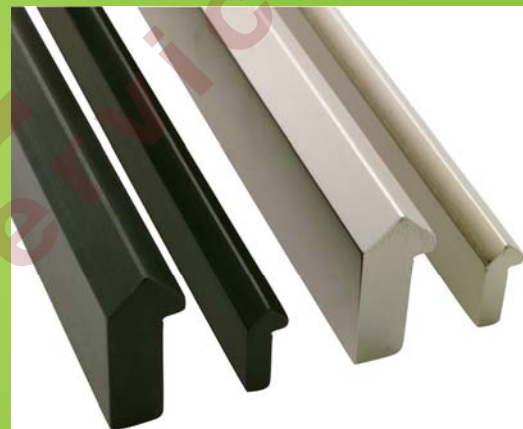
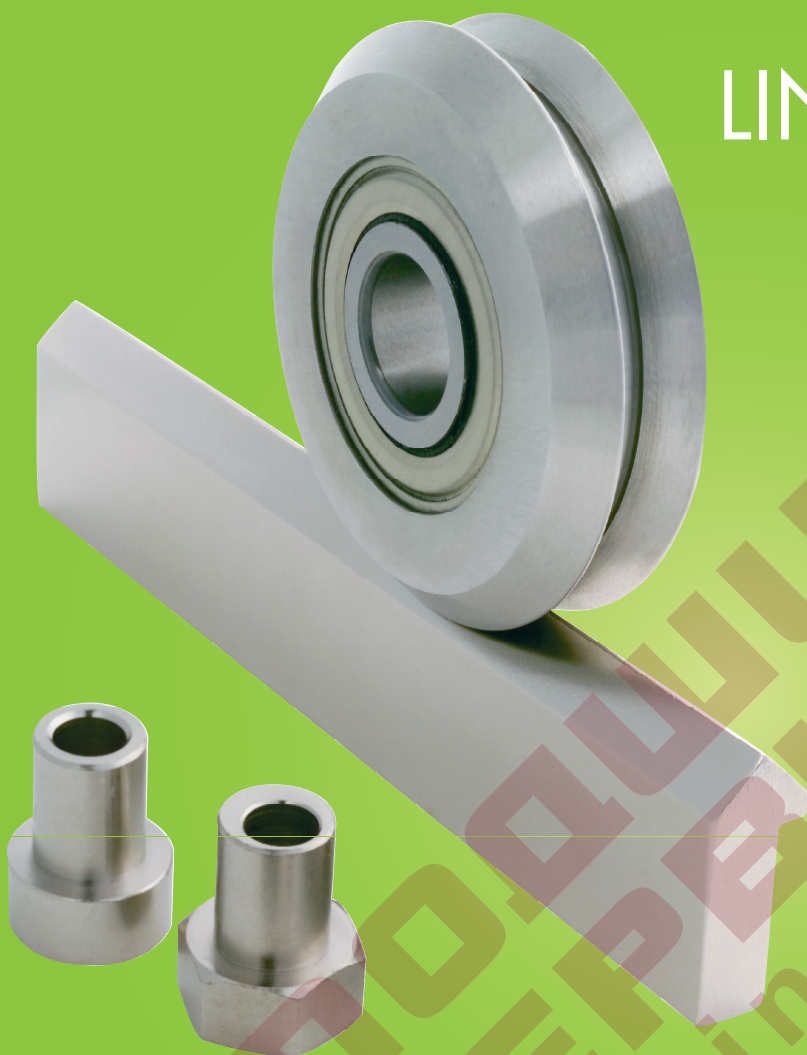


CAM ROLLER TECHNOLOGY (CRT)

LINEAR V-GUIDE

RAILS, WHEELS & BUSHINGS



www.linearvguides.com

PBC
LINEAR
A PACIFIC BEARING CO.



FEATURES & BENEFITS

PBC Linear V-Guide System components provide an excellent alternative for linear motion applications in harsh environments with medium accuracy requirements, and high speed capabilities.

V-Guide System :

- Excellent for harsh environments
- High speed capabilities
- Low noise operation

V-Rail:

- Simple mounting and alignment
- Available in long lengths
- Induction hardened way surface

V-Wheels:

- Permanently lubricated
- Precision dual row bearing
- Available in steel or 440 stainless steel

Wheel Bushings:

- 303 stainless steel
- Available for Inch or metric hardware

APPLICATIONS

- Machine tool doors
- Vending machines
- Woodworking machinery
- Carpet and textile machinery
- Laboratory automation
- Paper converting equipment
- Packaging machinery

TECHNICAL SPECIFICATIONS

AXIAL OR RADIAL LOAD V-WHEELS

V-wheels are precision ground dual row angular contact ball bearings with hardened outer way surfaces that provide low friction guidance for linear motion applications.

V-wheels can be used with internal or external 90-degree ways, or used with round shafts.

- Available in four sizes
- 52100 Bearing Steel or 440 Stainless Steel construction
- Permanently grease lubricated
- Available with 304 Stainless Steel shields, or nitrile rubber seals

V-RAILS

V-Rails are available in four sizes, which are designed for the corresponding size wheels. V-Rails are hardened and polished, while the track body is left soft for easy drilling of mounting holes.

- Available in carbon steel or stainless steel
- Optional black oxide finish
- Choose predrilled rail from stock, or custom cut and drilled to your specification

WHEEL BUSHINGS

Bushings allow for the wheels to be mounted with the appropriate fastener for the specific application.

- Fixed bushings are used in the primary radial load direction
- Adjustable bushings allow adjustable fit and preload
- Stainless Steel construction

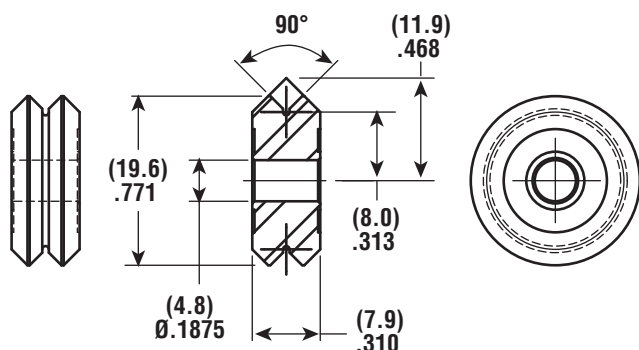


3/4" WHEEL

Radial Loads to 110 lbs. (50 kg) per Wheel

V-GUIDE WHEELS

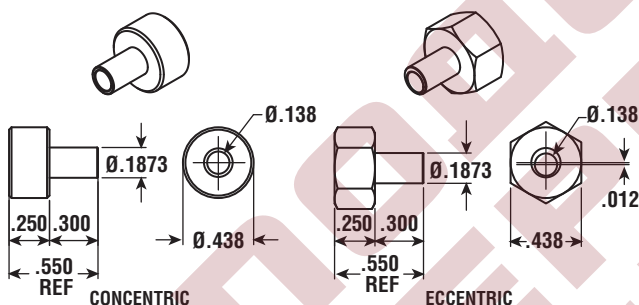
VW1	Shielded Bearing
VWS1	Sealed Bearing
VWSS1	Sealed Stainless Bearing



WEIGHT: .42 oz. (12 g)

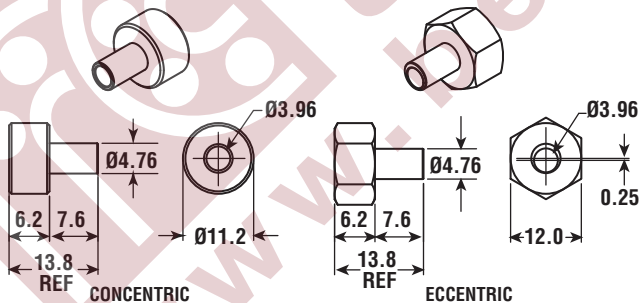
WHEEL BUSHINGS

VB1	Fixed Bushing
VBA1	Adjustable Bushing



METRIC WHEEL BUSHINGS

MVB1	Metric Fixed Bushing
MVBA1	Metric Adjustable Bushing

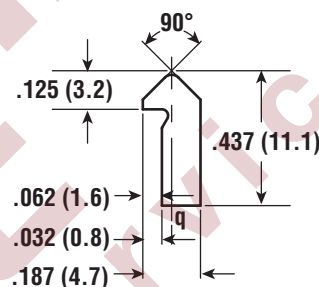


Rated for:

Radial loads to 110 lbs. (50 kg) per wheel
Moment loads to 40 lbs. (18 kg) per wheel

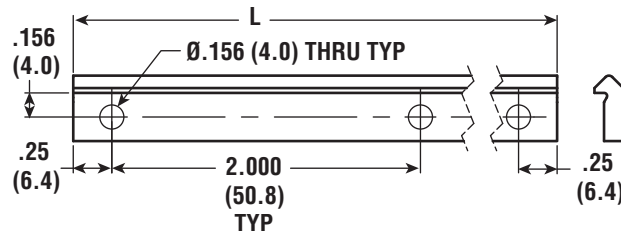
V-GUIDE RAIL

CARBON STEEL	
VR1-xxx	undrilled rail max. length 21' (6400 mm)
VRD1-xxx	drilled rail, see table
STAINLESS STEEL	
VRS1-xxx	undrilled rail, max. length 21' (6400 mm)
VRSD1-xxx	drilled rail, see table



STANDARD DRILLED RAILS

PART NUMBER	LENGTH	NO. OF HOLES
CARBON STEEL		
VRD1-1250	12.5" (317.5 mm)	7
VRD1-2450	24.5" (622.3 mm)	13
VRD1-3650	36.5" (927.1 mm)	19
VRD1-4850	48.5" (1231.9 mm)	25
VRD1-6050	60.5" (1536.7 mm)	31
VRD1-7250	72.5" (1841.5 mm)	37
STAINLESS STEEL		
VRSD1-1250	12.5" (317.5 mm)	7
VRSD1-2450	24.5" (622.3 mm)	13
VRSD1-3650	36.5" (927.1 mm)	19
VRSD1-4850	48.5" (1231.9 mm)	25
VRSD1-6050	60.5" (1536.7 mm)	31
VRSD1-7250	72.5" (1841.5 mm)	37



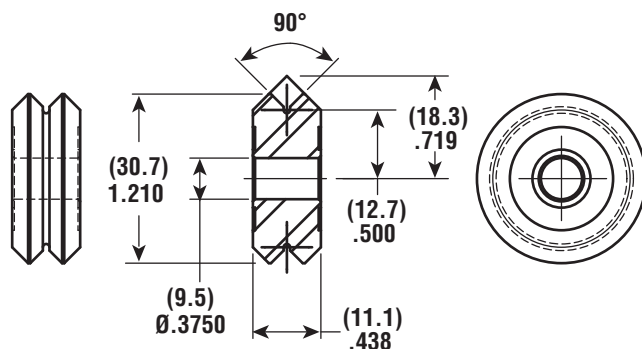
1-1/4" WHEEL

Radial Loads to 251 lbs. (114 kg) per Wheel



V-GUIDE WHEELS

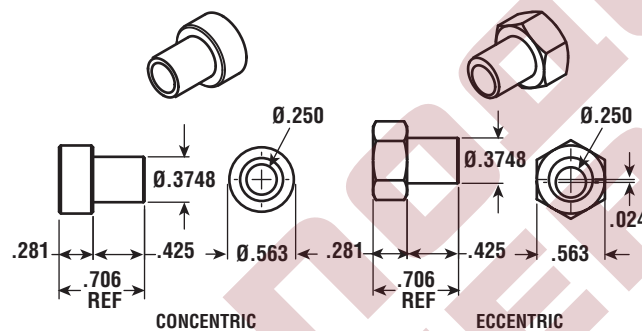
VW2	Shielded Bearing
VWS2	Sealed Bearing
VWSS2	Sealed Stainless Bearing



WEIGHT: 1.41 oz. (40 g)

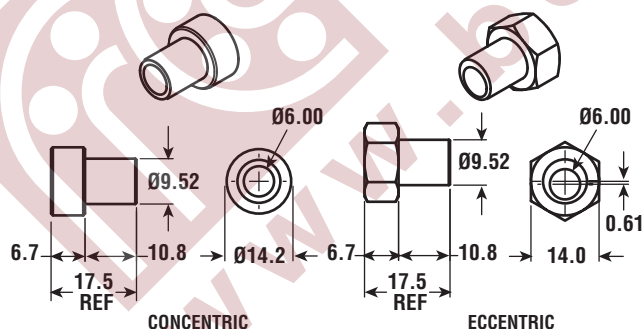
WHEEL BUSHINGS

VB2	Fixed Bushing
VBA2	Adjustable Bushing



METRIC WHEEL BUSHINGS

MVB2	Metric Fixed Bushing
MVBA2	Metric Adjustable Bushing



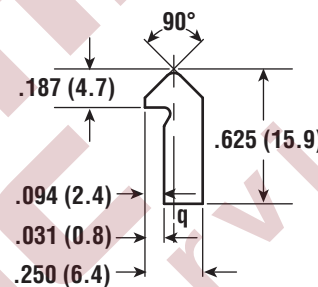
Rated for:

Radial loads to 251 lbs. (114 kg) per wheel

Moment loads to 88 lbs. (40 kg) per wheel

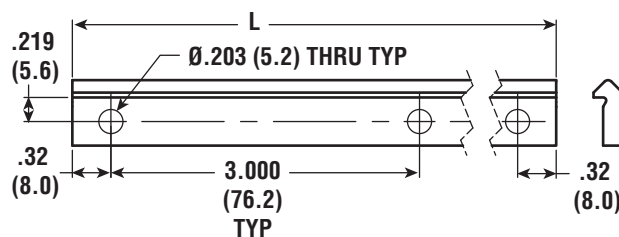
V-GUIDE RAIL

CARBON STEEL	
VR2-xxx	undrilled rail max. length 21' (6400 mm)
VRD2-xxx	drilled rail, see table
STAINLESS STEEL	
VRS2-xxx	undrilled rail, max. length 21' (6400 mm)
VRSD2-xxx	drilled rail, see table



STANDARD DRILLED RAILS

PART NUMBER	LENGTH	# OF HOLES
CARBON STEEL		
VRD2-1263	12.63" (320.8 mm)	5
VRD2-2463	24.63" (625.6 mm)	9
VRD2-3663	36.63" (930.4 mm)	13
VRD2-4863	48.63" (1235.2 mm)	17
VRD2-6063	60.63" (1540 mm)	21
VRD2-7263	72.63" (1844.8 mm)	25
STAINLESS STEEL		
VRSD2-1263	12.63" (320.8 mm)	5
VRSD2-2463	24.63" (625.6 mm)	9
VRSD2-3663	36.63" (930.4 mm)	13
VRSD2-4863	48.63" (1235.2 mm)	17
VRSD2-6063	60.63" (1540 mm)	21
VRSD2-7263	72.63" (1844.8 mm)	25



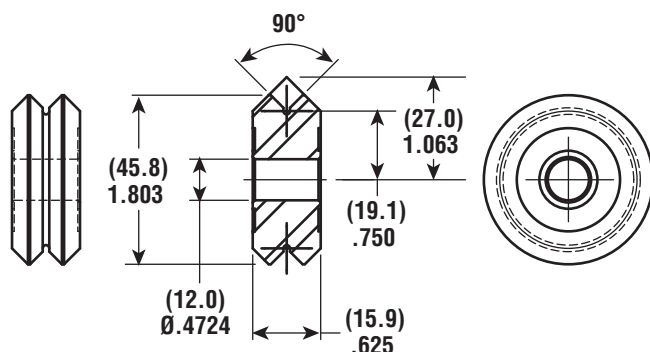


1-3/4" WHEEL

Radial Loads to 1300 lbs. (591 kg) per Wheel

V-GUIDE WHEELS

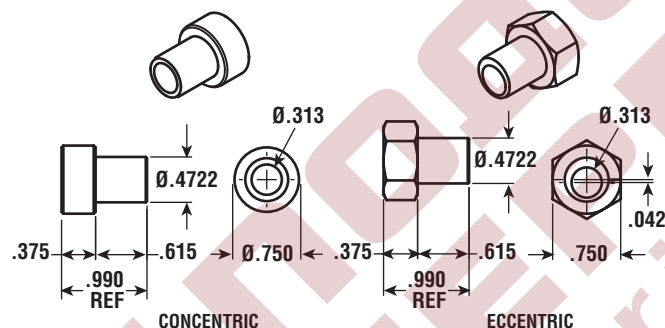
VW3	Shielded Bearing
VWS3	Sealed Bearing
VWSS3	Sealed Stainless Bearing



WEIGHT: 4.79 oz. (136 g)

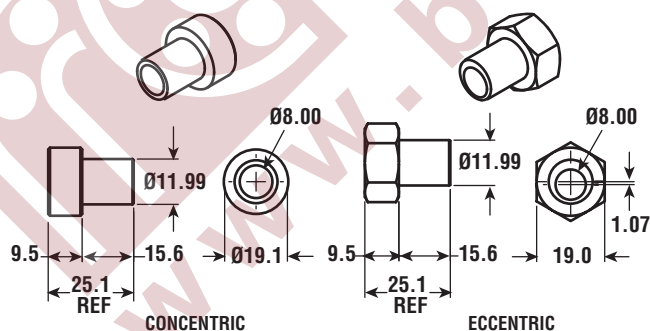
WHEEL BUSHINGS

VB3	Fixed Bushing
VBA3	Adjustable Bushing



METRIC WHEEL BUSHINGS

MVB3	Metric Fixed Bushing
MVBA3	Metric Adjustable Bushing

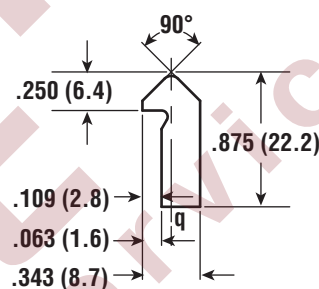


Rated for:

Radial loads to 1300 lbs. (591 kg) per wheel
Moment loads to 121 lbs. (55 kg) per wheel

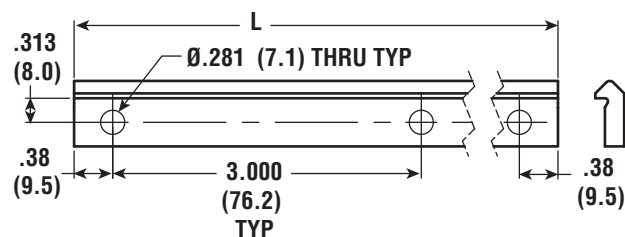
V-GUIDE RAIL

CARBON STEEL	
VR3-xxx	undrilled rail max. length 21' (6400 mm)
VRD3-xxx	drilled rail, see table
STAINLESS STEEL	
VRS3-xxx	undrilled rail, max. length 21' (6400 mm)
VRSD3-xxx	drilled rail, see table



STANDARD DRILLED RAILS

PART NUMBER	LENGTH	# OF HOLES
CARBON STEEL		
VRD3-1275	12.75" (323.9 mm)	5
VRD3-2475	24.75" (628.7 mm)	9
VRD3-3675	36.75" (933.5 mm)	13
VRD3-4875	48.75" (1238.3 mm)	17
VRD3-6075	60.75" (1543.1 mm)	21
VRD3-7275	72.75" (1847.9 mm)	25
STAINLESS STEEL		
VRSD3-1275	12.75" (323.9 mm)	5
VRSD3-2475	24.75" (628.7 mm)	9
VRSD3-3675	36.75" (933.5 mm)	13
VRSD3-4875	48.75" (1238.3 mm)	17
VRSD3-6075	60.75" (1543.1 mm)	21
VRSD3-7275	72.75" (1847.9 mm)	25



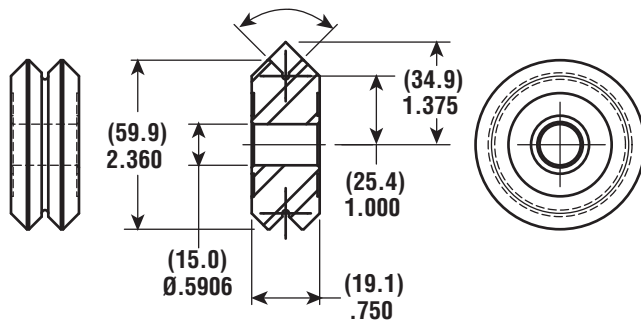
2-1/4" WHEEL

Radial Loads to 1980 lbs. (900 kg) per Wheel



V-GUIDE WHEELS

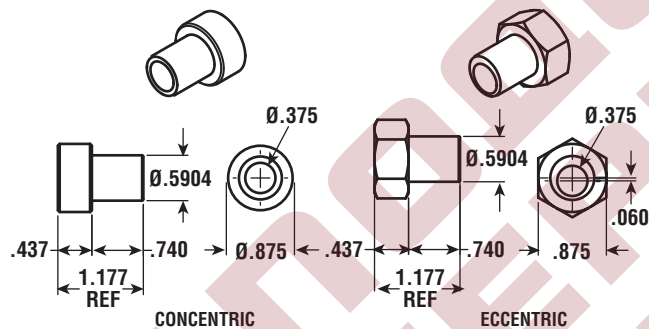
VW4	Shielded Bearing
VWS4	Sealed Bearing
VWSS4	Sealed Stainless Bearing



WEIGHT: 10 oz. (285 g)

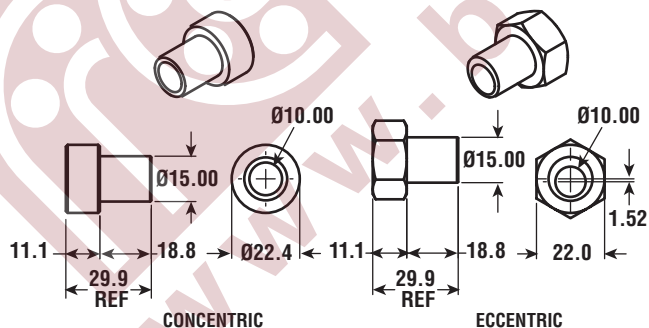
WHEEL BUSHINGS

VB4	Fixed Bushing
VBA4	Adjustable Bushing



METRIC WHEEL BUSHINGS

MVB4	Metric Fixed Bushing
MVBA4	Metric Adjustable Bushing



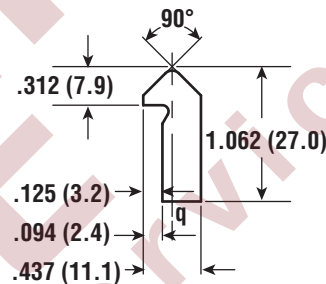
Rated for:

Radial loads to 1980 lbs. (900 kg) per wheel

Moment loads to 180 lbs. (82 Kg) per wheel

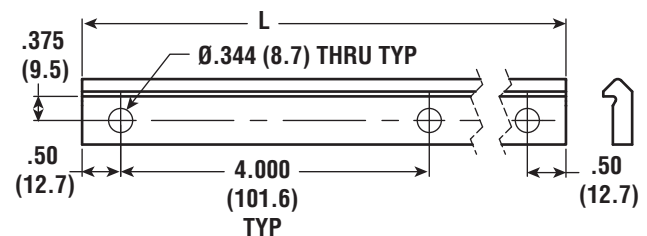
V-GUIDE RAIL

CARBON STEEL	
VR4-xxx	undrilled rail max. length 21' (6400 mm)
VRD4-xxx	drilled rail, see table
STAINLESS STEEL	
VRS4-xxx	undrilled rail, max. length 21' (6400 mm)
VRSD4-xxx	drilled rail, see table



STANDARD DRILLED RAILS

PART NUMBER	LENGTH	# OF HOLES
CARBON STEEL		
VRD4-1300	13.00" (330.2 mm)	4
VRD4-2500	25.00" (635 mm)	7
VRD4-3700	37.00" (939.8 mm)	10
VRD4-4900	49.00" (1244.6 mm)	13
VRD4-6100	61.00" (1549.4 mm)	16
STAINLESS STEEL		
VRSD4-1300	13.00" (330.2 mm)	4
VRSD4-2500	25.00" (635 mm)	7
VRSD4-3700	37.00" (939.8 mm)	10
VRSD4-4900	49.00" (1244.6 mm)	13
VRSD4-6100	61.00" (1549.4 mm)	16





LOAD CALCULATIONS

L = applied load / number of wheel pairs

L_R = wheel radial load

L_0 = wheel load from moment

A = load offset dimension

B = track width dimension

F_A = .5 for light duty, well lubricated use

F_A = 1 for normal lubricated use

F_A = 2 for dry, or harsh environments

LOAD CONDITION A

$$L_{01} = \frac{L \times (B - A) \times F_A}{B}$$

$$L_{02} = (L \times F_A) - L_{01}$$

Compare the greater of these loads to the rated moment and radial load capacities.

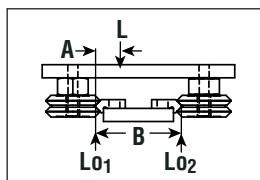
Example: Load is 100 lbs on 4 wheel carriage,

$L = 100 / 2$ pair wheels = 50 lbs.

$A = 4"$, $B = 10"$, $F_A = 1$

$$L_{01} = \frac{50 \times (10 - 4) \times 1}{10} = 30 \text{ lbs.}$$

$$L_{02} = 50 - 30 = 20 \text{ lbs.}$$



LOAD CONDITION B

$$L_{01} = \frac{L \times A}{B} \times F_A$$

$$L_{02} = (L \times F_A) + L_{01}$$

Compare the greater of these loads to the rated moment and radial load capacities.

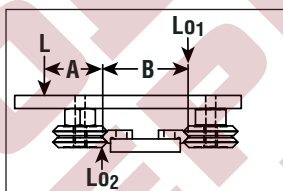
Example: Load is 100 lbs on 4 wheel carriage,

$L = 100 / 2$ pair wheels = 50 lbs.

$A = 4"$, $B = 6"$, $F_A = 1$

$$L_{01} = \frac{50 \times 4 \times 1}{6} = 33 \text{ lbs.}$$

$$L_{02} = 50 + 33 = 83 \text{ lbs.}$$



LOAD CONDITION C

$$L_{01} = \frac{L \times A}{B} \times F_A$$

$$L_R = (L \times F_A) + L_{01}$$

$$L_{01} = L_{02}$$

Compare the greater of these loads to the rated moment and radial load capacities.

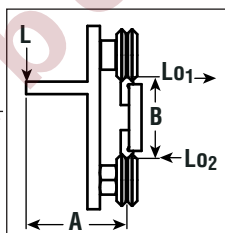
Example: Load is 100 lbs on 4 wheel carriage,

$L = 100 / 2$ pair wheels = 50 lbs.

$A = 4"$, $B = 6"$, $F_A = 1$

$$L_{01} = \frac{50 \times 4 \times 1}{6} = 33 \text{ lbs.}$$

$$L_R = (50 \times 1) + 33 = 83 \text{ lbs.}$$



MOUNTING AND ADJUSTMENT

Use the recommended fasteners for the specified track and wheel bushings.

Use the following table, and the center distance formulas in the next column, to configure the appropriate wheel mounting dimensions.

V-RAIL SIZE	IV (IN.)	OV (IN.)	IV (MM)	OV (MM)
1	0.874	0.934	22.2	23.7
2	1.374	1.436	34.9	36.5
3	2	2.124	50.8	53.9
4	2.624	2.75	66.6	69.9

The fixed bushing should be used to carry the heaviest loading. Preload the adjustable bushing so that the wheel can just be turned by hand. Over-tightening the preload will cause premature wear of the components.

LUBRICATION

The V-wheels are grease lubricated, and will not require any additional lube. The track should be lubricated for optimum performance and service life. Suggested lubricants are Mobil Vactra #2 Way Oil, or Mobil Polyrex EP 2 Extreme Pressure Grease.

SUGGESTED FASTENERS

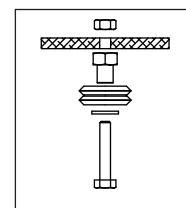
BUSHINGS			
ENGLISH		METRIC	
VB1	#6	MVB1	M4
VB2	1/4"	MVB2	M6
VB3	5/16"	MVB3	M8
VB4	3/8"	MVB4	M10
V-RAIL			
VR1	#6, M3	VR3	1/4", M6
VR2	#10, M6	VR4	5/16", M8

CENTER DISTANCE FORMULA

$A = B + IV$	$A + C - IV$	$A = D - OV$

WHEEL / BUSHING ASSEMBLY

Use SAE series N flat washers and lock washers to secure the wheel bushing assemblies.



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For technical & application information call **1-888-777-0556**

The data and specifications in this publication have been carefully compiled and are believed to be accurate and correct. However, it is the responsibility of the user to determine and ensure the suitability of PBC Linear™ products for a specific application. PBC Linear™ only obligation will be to repair or replace without charge, any defective components if returned promptly. No liability is assumed beyond such replacement. Specifications are subject to change without notice.

3/09

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