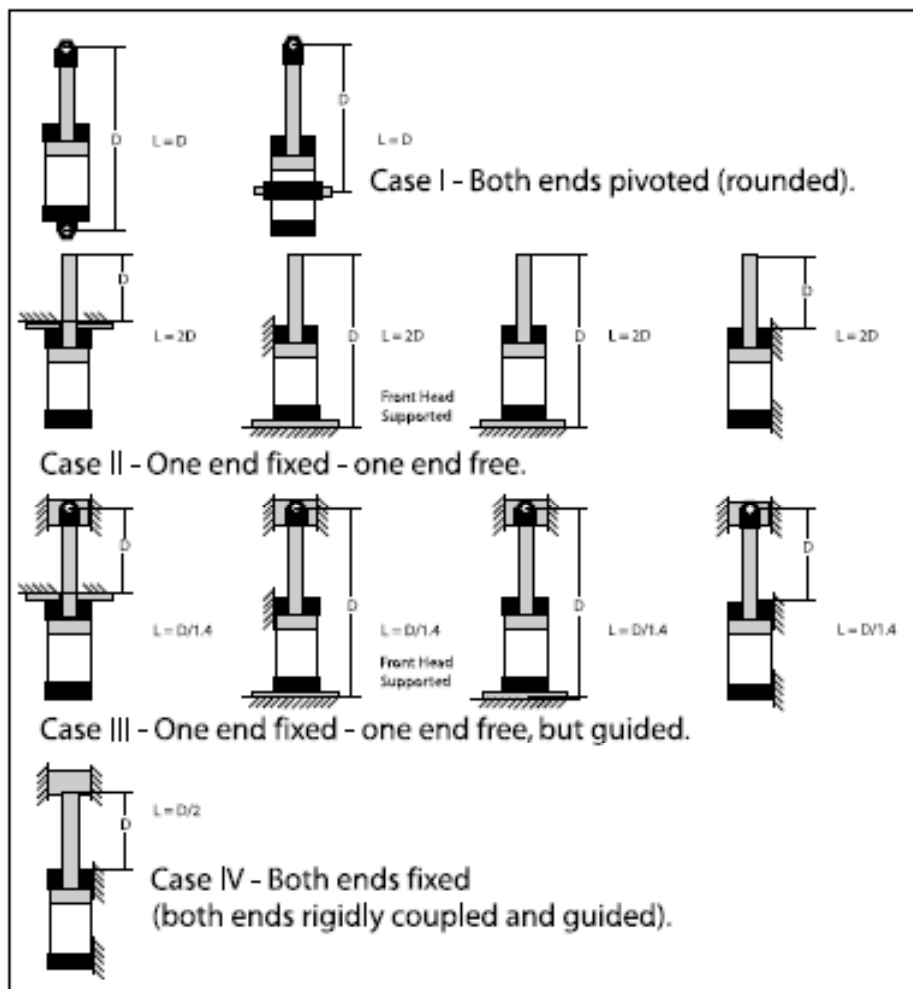


Series 101 Piston Rod Selector Chart



VALUES OF "L" IN INCHES

THRUST LOAD IN LBS.	Piston Rod Diameters					
	¾	1	1¼	1½	1¾	2¼
100	107	191				
150	87	156				
200	75	135				
250	67	121				
300	61	110	171	247	334	
350	57	102	159	229	312	
400	53	96	148	214	292	
450	50	90	140	202	275	
500	47	86	133	191	261	
600	43	79	121	175	239	
700	40	72	112	162	221	
800	37	68	105	151	207	
900	35	64	99	142	195	
1000	33	61	94	135	187	305
1200	30	55	85	123	169	278
1400	28	51	74	114	156	257
1600	26	48	74	107	146	241
1800	25	45	70	101	138	227
2000	23	43	66	95	131	215
2200	22	41	63	91	125	205
2600	21	38	58	84	115	189
3000	19	35	54	78	107	176
3500	18	32	50	72	99	163
4000	16	30	47	67	93	152
5000	15	27	42	60	83	136
6000	13	25	38	55	76	124
7000	12	23	35	51	70	115
8000	11	22	33	47	66	107
9000		20	31	45	62	101
10000		19	29	42	59	96
12500		17	26	38	52	86
15000		16	24	35	48	78
17500		14	22	32	44	72
20000		13	21	30	42	68
25000		12	18	27	37	61
30000			17	24	34	55
40000				21	29	48
50000				19	26	43
60000					24	39
80000						34

The Piston Rod in a cylinder acts as a column and, as such, is subjected not only to compressive stresses, but also buckling stresses which are a function of the moment of inertia for a constant modulus of elasticity. The "column strength" of a piston rod cannot be increased by using higher tensile strength or heat treated materials. For this reason, it is sometimes necessary to use an oversize piston rod strictly for the purpose of achieving the necessary "column strength."

The data shown in chart form is based on Euler's equation for a vertical column with both ends rounded (see Case I illustration). The values of "L" shown in the chart are approximately one-half of the theoretical limit of "L" as determined by this equation. Factors such as vertical or horizontal mounting, shock or non-shock loading, frequency of operation, etc., should be taken into consideration in selecting a permissible value of "L". The values shown indicate our recommended maximum "column lengths" for the various piston rods under specified compressive loads and may be considered safe for most normal cylinder applications, both horizontal and vertical. Deviations from these recommendations are, of course, a matter of engineering judgment based on a knowledge of the application. In some vertical applications, it may be possible to

use values of "L" one-third greater than those on the chart shown. On the other hand, for a long stroke, horizontally mounted cylinder subjected to shock loading, it may be desirable to decrease the value of "L" by one-third.

To determine the proper piston rod diameter for your application, proceed as follows:

1. Determine the maximum thrust required for your application.
2. Identify your installation with one of those illustrated as Case I, II, III or IV.
3. Determine the recommended stop tube length, if one is required. (See "stop tubes" below.)
4. Determine the value of "L" for your installation with the piston rod in the fully extended position.
5. Now, referring to the chart, select the thrust figure that equals or exceeds your requirements.
6. Scan to the right on the chart until the value of "L" equals or exceeds the "L" dimension on your cylinder installation.
7. In some cases the recommended piston rod diameter may exceed that of the piston rod available for the cylinder under consideration. If this happens, it may be necessary to use a larger bore cylinder, operating at a reduced pressure, in order to obtain the required column strength.