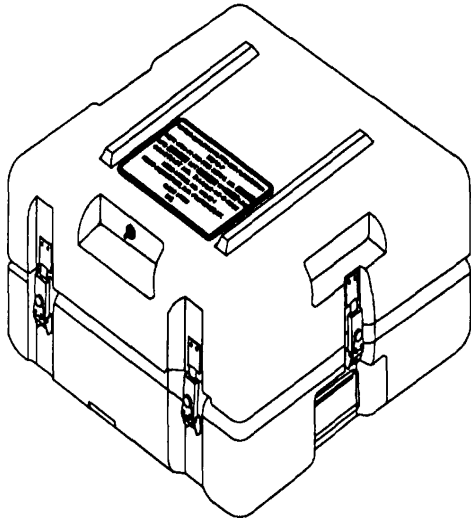


TECHNICAL MANUAL
OPERATOR'S AND UNIT
MAINTENANCE MANUAL
INCLUDING
REPAIR PARTS AND SPECIAL
TOOLS LIST (RPSTL)



WATER QUALITY ANALYSIS SET:
PURIFICATION

MODEL WQAS-1
NSN 6630-01- 365- 5588

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1 FEBRUARY 1994

CHANGE

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WASHINGTON, D.C., 30 JANUARY 1999

OPERATOR'S AND UNIT MAINTENANCE MANUAL
INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)
WATER QUALITY ANALYSIS SET:
PURIFICATION
MODEL WQAS-1
NSN 6630-01-365-5588

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By Order of the Secretary of the Army:

DENNIS J. REIMER
General, United States Army
Chief of Staff

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INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)
WATER QUALITY ANALYSIS SET:.
PURIFICATION
MODEL WQAS-1
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TM 10-6630-246-12&P
TM 09241B-12&P
C1

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02135

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WARNING

Do not use decontamination spray on personnel. It could cause personal injury.

Do not take any of the chemicals in this kit internally. Personal injury can result.

Avoid direct contact with all chemicals in this kit, some cause skin and eye irritation. Wear protective clothing and eye or face protection as needed.

DPD no. 1 chlorine test tablets are irritating to eyes, respiratory tract, and may cause allergic skin reaction. Provide ventilation when handling and wear safety glasses and gloves.

Avoid all bodily contact with kit chemicals: some can be VERY HARMFUL to your health. Kit tests should be done only by personnel who are properly trained and wearing chemical protective rubber gloves with inserts and industrial goggles or protective mask. If exposed, follow FIRST AID INFORMATION inside kit lid or manual.

Alkaline chemical used in the mustard test is extremely hazardous. One drop of this liquid accidentally splashed into the eye can cause permanent vision loss even if immediate first aid is applied. Immediately flush the eye with large amounts of water for 20 to 30 minutes, if possible, with another person's help.

Seek immediate medical treatment. If alkaline solution is swallowed, DO NOT induce vomiting. Dilute alkali by giving water to drink, and seek medical treatment.

During a CW alert or CW agent work, wear MOPP level 4 protective equipment.

Do not use this kit if you cannot see colors correctly.

Do not use an outdated kit for testing because it will give unreliable test results.

Read nerve agent test results carefully. In this test, NO COLOR CHANGE means agent is present.

In preparing simulant test water, DO NOT USE canteens, canteen cups, or other containers intended for potable water.

For first aid, refer to FM 21-11.

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TECHNICAL MANUAL
TM 10-6630-246-12&P
TM 09241 B-12&P

HEADQUARTERS,
DEPARTMENT OF THE ARMY AND
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WASHINGTON D.C., 1 February 1994

OPERATOR'S AND UNIT MAINTENANCE MANUAL
INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

FOR

WATER QUALITY ANALYSIS SET: PURIFICATION

MODEL WQAS-1

NSN 6630-01-365-5588

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 these procedures, please let us know. Mail your DA Form (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 Tank-automotive and Armaments Command, ATTN: AMSTA-AC-NML, Rock Island, IL 61299-7630. Marine Corp users submit NAVC 10772 directly to Commander, Marine Corps Logistics Base. Code 850, 814 Radford Boulevard, Albany, GA 31704-1128. A reply will be furnished directly to you.

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HOW TO USE THIS MANUAL

CONTENT

This manual is provided for your use in operating and maintaining the Water Quality Analysis Set: Purification. Before performing any operation or maintenance task, you must familiarize yourself with the entire procedure by carefully reading through it step by step.

MANUAL OVERVIEW

To help you become familiar with this manual as quickly as possible, spend some time looking through the pages.

The front cover index has bleed to edge tabs that line up with bleed to edge tabs in the text to ease finding these key items. The table of contents entries that match the front cover index have been boxed for easy identification. A list of tables and illustrations is also provided in the table of contents to aid in locating these specific items.

A glossary is provided to identify any abbreviations used.

An alphabetical index is provided to locate specific paragraphs by name.

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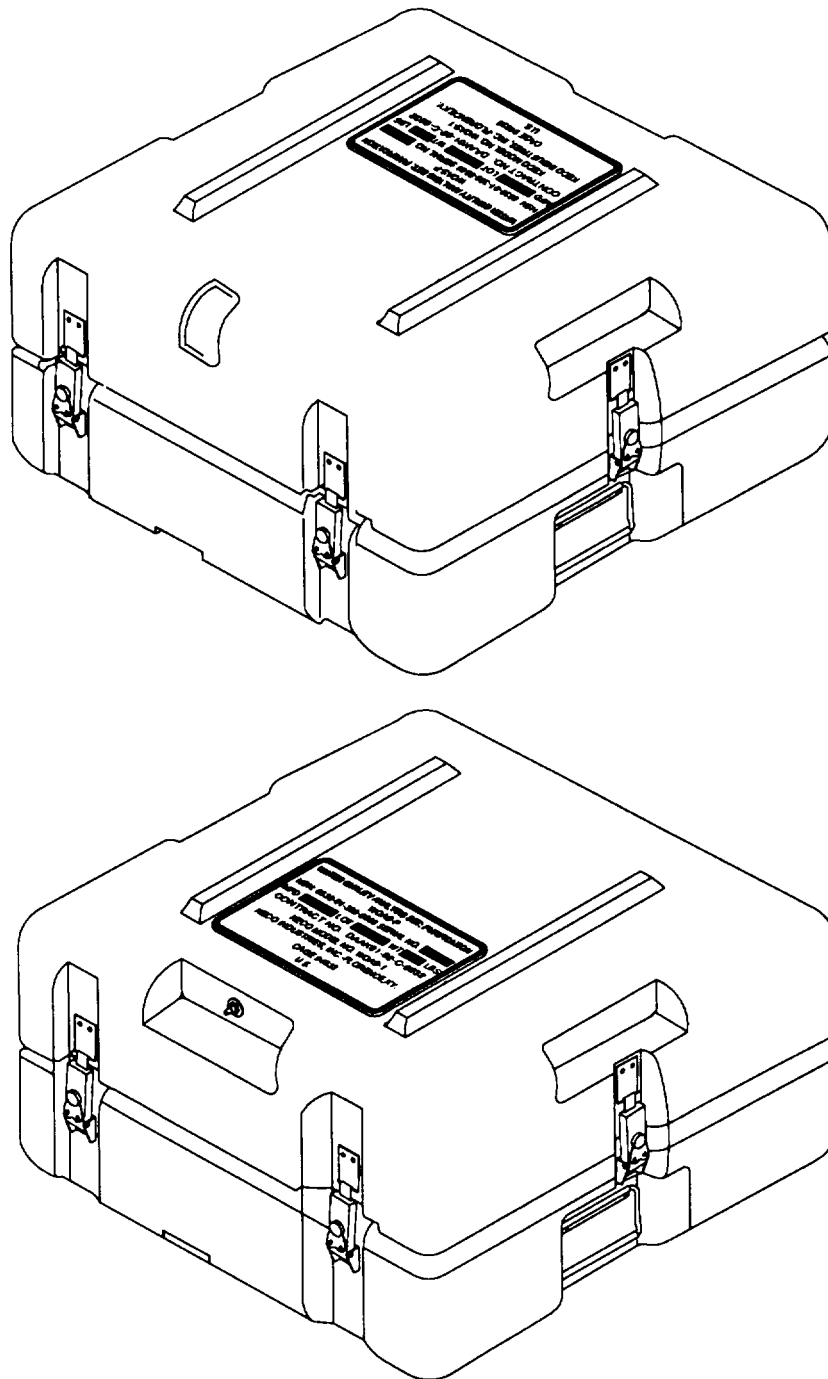


Figure 1-1. Water Quality Analysis Set: Purification

CHAPTER 1

INTRODUCTION

Section I. GENERAL INFORMATION

1-1. SCOPE.

This manual covers the use and maintenance of the Water Quality Analysis Set Purification (WQAS 1), in testing water for contamination. This manual provides descriptions of the various meters and accessory equipment and supplies with instructions for operating and maintaining them. Also included are instructions for preparing the unit for storage and shipment.

1-2. MAINTENANCE FORMS AND PROCEDURES.

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750 as contained in the Maintenance Management Update.

1-3. CORROSION PREVENTION AND CONTROL (CPC).

Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items. While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials, such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem. If a corrosion problem is identified, it can be reported using Standard Form 368, Product Quality Deficiency Report. Use of keywords such as "corrosion," "rust," "deterioration," or "cracking" will ensure that the information is identified as a CPC problem. The form should be submitted to the address specified in DA PAM 738-750.

1-4. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE.

Methods and/or procedures for the destruction of Army materiel to prevent enemy use are covered in TM 750-244-3.

1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATION (EIR).

If your Water Quality Analysis Set: Purification needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to us at Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-TR-E/MPA, Warren, MI 48397-5000. We will send you a reply.

Section II. EQUIPMENT DESCRIPTION

1-6. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES.

The Water Quality Analysis Set Purification is a one-man portable suitcase kit containing equipment for testing water quality. The kit is self-contained in a gasketed waterproof case. Foam inserts secure equipment in the case. Carbon impregnated foam liners protect electromagnetic pulse sensitive instruments.

1-7. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.

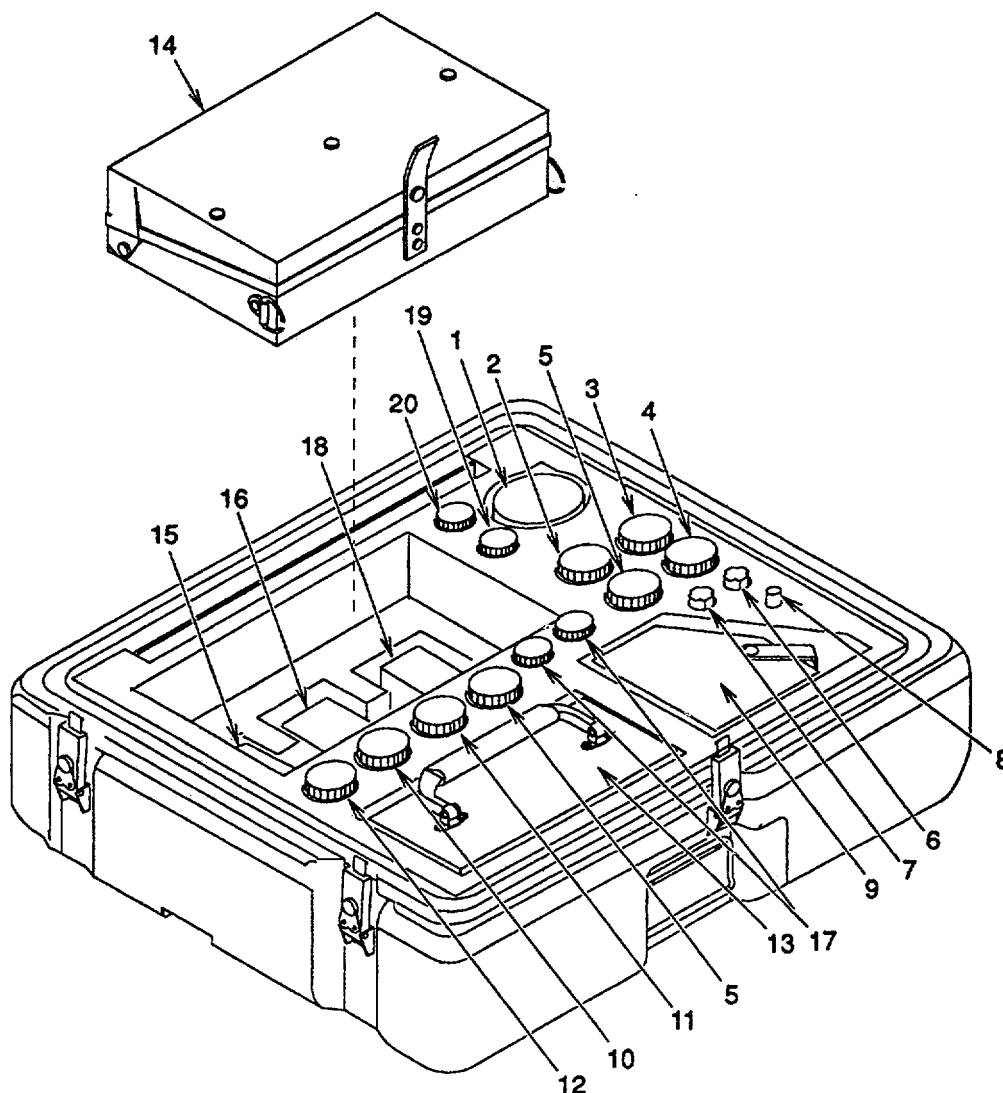


Figure 1-2. Major Components, Lower Section

1. BEAKERS. Used to collect samples and conduct tests.
2. TURBIDITY STANDARD (0.5 NTU). Used as reference for turbidity meter.
3. TURBIDITY STANDARD (60 NTU). Used as reference for turbidity meter.
4. TURBIDITY STANDARD (100 NTU). Used as reference for turbidity meter.
5. BOTTLE, 60 ml. Used to store and transport samples if needed.
6. PHILLIPS SCREWDRIVER. Used to remove phillips head screws.
7. FLAT TIP SCREWDRIVER. Used to remove slotted head screws.
8. MARKER. Used to record information and data as needed.
9. TOTAL DISSOLVED SOLIDS METER. Electronic meter to measure total dissolved solids in parts per million on an analog scale.
10. DISSOLVED SOLIDS STANDARD SOLUTION (300 PPM (300 mg/l)). Used as reference for total dissolved solids meter.
11. DISSOLVED SOLIDS STANDARD SOLUTION (3,000 PPM (3,000 mg/l)). Used as reference for total dissolved solids meter.
12. DISSOLVED SOLIDS STANDARD SOLUTION (30,000 PPM (30,000 mg/l)). Used as reference for total dissolved solids meter.
13. COLOR COMPARATOR. Visual instrument used to compare prepared sample against color references to determine pH and chlorine content.
14. CHEMICAL AGENTS WATER TESTING KIT. Visual tests using color comparison to determine hazardous levels of Lewisite, Nerve, Cyanide, and Mustard agents. (See TM 3-6665-319-10.)
15. AC to DC ADAPTER (TURBIDITY TEST SET). Used to convert standard AC power to DC for use with turbidity test set
16. CHLORINE TEST TABLETS. Used for checking chlorine level with color comparator.
17. pH STANDARD BUFFER POWDER (7.00 pH). Used as reference for pH/temperature test set.
18. AC to DC ADAPTER (TOTAL DISSOLVED SOLIDS METER). Used to convert standard AC power to DC for use with total dissolved solids meter.
19. pH STANDARD BUFFER POWDER (4.00 pH). Used as reference for pH/temperature test set.
20. pH STANDARD BUFFER POWDER (10.00 pH). Used as reference for pH/temperature test set.

1-7. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.-continued

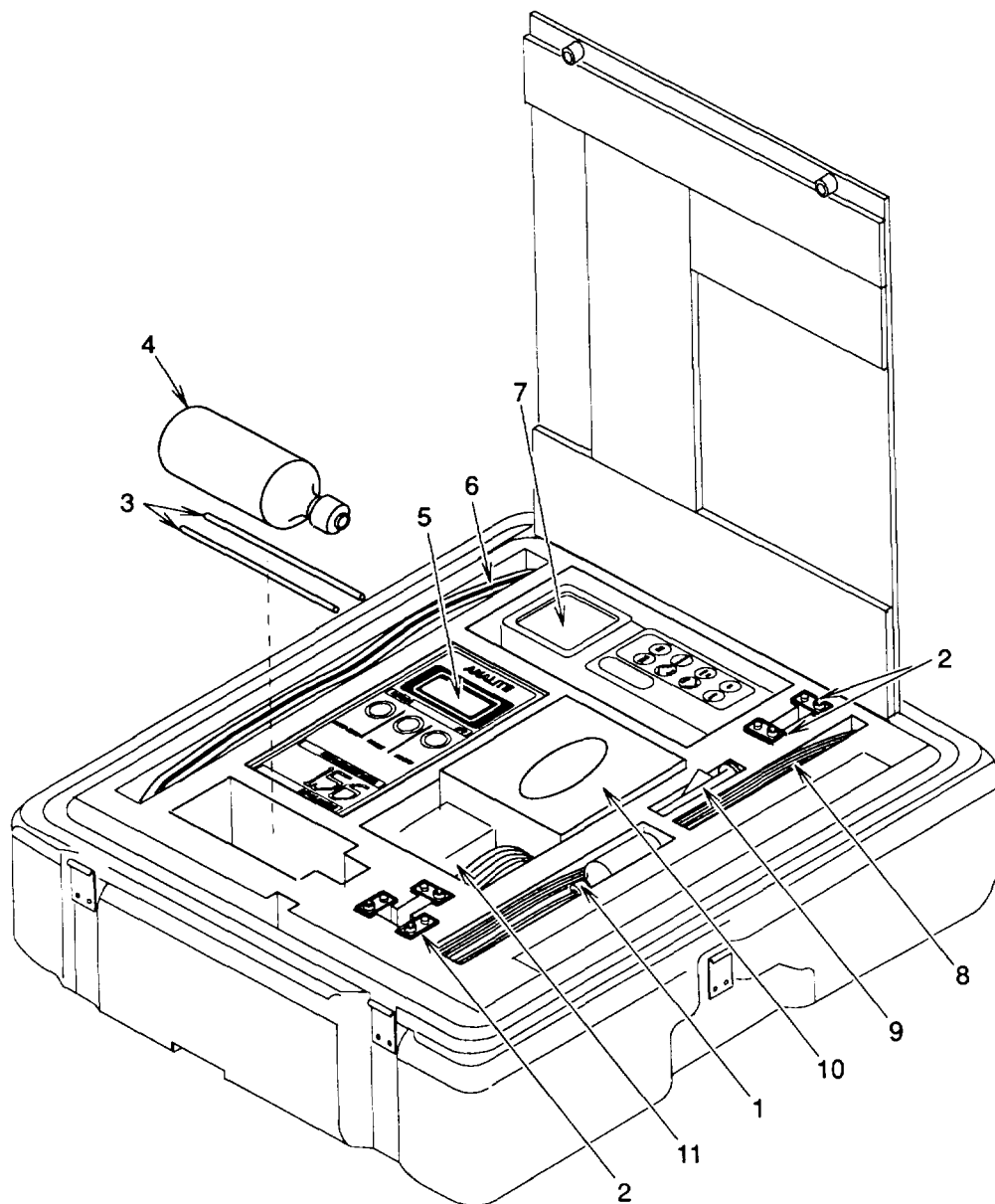


Figure 1-3. Major Components, Upper Section

1. pH ELECTRODE. Used with pH/temperature test set to measure pH levels.
2. NON-RECHARGEABLE BATTERY. Used to power test equipment when AC power is unavailable.
3. LABORATORY STIRRING ROD. Used to mix samples and test/standard solutions.

4. WASH BOTTLE. Filled with demineralized resin which absorbs impurities in standard water to rinse and clean test instruments and equipment when demineralized or distilled water is unavailable.
5. TURBIDITY TEST SET. Electronic instrument to measure turbidity in Nephelometric Turbidity Units on a digital display.
6. TURBIDITY TEST SET PROBE. Used with turbidity test set to measure turbidity levels.
7. pH/TEMPERATURE TEST SET. Electronic instrument used to measure temperature and pH on a digital display.
8. TEMPERATURE PROBE. Used with pH/temperature test set to measure, and compensate for, temperature levels.
9. RANGE EXTENDER. Used with total dissolved solids meter to extend above the standard meter range.
10. PAPER TOWEL. Used to clean and dry test instruments and equipment.
11. AC to DC ADAPTER (pH/TEMPERATURE TEST SET). Used to convert standard AC power to DC for use with pH/temperature test set.

1-8. EQUIPMENT DATA.

WEIGHT AND DIMENSIONS

Weight	29.1 lb (13.2 kg)
Length	19.00 in. (48.26 cm)
Width	19.00 in. (48.26 cm)
Height	9.75 in. (24.77 cm)

Section III. PRINCIPLES OF OPERATION

1-9. CHEMICAL AGENTS: M272 WATER TESTING KIT.

Water samples are taken and test chemicals added to cause a change in color within test tubes and or a chemical coated ticket. The color change is compared to a reference standard to determine hazardous levels of Lewisite, Nerve, Cyanide, and Mustard agents. (See TM 3-6665-319-10.)

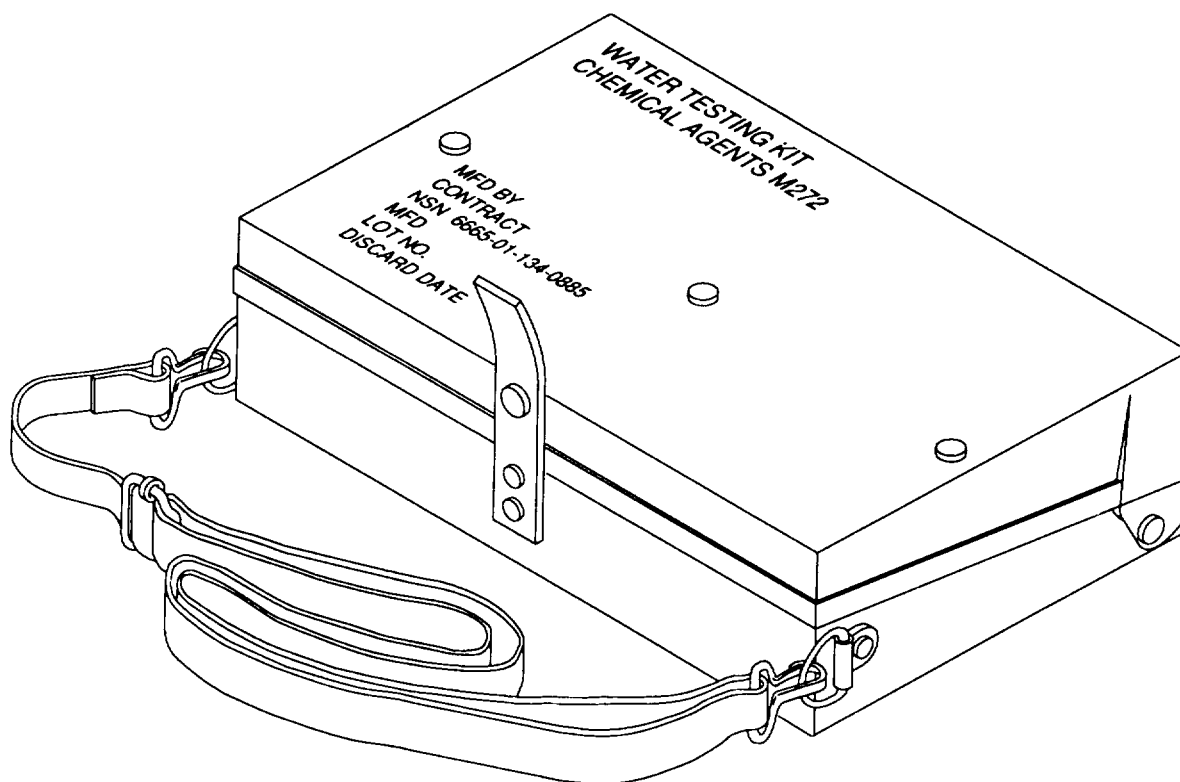


Figure 1-4. Chemical Agents: M272 Water Testing Kit

1-10. TOTAL DISSOLVED SOLIDS METER.

Solids dissolving in a liquid leave ions suspended in that liquid. Ions conduct electrical current and can be used to measure dissolved solids. The conductivity of a liquid is measured in microhms (μohm) and is directly proportional to the total dissolved solids displayed by the meter in parts per million (milligrams per liter) (PPM (mg/l)).

A water sample is taken and placed inside the cell cup for test. The meter is set to the desired range and activated. Reading is given in parts per million from an analog scale. A range extender is supplied for testing beyond the standard meter range.

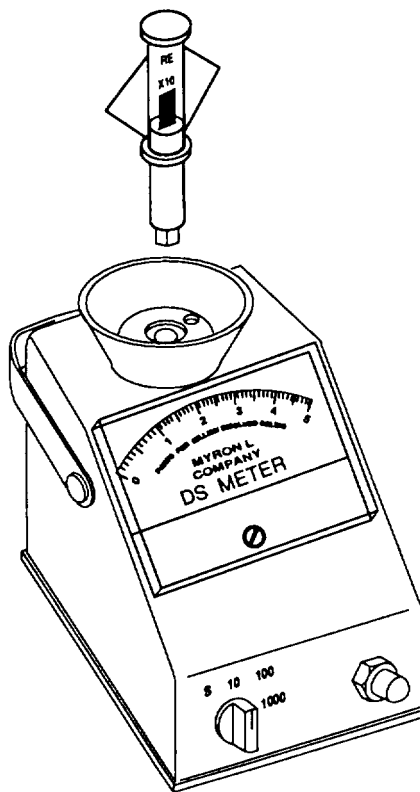


Figure 1-5. Total Dissolved Solids Meter

1-11. TURBIDITY TEST SET.

Turbidity is a measurement of undissolved solids suspended in a liquid. A nephelometer emits a light beam into a liquid sample and measures the amount of light reflected from undissolved solids. This measurement is automatically compared to a stored measurement, usually taken from a known reference sample, and the difference is displayed by the meter in Nephelometric Turbidity Units (NTU).

A probe is "zeroed" by immersing in a reference standard solution and activating the meter. The probe is then immersed into the water being tested. Reading is given in Nephelometric Turbidity Units (NTU) on a digital display.

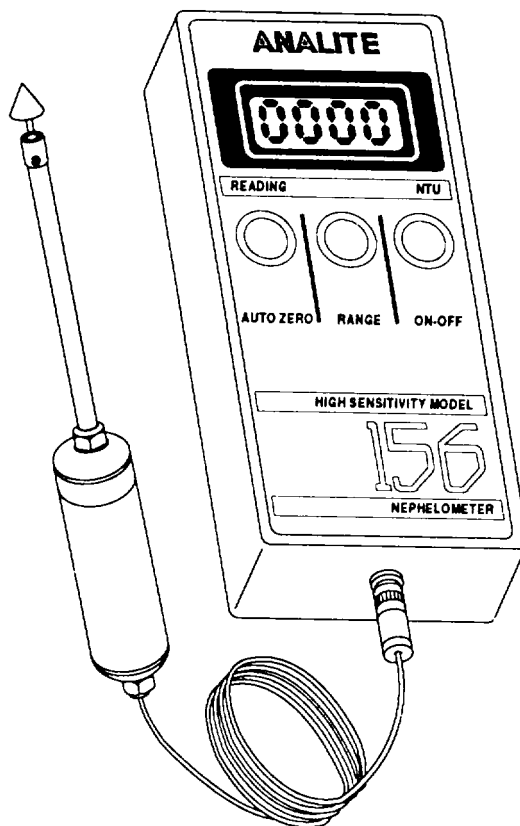


Figure 1-6. Turbidity Test Set

1-12. pH/TEMPERATURE TEST SET.

The concentration/activity of hydrogen ions in a liquid indicates how acidic (acid) or alkaline (base) the liquid is and expressed as its pH value. pH is measured on a scale of 0 to 14 with 7 being neutral. A pH number less than 7 is acidic and a number greater than 7 is alkaline.

The temperature probe senses actual temperature of the liquid being tested and provides temperature correction information for accurate pH measurements.

The pH electrode and temperature probe is immersed in a reference standard pH solution and calibrated using the auto calibration feature. The probe is then immersed into the water being tested. Temperature and pH readings are given on a digital display.

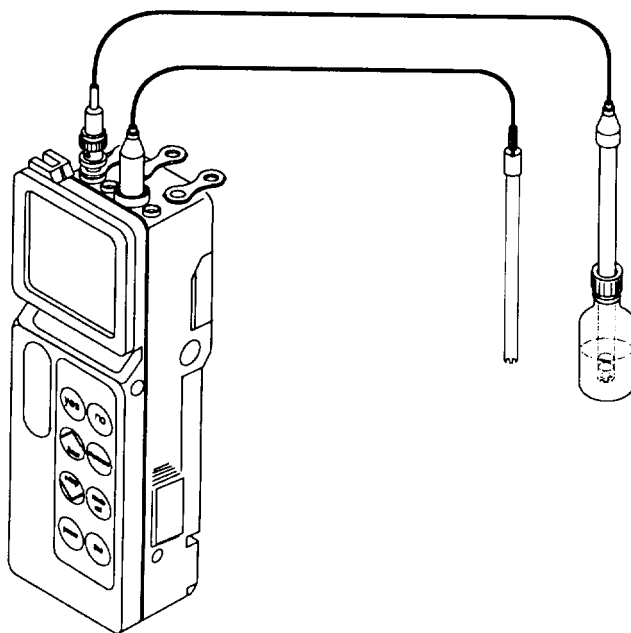


Figure 1-7. pH/Temperature Test Set

1-13. COLOR COMPARATOR.

Water samples are taken and test chemicals added to cause a change in color. The color change is compared to a reference standard color wheel through a comparator viewer to determine pH and chlorine content.

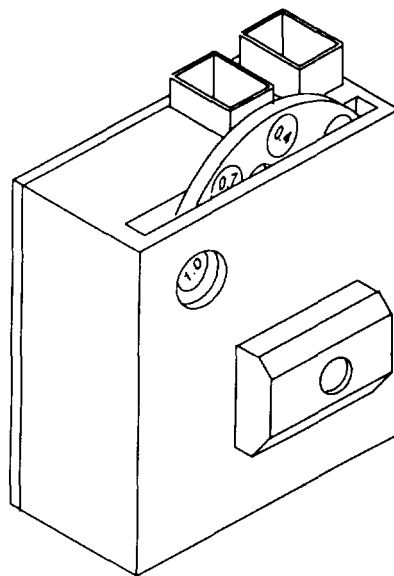


Figure 1-8. Color Comparator

CHAPTER 2

OPERATING INSTRUCTIONS

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Section I. SERVICE UPON RECEIPT

2-1. UNPACKING AND INSPECTION.

- a. Remove the Water Quality Analysis Set: Purification from the packing container.
- b. Open the case and inspect the equipment for damage incurred during shipment. If any equipment has been damaged, report the damage on SF 364, Report of Discrepancy.
- c. Check that the set is complete. See appendix D, section II.

Section II. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

2-2. CHEMICAL AGENTS WATER TESTING KIT.

See TM 3-6665-319-10.

2-3. TOTAL DISSOLVED SOLIDS METER.

NOTE

If sample being measured is out of standard range, refer to calibration procedures in paragraph 2-9.

The controls and indicators are located on the meter front and top.

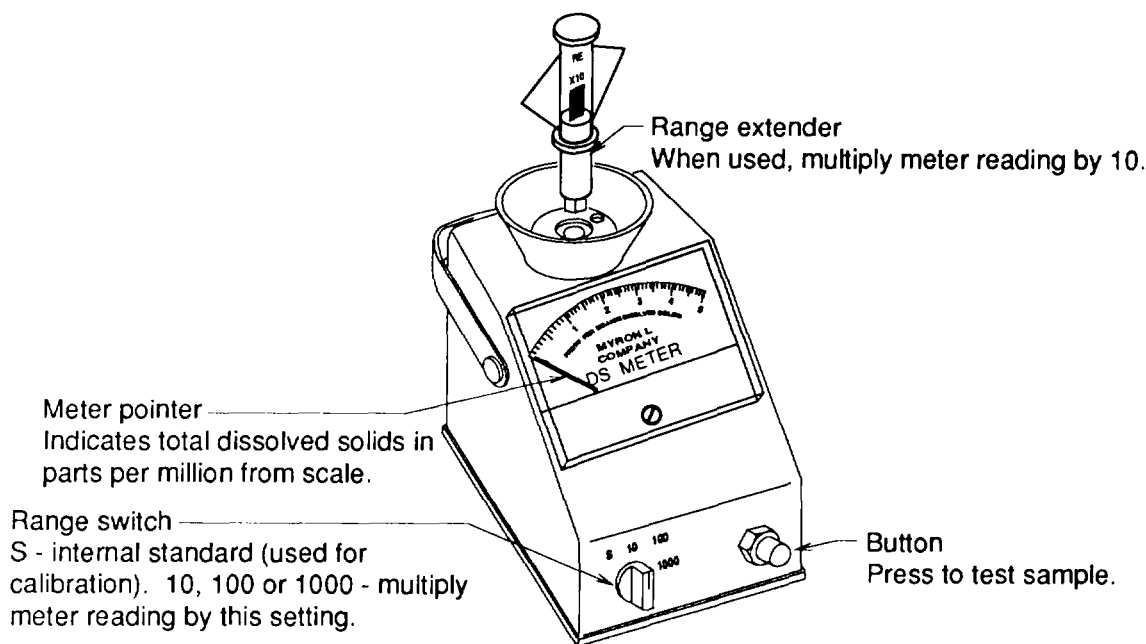


Figure 2-1. Total Dissolved Solids Meter

2-4. TURBIDITY TEST SET.

The controls and indicators are located on the instrument front.

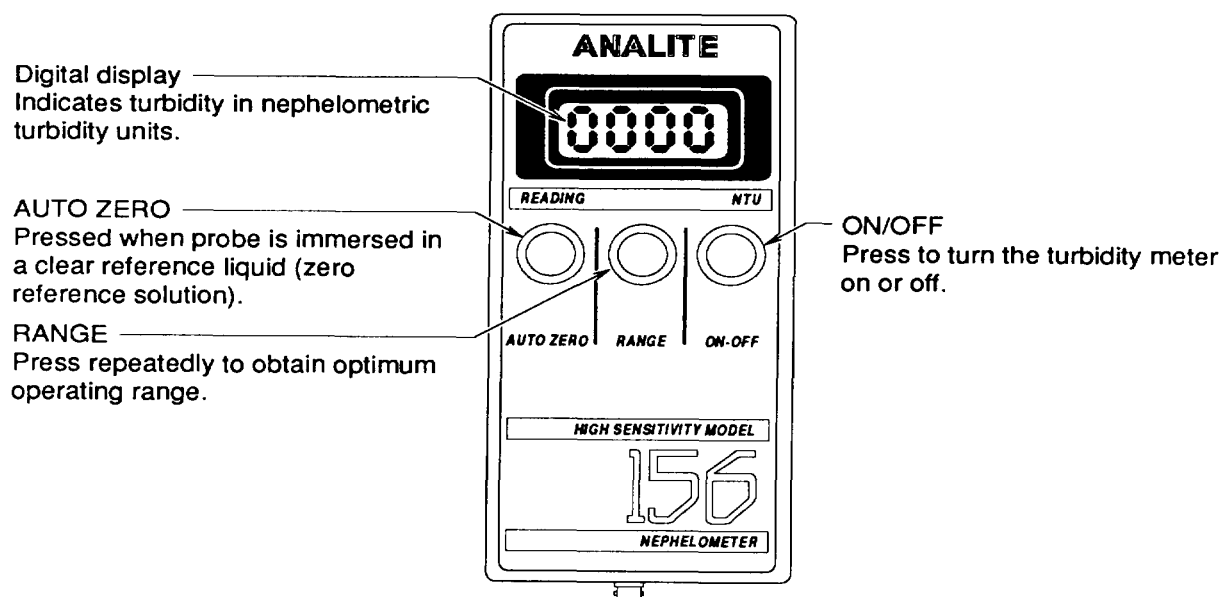


Figure 2-2. Turbidity Test Set

2-5. pH/TEMPERATURE TEST SET.

The controls and indicators are located on the instrument front.

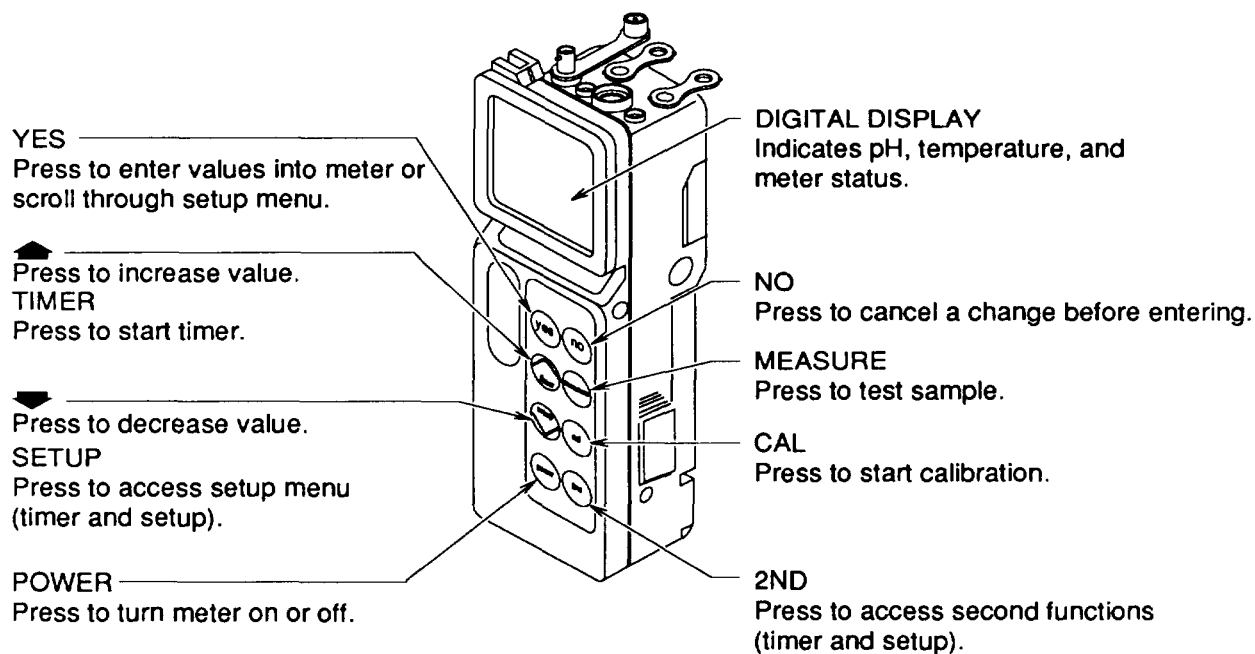


Figure 2-3. pH/Temperature Test Set

2-6. COLOR COMPARATOR.

The indicators used are chemicals that change color when exposed to sample.

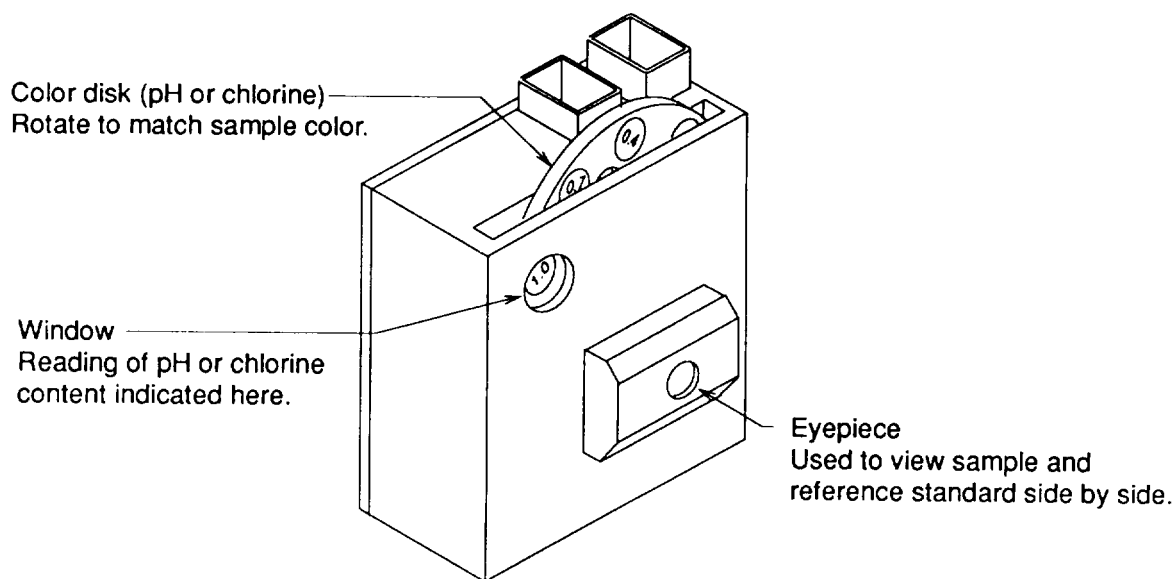


Figure 2-4. Color Comparator

Section III. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-7. GENERAL.

Preventive Maintenance Checks and Services means systematic caring, inspection, and servicing of equipment to keep it in good condition and ready to use. As the operator, your mission is to:

(1) Be sure to perform your PMCS each time you use the Water Quality Analysis Set: Purification.

(2) Do your "Before" PMCS just before you use the equipment.

(3) Do your "After" PMCS right after using the equipment.

(4) Use DA Form 2404 (Equipment Inspection and Maintenance Worksheet) to record any faults that you discover before, during, or after use, unless you can fix the fault. You DO NOT need to record faults that you fix.

2-8. PMCS PROCEDURES.

a. Your Preventive Maintenance Checks and Services, table 2-1, lists inspections and care required to keep the equipment in good operating condition.

b. The "Interval" column of table 2-1 tells you when to do a certain check or service.

c. The "Procedure" column of table 2-1 tells you how to do required checks and services.

NOTE

Terms "ready/available" and "mission capable" refer to same status: Equipment is on hand and ready to perform its mission. (See DA Pam 738-750.)

d. The "Equipment Is Not Ready/Available If:" column in table 2-1 tells you when your equipment is non mission capable and why it cannot be used.

e. If the equipment does not perform as required, notify supervisor.

f. If anything looks wrong and you can't fix it, write it on your DA Form 2404 IMMEDIATELY, report it to your supervisor.

g. When you check for "operating condition", you look at the component to see if it is serviceable.

Table 2-1. Operator Preventive Maintenance Checks and Services for Water Quality Analysis Set:
Purification

ITEM NO.	INTERVAL	LOCATION	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
		ITEM TO CHECK/SERVICE		
1	Before	Case Assembly	<p>Inspect case (1) for cuts, dents, broken hardware, and missing or damaged gaskets.</p> <p>Check for any missing or damaged equipment and supplies, missing or visibly damaged AC to DC adapters.</p>	<p>Case damaged to cause possible leaks.</p> <p>Missing or damage to equipment and supplies, batteries missing or damaged, AC to DC adapters missing or damaged.</p>
2	Before	Chemical Agents Water Testing Kit	<p>Check name on case (2) (Water Testing Kit Chemical Agents M272).</p> <p>Check discard date on case.</p> <p>Check condition of case; latch attached and working, shoulder strap attached and working, D-rings attached, hinge pins in holes and able to hold cover open, first aid, chemical, operation under unusual conditions, and caution/warning labels in place and readable, windscreen in place, retainer strap attached to lid, and match striker in place.</p>	<p>Wrong kit.</p> <p>Kit outdated or date not readable.</p> <p>Case damaged and can not carry components. Any labels missing or not readable. Windscreen missing. Strap missing or damaged.</p>
2-6				

ITEM NO.	INTERVAL	LOCATION	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
		ITEM TO CHECK/SERVICE		

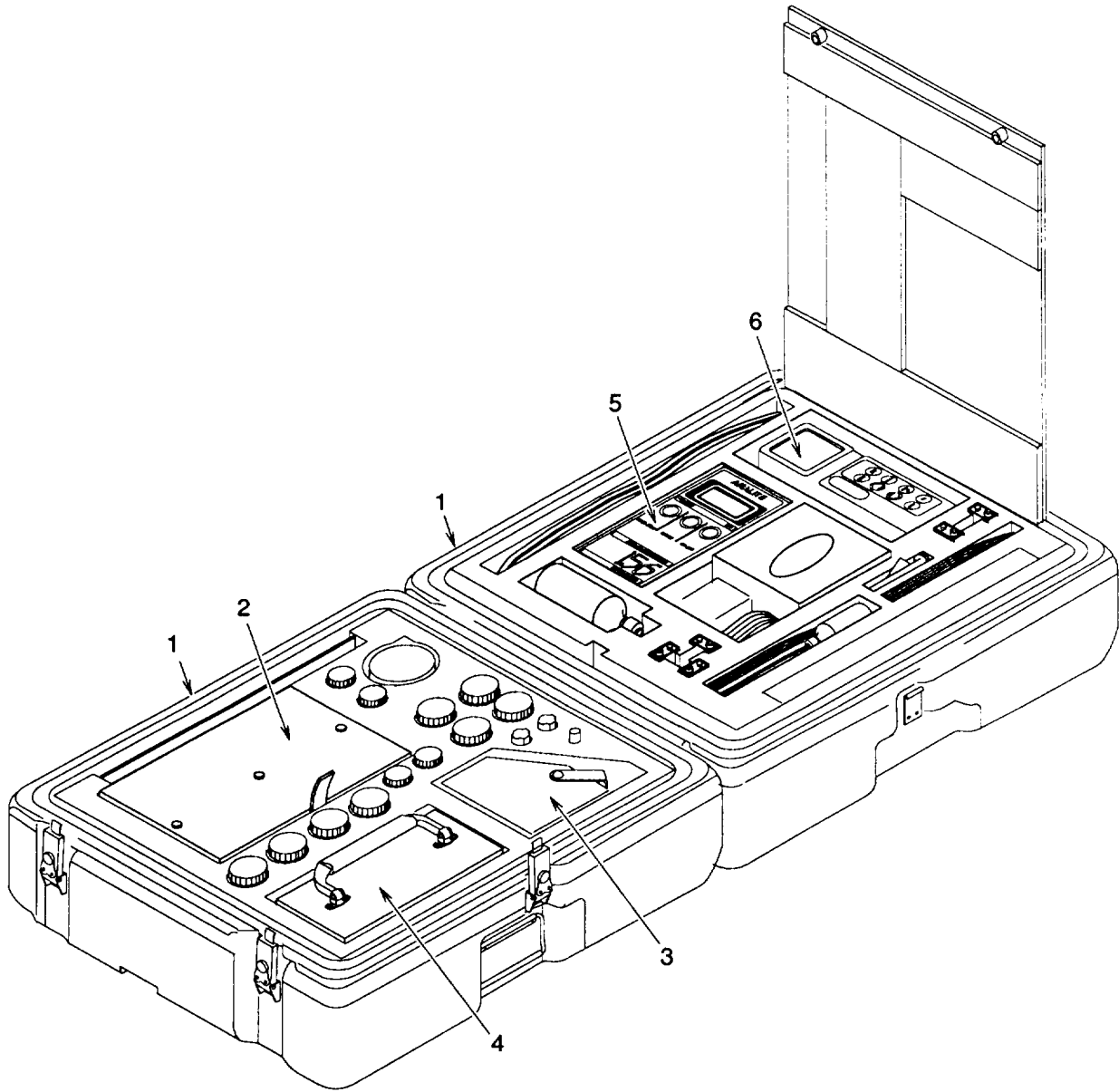


Table 2-1. Operator Preventive Maintenance Checks and Services for Water Quality Analysis Set:
Purification-continued

ITEM NO.	INTERVAL	LOCATION	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
		ITEM TO CHECK/SERVICE		
2		Chemical Agents Water Testing Kit-continued	<p>CAUTION</p> <p>Do not open sealed packages for inspection. This can ruin chemicals.</p> <p>Do not use chemicals from one kit to refill another kit.</p> <p>Check that kit chemical packets and containers are not damaged and that kit contains enough chemicals to perform at least one set of tests as follows: one ticket (white label packet), one detector tube (red band), two detector tubes (blue band), one zinc mix (orange label packet), one salt mix (yellow label packet), one tablet (green label packet), alkaline solution, simulant tubes (blue/white, blue/orange, blue/yellow, and blue/red band).</p> <p>Check that test bottle and stopper assembly trap and connector are not broken or missing.</p> <p>NOTE</p> <p>New kits have a test strip instead of a thermometer. Both are discussed to cover either a new or old kit.</p> <p>Is test strip missing? While test bottle is empty, does test strip read hot at room temperature? If so, fill test bottle with hot water, allow to stand for one minute. Empty water, make sure the test strip is black.</p> <p>Check for broken or missing thermometer with case.</p> <p>Check for broken or missing heater or metal clip.</p> <p>2-8</p>	<p>Not enough intact chemicals to run at least one set of tests.</p> <p>Test bottle or stopper assembly damaged or missing.</p> <p>Test strip reads hot at room temperature after attempting repair or is missing.</p> <p>Thermometer broken or missing.</p> <p>Heater or metal clip is broken or missing.</p>

ITEM NO.	INTERVAL	LOCATION	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
		ITEM TO CHECK/SERVICE		
3	Before Meter	Total Dissolved Solids	<p>Check to see that at least one connector is in flip-top vial.</p> <p>Check to see that at least two dry matches are available in container and the cap is on tight</p> <p>Check to see that instruction card is attached by string and readable.</p> <p>Check meter (3) for any damage, missing or damaged range extender, or missing standard solutions.</p>	<p>No connector in vial.</p> <p>No matches (heat source) available.</p> <p>Instruction card missing or not readable.</p> <p>Missing standard solution, damage to range extender, or damage to meter.</p>
4	Before	Color Comparator	Check kit (4) for any damage to equipment or missing supplies.	Missing or damage to equipment and supplies.
5	Before	Turbidity Test Set	Check meter (5) for any damage or missing or damaged probe or deflector cone.	Missing standard solutions, damage to probe or deflector cone, or damage to meter.
6	Before	pH/Temperature Test Set	<p>Check meter (6) for any damage or missing or damaged electrode or probe.</p> <p>Check that storage/soaker bottle is topped off with pH 4.00 buffer solution.</p>	<p>Missing pH standard capsules, damage to electrode or probe, or damage to meter.</p> <p>Electrode tip is dry.</p>

Table 2-1. Operator Preventive Maintenance Checks and Services for Water Quality Analysis Set:
Purification-continued

ITEM NO.	INTERVAL	LOCATION	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
		ITEM TO CHECK/SERVICE		
7	After	Case Assembly	<p>Using demineralized or distilled water, thoroughly rinse all collection bottles and equipment. Be sure equipment is thoroughly dry before repacking.</p> <p>Clean case (7) using clear water and detergent. Note orientation of inserts when removing, for proper installation. Dry case thoroughly before repacking.</p> <p>Replace any missing supplies.</p>	Missing supplies.
8	After	Chemical Agents Water Testing Kit	Replace any missing chemicals or supplies.	Missing chemicals or supplies.
9	After	Total Dissolved Solids Meter	<p>Using demineralized or distilled water, thoroughly rinse cell cup of TDS meter (9). Be sure equipment is thoroughly dry before repacking.</p> <p>Replace any missing standard solutions.</p>	Missing standard solution.
10	After	Color Comparator	<p>Using demineralized or distilled water, thoroughly rinse comparator cells and equipment. Be sure equipment is thoroughly dry before repacking.</p> <p>Replace any missing supplies.</p>	Missing supplies.
2-10				

ITEM NO.	INTERVAL	LOCATION	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
		ITEM TO CHECK/SERVICE		

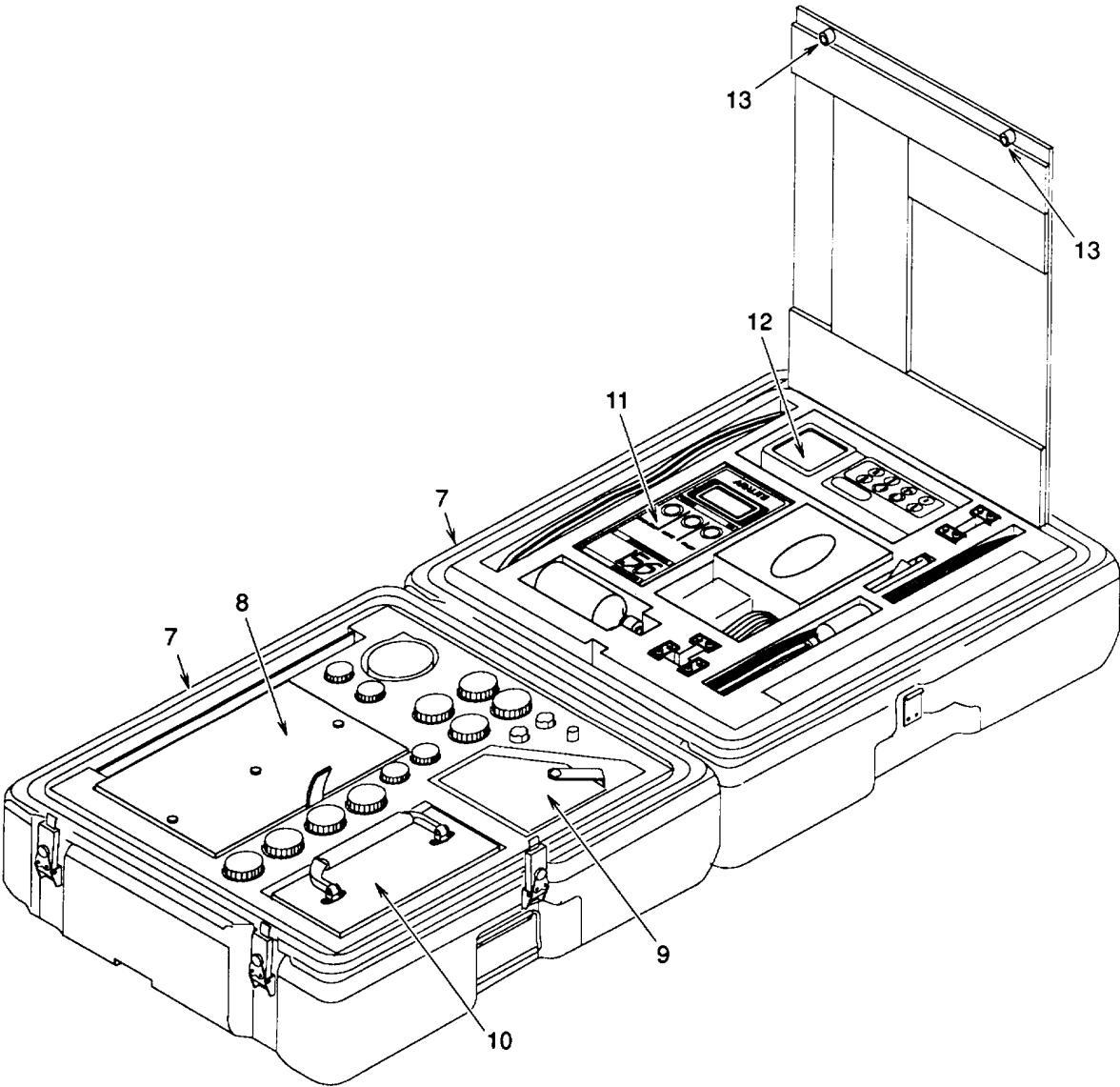


Table 2-1. Operator Preventive Maintenance Checks and Services for Water Quality Analysis Set:
Purification-continued

ITEM NO.	INTERVAL	LOCATION	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
		ITEM TO CHECK/SERVICE		
11	After	Turbidity Test Set	Using demineralized or distilled water, thoroughly rinse probe tip and deflector cone. Be sure equipment is thoroughly dry before repacking.	Electrode tip is dry.
12	After	pH/temperature Test Set	Using demineralized or distilled water, thoroughly rinse electrode and probe tip. Be sure equipment is thoroughly dry before repacking. Check that storage/soaker bottle is topped off with pH 4.00 buffer solution.	
13	After	Insert Divider Fasteners	With fastener unlatched, snug nut against rubber bushing. Do not compress rubber bushing with nut. 2-12	

Section IV. OPERATION UNDER USUAL CONDITIONS

CAUTION

The following items contained in this kit must be removed and protected from temperatures below 320F (0°C):

- Three bottles TDS/conductivity standard solution.
- Three bottles NTU primary standard.
- One bottle wide range pH indicator solution.
- One bottle demineralizer resin.
- One pH electrode.

These chemicals can be rendered useless and equipment damaged if allowed to freeze.

2-9. OPERATION OF TOTAL DISSOLVED SOLIDS TEST SET.

- a. Open case and carefully remove equipment and supplies as needed. Note location for repacking.
- b. Set up the meter. See figure 2-5.
 - (1) With meter off, adjust pointer (1) to zero by turning meter zero adjust screw (2).

CAUTION

Observe correct polarity when installing battery. Incorrect connection can damage the equipment.

- (2) Remove bottom cover (3) by carefully prying it off total dissolved solids meter (4) and connect AC to DC adapter (5) or install a battery (6) as appropriate. Be sure battery removal clip (7) is in place prior to installing battery. Check battery condition per following procedures. Attach bottom cover if AC to DC adapter was connected.
 - (a) Adjust range switch (8) to S position.
 - (b) Press button (9) and adjust the master calibration control (10) to maximum. Pointer (1) must indicate full scale or above. If not, replace battery (6).
 - (c) Press button (9) and adjust the master calibration control (10) until the meter reading matches the internal standard value on label attached to bottom cover (3). Attach bottom cover.

2-9. OPERATION OF TOTAL DISSOLVED SOLIDS TEST SET.-continued

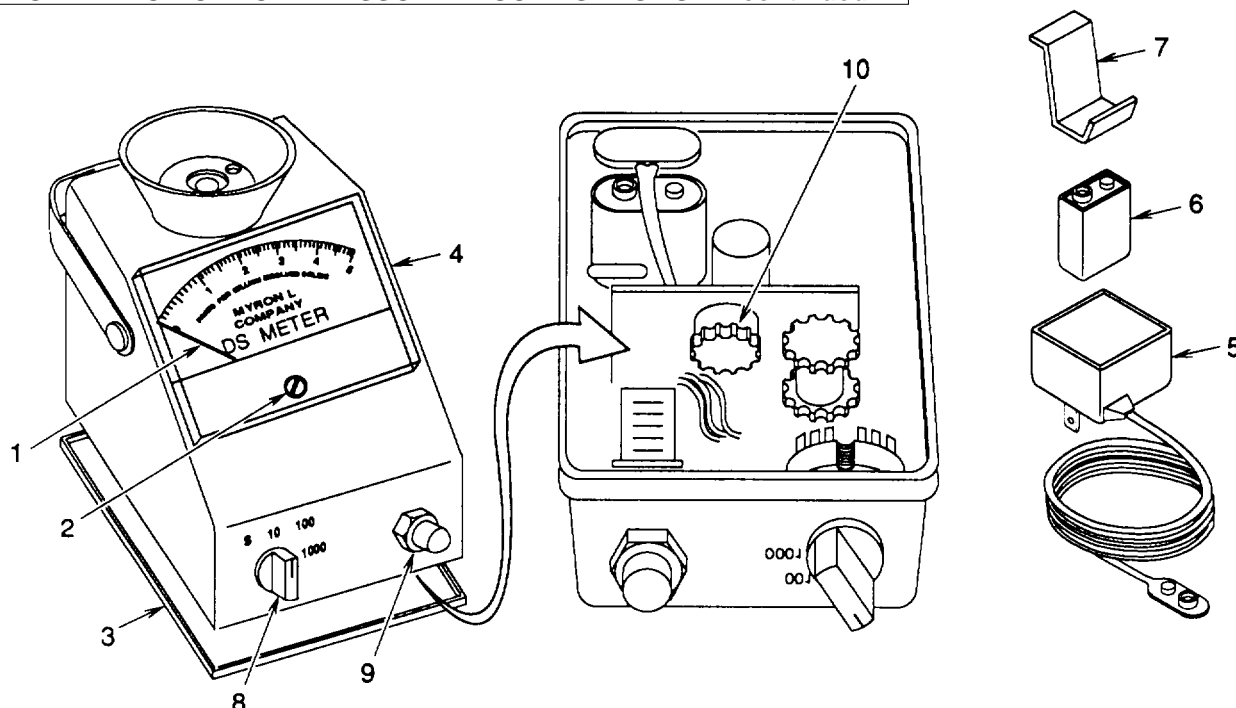


Figure 2-5. Total Dissolved Solids Meter

c. Operate the meter. See figure 2-6.

- (1) If AC to DC adapter (1) is being used, connect it to a source of 120 VAC power and check meter (2) adjustment as follows.
 - (a) With meter (2) off, adjust pointer (3) to zero by turning meter zero adjust screw (4).
 - (b) Turn range switch (5) to S position.
 - (c) Press button (6) and compare meter reading with internal standard value on label attached to bottom cover (7). If reading is different, remove bottom cover and adjust the master calibration control (8) until it matches. Attach bottom cover if removed.

NOTE

If the meter does not function per the following procedures, see troubleshooting.

- (2) Turn the range switch (5) to 1000.

CAUTION

Do not dip the meter into water being tested to fill the cell cup. Damage to meter can result.

(3) Rinse the cell cup (9) three times with water to be tested. Let the three rinse samples each remain in the cell cup for several seconds to allow the automatic temperature compensation feature time to work properly. Immediately proceed to next step.

(4) Fill the cell cup (9) with water to be tested to at least 1/4 inch (6 mm) above the upper electrode (10).

NOTE

Range extender will be needed when testing salt water and may be needed when testing brackish water. In extreme cases, total dissolved solids exceeds 50,000 PPM (50,000 mg/l), the meter will need to be adjusted for range doubling.

(5) Press the black button (6).

(a) If the pointer (3) is below 0.5 on scale, adjust range switch (5) to 100. If pointer is still below 0.5 on scale, adjust range switch to 10.

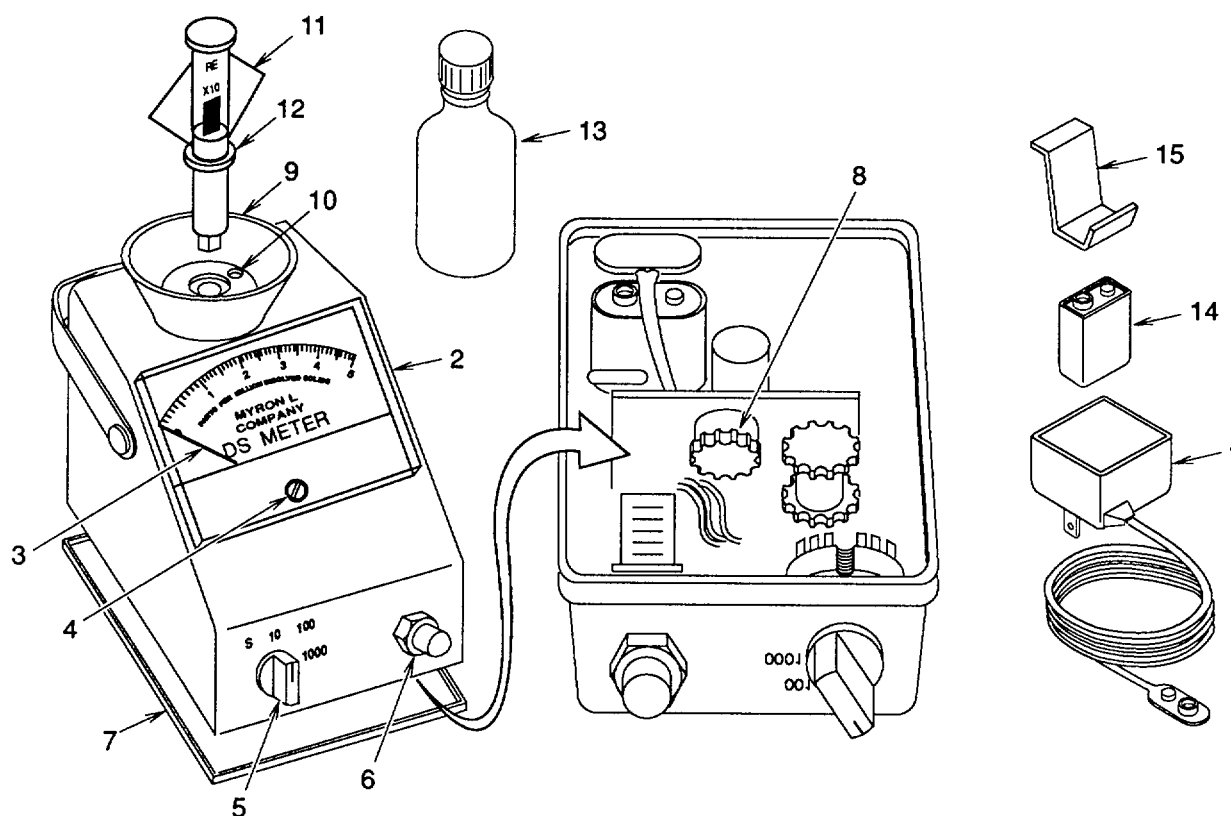


Figure 2-6. Total Dissolved Solids Test

2-9. OPERATION OF TOTAL DISSOLVED SOLIDS TEST SET. - continued

(b) If the pointer (3) goes off the scale to the right on the 1000 range setting, use the range extender (11) which will increase the range 10 times.

1 Rinse the range extender (11) three times with water to be tested, discarding water between rinses.

2 Push the range extender (11) into the filled cell cup (9), seating the O-ring seal (12).

3 Press the black button (6) and adjust range switch (5) per (a) above.

(c) If the pointer (3) goes off the scale to the right on the 1000 range setting, the meter must be adjusted for range doubling as follows.

1 Discard water in cell cup (9).

2 Rinse cell cup (9) with demineralized or distilled water and dry thoroughly.

3 Remove bottom cover (7).

4 Adjust range switch (5) to S position.

5 Press button (6) and adjust master calibration control (8) until pointer (3) reaches half the internal standard value on label attached to bottom cover (7). Attach bottom cover.

6 Repeat test beginning at step c. (2).

(6) To determine Total Dissolved Solids in Parts Per Million, multiply pointer (3) reading by range setting of range switch (5). If range extender (11) was used, multiply the answer by 10. If meter (2) was adjusted for range doubling, multiply the answer by 2.

(7) Remove range extender (11), if used, and empty cell cup (9).

(8) Thoroughly rinse cell cup (9), collection bottle (13), and any equipment used with demineralized or distilled water. Dry thoroughly after rinsing.

(9) If meter (2) was adjusted for range doubling, readjust for standard range as follows.

(a) Remove bottom cover (7).

(b) Adjust range switch (5) to S position.

(c) Press button (6) and adjust master calibration control (8) until pointer (3) matches the internal standard value on label attached to bottom cover (7). Attach bottom cover.

(10) If meter is to be stored for an extended period, remove bottom cover (7) by carefully prying it off and remove AC to DC adapter (1) or 'battery (14) as appropriate. Be sure battery removal clip (15) is in meter (2). Attach bottom cover.

- d Calibrate the meter.

NOTE

With daily use, the total dissolved solids meter only needs to be calibrated once every three months.

Be sure cell cup is clean and free of any scale prior to calibration.

If the meter does not function per the following procedures, see troubleshooting.

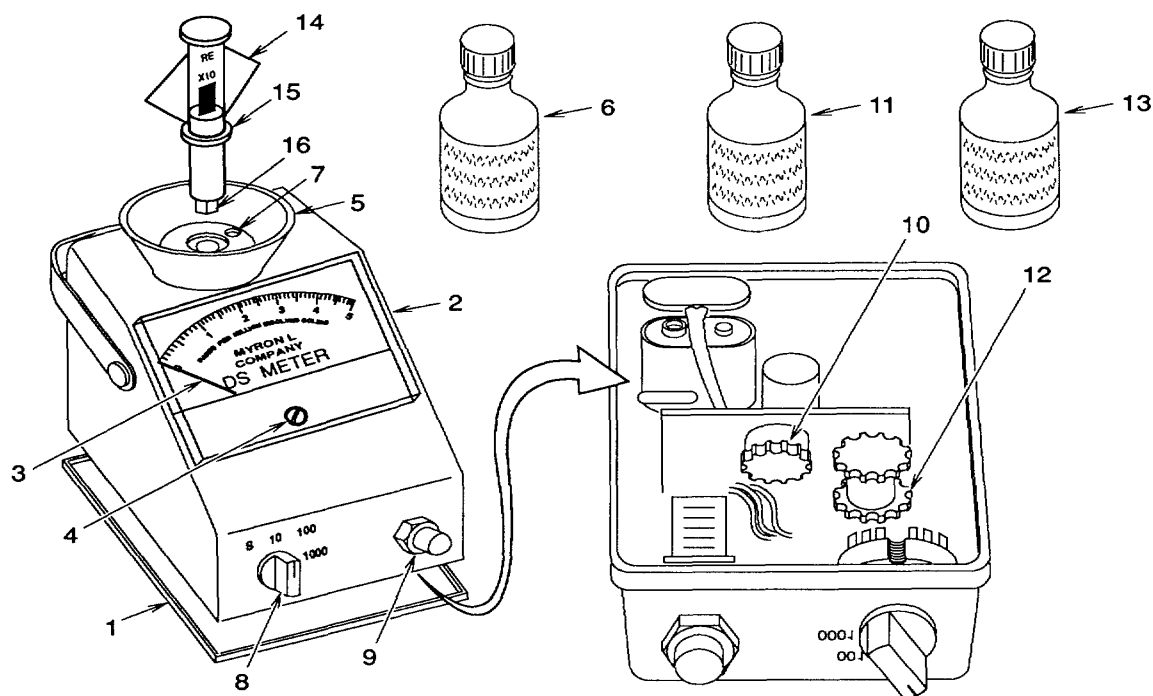


Figure 2-7. Total Dissolved Solids Meter Adjustment

- (1) Carefully pry the bottom cover (1) off meter (2).
- (2) With meter (2) off, adjust pointer (3) to zero by turning meter zero adjust screw (4).
- (3) Fill the cell cup (5) with standard solution 442-3,000 (6) to 1/4 inch (6 mm) above upper electrode (7).
- (4) Position range switch (8) to 1000.
- (5) Press button (9). Pointer (3) should be at 3f0.1 on scale, if not, adjust master calibration control (10) until pointer reaches 3.
- (6) Discard solution and flush the cell cup (5) with demineralized or distilled water. Discard wash water.
- (7) Flush the cell cup (5) with standard solution 442-300 (11) and discard solution. D-2 c

2-9. OPERATION OF TOTAL DISSOLVED SOLIDS TEST SET. - continued

- (8) Fill the cell cup with standard solution 442-300 (11) to 1/4 inch (6 mm) above upper electrode (7).
- (9) Position range switch (8) to 100.
- (10) Press button (9). Pointer (3) should be at 3f0.1 on scale, if not, adjust trimmer (12) until pointer reaches 3.
- (11) Discard solution and flush the cell cup (5) with demineralized or distilled water. Discard wash water. Dry cell cup thoroughly.
- (12) Install bottom cover (1).
- (13) Position range switch (8) to S.
- (14) Press button (9) and compare reading with internal standard value on label attached to bottom cover (1). If reading is not within ± 0.1 , change label to match reading.
- e. Calibrate the range extender.
 - (1) Fill the cell cup (5) with standard solution 442-30,000 (13) to 1/4 inch (6 mm) above upper electrode (7).
 - (2) Position range switch (8) to 1000.
 - (3) Rinse the range extender (14) in standard solution 442-30,000 (13). Discard solution.
 - (4) Insert range extender (14) into filled cell cup (5), seating the O-ring seal (15).

NOTE

Range extender is adjusted to correct meter reading. Do not adjust internal calibration controls.

- (5) Press button (9). Pointer (3) should be at 3 ± 0.1 on scale, if not, adjust range extender (14) as follows.
 - (a) Remove range extender (14) from cell cup (5).
 - (b) If reading was too high, push or tap white insert (16) into range extender (14) body.
 - (c) If reading was too low, twist and pull white insert (16) out of range extender (14) body.
 - (d) Insert range extender (14) into cell cup, seating the O-ring seal (15).
 - (e) Press button (9). Pointer (3) should be at 3 ± 0.1 on scale, if not, repeat (a) through (e) as necessary.
- (6) Discard solution and flush the cell cup (5) and range extender (14) with demineralized or distilled water. Discard wash water. Thoroughly dry cell cup.
- f. Replace any supplies used during testing.
- g. Carefully pack all equipment and supplies into case. Close and latch the case.

2-10. OPERATION OF TURBIDITY TEST SET.

- a. Open case and carefully remove equipment and supplies as needed. Note location for repacking.

NOTE

An indent is provided on probe to align and secure deflector cone thumb screw.

- b. Set up the meter.

- (1) Remove protective cover (1) and attach deflector cone (2) onto probe (3) secure into indent with thumb screw (4).
(2) Connect probe (3) lead to turbidity meter (5).

CAUTION

Observe correct polarity when installing battery. Incorrect connection can damage the equipment.

Do not use AC to DC adapter if a battery is installed in meter. Damage to the battery or adapter can result.

- (3) Connect AC to DC adapter (6) or remove four screws (7) and back cover (8), install a battery (9), and attach back cover onto turbidity meter (5) as appropriate.

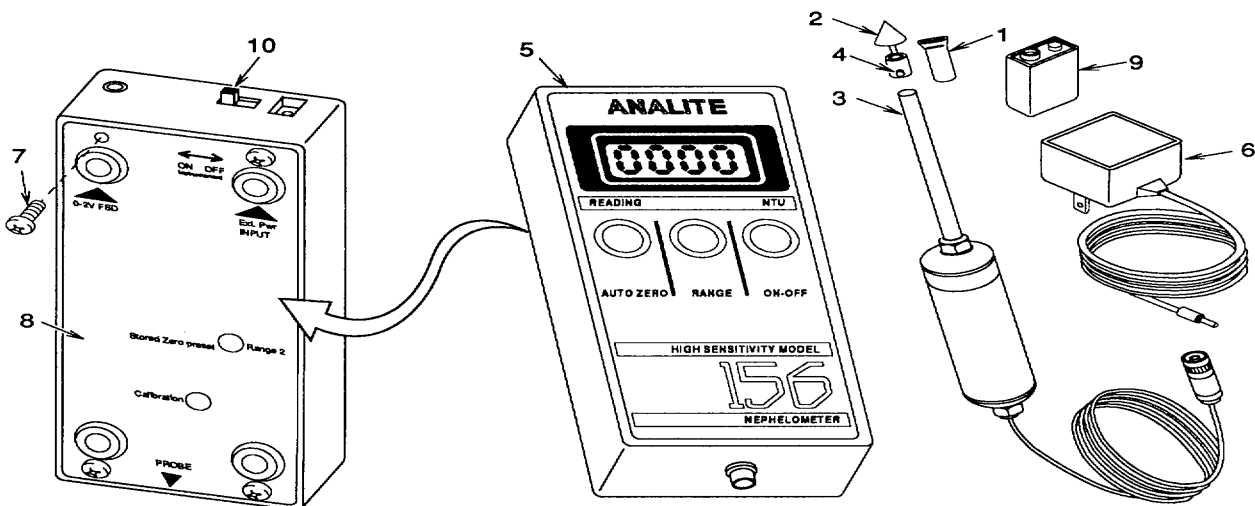


Figure 2-8. Turbidity Test Set

2-10. OPERATION OF TURBIDITY TEST SET. - continued

NOTE

ON-OFF switch located on top of turbidity meter should always be left in ON position. Calibration information stored in meter will be lost if switch is turned OFF.

- (4) Check that ON-OFF switch (10) located on top of turbidity meter (5) is in ON position.
- c. Calibrate the meter.

NOTE

The turbidity meter is equipped with an auto shutoff feature that will activate after meter is idle for 8 minutes. No settings will be lost if this happens and pressing the ON-OFF keypad will turn the meter back on.

If the meter does not function per the following procedures, see troubleshooting.

- (1) Press ON-OFF keypad (1) to turn on the meter (2). Allow the display to stabilize for 3 to 5 minutes.
- (2) Rinse beaker (3) three times with demineralized or distilled water and dry thoroughly.
- (3) Empty bottle of 0.5 NTU standard solution (4) into beaker (3).

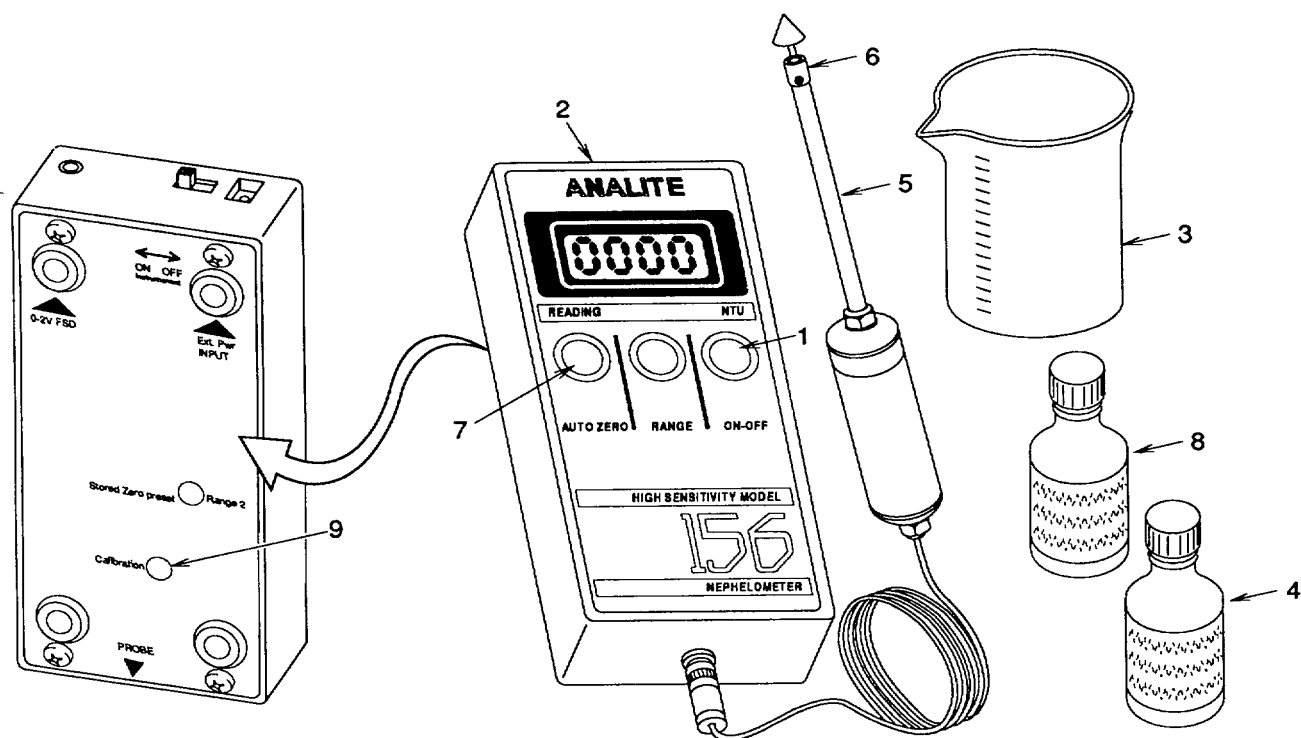


Figure 2-9. Turbidity Meter Adjustment

NOTE

Immerse probe into solutions at an angle to avoid trapping air bubbles under tip which would affect readings. Cone assembly must be completely immersed.

(4) Completely immerse probe (5) tip and cone assembly (6) into beaker (3) solution. Tip beaker if necessary.

(5) With probe (5) tip and cone assembly (6) immersed, press the AUTO ZERO keypad (7) and hold until display indicates -1 then release and note display value. Repeat until lowest value is reached. Display must indicate less than 1.

(6) Remove the probe (5) and lightly tap excess solution from tip. Let dry completely.

NOTE

Standard solution can be reused if not contaminated.

(7) Discard or return standard solution to original container.

(8) Rinse beaker (3) with demineralized or distilled water and dry thoroughly.

(9) Empty bottle of 60 NTU standard solution (8) into beaker (3).

NOTE

Immerse probe into solutions at an angle to avoid trapping air bubbles under tip which would affect readings. Cone assembly must be completely immersed.

(10) Completely immerse probe (5) tip and cone assembly (6) into beaker (3) solution. Tip beaker if necessary.

(11) Meter (2) should stabilize at a reading of 60 ± 3 NTU's, if not, remove plug (9) and adjust potentiometer until 60 is displayed.

(12) Remove the probe (5) and rinse with demineralized or distilled water. Lightly tap excess water from tip and let dry completely.

NOTE

Standard solution can be reused if not contaminated.

(13) Discard or return standard solution to original container. Rinse beaker (3) with demineralized or distilled water and dry thoroughly.

(14) Install plug (9) if removed.

NOTE

Calibration information stored in meter will be lost if power is disconnected or if ON/OFF switch, located on top of meter, is turned OFF.

(15) Press ON/OFF keypad (1) to turn off the meter.

2-10. OPERATION OF TURBIDITY TEST SET. - continued I

d Test for turbidity.

NOTE

The turbidity meter is equipped with an auto shutoff feature that will activate after meter is idle for 8 minutes. No settings will be lost if this happens and pressing the ON-OFF keypad will turn the meter back on. If power has been disconnected from meter or ON-OFF switch, located on top of meter, has been turned OFF, calibration will have to be repeated prior to testing.

If the meter does not function per the following procedures, see troubleshooting.

- (1) Press ON-OFF keypad (1) to turn on the meter. Allow the display to stabilize for 3 to 5 minutes.

NOTE

Immerse probe into solutions at an angle to avoid trapping air bubbles under tip which would affect readings. Cone assembly must be completely immersed.

- (2) Fill beaker (2) to a depth of at least 3 in. (7.6 cm) with water to be tested and completely immerse probe
- (3) tip and cone assembly (4).

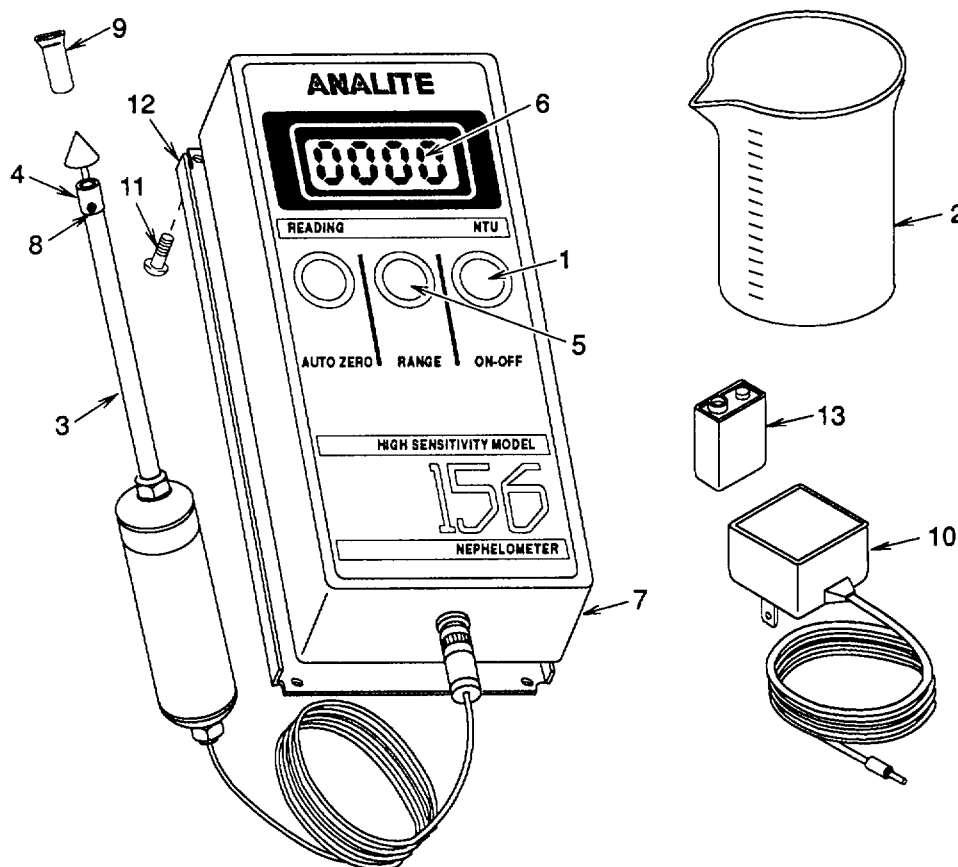


Figure 2-10. Turbidity Test

- (3) Press RANGE keypad (5) until best range is selected.
- (4) Reading is given directly in Nephelometric Turbidity Units on digital display (6).
- (5) Press ON-OFF keypad (1) to turn meter off.
- (6) Discard water and thoroughly rinse beaker (2) and any other equipment used with demineralized or distilled water.
- (7) Disconnect probe (3) from meter (7).
- (8) Loosen thumb screw (8) and remove deflector cone (4) from probe (3). Install protective cover (9) onto probe tip.

NOTE

Calibration information stored in meter will be lost if power is disconnected or if ON- OFF switch, located on top of meter, is turned OFF.

(9) If meter (7) is to be stored for an extended period, disconnect AC to DC adapter (10) or remove four screws (11) and back cover (12), disconnect battery (13), and attach back cover using four screws, as appropriate.

- e. Replace any supplies used during testing.
- f. Carefully pack all equipment and supplies into case. Close and latch the case.

2-11. OPERATION OF pH/TEMPERATURE TEST SET.

- a. Open case and carefully remove equipment and supplies as needed. Note location for repacking.

Table 2-2. pH/Temperature Meter Display and Functions

DISPLAY -	
Operating Mode	Indicates instrument operating mode.
SETUP	Indicates meter is in setup mode. Used to define operating parameters.
CALIBRATE	Indicates the meter is in calibration mode. Accessed by pressing the cal key.
MEASURE	Indicates the meter is in measurement mode, accessed by pressing the measure key.
Main Field	Displays pH readings, electrode slope and other significant information.
ON/OFF	Indicates if a particular feature is active or not in the setup menu.
Lower Field	Displays temperature in degrees Celsius. The °C designation is displayed when temperature is displayed.
AT C	Displayed when a temperature probe is attached.
2nd	Displayed when the 2nd key has been pressed, indicating the meter is ready to perform a second function.
ready	Displayed when the electrode signal has stabilized.
hold	Displayed when the pH reading is frozen after reaching stability in measure mode. The hold feature may be turned on or off in the setup menu.
timer	Displayed when the timer function has been activated.
bat.	Displayed when the battery is low and needs to be replaced.
KEYPAD	
Primary Functions	
yes	Press to enter a value during calibration or setup. May also be used to scroll through the setup menu without changing any parameters.
no	Press to cancel a change to a parameter before entering.
measure	Press for sample analysis. Instrument will remain in measure mode until another key is pressed. Press to unlock hold.
cal	Press to start calibration. Meter automatically advances to measure after the calibration is complete.
2nd	Press to access second functions: timer or setup menu.
↑	Press to increase value.
↓	Press to decrease value.
power	Press to turn meter on or off.

KEYPAD

Second Functions

All second functions are accessed by first pressing
the **2nd** key .

timer	Press to start the timer. When the preset time has elapsed the instrument will beep for 1 minute or until a key is pressed.
setup	Press to access the setup menu. This is used for setting instrument operating parameters.

2-11 . OPERATION OF pH/TEMPERATURE TEST SET. - continued

- b. Be sure shorting plug/cap (1) is attached to pH electrode connector (2).

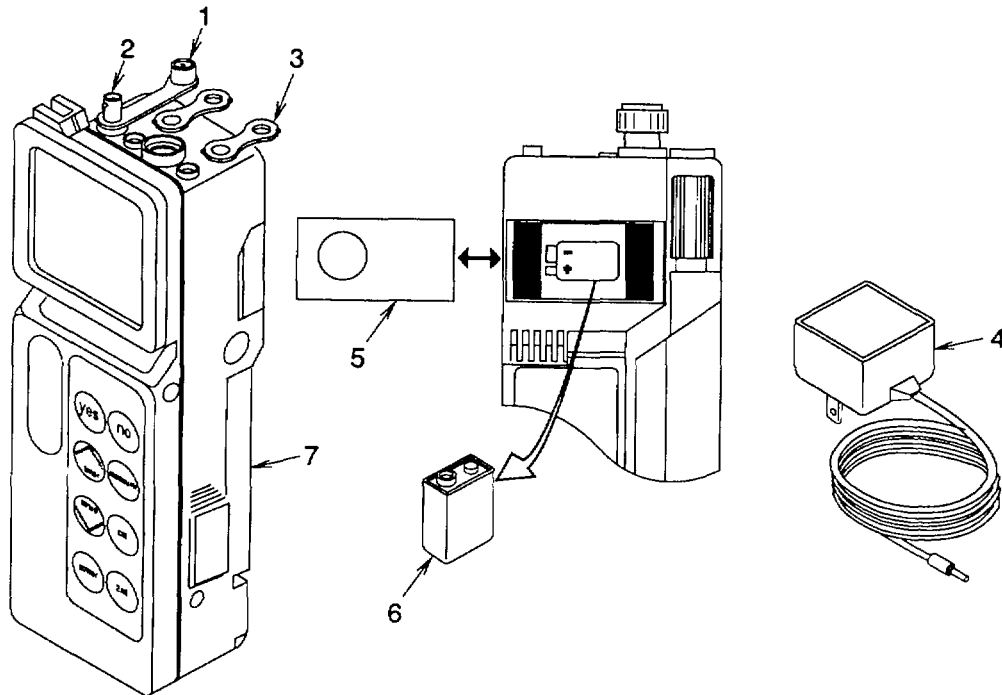


Figure 2-11. pH/Temperature Test Set

CAUTION

Observe correct polarity when installing battery. Incorrect connection can damage the equipment

Do not use AC to DC adapter if a battery is installed in meter. Damage to the battery or adapter can result.

- c. Remove plug (3) and connect AC to DC adapter (4) or remove battery cover (5), install a battery (6) and attach battery cover onto pH/temperature meter (7), as appropriate.

- d Adjust/test the meter.

NOTE

If the meter does not function per the following procedures, see troubleshooting.

Table 2-3 lists and describes self test sequence and error codes.

- (1) Press and hold yes keypad (1) while pressing power keypad (2) to begin self test. Release all buttons.

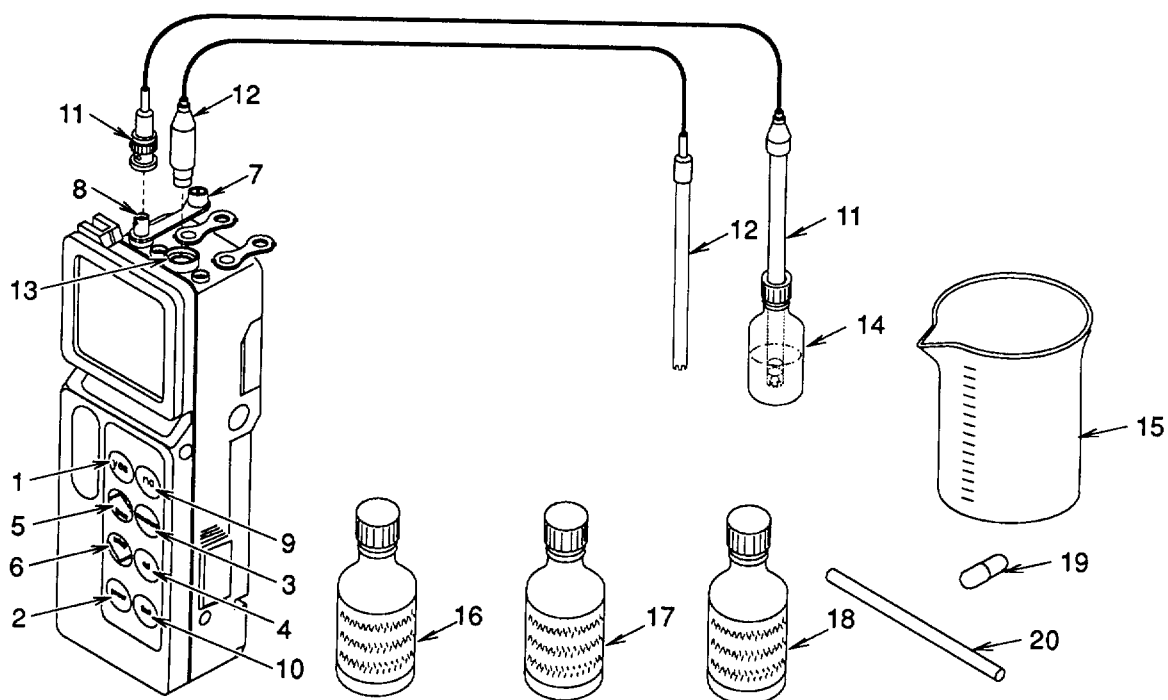


Figure 2-12. pH/Temperature Meter Adjustment

2-11. OPERATION OF pH/TEMPERATURE TEST SET. - continued I

Table 2-3. Self Test Sequence and Error Codes

TEST Number	Section Under Test	Description	Error Code
1	Segment Display	Checks meter display. All segments should be lit.	
2	RAM Check	Checks that external RAM is working properly	E-2
3	External Input	Checks the electrode input (shorting plug must be on connector for this test to check).	E-3
4	Internal Check	Checks the meter internal functions.	E-4
5	Internal Reference	Checks the meter internal reference	E-5
6	Ground Reference	Checks the meter ground.	E-6
7	Keypad Test	Checks the function of the keys as they are pressed.	E-7
8	Auto Shut OFF Test	Checks the automatic shut off feature by turning the meter off.	E-8

(2) If an error code is displayed, note number and press yes keypad (1) to continue test.

(3) When test number 7 is reached, a 0 (zero) is displayed. Within 10 seconds, press each key in any order. The display will show a different number for each key pressed.

NOTE

Test number 8 checks the auto shut off feature and will result in the meter turning off.

(4) Press power keypad (2) to turn meter on.

(5) Press measure keypad (3). Display should be steady at 7.00+.02, if not, adjust as follows.

- (a) Press cal keypad, (4) when the display flashes 7.00, press yes keypad (1).
- (b) Press measure keypad (3). Display should be at 100.0, if not, press T (5) or 1 (6) keypad to change.
- (c) Press yes keypad (1). Display should be at 7.00. Press power keypad (2) to turn meter off.
- (d) Remove shorting plug/cap (7) from pH electrode connector (8).

(6) Check the setup menu and adjust, if needed, as follows.

(a) The setup menu is used to identify and change instrument operating parameters. While in setup the yes keypad (1) is used to scroll through the menu without changing any parameters. To change a parameter, press scroll keypad T (5) or \$ (6), then yes keypad (1) to enter. Pressing no keypad (9) reverts the parameter to its former state (if done before entering the new setting).

(b) Press power keypad (2) to turn meter on.

(c) To enter the setup menu press 2nd keypad (10) then setup keypad (6). 1-1 and ready will be displayed. The ON or OFF indicator will flash indicating the current status. Press yes keypad (1) to accept and continue through the menu. Press scroll keypad t (5) or 1 (6), to change. After changing a setting, press yes keypad to enter.

(d) To change a numeric value, press the T (5) or \$ (6) keypad. The first digit will start flashing, scroll until the first digit is the desired value then press yes keypad (1). The second digit will flash, scroll until the desired value is displayed then press yes keypad. Continue in this manner until all digits have been changed to the desired value.

(e) Scroll through the setup menu accepting or changing parameters as desired. To exit the setup menu press cal keypad (4) to begin the calibration sequence, measure keypad (3) to analyze samples, or power keypad (2) to turn meter off.

(f) The following parameters are accessed in the setup menu.

1 READY: Turning ready on will cause the ready indicator to be displayed when the electrode signal is stable. It is always on during calibration and when hold is turned on. The default setting is on.

2 HOLD: Turning hold on will cause the display to freeze during sample measurements when the electrode signal is stable. Press the measure keypad (3) to unlock hold during analysis. The default setting is off.

3 BEEP: Turning beep on will cause an audible signal to sound when a key is pressed, when the electrode signal is stable (ready), and when an operator assistance code is displayed. The default setting is on.

4 AUTO SHUTOFF: Turning auto shutoff on will cause the meter to turn off if no keys have been pressed for 10 minutes. This feature will save battery life. The default setting is on.

5 SLOPE: Allows review of electrode slope in memory at any time. Value cannot be changed in the setup menu.

6 TIMER INTERVAL: Used to set the timer interval. The maximum interval that can be set is 23 hours, 59 minutes, and 59 seconds. The minimum interval is five seconds. When the timer interval code is displayed, the current interval hours setting is first displayed in the main field (H 00). Press **yes** keypad (1) to accept current setting or scroll to desired value using T1 (5) or 1 (6) keypad then press **yes** keypad to enter. Next the current interval in minutes:seconds will be displayed. Press **yes** keypad to accept or scroll to desired value using T or I keypad then press yes keypad. The default setting is five seconds.

7 TIME REMAINING: Allows review of the time remaining before the timer is set to go off. If the timer has not been activated 00:00 will be displayed.

(7) Connect the pH electrode (11) to connector (8) and temperature probe (12) to connector (13).

2-11. OPERATION OF pH/TEMPERATURE TEST SET. - continued

- e. Calibration procedures. See figure 2-12.

NOTE

A one or two buffer calibration should be performed before pH is measured. It is recommended that a two buffer calibration using buffers that bracket the expected sample range be performed at the beginning of each day to determine the slope of the electrode. This serves the dual purpose of determining if the electrode is working properly and storing the slope value in memory. Perform a one buffer calibration every two hours during operation/testing to compensate for electrode drift.

There are two ways of calibrating the pH/temperature meter; auto calibration which recognizes the buffers 7.00, 4.00, and 10.00 included in the kit or manual calibration for use with buffers other than 7.00, 4.00, and 10.00. The following procedures cover each method.

Table 2-4 lists and describes error codes that may be displayed during calibration and measurement.

If the meter does not function per the following procedures, see troubleshooting.

- (1) Auto calibration with two buffers.

- (a) Loosen cap on storage/soaker bottle (14) and slide bottle off electrode (11). Save for reuse.
- (b) If an air bubble is in electrode (11) tip, shake as you would a clinical thermometer to remove.
- (c) Rinse two beakers (15) three times with demineralized or distilled water.
- (d) Choose either 4.00 (16) and 7.00 (17) or 7.00 and 10.00 (18) buffers, whichever will bracket your expected sample pH range.
- (e) Open one each buffer capsule (19) and dissolve powder in beaker (15) with 3.4 oz (100 ml) demineralized or distilled water. Use two stir rods (20), one for each, if needed.
- (f) Rinse electrode (11) and probe (12) tip in demineralized or distilled water. Shake dry and place into lowest prepared buffer solution.
- (g) Press power keypad (2) to turn meter on.
- (h) While stirring gently, press cal keypad (4), CALIBRATE is displayed above the main readout and P1 is displayed in the lower field. P1 indicates that the meter is ready for the first buffer. When the electrode (11) is stable the ready prompt will be displayed and the temperature corrected pH value for the buffer is displayed. Press yes keypad (1). The display will remain frozen for two seconds then P2 will be displayed in the lower field indicating the meter is ready for the second buffer. Remove electrode and probe (12).

Table 2-4. Calibration and Measurement Error Codes

Error Code	Description	Action/Remedy
E-20	Out of range	<p>If this occurs only when electrode is out of solution being checked, the code should disappear when returned to the solution</p> <p>Check electrode and probe connections to meter.</p> <p>Recalibrate using fresh standard buffer solutions.</p>
E-21	Automatic calibration error	<p>Press any key to reset.</p> <p>Check that proper standard buffer solution is being used.</p> <p>Clean electrode bulb by vigorously stirring in demineralized or distilled water or by squirting water from wash bottle.</p> <p>Recalibrate using fresh standard buffer solution. If error code repeats, replace electrode.</p>
E-22	Calibration standard error. Two of the same standard buffer solutions are being measured.	<p>Press any key to reset.</p> <p>Check that two different standard buffer solutions are being used and the correct one is being measured.</p> <p>Recalibrate using fresh standard buffer solutions.</p>
E-23	Electrode slope is not within 80% to 120% range.	<p>Press any key to reset.</p> <p>Clean electrode bulb by vigorously stirring in demineralized or distilled water or by squirting water from wash bottle.</p> <p>Recalibrate using fresh standard buffer solution. If error code repeats, replace electrode.</p>
E-31	A value has been entered which is not within the acceptable range.	<p>Press any key to reset.</p> <p>Enter a new value. Acceptable values are: pH: -2.00 to +19.999. pH Slope: 80% to 120%. Timer Interval: 5 seconds to 23 hours 59 minutes.</p>

2-11. OPERATION OF pH/TEMPERATURE TEST SET. - continued

NOTE

The hold prompt will be displayed if the electrode remains in the buffer too long after completing calibration. If this happens, press **measure**.

(i) Rinse electrode (11) and probe (12) tip with demineralized or distilled water. Shake dry and place in highest prepared buffer solution. While stirring gently, wait for a stable pH display, indicated by **ready** prompt, and press **yes** keypad (1). SLP appears in the lower field while the actual electrode slope (in percent) appears in the main field. If slope is out of tolerance, an error code will be displayed. The meter will automatically advance to the measure mode with MEASURE displayed above the main field. Remove electrode and probe. Press **power** keypad (2) to turn meter off.

(j) Rinse electrode (11), probe (12), beakers (15), and stir rods (20) if used with demineralized or distilled water.

(k) If storage/soaker bottle (14) is not full, top off with prepared standard pH buffer solution 4.00. Slide storage/soaker bottle onto electrode (11) and tighten cap. Be sure electrode tip is immersed in buffer solution.

(2) Auto calibration with one buffer.

(a) Loosen cap on storage/soaker bottle (14) and slide bottle off electrode (11). Save for reuse.

(b) If an air bubble is in electrode (11) tip, shake as you would a clinical thermometer to remove.

(c) Rinse a beaker (15) three times with demineralized or distilled water.

(d) Choose either 4.00 (16), 7.00 (17), or 10.00 (18) buffer, whichever is closest to your expected sample pH.

(e) Open one buffer capsule (19) and dissolve powder in beaker (15) with 3.4 oz (100 ml) demineralized or distilled water. Use stir rod (20) if needed.

(f) Rinse electrode (11) and probe (12) tip in demineralized or distilled water and place into prepared buffer solution.

(g) Press **power** keypad (2) to turn meter on.

NOTE

The **hold** prompt will be displayed if the electrode remains in the buffer too long after completing calibration. If this happens, press **measure**.

(h) While stirring gently, press **cal** keypad (4), CALIBRATE is displayed above the main readout and P1 is displayed in the lower field. P1 indicates that the meter is ready for the buffer. When the electrode (11) is stable the ready prompt will be displayed and the temperature corrected pH value for the buffer is displayed. Press **yes** keypad (1). The display will remain frozen for two seconds then P2 will be displayed in the lower field. Press **measure** keypad (3). SLP will be displayed in the lower field and the electrode slope, in memory, will be displayed in the main field. Press **yes** keypad. If no slope value is in memory, enter the correct slope determined from a two buffer calibration or 100.0 if unknown and then press yes keypad. Remove electrode and probe (12). Press power keypad (2) to turn meter off.

(i) Rinse electrode (11), probe (12), beaker (15), and stir rod (20) if used with demineralized or distilled water.

(j) If storage/soaker bottle (14) is not full, top off with prepared standard pH buffer solution 4.00. Slide storage/soaker bottle onto electrode (11) and tighten cap. Be sure electrode tip is immersed in buffer solution.

(3) Manual calibration with two buffers.

- (a) Loosen cap on storage/soaker bottle (14) and slide bottle off electrode (11). Save for reuse.
- (b) If an air bubble is in electrode (11) tip, shake as you would a clinical thermometer to remove.
- (c) Rinse two beakers (15) three times with demineralized or distilled water.
- (d) Prepare two buffer solutions that will bracket your expected sample pH range.
- (e) Rinse electrode (11) and probe (12) tip in demineralized or distilled water. Shake dry and place into lowest prepared buffer solution.
- (f) Press power keypad (2) to turn meter on.
- (g) While stirring gently, press cal keypad (4), CALIBRATE is displayed above the main readout and P1 is displayed in the lower field. P1 indicates that the meter is ready for the first buffer. When the electrode (11) is stable the ready prompt will be displayed and a temperature corrected pH value for the buffer is displayed. Press the ? (5) or 1 (6) keypad, the first digit will start flashing. Scroll until the correct first digit value for the buffer appears, press yes keypad (1). The second digit will start flashing. Scroll until the correct second digit value for the buffer appears, press yes keypad. Continue until all digits have been correctly entered. The display will remain frozen for two seconds then P2 will be displayed in the lower field indicating the meter is ready for the second buffer. Remove electrode and probe (12).

NOTE

The **hold** prompt will be displayed if the electrode remains in the buffer too long after completing calibration. If this happens, press **measure**.

(h) Rinse electrode (11) and probe (12) tip with demineralized or distilled water. Shake dry and place in highest prepared buffer solution. While stirring gently, wait for a stable pH display, indicated by **ready** prompt. Press the T (5) or ,1 (6) keypad, the first digit will start flashing. Scroll until the correct first digit value for the buffer appears, press yes keypad (1). The second digit will start flashing. Scroll until the correct second digit value for the buffer appears, press yes keypad. Continue until all digits have been correctly entered. SLP appears in the lower field while the actual electrode slope (in percent) appears in the main field. If slope is out of tolerance, an error code will be displayed. The meter will automatically advance to the measure mode with MEASURE displayed above the main field. Remove electrode and probe. Press **power** keypad (2) to turn meter off.

- (i) Rinse electrode (11), probe (12), beakers (15), and stir rods (20) if used with demineralized or distilled water.

(j) If storage/soaker bottle (14) is not full, top off with prepared standard pH buffer solution 4.00. Slide storage/soaker bottle onto electrode (11) and tighten cap. Be sure electrode tip is immersed in buffer solution.

(4) Manual calibration with one buffer.

- (a) Loosen cap on storage/soaker bottle (14) and slide bottle off electrode (11). Save for reuse.
- (b) If an air bubble is in electrode (11) tip, shake as you would a clinical thermometer to remove.
- (c) Rinse a beaker (15) three times with demineralized or distilled water.
- (d) Prepare a buffer solution that is nearest your expected sample pH range.
- (e) Rinse electrode (11) and probe (12) tip in demineralized or distilled water. Shake dry and place into prepared buffer solution.
- (f) Press **power** keypad (2) to turn meter on.

2-11. OPERATION OF pH/TEMPERATURE TEST SET. - continued

NOTE

The **hold** prompt will be displayed if the electrode remains in the buffer too long after completing calibration. If this happens, press measure.

(g) While stirring gently, press cal keypad (4), CALIBRATE is displayed above the main readout and P1 is displayed in the lower field. P1 indicates that the meter is ready for the first buffer. When the electrode (11) is stable the ready prompt will be displayed and a temperature corrected pH value for the buffer is displayed. Press the \uparrow (5)

or

\downarrow (6) keypad, the first digit will start flashing. Scroll until the correct first digit value for the buffer appears, press yes keypad (1). The second digit will start flashing. Scroll until the correct second digit value for the buffer appears, press yes keypad. Continue until all digits have been correctly entered. The display will remain frozen for two seconds then P2 will be displayed in the lower field. Press measure keypad (3). SLP will be displayed in the lower field and the electrode slope, in memory, will be displayed in the main field. Press yes keypad. If no slope value is in memory enter the correct slope determined from a two buffer calibration or 100.0 if unknown and then press yes keypad. Remove electrode and probe (12). Press power keypad (2) to turn meter off.

(h) Rinse electrode (11), probe (12), beakers (15), and stir rods (20) if used with demineralized or distilled water.

(i) If storage/soaker bottle (14) is not full, top off with prepared standard pH buffer solution 4.00. Slide storage/soaker bottle onto electrode (11) and tighten cap. Be sure electrode tip is immersed in buffer solution.

f. Testing procedures.

(1) Loosen cap on storage/soaker bottle (1) and slide bottle off electrode (2). Save for reuse.

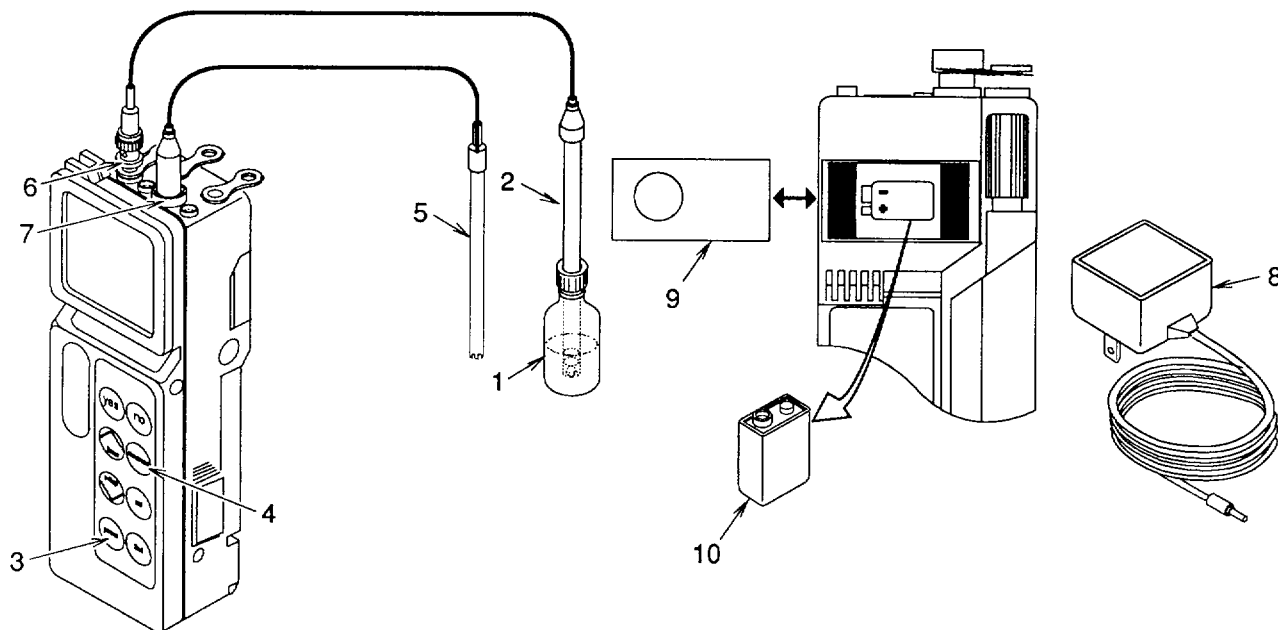


Figure 2-13. pH/Temperature Test

(2) If an air bubble is in electrode (2) tip, shake as you would a clinical thermometer to remove.

(3) Press power keypad (3) to turn meter on.

(4) Press measure keypad (4).

(5) Rinse electrode (2) and probe (5) tip with sample of water being tested. Discard sample.

(6) Immerse electrode (2) and probe (5) into new sample of water being tested. Gently stir electrode and probe in sample and read pH and temperature direct from display when hold prompt is displayed. Press measure keypad (4) for additional readings.

(7) Press power keypad (3) to turn meter off and remove electrode (2) and probe (5) from sample. Rinse each with demineralized or distilled water.

(8) If storage/soaker bottle (1) is not full, top off with prepared standard pH buffer solution 4.00. Slide storage/soaker bottle onto electrode (2) and tighten cap. Be sure electrode tip is immersed in buffer solution.

(9) Disconnect electrode (2) and probe (5) from connectors (6) and (7).

(10) Discard water sample and solutions. Thoroughly rinse all collection bottles and equipment with demineralized or distilled water.

(11) If meter is to be stored for an extended period, disconnect AC to DC adapter (8) or remove battery cover (9), disconnect battery (10), and attach battery cover as appropriate.

g. Replace any supplies used during testing.

h. Carefully pack all equipment and supplies into case. Close and latch the case.

2-12. OPERATION OF COLOR COMPARATOR.

a. Open case and carefully remove equipment and supplies as needed. Note location for repacking.

NOTE

The color comparator does not require any adjustment or testing prior to use.

b. Unlatch and open carrying case (1) cover. Remove comparator housing (2) and eyepiece (3). Fit eyepiece onto housing. See figure 2-14.

(1) Perform the pH test.

(a) Remove color disk (4) (pH) and insert into housing (2). Numbers must be visible through indicator window (5).

(b) Rinse two comparator cells (6) and (7) three times with water being tested.

(c) Fill two comparator cells (6) and (7) as indicated up to mark 0.51 oz (15ml) with water to be tested and insert into housing (2).

(d) Fill the dropper (8) of the wide range indicator solution (9) to mark 0.169 oz (0.50ml) with solution.

(e) Add the wide range indicator solution from the dropper (8) to the comparator cell (7) on the left. Use sufficient force to mix solution.

2-12. OPERATION OF COLOR COMPARATOR. - continued

(f) Hold the comparator housing (2) up and look through the eyepiece (3). Face a good light source (daylight, but not the direct rays of the sun, or artificial light reflected from a white surface). Be sure your fingers do not cover the light window in the back of the comparator housing. Rotate the color disc (4) until a color on the disc matches the color of the comparator cell (7) in the left opening. The reading can be made directly from the window (5) in the front of the comparator housing. If color falls between readings, estimate.

(g) Remove comparator cells (6) and (7) from comparator housing (2) and discard water samples and solutions. Thoroughly rinse all equipment with demineralized or distilled water.

(2) Perform chlorine residual test.

(a) Remove color disk (10) (Chlorine) and insert into housing (2). Numbers must be visible through indicator window (5).

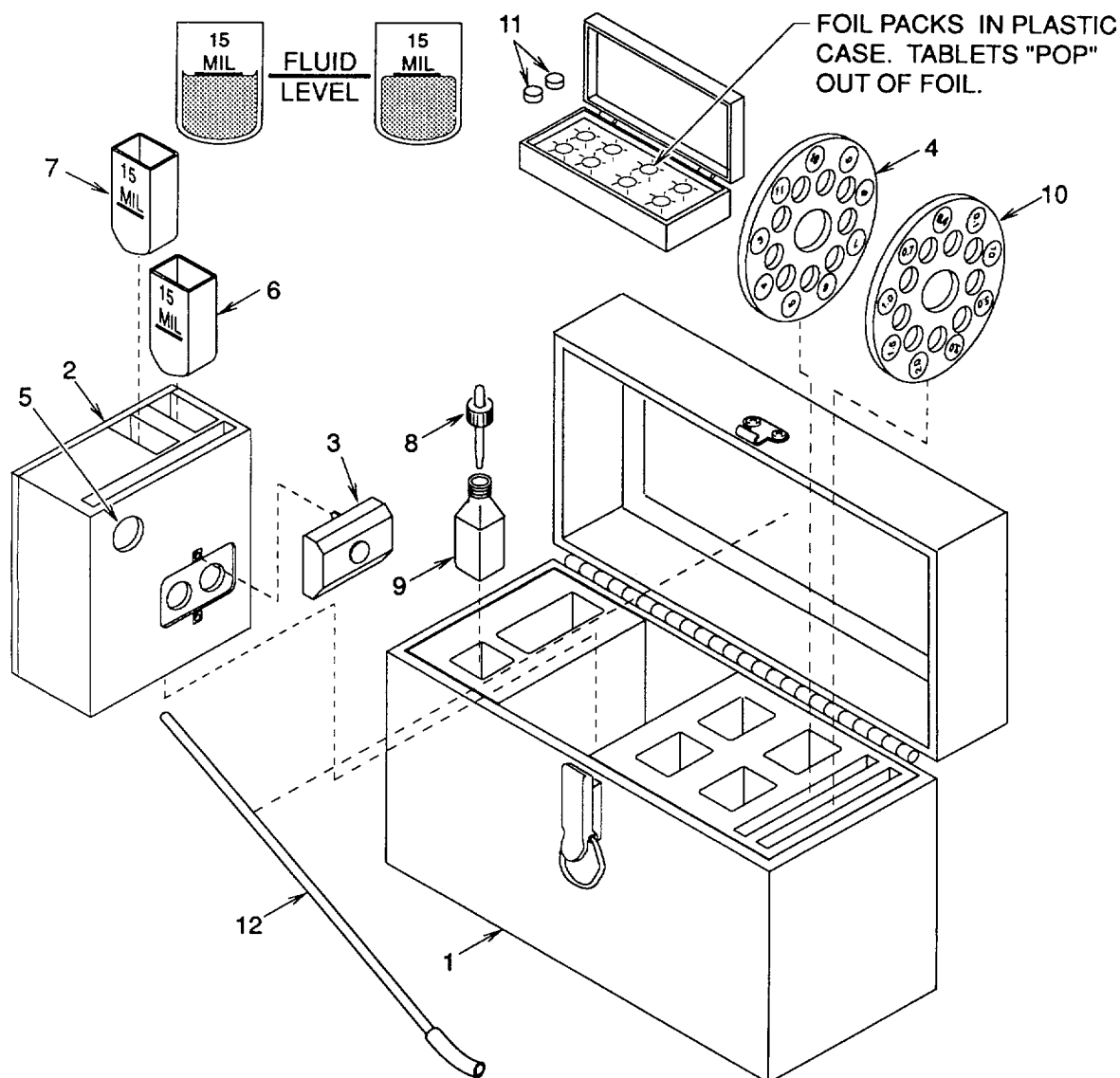


Figure 2-14. pH/Chlorine Test

- (b) Rinse two comparator cells (6) and (7) three times with water being tested.
- (c) Fill the first comparator cell (6) as indicated up to mark 0.51 oz (15ml) with water to be tested.

WARNING

DPD no. 1 chlorine test tablets are irritating to eyes, respiratory tract, and may cause allergic skin reaction. Provide ventilation when handling and wear safety glasses and gloves.

CAUTION

Comparator cells are fragile. Care must be taken when crushing DPD no. 1 tablets.

NOTE

Chlorine test must be performed rapidly once tablets are mixed with water.

(d) Put a small amount of water from the first comparator cell (6) into a second comparator cell (7) and add two DPD no. 1 chlorine tablets (11) to second comparator cell (7). Crush tablets with plastic rod (12) to dissolve. Pour remaining water from the first comparator cell (6) into the second comparator cell (7) and insert into left slot in housing (2).

(e) Refill first comparator cell (6) as indicated up to mark 0.51 oz (15ml) with water to be tested and insert into right slot in housing (2).

(f) Hold the comparator housing (2) up and look through the eyepiece (3). Face a good light source (daylight but not the direct rays of the sun, or artificial light reflected from a white surface). Be sure your fingers do not cover the light window in the back of the comparator housing. Rotate the color disc (10) until a color on the disc matches the color of the comparator cell (7) in the left opening. The reading can be made directly from the window (5) in the front of the comparator housing. If color falls between readings, estimate.

(g) Remove comparator cells (6) and (7) from comparator housing (2) and discard water samples and solutions. Thoroughly rinse all equipment with demineralized or distilled water.

(4) Remove eyepiece (3) and color disk (4) or (10) from housing (2) and carefully pack all equipment back into carrying case (1). Close and latch cover.

c. Replace any supplies used during testing.

d. Carefully pack all equipment and supplies into case. Close and latch the case.

2-13. OPERATION OF CHEMICAL AGENTS WATER TESTING KIT.

See TM 3-6665-319-10. Be sure to observe all warnings and special medical information in appendix E of TM 3-6665-319-10

2-14. INFORMATION PLATES.

The identification plate is attached to the exterior top of the case. The two sided instruction plate is secured to the inside of the case by a chain.

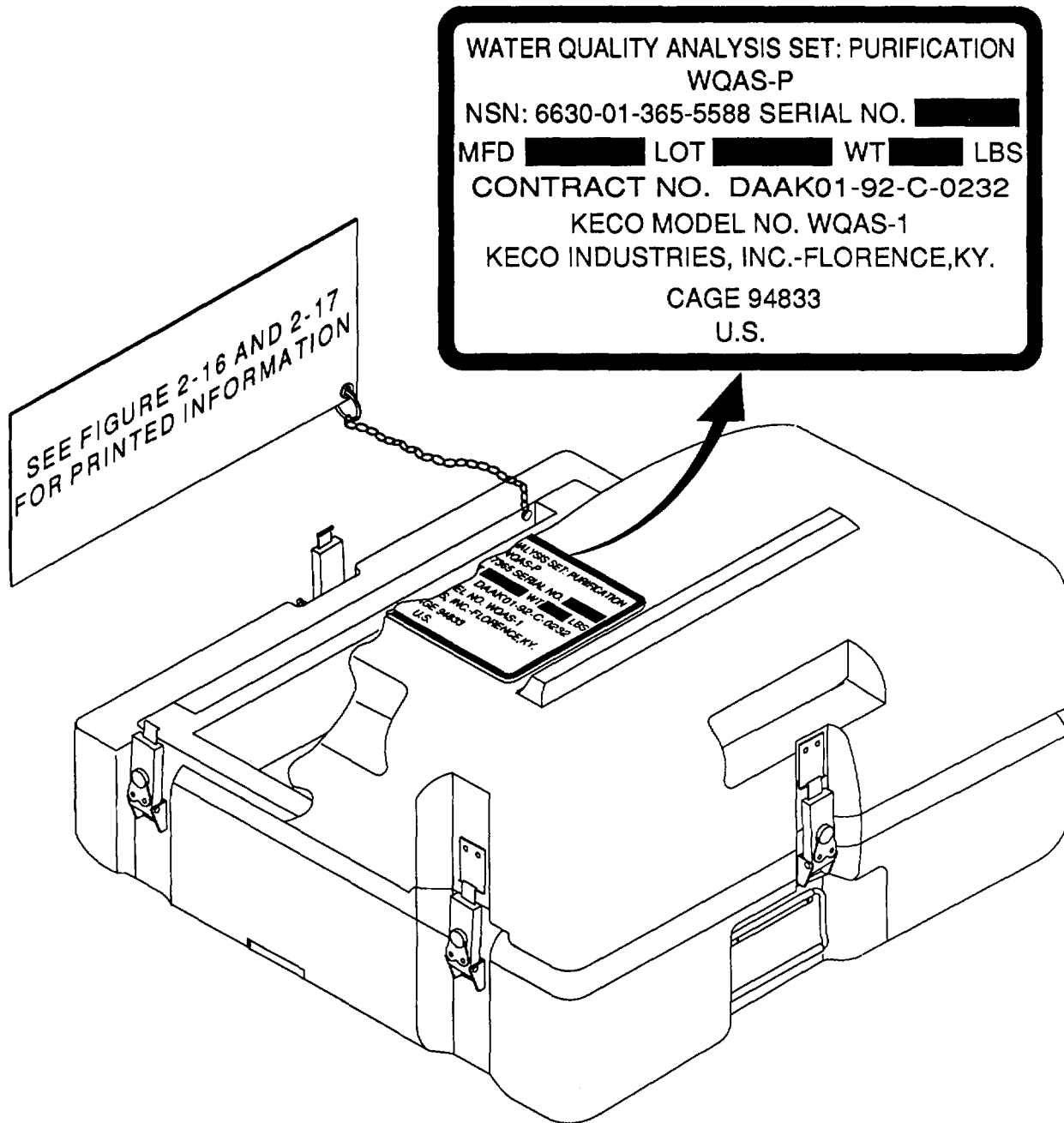


Figure 2-15. Instruction Plates and Marking



ABBREVIATED CALIBRATION AND OPERATION PROCEDURES FOR THE WATER QUALITY ANALYSIS SET - PURIFICATION (WQAS-P)

THESE PROCEDURES ARE A READY REFERENCE IN ABBREVIATED FORM. FULL
DETAILS ARE FOUND IN THE ACCOMPANYING TECHNICAL MANUAL.

EQUIVALENT TEMPERATURE CHART CELSIUS AND FAHRENHEIT				pH METER CALIBRATION		TOTAL DISSOLVED METER CALIBRATION	TURBIDITY METER CALIBRATION
C	F	C	F	O CONNECT ATC AND pH PROBES. O VERIFY ISO = 7 OR SCROLL TO 7 TWO BUFFERS O SELECT pH RANGE WITH MODE . O PLACE ELECTRODES IN 1ST BUFFER AND PRESS CAL . O WAIT FOR STABLE pH DISPLAY O IF INCORRECT, SCROLL TO CORRECT VALUE. O PRESS ENTER . O WHEN DISPLAY ADVANCES TO 2, RINSE ELECTRODES AND PLACE IN 2ND BUFFER AND PRESS ENTER . O PRESS SAMPLE . METER READY.		O CALIBRATION CHECK. CHECK OR SET S VALUE FOR FRESH OR SALT WATER MEASURE STANDARD SOLUTION. IF METER READS CORRECT, PUT IN USE. IF VALUE NOT SAME AS CALIBRATION STANDARD, RECALIBRATE. O RECALIBRATION. CALIBRATION ADJUSTMENT INSIDE BOTTOM COVER. ADJUST MASTER CALIBRATION CONTROL UNTIL METER INDICATES VALUE OF STANDARD SOLUTION.	O CALIBRATION WITH REFERENCE SOLUTION. TURN INSTRUMENT ON AND STABILIZE. CONNECT PROBE AND DEFLECTOR CONE. SELECT LOW RANGE . WASH WITH CLEAN WATER. INSERT IN DEIONIZED WATER OR 0.5 NTU STANDARD. PRESS AUTO ZERO . REPEAT AS NECESSARY FOR BEST VALUE. REMOVE PROBE, WASH AND DRY. CHECK 60 NTU SOLUTION. IF VALUE ACCEPTABLE, PROCEED TO MAKE MEASUREMENTS. IF VALUE UNACCEPTABLE, REFER TO MANUAL FOR DETAILED ADJUSTMENTS.
0	32	21	69.8	ONE BUFFER O VERIFY SLOPE OR ENTER 100 O PLACE ELECTRODES IN BUFFER. O PRESS CAL . IF VALUE INCORRECT SCROLL TO CORRECT VALUE AND PRESS ENTER THEN SAMPLE . O CALIBRATION COMPLETE. pH METER OPERATION O pH MEASUREMENTS. RINSE ELECTRODES WITH DEIONIZED WATER OR EXCESS SAMPLE. SHAKE GENTLY. IMMERSE INTO SAMPLE. PRESS SAMPLE . RECORD VALUE. O SECURE pH METER AFTER USE. ON/OFF SWITCH OFF. DISCONNECT pH AND ATC PROBES. RINSE AND STORE IN DESIGNATED CUTOUPS. O DISPOSE OF BUFFER SOLUTIONS AS DESCRIBED IN MATERIAL SAFETY DATA SHEETS.			
1	33.8	22	71.6				
2	35.6	23	73.4				
3	37.4	24	75.2				
4	39.2	25	77				
5	41	26	78.8				
6	42.8	27	80.6				
7	44.6	28	82.4			TOTAL DISSOLVED METER OPERATION O MEASUREMENTS. CHECK AND SET S VALUE FOR SALT OR FRESH WATER. RINSE CUP THREE TIMES WITH TEST SAMPLE AND FILL. PRESS BLACK BUTTON ON FRONT PANEL. IF OFF SCALE, SWITCH TO HIGHER RANGE. READ POINTER DIAL VALUE AND MULTIPLY BY RANGE VALUE TO GET TDS IN PARTS PER MILLION (PPM). O TEMPERATURE COMPENSATION. IF SAMPLES ARE EXTREMELY HOT OR COLD, LET SAMPLE REMAIN IN CUP THIRTY SECONDS FOR THERMAL STABILIZATION BEFORE TAKING MEASUREMENTS. O STORAGE. RINSE WITH CLEAN WATER SHAKE OFF EXCESS WATER AND STORE IN ITS COMPARTMENT.	TURBIDITY METER OPERATION O MEASUREMENTS. ASSEMBLE WITH PROBE AND CONE. CALIBRATE IF NECESSARY. INSERT IN CLEAN WATER AND PRESS AUTO ZERO . INSERT IN SAMPLE AND READ VALUE. IF OFF SCALE, PRESS RANGE BOTTOM FOR HIGHER RANGE. O STORAGE. ON/OFF SWITCH TO OFF. REMOVE CONE AND PROBE AND SECURE. FOR EXTENDED PERIODS OF STORAGE REMOVE BATTERY.
8	46.4	29	84.2				
9	48.2	30	86				
10	50	32	89.6				
11	51.8	34	93.2				
12	53.6	36	96.8				
13	55.4	38	100.4				
14	57.2	40	104				
15	59	42	107.6				
16	60.8	44	111.2				
18	66.2	46	114.8				
20	68	48	118.4				

NOTE: SEE MATERIAL SAFETY DATA SHEET FOR THE PROPER METHODS FOR DISPOSAL OF CHEMICALS.

Figure 2-16. Instruction Plate, Front

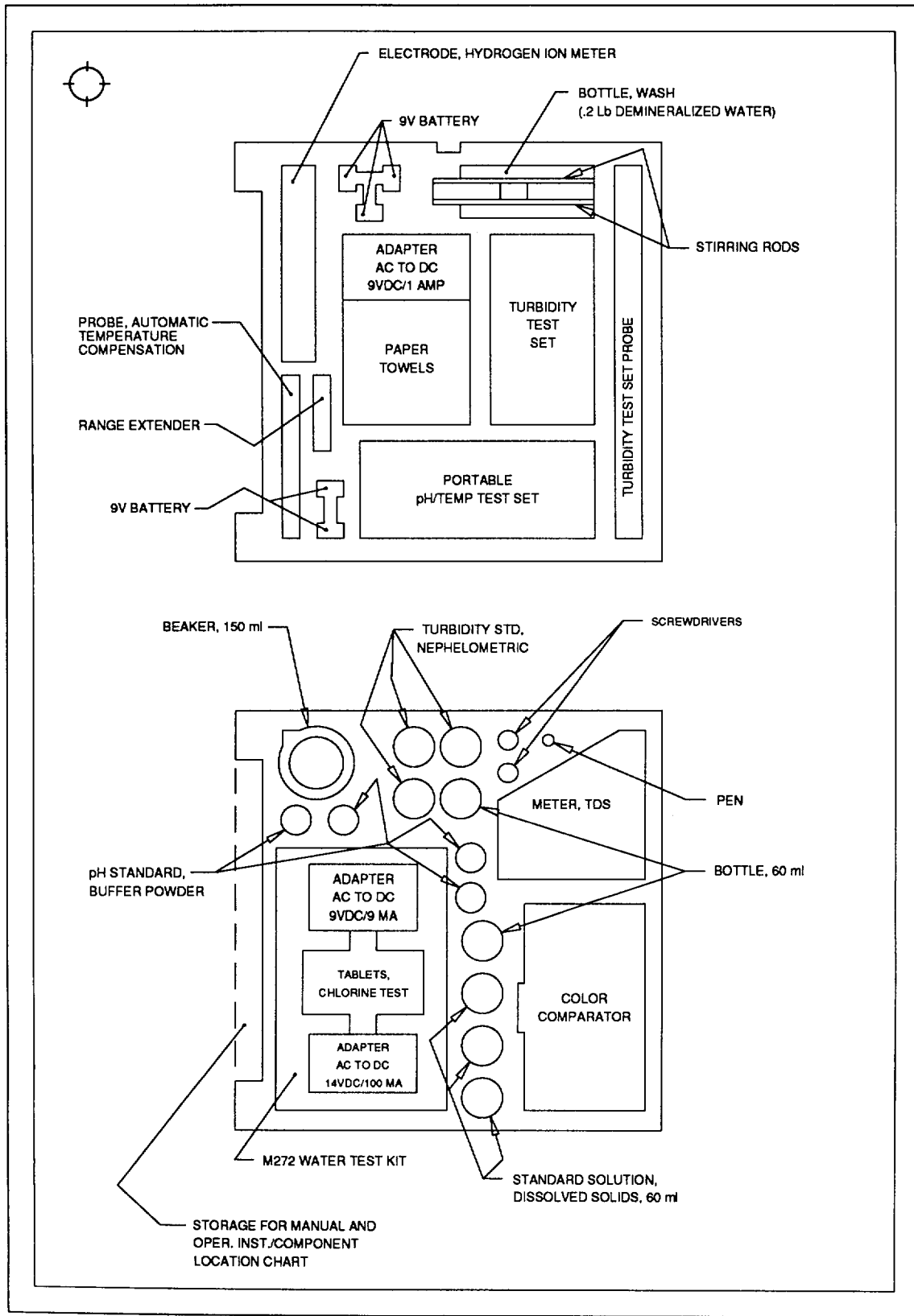


Figure 2-17. Instruction Plate, Rear

Section V. OPERATION UNDER UNUSUAL CONDITIONS

2-15. EXTREME COLD.

CAUTION

The following items contained in this kit must be removed and protected from temperatures below 32°F (0°C):

Three bottles TDS/conductivity standard solution. Three bottles NTU primary standard. One bottle wide range pH indicator solution. One bottle demineralizer resin. One pH electrode.

These chemicals can be rendered useless and equipment damaged if allowed to freeze.

All tests must be performed with equipment and samples above 32°F (0°C).

2-16. EXTREME HEAT.

All tests must be performed with equipment and samples below 125°F (51.70C).

2-17. DUSTY OR SANDY ENVIRONMENT.

- a. Keep equipment in closed case or covered until ready to use.
- b. Use cover (coat, blanket, etc.) if possible to protect test area.
- c. Keep test equipment, water samples, and solutions as clean as possible during and between tests. Keep lids tightly closed and open only when needed. Cover beakers when in use.

2-18. SALT AIR OR SEA SPRAY.

- a. Salt presents a serious corrosion problem and all equipment coming in contact with salt water or salt fog should be flushed or sponged with fresh clean water as soon as possible then dried thoroughly.
- b. During tests, be careful not to contaminate samples or solutions with any salt water or spray. Perform tests as quickly as possible and clean equipment thoroughly between steps.

2-19. UNCONTROLLED FIELD CONDITIONS.

- a. When demineralized or distilled water is not available, use cleanest water available (drinking water, clear stream, etc.) to fill the wash bottle containing demineralized resin.
- b. Use water from wash bottle whenever demineralized or distilled water is called for to clean equipment and prepare test solutions.
- c. Test wash bottle water periodically to check effectiveness of demineralized resin. Test water using total dissolved solids meter. A reading above 750 PPM (750 mg/l) indicates that the demineralized resin is no longer effective and that the wash bottle must be replaced.

2-20. ELECTROMAGNETIC PULSE (EMP) ENVIRONMENT.

- a. Keep all electronic equipment in its proper place inside the case, keep closed and latched.
- b. Remove the electronic equipment from the case only when and if it is absolutely necessary and return it as soon as possible.

2-21. NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) DECONTAMINATION.

NOTE

Detailed decon procedures can be found in: FM 3-3, FM 3-4, and FM 3-5.

- a. General: The following emergency procedures can be performed until field NBC decon facilities are available.
- b. Emergency Procedures: If NBC attack is known or suspected, mask at once and continue mission. If outside, follow decon procedures below to avoid taking contamination into controlled area. Do not unmask until told to do so.
 - (1) Nuclear decontamination: Brush fallout from skin, clothing, and equipment with available brushes, rags, and tree branches. Wash skin and have radiation check made as soon as tactical situation permits.
 - (2) Biological decontamination: Remain masked and continue mission until told to unmask.
 - (3) Chemical detection and decontamination:

WARNING

Do not use decontamination spray on personnel. It could cause personal injury.

- (a) Use M8 paper from the M256 Chemical Agent Detector Kit or M9 paper to determine if liquid agent is present on the equipment or case.
- (b) If exposure to liquid agent is known or suspected, clean exposed skin, clothing, personal gear, and equipment, in that order using M258A1 kit. Use the buddy system. Wash exposed skin and thoroughly decontaminate as soon as tactical situation permits.
- (c) If the M8 or M9 paper indicates that liquid chemical agent is present on the equipment or case, use the NBC-M11 decon apparatus for decon of equipment and case.

CHAPTER 3 OPERATOR MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION INSTRUCTIONS

Lubrication not required.

Section II. TROUBLESHOOTING PROCEDURES

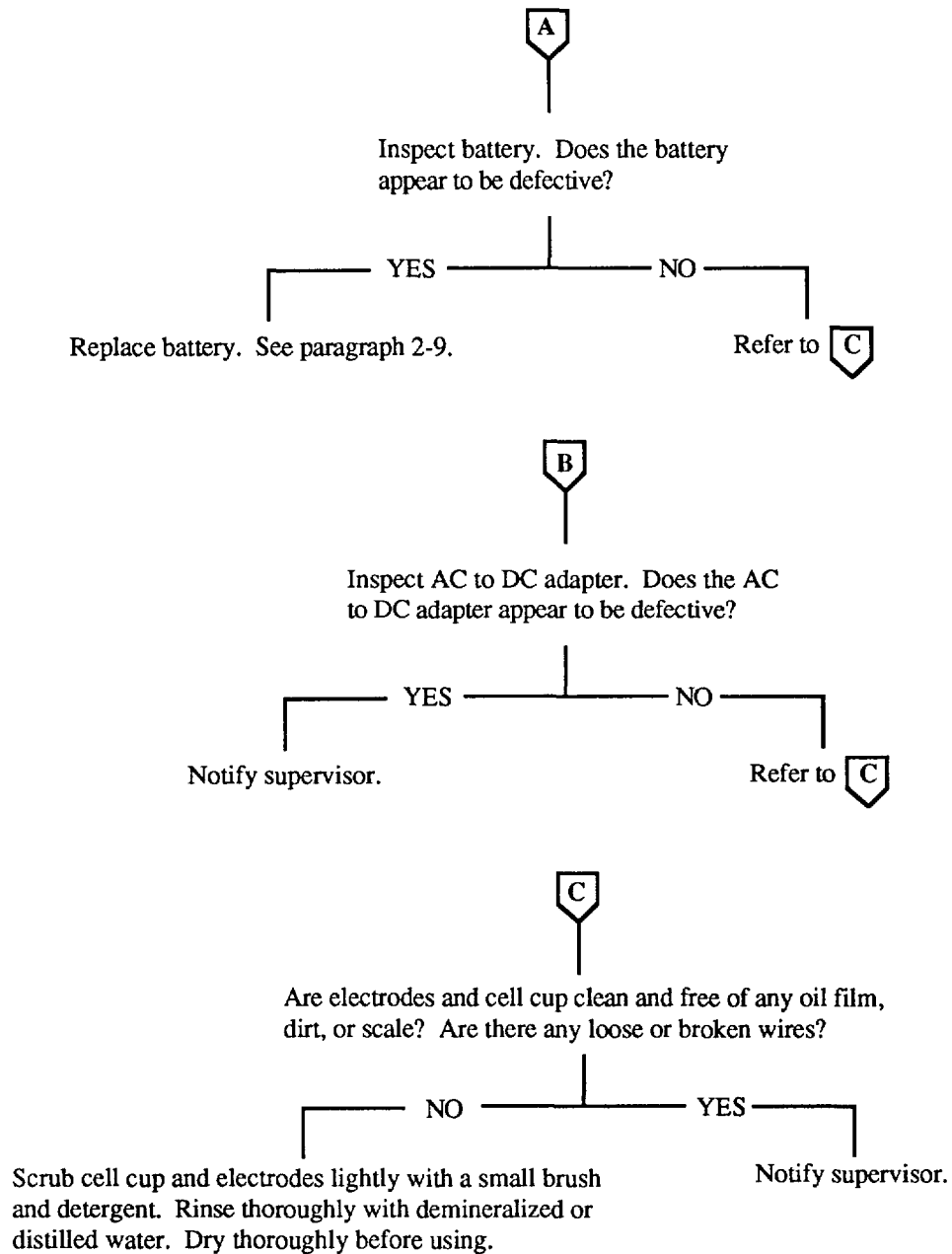
3-1. GENERAL.

The following is a list of common malfunction symptoms that may occur with your equipment. Each symptom is followed by a branching logic tree for troubleshooting. Follow the actions given in the order presented. The following cannot list all the possible symptoms that may occur with your equipment or all the possible branches in each logic tree. If the symptom you are experiencing is not listed or actions given in the logic tree do not correct it, notify your supervisor.

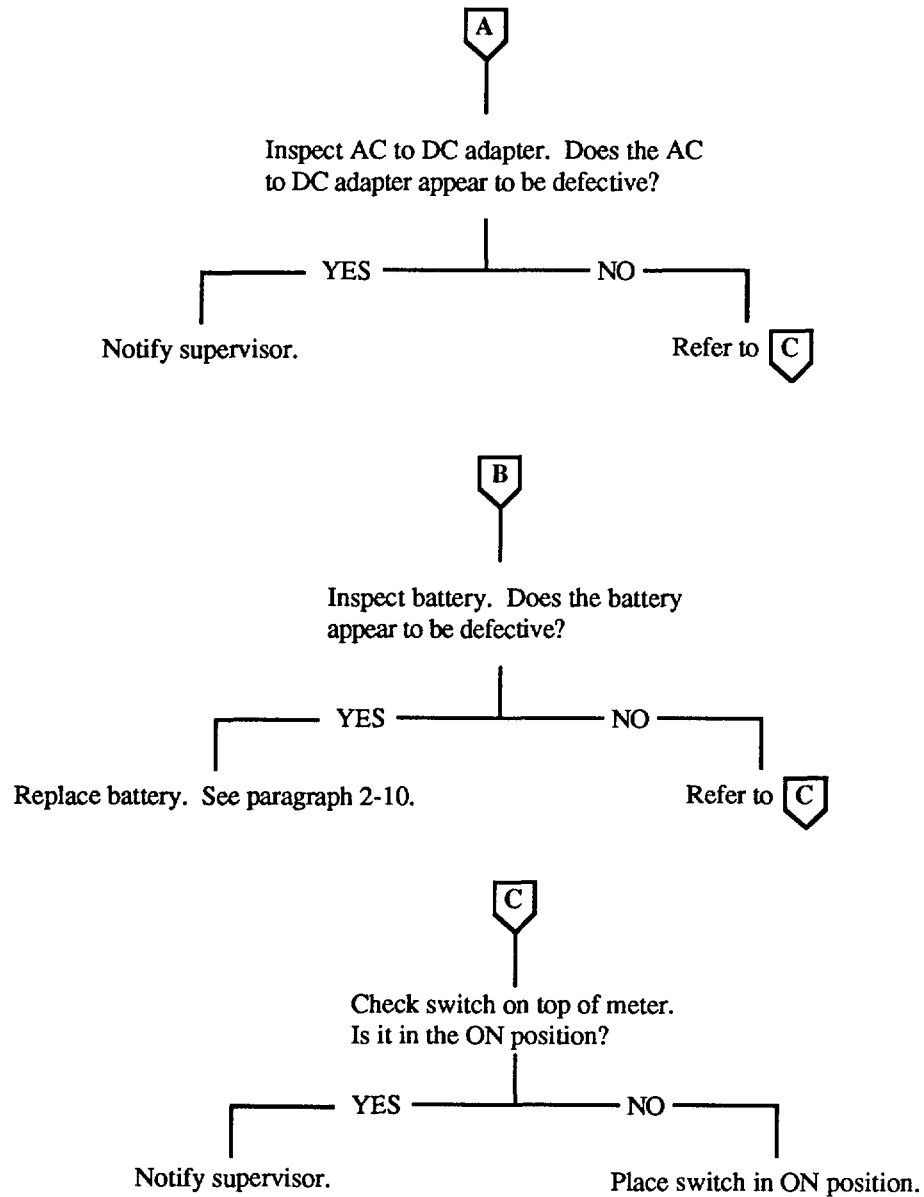
MALFUNCTION INDEX

MALFUNCTION	TROUBLESHOOTING PROCEDURE (PARA)
TOTAL DISSOLVED SOLIDS METER WILL NOT OPERATE OR GIVES ERRATIC READINGS.....	3-2
TURBIDITY METER SHOWS NO DISPLAY WHEN SWITCHED ON	3-3
CANNOT BE "ZEROED"	3-4
pH/TEMPERATURE METER SHOWS NO DISPLAY WHEN SWITCHED ON	3-5
SHOWS ERRATIC OR OUT OF RANGE READINGS ON DISPLAY	3-6

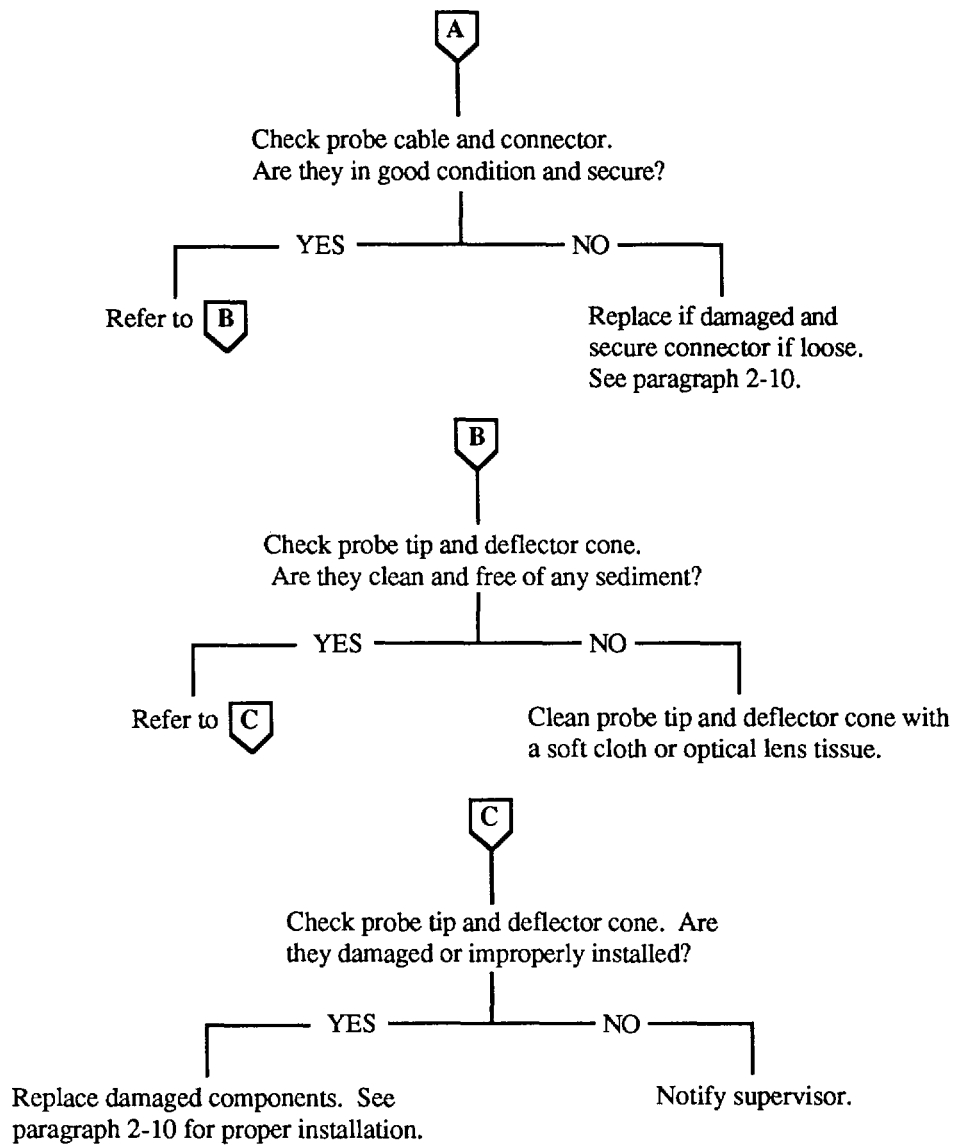
3-2. TOTAL DISSOLVED SOLIDS METER WILL NOT OPERATE OR GIVES ERRATIC READINGS.



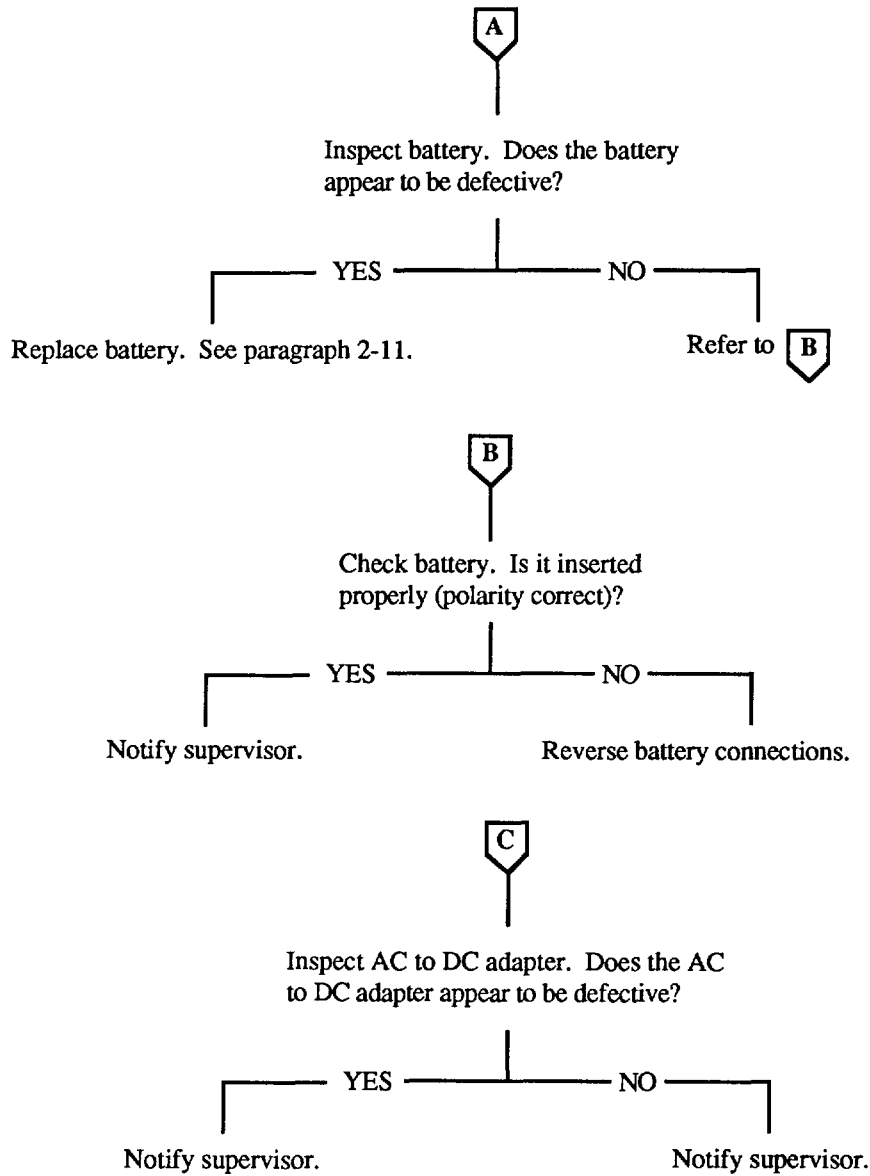
3-3. TURBIDITY METER SHOWS NO DISPLAY WHEN SWITCHED ON.



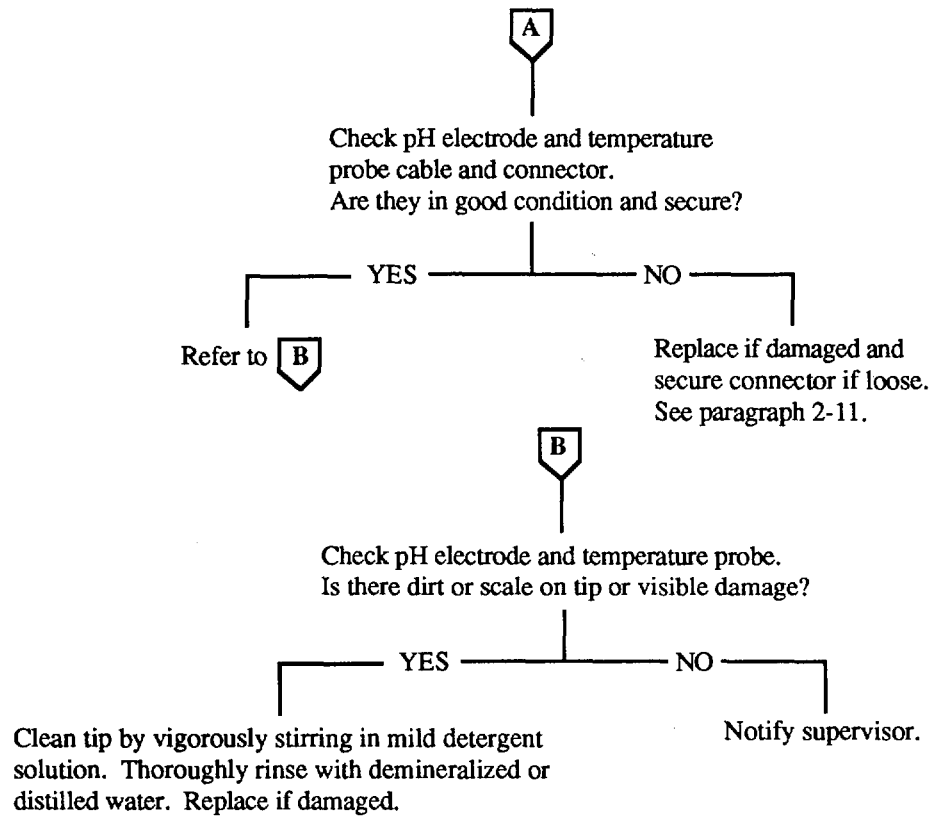
3-4. TURBIDITY METER CANNOT BE "ZEROED".



3-5. pH/TEMPERATURE METER SHOWS NO DISPLAY WHEN SWITCHED ON.



3-6. pH/TEMPERATURE METER SHOWS ERRATIC OR OUT OF RANGE READINGS ON DISPLAY



Section III. OPERATOR'S MAINTENANCE PROCEDURES

3-7. GENERAL.

The procedures in this section have been arranged in the order in which the items appear in the operator (C) maintenance level column on the Maintenance Allocation Chart (MAC) which is provided in Appendix B. Step-by-step procedures have been provided for all actions authorized to be performed by operator maintenance in the order in which they appear on the MAC.

3-8. TURBIDITY TEST SET.

This task covers:

a. Inspection

b. Servicing

c. Calibration

INITIAL SETUP:

Materials/Parts

Rags
(Appendix F, item 14)

Detergent
(Appendix F, item 15)

Paper Towel
(Appendix F, item 16)

Tools

Screwdriver
(Appendix D, section II)

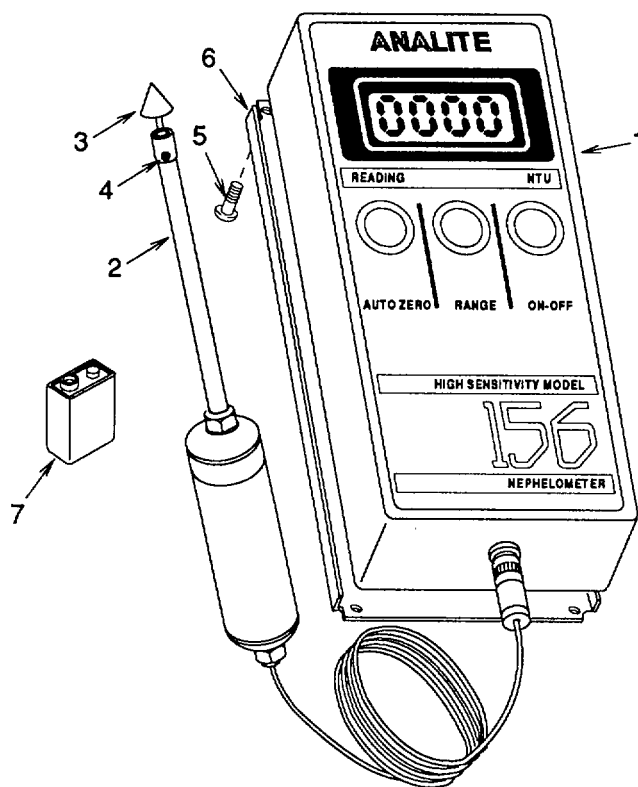


Figure 3-1. Turbidity Test Set

a. Inspection.

- (1) Check turbidity meter (1) for any visible damage. If damaged, notify supervisor.
- (2) Check probe (2) for any visible damage, cut or frayed wire lead or damaged connector end. If damaged, replace. See paragraph 2-10.
- (3) Inspect probe (2) tip, deflector cone (3), and thumb screw (4) for serviceability.

b. Servicing.

- (1) Clean turbidity meter (1) with a damp rag and detergent if necessary. Remove detergent residue with a damp rag and dry thoroughly before repacking.

CAUTION

Use only a soft cloth or optical lens tissue to clean probe tip and deflector cone. Scratches on probe tip or deflector cone can cause errors in readings when meter is used.

- (2) Clean probe (2) with a damp rag and detergent if necessary. Rinse with a damp rag and dry thoroughly before repacking.
- (3) Clean probe (2) tip, deflector cone (3), and thumb screw (4) with a stream of water and detergent if necessary and rinse with demineralized or distilled water. Dry thoroughly before repacking.
- (4) Remove four screws (5), back cover (6), and battery (7), if installed. Store battery in one of the case battery storage areas unless immediate use of the meter is anticipated.
- (5) Secure back cover (6) using four screws (5).
- (6) If battery is suspected to be bad, replace it. See paragraph 2-10.

NOTE

Dispose of old batteries in accordance with local regulations/ordinances.

c. Calibration. Calibration is performed during setup for use. See paragraph 2-10.

NOTE

Repair is limited to replacement of probe only.

3-9. pH/TEMPERATURE TEST SET.

This task covers:

a. Inspection

b. Servicing

c. Calibration

d. Calibration

INITIAL SETUP:

Materials/Parts

Buffer 4.00
(Appendix F, item 9)

Detergent
(Appendix F, item 15)

Rags
(Appendix F, item 14)

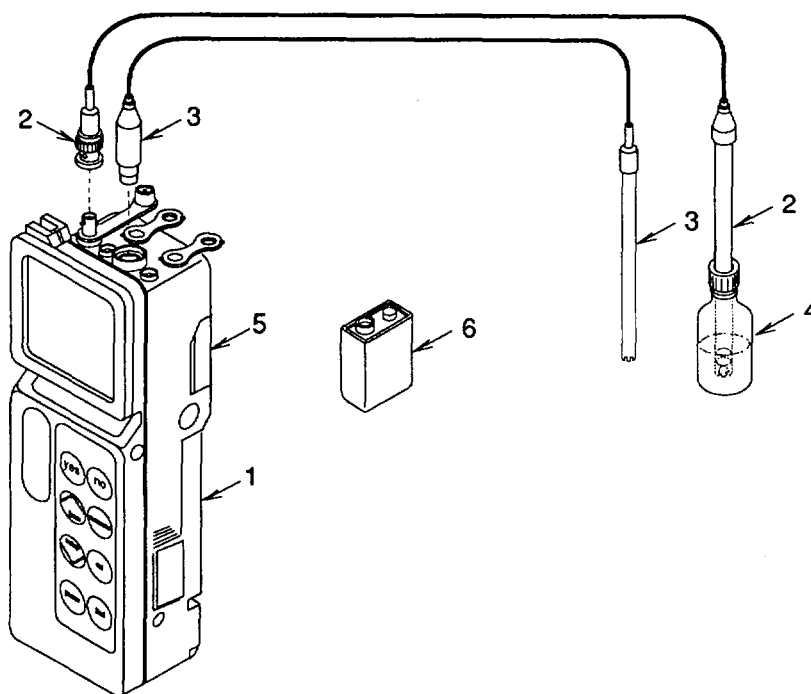


Figure 3-2. pH/Temperature Test Set

a. Inspection.

- (1) Check pH/temperature meter (1) for any visible damage. If damaged, notify supervisor.
- (2) Check pH electrode (2) and soaker bottle (4) for any visible damage, cut or frayed wire lead or damaged connector end. If damaged, replace.
- (3) Check temperature probe (3) for any visible damage, cut or frayed wire lead or damaged connector end. If damaged, replace.

b. Testing.

Testing is performed during setup for use. See paragraph 2-11.

c. Servicing.

- (1) Clean pH/temperature meter (1) with a damp rag and detergent if necessary. Remove detergent residue with a damp rag and dry thoroughly before repacking.
- (2) Clean pH electrode (2) with a damp rag and detergent if necessary. Remove detergent residue with a damp rag and dry thoroughly before repacking. Do not remove storage/soaker bottle (4).
- (3) Clean temperature probe (3) with a damp rag and detergent if necessary. Remove detergent residue with a damp rag and dry thoroughly before repacking.
- (4) Fill storage/soaker bottle (4) if solution level is below 3/4 full.
 - (a) Loosen cap on storage/soaker bottle (4) and slide bottle off pH electrode (2).
 - (b) Fill storage/soaker bottle (4) with prepared pH 4.00 buffer solution (figure 1-2, item 19).
 - (c) Slide storage/soaker bottle (4) onto pH electrode (2) and tighten cap. Be sure pH electrode tip is immersed in buffer solution.
 - (d) Change storage/soaker bottle (4) solution if undissolved particles are apparent.
 - (e) Remove cover (5) and battery (6), if installed. Store battery in one of the case battery storage areas unless immediate use of the meter is anticipated.
 - (f) Replace cover (5).
 - (g) If battery (6) is suspected to be bad, replace it. See paragraph 2-1 1.

NOTE

Dispose of old batteries in accordance with local regulations/ordinances.

d. Calibration.

Calibration is performed during use. See paragraph 2-11.

NOTE

Repairs are limited to replacement of probes only.

3-10. COLOR COMPARATOR.

This task covers:

- a. Inspection b. Servicing

INITIAL SETUP:

Materials/Parts

Rags
(Appendix F, item 14)

Detergent
(Appendix F, item 15)

pH Indicator Solution
(Appendix F, item 2)

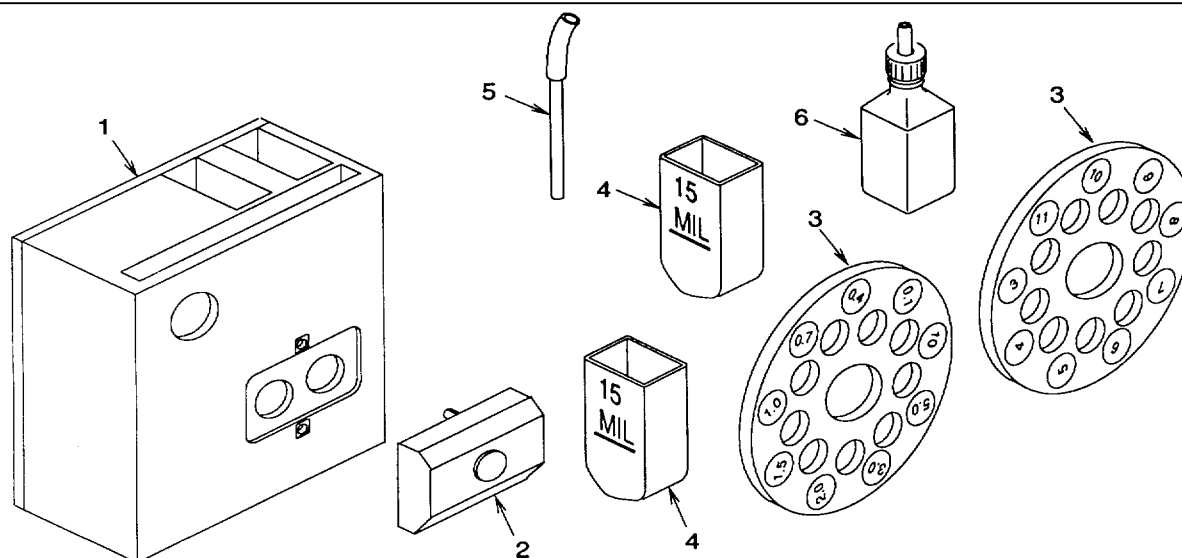


Figure 3-3. Color Comparator

a. Inspection

- (1) Check comparator (1), eyepiece (2), color wheels (3), cells (4), stir rod (5), and dropper bottle (6) for any visible damage. Replace any damaged components.
- (2) Check indicator solution dropper bottle (6) for evidence of leakage. Tighten cap. Replace if still leaking.

b. Servicing.

- (1) Clean individual components and case with a damp rag and detergent if necessary. Remove detergent residue with a damp rag and dry thoroughly before repacking.
- (2) Wash comparator cells (4) with water and detergent solution. Rinse with demineralized or distilled water and dry thoroughly before repacking.
- (3) Refill indicator solution dropper bottle (6) if solution level is very low or empty.

3-11. TOTAL DISSOLVED SOLIDS METER.

This task covers:

- | | | |
|----------------|------------|--------------|
| a. Inspection | b. Testing | c. Servicing |
| d. Calibration | e. Repair | |

INITIAL SETUP:

Materials/Parts

Rags
(Appendix F, item 14)

Detergent
(Appendix F, item 15)

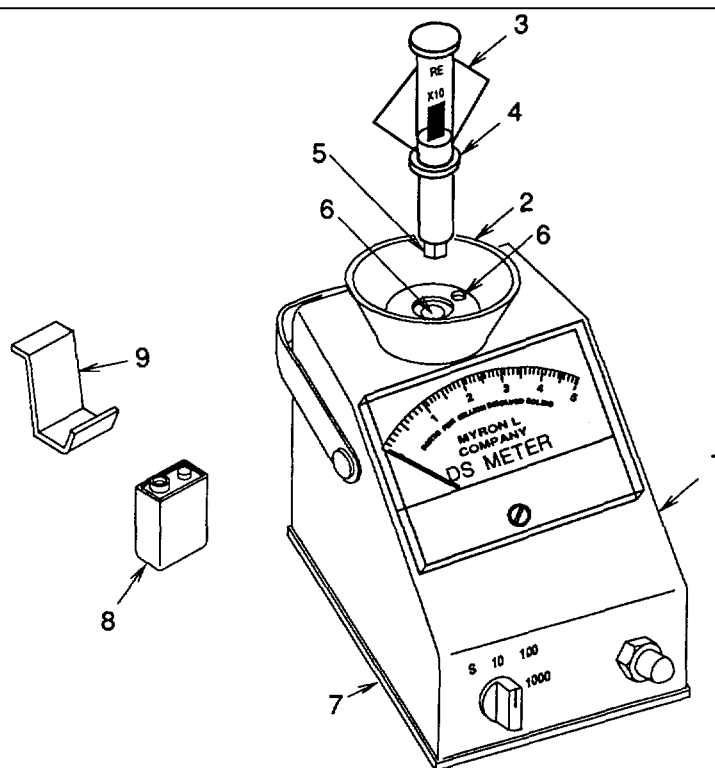


Figure 3-4. Total Dissolved Solids Meter

a. Inspection.

- (1) Check meter (1) for any visible damage. If damaged, notify supervisor.
- (2) Check cell cup (2) for any visible damage. If damaged, notify supervisor.
- (3) Check range extender (3) to see that o-ring (4) and white insert (5) is not damaged or missing.

b. Testing.

Testing is performed during setup to use. See paragraph 2-9.

3-11. TOTAL DISSOLVED SOLIDS METER. - continued

c. Servicing.

- (1) Clean meter (1) with a damp rag and detergent if necessary. Remove detergent residue with a damp rag and dry thoroughly before repacking.
- (2) Clean cell cup (2) and electrodes (6) with detergent/water solution. Rinse with demineralized or distilled water and dry thoroughly before repacking.
- (3) Remove cover (7) and battery (8), if installed. Store battery in one of the case battery storage areas unless immediate use of the meter is anticipated.
- (4) Replace cover (7). Be sure battery clip (9) is in meter (1).
- (5) If battery (8) is suspected to be bad, replace it. See paragraph 2-9.

NOTE

Dispose of old batteries in accordance with local regulations/ordinances.

d. Calibration.

Calibration is performed during setup to use. See paragraph 2-9.

NOTE

Repairs are limited to replacement of range extender only.

e. Repair.

Replace range extender (3) if damaged or missing.

3-12. CHEMICAL AGENTS WATER TESTING KIT.

See TM 3-6665-319-10

3-13. CARRYING CASE.

This task covers:

a. Inspection

b. Service

INITIAL SETUP:

Materials/Parts

Rags
(Appendix F, item 14)

Oil
(Appendix F, item 23)

Detergent
(Appendix F, item 15)

- a. Inspection. See figure 3-5.
 - (1) Check case (1) for any visible damage. If damaged, notify supervisor.
 - (2) Open case (1) and remove all components. Note location for repacking.
 - (3) Check foam liners (2) and insert divider (3) for any visible damage. If damaged, notify supervisor.
 - (4) If case (1) and liner (2) are not damaged, repack all components as noted during removal. Close and secure case.
- b. Service
 - (1) Clean outside of case (1) using rags with detergent and water. Remove detergent residue using rags with clear water. Dry thoroughly.
 - (2) Lubricate latches (4) with oil.

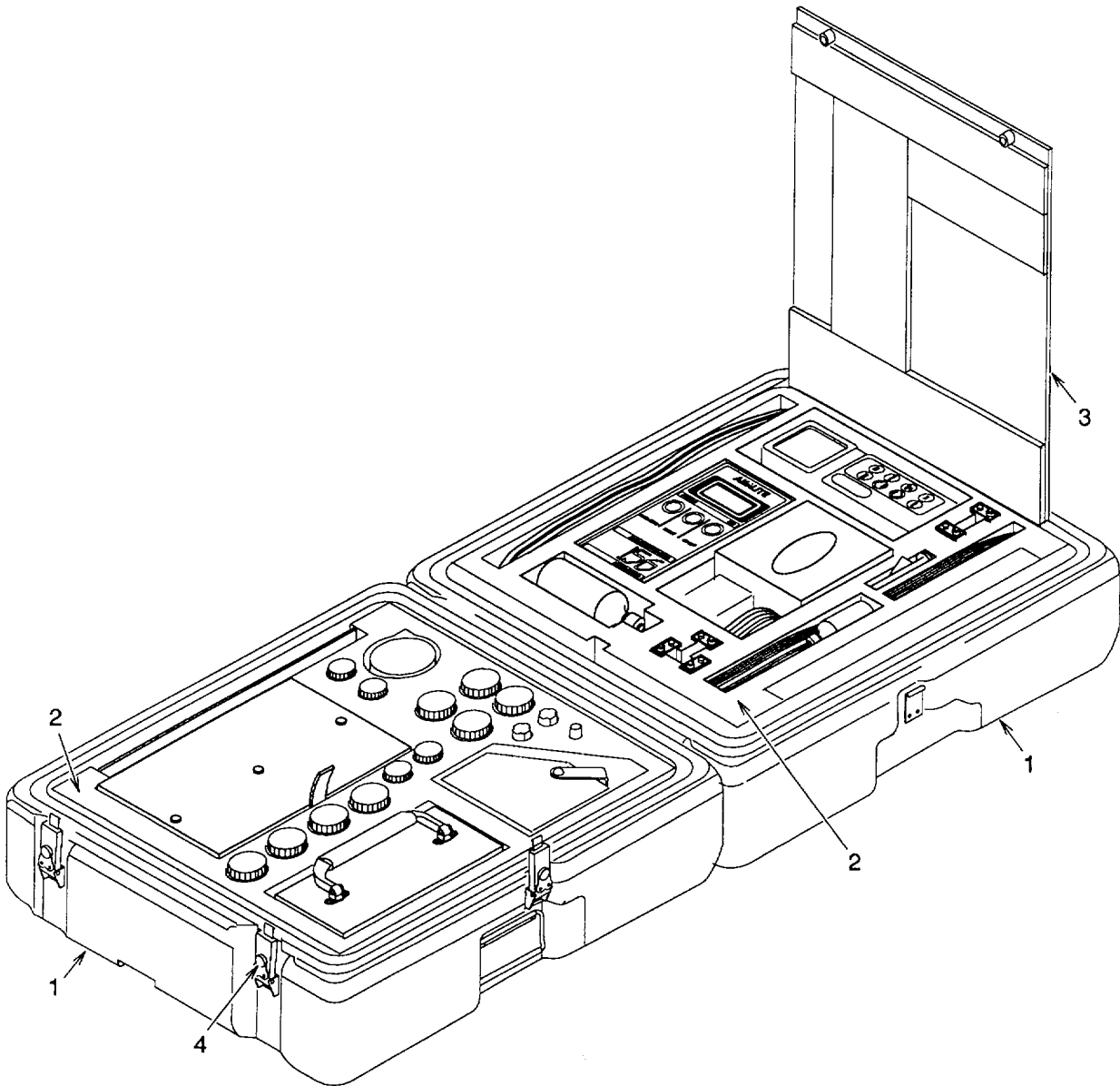


Figure 3-5. Carrying Case

CHAPTER 4

UNIT MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, TOOLS, SPECIAL TOOLS, TEST MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE), AND SUPPORT EQUIPMENT

4-1. COMMON TOOLS AND EQUIPMENT.

- a. For authorized common tools and equipment refer to the Modified Table of Organization and Equipment (MTOE) CTA 50-970 or CTA 8-100 as applicable to your unit.
- b. No special tools are required for unit maintenance. All tools needed are available in Auto Organizational Number 1 Common Shop Equipment Tool Kit SC 4910-95-A74.

4-2. REPAIR PARTS.

- a. Mandatory replacement parts are listed in appendix J of this manual.
- b. Repair parts are listed and illustrated in appendix C of this manual.

Section II. SERVICE UPON RECEIPT

See paragraph 2-1.

Section III. UNIT PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

PMCS not required.

Section IV. UNIT TROUBLESHOOTING PROCEDURES

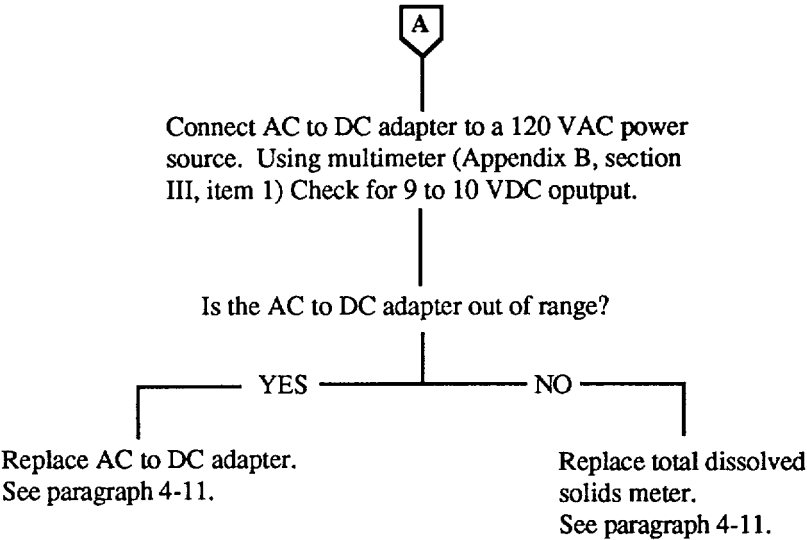
4-3. GENERAL.

The following is a list of common malfunction symptoms that may occur with your equipment. Each symptom is followed by a branching logic tree for troubleshooting. Follow the actions given in the order presented. The following cannot list all the possible symptoms that may occur with your equipment or all the possible branches in each logic tree. If the symptom you are experiencing is not listed or actions given in the logic tree do not correct it, notify your supervisor.

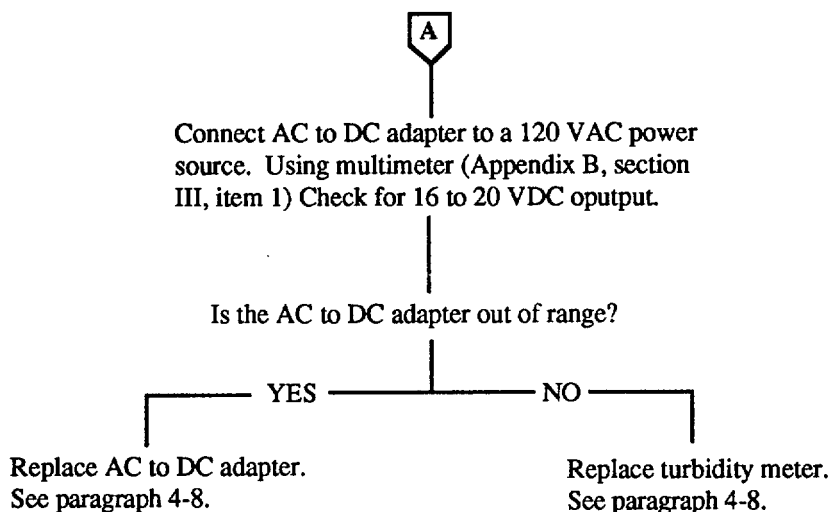
MALFUNCTION INDEX

MALFUNCTION	TRoubleshooting PROCEDURE (PARA)
TOTAL DISSOLVED SOLIDS METER WILL NOT OPERATE	4-4
TURBIDITY METER SHOWS NO DISPLAY WHEN SWITCHED ON	4-5
pH/TEMPERATURE METER SHOWS NO DISPLAY WHEN SWITCHED ON	4-6

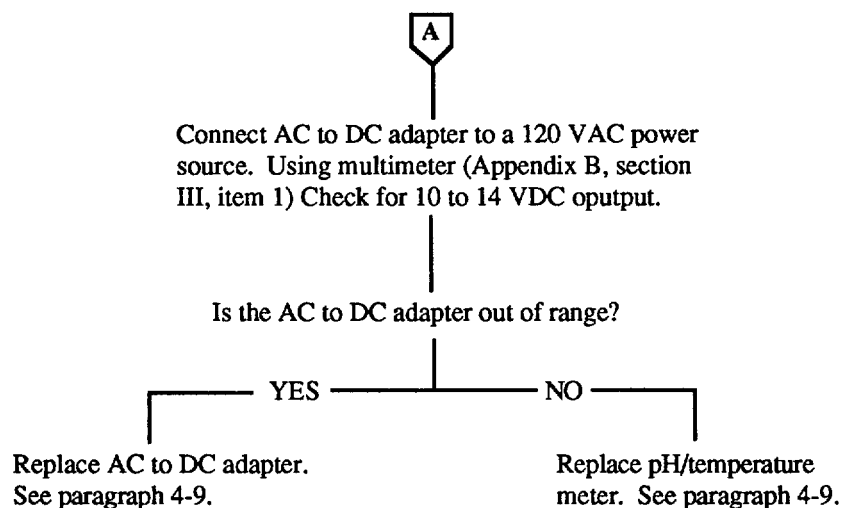
4-4. TOTAL DISSOLVED SOLIDS METER WILL NOT OPERATE.



4-5. TURBIDITY METER SHOWS NO DISPLAY WHEN SWITCHED ON.



4-6. pH/TEMPERATURE METER SHOWS NO DISPLAY WHEN SWITCHED ON.



Section V. UNIT MAINTENANCE PROCEDURES

4-7. GENERAL.

The procedures in this section have been arranged in the order in which the items appear in the unit (0) maintenance level column on the Maintenance Allocation Chart (MAC) which is provided in Appendix B. Step-by-step procedures have been provided for all actions authorized to be performed by unit maintenance in the order in which they appear on the MAC.

4-8. TURBIDITY TEST SET.

This task covers: Repair

CAUTION

Battery must be removed from meter prior to shipment to avoid damage to equipment.

- a. Repair is limited to replacement of defective components only from turbidity test set. If turbidity meter is defective, be sure battery has been removed prior to shipment. See paragraph 2-10 for battery removal.
- b. This meter is a precision piece of equipment and must be handled appropriately. Package the meter and probe to prevent any shipping damage due to rough handling or the elements.
- c. Mark the shipping package to indicate that a fragile electronic instrument is enclosed.

4-9. pH/TEMPERATURE TEST SET.

This task covers: Repair

CAUTION

Battery must be removed from meter prior to shipment to avoid damage to equipment.

- a. Repair is limited to replacement of defective components only from pH/temperature test set. If pH/temperature meter is defective, be sure battery has been removed prior to shipment. See paragraph 2-11 for battery removal.
- b. The pH electrode tip is immersed in an attached bottle of storage/soaker solution. If this bottle is not full, refill it using pH 4.00 buffer solution (figure 1-2, item 19). pH 4.00 buffer solution is a mixture of salts (Potassium Biphthalate) which is non-hazardous and safe for any means of shipment.
- c. This meter is a precision piece of equipment and must be handled appropriately. Package the meter, pH electrode, and temperature probe to prevent any shipping damage due to rough handling or the elements.
- d. Mark the shipping package to indicate that a fragile electronic instrument is enclosed.

4-10. COLOR COMPARATOR

This task covers: Repair

- a. Repair is limited to replacement of defective components only from color comparator.
- b. This is a precision piece of optical equipment and must be handled appropriately. Package to prevent any shipping damage due to rough handling or the elements.
- c. Mark the shipping package to indicate that a fragile optical instrument is enclosed.

4-11. TOTAL DISSOLVED SOLIDS METER.

This task covers: Repair

CAUTION

Battery must be removed from meter prior to shipment to avoid damage to equipment.

- a. Repair is limited to replacement of defective components only from total dissolved solids meter. If total dissolved solids meter is defective, be sure battery has been removed prior to shipment. See paragraph 2-9 for battery removal.
- b. This meter is a precision piece of equipment and must be handled appropriately. Package the meter and range extender to prevent any shipping damage due to rough handling or the elements.
- c. Mark the shipping package to indicate that a fragile electronic instrument is enclosed.

4-12. CARRYING CASE.

This task covers:

a. Repair

b. Replacement

INITIAL SETUP:

Equipment Condition

All components and manuals removed.
(Appendix D, section II and III)

Tools

Drill Metal Cutting, 1/8 inch (3.175 mm)
(Appendix B, section III, item 2)

Drill Portable Electric
(Appendix B, section III, item 2)

Riveter, Blind, Hand
(Appendix B, section III, item 3)

Tool Kit, General Mechanics
(Appendix B, section III, item 1)

Materials/Parts

Rivets (24)
(Appendix C, figure C-5, item 15)

Rivet
(Appendix C, figure C-5, item 2)

Tape, Double Sided
(Appendix C, figure C-5, item 10)

Adhesive Remover
(Appendix F, item 22)

Adhesive Sealant (RTV)
(Appendix F, item 24)

Adhesive
(Appendix F, item 21)

a. Repair.

Repair is limited to replacement of individual components.

b. Replacement.

(1) Card and ring/chain assembly.

(a) Remove insert (1).

CAUTION

Care must be taken when drilling case to avoid penetrating cavities behind rivets or exterior. Improper or excessive drilling depth can cause case to leak and make it unusable.

(b) Drill out rivet (2) being careful not to penetrate case half (3). Remove card (4) and ring/chain assembly.

(c) Remove split ring (5).

(d) Remove chain fasteners (6) and (7) from chain (8).

(e) Replace any damaged components.

(f) Attach chain fasteners (6) and (7) to chain (8).

(g) Attach split ring (5) to chain fastener (6) and card (4).

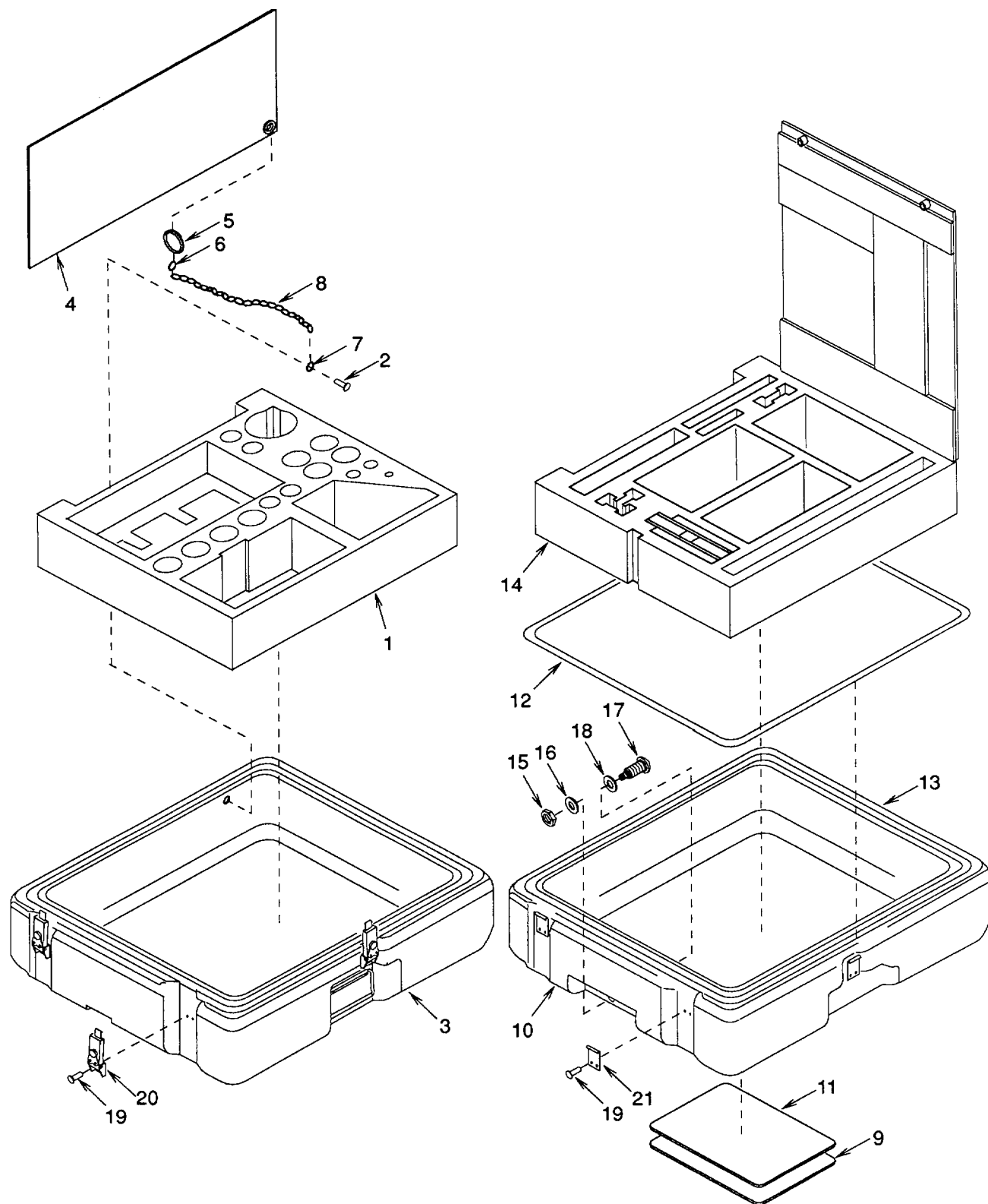


Figure 4-1. Carrying Case

4-12. CARRYING CASE. - continued

- (h) Position chain fastener (7) and secure to case half (3) using new rivet (2).
- (2) Nameplate.
 - (a) Transfer all data from old nameplate (9) to new nameplate as needed.
 - (b) Remove old nameplate (9).
 - (c) Remove any adhesive from case half (10) using adhesive remover.
 - (d) Secure new nameplate (9) to case half (10) using new double sided tape (11).
- (3) Gasket.
 - (a) Remove old gasket (12) material.
 - (b) Remove any adhesive from case half (10) using adhesive remover.
 - (c) Apply a thin bead of adhesive into channel (13) and install new gasket (12).
- (4) Insert set.
 - (a) Carefully remove old inserts (1) and (14).
 - (b) Install new inserts (1) and (14) oriented per illustration.
- (5) Valve.
 - (a) Remove insert (14).
 - (b) Remove nut (15), washer (16), valve (17), and gasket (18).
 - (c) Clean any adhesive sealant (RTV) from case half (10).
 - (d) Coat new gasket (18) with adhesive sealant (RTV).
 - (e) Install new valve (17) with new coated gasket (18) into case half (10).
 - (f) Secure new valve (17) using new washer (16) and new nut (15).
- (6) Latch and latch clip.

CAUTION

Care must be taken when drilling case to avoid penetrating cavities behind rivets or exterior. Improper or excessive drilling depth can cause case to leak and make it unusable.

NOTE

Procedures are typical for replacement of all latches and clips.

- (a) Drill out two rivets (19) being careful not to penetrate case half (3) or (10). Remove old latch (20) or latch clip (21).

- (b) Position new latch (20) or new latch clip (21) and secure to case half (3) or (10) using two new rivets (19).

(7) Case.

- (a) Remove inserts (1) and (14).

CAUTION

Care must be taken when drilling case to avoid penetrating cavities behind rivets or exterior. Improper or excessive drilling depth can cause case to leak and make it unusable.

- (b) Drill out rivet (2) being careful not to penetrate case half (3). Remove card (4) and ring/chain assembly.
- (c) Carefully remove nameplate (9).
- (d) Remove any adhesive from nameplate (9) using adhesive remover.
- (e) Secure nameplate (9) to new case half (10) using new double sided tape (11).
- (f) Position card (4) and ring/chain assembly and secure to new case half (3) using new rivet (3).
- (g) Install inserts (1) and (14) oriented per illustration.

Section VI. PREPARATION FOR STORAGE OR SHIPMENT

CAUTION

The following items contained in this kit must be removed and protected from temperatures below 32°F (0°C):

Three bottles TDS/conductivity standard solution.
Three bottles NTU primary standard.
One bottle wide range pH indicator solution.
One bottle demineralizer resin.
One pH electrode.

These chemicals can be rendered useless and equipment damaged if allowed to freeze.

4-13. PREPARATION FOR STORAGE.

Before placing the equipment in administrative storage, current Preventive Maintenance Checks and Services (PMCS) should be completed, shortcomings and deficiencies should be corrected, and all Modification Work Orders (MWO) should be applied.

a. 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.

b. Administrative Storage. 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.

4-13. PREPARATION FOR STORAGE. - continued

- c. Intermediate Storage - 46 to 180 days. No special handling is required other than protection from damage and the elements.
- d. Long Term or Flyable Storage. There is no time limit for this type of storage.
 - (1) Package in accordance with paragraphs 4-14 and 4-15.
 - (2) The valve on the front of the case must be opened before air flight and closed after air flight.

4-14. PREPARATION FOR SHIPMENT.

- a. Secure all lids on bottles and boxes.
- b. Inventory and secure all equipment in proper compartments per loading plan on placards.
- c. Close case lid and secure all latches.
- d. The valve on the front of the case must be opened before air flight and closed after air flight.

4-15. GENERAL.

- a. Check to see that battery is not installed in any meter. If it is, remove it. See paragraphs 2-9, 2-10, and 2-11.
- b. The pH electrode tip is immersed in an attached bottle of storage/soaker solution. If this bottle is not full, refill it using prepared pH 4.00 buffer solution (figure 1-2, item 19). pH 4.00 buffer solution is a mixture of salts (Potassium Biphthalate) which is non-hazardous and safe for any means of shipment.
- c. The meters and electrodes/probes are precision equipment and must be handled appropriately. Package them to prevent any shipping damage due to rough handling or the elements.
- d. Mark the shipping package to indicate that fragile electronic instruments are enclosed.

APPENDIX A
REFERENCES

A-1. SCOPE

This appendix lists all forms, field manuals, and technical manuals referenced in this manual.

A-2. PAMPHLETS

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

A-3. FORMS

Recommended Changes to Publications and Blank Forms DA 2028
Product Quality Deficiency Report SF 368
Equipment Inspection and Maintenance Worksheet DA 2404
Report of Discrepancy SF 364

A-4. TECHNICAL MANUALS

Destruction of Army Materiel to Prevent Enemy Use..... TM 750-244-3
Water Testing Kit, Chemical Agents: M272 TM 3-6665-319-10

A-5. FIELD MANUALS

NBC Contamination Avoidance FM 3-3
NBC Protection FM 3-4
NBC Decontamination FM 3-5

A-6. ARMY REGULATIONS

The Army Material Maintenance Policy and Retail Operations..... AR 750-1

APPENDIX B

MAINTENANCE ALLOCATION CHART (MAC)

Section I. INTRODUCTION

B-1. THE ARMY MAINTENANCE SYSTEM MAC.

a. This introduction (section I) provides a general explanation of all maintenance and repair functions authorized at various maintenance levels under the standard Army Maintenance System concept.

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 levels, which are shown on the MAC in column (4) as:

Unit - Includes two subcolumns, C (operator/crew) and O (unit) maintenance.

Direct Support - Includes an F subcolumn

General support - Includes an H subcolumn.

Depot - Includes a D subcolumn.

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, e.g., 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 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.

B-2. MAINTENANCE FUNCTIONS. - continued

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known 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 assigned maintenance level is shown as the 3rd position code of the SMR code.

i. Repair. The application of maintenance services¹, including fault location/troubleshooting², removal/installation, and disassembly/assembly³ procedures, and maintenance actions⁴ 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 material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

B-3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II.

a. Column 1. 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.

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

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

²Fault location/troubleshooting - 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).

³Disassembly/assembly - The step-by-step breakdown (taking apart) of a spare/functional group coded item to the level of its least component, that is assigned an SMR code for the level of maintenance under consideration (e.g., identified as maintenance significant).

⁴Actions - Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

d. Column 4. Maintenance Level. Column 4 specifies each level of maintenance authorized to perform each function listed in column 3, by indicating work time required (expressed as man-hours in whole hours or decimals) in the appropriate subcolumn. This work-time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate work-time figures are to be shown for each level. 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 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 levels are as follows:

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

e. Column 5. Tools and Test Equipment Reference Code. Column 5 specifies, by code, those common tools sets (not individual tools), common TMDE, and special tools, special TMDE, and special support equipment required to perform the designated function. Codes are keyed to tools and test equipment in section III.

f. Column 6. Remarks. When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks contained in Section IV.

B-4. EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION III.

a. Column 1. 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 Level. The lowest level 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 or type number.

B-5. EXPLANATION OF COLUMNS IN REMARKS, SECTION IV.

a. Column 1. Remarks 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		
00	WATER QUALITY ANALYSIS SET	Inspect Service Replace Repair	0.5 0.3	0.2 0.3					A
01	CHEMICALS AND SUPPLIES	Inspect Service Replace	0.5 0.3	0.1					D
02	TURBIDITY TEST SET	Inspect Test Service Calibrate Replace Repair	0.1 0.3 0.5	0.1 0.1 0.1 0.2					B C A, C
03	pH/TEMPERATURE TEST SET	Inspect Test Service Calibrate Replace Repair	0.1 0.5 0.5 0.5	0.1 0.1 0.1 0.8					B C A, C
04	COLOR COMPARATOR	Inspect Service Replace Repair	0.2 0.3	0.1 0.2					A
05	TOTAL DISSOLVED SOLIDS METER	Inspect Test Service Calibrate Replace Repair	0.1 0.3 0.3 0.5	0.1 0.1 0.1 0.2					B C A, C
06	CARRYING CASE	Inspect Service Replace Repair	0.3 0.2		0.5 0.5			1,2, 3	A
		B-4							

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

MAINTENANCE ALLOCATION CHART

(1) TOOL OR TEST EQUIPMENT REF CODE	(2) MAINTENANCE LEVEL	(3) NOMENCLATURE	(4) NATIONAL STOCK NUMBER	(5) TOOL NUMBER
1	O	Tool Kit, General Mechanics	5180-00-177-7033	SC-5180-90-CL-N26
2	O	Tool Kit, Common No. 1	4910-00-754-0654	SC-4910-95-CL-A74
3	O	Riveter, Blind, Hand	5120-00-017-2849	

Section IV. REMARKS

MAINTENANCE ALLOCATION CHART

Remarks Code	Remarks
A	Repair is limited to replacement of components.
B	Test for AC to DC adapter is found in troubleshooting.
C	If required by SMR code, send to special maintenance shop for repairs.
D	Replace chemicals and supplies as needed. Refer to RPSTL, Appendix C, and Expendable and Durable Supplies List, Appendix F

B-5/(B-6 blank)

APPENDIX C

UNIT MAINTENANCE

REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

Section I. INTRODUCTION

C-1. SCOPE.

This RPSTL lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of unit and direct support maintenance of the Water Quality Analysis Set: Purification. It authorizes the requisitioning, issue, and disposition of spares, repair parts and special tools as indicated by the source, maintenance, and recoverability (SMR) codes.

C-2. GENERAL.

In addition to Section I, Introduction, this Repair Parts and Special Tools List is divided into the following sections:

a. Section II. Repair Parts List. A list of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Bulk materials are listed in item name sequence. Repair parts kits are listed separately in their own functional group within Section II. Repair parts for repairable special tools are also listed in this section. Items listed are shown on the associated illustration(s)/ figure(s).

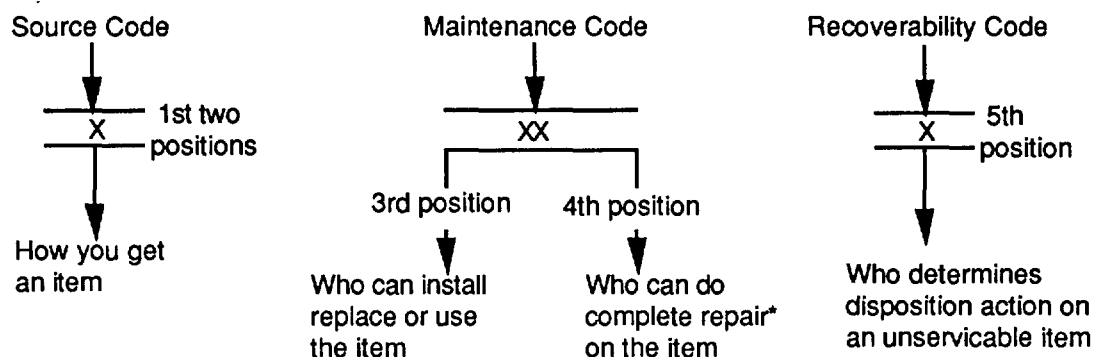
b. Section III. Special Tools List. A list of special tools, special TMDE, and other special support equipment authorized by this RPSTL (as indicated by Basis Of Issue (BOI) information in DESCRIPTION AND USABLE ON CODE column) for the performance of maintenance.

c. Section IV. Cross Reference Index. A list, in National Item Identification Number (NIIN) sequence, of all National Stock Number (NSN) items appearing in the listing, followed by a list in alphanumeric sequence of all part numbers appearing in the listings. National stock numbers and part numbers are cross-referenced to each illustration figure and item number appearance. The figure and item number index lists figure and item numbers in alphanumeric sequence and cross-references NSN, CAGEC and part numbers.

C-3. EXPLANATION OF COLUMNS (Sections II and III).

a. Item No., Column (1). Indicates the number used to identify items called out in the illustration.

b. SMR Code, Column (2). The Source, Maintenance, and Recoverability (SMR) code is a five position code containing supply/requisitioning information, maintenance category authorization criteria, and disposition instructions, as shown in the following breakout.



* Complete Repair: Maintenance capacity, capability, and authority to perform all the corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

(1) Source Code. The source code tells you how you get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follow.

Code

Explanation

PA
PB
PC
PD
PE
PF
PG

Stocked items; use the applicable NSN to request/requisition items with these source codes. They are authorized to the category indicated by the code entered in the 3rd position of the SMR code.

****NOTE:** Items codes PC are subject to deterioration

KD
KF
KB

Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance category indicated in the 3rd position of the SMR code. The complete kit must be requisitioned and applied.

MO—Made at org/
AVUM category
MF—Made at DS/
AVUM category
MH—Made at GS
category
ML—Made at
Specialized
Repair Activity
(SRA)
MD—Made at Depot

Items with these codes are not to be requested/requisitioned individually. They must be made from bulk material which is identified by the part number in the DESCRIPTION and USABLE ON CODE (UOC) column and listed in the Bulk Material group of the repair parts list in the RPSTL. If the item is authorized to you by the 3rd position code of the SMR code, but the source code indicates it is made at a higher level, order the item from the higher level of maintenance.

AO—Assembled by
org/AVUM
category
AF—Assembled by
DS/AVUM
category
AH—Assembled by
GS category
AL—Assembled by
SRA
AD—Assembled by
Depot

Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the 3rd position code of the SMR code, authorizes you to replace the item, but the source code indicates the items are assembled at a higher level, order the item from the higher level of maintenance.

Code Explanation

XA - - Do not requisition an "XA"-coded item. Order its next higher assembly. (Also, refer to the NOTE below.)

XB - - If an "XB" item is not available from salvage, order it using the CAGEC and part number given.

XC - - Installation drawing, diagram, instruction sheet, field service drawing, that is identified by manufacturer's part number.

]

XD - - Item is not stocked. Order an "XD"-coded item through normal supply channels using the CAGEC and part number given, if no NSN is available.

C-3. EXPLANATION OF COLUMNS (Sections II and III). - continued

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes, except for those source coded "XA" or those aircraft support items restricted by requirements of AR 750-1 as contained in the maintenance management update.

(2) Maintenance Code. Maintenance codes tell you the level(s) of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the SMR Code as follows:

(a) The maintenance code entered in the third position tells you the lowest maintenance category authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to one of the following categories of maintenance.

Code	Application/Explanation
------	-------------------------

C - Crew or operator maintenance done within unit or aviation unit maintenance.

O - Unit or aviation unit category can remove, replace, and use the item.

F - Direct support or aviation intermediate category can remove, replace, and use the item.

H - General support level can remove, replace, and use the item.

L - Specialized repair activity can remove, replace, and use the item.

D - Depot category can remove, replace, and use the item.

(b) The maintenance code entered in the fourth position tells you whether or not the item is to be repaired and identifies the lowest maintenance category with the capability to do complete repair (i.e., perform all authorized repair functions). (NOTE: Some limited repair may be done on the item at a lower category of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.) This position will contain one of the following codes.

Code	Application/Explanation
------	-------------------------

O - Unit or aviation unit is the lowest category that can do complete repair of the item.

F - Direct support or aviation intermediate is the lowest category that can do complete repair of the item.

H - General support is the lowest category that can do complete repair of the item.

L - Repair restricted to designated specialized repair activity.

D - Depot is the lowest category that can do complete repair of the item.

Z - Non-repairable. No repair is authorized.

B - No repair is authorized. (No parts or special tools are authorized for the maintenance of a "B" coded item.) However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

(3) Recoverability Code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the SMR Code as follows.

Recoverability Codes	Definition
-------------------------	------------

Z - Non-repairable item. When unserviceable, condemn and dispose of the item at the category of maintenance shown in third position of SMR Code.

O - Repairable item. When uneconomically repairable, condemn and dispose of the item at unit or aviation unit category.

F - Repairable item. When uneconomically repairable, condemn and dispose of the item at the intermediate direct support or aviation intermediate category.

H - Repairable item. When uneconomically repairable, condemn and dispose of the item at the intermediate general support category.

D - Repairable item. When beyond lower category repair capability, return to depot. Condemnation and disposal of item not authorized below depot category.

L - Repairable item. Condemnation and disposal not authorized below specialized repair activity.

A - Item requires special handling or condemnation procedures because of specific reasons (i.e., precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.

c. CAGEC, Column (3). The Commercial And Government Entity Code (CAGEC) is a 5-digit numeric code which is used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

d. Part Number, Column (4). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

NOTE

When you use an NSN to requisition an item, the item you receive may have a different part number from the part ordered, but go ahead and use or furnish it as the replacement part.

e. Description and USABLE ON CODE, Column 5. This column includes the following information:

(1) The Federal item name and, when required, a minimum description to identify the item.

(2) The physical security classification of the item is indicated by the parenthetical entry (insert applicable physical security classification abbreviation, e.g., Phy Sec C1 (C) - Confidential, Phy Sec C1 (S) - Secret, Phy Sec C1 (T) - Top Secret).

(3) Items that are included in kits and sets are listed below the name of the kit or set.

(4) Spare/repair parts that make up an assembled item are listed immediately following the assembled item line entry.

C-3. EXPLANATION OF COLUMNS (Sections II and III). - continued

(5) Part numbers for bulk material are referenced in the description column in the line item entry for the item to be manufactured/fabricated.

(6) When the item is not used, part to be used differs between serial numbers of the same model, the effective serial numbers are shown as the last line of the description.

(7) The USABLE ON CODE, when applicable (see paragraph 4, Special Information).

(8) In the Special Tools List section, the Basis Of Issue (BOI) appears as the last line(s) in the entry for each special tool, special TMDE, and other special support equipment. When density of equipment supported exceeds density spread indicated in the basis of issue, the total authorization is increased proportionately.

(9) The statement "END OF FIGURE" appears just below the last item description in column five for a given figure in both Sections II and III.

f. QTY, Column (6). The QTY (quantity per figure column) indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column in lieu of a quantity indicates that the quantity is variable and the quantity may vary from application to application.

C-4. EXPLANATION OF COLUMNS (SECTION IV).

a. National Stock Number (NSN) Index.

(1) Stock Number Column. This column lists the NSN by National Item Identification Number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN, i.e.,

_____NSN_____
(5305-01-574-1467).
NIIN

When using this column to locate an item, ignore the first four digits of the NSN. However, the complete NSN should be used when ordering items by stock number

(2) FIG. Column. This column lists the number of the figure where the item is identified/located. The figures are in numerical order in Section II and Section III.

(3) ITEM. Column. The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

b. Part Number Index. Part numbers in this index are listed by part number in ascending alphanumeric sequence (i.e., vertical arrangement of letter and number combination which places the first letter or digit of each group in order A through Z, followed by the numbers) through 9 and each following letter or digit in like order).

(1) CAGEC Column. The Commercial And Government Entity Code (CAGEC) is a five digit numeric code used to identify the manufacturer, distributor, or government agency, etc., that supplies the item.

(2) Part Number Column. Indicates the primary number used by the manufacturer (individual, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements to identify an item or range of items.

(3) Stock Number Column. This column lists the NSN for the associated part number and manufacturer identified in the PART NUMBER and CAGEC columns to the left.

(4) Fig. Column. This column lists the number of the figure where the item is identified/located in Sections II and III.

(5) Item Column. The item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

c. Figure and Item Number Index.

(1) FIG. Column. This column lists the number of the figure where the item is identified/located in section II and III.

(2) ITEM Column. The item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

(3) STOCK NUMBER Column. This column lists the NSN for the item.

(4) CAGEC Column. The Commercial And Government Entity Code (CAGEC) is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

(5) PART NUMBER Column. Indicates the primary number used by the manufacturer (individual, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements to identify an item or range of items.

C-5. SPECIAL INFORMATION.

a. USABLE ON CODE. The Usable On Code appears in the lower left corner of the description column heading. Usable On Codes are shown as "UOC: ..." in the Description Column (justified left) on the last line applicable item description/nomenclature. Uncoded items are applicable to all models.

b. ASSOCIATED PUBLICATIONS. See appendix A.

C-6. HOW TO LOCATE REPAIR PARTS.

a. When National Stock Number or Part Number is NOT Known.

(1) First. Using the table of contents, determine the assembly group or subassembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and listings are divided into the same groups.

(2) Second. Find the figure covering the assembly group or subassembly group to which the item belongs.

(3) Third. Identify the item on the figure and use the figure and item number index to find the NSN.

C-6. HOW TO LOCATE REPAIR PARTS. - continued

b. When National Stock Number or Part Number is Known.

(1) First. Using the National Stock Number or Part Number index, find the pertinent National Stock Number or Part Number. The NSN index is in National Item Identification Number (NIIN) sequence, (see C-4. a. (1)). The part numbers in the Part Number index are listed in ascending alphanumeric sequence, (see paragraph C-4 b.). Both indexes cross-reference you to the illustration figure and item number of the item you are looking for.

(2) Second. Turn to the figure and item number, verify that the item is the one you are looking for, then locate the item number in the repair parts list for the figure.

C-7. ABBREVIATIONS.

Abbreviations used in this manual are listed in MIL-STD-12. See glossary for unique abbreviations.

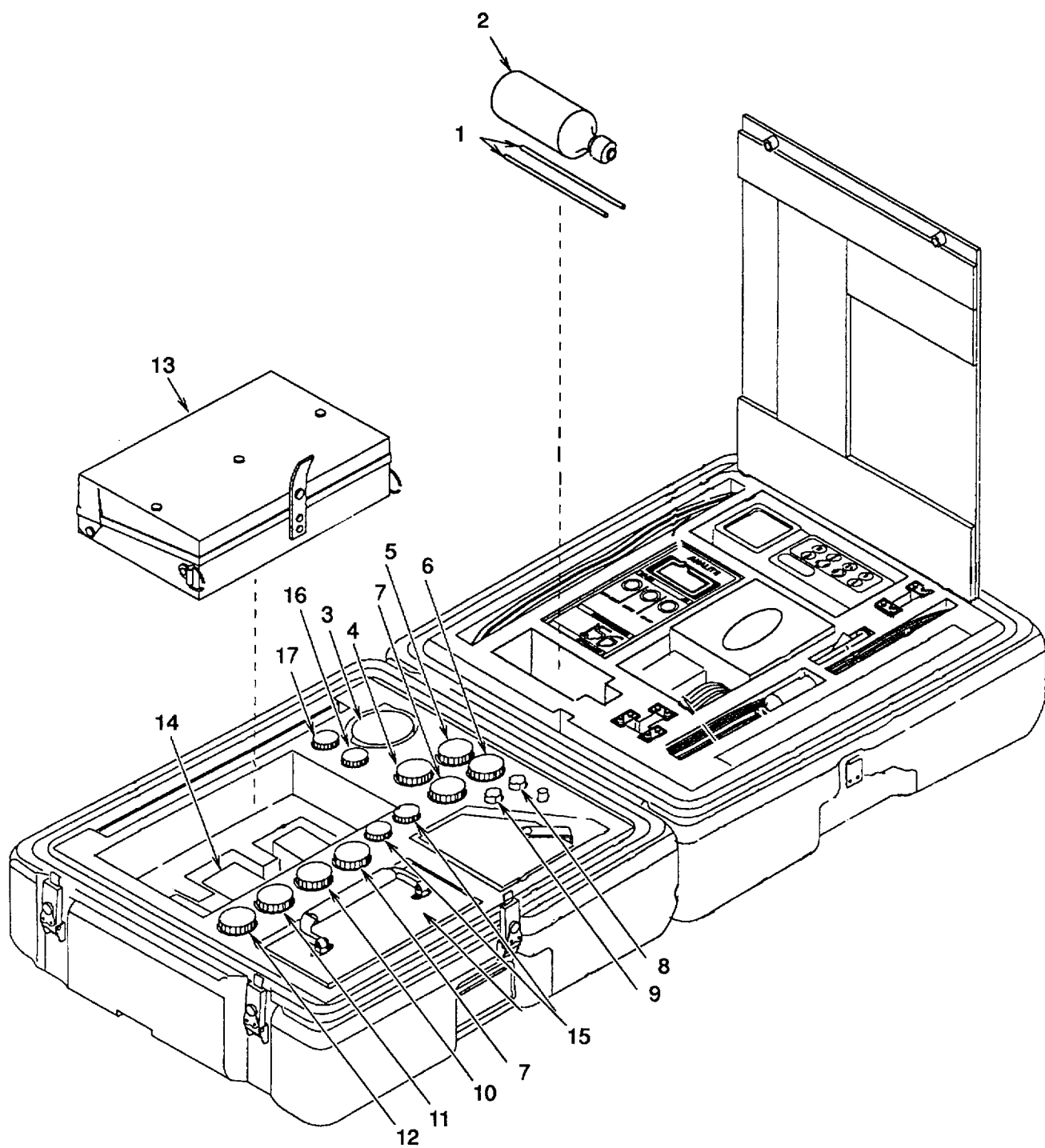


Figure C-1. Chemicals and Supplies

SECTION II					
(1)	(2)	(3)	(4)	(5)	(6)
ITEM	SMR		PART		
NO	CODE	CAGEC	NUMBER	DESCRIPTION AND USABLE ON CODES (UOC)	QTY
GROUP 01 CHEMICALS AND SUPPLIES					
FIG. C-1 CHEMICALS AND SUPPLIES					
1	PAOZZ	81348	A-A-53682, SIZE 1	ROD, STIRRING, LABORA	2
2	PAOZZ	91224	545-00	WASH BOTTLE, LABORAT WITH 1/4 LB.....	1
3	PBOZZ	27901	77037	DEMINERALIZED RESIN	2
4	PCOZZ	0F0F0	CRS-0.5-60	BEAKER, 150ML	1
5	PCOZZ	0F0F0	CRS-60-60	TURBIDITY STANDARD NEPHELOMETRIC	1
6	PCOZZ	0F0F0	CRS-100-60	(0.5 NTU)	1
7	PAOZZ	05178	2104-0002	TURBIDITY STANDARD	2
8	PAOZZ	81348	GGG-S-121, TY VI, CL I	TURBIDITY STANDARD NEPHELOMETRIC	1
9	PAOZZ	78525	64-840	(100 NTU)	1
10	PCOZZ	30053	442-300	BOTTLE, SCREW CAP 60 ML	1
11	PCOZZ	30053	442-3000	SCREWDRIVER PHILLIPS, NUMBER 0 X 2-	1
12	PCOZZ	30053	442-30000	1/2 INCHES	1
13	PCOZA	81361	D5-77-2500	SCREWDRIVER, FLAT TIP, 1/8 X 2	1
14	PCOZZ	79172	U-25410	INCHES	1
15	PAOZZ	93255	270-7.00	STANDARD SOLUTION, DISSOLVED	1
16	PAOZZ	93255	270-4.00	SOLIDS, 60ML (300 PPM)	1
17	PAOZZ	93255	270-10.00	STANDARD SOLUTION, DISSOLVED	1
				SOLIDS, 60ML (3000 PPM)	1
				STANDARD SOLUTION, DISSOLVED	1
				SOLIDS, 60ML (30, 000 PPM)	1
				WATER TESTING KIT, C	1
				CHLORINE TEST TABLE BOX OF DPD NO. 1	1
				PH STANDARD, BUFFER CAPLETS (7 PH)	2
				PH STANDARD, BUFFER CAPLETS (4 PH)	1
				PH STANDARD, BUFFER CAPLETS (10 PH)	1

END OF FIGURE

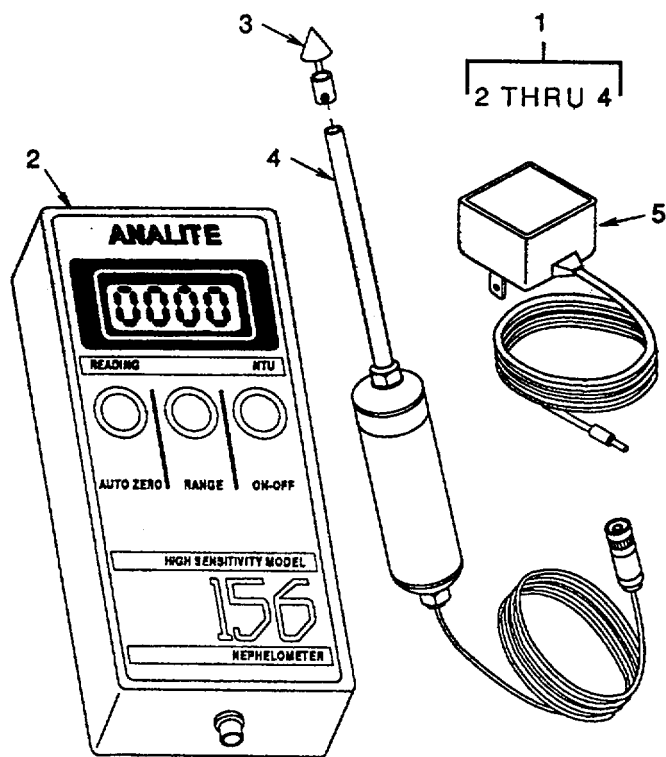


Figure C-2. Turbidity Test Set

SECTION II

TM 10-6630-246-12&P
TM 09241 B-12&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
-------------------	--------------------	--------------	-----------------------	---------------------------------------------	------------

GROUP 02 TURPIDITY TEST SET

FIG. C-2 TURPIDITY TEST SET

1	PBOLA	OFOFO	156-AP1	TEST SET,TURBIDITY	1
2	PBOLA	OFOFO	I-56DU	DISPLAY UNIT ASSY	1
3	PBOZZ	OFOFO	I-56DC	DEFLECTOR CONE WITH THUMB SCREW	1
4	PBOLA	OFOFO	I-56PA	PROBE,FIBER OPTIC	1
5	PBOZZ	94833	141K0007	POWER SUPPLY FOR TURBIDITY METER	1

END OF FIGURE

C-2-1

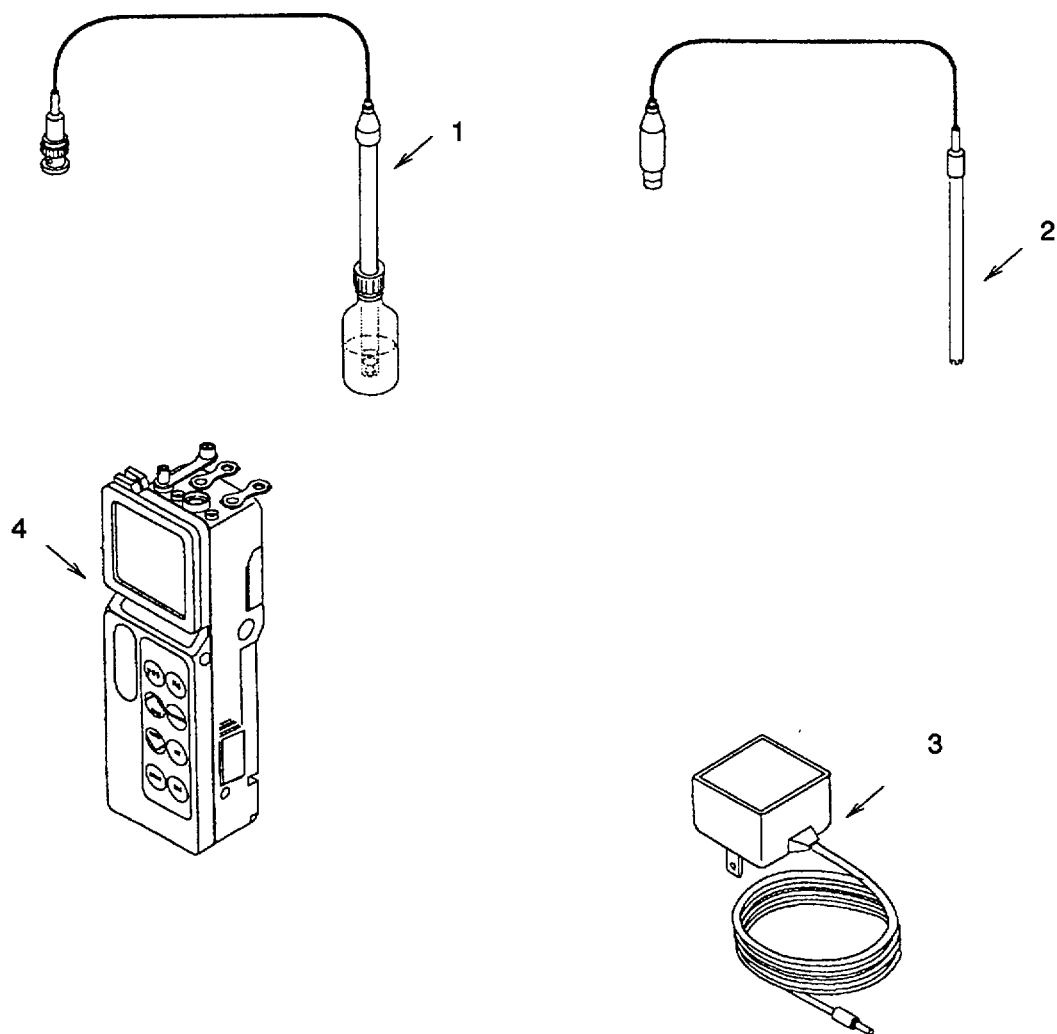


Figure C-3. pH/Temperature Test Set

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
-------------------	--------------------	--------------	-----------------------	---------------------------------------------	------------

GROUP 03 PH/TEMPERATURE TEST SET

FIG. C-3 PH/TEMPERATURE TEST SET

1	PBOZZ	97403	13229E9651	ELECTRODE, HYDROGEN PH PROBE	1
2	PBOZZ	30260	917005	PROBE, AUTOMATIC TEMPERATURE	1
				COMPENSATION	1
3	PBOZZ	94833	141K0008	POWER SUPPLY: VDC/1 AMP, FOR THE PH/	1
				TEMPERATURE METER.....	
4	PBOLA	30260	0230AO	TEST SET, PH/TEMPERA.....	1

END OF FIGURE

Change 1 C-3-1

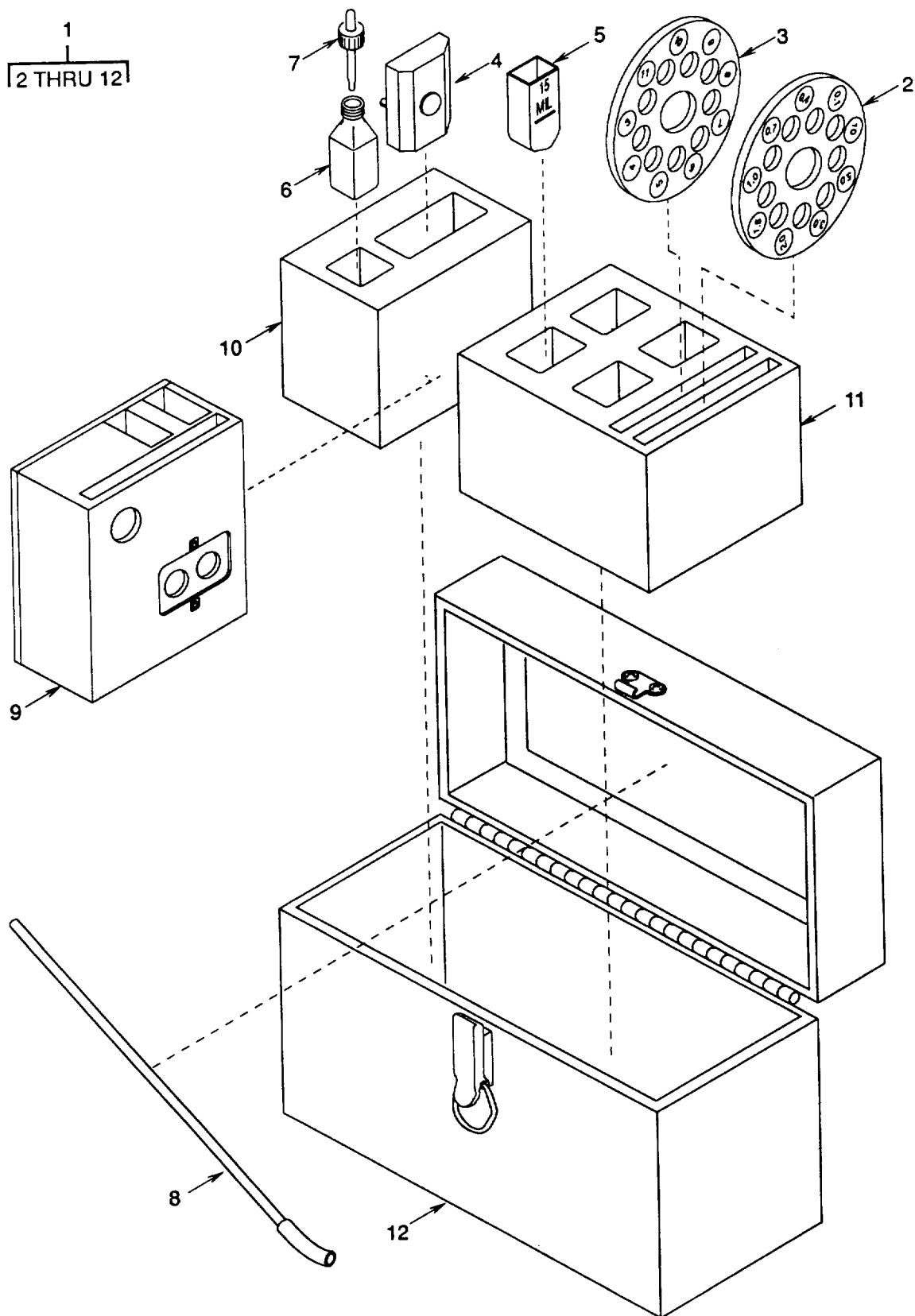


Figure C-4. Color Comparator

SECTION II

TM 10-6630-246-12&P
TM 09241B-12&P

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
GROUP 04 COLOR COMPARATOR FIG. C-4 COLOR COMPARATOR					
1	PBOOO	53390	5524-01-3	COMPARATOR, COLOR.....	1
2	PBOZZ	53390	5531-01-8	DISK, COLOR STANDARD (DPD)	1
3	PBOZZ	53390	5532-01-6	DISK, COLOR STANDARD (RANGE)	1
4	PBOZZ	53390	5533-01-4	EYEPIECE, PRISM	1
5	PBOZZ	53390	1789-01-7	CELL, COLORIMETER	4
6	PBOZZ	53390	5529-01-3	BOTTLE, DROPPER H INDICATOR,	1
				REFILL WITH (53390) G100019.....	
7	XAOZZ	53390	5524DRPCP	CAP, DROPPER	1
8	PBOZZ	53390	5524STROD	ROD ASSY, STIRRING.....	1
9	XBOZZ	53390	5524-01-0	COMPARATOR.....	1
10	XBOZZ	53390	5524FOAML	FOAM, LEFT SIDE	1
11	XBOZZ	53390	5524FOAMR	FOAM, RIGHT SIDE.....	1
12	XBOZZ	53390	5524-01-2	CASECOLOR COMPARATOR	1

END OF FIGURE

Change 1 C-4-1

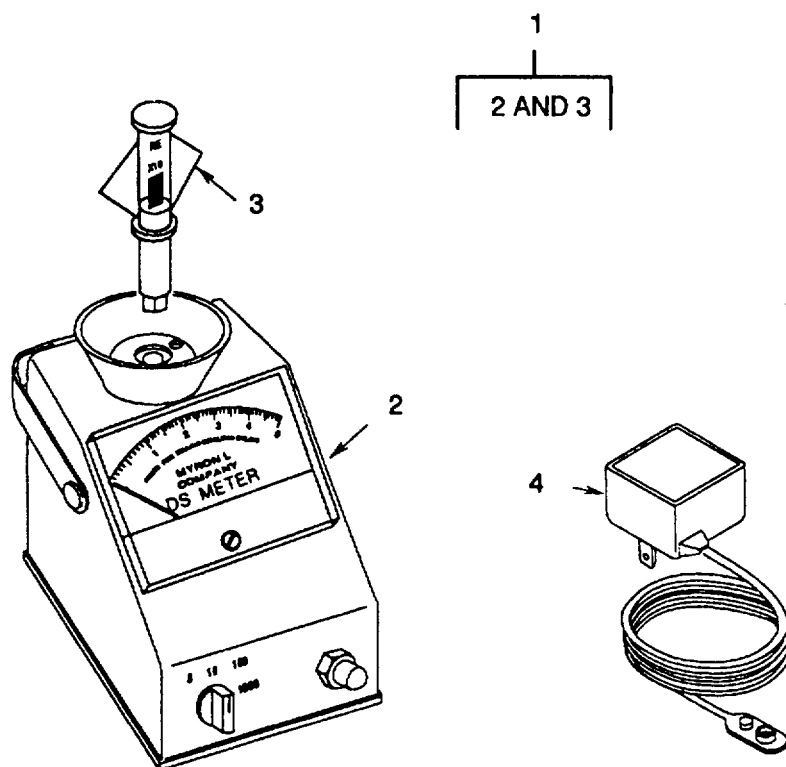


Figure C-5. Total Dissolved Solids (TDS) Meter

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
-------------------	--------------------	--------------	-----------------------	---------------------------------------------	------------

GROUP 05 DISSOLVED SOLIDS METER

FIG. C-5 DISSOLVED SOLIDS
(TDS) METER

1	XBOLA 97403 13229E9645			METER,TOTAL DISSOLVSOLIDS	1
2	PBOLA 30053 532T1E			CONDUCTIVY METER	1
3	PBOZZ 30053 RE-10			METER RANGE MULTIPL.....	1
4	PBOZZ 94833 141K0009			ADAPTER,AC TO DC VDC/25 MA,FOR TDS	1
				METER	

END OF FIGURE

C-5-1

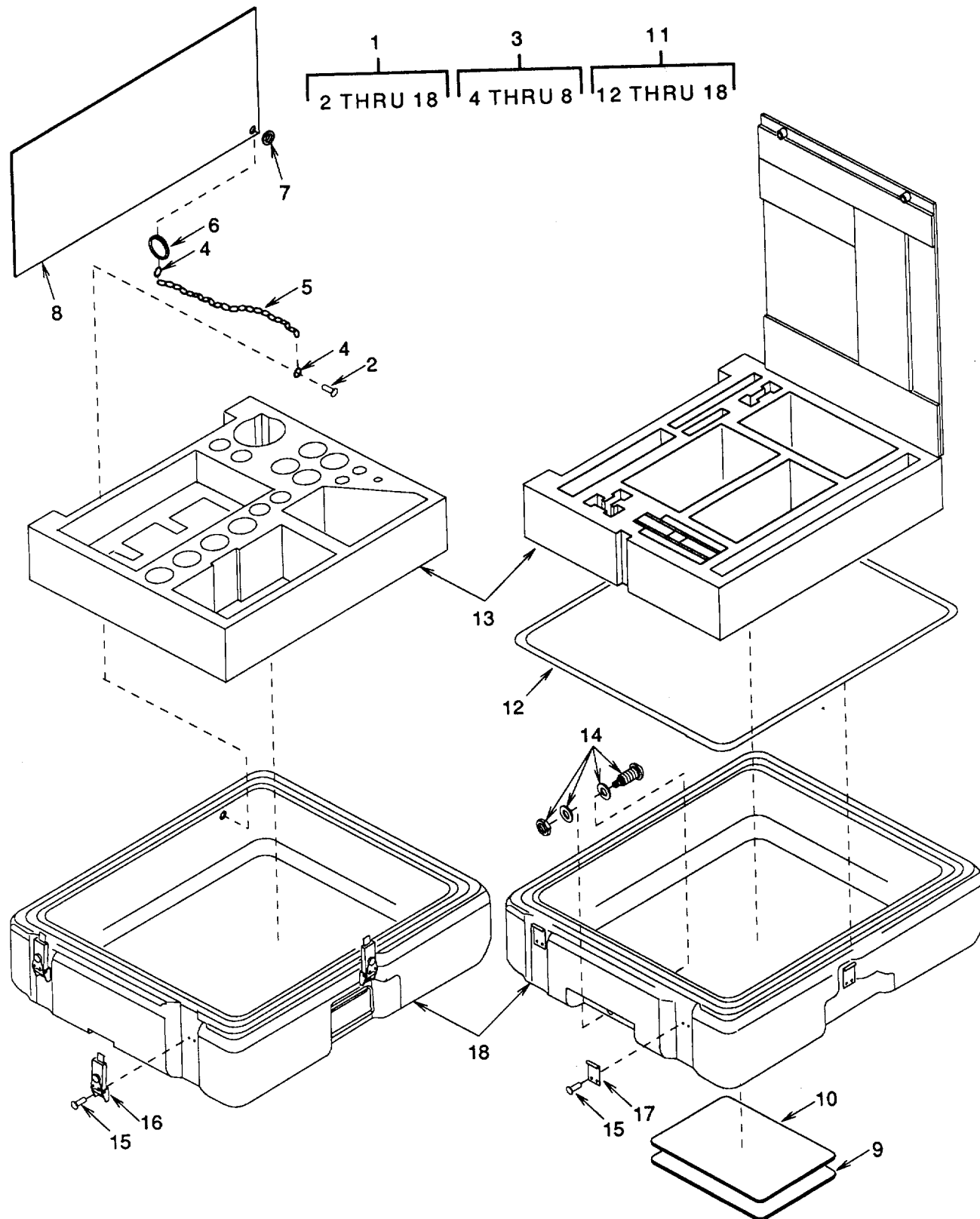


Figure C-6. Case

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
GROUP 06 CARRYING CASE					
FIG. C-6 CARRYING CASE					
1	XBOOO	94833	141K0000-1	CASE ASSEMBLY	1
2	PAOZZ	07707	SD42BS	..RIVET,BLIND	1
3	XBOOO	94833	141KO005-1	..CARD ASSEMBLY,INSTRUCTION/	1
4	PBOZZ	80406	13B	..COMPONENT LOCATION	2
5	MOOZZ	94833	141K0005-1-2	..COUPLING,BEAD CHAIN.....	1
6	PBOZZ	39428	90177A219	..CHAIN,BEAD MAKE FROM RR-C-271B,	1
7	XAOZZ	96906	MS20230RBS10	TYII,CL5,SZ13,18.00 IN LONG.....	1
8	XAOZZ	94833	141K0003	..HOLDER,KEY	1
9	PFOZZ	94833	141K0002	..GROMMET,METALLIC	1
10	MOOZZ	94833	141K0000-1-3	..CARD,INSTRUCTION/COMPONENT	1
11	XBOOO	61528	1616-0404 AP 812 6	LOCATION	1
12	PCOZZ	61528	1-090-10030	..PLATE,IDENTIFICATIO.....	1
13	PCOOO	61528	1616-0404	..TAPE,DOUBLE SIDED MAKE FROM	1
14	PBOZZ	98021	C200-AC	(52152) 950, 3.68 INCHES X 6.00 INCHES	1
15	PBOZZ	11214	CSP-42	..INSERT WQAS-P,SUB-ASSEMBLY	12
16	PBOZZ	61528	P-21-0430-02	..GASKET	6
17	PBOZZ	61528 P-21-0299-06		..INSERT	6
18	XBOZZ	61528 AP8126		..VALVE	1
				..RIVET	1
				..LATCH MUST BE REPLACED WITH.....	6
				(61528)P-21-0299-06	6
				..CLIP,LATCH MUST BE REPLACED WITH	6
				(61528)P-21-0430-02	1
				..CASE.....	1

END OF FIGURE

C-6-1

SECTION II

(1) ITEM NO	(2) SMR CODE	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODE (UOC)	(6) QTY
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GROUP 07 BULK

FIG. BULK

1	PBOZZ	70892	13S	CHAIN,BEAD.....	V
2	PBOZZ	52152	950	TAPE,DOUBLE SIDED 300 FOOT SPOOLS	V

END OF FIGURE

BULK-1

**Section III. Special Tools List
(Not Applicable)**

SECTION IV

CROSS-REFERENCE INDEX

NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
6640-00-127-4761	C-1	2			
5320-00-879-4473	C-6	2			
4010-00-889-2210	BULK	1			
6630-00-926-1288	C-4	3			
6640-00-926-2236	C-4	6			
6630-01-103-9007	C-5	3			
6810-01-110-1493	C-1	14			
6630-01-115-5281	C-4	2			
6665-01-134-0885	C-1	13			
6850-01-399-0092	C-1	4			
6850-01-399-0096	C-1	5			
6850-01-399-0098	C-1	6			
6810-01-399-1288	C-1	10			
6810-01-399-1287	C-1	11			
6810-01-399-1289	C-1	12			
6630-01-880-3001	C-1	15			
6630-01-880-3003	C-1	16			
6630-01-880-3004	C-1	17			

SECTION IV

CROSS-REFERENCE INDEXES
PART NUMBER INDEX

CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
81348	A-A-53682, SIZE 1		C-1	1
61528	AP8126		C-6	18
0F0F0	CRS-0.5-60	6850-01-399-0092	C-1	4
0F0F0	CRS-100-60	6850-01-399-0098	C-1	6
0F0F0	CRS-60-60	6850-01-399-0096	C-1	5
11214	CSP-42		C-6	15
98021	C200-AC		C-6	14
81361	D5-77-2500	6665-01-134-0885	C-1	13
81348	GGG-S-121, TY VI, CL I		C-1	8
0F0F0	I-56DC		C-2	3
0F0F0	I-56DU		C-2	2
0F0F0	I-56PA		C-2	4
96906	MS20230RBS10		C-6	7
61528	P-21-0299-06		C-6	17
61528	P-21-0430-02		C-6	16
30053	RE-10	6630-01-103-9007	C-5	3
07707	SD42BS	5320-00-879-4473	C-6	2
79172	U-25410	6810-01-110-1493	C-1	14
30260	0230A0		C-3	4
61528	1-090-10030		C-6	12
80406	13B		C-6	4
70892	13S	4010-00-889-2210	BULK	1
97403	13229E9645		C-5	1
97403	13229E9651		C-3	1
94833	141K0000-1		C-6	1
94833	141K0000-1-3		C-6	10
94833	141K0002		C-6	9
94833	141K0003		C-6	8
94833	141K0005-1		C-6	3
94833	141K0005-1-2		C-6	5
94833	141K0007		C-2	5
94833	141K0008		C-3	3
94833	141K0009		C-5	4
0F0F0	156-AP1		C-2	1
61528	1616-0404		C-6	13
61528	1616-0404 AP 812 6		C-6	11
53390	1789-01-7		C-4	5
05178	2104-0002		C-1	7
93255	270-10.00	6630-01-880-3004	C-1	17
93255	270-4.00	6630-01-880-3003	C-1	16
93255	270-7.00	6630-01-880-3001	C-1	15
30053	442-300	6810-01-399-1288	C-1	10
30053	442-3000	6810-01-399-1287	C-1	11
30053	442-30000	6810-01-399-1289	C-1	12
30053	532T1E		C-5	2
91224	545-00	6640-00-127-4761	C-1	2
53390	5524-01-0		C-4	9
53390	5524-01-2		C-4	9
53390	5524-01-3		C-4	1

SECTION IV

CROSS-REFERENCE INDEXES

PART NUMBER INDEX

CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
53390	5524DRPCP		C-4	7
53390	5524FOAML		C-4	10
53390	5524FOAMR		C-4	11
53390	5524STROD		C-4	8
53390	5529-01-3	6640-00-926-2236	C-4	6
53390	5531-01-8	6630-01-115-5281	C-4	2
53390	5532-01-6	6630-00-926-1288	C-4	3
53390	5532-01-4		C-4	4
78525	64-840		C-1	9
27901	77037		C-1	3
39428	90177A219		C-6	6
30260	917005		C-3	2
52152	950		BULK	2

SECTION IV

CROSS-REFERENCE INDEXES
FIGURE AND ITEM NUMBER INDEX

FIG.	ITEM	STOCK NUMBER	CAGEC	PART NUMBER
BULK	1	4010-00-889-2210	70892	13S
BULK	2		52152	950
C-1	1		81348	A-A-53682, SIZE 1
C-1	2	6640-00-127-4761	91224	545-00
C-1	3		27901	77037
C-1	4	6850-01-399-0092	0F0F0	CRS-0.5-60
C-1	5	6850-01-399-0096	0F0F0	CRS-60-60
C-1	6	6850-01-399-0098	0F0F0	CRS-100-60
C-1	7		05178	2104-0002
C-1	8		81348	GGG-S-121, TY, VI CL I
C-1	9		78525	64-840
C-1	10	6810-01-399-1288	30053	442-300
C-1	11	6810-01-399-1287	30053	442-3000
C-1	12	6810-01-399-1289	30053	442-30000
C-1	13	6665-01-134-0885	81361	D5-77-2500
C-1	14	6810-01-110-1493	79172	U-25410
C-1	15	6630-01-880-3001	93255	270-7.00
C-1	16	6630-01-880-3003	93255	270-4.00
C-1	17	6630-01-880-3004	93255	270-10.00
C-2	1		0F0F0	156-AP1
C-2	2		0F0F0	I-56DU
C-2	3		0F0F0	I-56DC
C-2	4		0F0F0	I-56PA
C-2	5		94833	141K0007
C-3	1		97403	13229E9651
C-3	2		30260	917005
C-3	3		94833	141K0008
C-3	4		30260	0230A0
C-4	1		53390	5524-01-3
C-4	2	6630-01-115-5281	53390	5531-01-8
C-4	3	6630-00-926-1288	53390	5532-01-6
C-4	4		53390	5533-01-4
C-4	5		53390	1789-01-7
C-4	6	6640-00-926-2236	53390	5529-01-3
C-4	7		53390	5524DRPCP
C-4	8		53390	5524STROD
C-4	9		53390	5524-01-0
C-4	10		53390	5524FOAML
C-4	11		53390	5524FOAMR
C-4	12		53390	5524-01-2
C-5	1		97403	13229E9645
C-5	2		30053	532T1E
C-5	3	6630-01-103-9007	30053	RE-10
C-5	4		94833	141K0009
C-6	1		94833	141K0000-1
C-6	2	5320-00-879-4473	07707	SD42BS
C-6	3		94833	141K0005-1
C-6	4		80406	13B
C-6	5		94833	141K0005-1-2
C-6	6		39428	90177A219

SECTION IV

CROSS REFERENCE INDEXES
FIGURE AND ITEM NUMBER INDEX
STOCK NUMBER

FIG.	ITEM	CAGEC	PART NUMBER
C-6	7	96906	MS20230RBS10
C-6	8	94833	141K0003
C-6	9	94833	141K0002
C-6	10	94833	141K0000-1-3
C-6	11	61528	1616-0404 AP 812 6
C-6	12	61528	1-090-10030
C-6	13	61528	1616-0404
C-6	14	98021	C200-AC
C-6	15	11214	CSP-42
C-6	16	61528	P-21-0430-02
C-6	17	61528	P-21-0299-06
C-6	18	61528	AP8126

C-I-5

APPENDIX D
COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LIST

Section I. INTRODUCTION

D-1. SCOPE.

This appendix lists components of end item and basic issue items for the Water Quality Analysis Set: Purification, to help you inventory the items required for safe and efficient operation of the equipment.

D-2. GENERAL.

The Components Of End Item (COEI) and Basic Issue Items (BII) Lists are divided into the following sections.

a. Section II. Components Of End Item. This listing is for information purposes only, and is not authority to requisition replacements. These items are part of the Water Quality Analysis Set: Purification. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Items of COEI are removed and separately packaged for transportation or shipment only when necessary. Illustrations are furnished to help you find and identify the items.

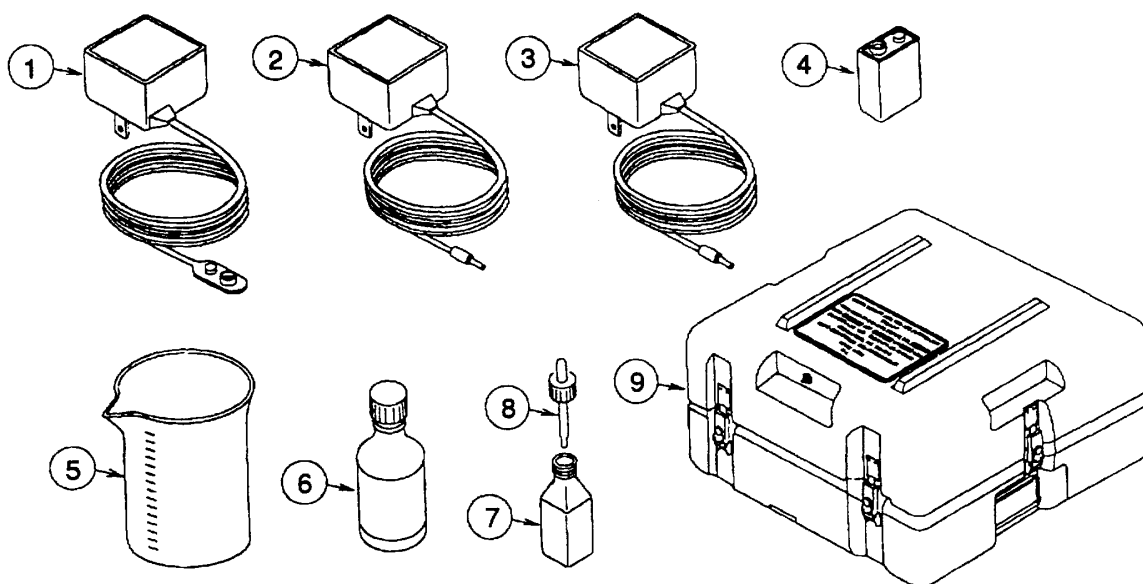
b. Section III. Basic Issue Items. These essential items are required to place the Water Quality Analysis Set: Purification in operation, operate it, and to do emergency repairs. Although shipped separately packaged, BII must be with the Water Quality Analysis Set: Purification during operation and when it is transferred between property accounts. This list is your authority to request/requisition them for replacement based on authorization of the end item by the TOE/MTOE. Illustrations are furnished to help you find and identify the items.

D-3. EXPLANATION OF COLUMNS.

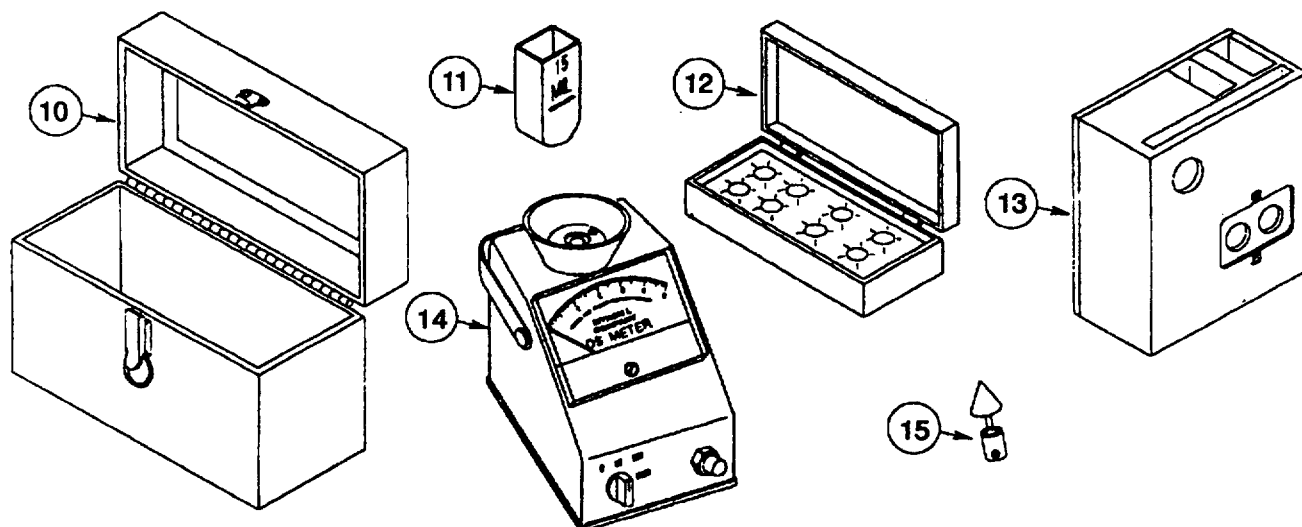
The following provides an explanation of columns found in the tabular listings.

- a. Column (1), Illus Number, gives you the number of the item illustrated.
- b. Column (2), National Stock Number, identifies the stock number of the item to be used for requisitioning purposes.
- c. Column (3), Description and Usable On Code, identifies the Federal item name (in all capital letters) followed by a minimum description when needed. The last line below the description is the Commercial And Government Entity Code (CAGEC) (in parentheses) and the part number.
- d. Column (4), U/M (unit of measure), indicates how the item is issued for the National Stock Number shown in column two.
- e. Column (5), Qty Req'd, indicates the quantity required.

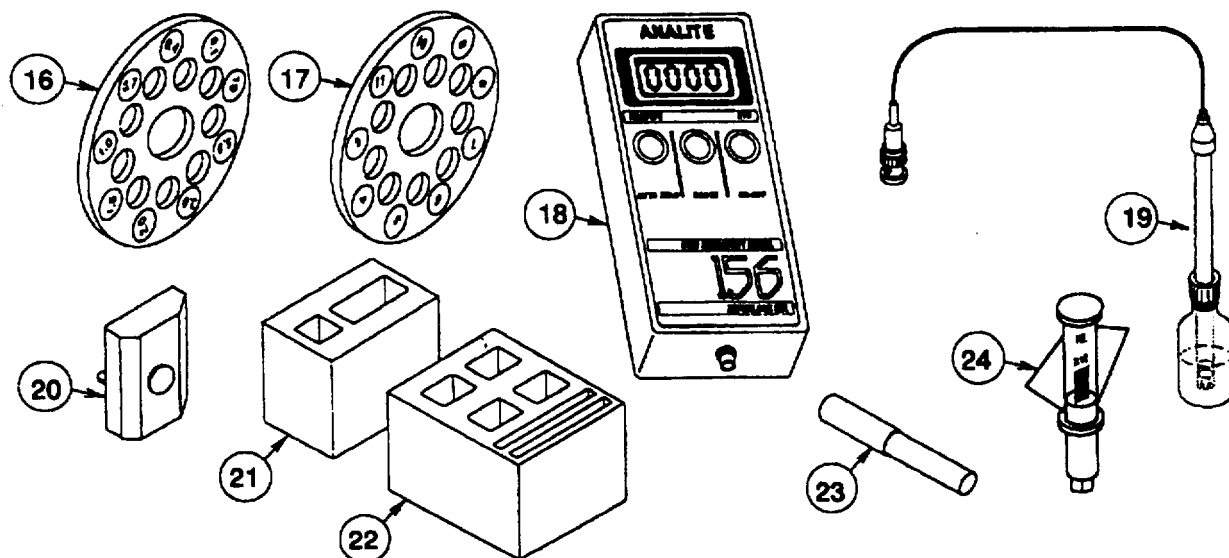
Section II. COMPONENTS OF END ITEM



(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, CAGEC and Part Number	(4) Usable On Code U/M	(5) QTY Reqd
1	6130-01-399-4874	POWER SUPPLY (TDS meter) (94833)141 K0009	EA	1
2	6130-01-399-4875	POWER SUPPLY (Turbidity Meter) (94833) 141 K0007	EA	1
3	6130-01-399-4876	POWER SUPPLY (pH/temperature test set) (94833) 141 K0008	EA	1
4	6135-00-900-2139	BATTERY, NON-RECHARGEABLE (90303) MN1604	EA	5
5	6640-01-408-7245	BEAKER, 150ML (05178)1203-0150	EA	2
6	6640-01-271-0597	BOTTLE, SCREW CAP (05178) 2104-0002	EA	2
7	6640-00-926-2236	BOTTLE, WIDE RANGE pH INDICATOR (PART OF COLOR COMPARATOR) (53390) 5529-01-3	EA	1
8		CAP, DROPPER (PART OF COLOR COMPARATOR) (53390) 5524DRPCP	EA	1
9		CASE ASSEMBLY (94833) 141 K000000-1	EA	1

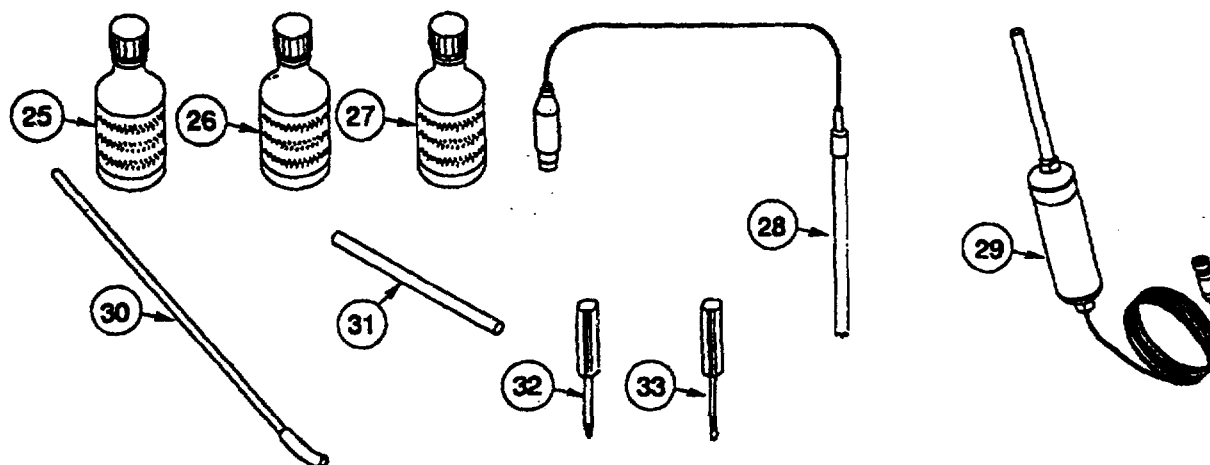


(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, CAGEC and Part Number	(4) Usable On Code U/M	(5) QTY Reqd
10		CASE (PART OF COLOR COMPARATOR) (61528) AP8126	EA	1
11	6630-01-410-6721	CELL, COLORIMETER (PART OF COLOR COMPARATOR) (53390) 1789-Q1-7	EA	4
12	6810-01-110-1493	CHLORINE TEST TABLETS (79172) U-25410	BX	1
13	6630-01-397-6051	COMPARATOR (PART OF COLOR COMPARATOR) (53390) 5524-01-3	EA	1
14	6630-01-397-5018	CONDUCTIVITY METER (TDS METER) (30053) 532T1 E	EA	1
15	6630-01-397-6936	DEFLEC CONE WITH SET SCREW (PART OF TURBIDITY METER) (OFOFO) 1-56DC	EA	1

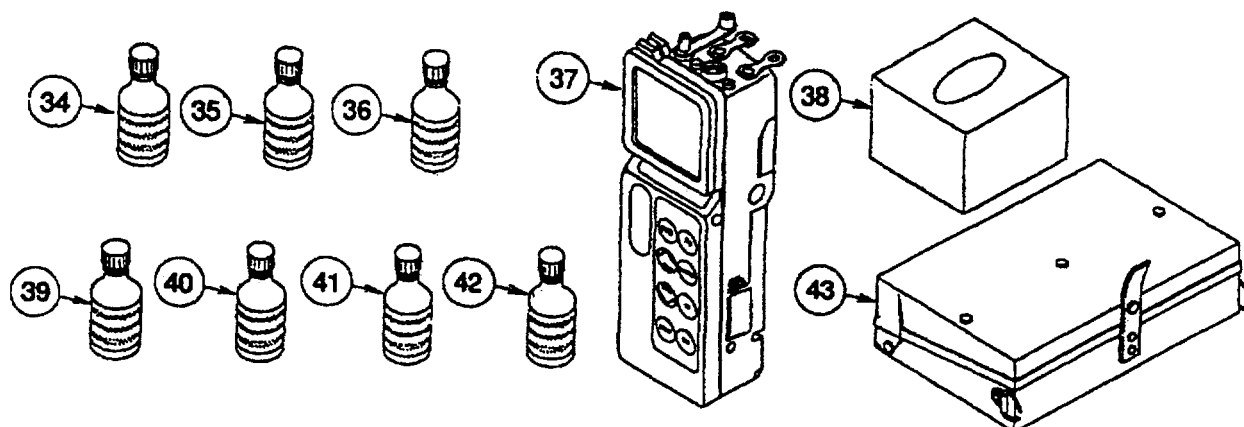


(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, CAGEC and Part Number	(4) Usable On Code U/M	(5) QTY Reqd
16	6630-01-115-5281	DISC, COLOR-CHLORINE (DPD) (PART OF COLOR COMPARATOR) (53390) 5531-01-8	EA	1
17	6630-00-926-1288	DISC, COLOR-PH (WIDE RANGE) (PART OF COLOR COMPARATOR) (53390) 5532-01-6	EA	1
18		DISPLAY UNIT ASSY (TURBIDITY METER) (OFOFO) 1-56DU	EA	1
19		ELECTRODE, HYDROGEN ION METER COMBINATION (pH/TEMPERATURE TEST SET) (97403) 13229E9651	EA	1
20	6650-01-399-8039	EYEPIECE, PRISM (PART OF COLOR COMPARATOR) (53390) 5533-01-4	EA	1
21		FOAM, LEFT SIDE (PART OF COLOR COMPARATOR) (53390) 5524FOAML	EA	1
22		FOAM, RIGHT SIDE (PART OF COLOR COMPARATOR) (53390) 5524FOAMR	EA	1
23	7520-00-904-1265	MARKER, TUBE TYPE (99802) 863 BLACK	EA	1
24	6630-01-103-9007	METER RANGE MULTIPLIER (TDS METER) (30053) RE-10	EA	1

Change 1 D-4



(1) Illus No.	(2) National Stock Number	(3) Description CAGEC and Part Number	Usable on code	(4) U/M	(5) Qty Reqd
25	6630-01-880-3004	pH STANDARD, BUFFER POWDER (10 pH) (93255) 270-10.00		VL	1
26	6630-01-880-3003	pH STANDARD, BUFFER POWDER (4 pH) (93255) 270-4.00		VL	1
27	6630-01-880-3001	pH STANDARD, BUFFER POWDER (7 pH) (93255) 270-7.00		VL	2
28		PROBE, AUTOMATIC TEMPERATURE COMPENSATION (pH/TEMPERATURE TEST SET) (30260) 917005		EA	1
29	6640-01-397-6937	PROBE, FIBER OPTIC (PART OF TURBIDITY METER) (0F0F0) 1-56PA		EA	1
30		ROD ASSY, STIRRING (PART OF COLOR COMPARATOR) (53390) 5524STROD		EA	1
31		ROD, STIRRING, LABORATORY (81348) A-A-53682, SIZE 1		EA	1
32	5120-00-820-2995	SCREWDRIVER, CROSS (81348) GGG-S-121, TYVI, CLL		EA	1
33	5120-01-407-3131	SCREWDRIVER, FLAT (78525) 64-840		EA	1



(1) Illus No.	(2) National Stock Number	(3) Description CAGEC and Part Number	Usable on code	(4) U/M	(5) Qty Reqd
34	6810-01-399-1287	STANDARD SOLUTION, DISSOLVED SOLIDS, 60 ML (3,000 PPM) (30053) 442-3000		EA	1
35	6810-01-399-1289	STANDARD SOLUTION, DISSOLVED SOLIDS, 60 ML (30,000 PPM) (30053) 442-30000		EA	1
36	6810-01-399-1288	STANDARD SOLUTION, DISSOLVED SOLIDS, 60 ML (300 PPM) (30053) 442-300		EA	1
37	6630-01-410-5069	TEST SET, pH/TEMPERATURE (30260) 0230A0		EA	1
38	7920-01-108-7915	TOWEL, PAPER (33591) 34155		CT	1
39	6850-01-399-0092	TURBIDITY STANDARD NEPHELOMETRIC (0.5 NTU) (0F0F0) CRS-0.5-60		BT	1
40	6850-01-399-0098	TURBIDITY STANDARD NEPHELOMETRIC (100 NTU) (0F0F0) CRS-1 00-60		BT	1
41	6850-01-399-0096	TURBIDITY STANDARD NEPHELOMETRIC (60 NTU) (0F0F0) CRS-60-60		BT	1
42	6640-00-127-4761	WASH BOTTLE, LABORATORY, WITH 0.2 LB DEMINERALIZED RESIN (91224) 545-00		EA	1
43	6665-01-134-0885	WATER TESTING KIT (SEE TM 3-6665-319-10) (81361) D5-77-2500		EA	1

Section III. BASIC ISSUE ITEMS LIST

TM 10-6630-246-12&P
TM 09241B-12&P

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, CAGEC and Part Number	Usable On Code	(4) U/M	(5) QTY Reqd
1		DA Technical Manual; Operators and Unit Maintenance Manual Including Repair Parts and Special Tools List (RPSTL) TM 10-6630-246-128P		EA	1
2		DA Technical Manual: Operators Manual TM 3-6665-319-10		EA	1

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APPENDIX E
ADDITIONAL AUTHORIZATION LIST (AAL)
Section I. INTRODUCTION

E-1. SCOPE.

This appendix lists additional items you are authorized for the support of the WQAS-1 Water Quality Analysis Set: Purification.

E-2. GENERAL.

This list identifies items that do not have to accompany the WQAS-1 and that do not have to be turned in with it. These items are all authorized to you by MTOE or CTA.

E-3. EXPLANATION OF LISTING.

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type of document (MTOE or CTA) which authorizes the item(s) to you.

Section II. ADDITIONAL AUTHORIZATION LIST

(1) National Stock Number	(2) Description CAGEC & Part Number Usable On Code	(3) U/M	(4) Qty Auth
6645-00-066-4279	<u>MTOF AUTHORIZED ITEM</u> WATCH, WRIST (81349) MIL-W-46374	EA	1
4230-01-101-3984	<u>CTA AUTHORIZED ITEM</u> DECONTAMINATING KIT, SKIN: M258A1 (81361) D5-77-2366	EA	1
6230-00-264-8261	FLASHLIGHT (21108) MX991-U	EA	1
8415-01-033-3517	GLOVE SET, CHEMICAL PROTECTIVE, SMALL (81349) MIL-G-43976	SE	1
8415-01-033-3518	GLOVE SET, CHEMICAL PROTECTIVE, MEDIUM (81349) MIL-G-43976	SE	1
8415-01-033-3519	GLOVE SET, CHEMICAL PROTECTIVE, LARGE (81349) MIL-G-43976	SE	1
4240-00-027-7398	GOGGLES, INDUSTRIAL (02622) 700A	EA	1

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APPENDIX F
EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (EDSML)
Section I. INTRODUCTION

F-1. SCOPE.

This appendix lists expendable and durable items that you will need to operate and maintain the Water Quality Analysis Set: Purification. This listing is for information 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), or CTA 8-100, Army Medical Department Expendable/Durable Items.

F-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 chlorine test tablets, Item 1, Appendix F).
- b. Column 2. Level. This column identifies the lowest level of maintenance that requires the listed item.
- c. Column 3. National Stock Number. This is the national stock number assigned to the item; which you can use to requisition it
- d. Column 4. item name, description, Commercial and Government Entity Code (CAGEC), and part number. This provides the other information you need to identify the item.
- e. Column 5. Unit of measure. This code shows that physical measurement or count of an item, such as gallon, dozen, gross, etc.

Section II EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION CAGEC, PART NUMBER	(5) U/M
1	C	6810-01-110-1493	CHLORINE TEST TABLETS: (79172) U-25410	bx
2	C		INDICATOR SOLUTION, pH: (53390) G100019	pt
3	C	6850-01-399-0092	NEPHELOMETRIC TURBIDITY STANDARD (0.5 NTU): (0F0F0) CRS-0.5-60	bt
4	C	6850-01-399-0096	NEPHELOMETRIC TURBIDITY STANDARD (60 NTU): (0F0F0) CRS-60-60	bt
5	C	6850-01-399-0098	NEPHELOMETRIC TURBIDITY STANDARD (100 NTU): (0F0F0) CRS-100-60	bt

Section II EXPENDABLE AND DURABLE ITEMS LIST - continued

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION CAGEC, PART NUMBER	(5) U/M
6	C	6810-01-399-1288	DISSOLVED SOLIDS STANDARD SOLUTION (300 PPM): (30053) 442-300	qt
7	C	6810-01-399-1287	DISSOLVED SOLIDS STANDARD SOLUTION (3,000 PPM): (30053) 442-3000	qt
8	C	6810-01-399-1289	DISSOLVED SOLIDS STANDARD SOLUTION (30,000) PPM): (30053) 442-30000	qt
9	C	6630-01-880-3003	BUFFER POWDER pH STANDARD (4.00): (93255) 270-4.00	vl
10	C	6630-01-880-3001	BUFFER POWDER pH STANDARD (7.00): (93255) 270-7.00	vl
11	C	6630-01-880-3004	BUFFER POWDER pH STANDARD (10.00): (93255) 270-10.00	vl
12	C	6640-00-127-4761	WASH BOTTLE WITH 1/4 LB DEMINERALIZED RESIN: (91224) 545-00	ea
13	C	6135-00-900-2139	NON-RECHARGEABLE BATTERY: (90303) MN1604	ea
14	C	7920-00-205-1711	RAGS: (64067) 72900-205-1711	pk
15	C	7930-00-764-5066	DETERGENT, DISHWASHER: (74188) JOY	oz
16	C	7920-01-108-7915	PAPER TOWEL: (33591) 34155	ct
17	C	7520-00-904-1265	TUBE TYPE MARKER: (99802) 863 BLACK	ea
18	C	7690-01-407-8230	MARKER, IDENTIFICATION: (300 PPM) (97403) 13229E9653-1	ea
19	C	7690-01-407-8231	MARKER, IDENTIFICATION: (3,000 PPM) (97403) 13229E9653-2	ea
20	C	7690-01-407-8225	MARKER, IDENTIFICATION: (30,000 PPM) (97403) 13229E9653-3	ea
21	O	8040-00-079-7158	ADHESIVE: (52152) 4693	qt
22	O	6510-01-016-8772	REMOVER, SURGICAL: (62000) HRI-8026-4024-00	pg
23	C	9150-00-189-6727	LUBRICATING OIL, ENGINE: (98308) BRAYC 0421C	qt
24	O	8040-00-845-4304	PRIMER, ADHESIVE: (06481) 960119-0001	pt
25	C	7920-00-514-2417	BRUSH, ACID SWABBING: (58536) A-A-289	ea
26	C	6640-01-271-0597	BOTTLE, SCREW CAP (REPLACEMENT BOTTLE FOR DISSOLVED SOLIDS STANDARD SOLUTION) (05178): 2104-0002	ea

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APPENDIX G
LUBRICATION INSTRUCTIONS
Lubrication instruction for latches are contained in PMCS.

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APPENDIX H
ILLUSTRATED LIST OF MANUFACTURED ITEMS
Section I. INTRODUCTION

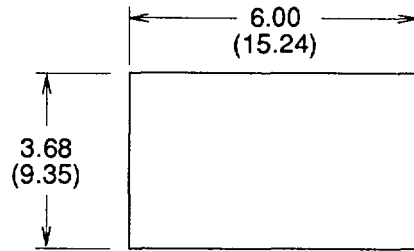
H-1. SCOPE.

- a. This appendix includes complete instructions for making items authorized to be manufactured or fabricated at unit maintenance.
- b. A part number index in alphanumeric order is provided for cross-referencing the part number of the item to be manufactured to the figure which covers fabrication criteria.
- c. All bulk materials needed for manufacture of an item are listed by part number or specification number in a tabular list on the illustration.
- d. All dimensions are given in inches with centimeters shown in parenthesis.

Manufactured Items Part Number Index

Part Number	Figure Number
141K000-1-3	H-1
141K005-1-2	H-2

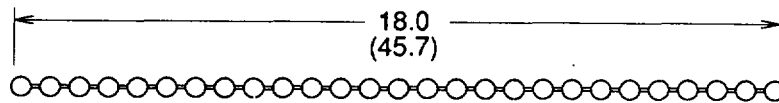
Section II. MANUFACTURED ITEMS ILLUSTRATIONS



NOTE

1. FABRICATE FROM DOUBLE SIDED TAPE
PART NO. (52152) 950

Figure H-1. Tape, Double Sided, Part Number 141K0000-1-3



NOTE

1. FABRICATE FROM BEAD CHAIN
PART NO. (81348) BR-C-271B, TYPE II, CLASS 5, SIZE 13

Figure H-2. Chain, Bead, Part Number 141K0005-1-2

**APPENDIX I
TORQUE LIMITS**

(Not Applicable)

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APPENDIX J

MANDATORY REPLACEMENT PARTS

(Not Applicable)

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GLOSSARY

Section I. ABBREVIATIONS

AAL.....	Additional Authorization List
AC.....	Alternating Current
ATTN.....	Attention
BII.....	Basic Issue Items
Blvd.....	Boulevard
BOI.....	Basis Of Issue
C.....	Centigrade
CAGEC.....	Commercial And Government Entity Code
COEI.....	Components Of End Item
CPC.....	Corrosion Prevention and Control
CTA.....	Common Table of Allowances
DC.....	Direct Current
DECON.....	Decontamination
DPD.....	N-Diethyl-P-Phenylanadamine
e.g.....	for example
EDSML.....	Expendable/Durable Supplies and Materials List
EIR.....	Equipment Improvement Recommendation
EMP.....	ElectroMagnetic Pulse
Equip.....	Equipment
etc.....	etceteras
F.....	Fahrenheit
FIG.....	Figure
MAC.....	Maintenance Allocation Chart
ml.....	Milliliters
mm.....	millimeter
MO.....	Missouri
MTOE.....	Modified Table of Organization and Equipment
NBC.....	Nuclear, Biological, and Chemical
NIIN.....	National Item Identification Number
No.....	Number
NSN.....	National Stock Number
NTU.....	Nephelometric Turbidity Units
PMCS.....	Preventive Maintenance Checks and Services
PPM.....	Parts Per Million
QTY.....	Quantity
Ref.....	Reference
RPSTL.....	Repair Parts and Special Tools List
SMR.....	Source Maintenance and Recoverability
St.....	saint
TMDE.....	Test Measurement and Diagnostic Equipment
U.S.....	United States
UOC.....	Usable On Code
UUT.....	Unit Under Test

Section II. DEFINITION OF UNUSUAL TERMS

SLOPE: The result of an automatic control that adjusts for pH electrode span error due to electrode aging.

SPAN: The accuracy of a pH electrode at varying pH levels.

CHLORINE (TEST) TABLETS: DPD no.1 chlorine tablets.

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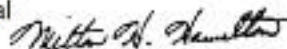
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TEAR ALONG PERFORATED LINE



THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters =
0.3937 Inches
1 Meter = 100 Centimeters = 1.000 Millimeters =
39.37 Inches
1 Kilometer = 1.000 Meters = 0.621 Miles

SQUARE MEASURE

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches
1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet
1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

CUBIC MEASURE

1 Cu Centimeter = 1.000 Cu Millimeters = 0.06 Cu Inches
1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1.000 Milliliters = 33.82 Fluid Ounces

TEMPERATURE

$5/9 (^{\circ}\text{F} - 32) = ^{\circ}\text{C}$
212° Fahrenheit is equivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
 $9/5 ^{\circ}\text{C} + 32 = ^{\circ}\text{F}$

WEIGHTS

1 Gram = 0.001 Kilograms = 1.000 Milligrams =
0.035 Ounces
1 Kilogram = 1.000 Grams = 2.2 lb.
1 Metric Ton = 1,000 Kilograms = 1 Megagram =
1.1 Short Tons

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds Per Square Inch	Kilopascals	6.895
Miles Per Gallon	Kilometers Per Liter	0.425
Miles Per Hour	Kilometers Per Hour	1.609
TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds Per Square Inch	0.145
Kilometers Per Liter	Miles Per Gallon	2.354
Kilometers Per Hour	Miles Per Hour	0.621

