

STP 9-91J12-SM-TG

Soldier's Manual and Trainer's Guide

QUARTERMASTER AND CHEMICAL EQUIPMENT REPAIRER MOS 91J

SKILL LEVELS 1/2

SEPTEMBER 2019



HEADQUARTERS, DEPARTMENT OF THE ARMY

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SOLDIER TRAINING
PUBLICATION
No. 9-91J12-SM-TG

Headquarters
Department of the Army
Washington, DC, 19 September 2019

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QUARTERMASTER CHEMICAL EQUIPMENT REPAIRER

MOS 91J

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PREFACE

This publication is for skill levels 1 and 2 Soldiers holding Military Occupational Specialty (MOS) 91J Quartermaster Chemical Equipment Repairer, for trainers and first-line supervisors. It contains standardized training objectives, in the form of task summaries, to train and evaluate Soldiers on critical tasks that support unit missions during wartime. Trainers and first-line supervisors should ensure Soldiers holding MOS 91J have access to this publication.

This manual applies to both Active and Reserve Component Soldiers.

The proponent of this publication is HQ, TRADOC. Send comments and recommendations on DA FORM 2028 (Recommended Changes to Publications and Blank Forms) directly to Commander, CASCOS SCOE(ATCL-TDF), G-3 Training & Doctrine Development, Suite 1036, 2221 Adams Ave, Fort Lee, VA 23801-2102.

CHAPTER 1

Introduction

1.1 General

The Soldier training publication (STP) identifies the individual Military Occupational Specialty (MOS) training requirements for Soldiers in various specialties, for example, another source of STP task data is the Central Army Registry website at <https://atiam.train.army.mil/catalog/>. Commanders, Trainers, and Soldiers should use the STP to plan, conduct, and evaluate individual training in units. The STP is the primary MOS reference to support the self-development and training of every Soldier in the unit. It is used with the Soldier's Manual of Common Tasks, and ADP 7-0, Training Units and Developing Leaders, to establish effective training plans and programs that integrate Soldier, leader, and collective tasks. This chapter explains how to use the STP in establishing an effective individual training program. It includes doctrinal principles and implications outlined in ADP 7-0. Based on these guidelines, commanders and unit trainers must tailor the information to meet the requirements for their specific unit.

1.2 Training Requirement

Every Soldier, Non-Commissioned Officer (NCO), Warrant Officer, and Officer has one primary mission — to be trained and ready to fight and win our nation's wars. Success in battle does not happen by accident; it is a direct result of tough, realistic, and challenging training.

a. Operational Environment.

(1) Commanders and leaders at all levels must conduct training with respect to a wide variety of operational missions across the full spectrum of operations. These operations may include combined arms, joint, multinational, and interagency considerations, and span the entire breadth of terrain and environmental possibilities. Commanders must strive to set the daily training conditions as closely as possible to those expected for actual operations.

(2) The operational missions of the Army include not only war, but also Military Operations Other Than War (MOOTW). Operations may be conducted as major combat operations, a small-scale contingency, or a peacetime military engagement. Offensive and defensive operations normally dominate military operations in war along with some small-scale contingencies. Stability operations and support operations dominate in MOOTW. Commanders at all echelons may combine different types of operations simultaneously and sequentially to accomplish missions in war and MOOTW. These missions require training since future conflict will likely involve a mix of combat and MOOTW, often concurrently. The range of possible missions complicates training. Army forces cannot train for every possible mission; they train for war and prepare for specific missions as time and circumstances permit.

(3) One type of MOOTW is the Chemical, Biological, Radiological, Nuclear, and High-Yield Explosive (CBRNE) event. To assist commanders and leaders in training their units, CBRNE-related information is being included in Army Medical Department (AMEDD) Mission Training Plans (MTPs). Even though most collective tasks within an MTP may support a CBRNE event, the ones that will most directly be impacted are clearly indicated with a statement in the CONDITION that reads: "THIS TASK MAY BE USED TO SUPPORT A CBRNE EVENT." These collective tasks and any supporting individual tasks in this Soldier's manual should be considered for training emphasis.

(4) Our forces today use a train-alert-deploy sequence. We cannot count on the time or opportunity to correct or make up training deficiencies after deployment. Maintaining forces that are ready now, places increased emphasis on training and the priority of training. This concept is a key link between operational and training doctrine.

(5) Units train to be ready for war based on the requirements of a precise and specific mission. In the process they develop a foundation of combat skills that can be refined based on the requirements of the assigned mission. Upon alert, commanders assess and refine from this foundation of skills. In the train-alert-deploy process, commanders use whatever time the alert cycle provides to continue refinement of mission-focused training. Training continues during time available between alert notification and deployment, between deployment and employment, and even during employment as units adapt to the specific battlefield environment and assimilate combat replacements.

b. How the Army Trains the Army.

(1) Training is a team effort and the entire Army - Department of the Army Commands (ACOMs), the Institutional Training Base, Units, the Combat Training Centers (CTCs), each individual Soldier, and the civilian workforce - has a role that contributes to force readiness. Department of the Army and ACOMs are responsible for resourcing the Army to train. The Institutional Army, including schools, training centers, and NCO academies, for example, train Soldiers and leaders to take their place in units in the Army by teaching the doctrine and Tactics, Techniques, and Procedures (TTP). Units, leaders and individuals train to standard on their assigned critical individual tasks. The unit trains first as an organic unit and then as an integrated component of a team. Before the unit can be trained to function as a team, each Soldier must be trained to perform their individual supporting tasks to standard. Operational deployments and major training opportunities, such as major training exercises, CTCs and after evaluations provide rigorous, realistic, and stressful training and operational experience under actual or simulated combat and operational conditions to enhance unit readiness and produce bold, innovative leaders. The result of this Army-wide team effort is a training and leader development system that is unrivaled in the world. Effective training produces the force Soldiers, leaders, and units that can successfully execute any assigned mission.

(2) The Army Training and Leader Development Model (Figure 1-1) centers on developing trained and ready units led by competent and confident leaders. The model depicts an important dynamic that creates a lifelong learning process. The three core domains that shape the critical learning experiences throughout a Soldier's and leader's time span are the operational, institutional, and self-development domains. Together, these domains interact using feedback and assessment from various sources and methods to maximize warfighting readiness. Each domain has specific, measurable actions that must occur to develop our leaders.

The Operational domain includes home station training, CTC rotations, and joint training exercises and deployments that satisfy national objectives. Each of these actions provides foundational experiences for Soldier, Leader, and Unit Development.

The Institutional domain focuses on educating and training Soldiers and leaders on the key knowledge, skills, and attributes required to operate in any environment. It includes individual, unit and joint schools, and advanced education.

The Self-Development domain, both structured and informal, focuses on taking those actions necessary to reduce or eliminate the gap between operational and institutional experiences.

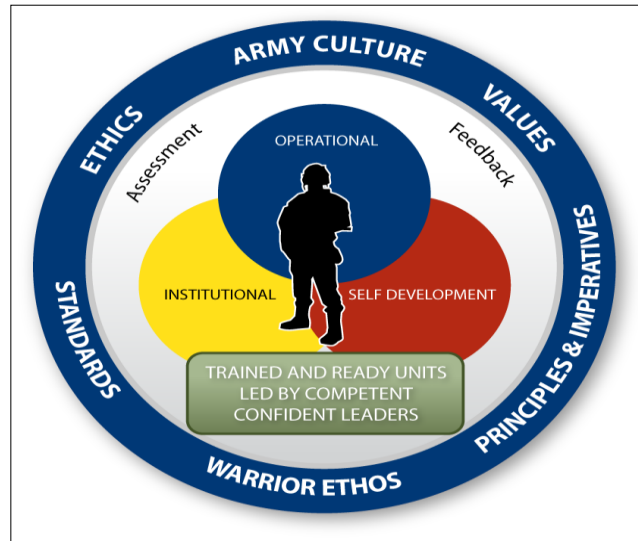


Figure 1-1. Army Training and Leader Development Model

(3) Throughout this lifelong learning and experience process, there is formal and informal assessment and feedback of performance to prepare leaders and Soldiers for their next level of responsibility. Assessment is the method used to determine the proficiency and potential of leaders against a known standard. Feedback must be clear, formative guidance directly related to the outcome of training events measured against standards.

c. Leader Training and Leader Development.

(1) Competent and confident leaders are a prerequisite to the successful training of t is important to understand that leader training and leader development are integral parts of unit readiness. Leaders are inherently Soldiers first and should be technically and tactically proficient in basic Soldier skills. They are also adaptive, capable of sensing their environment, adjusting the plan when appropriate, and properly applying the proficiency acquired through training.

(2) Leader training is an expansion of these skills that qualifies them to lead other Soldiers. As such, doctrine and principles of training require the same level of attention of senior commanders. Leader training occurs in the Institutional Army, the unit, the CTCs, and through self-development. Leader training is just one portion of leader development.

(3) Leader development is the deliberate, continuous, sequential, and progressive process, grounded in Army values, that grows Soldiers and civilians into competent and confident leaders capable of decisive action. Leader development is achieved through the life-long synthesis of the knowledge, skills, and experiences gained through institutional training and education, organizational training, operational experience, and self-development. Commanders play the key role in leader development that ideally produces tactically and technically competent, confident, and adaptive leaders who act with boldness and initiative in dynamic, complex situations to execute mission-type orders achieving the commander's intent.

(4) A life cycle management diagram for Soldiers is on page 1-5. You can find more information and check for updates at <http://das.cs.amedd.army.mil/ooc.htm> (scroll down to Life Cycle Management, select ENLISTED, and find the appropriate tab along the bottom). This information, combined with the MOS Training Plan in Chapter 2, forms the career development model for the MOS.

d. Training Responsibility. The soldier and leader training and development continues in the unit. Using the institutional foundation, training in organizations and units focuses and hones individual and team skills and knowledge.

(1) Commander Responsibility.

(a) The unit commander is responsible for the wartime readiness of all elements in the formation. The commander is, therefore, the primary trainer of the organization and is responsible for ensuring that all training is conducted in accordance with the STP to the Army standard.

(b) Commanders ensure STP standards are met during all training. If a Soldier fails to meet established standards for identified MOS tasks, the Soldier must retrain until the tasks are performed to standard. Training to standard on MOS tasks is more important than completion of a unit training event such as an ARTEP evaluation. The objective is to focus on sustaining MOS proficiency - this is the critical factor commanders must adhere to when training individual Soldiers in units.

(2) NCO Responsibility.

(a) A great strength of the U.S. Army is its professional NCO Corps who takes pride in being responsible for the individual training of Soldiers, crews, and small teams. The NCO support channel parallels and complements the chain of command. It is a channel of communication and supervision from the Command Sergeant Major (CSM) to the First Sergeants (1SGs) and then to other NCOs and enlisted personnel. NCOs train Soldiers to the non-negotiable standards published in STPs. Commanders delegate authority to NCOs in the support channel as the primary trainers of individual, crew, and small team training. Commanders hold NCOs responsible for conducting standards-based, performance-oriented, battle-focused training and providing feedback on individual, crew, and team proficiency. Commanders define responsibilities and authority of their NCOs to their staffs and subordinates.

(b) NCOs continue the Solidierization process of newly assigned enlisted Soldiers, and begin their professional development. NCOs are responsible for conducting standards-based, performance-oriented, battle-focused training. They identify specific individual, crew, and small team tasks that support the unit's collective mission essential tasks; plan, prepare, rehearse, and execute training, evaluate training and conduct after action reviews (AARs) to provide feedback to the commander on individual, crew, and small team proficiency. Senior NCOs coach junior NCOs to master a wide range of individual tasks.

(3) Soldier Responsibility.

(a) Each Soldier is responsible for performing individual tasks identified by the first-line supervisor based on the unit's mission essential task list (METL). Soldiers must perform tasks to the standards included in the task summary. If Soldiers have questions about tasks or which tasks in this manual they must perform, they are responsible for asking their first-line supervisor for clarification, assistance, and guidance. First-line supervisors know how to perform each task or can direct Soldiers to appropriate training materials, including current Field Manuals, Technical Manuals, and Army regulations. Soldiers are responsible for using these materials to maintain performance. They are also responsible for maintaining standard performance levels of all Soldier's Manual of Common Tasks at their current skill level and below. Periodically, Soldiers should ask their supervisor or another Soldier to check their performance to ensure that they can perform the tasks.

1.3 Battle-Focused Training

Battle focus is a concept used to derive peacetime training requirements from assigned and anticipated missions. The priority of training in units is to train to standard on the wartime mission. Battle focus guides the planning, preparation, execution, and assessment of each organization's training program to ensure its members train as they are going to fight. Battle focus is critical throughout the entire training process and is used by commanders to allocate resources for training based on wartime and operational mission requirements. Battle focus enables commanders and staffs at all echelons to structure a training program that copes with non-mission-related requirements while focusing on mission essential training activities. It is recognized that a unit cannot attain proficiency to standard on every task whether due to time or other resource constraints. However, unit commanders can achieve a successful training program by consciously focusing on a reduced number of METL tasks that are essential to mission accomplishment.

a. Linkage between METL and STP. A critical aspect of the battle focus concept is to understand the responsibility for and the linkage between the collective mission essential tasks and the individual tasks that support them. For example, the commander and the CSM/1SG must jointly coordinate the collective mission essential tasks and supporting individual tasks on which the unit will concentrate its efforts during a given period. This task hierarchy is provided in the task database at the Central Army Registry. The CSM/1SG must select the specific individual tasks that support each collective task to be trained. Although NCOs have the primary role in training and sustaining individual Soldier skills, officers at every echelon remain responsible for training to established standards during both individual and collective training. Battle focus is applied to all missions across the full spectrum of operations.

b. Relationship of STPs to Battle-focused Training. The two key components of any STP are the Soldier's Manual (SM) and Trainer's Guide (TG). Each gives leaders important information to help implement the battle-focused training process. The TG relates Soldier and leader tasks in the MOS and skill level to duty positions and equipment. It states where the task is trained, how often training should occur to sustain proficiency, and who in the unit should be trained. As leaders assess and plan training, they should rely on the trainer's guide to help identify training needs.

(1) Leaders conduct and evaluate training based on Army-wide training objectives and on the task standards published in the Soldier's manual task summaries or in the Central Army Registry. The task summaries ensure that i

Trainers in every unit and location define task standards the same way.

Trainers evaluate all Soldiers to the same standards.

(2) Figure 1-2 shows how battle-focused training relates to the trainer's guide and Soldier's manual:

The left column shows the steps involved in training Soldiers.

The right column shows how the STP supports each of these steps.

BATTLE-FOCUS PROCESS	STP SUPPORT PROCESS
Select supporting Soldier tasks	Use TG to relate tasks to METL
Conduct training assessment	Use TG to define what Soldier tasks to assess
Determine training objectives	Use TG to set objectives
Determine strategy; plan for training	Use TG to relate Soldier tasks to strategy
Conduct pre-execution checks	Use SM task summary as source for task performance
Execute training; conduct after action review	Use SM task summary as source for task performance
Evaluate training against established standards	Use SM task summary as standard for evaluation

Figure 1-2. Relationship of Battle-focused Training and STP Support

1.4 Task Summary Format

Task summaries outline the wartime performance requirements of each critical task in the SM. They provide the Soldier and the trainer with the information necessary to prepare, conduct, and evaluate critical task training. As a minimum, task summaries include information the Soldier must know the skills that they must perform to standards for each task. The format of the task summaries included in this SM is as follows:

- a. **Task Title.** The task title identifies the action to be performed.
- b. **Task Number.** A 10-digit number identifies each task or skill. This task number, along with the task title, must be included in any correspondence pertaining to the task.
- c. **Conditions.** The task conditions identify all the equipment, tools, references, job aids, and supporting personnel that the Soldier needs to use perform the task in wartime. This section identifies any environmental conditions that can alter task performance, such as visibility, temperature, or wind. This section also identifies any specific cues or events that trigger task performance, such as a chemical attack or identification of a threat vehicle.
- d. **Standards.** The task standards describe how well and to what level the task must be performed under wartime conditions. Standards are typically described in terms of accuracy, completeness, and speed.

e. Performance Steps. This section includes a detailed outline of information on how to perform the task. Additionally, some task summaries include safety statements and notes. Safety statements (danger, warning, and caution) alert users to the possibility of immediate death, personal injury, or damage to equipment. Notes provide a small, extra supportive explanation or hint relative to the performance steps.

f. Evaluation Preparation (when used). This subsection indicates necessary modifications to task performance in order to train and evaluate a task that cannot be trained to the wartime standard under wartime conditions. It may also include special training and evaluation preparation instructions to accommodate these modifications and any instructions that should be given to the Soldier before evaluation.

g. Performance Measures. This evaluation guide identifies the specific actions that the Soldier must do to successfully complete the task. These actions are listed in a GO/NO-GO format for easy evaluation. Each evaluation guide contains an evaluation guidance statement that indicates the requirements for receiving a GO on the evaluation.

h. References. This section identifies references that provide more detailed and thorough explanations of task performance requirements than those given in the task summary description.

1.5 Training Execution

All good training, regardless of the specific collective, leader, and individual tasks being executed, must comply with certain common requirements. These include adequate preparation, effective presentation and practice, and thorough evaluation. The execution of training includes preparation for training, conduct of training, and recovery from training.

a. Preparation for Training. Formal near-term planning for training culminates with the publication of the unit training schedule. Informal planning, detailed coordination, and preparation for executing the training continue until the training is performed. Commanders and other trainers use training meetings to assign responsibility for preparation of all scheduled training. Preparation for training includes selecting tasks to be trained, planning the conduct of the training, training the trainers, reconnaissance of the site, issuing the training execution plan, and conducting rehearsals and pre-execution checks. Pre-execution checks are preliminary actions commanders and trainers use to identify responsibility for these and other training support tasks. They are used to monitor preparation activities and to follow up to ensure planned training is conducted to standard. Pre-execution checks are a critical portion of any training meeting. During preparation for training, battalion and company commanders identify and eliminate potential training distracters that develop within their own organizations. They also stress personnel accountability to ensure maximum attendance at training.

(1) Subordinate leaders, as a result of the bottom-up feed from internal training meetings, identify and select the individual tasks necessary to support the identified training objectives. Commanders develop the tentative plan to include requirements for preparatory training, concurrent training, and training resources. At a minimum, the training plan should include confirmation of training areas and locations, training ammunition allocations, training simulations and simulators availability, transportation requirements, Soldier support items, a risk management analysis, assignment of responsibility for the training, designation of trainers responsible for approved training, and final coordination. The time and other necessary resources for retraining must also be an integral part of the original training plan.

(2) Leaders, trainers, and evaluators are identified, trained to standard, and rehearsed prior to the conduct of the training. Leaders and trainers are coached on how to train, given time to prepare, and rehearse so that training will be challenging and doctrinally correct. Commanders ensure that trainers and evaluators are not only tactically and technically competent on their training tasks, but also understand how the training relates to the organization's METL. Properly prepared trainers, evaluators, and leaders project confidence and enthusiasm to those being trained. Trainer and leader training is a critical event in the preparation phase of training. These individuals must demonstrate proficiency on the selected tasks prior to the conduct of training.

(3) Commanders, with their subordinate leaders and trainers, conduct site reconnaissance, identify additional training support requirements, and refine and issue the training execution plan. The training plan should identify all those elements necessary to ensure the conduct of training to standard. Rehearsals are essential to the execution of good training. Realistic, standards-based, performance-oriented training requires rehearsals for trainers, support personnel, and evaluators. Preparing for training in Reserve Component (RC) organizations can require complex pre-execution checks. RC trainers must often conduct detailed coordination to obtain equipment, training support system products, and ammunition from distant locations. In addition, RC pre-execution checks may be required to coordinate Active Component assistance from the numbered CONUSA, training support divisions, and directed training affiliations.

b. Conduct of Training. Ideally, training is executed using the crawl-walk-run approach. This allows and promotes an objective, standards-based approach to training. Training starts at the basic level. Crawl events are relatively simple to conduct and require minimum support from the unit. After the crawl stage, training becomes incrementally more difficult, requiring more resources from the unit and home station, and increasing the level of realism. At the run stage, the level of difficulty for the training event intensifies. Run stage training requires optimum resources and ideally approaches the level of realism expected in combat. Progression from the walk to the run stage for a particular task may occur during a one-day training exercise or may require a succession of training periods over time. Achievement of the Army standard determines progression between stages.

(1) In crawl-walk-run training, the tasks and the standards remain the same; however, the conditions under which they are trained change. Commanders may change the conditions, for example, by increasing the difficulty of the conditions under which the task is being performed, increasing the tempo of the task training, increasing the number of tasks being trained, or by increasing the number of personnel involved in the training. Whichever approach is used, it is important that all leaders and Soldiers involved understand in which stage they are currently training and understand the Army standard.

(2) An AAR is immediately conducted and may result in the need for additional training. Any task that was not conducted to standard should be retrained. Retraining should be conducted at the earliest opportunity. Commanders should program time and other resources for retraining as an integral part of their training plan. Training is incomplete until the task is trained to standard. Soldiers will remember the standard enforced, not the one discussed.

c. **Recovery from Training.** The recovery process is an extension of training, and once completed, it signifies the end of the training event. At a minimum, recovery includes conduct of maintenance training, turn-in of training support items, and the conduct of AARs that review the overall effectiveness of the training just completed.

(1) Maintenance training is the conduct of post-operations preventive maintenance checks and services, accountability of organizational and individual equipment, and final inspections. Class IV, Class V, TADSS, and other support items are maintained, accounted for, and turned-in, and training sites and facilities are closed out.

(2) AARs conducted during recovery focus on collective, leader, and individual task performance, and on the planning, preparation, and conduct of the training just completed. Unit AARs focus on individual and collective task performance, and identify shortcomings and the training required to correct deficiencies. AARs with leaders focus on tactical judgment. These AARs contribute to leader learning and provide opportunities for leader development. AARs with trainers and evaluators provide additional opportunities for leader development.

1.6 Training Assessment

Assessment is the commander's responsibility. It is the commander who determines the organization's ability to accomplish its wartime operational mission. Assessment is a continuous process that includes evaluating individual training, conducting an organizational assessment, and preparing a training assessment. The commander uses his/her experience, feedback from training evaluations, and other evaluations and reports to arrive at his assessment. Assessment is both the end and the beginning of the training management process. Training assessment is more than just training evaluation, and encompasses a wide variety of inputs. Assessments include such diverse systems as training, force integration, logistics, personnel, and provide the link between the unit's performance and the Army standard. Evaluation of training is, however, a major component of assessment. Training evaluations provide the commander with feedback on the demonstrated training proficiency of Soldiers, leaders, battle staffs, and units. Commanders cannot personally observe all training in their organization and, therefore, gather feedback from their senior staff officers and NCOs.

a. **Evaluation of Training.** Training evaluations are a critical component of any training assessment. Evaluation measures the demonstrated ability of Soldiers, commanders, leaders, battle staffs, and units against the Army standard. Evaluation of training is integral to standards-based training and is the cornerstone of leader training and leader development. STPs describe standards that must be met for each Soldier task.

(1) All training must be evaluated to measure performance levels against the established Army standard. The evaluation can be as fundamental as an informal internal evaluation performed by the leader conducting the training. Evaluation is conducted specifically to enable the individual undergoing the training to know whether the training standard has been achieved. Commanders must establish a climate that encourages candid and accurate feedback for the purpose of developing leaders and trained Soldiers.

(2) Evaluation of training is not a test; it is not used to find reasons to punish leaders and Soldiers. Evaluation tells Soldiers whether or not they achieved the Army standard and, therefore, assists them in determining the overall effectiveness of their training plans. Evaluation produces disciplined Soldiers, leaders, and units. Training without evaluation is a waste of time and resources.

(3) Evaluations are used by leaders as an opportunity to coach and mentor Soldiers. A key element in developing leaders is immediate, positive feedback that coaches and leads subordinate leaders to achieve the Army standard. This is a tested and proven path to develop competent, confident adaptive leaders.

b. Evaluators. Commanders must plan for formal evaluation and must ensure the evaluators are trained. These evaluators must also be trained as facilitators to conduct AARs that elicit maximum participation from those being trained. External evaluators will be certified in the tasks they are evaluating and normally will not be dual-hatted as a participant in the training being executed.

c. Role of Commanders and Leaders. Commanders ensure that evaluations take place at each echelon in the organization. Commanders use this feedback to teach, coach, and mentor their subordinates. They ensure that every training event is evaluated as part of training execution and that every trainer conducts evaluations. Commanders use evaluations to focus command attention by requiring evaluation of specific mission essential and battle tasks. They also take advantage of evaluation information to develop appropriate lessons learned for distribution throughout their commands.

d. After Action Review. The AAR, whether formal or informal, provides feedback for all training. It is a structured review process that allows participating Soldiers, leaders, and units to discover for themselves what happened during the training, why it happened, and how it can be done better. The AAR is a professional discussion that requires the active participation of those being trained.

1.7 Training Support

This manual includes the following information which provides additional training support information.

CHAPTER 2

Trainer's Guide

2.1 General

The MOS Training Plan identifies the essential components of a unit training plan for individual training. Units have different training needs and requirements based on differences in environment, location, equipment, dispersion, and similar factors. Therefore, the MOS Training Plan should be used as a guide for conducting unit training and not a rigid standard. The MOS Training Plan consists of two parts. Each part is designed to assist the commander in preparing a unit training plan which satisfies integration, cross training, training up, and sustainment training requirements for Soldiers in this MOS.

Part One of the MOS Training Plan shows the relationship of an MOS skill level between duty position and critical tasks. These critical tasks are grouped by task commonality into subject areas.

Section I lists subject area numbers and titles used throughout the MOS Training Plan. These subject areas are used to define the training requirements for each duty position within an MOS.

Section II identifies the total training requirement for each duty position within an MOS and provides a recommendation for cross training and train-up/merger training.

- ☐ **Duty Position Column.** This column lists the duty positions of the MOS, by skill level, which have different training requirements.
- ☐ **Subject Area Column.** This column lists, by numerical key (see Section I), the subject areas a Soldier must be proficient in to perform in that duty position.
- ☐ **Cross Train Column.** This column lists the recommended duty position for which Soldiers should be cross trained.
- ☐ **Train-up/Merger Column.** This column lists the corresponding duty position for the next higher skill level or MOSC the Soldier will merge into on promotion.

Part Two lists, by general subject areas, the critical tasks to be trained in an MOS and the type of training required (resident, integration, or sustainment).

- ☐ **Subject Area Column.** This column lists the subject area number and title in the same order as Section I, Part One of the MOS Training Plan.
- ☐ **Task Number Column.** This column lists the task numbers for all tasks included in the subject area.
- ☐ **Title Column.** This column lists the task title for each task in the subject area.

- **Training Location Column.** This column identifies the training location and the Leadership Domain (Institutional, Operational, or Self-Development) where the task is first trained to Soldier training publications standards. If the task is first trained to standard in the unit, the word “OP” will be in this column. If the task is first trained to standard in the training base, it will identify, by brevity code (S-D, INST), the resident course where the task was taught. Figure 2-1 contains a list of training locations and their corresponding brevity codes.

INST	Institutional
OP	Operational/Unit

Figure 2-1. Training Locations

- **Sustainment Training Frequency Column.** This column indicates the recommended frequency at which the tasks should be trained to ensure Soldiers maintain task proficiency. Figure 2-2 identifies the frequency codes used in this column.

BA	Biannually
AN	Annually
SA	Semi-annually
QT	Quarterly
BM	Bimonthly
MO	Monthly
BW	Biweekly
WK	Weekly
DA	Daily
HR	Hourly
OT	One time
OTHER	

Figure 2-2. Sustainment Training Frequency Codes

□

2-2. Part One, Section I. Subject Area Codes.**Skill Level SL1**

- 1 PREVENTIVE MAINTENANCE, CHECKS AND SERVICE TASKS
- 2 BATTLE DAMAGE ASSESSMENT AND REPAIR PROGRAM
- 3 TECHNICAL TASKS (SKILL LEVEL 1/2)
- 4 LAUNDRY EQUIPMENT (SKILL LEVEL 1/2)

2-3. Part One, Section II, Duty Position Training Requirements.

SKILL LEVEL	DUTY POSITION	SUBJECT AREAS	CROSS TRAIN	TRAIN-UP/MERGER
L1	Quartermaster & Chemical Equipment	1	N/A	N/A

Figure 2-3 Duty Positions Training Requirements

2-4. Part Two, Critical Tasks List.

**MOS TRAINING PLAN
MOS 91J**

CRITICAL TASKS

Task Number	Title	Training Location	Sust Tng Freq	Sust Tng SI
Skill Level SL1				
Subject Area 1 PREVENTIVE MAINTENANCE, CHECKS AND SERVICE TASKS				
091-91J-1018	Perform Preventive Maintenance Checks and Services on Quartermaster and Chemical Equipment	INST	SA	1-2
Subject Area 2 BATTLE DAMAGE ASSESSMENT AND REPAIR PROGRAM				
091-91J-1019	Perform Battlefield Damage Assessment and Repair on Quartermaster and Chemical Equipment	INST	SA	1-2

Task Number	Title	Training Location	Sust Tng Freq	Sust Tng SI
SKILL LEVEL 1				
Subject Area 3 TECHNICAL TASKS				
091-91J-1001	Maintain Fuel System on a Decontaminating Apparatus	INST	SA	1-2
091-91J-1002	Maintain Water Assembly on a Decontaminating Apparatus	INST	SA	1-2
091-91J-1003	Maintain Heating Assembly on a Decontaminating Apparatus	INST	SA	1-2
091-91J-1004	Maintain Electrical Systems on Decontaminating Apparatus	INST	SA	1-2
091-91J-1005	Maintain AC/DC Electrical System on a Pump Assembly	INST	SA	1-2
091-91J-1006	Maintain Pressure Recovery Turbochargers on Water Purification Equipment	INST	SA	1-2
091-91J-1007	Maintain Pressure Switch on Water Purification Equipment	INST	SA	1-2
091-91J-1008	Maintain Level Switch Assembly on Water Purification Equipment	INST	SA	1-2
091-91J-1009	Maintain Air System on a Water Purification System	INST	SA	1-2
091-91J-1010	Maintain Gauges on a Water Purification Equipment	INST	SA	1-2
091-91J-1011	Maintain Water System on Water Purification Equipment	INST	SA	1-2
091-91J-1012	Maintain Air Subsystem on Water Purification Equipment	INST	SA	1-2
091-91J-1013	Maintain Electrical System on Water Purification Equipment	INST	SA	1-2
091-91J-1014	Maintain Reverse Osmosis Rupture Disc Water Purification Equipment	INST	SA	1-2
091-91J-1015	Maintain Liquid Pump Assembly on Quartermaster and Chemical Equipment	INST	SA	1-2
091-91J-1016	Maintain Diesel Engine Assembly on Quartermaster and Chemical Equipment	INST	SA	1-2
091-91J-1017	Maintain Personnel Heaters	INST	SA	1-2

Task Number	Title	Training Location	Sust Tng Freq	Sust Tng Sl
SKILL LEVEL 1				
Subject Area 4 LAUNDRY EQUIPMENT				
091-91J-1024	Operate Laundry Advanced System (LADS)	INST	SA	1-2
091-91J-1025	Perform Field Level Maintenance on the Laundry Advanced System (LADS)	INST	SA	1-2
091-91J-1026	Troubleshoot Electrical Malfunctions on the Laundry Advanced System (LADS)	INST	SA	1-2
091-91J-1027	Operate Containerized Batch Laundry (CBL) System	INST	SA	1-2
091-91J-1028	Maintain Washer Assembly on a Containerized Batch Laundry System (CBL)	INST	SA	1-2
091-91J-1029	Maintain Drive Belt on a Containerized Batch Laundry System Washer Assembly	INST	SA	1-2
091-91J-1030	Maintain Dryer Assembly Controls on a Containerized Batch Laundry System Washer Assembly	INST	SA	1-2
091-91J-1031	Troubleshoot malfunction of the Containerized Batch Laundry (CBL) electrical system	INST	SA	1-2

Figure 2-4 91J Critical Tasks

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CHAPTER 3

MOS/Skill Level Tasks

Skill Level 1

Subject Area 1: PREVENTIVE MAINTENANCE, CHECKS AND SERVICE TASKS

091-91J-1018

Perform Preventive Maintenance Checks and Services on Quartermaster and Chemical Equipment.

DANGER

Failure to obey any of the below warnings may result in personnel injury or death. Do not operate equipment in an enclosed area unless exhaust gases are piped to outside and adequate ventilation is provided. Avoid inhalation of exhaust fumes. Do not smoke, use open flames or operate equipment while working with fuel. Avoid inhalation of fumes from fuel.

WARNING

To prevent contamination of drinking water, make sure all couplings are capped and plugged when components are not connected or not in use. Keep dirt, mud, sand and debris from entering open couplings during assembly and disassembly. Have water tested by medical personnel before dispensing to users. Do not use petroleum based lubricants in the water system.

CAUTION

Do not open hose couplings when water system is under pressure. Hose end can whip, causing injury to personnel and damage to equipment.

Conditions: In an operational environment, given Quartermaster and Chemical Equipment, DA Form 5988-E (EGA) (Equipment Maintenance and Inspection Worksheet), general mechanic's tool kit, and equipment specified in technical manuals (TMs), repair parts, applicable maintenance forms and technical publications, and supervision/assistance.

Standards: Perform preventive maintenance checks and services on Quartermaster and Chemical Equipment in accordance with applicable technical publications and performance measures. When the task is completed, all shortcomings and deficiencies are identified on the proper maintenance forms.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: All required references and technical manuals will be provided by the local Command.

Performance Steps

1. Perform Administrative Actions.
 - a. Use applicable technical publication.
 - b. Practice shop safety and maintenance discipline.
 - c. Ensure proper tools, Test Measurement, and Diagnostics Equipment (TMDE) are available to inspect, replace or repair malfunction.
 - d. Perform initial inspection.
2. Operate under normal conditions.
 - a. Perform before-operation checks.
 - b. Operate equipment.
 - c. Perform during-operation checks.
 - d. Shut down equipment.
 - e. Perform after-operation checks.
3. Operate under extreme heat (up to 125 degrees Fahrenheit).
 - a. Check coolant level, temperature indicators, fan belt, and air passages for obstructions frequently (If applicable).
 - b. Maintain coolant levels approximately two inches below the radiator overflow pipe if so equipped (If applicable).
 - c. Check radiator frequently. If applicable.
 - d. Check fan belt for proper tension. If applicable.
4. Identify repair parts and requisition as required.
5. Ensure all fault(s) found are in accordance with appropriate TM's and references.
6. Ensure tools and equipment are properly maintained.
7. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

Performance Measures	GO	NO GO
1. Performed Administrative Actions.	_____	_____
2. Operated under normal conditions.	_____	_____
3. Operated under extreme heat (up to 125 degrees F).	_____	_____
4. Identified repair parts and requisitioned as required.	_____	_____
5. Ensured all fault(s) found were in accordance with appropriate TMs and references.	_____	_____
6. Ensured tools and equipment were properly maintained.	_____	_____
7. Completed DA Form 5988-E (EGA) as required.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

References Required

Primary

TM 3-4230-237-10
TM 3-4230-209-20&P
DA Form 5988-E (EGA)

Subject Area 2: BATTLE DAMAGE ASSESSMENT AND REPAIR PROGRAM

091-91J-1019

Perform Battlefield Damage Assessment and Repair on Quartermaster and Chemical Equipment.

CAUTION

Identifying hazards and controlling risks across the full spectrum of Army functions, operations and activities is the responsibility of all Soldiers.

Conditions: Given an item of Quartermaster and Chemical Equipment that requires expedient repairs in a combat situation; the applicable Battle Damage Assessment and Repair (BDAR) technical manual (TM) and kit; Test, Measurement, and Diagnostic Equipment (TMDE); personal protective equipment (PPE); an equipment inspection and maintenance work sheet or an equipment maintenance request for supporting a work order DA Form 2407-1 (Maintenance Request Continuation Sheet) and a pen.

Standards: Perform BDAR on an item of Quartermaster and Chemical Equipment in accordance with applicable TM procedures and specifications. Complete the BDAR without causing injury to any personnel and damage to the equipment. Initiate additional actions required as a result of the inspection.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: Assigned as a quartermaster and chemical equipment repairer, given an item of quartermaster and chemical equipment that requires expedient repairs in combat situation, the applicable BDAR technical manual and kit, test measurement and diagnostic equipment, a maintenance inspection worksheet, a maintenance request for support work order and a pen.

Note: None

Performance Steps

1. Receive the mission to perform a BDAR.
 - a. Obtain and verify the location of the equipment.
 - b. Obtain an initial report of damage or required repairs.
 - c. Obtain a BDAR Kit and manual.
2. Establish security requirements.
 - a. Obtain a situation report regarding enemy and friendly forces.
 - b. Assemble and brief the security team.

3. Deploy with the security team to the site.
 - a. Don appropriate mission-oriented protection posture (MOPP) level based on the nuclear, biological, and chemical (NBC) reports.
 - b. Navigate to the site and locate the equipment.
 - c. Deploy the security elements.
4. Perform an equipment inspection.
 - a. Check the equipment for NBC contamination.
 - b. Inspect the vehicle for booby traps.
 - c. Locate the damage or required repairs.
5. Determine the extent of the repairs.
 - a. Determine if self-evacuation/recovery is possible.
 - b. Determine if recovery assets are required.
 - c. Determine if repairs warrant destruction of the equipment in place.
6. Perform expedient repairs to allow for self-evacuation/recovery.
 - a. Use BDAR procedures to rapidly repair damages.
 - b. Use substitute parts, if required.
 - c. Use field expedient materials to make repairs, as required.
 - d. Use field expedient lubricants, fuels, or fluids, if required.
7. Notify the chain of command for destruction procedures, if required.
 - a. Contact the command element.
 - b. Prepare equipment for destruction as directed and according to the BDAR manual.
8. Request recovery support, if required.
 - a. Contact the support element.
 - b. Verify coordinates.
9. Return equipment to the maintenance collection point and forward the equipment inspection and maintenance work sheet to the maintenance shop supervisor or shop foreman.

Evaluation Preparation: Provide the soldier with the items listed in the conditions. Ensure that the site is set up with all of the equipment and tools that are needed. If an item of Quartermaster and Chemical equipment is not available, use another item of Quartermaster and Chemical equipment with a similar system and the applicable TM. Ensure that expendable material and supplies are on hand and in sufficient quantities. Ensure that any required repair parts are on hand.

Performance Measures	GO	NO GO
1 Received the mission to perform BDAR.	_____	_____
2 Established security requirements.	_____	_____
3 Deployed with the security team to the site.	_____	_____
4 Performed an equipment inspection.	_____	_____
5 Determined the extent of the repairs.	_____	_____
6 Performed expedient repairs to allow self-evacuation/recovery.	_____	_____
7 Notified the chain of command for destruction procedures, if required.	_____	_____
8 Requested recovery support, if required.	_____	_____
9 Returned equipment to the maintenance collection point and forwarded the equipment inspection and maintenance work sheet to the maintenance shop supervisor or shop foreman.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

References Required

Primary

ATP 4-31
DA FORM 2404 (Equipment Inspection and Maintenance Worksheet)
DA FORM 2407-1
DA FORM 5988-E (EGA)

Subject Area 3: TECHNICAL TASKS
091-91J-1001
Maintain Fuel System on a Decontaminating Apparatus.

DANGER

DANGEROUS CHEMICALS, GASOLINE, HIGH VOLTAGE (maximum 24 volts), AND SCALDING WATER are used in the operation of the equipment. CARBON-MONOXIDE is present in the exhaust gases of the gasoline engine and the water heater. Wear protective clothing and a mask when engaged in decontaminating operations. STB decontaminating agent and slurry are harmful to the skin, eyes, lungs, and clothing. If STB decontaminating agent or slurry gets into the eyes, flush them immediately with clear water. If STB decontaminating agent or slurry is taken internally, drink raw egg white, milk, rice gruel, or milk of magnesia. Do not induce vomiting and seek medical assistance immediately. If STB decontaminating agent or slurry contacts the skin, wash off immediately with clear water.

WARNING

To avoid injury or electrical shock, keep the HEATER RECEPTACLE AND SWITCH on the pump unit control panel to OFF when the water heater is not in use. Avoid contact with the battery's positive contact at the starter solenoid when adjusting the belt tension. Electrical shock or damage to the equipment may result. If it is necessary to disconnect the hoses with the water temperature at or above 100°F (38°C), exercise extreme care to prevent scalding.

CAUTION

Use caution when opening drums of Super Tropical Bleach (STB); wear protective clothing and mask. Avoid contact with skin or eyes. Avoid contamination with acids and oxidizable materials such as fuels, oils, paint products, disinfectants, and ammonia. Such contamination can cause release of hazardous gases. Keep container closed and stored in a cool dry place. Mix only in accordance with directions for use. In case of contact with skin or eyes, immediately flush continuously with water; for eyes get medical attention. Keep clear of the exhaust stack during operation of the water heater.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on decontamination apparatus equipment and general mechanic tool kit, additional tools and equipment specified in technical manuals, repair parts, and applicable maintenance forms and technical publications.

Standards: Perform troubleshooting of the fuel system on the decontaminating apparatus in accordance with applicable technical publications. When the task is completed, the decontaminating apparatus must be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: All required references and technical manuals will be provided by the local Command.

Performance Steps

1. Perform administrative actions.
 - a. Select applicable technical publications.
 - b. Practice shop safety and maintenance discipline.
 - c. Ensure proper tools, test equipment, and diagnostics equipment (TMDE) are available to inspect, replace or repair malfunction.
 - d. Perform initial inspection.
2. Diagnose fault on fuel system on the decontaminating apparatus and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all maintenance fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the decontaminating apparatus is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

Performance Measures	GO	NO GO
1. Performed administrative actions.	_____	_____
2. Diagnosed fault on fuel system on the decontaminating apparatus and determined maintenance action to be performed.	_____	_____
3. Identified repair parts and requisitioned as required.	_____	_____
4. Ensured all maintenance fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5. Performed a final inspection to ensure the Decontaminating Apparatus was fully mission capable.	_____	_____
6. Ensured tools and equipment were properly maintained.	_____	_____
7. Completed DA Form 5988-E (EGA) as required.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed show the Soldier what was done wrong and how it should have been done to score a GO.

**References
Required**

Primary

TM 3-4230-238-10
TM 3-4230-238-23&P
DA FORM 2404
DA FORM 5988-E (EGA)

091-91J-1002**Maintain Water Assembly on a Decontaminating Apparatus****DANGER**

DANGEROUS CHEMICALS, GASOLINE, HIGH VOLTAGE (maximum 24 volts), AND SCALDING WATER are used in the operation of the equipment. CARBON-MONOXIDE is present in the exhaust gases of the gasoline engine and the water heater. Wear protective clothing and a mask when engaged in decontaminating operations. STB decontaminating agent and slurry are harmful to the skin, eyes, lungs, and clothing. If STB decontaminating agent or slurry gets into the eyes, flush them immediately with clear water. If STB decontaminating agent or slurry is taken internally, drink raw egg white, milk, rice gruel, or milk of magnesia. Do not induce vomiting and seek medical assistance immediately. If STB decontaminating agent or slurry contacts the skin, wash off immediately with clear water.

WARNING

To avoid injury or electrical shock, keep the HEATER RECEPTACLE AND SWITCH on the pump unit control panel to OFF when the water heater is not in use. Avoid contact with the battery's positive contact at the starter solenoid when adjusting the belt tension. Electrical shock or damage to the equipment may result. If it is necessary to disconnect the hoses with the water temperature at or above 100°F (38°C), exercise extreme care to prevent scalding.

CAUTION

Use caution when opening drums of Super Tropical Bleach (STB); wear protective clothing and mask. Avoid contact with skin or eyes. Avoid contamination with acids and oxidizable materials such as fuels, oils, paint products, disinfectants, and ammonia. Such contamination can cause release of hazardous gases. Keep container closed and stored in a cool dry place. Mix only in accordance with directions for use. In case of contact with skin or eyes, immediately flush continuously with water; for eyes get medical attention. Keep clear of the exhaust stack during operation of the water heater.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on decontamination apparatus equipment and general mechanic tool kit, additional tools and equipment specified in technical manuals, repair parts, and applicable maintenance forms and technical publications.

Standards: Perform troubleshooting of the water system on the decontaminating apparatus in accordance with applicable technical publications. When the task is completed, the decontaminating apparatus must be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note:

1. Task may be taught, supported and evaluated in multiple lessons.
2. Equipment identified at the task may not reflect what is required in the formal training environment.
3. All required references and technical manuals will be provided by the local Command.

Performance Steps

1. Perform administrative actions.
 - a. Select applicable technical publications.
 - b. Practice shop safety and maintenance discipline.
 - c. Ensure proper tools and test equipment are available to inspect, repair/replace and Test, Measurement, Diagnostics Equipment (TMDE).
 - d. Perform initial inspection.
2. Diagnose fault on water system on the decontaminating apparatus and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all maintenance fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the decontaminating apparatus is fully mission capable
6. Ensure tools and equipment are properly maintained.
7. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

Performance Measures	GO	NO GO
1. Performed administrative actions.	_____	_____
2. Diagnosed fault on water assembly on the decontaminating apparatus and determine maintenance action to be performed.	_____	_____
3. Identified repair parts and requisition as required.	_____	_____
4. Ensured all maintenance fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5. Performed a final inspection to ensure the decontaminating apparatus was fully mission capable.	_____	_____
6. Ensured tools and equipment were properly maintained.	_____	_____
7. Completed DA Form 5988-E (EGA) as required.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

**References
Required**

Primary

TM 3-4230-238-10
TM 3-4230-238-23&P
DA FORM 2404
DA FORM 5988-E (EGA)

091-91J-1003**Maintain Heating Assembly on a Decontaminating Apparatus****DANGER**

DANGEROUS CHEMICALS, GASOLINE, HIGH VOLTAGE (maximum 24 volts), AND SCALDING WATER are used in the operation of the equipment. CARBON-MONOXIDE is present in the exhaust gases of the gasoline engine and the water heater. Wear protective clothing and a mask when engaged in decontaminating operations. STB decontaminating agent and slurry are harmful to the skin, eyes, lungs, and clothing. If STB decontaminating agent or slurry gets into the eyes, flush them immediately with clear water. If STB decontaminating agent or slurry is taken internally, drink raw egg white, milk, rice gruel, or milk of magnesia. Do not induce vomiting and seek medical assistance immediately. If STB decontaminating agent or slurry contacts the skin, wash off immediately with clear water.

WARNING

To avoid injury or electrical shock, keep the HEATER RECEPTACLE AND SWITCH on the pump unit controlpanel to OFF when the water heater is not in use. Avoid contact with the battery's positive contact at the starter solenoid when adjusting the belt tension. Electrical shock or damage to the equipment may result. If it is necessary to disconnect the hoses with the water temperature at or above 100°F (38°C), exercise extreme care to prevent scalding.

CAUTION

Use caution when opening drums of Super Tropical Bleach (STB); wear protective clothing and mask. Avoid contact with skin or eyes. Avoid contamination with acids and oxidizable materials such as fuels, oils, paint products, disinfectants, and ammonia. Such contamination can cause release of hazardous gases. Keep container closed and stored in a cool dry place. Mix only in accordance with directions for use. In case of contact with skin or eyes, immediately flush continuously with water; for eyes get medical attention. Keep clear of the exhaust stack during operation of the water heater.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on decontamination apparatus equipment and general mechanic tool kit, additional tools and equipment specified in technical manuals, repair parts, and applicable maintenance forms and technical publications.

Standards: Perform troubleshooting of the heating assembly on the decontaminating apparatus in accordance with applicable technical publications. When the task is completed, the decontaminating apparatus must be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note:

1. Task may be taught, supported and evaluated in multiple lessons.
2. Equipment identified at the task may not reflect what is required in the formal training environment.
3. All required references and technical manuals will be provided by the local Command.

Performance Steps

1. Perform administrative actions.
 - a. Select applicable technical publications.
 - b. Maintain tools, equipment and Test Measurements and Diagnostics Equipment (TMDE)
 - c. Ensure proper tools and test equipment are available to inspect, repair/replace and diagnostics equipment (TMDE).
 - d. Perform initial inspection.
2. Diagnose fault on heating assembly on the decontaminating apparatus and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all maintenance fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the decontaminating apparatus is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

Performance Measures

	GO	NO GO
1. Performed administrative actions.	_____	_____
2. Diagnosed fault on heating assembly on the decontaminating apparatus and determine maintenance action to be performed.	_____	_____
3. Identified repair parts and requisition as required.	_____	_____

- | | | |
|--|-------|-------|
| 4. Ensured all maintenance fault(s) were repaired in accordance with appropriate TMs and references. | _____ | _____ |
| 5. Performed a final inspection to ensure the decontaminating apparatus was fully mission capable. | _____ | _____ |
| 6. Ensured tools and equipment were properly maintained. | _____ | _____ |
| 7. Completed DA Form 5988-E (EGA) as required. | _____ | _____ |

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

References Required

Primary

TM 3-4230-238-10
 TM 3-4230-238-23&P
 DA FORM 2404
 DA FORM 5988-E (EGA)

091-91J-1004**Maintain Electrical Systems on Decontaminating Apparatus****DANGER**

DANGEROUS CHEMICALS, GASOLINE, HIGH VOLTAGE (maximum 24 volts), AND SCALDING WATER are used in the operation of the equipment. CARBON-MONOXIDE is present in the exhaust gases of the gasoline engine and the water heater. Wear protective clothing and a mask when engaged in decontaminating operations. STB decontaminating agent and slurry are harmful to the skin, eyes, lungs, and clothing. If STB decontaminating agent or slurry gets into the eyes, flush them immediately with clear water. If STB decontaminating agent or slurry is taken internally, drink raw egg white, milk, rice gruel, or milk of magnesia. Do not induce vomiting and seek medical assistance immediately. If STB decontaminating agent or slurry contacts the skin, wash off immediately with clear water.

WARNING

To avoid injury or electrical shock, keep the HEATER RECEPTACLE AND SWITCH on the pump unit control panel to OFF when the water heater is not in use. Avoid contact with the battery's positive contact at the starter solenoid when adjusting the belt tension. Electrical shock or damage to the equipment may result. If it is necessary to disconnect the hoses with the water temperature at or above 100°F (38°C), exercise extreme care to prevent scalding.

CAUTION

Use caution when opening drums of Super Tropical Bleach (STB); wear protective clothing and mask. Avoid contact with skin or eyes. Avoid contamination with acids and oxidizable materials such as fuels, oils, paint products, disinfectants, and ammonia. Such contamination can cause release of hazardous gases. Keep container closed and stored in a cool dry place. Mix only in accordance with directions for use. In case of contact with skin or eyes, immediately flush continuously with water; for eyes get medical attention. Keep clear of the exhaust stack during operation of the water heater.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on decontamination apparatus equipment and general mechanic tool kit, additional tools and equipment specified in technical manuals, repair parts, and applicable maintenance forms and technical publications.

Standards: Perform troubleshooting of the electrical system on the decontaminating apparatus in accordance with applicable technical publications. When the task is completed, the decontaminating apparatus must be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: All required references and technical manuals will be provided by the local Command.

Performance Steps

1. Perform administrative actions.
 - a. Select applicable technical publications.
 - b. Practice Shop Safety and maintenance discipline.
 - c. Ensure proper tools and test equipment are available to inspect, repair/replace and Test, Measurement and Diagnostics Equipment (TMDE).
 - d. Perform initial inspection.
2. Diagnose fault of electrical system on the decontaminating apparatus and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all maintenance fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the decontaminating apparatus is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task

Performance Measures	GO	NO GO
1. Performed administrative actions.	_____	_____
2. Diagnosed fault on electrical system on the decontaminating apparatus and determined maintenance action to be performed.	_____	_____
3. Identified repair parts and requisition as required.	_____	_____
4. Ensured all maintenance fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5. Performed a final inspection to ensure the decontaminating apparatus was fully mission capable.	_____	_____
6. Ensured tools and equipment were properly maintained.	_____	_____
7. Completed DA Form 5988-E (EGA) as required.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

**References
Required**

Primary

TM 3-4230-238-10
TM 3-4230-238-23&P
DA FORM 2404
DA FORM 5988-E (EGA)

091-91J-1005**Maintain AC/DC Electrical System on a Pump Assembly.****WARNING**

Any leakage of fuel renders unit non mission capable. Special Instructions. Leakage definitions for the operator/crew PMCS are defined as: Class I Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops. Class II Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected. Class III Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

CAUTION

Equipment operation is allowed with minor leakage (Class I or II). Of course, you must consider the fluid capacity of the item/system being checked/inspected. When in doubt, notify your supervisor. (1) When operating with Class I or Class II leaks, continue to check fluid levels as required in your PMCS. (2) Class III leaks should be reported to your supervisor or unit maintenance.

Conditions: In an operational environment, given a pump assembly, general mechanic's tool kit, multimeter, maintenance request or equipment inspection worksheet describing equipment malfunctions, additional tools, equipment specified in technical manuals (TMs), repair parts, applicable maintenance forms and technical publications.

Standards: Perform troubleshooting of electrical system on a pump assembly in accordance with performance measures and applicable technical publications. When the task is completed, pump assembly must be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: All required references and technical manuals will be provided by the local Command.

Performance Steps

1. Perform administrative actions.
 - a. Select applicable technical publications.
 - b. Practice shop safety and maintenance discipline.
 - c. Select and use applicable tools and Test, Measurement, and Diagnostic Equipment (TMDE).
 - d. Perform initial inspection.
2. Diagnose fault on AC/DC electrical system on the pump assembly and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all maintenance and fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the pump assembly is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

Performance Measures	GO	NO GO
1. Performed administrative actions.	_____	_____
2. Diagnosed fault on AC/DC electrical system of the pump assembly and determine maintenance action to be performed.	_____	_____
3. Identified repair parts and requisition as required.	_____	_____
4. Ensured all maintenance and fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5. Performed a final inspection to ensure the pump assembly was fully mission capable.	_____	_____
6. Ensured tools and equipment were properly maintained.	_____	_____
7. Completed DA Form 5988-E (EGA) as required.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

References**Required****Primary**

TM 10-4320-374-13&P
DA FORM 2404
DA FORM 5988-E (EGA)

091-91J-1006

Maintain Pressure Recovery Turbochargers on Water Purification Equipment.**DANGER****HEAVY EQUIPMENT HAZARD**

Lifting or moving heavy equipment incorrectly can cause serious injury. Do not try to lift or move more than 50 pounds by yourself. Get an assistant. Bend legs while lifting. Don't support heavy weight with your back. Always use assistants during lifting operations. Use guide ropes to move hanging assemblies. A lack of attention or being in an improper position during lifting operations can result in serious injury or death. Pay close attention to movements of assemblies being lifted. Do not stand under lifted assembly or in a position where you could be pinned against another object. Watch your footing. Hoist used to lift water tanks from water tank chests must have minimum lifting capacity of 750 pounds.

WARNING**CONTAMINATION HAZARD**

To prevent contamination of drinking water, make sure all couplings are capped and plugged when components are not connected or not in use. Keep dirt, mud, sand and debris from entering open couplings during assembly and disassembly. Have water tested by medical personnel before dispensing to users. Do not use petroleum based lubricants in the water system.

CAUTION**HIGH PRESSURE**

Do not open hose couplings when water system is under pressure. Hose end can whip, causing injury to personnel and damage to equipment.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on pressure recovery turbochargers on water purification equipment, general mechanic tool kit, equipment specified in technical manuals (TMs), repair parts, and applicable maintenance forms and technical publications.

Standards: Perform troubleshooting of the pressure recovery turbochargers on water purification equipment in accordance with applicable technical publications. When the task is completed, the water purification equipment must be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: All required references and technical manuals will be provided by the local Command.

Performance Steps

1. Perform administrative actions.
 - a. Select applicable technical publications.
 - b. Practice Shop Safety and maintenance discipline.
 - c. Ensure proper tools and test equipment are available to inspect, repair/replace and Test, Measurement and Diagnostics Equipment (TMDE).
 - d. Perform initial inspection.
2. Diagnose fault of pressure recovery turbochargers on water purification equipment and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all maintenance fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the water purification equipment is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

Performance Measures	GO	NO GO
1. Performed administrative actions.	_____	_____
2. Diagnosed fault of pressure recovery turbochargers on water purification equipment and determined maintenance action to be performed.	_____	_____
3. Identified repair parts and requisition as required.	_____	_____
4. Ensured all maintenance fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5. Performed a final inspection to ensure the water purification equipment was fully mission capable.	_____	_____

6. Ensured tools and equipment were properly maintained.

7. Completed DA Form 5988-E (EGA) as required.

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

**References
Required**

Primary

TM 10-4610-232-12

TM 10-4610-232-34

DA FORM 2404

DA FORM 5988-E (EGA)

091-91J-1007**Maintain Pressure Switch on Water Purification Equipment.****DANGER****HEAVY EQUIPMENT HAZARD**

Lifting or moving heavy equipment incorrectly can cause serious injury. Do not try to lift or move more than 50 pounds by yourself, get assistance. Prevent back injuries; bend your knees, keep legs bent and back straight while lifting. Do not support heavy weight with your back. Always use assistance during heavy lifting operations. Use guide ropes to move hanging assemblies. A lack of attention or being in an improper position during lifting operations can result in serious injury or death. Pay close attention to movements of assemblies being lifted. Do not stand under lifted assembly or in a position where you could be pinned against another object. Watch your footing. Hoist being used to lift water tanks from water tank chests must have minimum lifting capacity of 750 pounds.

WARNING**CONTAMINATION HAZARD**

To prevent contamination of drinking water, make sure all couplings are capped and plugged when components are not connected or not in use. Keep dirt, mud, sand and debris from entering open couplings during assembly and disassembly. Have water tested by medical personnel before dispensing to users. Do not use petroleum based lubricants in the water system.

CAUTION**HIGH PRESSURE**

Do not open hose couplings when water system is under pressure. Hose end can whip, causing injury to personnel and damage to equipment.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on water purification equipment and general mechanic tool kit, additional tools and equipment specified in technical manuals, repair parts, and applicable maintenance forms and technical publications.

Standards: Perform troubleshooting of the pressure switch on the water purification equipment in accordance with applicable technical publications. When the task is completed, the water purification equipment must be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: All required references and technical manuals will be provided by the local Command.

Performance Steps

1. Perform administrative actions.
 - a. Select applicable technical publications.
 - b. Practice Shop Safety and maintenance discipline.
 - c. Ensure proper tools, Test Equipment, and Diagnostics Equipment (TMDE) are available to inspect, replace or repair malfunction.
 - d. Perform initial inspection.
2. Diagnose fault on pressure switch on the water purification equipment and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all maintenance fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the water purification equipment is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

Performance Measures	GO	NO GO
1. Performed administrative actions.	_____	_____
2. Diagnosed fault on pressure switch on the water purification equipment and determined maintenance action to be performed.	_____	_____
3. Identified repair parts and requisitioned as required.	_____	_____
4. Ensured all maintenance fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5. Performed a final inspection to ensure the water purification equipment was fully mission capable.	_____	_____
6. Ensured tools and equipment were properly maintained.	_____	_____
7. Completed DA Form 5988-E (EGA) as required.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

**References
Required**

Primary

TM 10-4610-232-12
TM 10-4610-232-34
DA FORM 2404
DA FORM 5988-E (EGA)

091-91J-1008**Maintain Level Switch Assembly on Water Purification Equipment.****DANGER****HEAVY EQUIPMENT HAZARD**

Lifting or moving heavy equipment incorrectly can cause serious injury. Do not try to lift or move more than 50 pounds by yourself, get assistance. Prevent back injuries; bend your knees, keep legs bent and back straight while lifting. Do not support heavy weight with your back. Always use assistance during heavy lifting operations. Use guide ropes to move hanging assemblies. A lack of attention or being in an improper position during lifting operations can result in serious injury or death. Pay close attention to movements of assemblies being lifted. Do not stand under lifted assembly or in a position where you could be pinned against another object. Watch your footing. Hoist being used to lift water tanks from water tank chests must have minimum lifting capacity of 750 pounds.

WARNING**CONTAMINATION HAZARD**

To prevent contamination of drinking water, make sure all couplings are capped and plugged when components are not connected or not in use. Keep dirt, mud, sand and debris from entering open couplings during assembly and disassembly. Have water tested by medical personnel before dispensing to users. Do not use petroleum based lubricants in the water system.

CAUTION**HIGH PRESSURE**

Do not open hose couplings when water system is under pressure. Hose end can whip, causing injury to personnel and damage to equipment.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on water purification equipment, general mechanic tool kit, additional tools and equipment specified in technical manuals, repair parts, and applicable maintenance forms and technical publications.

Standards: Perform troubleshooting of the level switch on the water purification equipment in accordance with applicable technical publications. When the task is completed, the water purification must be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: All required references and technical manuals will be provided by the local Command.

Performance Steps

1. Perform administrative actions.
 - a. Select applicable technical publications.
 - b. Practice shop safety and maintenance discipline.
 - c. Ensure proper tools, Test Equipment, and Diagnostics Equipment (TMDE) are available to inspect, replace or repair malfunction.
 - d. Perform initial inspection.
2. Diagnose fault on level switch assembly on the water purification equipment and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all maintenance fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the water purification Equipment is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

Performance Measures	GO	NO GO
1. Performed administrative actions.	_____	_____
2. Diagnosed fault on level switch assembly on the water purification equipment and determined maintenance action to be performed.	_____	_____
3. Identified repair parts and requisitioned as required.	_____	_____
4. Ensured all maintenance fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5. Performed a final inspection to ensure the water purification Equipment was fully mission capable.	_____	_____
6. Ensured tools and equipment were properly maintained.	_____	_____
7. Completed DA Form 5988-E (EGA) as required.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

**References
Required**

Primary

TM 10-4610-232-12
TM 10-4610-232-34
DA FORM 2404
DA FORM 5988-E (EGA)

091-91J-1009
Maintain Air System on a Water Purification System.

DANGER

HEAVY EQUIPMENT HAZARD

Lifting or moving heavy equipment incorrectly can cause serious injury. Do not try to lift or move more than 50 pounds by yourself, get assistance. Prevent back injuries; bend your knees, keep legs bent and back straight while lifting. Do not support heavy weight with your back. Always use assistance during heavy lifting operations. Use guide ropes to move hanging assemblies. A lack of attention or being in an improper position during lifting operations can result in serious injury or death. Pay close attention to movements of assemblies being lifted. Do not stand under lifted assembly or in a position where you could be pinned against another object. Watch your footing. Hoist being used to lift water tanks from water tank chests must have minimum lifting capacity of 750 pounds.

WARNING

CONTAMINATION HAZARD

To prevent contamination of drinking water, make sure all couplings are capped and plugged when components are not connected or not in use. Keep dirt, mud, sand and debris from entering open couplings during assembly and disassembly. Have water tested by medical personnel before dispensing to users. Do not use petroleum based lubricants in the water system.

CAUTION

HIGH PRESSURE

Do not open hose couplings when water system is under pressure. Hose end can whip, causing injury to personnel and damage to equipment.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on water purification equipment and general mechanic tool kit, equipment specified in technical manuals, repair parts, and applicable maintenance forms and technical publications.

Standards: Perform troubleshooting of the air system on the water purification equipment in accordance with applicable technical publications. When the task is completed, the water purification system must be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: All required references and technical manuals will be provided by the local Command.

Performance Steps

1. Perform administrative actions.
 - a. Select applicable technical publications.
 - b. Practice Shop Safety and maintenance discipline.
 - c. Ensure proper tools, Test Equipment and Diagnostics Equipment (TMDE) are available to inspect, replace and repair malfunction.
 - d. Perform initial inspection.
2. Diagnose fault on air system on the water purification equipment and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all maintenance fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the water purification equipment is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

Performance Measures	GO	NO GO
1. Performed administrative actions.	_____	_____
2. Diagnosed fault on air system on the water purification equipment and determine maintenance action to be performed.	_____	_____
3. Identified repair parts and requisition as required.	_____	_____
4. Ensured all maintenance fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5. Performed a final inspection to ensure the water purification equipment was fully mission capable.	_____	_____
6. Ensured tools and equipment were properly maintained.	_____	_____
7. Completed DA Form 5988-E (EGA) as required.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

References**Required****Primary**

TM 10-4610-232-13-1
TM 10-4610-232-13-2
DA FORM 2404
DA FORM 5988-E (EGA)

091-91J-1010
Maintain Gauges on a Water Purification Equipment.

DANGER

HEAVY EQUIPMENT HAZARD

Lifting or moving heavy equipment incorrectly can cause serious injury. Do not try to lift or move more than 50 pounds by yourself. Get an assistant. Bend legs while lifting. Don't support heavy weight with your back. Always use assistants during lifting operations. Use guide ropes to move hanging assemblies. A lack of attention or being in an improper position during lifting operations can result in serious injury or death. Pay close attention to movements of assemblies being lifted. Do not stand under lifted assembly or in a position where you could be pinned against another object. Watch your footing. Hoist used to lift water tanks from water tank chests must have minimum lifting capacity of 750 pounds.

WARNING

CONTAMINATION HAZARD

To prevent contamination of drinking water, make sure all couplings are capped and plugged when components are not connected or not in use. Keep dirt, mud, sand and debris from entering open couplings during assembly and disassembly. Have water tested by medical personnel before dispensing to users. Do not use petroleum based lubricants in the water system.

CAUTION

HIGH PRESSURE

Do not open hose couplings when water system is under pressure. Hose end can whip, causing injury to personnel and damage to equipment.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on water purification equipment and general mechanic tool kit, equipment specified in technical manuals, repair parts, and applicable maintenance forms and technical publications.

Standards: Perform troubleshooting of the gauges on the water purification equipment in accordance with applicable technical publications. When the task is completed, the water purification must be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: All required references and technical manuals will be provided by the local Command.

Performance Steps

1. Perform administrative actions.
 - a. Select applicable technical publications.
 - b. Practice shop safety and maintenance discipline.
 - c. Ensure proper tools, Test Equipment, and Diagnostics Equipment (TMDE) are available to inspect, replace or repair malfunction.
 - d. Perform initial inspection.
2. Diagnose fault on gauges on the water purification equipment and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all maintenance fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the water purification equipment is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

Performance Measures	GO	NO GO
1. Performed administrative actions.	_____	_____
2. Diagnosed fault on gauge on the water purification equipment and determined maintenance action to be performed.	_____	_____
3. Identified repair parts and requisitioned as required.	_____	_____
4. Ensured all maintenance fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5. Performed a final inspection to ensure the water purification equipment was fully mission capable.	_____	_____
6. Ensured tools and equipment were properly maintained.	_____	_____
7. Completed DA Form 5988-E (EGA) as required.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

**References
Required**

Primary

TM 10-4610-232-13-1
TM 10-4610-232-13-2
DA FORM 2404
DA FORM 5988-E (EGA)

091-91J-1011
Maintain Water System on Water Purification Equipment.

DANGER

HEAVY EQUIPMENT HAZARD

Lifting or moving heavy equipment incorrectly can cause serious injury. Do not try to lift or move more than 50 pounds by yourself. Get an assistant. Bend legs while lifting. Don't support heavy weight with your back. Always use assistants during lifting operations. Use guide ropes to move hanging assemblies. A lack of attention or being in an improper position during lifting operations can result in serious injury or death. Pay close attention to movements of assemblies being lifted. Do not stand under lifted assembly or in a position where you could be pinned against another object. Watch your footing. Hoist used to lift water tanks from water tank chests must have minimum lifting capacity of 750 pounds.

WARNING

CONTAMINATION HAZARD

To prevent contamination of drinking water, make sure all couplings are capped and plugged when components are not connected or not in use. Keep dirt, mud, sand and debris from entering open couplings during assembly and disassembly. Have water tested by medical personnel before dispensing to users. Do not use petroleum based lubricants in the water system.

CAUTION

HIGH PRESSURE

Do not open hose couplings when water system is under pressure. Hose end can whip, causing injury to personnel and damage to equipment.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on water purification equipment and general mechanic tool kit, equipment specified in technical manuals, repair parts, and applicable maintenance forms and technical publications.

Standards: Perform troubleshooting of the water system on the water purification equipment in accordance with applicable technical publications. When the task is completed, the water purification must be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: All required references and technical manuals will be provided by the local Command.

Performance Steps

1. Perform administrative actions.
 - a. Select applicable technical publications.
 - b. Practice shop safety and maintenance discipline.
 - c. Ensure proper tools, Test Equipment, and Diagnostics Equipment (TMDE) are available to inspect, replace or repair malfunction.
 - d. Perform initial inspection.
2. Diagnose fault on water system on the water purification equipment and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all maintenance fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the water purification equipment is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

Performance Measures	GO	NO GO
1. Performed administrative actions.	_____	_____
2. Diagnosed fault on water system on the water purification equipment and determined maintenance action to be performed.	_____	_____
3. Identified repair parts and requisitioned as required.	_____	_____
4. Ensured all maintenance fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5. Performed a final inspection to ensure the water purification Equipment was fully mission capable.	_____	_____
6. Ensured tools and equipment were properly maintained.	_____	_____
7. Completed DA Form 5988-E (EGA) as required.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

**References
Required**

Primary

TM 10-4610-310-13
DA FORM 2404
DA FORM 5988-E (EGA)

091-91J-1012**Maintain Air Subsystem on Water Purification Equipment.****DANGER****HEAVY EQUIPMENT HAZARD**

Lifting or moving heavy equipment incorrectly can cause serious injury. Do not try to lift or move more than 50 pounds by yourself. Get an assistant. Bend legs while lifting. Don't support heavy weight with your back. Always use assistants during lifting operations. Use guide ropes to move hanging assemblies. A lack of attention or being in an improper position during lifting operations can result in serious injury or death. Pay close attention to movements of assemblies being lifted. Do not stand under lifted assembly or in a position where you could be pinned against another object. Watch your footing. Hoist used to lift water tanks from water tank chests must have minimum lifting capacity of 750 pounds.

WARNING**CONTAMINATION HAZARD**

To prevent contamination of drinking water, make sure all couplings are capped and plugged when components are not connected or not in use. Keep dirt, mud, sand and debris from entering open couplings during assembly and disassembly. Have water tested by medical personnel before dispensing to users. Do not use petroleum based lubricants in the water system.

CAUTION**HIGH PRESSURE**

Do not open hose couplings when water system is under pressure. Hose end can whip, causing injury to personnel and damage to equipment.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on water purification equipment and general mechanic tool kit, equipment specified in technical manuals, repair parts, and applicable maintenance forms and technical publications.

Standards: Perform troubleshooting of the air subsystem on the water purification equipment in accordance with applicable technical publications. When the task is completed, the water purification must be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: All required references and technical manuals will be provided by the local Command.

Performance Steps

1. Perform administrative actions.
 - a. Select applicable technical publications.
 - b. Practice shop safety and maintenance discipline.
 - c. Ensure proper tools, Test Equipment, and Diagnostics Equipment (TMDE) are available to inspect, replace or repair malfunction.
 - d. Perform initial inspection.
2. Diagnose fault on air subsystem on the water purification equipment and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all maintenance fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the water purification equipment is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

Performance Measures	GO	NO GO
1. Performed administrative actions.	_____	_____
2. Diagnosed fault on air subsystem on the water purification equipment and determined maintenance action to be performed.	_____	_____
3. Identified repair parts and requisitioned as required.	_____	_____
4. Ensured all maintenance fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5. Performed a final inspection to ensure the water purification equipment was fully mission capable.	_____	_____
6. Ensured tools and equipment were properly maintained.	_____	_____
7. Completed DA Form 5988-E (EGA) as required.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

**References
Required**

Primary

TM 10-4610-232-13-1
TM 10-4610-232-13-2
DA FORM 2404
DA FORM 5988-E (EGA)

091-91J-1013**Maintain Electrical System on Water Purification Equipment.****DANGER****HEAVY EQUIPMENT HAZARD**

Lifting or moving heavy equipment incorrectly can cause serious injury. Do not try to lift or move more than 50 pounds by yourself. Get an assistant. Bend legs while lifting. Don't support heavy weight with your back. Always use assistants during lifting operations. Use guide ropes to move hanging assemblies. A lack of attention or being in an improper position during lifting operations can result in serious injury or death. Pay close attention to movements of assemblies being lifted. Do not stand under lifted assembly or in a position where you could be pinned against another object. Watch your footing. Hoist used to lift water tanks from water tank chests must have minimum lifting capacity of 750 pounds.

WARNING**CONTAMINATION HAZARD**

To prevent contamination of drinking water, make sure all couplings are capped and plugged when components are not connected or not in use. Keep dirt, mud, sand and debris from entering open couplings during assembly and disassembly. Have water tested by medical personnel before dispensing to users. Do not use petroleum based lubricants in the water system.

CAUTION**HIGH PRESSURE**

Do not open hose couplings when water system is under pressure. Hose end can whip, causing injury to personnel and damage to equipment.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on water purification equipment and general mechanic tool kit, equipment specified in technical manuals, repair parts, and applicable maintenance forms and technical publications.

Standards: Perform troubleshooting of the electrical system on the water purification equipment in accordance with applicable technical publications. When the task is completed, the water purification must be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: All required references and technical manuals will be provided by the local Command.

Performance Steps

1. Perform administrative actions.
 - a. Select applicable technical publications.
 - b. Practice shop safety and maintenance discipline.
 - c. Ensure proper tools, Test Equipment, and Diagnostics Equipment (TMDE) are available to inspect, replace or repair malfunction.
 - d. Perform initial inspection.
2. Diagnose fault on electrical system on the water purification equipment and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all maintenance fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the water purification equipment is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

Performance Measures	GO	NO GO
1. Performed administrative actions.	_____	_____
2. Diagnosed fault on electrical system on the water purification equipment and determined maintenance action to be performed.	_____	_____
3. Identified repair parts and requisitioned as required.	_____	_____
4. Ensured all maintenance fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5. Performed a final inspection to ensure the water purification Equipment was fully mission capable.	_____	_____
6. Ensured tools and equipment were properly maintained.	_____	_____
7. Completed DA Form 5988-E (EGA) as required.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

References Required**Primary**

TM 10-4610-232-12
TM 10-4610-232-34
TM 10-4610-309-14
TM 10-4610-309-23
TM 10-4610-309-23P
DA FORM 2404
DA FORM 5988-E (EGA)

Maintain Reverse Osmosis Rupture Disc on Water Purification Equipment.**DANGER****HEAVY EQUIPMENT HAZARD**

Lifting or moving heavy equipment incorrectly can cause serious injury. Do not try to lift or move more than 50 pounds by yourself. Get an assistant. Bend legs while lifting. Don't support heavy weight with your back. Always use assistants during lifting operations. Use guide ropes to move hanging assemblies. A lack of attention or being in an improper position during lifting operations can result in serious injury or death. Pay close attention to movements of assemblies being lifted. Do not stand under lifted assembly or in a position where you could be pinned against another object. Watch your footing. Hoist used to lift water tanks from water tank chests must have minimum lifting capacity of 750 pounds.

WARNING**CONTAMINATION HAZARD**

To prevent contamination of drinking water, make sure all couplings are capped and plugged when components are not connected or not in use. Keep dirt, mud, sand and debris from entering open couplings during assembly and disassembly. Have water tested by medical personnel before dispensing to users. Do not use petroleum based lubricants in the water system.

CAUTION**HIGH PRESSURE**

Do not open hose couplings when water system is under pressure. Hose end can whip, causing injury to personnel and damage to equipment.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on water purification equipment and general mechanic tool kit, equipment specified in technical manuals, repair parts, and applicable maintenance forms and technical publications.

Standards: Perform troubleshooting of the reverse osmosis rupture disc water purification equipment in accordance with applicable technical publications. When the task is completed, the water purification must be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: All required references and technical manuals will be provided by the local Command.

Performance Steps

1. Perform administrative actions.
 - a. Select applicable technical publications.
 - b. Practice shop safety and maintenance discipline.
 - c. Ensure proper tools, Test Equipment, and Diagnostics Equipment (TMDE) are available to inspect, replace or repair malfunction.
 - d. Perform initial inspection.
2. Diagnose fault on reverse osmosis rupture disc water purification equipment and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all maintenance fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the water purification equipment is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

Performance Measures	GO	NO GO
1. Performed administrative actions.	_____	_____
2. Diagnosed fault on Reverse Osmosis Rupture Disc on the water purification equipment and determined maintenance action to be performed.	_____	_____
3. Identified repair parts and requisitioned as required.	_____	_____
4. Ensured all maintenance fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5. Performed a final inspection to ensure the water purification equipment was fully mission capable.	_____	_____
6. Ensured tools and equipment were properly maintained.	_____	_____
7. Completed DA Form 5988-E (EGA) as required.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

**References
Required**

Primary

TM 10-4610-232-13-1
TM 10-4610-232-13-2
DA FORM 2404
DA FORM 5988-E (EGA)

091-91J-1015**Maintain Liquid Pump Assembly on Quartermaster and Chemical Equipment.****DANGER**

Failure to obey any of the above warnings may result in personnel injury or death. Do not operate equipment in enclosed area unless exhaust gases are piped to outside and adequate ventilation is provided. Avoid inhalation of exhaust fumes. Do not smoke, use open flames or operate equipment while working with fuel. Avoid inhalation of fumes from fuel.

WARNING

Dry cleaning solvent is potentially dangerous to personnel and property. Do not use dry cleaning solvent without proper ventilation and clothing. Do not smoke or use near open flame or excessive heat. Clean parts in a well-ventilated area. Avoid inhalation of solvent fumes. Wear goggles and rubber gloves to protect eyes and skin. Wash exposed skin thoroughly. Flash point of solvent is 100°F to 138°F (38°C to 59°C).

CAUTION

Do not lift heavy assemblies without lifting device. Do not operate pump unless priming port is capped. Do not come within 50 feet of operating equipment without ear protection. Do not service battery without rubber gloves and protective clothing. Electrolyte causes serious burns. Hot surfaces can cause serious burns. Do not touch hot surfaces caused by equipment operation. Do not work on equipment that is operating.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on liquid pump assembly and general mechanic tool kit, equipment specified in technical manuals, repair parts, and applicable maintenance forms and technical publications.

Standards: Perform troubleshooting of the liquid pump assembly on Quartermaster and Chemical Equipment in accordance with applicable technical publications. When the task is completed, the liquid pump assembly must be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: Pump stops or fails to deliver rated flow or pressure.

Note: All required references and technical manuals will be provided by the local Command.

Performance Steps

1. Perform administrative actions.
 - a. Select applicable Technical Publications.
 - b. Practice shop safety and maintenance discipline.
 - c. Ensure proper tools, Test Equipment, and Diagnostics Equipment (TMDE) are available to inspect, replace or repair malfunction.
 - d. Perform initial inspection.
2. Diagnose fault on liquid pump assembly on quartermaster and chemical equipment and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all maintenance fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the liquid pump assembly is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

Performance Measures	GO	NO GO
1. Performed administrative actions.	_____	_____
2. Diagnosed fault on liquid pump assembly on quartermaster and chemical equipment and determined maintenance action to be performed.	_____	_____
3. Identified repair parts and requisitioned as required.	_____	_____
4. Ensured all maintenance fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5. Performed a final inspection to ensure the liquid pump assembly was fully mission capable.	_____	_____
6. Ensured tools and equipment were properly maintained.	_____	_____
7. Completed DA Form 5988-E (EGA) as required.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed show the Soldier what was done wrong and how it should have been done to score a GO.

**References
Required**

Primary

TM 10-4320-374-13&P
DA FORM 2404
DA FORM 5988-E (EGA)

091-91J-1016**Maintain Diesel Engine Assembly on Quartermaster and Chemical Equipment.****DANGER**

Failure to obey any of the above warnings may result in personnel injury or death. Do not operate equipment in enclosed area unless exhaust gases are piped to outside and adequate ventilation is provided. Avoid inhalation of exhaust fumes. Do not smoke, use open flames or operate equipment while working with fuel. Avoid inhalation of fumes from fuel.

WARNING

Dry cleaning solvent is potentially dangerous to personnel and property. Do not use dry cleaning solvent without proper ventilation and clothing. Do not smoke or use near open flame or excessive heat. Clean parts in a well-ventilated area. Avoid inhalation of solvent fumes. Wear goggles and rubber gloves to protect eyes and skin. Wash exposed skin thoroughly. Flash point of solvent is 100°F to 138°F (38°C to 59°C).

CAUTION

Do not lift heavy assemblies without lifting device. Do not operate pump unless priming port is capped. Do not come within 50 feet of operating equipment without ear protection. Do not service battery without rubber gloves and protective clothing. Electrolyte causes serious burns. Hot surfaces can cause serious burns. Do not touch hot surfaces caused by equipment operation. Do not work on equipment that is operating.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing malfunctions of a diesel engine assembly on Quartermaster and Chemical Equipment, general mechanic tool kit, equipment specified in technical manuals, repair parts, applicable maintenance forms, and technical publications.

Standards: Perform troubleshooting of the diesel engine assembly on Quartermaster and Chemical Equipment in accordance with applicable technical publications. When the task is completed, the diesel engine assembly must be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: All required references and technical manuals will be provided by the local Command.

Performance Steps

1. Perform administrative actions.
 - a. Select applicable technical publications.
 - b. Practice shop safety and maintenance discipline.
 - c. Ensure proper tools, Test Equipment, and Diagnostics Equipment (TMDE) are available to inspect, replace or repair malfunction.
 - d. Perform initial inspection.
2. Diagnose fault on diesel engine assembly and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all maintenance fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the diesel engine assembly is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

Performance Measures	GO	NO GO
1. Performed administrative actions.	_____	_____
2. Diagnosed fault on diesel engine assembly and determined maintenance action to be performed.	_____	_____
3. Identified repair parts and requisitioned as required.	_____	_____
4. Ensured all maintenance fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5. Performed a final inspection to ensure the diesel engine assembly was fully mission capable.	_____	_____
6. Ensured tools and equipment were properly maintained.	_____	_____
7. Completed DA Form 5988-E (EGA) as required.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed show the Soldier what was done wrong and how it should have been done to score a GO.

**References
Required**

Primary

TM 10-4320-374-13&P
DA FORM 2404
DA FORM 5988-E (EGA)

091-91J-1017
Maintain Personnel Heaters.

DANGER

Do not operate the heater unit in fuel vapor areas or in areas lacking adequate ventilation to support heater fuel combustion. Do not smoke or use open flame in the vicinity when filling fuel tank. Always provide metal-to-metal contact between fuel container and fuel tank to prevent a spark from being generated as fuel flows over metallic surfaces.

WARNING

Do not operate the heater unit inside a building unless the exhaust gases are properly vented to the outside. Be sure the duct dust covers are removed prior to operation. A 50-lb. (22.7 kg) capacity carbon dioxide fire extinguisher should be available on a standby basis in the area where the heater unit is to be operated. Do not operate the heater unit for longer than 10 minutes in the heating mode when the ambient temperature is above +70°F (+21.1°C). Do not restrict ventilating airflow. Equipment damage and/or improper operation will occur.

CAUTION

Do not set up the heater unit on extremely unlevel (greater than 8 1/2 degrees from true horizontal position) terrain. Doing so may result in improper operation or damage to equipment. Position the heater unit approximately 7 ft. (2134 mm) from the shelter. Be sure the heater unit's duct openings face the shelter connections.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on personnel heaters and general mechanic tool kit, equipment specified in technical manuals, repair parts, and applicable maintenance forms and technical publications.

Standards: Perform troubleshooting of the personnel heater in accordance with applicable technical publications. When the task is completed, the heater must be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: All required references and technical manuals will be provided by the local Command.

Performance Steps

1. Perform administrative actions.
 - a. Select applicable technical publications.
 - b. Practice shop safety and maintenance discipline.
 - c. Ensure proper tools, Test Equipment, and Diagnostics Equipment (TMDE) are available to inspect, replace or repair malfunction.
 - d. Perform initial inspection.
2. Diagnose fault on personnel heater and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all maintenance fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the personnel heaters is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

Performance Measures	GO	NO GO
1. Performed administrative actions.	_____	_____
2. Diagnosed fault on personnel heater and determined maintenance action to be performed.	_____	_____
3. Identified repair parts and requisitioned as required.	_____	_____
4. Ensured all maintenance fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5. Performed a final inspection to ensure the personnel heaters was fully mission capable.	_____	_____
6. Ensured tools and equipment were properly maintained.	_____	_____
7. Completed DA Form 5988-E (EGA) as required.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

References**Required****Primary**

TM 9-4520-271-14

DA FORM 2404

DA FORM 5988-E (EGA)

Subject Area 4: LAUNDRY EQUIPMENT
091-91J-1024
Operate Laundry Advanced System (LADS)

WARNING

Prior to removing power from the LADS a cool down cycle must be run. This allows piping and system components to cool down to safe temperatures prior to performing after PMCS procedures. Thermal fluid can reach temperatures near 400 °F while the heating system is operating. Failure to perform the cool down procedure could result in personnel being exposed to hot fluids and external surfaces causing severe burn injury or death. Seek immediate medical attention if injury occurs.

CAUTION

Do not load more than 200 lbs or less than 50 lbs of laundry into one drum to avoid causing stress to drum structure leading to premature failure of equipment. Only use specified detergent. Never add more than 1ounce of detergent per load to avoid excessive sudsing, overflowing of tanks, and still boil-overs. NEVER use chlorine bleach in the LADS. If chlorine bleach enters the still, hydrochloric acid will be produced, causing rapid deterioration of the still, still condenser, and condensate plumbing.

Conditions: As a Quartermaster and Chemical Equipment Repairer in an operational environment, given a Laundry Advanced System (LADS), maintenance request or inspection worksheet, general mechanics tool kit and appropriate technical manuals.

Standards: Operate the Laundry Advanced System in accordance with the applicable technical publications. When the task is completed, all shortcomings and deficiencies have been identified on the proper maintenance forms.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: Quartermaster and Chemical Equipment Repairer is given a Maintenance Request or Inspection Worksheet stating a malfunction.

Note: If you have a C model LAD follow the operating instructions that refers to the TM 10-3510-221-10

Performance Steps

Note: Ensure all Before PMCS procedures have been completed.

- (1) FUEL SUPPLY: Check for adequate supply of fuel in fuel tank. Ensure supply hoses are not damaged and are connected at fuel tank and heater. Ensure supply hose is not damaged and is connected at supply hose and generator.
- (2) HEATER: Ensure blower air inlet screen is not blocked with debris. Check fuel lines for evidence of leakage
- (3) THERMAL FLUID PLUMBING: Check thermal fluid plumbing for evidence of leakage.
- (4) STILL: Ensure doors are closed and knobs are hand tight. Ensure handles on drain valves are in the closed/forward position.
- (5) STILL CONDENSER: Ensure all three heat exchanger inlet screens are not blocked with debris.
- (6) WATER SUPPLY: Check for adequate supply of water in external container. Ensure supply hoses are not damaged and are connected at external container, water supply pump, and LADS piping connections.
- (7) WATER SUPPLY PUMP: Check electrical cable on water supply pump for damage and proper connection at junction box.
- (8) WATER PUMPS: Ensure manual valves are closed. Ensure pump cover is properly installed.
- (9) WATER PLUMBING: Check water plumbing for evidence of leakage. Ensure shut-off valve for utility hose is closed.
- (10) WASHING/DRYING DRUMS: Ensure dryer inlet screens are installed and there is no debris blocking air flow. Ensure load binders are not installed.
- (11) INVERTER ENCLOSURE: Ensure inlet door is open and not blocked with debris.
- (12) AIR SYSTEM: Ensure shutoff valve is open.
- (13) ELECTRICAL SUPPLY: Ensure external electrical power is available. If power is supplied by Tactical Quiet Generator (TQG) ensure all PMCS has been done per TM 9-6115-644-0. Check main electrical cable for damage and proper connection at external power source and at the LADS electrical box. Check ground wires for proper connection at ISO frame and trailer.
- (14) DRYER AIR OUTLET GUARDS: Ensure dryer blower outlet guards are not blocked with debris.
- (15) STILL CONDENSER: Ensure fan guard and inlet shroud are not blocked with debris.
- (16) HEATER: Ensure exhaust duct is not blocked with debris.
- (17) ANTI-FOAM SUPPLY: Check for adequate supply of anti-foam in external container. Shake anti-foam container to mix solution. Ensure hand pump is inserted completely into container.
- (18) DETERGENT SUPPLY: Check for adequate supply of detergent in external container.
- (19) REWASH MAINIFOLD: Ensure Pre-Wash manifold is properly connected to LADS piping connections. Check electrical cable for proper connection. Ensure hose is properly connected and routed to drain area. Ensure both operation levers are set to AUTO.

(20) SUBCOLLER: Ensure inlet screen is not blocked with debris. Ensure eight (8) manual valves are closed.

(21) PRE-FILTER: Ensure manual valve is closed.

(22) COALESCER: Ensure manual valve is closed. Ensure petcock is closed.

(23) DISTILLATE PUMP: Ensure manual valve is closed.

(24) AIR SYSTEM: Ensure three (3) Manual valves are closed (See Figure 10, Item 51). Ensure manual valve is open (See Figure 10, Item 52).

(25) INVERTER ENCLOSURE: Ensure inlet door and outlet door are open and not blocked with debris.

(26) WASHING/DRYING DRUMS: Ensure sluice lids are closed and latches are engaged. Ensure retaining points are not installed. Ensure four (4) air bag manual valves are closed. Ensure lint filters are cleaned and installed and latches are engaged.

(27) INVERTER ENCLOSURE FAN: At start-up, ensure fan is blowing air out of enclosure after start-up.

1. Bring MEP-805A generator on line (TM 9-6115-644-10) or apply external power as required.

2. Set generator output to 210 VAC, 60 HZ.

3. Verify EMERGENCY STOP switch is pulled out.

4. Position MAIN DISCONNECT switch to ON.

5. Verify MAIN POWER lamp is on.

6. Perform DURING PMCS items 1 and 2. (WP 0041)

(28) INVERTER ENCLOSURE FAN: At start-up, ensure fan is blowing air out of enclosure after start-up. (See Figure 1, Item 1).

(29) DRUM MOTOR COOLING FANS: At start-up, ensure fans are blowing air around drive motors after start-up (See Figure 1, Item 2).

(30) Position CONTROL POWER switch to ON. Note: LADS contains a monitor that verifies correct electrical phasing with external power source. If phasing is not correct, CONTROL POWER lamp will not come on, with CONTROL POWER switch in ON position.

(31) Verify POWER lamp is ON. Note: If indications displayed at touch screen are not as stated in the following procedures refer to the Troubleshooting Index, WP 0024, to determine the proper action to take. If the control system detects a system failure the audible alarm will go on and off intermittently. Further operations may or may not be interrupted, depending on the nature of the fault. If this occurs touch screen will display an Alarm Message. In either refer to WP 0024, Troubleshooting Procedures to determine the proper action to take.

(32) Monitor touch screen. System will take approximately 30 to 40 seconds to boot up for the START MENU to be displayed.

(33) Press UTILITY OPERATION on touchscreen. UTILITY OPERATION MENU will be displayed and air compressor will automatically start if system senses low air pressure. Note: Only AIR SYSTEM STATUS, USE UTILITY HOSE, and RETURN will be selectable on touchscreen until air pressure in system reaches 80 psi.

(34) Press AIR SYSTEM STATUS on touchscreen and verify display advances to START AIR SYSTEM screen.

(35) Once air system has pressurized, verify touchscreen displays the message READY TO PERFORM UTILITY OPERATIONS. Press RETURN to go to UTILITY OPERATION MENU.

(36) Check rotation and prime water supply pump as follows:

- (1) Press USE UTILITY HOSE on touchscreen.
- (2) Press START WATER PUMP on touchscreen.
- (3) Unplug electrical cable or position water supply pump power switch to OFF.
- (4) When pump starts to slow down check rotation of the fan on the pump motor and ensure that it is rotating in the same direction as pump direction arrow.
- (5) Plug electrical cable back into water supply pump or position power switch back to ON.
- (6) Press STOP WATER PUMP then press RETURN.
- (7) Press RETURN to return to UTILITY OPERATION MENU.

(37) Press FILL WATER TANKS on touchscreen. (Utility Operation Menu). Note: Water tanks take between 10-15 minutes to fill. At any point in filling cycle OVERRIDE FILLING can be selected on touchscreen to stop filling process and return to UTILITY OPERATION MENU.

(38) Observe touchscreen and verify FILL WATER TANKS MODE screen is displayed.

(39) Verify touchscreen has returned to UTILITY OPERATION MENU once water tanks are full.

(40) If water heating is desired press HEAT RINSE 2 WATER. Set at desired temperature then press HEAT WATER. Note: Setting temperature above or below allowable range of 70-160 degrees will cause the temperature "to return to the default value of 150 degrees".

(41) Observe touchscreen and verify the following screens display in succession as HEAT RINSE 2 WATER cycle progresses.

(42) Verify touchscreen shows Heat Rinse Water cycle is complete. Note: If one drum is already operating and the other drum is selected the touchscreen will display STAGGERING CYCLES. The laundry menu will appear for the second drum as soon as the first drum reaches the DRAIN TO RINSE 1 TANK step. This typically occurs 18-20 minutes after the first cycle is started. During continuous laundry operations refer to WP 0041, During PMCS after each cycle and at shift change. Perform actions as indicated.

(43) Start Laundry Operation.

(44) Press RETURN to go to START MENU, then press LAUNDRY OPERATION.

(45) Select OPERATE DRUM A or OPERATE DRUM B as desired.

(46) Select Laundry Cycle.

(47) Determine type of items to be laundered.

(48) Press CHANGE CYCLE to toggle through available cycles until desired laundry cycle is displayed. (Laundry Cycle Screen). Note: Default washing temperature is 150 degrees and default drying temperature is 160 degrees.

(49) Load Laundry.

(49) Open drum door.

(50) Add 1 ounce (stroke) of detergent onto any bag of laundry being loaded.

(51) Load laundry bags. A typical load should be 20 to 30 properly loaded mesh bags.

(52) Close drum door then push in on handle to lock door. Ensure that laundry is clear of door.

(53) Laundry Cycle Operation Note: A typical laundry lasts 65-75 minutes. Once a laundry cycle starts, operation is automatic until the cycle is complete. When a continuous audible alarm sounds, this indicates that some type of operator action is required or the cycle is complete.

a. Press START CYCLE on touchscreen.

b. Observe display to verify system is progressing through laundry cycle.

c. Wait for laundry cycle to reach DRAIN TO STILL.

d. When audible alarm sounds, press ACKNOWLEDGE ALARM.

e. Add one stroke of anti-foam with hand pump.

f. If FRS or sanitizer need to be added unlock latch and open lid and add FRS or sanitizer and then close lid and engage latch.

g. Press CONTINUE CYCLE on touchscreen.

h. Wait for cycle to complete. When audible alarm sounds, press ACKNOWLEDGE ALARM.

(54) Unload Laundry.

a. Pull out on handle and open drum door.

b. Unload laundry. Note: After laundry is unloaded it should be removed from the mesh bag as soon as possible. Laundry will be extremely wrinkled if left in mesh bags.

c. Clean lint filter.

(55) System Shutdown Note: If the LADS needs to be drained to change the water for sanitary reasons, dirty water, prevent over-night freezing, or in preparation for movement, refer to WP 0017, Draining Procedures. Laundry cycle must be completed for both systems before a cool down cycle can be initiated. A normal cool down lasts about 30 minutes. Once a cool down cycle starts, operation is automatic until cycle is completed. When a continuous audible alarm sounds this indicates the cycle is complete. Operator can override cool down at any time by selecting OVERRIDE COOLDOWN on touchscreen.

- a. Press SYSTEM COOLDOWN.
- b. Observe touchscreen to verify system is progressing through Cool Down Mode, Boiling Down the Still Screen and Cooling thermal Fluid Screen.
- c. When cooldown is complete, alarm will sound. Press ACKNOWLEDGE ALARM.
- d. Perform AFTER PMCS (WP 0042)
 - (1) Ensure dryer inlet screens are not blocked with debris.
 - (2) Ensure dryer outlet guards are not blocked with debris.
 - (3) Clean/Inspect strainers.
 - (4) Drain and clean still.
 - (5) Ensure three heat exchanger air inlet screens are not blocked with debris.
 - (6) Ensure air inlet screens are not blocked with debris.
- e. Position CONTROL POWER switch to OFF.
- f. Position MAIN DISCONNECT switch to OFF and apply lock-out by pushing the table to apply padlock.
- g. Discontinue operation of MEP-805A generator (TM 9-6115-644-10) or remove external power as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

Performance Measures	GO	NO GO
1. Ensured before PMCS procedures have been completed.	_____	_____
2. Applied external power as required with generator.	_____	_____
3. Positioned generator output to 210 VAC, 60 HZ. Verified	_____	_____
4. emergency stop switch is pulled out.	_____	_____
5. Positioned main disconnect switch to on.	_____	_____
6. Verified main power lamp is on.	_____	_____
7. Performed during PMCS.	_____	_____
8. Positioned control power switch to on.	_____	_____
9. Verified power lamp is on.	_____	_____
10. Monitored touchscreen.	_____	_____
11. Pressed utility operation on touchscreen.	_____	_____
12. Pressed air system status on touchscreen.	_____	_____
13. Verified touchscreen displays the message ready to perform.	_____	_____
14. Checked rotation and prime water supply.	_____	_____
15. Pressed fill water tanks on touchscreen.	_____	_____
16. Observed touchscreen and verified fill water tanks mode screen is displayed.	_____	_____
17. Verified touchscreen has returned to utility operation menu once water tanks are full.	_____	_____
18. Pressed heat 2 rinse water.	_____	_____
19. Observed touchscreen and verified the following screens display in succession as heat rinse 2 water cycle.	_____	_____
20. Verified touchscreen shows heat rinse 2 water cycle is complete.	_____	_____
21. Started laundry operation.	_____	_____
22. Pressed RETURN to go to START MENU, then pressed LAUNDRY OPERATION.	_____	_____

- | | | |
|---|-------|-------|
| 23. Selected OPERATE DRUM A or OPERATE DRUM B as desired. | _____ | _____ |
| 24. Selected laundry cycle. | _____ | _____ |
| 25. Determined type of items to be laundered. | _____ | _____ |
| 26. Pressed CHANGE CYCLE to toggle through available cycles until desired laundry cycle is displayed. | _____ | _____ |
| 27. Loaded laundry. | _____ | _____ |
| 28. Opened drum door. | _____ | _____ |
| 29. Added 1 ounce (stroke) of detergent onto any bag of laundry being loaded. | _____ | _____ |
| 30. Loaded laundry bags. | _____ | _____ |
| 31. Closed drum door then push in on handle to lock door. Ensured that laundry is clear of door. | _____ | _____ |
| 32. Selected laundry cycle operation. | _____ | _____ |
| 33. Unloaded laundry. | _____ | _____ |
| 34. Conducted system shutdown. | _____ | _____ |

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

**References
Required**

Primary

TM 10-3510-221-10
DA FORM 2404
DA FORM 5988-E (EGA)

091-91J-1025

Perform Field Level Maintenance on the Laundry Advanced System (LADS)

Conditions: As a Quartermaster and Chemical Equipment Repairer in an operational environment, given a Laundry Advance System, Maintenance Request or Inspection Worksheet stating malfunction, general mechanics tool kit, and appropriate Technical Manuals.

Standards: Perform field level maintenance on the laundry advance system in accordance with the applicable technical publications. When the task is complete, the unit must be fully mission capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: Quartermaster and Chemical Equipment Repairer is given a Maintenance Request or Inspection Worksheet stating a malfunction.

Note: None

Performance Steps

1. Perform administrative actions.
 - a. Select applicable technical publications.
 - b. Practice Shop Safety and maintenance discipline.
 - c. Ensure proper tools and test equipment are available to inspect, repair/replace and diagnostics equipment.
 - d. Perform initial inspection.
2. Diagnose fault on LADS and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all maintenance fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the LADS is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

Performance Measures	GO	NO GO
1. Selected and used applicable technical publications, tools, equipment, and TMDE.	_____	_____
2. Diagnosed fault on LADS and determined maintenance action to be performed.	_____	_____
3. Identified repair parts and requisitioned as required.	_____	_____
4. Ensured all maintenance fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5. Performed a final inspection to ensure the LADS was fully mission capable.	_____	_____
6. Ensured tools and equipment were properly maintained.	_____	_____
7. Completed DA Form 5988-E (EGA) as required.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

References
Required

Primary

TM 10-3510-221-10
DA FORM 2404
DA FORM 5988-E (EGA)

091-91J-1026

Troubleshoot Electrical Malfunctions on the Laundry Advanced System (LADS)

Conditions: In an operational environment, given a Laundry Advanced System, maintenance request or Inspection Worksheet stating malfunction, General Mechanics Tool Kit, Multimeter, and applicable technical manuals.

Standards: Troubleshoot electrical malfunctions on the laundry advanced system in accordance with the applicable technical publications. When the task is complete, the unit must be fully mission capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note:

Performance Steps

1. Perform administrative actions.
 - a. Select applicable technical publications.
 - b. Practice Shop Safety and maintenance discipline.
 - c. Ensure proper tools and test equipment are available to inspect, repair/replace and diagnostics equipment (TMDE).
 - d. Perform initial inspection.
2. Inspect affected electrical component or circuits and determine the serviceability/malfunctions.
3. Disassemble the electrical component or circuits as required.
4. Replace / repair defective electrical component or circuits on the control panel assembly.
5. Assemble the electrical component or circuit's assembly.
6. Perform final test/ inspection to verify fault(s) have been corrected.
7. Annotate corrective actions taken on DA FORM 5988-E (EGA) Equipment Maintenance and Inspection Worksheet.
8. Maintain tools, equipment, and TDME.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

Performance Measures	GO	NO GO
1. Performed administrative actions.	_____	_____
2. Inspected affected electrical component or circuits and determined the serviceability/malfunctions.	_____	_____
3. Disassembled the electrical component or circuits as required.	_____	_____
4. Replaced/repaired defective electrical component or circuits on the control panel assembly.	_____	_____
5. Assembled the electrical component or circuits assembly.	_____	_____
6. Performed final test/inspection and verified fault(s) have been corrected.	_____	_____
7. Annotated corrective actions taken on DA FORM 5988-E (EGA).	_____	_____
8. Maintained tools, equipment, and TMDE.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

**References
Required**

Primary

TM10-3510-221-10
TM 10-3510-221-23
DA FORM 2404
DA FORM 5988-E (EGA)

091-91J-1027
Operate Containerized Batch Laundry (CBL) System

Conditions: As a Quartermaster and Chemical Equipment Repairer in an operational environment, given a Containerized Batch Laundry (CBL) system, maintenance request or Inspection Worksheet, and appropriate Technical Manuals.

Standards: Operate the CBL in accordance with TM 10-3510-226-10. When the task is completed, all shortcomings and deficiencies have been identified on the proper maintenance forms.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: Quartermaster and Chemical Equipment Repairer is given a maintenance request or Inspection Worksheet stating a malfunction during operation of the CBL.

Note:

Performance Steps

1. Perform BEFORE PMCS before operating CBL components machinery.
2. System Start-Up.
 - a. Operating the Lighting.
 - b. Before system start-up, the assembly procedures outlined in WP 0006 00 and WP0007 00 of the TM must be completed. Power must be supplied to the CBL, a source water fabric bag must be connected, and a Graywater fabric bag must be connected.
 - c. Switch ON the battery backup switch for the emergency lighting.
 - d. Use the Primary Logic Control (PLC) screen to switch the interior lighting or blackout lighting ON, as required.
 - e. Locate the drain valve manifold inside the container.
 - f. Ensure the drains valves on both manifolds are closed.
 - g. Ensure the Automatic Soap Dispenser overflow valve is open.
3. Water Reuse Valve Setup.
 - a. Locate the water reuse selection valve V-15 and V-16 located behind the washers, and set the valve as shown in this TM
 - b. Close the tank drain valve.
 - c. Close the pump drain valve.
 - d. Close the waste tank drain valve.

- e. Close the WTS transfer tank drain valve.
 - f. Close the boiler drain valve.
 - g. Open the external service valve.
 - h. Open the hot and cold water supply valves to both washers.
 - i. Close the nanofilter drain valves located behind the dryers.
 - j. Close the vent valve.
 - k. Ensure the vent valves on the vent valve manifold are closed.
 - l. Ensure the sight glass isolation valves are open and the sight glass drain petcocks are closed.
4. Prime the P-1 Pump.
- a. Ensure the water supply is set up as described in WP 0007 00 of the TM. Ensure the pump is not operating.
 - b. Remove the QD cap from the priming standpipe.
 - c. Pour approximately 1/2 gallon of source water into the open standpipe.
 - d. Install the QD cap onto the standpipe, and lock in place.
 - e. Switch the P-1 pump ON at the PLC and monitor system pressure.
 - f. As system pressure rises to approximately 25 PSI, relieve air from the system by slowly opening the external service water spigot and closing. Listen for pump action and wait for water pressure to rise to approximately 60PSI.
 - g. If pump fails to prime after two minutes, shut off P-1 pump at PLC. Relieve pressure on the system by opening the external service water spigot, check water supply valve on source water tank, and repeat steps 2 through 6. If pump fails to prime after second attempt, notify Unit maintenance.
5. Operate the Automatic Soap Dispenser.
- a. The Automatic Soap Dispenser normally requires no operator attention other than replacement of laundry chemicals. If a chemical is depleted, an alarm will sound and a signal light on either or both of the control modules will indicate which chemical needs to be replenished.
 - b. To replace laundry chemicals, first ensure the correct laundry chemicals are available before proceeding.
 - c. Remove the lid from the detergent canister. Invert the detergent canister and quickly place the canister in the recessed closet to washer No.1.
 - d. Remove the lid from the bleach canister. Invert the bleach canister and quickly insert the canister in the center recess.
 - e. Remove the lid from the laundry sour canister. Invert the laundry sour canister and quickly insert the canister into the remaining recess.

6. Operate the Boiler.

- a. Ensure the boiler has an adequate supply of fuel, and the hoses have been connected IAW procedures in WP 0007 00.
- b. Ensure the boiler glycol level is sufficient. Add glycol as necessary into reservoir.
- c. Switch the boiler ON at the PLC. You should hear the boiler come immediately.
- d. Monitor the boiler for at least five minutes to ensure proper operation. If the boiler shuts down within this amount of time, press the reset button on the controller for at least three seconds and continue to monitor for at least five minutes. If the boiler shuts down again, shut the boiler off at the PLC and notify unit maintenance. Do not attempt a second restart.
- e. Monitor the fuel supply during CBL operation. To replenish, shutdown the boiler at the PLC, remove the fuel can adapter, and refill the can. Replace the fuel can adapter and restart the boiler at the PLC. Do not allow the boiler to run out of fuel – if this occurs, the boiler fuel system must be bled of air by unit maintenance personnel.

7. Initial Fill Cycle for Water Treatment System.

- a. In order to fill the system with water for recycling, washer No.1 (closest to entry door) must be run through an initial fill cycle. Both washers been preprogrammed with Cycle 01 for this purpose and either may be used – do not run an initial fill with both at the same time. The procedure requires approximately 15 minutes to complete. To start the cycle that has been selected, press the “START” Key. As the cycle.
- b. proceeds, the display will show the function being executed, step number, program number, time remaining in each step and function (drain, high warm, etc...).
- c. Ensure the P-1 Pump switch on the PLC Control Panel is in the ON position. The indicator will flip to the right and turn green when the switch in ON.
- d. Switch the P-3 Pump and P-4 Pump on the PLC Control Panel to the ON position. The indicator will flip to the right and turn green when the switch is ON.
- e. Ensure that the bypass valves V-15 and V-16 are in the positions shown so that the water reuse system is engaged.
- f. Power is engaged by twisting out the emergency stop switch clockwise on the washer control panel.
- g. The front panel display on the washer should be lit and displaying the last cycle that was run; Example (Cycle 03). This display will be on at all times that power is ON indicating the machine is ready for loading and unloading.
- h. Enter cycle 01 by pressing (do not punch) the numbers on the keyboard and note that this number is shown on the display as “Cycle 01”. When keys are pressed on the keyboard, a beep will be heard. If an error is made, simply press the numbers again.
- i. Use valve V-9 to select either filter F-1A or F-1B.

- j. Open the vent valves on the vent manifold for F-1A or F-1B (whichever is selected) and Filter F-2. As the Water Treatment System Hold tank (WTS) fills, a level sensor will activate causing pump P-3 to run.
- k. Once water is observed flowing through the clear vent hoses on the filter F-1A or F-1B (whichever is selected) and filter F-2, close the vent valves.
- l. Open the vent valves on the vent manifold of filter F-3 and P-4 Pump.
- m. As the NANO Feed Tank fills, a level sensor will activate causing Pump P-4 to run.
- n. Once Water is observed flowing through the clear vent hoses on F-3 and P-4 pump, close the vent valves.
- o. As the initial fill continues, the Reuse Tank will fill. Initial fill is completed when the washer cycle is complete. Monitor the Reuse Tank thermometer to ensure the water is 110 degrees F minimum.

8. Adjusting water temperature.

- a. The temperature of the water used for the wash and rinse operations are controlled by mixing valves installed on the top of the water boiler. One mixing valve controls the temperature of the incoming water being supplied to the washer while the second mixing valve controls the temperature of the reuse water being sent to the water reuse tank. The mixing valves are preset and should be acceptable for most applications in average temperatures; however, they may require adjustment should the outside ambient temperatures be colder and therefore the temperature of the source water be colder than normal.
- b. To adjust the temperature of the water in the water reuse tank, turn the knob on the side of the potable water mixing valve counterclockwise to increase temperature and clockwise to decrease temperature. Therefore, turn the knob in the direction of MAX to increase and in the direction of MIN to decrease the temperature.
- c. To adjust the temperature of the water in the water reuse tank, turn the knob on the side of the reuse water mixing valve counterclockwise to increase temperature and clockwise to decrease the temperature. Turn the knob in the direction of MAX to increase and in the direction of MIN to decrease the temperature. Monitor the temperature using the gauge installed on the front of the water recycle tank and maintain a temperature of approximately 120 degrees F. Do not allow the water temperature to exceed 125 degrees F.
- d. Do not expect immediate changes in temperature after a mixing valve adjustment. Turn the valves in the desired direction one increment at a time and monitor the water temperature for at least 45 minutes to determine if the water is now at the desired temperature. Continue this process until the desired temperature is reached.

9. Operate Washer.

- a. Ensure that the emergency stop switch on the washer control panel has been turned out and is in the operational position.
- b. Press the release button on the latch and open the door. The washer may be filled with up 50 pounds of laundry – for example, this would come to 18 complete sets of OCP's (blouse and trousers).

- c. Close the washer door. Ensure the door has latched securely.
- d. The front panel display on the washer should be lit. This display will be on at all times that the power is ON indicating the machine is ready for loading and unloading.
- e. Refer to Table 1 of WP 0008 in the TM to determine the cycle number for the clothes being laundered.
- f. Enter the desired cycle number by pressing (do not punch) with your finger the number on the keyboard and note that this number is displayed. When keys are pressed on the keyboard, a beep will be heard. If an error is made, simply press the numbers again. As numbers are entered, they move from right to left on the display.
- g. To start the cycle that has been selected, press the “start” key. As the cycle proceeds, the display will show the function being executed, step number and the cycle number selected.
- h. The front display will indicate when the cycle is complete. At that time, the washer may be unloaded by pressing the release button on the latch and using the latch to open the washer door. The washer door will not open while the washer is in an operating cycle.

10. Pre-Programmed Wash Cycles and Laundry Additives.

- a. Table 1 of WP 0008 00 in the TM lists the washer operating cycles that are pre-programmed into the washer control panel. This table replaces any pre-programmed cycles that commercial washer technical manual.
- b. Some cycles such as Cycle #5 list the phrase “WITH MIN REUSE”. These cycles are used when valves V-15 and V-16 at the rear of the washers have been set to send washer reuse water directly into the reuse tank, bypassing the water filtration system. Refer to WP 0018 00 of the TM for additional information.
- c. Some cycles such as Cycle #8, list the phrase “NO REUSE”. This indicated that if for some reason the water reuse system fails to work properly, wash cycles should be used which do not use the water reuse system (wash cycles 08, 09, and 10). Refer to WP 0018 00 in the TM for additional information.
- d. Special cycles have been included to aide with system operation and maintenance. Cycle 01, INITIAL FILL, is used to prepare the water treatment system for use. Cycle 11, BAG FILTER is used when filters F-1A or F-1B are changed. Cycle 31, NANO FILTER FLUSH/CLEAN, is used daily to purge contaminants from the nanofilters. Cycle 32, NANO FILTER STORAGE (SODIUM BISULPHITE) is used to neutralize chlorine contaminants in the nanofilters. Cycle 33, WINTERIZE SOAP DISPENSER, is used to evacuate water from the soap dispenser prior to storage; cycles 34 and 35 do the same for the washer hot and cold water lines.
- e. Cycle 11, BAG FILTER, is used to wash the F-1A and F-1B filters, preparing the filter bags for reuse.
- f. Cycle 30, REUSE TANK TOPOFF, is used to raise the reuse tank level if necessary. This will reduce the time necessary to fill the reuse tank, as the WTS system is bypassed and the tank is filled directly with source water. Do not run this cycle more than once every four hours, and only when no water is visible in the reuse tank sight glass.
- g. Cycle 36, EXTRACT ONLY, provides an additional extract cycle in the event one is desired. This allows the washer to spin out excess moisture without having to go through a additional wash cycle.
- h. Additional cycles have been provided in the event the Automatic Soap Dispenser is inoperable

i. Table 2 of WP 0008 00 lists the laundry additives for a given washer cycle. The first column of the table lists the items to be laundered while column 2 shows the cycles appropriate for those items. The columns labeled S1 through S4 indicate the supply trays of the washer. The type and quantity of additive are listed in these columns. For example, if it was desired to launder OCP's using washer operating Cycle 53, supply tray S4 would be filled with 2.0 oz. of detergent using Cycle 52, supply tray S4 would be filled with 2.0 oz. of detergent, supply tray S2 would be filled with 0.3 oz. of Sour, supply tray S3 would be filled with 0.3 oz. of bleach, and supply tray S1 filled with 9 oz. of Sodium Bisulphite.

11. Operate the Dryer: Pre-programmed Drying Cycles.

a. Pull the emergency stop out to allow the dryer to function. The dryer display will still be lit if the emergency stop is pushed in. If the dryer display is not lit, pull out on the emergency stop and select a drying temperature. This will cause the display to light.

b. To activate a preprogrammed drying cycle, open the dryer door and fill the dryer with no more than 50 lbs. of wet clothing (approximately 18 complete sets of BDU's). Ensure that the clothes do not prevent the door from closing. Use the door handle to close the dryer door securely, but do not slam. Do not press on the dryer door glass.

c. To dry OCP's, press the Medium key twice, then press the START key. The dryer will start, run for the pre-programmed amount of time, and stop automatically. The remaining drying time and cool down time will be shown in the display.

d. To dry Linens or Colored Linens, press the HIGH key twice, then press the START key. The remaining drying time will be shown in the display.

e. Do not open the dryer door when the dryer is running. To pause a drying cycle, use the STOP key. Press the START key to resume the cycle.

f. Use the exhaust fans as necessary to dissipate the heat from the dryers.

g. When the cycle is complete, an alarm will sound and LR will show in the display. Remove the clothes and place in a clean laundry basket for folding in the TEMPER work area.

12. Operate the Exhaust Fans.

a. Operate fans with the EXHAUST FAN switch located on the PLC touchscreen as required. Ensure to follow the instructions on the touchscreen.

13. Operate the Blackout Lighting.

a. Ensure the SYSTEM CONTROL screen is displayed, and the INT LIGHT switch is ON. The blackout lighting will only function if the interior lighting switch is ON.

b. Turn the BLKOUT LIGHT switch to the ON position. The switch will turn green when the switch is ON and red when the switch is OFF. The lighting will change from standard interior lighting to blackout lighting.

14. Operate the Exhaust fans.

a. Ensure the SYSTEM CONTROL screen is displayed. Turn the EXHAUST FAN switch to the ON position. The switch will turn green when the switch is ON and red when the switch is OFF.

b. Ensure to follow the instructions on the touchscreen.

15. Operate the P-1, P-3, and P-4 Pumps.

a. Ensure the SYSTEM CONTROL screen is displayed.

b. Turn the P-1 PUMP, P-3 PUMP, and P-4 PUMP switches to the ON position. The switches will turn green when the switch is ON and red when the switch is OFF. Each pump may be switched ON and OFF individually, as desired.

16. Operating the Boiler.

a. Ensure the SYSTEM CONTROL screen is displayed.

b. Turn the BOILER switch to the ON position. The switches will turn green when the switch is ON and red when the switch is OFF.

17. Operate the Clean Screen Off Delay.

a. Ensure the SYSTEM CONTROL screen is displayed.

b. Touch the CLEAN SCREEN OFF DELAY button.

c. The screen displayed will appear. While this screen is displayed, the touch screen may be cleaned. The bar indicator shows the delay time remaining. If additional time is required to clean the touch screen, repeat the procedure starting at Step 1.

18. Viewing Start and Runtimes.

a. Ensure the SYSTEM CONTROL screen is displayed.

b. Touch the GO TO START & RUNTIMES button.

c. The screen displayed will appear. This display provides information on the runtimes for the P3 pump, P4 pump, and the boiler. The runtime information may be cleared from this screen.

d. If additional runtime information is required, touch the MORE RUNTIMES button.

e. The screen displayed will appear. This display provides information on the runtimes for the carbon filter and the nanofilters. The runtime information may be cleared from this screen. To return to the previous runtimes display, touch the RETURN TO RUNTIMES button.

f. Press the SYSTEM CONTROL button to return to the SYSTEM CONTROL display.

19. Selecting the SYSTEM PRESS Display (System Press Menu).

a. The PLC is programmed to control and monitor the operation of the CBL. The functions are selected through separate displays presented on the PLC screen. The displays may be selected by touching the tab at the top of the screen. When the PLC is powered up, the SYSTEM CONTROL display is presented.

b. If a SYSTEM PRESS function is desired, touch the SYSTEM PRESS tab to access the screen. An indicator bar or highlight will indicate that the SYSTEM PRESS screen is presented. The PLC will show the following display. The bar graphs indicate the status of the pressure differentials across the system filters. The differential pressure is the difference between the outlet pressure and the inlet pressure.

c. The PLC displays the differential pressure across the F-1 (bag filter), F-2 filter, F-3 filter, and nanofilters. The bar graph will indicate green when the filter is operating in a normal range. The bar graph will indicate RED when the pressure is above normal operating limits. See alarm section for further details.

d. Press the NEXT button to access additional system pressures for the system and the P-3 pump. Press BACK to return to the previous display, or SYSTEM CONTROL to return to the SYSTEM CONTROL menu.

20. Selecting the SYSTEM FLOWS Display.

a. The PLC is programmed to control and monitor the operation of the CBL. The functions are selected through separate displays presented on the PLC screen. The displays may be selected by touching the tab at the top of the screen.

b. When the PLC is powered up, the SYSTEM CONTROL display is presented. If a SYSTEM FLOWS function is desired, touch the SYSTEM FLOWS tab to access the screen. An indicator bar or highlight will indicate that the SYSTEM FLOWS screen is presented.

c. The PLC will show the following display. The bar graphs indicate the flow in various system loops. The PLC will regulate the flow of each water loop to a preset value by monitoring the valve actuator will maintain flow within normal operating limits and will display green. The PLC will notify the operator with flow alarm if insufficient flow is present. Display will be RED. See alarm section for further details.

d. Press SYSTEM CONTROL to return to the SYSTEM CONTROL menu.

21. Selecting the BOILER STATUS Display.

a. The PLC is programmed to control and monitor the operation of the CBL. The functions are selected through separate displays presented on the PLC screen. The displays may be selected by touching the tab at the top of the screen.

b. When the PLC is powered up, the SYSTEM CONTROL display is presented. If a BOILER STATUS function is desired, touch the BOILER STATUS tab to access the screen. An indicator bar or highlight will indicate that the BOILER STATUS screen is presented.

c. The PLC will show the following display. The green bars indicate the status of the boiler electrical power, boiler glycol level, boiler glycol temperature, and burner operation. The PLC indicates normal operation by displaying green. The PLC monitors the boiler glycol level, glycol temperature, and burner control module. In the event of an alarm condition the PLC will display this item in RED and generate an alarm. See the alarm section for further details.

d. Press the SYSTEM CONTROL to return to the SYSTEM CONTROL menu.

21. Selecting the SYSTEM INFO Display.

a. The PLC is programmed to control and monitor the operation of the CBL. The functions are selected through separate displays presented on the PLC screen. The displays may be selected by touching the tab at the top of the screen.

b. When the PLC is powered up, the SYSTEM CONTROL display is presented. If a BOILER STATUS function is desired, touch the BOILER STATUS tab to access the screen. An indicator bar or highlight will indicate that the BOILER STATUS screen is presented.

c. The PLC will show the following display. The green bars indicate the status of the boiler electrical power, boiler glycol level, boiler glycol temperature, and burner operation. The PLC indicates normal operation by displaying green. The PLC monitors the boiler glycol level, glycol temperature, and burner control module. In the event of an alarm condition the PLC will display this item in RED and generate an alarm. See the alarm section for further details.

d. Press the SYSTEM CONTROL to return to the SYSTEM CONTROL menu.

22. Selecting the SYSTEM INFO Display.

a. The PLC is programmed to control and monitor the operation of the CBL. The functions are selected through separate displays presented on the PLC screen. The displays may be selected by touching the tab at the top of the screen.

b. When the PLC is powered up, the SYSTEM CONTROL display is presented. If a SYSTEM INFO function is desired, touch the SYSTEM INFO tab to access the screen. An indicator bar or highlight will indicate that the SYSTEM INFO screen is presented.

c. The PLC will show the following display. Each button provides access to a menu function.

d. Press SYSTEM CONTROL to return to the SYSTEM CONTROL menu.

23. Analog Status.

a. Press the GO TO ANALOG STATUS button to view all of the information from the flow pressure transmitters. The PLC will show the following display.

b. Ensure to follow instructions on the flow pressure transmitter

24. Digital Status.

a. Press the GO TO DIGITAL STATUS button to view all of the information from the boiler, level sensor, and PLC relay outputs. The PLC will show the following display. The PLC displays the status of the PLC relay outputs for each controlled device. The indicators will show a light green background when ON and a dark green background when OFF.

b. The PLC displays the status of the boiler inputs, WTS holding tank, level sensor, and non feed tank level sensor.

c. The operator should utilize the BOILER STATUS screen to obtain information for boiler operation. The PLC will use the information from the tank level sensors to determine operation of the P-3 and P-4 water filtration loops.

25. System Alarms.

a. The PLC is programmed to control and monitor the operation of the CBL. The functions are selected through separate displays presented on the PLC screen. The displays may be selected by touching the tab at the top of the screen.

b. When a system alarm is triggered, the following screen will be displayed. Make note of the component which requires service, and press ACK to acknowledge and silence the alarm. If a caution flag is still displayed on this screen after reset, the alarm has not been properly reset.

c. After the required service has been performed to correct the cause of the alarm, the alarm must be reset. This may be done from the SYSTEM INFO tab. For example, if Filter F-2 had required service, press ACCESS ALARM INFO & RESETS. On the screen that follows, press F2 MICRON RESET. The boiler must be shut down and restarted to reset this alarm.

26. PLC Emergency Bypass Switches.

a. The PLC Emergency Bypass Switches may be accessed by opening the control panel. Do not leave the control panel open unless the switches are being switched ON or OFF.

b. The P-1 pump, the boiler, the exhaust fans, the interior lights, and the blackout lights can be manually operated. A 5A circuit breaker fans, the interior lights, and the blackout lights can be manually operated. A 5A circuit breaker protects the system. Refer to WP 0014 00 of the TM entitled "Manual Operation" for the information on operating the CBL without a functional PLC.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

Performance Measures	GO	NO GO
1. Performed before PMCS.	_____	_____
2. Performed system start up procedures.	_____	_____
3. Ensured water reuse valve setup.	_____	_____
4. Primed the p-1 pump.	_____	_____
5. Operated the automatic soap dispenser.	_____	_____
6. Operated the boiler.	_____	_____
7. Filled cycle for water treatment system.	_____	_____
8. Adjusted water temperature.	_____	_____
9. Operated washer.	_____	_____
10. Pre-programmed wash cycles.	_____	_____
11. Operated the dryer.	_____	_____
12. Operated the exhaust fans.	_____	_____

- | | | |
|---|-------|-------|
| 13. Operated the blackout lighting. | _____ | _____ |
| 14. Operated the Exhaust fans. | _____ | _____ |
| 15. Operated the P-1, P-3, and P-4 Pumps. | _____ | _____ |
| 16. Operated the Boiler. | _____ | _____ |
| 17. Operated the Clean Screen Off Delay. | _____ | _____ |
| 18. Viewed Start and Runtimes. | _____ | _____ |
| 19. Selected the SYSTEM PRESS Display | _____ | _____ |
| 20. Selected the SYSTEM FLOWS Display. | _____ | _____ |
| 21. Selected the BOILER STATUS Display | _____ | _____ |
| 22. Selected the SYSTEM INFO Display. | _____ | _____ |
| 23. Pressed Analog Status. | _____ | _____ |
| 24. Pressed Digital Status. | _____ | _____ |
| 25. Selected the System Alarms. | _____ | _____ |
| 26. Selected the PLC Emergency Bypass Switches. | _____ | _____ |

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

**References
Required**

Primary

TM 10-3510-226-10
TM 10-3510-226-23
DA FORM 2404
DA FORM 5988-E (EGA)

091-91J-1028**Maintain Washer Assembly on a Containerized Batch Laundry System (CBL)**

Conditions: As a Quartermaster and Chemical Equipment Repairer in an operational environment, given a Containerized Batch Laundry system, Maintenance Request or Inspection Worksheet stating malfunction, General Mechanics Tool Kit, Multimeter, and appropriate Technical Manuals.

Standards: Maintain washer assembly in accordance with TM 10-3510-226-23. When the task is complete, the unit must be fully mission capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: Quartermaster and Chemical Equipment Repairer is given a Maintenance Request or Inspection Worksheet stating a malfunction during operation of the CBL.

Note: None

Performance Steps

1. Perform administrative actions.
 - a. Select applicable technical publications.
 - b. Practice Shop Safety and maintenance discipline.
 - c. Ensure proper tools and test equipment are available to inspect, repair/replace and diagnostics equipment (TMDE).
 - d. Perform initial inspection.
2. Diagnose fault on washer assembly on the CBL and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all maintenance fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the Containerized Batch Laundry system is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

Performance Measures	GO	NO GO
1. Performed administrative actions.	_____	_____
2. Diagnosed fault on washer assembly on the Containerized Batch Laundry System and determine maintenance action to be performed.	_____	_____
3. Identified repair parts and requisitioned as required.	_____	_____
4. Ensured all maintenance fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5. Performed a final inspection to ensure the CBL was fully mission capable.	_____	_____
6. Ensured tools and equipment were properly maintained.	_____	_____
7. Completed DA Form 5988-E (EGA) as required.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

**References
Required**

Primary

TM 10-3510-226-10
TM 10-3510-226-23
DA FORM 2404
DA FORM 5988-E (EGA)

091-91J-1029**Maintain Drive Belt on a Containerized Batch Laundry System Washer Assembly**

Conditions: As a Quartermaster and Chemical Equipment Repairer in an operational environment, given a CBL, Maintenance Request or Inspection Worksheet stating malfunction, General Mechanics Tool Kit, Multimeter, and appropriate Technical Manuals.

Standards: Maintain drive belt on the washer assembly in accordance with TM 10-3510-226-23. When the task is complete, the unit must be fully mission capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: Quartermaster and Chemical Equipment Repairer is given a Maintenance Request or Inspection Worksheet stating a malfunction during operation of the CBL.

Note: None

Performance Steps

1. Perform administrative actions.
 - a. Select applicable technical publications.
 - b. Practice Shop Safety and maintenance discipline.
 - c. Ensure proper tools and test equipment are available to inspect, repair/replace and diagnostics equipment (TMDE).
 - d. Perform initial inspection.
2. Diagnose fault on the drive belt of the Containerized Batch Laundry System and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all maintenance fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the Containerized Batch Laundry System is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

	GO	NO GO
Performance Measures		
1. Performed administrative actions.	_____	_____
2. Diagnosed fault on the drive belt of the Containerized Batch Laundry System and determined maintenance action to be perform.	_____	_____
3. Identified repair parts and requisitioned as required.	_____	_____
4. Ensured all maintenance fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5. Performed a final inspection to ensure the Containerized Batch Laundry System was fully mission capable.	_____	_____
6. Ensured tools and equipment were properly maintained.	_____	_____
7. Completed DA Form 5988-E (EGA) as required.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

**References
Required**

Primary

TM 10-3510-226-10
TM 10-3510-226-23
DA FORM 2404
DA FORM 5988-E (EGA)

091-91J-1030**Maintain Dryer Assembly Controls on a Containerized Batch Laundry System Washer Assembly**

Conditions: As a Quartermaster and Chemical Equipment Repairer in an operational environment, given a Containerized Batch Laundry system, Maintenance Request or Inspection Worksheet stating malfunction, General Mechanics Tool Kit, Multimeter, and appropriate Technical Manuals.

Standards: Maintain the dryer assembly in accordance with TM 10-3510-226-23. When the task is complete, the unit must be fully mission capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: Quartermaster and Chemical Equipment Repairer is given a Maintenance Request or Inspection Worksheet stating a malfunction during operation of the CBL.

Note: None

Performance Steps

1. Perform administrative actions.
 - a. Select applicable technical publications.
 - b. Practice Shop Safety and maintenance discipline.
 - c. Ensure proper tools and test equipment are available to inspect, repair/replace and diagnostics equipment (TMDE).
 - d. Perform initial inspection.
2. Diagnose fault on the Dryer Assembly controls and determine maintenance action to be performed.
3. Test the dryer air flow switch.
4. Adjust the thermostat.
5. Ensure all maintenance fault(s) are repaired in accordance with appropriate TMs and references.
6. Perform a final inspection to ensure the Containerized Batch Laundry is fully mission capable.
7. Ensure tools and equipment are properly maintained.
8. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

	GO	NO GO
Performance Measures		
1. Performed administrative actions.	_____	_____
2. Diagnosed fault on the Dryer Assembly controls and determined maintenance action to be performed.	_____	_____
3. Tested the dryer air flow switch.	_____	_____
4. Adjusted the thermostat.	_____	_____
5. Ensured all maintenance fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
6. Performed a final inspection to ensure the Containerized Batch Laundry was fully mission capable.	_____	_____
7. Ensured tools and equipment were properly maintained.	_____	_____
8. Completed DA Form 5988-E (EGA) as required.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

**References
Required**

Primary

TM 10-3510-226-10
TM 10-3510-226-23
DA FORM 2404
DA FORM 5988-E (EGA)

091-91J-1031**Troubleshoot Malfunction of the Containerized Batch Laundry (CBL) electrical system**

Conditions: As a Quartermaster and Chemical Equipment Repairer in an operational environment, given a Containerized Batch Laundry system, Maintenance Request or Inspection Worksheet stating malfunction, General Mechanics Tool Kit, Multimeter, and appropriate Technical Manuals.

Standards: Troubleshoot electrical malfunction in accordance with TM 10-3510-226-23. When the task is completed, the unit must be fully mission capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: Quartermaster and Chemical Equipment Repairer is given a Maintenance Request or Inspection Worksheet stating a malfunction during operation of the CBL.

Note: None

Performance Steps

1. Perform administrative actions.
 - a. Select applicable technical publications.
 - b. Practice Shop Safety and maintenance discipline.
 - c. Ensure proper tools and test equipment are available to inspect, repair/replace and diagnostics equipment.
 - d. Perform initial inspection.
2. Diagnose fault on the electrical system and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all maintenance fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the Containerized Batch Laundry System is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete DA Form 5988-E (EGA) as required.

Evaluation Preparation: Ensure all equipment and special tools are available before evaluation. All initial set up and equipment conditions must be performed in accordance with appropriate references to successfully complete the task.

	GO	NO GO
Performance Measures		
1. Performed administrative actions.	_____	_____
2. Diagnosed fault on the electrical system and determined maintenance action to be performed.	_____	_____
3. Identified repair parts and requisitioned as required.	_____	_____
4. Ensured all maintenance fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5. Performed a final inspection to ensure the Containerized Batch Laundry System was fully mission capable.	_____	_____
6. Ensured tools and equipment were properly maintained.	_____	_____
7. Completed DA Form 5988-E (EGA) as required.	_____	_____

Evaluation Guidance: The Soldier scores a GO if all performance measures were passed. The Soldier scores a NO-GO if any performance measure was failed. If any performance measure was failed, then show the Soldier what was done wrong and how it should have been done to score a GO.

**References
Required**

Primary

TM 10-3510-226-10
TM 10-3510-226-23P
DA FORM 2404
DA FORM 5988-E (EGA)

GLOSSARY**Section I
Acronyms & Abbreviations**

APFT	Army physical fitness test
ASI	Additional skill identifier
BMT	Battalion Maintenance Technician
CASCOM	Combined Arms Support Command
CBRNE	Chemical, Biological, Radiological, Nuclear, and High Yield Explosives
DA FORM	Department of the Army Form
DA PAM	Department of the Army Pamphlet
DOD	Department of Defense
DTMS	Digital Training Management System
GPH	Gallons Per Hour
LSA	Longitudinal Support Assembly
PMCS	Preventive Maintenance Checks and Services
QTR	Quarterly (frequency code)
QTY	Quantity
ROWPU	Reverse Osmosis Water Purification Unit
SSA	Supply Support Activity
TM	Technical Manual
TWPS	Tactical Water Purification System
WK	Weekly

Section II

Terms

Active Duty

Full-time duty in the active military service of the United States. This includes members of the Reserve Components serving on active duty or full-time training duty, but does not include full-time National Guard duty. Also called AD. See also active duty for training; inactive duty training.

Active Duty for Training (ADT)

A tour of active duty which is used for training members of the Reserve Components to provide trained units and qualified persons to fill the needs of the Armed Forces in time of war or national emergency and such other times as the national security requires. The member is under orders that provide for return to non-active status when the period of active duty for training is completed.

After Action Report

A professional discussion that focuses on the training objectives of on-going or completed training. It is a review of a training activity that allows Soldiers to discover for themselves what happened and why.

After-action review (AAR)

A professional discussion of an event, focused on performance standards, that enables Soldiers to discover for themselves what happened, why it happened, and how to sustain strengths and improve on weaknesses. It is a tool leaders, trainers, and units can use to get maximum benefit from every mission or task.

Alternating Current (AC)

Electrical energy as supplied by normal wall outlets.

Ammeter

An electric meter that measures current, In amperes, in an electric circuit.

Antifreeze

A substance added to the coolant system In a liquid-cooled engine to prevent freezing.

Appendix

A document appended to an annex of an operation order, operation plan, or other document to clarify or to give further details.

Battle Damage Assessment and Repair (BDAR)

Any expedient action that returns a damaged item or assembly to a mission-capable or limited mission-capable condition. Repairs are often temporary. (See also cannibalize.)

COMBAT READINESS

A unit's ability to perform in combat. Includes the status of personnel, logistics, morale, and training.

Check

Usually used to indicate that an examination is to be made for condition or workability, and that one's senses will be used (sight, hearing, touch, smell).

Combat Readiness

Synonymous with operational readiness, with respect to missions or functions performed in combat.

Control Area

A controlled airspace extending upwards from a specified limit above the Earth.

Course of Action (COA)

(1) Any sequence of acts that an individual or unit may follow. (2) A possible plan open to an individual or command that would accomplish or is related to the accomplishment of his mission. (3) The scheme adopted to accomplish a job or mission. (4) A line of conduct in an engagement. (5) A plan to accomplish a mission. It describes the execution concept for BMD of North America. It will specify the engagement priorities, resource allocation and desired results by Area of Operation (AO). (USSPACECOM) (6) The scheme adopted to accomplish a task or mission. It is a product of the Joint Operation Planning and Execution System concept development phase. The supported commander will include a recommended course of action in the commander's estimate. The recommended course of action will include the concept of operations, evaluation of supportability estimates of supporting organizations, and an integrated time-phased data base of combat, combat support, and combat service support forces and sustainment. Refinement of this database will be contingent on the time available for course of action development. When approved, the course of action becomes the basis for the development of an operation plan or operation order.

Crawl-Walk-Run

a progressive training regimen where units begin training simple, fundamental individual and collective tasks first, then gradually progresses to more complex, unit- level collective tasks (ADP 7-0).

Date-time group (DTG)

A military way of expressing the date and time of an event (e.g., 2 o'clock in the afternoon (PM) in Greenwich, England (Greenwich Mean Time) on the 10th day of November 1984 would be written 101400ZNOV84).

Declassification

The determination that, in the interests of national security, classified information no longer requires any degree of protection against unauthorized disclosure, coupled with removal or cancellation of the classification designation.

Direct Approach

To apply combat power directly against the enemy center of gravity or the enemy's principal strength. (FM 3-0)

Duty MOS

The MOS of the position on the TOE/TDA/MTOE to which a Soldier is assigned.

Environmental Hazards

All activities that may pollute, create negative noise-related effects, degrade archeological/ cultural resources, or negatively affect threatened or endangered species habitats. They also include environmental health-related hazards. (ATP 3-34.5)

General Support

(DOD, NATO) That support which is given to the supported force as a whole and not to any particular subdivision thereof. [Note: the Army designates general support as a "support relationship."] Also called GS. See also direct support; general support-reinforcing; mutual support; support. See ADP 5-0.

GO/NG -pass or fail

The evaluation criteria whereby students cannot partially pass. They either pass (go: meet the standard) or fail (no-go: do not meet the standard).

Hazard Communication

The responsibility of leaders and supervisors concerning possible hazards in the workplace and notification of hazards and necessary precaution to their Soldiers. Also called HAZCOM. (ATP 3-34.5)

Hazardous Material (HAZMAT)

all hazardous substances; usually petroleum, natural gas, synthetic gas, acutely toxic chemicals, and other toxic chemicals (including hazardous waste)

Identification Number

Identification number assigned to each proper shipping name.

Military Occupational Specialty (MOS)

A term used to identify a group of duty positions so closely related that they are interchangeable among Soldiers so classified at any skill level.

MOS Training Plan (MTP)

The MTP addresses all skill levels (SL) of an MOS and all duty positions, to include additional skill identifiers (ASI), special qualifications identifiers (SQI), and language identifier codes (LIC), associated with each SL which has unique critical task training requirements. The MTP lists all MOS-specific and shared critical tasks for which the MOS is responsible.

National Stock Number

The 13-digit stock number replacing the 11-digit Federal Stock Number. It consists of the 4-digit Federal Supply Classification code and the 9-digit National Item Identification Number. The National Item Identification Number consists of a 2-digit National Codification Bureau number designating the central cataloging office (whether North Atlantic Treaty Organization or other friendly country) that assigned the number and a 7-digit (xxx-xxxx) nonsignificant number. The number shall be arranged as follows: 9999-00-999-9999. Also called NSN.

Preventive Maintenance Checks and Services

Operator-level maintenance conducted before, during, and after equipment operations to identify actual and potential problems and to make repairs in a timely manner to minimize equipment downtime. Also called PMCS.

Sensor

Equipment which detects, and may indicate and or record, objects and activities by means of energy or particles emitted, reflected, or modified by objects; device used to detect a change in pressure, temperature, or mechanical movement (information detected is converted into an electrical signal)

SOP (standing operating procedure)

A set of instructions covering those features of operations that lend themselves to a definite or standardized procedure without loss of effectiveness. The procedure is applicable unless ordered otherwise.

Soldier Manual of Common Tasks (SMCT)

A document which contains the critical tasks which every soldier must be able to perform in order to fight and win on the battlefield. It provides the conditions, standards, and performance measures for each common soldier critical task.

Tactics, Techniques, and Procedures (TTP)

See individual definitions for tactics; techniques; procedures.

Task Conditions

The specific circumstances or situations under which a job is done. It lists the people, tools, equipment, environment, and other items necessary to perform the job.

Tasks

A set of instructions, data, and control information capable of being executed by a Soldier in job specific duties, or by a CPU to accomplish a specific purpose.

TASK PERFORMANCE SPECIFICATION

The specifications that describe how the task is actually performed, under what conditions it is performed, and how well the individual must perform it. They are the task performance details needed to establish the individual training strategy and to design and develop follow on training. The specifications are --Task statement; Task number; Task performance condition; Task performance standard; Performance steps; Supporting skills and knowledges for each performance step. References required for performance step; Safety factors, hazards, and considerations associated with for each performance step; Environmental factors and considerations associated with for each performance step; Equipment and materials required to perform the performance step; Supporting individual task(s) performed as part of or in support of the individual task being analyzed; Performance measures; Supported individual task(s); Supported collective task(s); Supported Battlefield Operating System (BOS); Task certification requirements if applicable.

Technical Manual (TM)

A publication that describes equipment, weapons, or weapons systems with instructions for effective use. It may include sections for instructions covering initial preparation for use and operational maintenance and overhaul.

Test and Evaluation (T&E)

Process by which components or systems are tested and the results evaluated to assess progress of design, performance, supportability, etc. There are three types of T&E -- Development (DT&E), Operational (OT&E), and Production Acceptance (PAT&E)-- occurring during the acquisition cycle. DT&E is conducted to assist the engineering design and development process, to proof manufacturing processes and control and to verify attainment of technical performance specifications and objectives. OT&E is conducted to estimate a system's operational effectiveness and suitability, identify needed modifications, and provide information on tactics, doctrine, organization, and personnel requirements. PAT&E is conducted on production items to demonstrate that those items meet the requirements and specifications of the procuring contracts or agreements. OT&E is further subdivided into two phases--Initial Operational (IOT&E) and Follow-on Operational (FOT&E). IOT&E must be conducted before the production decision (Milestone III) to provide a credible estimate of operational effectiveness and suitability. Therefore, IOT&E is a field test conducted on a production representative system in an operationally realistic environment, by typical user personnel and includes use of realistic threats. FOT&E is conducted on the production system to verify operational effectiveness and suitability, to fill data voids from the IOT&E, or to verify correction of deficiencies in materiel, training, or concepts.

Trainer's Guide

A publication that covers the information needed by your commander, training manager, and trainer to plan, conduct, and evaluate training in your MOS. There is a trainer's guide for each MOS.

Training Aids, Devices, Simulators and Simulations (TADSS)

these enhance the training of Soldier, leader, crew and collective tasks. TADSS has four elements: training aids (VISMOD, GTA, models, displays, etc); training devices (MILES, practice mines, training grenades, etc); simulators (flight simulators, Conduct of Fire Trainer (COFT, etc); and simulations. (AR 350-1).

Training and Evaluation Outline (T&EO)

a summary document that provides information on collective training objectives, related individual training objectives, resource requirements, and applicable evaluation procedures for a type of organization (ADRP 7-0).

Unit Training Plan (UTP)

a unit's overarching training plan to achieve proficiency in the key collective tasks the commander has chosen to train. The UTP covers a specified "planning horizon" from ARFORGEN, or as designated by the unit commander. (The Leader's Guide to Unit Training Management (UTM).

Warning Order

A preliminary notice of an order or action that is to follow.

Water Pump

In the cooling system, the pump that circulates coolant between the engine water jackets and the radiator.

Workstation

A general purpose computer designed to be used by one person at a time and which offers higher performance than normally found in a personal computer, especially with respect to graphics, processing power and the ability to carry out several tasks at the same time.

ZULU Time

See Universal Time.

REFERENCES

Required Publications

These sources must be available to intended users of this publication.

JOINT AND DEPARTMENT OF DEFENSE PUBLICATIONS

Most joint publications are available online: <https://www.jcs.mil/doctrine>.

DOD Dictionary of Military and Associated Terms, July 2019

ARMY PUBLICATIONS

Most Army doctrinal publications are available online: <https://armypubs.army.mil>.

ADP 5-0 The Operations Process, 31 July 2019.

ADP 7-0 Training, 31 July 2019.

TM 3-4230-209-20&P Operators and Organizational Maintenance Manual (including repair parts and special tools list) for Decontaminating Apparatus: Power-driven, Portable, 28 June 1986.

TM 3-4230-237-10 Operator's Manual for Decontaminating Apparatus: Diesel Engine-Driven (DED), 25 July 2012.

TM 3-4230-238-10 Operator Maintenance Manual for Decontaminating Apparatus: Joint Service Transportable Small Scale, M26, 31 July 2009.

TM 3-4230-238-23&P Field Maintenance Manual (including repair parts and special tools list) for Decontaminating Apparatus: Joint Service Transportable Small Scale, M26, 5 November 2009.

TM 9-4520-272-14&P Operator, Field and Sustainment Maintenance Manual Including Repair Parts and Special Tools List (RPSTL) for Large Capacity Field Heater(LCFH) 1 June 2006.

TM 10-3510-221-10 Operators Manual for Laundry Advanced System (LADS), 7 July 2008.

TM 10-3510-221-23 Field Maintenance for Laundry Advanced System (LADS), 15 January 2009.

TM 10-3510-221-23P Repair Parts and Special Tools List for Laundry Advanced System (LADS), 15 May 2009.

TM 10-3510-226-10 Operator's Maintenance Manual for Containerized Batch Laundry (CBL), 31 August 2005.

TM 10-3510-226-23 Unit and Direct Support Maintenance Manual for Containerized Batch Laundry (CBL), 30 September 2005.

TM 10-3510-226-23P Unit and Direct Support Maintenance Repair Parts and Special Tools List for Containerized Batch Laundry (CBL), 30 November 2005.

TM 10-4320-372-14 Operator's, Unit, Direct Support and General Support Maintenance Manual for Fuel Pumping Assembly 350GPM, 31 March 2008.

TM 10-4320-374-13&P Operation and Field Maintenance Manual Including Repair Parts and Special Tools List (RPSTL) for Pump Assembly 600GPM, 30 May 2008.

TM 10-4610-232-12 Operators and Unit Maintenance Manual for Water Purification Unit, Reverse Osmosis, 3,000 GPH Trailer Mounted, Flatbed Cargo, 22-1/2 TON 8 Wheel Tandem Model, 29 January 2007.

TM 10-4610-232-34 Direct Support and General Support Maintenance Manual for Water Purification Unit, Reverse Osmosis, 3,000 GPH, Trailer Mounted, Flatbed Cargo, 22-1/2 TON 8 Wheel Tandem Model, 29 January 2007.

TM 10-4610-309-23 Field Maintenance Manual for Tactical Water Purification System (TWPS), 15 May 2008.

TM 10-4610-310-13 Technical Manual Operator and Field Maintenance Manual for Light Weight Water Purifier, 15 October 2009.

AIS MAN. GCSS-A/T PUBUSE Global Combat Support System - Army/Tactical (GCSS-A/T) Property Book Unit Supply Enhanced Module (PBUSE Module) End User Manual: https://pbuse.army.mil/gcss/jsp/index_NOGIF.html, 17 December 2016.

RELATED PUBLICATIONS

Related publications are sources of additional information. They are not required in order to understand this publication. Most joint publications are available online: <https://www.jcs.mil/doctrine>. Most Army doctrinal publications are available online: <https://armypubs.army.mil>.

PRESCRIBED FORMS

This section contains no entries

REFERENCED FORMS

Unless otherwise indicated, DA forms are available on the APD Web site (<http://www.armypubs.army.mil>).

DA FORM 2404 Equipment Inspection and Maintenance Worksheet

DA FORM 2407 Maintenance Request

DA FORM 2407-1 Maintenance Request Continuation Sheet

DA FORM 5458 Shower/Decontamination Point Inspection

DA FORM 5988-E Equipment Maintenance and Inspection Worksheet (EGA)

STP 9-91J12-SM-TG

19 September 2019

By Order of the Secretary of the Army:

JAMES C. MCCONVILLE

*General, United States Army
Chief of Staff*

Official:

A handwritten signature in black ink, appearing to read 'Kathleen S. Miller', is written over the printed name.

KATHLEEN S. MILLER
*Administrative Assistant
to the Secretary of the Army
1925409*

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