

MIL-E-85583/1(AS)  
13 March 1987

## MILITARY SPECIFICATION SHEET

ELECTRIC POWER GENERATING CHANNEL,  
VARIABLE INPUT SPEED, 2390 TO 8560 RPM,  
ALTERNATING CURRENT, 400 HZ, 12.5 KVA, AIRCRAFT

This specification sheet is approved for use by the Naval Air Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

The complete requirements for procuring the electric power generating channel described herein shall consist of this document and the latest issue of specification MIL-E-85583(AS).

Channel Output

AC Power	
Rated output power with generator package input shaft speed of 2390 to 8560 RPM	12.5 KVA
Phases	3-Wye connected
Voltage	115/200 volts
Frequency	400 Hz
DC Power	None

Generator Package (P/N M85583/1-1) (engine mounted)

Configuration	Figure 1
Maximum weight	98 lbs
Maximum overhung moment	800 in. lbs
Input shaft	
Normal speed range	2390 to 8560 RPM
Cruise speed	6000 RPM
Overspeed	9416 RPM
Shaft shear section	2000 ± 250 in. lbs
Direction of rotation (viewing drive end)	CW
Coolant	Air
Continuous inlet temperature	-55°C to +70°C
Air flow	See para 3.4.2.3
Ambient temperature	-55°C to +70°C
Maximum altitude	50,000 ft
Efficiency	70% minimum

Channel Adapter (P/N M85583/1-4) (non-engine mounted)

Configuration	Figure 2
Maximum weight	0.5 lbs

AMSC N/A

FSC 6115

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Channel Wire Harness (P/N M85583/1-5) (non-engine mounted)

Configuration  
Maximum weight

Figure 3  
1.0 lb

1. REQUIREMENTS. The electric power generating channel and channel components utilizing the interconnecting wiring of Figure 4 of this specification shall meet the requirements of MIL-E-85583(AS) as modified below:

2.1.1 Specifications, standards and handbooks. Add the following documents:

MS17333	Transmission, Power Constant Speed
MIL-STD-889	Dissimilar Metals

3.4.1 General design and construction. Add: A dc power source for use external to the channel is not required.

3.4.1.1 Environmental. Delete and add: All channel components shall operate in accordance with this specification when subjected to the tests of MIL-E-81910 except as modified in paragraph 4.6.10. The minimum coolant and ambient temperatures for start-up operation of any channel component shall be -40°C. The temperature-altitude curve, Figure 7 of this specification sheet, and the cooling requirements of paragraph 3.4.2.3 shall be used during environmental testing in place of Figure 2 of MIL-E-81910.

3.4.1.2 Channel control switch. Delete and add: Provisions shall be made for manual control of the channel by means of a single pole, single throw switch which shall perform the following control functions in the positions indicated:

NORMAL (switch closed). The channel shall be energized automatically if the generator is above its minimum operating speed. Protective functions shall be operative.

OFF-RESET (switch open). The channel shall be electrically de-energized. In the event that the channel is deenergized with the switch in the NORMAL position, placing the switch in the OFF-RESET position shall reset the protective functions and enable the channel to be energized when the switch is returned to the NORMAL position.

3.4.1.3 Reliability. Delete the second sentence and replace with the following: A stress analysis with associated predictions and allocations in conformance with MIL-HDBK-217 shall be performed.

3.4.1.5 Electrostatic discharge control. Electrostatic discharge control shall be applicable as defined in 6.4, Design guides.

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3.4.1.8 Threaded parts. Delete the last sentence and add: The minimum sizes for threaded fasteners (bolts or screws) shall be as follows: #8 for structural fasteners, #8 for sheet metal covers and #6 for screen assembly attachment. Other fasteners, such as those used for nameplates or electrical receptacles, shall be sized as appropriate.

3.4.1.10 Mean flight hours between failure. Delete and add: The minimum predicted mean time between failure (MTBF) for the channel while operating under specified conditions shall be 3000 hours.

3.4.1.13 Failure mode and effects analysis (FMEA). A FMEA is not required.

3.4.2.3 Cooling system. Delete and add: The generator package shall be blast air cooled in accordance with the inlet temperature and altitude requirements of Figure 7 at altitudes up to 50,000 feet. A heat exchanger attached to and supported by the generator package may be used provided that the outline of the generator package and the heat exchanger conform to the dimensional requirements of Figure 1. In the aircraft, the generator package will receive air directly from existing air ducting which channels a small portion of the engine inlet air to the generator compartment for cooling. Airflow is dependent on the internal configuration of the channel and the engine RPM. Modification to the aircraft cooling ducts or the use of an electrical fan is not permitted. During thermal testing, airflow will be provided at 6.5 lbs/min or at a differential pressure of .77 inches of water, whichever results in the lowest mass flow at up to 45°C and up to 6000 RPM to simulate sea level ground operation conditions. At all other conditions at sea level or at altitude, airflow shall be provided at  $18 \pm 2$  lbs/min or at a differential pressure of 10 inches of water, whichever results in the lowest mass flow. The ambient temperature shall be maintained during thermal tests at 20°C above the inlet temperature.

3.5.1 Channel capacity (rating). Change: "as defined by Figure 5" to "as defined by Figure 4 of this specification sheet."

3.5.1.1.1 Continuous rating. Delete and add: The channel ac power source shall be capable of continuously delivering power from no load to full load at .75 lagging to unity power factor. The channel shall also be capable of delivering power to unbalanced loads within the rating of the system where the difference in the per phase load currents do not exceed one-third of the phase current rating. The power factor rating for unbalanced loads shall also be .75 lagging to unity power factor. The channel shall also be capable of delivering 20 percent of rated load continuously at a power factor of .5 lagging.

3.5.1.1.2 Overloads. Delete and add: The channel ac power source shall be capable of delivering 125 percent of the rated current for 5 minutes and 150 percent of rated current for 5 seconds to loads having a power factor of .75 lagging to unity and having an unbalance wherein the difference in the current delivered by any two phases does not exceed one-third of the phase current at rated channel output.

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3.5.1.2 Rating of the dc power source. Not applicable.

3.5.2 Electrical performance of the ac power source. Delete the second sentence.

3.5.2.1.2 Voltage protection. Delete "or the generator feeder contactor opened" from the first sentence.

3.5.2.1.3 Wave form. Delete and add: Each phase voltage wave shall have a crest factor of  $1.41 + .07$  under continuous and  $1.41 + .10$  under overload conditions of 3.5.1.1.1 and 3.5.1.1.2, respectively. The total distortion shall not exceed 4.5 percent and no single extraneous frequency or harmonic shall exceed 3.0 percent for loads up to rated full load. Total distortion shall not exceed 7.0 percent for loads above 100% to 150% rated full load. The dc content of the ac output shall not exceed plus or minus 0.10 volts under any normal operating condition. Under abnormal conditions, protective functions within the channel shall operate to deenergize the ac power source before the dc content on any phase exceeds 2.0 volt seconds above an ultimate trip point of 0.5 volts dc unless the channel design precludes the generation of dc content on the ac output. Voltage modulation, defined as the difference in volts between the minimum and maximum peak voltages over a one second period, shall not exceed 3.5 and 7.0 volts, when measured with a 600 Hz low pass filter, for loads up to 100% rated full load and for loads above 100% to 150% rated full load, respectively.

3.5.2.1.4 Fault isolation. Not applicable.

3.5.2.1.5 Phase displacement and voltage unbalance. Add: During unbalanced loading the output individual phase voltages shall remain within the limits of 111.0 to 118.0 VRMS.

3.5.2.2.2 Frequency protection. Delete "or the generator feeder contactor opened" from the first sentence.

3.5.3 Electrical performance of the dc power source. Not applicable.

3.5.4 Underspeed monitor. Delete and add: An underspeed monitoring function within the channel shall be provided to energize the ac power source when the shaft speed is between 2340 and 2390 RPM and deenergize the ac power source when the speed is below 2290 RPM. Operation of the underspeed monitoring function shall occur under conditions of either increasing or decreasing shaft speed without having to manually reset the channel. The channel shall not be damaged when operated continuously between the underspeed turn-off speed and 2390 RPM under the loading conditions of paragraph 3.5.1. The voltage and frequency shall remain within the limits of 3.5.2.1.1 and 3.5.2.2, respectively. The channel shall come on-line within one second after reaching the turn-on speed or if already at or above minimum rated speed the channel shall come on-line within one second when the channel control switch is placed in the NORMAL position.

3.5.5 Feeder fault protection. Not applicable.

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3.5.6 Heat rejection. Delete and add: The channel efficiency shall not be less than 70 percent at rated full load over the rated speed range. System losses shall not be greater at loads less than rated load than they are at rated load.

3.6 Marking. Both generator package components, the generator and converter, shall be marked as specified in MIL-STD-130 with both nameplates including the following:

Warranty Expiration Date \_\_\_\_\_  
 No maintenance, non-repairable  
 Do not attempt to disassemble

4.5.1 Test sample. Delete and add: Tests are to be conducted on a single channel with channel components interconnected as shown in Figure 4.

4.5.2 Loading of the ac power source. Replace Figure 5 with Figure 4 of this specification sheet.

4.5.3 Loading of the dc power source. Not applicable.

4.5.4 Voltage and frequency measurements. Replace Figure 5 with Figure 4 of this specification sheet.

4.5.7.2 Channel component cooling. Add: The generator package inlet massflow shall be 16 to 20 lb/min at a temperature of  $30 \pm 10^{\circ}\text{C}$ .

4.6.4 Burn-in. Add: The vibration test may be conducted separate from the temperature cycling of Figure 7. If conducted separately the vibration test shall be conducted following the fifth and tenth cycles of Figure 7. During the vibration testing the generator package may be operated at no load and cruise speed. The vibration level shall be  $0.02 \text{ g}^2/\text{Hz}$ .

4.6.5.1 Electrical performance at standard temperatures. Delete and add: Determine channel performance under standard temperature conditions, sea level altitude, as follows:

(a) Under conditions wherein the generator package input shaft is accelerated from a speed of zero RPM to maximum rated speed and then decelerated back to zero RPM, determine (1) that the ac voltage and frequency regulation conforms to Figures 1 and 3, respectively, over the shaft speed range specified for rated ac output and (2) that the channel underspeed monitoring function conforms to the requirement of 3.5.4. Tests shall be conducted with 10, 60 and 100 percent rated load on the ac power source. Shaft acceleration rates shall be maintained at 45 to 55 percent of the maximum specified in 3.4.2.3.1.

(b) Repeat 4.6.5.1(a) at 10 and 100 percent rated load with the speed accelerated from zero RPM up to overspeed, held for five

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minutes, and then decelerated back to zero RPM. Shaft acceleration and deceleration rates shall be maintained between 90 and 100 percent of the maximum specified in 3.4.2.4.1.

(c) With the generator package input shaft at cruise speed and the ac power source delivering 10, 60, 100, 125 and 150 percent rated ac power output, determine conformance to the regulation and waveform requirements of 3.5.2.1.1, 3.5.2.2.1 and 3.5.2.1.3, except waveform measurements are not required at 150 percent rated power. The transient requirements of Figure 1 and 3 shall be verified.

(d) Repeat 4.6.5.1(c) at minimum and maximum power factors specified by 3.5.1.1.1. Conduct the same tests with the generator package input shaft speed at the minimum and at the maximum speed for rated ac power output.

(e) With the generator input shaft speed at minimum and maximum rated speed, at power factors of minimum and maximum specified by 3.5.1.1.1, and at base loads of 10, 60, 100, and 125 percent of rated load, verify operation under unbalanced loads as specified by 3.5.1.1.1.

(f) With the generator input shaft speed at minimum and maximum rated speed, verify the short circuit capacity requirements of 3.5.1.1.3 by applying one of each type fault (line-to-neutral, line-to-line, two phase-to-neutral, etc.) to the channel.

(g) Determine conformance of the ac power source to the electrical protection requirements of 3.5.2.1.2, 3.5.2.1.3 and 3.5.2.2.2 at 10, 60, 100 and 125 percent of rated ac power output. This test may be conducted on a subassembly level if it is not practical to conduct the test on the entire channel.

4.6.5.2 Electrical performance at minimum temperatures. Delete and add: Determine channel performance under minimum temperature component cooling conditions, sea level altitude, as follows: All components of the channel shall be soaked at an ambient temperature of  $-40^{\circ}\text{C}$  for 4 hours during which time no power shall be connected to any channel component.

(a) Repeat 4.6.5.1(a) at  $-40^{\circ}\text{C}$  ambient and  $-40^{\circ}\text{C}$  inlet air temperature.

(b) With the channel operating at minimum rated speed, lower the ambient and inlet air temperature to  $-55^{\circ}\text{C}$  and stabilize the unit.

(c) Repeat 4.6.5.1(d) and 4.6.5.1(f) at  $-55^{\circ}\text{C}$  ambient and inlet air temperature.

4.6.5.3 Electrical performance at maximum temperatures. Delete and add: Determine channel performance under maximum temperature component

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cooling conditions, sea level altitude, as follows: All channel components are to be soaked at the maximum ambient temperatures indicated in 3.4.2.3 for 4 hours with no electrical power connected to any channel component.

- (a) Repeat 4.6.5.1(a), 4.6.5.1(d), and 4.6.5.1(f) at maximum ambient and maximum air inlet temperature indicated in 3.4.2.3.

4.6.6 Electrical performance for quality conformance inspection. Delete and add:

- (a) Conduct 4.6.5.1(a) at 10 and 100 percent of rated load only.
- (b) Conduct 4.6.5.1(d) at 10, 100 and 125 percent of rated load only.
- (c) Conduct 4.6.5.1(f) except that only two faults of differing types shall be applied.

4.6.7 Motor starting. Change "cooling oil temperature" to "maximum inlet air temperature to the generator package." Change Figure 1 "Curve B" to Figure 5 "Curve C" of this specification sheet.

4.6.8 Heat rejection. Delete and add: The efficiency of the channel shall be determined at full rated load at minimum and maximum power factors over the rated speed range. Sufficient data shall be taken to plot efficiency vs RPM at each load condition. The efficiency for each channel component shall not exceed the values specified by 3.5.6.

4.6.10 Environmental effects. Delete and add: Environmental tests shall be conducted in conformance to MIL-E-81910 as amended below:

- (a) The acceleration and burn-in tests are deleted. Burn-in shall be conducted in accordance with 4.6.4.
- (b) The dust test shall be conducted on blast air cooled and self cooled channel components but is not required for oil cooled channel components which are not vented to the atmosphere.
- (c) Paragraph 4.6.3.1.1 of MIL-E-81910 shall not be conducted on channel components required to undergo oil-salt water ingestion testing if the channel component contains no oil or is not mated to oil cooled components. Channels failing the oil-salt water ingestion test may be repaired and the test resumed provided that the last three cycles are failure free. If a failure occurs in the last three cycles, three failure free cycles shall be conducted. Testing after the third failure may be continued at the discretion of the qualifying activity.
- (d) During temperature-altitude testing, self cooled and blast air cooled components shall be subjected to the requirements of

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MIL-E-81910 as amended by 3.4.1.1. At each test condition, the test of 4.6.6(b) shall be conducted; the system shall be cycled off and on, a single fault shall be applied and 150% load shall be applied and removed to verify transient operation.

(e) The fungus test shall be deleted if a certificate, signed by an official of the supplying firm, indicating that channel components will not support the growth of fungus, is submitted. Installation instructions shall not be put through the fungus test if a similar certificate is submitted indicating that they will remain acceptable for use by service personnel after being exposed to the specified fungus test for ten (10) days.

(f) Requirements concerning conducted electromagnetic interference do not pertain to conductors between channel components. An electromagnetic susceptibility test is not required. The conducted emissions, CEO3, and the radiated emissions, REO2, specification limits of MIL-STD-461 are relaxed by 20 and 10 db, respectively.

(g) During the humidity test, the applicable installation instructions shall be attached to each channel component and shall remain acceptable for use by service personnel after two cycles of the specified test. Components may be removed from the humidity chamber for operational checks if impractical to operate the channel components in the chamber.

(h) In conducting vibration testing, the generator package shall be considered as an engine mounted component and all other channel components as non-engine mounted components. The generator package shall be vibrated in accordance with Figure 3 of MIL-E-81910 except that the vibration level between 500 and 2000 Hz shall be 5 instead of 10g's. The vibration level on the anti-drive end of the generator package shall be limited to 30g's but input vibration level shall not be less than 2g's during resonant dwells.

(i) After environmental tests, except crash safety, satisfactory performance shall be demonstrated by satisfactorily completing the tests required by 4.6.6.

4.6.12.1 Generator package position. Delete and add: With the generator package in the positions and for the times listed in Table II of this specification sheet determine conformance of the ac power source to the regulation limits of Figure 5 of this specification sheet and Figure 3 of the general specification while delivery 100 percent rated load. If a fixed angle gearbox is used to perform these tests, the test times of Table II of this specification sheet shall commence after the channel component has attained appropriate speed and load. Pitch and roll angles apply to the rotational axis and zero degree roll position indicated in Figure 1.

4.6.14 Endurance. Delete and add: The channel shall be operated for 60 cycles of the test schedule shown by Table III of the general specification. During each hour of the test the generator input shaft shall be

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operated at minimum rated input speed for rated ac power output the first 15 minutes, at cruise speed for the next half hour, and at maximum rated speed for rated ac power output the last 15 minutes. The channel shall be shut down with the generator package input shaft speed reduced to zero until all channel components have stabilized at  $23 \pm 10^{\circ}\text{C}$  after each cycle. The following conditions shall be imposed randomly over the first 60 cycles of the test:

- (a) 125 percent ac load for 2 minutes, a total of 15 times.
- (b) 150 percent ac load for 5 seconds, a total of 15 times.
- (c) Single phase line-to-neutral, two phase line-to-line and three-phase line to neutral short circuits shall be applied to the ac power source for a duration of 5 seconds. Each type of short circuit shall be applied 10 times for a total of 30 short circuits.
- (d) While the channel is under load and thermally stabilized, the generator package input shaft speed shall be increased to the over-speed condition indicated by the detail specification and held there for 5 minutes a total of 5 times.

Forty-five cycles shall be conducted in accordance with Table IIIA of this specification sheet with the channel components at room ambient, sea level conditions with generator package inlet air temperature and ambient temperatures at  $30 \pm 10^{\circ}\text{C}$ . Fifteen cycles shall be conducted with the inlet and ambient temperatures varied in accordance with Table IIIB of this specification sheet.

If a part in a channel component fails during this test, it may be replaced and the test continued. When such a failure occurs the supplier of the channel component shall submit a report to the qualifying activity identifying the failure, its cause, and proposed corrective action. The qualifying activity may, at its discretion, require that the failed component part(s) be replaced in all qualification test channel components. Each channel component shall complete all 60 cycles of the endurance test with the last 5 cycles being failure free. If a part fails within the last 5 cycles, 5 failure free cycles shall be conducted to satisfy the above requirement even if more than 60 cycles are required. If a part fails during extended testing after successfully completing 60 cycles, 5 additional failure free cycles are not required on that part. The channel shall successfully complete the tests of 4.6.6(b) at the completion of endurance testing.

4.6.15 Fluid contamination. Applicable to channels using oil cooling.

6.1 Intended use. Delete "and as a limited source of 28 volt dc power for use in electric power control and protective circuitry" in the first sentence.

6.5.4 Load. Delete "and Figure 4" and "and DC respectively."

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6.5.6 Normal operating conditions. Delete "and dc loads up to 200 percent overload (3.5.1.2)" from the last sentence.

6.5.7 Point of regulation. Delete and add: The point of regulation is at the current limiters as shown in Figure 4 of this specification sheet.

2. The following changes are made to the tables and figures of MIL-E-85583(AS):

Table I                    Change Note 5 to read: The endurance test shall be conducted on any one of the channels submitted for qualification.

Table II                    Replace with Table II herein.

Table III                    Replace with Table IIIA and IIIB herein.

Figure 1                    Replace with Figure 5 herein.

The transient voltages and recovery time shall meet the requirements of Figure 5 of this specification sheet except as modified below. For 7.5 ms after removal of 100, 125, and 150% load, the maximum transient voltage shall not exceed 168, 184 and 196 peak volts divided by the square root of two, respectively. For 7.5 ms after application of 125 and 150% load, the minimum transient voltage shall not be lower than 75 and 70 peak volts divided by the square root of two, respectively. The minimum transient voltage on application of 150% load shall not be less than 5 volts below curve C between 7.5 and 20 ms after the onset of the transient. During load application or removal of 100, 125, and 150% load at speeds below 4000 RPM, the maximum steady state limit of Figure 5 of this specification sheet shall be increased to 120 vrms for 150 ms from application or removal of the load. On load application from 20 to 125 or 150% load, and on load removal to 20% load from 100, 125 and 150% load, the voltage transients shall remain within the limits of Figure 5 of this specification sheet.

Figure 2                    The undervoltage trip level tolerance shall be 103 to 108 rather than below 105 volts.

Figure 4                    Delete this figure.

Figure 5                    Delete this figure.

Figure 6                    Replace with Figure 6 herein.

Figure 7                    Replace notes A and B as follows:  
 A. -40°C ambient and inlet temperature.  
 B. +55°C ambient and inlet temperature.

3. The following requirements apply to Figure 1 - Generator Package:

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- a. The generator package shall break into two parts of approximately equal size and weight for installation. A QAD clamp (Aeroquip P/N 53079C-800D or equivalent) shall be provided to mate the two parts of the generator package together.
  - b. The generator package shall mate to the aircraft mounting pad with a V-band type QAD clamp (Aeroquip P/N 53079C-800D or equivalent) which is not required as part of a generating channel.
  - c. All access to the generator package shall be through the service access area. The terminal block, connectors, and QAD clamps shall be located in this area. The location of these items or any part of the generator package that requires access during the installation procedure shall be approved by the procuring activity.
  - d. The outline of the generator package need not have the exact shape shown provided that the provisions for attaching to the mounting plate and the air adapter are not modified. There shall be no protrusions outside of the outline including the QAD clamp used to mate the two halves of the generator package together.
  - e. There is to be an area of approximately one inch diameter recessed .25 inches into the generator package outline to provide clearance for a pin that extends in towards the generator on the aircraft door latchbolt assembly. The recess shall be located on the drive end, 1.5" from the mounting surface at 25.5 degrees up from the bottom of the unit in the service access area.
  - f. Mounting provisions shall be in accordance with MS17333 except that a circular spline and a plastic spline adapter in accordance with MS14169 shall be used. The spline adapter or shaft shall be modified to prevent movement of the adapter toward the generator package when installed. Also, the spline adapter shall be designed such that no part of the adapter is unsupported when installed in the aircraft.
  - g. A marking shall be provided on the generator package near the mounting plate that is 90° from the alignment pin to aid in aligning the generator package with the mounting plate.
  - h. The alignment pin is at the 12 o'clock position and marks the zero degree roll position. When installed on the aircraft, the rotational axis will be 6.0 degrees above the horizontal with the antidrive end high.
4. The following requirements apply to Figure 2 - Channel Adapter:
- a. The outline of the channel adapter need not have the shape shown provided that the mounting and connector locations are not altered.
  - b. The channel adapter shall contain jumper wires to route POR sensing leads and control switch functions to the generator package. The jumper wires shall be potted to prevent movement.

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5. The following requirements apply to Figure 3 - Channel Wire Harness:
  - a. The wire harness shall extend from the terminal block to the wire harness receptacle location shown below the generator. Provisions shall be made to securely attach (and detach) the wire harness to the generator package when it is installed in the aircraft. The attachment point shall be accessible through the service access area and shall provide adequate support for the harness. The wire harness will normally remain in the aircraft when the generator package is removed. The wire harness shall be sheathed the entire length to prevent damage to individual wires with a material which shall not be damaged during normal handling or during all environmental testing conducted on the generator package. The wire harness shall use AWG #10 wire for the three feeders, AWG #16 wire for the power ground and AWG #20 wire for the sensing and control leads.
6. The following requirements apply to Figure 4 - Channel Wiring Diagram:
  - a. In the aircraft, the channel control switch is actually a set of contacts on the DC monitored bus relay. When the emergency generator is deployed, the contacts will open to the OFF-RESET position. The emergency generator bypass switch can be used to turn the channel back on. This function will not normally be used except in an emergency or to check emergency and primary generators.
  - b. Wire lengths and sizes shall be as follows:
    - (1) The three power feeders shall be AWG #10 wire and shall be 65 inches long to the point of regulation. The power ground shall be AWG #16 wire and shall be 65 inches long.
    - (2) The three POR sensing leads shall be AWG #20 wire and shall be 84 inches long.
    - (3) The generator package control leads from pin B to pin C on the generator package connector shall be AWG #20 and shall be 47 feet long.

## NOTES:

1. All dimensions are in inches.

Preparing activity:  
Navy - AS  
Project No. 6115-N515

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TABLE II. Generator package attitude/time test (4.6.12).

Pitch ( <u>+1</u> Deg)	Roll ( <u>+1</u> Deg)	Minimum Time (Min)
+15	+7.5	120
+15	-7.5	120
-7.5	+7.5	120
-7.5	-7.5	120
0	+10	5
0	-10	5
+45	+10	5
+45	-10	5
-15	+10	5
-15	-10	5
0	+20	1
0	-20	1
+90	+10	1
+90	-10	1
-90	+10	1
-90	-10	1
0	+90	0.5
0	-90	0.5
0	+180	0.5
+45	+45	0.5
+45	-45	0.5
-45	+45	0.5
-45	-45	0.5

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TABLE IIIA. Endurance test schedule (45 cycles) at room ambient (4.6.14).

Step	Operating Time (Min)	AC Load (%)	Power Factor	Temp of Inlet Air (°C)	Airflow (lbs/min)
1	30	30	unity	30 ± 10	min*
2	120	50	.75 lag	30 ± 10	18
3	120	70	unity	30 ± 10	18
4	120	10	.9 lag	30 ± 10	18
5	120	100	.9 lag	30 ± 10	18
6	120	20	unity	30 ± 10	18
7	120	50	unity	30 ± 10	18
8	120	100	.75 lag	30 ± 10	18
9	90	20	.9 lag	30 ± 10	18

TABLE IIIB. Endurance test schedule (15 cycles) at temperature (4.6.14).

Step	Operating Time (Min)	AC Load (%)	Power Factor	Temp of Inlet Air (°C)	Airflow (lbs/min)
1	30	30	.9 lag	30 ± 10	min*
2	120	70	.75 lag	0 ± 5	20
3	120	100	unity	-15 ± 5	20
4	120	10	.9 lag	-30 ± 5	20
5	120	50	unity	-40 ± 5	20
6	120	70	.75 lag	-10 ± 5	20
7	120	100	unity	50 ± 5	20
8	120	40	.9 lag	70 ± 5	20
9	90	20	unity	30 ± 10	20

\*Step 1 to be conducted at minimum RPM with airflow for ground idle conditions as defined in 3.4.2.3.

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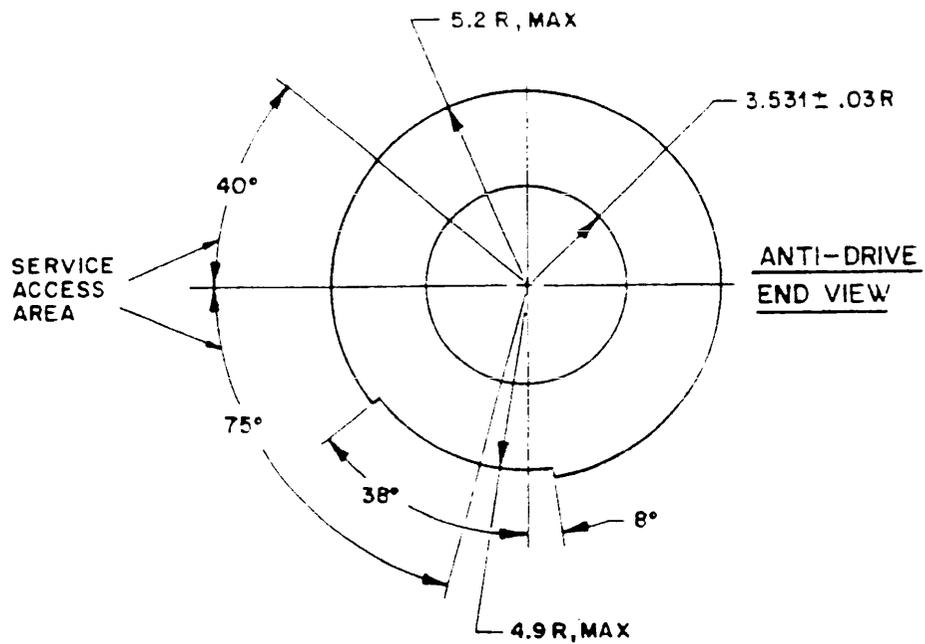
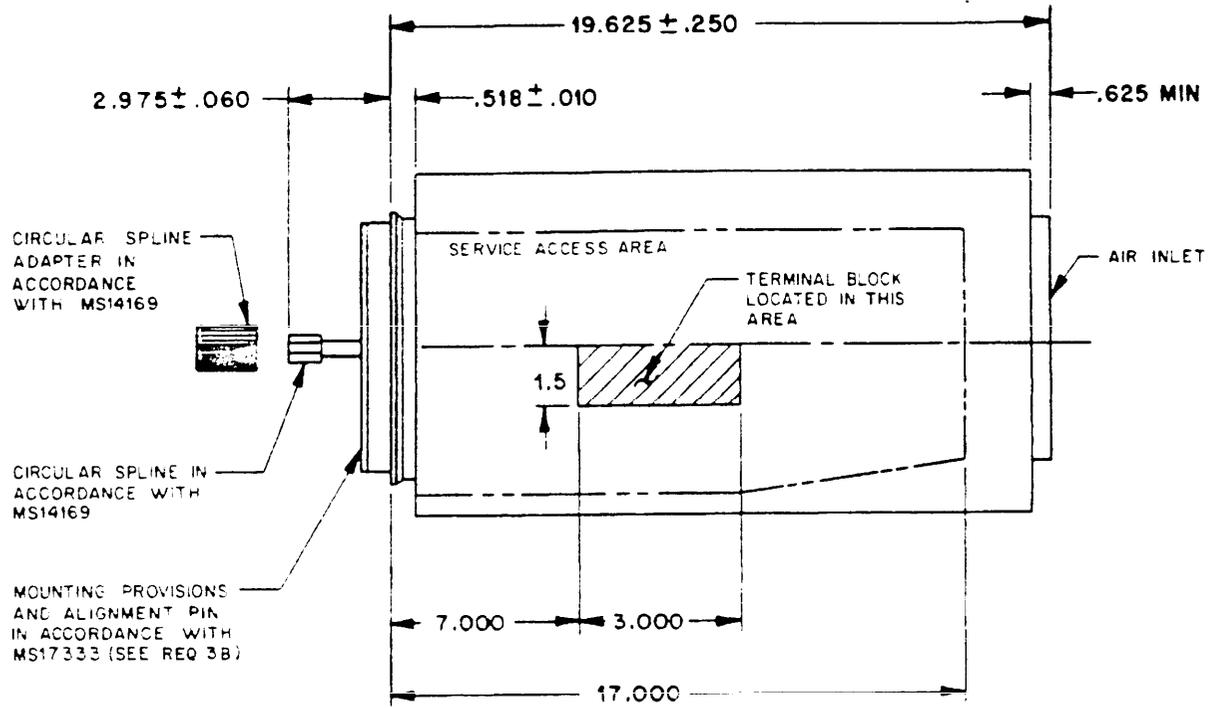


FIGURE 1. Generator package P/N M85583/1-1 (see Requirement 3).

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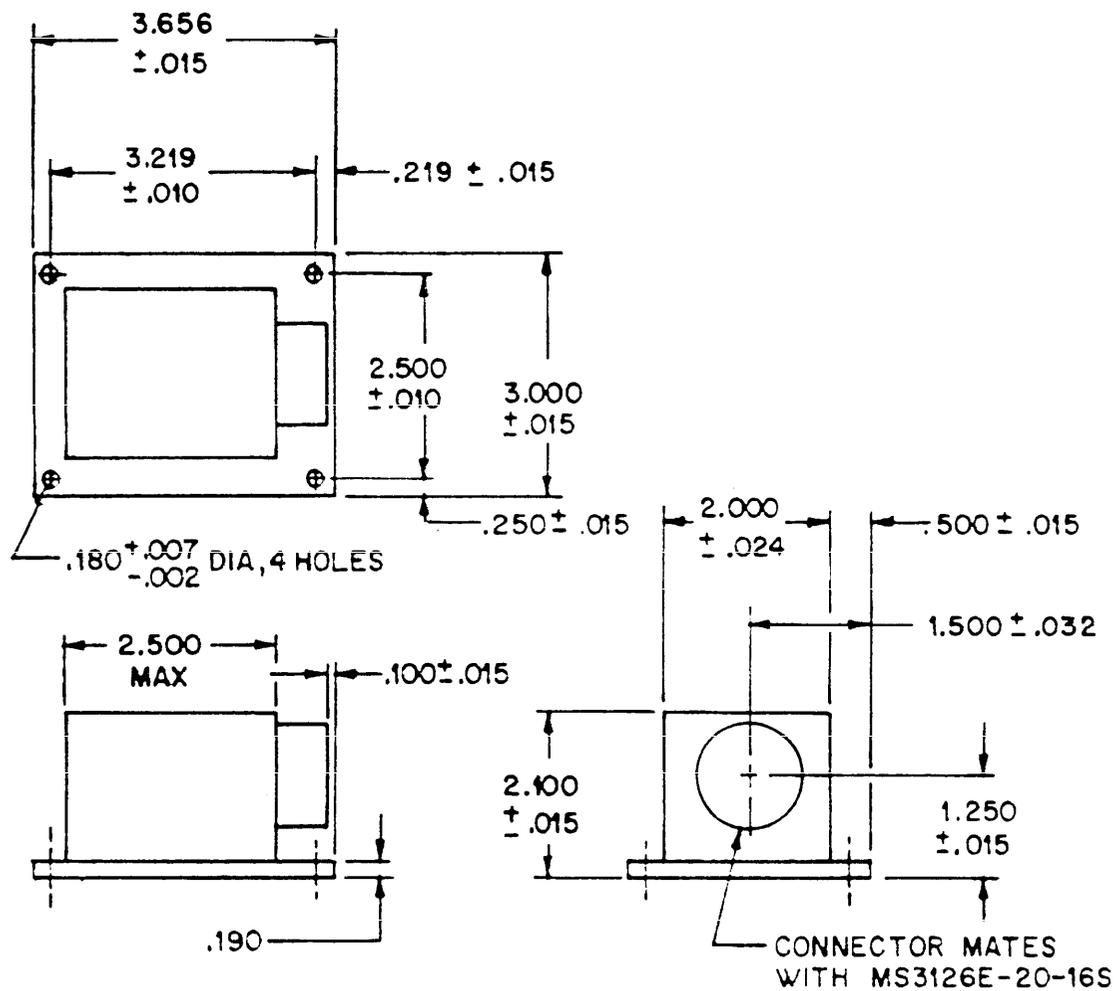


FIGURE 2. Channel adapter P/N M85583/1-4 (see Note 4).

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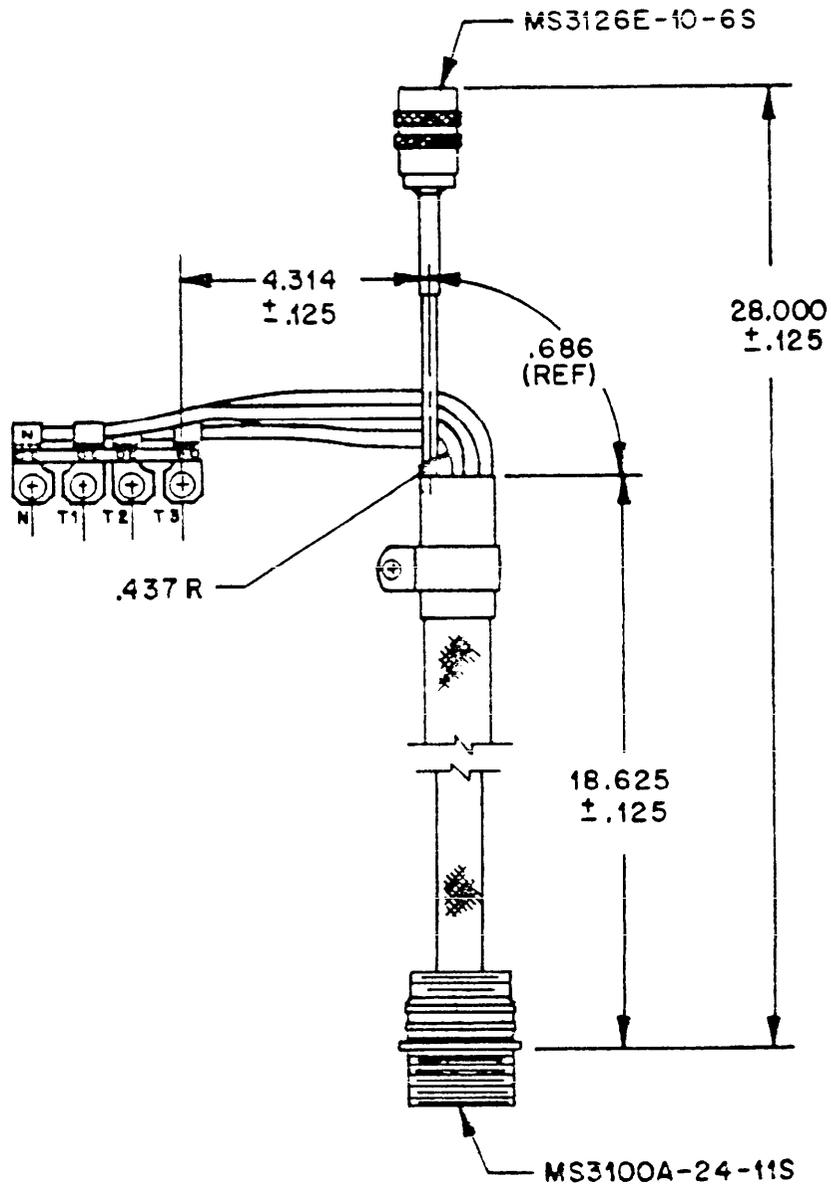


FIGURE 3. Channel wire harness P/N M85583/1-5 (Requirement 5).

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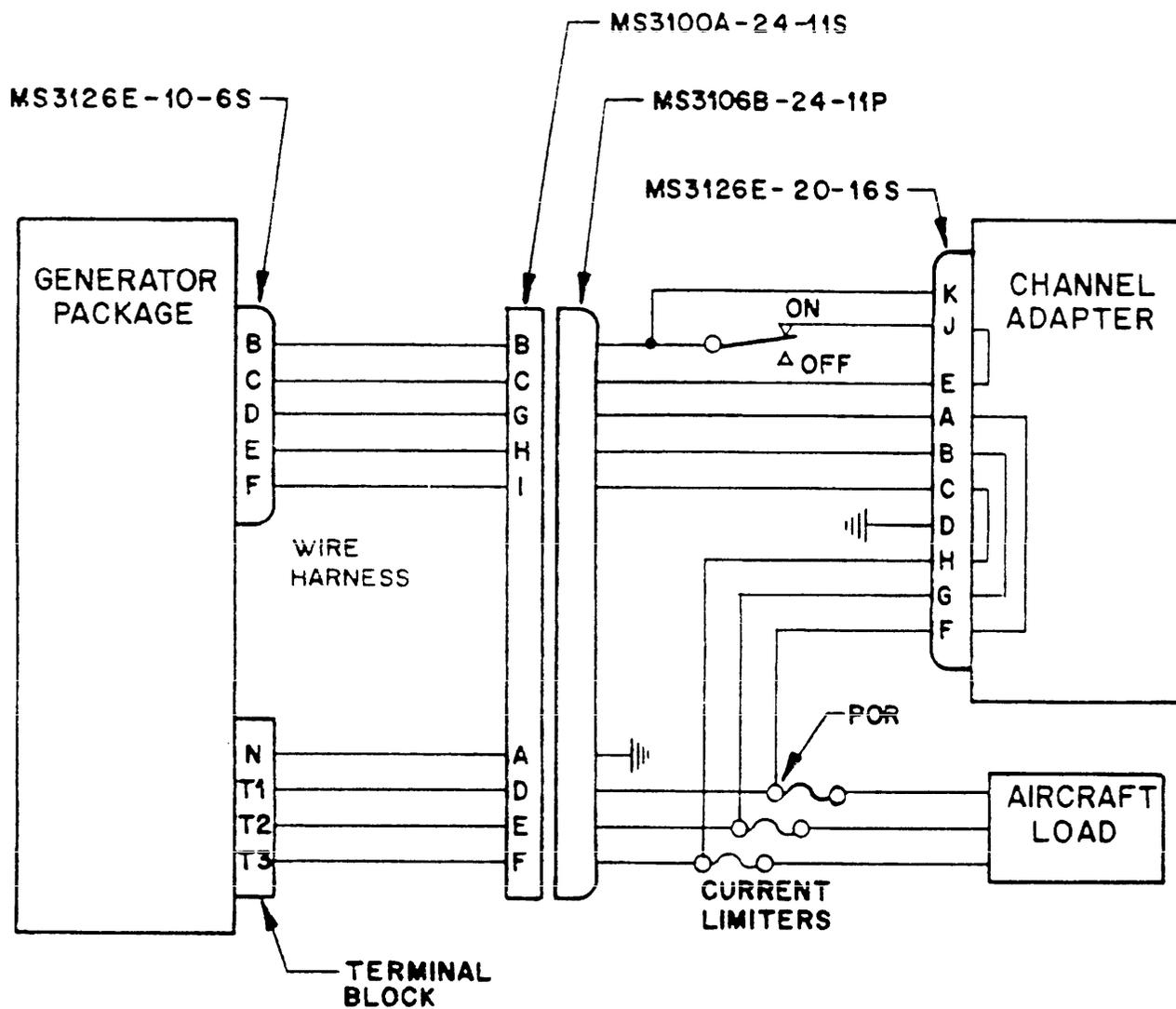
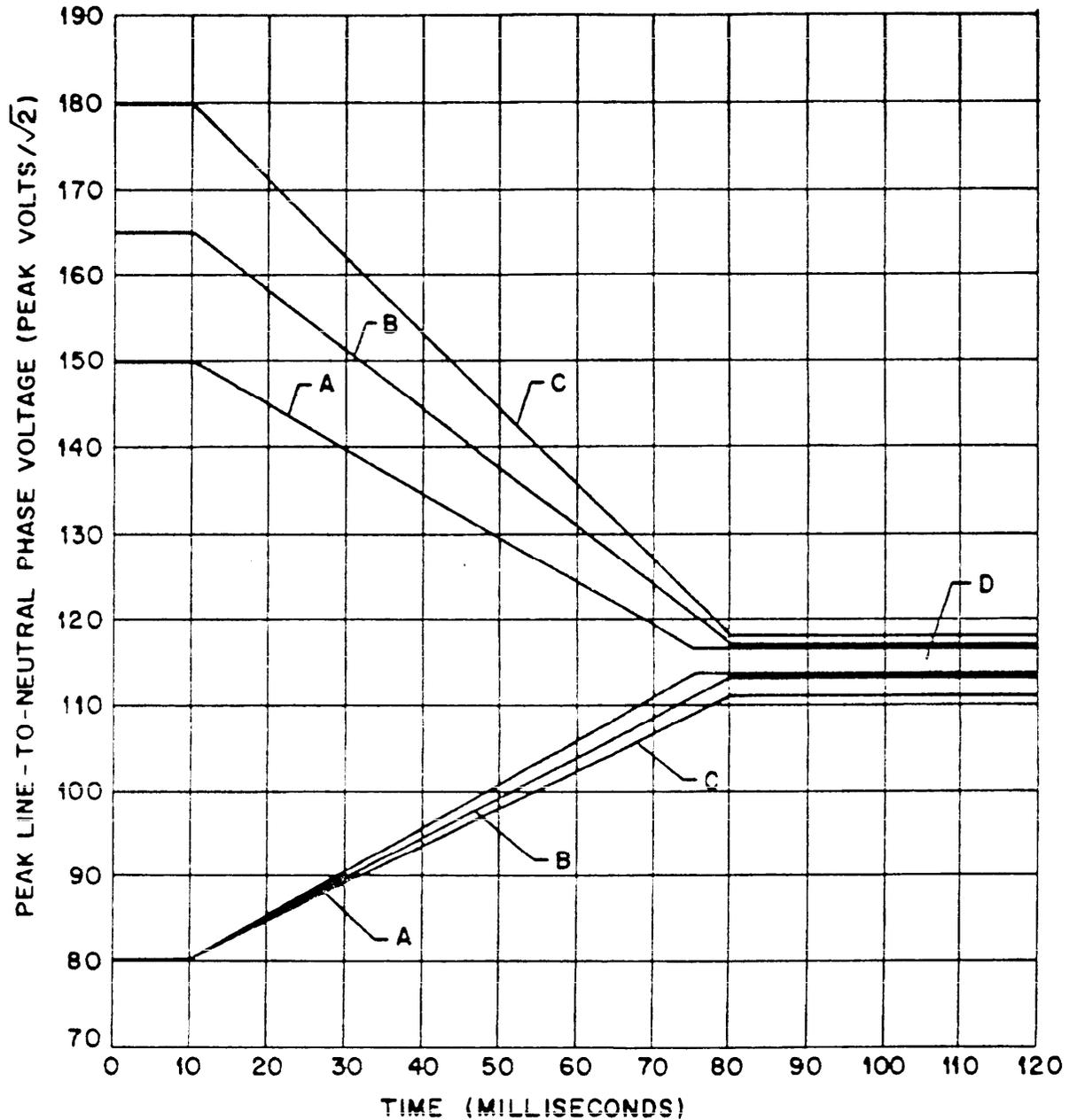


FIGURE 4. Channel wiring diagram (see Requirement 6).

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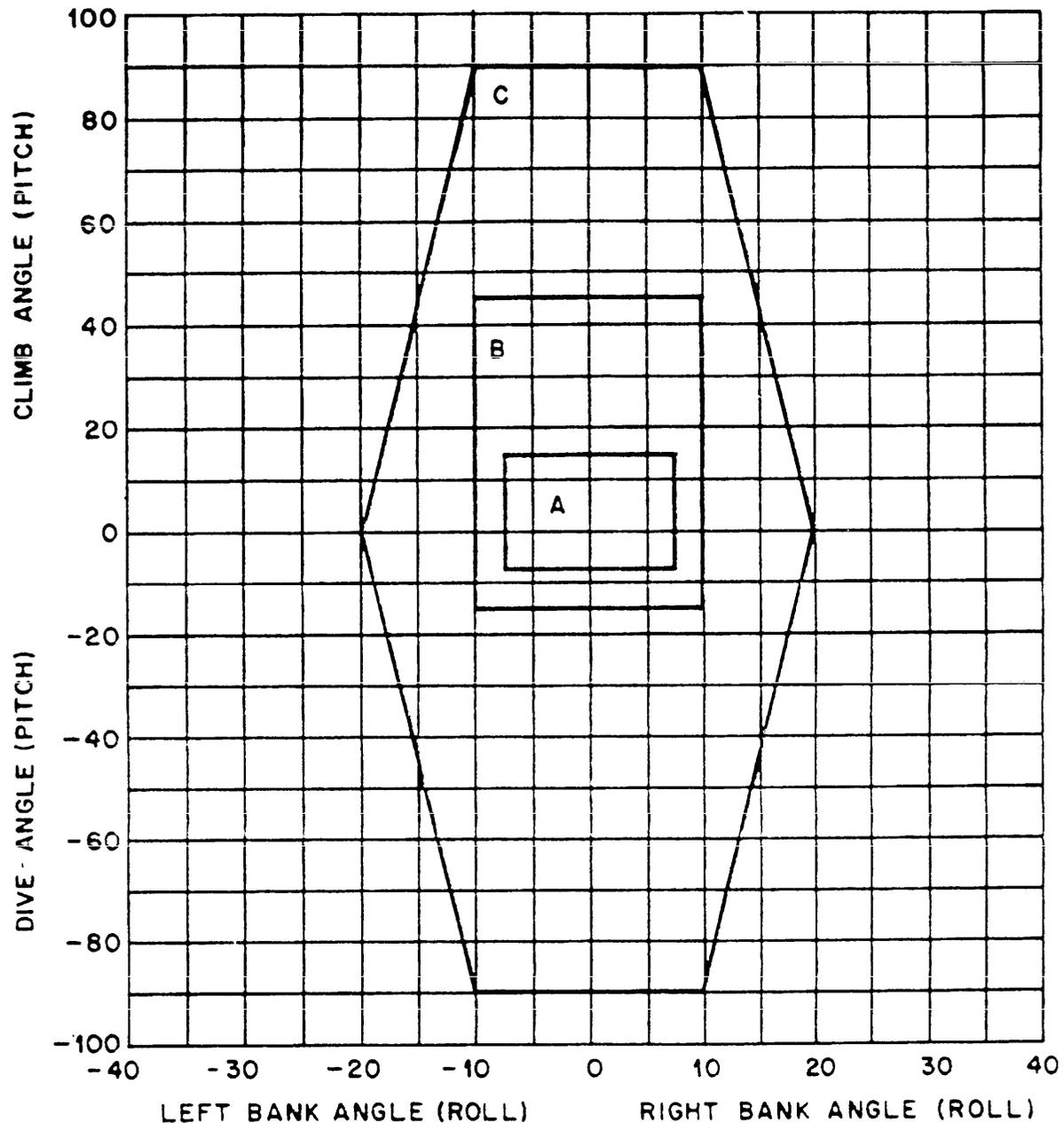


## NOTES:

1. (A) APPLICATION OR REMOVAL OF 0 TO 100% RATED FULL LOAD.
2. (B) APPLICATION OR REMOVAL OF ABOVE 100% TO 125% RATED FULL LOAD.
3. (C) APPLICATION OR REMOVAL OF ABOVE 125% TO 150% RATED FULL LOAD, AND MOTOR STARTING.
4. (D) STEADY STATE RMS VOLTAGE LIMITS:  
 0 TO 100% RATED LOAD - 113.5 TO 116.5 VRMS  
 ABOVE 100 TO 125% LOAD - 113.0 TO 117.0 VRMS  
 ABOVE 125 TO 150% LOAD - 111.0 TO 118.0 VRMS

FIGURE 5. AC voltage regulation, normal limits (3.5.2.1.1).

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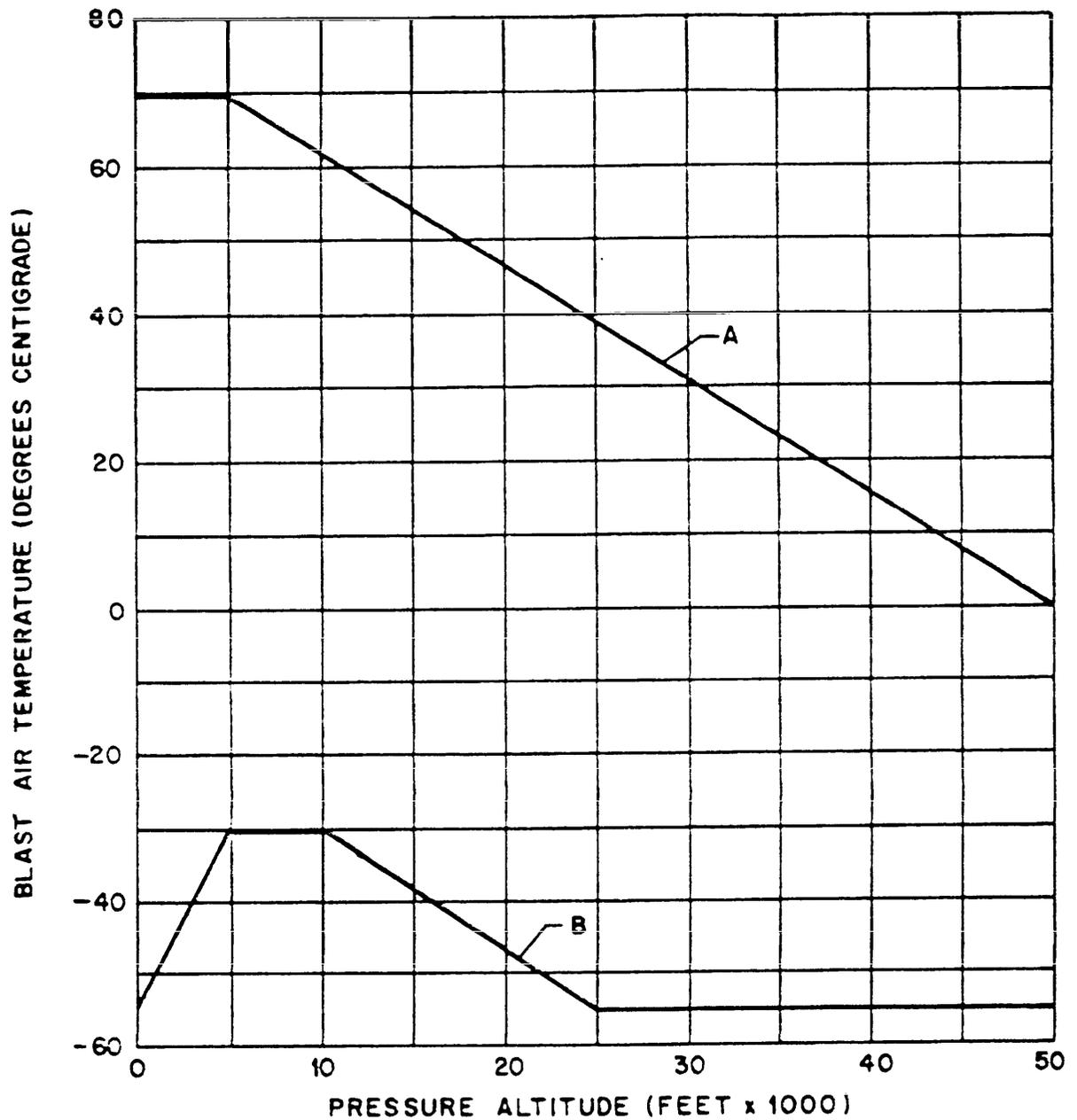


## NOTES:

1. (A) CONTINUOUS OPERATION.
2. (B) FIVE MINUTE OPERATION.
3. (C) ONE MINUTE OPERATION.
4. ALL ROLL AND PITCH ANGLES ARE WITH RESPECT TO THE ROTATIONAL AXIS OF THE GENERATOR AS SHOWN IN THE SPECIFICATION SHEET.
5. FIGURE ASSUMES ONLY GRAVITATIONAL FORCES ON THE UNIT UNDER TEST.
6. THE TOTAL REQUIREMENT INCLUDES 30 SECONDS IN ZERO GRAVITY, AT NEGATIVE 1G AND AT ALL OTHER ATTITUDES OUTSIDE OF THE ONE MINUTE OPERATION CURVE.

FIGURE 6. Generator package attitude (3.4.2.7).

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## NOTES:

1. (A) MAXIMUM TEMPERATURE FOR INLET BLAST AIR.
2. (B) MINIMUM TEMPERATURE FOR INLET BLAST AIR.
3. PRESSURE ALTITUDE IS MEASURED AT EQUIPMENT EXIT.
4. AIR TEMPERATURE IS MEASURED AT EQUIPMENT INLET.

FIGURE 7. Temperature-altitude requirements for blast air cooled equipment (3.4.2.3).

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