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TB 9-2300-409-30

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

GENERATING SYSTEM TESTER (GO/NO-GO)

Headquarters, Department of the Army, Washington D.C.
17 October 1972

SECTION I INTRODUCTION

l. General. This bulletin describes the fabrication, functions, and operation of a special generating system testing device to be used by direct support maintenance personel.

a. The tester will be used to determine the serviceability of 25-, 60-, and 100-ampere generators and alternators, with separate or integrated (internal) rectifiers, along with their compatible regulators.

b. It is designed to perform basis tests to determine the operational serviceability of generating system components on a go/no-go basis. It is not meant for use in total-performance characteristics determination, nor for calibration, nor operational adjustment of components. Basically, it **is a simulated** vehicle generating system for bench use which easily facilitates interchange of components so that faulty items can readily be detected through troubleshooting by substitution.

c. The tester can be used for all generators, alternators, regulators and rectifiers listed in table 1.

Table 1. Applicable Generating Systems Components

25 AMP COMPONENTS

FSN	Component name	*Part number*
2920-903-9534	GENERATOR	1095808
~2920-953-9784	REGULATOR: Mechanical (relay) type	8712283
2920-800-7218	REGULATOR: Solid state type	11631857
~2920-737-4750	GENERATOR	7524310
2920-293-4380	GENERATOR	7355736

60 AMP COMPONENTS

FSN	Component name	Part number
2920-909-2483	GENERATOR: Internal rectifier and solid state regulator.	10929868

100 AMP COMPONENTS

[3]2920-818-8635	GENERATOR/ALTERNATOR	7954720
2920-314-0556	GENERATOR/ALTERNATOR	8376691
2920-475-1446	GENERATOR/ALTERNATOR	10922191
2920-782-1955	GENERATOR/ALTERNATOR	10947517
6130-314-0545	RECTIFIER	7954343
3130-085-6027	RECTIFIER	10897985
6130-065-1975	RECTIFIER	10936129
2920-540-9476	REGULATOR	8699744
~2920-758-1911	REGULATOR	10947114
2920-900-7993	REGULATOR	10947439

[1] **exhaust to 2920-800-7218**
[2] **exhaust to 2920-903-9534**
[3] **exhaust to 2920-782-1955**
[4] **exhaust to 2920-900-7993**

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SECTION II. DESCRIPTION, FABRICATION AND OPERATION

3. Physical Description. a. The primary design criteria dictated the use of those components and materials readily available in the field. Only those connectors which are normally used with the components for which tile test unit was designed are included.

b. The 110-volt motor (fig. 1) specification requires one horsepower minimum output at a speed of approximately 1800 rpm at less than 10 amperes.

c. A list of parts and common hardware required to fabricate tile tester is shown in table 2.

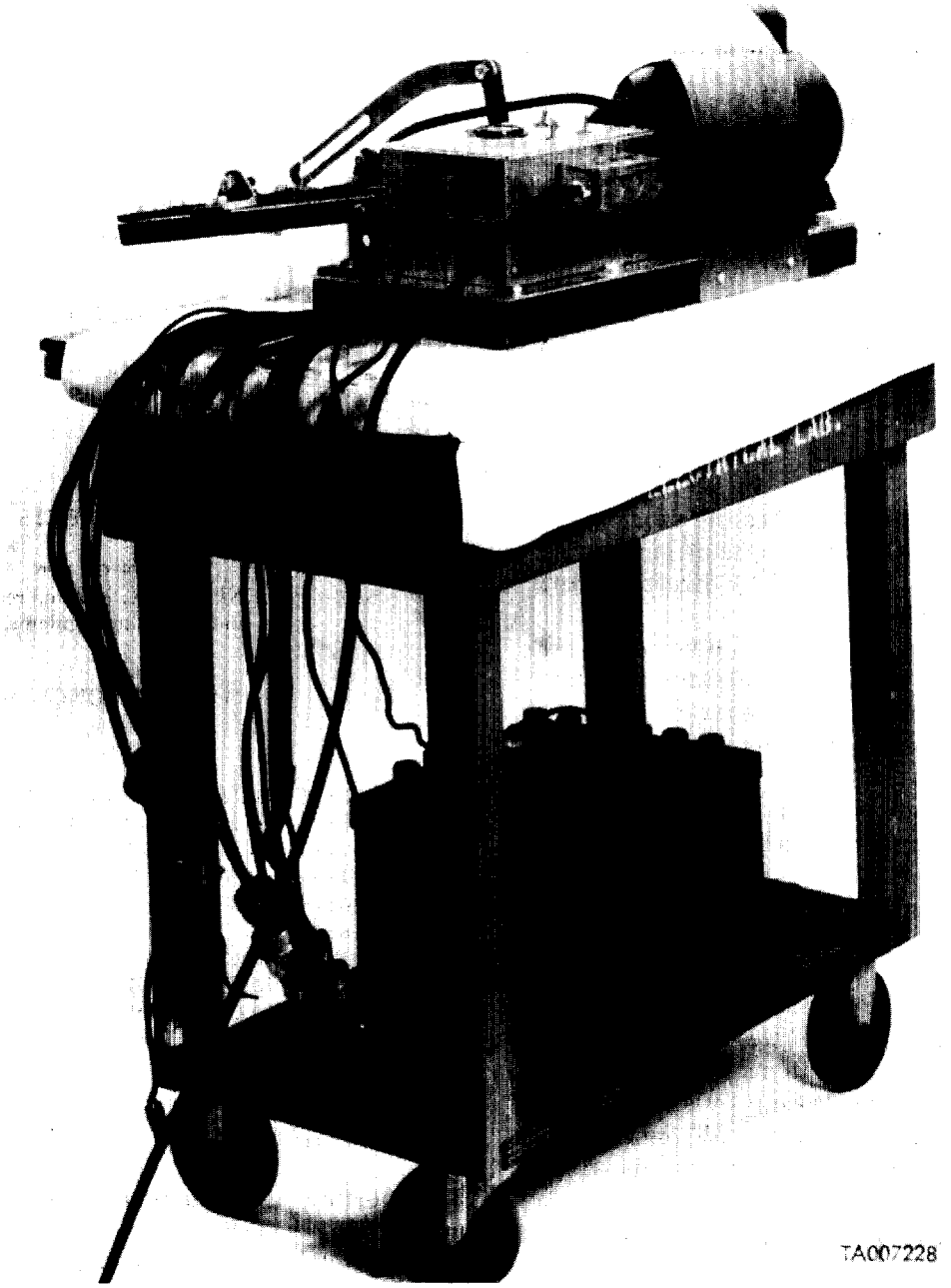

Figure 1. Generating system tester.

Table 2. ***List of*** **Fabrication Parts**

FSN	Name	Part No.	Qty
5935-713-8328	**SHELL: Connector,** plug	8724237	1
5935-686-2609	**SHELL: Connector, plug**	8724237	1
5315-934-0095	**SHELL**	8724249	I
5935-081-0400	**SHELL: Connector, plug**	8724259	1
5935-081-0401	**SHELL**	8724260	1
5935-537-0167	**SHELL**	8724261	1
5935-730-7325	**SHELL**	8724262	2
5935-691-5591	**SHELL**	8724495	1
5325-338-1274	**GROMMET**	7524564	2
5340-854-3089	**GROMMET**	7731435	1
5340-811-0948	**GROMMET**	8708784	3
5935-569-4718	GROMMET	8724726	2
5935-333-9414	NUT: Retaining	7723308	3
5935-772-3309	NUT: Retaining	7723309	5
5310-656-0067	WASHER : Slotted	8724497	1
5950-926-3114	TERMINAL	MS 27148-3	1
5940-705-6714	TERMINAL: Lug	7056714	1
	TERMINAL	11630403	1
6625-321-6365	INDICATOR: Generator-Battery.	MS24532-2	1
6145-705-6678	WIRE: Electrical	7056678	#
	Motor electric, one hp (1700-1800 **rpm).**		1
	RESISTOR : Load, 2.8-ohm, 100 watts		1
	BELT: MIL-B-11040B		2
	SWITCH: DPDT, 1 O-amp rating		3
	CABINET: Utility, 5x6x9-inch		1
	BATTERY: 12-Volt		2
	CHANNEL: Unistrut, 1 5/8.inch		#
	CHANNEL: Unistrut, 1 3/8-inch		#
	CIRCUIT BREAKER: 10 Amp		1
	RESISTOR: l-ohm, 10 watts		1
	RECEPTACLE: Jack		2
	JACKS: plug type		2

4. Frame Fabrication Instructions.

a. The frame or base of the unit is made from 1 1 5/8x1 3/8 inch unistrut channel held together with suitable unistrut fitting's and fasteners. The material used in the construction need not be restricted to unistrut channel, however, the material used could be unistrut and/or telespar perforated square tubing, prepunched aluminum or steel angle, and/or aluminum or steel plate drilled for mounting the drive motor, control panel box, and swinging generator mount (made of similar materials). Dimensions of the frame components are shown in figure **2.**

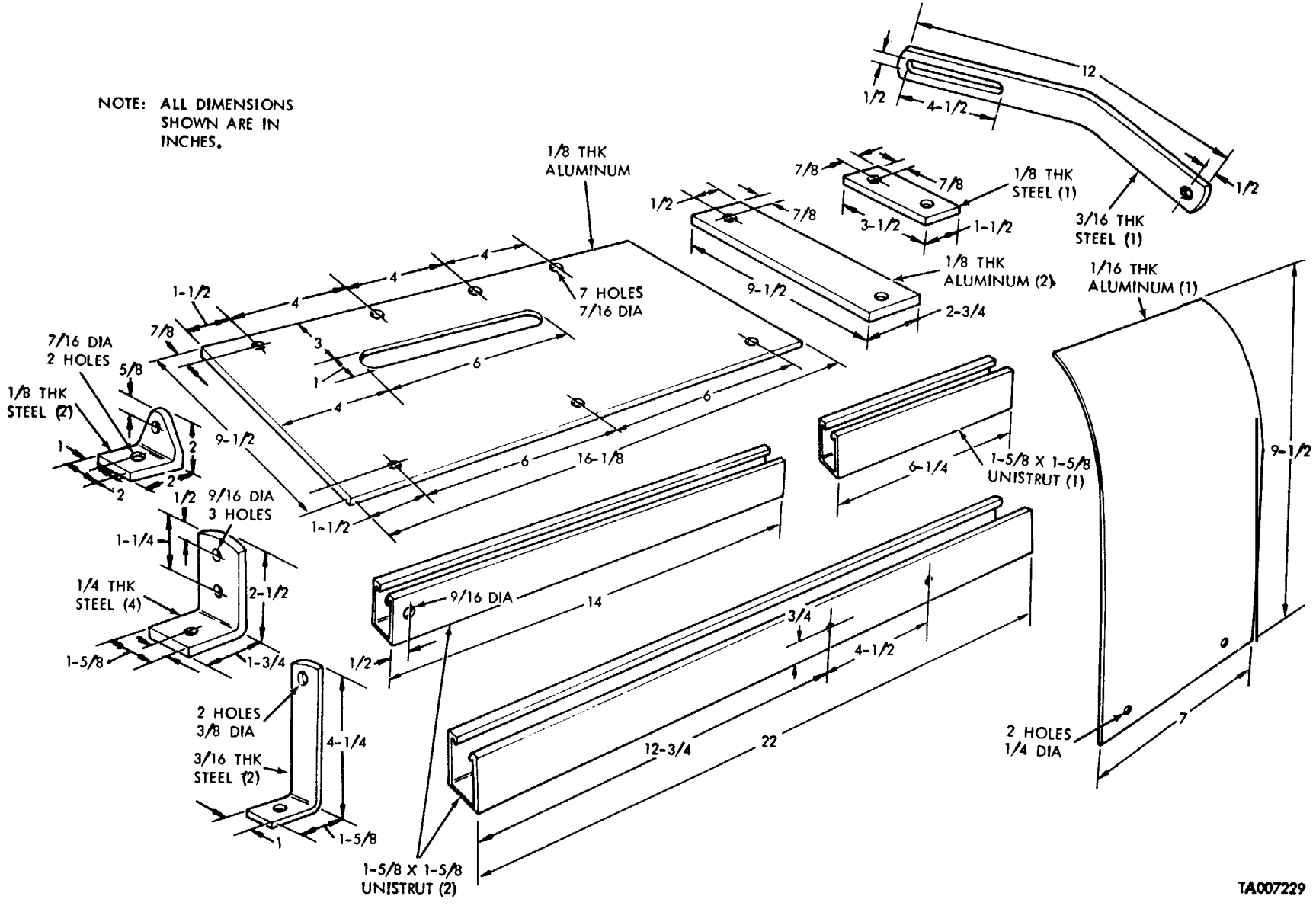

Figure 2. Fabricated frame components.

b. The generator mount is the only item of critical dimensions and alinement. It must be made to the dimensions shown in figure 3 to insure interchangeability of generators. Drive belt misalinement between the drive motor pulley and generator pulley must be kept to a minimum.

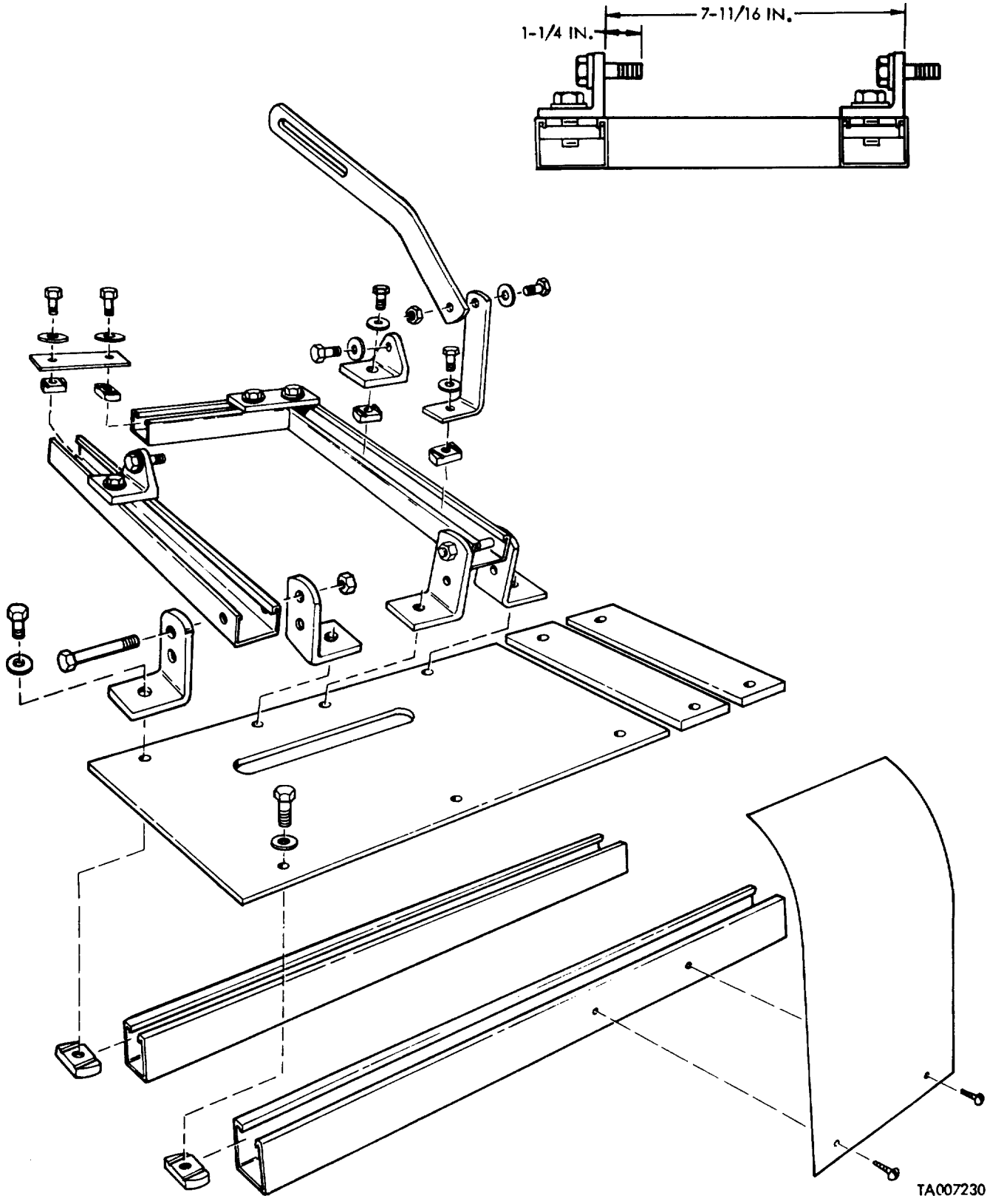

Figure 3 Frame subassembly and generator mount.

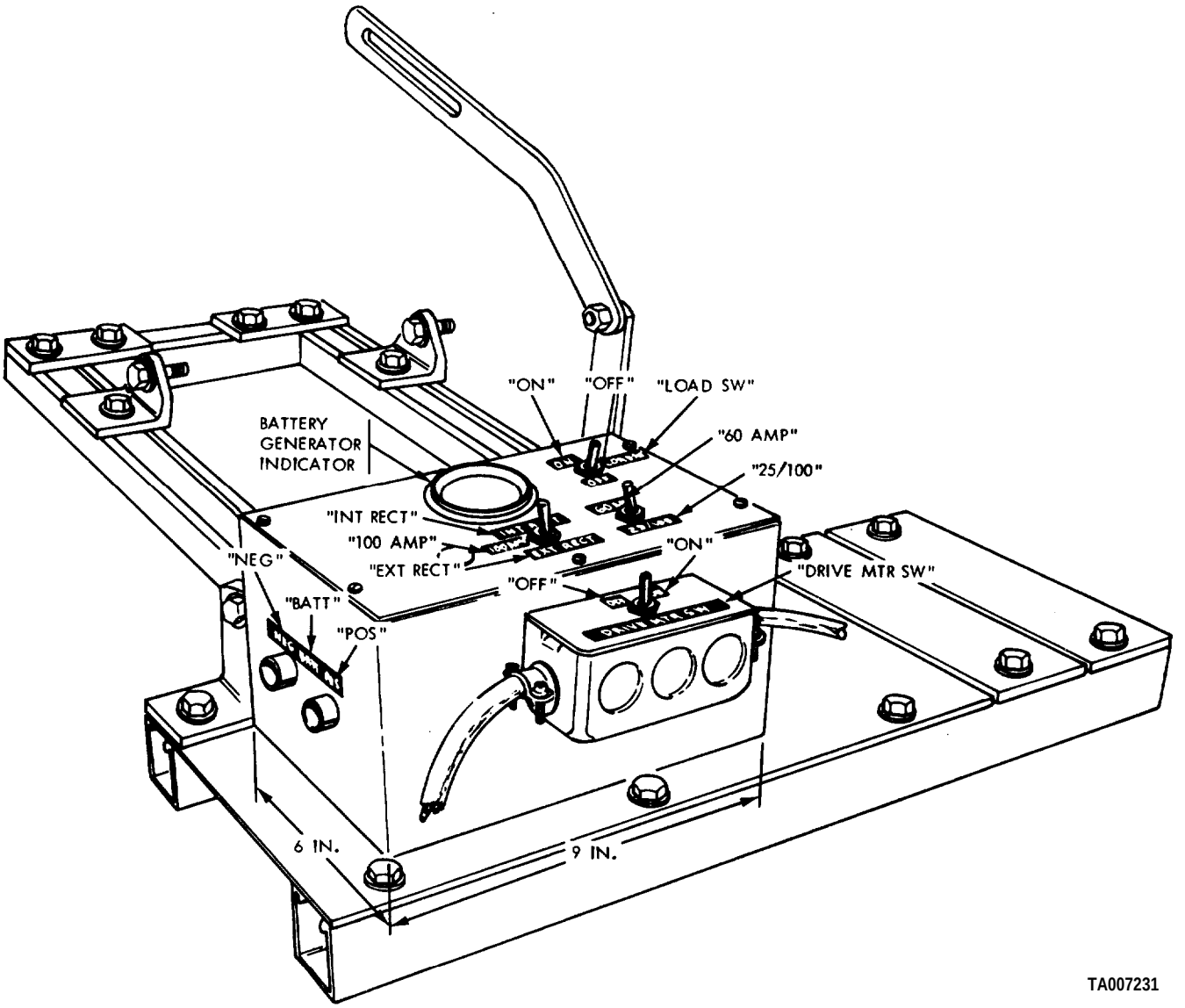

Figure 4. Frame assembly and control **cabinet.**

5. Control Cabinet. a. Exterior cabinet dimensions (fig. 4).

b. Wiring diagram of internal cabinet components (fig. 5).

c. The indicator (voltmeter) FSN 6625-321-6365 is a military standard item and the wire FSN 6145-705-6678 is available in bulk quantity.

d. Each of the three toggle switches can be any two-pole, double-throw unit with a contact rating of ten.

e. The battery cables will be fabricated with an alligator clamp at one end and a telephone-type jack at the other. The jack receptacles in the cabinet will be marked positive and negative to insure proper polarity when connected to the batteries.

NOTE

When fabricating the cabinet, it is better to install the battery jack receptacle in the left end plate instead of the right end plate as shown in the electrical schematic drawing

6. General. This tester has been designed and manufactured with connectors that fit only the components listed in table **1 or** their predecessors. It is **not possible to connect the wrong** component to the wrong receptacle.

a. Place the tester on a work bench so that the generator mounting bracket and the belt tension adjusting lever arm, when extended, will rest on the bench (fig. 1). Secure the tester to the bench.

b. Check the battery, load, and motor switches and insure that they are in the OFF position (fig. **6).**

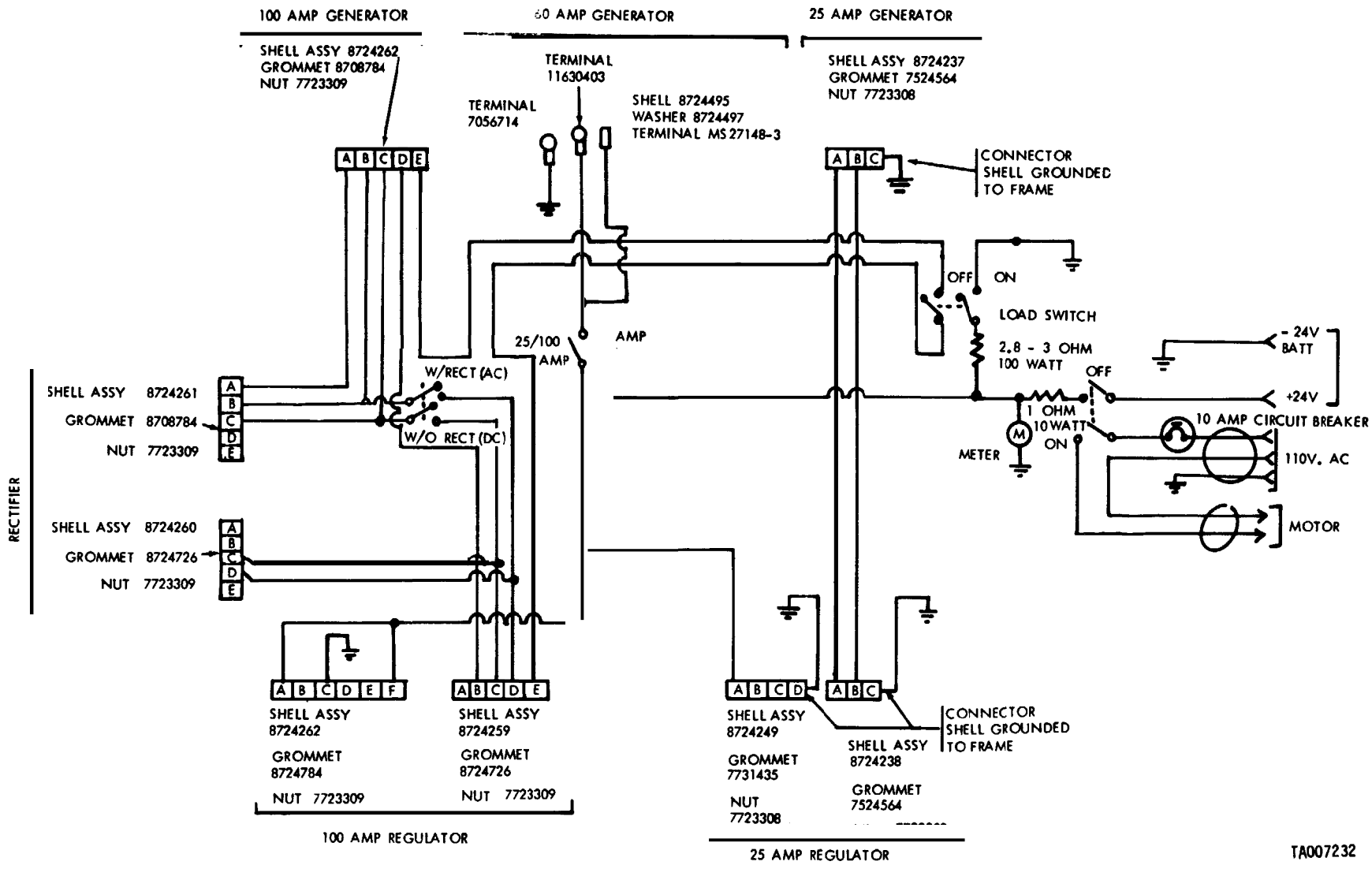

Figure 5. Wiring diagram—generating system tester.

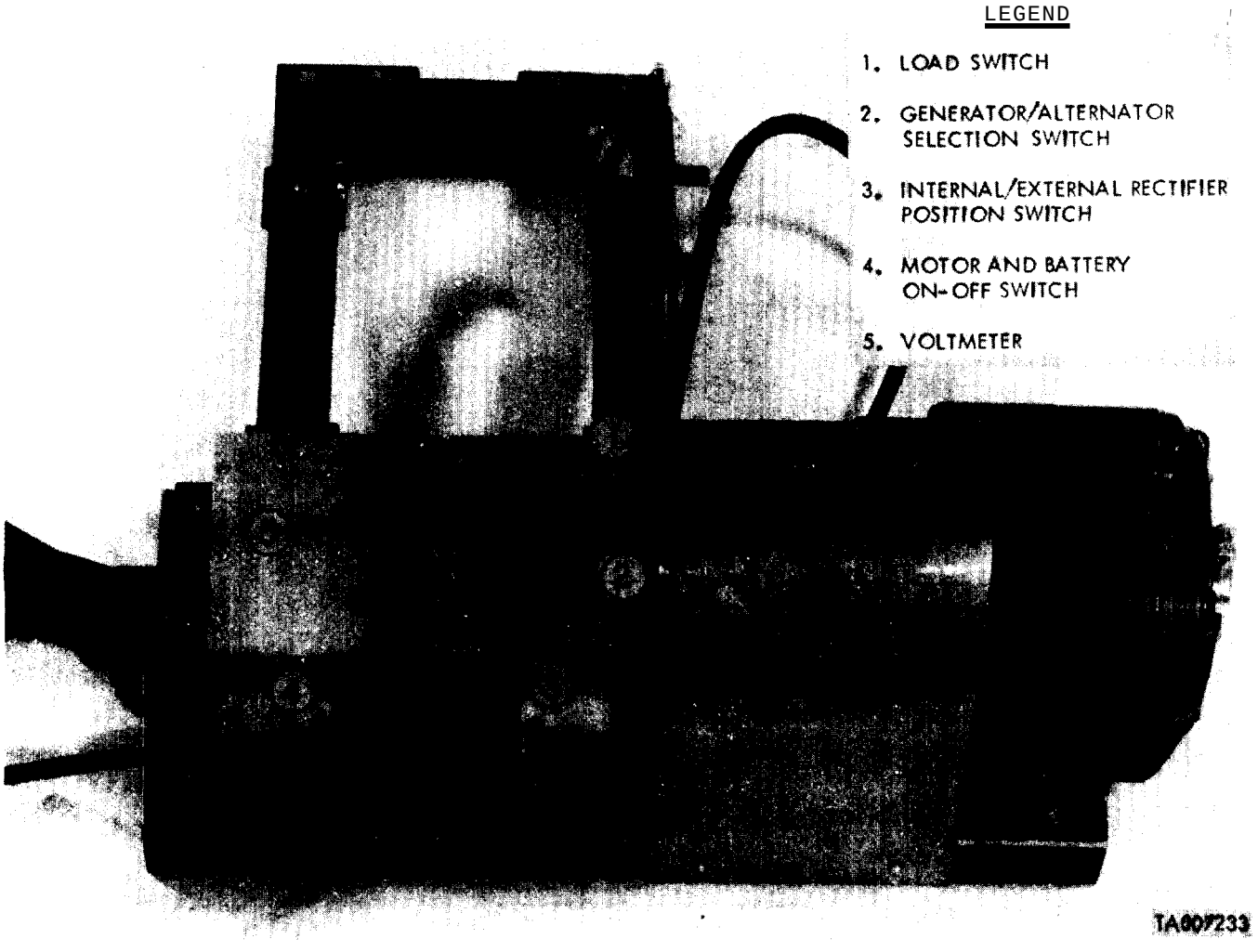

Figure 6. Control cabinet switches.

r. Connect two 12-volt batteries in series for 24 voIts output. Connect the alligator clamps of the tester's battery cables to the proper terminal of each battery. Check polarity and insure that there is good contact between the cable connectors and the battery teminals.

d. Connect the 110-volt cord for the motor to a power outlet.

e. Check each component type.

NOTE

To insure that the tester is working proper]?-, pretest with previously tested or new components. Check each type of component individually before proceeding to another type.

7. **Generator** (Fig. 7). a. Place the generator on the studs of the generator mount.

b. Place the V belt over the motor drive pulley.

c. Attach the adjustment arm to the generator. Install the screw..

d. Allow the generator mount to drop so that the weight of the generator will automatically set tension in the belt. Tighten the screw.

c. If the generator is equipped with an internal rectifier and solid state regulator, proceed to paragraph 9.

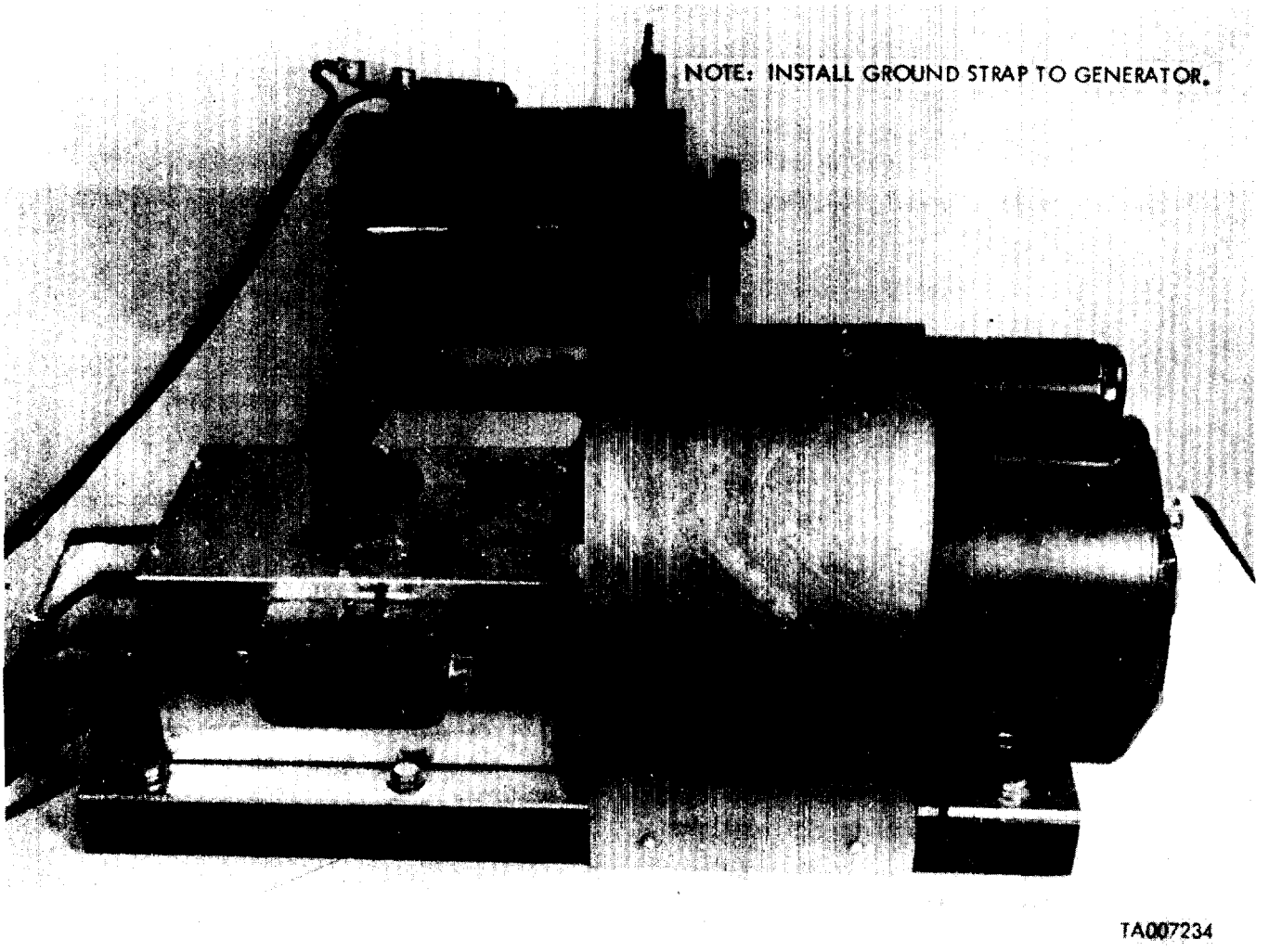

Figure 7. Test set-up with generator Only.

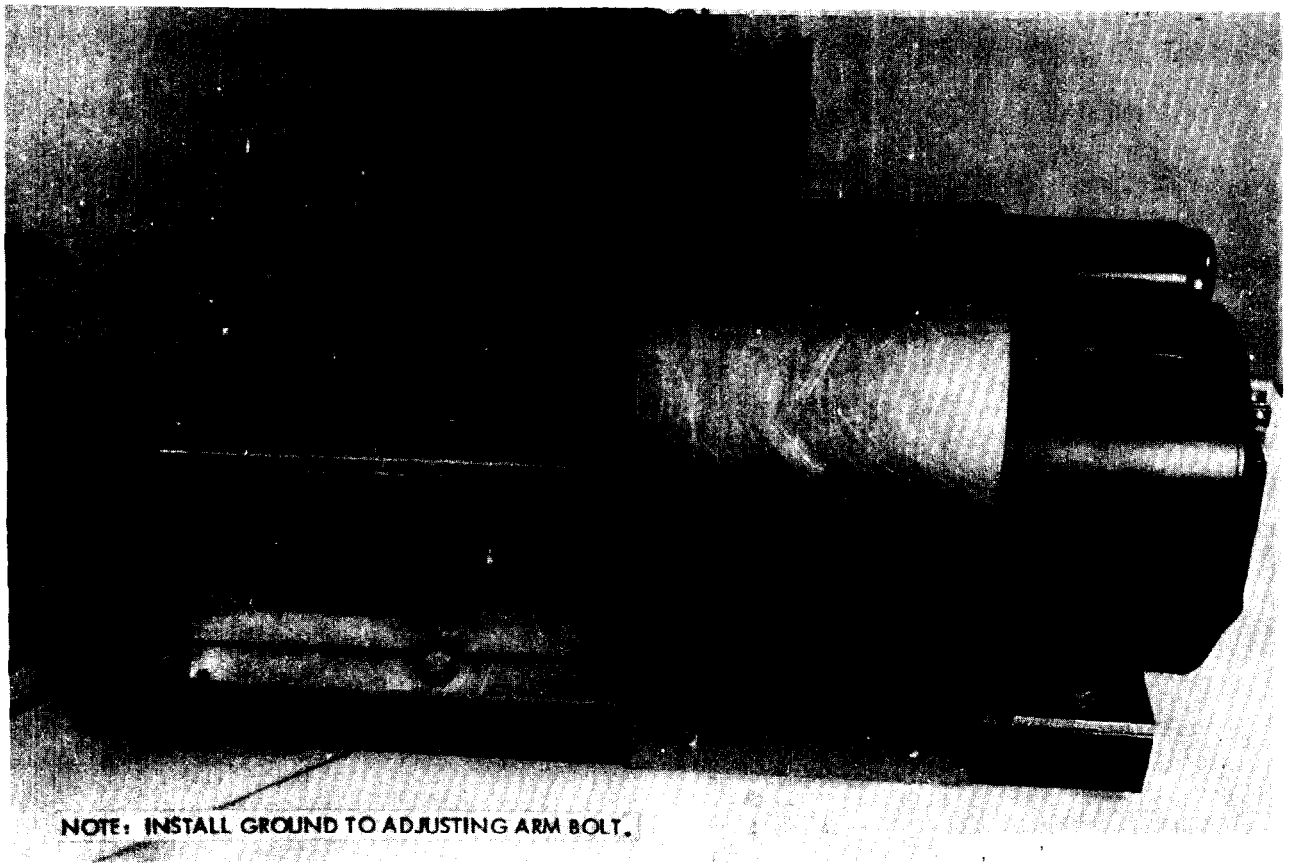

Figure *8. Test setup with generator and regulator.*

8. Regulator (Fig. 8). a. Select the pair of connectors compatible to the regulator to be tested.

b. Aline the connectors on the regulator with those on the tester, keeping the regulator in the upright position, and push the regulator in to engage the connectors.

c. Connect the ground strap to the regulator (25-amp regulator only).

9. Rectifier (fig. 9). a. Aline the connectors with the rectifier in the upside down position and push the rectifier in to engage the connectors.

b. Install operable complementary components, if required. (When checking a generator use a good regulator; etc.)

c. Position the rectifier INT. RECT./100A/ EXT. RECT. position switch (fig. 6, item 3).

d. Position the generator/alternator 60A/25/ 100 selection switch (fig. 6, item 2).

e. After insuring that the ON/LOAD SW/OFF switch (fig. 6, item 1) is in the OFF position, set the OFF/ON—DRIVE MTR. SW. switch (fig. 6, item 4) to ON. The voltmeter needle (fig. 6, item 5) should be in the green area. If not, replace the batteries with fully charged batteries.

f. Set the ON/LOAD SW/OFF switch (fig. 6, item 1) to ON. If any unit is defective, the meter needle will register in the yellow area, and the part being tested should be replaced.

NOTE

If the motor is overloaded, a circuit breaker will turn it off.

To replace a defective item, turn the OFF/ON-DRIVE MTR. SW switch to the OFF position, and check and replace the defective item (s). Then proceed as outlined in d above until a complete go condition exists.

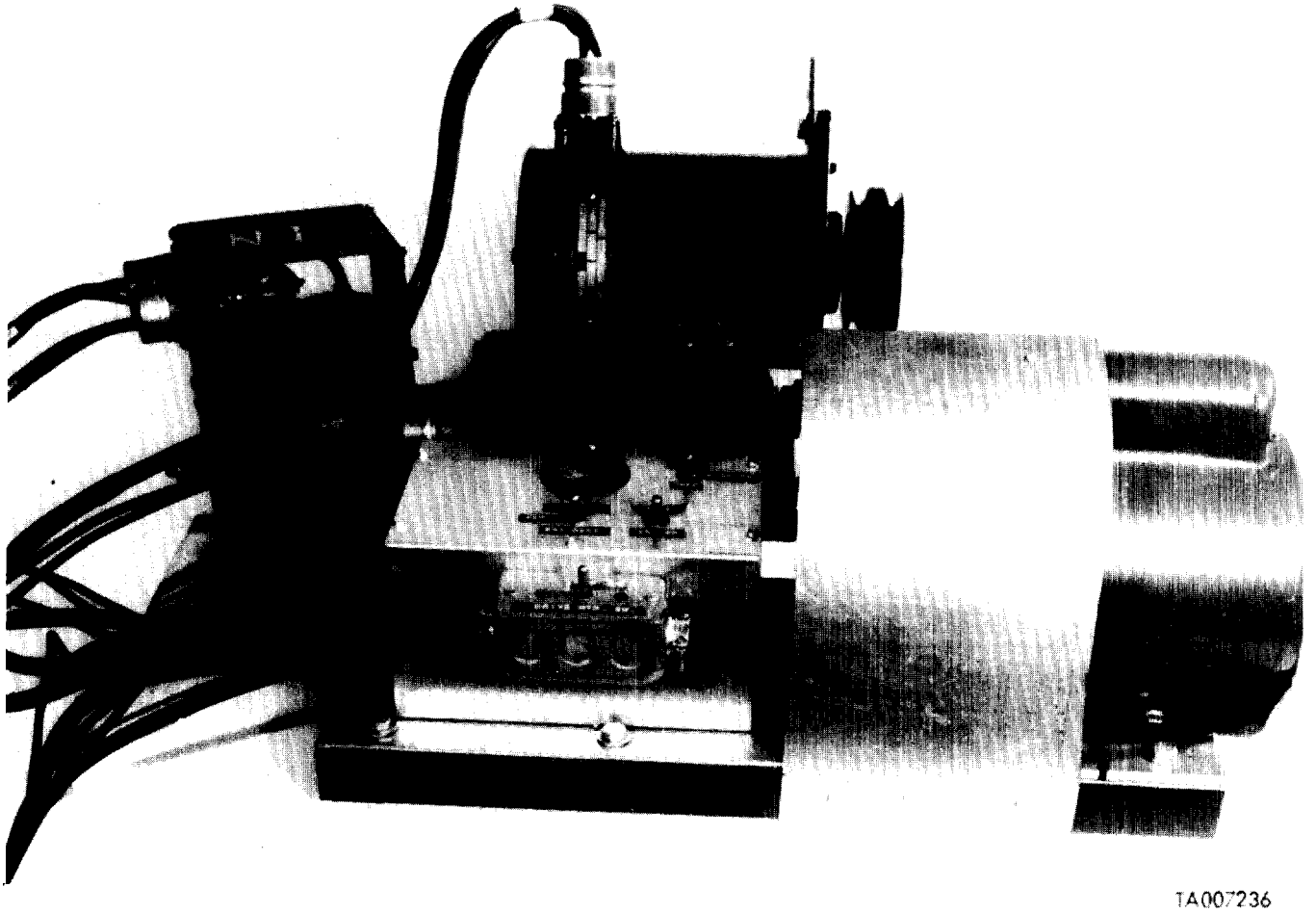

Figure 9. Test setup with generator, regulator, and rectifier.

By Order of the Secretary of the Army:

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The Metric System and Equivalents

Linear Measure

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

Weights

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

Liquid Measure

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

Square Measure

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

Cubic Measure

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

Approximate Conversion Factors

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

Temperature (Exact)

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

PIN: 010936-000