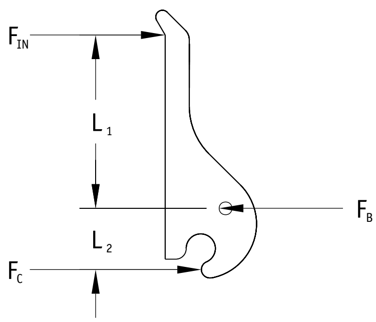
Basic theory, knowledge of pertinent forces and understanding of product functionality enables an engineer to select the proper components. The discussion below illustrates the advantage of five or more piece Wedge-Lok and provides information on how to calculate ejection/extraction forces.

Ejector Theory



$$M_C = 0 = F_{IN}(L_1 + L_2) - F_B(L_2)$$

$$\frac{F_B}{F_{IN}} = \frac{L_1 + L_2}{L_2} = C$$

Example:

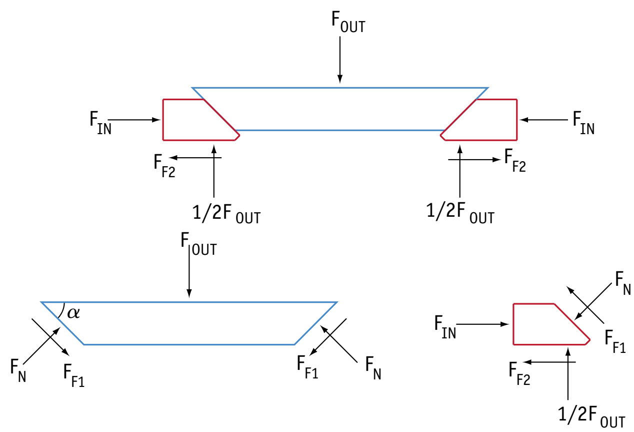
Calculate the injection force exerted on the backplane connector when 2 lbs. finger force is applied to a pair of 73 series extractors/ injectors

$$F_B = C\ F_{in}\ 2 = 3.85(2 \text{ lbs})\ (2) = 15.4 \text{ lbs}$$

Series #	L_1	L_2	$F_B/F_{IN}=C$
71	1.14	0.36	4.17
73	1.48	0.52	3.85*
87	1.46	0.54	3.70*
S-214	1.52	0.42	4.62*
S-209	.88	0.46	2.91
91	0.84	0.27	4.11
S-200	0.68	0.44	2.55
S-202	0.68	0.44	2.55
S-203	0.72	0.38	2.89
S-208	0.68	0.38	2.68

Values represent injection force ratios. Extraction force ratios are slightly higher for these products.

Wedge-Lok™ Theory



$$F_{out} = (N-1)F_{in}\left[\frac{1-\mu_1 \tan(\alpha)}{\tan(\alpha)+\mu_1+\mu_2(1-\mu_1\tan(\alpha))}\right]$$

Where N = number of wedge segments

α = angle of interface

μ_1 = friction coefficient of 45 wedge face

μ_2 = friction coefficient of wedge surface in contact with cold wall

If $\mu_1 = \mu_2 = \mu$ and $\alpha = 45°$ then

$$F_{out} = (N-1)F_{in}\left[\frac{1-\mu}{1+2\mu-\mu^2}\right]$$

μ	Three-piece F_{out}	Five-piece F_{out}	Seven-piece F_{out}
0	2.00•Fin	4.00•Fin	6.00•Fin
.05	1.73•Fin	3.40•Fin	5.19•Fin
.10	1.51•Fin	3.03•Fin	4.54•Fin
.15	1.33•Fin	2.66•Fin	3.99•Fin
.20	1.18•Fin	2.35•Fin	3.53•Fin
.25	1.04•Fin	2.09•Fin	3.13•Fin
.30	.93•Fin	1.85•Fin	2.78•Fin
.40	.73•Fi	1.46•Fin	2.20•Fin

$$F_{in} = \frac{T}{kd} \text{ where } k \approx .25 \text{ (friction coef. of screw)}$$

d = diameter of screw and T=Torque