

Soldier's Manual and Trainer's Guide

UTILITIES EQUIPMENT REPAIRER MOS 91C

SKILL LEVELS SL1/SL3

AUGUST 2018



HEADQUARTERS, DEPARTMENT OF THE ARMY

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PREFACE

This publication is for skill levels 1 and 3 soldiers holding Military Occupational Specialty (MOS) 91C and 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/SL 91C 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, CASCOM 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, Army training and Evaluation Program (ARTEP) products, and ADRP 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 ADRP 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, CBERNE-related information is being included in 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 ARTEP 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.

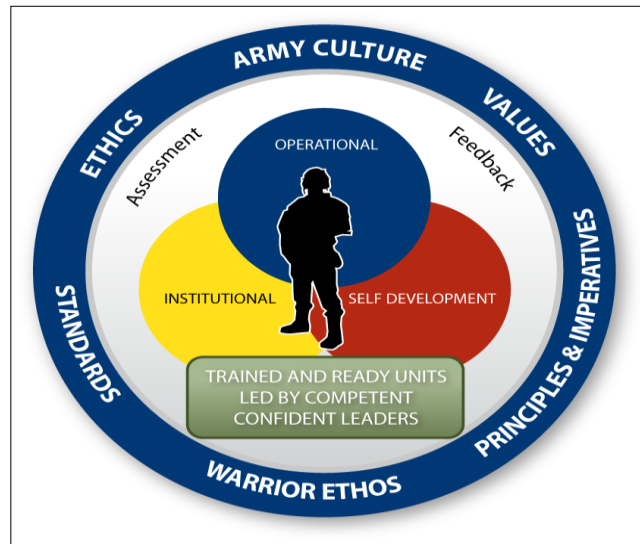


Figure 1-1. Army Training and Leader Development Model

(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 units. It 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. Soldier and leader training and development continue 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 US 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 Solidarization 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; and 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 Reimer Digital Library. 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 trainer's guide 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 Reimer Digital Library. The task summaries ensure that –

- ☐ 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 and the skills that he 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 to 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 rehearsed 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's judgment of 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 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, and 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

- **Sustainment Training Skill Level Column.** This column lists the skill levels of the MOS for which Soldiers must receive sustainment training to ensure they maintain proficiency to Soldier’s manual standards.

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

- 1 AIR CONDITIONER TASKS
- 2 PREVENTIVE MAINTENANCE, CHECKS AND SERVICE TASKS
- 3 RECHARGER, FIRE EXTINGUISHER (HALON) TASKS
- 4 AUTOMOTIVE AIR CONDITIONING (A/C) SYSTEMS TASKS

Skill Level SL3

- 5 AIR CONDITIONER TASKS
- 6 AUTOMOTIVE AIR CONDITIONING (A/C) SYSTEMS TASKS
- 7 ENGINE TASKS
- 8 PREVENTIVE MAINTENANCE, CHECKS AND SERVICE TASKS
- 9 RECHARGER, FIRE EXTINGUISHER (HALON) TASKS
- 10 WATER PURIFICATION REVERSE OSMOSIS UNITS
- 11 DECONTAMINATING APPARATUS

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

SKILL LEVEL	DUTY POSITION	SUBJECT AREAS	CROSS TRAIN	TRAIN-UP/MERGER
SL1	UTILITIES EQUIP REP	1	N/A	N/A
SL3	SR UTILITIES EQUIP REP	1, 3	N/A	N/A

Figure 2-3 Duty Positions Training Requirements

2-4. Part Two, Critical Tasks List.

**MOS TRAINING PLAN
MOS 91C**

CRITICAL TASKS

Task Number	Title	Training Location	Sust Tng Freq	Sust Tng Sl
Skill Level SL1				
Subject Area 1 AIR CONDITIONER TASKS				
091-91C-1001	Maintain Instrument Control Panel on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment.	INST	SA	1-3
091-91C-1002	Maintain Fan and Drive Assembly on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment.	INST	SA	1-3
091-91C-1003	Maintain Coil Components on a Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment.	INST	SA	1-3
091-91C-1004	Maintain Solenoid Valves on a Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment.	INST	SA	1-3
091-91C-1007	Maintain Mechanical Systems on Heating, Ventilation, Air Condition, and Refrigeration (HVAC/R) Equipment.	INST	SA	1-3
091-91C-1008	Maintain Electric Systems on Heating, Ventilation, Air Condition, and Refrigeration (HVAC/R) Equipment.	INST	SA	1-3
091-91C-1010	Operate Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Recovery Equipment.	INST	SA	1-3
Subject Area 2 PREVENTIVE MAINTENANCE, CHECKS AND SERVICE TASKS				
091-91C-1012	Perform Preventive Maintenance, Checks and Services on HVAC/R Equipment	INST	SA	1-3
Subject Area 3 RECHARGER, FIRE EXTINGUISHER (HALON) TASKS				
091-91C-1011	Maintain Fire Suppression System	INST	SA	1-3
Subject Area 4 AUTOMOTIVE AIR CONDITIONING (A/C) SYSTEMS TASKS				
091-91C-1009	Maintain Automotive Air Conditioning (A/C) Systems.	INST	SA	1-3

Skill Level SL3				
Subject Area 5 AIR CONDITIONER TASKS				
091-91C-3001	Complete Diagnostics of Mechanical Systems on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment.	INST	SA	3
091-91C-3002	Complete Diagnostics of Electrical Systems on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment.	INST	SA	3
091-91C-3003	Complete Diagnostics of Refrigerant Systems on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment.	INST	SA	3
091-91C-3004	Complete Diagnostics of Fuel System on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment.	INST	SA	3
Subject Area 6 AUTOMOTIVE AIR CONDITIONING (A/C) SYSTEMS TASKS				
091-91C-3005	Complete Diagnostics of Automotive Air Conditioning (A/C) Systems.	INST	SA	3
Subject Area 7 ENGINE TASKS				
091-91C-3012	Complete Diagnostics of Diesel Engine Assembly on Quartermaster and Chemical Equipment.	INST	SA	3
Subject Area 8 PREVENTIVE MAINTENANCE, CHECKS AND SERVICE TASKS				
091-91C-3017	Perform a Quality Control/Quality Assurance Inspection on Ground Support Equipment.	INST	SA	3
Subject Area 9 RECHARGER, FIRE EXTINGUISHER (HALON) TASKS				
091-91C-3006	Complete Diagnostics on Fire Suppression Systems.	INST	SA	3
Subject Area 10 PUMP ASSY				
091-91C-3010	Complete Diagnostics of AC/DC Electrical Systems on a Pump Assembly	INST	SA	3
091-91C-3011	Complete Diagnostics of Liquid Pump Assembly on Quartermaster and Chemical Equipment.	INST	SA	3
Subject Area 11 WATER PURIFICATION REVERSE OSMOSIS UNITS				
091-91C-3013	Complete Diagnostics of Air Systems on Water Purification Equipment.	INST	SA	3
091-91C-3014	Complete Diagnostics of Electrical Systems on Water Purification Equipment.	INST	SA	3
091-91C-3015	Complete Diagnostics of Reverse Osmosis Rupture Disc on Water Purification Equipment.	INST	SA	3
091-91C-3016	Complete Diagnostics of Water System on Water Purification Equipment.	INST	SA	3
Subject Area 12 DECONTAMINATING APPARATUS				
091-91C-3007	Complete Diagnostics of Electrical Assembly on Decontaminating Apparatus.	INST	SA	3
091-91C-3008	Complete Diagnostics of Water Assembly on Decontaminating Apparatus.	INST	SA	3
091-91C-3009	Complete Diagnostics of Heating Systems on Decontaminating Apparatus.	INST	SA	3

Figure 2-4 91C Critical Tasks

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CHAPTER 3

MOS/Skill Level Tasks

Skill Level SL1

Subject Area 1: AIR CONDITIONER TASKS

091-91C-1001

Maintain Instrument Control Panel on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment.

DANGER

Never use a heating torch on any part that contains refrigerant 22. All refrigerant 22 must be discharged from the system and the entire system must be purged with dry nitrogen before beginning any debrazing operation. Use great care to avoid contact with liquid refrigerant or inhaling refrigerant gas being discharged from any container under pressure. Sudden and irreversible tissue damage can result from freezing. Wear thermal protective gloves and a face protector or safety glasses in any situation where skin or eye contact is possible. Prevent contact of refrigerant gas with flame or hot surfaces. Heat causes the refrigerant to break down and form carbonyl chloride (phosgene), a highly toxic and corrosive gas. Never pressurize refrigerant lines with oxygen, mixture with oil will cause an explosion. The polyurethane foam used as insulation in the air conditioner will break down to form toxic gases if exposed to the flame of a torch or brazing temperature.

WARNING

Severe injury may result if personnel fail to observe safety precautions. To prevent shock hazard, connect a 10 AWG (minimum) ground wire to the air conditioner external ground. Make sure that shelter is properly grounded. Disconnect power from the air conditioner before doing any maintenance work to the electrical system. High voltage in air conditioner can kill. Ground capacitors before touching. High voltages can be stored in a charged capacitor.

CAUTION

Compressed air used for cleaning purposes will not exceed 30 psi (2.1 kg/cm²) to avoid injury to personnel. Do not use steam to clean coils. Refrigerant lines could rupture causing personal injury. When the unit is to be operated in a nuclear/biological/chemical (NBC) environment the fresh air opening must be sealed or connected to an appropriate NBC filtering device. Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Do not use near open flame or excessive heat. Use in well ventilated area. Adhesive remover is flammable and the vapors can be explosive. Repeated or prolonged skin contact or inhalation of vapors can be toxic. Use a well ventilated area, wear gloves, and keep away from sparks or flame.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment and air conditioning tool kit, additional tools and equipment specified in Technical Manuals (TMs), repair parts, and applicable Maintenance Forms and Technical Publications.

Standards: Perform troubleshooting of the control panel on a Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment in accordance with applicable technical publications. When the task is completed the refrigeration unit/air conditioner will 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 applicable administrative tasks.
 - a. Use 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 the instrument control panel.
 - d. Perform initial inspection.
2. Base on the find on your initial diagnose fault on the equipment. Choose the appropriate procedure to correct the fault(s).
 - a. Diagnose fault on instrument control panel on a refrigeration unit and determine maintenance action to be performed.
 - b. Diagnose fault on electrical safety/ protection devices, rectifier circuits, series/ parallel circuits on a refrigeration unit and determine maintenance action to be performed.
 - c. Diagnose fault on small appliances and high pressure systems (section 608 Typel and II), ice making equipment and defrost systems on a refrigeration unit and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment is fully mission capable.

6. Ensure tools and equipment are properly maintained.

7. Ensure maintenance forms are completed 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 applicable administrative tasks.	_____	_____
2 Diagnosed fault(s) and determined maintenance action to be performed.	_____	_____
3 Identified repair parts and requisition as required.	_____	_____
4 Ensured all fault(s) are repaired in accordance with appropriate TMs and references.	_____	_____
5 Performed a final inspection to ensure the Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment was fully mission capable.	_____	_____
6 Ensured tools and equipment were properly maintained.	_____	_____
7 Ensured maintenance forms were completed 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 10-8145-222-10

091-91C-1002**Maintain Fan and Drive Assembly on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment.****DANGER**

Never use a heating torch on any part that contains refrigerant 22. All refrigerant 22 must be discharged from the system and the entire system must be purged with dry nitrogen before beginning any debrazing operation. Use great care to avoid contact with liquid refrigerant or inhaling refrigerant gas being discharged from any container under pressure. Sudden and irreversible tissue damage can result from freezing. Wear thermal protective gloves and a face protector or safety glasses in any situation where skin or eye contact is possible. Prevent contact of refrigerant gas with flame or hot surfaces. Heat causes the refrigerant to break down and form carbonyl chloride (phosgene), a highly toxic and corrosive gas. Never pressurize refrigerant lines with oxygen, mixture with oil will cause an explosion. The polyurethane foam used as insulation in the air conditioner will break down to form toxic gases if exposed to the flame of a torch or brazing temperature.

WARNING

Severe injury may result if personnel fail to observe safety precautions. To prevent shock hazard, connect a 10 AWG (minimum) ground wire to the air conditioner external ground. Make sure that shelter is properly grounded. Disconnect power from the air conditioner before doing any maintenance work to the electrical system. High voltage in air conditioner can kill. Ground capacitors before touching. High voltages can be stored in a charged capacitor

CAUTION

Compressed air used for cleaning purposes will not exceed 30 psi (2.1 kg/cm²) to avoid injury to personnel. Do not use steam to clean coils. Refrigerant lines could rupture causing personal injury. When the unit is to be operated in a nuclear/biological/chemical (NBC) environment the fresh air opening must be sealed or connected to an appropriate NBC filtering device. Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Do not use near open flame or excessive heat. Use in well ventilated area. Adhesive remover is flammable and the vapors can be explosive. Repeated or prolonged skin contact or inhalation of vapors can be toxic. Use a well ventilated area, wear gloves, and keep away from sparks or flame.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment and air conditioning tool kit, additional tools and equipment specified in Technical Manuals (TMs), repair parts, and applicable Maintenance Forms and Technical Publications.

Standards: Perform troubleshooting of the fan and drive assembly on a Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment in accordance with applicable Technical Publications. When the task is completed the refrigeration unit/air conditioner will be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: Task may be taught, supported, and evaluated in multiple lessons. Equipment identified in the task may not reflect what is required in the Formal Training Environment. All required references and technical manuals will be provided by the local Command.

Performance Steps

1. Perform Administrative Actions.
 - a. Use 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 the fan and drive assembly on HVAC/R equipment.
 - d. Perform initial inspection.
2. Base on the find on your initial diagnose fault on the equipment. Choose the appropriate procedure to correct the fault(s).
 - a. Diagnose fault on fan and drive assembly on a small refrigeration appliances and determine maintenance action to be performed.
 - b. Diagnose fault on fan and drive assembly on a high pressure refrigeration appliances and determine maintenance action to be performed.
 - c. Diagnose electrical fault on fan and drive assembly on a HVACR equipment and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Ensure maintenance forms are completed 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(s) and determined maintenance action to be performed.	_____	_____
3 Identified repair parts and requisition as required.	_____	_____
4 Ensured all fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5 Performed a final inspection to ensure the Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment was fully mission capable.	_____	_____
6 Ensured tools and equipment were properly maintained.	_____	_____
7 Ensured maintenance forms were completed 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

091-91C-1003**Maintain Coil Components on a Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment.****DANGER**

Never use a heating torch on any part that contains refrigerant 22. All refrigerant 22 must be discharged from the system and the entire system must be purged with dry nitrogen before beginning any debrazing operation. Use great care to avoid contact with liquid refrigerant or inhaling refrigerant gas being discharged from any container under pressure. Sudden and irreversible tissue damage can result from freezing. Wear thermal protective gloves and a face protector or safety glasses in any situation where skin or eye contact is possible. Prevent contact of refrigerant gas with flame or hot surfaces. Heat causes the refrigerant to break down and form carbonyl chloride (phosgene), a highly toxic and corrosive gas. Never pressurize refrigerant lines with oxygen, mixture with oil will cause an explosion. The polyurethane foam used as insulation in the air conditioner will break down to form toxic gases if exposed to the flame of a torch or brazing temperature.

WARNING

Severe injury may result if personnel fail to observe safety precautions. To prevent shock hazard, connect a 10 AWG (minimum) ground wire to the air conditioner external ground. Make sure that shelter is properly grounded. Disconnect power from the air conditioner before doing any maintenance work to the electrical system. High voltage in air conditioner can kill. Ground capacitors before touching. High voltages can be stored in a charged capacitor.

CAUTION

Compressed air used for cleaning purposes will not exceed 30 psi (2.1 kg/cm²) to avoid injury to personnel. Do not use steam to clean coils. Refrigerant lines could rupture causing personal injury. When the unit is to be operated in a nuclear/biological/chemical (NBC) environment the fresh air opening must be sealed or connected to an appropriate NBC filtering device. Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Do not use near open flame or excessive heat. Use in well ventilated area. Adhesive remover is flammable and the vapors can be explosive. Repeated or prolonged skin contact or inhalation of vapors can be toxic. Use a well ventilated area, wear gloves, and keep away from sparks or flame.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment and air conditioning tool kit, additional tools and equipment specified in Technical Manuals (TM's), repair parts, and applicable Maintenance Forms and Technical Publications.

Standards: Perform troubleshooting of the coil components on a Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) equipment in accordance with applicable technical publications. When the task is completed the Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) equipment will be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

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

Performance Steps

1. Perform Administrative Actions.
 - a. Select applicable Technical Publication.
 - b. Practice Shop Safety and Maintenance Discipline.
 - c. Ensure proper tools and test equipment are available to inspect, repair/replace and test the coil components.
 - d. Perform initial inspection.
2. Base on the find on your initial diagnose fault on the equipment. Choose the appropriate procedure to correct the fault(s).
 - a. Diagnose heat and heat transfer on coil components on the HVACR and determine maintenance action to be performed.
 - b. Diagnose heat and heat transfer on coil components on the HVACR and determine maintenance action to be performed.
 - c. Diagnose fault on condenser coil components on HVACR and determine maintenance action to be performed.
 - d. Diagnose fault on evaporator coil components on HVACR and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Ensure maintenance forms are completed 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(s) and determined maintenance action to be performed.	_____	_____
3 Identified repair parts and requisition as required.	_____	_____
4 Ensured all fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5 Performed a final inspection to ensure the Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment was fully mission capable.	_____	_____
6 Ensured tools and equipment were properly maintained.	_____	_____
7 Ensured maintenance forms were completed 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

091-91C-1004**Maintain Solenoid Valves on a Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment.****DANGER**

Never use a heating torch on any part that contains refrigerant 22. All refrigerant 22 must be discharged from the system and the entire system must be purged with dry nitrogen before beginning any debrazing operation. Use great care to avoid contact with liquid refrigerant or inhaling refrigerant gas being discharged from any container under pressure. Sudden and irreversible tissue damage can result from freezing. Wear thermal protective gloves and a face protector or safety glasses in any situation where skin or eye contact is possible. Prevent contact of refrigerant gas with flame or hot surfaces. Heat causes the refrigerant to break down and form carbonyl chloride (phosgene), a highly toxic and corrosive gas. Never pressurize refrigerant lines with oxygen, mixture with oil will cause an explosion. The polyurethane foam used as insulation in the air conditioner will break down to form toxic gases if exposed to the flame of a torch or brazing temperature.

WARNING

Severe injury may result if personnel fail to observe safety precautions. To prevent shock hazard, connect a 10 AWG (minimum) ground wire to the air conditioner external ground. Make sure that shelter is properly grounded. Disconnect power from the air conditioner before doing any maintenance work to the electrical system. High voltage in air conditioner can kill. Ground capacitors before touching. High voltages can be stored in a charged capacitor.

CAUTION

Compressed air used for cleaning purposes will not exceed 30 psi (2.1 kg/cm²) to avoid injury to personnel. Do not use steam to clean coils. Refrigerant lines could rupture causing personal injury. When the unit is to be operated in a nuclear/biological/chemical (NBC) environment the fresh air opening must be sealed or connected to an appropriate NBC filtering device. Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Do not use near open flame or excessive heat. Use in well ventilated area. Adhesive remover is flammable and the vapors can be explosive. Repeated or prolonged skin contact or inhalation of vapors can be toxic. Use a well ventilated area, wear gloves, and keep away from sparks or flame.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment and air conditioning tool kit, additional tools and equipment specified in Technical Manuals (TMs), repair parts, and applicable Maintenance Forms and Technical Publications.

Standards: Perform troubleshooting of the solenoid valves on a Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment in accordance with applicable technical publications. When the task is completed the Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment will 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 the instrument control panel.
 - d. Perform initial inspection.
2. Base on the find on your initial diagnose fault on the equipment. Choose the appropriate procedure to correct the fault(s).
 - a. Diagnose series/parallel circuits as applicable.
 - b. Analyze pressure.
 - c. Diagnose Defrost systems as applicable.
 - d. Diagnose metering devices as applicable.
 - e. Diagnose accessories as applicable.
3. Identify repair parts and requisition as required.
4. Ensure all fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) equipment is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete the Army Maintenance Management System, (TAMMS) forms 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(s) and determined maintenance action to be performed.	_____	_____
3 Identified repair parts and requisition as required.	_____	_____
4 Ensured all fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5 Performed a final inspection to ensure the Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment was fully mission capable.	_____	_____
6 Ensured tools and equipment were properly maintained.	_____	_____
7 Completed The Army Maintenance Management System (TAMMS) forms 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

091-91C-1007**Maintain Mechanical Systems on Heating, Ventilation, Air Condition, and Refrigeration (HVAC/R) Equipment.****DANGER**

Never use a heating torch on any part that contains refrigerant 22. All refrigerant 22 must be discharged from the system and the entire system must be purged with dry nitrogen before beginning any debrazing operation. Use great care to avoid contact with liquid refrigerant or inhaling refrigerant gas being discharged from any container under pressure. Sudden and irreversible tissue damage can result from freezing. Wear thermal protective gloves and a face protector or safety glasses in any situation where skin or eye contact is possible. Prevent contact of refrigerant gas with flame or hot surfaces. Heat causes the refrigerant to break down and form carbonyl chloride (phosgene), a highly toxic and corrosive gas. Never pressurize refrigerant lines with oxygen, mixture with oil will cause an explosion. The polyurethane foam used as insulation in the air conditioner will break down to form toxic gases if exposed to the flame of a torch or brazing temperature.

WARNING

Severe injury may result if personnel fail to observe safety precautions. To prevent shock hazard, connect a 10 AWG (minimum) ground wire to the air conditioner external ground. Make sure that shelter is properly grounded. Disconnect power from the air conditioner before doing any maintenance work to the electrical system. High voltage in air conditioner can kill. Ground capacitors before touching. High voltages can be stored in a charged capacitor.

CAUTION

Compressed air used for cleaning purposes will not exceed 30 psi (2.1 kg/cm²) to avoid injury to personnel. Do not use steam to clean coils. Refrigerant lines could rupture causing personal injury. When the unit is to be operated in a nuclear/biological/chemical (NBC) environment the fresh air opening must be sealed or connected to an appropriate NBC filtering device. Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Do not use near open flame or excessive heat. Use in well ventilated area. Adhesive remover is flammable and the vapors can be explosive. Repeated or prolonged skin contact or inhalation of vapors can be toxic. Use a well ventilated area, wear gloves, and keep away from sparks or flame.

Conditions: In an operational environment with minimum assistance, given a maintenance request or equipment inspection worksheet describing equipment malfunctions, required tools, and test equipment and Heating, Ventilation, Air Condition, and Refrigeration (HVAC/R) Equipment.

Standards: Perform troubleshooting the mechanical systems on a Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment in accordance with applicable technical publications. When the task is completed the refrigeration unit/air conditioner will 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 the mechanical systems on HVACR equipment.
 - d. Perform initial inspection.
2. Base on the find on your initial diagnose fault on the equipment. Choose the appropriate procedure to correct the fault(s).
 - a. Diagnose fault on tubing/fitting on the HVACR and determine maintenance action to be performed.
 - b. Diagnose fault on compressor on the HVACR and determine maintenance action to be performed.
 - c. Diagnose fault on piping and valves on the HVACR and determine maintenance action to be performed.
 - d. Diagnose fault on service valves on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment.
 - e. Diagnose fault on eletrical componenet on Compressor on the Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment.
3. Identify repair parts and requisition as required.
4. Ensure all fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete The Army Maintenance Management System (TAMMS) forms as require.

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(s) and determined maintenance action to be performed.	_____	_____
3 Identified repair parts and requisition as required.	_____	_____
4 Ensured all fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5 Performed a final inspection to ensure the Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment was fully mission capable.	_____	_____
6 Ensured tools and equipment were properly maintained.	_____	_____

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

TB 11-5820-1187-23
 TM 9-4120-422-14&P
 TM 9-4120-423-14&P
 TM 9-4120-425-14&P

091-91C-1008

Maintain Electric Systems on Heating, Ventilation, Air Condition, and Refrigeration (HVAC/R) Equipment.**DANGER**

Never use a heating torch on any part that contains refrigerant 22. All refrigerant 22 must be discharged from the system and the entire system must be purged with dry nitrogen before beginning any debrazing operation. Use great care to avoid contact with liquid refrigerant or inhaling refrigerant gas being discharged from any container under pressure. Sudden and irreversible tissue damage can result from freezing. Wear thermal protective gloves and a face protector or safety glasses in any situation where skin or eye contact is possible. Prevent contact of refrigerant gas with flame or hot surfaces. Heat causes the refrigerant to break down and form carbonyl chloride (phosgene), a highly toxic and corrosive gas. Never pressurize refrigerant lines with oxygen, mixture with oil will cause an explosion. The polyurethane foam used as insulation in the air conditioner will break down to form toxic gases if exposed to the flame of a torch or brazing temperature.

WARNING

Severe injury may result if personnel fail to observe safety precautions. To prevent shock hazard, connect a 10 AWG (minimum) ground wire to the air conditioner external ground. Make sure that shelter is properly grounded. Disconnect power from the air conditioner before doing any maintenance work to the electrical system. High voltage in air conditioner can kill. Ground capacitors before touching. High voltages can be stored in a charged capacitor.

CAUTION

Compressed air used for cleaning purposes will not exceed 30 psi (2.1 kg/cm²) to avoid injury to personnel. Do not use steam to clean coils. Refrigerant lines could rupture causing personal injury. When the unit is to be operated in a nuclear/biological/chemical (NBC) environment the fresh air opening must be sealed or connected to an appropriate NBC filtering device. Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Do not use near open flame or excessive heat. Use in well ventilated area. Adhesive remover is flammable and the vapors can be explosive. Repeated or prolonged skin contact or inhalation of vapors can be toxic. Use a well ventilated area, wear gloves, and keep away from sparks or flame.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment and air conditioning tool kit, additional tools and equipment specified in Technical Manuals (TMs), repair parts, and applicable Maintenance Forms and Technical Publications.

Standards: Perform troubleshooting of the electric systems on a Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment in accordance with applicable technical publications. When the task is completed the refrigeration unit/air conditioner will be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: Task may be taught, supported and evaluated in multiple lessons. Equipment identified at the task may not reflect what is required in the formal training environment. 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 and test equipment are available to inspect, repair/replace and test the electric systems on HVACR equipment.
 - d. Perform initial inspection.
2. Base on the find on your initial diagnose fault on the equipment. Chose the appropriate procedure to fix the fault.
 - a. Diagnose fault and maintain compressor on a HVACR and determine maintenance action to be performed.
 - b. Diagnose fault and maintain evaporator fan assembly on a HVACR and determine maintenance action to be performed.
 - c. Diagnose fault and maintain junction box assembly on a HVACR and determine maintenance action to be performed.
 - d. Diagnose fault and maintain wiring harness on a HVACR and determine maintenance action to be performed.
 - e. Diagnose fault and maintain electric system on a Heater and determine maintenance action to be performed.
 - f. Diagnose fault and maintain control module on a HVACR and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete The Army Maintenance Management System, (TAMMS) forms 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 and maintain electric system on HVACR and determine maintenance action to be performed.	_____	_____
3 Identified repair parts and requisition as required.	_____	_____
4 Ensured all fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5 Performed a final inspection to ensure the Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment was fully mission capable.	_____	_____
6 Ensured tools and equipment were properly maintained.	_____	_____
7 Completed The Army Maintenance Management System (TAMMS) forms 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

091-91C-1010**Operate Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Recovery Equipment.****DANGER**

Never use a heating torch on any part that contains refrigerant 22. All refrigerant 22 must be discharged from the system and the entire system must be purged with dry nitrogen before beginning any debrazing operation. Use great care to avoid contact with liquid refrigerant or inhaling refrigerant gas being discharged from any container under pressure. Sudden and irreversible tissue damage can result from freezing. Wear thermal protective gloves and a face protector or safety glasses in any situation where skin or eye contact is possible. Prevent contact of refrigerant gas with flame or hot surfaces. Heat causes the refrigerant to break down and form carbonyl chloride (phosgene), a highly toxic and corrosive gas. Never pressurize refrigerant lines with oxygen, mixture with oil will cause an explosion. The polyurethane foam used as insulation in the air conditioner will break down to form toxic gases if exposed to the flame of a torch or brazing temperature.

WARNING

Severe injury may result if personnel fail to observe safety precautions. To prevent shock hazard, connect a 10 AWG (minimum) ground wire to the air conditioner external ground. Make sure that shelter is properly grounded. Disconnect power from the air conditioner before doing any maintenance work to the electrical system. High voltage in air conditioner can kill. Ground capacitors before touching. High voltages can be stored in a charged capacitor.

CAUTION

Compressed air used for cleaning purposes will not exceed 30 psi (2.1 kg/cm²) to avoid injury to personnel. Do not use steam to clean coils. Refrigerant lines could rupture causing personal injury. When the unit is to be operated in anuclear/biological/chemical (NBC) environment the fresh air opening must be sealed or connected to an appropriate NBC filtering device. Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Do not use near open flame or excessive heat. Use in well ventilated area. Adhesive remover is flammable and the vapors can be explosive. Repeated or prolonged skin contact or inhalation of vapors can be toxic. Use a well ventilated area, wear gloves, and keep away from sparks or flame.

Conditions: In an operational environment with minimum assistance, given a maintenance request or equipment inspection worksheet describing equipment malfunctions, required tools, and test equipment.

Standards: Perform troubleshooting of the operation on a Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) recovery equipment in accordance with applicable technical publications. When the task is completed the Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) recovery equipment will 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. Maintain tools, Equipment and Test, Measurement and Diagnostic Equipment, (TMDE).
 - c. Practice Shop Safety and Maintenance Discipline.
 - d. Determine serviceability based on inspection.
2. Inspect refrigerant recovery/recycling machine and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the Recovery/Recycling machine is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete The Army Maintenance Management System (TAMMS) forms 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 Inspected the refrigerant recovery/recycling machine and determine maintenance action to be performed.	_____	_____
3 Identified repair parts and requisition as required.	_____	_____
4 Ensured all fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5 Performed a final inspection to ensure the Recovery/Recycling machine was fully mission capable.	_____	_____
6 Ensured tools and equipment were properly maintained.	_____	_____
7 Completed The Army Maintenance Management System (TAMMS) forms 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

Subject Area 2: PREVENTIVE MAINTENANCE, CHECKS AND SERVICE TASKS

091-91C-1012

Perform Preventive Maintenance, Checks and Services on HVACR Equipment

WARNING

Severe injury may result if personnel fail to observe safety precautions. To prevent shock hazard, connect a 10 AWG (minimum) ground wire to the air conditioner external ground. Make sure that shelter is properly grounded. Disconnect power from the air conditioner before doing any maintenance work to the electrical system. High voltage in air conditioner can kill. Ground capacitors before touching. High voltages can be stored in a charged capacitor.

CAUTION

Compressed air used for cleaning purposes will not exceed 30 psi (2.1 kg/cm²) to avoid injury to personnel. Do not use steam to clean coils. Refrigerant lines could rupture causing personal injury. When the unit is to be operated in a nuclear/biological/chemical (NBC) environment the fresh air opening must be sealed or connected to an appropriate NBC filtering device. Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Do not use near open flame or excessive heat. Use in well ventilated area. Adhesive remover is flammable and the vapors can be explosive. Repeated or prolonged skin contact or inhalation of vapors can be toxic. Use a well ventilated area, wear gloves, and keep away from sparks or flame.

Conditions: In an operational environment with minimum assistance, given a maintenance request or equipment inspection worksheet describing equipment malfunctions, required tools, and test equipment.

Standards: Perform PMCS on HVACR equipment following all applicable safety precautions and references in a manner that does not cause damage to equipment or injury to personnel.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: Task may be taught, supported and evaluated in multiple lessons. Equipment identified at the task may not reflect what is required in the formal training environment. 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. Select and use applicable tools, equipment, and Test, Measurement, and Diagnostic Equipment (TMDE).

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 [F]).

a. Check coolant level, temperature indicators, fan belt, and air passages for obstructions frequently.

b. Maintain coolant levels approximately two inches below the radiator overflow pipe if so equipped.

c. Check radiator frequently.

d. Check fan belt for proper tension.

4. Identify repair parts and requisition as required.

5. Ensure all fault(s) found are within accordance with appropriate TMs and references.

6. Ensure tools and equipment are properly maintained.

7. Complete The Army Maintenance Management System, (TAMMS) forms 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 requisition as required.	_____	_____
5 Ensured all fault(s) found were within accordance with appropriate TMs and references.	_____	_____

Performance Measures	GO	NO GO
6 Ensured tools and equipment were properly maintained.	_____	_____
7 Completed The Army Maintenance Management System, (TAMMS) forms 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
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Subject Area 3: RECHARGER, FIRE EXTINGUISHER (HALON) TASKS

091-91C-1011

Maintain Fire Suppression System

DANGER

Before starting motor or operating any of the components, ensure that no loose bars, tools or parts are lying in or on any of the equipment as they could cause serious damage to equipment or bodily injury to personnel. Make certain any lifting device used has a capacity equal to the weight being lifted. Failure to observe this precaution could result in injury or death to personnel and damage to equipment.

WARNING

Always disconnect electric power from the air compressor before starting any work on it. The air compressor could start up accidentally and could cause serious injury to maintenance personnel.

CAUTION

Never attempt to service any of the air compressor components until the unit is relieved of all air pressure. Eye protective equipment must be worn when scraping rust and loose paint. Lethal voltages are present in the circuitry of the air compressor. Disconnect power from the compressor before starting any repair work.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on a fire suppression systems, tools kits, equipment specified in Technical Manuals (TMs), repair parts, and applicable Maintenance Forms and Technical Publications.

Standards: Perform complete diagnostics on a fire suppression systems in accordance with applicable technical publications. When the task is completed the fire suppression systems will 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. Maintain tools, equipment and Test, Measurement and Diagnostic Equipment, (TMDE).
 - c. Practice Shop Safety and Maintenance Discipline.

d. Determine serviceability based on inspection.

2. Determine serviceability based on an inspection of the Fire Suppression System, (valve and cylinder).

3. Identify repair parts and requisition as required.

4. Ensure all fault(s) are repaired in accordance with appropriate TMs and references.

5. Perform a final inspection to ensure the Fire Suppression System (Valve and Cylinder) is fully mission capable.

6. Ensure tools and equipment are properly maintained.

7. Complete The Army Maintenance Management System, (TAMMS) forms 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 Determined serviceability based on an inspection of the Fire Suppression System, (valve and cylinder).	_____	_____
3 Identified repair parts and requisition as required.	_____	_____
4 Ensured all fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5 Performed a final inspection to ensure the Fire Suppression System (Valve and Cylinder) is fully mission capable.	_____	_____
6 Ensured tools and equipment were properly maintained.	_____	_____
7 Completed The Army Maintenance Management System, (TAMMS) forms 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

Subject Area 4: AUTOMOTIVE AIR CONDITIONING (A/C) SYSTEMS TASKS

091-91C-1009

Maintain Automotive Air Conditioning (A/C) Systems.

Conditions: As a utilities equipment repairer in an operational environment, given service kit, refrigerant, multimeter, digital, AN/PSM-45A, truck, ambulance, 4-litter armed, 4x4 w/e, M997, tool kit, service refrigeration unit, general maintenance, DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection and Maintenance Worksheet (EGA)), and TM 9-2320-280-10. The vehicle's air conditioning system does not cool.

Standards: Service the automotive air conditioner system in accordance with applicable technical references. When the task was completed, the A/C will be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: The vehicle's air conditioning system does not cool.

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 and test equipment are available to inspect, repair/replace and test the Automotive Air Conditioning systems.
 - d. Perform initial inspection.
2. Diagnose fault and maintain Automotive air conditioning systems and determine maintenance action to be performed.
3. Identify repair parts and requisition as required.
4. Ensure all fault(s) are repaired in accordance with appropriate TMs and references.
5. Perform a final inspection to ensure the Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment is fully mission capable.
6. Ensure tools and equipment are properly maintained.
7. Complete The Army Maintenance Management System, (TAMMS) forms 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 and maintained Automotive Air Conditioning Systems and determine maintenance action to be performed.	_____	_____
3 Identified repair parts and requisition as required.	_____	_____
4 Ensured all fault(s) were repaired in accordance with appropriate TMs and references.	_____	_____
5 Performed a final inspection to ensure the Automotive Air Conditioning (A/C) Systems was fully mission capable.	_____	_____
6 Ensured tools and equipment were properly maintained.	_____	_____
7 Completed The Army Maintenance Management System, (TAMMS) forms 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

DA FORM 2404
DA FORM 5988-E
TM 9-2320-280-10
TM 9-2320-280-13&P

Skill Level SL3
Subject Area 5: AIR CONDITIONER TASKS
091-91C-3001

Complete Diagnostics of Mechanical Systems on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment.

DANGER

Never use a heating torch on any part that contains refrigerant 22. All refrigerant 22 must be discharged from the system and the entire system must be purged with dry nitrogen before beginning any debrazing operation. Use great care to avoid contact with liquid refrigerant or inhaling refrigerant gas being discharged from any container under pressure. Sudden and irreversible tissue damage can result from freezing. Wear thermal protective gloves and a face protector or safety glasses in any situation where skin or eye contact is possible. Prevent contact of refrigerant gas with flame or hot surfaces. Heat causes the refrigerant to break down and form carbonyl chloride (phosgene), a highly toxic and corrosive gas. Never pressurize refrigerant lines with oxygen, mixture with oil will cause an explosion. The polyurethane foam used as insulation in the air conditioner will break down to form toxic gases if exposed to the flame of a torch or brazing temperature.

WARNING

Severe injury may result if personnel fail to observe safety precautions. To prevent shock hazard, connect a 10 AWG (minimum) ground wire to the air conditioner external ground. Make sure that shelter is properly grounded. Disconnect power from the air conditioner before doing any maintenance work to the electrical system. High voltage in air conditioner can kill. Ground capacitors before touching. High voltages can be stored in a charged capacitor.

CAUTION

Compressed air used for cleaning purposes will not exceed 30 psi (2.1 kg/cm²) to avoid injury to personnel. Do not use steam to clean coils. Refrigerant lines could rupture causing personal injury. When the unit is to be operated in a nuclear/biological/chemical (NBC) environment the fresh air opening must be sealed or connected to an appropriate NBC filtering device. Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Do not use near open flame or excessive heat. Use in well ventilated area. Adhesive remover is flammable and the vapors can be explosive. Repeated or prolonged skin contact or inhalation of vapors can be toxic. Use a well ventilated area, wear gloves, and keep away from sparks or flame.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment and air conditioning tool kit, equipment specified in Technical Manuals (TMs), repair parts, and applicable Maintenance Forms and Technical Publications.

Standards: Perform troubleshooting of the mechanical system on a Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment in accordance with applicable technical publications. When the task is completed the refrigeration unit/air conditioner will 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. Review work request.
2. Ensure all safety precautions are followed.
3. Ensure task is within shop capability/responsibility.
4. Ensure applicable technical publications are available.
5. Ensure proper tools and test equipment are available to inspect, repair/replace and test the mechanical system.
6. Assign personnel to perform necessary tasks.
7. Perform initial inspection.
8. Base on the find on your initial diagnose fault on the equipment. Choose the appropriate procedure to correct the fault(s).
 - a. Diagnose fault on mechanical system on a refrigeration unit and determine maintenance action to be performed.
 - b. Diagnose fault on the compressor assembly on a refrigeration unit and determine maintenance action to be performed.
 - c. Diagnose fault on the mechanical system on a heater equipment and determine maintenance action to be performed.
 - d. Diagnose fault on the mechanical system on an air conditioner and determine maintenance action to be performed.
9. Identify repair parts and requisition as required.
10. Provide assistance if necessary.
11. Ensure all fault(s) are repaired in accordance with appropriate TMs and references.
12. Perform a final inspection to ensure the Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment is fully mission capable.
13. Ensure tools and equipment are properly maintained.

14. Ensure maintenance forms are completed 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 Reviewed work request.	_____	_____
2 Ensured all safety precautions and procedures were followed.	_____	_____
3 Ensured task was within shop capability/authorization.	_____	_____
4 Ensured applicable technical publications were available.	_____	_____
5 Ensured proper tools and test equipment were available to inspect, repair/replace, and test the mechanical system.	_____	_____
6 Assigned personnel to perform necessary repairs.	_____	_____
7 Performed initial inspection.	_____	_____
8 Diagnosed fault(s) and determined maintenance action to be performed.	_____	_____
9 Identified repair parts and requisitioned, if required.	_____	_____
10 Provided assistance if necessary.	_____	_____
11 Ensured all the fault(s) was repaired in accordance with appropriate TMs and references.	_____	_____
12 Performed a final inspection to ensure the Heating, Ventilation, Air Condition, and Refrigeration (HVAC/R) Equipment was fully mission-capable.	_____	_____
13 Ensured tools and equipment were properly maintained.	_____	_____
14 Ensured maintenance forms were completed as required.	_____	_____

Evaluation Guidance: Score the Soldier GO if all performance measures were passed. Score the Soldier NO GO if any performance measure was failed. If the Soldier fails any performance measure, show what was done wrong and how to do it correctly, and have the Soldier repeat the task.

References

Required

Primary

TC 9-62
TM 10-4110-263-10
TM 10-8145-222-10
TM 9-4110-256-14
TM 9-4120-385-14
TM 9-4120-400-14
TM 9-8000

091-91C-3002**Complete Diagnostics of Electrical Systems on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment.****DANGER**

Never use a heating torch on any part that contains refrigerant 22. All refrigerant 22 must be discharged from the system and the entire system must be purged with dry nitrogen before beginning any debrazing operation. Use great care to avoid contact with liquid refrigerant or inhaling refrigerant gas being discharged from any container under pressure. Sudden and irreversible tissue damage can result from freezing. Wear thermal protective gloves and a face protector or safety glasses in any situation where skin or eye contact is possible. Prevent contact of refrigerant gas with flame or hot surfaces. Heat causes the refrigerant to break down and form carbonyl chloride (phosgene), a highly toxic and corrosive gas. Never pressurize refrigerant lines with oxygen, mixture with oil will cause an explosion. The polyurethane foam used as insulation in the air conditioner will break down to form toxic gases if exposed to the flame of a torch or brazing temperature.

WARNING

Severe injury may result if personnel fail to observe safety precautions. To prevent shock hazard, connect a 10 AWG (minimum) ground wire to the air conditioner external ground. Make sure that shelter is properly grounded. Disconnect power from the air conditioner before doing any maintenance work to the electrical system. High voltage in air conditioner can kill. Ground capacitors before touching. High voltages can be stored in a charged capacitor

CAUTION

Compressed air used for cleaning purposes will not exceed 30 psi (2.1 kg/cm²) to avoid injury to personnel. Do not use steam to clean coils. Refrigerant lines could rupture causing personal injury. When the unit is to be operated in a nuclear/biological/chemical (NBC) environment the fresh air opening must be sealed or connected to an appropriate NBC filtering device. Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Do not use near open flame or excessive heat. Use in well ventilated area. Adhesive remover is flammable and the vapors can be explosive. Repeated or prolonged skin contact or inhalation of vapors can be toxic. Use a well ventilated area, wear gloves, and keep away from sparks or flame.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions, on a Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment and air conditioning tool kit, equipment specified in Technical Manuals (TM's), repair parts, multimeter, and applicable Maintenance Forms and Technical Publications.

Standards: Complete diagnostics of electrical systems on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment in accordance with applicable technical publications and performance measures. When the task is complete, the Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment will be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

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

Performance Steps

1. Review work request.
2. Ensure all safety precautions and procedures are followed.
3. Ensure maintenance required is within shop capability/authorization.
4. Ensure applicable technical publications are available.
5. Ensure proper tools, equipment, and Test Measurement, and Diagnostic Equipment, (TMDE) are available to inspect, repair/replace and test the electrical system.
6. Perform an initial inspection.
7. Assign personnel to perform maintenance.
8. Base on the find on your initial inspection fault on the equipment. Choose the appropriate procedure to diagnose fault(s) and determine maintenance action to be performed.
 - a. Diagnose electrical system on a Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment.
 - b. Diagnose electrical system on a heater.
 - (1) Diagnose 120,000 BTU Heater as applicable.
 - (2) Diagnose 140,000 BTU Heater as applicable.
9. Identify repair parts and requisition if required.
10. Provide assistance if necessary.
11. Ensure the electrical system is repaired in accordance with appropriate TMs and references.
12. Perform a final inspection to ensure the electrical system is fully mission capable.
13. Ensure tools and equipment are properly maintained.
14. Complete maintenance forms 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 Reviewed work request.	_____	_____
2 Ensured all safety precautions and procedures were followed.	_____	_____
3 Ensured maintenance required was within shop capability/authorization.	_____	_____
4 Ensured applicable technical publications were available.	_____	_____
5 Ensured proper tools, equipment, and Test Measurement, and Diagnostic Equipment (TMDE) were available to inspect, repair/replace, and test the electrical system.	_____	_____
6 Performed initial inspection.	_____	_____
7 Assigned personnel to perform maintenance.	_____	_____
8 Diagnosed fault(s) and determined maintenance action to be performed.	_____	_____
9 Identified repair parts and requisitioned, if required.	_____	_____
10 Provided assistance if required.	_____	_____
11 Ensured the electrical system was repaired in accordance with appropriate TMs and references.	_____	_____
12 Performed a final inspection to ensure the electrical system was fully mission-capable.	_____	_____
13 Ensured maintenance forms were completed as required.	_____	_____
14 Ensured tools and equipment were properly maintained.	_____	_____

Evaluation Guidance: Score the Soldier GO if all performance measures were passed. Score the Soldier NO GO if any performance measure was failed. If the Soldier fails any performance measure, show what was done wrong and how to do it correctly, and have the Soldier repeat the task.

**References
Required**

Primary

DA FORM 2404
DA FORM 5988-E
TM 10-8145-222-23
TM 5-4120-339-14
TM 5-4120-359-14
TM 5-4120-377-14
TM 5-4120-384-14
TM 5-4120-386-14
TM 5-4120-393-14
TM 9-4110-256-14
TM 9-4120-371-14
TM 9-4120-378-14
TM 9-4120-385-14
TM 9-4120-389-14

091-91C-3003**Complete Diagnostics of Refrigerant Systems on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment.****DANGER**

Never use a heating torch on any part that contains refrigerant 22. All refrigerant 22 must be discharged from the system and the entire system must be purged with dry nitrogen before beginning any debrazing operation. Use great care to avoid contact with liquid refrigerant or inhaling refrigerant gas being discharged from any container under pressure. Sudden and irreversible tissue damage can result from freezing. Wear thermal protective gloves and a face protector or safety glasses in any situation where skin or eye contact is possible. Prevent contact of refrigerant gas with flame or hot surfaces. Heat causes the refrigerant to break down and form carbonyl chloride (phosgene), a highly toxic and corrosive gas. Never pressurize refrigerant lines with oxygen, mixture with oil will cause an explosion. The polyurethane foam used as insulation in the air conditioner will break down to form toxic gases if exposed to the flame of a torch or brazing temperature.

WARNING

Severe injury may result if personnel fail to observe safety precautions. To prevent shock hazard, connect a 10 AWG (minimum) ground wire to the air conditioner external ground. Make sure that shelter is properly grounded. Disconnect power from the air conditioner before doing any maintenance work to the electrical system. High voltage in air conditioner can kill. Ground capacitors before touching. High voltages can be stored in a charged capacitor.

CAUTION

Compressed air used for cleaning purposes will not exceed 30 psi (2.1 kg/cm²) to avoid injury to personnel. Do not use steam to clean coils. Refrigerant lines could rupture causing personal injury. When the unit is to be operated in a nuclear/biological/chemical (NBC) environment the fresh air opening must be sealed or connected to an appropriate NBC filtering device. Dry cleaning solvent used to clean parts is potentially dangerous to personnel and property. Do not use near open flame or excessive heat. Use in well ventilated area. Adhesive remover is flammable and the vapors can be explosive. Repeated or prolonged skin contact or inhalation of vapors can be toxic. Use a well ventilated area, wear gloves, and keep away from sparks or flame.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions, on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment and air conditioning tool kit, multimeter, equipment specified in Technical Manuals (TMs), repair parts, and applicable Maintenance Forms and Technical Publications.

Standards: Perform complete diagnostics of refrigerant systems on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment in accordance with applicable technical publications and performance measures. When the task is complete, the Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment will be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: Task may be taught, supported and evaluated in multiple lessons. Equipment identified at the task may not reflect what is required in the formal training environment.

Performance Steps

1. Review work request.
2. Ensure all safety precautions are followed.
3. Ensure task is within shop capability/responsibility.
4. Ensure applicable technical publications are available.
5. Ensure proper tools, equipment, and Test Measurement and Diagnostic Equipment, (TMDE) are available to inspect, repair/replace and test the system for leak.
6. Perform an initial inspection.
7. Base on the find on your initial inspection fault on the equipment. Choose the appropriate procedure to correct the fault(s).
 - a. Diagnose fault on recovery/ recycling system on a Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment and determine maintenance action to be performed.
 - b. Determine maintenance action on electrical system of a recovery and recycling unit.
 - c. Determine maintenance action on a recovery and recycling unit.
8. Identify repair parts and requisition if required.
9. Ensure the recovery/recycling sysems and Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment are repaired in accordance with appropriate TMs and references.
10. Perform a final inspection to ensure the recovery/recycling sysems and Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment are fully mission capable.
11. Ensure tools and equipment are properly maintained.
12. Ensure maintenance forms are completed 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	Reviewed work request.	_____	_____
2	Ensured all safety precautions were followed.	_____	_____
3	Ensured maintenance required was within shop capability/responsibility.	_____	_____
4	Ensured applicable technical publications were available.	_____	_____
5	Ensured proper tools, equipment, and Test Measurement, and Diagnostic Equipment (TMDE) were available to inspect, repair/replace, and test the system for leak.	_____	_____
6	Performed initial inspection.	_____	_____
7	Diagnosed fault(s) and determined maintenance action to be performed.	_____	_____
8	Identified repair parts and requisitioned, if required.	_____	_____
9	Ensured the recovery/recycling systems and Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment were repaired in accordance with appropriate TMs and references.	_____	_____
10	Performed a final inspection to ensure the recovery/recycling systems and Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment were fully mission-capable.	_____	_____
11	Ensured tools and equipment were properly maintained.	_____	_____
12	Ensured maintenance forms were completed as required.	_____	_____

Evaluation Guidance: Score the Soldier GO if all performance measures were passed. Score the Soldier NO GO if any performance measure was failed. If the Soldier fails any performance measure, show what was done wrong and how to do it correctly, and have the Soldier repeat the task.

**References
Required**

Primary

DA FORM 2404
DA FORM 5988-E
TM 10-8145-222-23
TM 5-4120-386-14
TM 9-4120-389-14
TM 5-4120-384-14
TM 9-4120-385-14
TM 9-4120-378-14
TM 9-4120-371-14
TM 5-4120-359-14
TM 5-4120-339-14

091-91C-3004

Complete Diagnostics of Fuel System on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment.**DANGER**

DEATH or serious injury may result if personnel fail to observe safety precautions. **CARBON MONOXIDE (EXHAUST GAS) CAN KILL YOU** Carbon monoxide is without color or smell, but can kill you. Breathing carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, a sleepy feeling, and coma. Brain damage or death can result from heavy exposure. Carbon monoxide occurs in the exhaust fumes of fuel-burning heaters and internal combustion engines. Carbon monoxide can become dangerously concentrated under conditions of no ventilation. Precautions must be followed to ensure operator's safety when the ASH Unit is in operation. **OPERATE** the ASH Unit with the exhaust pipe attached in a well-ventilated area. **DO NOT** operate ASH Unit with a known exhaust (combustion air) leak. **BE ALERT** at all times during operating procedures for carbon monoxide poisoning. If exposure is present, **IMMEDIATELY** evacuate personnel to fresh air. **BE AWARE** the field protection mask used for nuclear-biological-chemical attack **WILL NOT** protect you from carbon monoxide poisoning. **THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS GOOD VENTILATION.** **ELECTRICAL HIGH VOLTAGE CAN KILL YOU** Electrical high voltage cannot be seen, but it can kill you. Electricity is unlike most other dangerous things you can come in contact with because it gives no warning and no symptoms to be wary of. Its effect is immediate. It can kill you, render you unconscious, or severely burn you. To ensure your safety and that of other maintenance personnel, always observe the following precautions: **DO NOT** perform any maintenance on electrical equipment unless all power is removed. **BE CERTAIN** that there is someone assisting you who can remove power immediately. **ALWAYS** place **POWER OFF** warning tags on power supply switches so that no one will apply power while you are performing maintenance.

WARNING

FUEL FLAMMABLE/NO SMOKING Fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection is required. Avoid repeated/prolonged contact. Use only in well ventilated areas. Keep away from open flames or other sources of ignition. Post **FUEL FLAMMABLE/NO SMOKING** signs around the area. Suitable fire extinguisher must be present. Fuel on clothing can be fatal if ignited by a static discharge. If fuel gets on your clothes, leave the refueling area as soon as possible, remove clothes and wash skin with warm soapy water before getting dressed. Spilled fuel creates a flammable, vapor-air mixture and fire can take place. Stop refueling immediately if fuel spill occurs.

CAUTION

COMPRESSED AIR HAZARD When using compressed air for cooling, cleaning, or drying operation, do not exceed 30 psig at the nozzle. Eyes can be permanently damaged by contact with liquid and large particles or solvent vapor can damage lungs. When using air for cleaning at an air-exhausted workbench, wear approved goggles or face shield. When using air for cleaning at an unexhausted workbench, wear approved respirator and goggles.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment and air conditioning tool kit, equipment specified in Technical Manuals (TMs), repair parts, and applicable Maintenance Forms and Technical Publications.

Standards: Perform troubleshooting of the fuel system on a Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC/R) Equipment in accordance with applicable technical publications. When the task is completed the refrigeration unit/air conditioner will be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: Task may be taught, supported and evaluated in multiple lessons. Equipment identified at the task may not reflect what is required in the formal training environment.

Performance Steps

1. Review work request.
2. Ensure all safety precautions are followed.
3. Assign personnel to perform maintenance.
4. Determine maintenance action in the fuel system on a heater.
 - a. Diagnose 120,000 BTU Heater as applicable.
 - b. Diagnose 140,000 BTU Heater as applicable.
5. Ensure maintenance required is within shop capability/authorization.
6. Ensure proper tools, test equipment, and correct Technical Manual are available.
7. Identify repair parts to be requisitioned.
8. Provide assistance if necessary.
 - a. Perform the following steps.
 - b. Test the heater fuel system components.
 - c. Service the heater fuel system components as applicable.
 - d. Adjust the heater fuel system components as applicable.
 - e. Repair the heater fuel system components as applicable.

- f. Replace the heater fuel system components as applicable.
9. Ensure the fuel system is repaired in accordance with appropriate technical manuals and references.
10. Perform a final inspection to ensure the fuel system is fully mission capable.
11. Ensure tools and equipment are properly maintained.
12. Ensure The Army Maintenance Management System (TAMMS) forms are completed 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	Reviewed work request.	_____	_____
2	Ensured all safety precautions were followed.	_____	_____
3	Assigned personnel to perform maintenance.	_____	_____
4	Determined maintenance action in the fuel system on a heater.	_____	_____
5	Ensured maintenance required was within shop capability/authorization.	_____	_____
6	Ensured proper tools, test equipment, and correct Technical Manual were available.	_____	_____
7	Identified repair parts to be requisitioned.	_____	_____
8	Provided assistance if necessary.	_____	_____
9	Ensured the fuel system was repaired in accordance with appropriate technical manuals and references.	_____	_____
10	Performed a final inspection to ensure the fuel system was fully mission-capable.	_____	_____
11	Ensured tools and equipment were properly maintained.	_____	_____
12	Ensured The Army Maintenance Management System (TAMMS) forms were completed, as required.	_____	_____

Evaluation Guidance: Score the Soldier GO if all performance measures were passed. Score the Soldier NO GO if any performance measure was failed. If the Soldier fails any performance measure, show what was done wrong and how to do it correctly, and have the Soldier repeat the task.

**References
Required**

Primary

TM 5-4520-244-24P
TM 5-4520-253-13
TM 9-4520-257-12&P
TM 9-4520-258-13&P
TM 9-4520-271-14
TM 9-4520-271-24P
TM 9-4520-272-14&P

Subject Area 6: AUTOMOTIVE AIR CONDITIONING (A/C) SYSTEMS TASKS

091-91C-3005

Complete Diagnostics of Automotive Air Conditioning (A/C) Systems.

DANGER

EXHAUST GASES CAN KILL Brain damage or death can result from heavy exposure. Precautions must be followed to ensure personnel safety when the personnel heater or engine of any vehicle is operated for any purpose. 1. Do not operate your vehicle engine in enclosed areas. 2. Do not idle vehicle engine with vehicle windows closed. 3. Be alert at all times for exhaust odors. 4. Be alert for exhaust poisoning symptoms. They are: • Headache • Dizziness • Sleepiness • Loss of muscular control 5. If you see another person with exhaust poisoning symptoms: • Remove person from area • Expose to open air • Keep person warm • Do not permit physical exercise • Administer artificial respiration, if necessary • Notify a medic • For artificial respiration, refer to FM 21-11.6. BE AWARE, the field protective mask for nuclear-biological-chemical (NBC) protection will not protect you from exhaust poisoning. THE BEST DEFENSE AGAINST EXHAUST POISONING IS ADEQUATE VENTILATION. • Improper cleaning methods and use of unauthorized cleaning solutions may cause injury to personnel or damage to equipment. See TM 9-247 for correct information. • Compressed air used for cleaning purposes will not exceed 30 psi (207 kPa). Use only with effective chipguarding and personal protective equipment (goggles/shield, gloves, etc.). • Do not use compressed air to dry bearings. Spinning a dry bearing with compressed air may cause injury to personnel or damage to equipment. • Direct all personnel to stand clear during hoisting operations. Failure to do this may cause injury.

WARNING

Do not attempt to connect servicing equipment while engine is running. Injury to personnel or damage to equipment may result. • Gaskets installed on some 6.2L engines assembled prior to 1991 may contain asbestos. Gaskets should be removed with a scraper or putty knife then disposed of IAW current directives. Inhalation of asbestos fibers can cause respiratory ailments. • Air-conditioning system must be discharged prior to replacing components. Failure to do this may result in injury to personnel or damage to equipment.

CAUTION

Always wear eye protection around air-conditioning refrigerant, or when servicing the air-conditioning system. • Exercise extreme care when handling air-conditioning refrigerant, direct contact between air-conditioning refrigerant and skin may cause frostbite. • Never smoke in areas where air-conditioning refrigerant is used or stored. • Ensure adequate ventilation whenever air-conditioning refrigerant is being discharged. Personnel with a history of cardiac rhythm abnormalities should be made aware of potential aggravation as a result of exposure to air-conditioning refrigerant. Failure to do so may result in injury to personnel. • Avoid breathing air-conditioning refrigerant. The gas will irritate the nose, throat, and lungs. In addition, because air-conditioning refrigerant is heavier than air, it can displace oxygen in a confined and a poorly ventilated area. Be sure the work area is properly ventilated in case of accidental release into the nearby atmosphere.

Conditions: As a utilities equipment repairer in an operational environment, given service kit, refrigerant, truck, ambulance, 4-litter armed, 4x4 w/e, M997, tool kit, service refrigeration unit, general maintenance, DA Form 2404 (Equipment Inspection and Maintenance Worksheet) or DA Form 5988-E (Equipment Inspection and Maintenance Worksheet (EGA), and TM 9-2320-280-10. The vehicle's air conditioning system does not cool.

Standards: Service the automotive air conditioner system in accordance with applicable technical references. When the task is complete, the Automotive Air Conditioning (A/C) Systems will be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: The vehicle's air conditioning system does not cool.

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

Performance Steps

1. Review work request.
2. Ensure all safety precautions are followed.
3. Assign personnel to perform maintenance.
4. Inspect automotive air conditioner system and determine serviceability/malfunction.
5. Ensure maintenance required is within shop capability/authorization.
6. Ensure proper tools, test equipment and correct Technical Manual are available.
7. Identify repair parts to be requisitioned.
8. Provide assistance if necessary.
 - a. Diagnose the automotive a/c system.
 - b. Repair the automotive a/c system components as applicable.
 - c. Replace the automotive a/c system components as applicable.
9. Ensure the automotive a/c system is repaired in accordance with appropriate technical manuals and references.
10. Perform a final inspection to ensure the automotive a/c system is fully mission capable.
11. Ensure tools and equipment are properly maintained.
12. Ensure The Army Maintenance Management System (TAMMS) forms are completed 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 Reviewed work request.	_____	_____
2 Ensured all safety precautions were followed.	_____	_____
3 Assigned personnel to perform maintenance.	_____	_____
4 Inspected automotive air conditioner system and determined serviceability/malfunction(s).	_____	_____
5 Ensured maintenance required was within shop capability/authorization.	_____	_____
6 Ensured proper tools, test equipment, and Technical Manual were available.	_____	_____
7 Identified repair parts to be requisitioned.	_____	_____
8 Provided assistance if necessary.	_____	_____
9 Ensured the automotive a/c system was repaired in accordance with appropriate technical manuals and references.	_____	_____
10 Performed a final inspection to ensure the fuel system was fully mission capable.	_____	_____
11 Ensured tools and equipment were properly maintained.	_____	_____
12 Ensured The Army Maintenance Management System (TAMMS) forms were completed, as required.	_____	_____

Evaluation Guidance: Score the Soldier GO if all performance measures were passed. Score the Soldier NO GO if any performance measure was failed. If the Soldier fails any performance measure, show what was done wrong and how to do it correctly, and have the Soldier repeat the task.

References Required

Primary

DA FORM 2404
DA FORM 5988-E
TB 9-2320-387-35-2
TM 9-2320-280-10
TM 9-2320-280-13&P

Subject Area 7: ENGINE TASKS**091-91C-3012****Complete Diagnostics of 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 diesel engine assembly on a quartermaster and chemical equipment, general mechanic's tool kit, TMDE, equipment specified in Technical Manuals (TM's), repair parts, and applicable Maintenance Forms and Technical Publications.

Standards: Complete diagnostics of diesel engine assembly on quartermaster and chemical equipment with applicable technical publications and performance measures. When the task is complete, the liquid pump assembly on quartermaster and chemical equipment will be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: Task may be taught, supported and evaluated in multiple lessons. Equipment identified at the task may not reflect what is required in the formal training environment.

Performance Steps

1. Review work request.
2. Ensure all safety precautions and procedures are followed.
3. Ensure task is within shop capability/authorization.
4. Ensure applicable technical publication are available.
5. Ensure proper tools, equipment, and TMDE are available to inspect, repair/replace and test the engine assembly on the pump.
6. Assign personnel to perform maintenance.
7. Perform an initial inspection.
8. Diagnose fault(s) and determine maintenance action to be perform.
9. Identify repair parts and requisition as require.
10. Provide assistance if necessary.
11. Ensure the diesel engine assembly electrical system is repair in accordance with appropriate technical manuals and references.
12. Perform a final inspection to ensure the diesel engine assembly is fully mission capable.
13. Ensure tools and equipment are properly maintained.
14. Ensure maintenance forms are completed as required.

Evaluation Preparation: Ensure all equipment and specials 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	Reviewed work request.	_____	_____
2	Ensured all safety precautions and procedures are followed.	_____	_____
3	Ensured task was within shop capability/authorization.	_____	_____
4	Ensured applicable technical publications are available.	_____	_____
5	Ensured proper tools, equipment, and TMDE are available to inspect, repair/replace, and test the engine assembly.	_____	_____
6	Assigned personnel to perform necessary repairs.	_____	_____

Performance Measures		GO	NO GO
7	Performed initial inspection.	_____	_____
8	Diagnosed fault(s) and determine maintenance action to be performed.	_____	_____
9	Identified repair parts and requisition, if required.	_____	_____
10	Provided assistance if necessary.	_____	_____
11	Ensured the diesel engine assembly electrical system was repaired in accordance with appropriate technical manuals and references.	_____	_____
12	Performed a final inspection to ensure the diesel engine assembly is fully mission-capable.	_____	_____
13	Ensure tools and equipment were properly maintained.	_____	_____
14	Ensured maintenance forms were completed as required.	_____	_____

Evaluation Guidance: Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier fails any performance measure, show what was done wrong and how to do it correctly.

**References
Required**

Primary

DA PAM 750-8
TM 10-4320-226-14
TM 10-4320-343-14

Subject Area 8: PREVENTIVE MAINTENANCE, CHECKS AND SERVICE TASKS

091-91C-3017

Perform a Quality Control/Quality Assurance Inspection on Ground Support 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 a operational environment, given ground support equipment, necessary tools, equipment specified in Technical Manuals (TMs), and applicable Maintenance Forms and Technical Publications.

Standards: Perform a quality control/quality assurance inspection of ground support equipment in accordance with applicable technical publications, ensuring all findings and corrective actions taken are annotated on applicable maintenance forms.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

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

Performance Steps

1. Review work request.
2. Ensure all safety precautions and procedures are followed.
3. Ensure applicable technical publication are available.
4. Ensure proper tools, equipment, and Test Measurement, and Diagnostic Equipment (TMDE) are available to perform a quality control/quality assurance inspection of ground support equipment.
5. Perform inspection in accordance with appropriate TMs and references.
6. Ensure tools, equipment, and TMDE are properly maintained.
7. Ensure all findings and corrective actions taken are annotated on the DA Form 5988-E (Equipment Inspection Maintenance Worksheet) (EGA) in accordance with appropriate TMs and references.

Evaluation Preparation: Ensure all equipment and specials 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 Reviewed work request.	_____	_____
2 Ensured all safety precautions and procedures were followed.	_____	_____
3 Ensured applicable technical publications were available.	_____	_____
4 Ensured proper tools, equipment, and Test Measurement, and Diagnostic Equipment (TMDE) were available to perform a quality control/quality assurance inspection of ground support equipment.	_____	_____
5 Performed inspection in accordance with appropriate TMs and references.	_____	_____
6 Ensured tools, equipment, and TMDE were properly maintained.	_____	_____
7 Ensured all findings and corrective actions taken were annotated on the DA Form 5988-E (Equipment Inspection Maintenance Worksheet) (EGA) in accordance with appropriate TMs and references.	_____	_____

Evaluation Guidance: Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier fails any performance measure, show what was done wrong and how to do it correctly.

References**Required****Primary**

AR 750-1
ATP 4-33
DA FORM 2404
DA FORM 2407 Maintenance Request
DA FORM 2407-1 Maintenance Request Continuation Sheet
DA FORM 5988-E
DA PAM 750-8

Subject Area 9: RECHARGER, FIRE EXTINGUISHER (HALON) TASKS

091-91C-3006

Complete Diagnostics on Fire Suppression Systems.

DANGER

Before starting motor or operating any of the components, ensure that no loose bars, tools or parts are lying in or on any of the equipment as they could cause serious damage to equipment or bodily injury to personnel. Make certain any lifting device used has a capacity equal to the weight being lifted. Failure to observe this precaution could result in injury or death to personnel and damage to equipment.

WARNING

Always disconnect electric power from the air compressor before starting any work on it. The air compressor could start up accidentally and could cause serious injury to maintenance personnel.

CAUTION

Never attempt to service any of the air compressor components until the unit is relieved of all air pressure. Eye protective equipment must be worn when scraping rust and loose paint. Lethal voltages are present in the circuitry of the air compressor. Disconnect power from the compressor before starting any repair work.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on a fire suppression systems, tools kits, equipment specified in Technical Manuals (TMs), repair parts, and applicable Maintenance Forms and Technical Publications.

Standards: Perform complete diagnostics on a fire suppression systems in accordance with applicable technical publications. When the task is completed the fire suppression systems will be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: Task may be taught, supported and evaluated in multiple lessons. Equipment identified at the task may not reflect what is required in the formal training environment.

Performance Steps

1. Review work request.
2. Ensure all safety precautions are followed.
3. Ensure task is within shop capability/authorization.
4. Ensure applicable technical publications are available.
5. Ensure proper tools and test equipment are available.
6. Perform an initial inspection.
7. Assign personnel to perform necessary tasks.
8. Base on the find on your initial diagnose fault on the equipment. Choose the appropriate procedure to correct the fault(s).
 - a. Diagnose fault on transfer pump on a halon recovery/recharger unit and determine maintenance action to be performed.
 - b. Diagnose fault on compressor, air reciprocating, 15 CFM on a halon recovery/recharger unit and determine maintenance action to be performed.
 - c. Diagnose fault on halon/DPSU recovery/recharger unit and determine maintenance action to be performed.
9. Disassemble the fire suppression systems as necessary in accordance with appropriate technical manuals and references.
10. Identify repair parts to be requisitioned.
11. Provide assistance if necessary.
12. Assemble the fire suppression systems as necessary in accordance with appropriate technical manuals and references.
13. Perform a final inspection to ensure the fire suppression system is fully mission capable in accordance with appropriate technical manuals and references.
14. Ensure tools and equipment are properly maintained.
15. Ensure The Army Maintenance Management System (TAMMS) forms are completed 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 Reviewed work request.	_____	_____
2 Ensured all safety precautions were followed.	_____	_____
3 Ensured task was within shop capability/authorization.	_____	_____
4 Ensured applicable technical publications were available.	_____	_____
5 Ensured proper tools and test equipment were available.	_____	_____
6 Performed initial inspection.	_____	_____
7 Assigned personnel to perform necessary repairs.	_____	_____
8 Diagnosed fault(s) and determine maintenance action to be performed.	_____	_____
9 Disassembled the fire suppression systems as necessary in accordance with appropriate technical manuals and references.	_____	_____
10 Identified repair parts to be requisitioned.	_____	_____
11 Provided assistance if necessary.	_____	_____
12 Assembled the fire suppression systems as necessary in accordance with appropriate technical manuals and references.	_____	_____
13 Performed a final inspection to ensure the fire suppression system was fully mission-capable in accordance with appropriate technical manuals and references.	_____	_____
14 Ensured tools and equipment were properly maintained.	_____	_____
15 Ensured The Army Maintenance Management System (TAMMS) forms were completed, as required.	_____	_____

Evaluation Guidance: Score the Soldier GO if all performance measures were passed. Score the Soldier NO GO if any performance measure was failed. If the Soldier fails any performance measure, show what was done wrong and how to do it correctly, and have the Soldier repeat the task.

**References
Required**

Primary

TM 5-4210-218-13&P
TM 5-4310-373-14
TM 5-4310-373-24P

Subject Area 10: PUMP ASSY, 350 GPM 275 FOOT HEAD**091-91C-3010****Complete Diagnostics of AC/DC Electrical Systems on a Pump Assembly.****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 pump assembly on a quartermaster and chemical Equipment, general mechanic's tool kit, TMDE, equipment specified in Technical Manuals (TM's), repair parts, and applicable Maintenance Forms and Technical Publications.

Standards: Complete diagnostics of pump assembly on quartermaster and chemical equipment with applicable technical publications and performance measures. When the task is complete, the pump assembly on quartermaster and chemical equipment will be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: Task may be taught, supported and evaluated in multiple lessons. Equipment identified at the task may not reflect what is required in the formal training environment.

Performance Steps

1. Review work request.
2. Ensure all safety precautions and procedures are followed.
3. Ensure task is within shop capability/authorization.
4. Ensure applicable technical publication are available.
5. Ensure applicable tools, equipment, Test Measurement, and Diagnostic Equipment, (TMDE) is available to inspect, repair/replace and test the electrical system. Ensure all equipment and specials 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

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 Reviewed work request.	_____	_____
2 Ensured all safety precautions and procedures were followed.	_____	_____
3 Ensured task was within shop capability/authorization.	_____	_____
4 Ensured applicable technical publications were available.	_____	_____
5 Ensured applicable tools, equipment, and Test, Measurement, and diagnostic equipment (TMDE) were available to inspect, repair/replace, and test the electrical system.	_____	_____
6 Assigned personnel to perform necessary repairs.	_____	_____
7 Performed initial inspection.	_____	_____
8 Diagnosed fault(s) and determined maintenance action to be performed.	_____	_____
9 Identified repair parts and requisitioned, if required.	_____	_____
10 Provided assistance if necessary.	_____	_____
11 Ensured the electrical system on pump assembly was repaired in accordance with appropriate technical manuals and references.	_____	_____
12 Performed a final inspection to ensure the pump assembly electrical system was fully mission-capable.	_____	_____

Performance Measures		GO	NO GO
13	Ensured tools and equipment were properly maintained. Assign personnel to perform necessary tasks.	_____	_____

Evaluation Guidance: Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier fails any performance measure, show what was done wrong and how to do it correctly.

**References
Required**

Primary

- DA PAM 750-8
- TM 10-4320-226-14
- TM 10-4320-343-14
- TM 5-4520-256-14

091-91C-3011**Complete Diagnostics of 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 liquid pump assembly on a quartermaster and chemical equipment, general mechanic's tool kit, TMDE, equipment specified in Technical Manuals (TM's), repair parts, and applicable Maintenance Forms and Technical Publications.

Standards: Complete diagnostics of liquid pump assembly on quartermaster and chemical equipment with applicable technical publications and performance measures. When the task is complete, the liquid pump assembly on quartermaster and chemical equipment will be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: Task may be taught, supported and evaluated in multiple lessons. Equipment identified at the task may not reflect what is required in the formal training environment.

Performance Steps

1. Review work request.
2. Ensure all safety precautions and procedures are follow.

3. Ensure task is within shop capability/authorization.
4. Ensure applicable technical publications are available.
5. Ensure proper tools are available to inspect, repair/replace and test the liquid pump assembly or components.
6. Assign personnel to perform necessary tasks.
7. Perform initial inspection.
8. Diagnose fault(s) and determine maintenance action to be performed in accordance with appropriate technical manuals and references.
9. Disassemble the liquid pump if necessary.
10. Identify repair parts and requisition as applicable.
11. Provide assistance if necessary.
12. Assemble the liquid pump if necessary.
13. Ensure the liquid pump assembly is repaired in accordance with appropriate technical manuals and references.
14. Perform a final inspection to ensure the liquid pump assembly is fully mission capable.
15. Ensure tools and equipment are properly maintained.
16. Ensure maintenance forms are completed as required.

Evaluation Preparation: Ensure all equipment and specials 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	Reviewed work request.	_____	_____
2	Ensured all safety precautions and procedures were followed.	_____	_____
3	Ensured tasks was within shop capability/authorization.	_____	_____
4	Ensured applicable technical publications were available.	_____	_____
5	Ensured proper tools were available to inspect, repair/replace, and test the liquid pump assembly or components.	_____	_____
6	Assigned personnel to perform necessary.	_____	_____

Performance Measures		GO	NO GO
7	Performed initial inspection.	_____	_____
8	Diagnosed fault(s) and determined maintenance action to be performed in accordance with appropriate technical manuals and references.	_____	_____
9	Disassembled the liquid pump if necessary.	_____	_____
10	Identified repair parts and requisitioned, if applicable.	_____	_____
11	Provided assistance if necessary.	_____	_____
12	Assembled the liquid pump if necessary.	_____	_____
13	Ensured the liquid pump assembly is repaired in accordance with appropriate technical manuals and references.	_____	_____
14	Performed a final inspection to ensure the pump assembly was fully mission-capable.	_____	_____
15	Ensured tools and equipment were properly maintained.	_____	_____
16	Ensured maintenance forms were completed as required.	_____	_____

Evaluation Guidance: Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier fails any performance measure, show what was done wrong and how to do it correctly.

References

Required

Primary

DA PAM 750-8
 TM 10-4320-226-14
 TM 10-4320-343-14
 TM 5-4520-256-14

Subject Area 11: WATER PURIFICATION REVERSE OSMOSIS UNITS
091-91C-3013
Complete Diagnostics of Air Systems 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 air systems water purification equipment, general mechanic tool kit, equipment specified in Technical Manuals (TMs), repair parts, and applicable Maintenance Forms and Technical Publications.

Standards: Repair the water air systems on purification equipment and repair or replace its components in accordance with the applicable technical publications and performance measures procedures and specifications. When the task is complete, the water air systems on purification equipment will be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: Task may be taught, supported and evaluated in multiple lessons. Equipment identified at the task may not reflect what is required in the formal training environment.

Performance Steps

1. Review work request.
2. Ensure all safety precautions are followed.
3. Ensure task is within shop capability/authorization.
4. Ensure applicable technical publication are available.
5. Ensure proper tools and test equipment are available.
6. Assign personnel to perform necessary tasks.
7. Perform initial inspection.
8. Diagnose fault(s) and determine maintenance action to be performed in accordance with appropriate technical manuals and references and type of equipment.
9. Disassemble the air systems if necessary in accordance with appropriate technical manuals and references.
10. Identify repair parts and requisition if required.
11. Provide assistance if necessary.
12. Assemble the air systems if necessary in accordance with appropriate technical manuals and references.
13. Ensure the air systems is repaired in accordance with appropriate technical manuals and references.
14. Perform a final inspection to ensure the air systems on water purification equipment is fully mission capable.
15. Ensure tools and equipment are properly maintained.
16. Ensure The Army Maintenance Management System (TAMMS) forms are completed as required.

Evaluation Preparation: Ensure all equipment and specials 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 Reviewed work request.	_____	_____
2 Ensured all safety precautions were followed.	_____	_____
3 Ensured tasks was within shop capability/authorization.	_____	_____
4 Ensured applicable technical publications were available.	_____	_____
5 Ensured proper tools and test equipment were available.	_____	_____
6 Assigned personnel to perform necessary.	_____	_____
7 Performed initial inspection.	_____	_____
8 Diagnosed fault(s) and determine maintenance action to be performed in accordance with appropriate technical manuals and references and type of equipment.	_____	_____
9 Disassembled the air systems if necessary in accordance with appropriate technical manuals and references.	_____	_____
10 Identified repair parts and requisition, if required.	_____	_____
11 Provided assistance if necessary.	_____	_____
12 Assembled the air systems if necessary in accordance with appropriate technical manuals and references.	_____	_____
13 Ensured the air systems was repaired in accordance with appropriate technical manuals and references.	_____	_____
14 Performed a final inspection to ensure the air systems on water purification equipment is fully mission capable.	_____	_____
15 Ensured tools and equipment were properly maintained.	_____	_____
16 Ensured The Army Maintenance Management System (TAMMS) forms are completed, as required.	_____	_____

Evaluation Guidance: Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier fails any performance measure, show what was done wrong and how to do it correctly.

References**Required****Primary**

TM 10-4610-215-10
TM 10-4610-215-24
TM 10-4610-215-24P
TM 10-4610-232-12
TM 10-4610-232-34
TM 10-4610-239-10
TM 10-4610-239-24
TM 10-4610-239-24P

091-91C-3014**Complete Diagnostics of Electrical Systems 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 electrical systems water purification equipment, general mechanic tool kit, equipment specified in Technical Manuals (TMs), repair parts, and applicable Maintenance Forms and Technical Publications.

Standards: Repair the water purification equipment in accordance with the applicable technical publications and performance measures procedures and specifications. When the task is complete, the water air systems on purification equipment will be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: Task may be taught, supported and evaluated in multiple lessons. Equipment identified at the task may not reflect what is required in the formal training environment.

Performance Steps

1. Review work request.
2. Ensure all safety precautions are followed.
3. Ensure task is within shop capability/authorization.
4. Ensure applicable technical publication are available.
5. Ensure proper tools and test equipment are available.
6. Assign personnel to perform necessary tasks.
7. Perform initial inspection.
8. Diagnose fault(s) and determine maintenance action to be performed in accordance with appropriate technical manuals and references and type of equipment.
9. Disassemble the electrical systems if necessary in accordance with appropriate technical manuals and references.
10. Identify repair parts and requisition if required.
11. Provide assistance if necessary.
12. Assemble the electrical systems if necessary in accordance with appropriate technical manuals and references.
13. Ensure the electrical systems is repaired in accordance with appropriate technical manuals and references.
14. Perform a final inspection to ensure the electrical systems on water purification equipment is fully mission capable.
15. Ensure tools and equipment are properly maintained.
16. Ensure The Army Maintenance Management System (TAMMS) forms are completed as required.

Evaluation Preparation: Ensure all equipment and specials 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	Reviewed work request.	_____	_____
2	Ensured all safety precautions were followed.	_____	_____
3	Ensured tasks was within shop capability/authorization.	_____	_____
4	Ensured applicable technical publications were available.	_____	_____
5	Ensured proper tools and test equipment were available.	_____	_____
6	Assigned personnel to perform necessary.	_____	_____
7	Performed initial inspection.	_____	_____
8	Diagnosed fault(s) and determine maintenance action to be performed in accordance with appropriate technical manuals and references and type of equipment.	_____	_____
9	Disassembled the electrical systems if necessary in accordance with appropriate technical manuals and references.	_____	_____
10	Identified repair parts and requisition, if required.	_____	_____
11	Provided assistance if necessary.	_____	_____
12	Assembled the electrical systems if necessary in accordance with appropriate technical manuals and references.	_____	_____
13	Ensured the electrical systems is repaired in accordance with appropriate technical manuals and references.	_____	_____
14	Perform a final inspection to ensure the electrical systems on water purification equipment is fully mission capable.	_____	_____
15	Ensured tools and equipment were properly maintained.	_____	_____
16	Ensured The Army Maintenance Management System (TAMMS) forms are completed, as required.	_____	_____

Evaluation Guidance: Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier fails any performance measure, show what was done wrong and how to do it correctly.

References**Required****Primary**

TM 10-4610-215-10
TM 10-4610-215-24
TM 10-4610-215-24P
TM 10-4610-232-12
TM 10-4610-232-34
TM 10-4610-239-10
TM 10-4610-239-24
TM 10-4610-239-24P

091-91C-3015
Complete Diagnostics of Reverse Osmosis Rupture Disc on Water Purification 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 a reverse osmosis rupture disc 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 diagnostics of reverse osmosis rupture disc on water purification equipment and repair or replace its components in accordance with the applicable technical publications and performance measures procedures and specifications. When the task is complete, the reverse osmosis rupture disc on water purification equipment will be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: Task may be taught, supported and evaluated in multiple lessons. Equipment identified at the task may not reflect what is required in the formal training environment.

Performance Steps

1. Review work request.
2. Ensure all safety precautions and procedures are followed.
3. Ensure applicable technical manuals are available.
4. Ensure proper tools, equipment and TMDE are available.
5. Perform an initial inspection.
6. Diagnose fault(s) and determine maintenance action to be performed in accordance with appropriate technical manuals and references and type of equipment.
7. Disassemble the ROWPU system as necessary.
8. Identify repair parts and requisition as necessary.
9. Assemble the ROWPU system.
10. Ensure the ROWPU System is repaired in accordance with appropriate TMs and references.
11. Perform a final inspection to ensure the ROWPU is fully mission capable.
12. Ensure tools and equipment are properly maintained.
13. Ensure TAMMS forms are completed as required.

Evaluation Preparation: Ensure all equipment and specials 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	Reviewed work request.	_____	_____
2	Ensured all safety precautions and procedures are followed.	_____	_____
3	Ensured applicable technical publications were available.	_____	_____
4	Ensured proper tools, equipment and TMDE were available.	_____	_____
5	Performed an initial inspection.	_____	_____
6	Diagnosed fault(s) and determine maintenance action to be performed in accordance with appropriate technical manuals and references and type of equipment.	_____	_____

Performance Measures	GO	NO GO
7 Disassembled the ROWPU system as necessary.	_____	_____
8 Identified and requisitioned repair parts as necessary.	_____	_____
9 Assembled the ROWPU system.	_____	_____
10 Ensured the ROWPU is repaired in accordance with appropriate TMs and references.	_____	_____
11 Performed a final inspection to ensure the ROWPU was fully mission capable.	_____	_____
12 Ensured tools and equipment were properly maintained.	_____	_____
13 Ensured that TAMMS forms were completed as required.	_____	_____

Evaluation Guidance: Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier fails any performance measure, show what was done wrong and how to do it correctly.

References Required

Primary

DA PAM 750-8
 TM 10-4320-226-14
 TM 10-4320-343-14
 TM 10-4610-310-13
 TM 5-4520-256-14

091-91C-3016**Complete Diagnostics of Water System on Water Purification 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 of water system 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 diagnostics of water system on water purification equipment and repair or replace its components in accordance with the applicable technical publications and performance measures procedures and specifications. When the task is complete, the water system on water purification equipment will be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

Note: Task may be taught, supported and evaluated in multiple lessons. Equipment identified at the task may not reflect what is required in the formal training environment.

Performance Steps

1. Review work request.
2. Ensure all safety precautions are followed.
3. Select and use appropriate references.
4. Ensure proper tools and test equipment are available.
5. Perform initial inspection.
6. Diagnose fault(s) and determine maintenance action to be performed in accordance with appropriate technical manuals and references.
7. Identify repair parts to be requisitioned if applicable.
8. Ensure operational test is performed.
9. Inspect system components.
10. Repair water system on water purification equipment as required.
11. Replace water system on water purification equipment as required.
12. Perform a test operation on the equipment after task is completed.
13. Ensured maintenance procedures are in accordance with applicable technical publications.
14. Ensure tools and equipment are properly maintained.
15. Ensure The Army Maintenance Management System (TAMMS) forms are completed as required.

Evaluation Preparation: Ensure all equipment and specials 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	Reviewed work request.	_____	_____
2	Ensured all safety precautions were followed.	_____	_____
3	Selected and used appropriate references.	_____	_____
4	Ensured proper tools and test equipment were available.	_____	_____

Performance Measures		GO	NO GO
5	Performed initial inspection.	_____	_____
6	Diagnosed fault(s) and determined maintenance action to be performed in accordance with appropriate technical manuals and references.	_____	_____
7	Identified repair parts to be requisitioned if applicable.	_____	_____
8	Ensured operational test is performed.	_____	_____
9	Inspected system components.	_____	_____
10	Repaired water system on water purification equipment as required.	_____	_____
11	Replaced water system on water purification equipment as required.	_____	_____
12	Performed a test operation on the equipment after task was completed.	_____	_____
13	Ensured maintenance procedures were in accordance with technical publications.	_____	_____
14	Ensured tools and equipment were properly maintained.	_____	_____
15	Ensured The Army Maintenance Management System (TAMMS) forms were completed, as required.	_____	_____

Evaluation Guidance: Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier fails any performance measure, show what was done wrong and how to do it correctly.

References Required

Primary

DA PAM 750-8
 TM 10-4610-215-10
 TM 10-4610-215-24
 TM 10-4610-215-24P
 TM 10-4610-232-12
 TM 10-4610-232-34
 TM 10-4610-239-10
 TM 10-4610-239-24
 TM 10-4610-239-24P

Subject Area 12: DECONTAMINATING APPARATUS**091-91C-3007****Complete Diagnostics of Electrical Systems on Decontaminating Apparatus.****DANGER****DEATH OR SEVERE INJURY MAY RESULT IF PERSONNEL FAIL TO OBSERVE**

WARNINGS Remove all jewelry before starting work. Metal objects such as rings or tools can cause short circuits. Do not allow tools to contact live circuits. A direct short can cause instant heating of tools resulting in equipment damage and personnel burns. Failure to comply may result in personal injury. **DANGEROUS CHEMICALS, DIESEL FUEL, 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 engine and the water heater.

WARNING

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. Seek medical assistance immediately. If STB decontaminating agent or slurry contacts the skin, wash off immediately with clear water.

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.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on Decontaminating Apparatus Equipment, and mechanical tool kit, equipment specified in Technical Manuals (TM's), repair parts, and applicable Maintenance Forms, and Technical Publications.

Standards: Perform complete diagnostics of water of electrical system on a Decontaminating Apparatus Equipment in accordance with applicable technical publications. When the task is completed the Decontaminating Apparatus Equipment will be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

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

Performance Steps

1. Review work request.
2. Ensure all safety precaution are followed.
3. Ensured tasks is within shop capability/authorization.
4. Ensure applicable technical publications are available.
5. Ensure proper tools and test equipment are available.
6. Assign personnel to perform necessary tasks.
7. Perform initial inspection.
8. Diagnose fault(s) and determine maintenance action to be performed.
9. Provide assistance if necessary.
10. Identify repair parts and requisition if applicable.
11. Ensure the electrical system is repaired in accordance with appropriate technical manuals and references.
12. Perform a final inspection to ensure the fuel system is fully mission capable.
13. Ensure tools and equipment are properly maintained.
14. Ensure The Army Maintenance Management System (TAMMS) forms are completed as required.

Evaluation Preparation: Ensure all equipment and specials 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 Reviewed work request.	_____	_____
2 Ensured all safety precautions were followed.	_____	_____
3 Ensured maintenance required was within shop capability/authorization.	_____	_____
4 Ensured applicable technical publications were available.	_____	_____
5 Ensured proper tools and test equipment were available.	_____	_____
6 Assigned personnel to perform maintenance.	_____	_____
7 Performed initial inspection.	_____	_____
8 Diagnosed fault(s) and determined maintenance action to be performed.	_____	_____
9 Provided assistance if necessary.	_____	_____
10 Identified repair parts and requisition, if applicable.	_____	_____
11 Ensured the electrical system was repaired in accordance with appropriate technical manuals and references.	_____	_____
12 Performed a final inspection to ensure the electrical system was fully mission capable.	_____	_____
13 Ensured tools and equipment were properly maintained.	_____	_____

Evaluation Guidance: Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier fails any performance measure, show what was done wrong and how to do it correctly.

References Required

Primary

DA FORM 5458 Shower/Decontamination Point Inspection
 FM 3-11/MCWP 3-37.1/NWP 3-11/AFTTP 3-2.42
 SC 6545-8-M38
 SC 6545-8-M64
 TM 3-4230-218-12&P
 TM 3-4230-218-30&P
 TM 3-4230-235-10
 TM 3-4230-236-10

091-91C-3008**Complete Diagnostics of Water Assembly on Decontaminating Apparatus.****DANGER**

DEATH OR SEVERE INJURY MAY RESULT IF PERSONNEL FAIL TO OBSERVE WARNINGS. Remove all jewelry before starting work. Metal objects such as rings or tools can cause short circuits. Do not allow tools to contact live circuits. A direct short can cause instant heating of tools resulting in equipment damage and personnel burns. Failure to comply may result in personal injury. **DANGEROUS CHEMICALS, DIESEL FUEL, 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 engine and the water heater.

WARNING

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. Seek medical assistance immediately. If STB decontaminating agent or slurry contacts the skin, wash off immediately with clear water.

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.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on Decontaminating Apparatus Equipment and mechanical tool kit, equipment specified in Technical Manuals (TM's), repair parts, and applicable Maintenance Forms and Technical Publications.

Standards: Perform complete diagnostics of water of electrical system on a Decontaminating Apparatus Equipment in accordance with applicable technical publications. When the task is completed the Decontaminating Apparatus Equipment will be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

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

Performance Steps

1. Review work request.
2. Ensure all safety precautions and procedures are followed.
3. Ensure applicable technical manuals are available.
4. Ensure proper tools, equipment, and TMDE are available.
5. Perform initial inspection.
6. Disassemble the water assembly as required.
7. Diagnose fault(s) and determine maintenance action to be performed.
8. Identify repair parts and requisition if required.
9. Assemble the water assembly.
10. Ensure the water assembly is repaired in accordance with appropriate TMs and references.
11. Perform a final inspection to ensure the water assembly is fully mission capable.
12. Ensure tools and equipment are properly maintained.
13. Ensure maintenance forms are completed as required.

Evaluation Preparation: Ensure all equipment and specials 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 Reviewed work request.	_____	_____
2 Ensured all safety precautions and procedures were followed.	_____	_____
3 Ensured applicable technical publications were available.	_____	_____
4 Ensured proper tools, equipment, and Test Measurement, and Diagnostic Equipment (TMDE) were available to inspect, repair/replace, and test the water assembly.	_____	_____
5 Performed initial inspection.	_____	_____
6 Disassembled the water assembly.	_____	_____
7 Diagnosed fault(s) and determine maintenance action to be performed.	_____	_____
8 Identified repair parts and requisition, if required.	_____	_____
9 Assembled the water assembly.	_____	_____
10 Ensured the water assembly was repaired in accordance with appropriate TMs and references.	_____	_____
11 Performed a final inspection to ensure the water assembly was fully mission-capable.	_____	_____
12 Ensured tools and equipment were properly maintained.	_____	_____
13 Ensured maintenance forms were completed as required.	_____	_____

Evaluation Guidance: Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier fails any performance measure, show what was done wrong and how to do it correctly.

References**Required****Primary**

ATP 3-11.50
DA FORM 5458
FM 3-11/MCWP 3-37.1/NWP 3-11/AFTTP 3-2.42
DA PAM 750-8
SC 6545-8-M38
TM 3-4230-209-10
TM 3-4230-209-20&P
TM 3-4230-218-12&P
TM 3-4230-218-30&P
TM 3-4230-235-10
TM 3-4230-236-10

091-91C-3009

Complete Diagnostics of Heating Assembly on Decontaminating Apparatus.

DANGER

DEATH OR SEVERE INJURY MAY RESULT IF PERSONNEL FAIL TO OBSERVE WARNINGS. Remove all jewelry before starting work. Metal objects such as rings or tools can cause short circuits. Do not allow tools to contact live circuits. A direct short can cause instant heating of tools resulting in equipment damage and personnel burns. Failure to comply may result in personal injury. **DANGEROUS CHEMICALS, DIESEL FUEL, 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 engine and the water heater.

WARNING

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. Seek medical assistance immediately. If STB decontaminating agent or slurry contacts the skin, wash off immediately with clear water.

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.

Conditions: In an operational environment, given a maintenance request or equipment inspection worksheet describing equipment malfunctions on Decontaminating Apparatus Equipment and mechanical tool kit, equipment specified in Technical Manuals (TM's), repair parts, and applicable Maintenance Forms and Technical Publications.

Standards: Perform complete diagnostics of water of electrical system on a Decontaminating Apparatus Equipment in accordance with applicable technical publications. When the task is completed the Decontaminating Apparatus Equipment will be fully mission-capable.

Special Condition: None

Special Standards: None

Special Equipment:

Cue: None

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

Performance Steps

1. Review work request.
2. Ensure all safety precautions are followed.
3. Ensure task is within shop capability/authorization.
4. Ensure applicable technical publication are available.
5. Ensure proper tools and test equipment are available.
6. Assign personnel to perform necessary tasks.
7. Perform initial inspection.
8. Diagnose fault(s) and determine maintenance action to be performed in accordance with appropriate technical manuals and references and type of equipment.
9. Disassemble the heating assembly if necessary in accordance with appropriate technical manuals and references.
10. Identify repair parts and requisition if required.
11. Provide assistance if necessary.
12. Assemble the heating assembly if necessary in accordance with appropriate technical manuals and references.
13. Ensure the heating assembly is repaired in accordance with appropriate technical manuals and references.
14. Perform a final inspection to ensure the heating assembly on Decontaminating Apparatus is fully mission capable.
15. Ensure tools and equipment are properly maintained.
16. Ensure The Army Maintenance Management System (TAMMS) forms are completed as required.

Evaluation Preparation: Ensure all equipment and specials 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 Reviewed work request.	_____	_____
2 Ensured all safety precautions were followed.	_____	_____
3 Ensured tasks was within shop capability/authorization.	_____	_____
4 Ensured applicable technical publications were available.	_____	_____
5 Ensured proper tools and test equipment were available.	_____	_____
6 Assigned personnel to perform necessary.	_____	_____
7 Performed initial inspection.	_____	_____
8 Diagnosed fault(s) and determine maintenance action to be performed in accordance with appropriate technical manuals and references and type of equipment.	_____	_____
9 Disassembled the heating assembly if necessary in accordance with appropriate technical manuals and references.	_____	_____
10 Identified repair parts and requisition, if required.	_____	_____
11 Provided assistance if necessary.	_____	_____
12 Assembled the heating assembly if necessary in accordance with appropriate technical manuals and references.	_____	_____
13 Ensured the heating assembly was repaired in accordance with appropriate technical manuals and references	_____	_____
14 Performed a final inspection to ensure the heating assembly on Decontaminating Apparatus was fully mission capable.	_____	_____
15 Ensured tools and equipment were properly maintained.	_____	_____
16 Ensured The Army Maintenance Management System (TAMMS) forms are completed, as required.	_____	_____

Evaluation Guidance: Score the Soldier GO if all performance measures are passed. Score the Soldier NO-GO if any performance measure is failed. If the Soldier fails any performance measure, show what was done wrong and how to do it correctly.

References**Required****Primary**

ATP 3-11.50
DA FORM 5458
FM 3-11/MCWP 3-37.1/NWP 3-11/AFTTP 3-2.42.
SC 6545-8-M38
SC 6545-8-M64
TM 3-4230-218-12&P
TM 3-4230-218-30&P
TM 3-4230-235-10
TM 3-4230-236-10

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CHAPTER 4

Duty Position Tasks

91C - Utilities Equipment Repairer, CMF91

- A. Major duties. The utilities equipment repairer supervises and performs Unit, Direct Support and General Support (DS/GS) maintenance to include utilities equipment and special purpose support systems.

Duties for MOS 91C at each skill level are:

(1) **MOSC 91C10.** Maintains (inspects, repairs, tests, and adjusts) gasoline engine systems, air conditioner electrical systems, air conditioner vapor systems, refrigeration unit, electrical systems, portable heater fuel/electrical systems, fire extinguisher rechargers and fire extinguishers/valves.

(2) **MOSC 91C20.** Perform duties in preceding skill level, supervises lower grade Soldiers and provides technical guidance to the Soldiers in the accomplishment of their duties.

(3) **MOSC 91C30.** Perform duties in preceding skill levels, perform quartermaster and chemical equipment repairer (MOS 91J) duties, supervises lower grade soldiers and provides technical guidance to the soldiers in the accomplishment of their duties. Inspects and troubleshoots petroleum, oil, and lubrication equipment, laundry and bath units, chemical equipment, water purification equipment systems, portable forced air heaters, air conditioner units, refrigeration units, and fire extinguisher recharger. Performs maintenance management activities, including production and quality control.

B. Physical demands rating and qualifications for initial award of MOS. Utilities equipment repairers must possess the following qualifications:

- (1) A physical demands rating of moderately heavy.
- (2) A physical profile of 221121.
- (3) Normal color vision.
- (4) A minimum score of 100 in aptitude area GM.
- (5) Formal training (completion of MOS 91C course conducted under the auspices of the USA Ordnance Center and School) mandatory.

C. Additional skill identifiers

- (1) P5—Master Fitness Trainer.
- (2) 2S—Battle Staff Operations (skill level 3 and above).
- (3) 4A—Reclassification Training.

D. Physical requirements and standards of grade.

- (1) Table 10-91C-1. Physical requirements.
- (2) Table 10-91C-2. Standards of grade TOE/MTOE.
- (3) Table 10-91C-3. Standards of grade TDA

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GLOSSARY

Section I

Acronyms & Abbreviations

PMCS	Preventive Maintenance Checks and Services
AKO	Army Knowledge Online
ALC	Advanced Leaders Course
APFT	Army physical fitness test
ARCOM	Army commendation medal; Army Reserve Command
ASI	additional skill identifier
ASVAB	Armed Service Vocational Aptitude Battery
BM	Bimonthly; Benchmark
BMT	Battalion Maintenance Technician
CASCOM	Combined Arms Support Command
CBRNE	Chemical, Biological, Radiological, Nuclear, and High Yield Explosives
CIF	Central Issue Facility; Crew Information File
DA Form	Department of the Army Form
DA PAM	Department of the Army pamphlet
DOD	Department of Defense
DTMS	Digital Training Management System
E-mail	Electronic mail
FOB	Forward Operating Base
FSB	Forward Support Battalion
GPH	Gallons Per Hour
LOGSA	Logistics Support Activity
LSA	Logistics Support Analysis; Longitudinal Support Assembly
PMCS	Preventive Maintenance Checks and Services
QT	Quarterly (frequency code)
QTY	Quantity
ROWPU	Reverse Osmosis Water Purification Unit
SALT	Size, Activity, Location, and Time
SALUTE	Size, Activity, Location, Unit, Time, and Equipment
SSA	Supply Support Activity; Space Situational Awareness
TM	Technical Manual
TPU	Trained, Practiced, and Untrained; Troop Program Unit
TWPS (1)	Tactical Water Purification System
WK	Weekly
ZULU	Universal Time
e.g.	For Example
hr(s)	Hour(s)

Section II

Terms

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 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.

Air Conditioning

A system designed to provide control over air temperature, movement, and humidity.

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.

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.

Concept of Operations (CONOPS)

(1) A statement, in broad outline, of a commander's outline or intent in regard to an operation or series of operations. The concept is designed to give an overall picture of the operation. (MDA Lexicon) (2) A verbal or graphic statement, in broad outline, of a commander's assumptions or intent in regard to an operation or series of operations. The concept of operations frequently is embodied in campaign plans and operation plans; in the later case, particularly when the plans cover a series of connected operations to be carried out simultaneously or in succession. The concept is designed to give an overall picture of the operation. It is included primarily for additional clarity of purpose.

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 (ADRP 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).

Department of Defense Activity Address Code (DODAAC)

A six-digit code that gives a delivery address for supplies and equipment.

Digital Training Management System (DTMS)

a web-based training management system. It assists units in training planning and management, and tracking unit training and Soldiers Individual Training Records (ITR) in accordance with AR 350-1, Army Training and Leader Development. It also assists with implementing the doctrine, tactics, techniques, and procedures outlined in ADRP 7-0, Training Units and Developing Leaders and Unit Training Management (UTM).

Duty MOS

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

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).

Identification Number

Identification number assigned to each proper shipping name.

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.

Ohm

A measure of electrical resistance A conductor of 1-ohm resistance will allow a flow of 1 ampere of current when 1 volt is imposed on it

Ohmmeter

A device for measuring ohms resistance of a circuit or electrical machine

Rectifier

An electrical device that changes alternating current to direct current

Refrigerant-12

A refrigeration gas commonly used in automotive air conditioning systems

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.

Starter Solenoid

An electric relay used to deliver electrical power to the starting motor

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.

TRAINING SAFELY

Achieved by identifying task performance safety hazards and integrating safety in training procedures during training design, development and implementation. Safety in training and training safely are not one and the same.

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 TandE -- Development (DTandE), Operational (OTandE), and Production Acceptance (PATandE)-- occurring during the acquisition cycle. DTandE 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. OTandE is conducted to estimate a system's operational effectiveness and suitability, identify needed modifications, and provide information on tactics, doctrine, organization, and personnel requirements. PATandE is conducted on production items to demonstrate that those items meet the requirements and specifications of the procuring contracts or agreements. OTandE is further subdivided into two phases--Initial Operational (IOTandE) and Follow-on Operational (FOTandE). IOTandE must be conducted before the production decision (Milestone III) to provide a credible estimate of operational effectiveness and suitability. Therefore, IOTandE 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. FOTandE is conducted on the production system to verify operational effectiveness and suitability, to fill data voids from the IOTandE, 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).

Troop Leading Procedures (TLP)

the Army's operational and training process for the development of plans. Normally used by units that do not have a coordinating staff (company and platoon) (ATP 5-0.1).

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.

Universal Time (DOD)

A measure of time that conforms, within a close approximation, to the mean diurnal rotation of the Earth and serves as the basis of civil timekeeping. Universal Time (UT1) is determined from observations of the stars, radio sources, and also from ranging observations of the moon and artificial Earth satellites. The scale determined directly from such observations is designated Universal Time Observed (UTO); it is slightly dependent on the place of observation. When UTO is corrected for the shift in longitude of the observing station caused by polar motion, the time scale UT1 is obtained. When an accuracy better than one second is not required, Universal Time can be used to mean Coordinated Universal Time (UTC). Formerly called Greenwich Mean Time. Also called ZULU time. See ADP 5-0.

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

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

(DOD) 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 which provide for return to nonactive status when the period of active duty for training is completed. This includes annual training, special tours of active duty for training, school tours, and the initial duty for training performed by nonprior service enlistees. Also called ADT.

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.

Alternating Current (AC)

Electrical energy as supplied by normal wall outlets.

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.)

Casualty Evacuation

(DOD) The movement of casualties. It includes movement both to and between medical treatment facilities. Any vehicle may be used to evacuate casualties. (Army) A term used by nonmedical units to refer to the movement of casualties aboard nonmedical vehicles or aircraft. (ATP 4-25.13) (Marine Corps) The movement of the sick, wounded, or injured. It begins at the point of injury or the onset of disease. It includes movement both to and between medical treatment facilities. All units have an evacuation capability. Any vehicle may be used to evacuate casualties. If a medical vehicle is not used it should be replaced with one at the first opportunity. Similarly, aeromedical evacuation should replace surface evacuation at the first opportunity. Also called CASEVAC.

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)

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)

Fragmentary Order (FRAGO)

An abbreviated operation order used to make changes in missions to units and to inform them of changes in the tactical situation.

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.

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)

Medical Evacuation (MEDEVAC)

The timely and efficient movement of patients while providing en route medical care to and between medical treatment facilities. See ATP 4-25.13.

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.

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)

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.

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REFERENCES

Required Publications

Required publications are sources that users must read in order to understand or to comply with this publication. New reference material is being published all the time. Present references, as listed below may become obsolete. To keep up-to-date, see PAM 25-30. Many of these publications and forms are available in electronic format from the sites listed below:

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TC 9-62 Communications-Electronics Fundamentals: Solid State Devices and Solid State Power Supplies and Amplifiers, 23 June 2005

TM 3-4230-209-10 Decontaminating Apparatus: Power Driven, Skid Mounted, Multipurpose Non-Integral 500-gallon, M12A1, 20 June 1986

TM 3-4230-209-20&P Unit Maintenance Manual Including Repair Parts and Special Tools List Decontaminating Apparatus: Power-Driven, Skid-Mounted, 500 gallon, M12A1, 28 June 1986

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TM 5-4120-384-14 Operator`s, Organizational, Direct and General Support Maintenance Manual for Air Conditioner, Horizontal Compact; 18,000 BTU/HR, 27 May 1985

TM 5-4120-386-14 Operator`s, Organizational, Direct and General Support Maintenance Manual for Air Conditioner horizontal, Compact, 9,000 BTU/HR, 27 March 1987

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Related Publications

Related publications are sources of additional information. They are not required in order to understand this publication. Most Army doctrinal publications are the Army Publishing Directorate ADP web site: <https://armypubs.army.mil>

Prescribed Forms

This section contains no entries.

Referenced Forms

Department of the Army Form

Unless otherwise indicated, DA forms are available on the Army Publishing Directorate (APD) Web site (<http://www.apd.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 Inspection Maintenance Worksheet (EGA)

DA FORM 2028 Recommended Changes to Publications and Blank Forms

DA FORM 5891 Acknowledgment of Counseling on Legal/Procedural Rights

Department of the Army Labels

DA Label 80 US Army Calibrated Instrument

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STP 9-91C13-SM-TG
27 August 2018

By Order of the Secretary of the Army:

MARK A. MILLEY
General, United States Army
Chief of Staff

Official:

A handwritten signature in black ink, appearing to read 'Mark F. Averill', written in a cursive style.

MARK F. AVERILL
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