

Bearing LifeGuard[®]

A brief tutorial on bearing fault monitoring.

Part #1 Four steps

1. Select point.
2. Hit collect.
3. Check waveform.
4. Read report!
5. Take action?
6. Diagnostics?

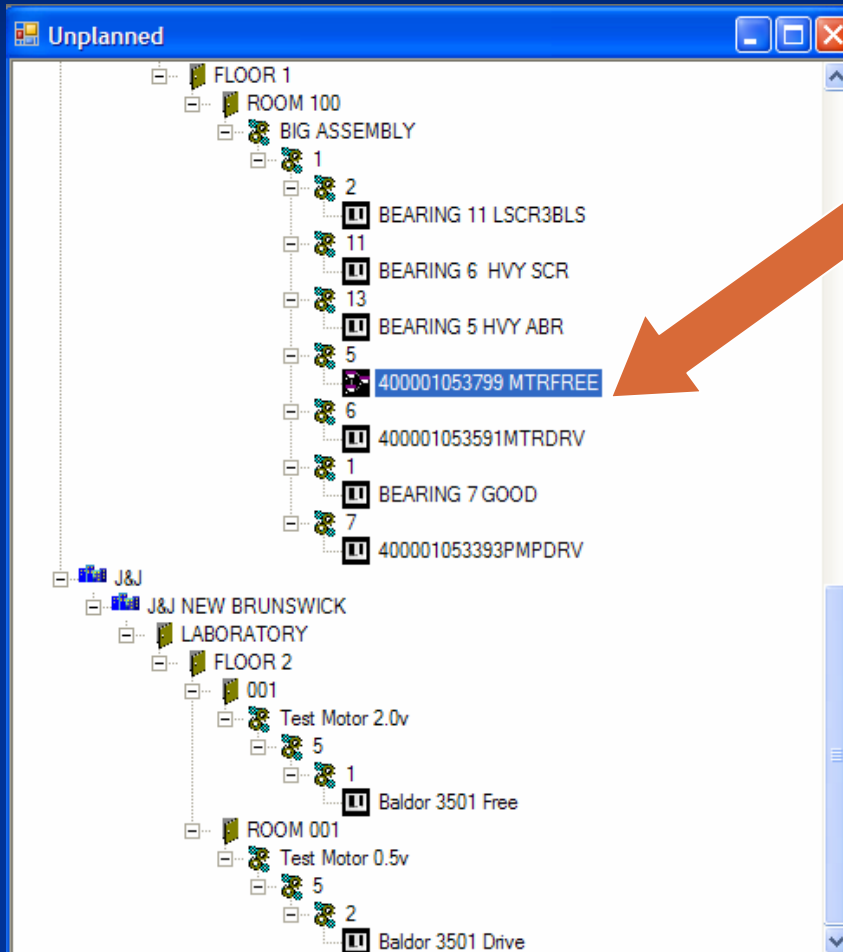
Part #2-Data collection hints.

1. Do's and Don'ts.
2. Getting reliable data.
3. Mounting preparation.
4. Where to mount.
5. High Frequency effects.
6. Hand probe sample response.

Part #1

The Four Steps!

STEP # 1 SELECT ID POINT ON THE ASSEMBLY TREE.



- Select Planned or Unplanned Tab.
- Bring up Assembly tree
- Find assembly and click on ID point.
- Or –scan Barcode at machine to automatically activate point.

STEP # 2 Hit COLLECT on 'take measurement' screen.

TakeMeasurementSet

BEARING 5 HVY ABR

of Measurements: 10

Duration: 0.2 Sec.

Motor Speed: 3600 RPM

Notes: Wideband Detection

Filter stack notch width 20Hz, 1st order center frequency 3000 +/- 30, +/- 60, 2nd order center frequency 6000 +/- 30, +/- 60. VFD frequency notches between 2100 to 2500 and 4000 to 4500.

Collect

- This will collect and analyze ten data samples.
- Time 0.2 seconds ea.
- Based on 3600 RPM
- Notes tell us we have a notch to reduce Variable Frequency drive noise.
- And notches to reduce gear mesh noise.

3 Examine Waveform before collecting and analyzing.



- This is a 'test' signal.
- It looks good!
- Click 'use this data'.
- Bad signal? 'Collect again' 'Skip', or check connection Alarms.

#4 Read Report on Bearing Condition.

Bearing Information for AssemblyID = [BEARING 6 HVY SCR]

Settings | Processed Data

Timestamp = 1/13/2007 9:47:11 AM

Forecast period (days)	90	RPM	3600
Estimated MTTF (hours)	2160		
Estimated Life (hours)	1928		
Probability of Failure in forecast period	63 %		
Short term Probability (14 day)	6 %		
Risk Estimate (Forecast Period)	\$6321	CoAF	\$10000

Bearing service recommended

Factors | Discriminants | MTTF

- Date Time
- Forecast. Period.
- Estimated. mean time to failure. (Hours)
- Estimated mean life. (Hours)
- Probability of Failure.
- Probability of Failure within 14 days.
- Estimated Financial risk.
- Warning to take action.

Bearing LifeGuard-makes it easy!

- Took less than one minute.
- It does the work.
- You make the informed maintenance decision.
- More detailed analysis if you need it.

It Examines:

- High Frequency 'g' Energy.
- Envelope Demodulation.
- Crest Factor.
- Peak Acceleration.
- Kurtosis Analysis.
- Dynamic Forces.

Part #2

Data Collection Hints!

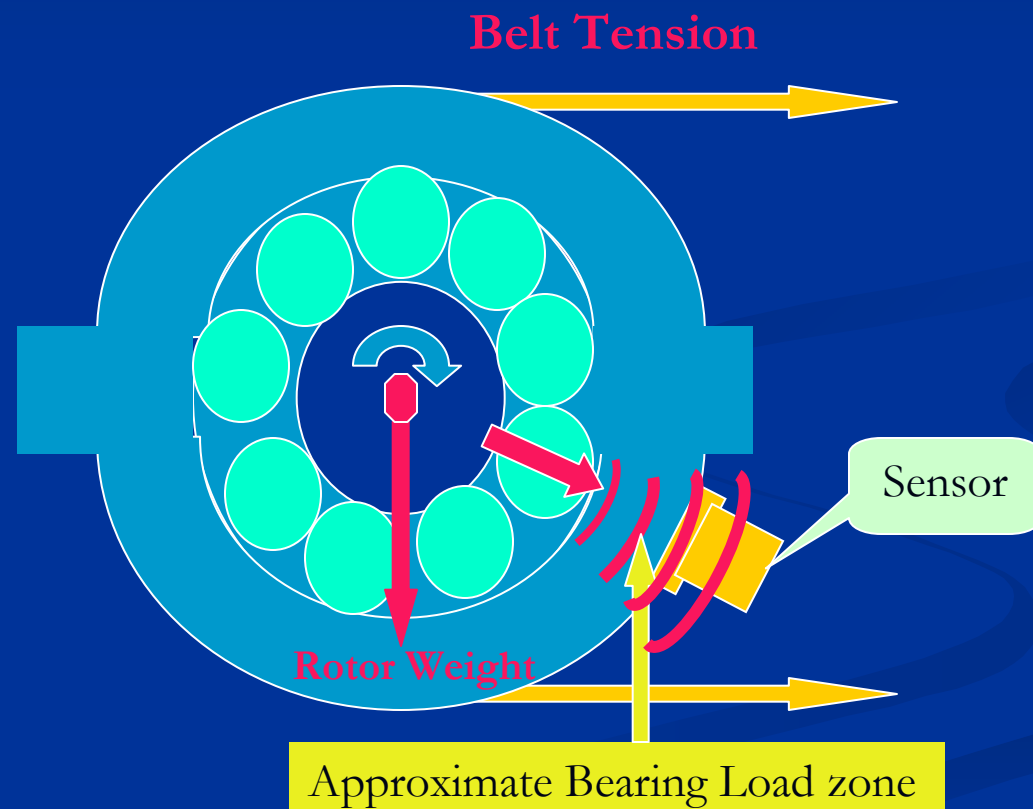
Bearing Analysis-Do's & Don'ts.

- Hand Held Probe-----**Don't!**
- Horseshoe Magnet-----**Don't!**
- Mount on bracket-----**Don't!**
- Mount on motor shell-----**Don't!**
- Bonded mount----**Caution! (Contact Tech support.)**
- Super Magnet—**use thin film of silicone grease on stud mounted machined bushing -----OK!**
- Properly stud mounted accelerometer with thin film of silicone grease.----**Best!**
- Mount on bearing housing near load zone-----**Best!**

IMPORTANCE OF ACCELEROMETER MOUNTING IN OBTAINING RELIABLE BEARING DATA.

- The use of stud mounted accelerometers is recommended-20 kHz f_n -for good high frequency response.
- Do not use hand probes! (See next slide.)
They are not repeatable and filter out high frequencies.
- Do not use horseshoe magnets.
They are only useful for measurement of balance, alignment and low frequency bearing components.
- Use only carefully bonded accelerometers.
Difficult to verify quality of a bond. (Check Tech Support.)

Mount Sensor Close to Load Zone.



ACCELEROMETER MOUNTING

SURFACE PREPARATION

Drilled and tapped holes shall be perpendicular to the finished surfaces within ± 1 degree

Chamfer

Remove burrs

Surface finish of 125 micro-inches or better

Accelerometer mounting surfaces shall be flat within 700 micro inches Rms

Mounting holes shall be drilled and tapped to a depth to accommodate the proper stud

Thin film silicon grease.

Mounting - High Frequency Effects

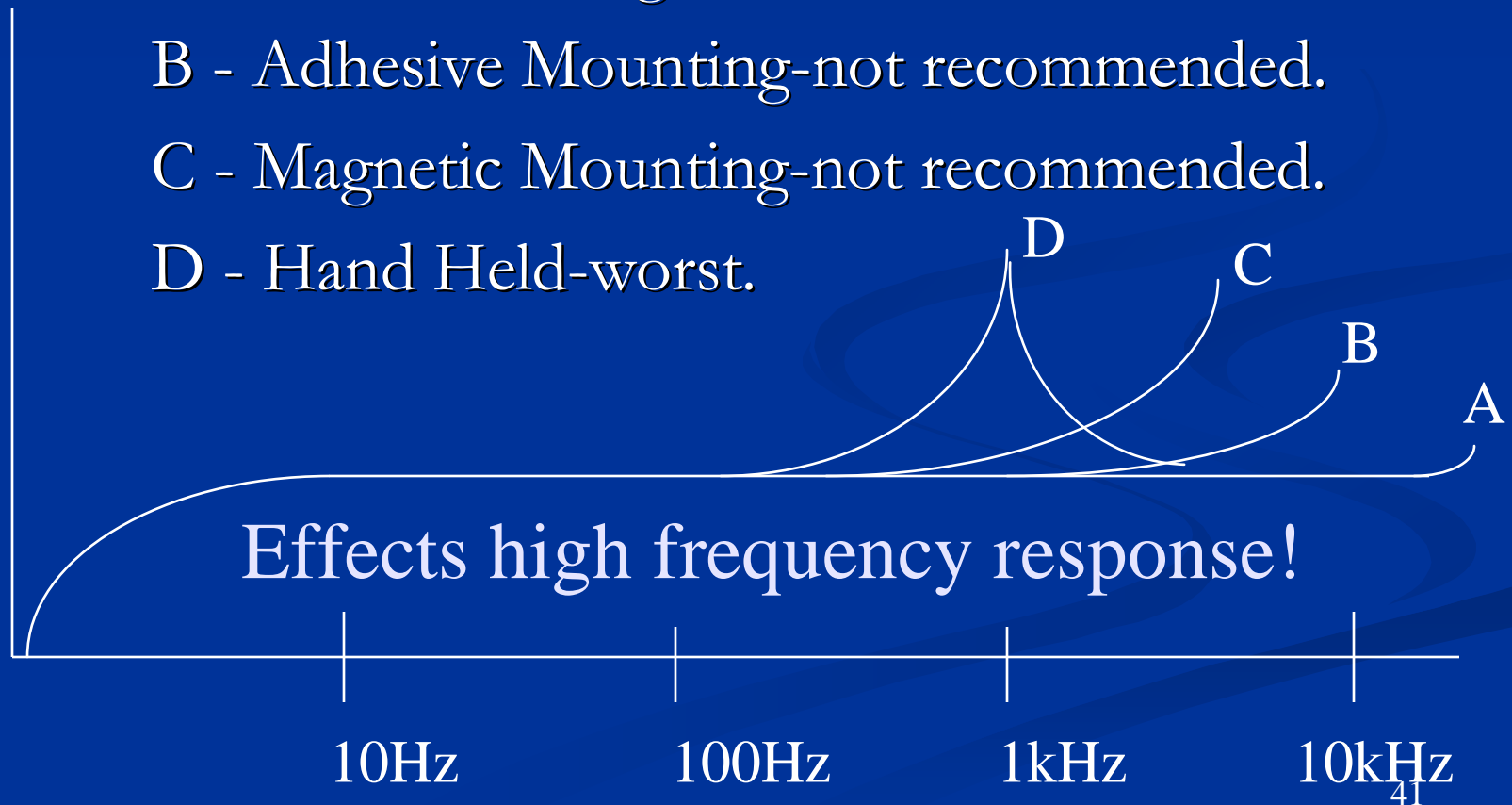
A. Mounting

A. A - Stud Mounting-best.

B. B - Adhesive Mounting-not recommended.

C. C - Magnetic Mounting-not recommended.

D. D - Hand Held-worst.



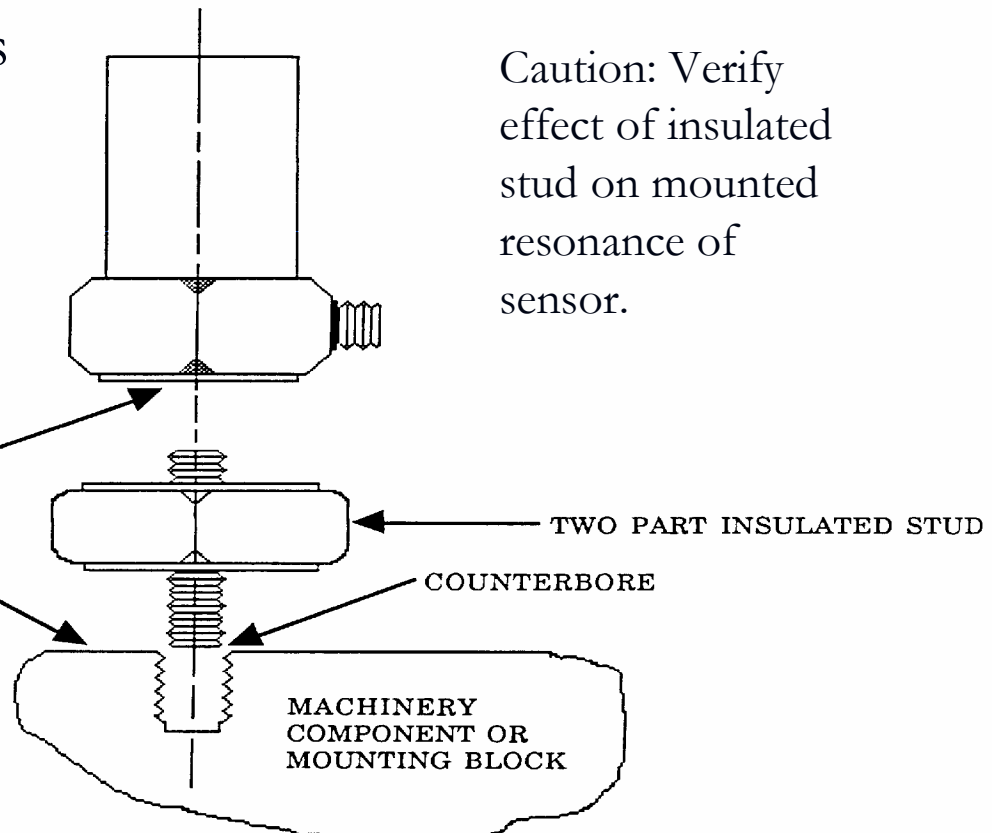
Isolating bushing w/stud

STAINLESS STEEL INSULATED STUD USED TO ELECTRICALLY ISOLATE THE ACCELEROMETER FROM THE MACHINERY PART

This technique is an acceptable substitute for direct hard mounting.

Caution: Verify effect of insulated stud on mounted resonance of sensor.

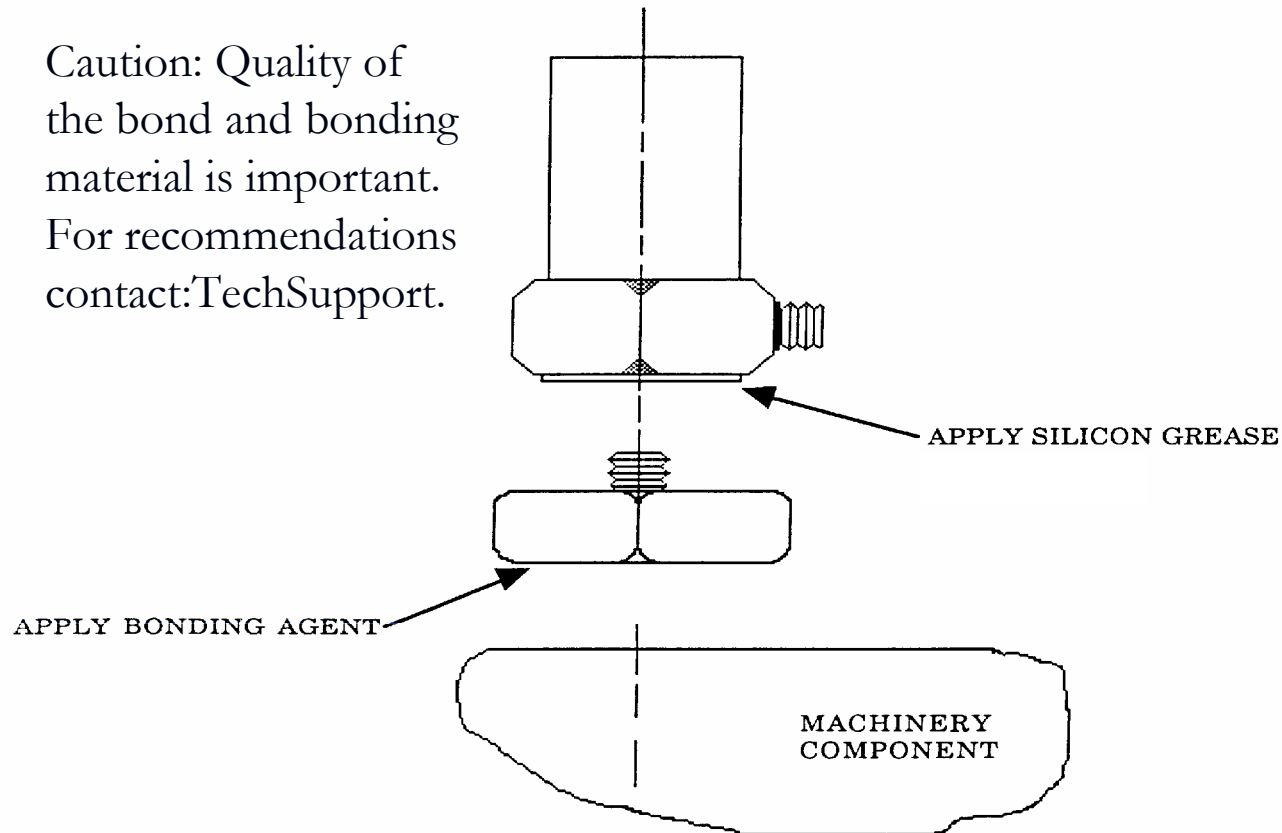
APPLY A SMALL AMOUNT OF SILICON GREASE OR LIGHT OIL BETWEEN MATING SURFACES



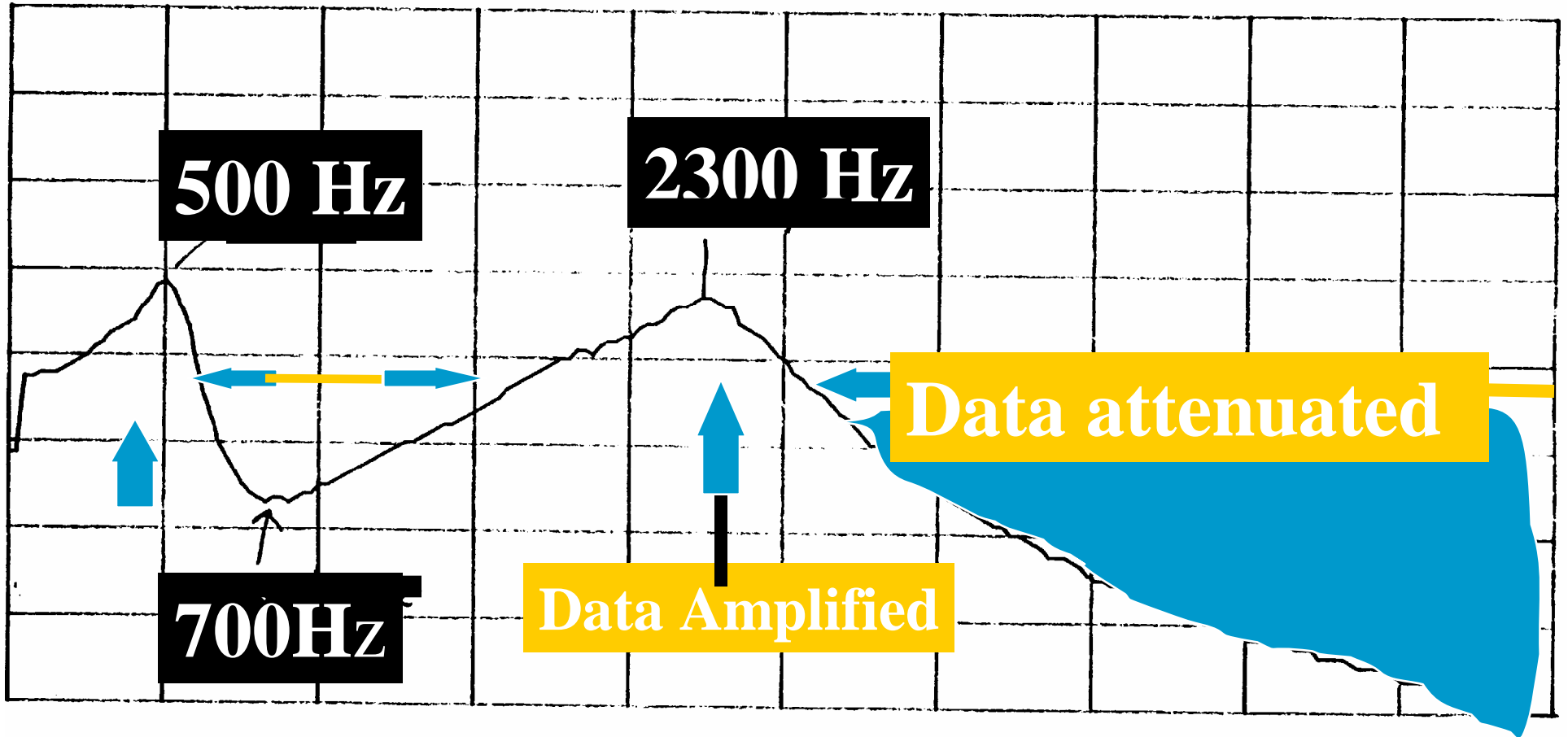
Isolating bushing

ANODIZED ALUMINUM CEMENTING STUD USED TO ELECTRICALLY ISOLATE THE ACCELEROMETER FROM THE MACHINERY PART

Caution: Quality of
the bond and bonding
material is important.
For recommendations
contact: TechSupport.



Hand Held Probe- 4 1/2 in stinger



AVG= 32

XFR FN MAG :

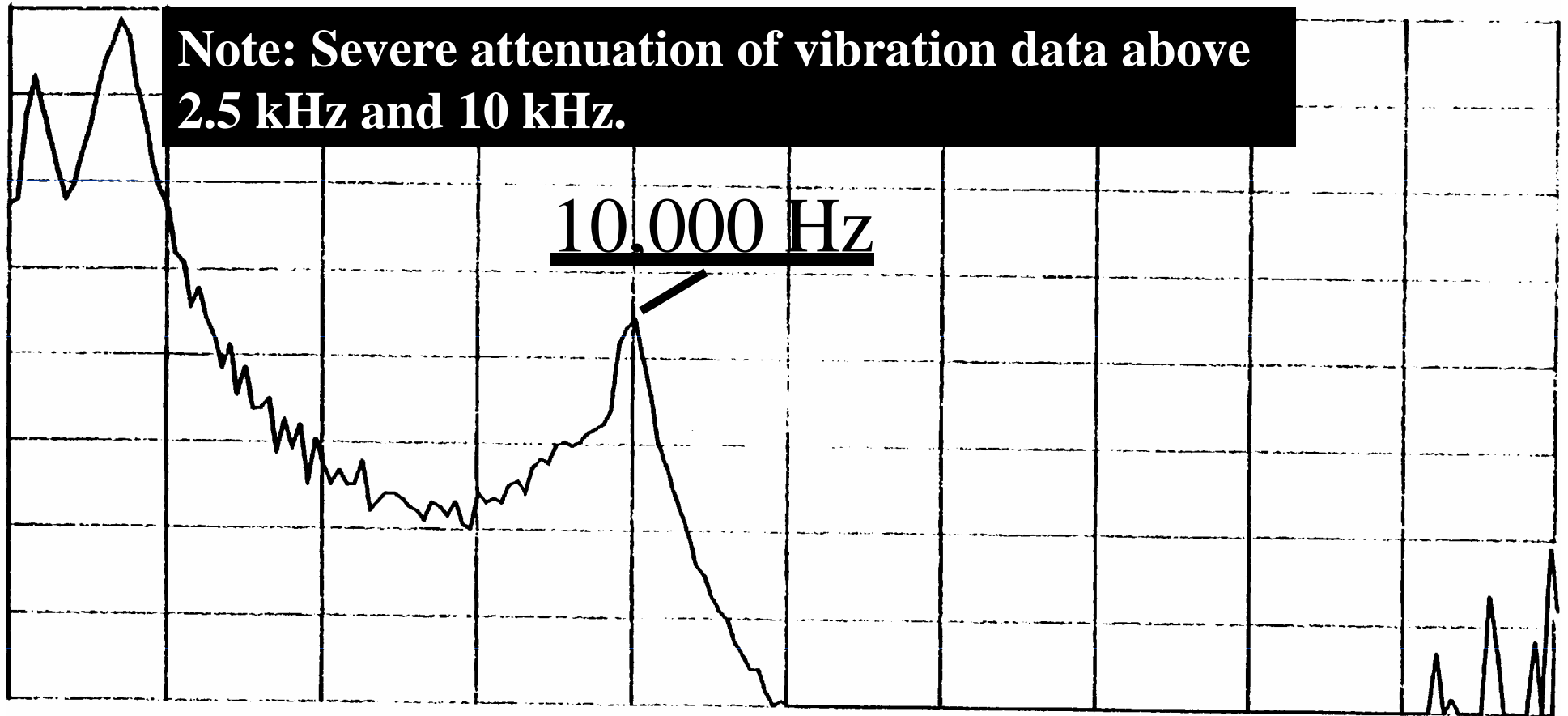
N: 32 P: 25HZ

SPAN: 0.000000HZ-5.000000KHZ

FS: 41.00dB

5dB/

Acceleration vs. frequency-to 25 kHz w/4.5 inch hand probe.



AVG= 10

XFR FN MAG :

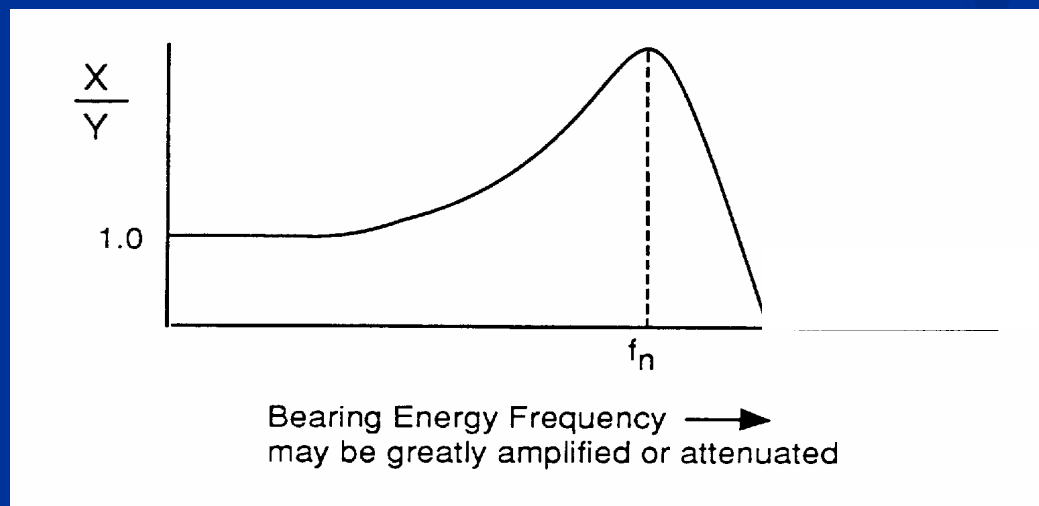
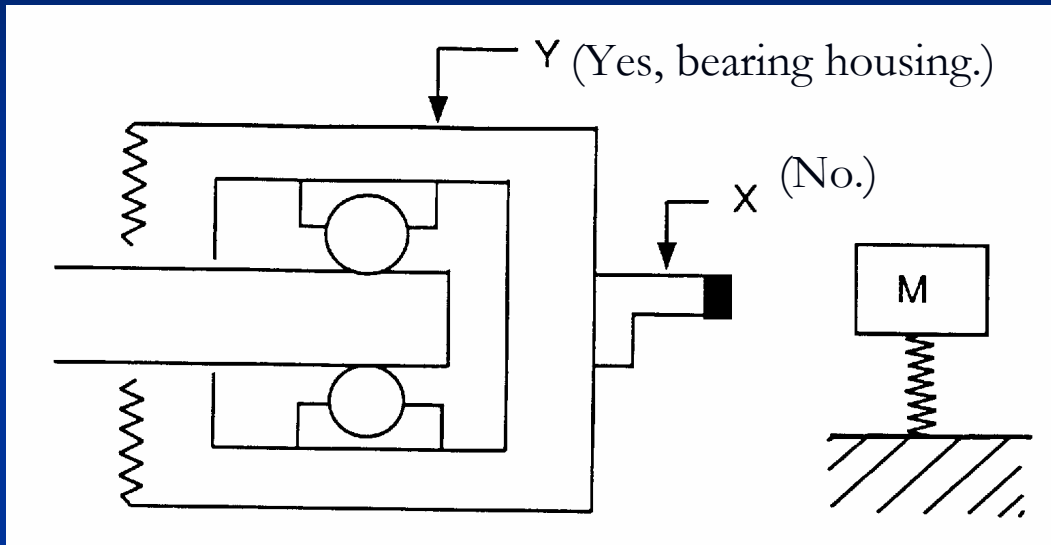
N: 16 F: 125HZ

SPAN: 0.000000HZ-25.0000KHZ

FS: 26.00dB

5dB/

Mount to solid surfaces- avoid brackets!



Bracket resonance can modify machine spectrum!

The Bearing LifeGuard[®] System.

YOU DON'T NEED TO BE A VIBRATION EXPERT TO:

- **SEARCH FOR HIGH COST/RISK PROBLEMS.**
- **MAKE TIMELY SHUT DOWN DECISIONS.**
- **MAKE SOUND FINANCIAL DECISIONS.**
- **OPTIMIZE YOUR MACHINERY BEARING LIFE.**
- **TREND MACHINE LIFE EXPECTANCY .**
- **BENCHMARK FACILITIES/DEPARTMENTS.**
- **For questions or more info: Sales@bearinglifeguard.com**