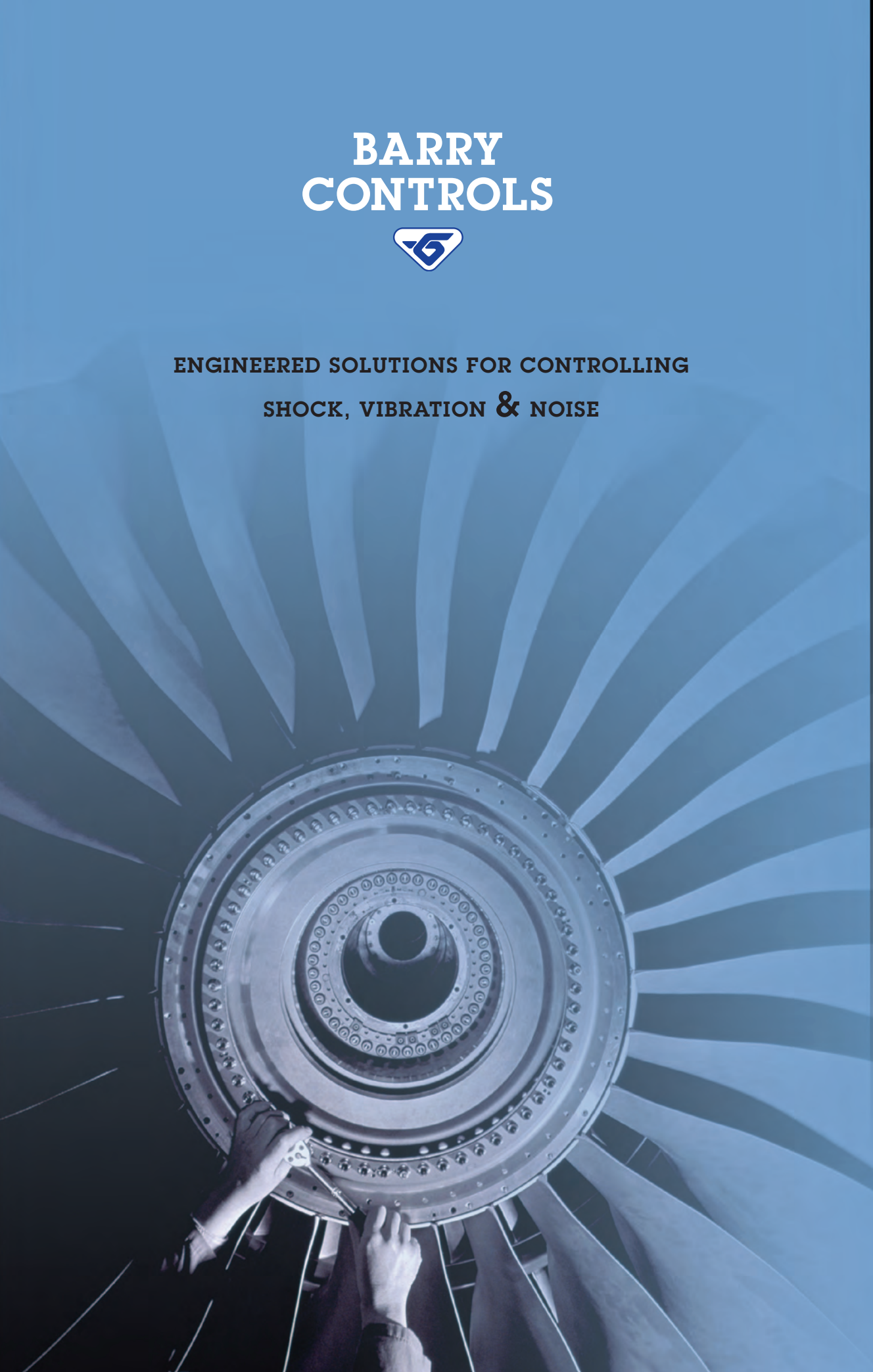
BARRY CONTROLS

ENGINEERED SOLUTIONS FOR CONTROLLING

SHOCK, VIBRATION & NOISE



DESIGN REFERENCE MANUAL

ENGINEERED SOLUTIONS FOR ALL YOUR SHOCK, VIBRATION AND NOISE PROBLEMS

Barry Engineering Makes the Difference

Barry Controls is a world leader in the design, manufacture, and application of products and systems to control vibration, mechanical shock, and structureborne noise. Barry's technical expertise is commonly acknowledged to be unsurpassed in the shock and vibration control industry. When required by unique or especially demanding applications, Barry is staffed and equipped to develop special items that fully meet customer requirements and performance specifications at reasonable cost. Using sophisticated 3-D modeling techniques, modal and finite element analyses on the latest CAD equipment, and modern test equipment, Barry engineers will work with you at each step of the design and development process to insure that the result is fully integrated into your end product.

Barry's Reputation for Quality Means Customer Confidence

Along with a reputation for engineering excellence going back over sixty years, Barry Controls has earned customers' respect for manufacturing products of outstanding quality. Barry is certified to AS-9100, QS-9000 and ISO 9001:2000 by TÜV Management Services, a Division of TÜV America Inc., and is continually striving to achieve certification to the latest national and worldwide quality standards. Employee involvement and an ongoing Quality Improvement Process demonstrate Barry's commitment to being a producer of first quality products.

Barry Quality Systems meet the requirements of MIL-I-45208 (Quality Assurance System Requirement) and MIL-STD-45662 (Calibration System Requirement).

An Extensive Line of Products

Since 1943, Barry has produced a wide variety of products to serve the defense, industrial, aircraft/aerospace, vehicle, and scientific markets. Barry's long experience in designing and manufacturing products to serve these diverse and demanding markets has produced a portfolio of products that is unmatched in the industry for variety and effectiveness.

Barry Controls' isolators have flown on the Space Shuttle, protecting critical components and helping to guarantee the success of the mission. Products from Barry Controls can be found on every type of military equipment, from sensitive electronics to ordnance pallets, from instrumentation to power generators. We provide engine, cabin and associated isolation systems for major vehicle and equipment manufacturers.

When it comes to finding quality, cost-effective solutions to equipment survivability and reliability problems - solutions that meet customer specifications and get the job done - Barry offers the widest selection of proven performers.

Barry Controls specializes in customized isolation solutions. In addition to the products shown in this catalog, Barry Controls provides other sizes, configurations, and materials, as well as expertise to create entirely new designs to meet unique or challenging requirements. Barry has built products to meet the needs of manufacturers of all types of equipment.

History:

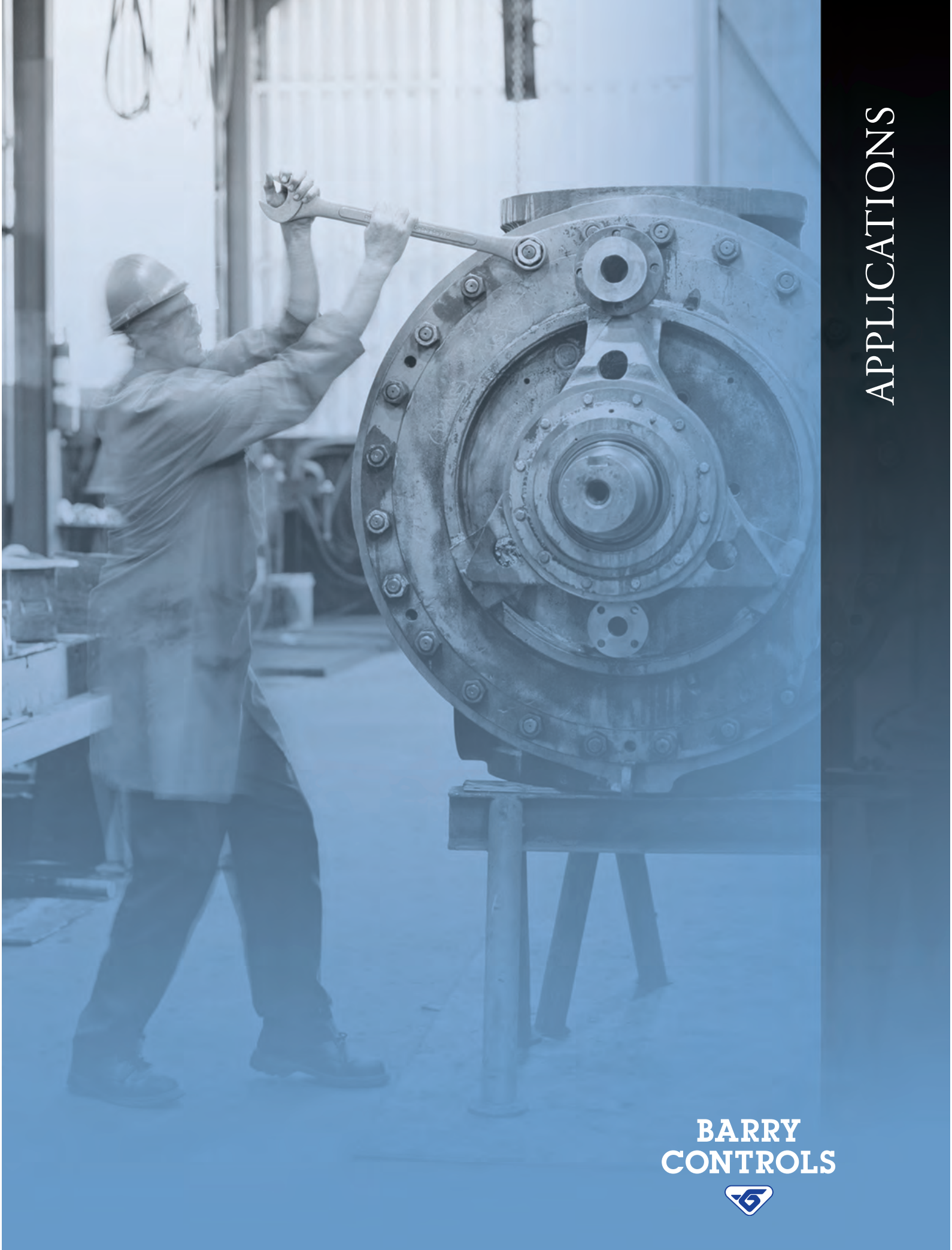
Barry Controls was established in 1943 to provide the U.S. Navy with isolators to protect shipboard machinery from failing after exposure to ballistic shock and operational vibration. The Barry Cupmount was the first mount developed and is still widely used in defense systems. Barry Controls later began to serve other industrial and aerospace markets with shock and vibration isolation systems. Today Barry Controls helps a wide variety of customers worldwide build better products.

In June of 2000 Barry Controls was acquired by the Hutchinson Group, thereby creating the largest engineering and manufacturing company in the world developing vibration, shock and structure-borne noise control products for aerospace, defense and industrial markets.

TABLE OF CONTENTS

PRODUCT CATEGORIES

- Bonded Tube Mounts
- Machinery Mounts
- Cup-Style Mounts
- High Deflection Mounts
- Low Profile Mounts
- Cylindrical Stud Mounts
- All Elastomer Isolators
- Metal & Mesh Isolators
- Specialty Isolators

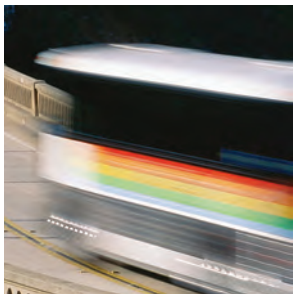


APPLICATIONS

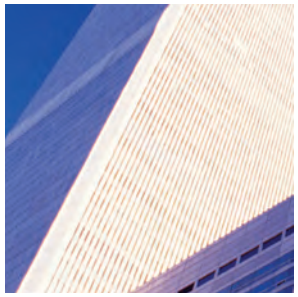
BARRY CONTROLS

APPLICATIONS

VEHICLE



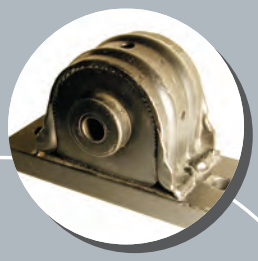
INDUSTRY



DEFENSE

EXHAUST

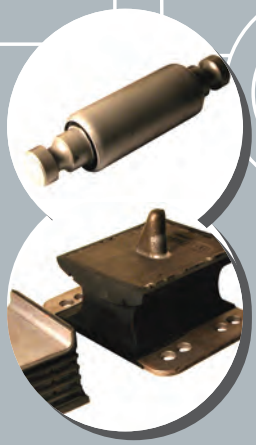
HOODS



CABS

ELECTRONIC EQUIPMENT

SUSPENSION COMPONENTS



HEAVY TRUCKS

Products to provide driver safety and comfort and vehicle protection, including on-board equipment, from road dynamics and power plant operation.

ENGINES

COOLING SYSTEMS

platform

Medium Duty Trucks
Heavy Duty Trucks
Emergency Vehicles
Custom Applications

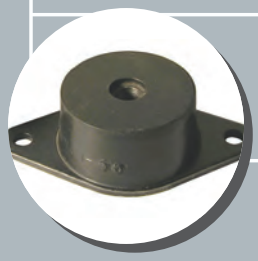
equipment to be protected

Suspension Components
Cabs
Engines/transmissions
Radiators
Hoods
Exhaust
Electronic Equipment
Cooling Systems
Engine Control Units (ECU)
Auxiliary Power Units (APU)

EXHAUST

COOLING SYSTEMS

BODIES



AIR CONDITIONING SYSTEMS

ENGINES/ TRANSMISSIONS

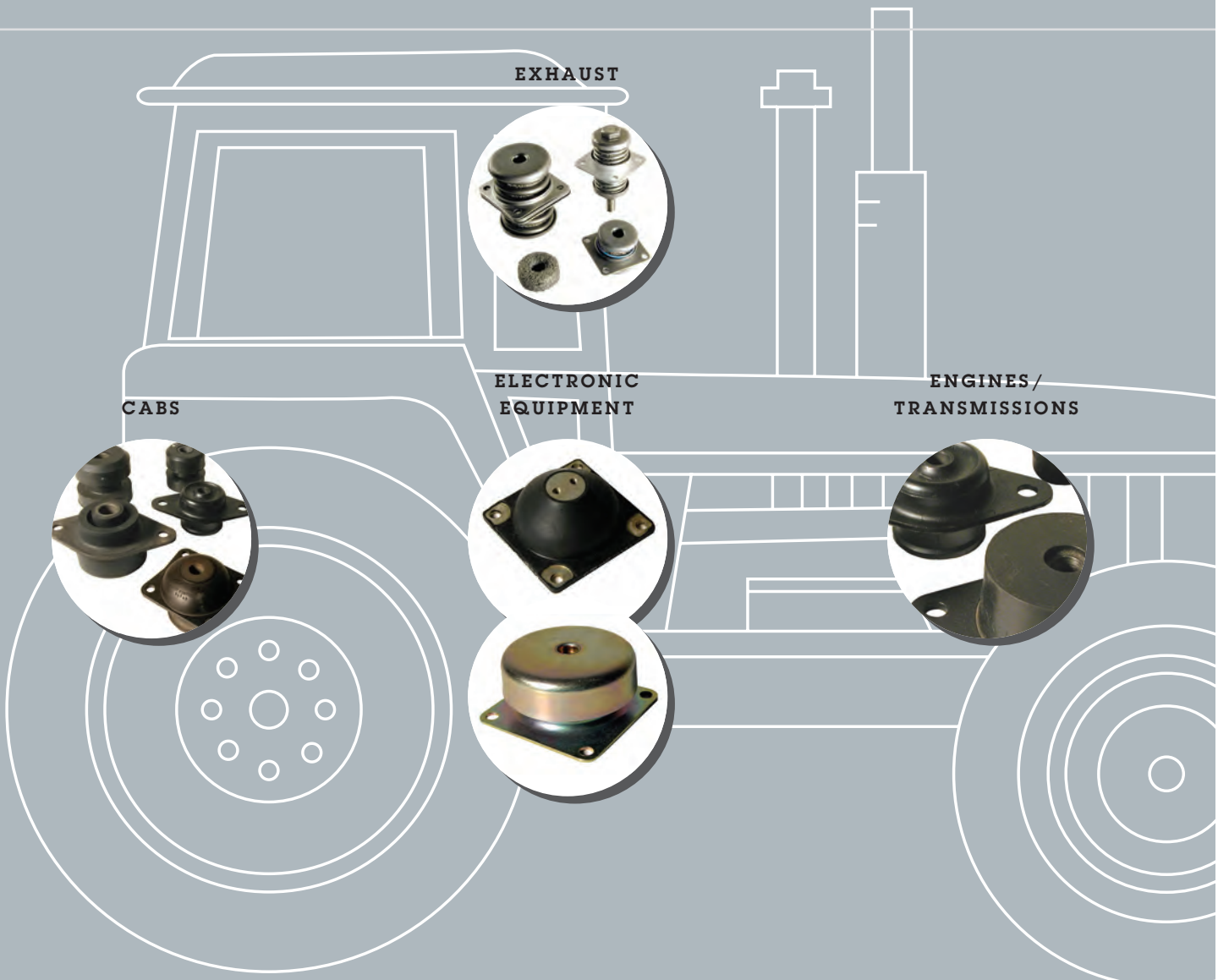
Products to provide driver and passenger safety and comfort and vehicle protection, including on-board equipment, from road dynamics and power plant operation.

platform

Motor Coach
School Bus
Transit Bus
Recreational Vehicles

equipment to be protected

Suspension Components
Bodies
Engines/transmissions
Radiators
Hoods
Exhaust
Electronic Equipment
Air Conditioning Systems
Engine Control Units (ECU)
Auxiliary Power Units (APU)
Cooling Systems


EXHAUST
CABS
ELECTRONIC EQUIPMENT
ENGINES/ TRANSMISSIONS

Products to provide operator safety and fatigue resistance and vehicle protection from rough terrain and power plant and accessory operation.

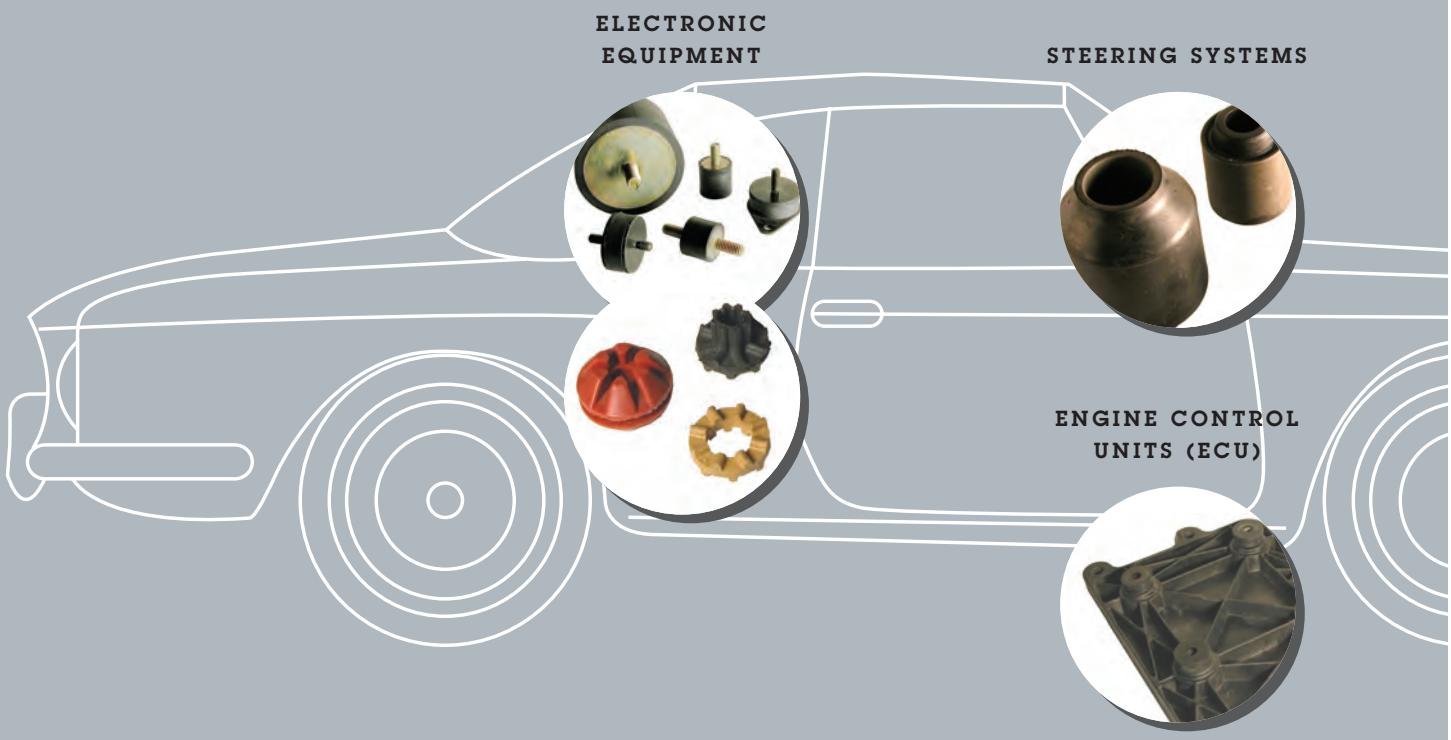
RADIATORS

platform

Combines
Compactors
Crawler Dozers
Crawler Loaders
Motor Graders
Off Road Haulers
Pickers
Scrapers
Skid Steers
Sprayers
Tractors
Wheeled Loaders

equipment to be protected

Suspension Components
Cabs
Engines/transmissions
Radiators
Exhaust
Electronic Equipment
Attachments/Implements
Air Conditioning Systems
Global Positioning Systems (GPS)


ELECTRONIC
EQUIPMENT
STEERING SYSTEMS
ENGINE CONTROL
UNITS (ECU)

ENGINES

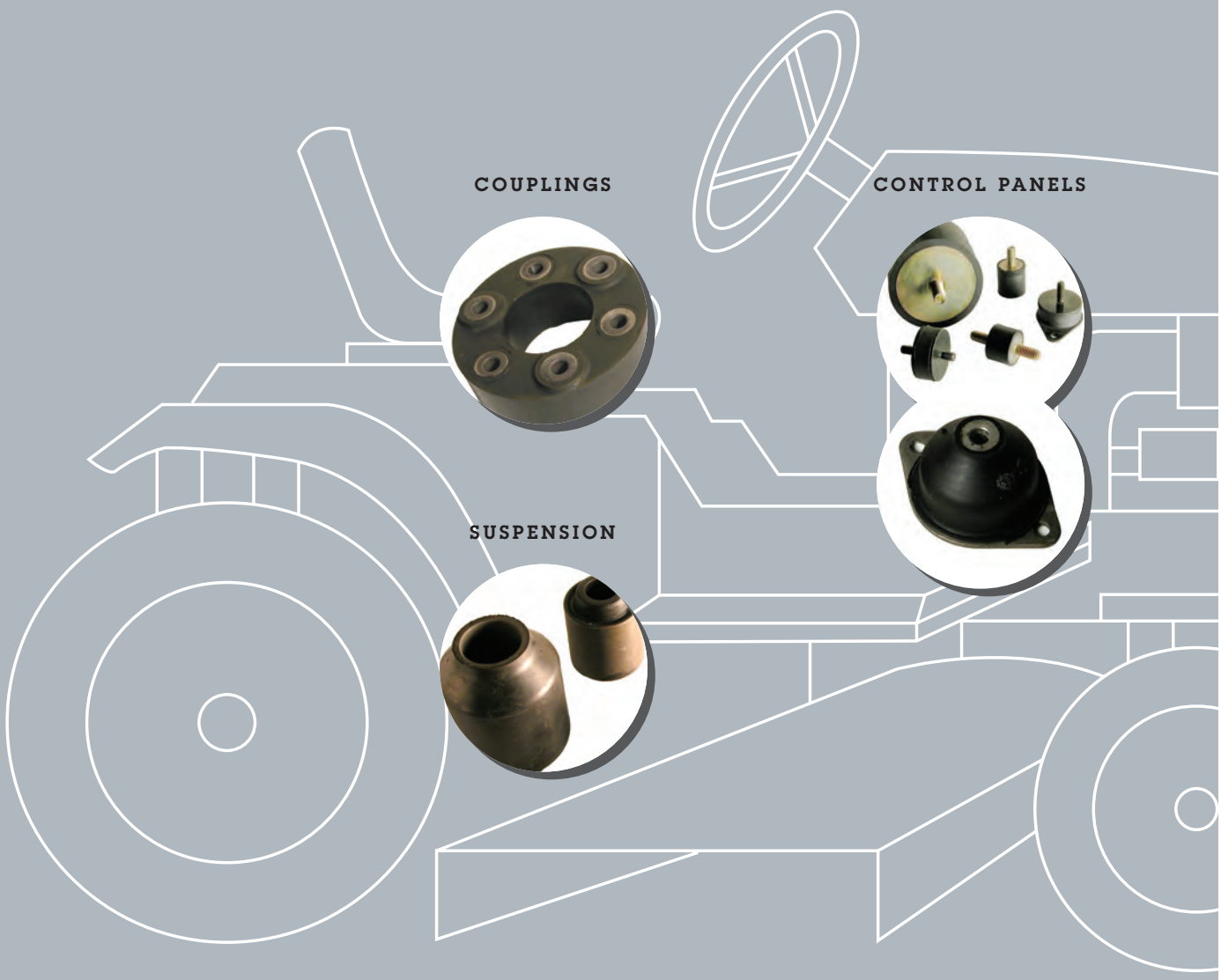
Products to reduce noise, harshness and vibration for passengers, and to protect sensitive electronics.

platform

Passenger Cars
Pick Up Trucks

equipment to be protected

Steering Systems
Engine Control Units (ECU)
Electronic Equipment
Specialty Engine Applications


COUPLINGS
CONTROL PANELS
SUSPENSION

ENGINES

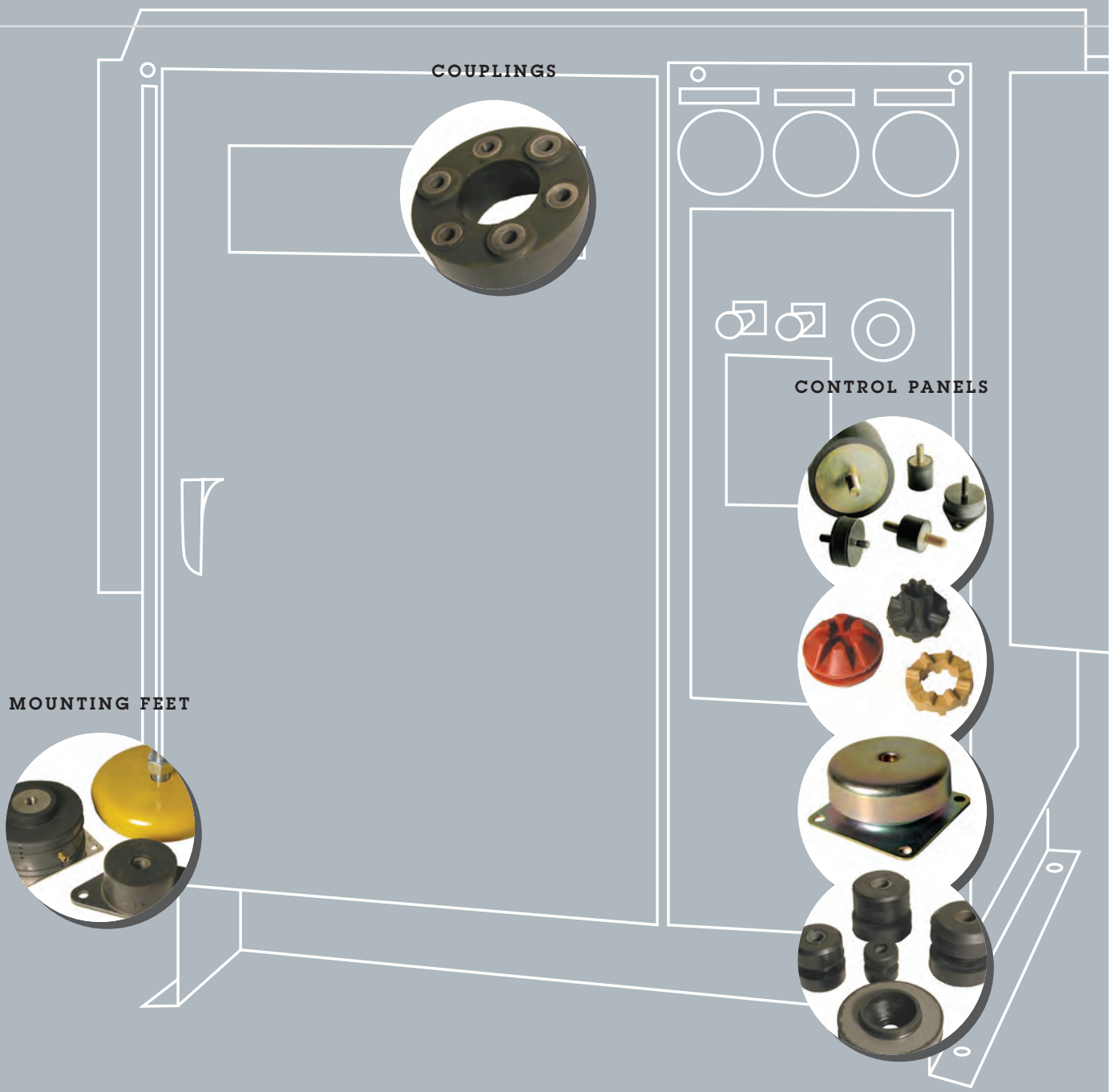
Products to provide operator safety and fatigue resistance, where applicable, and equipment protection from rough terrain and power plant and accessory operation.

platform

Aircraft Ground Support
Compressors
GenSets
Golf Carts
HVAC Systems
Lawn & Turf Care
Lift Trucks
Man Lifts
Personnel Carriers
Telescopic Handlers

equipment to be protected

Engines
Motors
Couplings
Control Panels
Suspension Components


COUPLINGS
CONTROL PANELS
MOUNTING FEET

MACHINERY

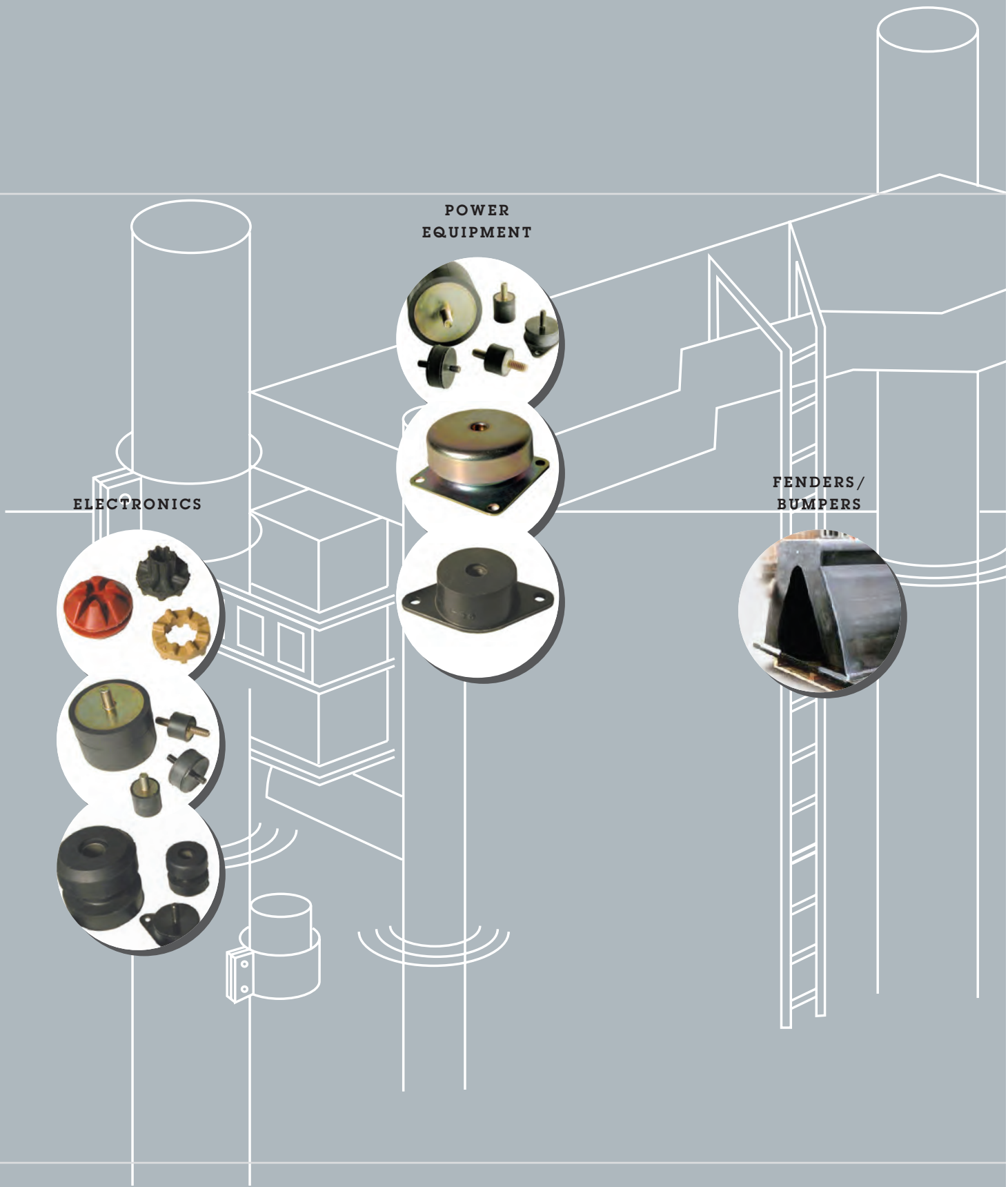
Reduce machinery noise and vibration effects on operators and sensitive equipment.

platform

Punch Presses
Milling Machines
Compressors
Pumps
Brakes
Grinders
Drill Presses
Drop Hammers
Forging Hammers
Lathes
Precision Measuring Equipment
Microscopes
Printing Machines

equipment to be protected

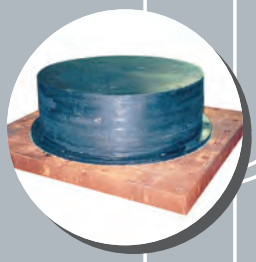
Control Panels
Machinery


POWER
EQUIPMENT
ELECTRONICS
FENDERS/
BUMPERS

OFF SHORE PLATFORMS

Protect the platform and water craft from the dynamics of docking and heavy seas and reduce noise to occupants from operating equipment.

STRUCTURES



equipment to be protected

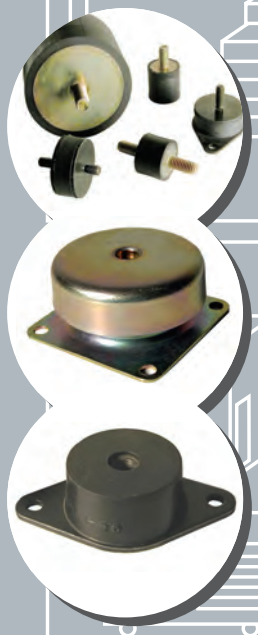
Power Equipment
Electronics
Structures

ELECTRICAL EQUIPMENT

ELECTRONIC CONTROL PANELS & CABINETS

ROOF TOP

MOTORS/PUMPS

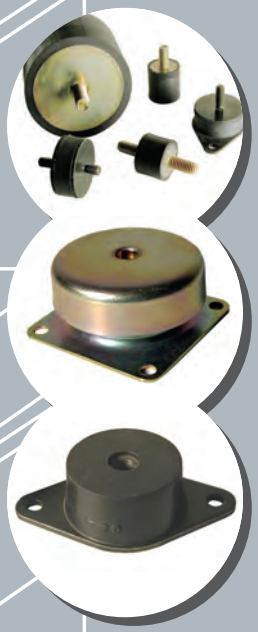


SEISMIC

BUILDINGS

Protect buildings and installed equipment from seismic activity and reduce noise to occupants from operating equipment.

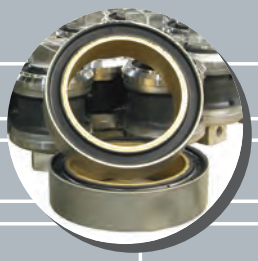
RECIPROCATING EQUIPMENT



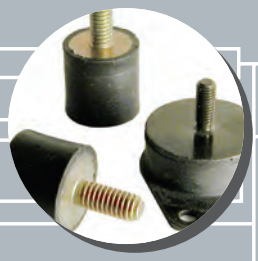
equipment to be protected

Electronic Control Panels & Cabinets
Electrical Equipment
Reciprocating Equipment
Motors/Pumps
Building Structure

COUPLERS



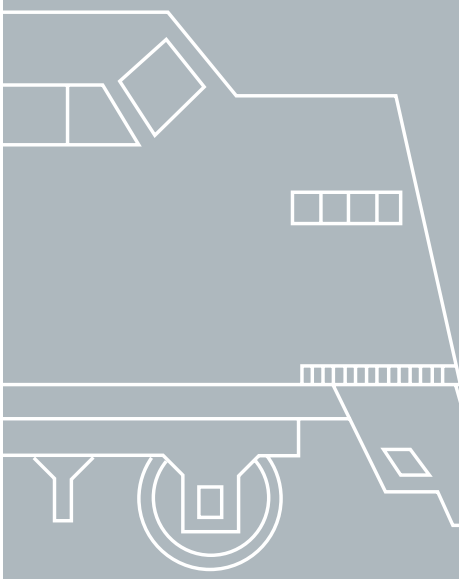
ELECTRICAL EQUIPMENT



BOGIES

PRODUCTS AND APPLICATIONS ARE EXAMPLES ONLY. CONTACT US . 1-800-BARRY-MA (1-800-227-7962)

Products to provide passenger safety and comfort and vehicle protection, including on-board equipment, from track disturbances and power plant operation.

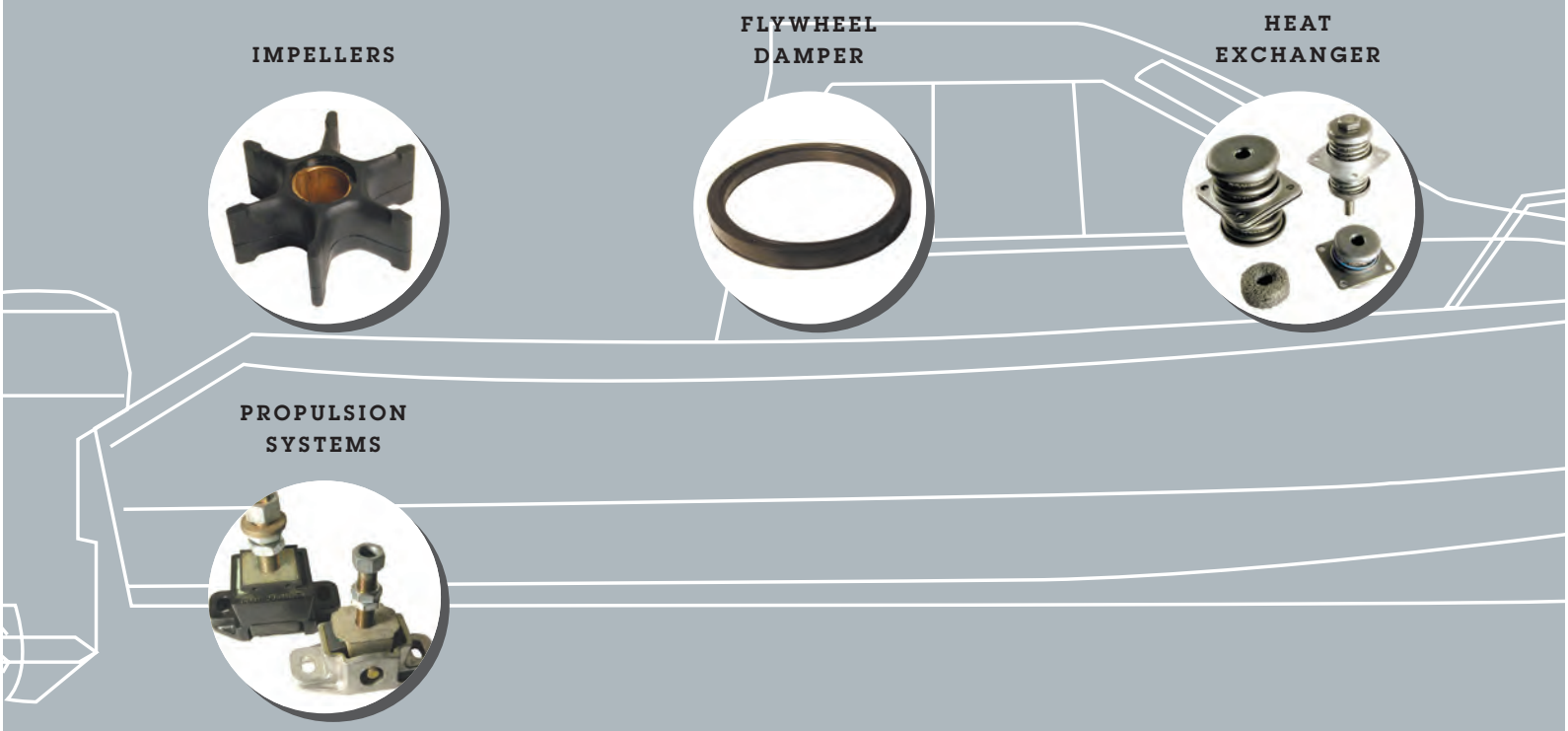


platform

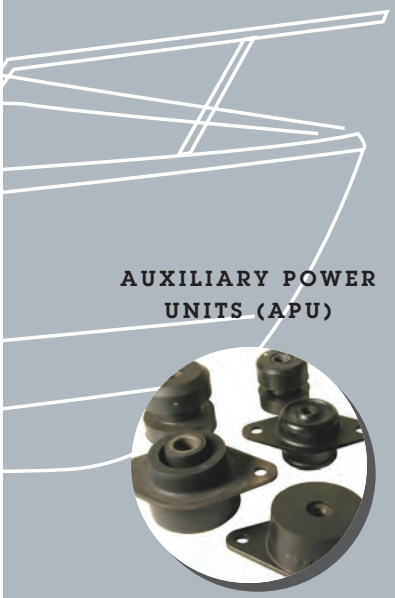
Passenger Trains
Subway Cars

equipment to be protected

Bogies
Couplers
Power Train
Car Separators
Electrical Equipment


IMPELLERS
FLYWHEEL DAMPER
HEAT EXCHANGER
PROPULSION SYSTEMS

Products to provide passenger safety and comfort and vehicle protection, including on-board equipment, from power plant operation and wave action.



AUXILIARY POWER UNITS (APU)

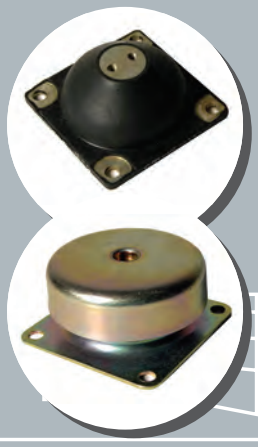
platform

Sport Yachts
Runabouts
Cruisers
Ferries
Sport Fishing Vessels
Work Boats

equipment to be protected

Propulsion Systems
Exhaust
Auxiliary Power Units (APU)
Electronics
Impellers
Heat Exchanger
Flywheel Damper

WEAPONS SYSTEMS

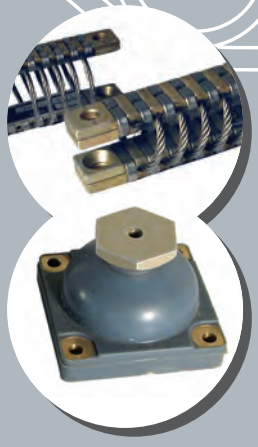


OPTICS

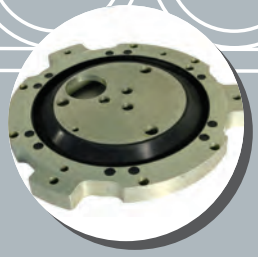
APU'S

ELECTRONIC SYSTEMS
& DISPLAYS

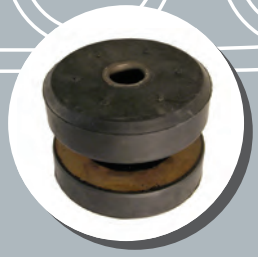
PUMPS



IMU'S



POWER TRAIN
& COMPONENTS



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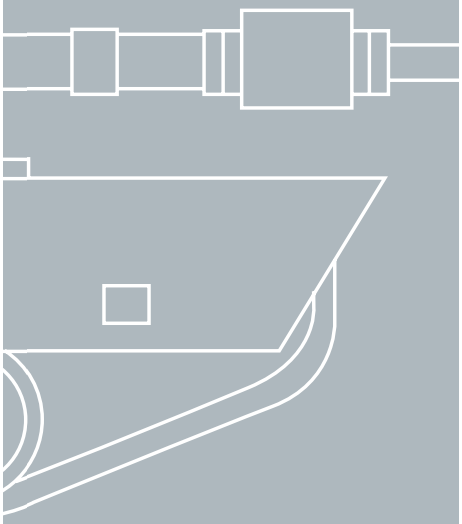
TANKS & OTHER TRACKED VEHICLES

Products to protect sophisticated equipment from extremely rough terrain, weapons operation, and harsh environments.



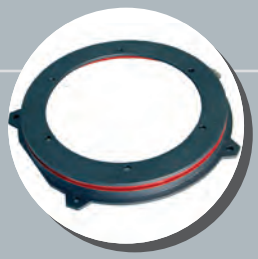
platform

Tanks
Personnel Carriers
Mobile Rocket Launchers
Self Propelled Howitzers
Re-Supply Vehicles

equipment to be protected

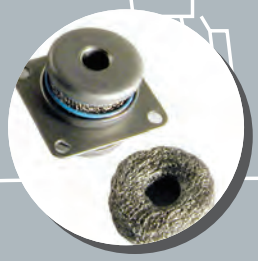
Power Train & Components
Electronic Systems & Displays
Weapons Systems
Ammunition Racks
Gyros
Pumps
Battery Packs
Chemical Detectors
Smoke Generators
Hydraulic Lines
Auxiliary Power Units (APU)
Sensors
Turret Control Systems
Optics
Engine Control Units (ECU)
Inertial Measurement Units (IMU)

GUIDANCE SYSTEMS



WEAPONS

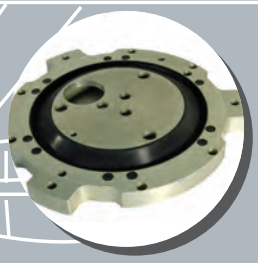
APU'S



COMMUNICATIONS SYSTEMS

ECU'S

IMU'S



COUNTERMEASURES

FIXED WING AIRCRAFT

Products to protect sophisticated equipment from extreme vehicle dynamics, including hard landing shock, maneuvers and weapons operation, while resisting harsh environments.

OPTICS

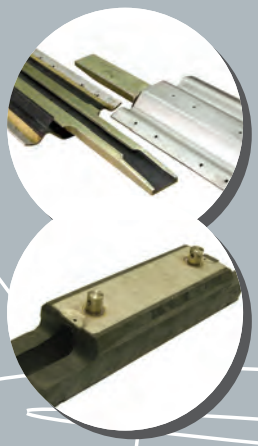
platform

Fighters
Bombers
Cargo Aircraft
Reconnaissance Aircraft
Attack Aircraft
Unmanned Aerial Vehicles
Trainers
Surveillance Aircraft

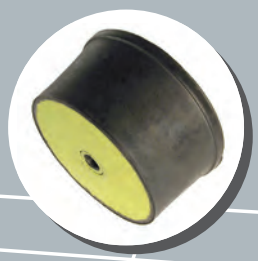
equipment to be protected

Weapons
Communications Systems
Guidance Systems
Radar
Auxiliary Power Units (APU)
Electronic Systems & Displays
Flight Controllers
Lasers
Countermeasures
Engine Control Units (ECU)
Engines
Optics
Inertial Measurement Units (IMU)

LAUNCH SYSTEMS

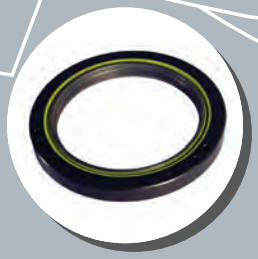


TRANSPORT SYSTEMS



SENSITIVE PAYLOADS

IMU'S



ELECTRONIC SYSTEMS & DISPLAYS

Products to protect sophisticated electronics and guidance systems from extreme vehicle dynamics, operational maneuvers and transportation inputs, while resisting harsh environments.

OPTICS

SEEKERS

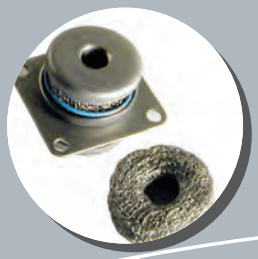
platform

Air Defense Missiles
Air-to-Air Missiles
Air-to-Surface Missiles
Surface-to-Air Missiles
Surface-to-Surface Missiles
Intercontinental Ballistic Missiles (ICBM)
Guided Bombs
Targeting Pods
Most Major Torpedoes

equipment to be protected

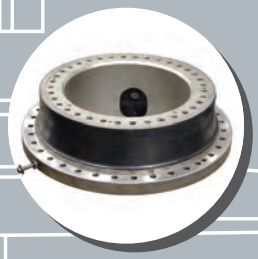
Navigation & Guidance Systems
Electronic Systems & Displays
Seekers
Launch Systems
Container Systems
Optics
Inertial Measurement Units (IMU)
Lasers
Transport Systems
Radar & Electronic Support Systems
Sensitive Payloads

EXHAUST

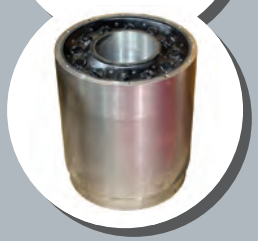


AUXILIARY POWER UNITS (APU)

VERTICAL LAUNCH SYSTEM



PROPULSION SYSTEMS



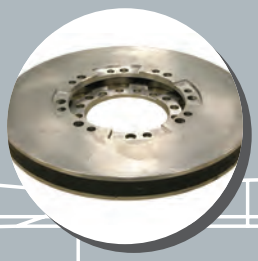
TURBINE GENERATORS

ELECTRONICS

SUBMARINES

Products to protect sophisticated equipment from vessel dynamics and weapons operation and reduce noise to structures from operating equipment to avoid detection.

TORPEDO EJECTION SYSTEM



PIPING

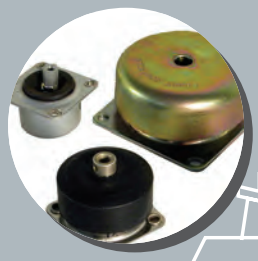
platform

Attack Submarines
Missile Submarines

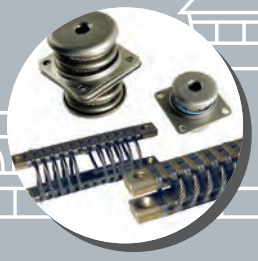
equipment to be protected

Propulsion Systems
Exhaust
Auxiliary Power Units (APU)
Electronics
Piping
Weapons Systems
Radar
Communications
Sonar Systems
HVAC Systems
Transformers
Compressors
Fans
Pumps
Motors
Fire Control Systems
Turbine Generators
Torpedo Ejection Systems
Vertical Launch System
Periscope Systems
Purifiers

COMPRESSORS



EXHAUST



PROPULSION SYSTEMS

TURBINE GENERATORS

SURFACE SHIPS

RADAR

Products to protect sophisticated equipment from vessel dynamics, heavy seas and weapons operation.

platform

Destroyers
Cruisers
Aircraft Carriers
Command/Control
Amphibious Transport Dock
Mine Countermeasures Support
Sealift
Landing Craft
Underway Replenishment

PIPING

equipment to be protected

Propulsion Systems
Exhaust
Auxiliary Power Units (APU)
Electronics
Piping
Weapons Systems
Radar
Communications
Sonar Systems
HVAC Systems
Transformers
Compressors
Fans
Pumps
Motors
Fire Control Systems
Turbine Generators
Torpedo Ejection Systems
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Periscope Systems
Purifiers
Anti-Submarine Warfare Systems
Flight Arresting Systems

COUNTERMEASURES

FLIGHT CONTROLLERS

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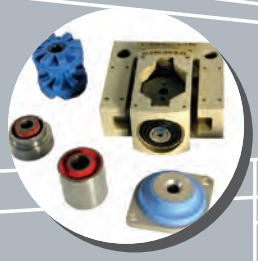
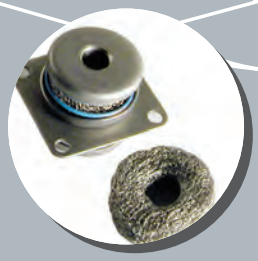


ECU'S



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Attack
Light Observation
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Communications Systems
Navigation & Guidance Systems
Radar
Electronic Systems & Displays
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Lasers
Countermeasures
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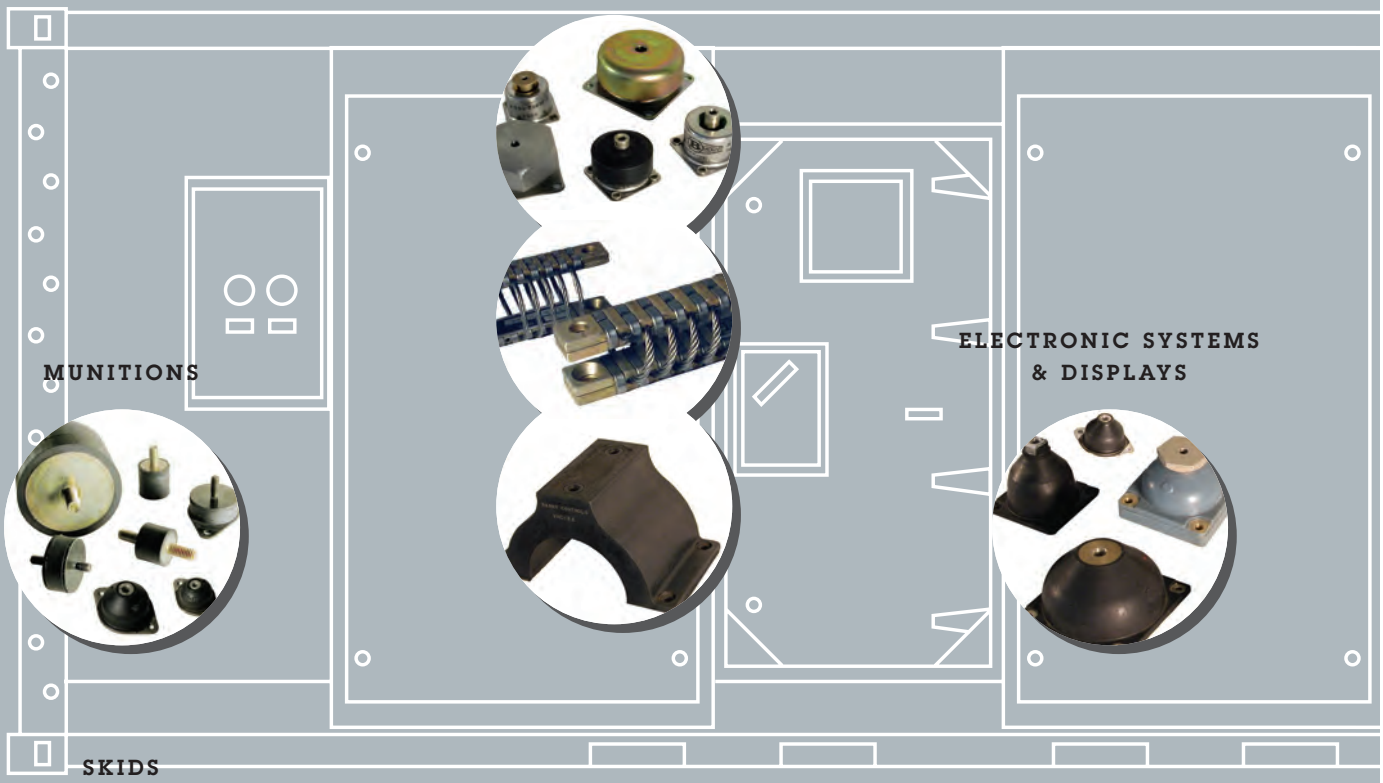

MUNITIONS

ELECTRONIC SYSTEMS
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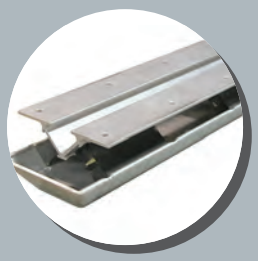
SKIDS



TRANSPORTABLE SHELTERS

Protection for sensitive and sophisticated electronics from aircraft deployment drop shocks and general transportation, while resisting harsh environments.

platform

Standard and Special Systems

equipment to be protected

Electronic Systems & Displays
Munitions
Weapons Systems
Shelter Structure

APPLICATION MATRIX

The following six pages contain information about various type of applications. We have tried to identify a number of typical applications and provide information that may be important when selecting an isolation system. Keep in mind that any vibration inputs contained in this section represent typical inputs, but your application may not conform to these inputs. Whenever possible, one should use specifications and/or measured data that relate to the specific application.

Environment	Equipment to be protected	Sources of Vibration-Shock-Noise	Other Destructive or Deteriorative Conditions
General Industrial Equipment **Business Machines** Computers & Accessories. Typewriter. Copy Machine. Medical Equipment. Test Equipment.	Memory drums. Electronic Components. Structure of machine (Reduce fatigue). Personnel in the surrounding areas (noise reduction).	Motors. Fans & blowers. Air Compressors. Pumps. Transportation Handling.	Oil. Chemicals. Fluids.
Recreational Vehicles Boats. Snowmobiles. Golf Carts. Trail Bikes. Motorcycles. Motor Home.	Passenger (safety & comfort). Structure of vehicle (reduce fatigue). Personnel in the surrounding areas (noise reduction). Communication equipment. Mechanical, electrical hydraulic, and pneumatic operating components.	Power plant. Choppy waters. Rough terrain.	Oil. Sunlight. Ozone. Humidity. Salt Spray.
Farm Equipment Tractors. Harvesters. Planters. Spreaders.	Passenger (safety & comfort). Structure of vehicle (reduce fatigue). Personnel in the surrounding areas (noise reduction). Communication equipment. Mechanical, electrical hydraulic, and pneumatic operating components.	Power plant. Rough terrain. Accessory equipment.	Oil. Sunlight. Ozone. Humidity.
Truck & Construction Equipment On highway. Off highway.	Passenger (safety & comfort). Structure of vehicle (reduce fatigue). Personnel in the surrounding areas (noise reduction). Communication equipment. Mechanical, electrical hydraulic, and pneumatic operating components.	Engine. Normal road shock. Off-road terrain.	Heat and cold. Humidity. Lubricants. Chemicals, hydraulic fluids, etc. Sunlight and ozone.
Industrial Machinery	Metal forming or cutting equipment, presses, brakes, shears, hammers, grinders, compressors.	Impact operations. Accessory equipment. Motors. Pumps.	Oils. Chemicals.
AIRCRAFT			
Commercial Piston Engine.	Flight recorder. Radar. Radios. Air data recorder. Gyroscopes. Instrument panels. Radar antennae. Antenna couplers. Instruments, indicators, gages, etc.	Propulsion system (Warm-up & Flight). Air turbulence. Landing impact. Taxiing. Amplified vibration caused by structural resonances.	Temperature and humidity extremes. Altitude. Chemical action of hydraulic fluids, fuels, lubricants. Sunlight and ozone.
Jets and turboprops.	Flight recorder. Radar. Radios. Air data recorder. Gyroscopes. Instrument panels. Engine pressure ratio transducers. Radar antennae. Antenna couplers. Instruments, indicators, gages, etc.	Propulsion system. Air turbulence. Landing impact. Taxiing. Amplified vibration caused by structural resonances.	Temperature and humidity extremes. Altitude. Chemical action of hydraulic fluids, fuels, lubricants. Sunlight and ozone.
Military & Other High Performance Aircraft Piston engine.	Flight recorder; .Air data recorder. Radar; Radios. Gyroscopes; Instrument panels. Engine pressure ratio transducers. Radar antennae; Antenna couplers. Instruments, indicators, gages, etc. Electronic countermeasures equipment. Fire control radar & computers. Bomb racks & sights. Cathode ray display tubes. Integrated avionics packages.	Propulsion system (Warm-up & Flight) Air turbulence. Landing impact. Taxiing. Amplified vibration caused by structural resonances. Gunfire.	Temperature and humidity extremes. Altitude. Chemical action of hydraulic fluids, fuels, lubricants. Sunlight and ozone. Salt Spray. Fungus. Sand and dust.

Applicable Specifications and Typical Vibration, Shock, Noise Input Level	Desirable Isolator Characteristics	Applicable Barry Isolators or Systems
Operating speeds of the disturbing sources. Determined by structural conditions and location of equipment within structures.	Low natural frequency (5 to 15 Hz) Low cost. Facilitate installation.	WR/WB Ring & Bushing Series; Ball Mounts. Cupmounts; 6300, 6550 Series. Industrial Machinery Mounts; 633A Series 500 Series; 500SL Series; HR Series; 22000 Series; Barry-Bond Series; Industrial Conical Mount Series. ME Series; TTA & TTB Series.
Operating speeds of power plant. Typical shock input 8 to 10 g's. or greater.	Low natural frequency (5 to 15 Hz) Low cost. Facilitate installation. Provide cushioned bottoming.	WR/WB Ring & Bushing Series; Ball Mounts. Cupmounts; 5200 Series; 6300, 6550 Series. 500 Series; 500SL Series; HR Series; 22000 Series; Barry-Bond Series; Industrial Conical Mount Series. SLM Series
Operating speeds of power plant. Typical shock input 2 to 5 g's.	Low natural frequency (5 to 15 Hz). Low cost. Facilitate installation. Provide cushioned bottoming.	Cupmounts; 5200 Series; 6300, 6550 Series. 500 Series; 500SL Series; HR Series; 22000 Series; Barry-Bond Series; Industrial Conical Mount Series. SLM Series.
Function of vehicle suspension, road & terrain condition.	Attenuate high frequency road & terrain shock and transient vibrations.	WR/WB Ring & Bushing Series. Cupmounts; 5200 Series; 6300, 6550 Series. 500 Series; 500SL Series; HR Series; 22000 Series; Barry-Bond Series; Industrial Conical Mount Series. VHC Series; SLM Series. ME Series; TT-A & TT-B Series.
Operating speeds of the disturbing sources. Determined by structural conditions & the location of equipment within structures. OSHA requirements.	Low natural frequency (5-15 Hz) Low cost. Facilitate installation.	Industrial Machinery Mounts; 633A Series. 30005 Series Neoprene Pads. Serva-Levl^{t}; SLM Series.
Airframe & Component Manufacturer's Specifications. Typical Vibration Input: 5-55 Hz .060" D. A. 55-500 Hz 10 g Typical shock Input: 15 g - .011 sec. 30 g - 011 sec. (Crash safety).	Natural frequency 5-15 Hz. Maximum isolation efficiency. Low amplification at resonance. Minimum rotational coupling. Minimum shock output. Minimum sway space. Minimum size and weight. Electrical grounding. Designed to ensure equipment survival.	L-Mounts; S-Mounts 500 Series; 500 SL Series; 22000 Series; Barry-Bond Series. Cable Mounts ME Series; TTA & TT-B Series Special High-Performance Mounts.
Airframe & Component Manufacturer's Specifications. Typical Vibration Input: 5-55 Hz .060" D. A. 55-2000 Hz 10 g. Typical shock Input (half-sine): 15 g - .011 sec. 30 g - .011 sec. (Crash safety).	Natural frequency 10-25 Hz. Operable at commercial jet climb & maneuver attitudes. Maximum isolation efficiency. Low amplification at resonance. Minimum rotational coupling. Minimum shock output. Minimum sway space. Minimum size and weight. Electrical grounding. Designed to ensure equipment survival	B-Mounts; T-Mounts; Cupmounts 5200 Series; E21/E22 Series; 6300/6550 Series. 500 Series; 500SL Series; HR Series; 22000 Series; Barry-Bond Series. ME Series; TTA & TTB Series. Special High-Performance Mounts.
MIL-E-5400; MIL-E-5272; MIL-STD-810 Typical Vibration Input: 5-10 Hz .080" D. A. 10-15 Hz .41 g. 15-75 Hz .036" D. A. 75-1000 Hz 10 g. Typical Shock Input: 15 g - .011 sec. 30 g - .011 sec. (crash safety). MIL-C-172: Transmissibility (max) at 23 Hz T<1.00 at 30 Hz T<.35 at 500 Hz T<.20	Natural frequency 10-25 Hz. All attitude performance for combat aircraft. Maximum isolation efficiency. Low amplification at resonance. Minimum rotational coupling. Minimum shock output. Minimum sway space. Minimum size and weight. Electrical grounding. Designed to ensure equipment survival	S-Mounts; L-Mounts; B-Mounts; T-Mounts; Cupmounts. 5200 Series, E21/E22 Series; 6300/6550 Series. Cable Mounts. ME Series; TTA & TTB Series Special High-Performance Mounts

Environment	Equipment to be protected	Sources of Vibration-Shock-Noise	Other Destructive or Deteriorative Conditions
Jet transports and bombers.	Flight recorder; Air data recorder. Radar; Radios. Gyroscopes; Instrument panels. Engine pressure ratio transducers. Radar antennae; Antenna couplers. Instruments, indicators, gages, etc. Electronic countermeasures equipment. Fire control radar & computers, Bomb racks & sights, Cathode ray display tubes, Integrated avionics packages.	Propulsion system. Air turbulence. Landing impact. Taxiing. Amplified vibration caused by structural resonances. Gunfire.	Temperature and humidity extremes. Altitude. Chemical action of hydraulic fluids, fuels, lubricants. Sunlight and ozone. Salt Spray. Fungus. Sand and dust.
Jet fighters, interceptors, attack bombers, Special-mission aircraft.	Radar; Radios. Air data recorder. Gyroscopes; Instrument panels. Engine pressure ratio transducers. Radar antennae; Antenna couplers. Instruments, indicators, gages, etc. Electronic countermeasures equipment. Fire control radar and computers. Bomb racks and sights. Integrated avionics packages. Photographic and other optical equipment.	Propulsion system. Air turbulence. Landing impact. Taxiing. Amplified vibration caused by structural resonances. Gunfire.	Temperature and humidity extremes. Altitude. Chemical action of hydraulic fluids, fuels, lubricants. Sunlight and ozone. Salt spray. Fungus. Sand and dust.
Carrier based.	Flight recorder. Radar; Radios. Air data recorder. Gyroscopes; Instrument panels. Engine pressure ratio transducers. Radar antennae; Antenna couplers. Instruments, indicators, gages, etc. Electronic countermeasures equipment. Fire control radar and computers. Bomb racks and sights. Integrated avionics packages. Photographic and other optical equipment.	Propulsion system. Air turbulence. Landing impact. Amplified vibration caused by structural resonances. Gunfire. Catapult take-offs. Arrested landings.	Temperature and humidity extremes. Altitude. Chemical action of hydraulic fluids, fuels, lubricants. Sunlight and ozone. Salt spray. Fungus. Sand and dust.
Helicopters	Radar; Radios. Gyroscopes; Instrument panels. Radar antennae; Antenna couplers. Instruments, indicators, gages, etc. Integrated avionics packages. Fire control equipment	Propulsion system. Rotor. Landing impact. Amplified vibration caused by structural resonances. Gunfire.	Temperature and humidity extremes. Altitude. Chemical action of hydraulic fluids, fuels, lubricants. Sunlight and ozone. Salt spray; Sand and dust. Fungus.
ROCKETS, MISSILES, AND SPACE VEHICLES			
	Telemetry; Electronics. Fuel lines. Relay boxes, Arming and fusing systems Electronics. Antennae; Antenna couplers. Instruments, indicators, gages, etc., Instruments panels. Structural members. Photographic and other optical equipment.	Propulsion system. Separation of booster stages. Re-entry deceleration. Amplified vibration caused by structural resonances.	Temperature and humidity extremes. Altitude. Chemical action of hydraulic fluids, fuels, lubricants. Sunlight and ozone. Special handling. Transport. Storage and service environmental conditions.

Applicable Specifications and Typical Vibration, Shock, Noise Input Level	Desirable Isolator Characteristics	Applicable Barry Isolators or Systems
MIL-E-5400; MIL-E-5272; MIL-STD-810 Typical Vibration Input: 5-10 Hz .080″ D. A. 10-15 Hz .41 g. 15-75 Hz .036″ D. A. 75-1000 Hz 10 g. Typical Shock Input: 15 g - .011 sec. 30 g - .011 sec. (crash safety). MIL-C-172 (general reference for size & hardware requirements).	Natural frequency 10-25 Hz. All attitude performance. Maximum isolation efficiency. Low amplification at resonance. Minimum rotational coupling. Minimum shock output. Minimum sway space. Minimum size and weight. Electrical grounding. Designed to ensure equipment survival Note: Isolator characteristics are a function of use & location in airframe. Most severe vibration from high speed. Low level flight is dense, turbulent air.	T-Mounts; B-Mounts; Cupmounts. 5200 Series; E21/E22 Series; 6300/6550 Series. Cable Mounts. ME Series; TTA & TTB Series. Special High-Performance Mounts.
MIL-E-5400; MIL-E-5272; MIL-STD-810. Typical Vibration Input: 5-10 Hz .080″ D. A. 10-15 Hz .41 g. 15-75 Hz .036″ D. A. 75-1000 Hz 10 g. Typical Shock Input: 15 g - .011 sec. 30 g - .011 sec. (crash safety). Note: Vibration & shock input levels vary widely; usually specified by airframe & component manufacturers. MIL-C-172 (general reference for size & hardware requirements).	Natural frequency 10-25 Hz. All attitude performance. Maximum isolation efficiency. Low amplification at resonance. Minimum rotational coupling. Minimum shock output. Minimum sway space. Minimum size and weight. Electrical grounding. Designed to ensure equipment survival. Note: Isolator characteristics are a function of mission of aircraft and performance parameters to which equipment is subjected. Example: extreme sustained acceleration.	T-Mounts; B-Mounts; Cupmounts. 5200 Series; E21/E22 Series; 6300/6550 Series. Cable Mounts. ME Series; TTA & TTB Series. Special High-Performance Mounts.
MIL-E-5400; MIL-E-5272; MIL-STD-810. Typical Vibration Input: 5 - 10 Hz .080″ D. A. 10 - 15 Hz . 41 g. 15 - 75 Hz .036″ D. A. 75 - 1000 Hz 10 g. Typical Shock Input: 15 g - .011 sec. 30 g - .011 sec. (crash safety). Note: Vibration & shock input levels vary widely; usually specified by airframe & component manufacturers. Landing shocks can be as severe as 12 g, .125 sec.) MIL-C-172 (general reference for size & hardware requirements).	Natural frequency 10-25 Hz. All attitude performance. Maximum isolation efficiency. Low amplification at resonance. Minimum rotational coupling. Minimum shock output. Minimum sway space. Minimum size and weight. Electrical grounding. Designed to ensure equipment survival. Note: Isolator characteristics are a function of mission of aircraft and performance parameters to which equipment is subjected. Example: extreme sustained acceleration.	T-Mounts; B-Mounts; Cupmounts. 5200 Series; E21/E22 Series; 6300/6550 Series. Cable Mounts. ME Series; TTA & TTB Series. Special High-Performance Mounts.
MIL-E-5400; MIL-E-5272; MIL-STD-810. Airframe and Component Manufacturers' Specifications. Typical Vibration Input: 5 - 20 Hz .100″ D. A. 20 - 32 Hz 2 g. 32 - 72 Hz .036″ D. A. 72 - 500 Hz 10 g. Typical Shock Input: 15 g - .011 sec. 30 g - .011 sec. (crash safety). MIL-C-172 (general reference for size & hardware requirements).	Natural frequency 5-15 Hz. Maximum isolation efficiency. Low amplification at resonance. Minimum rotational coupling. Minimum shock output. Minimum sway space. Minimum size and weight. Electrical grounding. Designed to ensure equipment survival.	H-Mounts. 5200 Series; E21/E22 Series. HTTA Series. Cable Mounts. SLM Series. Specially-designed isolation systems to meet severe vibration inputs/
Specifications established by Systems Contractor. Vibration inputs up to .50″ D. A. Sustained acceleration as high as 1000 g.	All attitude performance. Maximum isolation efficiency. Low amplification at resonance. Minimum rotational coupling. Minimum shock output. Minimum sway space. Minimum size and weight. Electrical grounding. Designed to ensure equipment survival.	T-Mounts; B-Mounts; Cupmounts. 5200 Series; E21/E22 Series; 6300/6550 Series. Cable Mounts. Special High-Performance Mounts.

Environment	Equipment to be protected	Sources of Vibration-Shock-Noise	Other Destructive or Deteriorative Conditions
MARINE			
Naval Surface vessels and submarines.	Engines; Generators. Navigation and communications gear; Radar; Sonar. Plotting boards. Fire control and guidance equipment. Missile and ammunition storage. Radar antennae, etc. Hydrophones; Gyrocompasses. Instruments, indicators, gages, etc. Automatic control and logging systems.	Power plant. Heavy seas. Gunfire. Near misses. Depth charges. Pumps. Engine generators.	Salt spray. Oil. Humidity. Fungus. Sunlight and ozone.
Merchant	Engines; Generators. Navigation and communications gear. Radar; Sonar. Plotting boards. Radar antennae, etc. Instruments, indicators, gages, etc. Automatic control and logging systems.	Power plant. Heavy seas. Pumps. Engine generators.	Salt spray. Fungus. Humidity. Oil. Sunlight and ozone.
General Marine and Small Boats	Navigation and communications gear. Sonar; Radar. Engines; Generators. Instruments, indicators, gages, etc.	Power plant. Outboard motors. Pumps. Heavy seas. Engine generators.	Salt spray. Fungus. Humidity. Oil. Sunlight and ozone.
VEHICLES			
Trucks	Cargo and passengers. Indicators and controls. Mechanical, electrical, hydraulic, pneumatic operating components. Communications equipment.	Engine. Normal road shock. Off-road terrain.	Heat and cold. Humidity. Lubricants. Chemicals, hydraulic fluids, etc. Sunlight and ozone.
Military Vehicles Tanks, Trucks and Jeeps.	Cargo and passengers. Indicators and controls. Mechanical, electrical hydraulic, pneumatic operating components. Communications equipment. Fire control equipment.	Engine. Normal road shock. Off-road terrain. Gunfire.	Heat and cold. Humidity. Fungus. Lubricants. Chemicals, hydraulic fluids, etc. Sunlight and ozone. Sand and dust.
Military Transportable Shelters	Shelters for Military field systems such as: Communications centers. Aircraft control centers. Medical aid stations, etc. Equipment within shelters.	Air to ground transfer (18″ free fall helicopter cable to ground). Rough handling, dragging, etc.	Temperature extremes. High humidity. Fungus. Salt spray. Oils and chemicals. Sunlight and ozone.
BUILDINGS			
Laboratories. Quality Control Departments. Fabrication Areas.	Spectrometers. Electron microscopes. Precision measuring equipment. Optical and Mechanical vibration test equipment.	Compressors. Air Conditioners. Elevators. Motor and rail traffic. Personnel walking. Natural seismic.	Air turbulence. RF interference. Temperature extremes.
PACKAGING			
Re-Usable Containers and Shipping Pallets	Usually sensitive electronic, mechanical, or optical equipment such as: Computers. Gyroscopes. Office copiers. Radios. Radar. Laboratory equipment. Missiles.	Handling. Air, sea, truck and train transport.	Heat and cold. Humidity. Fungus. Lubricants. Chemicals. Sunlight and ozone. Sand and dust.

Applicable Specifications and Typical Vibration, Shock, Noise Input Level	Desirable Isolator Characteristics	Applicable Barry Isolators or Systems
General Environment: MIL-E-16400 Vibration: MIL-STD-167 Shock: MIL-S-901 Typical Vibration Input: 5 - 15 Hz .060″ D. A. 16 - 25 Hz .040″ D. A. 26 - 33 Hz .020″ D. A. Typical Shock Input: 250 - 1000 g.	Low frequency vibration isolation and high deflection shock attenuation with minimum tilt under all conditions. Reduce sound transmission from equipment to hull (i.e., to prevent submarine detection). Designed to ensure equipment survival.	Stainless 633A Series. 2K Series and 2K Systems. Cupmounts. Standard Navy Mount Designs: EES and Portsmouth Mounts. 500 Series; 500SL Series; HR Series; 22000 Series; Barry-Bond Series; Industrial Conical Mount Series. 30005 Series (D.I.M.) Neoprene Pad CableMounts, VHC Series.
Typical Vibration Input: 5 - 15 Hz .060″ D. A. 16 - 25 Hz .040″ D. A. 26 - 33 Hz .020″ D. A.	Low frequency vibration isolation and high deflection shock attenuation with minimum tilt under all conditions.	2K Series and 2K Systems. Cupmounts. Standard Navy Mount Designs: EES and Portsmouth Mounts. 500 Series; 500SL Series; HR Series; 22000 Series; Barry-Bond Series; Industrial Conical Mount Series. 30005 Series (D.I.M.) Neoprene Pad CableMounts, VHC Series. SLM Series. Marine Mount Series.
Typical Vibration Input: 5-100 Hz .005″ to .050″ D. A. Typical Shock Input: 8 to 10 g's.	Low frequency vibration isolation to minimize energy transmission. High-frequency isolation for shock protection and minimum noise transmission.	WR/WB Ring & Bushing Series. Stainless 633A Series. 5200 Series; 6300/6550 Series. 500 Series; 500SL Series; HR Series; 22000 Series; Barry-Bond Series; Industrial Conical Mount Series. LM Series; LMS Leveler Series. SLM Series. 30005 Series (D.I.M.) Neoprene Pad Marine Mount Series.
Function of vehicle suspension system and road conditions.	Attenuate high-frequency road shock and transient vibrations.	Industrial Machinery Mounts; 633A Series. Cable Mounts. VHC Series. ME Series; TTA & TTB Series. SLM Series.
Vibration: Package Test (bounce test). Shock: MIL-S-901. Typical Vibration Input: 5 Hz 1.00″ D. A. Typical Shock Input: 250 - 1000 g @ 2-6ms.	Natural frequency 25-35 Hz. Attenuate high-frequency road & terrain shock and transient vibrations. Designed to ensure equipment survival.	T-Mounts; B-Mounts; Cupmounts. 5200 Series; E21/E22 Series; 6300/6550 Series. 500 Series; 500SL Series; HR Series; 22000 Series; Barry-Bond Series; Industrial Conical Mount Series. Cable Mounts. ME Series; TTA & TTB Series. Special High-Performance Mounts.
MIL-S-52509. MIL-S-55286. (Flat and rotational drops, 2-direction drag test, 2-inch pipe rolling, pivoting, or balancing).	Limits shock input to shelter to less than 30 g during flat or rotational drop tests. Lift truck access slots.	Cable Mounts; VHC Series. Specially designed Skid-Mounts.
Low threshold sensitivity of equipment to vibration/shock. Low frequency fundamental modes of buildings, labs. Typical 4-25 Hz.	Low natural frequency, 0.5 to 5.0 Hz as required, non linear damping, constant natural frequency regardless of load, automatic leveling.	SLM Series.
Vibration (rough handling): Package Test (bounce test). 5 Hz 1.00″ D. A. Shock: 18″ and 30″ flat-drop and corner-drop tests. NOTE: Other specific requirements determined by equipment manufacturer or transport carrier used.	High- deflection, low-frequency (5 to 10 Hz) for maximum shock attenuation. NOTE: Individual manufacturer's specifications to ensure equipment survival.	Cupmounts. Special shear mounts Shipping-Container Mount Series. SLM Series. Cable Mounts; VHC Series.

ISOLATOR SELECTION GUIDE

BARRY CONTROLS

INTRODUCTION

Mechanical vibration and shock are present in varying degrees in virtually all locations where equipment and people function. The adverse effect of these disturbances can range from negligible to catastrophic depending on the severity of the disturbance and the sensitivity of the equipment.

In one extreme, the vibration environment may consist of low-level seismic disturbances present everywhere on earth, which present operating problems to highly sensitive items such as delicate optical equipment. When other disturbances are superimposed on the seismic disturbances, a wide range of precision equipment is adversely affected.

These other disturbances are caused by such things as vehicular and foot traffic, passing trains, air conditioning systems, and nearby rotating and reciprocating machinery. They cause resolution problems in electron microscopes, disturb other optical systems, cause surface finish problems on precision grinders and jig borers, and hamper delicate work on microcircuitry.

Another concept is the detrimental effect of vibrating internal components of certain equipment such as motors, blowers, and fans in computers or similar systems. These components transmit noise and vibration to the surrounding structure resulting in fatigue, reduced reliability, and a "noisy" product.

When compared to stationary applications, vehicular installations subject equipment to much more severe shock and vibration. Vibration from a propulsion engine is present in air, sea and road vehicles as well as shock and vibration effects from the media in which they travel.

Such common phenomena as air turbulence and rough roads impart severe dynamic transients to the vehicles traveling on them. In addition to rough seas, military ships are also subjected to very severe mechanical shock when they encounter near-miss air and underwater explosions in combat.

Vibration-control techniques in the form of shock and vibration isolators have been devised to provide dynamic protection to all types of equipment.

In discussing vibration protection, it is useful to identify the three basic elements of dynamic systems:

1. The equipment (component, machine motor, instrument, part, etc. ..);
2. The support structure (floor, baseplate, concrete foundation, etc. ..); and
3. The resilient member referred to as an isolator or mount (rubber pad, air column, spring, etc.) which is interposed between the equipment and the support structure.

If the equipment is the source of the vibration and/or shock, the purpose of the isolator is to reduce the force transmitted from the equipment to the support structure. The direction of force transmission is from the equipment to the support structure. This is illustrated in Figure 1, where M represents the mass of a motor which is the vibrating source, and K, which is located between the motor and the support structure, represents the isolator.

If the support structure is the source of the vibration and/or shock, the purpose of the isolator is to reduce the dynamic disturbance transmitted from the support structure to the equipment. The direction of motion transmission is from the support structure to the equipment. This occurs, for instance, in protecting delicate measuring instruments from vibrating floors. This condition is illustrated in Figure 2, where M represents the mass of a delicate measuring instrument which is protected from vibrating floor by an isolator signified as K.

In either case, the principle of isolation is the same. The isolator, being a resilient element, stores the incoming energy at a time interval which affords a reduction of the disturbance to the equipment or support structure.

The purpose of this Design Guide is to aid the design engineer in selecting the proper isolator to reduce the amount of vibration and/or shock that is transmitted to or from equipment.

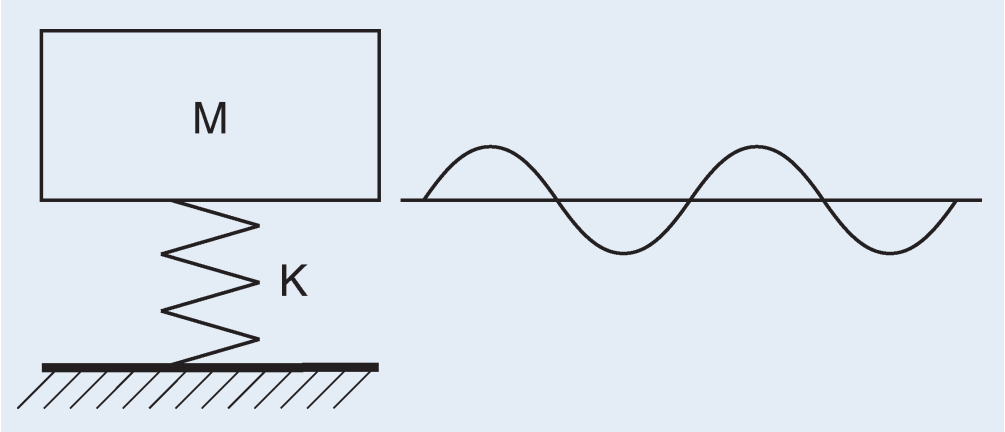


Figure 1 Schematic diagram of a dynamic system where the mass, M, is the vibratory source

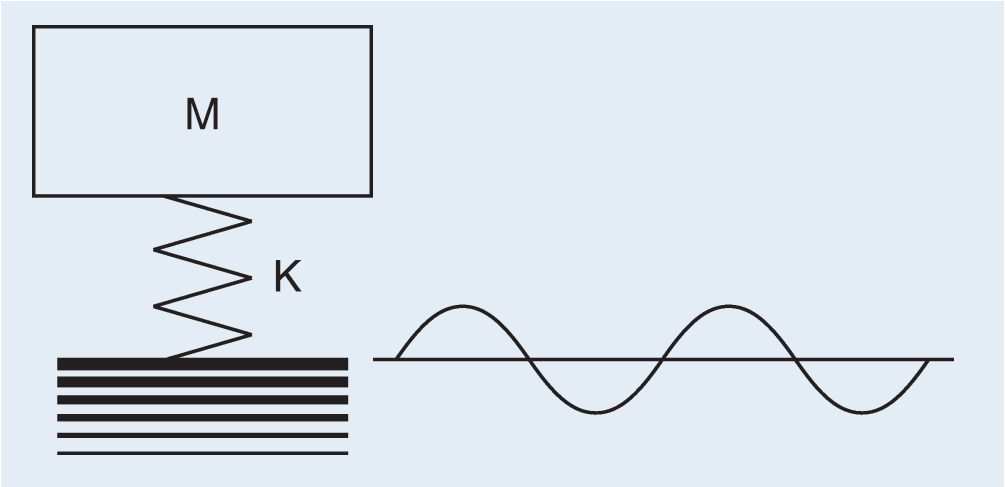


Figure 2 Schematic diagram of a dynamic system where floor is the vibratory source

DEFINITIONS

Although a vibration isolator will provide some degree of shock isolation, and vice versa, the principles of isolation are different, and shock and vibration requirements should be analyzed separately. In practical situations, the most potentially troublesome environment, whether it be vibration or shock, generally dictates the design of the isolator. In other applications, where both are potentially troublesome, a compromise solution is possible.

Before a selection of a vibration and/or shock isolator can be made, the engineer should have a basic understanding of the following definitions, symbols, and terms:

Vibration: A magnitude (force, displacement, or acceleration) which oscillates about some specified reference where the magnitude of the force, displacement, or acceleration is alternately smaller and greater than the reference. Vibration is commonly expressed in terms of frequency (cycles per second or Hz) and amplitude, which is the magnitude of the force, displacement, or acceleration. The relationship of these terms is illustrated in Figure 3.

Frequency: Frequency may be defined as the number of complete cycles of oscillations which occur per unit of time.

$$\text{Frequency} = f = \frac{\text{cycles}}{\text{second}}\,(\text{cps}) = \text{Hertz (Hz)}$$

Period: The time required to complete one cycle of vibration.

$$\text{Period} = \lambda = \frac{1}{f}$$

Forcing Frequency: Defined as the number of oscillations per unit time of an external force or displacement applied to a system.

$$\text{Forcing Frequency} = f_d$$

Natural Frequency: Natural frequency may be defined as the number of oscillations that a system will carry out in unit time if displaced from it equilibrium position and allowed to vibrate freely. (See Figure 3)

Eq. 1 $$f_n = \frac{1}{2\pi}\sqrt{\frac{K}{M}}$$

Eq. 2 $$f_n = \frac{1}{2\pi}\sqrt{\frac{Kg}{W}}$$

Eq. 3 $$f_n = 3.13\sqrt{\frac{K}{W}}$$

Natural frequency in terms of static deflection:

Eq. 4 $$f_n = 3.13\sqrt{\frac{1}{\Delta_s}}$$

Also, natural frequency for torsional vibration:

Eq. 5 $$f_n = 3.13\sqrt{\frac{K_t}{I}}$$

Equations 1 through 5 all neglect the effects of damping. When damping is considered, Equation 2 becomes:

Eq. 6 $$f_n = \frac{1}{2\pi}\sqrt{\frac{Kg}{W}\left[1-\left(\frac{C}{C_c}\right)^2\right]}$$

Amplitude: The amplitude of a harmonic vibration such as displacement, velocity, or acceleration is the zero to peak value corresponding to the maximum magnitude of a harmonic vibration time-history. (See Figure 3.)

Displacement: Displacement is a vector quantity that specifies the change of the position of a body or particle and is usually measured from the mean position or equilibrium position. In general it can be represented by a translation or rotation vector or both. (See Figure 3)

$$\text{Displacement} = X = \text{inches, feet, etc...}$$

Velocity: Velocity is a vector that specifies the time rate change of displacement with respect to a frame of reference.

$$\text{Velocity} = V = \dot{X} = \frac{\text{inches}}{\text{sec}}$$

Acceleration: Acceleration is a vector that specifies the time rate of change of velocity with respect to a frame of reference. The acceleration produced by the force of gravity, which varies with the latitude and elevation of the point of

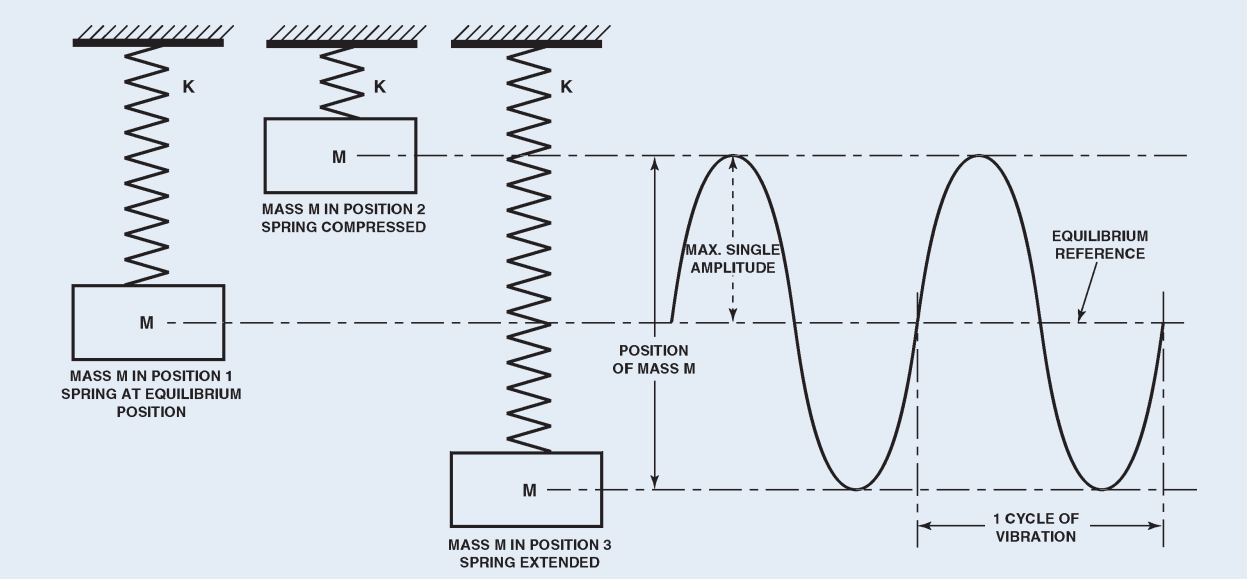


Figure 3 Schematic of oscillating spring mass system and graphical representation of vibratory responses

observation, is given by g = 980.665 cm/sec^2 = 386.093 in/sec^2 = 32.1739 ft/sec^2, which has been chosen as a standard acceleration due to gravity.

$$\text{Acceleration} = g = \ddot{X} = \frac{inches}{sec^2}$$

Deflection: Deflection is defined as the distance an body or spring will move when subjected to a static or dynamic force, F.

$$\text{Deflection} = \Delta = \text{inches}$$

Spring Stiffness: Described as a constant which is the ratio of a force increment to a corresponding deflection increment of the spring.

Eq. 7

$$\text{Spring Stiffness} = K = \frac{F}{\Delta} = \frac{\text{Force}}{\text{Deflection}} = \frac{lb}{in}$$

Rotational spring stiffness:

Eq. 8

$$K_r = \frac{m}{\phi} = \frac{\text{Moment}}{\text{Angular Displacement}} = \frac{in \cdot lb}{sec}$$

Elastic Center: The elastic center is defined as a single point at which the stiffness of an isolator or system isolators can be represented by a single stiffness value.

Damping: Damping is the phenomenon by which energy is dissipated in a vibratory system. Three types of damping generally encountered are: coulomb, hysteresis and viscous.

Coulomb Damping: If the damping force in a vibratory system is constant and independent of the position or velocity of the system, the system is said to have coulomb or dry friction damping.

Hysteresis (Inherent) Damping: Damping which results from the molecular structure of a material when that material is subjected to motion is referred to as hysteresis damping. Elastomers are good examples of materials which possess this type of damping.

Viscous Damping: If any particle in a vibrating body encounters a force which has a magnitude proportional to the magnitude of the velocity of the particle in a direction opposite to the direction of the velocity of the particle, the particle is said to be viscously damped. This is the easiest type of damping to model mathematically. All of the equations in this text are based on use of a viscous damping coefficient. Although most isolators do not use viscous damping, equivalent viscous damping usually yields excellent results when modeling systems.

Damping Coefficient: Damping for a material is expressed by its damping coefficient.

$$\text{Damping coeff.} = C = \frac{lb \cdot sec}{in}$$

Critical Damping: A system is said to be critically damped when it is displaced from its static position and most quickly returns to this initial static position without any over-oscillation. The damping coefficient required for critical damping can be calculated using:

Eq. 9

$$C_c = 2\sqrt{KM}$$

Damping Factor: The non-dimensionless ratio which defines the amount of damping in a system.

$$\text{Damping factor} = \frac{C}{C_c} = \zeta$$

Resonance: When the forcing frequency coincides with the natural frequency of a suspension system, this condition is known as resonance.

Transmissibility: Defined as the ratio of the dynamic output to the dynamic input.

Eq. 10

$$T = \sqrt{\frac{1 + \left(2\frac{f_d}{f_n} \cdot \frac{C}{C_c}\right)^2}{\left(1 - \frac{f_d^2}{f_n^2}\right)^2 + \left(2\frac{f_d}{f_n} \cdot \frac{C}{C_c}\right)^2}}$$

For negligible damping ($C/C_c = 0$), T becomes:

Eq. 11

$$T = \left| \frac{1}{1 - \left(\frac{f_d}{f_n}\right)^2} \right|$$

When resonance occurs, and, T is at its max and Equation 10 becomes:

Eq. 12

$$T_{max} = \frac{1}{2\frac{C}{C_c}}$$

Shock: Defined as a motion in which there is a sharp, nearly sudden change in velocity. Examples of this are a hammer blow on a anvil or a package falling to the ground. Shock may be expressed mathematically as a motion in which the velocity changes very suddenly.

Shock Pulse: Shock pulse is a primary disturbance characterized by a rise and decay of acceleration from a constant value in a very short period of time. Shock pulses are normally displayed graphically as acceleration vs. time curves. See Figure 11 for examples of typical curves.

Shock Transmission: Shock transmitted to the object subjected to the shock. This can be calculated with the following equation:

Eq. 13

$$\text{Shock transmitted} = G_T$$

$$G_T = \frac{V(2\pi f_n)}{386} = \frac{V(f_n)}{61.4}$$

In this equation, V represents an instantaneous velocity shock. Most shock inputs can be approximated by an instantaneous velocity shock. See shock isolation section starting on page X for more detail.

The associated dynamic linear deflection of an isolator under shock can be determined by the use of the following equation:

Eq. 14

$$\Delta_D = \frac{V}{2\pi f_n}$$

DESIGN CONSIDERATIONS

Vertical Vibration: In the general introduction of this Guide, it was pointed out that vibration and shock can have gross detrimental effects on the performance and reliability of a particular product. The vibration which a unit transmits to a supporting structure or the vibration which a unit feels when it is being excited by a vibrating structure can be reduced or attenuated by an isolator if properly selected. Referring to the following discussion of how an isolator functions, the design example section of this Guide contains problem solutions which use the equations and graphs presented in this section.

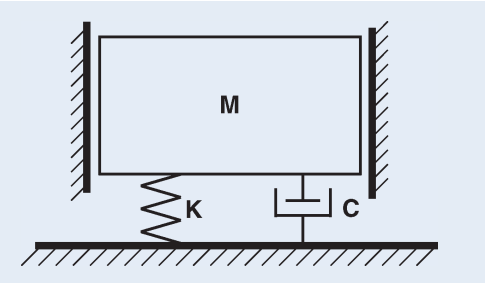


Figure 4 Schematic of the simplest form of an isolator, a spring, K, and a viscous damper, C, supporting the equipment mass, M.

The function of an isolator may be best understood by first reducing it to its simplest form, as illustrated in Figure 4. The system of Figure 4 includes a rigid mass M supported by a spring K and constrained by guides to move only in vertical translation without rotation about a vertical axis. A damper C is arranged in parallel with the spring between the support and the mass. The mounted equipment is simulated by the mass while the spring and damper taken together simulate the elasticity and damping of the conventional isolator. The system shown in Figure 4 is said to be a single-degree-of-freedom system because its configuration at any time may be specified by a single coordinate; e.g., by the height of the mass M with respect to the fixed support.

Isolation is attained primarily by maintaining the proper relationship between the disturbing frequency and the system's natural frequency. The characteristics of the isolator include its natural frequency, or more properly, the natural frequency of the system consisting of isolator and mounted equipment. In general, a system has a natural frequency for each degree of freedom; the single-degree-of-freedom system illustrated in Figure 4 thus has one natural frequency. The expression for the damped natural frequency of the system illustrated in Figure 4, expressed in cycles per second, is:

(Eq. 6)

$$f_n = \frac{1}{2\pi}\sqrt{\frac{Kg}{W}\left[1-\left(\frac{C}{C_c}\right)^2\right]}$$

A critical damped system returns without oscillation to equilibrium if displaced; it has no natural frequency of oscillation, as indicated by the substitution of C=Cc in Equation 6.

In most circumstances the value of the damping coefficient is relatively small. The influence of damping on the natural frequency may then be neglected. Setting the damping coefficient C equal to zero, the system becomes an undamped single-degree-of-freedom system, and the undamped natural frequency given by:

(Eq. 2)

$$f_n = \frac{1}{2\pi}\sqrt{\frac{Kg}{W}}$$

This expression is sufficiently accurate for calculating the actual natural frequency in most instances.

The concept of static deflection often is used to define the characteristics of an isolator. Static deflection is the deflection of the isolator under the static or deadweight load of the mounted equipment. Referring to Equation 2 and substituting in/sec2, , the following expression is obtained for natural frequency in terms of static deflection:

(Eq. 4)

$$f_n = 3.13\sqrt{\frac{1}{\Delta_s}}$$

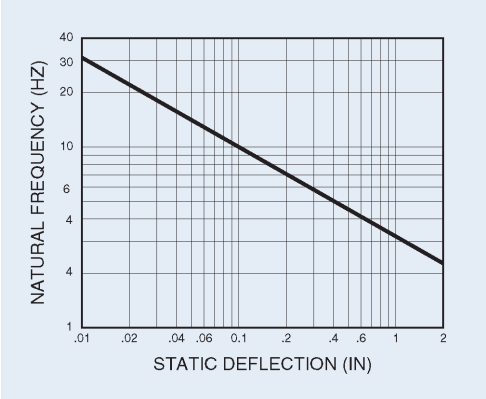


Figure 5 Relation of natural frequency and static deflection of a linear, single-degree-of-freedom system.

A graphic portrayal of Equation 4 is given in Figure 5. It thus appears possible to determine the natural frequency of a single-degree-of-freedom system by measuring only the static deflection. This is true with certain qualification. First, the spring must be linear — its force vs. deflection curve must be a straight line. Second, the resilient material must have the same type of elasticity under both static and dynamic conditions.

Metallic springs generally meet this latter requirement, but many organic materials used in isolators do not. The dynamic modulus of elasticity of these materials is higher than the static modulus; the natural frequency of the isolator is thus somewhat greater than that calculated on the basis of static deflection alone.

Dynamic stiffness may be obtained indirectly by determining the natural frequency when the isolator is vibrated with a known load and calculating the dynamic stiffness from Equation 2. The various organic materials have certain peculiarities with respect to dynamic stiffness which will be discussed later in connection with the specific materials.

Effectiveness of isolators in reducing vibration is indicated by the transmissibility of the system. Figure 6 illustrates a typical transmissibility curve for an equipment of weight W supported on an isolator with stiffness K and damping coefficient C which is subjected to a vibration disturbance of frequency fd. When the system is excited at its natural frequency, the system will be in resonance and the disturbance forces will be amplified rather than reduced.Therefore, it is very desirable to select the proper isolator so that its natural frequency will be excited as little as possible in service and will not coincide with any critical frequencies of the equipment.

Referring to Figure 6, it can be seen that when the ratio of the disturbing frequency fd over the natural frequency fn is less than or 1.4, the transmissibility is greater than 1, or the equipment experiences amplification of the input. Simply expressed, when:

$$f_d / f_n \leq \sqrt{2} \ , \ T \geq 1$$

theoretically, isolation begins when:

$$f_d / f_n = \sqrt{2} \ \text{(at this point } T = 1)$$

Also it can be seen that when:

$$f_d / f_n > \sqrt{2} \ , \ T < 1$$

the mounted unit is said to be isolated; i.e., the output Xo is less than input Xi.

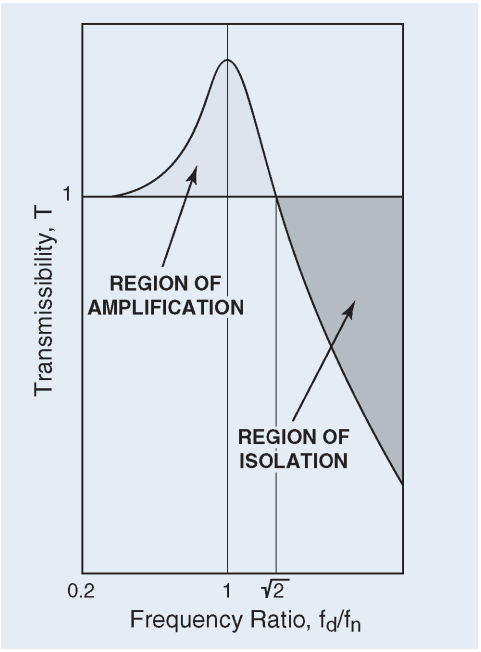


Figure 6 Typical transmissibility curve for an isolated system where fd = disturbance frequency and fn = isolation system natural frequency.

Damping: The majority of isolators possess damping in varying degrees. A convenient reference illustrating damping factor C/Cc for various materials is shown in Table 1. Damping is advantageous when the mounted system is operating at or near its natural frequency because it helps to reduce transmissibility. For example, consider an internal combustion engine mounted on steel springs which possess very little damping (see Table 1). Upon start up of the engine and as the engine RPM increases, the disturbing frequency of the engine will at some point correspond with the natural frequency of the spring-mass system. With light damping,

the buildup of forces from the engine to the support will be very large; that is, transmissibility will be very high. If the idle RPM of the engine falls in the range of the natural frequency of the spring-mass system, serious damage may result to the engine or to the support chassis. If, on the other hand, the designer selects an elastomeric isolator which possesses a higher degree of damping, amplification at resonance would be much less.

Material	Approx Damping Factor C/Cc	Tmax (approx.)
Steel Spring	0.005	100
Elastomers:	-	-
Natural Rubber	0.05	10
Neoprene	0.05	10
Butyl	0.12	4.0
Barry Hi Damp	0.15	3.5
Barry LT	0.11	4.5
Barry Universal	0.08	6.0
Friction Damped Springs	0.33	1.5
Metal Mesh	0.12	4.0
Air Damping	0.17	3.0
Felt and Cork	0.06	8.0

Table 1 Damping factors for materials commonly used for isolators

The relationship between a highly damped and a lightly damped system is illustrated in Figure 8. This figure shows that as damping is increased, isolation efficiency is somewhat reduced in the isolation region. While high values of damping cause significant reduction of transmissibility at resonance, its effect in the isolation region is only a small increase transmissibility.

A family of curves which relate fn, fd, transmissibility and damping are shown in Figure 8. This family of curves was derived by use of Equation 10.

Horizontal Vibration: When an isolation system is excited horizontally, two natural frequencies result if the center of gravity of the unit is not in line with the elastic center of the isolators. A typical transmissibility curve illustrating this horizontal vibration output is illustrated in Figure 9. The two natural frequencies which are involved include a lower mode wherein the equipment rocks about a point well below the elastic center of the isolators and a higher mode where the equipment oscillates about a point in the vicinity of the center of gravity. Two other natural frequencies will occur if the equipment is rotated 90 degrees in the horizontal plane with respect to the exciting force.

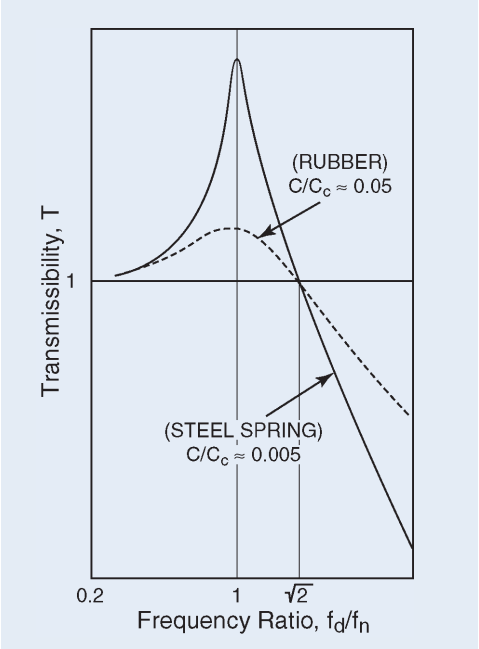


Figure 7 Typical transmissibility curves for highly and lightly damped systems.

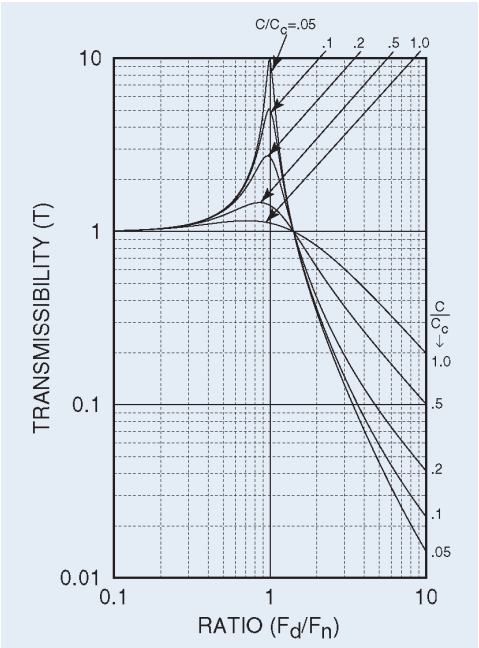


Figure 8 Family of transmissibility curves for a single degree of freedom system.

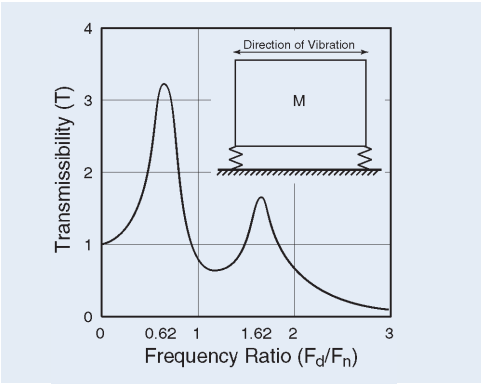


Figure 9 Typical transmissibility curve for horizontal vibration inputs.

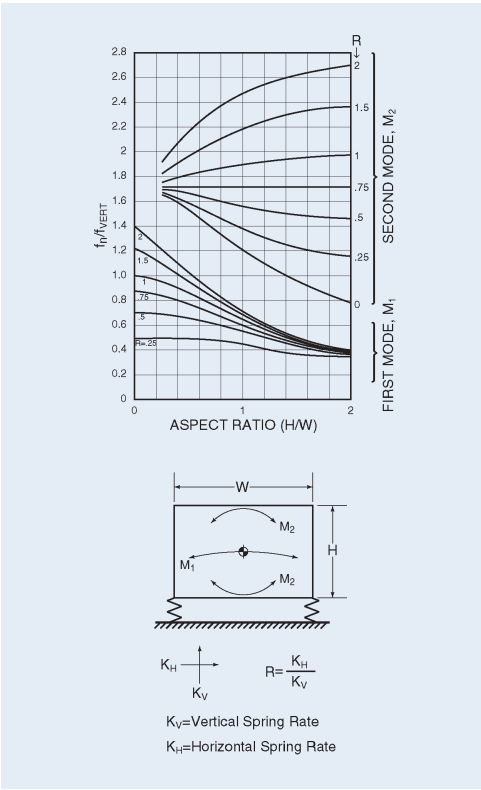


Figure 10 Horizontal natural frequencies of a homogeneous solid mounted on linear, undamped springs at edge of mass.

Figure 10 can be used to determine the approximate frequencies of these modes as a function of spring stiffness and equipment dimensions. These curves assume that the equipment is solid, of uniform mass, and that the isolators are attached at the extreme corners. Under horizontal excitation the equipment may be made to translate only by lining up the center of gravity of the equipment with the elastic center of the isolators instead of installing the isolators at the bottom corners of the equipment. In this case, Figure 10 may be applied by letting H/W = 0, which results in only one mode of vibration, that of translation. A second mode can only be excited by torsional excitation.

Structure-Borne Noise: The demand on equipment today is to maximize its output which generally requires faster operation and more complex mechanical motions. As a result, noise is sometimes generated. High frequency disturbances are excited because the moving components within the equipment impose vibratory inputs to the internal structures. These vibrations are amplified and structure-borne noise is encountered. Complete equipments bolted to their support foundations also cause similar noisy conditions.

An effective and low cost means of alleviating structure-borne noise problems is to physically separate the solid structures and interpose a resilient material between them. In this manner a mechanical attachment is provided but the resilient media prevents the vibration forces from being transmitted and structure-borne noise is substantially reduced.

Elastomeric materials are generally best suited for structure-borne noise reduction. They exhibit the desirable characteristics of shape flexibility and inherent damping to avoid spring-like response which might produce violent resonances at critical frequencies. They afford high frequency isolation. Many isolators suitable for attenuation of structure-borne noise problems are available from Barry and these are outlined in the Selection Guide, Section 6.

Shock: Shock is normally classified as a transient phenomenon, while a typical vibration input is classified as a steady-state phenomenon. A shock input pulse is normally described by its peak amplitude A expressed in g's, by its duration t normally expressed in milliseconds, and its overall shape, which can take such forms as half-sine, triangular, (initial peak sawtooth, symmetrical and terminal peak sawtooth), versed sine, rectangular, and the form most likely to occur in nature, a more or less random shaped complex waveform force and acceleration impulse as shown in Figure 11.

Since there are many types of shock pulses encountered in nature, there are many types of shock tests specified for testing a piece of equipment. The different shock tests are normally associated with the environment that the equipment will encounter during its lifetime. Equipment installed in aircraft is normally tested on a free-fall shock machine which will generate either a half-sine or terminal peak sawtooth form. A typical test is an 11-millisecond half-sine waveform with a peak acceleration of 15 g's. For components in some areas of missiles where large shock pulses will be felt due to explosive separation of stages, a 6-millisecond sawtooth at 100 g's may be specified. If a piece of equipment is going on board a Navy vessel, the normal test will be the hammer blow specified in MIL-S-901, which exhibits a velocity shock of approximately 120 in./sec. Shipping containers are normally tested by dropping the container on a concrete floor, or by suspending it by some suitable support mechanism and letting it swing against a concrete abutment. Other tests pertaining to shipment are edge and corner drops from various drop heights. All of these tests

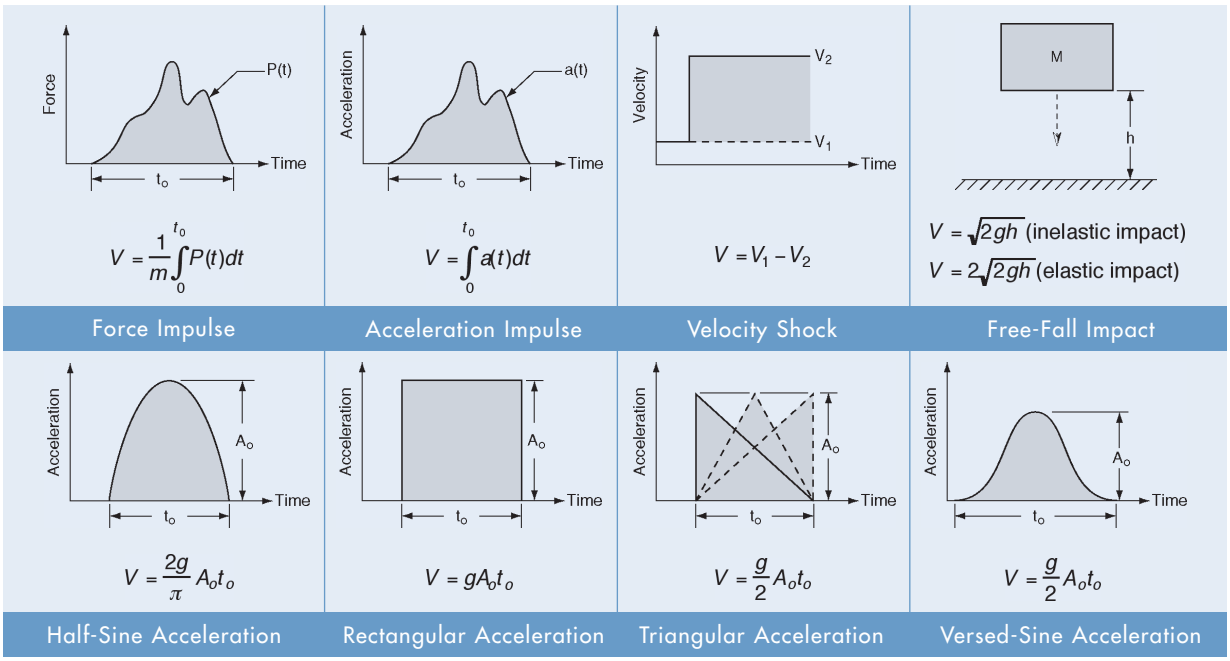


Figure 11 Idealized forms of shock excitation and the velocity change, V, associated with each shock pulse

mentioned attempt to simulate the shock pulse which will be encountered in the normal environment of the equipment. These are generally called out by the specific contractual requirements either in a specification or in a work requirement.

The isolation of shock inputs is considerably different from that of a vibration input. The shock isolator is characterized as a storage device wherein the input energy, usually with a very steep wave front, is instantaneously absorbed by the isolator. This energy is stored in the isolator and released at the natural frequency of the spring-mass system.

The most common procedure for predicting shock isolation is a mathematical approach utilizing equations in Figure 11, for determining the velocity, and Equation 13, for calculating transmitted accelerations.

Another means is through the use of shock transmissibility curves. Shock transmissibility curves are not included in this Guide, but are included in a technical paper published by Barry Controls titled Passive Shock Isolation. Please call 1-800-BARRY MA for a copy of this paper.

These two methods are valid for solving shock problems provided that the shock pulse is thoroughly defined, and that the isolation system responds in its linear region.

Nonlinear Isolators: The preceding discussion of vibration and shock isolation presumes that the isolator is linear, the force-deflection curve for the isolator is a straight line. This simplified analysis is entirely adequate for many purposes. In the isolation of steady-state vibration, displacement amplitude is usually small, and nonlinearity of the isolator tends to be unimportant except where deflection resulting from the static load is relatively great. In the isolation of shock, nonlinearity tends to be more important because large deflections prevail. The degree of isolation may then be substantially affected by the ability, or lack thereof, of the isolator to accommodate the required deflection.

In many applications of shock isolation, sufficient space is not available to allow for full travel of a linear isolator. Therefore, a nonlinear isolator is necessary. There are two types of isolators that can be designed to help solve the problem of insufficient space.

The first solution is to make an isolator that gets stiffer as deflection increases. This will limit the amount of motion, but will increase the G level imparted on the equipment.

The second is to use an isolator that is stiff at small deflection, but gets softer at higher deflections. This is referred to as a buckling isolator, and is shown in Figure 12. This allows the isolator to store more energy in the same amount of deflection. (A shock isolator is basically an energy storage device; it stores high g-level, short-duration shock and releases them as low g-level, longer-duration shocks.)

ISOLATORS AND MATERIALS

Isolators are made from a wide variety of resilient media having diverse characteristics. Each type of isolator has characteristic properties and is particularly suited to certain specialized applications. To make the best use of available isolators, the designer should understand the basic properties of each type. He should also be familiar with the requirements for isolators for various types of equipment, as indicated in the preceding discussions. Keep in mind that not all isolators can be manufactured out of any material.

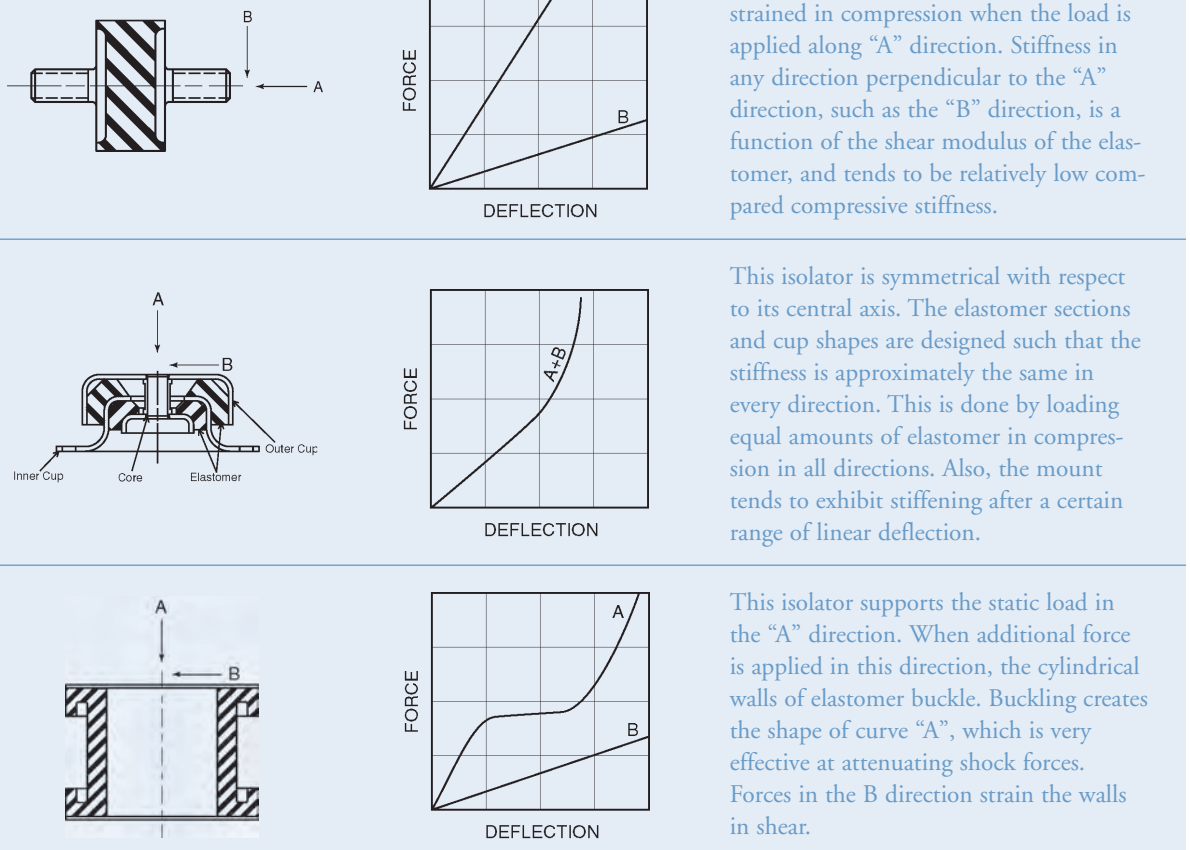


Figure 12 Force vs. Deflection curves for some typical elastomeric isolators

Elastomeric Isolators: Elastomers are well adapted for use in shock isolators because of their high energy storage capacity and because the convenience of molding to any shape makes it possible to attain the linearity or nonlinearity required for adequate shock isolation.

Most elastomeric isolators cannot be constantly subjected to large strains. An isolator with a large static deflection may give satisfactory performance temporarily but it tends to drift or creep excessively over a relatively short period of time. Opinions on maximum permissible static strain vary widely, but it may be taken as a conservative limitation that elastomers should not be continuously strained more than 10 to 15% in compression, nor more than 25 to 50% in shear. These rules of thumb are often used to determine the maximum load capacity of a given isolator.

In spite of the limitations of elastomeric materials used in isolators, the overall advantages far outweigh the disadvantages and make elastomers the most highly desirable type of resilient media for isolators.

With this type of isolator, the elastomer is strained in compression when the load is applied along "A" direction. Stiffness in any direction perpendicular to the "A" direction, such as the "B" direction, is a function of the shear modulus of the elastomer, and tends to be relatively low compared compressive stiffness.

Springs: Metal springs can be used as vibration isolators. In some instances, these types of isolators work well. Frequently, the lack of damping in these type of isolators forces them to experience extremely violent resonances conditions (see "Damping" section and Figure 8).

Combination Spring-Friction Damper: To overcome the disadvantages of little or no damping in coil springs, friction dampers can be designed in parallel with the load-carrying spring. These types of isolators are widely used in practice. An example of this is illustrated in Figure 13.

In this construction, along the vertical axis a plastic damper slides along the walls of a cup housing, and the normal force is provided by a radial damper spring. For horizontal damping, a central metal core which is directly attached on its top side to the equipment bears on the damper on its bottom side. The normal force is provided by the weight of the equipment, and damping results from the sliding during horizontal excitations. Transmissibility values of about 2 are exhibited by using this type of spring/damper combination.

Properties	Natural Rubber	Neoprene	Hi-Damp ® Silicone	Barry LT Compound
Adhesion to Metal	Excellent	Excellent	Good	Very Good
Tensile Strength	Excellent	Excellent	Good	Excellent
Tear Resistance	Good	Good	Fair	Good
Compression Set Resistance	Good	Fair	Fair	Good
Damping Factor, C/Cc (approx.)	0.05	0.05	0.15	0.12
Operating Temperature (max)	180F	180 F	300F	200F
Stiffness Increase (approx.) @ -65F	10X	10X	< 2X	2X
Oil Resistance	Poor	Good	Fair	Fair
Ozone Resistance	Poor	Good	Excellent	Fair
Resistance to Sunlight Aging	Poor	Very Good	Excellent	Good
Resistance to Heat Aging	Fair	Good	Excellent	Good
Cost	Low	Low	High	Moderate

Table 2 Relative properties of elastomers used as the resilient media for isolators

Combination Springs with Air Damping:

Another method of adding damping to a spring is by use of an air chamber with an orifice for metering the air flow. An example of this type of isolator is illustrated in Figure 14. In this construction the load-carrying spring is located within the confines of an elastomeric damping balloon. The air chamber is formed by closing the balloon with a cap which contains an orifice or the force flow metering. Under dynamic excitations the air in the balloon passes through a predetermined sized orifice by which damping is closely controlled. Transmissibilities generally under 4 result with this type of design.

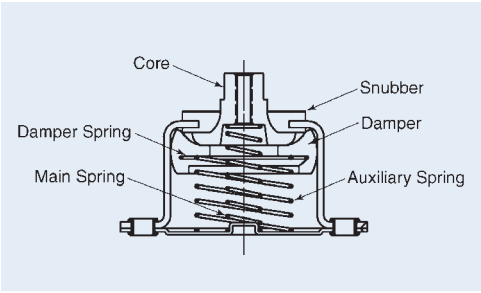


Figure 13 Isolator using friction damped spring.

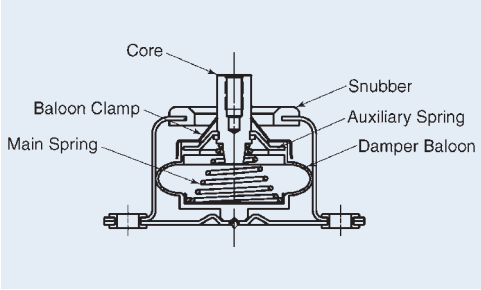


Figure 14 Isolator using air damped spring.

Air-damped springs have some specific advantages over seemingly similar friction damped designs with respect to isolating low-level inputs. Air damping, a form of viscous damping, causes the damping forces to be reduced if the input levels are reduced.

With friction damping, the friction force is constant. In practice, this means that the damping ratio is effectively increased with the input levels are decreased. Referring to Figure 8, one can see increasing the damping ratio decreases the level of isolation. In summary, air damped isolators are best suited for isolating low-level vibrations, while friction damped isolators are usually ideal for higher-level vibrations.

Combination Springs with Wire Mesh Damping:

For applications where all meal isolators are desired because of temperature extremes or other environmental factors, damping can be added to a load carrying spring by use of metal mesh inserts Figure 15 illustrates this concept.

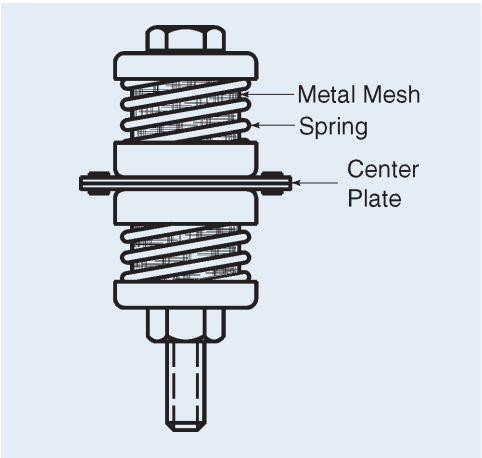


Figure 15 Isolator using metal-mesh damped spring.

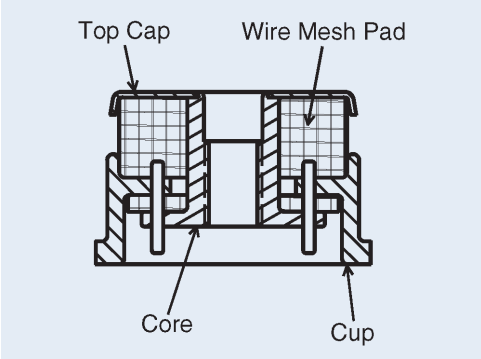


Figure 16 Isolator with wire mesh load carrying pad.

In this construction a knitted mesh wire is formed into a resilient cushion and inserted within the inside diameter of the coil spring. When dynamic loads are applied, the strands of the mesh rub on each other and damping is accomplished. Transmissibilities under 6 are generally exhibited by the spring-wire mesh damper combination.

Wire mesh cushions are sometimes used as isolators without the addition of a spring in parallel. Although transmissibilities of such an isolator range in the region of 4, an isolator so designed has the disadvantage of creep or high compression set. Once the metal pads take a compression set their performance under dynamic conditions is difficult to predict. An example of this type isolator is illustrated in Figure 16.

Pneumatic Systems: This type of isolator utilizes the principle of supporting the static load on an air column. It is particularly useful where low fn systems are required; that is, 0.5 to 3 Hz region. An air spring enables the system to have a "zero" static deflection under load. This is particularly noteworthy since a conventional spring system would need to deflect a magnitude of 3.3 feet to acquire a 0.5 Hz natural frequency and 1.1 in. for a 3 Hz natural frequency. Pneumatic isolators can use a method of damping called sprung damping. This allows the isolator to have very high damping at resonance, but very low damping in the isolation region. A Barry pneumatic isolator which follows the laws of relaxation of sprung damping offers the benefits of very low T at resonance (generally 1.5) and yet offer a high degree of isolation in the high-frequency regions by acting as an undamped spring.

This catalog contains information on the SLM series of pneumatic isolators. `

Miscellaneous Types of Isolators: Other materials sometimes are used for vibration and shock isolators. Wool felt is often used for mounting entire machines but is seldom designed as a component part of a machine. A similar situation exists with regard to cork. Another material in the same category is neoprene impregnated fabric. The manufacturers of spun glass have also suggested the use of this material for the isolation of vibration. All of these materials appear to have characteristic advantages for particular installation. However, the ability of these materials to isolate vibration and particularly shock is difficult to predict, and the dynamic properties of these materials are not well documented in the technical literature.

Little difficulty is encountered in the design of isolators using elastomeric materials or metal springs. The performance characteristics of these materials are very predictable under dynamic conditions.

STEP-BY-STEP ISOLATOR SELECTION

Step 1: Determine the frequency of the disturbing vibration, often called the disturbing frequency, fd. There are a number of ways to determine the disturbing frequency. For rotating equipment, the disturbing frequency is usually equal to the rotational speed of the equipment, expressed in revolutions per minute (RPM) or cycles per minute (CPM). If the speed is specified in RPM or CPM, it must be converted to cycles per second (Hz) by dividing by 60.

For other types of equipment, disturbing frequencies must be specified by the manufacturer or measured. Environmental vibrations can also be measured, or are sometimes specified in military or commercial specifications or test reports.

There could be more than one disturbing frequency. In this case, one should first focus on the lowest frequency. If the lowest frequency is isolated, then all of the other higher frequencies will also be isolated.

The most important thing to remember about vibration isolation is that without knowing the frequency of the disturbing vibration, no analytical isolation predictions can be made. In many of these cases, Barry Controls can recommend solutions that have worked well in similar past applications. Please contact us or your local sales engineer listed on our website (www.barrycontrols.com) if you need help or advice on your application.

Step 2: Determine the minimum isolator natural frequency, fn, that will provide isolation. This natural frequency can be calculated by using the following equation:

Eq. 15 $$f_n = \frac{f_d}{\sqrt{2}} \cong f_d \times .707$$

If this fn is exceeded, this isolation system will not perform properly, and it is quite possible that you will amplify the vibrations. Isolators that have a fn lower than that calculated in Equation 15 will provide isolation.

At this point, there will be many isolators that can be removed from the list of possible selections. Our catalog clearly states the natural frequency range of each isolator family in the main information block on the first page of each family. If any of the information is missing or unclear, please contact us or your local sales engineer listed on our website (www.barrycontrols.com) if you need help or advice on your application.

Step 3: Determine what isolator natural frequency will provide the desired level of isolation. Step 2 has provided a quick way to determine which mounts provide isolation, but does not provide any information on the level of isolation that will be achieved. Equation 11 can be used to calculate transmissibility:

(Eq. 11)

$$T = \left| \frac{1}{1 - \left(\frac{f_d}{f_n}\right)^2} \right|$$

Equation 11 can be used to calculate the transmissibility of a known disturbing frequency through a mount with a known natural frequency. It can also be rearranged to the following form:

Eq. 16

$$\text{when } \frac{f_d}{f_n} > 1 \quad f_n = \frac{f_d}{\sqrt{1 + \frac{1}{T}}}$$

Equation 16 is valid only when fd/fn>1. This can be used to calculate the required natural frequency to achieve the desired level of isolation of a particular disturbing frequency.

Step 4: Select the appropriate isolator for your application. Step 3 should reduce the list of possible isolators considerably, but there still may be more than one isolator that "qualifies." One way to determine which is best suited is to look under the "Applications" heading on the first page of each isolator family. If your application is not in this list, it does not necessarily mean that the isolator can't be used, but there may be a better choice.

The selection can also be narrowed down by looking at the environmental and dimensional data sections for each candidate isolator. Is the temperature range appropriate? Can the isolator fit in the required space? Is the mount capable of supporting a load in the necessary direction? These are typical questions than can be used to make a final selection.

If there is still more than one isolator that fits your application, or if you cannot find one that meets all of your requirements, please contact us or your local sales engineer listed on our website (www.barrycontrols.com) if you need help or advice on your application. We have expert engineers available to help make selections and answer questions about our products.

DESIGN EXAMPLES

This section deals with the selection and application of vibration and shock isolators. For the proper selections of isolators, it is desirable to obtain, where possible, pertinent information relating to the equipment, input and output requirements, and the general environment. Examples of the type of information or data required are:

Relating to the equipment:
- Weight.
- Dimensions.
- CG location.
- Number and location of isolators.
- Available space for isolators.
- Fragility level of the equipment.

Relating to the dynamic inputs and outputs:
- Level of vibration.
- Level of shock.
- Space limitations.

Relating to general environment:
- Temperature.
- Humidity.
- Salt spray.
- Corrosive atmosphere.
- Altitude.

All of the above information is not always readily available nor is it always completely required in some applications. This will be further clarified in the following problem examples.

Example 1 - Vertical Vibration: A metal tumbling drum directly driven by a 1080 RPM motor is causing vibration disturbance to the floor on which it is mounted the drum, motor, and support base weighs 400 pounds. There are 4 mounting points for the isolators. The required isolation is 80%.

1. Determine fn of isolators required by using mathematical methods.
2. Determine static deflection of isolators by using (a) mathematical methods and (b) the static deflection vs. natural frequency curve in Figure 5.
3. Determine damping factor C/Cc to limit transmissibility at resonance to 10 by using (a) mathematical methods and (b) the transmissibility curve in Figure 8.
4. Determine the resilient media which could be used in the isolator selected to provide the C/Cc required.
5. Determine the proper isolator to use for this application.

Solution:

Known facts

$W = 400$ lb

$$\text{Weight per mounting point} = \frac{400}{4} = 100 \text{ lb}$$

Isolation required = 80%
i.e. transmissibility = 0.20
Disturbing frequency, fd = 1080 RPM

1. Using Equation 16, page 63:

$$f_n = \frac{f_d}{\sqrt{1+\frac{1}{T}}} = \frac{18}{\sqrt{1+\frac{1}{.2}}} = 7.35 \text{ Hz}$$

2a. To find static deflection using mathematical approach use Equation 4, page 53:

$$\Delta_s = \frac{3.13^2}{f_n^2} = 0.18$$

2b. To find static deflection using static deflection-natural frequency curve Figure 5, page 56. The intersection of fn of 7.35 Hz and the solid diagonal line yields a Ds of approximately 0.18 inches.

3a. To find C/Cc for a transmissibility of 10 by mathematical approach use Equation 12, page 54. Solving for C/Cc:

$$\frac{C}{C_c} = \frac{1}{2T} = 0.05$$

3b. To find C/Cc for a T of 10 by use of the transmissibility curve Figure 8, page 57. This curve shows that for a transmissibility of 10, C/Cc = 0.05.

4a. To find the correct resilient media which exhibits a C/Cc = 0.05 refer to Table 1, page 57. It can be seen that natural rubber or neoprene would be the proper selection.

5a. An isolator which best fits the above solved parameters is Barry Part No. 633A-100. Refer to the product information on pages 116-118 of this catalog to confirm that this product meets all of the above needs.

Example 2 - Vertical and Horizontal Vibration: An electronic transmitter which weighs 100 pounds, and has a height of 15", a width of 20" and a length of 30" is to be mounted in a ground vehicle which imparts both vertical and horizontal vibratory inputs to the equipment. Since rough terrain is to be encountered a captive isolator is required. Four mounting points, one at each corner, are provided. It has been determined that the first critical frequency of the equipment is such that an isolator with a 25 Hz vertical natural frequency would be satisfactory. Select an appropriate isolator and determine the approximate horizontal rocking modes in the direction of the short axis of the equipment which would be excited.

Solution:

1. For vertical natural frequency:

   Load per isolator = 100/4 = 25 lb.

   Referring to a Barry isolator series designed for the rigors of vehicular applications, the 5200 series is suitable. From the load rating table in the product information section (18-30 pounds capacity for vehicular applications) would handle the 25 pound load.

   Using the load vs. natural frequency plots on page 192, the intersection of the 5220 curve for the 25 pounds load yields an fn of 24 Hz.

2. For horizontal rocking modes: The dynamic stiffness ratio of horizontal to vertical = 0.6 for the 5200 series. Referring to Figure 10, page 58 and assuming that mass is homogeneous and isolators are at extreme corners, the following is found:

$$R = \frac{K_L}{K_V} = 0.6$$

$$\frac{H}{W} = \frac{15}{20} = 0.67$$

   From the curves in Figure 10, page 58, the ratios of fn/fVERT for first mode M1 is 0.7 and for second mode, M2, is 1.7.

   fn, 1st mode = 24 X 0.7 = 16.9 Hz
   fn, 2nd mode = 24 X 1.7 = 40.8 Hz

   It is seen that this procedure lends a ready solution to determining the horizontal rocking modes based on the assumptions made. This solution is not exact but is generally satisfactory for practical purposes.

Example 3 - Shock: An electronic equipment is to be subjected to a 15G, 11 millisecond half-sine shock input. The equipment is mounted on a 10 Hz natural frequency isolation system. Determine maximum shock transmission and isolator deflection.

Solution:

1. From Figure 11, page 59, the equation for shock velocity change for a half-sine pulse is:

$$V = \frac{2gA_o t_o}{\pi}$$

where: Ao=15G
to=0.011 sec
g=386 in/sec2

$$V = \frac{2 \times 386 \times 15 \times 0.011}{\pi} = 40.5 \text{ in/sec}$$

using Equation 13, page 55, the maximum shock transmission is:

$$G_T = \frac{V(f_n)}{61.4} = \frac{40.5 \times 10}{61.4} = 6.6 \text{ G's}$$

using equation 14, page 55, the isolator deflection required to attenuate this shock:

$$\Delta_D = \frac{V}{2\pi f_n} = \frac{40.5}{2\pi(10)} = .64$$

This example could also be done in the "reverse" direction. If one knew the desired output, 6.6 G's, one could calculate the required natural frequency, 10 Hz, to attenuate the input shock.

In either case, the deflection is calculated last, and used to determine 1) if the allowable sway space is sufficient to accommodate the required deflection, and 2) if the selected isolator has enough linear deflection capability to withstand the shock.

ISOLATOR PROPERTIES MATRIX

Product‡	Page Number	Load Range (lbs)	Natural Frequency	All Attitude	1:1 Stiffness	Primary Application	Specialty
Cupmounts	131	0-1800	High	Yes	Yes	Vibration	Low-profile, rugged
S-Mounts	137	0.3-45	Low	No*	No	Vibration	Air-damped
L-Mounts	140	0.4-40	Low	No*	No	Vibration	Friction-damped
H-Mounts	146	0.3-40	Low	No*	No	Vibration	Friction-damped
T-Mounts	150	0-150	High	Yes	Yes	Vibration	Low-profile, rugged
B-Mounts	154	0-40	Mid/High	Yes	Yes	Vibration	Friction-damped
ME Series	163	0-10	Mid	No	No	Vib/Shock	Low-profile, buckling
TTA Mounts	166	0-15	Mid	No	Yes	Shock	Buckling
TTB Mounts	168	0-30	High	No	No	Shock	Buckling
HTTA Mounts	170	0-20	Mid	No	No	Shock	Buckling
VHC Mounts	172	0-145	Mid	No	No	Shock	Buckling
Cablemounts	231	0-1800	Low/Mid	Yes	No	Shock	High-Temperature
2K Mounts/Systems	174	1-6000	Low/Mid	No*	No	VIb/Shock	Two-stage isolation
GB530 Mounts	178	0-1322	Low	No	No	Vib/Shock	Buckling, high capacity
Barryflex (GBCO) Mounts	180	0-40	Mid	No	No	Shock	Buckling
Stabl-Levl (SLM)	107	0-19200	Low	No*	Yes	Vibration	Pneumatic mount
LM and LMS Leveling Mounts	110	0-13000	Mid	No*	No	Vib/Shock	Built-in Leveling
633A Series	116	0-260	Low/Mid	No	No	Vibration	
Industrial Machinery Mounts	119	0-4400	Low/Mid	No	No	Vibration	
30005 Series Neoprene Pads	123	0-50 (psi)	High	No*	No	Vibration	
6300/6550 Series	185	0-18	Mid/High	Yes	Yes	Vibration	Low-profile
E21/E22	188	0-10	High	Yes	Yes	Vibration	Low-profile grommet
5200 Series	191	0-50	High	Yes	No	Vibration	Low-profile grommet
6820 Series	194	0-80	Mid	Yes	No	Vibration	Low-profile
500 Series	69	0-2700	Mid	No	Yes	Vibration	Rugged
500SL Series	78	0-920	Mid	No	No	Vibration	Low stiffness ratio
HR Series	82	0-420	Mid	No	No	Vibration	High stiffness ratio
22000 Series	87	0-4500	Mid	Yes	Yes	Vibration	Low-cost, rugged
Barry-Bond Mounts	93	0-2100	Mid/High	No	No	Vibration	Low-cost
Industrial Conical Mounts	99	0-1146	Mid	No	No	Vibration	Rugged
Cylindrical Stud-Mounts	201	0-260	Low/Mid	No	No	Vib/Shock	Very Low-cost
W Series Ring and Bushing	213	0-350	Mid	No	No	Vibration	All Elastomer
Ball Mounts	219	0-9	Mid	No	No	Vibration	Light loads, low-cost
ES Series Elastomer Springs	125	0-14794	-	No*	No	Shock	Motion control

Key:

Frequency
Low: 10 Hz and below
Mid: 10 Hz to 20 Hz
High: 20 Hz and above

All Attitude
"Yes" means isolators can carry static load in any direction.
* indicates base loading only.

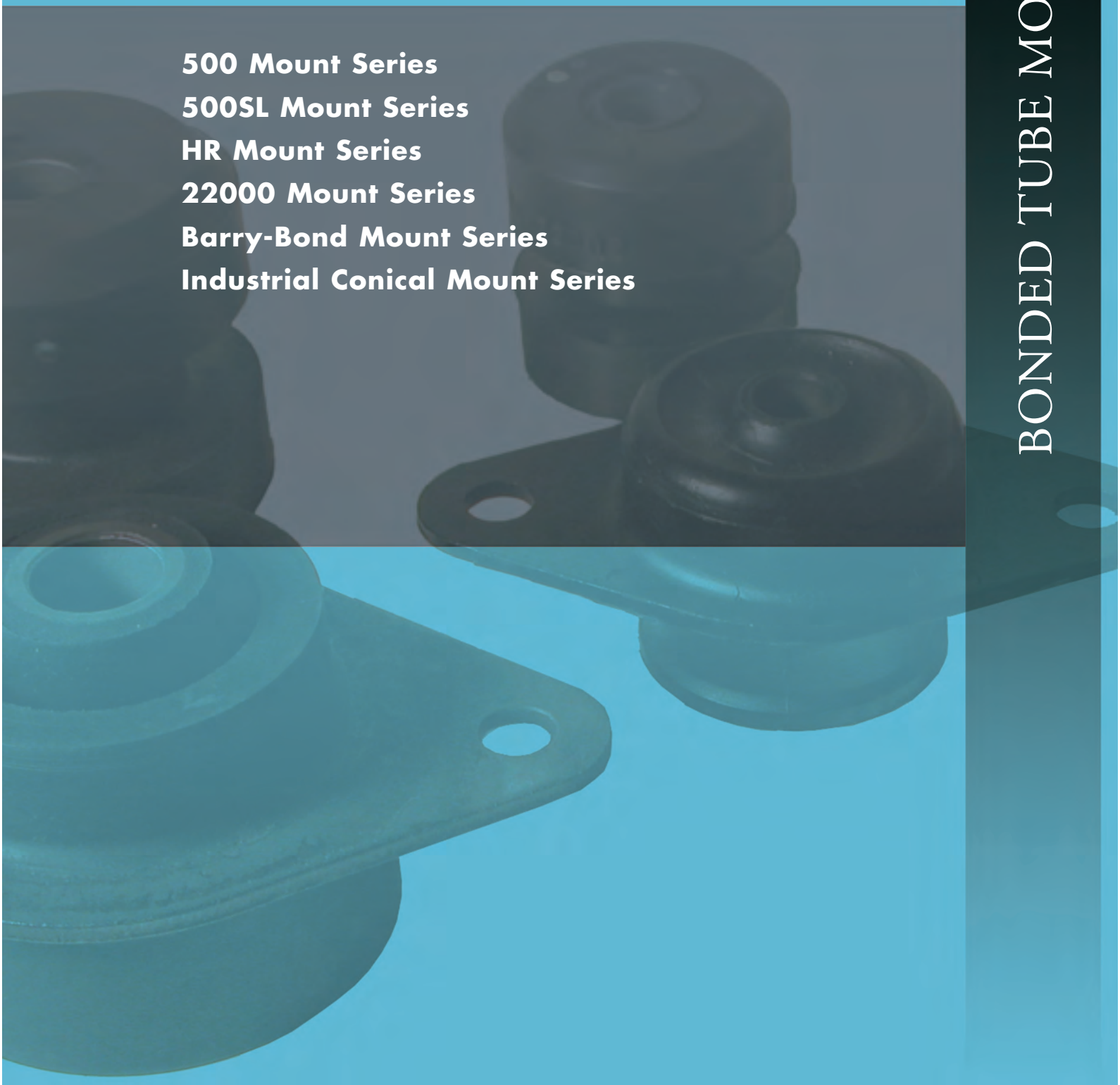
1:1 Stiffness
Refers to axial-to-radial stiffness ratio.

Primary Application
This indicates the type of environment that this mount was primarily designed for. In most cases, each series can be compatible with both shock and vibration environments.

‡This matrix includes all general-purpose isolators in this catalog. There may also be specialty isolators that were designed specifically for your application. Please refer to the "Specialty Isolators" Section on page 243 of this catalog.

BONDED TUBE MOUNTS

500 Mount Series
500SL Mount Series
HR Mount Series
22000 Mount Series
Barry-Bond Mount Series
Industrial Conical Mount Series



500 MOUNT SERIES

Low-profile, high capacity mounts for vibration and shock protection.

APPLICATIONS

- Truck, bus and marine engines
- Generators
- HVAC equipment
- Electronic equipment
- Truck cabs
- Machinery, pumps & compressors

FEATURES

- Fail-safe when used with snubbing washer
- Axial to radial stiffness of 1:1
- Low natural frequency
- Sturdy, reliable construction

BENEFITS

- Economical
- Bonded construction provides constant performance characteristics
- Overlapping load ranges

LOAD RANGE

- 7 sizes with 31 load ratings to 1,780 lbs. per isolator

500 Series mounts are low cost isolators that provide high load carrying capacity, compact size and stability. These all attitude mounts are perfect for isolating truck, bus and marine engines.

Specifications

• Natural Frequency	8-18 Hertz
• Transmissibility at resonance	8:1
• Resilient Element	Neoprene
• Standard Materials	Sintered metal and cold-rolled steel
• Weight	See dimensional drawings

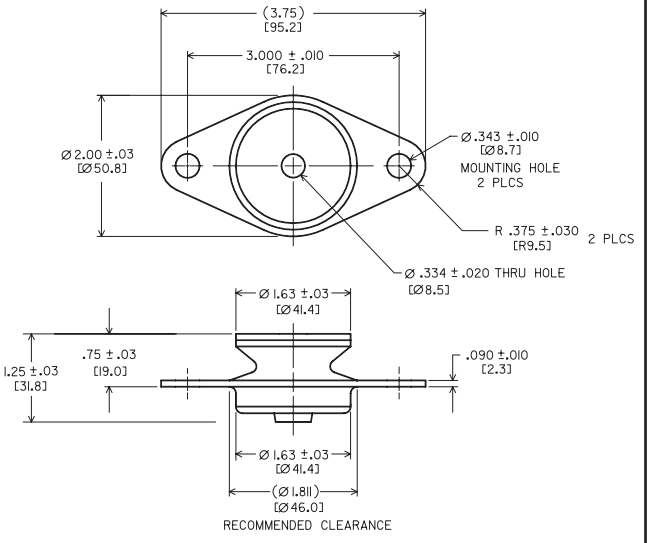
Environmental Data

- Neoprene elastomer has an operating temperature range of -20°F to +180°F (-30°C to +82°C) and is resistant to oils, most solvents and ozone.
- Special elastomers and finishes are available for applications in severe environments. Please note that Silicone elastomer is not compatible with nickel plating.

Caution: Not suitable for skid steer loaders.

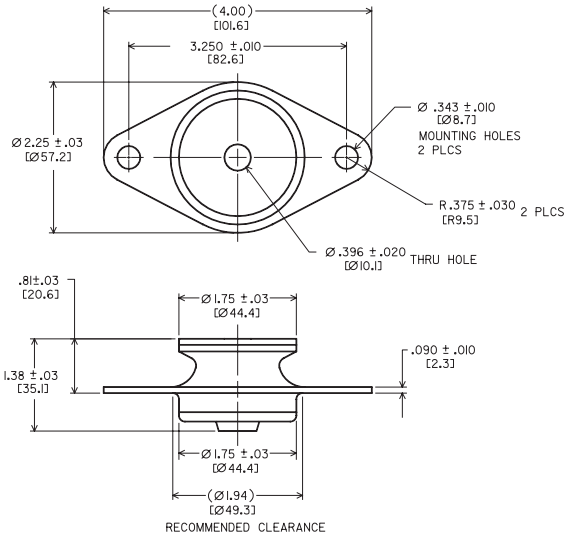
Dimensions & Performance Characteristics

SERIES 505 (.25 lbs.) - NOT FOR RADIAL LOADING



AXIAL STATIC LOAD RANGE - 505 (LBS.)				COLOR
Code	Min.	Nominal	Max.	CODE
-1	12.5	25	38	Red & White
-2	20	40	60	Blue & White
-3	30	60	90	Yellow & White

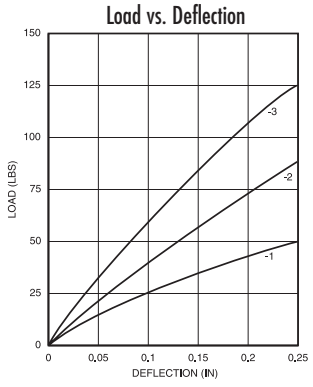
SERIES 506 (.312 lbs.) - NOT FOR RADIAL LOADING



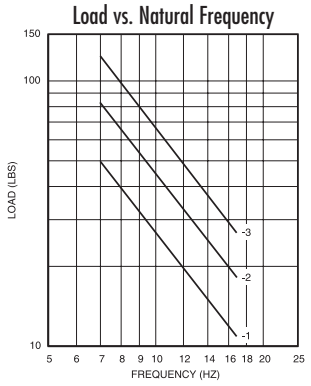
AXIAL STATIC LOAD RANGE - 506 (LBS.)				COLOR
Code	Min.	Nominal	Max.	CODE
-1	25	50	75	Red & White
-2	35	70	105	Blue & White
-3	50	100	150	Yellow & White

505 Series Performance Data

Load vs. Deflection

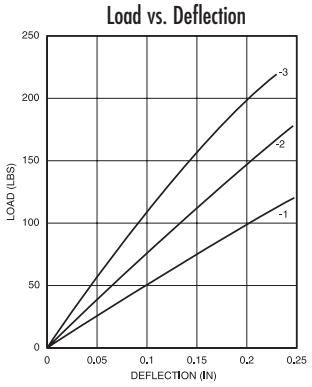


Load vs. Natural Frequency

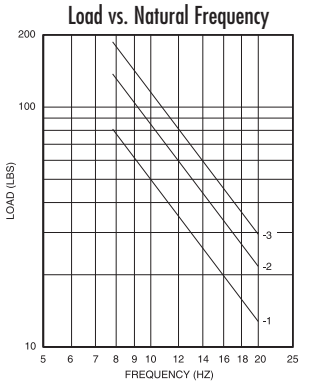


506 Series Performance Data

Load vs. Deflection

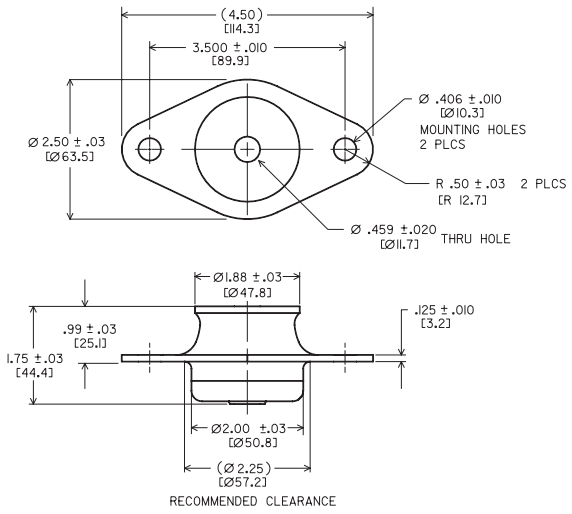


Load vs. Natural Frequency



Dimensions & Performance Characteristics

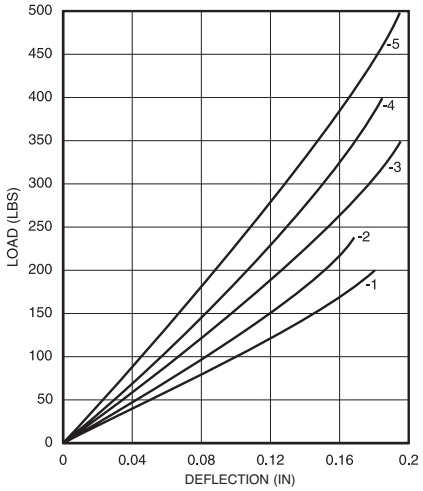
507 MOUNT SERIES (.50 lbs.)
Dimensional Drawing



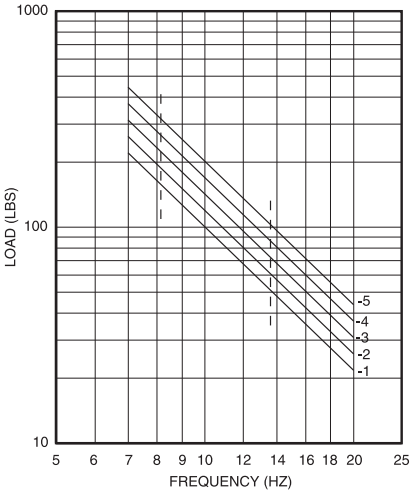
507 SERIES LOAD RANGE (lbs.)					COLOR CODE
	Axial Static Load Range		Radial Static Load Range		
Code	Nominal	Max.	Nominal	Max.	
-1	100	150	50	100	Red & White
-2	120	180	60	120	Orange & White
-3	150	225	75	150	Yellow & White
-4	180	270	90	180	Green & White
-5	220	330	110	220	Blue & White

507 Series Performance Data

Load vs. Deflection

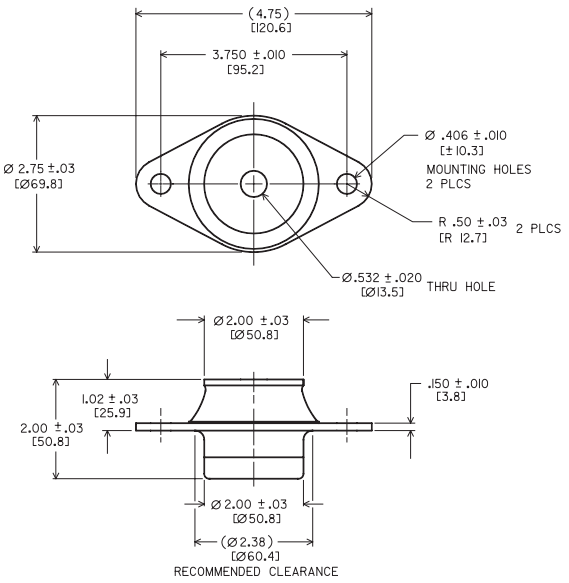


Load vs. Natural Frequency



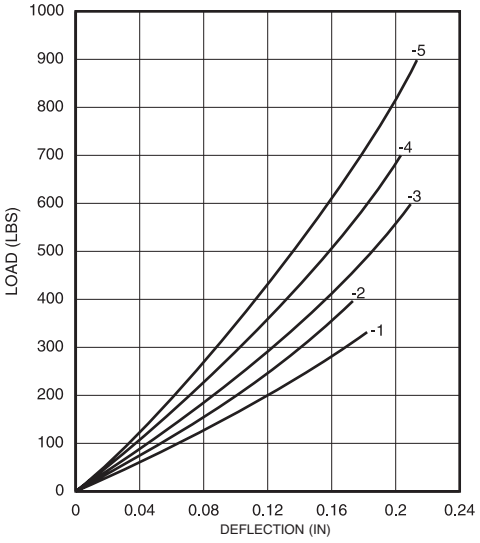
Dimensions & Performance Characteristics

508 MOUNT SERIES (.81 lbs.)
Dimensional Drawing

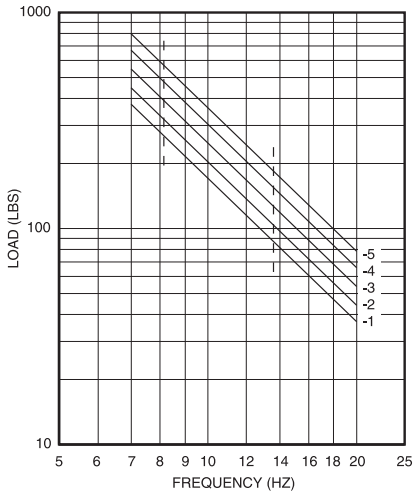


508 Series Performance Data

Load vs. Deflection



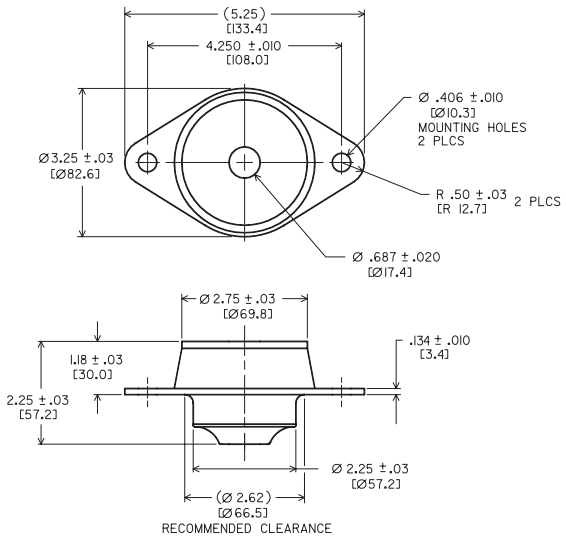
Load vs. Natural Frequency



508 SERIES LOAD RANGE (lbs.)					COLOR CODE
	Axial Static Load Range		Radial Static Load Range		
Code	Nominal	Max.	Nominal	Max.	
-1	180	270	90	180	Red & White
-2	220	330	110	220	Orange & White
-3	260	390	130	260	Yellow & White
-4	320	480	160	320	Green & White
-5	380	570	190	380	Blue & White

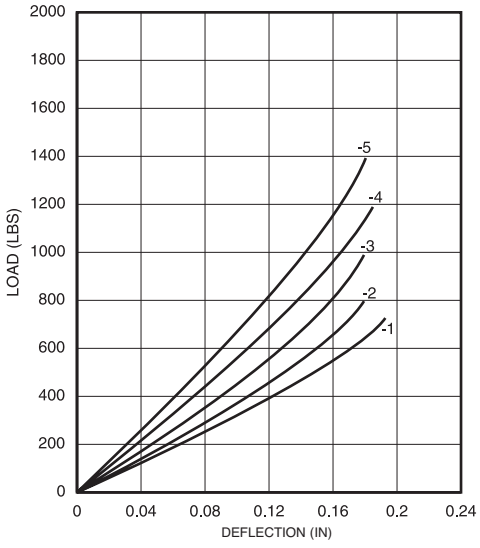
Dimensions & Performance Characteristics

510 MOUNT SERIES (1.19 lbs.)
Dimensional Drawing

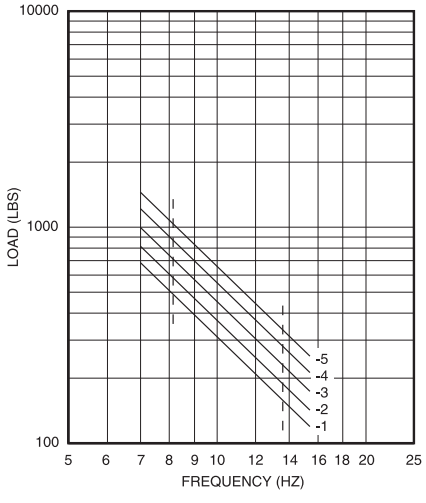


510 Series Performance Data

Load vs. Deflection



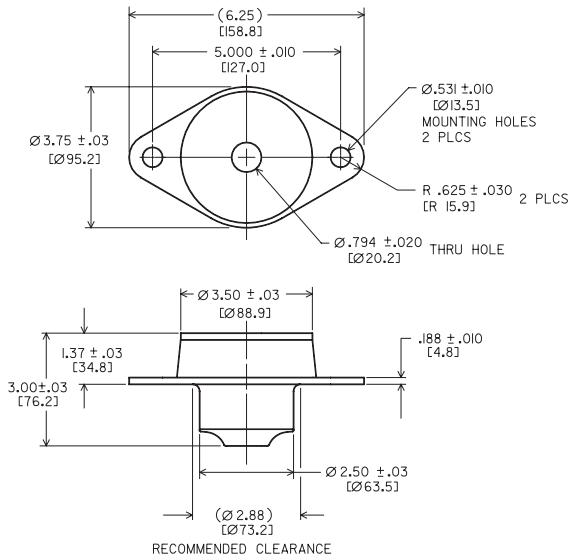
Load vs. Natural Frequency



510 SERIES LOAD RANGE (lbs.)					COLOR CODE
	Axial Static Load Range		Radial Static Load Range		
Code	Nominal	Max.	Nominal	Max.	
-1	320	480	150	320	Orange & White
-2	380	570	190	380	Yellow & White
-3	460	690	230	460	Green & White
-4	560	840	280	560	Blue & White
-5	680	1020	340	680	Brown & White

Dimensions & Performance Characteristics

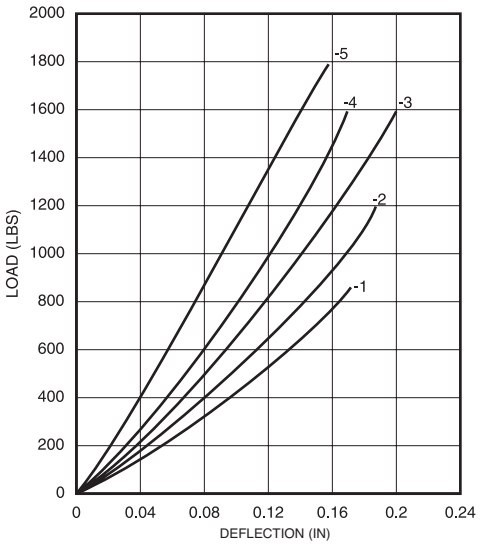
512 MOUNT SERIES (2.06 lbs.)
Dimensional Drawing



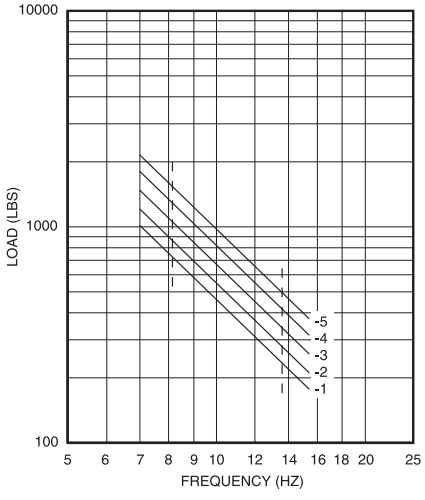
512 SERIES LOAD RANGE (lbs.)					COLOR CODE
	Axial Static Load Range		Radial Static Load Range		
Code	Nominal	Max.	Nominal	Max.	
-1	460	690	230	450	Red & White
-2	560	840	280	560	Orange & White
-3	680	1020	340	680	Yellow & White
-4	830	1245	415	830	Green & White
-5	1000	1500	500	1000	Blue & White

512 Series Performance Data

Load vs. Deflection

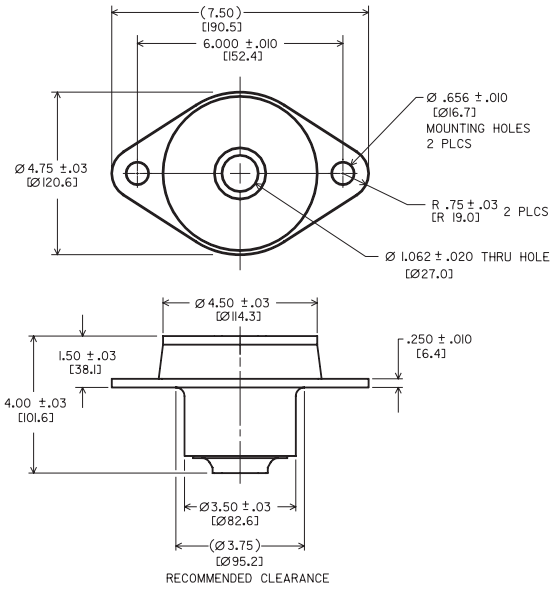


Load vs. Natural Frequency



Dimensions & Performance Characteristics

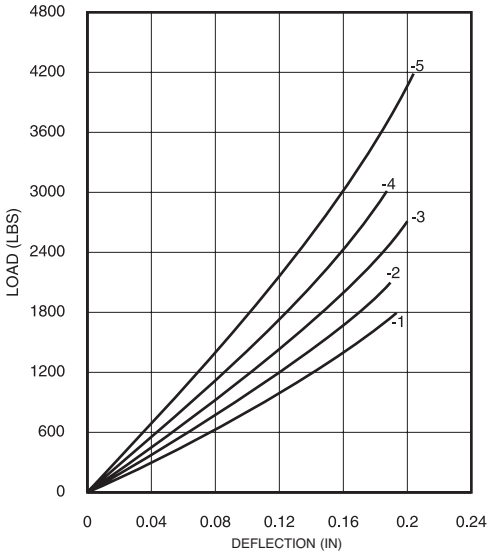
516 MOUNT SERIES (5.44 lbs.)
Dimensional Drawing



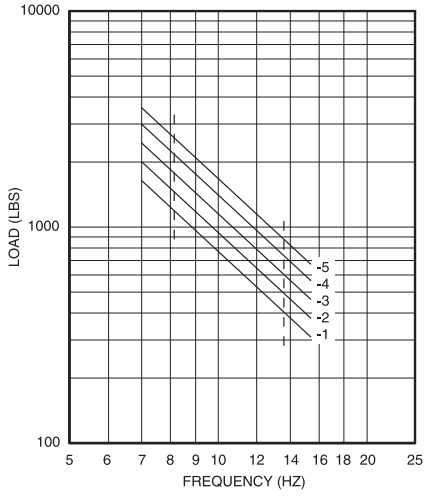
516 SERIES LOAD RANGE (lbs.)					COLOR CODE
	Axial Static Load Range		Radial Static Load Range		
Code	Nominal	Max.	Nominal	Max.	
-1	830	1245	415	830	Red & White
-2	1000	1500	500	1000	Orange & White
-3	1210	1815	605	1210	Yellow & White
-4	1470	2205	735	1470	Green & White
-5	1780	2700	890	1780	Blue & White

516 Series Performance Data

Load vs. Deflection



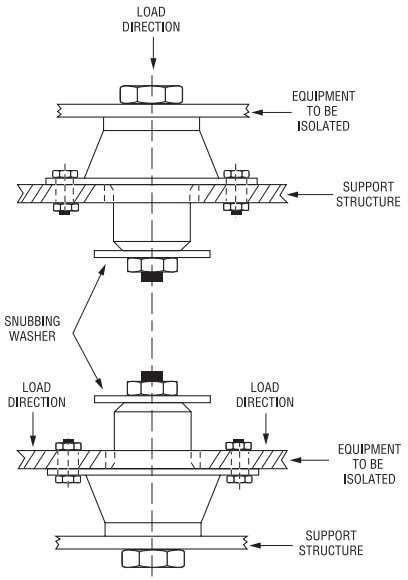
Load vs. Natural Frequency



Technical Data

500 SERIES MAXIMUM TIGHTENING TORQUES (ft-lb.)			
Part #	Bolt Diameter	Torque (dry)	Torque (lubricated or plated)
505	.313	25*	20*
506	.375	45*	35*
507	.433	80*	60*
508	.500	120*	90*
510	.625	240*	180*
512	.750	380	280
516	1.000	365	275
* = GRADE 8 BOLT TORQUE			

500 MOUNT SERIES RECOMMENDED INSTALLATION



HOW TO ORDER 500 SERIES ISOLATORS

500 - 1 N S

Basic model #

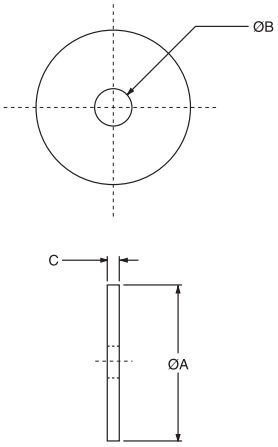
Code for load rating

"N" = Neoprene
"R" = Natural Rubber
"B" = Butyl
"S" = Silicone
"L" = Barry LT

"S" = Standard resistant varnish
"P" = Black enamel paint
"E" = Electroless nickel

Standard suffix is "NS". Consult factory for availability and compatibility of other materials & finishes.

Dimensions



500 MOUNT SERIES SNUBBING WASHER

The use of snubbing washers is recommended to ensure proper static and dynamic loading of the isolator and retention of suspended equipment under severe shock environments.

Snubbing washers are ordered by separate part numbers as shown in the table below. The standard material is low-carbon steel and the standard finish is zinc plate. Other materials and finishes are available upon request.

Size	"A" Dia.	"B" Dia.	"C"	Part #
505	1.63	.322	.093	R18733-6
506	1.75	.385	.093	R18733-7
507	2.00	.450	.125	R18733-1
508	2.00	.510	.125	R18733-2
510	2.25	.635	.164	R18733-3
512	2.50	.780	.188	R18733-4
516	3.25	1.010	.250	R18733-5

500SL MOUNT SERIES

Rugged, versatile isolator utilizes elastomer-in-shear for low frequency vibration and in compression for impact shock.

APPLICATIONS

- Truck, bus and marine engines
- Generators
- HVAC equipment
- Farm and construction equipment
- Truck cabs
- Machinery, pumps & compressors

Barry 500SL Series mounts are best suited for applications that require a low vertical natural frequency in conjunction with impact shock protection and superior structure borne noise attenuation.

FEATURES

- Fail-safe when used with snubbing washer
- Axial to radial stiffness of 1:2.5
- Low natural frequency
- Sturdy, reliable construction

BENEFITS

- Economical
- Bonded construction provides constant performance characteristics
- Overlapping load ranges

LOAD RANGE

- 558SL = 2 load ratings to 250 lbs. per mount
- 562SL = 2 load ratings to 520 lbs. per mount
- 566SL = 2 load ratings to 1,800 lbs. per mount

Specifications

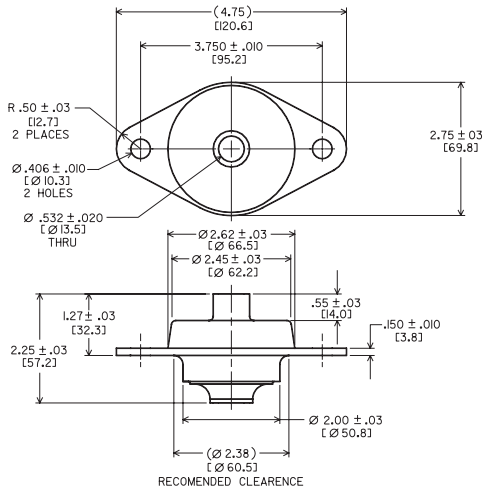
• Natural Frequency	7-10 Hertz Axial
• Transmissibility at resonance	8:1
• Resilient Element	Neoprene
• Standard Materials	Cold-rolled steel
• Weight	See dimensional drawings

Environmental Data

- Neoprene elastomer has an operating temperature range of -20°F to +180°F (-30°C to +82°C) and is resistant to oils, most solvents and ozone.
- Special elastomers and finishes are available for applications in severe environments. Please note that Silicone elastomer is not compatible with nickel plating.

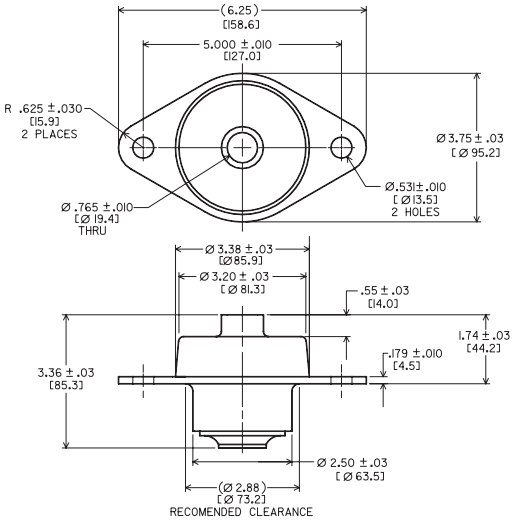
Dimensions & Performance Characteristics

SERIES 558SL Dimensional Drawing (11 oz.)



AXIAL STATIC LOAD RANGE - 558SL		
Code	Minimum	Maximum
-1	50 lbs.	110 lbs.
-2	90 lbs.	180 lbs.

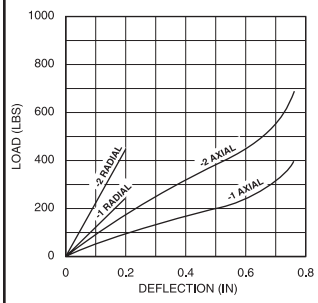
SERIES 562SL Dimensional Drawing (1 lb. 13 oz.)



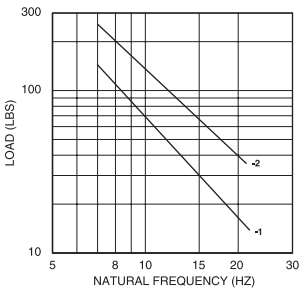
AXIAL STATIC LOAD RANGE - 562SL		
Code	Minimum	Maximum
-1	130 lbs.	260 lbs.
-2	260 lbs.	520 lbs.

558SL Series Performance Data

Load vs. Deflection

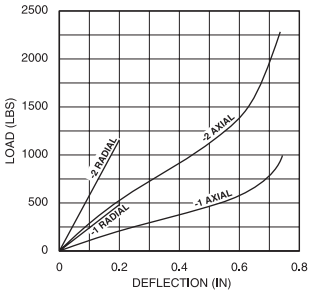


Load vs. Natural Frequency

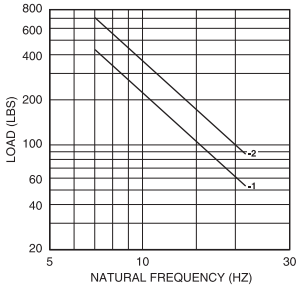


562SL Series Performance Data

Load vs. Deflection



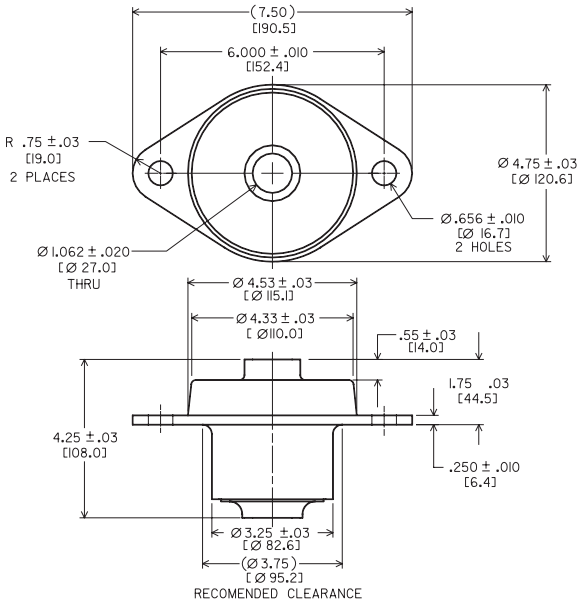
Load vs. Natural Frequency



566SL & SNUBBING WASHER

Dimensions & Performance Characteristics

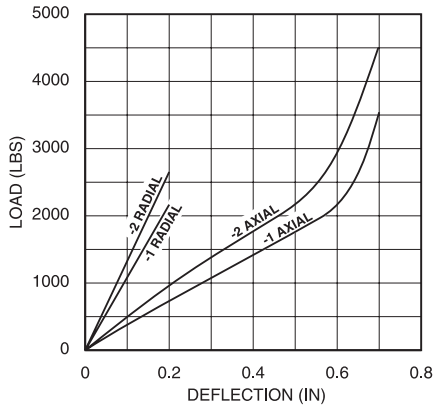
SERIES 566SL Dimensional Drawing (4 lbs. 12 oz.)



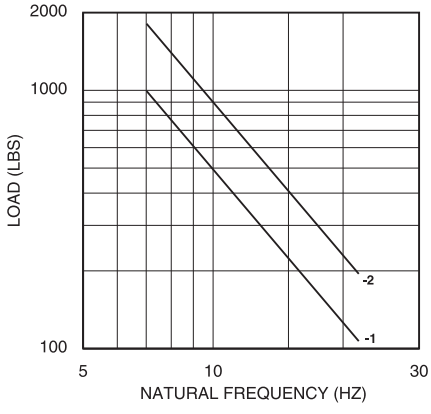
AXIAL STATIC LOAD RANGE - 566SL		
Code	Minimum	Maximum
-1	500 lbs.	1000 lbs.
-2	900 lbs.	1800 lbs.

566SL Series Performance Data

Load vs. Deflection

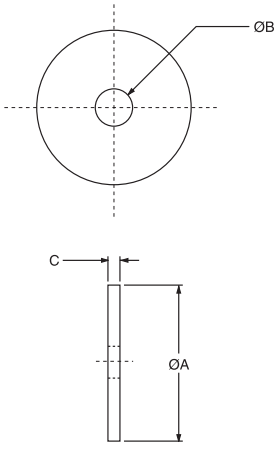


Load vs. Natural Frequency



Dimensions

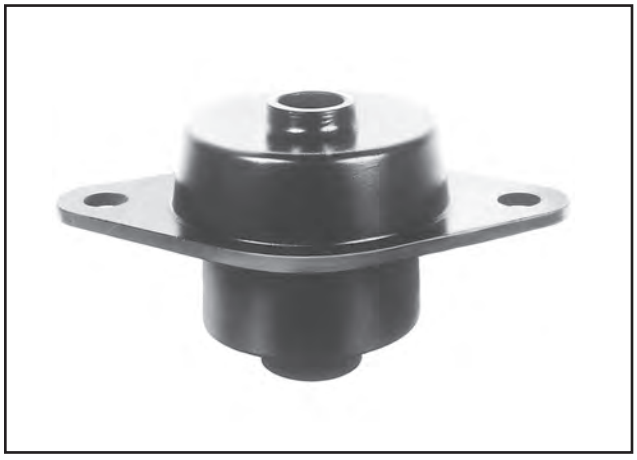
500SL MOUNT SERIES SNUBBING WASHER



Size	"A" Dia.	"B" Dia.	"C"	Part #
558SL	2.00	.510	.125	R18733-2
562SL	2.50	.760	.188	R18733-4
566SL	3.25	1.010	.250	R18733-5

The use of snubbing washers is recommended to ensure proper static and dynamic loading of the isolator and retention of suspended equipment under severe shock environments.

Snubbing washers are ordered by separate part numbers as shown in the above table. The standard material is low-carbon steel and the standard finish is zinc plate. Other materials and finishes are available upon request.



HOW TO ORDER 500SL SERIES ISOLATORS

500SL - 1 N S

Basic model #

Code for load rating

"N" = Neoprene
"R" = Natural Rubber
"B" = Butyl
"S" = Silicone
"L" = Barry LT

"S" = Standard resistant varnish
"P" = Black enamel paint
"E" = Electroless nickel

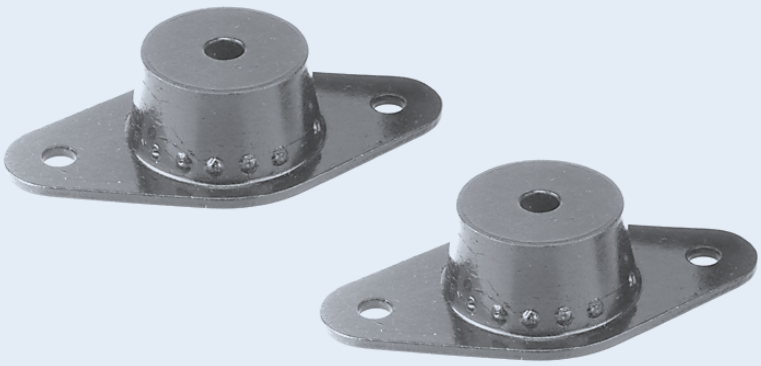
Standard suffix is "NS". Consult factory for availability and compatibility of other materials & finishes.

HR MOUNT SERIES

Vibration mounts for effective isolation of small to medium sized diesel engines.

APPLICATIONS

- Small to medium diesel engines
- Generators
- Recreational/off road vehicles
- Farm and construction equipment
- Motors
- Machinery, pumps & compressors



Barry HR Series mounts are best suited for isolation of diesel engines with five or less cylinders for on or off-highway applications. The standard neoprene elastomer provides resistance to oils and most solvents. Other elastomers are available, consult factory for more information.

FEATURES

- Wide load range
- Axial to radial stiffness of 6:1
- Low stiffness in roll mode
- Sturdy, reliable construction

BENEFITS

- Built-in rebound protection
- Excellent performance even with difficult to isolate five, three, two or even single cylinder engines
- Overlapping load ranges
- Fail-safe when used with snubbing washer

LOAD RANGE

- 2 Sizes and 5 stiffness from 25 - 400 lbs. per isolator

Specifications

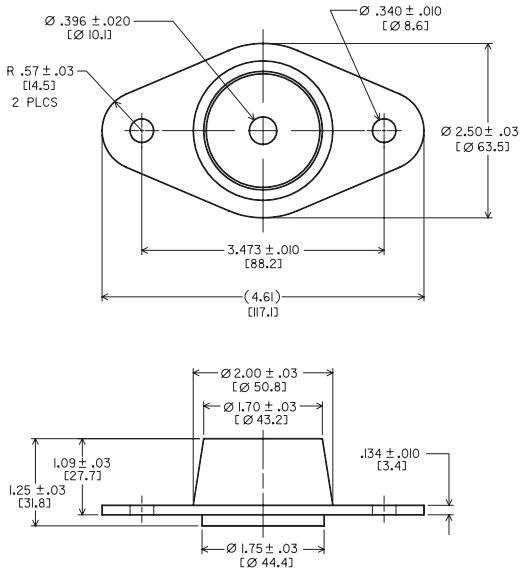
• Natural Frequency	10-20 Hertz
• Transmissibility at resonance	8:1
• Resilient Element	Neoprene
• Standard Materials	Steel and sintered metal
• Weight	7 oz. (25453) 9 oz. (25641)

Environmental Data

- Neoprene elastomer has an operating temperature range of -20°F to +180°F (-30°C to +82°C) and is resistant to oils, most solvents and ozone.

Dimensions & Performance Characteristics

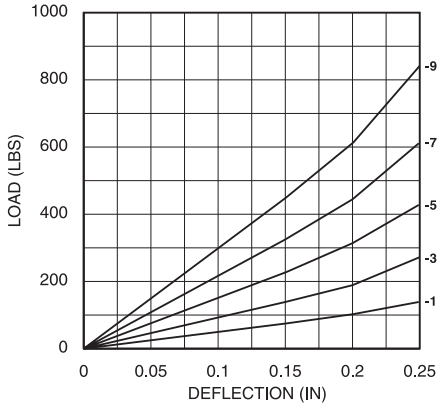
25453 Series Dimensional Drawing



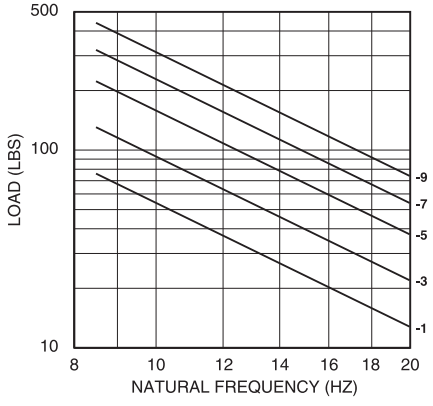
AXIAL STATIC LOAD RANGE - 25453		
Code	Nominal	Color Code
-1	50 lbs.	Red
-3	90 lbs.	White
-5	150 lbs.	Blue
-7	215 lbs.	Purple
-9	300 lbs.	Gray

25453 Series Performance Data

Load vs. Deflection

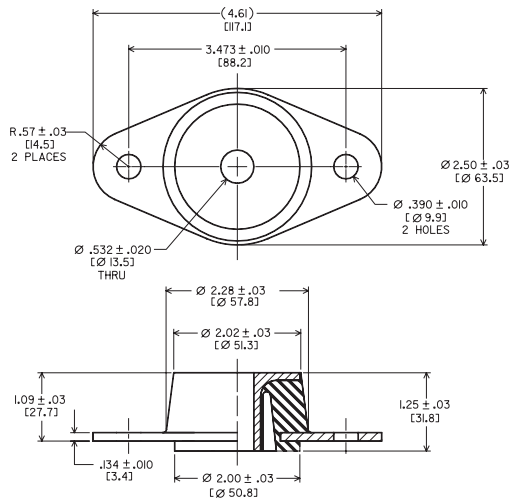


Load vs. Natural Frequency



Dimensions & Performance Characteristics

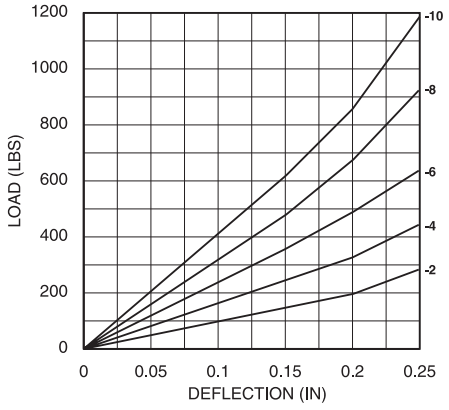
25641 Series Dimensional Drawing



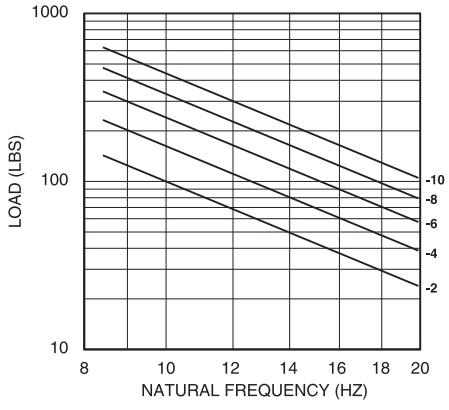
AXIAL STATIC LOAD RANGE - 25641		
Code	Nominal	Color Code
-2	100 lbs.	Red
-4	155 lbs.	White
-6	230 lbs.	Blue
-8	320 lbs.	Purple
-10	420 lbs.	Gray

25641 Series Performance Data

Load vs. Deflection



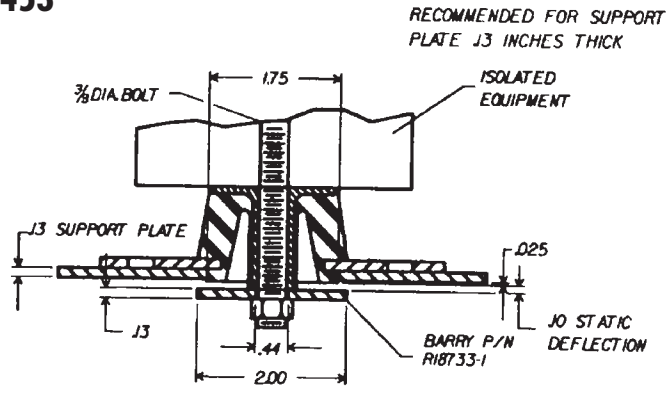
Load vs. Natural Frequency



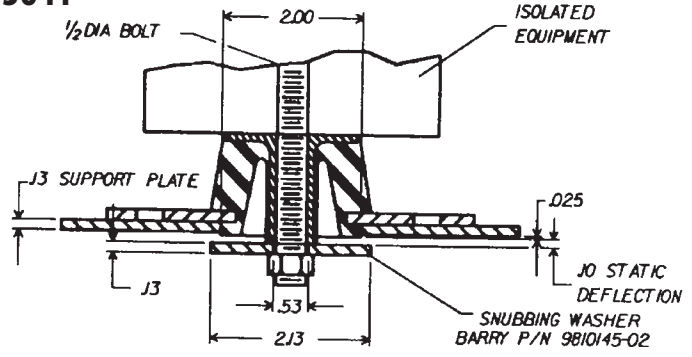
Technical Data

HR SERIES RECOMMENDED INSTALLATION

25453



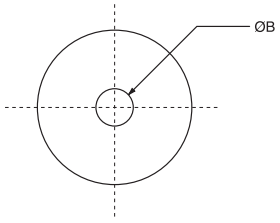
25641

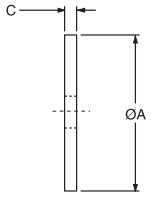


HR SERIES MAXIMUM TIGHTENING TORQUES (FT - LBS)			
Part #	Bolt Diameter	Torque (dry)	Torque (lubricated or plated)
25453	.375	45*	35*
25641	.500	120*	90*
* = GRADE 8 BOLT TORQUE			

Dimensions

HR MOUNT SERIES SNUBBING WASHER





The use of snubbing washers is recommended to ensure proper static and dynamic loading of the isolator and retention of suspended equipment under severe shock environments.

Snubbing washers are ordered by separate part numbers as shown in the table below. The standard material is low-carbon steel and the standard finish is zinc plate. Other materials and finishes are available upon request.

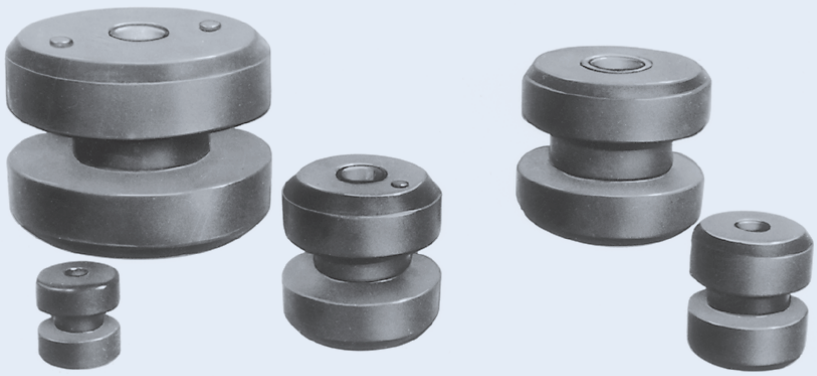
Size	"A" Dia.	"B" Dia.	"C"	Part #
25453	2.00	.45	.125	R18733-1
25641	2.13	.532	.134	9810145-02804

22000 MOUNT SERIES

Low-profile, high capacity mounts for vibration and shock protection.

APPLICATIONS

- Truck, bus and marine engines
- Generators
- HVAC equipment
- Electronic equipment
- Truck cabs
- Machinery, pumps & compressors



22000 Series mounts are designed to withstand the rigors of heavy-duty vehicular applications, off-the-road equipment, large trucks and construction equipment. The standard neoprene elastomer is resistant to oil. Other materials are available on special order.

FEATURES

- Fail-safe when used with snubbing washer
- Axial to radial stiffness of 1:1
- Low natural frequency
- Sturdy, reliable construction

BENEFITS

- Economical
- Bonded construction provides constant performance characteristics
- Overlapping load ranges

LOAD RANGE

- 5 sizes with 25 load ratings to 4,560 lbs. per isolator

Specifications

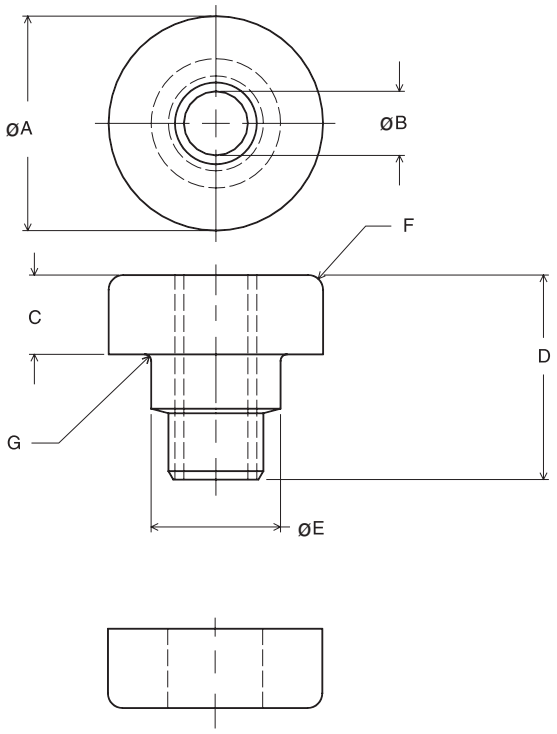
• Natural Frequency	8-18 Hertz
• Transmissibility at resonance	8:1
• Resilient Element	Neoprene
• Standard Materials	Steel
• Weight	See dimensional drawings

Environmental Data

- Neoprene elastomer has an operating temperature range of -20°F to +180°F (-30°C to +82°C) and is resistant to oils, most solvents and ozone.
- Special elastomers and finishes are available for applications in severe environments.

Dimensions

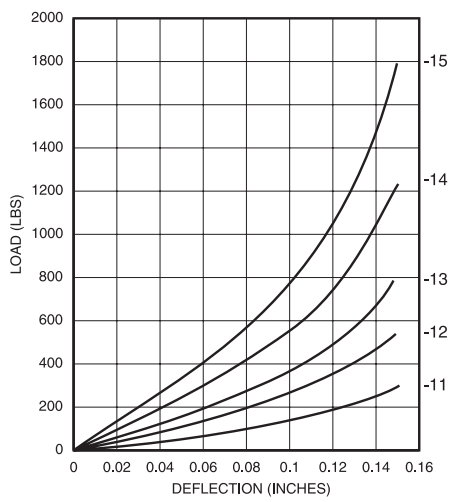
22000 MOUNT SERIES
Dimensional Drawing (Inches)



Part #	A	B	C	D	E	F	G	Weight
22001	1.31	.397	.485	1.25	0.79	0.09	0.04	1.5 oz.
22002	1.88	.532	0.78	1.94	1.30	0.15	0.06	5.0 oz.
22003	2.55	.657	0.90	2.43	1.58	0.25	0.09	11.0 oz.
22004	3.50	.938	1.00	2.88	2.30	0.20	0.12	1 lb. 7.5 oz.
22005	4.88	1.063	1.25	3.38	2.55	0.20	0.12	2 lb. 14 oz.

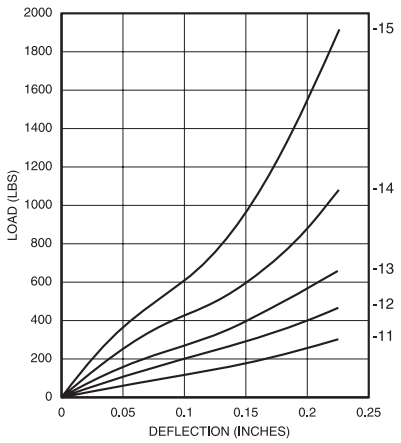
Performance Characteristics

22001 Series Axial Load vs. Deflection

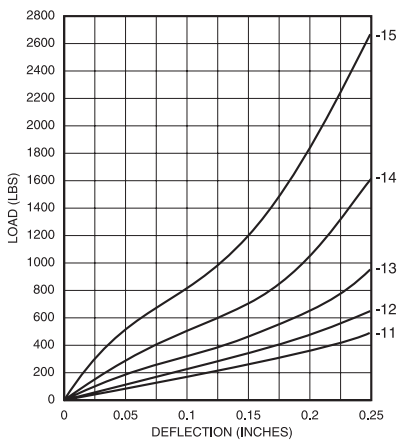


22002 Series Axial Load vs. Deflection

Thin Center Mounting Structure



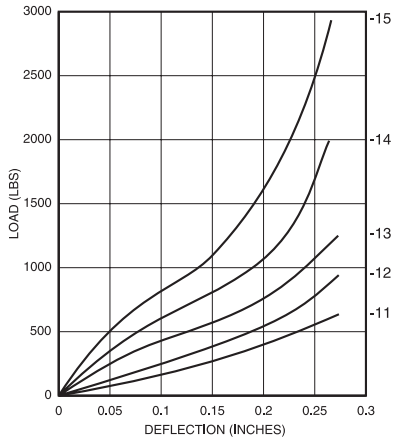
Thick Center Mounting Structure



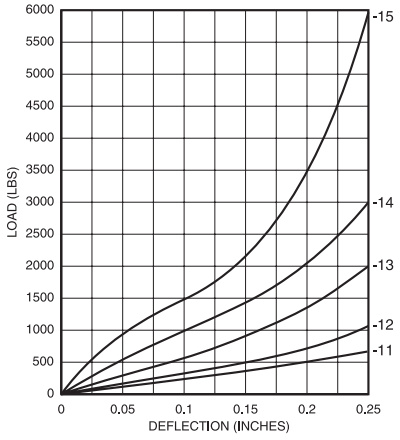
Performance Characteristics

22003 Series Axial Load vs. Deflection

Thin Center Mounting Structure

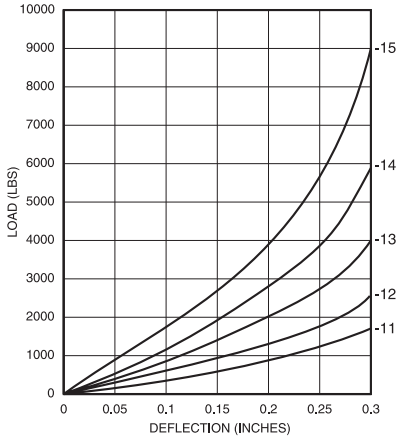


Thick Center Mounting Structure

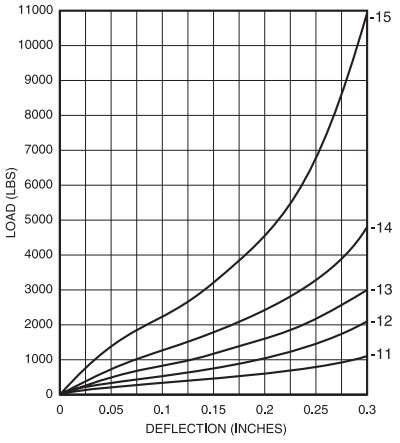


22004 Series Axial Load vs. Deflection

Thin Center Mounting Structure

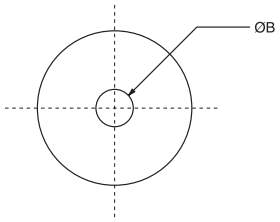


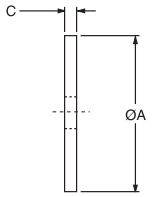
Thick Center Mounting Structure



Performance Data & Dimensions

22000 MOUNT SERIES SNUBBING WASHER





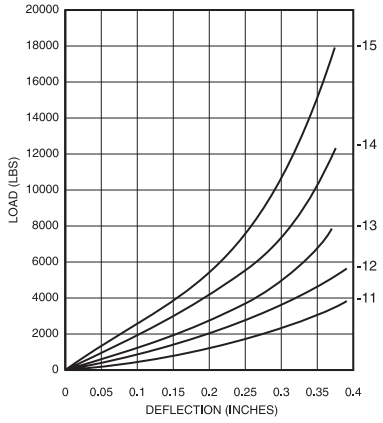
The use of snubbing washers is required to ensure proper static and dynamic loading of the isolator and retention of suspended equipment under severe shock environments.

Snubbing washers are ordered by separate part numbers as shown in the table below. The standard material is low-carbon steel and the standard finish is zinc plate. Other materials and finishes are available upon request.

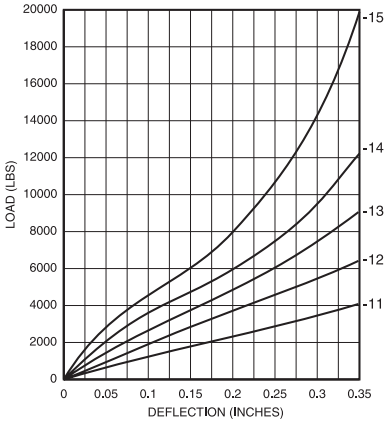
Size	"A" Dia.	"B" Dia.	"C"	Part #
22001	1.56	.391	.090	9810145-01804
22002	2.13	.532	.134	9810145-02804
22003	2.81	.657	.188	9810145-03804
22004	3.88	.938	.250	9810145-04804
22005	5.25	1.063	.375	9810145-05804

22005 Series Axial Load vs. Deflection

Thin Center Mounting Structure



Thick Center Mounting Structure

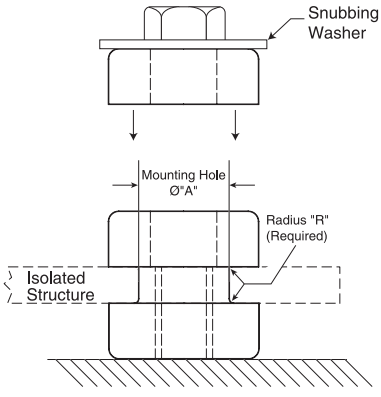


Static Load Ratings & Installation Data

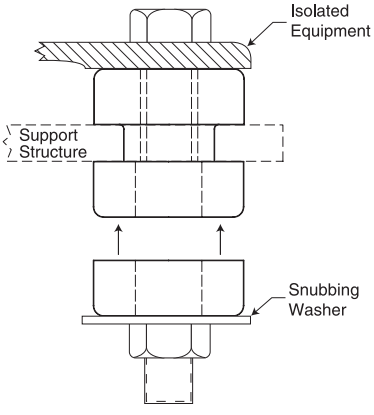
Rated Static Load Per Mount ✶

Isolator		Thick Center Mounting Structure (Recommended)				Thin Center Mounting Structure (Optional)				Bolt Information		
Axial (Neoprene)	Color Code (Neoprene)	Plate Thickness	Axial Load (lbs)	Radial Load (lbs)	Axial Nat. Freq. @ Rated Load	Plate Thickness	Axial Load (lbs)	Radial Load (lbs)	Axial Nat. Freq. @ Rated Load	Size	SAE Grade	Max. Torque Dry (ft-lbs)
22001-11	Red & White		40	20			-	-	-			
22001-12	Yellow & White		90	30			-	-	-			
22001-13	Green & White	.375"	140	40	15 Hz	-	-	-	-	.375"	5	30
22001-14	Blue & White		250	50			-	-	-			
22001-15	Purple & White		300	60			-	-	-			
22002-11	Red & White		130	50			60	40				
22002-12	Yellow & White		175	65			120	80				
22002-13	Green & White	.563"	240	90	12 Hz	.500"	160	125	15 Hz	.500"	8	120
22002-14	Blue & White		380	165			210	180				
22002-15	Purple & White		630	280			380	280				
22003-11	Red & White		210	90			90	70				
22003-12	Yellow & White		350	140			150	105				
22003-13	Green & White	.875"	490	225	11 Hz	.750"	225	160	15 Hz	.625"	8	220
22003-14	Blue & White		860	385			325	245				
22003-15	Purple & White		1330	690			500	360				
22004-11	Red & White		270	135			150	110				
22004-12	Yellow & White		510	230			300	220				
22004-13	Green & White	1.125"	770	345	10 Hz	1.000"	400	300	15 Hz	.875"	8	600
22004-14	Blue & White		1170	590			500	400				
22004-15	Purple & White		2100	975			600	580				
22005-11	Red & White		1140	240			300	150				
22005-12	Yellow & White		1930	340			500	220				
22005-13	Green & White	1.25"	2580	610	10 Hz	1.000"	700	300	15 Hz	1.000"	8	900
22005-14	Blue & White		3540	890			900	470				
22005-15	Purple & White		4560	1410			1200	660				

*Ratings are for general industrial applications. For heavy-duty applications, please call Barry Controls Application Engineering at 1-800-BARRY MA.



Part #	(ø"A")	"R"
22001	.75	.04
22002	1.25	.06
22003	1.50	.09
22004	2.25	.12
22005	2.50	.12

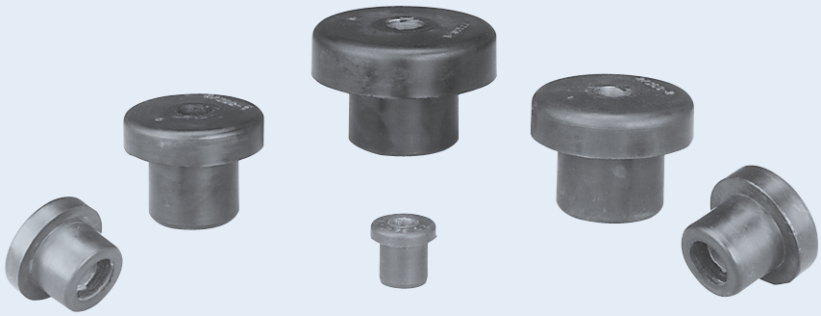


BARRY-BOND MOUNTS

Versatile, low cost elastomeric isolators protect against shock & vibration and reduce structure-borne noise in vehicular and industrial applications.

APPLICATIONS

- Engines
- Operator compartments (cabs)
- Radiators
- Pumps
- Compressors
- Machinery



Barry-Bond Mounts are designed for multi-directional vibration isolation, shock attenuation and noise reduction due to structure-borne vibrations. These one-piece, fail-safe mounts are easy to install and provide consistent performance.

FEATURES

- One piece bonded construction
- Compact size
- Rebound feature formed during installation

BENEFITS

- Easy, low cost installation
- Cushioned snubbing in all directions
- Consistent performance
- Multi-directional vibration isolation
- Noise attenuation
- Fail-safe when used with recommended snubbing washers

LOAD RANGE

- Six sizes with axial load ranges from 75 to 2,100 lbs. per mount

Specifications

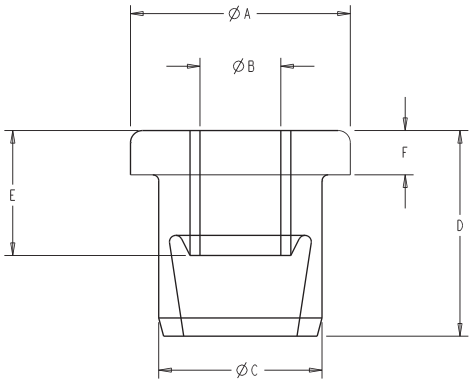
• Resilient Element	Natural rubber	
• Standard Materials	Steel	
• Weight	BC-1120-1 & 3	.02 lbs.
	BC-1121-2 & 4	.10 lbs.
	BC-1122-2 & 4	.16 lbs.
	BC-1123-2 & 5	.36 lbs.
	BC-1124-2 & 5	.56 lbs.
	BC-1125-2 & 4	.86 lbs.

Environmental Data

- Natural Rubber elastomer has an operating temperature range of -40°F to +180°F (-40°C to +82°C).

Dimensions & Load Ranges

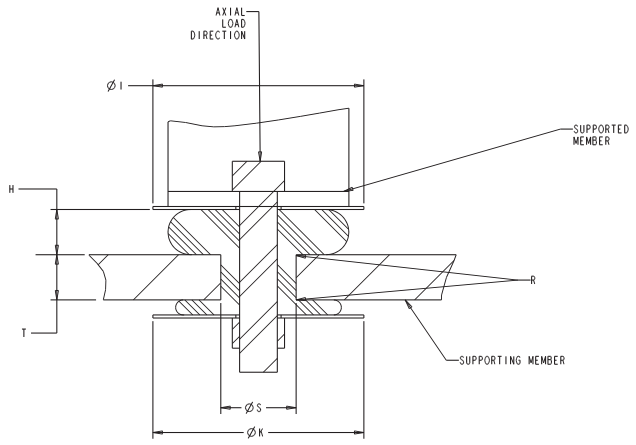
BARRY-BOND MOUNT SERIES
Dimensional Drawing



Part Number	Drawing Number	Maximum Axial Static Load Rating (lbs.)	Part Dimensions (inches)					
			A	B	C	D	E	F
BC-1120-1 BC-1120-3	27365	75 lbs. 125 lbs.	1.09 1.09	0.40 0.40	0.81 0.81	1.02 1.02	0.62 0.62	0.22 0.22
BC-1121-2 BC-1121-4	27366	250 lbs. 450 lbs.	1.75 1.75	0.532 0.532	1.24 1.24	1.25 1.25	1.00 1.00	0.41 0.41
BC-1122-2 BC-1122-4	27367	350 lbs. 600 lbs.	2.00 2.00	0.532 0.532	1.35 1.35	1.62 1.62	1.31 1.31	0.53 0.53
BC-1123-2 BC-1123-5	27368	500 lbs. 1,000 lbs.	2.50 2.50	0.648 0.648	1.62 1.62	2.00 2.00	1.69 1.69	0.62 0.62
BC-1124-2 BC-1124-5	27369	750 lbs. 1,400 lbs.	2.98 2.98	0.648 0.648	1.98 1.98	2.22 2.22	2.00 2.00	0.81 0.81
BC-1125-2 BC-1125-4	27370	1,400 lbs. 2,100 lbs.	3.74 3.74	0.803 0.803	2.23 2.23	2.48 2.48	2.00 2.00	1.00 1.00

Dimensions & Bolt Information

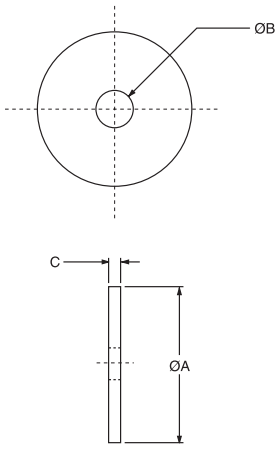
BARRY-BOND MOUNT SERIES
Installation Drawing



Part Number	Drawing Number	Required Mating Dimensions (Inches)						Recommended Bolt Information			
		H	I	K	S	T	R	Size	Grade		Torque (ft-lb)
									SAE	ISO	
BC-1120-1	27365	0.21	1.25	1.12	0.75	0.31	0.06	3/8″	2	5.8	23
BC-1120-3		0.21	1.25	1.12	0.75	0.31	0.06	3/8″	2	5.8	23
BC-1121-2	27366	0.38	2.00	1.50	1.12	0.38	0.06	1/2″	2	5.8	55
BC-1121-4		0.38	2.00	1.50	1.12	0.38	0.06	1/2″	2	5.8	55
BC-1122-2	27367	0.45	2.25	2.00	1.25	0.62	0.06	1/2″	2	5.8	55
BC-1122-4		0.45	2.25	2.00	1.25	0.62	0.06	1/2″	2	5.8	55
BC-1123-2	27368	0.56	2.88	2.25	1.50	0.75	0.06	5/8″	8	10.9	240
BC-1123-5		0.56	2.88	2.25	1.50	0.75	0.06	5/8″	8	10.9	240
BC-1124-2	27369	0.71	3.50	2.50	1.81	0.93	0.06	5/8″	8	10.9	240
BC-1124-5		0.71	3.50	2.50	1.81	0.93	0.06	5/8″	8	10.9	240
BC-1125-2	27370	0.94	4.25	3.00	2.00	0.75	0.12	3/4″	8	10.9	420
BC-1125-4		0.94	4.25	3.00	2.00	0.75	0.12	3/4″	8	10.9	420

Snubbing Washer

BARRY-BOND MOUNT SERIES SNUBBING WASHER



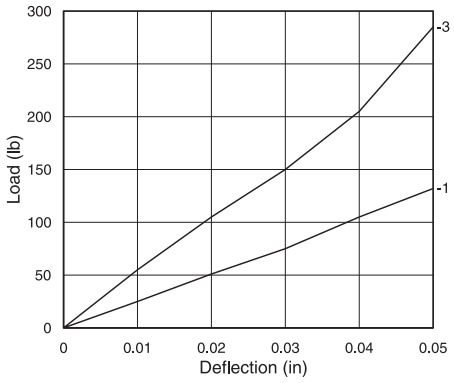
The use of snubbing washers is recommended to ensure proper static and dynamic loading of the isolator and retention of suspended equipment under severe shock environments.

Snubbing washers are ordered by separate part numbers as shown in the table below. The standard material is low-carbon steel and the standard finish is zinc plate. Other materials and finishes are available upon request.

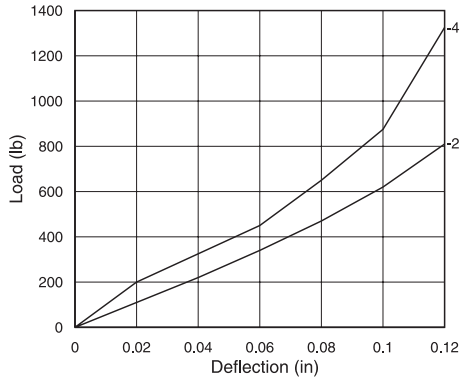
Part Number	Head Washer Part Number	Part Dimensions (Inches)			Tail Washer Part Number	Part Dimensions (Inches)		
		A	B	C		A	B	C
BC-1120-1	9810276-02804	1.25	0.40	0.125	9810276-01804	1.12	0.40	0.125
BC-1120-3	9810276-02804	1.25	0.40	0.125	9810276-01804	1.12	0.40	0.125
BC-1121-2	9810276-04804	2.00	0.52	0.125	9810276-03804	1.50	0.52	0.125
BC-1121-4	9810276-04804	2.00	0.52	0.125	9810276-03804	1.50	0.52	0.125
BC-1122-2	9810276-05804	2.25	0.52	0.125	9810276-04804	2.00	0.52	0.125
BC-1122-4	9810276-05804	2.25	0.52	0.125	9810276-04804	2.00	0.52	0.125
BC-1123-2	9810276-08804	2.88	0.66	0.125	9810276-06804	2.25	0.64	0.125
BC-1123-5	9810276-08804	2.88	0.66	0.125	9810276-06804	2.25	0.64	0.125
BC-1124-2	9810276-10804	3.50	0.64	0.190	9810276-07804	2.50	0.64	0.125
BC-1124-5	9810276-10804	3.50	0.64	0.190	9810276-07804	2.50	0.64	0.125
BC-1125-2	9810276-11804	4.25	0.80	0.190	9810276-09804	3.00	0.80	0.190
BC-1125-4	9810276-11804	4.25	0.80	0.190	9810276-09804	3.00	0.80	0.190

Performance Characteristics

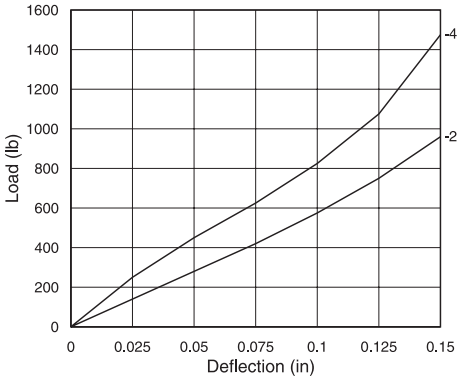
BC1120 Series Axial Load vs. Deflection



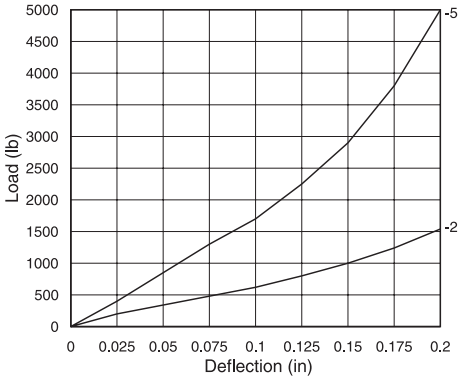
BC1121 Series Axial Load vs. Deflection



BC1122 Series Axial Load vs. Deflection

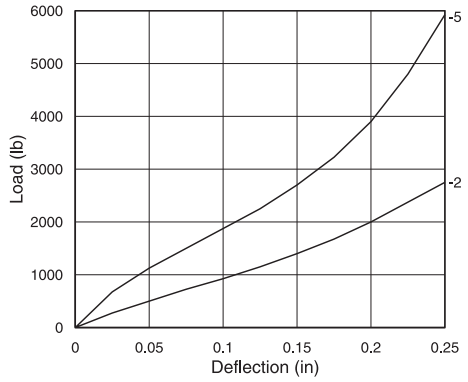


BC1123 Series Axial Load vs. Deflection

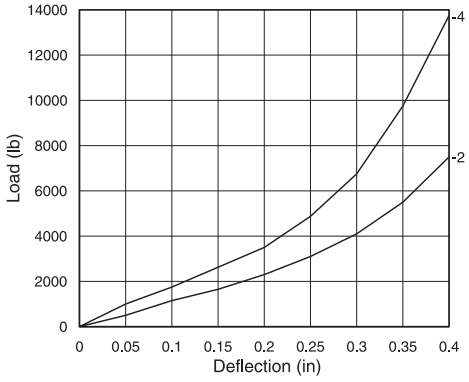


Performance Characteristics

BC1124 Series Axial Load vs. Deflection



BC1125 Series Axial Load vs. Deflection



INDUSTRIAL CONICAL MOUNTS

Rugged, high load capacity mounts provide vibration, shock and noise protection

APPLICATIONS

- Cabs/platforms
- Engines
- Generator sets
- Transmissions
- Compressors
- Fuel tanks

Industrial Conical Mount Series Isolators are designed to withstand the rigors of heavy-duty vehicular applications, off-road equipment, large trucks and construction equipment. They provide shock, vibration and noise isolation and are designed for high impact applications.

FEATURES

- One piece bonded construction
- High load capacity
- Low natural frequency
- Non-linear stiffness
- Snubbing feature on bottom

BENEFITS

- Consistent performance
- Low cost installation
- Fail safe when used with recommended hardware
- Provides shock, vibration and noise attenuation
- Withstands high impact shock
- High static deflection in the axial direction

LOAD RANGE

- 3 styles with axial static load ratings up to 1,146 lbs. per isolator

Specifications

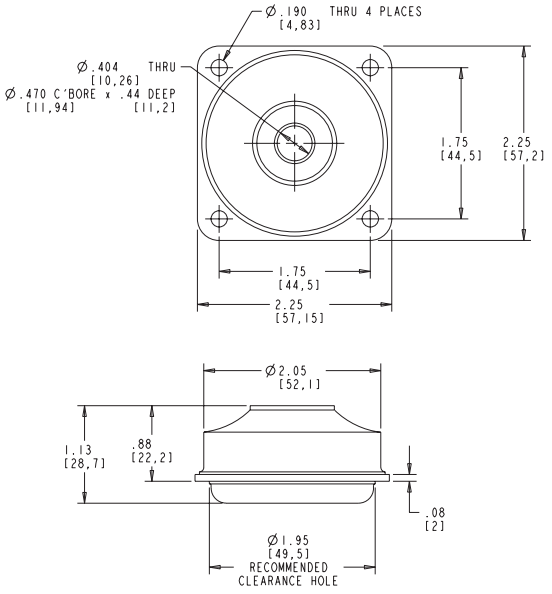
• Natural Frequency	10-14 Hertz
• Transmissibility at resonance	10
• Resilient Element	Natural Rubber
• Standard Materials	Sintered metal and cold-rolled steel
• Weight	See dimensional drawings

Environmental Data

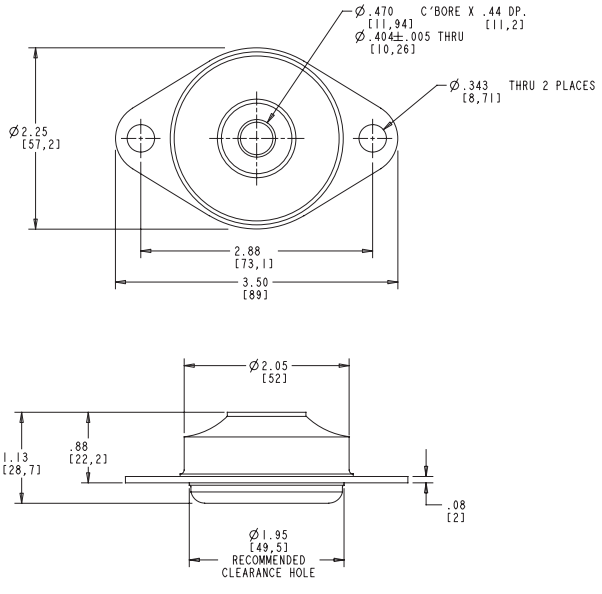
- Natural Rubber elastomer has an operating temperature range of -40°F to +180°F (-40°C to +82°C).

Dimensions & Performance Characteristics

27327 CONICAL MOUNT (4.25 oz.)
Dimensional Drawing



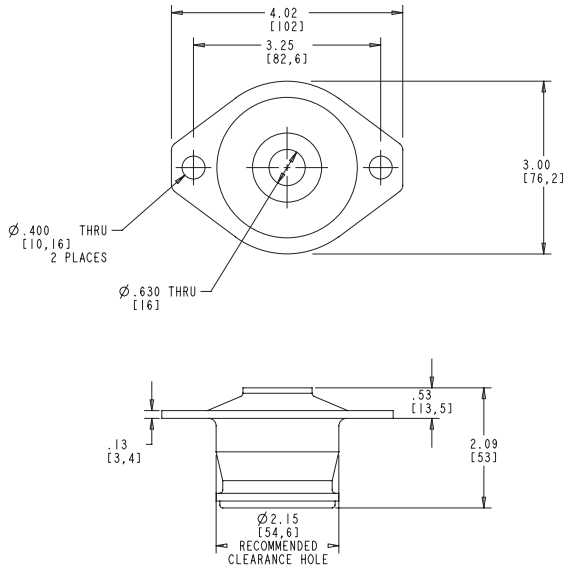
27328 CONICAL MOUNT (4.30 oz.)
Dimensional Drawing



Part Number	Max. Axial Load Range (lbs.)	Color Code	Natural Frequency at Max. Load	Radial to Axial Stiffness Ratio	Bolt Size	Bolt Grade		Torque	
						SAE	ISO	ft-lbs	N-m
27327-45	82 lbs.	White	10 Hertz	2:1	3/8″ or M10	8	10.9	50	76
27327-60	156 lbs.	Brown	10 Hertz	2:1	3/8″ or M10	8	10.9	50	76
27327-70	233 lbs.	Orange	10 Hertz	2:1	3/8″ or M10	8	10.9	50	76
27328-45	82 lbs.	White	10 Hertz	2:1	3/8″ or M10	8	10.9	50	76
27328-60	156 lbs.	Brown	10 Hertz	2:1	3/8″ or M10	8	10.9	50	76
27328-70	233 lbs.	Orange	10 Hertz	2:1	3/8″ or M10	8	10.9	50	76

Dimensions & Performance Characteristics

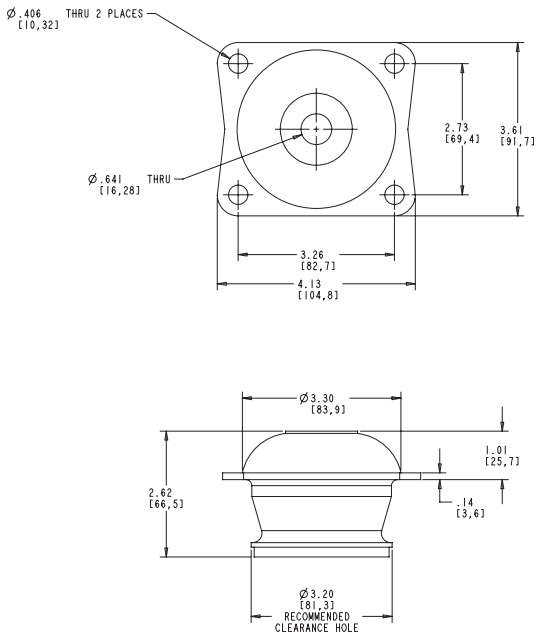
26748 CONICAL MOUNT (16.5 oz.)
Dimensional Drawing



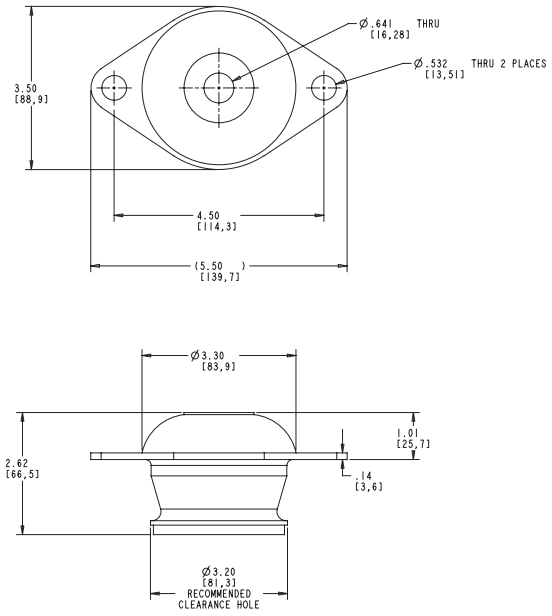
Part Number	Max. Axial Load Range (lbs.)	Color Code	Natural Frequency at Max. Load	Radial to Axial Stiffness Ratio	Bolt Size	Bolt Grade		Torque	
						SAE	ISO	ft·lbs	N·m
26748-45	286 lbs.	White	14 Hertz	4:1	5/8″ or M16	5	8.8	180	235
26748-60	562 lbs.	Brown	14 Hertz	4:1	5/8″ or M16	5	8.8	180	235
26748-70	750 lbs.	Orange	14 Hertz	4:1	5/8″ or M16	5	8.8	180	235

Dimensions & Performance Characteristics

26749 CONICAL MOUNT (30 oz.)
Dimensional Drawing



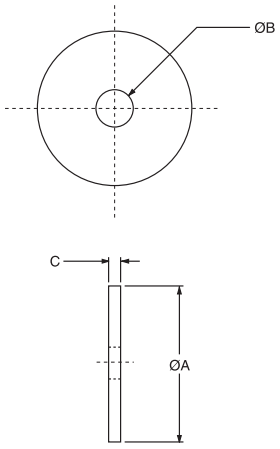
27595 CONICAL MOUNT (29 oz.)
Dimensional Drawing



Part Number	Max. Axial Load Range (lbs.)	Color Code	Natural Frequency at Max. Load	Radial to Axial Stiffness Ratio	Bolt Size	Bolt Grade		Torque	
						SAE	ISO	ft·lbs	N·m
26749-45	463 lbs.	White	12 Hertz	1.5:1	5/8" or M16	5	8.8	180	235
26749-60	860 lbs.	Brown	12 Hertz	1.5:1	5/8" or M16	5	8.8	180	235
26749-70	1,146 lbs.	Orange	12 Hertz	1.5:1	5/8" or M16	5	8.8	180	235
27595-45	463 lbs.	White	12 Hertz	1.5:1	5/8" or M16	5	8.8	180	235
27595-60	860 lbs.	Brown	12 Hertz	1.5:1	5/8" or M16	5	8.8	180	235
27595-70	1,146 lbs.	Orange	12 Hertz	1.5:1	5/8" or M16	5	8.8	180	235

Dimensions & Selection Guide

INDUSTRIAL CONICAL MOUNT SERIES SNUBBING WASHER



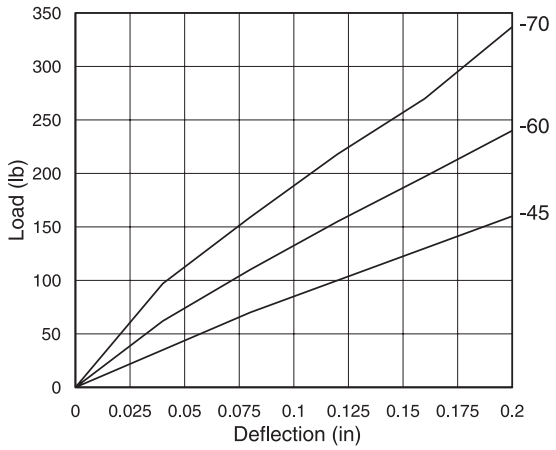
The use of snubbing washers is recommended to ensure proper static and dynamic loading of the isolator and retention of suspended equipment under severe shock environments.

Snubbing washers are ordered by separate part numbers as shown in the below table. The standard material is low-carbon steel and the standard finish is zinc plate. Other materials and finishes are available upon request.

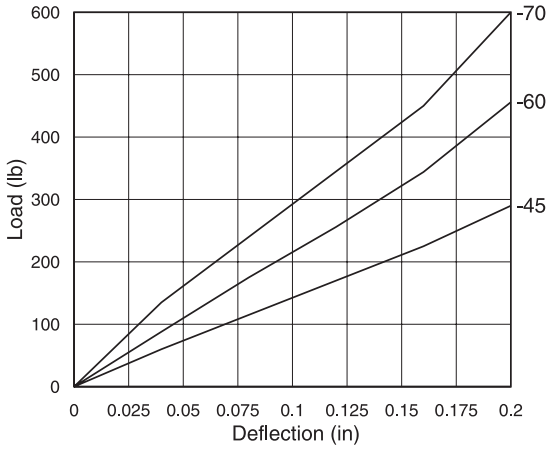
Part Number	Head Washer Part Number	Part Dimensions (Inches)			Tail Washer Part Number	Part Dimensions (Inches)		
		A	B	C		A	B	C
27327	9810276-05804	2.25	0.52	0.125	9810276-05804	2.25	0.52	0.125
27328	9810276-05804	2.25	0.52	0.125	9810276-05804	2.25	0.52	0.125
26748	9810276-07804	2.50	0.64	0.125	9810276-06804	2.25	0.64	0.125
26749	9810276-12804	4.60	0.64	0.25	9810276-10804	3.50	0.64	0.19
27595	9810276-12804	4.60	0.64	0.25	9810276-10804	3.50	0.64	0.19

Performance Characteristics

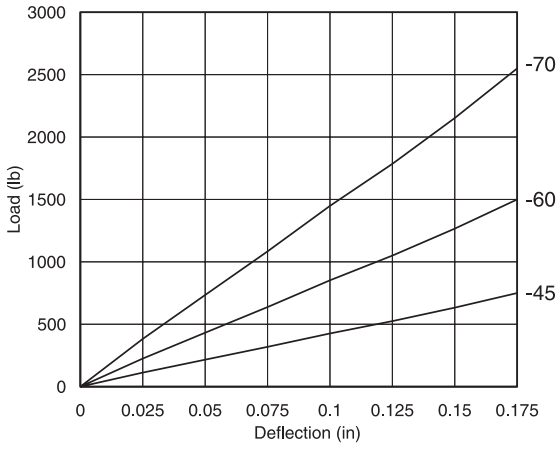
27327 & 27328 Series - Axial Load vs. Deflection



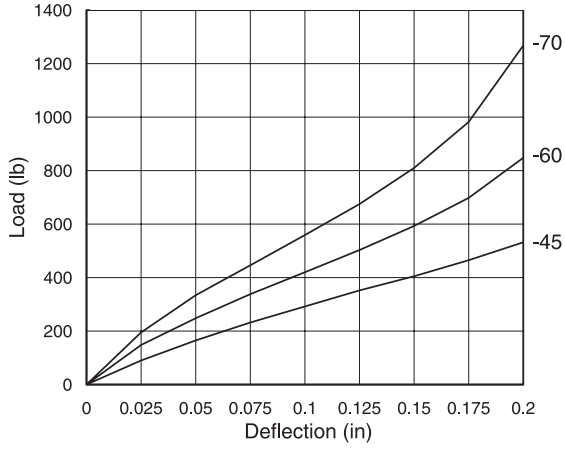
27327 & 27328 Series - Radial Load vs. Deflection



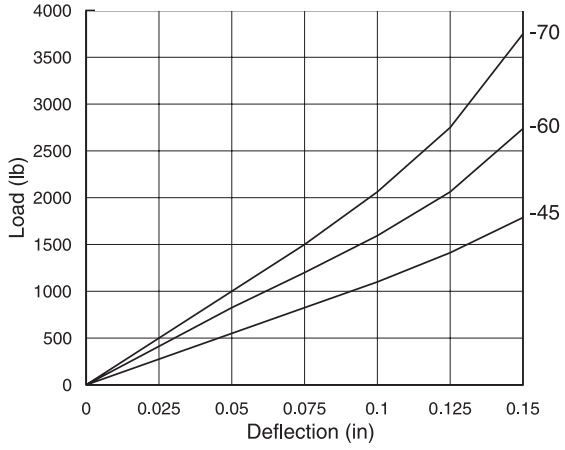
26749 & 27595 Series - Radial Load vs. Deflection



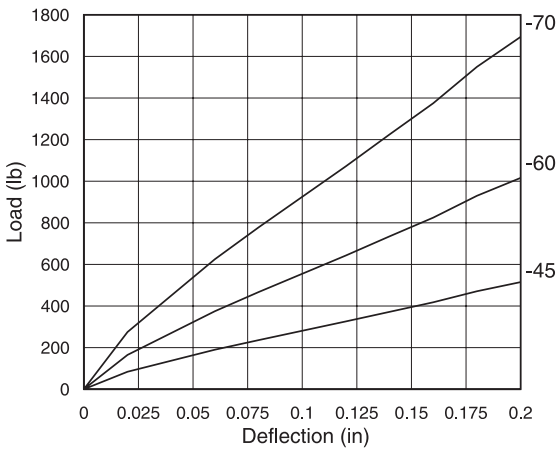
26748 Series - Axial Load vs. Deflection



26748 Series - Radial Load vs. Deflection

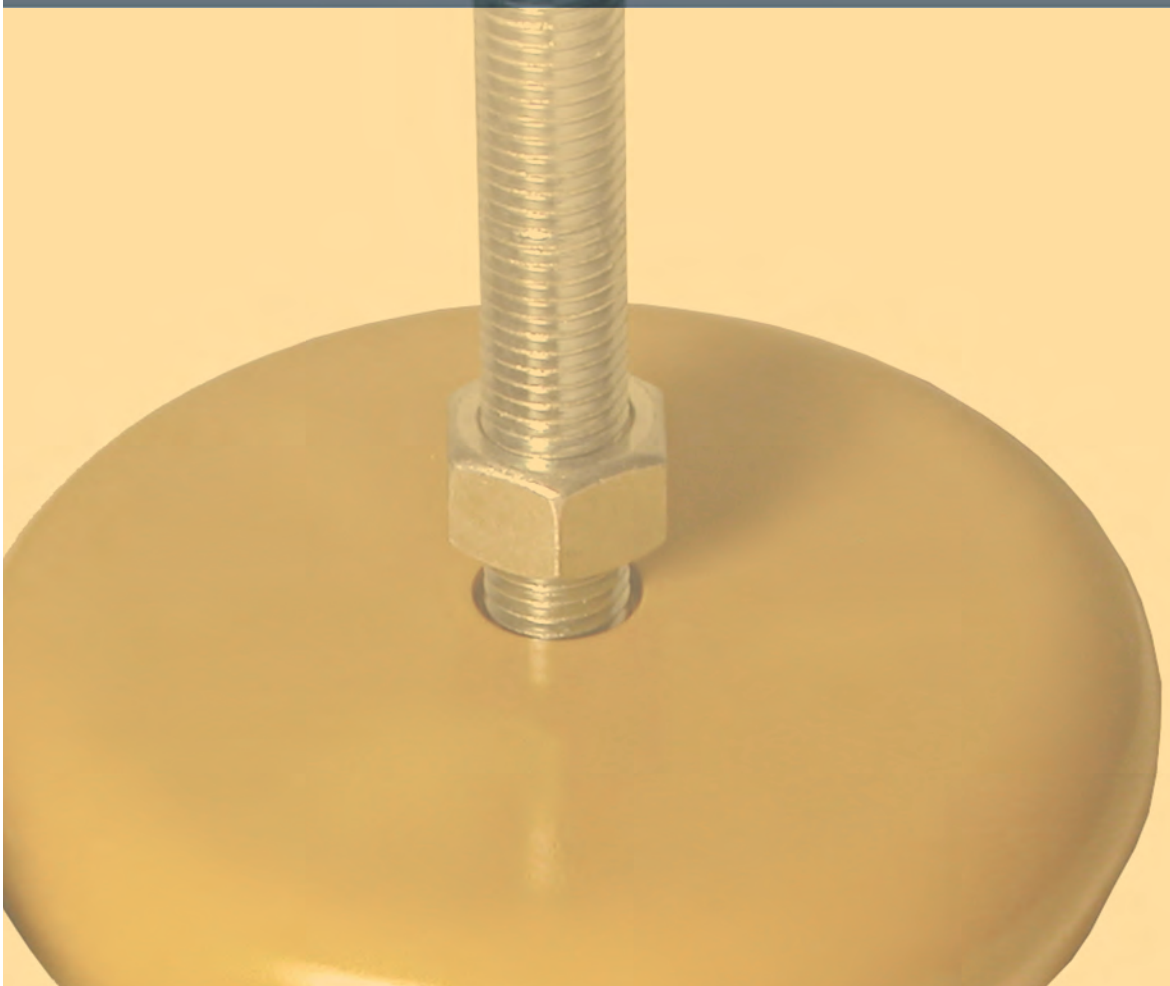


26749 & 27595 Series - Axial Load vs. Deflection



MACHINERY MOUNTS

SLM Mount Series
Leveling Mount Series
633A Mount Series
LMS Mount Series
661 Mount Series
670 Mount Series
297 Mount Series
30005 Series Neoprene Pads
Elastomer Springs
990/915 Mount Series

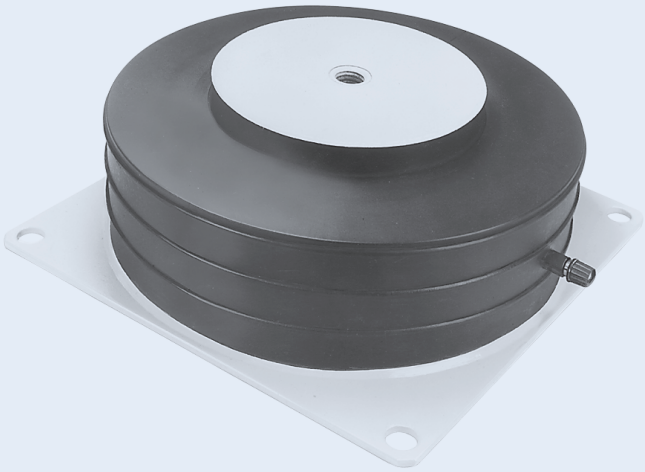


SLM MOUNT SERIES

Low-profile, high capacity mounts for vibration and shock protection.

APPLICATIONS

- Industrial equipment, tools and machinery
- CMM machinery
- Forging hammers
- Air compressors



Barry SLM Series Mounts are pneumatic elastomeric mounts, ideal for applications requiring higher deflection isolators. The SLM's mechanical bond design incorporates a positive locking system to ensure performance and safe operation.

FEATURES

- Air spring isolator with integral heavy wall construction
- Deflection transfers shock to outer wall
- Will not bottom out
- Continued support & isolation even with no air pressure

BENEFITS

- Combined resiliency and air prevents high static deflection, drift or permanent set
- Extends machinery life
- Wide load range available
- Low maintenance

LOAD RANGE

- 8 load ratings up to 19,200 lbs. per isolator

Specifications

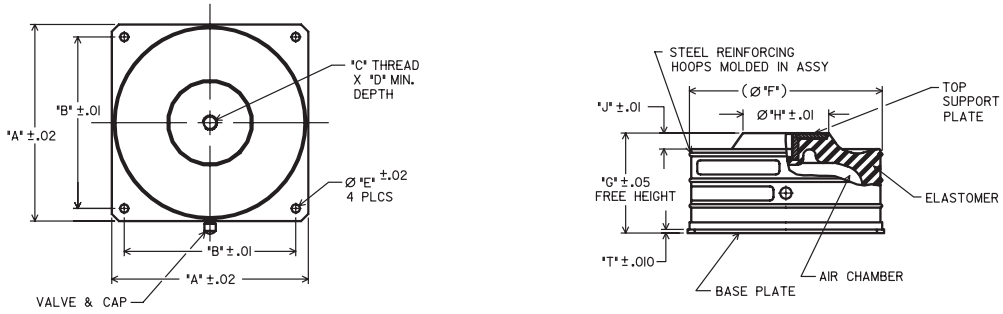
• Natural Frequency	3-5 Hertz (10 Hz. unpressurized)
• Transmissibility at resonance	8:1
• Resilient Element	Air and neoprene diaphragm
• Standard Materials	Steel and aluminum
• Weight	See table

Environmental Data

- Neoprene elastomer has an operating temperature range of -20°F to +180°F (-30°C to +82°C) and is resistant to oils, most solvents and ozone.

Dimensions & Load Ranges

SLM SERIES
Dimensional Drawing



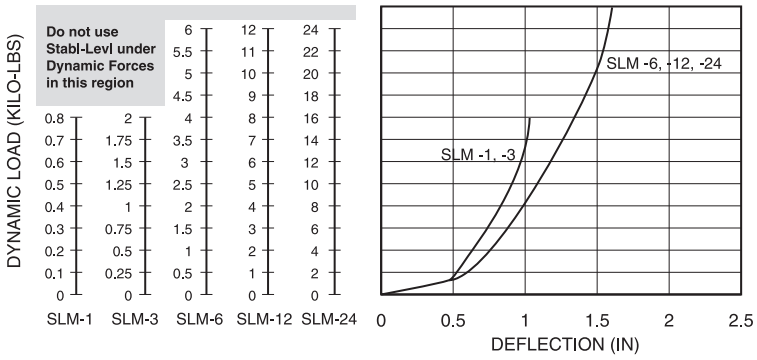
Valve external thread 302-32 2A

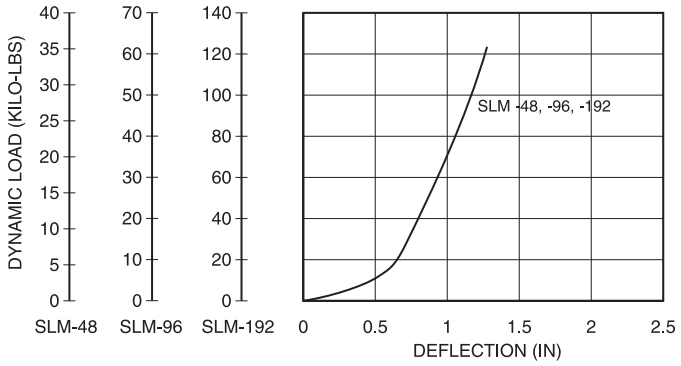
TYPE NO.	MAX. LOAD LBS.	MAX. PRESSURE PSIG	DIMENSIONS										WT. (LBS.)
			"A"	"B"	"C"	"D"	"E"	("F")	"G"	"H"	"J"	"T"	
SLM-1A	100	60	3.00	2.38	.375-16 UNC-2B	.47	.28	2.88	2.50	1.00	.50	.125	1
SLM-3A	300	60	4.19	3.50	.500-13 UNC-2B	.53	.28	4.14	2.45	2.06	.54	.125	1.5
SLM-6A	600	80	5.12	4.25	.500-13 UNC-2B	.53	.29	4.99	3.50	2.38	.56	.125	3.25
SLM-12A	1200	80	6.88	6.00	.500-13 UNC-2B	.53	.29	6.74	3.50	3.75	.56	.125	5.5
SLM-24A	2400	80	10.00	8.50	.625-11 UNC-2B	.75	.56	9.66	3.50	4.75	.56	.188	13
SLM-48A	4800	80	13.50	12.00	.625-11 UNC-2B	.75	.56	13.31	3.50	7.50	.56	.188	26
SLM-96A	9600	80	18.50	16.00	1.000-14 UNS-2B	.88	.81	18.44	3.50	11.60	.56	.250	57
SLM-192A	19200	80	24.00	20.00	1.000-14 UNS-2B	.88	.81	24.00	3.50	15.75	.56	.250	100

METRIC LOAD RANGES & DIMENSIONAL DATA												
PART #	LOAD RANGE (kg)	A	B	C	D	E	(F)	G	H	J	T	Wt. (kg)
SLM-M1A	11-45	76.2	60.4	M10	12.0	7.0	73.2	63.5	25.4	12.7	3.2	0.5
SLM-M3A	34-136	106.4	88.9	M12	14.0	7.0	105.2	62.2	52.3	12.7	3.2	0.7
SLM-M6A	68-272	130.0	108.0	M12	14.0	7.0	126.7	88.9	60.5	14.2	3.2	1.5
SLM-M12A	136-545	174.8	152.4	M12	14.0	7.0	171.2	88.9	95.2	14.2	3.2	2.5
SLM-M24A	272-1090	254.0	215.9	M16	19.0	14.2	245.4	88.9	138.2	14.2	4.8	6
SLM-M48A	545-2180	342.9	304.8	M16	19.0	14.2	338.1	88.9	190.5	14.2	4.8	11.8
SLM-M96A	1090-4360	469.9	406.4	M24	22.0	20.6	468.4	88.9	294.6	14.2	6.4	26
SLM-M192A	2180-8720	609.6	508.0	M24	22.0	20.6	609.6	88.9	400.1	14.2	6.4	45.0

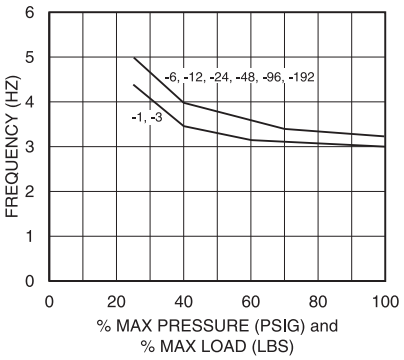
Performance Characteristics

SLM Series Dynamic Load and Approximate Deflections

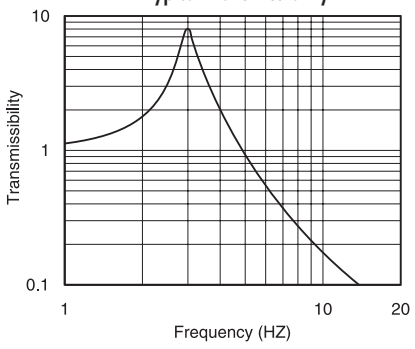




Natural frequency vs. % Max Pressure and % Max Load



Typical Transmissibility



LEVELING MOUNTS

Low-profile, high capacity leveling mounts for vibration and shock protection.

APPLICATIONS

- Punch Presses
- Milling Machines
- Drilling Machines
- Boring Machines
- Die casting machines
- Screw machines
- Injection Molding
- Lathes
- Grinders
- Jig Borers
- Riveters
- Sanders
- Saws
- Shapers

FEATURES

- High level of shock & vibration isolation
- Full inch of elastomer for controlled deflection
- Leveling bolt adjusts height up to a full half inch above load
- Sturdy, reliable construction

BENEFITS

- Economical
- Extends machinery life
- Wide load range available

LOAD RANGE

- 7 sizes with load ratings to 13,000 lbs. per isolator

Barry Leveling Mounts are ideal for protecting heavy industrial equipment and machinery such as CNC machines, punch presses, drill presses, sanders, saws, injection molding and many other types of industrial equipment.

Specifications

• Natural Frequency	12-18 Hertz
• Transmissibility at resonance	8:1
• Resilient Element	LM0-B + LM1-B Neoprene LM3-B through LM9-B Nitrile
• Weight	See load range chart

Environmental Data

- Nitrile and Neoprene elastomers have an operating temperature range of -20°F to +180°F (-30°C to +82°C) and are resistant to oils and most solvents.

Dimensions & Performance Characteristics

LEVELING MOUNT SERIES LOAD RATING & DIMENSIONAL DATA						
Part #	Load Range Rating (lbs.)	Base (Inches)		Bolt (Inches)		Weight
		Outside Dia. (A)	Free Height (B)	Size	Length	
LM0-B	30-100	2	1	.25-28	1.75	4 ozs.
LM1-B	100-300	3.125	1.50	.375-24	3	1 lb. 4 ozs.
LM3-B	300-1,000	4.75	1.50	.50-13	5	2 lbs. 5 ozs.
LM5-B	1,000-4,200	6.312	1.625	.75-10	5	5 lbs. 2 ozs.
LM6-B	4,000-10,000	7.25	1.61	.75-10	5	7 lbs. 6 ozs.
LM7-B	4,000-13,000	9	2.50	1-14	8	12 lbs. 14 ozs.
LM9-B*	4,000-13,000	9	2.25	1-14	8	12 lbs. 11 ozs.

* LM-9B should be substituted for LM-7B in applications with heavy horizontal forces.
For punch press applications between 150-300 SPM, reduce load rating of each mount by 50%. Above 300 SPM, please call Barry Controls applications engineering at 1-800-BARRY-MA.

METRIC LEVELING MOUNT SERIES LOAD RATING & DIMENSIONAL DATA						
Part #	Load Range Rating (lbs.)	Base (Inches)		Bolt (Inches)		Weight
		Outside Dia. (A)	Free Height (B)	Size	Length	
LM0-MB	30-100	2	1	M6-1	30 mm	4 ozs.
LM1-MB	100-300	3.125	1.50	M10-1.5	75 mm	1 lb. 4 ozs.
LM3-MB	300-1,000	4.75	1.50	M12-1.75	127 mm	2 lbs. 5 ozs.
LM5-MB	1,000-4,200	6.312	1.625	M20-2.5	127 mm	5 lbs. 2 ozs.
LM6-MB	4,000-10,000	7.25	1.61	M20-2.5	127 mm	7 lbs. 6 ozs.
LM7-MB	4,000-13,000	9	2.50	M24-3	200 mm	12 lbs. 14 ozs.
LM9-MB*	4,000-13,000	9	2.25	M24-3	200 mm	12 lbs. 11 ozs.

* LM-9B should be substituted for LM-7B in applications with heavy horizontal forces.
For punch press applications between 150-300 SPM, reduce load rating of each mount by 50%. Above 300 SPM, please call Barry Controls applications engineering at 1-800-BARRY-MA.

OPTIONAL BOLTS & BUSHINGS FOR LEVELING MOUNTS:

Ordering Information

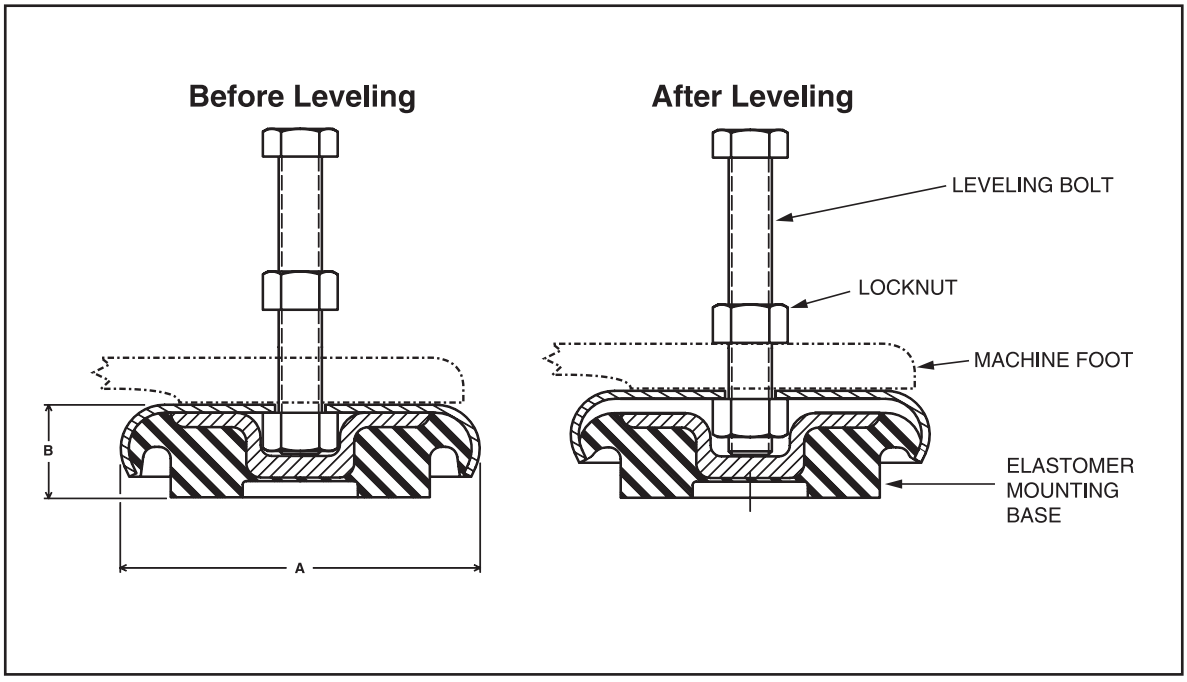
OPTIONAL BOLTS WITH NUTS		
Part#	Comes Standard w/:	Size (in.)
2099-02000/1		3/8-16x5
100551-01000/1	LM3-B	1/2-13x5
2099-12000/1		1/2-13x8
2099-16000/1		1/2-13x10
2099-07000/1		5/8-11x5
2099-10000/1		5/8-11x8
100551-03000/1	LM5-B/LM6-B	3/4-10x5
2099-11000/1		3/4-10x8
2099-09000/1		3/4-10x10
100551-19000/1		1-14x5
100551-16000/1	LM7-B/LM9-B	1-14x8
2099-29000/1	LM0-B	1/4-28x1-3/4
2099-30000/1	LM1-B	3/8-24x3

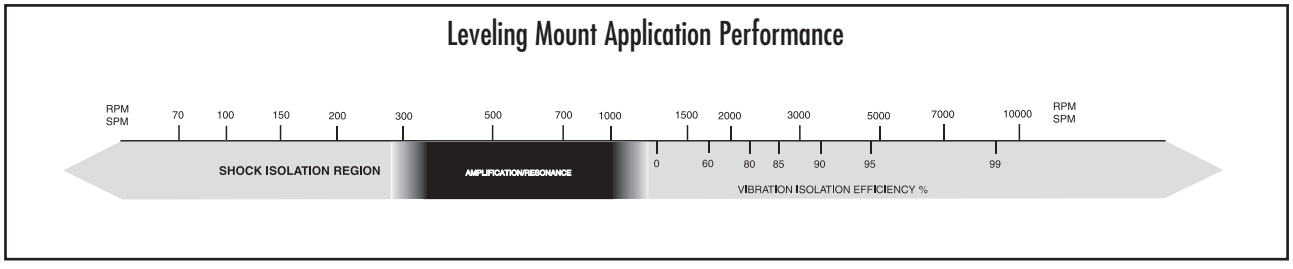
OPTIONAL BUSHINGS FOR MOUNTS:		
Part#	Designed for Mount:	Size (in.)
101056-01801	LM5-B/LM6-B	3/4-10 to 3/8-16
101056-02801	LM5-B/LM6-B	3/4-10 to 1/2-13
101965-03801	LM7-B/LM-9B	1-14 to 1/2-13
101965-02801	LM7-B/LM-9B	1-14 to 5/8-11
108123-03801	LM7-B/LM-9B	1-14 to 3/4-10

METRIC BOLTS & BUSHINGS FOR LEVELING MOUNTS:

Ordering Information

METRIC BOLTS w/NUTS		
Part#	Designed for Mount:	Size (in.)
2099-39000/1	LM0-MB	M6-1 x 1.181 (30 mm)
2099-40000/1	LM1-MB	M10-1.5 x 2.953 (75 mm)
2099-44000/1	LM3-MB	M12-1.75 x 5 (127 mm)
2099-43000/1	LM5-MB/LM6-MB	M20-2.5 x 5 (127 mm)
2099-41000/1	LM7-MB/LM9-MB	M24-3.0 x 7.874 (200 mm)





LMS MOUNT SERIES

Attenuated levelers designed for leveling and aligning sensitive electronic manufacturing equipment

APPLICATIONS

- Semiconductor equipment
- Electronic manufacturing equipment
- Industrial machinery

LMS attenuated levelers are designed for leveling, aligning and isolating sensitive electronic manufacturing equipment. LMS Series levelers feature over .5" of neoprene elastomer bonded to the bottom of the leveler to provide shock-attenuated, non-skid support.

FEATURES

- Neoprene elastomer bonded to steel construction
- Corrosion resistant exposed metal parts
- Proven durability
- ANSI and metric steel threads

BENEFITS

- Non skid elastomer
- Protects floor or surface finish
- Extends machinery life
- 1/2" of elastomer for controlled deflection and attenuation

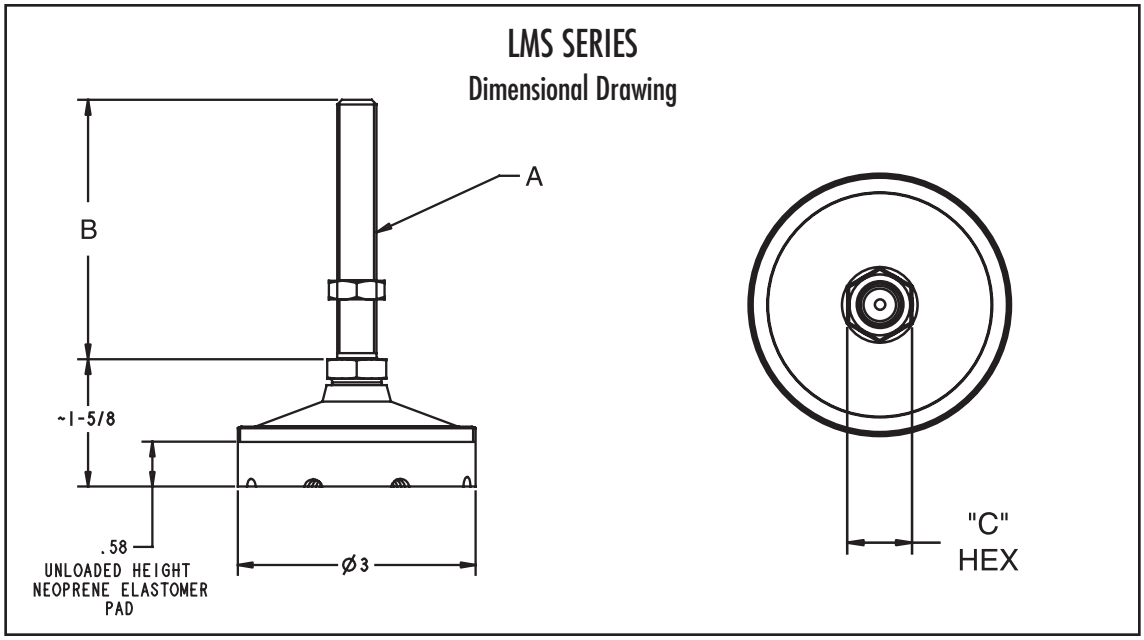
Specifications

• Natural Frequency	10-20 Hertz
• Transmissibility at resonance	8:1
• Resilient Element	Neoprene
• Standard Materials	Black Corrosion Resistant Steel
• Elastomer Color	Black

Environmental Data

- Neoprene elastomer has an operating temperature range of -20°F to +180°F (-30°C to +82°C) and is resistant to oils, most solvents and ozone.

Dimensions & Performance Characteristics



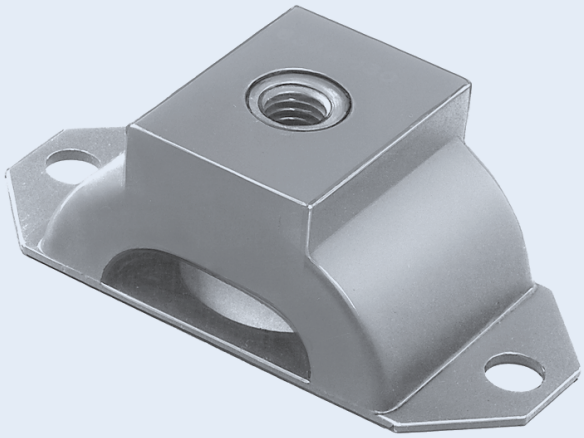
LMS MOUNT SERIES LOAD RATING & DIMENSIONAL DATA					
Part #	Load Range Rating (lbs.)	Thread Units	"A"	"B"	"C"
LMS-12042	100-400	INCH	.500-13 UNC 2B	2"	.750"
LMS-12044	100-400			4"	
LMS-12082	200-800			2"	
LMS-12084	200-800			4"	
LMS-12122	400-1200			2"	
LMS-12124	400-1200			4"	
LMS-M112042	100-400	METRIC	M12 x 1.75	51 mm	19 mm
LMS-M112043	100-400			84 mm	
LMS-M112082	200-800			51 mm	
LMS-M112083	200-800			84 mm	
LMS-M112122	400-1200			51 mm	
LMS-M112123	400-1200			84 mm	

633A MOUNT SERIES

Low-profile, low frequency elastomeric noise and vibration isolators for medium weight industrial equipment.

APPLICATIONS

- Industrial equipment, tools and machinery
- Generators
- Pumps & blowers
- HVAC equipment
- Chillers



Barry 633A Series Mounts are medium weight mounts normally used for vertically applied loads to prevent transmission of noise and vibration caused by rotation of imbalanced equipment (i.e. generators, blowers, pumps, etc...)

FEATURES

- Effectively isolate disturbing frequencies as low as 900 rpm (15 Hz)
- Cold-rolled steel construction
- Optional stainless steel version available upon request for highly corrosive and marine applications
- Elastomer in shear design
- Compressive to shear stiffness of 2.5:1

BENEFITS

- Effectively interrupts noise transmission paths to prevent sounding board amplification
- Extends machinery life
- Resistant to oils, most solvents and ozone
- Provides up to 90% isolation efficiency at 1,500 rpm (25 Hz)

LOAD RANGE

- 5 load ratings up to 260 lbs. per mount

Specifications

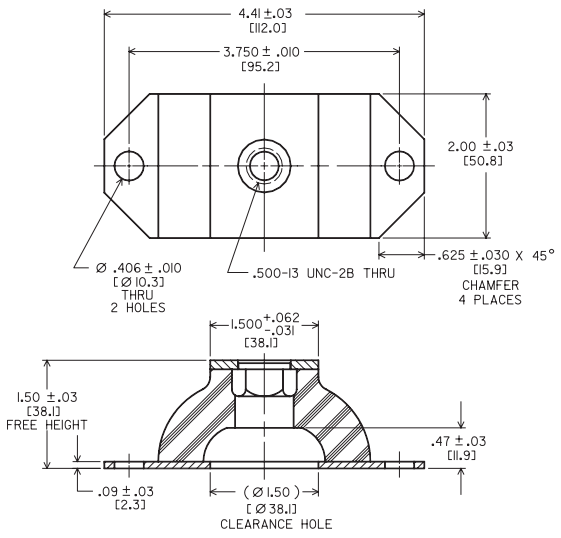
• Natural Frequency	8 Hertz
• Transmissibility at resonance	8:1
• Resilient Element	Neoprene
• Standard Materials	Cold Rolled Steel or Stainless Steel
• Weight	633A-60 through 130 = 7 oz. 633A-200 and 260 = 16 oz.

Environmental Data

- Neoprene elastomer has an operating temperature range of -20°F to +180°F (-30°C to +82°C) and is resistant to oils, most solvents and ozone.
- Stainless Steel version is corrosion resistant for marine applications.

Dimensions & Performance Characteristics

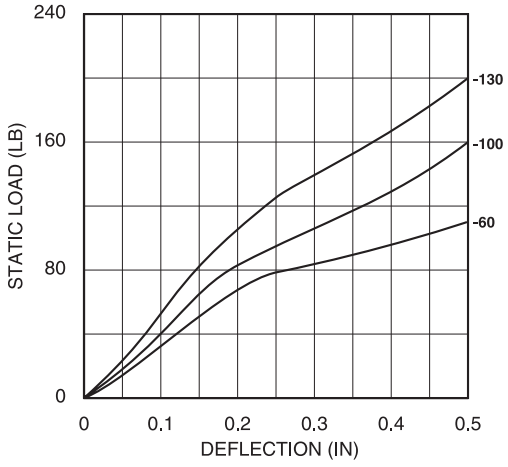
633A-60 through 633A-130 SERIES
Dimensional Drawing



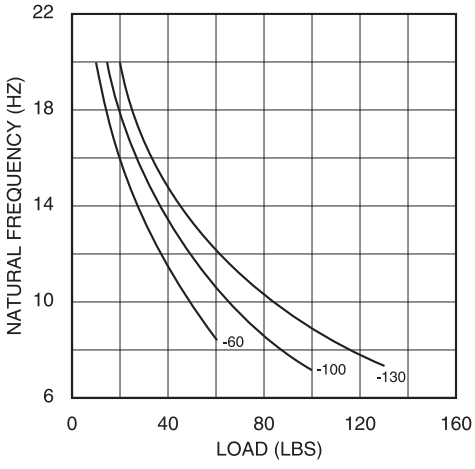
633A SERIES LOAD RANGES	
Part #	Maximum Static Load/Isolator (lbs.)
633A-60	60
633A-100	100
633A-130	130

NOTE: For stainless steel applications please add "SS" to part number. Example: For Stainless Steel 633A-60 order as part number 633A-SS60

633A-60 through 633A-130
Load vs. Deflection

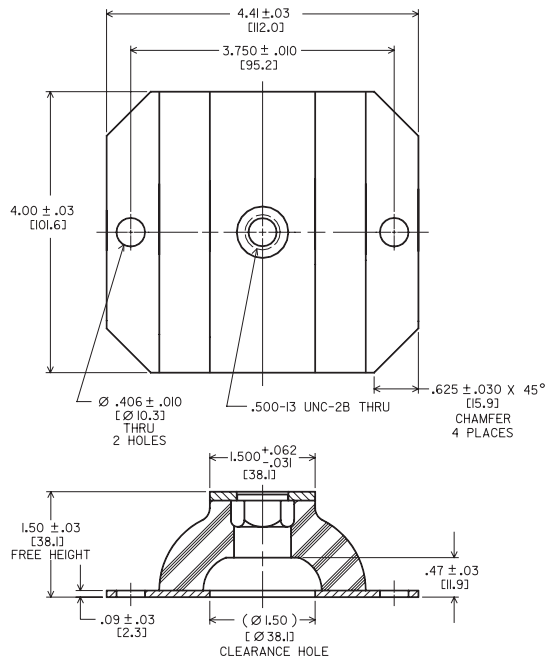


633A-60 through 633A-130
Frequency vs. Load



Dimensions & Performance Characteristics

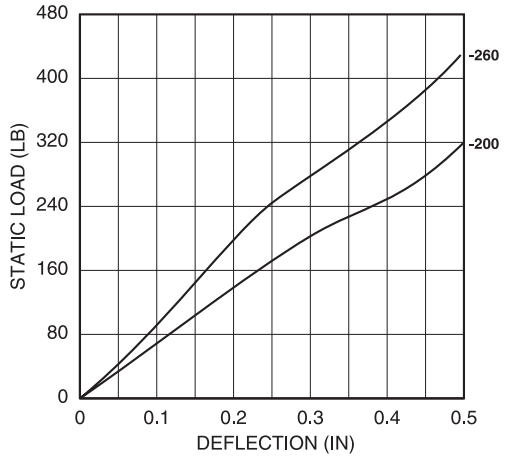
633A-200 through 633A-260 SERIES
Dimensional Drawing



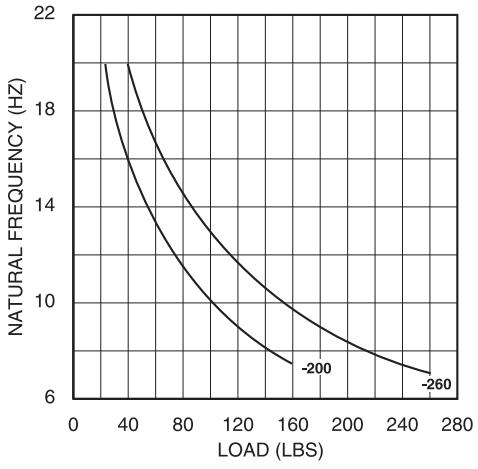
633A SERIES LOAD RANGES	
Part #	Maximum Static Load/Isolator (lbs.)
633A-200	200
633A-260	260

NOTE: For stainless steel applications please add "SS" to part number. Example: For Stainless Steel 633A-200 order as part number 633A-SS200

633A-200 through 633A-260 Load vs Deflection



633A-200 through 633A-260 Frequency vs. Load

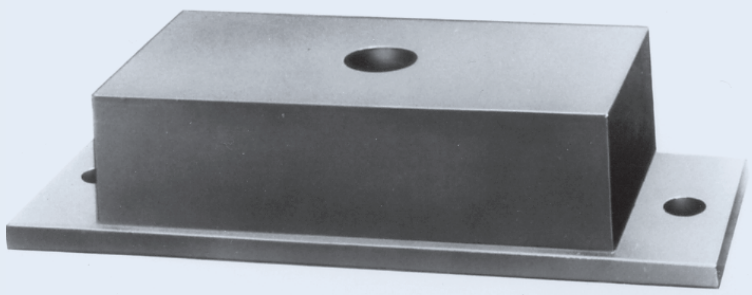


INDUSTRIAL MACHINERY MOUNT SERIES

Low-frequency elastomeric compression mounts for industrial machinery.

APPLICATIONS

- Heavy industrial equipment, machinery and tools
- Motors, pumps and generators



Barry Industrial Machinery Mounts are for use under heavy industrial machinery for shock, vibration and/or structure borne noise control. Barry Machinery Mounts provide efficient isolation for machine speeds as low as 750 rpm.

FEATURES

- Ideal for heavy industrial machinery
- For all types of industrial machinery
- Cold-rolled steel construction
- Provides efficient isolation for speeds as low as 750 rpm
- Compressive to shear stiffness of 5:1

BENEFITS

- Protects industrial equipment from damage caused by extended shock, noise and vibration exposure
- Extends machinery life
- Wide load range available
- Low maintenance
- Resistant to oils, most solvents and ozone

LOAD RANGE

- 670 Series = 3 ratings to 1,500 lbs. per mount
- 297 Series = 4 ratings to 4,400 lbs. per mount

Specifications

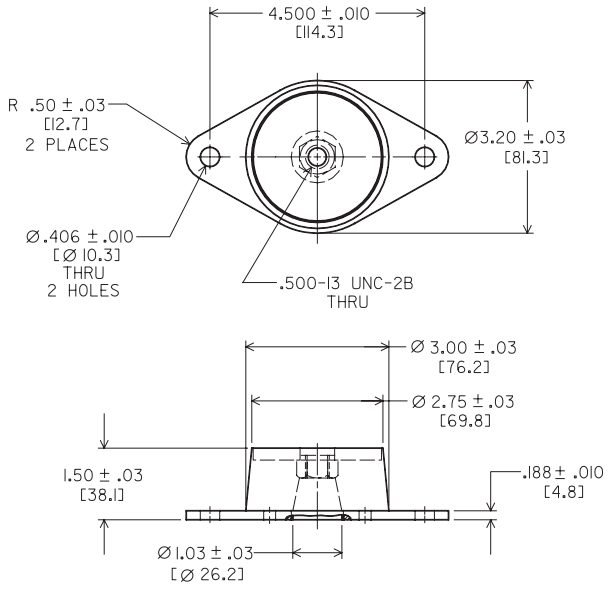
• Natural Frequency	8-18 Hertz
• Transmissibility at resonance	8:1
• Resilient Element	Neoprene
• Standard Materials	Cold rolled steel
• Weight	Series 661 = 2 lbs. Series 670 = 2 lbs. Series 297 = 3 lbs.

Environmental Data

- Neoprene elastomer has an operating temperature range of -20°F to +180°F (-30°C to +82°C) and is resistant to oils, most solvents and ozone.

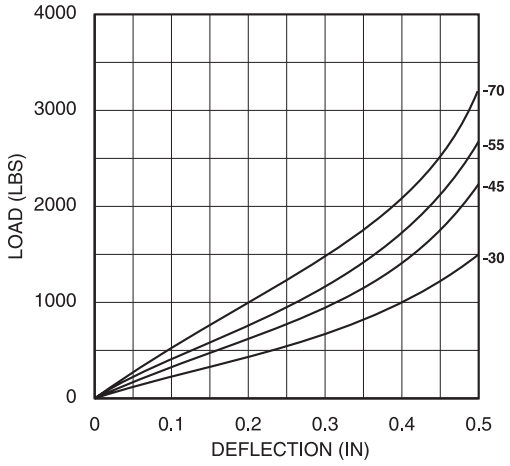
Dimensions & Performance Characteristics

661 SERIES
Dimensional Drawing

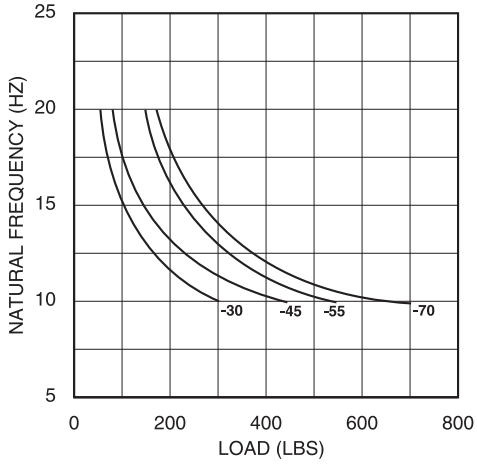


661 SERIES LOAD RANGE DATA	
Part #	Maximum Static Load/Isolator (lbs.)
661-30	300
661-45	450
661-55	550
661-70	700

661 Series
Load vs. Deflection

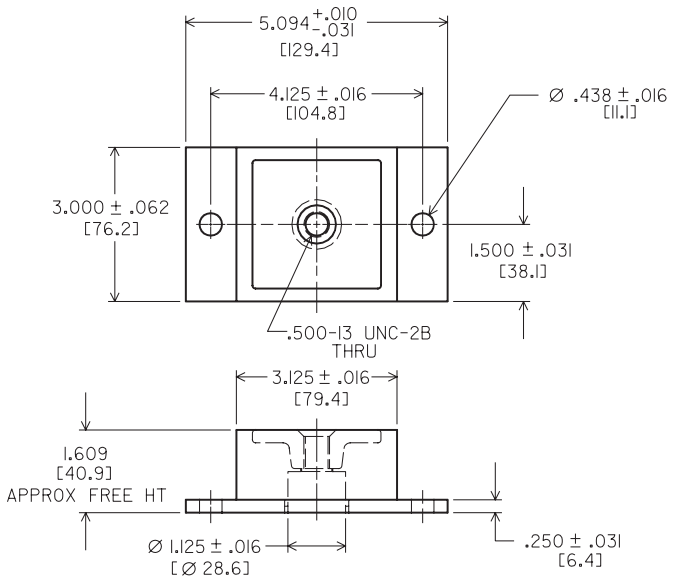


661 Series
Frequency vs. Load



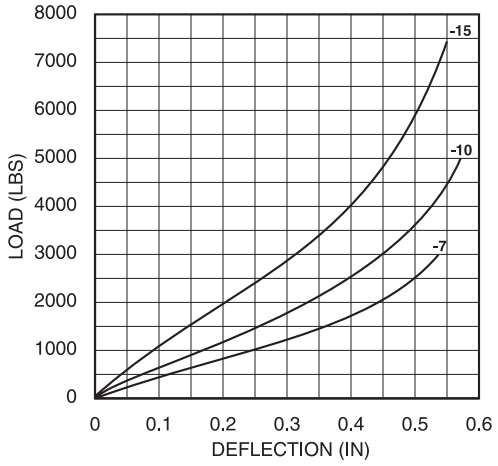
Dimensions & Performance Characteristics

670 SERIES
Dimensional Drawing

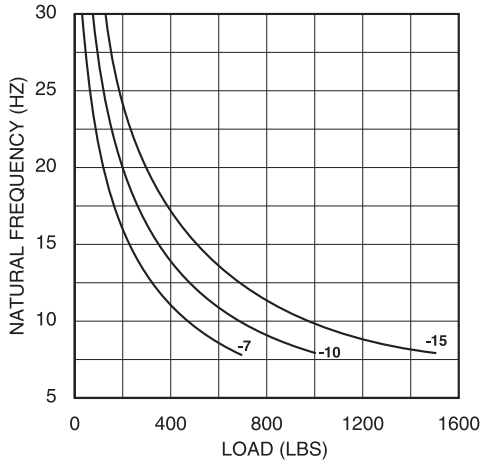


670 SERIES LOAD RANGE DATA	
Part #	Maximum Static Load/Isolator (lbs.)
670-7	700
670-10	1,000
670-15	1,500

670 Series
Load vs Deflection

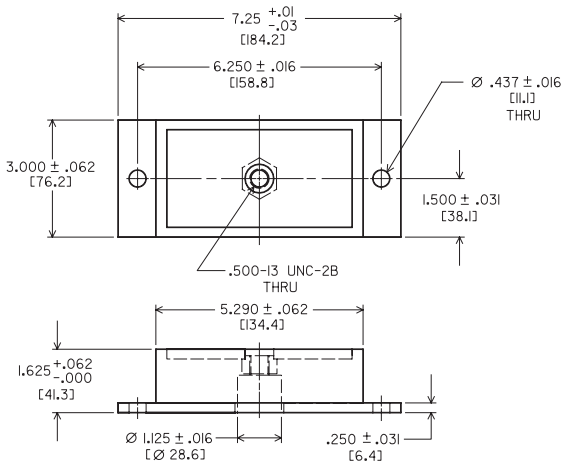


670 Series
Frequency vs. Load



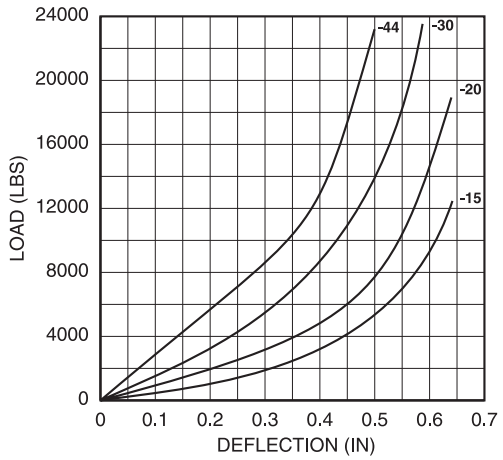
Dimensions & Performance Characteristics

297 SERIES
Dimensional Drawing

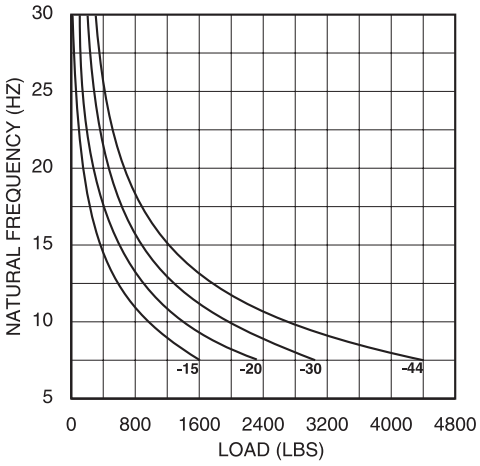


297 SERIES LOAD RANGE DATA	
Part #	Maximum Static Load/Isolator (lbs.)
297-15	1,500
297-20	2,000
297-30	3,000
297-44	4,400

297 Series
Load vs Deflection



297 Series
Frequency vs. Load

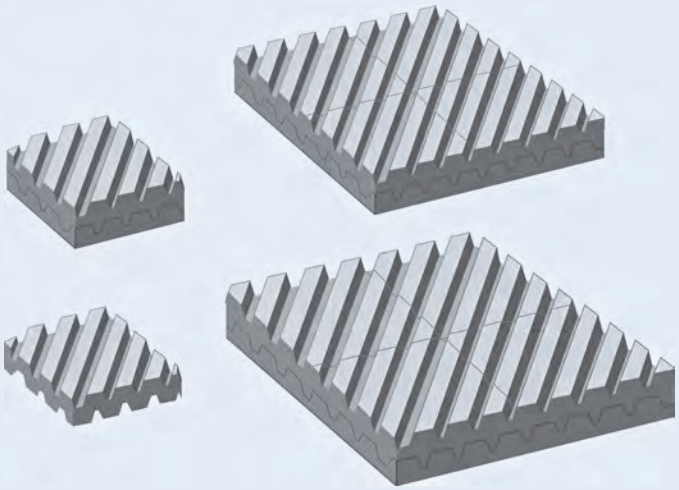


30005 SERIES NEOPRENE PADS

An economical solution to general shock, vibration and noise problems in a variety of applications

APPLICATIONS

- Drill Presses
- Microscopes
- Printing Equipment
- Riveters
- Sanders and Saws
- Work Benches



Barry Neoprene Pads are designed for use as a general purpose shock, vibration and noise attenuator or where the advantages of elastomeric characteristics are required but a specific type of isolator has not been called out.

FEATURES

- Ideal for a wide range of industrial applications
- No tools, bolting or adhesives required for installation
- Neoprene isolator
- Pads can be easily cut to smaller sizes
- US Navy approved for Distributed Isolation Materials in construction of ships & submarines

BENEFITS

- Protects industrial equipment from damage caused by extended shock, noise and vibration exposure
- Easily installed or relocated
- Can be used in a broad range of applications where moderate shock, vibration and noise reduction is required
- Low maintenance
- Resistant to oils, most solvents and ozone

LOAD RANGE

- Provides drift resistance up to 50 psi

Specifications

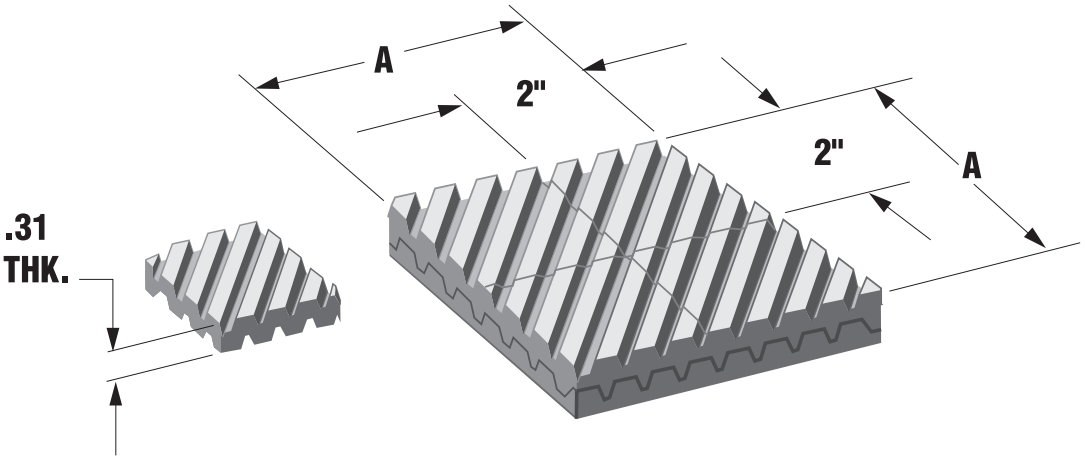
• Natural Frequency	20-35 Hertz
• Transmissibility at resonance	8:1
• Resilient Element	Neoprene
• Standard Materials	Neoprene
• Weight	4" x 4" square = 2 oz.

Environmental Data

- Neoprene elastomer has an operating temperature range of -20°F to +180°F (-30°C to +82°C) and is resistant to oils, most solvents, salt spray and ozone.

Dimensions & Performance Characteristics

NEOPRENE PAD SERIES
Dimensional Drawing



PART #	"A" (Inches)	Description	Loading
30005-4	4	One 4" x 4" square pad	50 psi Nested 25 psi Crossed
30005-12	12	One 12" x 12" square pad	
30005-1	24	One 24" x 24" square pad	

ELASTOMER SPRING SERIES

Low cost, compact, all elastomer mounts for vibration and noise control.

APPLICATIONS

- Punching Dies
- Stamping Dies
- Drawing Dies

FEATURES

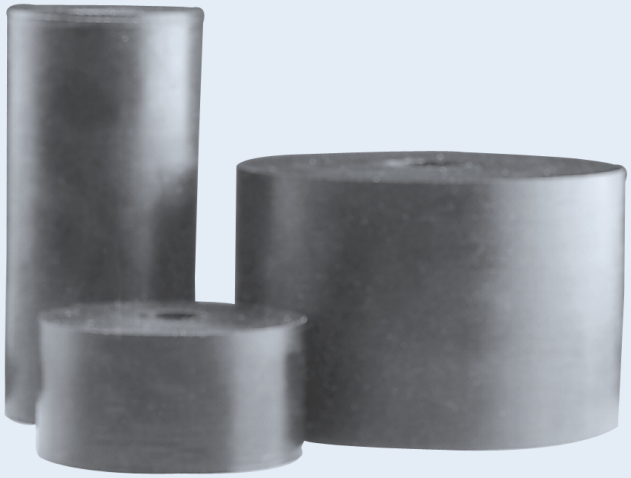
- All elastomer isolators
- Very slight pressure set
- Minimal wear through abrasion
- Excellent resistance to oil and ozone
- Stackable

BENEFITS

- Quieter and safer operation than steel
- Eliminates die damage caused by shattered springs
- Longer stroke at same load

LOAD RANGE

- Load range up to 15,000 lbs.



When compared to other types of springs, Barry Elastomer Springs have proven to be the safest, most efficient and reliable compression material for punching, stamping and drawing dies. Elastomer Springs can be used in other applications requiring exceptionally high energy storage in a small area.

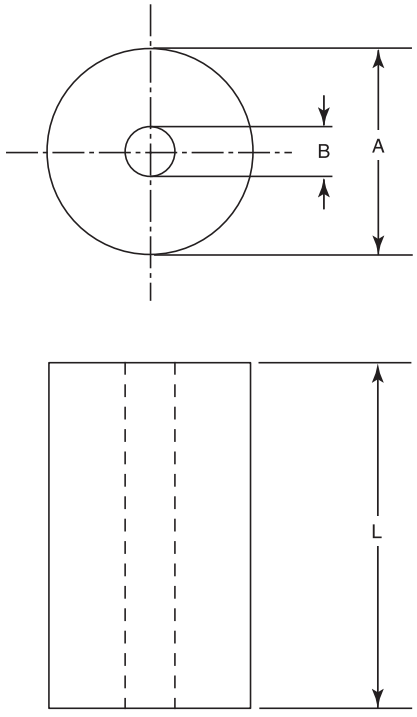
Since Barry Controls introduced elastomer springs, a steadily increasing number of metal fabricators in the aircraft, automobile, appliance and electronics industries are making use of their specific advantages which are: higher loads, increased durability, better performance, freedom from maintenance and a very long life.

Environmental Data

- Neoprene elastomer has an operating temperature range of -20°F to +180°F (-30°C to +82°C) and is resistant to oils, most solvents, salt spray and ozone.

Dimensions & Load Range Data

ELASTOMER SPRING SERIES
Dimensional Drawing



Part Number	A	B	L	R	D	T
ES-3500	.63″	.25″	15/32″	436	.17″	72
ES-3501			5/8″	353	.22″	77
ES-3502			25/32″	292	.27″	80
ES-3503			1″	236	.34″	83
ES-3510	.787″	.33″	5/8″	610	.22″	133
ES-3511			25/32″	482	.28″	132
ES-3512			1″	381	.35″	133
ES-3513			1.25″	287	.44″	126
ES-3520	1.00″	.41″	25/32″	787	.28″	215
ES-3521			1″	598	.35″	209
ES-3522			1.25″	524	.44″	229
ES-3523			1.562″	440	.55″	241
ES-3530	1.25″	.53″	1.25″	1031	.44″	451
ES-3531			1.578″	828	.55″	471
ES-3532			1.969″	651	.69″	456
ES-3533			2.50″	517	.87″	452
ES-3540	1.56″	.53″	1.25″	1790	.44″	783
ES-3541			1.578″	1434	.55″	816
ES-3542			1.969″	1148	.69″	804
ES-3543			2.50″	931	.87″	815
ES-3544			3.156	744	1.10″	830
ES-3550	2.00″	.66″	1.25″	2959	.44″	1295
ES-3551			1.578″	2411	.55″	1371
ES-3552			1.969″	1852	.69″	1296
ES-3553			2.50″	1482	.87″	1297
ES-3554			3.156″	1192	1.10″	1330
ES-3555			3.937″	950	1.38″	1330
ES-3560	2.50″	.66″	1.25″	4565	.44″	1997
ES-3561			1.578″	3650	.55″	2076
ES-3562			1.969″	2830	.69″	1981
ES-3563			2.50″	2286	.87″	2000
ES-3564			3.156″	1809	1.10″	2018
ES-3565			3.937″	1468	1.38″	2055
ES-3566			4.922″	1375	1.72″	2406
ES-3570	3.15″	.83″	1.25″	9088	.44″	3926
ES-3571			1.578″	7038	.55″	4003
ES-3572			1.969″	5768	.69″	4038
ES-3573			2.50″	4572	.87″	4000
ES-3574			3.156″	3485	1.10″	3889
ES-3575			3.937″	2567	1.38″	3594
ES-3576			4.922″	2010	1.72″	3518
ES-3580	3.94″	.83″	1.25″	15216	.44″	6657
ES-3581			1.578″	10427	.55″	5930
ES-3582			1.969″	8466	.69″	5926
ES-3583			2.50″	6435	.87″	5631
ES-3584			3.156″	4648	1.10″	5186
ES-3585			3.937″	3440	1.38″	4816
ES-3586			4.922″	2540	1.72″	4445
ES-3590	4.92″	1.06″	1.25″	33815	.44″	14794
ES-3591			1.578″	22810	.55″	12973
ES-3592			1.969″	14817	.69″	10372
ES-3593			2.50″	10584	.87″	9261
ES-3594			3.156″	7138	1.10″	7965
ES-3595			3.937″	5680	1.38″	7952
ES-3596			4.922″	4022	1.72″	7039
ES-3597			6.312	3102	2.21″	6853

R = Spring Rate, lbs./inch deflection +/- 20%

D = Maximum recommended deflection -35%L

T = Approximate total load at maximum deflection +/- 20%

Dimensions and data are subject to change without notice.

For technical, design, or application assistance, call toll free:

1-800-BARRY MA

990/915 MOUNT SERIES

Low-frequency, captive, industrial-type mounts
for vibration and structure-borne noise isolation

APPLICATIONS

- Phonographic Equipment
- Light motors (Fractional HP)
- Scales
- Cameras
- Optical Equipment
- Vacuum Pumps

990 and 915 mounts are for applications under light to medium weight industrial machinery requiring noise, shock and vibration isolation and are ideal for applications where structure-borne noise and sounding board effects must be minimized.

FEATURES

- Captive, fail-safe design
- Natural rubber elements
- Meet MIL standards
- Eyelet reinforced mounting holes

BENEFITS

- Reduce installation costs
- No special foundations required
- Isolate shock & vibration and reduce structure-borne noise
- Minimize sounding board effects
- Reduce maintenance costs

LOAD RANGE

- 990 = 7 sizes with load ratings from 1.8 - 30 lbs. per isolator
- 915 = 6 sizes with load ratings from 15 - 200 lbs. per isolator

Specifications

• Natural Frequency	10 Hertz
• Transmissibility at resonance	8:1
• Resilient Element	Natural Rubber (Standard)
• Standard Materials	Zinc-Plated Cold Rolled Steel
• Weight	5.3 oz.

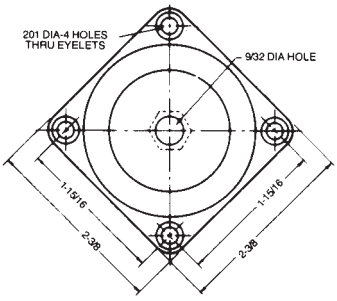
Environmental Data

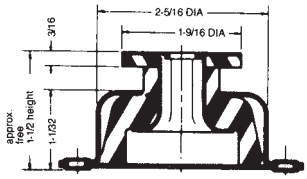
- Natural Rubber elastomer has an operating temperature range of -40°F to +180°F (-40°C to +82°C). Optional Neoprene elastomer is available for resistance to ozone and/or oil environments and has an operating temperature range of -20°F to +180°F (-30°C to +82°C).

990/915 MOUNT SERIES:

Dimensions & Load Ranges

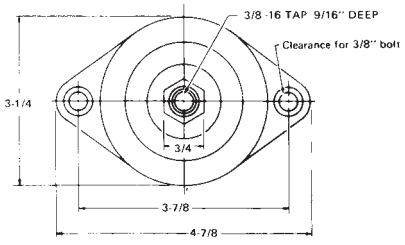
990 MOUNTS
Dimensional Drawing

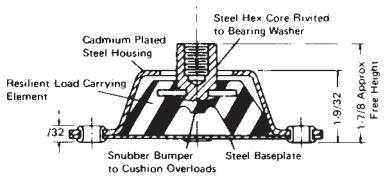




990 MOUNTS LOAD RATINGS	
Part #	Load Range - lbs.
990-3	1.8 - 3
990-5	3 - 5
990-7	4.5 - 7
990-10	5 - 10
990-15	8 - 15
990-20	12 - 20
990-30	19 - 30

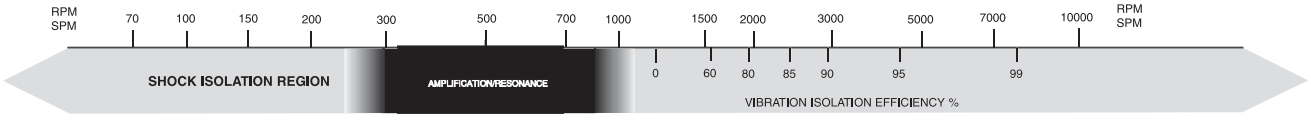
915 MOUNTS
Dimensional Drawing





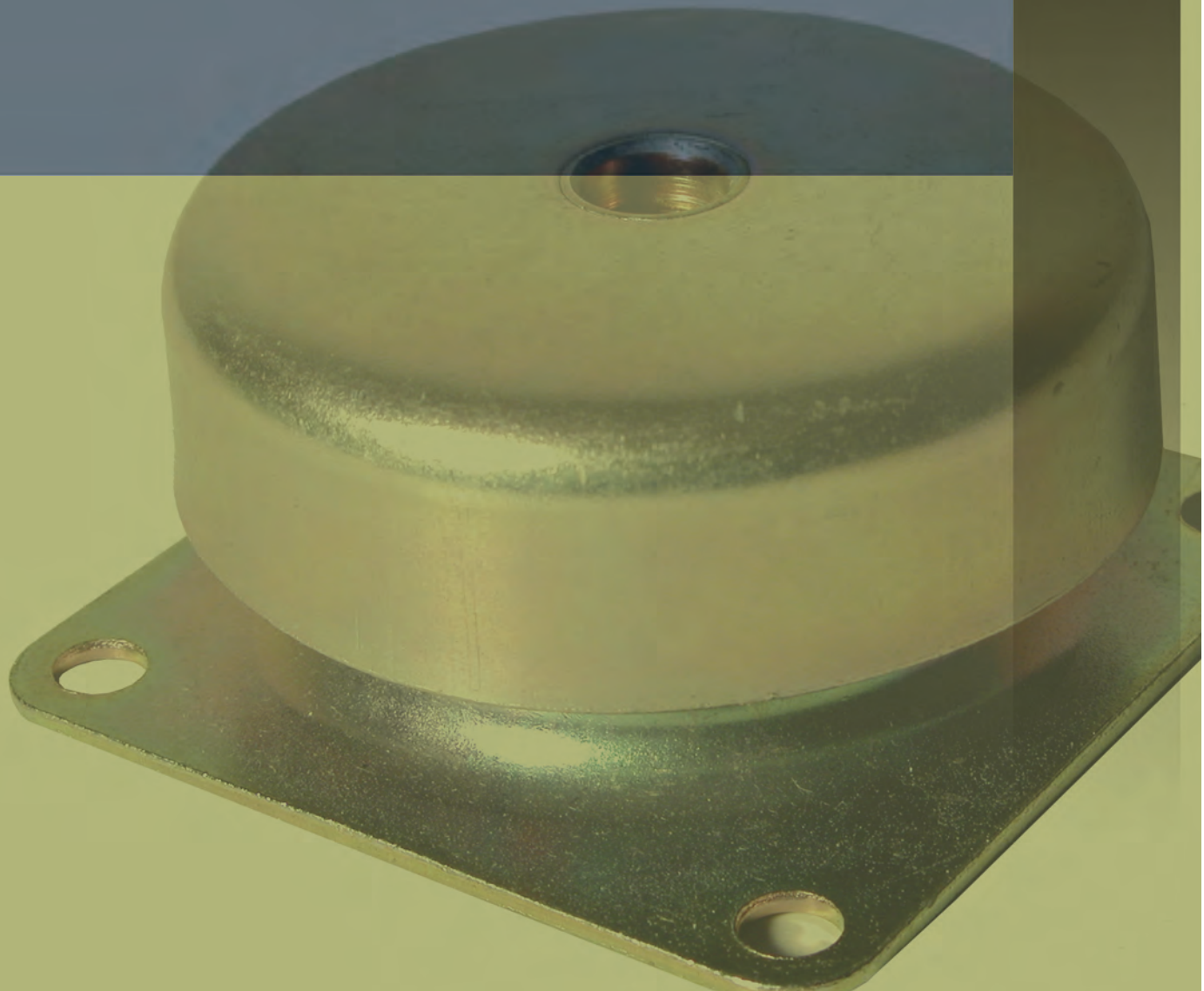
915 MOUNTS LOAD RATINGS	
Part #	Load Range - lbs.
915-25	15 - 25
915-40	25 - 40
915-60	35 - 60
915-90	50 - 90
915-150	70 - 150
915-200	120 - 200

990/915 Series Mounts Application Performance



CUP-STYLE MOUNTS

Cupmount Series (1000-4000)
S Mount Series (S22/S44/S64)
L Mount Series (L21/L44/L64)
H Mount Series (H44/H64)
T Mount Series (T22/T44/T64/T94)
B Mount Series (B21/B22/B44/B64)

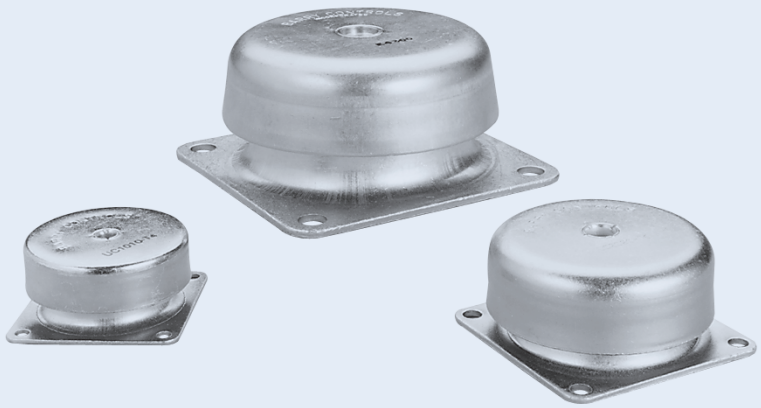


CUPMOUNT SERIES (1000-4000)

A universal set of mounts for protection from severe shock environments, high-frequency vibration and structure borne noise.

APPLICATIONS

- Vehicular electronics
- Motors & pumps
- Shipboard equipment
- Aircraft/missile electronics
- Racking systems
- Random vibration environments
- Fans & blowers
- Transformers



Barry Cupmounts combine protection against severe shock with efficient vibration isolation characteristics at frequencies above 40 Hertz. They can be mounted in any orientation for protection of sensitive electronic, electrical and mechanical equipment from high impact shocks.

FEATURES

- Fail-safe, all-attitude isolators
- Gradually increasing stiffness under compression prevents bottoming out
- Zinc plated steel construction
- Provides isolation for frequencies above 40 Hz at max. load
- Compact, low-profile design

BENEFITS

- Provides protection in all directions
- Provides effective reduction of structure borne noise

LOAD RANGE

- Series 1000 = 4 load ratings to 100 lbs./mount
- Series 2000 = 4 load ratings to 250 lbs./mount
- Series 4000 = 4 load ratings to 900 lbs./mount
- Series 3000 = 4 load ratings to 1,800 lbs./mount

Specifications

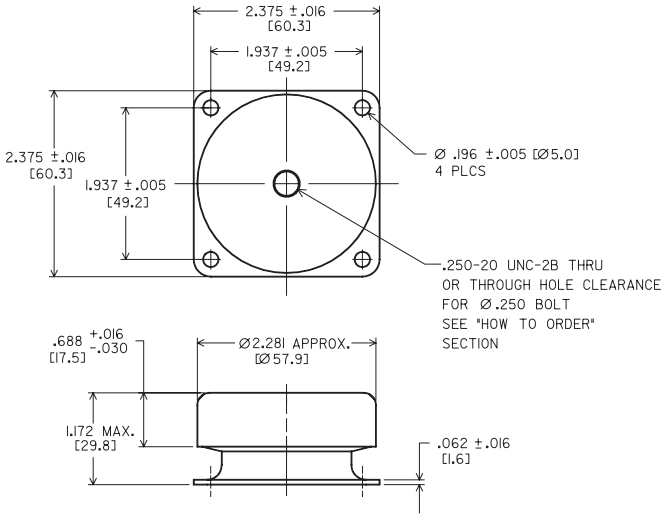
• Natural Frequency	20-45 Hertz
• Transmissibility at resonance	4 max. (Hi-Damp Silicone) 6 max. (Universal Compound) 10 max. (Natural Rubber)
• Resilient Element	Hi-Damp Silicone, Universal Black Elastomer, Natural Rubber
• Standard Materials	Zinc plated steel
• Weight	Series 1000 = 6 oz. Series 2000 - 1lb. Series 3000 = 10 lbs. Series 4000 = 4 lbs.

Environmental Data

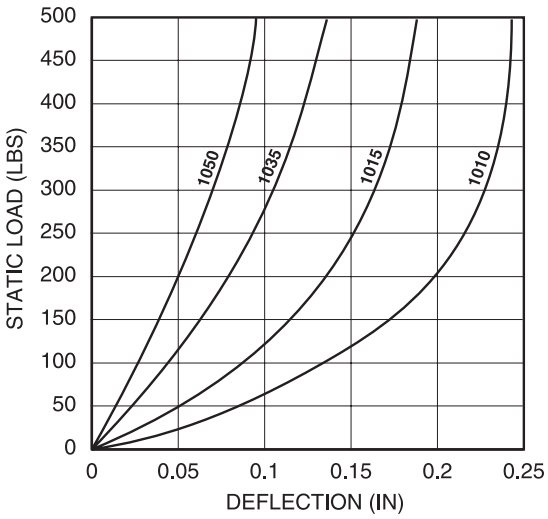
- Barry Hi-Damp® Elastomer provides the most damping, an exceptionally high operating temperature range of -67°F to +300°F (-55°C to +150°C) and is resistant to ozone, fungus and other contaminants.
- Universal Black Elastomer is ideal when moderate damping is required and where oil immersion is encountered. Meets MIL-M-17185 (environmental) and MIL-STD-167 (vibration) specifications. The operating temperature range is -65°F to +180°F (-54°C to +85°C).
- Natural rubber provides high fatigue life. Operating range is -40°F to +180°F (-40°C to +82°C).

Dimensions & Performance Characteristics

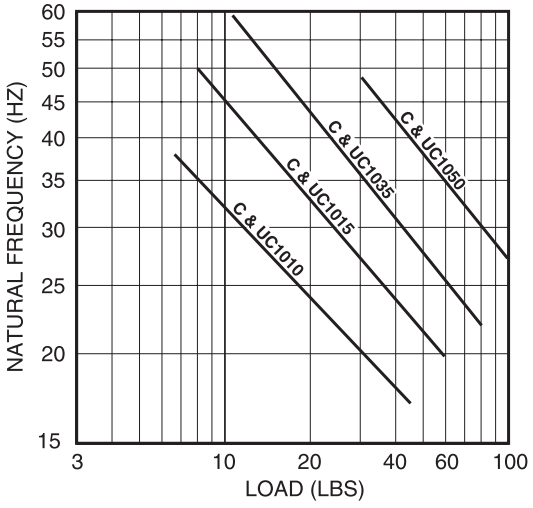
SERIES 1000
Dimensional Drawing



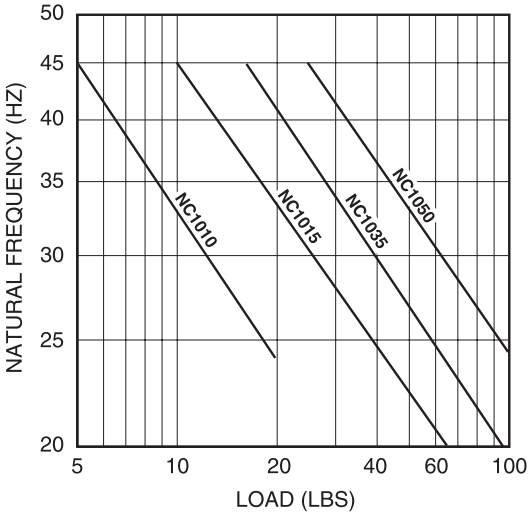
SERIES C, UC & NC 1000
Load vs. Deflection



SERIES C1000 and UC1000
Load vs. Natural Frequency

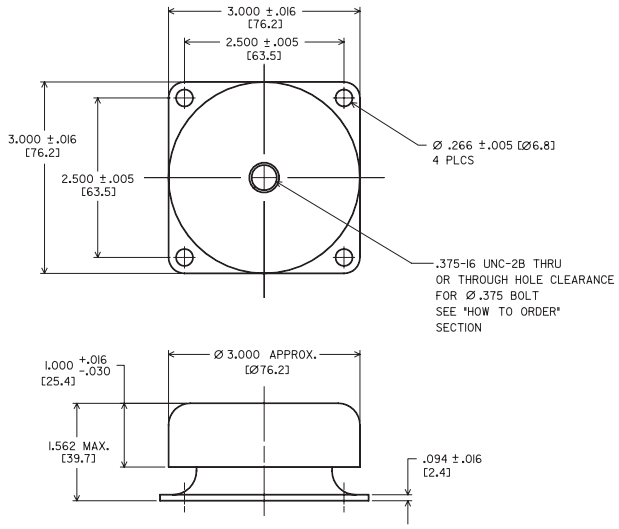


SERIES NC1000
Load Vs. Natural Frequency

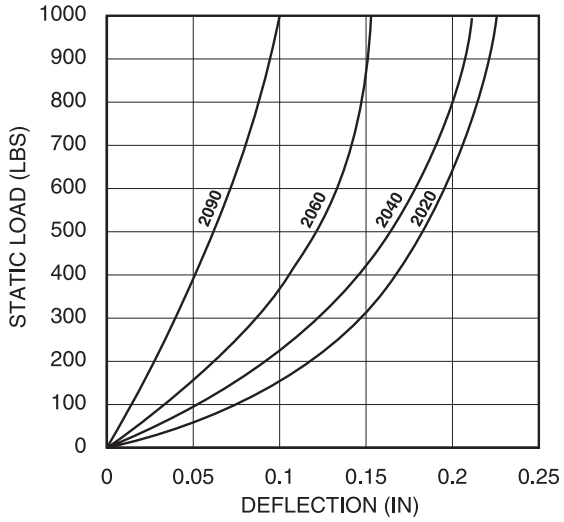


Dimensions & Performance Characteristics

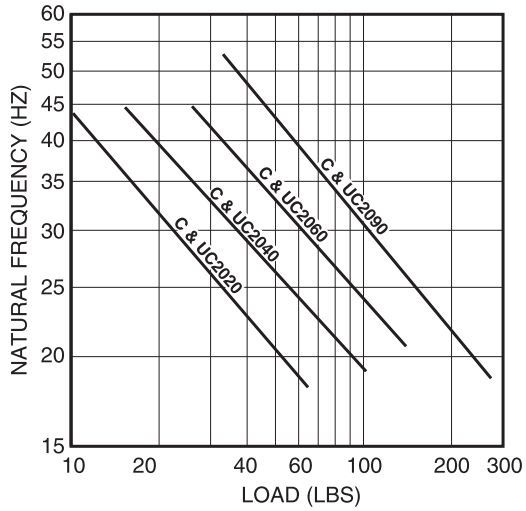
SERIES 2000
Dimensional Drawing



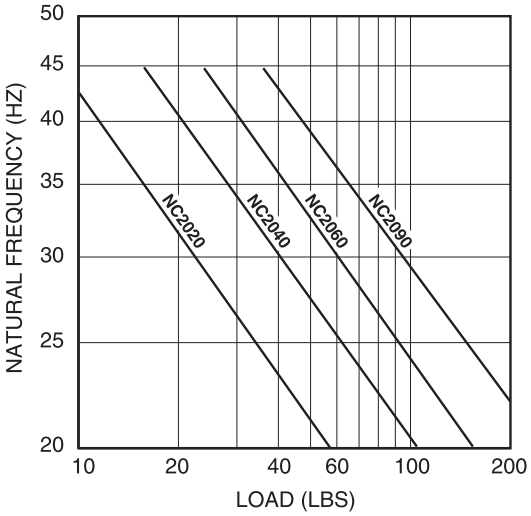
SERIES C, UC & NC 2000
Load vs. Deflection



SERIES C2000 and UC2000
Load vs. Natural Frequency

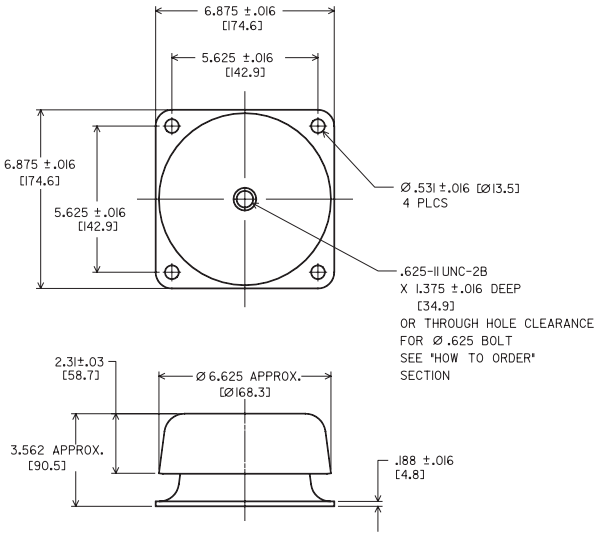


SERIES NC2000
Load Vs. Natural Frequency

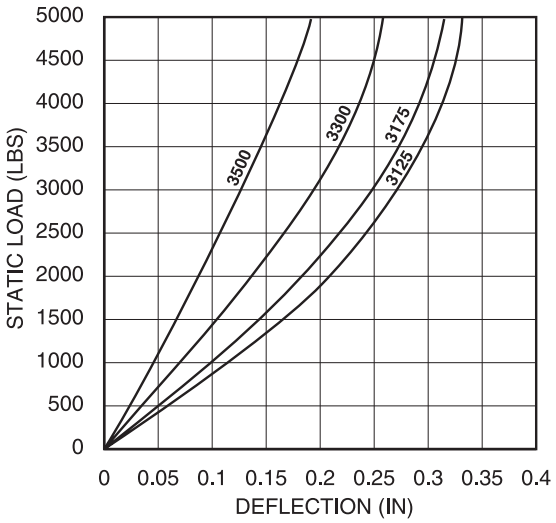


Dimensions & Performance Characteristics

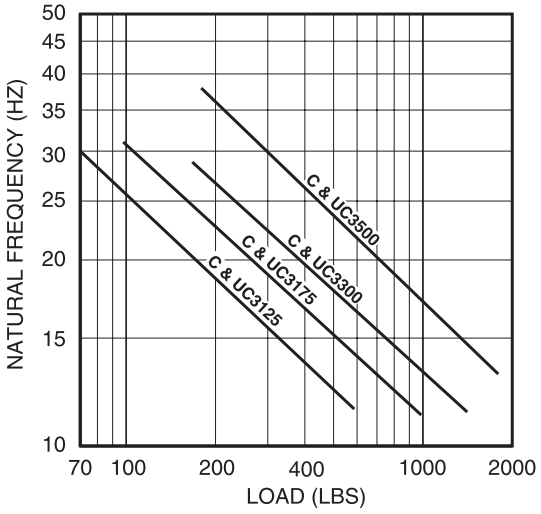
SERIES 3000
Dimensional Drawing



SERIES C, UC 3000
Load vs. Deflection

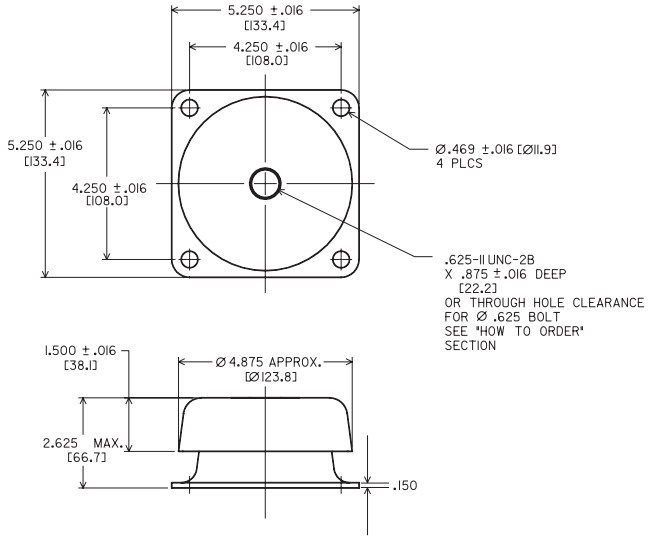


SERIES C3000 and UC3000
Load vs. Natural Frequency

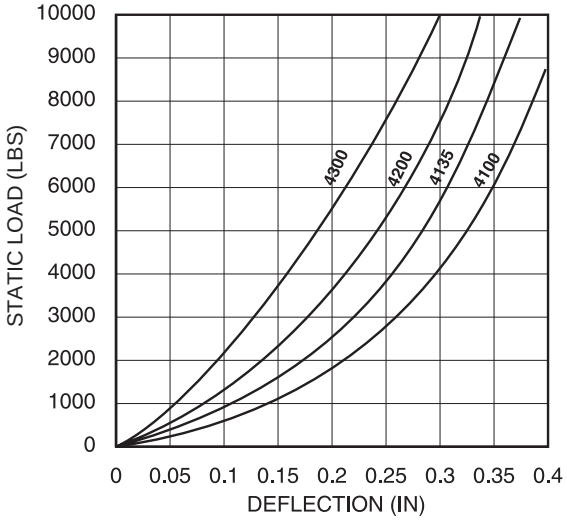


Dimensions & Performance Characteristics

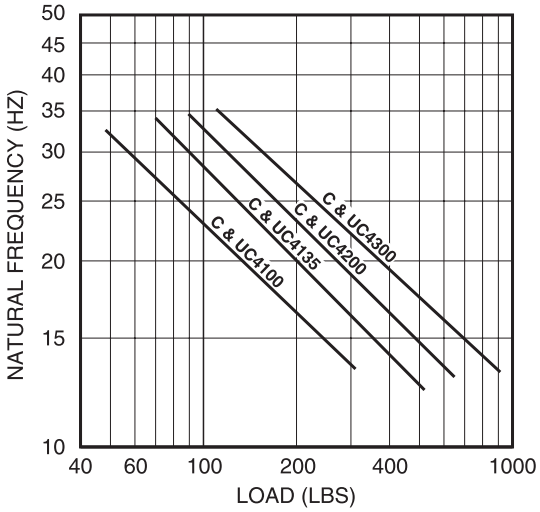
SERIES 4000
Dimensional Drawing



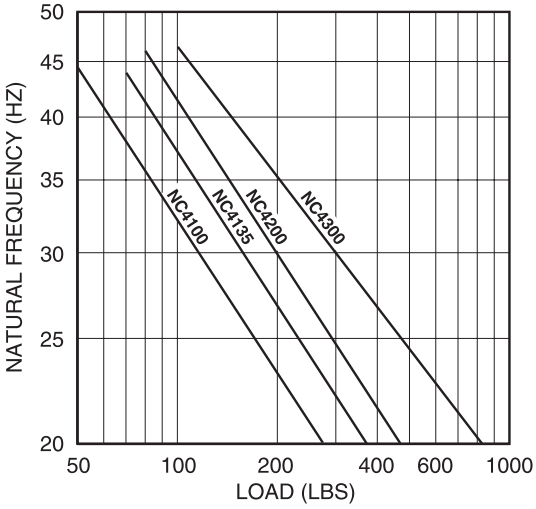
SERIES C, UC & NC 4000
Load vs. Deflection



SERIES C4000 and UC4000
Load vs. Natural Frequency



SERIES NC4000
Load Vs. Natural Frequency



How to order Cupmounts

The part numbering system of the Barry Cupmount series includes coded designations of the metal parts, elastomer, size, load rating and attachment core characteristics. Please note, aluminum parts are available for 1000 & 2000 series only.

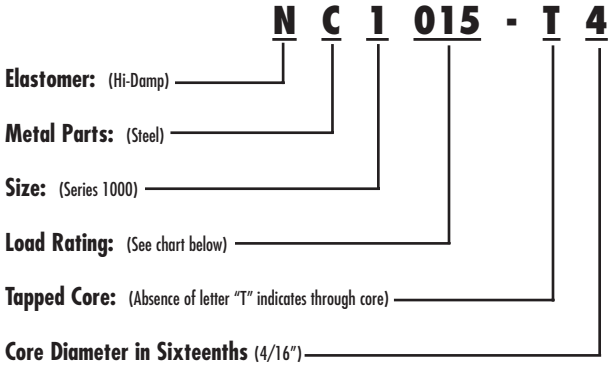
The **letter prefix** preceding a part number designates the metal and elastomer. The **first number** of the four digit part number designates the size, or series of the Cupmount.

The **suffix** designates a through core or tapped core, and core diameter. The absence of the letter "T" indicates a through core. The **number** indicates the core diameter bolt size. Refer to dimensional drawings for standard core diameters.

To avoid overstressing attachment bolts, core diameter cannot be interchanged from series to series.

PREFIX	METAL	ELASTOMER
NC	Cold-rolled steel (zinc plated finish)	Hi-damp Silicone
UC		Universal
C		Natural Rubber
NL	Aluminum	Hi-damp Silicone

Typical Barry Controls Cupmount Part Number:



CUPMOUNT SERIES LOAD RATINGS

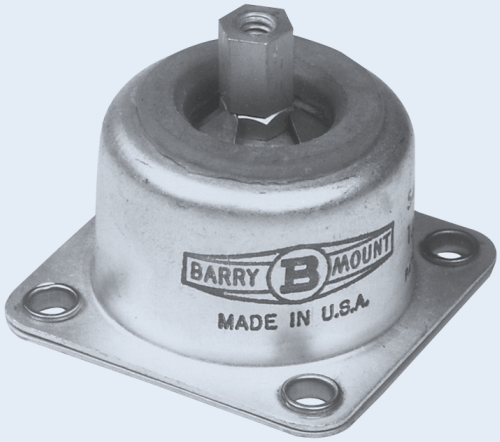
Part #	Maximum Load Range - lbs. (Vibration Applications)	Load Range - lbs. (Shock Applications)
1010	20	8-14
1015	30	14-24
1035	70	24-38
1050	100	38-60
2020	50	15-30
2040	100	30-50
2060	150	50-80
2090	250	80-105
4100	250	65-100
4135	400	100-155
4200	650	155-200
4300	900	200-285
3125	600	80-120
3175	800	120-185
3300	1400	185-285
3500	1800	285-530

S-MOUNT SERIES (S22/S44/S64)

Low-frequency variable air-damped mounts
for a high level of vibration isolation.

APPLICATIONS

- Military & commercial airborne equipment
- Computers and storage devices
- Optical devices & instrumentation
- Lasers
- Clinical diagnostic equipment



Barry S-Mounts are air-damped isolators and are designed to provide the highest degree of vibration isolation for sensitive commercial and military airborne equipment. S-Mounts are particularly effective at isolating low level vibration.

FEATURES

- Low resonant transmissibility
- 2 stage air-damping
- Low natural frequency isolation
- Axial to radial stiffness ratio of 4:1
- Fail safe construction

BENEFITS

- Up to 90% isolation efficiency with inputs as low as 40 Hz.
- Variable air-damping provides increasing isolation efficiency in high-frequency regions, even when input excursions become small

LOAD RANGE

- S22 = 6 load ratings from .3 - 3 lbs. per mount
- S44 = 7 load ratings from .25 - 9 lbs. per mount
- S64 = 7 load ratings from 2.0 - 35 lbs. per mount

Specifications

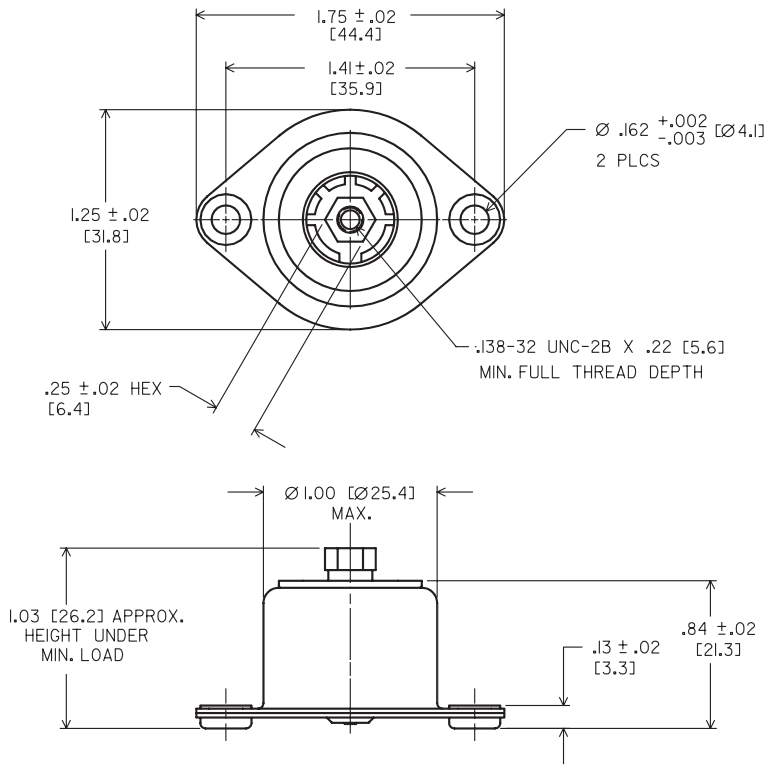
• Natural Frequency	7-10 Hertz vertical
• Transmissibility at resonance	3.5 Max. at sea level Approx. 4.3 at 50,000 feet
• Resilient Element	Air-damped spring
• Standard Materials	Varies with model
• Weight	S22 = 0.5 oz. S44 = 2.5 oz. S64 = 5.0 oz.

Environmental Data

- Silicone Air Chambers and Snubbers have operating temperature ranges of -67°F to +300°F (-55°C to +150°C).
- Mounts meet all applicable standards of MIL-C-172 and are fungus and oil resistant.

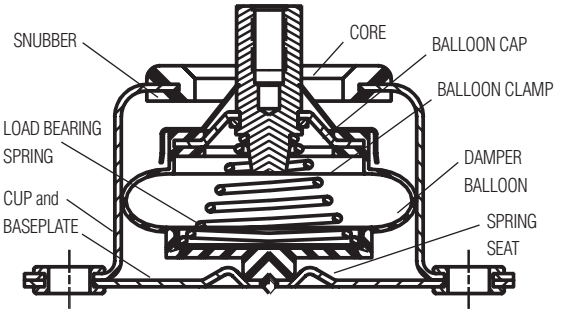
Dimensions

S22 SERIES
Dimensional Drawing



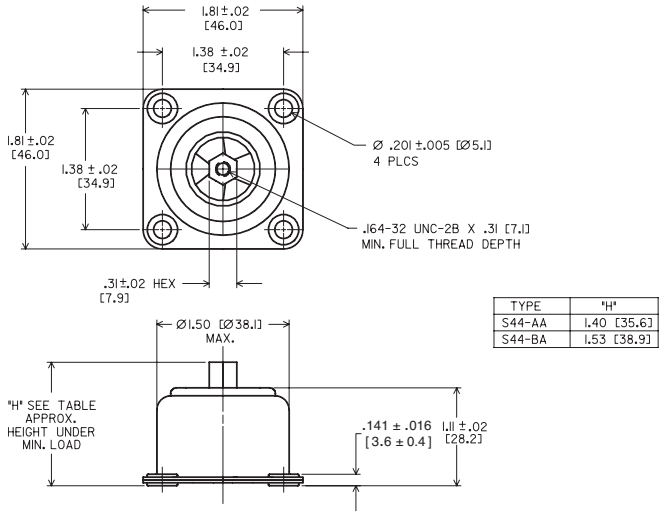
S22 LOAD RANGES	
Part #	Static Load Range /Isolator (lbs.)
S22-AA-0.5	0.3 - 0.5
S22-AA-0.8	0.5 - 0.8
S22-AA-1.1	0.6 - 1.1
S22-AA-1.5	0.9 - 1.5
S22-AA-2.2	1.3 - 2.2
S22-AA-3.0	2.2 - 3.0

S MOUNT SERIES
Cutaway Drawing



Dimensions & Load Range Data

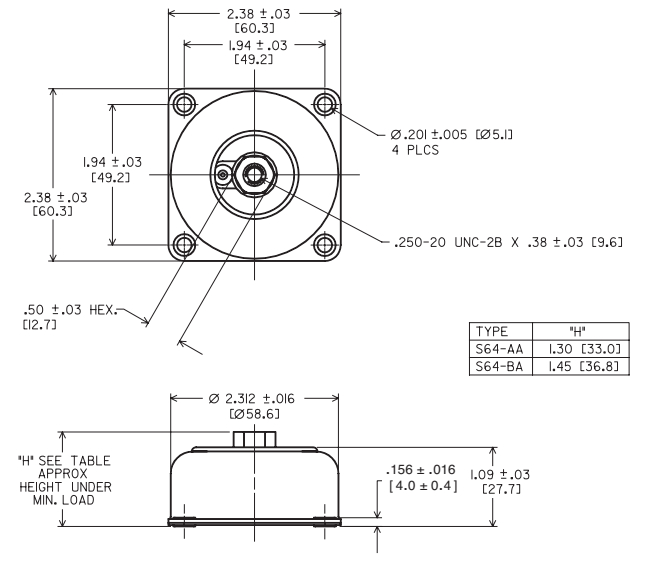
S44 SERIES
Dimensional Drawing



TYPE	"H"
S44-AA	1.40 [35.6]
S44-BA	1.53 [38.9]

S44 LOAD RANGES	
Part #	Static Load Range /Isolator (lbs.)
S44-AA-0.5 & BA-0.5	0.25-0.5
S44-AA-1.0 & BA-1.0	0.5-1.0
S44-AA-3.0 & BA-3.0	1.5-3.0
S44-AA-4.5 & BA-4.5	2.5-4.5
S44-AA-7.0 & BA-7.0	4.0-7.0
S44-AA-9.0 & BA-9.0	6.5-9.0

S64 SERIES
Dimensional Drawing



TYPE	"H"
S64-AA	1.30 [33.0]
S64-BA	1.45 [36.8]

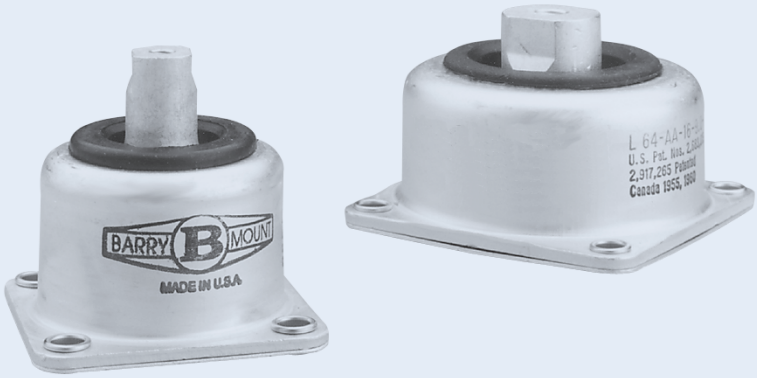
S64 LOAD RANGES	
Part #	Static Load Range /Isolator (lbs.)
S64-AA-4.5 & BA-4.5	3.0-4.5
S64-AA-6.0 & BA-6.0	3.5-6.0
S64-AA-10.0 & BA-10.0	6.0-10.0
S64-AA-12.5 & BA-12.5	9.5-12.5
S64-AA-20.0 & BA-20.0	12.5-20.0
S64-AA-25.0 & BA-25.0	19.0-25.0
S64-AA-35.0 & BA-35.0	25.0-35.0

L-MOUNT SERIES (L21/L22/L44/L64)

Low-frequency, highly damped mounts for a high level of vibration isolation.

APPLICATIONS

- Avionic equipment in propeller driven aircraft
- Sensitive instrumentation and medical equipment
- Stationary applications where cost effective, low frequency isolation is required



Barry L-Mounts increase equipment reliability and extend component life by providing isolation for frequencies as low as 10 Hertz and exhibiting low transmissibility at resonance (below 2.5) with 0.060" double amplitude vibratory input.

FEATURES

- Marking of mounts with military designations available on special order
- Aluminum construction
- Axial to radial stiffness of 4:1
- For base mounting only
- Fail safe construction

BENEFITS

- Isolation performance maintained in attitudes up to 10° from the horizontal
- Low ratio of horizontal and vertical stiffness which holds transmissibility in rocking modes to unusually low magnitudes

LOAD RANGE

- L21/L22 = 7 load ranges from .35 - 4 lbs. per mount
- L44 = 7 load ratings from .25 - 10 lbs. per mount
- L64 = 7 load ratings from 2.0 - 40 lbs. per mount

Specifications

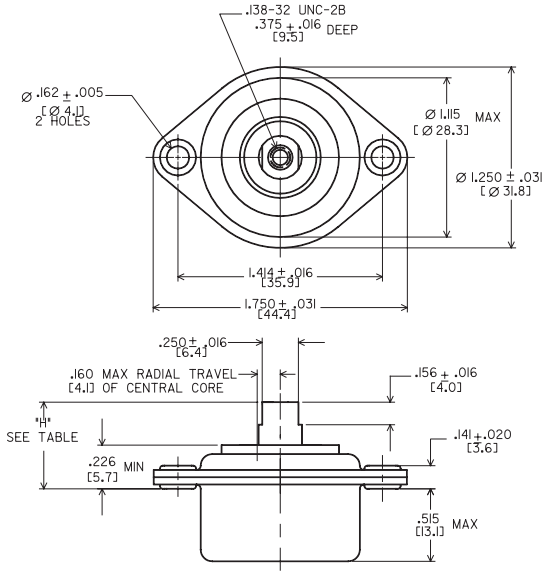
• Natural Frequency	7-10 Hertz
• Transmissibility at resonance	2.5
• Resilient Element	Friction damped spring
• Standard Materials	Aluminum
• Weight	L21 = .031 lbs. L22 = .031 lbs. L44 = .098 lbs. L64 = .226 lbs.

Environmental Data

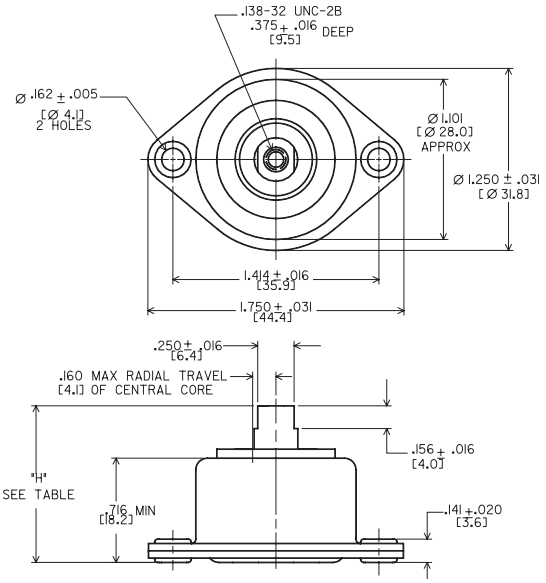
- Operating temperature ranges of -67°F to +250°F (-55°C to +120°C).
- Meets vibration and shock requirements of MIL-C-172C.
- L44 and L64 isolators are known as “MS” (Military Standard) mounts and appear on QPL’s.

Dimensions & Performance Characteristics

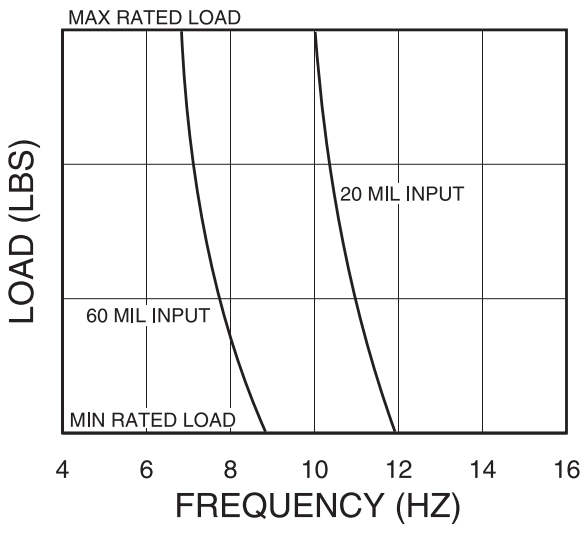
L21 Dimensional Drawing



L22 Dimensional Drawing



L21 & L22 Load vs. Natural Frequency

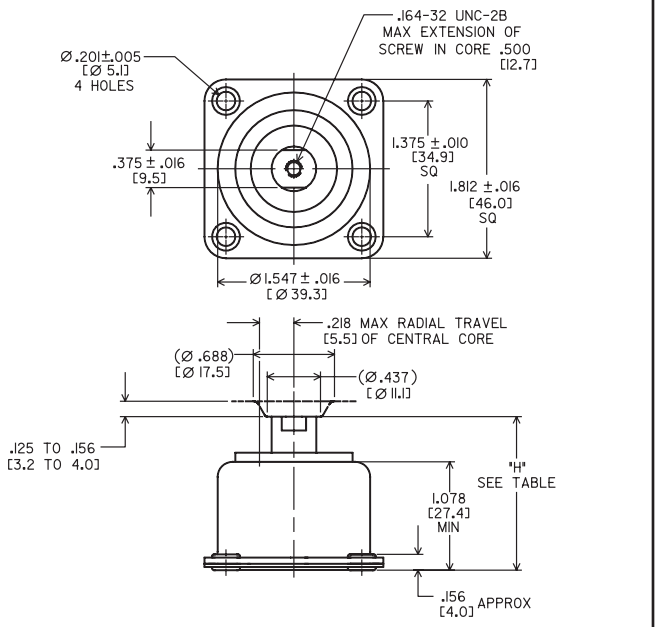


L21-BA MOUNT	
HEIGHT OF ALUMINUM CORE (Inches) ("H")	
Compressed	.219 (min.)
Under min. load	0.50 (approx.)
Extended	.703 (max.)

L22-BA MOUNT	
HEIGHT OF ALUMINUM CORE (Inches) ("H")	
Compressed	.719 (min.)
Under min. load	1.00 (approx.)
Extended	1.172 (max.)

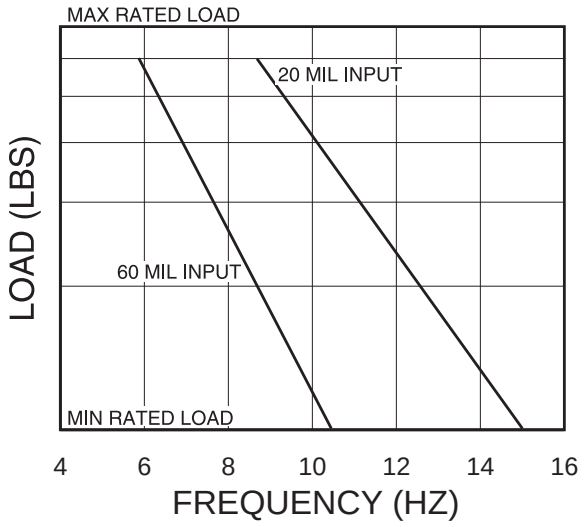
Dimensions & Performance Characteristics

L44 Dimensional Drawing



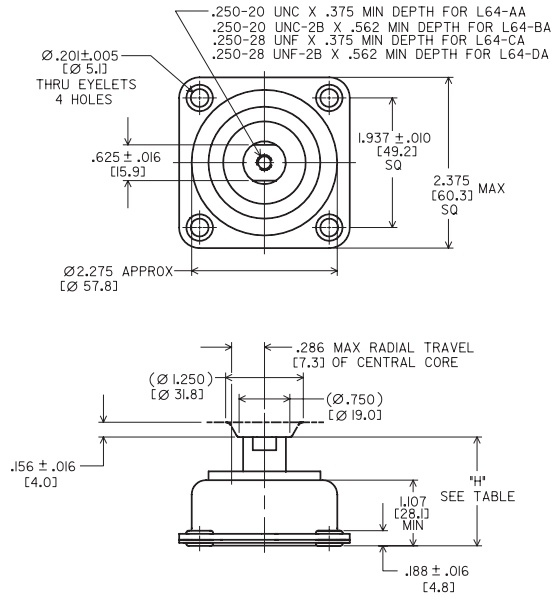
L44 MOUNT	L44-AA	L44-BA
HEIGHT OF ALUMINUM CORE (Inches) ("H")		
Compressed (min.)	.975	1.131
Under min. load (approx.)	1.375	1.562
Extended (max.)	1.632	1.788

L44 Load vs. Natural Frequency



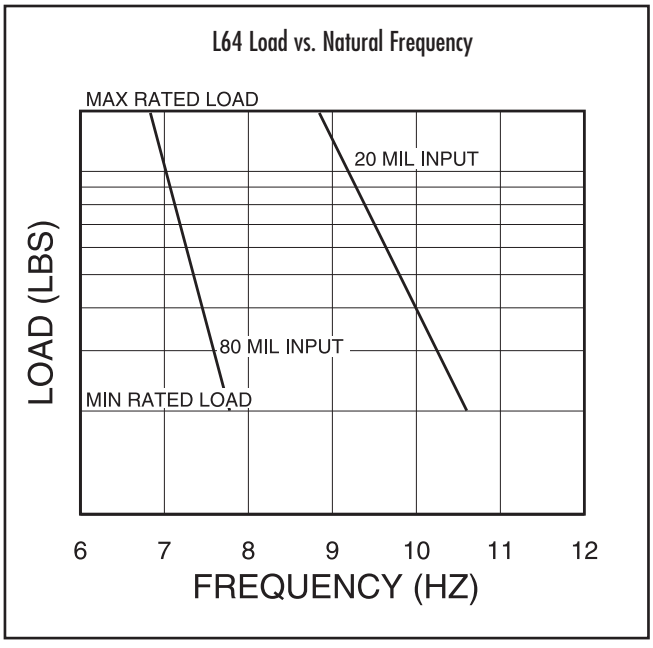
Dimensions & Performance Characteristics

L64 Dimensional Drawing



L64 MOUNT	L64-AA+CA	L64-BA+DA
HEIGHT OF ALUMINUM CORE (Inches) ("H")		
Compressed (min.)	.982	1.148
Under min. load (approx.)	1.406	1.562
Extended (max.)	1.540	1.706

L64 Load vs. Natural Frequency



L64 Series Mount

Load Range & MS Specifications

LOAD RANGES (L21/L22/L44 SERIES)	
Part #	Static Load/Isolator
L21 & L22-BA-0.5	0.38-0.54 lbs.
L21 & L22-BA-0.7	0.44-0.75 lbs.
L21 & L22-BA-1.0	0.56-1.00 lbs.
L21 & L22-BA-1.3	0.88-1.30 lbs.
L21 & L22-BA-2.0	1.20-2.00 lbs.
L21 & L22-BA-3.0	1.70-3.00 lbs.
L21 & L22-BA-4.0	2.50-4.00 lbs.
L44-AA-.5 & BA-.5	0.25-.50 lbs.
L44-AA-1 & BA-1	0.50-1.00 lbs.
L44-AA-2 & BA-2	1.0-2.0 lbs.
L44-AA-3 & BA-3	1.50-3.0 lbs.
L44-AA-4 & BA-4	2.0-4.0 lbs.
L44-AA-5 & BA-5	2.5-5.0 lbs.
L44-AA-10 & BA-10	5.0-10.0 lbs.
L64-AA-4, BA-4, CA-4 & DA-4	2.0-4.5 lbs.
L64-AA-6, BA-6, CA-6 & DA-6	3.0-6.0 lbs.
L64-AA-10, BA-10, CA-10 & DA-10	4.5-10.0 lbs.
L64-AA-12, BA-12, CA-12 & DA-12	6.25-12.5 lbs.
L64-AA-16, BA-16, CA-16 & DA-16	9.0-16.0 lbs.
L64-AA-20, BA-20, CA-20 & DA-20	10.0-20.0 lbs.
L64-AA-40, BA-40, CA-40 & DA-40	20.0-40.0 lbs.

L64 Series Load Range, "H" Dimension and MS Designation

**Military designation load ranges are tighter than Barry Standard*

Part #	*Load Range (lbs.)	*Military Designation	"H"
L64-AA-4 L64-BA-4 L64-CA-4 L64-DA-4	1.91-2.59 1.91-2.59 1.91-2.59 1.91-2.59	MS91418-2BAL MS91418-2BAS MS91418-2BAD MS91418-2BAH	1.405 1.571 1.405 1.571
L64-AA-4 L64-BA-4 L64-CA-4 L64-DA-4	2.0-4.5 2.0-4.5 2.0-4.5 2.0-4.5	MS91418-2AAL MS91418-2AAS MS91527-2AAD MS91527-2AAH	1.399 1.565 1.399 1.565
L64-AA-4 L64-BA-4 L64-CA-4 L64-DA-4	2.55-3.45 2.55-3.45 2.55-3.45 2.55-3.45	MS91418-2BBL MS91418-2BBS MS91527-2BBD MS91527-2BBH	1.352 1.518 1.352 1.518
L64-AA-6 L64-BA-6 L64-CA-6 L64-DA-6	3.0-5.0 3.0-5.0 3.0-5.0 3.0-5.0	MS91418-2ABL MS91418-2ABS MS91527-2ABD MS91527-2ABH	1.390 1.556 1.390 1.556
L64-AA-6 L64-BA-6 L64-CA-6 L64-DA-6	3.40-4.60 3.40-4.60 3.40-4.60 3.40-4.60	MS91418-2BCL MS91418-2BCS MS91527-2BCD MS91527-2BCH	1.365 1.561 1.365 1.561
L64-AA-10 L64-BA-10 L64-CA-10 L64-DA-10	4.5-10.0 4.5-10.0 4.5-10.0 4.5-10.0	MS91418-2ACL MS91418-2ACS MS91527-2ACD MS91527-2ACH	1.395 1.561 1.395 1.561
L64-AA-10 L64-BA-10 L64-CA-10 L64-DA-10	4.67-6.33 4.67-6.33 4.67-6.33 4.67-6.33	MS91418-2BDL MS91418-2BDS MS91527-2BDD MS91527-2BDH	1.392 1.558 1.392 1.558
L64-AA-10 L64-BA-10 L64-CA-10 L64-DA-10	6.37-8.63 6.37-8.63 6.37-8.63 6.37-8.63	MS91418-2BEL MS91418-2BES MS91527-2BED MS91527-2BEH	1.362 1.528 1.362 1.528
L64-AA-12 L64-BA-12 L64-CA-12 L64-DA-12	6.25-12.50 6.25-12.50 6.25-12.50 6.25-12.50	MS91418-2ADL MS91418-2ADS MS91527-2ADD MS91527-2ADH	1.372 1.538 1.372 1.538
L64-AA-12 L64-BA-12 L64-CA-12 L64-DA-12	8.50-11.50 8.50-11.50 8.50-11.50 8.50-11.50	MS91418-2BFL MS91418-2BFS MS91527-2BFD MS91527-2BFH	1.339 1.505 1.339 1.505
L64-AA-16 L64-BA-16 L64-CA-16 L64-DA-16	9.0-16.0 9.0-16.0 9.0-16.0 9.0-16.0		1.323 1.489 1.323 1.489
L64-AA-20 L64-BA-20 L64-CA-20 L64-DA-20	10.0-20.0 10.0-20.0 10.0-20.0 10.0-20.0	MS91418-2AEL MS91418-2AES MS91527-2AED MS91527-2AEH	1.391 1.557 1.391 1.557
L64-AA-20 L64-BA-20 L64-CA-20 L64-DA-20	11.48-15.53 11.48-15.53 11.48-15.53 11.48-15.53	MS91418-2BGL MS91418-2BGS MS91527-2BGD MS91527-2BGH	1.366 1.532 1.366 1.532
L64-BA-20 L64-DA-20	15.30-20.70 15.30-20.70	MS91418-2BHL MS91527-2BHD	1.406 1.406
L64-AA-40 L64-BA-40 L64-CA-40 L64-DA-40	20.0-40.0 20.0-40.0 20.0-40.0 20.0-40.0		1.400 1.566 1.400

Load Range & MS Specifications

Load Range in Pounds	Military** Designation	Barry Type No.	Weight ounces	H dimension (tolerance ± .045") Under Min. rated load	Maximum extended*	Minimum compressed*
0.25 - 0.50	See note	L44-AA-1/2	1 7/16	1.371	1.632	0.975
0.25 - 0.50	See note	L44-BA-1/2	1 1/2	1.527	1.788	1.131
0.17 - 0.23	MS91418-1BAL MS91527-1BAD	L44-CA-1/2	1 7/16	1.395	1.594	0.937
0.17 - 0.23	MS91418-1BAS MS91527-1BAH	L44-BA-1/2	1 1/2	1.589	1.788	1.131
0.25 - 0.35	MS91418-1BBL MS91527-1BBD	L44-AA-1/2	1 7/16	1.392	1.632	0.975
0.25 - 0.35	MS91418-1BBS MS91527-1BBH	L44-BA-1/2	1 1/2	1.562	1.788	1.131
0.34 - 0.46	MS91418-1BCL MS91527-1BCD	L44-AA-1/2	1 7/16	1.347	1.632	0.975
0.34 - 0.46	MS91418-1BCS MS91527-1BCH	L44-BA-1/2	1 1/2	1.520	1.788	1.131
0.50 - 1.00	See note	L44-AA-1	1 7/16	1.389	1.632	0.975
0.50 - 1.00	See note	L44-BA-1	1 1/2	1.545	1.788	1.131
0.51 - 0.69	MS91418-1BDL MS91527-1BDD	L44-AA-1	1 7/16	1.395	1.632	0.975
0.51 - 0.69	MS91418-1BDS MS91527-1BDH	L44-BA-1	1 1/2	1.562	1.788	1.131
0.68 - 0.92	MS91418-1BEL MS91527-1BED	L44-AA-1	1 7/16	1.352	1.632	0.975
0.68 - 0.92	MS91418-1BES MS91527-1BEH	L44-BA-1	1 1/2	1.526	1.788	1.131
0.85 - 1.15	MS91418-1BFL MS91527-1BFD	L44-AA-1	1 7/16	1.342	1.632	0.975
0.85 - 1.15	MS91418-1BFS MS91527-1BFH	L44-BA-1	1 1/2	1.501	1.788	1.131
1.00 - 2.00	See note	L44-AA-2	1 7/16	1.404	1.632	0.975
1.00 - 2.00	See note	L44-BA-2	1 1/2	1.566	1.788	1.131
1.16 - 1.58	MS91418-1BGL MS91527-1BGD	L44-AA-2	1 7/16	1.376	1.632	0.975
1.16 - 1.58	MS91418-1BGS MS91527-1BGH	L44-BA-2	1 1/2	1.562	1.788	1.131
1.48 - 2.01	MS91418-1BHL MS91527-1BHD	L44-AA-2	1 7/16	1.335	1.632	0.975
1.48 - 2.01	MS91418-1BHS MS91527-1BHH	L44-BA-2	1 1/2	1.525	1.788	1.131
1.50 - 3.00	See note	L44-AA-3	1 1/2	1.404	1.632	0.975
1.50 - 3.00	See note	L44-BA-3	1 9/16	1.566	1.788	1.131
1.50 - 3.00	MS91418-1AAL MS91527-1AAD	L44-AA-3	1 1/2	1.404	1.632	0.975
1.50 - 3.00	MS91418-1AAS MS91527-1AAH	L44-BA-3	1 9/16	1.562	1.788	1.131
2.01 - 2.73	MS91418-1BJL MS91527-1BJD	L44-AA-3	1 1/2	1.346	1.632	0.975
2.01 - 2.73	MS91418-1BJS MS91527-1BJH	L44-BA-3	1 9/16	1.562	1.788	1.131
2.00 - 4.00	See note	L44-AA-4	1 1/2	1.401	1.632	0.975
2.00 - 4.00	See note	L44-BA-4	1 9/16	1.557	1.788	1.131
2.76 - 3.73	MS91418-1BKL MS91527-1BKD	L44-AA-4	1 1/2	1.349	1.632	0.975
2.76 - 3.73	MS91418-1BKS MS91527-1BKH	L44-BA-4	1 9/16	1.524	1.788	1.131
2.50 - 5.00	See note	L44-AA-5	1 1/2	1.393	1.632	0.975
2.50 - 5.00	See note	L44-BA-5	1 9/16	1.549	1.788	1.131
2.50 - 5.50	MS91418-1ABL MS91527-1ABD	L44-AA-5	1 1/2	1.393	1.632	0.975
2.50 - 5.50	MS91418-1ABS MS91527-1ABH	L44-BA-5	1 9/16	1.562	1.788	1.131
3.61 - 4.89	MS91418-1BLL MS91527-1BLD	L44-AA-5	1 1/2	1.338	1.632	0.975
3.61 - 4.89	MS91418-1BLS MS91527-1BLH	L44-BA-5	1 9/16	1.523	1.788	1.131
5.00 - 10.00	See note	L44-AA-10	1 1/2	1.395	1.632	0.975
5.00 - 10.00	See note	L44-BA-10	1 9/16	1.551	1.788	1.131
4.89 - 6.61	MS91418-1BML MS91527-1BMD	L44-AA-10	1 1/2	1.399	1.632	0.975
4.89 - 6.61	MS91418-1BMS MS91527-1BMH	L44-BA-10	1 9/16	1.562	1.788	1.131
6.58 - 8.91	MS91418-1BNL MS91527-1BND	L44-AA-10	1 1/2	1.379	1.632	0.975
6.58 - 8.91	MS91418-1BNS MS91527-1BNH	L44-BA-10	1 9/16	1.535	1.788	1.131
8.50 - 11.50	MS91418-1BOL MS91527-1BOD	L44-AA-10	1 1/2	1.343	1.632	0.975
8.50 - 11.50	MS91418-1BOS MS91527-1BOH	L44-BA-10	1 9/16	1.501	1.788	1.131

NOTE: All standard l44 Barrymounts have a 2-to-1 load range to meet performance requirements of Spec. MIL-C-172C and are designated -AA and -BA in table above. Other designations listed above are designed to meet Class B requirements of Spec. MIL-C-172C for specified load rating (± 15%).

** Parts will not be stamped with military designation unless specifically requested.

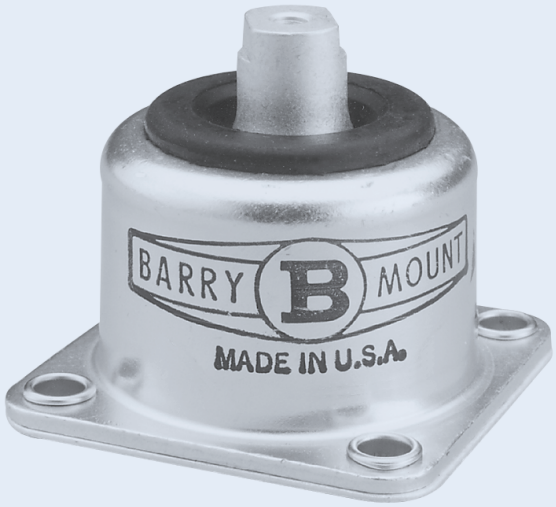
* Under 15-times maximum rated load.

H-MOUNT SERIES (H44/H64)

Low-frequency, friction damped mounts for high level vibration isolation and shock protection in rotary wing aircraft.

APPLICATIONS

- Avionic equipment in propeller driven aircraft
- Sensitive instrumentation and medical equipment
- Stationary applications where cost effective, low frequency isolation is required



Barry H-Mounts are ideally suited for protecting equipment in helicopters or similar environments where high amplitude, low frequency vibration is predominant.

FEATURES

- Axial to radial stiffness ratio of 4:1
- Friction damped spring
- For base mounting only
- Fail safe construction

BENEFITS

- Ideally suited for protecting equipment in helicopters or similar environments where high-amplitude, low frequency vibration is predominant
- Increased equipment reliability and extended component life

LOAD RANGE

- H44 = 7 ratings from .25-10 lbs. per mount
- H64 = 7 load ratings from 2.0-40 lbs. per mount

Specifications

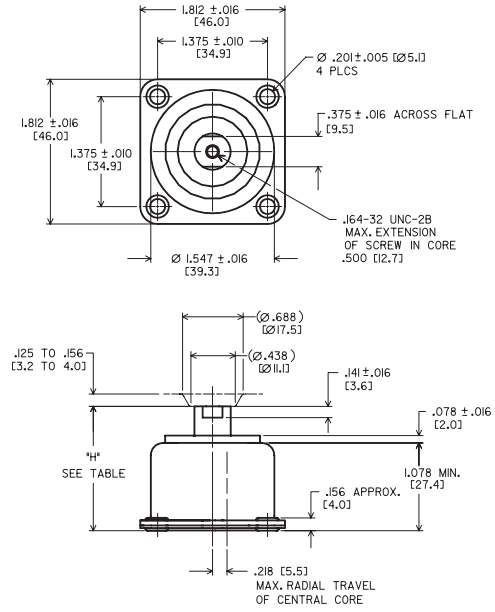
• Natural Frequency	7-10 Hertz
• Transmissibility at resonance	2.0 Max.
• Resilient Element	Friction damped spring
• Standard Materials	Aluminum
• Weight	H44 = 1.63 oz. H64 = 3.56 oz.

Environmental Data

- Operating temperature ranges of -67°F to +250°F (-55°C to +120°C).
- Designed for the rotary wing vibration requirements of MIL-STD-810B.
- Performs in attitudes up to 10° from horizontal.
- Meets vibration and shock requirements of Mil-C-172C.

Dimensions & Performance Characteristics

H44 Dimensional Drawing

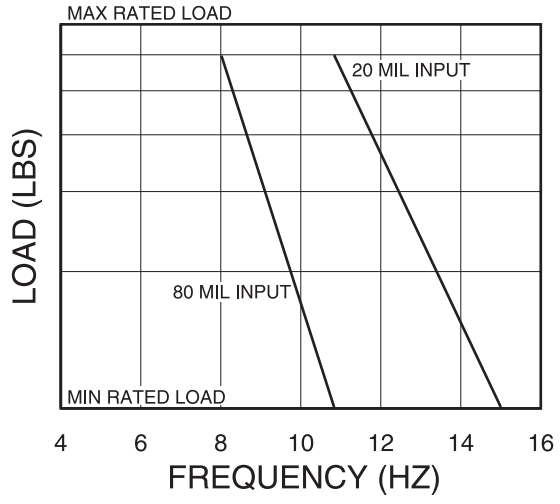


"H"		
TYPE	H44-AA	H44-BA
MIN. COMPRESSED	.98[24.9]	1.13 [28.7]
APPROX. UNDER MIN. LOAD	1.40 [35.6]	1.56 [39.6]
MAX. EXTENDED	1.63 [41.4]	1.79 [45.5]

LOAD RANGES

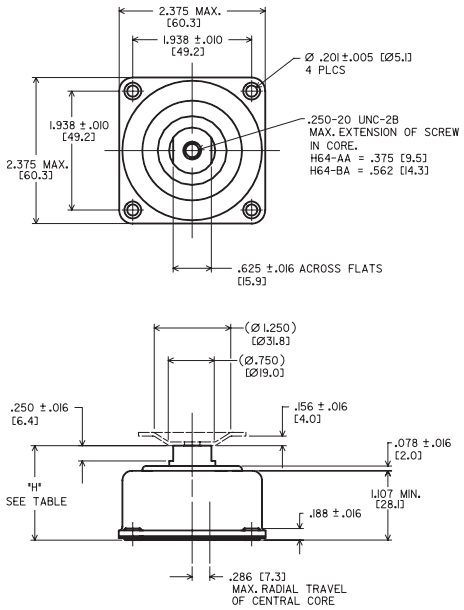
Part #	Static Load Range (lbs.)
H44-AA-1/2 & BA-1/2	0.25 - 0.5
H44-AA-1 & BA-1	0.5 - 1.0
H44-AA-2 & BA-2	1.0 - 2.0
H44-AA-3 & BA-3	1.5 - 3.0
H44-AA-4 & BA-4	2.0 - 4.0
H44-AA-6 & BA-6	4.0 - 6.0
H44-AA-10 & BA-10	5.0 - 10.0

H44 Load vs Natural Frequency



Dimensions & Performance Characteristics

H64 Dimensional Drawing

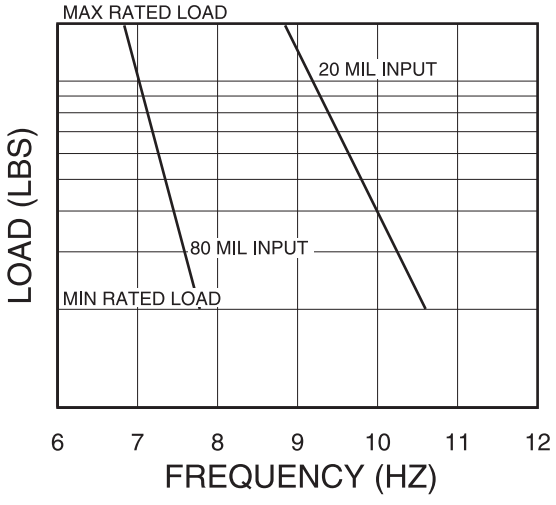


"H"		
TYPE	H64-AA	H64-BA
MIN. COMPRESSED	.98 [24.9]	1.14 [29.0]
APPROX. UNDER MIN. LOAD	1.41 [35.8]	1.57 [39.9]
MAX. EXTENDED	1.54 [39.1]	1.70 [43.2]

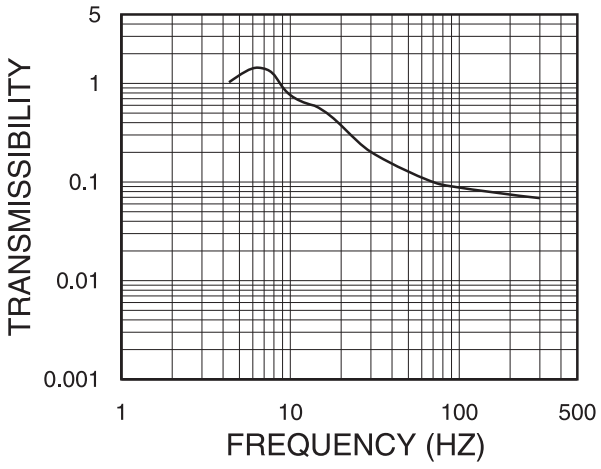
LOAD RANGES

Part #	Static Load Range (lbs.)
H64-AA-4 & BA-4	2-4
H64-AA-6 & BA-6	3-6
H64-AA-10 & BA-10	5-10
H64-AA-15 & BA-15	9-15
H64-AA-20 & BA-20	14-20
H64-AA-30 & BA-30	18-30
H64-AA-40 & BA-40	25-40

H64 Load vs Natural Frequency



Typical Transmissibility (H44 & H64 Series)



T-MOUNT SERIES (T22/T44/T64/T94)

General purpose, all-attitude isolators for mounting aircraft, shipboard or vehicular equipment.

APPLICATIONS

- Shipboard electronics
- Missile electronics
- Racking systems
- Aircraft & mobile applications
- Avionics & electronics

Barry T-Mounts are general purpose isolators for mounting aircraft, shipboard or vehicular equipment in any attitude. They are ideally suited for applications requiring high frequency vibration isolation with low resonant amplification.

FEATURES

- Fail safe, all-attitude isolators
- Meets crash safety requirements of MIL-E-5400 (30g 11 millisecond half-sine pulse shock)
- Axial to radial stiffness of 1:1
- Isolates under sustained loadings of up to 5g's

BENEFITS

- Provides efficient vibration isolation at frequencies above 40 hertz
- Increased equipment reliability and extended component life

LOAD RANGE

- T22 = 4 ratings to 5 lbs. per mount
- T44 = 3 ratings to 20 lbs. per mount
- T64 = 3 ratings to 80 lbs. per mount
- T94 = 2 ratings to 150 lbs. per mount

Specifications

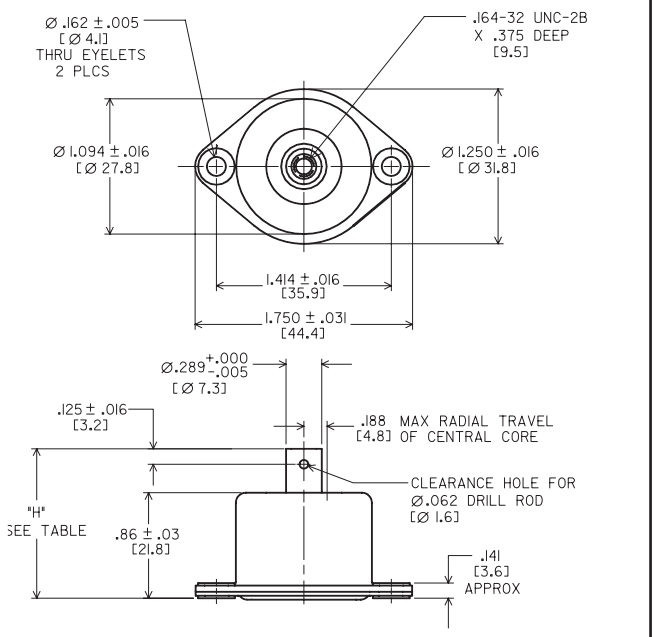
• Natural Frequency	15-40 Hertz
• Transmissibility at resonance	4.0 Max.
• Resilient Element	Hi-Damp Silicone
• Standard Materials	Varies with model
• Weight	T22 = 1.1 oz. T44 = 2.8 oz. T64 = 5.3 oz. T94 = 14.2 oz.

Environmental Data

- Hi-Damp Silicone exceeds the temperature requirements of MIL-E-5400 (-67°F to +300°F or -55°C to +150°C) operational and (-100°F to +300°F or -75°C to +150°C) storage.
- Meets MIL-E-5400 requirements for resistance to ozone, humidity, salt spray and fungus.
- Meets MIL-S-901 lightweight Grade B Navy high impact shock test requirements.

Dimensions & Performance Characteristics

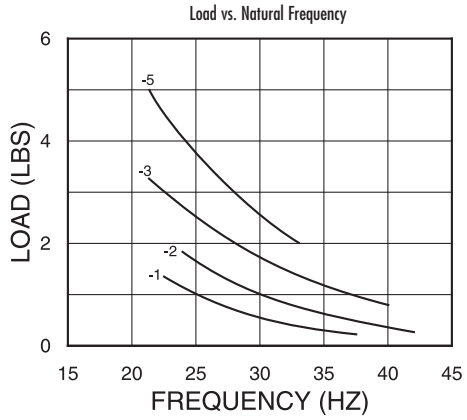
T22 Dimensional Drawing

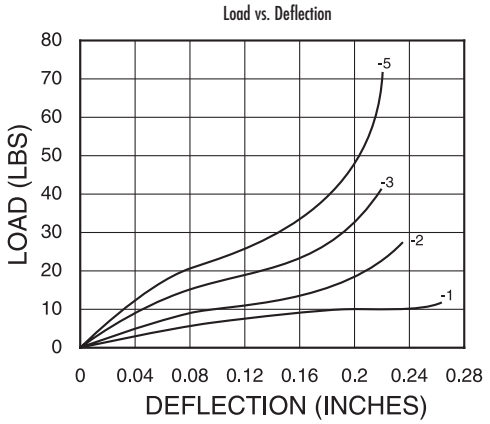


T22 SERIES "H" DIMENSION	
Compressed	.91
Approx. Free	1.22
Max. Extended	1.56

T22 SERIES LOAD RANGE DATA	
Part #	Max. Load/Isolator
T22-AB-1	1 lb.
T22-AB-2	2 lbs.
T22-AB-3	3 lbs.
T22-AB-5	5 lbs.

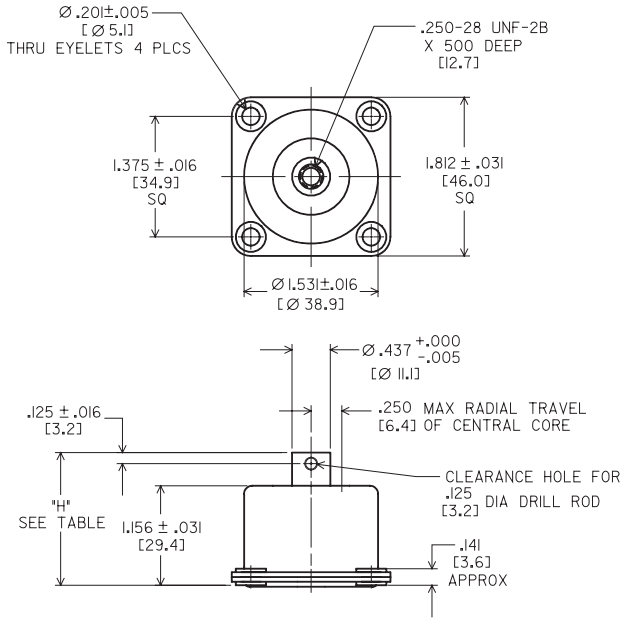
T22 Performance Data





Dimensions & Performance Characteristics

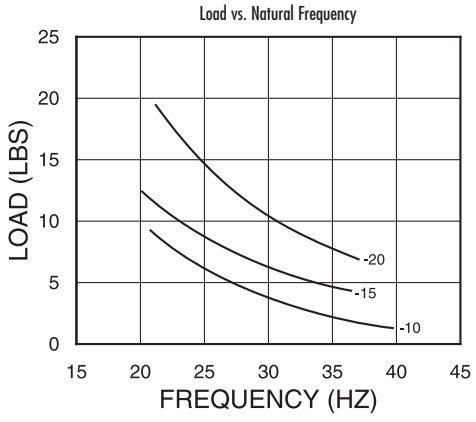
T44 Dimensional Drawing

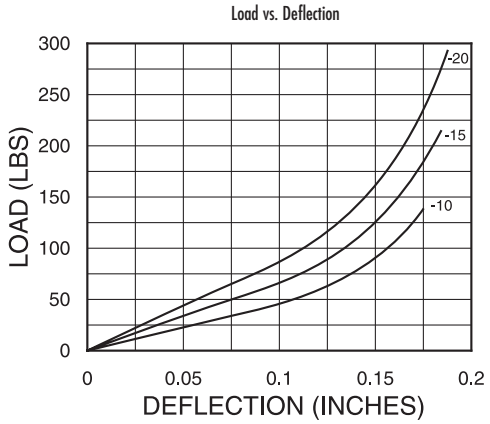


T44 SERIES "H" DIMENSION	
Compressed	1.19
Approx. Free	1.50
Max. Extended	1.88

T44 SERIES LOAD RANGE DATA	
Part #	Max. Load/Isolator
T44-AB-10	10 lbs.
T44-AB-15	15 lbs.
T44-AB-20	20 lbs.

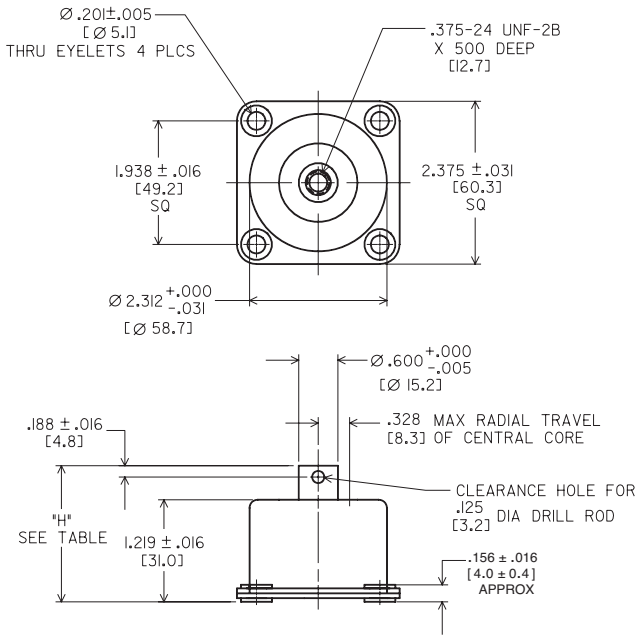
T44 Performance Data





Dimensions & Performance Characteristics

T64 Dimensional Drawing

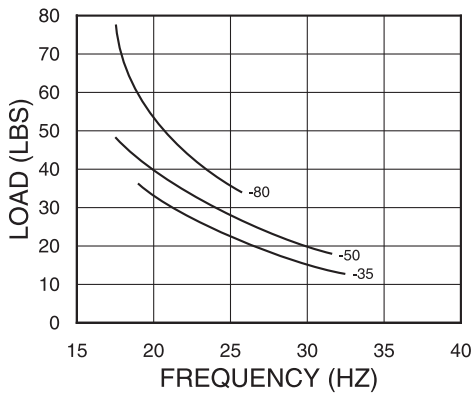


T64 SERIES "H" DIMENSION	
Compressed	1.25
Approx. Free	1.62
Max. Extended	1.94

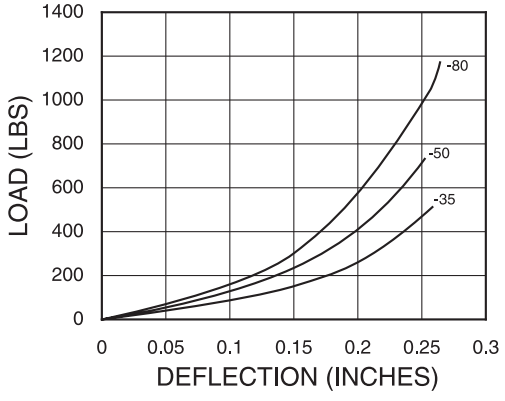
T64 SERIES LOAD RANGE DATA	
Part #	Max. Load/Isolator
T64-AB-35	35 lbs.
T64-AB-50	50 lbs.
T64-AB-80	80 lbs.

T64 Performance Data

Load vs. Natural Frequency

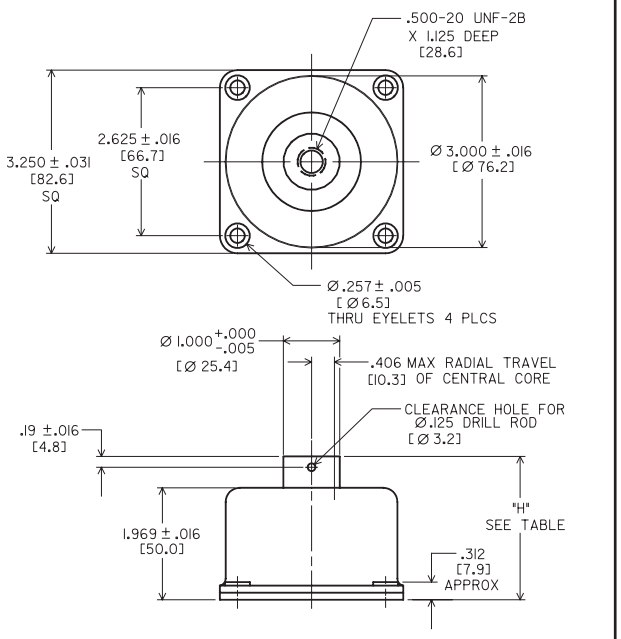


Load vs. Deflection



Dimensions & Performance Characteristics

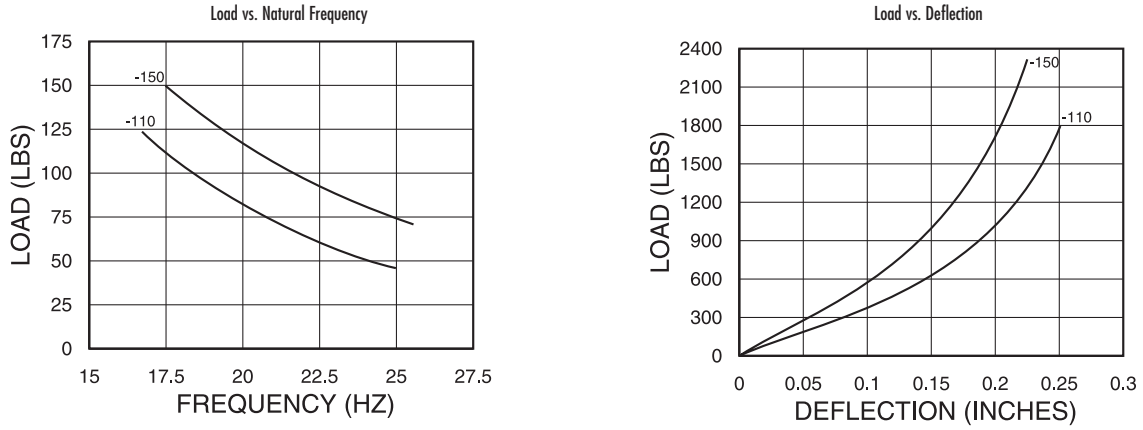
T94 Dimensional Drawing



T94 SERIES "H" DIMENSION	
Compressed	2.13
Approx. Free	2.54
Max. Extended	3.06

T94 SERIES LOAD RANGE DATA	
Part #	Max. Load/Isolator
T94-AB-110	110 lbs.
T94-AB-150	150 lbs.

T94 Performance Data

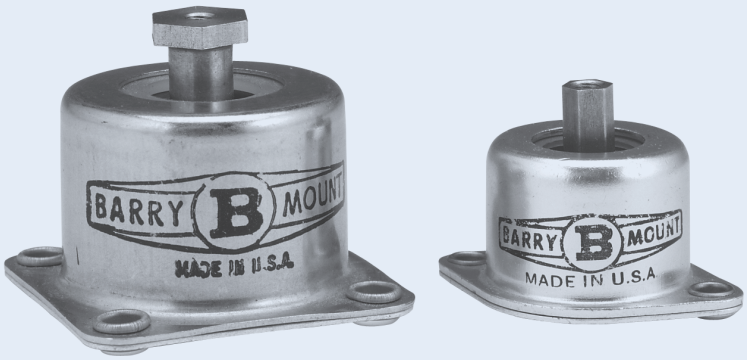


B-MOUNT SERIES (B22/B44/B64/B43)

All-attitude, highly damped mounts for protection of equipment from vibration, shock during steady-state acceleration.

APPLICATIONS

- Avionics in high performance aircraft
- Electronics in transportable shelters
- Mobile ground equipment



Barry B-Mounts provide shock and vibration isolation for avionic equipment in high performance aircraft. They feature low resonant transmissibility and isolate high frequency vibration without snubbing during high "g" maneuvers.

FEATURES

- Low resonant transmissibility
- Metal spring with friction damping
- All-attitude mounting
- Aluminum or stainless steel outer cup and core
- Fail safe construction
- Axial to radial stiffness of 1:1

BENEFITS

- Continuous isolation even under loads of up to 5g's
- Interchangeable with MIL size counterparts

LOAD RANGE

- B21/22 = 4 ratings to 3 lbs. per mount
- B43/44 = 5 ratings to 10 lbs. per mount
- B64 = 4 ratings to 40 lbs. per mount

Specifications

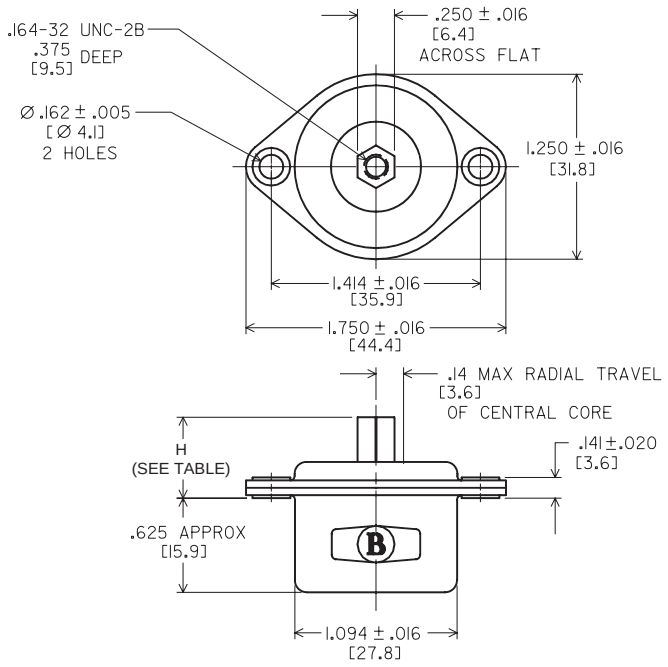
• Natural Frequency	15-30 Hertz
• Transmissibility at resonance	3.0 Max.
• Resilient Element	Friction damped spring
• Standard Materials	Varies w/model
• Weight	See Tables

Environmental Data

- Operating temperature range -85°F to +250°F (-65°C to +120°C).
- Meets strength, corrosion resistance and environmental requirements of MIL-E-5272, MIL-E-5400 and MIL-STD-810.

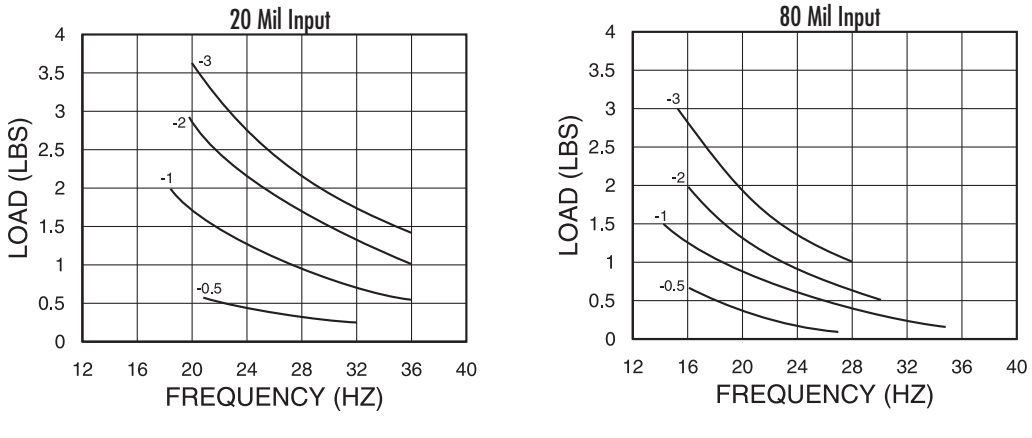
Dimensions & Performance Characteristics

B21 Dimensional Drawing



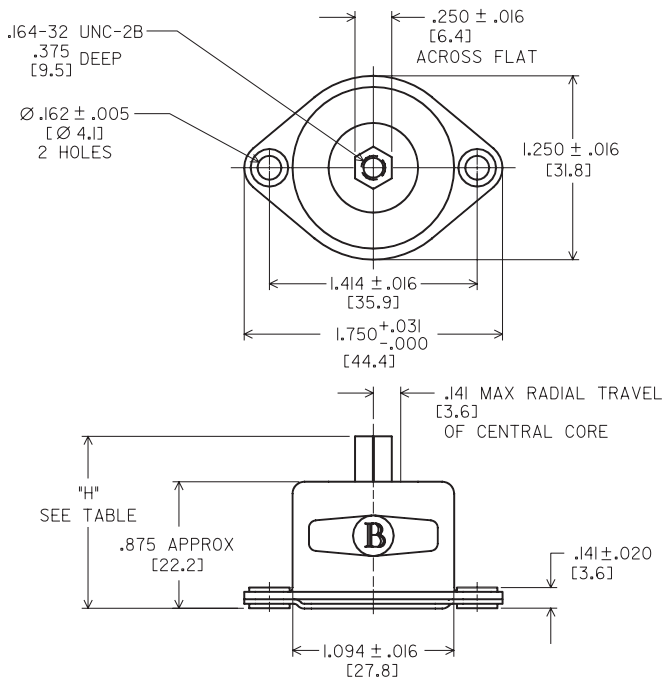
B21 SERIES "H" DIMENSION	
Compressed	.266
Approx. Free	.547
Max. Extended	.813

B21 Load vs. Natural Frequency



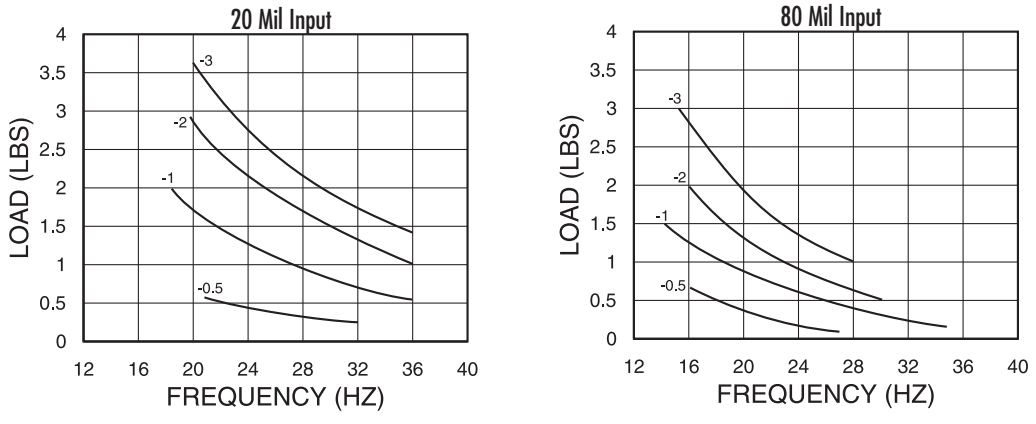
Dimensions & Performance Characteristics

B22 Dimensional Drawing



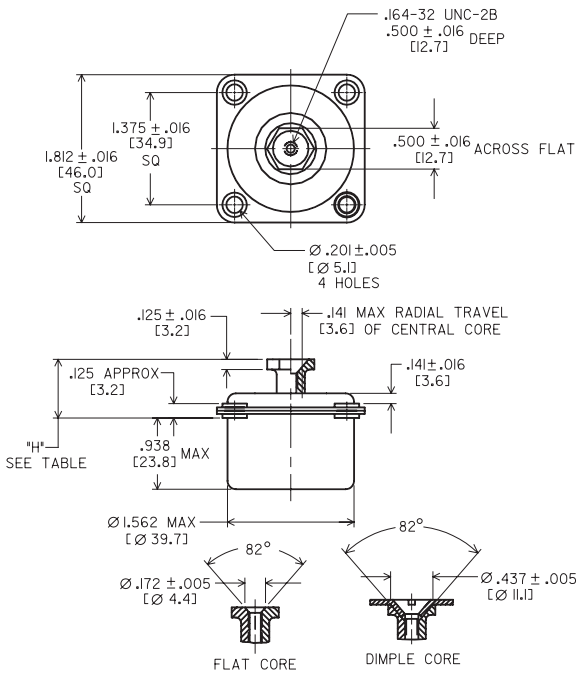
B22 SERIES "H" DIMENSION	
Compressed	.891
Approx. Free	1.172
Max. Extended	1.438

B22 Load vs. Natural Frequency



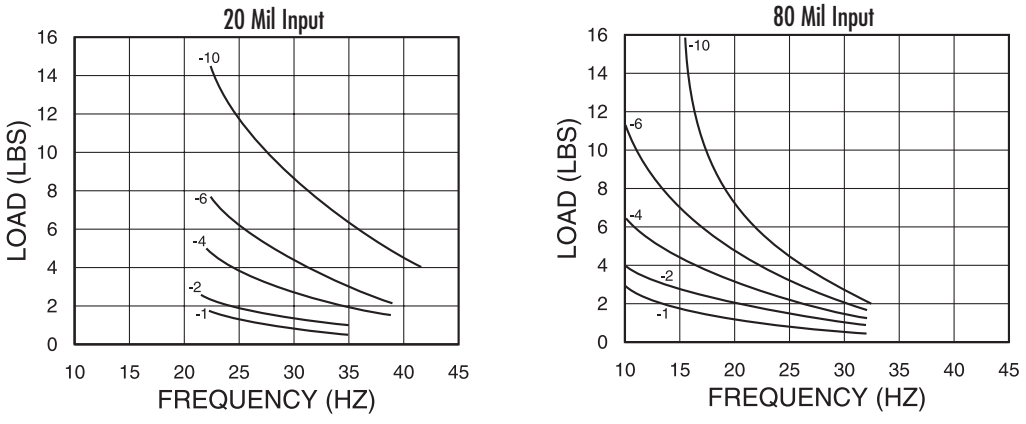
Dimensions & Performance Characteristics

B43 Dimensional Drawing



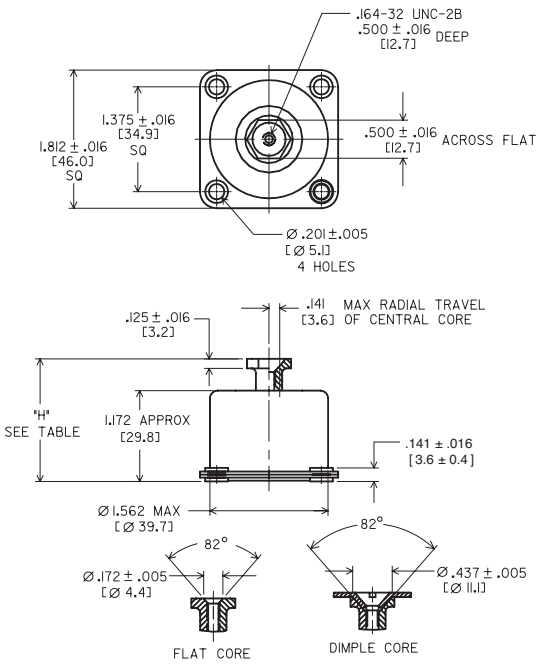
B43 SERIES "H" DIMENSION	
Compressed	.344
Approx. Free	.672
Max. Extended	.953

B43 Load vs. Natural Frequency



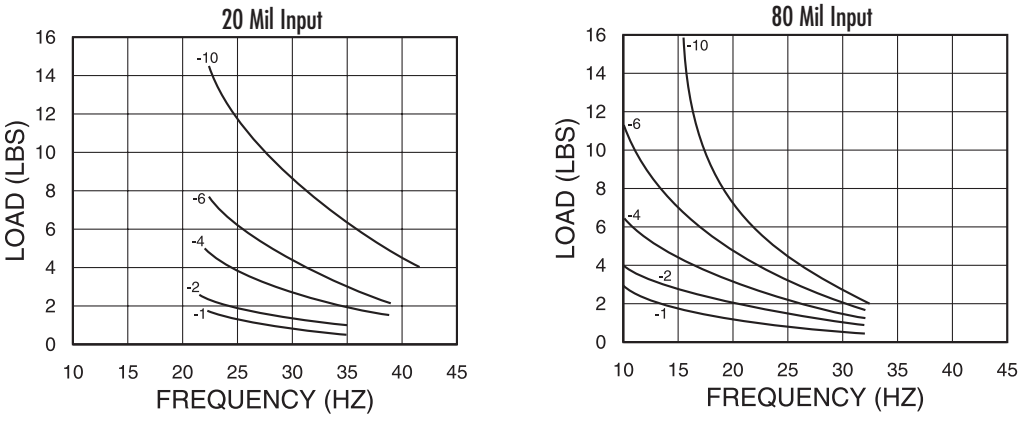
Dimensions & Performance Characteristics

B44 Dimensional Drawing



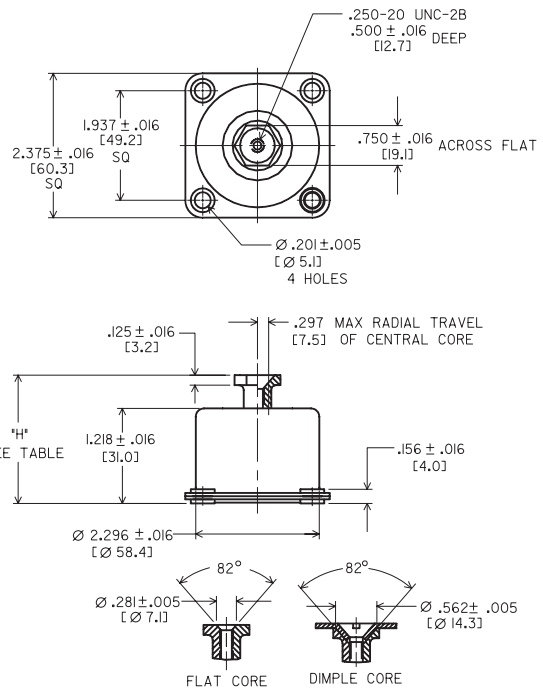
B44 SERIES "H" DIMENSION	
Compressed	1.328
Approx. Free	1.578
Max. Extended	1.858

B44 Load vs. Natural Frequency



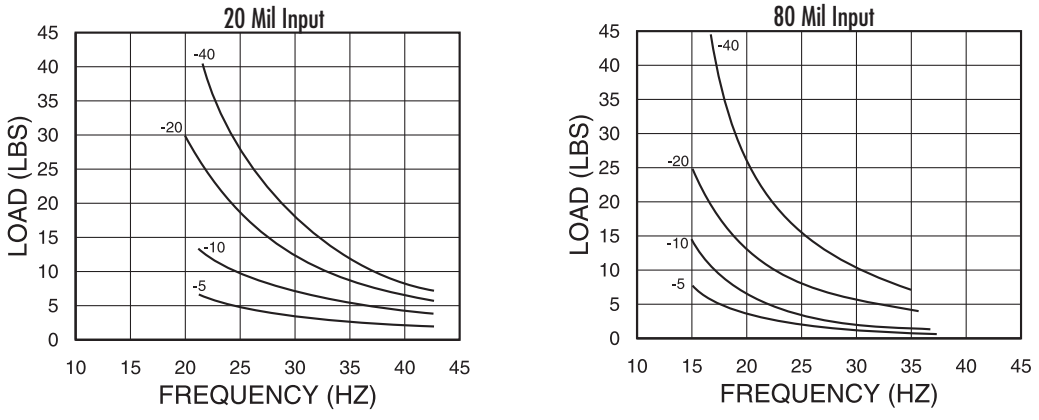
Dimensions & Performance Characteristics

B64 Dimensional Drawing



B64 SERIES "H" DIMENSION	
Compressed	1.312
Approx. Free	1.531
Max. Extended	1.828

B64 Load vs. Natural Frequency



Load Range (B-Series) & "H" Dimensions

CUP TYPE					
Flat Core	Dimple Core	Height	Max. S.A Def.	Weight	Max. Static Load
B22-BC-0.5 B22-BC-1.0 B22-BC-2.0 B22-BC-3.0	Not Available	1.17"	.25"	.05 lbs.	0.5 lbs. 1.0 lbs. 2.0 lbs. 3.0 lbs.
B44-EB-1 B44-EB-2 B44-EB-4 B44-CB-6 B44-CB-10	B44-DB-1 B44-DB-2 B44-DB-4 B44-BB-6 B44-BB-10	1.58"	.25"	.16 lbs.	1.0 lbs. 2.0 lbs. 4.0 lbs. 6.0 lbs. 10.0 lbs.
B64-CB -5 B64-CB-10 B64-CB-20 B64-CB-40	B64-BB-5 B64-BB-10 B64-BB-20 B64-BB-40	1.53"	.25"	.44 lbs.	5.0 lbs. 10.0 lbs. 20.0 lbs. 40.0 lbs.
PLATE TYPE					
B21-BC-0.5 B21-BC-1.0 B21-BC-2.0 B21-BC-3.0	Not Available	.55"	.25"	.05 lbs.	0.5 lbs. 1.0 lbs. 2.0 lbs. 3.0 lbs.
B43-EB -1 B43-EB-2 B43-EB-4 B43-CB-6 B43-CB-10	B43-DB-1 B43-DB-2 B43-DB-4 B43-DB-6 B43-DB-10	.67"	.25"	.16 lbs.	1.0 lbs. 2.0 lbs. 4.0 lbs. 6.0 lbs. 10.0 lbs.

B64 Series Core				
Designation	Core Material	Core Thread	Core C'Sink ø	
BA	SST	COARSE	0.562	Dimple
CA	SST	COARSE	0.281	Flat
DA	SST	FINE	0.562	Dimple
EA	SST	FINE	0.281	Flat
BB	ALUM	COARSE	0.562	Dimple
CB	ALUM	COARSE	0.281	Flat
DB	ALUM	COARSE	0.562	Helicoil/Flat
EB	ALUM	FINE	0.281	Flat
FB	ALUM	FINE	0.652	Dimple

B43 & B44 Series Cores				
Designation	Core Material	Core Thread	Core C'Sink ø	
BB	SST	COARSE	0.437	Dimple
CB	SST	COARSE	0.172	Flat
DB	SST	COARSE	0.437	Dimple
EB	SST	COARSE	0.172	Flat
BC	ALUM	COARSE	0.437	Dimple
CC	ALUM	COARSE	0.172	Flat
DC	ALUM	COARSE	0.437	Dimple
EC	ALUM	COARSE	0.172	Flat

HIGH DEFLECTION MOUNTS

ME Mount Series (ME-100/ME-500)
TT-A Mount Series
TT-B Mount Series
HTTA Mount Series
VHC Mount Series
2K Mount Series (2K1/2K2/2KS)
GB530 Isolators
Barry-Flex Isolators

ME-MOUNT SERIES (ME100/ME500)

An effective isolation solution for installations where instrumentation is subjected to rugged environmental conditions.

APPLICATIONS

- Militarized computer installations (such as disk drives)
- Vehicular mounted equipment
- Avionics
- Lightweight electrical equipment

FEATURES

- Compact, low-profile design
- Available in two sizes
- High deflection capability and compact size for light loads
- Axial to radial stiffness ratio 2:1

BENEFITS

- Can be used in tandem for extended deflection capability

LOAD RANGE

- ME-100 = 5 load ratings to 10 lbs. per mount
- ME-500 = 5 load ratings to 10 lbs. per mount

ME Series Mounts are low frequency, free standing isolators which are environmentally resistant and operate over a wide temperature range. They are for use in isolating delicate instrumentation in mobile, military or office equipment applications.

Specifications

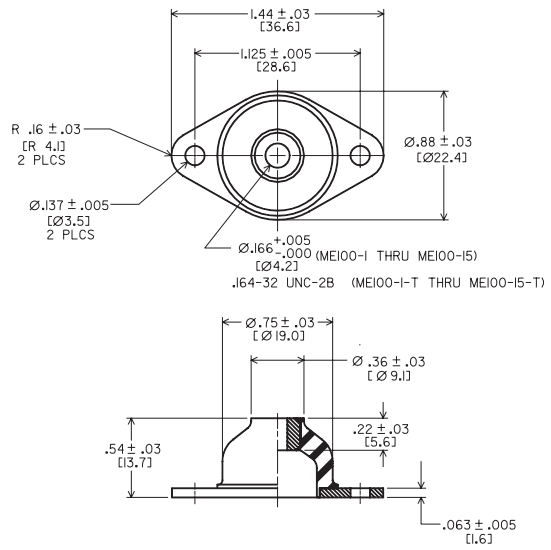
• Natural Frequency	12-20 Hertz
• Transmissibility at resonance	10 Max.
• Resilient Element	Neoprene
• Standard Materials	Aluminum
• Weight	ME-100 = 0.2 oz. ME-500 = 0.5 oz.

Environmental Data

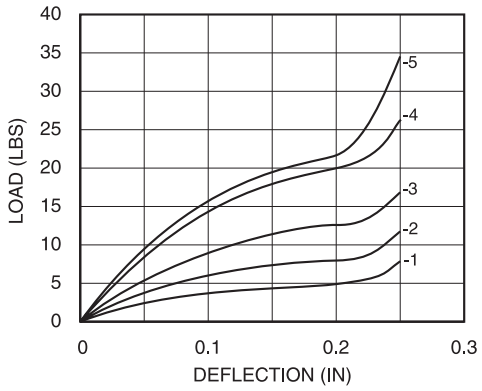
- Operating temperature range is -20°F to +180°F (-30°C to +82°C).
- Resistant to oil, most solvents and ozone.
- Butyl and Barry LT available on special order where high damping and extended temperature performance characteristics are required.

Dimensions & Load Range Specifications

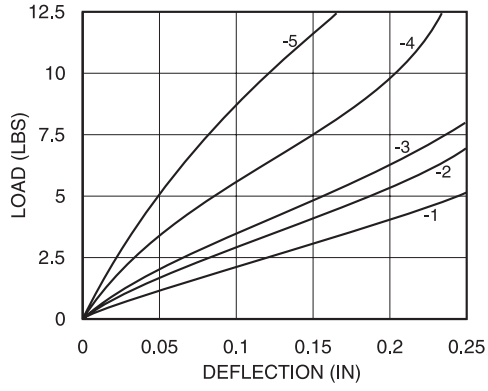
ME100 SERIES
Dimensional Drawing



ME-100 Axial Load vs. Deflection



ME-100 Radial Load vs. Deflection

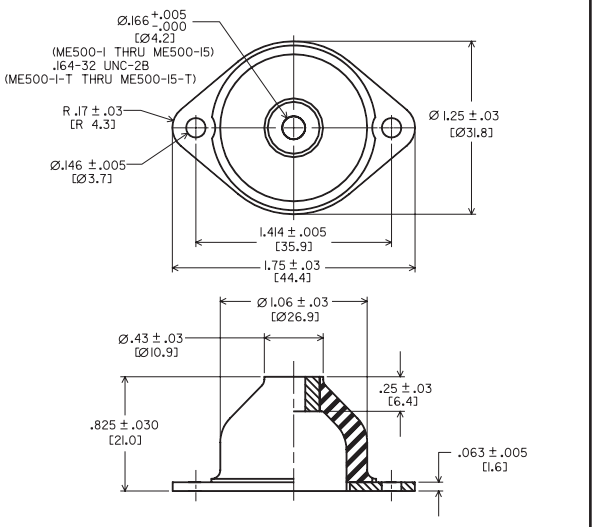


ME100 SERIES LOAD RATINGS

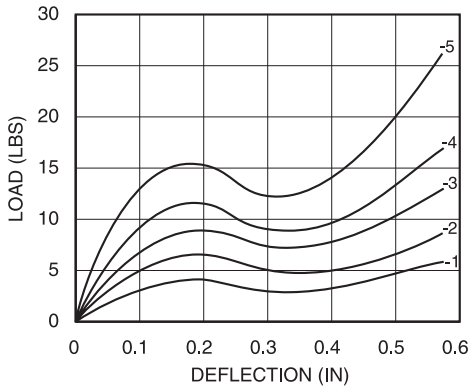
Part #	Maximum Load (lbs.)		Axial Natural Frequency	Color Code
	Axial Compression	Radial		
ME100-1	2.50	1.40	14 Hz	Blue
ME100-2	3.75	1.90	14 Hz	Red
ME100-3	4.25	2.75	16 Hz	Green
ME100-4	6.50	3.75	16 Hz	Yellow
ME100-5	10.00	6.25	16 Hz	White

Performance Characteristics

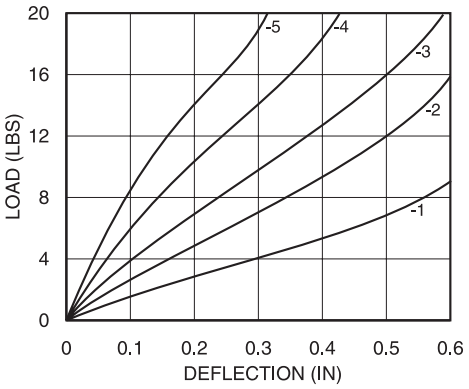
ME500 SERIES
Dimensional Drawing



ME-500 Axial Load vs. Deflection



ME500 Radial Load vs. Deflection



ME500 SERIES LOAD RATINGS

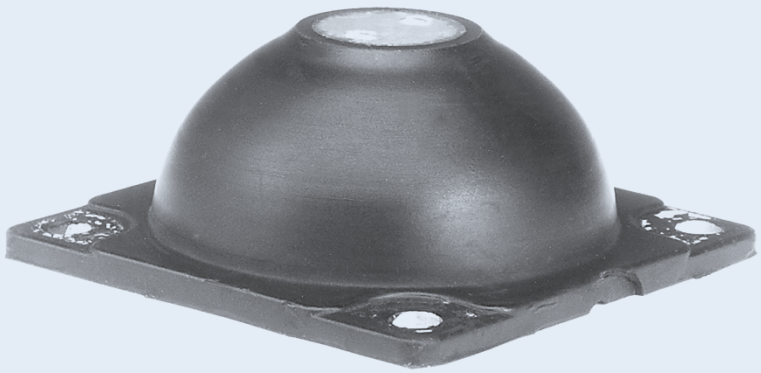
Part #	Maximum Load (lbs.)		Axial Natural Frequency	Color Code
	Axial Compression	Radial		
ME500-1	2.00	0.75	12 Hz	Blue
ME500-2	3.00	1.50	12 Hz	Red
ME500-3	5.00	2.25	12 Hz	Green
ME500-4	7.50	4.00	12 Hz	Yellow
ME500-5	10.00	5.50	12 Hz	White

TTA MOUNT SERIES

Mid-frequency, high deflection mounts for protection from severe vibration and shock.

APPLICATIONS

- Ruggedized disk drives
- Electronics for rotary wing and propeller driven aircraft
- Mobile ground equipment
- Other applications where high amplitude, low frequency vibration is present



The TT-A mount is a mid frequency isolator which combines a low profile and large deflection capability in order to provide both shock and vibration protection. The TT-A is ideal for applications where high amplitude vibration inputs are expected or where large shock deflections are needed.

FEATURES

- Available in Silicone or Neoprene
- Axial to radial stiffness of 1:1
- Mid frequency isolation
- Aluminum construction

BENEFITS

- Attenuates a 15g, 11 millisecond half-sine shock to 6g's
- Survives a 30g, 11 millisecond half-sine crash safety shock
- Lightweight & durable

LOAD RANGE

- 3 load ratings to 15 lbs. per mount

Specifications

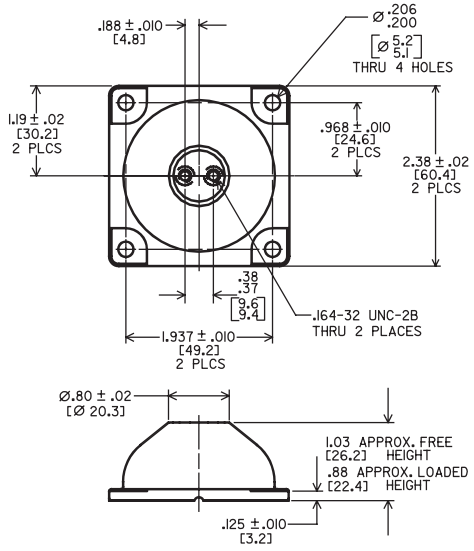
• Natural Frequency	12-20 Hertz
• Transmissibility at resonance	4.0 Max. (Hi-Damp Silicone) 10.0 Max. (Neoprene)
• Resilient Element	Hi-Damp Silicone or Neoprene
• Standard Materials	Aluminum (Restraining Strap Phosphor Bronze)
• Weight	2.0 oz.

Environmental Data

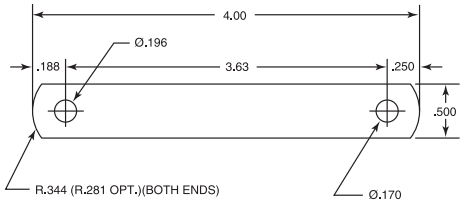
- Hi-Damp Silicone operating temperature range is -67°F to +300°F (-55°C to +150°C) and is resistant to fungus and ozone.
- Neoprene operating temperature range is -20°F to +180°F (-30°C to +82°C) and is resistant to oil and ozone.

Dimensions & Performance Characteristics

TTA SERIES
Dimensional Drawing



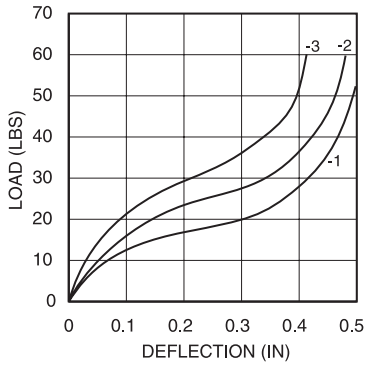
OPTIONAL RESTRAINING STRAP
Dimensional Drawing - Part #880749-02804



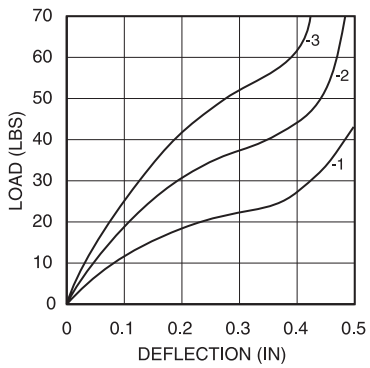
*Please note, mounts are not inherently fail-safe.
They may require the use of a suitable restraining device.

TTA SERIES ORDERING INFORMATION		
PART #		LOAD RANGE (lbs.)
Neoprene	Silicone	
TTNA-1	TTA-1	5-7
TTNA-2	TTA-2	7-10
TTNA-3	TTA-3	10-15

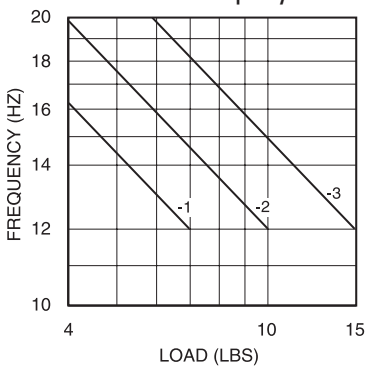
TTA Load vs. Deflection



TTNA Load vs. Deflection



TTA & TTNA Natural Frequency vs. Load



TTB MOUNT SERIES

Mid-frequency, low profile, high deflection mounts for protection from severe vibration and shock.

APPLICATIONS

- Shipping containers
- Airborne electronics & racking
- Shipboard equipment
- Mobile mounted equipment
- Other applications where high amplitude, low frequency vibration is present

FEATURES

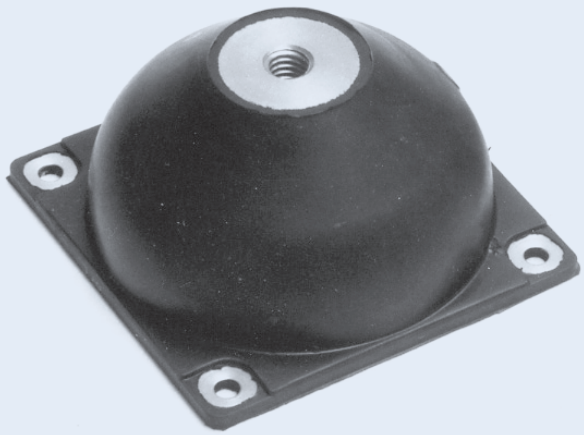
- Available in Silicone or Neoprene
- Axial to radial stiffness of 2.3:1
- Mid frequency isolation
- Aluminum construction

BENEFITS

- Attenuates a 15g, 11 millisecond half-sine shock to 10g's
- Attenuates a 30g, 11 millisecond half-sine crash safety shock to 16 g's
- Lightweight

LOAD RANGE

- 3 load ratings to 30 lbs. per mount



Barry TT-B Mounts are mid-frequency isolators with a large deflection capacity, designed to give both shock and vibration isolation protection. The standard Neoprene version is for applications where temperature extremes are not a factor.

Specifications

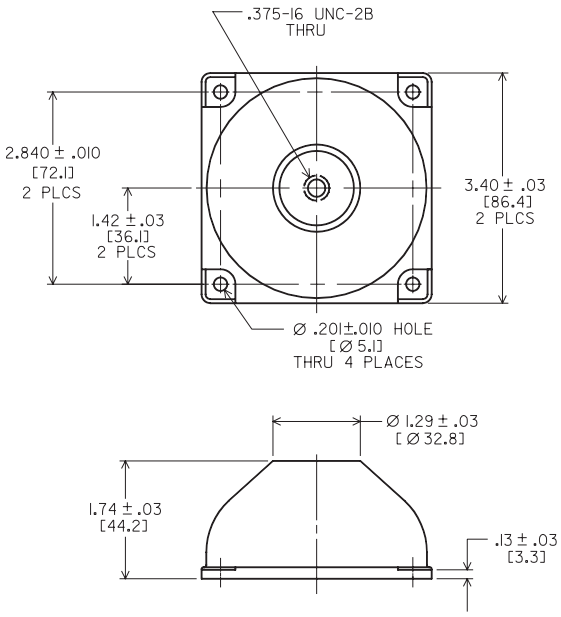
• Natural Frequency	25-35 Hertz
• Transmissibility at resonance	4.0 Max. (Hi-Damp Silicone) 10.0 Max. (Neoprene)
• Resilient Element	Hi-Damp Silicone or Neoprene
• Standard Materials	Aluminum (Restraining Strap Beryllium Copper)
• Weight	6.5 oz.

Environmental Data

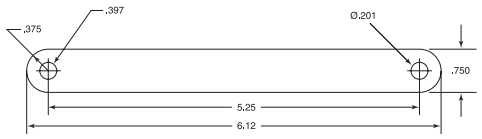
- Hi-Damp Silicone operating temperature range is -67°F to +300°F (-55°C to +150°C) and is resistant to fungus and ozone.
- Neoprene operating temperature range is -20°F to +180°F (-30°C to +82°C) and is resistant to oil and ozone.

Dimensions & Performance Characteristics

TTB SERIES
Dimensional Drawing



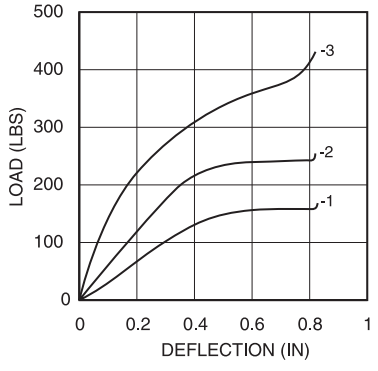
OPTIONAL RESTRAINING STRAP
Dimensional Drawing - Part #8810015-12804



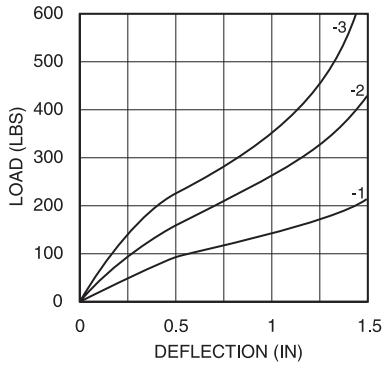
*Please note, mounts are not inherently fail-safe.
They may require the use of a suitable restraining device.

ORDERING INFORMATION			
PART #		LOAD RANGE (lbs.)	
Neoprene	Silicone	Neoprene	Silicone
TTN-B-1	TT-B-1	12	10
TTN-B-2	TT-B-2	20	18
TTN-B-3	TT-B-3	30	25

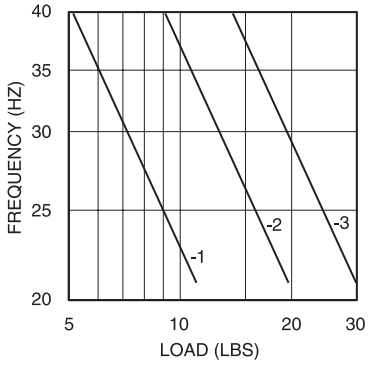
TTB Axial Load vs. Deflection



TTB Radial Load vs. Deflection



TTB Series Natural Frequency vs. Load



HTTA MOUNT SERIES

Low-frequency, highly damped mounts for high level shock and vibration isolation.

APPLICATIONS

- Mounting equipment in helicopter environments (meets MIL-STD-810C requirements)
- Other applications where a large deflection capacity is required

Barry HTTA-Series Mounts are low frequency isolators with a large deflection capacity to provide both vibration and shock protection. They are designed to meet the requirements of MIL-STD-810C for mounting electronic equipment in helicopter environments.

FEATURES

- Low natural frequency (10-13 Hertz)
- Axial to radial stiffness is 1:1.4
- Aluminum construction

BENEFITS

- Will not degrade in performance when subjected to a 15g, 11 millisecond half-sine shock input
- Will not fail under a 30g, 11 millisecond half sine shock input
- Lightweight
- Fungus and ozone resistant

LOAD RANGE

- 3 load ratings from 5 - 20 lbs. per mount

Specifications

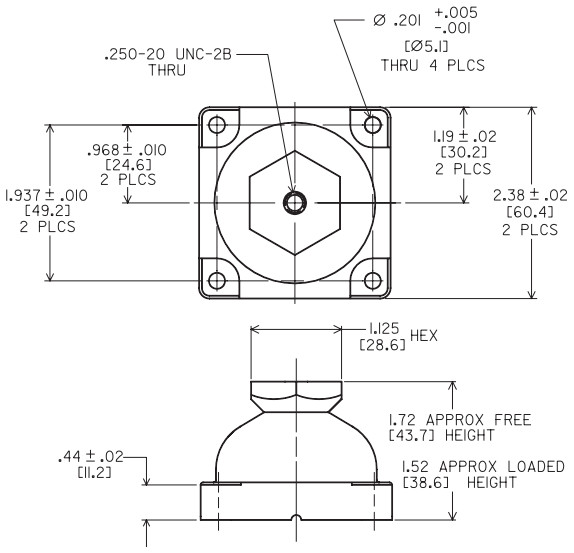
• Natural Frequency	10-13 Hertz
• Transmissibility at resonance	4.0 Max.
• Resilient Element	Hi-Damp Silicone
• Standard Materials	Aluminum (Restraining Strap Phosphor Bronze)
• Weight	4 oz.

Environmental Data

- Hi-Damp Silicone elastomer has an operating temperature range of -67°F to +300°F (-55°C to +150°C) and is fungus and ozone resistant.

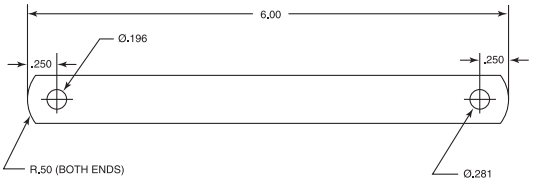
Dimensions & Performance Characteristics

HTTA SERIES
Dimensional Drawing



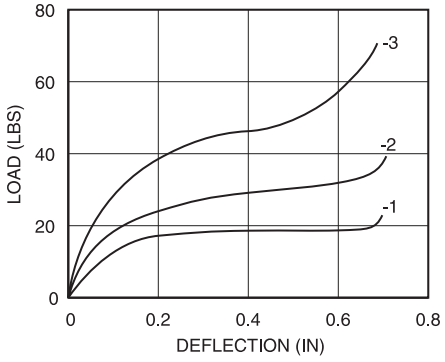
HTTA SERIES OPERATING RANGE DATA			
Part #	Axial Load Range (lbs.)	Static Deflection Range	Natural Frequency Range (Hz.)
HTTA-1	5-8	.028"-.055"	13-10
HTTA-2	7-13	.021"-.061"	13-10
HTTA-3	13-20	.028"-.062"	13-10

OPTIONAL RESTRAINING STRAP
Dimensional Drawing - Part #885368-12804

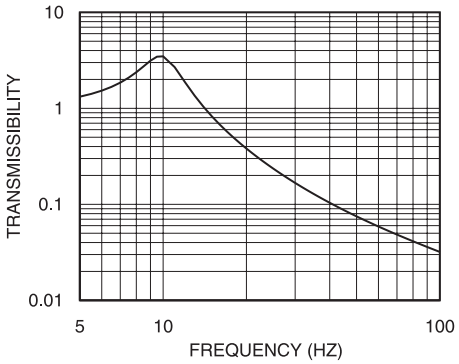


*Please note, mounts are not inherently fail-safe.
They may require the use of a suitable restraining device.

HTTA Load vs. Deflection



HTTA Typical Transmissibility



VHC MOUNT SERIES

High deflection shock and vibration isolators for medium-weight sensitive equipment.

APPLICATIONS

- Ground vehicle electronics
- Shipboard equipment
- Shipping containers
- Equipment installed in transportable shelters

Barry VHC-Series mounts are special purpose, mid-frequency isolators designed to protect sensitive equipment when high level shock and vibration inputs are expected. Typical applications include electronic equipment installed in mobile equipment subjected to off-road environments.

FEATURES

- Buckling design
- Steel construction
- Compression to shear stiffness ratio 2:1
- Designed to carry static loads in the axial direction, but can accommodate dynamic inputs in the radial direction
- Attenuates 18" freefall shock input to approximately 12g's

BENEFITS

- Large deflection capacity provides superior shock attenuation
- Can be used as stabilizers for tall equipment packages
- Maximum loads apply when mount will be subjected to an 18" freefall Larger loads can be accommodated for less severe shock inputs

LOAD RANGE

- 4 load ratings to 145 lbs. per mount

Specifications

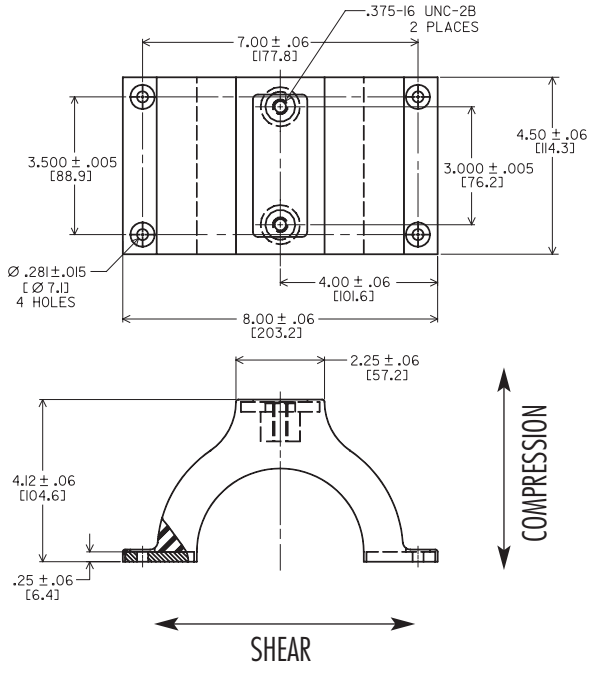
• Natural Frequency	12-20 Hertz
• Transmissibility at resonance	5.0 Max. (Barry LT Compound) 10.0 Max. (Neoprene)
• Resilient Element	Barry LT Compound or Neoprene
• Standard Materials	Steel (Restraining Strap Beryllium Copper)
• Weight	4 lbs.

Environmental Data

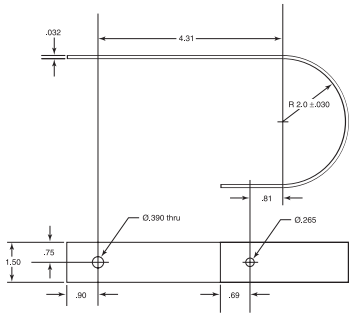
- Barry LT (low-temperature) Compound, which is ideal for military applications, operates between -67°F and +180°F (-55°C to +82°C) and is resistant to fungus and ozone.
- Neoprene has an operating temperature range of -20°F to +180°F (-30°C to +82°C) and resists oil and ozone.

Dimensions & Performance Characteristics

VHC SERIES
Dimensional Drawing



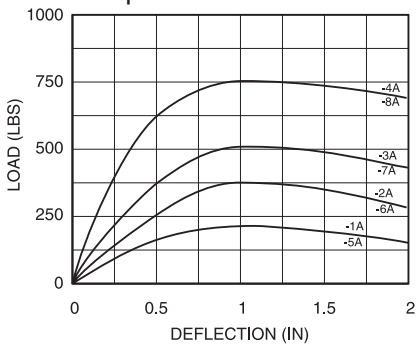
OPTIONAL RESTRAINING STRAP
Dimensional Drawing - Part #8810090-01804



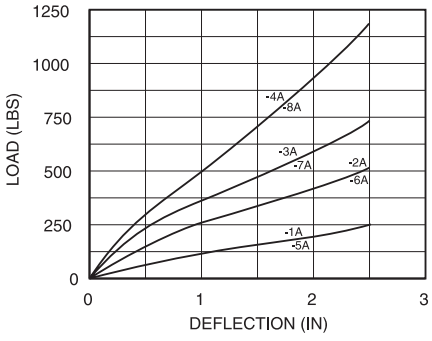
*Please note, mounts are not inherently fail-safe.
They may require the use of a suitable restraining device.

LOAD RATINGS		
Part #		Max. Axial Load Rating (lbs.)
Neoprene	Barry LT	
VHC-1A	VHC-5A	45
VHC-2A	VHC-6A	70
VHC-3A	VHC-7A	100
VHC-4A	VHC-8A	145

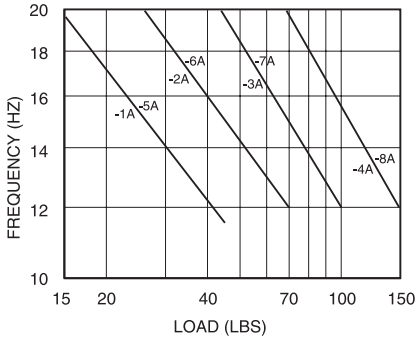
Compression Load vs. Deflection



Shear Load vs. Deflection



Natural Frequency vs. Load

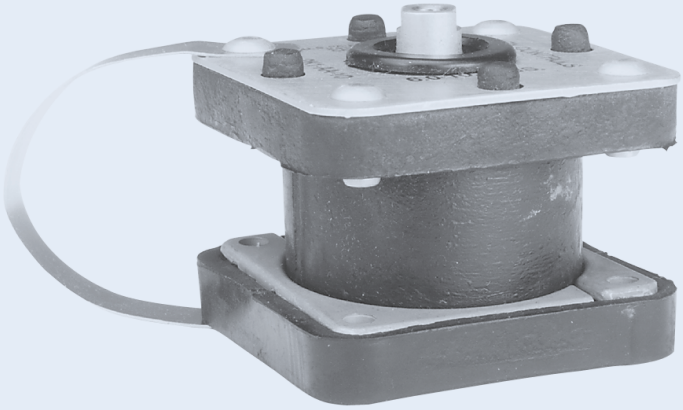


2K MOUNT SERIES

Two stage shock mount and vibration isolator for severe dynamic environments such as shipboard and ground vehicles.

APPLICATIONS

- Naval sonar equipment
- Shipboard electronics
- Radar installations
- Computer & video displays



Barry 2K-Series mounts offer the advantage of superior vibration and shock protection for a wide range of loads in a single compact unit. These isolators are ideal for isolating naval sonar equipment, shipboard electronics and communications.

FEATURES

- Combines shock and vibration isolation in a single isolator
- Protects from vibratory inputs as low as 10 Hz
- Designed for base mounting only
- Wide load range for most applications

BENEFITS

- Elastomeric shock attenuating elements have as much as 1 inch of available deflection (1.5 inches for 2KS)
- Limit shock transmissions to 20g's when subjected to a five foot hammer blow per MIL-S-901
- Many custom versions are available. Consult factory for more information

LOAD RANGE

- 2K1 Series = 4 load ratings from 1 - 10 lbs. per mount
- 2K2 Series = 8 load ratings from 4 - 90 lbs. per mount
- 2KS Series for loads from 250 -6,000 lbs.

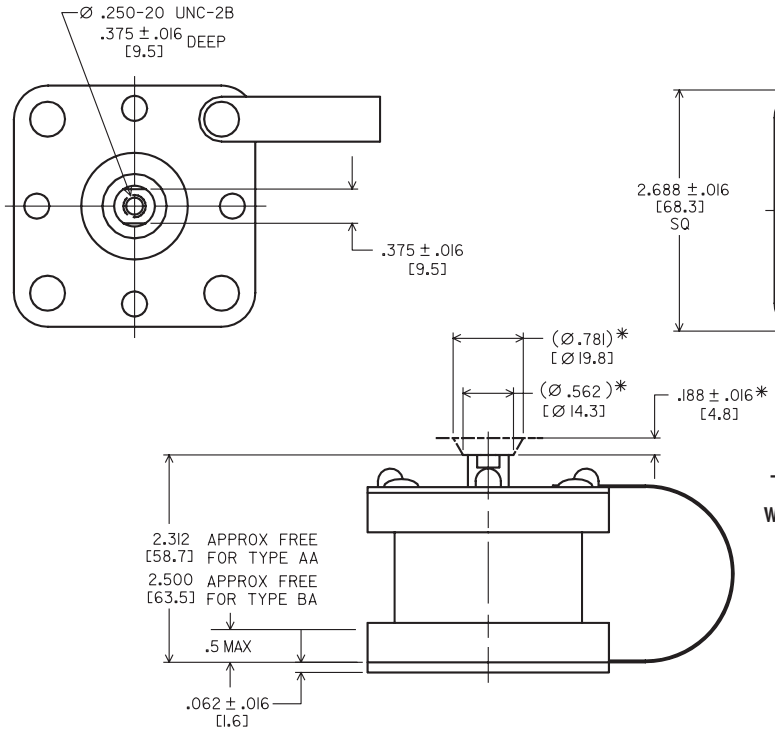
Specifications

• Natural Frequency	
Vibration Element	6-8 Hertz vertical
Shock Element	15 Hertz
• Transmissibility at resonance	
Vibration Element	2.5 Max.
Shock Element	10 Max.
• Resilient Element	
Vibration Element	Friction Damped Spring
Shock Element	Neoprene or Nitrile Elastomer
• Standard Materials	Varies with model (Standard Beryllium Copper Restraining Strap)
• Weight	See dimensional drawings

Environmental Data

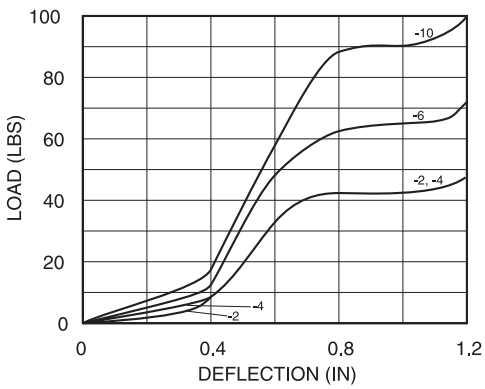
- 2K1 and 2K2 isolators are for use with lightweight MIL-S-901 applications.
- 2KS systems are for use with medium weight MIL-S-901 applications.
- Isolators and systems met MIL-STD-16400 inclination, temperature, humidity and salt spray specifications, MIL-STD-167 vibration tests and MIL-M-17185 environmental and oil immersion tests.
- Operating temperature range is -20°F to +180°F (-30°C to +82°C).
- Isolators are unaffected by humidity, sand, dust and fungus.

Dimensions & Performance Characteristics



* PLEASE NOTE: On 2K1 and 2K2 Isolators, -AA part number indicates a short core for use with dimpled mounting trays. -BA part number indicates a long core for attachment directly to equipment.

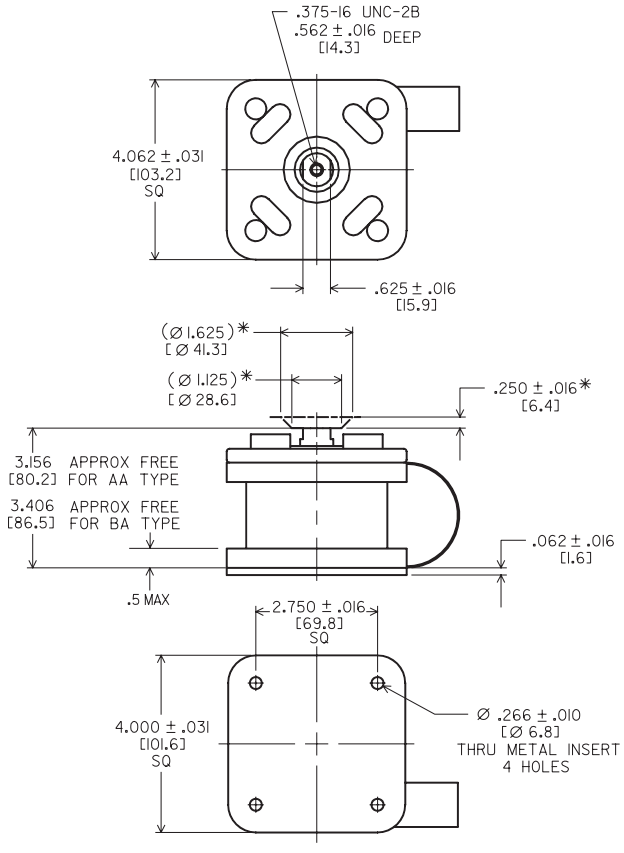
2K1 Series Mounts = 10 oz.



2K1 LOAD RATINGS	
PART #	STATIC LOAD RANGE /ISOLATOR (LBS.)
2K1-AA-2 & BA-2	1-2
2K1-AA-4 & BA-4	2-4
2K1-AA-6 & BA-6	4-6
2K1-AA-10 & BA-10	6-10

Dimensions & Performance Characteristics

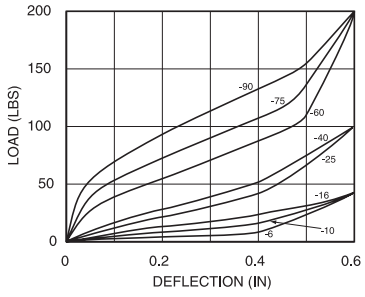
2K2 Series Mounts = 1.6 lbs.



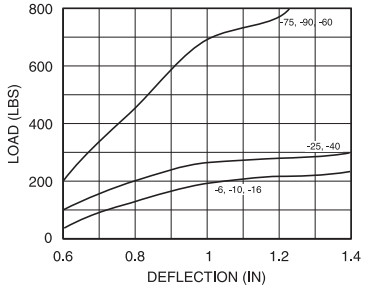
* PLEASE NOTE: On 2K1 and 2K2 Isolators, -AA part number indicates a short core for use with dimpled mounting trays. -BA part number indicates a long core for attachment directly to equipment.

2K2 LOAD RATINGS	
PART #	STATIC LOAD RANGE /ISOLATOR (LBS.)
2K2-AA-6 & BA-6	4-6
2K2-AA-10 & BA-10	6-10
2K2-AA-16 & BA-16	10-16
2K2-AA-25 & BA-25	16-25
2K2-AA-40 & BA-40	25-40
2K2-AA-60 & BA-60	40-60
2K2-AA-75 & BA-75	60-75
2K2-AA-90 & BA-90	75-90

2K2 Load vs. Deflection (0 to .6 inches)

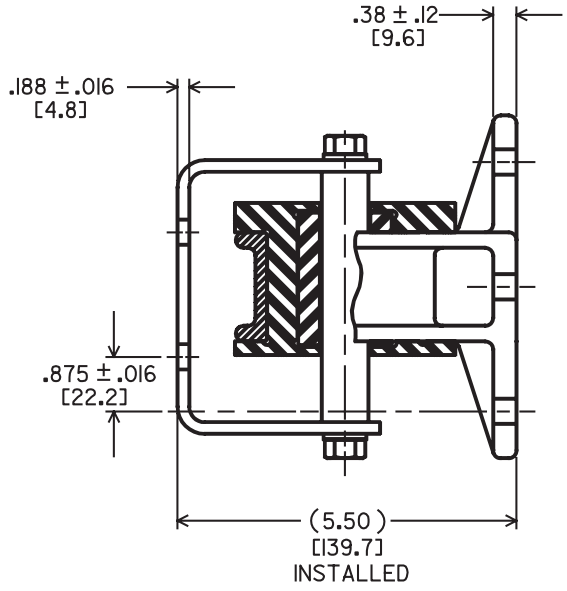


2K2 Load vs. Deflection (0.6 to 1.4 inches)

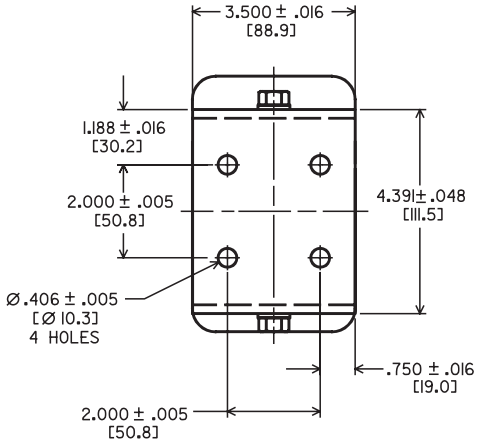


Dimensional Drawing

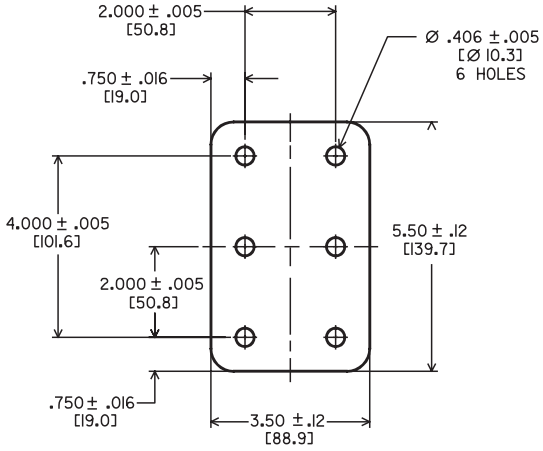
LIGHTWEIGHT STABILIZER 21335-5 DIMENSIONAL DRAWINGS



2K EQUIPMENT INTERFACE



2K BULKHEAD INTERFACE



GB530 MOUNT SERIES

Shock & vibration isolators protect naval equipment installed in high impact and shock loading environments.

APPLICATIONS

- Naval sonar equipment
- Shipboard electronics
- Radar installations
- Protection of sensitive equipment & weaponry during transportation

Barry GB530 Series mounts provide large deflections under shock input and effective attenuation of structure-borne noise in the range of 12.5 - 10,000 Hertz. GB530 isolators are ideal for shipboard applications.

FEATURES

- Steel construction
- Protects from vibratory inputs as low as 7 Hz

BENEFITS

- Capable of large deflections under shock inputs
- Available in natural rubber with a transmissibility at resonance of approximately 10
- Excellent attenuation of structure borne noise in the range of 12.5-10,000 Hz

LOAD RANGE

- Load range to 1,322 lbs. per isolator

Specifications

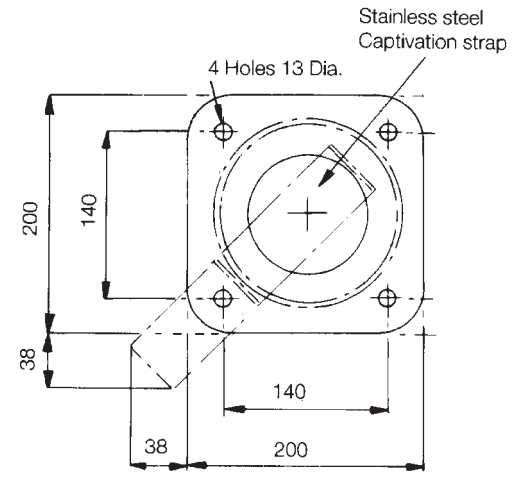
• Natural Frequency	As low as 7 Hertz
• Transmissibility at resonance	10
• Resilient Element	Natural rubber
• Standard Materials	Steel
• Weight	7.45 lbs.

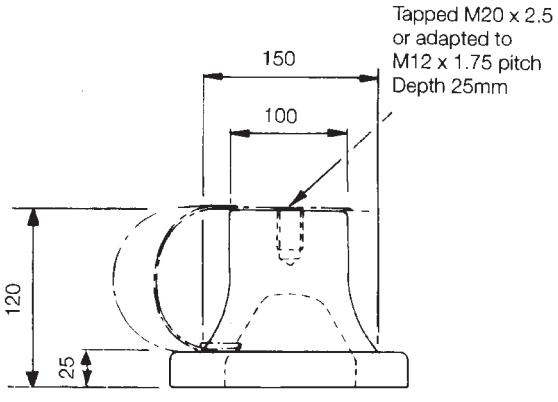
Environmental Data

- Natural rubber has an operating temperature range of -40°F to +180°F (-40°C to +82°C).

Dimensions & Performance Characteristics

GB530 SERIES (dimensions in mm)





Isolator Type	Min. load	Max. load
Natural Rubber		
GB530 (NR1)	16.5 lbs.	165 lbs.
GB530 (NR2)	33 lbs.	330 lbs.
GB530 (NR3)	55 lbs.	551 lbs.
GB530 (NR4)	88 lbs.	881 lbs.
GB530 (NR5)	132 lbs.	1,322 lbs.

- (M12) = Tapped top hole
- (M20) = Tapped top hole
- (FM) = Ferrous metal parts
- (NM) = Non magnetic parts
- (S) = Captivation strap
- (O) = Without captivation strap

GB530 - NR - M20 - NM - O Typical GB530 Part #

BARRY-FLEX ISOLATOR SERIES (GBCO1/GBCO2)

Low-profile, high-deflection elastomeric shock & vibration isolators protect sensitive military equipment in harsh environments.

APPLICATIONS

- Electronic packages, computers & communications equipment installed within military vehicles

FEATURES

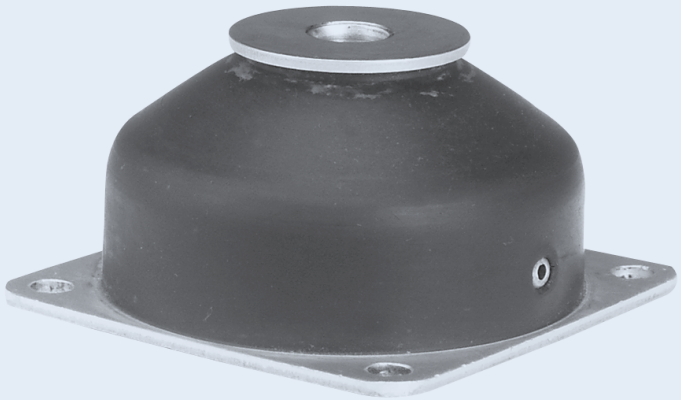
- Aluminum alloy construction
- Meets requirements of MIL-STD-810 and DEF.STAN.07-55
- Low-profile design
- Unique cooling feature

BENEFITS

- Static deflection of .04" under maximum load
- Special elastomer formulation meets damping and high deflection characteristics of current defense standards
- Up to .47" dynamic deflection available, despite low profile
- Elastomer will not overheat during prolonged dynamic excursions

LOAD RANGE

- GBCO1 Series available in 3 load ratings from 8.8 to 17.6 lbs.
- Series available in 4 load ratings from 17.6 to 40 lbs.



Barry-Flex isolators are designed for harsh environments where high-amplitude shock and vibration are encountered. Their rugged design and high deflection capabilities are ideal for this type of environment.

Specifications

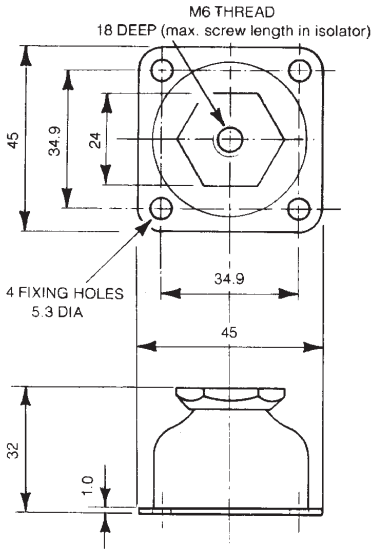
• Natural Frequency	15 Hertz at maximum load
• Transmissibility at resonance	4.0
• Resilient Element	Barry LT
• Standard Materials	Aluminum alloy
• Weight	GBCO1 = 1.45 oz. GBCO2 = 2.68 oz.

Environmental Data

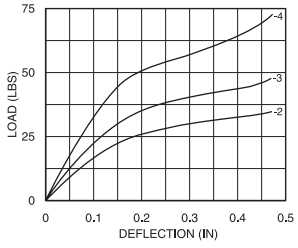
- Operating temperature range of -40°F to 180°F (-40°C to +82°C).
- Can be stored at temperatures as low as -67°F (-55°C).
- Unique cooling feature ensures that elastomer does not overheat during prolonged dynamic excursions.

Dimensions & Performance Characteristics

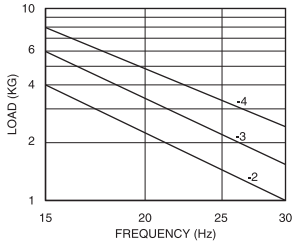
GBC01 SERIES (dimensions in mm)



Load vs. Deflection



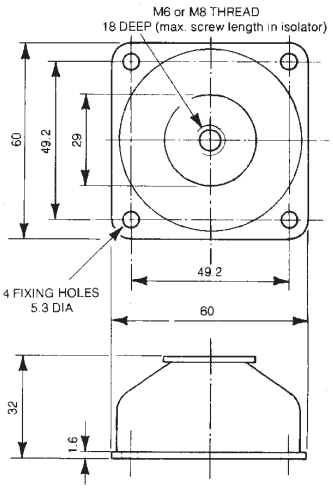
Load vs. Natural Frequency



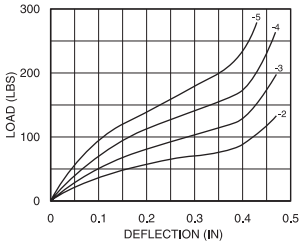
Part Numbers Load (kg)

GBC01-2-TM6-L	4
GBC01-3-TM6-L	6
GBC01-4-TM6-L	8

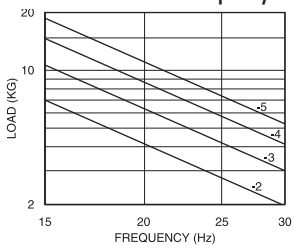
GBC02 SERIES (dimensions in mm)



Load vs. Deflection



Load vs. Natural Frequency



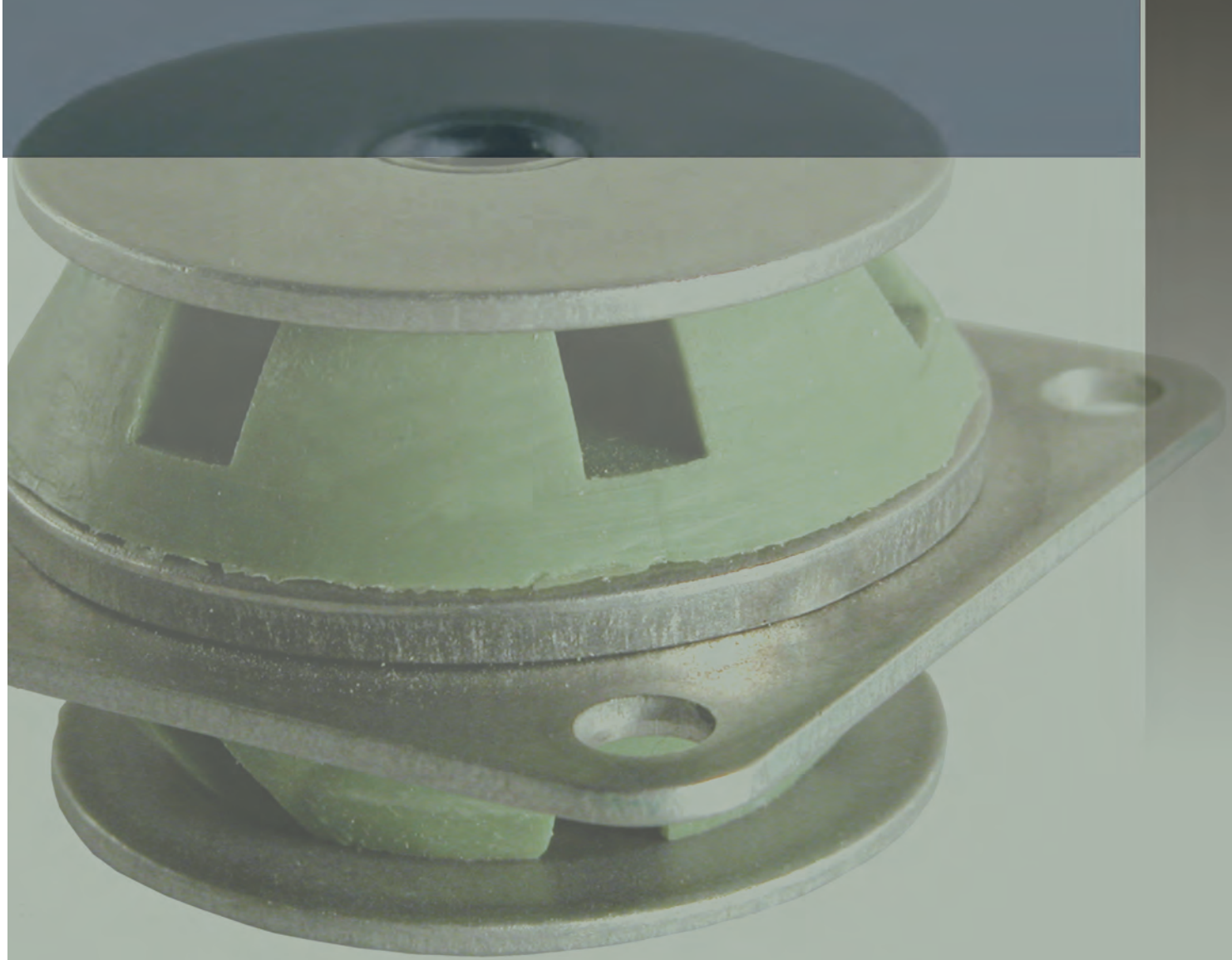
Part Numbers Load (kg)

GBC02-2-TM6-L or GBC02-2-TM8-L	7
GBC02-3-TM6-L or GBC02-3-TM8-L	10
GBC02-4-TM6-L or GBC02-4-TM8-L	15
GBC02-5-TM6-L or GBC02-5-TM8-L	20

NOTES:

LOW PROFILE MOUNTS

6300/6550 Mount Series
E Mount Series (E21/E22)
5200 Mount Series
6820 Mount Series
Multiaxis Mounts

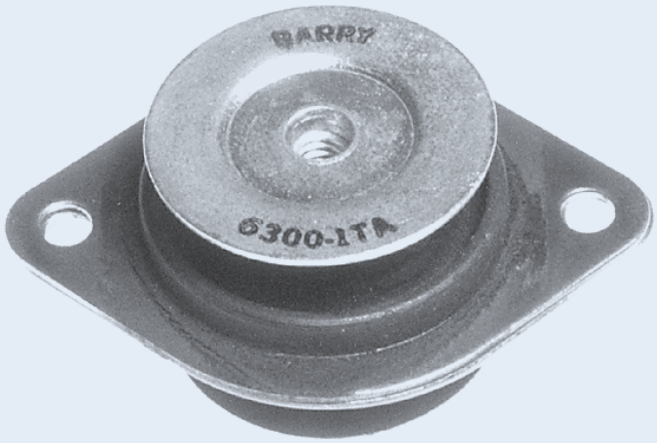


6300/6550 MOUNT SERIES

Small, low-profile, all-attitude elastomeric mounts for vibration and shock protection.

APPLICATIONS

- Airborne electronics and racking
- Ruggedized disk drives
- Electronic chassis
- Electric motors



Barry 6300/6550 Series Mounts are designed for use either as an integral mount or isolation system for light to medium weight electronic equipment. Versions are available in Neoprene or Hi-Damp Silicone for MIL specifications.

FEATURES

- All attitude
- Low-cost
- Axial to radial stiffness of 1:1
- Compact, low-profile design

BENEFITS

- Compact size minimizes required mounting space
- Mounting permitted at any angle
- Fail-safe design captivates equipment even if elastomer is destroyed

LOAD RANGE

- 6300 = 4 load ratings to 11 lbs. per mount
- 6550 = 4 load ratings to 18 lbs. per mount

Specifications

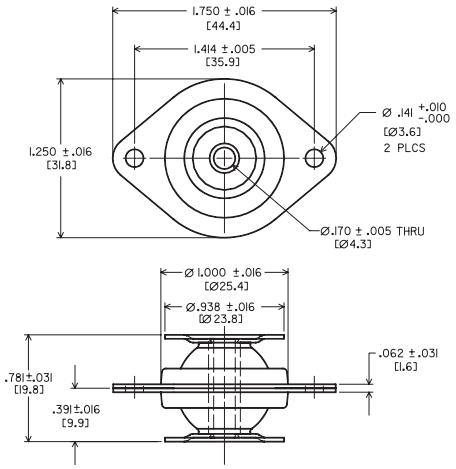
• Natural Frequency	15-40 Hertz (6300) 20-40 Hertz (6550)
• Transmissibility at resonance	4.0 Max. (Hi-Damp Silicone) 10.0 Max. (Neoprene)
• Resilient Element	Hi-Damp Silicone or Neoprene
• Standard Materials	Varies with model
• Weight	6300 = 1.0 oz. 6550 = 1.0 oz.

Environmental Data

- Hi-Damp Silicone is ideal for applications requiring greater damping, extreme temperature service and resistance to fungus and ozone. Operating temperature range is -67°F to +300°F (-55°C to +150°C).
- Neoprene operating temperature range is -20°F to +180°F (-30°C + 83°C) and is resistant to oil and ozone.

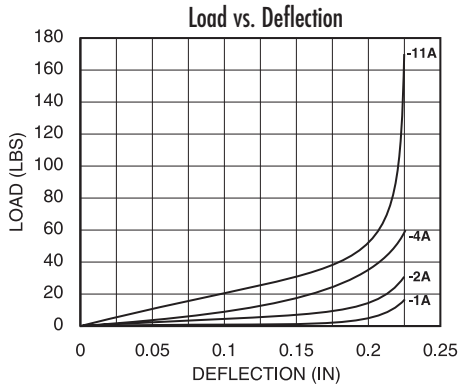
Dimensions & Performance Characteristics

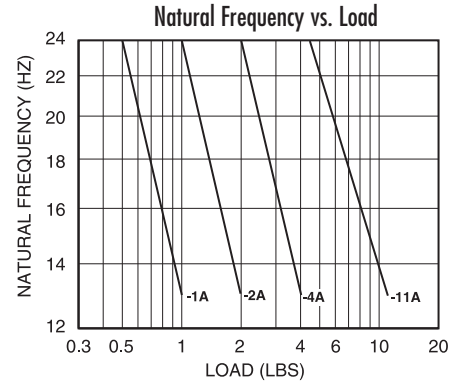
SERIES 6300 DIMENSIONAL DRAWING



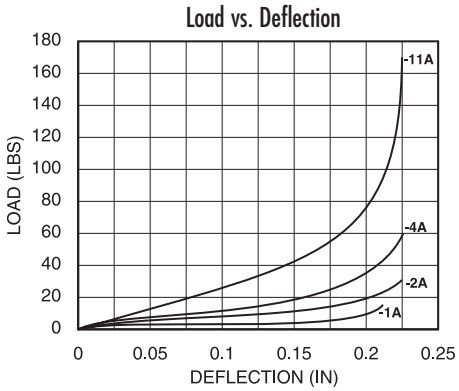
LOAD RATINGS			
Nat. Rubber	Hi-Damp	Neoprene	Max. Load/Mount (lbs.)
6300-1A	N6300-1A	6300-1NA	1
6300-2A	N6300-2A	6300-2NA	2
6300-4A	N6300-4A	6300-4NA	4
6300-11A	N6300-11A	6300-11NA	11

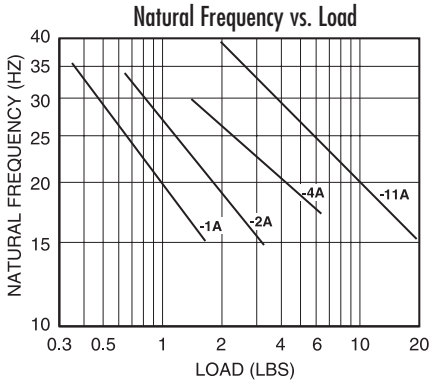
6300-A and 6300-NA Series Performance Data





N6300 Series Performance Data

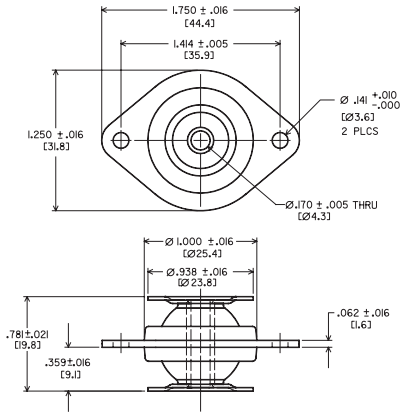




6550 MOUNT SERIES:

Dimensions & Performance Characteristics

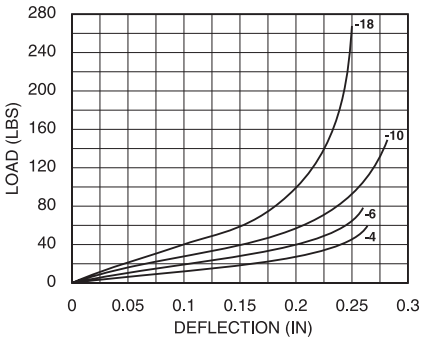
SERIES 6550 DIMENSIONAL DRAWING



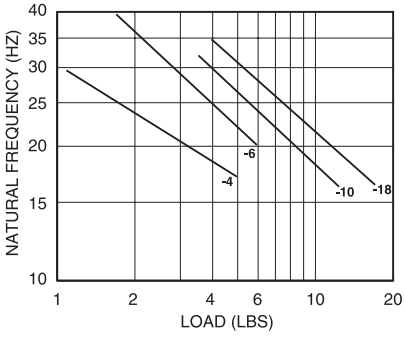
6550 SERIES LOAD RATINGS			
Nat. Rubber	Hi-Damp	Neoprene	Max. Load/Mount (lbs.)
6550-4	N6550-4	6550-4N	4
6550-6	N6550-6	6550-6N	6
6550-10	N6550-10	6550-10N	10
6550-18	N6550-18	6550-18N	18

6550 and 6550-N Series Performance Data

Load vs. Deflection

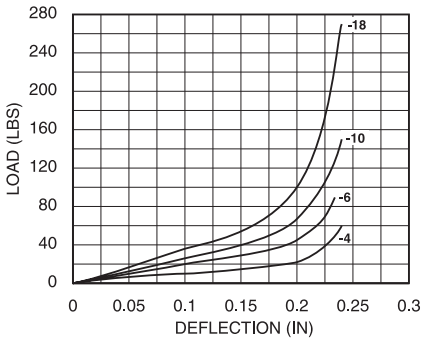


Natural Frequency vs. Load

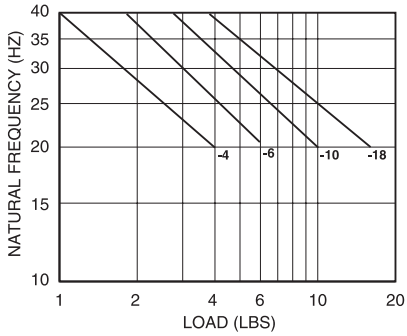


N6550 Series Performance Data

Load vs. Deflection



Natural Frequency vs. Load



E MOUNT SERIES (E21/E22)

Low-profile, all-attitude isolators for vibration and shock protection.

APPLICATIONS

- Equipment in commercial or military jet aircraft
- Missile electronics
- Ruggedized disk drives
- Random vibration environments

FEATURES

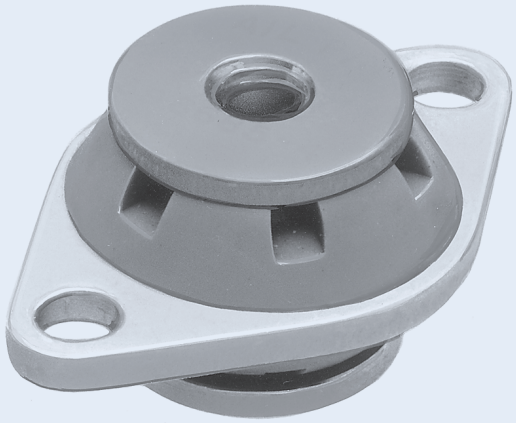
- Lightweight, low-profile, all-attitude isolators
- Available as standard plate type (E21) or optional cup type (E22)
- Axial to radial stiffness of 1:1
- Sturdy, reliable construction

BENEFITS

- Fail-safe
- Survives a 30g, 11 millisecond 1/2 sine shock input at rated load

LOAD RANGE

- 3 load ratings to 10 lbs. per mount



Barry E Series Mounts are designed for optimum shock and vibration isolation of lightweight electronic equipment, where space is a concern. E-Mounts are ideal for isolation where random vibration environments occur, such as in military or commercial aircraft applications.

Specifications

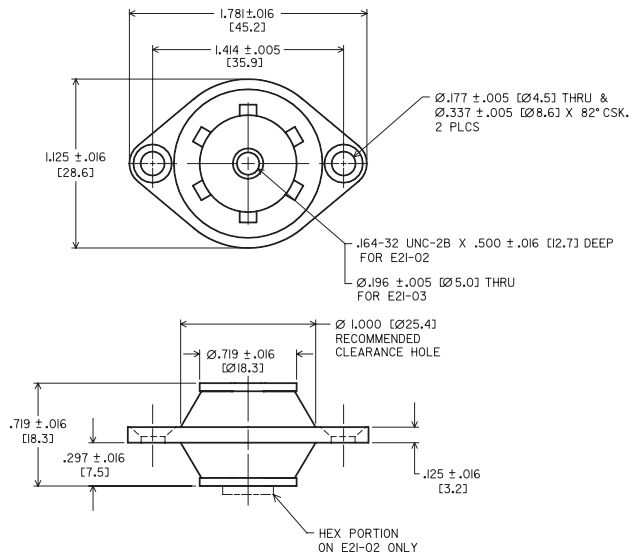
• Natural Frequency	25-40 Hertz
• Transmissibility at resonance	4.0 Max.
• Resilient Element	Hi-Damp Silicone
• Standard Materials	Aluminum w/zinc plated core
• Weight	E21 = .023 lbs. E22 = .045 lbs.

Environmental Data

- Hi-Damp Silicone operating temperature range is -67°F to +300°F (-55°C to +150°C) and storage temperature range is -100°F to +300°F (-75°C to +150°C). Elastomer is fungus and ozone resistant and meets environmental requirements of MIL-E-5400.

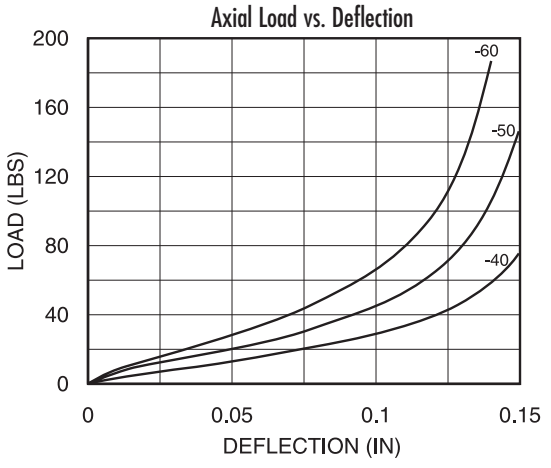
Dimensions & Performance Characteristics

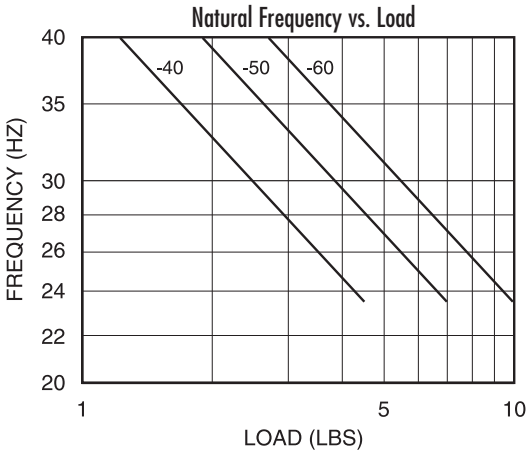
E21 SERIES DIMENSIONAL DRAWING



LOAD RATINGS			
Max. Load/Mount (lbs.)	Plate Type Tapped Core	Plate Type Thru Core	Weight (lbs.)
4.50	E21-02-40	E21-03-40	.023
7.00	E21-02-50	E21-03-50	
10.00	E21-02-60	E21-03-60	

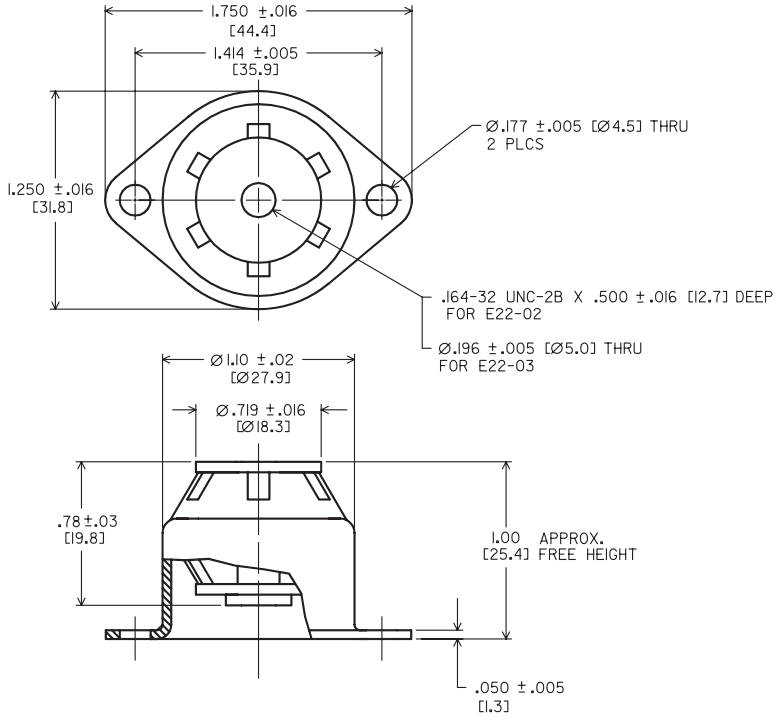
E21 and E22 Series Performance Data





Dimensions & Performance Characteristics

E22 SERIES DIMENSIONAL DRAWING



LOAD RATINGS			
Max. Load/Mount (lbs.)	Cup Type Tapped Core	Cup Type Thru Core	Weight (lbs.)
4.50	E22-02-40	E22-03-40	.045
7.00	E22-02-50	E22-03-50	
10.00	E22-02-60	E22-03-60	

5200 MOUNT SERIES (5200/5200HT)

Versatile all-attitude isolators for vibration and shock protection.

APPLICATIONS

- Airborne electronics and racking
- Ground transportation applications
- Severe random vibration environments
- Electric motors

Barry 5200 Series Mounts are for applications where protection is required from shock, vibration or noise. The fail-safe, low profile construction of 5200 Series Isolators are ideal for use where space is at a minimum.

FEATURES

- All-attitude mounting with rugged, fail-safe construction
- Axial to radial stiffness of 1:0.6
- Low profile mounts
- Wide range of load ratings for both stationary and mobile environments

BENEFITS

- Isolator provides effective vibration isolation in any attitude
- Fail-safe design captivates the mounted equipment even if the elastomeric elements should be destroyed

LOAD RANGE

- 4 load ratings to 50 lbs. per mount

Specifications

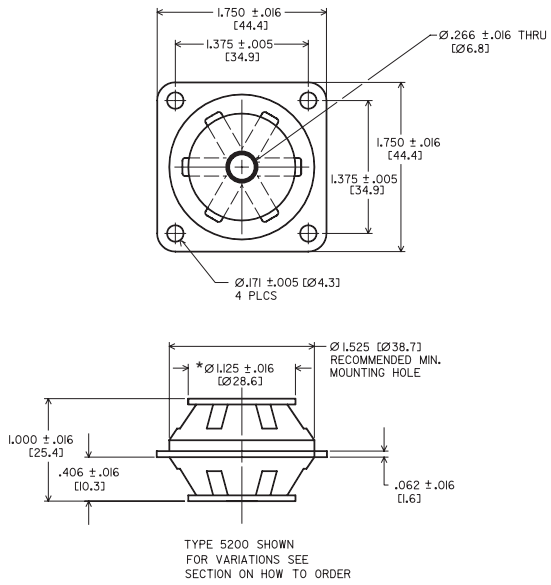
• Natural Frequency	15-40 Hertz
• Transmissibility at resonance	4.0 Max. (Hi-Damp Silicone) 10.0 Max. (Neoprene & Natural Rubber)
• Resilient Element	Hi-Damp Silicone, Neoprene, or Natural Rubber
• Standard Materials	Zinc plated steel
• Weight	5200 = 2.5 oz. 5200H = 3.5 oz.

Environmental Data

- Hi-Damp Silicone version meets shock & vibration requirements of MIL-E-5400 with an operating temperature range of -67°F to +300°F (-55°C to +150°C).
- Neoprene version is available for use where temperature extremes are not encountered, but resistance to oil or ozone is required. Operational temperature range is -20°F to +180°F (-30°C to +83°C).

Dimensions & Performance Characteristics

5200 SERIES DIMENSIONAL DRAWING



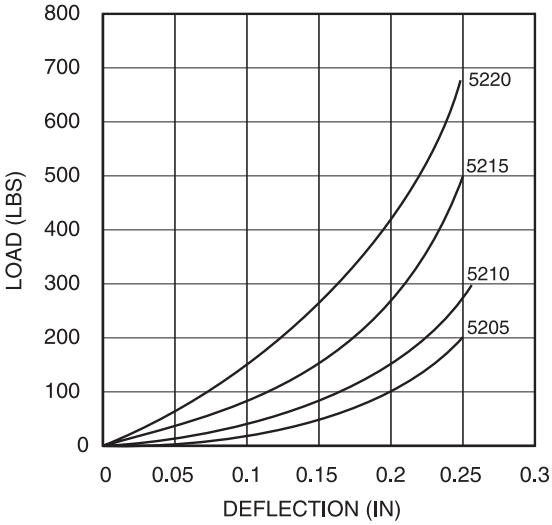
*ø1.375 for 'N' prefix (Hi-Damp) Parts

5200 SERIES LOAD RATINGS		
Part #*	Maximum Load /Isolator (lbs.) - Stationary -	Maximum Load /Isolator (lbs.) - Mobile -
5205	15	4 - 7
5210	25	8 - 11
5215	35	12 - 17
5220	50	18 - 30

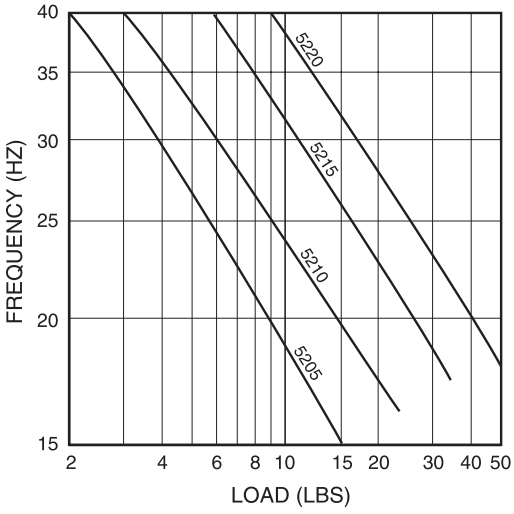
*Part Numbers shown above are basic numbers.
For complete part numbers please see page 193.

5200 Series Performance Data

Load vs. Deflection

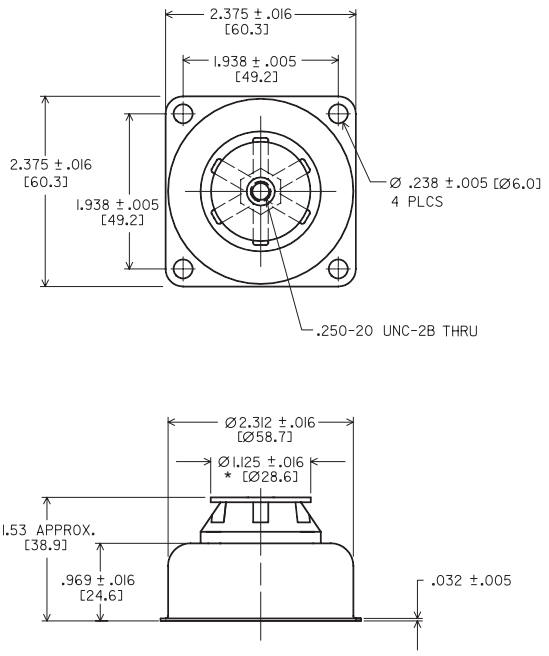


Natural Frequency vs. Load



Dimensions & Performance Characteristics

5200HT SERIES DIMENSIONAL DRAWING



TYPE 5200-HT SHOWN
FOR VARIATIONS SEE
SECTION ON HOW TO ORDER
*ø1.375 for 'N' prefix (Hi-Damp) Parts

HOW TO ORDER 5200 SERIES ISOLATORS

PLATE STYLE ISOLATORS (5200 SERIES)

Letter N placed at beginning for Silicone
Letter N placed at end for Neoprene
(Absence of letter N indicates special natural rubber version)

N 5205-T X N

- Use T for 1/4-20 UNC 2B threaded core
- Leave blank for through hole
- Use X for hex end of tapped core opposite 1.5 dia. ring
- Use Y for hex end of tapped core on side nearest 1.5 dia. ring

CUP STYLE ISOLATORS (5200H SERIES)

Letter N placed at beginning for Silicone
Letter N placed at end for Neoprene
(Absence of letter N indicates special natural rubber version)

N 5205-H T N

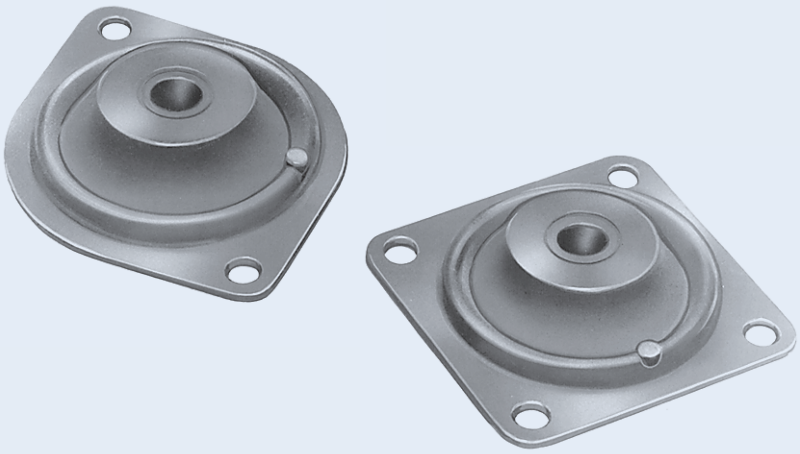
- H denotes cup-style version
- Use T for 1/4-20 UNC 2B threaded core (hex is inside cup, opposite 1.5" dia. ring)
- Leave blank for through hole

6820 MOUNT SERIES

Economical, low-frequency, low-profile mounts provide vibration and structure-borne noise control.

APPLICATIONS

- Electronic equipment where low-profile equipment installation is required
- Instrument panels
- Airborne electronics
- Motors & generators



Barry 6820 Series Mounts are ideal for providing economical isolation from vibration and structure-borne noise for electronic equipment in cramped environments, such as instrument panels or for motors and generators.

FEATURES

- Compact, low-profile design
- Low cost isolator
- Wide load range for most applications
- Radial to Axial stiffness of 1.5:1

BENEFITS

- Compact size minimizes required mounting space
- Economical operation
- Design flexibility

LOAD RANGE

- 2 sizes to 80 lbs. per mount

Specifications

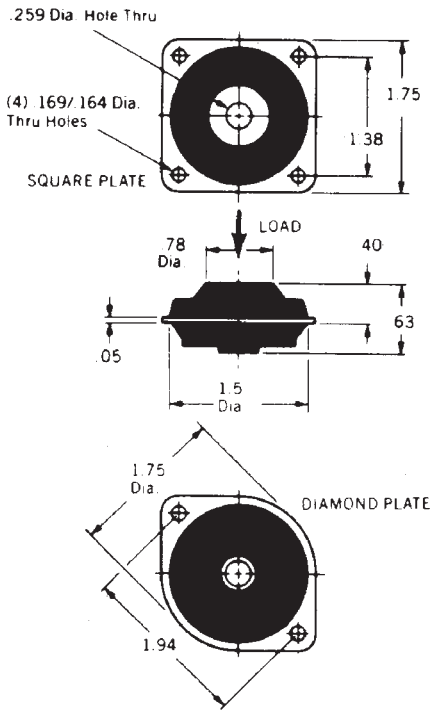
• Natural Frequency	10-30 Hertz
• Transmissibility at resonance	10.0 Max.
• Resilient Element	Neoprene
• Standard Materials	Steel
• Weight	6821 = 1.0 oz. 6822 = 2.25 oz.

Environmental Data

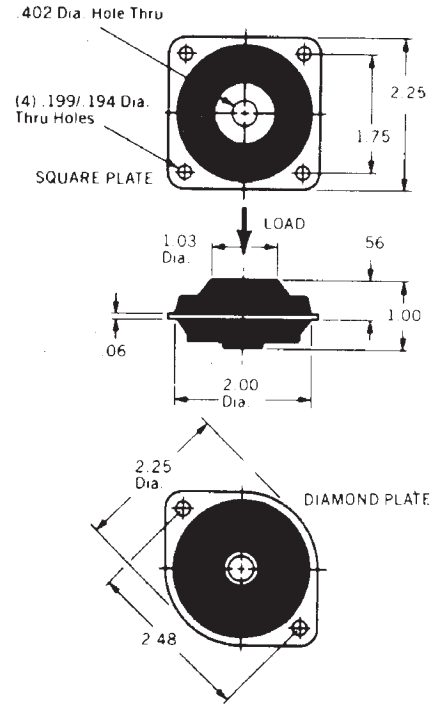
- Hi-Damp Silicone is available as an elastomer option. Limits amplification at resonance to 4 or less. Operating temperature range is -67°F to +300°F (-55°C to +150°C).
- Neoprene version is standard and operational temperature range is -20°F to +180°F (-30°C to +82°C). Neoprene elastomer is resistant to oils and ozone.

Dimensions & Load Ranges

6821 SERIES DIMENSIONAL DRAWING



6822 SERIES DIMENSIONAL DRAWING



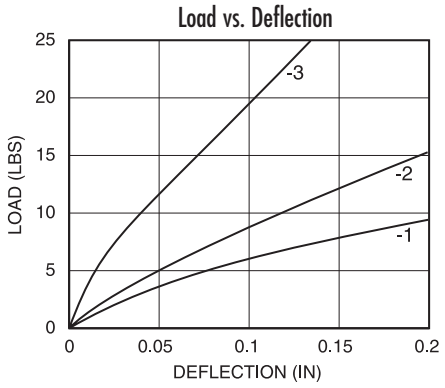
LOAD RANGES - 6821 SERIES (lbs.)			
Code	Min.	Norm.	Max.
-1	1.40	2.00	2.80
-2	2.50	4.00	5.50
-3	5.50	10.00	14.00

LOAD RANGES - 6822 SERIES (lbs.)			
Code	Min.	Norm.	Max.
-1	14.00	20.00	28.00
-2	25.00	40.00	55.00
-3	40.00	60.00	80.00

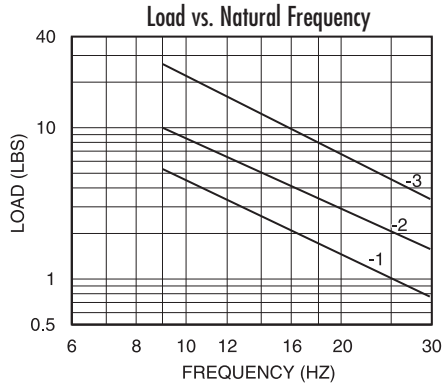
Performance Characteristics

6821 Series Performance Data

Load vs. Deflection

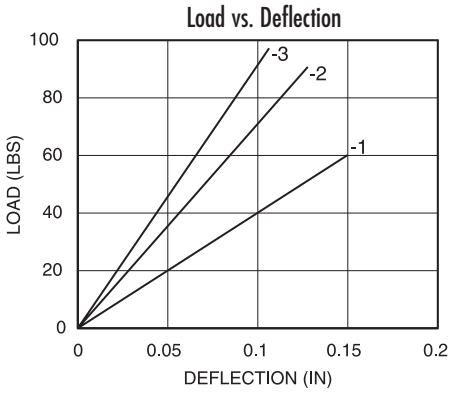


Load vs. Natural Frequency

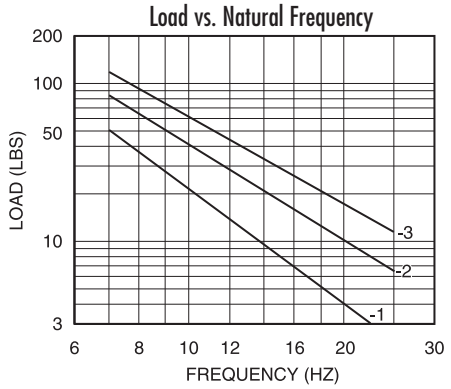


6822 Series Performance Data

Load vs. Deflection



Load vs. Natural Frequency



HOW TO ORDER 6820 ISOLATORS

6822 - 1 - S - N

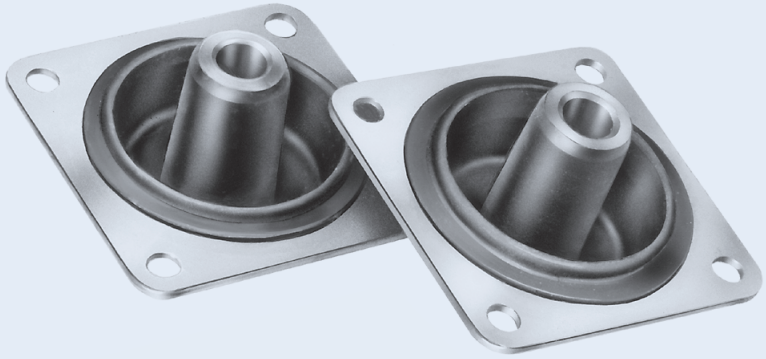
- 6822 — Basic Model # (6821/6822)
- 1 — Code For Load Rating (1/2/3)
- S — Configuration of Mounting (S=Square/D=Diamond)
- N — Elastomer (N=Neoprene, S=Hi-Damp Silicone)

BARRY CONTROLS MULTIAXIS MOUNTS

Low-profile, economical mounts provide
low-frequency vibration isolation in all directions

APPLICATIONS

- Oxygen Concentrators
- Small Pumps
- Electronic Equipment
- Medical Equipment
- Instruments
- Compressors



Barry Controls Multiaxis Mounts are designed for low-frequency vibration isolation. These all-attitude isolators provide effective vibration protection in all directions and are available in either square or diamond configurations. Snubbing washers provide an interlocking system of metal fasteners which act to prevent damage from overload or excessive shock impact.

FEATURES

- All attitude
- Low-cost
- Axial to radial stiffness of 1:1
- Compact, low-profile design
- Available in square or diamond shape

BENEFITS

- Provides low-frequency vibration isolation in all directions
- Compact size minimizes required mounting space
- Designed for a wide range of applications
- Easy to install

LOAD RANGE

- Load ratings from 1 to 16 lbs. per isolator at 3/16" deflection

Specifications

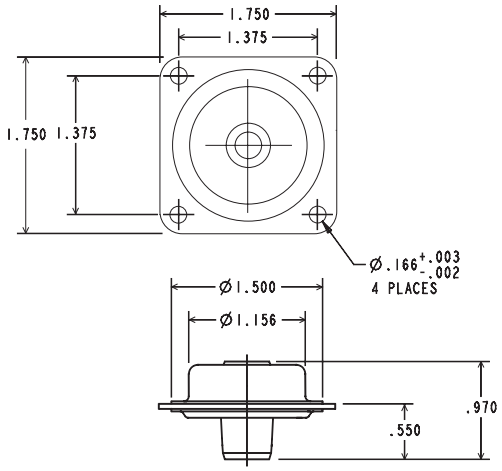
• Natural Frequency	7 Hertz Under Max. Load
• Transmissibility at resonance	10
• Resilient Element	Neoprene
• Standard Materials	Cold-rolled steel
• Weight	1 oz. (27481-S or 27481-D)

Environmental Data

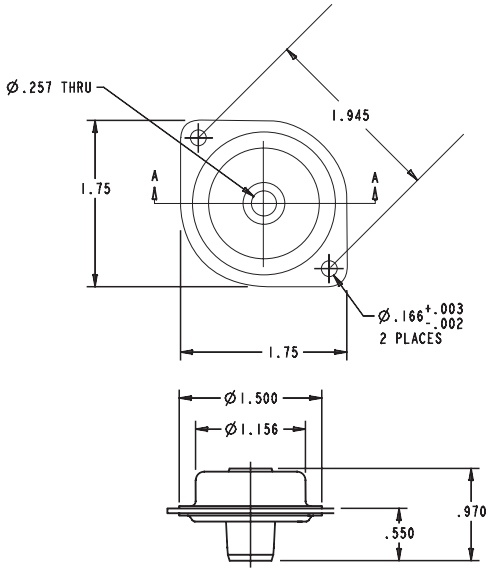
- Standard neoprene elastomer has an operating temperature range of -20°F to +180°F (-30°C to +82°C) and is resistant to oils, most solvents and ozone.

Dimensions & Performance Characteristics

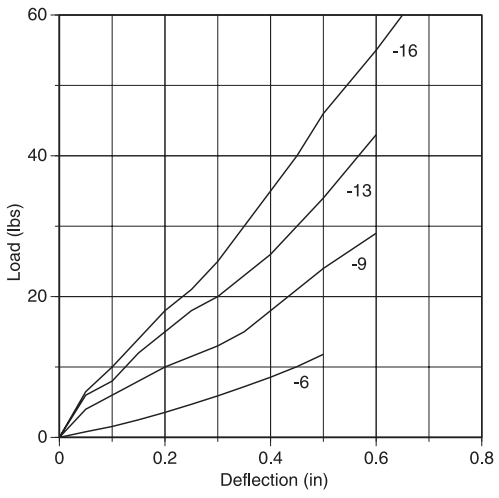
SERIES 27481-XS SERIES
Dimensional Drawing



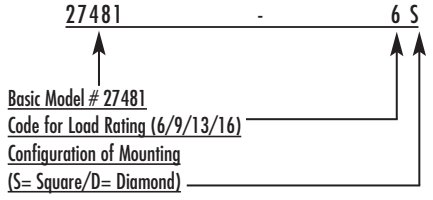
SERIES 27481-XD SERIES
Dimensional Drawing



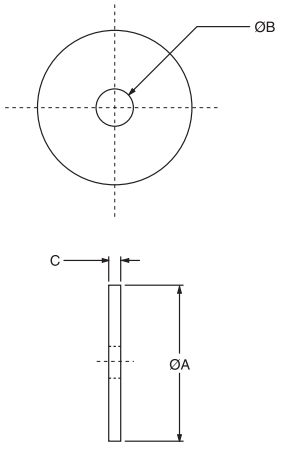
MULTIAXIS MOUNT SERIES
Load vs Deflection



HOW TO ORDER 27481 ISOLATORS



MULTIAXIS MOUNT SERIES
Snubbing Washer



The use of snubbing washers is recommended to ensure proper static and dynamic loading of the isolator and retention of suspended equipment under severe shock environments.

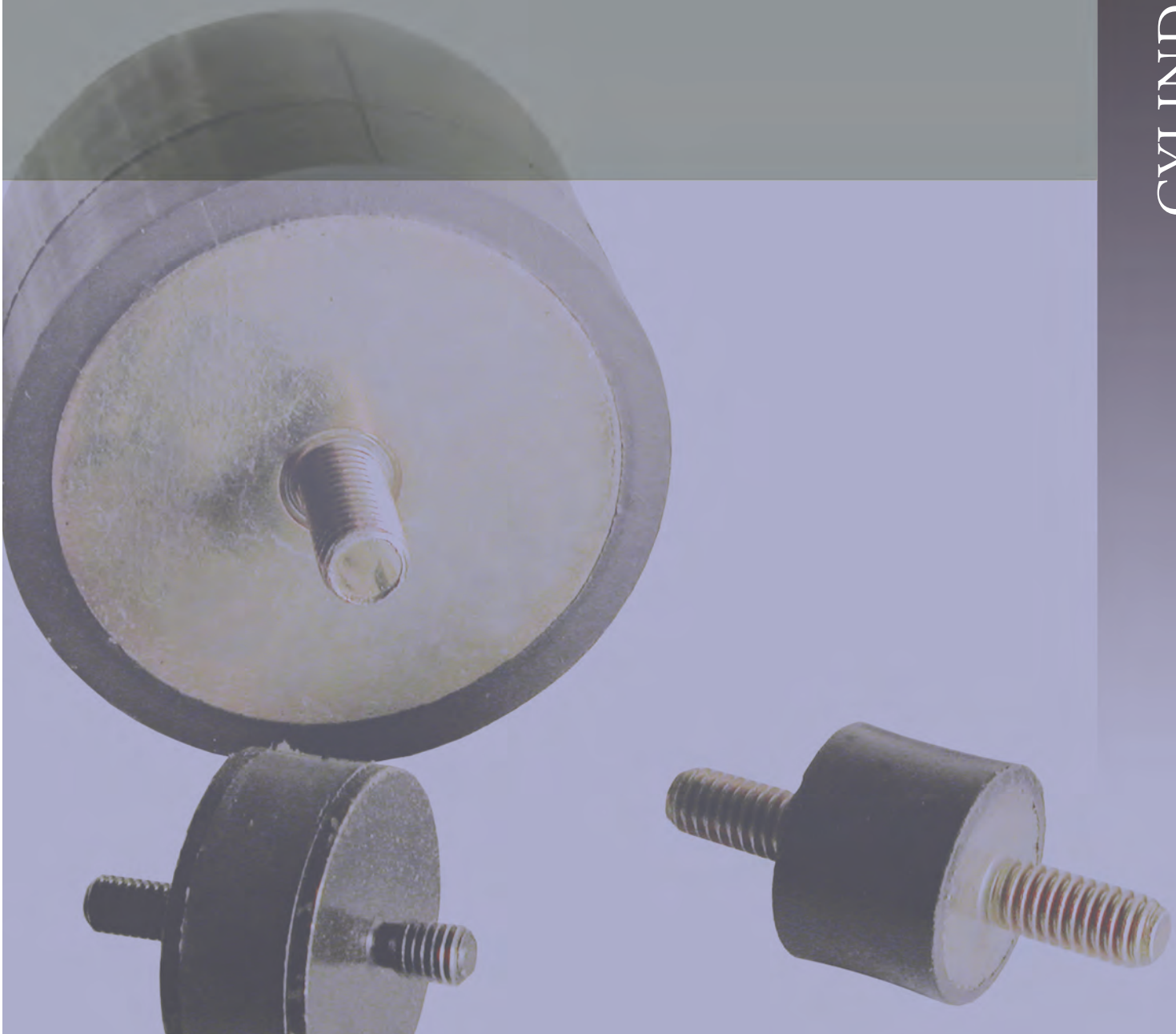
Snubbing washers are ordered by separate part numbers as shown in the table below. The standard material is low-carbon steel and the standard finish is zinc plate. Other materials and finishes are available upon request.

Please consult with Barry Controls Applications Engineering at 1-800-Barry-MA for more information on the use of snubbing washers.

Part #	"A" Dia.	"B" Dia.	"C"
9810321-01000	1.5"	.27"	.062"

CYLINDRICAL STUD MOUNTS

Double Stud (Male/Male) Series
Stud Insert (Male/Female) Series
Bumpers (Male Stud only) Series



CYLINDRICAL STUD MOUNT SERIES

Versatile, low-cost, lightweight stud type mounts for vibration, shock, noise control, and motion accommodation.

APPLICATIONS

- Fans
- Appliances
- HVAC equipment
- Electronic equipment
- Pumps, relays & control panels
- Blowers
- Bumpers

FEATURES

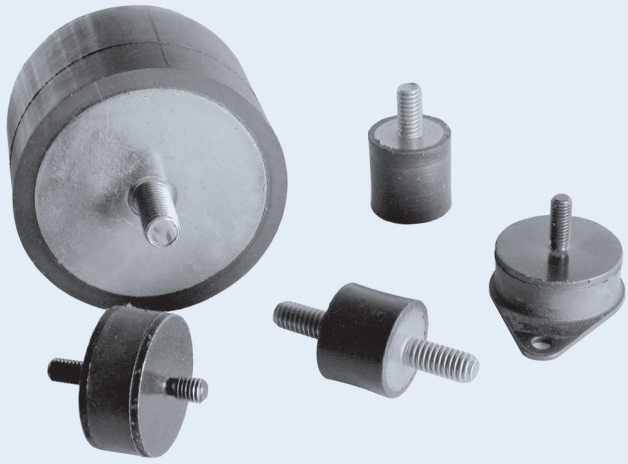
- Low-cost
- Axial to radial stiffness of 5:1
- Compact, low-profile design

BENEFITS

- Compact size minimizes required mounting space
- Mounting permitted at any angle

LOAD RANGE

- Load ratings to 260 lbs. per mount



Barry Stud Mounts are designed to support loads up to 260 lbs. per mount in compression and up to 70 lbs. in shear. Their simple design and sturdy construction permit their use in a wide variety of industrial applications. Available in 3 styles: (1) Double stud, (2) Stud/Insert, (3) Bumpers.

Specifications

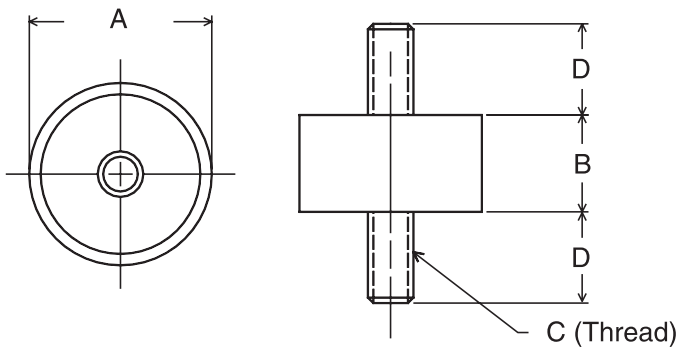
• Natural Frequency	7-28 Hertz
• Transmissibility at resonance	8:1
• Resilient Element	Neoprene & Natural Rubber
• Standard Materials	Low carbon steel

Environmental Data

- Neoprene elastomer has an operating temperature range of -20°F to +180°F (-30°C to +82°C) and is resistant to oils, most solvents and ozone.
- Natural Rubber elastomer has an operating temperature range of -40°F to +180°F (-40°C to +82°C).
- Other materials are available on special order to meet specific operating characteristics.

Dimensions

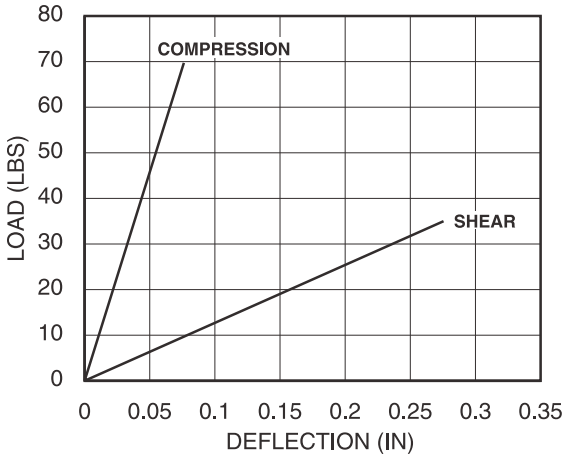
Double Stud (Male/Male) Series
Dimensional Drawing (Inches)



					Compression		Shear		
Part #	A	B	C	D	Max. Load (lbs.)	Natural Frequency (Hz)	Max. Load (lbs.)	Natural Frequency (Hz)	Material
A76-041	0.250	0.280	#4-40	0.190	1.0	9.0	2.0	8.0	Natural Rubber
A88-041	0.375	0.625	#8-32	0.375	2.0	20.0	5.0	18.0	Natural Rubber
A00-051	0.438	0.500	#8-32	0.375	10.3	14.0	5.5	10.0	Natural Rubber
A00-031	0.438	0.500	#8-32	0.375	4.8	14.0	2.5	9.0	Natural Rubber
A07-041	0.438	0.438	#6-32	0.250	4.0	13.5	1.0	12.0	Natural Rubber
A07-042	0.438	0.438	#8-32	0.250	4.0	13.5	1.0	12.0	Natural Rubber
A10-041	0.563	0.500	#8-32	0.375	14.0	12.5	7.0	11.0	Natural Rubber
A10-042	0.563	0.500	#10-32	0.375	14.0	12.5	7.0	11.0	Natural Rubber
A98-041	0.750	0.625	#10-32	0.375	18.0	11.0	3.0	9.5	Natural Rubber
A25-041	1.000	0.250	0.250-20	0.500	60.0	25.0	15.0	28.0	Natural Rubber
A20-041	1.000	0.500	0.250-20	0.750	60.0	14.0	20.0	10.0	Natural Rubber
A21-141	1.000	0.531	0.250-20	0.500	55.0	13.0	23.0	7.5	Neoprene
A22-172	1.000	0.750	0.250-20	0.625	90.0	14.0	50.0	10.0	Neoprene
A22-041	1.000	0.750	0.250-20	0.750	40.0	11.0	10.0	13.0	Natural Rubber
A22-141	1.000	0.750	0.250-20	0.500	50.0	10.0	14.0	7.5	Neoprene
A22-131	1.000	0.750	0.250-20	0.500	44.0	10.0	11.5	7.5	Neoprene
A22-062	1.000	0.750	0.312-18	0.750	70.0	12.0	35.0	10.0	Natural Rubber
A22-142	1.000	0.750	0.312-18	0.562	50.0	10.0	14.0	7.5	Neoprene
A22-053	1.000	0.750	6mm	0.500	60.0	10.0	33.0	8.0	Natural Rubber
A23-042	1.000	1.000	0.250-20	0.750	35.0	9.0	8.0	8.0	Natural Rubber
A23-041	1.000	1.000	0.312-18	0.625	35.0	9.0	8.0	8.0	Natural Rubber
A23-141	1.000	1.000	0.312-18	0.562	35.0	10.0	12.0	7.5	Neoprene
A32-151	1.250	0.750	0.312-18	0.562	98.0	10.0	31.0	7.5	Neoprene
A34-141	1.250	1.250	0.312-18	0.562	76.0	10.0	13.5	7.5	Neoprene
A43-042	1.375	1.000	0.375-16	0.750	70.0	12.0	40.0	9.0	Natural Rubber
A43-151	1.375	1.000	0.312-18	0.562	96.0	10.0	32.0	7.5	Neoprene
A53-061	1.500	1.000	0.375-16	1.000	150.0	9.0	40.0	6.5	Natural Rubber

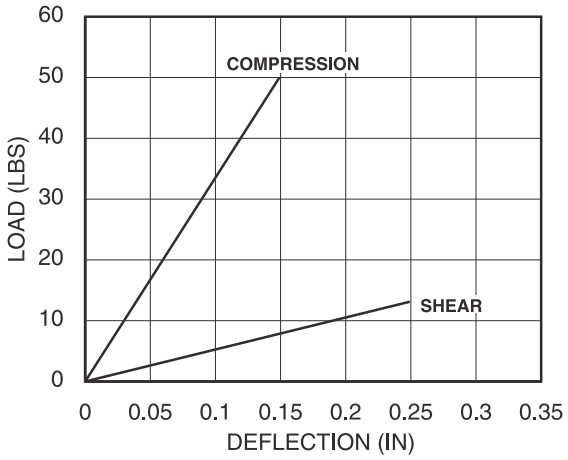
Performance Characteristics

A21-141 Load vs Deflection



Static Load (lbs.)	Natural Frequency (Hertz)
IN SHEAR	
23.0	7.5
18.5	8.0
12.5	10.0
9.5	12.0
7.0	13.0
4.0	17.0
3.0	20.0
IN COMPRESSION	
55.0	13.0
32.5	17.0
10.0	30.0

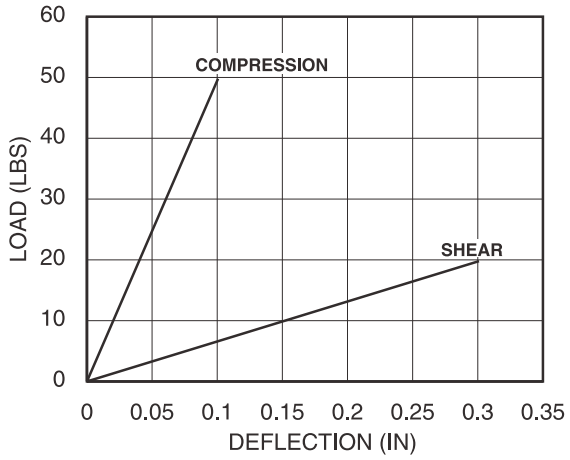
A23-141 Load vs Deflection



Static Load (lbs.)	Natural Frequency (Hertz)
IN SHEAR	
12.0	7.0
10.5	7.5
8.5	8.0
5.7	10.0
4.5	12.0
3.5	13.0
2.3	17.0
1.0	20.0
IN COMPRESSION	
35.0	10.0
20.0	12.0
15.0	13.0
9.5	17.0
7.0	20.0

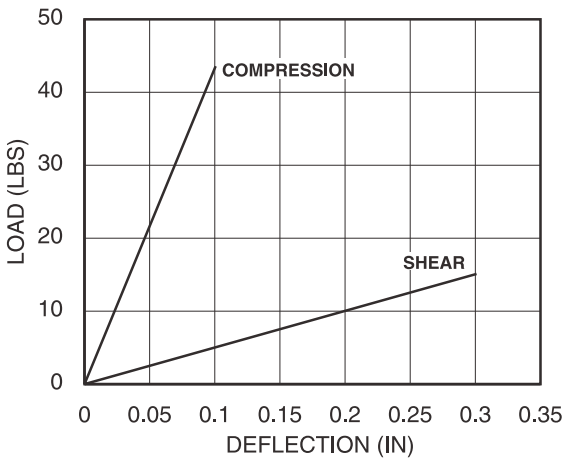
Performance Characteristics

A22-142 Load vs Deflection



Static Load (lbs.)	Natural Frequency (Hertz)
IN SHEAR	
14.0	7.0
10.0	9.0
6.0	14.0
2.0	22.0
IN COMPRESSION	
50.0	10.0
40.0	11.0
30.0	12.5
20.0	15.5
10.0	21.0

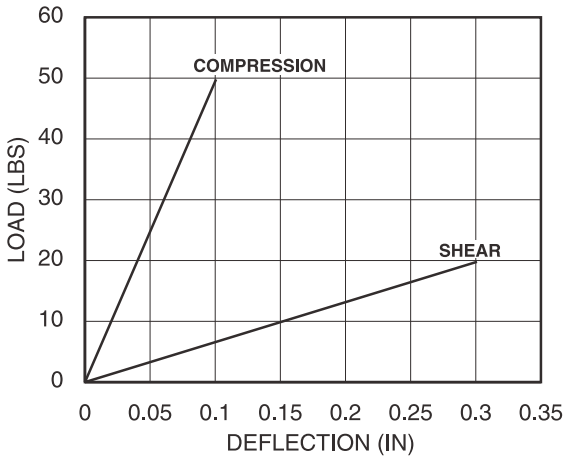
A22-131 Load vs Deflection



Static Load (lbs.)	Natural Frequency (Hertz)
IN SHEAR	
11.5	7.5
7.2	8.0
6.0	10.0
4.5	12.0
3.3	13.0
2.0	17.0
1.5	20.0
IN COMPRESSION	
44.0	10.0
31.5	12.0
23.0	13.0
14.5	17.0
10.0	20.0

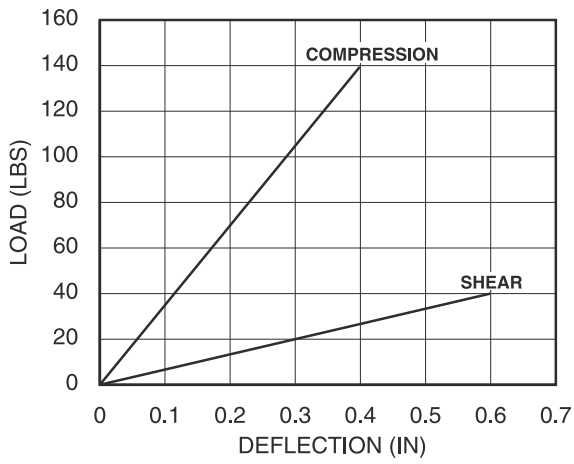
Performance Characteristics

A22-141 Load vs Deflection



Static Load (lbs.)	Natural Frequency (Hertz)
IN SHEAR	
14.5	7.5
11.5	8.0
8.0	10.0
5.7	12.0
4.5	13.0
3.0	17.0
2.0	20.0
IN COMPRESSION	
50.0	10.0
35.5	12.0
25.5	13.0
16.5	17.0
12.5	20.0

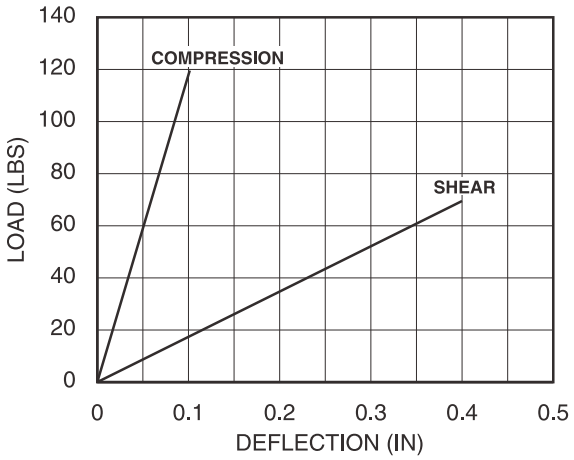
A34-141 Load vs Deflection



Static Load (lbs.)	Natural Frequency (Hertz)
IN SHEAR	
13.5	7.5
10.0	8.0
8.0	10.0
6.0	12.0
4.0	13.0
3.0	17.0
2.0	20.0
IN COMPRESSION	
76.0	8.0
42.0	10.0
31.0	12.0
23.0	13.0
15.0	17.0
10.0	20.0

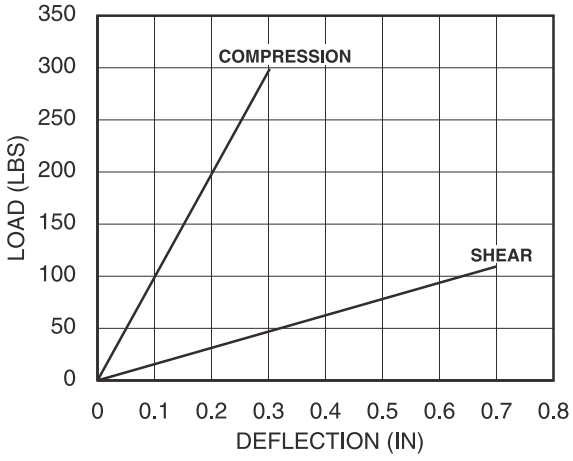
Performance Characteristics

A32-151 Load vs Deflection



Static Load (lbs.)	Natural Frequency (Hertz)
IN SHEAR	
31.0	7.5
24.0	8.0
16.5	10.0
12.0	12.0
9.0	13.0
6.0	17.0
5.0	20.0
IN COMPRESSION	
98.0	10.0
68.0	12.0
50.0	13.0
30.0	17.0
20.0	20.0

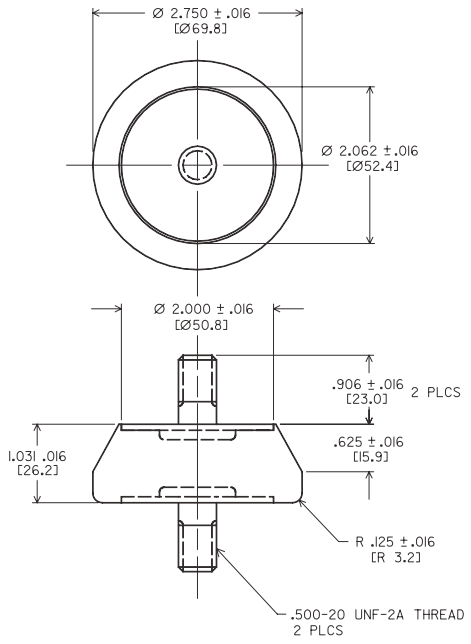
A43-151 Load vs Deflection



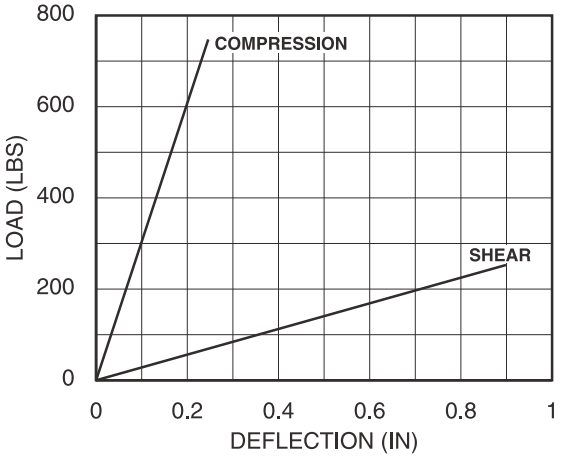
Static Load (lbs.)	Natural Frequency (Hertz)
IN SHEAR	
32.0	7.5
24.0	8.0
16.0	10.0
12.0	12.0
10.0	13.0
6.0	17.0
4.0	20.0
IN COMPRESSION	
96.0	10.0
68.0	12.0
48.0	13.0
32.0	17.0
24.0	20.0

Dimensions & Performance Characteristics

G05-141 CYLINDRICAL STUD MOUNT
Dimensional Drawing



G05-141 Load vs Deflection

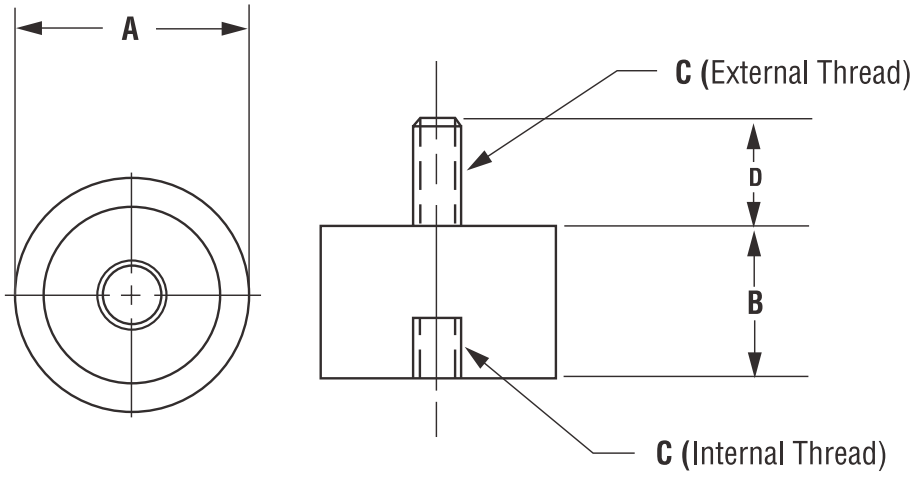


Static Load (lbs.) IN SHEAR	Natural Frequency (Hertz)
70.0	6.0
60.0	7.5
45.0	8.0
35.0	10.0
30.0	12.0
19.0	13.0
17.0	17.0
9.0	20.0
IN COMPRESSION	
260.0	10.0
190.0	12.0
140.0	13.0
90.0	17.0
60.0	20.0
24.0	30.0

Performance Characteristics

STUD/INSERT (MALE/FEMALE) SERIES

Dimensional Drawing (Inches)

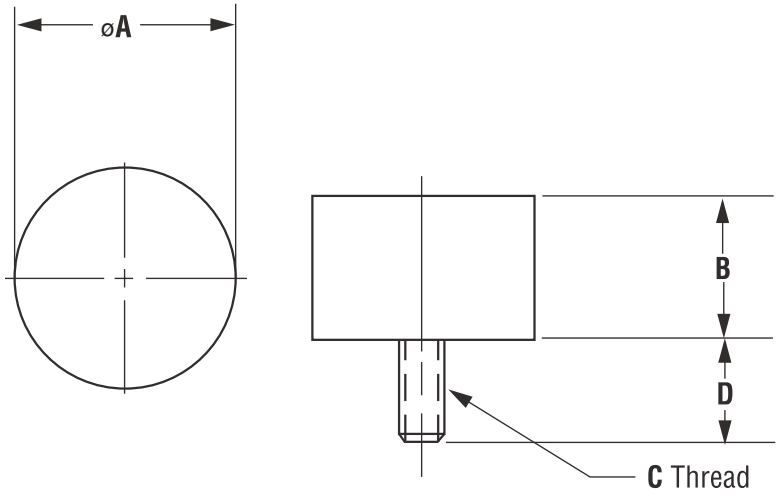


					Compression		Shear		
Part #	A	B	C	D	Max. Load (lbs.)	Natural Frequency (Hz)	Max. Load (lbs.)	Natural Frequency (Hz)	Material
27052-01	0.438	0.438	#6-32	0.250	4.0	13.5	1.0	12.0	Natural Rubber
27052-02	0.438	0.438	#8-32	0.250	4.0	13.5	1.0	12.0	Natural Rubber
27052-07	0.563	0.500	#10-32	0.375	8.0	19.0	2.0	20.0	Natural Rubber
27052-04	0.563	0.500	#8-32	0.250	14.0	12.5	8.0	11.0	Natural Rubber
27052-08	0.563	0.500	#8-32	0.250	25.0	13.0	12.0	12.0	Natural Rubber
27052-06	0.750	0.625	#10-32	0.375	18.0	11.0	3.0	9.5	Natural Rubber
27052-09	1.000	0.750	0.250-20	0.500	40.0	9.5	12.0	10.0	Natural Rubber
27052-10	1.000	0.750	0.250-20	0.500	95.0	13.0	40.0	10.0	Natural Rubber
27052-11	1.000	0.750	0.250-20	0.500	60.0	13.0	33.0	10.0	Natural Rubber
27052-05	1.000	1.000	0.250-20	0.500	35.0	9.0	10.0	8.0	Natural Rubber
27052-12	1.000	1.000	0.312-18	0.500	35.0	12.0	10.0	10.0	Natural Rubber
27052-03	1.250	1.000	0.312-18	0.625	50.0	9.0	12.0	7.0	Natural Rubber
27052-13	1.500	1.375	0.375-16	0.625	75.0	10.0	15.0	12.0	Natural Rubber
27052-14	1.500	1.375	0.375-16	0.625	100.0	10.0	20.0	12.0	Natural Rubber

Dimensions & Performance Characteristics

BUMPERS (MALE STUD ONLY) SERIES

Dimensional Drawing (Inches)



Part #	A	B	C	D	Max. Load (lbs.) Compression	Material
27051-03	0.438	0.438	#6-32	0.250	3.0	Natural Rubber
27051-04	0.563	0.500	#8-32	0.375	6.0	Natural Rubber
27051-05	0.750	0.625	#10-32	0.375	15.0	Natural Rubber
27051-02	1.000	0.375	0.312-18	1.250	40.0	Natural Rubber
27051-06	1.000	0.375	0.312-18	0.625	45.0	Natural Rubber
27051-07	1.000	0.625	0.312-18	0.625	48.0	Natural Rubber
27051-08	1.000	0.750	0.250-20	0.500	35.0	Natural Rubber
27051-01	1.000	1.000	0.312-18	0.625	40.0	Natural Rubber
27051-09	1.250	0.750	0.312-18	0.625	50.0	Natural Rubber
27051-10	1.500	1.000	0.312-18	0.625	100.0	Natural Rubber
27051-11	1.500	1.000	0.375-16	0.625	100.0	Natural Rubber

NOTES:

ALL ELASTOMER ISOLATORS

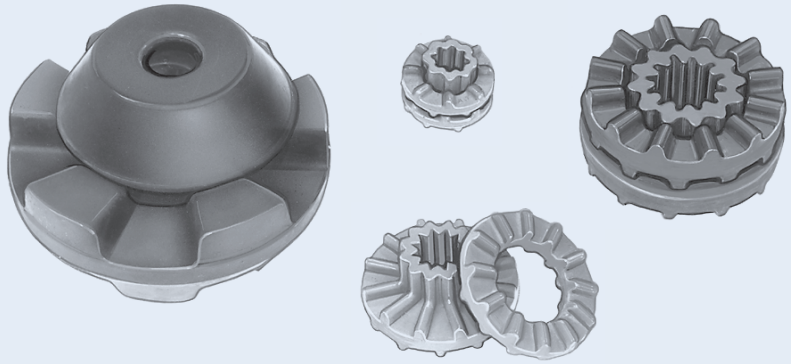
Ring & Bushing Isolators
Ball Mounts

RING & BUSHING MOUNT SERIES

Versatile, low cost elastomeric isolators protect against shock and vibration and reduce structure borne noise.

APPLICATIONS

- Office machines
- Motors
- Fans & blowers
- HVAC equipment
- Electronics equipment
- Telecommunications equipment



Barry Ring & Bushing Isolators consist of an elastomeric ring and elastomeric bushing and are designed to be directly incorporated into the structural components of the equipment to be mounted. Any number of these isolators can be installed in parallel for greater load capacity and may be stacked in series when greater deflection capacity is required.

FEATURES

- Can be installed in parallel or series for greater load capacity
- Ribbed protrusions act as load bearing members
- Available in four stiffnesses (-030, -040, -050 and -060)
- Designed for base mounting

BENEFITS

- Highly efficient noise reduction
- Reduce vibration and shock perpendicular to mounting axis
- WB4 bushings have radial fingers on one surface only to act as rebound (shock absorbing) members

LOAD RANGE

- WR1/WB1 = 4 load ratings to 12 lbs. per isolator
- WR3/WB3 = 4 load ratings to 35 lbs. per isolator
- WR4/WB4 = 4 load ratings to 75 lbs. per isolator
- WR6/WB6 = 4 load ratings to 350 lbs. per isolator

Specifications

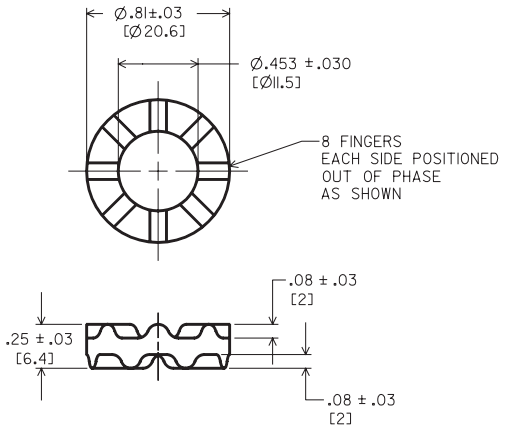
• Natural Frequency	See tables
• Transmissibility at resonance	10:1
• Resilient Element	Natural rubber
• Standard Materials	None
• Weight	WB6 = 3.37 oz. (All other WR/WB parts weigh less than 1.0 oz.)

Environmental Data

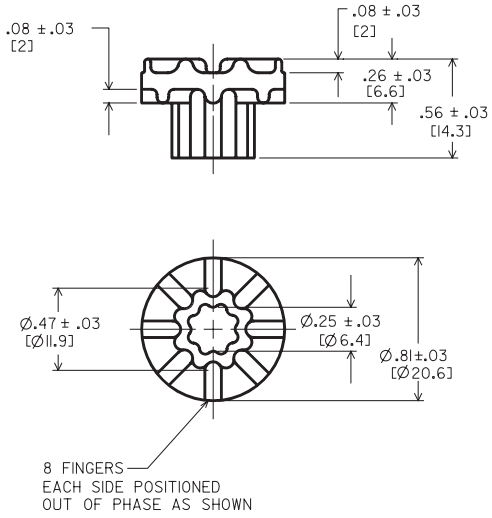
- Natural rubber elastomer is compatible with most industrial and commercial environments and has an operating temperature range of -40°F to +180°F (-40°C to +82°C).
- Special materials are available upon special order.

Dimensions & Performance Characteristics

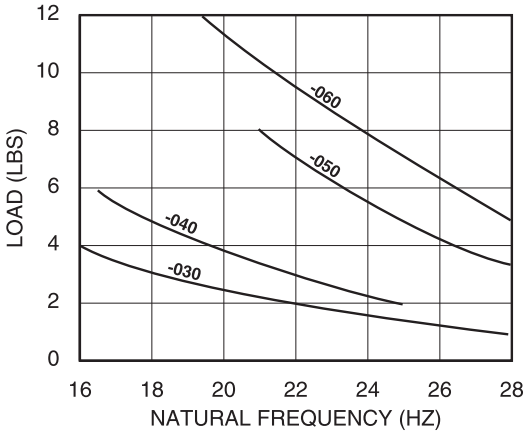
WR-1 (Ring)



WB-1 (Bushing)



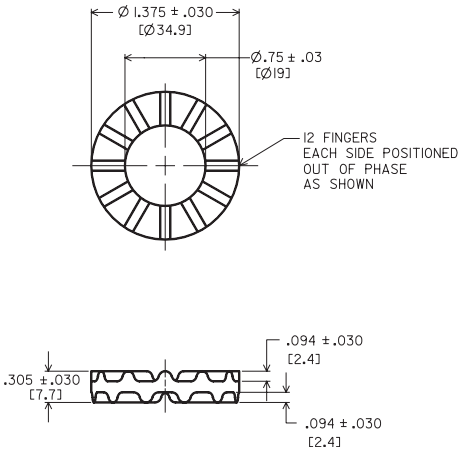
WR-1 Series Load vs Natural Frequency



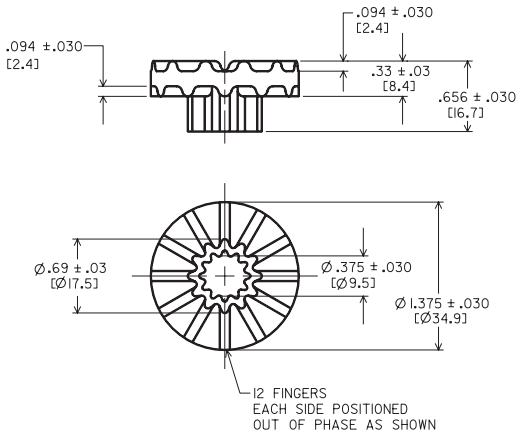
RECOMMENDED LOAD LIMITS FOR RING & BUSHING ASSEMBLY		
Assembly	Min. Load	Max. Load
WR1-030/WB1-030	1 lb.	4 lbs.
WR1-040/WB1-040	2 lbs.	6 lbs.
WR1-050/WB1-050	3 lbs.	8 lbs.
WR1-060/WB1-060	5 lbs.	12 lbs.

Dimensions & Performance Characteristics

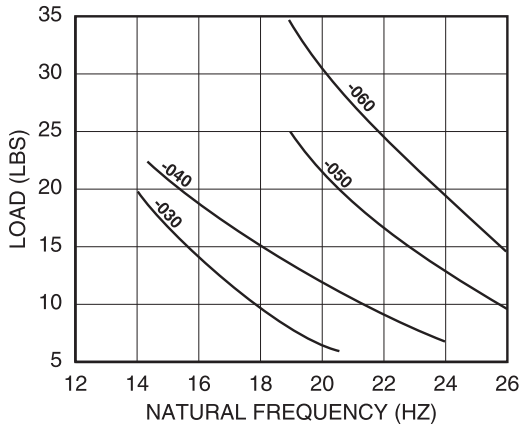
WR-3 (Ring)



WB-3 (Bushing)

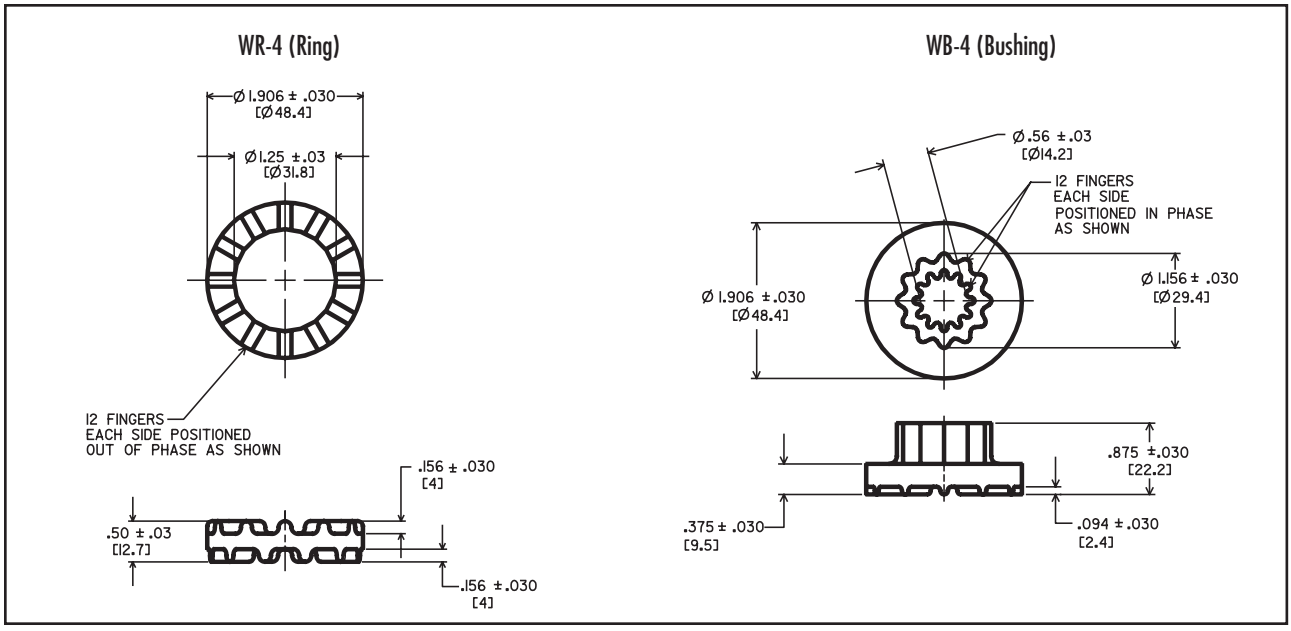


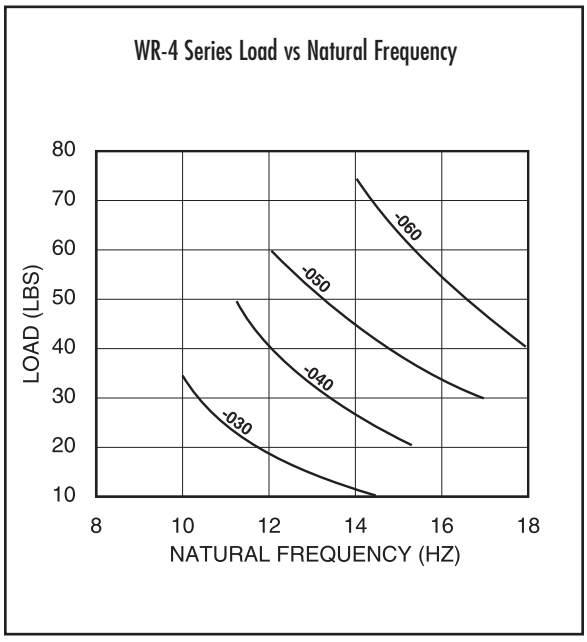
WR-3 Series Load vs Natural Frequency



RECOMMENDED LOAD LIMITS FOR RING & BUSHING ASSEMBLY		
Assembly	Min. Load	Max. Load
WR3-030/WB3-030	6 lb.	20 lbs.
WR3-040/WB3-040	7 lbs.	23 lbs.
WR3-050/WB3-050	10 lbs.	25 lbs.
WR3-060/WB3-060	15 lbs.	35 lbs.

Dimensions & Performance Characteristics

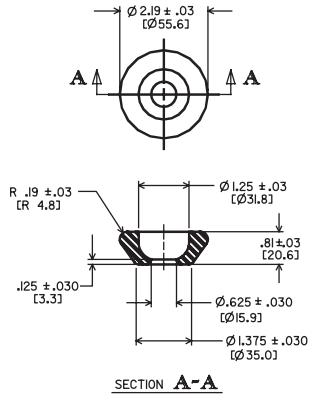




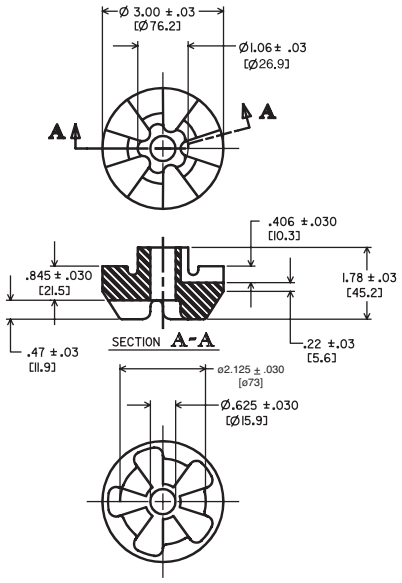
RECOMMENDED LOAD LIMITS FOR RING & BUSHING ASSEMBLY		
Assembly	Min. Load	Max. Load
WR4-030/WB4-030	10 lbs.	35 lbs.
WR4-040/WB4-040	20 lbs.	50 lbs.
WR4-050/WB4-050	30 lbs.	60 lbs.
WR4-060/WB4-060	40 lbs.	75 lbs.

Dimensions & Performance Characteristics

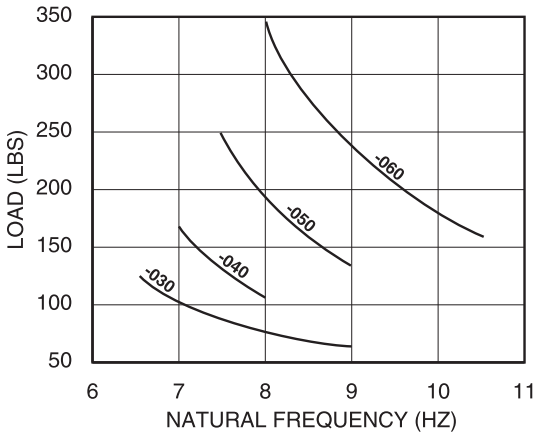
WR-6 (Ring)



WB-6 (Bushing)



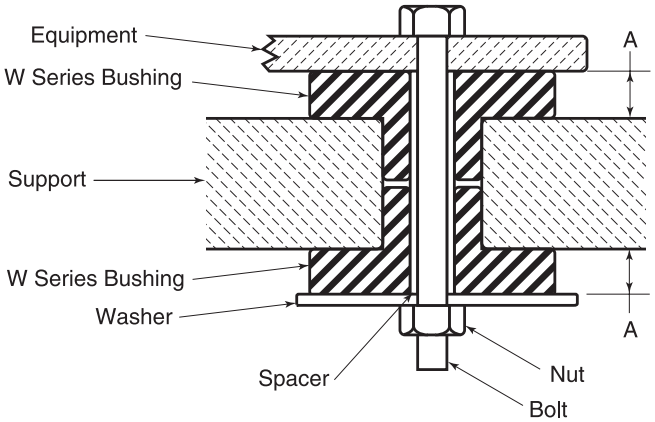
WR-6 Series Load vs Natural Frequency

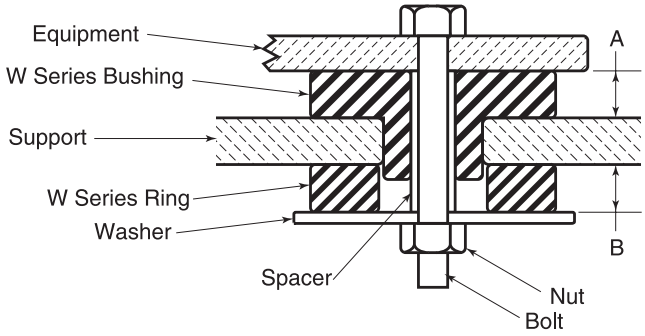


RECOMMENDED LOAD LIMITS FOR RING & BUSHING ASSEMBLY		
Assembly	Min. Load	Max. Load
WR6-030/WB6-030	60 lb.	120 lbs.
WR6-040/WB6-040	110 lbs.	160 lbs.
WR6-050/WB6-050	135 lbs.	250 lbs.
WR6-060/WB6-060	160 lbs.	350 lbs.

Installation Data & Specifications

TYPICAL INSTALLATION - RING & BUSHING





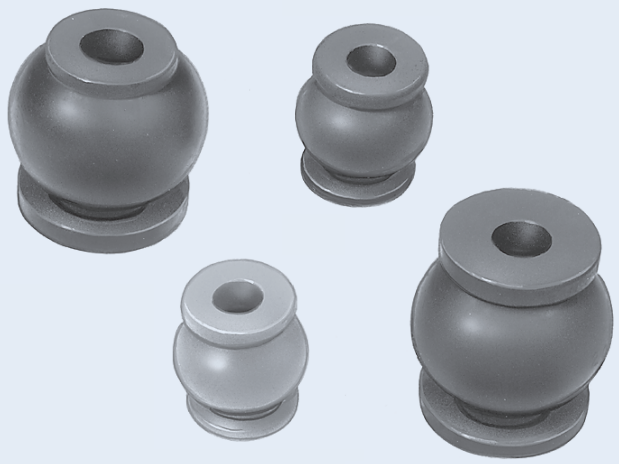
Installed Dimensions		
	A	B
WR1	-	.23
WB1	.23	-
WR3	-	.30
WB3	.30	-
WR4	-	.45
WB4	.33	-
WR6	-	.75
WB6	1.25	-

BALL MOUNT SERIES

Low cost, compact, all elastomer mounts for vibration and noise control.

APPLICATIONS

- Electromechanical equipment
- Medical equipment
- Appliances
- Office equipment
- Other precision applications



Barry Ball Mount Series Isolators are miniature, low-cost isolators that provide medium natural frequency vibration isolation for precision equipment, electronics and office equipment.

FEATURES

- All elastomer isolators
- Fail-safe when installed with ordinary nuts & washers
- Wide load range ratings
- Offer a wide variety of installation options

BENEFITS

- Provide low frequency vibration isolation
- Effective noise isolators
- Will not bottom out under light shock loadings

LOAD RANGE

- Series 7110 = 3 load ratings to 2 lbs. per isolator
- Series 275 = 5 load ratings to 3.2 lbs. per isolator
- Series 302 and 372 = 4 load ratings to 9 lbs. per isolator

Specifications

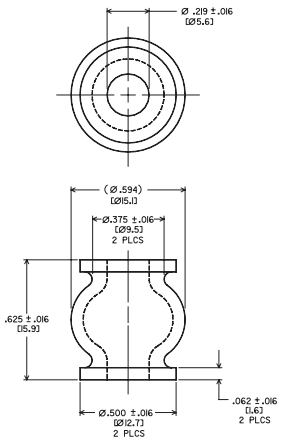
• Natural Frequency	10-20 Hertz
• Transmissibility at resonance	10 (Neoprene)/4.0 (Silicone)
• Resilient Element	Neoprene or Hi-damp silicone
• Standard Materials	None
• Weight	See load range table

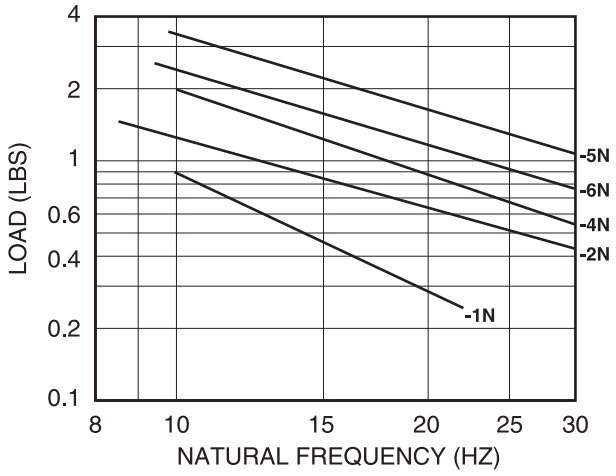
Environmental Data

- Neoprene elastomer has an operating temperature range of -20°F to +180°F (-30°C to +83°C) and is resistant to oil and ozone.
- Silicone elastomer has an operating temperature range of -67°F to +300°F (-55°C to +150°C).

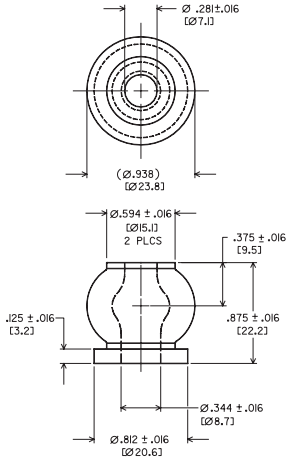
Dimensions & Performance Characteristics

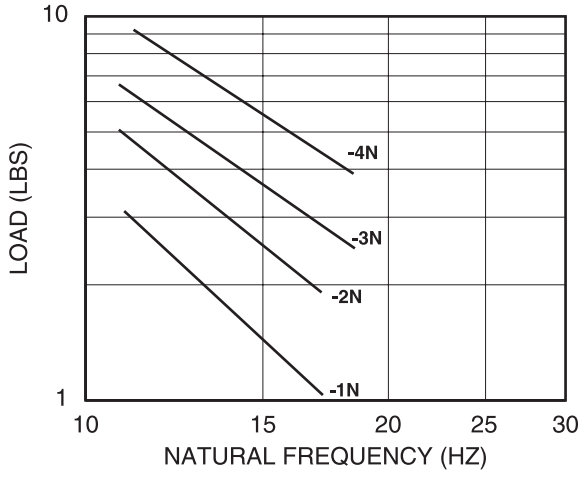
275 Series Dimensional Drawing





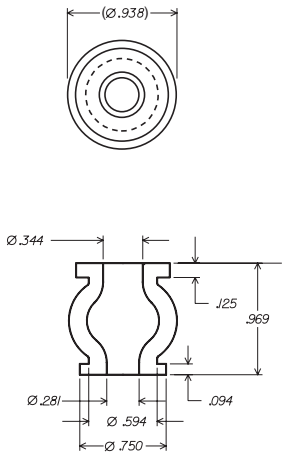
372 Series Dimensional Drawing

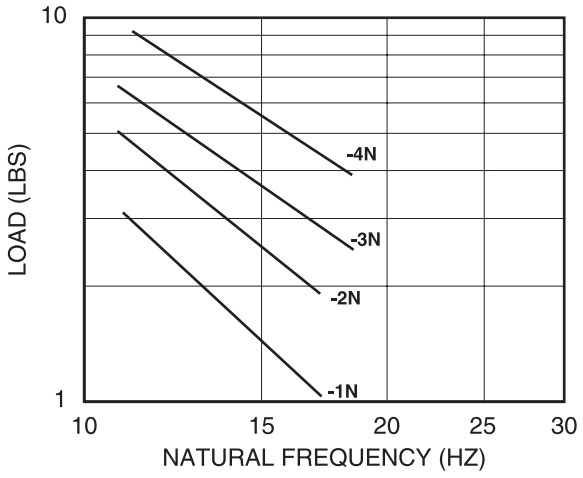




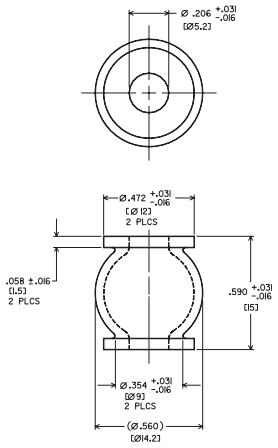
Dimensions & Performance Characteristics

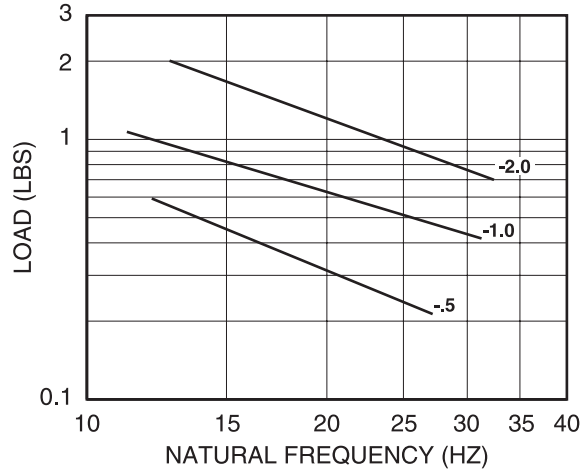
302 Series Dimensional Drawing





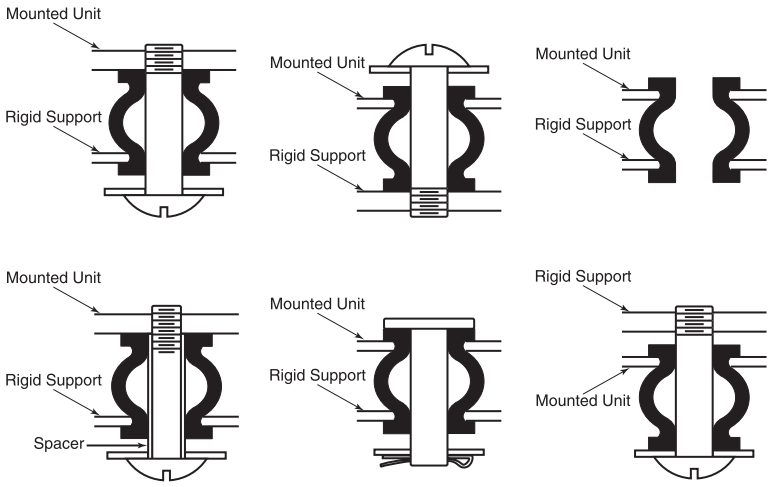
7110 Series Dimensional Drawing





Installation Data & Load Range Specifications

TYPICAL INSTALLATION - BALL MOUNT

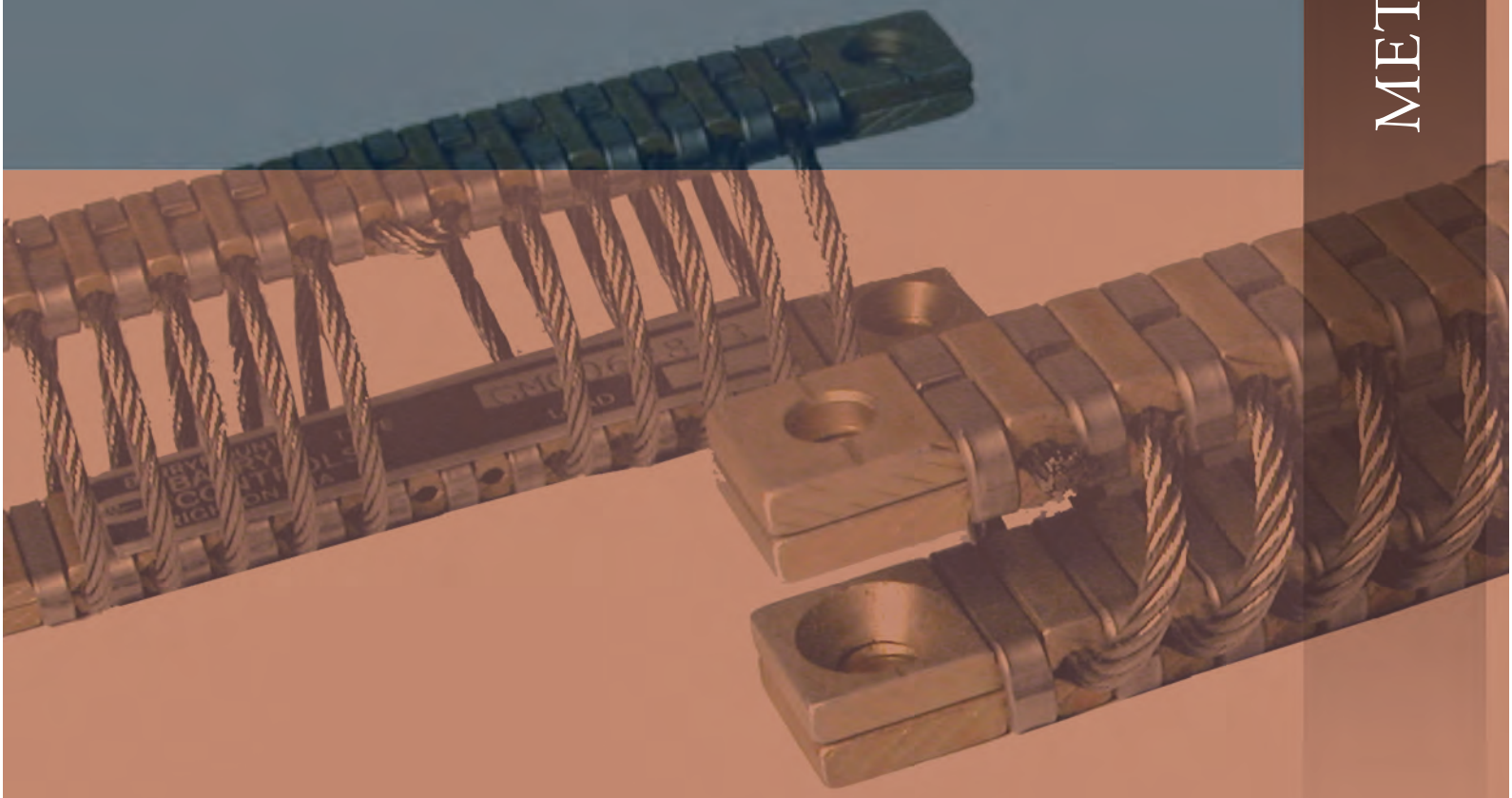


BALL MOUNT SERIES LOAD RANGES AND SPECIFICATIONS

Elastomer	Catalog No.	Color Code	Static Load Range/ Mount (lbs)	Horiz. to Vert. Stiffness Ratio	Wt. (ozs.) Approx.
Neoprene	275-1N	Orange & White	0.4-0.7	0.35 (Approx.)	0.1
	275-2N	Red & White	0.6-1.2		
	275-4N	Yellow & White	0.8-1.6		
	275-5N	Green & White	1.3-2.6		
	275-6N	Blue & White	1.6-3.2		
Neoprene	302-1N 372-1N	Yellow & White	1.3-3.5	0.25 (Approx.)	0.5
Neoprene	302-2N 372-2N	Purple & White	2.3-4.5		
Neoprene	302-3N 372-3N	Green & White	3.0-6.0		
Neoprene	302-4N 372-4N	Blue & White	4.5-9.0		
Silicone	7110-0.5	Red	0.3-0.5	0.35	0.1
	7110-1.0	Blue	0.5-1.0	0.35	0.1
	7110-2.0	Orange	1.0-2.0	0.35	0.1

METAL & MESH ISOLATORS

1200 Series
MET-L-FLEX Bushings
9300 Series Mounts
Cablemount Series



1200 MOUNT SERIES (1201/1202)

Small, lightweight unit isolators for airborne, vehicular and industrial applications.

APPLICATIONS

- Electronic, pneumatic and hydraulic devices
- Vehicular mounted equipment
- Industrial & military packaging
- Shipboard electronics
- Communications equipment

FEATURES

- Axial to radial stiffness of 3:1
- Rugged, reliable construction
- Stainless steel cushions
- Vertical natural frequency as low as 10 Hertz

BENEFITS

- Isolators are not effected by oil, dust water, ozone or atmospheric pressure
- High damping characteristics

LOAD RANGE

- 1201 Series = 3 load ratings to 10 lbs. per mount
- 1202 Series = 4 load ratings to 40 lbs./mount

The high damping and nonlinear characteristics of MET-L-FLEX load carrying element and limiter pads in the all metal 1201 and 1202 Series Isolators assure controlled shock and vibration isolation protection for mounted equipment.

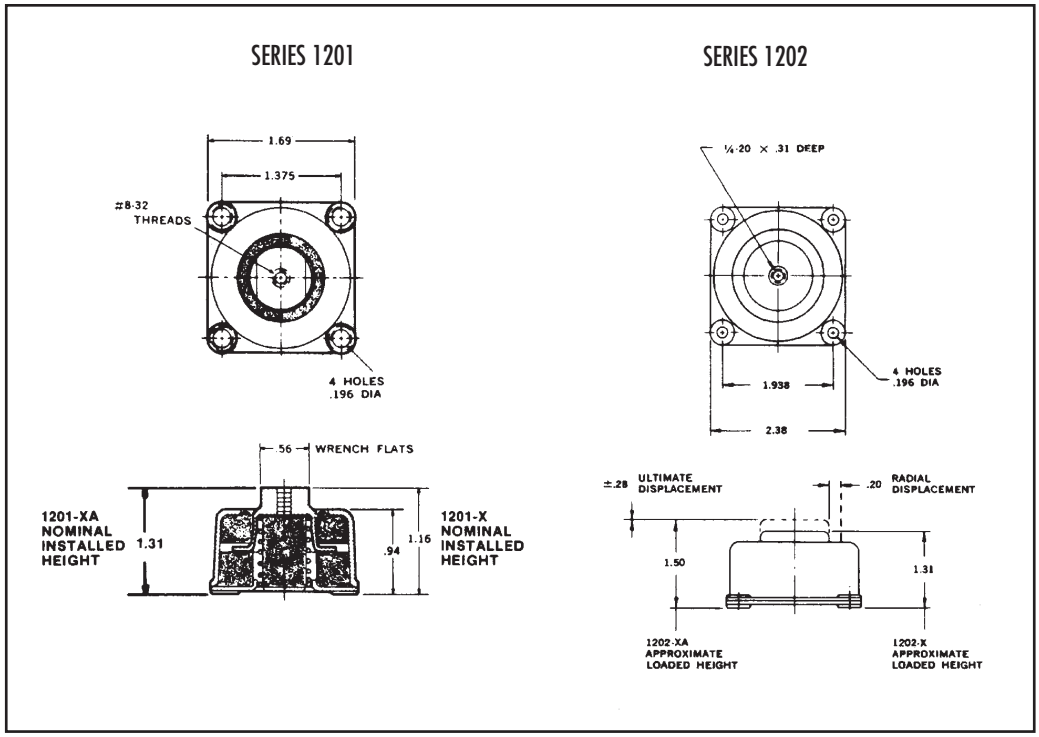
Specifications

• Natural Frequency	15-20 Hertz
• Transmissibility at resonance	3.0-4.0
• Resilient Element	Metal Mesh
• Standard Materials	Aluminum
• Weight	1201 = 1.5 oz. 1202 = 4.2 oz.

Environmental Data

- Operating temperature ranges of -130°F to +375°F.
- Applicable to military standards.
- Resistant to dust, oils, oil-based solvents, salt water and sand.

Dimensions & Performance Characteristics



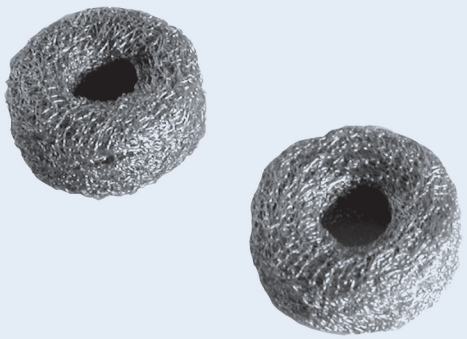
LOAD RATING		
Dimpled Mounting	Non-Dimpled Mounting	Load Rating (lbs.)
1201-1	1201-1A	1 - 3
1201-2	1201-2A	2.5 - 5.5
1201-3	1201-3A	5 - 10
1202-1	1202-1A	2.5 - 6
1202-2	1202-2A	5.5 - 12.5
1202-3	1202-3A	10 - 20
1202-4	1202-4A	18 - 40

MET-L-FLEX BUSHINGS

All metal bushings provide excellent vibration and shock protection under adverse environmental conditions.

APPLICATIONS

- Shipboard, marine and vehicle applications
- Fans & blowers
- Aerospace & military applications
- Motor/generator sets



Barry MET-L-FLEX Bushings are used wherever environmental conditions could damage or destroy conventional elastomeric bushings. They are used in the assembly and interconnection of mounting and structural elements.

FEATURES

- Wide temperature range
- Metal mesh construction
- Axial to radial stiffness of 0.8:1
- Non-linear spring rate

BENEFITS

- Isolators are not effected by oil, dust, water, ozone or atmospheric pressure
- Excellent vibration isolation
- Rapid elimination of shock without damaging rebound
- No distortion set under sustained loads

Specifications

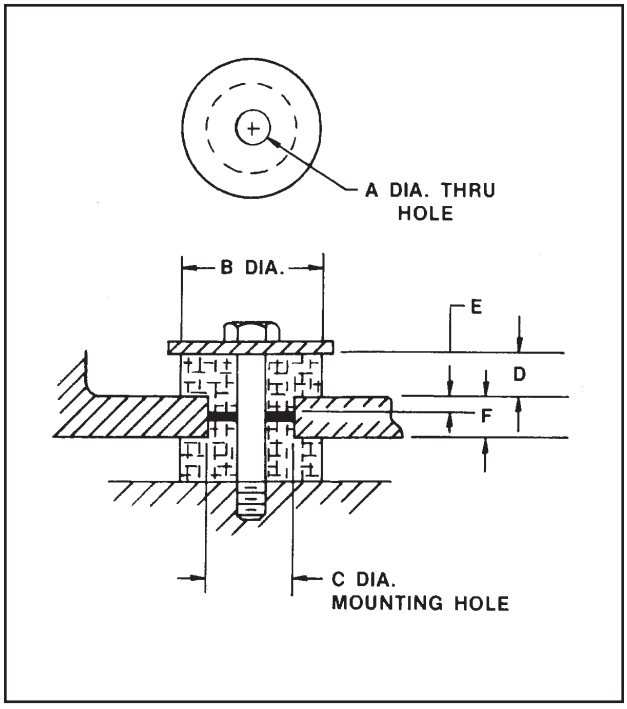
• Natural Frequency	230 Hertz Vertical
• Transmissibility at resonance	5.5
• Resilient Element	Metal Mesh
• Standard Materials	Stainless Steel
• Weight	See Table

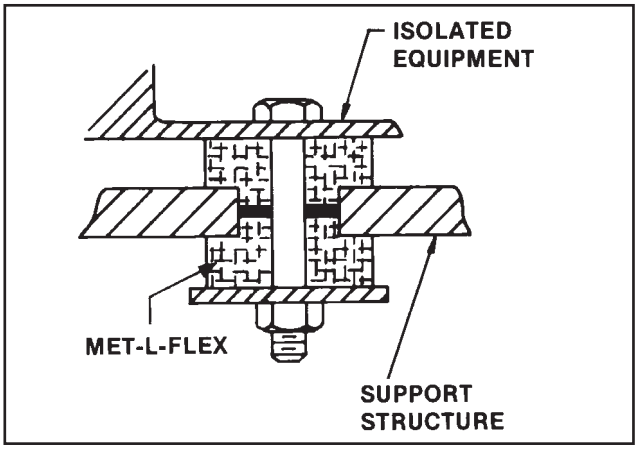
Environmental Data

- Operating temperature ranges of -130°F to +500°F (-90°C to +260°C).
- Resistant to dust, oils, oil-based solvents, extreme temperatures, salt water and sand.

Dimensions & Performance Characteristics

MET-L-FLEX BUSHINGS								
Part #	A	B	C	D	E	F	WEIGHT	RECOMMENDED LOAD*
MG30425-1	.14	11/32	1/4	7/64	1/16	1/8	.03	10 lbs.
MG30428-1	.16	25/64	9/32	9/64	1/16	1/8	.05	12 lbs.
MG30431-1	.19	7/16	5/16	9/64	1/16	1/8	.06	16 lbs.
MG30441-1	.25	9/16	13/32	11/64	5/64	5/32	.11	27 lbs.
MG30450-1	.31	11/16	1/2	7/32	3/32	3/16	.21	42 lbs.
MG30462-1	.38	7/8	5/8	17/64	1/8	1/4	.42	64 lbs.





*Consistent with 5% deflection of the 'D' dimension due to tightening.
Do not over tighten so as to exceed deflection of 5% of 'D' dimension.

9300 MOUNT SERIES

APPLICATIONS

- Airborne electronics
- Ideal for use in applications where attitude of equipment inoperation may vary, such as missiles

FEATURES

- Axial to radial stiffness of 1:1
- Rugged, reliable construction
- All attitude isolators

BENEFITS

- Isolators are not effected by oil, dust, water, ozone atmospheric pressure or temperature
- Ideal for center of gravity type suspensions

LOAD RANGE

- 9300 Series = 17 load ratings to 16 lbs. per mount

Barry 9300 Series isolators are versatile, double acting mountings for installation with electronic & electro-mechanical equipment requiring protection against the vibration and shock encountered in airborne operations.

Specifications

• Natural Frequency	12-15 Hertz
• Transmissibility at resonance	4.0 Max
• Resilient Element	Springs & Metal Mesh
• Standard Materials	Aluminum Housing
• Weight	9301 = 1.25 oz. 9302 = 2.75 oz. 9303 = 4.75 oz.

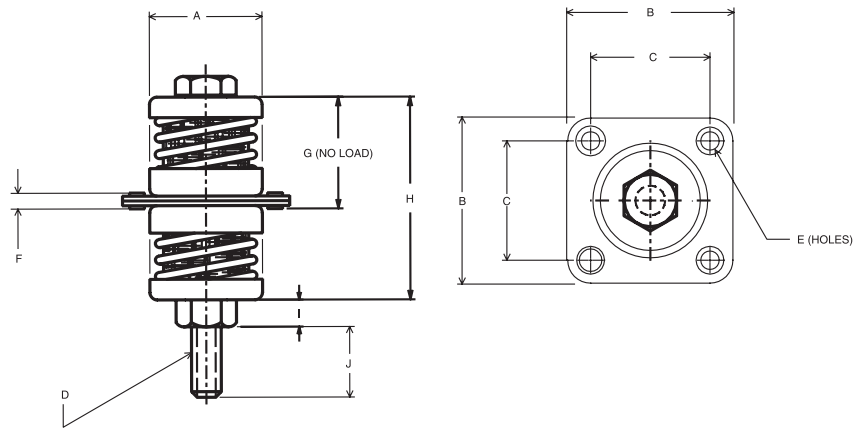
Environmental Data

- Operating temperature ranges of -130°F to +375°F (-90°C to +190°C).
- Resistant to dust, oils, oil-based solvents, salt water and sand.

9300 MOUNT SERIES:

Dimensions & Load Range Specifications

9300 MOUNT SERIES DIMENSIONAL DRAWING



		DIMENSIONS (INCHES)									
Part #	Load Range	A	B	C	D	E	F	G	H	I	J
9301-1	.5 - 1 lbs.	15/16	1 1/4	1	10-32	.141	3/64	51/64	1 1/2	5/16	3/8
9301-2	1 - 2 lbs.										
9301-3	2 - 3 lbs.										
9302-1	1-2 lbs.	1 7/32	1 3/4	1.375	1/4-20	.196	3/16	1 3/32	2	1/8	9/16
9302-2	1 3/4 - 3 1/2 lbs.										
9302-3	3 1/4 - 6 1/2 lbs.										
9303-1	2 - 3 lbs.	1 9/16	1 31/32	1.375	5/16-24	.196	3/16	1 1/4	2 5/16	5/16	1/2
9303-2	3 - 5 lbs.										
9303-3	5 - 7 lbs.										
9303-4	7 - 10 lbs.										
9303-7	10 - 13 lbs.										
9304-1	1 - 2 lbs.	1 15/16	2 1/4	1.750	5/16-24	.196	3/16	1 1/4	2 5/16	5/16	1/2
9304-2	7 - 11 lbs.										
9304-3	11 - 16 lbs.										
9304-4	4.5 - 7 lbs.										
9304-5	2 - 3 lbs.										
9304-6	3 - 4.5 lbs.										

CABLEMOUNT SERIES

Rugged, all metal cable type isolators offer excellent shock and vibration protection in hostile environments.

APPLICATIONS

- Shipboard navigational, fire control & communications equipment
- On/Off road vehicles
- Motor/Generator sets
- Extreme temperature environments, such as engine compartments

FEATURES

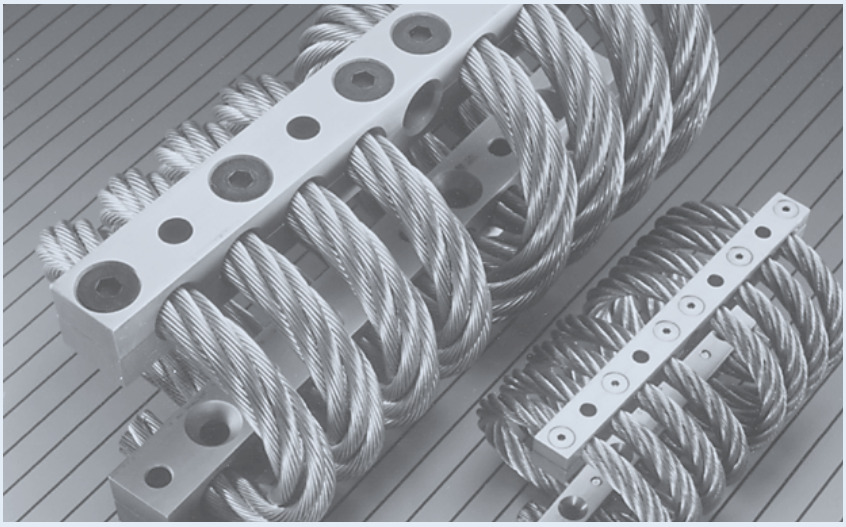
- All-attitude mounting
- Fail-safe design
- Available in a wide range of sizes and load ranges for most applications
- High damping

BENEFITS

- Performs efficiently without material degradation in hostile environments
- Ideal for use in high temperature and/or under corrosive conditions
- Many custom versions are available Consult factory for more information

LOAD RANGE

- 11 styles to accommodate up to 1,500 lbs. per mount



Cablemounts are designed to perform efficiently without material or performance degradation in extremely hostile environments. They are operational under wide extremes of temperature ranges and resist chemicals, oils and abrasives.

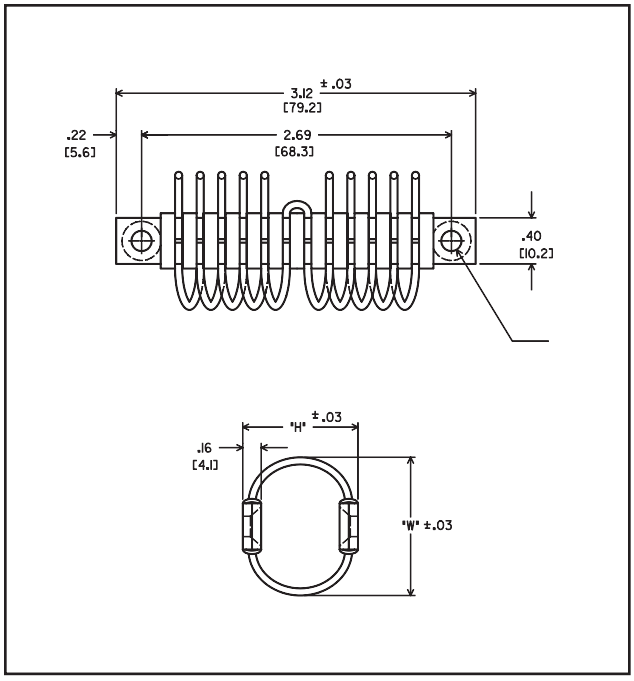
Specifications

• Natural Frequency	10-20 Hertz
• Transmissibility at resonance	3.5
• Resilient Element	Stainless steel cable
• Standard Materials	Aluminum mounting bars

Environmental Data

- Operating temperature ranges of -400°F to +700°F (-240°C to +370°C).
- Applicable to military standards of MIL-STD-167 (vibration), MIL-S-901 (shock) and MIL-E-16400.
- Resistant to dust, oils, oil-based solvents, salt water and sand.

Dimensions & Load Ratings

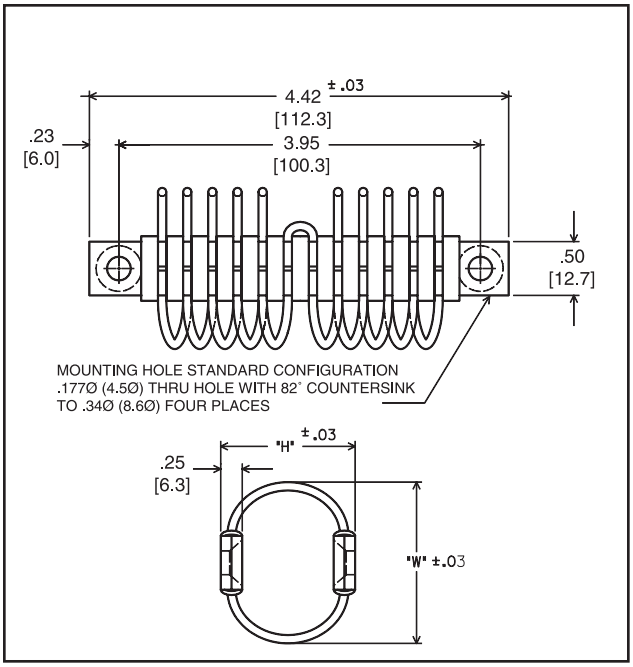


SUFFIX	MOUNTING HOLE CONFIGURATION
NONE	Standard Configuration as shown in drawing
- A	8-32 Threaded inserts in both retaining bars
- B	8-32 Threaded inserts in one retaining bar and standard configuration as shown in drawing in other retaining bar
- C	M4 x .7 Threaded inserts in both retaining bars
- D	M4 x .7 Threaded inserts in one retaining bar and standard configuration as shown in drawing in other retaining bar w/90˚ countersink
- E	Standard configuration as shown in drawing w/ 90˚ countersink

PART #	DIMENSIONS		COMPRESSION		SHEAR		ROLL		45˚ COMP/ROLL	
	H	W	Load Rating	Max. Deflection	Load Rating	Max. Deflection	Load Rating	Max. Deflection	Load Rating	Max. Deflection
CM00628-1	.70	1.00	14.0	.3	7.0	.3	6.5	.3	7.5	.7
CM00628-2	.80	1.10	8.5	.4	3.5	.4	3.5	.4	4.2	.7
CM00628-3	1.00	1.20	5.2	.5	1.6	.6	1.6	.6	3.4	.8
CM00628-4	1.10	1.30	4.8	.7	1.4	.7	1.4	.7	2.5	.9
CM00628-5	1.20	1.40	2.9	.8	1.3	.9	1.3	.9	1.9	.9
CM00628-6	1.30	1.50	2.5	.9	.7	.9	.7	.9	1.5	1.1

Natural Frequency at rated load = approx. 10 Hertz

Dimensions & Load Ratings

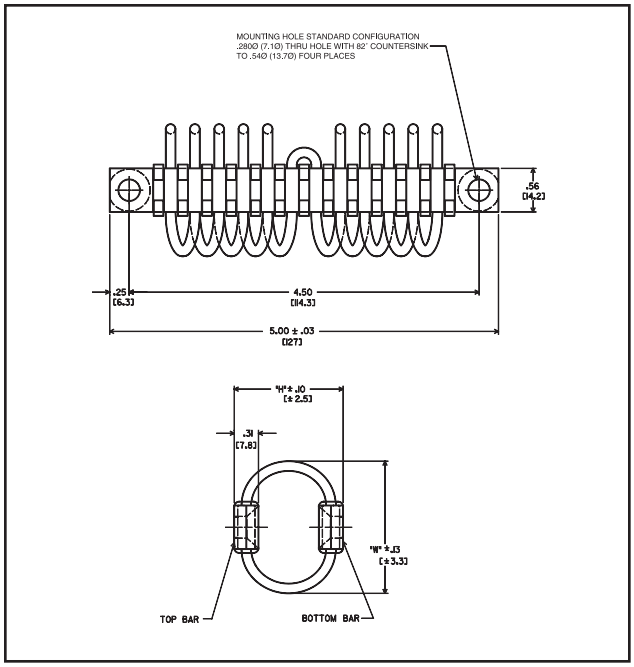


SUFFIX	MOUNTING HOLE CONFIGURATION
NONE	Standard Configuration as shown in drawing
- A	10-32 Threaded inserts in both retaining bars
- B	10-32 Threaded inserts in one retaining bar and standard configuration as shown in drawing in other retaining bar
- C	M5 x .8 Threaded inserts in both retaining bars
- D	M5 x .8 Threaded inserts in one retaining bar and standard configuration as shown in drawing in other retaining bar w/90° countersink
- E	Standard configuration as shown in drawing w/ 90° countersink

PART #	DIMENSIONS		COMPRESSION		SHEAR		ROLL		45° COMP/ROLL	
	H	W	Load Rating	Max. Deflection	Load Rating	Max. Deflection	Load Rating	Max. Deflection	Load Rating	Max. Deflection
CM00938-1	.90	1.10	50.0	.3	23.0	.4	15.0	.4	28.0	.8
CM00938-2	1.00	1.20	31.0	.3	10.0	.5	10.0	.5	19.0	.9
CM00938-3	1.10	1.30	25.0	.4	6.5	.5	6.5	.5	14.5	.9
CM00938-4	1.30	1.50	12.0	.5	4.0	.6	4.0	.6	9.0	.9
CM00938-5	1.40	1.60	9.5	.6	3.0	.7	3.0	.7	6.0	1.1
CM00938-6	1.50	1.70	7.5	.7	2.5	.8	2.5	.8	5.0	1.5

Natural Frequency at rated load = approx. 10 Hertz

Dimensions & Load Ratings

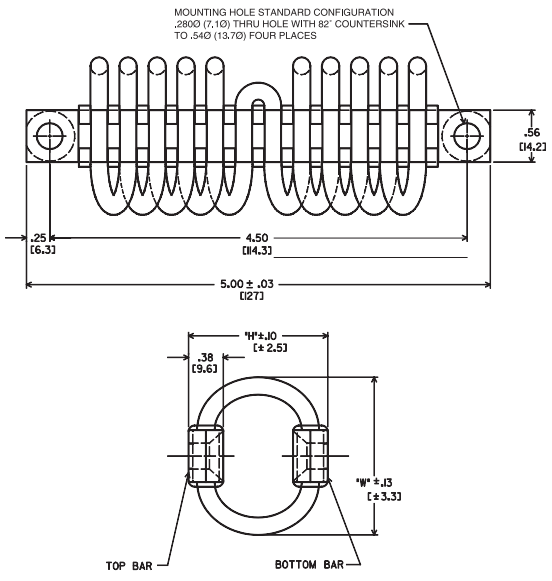


SUFFIX	MOUNTING HOLE CONFIGURATION
NONE	Standard Configuration as shown in drawing
- A	1/4 -20 Threaded inserts in both retaining bars
- B	1/4 -20 Threaded inserts in one retaining bar and standard configuration as shown in drawing in other retaining bar
- C	M6 x 1.0 Threaded inserts in both retaining bars
- D	M6 x 1.0 Threaded inserts in one retaining bar and standard configuration as shown in drawing in other retaining bar w/90˚ countersink
- E	Standard configuration as shown in drawing w/ 90˚ countersink

PART #	DIMENSIONS		COMPRESSION		SHEAR		ROLL		45˚ COMP/ROLL	
	H	W	Load Rating	Max. Deflection	Load Rating	Max. Deflection	Load Rating	Max. Deflection	Load Rating	Max. Deflection
CM01258-1	1.10	1.40	75.0	.2	30.0	.4	28.0	.4	55.0	.9
CM01258-2	1.20	1.50	68.0	.4	21.0	.6	24.0	.6	43.0	.9
CM01258-3	1.30	1.60	50.0	.5	19.0	.7	19.0	.7	33.5	1.0
CM01258-4	1.40	1.70	44.0	.7	13.0	.8	13.0	.8	25.0	1.1
CM01258-5	1.50	1.80	34.0	.7	12.0	.9	12.0	.9	21.0	1.2
CM01258-6	1.60	1.90	33.0	.7	10.0	.9	10.0	.9	19.0	1.5

Natural Frequency at rated load = approx. 10 Hertz

Dimensions & Load Ratings

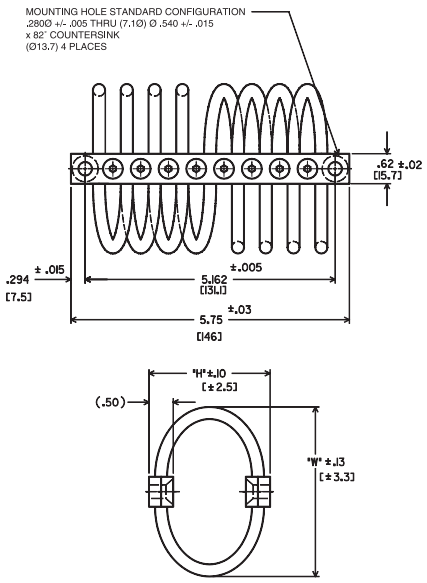


SUFFIX	MOUNTING HOLE CONFIGURATION
NONE	Standard Configuration as shown in drawing
- A	1/4 -20 Threaded inserts in both retaining bars
- B	1/4 -20 Threaded inserts in one retaining bar and standard configuration as shown in drawing in other retaining bar
- C	M6 x 1.0 Threaded inserts in both retaining bars
- D	M6 x 1.0 Threaded inserts in one retaining bar and standard configuration as shown in drawing in other retaining bar w/90˚ countersink
- E	Standard configuration as shown in drawing w/ 90˚ countersink

PART #	DIMENSIONS		COMPRESSION		SHEAR		ROLL		45˚ COMP/ROLL	
	H	W	Load Rating	Max. Deflection	Load Rating	Max. Deflection	Load Rating	Max. Deflection	Load Rating	Max. Deflection
CM01878-1	1.20	1.40	325	.3	160	.4	90	.4	370	.4
CM01878-2	1.30	1.50	190	.3	58	.4	63	.4	250	.6
CM01878-3	1.40	1.60	165	.4	55	.5	45	.5	230	.7
CM01878-4	1.50	1.70	150	.5	45	.5	35	.5	190	.9
CM01878-5	1.60	1.80	120	.7	38	.5	33	.5	150	.9
CM01878-6	1.70	1.90	100	.8	25	.6	31	.6	130	1.0

Natural Frequency at rated load = approx. 10 Hertz

Dimensions & Load Ratings

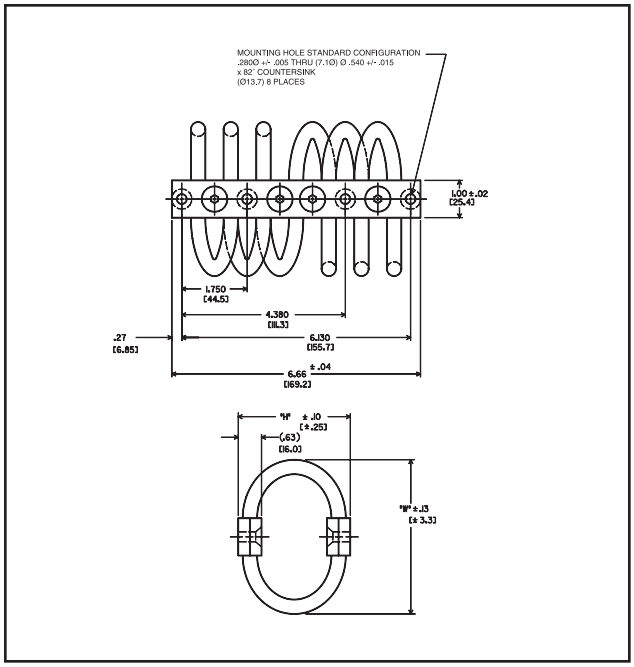


SUFFIX	MOUNTING HOLE CONFIGURATION
NONE	Standard Configuration as shown in drawing
- A	1/4 -28 Threaded inserts in both retaining bars
- B	1/4 -28 Threaded inserts in one retaining bar and standard configuration as shown in drawing in other retaining bar
- C	M6 x 1.0 Threaded inserts in both retaining bars
- D	M6 x 1.0 Threaded inserts in one retaining bar and standard configuration as shown in drawing in other retaining bar w/90° countersink
- E	Standard configuration as shown in drawing w/ 90° countersink

PART #	DIMENSIONS		COMPRESSION		SHEAR		ROLL		45° COMP/ROLL	
	H	W	Load Rating	Max. Deflection	Load Rating	Max. Deflection	Load Rating	Max. Deflection	Load Rating	Max. Deflection
CM02508-1	1.90	2.20	163	.6	69	.8	62	.8	90	1.5
CM02508-2	2.13	2.50	113	.8	45	1.0	40	1.0	65	1.8
CM02508-3	2.31	2.80	94	1.0	30	1.3	33	1.3	50	2.2
CM02508-4	2.50	3.13	63	1.1	20	1.6	23	1.6	38	2.3
CM02508-5	2.50	3.50	50	1.3	15	1.7	21	1.7	30	2.5
CM02508-6	2.63	3.75	43	1.5	13	1.9	20	1.9	24	2.7
CM02508-7	2.63	3.95	38	1.5	12	2.0	13	2.0	26	2.8
CM02508-8	3.25	4.25	29	2.0	9	2.2	12	2.2	18	3.0

Natural Frequency at rated load = approx. 10 Hertz

Dimensions & Load Ratings

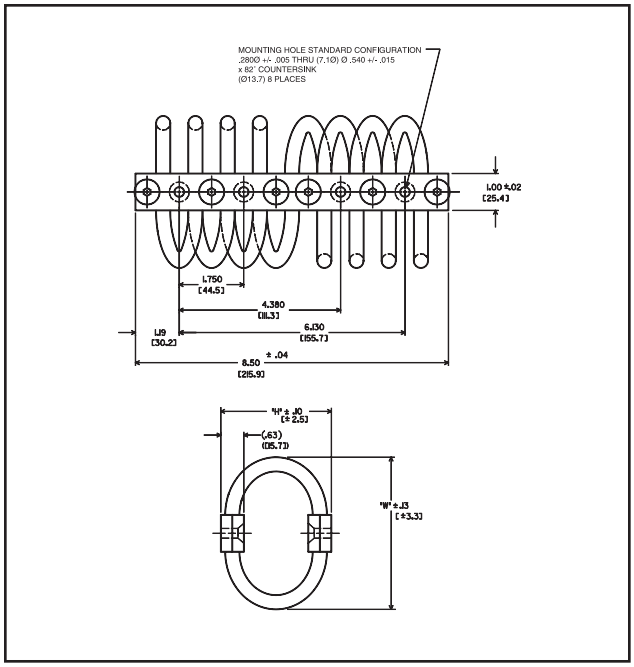


SUFFIX	MOUNTING HOLE CONFIGURATION
NONE	Standard Configuration as shown in drawing
- A	1/4 - 28 Threaded inserts in both retaining bars
- B	1/4 - 28 Threaded inserts in one retaining bar and standard configuration as shown in drawing in other retaining bar
- C	M6 x 1.0 Threaded inserts in both retaining bars
- D	M6 x 1.0 Threaded inserts in one retaining bar and standard configuration as shown in drawing in other retaining bar w/90˚ countersink
- E	Standard configuration as shown in drawing w/ 90˚ countersink

PART #	DIMENSIONS		COMPRESSION		SHEAR		ROLL		45˚ COMP/ROLL	
	H	W	Load Rating	Max. Deflection	Load Rating	Max. Deflection	Load Rating	Max. Deflection	Load Rating	Max. Deflection
CM03756-1	2.80	3.31	263	1.0	113	1.0	80	1.0	195	1.5
CM03756-2	2.90	3.50	244	1.1	48	1.1	66	1.1	180	2.0
CM03756-3	3.00	4.13	150	1.3	43	1.5	52	1.5	100	2.3
CM03756-4	3.25	4.25	131	1.5	29	1.6	44	1.6	90	2.8
CM03756-5	3.50	4.50	104	1.8	25	1.7	24	1.7	56	3.5
CM03756-6	4.13	4.75	94	2.0	23	2.0	21	2.0	52	4.0
CM03756-7	4.25	5.50	56	2.2	14	2.2	17	2.2	30	4.5

Natural Frequency at rated load = approx. 10 Hertz

Dimensions & Load Ratings

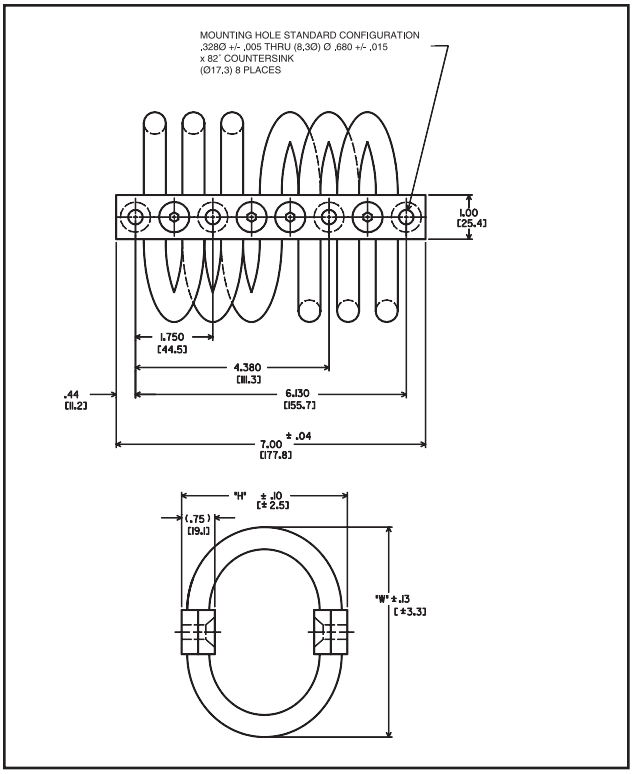


SUFFIX	MOUNTING HOLE CONFIGURATION
NONE	Standard Configuration as shown in drawing
- A	1/4 -28 Threaded inserts in both retaining bars
- B	1/4 - 28 Threaded inserts in one retaining bar and standard configuration as shown in drawing in other retaining bar
- C	M 6 x 1.0 Threaded inserts in both retaining bars
- D	M 6 x 1.0 Threaded inserts in one retaining bar and standard configuration as shown in drawing in other retaining bar w/90˚ countersink
- E	Standard configuration as shown in drawing w/ 90˚ countersink

PART #	DIMENSIONS		COMPRESSION		SHEAR		ROLL		45˚ COMP/ROLL	
	H	W	Load Rating	Max. Deflection	Load Rating	Max. Deflection	Load Rating	Max. Deflection	Load Rating	Max. Deflection
CM03758-1	2.80	3.31	350	1.0	150	1.0	106	1.0	260	1.5
CM03758-2	2.90	3.50	325	1.1	63	1.1	88	1.1	240	2.0
CM03758-3	3.00	4.13	200	1.3	60	1.5	69	1.5	135	2.3
CM03758-4	3.25	4.25	175	1.5	38	1.6	59	1.6	120	2.8
CM03758-5	3.50	4.50	138	1.8	34	1.7	30	1.7	75	3.5
CM03758-6	4.13	4.75	125	2.0	31	2.0	28	2.0	70	4.0
CM03758-7	4.25	5.50	75	2.2	19	2.2	22	2.2	40	4.5

Natural Frequency at rated load = approx. 10 Hertz

Dimensions & Load Ratings

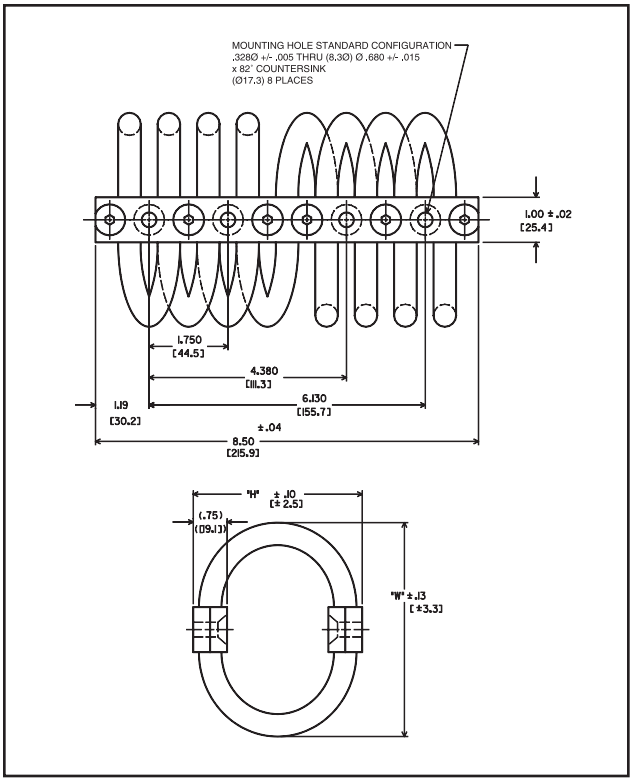


SUFFIX	MOUNTING HOLE CONFIGURATION
NONE	Standard Configuration as shown in drawing
- A	1/4 -28 Threaded inserts in both retaining bars
- B	1/4 - 28 Threaded inserts in one retaining bar and standard configuration as shown in drawing in other retaining bar
- C	M 6 x 1.0 Threaded inserts in both retaining bars
- D	M 6 x 1.0 Threaded inserts in one retaining bar and standard configuration as shown in drawing in other retaining bar w/90° countersink
- E	Standard configuration as shown in drawing w/ 90° countersink

PART #	DIMENSIONS		COMPRESSION		SHEAR		ROLL		45° COMP/ROLL	
	H	W	Load Rating	Max. Deflection	Load Rating	Max. Deflection	Load Rating	Max. Deflection	Load Rating	Max. Deflection
CM05006-1	3.25	4.00	469	1.0	143	1.0	158	1.0	300	1.5
CM05006-2	3.50	4.13	356	1.1	113	1.1	120	1.1	225	2.0
CM05006-3	3.75	4.75	206	1.3	53	1.5	83	1.5	180	2.3
CM05006-4	4.25	5.25	150	1.5	41	1.6	56	1.6	128	2.8
CM05006-5	4.90	5.65	90	1.8	38	1.7	30	1.7	98	3.5
CM05006-6	5.40	6.13	75	2.0	26	2.0	26	2.0	68	4.0
CM05006-7	6.10	7.10	45	2.2	21	2.2	24	2.2	41	4.5

Natural Frequency at rated load = approx. 10 Hertz

Dimensions & Load Ratings

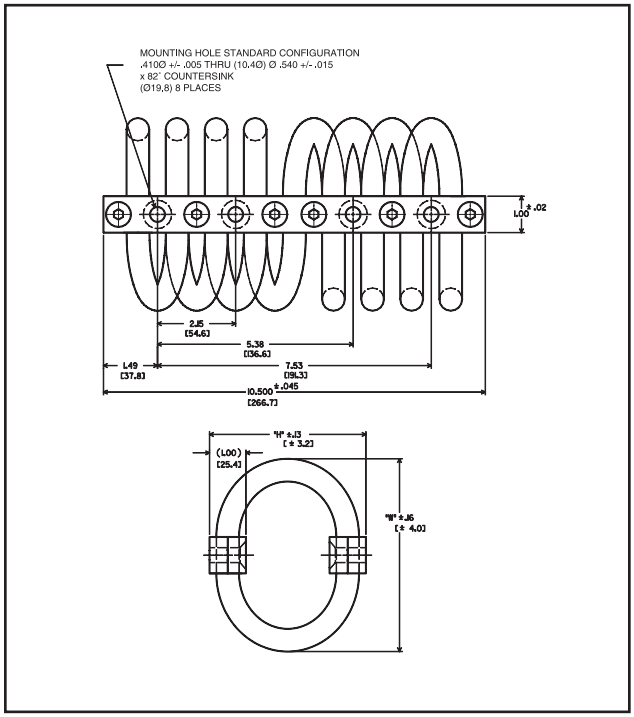


SUFFIX	MOUNTING HOLE CONFIGURATION
NONE	Standard Configuration as shown in drawing
- A	1/4 -28 Threaded inserts in both retaining bars
- B	1/4 - 28 Threaded inserts in one retaining bar and standard configuration as shown in drawing in other retaining bar
- C	M 6 x 1.0 Threaded inserts in both retaining bars
- D	M 6 x 1.0 Threaded inserts in one retaining bar and standard configuration as shown in drawing in other retaining bar w/90° countersink
- E	Standard configuration as shown in drawing w/ 90° countersink

PART #	DIMENSIONS		COMPRESSION		SHEAR		ROLL		45° COMP/ROLL	
	H	W	Load Rating	Max. Deflection	Load Rating	Max. Deflection	Load Rating	Max. Deflection	Load Rating	Max. Deflection
CM05008-1	3.25	4.00	625	1.0	190	1.0	210	1.0	400	1.5
CM05008-2	3.50	4.13	475	1.1	150	1.1	160	1.1	300	2.0
CM05008-3	3.75	4.75	275	1.3	70	1.5	110	1.5	250	2.3
CM05008-4	4.25	5.25	200	1.5	55	1.6	75	1.6	170	2.8
CM05008-5	4.90	5.65	120	1.8	50	1.7	40	1.7	130	3.5
CM05008-6	5.40	6.13	100	2.0	38	2.0	35	2.0	90	4.0
CM05008-7	6.10	7.10	60	2.2	28	2.2	30	2.2	55	4.5

Natural Frequency at rated load = approx. 10 Hertz

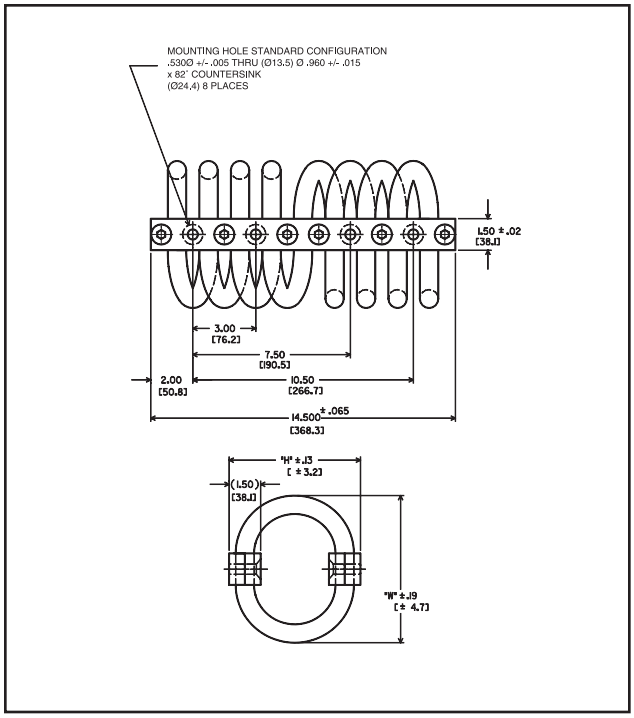
Dimensions & Load Ratings



SUFFIX	MOUNTING HOLE CONFIGURATION
NONE	Standard Configuration as shown in drawing
- A	3/8 - 24 Threaded inserts in both retaining bars
- B	3/8 - 24 Threaded inserts in one retaining bar and standard configuration as shown in drawing in other retaining bar
- C	M 10 x 1.5 Threaded inserts in both retaining bars
- D	M 10 x 1.5 Threaded inserts in one retaining bar and standard configuration as shown in drawing in other retaining bar w/90° countersink
- E	Standard configuration as shown in drawing w/ 90° countersink

PART #	DIMENSIONS		COMPRESSION		SHEAR		ROLL		45° COMP/ROLL	
	H	W	Load Rating	Max. Deflection	Load Rating	Max. Deflection	Load Rating	Max. Deflection	Load Rating	Max. Deflection
CM06258-1	3.50	4.00	1300	1.2	325	1.2	200	1.2	800	1.8
CM06258-2	3.90	4.40	800	1.4	250	1.4	190	1.4	450	2.3
CM06258-3	4.30	5.30	625	1.8	130	1.8	150	1.2	325	2.8
CM06258-4	4.70	6.00	440	2.2	110	2.2	145	2.2	275	3.2
CM06258-5	5.00	6.50	350	2.5	70	2.5	130	2.5	175	3.6
Natural Frequency at rated load = approx. 10 Hertz										

Dimensions & Load Ratings

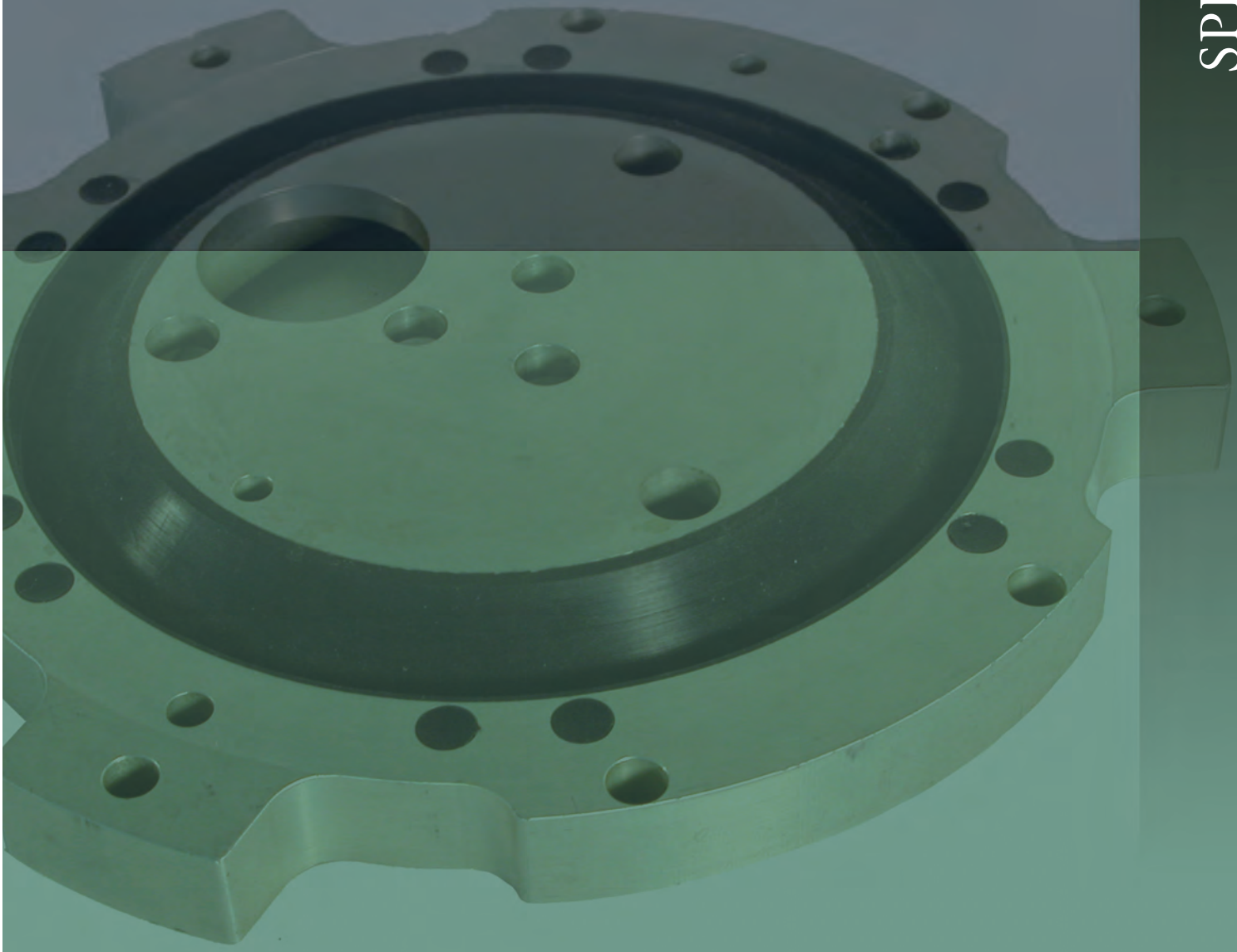


SUFFIX	MOUNTING HOLE CONFIGURATION
NONE	Standard Configuration as shown in drawing
- A	1/2 - 13 Threaded inserts in both retaining bars
- B	1/2 - 13 Threaded inserts in one retaining bar and standard configuration as shown in drawing in other retaining bar
- C	M 12 x 1.75 Threaded inserts in both retaining bars
- D	M 12 x 1.75 Threaded inserts in one retaining bar and standard configuration as shown in drawing in other retaining bar w/90° countersink
- E	Standard configuration as shown in drawing w/ 90° countersink

PART #	DIMENSIONS		COMPRESSION		SHEAR		ROLL		45° COMP/ROLL	
	H	W	Load Rating	Max. Deflection	Load Rating	Max. Deflection	Load Rating	Max. Deflection	Load Rating	Max. Deflection
CM08758-1	5.25	5.50	1500	1.8	400	2.1	350	2.1	875	2.5
CM08758-2	6.00	6.50	1000	2.1	300	2.6	300	2.6	750	3.2
CM08758-3	6.25	7.00	900	2.3	225	2.9	238	2.9	600	3.8
CM08758-4	7.50	8.25	600	3.4	125	3.3	138	3.3	450	4.7
CM08758-5	8.50	9.25	400	4.2	100	4.0	125	4.0	250	6.4
Natural Frequency at rated load = approx. 10 Hertz										

SPECIALTY ISOLATORS

Barry V Mounts
Barry Spring Pivot
Marine Mounts
Navy Mounts



V MOUNT SERIES

Engine mounts isolate vibration, absorb shock and attenuate noise due to structure-borne vibrations.

APPLICATIONS

- Class 6,7,8 truck engines
- Bus engines
- Off-highway vehicle engines
- On & off-highway vehicle cabs

FEATURES

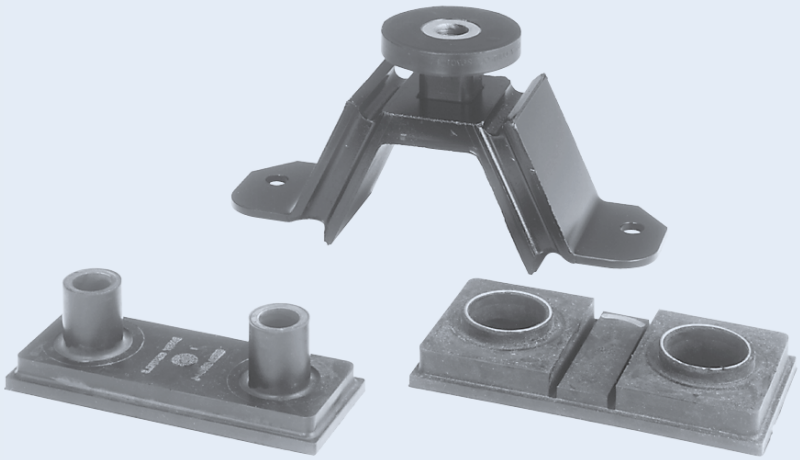
- Low natural frequency (9-10 Hertz)
- Long, dependable service life
- Off-the-shelf availability
- Proven durability

BENEFITS

- Improved ride comfort
- Prevents mechanical noise transmission
- Ensures drivetrain alignment
- Eliminates minor shake
- Superior V-mount isolation

LOAD RANGE

- 3 load ratings from 950 - 1400 lbs. per mount



Barry V-Spring Engine mounts isolate vibration, absorb shock and attenuate noise due to structure-borne vibration. These mounts feature uniquely tuned stiffnesses to achieve optimum performance and ride comfort.

Specifications

• Natural Frequency	9-10 Hertz
• Transmissibility at resonance	8:1
• Resilient Element	Natural Rubber (Neoprene Optional)
• Standard Materials	High Strength Steel
• Weight	4.3 lbs. (w/snubber)

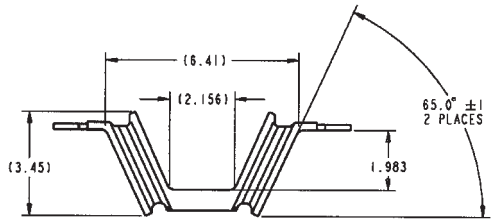
Environmental Data

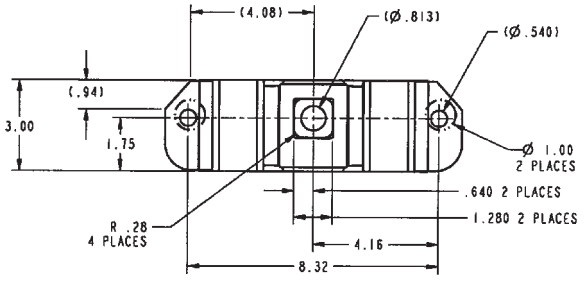
- Natural rubber elastomer has an operating temperature range of -40°F to +180°F (-40°C to +82°C).
- Neoprene elastomer has an operating temperature range of -20°F to +180°F (-30°C to +82°C).

Dimensions & Performance Characteristics

LOAD & STIFFNESS CHARACTERISTICS										
Part #	Load Range		Vertical Deflection		Nominal Static Characteristics					
	lbs.	N	in.	mm	Vertical		Lateral		Longitudinal	
					lbs./inch	N/mm	lbs./inch	N/mm	lbs./inch	N/mm
27330-1	1,150-1,400	5,110-6,220	.10″	2.5	13,000	2,280	6,500	1,140	19,500	342
27330-2	950-1,200	4,220-5,330	.11″	2.9	9,400	1,650	4,700	825	14,000	2,457

V-SPRING MOUNT





SUSPENSION PIN/BUSHING ASSEMBLY

Significantly extends service life of suspension components in vehicular applications.

APPLICATIONS

- Medium & Heavy-Duty Truck/Tractor Front & Rear Suspension Assemblies

Barry Suspension Pin/Bushing Assembly is designed and constructed for maintenance free and consistent service life. These superior parts will outlast the predicted life of modern heavy-duty leaf spring suspension in vehicular applications.

FEATURES

- Rugged crimped construction
- High load capacity
- Tight tolerance
- High compression elastomer

BENEFITS

- Eliminates need for lubrication
- Extra long service life
- Withstands high impact shock and +/- 7° torsional rotation
- Provides vibration, shock and noise attenuation

LOAD RANGE

- 2,000 lbs. to 4,500 lbs. per pin

Specifications

• Resilient Element	Natural Rubber
• Standard Materials	High Strength Steel
• Weight	2.5 lbs.

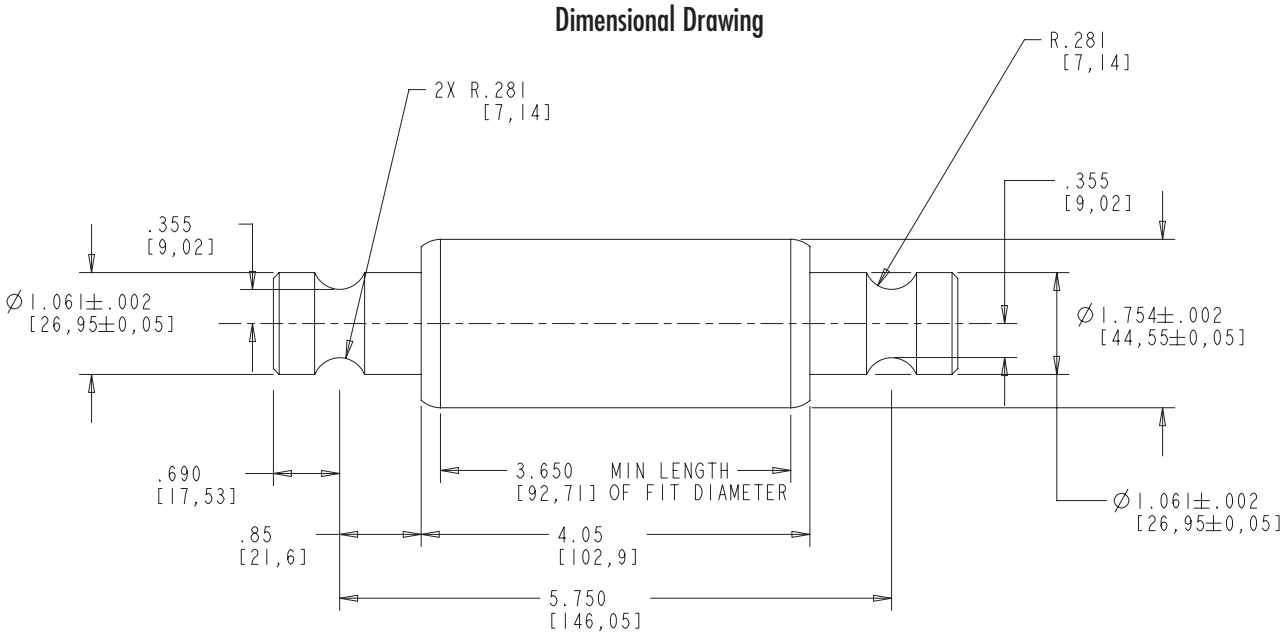
Environmental Data

- Natural Rubber elastomer has an operating temperature range of -40°F to +180°F (-40°C to +82°C)

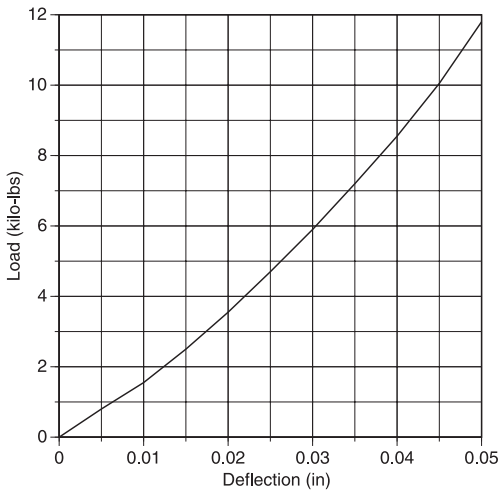
SUSPENSION PIN/BUSHING ASSEMBLY:

Dimensions & Performance Characteristics

SUSPENSION PIN/BUSHING ASSEMBLY
Dimensional Drawing



SUSPENSION PIN/BUSHING ASSEMBLY
Radial Load vs. Deflection



MARINE MOUNT SERIES

Effective reduction of noise and vibration of internal combustion diesel engines in marine installations.

APPLICATIONS

- Marine Internal Combustion Engines
- Pumps
- Compressors
- Generator Sets

FEATURES

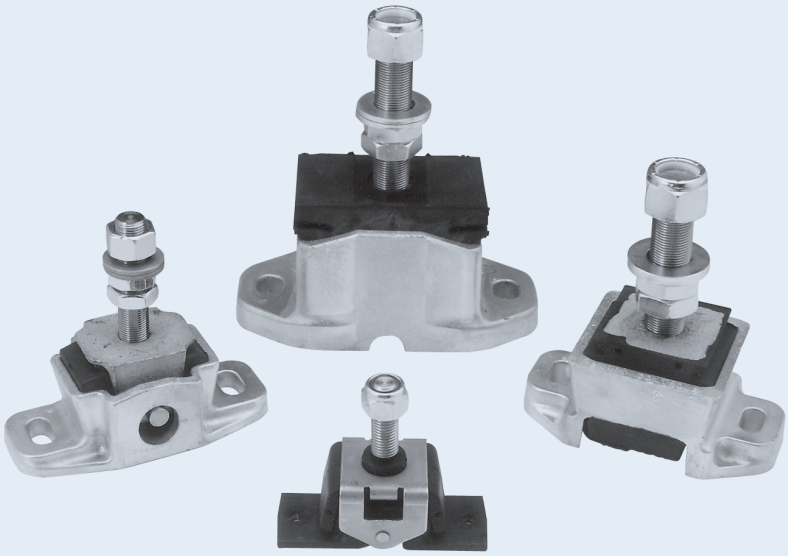
- Mechanically captive
- Resilient elements of oil-resistant Neoprene
- Corrosion resistant exposed metal parts
- Off-the-shelf availability
- Easy to install
- Proven durability
- Height adjustability for engine alignment purposes

BENEFITS

- Improved ride comfort
- Significantly reduces mechanical noise transmission
- Able to transmit propeller thrust longitudinally along mount
- Superior isolation at start-up and low RPMs

LOAD RANGE

- 4 versions with 17 load ratings from 39 - 1,980 lbs. per mount



Barry Controls Marine Mounts are designed to provide effective noise and vibration isolation of marine engines up to, but not limited to, 1,000 hp.

One of the most important features of Barry Controls Marine Mounts is their ability to isolate vibration while transmitting full propeller thrust, efficiently isolating engine noise and vibration from the hull of the vessel.

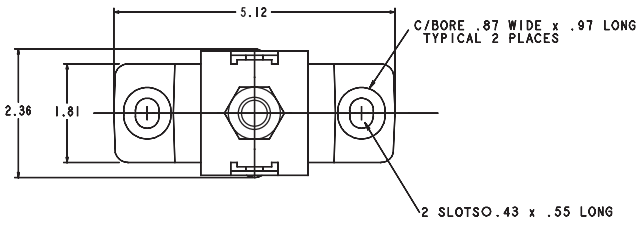
This improves the reliability of equipment, and provides unmatched occupant comfort, particularly during start up or while at low RPMs.

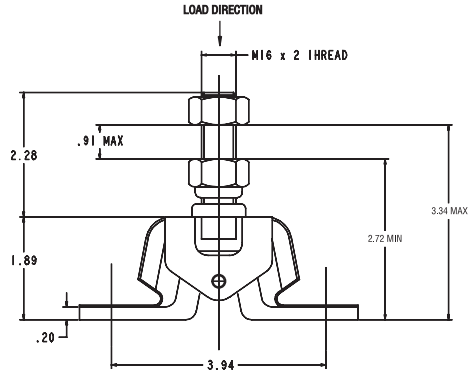
Environmental Data

- Neoprene elastomer has an operating temperature range of -20°F to +180°F (-30°C to +82°C) and is resistant to oils, salt spray, ozone and oil-based solvents.

MARINE MOUNT SERIES: F50

Dimensions & Performance Characteristics





F50 Marine Mounts are compact, captive marine isolators designed to support lightweight loads from 39-380 lbs. per mount.

They provide effective noise and vibration isolation of marine engines up to 250 horsepower.

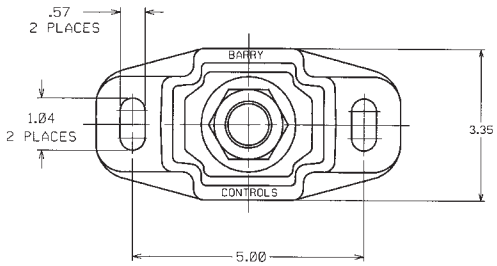
NATURAL FREQUENCY	10-16 Hertz
TRANSMISSIBILITY AT RESONANCE	8:1
RESILIENT ELEMENT	Neoprene
STANDARD MATERIALS	Corrosion resistant steel & Aluminum
WEIGHT	1.65 lbs.

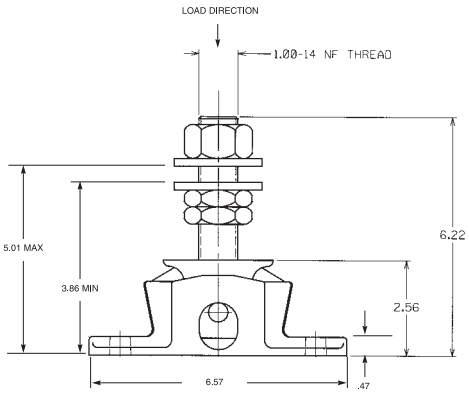
PART #	LOAD RANGE (lbs.) 30 60 90 120 150 200 300 400	MINIMUM LOAD (lbs.)	MAXIMUM LOAD (lbs.)
F50-1-1	◄——►	39	99
F50-1-2	◄——►	60	160
F50-1-3	◄——►	90	231
F50-1-4	◄——►	121	300
F50-1-5	◄——►	160	380

MARINE MOUNT SERIES: 27166

Dimensions & Performance Characteristics

NOTE: SEE BELOW FOR 3/4 STUD INFORMATION





27166 Marine Mounts are compact, captive marine isolators designed to support light to medium loads from 138-750 lbs. per mount.

They provide effective noise and vibration isolation of marine engines up to 400 horsepower.

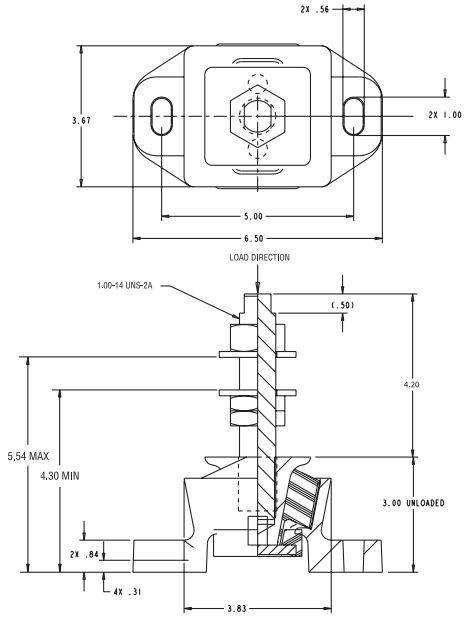
NATURAL FREQUENCY	10-16 Hertz
TRANSMISSIBILITY AT RESONANCE	8:1
RESILIENT ELEMENT	Neoprene
STANDARD MATERIALS	Corrosion resistant steel & Aluminum
WEIGHT	4.25 lbs.

PART #	LOAD RANGE (lbs.) 0 100 200 300 400 500 600 700 800	MINIMUM LOAD (lbs.)	MAXIMUM LOAD (lbs.)
27166-4*	◄►	138	225
27166-7+	◄►	190	350
27166-6	◄►	300	500
27166-11	◄►	450	750

* Order Part #27166-8 for 3/4" stud and adjustability from 4.82 max to 3.51 min.
\+ Order Part #27166-9 for 3/4" stud and adjustability from 4.82 max to 3.51 min

MARINE MOUNT SERIES: 27391

Dimensions & Performance Characteristics



27391 Marine Mounts are compact, captive marine isolators designed to support medium loads from 125-1000 lbs. per mount.

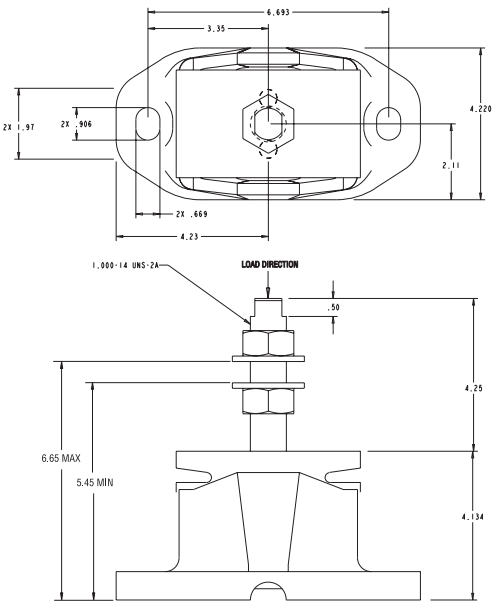
They provide effective noise and vibration isolation of marine engines up to 500 horsepower and are ideal for V-drive applications.

NATURAL FREQUENCY	8-14 Hertz
TRANSMISSIBILITY AT RESONANCE	8:1
RESILIENT ELEMENT	Neoprene
STANDARD MATERIALS	Corrosion resistant steel & Aluminum
WEIGHT	6.15 lbs.

PART #	LOAD RANGE (lbs.) 125 250 500 750 1,000	MINIMUM LOAD (lbs.)	MAXIMUM LOAD (lbs.)
27391-2	◄——►	125	275
27391-3	◄——►	250	500
27391-4	◄——►	350	750
27391-5	◄——►	500	1,000

MARINE MOUNT SERIES: 27458

Dimensions & Performance Characteristics



27458 Marine Mounts are compact, captive marine isolators designed to support medium to heavy loads from 350-1,980 lbs. per mount.

They provide effective noise and vibration isolation of marine engines up to 1,000 horsepower and are ideal for V-Drive applications.

NATURAL FREQUENCY	10-16 Hertz
TRANSMISSIBILITY AT RESONANCE	8:1
RESILIENT ELEMENT	Neoprene
STANDARD MATERIALS	Corrosion resistant steel & Aluminum
WEIGHT	10.6 lbs.

PART #	LOAD RANGE (lbs.) 300 500 1,000 1,500 2,000	MINIMUM LOAD (lbs.)	MAXIMUM LOAD (lbs.)
27458-2		350	814
27458-3		506	1,056
27458-4		726	1,430
27458-5		880	1,980

NAVY MOUNT SERIES

APPLICATIONS

- Mounting of power generating equipment in marine applications

FEATURES

- Rugged Construction
- Corrosion Resistant
- Navy Designed & Approved

BENEFITS

- Reduces transmission of vibration from equipment to hull structure
- Provides effective reduction of structure-borne noise

LOAD RANGE

- Several designs with load ratings from 15 lbs to 10,000 lbs per mount

Navy mounts are U.S. Navy developed and QPL approved mounts commonly known as Portsmouth, EES and Mare Island mounts for use in mounting power generating equipment. These mounts resist high impact shipboard shocks and prevent structure-borne noise.

Part Numbering Systems

- Natural Frequency is the numerical prefix of the Navy type number and indicates the axial natural frequency of the mount when loaded to its specified capacity.
- Design Activity is the single letter following the numerical prefix: M = Mare Island Naval Shipyard, P = Portsmouth Naval Shipyard, E = Engineering Experimental Station, B = NAVSHIPS.
- Capacity is the numbers following the design activity designation and indicates the maximum rated capacity of the mount in pounds.
- Metal Member: If non-magnetic construction is required, NM should be added to the end of the Navy Mount part number. Suffix "H" denotes natural rubber only (5,000 and 10,000 lbs. mounts).

6 - E - 100 - NM

- 6 = 6 Hz Natural Frequency
- E = Design Activity (Eng. Experimental Station)
- 100 = Load Capacity (100 lbs.)
- NM = Non-Magnetic Construction

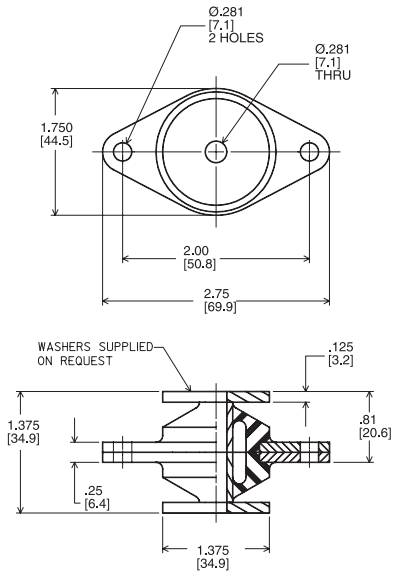
Environmental Data

- Naval mounts are fully qualified to the following military specifications: MIL-M-19379 (10M/11M Series) MIL-M-17191 (15P Series), MIL-M-17508 (6E and 7E Series), MIL-M-21649 (5M10000) and MIL-M-19863 (5B5000H).

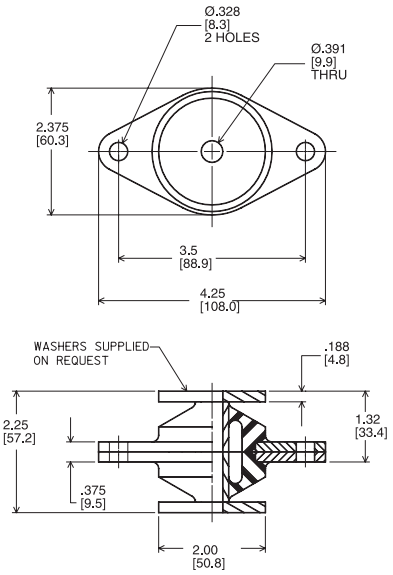
MARE ISLAND MOUNTS

Dimensions & Performance Characteristics

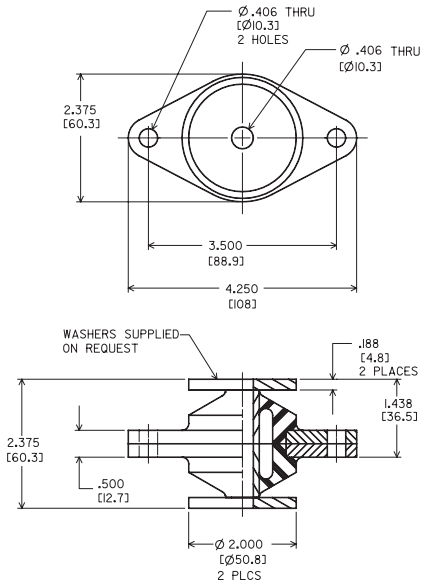
NAVY MOUNT 31110-2



NAVY MOUNT 31110-1



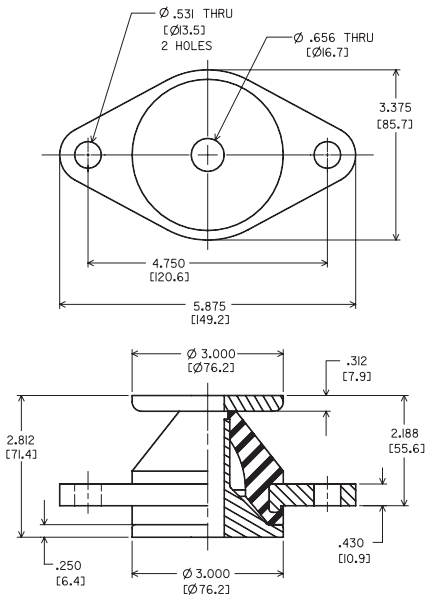
NAVY MOUNT 31111-1



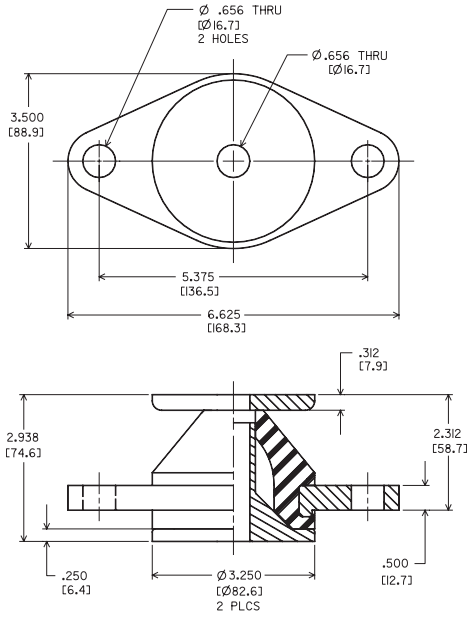
Part #	Navy Type #	Capacity (lbs)	Natural Frequency	Weight
31110-2	11M15	15	11 Hz	1 lb.
31110-1	11M25	25	11 Hz	1 lb.
31111-1	10M50	50	10 Hz	1 lb.
31114-1	6E100	100	6 Hz	2.8 lbs.
31115-1	7E450	450	7 Hz	4.5 lbs.
31114-3	6E900	900	6 Hz	18 lbs.

Dimensions & Performance Characteristics

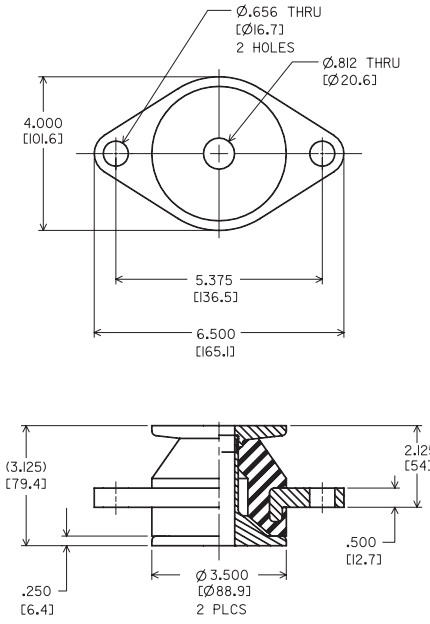
NAVY MOUNT 31114-1



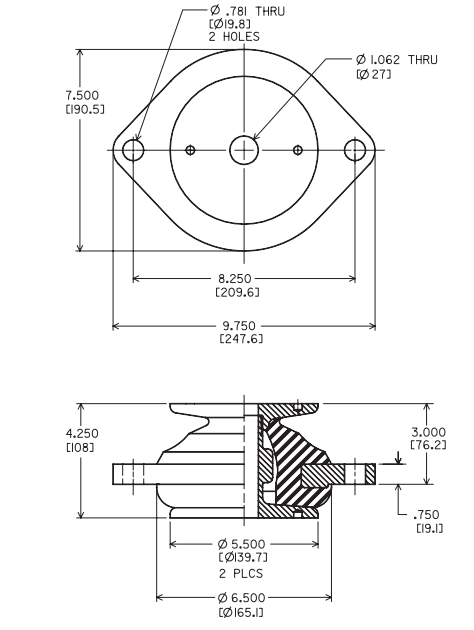
NAVY MOUNT 31114-2



NAVY MOUNT 31115-1



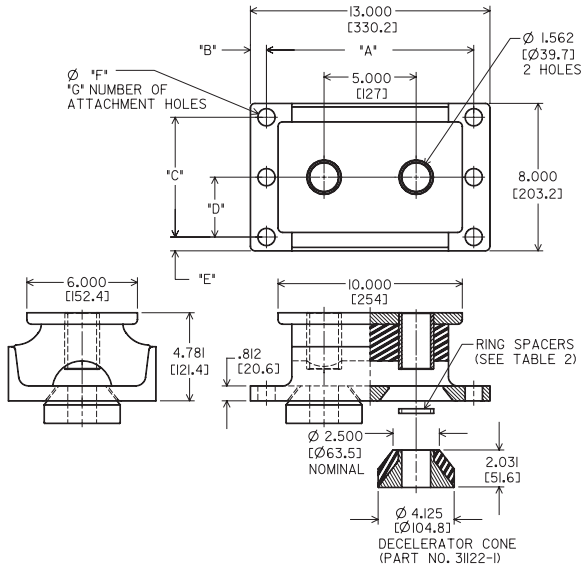
NAVY MOUNT 31114-3



Dimensions & Performance Characteristics

All Parts of Type 31120 have 5000 lb capacity and 5 Hz Natural Frequency						
Part #	A	B	C	D	E	F
31120-1-0	-	-	-	-	-	-
31120-1-4	10.75	1.125	5.75	-	1.125	1.281
31120-1-6	11.25	.875	6.5	3.25	.75	.906

Part Numbers 31120-1-0 through 31120-1-6
Navy Type Number 5B5000H



Part Number 31121-1
Auxiliary Snubber for P/N 31120-1

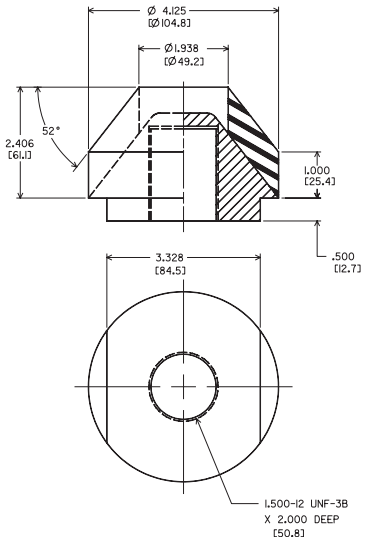


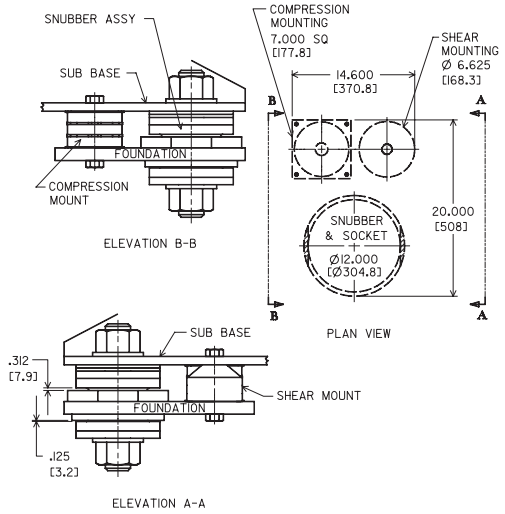
Table 2

Ring Spacers		
Part No.	Length (in)	No. Required
8510084-019036	0.250	2
8510084-029036	0.125	2
8510084-039036	0.062	8

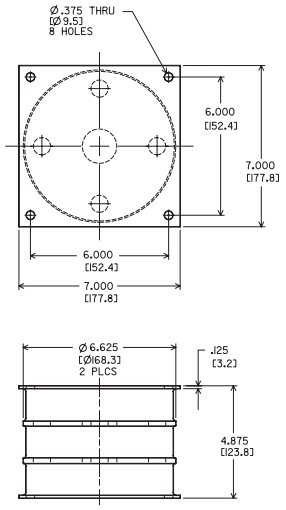
NAVY MOUNT SERIES: 5M10000H

Dimensions & Performance Characteristics

Part Number 31116-1

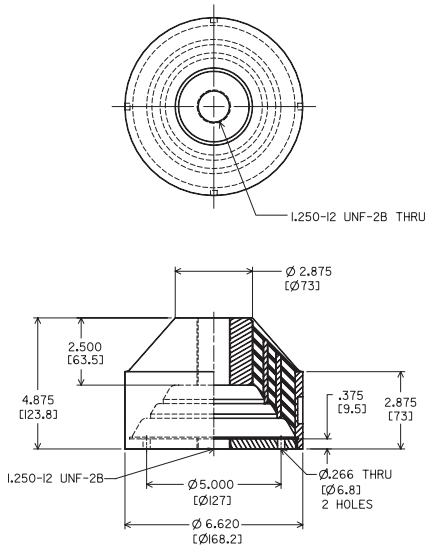


Part Number 31117-1

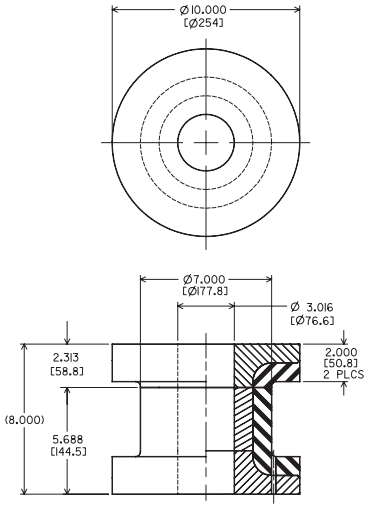


Part #	Navy Type #	Description	Load Rating	Natural Frequency	Weight
31116-1	5M10000H	Complete Assembly	10000 lbs	5 Hz	98.5 lbs.
31117-1	5M10000H	Compression Element	for	for	13.2 lbs.
31118-1	5M10000H	Shear Element	complete	complete	14.1 lbs.
31119-1	5M10000H	Snubber Element	assembly	assembly	71.1 lbs

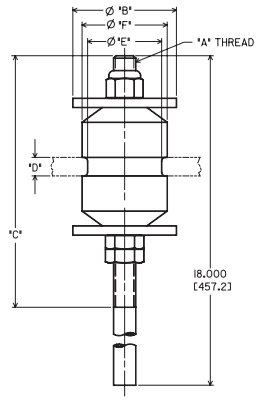
Part Number 31118-1



NAVY MOUNT 31119-1



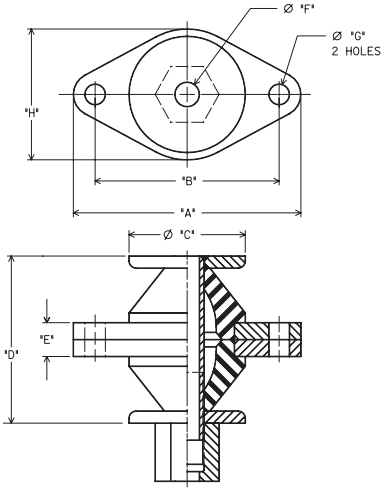
Dimensions & Performance Characteristics



UBST Un-bonded Spool Mount Series

BARRY PART NO.	Ø B	C	D	Ø E	Ø F	"A" THREAD SIZE
21482-1	1.250 [31.8]	3.000 [76.2]	.250 [6.4]	.875 [22.2]	1.000 [25.4]	.312-18 UNC-2A
21482-2	1.750 [44.4]	4.250 [108]	.375 [9.5]	1.250 [31.8]	1.438 [36.5]	.375-16 UNC-2A
21482-3	2.000 [50.8]	5.000 [127]	.500 [12.7]	1.438 [36.5]	1.688 [42.9]	.500-13 UNC-2A
21482-4	2.250 [57.2]	5.250 [133.4]	.625 [15.9]	1.625 [41.3]	2.000 [50.8]	.625-11 UNC-2A

Part #	Navy Type #	Capacity (lbs)
21482-1	UBST-15	15
21482-2	UBST-50	50
21482-3	UBST-100	100
21482-4	UBST-200	200
22416-1	6E100BB	100
22417-1	6E150BB	150
31114-5	6E900BB	900
31115-2	7E450BB	450



EES Back-to-Back Series

BARRY PART NO.	A	B	Ø C	D	E	Ø F	Ø G	H
22416-1	5.875 [149.2]	4.750 [120.6]	3.000 [76.2]	4.312 [109.5]	.875 [22.2]	.640 [16.3]	.531 [13.5]	3.375 [85.7]
22417-1	6.625 [168.3]	5.375 [136.5]	3.250 [82.6]	4.562 [115.9]	1.000 [25.4]	.640 [16.3]	.656 [16.7]	3.500 [88.9]
31114-5	9.750 [247.6]	8.250 [209.6]	5.500 [139.7]	6.125 [155.6]	.990 [25.2]	1.062 [27]	.781 [19.8]	7.500 [190.5]
31115-2	6.500 [165.1]	5.375 [136.5]	3.500 [88.9]	4.625 [114.5]	.875 [22.2]	.812 [20.6]	.656 [16.7]	4.000 [101.6]

NOTES:

PRODUCT INDEX/WORKSHEETS

BARRY CONTROLS

PRODUCT INDEX

Number Prefix

This index shows all isolators and isolator families that begin with a number.

Letter Prefix

This index shows all isolators and isolator families that begin with a letter.

Name Index

This index lists products by trade name or product description.

PRODUCT INFORMATION

We have made every effort to insure that the information contained in this catalog is correct at the time of publication. However, due to a continuing program of product improvement, some specifications, dimensions, materials or performance characteristics may change. **Therefore, we suggest that you contact Barry Controls prior to using the dimensional performance, or environmental data as the basis for drawings or specifications.** The information contained in this catalog is for reference only and the latest drawings are available on request.

BARRY CONTROLS designs the products described in this catalog for maximum performance, efficiency, and length of service. They are built according to selected standards of choice of material and method of manufacture.

BARRY CONTROLS warrants that all parts manufactured by it shall be free from defects in material or workmanship under proper and normal use. BARRY CONTROLS, at its option, shall repair or replace, free of charge, any part covered by the warranty which shall be returned to BARRY CONTROLS' shipping point, transportation charges prepaid, within ninety (90) days from shipment by BARRY CONTROLS and which examination proves defective in material or workmanship. BARRY CONTROLS shall not be liable for any repairs or replacements of parts covered by this warranty, except those made with BARRY CONTROLS' prior written consent. BARRY CONTROLS shall be liable for breach of this warranty only if it receives written notice of such breach within ninety (90) days from the date of shipment of the product to which the breach relates. The foregoing shall constitute the sole remedy for the purchaser for any breach by BARRY CONTROLS of its warranty.

When BARRY CONTROLS is to supply design specifications only, BARRY CONTROLS makes no warranty with respect to defects in materials or workmanship of items manufactured or installed by others. If BARRY CONTROLS is to undertake to manufacture and complete installation as well as supply the design specifications, BARRY CONTROLS warrants that the installation shall be free from defects in material or workmanship under proper and normal use. BARRY CONTROLS shall cause any such defects to be repaired if it receives written notice of such defects within ninety (90) days from the completion of the installation. BARRY CONTROLS MAKES NO OTHER WARRANTIES REGARDING PARTS MANUFACTURED BY IT, CUSTOM DESIGN SPECIFICATIONS SUPPLIED BY IT, OR CUSTOM INSTALLATIONS COMPLETED BY IT OR ITS AGENTS (INCLUDING WITHOUT IMPLIED LIMITATION WARRANTIES AS TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR WARRANTIES AGAINST INFRINGEMENT OF ANY PATENT), EITHER EXPRESS OR IMPLIED, EXCEPT AS PROVIDED HEREIN.

If questions should arise regarding proper selection, use or installation procedures, consult BARRY CONTROLS for details and recommendations.

SHOCK & VIBRATION APPLICATION WORKSHEET

General Application Data Form

Photocopy, fill out and fax to Barry Controls: (508) 417-7224 or email to Sales@BarryControls.com

Name

Title

Company

Email

Address

City

State Zip

Phone

Fax

Date Reply Required

Describe application (nature of equipment, problems, particular requirements, applicable specifications, etc.)

Provide sketch of equipment, including relevant dimensions, CG location, and mounting locations. Use additional sheets if necessary.

SHOCK & VIBRATION APPLICATION WORKSHEET

Engine Isolation Data Analysis Form

Photocopy, fill out and fax to Barry Controls: (508) 417-7224 or email to Sales@BarryControls.com

Name

Title

Company

Email

Address

City

State Zip

Phone

Fax

Date Reply Required

ENGINE (Make & Model)

# of Cylinders

Operating Speed Range Idle

☐ 2 Stroke ☐ 4 Stroke Firing Order

TRANSMISSION, GENERATOR OR PUMP (Make & Model)

WEIGHTS

Engine (wet) & Flywheel

Trans., Gen. or Pump

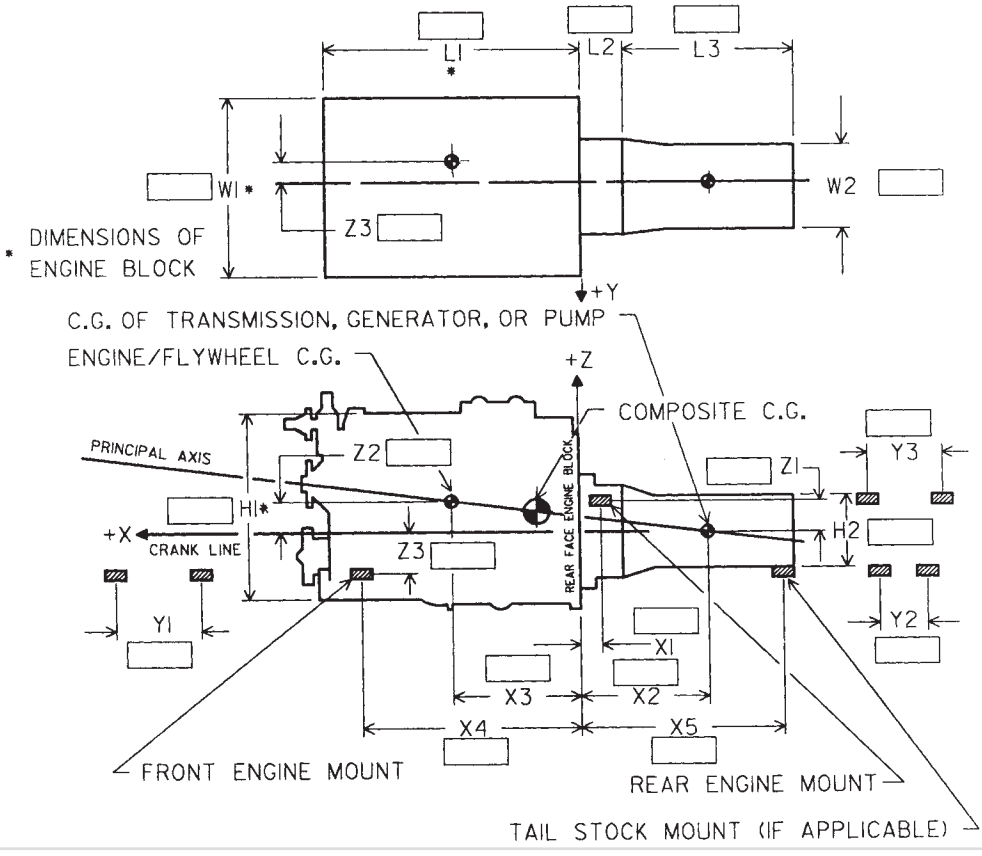
MOMENTS OF INERTIA (About Composite C.G.)

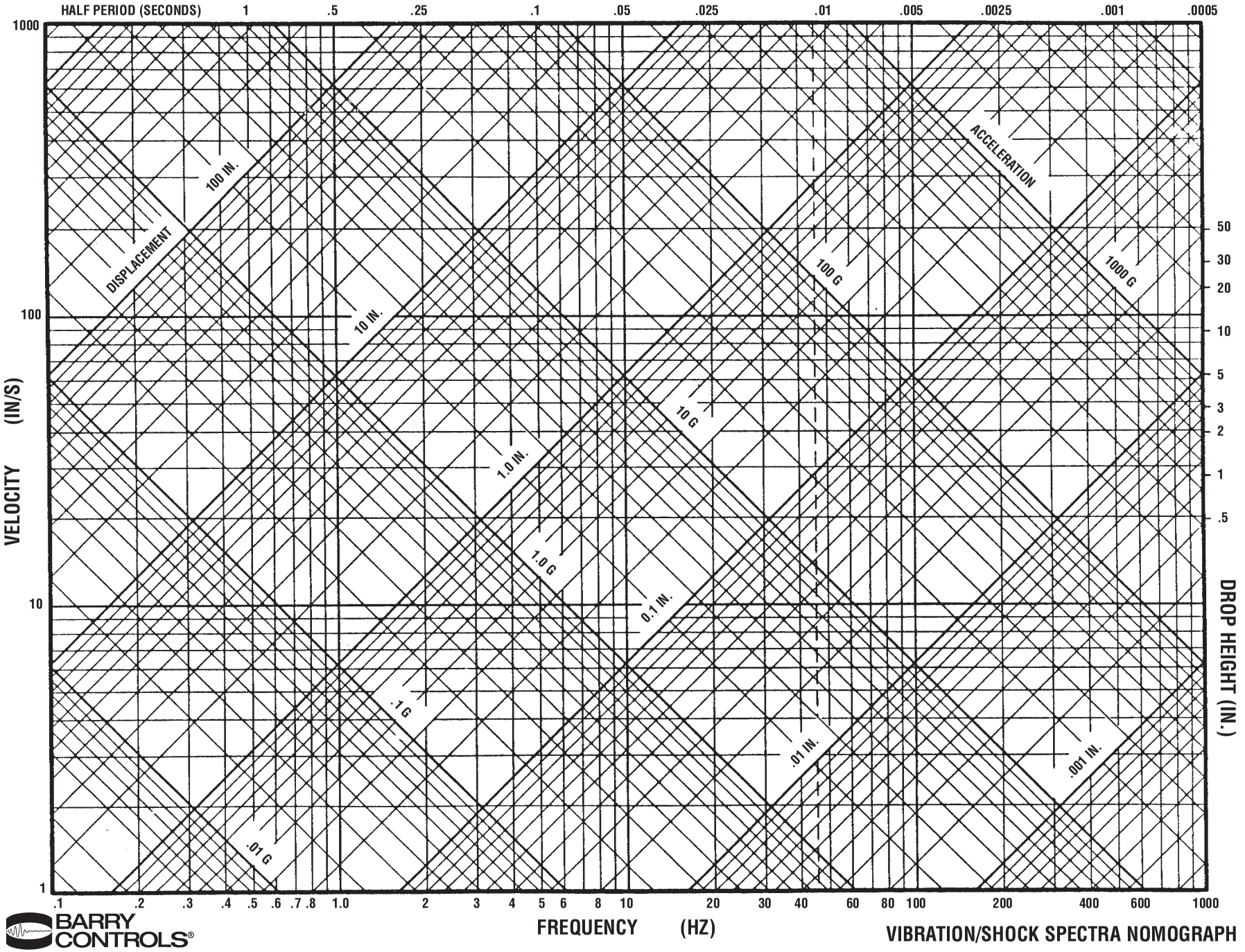
1 roll

1 yaw

1 pitch

Provide sketch of equipment, including relevant dimensions, CG location, and mounting locations. Use additional sheets if necessary.





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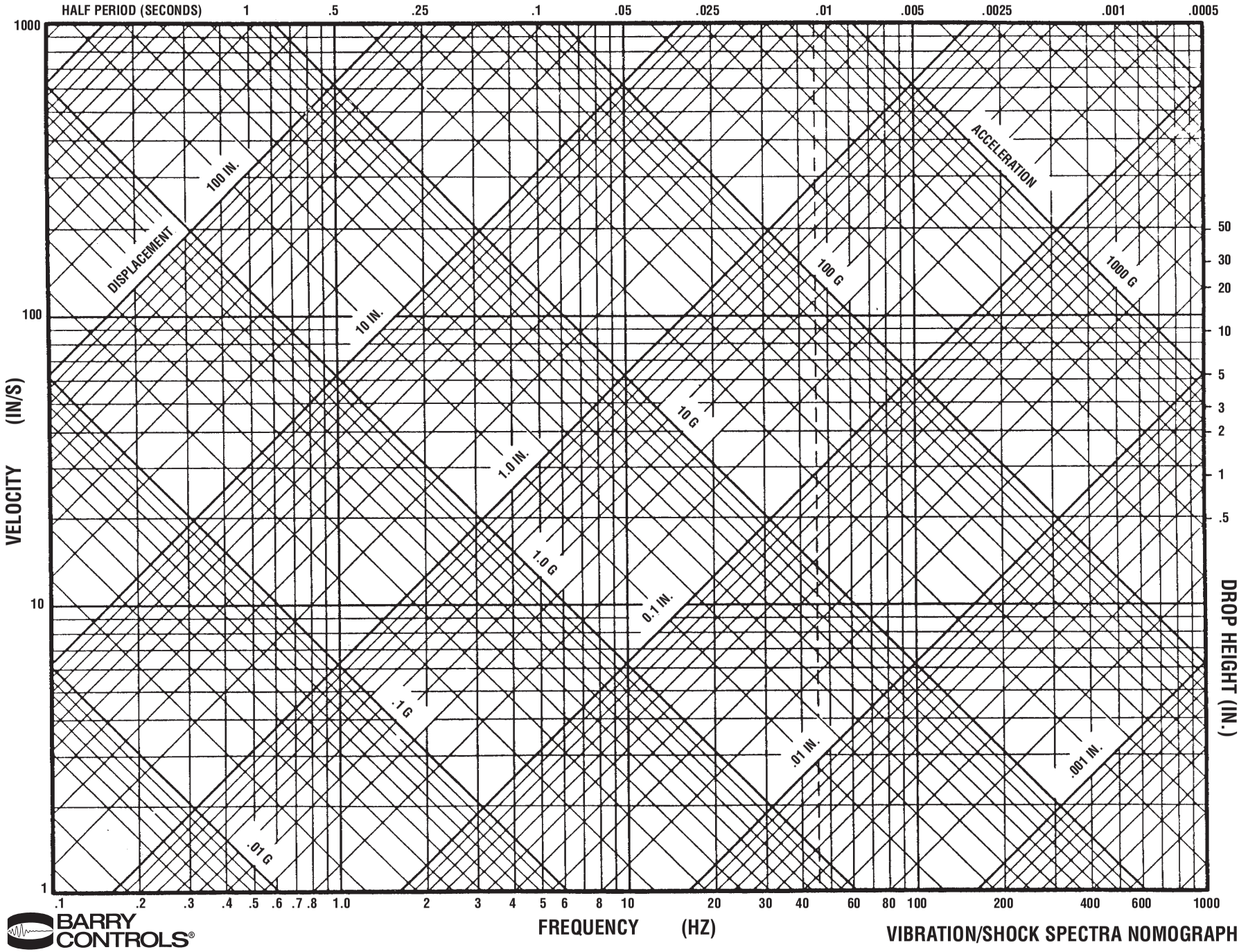
VIBRATION/SHOCK SPECTRA NOMOGRAPH



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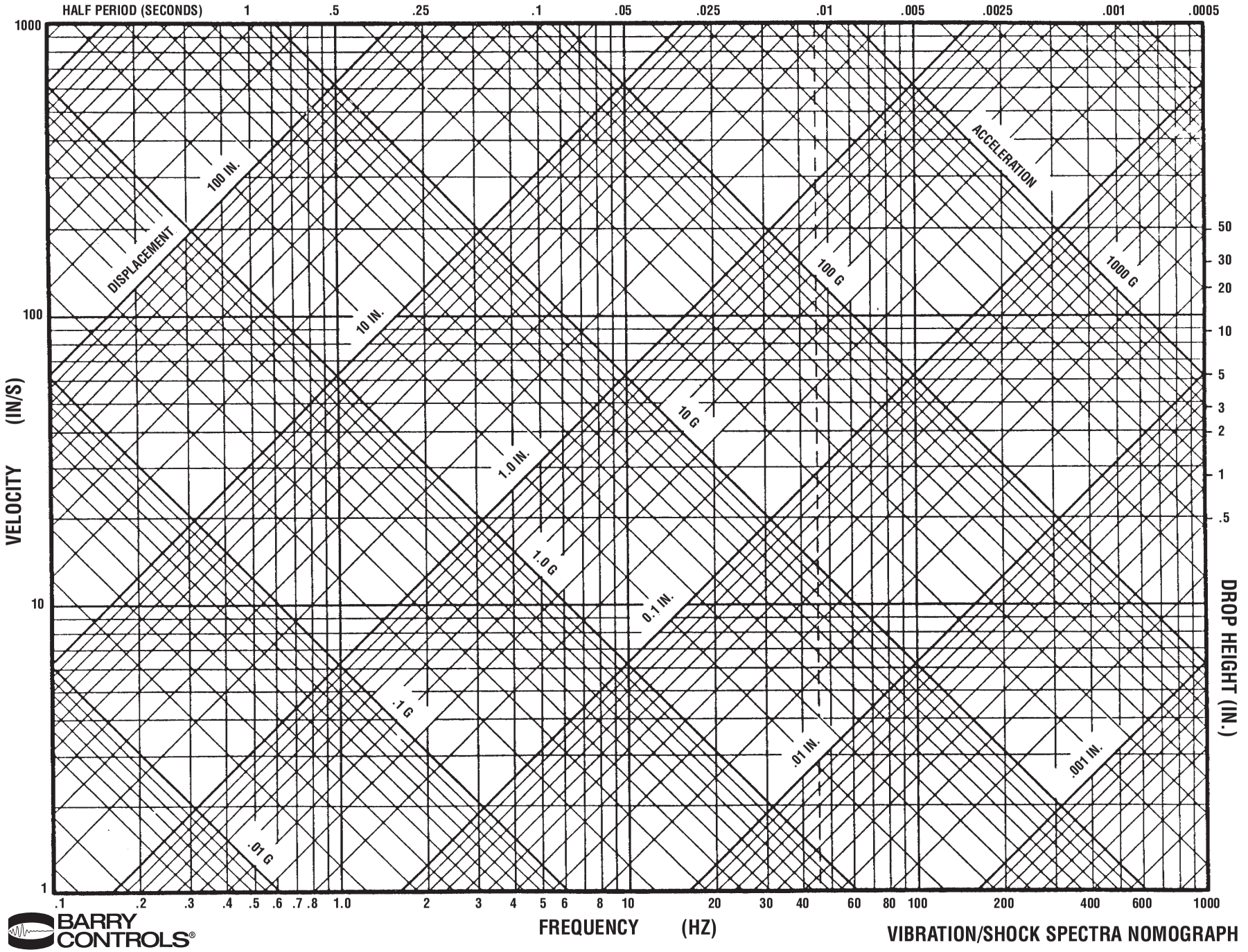
VIBRATION/SHOCK SPECTRA NOMOGRAPH



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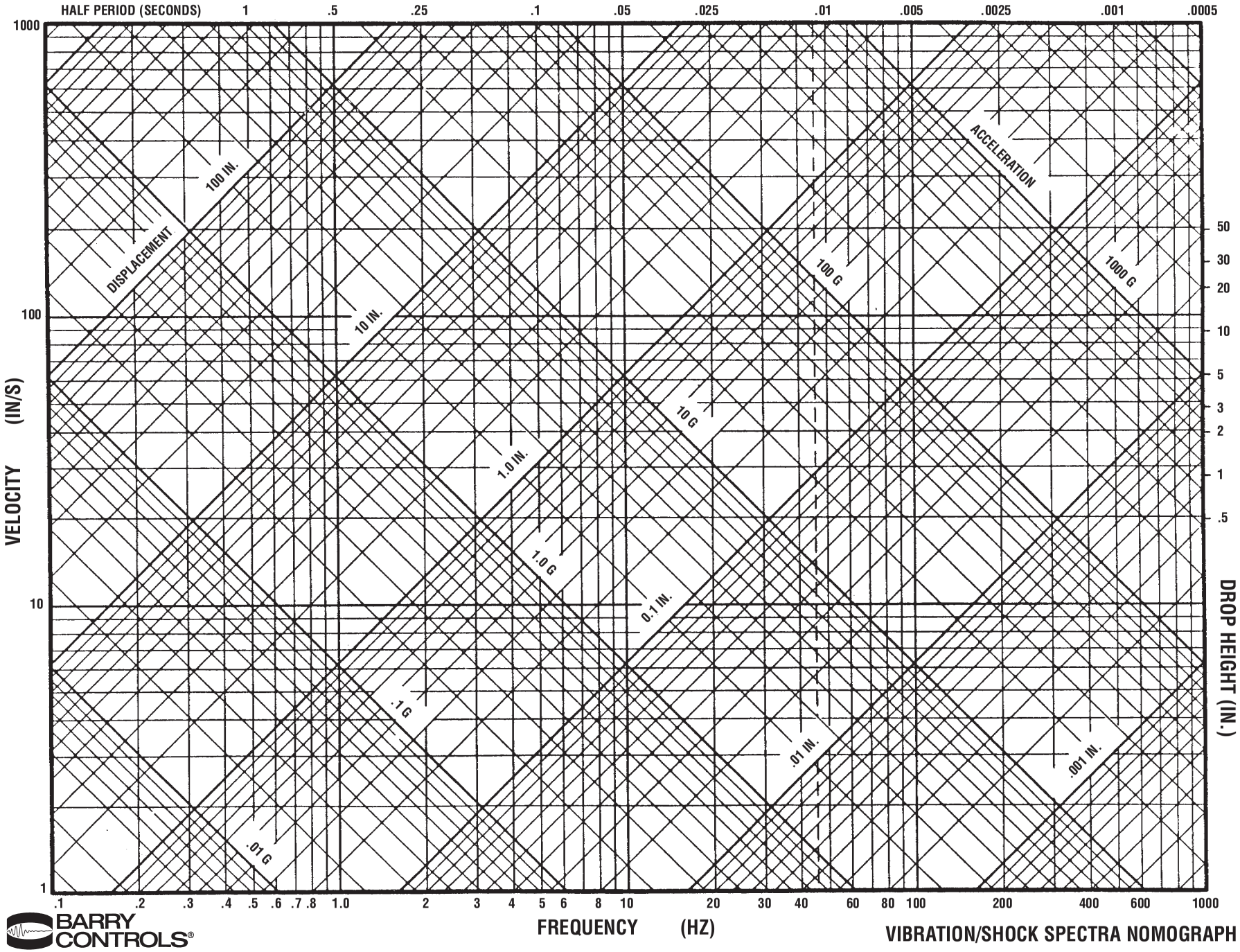

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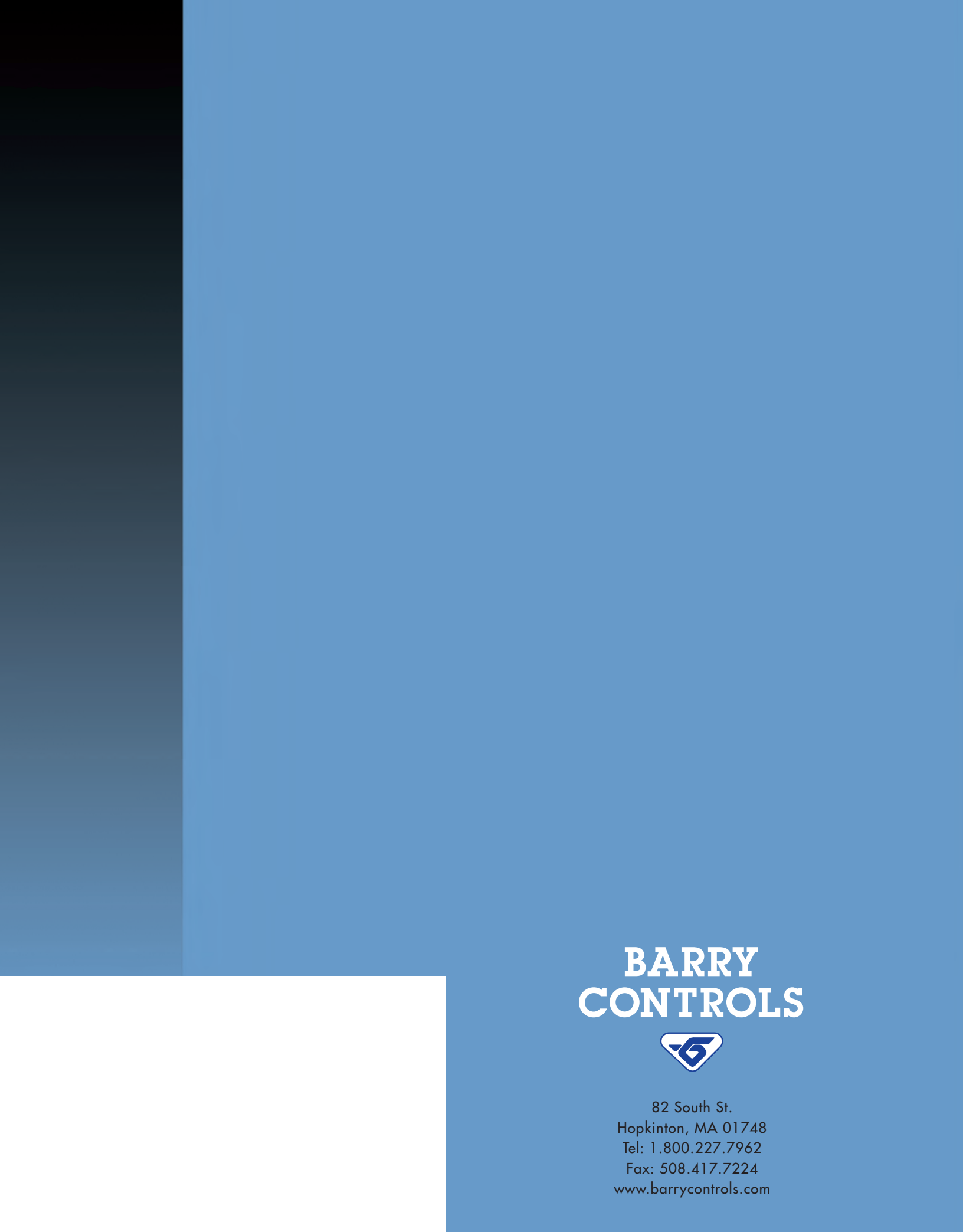
VIBRATION/SHOCK SPECTRA NOMOGRAPH



BARRY
CONTROLS

82 South St.
Hopkinton, MA 01748
Tel: 1.800.227.7962
Fax: 508.417.7224
www.barrycontrols.com