TRAINING SUPPORT PACKAGE
FOR

MAINTAIN M12A1 DECONTAMINATION APPARATUS

THIS PACKAGE HAS BEEN DEVELOPED FOR: MOS 63J10, QUARTERMASTER/CHEMICAL EQUIPMENT REPAIRER COURSE
PROPONENT FOR THIS IS: Commander, United States Army Combined Arms Support Command, Training Directorate, Ordnance Division, Suite 227, 401st Street, Fort Lee, VA 23801-1511.
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<table>
<thead>
<tr>
<th>POI Number Title:</th>
<th>091-63J10-981 QUARTERMASTER/CHEMICAL EQUIPMENT REPAIRER COURSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFN Number(s)</td>
<td>63J1-I01 MAINTAIN M12A1 DECONTAMINATION APPARATUS</td>
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<tr>
<td>PFN Title(s):</td>
<td></td>
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<tr>
<td>Effective Date:</td>
<td>TBD</td>
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<td>Supersedes TSP(s):</td>
<td>None</td>
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<td>TSP Use:</td>
<td>Any accredited Ordnance TASS Battalion and the Army Ordnance Center And School.</td>
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<tr>
<td>Comments Recommendations:</td>
<td>Send comments and recommendations directly to: Commander, United States Army Combined Arms Support Command, Training Directorate, Ordnance Division, Suite 227, 401st 1st Street, Fort Lee, VA 23801-1511.</td>
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PREFACE

Purpose:
This training support package provides the instructor with a standardized lesson plan and student evaluation for presenting instruction for:

Lesson number: 63J1-I01
Lesson title: Maintain M12A1 Decontamination Apparatus.

This TSP contains:

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<tr>
<td>63J1-I01 VGT 1 TO VGT 2</td>
<td>19</td>
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</table>
## SECTION I. ADMINISTRATIVE DATA

### All Courses Including This Lesson:

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
</tr>
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<tbody>
<tr>
<td>091-63J10-981</td>
<td>Quartermaster/Chemical Equipment Repairer</td>
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### Task(s) Taught or Supported:

<table>
<thead>
<tr>
<th>Task Number</th>
<th>Task Title</th>
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<tbody>
<tr>
<td>091-63J-2050</td>
<td>Correct a Malfunction of a Control Box Assembly on a M2</td>
</tr>
<tr>
<td>091-63j-2051</td>
<td>Correct a Malfunction of a Fuel System on a M2</td>
</tr>
<tr>
<td>091-63j-2052</td>
<td>Correct a Malfunction of a Boiler Assembly on a M2</td>
</tr>
<tr>
<td>091-63J-2053</td>
<td>Correct a Malfunction of a Combustion Assembly on a M2</td>
</tr>
<tr>
<td>091-63J-2054</td>
<td>Correct a Malfunction of a Water Assembly on a M2</td>
</tr>
<tr>
<td>091-63J-2055</td>
<td>Correct a Malfunction of the Power Cable Electrical Comp on a M2</td>
</tr>
<tr>
<td>091-63J-2056</td>
<td>Perform PMCS on a M2</td>
</tr>
<tr>
<td>091-63J-2057</td>
<td>Correct a Malfunction of a Control Panel on a M2</td>
</tr>
<tr>
<td>091-63J-2058</td>
<td>Correct a Malfunction of a Pump Assembly on a M2</td>
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### Task(s) Reinforced

<table>
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<tr>
<th>Task Number</th>
<th>Task Title</th>
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<tbody>
<tr>
<td>None</td>
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</table>

### Academic Hours

The academic hours required to teach this course are as follows:

<table>
<thead>
<tr>
<th>IDT</th>
<th>ADT</th>
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</thead>
<tbody>
<tr>
<td>HOURS/METHODS</td>
<td>HOURS/METHODS</td>
</tr>
<tr>
<td>1.0/CO</td>
<td>0.0/D</td>
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<tr>
<td>4.0/PE1</td>
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</table>

*Total Hours: 5.0

### Test Lesson:

<table>
<thead>
<tr>
<th>Testing:</th>
<th>Review of test results:</th>
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<tbody>
<tr>
<td>1.0 63J1-I04</td>
<td>0</td>
</tr>
<tr>
<td>2.0 63J1-I05</td>
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</table>
Prerequisite Lesson(s):

Lesson Number Lesson Title

Students must have successfully completed previous Annex lessons.

Clearance and Access:

UNCLASSIFIED

References:

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>TITLE</th>
<th>DATE</th>
<th>Par NO.</th>
<th>Add. Info</th>
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<tbody>
<tr>
<td>DA PAM 738-750</td>
<td>Army Maintenance Management System</td>
<td>08/94</td>
<td>All</td>
<td>None</td>
</tr>
<tr>
<td>TM 3-4230-209-10</td>
<td>Operator's Manual, M12A1 Decontamination Apparatus</td>
<td>06/86</td>
<td>All</td>
<td>None</td>
</tr>
<tr>
<td>TM 3-4230-209-20</td>
<td>Unit Level Maintenance Manual, M12A1 Decontamination Apparatus</td>
<td>06/86</td>
<td>All</td>
<td>None</td>
</tr>
</tbody>
</table>

NOTE:

Make assignments so as to allow sufficient time for the students to complete the assignments by the desired due date. Explain assignments and provide due date and arrangements for collecting and providing feedback on the assignments.

Student Study Assignments:

None.

Instructor Requirements:

PE 1:6
CO 1:Group
Additional Personnel Requirements: None

Equipment Required: M12A1 Decontamination Apparatus

Materials Required: Instructor materials: 63J1-I01, Suppl 1, Overhead Projector, VGT (2).

Student materials: TM 3-4230-209-10, TM 3-4230-209-20, DA Form 2404, Multimeter, General Mechanic's Tool Kit, M12A1 Decontamination Apparatus

Training Area and Range Requirements: One classroom and shop Area.

Ammunition Requirements: None

NOTE: Before presenting this lesson, thoroughly prepare by studying this lesson and identify reference material.

Instructional Guidance: During this lesson, the instructor will guide the students through the completion of Maintenance of the M12A1 Decontamination Apparatus.

Approvals: NAME / RANK / POSITION / DATE

Writer Safety Officer Annual Reviewer
Annual Reviewer
SECTION II. INTRODUCTION

Method of instruction: CO
Instructor to student ratio is: 1:Group
Time of instruction 0.1 hours
Media used: None.

Motivator:
The M12A1 Decon Apparatus has many uses, a few years ago the M12A1 was used to assist the state of Montana to put out a major fire at Yellowstone Park. Active Duty, Reserve, and National Guard soldiers were the operators of the M12A1. It was also deployed during Desert Storm/Desert Shield in Kuwait. As a Quartermaster/Chemical Equipment Repairer, you will find that the soldier's life depends on your ability to repair this equipment quickly in the event of an NBC attack. This unit is usually found in a Supply & Service, Chemical or Corps Support Unit.

NOTE:
Provide students with the terminal learning objective.

Terminal Learning Objective:
At the completion of this lesson the student will:

<table>
<thead>
<tr>
<th>Action</th>
<th>Maintain the M12A1 Decontamination Apparatus.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions</td>
<td>In a classroom/shop environment, given a M12A1 Decon Apparatus, instruction, references, necessary tools, and equipment.</td>
</tr>
</tbody>
</table>

Safety:
Ensure students remove all rings, watches, and jewelry when performing any electrical or maintenance tasks. Do not operate any machinery in an enclosed area unless it is adequately ventilated. Do not operate any machinery unless otherwise instructed by an instructor. Park vehicles on ground which is as level as possible, and chock the front and rear wheels before performing maintenance.
Soldiers WILL NOT START equipment without an instructor present.

Risk Assessment Level:
Low
NOTE:
Obtain approval of any training that receives a high risk assessment level.

Environmental Considerations:

When working with equipment, in the event of an accidental spill of hydraulic fluid, fuels, oils, solvents, acids, and coolants. The spill must be contained and cleaned up immediately. Floor dry sweep is the most effective material to contain and clean up environmental spills. The student will report the incident to the instructor who will direct appropriate cleanup actions. All contaminated floor dry materials must be stored in a separate container. The container must be inspected by qualified environmental specialist before to determine proper disposal procedures. Additional warnings and cautions concerning environmental hazards will be explained to you at the applicable point in later lessons.

NOTE:
Add considerations that are applicable to your specific training location or installation.

Evaluation:
In lesson 63J1-I04 and 63J1-I05 you, the student, will have three hours to take a job knowledge and performance test on the material presented in this lesson.

Instructional Lead-in:
We are now ready to begin our instruction on the Maintenance of the M12A1 Decontamination Apparatus.
SECTION III. PRESENTATION

A. ENABLING LEARNING OBJECTIVE 1

NOTE:
Inform the students of the enabling learning objective requirements.

<table>
<thead>
<tr>
<th>Action:</th>
<th>Describe the characteristics of the M12A1 Decon Apparatus.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions:</td>
<td>In a classroom environment, given instruction, and references.</td>
</tr>
</tbody>
</table>

1. Learning Step/Activity 1 - Instructor will lead a discussion on the M12A1 Decon Apparatus.

   Method of instruction- CO
   Instructor to student ratio is- 1:Group
   Time of instruction –
   Media – Overhead Projector.

NOTE:
Refer students to TM 3-4230-209-10, and show VGT #1 (M12A1 Decon Apparatus, Tank Unit Assembly) and discuss the purpose of the M12A1.

   a. Purpose: Provides the capability of spraying decontaminating materials, fire fighting, deicing, cleaning vehicles, pumping various fluids, and showering personnel.

   b. Characteristics, Capabilities, and Features:

      (1) The decontaminating apparatus is intended for field use

      (2) The pump, tank, personnel shower assembly and water heater units are designed to be stationary or mobile. It is not authorized for use with defoliants, herbicides, or insecticides.

      (3) M12A1 PDDA consists of four non-integral units.

         (a) Pump unit.

         (b) Tank unit.
(c) M2 water heater.

(d) Shower unit

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NOTE:
Show VGT #2 (M12A1 Decon Apparatus Pump Unit) and discuss the pump unit, refer students to TM 3-4230-209-10.

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c. Units/components.

(1) Pump unit. (VGT 2)

(a) Skid-mounted/air transportable.

(b) Battery - 24-VDC/40-amp, recharged by engine alternator.

(c) Alternator/Generator - 24-VDC/40-amp, supplies power through a voltage regulator to the M2 water heater.

(d) Pump one-stage centrifugal.

  1. 60 to 120 PSI operating pressure.


  3. Discharge rate - 50 GPM.

(e) Drive belts.

  1. Four belts drive the pump.

  2. One belt drives the generator.

(f) Engine (military standard).

  1. 20-HP.

  2. Air-cooled oil baffle.

  3. Optimum speed - 3,850 RPM.

(g) Prime tank.
1. 10-gallon capacity.

2. Primary use is to hold water to prime the pump.

(h) Fuel tank - 20-gallon capacity.

(i) Hose reel (two).


2. Ball valve operates gun assemblies with nozzles.
   - Slurry nozzle (two).
   - Fire nozzle (two).
   - Foam nozzle (two).

(j) Control panel.

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**NOTE:**

Refer students to TM 3-4230-209-10, and explain the following:

1. Heater Receptacle & Switch - Provides power to the M2 water heater.

2. Valve No 2 Lower Reel - Controls the flow of liquids from upper manifold to the lower hose reel discharge hose.


4. Valve No 3 Upper Reel - Diaphragm Valve.

5. Fuel Indicator Switch - Pressed and held in to register the amount of fuel in the fuel tank.

6. Fuel Quantity gage - Indicates the amount of fuel at fuel tank (must close fuel switch to get reading).

7. Vacuum gage - Indicates the pump intake vacuum in inches of mercury (0-30), normal reading is (0-15).

8. Ammeter Battery Charge - Measures and registers the amount of direct current that is charging the battery.
9 Generator warning light - Indicates that the engine’s alternator is generating alternating current (AC).

10 Fuel shutoff valve - Controls the flow of fuel from tank to the engines carburetor. (2 ea.)

11 Choke - Chokes engine to ease starting.

12 Low oil pressure switch - manually operated, push to open switch. Switch must be depressed until pressure gage reads 20 psi.

13 Start magneto switch - (Single pole, Double throw) Three position rotary switch (stop, run, and start).

14 Pressure gage - Indicates pump discharge pressure in psi (0-300) normal pressure (60-120).

15 Tachometer/hour meter - Indicates engine speed in RPM/ indicates total running time of pump and engine. Normal reading is 3850 RPMs when unit is running.

16 Valve number 4 - Controls flow of liquid from prime tank to pump.

17 Oil pressure gage - Engine will not run if oil pressure is below 20 psi.

18 Throttle - Used to adjust engine to approximately 3850 RPM.

19 Valve number 1 - selects the routing of liquids discharged by the pump (main valve).

20 Pump drain valve - Open the valve for draining pump. Leave open when not in operation to prevent water from damaging the pump.

(2.) Tank unit and components.

(a) Skid-mounted/air transportable.

(b) Stainless steel.

(c) Capacity.

1 Volume - 500 gallons of water.
2. Working capacity with water - 447 gallons.


- Hopper- Blender assembly along with a fluid agitation system in the tank blends decon agents with water.
- Suction and blender/agitator hoses.
- Foot valve- Prevents objects from clogging suction hoses when water is being pumped from natural source.
- Pump unit troubleshooting procedures.

NOTE:

Issue schematic to the students and explain pump unit electrical schematic. Let the soldiers know that electrical wiring removal and installation is a Direct Support level maintenance. TM 9-4230-209-20&P, APPENDIX B-7. Conduct a check on learning and summarize the learning activity.

NOTE:

Inform the students of the enabling learning objective requirements.

B. ENABLING LEARNING OBJECTIVE 2

| Action: | Repair the mechanical/electrical systems on the M12A1 Decon Apparatus. |
| Conditions: | In a shop environment, given a M12A1 Decon Apparatus, DA Form 2404, Multimeter, General Mechanics Tool Kit, schematics, Tension Meter, and references. |

1. Learning Step/Activity 1 - Instructor will direct students thru PE on PMCS and operation of the M12A1 PDAA.

   Method of instruction- PE
   Instructor to student ratio is- 2:Group
   Time of instruction – 2.0 hours
   Media – None.

   a. PMCS
NOTE:
Refer students to TM 3-4230-209-10 and TM 3-4230-209-12 and direct them to follow the steps to perform PMCS on M12A1 PDDA. Students will familiarize themselves with all components during PMCS. Break students into work groups and issue them a DA Form 2404. Reemphasize safety, risk assessment, and environmental considerations

b. Operation

NOTE:
Direct students/groups through the procedures to operate and shutdown of the M12A1. Conduct a check on learning and summarize the learning activity.

2. Learning Step/Activity 2 - Instructor will direct students thru PE on troubleshooting and repair of the M12A1 PDDA.

   Method of instruction- PE
   Instructor to student ratio is- 2:Group
   Time of instruction – 2.0
   Media – None.

   a. Troubleshoot and repair the M12A1 Decon Apparatus mechanical system.

NOTE:
Instructor will use TM 3-4230-209-12 to place the following malfunctions on the equipment and the students will troubleshoot the M12A1. Provide assistance as needed.

   (1) Engine fails to start.
      (a) Replace engine fuse
      (b) Open fuel shutoff valve.

   (2) Pump pressure low or falling.
      (a) Adjust drive belts.
      (b) Replace drive belts, if broken.
NOTE:

a. Once the students have identified the problem, then direct them to perform the necessary procedures to correct the malfunctions and place equipment into operation.

b. Instructor will use TM 3-4230-209-20/30&P to place the following malfunctions on the equipment. Issue students wiring schematic for the pump unit and have students troubleshoot the M12A1. Provide assistance as needed.

(3) Gasoline engine fails to start.
   (a) Bad a, b, or c wire on JP1.
   (b) Bad S2 switch or wires going to it.
   (c) Bad S1 switch or wires going to it.
   (d) Bad circuit breaker or wires going to it.

(4) Generator light inoperative.
   (a) Bad of missing lamp.
   (b) Disconnected plug J3 from engine alternator.

NOTE:

a. Once the students have identified the problem, then direct them to perform the necessary procedures to correct the malfunctions and place equipment into operation.

b. If time permits instructor will place additional malfunctions for the mechanical and electrical systems and allow students to practice the troubleshooting procedures. Conduct a check on learning and summarize the learning activity.

SECTION IV. SUMMARY

Method of instruction- CO
Instructor to student ratio: 1:Group
Time of Instruction: 0.1 hours
Media: None
Review/Lesson

Summary:

For approximately the past five hours we have talked about Maintenance of the M12A1 Decontamination Apparatus.

NOTE:

Make sure you repeat the terminal learning objective of the lesson.

NOTE:

Determine if students have learned the material presented by soliciting student questions and explanations. Ask the students questions and correct misunderstandings.

Q. What is the normal rpm reading when the unit is in operation?
A. 3,850 RPM

Q. What is the belt tension on the belts?
A. 5-7 lbs tension

Q. What is the M12A1 normal operating pump pressure?
A. 60-120 PSI

Q. How many belts are there on the pump unit?
A. 5

Transition to Next Class:

The next lesson will be Maintain M2 Water Heater.
SECTION V. STUDENT EVALUATION

Testing:

a. The test will be administered during the lesson 63J1-I04 and 63J1-I05. You (the student) will have three hours to take a written and job performance, hands-on, test on this lesson and other lessons covered in this annex. With references but without assistance you must make at least 70% accuracy on the Job Knowledge Test, 63J1-I04, and 100% accuracy on the Job Performance Test, 63J1-I05.

b. Refer student to the Evaluation Plan.

Feedback Requirements:

a. Schedule and provide student feedback on the evaluation and any information to help answer students’ questions about the test.

b. Provide remedial training as needed.

END
PRACTICAL EXERCISE CHECKLIST

COURSE(S): QUARTERMASTER/CHEMICAL EQUIPMENT REPAIRER(63J10)

SUBJECT: MAINTAIN THE M12A1 DECONTAMINATION APPARATUS

REFERENCES: TM 3-4230-209-SERIES

DIRECTIONS TO THE INSTRUCTOR:

Conduct a detailed review to ensure that each student can accomplish the following performance measures.

_____ 1. Select and use references correctly.

_____ 2. Observes maintenance discipline and safety procedures.

_____ 3. Perform PMCS and record on DA Form 2404.

_____ 4. Identify major components.

_____ 5. Inspect the M12A1 decon unit.

_____ 6. Troubleshoot the mechanical system.

_____ 7. Repair the mechanical system.

_____ 8. Troubleshoot the electrical system.

_____ 9. Repair the electrical system.

_____ 10. Test operate the M12A1 decon unit.

_____ 11. Complete the task without injury to personnel or damage to the equipment.