PRODUCT OVERVIEW

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

FEATURES & BENEFITS

V-Guide systems are an industry standard for linear motion, and offer features that make them an ideal solution for a wide range of motion control applications.

V-Guide Rail:
- Has shoulder for simple mounting and alignment
- Available in long lengths
- Induction hardened way surface
- 1045 Carbon Steel or 400 Series Stainless Steel
- Optional black oxide finish
- Choose predrilled rail from stock, or custom cut and drilled to your specification

V-Guide Wheels:
- Four (4) sizes
- Permanently lubricated
- Precision dual row bearing construction
- Available in 52100 Bearing Steel or 420 Stainless Steel construction
- 304 Stainless Steel shields, or nitrile rubber seals

Wheel Bushings:
- 303 Stainless Steel
- Inch or metric hardware
- Adjustable bushings allow adjustable fit and preload
- Fixed bushings are used in the primary radial load direction
- Stainless Steel construction

APPLICATIONS

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

TECHNICAL SPECIFICATIONS

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

V-Guide Rails:
The rail V-Ways are induction or flame hardened, ground and polished. The track body is left soft for easy drilling of mounting holes. Available in (4) four sizes, which are designed for the corresponding size wheels.

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

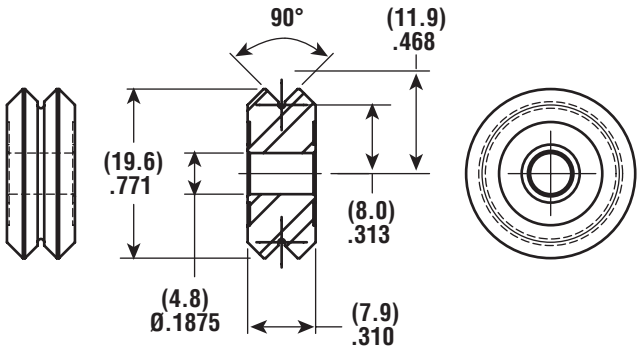
Working Temperature Rating: ≈ 180°F

V-Guide System - 20 mm (3/4")

Radial Loads to 283 lbs. (1,260 N) per Wheel

V-GUIDE WHEELS

VW1	Shielded Bearing
VWS1	Sealed Bearing
VWSS1	Sealed Stainless Bearing



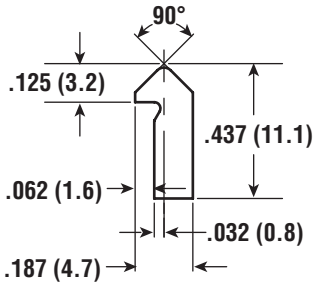
WEIGHT: .42 oz. (12 g)

Rated for:
Radial loads to 283 lbs. (1,260 N) per wheel
Axial loads to 67 lbs. (297 N) per wheel

V-GUIDE RAIL

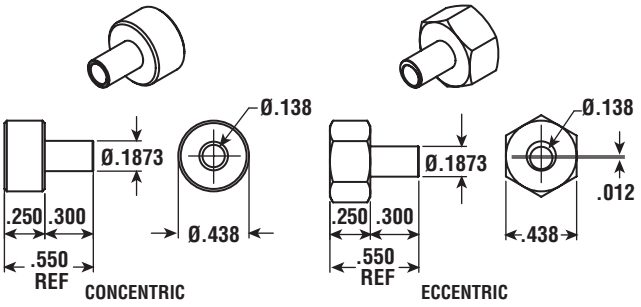
Carbon Steel	
VR1-xxx	undrilled rail max. length 21' (6400 mm)
VRD1-xxx	drilled rail, see table
Stainless Steel	
VRS1-xxx	undrilled rail, max. length 21' (6400 mm)
VRSD1-xxx	drilled rail, see table

NOTE: Non-heat treated rails available in all sizes, contact factory.



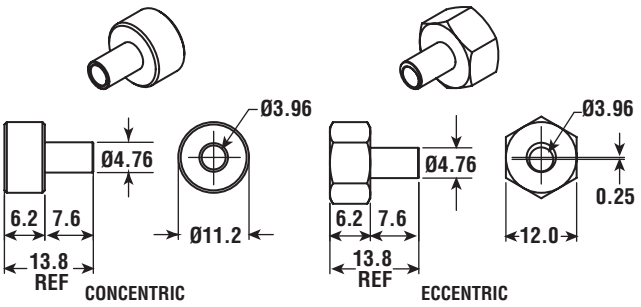
WHEEL BUSHINGS

VB1	Fixed Bushing
VBA1	Adjustable Bushing



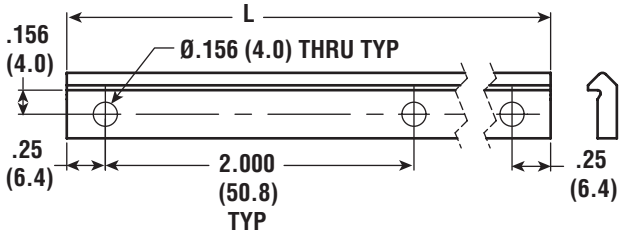
METRIC WHEEL BUSHINGS

MVB1	Metric Fixed Bushing
MVBA1	Metric Adjustable Bushing



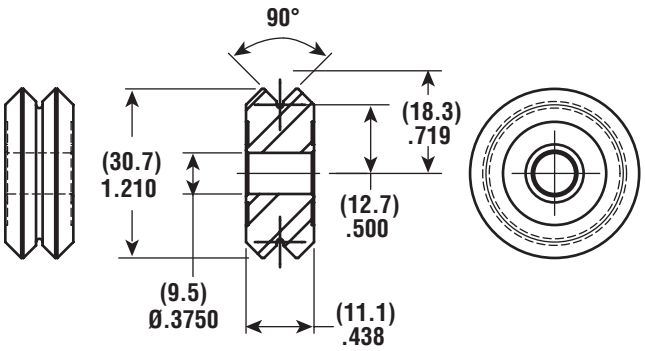
STANDARD DRILLED RAILS

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



V-GUIDE WHEELS

VW2	Shielded Bearing
VWS2	Sealed Bearing
VWSS2	Sealed Stainless Bearing



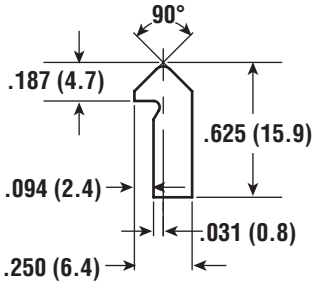
WEIGHT: 1.3 oz. (38 g)

Rated for:
Radial loads to 614 lbs. (2,730 N) per wheel
Axial loads to 142 lbs. (632 N) per wheel

V-GUIDE RAIL

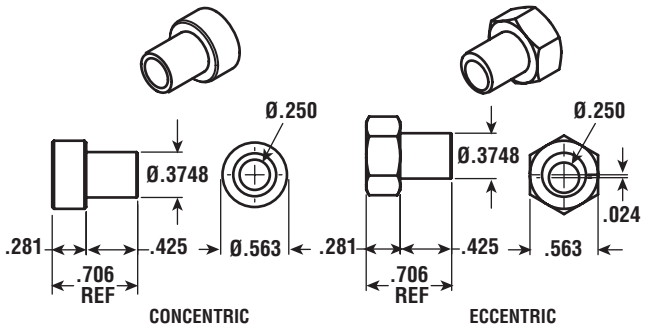
Carbon Steel	
VR2-xxx	undrilled rail max. length 21' (6400 mm)
VRD2-xxx	drilled rail, see table
Stainless Steel	
VRS2-xxx	undrilled rail, max. length 21' (6400 mm)
VRSD2-xxx	drilled rail, see table

NOTE: Non-heat treated rails available in all sizes, contact factory.



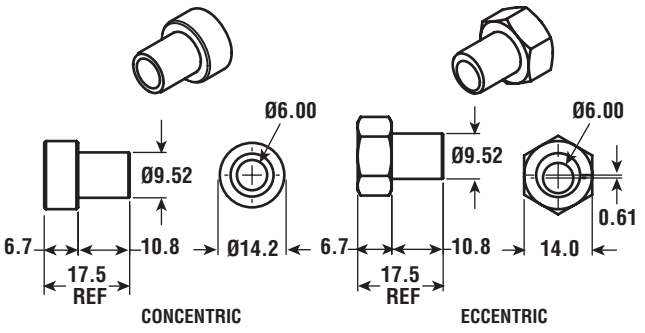
WHEEL BUSHINGS

VB2	Fixed Bushing
VBA2	Adjustable Bushing



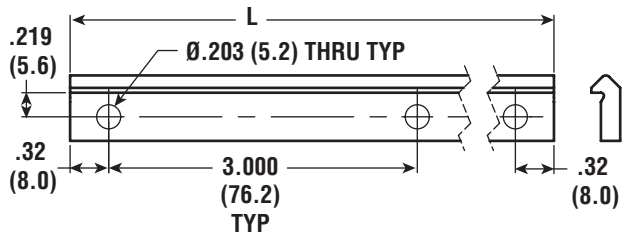
METRIC WHEEL BUSHINGS

MVB2	Metric Fixed Bushing
MVBA2	Metric Adjustable Bushing



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

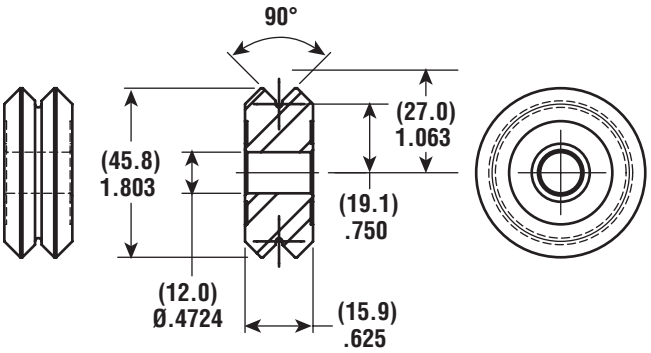


V-Guide System - 45 mm (1-3/4")

Radial Loads to 1,386 lbs. (6,166 N) per Wheel

V-GUIDE WHEELS

VW3	Shielded Bearing
VWS3	Sealed Bearing
VWSS3	Sealed Stainless Bearing



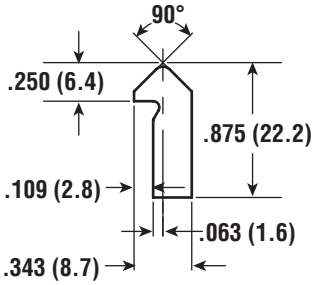
WEIGHT: 4.6 oz. (131 g)

Rated for:
Radial loads to 1,386 lbs. (6,166 N) per wheel
Axial loads to 326 lbs. (1,448 N) per wheel

V-GUIDE RAIL

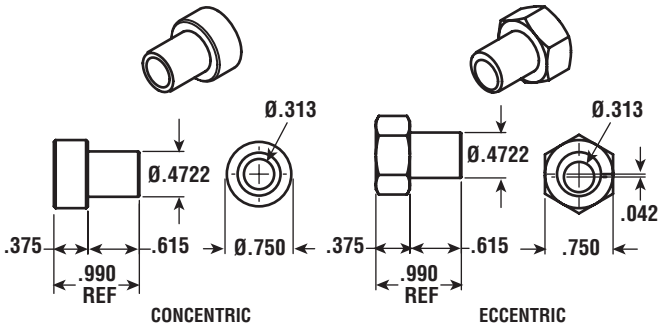
Carbon Steel	
VR3-xxx	undrilled rail max. length 21' (6400 mm)
VRD3-xxx	drilled rail, see table
Stainless Steel	
VRS3-xxx	undrilled rail, max. length 21' (6400 mm)
VRSD3-xxx	drilled rail, see table

NOTE: Non-heat treated rails available in all all sizes, contact factory.



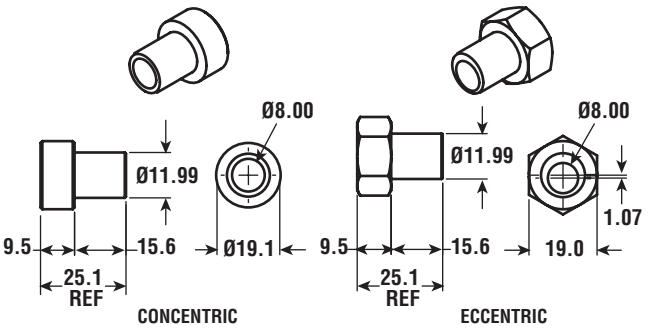
WHEEL BUSHINGS

VB3	Fixed Bushing
VBA3	Adjustable Bushing



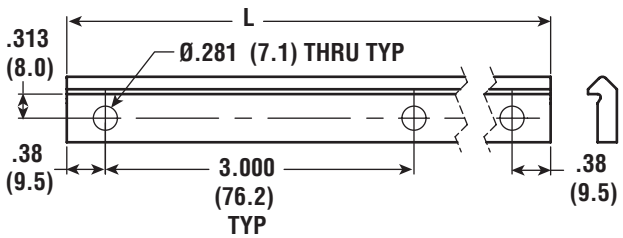
METRIC WHEEL BUSHINGS

MVB3	Metric Fixed Bushing
MVBA3	Metric Adjustable Bushing



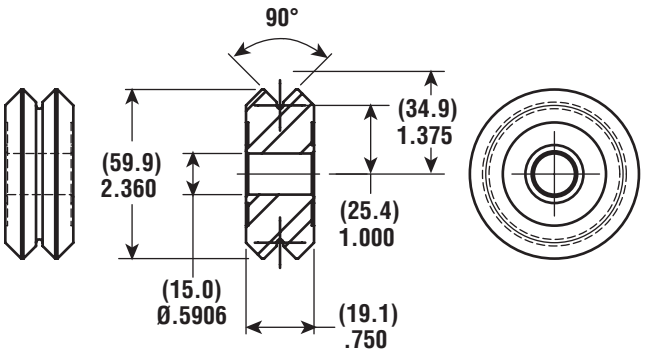
STANDARD DRILLED RAILS

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



V-GUIDE WHEELS

VW4	Shielded Bearing
VWS4	Sealed Bearing
VWSS4	Sealed Stainless Bearing



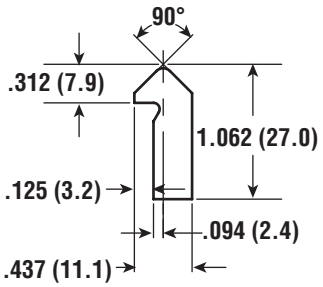
WEIGHT: 10 oz. (281 g)

Rated for:
Radial loads to 2,246 lbs. (9,991 N) per wheel
Axial loads to 520 lbs. (2,313 N) per wheel

V-GUIDE RAIL

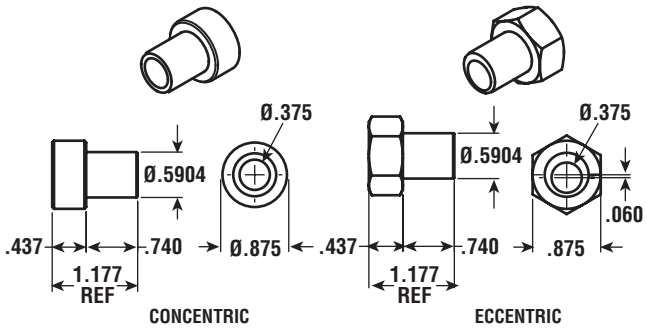
Carbon Steel	
VR4-xxx	undrilled rail max. length 21' (6400 mm)
VRD4-xxx	drilled rail, see table
Stainless Steel	
VRS4-xxx	undrilled rail, max. length 21' (6400 mm)
VRSD4-xxx	drilled rail, see table

NOTE: Non-heat treated rails available in all sizes, contact factory.



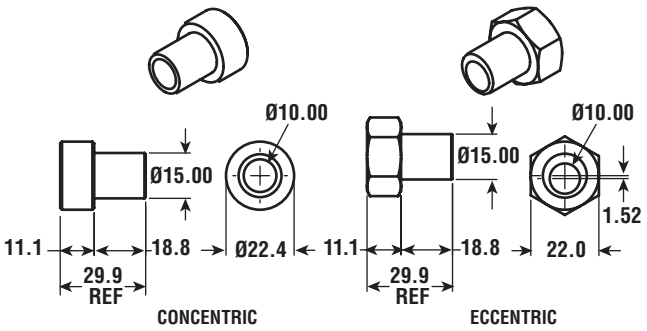
WHEEL BUSHINGS

VB4	Fixed Bushing
VBA4	Adjustable Bushing



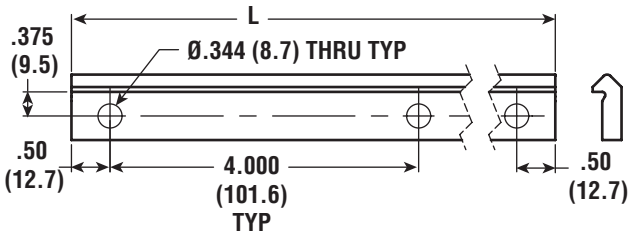
METRIC WHEEL BUSHINGS

MVB4	Metric Fixed Bushing
MVBA4	Metric Adjustable Bushing



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_O = wheel load from moment

A = load offset dimension

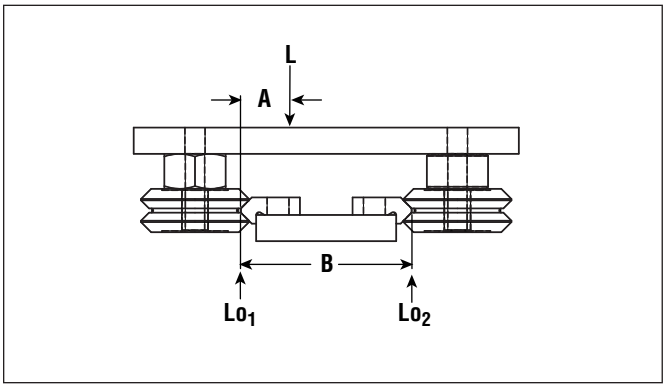
B = track width dimension

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



$$Lo_1 = \frac{L \times (B - A)}{B} \times F_A$$

$$Lo_2 = (L \times F_A) - Lo_1$$

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

Example:

Load is 100 lbs on 4 wheel carriage,

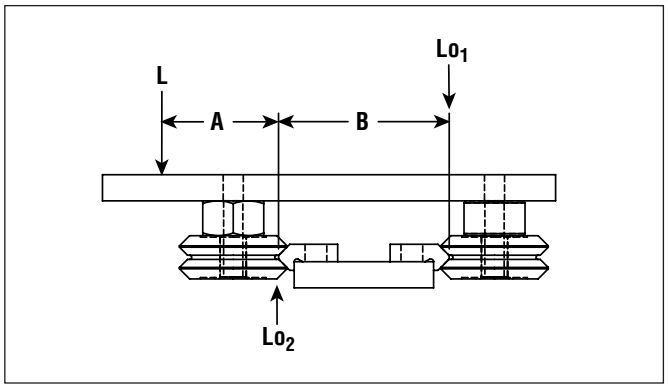
L = 100 / 2 pair wheels = 50 lbs.

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

$$Lo_1 = \frac{50 \times (10 - 4) \times 1}{10} = 30 \text{ lbs.}$$

Lo_2 = 50 - 30 = 20 lbs.

LOAD CONDITION B



$$Lo_1 = \frac{L \times A}{B} \times F_A$$

$$Lo_2 = (L \times F_A) + Lo_1$$

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

$$Lo_1 = \frac{50 \times 4 \times 1}{6} = 33 \text{ lbs.}$$

Lo_2 = 50 + 33 = 83 lbs.

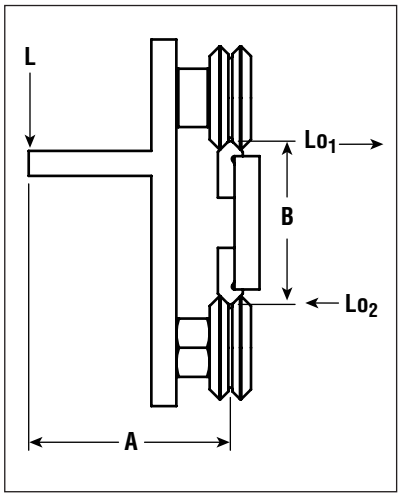
LOAD CONDITION C

$$Lo_1 = \frac{L \times A}{B} \times F_A$$

$$L_R = (L \times F_A) + Lo_1$$

$$Lo_1 = Lo_2$$

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

$$Lo_1 = \frac{50 \times 4 \times 1}{6} = 33 \text{ lbs.}$$

L_R = (50 x 1) + 33 = 83 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.

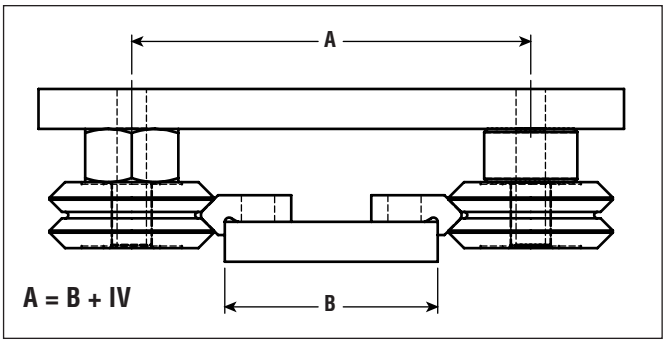
LUBRICATION

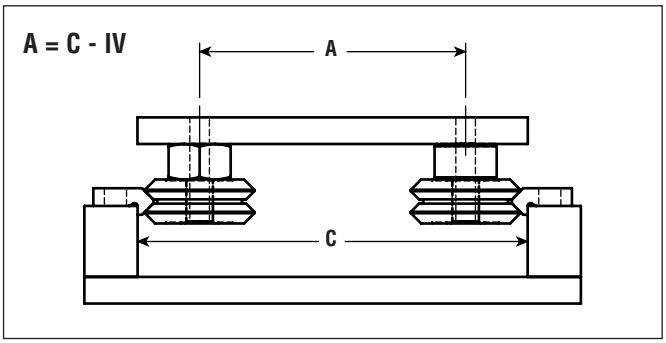
The V-Guide wheels are grease lubricated, and will not require any additional lube. The track should be lubricated for optimum performance and service life. Suggested lubricants are Mobil Vactra #2 Way Oil, or Mobil Polyrex EP 2 Extreme Pressure Grease.

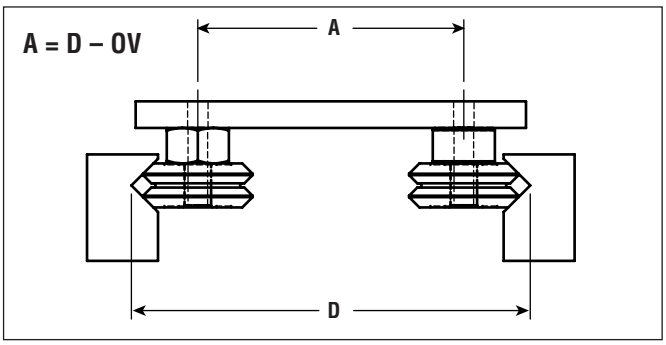
SUGGESTED FASTENERS

BUSHINGS			
INCH		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







WHEEL / BUSHING ASSEMBLY

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