

STOP VIBRATION



VIBRATION ELIMINATOR Company Inc.

THE ISOLATION OF MACHINERY VIBRATION

PLANNED ISOLATION:

The isolation of machinery to prevent the transmission of vibration has become one of the important phases of modern plant engineering. Because concrete, steel, and other building materials are all good conductors of vibration, all mechanical equipment should be isolated. Properly planned isolation acts not only as a shield to prevent vibration transmission to the foundation, floor, the building structure and surrounding equipment, but it also materially reduces dynamic bearing loads.

APPLICATION:

The type of isolation best suited for a given machine depends on the predominant disturbance transmitted by the machine and its effect on the surroundings. Considering the large variety of machinery encountered in the modern world, it is advisable to establish grouping of machines having common operating characteristics as follows:

A. IMPACT

Example: Hammers, Slow Speed Punch Presses, etc.

B. IMPACT & VIBRATIONS

Example: Ball Mills, Tumbling Barrels

C. VIBRATIONS, UNIFORM

Example: Blowers, Diesel Generators

D. VIBRATIONS, COMPLEX

Example: Lathes, Milling Machines

E. VIBRATION AND/OR SHOCK, REVERSE

Example: Instrument Panels, Precision Grinders.

Effective isolation is not the mere interposition of a resilient material or system. Incorrectly applied isolation may even aggravate the vibratory condition. To be of any value the isolation material or system must be resilient under the condition of installation; that is, under the impact of operation, it must have a certain predetermined action. Briefly, if the isolation system is underloaded it cannot be resilient. Its reaction will be the same as that of a solid mass, and it will transmit vibration. At the other extreme, if the isolation system is overloaded, fatigue results, with a complete breakdown of the resiliency factors. It is clear to the trained engineer, therefore, that the isolation material must be properly loaded for maximum isolation efficiency.

ISOLATION, TYPES AND MATERIALS:

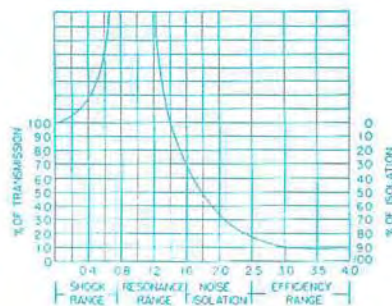
There are a number of materials suggested as vibration isolators. Those which are generally accepted and which meet the requirements described herein are steel springs, elastomers, cork, neoprene and cork and laminated pads of cotton duck and neoprene.

The most essential factor of an isolator is that it must be truly resilient, that is, it must have the ability to return to its original height when loads or forces are removed. Such a material, when loaded within its elastic limits, will have a long effective life.

ISOLATION, WHAT IT DOES:

The use of isolators is primarily for the purpose of reducing the effect of the dynamic forces set up or generated by moving parts in a machine.

In the case where vibrations are present due to a constant steady-state oscillation of unbalance in a machine a precise formula may be applied with reasonable certainty of attaining desired results. In substance, this formula is based on the ratio of the operating frequency of the machine, or other equipment to be isolated, to the natural frequency of the isolated system. This ratio and the resulting isolation efficiency is shown in the accompanying graph. It will be observed that when the ratio of the operating frequency to the natural frequency of the system lies in the range between 2.5 and 4.0, we have approached that point of diminishing returns beyond which increased efficiency is not practical nor is it essential. Even at a ratio of 2 to 1, we get approximately 66% efficiency.



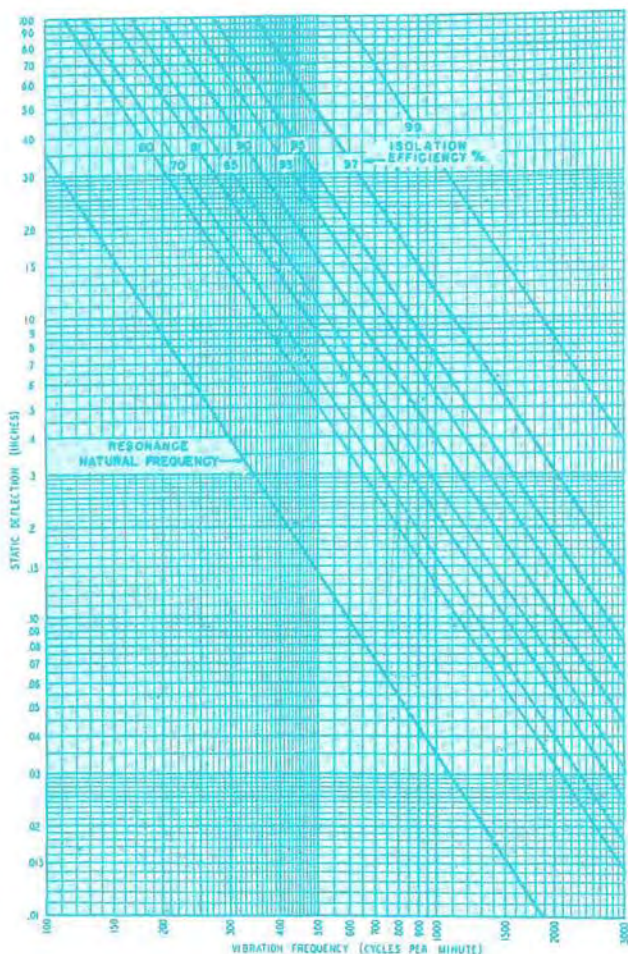
See also curve on page 3 for selecting static deflections knowing the disturbing frequency and isolation efficiency desired.

The design and selection of an isolation system for impact machines must take into account that the energy of each blow is dissipated before the next impact occurs.

Accordingly, the theory of isolation outlined above is not applicable as the forcing (disturbing) frequency is usually low (under 100 cpm). However, best results are obtained with isolators providing low natural frequencies that are compatible with tolerable equipment motion and out of resonance with any of the operating frequencies.

When necessary, use of inertia mass and damping devices may be employed to attain desired stability.

The following pages offer specific recommendations for isolating equipment comprising the groups A through E referred to on page 2.



TO DETERMINE THE PERCENT ISOLATION EFFICIENCY, READ FROM THE ABOVE GRAPH AT THE INTERSECTION OF VIBRATION (DISTURBING) FREQUENCY AND STATIC DEFLECTION.

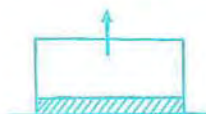
NOISE:

With passage of the Noise Control Act of 1972 and OSHA regulations which set limits to factory noise, it is important that all areas of noise reduction be considered.

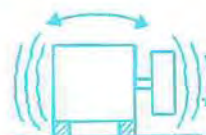
The use of a resilient medium between the equipment and structure acts to break the path of structural borne noise as well as noise resulting from sound waves that are magnified by the "sounding board" effect associated with machinery mounted solidly to the structure.

Use of isolation does not reduce air borne noise which if found to be above allowable levels must be treated acoustically with acoustic enclosures or other sound absorbing devices.

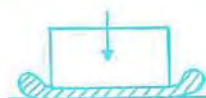
DON'TS for machine isolation



Don't put a solid sheet of cork, rubber or other material under the complete base. Nine chances out of ten it's too much, it won't help much and you are wasting your money. Isolation must be right or it is no good.



Don't neglect the overhang of the drive. If you do, your machine will rock excessively. Extend the base and the isolation out under the drive, and your rocking troubles will be minimized.



Don't use a material that will soften in warm weather and flow out from under the base. It's just as bad to use a material that will harden in cold weather. Either will give you questionable isolation only in spring and fall.



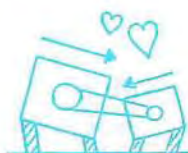
Don't ignore uneven weight distribution. If you do, the isolation will compress unevenly and the machine will tip. Excessive tipping or rocking may lead to serious trouble.



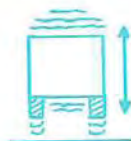
Don't use a brittle isolator. Avoid materials that harden with age or vibration. Impact will break it up and the floor sweeper will brush it away.



Don't use a dead or lifeless material. Such materials may absorb vibration when first installed, but in time they pack and settle, which means that they no longer isolate.



Don't encourage affectionate machines. If a fan and its motor are both separately, resiliently mounted, they tend to nod to each other with resulting drive distortion. Have a rigid base on top of the isolation.



Don't make a bouncing ball out of your machine. It's important that the isolation be just right, not too hard nor too soft. At one point in its softness resonance develops and with it plenty of trouble.

ISOLATORS

ELASTOMER:

Elastomer can be molded into any shape, vulcanized to metal, is available in different hardnesses, possesses inherent damping, meets the basic requirements as to resiliency and possesses excellent sound deadening characteristics. Because of these qualities elastomer, within its scope, is probably the most versatile of all isolators.

Load deflection curves of elastomer mounts are non-linear and when they deflect under impact they build up resistance to further deflection thus bringing the system to a gradual "soft" stop before returning to the starting point. This absorbs impact forces, permits "follow through" and reduces wear on machinery and dies.

Because of the limitations of currently available shapes, it is considered practical to limit the use of elastomers to applications requiring static deflections of no more than $\frac{1}{2}$ ". Greater deflections can be obtained but often result in cumbersome mounts that are frequently more costly than springs.

SHEAR MOUNTS:

Typical of elastomer-in-shear mounts that provide up to $\frac{1}{4}$ " static deflection are Vibration Eliminator Co., Inc. Types 368S and 140S isolators. When assembled in series as illustrated by Type 368TD, double deflection to $\frac{1}{2}$ " is attained.

By varying the durometer (hardness) of the elastomer elements or by assembling them in parallel, unlimited load capacity is attainable.

Elastomer-in-shear isolators are available in unit, rail or integral base form and are commonly used to isolate a variety of machinery whose predominant disturbance is due to steady state uniform vibrations above 600 cpm.

Typical of such machines are:

- Blowers
- Reciprocating or centrifugal compressors
- Diesel Generators
- Pumps and Piping

They may also be used for limited cases of impact machinery such as:

- Punch Presses
- Paper Cutters
- Ball Mills

COMPRESSION MOUNTS:

The need for a low profile, high load capacity mount to occupy small areas led to the development of our "FP" mount. These isolators consist of highest quality elastomer molded to specifications establishing shape factors which control the load-deflection characteristics of the mounts. Type "FPA" may be loaded to 125 lbs. per sq. inch providing $\frac{1}{2}$ " static deflection. Type "FPB" will take 250 lbs. per sq. inch for the same deflection for steady state vibrations. For use with impact machinery maximum load recommended is 90 lbs. and 180 lbs. per sq. inch, respectively.

"FP" mounts may be of any desired dimensions and/or load capacity. Selection of size and capacity should be made in cooperation with our engineering department to assure best results.

Typical application for control of vibrations would be for:

- Centrifugal Compressors
- Diesel Generators, Large
- Pipe Riser Supports
- Printing Presses

Typical application under impact machinery such as:

- Punch Presses
- Drop Hammers, Small
- Ball Mills
- Hammer Mills
- Injection Molders

RIBBED NEOPRENE AND CORK:

There is an increasing need for an inexpensive form of resilient pad for machines of high speed with negligible unbalance. The types 100N, 200N and 300N Vibration Eliminators serve this purpose very effectively. This material is provided in standard sheets 12" x 36" and can be cut readily with a band saw or knife. Smaller pads can be supplied factory cut to your specifications.

These pads are designed to support loads up to 50 lbs. per square inch for normal applications and 25 lbs. per square inch for impact machines. The unique design of the corrugations affords the resiliency not available in sheet rubber. Since elastomers have no elasticity by volume these corrugations provide the necessary flow area for the elastomer under load.

These pads may be used under machinery producing low magnitude uniform vibrations or in non-critical areas where sound attenuation is more of a factor than the transmission of vibrations. Also excellent for use under general machine shop machinery.

Typical of the above are:

- Lathes
- Boring Machines
- Broachers
- Grinders

They may also be used under impact machinery as an inexpensive alternate to more sophisticated isolation as in the case of:

- Punch Presses
- Mills
- Press Brakes
- Shears

NATURAL CORK:

There seems to be a degree of confusion with respect to the use of cork for machinery isolation. Only one form of cork is enduringly effective for the purpose and that is pure natural cork. This is the bark of the cork oak tree that is cut into strips and assembled in plate form for ease of handling. More than 50% of the volume of natural cork is accounted for by the air imprisoned within the cells making it extremely resilient. The confusion results from the common practice of substituting various forms of compressed cork for this type of service. All types of compressed cork are fabricated products consisting of ground cork in sheet form. In the process the sealed air cells are destroyed and an adhesive binder holds the granules in position. Constant vibration tends to destroy the binder and materially reduce the resiliency and life of the cork. Since the necessary qualities of natural cork are so readily available no substitutions should be permitted. Like any other truly resilient material, natural cork plates must be properly loaded, that is, the layout of the cork must be such as to support between 1500 lbs. to 2000 lbs. per square foot. A thickness of three inches is recommended and under no circumstances should the material be less than 2" thick.

Natural cork is generally recommended for isolating heavy equipment, often involving concrete foundations that serve to maintain machinery alignment or to serve as inertia mass to limit motion due to the large magnitude of inherent unbalance.

Typical of use with concrete blocks are such equipment as:

- Drop Hammers
- Rolling Mills
- Large Punch Presses
- Coal Pulverizers
- Large Single Cylinder Air Compressors
- Ball Mills

Natural cork may also be used without concrete block with excellent results under equipment such as:

- Printing Presses
- Injection Molders
- Floating Floors

METAL SPRINGS:

Metal springs become preferable when the required static deflections exceed $\frac{1}{2}$ ". Springs are highly efficient mechanical vibration absorbers and their lack of inherent damping and sound absorbing qualities may be readily overcome by the application of properly designed damping and sound absorbing materials. The use of spring devices for large deflections dictates the incorporation of leveling bolts in order to facilitate installation and to compensate for variations in deflection.

Spring isolators are usually available either housed or free standing. Free standing springs are unrestrained devices which must be stable, i.e., where the ratio of the lateral to the axial spring constants is approximately equal; or where the outside spring diameter is at least 0.8 of the spring operating height.

Housed springs vary in design and can be furnished with vertical and/or lateral restraints depending on the application. They are usually preferred over unhoused springs for in-plant installation.

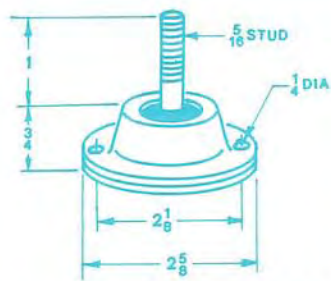
Springs are excellent isolators for both steady state vibrations and for impact. Typical equipment isolated for vibration are:

- Blowers
- Air Handling Units
- Pumps
- Chillers
- Diesel Generators
- Air Compressors
- Centrifugal Refrigerator Compressors
- Reciprocating Refrigerator Compressors

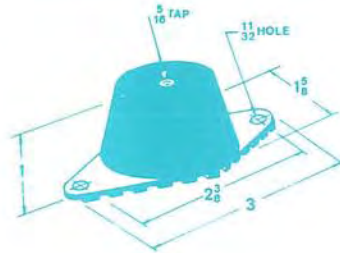
Typical equipment isolated for impact applications are:

- Punch Presses
- Drop Hammers

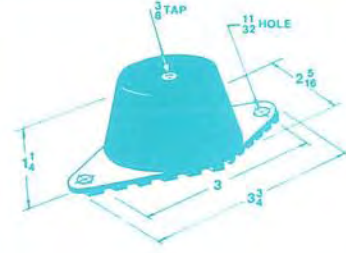
RUBBER-IN-SHEAR ISOLATORS FOR FLOOR MOUNTING



109S FIG 1



T22 FIG 2



T44 FIG 3

FIG. NO.	MODEL NUMBER	COLOR CODE	RATED LOAD	RATED DEFL.	SHIP WGT.
1	109S-40	White	25#	.15"	0.3#
2	T22-3	White	40	.25"	0.2#
3	T44 { 3A 5A 7A 8A	White Blue Green Orange	100 150 300 400	.25"	0.3#
4	368S { 1 2 3 4	White Green Blue Orange	150 350 550 900	.25"	2.5#
	368TD { 1 2 3 4	White Green Blue Orange	150 350 550 900	.50"	3.0#
5	140S { 1 2 3 4	White Green Blue Orange	150 350 550 900	.25"	3.0#
	240S { 2 3 4	Green Blue Orange	700 1100 1800	.25"	6.0#
	340S { 3 4	Blue Orange	1650 2700	.25"	7.0#
	440S { 3 4	Blue Orange	2200 3600	.25"	10.0#
	140TD { 1 2 3 4	White Green Blue Orange	150 350 550 900	.50"	3.0#
	240TD { 2 3 4	Green Blue Orange	700 1100 1800	.50"	6.0#
	340TD { 3 4	Blue Orange	1650 2700	.50"	7.0#
	440TD { 3 4	Blue Orange	2200 3600	.50"	10.0#

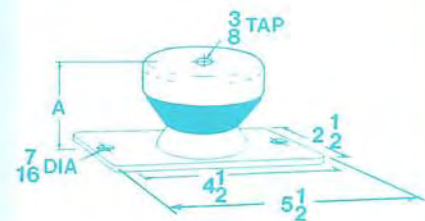


FIG 4

MODEL NO	A
368S	1 15/16"
368TD	2 5/8"

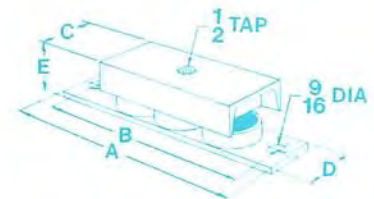


FIG 5

MODEL NO.	A	B	C	D	E	NO. OF RUBBER INSERTS
140S	6	4 1/2	4	3	2 5/8	1
140TD	6	4 1/2	4	3	3	1
240S	11	9	4	3	2 5/8	2
240TD	11	9	4	3	3	2
340S	13	11	4	3	2 5/8	3
340TD	13	11	4	3	3	3
440S	11	9	8	7	2 5/8	4
440TD	11	9	8	7	3	4

RUBBER-IN-SHEAR HANGERS

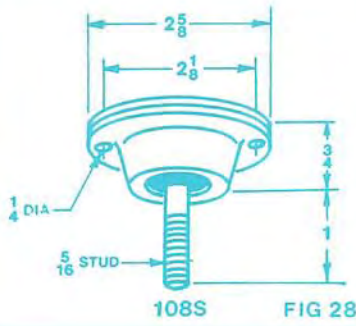


FIG 28

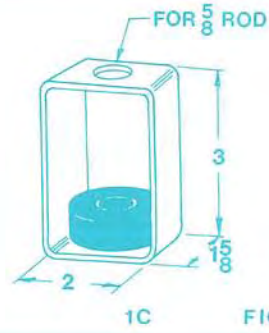


FIG 29

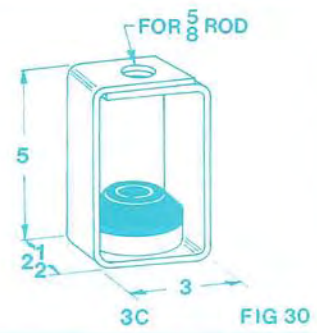


FIG 30

FIG. NO.	MODEL NUMBER	COLOR CODE	RATED LOAD	RATED DEFL.	SHIP WGT.
28	108S	White	40#	.15"	0.3#
29	1C	White	100	.20"	0.5#
30	3C	1 White	150	.25"	1.9#
		2 Green	300		
		3 Blue	460		
		4 Orange	700		
31	3CTD	1 White	150	.5"	3.0#
		2 Green	300		
		3 Blue	450		
		4 Orange	700		
32	5C	1 Silver	850	.25"	4.0#
		2 Yellow	1200		
		3 Red	1600		
		4 White	1900		
		5 Green	2500		
33	5CD	1 Silver	850	.5"	4.8#
		2 Yellow	1200		
		3 Red	1600		
		4 White	1900		
		5 Green	2500		

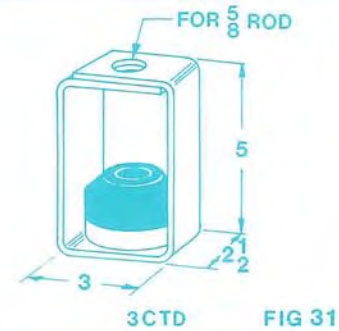


FIG 31

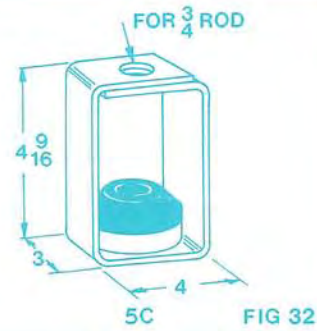


FIG 32

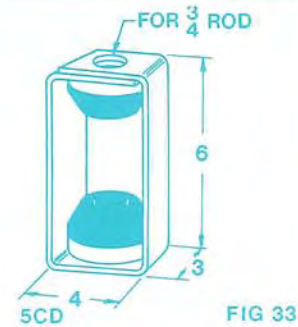


FIG 33

SPRING & COMBINATION SPRING & R-I-S HANGERS

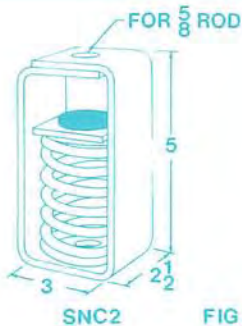


FIG 34

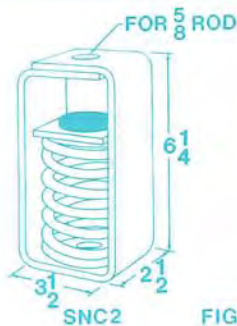


FIG 35

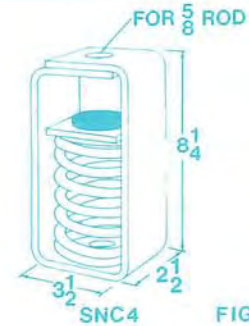


FIG 36

FIG. NO.	MODEL NUMBER	COLOR CODE	RATED LOAD	RATED DEFL.	SHIP WGT.
34	SNC2	F21 Yellow	40#	1.0"	2.0#
		F22 Red	100	1.0"	
		F23 Red & Silver	145	1.0"	
		F24 Red & Yellow	205	1.0"	
		F25 Red & White	300	1.0"	
		F26 White	400	1.0"	
35	SNC2	4 White	380	.80"	3.0#
		5 Green	530	.80"	
		6 Blue	750	.75"	
		7 Orange	1125	.75"	
		8 Gold	1500	.75"	
36	SNC4	F30 Silver	155	1.85"	5.0#
		F31 Yellow	220	1.70"	
		F32 Red	310	1.55"	
		F33 White	420	1.40"	
		F34 Green	540	1.25"	
		F35 Blue	710	1.15"	
		F36 Orange	900	1.05"	
		F37 Gold	1030	1.00"	
		F38 Red & Silver	1275	1.00"	
		F39 Red & Yellow	1630	1.00"	
		F40 Red & White	2100	1.00"	
		F41 Red & Green	3000	1.00"	
37	SNRC2	F21 Yellow	40	1.25"	3.0#
		F22 Red	100	1.25"	
		F23 Red & Silver	145	1.25"	
		F24 Red & Yellow	205	1.25"	
		F25 Red & White	300	1.25"	
		F26 White	400	1.25"	
38	SNRC2	4 White	380	1.05"	4.0#
		5 Green	530	1.05"	
		6 Blue	750	1.00"	
		7 Orange	1125	1.00"	
		8 Gold	1500	1.00"	
39	SNRC4	F30 Silver	155	2.10"	5.5#
		F31 Yellow	220	1.95"	
		F32 Red	310	1.80"	
		F33 White	420	1.65"	
		F34 Green	540	1.50"	
		F35 Blue	710	1.40"	
		F36 Orange	900	1.30"	
		F37 Gold	1030	1.25"	
		F38 Red & Silver	1275	1.25"	
		F39 Red & Yellow	1630	1.25"	
		F40 Red & White	2100	1.25"	
		F41 Red & Green	3000	1.25"	

Note: The "SNC4" and "SNRC4" hangers are designed to allow as much as 30° angular rod misalignment.

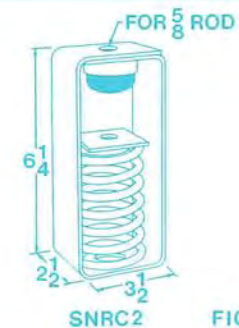


FIG 37

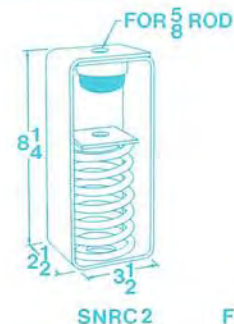


FIG 38

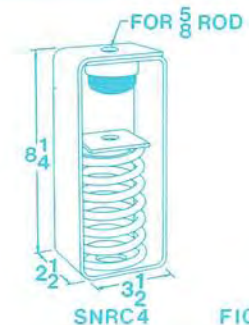
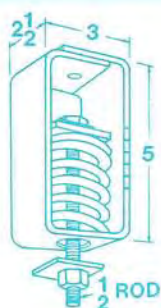


FIG 39

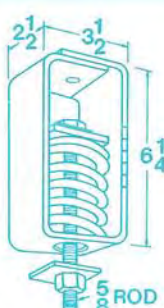
For hanger requiring greater loads and/or deflections refer to factory.

PRECOMPRESSED SPRING & COMBINATION SPRING & R-I-S HANGERS



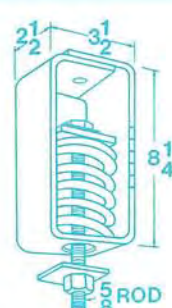
PCS2

FIG 40



PCS2

FIG 41



PCS4

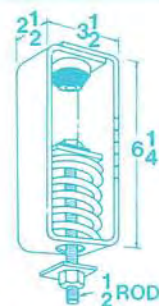
FIG 42

FIG. NO.	MODEL NUMBER	COLOR CODE	RATED LOAD	RATED DEFL.	SHIP WGT.
40	PCS2	F21 Yellow	40#	1.0"	2.5#
		F22 Red	100	1.0"	
		F23 Red & Silver	145	1.0"	
		F24 Red & Yellow	205	1.0"	
		F25 Red & White	300	1.0"	
41	PCS2	4 White	380	.80"	3.5#
		5 Green	530	.80"	
		6 Blue	750	.75"	
		7 Orange	1125	.75"	
		8 Gold	1500	.75"	
42	PCS4	F30 Silver	155	1.85"	6.0#
		F31 Yellow	220	1.70"	
		F32 Red	310	1.55"	
		F33 White	420	1.40"	
		F34 Green	540	1.25"	
		F35 Blue	710	1.15"	
		F36 Orange	900	1.05"	
		F37 Gold	1030	1.00"	
		F38 Red & Silver	1275	1.00"	
		F39 Red & Yellow	1630	1.00"	
43	PCSR2	F21 Yellow	40	1.25"	3.5#
		F22 Red	100	1.25"	
		F23 Red & Silver	145	1.25"	
		F24 Red & Yellow	205	1.25"	
		F25 Red & White	300	1.25"	
44	PCSR2	4 White	380	1.05"	4.5#
		5 Green	530	1.05"	
		6 Blue	750	1.00"	
		7 Orange	1125	1.00"	
		8 Gold	1500	1.00"	
45	PCSR4	F30 Silver	155	2.10"	6.5#
		F31 Yellow	220	1.95"	
		F32 Red	310	1.80"	
		F33 White	420	1.65"	
		F34 Green	540	1.50"	
		F35 Blue	710	1.40"	
		F36 Orange	900	1.30"	
		F37 Gold	1030	1.25"	
		F38 Red & Silver	1275	1.25"	
		F39 Red & Yellow	1630	1.25"	

Note: The "PCS4" and "PCSR4" hangers are designed to allow as much as 30° angular rod misalignment.

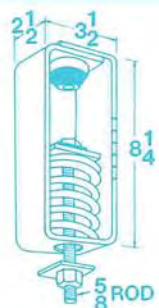
Type "PCS" and "PCSR" hangers are precompressed to hold equipment or pipe at a fixed elevation for ease in installation.

Hangers for greater loads and/or deflections refer to factory.



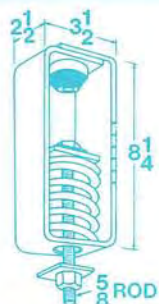
PCSR2

FIG 43



PCSR2

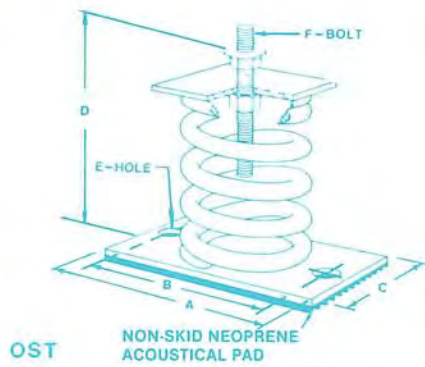
FIG 44



PCSR4

FIG 45

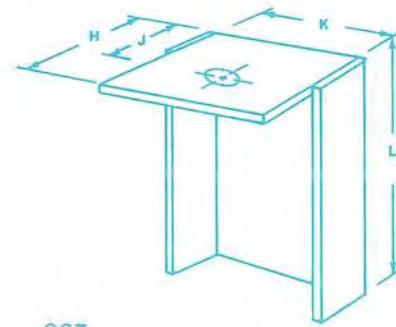
FREE STANDING SPRING ISOLATORS FOR FLOOR MOUNTING



OST

NON-SKID NEOPRENE
ACOUSTICAL PAD

FIG 50



OST
MATCHING BRACKET

FIG 51

FIG. NO.	MODEL NUMBER	COLOR CODE	RATED LOAD	RATED DEFL.	SPRING		ISOLATOR FIG. 50						BRACKET FIG. 51				SH. WT.	
					OD	FH	A	B	C	D	E	F	H	J	K	L	SPR.	BKT.
50 & 51	OST1	1 Silver	100#	1.00"	$2\frac{1}{2}$ $3\frac{1}{2}$	5	4	$2\frac{1}{2}$	$5\frac{1}{4}$	$\frac{9}{16}$	$\frac{5}{8}$	$3\frac{1}{2}$	$2\frac{1}{2}$	4	5	5# 4#		
		2 Yellow	200	1.00"														
		3 Red	295	.80"														
		4 White	380	.80"														
		5 Green	530	.80"														
		6 Blue	750	.75"														
		7 Orange	1125	.75"														
		8 Gold	1500	.75"														
	OST2	F21 Yellow	40	1.00"	$1\frac{3}{4}$ $3\frac{1}{8}$	$3\frac{3}{4}$	$2\frac{3}{4}$	2	$4\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{3}{4}$	3	$1\frac{1}{2}$	2# 1#		
		F22 Red	100	1.00"														
		F23 Red & Silver	145	1.00"														
		F24 Red & Yellow	205	1.00"														
		F25 Red & White	300	1.00"														
	OST3	F30 Silver	155	1.85"	$2\frac{7}{8}$ $4\frac{1}{4}$	6	5	3	6	$\frac{9}{16}$	$\frac{5}{8}$	4	3	$4\frac{1}{2}$	6	6# 6#		
		F31 Yellow	220	1.70"														
		F32 Red	310	1.55"														
		F33 White	420	1.40"														
		F34 Green	540	1.25"														
		F35 Blue	710	1.15"														
		F36 Orange	900	1.05"														
		F37 Gold	1030	1.00"														
		F38 Red & Silver	1275	1.00"														
		F39 Red & Yellow	1630	1.00"														
		F40 Red & White	2100	1.00"														
		F41 Red & Green	3000	1.00"														
	OST4	F50 Silver	260	3.00"	$4\frac{1}{2}$ $6\frac{1}{2}$	7	6	$4\frac{1}{2}$	$8\frac{1}{4}$	$\frac{9}{16}$	$\frac{3}{4}$	6	$3\frac{1}{2}$	$6\frac{1}{2}$	6	13# 10#		
		F51 Yellow	400	2.80"														
		F52 Red	555	2.58"														
		F53 White	690	2.42"														
		F54 Green	840	2.28"														
		F55 Blue	1025	2.13"														
		F56 Orange	1220	2.00"														
		F57 Gold	1730	2.16"														
		F58 Red & Silver	2340	2.00"														
	OST7	F71 Silver	355	5.90"	7 $10\frac{3}{4}$	10	$8\frac{1}{2}$	7	$13\frac{1}{4}$	$\frac{9}{16}$	1	7	5	$8\frac{1}{2}$	$14\frac{1}{2}$	46# 30#		
		F72 Yellow	770	5.30"														
		F73 Red	1080	5.00"														
		F74 White	1470	4.75"														
		F75 Green	1960	4.50"														
		F76 Blue	2575	4.20"														
		F77 Orange	3270	3.90"														
		F78 Gold	4025	3.60"														
	OST8	F83 Red	4702	4.30"	8 $8\frac{1}{2}$	$11\frac{1}{2}$	10	8	15	$\frac{9}{16}$	1	$7\frac{1}{2}$	$5\frac{1}{2}$	$10\frac{1}{2}$	$15\frac{3}{4}$	53# 38#		
		F84 White	5940	4.10"														

For greater deflections and/or loads refer to factory.

All springs designed to provide additional travel to solid of 50% of rated load.

All springs are free standing and laterally stable (meeting a minimum of 0.8 ratio of spring diameter to compressed height).

VERTICALLY RESTRAINED SPRING ISOLATORS FOR FLOOR MOUNTING

FIG. NO.	MODEL NUMBER	A	B	C	D	E	F	SHIP WGT.
53	1KW2	6 1/4	4 3/4	2 1/2	—	1 1/4	4 3/4	6#
	2KW2	9	7 1/2	2 1/2	—	1 1/4	4 3/4	10
	1KW3	7	5 1/2	3	—	1 1/2	7	9
	2KW3	11 1/4	9 3/4	3	—	1 1/2	7	21
	3KW3	13 1/4	11 3/4	3	—	1 1/2	7	27
	4KW3	11	9 1/2	6	3	1 1/2	7	43
	6KW3	14 1/2	13	6	3	1 1/2	7	60
	8KW3	17	15 1/2	6	3	1 1/2	7	78
	1KW4	9	7 1/2	4 1/2	—	2 1/4	9	34
	2KW4	14	12 1/2	4 1/2	—	2 1/4	9	52
	3KW4	19	17 1/2	6	4 1/2	3/4	9	69
	4KW4	14	12 1/2	10	8 1/2	3/4	9	84
	6KW4	19	17 1/2	10	8 1/2	3/4	9	117
	8KW4	24	22 1/2	10	8 1/2	3/4	9	150
54	1KW7	12 1/4	10 3/4	7	3 1/2	1 3/4	14 1/2	85
	2KW7	19 1/2	18	7	3 1/2	1 3/4	14 1/2	130
	1KW8	14	12 1/2	8	3 1/2	2 1/4	15 1/2	95
	2KW8	23	21 1/2	8	3 1/2	2 1/4	15 1/2	150

Top plate can be furnished with stud or tap to suit.

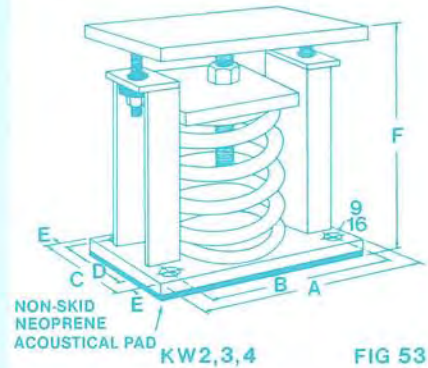


FIG 53

FIG. NO.	ISOLATOR MODEL		1KW2	2KW2	RATED LOAD IN POUNDS						RATED DEFL.	
	SUFFIX SPRING NO.	COLOR CODE										
53	KW2	F21	Yellow	40#	80#							1.00"
		F22	Red	100	200							1.00"
		F23	Red / Sil	145	290							1.00"
		F24	Red / Yel	205	410							1.00"
		F25	Red / Wht	300	600							1.00"
	ISOLATOR MODEL		1KW3	2KW3	3KW3	4KW3	6KW3	8KW3				
	KW3	F30	Silver	155#						1.85"		
		F31	Yellow	220						1.70"		
		F32	Red	310						1.55"		
		F33	White	420						1.40"		
		F34	Green	540						1.25"		
		F35	Blue	710						1.15"		
		F36	Orange	900						1.05"		
		F37	Gold	1030						1.00"		
		F38	Red / Sil	1275	2550#					1.00"		
		F39	Red / Yel	1630	3260	4890#	6520#	9780#	13040#	1.00"		
		F40	Red / Wht	2100	4200	6300	8400	12600	16800	1.00"		
		F41	Red / Grn	3000	6000	9000	12000	18000	24000	1.00"		
	ISOLATOR MODEL		1KW4	2KW4	3KW4	4KW4	6KW4	8KW4				
	KW4	F50	Silver	260#						3.00"		
		F51	Yellow	400						2.80"		
		F52	Red	555						2.58"		
		F53	White	690						2.42"		
		F54	Green	840						2.28"		
		F55	Blue	1025						2.13"		
		F56	Orange	1220	2440#					2.00"		
		F57	Gold	1730	3460	5190#	6920#	10380#	13840#	2.16"		
		F58	Red / Sil	2340	4680	7020	9360	14040	18720	2.00"		
		F59	Red / Yel	3000	6000	9000	12000	18000	24000	2.00"		
54	ISOLATOR MODEL		1KW7	2KW7								
	KW7	F71	Silver	355#						5.90"		
		F72	Yellow	770						5.30"		
		F73	Red	1080						5.00"		
		F74	White	1470	2814#					4.75"		
		F75	Green	1960	2920					4.50"		
		F76	Blue	2575	5150					4.20"		
		F77	Orange	3270	6540					3.90"		
		F78	Gold	4025	8050					3.60"		
	ISOLATOR MODEL		1KW8	2KW8								
	KW8	F81	Silver	3227#	6454#					4.85"		
		F82	Yellow	4010	8020					4.60"		
		F83	Red	4720	9440					4.30"		
		F84	White	5940	11880					4.10"		

Top plate can be furnished with stud or tap to suit.

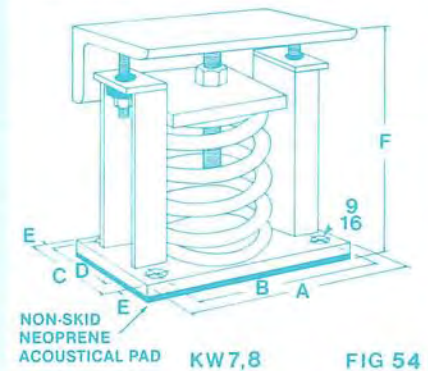


FIG 54

NOMENCLATURE

2 KW 4 — F58

No. Springs Per Unit —

Model No. —

Spring Series —

Suffix Spring No. —

For greater deflections and/or loads refer to factory.

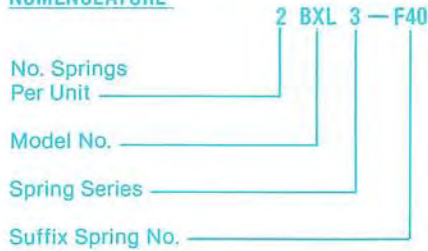
All springs designed for additional travel to solid of 50% of rated defl.

All springs are free standing and laterally stable (meeting a minimum of 0.8 ratio of spring diameter to compressed height)

ALL DIRECTIONAL RESTRAINED SPRING ISOLATORS FOR FLOOR MOUNTING

FIG. NO.	MODEL NUMBER	A	B	C	D	E	F	SHIP WGT.
55	1BXL3	8½	7	6	—	3	7	20#
	2BXL3	12¼	10¾	6	—	3	7	42
	4BXL3	14½	13	6	3	1½	7	46
	6BXL3	18	16½	6	3	1½	7	58

NOMENCLATURE



Top plate can be furnished with stud or tap to suit.

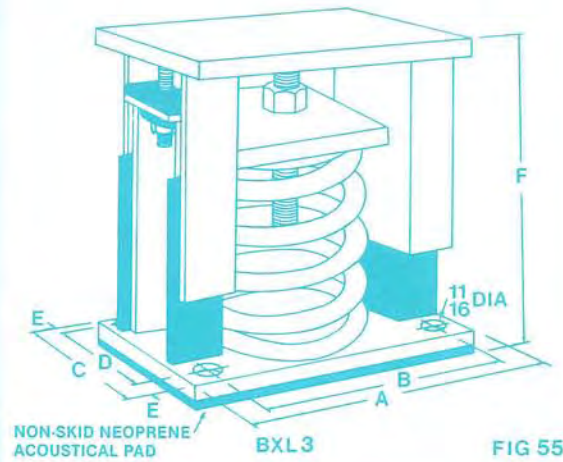


FIG. NO.	MODEL NUMBER	COLOR CODE	RATED LOAD IN POUNDS				RATED DEFL.
			1BXL3	2BXL3	4BXL3	6BXL3	
55	BXL3	F30 Silver	155#				1.85"
		F31 Yellow	220				1.70"
		F32 Red	310				1.55"
		F33 White	420				1.40"
		F34 Green	540				1.25"
		F35 Blue	710				1.15"
		F36 Orange	900				1.05"
		F37 Gold	1030				1.00"
		F38 Red / Silver	1275	2550#			1.00"
		F39 Red / Yellow	1630	3260	6520#	9780#	1.00"
		F40 Red / White	2100	4200	8400	12600	1.00"
		F41 Red / Green	3000	6000	12000	18000	1.00"

For greater deflections and/or loads refer to factory.

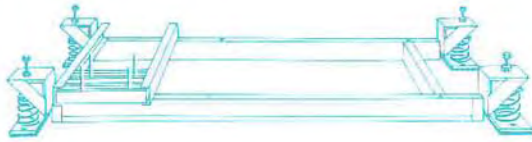
TYPE "BXL" SEISMIC ISOLATOR

The type "BXL" Seismic isolators are totally captive mounts, used for earthquake applications. The "BXL" mounts serve as highly efficient vibration isolators, and are designed to resist movement in ALL directions, caused by earthquakes or other externally applied shock or impact forces.

Resilient elastomeric material is located between the parallel steel guides in order to eliminate direct metal to metal contact, and to cushion the applied shock forces. The unique design of the "BXL" seismic isolator can withstand very high horizontal "g" (gravity) impact forces, and still resist motion which might otherwise cause damage to the spring supported system.

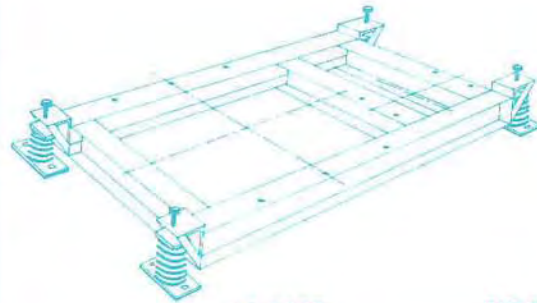
In addition to offering a complete line of "BXL" isolators for ALL seismic application, the Vibration Eliminator will also provide seismic calculations. For additional information concerning seismic analysis and application or high deflection "BXL" isolators, contact the Vibration Eliminator Co., Inc.

STRUCTURAL STEEL VIBRATION ISOLATION BASES



OSK BASE

FIG 68



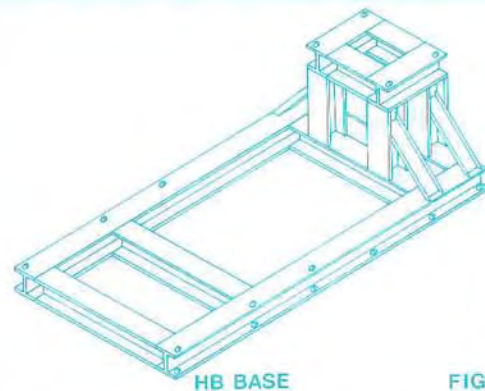
HB BASE

FIG 69

SPECIAL "HB" BASES (Fig. # 70)

These bases are manufactured for applications that require steel pedestal supports for motors, gears boxes and bearings for fans, refrigeration machines and other equipment which may require a rigid unitized supporting base.

These bases can be furnished with or without isolation devices depending upon the specific application. They are often mounted directly on the type "KW" isolators which are illustrated in fig. #53 & 54.

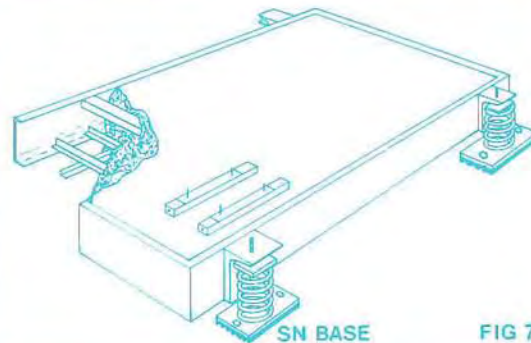


HB BASE

FIG 70

TYPE "SN" INERTIA FRAME BASE (Fig. # 71)

These bases are designed to provide an inexpensive pouring form for concrete when inertia mass is required. The bases consist of a structural steel channel perimeter frame incorporating channel mounting templates drilled for proper positioning of the equipment and driving motor, 1" x 1" angle stiffening members running in two directions on nine inch centers, height saving brackets, and housed or open steel springs selected for the desired static deflection up to 1" and 5" maximum respectively. (See Fig. 50 & 51 for details).



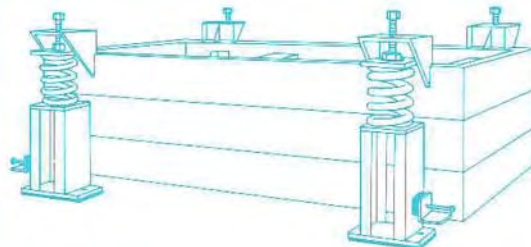
SN BASE

FIG 71

TYPE "SN-CG" INERTIA FRAME BASE (Fig. # 72)

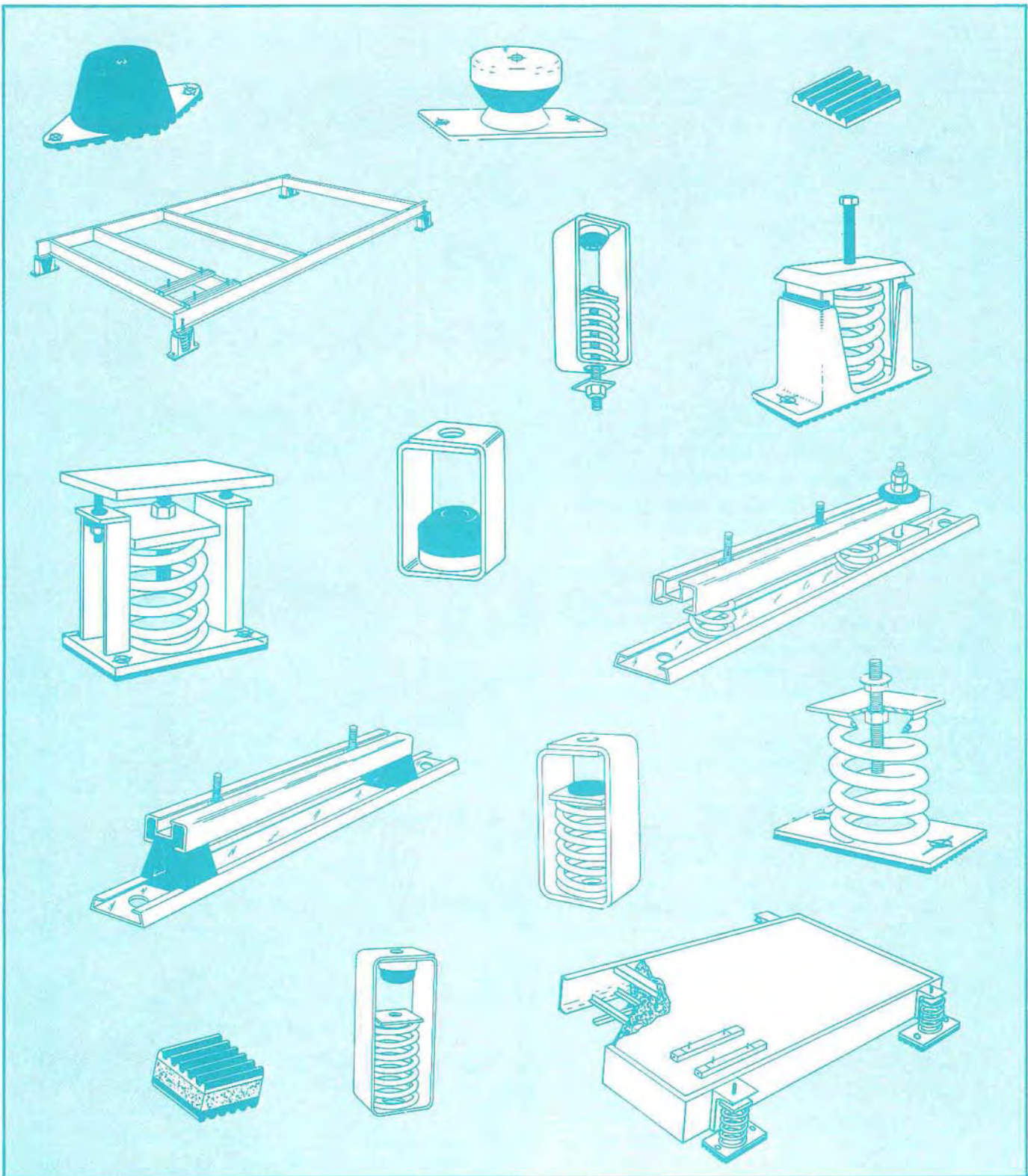
This base is essentially the same as the "SN" base described above with the exception that the outrigger brackets and spring isolators are located at such an elevation that a horizontal plane which passes through the system center-of-gravity, also passes through the vertical mid-point of each spring element.

This base is recommended for machinery which generates large unbalanced forces such as single cylinder air compressors.



SN-CG BASE

FIG 72



Vibration Eliminator Co., Inc., has pioneered in and developed the application of "isolation" to H.V. & A.C. equipment in all types of structures over the past 50 years. Our representatives and factory trained engineers are available to assist you and are as close as your telephone.