MIL-R-62576
19 January 1988
SUPERSEDING
(see 6.7)

MILITARY SPECIFICATION

REGULATOR, ENGINE GENERATOR

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers two types of solid state regulators incorporating electronic devices to control reverse current and to regulate the voltage and current of the 28 volt (V) direct current (dc) generator (see 6.1).

1.2 Classification. The solid state regulator shall be one of the types listed below:

Type I	- Regulator (Drawing 11631857) furnished with 28 v, 25 ampere (A), dc generator.
Type II	- Regulator (Drawing 12257823) furnished with 28 V, 300 A, dc generator.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: US Army Tank-Automotive Command, ATTN: AMSTA-GDS, Warren, MI 48397-5000, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document, or by letter.

AMSC N/A FSC 2920

SPECIFICATIONS
FEDERAL

TT-C-490	- Cleaning Methods of Ferrous Surfaces and Pretreatment for Organic Coatings.
TT-E-489	- Enamel, Alkyd, Gloss (for Exterior and Interior Surfaces).
TT-P-636	- Primer Coating, Alkyd, Wood and Ferrous Metal.
TT-P-1757	- Primer Coating, Zinc Chromate, Low-Moisture-Sensitivity.

MILITARY

MIL-P-514	- Plates, Identification, Instruction and Marking, Blank.
MIL-C-5541	- Chemical Films and Chemical Film Materials for Aluminum and Aluminum Alloys.
MIL-A-8625	- Anodic Coatings, for Aluminum and Aluminum Alloys.
MIL-B-11188	- Battery Storage, Lead-acid.
MIL-F-13927	- Fungus Resistance Test; Automotive Components.
MIL-G-62061	- Generator, Engine Accessory, 28 Volt DC, Rated Output 300 Amps.

STANDARDS
FEDERAL

FED-STD-H28	- Screw Thread Standards for Federal Services.

MILITARY

MIL-STD-105	- Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-130	- Identification Marking of US Military Property.
MIL-STD-202	- Test Methods for Electric and Electrical Component Parts.
MIL-STD-461	- Electromagnetic Interference Emission and Susceptibility Requirements for the Control of Electromagnetic Interference,
MIL-STD-462	- Electromagnetic Interference Characteristics, Measurement of.
MIL-STD-1184	- Electrical Components for Automotive Vehicles; Waterproofness Tests.
MIL-STD-1275	- Characteristics of 28 V dc Electrical Systems in Military Vehicles.
MIL-STD-45662	- Calibration System Requirements.

2.1.2 Government drawings. The following drawings form a part of this specification to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date of the solicitation.

DRAWINGS
ARMY

7355736	- Generator, 28 V dc, 25 A.
10950808	- Generator, 28 V dc, 25 A.
11631857	- Regulator, Engine Generator, 28 V dc 25 A, Solid State.
11655194	- Process Specification for Soldering, Electrical Connections, for Electrical and Electronic Equipment.
12257823	- DC Solid State Regulator.

(Copies of specifications, standards and drawings required by the contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First article. Unless otherwise specified (see 6.2), the contractor shall furnish regulators which shall be subjected to first article inspection (see 4.4). First article inspection samples, properly marked with identifying information shall be representative of the unit to be furnished to the Government. All subsequent regulators delivered to the Government shall conform to these samples in all of their pertinent physical and performance attributes.

3.2 Materials. Materials shall be as specified herein and on applicable drawings, standards and specifications. When the material used is not specifically covered in any of the referenced documents, it shall withstand the temperature range encountered within the component for which it is intended for use. There shall be no change in physical or chemical properties resulting in calibration or operation to fall outside the limits specified herein (see 4.8.1 and 6.4).

3.2.1 Dissimilar metals. Except where necessary to complete an electrical circuit, contact between dissimilar metals, which would encourage galvanic action, shall be avoided. Separation of dissimilar metals shall be accomplished by providing insulation between mating surfaces (see 4.8.1).

3.2.2 Recycled, virgin and reclaimed materials. There are no requirements for the exclusive use of virgin materials. The use of recycled or reclaimed (recovered) materials is acceptable provided that all other requirements of this specification are met (see 6.4.1).

3.3 Design and construction.

3.3.1 Configuration. Configuration construction shall conform to applicable drawings as follows (see 4.8.1 and 4.8.2):

3.3.1.1 Type I. The regulator shall be fabricated and assembled in accordance with Drawing 11631857 (see 4.8.1 and 4.8.2).

3.3.1.2 Type II. The regulator shall be fabricated and assembled in accordance with Drawing 12257823 (see 4.8.1 and 4.8.2).

3.3.2 Threaded surfaces. All screw threads shall conform to FED-STD-H28. The thread form, class and the number of threads per inch shall be as specified on the applicable standards or drawings (see 4.8.2).

3.3.3 Polarity. The regulator shall be designed to operate with a negatively grounded electrical system and shall be internally case grounded (see 4.8.2).

3.3.4 Mounting position. The regulator shall be designed to operate when mounted in any position and without the use of shock absorbing material or equipment (see 4.8.2).

3.3.5 Weight.

3.3.5.1 Type I. Not applicable.

3.3.5.2 Type II. The regulator weight shall be not more than 16 pounds (lb) (see 4.8.3).

3.3.6 Soldering. Electrical connections shall be soldered in accordance with Drawing 11655194 (see 4.8.2).

3.4 Performance.

3.4.1 Electrical system.

3.4.1.1 Reverse current (I_R). The reverse current shall be as specified in 3.4.1.1.1 and 3.4.1.1.2 when measured between regulator and batteries (see 4.8.4).

3.4.1.1.1 Type I. I_R shall be 5 milliamperes (mA).

3.4.1.1.2 Type II. I_R shall be 30 mA.

3.4.1.2 Voltage regulation (E_R).

3.4.1.2.1 Type I. The regulator shall establish and maintain output voltage at 28.5 ± 0.7 V throughout the generator speed range of 2000 to 8000 revolutions per minute (rpm) (see 4.8.5.1).

3.4.1.2.2 Type II. The regulator shall establish and maintain regulated voltage at 28 ± 0.7 V over a load range of 25 to 350 A as shown in figure 1. Overshoot and undershoot limits shall conform to limits on figure 1. For load currents above 350 A with load increased to 400 A, the regulated voltage shall be equal to or less than that measured at 350 A (see 4.8.5.2).

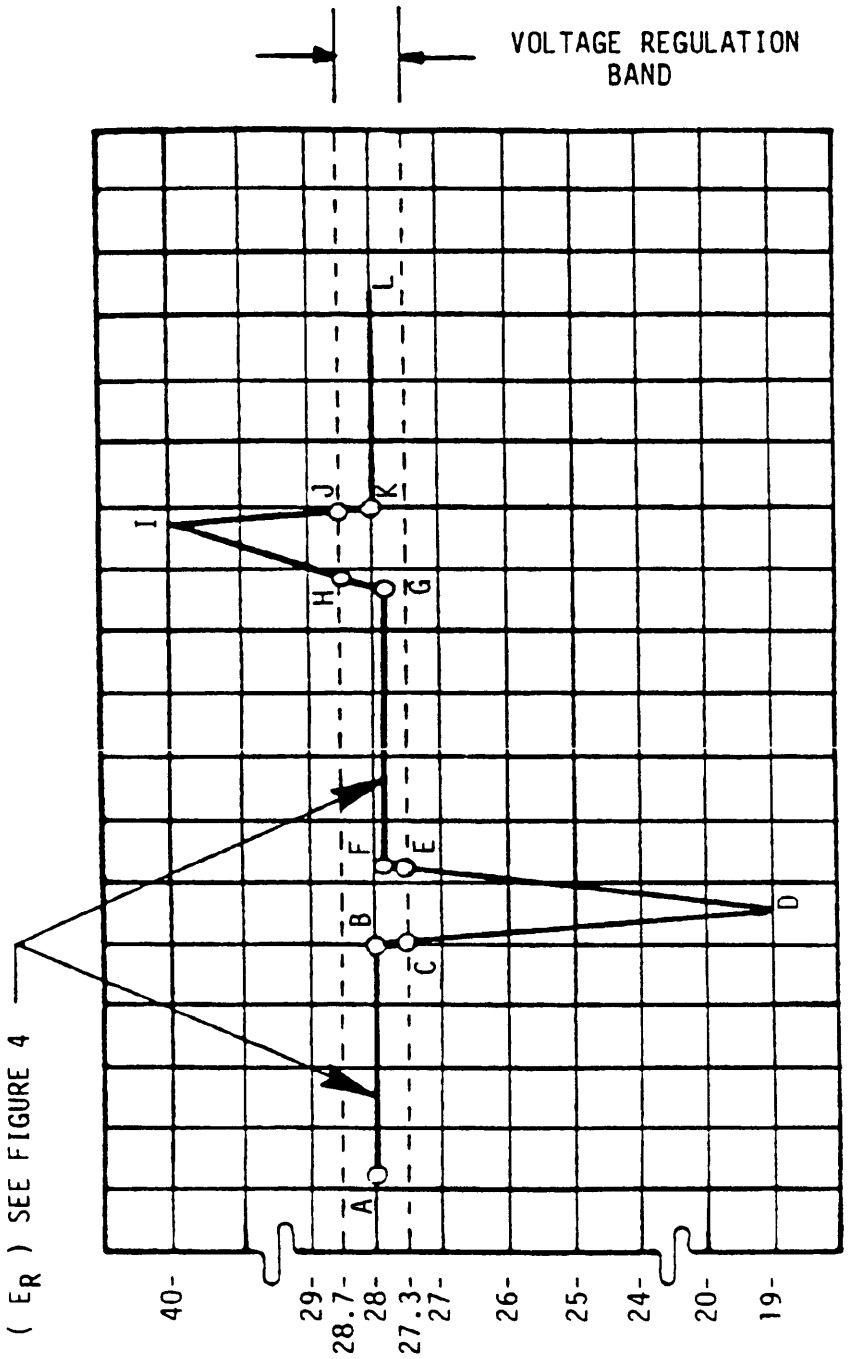


FIGURE 1. Voltage regulation limits.

3.4.1.3 Voltage ripple.

3.4.1.3.1 Type I. Not available.

3.4.1.3.2 Type II. The regulator output voltage waveform shall have the following limitations. The ac peak to peak ripple voltage shall be no more than 7 V. With batteries connected, the peak ripple voltage shall be no greater than 4 V, except that excursions of less than 1 milliseconds (ins) may exceed 4 V (see 4.8.6).

3.4.1.4 Current regulation.

3.4.1.4.1 Type I. With generator operating at 5000 rpm, the regulator shall maintain output current of 25 A at 28.5 ± 1.5 V (see 4.8.7.1).

3.4.1.4.2 Type II. With the generator operating at 5500 rpm, the regulator shall provide the following control (see 4.8.7.2):

a. No less than 370 A shall be maintained within the voltage regulation range of 28 ± 0.7 V.
b. The regulator shall limit the generator output current within the limits shown in figure 2.
c. The regulator shall attain stable current regulation in the current limit mode within 0.3 seconds of load application.
d. The regulator shall attain stable voltage regulation upon load release within 0.3 seconds after entering the lower voltage regulation limit (27.3V) shown in figure 3.
e. In the current limit mode, the frequency of oscillation of the dc voltage shall have a period of less than 14 ms (T figure 3) and a peak-to-peak value (V figure 3) of less than 10 percent (%) of the dc voltage.

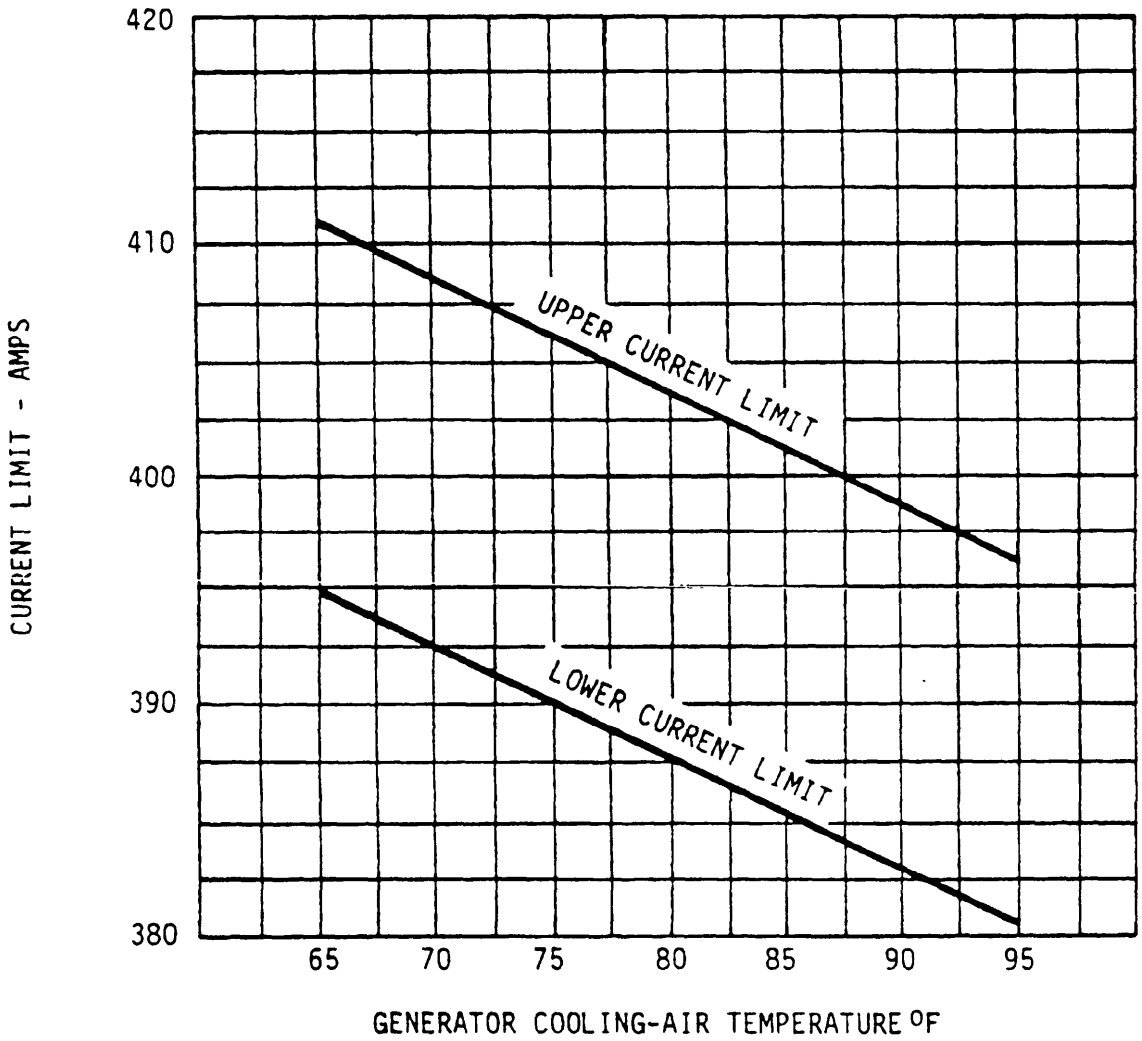


FIGURE 2. Current limit vs cooling air temperature.

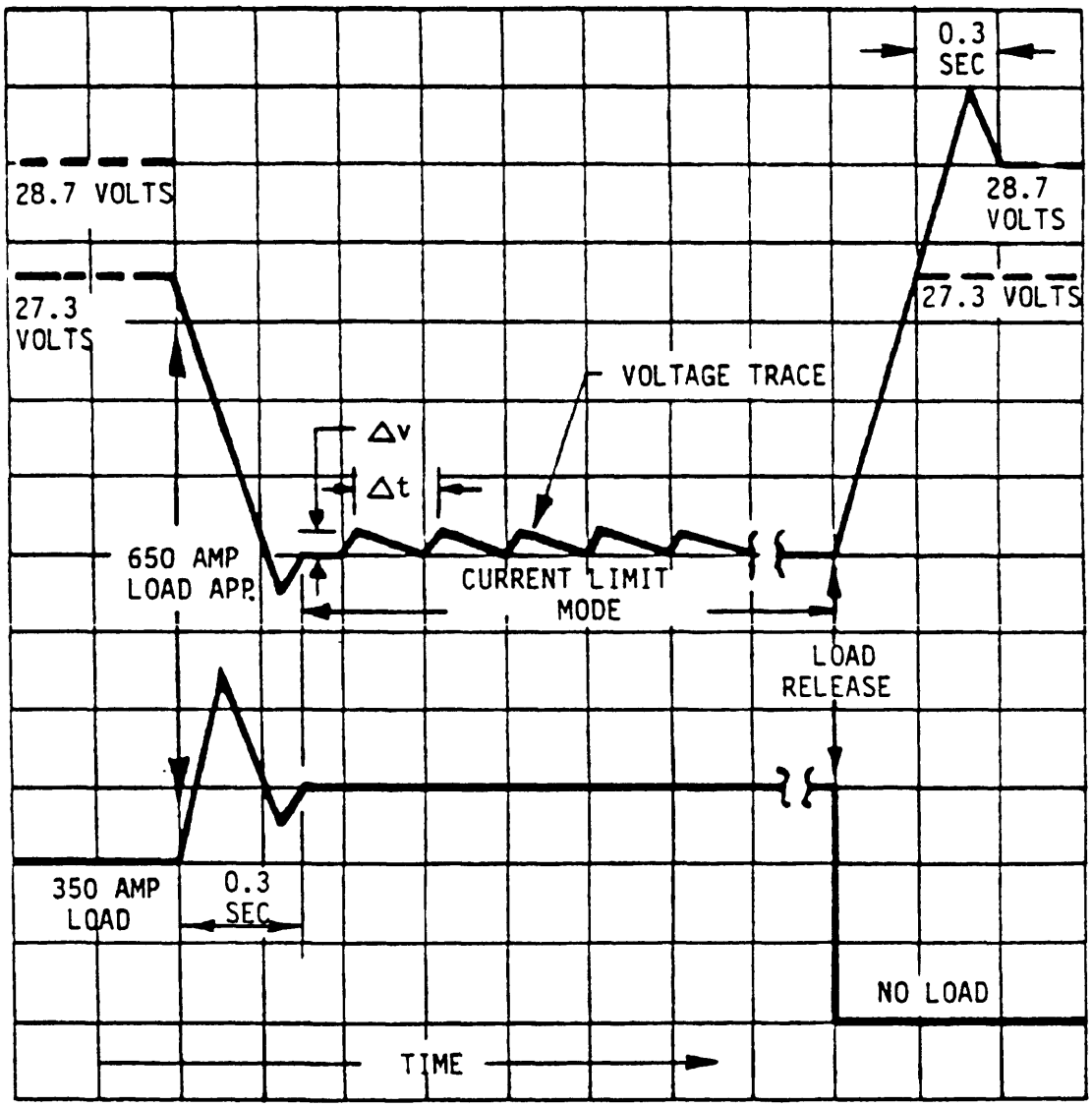


FIGURE 3. Current and voltage recovery time.

3.4.1.4.2.1 Interpole field coil voltage. The regulator shall limit the generator interpole coil voltage drop to 1.95 ± 0.05 V (see 4.8.7.2.1).

3.4.1.5 Overvoltage.

3.4.1.5.1 Type I. Not applicable.

3.4.1.5.2 Type II. The regulator generator system shall be protected from any failure in the regulator which will cause the regulator to go "full on". The overvoltage portion of the regulator shall react to deactivate the generator when the system voltage reaches a value of 33 ± 1.0 V. Overvoltage reaction time shall be not less than 0.25 second and not more than 1.0 second. Reset shall be manual and located on the regulator (see 4.8.8).

3.4.1.6 Field excitation. The regulator shall be activated and begin to regulate when the generator residual voltage reaches the value specified in 3.4.1.6.1 and 3.4.1.6.2 (see 4.8.9).

3.4.1.6.1 Type I. The residual voltage shall be no more than 1.5 V.

3.4.1.6.2 Type II. The residual voltage shall be no less than 0.7 V.

3.4.1.7 Effective field circuit resistance.

3.4.1.7.1 Type I. The regulator resistance at all times shall be no greater than 2 ohms (see 4.8.10).

3.4.1.7.2 Type II. Not applicable.

3.4.1.8 Negative voltage operation.

3.4.1.8.1 Type I. Not applicable.

3.4.1.8.2 Type II. The regulator shall not be damaged by the application of negative voltage (see 4.8.11).

3.4.1.9 Field circuit.

3.4.1.9.1 Type I. Not applicable.

3.4.1.9.2 Type II. The regulator shall be protected against any inductive energy that may be applied as a result of opening switch S_1 shown in figure 4 (see 4.8.12).

3.4.1.10 Reverse battery polarity. The regulator shall protect the generating system against damage by opening the circuit and shall prevent reversal of generator polarity (see 4.8.13).

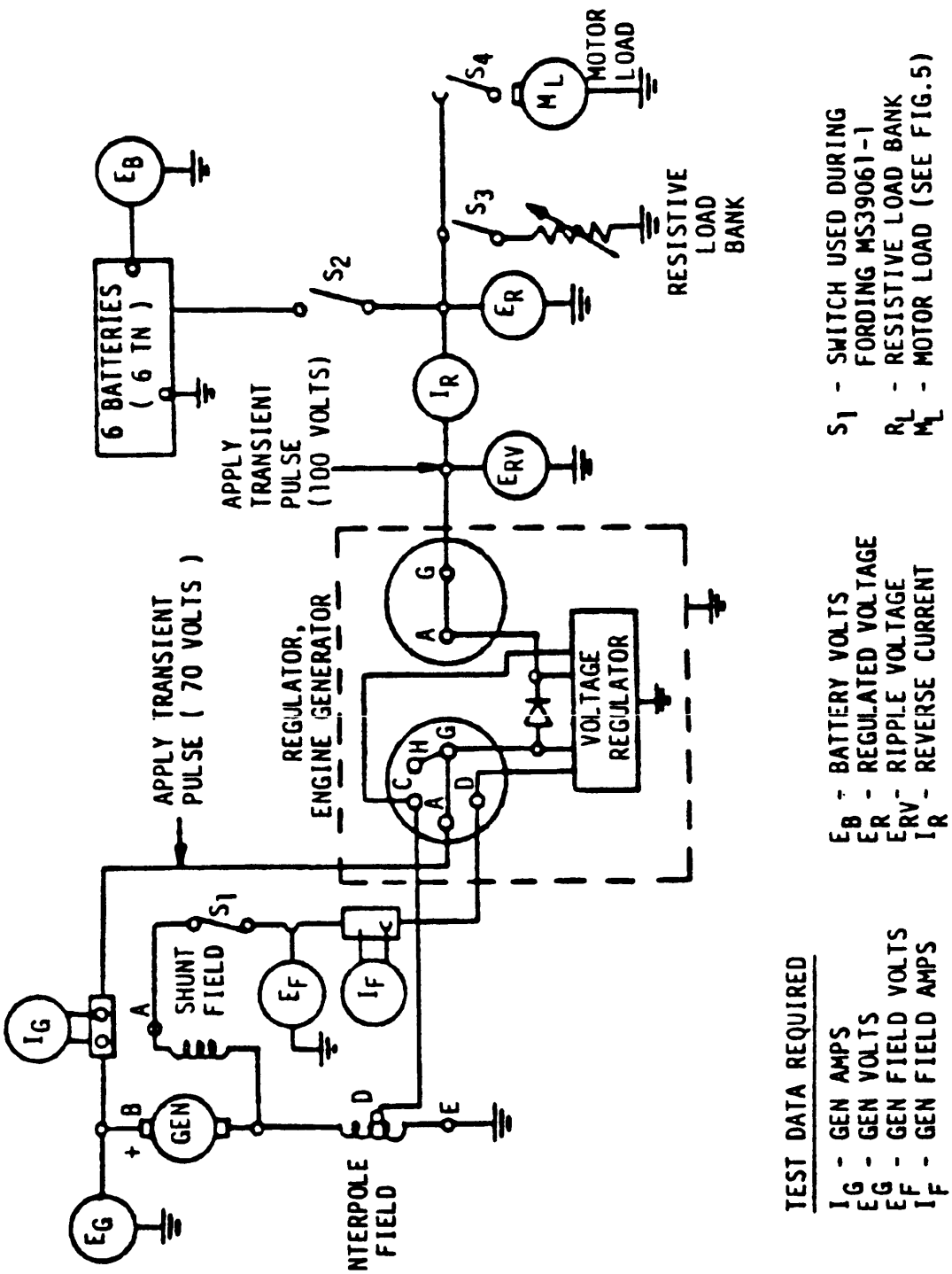


FIGURE 4. Test circuit.
(See M60 comments)

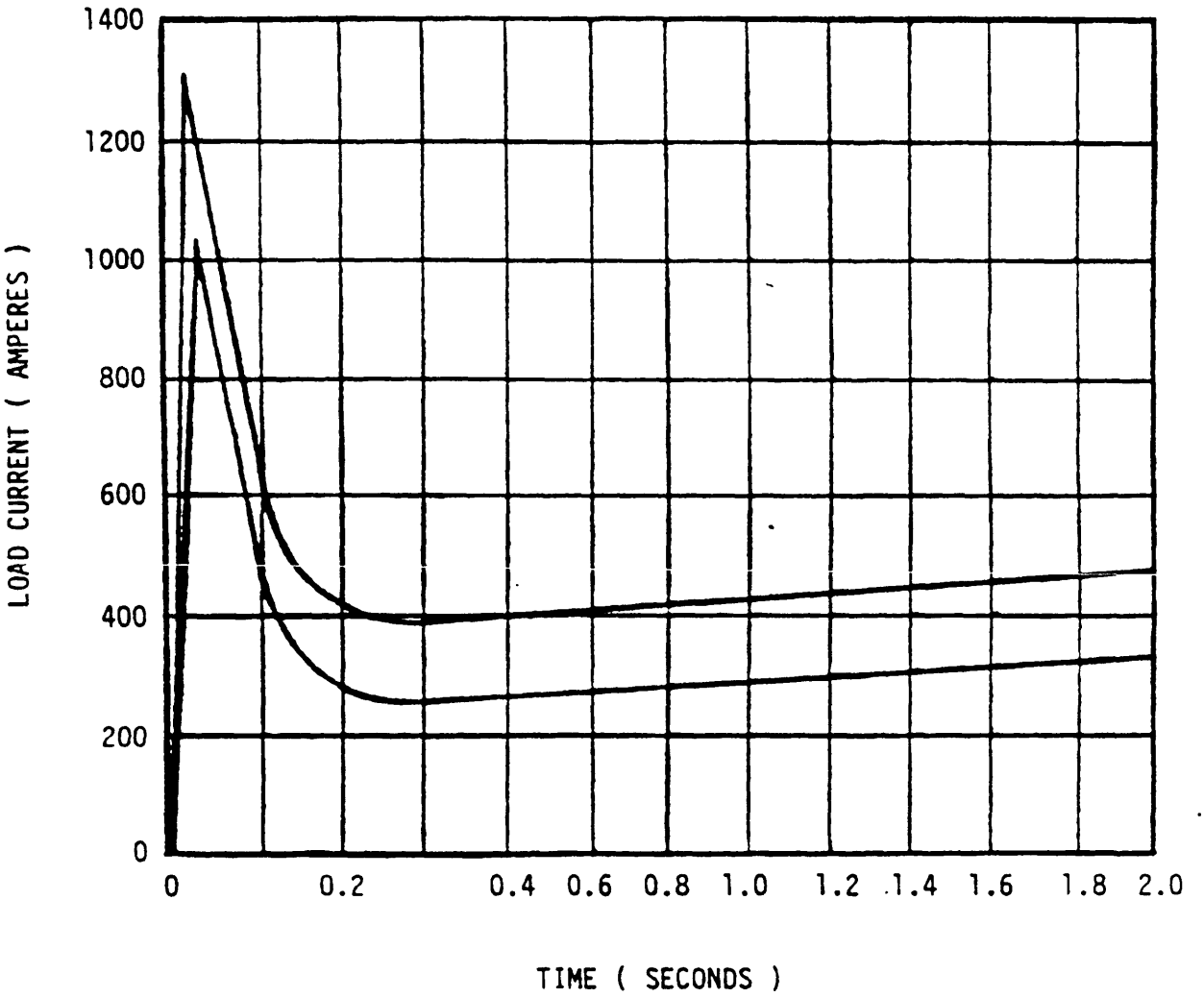


FIGURE 5. Motor load.

3.4.1.11 Transient voltage.

3.4.1.11.1 Type I. The regulator shall meet the abnormal system requirements of MIL-STD-1275, except that the steady state voltage shall be no greater than 30 V and the transient voltage shall be no greater than 80 V (see 4.8.14.1).

3.4.1.11.2 Type II. The regulator shall meet the requirements of MIL-STD-1275 (see 4.8.14.2).

3.4.1.12 Load switching.

3.4.1.12.1 Type I. The regulator shall meet the abnormal system requirements of MIL-STD-1275, except that the steady state voltage shall be no greater than 30 V, the transient voltage shall be no greater than 80 V, and the peak to peak ripple voltage shall be no greater than 5 V (see 4.8.15.1).

3.4.1.12.2 Type II. Not applicable.

3.4.2 Environmental.

3.4.2.1 High temperature.

3.4.2.1.1 Type I. The regulator shall operate at a temperature of 225° ± 5°F, except that the output voltage shall be 26.4 ± 0.8 V and the output current shall be 22 ± 2 A (see 4.8.16.1.1).

3.4.2.1.2 Type II. The regulator shall operate at a temperature of 215° ± 5°F, except that the output voltage shall be 26.5 ± 0.7 V (see 4.8.16.1.2).

3.4.2.2 Low temperature.

3.4.2.2.1 Type I. The regulator shall operate at a temperature of minus 65° ± 5°F, except that the output voltage shall be 29.6 ± 0.8 V and the output current shall be 35 ± 3A (see 4.8.16.2.1).

3.4.2.2.2 Type II. The regulator shall operate at a temperature of minus 65° ± 5°F, except that the output voltage shall be 29.5 ± 0.7 V (see 4.8.16.2.2).

3.4.2.3 Vibration. The regulator shall not be damaged nor performance degraded after exposure to vibration levels of MIL-STD-202, method 204, condition A (see 4.8.16.3).

3.4.2.4 Shock. The regulator shall not be damaged nor performance degraded after exposure to shock levels in accordance with MIL-STD-202, method 213, condition A (see 4.8.16.4).

3.4.2.5 Corrosion resistance. The regulator shall evidence no corrosion that would adversely affect performance after being subjected to the salt spray corrosion test specified in MIL-STD-202, method 101 (see 4.8.16.5).

3.4.2.6 Fungus resistance. The regulator shall not support microbial growth that would adversely affect performance after being exposed to fungi specified in MIL-F-13927, class 1 (see 4.8.16.6).

3.4.2.7 Waterproofness. The regulator shall show no evidence of leakage nor performance degradation after being subjected to the waterproofness test specified in MIL-STD-1184 for type II, class 2 (see 4.8.16.7).

3.4.2.8 Electromagnetic interference. The regulator shall provide electromagnetic interference reduction for the total generating system including the regulator, generator, and interconnecting shielded cable in accordance with the requirements of MIL-STD-461 for Tactical Vehicle Components (see 4.8.16.8).

3.4.2.8.1 Radiated emissions. The broadband (BB) and narrowband (NB) radiated emissions in the frequency range of 150 kilohertz (kHz) to 10 gigahertz (GHz) shall not exceed the limits of MIL-STD-461 subtest RE02(BB) and RE02.1(NB).

3.4.2.8.2 Conducted emissions. On a 28 V dc , 50 A lead of the split load, the BB and NB conducted emissions in the frequency range of 50 kHz to 50 mHz shall not exceed the limits of MIL-STD-461 subtest CE04.

3.4.3 Endurance.

3.4.3.1 Type I. The regulator shall withstand 2000 hours of operation under the load, speed and temperature conditions specified herein without servicing, adjustment or replacement parts (see 4.8.17.1).

3.4.3.2 Type II. The regulator shall withstand 1000 hours of operation under the load, speed and temperature conditions specified herein without servicing, adjustment or, replacement parts (see 4.8.17.2).

3.5 Finish.

3.5.1 Painting. All exterior surfaces of the regulator shall be painted, except the electrical connections and mating surfaces on the mounting bracket (see 4.8.2).

3.5.2 Ferrous surfaces. Ferrous metal surfaces shall be cleaned in accordance with the applicable method specified in TT-C-490. The cleaned surfaces shall be treated in accordance with type I or type III of TT-C-490. Exterior surfaces shall be given one coat of primer conforming to TT-P-636, 0.75 to 1.25 mil thick or TT-P-1757, 0.4 to 0.6 mil thick. The finish coat shall be black or white gloss enamel conforming to TT-E-489, 0.75 to 1.25 mil thick (see 4.8.1 and 4.8.2).

3.5.3 Aluminum alloy surfaces. Aluminum surfaces shall be cleaned and treated in accordance with MIL-C-5541 or anodized in accordance with MIL-A-8625. Exterior surfaces shall be given one coat of primer conforming to TT-P-1757, 0.4 to 0.6 mil thick. The finish coat shall be black or white gloss enamel conforming to TT-E-489, 0.75 to 1.25 mil thick (see 4.8.1 and 4.8.2).

3.5.4 Zinc and cadmium surfaces. Exterior zinc and cadmium surfaces shall be given one coat of primer conforming to TT-P-1757, 0.4 to 0.6 mil thick. The finish coat shall be black or white gloss enamel conforming to TT-E-489, 0.75 to 1.25 mil thick (see 4.8.1 and 4.8.2).

3.6 Identification and marking.

3.6.1 Marking. The regulator shall be marked in accordance with MIL-STD-130 (see 4.8.2).

3.6.2 Nameplate. A nameplate conforming to MIL-P-514 shall be attached to the regulator housing in the manner specified on the applicable standard or drawing. The legend contained on the plate shall include the following (see 4.8.2):

Regulator
28 V dc
Manufacturer's identification
Serial number
Military part number
Federal stock number
Manufacturer's part number
Date of manufacture
Contract number
US

3.7 Workmanship. Workmanship shall be of a quality which assures a product free of burrs, rust, scratches, chips, sharp edges, loose or defective connectors, cracked insulation, faulty soldering, or other defects which affect serviceability or appearance (see 4.8.2).

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order (see 6.2), the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform or witness any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.1.2 Inspection equipment. Unless otherwise specified in the contract (see 6.2), the contractor is responsible for the provision and maintenance of all inspection equipment necessary to assure that-supplies and services conform to contract requirements. Inspection equipment must be capable of repetitive measurements to an accuracy of 10% of the measurement tolerance, except as indicated in tables I and II. Calibration of inspection equipment shall be in accordance with MIL-STD-45662.

TABLE I. Measuring instrument tolerances for preproduction tests.

Measuring instrument	Accuracy	
	Type I	Type II
Voltmeter dc	± 0.25%	± 0.35% (40 V - full scale)
Ammeter dc	± 0.5% (multi-range)	± 0.5% (600 A - full scale)
Tachometer	± 1%	± 1%
Milliammeter	---	± 0.5% (600 mA full scale)
Oscilloscope	± 3%	± 3%

TABLE II. Measuring instrument tolerances of quality conformance and control tests.

Measuring instrument	Accuracy	
	Type I	Type II
Voltmeter dc	---	± 0.15 V
Ammeter dc	---	± 3.0 A
Tachometer	---	± 50 rpm at 1900 rpm
	---	± 200 rpm at 10 000 rpm
Milliammeter	---	± 5.0 mA
Oscilloscope	---	± 3%

4.2 Classification of inspections:

a. First article inspection (see 4.4).

b. Quality conformance inspections (see 4.5).
   1. Examination (see 4.5.2).
   2. Tests (see 4.5.3).

c. Control tests (see 4.6).

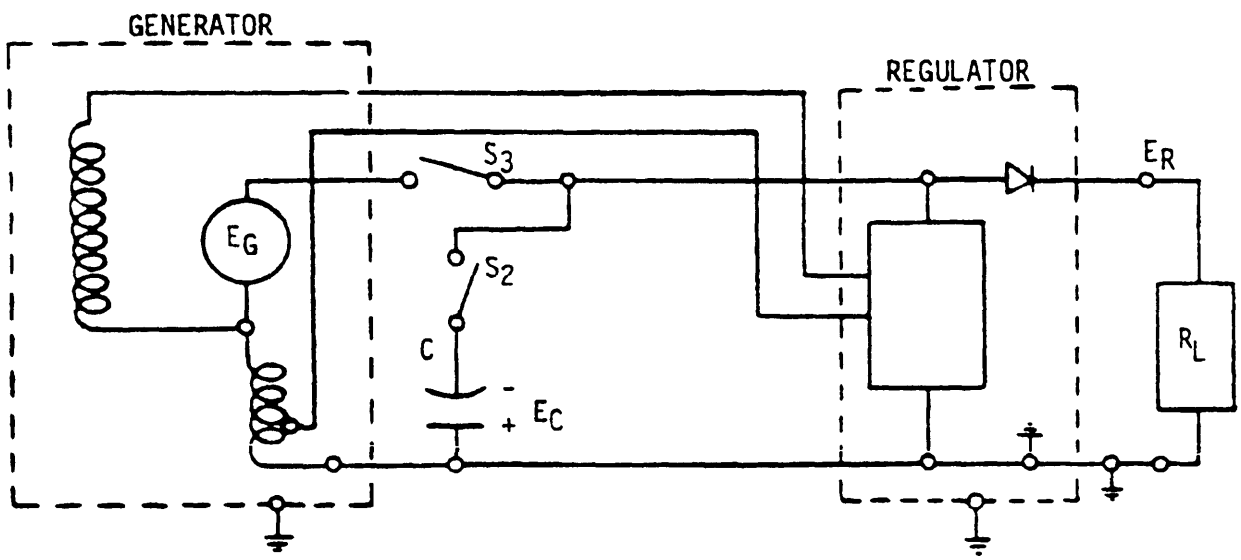
4.3 Inspection conditions. Unless otherwise specified (see 6.2), all inspections shall be conducted under the following conditions:

a. Air temperature 73 ± 18°F
b. Barometric pressure 28.5 ± 2 inches mercury (Hg)
- 3
c. Relative humidity 50 ± 30%

4.3.1 Type I. Unless otherwise specified herein, the test circuit shall include the regulator, battery, and generator. The generator employed in the test circuit shall conform to Drawing 7355736 or Drawing 10950808. The battery shall consist of two 12 V batteries conforming to type 2 HN of MIL-B-11188. The two batteries shall be connected in series. Batteries shall be fully charged (see 6.3.2.1) and shall be kept at room temperature.

4.3.2 Type II. The test circuit as shown in figure 6 shall include the regulator, mounted on a horizontal plane, battery and generator. The generator used in the test circuit shall conform to MIL-G-62061. The batteries shall consist of six 12 V batteries conforming to type 6 TN of MIL-B-11188. The six batteries shall be connected in series-parallel. Batteries shall be fully charged (see 6.3.2.2) and kept at room temperature.

4.3.3 Apparatus. In addition to standard measuring equipment (see tables I and II and the applicable test specification), the test apparatus shall include chambers for conducting low temperature (minus 80°F), high temperature (plus 225°F) tests and a submersion tank.



C = 5.3 ± .1 ufd
R_L = 50 ± 5 amps load at 28 volts
E_C = 595 ± 5 volts
E_R = Regulated voltage

FIGURE 6. Test circuit.

4.4 First article inspection. Unless otherwise specified (see 6.2), the Government shall select four regulator assemblies produced under the production contract for first article inspection. Approval of the first article sample by the Government shall not relieve the contractor of his obligation to supply assemblies that are fully representative of those inspected as a first article sample. Any changes or deviation of the production units from the first article sample shall be subject to the approval of the contracting officer.

4.4.1 First article inspection failure. Deficiencies found during, or as a result of, first article inspection shall be cause for rejection of the first article sample until evidence has been provided by the contractor that corrective action has been taken to eliminate the deficiency. Any deficiency found during, or as a result of, first article inspection, shall be evidence that all items already produced prior to completion of the first article inspection are similarly deficient unless contrary evidence satisfactory to the contracting officer is furnished by the contractor. Such deficiencies on all items shall be corrected by the contractor. The Government will not accept products until first article inspection is completed to the satisfaction of the Government.

TABLE III. Classification of inspections.

Title	Requirement	Inspection	First article 1/	2/	Quality conformance Examination	Tests 1/	2/	Control 1/	2/
Materials and construction	3.2, 3.2.1, 3.3.1 thru 3.3.1.2, 3.5.2 thru 3.5.4	4.8.1	X						
Defects (see table V)	3.3.1 thru 3.3.4, 3.3.6, 3.5.1, thru 3.7	4.8.2	X		X				
Weight	3.3.5	4.8.3	X						
Reverse current	3.4.1.1	4.8.4	X			X		X	X
Voltage regulation	3.4.1.2.1 & 3.4.1.2.2	4.8.5.1	X			X		X	
		4.8.5.2		X			X		X
Voltage ripple	3.4.1.3	4.8.6	X						X
Current regulation	3.4.1.4.1 & 3.4.1.4.2	4.8.7.1	X			X		X	
		4.8.7.2		X					X
Interpole field coil voltage	3.4.1.4.2.1	4.8.7.2.1	X				X		
Overvoltage	3.4.1.5	4.8.8	X				X		X
Field excitation	3.4.1.6.1 & 3.4.1.6.2	4.8.9	X				X	X	
									X

TABLE III. Classification of inspections - Continued.

Title	Requirement	Inspection	First article 1/	First article 2/	Quality conformance Examination	Quality conformance Tests 1/	Quality conformance Tests 2/	Control 1/	Control 2/
Effective field circuit resistance	3.4.1.7	4.8.10	X	X				X	
Negative voltage operation	3.4.1.8	4.8.11	X	X			X		X
Field circuit	3.4.1.9	4.8.12	X	X					X
Reverse battery polarity	3.4.1.10	4.8.13	X	X				X	
Transient voltage	3.4.1.11.1 and 3.4.1.11.2	4.8.14.1 and 4.8.14.2	X	X				X	
Load switching	3.4.1.12	4.8.15.1	X	X				X	
High temperature	3.4.2.1.1 and 3.4.2.1.2	4.8.16.1.1 and 4.8.16.1.2	X	X				X	X
Low temperature	3.4.2.2.1 and 3.4.2.2.2	4.8.16.2.1 and 4.8.16.2.2	X	X				X	X
Vibration	3.4.2.3	4.8.16.3	X	X					X
Shock	3.4.2.4	4.8.16.4	X	X					X
Corrosion resistance	3.4.2.5	4.8.16.5	X	X					
Fungus resistance	3.4.2.6	4.8.16.6	X	X					
Waterproofness	3.4.2.7	4.8.16.7.1	X			X		X	
		4.8.16.7.2		X			X		X
Electromagnetic interference	3.4.2.8	4.8.16.8	X	X					
Endurance	3.4.3	4.8.17	X	X					

1/ Type I regulator
2/ Type II regulator

TABLE IV. Sequence of first article inspection.

Test	Paragraph	Sample 1	2	3	4
Reverse current	4.8.4	X	X	X	X
Voltage regulation	4.8.5	X	X	X	X
Voltage ripple	4.8.6	X	X	X	
Current regulation	4.8.7	X	X	X	
Field excitation	4.8.9	X	X	X	
High temperature	4.8.16.1		X	X	
Low temperature	4.8.16.2		X	X	
Endurance	4.8.17	X			
Vibration	4.8.16.3		X	X	
Shock	4.8.16.4		X	X	
Waterproofness	4.8.16.7	X	X	X	
Corrosion resistance	4.8.16.5		X		
Transient voltage	4.8.14		X	X	
Overvoltage	4.8.8	X	X	X	
Fungus resistance	4.8.16.6			X	
Electromagnetic interference	4.8.16.8				X
Field circuit	4.8.12	X	X	X	
Negative voltage operation	4.8.11		X		

4.5 Quality conformance inspections.

4.5.1 Sampling.

4.5.1.1 Lot fomation. An inspection lot shall consist of all the assemblies of one type and part number, from an identifiable production period, from one manufacturer, submitted at one time for acceptance.

4.5.1.2 Sampling for examination. Samples for quality conformance examination shall be selected in accordance with general inspection level II of MIL-STD-105. Before sampling may be initiated, the contractor shall establish by examination of at least 20 consecutively produced assemblies that the process average percent defective, as defined in MIL-STD-105, is not greater than the specified AQLs.

4.5.1.3 Sampling for acceptance tests. Samples for acceptance tests shall be selected in accordance with level S-4 of MIL-STD-105.

4.5.2 Examination.

4.5.2.1 Acceptable quality level. Each sample selected in accordance with 4.5.1.2 shall be examined to determine conformance to the following acceptable quality levels (AQL).

Classification	AQL
Major	1.0
Minor	2.5

4.5.2.2 Classification of defects. For examination purposes, defects shall be classified as listed in table V.

TABLE V. Classification of defects.

Category	Defect	Method of examination
Critical	None	
Major	AQL 1.0% Defective	
101	Assembly incomplete (see 3.3).	Visual
102	Nonconformance in design and construction (see 3.3.3, 3.3.4).	Visual SIE 1/
103	Dimensions affecting interchangeability, out of tolerance (see 3.3.1, 3.3.2).	SIE 1/
104	Finish, improper application (see 3.5).	Visual
105	Identification marking, improper (see 3.6).	Visual
106	Faulty workmanship affecting performance (see 3.2).	Visual
Minor	AQL 2.5% Defective	
201	Dimensions not affecting interchangeability, out of tolerance (see 3.3.1).	SIE 1/
202	Finish, improper application (see 3.5).	Visual
203	Faulty workmanship affecting appearance (see 3.7).	Visual

1/ SIE = Standard inspection Equipment.

4.5.3 Tests. Samples selected in accordance with 4.5.1.3, shall be subjected to the quality conformance tests as specified in table III, and in the order listed in tables VI and VII.

4.5.3.1 Type I.

TABLE VI. Sequence of quality conformance tests.

Test	Paragraph
Reverse current	4.8.4
Voltage regulation	4.8.5.1
Current regulation	4.8.7.1
Waterproofness	4.8.16.7.1

4.5.3.2 Type II.

TABLE VII. Sequence of quality conformance tests.

Test	Paragraph
Voltage regulation	4.8.5.2
Interpole field coil voltage drop	4.8.7.2.1
Overvoltage	4.8.8
Field excitation	4.8.9
Negative voltage operation	4.8.11
Waterproofness	4.8.16.7.2

4.6 Control tests. Control tests shall be conducted at the rate of 3 from each lot of 500 units consecutively produced, except that not more than one test shall be performed in a 1-month period, nor less than one test in a 3-month period. The assemblies shall be subjected to the tests specified in table 111, in the order listed in tables VIII and IX.

4.6.1 Type I.

TABLE VIII. Sequence of control testing.

Test	Paragraph
Reverse battery polarity	4.8.13
Voltage transient	4.8.14.1
Field excitation	4.8.9
Load switching	4.8.15.1
Effective field circuit resistance	4.8.10
Reverse current	4.8.4
Voltage regulation	4.8.5.1
Current regulation	4.8.7.1
High temperature	4.8.16.1.1
Low temperature	4.8.16.2.1
Waterproofness	4.8.16.7.1

4.6.2 Type II.

TABLE IX. Control tests.

Test	Paragraph
Reverse current	4.8.4
Voltage regulation	4.8.5.2
Voltage ripple	4.8.6
Current regulation	4.8.7.2
Overvoltage	4.8.8
Field excitation	4.8.9
High temperature (215° ± 5°F)	4.8.16.1.2
Low temperature (-65° ± 5°F)	4.8.16.2.2
Vibration 1/	4.8.16.3
Shock 1/	4.8.16.4
Waterproofness	4.8.16.7.2
Field circuit	4.8.12
Negative voltage operation 1/	4.8.11

1/ Only two assemblies shall be subjected to the shock, vibration and negative voltage operation test from each procurement lot of 500 or less.

4.7 Failure. Failure of any assembly to pass any of the specified quality conformance or control tests shall be cause for the Government to refuse acceptance of the production quantity represented, until action taken by the contractor to correct defects and prevent recurrence has been approved by the Government.

4.8 Methods of inspection.

4.8.1 Materials and construction. Conformance to 3.2, 3.2.1, 3.3.1 through 3.3.1.2 and 3.5.2 through 3.5.4 shall be determined by inspection of contractor records providing proof or certification that design, construction , processing, and materials conform to requirements. Applicable records shall include drawings, specifications, design data, receiving inspection records, processing and quality control standards, vendor catalogs and certifications, industry standards, test reports, and rating data.

4.8.2 Defects. Conformance to 3.3.1 through 3.3.4, 3.3.6, and 3.5.1 through 3.7 shall be determined by examination for the defects listed in table V. Examination shall be visual, tactile, or by measurement with standard inspection equipment.

4.8.3 Weight (type II). To determine conformance to 3.3.5.2, the regulator shall be weighed.

4.8.4 Reverse current. To determine conformance to 3.4.1.1, the stabilized regulator (see 6.3.1) shall be connected to the test circuit with the generator operating at sufficient speed to deliver charging current to the battery. The maximum value of the reverse current shall be observed on the ammeter or milliammeter. Five test cycles shall be recorded.

4.8.5 Voltage regulation.

4.8.5.1 Type I. To determine conformance to 3.4.1.2.1, the operationally stabilized regulator (see 6.3.1.1) shall be connected in the test circuit. During the test, the resistance load shall be applied and removed suddenly, Observations shall be made of the output voltage while the regulator is being subjected to the following test procedure:

a. Increase generator speed from zero, and operate generator at 2000 rpm with resistance load at zero.
b. With generator at 2000 rpm, add resistance load to establish a total load of 20 amps.
c. Increase generator speed to 5000 rpm and maintain the 20 A load.
d. With generator at 5000 rpm, remove the resistance load.
e. Increase generator speed to 8000 rpm with resistance load at zero.
f. With generator at 8000 rpm, add resistance load to establish a total load of 20 A.
g. Decrease generator speed to 2000 rpm and maintain the 20 A load.
h. With generator at 2000 rpm, remove the resistance load.
j. Increase generator speed to 8000 rpm with resistance load at zero.

4.0.5.2 Type II. To determine conformance to 3.4.1.2.2, the temperature stabilized regulator (see 6.3.1.2) shall be connected in the test circuit. During the test, the resistance load shall be applied and removed suddenly. The change in load shall be accomplished in 10 ms maximum time. Tripping of overvoltage reset due to quick reaction shall not constitute failure. Observation shall be made of the output voltage while the regulator is being subjected to the following test procedure:

	RPM	Load (A)
a.	2400 ± 50	25
	2400 ± 50	100
	2400 ± 5O	350
b.	5500 ± 110	same sequence as in (a)
C.	8000 ± 160	same sequence as in (a)

E_R to be recorded on CEC tapes, or equivalent.

The generator shall be operated at 5500 rpm with a 350 A load for 5 minutes. The regulated voltage shall then be recorded with the unstabilized regulator at an ambient temperature of 80 ± 15 °F under the following conditions.

RPM	Load (A)
2400 ± 50	Battery load only
2400 ± 50	350
8000 ± 160	Battery load only
8000 ± 160	350

The fundamental frequency of the voltage waveform shall be greater than 100 hertz (Hz) during all portions of the test. Throughout the test, the regulator shall re-establish and maintain a regulated voltage within the time and voltage limits indicated on figure 1.

4.8.6 Voltage ripple Type II. To determine conformance to 3.4.1.3.2, using the test procedure specified in 3.4.1.2.2, the output voltage waveform at the regulator output shall be measured with an oscilloscope as shown in figure 3. Repeat the procedure with batteries disconnected.

4.8.7 Current regulation.

4.8.7.1 Type I. To determine conformance to 3.4.1.4.1, with the regulator operationally stabilized (see 6.3.1.1), the generator operating at 5000 rpm, and the battery disconnected from the test circuit, the resistance load shall be adjusted to establish current regulation. The resistance load shall be further adjusted until the voltage output has been reduced from a maximum voltage (28 V at minus 65°F, 27 V at 77°F, and 25 V at 225°F) to 6V. An ammeter shall be observed to verify current reading. Below 18 V, only the maximum current limit value shall apply (38 A at minus 65°F, 30 A at 77°F, and 24 A at 225°F). The procedure shall be repeated except that the battery shall be connected in the test circuit and the ammeter shall be observed for current reading at 25 V.

4.8.7.2 Type II. To determine conformance to 3.4.1.4.2, the regulator shall be operated, with no batteries connected, with generator speed at 5500 rpm, and with resistive load rated 350 A at 28 V (nominal). Generator inlet cooling air shall be ducted. Ducting configuration shall simulate that used on the M60A1 vehicle generator installation. Temperature shall be measured at a distance of 3 feet 6 inches from the fan centerline. The regulator shall be operated until circuit conditions are stabilized. The following tests shall then be performed (under static circuit conditions, using an average reading meter for voltage and current readings) (for transient circuit conditions, appropriate instrumentation shall be used):

a. The load resistance shall be reduced in steps not to exceed 6 ohms.
b. A resistive load bank of 1000 A capacity at 28 V (nominal) shall be suddenly applied and released.

4.8.7.2.1 Interpole field coil voltage. To determine conformance to 3.4.1.4.2.1, the batteries shall be disconnected and the generator operated at 5500 rpm with a 350 A resistive load. The output shall be switched into a resistive load bank of 1000 A at 28 V and the voltage drop across the interpole field coil at the generator terminals shall be measured and recorded.

4.8.8 Overvoltage. To determine conformance to 3.4.1.5.2, the regulator shall be connected to a dc power supply. The voltage shall be increased from 28 V by application of a step voltage of approximately 6 V. The voltage level and reaction time shall be measured and recorded. The test shall be repeated, except that the regulator shall be disconnected from the dc power supply.

4.8.9 Field excitation. To determine conformance to 3.4.1.6, the regulator shall be connected in the circuit (see figure 3 for type II) with batteries disconnected. The generator speed shall be gradually increased from zero until field excitation occurs. The generator voltage at excitation shall be recorded. The generator speed at start of regulation shall be recorded.

4.8.10 Effective field circuit resistance (type I). To determine conformance to 3.4.1.7.1, the operationally stabilized regulator shall be connected in the test circuit with battery disconnected. The generator speed shall be gradually increased from zero to produce a field current of 0.8 A in the unregulated mode and a load current adjusted to 18 A. The field current and generator-to-field voltage drop shall be recorded and the effective field circuit resistance calculated.

4.8.11 Negative voltage operation (type II). To determine conformance to 3.4.1.8.2, the regulator shall be operated until temperature stabilization. Then it shall be subjected to the following test procedure using the test circuit shown in figure 7 (batteries shall be fully charged).

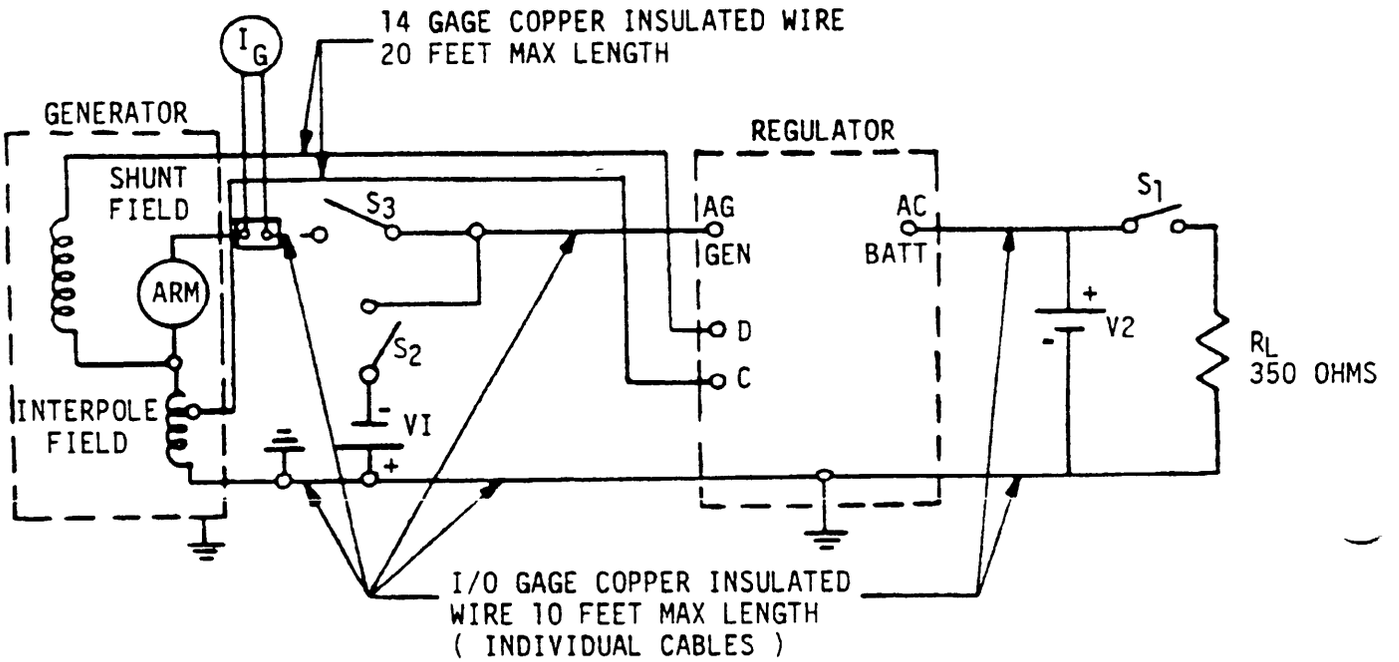
a. Arrange the test set-up as shown on the circuit diagram (figure 7 with S_1, S_2, and S_3 open.

b. Close S_2 for 1 to 5 seconds, then open S_2.

c. Close S_3 with generator at 2400 ± 50 rpm. Observe generator output (IG), which should be less than 20 A. If IG indicates 20 A or more, open S_3 and discontinue test. If IG does not exceed 20 A, close S_1 and test regulator in accordance with 4.8.5.2, 4.8.7.2 and 4.8.8.

d. Open S_1, S_2, and S_3. Lock generator to prevent rotation (rotation less than 10 rpm is permissible). Close S_3 and reverse the polarity of V2 for 10 seconds, then return polarity to normal. Repeat step (c) and determine that output is within specification.

NOTE: Steps (b) and (c) test for ability to withstand reverse generator operation. Step (d) tests the ability to withstand reverse slave battery operation.



$V_1 = V_2 = 24$ VDC (TWO 12V - 6TN BATTERIES, OR EQUIVALENT)

FIGURE 7. Negative voltage circuit.

4.8.12 Field circuit (type II). To determine conformance to 3.4.1.9.2, the regulator shall be tested as follows:

a. With the generator operating 2400 rpm in the circuit in figure 3 with a 30 A load, switch S_1 shall be opened and closed 5 times. The load shall be increased to 400 A and the procedure repeated.
b. Procedure (a) shall be repeated with the generator operating at 8000 rpm.

4.8.13 Reverse battery polarity. To determine conformance to 3.4.1.10, the regulator shall be connected in the test circuit (see figure 4 for type II). With the generator inoperative, the battery polarity shall be reversed and a voltage applied in increments from maximum voltage to a minimum of 6 V. During the tests, checks for open circuit shall be made.

4.8.14 Transient voltage.

4.8.14.1 Type I. To determine conformance to 3.4.1.11.1, the regulator shall be connected in the test circuit with the battery disconnected and the generating system inoperative. A negative voltage pulse of 100 V, square wave, of 50 ms duration, shall be applied to the regulator output terminal, once every 2 seconds, equally spaced, for a period of 10 minutes. The test shall then be repeated, except that the voltage pulse shall be positive and the period shall be 5 minutes. At the conclusion of this test, the regulator shall pass the tests of 4.8.4 through 4.8.7.

4.8.14.2 Type II. To determine conformance to 3.4.1.11.2, the regulator shall be disconnected from the test circuit as shown in figure 3 and stored for 24 hours at 215° ± 5°F. It shall then be tested in an ambient temperature of 215° ± 5°F as specified in paragraph 4.8.14.2.1. A voltage pulse of 100 V, square wave, not more than 160 microseconds rise time, of 50 ms duration shall be applied to the regulator output terminal once every 6 seconds, equally spaced for a period of 3 hours. The test shall be repeated except that a voltage pulse of 70 V shall be applied to the input terminal of the regulator.

4.8.14.2.1 Negative transient voltage. The regulator shall be temperature stabilized at 215° ± 5°F for a period of one hour before being subjected to five cycles of the following two-step test procedure, using the test circuit shown in figure 7. Steps one and two shall constitute a cycle and the cycle shall be repeated five times.

Step 1: a. Capacitor C shall be charged to a voltage (EC) of 595 ± 5 V.
b. Switch S_2 shall be closed (E_c is applied to the input terminal of the regulator) for a period of 6 seconds and then opened.

Step 2: a. With the generator running at a speed between 2400 and 3000 rpm, switch S_3 shall be closed for 6 minutes.

b. Capicitor C shall be charged to an EC of 595 ± 5 V and switch S_2 closed for a period of one hour.

c. Open all switches.

4.8.15 Load switching.

4.8.15.1 Type I. To determine conformance to 3.4.1.12.1, the regulator shall be connected in the test circuit with the battery disconnected. With the generator speed at 5000 rpm, the resistance load shall be adjusted to deliver a current regulated load at 20 V at -65°F, 27 V at ± 77°F and 25 V at ± 225°F. The load shall be switched on for one second, off for one second, and repeated for a period of 15 minutes. Load switching time shall be 1.5 ± 0.5 ms. At the conclusion of this test, the regulator shall pass the test of 4.8.4, 4.8.5.1 and 4.8.7.1.

4.8. 15.2 Type II. Not applicable.

4.8.16 Environmental conditions.

4.8.16.1 High temperature.

4.8.16.1.1 Type I. To determine conformance to 3.4.2.1.1, the regulator shall be stored for 24 hours in an ambient temperature of 225° ± 5°F. With ambient temperature maintained at 225° ± 5°F, the regulator shall be tested in accordance with 3.4.1.6, 3.4.1.10, 3.4.1.11.1, and 3.4.1.12.1. While remaining in an ambient temperature of 225° ± 5°F and connected in the test circuit, the regulator shall function continuously with a field current of 0.75 A for one-half hour at each of the following conditions:

a. Output voltage of 25 V in the current regulated mode.
b. Load current of 12.5 A in the voltage regulated mode.

Then the regulator shall be returned to an ambient room temperature of 77° ± 15°F and tested as specified in 4.8.12, 4.8.4, 4.8.5.1 and 4.8.7.1.

4.8.16.1.2 Type II. To determine conformance to 3.4.2.1.2, the regulator shall be stored for 24 hours in an ambient temperature of 215 ± 5°F. With ambient temperature maintained at 215° ± 5°F, the regulator shall function continuously for 4 hours while the generator speed and output load are adjusted to produce 2400 rpm and 400 A. While remaining in an ambient temperature 215° ± 5°F, the regulator shall be tested as specified in 4.8.4, 4.8.5, 4.8.8, 4.8.9, 4.8.11 and 4.8.14. The regulator shall be returned to an ambient temperature of 80° ± 5°F and tested as specified in 4.8.4, 4.8.7.2.1, and 4.8.8.

4.8.16.2 Low temperature.

4.8.16.2.1 Type I. To determine conformance to 3.4.2.2.1, the regulator shall be stored for 24 hours in an ambient temperature of minus 80° ± 5°F. The regulator shall then be tested in the following order in an ambient temperature of minus 65° ± 5°F in accordance with 4.8.13, 4.8.14.1, 4.8.9, 4.8.15.1, 4.8.10, 4.8.4, 4.8.5 and 4.8.6.

4.8. 16.2.2 Type II. To determine conformance to 3.4.2.2.2, the regulator shall be stored for 24 hours in an ambient temperature of minus 80° ± 5°F. After stabilizing for 4 hours at minus 65° ± 5°F, the regulator shall function continuously for 1 hour while the generator speed and output load are adjusted to produce 2400 rpm, and 400 A. While remaining in an ambient temperature of minus 65° ± 5°F, the regulator shall be tested as specified in 4.8.4, 4.8.5, 4.8.8, 4.8.9, 4.8.11, and 4.8.14. The regulator shall be returned to an ambient temperature of plus 80° ± 5°F and tested as specified in 4.8.4, 4.8.7.2.1, and 4.8.8.

4.8.16.3 Vibration. To determine conformance to 3.4.2.3, the regulator shall be tested to the requirements of MIL-STD-202, method 204, condition A, except that the sweep time shall be performed 24 times. At the conclusion of this test, the regulator shall pass the tests of 4.8.4 through 4.8.7.

4.8.16.4 Shock. To determine conformance to 3.4.2.4, the regulator shall be tested to the requirements of MIL-STD-202, method 213, condition A and using figure 213.2. At the conclusion of this test, the regulator shall pass the tests of 4.8.4 through 4.8.7.

4.8.16.5 Corrosion resistance. To determine conformance to 3.4.2.5, the regulator shall be tested in accordance with MIL-STD-810, method 509. The regulator shall be tested for four test cycles sealed (400 hours for type I and 192 hours for type II) and internal components shall not be exposed. At the conclusion of this test, the regulator shall pass the tests of 4.8.4 through 4.8.7.

4.8.16.6 Fungus resistance. To determine conformance to 3.4.2.6, the regulator shall be tested in accordance with MIL-F-13927, class 1, except that the period of exposure shall be a continuous 90 days. At the conclusion of this test, the regulator shall pass the tests of 4.8.4 through 4.8.7.

4.8.16.7 Waterproofness. To determine conformance to 3.4.2.7, the regulator shall be tested as follows:

4.8.16.7.1 Type I {nonoperational). The regulator shall be tested in accordance with MIL-STD-1184 for class 2, type II, except that tap water shall be used instead of a salt water solution. Electrical operation during submersion is not required. At the conclusion of this test, the regulator shall pass the tests of 4.8.4 through 4.8.7.

4.8.16.7.2 Type II (operational). The regulator shall be tested in accordance with MIL-STD-1184 for class 2, type II, except 10 pounds per square inch (psi) pressure and 10 psi vacuum shall be applied. During submersion, the regulator shall be-subjected to 10 psig for a period of 5 minutes. The regulator while submerged shall be operable and shall be tested in accordance with 4.8.5.2 during the pressure and vacuum tests phases.

4.8. 16.8 Electromagnetic interference. To determine conformance to 3.4.2.8, the regulator shall be tested in accordance with MIL-STD-462 and figure 8.

4.8.17 Endurance.

4.8.17.1 Type I. To determine conformance to 3.4.3.1, the regulator shall function continuously when cycled (see figure 9) at 24 cycles per hour for 2000 hours. Each 1000 hour test period shall be divided into time-temperature periods; and each time-temperature period shall be divided between different resistance loads as specified in table X. After each 1000 hour test period, the regulator shall pass the test of 4.8.15.1 and 4.8.4 through 4.8.7.

TABLE X. Endurance test sequence.

Time	Temperature	Resistance load	
		One-half of time temperature period	One-half of time temperature period
Hours	Fahrenheit	Amperes	Amperes
190	225°	18	4
190	77°	23.5	4
50	-65°	29	4
140	0°	27	4
190	77°	23.5	4
240	160°	20	4

4.8.17.2 Type II. To determine conformance to 3.4.3.2, the regulator shall be cycled at 18 cycles per hour for 1000 hours. The 1000 hours shall be divided into 500 hours with generator operating at 2400 rpm, 300 hours at 4000 rpm, 150 hours at 6000 rpm and 50 hours at 8000 rpm. A cycle shall consist of generator operation for 25 seconds each at battery load, 100 A, 200 A, 300 A and 400 A, followed by a reduction to 300 A, 200 A, 100 A and then at battery load. At the conclusion of this test, the regulator shall pass the tests of 4.8.4 through 4.8.7.

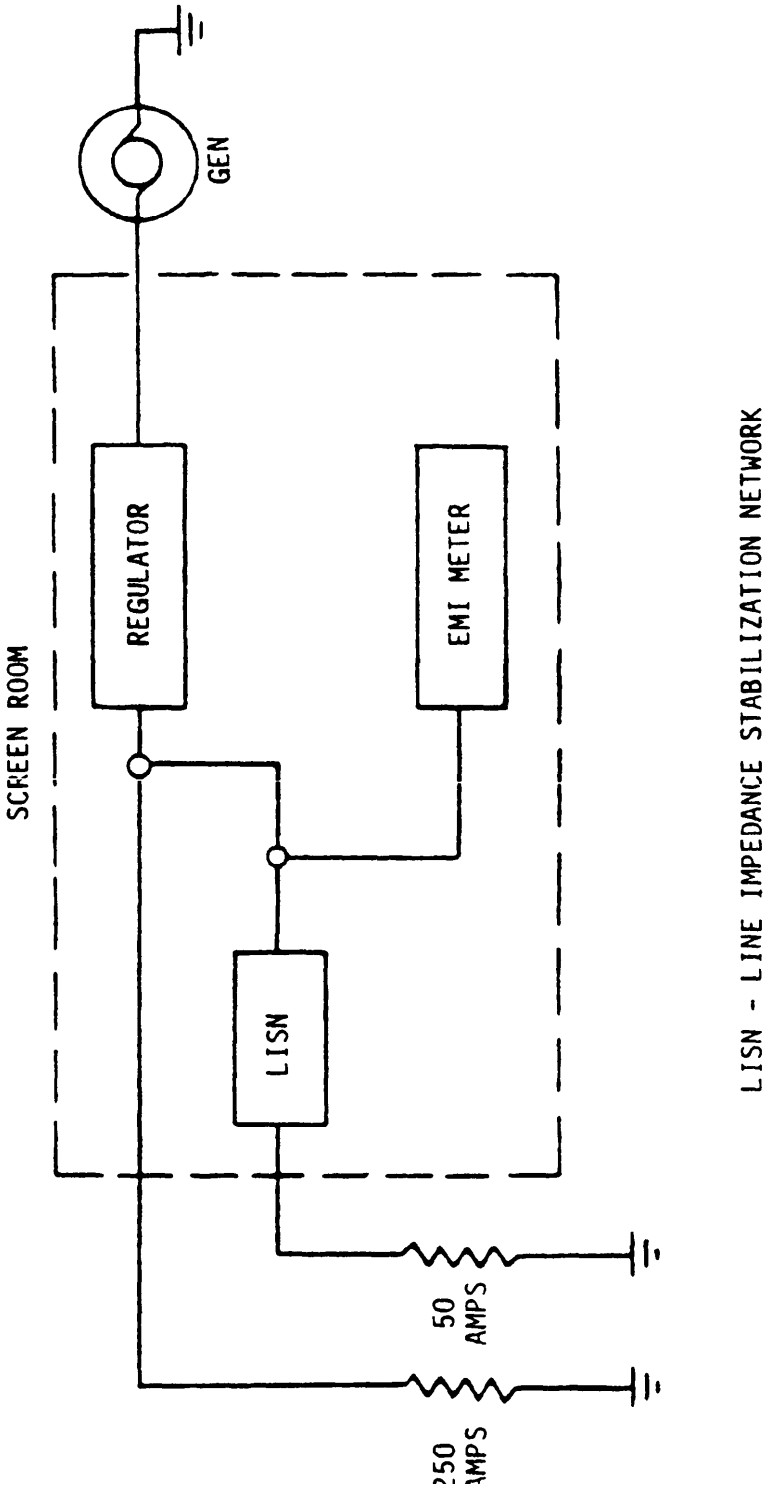


FIGURE 8. Electromagnetic interference tests.

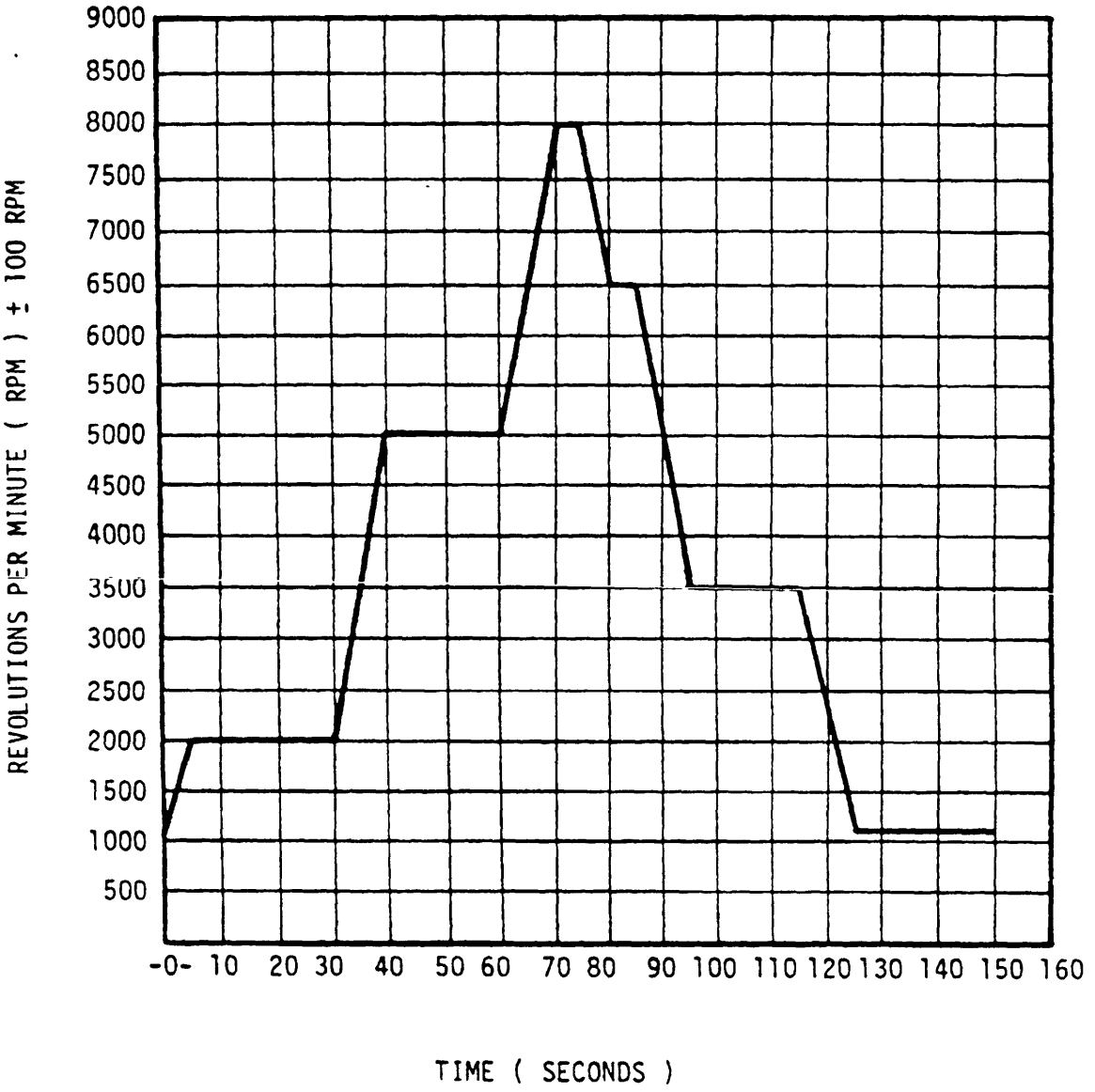


FIGURE 9. Endurance cycle.

5. PACKAGING

5.1 Preservation, packaging, packing, and marking. preservation, packaging, packing, and marking for the desired level shall be in accordance with the applicable packaging requirements specified by the contracting authority (see 6.2).

6. NOTES

6.1 Intended use. The regulators covered by this specification are intended for use in 28 V dc nominal electrical systems equipped with charging generators. The regulators are intended for use on tactical and combat military vehicles and industrial applications.

6.2 Ordering data. Acquisition documents should specify the following:

a. Title, number, and date of this specification.
b. If first article samples are not required (see 3.1).
c. Title, number, and date of the applicable drawing (see 3.3.1).
d. If responsibility for inspection shall be other than as specified (see 4.1).
e. If preproduction inspection is required (see 4.1.1).
f. If responsibility for inspection equipment shall be other than as specified (see 4.1.2).
g. If inspection conditions shall be other than as specified (see 4.3).
h. Selection of applicable level and packaging requirements (see 5.1).

6.3 DEFINITIONS

6.3.1 Stabilized regulator.

6.3.1.1 Type I. A temperature stabilized regulator is defined as a regulator" which has operated for one hour with the generator speed adjusted to 3000 rpm and the load adjusted to 12.5 A.

6.3.1.2 Type II. A temperature stabilized regulator is defined as a regulator which has been operated for 30 minutes with the generator speed adjusted to 2400 rpm, the load adjusted to 175 A and at ambient room temperature (see 4.3).

6.3.2 Fully charged battery.

6.3.2.1 Type I. For the purposes of the test procedures in this specification, a fully charged battery is defined as a battery having a current consumption of not more than 2 A at 28 V at ambient room temperature (see 4.3).

6.3.2.2 Type II. For the purposes of the test procedures in this specification, a fully charged battery is defined as a battery having a current consumption of not more than 4 A at 28 V at ambient room temperature (see 4.3).

6.3.3 Load current. Load current, for purposes of this specification, shall be considered as that current from generator and regulator to batteries and resistive load (see figure 3).

6.4 Definitions.

6.4.1 Recovered materials. "Recovered materials" means materials that have been collected or recovered from solid waste (see 6.4.2).

6.4.2 Solid waste. "Solid waste" means (a) any garbage, refuse, or sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility; and (b) other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from - community activities. It does not include solid or dissolved material in domestic sewage, or solid or dissolved material in irrigation return flows or industrial discharges which are point sources subject to permits under section 402 of the Clean Water Act, (33 U.S.C. 1342 et seq.) or source nuclear, or byproduct material as defined by the atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.) (Source: Federal Acquisition Regulations, section 23.402).

6.5 Cross-reference of classification. Type I regulator replaces the regulator specified in MIL-R-62067(AT) and type II regulator replaces the regulator specified in MIL-R-62104(AT).

6.6 Subject term (key word) listing.

Regulator
Regulator, generator system
Engine generator regulator

6.7 Supersession data. This military specification supersedes MIL-R-62067B(AT), 18 September 1974 and MIL-R-62104C(AT), 21 March 1979.

Custodian:
Army - AT

Preparing activity:
Army - AT

Review activity:
DLA - CS
Army - AV

(Project 2920-0413)

User activity:
Navy - YD

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DOCUMENT IDENTIFIER *(Number)* AND TITLE

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NAME OF ORGANIZATION AND ADDRESS OF SUBMITTER

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