



## EVALUATION

Company \_\_\_\_\_ P.O.C. \_\_\_\_\_ Phone # \_\_\_\_\_

Job # \_\_\_\_\_ Model \_\_\_\_\_ Serial # \_\_\_\_\_

Draw Bar Sent With Spindle  Yes  No  N/A Draw Bar Pull Force 18.5kN/4.15klbs Pulley Sent With Spindle  Yes  No  N/A

### Shaft Results

Nose Style 50 Taper

Nose O.D. Run Out N/A

Nose Face Run Out N/A

Nose I.D. Run Out .0001"

Middle Run Out .0002"

Tail Run Out .0001"

Nose Shoulder Run Out .0001"

Tail Shoulder Run Out .0001"

Nose Journal Meas. 3.93765"  Pass  Fail

Tail Journal Meas. Taper  Pass  Fail

Overall Condition of Shaft: Good

### Electrical Results

Ground Check  Pass  Fail  N/A

Ohms Check  Pass  Fail  N/A

Phase Check  Pass  Fail  N/A

Encoder Check  Pass  Fail  N/A

Overall Condition of Stator Good

### Housing Results

Nose Bore Meas. 5.9058"  Pass  Fail

Tail Bore Meas. 4.33025"  Pass  Fail

Overall Cond. Of Housing Good

### Bearing Results

Lubrication Air/Oil

Bearing # 1 Rough

Bearing # 2 Rough

Bearing # 3 Cage Destroyed

Bearing # 4 Cage Destroyed

Bearing # 5 Heavy Tracking

Bearing # 6 N/A

### Bearing(s) & Spacer(s) Arrangement

Nose <|> Tail Cyl Roller

### Nose Bearing Dimensions

24 X 100 X 150

### Tail Bearing Dimensions

20 X 70 X 110

Spacer Pre-Load  L  M  H

Spacer Reduction .0037"



## EVALUATION

Company \_\_\_\_\_ P.O.C. \_\_\_\_\_ Phone # \_\_\_\_\_

Job # \_\_\_\_\_ Model \_\_\_\_\_ Serial # \_\_\_\_\_

**-Remarks & Probable Cause of Failure:**

**-Nose Taper Ball Measurement 1.5046"**

**-Encoder Make & Model #**

**-Spindle RPM 15,000**

**-Sensor Make & Model N-900048-SPN501 SPN-01 Series Alpha I**

Spindle has light rust all over it. Spindle made a loud growling sound when rotated by hand. Bearings sounded very rough. The rear cylindrical bearing had excessive tracking. There is evidence of the nose retainer taking a side hit. A large amount of rust colored liquid drained from the nose compartment. The nose bearing lubricators show a large build up of a black substance. The # 3 & # 4 bearing cages are disintegrated. The # 2 & # 3 bearing lubricator shows damage from either a crash or previous improper disassembly procedures. The outside of the lubricator shows dent marks. The dent marks have caused the internal lubrication port to be partially obstructed. This could have been a contributing factor to the spindle failure. Repair damaged lubrication ports. The # 2 bearing races show heavy damage. The # 3 bearing is the cause of the spindle failure. The nose bearing preload spacers had an extremely large amount of light preload ground into them. Calculate and set the proper amount of light preload to match up with the new bearings. Spindle is currently set up with a step sleeve arrangement to secure the nose bearings. This has proven to be ineffective in maintaining nose bearing preload during heavy axial loads. Shaft will be thread ground and a nose bearing nut will be manufactured and installed to properly secure the nose bearings. The stator passed pressure check. The encoder checks are OK.

Person Evaluating Spindle: \_\_\_\_\_

Date \_\_\_\_\_

## DYNAMIC BALANCING TEST CERTIFICATE

Instrumentation: BalanceMaster EasyBalance 2.2, Date: 2008-02-22, Time: 10:05

### RMR Spindle Repair

650 Park Street  
Belgium, WI 53004  
Phone: 262-483-7088

Fax:

Comments : V-100 / 2386687  
Operator Name : Tammy Lindmeyer  
Rotor name : GMN V-100 SUB-ASSEMBLY  
Balancing Program : Both planes between supports (Tolerance in correction planes)  
No Key Compensation  
No Tooling Compensation  
Balancing Quality Standard : ISO G2.5  
Service speed : 8000 RPM  
Rotor weight at supports : Left: 6.000 lb      Right: 6.000 lb

Left Radius	Distance a	Distance b	Distance c	Right Radius
1.165 in	4.500 in	8.750 in	10.250 in	1.165 in

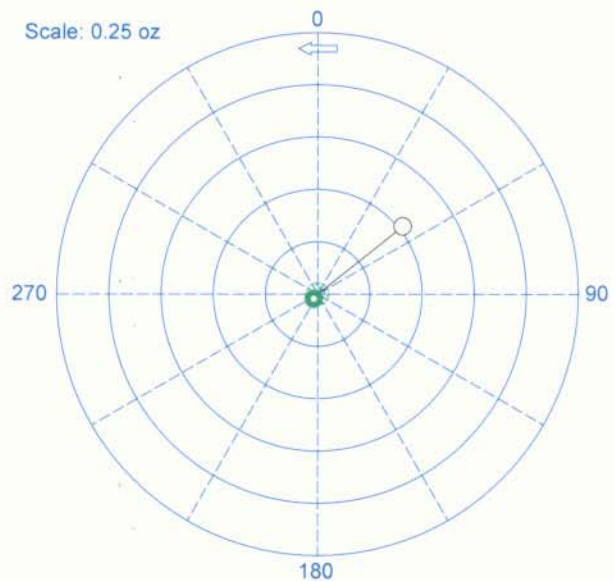
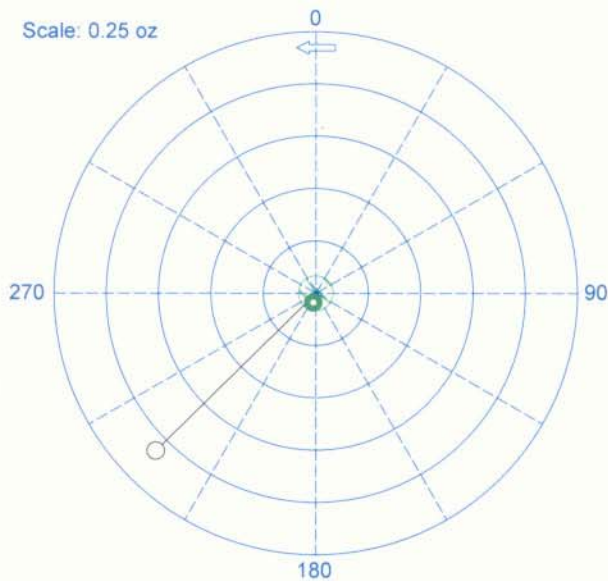
Balancing speed	Left Tolerance	Right Tolerance
1064 RPM	0.020 oz-in	0.013 oz-in

#### INITIAL RESULT:

	Left	Right
Correction Weight:	- 0.2143 oz at 225°	- 0.1040 oz at 52°
Unbalance:	0.250 oz-in	0.121 oz-in
	Reject (12.42 x Tol)	Reject (9.17 x Tol)

#### CURRENT RESULT:

	Left	Right
Correction Weight:	- 0.0095 oz at 196°	- 0.0060 oz at 220°
Unbalance:	0.011 oz-in	0.007 oz-in
	OK (0.55 x Tol)	OK (0.53 x Tol)



Signature



650 Park St.

Belgium, WI 53004

Office 262-285-3252 Cell 262-483-7088 Fax. 262-285-3218

e-mail [randy@spindlerepair.us](mailto:randy@spindlerepair.us) website [www.spindlerepair.us](http://www.spindlerepair.us)

## Vibration Report

Location	Schedule Entry	Type	Latest	Units	Date
<b>2460341</b>					
Nose - Vertical	Acc Freq 600000 CPM	Spectrum Overalls	<b>0.32</b>	g 0-pk	5/29/2009
Nose - Vertical	Vel Freq 96000 CPM	Spectrum Overalls	<b>0.012</b>	in/s 0-pk	5/29/2009
Nose - Horizontal	Vel Freq 96000 CPM	Spectrum Overalls	<b>0.025</b>	in/s 0-pk	5/29/2009
Nose - Axial	Vel Freq 96000 CPM	Spectrum Overalls	<b>0.008</b>	in/s 0-pk	5/29/2009
Tail - Vertical	Acc Freq 600000 CPM	Spectrum Overalls	<b>0.171</b>	g 0-pk	5/29/2009
Tail - Vertical	Vel Freq 96000 CPM	Spectrum Overalls	<b>0.009</b>	in/s 0-pk	5/29/2009
Tail - Horizontal	Vel Freq 96000 CPM	Spectrum Overalls	<b>0.01</b>	in/s 0-pk	5/29/2009

**GMN V-100 Cartridge Spindle**

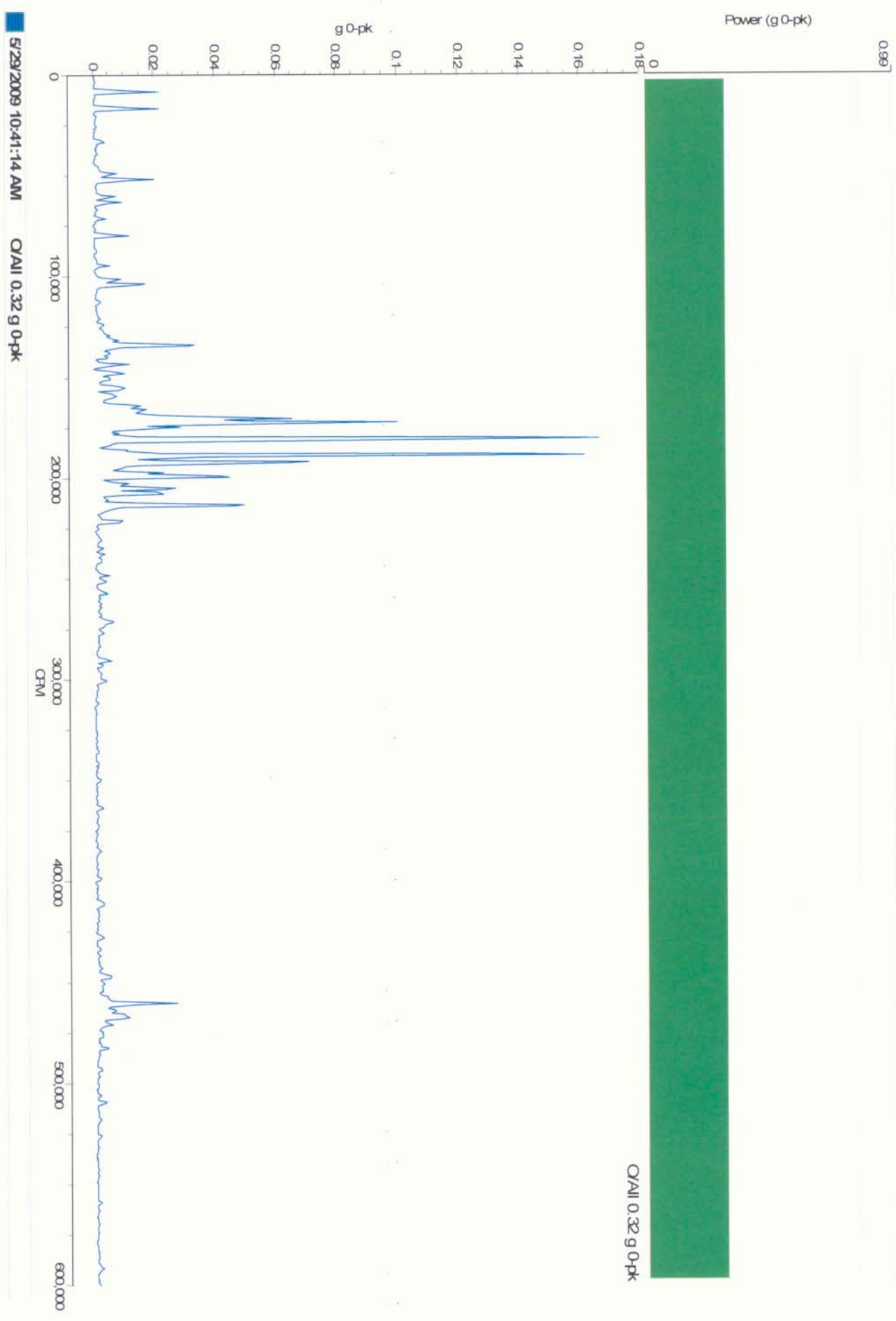
**8,000 RPM**

**Total number of locations: 5**

**Total machines without recordings: 0**

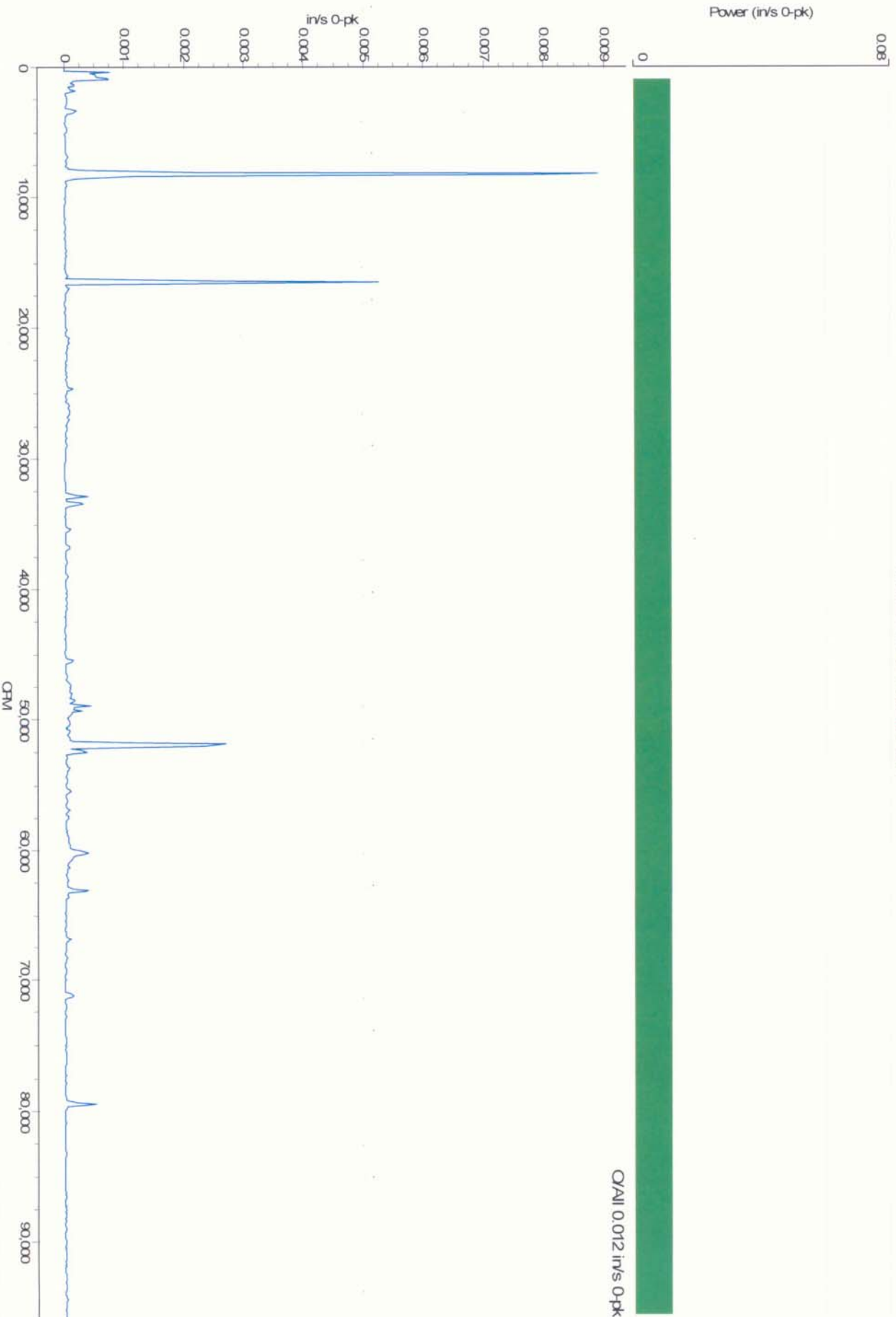
**Total locations without recordings: 0**

2460341 - Nose - Vertical - Acc Freq 600000 CPM  
5/29/2009 10:41:14 AM



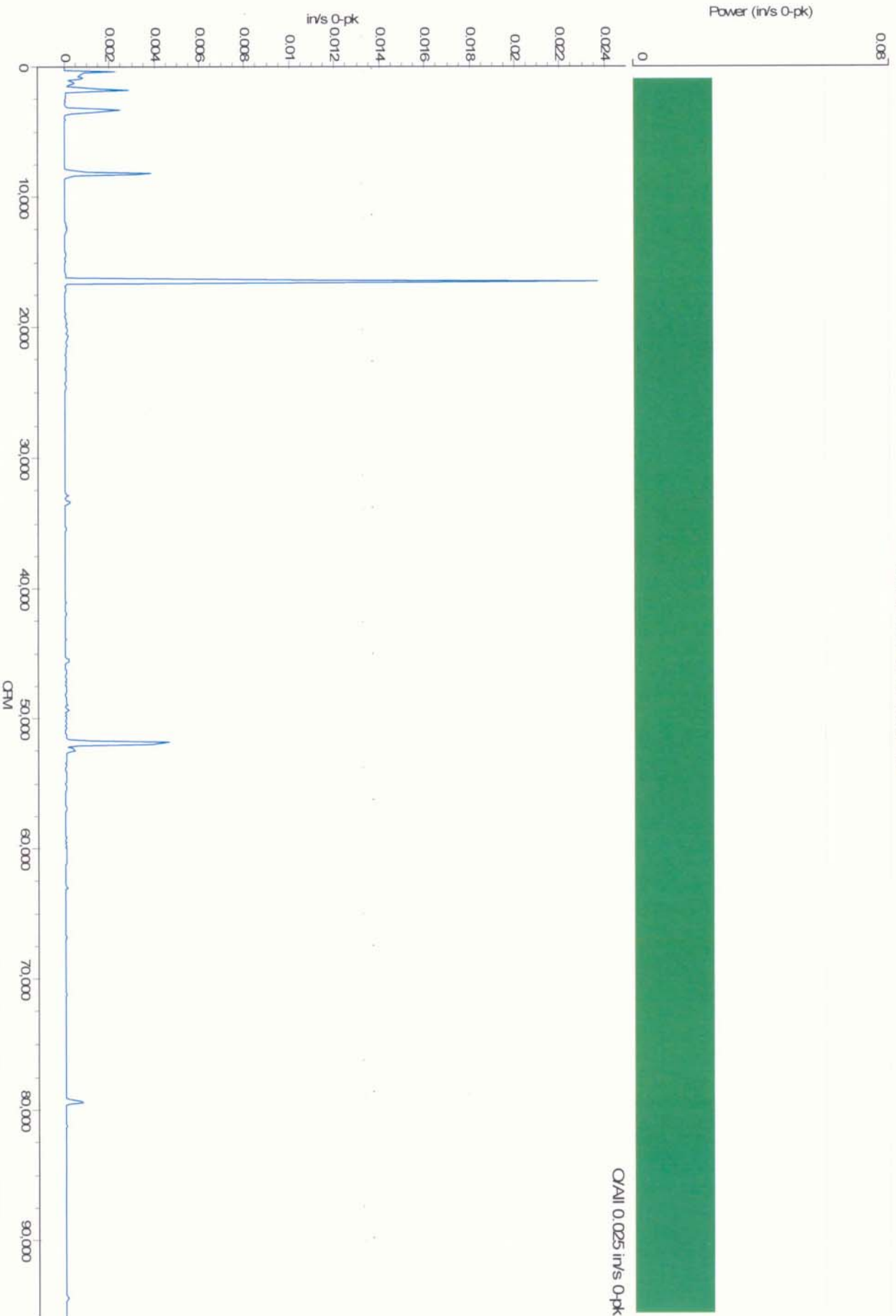
5/29/2009 10:41:14 AM Q/AII 0.32 g 0-pk

2460341 - Nose - Vertical - Vel Freq 96000 CPM  
5/29/2009 10:41:21 AM



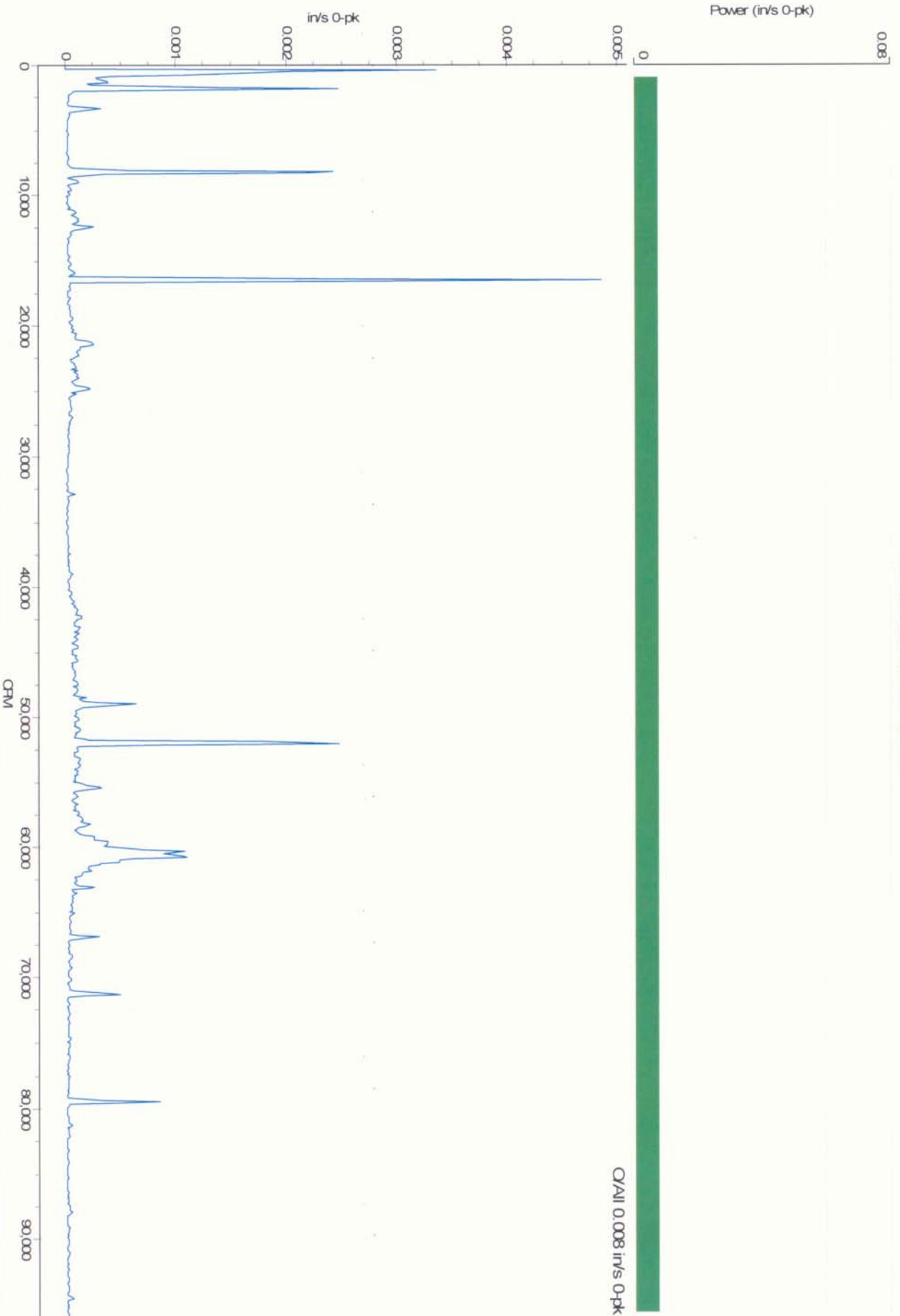
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2460341 - Nose - Horizontal - Vel Freq 96000 CPM  
5/29/2009 10:42:00 AM



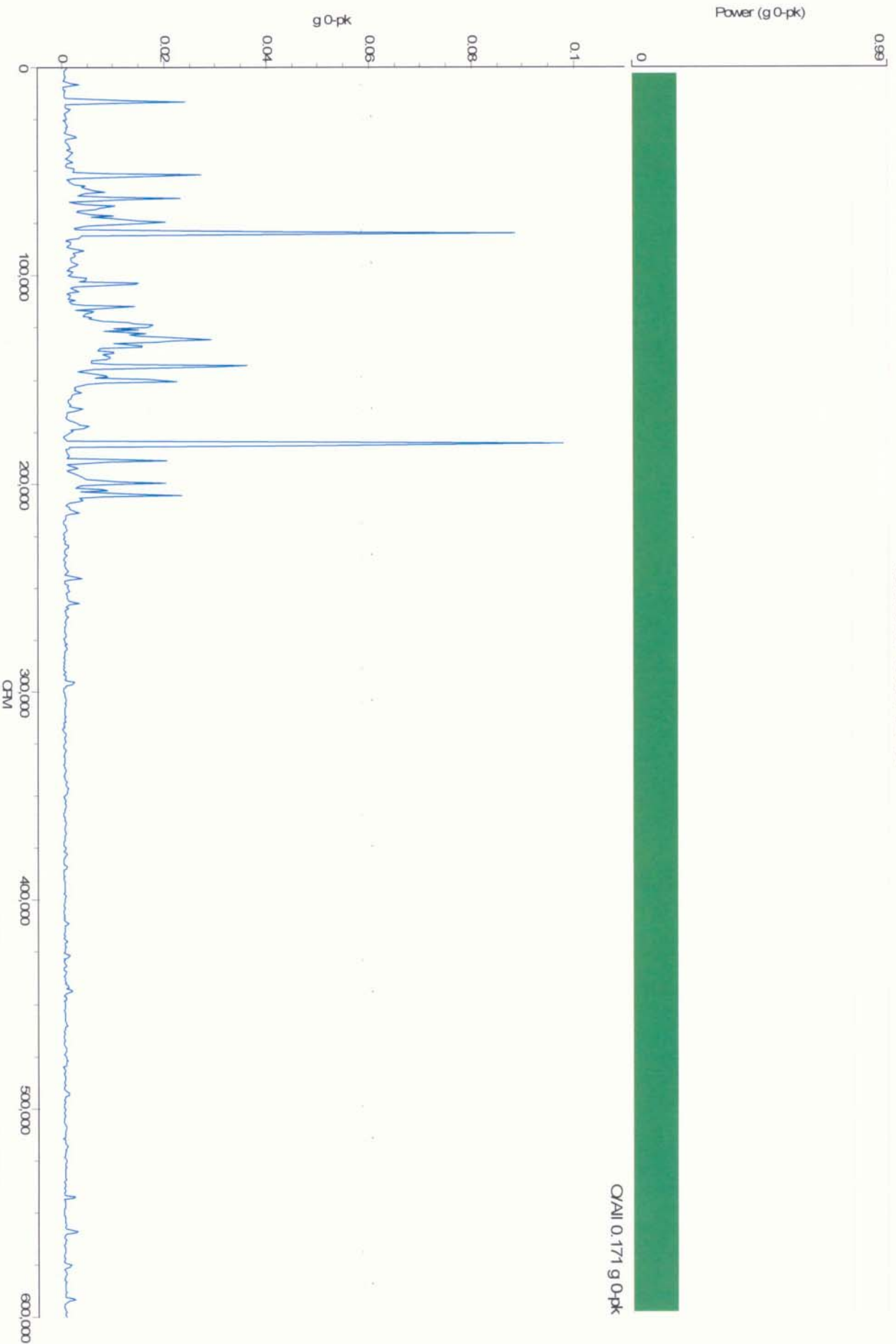
5/29/2009 10:42:00 AM O/All 0.025 in/s 0-pk

2460341 - Nose - Axial - Vel Freq 96000 CPM  
5/29/2009 10:42:16 AM



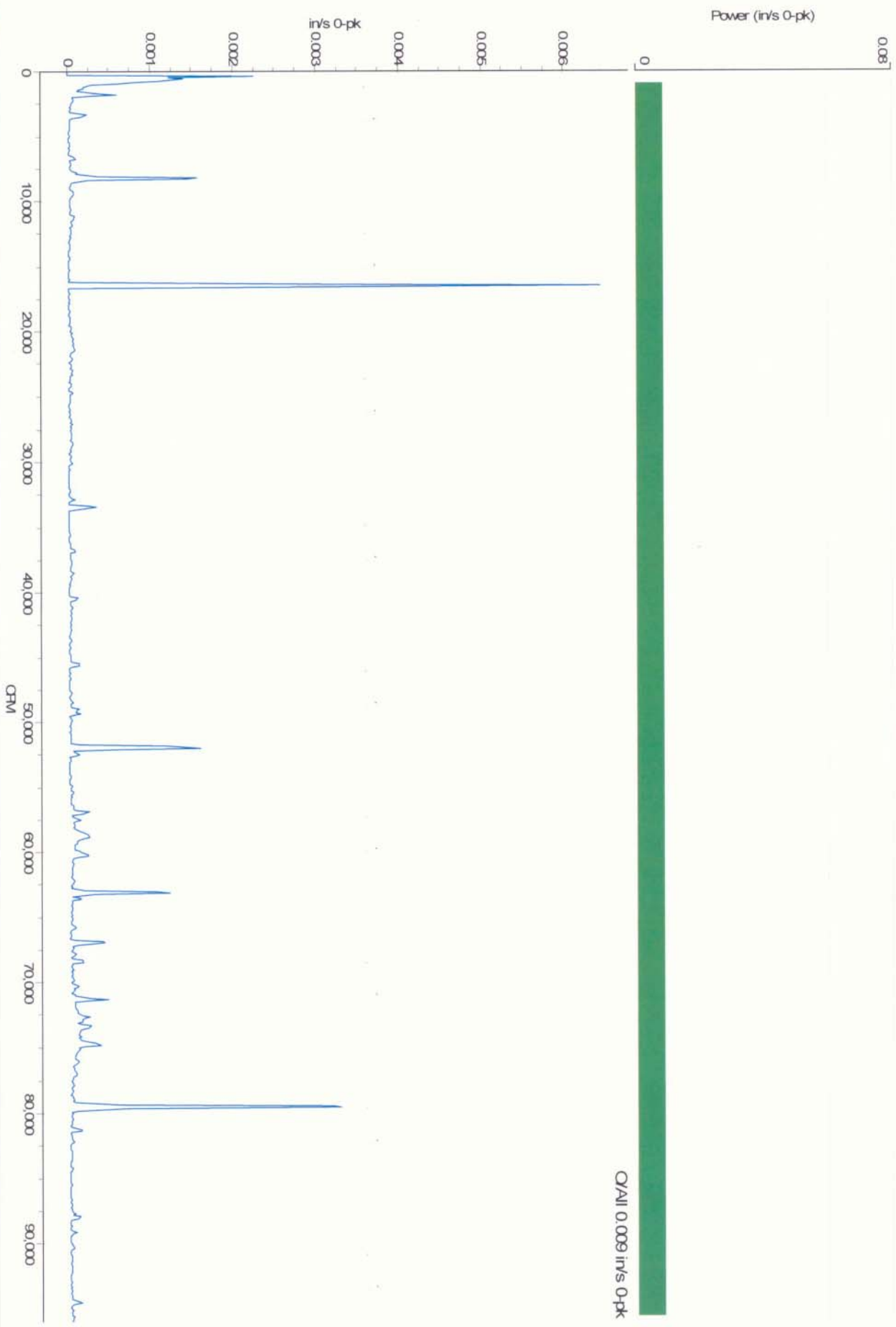
5/29/2009 10:42:16 AM Q/All 0.008 in/s 0-pk

2460341 - Tail - Vertical - Acc Freq 600000 CPM  
5/29/2009 10:42:42 AM



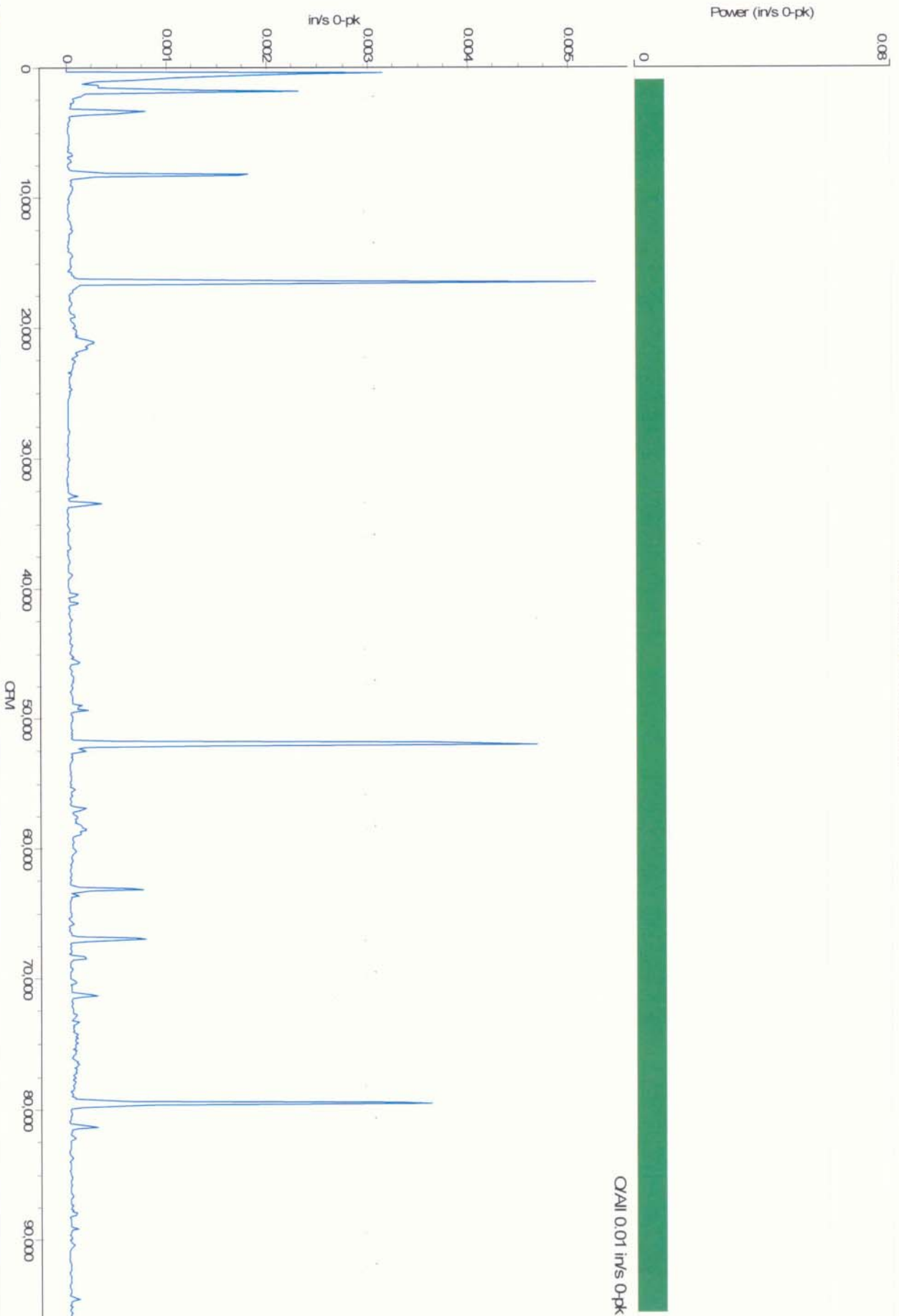
5/29/2009 10:42:42 AM Q/AI 0.171 g 0-pk

2460341 - Tail - Vertical - Vel Freq 96000 CPM  
5/29/2009 10:42:48 AM



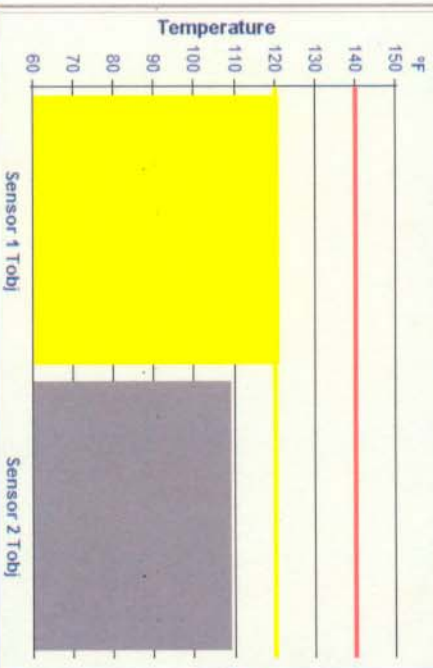
5/29/2009 10:42:48 AM Q/All 0.009 in/s 0-pk

2460341 - Tail - Horizontal - Vel Freq 96000 CPM  
5/29/2009 10:43:04 AM



06-2-4A

Bargraph



Sensor 1 Tobj

120.8°F

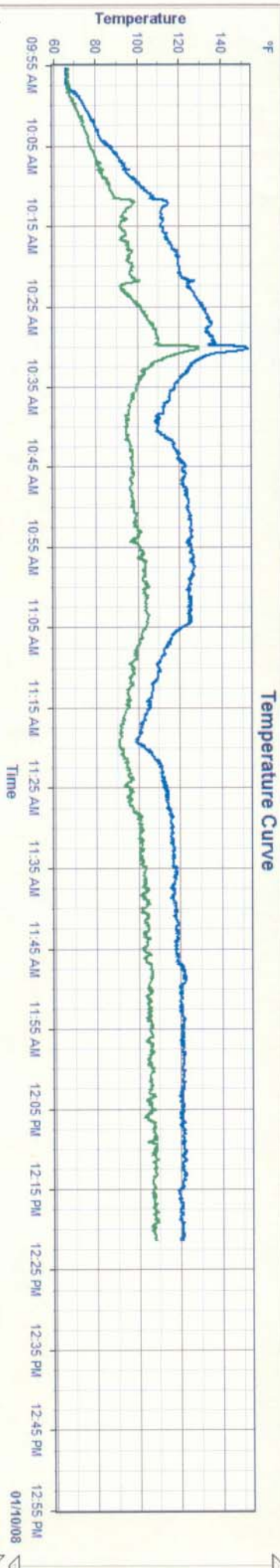
Sensor 2 Tobj

108.6°F

Records List

Time	Sensor 1 Tobj	Sensor 2 Tobj
10:05:06		
	F	F
11:40:10 AM	118.4	101.6
11:45:10 AM	118.4	103.2
11:50:10 AM	120.4	106.0
11:55:10 AM	121.2	106.0
12:00:10 PM	121.4	107.2
12:05:10 PM	120.8	105.8
12:10:10 PM	122.0	108.2
12:15:10 PM	119.0	106.6
12:20:10 PM	120.8	106.8

Graph





## FINAL INSPECTION REPORT

Customer \_\_\_\_\_

Job # \_\_\_\_\_

Model # \_\_\_\_\_

Serial # \_\_\_\_\_

Run Time 1 ½ Hrs

Final RPM 5,000

Nose O.D. Run N/A

Nose I.D. Run Out .00008"

Nose Face Run N/A

Tail Run Out .0001"

Lathe Nose O.D. N/A

Lathe Nose Face Run Out N/A

E.M. Dimension N/A

Pull force kN 19.4 or 4.37 klbs

Nose Bearing Temp 76° F

Tail Bearing Temp 79° F

Temp Sensor Check Good

Motor Phase Check Good

Motor Ground Check Good

Nose Lubrication Air/Oil

Encoder Signal Check Good

Tail Lubrication Air/Oil

Comments/Recommendations: Per the customer's instructions, run out @ the hilt is .00008" and 300 mm from hilt is .0003". Customer to run in spindle after installation into machine. Ensure lubricant is completely flowing through lubricant lines and into spindle before starting rotation of spindle. Allow lubrication system to purge lubricant through the bearings. Start @ 2,000 RPM & let run until temperature shows no increase or a minimum of 15 minutes. Increase in 1,000 RPM increments until reaching maximum RPM. Do not let temperature rise above 130 deg. F. during run in process. If temperature reaches 130 deg. F., shut spindle down and let cool to below 100 deg. F. and proceed with process. It is recommended to not run spindle for extended periods of time above 80 % of maximum RPM for the first 40 hours of operation. Questions, call Randy @ RMR Spindle Repair, 262-285-3252.

Assembled By: \_\_\_\_\_

Assembly Date: \_\_\_\_\_

Tested By: \_\_\_\_\_

Test Date: \_\_\_\_\_