Report No. 11207.1 **No. of Pages 16**

Medium Weight Shock and Vibration Test Report on Vertical Pump with 40 HP Motor for Sims Pump Valve Co., Inc. Hoboken, NJ

NU LABORATORIES, INC.

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28 July 2009

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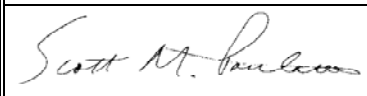	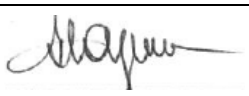	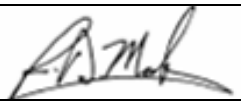
28 July 2009	28 July 2009	28 July 2009

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1. PURPOSE OF TEST

The purpose of this test was to demonstrate that the Vertical Pump with 40 HP Motor, "the Pump", complies with the requirements of MIL-S-901D for a nine (9) blow, medium weight, Grade A, Class 1, Type A, shock test, and with the requirements of MIL-STD-167-1 when subjected to vibration through the frequency range of 4 Hz through 50 Hz in each of the three (3) major axes.

2. MANUFACTURER

Sims Pump Valve Co., Inc.
1314 Park Avenue
Hoboken, NJ 07030

3. MANUFACTURER'S TYPE OR MODEL NO.

Vertical Pump with 40 HP Motor
Seawater service
NS18436-V40

4. SPECIFICATIONS

4.1 MILITARY

MIL-S-901D (NAVY) Military Specification, Shock Tests, H.I. (High Impact); Shipboard Machinery, Equipment and Systems, Requirements for, dated 17 March 1989

MIL-STD-167-1 (SHIPS) Military Standards Mechanical Vibrations of Shipboard Equipment, dated 1 May 1974

4.2 SIMS PUMP VALVE CO., INC.

Purchase Order No. 9159

5. NUMBER OF ITEMS TESTED

One (1) Pump

6. SECURITY CLASSIFICATION OF ITEM

Unclassified

7. DATES TESTS COMPLETED

17 July 2009

8. TEST CONDUCTED BY

NU Laboratories, Inc.
312 Old Allerton Road
Annandale, NJ 08801
(NAVY Certified Shock Test Facility by NAVSEAINST 9491.1C)

9. TEST WITNESSES

John Kozel – Sims Pump Valve Co., Inc.
Vladimir Speckor - Sims Pump Valve Co., Inc.

10. DISPOSITION OF TEST ITEM

The Pump was returned to Sims Pump Valve Co., Inc.

11. ABSTRACT

The Pump was subjected to a total of nine (9) medium weight shock blows in accordance with the referenced test specifications. Visual inspections, performed after each shock blow, revealed no discrepancies. Refer to Section 12 for additional information.

The Pump was subjected to vibration through the frequency range of 4 Hz through 50 Hz in each of the three (3) major axes in accordance with the referenced test specifications. Visual inspections, performed after each major axis, revealed no discrepancies. Refer to Section 13 for additional information.

12. SHOCK TEST DESCRIPTION

12.1 ACCEPTANCE CRITERIA

The Pump shall be considered to have failed the shock test if any portion of the equipment comes adrift or otherwise becomes a hazard to personnel, or equipment is not able to perform its Grade A specified function due to performance degradation in accordance with MIL-S-901D Section 3.1.10.1.

12.2 TEST SETUP

Upon receipt a visual inspection performed on the Pump revealed no obvious physical damage or discrepancy.

The Pump was weighed using a portable platform scale and the weight was recorded in the test log. The weight of the Pump was 951 pounds.

The Pump was attached to the test fixture using three (3) 3/4”-10 Grade 5 bolts torqued to 260 lbs-ft. The entire assembly was secured to fixture Figure 13 of MIL-S-901D on the medium weight shock machine oriented in the first major axis of test. The total weight on the anvil table was 3846.5 pounds. Refer to Table 1 for the medium weight shock test weights and Figure 1 for photographs of the test setup.

Table 1: Medium Weight Shock Test Weights

Unit	**951 lbs.**
Three(3) Ship and Car Channel	**87 lbs.**
Fixture	**1971.5 lbs.**
Mounting Bolts	**2 lbs.**
Suction Flange and Hose	**23 lbs.**
Suction Flange Bolts	**1.5 lbs.**
Discharge Flange and Hose	**17 lbs.**
Discharge Flange Bolts	**1.5 lbs.**
Four (4) Ship and Car Channels	**300 lbs.**
Eight (8) Ship and Car Channel Clamps	**68 lbs.**
Eight (8) Tee Blocks with Bolts	**32 lbs.**
Eight (8) ½” x 2” x 6” Spacers	**12 lbs.**
Figure 13	**380 lbs.**
Figure 16	**1470 lbs.**
Total Weight Fixture Figure 13	**3846.5 lbs.**
Total Weight Fixture Figure 16	**4936.5 lbs.**

12.3 TEST CONDITIONS

Throughout the shock test the Pump was monitored for any leaks or loss in pressure.

During blows marked as "**CONDITION A**" the Pump was flooded with water, energized with 440 VAC, three (3) phase, 60 Hz power and operating with the discharge pressure adjusted to 121 psig.

During blows marked as "**CONDITION B**" the Pump flooded with water and de-energized.

12.4 BLOW #1 – CONDITION A

12.4.1 Conditions: Vertical Axis, 1.75' hammer height, Group #I, 3" anvil table travel, Figure 13 of the referenced specifications.
12.4.2 Observations: A post-blow visual inspection revealed no obvious physical damage. No leakage or loss in pressure was reported.
12.4.3 Action: The mounting bolts were retorqued and testing was continued.

12.5 BLOW #2 – CONDITION B

12.5.1 Conditions: Vertical Axis, 2.75' hammer height, Group #II, 3" anvil table travel, Figure 13 of the referenced specifications.
12.5.2 Observations: A post-blow visual inspection revealed no obvious physical damage. No leakage or loss in pressure was reported.
12.5.3 Action: Testing was continued.

12.6 BLOW #3 – CONDITION A

12.6.1 Conditions: Vertical Axis, 2.75' hammer height, Group #III, 1.5" anvil table travel, Figure 13 of the referenced specifications.
12.6.2 Observations: A post-blow visual inspection revealed no obvious physical damage. No leakage or loss in pressure was reported.
12.6.3 Action: Testing was continued.

The entire assembly was then removed from fixture Figure 13 and attached to fixture Figure 16 of MIL-S-901D oriented with the side of the Pump facing down. The total weight on the anvil table was 4936.5 pounds. Refer to Table 1 for a breakdown of the test weights and Figure 1 for the photograph of the test setup.

12.7 BLOW #4 – CONDITION A

12.7.1 Conditions: 30° Side Down, 2.25' hammer height, Group #I, 3" anvil table travel, Figure 16 of the referenced specifications.
12.7.2 Observations: A post-blow visual inspection revealed no obvious physical damage. No leakage or loss in pressure was reported.
12.7.3 Action: Testing was continued.

12.8 BLOW #5 – CONDITION B

12.8.1 Conditions: 30° Side Down, 4.0' hammer height, Group #II, 3" anvil table travel, Figure 16 of the referenced specifications.
12.8.2 Observations: A post-blow visual inspection revealed no obvious physical damage. No leakage or loss in pressure was reported.
12.8.3 Action: Testing was continued.

12.9 BLOW #6 – CONDITION A

12.9.1 Conditions: 30° Side Down, 4.0' hammer height, Group #III, 1.5" anvil table travel, Figure 16 of the referenced specifications.
12.9.2 Observations: A post-blow visual inspection revealed no obvious physical damage. No leakage or loss in pressure was reported.
12.9.3 Action: Testing was continued.

The entire assembly was removed from fixture Figure 16, rotated and reattached with the Pump the discharge up. The total weight on the anvil table remained 4936.5 pounds. Refer to Figure 1 for the photograph of the test setup.

12.10 BLOW #7 – CONDITION A

12.10.1 Conditions: 30° Discharge Up, 2.25' hammer height, Group #I, 3" anvil table travel, Figure 16 of the referenced specifications.
12.10.2 Observations: A post-blow visual inspection revealed no obvious physical damage. No leakage or loss in pressure was reported.
12.10.3 Action: Testing was continued.

12.11 BLOW #8 – CONDITION B

12.11.1 Conditions: 30° Discharge Up, 4.0' hammer height, Group #II, 3" anvil table travel, Figure 16 of the referenced specifications.
12.11.2 Observations: A post-blow visual inspection revealed no obvious physical damage. No leakage or loss in pressure was reported.
12.11.3 Action: Testing was continued.

12.12 BLOW #9 – CONDITION A

12.12.1 Conditions: 30° Discharge Up, 4.0' hammer height, Group #III, 1.5" anvil table travel, Figure 16 of the referenced specifications.
12.12.2 Observations: A post-blow visual inspection revealed no obvious physical damage. No leakage or loss in pressure was reported.
12.12.3 Action: Shock testing was completed.

Refer to the Factory Test Record, Figure 2, and the Shock Acceptance Form, Figure 3 for additional information.

13. VIBRATION TEST DESCRIPTION

The Pump was removed from the medium weight shock machine and attached to the vibration machine oriented in the first major axis of test. Refer to Figure 4 for photographs of the test setups.

One (1) accelerometer was attached to the plate and one (1) accelerometer was attached to the top of the Pump, oriented in the direction of vibration, to aid in the detection of response prominences.

The Pump was flooded with water, energized with 440 VAC, three (3) phase, 60 Hz power and operating with the discharge pressure adjusted to 121 psig throughout the vibration test.

13.1 FIRST MAJOR AXIS OF VIBRATION (SIDE TO SIDE)

13.1.1 Exploratory Vibration

The Pump was vibrated from 4 Hz through 33 Hz with a vibration input of 0.020 ± 0.004 inches (double amplitude) to determine response prominences and from 34 Hz through 50 Hz with a vibration input of 0.006 + 0.000/-0.002 (double amplitude) to determine response prominences. The change in frequency was made in discrete intervals of 1 Hz and the vibration was maintained at each frequency for approximately 15 seconds. No response prominences were noted.

The table input vibration levels and the accelerometer output vibration levels at each frequency were recorded on the Vibration Test Data Sheets.

13.1.2 Variable Frequency Vibration

The Pump was vibrated from 4 Hz to 50 Hz with input amplitudes as shown in Table 2. The change in frequency was made in discrete intervals of 1 Hz and the vibration was maintained at each frequency for a period of five (5) minutes. No obvious physical damage, leakage or loss in pressure was noted.

The table input vibration levels and the accelerometer output vibration levels at each frequency were recorded on the Vibration Test Data Sheets.

Table 2: Variable Frequency Test Amplitudes

FREQUENCY (Hz)	INPUT INCHES (DOUBLE AMPLITUDE)
4 – 15 Hz	0.060 ± 0.012
16 – 25 Hz	0.040 ± 0.008
26 – 33 Hz	0.020 ± 0.004
34 – 40 Hz	0.010 ± 0.002
41 – 50 Hz	0.006 + 0.000 -0.002

13.1.3 Endurance Vibration

Since no response prominences were noted, the endurance vibration was performed at the upper frequency of 50 Hz for a period of two (2) hours. Upon the completion of the two (2) hour dwell an inspection was performed which revealed no obvious physical damage, leakage or loss in pressure.

The frequency, table input vibration levels, accelerometer output vibration levels and the duration of dwell were recorded on the Vibration Test Data Sheets.

13.2 SECOND MAJOR AXIS OF VIBRATION (VERTICAL)

13.2.1 Exploratory Vibration

The Pump was vibrated from 4 Hz through 33 Hz with a vibration input of 0.020 ± 0.004 inches (double amplitude) to determine response prominences and from 34 Hz through 50 Hz with a vibration input of 0.006 + 0.000/-0.002 (double amplitude) to determine response prominences. The change in frequency was made in discrete intervals of 1 Hz and the vibration was maintained at each frequency for approximately 15 seconds. No response prominences were noted.

The table input vibration levels and the accelerometer output vibration levels at each frequency were recorded on the Vibration Test Data Sheets.

13.2.2 Variable Frequency Vibration

The Pump was vibrated from 4 Hz to 50 Hz with input amplitudes as shown in Table 2. The change in frequency was made in discrete intervals of 1 Hz and the vibration was maintained at each frequency for a period of five (5) minutes. No obvious physical damage, leakage or loss in pressure was noted.

The table input vibration levels and the accelerometer output vibration levels at each frequency were recorded on the Vibration Test Data Sheets.

13.2.3 Endurance Vibration

Since no response prominences were noted, the endurance vibration was performed at the upper frequency of 50 Hz for a period of two (2) hours. Upon the completion of the two (2) hour dwell an inspection was performed which revealed no obvious physical damage, leakage or loss in pressure.

The frequency, table input vibration levels, accelerometer output vibration levels and the duration of dwell were recorded on the Vibration Test Data Sheets.

13.3 THIRD MAJOR AXIS OF VIBRATION (END TO END)

13.3.1 Exploratory Vibration

The Pump was vibrated from 4 Hz through 33 Hz with a vibration input of 0.020 ± 0.004 inches (double amplitude) to determine response prominences and from 34 Hz through 50 Hz with a vibration input of 0.006 + 0.000/-0.002 (double amplitude) to determine response prominences. The change in frequency was made in discrete intervals of 1 Hz and the vibration was maintained at each frequency for approximately 15 seconds. No response prominences were noted.

The table input vibration levels and the accelerometer output vibration levels at each frequency were recorded on the Vibration Test Data Sheets.

13.3.2 Variable Frequency Vibration

The Pump was vibrated from 4 Hz to 50 Hz with input amplitudes as shown in Table 2. The change in frequency was made in discrete intervals of 1 Hz and the vibration was maintained at each frequency for a period of five (5) minutes. No obvious physical damage, leakage or loss in pressure was noted.

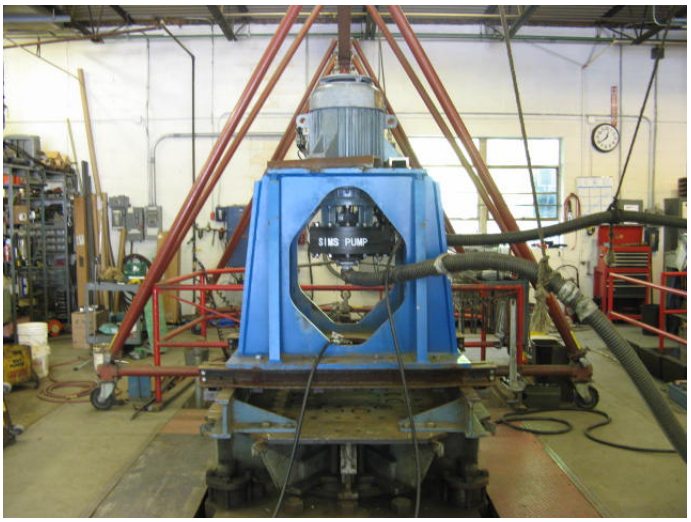
The table input vibration levels and the accelerometer output vibration levels at each frequency were recorded on the Vibration Test Data Sheets.

13.3.3 Endurance Vibration

Since no response prominences were noted, the endurance vibration was performed at the upper frequency of 50 Hz for a period of two (2) hours. Upon the completion of the two (2) hour dwell an inspection was performed which revealed no obvious physical damage, leakage or loss in pressure.

The frequency, table input vibration levels, accelerometer output vibration levels and the duration of dwell were recorded on the Vibration Test Data Sheets.

Refer to the Vibration Test Data Sheets, Figures 5 through 7, for additional information.



Vertical Axis

30° Side Down

30° Discharge Up

Shock Test Setups
Figure 1

FACTORY TEST RECORD: CLASS HI SHOCK

FACTORY TEST RECORD: CLASS HI SHOCK			DATE: 13 July 2009	TEST # 11207.1
1. ITEM NAME OF EQUIPMENT SHOCK TESTED Station, Fire, Interior Double 1 ½ Hose Assembly Open Mount		2. RATING (KW, VOLTS, GPM, CFM, ETC.)		
3. MAJOR PARTS				
PUMP, ETC. Vertical Pump with 40 HP motor	MANUFACTURER Sims Pump Valve Company, Inc.	ADDRESS 1314 Park Ave. Hoboken, NJ 07030	GOV DWG NO.	IDENTIFYING #
MOTOR, ETC.	MANUFACTURER	ADDRESS	GOV DWG NO.	IDENTIFYING #
STARTER, ETC.	MANUFACTURER	ADDRESS	GOV DWG NO.	IDENTIFYING #
4. CONTRACT NO.	CONTRACTOR	ADDRESS		
5. TYPE OF SHOCK TEST ☒ ASSEMBLY ☐ SUB-ASSEMBLY ☐ PART				
6. TOTAL WEIGHT OF ASSEMBLY TESTED 951 lbs.	WEIGHT OF INDIVIDUAL MOTOR PARTS	MOTOR	STARTER	
7. WEIGHT CLASSIFICATION OF ITEM ☐ LIGHT ☒ MEDIUM	8. APPLICABLE MOUNTING FIXTURE IN SPECIFICATION MIL-S-901 ☐ Fig 7, FIX 4A ☐ Fig 8, FIX 4C ☐ FIX 13 ☐ FIX 15 ☐ FIG 16 ☐ OTHER			

9. FOR LIGHTWEIGHT ITEMS

FIRST CONDITION				SECOND CONDITION			
BLOW	DROP	AXIS	DAMAGE INCURRED	BLOW	DROP	AXIS	DAMAGE INCURRED

ITEMS SUBJECT TO ABOVE TWO CONDITIONS WERE ☐ SAME ☐ DIFFERENT

REMARKS

10. FOR MEDIUM WEIGHT ITEMS

Fig. 13				Fig. 16			
BLOW	GROUP	HAMMER DROP	DAMAGE INCURRED	BLOW	GROUP	HAMMER DROP	DAMAGE INCURRED
1	I	1.75'	No damage noted	4	I	2.25'	No damage noted
2	II	3.0'	No damage noted.	5	II	4.0'	No damage noted
3	III	1.50'	No damage noted	6	III	4.0'	No damage noted
				7	I	2.25'	No damage noted
				8	II	4.0'	No damage noted
				9	III	4.0'	No damage noted

TOTAL WEIGHT ON ANVIL TABLE Fig. 13: 3848.5 lbs; Fig. 16: 4506.5 lbs	REMARKS	
TEST LABORATORY NU Laboratories, Inc.	ADDRESS 312 Old Allerton Road, Annandale, NJ 08801	TEST ENGINEER

Factory Test Record
Figure 2

MIL-S-901D: SHOCK ACCEPTANCE FORM

1. The item identified below has met the requirements of Military Specification MIL-S-901, based upon:

   ☒ Shock testing of the item identified below

   ❑ Previous shock testing of an item similar to the item identified below (shock test extension)

   ❑ Previous shock testing of an item identical to the item identified below (shock test extension)

2. Item (Nomenclature) Pump
3. Item (Description) Vertical Pump with 40 HP Motor
4. Tested For Sims Pump Valve Co., Inc.
5. M/N: NS18436-V40 6. S/N: _____
7. Dwg. Number _____ 8. Revision and Date _____
9. Military Specification MIL-S-901D
10. Ship _____ 11. Service _____
12. Contract No. _____
13. Shock Test Facility NU Laboratories, Inc.
14. Report No. 11207.1
15. Previous Shock test approval reference (if this form conveys shock test Extension approval) _____

16.	Test Category	☐ Lightweight	☒Medium weight	☐ Heavyweight	
17.	Shock Grade	☒ A	☐ B		
18.	Equipment Class	☒ I	☐ II	☐ III	
19.	Shock Test Type	☒ A	☐ B	☐ C	
20.	Mounting Location	☒ Deck	☐Hull	☐ Shell	☐ Wetted-Surface

21. Shipboard mounting plane represented during shock test:

☐Base	☐Front or Face	❑ Back
☐ Top	☐ Combination	☒ Other _____

22. Mounting orientation of item relative to ship's fore-and-aft axis (for medium weight and heavyweight test items only): Unrestricted
23. Approval Limitations: _____
24. Approved. _____

Authorized Signature	Approval Activity	Date
		14 July 2009

Shock Acceptance Form
Figure 3

Side to Side and Vertical Axes

End to End Axis

Vibration Test Setups
Figure 4

	EXPLORATORY FREQUENCY			VARIABLE FREQUENCY		
Hz	INPUT	CH. 1	CH. 2	INPUT	CH. 1	CH. 2
4	.016	.014		.060	.055	
5	.016	.016		.060	.055	
6	.016	.016		.060	.055	
7	.016	.016		.060	.055	
8	.016	.016		.060	.055	
9	.016	.016		.060	.055	
10	.016	.016		.060	.056	
11	.016	.016		.060	.056	
12	.016	.016		.061	.057	
13	.016	.016		.061	.057	
14	.016	.016		.061	.057	
15	.016	.016		.061	.057	
16	.016	.016		.040	.037	
17	.016	.016		.040	.037	
18	.016	.016		.040	.037	
19	.016	.016		.040	.038	
20	.016	.016		.040	.038	
21	.016	.016		.040	.039	
22	.016	.016		.040	.039	
23	.016	.016		.040	.039	
24	.016	.016		.040	.039	
25	.016	.016		.040	.039	
26	.016	.016		.018	.018	
27	.016	.016		.018	.018	
28	.016	.016		.018	.018	
29	.016	.016		.018	.018	
30	.016	.016		.018	.018	
31	.017	.017		.018	.018	
32	.017	.017		.019	.018	
33	.017	.017		.019	.018	
34	.006	.006		.011	.011	
35	.006	.006		.011	.011	
36	.006	.006		.011	.011	
37	.006	.006		.011	.011	
38	.006	.006		.011	.011	
39	.006	.006		.011	.011	
40	.006	.006		.011	.012	
41	.006	.006		.005	.005	
42	.006	.006		.005	.005	
43	.006	.006		.005	.005	
44	.006	.006		.005	.005	
45	.006	.006		.005	.005	
46	.006	.006		.005	.005	
47	.006	.006		.005	.005	
48	.006	.006		.005	.005	
49	.006	.006		.005	.005	
50	.006	.006		.005	.005	
	Res. _____ Hz					

VIBRATION TEST DATA SHEET

JOB NO. 11207
DATE 7-15-09
AXIS Side-to-Side

NU LABORATORIES
312 OLD ALLERTON RD., ANNANDALE, NJ
08801 (908) 713-9300

NOTE: RECORDED DATA IS DOUBLE AMPLITUDE

ENDURANCE

Hz	INPUT	DURATION
50 Hz.	.005	2 Hrs

TEST ARTICLE IDENTIFICATION:
VERTICAL pump w/40 HP motor

TESTED FOR:
Sims Pumps

ACCELEROMETER LOCATIONS

INPUT	fixture
CH. 1	Side of Pump housing
CH. 2	
CH. 3	

REMARKS:

TEST ENGINEER:

SHEET: 1

Vibration Test Data Sheet
Figure 5

	EXPLORATORY FREQUENCY			VARIABLE FREQUENCY		
Hz	INPUT	CH. 1	CH. 2	INPUT	CH. 1	CH. 2
4	.021	.021		.068	.060	
5	.021	.021		.064	.060	
6	.021	.021		.063	.060	
7	.021	.021		.061	.060	
8	.021	.021		.060	.059	
9	.021	.021		.059	.059	
10	.021	.020		.058	.057	
11	.021	.020		.058	.057	
12	.021	.020		.058	.057	
13	.021	.020		.057	.056	
14	.021	.020		.057	.056	
15	.021	.020		.057	.056	
16	.021	.020		.036	.036	
17	.021	.020		.036	.036	
18	.021	.020		.036	.036	
19	.021	.021		.036	.036	
20	.021	.021		.036	.036	
21	.021	.021		.036	.036	
22	.021	.021		.036	.036	
23	.021	.021		.036	.036	
24	.020	.020		.036	.036	
25	.020	.020		.036	.036	
26	.020	.020		.019	.019	
27	.020	.020		.019	.019	
28	.020	.020		.019	.019	
29	.020	.020		.019	.019	
30	.021	.021		.019	.019	
31	.021	.021		.019	.019	
32	.021	.021		.019	.019	
33	.021	.020		.019	.019	
34	.006	.006		.009	.009	
35	.006	.006		.009	.009	
36	.006	.006		.009	.009	
37	.006	.006		.009	.009	
38	.006	.006		.009	.009	
39	.006	.006		.009	.009	
40	.006	.006		.009	.009	
41	.006	.006		.006	.005	
42	.006	.006		.006	.005	
43	.006	.006		.006	.005	
44	.006	.006		.006	.006	
45	.006	.006		.006	.006	
46	.006	.006		.006	.006	
47	.006	.006		.006	.006	
48	.006	.006		.006	.006	
49	.006	.006		.006	.006	
50	.006	.006		.006	.006	
	Res. _____ Hz					

VIBRATION TEST DATA SHEET

JOB NO. 11207
DATE 7-16-09
AXIS VERTICAL

NU LABORATORIES
312 OLD ALLERTON RD., ANNANDALE, NJ
08801 (908) 713-9300

NOTE: RECORDED DATA IS DOUBLE AMPLITUDE

ENDURANCE

Hz	INPUT	DURATION
50 Hz	.006	2 HRS

TEST ARTICLE IDENTIFICATION:
VERTICAL PUMP W/ 40HP MOTOR

TESTED FOR:
SIMS PUMP

ACCELEROMETER LOCATIONS

INPUT	FIXTURE
CH. 1	SIDE OF PUMP HOUSING
CH. 2	
CH. 3	

REMARKS:

TEST ENGINEER:

SHEET: 2

Vibration Test Data Sheet
Figure 6

	EXPLORATORY FREQUENCY			VARIABLE FREQUENCY		
Hz	INPUT	CH. 1	CH. 2	INPUT	CH. 1	CH. 2
4	.019	.016		.056	.051	
5	.020	.017		.062	.062	
6	.020	.019		.064	.066	
7	.020	.020		.065	.071	
8	.021	.021		.066	.071	
9	.021	.021		.066	.071	
10	.021	.022		.067	.071	
11	.021	.022		.067	.071	
12	.021	.022		.068	.071	
13	.021	.022		.068	.071	
14	.021	.022		.068	.071	
15	.021	.022		.067	.071	
16	.021	.022		.040	.040	
17	.021	.022		.040	.040	
18	.021	.022		.040	.040	
19	.021	.023		.040	.040	
20	.021	.023		.040	.040	
21	.021	.023		.040	.040	
22	.021	.023		.040	.040	
23	.021	.023		.040	.040	
24	.021	.023		.040	.041	
25	.021	.023		.040	.041	
26	.021	.023		.019	.019	
27	.021	.023		.019	.019	
28	.021	.023		.019	.019	
29	.021	.023		.019	.019	
30	.021	.023		.019	.019	
31	.021	.023		.019	.019	
32	.021	.023		.019	.020	
33	.021	.023		.019	.020	
34	.005	.005		.010	.010	
35	.005	.005		.010	.010	
36	.005	.005		.010	.010	
37	.005	.005		.010	.010	
38	.005	.005		.010	.010	
39	.005	.005		.010	.011	
40	.005	.005		.010	.011	
41	.005	.005		.005	.005	
42	.005	.005		.005	.005	
43	.005	.005		.005	.005	
44	.005	.005		.005	.005	
45	.005	.005		.005	.005	
46	.005	.005		.005	.005	
47	.005	.005		.005	.005	
48	.005	.005		.005	.006	
49	.005	.006		.005	.006	
50	.005	.006		.005	.006	
	Res. _____ Hz					

VIBRATION TEST DATA SHEET

JOB NO. 11207
DATE 7-17-09
AXIS End to End

NU LABORATORIES
312 OLD ALLERTON RD., ANNANDALE, NJ
08801 (908) 713-9300

NOTE: RECORDED DATA IS DOUBLE AMPLITUDE

ENDURANCE

Hz	INPUT	DURATION
50	.005	2 HRS

TEST ARTICLE IDENTIFICATION:
VERTICAL Pump w/40HP MOTOR

TESTED FOR:
Sims Pump

ACCELEROMETER LOCATIONS

INPUT	FIXTURE
CH. 1	SIDE of Pump Housing
CH. 2	
CH. 3	

REMARKS:

TEST ENGINEER:

SHEET: 3

Vibration Test Data Sheet
Figure 7

LIST OF APPARATUS

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL DATE	DUE DATE
Digital Scale	Industrial Commercial	TI-500SSB-5K	5D1901100001	12/3/2008	12/3/2009
Medium Weight Shock Machine	New England Trawler	10-T-3351-C	N/A	Functional	
Vibration Machine	LAB	RVH-72-5000	51401	Functional	
Torque Wrench	Armstrong	CG3250FQARBH	5080258523	05/27/2009	05/27/2010
0-1000 psi Pressure Gauge	Span	4112654	MC002388	12/04/2008	12/04/2009
Multimeter	Fluke	83	57511058	06/04/2009	06/04/2010
1 Hour Timer	Gra Labs	165	739	05/08/2009	05/08/2010
Accelerometer	Endevco	2221D	EM03	03/23/2009	03/23/2010
Accelerometer	Endevco	2221D	EY63	03/23/2009	03/23/2010
Charge Amplifier	Trig Tek	203M	256	08/28/2008	08/28/2009
Thermometer Hygro	Radio Shack	63-855	007	05/06/2009	05/06/2010

All calibrations are traceable to the National Institute of Standards and Technology. Procedures satisfy the requirements set forth in MIL-STD-45662 and/or ANSI/NCSL Z540-1. Calibration records are on file at NU Laboratories, Inc.

All weights and scales are traceable to the State of NJ Office of Weights and Measures (NJSA 51:1-61; 75; NJAC 13:47E-1.2)