



## MINIMATIC® CYLINDER



Clippard offers more types of miniature pneumatic cylinders for the designer's convenience, including: spring return, spring extend, air retract, double-acting and double rod models. From sub-miniature (5/32" bore) to heavy duty (1 1/8" bore), the extensive Clippard line provides a wide selection of bore sizes to suit any application requirement. An even wider range of strokes are available in the complete Clippard line of miniature cylinders, in stroke sizes ranging from 1/4" to 20".



## FEATURES

- Buna-N "U"-cup rod seals for smooth leakproof operation
- Buna-N "U"-cup piston seals for full power, low friction and trouble-free performance
- Rods are threaded and bonded to piston
- The original miniature pneumatic cylinder
- 100% tested
- Pneumatic & hydraulic performance
- Sturdy, compact and long life
- Temperature range: 30° F to 180° F

The Clippard line offers numerous choices in the mounting of Clippard Minimatic® cylinders. The cylinders are provided in several types of mounting styles including plain end, stud mount, block

mount, and clevis mount (male and female). In addition, a complementary line of mounting hardware, including brackets, male and female clevises and Clippard's Minimatic® super structures are available for almost any application.



Clippard cylinders are of original design, pioneered by the world's most experienced manufacturer of miniature pneumatic equipment. They are of the finest OEM quality, fully tested for outstanding performance and long life. Special steps in manufacture insure the high quality of Clippard cylinders. These include: ground, polished and roller burnished rods to protect seals and provide smooth action; tube ID precision through "ballizing"

with carbide precision balls; high precision screw machine parts manufacture, based on concentric design that lends itself to close tolerance machining. The reputation Clippard has earned in the field is a result of our policy to test every cylinder (100%) we manufacture.

## Every Cylinder is 100% tested

Delrin® and Viton® are registered trademarks of Du Pont

### Cylinder Tubes:

Machined from heavy wall, cold-drawn brass tubing; ballized internally for precise size, fine finish and low seal friction; 1 1/8" bore: hard coat aluminum

### Piston Rods:

Except where otherwise specified, all rods are stainless steel, ground, polished and roller burnished for long seal life, low friction and smooth action

### Pistons:

Brass in all models except aluminum in 7/8" bore single acting series

### Springs:

Stainless steel for long life and resistance to corrosion

### Seals:

Buna N compound, impervious to a wide range of hydraulic fluids, liquids, and gases; rod seals replaceable on models where applicable; piston seals replaceable only on threaded construction models

### Bumpers:

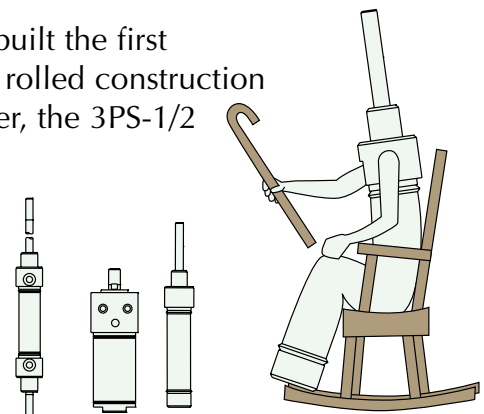
Resilient bumpers of Buna-N or polyurethane absorb shock, increase life and reduce noise level

### Finish:

All external brass parts are "bright-dipped" to resist corrosion and preserve finished appearance; 1 1/8" bore: hard coated aluminum with black oxide steel heads

### Did you know...

Clippard built the first miniature rolled construction air cylinder, the 3PS-1/2 in 1949.





# MINIMATIC® CYLINDER

Minimatic® Cylinders	Pg.	Engineering Data			Design Features						Remarks
		Medium	Force Factor	Rec. Max. Working Pres.	Piston Seals	Rod Seals	Rod Dia.	Rod End	Ports Tapped	Construction	
5/32" Bore Spring Return	85	Air	.02	150 psi	U-Cup		.062"	Plain	10-32 3-56	Rolled or Welded	45° Tapered rod end on SM-2 Spring force extend- 2 oz. Spring force compressed- 5 oz.
1/4" Bore 6.35 mm Spring Return	85	Air	.05	125 psi	U-Cup		.135"	Thd.	10-32	Rolled	Spring force extend- 6 oz. Spring force compressed-10 oz.
3/8" Bore Spring Return	86	Air	.10	125 psi	U-Cup		3/16"	Plain	10-32	RF Silver Soldered	Model 3PS-1/2 is rolled construction with non-rotating thd. brass rod, others; non-thd. stainless steel Spring force extend- 12 oz. Spring force compressed- 30 oz.
3/8" Bore Double Acting	87	Air & Hyd.	.10	125 psi -Air 500 psi -Hyd.*	U-Cup	Vee Ring	1/8"	Plain	10-32	RF Silver Soldered	
3/8" Bore Spring Extend Air Retract	86	Air	.10	125 psi	U-Cup		1/8"	Thd.	10-32	RF Silver Soldered	Min. of 14 psi to retract Spring force extend- 12 oz. Spring force compressed- 30 oz.
9/16" Bore Spring Return	88	Air	.22	125 psi	U-Cup		3/16"	Plain	10-32	RF Silver Soldered	9PS-3/4 & 9SS-3/4 have non- rotating, thd., stainless steel rods, others; non-thd., stainless steel Spring force extend- 1.6 oz. Spring force compressed- 3.7 oz.
9/16" Bore Double Acting	89	Air & Hyd.	.22	125 psi -Air 500 psi -Hyd.*	U-Cup	Vee Ring	3/16"	Plain	10-32	RF Silver Soldered	
9/16" Bore Spring Extend Air Retract	88	Air	.22	250 psi	U-Cup	Vee Ring	1/4"	Thd.	10-32	Threaded	Min. of 19 psi to retract Spring force extend- 2 lb. Spring force compressed- 4 lb.
9/16" Bore Heavy Duty Spring Return	90	Air	.20	250 psi	U-Cup		1/4"	Thd.	1/16" NPT	Threaded	Spring force extend- 2 lb. Spring force compressed- 4 lb.
9/16" Bore Heavy Duty Double Acting	91 **	Air & Hyd.	.20	250 psi -Air 1000 psi -Hyd.*	T- Ring	Vee Ring	1/4"	Thd.	1/16" NPT	Threaded	
7/8" Bore Spring Return	92	Air	.60	250 psi	U-Cup		1/4"	Thd.	1/8" NPT	Threaded	Sintered bronze rod bushing Spring force extend- 7 lb. Spring force compressed- 12 lb.
7/8" Bore Double Acting	93 **	Air & Hyd.	.60	250 psi -Air 1000 psi -Hyd.*	T- Ring	Vee Ring	1/4"	Thd.	1/8" NPT	Threaded	Sintered bronze rod bushing
7/8" Bore Spring Extend Air Retract	92	Air	.60	250 psi	U-Cup	Vee Ring	1/4"	Thd.	1/8" NPT	Threaded	Min. of 23 psi to retract Spring force extend- 7 lb. Spring force compressed- 12 lb.
1-1/8" Bore Double Acting	95 **	Air	1.0	250 psi	U-Cup	Vee Ring	3/8"	Thd.	1/8" NPT	Threaded	Sintered bronze rod bushing Low friction - 2 psi to operate
1-1/8" Bore Spring Return	94	Air	1.0	250 psi	U-Cup		3/8"	Thd.	1/8" NPT	Threaded	Spring force extend- 8 lb. Spring force compressed- 12 lb.

### Quick Cylinder Computations:

Cylinder Force = Force Factor x Pressure

Displacement = Force Factor x Stroke

(Force factor given in table above equals effective piston area)

\*\*NOTE: Double rods also available in these models.

Temperature: 30° F to +230° F

\*Consult factory for hydraulic applications

# SUB-MINIATURE MINIMATIC® CYLINDER

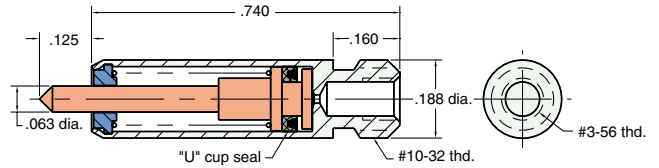


## SM-2

Single Acting

**Bore:** 5/32"  
**Mount:** Rear Thread  
**Type:** Spring Return

**Available Stroke Lengths:** 1/4  
**Materials:** Stainless steel body, piston & rod, Buna-N U-cup, Beryllium copper spring



## SM-3-□

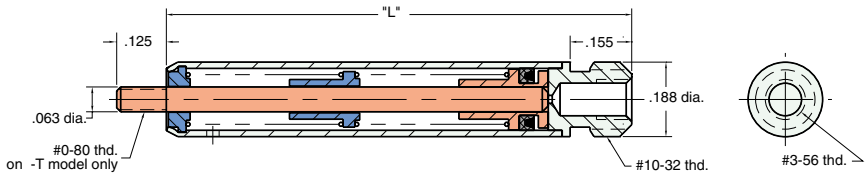
Single Acting

**Bore:** 5/32"  
**Mount:** Rear Thread  
**Type:** Spring Return

Model	SM-3-2	SM-3-3	SM-3-4
<b>Stroke</b>	1/2	3/4	1
<b>Length "L"</b>	1.171	1.593	2

**Materials:** Stainless steel tube and rod, brass piston, Buna-N U-cup

**To order:** Add stroke length to the end of the part number



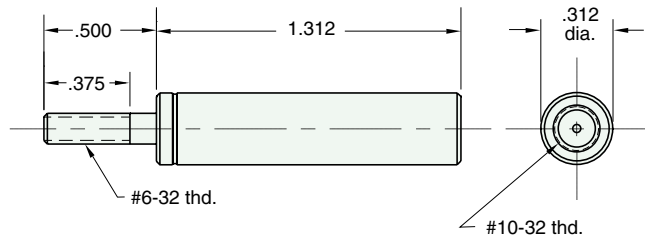
## SM-6

Single Acting

**Bore:** 1/4"  
**Mount:** Body\*  
**Type:** Spring Return

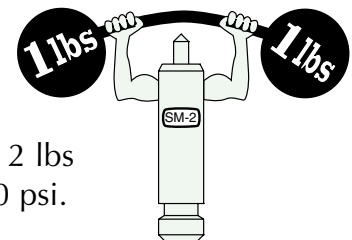
**Available Stroke Lengths:** 3/8  
**Materials:** Brass body, Buna-N U-cup, stainless steel piston & rod

\*Super structure recommended



Super structure 12327 pictured here is recommended for mounting the SM-6 cylinder. For more information see page 101.

### Did you know...



The tiny SM-2 cylinder gives 2 lbs of force at 100 psi.

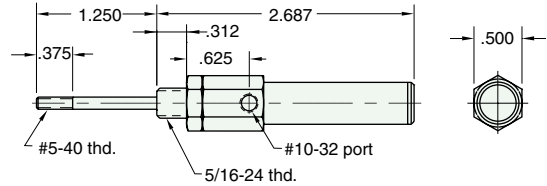


# 3/8" BORE BRASS MINIMATIC® CYLINDER

**3SS-AR-1/2**

**Mount:** Stud  
**Type:** Single Acting  
 Spring Extended

**Available Stroke Lengths:** 1/2



**3PS-1/2**

**Mount:** Body\*  
**Type:** Single Acting  
 Spring Return

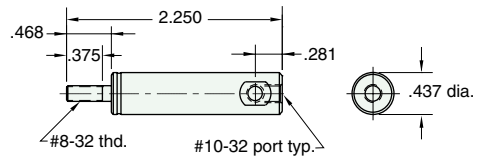
**Available Stroke Lengths:** 1/2

**Ports:** End or Side

Brass Rod - non-rotating

First Cylinder - 1949

\*Super Structure recommended



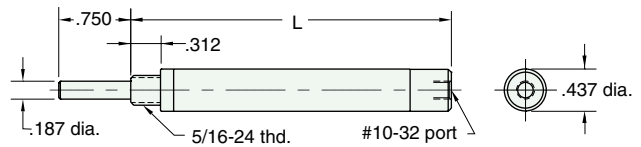
**3SS-□**

**Mount:** Stud  
**Type:** Single Acting  
 Spring Return

Stroke Length "L"	1/2	1	2	3
	2.093	3.343	5.218	7.093

**To order:** Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a 10-32 x 1/2" rod thread



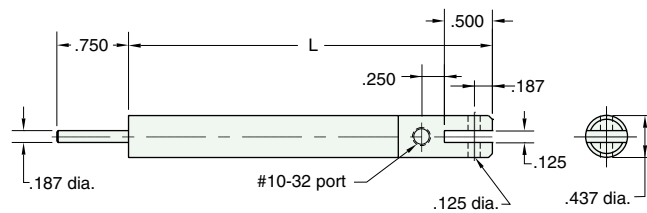
**3CS-□**

**Mount:** Clevis  
**Type:** Single Acting  
 Spring Return

Stroke Length "L"	1/2	1	2	3
	2.468	3.406	5.281	7.156

**To order:** Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a 10-32 x 1/2" rod thread



# 3/8" BORE BRASS MINIMATIC® CYLINDER

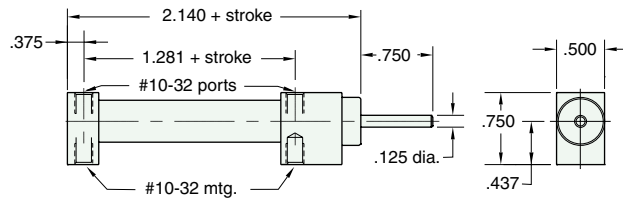


## 3BDS-□

**Mount:** Block      **Available Stroke Lengths:** 1, 2, 3, 4, 5, 6  
**Type:** Double Acting

**To order:** Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a 5-40 x 1/2" rod thread

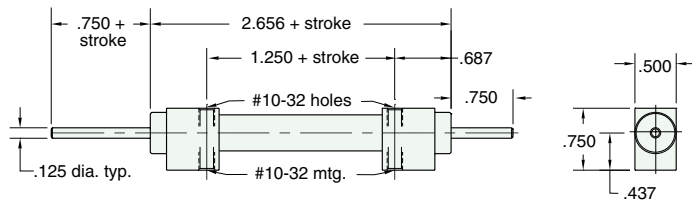


## 3BDD-□

**Mount:** Block      **Available Stroke Lengths:** 1, 2, 3, 4  
**Type:** Double Acting  
 Double Rod

**To order:** Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a 5-40 x 1/2" rod thread

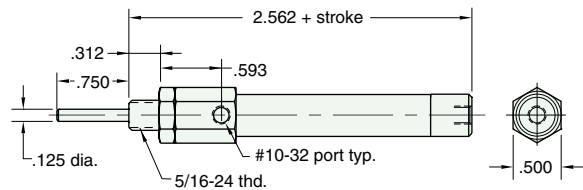


## 3SD-□

**Mount:** Stud      **Available Stroke Lengths:** 1, 2, 3, 4  
**Type:** Double Acting

**To order:** Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a 5-40 x 1/2" rod thread

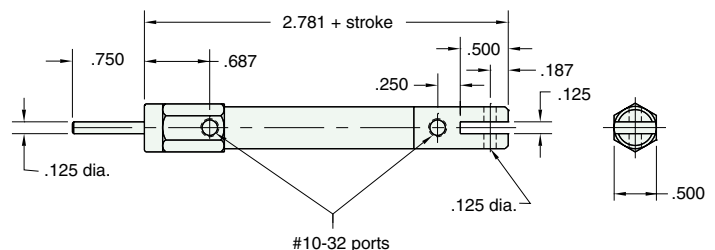


## 3CD-□

**Mount:** Clevis      **Available Stroke Lengths:** 1, 2, 3, 4  
**Type:** Double Acting

**To order:** Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a 5-40 x 1/2" rod thread



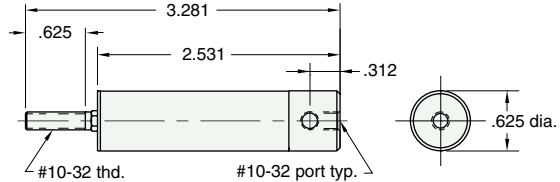


# 9/16" BORE BRASS MINIMATIC® CYLINDER

**9PS-3/4**

**Mount:** Body\*      **Available Stroke Lengths:** 3/4  
**Type:** Single Acting Spring Return      Non-Rotating Shaft

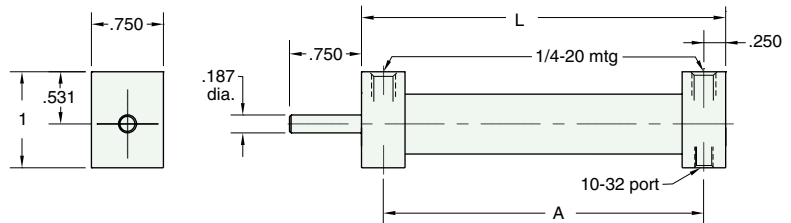
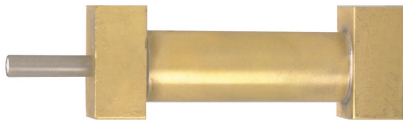
\*Super Structure recommended



**9BS-□**

**Mount:** Block      **Stroke**    3/4    1 1/2    2 1/4    3  
**Type:** Single Acting      **Length "L"**    2.750    4.218    5.593    6.937  
Spring Return      **"A"**    2.312    3.750    5.125    6.500      **To order:** Add stroke length to the end of the part number

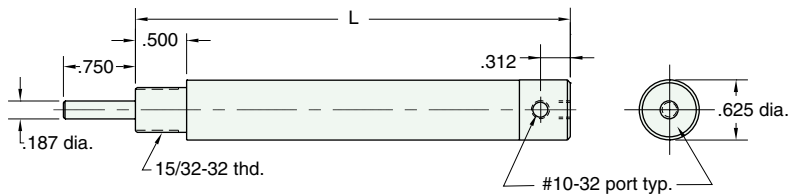
Add **-T** to the end of the part number after stroke for a 10-32 x 1/2" rod thread



**9SS-□**

**Mount:** Stud      **Stroke**    3/4    1 1/2    2 1/4    3  
**Type:** Single Acting      **Length "L"**    3.031    4.531    5.875    7.250  
Spring Return      **To order:** Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a 10-32 x 1/2" rod thread

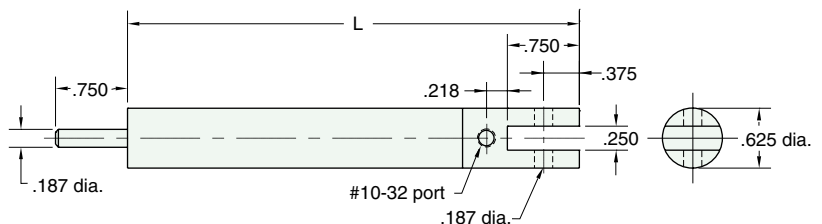


**Note:** On 3/4" stroke rod is hexagonal stainless steel (non-rotating) and threaded 10-32 x 5/8

**9CS-□**

**Mount:** Clevis      **Stroke**    3/4    1 1/2    2 1/4    3  
**Type:** Single Acting      **Length "L"**    3.343    4.687    6.062    7.406  
Spring Return      **To order:** Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a 10-32 x 1/2" rod thread



# 9/16" BORE BRASS MINIMATIC® CYLINDER

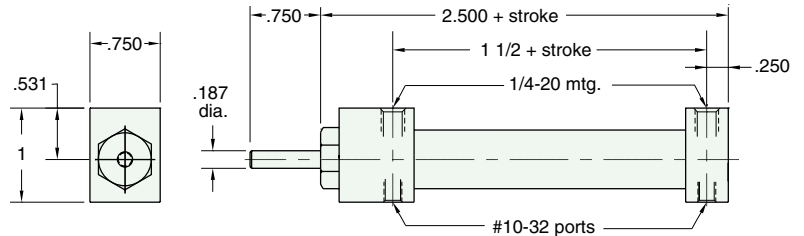
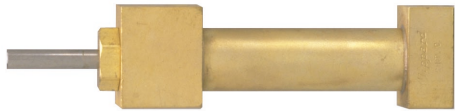


## 9BDS-□

**Mount:** Block      **Available Stroke Lengths:** 1, 2, 3, 4, 5, 6  
**Type:** Double Acting

**To order:** Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a 10-32 x 1/2" rod thread

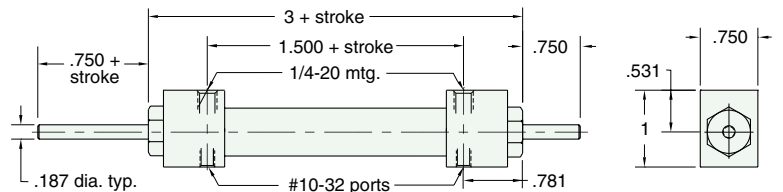


## 9BDD-□

**Mount:** Block      **Available Stroke Lengths:** 1, 2, 3, 4, 5, 6  
**Type:** Double Acting  
 Double Rod

**To order:** Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a 10-32 x 1/2" rod thread

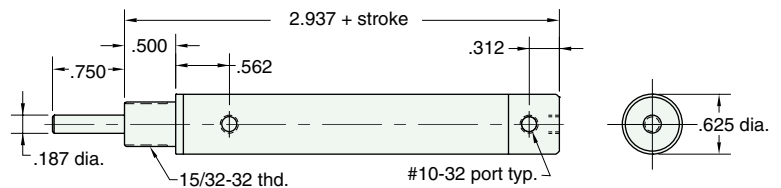


## 9SD-□

**Mount:** Stud      **Available Stroke Lengths:** 1, 2, 3, 4, 5, 6  
**Type:** Double Acting

**To order:** Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a 10-32 x 1/2" rod thread

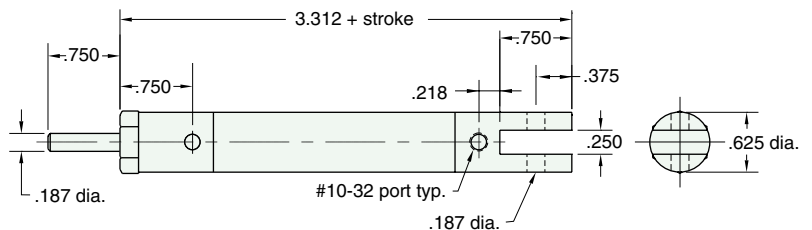
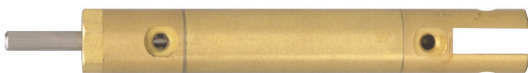


## 9CD-□

**Mount:** Clevis      **Available Stroke Lengths:** 1, 2, 3, 4, 5, 6  
**Type:** Double Acting

**To order:** Add stroke length to the end of the part number

Add **-T** to the end of the part number after stroke for a 10-32 x 1/2" rod thread





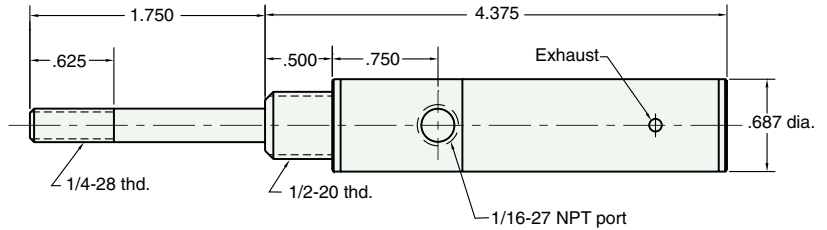


# 9/16" BORE BRASS HEAVY DUTY CYLINDER

## 9SS-AR-1

**Mount:** Stud  
**Type:** Single Acting  
 Spring Extended

**Available Stroke Lengths:** 1

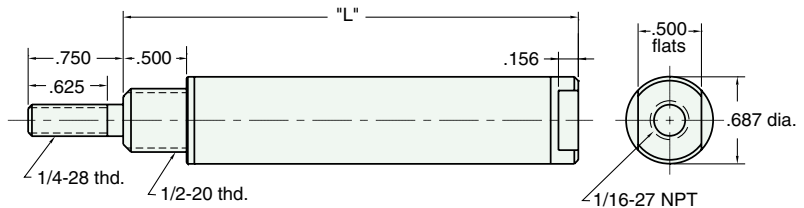


## H9S-□S

**Mount:** Stud  
**Type:** Single Acting  
 Spring Return

Stroke Length "L"	1	2	3
	3.593	5.250	6.906

**To order:** Indicate stroke in box □

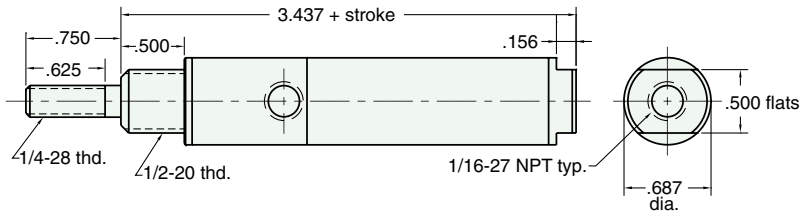


## H9S-□D

**Mount:** Stud  
**Type:** Double Acting

**Available Stroke Lengths:** 1, 2, 3, 4, 5, 6

**To order:** Indicate stroke in box □

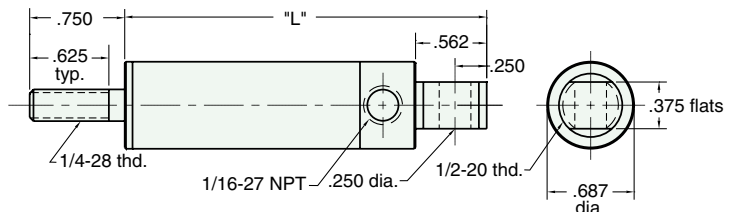


## H9C-□S

**Mount:** Clevis  
**Type:** Single Acting  
 Spring Return

Stroke Length "L"	1	2	3
	3.875	5.531	7.187

**To order:** Indicate stroke in box □



# 9/16" BORE BRASS HEAVY DUTY CYLINDER



Consult factory for hydraulic applications

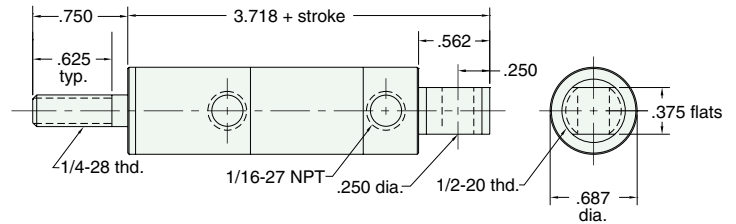
Note: Maximum recommended hydraulic working pressure for heavy duty cylinders is 1000 psig.

## H9C-□D

**Mount:** Clevis  
**Type:** Double Acting

**Available Stroke Lengths:** 1, 2, 3, 4, 5, 6

**To order:** Indicate stroke in box □

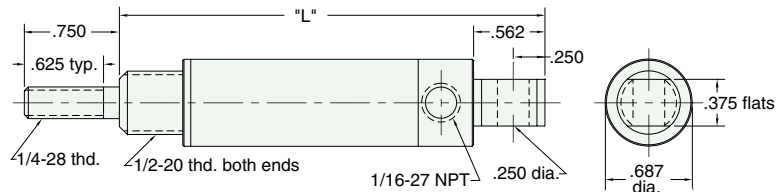


## H9U-□S

**Mount:** Universal  
**Type:** Single Acting Spring Return

Stroke Length "L"	1	2	3
	4.375	6.031	7.687

**To order:** Indicate stroke in box □

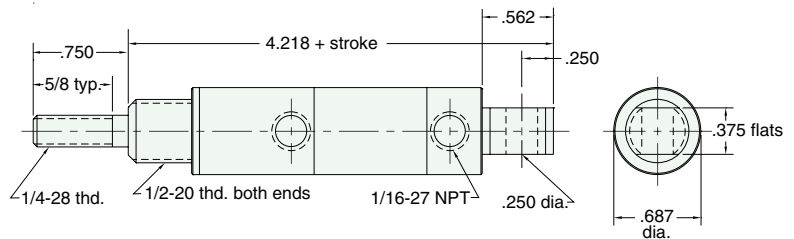


## H9U-□D

**Mount:** Universal  
**Type:** Double Acting

**Available Stroke Lengths:** 1, 2, 3, 4, 5, 6

**To order:** Indicate stroke in box □

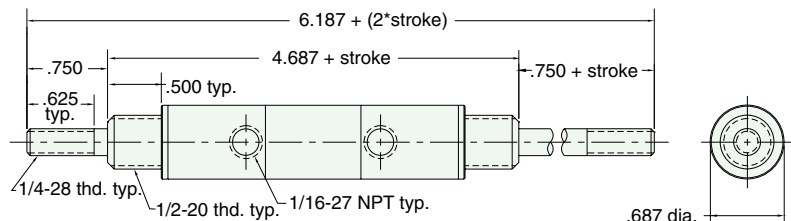
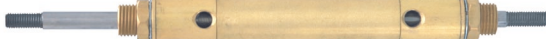


## H9D-□D

**Mount:** Stud  
**Type:** Double Acting Double Rod

**Available Stroke Lengths:** 1, 2, 3, 4, 5, 6

**To order:** Indicate stroke in box □





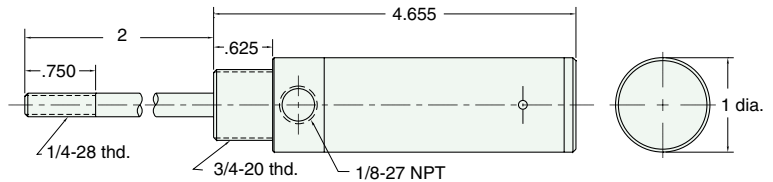
# 7/8" BORE BRASS HEAVY DUTY CYLINDER

Consult factory for hydraulic applications

**7SS-AR-1**

**Mount:** Stud  
**Type:** Single Acting  
Spring Extended

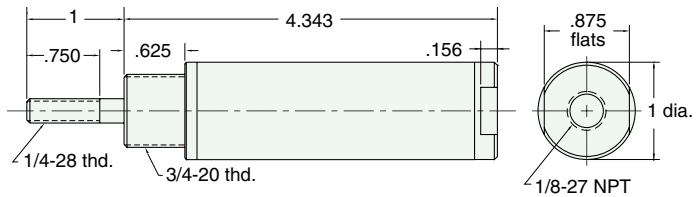
**Available Stroke Lengths:** 1



**7SS-1**

**Mount:** Stud  
**Type:** Single Acting  
Spring Return

**Available Stroke Lengths:** 1

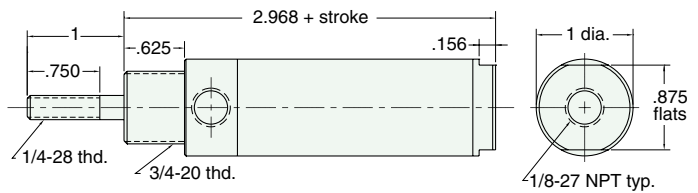


**7SD-□**

**Mount:** Stud  
**Type:** Double Acting

**Available Stroke Lengths:** 1, 2, 3, 5, 7, 9

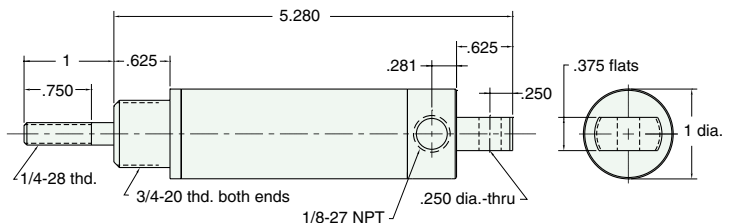
**To order:** Add stroke length to the end of the part number



**7S-1**

**Mount:** Universal  
**Type:** Single Acting  
Spring Return

**Available Stroke Lengths:** 1



# 7/8" BORE BRASS HEAVY DUTY CYLINDER



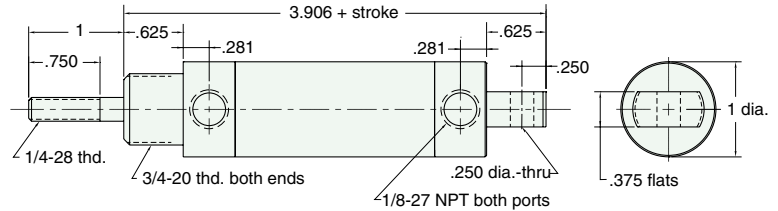
Consult factory for hydraulic applications

Note: Maximum recommended hydraulic working pressure for heavy duty cylinders is 1000 psig.

**7D-□**

**Mount:** Universal      **Available Stroke Lengths:** 1, 2, 3, 5, 7, 9  
**Type:** Double Acting

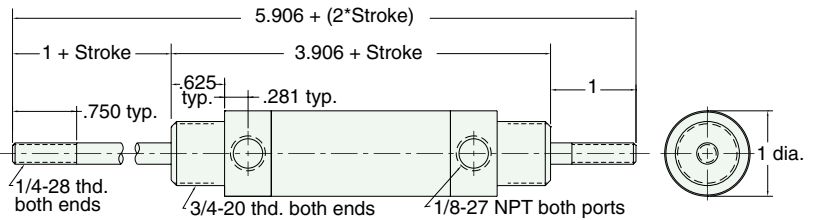
**To order:** Add stroke length to the end of the part number



**7DD-□**

**Mount:** Universal      **Available Stroke Lengths:** 1, 2, 3, 5, 7, 9  
**Type:** Double Acting  
 Double Rod

**To order:** Add stroke length to the end of the part number



## Did you know...

Leonard Clippard made the prototype cylinder piston seals by punching leather disks from his kids old shoe tongues.

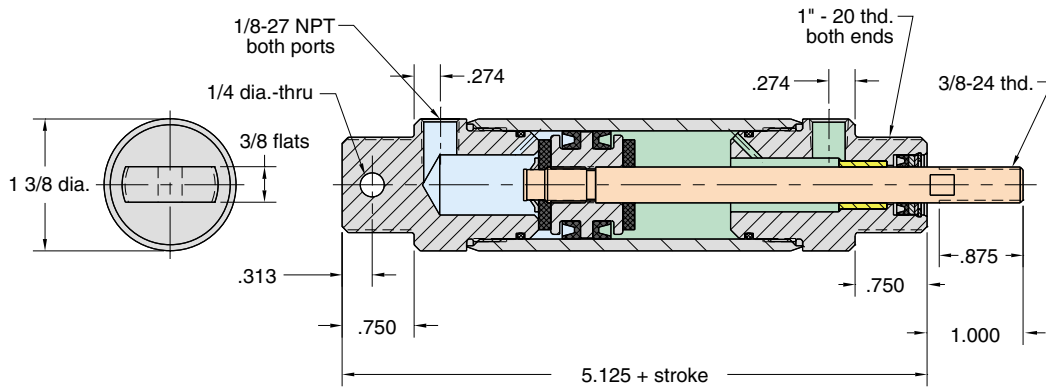




# 1 1/8" BORE HEAVY DUTY ALUMINUM CYLINDER

## Features

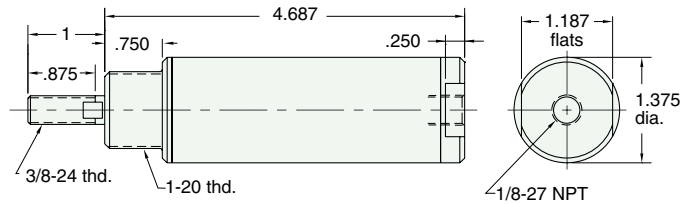
- Very low breakaway force - allows for a consistent stroke speed (no sudden jumps)
- Hard-anodized aluminum body - attractive, yet durable
- Force factor of 1 - 100 psig input provides 100 lbs. output force
- Available in many stroke lengths (even up to 8 ft. in special quantities!)
- Brass piston, stainless steel rod



**18SS-1**

**Mount:** Stud  
**Type:** Single Acting  
 Spring Return

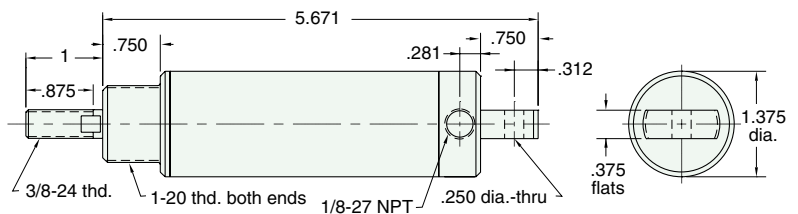
**Available Stroke Lengths:** 1



**18S-1**

**Mount:** Universal  
**Type:** Single Acting  
 Spring Return

**Available Stroke Lengths:** 1



# 1 1/8" BORE HEAVY DUTY ALUMINUM CYLINDER

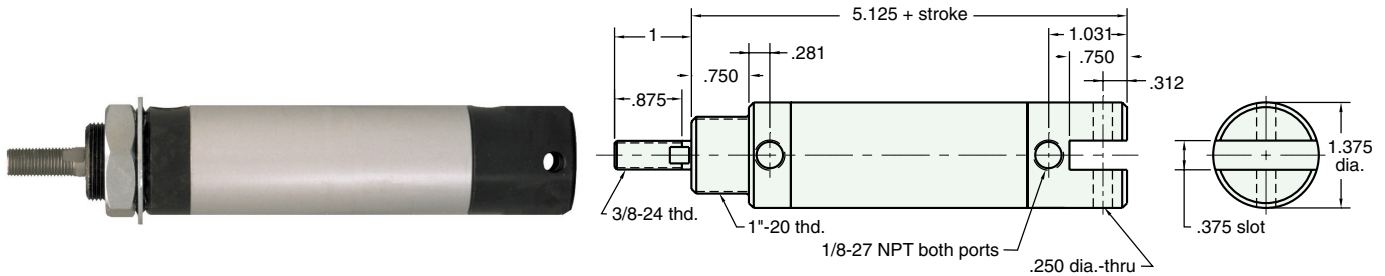


## 18CSD-□

**Mount:** Clevis  
**Type:** Double Acting

**Available Stroke Lengths:** 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20

**To order:** Add stroke length to the end of the part number

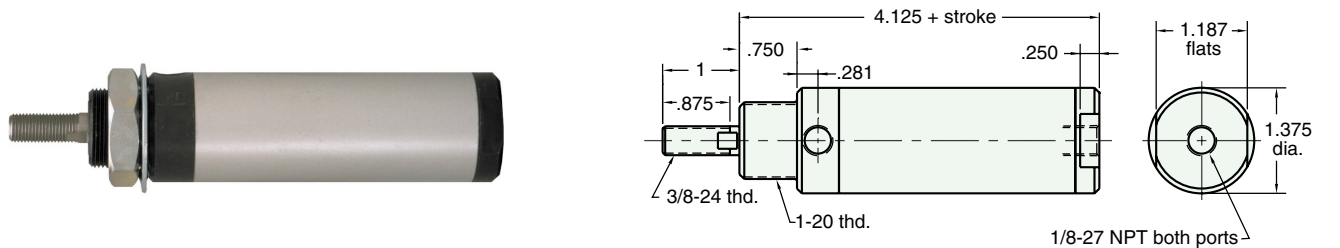


## 18SD-□

**Mount:** Stud  
**Type:** Double Acting

**Available Stroke Lengths:** 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20

**To order:** Add stroke length to the end of the part number

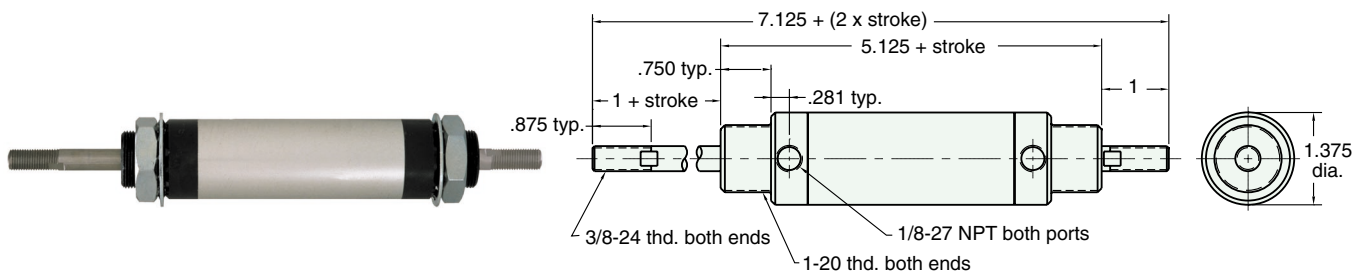


## 18DD-□

**Mount:** Stud  
**Type:** Double Acting  
Double Rod

**Available Stroke Lengths:** 1, 2, 3, 6

**To order:** Add stroke length to the end of the part number

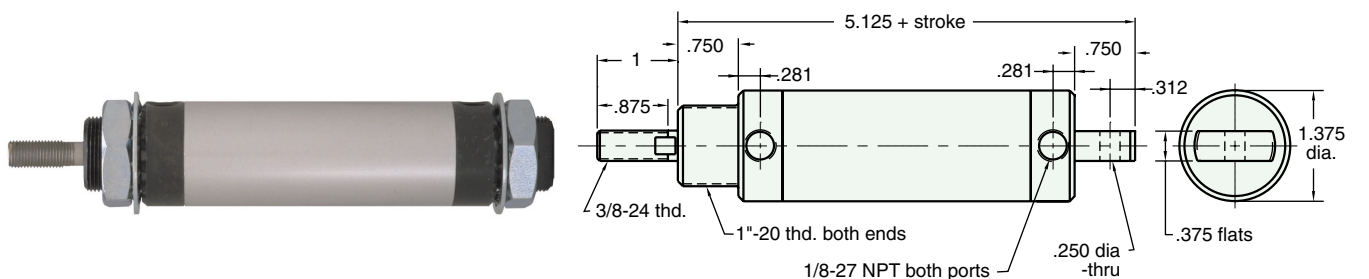


## 18D-□

**Mount:** Universal  
**Type:** Double Acting

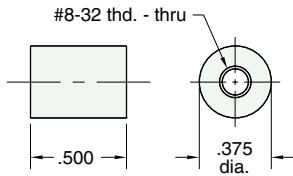
**Available Stroke Lengths:** 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20

**To order:** Add stroke length to the end of the part number



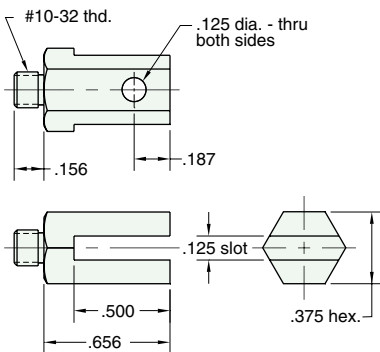
**11767**

**Ceramic Insulator**  
Use with cylinder having 8-32 threaded shaft to insulate cylinder from heat or electricity



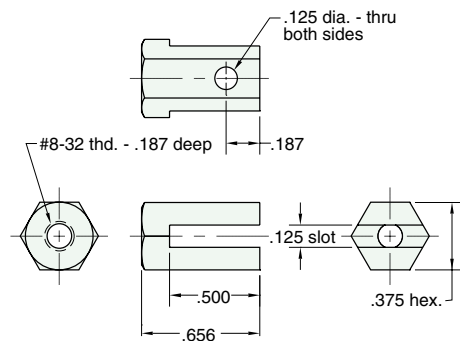
**11996**

**Male Clevis**  
Mounts in rear of cylinder tapped 10-32



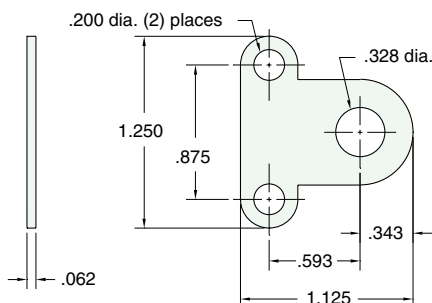
**11997**

**Female Clevis**  
Use with cylinder having 8-32 threaded shaft



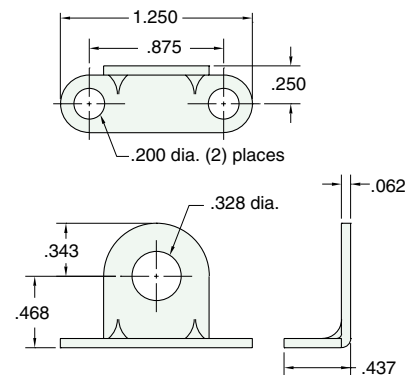
**11917-2**

**Mounting Bracket (flat)**



**11918-2**

**Mounting Bracket (angled)**



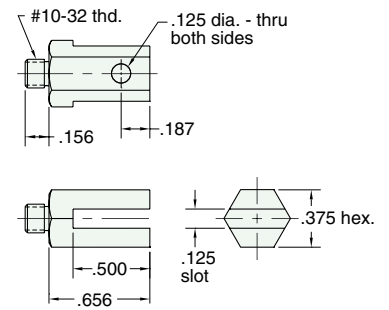
# 9/16" BORE MOUNTING BRACKETS



## 11996

Male Clevis

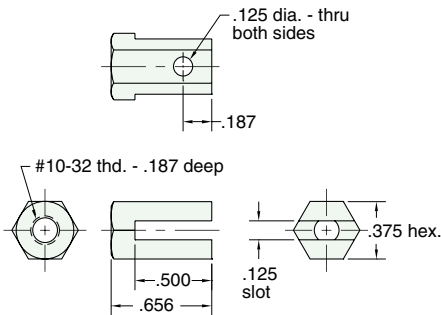
Mounts in rear of cylinder tapped 10-32



## 15009

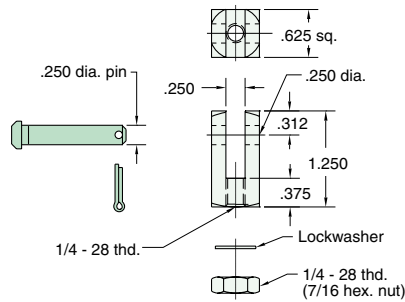
Female Clevis

For use with cylinders having 10-32 threaded shaft



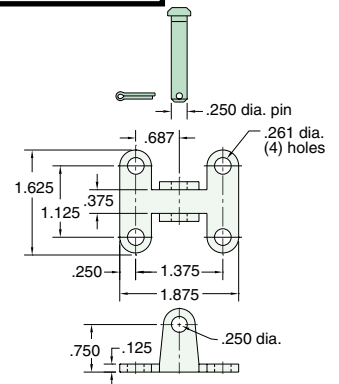
## 15015

Rod Clevis Assembly



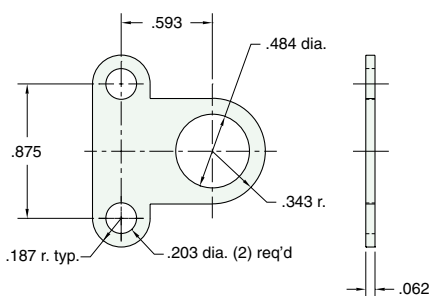
## 15019

Clevis Mounting Bracket



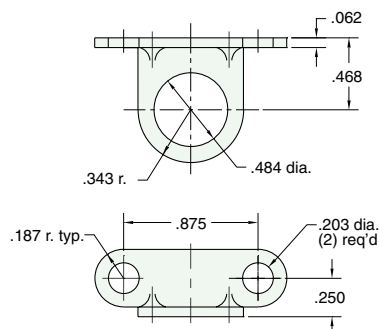
## 11917-1

Mounting Bracket (flat)



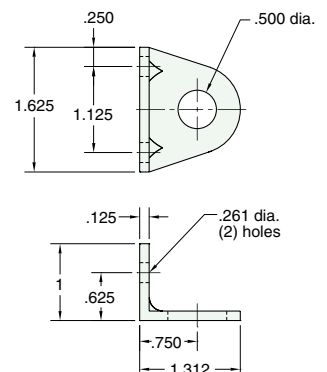
## 11918-1

Mounting Bracket (angled)



## 15018-2

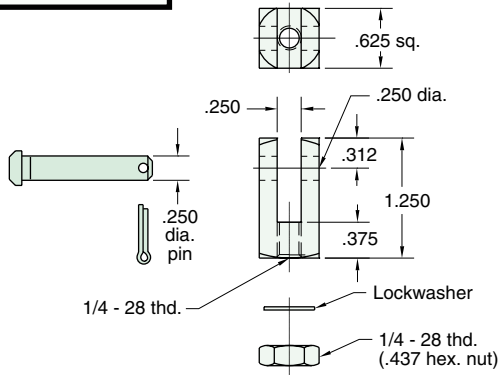
Mounting Bracket (angled)





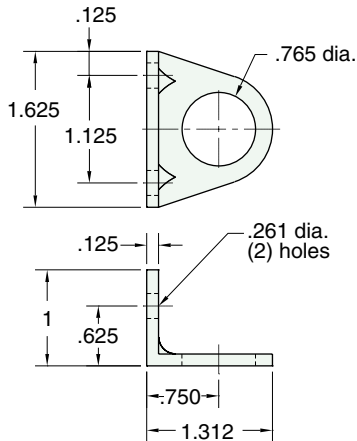
## 15015

Rod Clevis Assembly



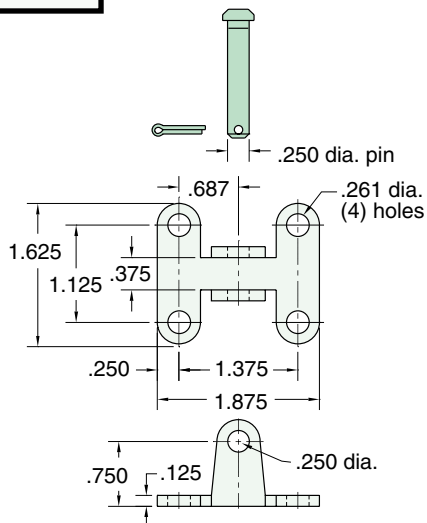
## 15018-1

Foot Mounting Bracket

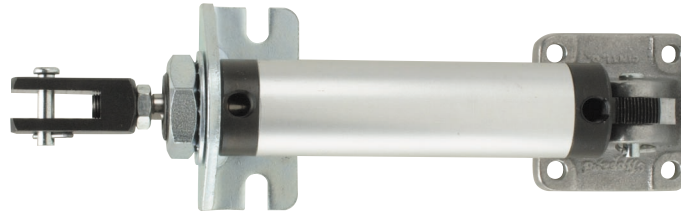


## 15019

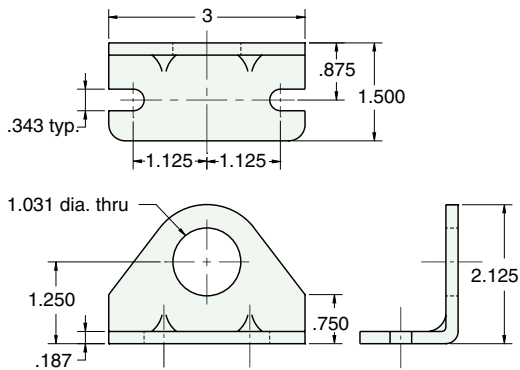
Clevis Mounting Bracket



# 1 1/8" BORE MOUNTING BRACKETS

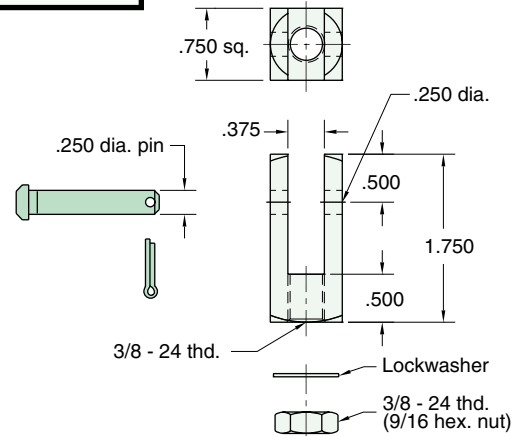


**FB-2891**



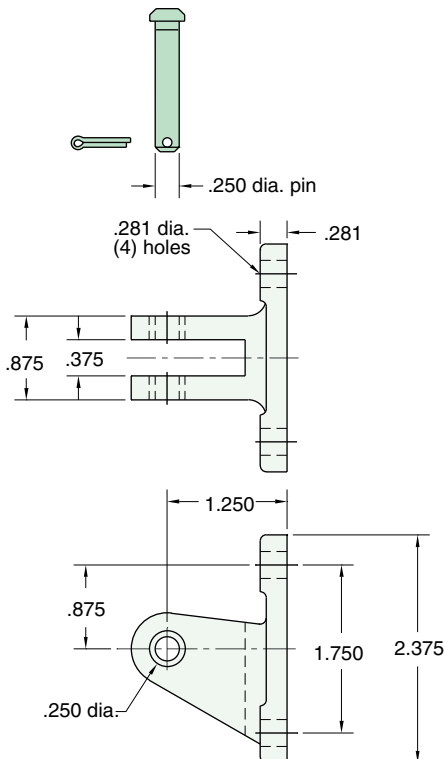
**12346**

Rod Clevis Assembly



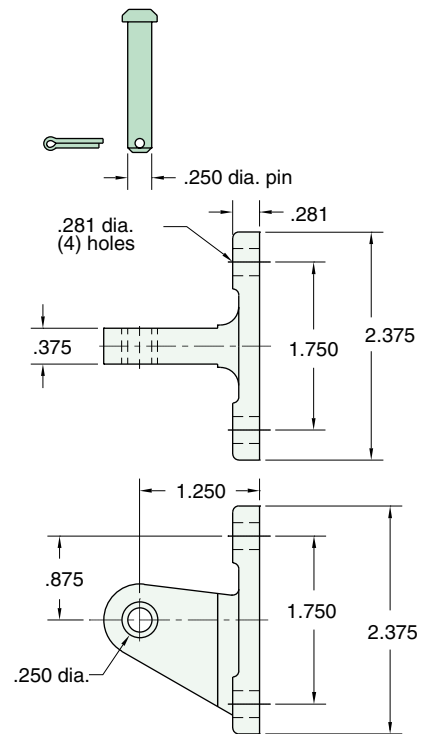
**12456**

Female Clevis Mounting Bracket



**12458**

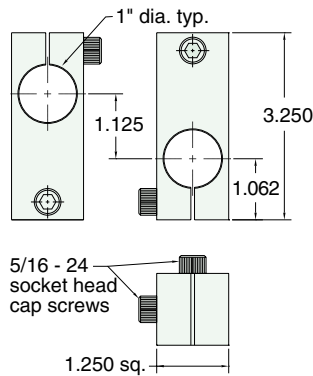
Male Clevis Mounting Bracket



Here's a building block concept to speed construction of small equipment, fixtures, jigs and tooling. Machined steel blocks adapt to any position on the column and base. Offset extensions are provided through use of fixture and block mounting shafts of various lengths. Use of proper size brass slotted adapter permits mounting small bore cylinders or other parts. Column base is drilled for mounting. The Super Structure is extremely solid and secure, yet fully adjustable.

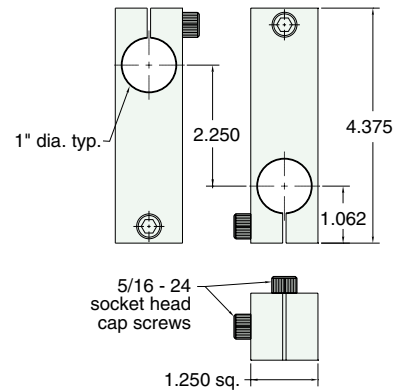
## 12361

Perpendicular mounting block  
(black oxide finished steel)



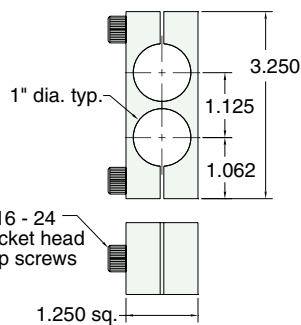
## 12362

Perpendicular mounting block  
(black oxide finished steel)



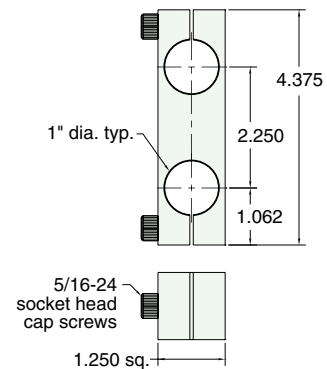
## 12363

Inline mounting block  
(black oxide finished steel)



## 12364

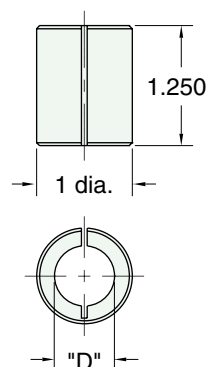
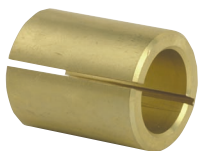
Inline mounting block  
(black oxide finished steel)



## 12365-□

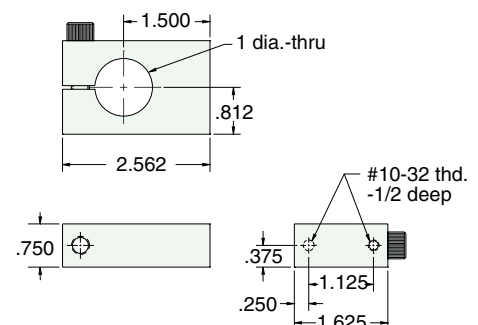
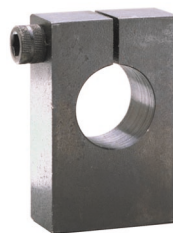
Part #	12365-1	12365-2	12365-3
"D" dia.	.437	.625	.687

Slotted adapters (brass)



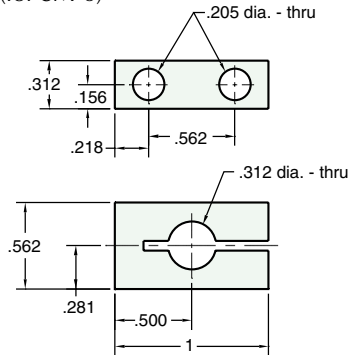
## 12369

Bracket mounting adapter block



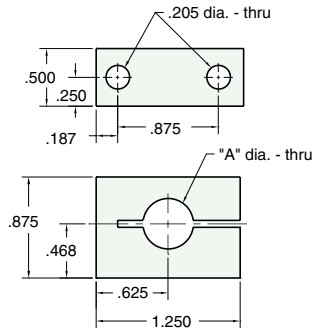
## 12327

Cylinder mounting squeeze block  
(for SM-6)



## 12326-□

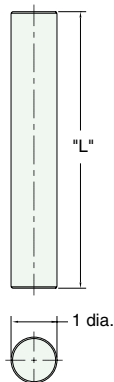
Cylinder mounting squeeze blocks  
(for 3/8" & 9/16" standard bore)



Part #	"A"	
12326-1	5/8	(for 9/16 stand. bore cylinder)
12326-2	7/16	(for 3/8 stand. bore cylinder)

## 12366-□

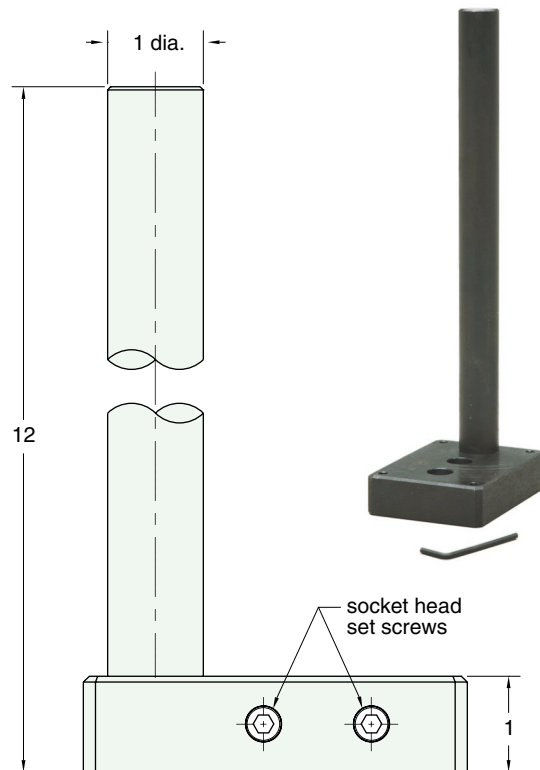
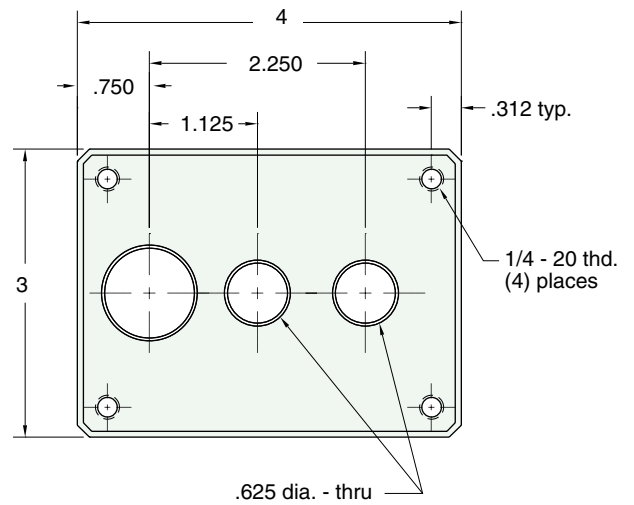
Fixture and bracket mounting shafts  
(black oxide finished steel)



Part #	"L"
12366-4	4"
12366-6	6"
12366-8	8"
12366-10	10"
12366-12	12"
12366-14	14"
12366-16	16"
12366-18	18"
12366-20	20"

## CMB

Column and mounting base  
(black oxide finished steel)



## Miniature Swing-In Automated Arbor Press

