

MIL-E-23001/3D(AS)  
AMENDMENT 1

25 March 1977

MILITARY SPECIFICATION SHEET

ELECTRIC GENERATING SYSTEM, AIRCRAFT, VSCF  
20 KVA, 115/200 VOLT, 3-PHASE, 400 Hz

This amendment forms a part of Military Specification Sheet MIL-E-23001/3D(AS), dated 25 July 1975.

Military Specification Sheet MIL-E-23001/3D(AS) is amended as follows:

Page 1

4. Generator Mounting Plate and Quick - Attach-Detach Clamps.  
Delete and substitute: "A mounting plate (P/N M23001/3-10) conforming to page 9 of this amendment shall be used. A mounting clamp (P/N M23001/3-11) suitable for mounting the generator to the mounting plate when the mounting plate is installed on a drive pad conforming to AND20006, Type No. XVI-A, and contained within a circle having a diameter of eleven inches and concentric with the mounting plate, shall be used. The generator mounting clamp shall not be of sheet metal construction and not exceed 1.5 pounds in weight.

Page 9

1.2 Delete "P/N M14165/10-1, and M14165/10-2" and substitute "M23001/3-10, and M23001/3-11."

2.3 Electric Receptacles.

2. Add: "or equivalent."

2.8 Lubrication. Delete and Substitute: "When fluid is used for either lubrication or cooling, the total loss of fluid shall not exceed 1 cc per hour (with mating electrical connectors attached) under any of the operating or static conditions covered in this specification."

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3.2 Electric Receptacles. Add: "or MS3122 equivalent" after each MS3112 connector number specified.

Page 11

Top view, change " $2.840 + .065$ " to "3.1 max". Free end view delete note - "Air inlet concentric with mounting flange" and delete " $7.062 + .060$ " and "6.625 max."

Page 14

Specification - Delete paragraph and add: "This system shall conform to MIL-E-23001A(AS), 1 July 1968, modified as follows:" (Initial numbers refer to paragraph of the specification.)

3.2.2 Add: "Curve F of Figure 1 of this amendment shall be modified to be zero volts from 0 to 2 seconds, after which time it goes directly to 100 volts."

3.2.4 Add the following to this paragraph: "Between 3100 and 3600 RPM rated load current shall be based on a system rating of 15 KVA."

3.3.1.1 Voltage Regulation. Add the following to the first sentence of this paragraph: "except when the converter is operated at air inlet temperatures above  $25^{\circ}\text{C}$  at which time steady state line-to-neutral voltage may exceed the upper limit of figure 1 but shall not exceed 118 volts."

Page 15

3.4.1.1 Delete last sentence.

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3.4.1.2.1 Temperature and Altitude. Delete paragraph in its entirety and substitute: "Delete and substitute: Cooling fluid when used shall conform to MIL-L-23699.

(1) Generator Package - Cooling air shall be supplied to the generator within the temperature ranges of Figure 8 from 0 to 50,000 feet altitude. During the 100 hour Flight Service Evaluation Test (4.5.22) the generator shall receive air direct from existing blast air ducting on the aircraft with no modification to the aircraft ducting other than that shown herein. During laboratory tests required by this specification blast air shall be delivered to the generator having a differential pressure across the generator package of four (4) inches of water minimum.

(2) Converter - The air flow and temperature for cooling shall be as indicated in Figure 9 during laboratory tests. During the 100 hour Flight Service Evaluation Test (4.5.22) the converter shall receive air direct from blast air ducting on the aircraft (A-4M as modified by ECP-A4-PN51 for VSCF). A fan shall be included in the converter for cooling during ground operation (Altitude: Sea Level to 5000 feet. Air inlet temperature:  $-40^{\circ}\text{C}$  to  $70^{\circ}\text{C}$ ). An inlet duct to simulate the duct to the aircraft shall be used when demonstrating compliance with the cooling requirements of this specification. The compartment ambient temperature shall not exceed  $125^{\circ}\text{C}$  or be lower than  $-55^{\circ}\text{C}$ . The converter shall be capable of operating in accordance to this specification under the following conditions:

CONVERTER COOLING CONDITIONS

<u>Operating Conditions</u>	<u>Inlet Air Temp <math>^{\circ}\text{C}</math></u>	<u>Max. Compartment Ambient Air Temp <math>^{\circ}\text{C}</math></u>	<u>Duration</u>
Flight (Forced Cooling)	Per Fig 9	125	Continuous

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<u>Operating Conditions</u>	<u>Inlet Air Temp °C</u>	<u>Max. Compartment Ambient Air Temp °C</u>	<u>Duration</u>
Ground (Self Cooling)	-40 to 40	125	Continuous
	41 to 50	75	Continuous
	41 to 50	100	30 Min.
	41 to 50	125	20 Min.
Ground (Self Cooling)	51 to 60	75	30 Min.
	51 to 60	100	20 Min.
	51 to 60	125	15 Min.
	61 to 70	75	25 Min.
	61 to 70	100	15 Min.
Ground (Self Cooling)	61 to 70	125	10 Min.

NOTE: The converter is stabilized nonoperational at the above inlet air temperatures and at an equal compartment ambient temperatures. Energize the converter and increase the compartment ambient temperature to the maximum allowable. The temperature increase from the stable temperature to the maximum shall not exceed five (5) minutes. The test duration shall commence when the converter is energized.

Both configurations under this specification shall be capable of starting in ambient temperature down to -40°C and operating continuously down to -55°C. The starting and operational requirements of this paragraph shall apply to all test requirements of Section 4 of this specification."

Page 17

3.4.1.11 Threaded Parts. Delete.

3.4.1.16 Operating Position. Delete "vertical" in line 11 and substitute "23 degrees above horizontal (as shown on sheet 11 of MIL-E-23001/3D)."

Page 20

3.5.1.4 Castings. Delete.

4.2.6 Disassembly and Inspection. Delete.

4.2.7 Test Completion. Delete.

Add: 4.5.8.1 Acceptance Test. The VSCF systems shall be operated at room ambient temperature, 20 KVA .95 power factor load, 11,100 RPM and 40 + 4 lb./min. air mass flow to the generator heat exchanger. Following complete stabilization of generator temperatures the difference between the generator oil sump temperature and the air inlet temperature to heat exchanger shall be reported to the qualifying activity within five days of shipment of the generator.

Add: 4.5.9 Voltage Modulation, Frequency Modulation, and Waveform. Delete "low-pass" and substitute "band-pass" in second sentence. Delete Figure 5 and substitute Figure 5 of this amendment.

Add: 4.5.9.1 Delete the second sentence and substitute: "At each load the voltage and frequency modulation and waveform shall be measured at both 0.75 and 0.95 lagging power factor."

Page 21

4.5.16.1.1 Add to first sentence "except that in the longitudinal axis the input acceleration shall be 2g."

4.5.16.1.2 Control Components. Delete and substitute: "This paragraph is applicable except that the dwell time at each resonance shall be reduced to 15 minutes. Also, delete '10g' and substitute '5g' in third sentence."

4.5.23 Delete: "4 cycles" in two places and substitute "5 cycles." Also delete "55°C" and substitute "-55°C".

Page 23

Add: 4.5.25 - Fluid Foaming - change to read: "After the generator package has been run for three hours at rated load, test a sample of oil for foaming per ASTM D892, Sequence 1. The foaming tendency and foam stability shall not exceed the following limits:

<u>Temp.</u>	<u>Foam at the end of 5 min. aeration</u>	<u>Foam volume after a 1 min. period</u>
75°F	25 milliliters	Nil

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The collapse time shall be as defined by ASTM D892. For reference, this time is defined as "time in minutes when the bubble layer fails to completely cover the oil surface and a patch or "eye" of clear fluid is visible.

The three hour load operation may be repeated until the above foaming test is successfully completed."

Add 6.2.9 True Voltage Modulation. Delete "low-pass filter having a cut off frequency of 600 Hz" substitute "band pass filter having an insertion loss of less than one (1) db between 200 and 600 Hz."

Add: 6.2.11 True Frequency Modulation. Delete: "low-pass filter having a cut off frequency of 600 Hz" substitute "band pass filter having an insertion loss of less than one (1) db between 200 and 600 Hz."

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Table 1

Add: "4.5.8.1" and place an "X" in acceptance test column.

Page 25

Figure 1

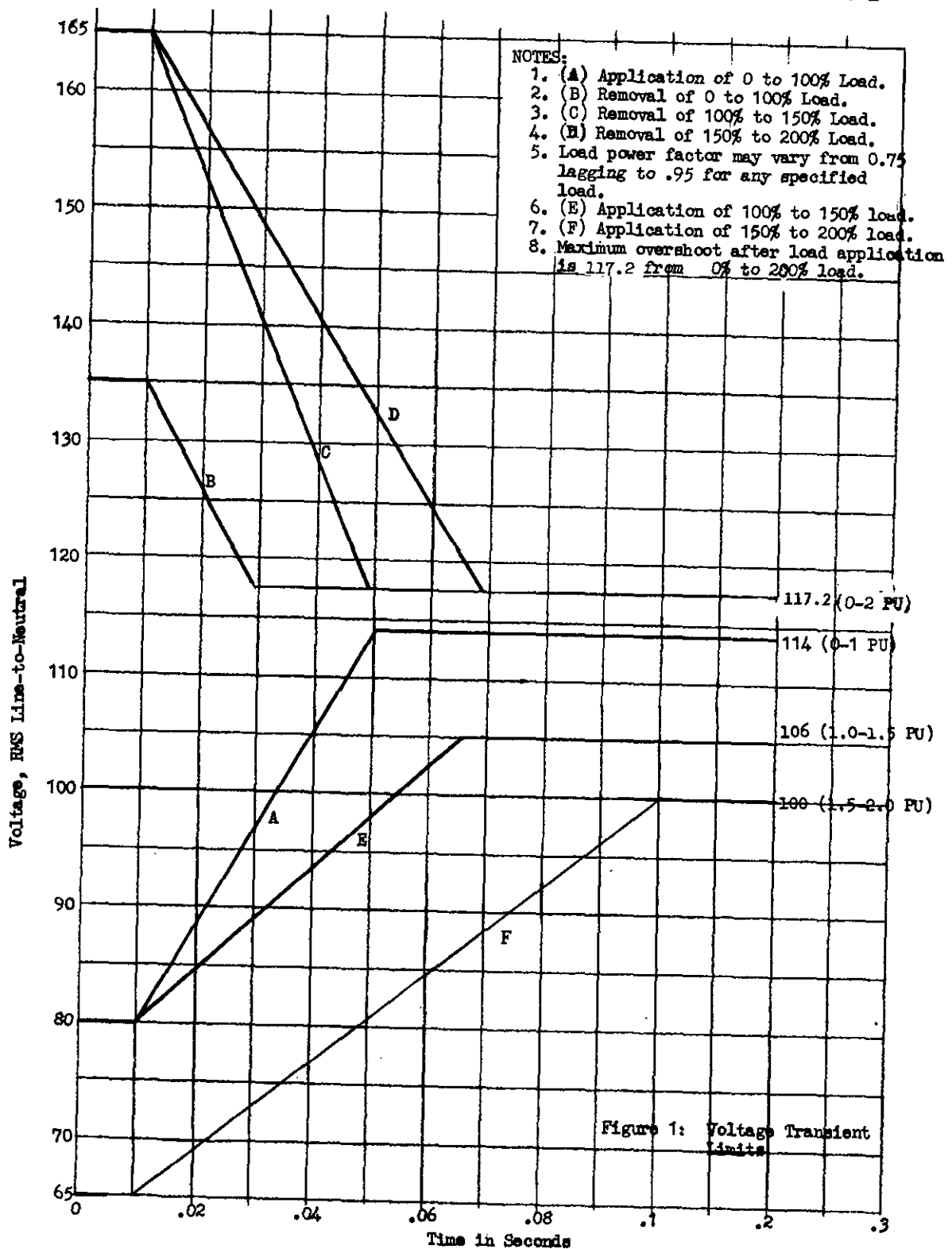
Delete and substitute Figure 1 of this amendment.

Preparing Activity:

Navy - AS

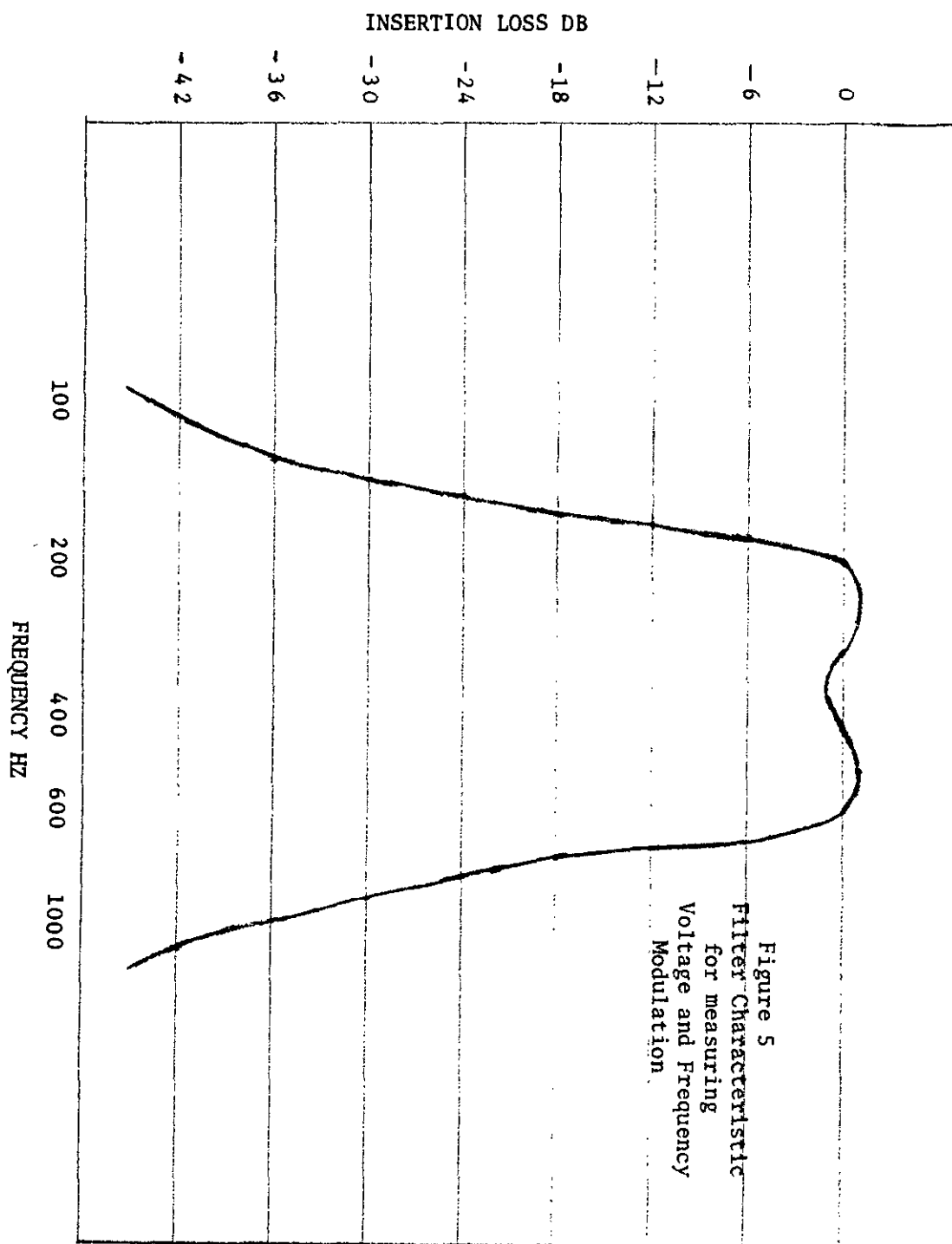
Project No: 6115-N410

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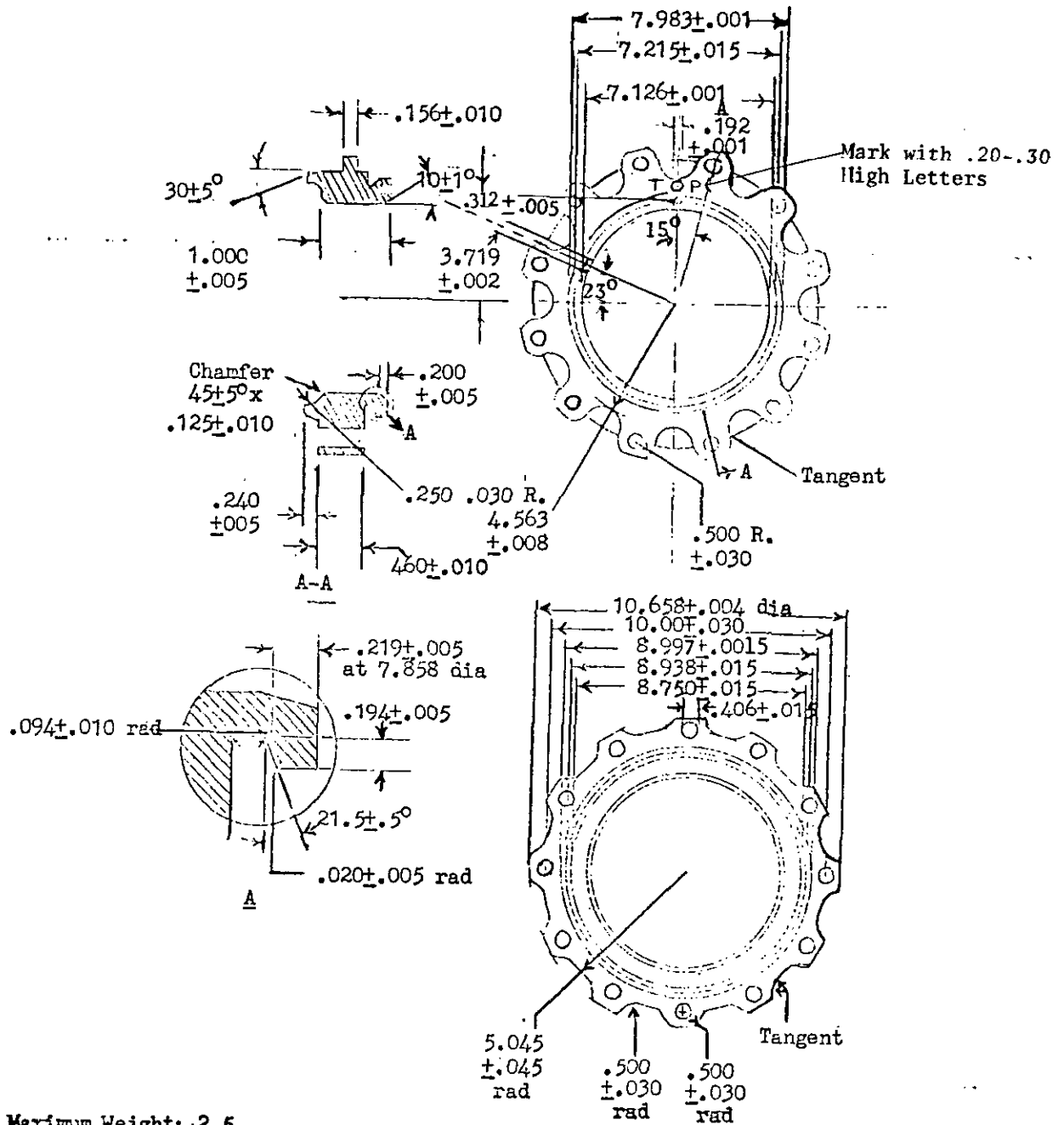


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Generator Mounting Plate

NOTE: Material  
1.) AMS 4135 - Aluminum  
or (forging)  
2.) MS 4209 - Aluminum  
(plate)  
Heat treated to a T-6  
condition.