

**SKILLS FRAMEWORK FOR PUBLIC TRANSPORT
TECHNICAL SKILLS AND COMPETENCIES (TSC) REFERENCE DOCUMENT**

TSC Category	Rail Systems Maintenance					
TSC	Rolling Stock Air-conditioning and Ventilation Systems Maintenance					
TSC Description	Implement preventive and corrective maintenance activities of rolling stock air-conditioning and ventilation systems					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	PTP-RSM-1026-1.1	PTP-RSM-2026-1.1	PTP-RSM-3026-1.1	PTP-RSM-4026-1.1		
	Carry out scheduled preventive maintenance work on rolling stock air-conditioning and ventilation systems	Conduct corrective maintenance on rolling stock air-conditioning and ventilation systems	Troubleshoot faulty rolling stock air-conditioning and ventilation systems to locate faults and recommend rectification methods	Diagnose root causes of rolling stock air-conditioning and ventilation systems failure and review maintenance plans to prevent fault recurrence		
Knowledge	<ul style="list-style-type: none"> Operating principles, functions and features of rolling stock air-conditioning and ventilation systems Types of rolling stock air-conditioning and ventilation systems Types of components in rolling stock air-conditioning and ventilation systems Procedures for servicing rolling stock air-conditioning and ventilation systems in accordance to organisational maintenance procedures, Work Instructions (WI) and/or Original Equipment Manufacturer (OEM) technical manuals Types and usage of tools and equipment for carrying out preventive maintenance on rolling stock air-conditioning and ventilation systems Safety guidelines on use of tools and equipment 	<ul style="list-style-type: none"> Operating principles, functions and features of rolling stock air-conditioning and ventilation systems Types of rolling stock air-conditioning and ventilation systems Types of components in rolling stock air-conditioning and ventilation systems Principles of electrical and electronic circuitry, printed circuit board (PCB) and schematic drawings Working principles of compressor, refrigeration, and piping drawings Common failures of rolling stock air-conditioning and ventilation systems Procedures to dismantle repair, replace, and re-assemble rolling stock air-conditioning and ventilation systems and its components 	<ul style="list-style-type: none"> Operating principles, functions and features of rolling stock air-conditioning and ventilation systems Principles of electrical and electronic circuitry, printed circuit board (PCB) and schematic drawings Working principles of compressor, refrigeration, and piping drawings Concepts of refrigeration cycles and vapour compression Principles of electrical installation and power distribution Common fault symptoms in rolling stock air-conditioning and ventilation systems Methods of locating and rectifying faults Types and usage of troubleshooting techniques, equipment and tools Safety guidelines for usage of tools and 	<ul style="list-style-type: none"> Factors affecting rolling stock air-conditioning and ventilation systems and components performance Failure investigation and prevention methods Methods and tools for diagnostic analysis Organisational maintenance procedures, Work Instructions (WI) and Original Equipment Manufacturer (OEM) technical recommendations Types and methods of functional tests on rolling stock air-conditioning and ventilation systems Functional relationships between, rolling stock air-conditioning and ventilation systems, other rolling stock systems, plant equipment and the overall rail system 		

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	<p>for preventive maintenance on rolling stock air-conditioning and ventilation systems</p> <ul style="list-style-type: none"> • Types and usage of Personal Protective Equipment (PPE) for rolling stock air conditioning and ventilation systems maintenance • Organisational maintenance documentation and fault reporting procedure for rolling stock air-conditioning and ventilation systems maintenance 	<ul style="list-style-type: none"> • Procedures to identify rolling stock air-conditioning and ventilation systems faults • Types and usage of tools and equipment for carrying out corrective maintenance on rolling stock air-conditioning and ventilation systems • Safety guidelines on use of tools and equipment for corrective maintenance on rolling stock air-conditioning and ventilation systems • Types and usage of Personal Protective Equipment (PPE) for rolling stock air conditioning and ventilation systems maintenance 	<p>equipment in troubleshooting rolling stock air-conditioning and ventilation systems</p>			
Abilities	<ul style="list-style-type: none"> • Perform preparation work to conduct maintenance on rolling stock air-conditioning and ventilation systems • Follow organisational maintenance procedures, WI and/or OEM technical manuals to carry out preventive maintenance on rolling stock air-conditioning and ventilation systems • Perform functionality checks on rolling stock air-conditioning and ventilation systems • Adhere to safety guidelines and operating instructions for tools and equipment during maintenance work 	<ul style="list-style-type: none"> • Interpret work orders and prepare for corrective maintenance • Apply fault identification procedures to determine causes of fault in rolling stock air-conditioning and ventilation systems • Dismantle rolling stock air-conditioning and ventilation components for corrective maintenance • Carry out rectification, repair and/or replacement of faulty components • Reassemble and reinstate rolling stock air-conditioning and ventilation systems • Perform functional tests to determine serviceability of rolling 	<ul style="list-style-type: none"> • Use troubleshooting tools, equipment and methods to locate and analyse causes of rolling stock air-conditioning and ventilation system faults • Recommend corrective actions for identified faults on rolling stock air-conditioning and ventilation systems • Implement procedures on safe usage of tools and equipment during maintenance work • Analyse maintenance work documented for rolling stock air-conditioning and ventilation systems to identify possible workflow improvements so as to prevent fault recurrence 	<ul style="list-style-type: none"> • Establish structured failure investigation and specify functional testing requirements • Apply failure investigation methods to diagnose root cause failure of rolling stock air-conditioning and ventilation systems • Review organisational rolling stock air-conditioning and ventilation systems maintenance procedures • Propose new and/or enhanced maintenance procedures and/or WI in reference to OEM technical recommendations • Monitor overall maintenance progress of rolling stock air- 		

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	<ul style="list-style-type: none"> Record rolling stock air-conditioning and ventilation systems maintenance activities and report occurrences of potential faults identified 	<p>stock air-conditioning and ventilation systems</p> <ul style="list-style-type: none"> Apply operating and safety measures in operating tools and equipment during maintenance work Record and collate documentation of rolling stock air-conditioning and ventilation systems maintenance work 		<p>conditioning and ventilation systems to ascertain effectiveness of maintenance procedures</p> <ul style="list-style-type: none"> Develop solutions by analysing diagnostic data to prevent faults and failures recurrence Develop troubleshooting, rectification and fault analysis methods Develop test procedures for system performance checks Coordinate rolling stock air-conditioning and ventilation systems maintenance with other rail systems maintenance needs 		
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