fire extinguisher is clamped to a stainless steel bracket, which is secured to the driver's desk by hex. head screws. The Sun-Blind assembly is secured to cab front upper panel by the hexagon bolts. Examination of the accessories is limited to a visual inspection and checking the safety of all fastenings.	3C-80246-01	X				
87	Wiper Arm	Lubricate all moving parts with universal grease 1. The cone boring between the wiper arm and wiper bearing or bearing pin. 2. The moving surfaces between the wiper arm and wiper blade, and also on the mating surfaces of the tension spring. 3. Check wiper arm connecting rod assembly for proper	3C-80247-02	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		position and damage.						
88	Wiper Blade	Swing back the wiper arm from the windscreen Inspect 1. Wiper blade for wear and external damage 2. Rubber lip for damage 3. The joints of wiper blade for free movement 4. The joint bolt used to fasten wiper blade to the wiper arm must be correctly fastened.	3C-80247-05	X				
89	Washer tank	1. Unscrew cap, and fill washer tank to the very top mark with the washing liquid (soapy water) 2. Screw on cap tight again by hand	3C-80247-08	X				
90	Ball Cock-Function Test	1. Turn the ballcock handle to open position. Compressed air freely passes through the ballcock. 2. Turn the ballcock handle to closed position. The supply of compressed air will be cut off and the venting noise can be heard. 3. The ballcock handle must be easy to turn without jerking.	3C-KM614-02	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
91	Ball Cock-Function Test	1. Turn the ballcock handle to open position. Compressed air freely passes through the ballcock. 2. Turn the ballcock handle to closed position. The supply of compressed air will be cut off and the venting noise can be heard. 3. The ballcock handle must be easy to turn without jerking.	3C-KM615-02	X	X			
92	PWM generator	1. Visually check the PWM Generator unit for signs of damage. 2. Check Connector and cable for any sign of damage or loose connection. 3. Check PWM box cover and fasteners for proper fitment. 4. Check for provision of earthing connection.	3C-153100-01	X				
94	PA & PIS	1. TFT Display walk through test TFT Display – 18.5” – Functional test vii. Go to the PAPIS HMI and select 'START TFT TEST' button in the 'TESTING ADVANCED	3C-KM-12-01-01	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>FUNCTIONS' tab.</p> <p>viii. Check if TFT Display is emitting the test pattern.</p> <p>2. Check PA/PIS, CCTV healthiness from PAPIS HMI by selecting 'DEVICE OVERVIEW ADVANCED FUNCTIONS' and by selecting one by one every individual subsystem of PAPIS/CCTV showing in the screen for every coach. If showing Green, it implies healthy, if showing Red, implies unhealthy and should be got attended.</p>						

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
95	PA & PIS	<ol style="list-style-type: none"> 1. Activate self-test through MCP and check any failures on MCP display . 2. Checking of manual announcement by MCP <ol style="list-style-type: none"> a. Press INT button on master MCP and check PA mode enable during PTT switch pressing b. Check announcement is executed from all loudspeakers (Internal and external) clearly 3. Check on manual announcement by ACP <ol style="list-style-type: none"> a. Push PTT to speak to the microphone of ACP. b. Check announcement is executed from all internal loudspeakers at clearly. 4. Check on Cab - Cab intercommunication by MCP <ol style="list-style-type: none"> a. Check that MCP becomes to CAB 	3C-KM-12-01-02,03	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>mode when the CREW CALL (C-C) button is pressed.</p> <p>b. CREW CALL button is blinking on MCP in leading (Occupied) and slave (that is non occupied) side</p> <p>c. Check that audible alarm is sounding in slave MCP.</p> <p>d. Press blinking button when the CREW CALL button is lit.</p> <p>e. Check that CAB/CAB intercommunication can be made.</p> <p>5. Check on Cab - Cab intercommunication by ACP</p> <p>a. Press CREW CALL (C-C) button on leading cab..</p> <p>b. C-C button is blinking on ACP in master and slave (non occupied) side.</p> <p>c. Check that audible alarm is sounding in slave (non occupied cab).</p> <p>d. Press blinking button</p>						

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		when the C-C button is lit. e. Check that CAB/CAB intercommunication can be made.						
96	PA & PIS	PEAU, PAD push button – Functional test Perform intercom from every PEAU	3C-KM-12-01-04,05	X	X	X		
97	PA & PIS	Cab Speaker - Audio walk through test – 1. Go to the HMI and select [Audio Test] in the maintenance section 2. Check if Cab speaker is emitting the test tone.	3C-KM-12-01-06	X				
98	PA & PIS	Interior Speaker - Audio walk through test – 1. Go to the HMI and select 'START PRM TEST' button in the 'TESTING ADVANCED FUNCTIONS' tab. 2. Walk through the complete train interior and check if every audio device is emitting the test tone in interior speakers.	3C-KM-12-01-07	X	X	X		
99	PA & PIS	Exterior Speaker - Audio walk through test – 1. Go to the HMI and	3C-KM-12-01-08	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>select 'START test PRM' button in the 'TESTING .. ADVANCED FUNCTIONS' tab</p> <p>2. Walk left & right outside (left & right) the complete train and check if every audio device is emitting the test tone in exterior speakers (left & right)</p>						
100	PA & PIS	<p>iCom & FDI – Functional test Go to the HMI</p> <p>a. Select a PRM and check it is launched on the system.</p> <p>b. Check the distance to next stations and the automatic announcement.</p> <p>c. Check if Front destination indicator is emitting the test pattern.</p>	3C-KM-12-01-09, 12	X				
101	PA & PIS	<p>PIS HMI Functional test - Network Check:</p> <p>Use the TGUT to check if all devices are online</p> <p>a. One single device not discovered could mean a failure of the devices itself of a rupture in the cable between the switch and the device or a</p>	3C-KM-12-01-10	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		switch port not working. b. Multiple devices that are on the same IP cable in failure could mean that one of the devices is blocking the communication or a rupture in the cable between the switch and the first device or a switch port not working. c. All devices in a car not working could mean that the local switch is not powered or is not connected to the backbone.						
102	PA & PIS	Microphone + PTT – Functional test Audio function test: 1. Perform a PA from every ACP 2. Perform a PA from every microphone 3. Perform a PA from OCC / BCC 4. Perform cab-to-cab intercom 5. Perform intercom from every ACP 6. Perform intercom from every PEAU	3C-KM-12-01-13	X				
103	PA & PIS	Switch 28 ports –	3C-KM-12-02-01	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		Functional test Network Check: Use the TGUT to check if all devices are online a. One single device not discovered could mean a failure of the devices itself of a rupture in the cable between the switch and the device or a switch port not working. b. Multiple devices that are on the same ip cable in failure could mean that one of the devices is blocking the communication or a rupture in the cable between the switch and the first device or a switch port not working. c. All devices in a car not working could mean that the local switch is not powered or is not connected to the backbone.						
104	PA & PIS	Switch 16 ports – Functional test Network Check: Use the TGUT to check if all devices are online a. One single device not	3C-KM-12-02-02		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>discovered could mean a failure of the devices itself of a rupture in the cable between the switch and the device or a switch port not working.</p> <p>b. Multiple devices that are on the same ip cable in failure could mean that one of the devices is blocking the communication or a rupture in the cable between the switch and the first device or a switch port not working.</p> <p>c. All devices in a car not working could mean that the local switch is not powered or is not connected to the backbone.</p>						
105	PA & PIS	<p>Coupler box – Functional test</p> <p>Network Check:</p> <p>Use the TGUT to check if all devices are online</p> <p>a. One single device not discovered could mean a failure of the devices itself of a rupture in the cable between the switch and the device or a</p>	3C-KM-12-02-03	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		switch port not working. b. Multiple devices that are on the same ip cable in failure could mean that one of the devices is blocking the communication or a rupture in the cable between the switch and the first device or a switch port not working. c. All devices in a car not working could mean that the local switch is not powered or is not connected to the backbone.						
106	PA & PIS	DVR, CCTV HMI Functional Test – CCTV test 1. Go to the HMI and check the view on few cameras.	3C-KM-12-03-01,04	X				
107	PA & PIS	Saloon camera Functional Test – CCTV test 1. Go to the HMI and check the view on each camera.	3C-KM-12-03-02	X	X	X		
108	PA & PIS	Exterior camera Functional Test – CCTV test 1. Go to the HMI and check the view on	3C-KM-12-03-03	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		each camera.						
109	PAPIS-Cleaning	Clean with damp cloth the following PAPIS equipment 1. TFT Display 18.5" 2. CCU 3. PEAU 4. PAD push button 5. Saloon camera 6. I Com 7. Switch ports 28 8. Switch ports 16	3C-KM-12-01-01, 03, 04, 05, 09 3C-KM-12-02-01,02 3C-KM-12-03-02	X	X	X		
110	PAPIS – Cleaning	Clean the following equipment by blow out the dust, max 1 bar 1. Cab speaker 2. Interior Speaker 3. Exterior Speaker	3C-KM-12-01-06,07,08					
111	PAPIS-Cleaning	Clean with damp cloth the following PAPIS equipment 1. ACP 2. PIS HMI 3. Microphone + PTT 4. Digital Video Recorder (DVR) 5. CCTV HMI	3C-KM-12-01-02, 10,13 3C-KM-12-03-01,04	X				
112	PAPIS-Cleaning	Clean with damp cloth the following PAPIS equipment	3C-KM-12-03-03	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		1. External camera						
Task 3. Interior								
114	Electrical Distribution Board (EDB)	1. Check if the component is damaged or deteriorated. 2. Inspect that bolts of Relay and Contactor have loosened 3. Check if MCB and Diode fasten in DIN Rail. 4. Check that the letter of label is removed. 5. Check the cable connection state. 6. Check if Relay and Contactor make a noise.	3C-80140-01		X	X		
115	Passenger Seat	Inspect 1. Outer surfaces for damage or scratching 2. Seat pans, seat lower covers and seat brackets to ensure safety of mountings 3. Major scratches or cracks of the rubber seal between the seat back and the window panel, and also between the seat edge and the draught screen glazing panel	3C-80238-01	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
116	Grab pole & Rail	Inspect 1. The grab pole and grabrail outer surfaces for damage or scratching 2. Any tube or parts shows a major permanent deformation 3. Any slack fixing screws or bolts 4. A fracture over 3 mm in length	3C-80239-01	X	X	X		
117	Doorway & Gangway grab handle	Inspect 1. The doorway grab handle outer surfaces for damage or scratching 2. Any tube or parts shows a major permanent deformation 3. Any slack fixing screws or bolts 4. A fracture over 3 mm in length	3C-80239-07	X	X	X		
118	Strap hanger	Inspect the joint between the strap hanger and grab rail for any slack fixing bolts.	3C-80239-10	X	X	X		
119	Draught screen Glasses	Inspect 1. The condition of the draught screen glass. 2. The condition of the	3C-80239-12	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		fixing of the upper and lower parts of the draught screen glass for any slack fixing bolts and/or rubber packing						
120	Bulkhead panels	Inspect 1. The condition of the bulkhead panel paint of the surface for any scratches 2. The condition of the bulkhead panel fixings for any slack fixing	3C-80239-14	X	X	X		
121	Fire Extinguisher	1. Ensure the extinguisher is properly located in plain view and its access is unobstructed. 2. Visually check unit for any signs of corrosion, leakage or physical damage. 3. Ensure the nameplate is secure and legible and that operating instructions face outward. 4. Ensure visual inspection safety clip is in place and intact. 5. Visually check the discharge hose to ensure it is not damaged or obstructed.	3C-8023B-01	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		6. Date and initial the inspection tag and keep a record. 7. Check for expiry date.						
122	Fire Extinguisher	1. Clean the exterior of the Fire Extinguisher, polish the painted portion with wax polish, the brass / gun metal parts with metal polish, chromium parts with silver polish and plastic parts to be thoroughly washed with soap solution and dried in sun. 2. Check the nozzle outlets and vent holes as well as threaded portion of the valve for clogging and check the valve is clean and moving freely. 3. Ensure the cap washer is intact and also grease the threads of the valve, etc and wipe clean. 4. Make sure that the extinguisher is in proper condition and is not accidentally discharged. 5. Ensure that the pointer in the pressure gauge are in green zone, if not send it for refilling.	3C-8023B-02	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		6. Maintenance shall be carried out by professional firemen. 7. Keep a record of last maintenance check and expire date.						
123	Fire Extinguisher	1. Empty the contents of the extinguisher in clean buckets and remove all the components. If there are visible rust marks, wash the cylinder thoroughly with clean water. 2. Visually check the external surface of the fire extinguisher in respect of painting and if there is damage to the painting, the surface should be re-painted with the same colour shade. 3. Check up the condition of the label and if it is not in order, ensure to replace with correct label. Visually check the cylinder and its components in detail apart from functional point of view for any physical damage, cracks, dents etc. In case of any doubt, such components if those are pressure	3C-8023B-03	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>parts (like hose, body) should be subjected to hydraulic pressure test. If the damage is beyond repair, the part should be replaced by the correct component.</p> <p>4. The extinguisher after inspection should be refilled immediately and checked for the pressure in the pressure gauge and ensure the pointer in green zone. The date of inspection and refilling should be indelibly marked on the extinguisher and record in the register of the fire extinguishers.</p>						
124	Double corrugated bellows, compl.	Inspect, 1. Damages, cuts or tears in the fabric 2. Broken bellows frames 3. Worn sealing profiles 4. Evenly fitting on couple frames and screw-on frame	3C-80411-01, 02	X	X			
125	Double corrugated bellows, compl.	Clean bottom area [inner corrugated bellows and bridge plates]	3C-80411-01, 02	X	X			
126	Bridge plate, compl.	Inspect, 1. Sluggishness of rod	3C-80412-01	X	X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>hinge by carefully moving the floor flap up and down</p> <p>2. Bridge plates resting correctly on couple frame sided bridge plate</p> <p>3. Sliding ledge worn</p>						
127	Passenger Saloon Door	<p>1. Open/close the Passenger Saloon doors by pressing push buttons</p> <p>2. Check the results on TMS Display</p> <p>3. While Opening and closing door, check that doors open and close without obstruction.</p>	3C-80810-01	X	X	X		
128	Passenger Saloon Door	<p>1. Check function of obstruction detection.</p> <p>2. Check the indication of obstruction detection.</p> <p>3. Check the door movement monitor in opening direction.</p> <p>4. Check, if all securing elements of drive and limit switches are intact</p> <p>5. Check, if sealing wax(torque marking) at mounting screws is intact.</p>	3C-80810-02	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		6. Check the pull arms for mechanical damage. 7. Check drive unit. 8. Check the wiring and electrical attachments. 9. Check emergency access device manually. 10. Check emergency egress device manually. 11. Check the mechanical door cut out.						
129	Passenger Saloon Door	Check the painting surface for damage or corrosion	3C-80810-03	X	X	X		
130	Passenger Saloon Door	Inspect sealing joints of windows for damage	3C-80810-04	X	X	X		
131	Door leaf RH&LH	1. Clean top and rear edge, finger protection rubber from old grease and dirt before applying any new lubricant 2. Apply Silicon paste P4 to all circumferential door seals 3. Clean finger protection rubber afterwards with a dry cloth	3C-80811-01	X	X	X		
132	Door leaf RH&LH	Inspect , 1. The brushes at the bottom of the door leaf	3C-80811-02	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		for wear 2. The brushes on portal on top of the door leaf for wear						
133	Upper guide rail (complete right & left)	Inspect the stop buffers for the door open end position for wear. If necessary, replace.	3C-80812-02	X	X	X		
134	Drive unit	1. Clean and re-grease spindle (Klüber Isoflex LDS 18 Spezial A) 2. Check the surface of the spindle to see if any anodising is missing (bare aluminium visible),	3C-80813-01	X	X	X		
135	Drive mechanism	Clean and re- grease the locking & release lever on the locking unit of the drive (Isoflex Topas NB 52)	3C-80813-02	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
136	Cab Side Door	<ol style="list-style-type: none"> 1. Check for mounting of cab door limit switch 2. With the cab side door closed and from inside the cab, check rotation the main lock handle on the cab side door between in and out. 3. Check that the door unlocks and can be opened into the cab. 4. Check that the main lock springs back when the handle is released in the door open position. 5. Close the door and check that it closes correctly. 6. Check the door is manually operated door type. 7. Check Two rollers connected with panel and those operate on the upper track rail. 8. Check bottom guides are operated on bottom rail simultaneously with the action of the two rollers. 9. Check the door can withstand rough handling including slam-open and slam close by operation and 	3C-80820-01	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		maintenance personnel. 10. Check the stoppers are possible to completely buff for opening power. 11. Check the Auto-Locking mechanism 12. Check for play in doors 13. Visually check if there are any damaged areas on the access panel. 14. Check door status on TCMS						
137	Saloon to Cab Door (Partition door)	1. With the partition door closed, Check the hinged single leaf is located on right side of walkway from saloon side. 2. Check that the door unlocks and can be opened into the saloon. 3. Check that this leaf consists of a door handle located on cab side 4. Close the door and check that it met correctly between tongue of locking door and limit switch. 5. With the partition door	3C-80830-01	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>closed, Check the door leaf is opened into the saloon by a square key form the saloon side.</p> <p>6. Check that the door can be locked, bolted or wedged from either side of the door to prevent opening.</p> <p>7. Check that the visual and audible alarm is turned on automatically when Saloon to cab door in the unoccupied cab is opened.</p> <p>8. Check the door leaf is normally kept closed with the partition wall.</p> <p>9. Check the door is mounted on a vertical structure in back wall cubicle by full piano hinge</p> <p>10. Visually check if there are any damaged areas on the access panel.</p> <p>11. Check the partition door status of TMS</p> <p>12. Check the Partition door lock / open / close function and status on TMS.</p>						

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
138	VAC	1. Open VAC service hatch. 2. Clean FAT, SAT, RAT sensor. 3. Close service hatch. 4. Functionality check for smoke sensors	3C-191117-01 3C-192117-01 MWI	X X	X 	X 		
139	VAC- Saloon	Fresh air filter cleaning	3C-191120-01	X	X	X		
140	VAC- Saloon	Return air filter cleaning	3C-191121-01	X	X	X		
141	VAC- Cab	Mixed air filter cleaning	3C-192120-01	X				
Task 4. Exterior								
142	Bridge plate, compl. couple frame side	Visually check 1. For tears and holes in fabric 2. To see if couple frames do not evenly fit 3. Sliding ledge worn/damaged	3C-80413-01	X	X	X		
Task 5. Roof								
143	VAC 3 phase 415V AC& 110V DC Power Plug (Saloon and Cab)	1. Inspect the 110V connector located on the panel. Check that it is locked in position. 2. Ensure no force has been used to connector in 110 V DC power cable and there is no existing physical or structural damage. 3. After visual inspection turn ON main control	3C-191130-01 3C-192127-01	X X	X 	X 		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		switch, and start the unit. Ensure the unit is operable. 4. Inspect the three-phase connector located on the panel. Check that it is locked in position. 5. Check that there are no loose pins in the insert module. 6. After visual inspection turn ON main control switch, and start the unit. Ensure the unit is operable.						
144	VAC (Saloon and Cab)	1. With power applied to the electrical cubicle, check that there are NO faults are available in TCMS 2. Run the VAC in Normal AUTO mode and observe any unusual noise in any VAC 3. Operate the A/C unit in each sub mode state and check that the unit provides the correct air conditioning operation, and that all components appear to be operating correctly. 4. Check that the sight glass is full (colour	3C-191110-03 3C-192110-01	X X	X X	X X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		change).						
145	VAC (Saloon and Cab)	1. Check the tray and drain under evaporator coil to see if any debris is found clean the tray and drain. 2. Check and clean if necessary drains in the condenser coil compartment	3C-191110-04 3C-192110-02	X X	X 	X 		
146	High Pressure Switch (incl. low pressure switch & sensor) (Ceiling & Cab Ceiling)	1. Fault message will be trigger on TCMS 2. If found fault, check the HP switch	3C-191115-01,02,03 3C-192115-01,02	X X	X 	X 		
147	VAC (Saloon and Cab)	1. Check that the sight glass is full (colour change). 2. Check that the plugs are locked into the position. 3. Check that the wiring is undamaged and is clear of the fan wheel. 4. Check that the wiring is not touching the evaporator coil fins. 5. Check that the wiring looms clear the condenser fan blades. 6. Check that the cable	3C-191116-01 3C-192116-01	X X	X 	X 		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		glands throughout the unit are tight.						
Task 6. Functional checks								
148	TCMS-Central Control Unit-CCU	a. Turn OFF control power to the Central Control Unit. b. Check the connector insulating materials for any defects, damage and contamination. Replace if necessary. c. Check the condition of the pins and sockets for defect and damage. Replace if necessary.	3C-1A1100-01	X				
149	TCMS-Communication Node	a. Turn OFF control power to the Communication Node. b. Check the connector insulating materials for any defects, damage and contamination. Replace if necessary. c. Check the condition of the pins and sockets for defect and damage. Replace if necessary.	3C-1A1200-01	X	X	X		
150	TCMS-Remote I/O	a. Turn OFF control power to the Remote I/O Unit and inputted/outputted signal source powers.	3C-1A1400-01	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		b. Check the connector insulating materials for any defects, damage and contamination. Replace if necessary. c. Check the condition of the pins and sockets for defect and damage. Replace if necessary.						
151	TCMS- Video display Unit	9. Check connector insulating materials for defect, damage and contamination. Replace if necessary. 10. Check the condition of the pins and sockets for defect and damage. Replace if necessary 11. Check frame for damage, defect and contamination, clean with a vacuum cleaner, alcohol and a dry cloth if required. 12. Check connecting cables for signs of damage. Repair if necessary.	3C-1A1300-021	X				
152	Brake System	1. Check the Brake page on TCMS monitor 2. Inspect MR Pressure (8 to 10 bar) and BP pressure (5 bar) from	3C-KM610-01	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		gauges in the Cab.						
153	Brake System	1. Check that brake equipment is working without any abnormal noise. 2. Check that each isolation cock is working properly. 3. Check that air hose (BC hose, Parking hose etc) is not detect any damage. 4. Check that EBCU is not display any fault. 5. Check that pressure gauge in the cab working properly.	3C-KM610-02	X	X	X		
154	Brake System	1. Parking Brake test a. Press Parking Brake Apply push button, on operation panel. b. Ensure the Parking Brake Apply push button illuminate. c. Press Parking Brake Release push button, on operation panel. d. Ensure that Parking Brake Apply push button goes off. 2. Service Brake test	3C-KM610-03	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		a. Ensure that main reservoir pressure gauge in the cab indicates between 7.5 bar and 10 bars. b. Move MASCON to brake position. Check that brake cylinder (BC) pressure gauge in the cab increase around 2.5 bar (+/- 0.25bar) and Brake Pipe (BP) pressure gauge in the Cab read 5.0 bars. c. Move MASCON to COAST position. Ensure that BC gauge indication in the cab decreases.						
155	Brake System	1. Emergency brake test a. Ensure that main reservoir pressure gauge in the cab indicates between 7.5 bar and 10 bars b. Move MASCON to emergency brake position. Check that brake cylinder (BC) pressure gauge in the cab increase around 3.0 bar (+/- 0.25bar) and Brake Pipe (BP)	3C-KM610-04	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>pressure gauge in the Cab read 5.0 bars</p> <p>c. Move MASCON to COAST position. Ensure that BC gauge indication in the cab decreases.</p> <p>2. Back up brake test</p> <p>a. Move pneumatic controller is intermediate position. Ensure that Brake Pipe (BP) pressure gauge in the cab indicate and maintain 5.0 bars.</p> <p>b. Move pneumatic controller to vent position. Ensure that Brake Pipe (BP) pressure gauge in the cab decreases below 3.0bar and BC gauge indication in the cab 3.0bar (\pm 0.2 bar).</p> <p>c. Move pneumatic controller is charging position. Ensure that Brake Pipe (BP) pressure gauge in the cab indicate and maintain 5.0 bars and BC gauge</p>						

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		indication in the cab decreases.						
156	Inspection of earth brush assembly (Ground contact assembly)	Carry out a visual inspection of the ground contact. Basically damaged parts have to be replaced against new ones. Replace the carbon brush if the remaining height is equal or smaller than 27 mm	3C-010800-01	X	X	X		
157	FDS – Smoke Toxicity (STD) and Smoke & Heat detectors (SHD)	Functional Check 1. Go to the cockpit (1-Fig.1); 2. Find the monitor HMI (Fig.2); 3. Turn on the monitor HMI (Fig.3); 4. Check that the alarm status is all "ok". 5. Go into the various carriages and find the STD and SHD sensors (Fig.5 and Fig.6). 6. Use the tester for smoke detectors for the on-site testing of the detectors by means of a spray designed to simulate smoke particles (1-Fig.4 for STD and 2-Fig.4 for SHD). Do not remove the test device from the detector; the optical smoke sensor activates	MR1-01A-TC001	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>approximately 60 seconds after the application of the test aerosol</p> <p>7. Return to the cockpit and check that alarms are reported on the monitor and reset the alarms (Fig.2).</p>						
158	FDS – Smoke Toxicity (STD) and Smoke & Heat detectors (SHD)	<p>Cleaning</p> <p>The cleaning of smoke sensors must be performed in order to remove the eventual dirt accumulated externally during the first months of life of the carriage and operation of the system. The execution does not include the disassembly of the unit from its installation position. Perform the operations described below with the unit not powered.</p> <p>Access the sensor and perform the following operations: 1. Vacuum the dust on the outside of the unit, especially that deposited on the grid.</p>	MR1-01A-TC002	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		2. Once the external dust has been sucked in, use compressed air (MAX 4BAR) from blow inside the grill, performing several full turns of the same. 3. If necessary, vacuum the dust coming out of the sensor again.						
159	FDS – Remote Modules MR-LHD for Interfacing with LHD Detectors	1. Go into the technical area DMC-Car-1, DMC Car-6 (1-Fig.1) and TC-Car 2, MC-Car3, MC-Car4, TC-Car5 (Fig.2). 2. Check that the temperature sensitive cables are correctly connected (1-Fig.3). 3. Go to theDMC-Car1 and DMC Car-6 (1-Fig4). 4. Locate the HMI monitor (1-Fig.5). 5. Check that each MR-LHD has its own IP address (different from the others) and that they are read correctly	MR1-01A-TC007	X	X	X		
160	Collector Shoe Junction Box	1. Check if the component is damaged or deteriorated. 2. Inspect that bolts of bus bar have not loosened. Retighten the bolts if necessary.	3C-KM512-01	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		3. Inspect that the component labelling are existing.						
161	Stinger Box	1. Check if the component is damaged or deteriorated. 2. Inspect that bolts of Terminal Block and Receptacle have not loosened Retighten the bolts if loose. 3. Inspect that the component labelling are existing. 4. Check the cable connection state.	3C-KM513-01	X		X		
162	BCB Panel	1. AUX OFF the train. 2. Turn the Battery Isolation Switch (BIS) to off position. 3. Unlock and open the inspection cover of end cubicle with maintenance key. 4. Disconnect the connectors connected 5. Unlock and open the front cover of BCB with maintenance key. 6. Visually inspect the inside component in upper area of BCB. 7. If found any obstacle or	3C-119000-01		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>dust, remove the obstacle and clean the dust with low compressed air (2 bar). Direct the air jet in the opposite direction of the airflow or absorb dust from the component.</p> <p>8. Check the cable connection on the terminal for any damage and rectify if found damage.</p> <p>9. Check the fixing fasteners of inside components. If found looseness, tighten the loosened bolts.</p> <p>10. Close and lock the box cover of BCB with maintenance key.</p> <p>11. Connect the connectors & cables disconnected.</p> <p>12. Close the inspection cover of end cubicle and lock.</p> <p>13. Turn ON the power supply to the BCB by restoring the BIS to on position and AUX ON.</p>						
163	Windows	Check if the window glasses (Windscreen and Bodyside windows glasses) are broken or	3C-80221-01	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		cracked, or the glazing sealing is damaged						
164	Signages & Stickers	<p>Inspection of Marking and Labelling</p> <p>If the marking / labelling is stained, has colour fading, is stretched, and shrunk, blistered or peeling off, replace in accordance within Maintenance Work Instruction 3C-80237-02 "Replacement of Marking and Labelling".</p>	3C-80237-01	X	X	X		
165	TCMS	<ol style="list-style-type: none"> 1. Check from TCMS display that there is no faulty equipment on the train. 2. Check door screen for faults and cutout switch position. 3. Check brake screens for brake controller and cutout switch. 4. Check powering screen for position of VVVF. 5. Check Auxiliary screen for APS position. 6. Perform on-board test for VVVF, APS, BECU, VAC, DCU, etc 7. Function test through TCMS for Interior Saloon light. 	-	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
Task No	Equipment	Maintenance Actions	MWI No.	DM	T	M	Result	Remark
166	Electrical Jumper	Visually check for any abnormalities	-	X	X	X		
167	Exterior	Visually check for any abnormalities	-	X	X	X		
168	Interior end wall panel	Check end wall panel fixing and its locking arrangement	-	X	X	X		
169	Under frame equipment	Visually check all under frame equipment cover and their fixation	-	X	X	X		
170	Cab light & Console light	Check driving console light by operating Driving Console Light Switch	-	X				
171	Head light and Tail light	3. Check head lights by operating Head Light Switch (HLS). 4. Check tail lights functionality	-	X				
172	Exterior Indicator	Check the function of Train Number Indicator(TNI) & Destination Indicator Front(DIF), Door Indicator Lamps	-	X	X	X		
173	Flasher Light	Check the flasher light function in MS FOR/REV & SCS cut-out mode.	-	X				
174	Air Horn	Check the operation (Dual tone)	-	X				
175	Sun Visor	Check functionality of sun visor	-	X				
176	VAC	Smoke sensor	-	X	X	X		

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				DM	T	M		
Inspection (Without DC & AC Power)								
Work Preparation								
1. Wear the Safety Helmet For U/F Working 2. Wear the Safety Vest 3. Switch off all Units 4. Isolate and earth the third rail power supply line 5. Ensure that MR pressure is normal(8 to 10 bar)								
Task 1. Underfloor Equipment								
1	Low Tension Junction Box	1. Visually check if the component is damaged or deteriorated. 2. Inspect that bolts of Terminal Block and Receptacle have not loosened. 3. Inspect that the component labelling are existing. 4. Check the cable connection state.	3C-80131-01	X	X	X		
2	High Tension Junction Box	1. Visually check if the component is damaged or deteriorated. 2. Inspect that bolts of Terminal Block and Receptacle have not loosened. 3. Inspect that the component labelling are existing.	3C-80132-01	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		4. Check the cable connection state.						
3	Traction Motor Junction Box	1. Visually check if the component is damaged or deteriorated. 2. Inspect the connection bolts torque(22.6NM) of inside TM terminal box. 3. Check if Receptacle is fastened. 4. Inspect that the component labelling are existing.	3C-80133-01	X		X		
4	Pressure Governor	Check to see if pressure governor reacts when the upper and lower pressure threshold are reached. If necessary, adjust or replace.	3C-KM611-20	X	X	X		
5	BC Hose Pipes (Flexible hose to brake cylinder)	1. Inspect the hose pipe connection for outward damage and cracking.	3C-KM611-25	X	X	X		
6	Collector Shoe Junction Box	1. Check if the component is damaged or deteriorated. 2. Inspect that bolts of bus bar have not loosened. Re-tighten the bolts if necessary.	3C-80512-01	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		3. Inspect that the component labelling are existing.						
7	Bogie	1 Visually check the following for damage and safety a. All earth cables (body/bogie and journal box/frame). b. Axle end earth cables. 2 Visually check the Journal box for sign of overheating (eg. discoloration, paint blisters, any grease leakage from the rear of the journal box) 3 Visually Check Journal box for mechanical damage or cracks 4 Visually Check the safety of front covers and the integrity of the cover seal, fixations with torque mark 5 All bogie mounted equipment's fixation with torque mark to be checked	3C-KM310-01	X	X	X		
8	Brake Calliper Unit	1. Visual Inspection of brake calliper unit for damage, safety, fixations with torque marks	3C-KM316-01	X	X	X		

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				DM	T	M		
		2. Poke out the breather hole with a rod-like tool. 3. Inspect the brake calliper unit, especially the bellows, for damage.						
9	Centre pivot	1. Visually Check fixations with its torque marks 2. Casting defects and cracks		X	X	X		
10	Mono link	1. Visually check for cracks,bent and spherical bush for damage. 2.Visually Check fixation and its torque mark	3C-KM313-02	X	X	X		
11	Anti-roll bar system	<ul style="list-style-type: none"> Visually check for any damage Check all fixings are present and secure with torque mark 	3C-KM335-01	X	X	X		
12	Lateral Buffer Stop	1. Visually check each rubber buffer stop for crack or any de-bonding of the rubber. 2. Check fixation and torque mark	3C-KM313-04	X	X	X		
13	Lateral and Vertical Damper	1. Visual check for any damage & oil leakage and cleaning to be done 2. Check rubber bushes for de-bonding	3C-KM313-06, KM333-01,02	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		3. Check fixation and its torque mark						
14	Driving Gear	Visual Inspection 1. The axle gear box oil leakage. 2. Change the axle gearbox oil with filtered oil via the filler opening up to the top mark. 3. The axle gearbox for visible damage. 4. The spherical bearings of the torque arm for cracks 5. Check Flexible coupling 6. Cleaning the Gear Box	3C-KM315-01,02	X		X		
15	Brake Pad	1. Inspect pads worn irregularly. 2. Check that no pad may be thinner than 5mm at any point.	3C-KM316-03	X	X	X		
16	Remote Control (Parking Brake hand release lever)	Check the parking brake release function by emergency release gear of the brake cylinder when MR pressure <4 bar.	3C-KM316-05	X	X	X		
17	BC Hose Pipes (Flexible hose to	Inspect visually the hose pipes for outward damage and cracking.	3C-KM316-07	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
	brake cylinder)							
18	Journal Box Assy (WSP) Gap check	Check the gap between pole wheel & speed sensor, within 0.9 ± 0.5 mm.	3C-KM317-02	X	X	X		
19	Flange Lubricator System	1. Check the position of wheel flange lubricator. 2. Check the free movement of sticks in the applicator case. 3. Inspect the wheel flange lubricator system for wear and crack. 4. Measure the amount of the stick and provide new one if required	3C-KM336-01	X	X	X		
20	Flange Lubricator System	3. The angle that is made between the applicator and the flat on the back of the wheel should be: $\Theta = 55^\circ$ 4. The distance between the dispensing end of the applicator and the wheel flange should be as per dimension "F" and "T" shown in Fig. MM-03-03-06-02, where: $F = 13.5 \text{ mm } -0+2$ $T = 6.5 \text{ mm } -0+2$	3C-KM336-02	X	X	X		
21	Gangway half	Check the following. 1. Gap free fit of	3C-80410-01	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		adjacent couple frames 2. Gap free fit of screw-on frame 3. Outer seal (transparent Elastosil Eplus) between couple frame and screw-on profile of outer corrugated bellows is existing 4. Free movement of floor flaps of bridge plates 5. Velcro correctly and accurately attached 6. Car floor level levelled with gangway floor level						
22	Wheel set	[Axle] Visual Inspection 1. The axles for any signs of corrosion, surface damage, poor paint adherence, blistered paint. 2. There is no debris lodged between the traction motors and motor axles. 3. Rust on axles [Wheel] Inspect 4. Measure Wheel diameter and Deviation from true running (New diameter 860mm (+0.5 / -0) condemn	3C-KM320-01	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		780mm) 5. Measure wheel profile i. Flange Thickness, new – 32.5mm condemn 22mm ii. Flange Height – min 28 mm, max – 36 mm iii. Gradient not less than 6.5 mm 6. Visual check wheel profile for crack, grooves, skid, metal out on tread 7. Measure wheel back to back distance – 1358 (+2 / -0)mm						
23	Conical Spring (Primary Spring)	1. Visual Inspection for bonding failure & any mechanical damage 2. Visual Inspection of fixations and torque mark 3. Check the crown height(H) 45 ± 5 mm. Check if the height difference(A) in a bogie is within 3mm 4. Check to see if it has cracks of size more than about 10% of adhesion area 5. Check to see if a crack have grown deeper than 3 mm throughout	3C-KM331-01	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
24	Air Spring	Inspect 1. The external rubber surface for damage and cracks. 2. Clean dirt or oil deposits from the air spring using clean water. 3. Check for any audible sound	3C-KM332-02	X	X	X		
25	Levelling Valve and Installation rod	1. Ensure that MR pressure is normal (8 to 10 bar). 2. Close the concerned cock L05.1 and L05.2 (marked as ASCO) at both bogies. 3. Discharge both air springs by operating the drain cocks (L09.1) mounted at the bottom of surge reservoirs (L09) at both bogies. 4. Close the drain cocks (L09.1) and open the concerned cock L05.1 and L05.2 5. Check if the lever of levelling valve is moving upward and stops when the lever is parallel to axis "x" 6. Measure Installation rod Height (300±3mm)	3C-KM334-01	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
26	Front Automatic Coupler	1. Rough cleaning 2. Visual check for damage 3. Check the coupler head for damages, rust or sign of wear. 4. Visual check of tension spring, 5. Grease coupler head according to greasing plan 6. Visual and audible check for Air pipe connection: Clean mouth pieces (socket and gasket) 7. Inspect supporting device for any defect 8. Visually check draft gear housing for any damages	3C-80421-01	X				
27	Front Automatic Coupler	1. Check coupler height (790mm) and inclination of coupler($\pm 0.5^\circ$) according to the Fig. MM-04-02-01-02 2. Inclination of coupler head is checked by placing spirit level on coupler head. 3. For adjustment of the couplers vertical position, turn the screw-nuts (Figure	3C-80421-02	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		MM-04-02-01-02/ 1) of the spring supporting devices, till to the adjustment of $\pm 0.5^\circ$.						
28	Front Automatic Coupler	Check horizontal and vertical alignment of coupler by means of a level indicator and adjust by turning the screw nuts	3C-80421-03	X				
28	Current Collector Device	1 Visual inspection of all components for damage and dirt 2 Check the right height of the Current Collector H1=120mm (+0/-2) H2=201mm (± 2) H3=221.5mm (± 2) 3 Wear inspection of the collector shoe	3C-KM511-01	X		X		
29	Current Collector Device	1. Cleaning and inspection the Current Collector, Fuse box and Connection box. 2. Inspect all components for proper seating. 3. Check the function of the latching mechanism.	3C-KM511-02	X		X		
30	Current Collector Device	1. Measurement of insulation value on insulator Setting of the Insulation tester: 3.9 kVDC Measurement time:	3C-KM511-03	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		1 minute Value to reach (target): $R \geq 100 \text{ M}\Omega$ 2 Check of the contact force $130\text{N} \pm 10 \text{ N}$.						
31	HSCB	1. Check the High Speed Circuit Breaker box for damage to the box, the covers, the fasteners and the FRP cover(Bolting torque value: $15\text{N}\cdot\text{m}$, M10 which is the torque value of FRP cover fixation bolt). 2. Check the connector is securely fitted. 3. Check the earth strap mounting point for signs of damage. 4. Check the earth strap for signs of damage. 5. If any damage is found, repair or replace the damaged part. 6. Checking of the mounting brackets (M12x 30L) and check the Torque (73.58 Nm)	3C-152100-02	X		X		
32	HSCB	1. Check condition of box cover, mounting brackets and fasteners as per 3C-	3C-152100-03,05	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		152100-02 2. Check damage or deterioration of electrical cables 3. Check main car body cable appearance within HSCB enclosure						
33	HSCB	1. Measure of the main contact wear 2. Inspection of the arc chute 3. Cleaning and horns inspection a. Remove the arc chute b. Operations c. Assemble the arc chute	3C-152100-04	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
34	Intermediate Automatic Coupler (MC-MC)	1. Rough cleaning with rag for visual check 2. Visual check for damage, without uncoupling 3. Visual check of tension spring, 4. Greasing of intermediate automatic coupler shall carried out during uncoupling of train for other schedule/ unscheduled maintenance as per MWI. 5. Visual and audible check for Air pipe connection: if leakage found then Clean mouth pieces (socket and gasket) 6. Inspect supporting device for any defect 7. Visually check draft gear housing for damages	3C-80422-01			X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
35	Intermediate Automatic Coupler (MC-MC)	1. Check coupler height (790mm) and inclination of coupler($\pm 0.5^\circ$) according to the Fig. MM-04-02-02-02 2. Inclination of coupler head is checked by placing spirit level on coupler head. 3. For adjustment of the couplers vertical position, turn the screw-nuts (Figure MM-04-02-02-02/ 1) of the spring supporting devices, till to the adjustment of $\pm 0.5^\circ$.	3C-80422-02			X		
36	Intermediate Automatic Coupler (MC-MC)	Check horizontal and vertical alignment of coupler by means of a level indicator and adjust by turning the screw nuts	3C-80422-03			X		
37	Semi-permanent Coupler	1. Visual check for damage without uncoupling. 2. Visual and audible check for the air connections. 3. Check the supporting device for its position and any damage, if any. 4. Visually check draft gear for any defect/damage	3C-80423-01	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		5. Muff coupling: Check visually, if bores of muffs are filled with grease						
38	Hose Pipe – Visual Inspection	1. Inspect the hose pipes for outward damage and cracking. 2. Exchange any hose pipe found to be damaged. 3. Test the hose pipes for leakage at their points of connection.	3C-KM615-04	X	X			
39	MS Box	1. Check each part visually. 2. Loose bolts and screws. 3. Check that cover opens and closes normally. 4. There must not be loose or damage, the stain, and the installation screw in the box. 5. Wipe off with the moist cloth when the dirt of the cover is awful. 6. Retighten bolts and screws with proper Torque.	3C-152300A-02	X		X		
40	MS Box 2	1. Check each part visually. 2. Check that cover	3C152300B-02	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		opens and closes normally. 3. Loose bolts and screws. 4. Measure the switch operating force. If measurement is not within values grease it with indicated following procedure in order to arrange the operating force.						
41	DC arrestor	1. Check for any sign of damage or looseness of the DC Arrestor Box. 2. Remove the bolts of the covers of DC Arrestor 3. Clean the porcelain surface with a damp cloth to remove any dirt. 4. Check visually the porcelain surface for any cracks. Replace if found. 5. Check by hand all high tension connections (Terminal lugs) for looseness. Torque if necessary. 6. Check by hand earth Connections (Terminal lugs) for looseness. Torque if necessary.	3C-152200-02	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		7. Measure the Insulation Resistance between the line terminal and earth terminal using a 500 Volt Megger .Confirm that the measured value is more than 100 mega ohms 8. Earth wire continuity and Resistance checking						
42	Filter Inductor	1. Check the mounting bolts and torque (343.35 Nm) 2. Check the mounting points for cracks or deformation. If there is any crack or deformation, repair it. 3. Check the main circuit cables HV512(L1), HV514(LL1), HV522(L2) and HV524(LL2) having any sign of insulation damage ,deformation or bend. 4. Check the safety earth cables having any sign of insulation damage. 5. Check the terminal covers for cracks or deformation. If there is any crack or deformation, repair it.	3C-152400-02	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		6. Check the side covers for cracks or deformation. If there is any crack or deformation, repair it. 7. Check the frame covers for cracks or deformation. If there is any crack or deformation, repair it. 8. Check the side covers for blockages or clogging of foreign materials. If there is any blockage or clogging of foreign materials, remove it.						
43	VVVF Inverter	1. Visually check condition of C/I box exterior covers ,rubber gasket of covers and locks for signs of damage, cracks or deformation 2. Ensure that covers are correctly fitted and secured by the key locks 3. Check mounting and safety brackets for signs of damage or cracks 4. Check that the Interior condition of VVVF box is free from dirt and dust.	3C-152500-03	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		5. Check that cooling fins with guide rods of VVVF power units are free from dust and dirt. Clean if required by a stiff brush. 6. Check earth cables/straps for damage and ensure these are connected properly. 7. Check connectors and pins for any sign of damage and ensure that no cable/wire is touching the body. 8. Check bus bars, terminal and cable, insulating material for any damage, discolouring, peeling, crack, etc						
44	Brake Resistor	a. Check that no bolts are evidently (visually) loose and no mechanical parts are damaged. If damages are noted, replace damaged parts on Work Instruction and tighten the bolts. b. Check that ceramic spacers and insulators are not visibly cracked. If a suspect crack exists, check the insulation resistance	3C-152600-03	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>and replace always damaged insulating materials according to Work Instruction and Work Instruction.</p> <p>c. Check that no foreign bodies are present between resistor elements and inside resistor frame. If noted, remove them immediately.</p>						
45	Traction Motor	<p>1. Clean wire net filter of air Inlet box by stiff Nylon brush or blowing compressed air (4 bar) over it.</p> <p>2. Check lead wire for damage, Inspection cover and motor exterior.</p> <p>3. Visually Check grease leakage from bearing surface.</p>	3C-80523-01	X		X		
46	Traction Motor	<p>1. Check all fixing bolts are loose or missing</p> <p>2. Tighten Traction Motor lead cable to 22.6 N/m. (Junction box)</p> <p>3. Check Bearing Box and Bearing Cap for signs of oil leakage</p> <p>4. Recoup the lost quantity of grease (COSMO LIMAX HS No. 2) in Roller and</p>	3C-80523-02		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		Ball Bearings by using High pressure Grease Gun. 5. Dust Blowing						
47	Piping	1. Check the damaged part of the piping. 2. Repair or replace with a new item. 3. Repair finishing	3C-KM112-01	X	X	X		
48	Isolation Cock (1/2") with electric switch	Replacement of Isolation Cock (1/2") with electric switch	3C-KM611-16	X	X	X		
49	Isolation Cock (1/2") with electric switch B01.1-SR B01.2A-EPIC B01.2B-EPIC B01.3A-BIC B01.3B-BIC	1. Turn the cock handle to open position. Compressed air freely passes through the isolating cock. 2. Turn the cock handle to closed position. The supply of compressed air will be cut off and the venting noise can be heard. 3. The cock handle must be easy to turn without jerking. 4. Inspect the isolating cock, and its cable connections and insulation for outward damage and wear. 5. The electric switch must be heard to operate when the	3C-KM611-17	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		isolating cock is changed over from open to close.						
50	Air Filter	1. Take out the screw plugs at the sides of the air filter, and remove the filter element and the screening pipe 2. Clean the filter element (TLF2) and the screening pipe in light-grade petrol 3. Assembly 4. Leakage test by soapy water	3C-KM611-27	X	X	X		
51	Double Pressure Gauge	1. Check the unions A and B for leakage 2. Check the dial lighting and the surrounding illumination	3C-KM612-02	X				
52	Ballcock (1/2") with electric switch D05-BPIC	1. Turn the cock handle to open position. Compressed air freely passes through the isolating cock. 2. Turn the cock handle to closed position. The supply of compressed air will be cut off and the venting noise can be heard. 3. The cock handle must be easy to turn without	3C-KM612-12	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>jerking.</p> <p>4. Inspect the isolating cock, and its cable connections and insulation for outward damage and wear.</p> <p>5. The electric switch must be heard to operator when the isolating cock is changed over from open to close.</p>						
53	Air Reservoir – Visual Inspection	<p>1. Inspect the air reservoir for outward damage.</p> <p>2. Exchange the air reservoir immediately if the inspection of the circumferential and longitudinal welds reveal any cracking.</p> <p>3. Check the reservoir connections. The fittings screwed into the reservoir connections must be either stainless steel or galvanised steel. No other kind of fitting is allowed.</p> <p>4. Check any air leakage from the fittings connected to the reservoir by using soap water. Tighten the fittings immediately if there is</p>	3C-KM613-06	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		air leak. 5. The fasteners holding the air reservoir on board the vehicle must fit tightly. The strap holding the air reservoir must fit tightly. 6. The water collected must be drained from the air reservoir by its water drain after specified time periods.						
54	Isolation Cock (1/2") with electric switch(L05.1, L05.2)	1. Turn the cock handle to open position. Compressed air freely passes through the isolating cock. 2. Turn the cock handle to closed position. The supply of compressed air will be cut off and the venting noise can be heard. 3. The cock handle must be easy to turn without jerking. 4. Inspect the isolating cock, and its cable connections and insulation for outward damage and wear. 5. The electric switch must be heard to operate when the isolating cock is changed over from	3C-KM613-10	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		open to close						
55	Pipeline filter (MR line)(L01)	<ol style="list-style-type: none"> 1. Use a soft wire brush to remove heavy dirt deposits. 2. clean the filter element with light grade petrol if necessary. 	3C-KM613-01	X	X	X		
56	Isolation Cock (drain cock-L04.1,L09.1)	<ol style="list-style-type: none"> 1. Turn the cock handle to open position. Compressed air freely passes through the isolating cock. 2. Turn the cock handle to closed position. The supply of compressed air will be cut off and the venting noise can be heard. 3. The cock handle must be easy to turn without jerking. 	3C-KM613-08	X	X	X		
57	Auxiliary Inverter box(APS)	<ol style="list-style-type: none"> 1. Visually check condition of APS box exterior, covers, rubber gasket of covers and locks for signs of damage, cracks or deformation. 2. Ensure that covers are correctly fitted and secured by the key locks. 3. Check mounting and safety brackets for signs of damage or cracks. 	3C-171100-03, 04		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		4. Check that the Interior condition of APS box is free from dirt and dust 5. Blow off dust by industrial vacuum cleaner 6. Check earth cables/straps for damage and ensure these are connected properly. 7. Check connectors and pins for any sign of damage and ensure that no cable/wire is touching the body. 8. Visually check following parts of Auxiliary static Inverter for damage or deterioration an Input contactor (IVK) b. Transformer(TR1) c. Reactor d. Resistance e. Control Unit. f. Con / Inv Unit g. APS K Contactors						
58	Auxiliary Inverter box(APS)	1. Check of box covers and fasteners, for damage, dirt, etc. 2. Check visually that the	3C-171100-04		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>exterior of APS box does not have any signs of corrosion, deformation, or other damage</p> <p>3. Check visually that the box-mounting brackets do not have any cracks or damage. Repair the box-mounting bracket(s) if necessary.</p> <p>4. Check visually that the box welds do not have any signs of cracks. Repair the box weld(s) if necessary</p> <p>5. Confirm that the earth strap does not have any signs of damage</p> <p>6. Check visually that the surface of the bus bars does not have any signs of damage such as discolouring, cracking, peeling, etc. Replace the bus bar(s) if necessary</p> <p>7. Check visually that the cable insulation and the terminals do not have any signs of damage such as discolouring, cracking, peeling, etc. Replace the cable(s) and/or the terminal(s) if</p>						

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				DM	T	M		
		<p>necessary.</p> <p>8. Check by hand that the terminations are tight. Tighten the termination(s) if necessary.</p> <p>9. Check visually that the insulated mounting panels, the terminals, and the posts do not have any signs of damage such as discoloring, cracking, peeling, delaminating, etc. Replace damaged part(s) if necessary.</p> <p>10. Check visually that the air filter does not have any signs of damage, dust, dirt, etc. Replace the air filter if necessary.</p> <p>11. Clean the air filter with compressed air or water.</p>						
59	Battery Control Box (BIS, Relay, contactor, Diode)	<p>1. Check to see if any of the components are damaged or have deteriorated.</p> <p>2. Inspect the component mounting bolts to see if any have become loosened.</p> <p>3. Check if any label lettering is damaged</p>	3C-80721-01		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		or missing. 4. Check that all cable connections are secure. 5. Check that the component does not make any abnormal noises.						
60	Battery Control Box	Low tension – Visual Inspection / Replace terminal block, Diode block, contactor, Battery switch, current sensor, power supply and Interface PCB, Relay MCB.	3C-80721-02		X			
61	Battery box	Visual check of Cells: 1. Check if fuses are damaged or have deteriorated. 2. Check to see if the fuse holder bolts have loosened. 3. Check if any label lettering is damaged or missing. 4. Check that all cable connections are secure. 5. Check that the component does not make any abnormal noises. 6. Ensure assembled cells are clean and	3C-172200-01		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		dust free. 7. Ensure no signs of leakage of electrolyte, cracks / damage. If minor traces of leakage of electrolyte is found, wipe it with soft cloth. If major leakage is observed, replace the cell with new one. 8. If any white crystals found on the cell around the vent cap, clean with wet cloth first, later with dry cloth. 9. Visual check of condition of CWS vent plugs: 10.Ensure for no cracks or no blockage of flow of water. If found, replace with new one. 11.Ensure no abnormality in the gasket used for CWS vent cap fixing to the cell. If found, replace with new one. 12.Visual check of condition of water pipes, water inlet & outlet connector and connector covers: 13.Check all the water pipes, L-bends, U-bends, Water inlet & outlet connectors for						

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>free from fraying or cracks. If found, replace with new one.</p> <p>14.Ensure all the cable ties are firmly tightened.</p> <p>15.Ensure connector covers free from any damages or melting or heat affected marks. If found, replace with new one.</p> <p>16.Visual check of condition of cable& Lug:</p> <p>17.Ensure cables are free from damages, fraying of strands at lug crimping area and overheating.</p> <p>18.Ensure lug is free from defects like peeling of electroplating, over heating</p> <p>If found any defects in cable & lug, replace with new one.</p> <p>Individual cell voltage</p> <p>19.Keep HSCB Off position.</p> <p>20.Keep BCB in OFF position.</p> <p>21.Pull the battery tray out and remove connector covers to access</p>						

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		polarity terminals 22. Check individual cell voltage with the help of Digital Multi-meter. Open circuit voltage of fully charged cells should be 1.30±0.03 volts. 23. If any cell is found below 1 volt, it should be removed and follow O&M manual for the corrective maintenance. Charger Output: 24. Keep BCB in ON position. 25. Keep train in auxiliary ON position. 26. Check output voltage of charger in float mode. it should be 110.4 min- 114.4 max volts. 27. Aux OFF train for a while and discharge the battery for 5~10 minutes. Aux ON and check the boost voltage. it should be 117.6 max to 112.8 min volts. Check drawing current with the help of clamp meter.						

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		28. Charging current should not be more than 18 amps (float mode).						
62	Battery	1. Topping up can be performed by gravity or by using a water filling station provided by SAFT with a flow rate of 0.7 L/min at a relative pressure of 0.3 bar maximum. 2. Check that all hydraulic connectors are clean to prevent contaminating the electrolyte. Check the tightness of all hoses connections of the central filling system. 3. If topping up is not performed using the automatic water filling station: connect a distilled water tank to the hydraulic connector and place the tank 1.5 meter above the filling circuit inlet. Then connect a container to the coupling without shutoff of the filling circuit. 4. If topping up is performed using the automatic water filling station: connect the	3C-172200-03		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>filling station hose to the hydraulic connector and the hose for return water to the coupling without shutoff of the filling circuit.</p> <p>5. Topping up is completed when an excess of 1 litre is measured at the outlet of the water filling circuit. The filling operation stops automatically when using the automatic water filling station.</p> <p>6. Record the total quantity of water introduced in the battery in order to adjust the topping up frequency.</p> <p>7. Disconnect the water tank or the filling station hose from the hydraulic connector and the container or the hose for return water from the filling circuit outlet.</p> <p>8. Perform this operation on all water filling systems of the battery.</p> <p>9. Reconnect the cables to the positive and negative terminals.</p>						

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
63	Refrigeration Equipment	1. The A/C unit covers are sealed via a rubber seal. Inspect the seal for any damage 2. Inspect the covers for for any dust trails, which may indicate an air leak due to a poor seal. any dust trails.	3C-191110-05 3C-192110-03	X X	X 	X 		
64	Condenser Coil (Saloon & Cab)	Inspection and Cleaning 1. Inspect the condenser compartment for any damage. 2. Inspect the condenser coil for any damage to the fins or copper tube 3. Clean the evaporator coil by using industrial cleaner BEML recommends (3M - Evaporator cleaner & Disinfectant) / shiny coil cleaner	3C-191112-01,02 3C-192112-01	X X	X 	X 		
65	Evaporator Coil (Saloon & Cab)	Inspection and Cleaning 4. Inspect the evaporator compartment for any damage. 5. Inspect the evaporator coil for any damage to the fins or copper tube 6. Clean the evaporator coil by using industrial cleaner BEML recommends (3M - Evaporator cleaner &	3C-191113-01 3C-192113-01	X X	X 	X 		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		Disinfectant) / shiny coil cleaner						
66	Main Air Compressor VV-120	Check vacuum indicator to see if the air filter is dirty; Once a negative pressure of about 50 mbar is reached, the indicator plunger latches and still remains fully visible when the compressor is turned off. The air filter element must be exchanged in this case	3C-KM1011-01-02		X			
67	Hose pipe	Visually check for any damages, Replace if found defective	3C-KM10114-02		X			
68	Main Air Compressor VV120	1. Check the air filter and replace if required 2. Cleaning cooler with compressed air or steam jet 3. Check safety valve for re-usability as directed by railway administration in charge	3C-KM1011-01-04		X			
69	Main Air Compressor VV120	1. Changing oil and exchanging the oil filter cartridge 2. Servicing the oil scavenge pipe filter	3C-KM1011-01-05		X			
70	Oil Separator	Visually check for any abnormalities and drain the oil manually	3C-KM1012-01,02		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
71	Micromesh Oil filter	1. Drain the accumulating oil off the filter 2. Record and compare the amount with the average 3. Check the oil filter for good external condition, especially for leakage around its body and connections. 4. If not found ok, replace the micromesh oil filter	3C-KM1013-01,02		X			
72	Safety Valve SV10, 12 bar	Entirely vent the compressed air pipes and unscrew the safety valve before removal. 1 Remove the safety valve 2 Install new safety valve by Sight-check the marking (component test) for the relevant service conditions and response pressure. 3 Sight-check the unit for external damage. Do not install damaged safety valves. 4 Remove any protective caps that are fitted to the safety valve inlet unions. 5 Prior to installation,	3C-KM1014-01		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>thoroughly clean the supply pipe and pipe work, and remove all traces of dust and dirt.</p> <p>6 Seal the fitting with suitable sealing rings. Apply the tightening torque from the installation drawing.</p> <p>7 Perform Leakage and Function testing after installation of new safety valve</p>						
73	Safety Valve SV10, 12 bar Main comp.	<p>Universal test bench (UTB) is required to test.</p> <p>1 Check the valve for freedom of movement,</p> <p>2 Unscrew the hand discharge screw to remove any dirt lodged in the valve seat with the air.</p> <p>3 Detach and mount the safety valve on a special test bench</p> <p>Check follows;</p> <p>a) Opening pressure difference above pressure setting,</p> <p>b) Closing pressure difference below pressure setting,</p> <p>c) Difference between response pressure and pressure setting,</p>	3C-KM1014-02		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		d) Discharge capacity						
74	Pressure Governor	Check to see if pressure governor reacts when the upper and lower pressure threshold are reached. If necessary, adjust or replace.	3C-KM1017-01, 02		X			
75	Pressure sensor with current outputs	<ul style="list-style-type: none"> The unit can be removed with standard tools. Turn off the supply of compressed air and vent all the reservoirs and air pipes connected to the unit. Do not allow any more compressed air to reach the unit. Switch off the power supply and prevent it from being restored. Do not allow electric power to reach the unit any longer. Release the union nut holding the onboard connecting cable, or unlock the bayonet fastener and remove the connecting cable. Unscrew the unit from the onboard port. Cover up the pneumatic and electric connections on the 	3C-KM1018-01		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>unit.</p> <ul style="list-style-type: none">• Cover up the onboard port and secure the connecting cable unless a replacement unit is going to be fitted immediately after removal. <p>For installation</p> <ul style="list-style-type: none">• Take the covers off the unit's port and off the on-board port.• Thoroughly clean the ports.• Only for units with enhanced resistance to low temperatures (letter "K" at the end of the type designation):• Lubricate sealing ring (b) with a thin film of RENOLIT KBS 1 grease.• For all other units:• Lubricate sealing ring (b) with a thin film of RENOLIT HLT2-KB grease.• Place the greased sealing ring (b) on the unit.• Screw the unit into the onboard port. Tightening torque: See installation drawing						

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<ul style="list-style-type: none"> Plug in the onboard connecting cable, and screw the union nut tight or plug in and secure the bayonet connector. Connect the supply of compressed air. Connect the power supply. Perform Leakage and Function testing after installation 						
76	Ball cock with or without exhaust valve – Function test	1. Turn the cock handle to open position. Compressed air freely passes through the isolating cock. 2. Turn the cock handle to closed position. The supply of compressed air will be cut off and the venting noise can be heard. 3. The cock handle must be easy to turn without jerking.	3C-KM1019-02		X			
77	Drain Valve	1. Start compressor. 2. The Drain Valve must automatically be vented through the drain port	3C-KM10110-02		X			
78	Silencer	Check the silencer for obstructions at the annular gap	3C-KM10111-02		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
79	Three way cock – Function test	Check if a) Three-way cock stiff to operate. b) Air discharging constantly from housing. c) When the path is open from A1 to A2 and from A1 to A3, air flows to A3 and to A2, respectively.	3C-KM10113-02		X			

Task 2. Cab


80	DC-DC Converter Panel (Driving cab inside)	1. Visually check to see if the component is damaged or deteriorated. 2. Inspect the bolts of the DC-DC converter to see if any have loosened. 3. Inspect Visually that the component labelling are existing. 4. Check Visually the cable connection state. 5. Check to see if the dc-dc converter makes a noise.	3C-117000-01	X				
81	Relay Panel	1. Visually Check to see if the component is damaged or deteriorated. 2. Inspect the bolts of the relay and contactor to	3C-114000-01	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		see if any have loosened. 3. Inspect Visually that the component labelling are existing. 4. Visually Check the cable connection state. 5. Check to see if the relay and contactor make a noise.						
82	Footrest Ass'y	Inspect 1. The safety of the footrest fixings. 2. The footrest functions normally.	3C-80242-03	X				
83	Miniature Circuit Breaker Panel	Inspect visually 1. The component is damaged or deteriorated 2. The MCB is secured in the DIN rail 3. The letters of any label are missing 4. The condition of the cable connection	3C-80243-01	X				
84	Driver's Seat	Inspect the safety of the seat frame fastenings and the seat mounted equipment fastenings Test 1. Unfolding/folding 2. Fore/aft sliding	3C-80244-01	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		3. Vertical height adjustment 4. Armrest rotation						
85	Auxiliary Seat	Inspect the safety of the seat frame fastenings and the brackets fastenings Test unfolding/folding	3C-80245-01	X				
86	Cab-Accessories Inspection	The fire extinguisher is clamped to a stainless steel bracket, which is secured to the driver's desk by hex. head screws. The Sun-Blind assembly is secured to cab front upper panel by the hexagon bolts. Examination of the accessories is limited to a visual inspection and checking the safety of all fastenings.	3C-80246-01	X				
87	Wiper Arm	Lubricate all moving parts with universal grease 1. The cone boring between the wiper arm and wiper bearing or bearing pin. 2. The moving surfaces between the wiper arm and wiper blade, and also on the mating surfaces of the tension spring. 3. Check wiper arm connecting rod assembly for proper	3C-80247-02	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		position and damage.						
88	Wiper Blade	Swing back the wiper arm from the windscreen Inspect 1. Wiper blade for wear and external damage 2. Rubber lip for damage 3. The joints of wiper blade for free movement 4. The joint bolt used to fasten wiper blade to the wiper arm must be correctly fastened.	3C-80247-05	X				
89	Washer tank	1. Unscrew cap, and fill washer tank to the very top mark with the washing liquid (soapy water) 2. Screw on cap tight again by hand	3C-80247-08	X				
90	Ball Cock-Function Test	1. Turn the ballcock handle to open position. Compressed air freely passes through the ballcock. 2. Turn the ballcock handle to closed position. The supply of compressed air will be cut off and the venting noise can be heard. 3. The ballcock handle must be easy to turn without jerking.	3C-KM614-02	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
91	Ball Cock-Function Test	1. Turn the ballcock handle to open position. Compressed air freely passes through the ballcock. 2. Turn the ballcock handle to closed position. The supply of compressed air will be cut off and the venting noise can be heard. 3. The ballcock handle must be easy to turn without jerking.	3C-KM615-02	X	X			
92	PWM generator	1. Visually check the PWM Generator unit for signs of damage. 2. Check Connector and cable for any sign of damage or loose connection. 3. Check PWM box cover and fasteners for proper fitment. 4. Check for provision of earthing connection.	3C-153100-01	X				
94	PA & PIS	1. TFT Display walk through test TFT Display – 18.5” – Functional test vii. Go to the PAPIS HMI and select 'START TFT TEST' button in the 'TESTING ADVANCED	3C-KM-12-01-01	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>FUNCTIONS' tab.</p> <p>viii. Check if TFT Display is emitting the test pattern.</p> <p>2. Check PA/PIS, CCTV healthiness from PAPIS HMI by selecting 'DEVICE OVERVIEW ADVANCED FUNCTIONS' and by selecting one by one every individual subsystem of PAPIS/CCTV showing in the screen for every coach. If showing Green, it implies healthy, if showing Red, implies unhealthy and should be got attended.</p>						

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
95	PA & PIS	<ol style="list-style-type: none"> 1. Activate self-test through MCP and check any failures on MCP display . 2. Checking of manual announcement by MCP <ol style="list-style-type: none"> a. Press INT button on master MCP and check PA mode enable during PTT switch pressing b. Check announcement is executed from all loudspeakers (Internal and external) clearly 3. Check on manual announcement by ACP <ol style="list-style-type: none"> a. Push PTT to speak to the microphone of ACP. b. Check announcement is executed from all internal loudspeakers at clearly. 4. Check on Cab - Cab intercommunication by MCP <ol style="list-style-type: none"> a. Check that MCP becomes to CAB 	3C-KM-12-01-02,03	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>mode when the CREW CALL (C-C) button is pressed.</p> <p>b. CREW CALL button is blinking on MCP in leading (Occupied) and slave (that is non occupied) side</p> <p>c. Check that audible alarm is sounding in slave MCP.</p> <p>d. Press blinking button when the CREW CALL button is lit.</p> <p>e. Check that CAB/CAB intercommunication can be made.</p> <p>5. Check on Cab - Cab intercommunication by ACP</p> <p>a. Press CREW CALL (C-C) button on leading cab..</p> <p>b. C-C button is blinking on ACP in master and slave (non occupied) side.</p> <p>c. Check that audible alarm is sounding in slave (non occupied cab).</p> <p>d. Press blinking button</p>						

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>when the C-C button is lit.</p> <p>e. Check that CAB/CAB intercommunication can be made.</p>						
96	PA & PIS	PEAU, PAD push button – Functional test Perform intercom from every PEAU	3C-KM-12-01-04,05	X	X	X		
97	PA & PIS	Cab Speaker - Audio walk through test – 1. Go to the HMI and select [Audio Test] in the maintenance section 2. Check if Cab speaker is emitting the test tone.	3C-KM-12-01-06	X				
98	PA & PIS	Interior Speaker - Audio walk through test – 1. Go to the HMI and select 'START PRM TEST' button in the 'TESTING ADVANCED FUNCTIONS' tab. 2. Walk through the complete train interior and check if every audio device is emitting the test tone in interior speakers.	3C-KM-12-01-07	X	X	X		
99	PA & PIS	Exterior Speaker - Audio walk through test – 1. Go to the HMI and	3C-KM-12-01-08	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>select 'START test PRM' button in the 'TESTING .. ADVANCED FUNCTIONS' tab</p> <p>2. Walk left & right outside (left & right) the complete train and check if every audio device is emitting the test tone in exterior speakers (left & right)</p>						
100	PA & PIS	<p>iCom & FDI – Functional test Go to the HMI</p> <p>a. Select a PRM and check it is launched on the system.</p> <p>b. Check the distance to next stations and the automatic announcement.</p> <p>c. Check if Front destination indicator is emitting the test pattern.</p>	3C-KM-12-01-09, 12	X				
101	PA & PIS	<p>PIS HMI Functional test - Network Check:</p> <p>Use the TGUT to check if all devices are online</p> <p>a. One single device not discovered could mean a failure of the devices itself of a rupture in the cable between the switch and the device or a</p>	3C-KM-12-01-10	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		switch port not working. b. Multiple devices that are on the same IP cable in failure could mean that one of the devices is blocking the communication or a rupture in the cable between the switch and the first device or a switch port not working. c. All devices in a car not working could mean that the local switch is not powered or is not connected to the backbone.						
102	PA & PIS	Microphone + PTT – Functional test Audio function test: 1. Perform a PA from every ACP 2. Perform a PA from every microphone 3. Perform a PA from OCC / BCC 4. Perform cab-to-cab intercom 5. Perform intercom from every ACP 6. Perform intercom from every PEAU	3C-KM-12-01-13	X				
103	PA & PIS	Switch 28 ports –	3C-KM-12-02-01	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		Functional test Network Check: Use the TGUT to check if all devices are online a. One single device not discovered could mean a failure of the devices itself of a rupture in the cable between the switch and the device or a switch port not working. b. Multiple devices that are on the same ip cable in failure could mean that one of the devices is blocking the communication or a rupture in the cable between the switch and the first device or a switch port not working. c. All devices in a car not working could mean that the local switch is not powered or is not connected to the backbone.						
104	PA & PIS	Switch 16 ports – Functional test Network Check: Use the TGUT to check if all devices are online a. One single device not	3C-KM-12-02-02		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>discovered could mean a failure of the devices itself of a rupture in the cable between the switch and the device or a switch port not working.</p> <p>b. Multiple devices that are on the same ip cable in failure could mean that one of the devices is blocking the communication or a rupture in the cable between the switch and the first device or a switch port not working.</p> <p>c. All devices in a car not working could mean that the local switch is not powered or is not connected to the backbone.</p>						
105	PA & PIS	<p>Coupler box – Functional test</p> <p>Network Check:</p> <p>Use the TGUT to check if all devices are online</p> <p>a. One single device not discovered could mean a failure of the devices itself of a rupture in the cable between the switch and the device or a</p>	3C-KM-12-02-03	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		switch port not working. b. Multiple devices that are on the same ip cable in failure could mean that one of the devices is blocking the communication or a rupture in the cable between the switch and the first device or a switch port not working. c. All devices in a car not working could mean that the local switch is not powered or is not connected to the backbone.						
106	PA & PIS	DVR, CCTV HMI Functional Test – CCTV test 1. Go to the HMI and check the view on few cameras.	3C-KM-12-03-01,04	X				
107	PA & PIS	Saloon camera Functional Test – CCTV test 1. Go to the HMI and check the view on each camera.	3C-KM-12-03-02	X	X	X		
108	PA & PIS	Exterior camera Functional Test – CCTV test 1. Go to the HMI and check the view on	3C-KM-12-03-03	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		each camera.						
109	PAPIS-Cleaning	Clean with damp cloth the following PAPIS equipment 1. TFT Display 18.5" 2. CCU 3. PEAU 4. PAD push button 5. Saloon camera 6. I Com 7. Switch ports 28 8. Switch ports 16	3C-KM-12-01-01, 03, 04, 05, 09 3C-KM-12-02-01,02 3C-KM-12-03-02	X	X	X		
110	PAPIS – Cleaning	Clean the following equipment by blow out the dust, max 1 bar 1. Cab speaker 2. Interior Speaker 3. Exterior Speaker	3C-KM-12-01-06,07,08					
111	PAPIS-Cleaning	Clean with damp cloth the following PAPIS equipment 1. ACP 2. PIS HMI 3. Microphone + PTT 4. Digital Video Recorder (DVR) 5. CCTV HMI	3C-KM-12-01-02, 10,13 3C-KM-12-03-01,04	X				
112	PAPIS-Cleaning	Clean with damp cloth the following PAPIS equipment	3C-KM-12-03-03	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		1. External camera						
Task 3. Interior								
114	Electrical Distribution Board (EDB)	1. Check if the component is damaged or deteriorated. 2. Inspect that bolts of Relay and Contactor have loosened 3. Check if MCB and Diode fasten in DIN Rail. 4. Check that the letter of label is removed. 5. Check the cable connection state. 6. Check if Relay and Contactor make a noise.	3C-80140-01		X	X		
115	Passenger Seat	Inspect 1. Outer surfaces for damage or scratching 2. Seat pans, seat lower covers and seat brackets to ensure safety of mountings 3. Major scratches or cracks of the rubber seal between the seat back and the window panel, and also between the seat edge and the draught screen glazing panel	3C-80238-01	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
116	Grab pole & Rail	Inspect 1. The grab pole and grabrail outer surfaces for damage or scratching 2. Any tube or parts shows a major permanent deformation 3. Any slack fixing screws or bolts 4. A fracture over 3 mm in length	3C-80239-01	X	X	X		
117	Doorway & Gangway grab handle	Inspect 1. The doorway grab handle outer surfaces for damage or scratching 2. Any tube or parts shows a major permanent deformation 3. Any slack fixing screws or bolts 4. A fracture over 3 mm in length	3C-80239-07	X	X	X		
118	Strap hanger	Inspect the joint between the strap hanger and grab rail for any slack fixing bolts.	3C-80239-10	X	X	X		
119	Draught screen Glasses	Inspect 1. The condition of the draught screen glass. 2. The condition of the	3C-80239-12	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		fixing of the upper and lower parts of the draught screen glass for any slack fixing bolts and/or rubber packing						
120	Bulkhead panels	Inspect 1. The condition of the bulkhead panel paint of the surface for any scratches 2. The condition of the bulkhead panel fixings for any slack fixing	3C-80239-14	X	X	X		
121	Fire Extinguisher	1. Ensure the extinguisher is properly located in plain view and its access is unobstructed. 2. Visually check unit for any signs of corrosion, leakage or physical damage. 3. Ensure the nameplate is secure and legible and that operating instructions face outward. 4. Ensure visual inspection safety clip is in place and intact. 5. Visually check the discharge hose to ensure it is not damaged or obstructed.	3C-8023B-01	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		6. Date and initial the inspection tag and keep a record. 7. Check for expiry date.						
122	Fire Extinguisher	1. Clean the exterior of the Fire Extinguisher, polish the painted portion with wax polish, the brass / gun metal parts with metal polish, chromium parts with silver polish and plastic parts to be thoroughly washed with soap solution and dried in sun. 2. Check the nozzle outlets and vent holes as well as threaded portion of the valve for clogging and check the valve is clean and moving freely. 3. Ensure the cap washer is intact and also grease the threads of the valve, etc and wipe clean. 4. Make sure that the extinguisher is in proper condition and is not accidentally discharged. 5. Ensure that the pointer in the pressure gauge are in green zone, if not send it for refilling.	3C-8023B-02	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		6. Maintenance shall be carried out by professional firemen. 7. Keep a record of last maintenance check and expire date.						
123	Fire Extinguisher	1. Empty the contents of the extinguisher in clean buckets and remove all the components. If there are visible rust marks, wash the cylinder thoroughly with clean water. 2. Visually check the external surface of the fire extinguisher in respect of painting and if there is damage to the painting, the surface should be re-painted with the same colour shade. 3. Check up the condition of the label and if it is not in order, ensure to replace with correct label. Visually check the cylinder and its components in detail apart from functional point of view for any physical damage, cracks, dents etc. In case of any doubt, such components if those are pressure	3C-8023B-03	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>parts (like hose, body) should be subjected to hydraulic pressure test. If the damage is beyond repair, the part should be replaced by the correct component.</p> <p>4. The extinguisher after inspection should be refilled immediately and checked for the pressure in the pressure gauge and ensure the pointer in green zone. The date of inspection and refilling should be indelibly marked on the extinguisher and record in the register of the fire extinguishers.</p>						
124	Double corrugated bellows, compl.	Inspect, 1. Damages, cuts or tears in the fabric 2. Broken bellows frames 3. Worn sealing profiles 4. Evenly fitting on couple frames and screw-on frame	3C-80411-01, 02	X	X			
125	Double corrugated bellows, compl.	Clean bottom area [inner corrugated bellows and bridge plates]	3C-80411-01, 02	X	X			
126	Bridge plate, compl.	Inspect, 1. Sluggishness of rod	3C-80412-01	X	X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>hinge by carefully moving the floor flap up and down</p> <p>2. Bridge plates resting correctly on couple frame sided bridge plate</p> <p>3. Sliding ledge worn</p>						
127	Passenger Saloon Door	<p>1. Open/close the Passenger Saloon doors by pressing push buttons</p> <p>2. Check the results on TMS Display</p> <p>3. While Opening and closing door, check that doors open and close without obstruction.</p>	3C-80810-01	X	X	X		
128	Passenger Saloon Door	<p>1. Check function of obstruction detection.</p> <p>2. Check the indication of obstruction detection.</p> <p>3. Check the door movement monitor in opening direction.</p> <p>4. Check, if all securing elements of drive and limit switches are intact</p> <p>5. Check, if sealing wax(torque marking) at mounting screws is intact.</p>	3C-80810-02	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		6. Check the pull arms for mechanical damage. 7. Check drive unit. 8. Check the wiring and electrical attachments. 9. Check emergency access device manually. 10. Check emergency egress device manually. 11. Check the mechanical door cut out.						
129	Passenger Saloon Door	Check the painting surface for damage or corrosion	3C-80810-03	X	X	X		
130	Passenger Saloon Door	Inspect sealing joints of windows for damage	3C-80810-04	X	X	X		
131	Door leaf RH&LH	1. Clean top and rear edge, finger protection rubber from old grease and dirt before applying any new lubricant 2. Apply Silicon paste P4 to all circumferential door seals 3. Clean finger protection rubber afterwards with a dry cloth	3C-80811-01	X	X	X		
132	Door leaf RH&LH	Inspect , 1. The brushes at the bottom of the door leaf	3C-80811-02	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		for wear 2. The brushes on portal on top of the door leaf for wear						
133	Upper guide rail (complete right & left)	Inspect the stop buffers for the door open end position for wear. If necessary, replace.	3C-80812-02	X	X	X		
134	Drive unit	1. Clean and re-grease spindle (Klüber Isoflex LDS 18 Spezial A) 2. Check the surface of the spindle to see if any anodising is missing (bare aluminium visible),	3C-80813-01	X	X	X		
135	Drive mechanism	Clean and re- grease the locking & release lever on the locking unit of the drive (Isoflex Topas NB 52)	3C-80813-02	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
136	Cab Side Door	<ol style="list-style-type: none"> 1. Check for mounting of cab door limit switch 2. With the cab side door closed and from inside the cab, check rotation the main lock handle on the cab side door between in and out. 3. Check that the door unlocks and can be opened into the cab. 4. Check that the main lock springs back when the handle is released in the door open position. 5. Close the door and check that it closes correctly. 6. Check the door is manually operated door type. 7. Check Two rollers connected with panel and those operate on the upper track rail. 8. Check bottom guides are operated on bottom rail simultaneously with the action of the two rollers. 9. Check the door can withstand rough handling including slam-open and slam close by operation and 	3C-80820-01	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		maintenance personnel. 10. Check the stoppers are possible to completely buff for opening power. 11. Check the Auto-Locking mechanism 12. Check for play in doors 13. Visually check if there are any damaged areas on the access panel. 14. Check door status on TCMS						
137	Saloon to Cab Door (Partition door)	1. With the partition door closed, Check the hinged single leaf is located on right side of walkway from saloon side. 2. Check that the door unlocks and can be opened into the saloon. 3. Check that this leaf consists of a door handle located on cab side 4. Close the door and check that it met correctly between tongue of locking door and limit switch. 5. With the partition door	3C-80830-01	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>closed, Check the door leaf is opened into the saloon by a square key form the saloon side.</p> <p>6. Check that the door can be locked, bolted or wedged from either side of the door to prevent opening.</p> <p>7. Check that the visual and audible alarm is turned on automatically when Saloon to cab door in the unoccupied cab is opened.</p> <p>8. Check the door leaf is normally kept closed with the partition wall.</p> <p>9. Check the door is mounted on a vertical structure in back wall cubicle by full piano hinge</p> <p>10. Visually check if there are any damaged areas on the access panel.</p> <p>11. Check the partition door status of TMS</p> <p>12. Check the Partition door lock / open / close function and status on TMS.</p>						

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
138	VAC	1. Open VAC service hatch. 2. Clean FAT, SAT, RAT sensor. 3. Close service hatch. 4. Functionality check for smoke sensors	3C-191117-01 3C-192117-01 MWI	X X	X 	X 		
139	VAC- Saloon	Fresh air filter cleaning	3C-191120-01	X	X	X		
140	VAC- Saloon	Return air filter cleaning	3C-191121-01	X	X	X		
141	VAC- Cab	Mixed air filter cleaning	3C-192120-01	X				
Task 4. Exterior								
142	Bridge plate, compl. couple frame side	Visually check 1. For tears and holes in fabric 2. To see if couple frames do not evenly fit 3. Sliding ledge worn/damaged	3C-80413-01	X	X	X		
Task 5. Roof								
143	VAC 3 phase 415V AC& 110V DC Power Plug (Saloon and Cab)	1. Inspect the 110V connector located on the panel. Check that it is locked in position. 2. Ensure no force has been used to connector in 110 V DC power cable and there is no existing physical or structural damage. 3. After visual inspection turn ON main control	3C-191130-01 3C-192127-01	X X	X 	X 		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		switch, and start the unit. Ensure the unit is operable. 4. Inspect the three-phase connector located on the panel. Check that it is locked in position. 5. Check that there are no loose pins in the insert module. 6. After visual inspection turn ON main control switch, and start the unit. Ensure the unit is operable.						
144	VAC (Saloon and Cab)	1. With power applied to the electrical cubicle, check that there are NO faults are available in TCMS 2. Run the VAC in Normal AUTO mode and observe any unusual noise in any VAC 3. Operate the A/C unit in each sub mode state and check that the unit provides the correct air conditioning operation, and that all components appear to be operating correctly. 4. Check that the sight glass is full (colour	3C-191110-03 3C-192110-01	X X	X X	X X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		change).						
145	VAC (Saloon and Cab)	1. Check the tray and drain under evaporator coil to see if any debris is found clean the tray and drain. 2. Check and clean if necessary drains in the condenser coil compartment	3C-191110-04 3C-192110-02	X X	X 	X 		
146	High Pressure Switch (incl. low pressure switch & sensor) (Ceiling & Cab Ceiling)	1. Fault message will be trigger on TCMS 2. If found fault, check the HP switch	3C-191115-01,02,03 3C-192115-01,02	X X	X 	X 		
147	VAC (Saloon and Cab)	1. Check that the sight glass is full (colour change). 2. Check that the plugs are locked into the position. 3. Check that the wiring is undamaged and is clear of the fan wheel. 4. Check that the wiring is not touching the evaporator coil fins. 5. Check that the wiring looms clear the condenser fan blades. 6. Check that the cable	3C-191116-01 3C-192116-01	X X	X 	X 		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		glands throughout the unit are tight.						
Task 6. Functional checks								
148	TCMS-Central Control Unit-CCU	a. Turn OFF control power to the Central Control Unit. b. Check the connector insulating materials for any defects, damage and contamination. Replace if necessary. c. Check the condition of the pins and sockets for defect and damage. Replace if necessary.	3C-1A1100-01	X				
149	TCMS-Communication Node	a. Turn OFF control power to the Communication Node. b. Check the connector insulating materials for any defects, damage and contamination. Replace if necessary. c. Check the condition of the pins and sockets for defect and damage. Replace if necessary.	3C-1A1200-01	X	X	X		
150	TCMS-Remote I/O	a. Turn OFF control power to the Remote I/O Unit and inputted/outputted signal source powers.	3C-1A1400-01	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		b. Check the connector insulating materials for any defects, damage and contamination. Replace if necessary. c. Check the condition of the pins and sockets for defect and damage. Replace if necessary.						
151	TCMS- Video display Unit	9. Check connector insulating materials for defect, damage and contamination. Replace if necessary. 10. Check the condition of the pins and sockets for defect and damage. Replace if necessary 11. Check frame for damage, defect and contamination, clean with a vacuum cleaner, alcohol and a dry cloth if required. 12. Check connecting cables for signs of damage. Repair if necessary.	3C-1A1300-021	X				
152	Brake System	1. Check the Brake page on TCMS monitor 2. Inspect MR Pressure (8 to 10 bar) and BP pressure (5 bar) from	3C-KM610-01	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		gauges in the Cab.						
153	Brake System	1. Check that brake equipment is working without any abnormal noise. 2. Check that each isolation cock is working properly. 3. Check that air hose (BC hose, Parking hose etc) is not detect any damage. 4. Check that EBCU is not display any fault. 5. Check that pressure gauge in the cab working properly.	3C-KM610-02	X	X	X		
154	Brake System	1. Parking Brake test a. Press Parking Brake Apply push button, on operation panel. b. Ensure the Parking Brake Apply push button illuminate. c. Press Parking Brake Release push button, on operation panel. d. Ensure that Parking Brake Apply push button goes off. 2. Service Brake test	3C-KM610-03	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		a. Ensure that main reservoir pressure gauge in the cab indicates between 7.5 bar and 10 bars. b. Move MASCON to brake position. Check that brake cylinder (BC) pressure gauge in the cab increase around 2.5 bar (+/- 0.25bar) and Brake Pipe (BP) pressure gauge in the Cab read 5.0 bars. c. Move MASCON to COAST position. Ensure that BC gauge indication in the cab decreases.						
155	Brake System	1. Emergency brake test a. Ensure that main reservoir pressure gauge in the cab indicates between 7.5 bar and 10 bars b. Move MASCON to emergency brake position. Check that brake cylinder (BC) pressure gauge in the cab increase around 3.0 bar (+/- 0.25bar) and Brake Pipe (BP)	3C-KM610-04	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>pressure gauge in the Cab read 5.0 bars</p> <p>c. Move MASCON to COAST position. Ensure that BC gauge indication in the cab decreases.</p> <p>2. Back up brake test</p> <p>a. Move pneumatic controller is intermediate position. Ensure that Brake Pipe (BP) pressure gauge in the cab indicate and maintain 5.0 bars.</p> <p>b. Move pneumatic controller to vent position. Ensure that Brake Pipe (BP) pressure gauge in the cab decreases below 3.0bar and BC gauge indication in the cab 3.0bar (\pm 0.2 bar).</p> <p>c. Move pneumatic controller is charging position. Ensure that Brake Pipe (BP) pressure gauge in the cab indicate and maintain 5.0 bars and BC gauge</p>						

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		indication in the cab decreases.						
156	Inspection of earth brush assembly (Ground contact assembly)	Carry out a visual inspection of the ground contact. Basically damaged parts have to be replaced against new ones. Replace the carbon brush if the remaining height is equal or smaller than 27 mm	3C-010800-01	X	X	X		
157	FDS – Smoke Toxicity (STD) and Smoke & Heat detectors (SHD)	Functional Check 1. Go to the cockpit (1-Fig.1); 2. Find the monitor HMI (Fig.2); 3. Turn on the monitor HMI (Fig.3); 4. Check that the alarm status is all "ok". 5. Go into the various carriages and find the STD and SHD sensors (Fig.5 and Fig.6). 6. Use the tester for smoke detectors for the on-site testing of the detectors by means of a spray designed to simulate smoke particles (1-Fig.4 for STD and 2-Fig.4 for SHD). Do not remove the test device from the detector; the optical smoke sensor activates	MR1-01A-TC001	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>approximately 60 seconds after the application of the test aerosol</p> <p>7. Return to the cockpit and check that alarms are reported on the monitor and reset the alarms (Fig.2).</p>						
158	FDS – Smoke Toxicity (STD) and Smoke & Heat detectors (SHD)	<p>Cleaning</p> <p>The cleaning of smoke sensors must be performed in order to remove the eventual dirt accumulated externally during the first months of life of the carriage and operation of the system. The execution does not include the disassembly of the unit from its installation position. Perform the operations described below with the unit not powered.</p> <p>Access the sensor and perform the following operations: 1. Vacuum the dust on the outside of the unit, especially that deposited on the grid.</p>	MR1-01A-TC002	X	X	X		

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				DM	T	M		
		2. Once the external dust has been sucked in, use compressed air (MAX 4BAR) from blow inside the grill, performing several full turns of the same. 3. If necessary, vacuum the dust coming out of the sensor again.						
159	FDS – Remote Modules MR-LHD for Interfacing with LHD Detectors	1. Go into the technical area DMC-Car-1, DMC Car-6 (1-Fig.1) and TC-Car 2, MC-Car3, MC-Car4, TC-Car5 (Fig.2). 2. Check that the temperature sensitive cables are correctly connected (1-Fig.3). 3. Go to theDMC-Car1 and DMC Car-6 (1-Fig4). 4. Locate the HMI monitor (1-Fig.5). 5. Check that each MR-LHD has its own IP address (different from the others) and that they are read correctly	MR1-01A-TC007	X	X	X		
160	Collector Shoe Junction Box	1. Check if the component is damaged or deteriorated. 2. Inspect that bolts of bus bar have not loosened. Retighten the bolts if necessary.	3C-KM512-01	X		X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		3. Inspect that the component labelling are existing.						
161	Stinger Box	1. Check if the component is damaged or deteriorated. 2. Inspect that bolts of Terminal Block and Receptacle have not loosened Retighten the bolts if loose. 3. Inspect that the component labelling are existing. 4. Check the cable connection state.	3C-KM513-01	X		X		
162	BCB Panel	1. AUX OFF the train. 2. Turn the Battery Isolation Switch (BIS) to off position. 3. Unlock and open the inspection cover of end cubicle with maintenance key. 4. Disconnect the connectors connected 5. Unlock and open the front cover of BCB with maintenance key. 6. Visually inspect the inside component in upper area of BCB. 7. If found any obstacle or	3C-119000-01		X			

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		<p>dust, remove the obstacle and clean the dust with low compressed air (2 bar). Direct the air jet in the opposite direction of the airflow or absorb dust from the component.</p> <p>8. Check the cable connection on the terminal for any damage and rectify if found damage.</p> <p>9. Check the fixing fasteners of inside components. If found looseness, tighten the loosened bolts.</p> <p>10. Close and lock the box cover of BCB with maintenance key.</p> <p>11. Connect the connectors & cables disconnected.</p> <p>12. Close the inspection cover of end cubicle and lock.</p> <p>13. Turn ON the power supply to the BCB by restoring the BIS to on position and AUX ON.</p>						
163	Windows	Check if the window glasses (Windscreen and Bodyside windows glasses) are broken or	3C-80221-01	X	X	X		

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
		cracked, or the glazing sealing is damaged						
164	Signages & Stickers	<p>Inspection of Marking and Labelling</p> <p>If the marking / labelling is stained, has colour fading, is stretched, and shrunk, blistered or peeling off, replace in accordance within Maintenance Work Instruction 3C-80237-02 "Replacement of Marking and Labelling".</p>	3C-80237-01	X	X	X		
165	TCMS	<ol style="list-style-type: none"> 1. Check from TCMS display that there is no faulty equipment on the train. 2. Check door screen for faults and cutout switch position. 3. Check brake screens for brake controller and cutout switch. 4. Check powering screen for position of VVVF. 5. Check Auxiliary screen for APS position. 6. Perform on-board test for VVVF, APS, BECU, VAC, DCU, etc 7. Function test through TCMS for Interior Saloon light. 	-	X				

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Task No	Equipment	Maintenance Actions	MWI No.	Car Applicability			Result	Remark
				DM	T	M		
166	Electrical Jumper	Visually check for any abnormalities	-	X	X	X		
167	Exterior	Visually check for any abnormalities	-	X	X	X		
168	Interior end wall panel	Check end wall panel fixing and its locking arrangement	-	X	X	X		
169	Under frame equipment	Visually check all under frame equipment cover and their fixation	-	X	X	X		
170	Cab light & Console light	Check driving console light by operating Driving Console Light Switch	-	X				
171	Head light and Tail light	3. Check head lights by operating Head Light Switch (HLS). 4. Check tail lights functionality	-	X				
172	Exterior Indicator	Check the function of Train Number Indicator(TNI) & Destination Indicator Front(DIF), Door Indicator Lamps	-	X	X	X		
173	Flasher Light	Check the flasher light function in MS FOR/REV & SCS cut-out mode.	-	X				
174	Air Horn	Check the operation (Dual tone)	-	X				
175	Sun Visor	Check functionality of sun visor	-	X				
176	VAC	Smoke sensor	-	X	X	X		



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