

**NEW**

# UtiliTrak<sup>®</sup> VC Series

A LINEAR  
GUIDE SOLUTION



# Introduction

UtiliTrak® VC is a compact hybrid design of the DualVee® and crown roller wheel perfect for commercial applications. It highlights the ease of selection by seamlessly pairing with both vee and C Channel profiles to fit your application.

## Design Benefits

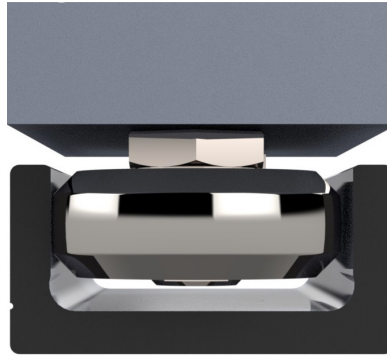
- Ease of installation
- Versatility between vee and C Channel profiles
- Eccentric bearing for easy wheel plate adjustment
- Very low rolling friction operation
- Low noise
- High speed capacity
- Butt-joining Channel for unlimited travel lengths

## Application Industries

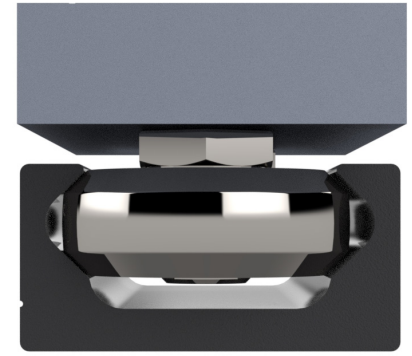
- Aerospace
- Architecture
- Automotive
- Medical
- Packaging
- Printing

## Application Examples

- Sliding doors, windows, & partitions
- Adjustable and movable walls & furniture for reduced square footage
- Adjustable seats
- Equipment trays and slide-outs
- Material handling equipment
- Product indexing, cartoning, & packaging



C Channel



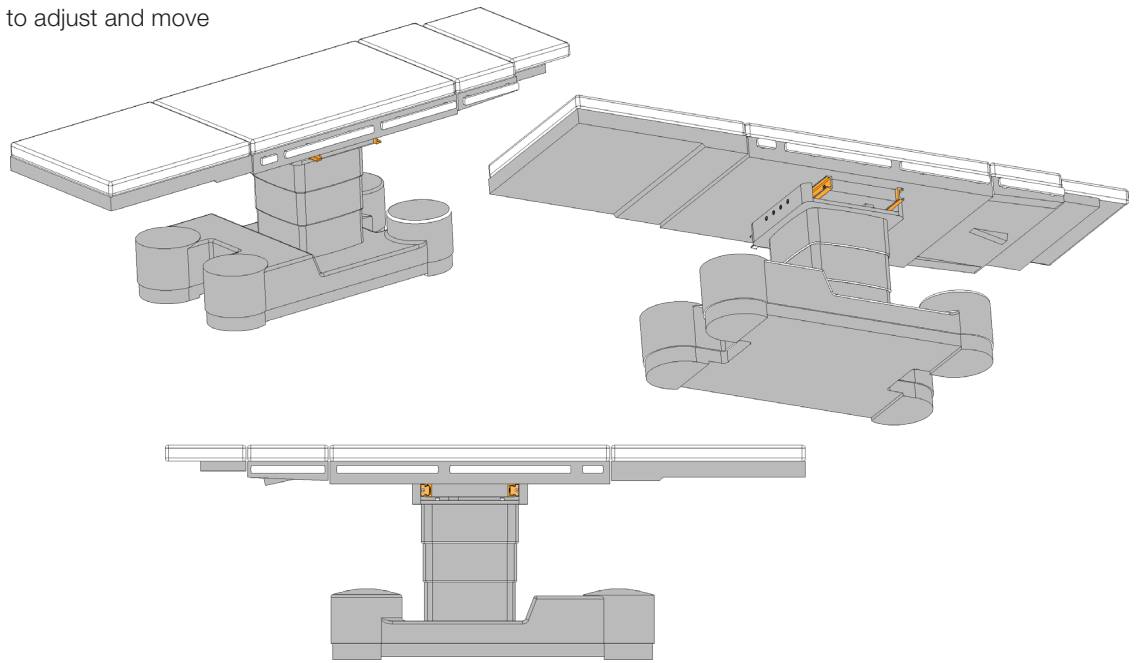
Vee Channel

		VC series
Overview	Compatible Channel	90° Vee & C Channel
	Compatible Wheel Plate	90° Vee/C Channel
	Loading Direction	Vee = Axial & Radial Crown = Radial Only
	Optional Brake	Yes
	Available Sizes	1, 2, 3
Channel	Material	Carbon Steel
	Standard Coating(s)	Polyurethane Paint Black Oxide (2019)
	Hardened	Yes
	Finish	Precision Ground
Wheel Plate	# of Wheels	3, 4, 5
	Bearing	Double Row Angular Contact
	Wheel Material	Carbon Steel
	Wheel Material Grade	52100
	Max Angular Misalignment	+/- 2°
	Wheel Bottom Hex Feature (Size 2 and 3)	Not Available
	Preload Adjustment Hex	Metric
	Lubrications	Molded Nylon End Caps
	Wheel Protection	Sealed
	Wheel Versions	Carbon Steel

# Application Examples

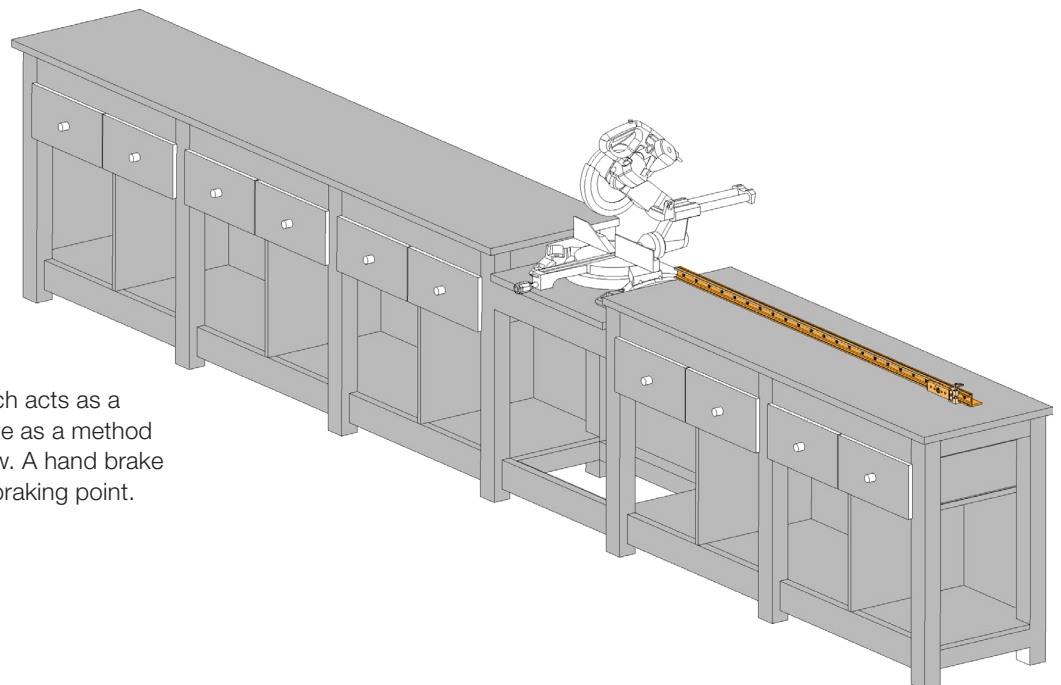
## Medical Table

The UtiliTrak® VC series is a compact solution perfect for applications such as medical tables that need to be able to adjust and move with limited space.



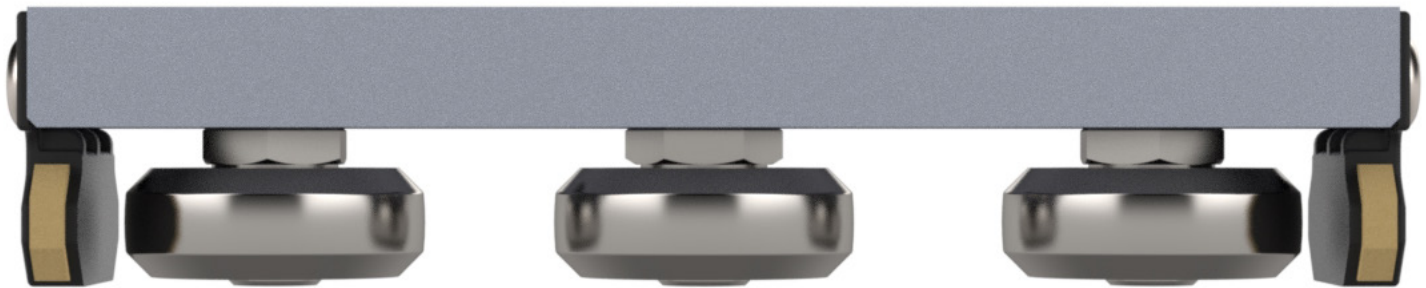
## Workbench

A channel mounted to a workbench acts as a guide when utilizing the wheel plate as a method for pushing material towards a saw. A hand brake is added for manually setting the braking point.



## Wheel Plate Max Load Capacity

Size	# Wheels	Stock Code	Axial L <sub>A</sub>		Radial L <sub>R</sub>		Pitch M <sub>P</sub>		Yaw M <sub>Y</sub>		Roll M <sub>R</sub>	
			(N)	(lbF)	(N)	(lbF)	(Nm)	(lbF-ft)	(Nm)	(lbF-ft)	(Nm)	(lbF-ft)
1	3	UTVC1XWPA	719	162	2440	549	18	13.3	30.5	22.5	7	5.2
	4	UTVC1XWPA4	862	194	2440	549	32.3	23.8	45.8	33.8	9.8	7.2
	5	UTVC1XWPA5	1014	228	2900	652	32.3	23.8	45.8	33.8	12.6	9.3
2	3	UTVC2XWPA	1475	332	5300	1191	58	42.8	100	73.8	22.7	16.7
	4	UTVC2XWPA4	1770	398	5300	1191	107	78.9	150	110.6	31.8	23.5
	5	UTVC2XWPA5	2080	468	6300	1416	107	78.9	150	110.6	40.9	30.2
3	3	UTVC3XWPA	5100	1147	11800	2653	229	168.9	346	255	118	87
	4	UTVC3XWPA4	6122	1376	11800	2653	408	300.9	519	382.8	165.2	121.8
	5	UTVC3XWPA5	7140	1605	14040	3156	408	300.9	519	382.8	212.4	156.7



## Painted Finish Channel Stock Codes

C Channel

UTTRS1 - (Channel length in mm)

UTTRS2 - (Channel length in mm)

UTTRS3 - (Channel length in mm)

90° Vee

UTTS1 - (Channel length in mm)

UTTS2 - (Channel length in mm)

UTTS3 - (Channel length in mm)

PW/VC/SW Standard Channel Length (mm)											
160	240	320	400	480	560	640	720	800	880	960	1040
1120	1200	1280	1360	1440	1520	1600	1680	1760	1840	1920	2000
2080	2160	2240	2320	2400	2480	2560	2640	2720	1840	2800	2960
3040	3120	3200	3280	3360	3440	3520	-	-	-	-	-

Channel lengths come in stock lengths and are customizable by application. Unlimited end-to-end available.

## Length Formula (M)

### Step 1: Calculate number of hole spaces

$$\frac{\text{Length (mm)}}{80} - X = \# \text{ of hole spaces (round down to nearest whole number)}$$

X = 16  
(size 1)

X = 18  
(size 2)

X = 20  
(size 3)

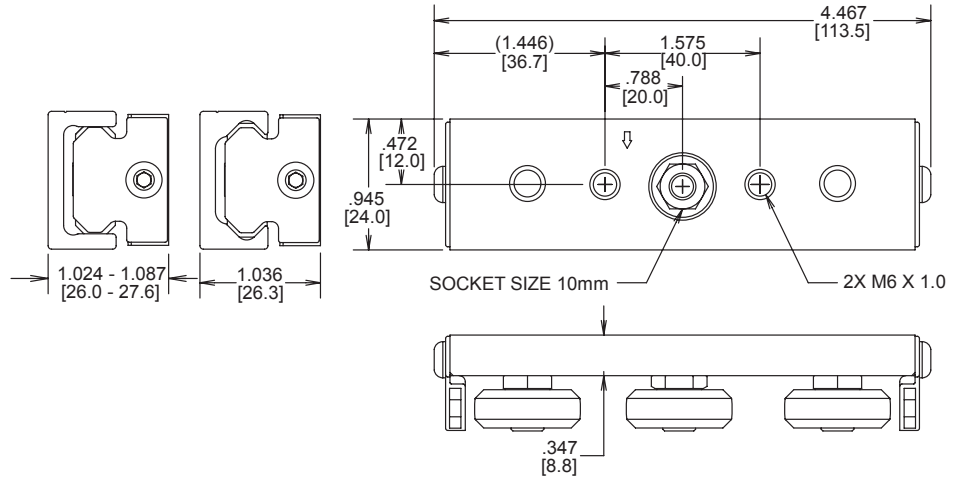
### Step 2: Calculate M

$$\text{Length} - (\# \text{ of spaces} \times 80) = M$$

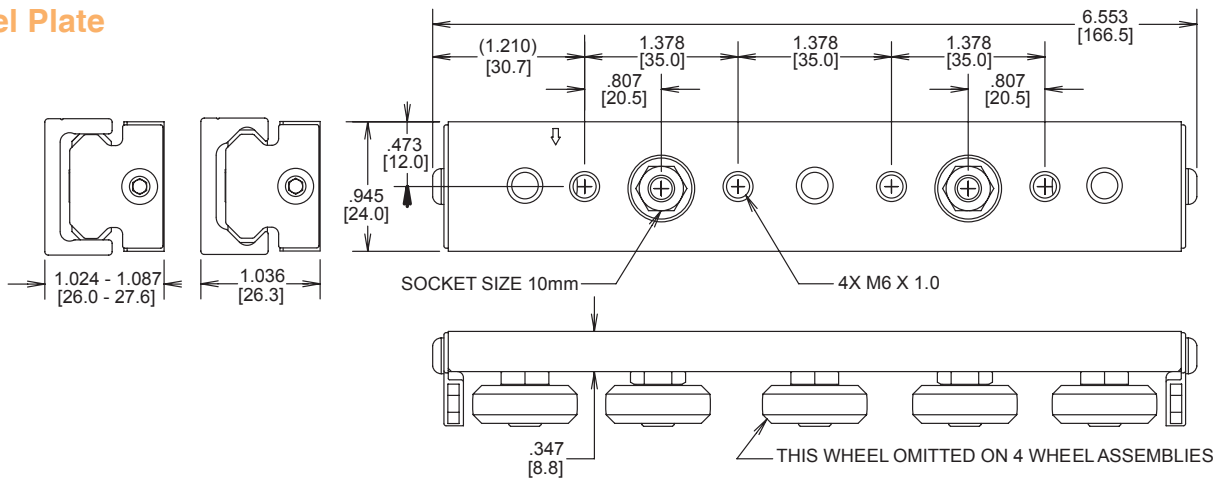
2

# VC Series, Size 1

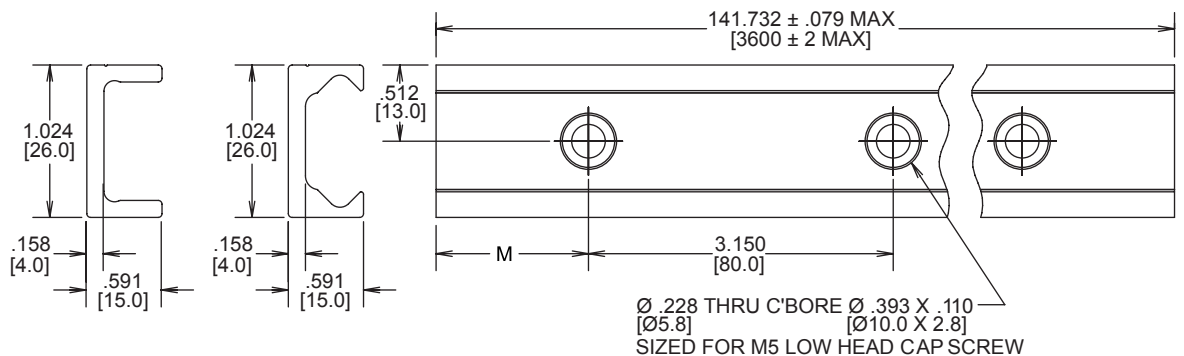
## 3 Wheel Plate



## 4 and 5 Wheel Plate



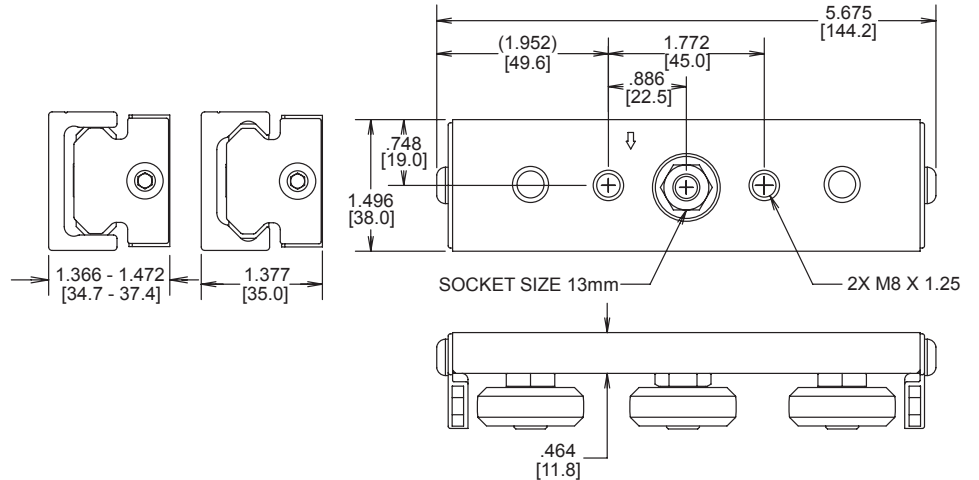
## Channel



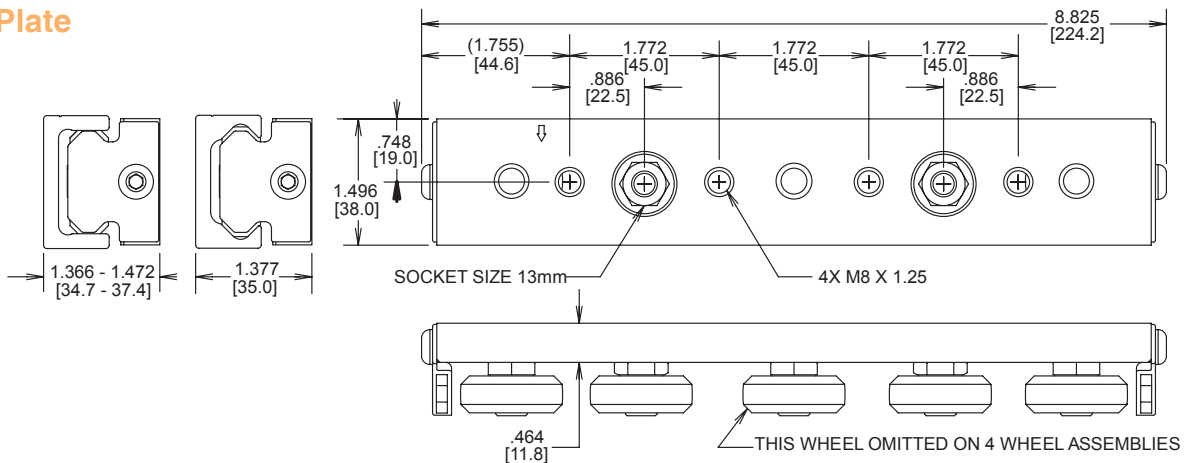
\* Dimensions are shown in inch and [metric] values

# VC Series, Size 2

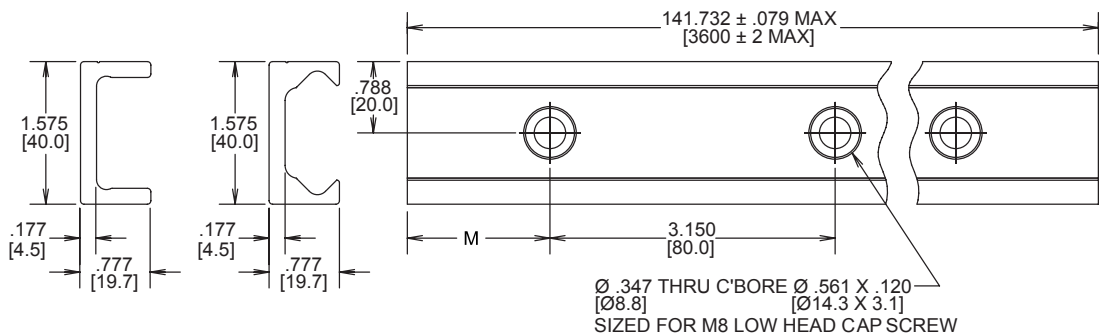
## 3 Wheel Plate



## 4 and 5 Wheel Plate



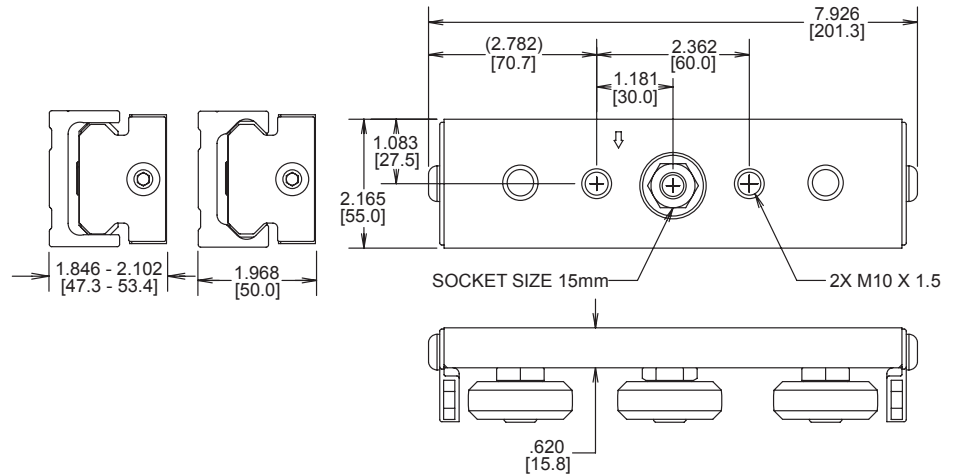
## Channel



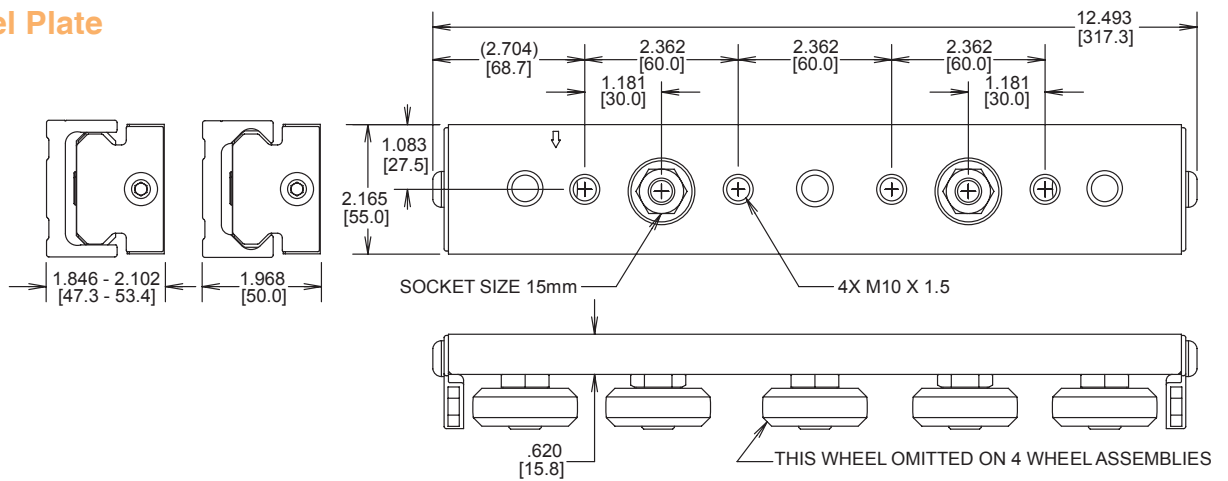
\* Dimensions are shown in inch and [metric] values

# VC Series, Size 3

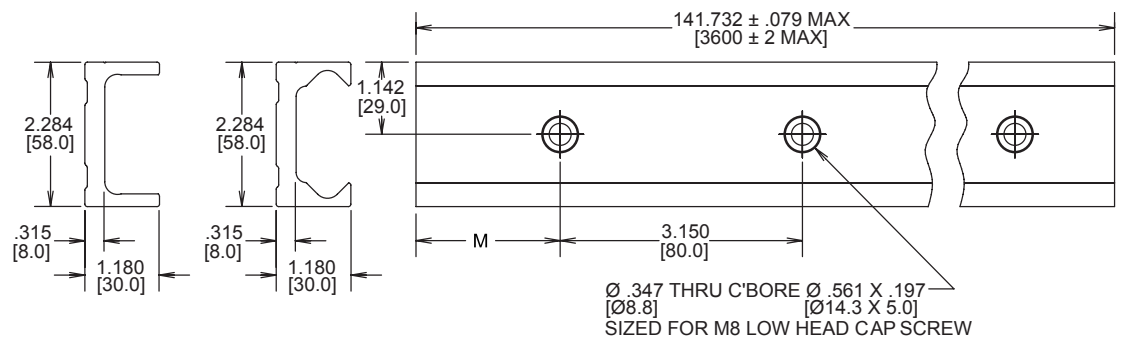
## 3 Wheel Plate



## 4 and 5 Wheel Plate



## Channel



\* Dimensions are shown in inch and [metric] values

# Accessories

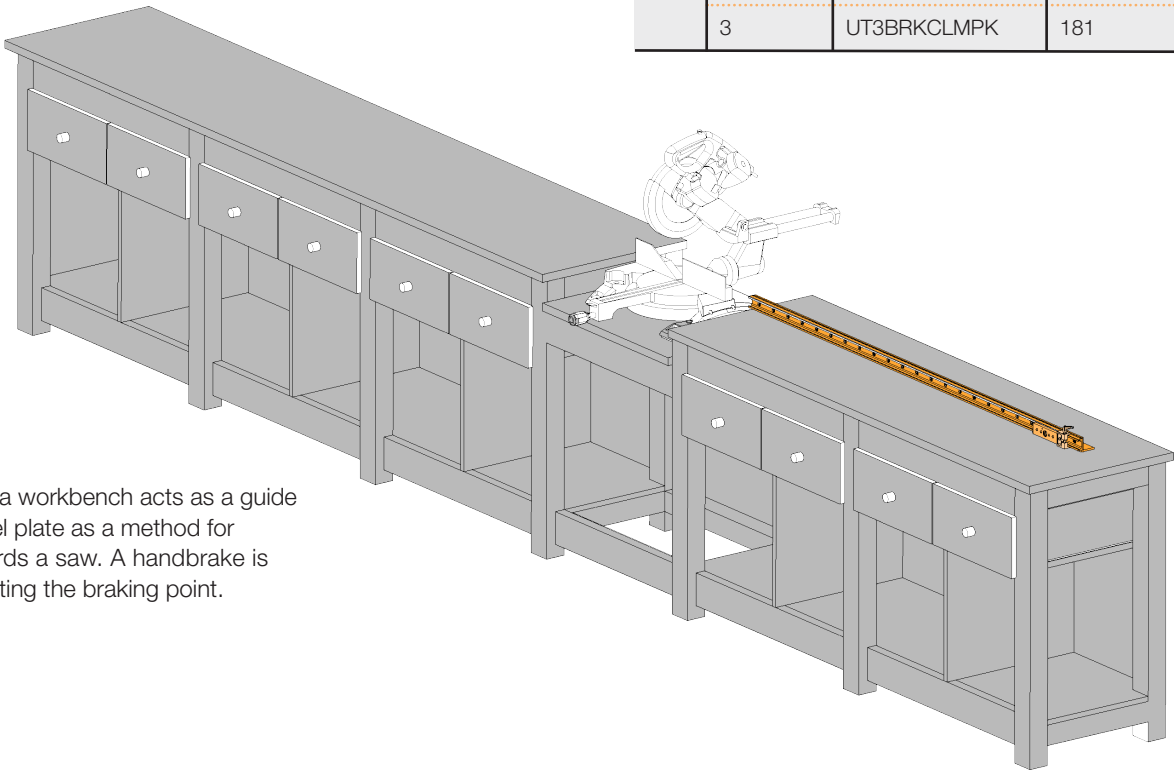


# Wheel Plate Hand Brake

- Sizes 0, 1, 2 & 3
- Compact system ideal for applications where handle arm access space is limited
- Brake system allows steel (VC and SW series) and aluminum (PW series) UtiliTrak® wheel plates, to be manually locked at any user-selected position on vee and C Channel
- Brake block fabricated from aluminum and hard anodized for corrosion resistance, abrasion resistance, good gripping/braking action, and long life



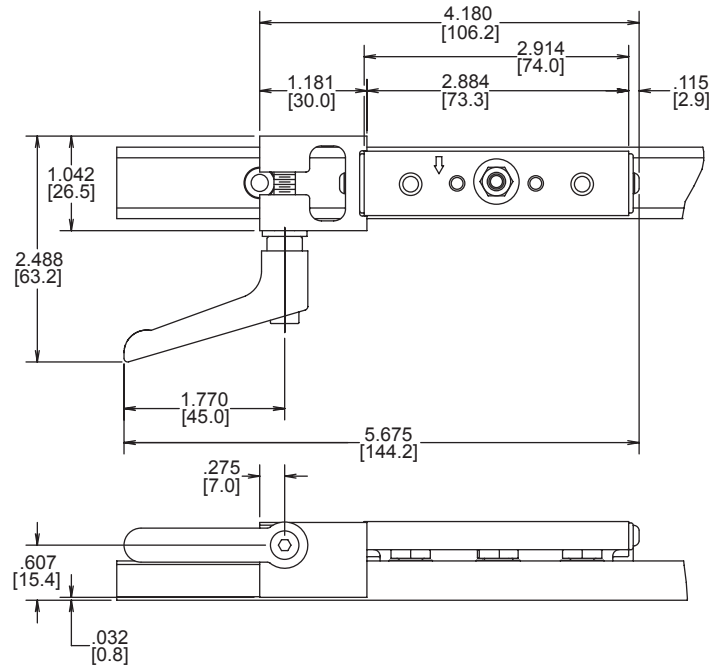
	Size	Stock Code	Mass (g)
Hand Brake	0	UT0BRKCLMPK	45
	1	UT1BRKCLMPK	54
	2	UT2BRKCLMPK	77
	3	UT3BRKCLMPK	181



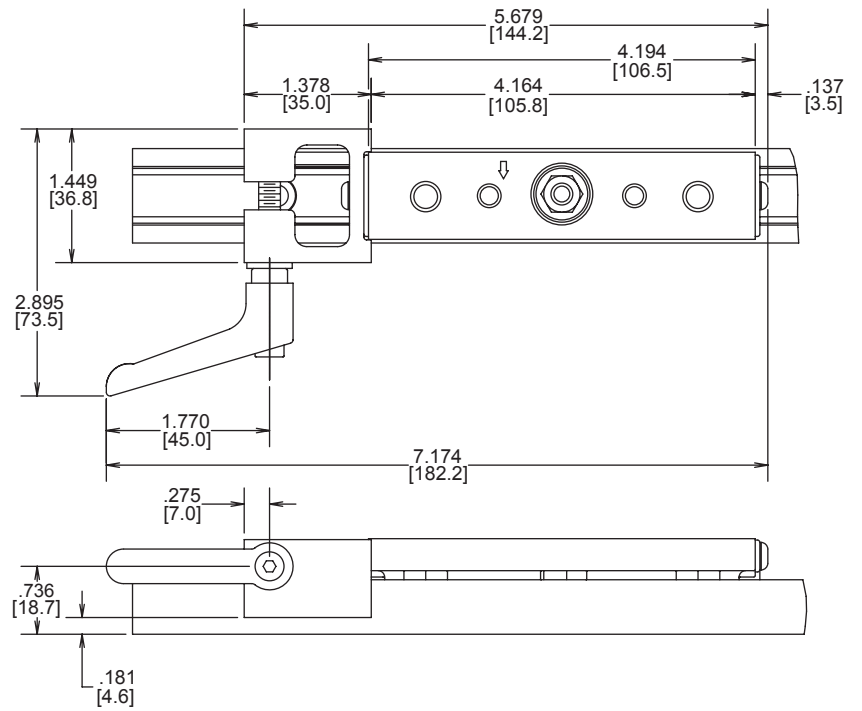
## Workbench

A channel mounted to a workbench acts as a guide when utilizing the wheel plate as a method for pushing material towards a saw. A handbrake is added for manually setting the braking point.

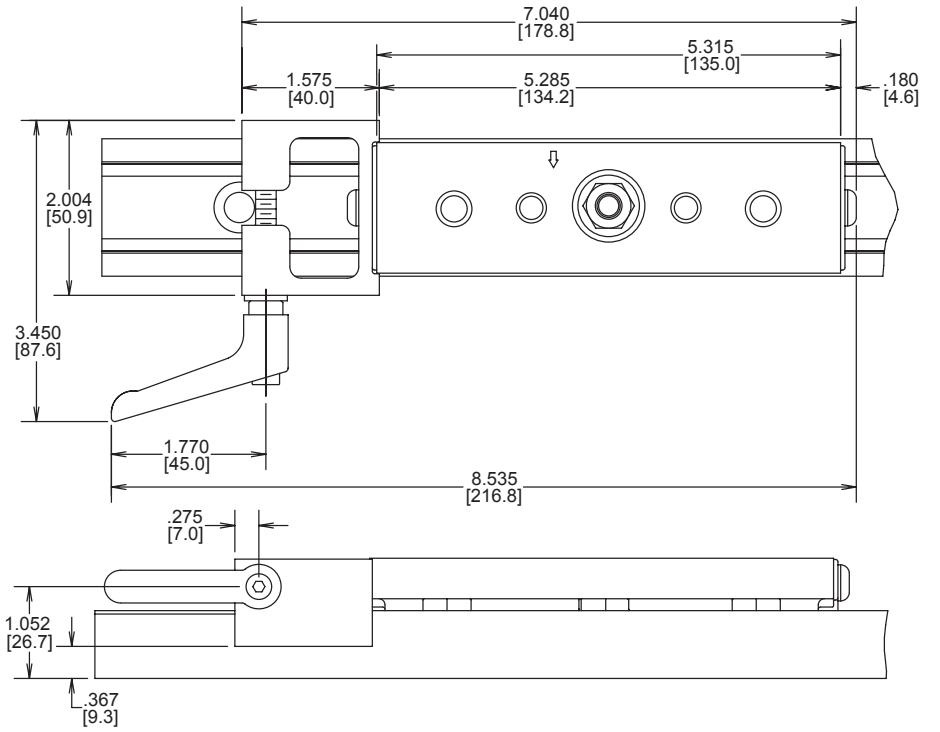
## Brake Kit, Size 0



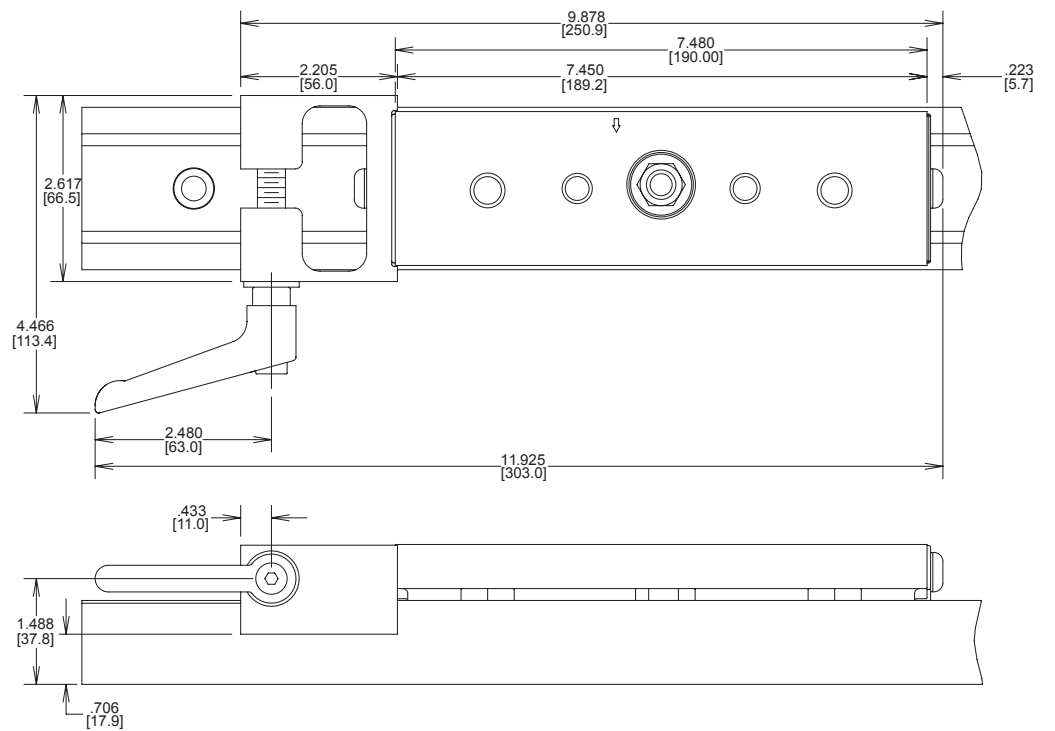
## Brake Kit, Size 1



## Brake Kit, Size 2



## Brake Kit, Size 3



# Technical Data

# Fit Up Adjustment

Fit up is pre-set at the factory (except for VC), but is easily field adjusted by rotating the eccentric guide wheels.

This allows modification of running characteristics such as drag and breakaway force.

- 1 Fit up adjustment should be performed while wheel plate is engaged with the channel.
- 2 Looking down on the top of the wheel plate, as shown in Fig. 1, the eccentric stud is locked into place with a hex nut.



**Fig. 1**  
Fit up adjustment of a UtiliTrak linear guide

- 3 Loosen the eccentric wheel/stud by turning the hex nut counter-clockwise with a socket wrench.
- 4 When the wheel/stud is loose enough, it can be rotated with a wrench, as shown in Fig. 2. Rotating the eccentric wheel's stud will adjust the wheel location into or out of mesh with the channel.



**Fig. 2**  
Fit up adjustment

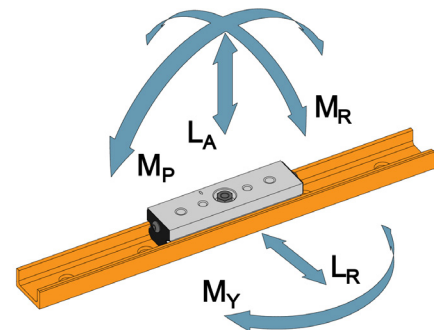
- 5 Begin with a small adjustment to the fit up and re-tighten the stud by turning the hex nut clockwise. If the fit up is too loose, the wheel plate will exhibit excessive play, such as rocking. If the fit up is too tight, the wheel plate will exhibit excessive drag. Move the wheel plate up and down the entire

channel length to ensure that it does not feel too loose or tight at any given location along the channel.

## Mounting Orientations

The UtiliTrak vee guide can be employed to accept loads in all orientations. However, it is primarily intended to support loads in the radial plane ( $L_R$ ). As such, it is good engineering practice to orient the slide such that the two outside wheels support the load radially. Each wheel plate includes an arrow pointing towards the optimal direction of load orientation. Loads oriented in this direction will produce a radial load on each of the concentric stud mounted guide wheels.

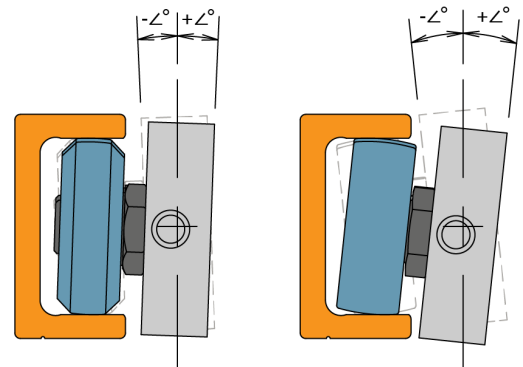
The crown roller should be subjected to radial loads only.



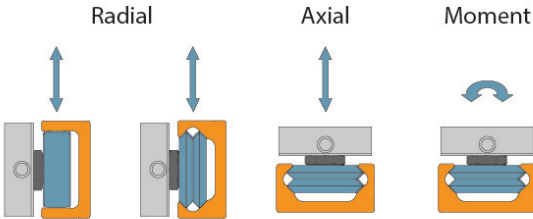
## Misalignment Capabilities

Vee/Crown Wheel  
Up to 2° Misalignment

Crown Wheel  
Up to 7° Misalignment

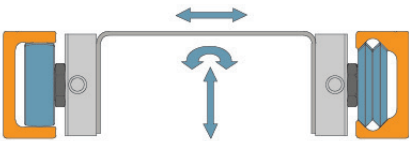


# Recommended



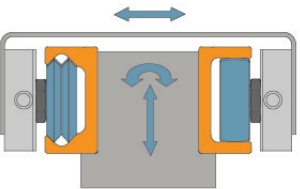
## 1A Vee/C Channel with direct loading

The vee channel can be used on its own to support radial or axial loading. The C Channel only supports radial loads, and must be accompanied with a vee channel.



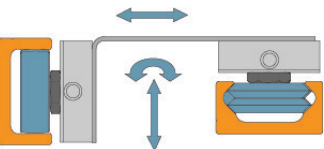
## 1B Face-to-face vee and C Channel

Together, the vee and C Channels stabilize radial loads and applied moments. The vee channel also constrains the axial motion of the bridged assembly.



## 1C Back-to-back vee and C Channel

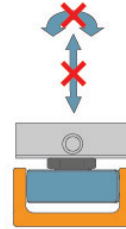
Similar to 1B, the channels stabilize radial loads and applied moments while mounted back-to-back.



## 1D C Channel facing vee channel (90 degrees)

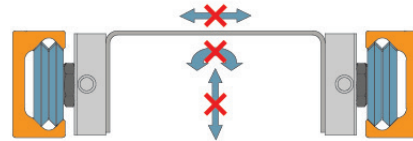
The vee channel stabilizes in its radial direction. The C channel also stabilizes in its own radial direction and supports applied moments.

# Non-Recommended



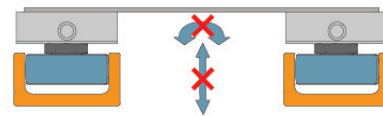
## 2A C Channel with direct loading

The C Channel does not support axial loads or applied moments, only radial loads. A C Channel should not be used on its own in the axial load direction.



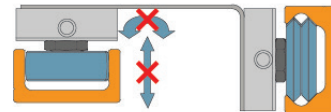
## 2B Face-to-face vee Channel

The bridge is over-constrained in both the axial and radial directions due to the precise fit of the vee guide wheels. This configuration requires high precision mounting to prevent binding.



## 2C Side-to-side C Channels

The bridge is unsupported in the axial direction by the C Channels. Even when the bearings are loaded radially, the assembly drifts in the axial direction.



## 2D Vee facing C Channel (90 degrees)

Though seemingly similar to 1D, the orientation of the C Channel provides little support for moments applied to the bridge.

## Load Capacity

The load capacity ratings in this guide are based on 100km (4 million inches) of service life. As with any linear bearing technology, UtiliTrak sizing should be done conservatively. If the guide selection is such that load capacities are marginal, it may be appropriate to consider the next larger size. Our applications engineers are available to assist with the evaluation of any application specific loading parameters.

The recirculating elements within DualVee guide wheels are permanently lubricated and sealed against the operating environment. The contact surfaces between the wheel and channel, however, require lubrication to maximize the life and speed capacity of the guide. All UtiliTrak wheel plates come complete with lubricators, consisting of an oil saturated felt within a housing. Lubricators should be periodically checked and reoiled to ensure that a sufficient coating of lubricant is maintained on the channel guideway surfaces.

## Accuracy

The precision of UtiliTrak is defined differently than typical square rail recirculating ball guides. Square rail guides are designed primarily for “high end” positioning applications, such as machine tool guideways, Cartesian coordinate robotics, and precision XY inspection equipment. These guides are more rigidly defined in terms of the running parallelism of wheel plates to rail, and are measured as a function of rail length. The tight tolerances are achieved through grinding and finishing operations. UtiliTrak, in contrast, has been developed for commercial applications.

As with any linear guide, installed accuracy is directly related to the straightness and flatness of the surface to which it is mounted. Because the guide will conform to the mounting surface, it is important for that surface to be more rigid than the UtiliTrak channel.

## Load/Life Calculations

The summation of applied loads divided by system load capacities (Max) should be less than or equal to one:

$$\frac{F_R}{L_{RMax}} + \frac{F_A}{L_{AMax}} + \frac{M_R}{M_{RMax}} + \frac{M_Y}{M_{YMax}} + \frac{M_P}{M_{PMax}} \leq 1$$

The applied force on the system is equivalent to:

$$F = F_R + \left( \frac{F_A}{L_{AMax}} + \frac{M_R}{M_{RMax}} + \frac{M_Y}{M_{YMax}} + \frac{M_P}{M_{PMax}} \right) * L_{RMax}$$

With an equivalent applied load, the system life can now be calculated:

$$L_{Km} = 100 * \left( \frac{C}{F} * \frac{1}{f_c} \right)^3$$

$L_{Km}$  = System life in kilometers

C = System Dynamic Load Rating

F = Equivalent Load

$f_c$  = Correction Factor

Environmental Factor	Correction Value $f_c$
No Shock, No Vibration, Cleaning Working Environment, Below 1 meter/sec	1.46
Light Shock, Light Vibration, Between 1 meter/sec to 2 meters/sec	1.85
Shocks, Vibrations, Harsh Environment, Above 2 meters/sec	3



DualVee® Guide Wheels  
 LoPro® Linear Motion System  
 MadeWell® Crown and Radial Wheels  
 MinVee® Linear Slide System  
 SMLA®  
 UtiliTrak® Linear Motion Guide  
 QuickTrak® Modular Linear Guide Kit

### HepcoMotion®

ALR Aluminum Rings  
 DAPDU2 Double Acting Profile Driven Unit  
 DLS Driven Linear System  
 DTS2 Driven Channel System  
 GV3 Linear Guidance and Transmission System  
 HDCB Heavy Duty Compact Beam  
 HDCS Heavy Duty Compact Screw  
 HDLS Heavy Duty Driven Linear System  
 HDRT Heavy Duty Ring Slides and Channel System  
 HDS2 Heavy Duty Slide System  
 MHD Heavy Duty Channel Roller Guidance System  
 MCS Machine Construction System  
 PDU2 Profile Driven Unit  
 PDU2M Belt Driven Unit  
 PRT2 Precision Ring and Channel System  
 PSD80 Screw Driven Linear Actuator  
 PSD120 Profile Screw Driven Unit  
 SBD Sealed Belt Drive  
 Simple-Select®  
 SL2 Stainless Steel Based Slide System

## SIGNATURE

EXPERIENCE

When engaging with Bishop-Wisecarver, customers can expect a Signature Experience as it relates to prompt customer service, technical collaboration and exceptional lead times. As a result, our commitment consistently fulfills expectations with reliable motion solutions that are on time and on budget, with no surprises.

### Key Industries Served

- Aeospace & Defense
- Aircraft & Automotive
- Architecture
- Consumer Products
- Conveying Equipment
- Cutting
- Entertainment
- Fabrication
- General Automation
- Industrial Equipment
- Instrumentation
- Lab Automation
- Liquid Handling
- Machine Tool
- Material Handling & Packaging
- Medical Device Manufacturing
- Power, transmission & railway
- Printing Machinery
- Printed Circuit Assembly
- Research & Development
- Relay & Industrial Controls
- Radio & TV Broadcasting
- Robotics, Semi-Conductor
- Food & Beverage
- Surgical Equipment
- Transportation
- Welding & Soldering
- Wood Processing

### 3D CAD Drawing

Download files at  
[www.bwc.com/3dcad.php](http://www.bwc.com/3dcad.php)

### News & Updates



### Product Orders

Please call us at **888.580.8272**, email [sales@bwc.com](mailto:sales@bwc.com), or submit Application Data Sheet online with your specific application requirements.



Now available at [bwc.com](http://bwc.com) to chat digitally with a customer service representative or applications engineer.

Complete terms, conditions and warranty information is available at [bwc.com/about\\_conditions.vp.html](http://bwc.com/about_conditions.vp.html)

Bishop-Wisecarver Corporation®, BWC®, DualVee®, Dual Vee®, Dua-L-Vee®, Dual-Vee®, DualVee Motion Technology®, UtiliTrak®, QuickTrak®, MinVee®, MadeWell®, and Motion Without Limits® are registered trademarks of Bishop-Wisecarver in the United States and other countries. Use of any of these registered marks is with expressed written permission only.