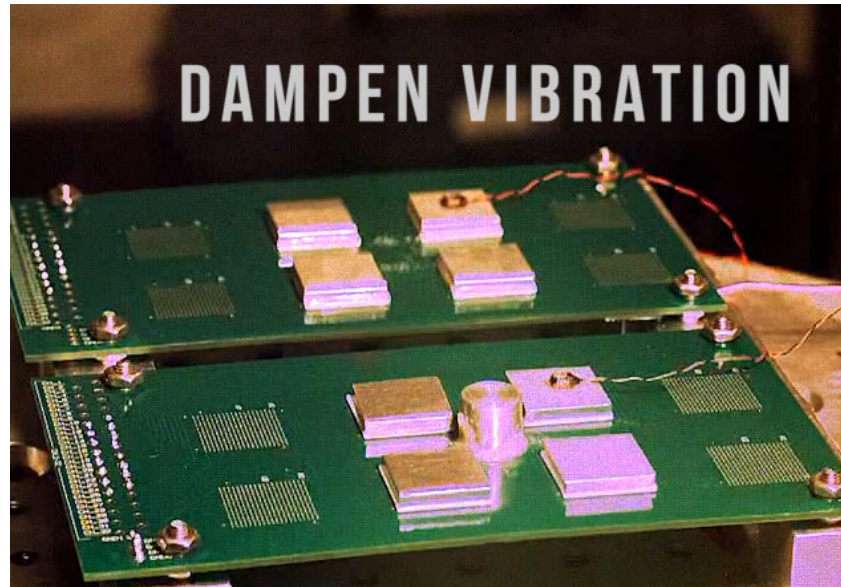
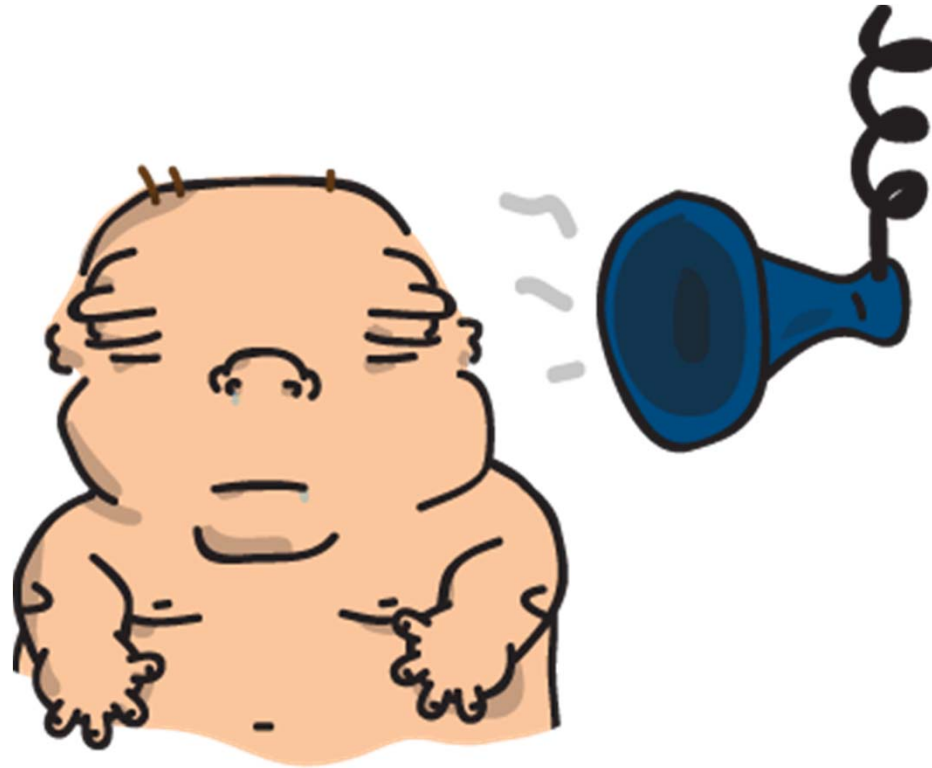


PCB Vibration Attenuation



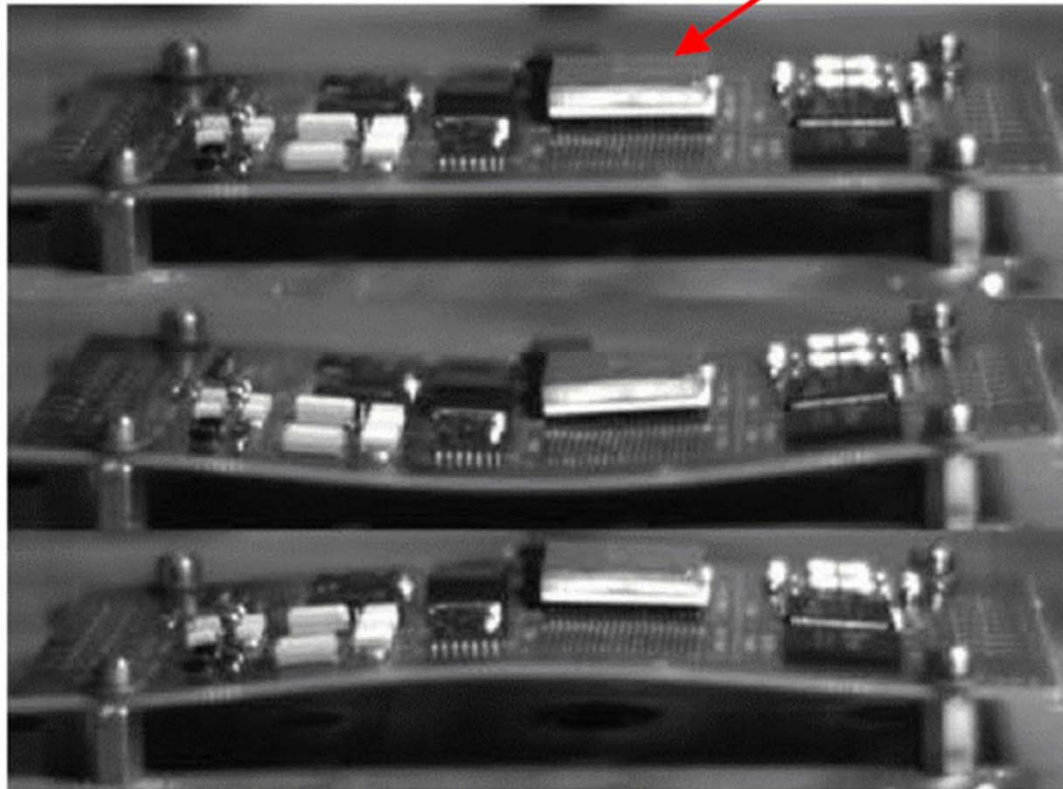
TopLine®

Low Frequency Vibration Damage



PCB Vibration Bending

CCGA with Micro-coil Spring Interconnects

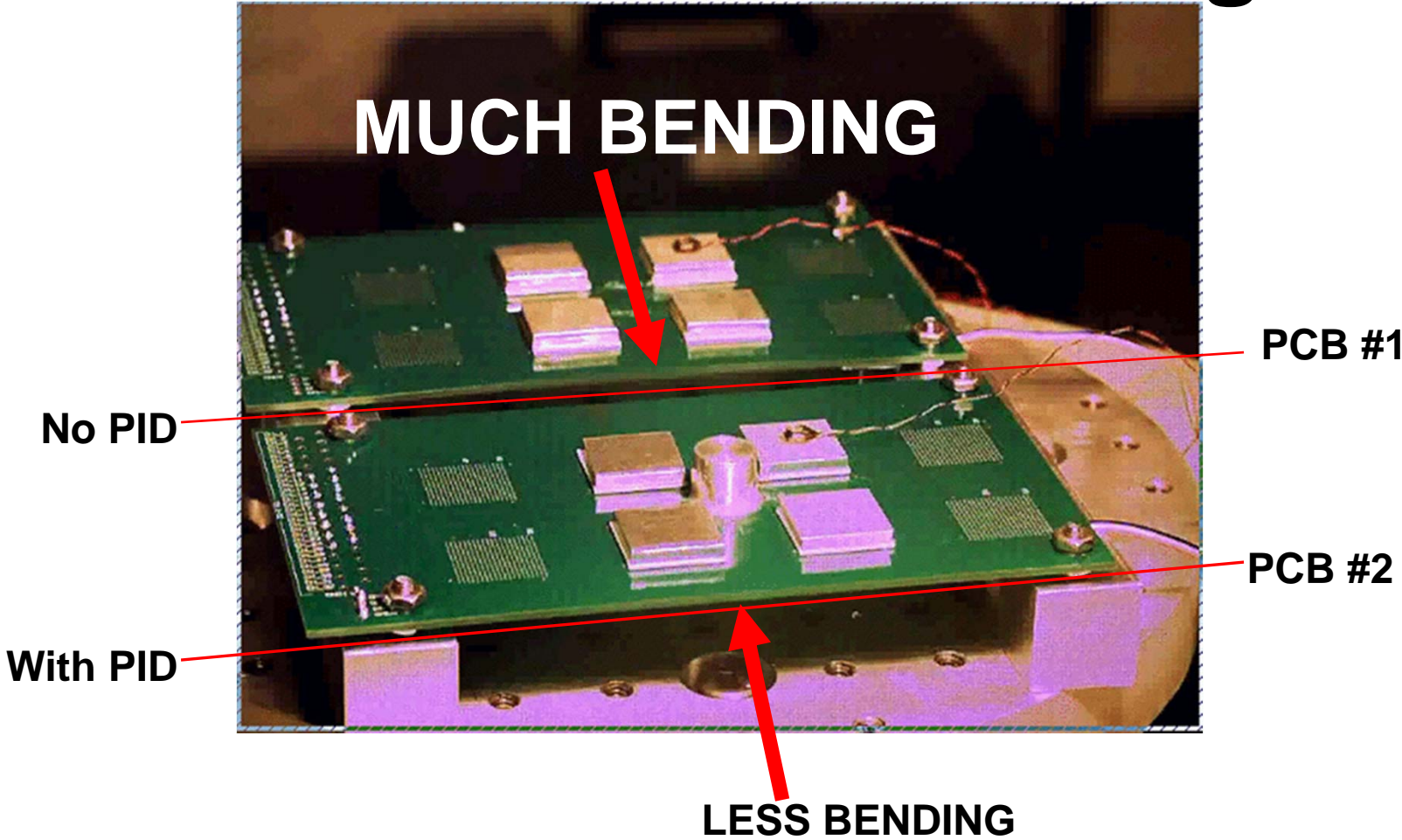


PCB
Without
Deflection

Negative
Deflection

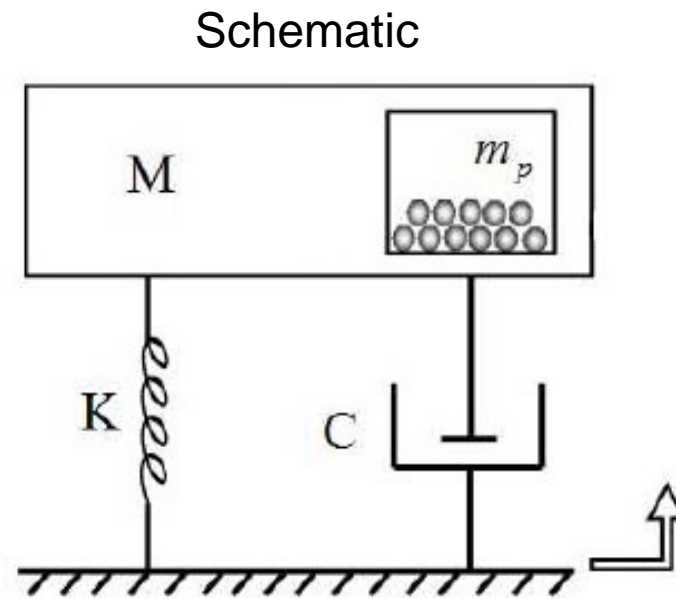
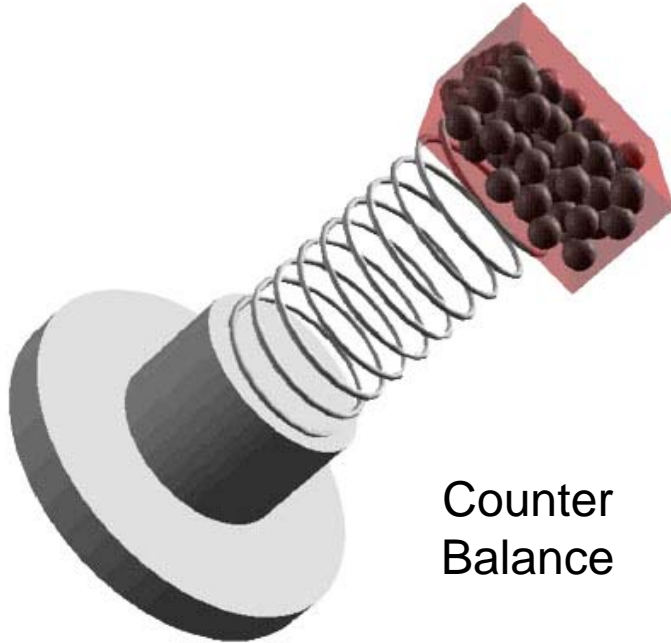
Positive
Deflection

PCB Vibration Bending



Solution from NASA USA

PID = Particle Impact Damping

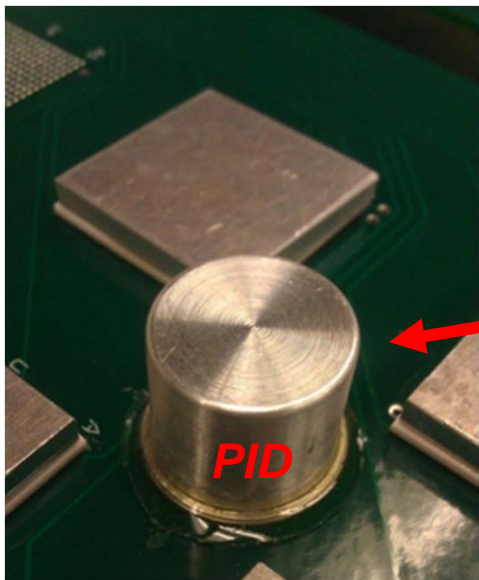


Inside *PID*

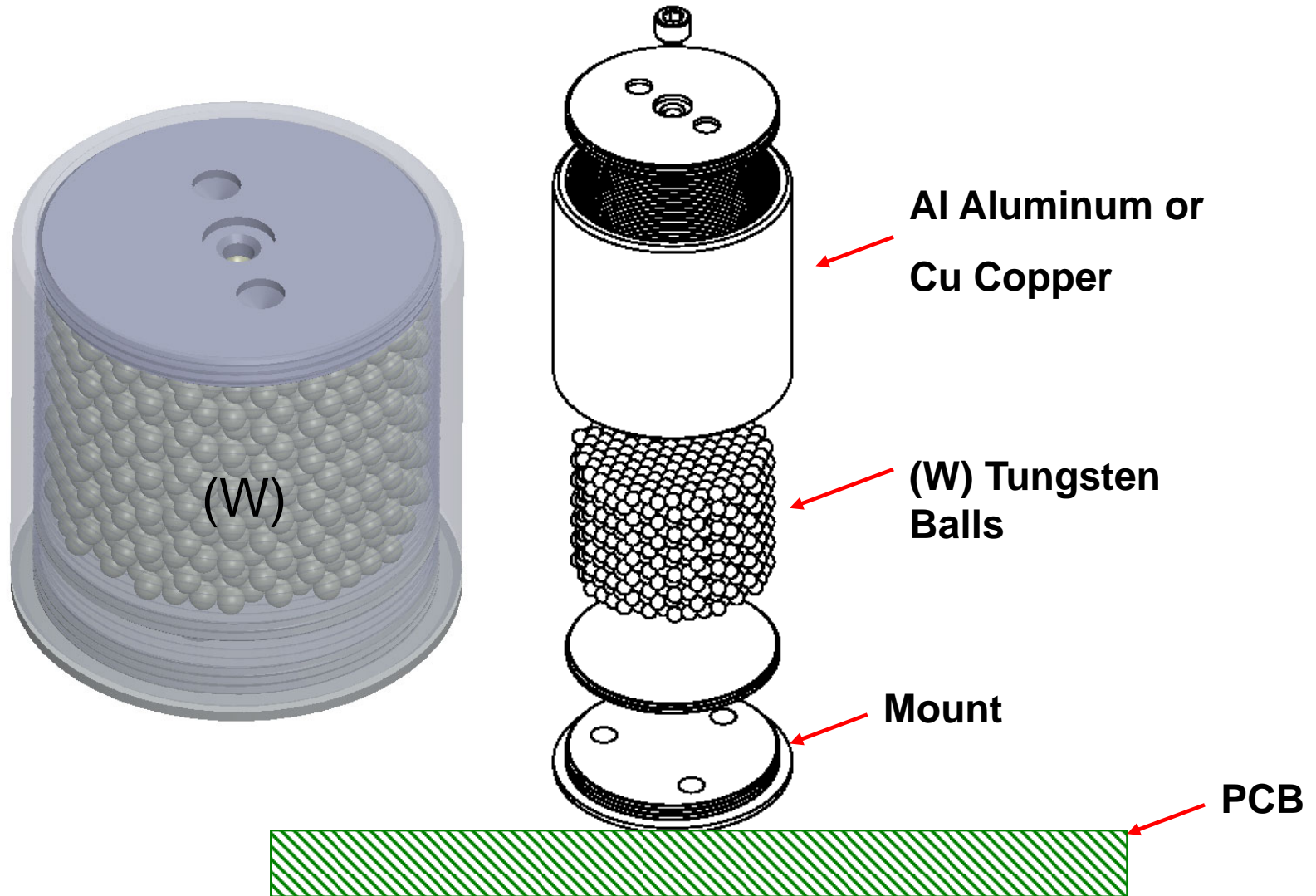
Tungsten Ball (W)

1 Ball = 0.073g

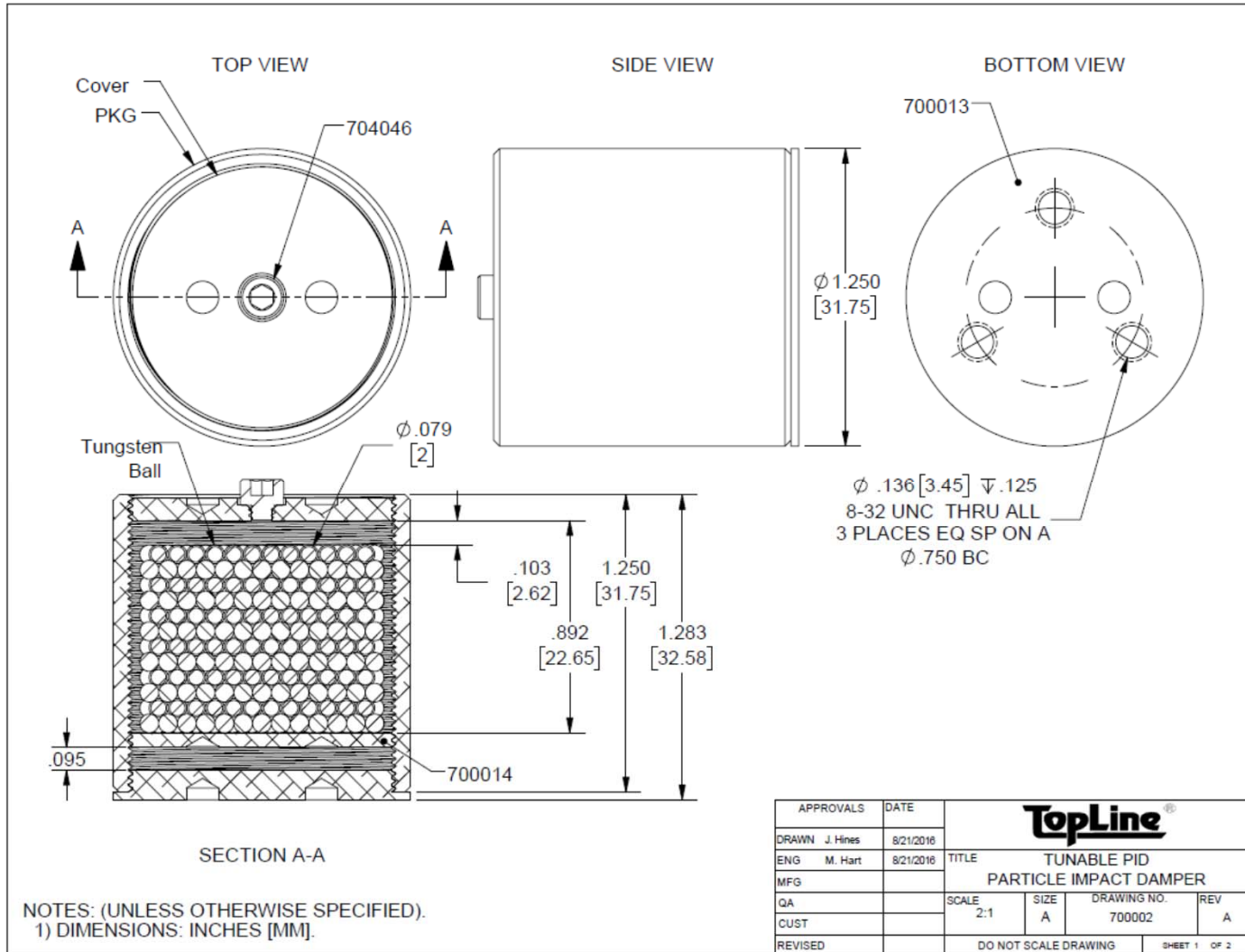
13,700 Balls = 1Kg



PID Model

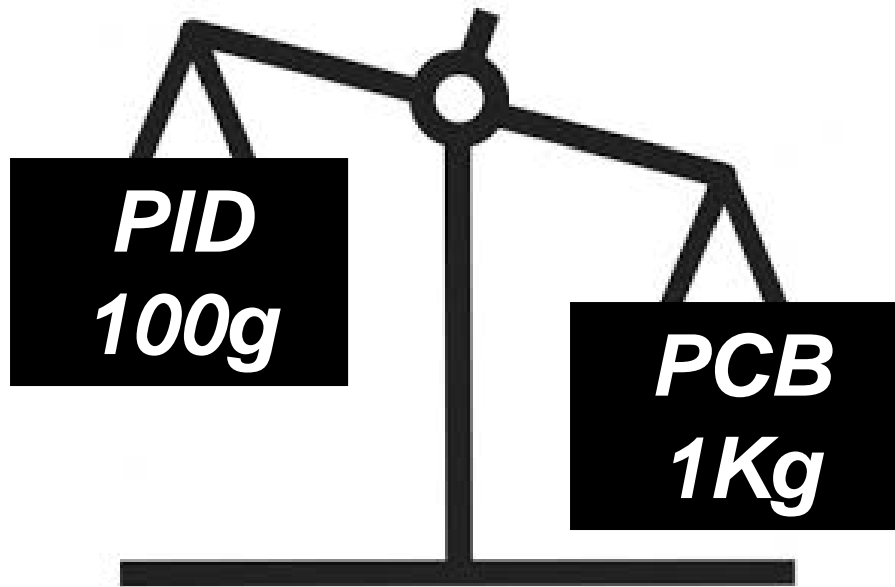


DWG *PID*



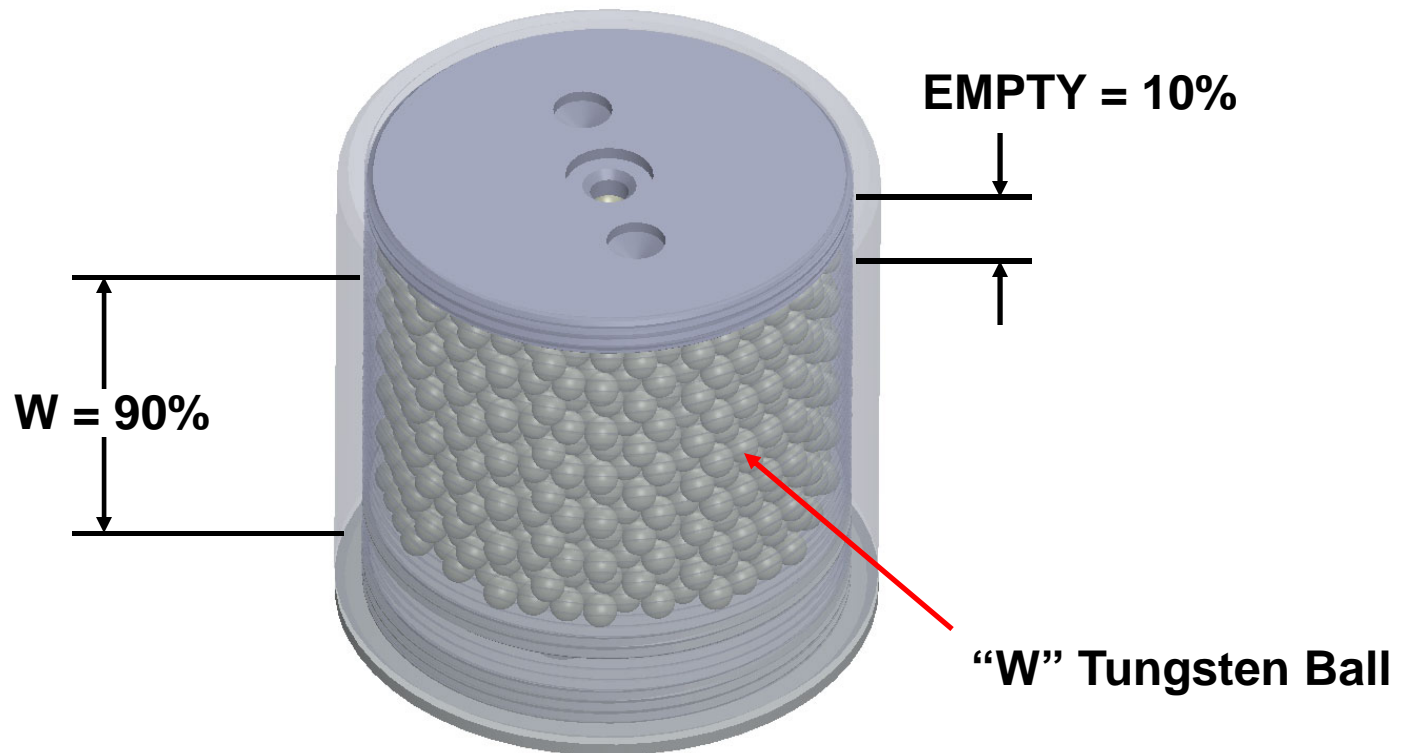
Design Rule #1

Mass of PID = 10% PCB



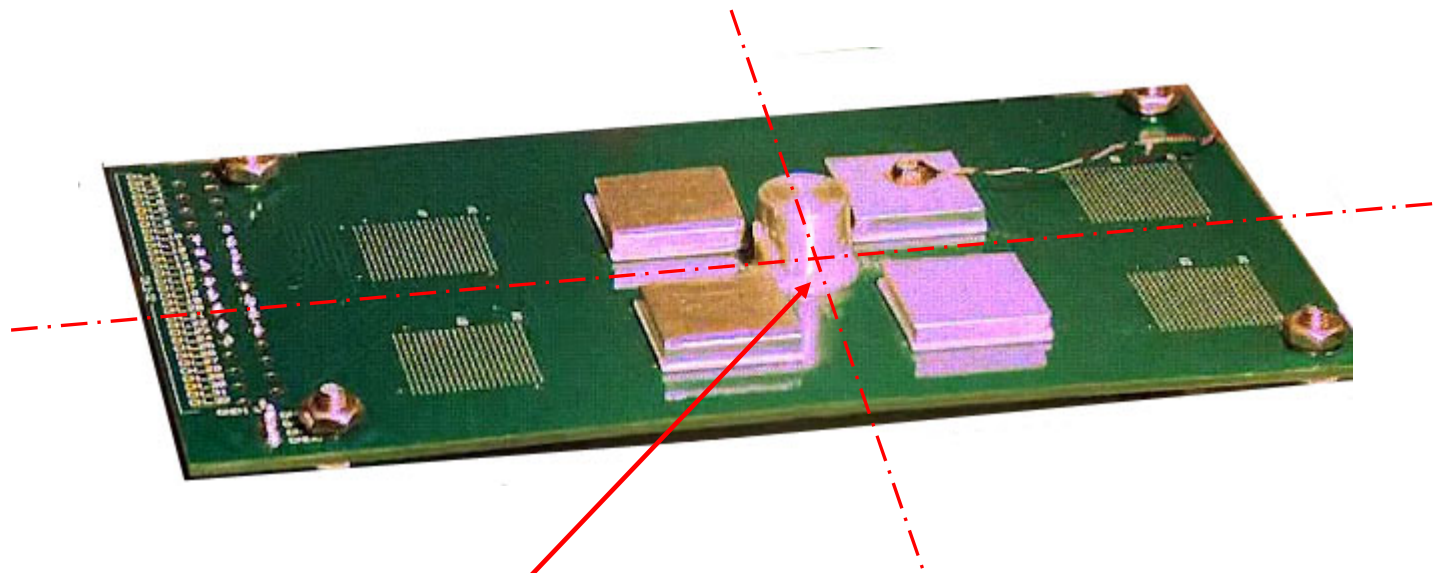
Design Rule #2

Fill "W" 90% PKG



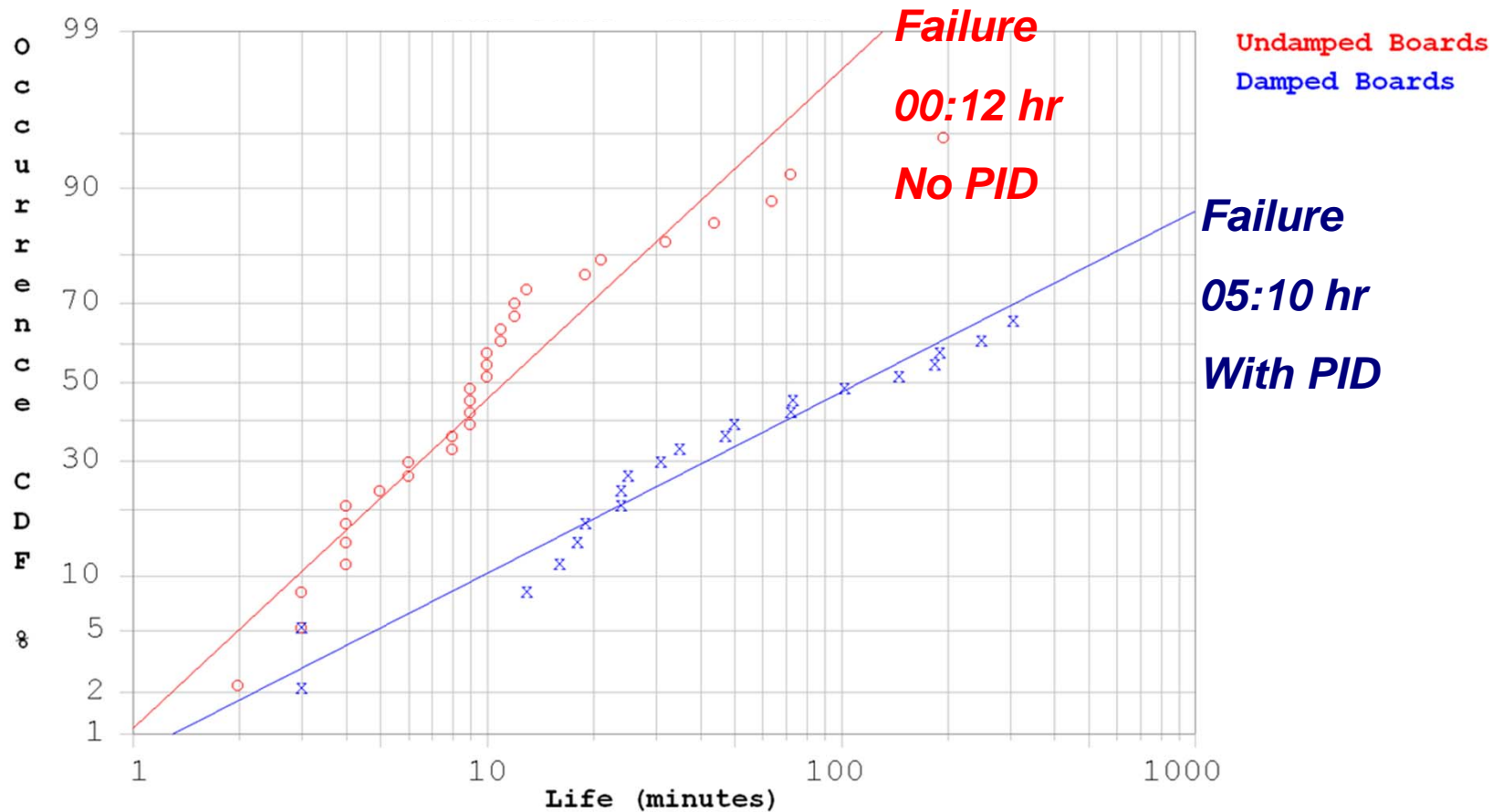
Design Rule #3

Mount PID Center of PCB



***PID* @ CENTER**

Weilbull Failure Analysis 19x PCB



2 Minute Video How *PID* Works

<https://youtu.be/P4SQuBaKXWw>

Applications for *PID*

Environments

- **Military - Space**
- **Telecommunication**
- **High Reliability**
- **Automotive**
- **Special Applications**

Thank You!



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