HI-SPEED INDUSTRIAL SERVICE QualiTest® Diagnostics

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April 8, 2024

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Bio-Energy Development
Memphis, TN

Tracy,

The following is a summary of findings from the March 2024 vibration survey that was performed on March 20, 2024.

QualiTest® uses a four step rating system for defects.

CLASS I: Defect is present, but effect on reliability is not clear; no immediate action is required. Continue to normally monitor.

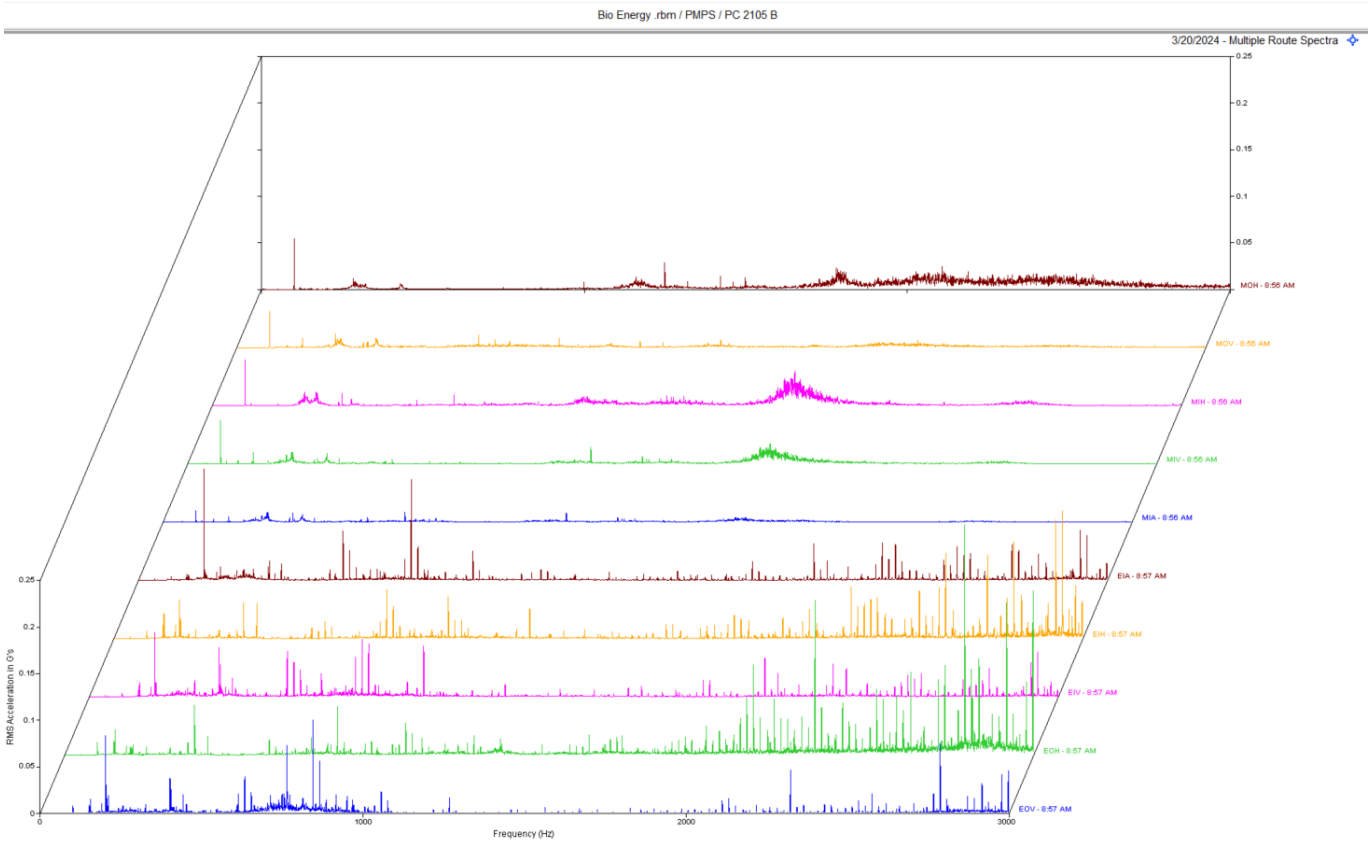
CLASS II: Defect (s) present that may cause problem in long term (2-6 months). Repair during normal maintenance scheduling. Continue to monitor.

CLASS III: Defect (s) present that may cause failure in short term (less than 2 months). This should be addressed as soon as practical, with a high maintenance priority. Increase monitoring frequency.

CLASS IV: Defect (s) present that makes continued reliability unpredictable, and possibility of secondary damage is high. Repairs should be made ASAP. An unscheduled shutdown should be considered for repairs

Defect Summary

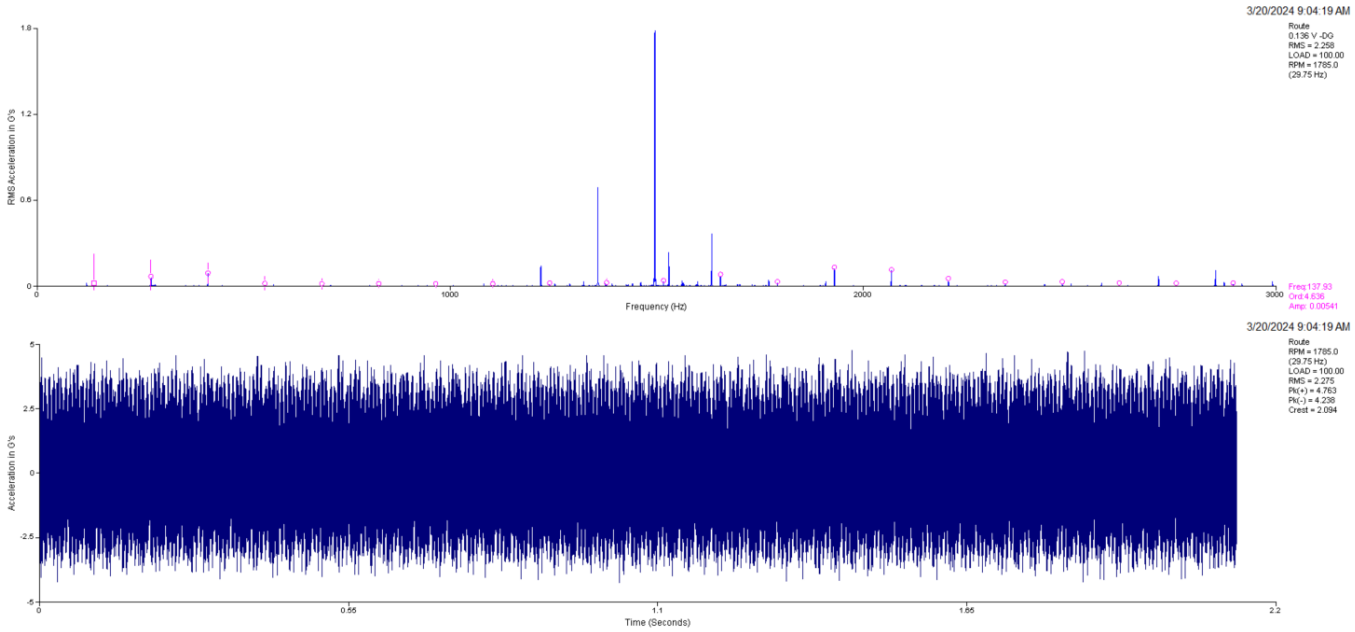
PC 2105 B CLASS II



Observation:
Data above is the multi-point spectra of the motor and pump. Pump data shows non-synchronous peaks throughout the pump spectra.

Recommendation:
Pump data shows defects in pump bearings. Replace pump as scheduling allows.

PC 2205 B CLASS II



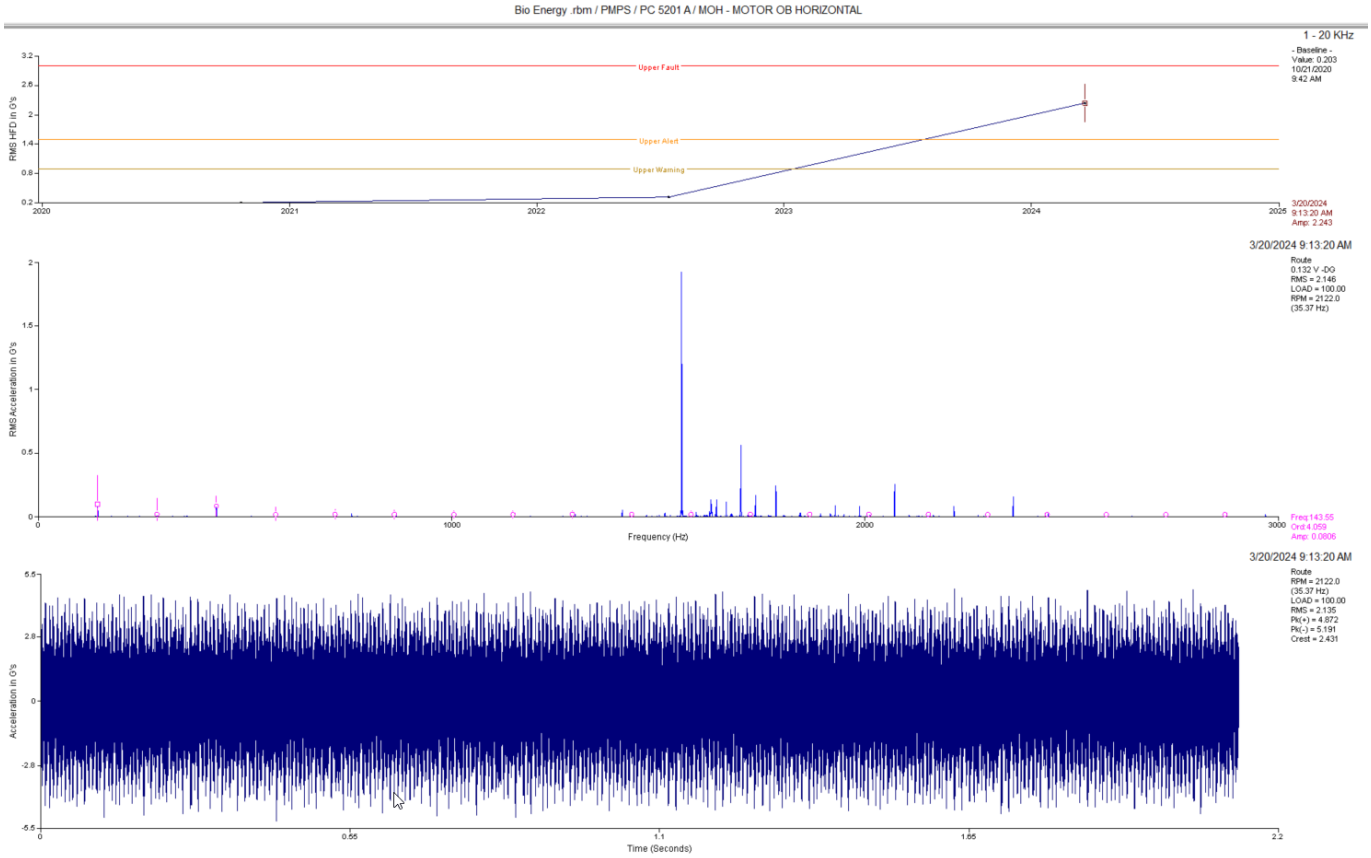
Observation:

Data above motor outboard horizontal. Peaks marked in spectrum are non-synchronous peaks that are harmonics of 4.36 orders of rpm. There is also some 120 Hz. vibration present as well.

Recommendation:

Motor may have some soft foot causing an air gap issue. Data also suggests bearing issues in the motor. Check motor for soft foot and bearing issues as scheduling allows.

PC 5201 A CLASS II



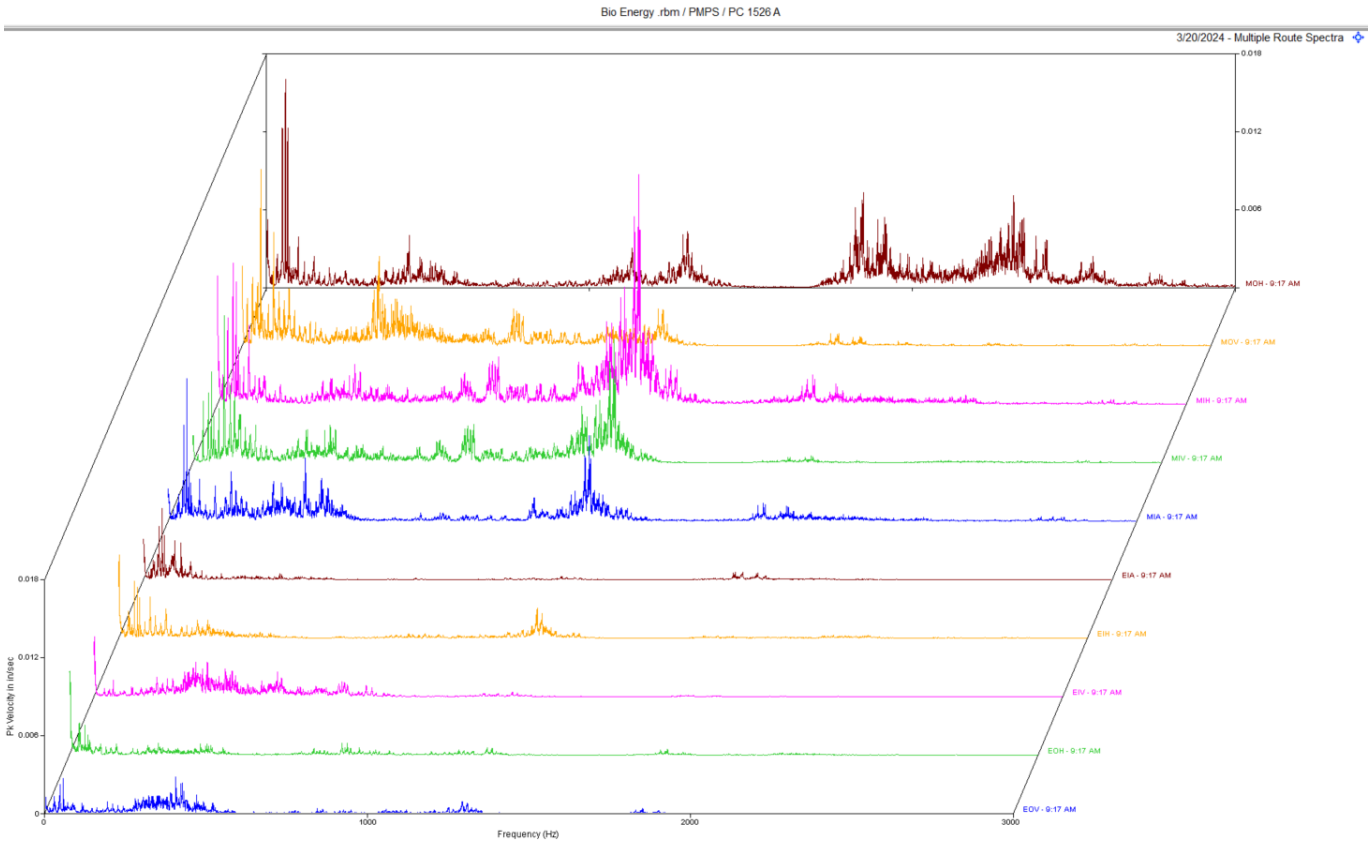
Observation:

Data above motor outboard horizontal. Peaks marked in spectrum are non-synchronous peaks that are harmonics of 4.06 orders of rpm. There is also some 120 Hz. vibration present as well.

Recommendation:

Motor may have some soft foot causing an air gap issue. Data also suggests bearing issues in the motor. Motor may also have some electrical issues. Check motor for soft foot and bearing issues as scheduling allows.

PC 1526A CLASS II



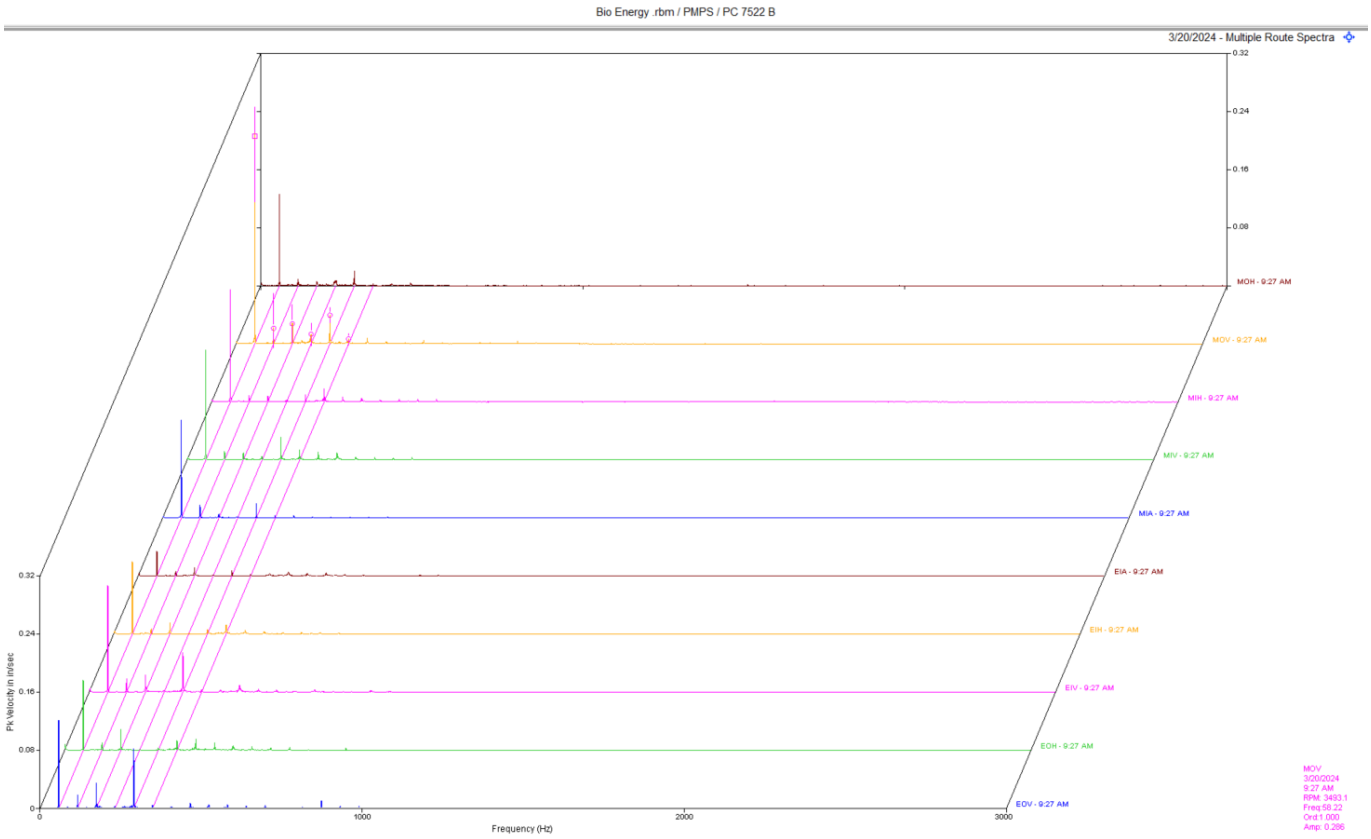
Observation:

Multi-point spectra of the motor and pump shows a significant amount of non-synchronous vibration according to motor data.

Recommendation:

The non-synchronous peaks are very likely race defect frequencies of the motor bearings. This is our second collection of this motor; therefore, severity is unclear. We recommend preparing to swap the motor in the next few months.

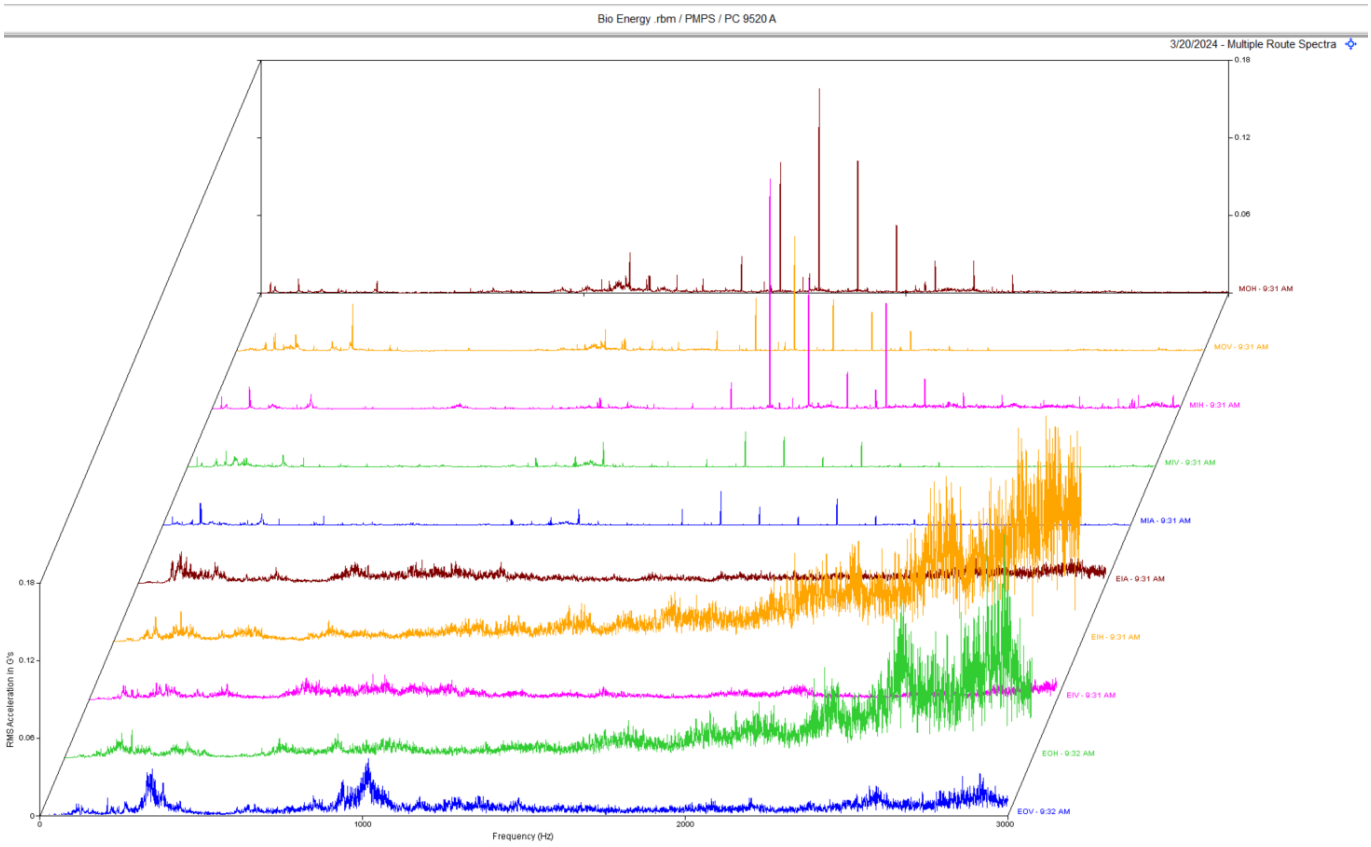
PC 7522 B CLASS II



Observation:
Multi-point spectra of the motor and pump shows 1-5 x rpm vibration present.

Recommendation:
Data suggests possible coupling wear. Ensure coupling is in good shape and motor is properly aligned.

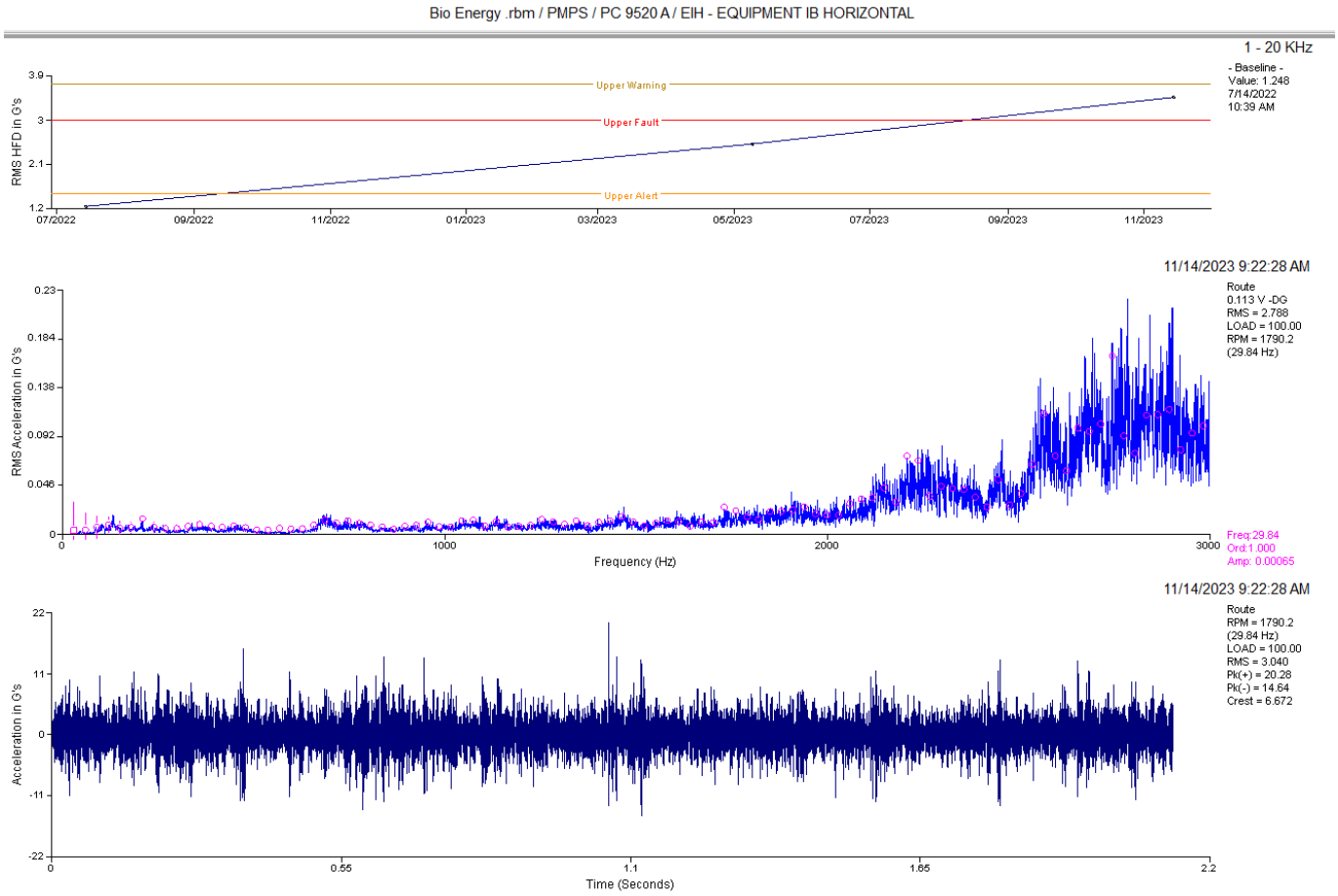
PC 9520 B CLASS II



Observation:
Motor and pump spectra above show a significant amount of random noise in pump data.

Recommendation:
Pump data indicates cavitation which may be due to impeller wear and or pump flow issues. Ensure pump to operating at normal flow parameters. If parameters are good, then the pump may need attention soon.

PC 9520 A CLASS II



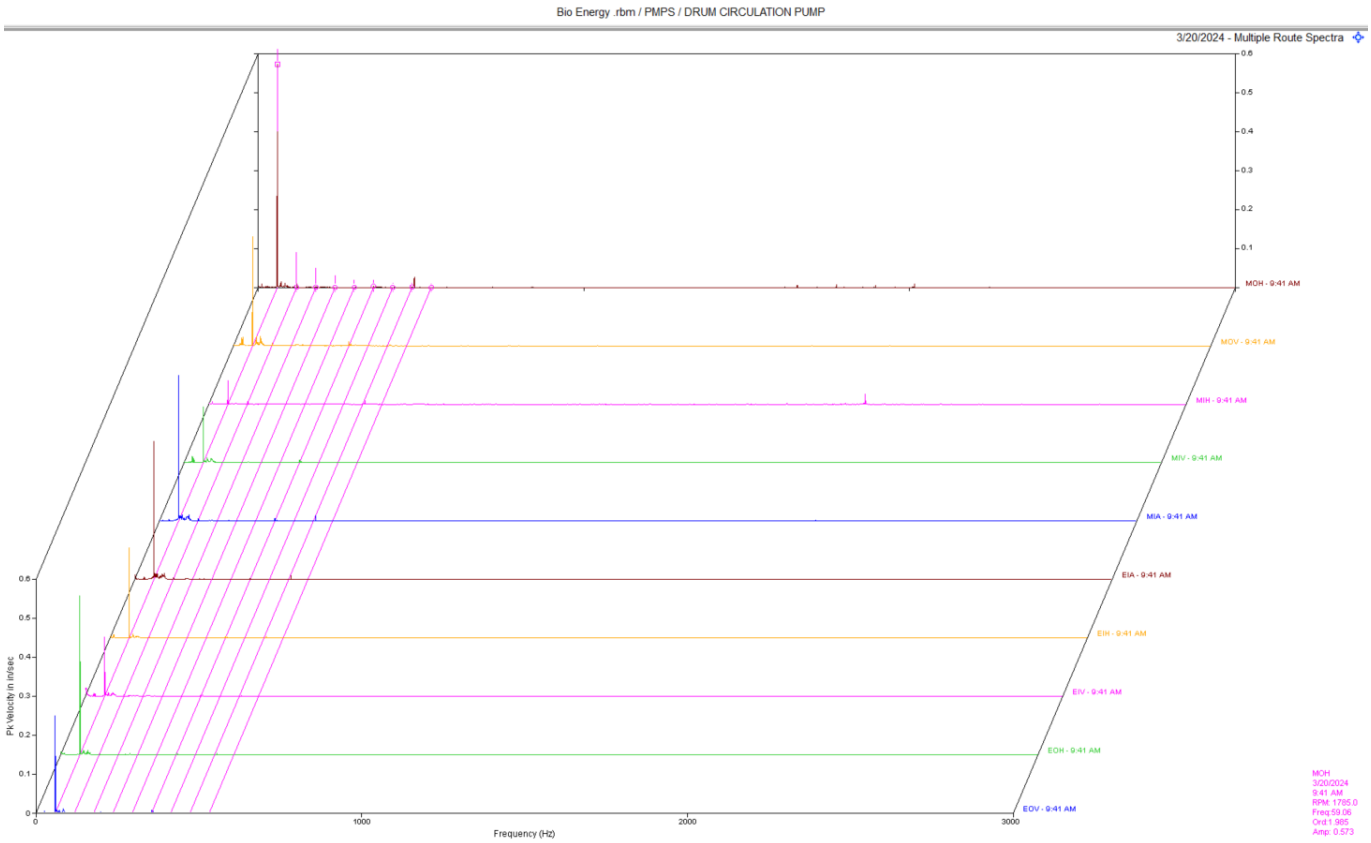
Observation:

Data above is the pump inboard horizontal. Spectral data shows high frequency non-synchronous vibration. Waveform data shows impacting with high peak to peak amplitude.

Recommendation:

Pump data either indicates internal defects are present in the pump and or pump has significant amounts of cavitation. Inspect pump soon.

Drum Circulation Pump CLASS III



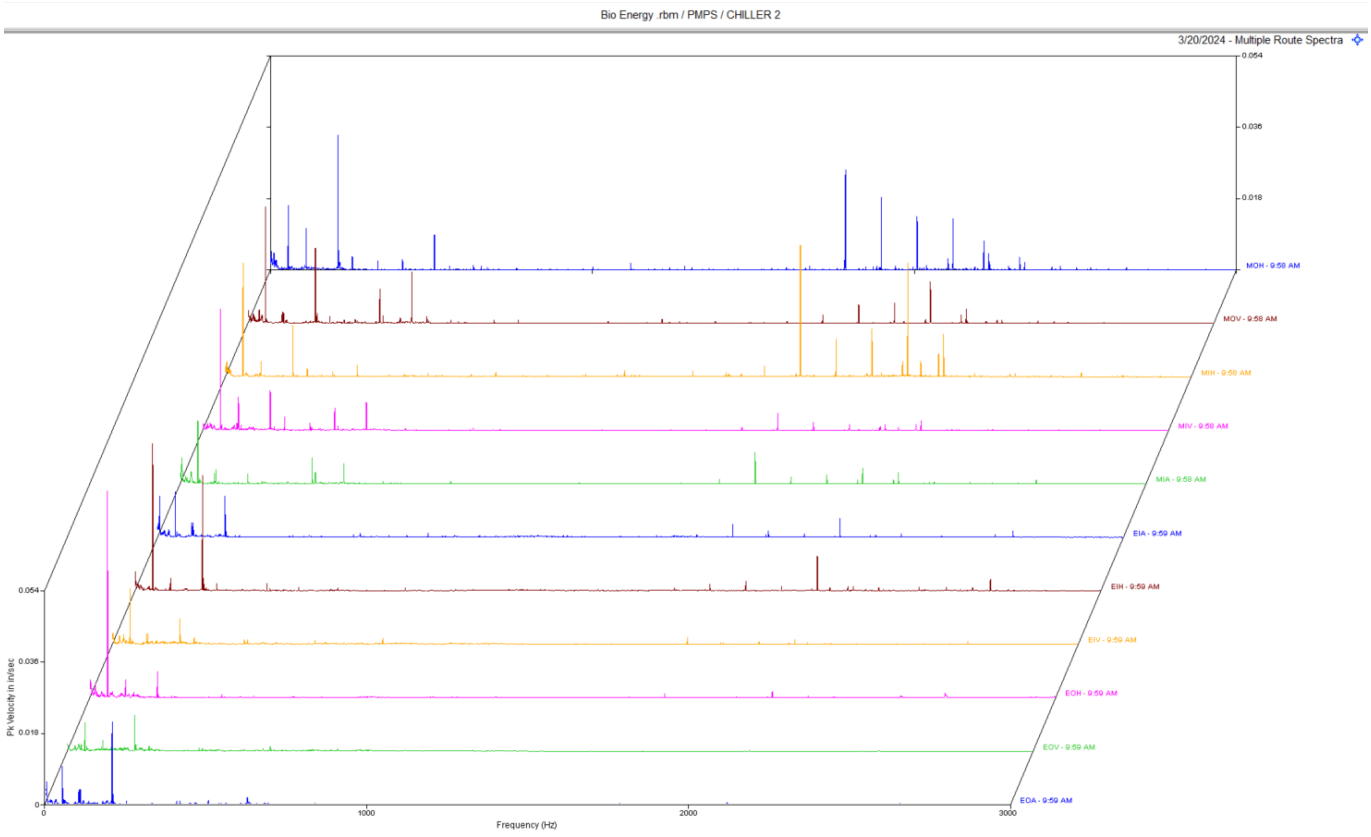
Observation:

Multi-point spectra above are the motor and pump. Data shows a dominant 1 x rpm vibration in motor and pump.

Recommendation:

Data suggests a possible coupling and or alignment issue. It is recommended to inspect couplings for wear and misalignment and ensure all fasteners are tight. Ensure motor/pump base is properly anchored down and does not have soft foot condition.

Chiller 2 CLASS I



Observation:

Multi point spectra shows some low level non-synchronous peaks in motor outboard. Both outboard and inboard motor data show some electrical vibrations that may be associated with rotor eccentricity/ air-gap variation in motor.

Recommendation:

The motor has evidence of bearing and electrical vibrations, but amplitudes are very low. We will continue to monitor this closely.

Abbreviated Last Measurement Summary

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Database: Bio Energy .rbm
Station: Pumps
Route No. 1: 1ST HALF

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD
4125 A - PC 4125 A	(20-Mar-24)	
	OVERALL LEVEL	1 - 20 KHz
MOH	.017 In/Sec	.120 G-s
MOV	.021 In/Sec	.091 G-s
MIH	.018 In/Sec	.077 G-s
MIV	.017 In/Sec	.031 G-s
MIA	.013 In/Sec	.031 G-s
EIA	.029 In/Sec	.147 G-s
EIH	.043 In/Sec	.624 G-s
EIV	.036 In/Sec	.143 G-s
EOH	.037 In/Sec	.535 G-s
EOV	.030 In/Sec	.065 G-s
2106 - PC 2106	(20-Mar-24)	
	OVERALL LEVEL	1 - 20 KHz
MOH	.016 In/Sec	.139 G-s
MOV	.022 In/Sec	.070 G-s
MIH	.020 In/Sec	.360 G-s
MIV	.027 In/Sec	.064 G-s
MIA	.020 In/Sec	.055 G-s
EIA	.033 In/Sec	.081 G-s
EIH	.054 In/Sec	.297 G-s
EIV	.036 In/Sec	.074 G-s
EOH	.044 In/Sec	.360 G-s
EOV	.044 In/Sec	.055 G-s
7210 B - PC 7210 B	(20-Mar-24)	
	OVERALL LEVEL	1 - 20 KHz
MOH	.041 In/Sec	.277 G-s
MOV	.034 In/Sec	.056 G-s
MIH	.046 In/Sec	.320 G-s
MIV	.043 In/Sec	.051 G-s
MIA	.039 In/Sec	.114 G-s
EIA	.059 In/Sec	.522 G-s
EIH	.061 In/Sec	.842 G-s
EIV	.055 In/Sec	.241 G-s
EOH	.082 In/Sec	1.806 G-s
EOV	.061 In/Sec	.418 G-s
7240 A - PC 7240 A	(20-Mar-24)	
	OVERALL LEVEL	1 - 20 KHz
MOH	.040 In/Sec	.121 G-s
MOV	.037 In/Sec	.040 G-s
MIH	.040 In/Sec	.102 G-s
MIV	.033 In/Sec	.069 G-s
MIA	.015 In/Sec	.068 G-s
EIA	.025 In/Sec	.130 G-s
EIH	.023 In/Sec	.319 G-s
EIV	.030 In/Sec	.058 G-s
EOH	.018 In/Sec	.536 G-s
EOV	.023 In/Sec	.089 G-s
7215 B - PC 7215 B	(20-Mar-24)	
	OVERALL LEVEL	1 - 20 KHz
MOH	.076 In/Sec	.144 G-s
MOV	.058 In/Sec	.022 G-s
MIH	.074 In/Sec	.187 G-s
MIV	.069 In/Sec	.028 G-s
MIA	.036 In/Sec	.027 G-s
EIA	.125 In/Sec	.317 G-s

	EIH	.118 In/Sec	.768 G-s
	EIV	.083 In/Sec	.278 G-s
	EOH	.078 In/Sec	.730 G-s
	EOV	.063 In/Sec	.244 G-s

6110 A - PC 6110 A (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.022 In/Sec	.141 G-s
MOV	.016 In/Sec	.075 G-s
MIH	.023 In/Sec	.179 G-s
MIV	.018 In/Sec	.041 G-s
MIA	.018 In/Sec	.049 G-s
EIA	.025 In/Sec	.039 G-s
EIH	.031 In/Sec	.101 G-s
EIV	.019 In/Sec	.064 G-s
EOH	.026 In/Sec	.183 G-s
EOV	.021 In/Sec	.039 G-s

6120 A - PC-6120 A (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.028 In/Sec	.138 G-s
MOV	.023 In/Sec	.120 G-s
MIH	.025 In/Sec	.141 G-s
MIV	.016 In/Sec	.044 G-s
MIA	.011 In/Sec	.048 G-s
EIA	.013 In/Sec	.046 G-s
EIH	.028 In/Sec	.137 G-s
EIV	.019 In/Sec	.075 G-s
EOH	.024 In/Sec	.262 G-s
EOV	.029 In/Sec	.080 G-s

2105 B - PC 2105 B (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.056 In/Sec	.702 G-s
MOV	.040 In/Sec	.197 G-s
MIH	.054 In/Sec	.901 G-s
MIV	.049 In/Sec	.211 G-s
MIA	.019 In/Sec	.468 G-s
EIA	.060 In/Sec	.216 G-s
EIH	.040 In/Sec	.874 G-s
EIV	.045 In/Sec	.190 G-s
EOH	.040 In/Sec	.802 G-s
EOV	.051 In/Sec	.205 G-s

1621 A - PD 1621 A (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.018 In/Sec	.106 G-s
MOV	.020 In/Sec	.042 G-s
MIH	.013 In/Sec	.078 G-s
MIV	.020 In/Sec	.027 G-s
MIA	.024 In/Sec	.030 G-s
EIA	.024 In/Sec	.042 G-s
EIH	.016 In/Sec	.309 G-s
EIV	.018 In/Sec	.043 G-s
EOH	.017 In/Sec	.083 G-s
EOV	.022 In/Sec	.027 G-s

4410 A - PC 4410 A (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.020 In/Sec	.084 G-s
MOV	.018 In/Sec	.045 G-s
MIH	.021 In/Sec	.177 G-s
MIV	.015 In/Sec	.036 G-s
MIA	.0076 In/Sec	.038 G-s
EIA	.017 In/Sec	.072 G-s
EIH	.026 In/Sec	.127 G-s
EIV	.016 In/Sec	.032 G-s
EOH	.027 In/Sec	.096 G-s
EOV	.024 In/Sec	.029 G-s

2115 B - PV 2115 B (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.176 In/Sec	.150 G-s
MOV	.257 In/Sec	.121 G-s
MIH	.047 In/Sec	.181 G-s
MIV	.156 In/Sec	.046 G-s
MIA	.107 In/Sec	.025 G-s
EIA	.102 In/Sec	.152 G-s
EIH	.082 In/Sec	.206 G-s
EIV	.126 In/Sec	.090 G-s
EOH	.176 In/Sec	.325 G-s
EOV	.064 In/Sec	.216 G-s

7225 A - PC 7225 A (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.161 In/Sec	.221 G-s
MOV	.134 In/Sec	.026 G-s
MIH	.053 In/Sec	.112 G-s
MIV	.048 In/Sec	.023 G-s
MIA	.067 In/Sec	.031 G-s
EIA	.065 In/Sec	.018 G-s
EIH	.047 In/Sec	.111 G-s
EIV	.036 In/Sec	.015 G-s
EOH	.024 In/Sec	.273 G-s
EOV	.020 In/Sec	.027 G-s

2205 B - PC 2205 B (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.136 In/Sec	2.148 G-s
MOV	.050 In/Sec	.695 G-s
MIH	.102 In/Sec	2.012 G-s
MIV	.051 In/Sec	.389 G-s
MIA	.038 In/Sec	.142 G-s
EIA	.064 In/Sec	.077 G-s
EIH	.087 In/Sec	.228 G-s
EIV	.072 In/Sec	.086 G-s
EOH	.053 In/Sec	.164 G-s
EOV	.049 In/Sec	.035 G-s

2510 A - PV 2510 A (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.044 In/Sec	.670 G-s
MOV	.049 In/Sec	.199 G-s
MIH	.041 In/Sec	.598 G-s
MIV	.033 In/Sec	.057 G-s
MIA	.022 In/Sec	.055 G-s
EIA	.050 In/Sec	.216 G-s
EIH	.048 In/Sec	.585 G-s
EIV	.052 In/Sec	.266 G-s
EOH	.041 In/Sec	.757 G-s
EOV	.049 In/Sec	.088 G-s

2310 A - PC 2310 A (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.045 In/Sec	.705 G-s
MOV	.049 In/Sec	.183 G-s
MIH	.041 In/Sec	.535 G-s
MIV	.034 In/Sec	.121 G-s
MIA	.020 In/Sec	.085 G-s
EIA	.032 In/Sec	.149 G-s
EIH	.056 In/Sec	.743 G-s
EIV	.043 In/Sec	.229 G-s
EOH	.037 In/Sec	.626 G-s
EOV	.039 In/Sec	.193 G-s

4110 B - PC 4110 B (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.012 In/Sec	.066 G-s
MOV	.0061 In/Sec	.014 G-s
MIH	.014 In/Sec	.078 G-s

MIV	.0075 In/Sec	.0080 G-s
MIA	.0054 In/Sec	.014 G-s
EIA	.026 In/Sec	.0081 G-s
EIH	.025 In/Sec	.021 G-s
EIV	.020 In/Sec	.0046 G-s
EOH	.019 In/Sec	.022 G-s
EOV	.018 In/Sec	.0029 G-s

5201 A - PC 5201 A (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.132 In/Sec	2.243 G-s
MOV	.074 In/Sec	.644 G-s
MIH	.082 In/Sec	1.189 G-s
MIV	.045 In/Sec	.303 G-s
MIA	.033 In/Sec	.255 G-s
EIA	.036 In/Sec	.039 G-s
EIH	.074 In/Sec	.085 G-s
EIV	.044 In/Sec	.032 G-s
EOH	.071 In/Sec	.163 G-s
EOV	.035 In/Sec	.031 G-s

7501 A - PC 7501 A (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.036 In/Sec	.592 G-s
MOV	.025 In/Sec	.183 G-s
MIH	.032 In/Sec	.510 G-s
MIV	.033 In/Sec	.112 G-s
MIA	.016 In/Sec	.209 G-s
EIA	.038 In/Sec	.040 G-s
EIH	.046 In/Sec	.084 G-s
EIV	.061 In/Sec	.021 G-s
EOH	.031 In/Sec	.062 G-s
EOV	.053 In/Sec	.017 G-s

7506 B - PC 7506 B (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.016 In/Sec	.086 G-s
MOV	.013 In/Sec	.013 G-s
MIH	.016 In/Sec	.071 G-s
MIV	.010 In/Sec	.012 G-s
MIA	.0056 In/Sec	.015 G-s
EIA	.0095 In/Sec	.045 G-s
EIH	.010 In/Sec	.076 G-s
EIV	.0075 In/Sec	.062 G-s
EOH	.012 In/Sec	.136 G-s
EOV	.013 In/Sec	.046 G-s

1526 A - PC 1526 A (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.075 In/Sec	1.644 G-s
MOV	.053 In/Sec	.288 G-s
MIH	.084 In/Sec	1.057 G-s
MIV	.056 In/Sec	.582 G-s
MIA	.044 In/Sec	.388 G-s
EIA	.017 In/Sec	.076 G-s
EIH	.021 In/Sec	.141 G-s
EIV	.024 In/Sec	.033 G-s
EOH	.017 In/Sec	.072 G-s
EOV	.018 In/Sec	.069 G-s

9901 B - PC 9901 B (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.042 In/Sec	.192 G-s
MOV	.045 In/Sec	.055 G-s
MIH	.046 In/Sec	.334 G-s
MIV	.048 In/Sec	.035 G-s
MIA	.041 In/Sec	.051 G-s
EIA	.073 In/Sec	.354 G-s
EIH	.109 In/Sec	.628 G-s
EIV	.095 In/Sec	.233 G-s

	EOH	.088 In/Sec	.983 G-s
	EOV	.092 In/Sec	.243 G-s

4401 A - PC 4401 A (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.010 In/Sec	.126 G-s
MOV	.012 In/Sec	.020 G-s
MIH	.010 In/Sec	.105 G-s
MIV	.0088 In/Sec	.019 G-s
MIA	.0091 In/Sec	.022 G-s
EIA	.012 In/Sec	.048 G-s
EIH	.017 In/Sec	.180 G-s
EIV	.013 In/Sec	.023 G-s
EOH	.018 In/Sec	.145 G-s
EOV	.013 In/Sec	.054 G-s

3110 B - PC 3110 B (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.034 In/Sec	.524 G-s
MOV	.052 In/Sec	.075 G-s
MIH	.038 In/Sec	.343 G-s
MIV	.055 In/Sec	.098 G-s
MIA	.041 In/Sec	.091 G-s
EIA	.060 In/Sec	.140 G-s
EIH	.071 In/Sec	.821 G-s
EIV	.034 In/Sec	.229 G-s

4101 A - PC 4101 A (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.024 In/Sec	.130 G-s
MOV	.023 In/Sec	.012 G-s
MIH	.028 In/Sec	.117 G-s
MIV	.025 In/Sec	.023 G-s
MIA	.025 In/Sec	.025 G-s
EIA	.125 In/Sec	.044 G-s
EIH	.095 In/Sec	.078 G-s
EIV	.133 In/Sec	.038 G-s
EOH	.066 In/Sec	.054 G-s
EOV	.023 In/Sec	.021 G-s

4211 A - PC 4211 A (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.034 In/Sec	.127 G-s
MOV	.029 In/Sec	.055 G-s
MIH	.031 In/Sec	.120 G-s
MIV	.033 In/Sec	.036 G-s
MIA	.016 In/Sec	.024 G-s
EIA	.047 In/Sec	.086 G-s
EIH	.052 In/Sec	.270 G-s
EIV	.090 In/Sec	.068 G-s

7522 B - PC 7522 B (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.136 In/Sec	.236 G-s
MOV	.324 In/Sec	.045 G-s
MIH	.162 In/Sec	.154 G-s
MIV	.164 In/Sec	.046 G-s
MIA	.142 In/Sec	.089 G-s
EIA	.056 In/Sec	.085 G-s
EIH	.127 In/Sec	.397 G-s
EIV	.202 In/Sec	.085 G-s
EOH	.115 In/Sec	.235 G-s
EOV	.163 In/Sec	.090 G-s

7520 B - PC 7520 B (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.013 In/Sec	.0027 G-s
MOV	.016 In/Sec	.0039 G-s
MIH	.0079 In/Sec	.0048 G-s
MIV	.010 In/Sec	.0042 G-s

MIA	.0066 In/Sec	.0043 G-s
EIA	.0075 In/Sec	.0053 G-s
EIH	.012 In/Sec	.0082 G-s
EIV	.013 In/Sec	.0067 G-s
EOH	.011 In/Sec	.0026 G-s
EOV	.0080 In/Sec	.0020 G-s

9520 A - PC 9520 A (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.038 In/Sec	.254 G-s
MOV	.033 In/Sec	.129 G-s
MIH	.044 In/Sec	.734 G-s
MIV	.040 In/Sec	.063 G-s
MIA	.037 In/Sec	.060 G-s
EIA	.086 In/Sec	.445 G-s
EIH	.108 In/Sec	3.084 G-s
EIV	.054 In/Sec	.370 G-s
EOH	.088 In/Sec	2.314 G-s
EOV	.071 In/Sec	.578 G-s

9701 B - PC 9701 B (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.192 In/Sec	.232 G-s
MOV	.137 In/Sec	.082 G-s
MIH	.127 In/Sec	.462 G-s
MIV	.190 In/Sec	.067 G-s
MIA	.068 In/Sec	.094 G-s
EIA	.173 In/Sec	.140 G-s
EIH	.213 In/Sec	.394 G-s
EIV	.182 In/Sec	.157 G-s
EOH	.092 In/Sec	.998 G-s
EOV	.175 In/Sec	.177 G-s

9621 B - PC 9621 B (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.134 In/Sec	2.098 G-s
MOV	.067 In/Sec	.868 G-s
MIH	.038 In/Sec	.964 G-s
MIV	.040 In/Sec	.251 G-s
MIA	.037 In/Sec	.228 G-s
EIA	.055 In/Sec	.400 G-s
EIH	.047 In/Sec	.666 G-s
EIV	.055 In/Sec	.299 G-s
EOH	.046 In/Sec	.614 G-s
EOV	.087 In/Sec	.256 G-s

1201 - PC 1201 (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.016 In/Sec	.190 G-s
MOV	.026 In/Sec	.036 G-s
MIH	.014 In/Sec	.089 G-s
MIV	.031 In/Sec	.016 G-s
MIA	.018 In/Sec	.022 G-s
EIA	.030 In/Sec	.016 G-s
EIH	.035 In/Sec	.075 G-s
EIV	.026 In/Sec	.018 G-s
EOH	.028 In/Sec	.109 G-s
EOV	.027 In/Sec	.018 G-s

1202 - PC 1202 (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.013 In/Sec	.052 G-s
MOV	.025 In/Sec	.016 G-s
MIH	.012 In/Sec	.044 G-s
MIV	.020 In/Sec	.012 G-s
MIA	.015 In/Sec	.017 G-s
EIA	.035 In/Sec	.090 G-s
EIH	.027 In/Sec	.130 G-s
EIV	.027 In/Sec	.053 G-s
EOH	.024 In/Sec	.118 G-s

EOV	.023 In/Sec	.070 G-s	

2101 B - PC 2101 B (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.014 In/Sec	.595 G-s
MOV	.013 In/Sec	.119 G-s
MIH	.013 In/Sec	.622 G-s
MIV	.010 In/Sec	.106 G-s
MIA	.0051 In/Sec	.127 G-s
EIA	.0061 In/Sec	.0092 G-s
EIH	.0088 In/Sec	.045 G-s
EIV	.0054 In/Sec	.0049 G-s
EOH	.0070 In/Sec	.045 G-s
EOV	.0069 In/Sec	.0041 G-s

Station: Pumps
Route No. 2: 2ND HALF

MEASUREMENT POINT	OVERALL LEVEL	HFD / VHFD

1520 B - PC 1520 B (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.083 In/Sec	.079 G-s
MOV	.053 In/Sec	.094 G-s
MIH	.044 In/Sec	.690 G-s
MIV	.041 In/Sec	.100 G-s
MIA	.024 In/Sec	.152 G-s
EIA	.028 In/Sec	.165 G-s
EIH	.037 In/Sec	.389 G-s
EIV	.031 In/Sec	.168 G-s
EOH	.038 In/Sec	.611 G-s
EOV	.022 In/Sec	.288 G-s

6501 A - PC 6501 A (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.050 In/Sec	.068 G-s
MOV	.026 In/Sec	.019 G-s
MIH	.057 In/Sec	.126 G-s
MIV	.044 In/Sec	.018 G-s
MIA	.110 In/Sec	.028 G-s
EIA	.023 In/Sec	.015 G-s
EIH	.050 In/Sec	.056 G-s
EIV	.019 In/Sec	.034 G-s
EOH	.041 In/Sec	.059 G-s
EOV	.014 In/Sec	.030 G-s

7252 A - PC 7252 A (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.026 In/Sec	.124 G-s
MOV	.021 In/Sec	.033 G-s
MIH	.025 In/Sec	.114 G-s
MIV	.016 In/Sec	.031 G-s
MIA	.0064 In/Sec	.032 G-s
EIA	.026 In/Sec	.181 G-s
EIH	.017 In/Sec	.234 G-s
EIV	.025 In/Sec	.217 G-s
EOH	.029 In/Sec	.683 G-s
EOV	.026 In/Sec	.171 G-s

1301 B - PC 1301 B (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.084 In/Sec	1.453 G-s
MOV	.043 In/Sec	.270 G-s
MIH	.047 In/Sec	.605 G-s
MIV	.041 In/Sec	.114 G-s
MIA	.042 In/Sec	.059 G-s
EIA	.281 In/Sec	.139 G-s
EIH	.200 In/Sec	.405 G-s

	EIV	.368 In/Sec	.132 G-s
	EOH	.096 In/Sec	.673 G-s
	EOV	.297 In/Sec	.284 G-s

4304 A - PC 4304 A (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.046 In/Sec	.239 G-s
MOV	.042 In/Sec	.040 G-s
MIH	.046 In/Sec	.273 G-s
MIV	.033 In/Sec	.037 G-s
MIA	.021 In/Sec	.041 G-s
EIA	.041 In/Sec	.313 G-s
EIH	.045 In/Sec	.425 G-s
EIV	.060 In/Sec	.241 G-s
EOH	.047 In/Sec	.660 G-s
EOV	.069 In/Sec	.290 G-s

4300 B - PC 4300 B (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.067 In/Sec	.147 G-s
MOV	.059 In/Sec	.028 G-s
MIH	.077 In/Sec	.116 G-s
MIV	.058 In/Sec	.020 G-s
MIA	.084 In/Sec	.035 G-s
EIA	.042 In/Sec	.128 G-s
EIH	.038 In/Sec	.188 G-s
EIV	.034 In/Sec	.126 G-s
EOH	.030 In/Sec	.181 G-s
EOV	.029 In/Sec	.081 G-s

1430 A - PC 1430 A (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.032 In/Sec	.143 G-s
MOV	.017 In/Sec	.026 G-s
MIH	.027 In/Sec	.209 G-s
MIV	.016 In/Sec	.033 G-s
MIA	.0085 In/Sec	.031 G-s
EIA	.0093 In/Sec	.028 G-s
EIH	.026 In/Sec	.151 G-s
EIV	.018 In/Sec	.031 G-s
EOH	.026 In/Sec	.082 G-s
EOV	.026 In/Sec	.019 G-s

1425 A - PC 1425 A (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.073 In/Sec	.281 G-s
MOV	.179 In/Sec	.098 G-s
MIH	.052 In/Sec	.323 G-s
MIV	.158 In/Sec	.054 G-s
MIA	.049 In/Sec	.055 G-s
EIA	.045 In/Sec	.085 G-s
EIH	.114 In/Sec	.416 G-s
EIV	.132 In/Sec	.124 G-s
EOH	.142 In/Sec	.348 G-s
EOV	.142 In/Sec	.043 G-s

7101 D - PC 7101 D (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.056 In/Sec	.119 G-s
MOV	.067 In/Sec	.036 G-s
MIH	.049 In/Sec	.165 G-s
MIV	.065 In/Sec	.029 G-s
MIA	.026 In/Sec	.059 G-s
EIA	.106 In/Sec	.155 G-s
EIH	.114 In/Sec	.650 G-s
EIV	.089 In/Sec	.171 G-s
EOH	.079 In/Sec	.660 G-s
EOV	.081 In/Sec	.109 G-s

1001 - PC 1001 A (20-Mar-24)

		OVERALL LEVEL	1 - 20 KHz
	MOH	.034 In/Sec	.424 G-s
	MOV	.052 In/Sec	.062 G-s
	MIH	.047 In/Sec	.427 G-s
	MIV	.065 In/Sec	.064 G-s
	MIA	.048 In/Sec	.077 G-s
	EIA	.070 In/Sec	.098 G-s
	EIH	.160 In/Sec	.572 G-s
	EIV	.083 In/Sec	.102 G-s
	EOH	.110 In/Sec	.551 G-s
	EOV	.053 In/Sec	.082 G-s

4320 B - PC 4320 B (20-Mar-24)

		OVERALL LEVEL	1 - 20 KHz
	MOH	.056 In/Sec	.172 G-s
	MOV	.050 In/Sec	.030 G-s
	MIH	.059 In/Sec	.236 G-s
	MIV	.038 In/Sec	.054 G-s
	MIA	.020 In/Sec	.094 G-s
	EIA	.076 In/Sec	.172 G-s
	EIH	.033 In/Sec	.481 G-s
	EIV	.055 In/Sec	.089 G-s
	EOH	.040 In/Sec	.272 G-s
	EOV	.040 In/Sec	.082 G-s

INFLUENT - DAF INFULENT (20-Mar-24)

		OVERALL LEVEL	1 - 20 KHz
	MOH	.062 In/Sec	.136 G-s
	MOV	.166 In/Sec	.106 G-s
	MIH	.084 In/Sec	.204 G-s
	MIV	.164 In/Sec	.133 G-s
	MIA	.179 In/Sec	.055 G-s
	EIA	.079 In/Sec	.015 G-s
	EIH	.075 In/Sec	.033 G-s
	EIV	.098 In/Sec	.0087 G-s
	EOH	.095 In/Sec	.010 G-s
	EOV	.055 In/Sec	.0082 G-s

CIRC PUMP - DRUM CIRCULATION PUMP (20-Mar-24)

		OVERALL LEVEL	1 - 20 KHz
	MOH	.581 In/Sec	.293 G-s
	MOV	.295 In/Sec	.030 G-s
	MIH	.071 In/Sec	.585 G-s
	MIV	.154 In/Sec	.042 G-s
	MIA	.386 In/Sec	.070 G-s
	EIA	.366 In/Sec	.032 G-s
	EIH	.235 In/Sec	.063 G-s
	EIV	.165 In/Sec	.022 G-s
	EOH	.414 In/Sec	.036 G-s
	EOV	.258 In/Sec	.015 G-s

EFFULENT - DAF EFFULENT (20-Mar-24)

		OVERALL LEVEL	1 - 20 KHz
	MOH	.070 In/Sec	.160 G-s
	MOV	.069 In/Sec	.175 G-s
	MIH	.074 In/Sec	.181 G-s
	MIV	.092 In/Sec	.177 G-s
	MIA	.072 In/Sec	.130 G-s
	EIA	.069 In/Sec	.049 G-s
	EIH	.114 In/Sec	.083 G-s
	EIV	.074 In/Sec	.035 G-s
	EOH	.148 In/Sec	.020 G-s
	EOV	.104 In/Sec	.027 G-s

CHILLER2 - CHILLER 2 (20-Mar-24)

		OVERALL LEVEL	1 - 20 KHz
	MOH	.063 In/Sec	.949 G-s
	MOV	.046 In/Sec	.373 G-s
	MIH	.064 In/Sec	1.137 G-s
	MIV	.038 In/Sec	.147 G-s

	MIA	.027 In/Sec	.223 G-s
	EIA	.025 In/Sec	.190 G-s
	EIH	.050 In/Sec	.537 G-s
	EIV	.020 In/Sec	.090 G-s
	EOH	.056 In/Sec	.317 G-s
	EOV	.018 In/Sec	.041 G-s
	EOA	.030 In/Sec	.069 G-s

7502 A - PD 7502 A (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.045 In/Sec	.030 G-s
MOV	.033 In/Sec	.0071 G-s
MIH	.039 In/Sec	.027 G-s
MIV	.048 In/Sec	.013 G-s
MIA	.037 In/Sec	.011 G-s
EIA	.069 In/Sec	.0037 G-s
EIH	.096 In/Sec	.024 G-s
EIV	.066 In/Sec	.0036 G-s
EOH	.014 In/Sec	.027 G-s
EOV	.046 In/Sec	.0045 G-s

6111 - PM 6111 (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.131 In/Sec	.269 G-s
MOV	.254 In/Sec	.133 G-s
MIH	.046 In/Sec	.284 G-s
MIV	.204 In/Sec	.097 G-s
MIA	.070 In/Sec	.092 G-s
EIA	.082 In/Sec	.013 G-s
EIH	.059 In/Sec	.014 G-s
EIV	.146 In/Sec	.016 G-s
EOH	.033 In/Sec	.967 G-s
EOV	.086 In/Sec	.185 G-s

PD-2116 - PD 2116 (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.012 In/Sec	.142 G-s
MOV	.017 In/Sec	.031 G-s
MIH	.010 In/Sec	.113 G-s
MIV	.011 In/Sec	.015 G-s
MIA	.015 In/Sec	.021 G-s
EIA	.014 In/Sec	.029 G-s
EIH	.012 In/Sec	.132 G-s
EIV	.011 In/Sec	.031 G-s
EOH	.019 In/Sec	.196 G-s
EOV	.013 In/Sec	.129 G-s

5004 - PC-5004 (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.021 In/Sec	.144 G-s
MOV	.014 In/Sec	.034 G-s
MIH	.023 In/Sec	.121 G-s
MIV	.014 In/Sec	.047 G-s
MIA	.011 In/Sec	.032 G-s
EIA	.013 In/Sec	.029 G-s
EIH	.014 In/Sec	.064 G-s
EIV	.011 In/Sec	.018 G-s
EOH	.014 In/Sec	.042 G-s
EOV	.010 In/Sec	.0078 G-s

9202 - PC-9202 (20-Mar-24)

	OVERALL LEVEL	1 - 20 KHz
MOH	.074 In/Sec	.305 G-s
MOV	.074 In/Sec	.029 G-s
MIH	.061 In/Sec	.243 G-s
MIV	.087 In/Sec	.031 G-s
MIA	.019 In/Sec	.027 G-s
EIA	.027 In/Sec	.023 G-s
EIH	.096 In/Sec	.071 G-s
EIV	.069 In/Sec	.023 G-s

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   Clarification Of Vibration Units:
      Acc       -->  G-s      RMS
      Vel       -->  In/Sec   PK
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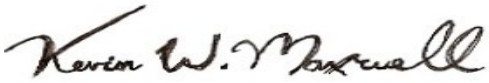
As always, it has been a pleasure to serve Bio-Energy Memphis, TN. If there are any comments or questions, do not hesitate to contact us.

Sincerely,



ISO Certified Vibration Analyst, Category III

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