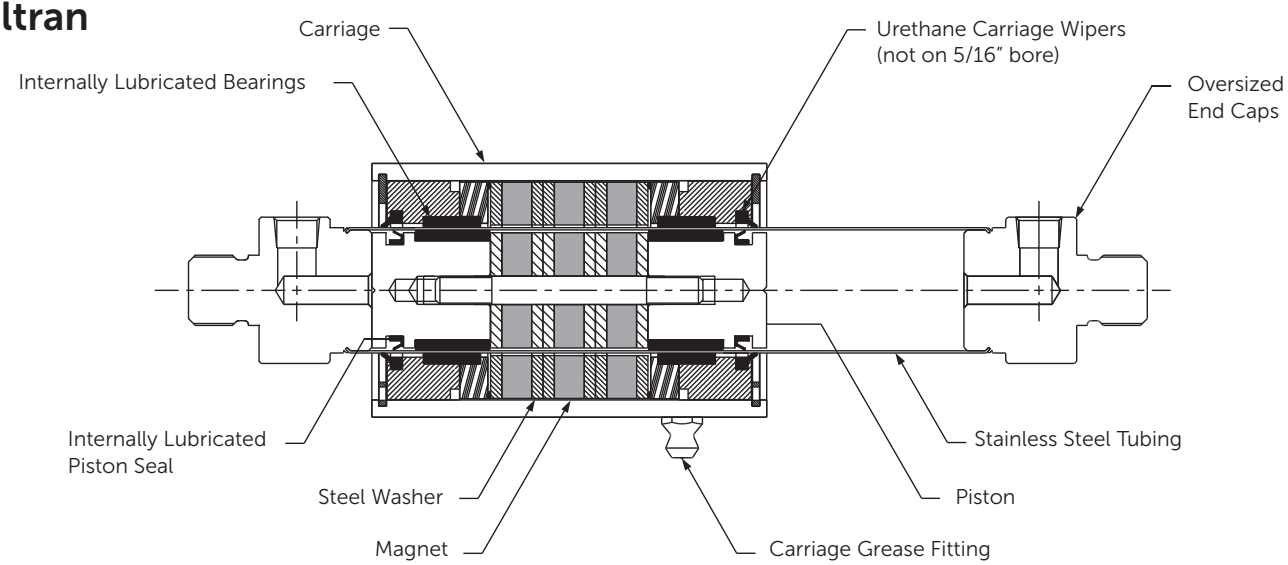
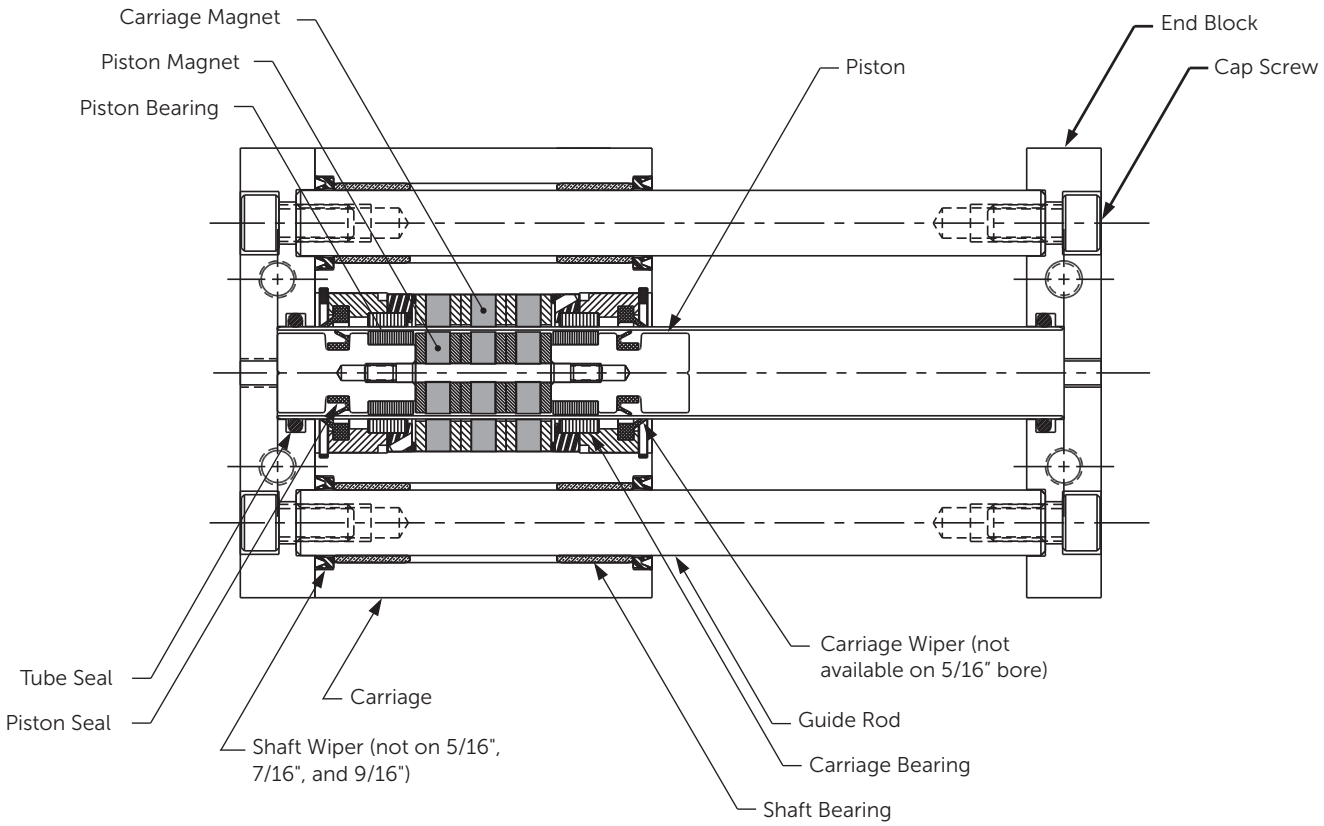
Ultran



Ultran Slide

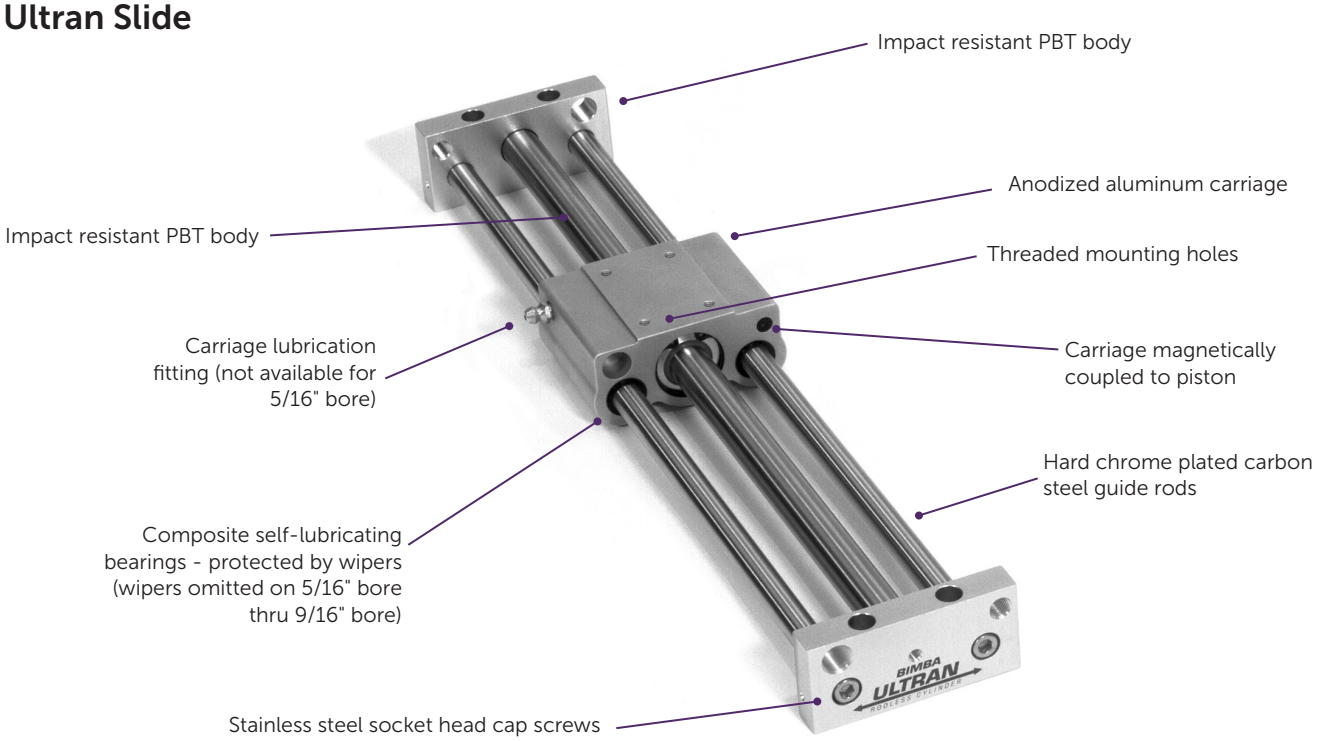


The above cutaway drawings show how IMI Bimba magnetically-coupled Ultran rodless cylinders work. Three magnets are located on the carriage, with three matching magnets on the piston. (For 5/16" bore, five magnets are used.) These magnets form a strong bond that holds the carriage and piston together. When the cylinder is actuated, the piston and carriage move as one unit. The magnetic attraction between the magnets determines a cylinder's magnetic coupling strength.

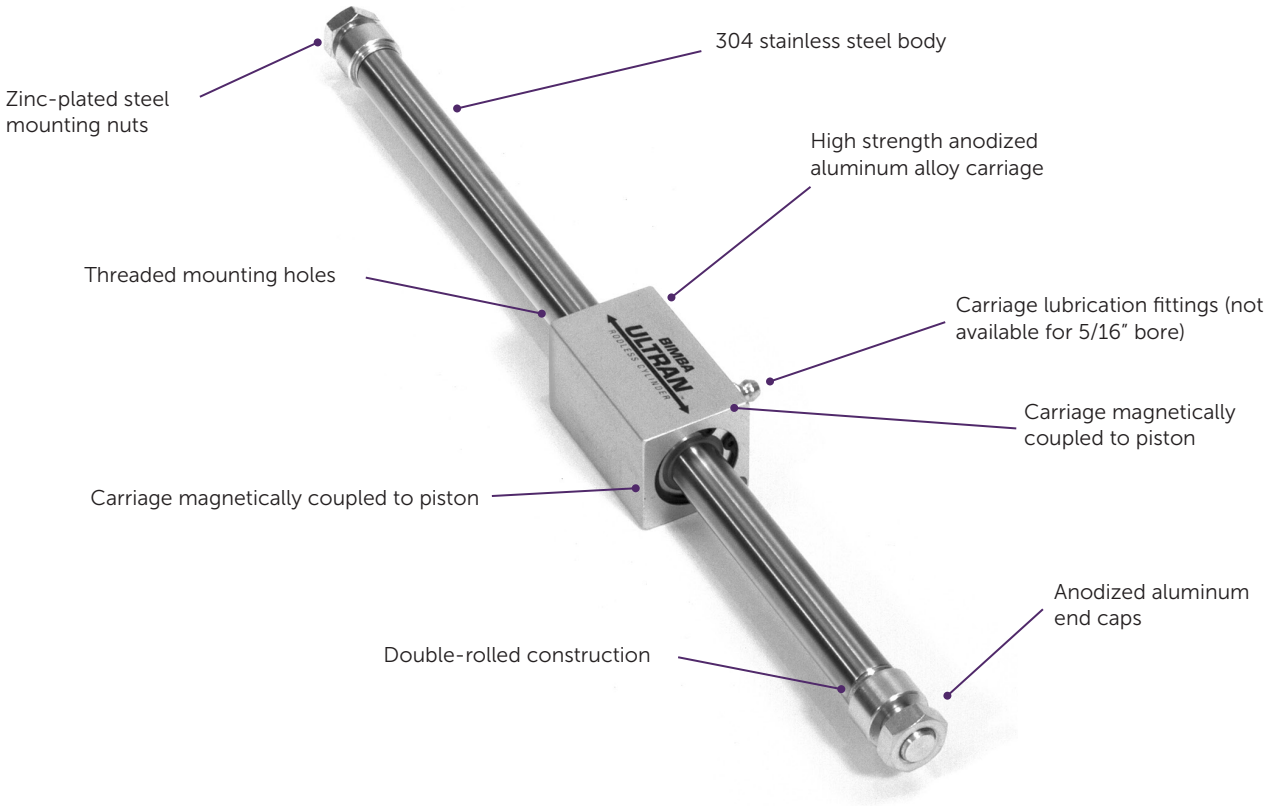
Ultran rodless cylinders provide one of the highest coupling strengths available, carrying higher loads without causing the piston to uncouple from the carriage. IMI Bimba also offers two magnetic coupling strength options (Gold and Silver) to suit a wide variety of applications. The Silver option uses two sets of magnets instead of three. (For 5/16" bore, four sets of magnets are used.)

IMI Bimba offers a model with built-in guides (Ultran Slide) and an unguided unit (Ultran).

Ultran Slide



Ultran



Engineering Specifications (Ultran and Ultran Slide)

Ratings

Pressure Rating:	**100 PSI (Air or Hydraulic)**
Temperature Range:	0 ° to 170 ° F
Breakaway:	Ultran Gold Coupling Strength - Less than 25 PSI
	Ultran Silver Coupling Strength - Less than 20 PSI
	Ultran Slide Gold Coupling Strength - Less than 30 PSI
	Ultran Slide Silver Coupling Strength - Less than 25 PSI

Magnetic Coupling Strength (lbs)

Cylinder Bore	Ultran Gold (UG/UGS)	Ultran Silver (US/USS)
5/16" (007)	13	8
7/16" (01)	20	10
9/16" (02)	29	16
3/4" (04)	61	33
7/8" (06)	102	55
1-1/16" (09)	127	74
1-1/4" (12)	190	110
1-1/2" (17)	270	150
2" (31)	552	332

Weight (lbs) (Ultran)

Cylinder Bore	Base Weight (0" Stroke)		Adder per 1"
	(UG)	(US)	
5/16" (007)	0.10	0.09	0.006
7/16" (01)	0.22	0.21	0.01
9/16" (02)	0.56	0.51	0.01
3/4" (04)	1.18	1.11	0.02
7/8" (06)	1.54	1.42	0.02
1-1/16" (09)	2.54	2.34	0.03
1-1/4" (12)	3.16	2.90	0.03
1-1/2" (17)	6.36	5.76	0.05
2" (31)	16.46	15.15	0.07

Weight (lbs) (Ultran Slide)

Cylinder Bore	Base Weight (0" Stroke)		Adder per 1"
	(UGS)	(USS)	
5/16" (007)	0.24	0.23	0.05
7/16" (01)	0.52	0.51	0.08
9/16" (02)	1.44	1.38	0.10
3/4" (04)	2.70	2.58	0.13
7/8" (06)	3.61	3.49	0.21
1-1/16" (09)	5.66	5.47	0.28
1-1/4" (12)	7.38	7.12	0.35
1-1/2" (17)	14.48	13.90	0.49
2" (31)	38.48	37.17	1.13

Lubrication

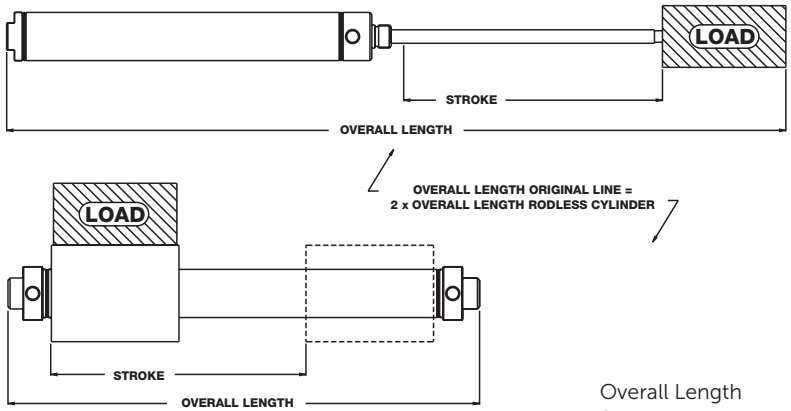
The Ultran rodless cylinder is pre-lubricated at the factory with a permanent grease eliminating the need for airline lubrication. The carriage should be lubricated every 100 linear miles with a high grade of bearing grease. Other types of pre-lubrication are available upon request. The lubricant used by the factory can be ordered as part number MS-2861-14OZ. The lubricant is packaged in a 14 oz grease gun cartridge.

Repairs

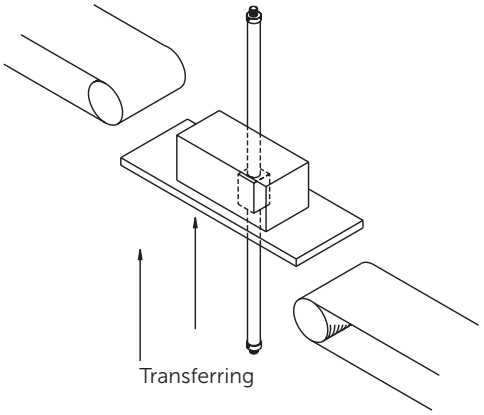
The Ultran rodless cylinder must be returned to the factory for repairs. Repair parts are available for the Ultran Slide - see How to Repair on page 405.

Application Possibilities

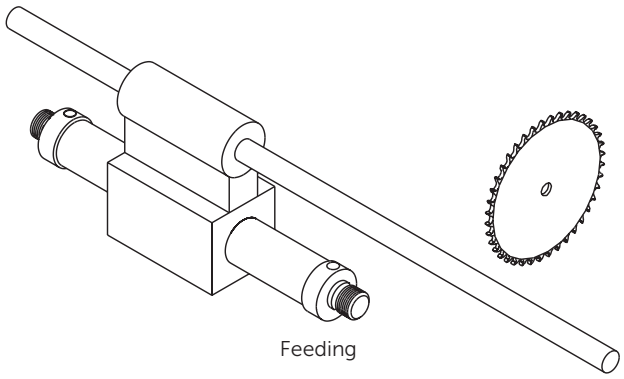
Save space and streamline your design with the IMI Bimba Ultran rodless cylinder.



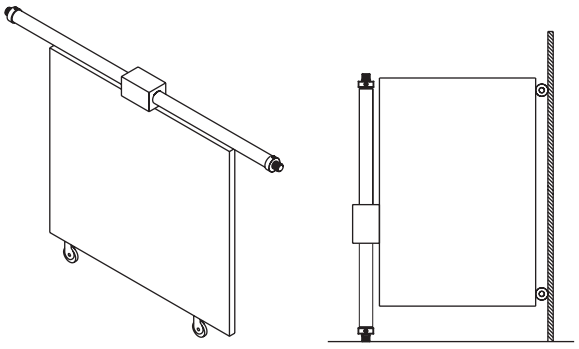
Overall Length Savings



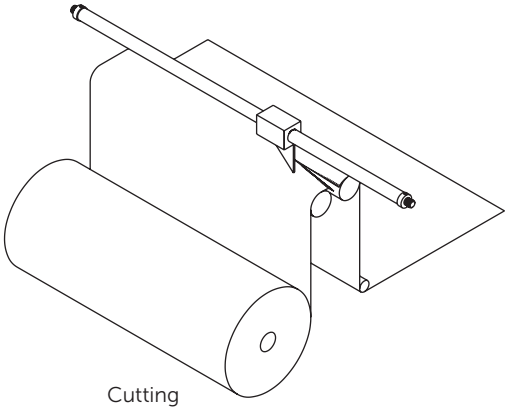
Transferring



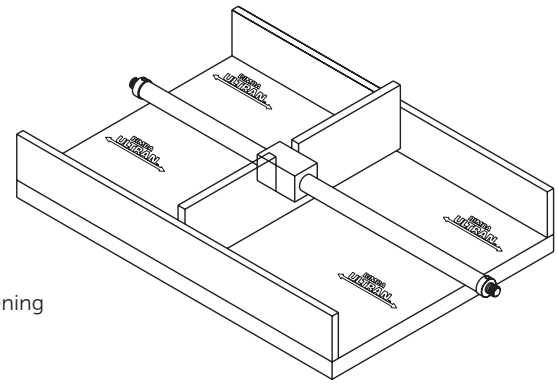
Feeding



Door Opening



Cutting



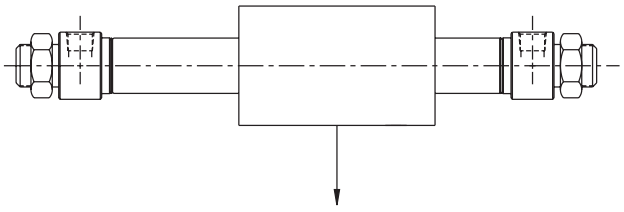
Silk Screening

Size/Application Considerations (Ultran)

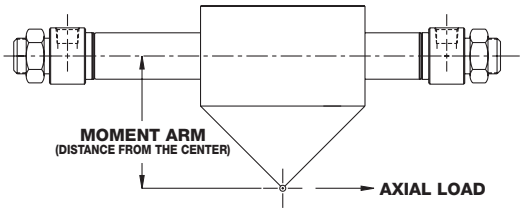
Each bore size of the IMI Bimba Ultran Slide rodless cylinder has specific load carrying capabilities. These capabilities can be enhanced by externally supporting the load or by ordering the internal cushion option or external shock absorbers. The load should always be guided and supported for optimum life. Cushions or shock absorbers will also increase cylinder life when used properly. Use the following procedures to determine the requirements for specific applications.

NOTE: Exceeding the load can cause the carriage and piston to decouple.

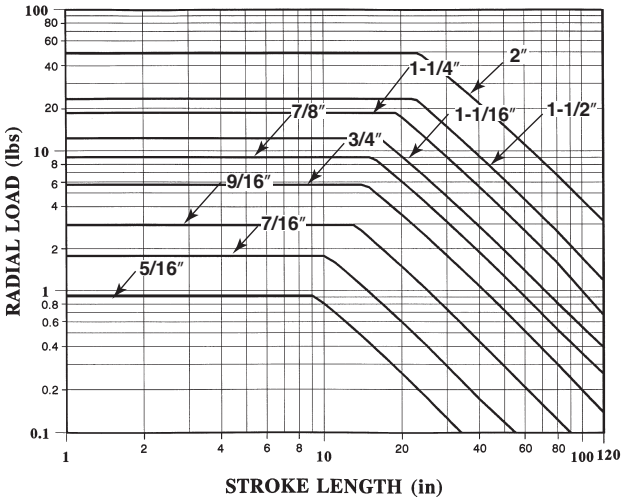
1. **Check radial load requirements.** Graph C, Radial Load vs. Stroke Length, shows the maximum radial load the cylinder will support for a specific bore size and stroke length. If your radial load requirements fall above the curve, the load must be externally supported.
2. **Check axial load requirements.** Graph D, Axial Load vs. Moment Arm, shows the maximum axial load the cylinder will support for a specific bore size and moment arm length. If your axial load requirements fall above the curve for the specific bore size, the load must be externally supported.
3. **Check End-of-Stroke Velocity and Load Requirements.** From Graphs E through H, Velocity vs. Load, choose the graph for your Ultran model and mounting position. If your velocity and load requirements fall above the curve for the specific bore size, you will need internal cushions or external shock absorbers to decelerate the load without causing the carriage and piston to decouple.
4. **Maximum Velocity.** If cylinder speed will exceed 20 in/sec or cycle rate will exceed 15 per minute, special application considerations may be required. Please consult your local distributor.
5. **Internal Cushions.** From Graphs I through L, Velocity vs. Load for Cushions, choose the graph for your Ultran model and mounting position. If your velocity and load requirements fall above the curve for the specific bore size, you will need external shock absorbers to decelerate the load.
6. **External Shock Absorbers.** Choose from Graphs EE through RR (Related Products), Velocity vs. Load for Shock Absorbers, for your bore size. Choose model LS, SS or HS based on your velocity and load.



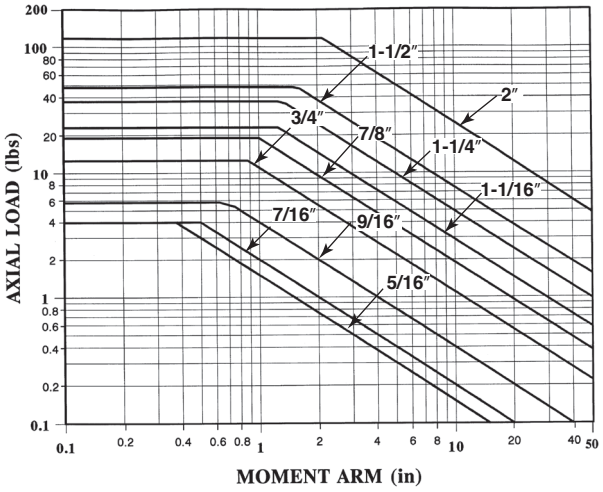
Radial Load



Radial Load Vs Stroke Length*



Axial Load Vs Moment Arm

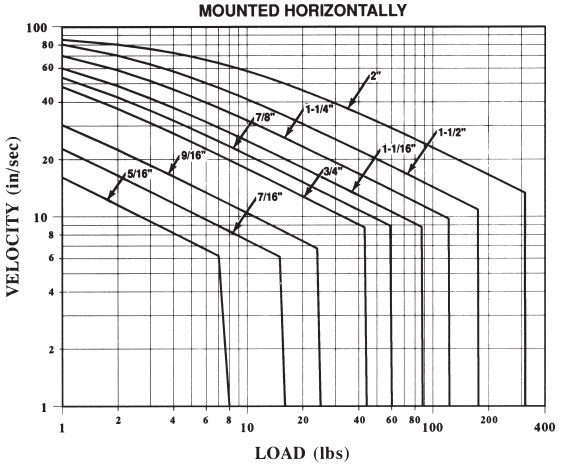


*Stud mount only. Consult factory if pivot mounted.

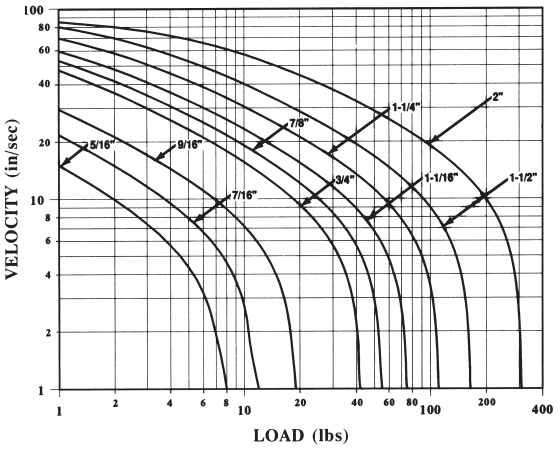
Velocity vs. Load for Basic Ultran Models

NOTE: Velocities in excess of 20 in/sec require application review by IMI Bimba.

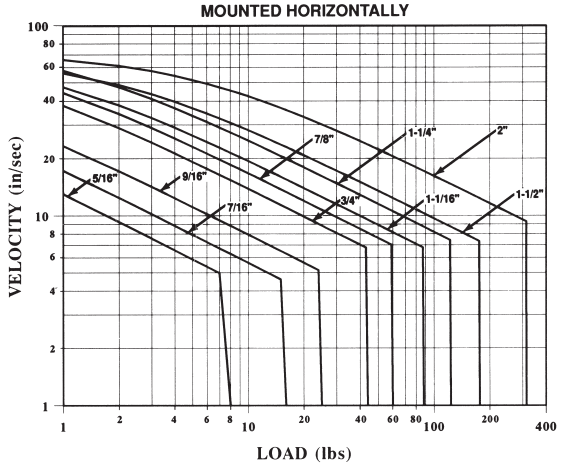
VELOCITY VS LOAD (ULTRAN GOLD)
MOUNTED HORIZONTALLY



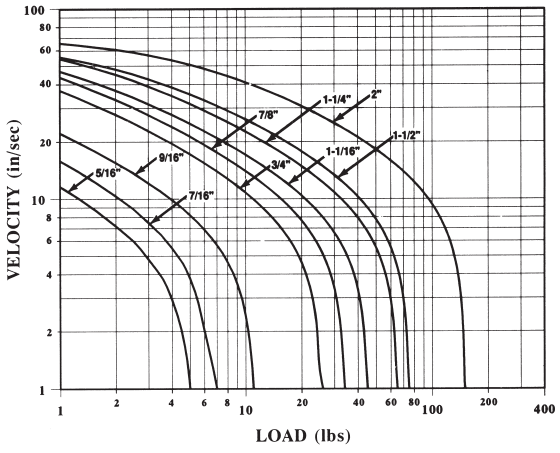
VELOCITY VS LOAD (ULTRAN GOLD)
MOUNTED VERTICALLY



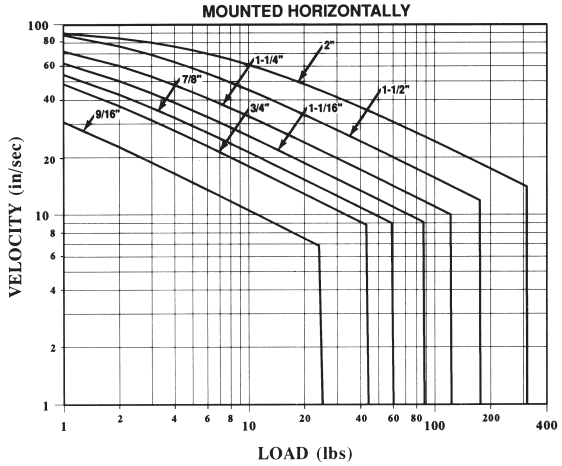
VELOCITY VS LOAD (ULTRAN SILVER)
MOUNTED HORIZONTALLY



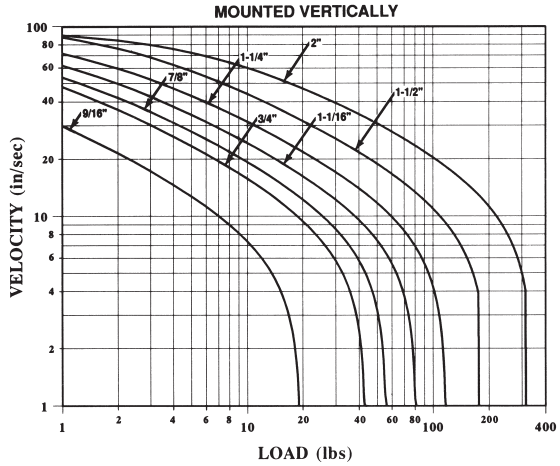
VELOCITY VS LOAD (ULTRAN SILVER)
MOUNTED VERTICALLY



VELOCITY VS LOAD (ULTRAN GOLD WITH CUSHIONS)
MOUNTED HORIZONTALLY

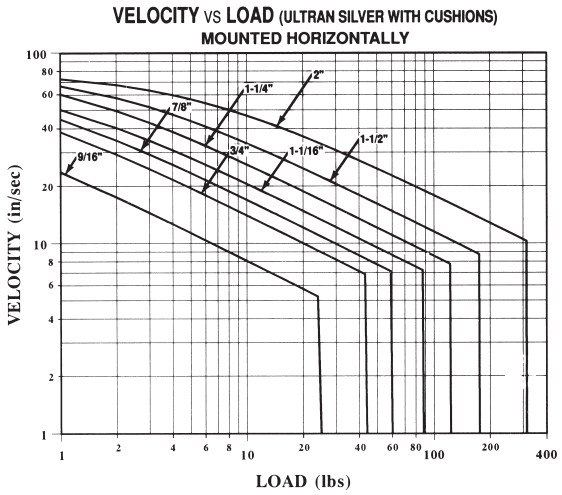


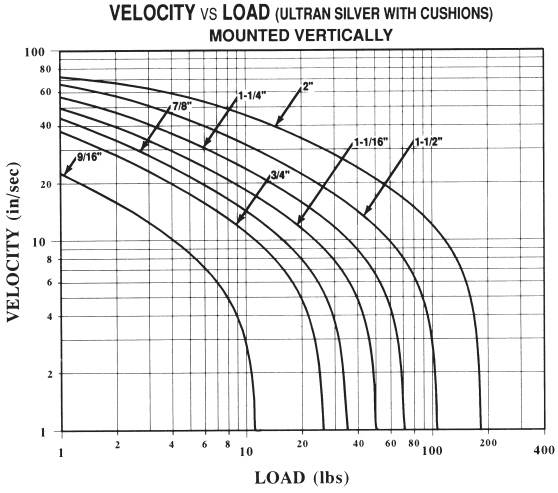
VELOCITY VS LOAD (ULTRAN GOLD WITH CUSHIONS)
MOUNTED VERTICALLY



Velocity vs. Load for Basic Ultran Models

NOTE: Velocities in excess of 20 in/sec require application review by IMI Bimba.





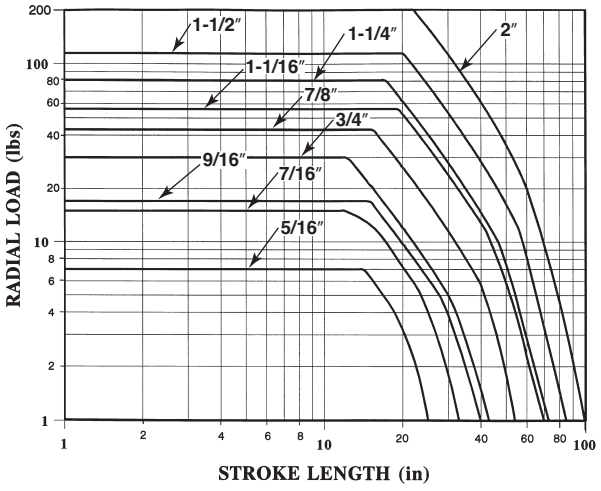
Size/Application Considerations (Ultran Slide)

Each bore size of the IMI Bimba Ultran Slide rodless cylinder has specific load carrying capabilities. These capabilities can be enhanced by ordering external shock absorbers. Shock absorbers will also increase cylinder life when used properly. Use the following procedures to determine the requirements for specific applications.

NOTE: Exceeding the load can cause the carriage and piston to decouple.

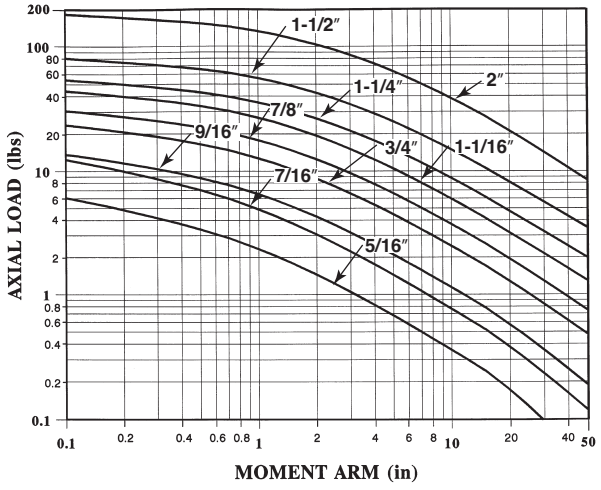
1. **Check side load or radial load requirements.** Graph A, Side Load/ Radial Load vs. Stroke Length, shows the maximum load the cylinder will support for a specific bore size and stroke length.
2. **Check axial load requirements.** Graph B, Axial Load vs. Moment Arm, shows the maximum load the cylinder will support for a specific bore size and stroke length. Use the illustrations and formulas beside the graph to determine the load on the Ultran Slide.
3. **External Shock Absorbers.** If your load requirements fall above the curve for the specific bore size, external shock absorbers may allow you to decelerate the load. Choose from Graphs M through DD - Velocity versus Load for Related Products for your bore size.
4. **Maximum Velocity.** If cylinder speed will exceed 20 in/sec or cycle rate will exceed 15 per minute, special application considerations may be required. Please consult your local distributor.

SIDE/RADIAL LOAD vs STROKE LENGTH



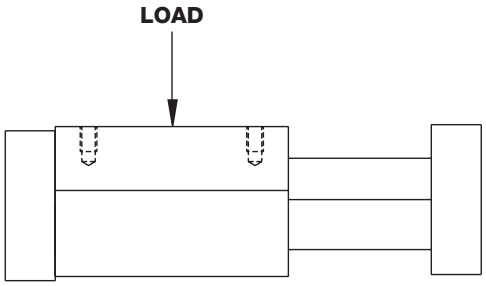
Graph A

AXIAL LOAD vs MOMENT ARM



Graph B

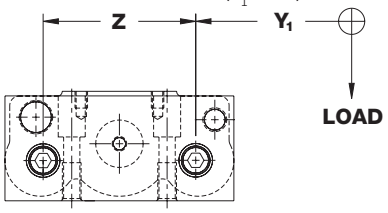
Radial Load



SEE GRAPH A

Side Load

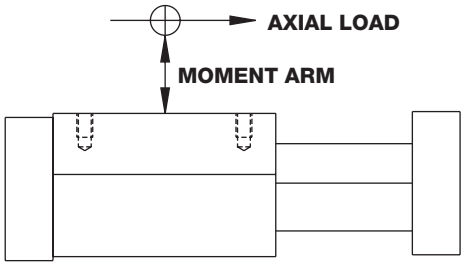
SIDE LOAD = 2 x LOAD (Y_1/Z +1)



SEE GRAPH A

Cylinder Bore	Z
5/16" (007)	1.312
7/16" (01)	1.562
9/16" (02)	2.000
3/4" (04)	2.518
7/8" (06)	2.750
1-1/16" (09)	3.062
1-1/4" (12)	3.500
1-1/2" (17)	4.500
2" (31)	5.750

Axial Load



SEE GRAPH B

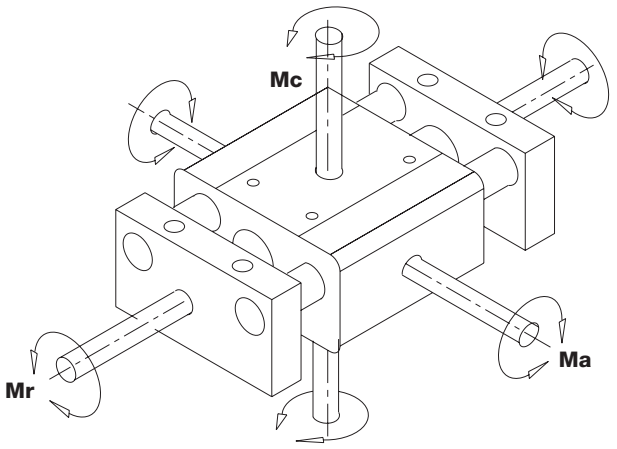
Size/Application Considerations (Ultran Slide)

Moments About the Carriage:

The table below gives the maximum allowable moment an Ultran Slide will support. There are three different directions that the moment can be applied (see Sketch A).

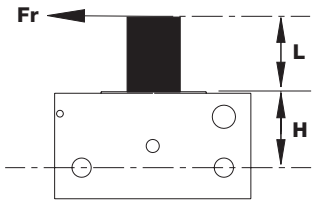
Maximum Allowable Moment (in-lb)

Bore	Radial	Axial	Cross	H
	Mr max.	Ma max.	MC max.	
5/16" (007)	2.3	5.2	5.2	0.625
7/16" (01)	4.9	9.4	9.4	0.656
9/16" (02)	6.6	17.2	17.2	0.906
3/4" (04)	11.1	37.5	37.5	1.168
7/8" (06)	14.3	68.4	68.4	1.374
1-1/16" (09)	19.5	89.1	89.1	1.563
1-1/4" (12)	26.5	160	160	1.937
1-1/2" (17)	40.4	250	250	2.281
2" (31)	67.0	800	800	3.000



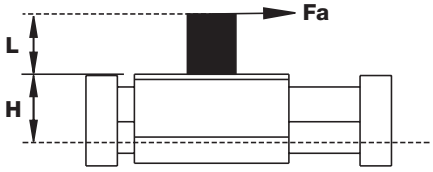
Sketch A

Radial Moment



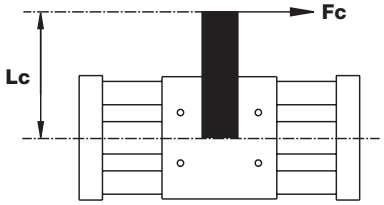
Sketch B

Axial Moment



Sketch C

Cross Moment



Sketch D

Sketches B, C, and D demonstrate how a force is applied to a moment arm to produce the moments shown in Sketch A. Use the equations below to determine the actual moments created by your application. The results of each calculated moment should be compared to the maximums listed in the table. (If the actual moments are greater than the listed maximums, then the load and moments should be evaluated using the next larger Ultran Slide.)

Radial Moment	=	Mr	=	Fr x (L+H)
Axial Moment	=	Ma	=	Fa x (L+H)
Cross Moment	=	Mc	=	Fc x (Lc)

An Ultran Slide can withstand compound moments but the maximum allowable will be determined by the total percentage of the axial, radial and cross moments. The equation below will determine the compound moment percent based on the total moments. The compound moment percent must not be greater than 100. (If the compound moment percent is greater than 100, then the load and moments should be evaluated using the next larger Ultran Slide.)

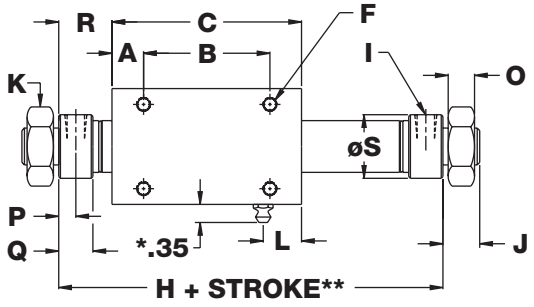
$$M\ compound\ \% = 100 \times \left(\frac{Mr}{Mr\ max} + \frac{Ma}{Ma\ max} + \frac{Mc}{Mc\ max} \right) < \underline{1}00\%$$

Dimensions (Ultran)

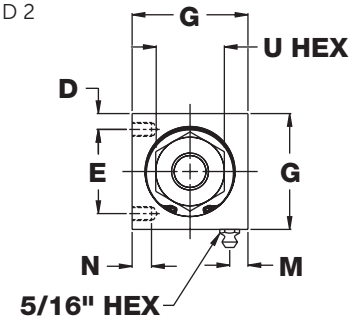
Bore	A	B	C	D	E	F	G	H	I	J
5/16" (007)	0.344	1.062	1.750	0.141	0.469	4-40-UNC	0.750	3.014	10-32	0.368
7/16" (01)	0.344	1.188	1.875	0.125	0.750	6-32 UNC	1.000	3.139	10-32	0.438
9/16" (02)	0.375	1.500	2.250	0.188	1.000	8-32 UNC	1.375	3.514	10-32	0.438
3/4" (04)	0.562	1.750	2.875	0.188	1.375	10-24 UNC	1.750	4.875	1/8 NPT	0.625
7/8" (06)	0.500	2.125	3.125	0.188	1.625	10-24 UNC	2.000	5.125	1/8 NPT	0.625
1-1/16" (09)	0.500	2.500	3.500	0.250	1.750	1/4-20 UNC	2.250	5.500	1/8 NPT	0.625
1-1/4" (12)	0.562	2.750	3.875	0.250	2.125	1/4-20 UNC	2.625	5.875	1/8 NPT	0.875
1-1/2" (17)	0.500	3.500	4.500	0.312	2.500	5/16-18 UNC	3.125	6.500	1/8 NPT	0.875
2" (31)	1.188	5.000	7.375	0.500	3.250	1/2-13 UNC	4.250	10.000	1/4 NPT	1.000

Bore	K	L	M	N	O	P	Q	R	S	U
5/16" (007)	5/16-24 NUT	N/A	N/A	0.125	0.188	0.203	0.406	0.632	0.625	0.500
7/16" (01)	7/16-20 NUT	0.395	0.312	0.125	0.250	0.203	0.406	0.632	0.704	0.688
9/16" (02)	7/16-20 NUT	0.455	0.312	0.220	0.250	0.203	0.406	0.632	0.755	0.688
3/4" (04)	5/8-18 NUT	0.572	0.375	0.312	0.375	0.315	0.630	1.000	0.985	0.938
7/8" (06)	5/8-18 NUT	0.635	0.375	0.375	0.375	0.315	0.630	1.000	1.110	0.938
1-1/16" (09)	5/8-18 NUT	0.706	0.500	0.375	0.375	0.315	0.630	1.000	1.297	0.938
1-1/4" (12)	3/4-16 NUT	0.750	0.375	0.500	0.420	0.315	0.630	1.000	1.545	1.125
1-1/2" (17)	3/4-16 NUT	0.756	0.750	0.520	0.420	0.315	0.630	1.000	1.735	1.125
2" (31)	1-1/4-12 NUT	1.500	0.750	0.750	0.500	0.438	0.875	1.312	2.312	1.875

END 1



END 2



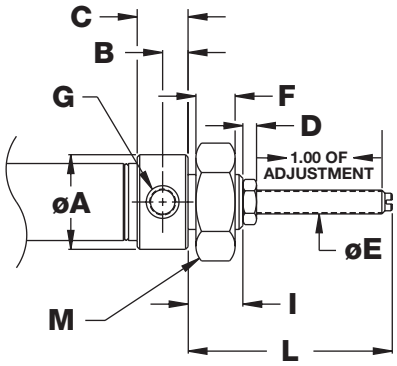
*Grease fitting on 2" bore is recessed.

**See page 395 for option length adders.

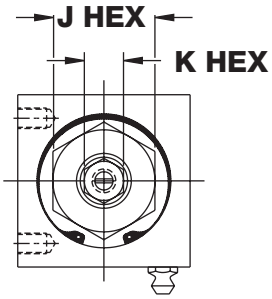
Stroke Adjustment (Ultran)

Stroke Adjustment Dimensions (in)

Bore	A	B	C	D	E	F
5/16" (007)	0.625	0.203	0.406	0.094	6-40 UNF	0.188
7/16" (01)	0.704	0.203	0.406	0.109	10-32 UNF	0.250
9/16" (02)	0.755	0.203	0.406	0.109	10-32 UNF	0.250
3/4" (04)	0.985	0.315	0.630	0.156	1/4-28 UNF	0.375
7/8" (06)	1.110	0.315	0.630	0.188	5/16-24 UNF	0.375
1-1/16" (09)	1.297	0.315	0.630	0.188	5/16-24 UNF	0.375
1-1/4" (12)	1.545	0.315	0.630	0.220	3/8-24 UNF	0.420
1-1/2" (17)	1.735	0.315	0.630	0.220	3/8-24 UNF	0.420
2" (31)	2.312	0.438	0.875	0.250	7/16-20 UNF	0.500



Bore	G	I	J	K	L	M
5/16" (007)	10-32	0.368	0.500	0.188	1.795	5/16-24 NUT
7/16" (01)	10-32	0.438	0.688	0.313	1.469	7/16-20 NUT
9/16" (02)	10-32	0.438	0.688	0.313	1.469	7/16-20 NUT
3/4" (04)	1/8-NPT	0.625	0.938	0.438	1.905	5/8-18 NUT
7/8" (06)	1/8-NPT	0.625	0.938	0.438	1.943	5/8-18 NUT
1-1/16" (09)	1/8-NPT	0.625	0.938	0.438	1.943	5/8-18 NUT
1-1/4" (12)	1/8-NPT	0.875	1.125	0.563	2.115	3/4-16 NUT
1-1/2" (17)	1/8-NPT	0.875	1.125	0.563	2.115	3/4-16 NUT
2" (31)	1/4-NPT	1.000	1.875	0.688	2.278	1-1/4-12 NUT



Stroke Adjustment Length Adder (in)

Bore	5/16" (007)	7/16" (01)	9/16" (02)	3/4" (04)	7/8" (06)	1-1/16" (09)	1-1/4" (12)	1-1/2" (17)	2" (31)
Add to overall length: (per end)	0.044	0.060	0.060	0.060	0.080	0.080	0.110	0.110	0.120

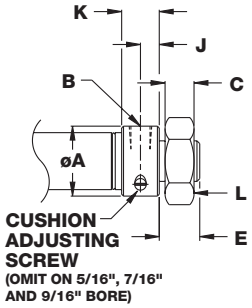
Bumper Length Adder (in)

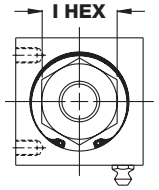
Bore	5/16" (007)	7/16" (01)	9/16" (02)	3/4" (04)	7/8" (06)	1-1/16" (09)	1-1/4" (12)	1-1/2" (17)	2" (31)
Add to overall length: (per end)	0.095	0.120	0.120	0.140	0.140	0.150	0.150	0.150	0.200

Cushions (in)

Bore	A	B	C	E	I	J	K	L
9/16" (02)	0.755	10-32	0.250	0.438	0.688	0.203	0.406	7/16-20 NUT
3/4" (04)	0.985	1/8 NPT	0.375	0.625	0.938	0.315	0.630	5/8-18 NUT
7/8" (06)	1.110	1/8 NPT	0.375	0.625	0.938	0.315	0.630	5/8-18 NUT
1-1/16" (09)	1.297	1/8 NPT	0.375	0.625	0.938	0.315	0.630	5/8-18 NUT
1-1/4" (12)	1.545	1/8 NPT	0.420	0.875	1.125	0.315	0.630	3/4-16 NUT
1-1/2" (17)	1.735	1/8 NPT	0.420	0.875	1.125	0.315	0.630	3/4-16 NUT
2" (31)	2.312	1/4 NPT	0.500	1.000	1.875	0.438	0.875	1-1/4-12 NUT

NOTE: There is no length adder for the cushion option. Cushion option not available for 5/16" and 7/16" bores.

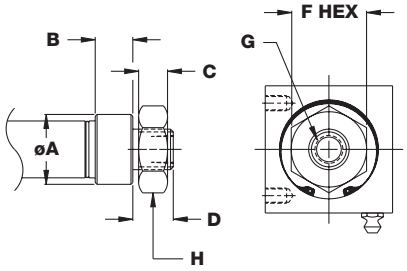




Axial Ports (in) (Ultran)

Bore	A	B	C	D	F	G	H
5/16" (007)	0.625	0.406	0.188	0.368	0.500	10-32	5/16-24 NUT
7/16" (01)	0.704	0.406	0.250	0.438	0.688	10-32	7/16-20 NUT
9/16" (02)	0.755	0.406	0.250	0.438	0.688	10-32	7/16-20 NUT
3/4" (04)	0.985	0.630	0.375	0.625	0.938	1/8 NPT	5/8-18 NUT
7/8" (06)	1.110	0.630	0.375	0.625	0.938	1/8 NPT	5/8-18 NUT
1-1/16" (09)	1.297	0.630	0.375	0.625	0.938	1/8 NPT	5/8-18 NUT
1-1/4" (12)	1.545	0.630	0.420	0.875	1.125	1/8 NPT	3/4-16 NUT
1-1/2" (17)	1.735	0.630	0.420	0.875	1.125	1/8 NPT	3/4-16 NUT
2" (31)	2.312	0.875	0.500	1.000	1.875	1/4 NPT	1-1/4-12 NUT

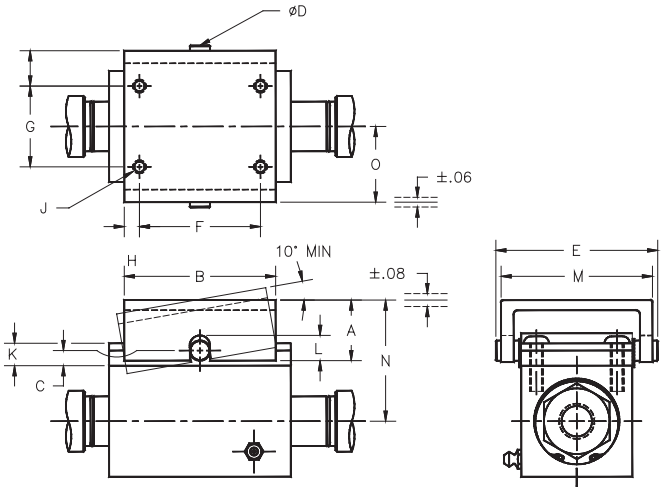
NOTE: There is no length adder for the Axial port option.



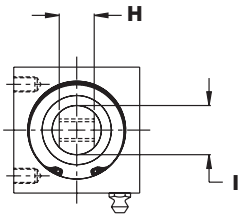
Floating Mount Bracket (in) (Ultran)

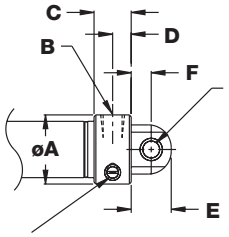
Bore	A	B	C	D	E	F	G	H	I	J	K
5/16" (007)	0.532	1.438	0.188	0.187	1.317	1.062	0.469	0.188	0.360	4-40 UNC	0.236
7/16" (01)	0.625	1.688	0.188	0.249	1.646	1.188	0.750	0.250	0.383	6-32 UNC	0.248
9/16" (02)	0.750	1.875	0.188	0.249	2.005	1.500	1.000	0.188	0.437	8-32 UNC	0.278
3/4" (04)	0.875	2.375	0.250	0.312	2.442	1.750	1.375	0.312	0.459	10-24 UNC	0.340
7/8" (06)	0.938	2.750	0.312	0.374	2.849	2.125	1.625	0.312	0.547	10-24 UNC	0.421
1-1/16" (09)	1.062	3.000	0.312	0.374	3.068	2.500	1.750	0.250	0.594	1/4-20 UNC	0.421
1-1/4" (12)	1.125	3.562	0.375	0.437	3.599	2.750	2.125	0.406	0.672	1/4-20 UNC	0.484
1-1/2" (17)	1.188	4.250	0.375	0.437	4.068	3.500	2.500	0.375	0.719	5/16-18 UNC	0.484
2" (31)	1.938	6.500	0.500	0.624	6.000	5.000	3.250	0.750	1.250	1/2-13 UNC	0.634

Bore	L	M	N	O
5/16" (007)	0.250	1.188	1.019	0.594
7/16" (01)	0.312	1.516	1.206	0.758
9/16" (02)	0.312	1.875	1.518	0.938
3/4" (04)	0.375	2.312	1.861	1.156
7/8" (06)	0.438	2.719	2.080	1.359
1-1/16" (09)	0.438	2.937	2.330	1.469
1-1/4" (12)	0.500	3.469	2.612	1.734
1-1/2" (17)	0.500	3.937	2.924	1.969
2" (31)	0.688	5.750	4.268	2.875



Pivot Option (in) (Ultran)



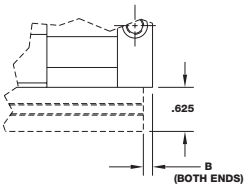


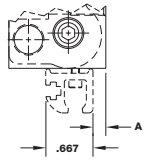
Cushion Option Only Cushion Adjustment Screw Location For 04, 06, 09, 12, 17, And 31 Bores

Bore	A	B	C	D	E	F	G	H	I
5/16" (007)	0.625	10-32	0.406	0.203	0.368	0.212	0.127	0.243	0.375
7/16" (01)	0.704	10-32	0.406	0.203	0.437	0.250	0.157	0.305	0.500
9/16" (02)	0.755	10-32	0.406	0.203	0.437	0.250	0.157	0.305	0.500
3/4" (04)	0.985	1/8-NPT	0.630	0.315	0.625	0.344	0.253	0.368	0.750
7/8" (06)	1.110	1/8-NPT	0.630	0.315	0.625	0.344	0.253	0.368	0.750
1-1/16" (09)	1.297	1/8-NPT	0.630	0.315	0.625	0.344	0.253	0.368	0.875
1-1/4" (12)	1.545	1/8-NPT	0.630	0.315	0.875	0.500	0.378	0.493	1.000
1-1/2" (17)	1.735	1/8-NPT	0.630	0.315	0.875	0.500	0.378	0.493	1.125
2" (31)	2.312	1/4-NPT	0.876	0.438	1.000	0.500	0.439	0.868	1.375

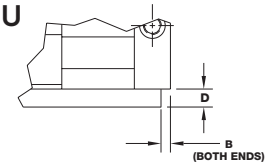
Switch Track for Miniature Switches (Ultran Slide)

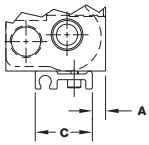
Option T





Option U

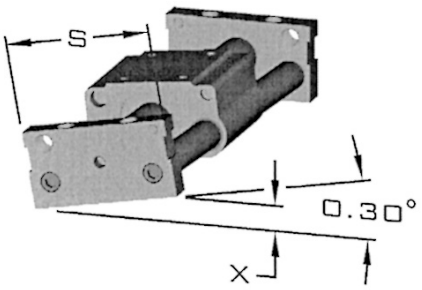




Bore	A	B	C	D
5/16" (007)	0.000	0.024	0.787	0.299
7/16" (01)	0.000	0.023	0.787	0.248
9/16" (02)	0.188	0.625	0.787	0.248
3/4" (04)	0.563	0.125	0.787	0.248
7/8" (06)	0.784	0.117	0.787	0.248
1-1/16" (09)	1.125	0.125	0.655	0.367
1-1/4" (12)	1.250	0.242	0.655	0.367
1-1/2" (17)	1.500	0.250	0.655	0.367
2" (31)	2.596	0.492	0.655	0.367

Ultran Slide Mounting Instructions (Ultran Slide)

Improper mounting of the Ultran slide could result in binding and/or excess breakaway. As a rule of thumb, the end blocks should be mounted flat with no more than 0.30° of differential misalignment end-to-end (including both end blocks, i.e., 0.30° on one end block if other end block is square. If both end blocks are out of square, the total between them cannot exceed 0.30°. The x dimension represents how much displacement 0.30° represents using 0.0175" per inch per degree of misalignment.)



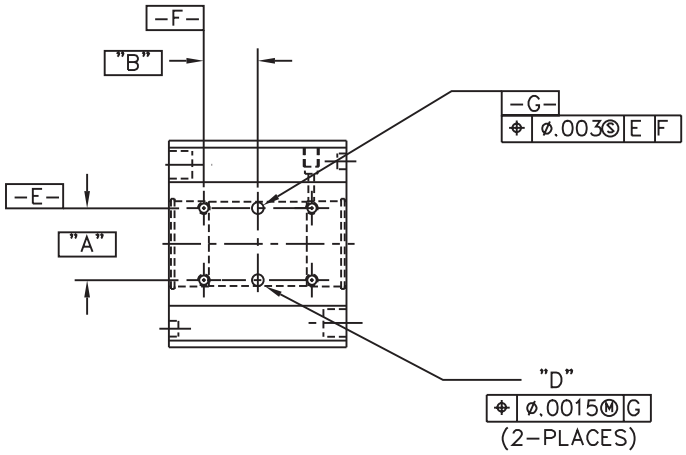
The following table shows the S dimension (End Block width dimension as found in the catalog) for all bore sizes:

Model	S in (mm)	x in (mm)
007 (5/16" Bore)	2.000 (50.8)	0.010 (0.25)
01 (7/16" Bore)	2.312 (58.7)	0.012 (0.30)
02 (9/16" Bore)	3.000 (76.2)	0.016 (0.40)
04 (3/4" Bore)	3.375 (85.7)	0.018 (0.46)
06 (7/8" Bore)	3.750 (95.3)	0.020 (0.51)
09 (1-1/16" Bore)	4.250 (108.0)	0.022 (0.56)
12 (1-1/4" Bore)	4.812 (122.2)	0.025 (0.64)
17 (1-1/2" Bore)	6.000 (152.4)	0.031 (0.79)
31 (2" Bore)	8.000 (203.2)	0.042 (1.07)

For example:

- A Model 007 (5/16" Bore) has a S dimension of 2.00". 0.30° of misalignment would yield approximately 0.010" of differential misalignment from end-to-end before binding and/or excess breakaway would occur.
- A Model 17 (1-1/2" Bore) has a S dimension of 6.00". 0.30° of misalignment would yield approximately 0.031" of differential misalignment from end-to-end before binding and/or excess breakaway would occur.

Dowel Pin Hole Locations



Bore	A	B	D
020 (9/16")	1.000	.750	.1270/.1280 x .240/.260 DP.
040 (3/4")	1.375	.876	.1895/.1905 x .410/.430 DP.
090 (1-1/16")	1.750	1.250	.2520/.2530 x .410/.430 DP.
170 (1-1/2")	2.500	1.750	.3145/.3155 x .560/.580 DP.

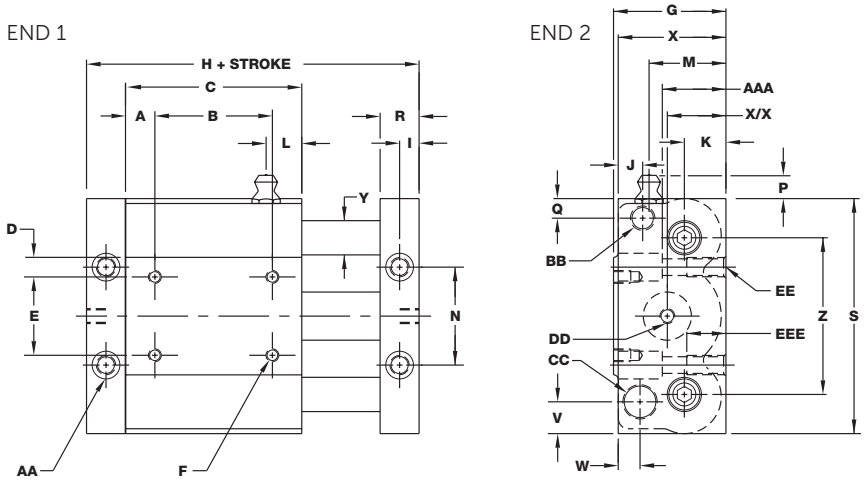
Dimensions (Ultran Slide)

Bore	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P
5/16" (007)	0.344	1.062	1.750	0.141	0.469	4-40-UNC	1.062	2.750	0.250	0.188	0.438	N/A	N/A	0.750	N/A
7/16" (01)	0.344	1.188	1.875	0.125	0.750	6-32 UNC	1.062	2.875	0.250	0.188	0.406	0.395	0.788	0.938	0.288
9/16" (02)	0.375	1.500	2.250	0.250	1.000	8-32 UNC	1.438	3.250	0.250	0.312	0.531	0.455	0.982	1.250	0.297
3/4" (04)	0.562	1.750	2.875	0.312	1.375	10-24 UNC	1.832	4.125	0.312	0.312	0.664	0.572	1.239	1.625	0.234
7/8" (06)	0.500	2.125	3.125	0.188	1.625	10-24 UNC	2.062	4.625	0.375	0.375	0.688	0.635	1.438	1.625	0.225
1-1/16" (09)	0.500	2.500	3.500	0.375	1.750	1/4-20 UNC	2.313	5.000	0.375	0.250	0.750	0.706	1.549	1.875	0.172
1-1/4" (12)	0.562	2.750	3.875	0.318	2.125	1/4-20 UNC	2.687	5.875	0.500	0.500	0.750	0.750	1.562	2.125	0.162
1-1/2" (17)	0.500	3.500	4.500	0.500	2.500	5/16-18 UNC	3.188	6.500	0.500	0.750	0.906	0.756	1.736	2.500	0.109
2" (31)	1.188	5.000	7.375	0.500	3.250	1/2-13 UNC	4.312	10.375	0.750	0.813	1.312	1.500	2.688	3.250	0.000

Bore	Q	R	S	V	W	X	X/X	Y	Z	AA	BB	CC	DD
5/16" (007)	0.188	0.500	2.000	0.215	0.215	1.000	0.562	0.312	1.312	#6	5/16-24 UNF	3/8-32 UNEF	10-32
7/16" (01)	0.219	0.500	2.312	0.218	0.220	1.000	0.562	0.375	1.562	#10	5/16-24 UNF	3/8-32 UNEF	10-32
9/16" (02)	0.250	0.500	3.000	0.406	0.281	1.375	0.749	0.438	2.000	#10	5/16-24 UNF	7/16-28 UNEF	10-32
3/4" (04)	0.313	0.625	3.375	0.406	0.313	1.750	0.957	0.500	2.518	1/4	5/16-24 UNF	7/16-28 UNEF	1/8 NPT
7/8" (06)	0.313	0.750	3.750	0.500	0.438	2.000	1.063	0.625	2.750	1/4	5/16-24 UNF	1/2-20 UNF	1/8 NPT
1-1/16" (09)	0.375	0.750	4.250	0.594	0.375	2.250	1.188	0.750	3.062	5/16	5/16-24 UNF	1/2-20 UNF	1/8 NPT
1-1/4" (12)	0.375	1.000	4.812	0.656	0.562	2.625	1.375	0.812	3.500	5/16	5/16-24 UNF	3/4-16 UNF	1/8 NPT
1-1/2" (17)	0.438	1.000	6.000	1.000	0.906	3.125	1.625	1.000	4.500	3/8	5/16-24 UNF	3/4-16 UNF	1/8 NPT
2" (31)	0.250	1.500	8.000	1.125	0.938	4.250	2.188	1.500	5.750	3/4	5/16-24 UNF	1-12 UNF	1/4 NPT

Bore	EE	AAA	EEE
5/16" (007)	10-32 UNF	0.750	0.315
7/16" (01)	1/4-28 UNF	0.750	0.322
9/16" (02)	1/4-28 UNF	0.750	0.500
3/4" (04)	5/16-24 UNF	1.080	0.625
7/8" (06)	5/16-24 UNF	1.375	0.625
1-1/16" (09)	3/8-24 UNF	1.375	0.750
1-1/4" (12)	3/8-24 UNF	1.750	0.750
1-1/2" (17)	7/16-20 UNF	1.750	0.750
2" (31)	7/8-9 UNC	3.125	1.000

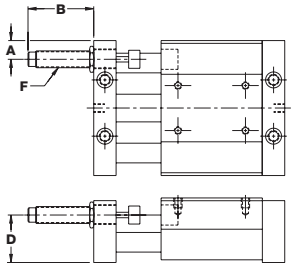
NOTE: H+ stroke tolerance for stroke lengths less than 42" is +/- 0.032". For stroke lengths greater than 42" the tolerance is +0.104/-0.047".



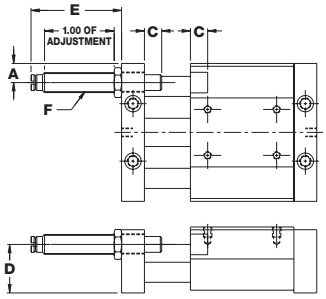
Shock Absorber/Stroke Adjustment (in) (Ultran Slide)

Bore	A	B	C	D	E	F
5/16" (007)	0.215	0.750	0.000	0.785	1.093	3/8-32 UNEF
7/16" (01)	0.218	0.750	0.000	0.780	1.093	3/8-32 UNEF
9/16" (02)	0.406	1.460	0.375	1.094	1.594	7/16-28 UNEF
3/4" (04)	0.406	1.335	0.375	1.438	1.469	7/16-28 UNEF
7/8" (06)	0.500	2.490	0.375	1.562	1.438	1/2-20 UNF
1-1/16" (09)	0.594	2.490	0.375	1.875	1.438	1/2-20 UNF
1-1/4" (12)	0.656	2.890	0.500	2.062	1.500	3/4-16 UNF
1-1/2" (17)	1.000	2.890	0.562	2.219	1.438	3/4-16 UNF
2" (31)	1.125	3.500	0.562	3.312	1.563	1-12 UNF

Shock Absorber



Stroke Adjustment

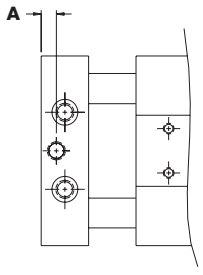


NOTE: Do not let the shock absorbers bottom out. The shock should not be used as a stroke adjuster. A stop collar is needed for the shock if stroke adjustment is required.

Cylinder Bore Size	Shock Absorbers			Stroke Adjustment	*Stop Collar
	Model			Model	Model
	Light	Standard	Heavy		
5/16" (007)	LS-02	SS-02	HS-02	USA-01	N/A
7/16" (01)					
9/16" (02)	LS-04	SS-04	HS-04	USA-02	USC-04
3/4" (04)				USA-04	
7/8" (06)	LS-09	SS-09	HS-09	USA-09	USC-09
1-1/16" (09)					
1-1/4" (12)	LS-17	SS-17	HS-17	USA-17	USC-17
1-1/2" (17)					
2" (31)	LS-31	SS-31	HS-31	USA-31	USC-31

*The Ultran Slide Cylinder needs to be increased by the B dimension in order to maintain intended stroke length. The overall length increases by the same amount. The A dimension indicates maximum amount of stroke adjustment attainable. See Related Products section for dimensions.

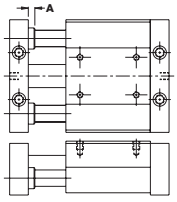
Alternate Port (in.)



Bore	A
5/16" (007)	0.162
7/16" (01)	0.150
9/16" (02)	0.162
3/4" (04)	0.188
7/8" (06)	0.312
1-1/16" (09)	0.312
1-1/4" (12)	0.500
1-1/2" (17)	0.500
2" (31)	0.750

NOTE: 3/4" port size is 10-32, all other sizes are same as standard.

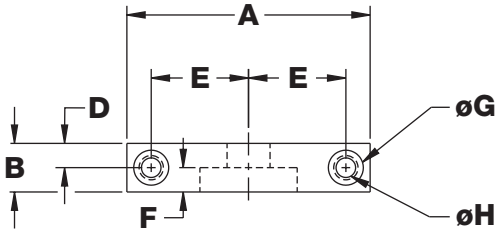
Bumper Adder (per end) (in.)

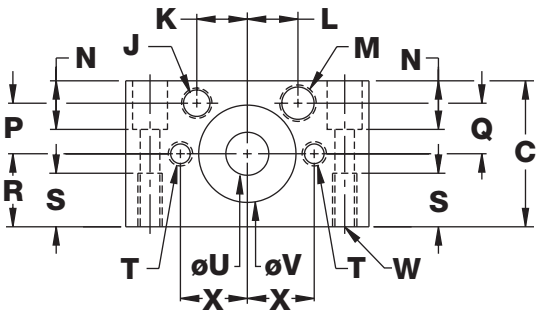


Bore	A
5/16" (007)	0.157
7/16" (01)	0.157
9/16" (02)	0.281
3/4" (04)	0.281
7/8" (06)	0.312
1-1/16" (09)	0.312
1-1/4" (12)	0.312
1-1/2" (17)	0.312
2" (31)	0.312

NOTE: Internal bumpers reach full compression at 80 PSI. External bumpers will not contact carriage until internal bumpers are fully compressed.

Mounting Block (in)



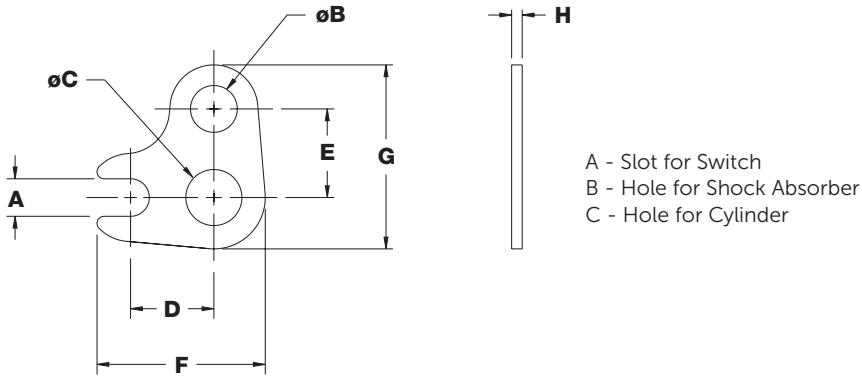


J - Hole for Switch
M - Hole for Shock Absorber

Bore	Model	A	B	C	D	E	F	G	H	J	K	L
5/16" (007)	MB-007	2.000	0.375	0.875	0.188	0.813	0.250	0.272	0.159	5/16-24 UNF	0.500	N/A
7/16" (01)	MB-01	2.500	0.500	1.125	0.250	0.938	0.250	0.357	0.213	5/16-24 UNF	0.562	N/A
9/16" (02)	MB-02	2.500	0.500	1.500	0.250	1.000	0.250	0.354	0.213	5/16-24 UNF	0.520	0.520
3/4" (04)	MB-04	3.500	0.750	1.875	0.375	1.312	0.375	0.422	0.272	5/16-24 UNF	0.671	0.671
7/8" (06)	MB-06	3.500	0.750	2.125	0.375	1.375	0.375	0.422	0.273	5/16-24 UNF	0.789	0.789
1-1/16" (09)	MB-09	4.000	0.750	2.500	0.375	1.563	0.375	0.515	0.332	5/16-24 UNF	0.893	0.893
1-1/4" (12)	MB-12	5.000	1.000	2.875	0.500	2.000	0.443	0.609	0.391	5/16-24 UNF	1.062	1.016
1-1/2" (17)	MB-17	5.000	1.000	3.375	0.500	2.000	0.443	0.609	0.391	5/16-24 UNF	1.240	1.240
2" (31)	MB-31	8.500	1.500	4.500	0.750	3.250	1.000	1.187	0.779	5/16-24 UNF	1.625	1.607

Bore	Model	M	N	P	Q	R	S	T	U	V	W	X
5/16" (007)	MB-007	N/A	0.312	0.250	N/A	0.438	0.315	6-40 UNF	0.318	0.776	6-40 UNF	0.594
7/16" (01)	MB-01	N/A	0.380	0.375	N/A	0.563	0.380	1/4-28 UNF	0.442	0.995	1/4-28 UNF	0.688
9/16" (02)	MB-02	3/8-32 UNEF	0.500	0.520	0.520	0.750	0.500	1/4-28 UNF	0.442	1.000	1/4-28 UNF	0.688
3/4" (04)	MB-04	7/16-28 UNEF	0.625	0.671	0.671	0.938	0.500	5/16-24 UNF	0.629	1.375	5/16-24 UNF	0.938
7/8" (06)	MB-06	1/2-20 UNF	0.625	0.789	0.789	1.063	0.750	5/16-24 UNF	0.629	1.375	5/16-24 UNF	0.938
1-1/16" (09)	MB-09	1/2-20 UNF	0.875	0.893	0.893	1.250	0.750	3/8-24 UNF	0.629	1.375	3/8-24 UNF	1.125
1-1/4" (12)	MB-12	3/4-16 UNF	1.125	1.062	1.016	1.438	1.125	7/16-20 UNF	0.754	1.625	7/16-20 UNF	1.375
1-1/2" (17)	MB-17	3/4-16 UNF	1.375	1.240	1.240	1.688	1.000	7/16-20 UNF	0.753	1.625	7/16-20 UNF	1.375
2" (31)	MB-31	1-12 UNF	1.625	1.625	1.607	2.250	1.500	7/8-9 UNC	1.380	2.750	7/8-9 UNC	2.125

Shock Absorber/Switch Bracket (For 9/16" bore and larger only) (Ultran)



Bore	Model	A	B	C	D	E	F	G	H
9/16" (02)	BU-02	0.320	0.399	0.442	0.710	0.755	1.433	1.568	0.090
3/4" (04)	BU-04	0.320	0.478	0.629	0.910	0.900	1.820	1.900	0.120
7/8" (06)	BU-06	0.320	0.556	0.629	0.875	1.116	1.785	2.179	0.120
1-1/16" (09)	BU-09	0.320	0.556	0.629	0.910	1.047	1.820	2.110	0.120
1-1/4" (12)	BU-12	0.320	0.793	0.754	0.375	1.437	2.410	2.812	0.120
1-1/2" (17)	BU-17	0.320	0.793	0.754	1.450	1.453	2.485	2.828	0.120
2" (31)	BU-31	0.320	1.005	1.254	2.230	2.290	3.640	4.165	0.224

Ultran

The model number of Ultran rodless cylinders consists of an alphanumeric cluster designating product type, bore size, stroke length, and other optional components that together make up the complete part number to use in ordering. Use the ordering information below to build a valid part number.

An example of a basic Ultran unit with Silver coupling strength, 1-1/2" bore, 66.375" stroke, and additional options is shown below.

US - 17 66.375 - A1B1F

Model	
UG	Ultran Rodless, Gold coupling strength
US	Ultran Rodless, Silver coupling strength*

* Specify silver coupling strengths for lower breakaway application requirements. Use caution as decoupling can occur at pressures less than 100 PSI. Refer to the engineering specifications on page 387 for details.

Bore Size	
007	5/16"
01	7/16"
02	9/16"
04	3/4"
06	7/8"
09	1-1/16"
12	1-1/4"
17	1-1/2"
31	2"

Stroke Length	
Standard	**Maximum**
1/4" - 30" (007)	30"
1/4" - 40" (01)	50"
1/4" - 40" (02)	90"
1/4" - 80" (04)	120"
1/4" - 80" (06)	120"
1/4" - 80" (09)	120"
1/4" - 80" (12)	120"
1/4" - 80" (17)	120"
1/4" - 80" (31)	100"

Options	
A	Stroke adjustment (both ends)
A1	Stroke adjustment (end 1)
A2	Stroke adjustment (end 2)
B	Bumpers (both ends)
B1	Bumpers (end 1)[1]
B2	Bumpers (e nd 2)
C	Cushions (both ends)*[2]
C1	Cushions (end 1)
C2	Cushions (end 2)
F	Floating Mount Bracket [3]
K	Pivot (both ends)
K1	Pivot (end 1)
K2	Pivot (end 2)
P	Axial ports (both ends)
P1	Axial port (end 1)
P2	Axial port (end 2)
S	Seals - oil service (low pressure hydraulic service)

[1] 80 PSI required to reach full stroke due to bumper compression.

[2] Not available for 5/16" and 7/16" bores. 9/16" bore has fixed cushions, other sizes have adjustable cushions.

[3] For use when application requirements dictate a non-parallel or floating interface with the Ultran carriage to prevent binding between the Ultran and external guiding systems. Refer to page 396 for dimensions.

The 9/16" bore fixed cushion operates like an air spring. A small amount of air is trapped behind the piston to help slow it down. Since there is no air bleed-off, this air will remain trapped behind the piston until the cylinder is cycled. A minimum of 40 psi is needed to move the cylinder to full stroke. If air pressure is removed from the front side of the piston, the trapped air will act like a spring and move the piston away from the end cap about 3/16 of an inch.

Combination Availability

	A	B	C	F	K	P	S
5/16"(007) 7/16"(01)	B,F,S	A,F,K,P	N/A	A,B,K,P,S	B,F,S	B,F,S	A,F,K,P
All other sizes	B,F,S	A,F,K,P	F,K	A,B,C,K,P,S	B,C,F,S	B,F,S	A,F,K,P

Location

See diagram on page 394 for location of End 1 and End 2. Incompatible options cannot be ordered on the same end (see combination availability chart above).

Ultran Slide

The model number of Ultran Slide cylinders consists of an alphanumeric cluster designating product type, bore size, stroke length, and other optional components that together make up the complete part number to use in ordering. Use the ordering information below to build a valid part number.

An example of a basic Ultran Slide unit with 1-1/2" bore, 23.375" stroke, and additional options is shown below.

UGS - 17 23.375 - A1T

Model	
UGS	Ultran Slide, Gold coupling strength
USS	Ultran Slide, Silver coupling strength

Bore Size	
007	5/16"
01	7/16"
02	9/16"
04	3/4"
06	7/8"
09	1-1/16"
12	1-1/4"
17	1-1/2"
31	2"

Stroke Length	
Standard	**Maximum**
1/4" - 15" (007)	25"
1/4" - 20" (01)	30"
1/4" - 30" (02)	40"
1/4" - 30" (04)	40"
1/4" - 40" (06)	50"
1/4" - 60" (09)	70"
1/4" - 60" (12)	70"
1/4" - 60" (17)	85"
1/4" - 60" (31)	100"

Options	
A	Stroke adjustment (both ends)
A1	Stroke adjustment (end 1)
A2	Stroke adjustment (end 2)
B	Bumpers (both ends)1
B1	Bumpers (end 1)
B2	Bumpers (end 2)
D	Dowel pin holes for Transition Plates [2]
L	Remove guide rod wipers in 3/4"-2" bores
S	Seals - oil service (low pressure hydraulic service)
T	Switch track
U	Switch track for miniature switch
Y	Alternate port (both ends)
Y1	Alternate port (end 1)
Y2	Alternate port (end 2)

[1] Increases overall dimension. Internal bumpers reach full compression at 80 PSI. External bumpers will not contact carriage until internal bumpers are fully compressed.

[2] Transition Plate Applications: Option -D must be ordered if dowel pin holes are required. Not available on all bore sizes. Refer to Related Products/Transition Plates for details. Hole locations shown in Related Products/Appendix.

Combination Availability

	A	B	D	S	T, U	Y
For all sizes	D,S,T,Y	D,T,Y	A,B,D,S,T,Y	A,D,T,Y	A,B,D,S,Y	A,B,D,S,T

NOTE: Option -A can be ordered with option -B if they are ordered on different ends, i.e., A1B2 or A2B1.

Location

See diagram on page 399 for location of End 1 and End 2.

Basic Repair Kits (Ultran Slide)

IMI Bimba recommends that the Ultran Slide be returned to the factory for repairs. However, the following parts and kits are available for the Ultran Slide rodless cylinder.

Part	Cylinder Bore Size								
	5/16" (007)	7/16" (01)	9/16" (02)	3/4" (04)	7/8" (06)	1-1/16" (09)	1-1/4" (12)	1-1/2" (17)	2" (31)
Shaft bearing	RD-50644	RD-50645	RD-48996	RD-48997	RD-50646	RD-48998	RD-50647	RD-48999	RD-50648
Shaft wiper	N/A	N/A	RD-22720	RD-23079	RD-15679	RD-23086	RD-50656	RD-16174	RD-50657
Tube seal	RD-1476	RD-22653	RD-13012	RD-1078	RD-10050	RD-48874	RD-50769	RD-1147	RD-50770
Carriage bearing	RD-51006	RD-51007	RD-41631	RD-41633	RD-51433	RD-41635	RD-51434	RD-41637	RD-51438
Carriage wiper	N/A	RD-49806	RD-47191	RD-47192	RD-49805	RD-47193	RD-49804	RD-47194	RD-49803
Piston bearing	N/A	N/A	RD-41632	RD-41634	RD-51435	RD-41636	RD-51436	RD-41638	RD-51439
Piston seal	RD-13970-T	RD-13435-T	RD-45616	RD-45621	RD-50651	RD-45622	RD-50652	RD-45623	RD-50653
Piston bumper	RD-50468	RD-50469	RD-33072	RD-33073	RD-33073	RD-33071	RD-33071	RD-33076	RD-36326
Shaft bumper	RD-50802	RD-50803	RD-50279	RD-50280	RD-50804	RD-50281	RD-50805	RD-50282	RD-50806
Shaft washer	RD-50797	RD-50798	RD-50283	RD-50284	RD-50799	RD-50285	RD-50800	RD-50286	RD-50801
Body[1]	KUB-007	KUB-01	KUB-02	KUB-04	KUB-06	KUB-09	KUB-12	KUB-17	KUB-31
Guide Rods[1]	KUG-007	KUG-01	KUG-02	KUG-04	KUG-06	KUG-09	KUG-12	KUG-17	KUG-31
Switch Track[1]-T	KUT-007	KUT-01	KUT-02	KUT-04	KUT-06	KUT-09	KUT-12	KUT-17	KUT-31
Switch Track[1]-U	KUU-007	KUU-01	KUU-02	KUU-04	KUU-06	KUU-09	KUU-12	KUU-17	KUU-31
Repair kit[2]	KU-007	KU-01	KU-02	KU-04	KU-06	KU-09	KU-12	KU-17	KU-31

[1] Option-B must be included at the end of part number if bumpers are being used with the Ultran Slide. (i.e., KUT-007-B)

[2] Includes required quantity of all except bumpers, oil service piston seals, bodies, guide rods and switch track, which are sold separately. Consult your local stocking IMI Bimba distributor for prices.