

Maintenance Support Workforce Category

LOGISTICS COMMUNITY OF INTEREST

5803 HEAVY MOBILE EQUIPMENT MECHANIC SERIES Competency-Based Learning Map and Training Strategy

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Heavy Mobile Equipment Mechanic Competency-Based Learning Map Overview

The United States Marine Corps (USMC) Logistics Community of Interest (COI) developed this competency-based learning map to support 5803 Heavy Mobile Equipment Mechanic series professional development of technical competencies and training. This learning map is organized by a group of competencies, which together define successful performance in the 5803 Heavy Mobile Equipment Mechanic series. Competency-based learning maps are essential resources for career development and useful for identifying the knowledge and skillsets needed to meet and/or enhance their skills in this occupational series.

Learning maps are comprised of several components, described in Table 1 below:

Competency Titles and Definitions	Describe the capabilities required within a particular position or job role
Proficiency Target Levels	Define different levels of required performance (Entry, Journeyman, Expert) within a competency area
Behavioral Indicators (BIs)	Examples of activities performed by an individual that illustrate how a competency is demonstrated at varying levels of proficiency: Entry, Journeyman, and Expert
	Mandatory: Training required to be completed based on Federal, State, or Marine Corps requirements/regulations
	Recommended : Core, Core-Plus, and Sustainment training identified to enhance performance in competency areas
Training	• Core: Initial training that all personnel should have in related position from entry to senior levels
	 Core-Plus: Advanced training that is necessary for career progression that all mid-senior personnel should have in addition to the core training. Core-Plus training is recommended for personnel from Wage Grade/Wage Leader/Wage Supervisor/Wage Determination (WG/WL/WS/WD)-5 to WG/WL/WS/WD-13
	 Sustainment: Training intended to maintain credentials or a good training course to have, but not necessary for career advancement

Table 1. Components of a Competency-Based Learning Map

Heavy Mobile Equipment Mechanic Series Defined

The 5803 standard covers work involved in the maintenance, repair, and modification of heavy-duty vehicles and mobile equipment that have utility systems or special hydraulic, pneumatic, mechanical, electrical, or electronic systems, features, or controls designed for such purposes as construction, combat, earth moving, ship loading, firefighting, and comparable industrial or special applications. Examples of heavy-duty equipment covered by this series include bulldozers, road graders, crawler tractors, power shovels, locomotives, combat tanks, cranes, large missile transporters, and fire trucks. The repair of major systems (such as diesel, gasoline, multi-fuel, and turbine engines; automatic, standard, and cross-drive transmissions; heavy-duty driveline systems; and hydraulic, electrical, and mechanical utility systems) is included, whether accomplished as part of or apart from repair of the total piece of heavy mobile equipment involved. The work requires knowledge of how heavy duty machinery, engines, parts, and systems work; ability to detect faulty items, determine causes of malfunction, and determine best repair methods; and skill to assemble, disassemble, repair, or modify components and systems.

Competency Areas

Six competencies have been identified for the successful performance in the 5803 series:

- 1. Direction and Comprehension
- 2. Instructions and Specifications
- 3. Tools and Equipment

- 4. Equipment Installation and Repair
- 5. Troubleshooting
- 6. Measuring Instruments

Proficiency and Skill Band Definitions

The Proficiency Rating Scale (Table 2) below details the rating given for each level of proficiency and its corresponding definition. Proficiency levels describe the degree of competency required to perform a specific job successfully; these levels relate to the work required for a specific job. Different jobs require different levels of proficiency for successful performance. The proficiency levels provided in this learning map indicate the minimum proficiency target for successful performance.

1	Basic No Proficiency Conceptual Knowledge Only/No Experie		Conceptual Knowledge Only/No Experience		
2	Applied	Low Proficiency Able to Apply with Help			
3	Intermediate	Moderate Proficiency	Able to Apply Autonomously		
4	Advanced	Advanced High Proficiency Proficient/Able to Help Others			
5	Expert	Very High Proficiency	Expert Knowledge		
	1 2 3 4 5	2Applied3Intermediate4Advanced	1BasicNo Proficiency2AppliedLow Proficiency3IntermediateModerate Proficiency4AdvancedHigh Proficiency		

Table 2.	Proficiency	Rating Scale
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The USMC COIs have outlined a career progress structure that more accurately reflects the change in your abilities and responsibilities over time. That structure is called the Skill Level Structure (Tables 3 and 4). It is associated with each occupational series and follows you from the time you are an entry-level employee until you attain the level of a management employee. Career progress in the USMC has traditionally

been based on the federal government pay schedule system. The ratings within the pay schedule system are associated with Job Skill Levels within the 5803 series indicated as follows:

Job Skill Level	Definition	Pay Plan	Beginning Grade	Target Grade	
1	Entry	WG	5	8	
2	Journeyman	WG/WL	9	10	
3	Expert	WG/WL	9	13	

Table 3. WG/WL Skill Level Structure

Table 4. WD/WS Skill Level Structure

Job Skill Level	Definition	Pay Plan	Beginning Grade	Target Grade
2	Journeyman	WD	6	8
3	Expert	WS	8	13

Behavioral Indicators (BIs)

It is important to define how competencies are manifested at different skill levels. Behavioral Indicators are on-the-job examples of behaviors and activities that illustrate how a competency is demonstrated at varying skill levels and provide an objective description of the behavior that can be observed in an individual as evidence that they either have or do not have the skills at the required level needed for the competency. These are examples of what the competency could look like at varying skill levels and are not inclusive of all behaviors demonstrating the competency for each skill level. This information is provided as a tool to help guide evaluations of employee proficiency; however, it should not be used as a checklist for employees' behaviors.

Certifications and Training

Certifications are a practical option for formalizing a specific competency or skillset. The Logistics COI has identified several certifications (Table 5) that are applicable to the 5803 series. While these certifications are not required, staff are encouraged to complete these programs to improve and formalize their skillsets. However, some certifications below may be required according to your command and billet. Work with your supervisor to ensure you meet command certification training requirements.

Table 5. Certifications

Certification / Program	Vendor
EPA Certification in Air Conditioning	Automotive Service Excellence (ASE)
Electric Power Lifts (Electric Boom Lift Service Training)	JLG Corp
Fuel Power Lifts (Boom Lift Service Training)	JLG Corp
Mobile Crane Operator	Crane Inspection & Certification Bureau (CICB)
Medium-Heavy Truck Cert	ASE
Auto Maintenance and Light Repair Cert	ASE
Truck Equipment Cert (Tests: E1-E3)	ASE
Electronic Diesel Engine Diagnosis Specialist Cert (Test: L2)	ASE
Parts Specialist Certification (Tests P1: Medium-Heavy Truck Parts specialists)	ASE
Medium/Heavy Truck Technology Program	Hennepin Technical College
Fire Bottle and Hydrostatic Testing	Department of Transportation
Air Conditioning Certification	OshKosh
Team Leader, Supervisor, Manager Certificate Programs	Graduate School USA
Fluid Power Hydraulic Specialist Certification	NTT

The Core and Core-Plus training courses found in Appendix A are recommended and may not be inclusive of all training available. These courses are aligned to competencies throughout the learning map. Training titles and vendors are subject to change as the courses evolve. Additionally, several external resources (Defense Acquisition University (DAU), MarineNet, Learning Tree, Lynda.com, etc.) provide a variety of training opportunities available to all personnel for professional knowledge and skill enhancement.

Competency Model

A competency model is a group of competencies that together define successful performance in a particular occupation. The Logistics COI has adapted this model from the Department of the Navy (DON) Office of Civilian Human Resources (OCHR) for the 5803 series. The competency model, to include definitions, corresponding BIs, minimum proficiency target levels, and training has been provided in the charts below.

COMPETENCY	DEFINITION		
1. Direction and Comprehension	Understands and carries out instructions involving tasks, decisions, policies, procedures, and directives.		
	MI	NIMUM PROFICIENCY TARGET LEVELS	
Job Skill Le	evel 1: Entry /Apprentice	Job Skill Level 2: Journeyman	Job Skill Level 3: Expert
	2	4	5
		BEHAVORIAL INDICATORS	
Entry	 Accomplishes work in accordance with instructions provided by higher graded employees. Follows posted safety regulations (e.g., safety data sheet, first aid instructions). Follows heavy mobile equipment trade requirements to accomplish assigned tasks. Follows oral directions given by team members to complete assignments. 		
Journeyman	 Oversees work accomplished by entry-level staff. Follows oral or written directions to accomplish diagnostic procedures. Follows specific oral instructions from immediate supervisor or work leader to complete work assignments. 		
Expert	 Keeps journey level workers supplied with tools and work materials as instructed. Carries out directions from upper-level management. Interprets instructions and communicates its relevance to assigned tasks. 		

COMPETENCY	DEFINITION			
2. Instructions and Specifications	Understands and interprets written material, including technical material, rules, regulations, instructions, reports, drawings, schematics, charts, graphs, or tables.			
	MI	NIMUM PROFICIENCY TARGET LEVELS		
Job Skill Le	Job Skill Level 1: Entry /ApprenticeJob Skill Level 2: JourneymanJob Skill Level 3: Expert			
	2	3	4	
		BEHAVORIAL INDICATORS		
Entry	-	verification checklist and modification sheets to maintand manuals (e.g., manufacturer's manuals, technical pu mpleted correctly.	•	
Journeyman	 Instructs coworkers on researching and interpretation of heavy mobile equipment repair information using diagrams and electrical schematics. Instructs teams on techniques and repair methods for modifying heavy mobile equipment. Interprets technical manuals, work instructions, blueprints, and inspection reports to communicate work requirement problems to management. Interprets safety instructions and manuals to verify heavy mobile equipment maintenance and repairs are completed safely. Interprets technical material, work instructions, and other guideline material to maintain quality control of heavy mobile equipment and work products. Reads and interprets instructions, standards, job orders, drawings, and blueprints to determine the overall inspection needs and 			
Expert	 quality checkpoints for heavy mobile equipment repair work. Interprets and maintains heavy mobile equipment modification and technical instructions in a computer database. Maintains provided updates on heavy mobile equipment inspection plans, manuals, and engineering instructions for compliance with current policies and regulations. Reads and interprets shop repair orders, original equipment manufacturers manuals, blueprints, and recall notifications to verify functionality of heavy mobile equipment. Interprets contract data, condition codes, blueprints, and drawings to determine if additional heavy equipment modifications are required. (QA) Interprets heavy mobile equipment procedures, instructions, and sketches to prepare procedures or checklists for quality control. (QA) 			

COMPETENCY	DEFINITION		
3. Tools and Equipment	Uses and maintains tools, instruments, and related equipment as appropriate to one or more lines of work. Performs maintenance work on tools and equipment and makes adjustments on equipment to operating tolerances.		
	MI	NIMUM PROFICIENCY TARGET LEVELS	
Job Skill L	evel 1: Entry /Apprentice	Job Skill Level 2: Journeyman	Job Skill Level 3: Expert
	2	4	5
		BEHAVORIAL INDICATORS	
Entry	 Identifies specialized tools (e.g., torque wrench, impact wrench, electric and pneumatic drill, special puller, grinder, jack, crane, hoist, hydraulic drill press) needed to repair heavy mobile equipment and vehicles. Uses basic tools (e.g., wrenches, sockets, torque wrenches, brake tools, screwdrivers, air and electric power tools) to repair or modify heavy mobile equipment. Inspects tools and equipment to ensure they are safe and serviceable. Responsible for personal issued tools. Cleans and maintains work areas in compliance with shop housekeeping rules. 		
Journeyman	 Operates vehicles for specific testing. Uses specialized tools and machinery (e.g., dial indicators, micrometers, calipers, dynamometer) to repair or modify heavy mobile equipment. Inspects tools and equipment to ensure they are safe and serviceable. 		
Expert	 Inspects tools and equipment to ensure they are safe and serviceable. Ensures tools are within calibration, serviceable, and perform accordingly. Oversees and maintains shop tools and equipment inventory and serviceability. Inspects tools and equipment to ensure they are safe and serviceable. 		

COMPETENCY	DEFINITION		
4. Equipment Installation & Repair	Assembles, disassembles, fabricates, installs, tests, repairs, adjusts and maintains equipment.		
	M	INIMUM PROFICIENCY TARGET LEVELS	
Job Skill Le	vel 1: Entry /Apprentice	Job Skill Level 2: Journeyman	Job Skill Level 3: Expert
	2	4	5
		BEHAVORIAL INDICATORS	
Entry	 Performs as an apprentice to a journeyman level mechanic. Gains knowledge of equipment and work processes. Executes periodic maintenance on heavy equipment and cranes. 		
Journeyman	 Diagnoses, tests, and troubleshoots. Performs extensive repairs or applies approved modifications on equipment with use of technical manuals, schematics, and special tools. Performs in absence of supervision. Inspects and ensures repairs and modifications are in compliance with quality control standards and procedures. Ensures documentation is compliant with job taskers. 		
Expert	 Ensures documentation is compliant with job taskers. Provides guidance and validates final inspection, tests, and repairs. Ensures all proper documentation is utilized. Ensures total performance of the product meets the prescribed standards. Maintains and communicates current knowledge on equipment for test and repairs. 		

COMPETENCY	DEFINITION		
5. Troubleshooting	Maintains knowledge of the complex relationships of mechanical, pneumatic, electrical, structural or hydraulic systems to identify malfunctions and errors using appropriate tests to determine method of repairs.		
	MI	NIMUM PROFICIENCY TARGET LEVELS	
Job Skill Le	vel 1: Entry /Apprentice	Job Skill Level 2: Journeyman	Job Skill Level 3: Expert
	2	4	5
		BEHAVORIAL INDICATORS	
Entry	 Assists journeyman in troubleshooting techniques. Gains knowledge of equipment troubleshooting and work processes. Utilizes appropriate technical manuals to aid in troubleshooting. 		
Journeyman	 Analyzes test results to determine if heavy mobile equipment or vehicles will pass or fail an inspection. Analyzes test results to locate non-functioning or defective parts for repair or replacement in heavy mobile equipment. Carries out road tests for wheeled and track vehicles to determine the nature of the problem. 		
Expert	 Inspects and diagnoses to determine if systems are safe for operation. Tests functionality of heavy mobile equipment after all repairs are complete. Maintains, assists, and communicates current knowledge on equipment for troubleshooting. 		

COMPETENCY	DEFINITION		
6. Measuring Instruments	Utilizes measuring instruments appropriate to the line of work.		
	MI	NIMUM PROFICIENCY TARGET LEVELS	
Job Skill Le	evel 1: Entry /Apprentice	Job Skill Level 2: Journeyman	Job Skill Level 3: Expert
	2	4	5
		BEHAVORIAL INDICATORS	
Entry	 Uses basic measuring instruments for heavy mobile equipment operation. Uses multimeters for analyzing resistance on motors and voltage readings on electrical systems. Uses measurement tools (e.g., hydrometers, dial and vacuum gauges) to diagnose and repair heavy mobile equipment. Uses feeler gage to measure the gap width between parts or components. Uses hydrometer to test batteries and coolant of heavy mobile equipment. Uses diagnostic or test equipment (e.g., multimeter, ignition timers, tachometers) for testing or inspection. 		
Journeyman	 Uses precision measuring instruments for heavy mobile equipment operation. Uses multimeters for analyzing resistance on motors and voltage readings on electrical systems. Uses measurement tools (e.g., voltmeters, hydrometers, dial gauges, timing lights, vacuum gauges) to diagnose and repair heavy mobile equipment. 		
Expert	 Verifies measurements are in compliance with standards. Maintains documentation of measured specifications. 		

Appendix A. Training-to-Competency Mapping

CORE TRAINING	VENDOR	C1	C2	C3	C4	C5	C6
Allison 3000, 4000 Service / ADOC	S&S	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Allison AT-HT-MT Series Service	S&S	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Allison E-Learn 1000 / 2000 Product Families Maintenance Familiarization	S&S	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Anti-Lock Brake System	OEM	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Basic Electrical Theory and Troubleshooting (SR-20)	CSTS	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Diesel fuel systems	OEM	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
DWG-501 Blueprint Reading Fundamentals I	180 Skills Maker	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
DWG-502 Blueprint Reading Fundamentals II	180 Skills Maker	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
EP C03 - Cat 3116 MUI Fuel System	CU	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
EP C04 - Cat C15 Engine Electronic Control System	CU	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Forklift Operator	CICB	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Fuel Injection Repair	OEM	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Hybrid Service Training	RRA/EATON	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
HYD C06 - Hydraulic Motors and Pumps	CU	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
HYD C08.1 - Directional Control Valve, Part 1	CU	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
HYD C08.1 - Directional Control Valve, Part 2	CU	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Insite Lite (SR-14)	CSTS	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Insite Pro (SR-19)	CSTS	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
M-ATV (MRAP) Maintenance	Oshkosh	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
M-ATV Maintenance	Oshkosh	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
M-ATV Operation	Oshkosh	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
MTVR Tractor Maintenance	Oshkosh	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
MTVR Wrecker Maintenance	Oshkosh	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Navy NAVFAC P-307	CICB	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
NCC-C4CS-02 Category 4 Crane Safety	NAVFAC/NeL	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
NCC-CM-01 Crane Mechanic	NAVFAC/NeL	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
NCC-GCS-03 General Crane Safety	NAVFAC/NeL		\checkmark	\checkmark		\checkmark	\checkmark
NCC-LTD-02 Load Test Director	NAVFAC/NeL	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
NCC-MCM-01 Mobile Crane Mechanic	NAVFAC/NeL	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
PLS Maintenance	Oshkosh	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark

PLS Operations	Oshkosh	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Vehicle Maintenance Training	Oshkosh	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
XPI Fuel System Diagnostics Hands-on Assessment	CSTS	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark

CORE-PLUS TRAINING	VENDOR	C1	C2	C3	C4	C5	C 6
Advanced Cat C6.6/C7/C9/C13/C15 ACERT TACTICAL VEHICLE/CE/MHE Engine							
Maintenance	Caterpillar	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Advanced Hydraulic Training	OEM	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Advanced Troubleshooting (SR-26)	CSTS	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Bucket Truck Operator	CICB	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
M-ATV (MRAP) Advanced Electrical	Oshkosh	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
MTVR Advanced Electrical Hydraulics	Oshkosh	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
MTVR Variant Conversion	Oshkosh			\checkmark	\checkmark	\checkmark	

Appendix B. Acronyms Defined

- ASE Automotive Service Excellence
- BI Behavioral Indicator
- CICB Crane Inspection and Certification Bureau
- COI Community of Interest
- CSTS Cummins Service Training System
- CU Caterpillar University
- DAU Defense Acquisition University
- DoD Department of Defense
- ◆ GD General Dynamics
- NAVFAC Naval Facilities Engineering Command (Navy Crane Center)
- NeL Navy eLearning
- OEM Original Equipment Manufacturer
- RRA RoadRanger Academy
- S&S Stewart and Stevenson
- USMC United States Marine Corps
- ♦ WD Wage Determination
- ♦ WG Wage Grade
- ♦ WL Wage Leader
- ♦ WS Wage Supervisor