

Items to Consider when using GKs

There are a number of items that should be considered when selecting and applying Guided Keepers. Here are some helpful tips and usage guidelines.

Base / Bushing

Bushing Length - pg 2

- SL recommends using the longest bushing possible in the available space. Longer bushings provide significant value in production by improving the guidance condition along with extending the performance life of the assembly.

Base Styles

- The “N” Base is recommended for most applications. It provides the latest features, most options, and greatest design flexibility.

Guide Pin

Guide Pin Length - pg 3

- Length of the guide pin should be considered in relation to the pin diameter and the bushing length.

Guide Pin Diameters and Series - pg 4

- SL recommends using the largest (within reason) diameter guide pin that will fit in your application. A larger diameter pin allows for more and/or larger fasteners that increases robustness.

Application

Qty and Positioning of Units - pgs 5-6

- It is important to design tools with an adequate number of Guided Keeper units based on the application. It's always the most cost effective to start with a quality tool design up front.
- On larger pads add GK's in the middle of the pad to support the weight and prevent flex.
- On narrow pads stagger the location of the GK's so they are not in-line with each other when possible.

Pad Tipping - pg 7

- Use stand offs and enough spring force to keep the Pad/Lifter balanced and flat with or without stock present.
- Add heel blocks in applications when significant side load is expected or likely.

Machining / Tolerances

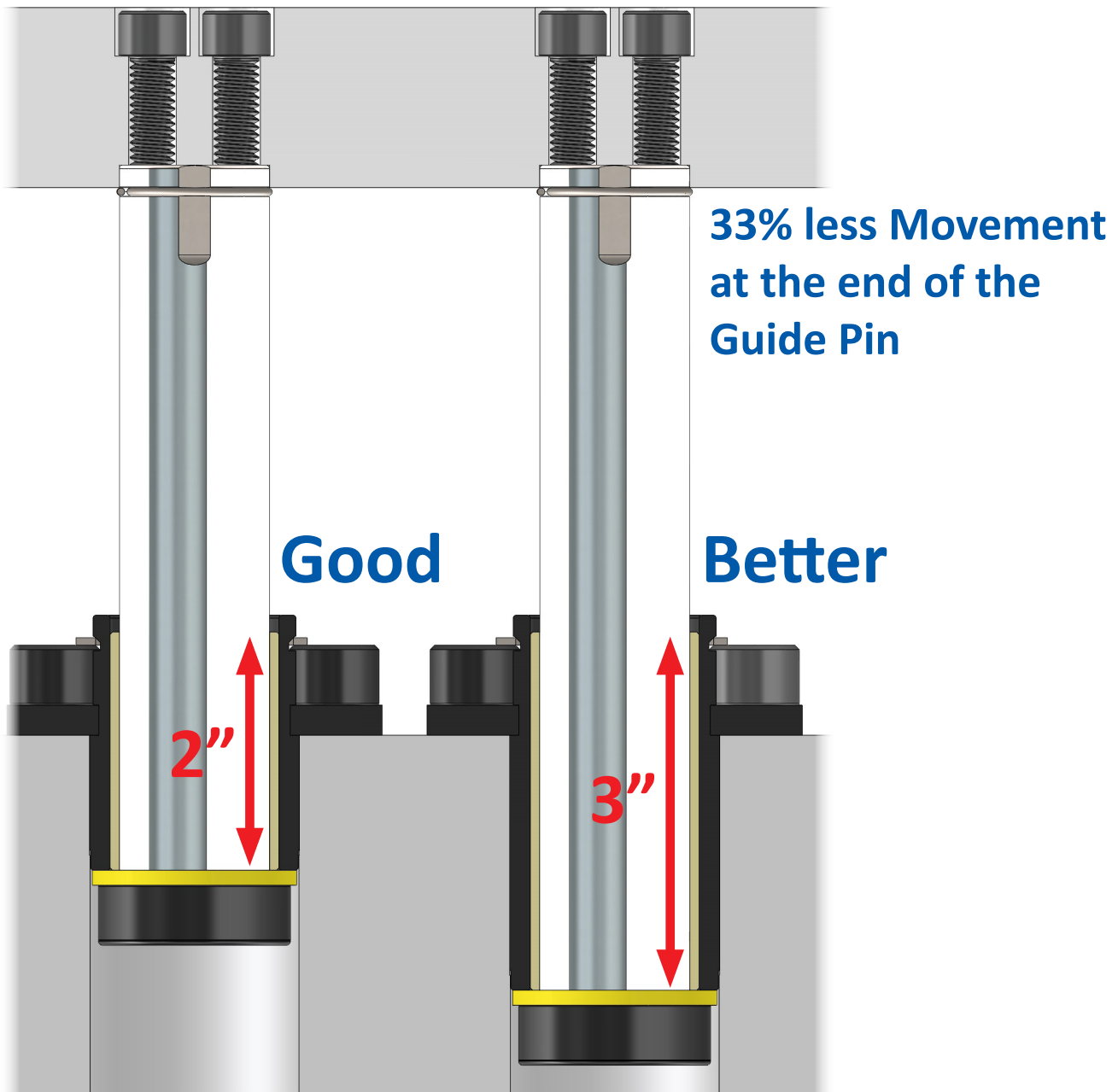
- Be sure the designed machining matches SL machining prints and requirements.



Why a Longer Bushing is Better

By using the longest bushing length available for your application, the amount of movement at the end of the pin will be significantly reduced.

Applications with high travel or units in-line, typically found on lifter rails, benefit greatly from using the longest bushing length available for your application.



A longer bushing provides more surface area contacting the guide pin which extends the performance life of the Guided Keeper.



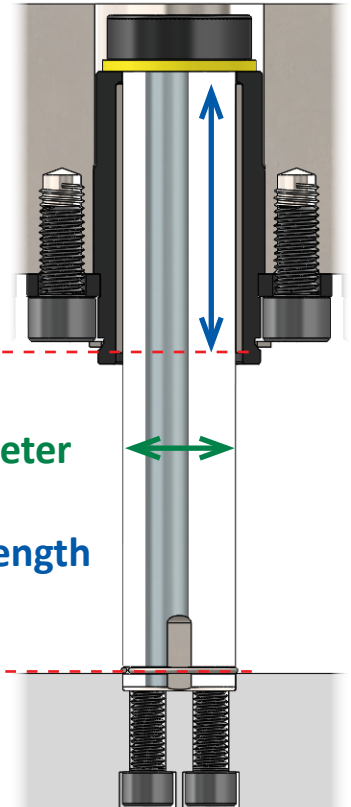
Guide Pin Length

It is important to take into account the length of the guide pin in relation to the pin diameter and the bushing length.

If an application requires a longer than average guide pin to be used, then a proper length bushing should be paired with it. If using the longest length bushing still does not provide a healthy ratio then a larger diameter guide pin should be considered.

Although it is difficult for SL to make a recommendation on what configuration to use for every application, the below matrix provides a guideline. It is based on the length of guide pin between the bushing and the pad not exceeding five times its diameter OR two times the bushing length, whichever is less.

5x Pin Diameter
OR
2x Bushing Length



Max Recommended Guide Pin Lengths

Bushing Length	Guide Pin Diameter / Series (available in .125" increments)						
	.75"	1.00"	1.25"		1.50"	1.75"	2.00"
	GK75	GK105	GK120	GK122	GK152	GK180	GK205
2"	6.250"	6.625"	6.625"	7.000"			
3"		8.625"	9.625"	10.000"	10.125"	9.625"	
4"							13.125"








Longer lengths are available, contact SL for information

Please use this information, along with your discretion, to determine the best configuration to use in your specific application.



Guide Pin Diameter

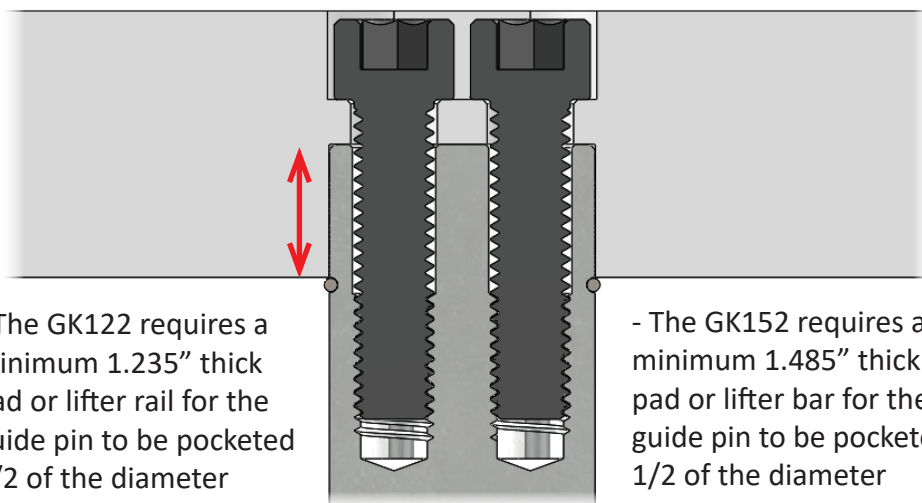
SL recommends using the largest(within reason) diameter guide pin that will fit in the application. This helps ensure an overbuilt application rather than an under engineered one, and the cost to upsize is incremental compared to the production value and confidence it provides Stampers.

	Guide Pin Diameter / Series						
	.75"	1.00"	1.25"		1.50"	1.75"	2.00"
	GK75	GK105	GK120	GK122	GK152	GK180	GK205
							
Fasteners	1 M10 (3/8")	1 M12 (1/2")	2 M10 (3/8")		2 M12 (1/2")	3 M12 (1/2")	3 M16 (5/8")
Added Cost to move up one diameter size		\$13.95 (from GK75)	\$13.45 (from GK105)	\$11.25 (from GK105)	\$14.56 (from GK122)	\$8.70 (from GK152)	\$34.14 (from GK180)
Added Strength of Fasteners		45% Stronger	38% Stronger		45% Stronger	50% Stronger	87% Stronger

Pin Location Vs Pin Support

The end of the guide pin is pocketed in the pad to provide location. For the GK122 and GK152 if the pin is pocketed by 1/2 the diameter of the Pin, it also provides "support" for the Pin as well.

When a significant tip condition occurs the screws will start to stretch but the body of the guide pin will make contact with the sides of the pocket and it will limit the amount of stretch/force subjected on the fasteners.



- The GK122 requires a minimum 1.235" thick pad or lifter rail for the guide pin to be pocketed 1/2 of the diameter

- The GK152 requires a minimum 1.485" thick pad or lifter bar for the guide pin to be pocketed 1/2 of the diameter







The GK Locking Collar Accessory prevents screws from possibly coming loose and falling into the tool during operation.

Available for GK180 and GK205 Series Guide Pins



Number of Units

It is important to design your tools with an adequate number of Guided Keeper units based on the application. It's always more cost effective to start with a quality tool design rather than re-engineer later on. If a Stamper needs to add a GK Unit to an under engineered condition it costs them 3-4 times as much as if the die was built with it originally. Although it is difficult for SL to make a recommendation on the number of GK Units to use for every application, the below matrix provides a general guideline based on what are "typical max" conditions. Please use this information, along with your discretion, to determine the number of GK Units to use in your specific application.

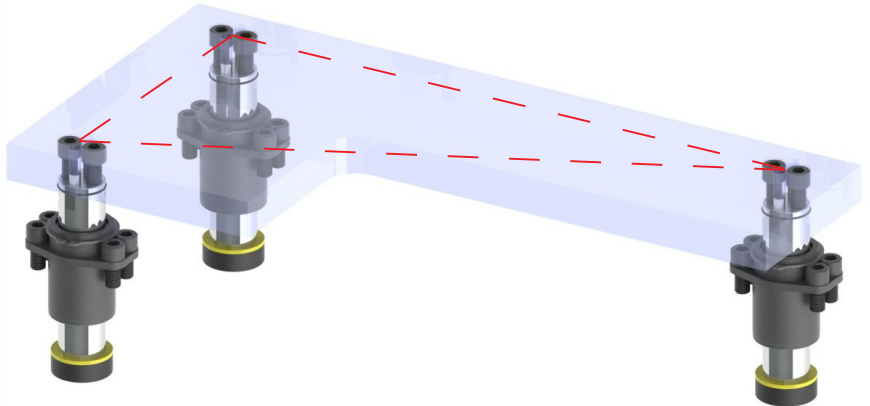
Guide Pin Series	Pad Travel	Recommended Max Limits - Per GK Unit (Lesser of the two items below)	
		Pad Weight	Pad Area
GK75 	< 1.5"	9 lbs	6" x 6" surface area / 36 sq In (Ex: 4 units up to a 9" x 16" Pad)
	1.5" - 2.25"	8 lbs	
	> 2.25"	6 lbs	
GK105 	< 2"	21 lbs	8" x 8" surface area / 64 sq In (Ex: 4 units up to a 12" x 21" Pad)
	2" - 3"	18 lbs	
	> 3"	14 lbs	
GK122 	< 2.5"	49 lbs	11" x 11" surface area / 121 sq In (Ex: 4 units up to a 17" x 28" Pad)
	2.5" - 3.75"	43 lbs	
	> 3.75"	32 lbs	
GK152 	< 3"	69 lbs	13" x 13" surface area / 169 sq In (Ex: 4 units up to a 20" x 35" Pad)
	3" - 4.5"	60 lbs	
	> 4.5"	45 lbs	
GK180 	< 3.5"	109 lbs	15" x 15" surface area / 225 sq In (Ex: 4 units up to a 23" x 39" Pad)
	3.5" - 5.25"	95 lbs	
	> 5.25"	71 lbs	
GK205 	< 4"	184 lbs	18" x 18" surface area / 324 sq In (Ex: 4 units up to a 27" x 48" Pad)
	4" - 6"	160 lbs	
	> 6"	120 lbs	

This is only a Guide - Discretion must be used based on each die application in regards to the number of units to design in. It's your responsibility to design a die that is adequately engineered. If there is known side load that will be subjected on the Pad, we recommend adding heel blocks.

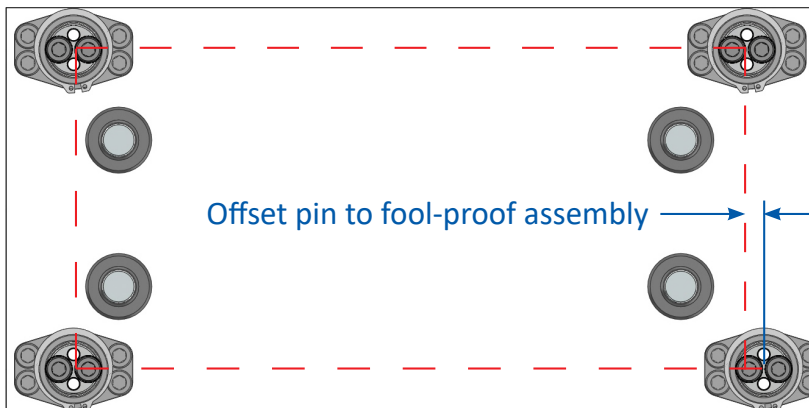


Positioning of Units

Use a minimum of three Guided Keepers per Pad and position them to not be in-line with each other when space allows. The Pad is less prone to tipping, the bushings will last longer, and the assembly is stronger in a miss-hit situation.



On larger pads use GKs in the middle of the pad to support the weight and prevent pad flex.



Offset one Guided Keeper location or use a different diameter pin as methods to fool-proof the assembly.



Preventing Pad Tipping

Pad tipping breaks screws, wears out pins/ bushings, and gas springs.

Apply stand-offs for pads & lifters to maintain parallel “flat” travel when starting the stock. Also to ensure the Pad/Lifter does not tip during the working stroke, apply enough pressure to keep the pad balanced and flat. Applying pressure in a balanced pattern will also help safeguard the pad from tipping.

