TM 11-6130-384-14&P

TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LISTS) FOR BATTERY CHARGER PP-2926B/U (NSN 6130-00-500-0069)

This copy is a reprint which includes current pages from Changes 1 and 2.

HEADQUARTERS, DEPARTMENT OF THE ARMY
29 JANUARY 1976

TM 11-6130-384-14&P
C2

Change
No. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 1 January 1989

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL FOR BATTERY CHARGER PP-2926B/U (NSN 6130-00-500-0069)

TM 11-6130-384-14&P, 5 October 1970, is changed as follows:

1. Remove old pages and insert new pages as indicated below. New or changed material is indicated by a vertical bar in the margin of the page. Added or revised illustrations are indicated by a vertical bar adjacent to the identification number.

Remove pages	Insert pages
6-5 through 6-8	6-5 through 6-8

2. File this change sheet in front of the publication for reference purposes.

By Order of the Secretary of the Army:

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Brigadier General, United States Army
The Adjutant General

DISTRIBUTION :
To be distributed in accordance with DA Form 12-36 Operator, Unit, and DS/GS requirements for PP-2926B/U.

CHANGE
No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC 27 April 1981

Operator's, Organizational, Direct Support, and General Support Maintenance Manual for BATTERY CHARGER PP-2926B/U (NSN 6130-00-500-0069)

TM 11-6130-384-14&P, 29 January 1976, is changed as follows:

1. The title of the manual is changed as shown above.
2. New or changed material is indicated by a vertical bar in the margin.
3. Remove and insert pages as indicated in the page list below:

Remove	Insert
None	A, B and C (front of manual)
i and ii	i and ii
1-1 through 1-4	1-1 through 1-2
2-1 through 2-3	2-1 through 2-3/(2-4 Blank)
4-1 through 4-3	4-1 through 4-3/(4-4 Blank)
5-1 and 5-2	5-1 and 5-2
A-1/(A-2 Blank)	A-1/(A-2 Blank)
B-1 through B-10	None

4. File this change sheet in front of the manual for reference purposes.

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- USACC (2)
- HISA (Ft Monmouth) (21)
- Armies (1)
- USASIGS (10)
- Svc Colleges (1)
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- Ft Carson (5)
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- Units org under fol TOE:
  - (2 copies each unit)
  - 29-207
  - 29-610
  - (1 copy each unit)
  - 29-134
  - 29-136

ARNG: None
USAR: None
For explanation of abbreviations used, see AR 310-50.

WARNINGS

DANGEROUS VOLTAGES (208 vac, 230 vac, or 460 vac) exist in this equipment. When equipment is operated with covers open or removed, DO NOT touch exposed connections or components. SERIOUS INJURY OR DEATH MAY RESULT. Deenergize the equipment before connecting or disconnecting the battery to be charged, and before performing any maintenance. Follow all precautions listed in TB 385-4.

Avoid personal injury. The battery charger weighs 250 pounds; be careful when moving. A mechanical lift is required.

Adequate ventilation should be provided while using TRICHLOROTRI-FLUOROETHANE. Prolonged breathing of vaper should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRI-FLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

Compressed air shall not be used for cleaning purposes except where reduced to less than 29 pounds per square inch (psi) and then only with effective chip guarding and personnel protective equipment. Do not use compressed air to dry parts when TRICHLOROTRIFLUOROETHANE has been used. Compressed air is dangerous and can cause serious bodily harm if protective means or methods are not observed to prevent chip or particle (of whatever size) from being blown into the eyes or unbroken skin of the operator or other personnel.

Never smoke or light matches in the charging area.

FIRST AID FOR CHEMICAL BURNS

1. In the event of contact with the eyes, IMMEDIATELY flush the eyes with water and continue to flush for 15 minutes. THE FIRST FEW SECONDS AFTER CONTACT are critical and IMMEDIATE FLUSHING of the eyes may prevent permanent damage. An eyewash fountain is preferred, however, an eyewash hose or any other source of water should be used in an emergency. Keep in mind that alkali (base) burns are usually more serious than acid burns.

2. Strong chemicals burn the skin rapidly. There is no time to waste. Begin flushing the area with water IMMEDIATELY. Remove and discard clothing, including socks and shoes (obtain other clothes and shoes). Continue to flood the area while clothing is being removed.

3. The precautionary warning on the product label should be consulted for full first-aid information. Provide the label information to the attending physician.

4. Neutralizers and solvents (alcohol, etc.) should not be used by the first-aider. The spread of skin-absorbing corrosive poison, like phenol, can result in death. Don't depend on spilled chemicals to evaporate from your clothes; exposure to the skin can KILL you.

5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK

1 DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL

2 IF POSSIBLE, TURN OFF THE ELECTRICAL POWER

3 IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A WOODEN POLE OR A ROPE OR SOME OTHER INSULATING MATERIAL

4 SEND FOR HELP AS SOON AS POSSIBLE

5 AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION

TECHNICAL MANUAL
No. 11-6130-384-14&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, 29 January 1976

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE MANUAL FOR BATTERY CHARGER PP-2926B/U (NSN 6130-00-500-0069)

Current as of 19 August 1975

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual direct to Commander, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, NJ 07703.

In either case, a reply will be furnished direct to you.

LIST OF ILLUSTRATIONS

LIST OF TABLES

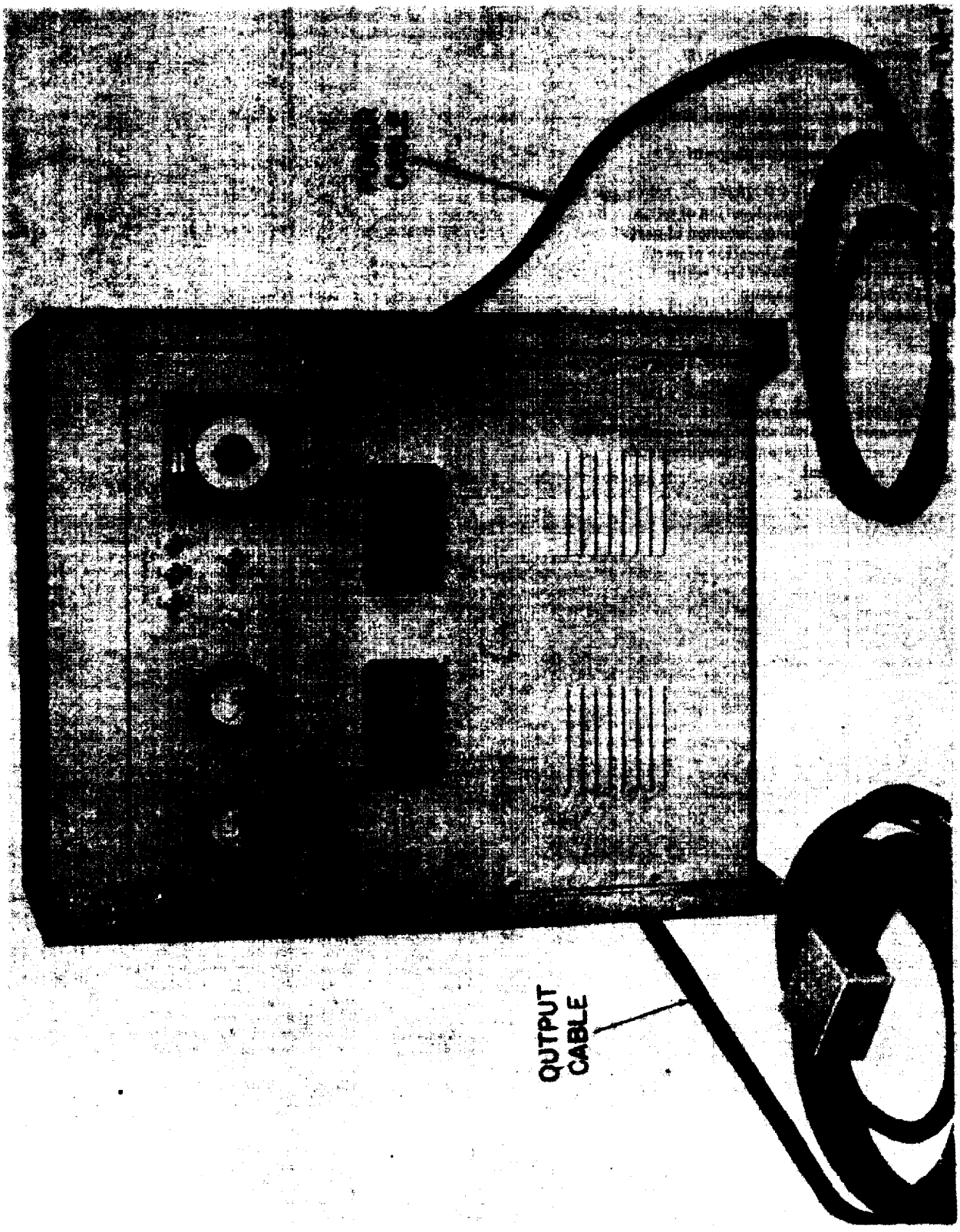


Figure 1-1. Battery Charger PP-2926B/U.

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1-1. Scope

a. This manual describes Battery Charger PP-2926B/U (fig. 1-1) and provides instructions for operation, organizational maintenance, and general support (GS) maintenance. It includes a maintenance allocation chart (app. C). Instructions are provided for the operator and organizational repairman for installation, operation, preventive maintenance, and replacement of parts available at the organizational maintenance. Circuit functioning is included for general support maintenance, together with instructions appropriate to these categories of maintenance for troubleshooting, testing, adjusting, aligning, and repairing the equipment and replacing maintenance parts.

b. No direct support maintenance is authorized.

1-2. Indexes of Publications

a. Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

b. Refer to DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

1-3. Maintenance Forms, Records, and Reports

a. Reports of Maintenance and Unsatisfactory Equipment. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System.

b. Report of Packaging and Handling Discrepancies. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.73/AFR 400-54/MCO 4430-33.

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33B/AFR 75-18/MC0 P4610.19C and DLAR 4600.15.

1-4. Reporting Equipment Improvement Recommendations (EIR)

If your Battery Charger PP-2926B/U 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. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, NJ 07703. We'll send you a reply.

1-5. Administrative Storage

Administrative storage of equipment issued to and used by Army activities will have preventive maintenance performed in accordance with the PMCS charts before storing. When removing the equipment from administrative storage, the PMCS should be performed to assure operational readiness.

1-6. Destruction of Army Electronics Materiel

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.

Section II. DESCRIPTION AND DATA

1-7. Purpose and Use

a. Battery Charger PP-2926B/U provides a source of direct current (dc) for charging lead-acid (LA) and nickel-iron (NI) type storage batteries such as those used in electrically operated forklift trucks.

b. The PP-2926B/U can be used to charge 18-cell LA batteries or 30-cell NI batteries without removing the battery from the forklift truck.

1-8. Description

The PP-2926B/U is housed in a steel cabinet with a door on the rear. Louvers on the front and sides and a short door on the rear allow for convection cooling.

a. All controls and meters are mounted on a panel which is mounted on the top front of the cabinet.

b. The input power cable is a 10-foot, four-conductor unterminated cable which comes out at the rear.

c. The dc output cable is terminated in a two-conductor storage battery plug and comes out the left side of the cabinet.

1-9. Tabulated Data

Power input
Voltage . . . . . .208 volts ±10%,230 volts ± 10%, or 460 volts ± 10% ,60 Hz, three phase, four wire.
Current per phase (maximum at full load) . . . . . .25 amperes for 208-volt input; 22 amperes for 230-volt input; 15 amperes for 460-volt input.

Power output:
Voltage . . . . . variable from 30 to 60 volts dc.
Current . . . . . to 180 amperes.
Timing control . . . . . adjustable for automatic cutoff up to 12 hours.
Charging time (completely discharged battery). . . . . approximately 8 hours.
Weight . . . . . .250 pounds
Dimensions . . . . . .22 in. w by 17 1/4 in. d by 26 in. h.

1-10. Items Comprising and Operable Equipment

Battery Charger PP-2926B/U, NSN 6130-00-500 0069, is self-contained and requires no additional items to comprise an operable equipment.

CHAPTER 2
INSTALLATION

Section I. SERVICE UPON RECEIPT OF MATERIAL

2-1. Unpacking

a. Packaging Data. When packed for shipment, Battery Charger PP-2926B/U is bolted to a skid, cushioned on all sides and covered with barrier material. A typical packing illustration is shown in figure 2-1.

WARNING

Battery Charger PP-2926B/U weighs 250 pounds. Be careful when moving. A mechanical lift is required.

b. Removing Contents. Perform the procedures in (1) through (4) below when unpacking the equipment.

(1) Remove the technical manual from the top.

(2) Remove the outer moistureproof barrier.

(3) Remove the cushioning material on all sides of the battery charger.

(4) Remove the nuts, bolts, and washers that hold the battery charger on the skid.

2-2. Checking Unpacked Equipment

a. Inspect the equipment for damage incurred during shipment.

b. Report all discrepancies in accordance with TM 38-750.

c. If the equipment has been used or reconditioned, see whether it has been changed by a modification work order (MWO). If the equipment had been modified, the MWO number will appear on the front near the nomenclature. Check to see whether the MWO) number (if any) and appropriate notations concerning the modification have been entered in the equipment manual.

NOTE

Current MWO's applicable to the equipment are listed in DA Pam 310-7.

Section II. INSTALLATION INSTRUCTIONS

The following installation procedure must be made with the assistance of organizational or higher maintenance personnel.

2-3. Tools and Material Required For Installation

No special tools or additional material are required for installation.

2-4. Installation and Connections

Place the battery charger near the power source (208, 230, or 460 volts, 3-phase, 60 Hz).

a. Strip 3 inches from the input power cable jacket.

b. Strip back 2 inches from each of the four wires.

c. Disconnect power from the power source.

d. Connect the black, red, and white wires to the 3-phase power source.

e. Connect the green wire to the power source ground.

f. According to the power source voltage, connect the transformer terminal boards as shown in figure 2-2.

NOTE

The battery charger is shipped already wired for 230-volt, 60-Hz, 3-phase operation.

g. Reconnect power to the power source.

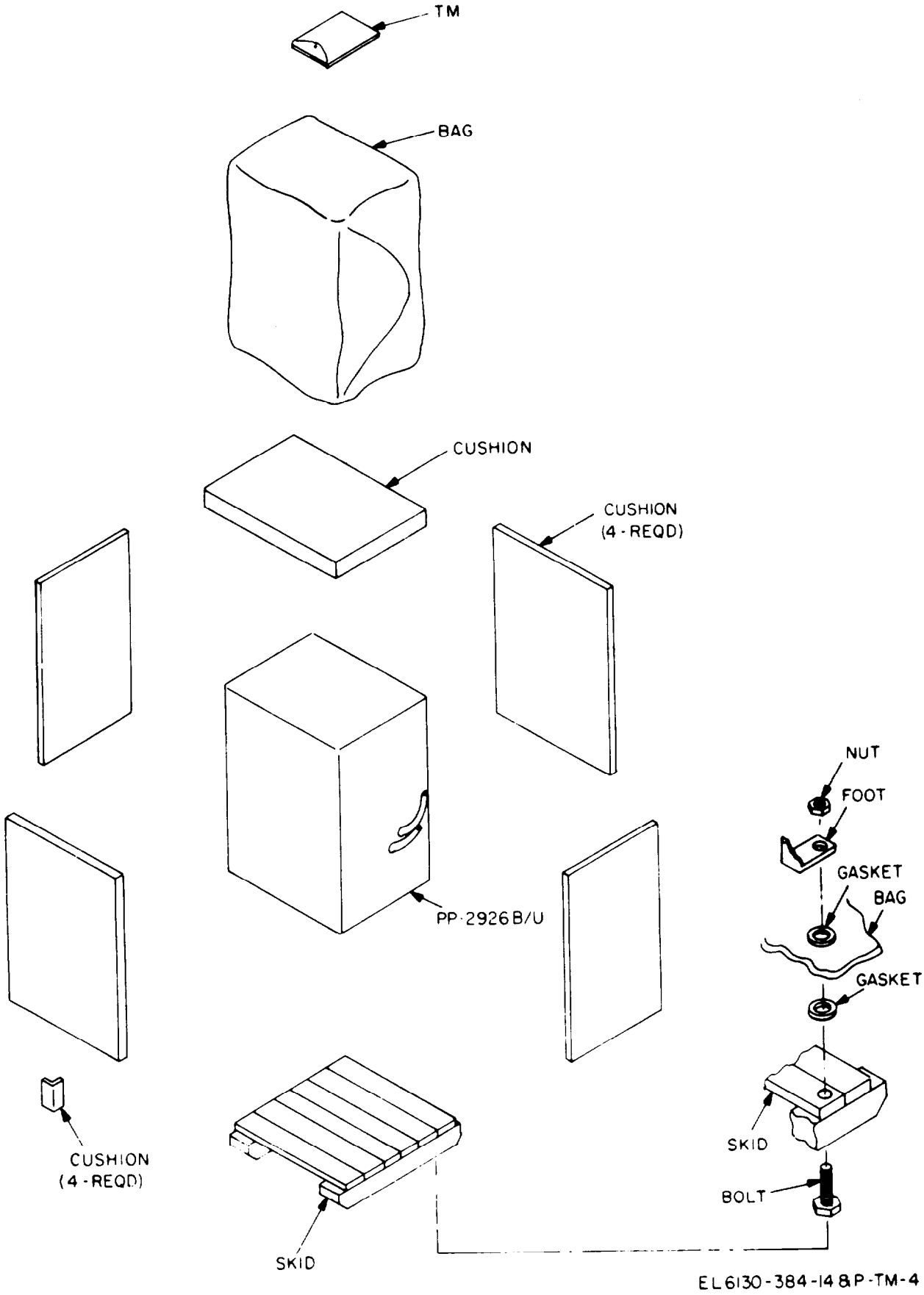


Figure 2-1. Typical packaging.

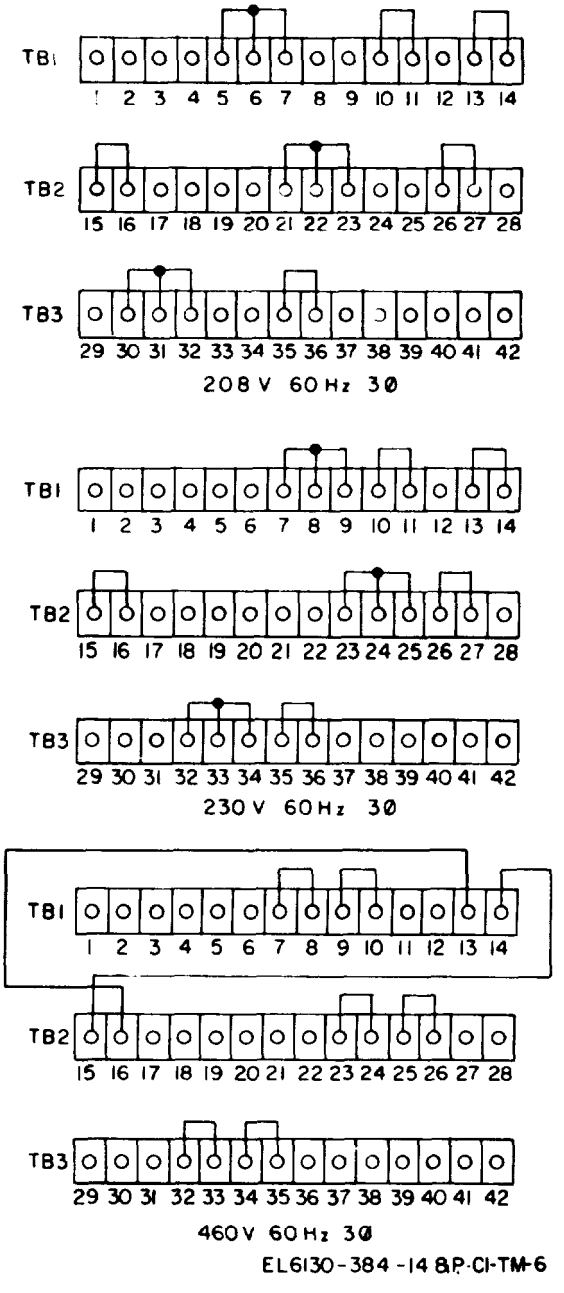


Figure 2-2. Transformer terminal board jumpers.

CHAPTER 3

OPERATING INSTRUCTIONS

Section I. CONTROLS AND INDICATORS

3-1. Damage From Improper Settings

This chapter should be read carefully before using the battery charger. Follow the instructions on the OPERATING INSTRUCTIONS plate on the front panel. When using nickel-iron batteries, be sure that the timer is set at NI.

3-2. Operator Controls and Indicators

The battery charger controls and indicators are on the front panel. They are shown in figure 3-1 and their functions are listed in table 3-1.

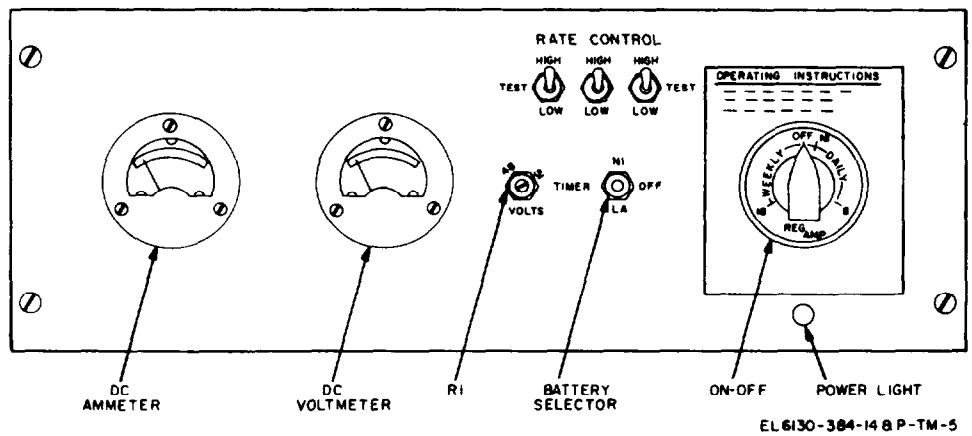


Figure 3-1. Controls and indicators.

Table 3-1. Controls and Indicators

Control or indicator	Function
RATE CONTROL switches	Three switches for three phases. At LOW, low charging current is available. At HIGH, high charging current is available. At TEST, charging current can be read on the ammeter.
Battery selector switch	Place at NI when nickel-iron battery is charged. Place at LA when lead-acid battery is charged. Place at OFF when unit is not in use.
VOLTS 48-51 control (RI)	Adjusts the NI control voltage for the timer.
Timer switch (ON-OFF)	Sets mode of operation and charge time cycle to maximum of 8 hours daily and 18 hours weekly. Timer is on as soon as switch is turned from OFF position. Input power to battery charger goes off when timer switch reaches OFF. SW pos NI Sets timer for nickel-iron battery charging. 8 Sets timer for lead-acid battery charging. Will turn off input power after 8 hours. I8 Sets timer for lead-acid battery charging on a weekly basis. Will turn off after 18 hours.
Power light	Illuminates when timer is turned on.
Dc ammeter	Indicates charging current.
Dc voltmeter	Indicates charging voltage.

Section II. OPERATING PROCEDURE

3-1. Charging 18-Cell Lead-Acid Battery

NOTE

For complete information concerning lead-acid batteries, refer to TM 9-6140-200-12 and TM 10-1690A.

After performing the connection procedures given in paragraph 2-4, charge an l&cell lead-acid battery as follows:

a. Set NI-LA switch to LA.

b. Set RATE CONTROL switches to LOW.

c. Remove the vent caps from the battery to be charged and add distilled or deionized water as necessary. Replace the vent caps.

d. Connect the dc output cable battery connector to the forklift 18-cell lead-acid battery receptacle .

CAUTION

Never smoke or. light matches in the charging area. Observe gassing carefully, particularly near the end of charge. Excessive violent gassing indicates that the battery is becoming overcharged.

e. Set the timer to 8, and monitor the initial battery-charging current on the ammeter. If the ammeter indicates greater than 180 amperes, refer to higher category maintenance for adjustment.

f. After the battery-charging current has reduced to one-twentieth of the initial battery-charging current, note the time remaining on the timer.

g. After 8 hours, the timer will disconnect the input power. Disconnect the dc output battery connector from the battery.

3-4. Charging 30-Cell Nickel-Iron Battery

NOTE

For complete information concerning nickel-iron batteries, refer to TM 10-1690A.

After performing the connection procedures given in paragraph 2-4, charge a 30-cell nickel-iron battery as follows:

a. Set NI-LA switch at NI.

b. Set RATE CONTROL switches at LOW.

c. Remove the vent caps from the battery to be charged and add distilled or deionized water as necessary. Replace the vent caps.

d. Connect the dc output cable battery connector to the forklift 30-cell battery receptacle.

CAUTION

Never smoke or light matches in the charging area. Observe gassing carefully, particularly near the end of charge. Excessive violent gassing indicates that the battery is becoming overcharged.

e. Set the timer to NI and monitor the initial battery-charging current on the ammeter. If the ammeter indicates greater than 180 amperes, refer to higher maintenance category for adjustment.

f. The timer will charge for one hour and then turn off the input power.

g. Disconnect the dc output battery connector from the battery.

CHAPTER 4

OPERATOR AND ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. GENERAL

4-1. Scope of Operator and Organizational Maintenance

The maintenance duties assigned to the operator and organizational repairman of Battery Charger PP-2926B/U are listed below together with corresponding references covering the specific maintenance functions.

a. Operator's daily and weekly preventive maintenance checks and services (table 4-1).

b. Organizational monthly and quarterly preventive maintenance checks and services (table 4-1).

c. Cleaning (para 4-5).

d. Rustproofing and painting (para 4-6).

4-2. Tools and Test Equipment

Tools and test equipment used by operator and organizational maintenance personnel for the PP-2926B/U are listed in appendix C.

Section II. PREVENTIVE MAINTENANCE

4-3. Scope of Preventive Maintenance

Preventive maintenance is the systematic care, servicing, and inspection of the equipment to prevent the occurrence of trouble, to reduce downtime, and to assure that the equipment is serviceable. The procedures given in table 4-1 cover routine systematic care and cleaning essential to proper upkeep and operation of the equipment.

4-1. Preventive Maintenance Checks and Services Periods

a. Preventive maintenance checks and services of the battery charger are required daily, weekly, monthly, and quarterly as shown in table 4-1 and under special conditions listed below:

(1) When the battery charger is initially installed.

(2) When the battery charger is reinstalled after removal for any reason.

(3) At least once a week, if equipment is maintained in standby condition.

b. Perform the maintenance functions indicated in the organizational monthly preventive maintenance checks and services once each month. A month is defined as approximately 30 calendar days of 8-hour-per-day operation. If the equipment is operated 16 hours a day, the monthly preventive maintenance checks and services should be performed at 15-day intervals. Adjustment of the maintenance interval must be made to compensate for any unusual operating conditions. Equipment maintained in a standby (ready for immediate operation) condition must have monthly preventive maintenance checks and services. Equipment in limited storage (requires service before operation) does not require monthly maintenance.

Table 4-1. Preventive Maintenance Checks and Services

ITEM NUMBER	INTERVAL						B--BEFORE OPERATION D-DURING OPERATION A-AFTER OPERATION W-WEEKLY W-MONTHLY Q-QUARTERLY		
	OPERATOR				ORG.				
	DAILY			W	M	Q	ITEM TO BE- INSPECTED	PROCEDURE	REFERENCE
	B	D	A						
1	X						Battery charger	Check for completeness and general condition	Para 1-10
2	X						Exterior surfaces	Check exterior surfaces.	Para 4-5
3	X						External receptacles	Inspect external receptacles for breakage and looseness.	
4	X						Meter glass	Inspect glass window for breaks. physical damage dust or moisture.	
5		X					Knobs, controls. and switches	During operation. check knobs. controls. and switch-	

Table 4-l. Preventive Maintenance Checks and Services - Continued

ITEM NUMBER	INTERVAL OPERATOR ORG. DAILY B	DAILY D	DAILY A	W	M	Q	ITEM TO BE INSPECTED	PROCEDURE	REFERENCE
								B — BEFORE OPERATION D — DURING OPERATION A — AFTER OPERATION W — WEEKLY M — MONTHLY Q—QUARTERLY	
								es for proper mechanical action.	
6		X					Operation	Be alert for any abnormal indications.	
7			X				Battery charger	Check for any peculiar odors which would indicate overheated components.	
8				X			Cables	Inspect cables for cuts, cracked or gouged jackets, fraying, or kinks.	
9				X			Hardware	Inspect all exterior hardware for looseness and damage.	
10				X			Preservation	Inspect equipment for bare spots, rust and corrosion.	Para 4-6
11					X		Publications	Inspect manual for completeness and usable condition. Be sure that all changes are on hand.	DA Pam 310-4
12					X		MWO's	Check to see that all URGENT MWO's have been applied and that all NORMAL MWO's have been scheduled.	DA Pam 310-7
13						X	Completeness	Same as item 1.	
14						X	Exterior surfaces	Same as item 2.	
15						X	External receptacles	Same as item 3.	
16						X	Preservation	Same as item 10.	
17						X	Meter glass	Same as item 4.	

4-5. Cleaning

Inspect the exterior surfaces of the battery charger. The exterior should be free of dirt, grease and fungus.

a. Remove the dust and other dirt with a clean, soft cloth.

WARNING

Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

b. Remove grease, fungus, and ground-in dirt from the cabinet, use a cloth dampened (not wet) with trichlorotrifluoroethane.

c. Remove dirt from the dc output cable with a brush.

CAUTION

Do not press on the meter face (glass) when cleaning; the meter may be damaged.

d. Clean the front panel meters and control knob; use a soft, clean cloth. If necessary, dampen cloth with water. Mild soap may be used for more effective cleaning.

4-6. Rustproofing and Painting

a. Rustproofing. When the finish on the battery charger has become badly scarred or damaged, rust and corrosion can be prevented by touching up the bare spots. Use No. 000 sandpaper to clean the surface down to the bare metal. Obtain a bright smooth finish.

b. Painting. Remove the rust and corrosion from the metal surface as explained in a above. Brush two thin coats of paint on the bare metal to protect it. Refer to the applicable cleaning and refinishing practices specified in TB 746-10.

Section III. OPERATOR AND ORGANIZATIONAL TROUBLESHOOTING

4-7. General Troubleshooting Information

Troubleshooting the PP-2926B/U is based upon the operational check contained in the daily portion of the preventive maintenance checks and services table 4-l. If an abnormal condition or result is observed, note the trouble in the troubleshooting chart and perform the corrective actions indicated therein. If the corrective measures indicated do not result in correction of the trouble, or if there is no corresponding trouble in the troubleshooting chart, higher category of maintenance is required.

4-8. Organizational Troubleshooting

Malfunction	Probable cause	Corrective action
Battery selector switch at NI or LA as required, timer set on, power lamp does not light.	a. Defective lamp. b. Defective fuses F1, F2, F3.	*a*. Check lamp DSI and replace if defective. b. Check fuses and replace defective fuse. c. Refer to higher maintenance category.

CHAPTER 5
FUNCTIONING OF EQUIPMENT

5-1. General

Battery Charger PP-2926B/U is basically three transformers, one for each of three phases, with a bridge-type rectifier, in parallel, across each transformer secondary (fig. 5-1). Jumpers on the transformer primary windings adapt the battery charger for input voltages of 208,230, or 460 volts, 3-phase, 60 Hz.

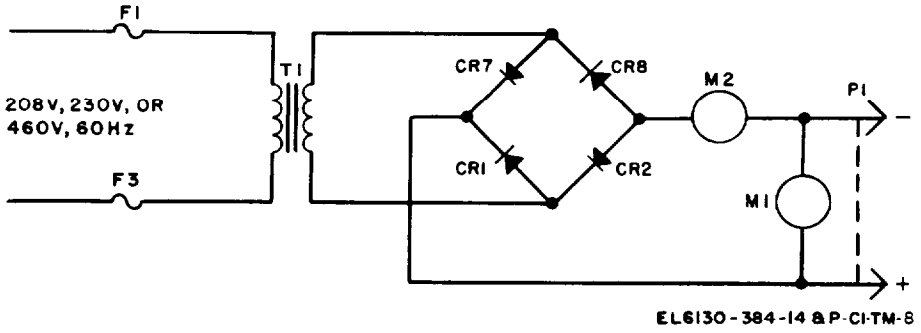


Figure 5-1. Simplified schematic diagram.

5-2. Circuit Functioning

NOTE

There are three identical circuits for the three phases. The circuit function of one described below is the same for all three (fig. 5-1). The complete schematic diagram is shown in (fig. 5-3).

Input power is connected to the battery charger through a lo-foot power cable which is connected to the power source. There is a 20-ampere fuse in each side of the line. When battery selector switch S4 is placed at LA and the timer is turned on (any position other than OFF), relays K1 and K2 are energized, lamp DS1 lights and power is applied to the primary of T1. The stepped down voltage across the secondary winding is rectified by a bridge-type rectifier, CR1, CR2, CR7, CR8. The rectified dc voltage goes to the dc output cord through fuse F4 in the +line. Ammeter M2 in the +line measures the dc flowing to the battery. Voltmeter M1 across the output measures the dc output voltage.

5-3. Control Circuits

a. With the battery selector switch set at LA and the timer turned on, the timer contacts close and power is applied to the coils of relays K1 and K2. The relays are energized and apply power to the

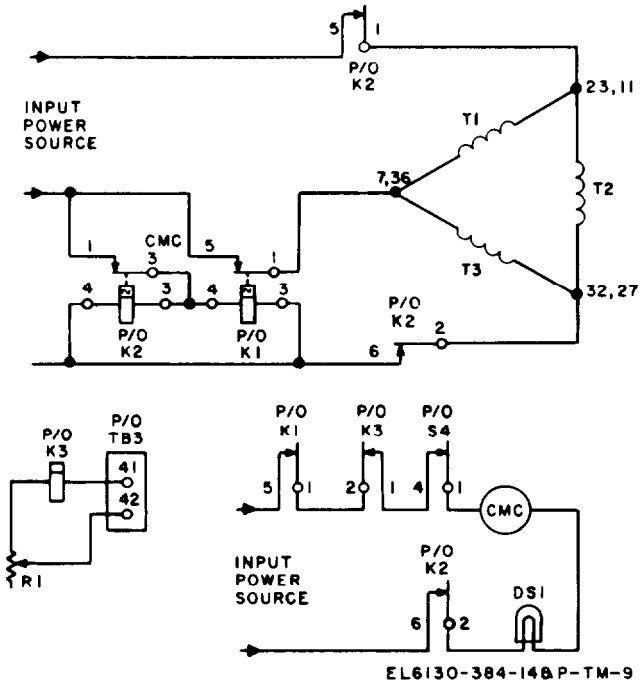


Figure 5-2. Control circuits.

three transformers through their contacts.

b. With the battery selector switch set at N1 and the timer set at N1, the battery charger operates but the timer does not start. When the dc output reaches 48-51 volts (setting of R1), relay K3 operates, the contacts close applying power to the timer. The timer will operate for 1 hour and automatically turn off.

c. When switch S1 is at LOW, capacitor Cl is across terminals 2 and 3 of T1 and the secondary current is low. When switch S1 is at HIGH, Cl is in series resonance with the primary (terminals 1 and 3) of T1. The low impedance in the primary allows for a high secondary current; therefore, a low or high charging current can be used.

d. There are three reverse polarity protection solenoids in parallel in the negative output line. If the battery is hooked up correctly, the solenoids close and the output voltage is connected to the battery. If the battery is hooked up in reverse, the solenoids will not close and there will be no dc output. Diode CR13 prevents the reverse current from flowing.

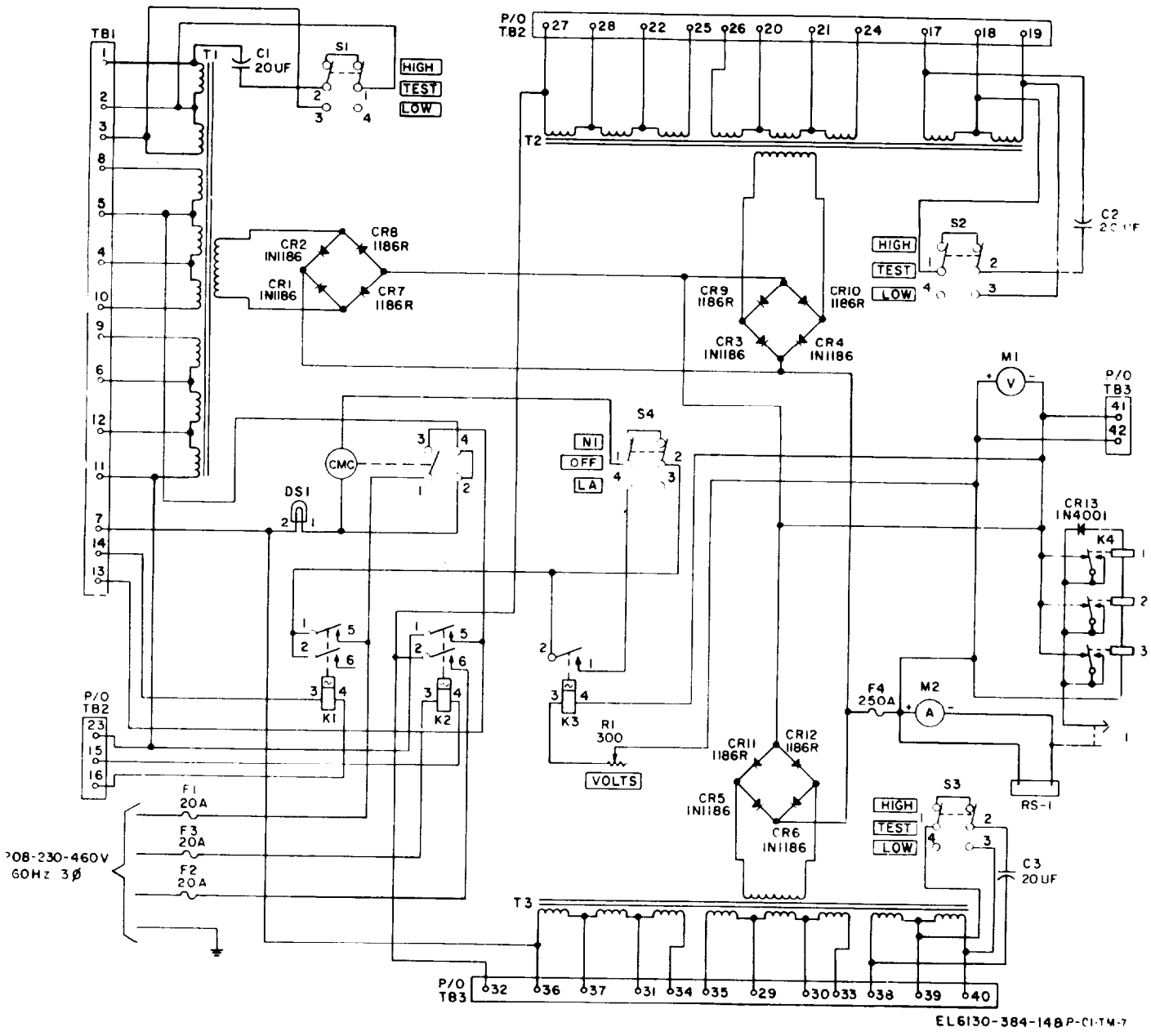


Figure 5-3. Battery Charger PP-2926B/U, schematic diagram

CHAPTER 6

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

Section I. GENERAL

6-1. Color Codes

Color codes for standard resistors, inductors, and capacitors are shown in figure FO-1.

6-2. Transformer DC Resistance Measurements

Table 6-l gives the dc resistance measurements for the three transformers. The numbers inside the parentheses refer to transformers T2 and T3.

Table 6-1. Transformer DC Resistance Measurements

Transformer terminals	Resistance (ohms)
T1 (T2, T3)	
4-5 (10-21.29-30)	1.0
4-10 (20-26, 29-35)	1.1
5-8 (21-24,30-33)	0.8
6-9 (22-25,31-34)	0.8
6-12 (22-28,31-37)	0.8
11-12 (27-28.36-37)	1.1
1-2 (17-18.38-39)	1.0
1-3 (17-19,38-40)	1.2

Section II. TOOLS AND TEST EQUIPMENT REQUIRED

6-3. Tools

No special tools are required.

6-4. Test Equipment

The test equipment required for general support testing and maintenance is listed in table 6-2.

Table 6-2. Test Equipment

Nomencalture	Technical manual
Insulation Breakdown Test Set AN/GSM-6	TM 11-6625-273-12
Multimeter TS-352B/U	TM 11-6625-366-15
Ohmmeter ZM-21A/U	TM 11-2050

Section III. GENERAL SUPPORT TROUBLESHOOTING

6-5. General Instructions

Troubleshooting at the general support maintenance includes the techniques required to isolate a defective part. Table 6-3 provides the troubleshooting information to be used by the repairman.

6-6. Organization of Troubleshooting Procedures

a. General. The first step in servicing a defective battery charger is to sectionalize the fault. Sectionalization means tracing the fault to the input or output portion of the unit. The second step is to localize the fault. Localization means tracing the fault to a defective circuit responsible for the condition. Some faults, such as burned-out resistors, arcing, and shorted transformers, can often be located by sight, smell, and sound. The majority of faults, however, must be isolated by checking voltages and resistances.

b. Sectionalization and Localization. The tests given in (1) and (2) below will reduce unnecessary work and aid in tracing trouble in a defective battery charger. The battery charger is a single unit and is theoretically divided into several sections for convenience in troubleshooting: ac input, rectifiers, dc output, and ac control.

(1) Visual inspection. The purpose of visual inspection is to locate faults without testing or measuring circuits. All meter readings on the front panel of the battery charger should be observed and an attempt made to sectionalize and localize the fault to a particular part.

(2) Operational test. Operational tests frequently indicate the general location of trouble. In many instances, the tests will help in determining the exact nature of the fault. The operational procedure given in chapter 3, with the normally expected indications called out in the procedures, provide good operational tests.

(3) Troubleshooting table. The troubleshooting table (table 6-3) lists symptoms of common troubles and gives the corrective measures or references. The table cannot include all trouble symptoms that may occur; therefore, the repairman should use this table as a guide in analyzing symptoms that may not be listed.

(4) Component locations. Figures 6-1, 6-2, and 6-3 show the component locations on the battery charger.

6-7. Localizing Troubles

a. General. Troubleshooting table 6-3 outlines procedures for localizing troubles within the various circuits of the battery charger. Refer to figures 6-1, 6-2, and 6-3 for parts location. Refer to the overall schematic diagram (fig. 5-3) to identify circuit components. Depending on the nature of the operational symptoms, one or more of the localizing procedures will be necessary. When the trouble has been localized to a particular circuit, use voltage and resistance measurements to isolate the trouble to a particular part.

b. Use of Troubleshooting Table. When an abnormal symptom is observed in the equipment, look for a description of the sympton in the Malfunction column, and perform the corrective action given in the Corrective action column.

c. Condition to Test. All checks outlined in the troubleshooting table are to be conducted with the battery charger connected to 208, 230-, or 460-volt power source. The battery charger should be connected to a battery load (lead-acid or nickel-iron, whichever is required).

Table 6-3. Troubleshooting

WARNING

When troubleshooting the battery charger, be extremely careful of high voltages. Be sure that the input power is off before opening the rear door to reach the interior of the unit. If tests must be performed with the power applied to the battery charger, be careful of the input voltage which is present at fuses F1, F2, F3, contacts and coil of relay K2 and contact 5 of K 1.

Malfunction	Probable cause	Corrective action
1. Power on indicator lamp DS1 does not illuminate with battery selector switch S4 set and timer set for any time other than OFF.	a. No ac power applied. b. Lamp DS1 burned out. c. Input power fuses are defective. d. Timer contacts 1 and 3 not closed. e. Relay K2 not energized.	a. Check for input power. b. Replace DS1. c. Replace fuses as required. d. Check timer, replace if necessary. e. Check continuity of K2 coil, replace as required.
2. Low output voltage.	a. Defective power transformer T1, T2, or T3. b. Defective rectifier CR1 through CR12.	a. Check resistance of windings, replace as required. b. Replace defective rectifier.
3. Battery charger continues to provide charging current with timer at OFF.	Defective timer.	Replace timer.
4. Voltmeter M1 indicates 48-51 volts when charging nickel-iron battery and timer does not start.	a. Rheostat R1 improperly adjusted. b. Defective relay K3.	o. Adjust R1. b. Check K3 and replace as required.

Section IV. REPAIRS AND ADJUSTMENTS

6-8. General Parts Replacement Techniques

When replacing parts in Battery Charger PP-2926B/U, follow the precautions given below.

a. Before a part is unsoldered, note the position of the leads. If the part to be replaced has a number of connections, such as a transformer, tag each lead.

b. Be careful not to damage other leads by pulling or pushing them out of the way to reach other parts or connections.

c. Do not allow drops of solder to fall into the equipment; they may cause short circuits and damage the unit.

d. When a part is replaced, it must be positioned exactly as the original part. Pay particular attention to proper grounding when replacing a part. Use the same ground as in the original wiring.

CAUTION

Meter repairs should be undertaken only by authorized instrument repair personnel in properly equipped shops. Attempted meter repair by unqualified personnel may result in irreparable damage to the meter.

6-9. Replacement of Parts

WARNING

When repairing or performing adjustments to the battery charger, be extremely careful of high voltages.

All battery charger parts can be reached easily

and replaced without special procedures. Refer to figures 6-1, 6-2, and 6-3 for the location of all parts. Connect replaced items according to the schematic diagram (fig. 5-3) and the parts location diagrams.

6-10. Adjustment of Rheostat RI

a. Connect the output cable to a nickel-iron battery.

b. Set battery selector switch S4 to N1.

c. Set the timer to N1.

d. Adjust R1 so that relay K3 activates when the battery voltage reaches 48-51 volts. This action starts the timer.

Section V. GENERAL SUPPORT TESTING PROCEDURES

6-11. General

a. The following testing procedures are prepared for use by general support maintenance personnel to determine the acceptability of repaired electronic equipment. These procedures establish specific requirements that repaired equipment must meet before it is returned to the using organization.

b. Comply with the instructions preceding each table. Perform each step in sequence; do not vary the sequence. For each step, perform all the actions required in the Control settings column; then perform each specified procedure and verify it against the performance standard.

6-12. Modification Work Orders

The performance standards listed in the tests below are based on the assumption that all modi-

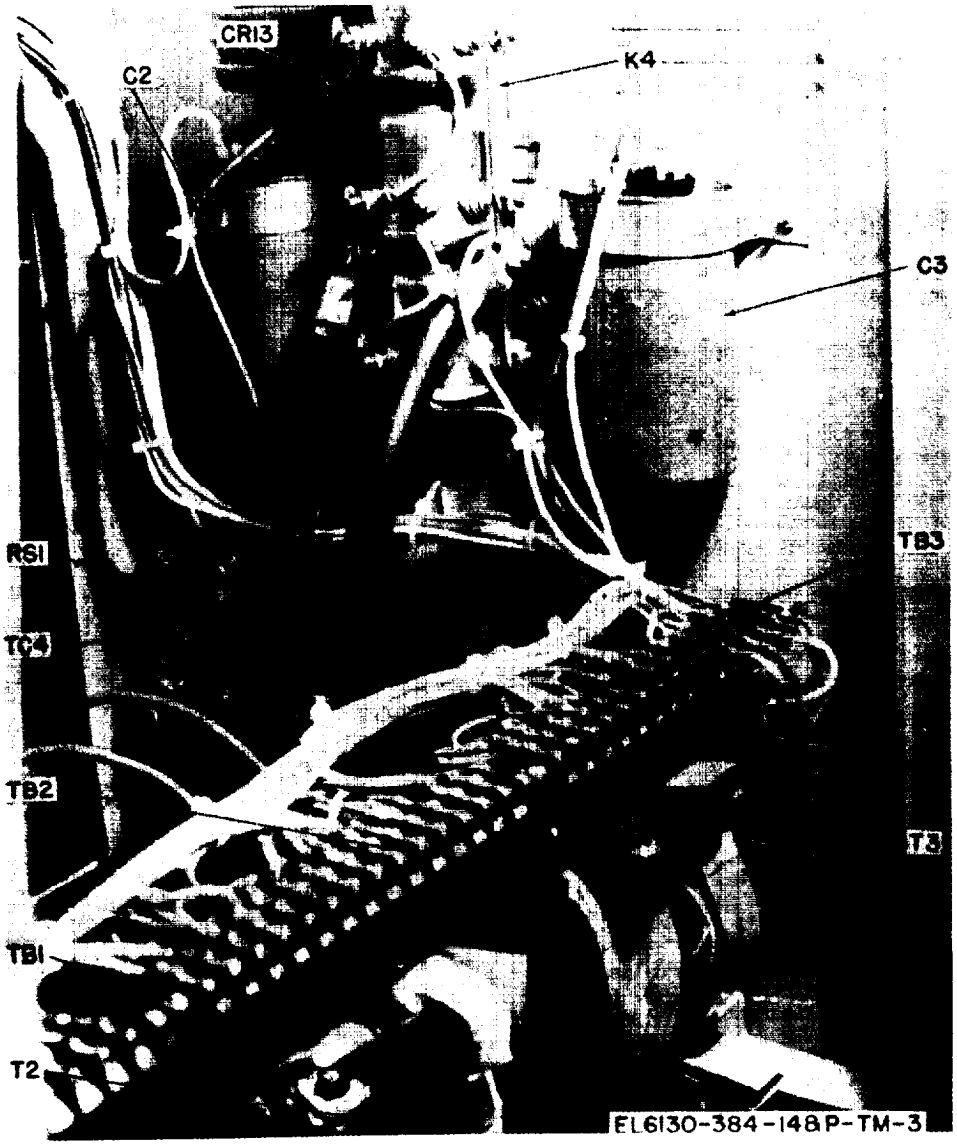


Figure 6-1. Left side of cabinet, location of parts.

fications have been performed. A listing of current modification work orders will be found in DA Pam 310-7.

6-13. Physical Tests and Inspection

a. Test Equipment and Materials. None required.

b. Test Connections and Conditions. No connections; no power; rear door open.

c. Procedure.

Step NO.	Control settings		Test procedure	Performance standard
	Test equipment	Equipment under test		
1	None	Any position	a. Inspect case and chassis for damage, missing parts and condition of paint.	a. No damage evident or parts missing. External surfaces intended to be painted will not show bare metal. Panel lettering will be legible.
			b. Inspect all controls and mechanical assemblies for loose or missing screws, bolts, and nuts.	b. Screws, bolts, and nuts will be tight; none missing.

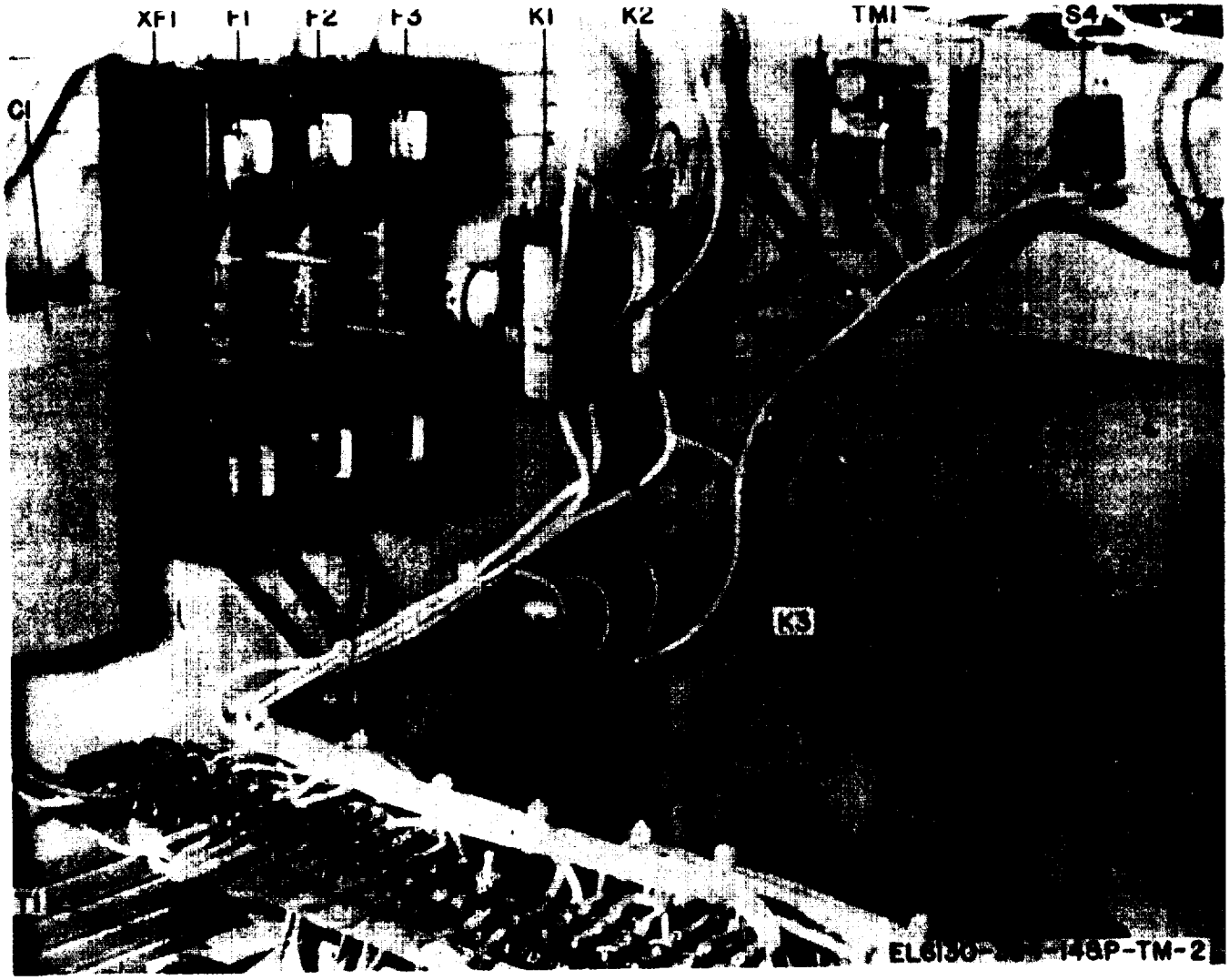


Figure 6-2. Right side of cabinet. location of parts.

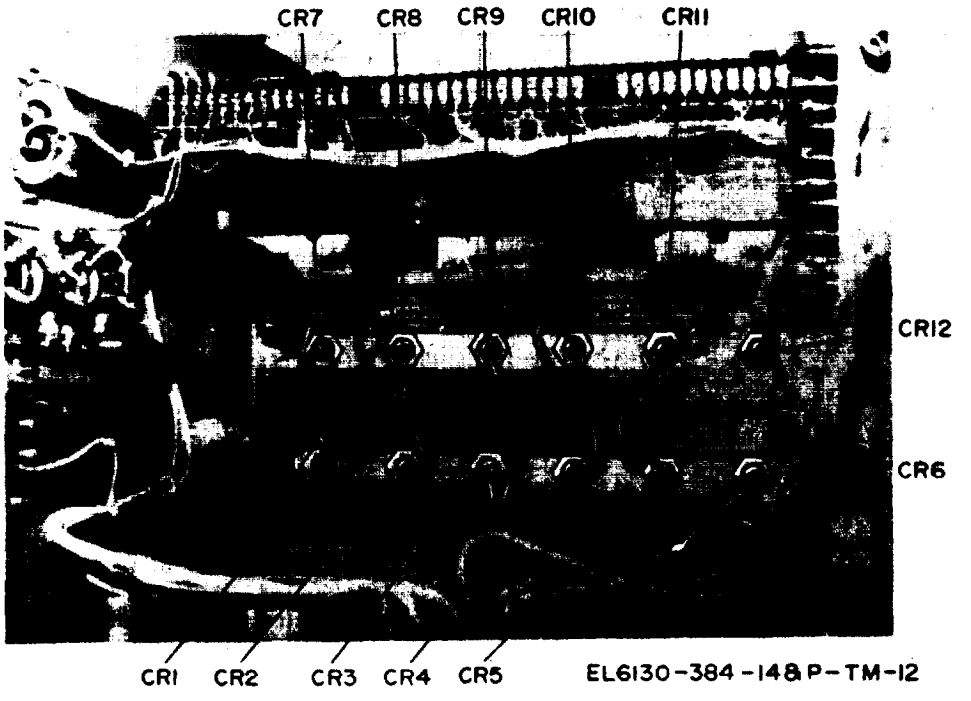


Figure 6-3. Bottom of cabinet, location of parts.

6-14. Insulation Breakdown Test

(fig. 6-4)

a. Test Equipment and Materials.

(1) Insulation Breakdown Test Set AN/GSM-6.

(2) Two-foot length of AWG %10 wire.

(3) Ohmmeter ZM-21A/U.

b. Test Connections and Conditions. Turn off all power to the battery charger.

c. Procedure.

Step No.	Control settings: Test equipment	Control settings: Equipment under test	Test procedure	Performance standard
1	None	None	a. On AN/GSM-6, connect output connector to negative (-) output terminal (fig. 6-4).	a. None.
			b. Connect terminal strap to positive (+) output terminal of AN/GSM-6.	b. None.
			c. Lower high-voltage plate of AN/GSM-6 against output terminal.	c. None.
			d. Connect output cable of AN/GSM-6 to PP-2926B/U as follows: (1) On PP-2926B/U. connect TB1-11 to TB2-27 to TB3-36. (2) Connect one end of two-foot length of #10 wire to TB1-11. (3) Connect high-voltage connection of AN/GSM-6 to other end of wire. CAUTION Be sure to maintain at	d. None.

Step NO.	Control settings: Test equipment	Control settings: Equipment under test	Test procedure	Performance standard
			least a 6-inch clearnce between guard wire and high-voltage bad, and between the guard wire and frame of PP-2926B/U during testing. (4) Connect a guard wire from guard connector of AN/GSM-6 to insulation of the #10 wire. (5) Connect chassis of PP-2926B/U to earth ground.	
2	AN/GSM-6 AMMETER MULTIPLIER switch to 1000. Kilovoltmeter polarity switch to -. Microammeter polarity switch to -. VOLTMETER RANGE switch to 5. Voltage control to 0. High-voltage caution plate raised and secured with chain. Cir breaker at ON.		a. Press high-voltage control end rotate ccw while watching kilovoltmeter and microammeter. Continue until maximum voltage (1920 volts) of teat is reached. b. Maintain output voltage for 60 to 90 seconds. c. Set voltage control to 0, circuit breaker switch to OFF. and allow AN/GSM-6 to discharge (through its internal resistance). When kilovoltmeter reading is nearly zero, short output terminals by lowering the high-voltage caution plate. d. Disconnect equipment. Deleted	a. Reading of approximately 1.92 kilovolts on 5Kv scale. b. No insulation breakdown. (Opening of circuit breaker switch, lighting of DC OVERLOAD indicator or wavering of microammeter pointer of AN/GSM-6 are indications that insulation is defec. tive.) c. None. d. None.

6-15. Performance Tort

(fig. 6-5)

a. Test Equipment and Materials.

(1) Multimeter TS-352B/U.

(2) Known good 18-cell lead-acid battery in discharged state (specific gravity less than 1.190).

(3) Known good 30-cell nickel-iron battery in partial discharged state (terminal voltage not greater than 33 volts).

b. Test Connection and Conditions. Connect the equipment as shown in figure 6-5. Do not turn on input power to the PP-2926B/U until instructed to do so in e below. This test is for operation of the PP-2926B/U at 208-volt, three-phase input power.)

c. Procedure.

	Control settings		Test procedure	Performance standard
	Test equipment	Equipment under test		
	TS-352B/U FUNCTION TO DIRECT	Timer to OFF.	a. Connect PP-2926B/U for 208-volt, 3-phase operation.	a. None.
		Battery selector to LA.	b. Connect PP-2926B/U to a 208-volt, 3-phase input power source.	b. None.
		RATE control switch to LOW.	c. Connect dc output cable to 18-cell lead-acid battery.	c. None.
			d. Remove vent caps from battery and add distilled or deionized water as necessary. Replace vent caps.	d. None.
			CAUTION Never smoke or light matches in the charging area.	
			e. Set timer to 8 and monitor initial battery charging current on unit dc ammeter.	e. Ammeter reading is less than 180 amps.
			f. Allow charging to continue while monitoring charging current.	f. Charging current reduces.
			g. Continue charging until timer reaches OFF.	g. PP-2926B/U automatically turns off.
2		Battery selector to NI	a. Same as a and b above.	a. None.
			b. Connect dc output cable to 30-cell nickel-iron battery.	b. None.
			c. Same as d above.	c. None.
			d. Set timer to N 1 and monitor initial battery charging current on unit dc am. meter.	d. Ammeter reading is less than 180 amps.
			e. Continue to monitor charging current.	e. Charging current reduces.
			f. Monitor unit voltmeter.	f. Timer starts when volt. meter indicates 48-51 volta.
			g. Monitor ammeter.	g. Charging current lowers when timer starts.
			h. Continue charging until timer reaches OFF.	h. PP-2926B//U automatically turns off.
			i. Disconnect equipment.	i. None.

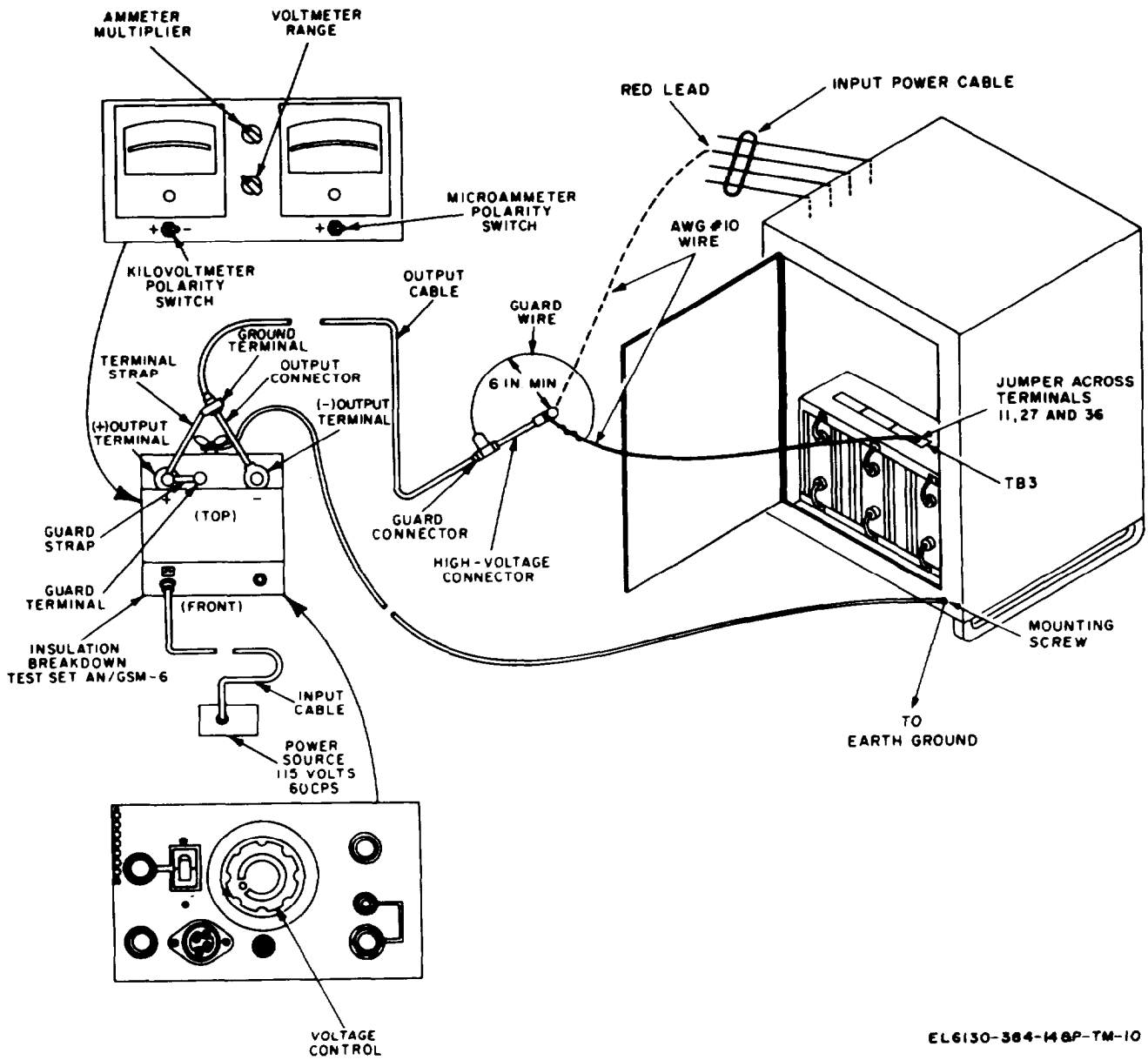


Figure 6-4. Insulation breakdown test setup.

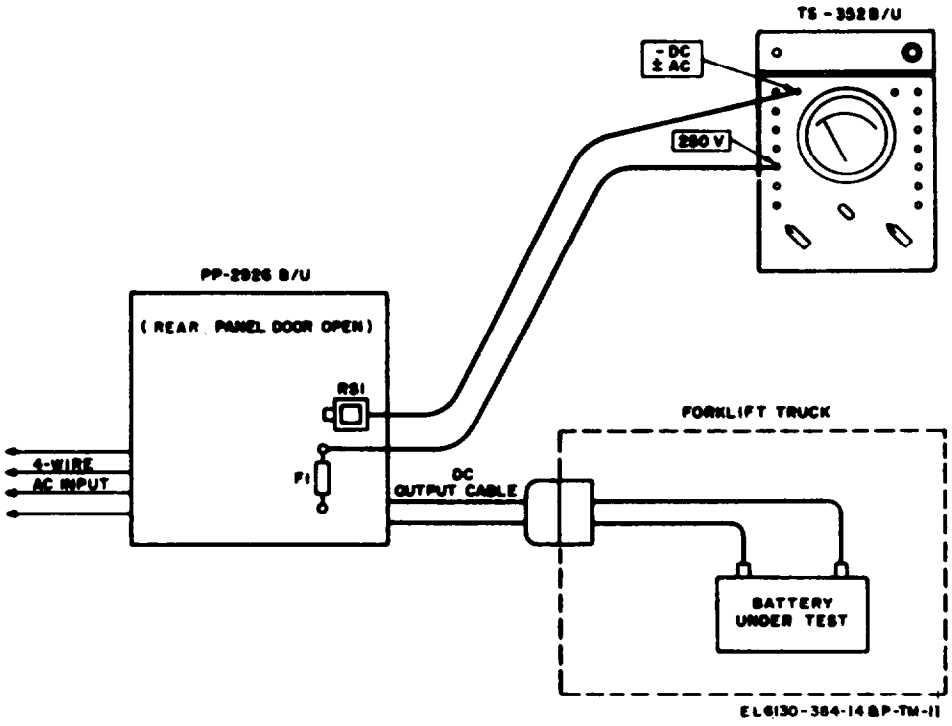


Figure 6-5. Performance test setup.

APPENDIX A
REFERENCES

DA Pam 310-4	Index of Technical Publications: Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8, and 9), Supply Bulletins, and Lubrications Orders.
DA Pam 310-7	US Army Equipment Index of Modification Work Orders.
TB 43-0118	Field Instructions for Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters.
TM 9-6140-200-14	Operator's, Organizational Direct Support and General Support Maintenance Manual for Lead-Acid Storage Batteries; 4HN,24V (NSN 6140-00-059-3528), MS75047-1; 2HN, 12V (NSN 6140-00-057-2553), MS35000-1; 6TN, 12V (NSN 6140-00-057-2554) MS35000-3.
TM 10-6140-206-14	Installation, Use, Maintenance, and Repair of Industrial Motive Power Storage Batteries for Materials Handling Equipment.
TM 11-2050	Test Set I-48-B and Ohmmeter ZM-21A/U.
TM 11-6130-384-24P	Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools Lists for Battery Charger PP-2926B/U (NSN 6130-00-500-0069). (Including Depot Maintenance Repair Parts and Special Tools).
TM 11-6626-273-12	Operation and Organizational Maintenance: Insulation Breakdown Test Sets AN/GSM-6 and AN/GSM-6A.
TM 11-6625-366-15	Operator's, Organizational, Direct Support, General Support, and Depot Maintenance Manual: Multimeter TS-352B/U (NSN 6625-00-553-0142).
TM 38-750	The Army Maintenance Management System (TAMMS).
TM 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command).

APPENDIX C

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

C-1. General

This appendix provides a summary of the maintenance operations for PP-2926B/U. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

C-2. Maintenance Function

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.

b. Test. To verify serviceability and to detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean, preserve, drain, paint, or to replenish fuel/lubricants/hydraulic fluids or compressed air supplies.

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

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

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipment used in precision measurement. Consists of the comparison 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. Install. The act of emplacing, seating, or fixing into position an item, part, module (component or assembly) in a manner to allow the proper functioning of the equipment/system.

h. Replace. The act of substituting a serviceable like-type part, subassembly, model (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module/component/assembly, end item or system.

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

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

C-3. Column Entries

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the noun 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.

d. Column 4, Maintenance Category. Column 4 specifies, by the listing of a “worktime” figure in the appropriate subcolumn(the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance

function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate "worktime" figures will be shown for each category. The number of man-hours specified by the "worktime" 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, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. Subcolumns of column 4 are as follows:

C-Operator/Crew
O-Organizational
F-Direct Support
H-General Support
D-Depot

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

C-4. Tool and Test Equipment Requirements (Table I)

a. Tool or Test Equipment Reference Code. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool or test equipment for the maintenance functions.

b. Maintenance Category. The codes in this column indicate the maintenance category allocated the tool or test equipment.

c. Nomenclature. This column lists the noun name and nomenclature of the tools and test equipment required to perform the maintenance functions.

d. National/NATO Stock Number. This column lists the National/NATO stock number of the specific tool or test equipment.

e. Tool Number. This column lists the manufacturer's part number of the tool followed by the Federal Supply Code for manufacturers (5-digit) in parentheses.

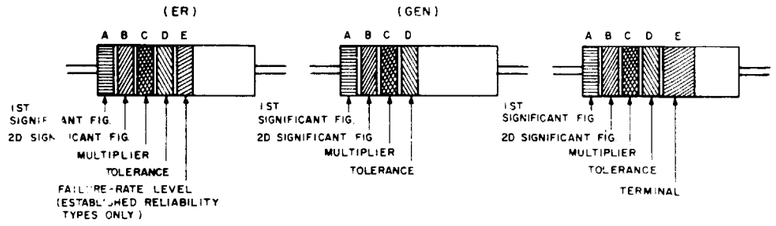
SECTION II MAINTENANCE ALLOCATION CHART
FOR
CHARGER BATTERY PP-2926B/U

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQUIPMENT
			C	O	F	H	D	
00	CHARGER BATTERY PP-2926B/U	Inspect 1	0.1					1
		Adjust 2	0.1					1
		Services 3		0.1				1
		Adjust 4		0.1				2
		Replace 5		0.2				2 thur 7
		Adjust 6				1.0		2
		Test				1.0		2 thru 10
		Replace				1.0		
		Overhaul					1 2	

(1) Exterior
(2) Operational controls excluding CHG. RATE ADJ
(3) Exterior
(4) Preoperational connections and controls including CHG RATE ADJ
(5) AC input power cable & fuses
(6) All ADJ except regulation

Table I. TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR
CHARGER BATTERY PP-2926B/U

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	0	TOOL KIT. ELECTRONIC EQUIPMENT TK-101/G	5180-00-064-5178	
2	H,D	TOOL KIT, ELECTRONIC EQUIPMENT TK-105/G	5180-00-610-8177	
3	H,D	MULTIMETER AN/USM-223/U (Rs TS-352B/U	6625-00-999-7465	
4	H,D	OHMMETER, ZM-21/U	6625-00-581-2466	
5	H,D	TEST SET, INSULATION BREAKDOWN AN/GSM-6	6625-00-542-1331	
6	H,D	VOLTMETER, TS-340/U	6625-00-643-0624	
7	H,D	LOAD BANK, BATTERY		
		(a) 18-cell lead-acid battery mounted in fork-lift truck.		
		(b) 30-cell nickel-iron battery mounted in fork-lift truck.		
8	D	A.C., D.C. CLAMP AMMETER, RANGE 0-100, 0-500 'TONG TEST" COLUMBIA ELECTRIC MFG. CO. OR EQUAL.		
9	D	AUTOTRANSFORMER, VARIAL, 30, 60 Hz, 0-240 VOLTS-100 AMPS, GENERAL RADIO CORP., TYPE W50HG6BBM; OR EQUAL		
10	D	LOAD BANK, RESISTIVE, VARIABLE RANGE 0.2 TO 32.0 0HMS, 250 AMPS, WARD LEONARD ELECTRIC CO., TYPE K 48149 OR EQUAL.		



COLOR CODE MARKING FOR COMPOSITION TYPE RESISTORS.

COLOR-CODE MARKING FOR FILM-TYPE RESISTORS.

TABLE 1

COLOR CODE FOR COMPOSITION TYPE AND FILM TYPE RESISTORS

BAND A		BAND B		BAND C		BAND D		BAND E		
COLOR	FIRST SIGNIFICANT FIGURE	COLOR	SECOND SIGNIFICANT FIGURE	COLOR	MULTIPLIER	COLOR	RESISTANCE TOLERANCE (PERCENT)	COLOR	FAILURE RATE LEVEL	TERM.
BLACK	0	BLACK	0	BLACK	1			BROWN	M=1.0	
BROWN	1	BROWN	1	BROWN	10			RED	P=0.1	
RED	2	RED	2	RED	100			ORANGE	R=0.01	
ORANGE	3	ORANGE	3	ORANGE	1,000			YELLOW	S=0.001	
YELLOW	4	YELLOW	4	YELLOW	10,000	SILVER	±10 (COMP. TYPE ONLY)	WHITE		SOLDERABLE
GREEN	5	GREEN	5	GREEN	100,000	GOLD	±5			
BLUE	6	BLUE	6	BLUE	1,000,000	RED	±2 (NOT APPLICABLE TO ESTABLISHED RELIABILITY)			
PURPLE (VIOLET)	7	PURPLE (VIOLET)	7							
GRAY	8	GRAY	8	SILVER	0.01					
WHITE	9	WHITE	9	GOLD	0.1					

BAND A — THE FIRST SIGNIFICANT FIGURE OF THE RESISTANCE VALUE (BANDS A THRU D SHALL BE OF EQUAL WIDTH.)

BAND B — THE SECOND SIGNIFICANT FIGURE OF THE RESISTANCE VALUE.

BAND C — THE MULTIPLIER (THE MULTIPLIER IS THE FACTOR BY WHICH THE TWO SIGNIFICANT FIGURES ARE MULTIPLIED TO YIELD THE NOMINAL RESISTANCE VALUE.)

BAND D — THE RESISTANCE TOLERANCE.

BAND E — WHEN USED ON COMPOSITION RESISTORS, BAND E INDICATES ESTABLISHED RELIABILITY FAILURE-RATE LEVEL (PERCENT FAILURE PER 1,000 HOURS) ON FILM RESISTORS, THIS BAND SHALL BE APPROXIMATELY 1-1/2 TIMES THE WIDTH OF OTHER BANDS, AND INDICATES TYPE OF TERMINAL

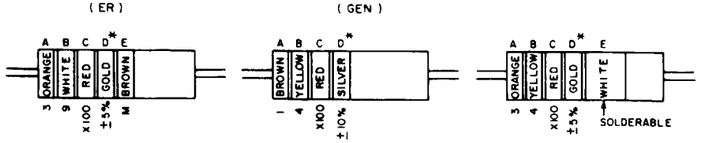
RESISTANCES IDENTIFIED BY NUMBERS AND LETTERS (THESE ARE NOT COLOR CODED)

SOME RESISTORS ARE IDENTIFIED BY THREE OR FOUR DIGIT ALPHA NUMERIC DESIGNATORS. THE LETTER R IS USED IN PLACE OF A DECIMAL POINT WHEN FRACTIONAL VALUES OF AN OHM ARE EXPRESSED. FOR EXAMPLE:

2R7 = 2.7 OHMS 10R0 = 10.0 OHMS

FOR WIRE-WOUND-TYPE RESISTORS COLOR CODING IS NOT USED, IDENTIFICATION MARKING IS SPECIFIED IN EACH OF THE APPLICABLE SPECIFICATIONS.

EXAMPLES OF COLOR CODING



NOMINAL RESISTANCE 3,900 OHMS
RESISTANCE TOLERANCE ±5%
FAILURE RATE LEVEL M

NOMINAL RESISTANCE 1,400 OHMS
RESISTANCE TOLERANCE ±10%

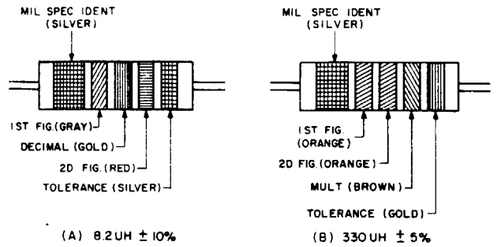
NOMINAL RESISTANCE 3,400 OHMS
RESISTANCE TOLERANCE ±5%
TERMINAL SOLDERABLE

COMPOSITION-TYPE RESISTORS

FILM-TYPE RESISTORS

* IF BAND D IS OMITTED, THE RESISTOR TOLERANCE IS ± 20% AND THE RESISTOR IS NOT MIL-STD.

A. COLOR CODE MARKING FOR MILITARY STANDARD RESISTORS.



(A) 8.2UH ± 10%

(B) 330UH ± 5%

COLOR CODING FOR TUBULAR ENCAPSULATED R.F. CHOKES. AT A, AN EXAMPLE OF OF THE CODING FOR AN 8.2UH CHOKE IS GIVEN. AT B, THE COLOR BANDS FOR A 330UH INDUCTOR ARE ILLUSTRATED.

TABLE 2

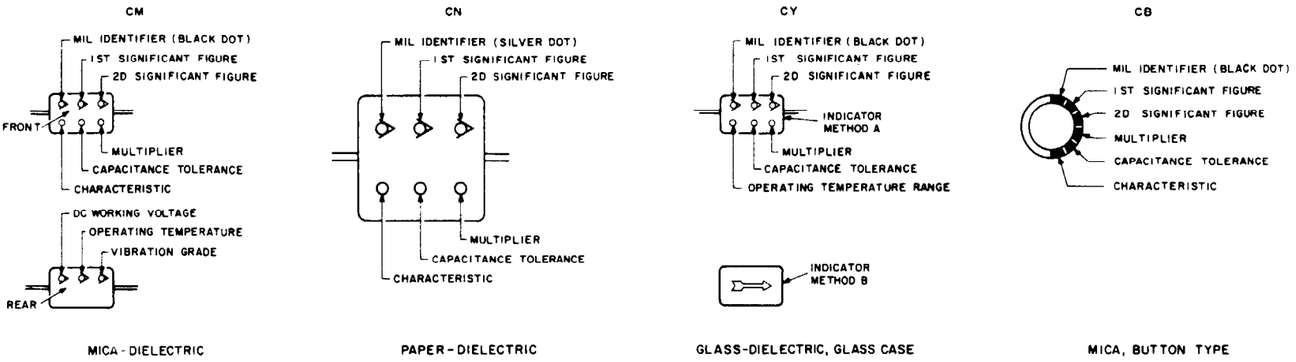
COLOR CODING FOR TUBULAR ENCAPSULATED RF CHOKES.

COLOR	SIGNIFICANT FIGURE	MULTIPLIER	INDUCTANCE TOLERANCE (PERCENT)
BLACK	0	1	
BROWN	1	10	1
RED	2	100	2
ORANGE	3	1,000	3
YELLOW	4		
GREEN	5		
BLUE	6		
VIOLET	7		
GRAY	8		
WHITE	9		
NONE			20
SILVER			10
GOLD	DECIMAL POINT		5

MULTIPLIER IS THE FACTOR BY WHICH THE TWO COLOR FIGURES ARE MULTIPLIED TO OBTAIN THE INDUCTANCE VALUE OF THE CHOKE COIL.

B. COLOR CODE MARKING FOR MILITARY STANDARD INDUCTORS.

CAPACITORS, FIXED, VARIOUS-DIELECTRICS, STYLES CM, CN, CY, AND CB.



MICA-DIELECTRIC | PAPER-DIELECTRIC | GLASS-DIELECTRIC, GLASS CASE | MICA, BUTTON TYPE

TABLE 3 - FOR USE WITH STYLES CM, CN, CY, AND CB.

COLOR	MIL ID	1ST SIG FIG.	2D SIG FIG.	MULTIPLIER[1]	CAPACITANCE TOLERANCE				CHARACTERISTIC[2]			DC WORKING VOLTAGE	OPERATING TEMP RANGE	VIBRATION GRADE
					CM	CN	CY	CB	CM	CN	CB	CM	CY, CM	CM
BLACK	CM, CY CB	0	0	1			±20%	±20%		A			-55°$_{TO}$+70°C	10-55 HZ
BROWN		1	1	10					B	E	B			
RED		2	2	100	±2%		±2%	±2%	C				-55°$_{TO}$+85°C	
ORANGE		3	3	1,000		±30%			D		D	300		
YELLOW		4	4	10,000					E				-55°$_{TO}$+125°C	10-2,000HZ
GREEN		5	5		±5%				F			500		
BLUE		6	6										-55°$_{TO}$+150°C	
PURPLE (VIOLET)		7	7											
GRAY		8	8											
WHITE		9	9											
GOLD				0.1			±5%	±5%						
SILVER	CN			0.01	±10%	±10%	±10%	±10%						

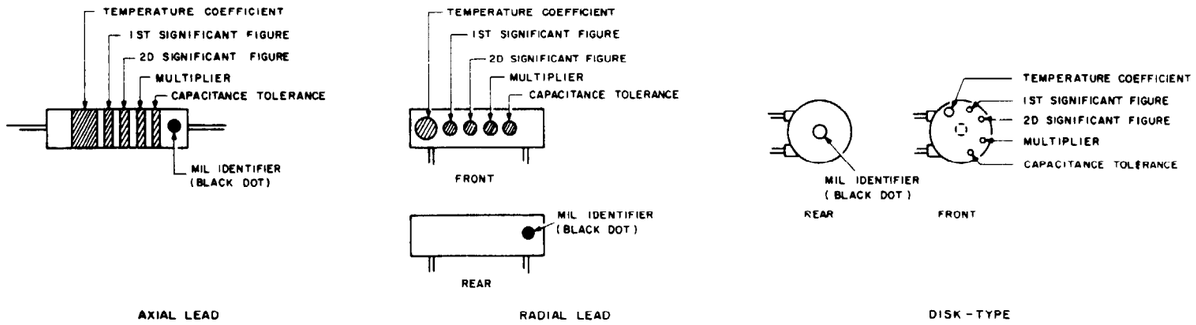


TABLE 4 - TEMPERATURE COMPENSATING. STYLE CC.

COLOR	TEMPERATURE COEFFICIENT[4]	1ST SIG FIG.	2D SIG FIG.	MULTIPLIER[1]	CAPACITANCE TOLERANCE		MIL ID
					CAPACITANCES OVER 10 UUF	CAPACITANCES 10 UUF OR LESS	
BLACK	0	0	0	1		±2.0 UUF	CC
BROWN	-30	1	1	10	±1%		
RED	-80	2	2	100	±2%	±0.25 UUF	
ORANGE	-150	3	3	1,000			
YELLOW	-220	4	4				
GREEN	-330	5	5		±5%	±0.5 UUF	
BLUE	-470	6	6				
PURPLE (VIOLET)	-750	7	7				
GRAY		8	8	0.01*			
WHITE		9	9	0.1*	±10%		
GOLD	+100			0.1		±1.0 UUF	
SILVER				0.01			

1. THE MULTIPLIER IS THE NUMBER BY WHICH THE TWO SIGNIFICANT (SIG) FIGURES ARE MULTIPLIED TO OBTAIN THE CAPACITANCE IN UUF.
2. LETTERS INDICATE THE CHARACTERISTICS DESIGNATED IN APPLICABLE SPECIFICATIONS: MIL-C-5, MIL-C-250, MIL-C-11272B, AND MIL-C-10950C RESPECTIVELY.
3. LETTERS INDICATE THE TEMPERATURE RANGE AND VOLTAGE-TEMPERATURE LIMITS DESIGNATED IN MIL-C-11015D.
4. TEMPERATURE COEFFICIENT IN PARTS PER MILLION PER DEGREE CENTIGRADE.

* OPTIONAL CODING WHERE METALLIC PIGMENTS ARE UNDESIRABLE.

C. COLOR CODE MARKING FOR MILITARY STANDARD CAPACITORS

Figure FO-1. Standard resistor, inductor, and capacitor color codes.

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USACC (4)
MDW (1)
Armies (2)
Corps (2)
HISA (Ft Monmouth) (33)
Instl (1) except
Ft Gillem (10)
Ft Gordon (10)
Ft Huachuca (10)
Ft Carson (5)
Ft Richardson (ECOM Ofc) (2)
SAAD (30)
LBAD (14)
TOAD (14)
SHAD (3)
Svc Colleges (1)
USASESS (10)
USAINTCS (3)
USAADS (2)
USAFAS (2)
USAARMS (2)
USAIS (2)
USAES (2)
ATS (1)
MAAG (1)
WRAMC (1)
USARMIS (1)
USAERDAA (1)
USAERDAW (1)
Sig FLDMS (1)
Units org under fol TOE:
11-500(AA-AC) (1)

ARNG: State AG (3).
USAR: None.
For explanation of abbreviations used, see AR 310-50.

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4 April 1978

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TM 11-5840-340-14&P	23 Jan 74	Radar Set AN/PRC-76

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PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
2-25	2-28			Recommend that the installation antenna alignment procedure be changed throughout to specify a 2° IFF antenna lag rather than 1°. REASON: Experience has shown that with only a 1° lag, the antenna servo system is too sensitive to wind gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 2° without degradation of operation.
3-10	3-3		3-1	Item 5, Function column. Change "2 db" to "3db." REASON: The adjustment procedure for the TRANS POWER FAULT indicator calls for a 3 db (500 watts) adjustment to light the TRANS POWER FAULT indicator.
5-6	5-8			Add new step f.1 to read, "Replace cover plate removed in step e.1, above." REASON: To replace the cover plate.
E-5				For item 2, change the NSN to read: 5835-00-134-9186. REASON: Accuracy.
E-8		E-3		Identify the cover on the junction box (item no. 5). REASON: It is a separate item and is not called out on figure 19.
E-9				Add the cover of the junction box as an item in the listing for figure 19. REASON: Same as above.

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