TECHNICAL MANUAL

# OPERATOR'S, UNIT AND DIRECT SUPPORT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) FOR KOEHLER COPPER STRIP CORROSION BOMB BATH

This technical manual is an authentication of the manufacturer's commercial literature and does not conform with the format and the content requirements normally associated with Army technical manuals. This technical manual does, however, contain all essential information required to operate and maintain the equipment.



HEADQUARTERS, DEPARTMENT OF THE ARMY
28 SEPTEMBER 1990

28 September 1990

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**Approved for public release; distribution is unlimited.**

## SUPPLEMENTARY INTRODUCTORY MATERIAL

### 1-1. Maintenance Forms and Records.

Department of the Army forms and procedures used for equipment maintenance will be those described by DA Pam 738-750, The Army Maintenance Management System.

### 1-2. Reporting Errors and Recommending Improvements.

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letters, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual, directly to: Commander, U.S. Army Troop Support Command, ATTN: AMSTR-MCTS, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. A reply will be furnished to you.

### 1-3. Destruction of Army Material to Prevent Enemy Use.

Refer to TM 750-244-3 for instructions covering the destruction of Army Material to prevent enemy use.

### 1-4. Administrative Storage of Equipment.

a. Placement of equipment in administrative storage should be for short periods of time when a shortage of maintenance effort exists. Items should be in mission readiness within 24 hours or within the time factors as determined by the directing authority. During the storage period appropriate maintenance records will be kept.

b. Before placing equipment in administrative storage, current preventive maintenance checks and services should be completed. Shortcomings and deficiencies should be corrected, and all modification work orders (MWO's) should be applied.

c. Storage site selection. Inside storage is preferred for items selected for administrative storage. If inside storage is not available, trucks, vans, conex containers and other containers may be used.

Koehler
INSTRUMENT COMPANY, INC.

K25310, K25319, K25320, K25329

COPPER STRIP CORROSION BOMB BATH

ASTM D130

DETECTION OF COPPER CORROSION

FROM PETROLEUM PRODUCTS

BY THE COPPER STRIP TARNISH TEST

1595 SYCAMORE AVE.
BOHEMIA, NY 11716
(516) 589-3800
TELEX 4973677 “KOEHLER”
FAX (516) 589-3815

Quality Test Equipment for Petroleum Products

## SAFETY AND HAZARD WARNING

THIS EQUIPMENT MAY INVOLVE HAZARDOUS MATERIAL AND OPERATIONS. THIS MANUAL DOES NOT PURPORT TO ADDRESS ALL OF THE SAFETY PROBLEMS ASSOCIATED WITH THE USE OF THE EQUIPMENT. IT IS THE RESPONSIBILITY OF WHOEVER USES THIS EQUIPMENT TO CONSULT AND ESTABLISH APPROPRIATE SAFETY AND HEALTH PRACTICES, AND DETERMINE THE APPLICABILITY OF REGULATORY LIMITATIONS PRIOR TO USE.

KOEHLER

K253, K253-1A, K253-2 & K253-2A

COPPER STRIP CORROSION BOMB BATH

ASTM D130

TABLE OF CONTENTS

SECTION:



NOTE: The K253-1 is the same as the K253-2, except the K253-2 is for 8 bombs and the (A) designation is for 230V., 50/60 Hz. operation.

## SECTION A

(1) **UNPACKING INSTRUCTIONS:**

Remove bath from the shipping carton, and remove the cardboard attached to the bottom and top plates. Remove styrofoam from around constant water level device. Unpack the Soxhlet condenser and rubber stoppers from the separate carton and place in a safe location. Clean the packing from inside the bath, and place on a firm level table.

(2) **ASSEMBLY INSTRUCTIONS:**

(A) Connect the line cord to a properly fused and grounded receptacle of the proper voltage, as marked on the back plate of the bath.

(B) Fill the bath with water through one of the port openings (see assembly drawing).

(C) Install the Soxhlet condenser to the bath and secure with the fitting on the tube.

(D) Connect the constant water level device to a water line and adjust the device to maintain the water level desired.

(3) **OPERATING INSTRUCTIONS:**

(A) Turn on the line switch and adjust to the desired temperature by turning graduated dial on the thermoregulator.

(B) When bath has reached desired temperature and has stabilized, insert the corrosion bombs into the rack and cover with the rubber stoppers.

(C) Proceed with test in accordance with ASTM D130.

(D) When operating bath at 2120F., connect a cooling water line to one of the small tubes on the Soxhlet condenser and a drain line to the other. This will condense the steam coming from the bath and return the condensation to the bath.

(4) **SERVICE INSTRUCTIONS:**

Under normal conditions this unit requires no service. However, any service problem can often be resolved inexpensively by phone or letter.

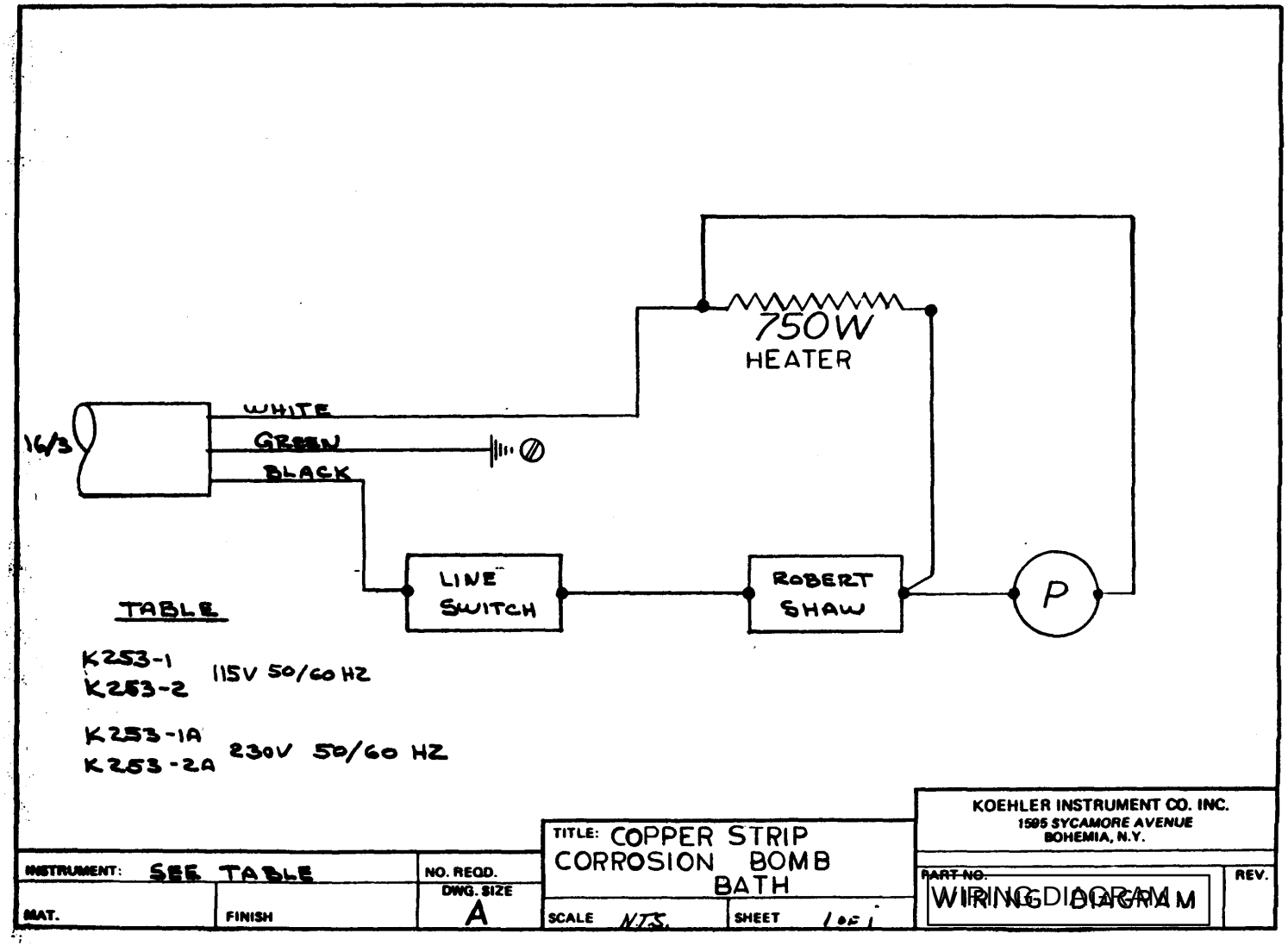
For further information, please contact our office

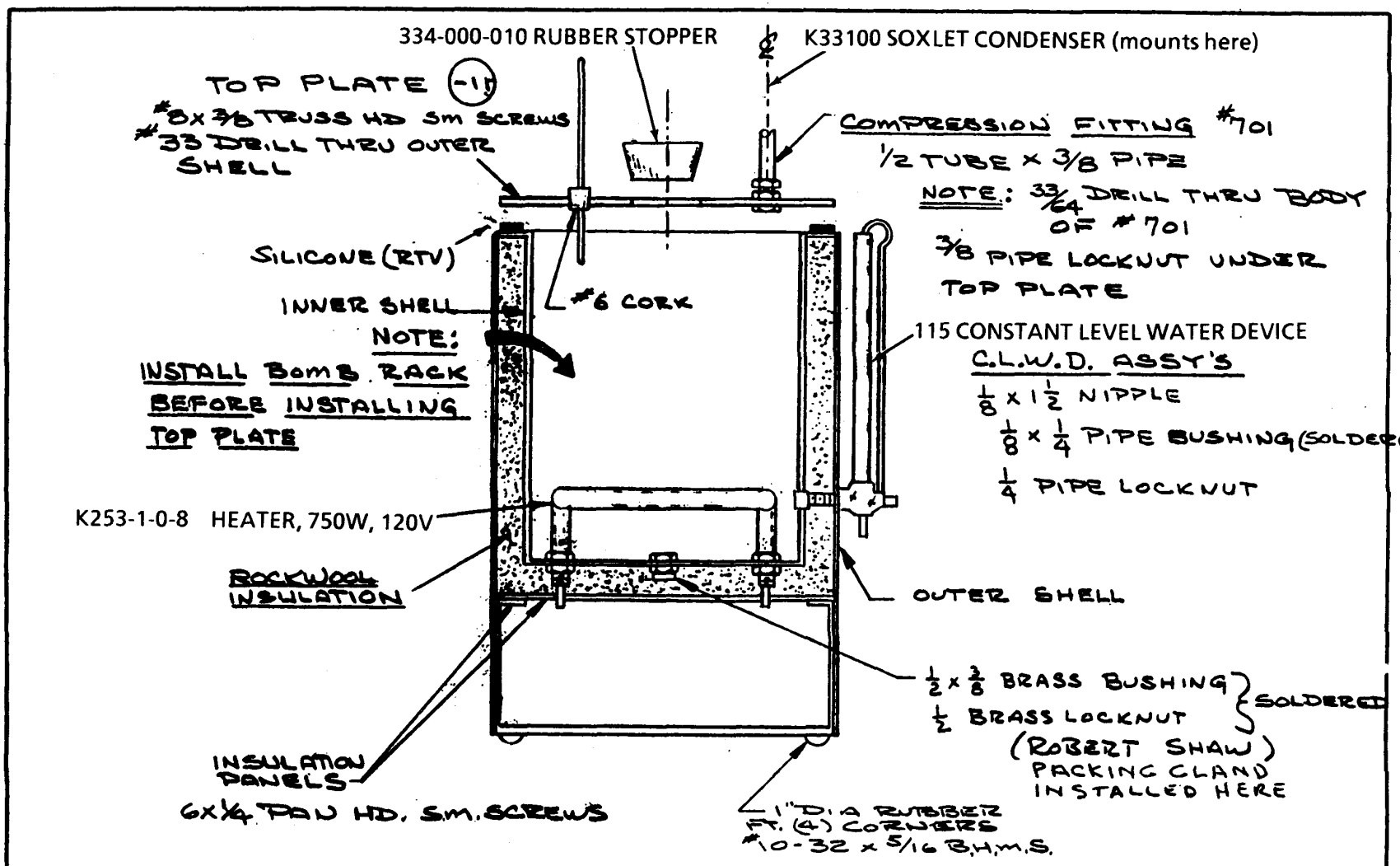
at:

KOEHLER INSTRUMENT COMPANY, INC.
1595 SYCAMORE AVENUE
BOHEMIA, NEW YORK 11716

TELEPHONE: (516) 589-3800

TELEX: 4973677 KOEHLER


750W
HEATER
16/3
WHITE
GREEN
BLACK
LINE
SWITCH
ROBERT
SHAW
P
TABLE
K253-1
K253-2
115V 50/60 HZ
K253-1A
K253-2A
230V 50/60 HZ
INSTRUMENT: SEE TABLE
NO. REQD.
MAT.
FINISH
DWG. SIZE
A
TITLE: COPPER STRIP CORROSION BOMB BATH
SCALE N.T.S.
SHEET 1 of 1
KOEHLER INSTRUMENT CO. INC.
1595 SYCAMORE AVENUE
BOHEMIA, N.Y.
PART NO.
WIRING DIAGRAM
REV.




| | | | |
|---|---|---|---|
| INSTRUMENT: K253-1 & -2 | NO. REQD. 1 | TITLE: ASSEMBLY (ASSEMBLY) COP. CORR. BOMB BATH | KOEHLER INSTRUMENT CO. INC. 1595 SYCAMORE AVENUE BOHEMIA, N.Y. |
| MAT. — FINISH — | DWG. SIZE A | SCALE NONE SHEET 1 OF 1 | PART NO. K253-1 & -2 REV. |

KOEHLER

K253-1, K253-1A, K253-2 & K253-2A

SPARE PARTS LIST

| Part No. | Description | Quantity |
|---|---|---|
| K253-1-0-8 | Heater, 750W., 120 V.) ) 4 Unit | 1 each |
| K253-1-0-8A | Heater, 750W., 230 V.) | 1 each |
| K253-2-0-8 | Heater, 750W., 120 V.) ) 8 Unit | 1 each |
| K253-2-0-8A | Heater, 750W., 230 V.) | |
| 255-200-001 | Thermoregulator | 1 each |
| 045-115-001 | Pilot Light, 115V. | 1 each |
| 045-230-001 | Pilot Light, 230V. | 1 each |
| 050-001-001 | Switch, Line | 1 each |
| K33100 | Soxhlet Condenser | 1 each |
| 025-308-OON | Condenser Fitting | 1 each |
| 115 | Constant Level Water Device | 1 each |
| 334-000-010* | Rubber Stopper | 4 each |

* 8 each for K253-2 & 253-2A

## APPENDIX A

## REFERENCES

A-1. **Scope.** This appendix contains all forms, pamphlets and technical manuals referenced in both the Air mobile and Semitrailer mounted Laboratories.

A-2. **Forms**.

| | |
|---|---|
| Recommended Changes to Publications | DA Form 2028<br>DA Form 2028-2 |
| Quality Deficiency Report | SF 368 |
| Equipment Inspection and Maintenance Work Sheet | DA Form 2404 |
| Hand Receipts | DA Form 2062 |

A-3. **Field Manuals.**

| | |
|---|---|
| Petroleum Testing Facilities: Laboratories and Kits | FM 10-72 |
| Inspecting and Testing Petroleum Products | FM 10-70 |
| ASTM Test Method Supplement to | FM 10-92C1/C2 |

A-4. **Technical Manuals.**

| | |
|---|---|
| Atlas-Copco Compressor | TM 10-4310-392-13&P |
| Alcor Jet Fuel Thermal Oxidation Tester Operating and Maintenance Manual | TM 10-6635-210-13&P |
| Bacharach Gas Alarm and Calibration Data | TM 10-6665-297-13&P |
| Brother Portable Typewriter | TM 10-7430-218-13&P |
| Chemtrix Field Ph Meter | TM 10-6630-237-13&P |
| Elkay Manufacturing 30 GPH Cooler | TM 10-4130-240-13&P |
| Emcee Micro-Separometer | TM 10-6640-222-13&P |
| Foxboro Pressure Recording Gauge | TM 10-6685-365-13&P |
| Gammon Aqua Glo Water Detector | TM 10-6640-221-13&P |
| Gammon Mini Monitor Fuel Sampling Kit | TM 10-6630-230-13&P |
| Jelrus Burn-Out Furnace | TM 10-6640-231-13&P |
| Koehler Cleveland Open Tester | TM 10-6630-236-13&P |
| Koehler Cloud and Pour Point Chamber | TM 10-6630-238-13&P |
| Koehler Copper Strip Corrosion Bomb Bath | TM 10-6640-220-13&P |
| Koehler Distillation Apparatus | TM 10-6630-233-13&P |
| Koehler Dropping Point Apparatus | TM 10-6635-211-13&P |
| Koehler Electric Pensky-Martins Tester | TM 10-6630-231-13&P |
| Koehler Foaming Characteristics Determination Apparatus | TM 10-6640-228-13&P |
| Koehler Kinematic Viscosity Bath | TM 10-6630-239-13&P |
| Koehler Tag Closed Cup Flash Tester | TM 10-6630-235-13&P |
| Lab-Line Explosion Proof Refrigerator | TM 10-6640-219-13&P |
| Lily Freezer | TM 10-6640-234-13&P |
| Millipore OM 39 Filter Holder | TM 10-6640-225-13&P |
| Millipore Vacuum Pump | TM 10-6640-217-13&P |
| Ohaus Harvard Trip Balance | TM 10-6670-278-13&P |
| Precision Gas-Oil Distillation Test Equipment | TM 10-6630-219-13&P |
| Precision General Purpose Water Bath | TM 10-6640-229-13&P |

Precision High Temperature Bronze Block Gum Bath ..... TM 10-6630-234-13&P
Precision General Purpose Ovens ..... TM 10-6640-218-13&P
Precision Heater Instruction Manual and Parts List ..... TM 10-6640-223-13&P
Precision Oxidation Stability Bath ..... TM 10-6640-232-13&P
Precision Pensky-Martens Flash Testers ..... TM 10-6640-231-13&P
Precision Reid Vapor Pressure Bath ..... TM 10-6640-226-13&P
Precision Slo-Speed Stirrer ..... TM 10-6640-224-13&P
Precision Universal Centrifuge ..... TM 10-6640-230-13&P
Precision Universal Penetrometer ..... TM 10-6640-228-13&P
Sargent-Welch Vacuum Pump ..... TM 10-4310-391-13&P
Sartorious Analytical Balance ..... TM 10-6670-277-13&P
Scotsman Cuber ..... TM 10-6640-227-13&P
Soltec VOM-Multimeter ..... TM 10-6625-3127-13&P
Teel Self-Priming Centrifugal Pump ..... TM 10-6640-217-13&P
Teel Submersible Pump ..... TM 10-4320-320-13&P
Texas Instrument TI-503011 Calculator ..... TM 10-7420-210-13&P

A-5. **Pamphlets.**

The Army Maintenance Management System (TAMMS) ..... DA Pam 738-750

A-6. **Miscellaneous Publications.**

The Army Integrated Publishing and Printing Program ..... AR 25-30
Laboratory, Airmobile, Aviation Fuel ..... MIL-L-52733A(ME)
Apparatus, Instruments, Chemicals, Furniture, and Supplies for Industrial,
Clinical, College and Government Laboratories ..... Fisher Scientific Laboratories Catalog
Petroleum-Petrochemical Testing Equipment ..... Precision Scientific Catalog

# APPENDIX B
# MAINTENANCE ALLOCATION CHART
## SECTION I. INTRODUCTION

B-1. **General.**

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance categories.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance categories.

c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. **Maintenance Functions**. Maintenance functions will be limited to and defined as follows:

*a*. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).

*b*. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

*c*. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

*d*. Adjust. To maintain or regulate, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

*e*. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

*f*. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of knob accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

*g*. Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

*h*. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and is shown as the third position code of the SMR code.

*i.* *Repair*. The application of maintenance services, [1]including fault location/troubleshooting,[2] removal/installation, and disassembly/assembly procedures[3] and maintenance actions[4] to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

*j.* *Overhaul*. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications (i.e, DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like-new condition.

*k.* *Rebuild*. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like-new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipment/components.

B-3. **Explanation Of Columns In The MAC, Section II** .

*a.* *Column I. Group Number*. Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly. End item group number shall be "00."

*b*. *Column 2. Component/Assembly*. Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

*c*. *Column 3. Maintenance Function*. Column 3 lists the functions to be performed on the item listed in column 2. (For a detailed explanation of these functions, see paragraph B-2.)

*d.* *Column 4. Maintenance Category*. Column 4 specifies, by the listing of a work time figure in the appropriate subcolumn(s), the category of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate work time figures will be shown for each category. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field, operating conditions. This time includes preparation time (including any necessary disassembly/ assembly time), troubleshooting/fault location time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance categories are as follows:

---

*1 Services - inspect, test, service, adjust, align, calibrate, and/or replace.*

*2. Fault locate/troubleshoot- the process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or unit under test (UUT).*

*3 Disassemble/assemble - encompasses the step-by-step taking apart (or breakdown) of a spare/functional group coded item to the level of its least componency identified as maintenance significant (ie., assigned an SMR code) for the category of maintenance under consideration.*

*4 Actions - welding, grinding, riveting, straightening, facing, remachining, and/or resurfacing.*

C ..... Operator/Crew
O ..... Unit Maintenance
F ..... Direct Support Maintenance
H ..... General Support Maintenance
D ..... Depot Maintenance

*e.* *Column 5. Tools and Equipment*. Column 5 specifies, by code, those common tool sets (not individual tools) and special tools, TMDE, and support equipment required to perform the designated function.

*f.* *Column 6. Remarks*. This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in section IV.

B-4. **Explanation Of Columns In Tool And Test Equipment Requirements, Section III.**

*a.* *Column I. Reference Code*. The tool and test equipment reference code correlates with a code used in the MAC, section II, column 5.

*b.* *Column 2. Maintenance Category*. The lowest category of maintenance authorized to use the tool or test equipment.

*c .* *Column 3. Nomenclature*. Name or identification of the tool or test equipment.

*d.* *Column 4. National Stock Number*. The National stock number of the tool or test equipment.

*e.* *Column 5. Tool Number*. The manufacturer's part number.

B-5. **Explanation Of Columns In Remarks, Section IV** .

*a.* *Column I. Reference Code*. The code recorded in column 6, Section II.

*b.* *Column 2. Remarks*. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, section II.

## Section II. MAINTENANCE ALLOCATION CHART

| (1) GROUP NUMBER | (2) COMPONENT/ ASSEMBLY | (3) MAINTENANCE FUNCTION | (4) MAINTENANCE LEVEL | | | | | (5) TOOLS AND EQUIPMENT | (6) REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| | | | UNIT | | DS | GS | DEPOT | | |
| | | | C | O | F | H | D | | |
| 01 | CORROSION BOMB BATH | INSPECT<br>REPLACE<br>REPAIR | 0.1 | <br>0.2<br>0.5 | <br><br>1.0 | | | <br>1<br>1,2 | |

## SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR MAINTENANCE ALLOCATION CHART

| (1) TOOL/TEST EQUIP. REF CODE | (2) MAINTENANCE CATEGORY | (3) NOMENCLATURE | (4) NSN | (5) TOOL NUMBER |
|---|---|---|---|---|
| 1 | O,F | TOOL KIT, GENERAL AUTOMOTIVE | 5180-00-177-7033 | (50980) SC 5180-90-SC-N26 |
| 2 | O,F | MULTIMETER, 0-500V | 6625-00-691-2453 | |

## SECTION IV. REMARKS

**NOT APPLICABLE**

# APPENDIX C
# COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS
## SECTION I. INTRODUCTION

C-1. **Scope**.

This appendix lists components of end item and basic issue items for the Copper Strip Corrosion Bomb Bath to help you inventory items required for safe and efficient operation.

C-2. **General.**

The Components of End Item and Basic Issue Items Lists are divided into the following sections:

*a.* *Section II. Components of End Item*. This listing is for informational purposes only, and is not authority to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between. property accounts. Illustrations are furnished to assist you in identifying the items.

*b.* *Section III. Basic Issue Items*. These are the minimum essential items required to place the Copper Strip Corrosion Bomb Bath in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, Bll must be with the shelter during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement B I , based on TOE/MTOE authorization of the end item.

C-3. **Explanation of Columns.**

The following provides an explanation of columns found in the tabular listings:

*a.* *Column (1) - Illustration Number (Illus Number).* This column indicates the number of the illustration in which the item is shown.

*b.* *Column (2) - National Stock Number*. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.

*c.* *Column (3) - Description*. Indicates the Federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the CAGEC (in parentheses) followed by the part number.

*d.* *Column (4) - Unit of Measure (U/M).* Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr).

*e.* *Column (5) - Quantity required (QTY RQR).* Indicates the quantity of the item authorized to be used with/on the equipment.

## SECTION II. COMPONENTS OF END ITEM

| (1) Illus | (2) National Stock Number | (3) Description CAGEC And Part Number Usable On Code | (4) U/M | (5) Qty |
|---|---|---|---|---|
| | 6630-00-522-1893 | BOMB, TEST, PETROLEUM: FOR ASTM TEST D-130; (22527) NO. 13-420-20 | EA | 2 |
| | 6640-00-179-2558 | CORK, PETROLEUM TEST: REGULAR LG.; ASSORTMENT OF NO. 6 TO 15 CORKS, 100 PER BAG; (80740) NO. 27-000 | EA | 1 |
| | 6640-00-074-3339 | COPPER STRIP CORROSION STANDARDS: COLOR STD. FOR GRADING CORROSION OF COPPER POST STRIPS; FOR ASTM TEST D-130; (80740) NO. 66-940-12 | EA | 1 |
| | 6640-00-323-8689 | CORROSION TEST STRIP, COPPER 1/16 TO 1/8 IN. THK, 3 IN. LG, 1/2 IN. WIDE; FOR ASTM TEST D-130; MS36252-1 | LB | 1 |
| | 6640-00-061-8967 | TEST TUBE: CULTURE; GENERAL PURPOSE; 55ML; 25 X 150MM; NO. 11 OR 4 CORK OR RUBBER STOPPER;12 PER BOX; NNN-T-189, TYPE 1, STYLE 1, SIZE 9 | EA | 1 |
| | | THERMOMETER, SELF INDICATING, LIQUID IN GLASS: MERCURY; ETCHED STEM SCALE; -20 TO +102°C RANGE; 0.10 ACCURACY RATING; 0.20 SMALLEST GRADUATION; 415 TO 425MM LG.; W/ EXPANSION CHAMBER AND RING; FOR ASTM TEST D-130; ASTM El NO. 12C | EA | 2 |

## SECTION III. BASIC ISSUE ITEMS

**NOT APPLICABLE**

# APPENDIX D

## ADDITIONAL AUTHORIZATION LIST

**NOT APPLICABLE**

# APPENDIX E

## EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

## SECTION I. INTRODUCTION

E-1. **Scope**. This listing is for informational purposes only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (except medical, class V, repair parts, and heraldic items).

E-2. **Explanation of Columns**.

*a. Column (1) - Item Number*. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., Use cleaning compound, item 5, appendix C).

*b. Column (2) - Level*. This column identifies the lowest level of maintenance that requires the listed item.

C - Operator/Crew

O - Unit Maintenance

F - Direct Support Maintenance

H - General Support Maintenance

*c. Column (3)- National Stock Number.* This is the National stock number assigned to the item; use it to request or requisition the item.

*d. Column (4) - Description*. Indicates the Federal item name, and, if required, a description to identify the item. The last line for each item indicates the Commercial and Government Entity Code (CAGEC) in parentheses followed by the part number.

*e. Column (5) - Unit of Measure (U/M).* Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., EA, IN, PR). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

## SECTION II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

| (1) Item Number | (2) Level | (3) National Stock Number | (4) Description | (5) U/M |
|---|---|---|---|---|
| | C | 5350-00-184-6255 | CARBORUNDUM POWDER: SILICON CARBIDE; 140 MESH, 1 LB CAN; FOR ASTM TEST D-130; MIL-A-21380, TYPE III | EA |
| | C | 6510-00-201-4000 | COTTON, PURIFIED; ROLLED; USP 12 IN. WIDE, 10 FT. LONG, 1LB PACKAGE; FOR ASTM TEST D-130; JJJ-C-561; GRADE A, CLASS 2, SIZE 4 | PG |
| | C | 5350-00-721-8117 | PAPER, ABRASIVE: SILICON CARBIDE; 9 X 11 IN. SHEETS; FOR ASTM TEST D-130; P-P-101; GRIT NO. 180; CLOSED COATING; WATER PROOF; PACKAGE | BX |
| | C | 5350-00-240-2920 | STEEL WOOL: 1LB ROLL; FF-W-1825, TYPE I, CLASS 00 FINE | PG |

**By Order of the Secretary of the Army:**

**CARL E. VUONO**
*General, United States Army*
*Chief of Staff*

**Official:**

**THOMAS F. SIKORA**
*Brigadier General, United States Army*
*The Adjutant General*

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|---|---|
| | |

TEAR ALONG PERFORATED LINE

**DA** FORM 1 JUL 79 **2028-2**

PREVIOUS EDITIONS ARE OBSOLETE.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

# The Metric System and Equivalents

***Linear Measure***

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

***Weights***

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

***Liquid Measure***

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

***Square Measure***

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

***Cubic Measure***

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

# Approximate Conversion Factors

| *To change* | *To* | *Multiply by* | *To change* | *To* | *Multiply by* |
|---|---|---|---|---|---|
| inches | centimeters | 2.540 | ounce-inches | newton-meters | .007062 |
| feet | meters | .305 | centimeters | inches | .394 |
| yards | meters | .914 | meters | feet | 3.280 |
| miles | kilometers | 1.609 | meters | yards | 1.094 |
| square inches | square centimeters | 6.451 | kilometers | miles | .621 |
| square feet | square meters | .093 | square centimeters | square inches | .155 |
| square yards | square meters | .836 | square meters | square feet | 10.764 |
| square miles | square kilometers | 2.590 | square meters | square yards | 1.196 |
| acres | square hectometers | .405 | square kilometers | square miles | .386 |
| cubic feet | cubic meters | .028 | square hectometers | acres | 2.471 |
| cubic yards | cubic meters | .765 | cubic meters | cubic feet | 35.315 |
| fluid ounces | milliliters | 29,573 | cubic meters | cubic yards | 1.308 |
| pints | liters | .473 | milliliters | fluid ounces | .034 |
| quarts | liters | .946 | liters | pints | 2.113 |
| gallons | liters | 3.785 | liters | quarts | 1.057 |
| ounces | grams | 28.349 | liters | gallons | .264 |
| pounds | kilograms | .454 | grams | ounces | .035 |
| short tons | metric tons | .907 | kilograms | pounds | 2.205 |
| pound-feet | newton-meters | 1.356 | metric tons | short tons | 1.102 |
| pound-inches | newton-meters | .11296 | | | |

# Temperature (Exact)

| | | | | |
|---|---|---|---|---|
| °F | Fahrenheit temperature | 5/9 (after subtracting 32) | Celsius temperature | °C |

PIN:  046477-000