

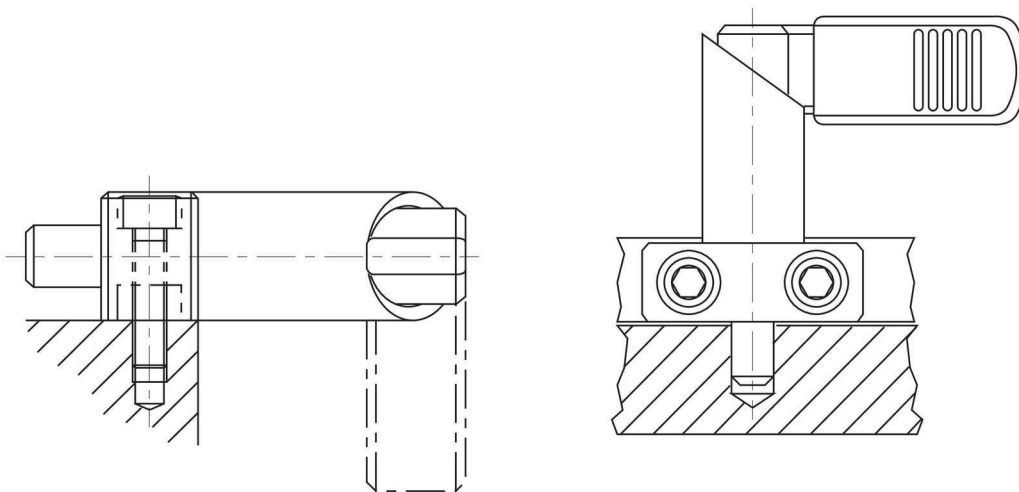
# Index Plungers - Lever Grip

flange mounting - locking



# 32520

Order No.	Type	d <sub>1</sub> 0 -0.05	l <sub>2</sub>	d <sub>2</sub>	d <sub>3</sub>	h	k	l <sub>1</sub>	l <sub>3</sub>	l <sub>4</sub>	s	Sprin		g	
												g load*	g load*		
												f <sub>1</sub>	f <sub>2</sub>	g	
32520.W0376	Without Grip	6	10	16	35	16	20	56	32	-	12	12	12	32	82
32520.W0378	Without Grip	8	10	16	35	16	20	56	32	-	12	12	12	32	85
32520.W0379	Without Grip	8	12	20	40	20	22	69	37	-	15	21	21	58	163
32520.W0381	Without Grip	10	10	16	35	16	20	56	32	-	12	12	12	32	85
32520.W0382	Without Grip	10	12	20	40	20	22	69	37	-	15	21	21	58	167
32520.W0384	Without Grip	12	12	20	40	20	22	69	37	-	15	21	21	58	168
32520.W0386	With Grip	6	10	16	35	16	20	56	-	42	12	12	12	32	83
32520.W0388	With Grip	8	10	16	35	16	20	56	-	42	12	12	12	32	85
32520.W0389	With Grip	8	12	20	40	20	22	69	-	52	15	21	21	58	169
32520.W0391	With Grip	10	10	16	35	16	20	56	-	42	12	12	12	32	86
32520.W0392	With Grip	10	12	20	40	20	22	69	-	52	15	21	21	58	171
32520.W0394	With Grip	12	12	20	40	20	22	69	-	52	15	21	21	58	171



### Material

Body & Lever: free cutting steel, blackened.

Pin: steel, nitrided, black.

Plastic Grip: thermoplastic, black, dull.

### Technical Notes

Turn lever 180° to retract pin. To enable pin to be held in retracted position, secure lever in notched catch on plunger body.

Countersunk holes on both sides of mounting flange enable both right or left mounting.

Plastic grip type, improves handling. Temperature resistance of type with plastic grip is -30°C to +80°C.

### Tips

Spring loads \* = statistical average.



## A wide selection of solutions

- Locating and positioning.
- Indexing.
- Securing.
- Positive locking.
- Rapid adjustment of all kinds of tables, platforms and fixtures.
- Machine and fixture design.
- OEM products.
- Sports equipment.
- Medical aides (wheelchairs etc.).
- Aerospace.
- Machine cabinets.

## Applications



Steel with plastic grip



Stainless with plastic grip



Stainless body and grip

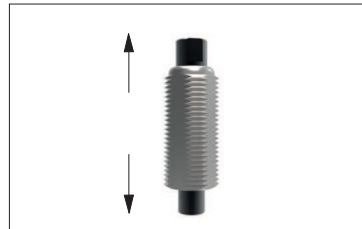
## Materials



Locking (park)



Non locking (spring back)



Push pull

## Locking or non locking



Standard grip



Lever grip



T-handle



Pull ring



Threaded for bespoke handle

## Handling and actuation methods



Fine threaded (standard)



Coarse thread



Flange mount



Thin wall mount



Weldable

## Mounting options

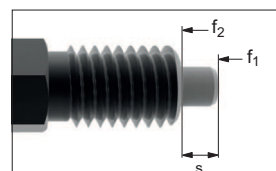
- Unless otherwise stated, grips on index plungers are not removeable.
- Many of the pins on index plungers are toleranced to either the pin or the hole. Please refer to the specific product table.
- Index plungers are not recommended for shear load applications.

### Pin Tol. Hole Tol.

①	$h_9$	+0,03 +0,08
②	-0,02 -0,04	$H_7$

## Additional technical notes

- s** Stroke, or movement of plunger's pin.
- f<sub>1</sub>** The force required in Newtons (N) to over come the static strength of the spring and achieve initial movement of the plunger's pin.
- f<sub>2</sub>** The force required in Newtons (N) to fully compress the spring until the pin is fully depressed against the plunger's body.



## Spring loads

# Computing the strength of index plungers

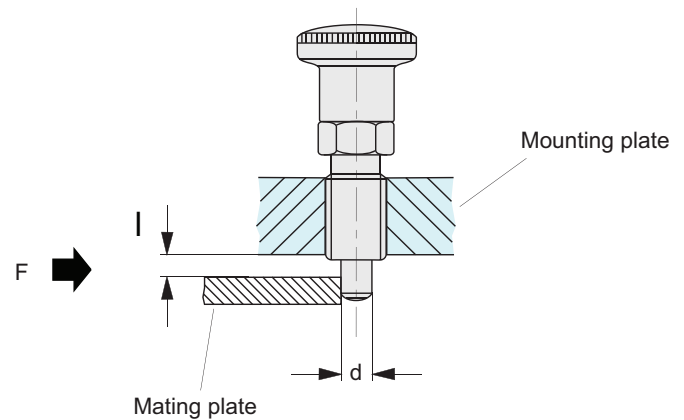
for shear loads / flexure loads of the plunger pin



## Flexure loads

As soon as a gap  $l$  exists between the mounting plate in which the index plunger is installed, and the mating or base plate, the load must be considered to be as per a flexure load, with rod clamped at one side.

With this approach, the calculation is made against the bending of the index plunger.



## Formulas for computation

### Resistance torque

$$W = \frac{\pi \times d^3}{32}$$

### Flexural stress

$$M_b = \sigma_b \times W$$

### Flexural strength

$$F = \frac{M_b}{l} = \frac{\sigma_b \times \pi \times d^3}{l \times 32}$$

## Material characteristics

The yield or substitute yield limit ( $R_e / R_p 0,2$ ) shown in the table opposite has been determined in tension tests involving tension specimen in accordance with DIN 50125-B6-30.

These tests constitute the basis for the load bearing details given.

Material Description	Material no.	$R_e$ in N/mm <sup>2</sup> (= per. flexural tension $\sigma_b$ )
C45Pb	1.0504	560
X 10 CrNiS 18 9A	ISI 303	580

## Calculation example, load values

Example:

Index plungers with a bolt diameter of 5 mm made of steel with a yield limit of  $R_e = 560 \text{ N/mm}^2$ , calculation against permanent deformation, the maximum permissible flexural strength is calculated as:

$$F_{\text{per}} = \frac{560 \text{ N/mm}^2 \times \pi \times (5\text{mm})^3}{2\text{mm} \times 32} = 3430 \text{ N}$$

d Bolt diameter	max. flexural strength $F$ in N, acc. to material and gap $l$ differentiated			
	C45Pb/1.0504		X 10 CrNiS 18 9/1.4305	
	$l = 2 \text{ mm}$	$l = 3 \text{ mm}$	$l = 2 \text{ mm}$	$l = 3 \text{ mm}$
3	740	490	760	510
4	1750	1170	1820	1210
5	3430	2290	3550	2370
6.5	930	3950	6140	4100
8	14070	9380	14570	9710
10	27480	18320	28470	18980
12	47490	31660	49190	32790
16	90070	102940	93290	119020

## Safety information

On principle, the design also needs an adequate safety coefficient to be taken into account. The usual safety coefficients under static load 1.2 to 1.5; pulsating 1.8 to 2.4 and alternating 3 to 4.

Disclaimer:

You should carry out your own test series to verify whether a certain product is suitable for your specific applications.

# Computing the strength of index plungers

for shear loads / flexure loads of the plunger pin



## Shear loads

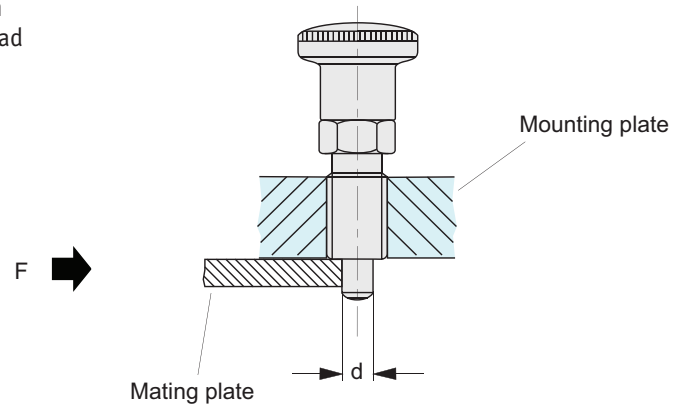
Providing only a very small gap exists between the mounting plate in which the index plunger is installed, and the mounting plate or base plate, the load can be calculated as a clean shear action.

As this is normally not the case, the "flexure" load should be used - see following page.

Approximately 80 % of the bolt's tensile strength is assumed for the shear strength. This approach calculates against the tensile strength  $R_m$ , i.e. against the index pin shearing off.

To ensure the permanent and proper function of the index plunger, the yield limit  $R_e$  must be considered in place of the tensile strength  $R_m$ .

Stop using the index plunger if the pin is damaged or deformed.



## Formulas for computation

### Bolt cross-section

$$S = \frac{d^2 \times \pi}{4}$$

### Limit tension

$$\tau_a = 0,8 \times R_m$$

### Shear force

$$F = S \times \tau_a = \frac{d^2 \times \pi}{4} \times 0,8 \times R_m$$

## Material characteristics

The tensile strength shown in the table opposite ( $R_m$ ) and the yield or substitute yield limit ( $R_e / R_p 0,2$ ) have been determine in tension tests involving tension specimen in accordance with DIN 50125- B6-30

These tests constitute the basis for the load bearing details given.

Material Description	Material no.	$R_e$ in N/mm <sup>2</sup>	$R_m$ in N/mm <sup>2</sup>
C45Pb	1.0504	560	640
X 10 CrNiS 18 9A	ISI 303	580	740

## Calculation example, load values

Example:

Index plungers with a bolt diameter of 6 mm made of Stainless Steel with a yield limit of  $R_e = 580 \text{ N/mm}^2$ , calculation against permanent deformation, the maximum permissible shear stress is calculated as:

$$F_{per} = \frac{(6 \text{ mm})^2 \times \pi}{4} \times 0,8 \times 580 \text{ N/mm}^2 = 13120 \text{ N}$$

d Bolt diameter	max. force F in N, acc. to material and strength value differs			
	C45Pb/1.05045		X 10 CrNiS 18 9/1.4305	
	at $R_e$	at $R_m$	at $R_e$	at $R_m$
3	3160	3610	3270	4180
4	5620	6430	5830	7430
5	790	10050	9110	11620
6	12660	14470	13120	16730
8	22510	25730	23320	29750
10	35180	40210	36440	46490
12	50660	57900	52470	66950
16	90070	102940	93290	119020

## Safety information

On principle, the design also needs an adequate safety coefficient to be taken into account. The usual safety coefficients under static load 1.2 to 1,5; pulsating 1.8 to 2.4 and alternating 3 to 4.

Disclaimer:

You should carry out your own test series to verify whether a certain product is suitable for your specific applications.