Gulfstream Aerospace

REPORT

NO: GAC-CR-607 DATE: 12-02-86

QUALIFICATION TEST REPORT
FOR
GULFSTREAM IV
SECTOR, CONTROL HEAD AND PEDESTAL
ASSEMBLIES

DEPARTMENT: ENGINEERING

SECTION: CREW & EQUIPMENT

PREPARED BY: SARGENT INDUSTRIES

CHECKED BY: [redacted]

TECHNICAL APPROVAL: [redacted]

APPROVED BY: [redacted]

REVISIONS

REV LTR	REV BY	APPROVAL	DATE	REVISIONS AND/OR ADDITIONS

REVISION CHANGES

REV LTR	REVISED BY	APPROVED BY	DATE	REVISIONS AND/OR ADDITIONS
A	[redacted]		9/16/02	Added page ii, Revision Changes Added page iii, Table of Contents Added page 1, Purpose Vendor Documents Enclosures Vendor Qualification Test Report Reference Documents Added page 2, Appendix A for Part 135 Operation Added Document No. RYY112-281 Rev. N/C Qualification by Similarity Report for Flap Lever and Speed Brake Assemblies

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A| 1.0 **PURPOSE**

This document provides qualification test results for vendor supplied equipment to be FAA certified as part of Gulfstream GIV type design. This document contains the vendor supplied information pertaining to the sector, control head, and pedestal assemblies, which are used in the Flight Controls Trim Control System. Furthermore, the documentation within supports in the verification that the vendor equipment being installed on the GIV aircraft will comply with the following requirements:

FAR 25.603 (a) (b) & (c)	Materials
FAR 25.605 (a)	Fabrication Methods
FAR 25.607 (a) (b) & (c)	Fasteners
FAR 25.1301 (a) (b) (c) & (d)	Function and Installation
FAR 25.1309 (a)	Equipment, Systems and Installations

A| 2.0 **VENDOR DOCUMENTS**

The following documents are vendor supplied documents which pertain to the Sector, Control Head, and Pedestal Assemblies.

A| 2.1 **ENCLOSURES**

A| 2.1.1 **VENDOR ACCEPTANCE TEST PROCEDURE**

The following enclosure consists of the vendor supplied acceptance test procedure as listed below:

Vendor Name:	Sargent Industries
Vendor Cage Code:	78062
Drawing Number:	07-43083-04, Rev. N/C
Drawing Title:	Gulfstream IV Qualification Tests Report

A| 3.0 **REFERENCE DOCUMENTS**

The following documents also relate to the Pedestal Assembly.

Document Number:	GAC-CR-161
Document Title:	Qualification Test Plan for Gulfstream GIV Sector, Control Head and Pedestal Assemblies
Document Number:	GAC-CR-162
Document Title:	Acceptance Test Procedures Pedestal Assembly, P/N 43083-002/-003/ -004/-005/-006 Control Head Assy, P/N 43087-004/-005 Gulfstream P/N 1159SCF450

Document Number:	GAC-CR-6344
Document Title:	GIV Pedestal GAC Source Control Drawing 1159SCF450 Vendor Name: Kaiser Electroptrcision Vendor Dwgs: 43083 Pedestal Assy, 43087 Control Head Assy Vendor Reports: RYY112-088 Stress Analysis, RYY312-002 Qualification By Similarity

A| 4.0 **APPENDIX A** part 135 phase II DFDR 88 parameter.
Note: Appendix A is applicable only to part 135 operation.

Vendor Name:	Kaiser Electroprecision
Vendor Cage Code:	86831
DOCUMENT Number:	RYY112-281, Rev. N/C
DOCUMENT Title:	Qualification by Similarity Report for Flap Lever And Speed Brake Assemblies Model (Kit) Numbers Flap Lever Assembly 4260-0022-1 (0184-0028-1) Speed Brake Assembly 4260-0023-1 (0184-0029-1)

07-43083-04	ENGINEERING DOCUMENT	SARGENT INDUSTRIES — HUNTINGTON PARK DIVISION, HUNTINGTON PARK, CA. 90255	NO. 07-43083-04
		CODE IDENT NO. 78062	PAGE 1 OF 1 — REV.

TITLE

Gulfstream GIV Qualification Test Report

References:

1. 51463 — Wyle Laboratories Test Report "Report of Qualification Tests on Gulfstream G-IV Sector Control Head & Pedestal Assy. Part Number 43083-001, Serial Number 736-008 for Sargent Industries, Huntington Park

2. 07-43083-05 — Sargent document "GIV Post-Qualification Inspection and Evaluation Report"

The purpose of this report is to verify qualification of the 43083-001 GIV control quadrant (Gulfstream P/N 1159SCF450). The report is divided into two (2) sections; the qualification testing and the post-qualification inspection and evaluation.

The qualification testing and results are included in Reference 1. These tests were performed at Wyle Laboratories, El Segundo, California. The tests were performed in conformance with Gulfstream control specifications 1159SCF451 and 1159SCF450. The results of these tests show conformance to control specification requirements.

Post-qualification disassembly evaluation is presented in Reference 2. After test the quadrant was disassembled and parts were inspected to ensure that there was no damage sustained during qualification testing. The results showed no signs of damage, excessive wear or permanent deformation which would affect performance or safety of the control quadrant.

From the results of the qualification and post-qualification tests, it is determined that the 43083-001 GIV control quadrant fully conforms to the requirements of Gulfstream control specification documents 1159SCF450, rev F and 1159SCF451, rev D.

PAGE NUMBER																								
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PREP.	[redacted]	11-26-84
CHECK		11-26-84
ENGR.		
APPD.		11-26-84
APPROVALS		DATE

SYM	REVISION DESCRIPTION	DATE	APPROVED

07-43083-04

FORM NO. 4.133A (3/77)

TEST REPORT

WYLE
ORATORIES SCIENTIFIC SERVICES & SYSTEMS GROUP
ERN OPERATIONS, EL SEGUNDO FACILITY

REPORT NO. 51463
OUR JOB NO. M51463
CONTRACT N.A.
YOUR P. O. NO. 567327-E

SARGENT INDUSTRIES
HUNTINGTON PARK DIVISION
2533 EAST 56TH STREET
HUNTINGTON PARK, CA 90255

54 PAGE REPORT

DATE 26 AUGUST 1986

REPORT
OF
QUALIFICATION TESTS
ON
GULFSTREAM G-IV SECTOR CONTROL HEAD & PEDESTAL ASSY.
PART NUMBER 43083-001, SERIAL NUMBER 736-008
FOR
SARGENT INDUSTRIES, HUNTINGTON PARK

STATE OF CALIFORNIA }
COUNTY OF LOS ANGELES } ss.

[redacted] being duly sworn, deposes and says: That the information contained in this report is the result of complete and carefully conducted tests and is to the best of his knowledge true and correct in all respects.

[redacted]

SUBSCRIBED and sworn to before me this 26 day of AUGUST, 86

[redacted]

OFFICIAL SEAL
WILLIAM H. VANDERBERG JR.
NOTARY PUBLIC - CALIFORNIA
LOS ANGELES COUNTY
My Commission Expires Jul 27, 1990

DEPARTMENT MECHANICAL SYSTEMS

TEST ENGINEER [redacted]

TEST WITNESS

NOT APPLICABLE
DCAS-QAR VERIFICATION

QUALITY CONTROL [redacted]

W-RAR

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1.0 PURPOSE

The purpose of this report is to present the procedures employed, and the results obtained, during Qualification Tests on Gulfstream GIV Sector, Control Head and Pedestal Assembly, Part Number 43083-001, Serial Number 736-008.

2.0 REFERENCES

2.1 Sargent Industries Purchase Order 567327-E.

2.2 Sargent Industries, Huntington Park Division, Engineering Document 07-43083-01, no revision.

2.3 MIL-STD-45662, 10 June 1980, Calibration Data and Instrumentation Verification.

2.4 MIL-STD-810D, 19 July 1983, Environmental Test Methods.

2.5 Wyle Laboratories Western Test and Engineering Operation Quality Assurance Manual, SPP 380, Revision "F", 1 March 1986.

3.0 SUMMARY

3.1 The specimen completed the Qualification Vibration, Endurance, Shock and Ultimate Load Tests with no apparent damage and no performance anomalies were indicated by SIHP personnel.

3.2 Detailed procedures and results are presented in Paragraphs 5.2 through 5.5.

4.0 TEST CONDITIONS AND EQUIPMENT

4.1 Ambient Conditions

Unless otherwise specified herein, all tests were performed at laboratory atmospheric pressure, a temperature of 77 ± 18F and a relative humidity of 90% or less.

4.2 Test Tolerances

The maximum allowable tolerances of test conditions (exclusive of instrument accuracy) were in accordance with MIL-STD-810D.

4.0 TEST CONDITIONS AND EQUIPMENT (CONTINUED)

4.3 Instrumentation and Equipment

4.3.1 Measuring and test equipment, utilized in the performance of this contract, were calibrated in accordance with MIL-STD-45662 by the Wyle Laboratories Standards Laboratory, or a commercial facility, utilizing reference standards (or interim standards) whose calibrations have been certified as being traceable to the National Bureau of Standards. All reference standards, utilized in the above calibration system, are supported by certificates, reports or data sheets attesting to the date, accuracy and conditions under which the results furnished were obtained. All subordinate standards, and measuring and test equipment, are supported by like data when such information is essential to achieve the accuracy control required by the subject contract.

4.3.2 Wyle Laboratories attests that the commercial sources providing calibration services on the above referenced equipment, other than the National Bureau of Standards, are in fact capable of performing the required services to the satisfaction of the Wyle Laboratories Quality Control Department. Certificates and reports of all calibrations performed are retained in the Wyle Laboratories Quality Control files and are available for inspection, upon request, by customer representatives.

4.3.3 The test equipment utilized to conduct the Qualification Vibration Test is listed in Table I.

TEST QUALIFICATION

CUSTOMER Sargent Industries Huntington Park SPECIMEN Gulfstream G-IV SCHP Assembly JOB NO. 51463

PART NO. 43083-001 S/N 008

TEST BY Mechanical Systems Department WITNESS DATE Noted Below

WYLE LABORATORIES SCIENTIFIC SERVICES & SYSTEMS GROUP

TABLE I TEST EQUIPMENT LIST

Report No. 51463

EQUIPMENT	MANUFACTURER	MODEL NO.	RANGE	WYLE NO.	CALIBRATION LAST	CALIBRATION DUE	ACCY.
		VIBRATION AND SHOCK TESTS (7-29-86 to 8-12-86)					
Electrodynamic Vibration Exciter	Ling	A-249	32K Force Pounds	6703	n.a.	n.a.	n.a.
Electrodynamic Vibration Exciter	Ling	A-340	30K Force Pounds	10663	n.a.	n.a.	n.a.
Power Amplifier	Ling	PP175/240	175 KVA	6871	n.a.	n.a.	n.a.
Power Amplifier	Ling	8096-36	72 KVA	10668	n.a.	n.a.	n.a.
Automatic Vib./Shock Digital Control Sys.	Hewlett-Packard	5427A	0.1 Hz to 5K Hz	8610	System Calibration Prior To Use		n.a.
Random/Shock Digital Control Sys.	Spectral Dynamics	SD1009A	4 Hz to 2K Hz	19972	System Calibration Prior To Use		n.a.
AC VTVMS	Bruel & Kjaer	2416	1 mv to 1000 volts	9114 1047	7-2-86 4-3-86	11-2-86 8-24-86	±5%
X-Y Recorder	Hewlett-Packard	7225	Digital	9085	System Calibration Prior To Use		n.a.
Charge Amplifiers	Endevco	2735	2 Hz to 20K Hz 3000 G Peak	8123 8124	2-8-86	8-31-86	±2%
Control Accelerometers	Endevco	7702-50	1 Hz to 7K Hz 1000 G Peak	9174 8744	6-25-86 3-11-85	10-23-86 9-18-86	±5%
X-Y Recorder	Hewlett-Packard	7015B	10 mv to 1 Volt/inch	7177	System Calibration Prior To Use		n.a.
Response Accelerometer	Endevco	2226C	3 Hz to 5K Hz 1000 G Peak	9478	3-14-86	10-8-86	±5%
		ENDURANCE TEST (7-31-86 to 8-7-86)					
Counter	Fluke	1941A	5 to 40M Hz	7379	4-14-86	10-19-86	±1 Count
		ULTIMATE LOAD TEST (8-12-86)					
Load Cells	RLH	U-1,C3P2D	0 to 300 Pounds	None	8-7-86	2-7-87	±0.68%
Indicator	Daytronic	2370	0 to 300 Pounds	None	8-7-86	2-7-87	±0.05%

W 614 C Q.C. Approval

SHEET OF

5.0 PROCEDURES, REQUIREMENTS AND RESULTS

5.1 Receiving Inspection

5.1.1 The specimen, as received, was visually examined for evidence of damage, or other defects, and completeness of identification.

5.1.2 There was no visible evidence of damage to the specimen. The results obtained are presented in Data Sheet 1.

DATA SHEET 1

Customer SARGENT IND. Job No. 51463

Date 7-28-86

Specimen S.S. H.P.

RECEIVING INSPECTION

No. of Specimens Received: (1) ONE

Record identification information exactly as it appears on the tag or specimen:

Manufacturer SARGENT INDUSTRIES

Part Numbers 43083-001

How does identification information appear: (name plate, tag, painted, imprinted, etc.)

NAME PLATE

Serial Numbers:* 001

Examination: Visual, for evidence of damage, poor workmanship, or other defects, and completeness of identification.

Inspection Results: There was no visible evidence of damage to the specimens unless noted below.

* If additional space is required for serial numbers, use an additional page, or reference first functional test data sheet (if applicable).

Inspected By [redacted]

Sheet No. 1 of 1

Approved [redacted] Date: 7-28-86

5.0 PROCEDURES, REQUIREMENTS AND RESULTS (CONTINUED)

5.2 Vibration Test

5.2.1 General

5.2.1.1 The specimen was installed in a test fixture and mounted on a vibration exciter as shown in Photographs 1, 2 and 3 for the lateral (X), longitudinal (Y) and vertical (Z) axes, respectively.

5.2.1.2 Vibration input was controlled by accelerometer C1 which was located on the fixture base plate, adjacent to the specimen, as shown in Photographs 1, 2 and 3. These photographs also show the location of response accelerometer (R1) which was used to determine specimen response during the Critical Frequency Surveys.

5.2.1.3 All vibration (Initial Critical Frequency Survey, Random Vibration and Final Critical Frequency Survey) was completed in one axis before changing to the next axis configuration.

5.2.1.4 The quadrant controls were positioned to the following normal operating positions by cognizant SIHP personnel prior to each vibration test:

5.2.1.4.1 The power levels were placed midway between minimum and maximum power.

5.2.1.4.2 The flap lever was raised to a setting of 10°

5.2.1.4.3 The trim wheel was placed at an indicator reading of 0°.

5.2.1.4.4 The gustlock lever was placed at the OFF position.

5.2.1.4.5 The fuel cock was put in the OPEN condition.

5.2.1.4.6 The quadrant's power lever friction control was set to obtain a 10 pound minimum tangential load on the power lever.

5.2.1.5 During vibration, the throttle lever friction of the engine power control assembly was verified and recorded by SIHP personnel.

5.2.2 Critical Frequency Surveys

5.2.2.1 The specimen was subjected to a logarithmic sweep, at one octave per minute, using the following levels, prior to and after each axis of Random Vibration:

5 to 54 Hz at 0.02" D.A.
54 to 2000 Hz at 0.26 g peak

5.2.2.2 The specimen completed the Critical Frequency Surveys with no apparent damage and no performance anomalies were indicated by SIHP personnel. The results obtained are presented in Data Sheet 2 which includes X-Y plots of the control and response accelerometers prior to and after Random Vibration. The critical frequencies, as determined from the X-Y plots of the control and response accelerometers, are also presented in Data Sheet 2.

5.0 PROCEDURES, REQUIREMENTS AND RESULTS (CONTINUED)

5.2 Vibration Test (Continued)

5.2.3 Random Vibration

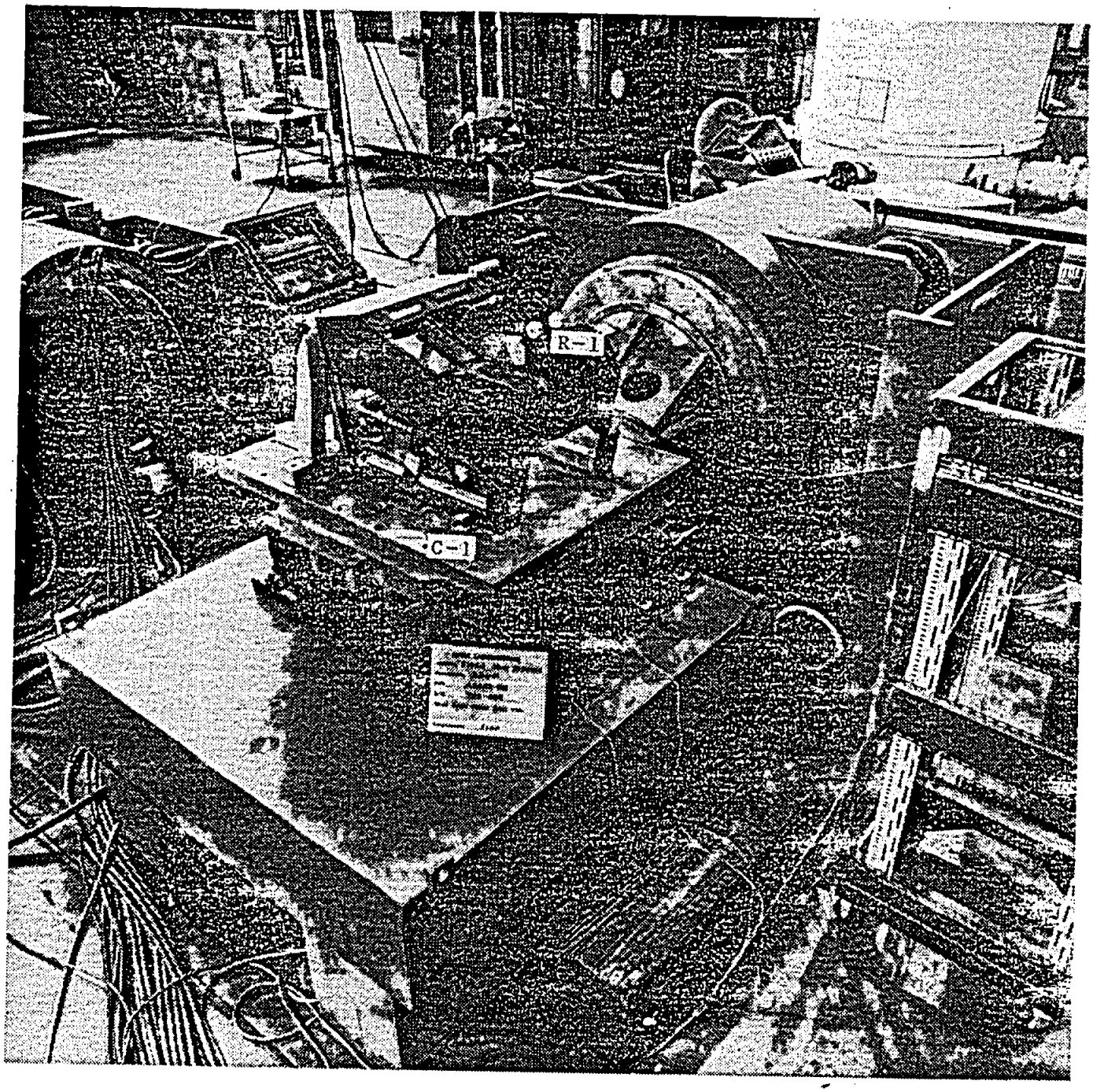
5.2.3.1 The specimen was subjected to the following random vibration spectrum which was applied for a period of one hour along each of the three mutually perpendicular axes:

10 to 20 Hz at 0.002 g^2/Hz
20 to 42 Hz at -12 dB/octave
42 to 250 Hz at 0.0001 g^2/Hz
250 to 2000 Hz at -3 dB/octave
2000 Hz at 0.0000126 g^2/Hz

Overall Level = 0.32 g_{rms}

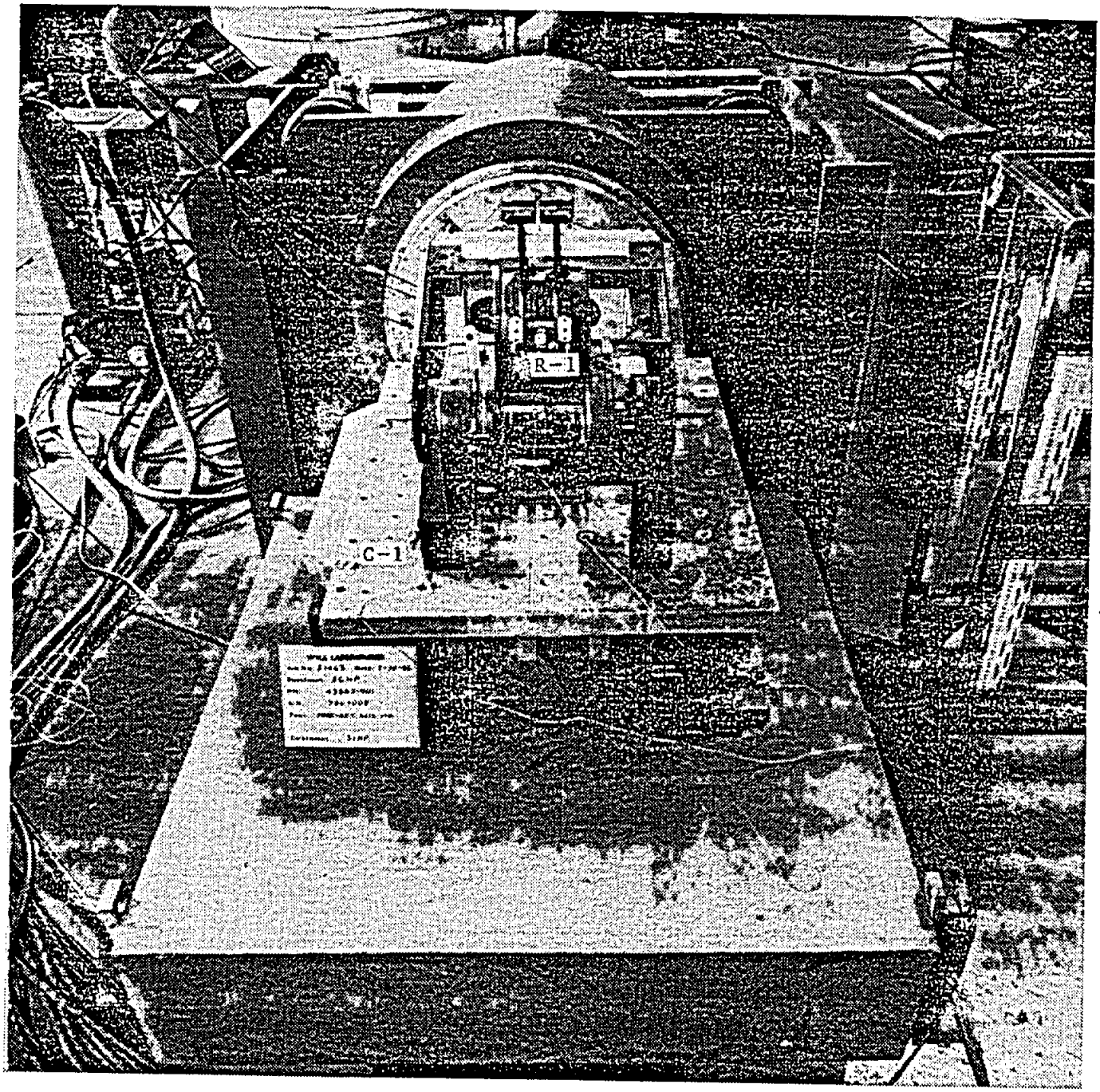
Spectrum equalization was accomplished using an Automatic Vibration Digital Control System, set to a 9.77 Hz bandwidth, which produced 144 degrees of freedom. This system automatically equalized the spectrum at -12, -9, -6 and -3 dB before going to full level.

5.2.3.2 The specimen completed Random Vibration, in each axis, with no apparent damage and no performance anomalies were indicated by SIHP personnel. The results obtained are presented in Data Sheet 3 which includes PSD plots of the control accelerometer, with the allowable spectrum limits superimposed, from the start, middle and end of each axis.



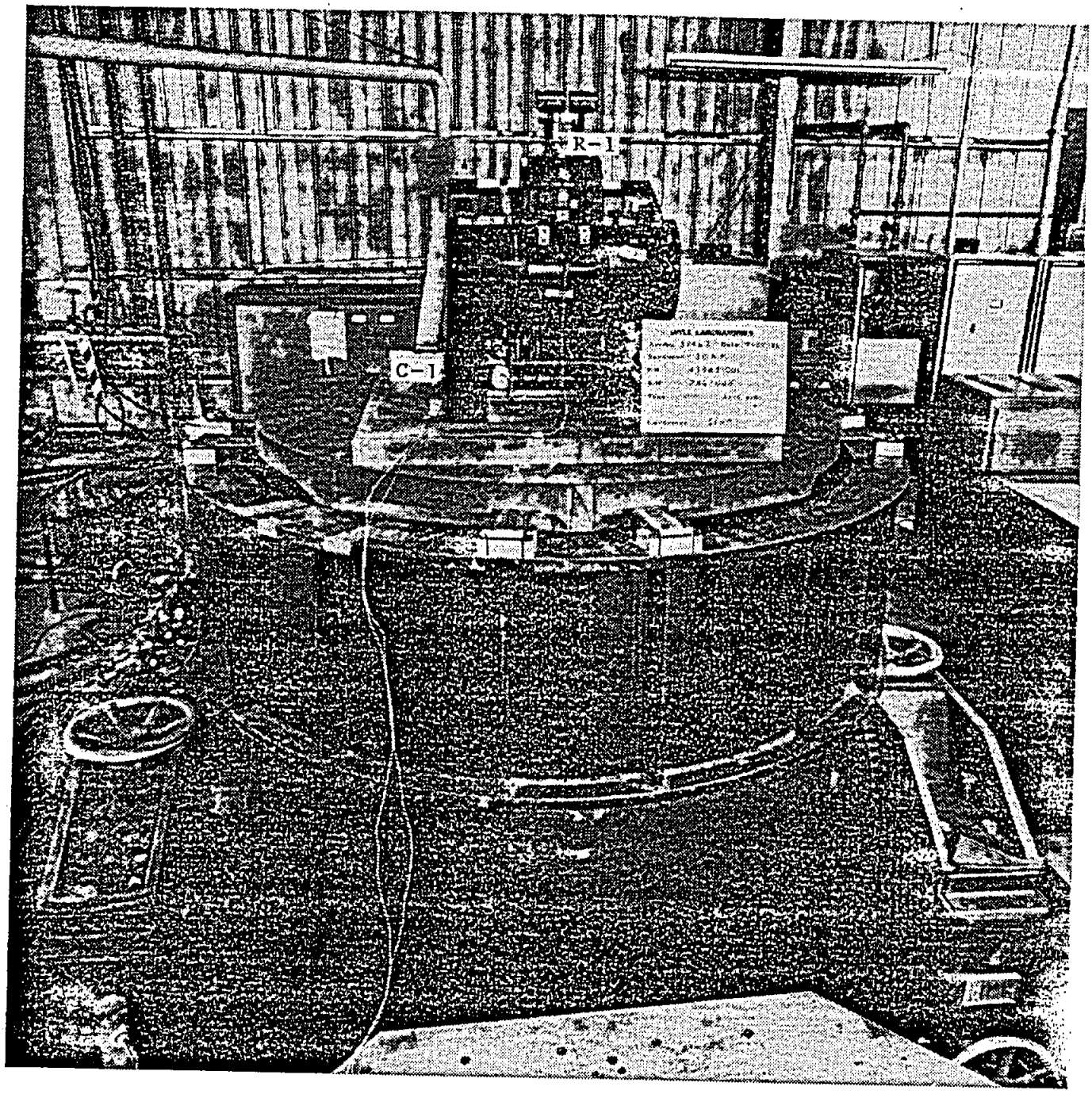
PHOTOGRAPH 1

LATERAL "X" AXIS VIBRATION SETUP



PHOTOGRAPH 2

LONGITUDINAL "Y" AXIS VIBRATION SETUP



PHOTOGRAPH 3

VERTICAL "Z" AXIS VIBRATION SETUP

WYLE LABORATORIES SCIENTIFIC & SYSTEMS GROUP

DYNAMICS SECTION
VIBRATION TEST DATA SHEET

Job No. 514.5

Sheet 1 of 1

Customer SARGENT INDUSTRIES Specimen S.C.H.P. P/N 43083-001 S/N 786-008

Date	Time	Axis	Temp (°F)	SINUSOIDAL Freq. (HZ)	SINUSOIDAL Disp. ("DA)	SINUSOIDAL Accel. (± G)	Test Time (Min.)	Comments	Plot No.
29-86	19:37	Z	AMB.	5-54	.02			COMPLETED RANDOM PRE-TEST CRITICAL	1&2
				54-2K		.26	8.6	FREQUENCY SURVEY WITH NO APPARENT DAMAGE.	
								RESONANCES IDENTIFIED AS FOLLOWS: 6.7:1 @ 79 Hz,	
								2.6:1 @ 145 Hz., 9:1 @ 360 Hz., 3.5:1 @ 520 Hz.,	
								9.4:1 @ 780 Hz., 23:1 @ 1000 Hz., 10:1 @ 1450 Hz.	
29-86	21:05	Z	AMB	5-54	.02			COMPLETED RANDOM POST TEST CRITICAL	3&4
				54-2K		.26	8.6	FREQUENCY SURVEY WITH NO APPARENT DAMAGE.	
								NO SIGNIFICANT CHANGE INDICATED.	
30-86	15:25	Y	AMB	5-54	.02				
				54-2K		.26	8.6	COMPLETED RANDOM PRE-TEST CRITICAL	5&6
								FREQUENCY SURVEY WITH NO APPARENT DAMAGE.	
								RESONANCES INDICATED AS FOLLOWS: 10.6:1 @ 76 Hz.,	
								2:1 @ 145 Hz., 6:1 @ 320 Hz., 3:1 @ 380 Hz.,	
								4:1 @ 520 Hz, 88:1 @ 69 Hz, 7.5:1 @ 795 Hz.,	
								3.7:1 @ 890 Hz, 4.7:1 @ 1000 Hz, 7.7:1 @ 1100 Hz.,	
								4.8:1 @ 1200 Hz, 5.8:1 @ 1555 Hz., 5.8:1 @	
								1890 Hz.	
30-86	19:25	Y	AMB	5-54	.02			COMPLETED RANDOM POST TEST CRITICAL	7&8
				54-2K		.26	8.6	FREQUENCY SURVEY WITH NO APPARENT DAMAGE.	
								CHANGES IN RESONANCES WERE INDICATED AS FOLLOWS:	
								5.8:1 @ 1555 Hz CHANGED TO 18.8:1 @ 1555 Hz.	

DATA SHEET 2 - CRITICAL FREQUENCY SURVEY TEST

Report No. 51463

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W589 ES

Signed: [redacted]

WYLE SCIENTIFIC SERVICES & SYSTEMS GROUP
LABORATORIES

DYNAMICS SECTION
VIBRATION TEST DATA SHEET

Job No. 5146
Sheet 1 of 1

Customer SARGENT INDUSTRIES Specimen S.C.H.P. P/N 43083-001 S/N 786-008

Date	Time	Axis	Temp (°F)	SINUSOIDAL Freq. (HZ)	SINUSOIDAL Disp. ("DA)	SINUSOIDAL Accel. (± G)	Test Time (Min.)	Comments	Plot No.
3-30-86	20:06	X	AMB	5-59	.02			COMPLETED RANDOM PRETEST CRITICAL FREQUENCY	9&10
				59-2K		.26	8.6	SURVEY WITH NO APPARENT DAMAGE. RESONANCES IDENTIFIED AS FOLLOWS: 37:1 @ 29 Hz, 9.4:1 @ 200 Hz, 2.3:1 @ 250 Hz, 2.1:1 @ 280 Hz, 2.2:1 @ 520 Hz, 2.4:1 @ 570 Hz, 6.5:1 @ 700 Hz, 2.9:1 @ 820 Hz, 2.5:1 @ 1050 Hz, 22:1 @ 1500 Hz.	
3-30-86	21:26	X	AMB	5-59	.02			COMPLETED RANDOM POST TEST CRITICAL	11&12
				59-2K		.26	8.6	FREQUENCY SURVEY WITH NO APPARENT DAMAGE. CHANGES IN RESONANCES WERE INDICATED AS FOLLOWS: 6.5:1 @ 700 Hz. CHANGED TO 6.5:1 @ 665 Hz, 22:1 @ 1500 Hz, CHANGED TO 22:1 @ 1900 Hz.	

CRITICAL FREQUENCY SURVEY TEST - DATA SHEET 2 (CONT.)

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Page No. 14

W589 ES

Signed: [redacted]

WYLE LABORATORIES SINUSOIDAL PLOT NO. 1 Report No. 51463

Page No. 15

Customer SARGENT INDUSTRIES Job. No. 51463 Date 7-29-86

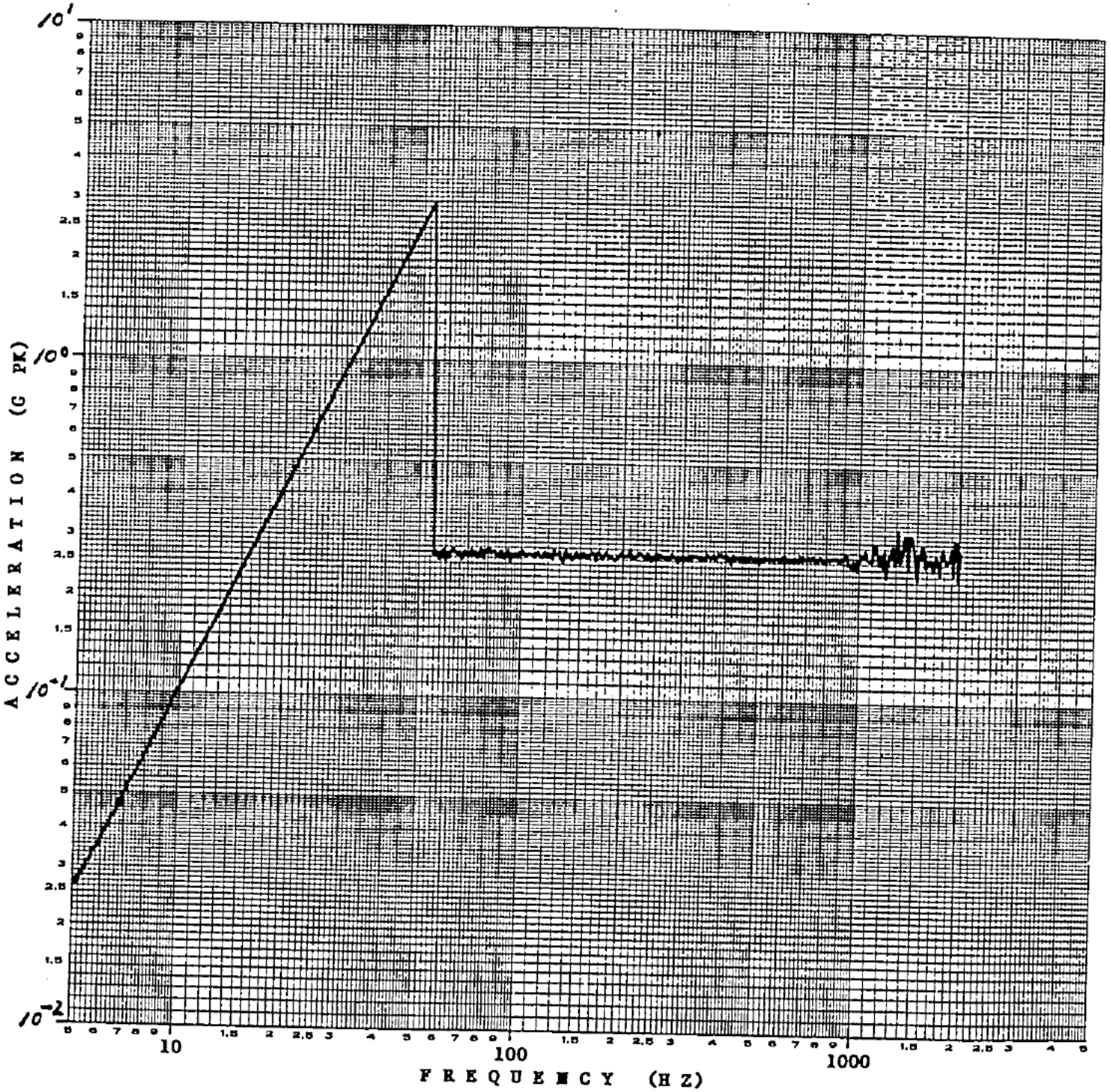
Specimen S.C.H.P. P/N 43083-001 S/N 786-008

Test Axis Z (VERTICAL) Accel. No. C1 & Axis Z Control ⋈ Response ( )

Upsweep ⋈ Downsweep ( ) Sweep Rate 1 Octaves/Minute Full Scale 10' G Pk

Operator [redacted] Resonance Search ( ) Sinusoidal Cycling ( )

PRE-TEST



WYLE LABORATORIES

SINUSOIDAL PLOT NO. 2

Report No. 51463

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Customer SARGENT INDUSTRIES Job. No. 51463 Date 7-29-86

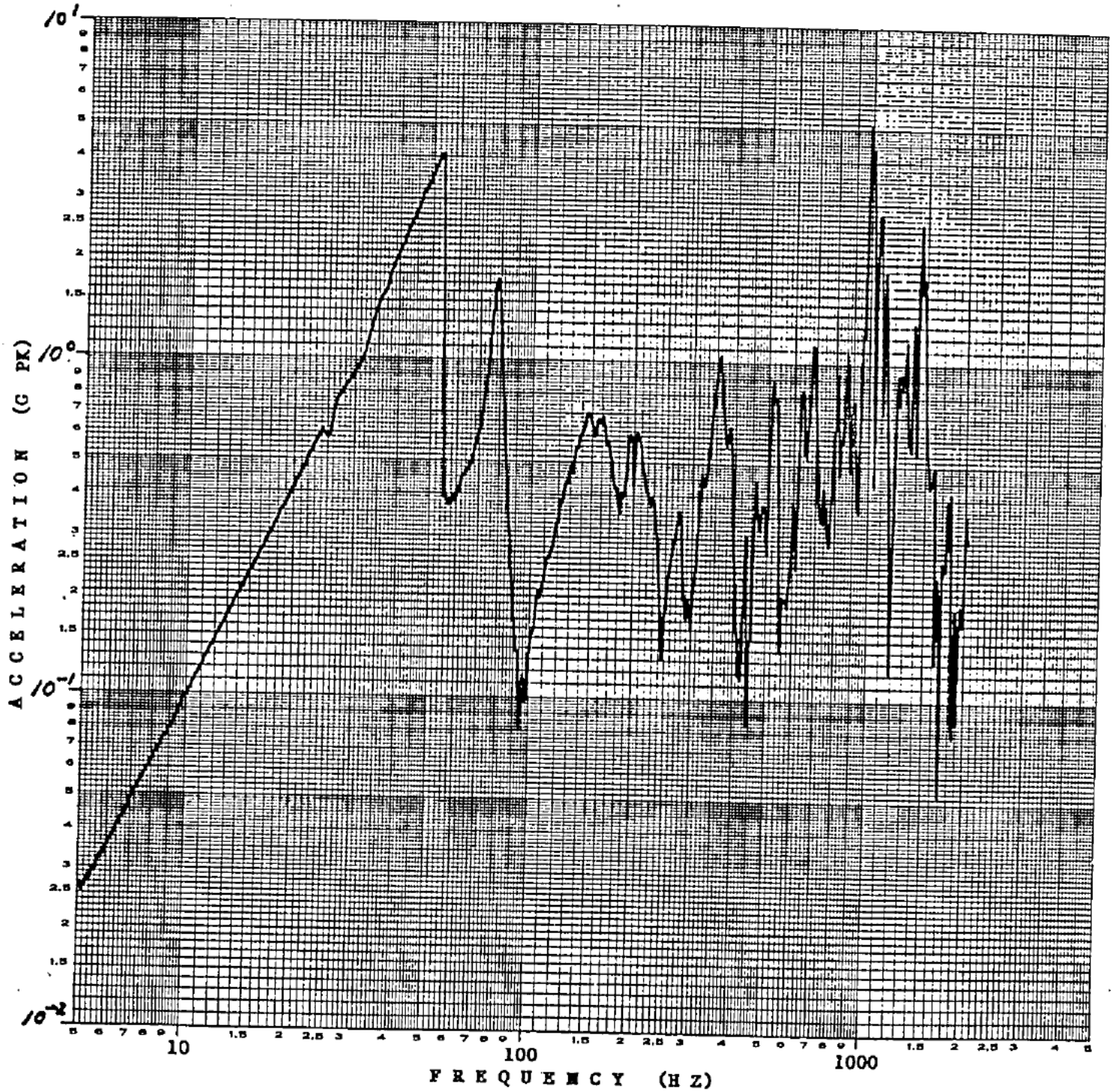
Specimen S.C.H.P. P/N 43083-001 S/N 786-008

Test Axis Z (VERTICAL) Accel. No. A1 & Axis Z Control ( ) Response (X)

Upsweep (X) Downsweep ( ) Sweep Rate 1 Octaves/Minute Full Scale 10' G Pk

Operator [redacted] Resonance Search ( ) Sinusoidal Cycling ( )

PRE-TEST



WYLE LABORATORIES SINUSOIDAL PLOT NO. 3 Report No. 51463

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Customer SARGENT INDUSTRIES Job. No. 51463 Date 7-29-86

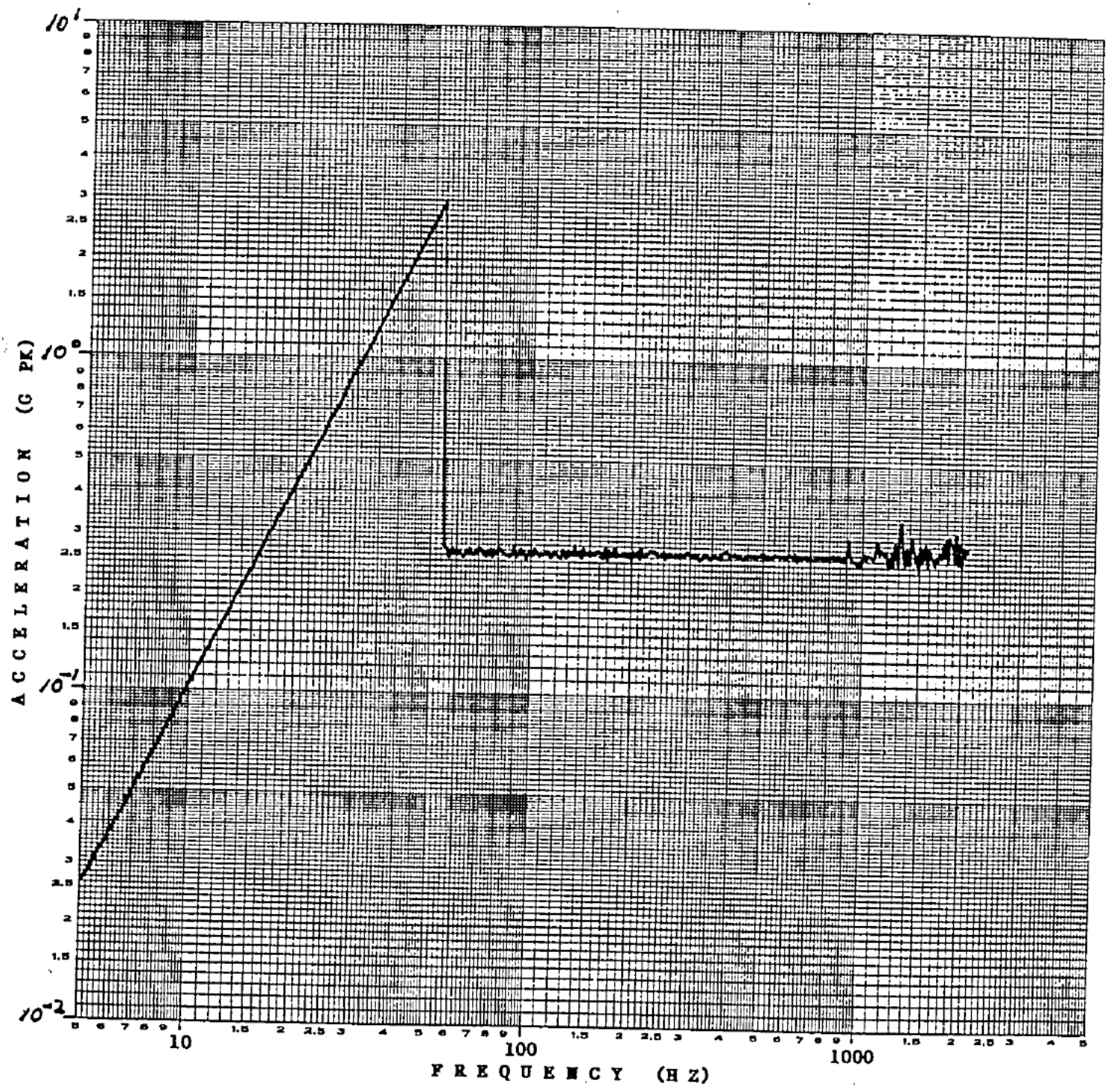
Specimen S.C.H.P. P/N 43083-001 S/N 786-008

Test Axis Z (VERTICAL) Accel. No. C1 & Axis Z Control ∞ Response ( )

Upsweep ∞ Downsweep ( ) Sweep Rate 1 Octaves/Minute Full Scale 10^1 G Pk

Operator [redacted] Resonance Search ( ) Sinusoidal Cycling ( )

POST TEST



WYLE LABORATORIES SINUSOIDAL PLOT NO. 4 Report No. 51463

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Customer SARGENT INDUSTRIES Job. No. 51463 Date 7-29-86

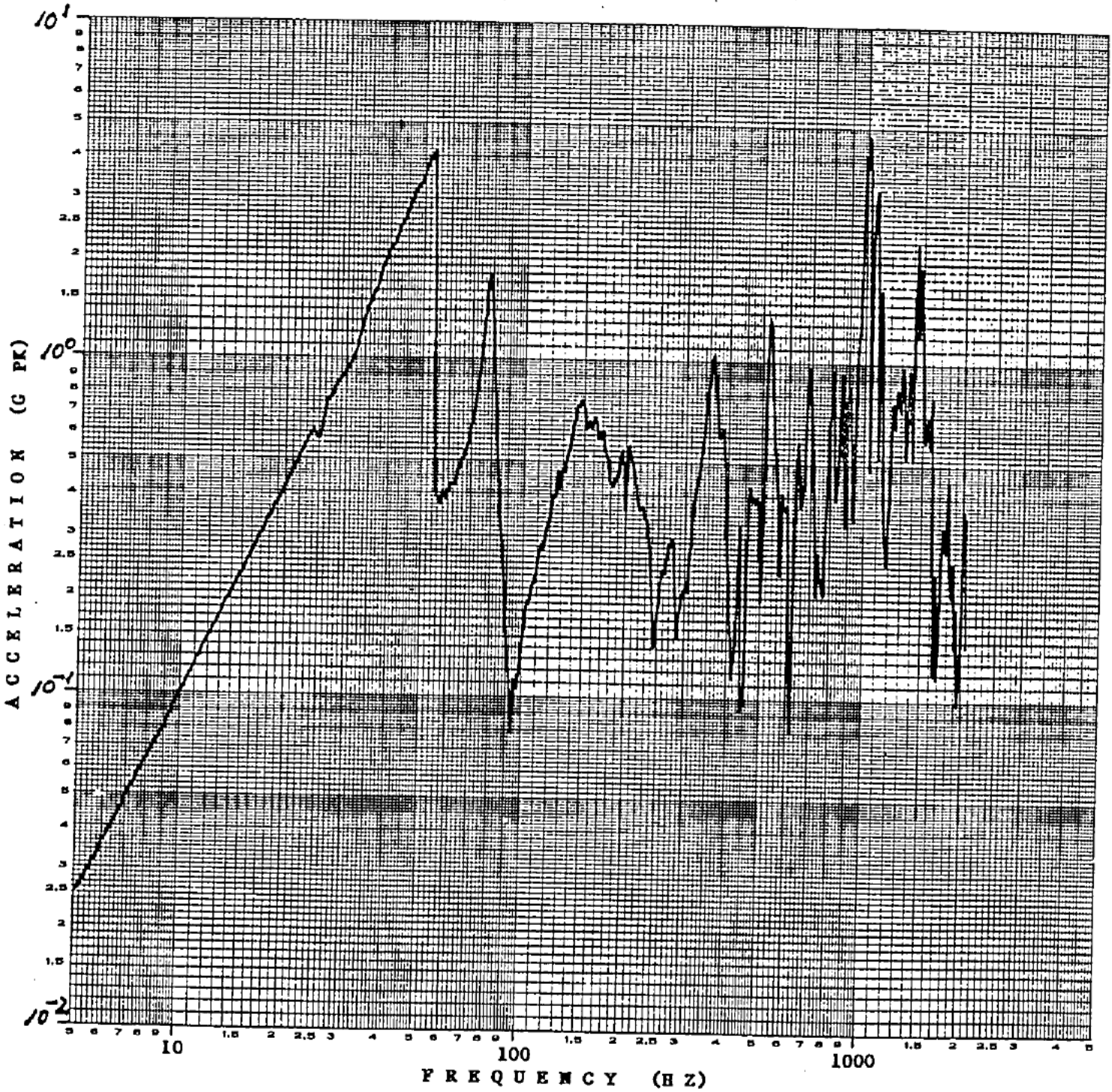
Specimen S.G.H.P. P/N 43083-001 S/N 786-008

Test Axis Z (VERTICAL) Accel. No. A1 & Axis Z Control ( ) Response (X)

Upsweep (X) Downsweep ( ) Sweep Rate 1 Octaves/Minute Full Scale 10 G Pk

Operator [redacted] Resonance Search ( ) Sinusoidal Cycling ( )

POST TEST



WYLE LABORATORIES SINUSOIDAL PLOT NO. 5 Report No. 51463

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Customer SARGENT INDUSTRIES Job. No. 51463 Date 7-30-86

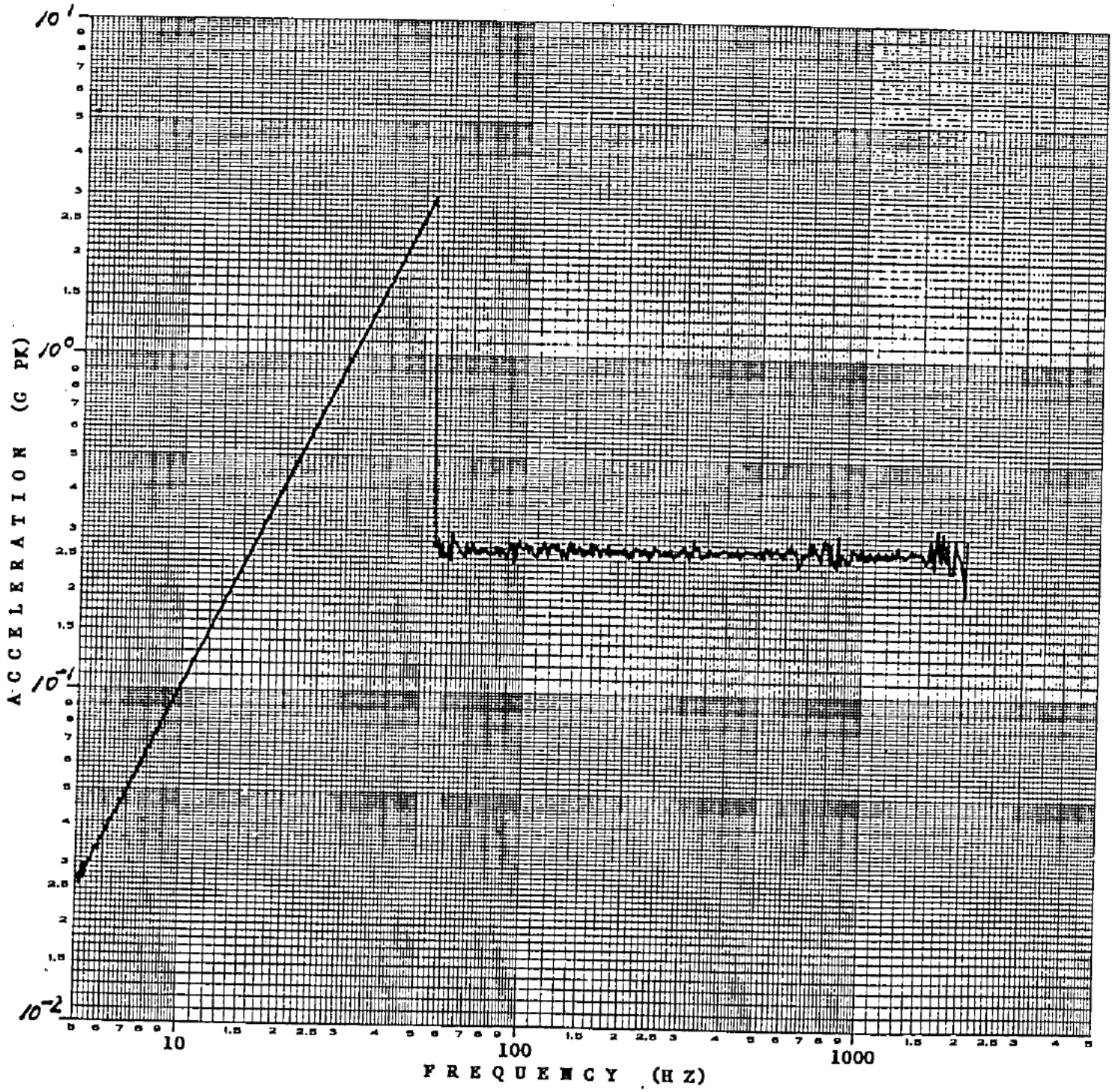
Specimen S.C.H.P. P/N 43083-001 S/N 786-008

Test Axis Y (LONGITUDINAL) Accel. No. C1 & Axis Y Control ☒ Response ( )

Upsweep ☒ Downsweep ( ) Sweep Rate 1 Octaves/Minute Full Scale 10^1 G Pk

Operator [redacted] Resonance Search ( ) Sinusoidal Cycling ( )

PRE-TEST



WYLE LABORATORIES SINUSOIDAL PLOT NO. 6 Report No. 51463

Page No. 20

Customer SARGENT INDUSTRIES Job. No. 51463 Date 7-30-86

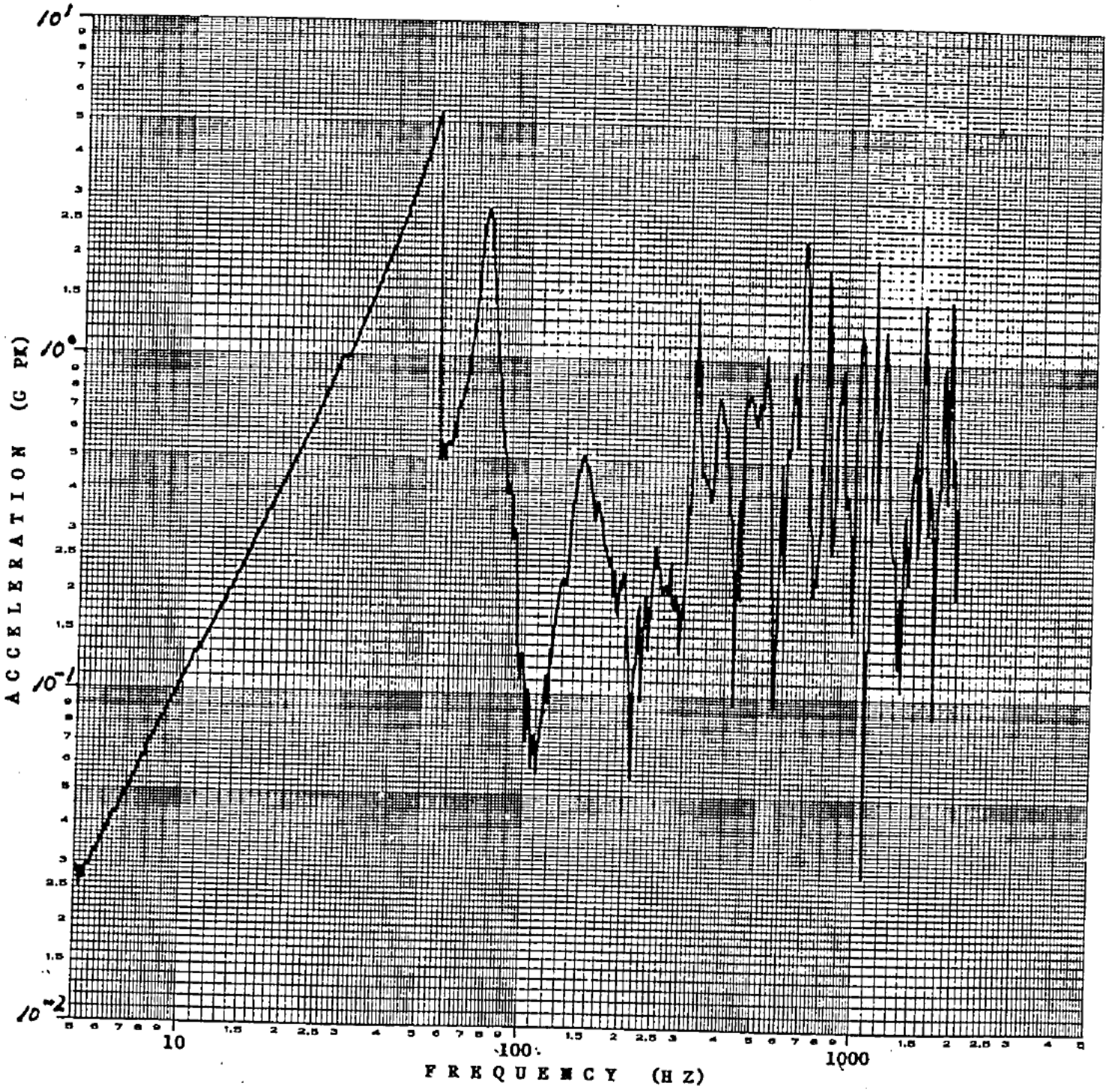
Specimen S.G.H.P. P/N 43083-001 S/N 786-008

Test Axis Y (LONGITUDINAL) Accel. No. A1 & Axis Y Control ( ) Response (X)

Upsweep (X) Downsweep ( ) Sweep Rate 1 Octaves/Minute Full Scale 10^1 G Pk

Operator [redacted] Resonance Search ( ) Sinusoidal Cycling ( )

PRE-TEST



WYLE LABORATORIES SINUSOIDAL PLOT NO. 7 Report No. 51463

Page No. 21

Customer SARGENT INDUSTRIES Job. No. 51463 Date 7-30-86

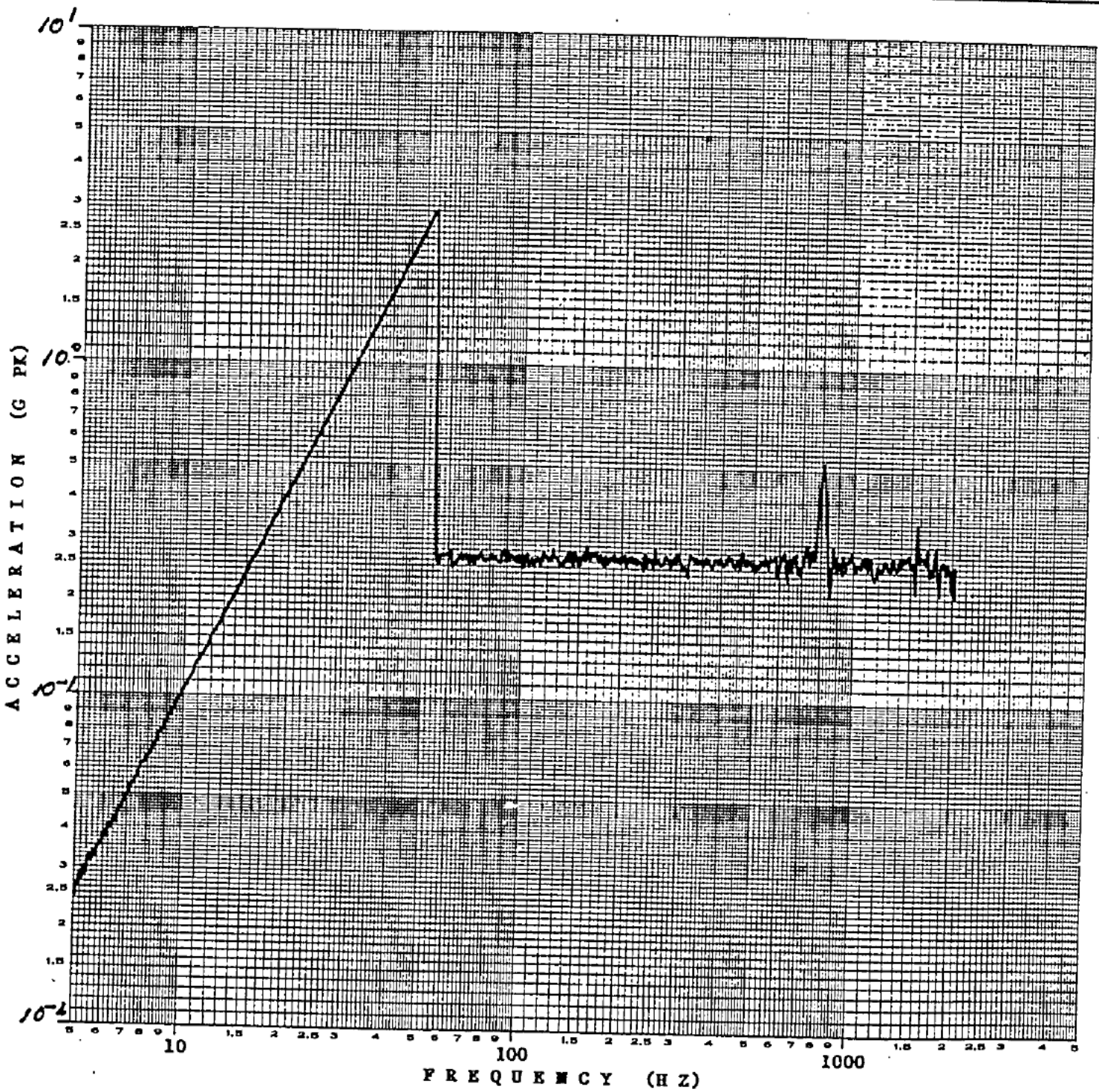
Specimen S.C.H.P. P/N 43083-001 S/N 786-008

Test Axis Y (LONGITUDINAL) Accel. No. C1 & Axis Y Control (X) Response ( )

Upsweep (X) Downsweep ( ) Sweep Rate _____ Octaves/Minute Full Scale 10 G Pk

Operator [redacted] Resonance Search ( ) Sinusoidal Cycling ( )

POST TEST



WYLE LABORATORIES SINUSOIDAL PLOT NO. 8 Report No. 51463

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Customer SARGENT INDUSTRIES Job. No. 51463 Date 7-30-86

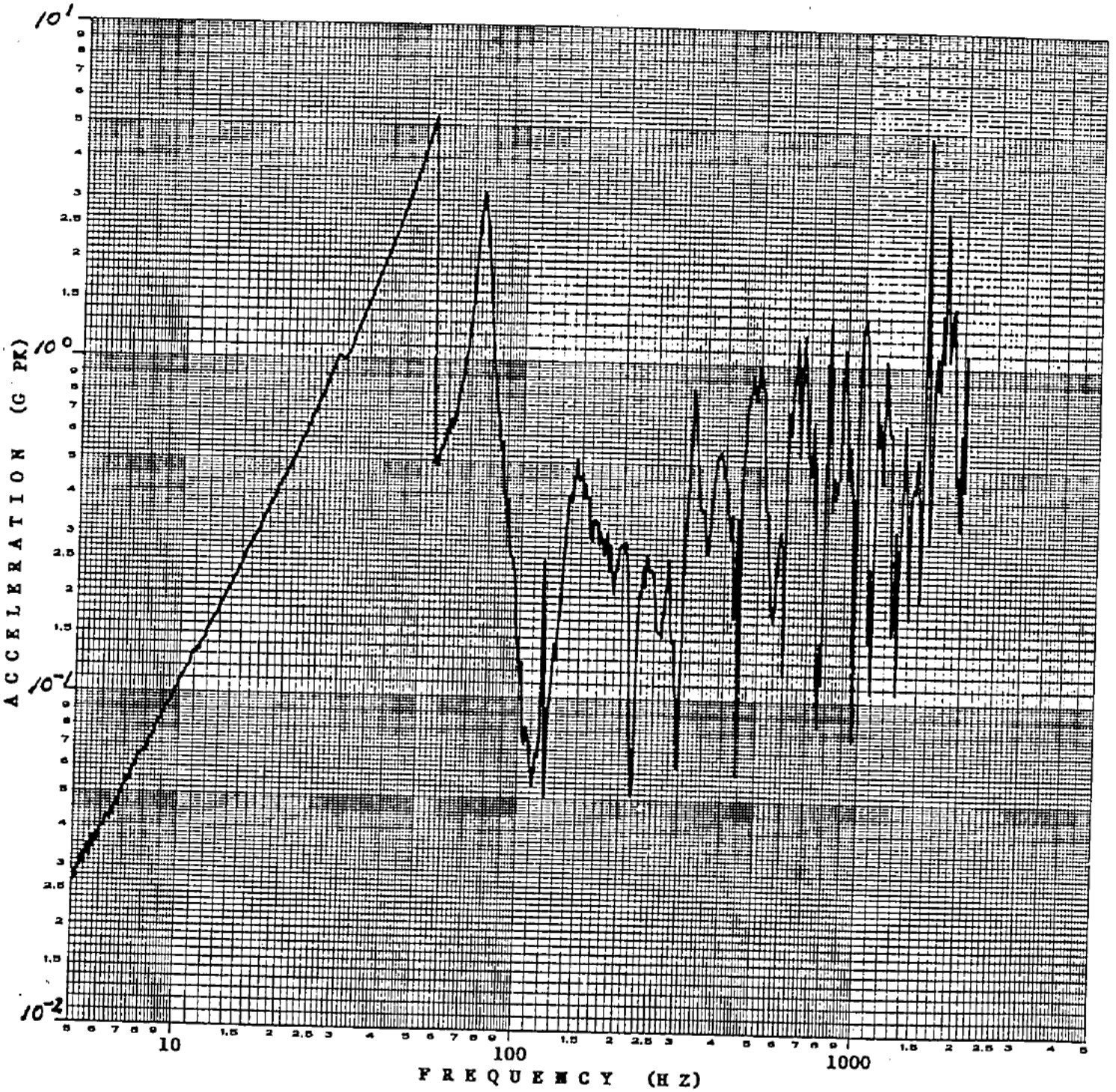
Specimen S.C.H.P. P/N 43083-001 S/N 786-008

Test Axis Y (LONGITUDINAL) Accel. No. R1 & Axis Y Control ( ) Response ⋈

Upsweep ⋈ Downsweep ( ) Sweep Rate _____ Octaves/Minute Full Scale 10' G Pk

Operator [redacted] Resonance Search ( ) Sinusoidal Cycling ( )

POST TEST



WYLE LABORATORIES

SINUSOIDAL PLOT NO. 9

Report No. 51463

Page No. 23

Customer SARGENT INDUSTRIES Job. No. 51463 Date 7-30-86

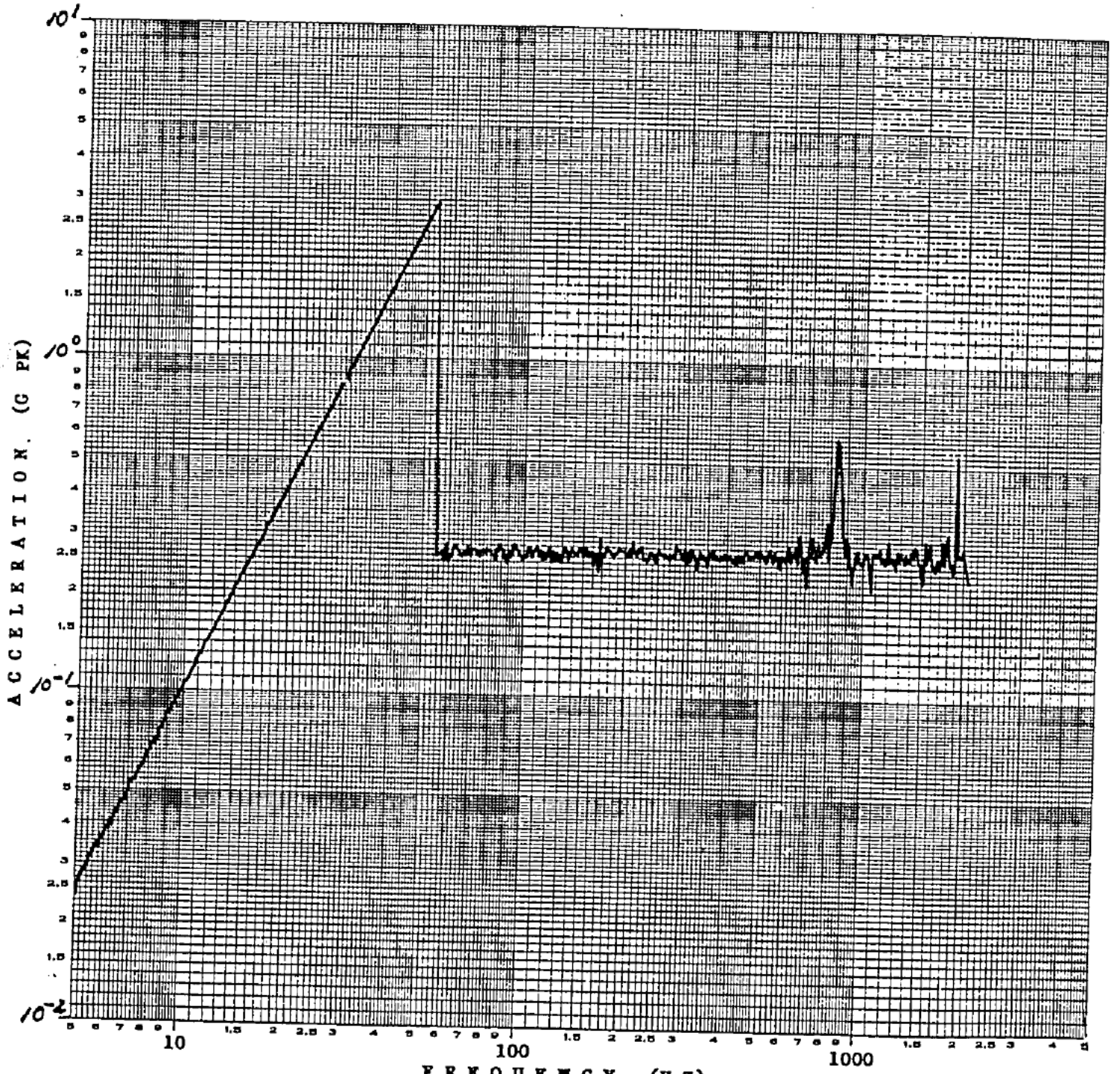
Specimen S.C.H.P. P/N 43083-001 S/N 786-008

Test Axis X (LATERAL) Accel. No. C1 & Axis X Control (X) Response ( )

Upsweep (X) Downsweep ( ) Sweep Rate _____ Octaves/Minute Full Scale 10' G Pk

Operator [redacted] Resonance Search ( ) Sinusoidal Cycling ( )

PRE-TEST



WYLE LABORATORIES SINUSOIDAL PLOT NO. 10 Report No. 51463

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Customer SARGENT INDUSTRIES Job. No. 51463 Date 7-30-86

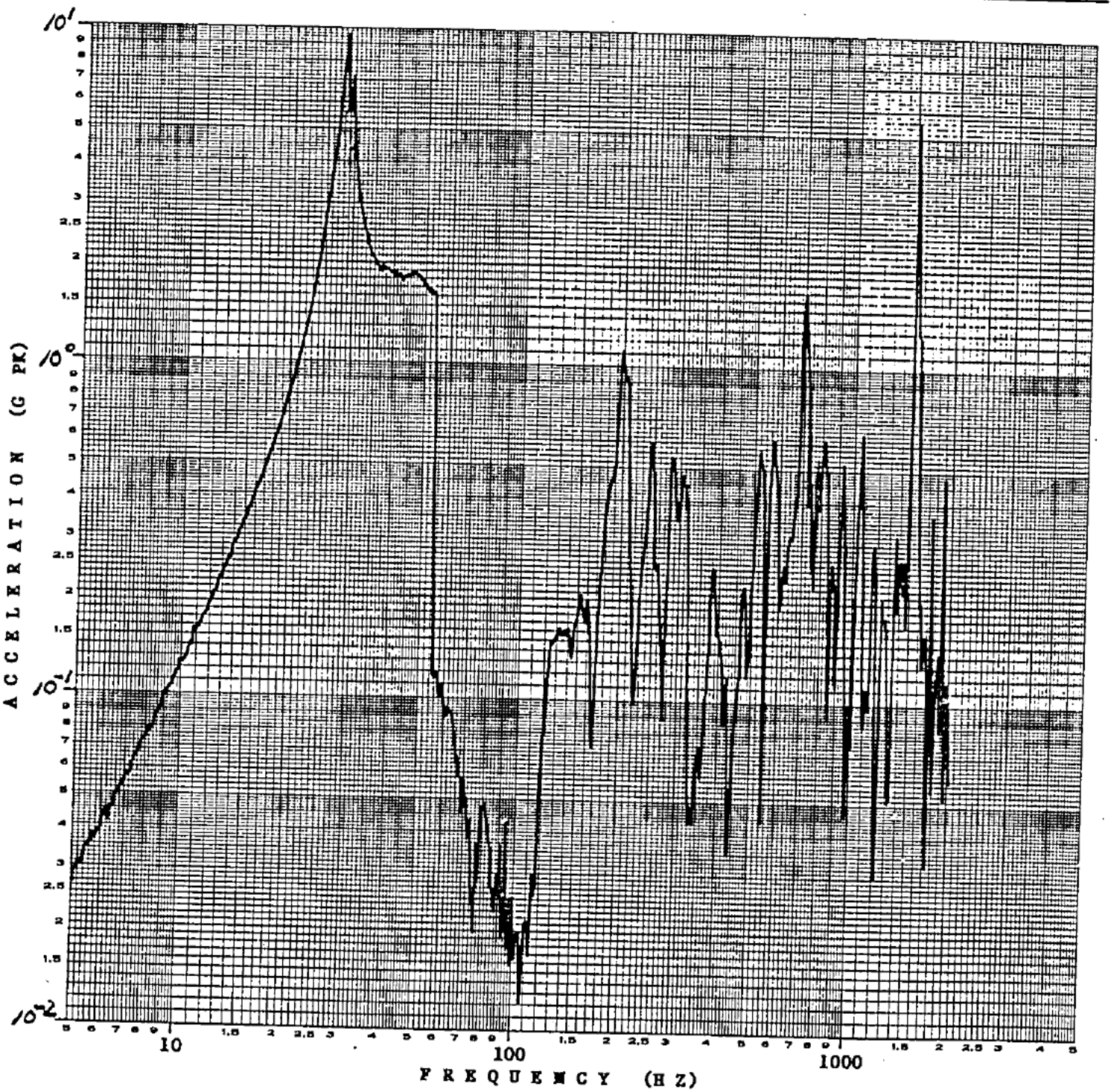
Specimen S.C.H.P. P/N 43083-001 S/N 786-008

Test Axis X (LATERAL) Accel. No. R1 & Axis X Control ( ) Response (X)

Upsweep (X) Downsweep ( ) Sweep Rate _____ Octaves/Minute Full Scale 10¹ G Pk

Operator [redacted] Resonance Search ( ) Sinusoidal Cycling ( )

PRE-TEST



WYLE LABORATORIES SINUSOIDAL PLOT NO. 11 Report No. 51463

Page No. 25

Customer SARGENT INDUSTRIES Job. No. 51463 Date 7-30-86

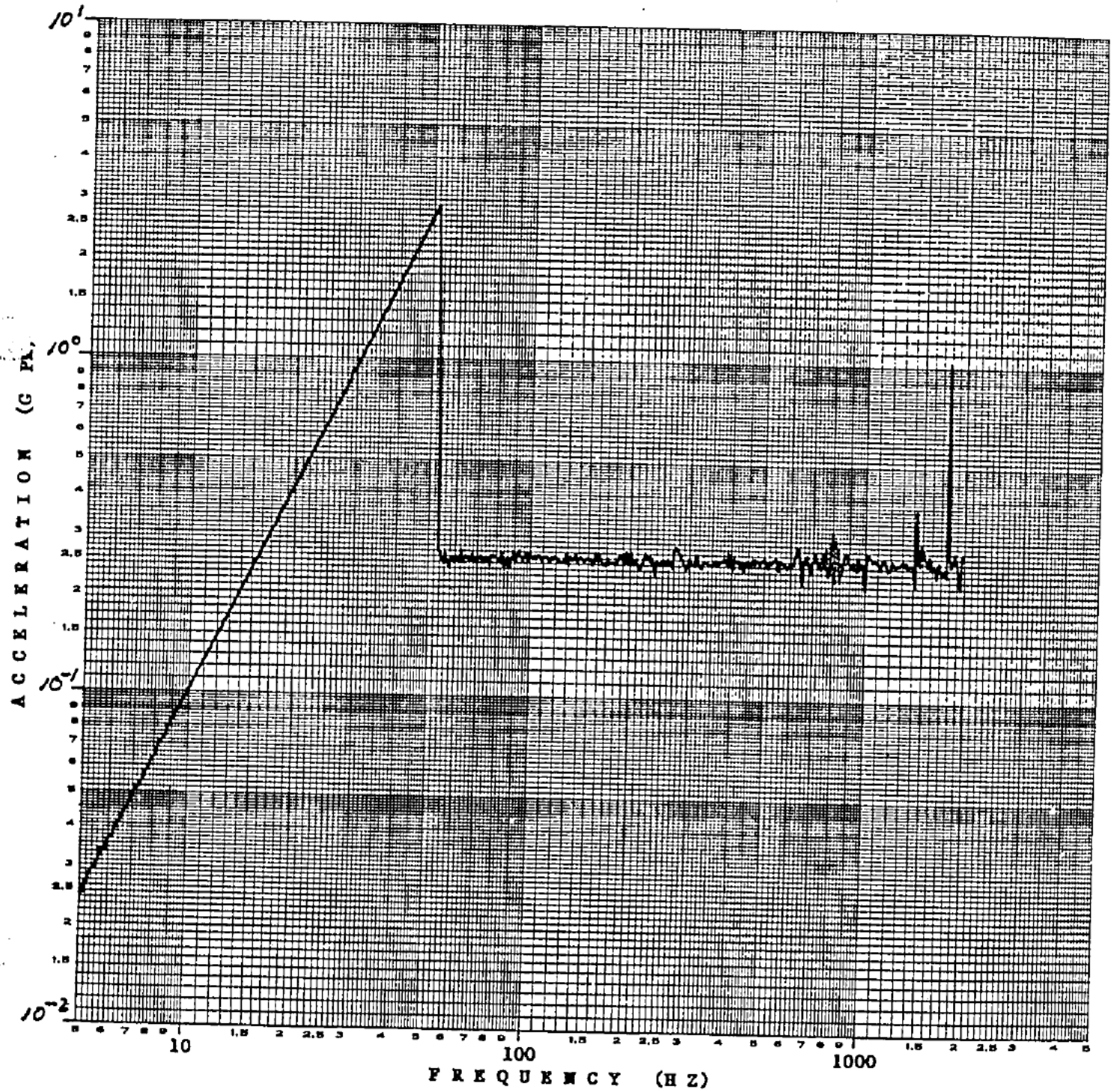
pecimen S.C.H.P. P/N 43083-001 S/N 786-008

Test Axis X (LATERAL) Accel. No. C1 & Axis X Control ∞ Response ( )

Upsweep ∞ Downsweep ( ) Sweep Rate _____ Octaves/Minute Full Scale 10^1 G Pk

Operator [redacted] Resonance Search ( ) Sinusoidal Cycling ( )

POST TEST



WYLE LABORATORIES

SINUSOIDAL PLOT NO. 12

Report No. 51463

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Customer SARGENT INDUSTRIES Job. No. 51463 Date 7-30-86

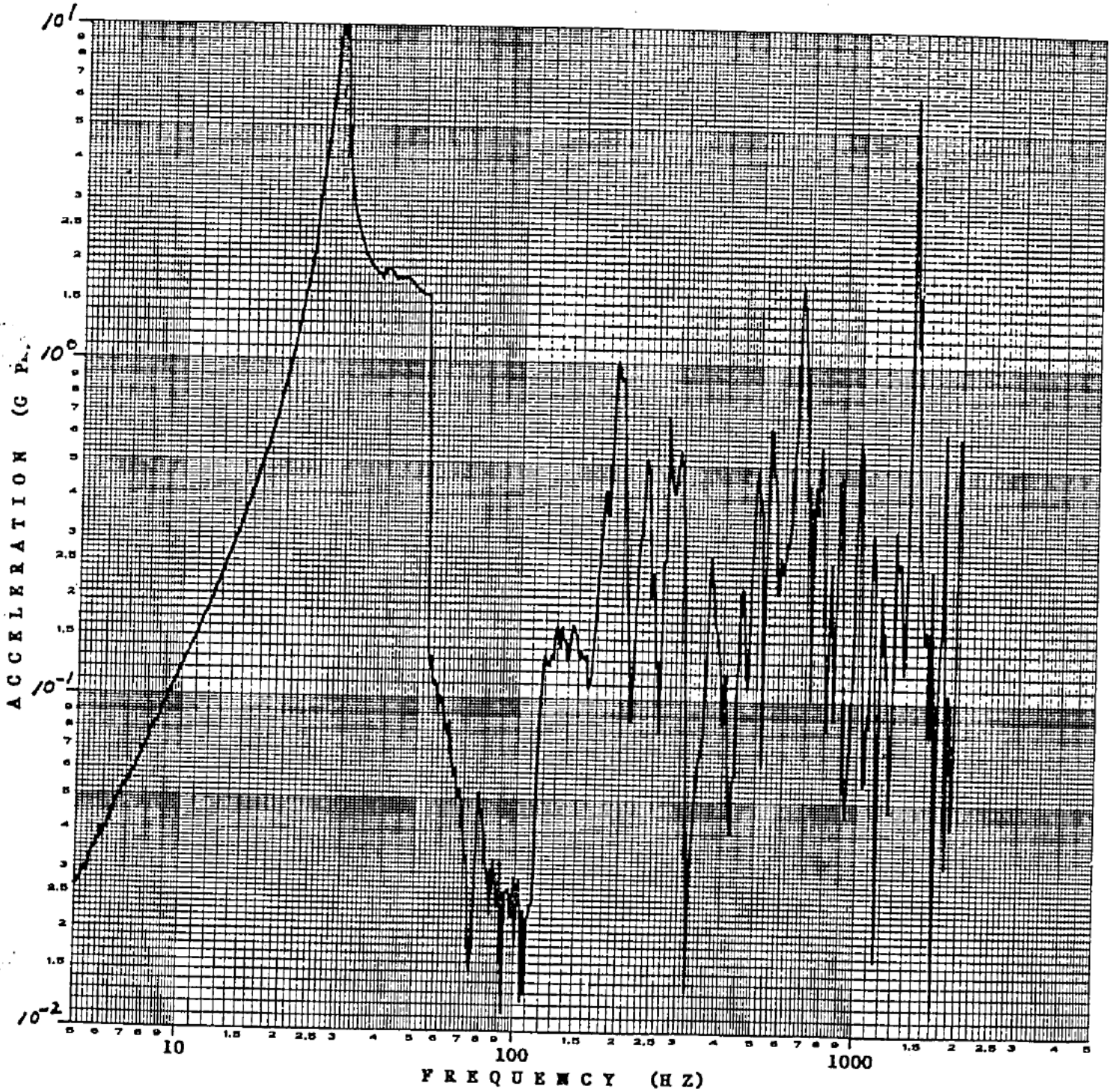
Specimen S.C.H.P. P/N 43083-001 S/N 786-008

Test Axis X (LATERAL) Accel. No. R1 & Axis X Control ( ) Response ⋈

Upsweep ⋈ Downsweep ( ) Sweep Rate _____ Octaves/Minute Full Scale 10 G Pk

Operator [redacted] Resonance Search ( ) Sinusoidal Cycling ( )

POST TEST



WYLE LABORATORIES GROUP — SCIENTIFIC SERVICES & SYSTEMS GROUP

DYNAMICS SECTION
VIBRATION TEST DATA SHEET

Job No. 51463

Sheet 1 of 1

Customer SARGENT INDUSTRIES Specimen S.C.H.P. P/N 43083-001 S/N 786-008

Date	Time	Axis	Temp. (F)	RANDOM SPECTRUM Freq. (Hz)	PSD G^2/Hz	PSD dB/Oct	Overall (G_{rms})	Test Time (MIN.)	Comments	Ref. Plot No.
7-29-86	20:53	Z	AMB.	10-20	.002				COMPLETED VIBRATION WITH NO	1-3
				20-42		-12			APPARENT DAMAGE. NO PERFORMANCE	
				42-250	.0001				ANOMALIES WERE REPORTED BY	
				250-2K		-3	.32	60	SARGENT.	
7-30-86	15:46	Y	AMB.	10-20	.002				COMPLETED VIBRATION WITH NO	4-6
				20-42		-12			APPARENT DAMAGE. NO PERFORMANCE	
				42-250	.0001				ANOMALIES WERE REPORTED BY	
				250-2K		-3	.32	60	SARGENT.	
7-30-86	21:15	X	AMB.	10-20	.002				COMPLETED VIBRATION WITH NO	7-9
				20-42		-12			APPARENT DAMAGE. NO PERFORMANCE	
				42-250	.0001				ANOMALIES WERE REPORTED BY	
				250-2K		-3	.32	60	SARGENT.	

- DATA SHEET 3 -

RANDOM VIBRATION TEST

Report No. 51463

Page No. 27

W603R-ES82

Signed: [redacted]

WYLE LABORATORIES RANDOM PLOT NO. 1 Report No. 51463

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Customer Sargent Industries Job. No. 51463 Date 7-29-86

Specimen * P/N 43083-001 S/N 786-008

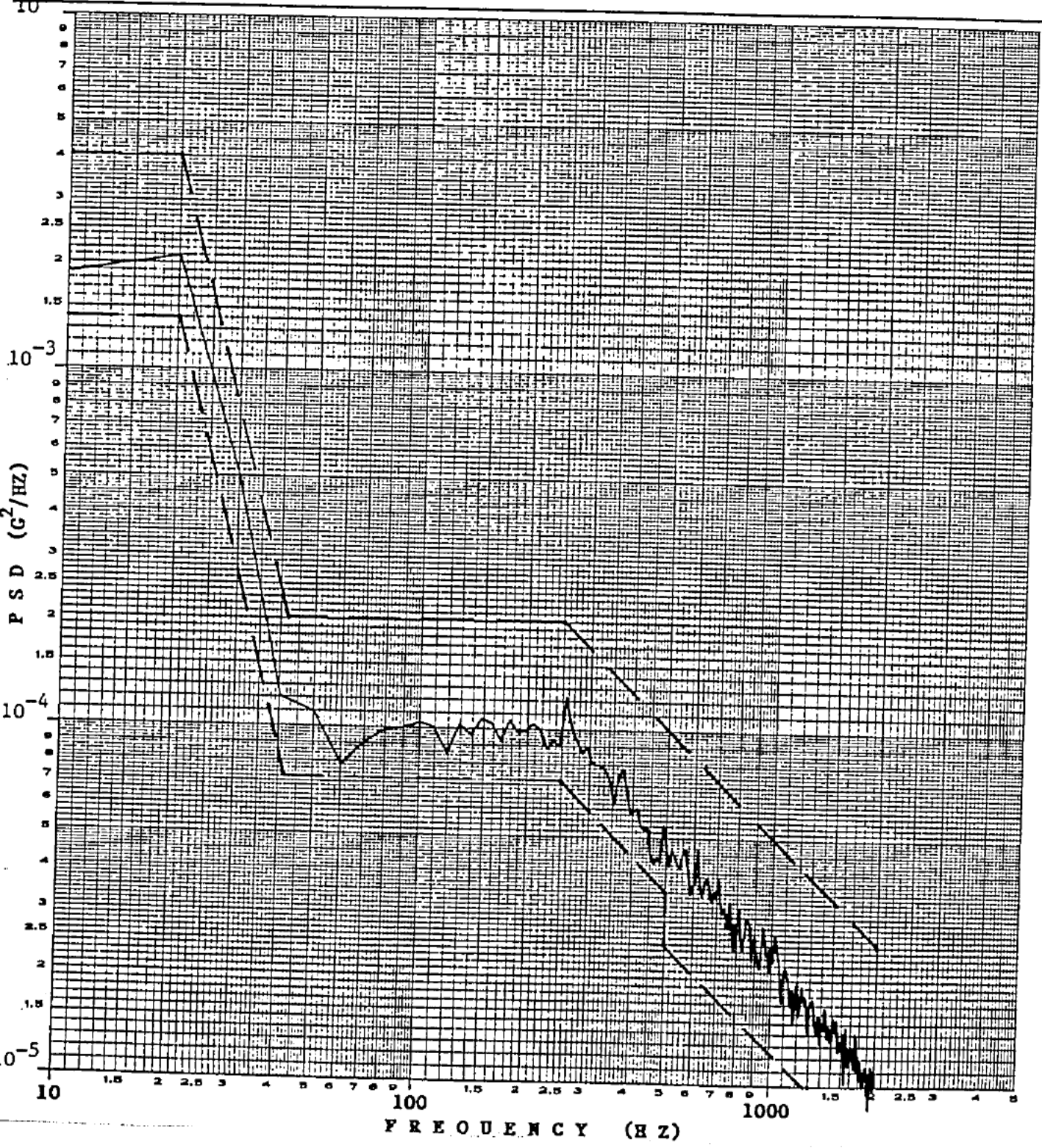
Test Axis Z (VERTICAL) Accel. No. C1 & Axis Z Control (X) Response ( )

Delta F 9.77 Degrees of Freedom 144 Full Scale 10^{-2} G^2/hz

Operator [redacted] AWF 5 Overall Grms .3194

PLOTTED AT 1 (MIN.)(HRS.) OF 60 (MIN.)(HOUR) TEST

* Gulfstream G IV Sector,Control Head and Pedestal



WYLE LABORATORIES

RANDOM PLOT NO. 2

Report No. 51463

Page No. 29

Customer Sargent Industries Job. No. 51463 Date 7-29-86

Specimen * P/N 43083-001 S/N 786-008

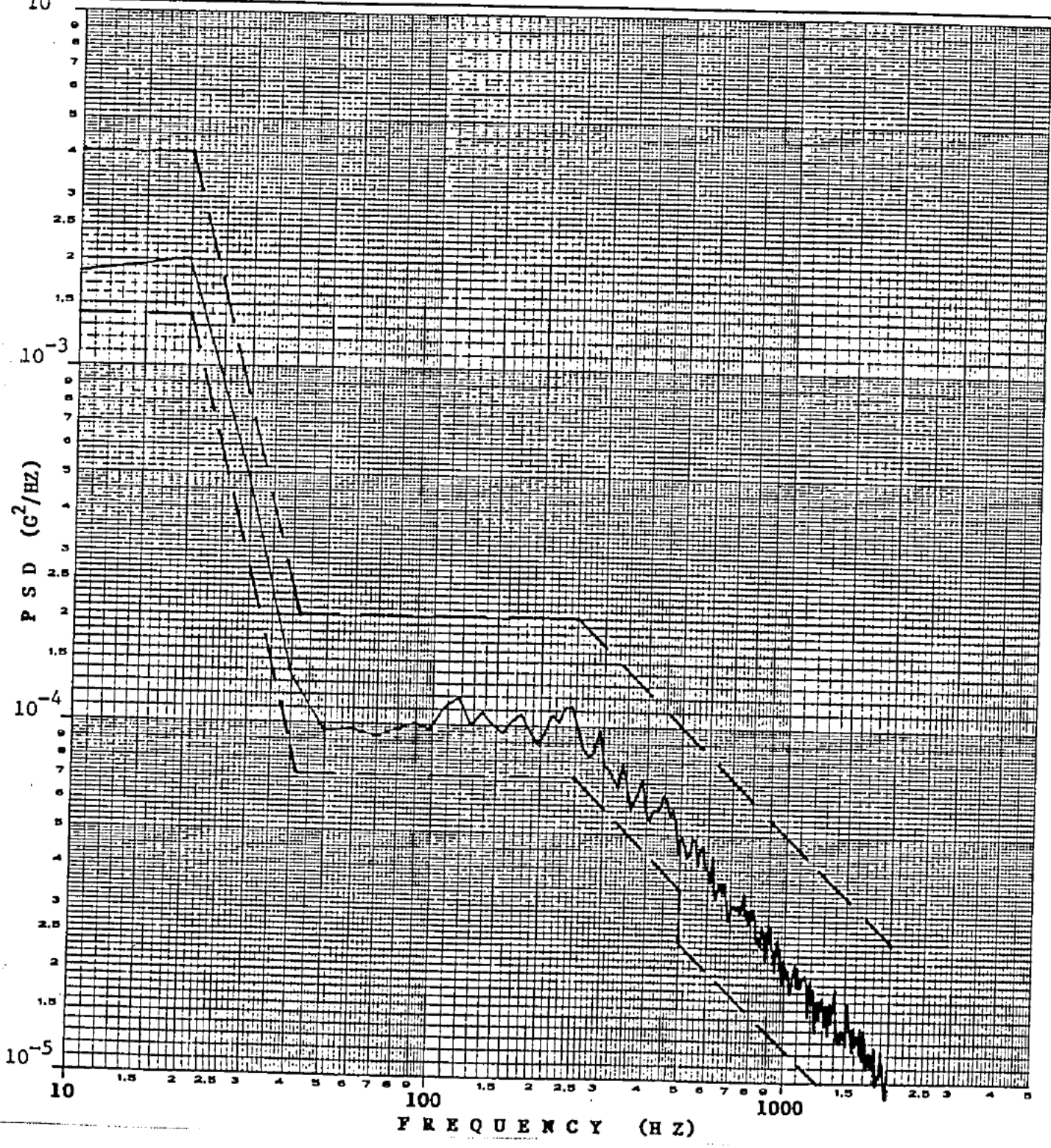
Test Axis Z (VERTICAL) Accel. No. C1 & Axis Z Control (X) Response ( )

Delta F 9.77 Degrees of Freedom 144 Full Scale 10^{-2} G^2/hz

Operator [redacted] AWF 5 Overall Grms .3190

PLOTTED AT 30 (MIN.)(~~HRS.~~) OF 60 (MIN.)(~~HOUR~~) TEST

* Gulfstream G IV Sector, Control Head and Pedestal



WYLE LABORATORIES RANDOM PLOT NO. 3

Report No. 51463
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Customer Sargent Industries Job. No. 51463 Date 7-29-86

Specimen * P/N 43083-001 S/N 786-008

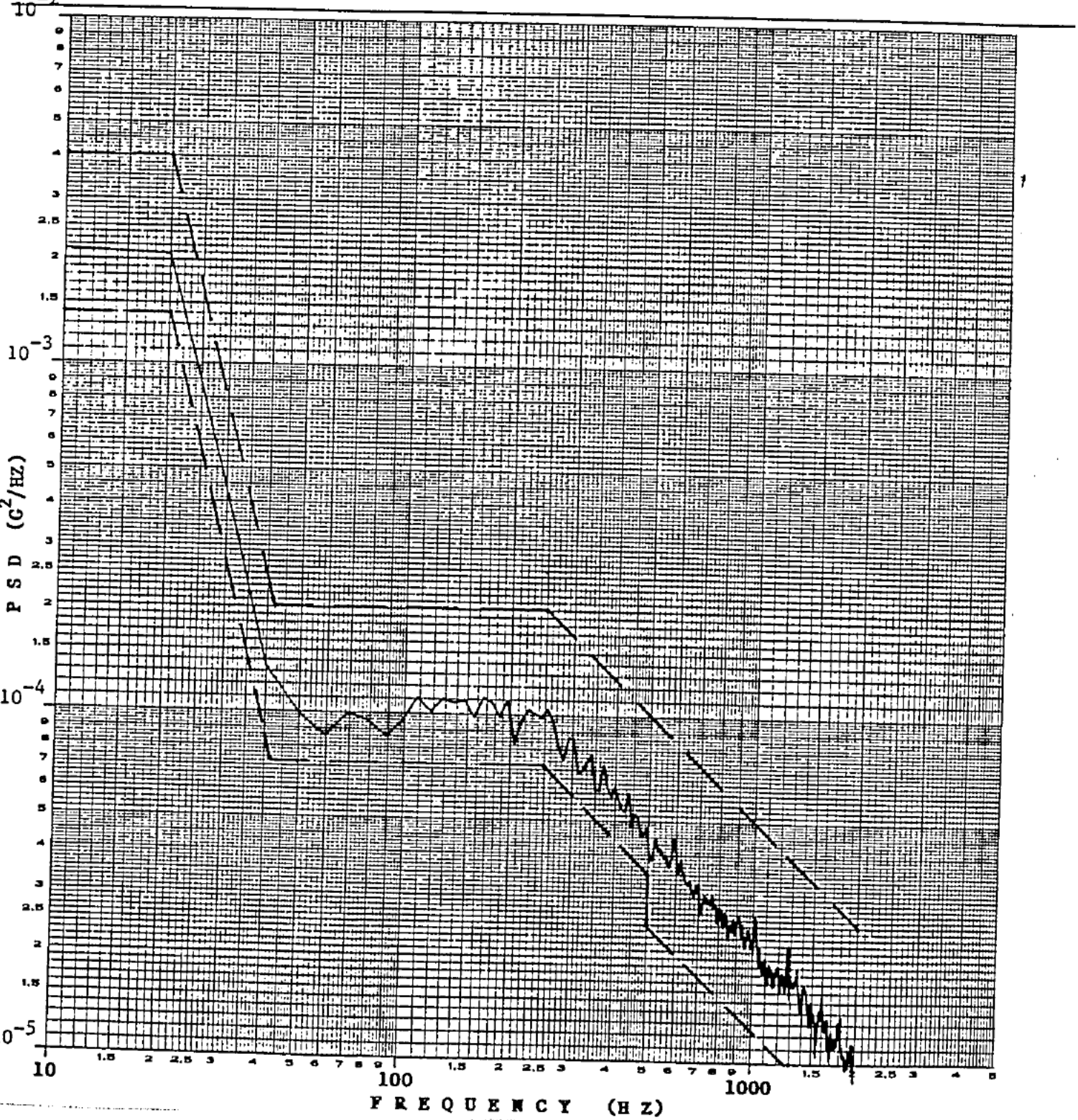
Test Axis Z (VERTICAL) Accel. No. C1 & Axis Z Control (X) Response ( )

Delta F 9.77 Degrees of Freedom 144 Full Scale 10^{-2} G^2/hz

Operator [redacted] AWF 5 Overall Grms .3391

PLOTTED AT 60 (MIN.)(~~HRS~~.) OF 60 (MIN.)(~~HOUR~~) TEST

* Gulfstream G IV Sector Control Head and Pedestal



WYLE LABORATORIES RANDOM PLOT NO. 4 Report No. 51463

Page No. 31

Customer Sargent Industries Job. No. 51463 Date 7-30-86

Specimen * P/N 43083-001 S/N 786-008

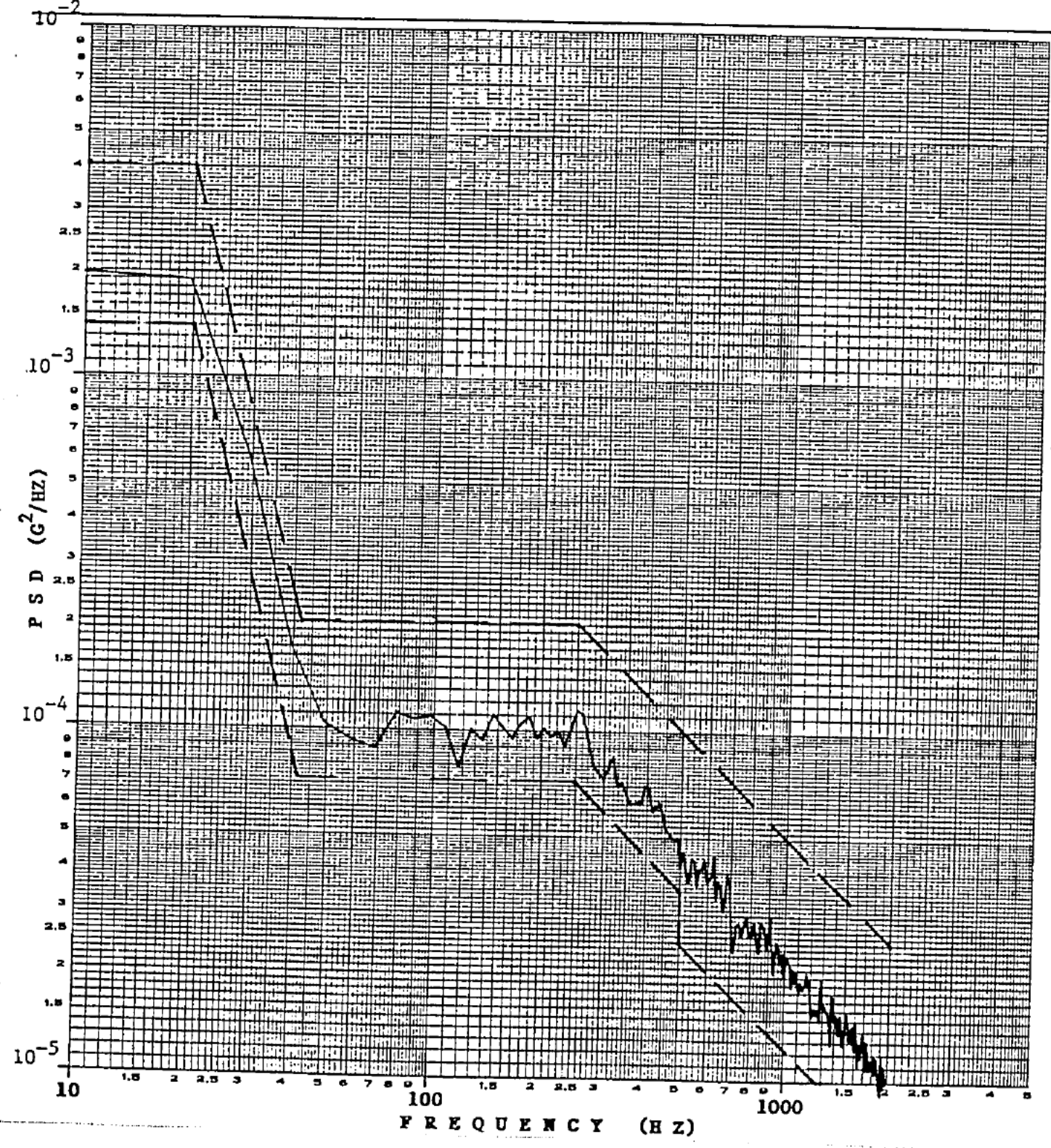
Test Axis Y (LONGITUDINAL) Accel. No. C1 & Axis Y Control (X) Response ( )

Delta F 9.77 Degrees of Freedom 144 Full Scale 10^{-2} G^2/hz

Operator [redacted] AWF 5 Overall Grms .3207

PLOTTED AT 1 (MIN.)(HRS.) OF 60 (MIN.)(HOUR) TEST

* Gulfstream G IV Sector, Control Head and Pedestal



WYLE LABORATORIES

RANDOM PLOT NO. 5

Report No. 51463

Page No. 32

Customer Sargent Industries Job. No. 51463 Date 7-30-86

Specimen * P/N 43083-001 S/N 786-008

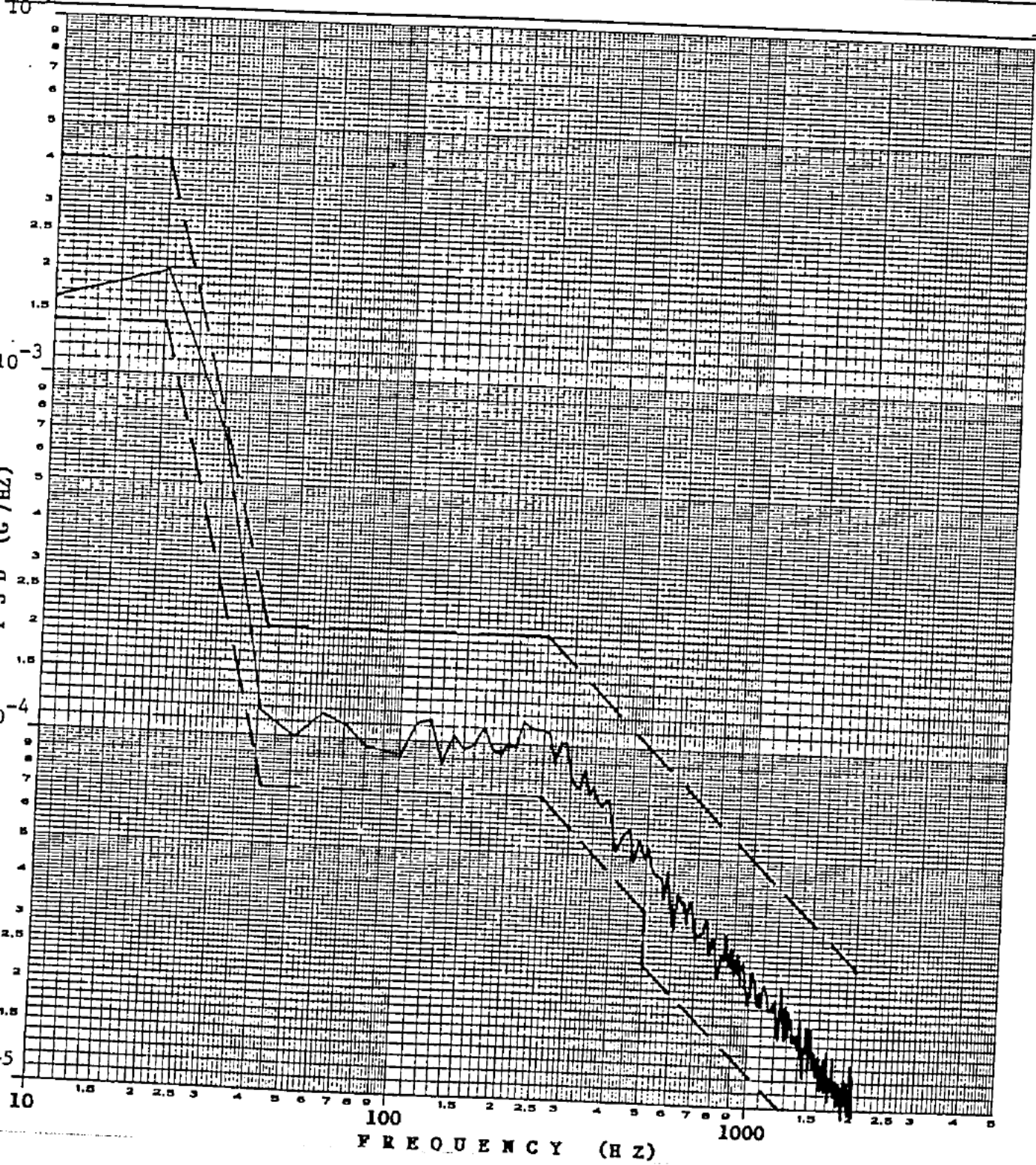
Test Axis Y (LONGITUDINAL) Accel. No. C1 & Axis Y Control (X) Response ( )

Delta F 9.77 Degrees of Freedom 144 Full Scale 10^{-2} G^2/hz

Operator [redacted] AWF 5 Overall Grms .3201

PLOTTED AT 30 (MIN.)(HRS.) OF 60 (MIN.)(HOUR) TEST

* Gulfstream G IV Sector Control Head and Pedestal



WYLE LABORATORIES

RANDOM PLOT NO. 6

Report No. 51463

Page No. 33

Customer Sargent Industries Job. No. 51463 Date 7-30-86

Specimen * P/N 43083-001 S/N 786-008

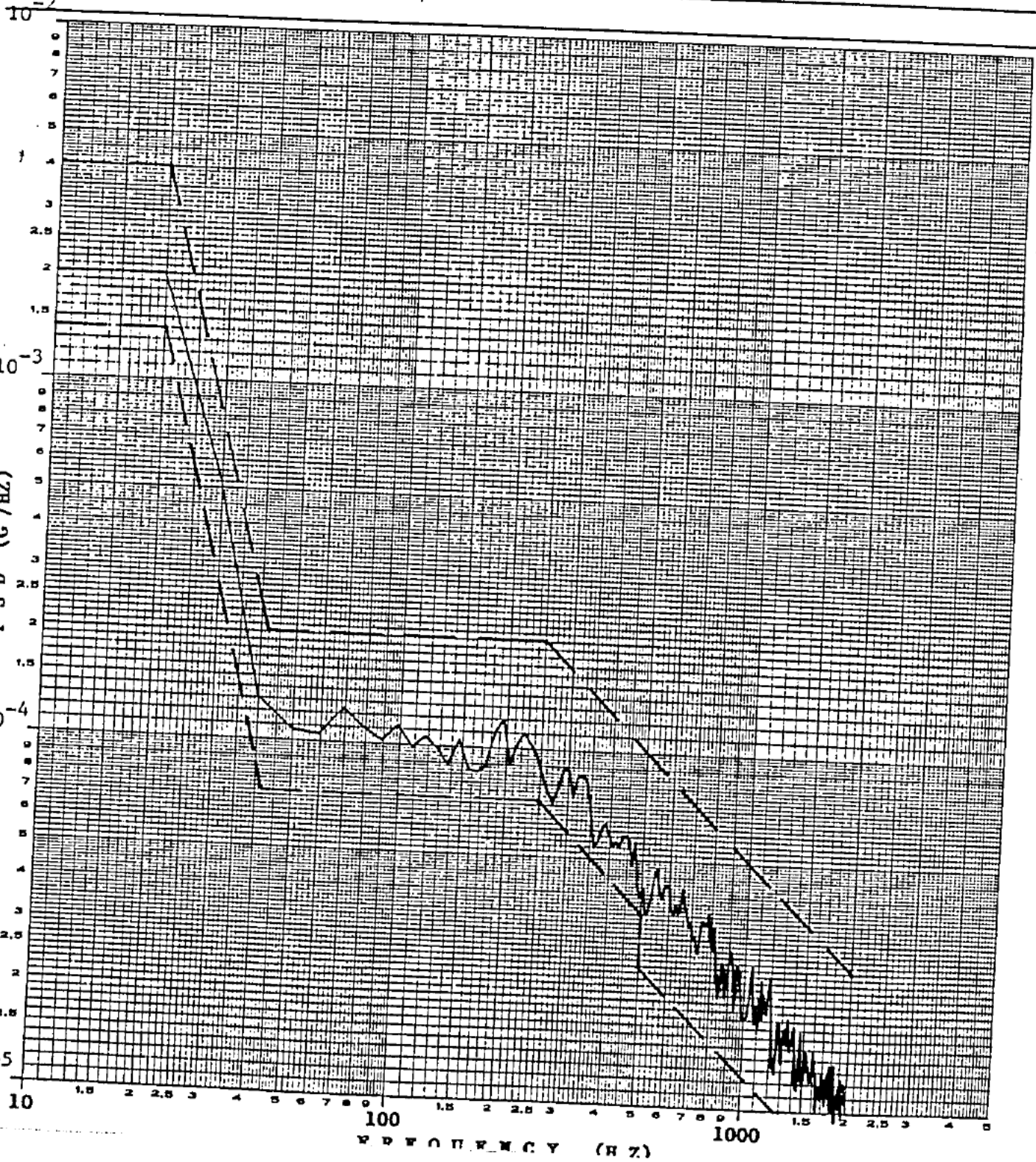
Test Axis Y (LONGITUDINAL) Accel. No. C1 & Axis Y Control (X) Response ( )

Delta F 9.77 Degrees of Freedom 144 Full Scale 10^{-2} G^2/hz

Operator [redacted] AWF 5 Overall Grms .3366

PLOTTED AT 60 (MIN.)(HRS.) OF 60 (MIN.)(HOUR) TEST

* Gulfstream G IV Sector, Control Head and Pedestal



WYLE LABORATORIES

RANDOM PLOT NO. 7

Report No. 51463

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Customer Sargent Industries Job. No. 51463 Date 7-30-86

Specimen * P/N 43083-001 S/N 786-008

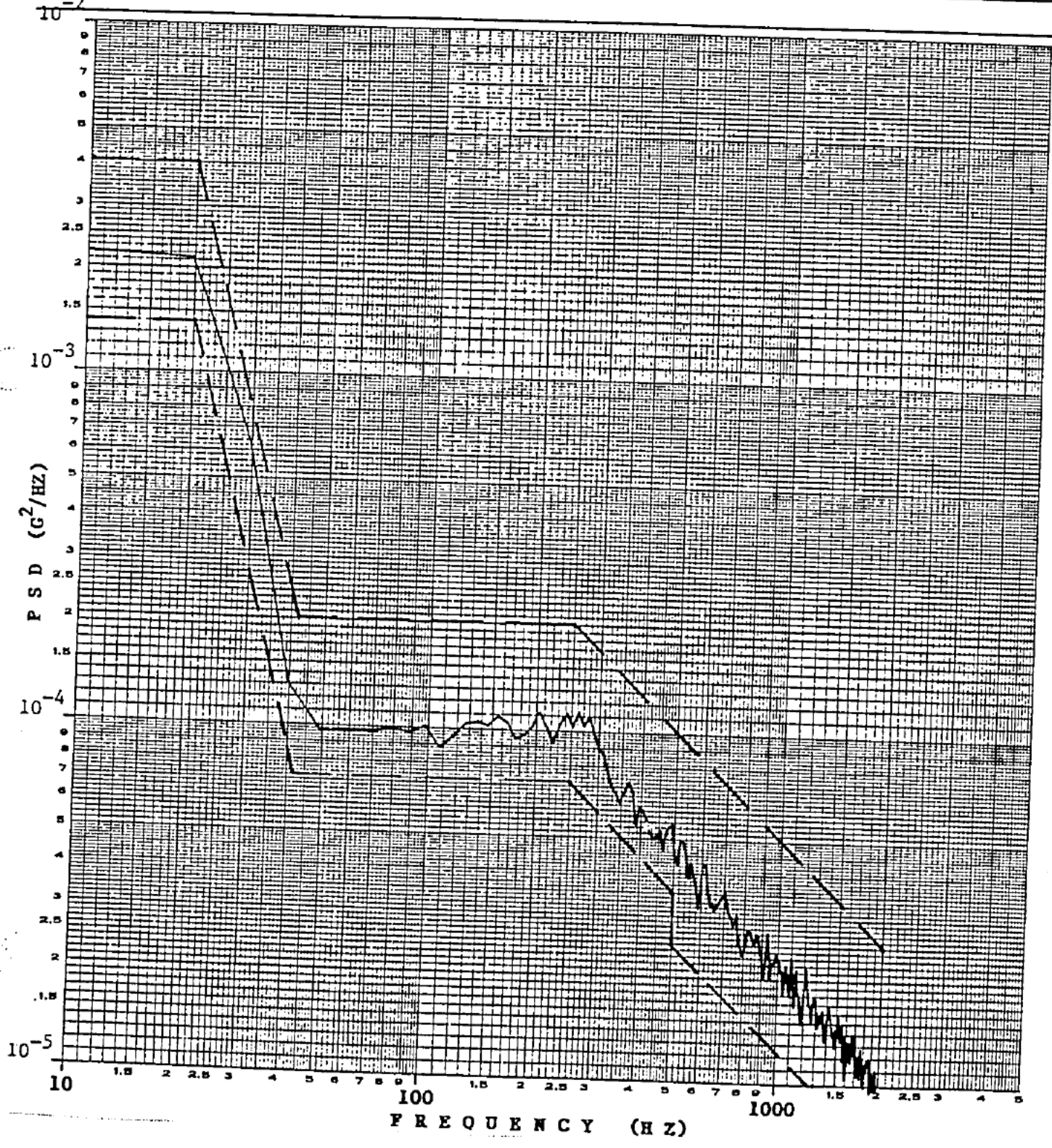
Test Axis X (LATERAL) Accel. No. C1 & Axis X Control (X) Response ( )

Delta F 9.77 Degrees of Freedom 144 Full Scale 10^{-2} G^2/hz

Operator [redacted] AWF 5 Overall Grms .3268

PLOTTED AT 1 (MIN.)(~~HRS.~~) OF 60 (MIN.)(~~HOUR~~) TEST

* Gulfstream G IV Sector, Control Head and Pedestal



WYLE LABORATORIES

RANDOM PLOT NO. 8

Report No. 51463

Page No. 35

Customer Sargent Industries Job. No. 51463 Date 7-30-86

Specimen * P/N 43083-001 S/N 786-008

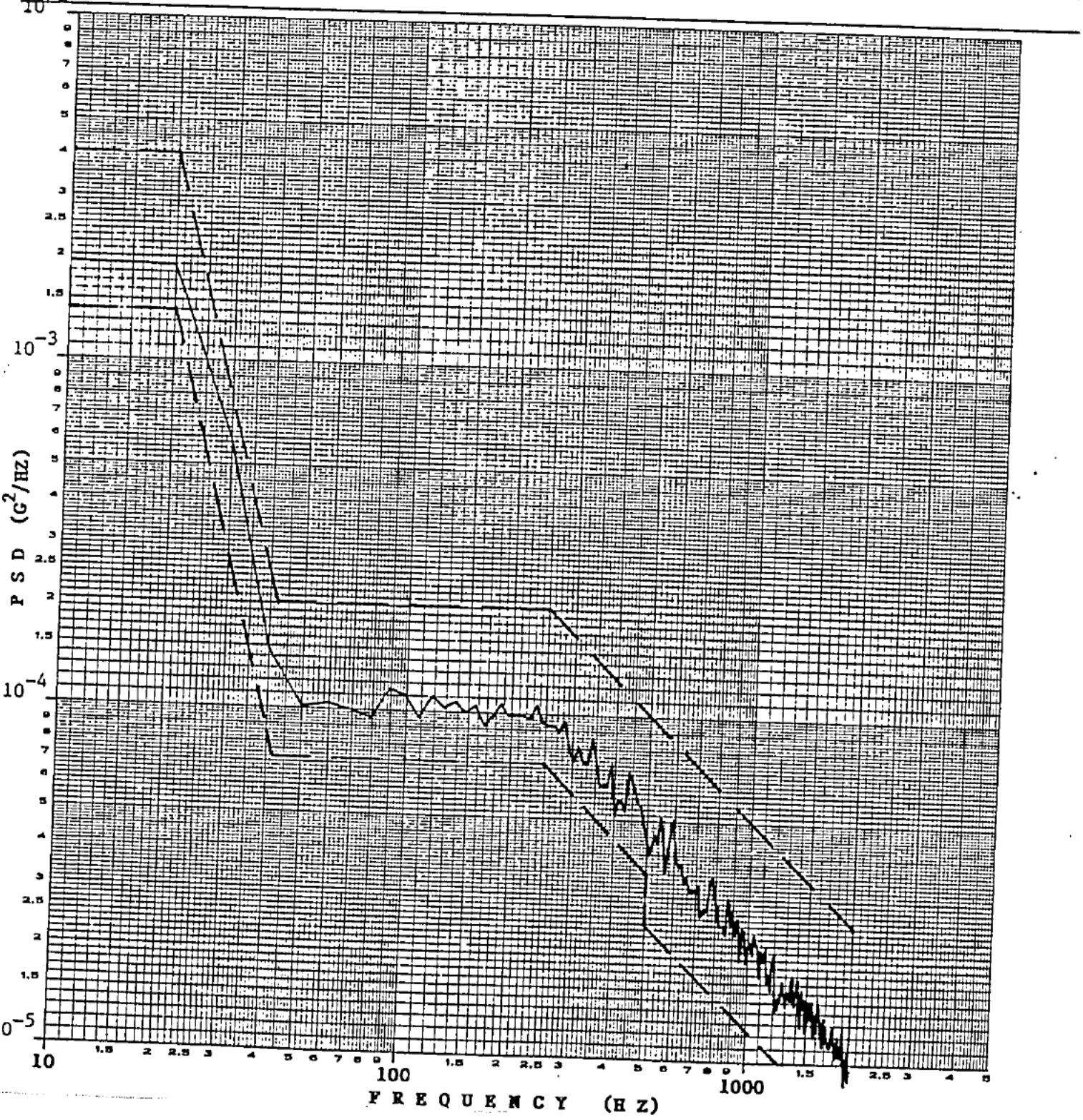
Test Axis X (LATERAL) Accel. No. C1 & Axis X Control (X) Response ( )

Delta F 9.77 Degrees of Freedom 144 Full Scale 10^{-2} G^2/hz

Operator [redacted] AWF 5 Overall Grms .3211

PLOTTED AT 30 (MIN.)(HRS.) OF 60 (MIN.)(HOUR) TEST

* Gulfstream G IV Sector, Control Head and Pedestal



WYLE LABORATORIES

RANDOM PLOT NO. 9

Report No. 51463

Page No. 36

Customer Sargent Industries Job. No. 51463 Date 7-30-86

Specimen * P/N 43083-001 S/N 786-008

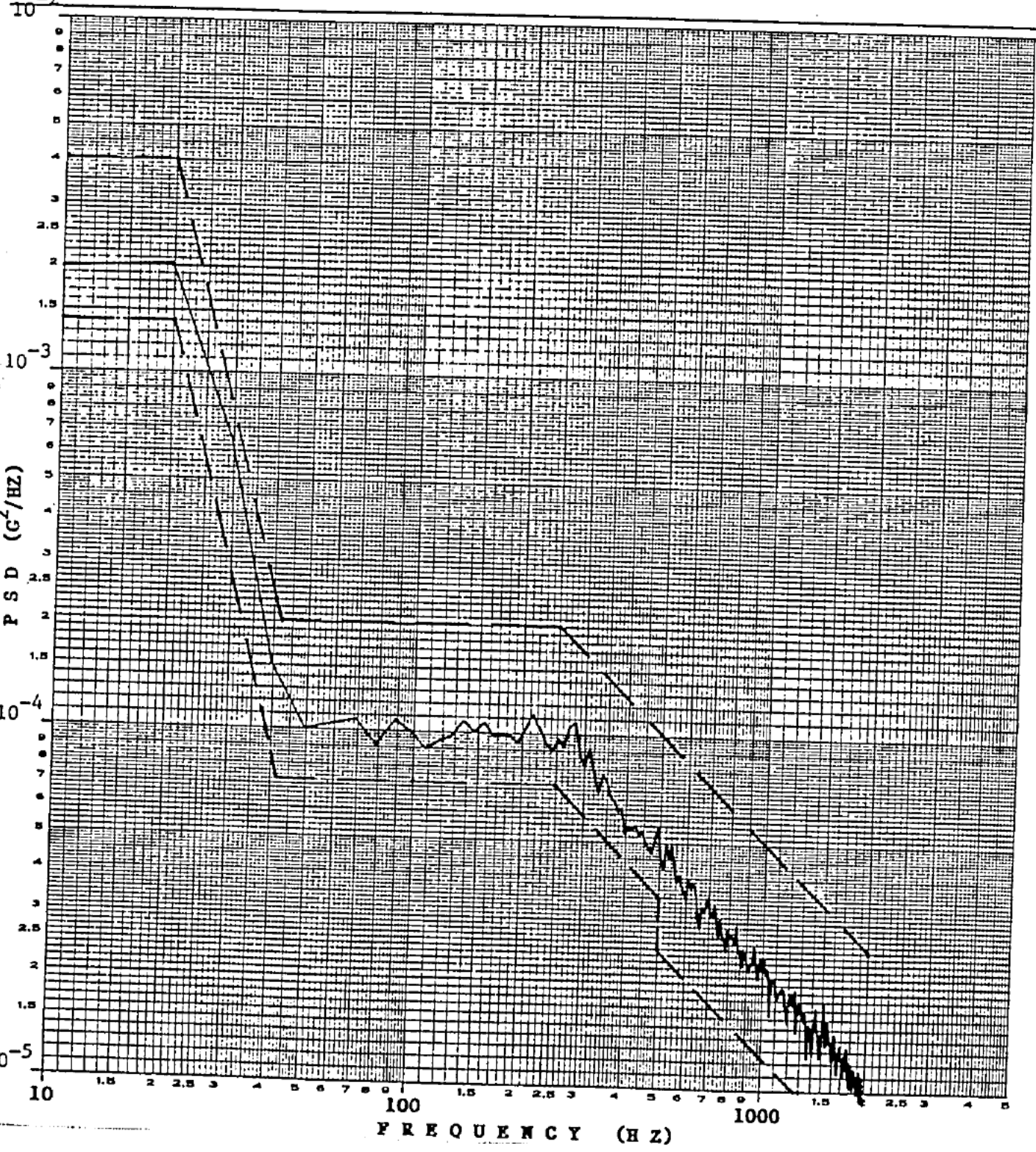
Test Axis X (LATERAL) Accel. No. C1 & Axis X Control (X) Response ( )

Delta F 9.77 Degrees of Freedom 144 Full Scale 10^{-2} G^2/hz

Operator [redacted] AWF 5 Overall Grms .3376

PLOTTED AT 60 (MIN.)(HRS.) OF 60 (MIN.)(HOUR) TEST

* Gulfstream G IV Sector, Control Head and Pedestal



5.0 PROCEDURES, REQUIREMENTS AND RESULTS (CONTINUED)

5.3 Endurance Test

5.3.1 The specimen was mounted in the vibration fixture and the friction control was set for a five pound friction force on the power levers. Photograph 4 shows the specimen undergoing the Endurance Test. The specimen Power, Fuel Cock and Friction Control Levers were each subjected to 25,000 cycles as follows:

5.3.1.1 Power Lever Cycling

5.3.1.1.1 The power levels were cycled, at a rate of approximately five cycles per minute, with one cycle consisting of operating each lever from minimum rpm to maximum rpm and back to minimum rpm.

5.3.1.1.2 The specimen completed the 25,000 Power Lever cycles with no apparent damage. The results obtained are presented in Data Sheet 4.

5.3.1.2 Fuel Cock Lever Cycling

5.3.1.2.1 The fuel cock levers were cycled, at a rate of approximately three cycles per minute, with one cycle consisting of operating each lever from shut to start and then open, returning back to shut, stopping at each detent.

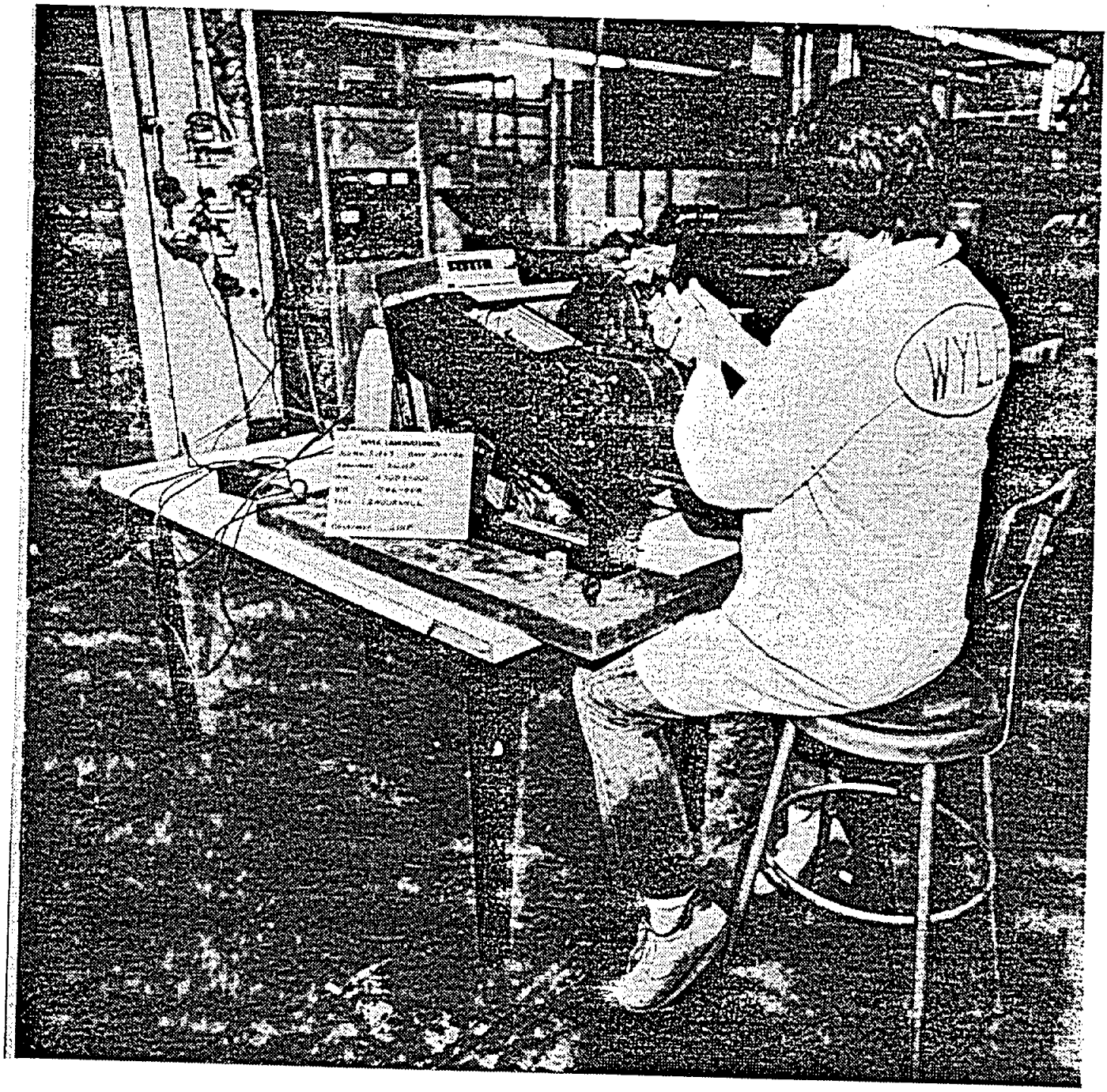
5.3.1.2.2 The specimen completed the 25,000 Fuel Cock Lever cycles with no apparent damage. The results obtained are presented in Data Sheet 4.

5.3.1.3 Friction Control Lever Cycling

5.3.1.3.1 The friction control lever was cycled, at a rate of approximately five cycles per minute, with one cycle consisting of operating the lever from friction off to full friction and back to friction off.

5.3.1.3.2 The specimen completed the 25,000 Friction Control Lever cycles with no apparent damage. The results obtained are presented in Data Sheet 4.

5.3.2 At the conclusion of the Endurance Test, the specimen was subjected to an Operational Test by SIHP personnel. No performance anomalies were indicated.



PHOTOGRAPH 4

ENDURANCE TEST SETUP

WYLE
LABORATORIES SCIENTIFIC SERVICES & SYSTEMS GROUP

Report No. 51463
Page No. 39

DATA SHEET 4

TEST TITLE ENDURANCE

CUSTOMER SARGENT INDUSTRIES Job No. 51463
Specimen GULFSTREAM G IV SECTOR, CONTROL HEAD & PEDESTA Date Started 7-31-86
Part No. 43083-001 Serial No. 786-008 Date Comp. 8-7-86
Spec. QTP 07-43083-01 Par. 3.7 Photo YES Amb. Temp. 70°F ± 15°F

THE ENGINE POWER CONTROL ASSEMBLY WAS MOUNTED IN A QUALIFICATION TEST FIXTURE. THE FRICTION CONTROL WAS SET FOR A 5 POUND FRICTION FORCE ON THE LEVERS AND THE FOLLOWING DATA WAS OBTAINED.

THE POWER LEVER CYCLING CONSISTED OF OPERATING EACH LEVER FROM MINIMUM RPM TO MAXIMUM RPM AND BACK TO MINIMUM RPM. THE ENGINE POWER CONTROL LEVERS WERE CYCLED FOR A TOTAL OF 25,000 CYCLES. RESULTS: NO APPARENT DAMAGE. COMPLETED 20:03 ON 8-1-86. R.V.

THE FUEL COCK LEVER CYCLING CONSISTED OF OPERATING EACH FUEL COCK LEVER FROM SHUT TO START AND THEN OPEN, RETURNING BACK TO SHUT, STOPPING AT EACH DETENT. THE HIGH PRESSURE FUEL COCK LEVERS WERE CYCLED FOR A TOTAL OF 25,000 CYCLES. RESULTS: NO APPARENT DAMAGE. COMPLETED 9:59 ON 8-6-86. R.V.

THE FRICTION CONTROL LEVER CYCLING CONSISTED OF OPERATING THE LEVER FROM FRICTION OFF TO FULL FRICTION AND BACK TO FRICTION OFF. THE FRICTION CONTROL LEVER WAS CYCLED FOR A TOTAL OF 25,000 CYCLES. RESULTS: NO APPARENT DAMAGE. COMPLETED 10:25 ON 8-7-86. R.V.

W614A-82 QA Form Approval [redacted]

Tested by [redacted]
Engineer

5.0 PROCEDURES, REQUIREMENTS AND RESULTS (CONTINUED)

5.4 Mechanical Shock Test

5.4.1 The Control Head Assembly (P/N 43084-001, S/N 009), with its controls in their respective mid positions, was mounted in the shock test fixture and installed on a vibration exciter. The specimen was then subjected to two shocks, in each direction of each axis, for a total of 12 shocks.

5.4.2 Each shock pulse had a sawtooth waveform shape with a magnitude of 20 ± 3g and a duration of 11 milliseconds.

5.4.3 The Control Head Assembly completed the Mechanical Shock Test with no apparent damage. The results obtained are presented in Data Sheet 5 which includes an X-Y plot of the pulse obtained in each direction of each axis.

WYLE LABORATORIES SCIENTIFIC SERVICES & SYSTEMS GROUP

DATA SHEET 5

TEST TITLE SHOCK

CUSTOMER SARGENT INDUSTRIES Job No. 51463
Specimen CONTROL HEAD ASSEMBLY Date Started 8-11-86
Part No. 430844-001 Serial No. 009 Date Comp. 8-12-86
Spec. QTP 07-42083-1 Par. 3.7 Photo No Amb. Temp. 70°F ±15°F

REQUIREMENTS: No. of Specimens 1 No. of Axes 3 (X, Y & Z)
No. of Impacts 12 No. of Directions 2 (+, -)
Impacts Each Direction 2 Wave Shape SAWTOOTH
Shock Magnitude 20 G Shock Duration 11 MS
Examination: Visual, at conclusion of test.
Other:

TEST METHOD:

The specimen~~(s)~~ (was) ~~(were)~~ assembled to a suitable test fixture and mounted on a vibration exciter, ~~or a Wyle Shock Test Machine,~~ pre-set to provide shock impacts in accordance with the above requirements. The following shock data was obtained:

Axis	Y	Y	X	X	Z	Z						
Direction	+	-	-	+	+	-						
Magnitude (G)	22.2	20.1	19.8	20.0	20.6	19.6						
Duration (MS)	11	11	11	11	11	11						
Total Impacts	2	2	2	2	2	2						
Ref. Plot No.	1	2	3	4	5	6						

At the conclusion of the test the specimen~~(s)~~ (was) ~~(were)~~ removed from the test fixture and visually examined for evidence of damage.

TEST RESULTS: COMPLETED SHOCK TEST WITH NO APPARENT DAMAGE. NO PERFORMANCE ANOMALIES WERE REPORTED BY SARGENT.

W614A-82 QA Form Approval SH

Tested by [redacted]
Engineer

WYLE LABORATORIES SHOCK PLOT NO. 1

Report No. 51463

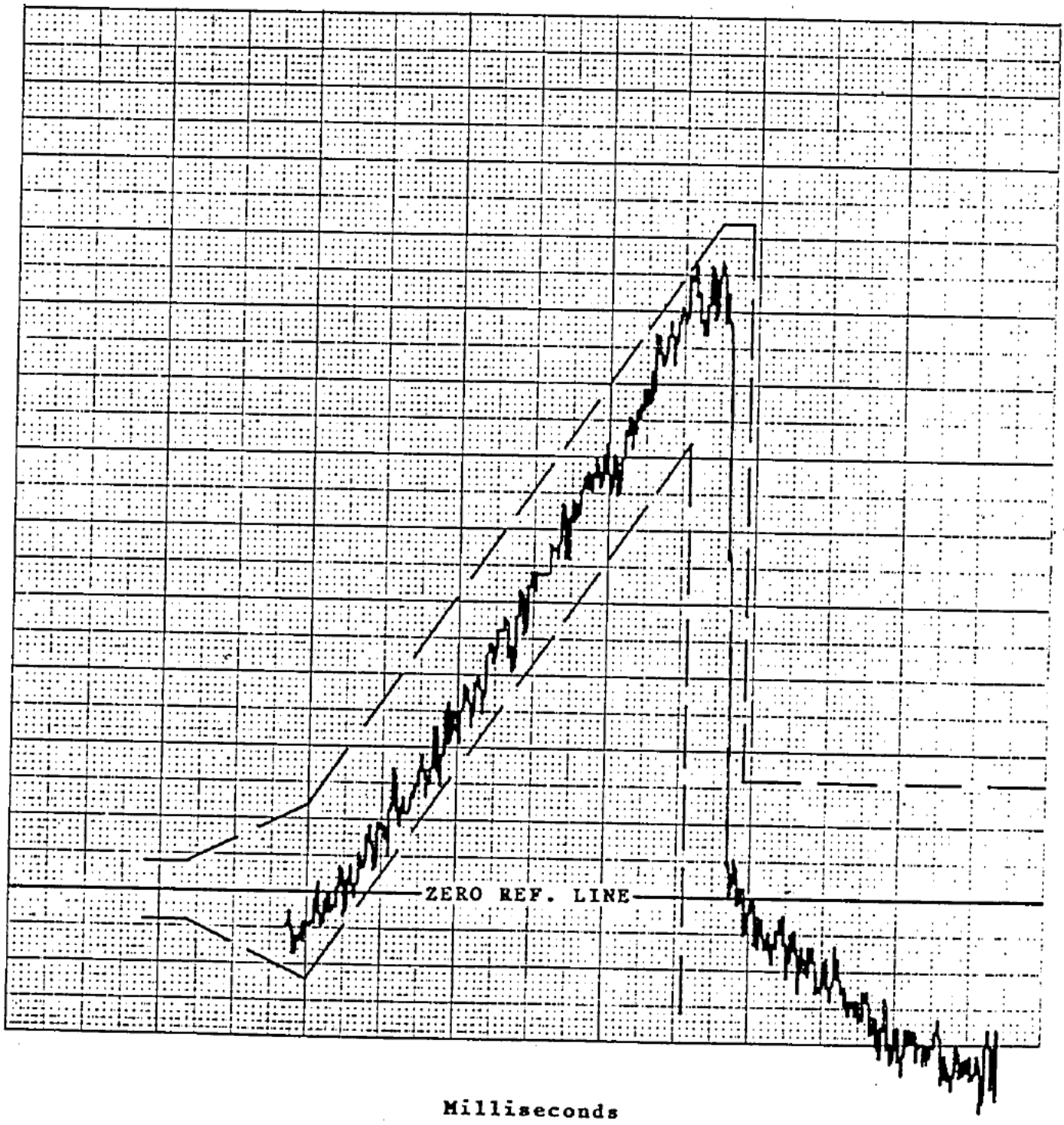
Page No. 42

Customer SARGENT INDUSTRIES J/N 51463 Date 8-11-86

Specimen CONTROL HEAD ASSEMBLY P/N 43084-001 S/N 009

Axis LONG. "Y" Typ. of Shocks 1 @ 2 Operator [redacted]

22.2 G's



WYLE LABORATORIES SHOCK PLOT NO. 2 Report No. 51463

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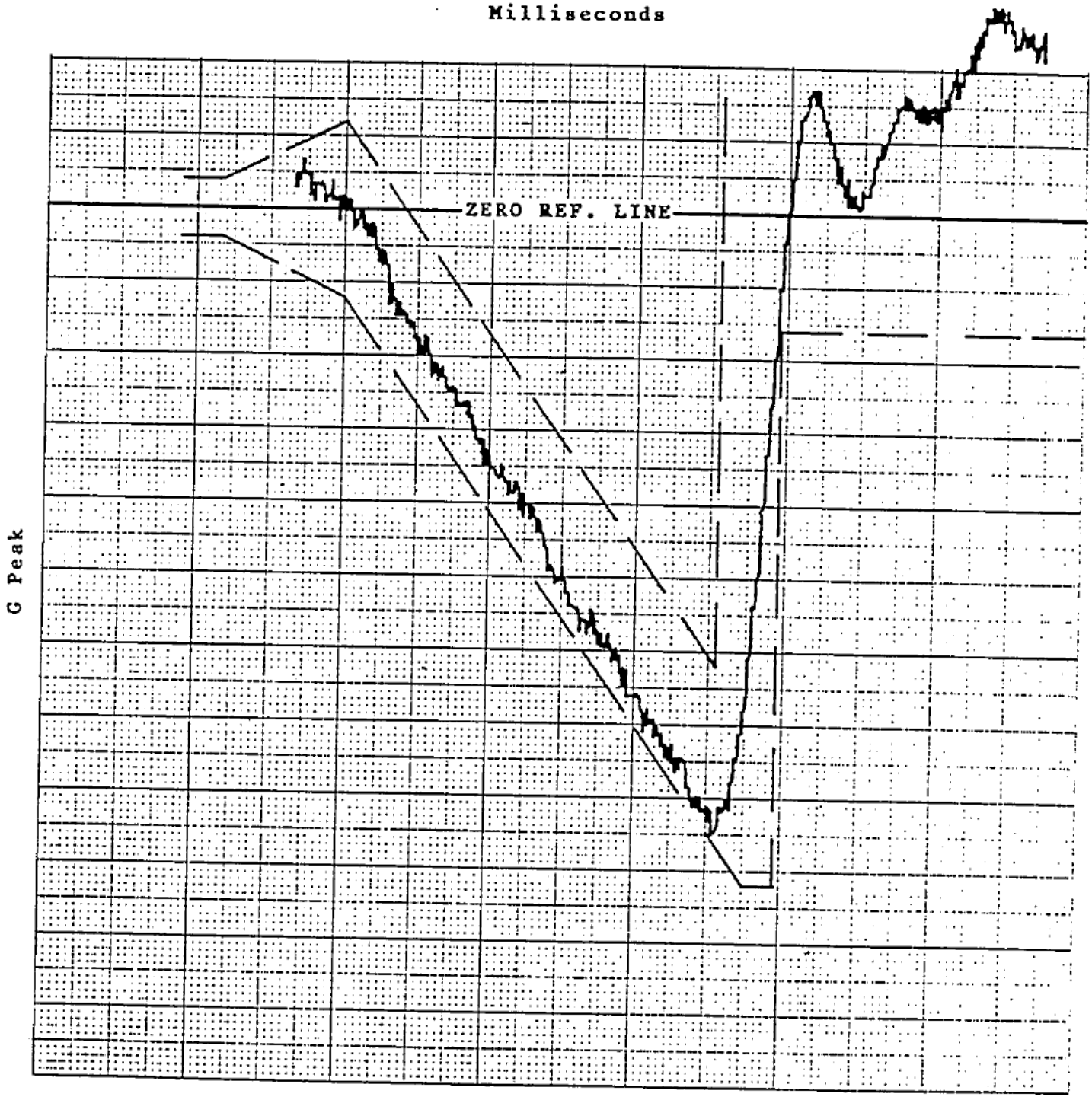
Customer SARGENT INDUSTRIES J/N 51463 Date 8-11-86

Specimen CONTROL HEAD ASSEMBLY P/N 43084-001 S/N 009

Axis LONG. "Y" Typ. of Shocks 3 & 4 Operator [redacted]

20.1 G's



WYLE LABORATORIES SHOCK PLOT NO. 3

Report No. 51463

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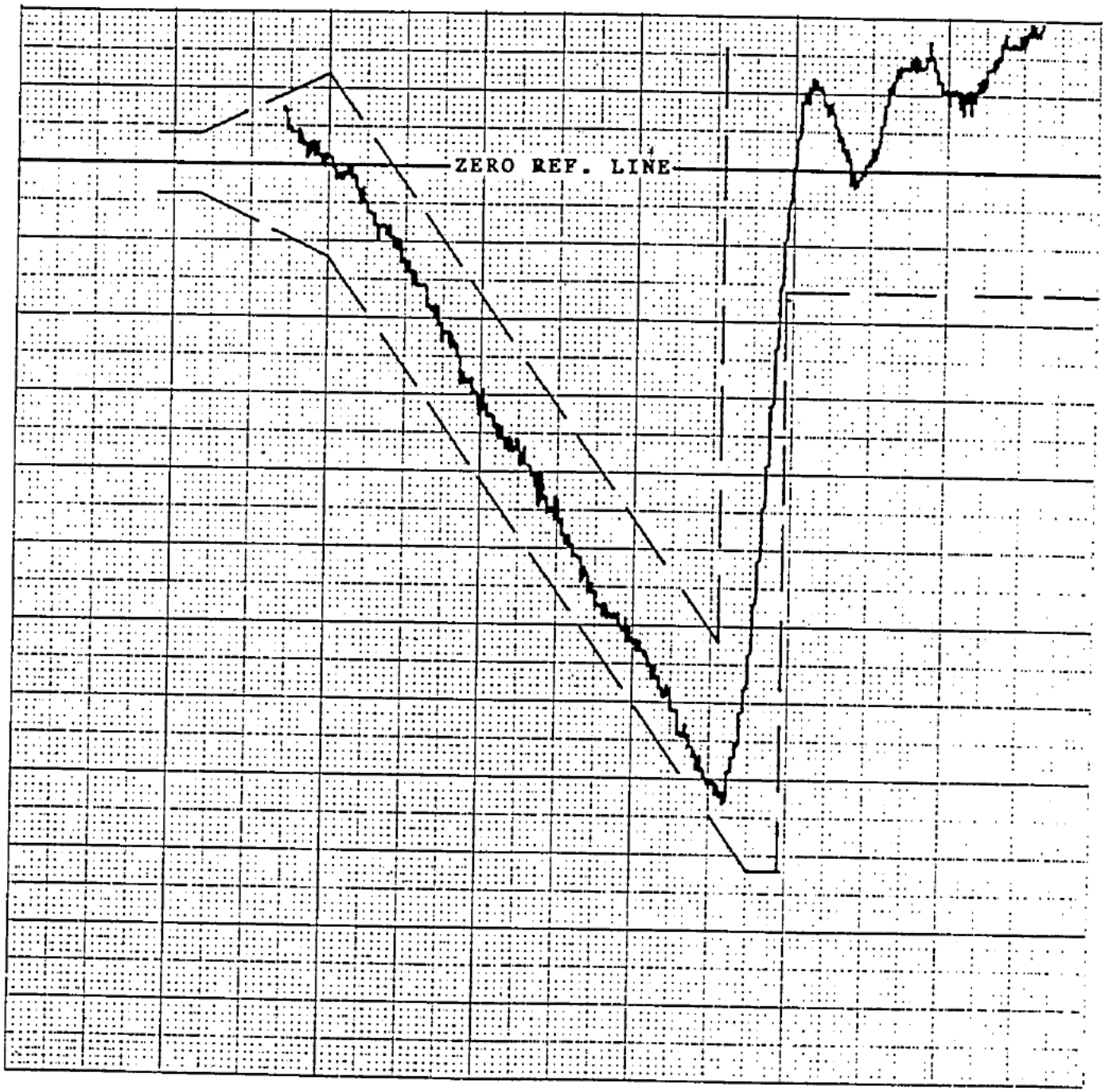
Customer SARGENT INDUSTRIES J/N 51463 Date 8-11-86

Specimen CONTROL HEAD ASSEMBLY P/N 43084-001 S/N 009

Axis LAT. "X" Typ. of Shocks 5 & 6 Operator [redacted]

20.0 G's

Milliseconds



WYLE LABORATORIES SHOCK PLOT NO. 4 Report No. 51463

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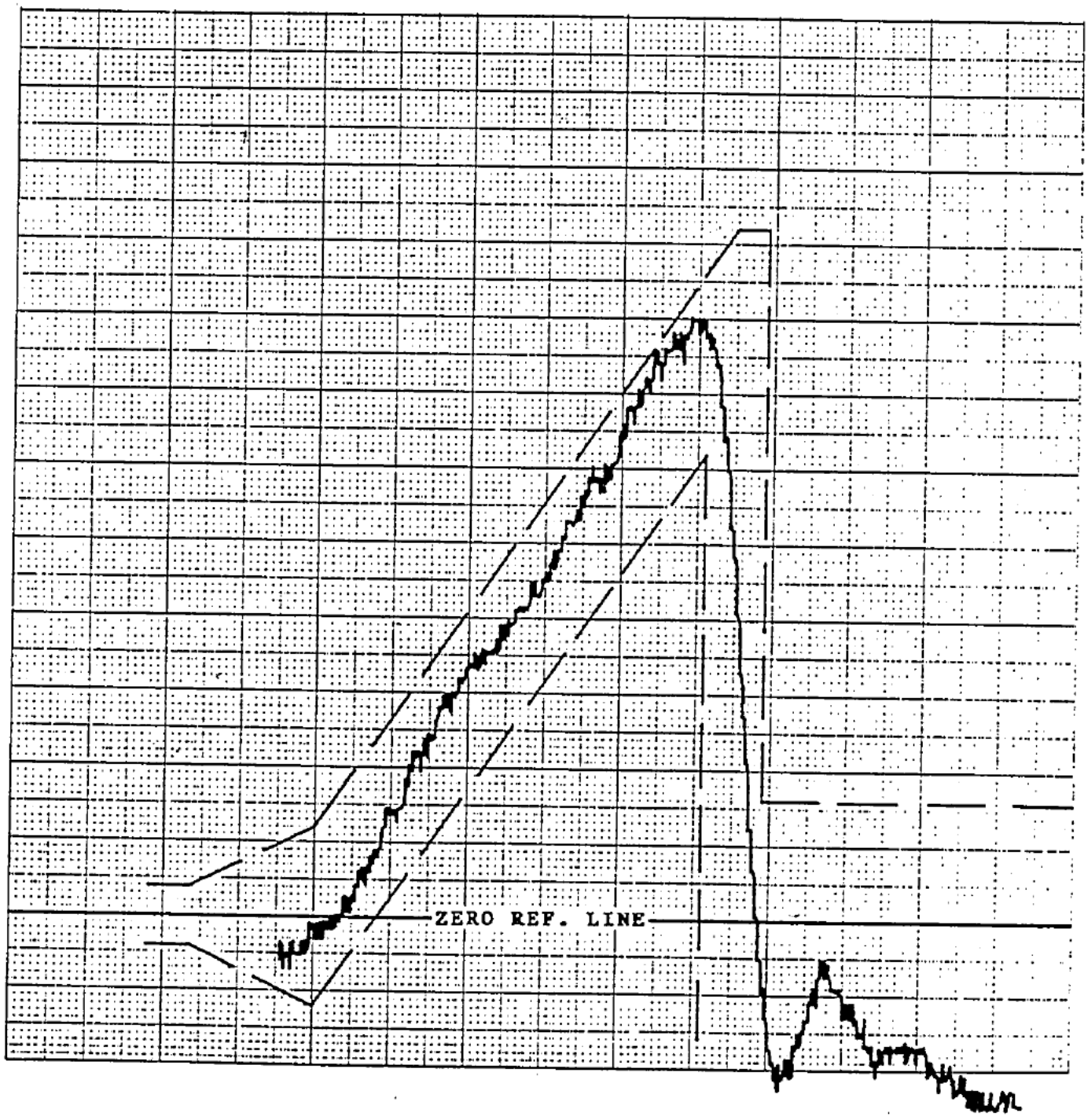
Customer SARGENT INDUSTRIES J/N 51463 Date 8-11-86

Specimen CONTROL HEAD ASSEMBLY P/N 43084-001 S/N 009

Axis LAT. "X" Typ. of Shocks 7 & 8 Operator [redacted]

19.8 G's



WYLE LABORATORIES SHOCK PLOT NO. 5

Report No. 51463

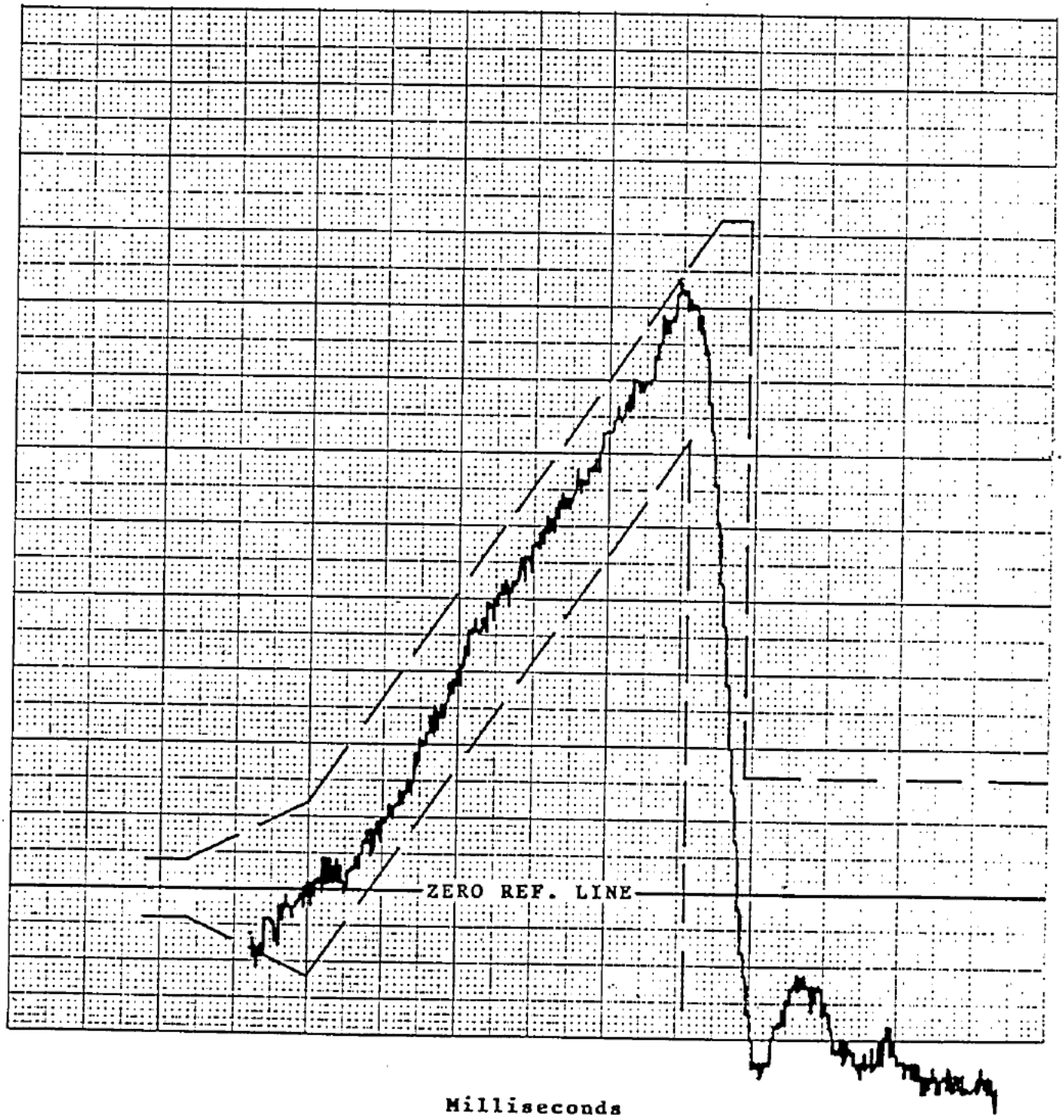
Page No. 46

Customer SARGENT INDUSTRIES J/N 51463 Date 8-12-86

Specimen CONTROL HEAD ASSEMBLY P/N 43084-001 S/N 009

Axis VERT."Z" Typ. of Shocks 9 @ 10 Operator [redacted]

20.6 G's



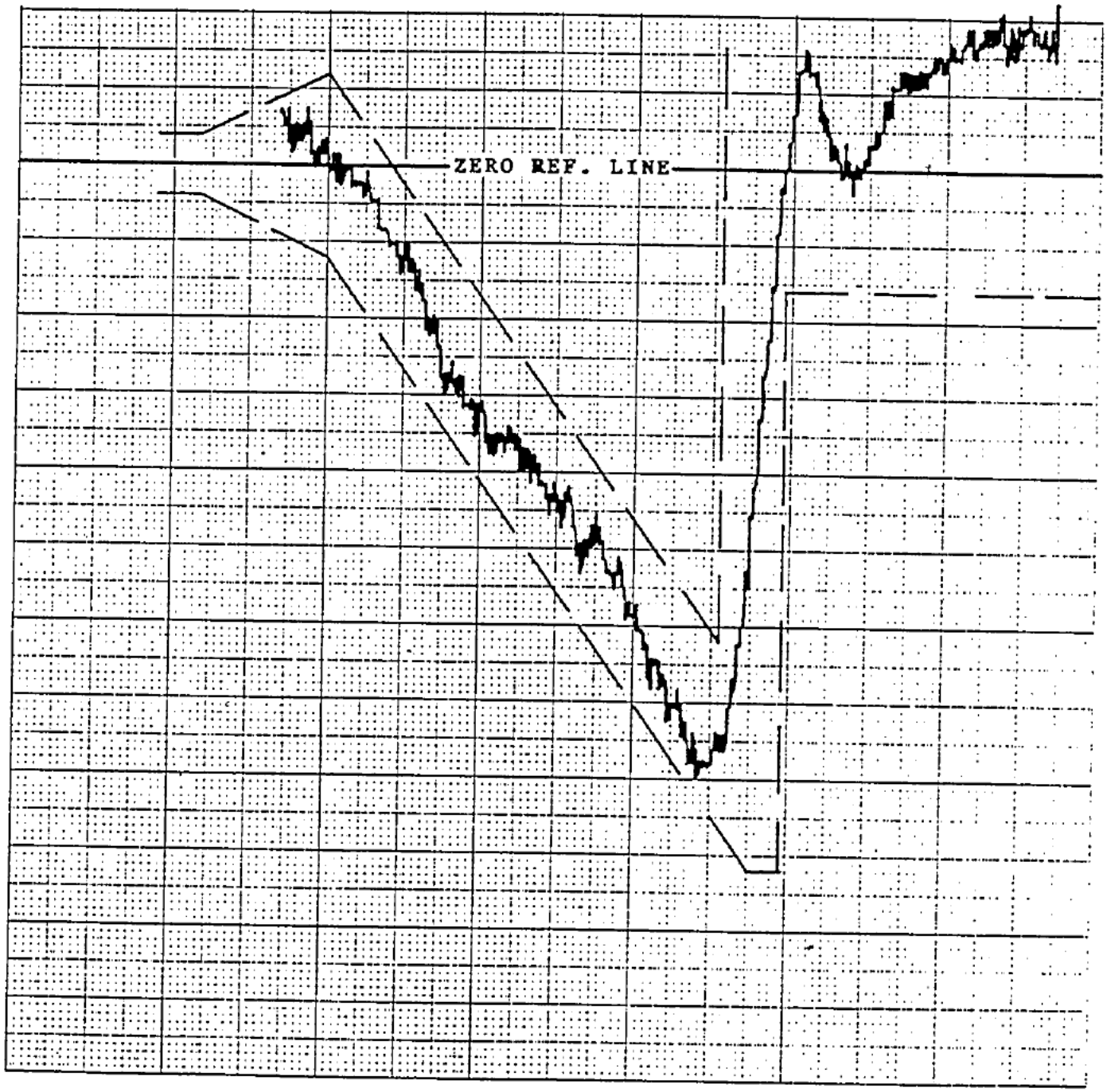
WYLE LABORATORIES SHOCK PLOT NO. 6

Report No. 51463
Page No. 47

Customer SARGENT INDUSTRIES J/N 51463 Date 8-12-86
Specimen CONTROL HEAD ASSEMBLY P/N 43084-001 S/N 009
Axis VERT. "Z" Typ. of Shocks 11 & 12 Operator [redacted]

19.6 G's

Milliseconds



5.0 PROCEDURES, REQUIREMENTS AND RESULTS (CONTINUED)

5.5 Ultimate Load Test

5.5.1 The specimen was installed in the setup shown in Photograph 5. The specimen was then subjected to the following loads which were applied for a minimum period of five seconds:

5.5.1.1 With the power levers against the forward stops and the thrust reverse levers in the stowed position, a 225 pound load was applied in the forward direction to the right hand and left hand levers against the forward stop and 20° to the right and 20° to the left of the forward stop.

5.5.1.2 With the power levers in a mid-position, the thrust reverse levers in the stowed position and the sheaves in the sector locked, a 225 pound load was applied to the right hand and left hand levers in the forward and aft directions.

5.5.1.3 With the power levers against the idle stops and the thrust reverse levers in the extended position, a 225 pound load was applied in the aft direction to the right hand and left hand levers against the idle stop and 20° to the right and 20° to the left of the idle stop.

5.5.1.4 With the high pressure fuel cock (HPFC) levers in the open position, a 225 pound load was applied to the left hand and right hand levers in the forward direction.

5.5.1.5 With the HPFC levers in the mid-position (not in detent slot) and the sheaves locked, a 225 pound load was applied to the right hand and left hand levers in the forward and aft directions.

5.5.1.6 With the HPFC levers in the shut position against the aft stop, a 225 pound load was applied to the right hand and left hand levers in the aft direction.

5.5.1.7 With the friction control lever in the forward (full friction on) position, a 225 pound load was applied in the forward direction at the lever grip hole.

5.5.1.8 With the friction control lever in the aft (full decrease) position, a 225 pound load was applied in the aft direction at the lever grip hole.

5.5.1.9 With the flap lever in the up position against the forward stop, a 225 pound load was applied in the forward direction at the lever grip hole.

5.5.1.10 With the flap lever in the down position against the aft stop, a 225 pound load was applied in the aft direction at the lever grip hole.

5.5.1.11 With the speed brake lever in the extend position against the stop, a 225 pound load was applied in the forward direction at the lever grip hole.

5.0 PROCEDURES, REQUIREMENTS AND RESULTS (CONTINUED)

5.5 Ultimate Load Test (Continued)

5.5.1 (Continued)

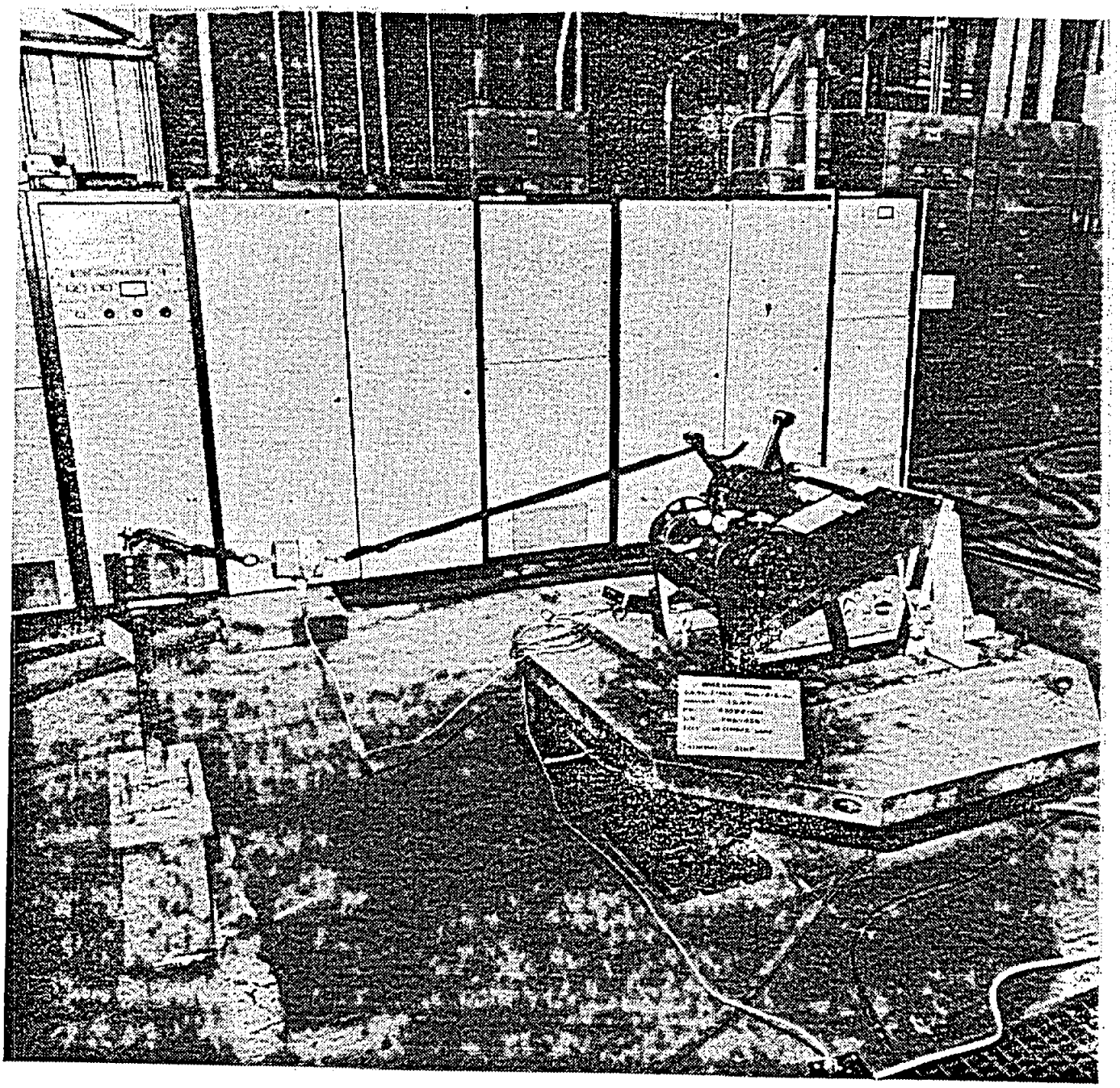
5.5.1.12 With the speed brake in the mid-position and the sheave locked, a 225 pound load was applied at the lever grip hole in the aft and forward directions.

5.5.1.13 With the speed brake in the retract position against the stop, a 225 pound load was applied in the aft direction at the lever grip hole.

5.5.2 The specimen completed the Ultimate Load Test with no apparent damage and no performance anomalies were indicated by SIHP personnel. The results obtained are presented in Data Sheet 6.

6.0 SPECIMEN DISPOSITION

At the conclusion of the Qualification Vibration, Endurance, Mechanical Shock and Ultimate Load Tests, the specimen was returned to SIHP for evaluation.



PHOTOGRAPH 5

ULTIMATE LOAD TEST SETUP

KAISER ELECTROPRECISION

DOCUMENT CHANGE/ RELEASE NOTICE

DOCUMENT NO.	DATE	REV.
RYY112-281	02-08-06	-

SIZE	DOCUMENT	DC/RN
A	SHT. 1 OF 45	SHT. 1 OF 1

DOCUMENT TITLE	SOURCE CODE	PROJECT NUMBER	RELEASE NUMBER
QUALIFICATION BY SIMILARITY REPORT FOR GIV FLAP AND SPEED BRAKE ASSEMBLIES		8814	

PARTS STATUS

PLANNED		NEXT ASSY 4260-0010	M.O. REQ'D.	QAIP REQ'D.	[redacted]
ORDERED		TOOLING STATUS			
IN PROGRESS		CUSTOMER GULFSTREAM AEROSPACE			
IN STOCK		CUSTOMER APPROVAL REQ'D. YES, OK TO RELEASE			
BY		PSS FORM REQ'D ☐ YES ☑ NO			

ITEM	DESCRIPTION OF CHANGE	CL I	CL II	REASON
1	NEW RELEASE SAME AS RYY112-281 X4	☐	☑	THIS REVISION IS SAME AS X4 REVISION APPROVED IN SEM 20040.

EFFECTIVITY

AS OF DATE OF RELEASE

[redacted]

DISPOSITION OF EXISTING PARTS	USE	REWORK	SCRAP	RECORD
IN STOCK:				✓
IN PROCESS:				✓
TOOLING:				

REMARKS:

PARTS LIST REV.

CCB2 RELEASE APPROVAL

[redacted]

DISTRIBUTION
G-IV LIST
(2) CUSTOMER

RELEASE DATE
8/8/02
MB

ELECT. ENG. N/A

CAD MS WORD

KEDCRN99-08

DATA SHEET 6 (CONT.)

TEST TITLE ULTIMATE LOAD Date 8-12-86
Customer Sargent Industries Job No. 51463
Specimen Gulfstream G IV Sector, Control Head & Pedestal Technician [redacted]
Part No. 43083-001 Serial No. 786-008 Engineer [redacted]

WITH THE POWER LEVERS IN A MID-POSITION, THE THRUST REVERSE LEVERS IN THE STOWED POSITION AND THE SHEAVES IN THE SECTOR LOCKED, A 225 LB. LOAD WAS APPLIED TO EACH LEVER IN THE AFT DIRECTION. RESULTS: NO APPARENT DAMAGE. COMPLETED 13:16. R.V.

WITH THE HPFC LEVERS IN THE MID-POSITION AND THE SHEAVES LOCKED, A 225 LB. LOAD WAS APPLIED TO EACH LEVER IN THE AFT DIRECTION. RESULTS: NO APPARENT DAMAGE. COMPLETED 13:29. R.V.

WITH THE SPEED BRAKE IN THE MID-POSITION AND THE SHEAVE LOCKED, A 225 LB. LOAD WAS APPLIED IN THE AFT DIRECTION AT THE LEVER GRIP HOLE. RESULTS: NO APPARENT DAMAGE. COMPLETED 13:44. R.V.

WITH THE POWER LEVERS AGAINST THE IDLE STOPS AND THE THRUST REVERSE LEVERS IN THE EXTENDED POSITION, A 225LB. LOAD WAS APPLIED AT A 20° ANGLE TO THE LEFT, APPLIED AT THE LEVER GRIP HOLE IN THE APT DIRECTION. RESULTS: NO APPARENT DAMAGE. COMPLETED 13:54. R.V.

WITH THE POWER LEVERS AGAINST THE IDLE STOPS AND THE THRUST REVERSE LEVERS IN THE EXTENDED POSITION, A 225 LB LOAD WAS APPLIED AT A 20° ANGLE TO THE RIGHT, APPLIED AT THE LEVER GRIP HOLE IN THE AFT DIRECTION. RESULTS: NO APPARENT DAMAGE. COMPLETED 13:59. R.V.

WITH THE POWER LEVERS AGAINST THE FORWARD STOPS AND THE THRUST REVERSE LEVERS IN THE STOWED POSITION, A 225 LB. LOAD WAS APPLIED TO EACH POWER LEVER IN THE FORWARD DIRECTION. RESULTS: NO APPARENT DAMAGE. COMPLETED 14:14. R.V.

WYLE SCIENTIFIC SERVICES & SYSTEMS LABORATORIES GROUP

Report No. 51463
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DATA SHEET 6 (CONT.)

TEST TITLE ULTIMATE LOAD Date 8-12-86
Customer Sargent Industries Job No. 51463
Specimen Gulfstream G IV Sector, Control Head & Pedestal Technician [redacted]
Part No. 43083-001 Serial No. 786-008 Engineer [redacted]

WITH THE FRICTION CONTROL LEVER IN THE FORWARD (FULL FRICTION ON) POSITION, A 225 LB. LOAD WAS APPLIED IN THE FORWARD DIRECTION AT THE LEVER GRIP HOLE. RESULTS: NO APPARENT DAMAGE. COMPLETED 14:16. R.V.

WITH THE SPEED BRAKE LEVER IN THE EXTEND POSITION AGAINST THE STOP, A 225 LB. LOAD WAS APPLIED IN THE FORWARD DIRECTION AT THE LEVER GRIP HOLE. RESULTS: NO APPARENT DAMAGE. COMPLETED 14:17. R.V.

WITH THE FLAP LEVER IN THE UP POSITION AGAINST FORWARD STOP, A 225 LB. LOAD WAS APPLIED IN THE FORWARD DIRECTION AT THE LEVER GRIP HOLE. RESULTS: NO APPARENT DAMAGE. COMPLETED 14:21. R.V.

WITH THE HPFC LEVERS IN THE OPEN POSITION, EACH LEVER WAS SUBJECTED TO A 225 LB. LOAD IN THE FORWARD DIRECTION. RESULTS: NO APPARENT DAMAGE. COMPLETED 14:27. R.V.

WITH THE POWER LEVERS IN A MID-POSITION, THE THRUST REVERSE LEVERS IN THE STOWED POSITION AND THE SHEAVES IN THE SECTOR LOCKED, A 225 LB. LOAD WAS APPLIED ON EACH LEVER IN THE FORWARD DIRECTION. RESULTS: NO APPARENT DAMAGE. COMPLETED 15:15. R.V.

WITH THE SPEED BRAKE IN THE MID-POSITION AND THE SHEAVE LOCKED, A 225 LB. LOAD WAS APPLIED AT THE LEVER GRIP HOLE IN THE FORWARD DIRECTION. RESULTS: NO APPARENT DAMAGE. COMPLETED 15:25. R.V.

WYLE LABORATORIES SCIENTIFIC SERVICES & SYSTEMS GROUP

Report No. 51463
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DATA SHEET 6 (CONT.)

TEST TITLE ULTIMATE LOAD Date 8-12-86
Customer Sargent Industries Job No. 51463
Specimen Gulfstream G IV Sector, Control Head & Pedestal Technician [redacted]
Part No. 43083-001 Serial No. 786-008 Engineer [redacted]

WITH THE HPFC LEVERS IN THE MID-POSITION AND THE SHEAVES LOCKED, A 225 LB. LOAD WAS APPLIED TO EACH LEVER IN THE FORWARD DIRECTION. RESULTS: NO APPARENT DAMAGE. COMPLETED 15:31. R.V.

WITH THE POWER LEVERS AGAINST THE FORWARD STOPS AND THE THRUST REVERSE LEVERS IN THE STOWED POSITION, A 225 LB. LOAD WAS APPLIED TO EACH LEVER AT AN ANGLE 20° TO THE LEFT IN THE FORWARD DIRECTION. RESULTS: NO APPARENT DAMAGE. COMPLETED 15:48. R.V

WITH THE POWER LEVERS AGAINST THE FORWARD STOPS AND THE THRUST REVERSE LEVERS IN THE STOWED POSITION, A 225 LB. LOAD WAS APPLIED AT AN ANGLE 20° TO THE RIGHT IN THE FORWARD DIRECTION. RESULTS: NO APPARENT DAMAGE. COMPLETED 15:52 R.V.

TITLE GIV Post-Qualification Inspection and Evaluation Report

1.0 REFERENCES

1.1 Wyle Laboratories, El Segundo, CA — Test Report 51463

2.0 PURPOSE

The purpose of this report is to present the results of the dimensional and physical inspection of component parts for the 43083-001 sector, control head and pedestal, S/N 736-008, used for the qualification test (reference Wyle Report No. 51463).

3.0 SUMMARY

3.1 The control quadrant met the requirements of the acceptance test procedure before disassembly and evaluation.

3.2 The sector, control head and pedestal successfully completed the post-qualification, dimensional and physical inspection. There was no evidence of excessive wear or physical anomalies that would impair control quadrant performance.

3.3 Procedures and results are presented in paragraphs 5.1 through 5.6.

4.0 TEST CONDITIONS

4.1 Ambient Conditions

All tests were performed at atmospheric pressure, a temperature of 77 ±18° F and a relative humidity of 90% or less.

4.2 Dimensions of evaluated parts were measured per Sargent Industries drawing 43083-001.

4.3 The physical condition of evaluated parts was obtained from visual, magnetic and liquid penetrant inspections. Magnetic inspections were performed at Sargent Industries, Huntington Park, California. The liquid penetrant inspections were performed at Aircraft X-Ray, Huntington Park, California.

5.0 PROCEDURES, REQUIREMENTS AND RESULTS

5.1 Post-Test Inspection

5.1.1 The control quadrant was visually examined for evidence of damage or other defects that may have resulted from qualification testing.

5.1.2 There was no visible evidence of damage to the control quadrant.

5.1.3 An acceptance test was performed on the control quadrant upon completion of the visual examination (paragraph 5.1.1). The control quadrant met all the requirements of the acceptance test procedure.

5.2 Control Quadrant Disassembly

5.2.1 The control quadrant was disassembled to piece part and permanent sub-assembly configurations; i.e., riveted or welded sub-assemblies.

5.2.2 Inspection procedures for the disassembled parts and sub-assemblies were separated into four (4) categories; visual, dimensional, magnetic and liquid penetrant. Visual only was required for mandatory replacement parts. Further inspection was required for parts to be re-assembled into a flightworthy quadrant upon passage of their respective inspections.

5.3 Visual Inspection Procedure and Results

5.3.1 Mandatory replacement parts such as nuts, bolts, cycled bearings, switches and springs were visually inspected to determine satisfactory completion of qualification testing. (ATP verified switch performance; visual inspection will determine condition.) New parts are to be issued for re-assembly of the quadrant.

5.3.2 There was no sign of damage or excessive wear which would affect the control quadrant's performance or safety.

5.4 Dimensional Inspection Procedure and Results

5.4.1 In addition to visual inspection, parts such as housings, covers and knobs were dimensionally inspected to determine conformance to blueprints after qualification testing of the control quadrant. These parts were not directly loaded during proof and ultimate testing or directly impacted during shock and endurance.

5.4.2 There were no signs of excessive wear or permanent deformation which would affect the performance or safety of the control quadrant. The dimensionally inspected parts were consistent with blueprint dimensions and tolerances.

5.5 Dimensionally and Magnetically Inspected Parts, Procedures and Results

5.5.1 Piece parts and sub-assemblies that were directly loaded during the qualification test and are of magnetic material were dimensionally inspected to determine if there were signs of excessive wear or permanent deformation. Parts were then magnetically inspected to determine if surface impairments (i.e., cracks) had developed during control quadrant qualification. Parts that were tested under this section were steel axles, lever components, hub assemblies, etc.

5.5.2 There were no signs of damage, excessive wear or permanent deformation which would affect performance or safety of the control quadrant. The dimensionally inspected parts were consistent with blueprint dimensions and tolerances. Parts were acceptable to magnetic inspection requirements.

5.6 Dimensionally and Penetrant Inspected Parts, Procedures and Results

5.6.1 In addition to visual inspection, piece parts and sub-assemblies that were directly loaded during the qualification test and are not of a magnetic material were dimensionally inspected to determine if there was excessive wear of bearing areas or permanent deformation. Parts were then liquid penetrant inspected to determine if surface impairments (i.e., cracks) had developed during control quadrant qualification. Parts that were inspected were non-magnetic, lever, hubs, axles, control rods, etc.

5.6.2 There were no signs of excessive wear, damage or permanent deformation that would affect performance or safety of the control quadrant. The dimensionally inspected areas were consistent with blueprint dimensions and tolerances. Liquid penetrant inspection disclosed no signs of abnormalities or deterioration.

APPENDIX A

Kaiser Electroprecision:

Document number: RYY112-281, REV N/C

Title: Qualification by Similarity Report for GIV Flap and Speed Brake Assemblies

Dated: August 6, 2002

KAISER ELECTROPRECISION

DOCUMENT CHANGE/ RELEASE NOTICE

DOCUMENT NO.	DATE	REV.
RYY112-281	02-08-06	-

SIZE	DOCUMENT	DC/RN
A	SHT. 1 OF 45	SHT. 1 OF 1

DOCUMENT TITLE	SOURCE CODE	PROJECT NUMBER	RELEASE NUMBER
QUALIFICATION BY SIMILARITY REPORT FOR GIV FLAP AND SPEED BRAKE ASSEMBLIES		8814	

PARTS STATUS

PLANNED		NEXT ASSY 4260-0010	M.O. REQ'D.	QAIP REQ'D.	CCB APPROVAL 02/08/06
ORDERED		TOOLING STATUS			
IN PROCESS		CUSTOMER GULFSTREAM AEROSPACE			
IN STOCK		CUSTOMER APPROVAL REQ'D. YES, OK TO RELEASE			
BY		PSS FORM REQ'D ☐ YES ☑ NO			

ITEM	DESCRIPTION OF CHANGE	CL I	CL II	REASON
1	NEW RELEASE SAME AS RYY112-281 X4	☐	☑	THIS REVISION IS SAME AS X4 REVISION APPROVED IN SEM 20040.

EFFECTIVITY

AS OF DATE OF RELEASE

PREPARED BY: [redacted]

DISPOSITION OF EXISTING PARTS	USE	REWORK	SCRAP	RECORD
IN STOCK:				✓
IN PROCESS:				✓
TOOLING:				

REMARKS:

PARTS LIST REV.

CCB2 RELEASE APPROVAL [redacted]

STRESS ENG. [redacted]

M[redacted]

ELECT. ENG. [redacted]

CAD [redacted]

DISTRIBUTION G-IV LIST (2) CUSTOMER

RELEASE DATE 8/8/02 MB

KEDCRN99-08