

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

TSC Category	Rail Systems Maintenance					
TSC	Locomotive Maintenance					
TSC Description	Implement preventive and corrective maintenance activities of locomotive					
TSC Proficiency Description	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
	PTP-RSM-1017-1.1	PTP-RSM-2017-1.1	PTP-RSM-3017-1.1	PTP-RSM-4017-1.1		
	Carry out scheduled preventive maintenance on locomotives	Conduct corrective maintenance on locomotives	Troubleshoot faults on locomotives to locate faults and recommend rectifications methods	Diagnose root causes of failure in locomotives to review root causes and review maintenance plans to prevent fault recurrence		
Knowledge	<ul style="list-style-type: none"> Operating principles of locomotives Types of locomotives that includes: <ul style="list-style-type: none"> Diesel locomotive Electrical Locomotive Types and functions of locomotive systems and components that includes: <ul style="list-style-type: none"> Mechanical systems Electrical and electronic systems Pneumatic systems Procedures for servicing locomotives in accordance to organisational maintenance procedures, Work Instructions (WI) and/or Original Equipment Manufacturer (OEM) technical manuals Types of tools and equipment for carrying out locomotive preventive maintenance Safety guidelines on use of tools and equipment for locomotive preventive maintenance 	<ul style="list-style-type: none"> Operating principles of locomotives Types of locomotives that includes: <ul style="list-style-type: none"> Diesel locomotives Electrical locomotives Types and functions of locomotive systems and components that includes: <ul style="list-style-type: none"> Mechanical systems Electrical and electronic systems Pneumatic systems Common failures and symptoms of locomotive systems Procedures to identify locomotive systems and components faults Procedures to dismantle, rectify, repair, replace, and reassemble locomotive systems Procedures to reinstate locomotive systems Procedures for conducting system performance and functionality checks on locomotive systems 	<ul style="list-style-type: none"> Fundamentals of diesel engine, generator and electric traction Electronics circuit diagram and electrical wiring schematics Pneumatic circuit diagrams Common fault symptoms of locomotive systems Methods of locating and rectifying faults Types of troubleshooting techniques, equipment, tools and software Safety guidelines for usage of tools and equipment to execute locomotive troubleshooting 	<ul style="list-style-type: none"> Factors affecting locomotive 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 Locomotive running behaviour in curved and straight tracks Kinematic and dynamic features of locomotive Principles of collision and derailment Types and methods of locomotive functional tests Functional relationships between locomotives, other engineering trains and plant equipment, and the overall rail systems 		

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	<ul style="list-style-type: none"> Types and usage of Personal Protective Equipment (PPE) for locomotive maintenance Organisational maintenance documentation and fault reporting procedures 	<ul style="list-style-type: none"> Types of tools and equipment for carrying out locomotive corrective maintenance Safety guidelines on use of tools and equipment for locomotive corrective maintenance Types and usage of Personal Protective Equipment (PPE) for locomotive maintenance 				
Abilities	<ul style="list-style-type: none"> Perform preparation work to conduct locomotive preventive maintenance Follow organisational maintenance procedure, WI and/or OEM technical manuals to carry out preventive maintenance on locomotive Carry out functionality checks on locomotive operations Adhere to safety guidelines and operating instructions for tools and equipment during maintenance work Record locomotive maintenance activities and report occurrences of faults identified 	<ul style="list-style-type: none"> Interpret work orders and prepare for corrective maintenance Apply fault identification procedures to determine causes of locomotive faults Dismantle locomotive systems for corrective maintenance Rectify, repair and/or replace faulty locomotive components Reassemble and reinstate locomotive systems Conduct functional tests to determine operability of locomotive systems Apply operating and safety measures in operating tools and equipment during maintenance work Record and collate documentation of locomotive maintenance work 	<ul style="list-style-type: none"> Use troubleshooting tools, equipment and methods to locate and analyse causes of locomotive faults Recommend corrective actions for identified faults on locomotive Implement procedures on safety tools and equipment usage during maintenance work Analyse locomotive maintenance work documented 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 Perform fault tree analyses to diagnose root cause failure of locomotive systems Review organisational maintenance procedures and WI Propose new and/or enhanced maintenance procedures and WI in reference to OEM technical recommendations Monitor overall maintenance progress of locomotive to ascertain effectiveness of maintenance procedures Develop solutions by analysing diagnostic data to prevent faults and failures recurrence Develop troubleshooting, rectification and fault analysis methods Develop test procedures and WI for locomotive performance checks 		

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				<ul style="list-style-type: none">• Coordinate locomotive maintenance with other rail systems maintenance needs		
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